KeyView

Software Version 12.7

Filter SDK C Programming Guide

MICRO FOCUS

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Contents

Part I: Overview of Filter SDK

This section provides an overview of the Micro Focus KeyView Filter SDK and describes how to use the C implementation of the API.

Chapter 1: Introducing Filter SDK

This section describes the Filter SDK package.

Overview

Micro Focus KeyView Filter SDK enables you to incorporate text extraction functionality into your own applications. It extracts text and metadata from a wide variety of file formats on numerous platforms, and can automatically recognize over 1000 document types. It supports both file-based and stream-based I/O operations, and provides in-process or out-of-process filtering.

Filter SDK is part of the KeyView suite of products. KeyView provides high-speed text extraction, conversion to web-ready HTML and well-formed XML, and high-fidelity document viewing.

Features

- Document readers are threadsafe. The benefit of a threadsafe technology is that you can successfully extract text from hundreds of documents simultaneously. Documents are not queued for sequential filtering, but are actually filtered at the same time.
- Filter supports popular word processing, spreadsheet, and presentation formats. Body text, endnotes, footnotes, and additional items such as document metadata are all included as part of the filtering process.
- Sample programs are provided to demonstrate the functionality of the APIs.
- You can extract files embedded within files, such as email attachments or embedded OLE objects, by using the File Extraction API.
- You can configure memory management. If using the C API, you can provide your own memory allocator to the document readers.
- Filter allows for redirected input and output. You can provide an input stream that is not restricted to file system access.

- Filter automatically recognizes the file type being filtered and uses the appropriate filter. Your application does not need to rely on file name extensions to determine file types.
- You can filter documents to specific character encodings, such as Unicode or UTF-8.
- You can write custom document readers for formats not directly supported by KeyView.

Platforms, Compilers, and Dependencies

This section lists the supported platforms, supported compilers, and software dependencies for the KeyView software.

Supported Platforms

- CentOS 7 x86 and x64
- FreeBSD 8.1 x86
- IBM AIX L6.1 PowerPC 32-bit and 64-bit
- IBM AIX L7.1 PowerPC 32-bit and 64-bit
- macOS 10.13 or later on 32- and 64-bit Apple-Intel architecture
- Microsoft Windows Server 2012 x64
- Microsoft Windows Server 2016 x64
- Microsoft Windows Server 2019 x64
- Microsoft Windows 7 x86 and x64
- Microsoft Windows 8 x86 and x64
- Microsoft Windows 10 x64
- Oracle Solaris 10 SPARC
- Oracle Solaris 10 x86 and x64
- Red Hat Enterprise Linux 6 x86 and x64
- Red Hat Enterprise Linux 7 x64
- Red Hat Enterprise Linux 8 x64
- SuSE Linux Enterprise Server 11 x86 and x64
- SuSE Linux Enterprise Server 12 x64
- SuSE Linux Enterprise Server 15 x64

Supported Compilers

Platform	Architecture	Compiler Name	Compiler Version
Microsoft Windows	x86	cl	Microsoft 32-bit C/C++ Optimizing Compiler Version 16.00.30319.01 for x86
	x64	cl	Microsoft C/C++ Optimizing Compiler Version 16.00.30319.01 for x64
Sun Solaris	x86 64-bit	Sun Studio 12	Sun C 5.9 SunOS_i386 Patch 124868-01 2007/07/12
	SPARC 64-bit	Sun Studio 11	Sun C 5.8 Patch 121015-06 2007/10/03
Linux	x86	gcc / g++	3.4.3 (Redhat 4), 4.1.0 (SuSE Linux 10)
	x64	gcc / g++	4.1.0 (Redhat 4), 4.1.0 (SuSE Linux 10)
IBM AIX	Power	xlC_r / cc_r	IBM XL C/C++ Enterprise Edition V8.0
macOS	Apple-Intel 32-bit and 64-bit	LLVM	Apple LLVM 5.1 (clang-503.0.40) (based on LLVM 3.4svn)
FreeBSD	BSD x86	gcc / g++	4.2.1 [FreeBSD] 20070719

Supported Compilers for Java Components

Component	Compiler
Java components	Java 7

Software Dependencies

Some KeyView components require specific third-party software:

- Java Runtime Environment (JRE) or Java Software Developer Kit (JDK) version 7 is required for Java API and graphics conversion in Export SDK.
- Outlook 2002 or later is required to process Microsoft Outlook Personal Folders (PST) files using the MAPI-based reader (`pstsr`). The native PST readers (`pstxsr` and `pstnsr`) do not require Outlook.

  > **NOTE:** You must install an edition of Microsoft Outlook (32-bit or 64-bit) that matches the KeyView software. For example, if you use 32-bit KeyView, install 32-bit Outlook. If you use

> 64-bit KeyView, install 64-bit Outlook.
>
> If the editions do not match, KeyView returns `Error 32: KVError_PSTAccessFailed` and an error message from Microsoft Office Outlook is displayed: `Either there is a no default mail client or the current mail client cannot fulfill the messaging request. Please run Microsoft Outlook and set it as the default mail client.`

- Lotus Notes or Lotus Domino is required for Lotus Notes database (NSF) file processing. The minimum requirement is 6.5.1, but version 8.5 is recommended.
- The Microsoft .NET Framework is required if you are using the .NET implementation of the API.
- Microsoft Visual C++ 2019 Redistributables (Windows only).

Windows Installation

To install the SDK on Windows, use the following procedure.

To install the SDK

1. Run the installation program, `KeyView`*`ProductName`*`SDK_`*`VersionNumber_OS`*`.exe`, where *`ProductName`* is the name of the product, *`VersionNumber`* is the product version number, and *`OS`* is the operating system.

   For example:

   `KeyViewFilterSDK_12.7_Windows_X86_64.exe`

   The installation wizard opens.
2. Read the instructions and click **Next**.

   The License Agreement page opens.
3. Read the agreement. If you agree to the terms, click **I accept the agreement**, and then click **Next**.

   The Installation Directory page opens.
4. Select the directory in which to install the SDK. To specify a directory other than the default, click  , and then specify another directory. After choosing where to install the SDK, click **Next**.

   The Pre-Installation Summary opens.
5. Review the settings, and then click **Next**.

   The SDK is installed.
6. Click **Finish**.

UNIX Installation

To install the SDK, use one of the following procedures.

To install the SDK from the graphical interface

- Run the installation program and follow the on-screen instructions.

To install the SDK from the console

1. Run the installation program from the console as follows:

   `./KeyViewFilterSDK_`*`VersionNumber_Platform`*`.exe --mode text`

   where:

`VersionNumber`	is the product version.
`Platform`	is the name of the platform.

2. Read the welcome message and instructions and press `Enter`.

   The first page of the license agreement is displayed.

3. Read the license information, pressing `Enter` to continue through the text. After you finish reading the text, and if you accept the agreement, type **`Y`** and press `Enter`.

   You are asked to choose an installation folder.

4. Type an absolute path or press `Enter` to accept the default location.

   The Pre-Installation summary is displayed.

5. If you are satisfied with the information displayed in the summary, press `Enter`.

   The SDK is installed.

Package Contents

The Filter SDK installation contains:

- All the libraries and executables necessary for extracting text from a wide variety of formats.
- The include files that define the functions and structures used by the application to establish an interface with Filter:

`adapi.h`	`kvfilter.h`
`adinfo.h`	`kvioobj.h`
`kvcfsr.h`	`kvtoken.h`
`kvcharset.h`	`kvtypes.h`
`kverrorcodes.h`	`kvxtract.h`

```
kvfilt.h            kwautdef.h
kvfilt2.h
```

- The Java API implemented in the package `com.verity.api.filter` contained in the file `KeyView.jar`.
- The .NET API implemented in the namespace `Autonomy.API.Filter` in the library `FilterDotNet.dll`.
- The C++ SDK, which can be found in the `cppapi` folder.
- Sample programs that demonstrate File Extraction and Filter functionality using the APIs.
- The files necessary to create a custom document reader, and the source for a sample document reader for UTF-8. See Develop a Custom Reader, on page 345.

License Information

Your license key controls whether you have the full version of the KeyView SDK, or a trial version. It also determines whether the following advanced features are enabled:

- Advanced character set detection with the character set detection library (`kvlangdetect`).
- Advanced document readers:
  - Microsoft Outlook Personal Folders (PST) readers (`pstsr`, `pstnsr`, and `pstxsr`)
  - Lotus Notes database (NSF) reader (`nsfsr`)
  - Mailbox (MBX) reader (`mbxsr`)
- Processing of documents protected by Microsoft RMS encryption.

If you obtain a new license key from Micro Focus, you must update the licensing information that you pass to KeyView. See Pass License Information to KeyView.

Enable Advanced Document Readers

To enable advanced readers, you must obtain an appropriate license key from Micro Focus and pass the license key to KeyView as described in Pass License Information to KeyView.

If you are enabling the MBX reader in an existing installation of Filter, in addition to updating the license key, change the parameter `208=eml` to `208=mbx` in the `formats.ini` file.

Pass License Information to KeyView

To provide license information to KeyView, do one of the following:

- Provide the license information through the API. Micro Focus recommends using this approach.
- Provide the license information as a text file named `kv.lic`. In earlier versions of KeyView, license information had to be stored in a file and included in the `bin` folder with the KeyView

libraries. The ability to provide license information as a file has been deprecated and might be removed in future. You should no longer include license information in your application as a file. Micro Focus recommends that you pass license information to KeyView through the API instead.

If you have an evaluation version of KeyView and purchase a full version of the SDK, or you are adding a document reader (for example, the PST reader), you must update the license information that you pass to KeyView.

To provide license information through the API

- In the C API, provide license information when you initialize KeyView by calling `fpInitWithLicenseData()`.
- In the C++ API, provide license information when you start a new session (see the constructor for the `Session` class).
- In the .NET API, provide license information to KeyView when you instantiate the `Filter` object.
- In the Java API, provide license information to KeyView when you instantiate the `Filter` object.

To provide license information as a file

1. Open or create the license key file, `kv.lic`, in a text editor. The file must be saved in the same directory as the KeyView libraries, and must contain your organization name and license key.

   ```
   COMPANY NAME
   XXXXXXX-XXXXXXX-XXXXXXX-XXXXXXX
   ```

2. Replace the text *`COMPANY NAME`* with the company name that appears at the top of the License Key Sheet provided by Micro Focus. Enter the text exactly as it appears in the document.
3. Replace the characters *`XXXXXX-XXXXXXX-XXXXXXX-XXXXXXX`* with the appropriate license key from the License Key Sheet provided by Micro Focus. The license key is listed in the **Key** column in the **Standalone Products** table. The key is a string that contains 31 characters, for example, `2TQD22D-2M6FV66-2KPF23S-2GEM5AB`. Enter the characters exactly as they appear in the document, including the dashes, but do not include a leading or trailing space.
4. The finished `kv.lic` file looks similar to the following:

   ```
   Autonomy
   24QD22D-2M6FV66-2KPF23S-2G8M59B
   ```

5. Save the file.

Directory Structure

The following table describes the directories created during the Filter SDK installation. The variable *`install`* is the path name of the Filter installation directory (for example, `/usr/autonomy/KeyviewFilterSDK` on UNIX, or `C:\Program Files\Autonomy\KeyviewFilterSDK` on Windows).

The variable *OS* is the operating system for which the SDK is installed. For example, the `bin` directory on a standard 32-bit Windows installation would be located at `C:\Program Files\Autonomy\KeyviewFilterSDK\WINDOWS\bin`.

Installed directory structure

Directory	Description
*install**OS*\bin	Contains the libraries, the format detection file `formats.ini`, the license key file `kv.lic`, and other supporting files.
*install**OS*\lib	(Solaris installations only) Contains the redistributable `libstlport.so.1` library, which is required to run KeyView on Solaris platforms.
install\dotnetapi	Contains the source files for the .NET API.
install\dotnetapi\dotnethelp	Contains the help for the .NET API.
install\dotnetapi\sample	Contains the sample programs for the .NET API.
install\cppapi	Contains the source files for the C++ API.
install\cppapi\sample	Contains the sample programs for the C++ API.
install\guide	Contains the KeyView Filter SDK programming guides in PDF and HTML format.
install\include	Contains the header files required for Filter.
install\javaapi\javadoc	Contains the Javadoc for the Java API.
install\javaapi\sample	Contains the source files and sample programs for the Java API.
install\rel_notes	Contains the *KeyView Filter SDK Release Notes* in PDF format.
install\samples\filter	Contains a sample program demonstrating the Filter interface for the C API.
install\samples\filterca	Contains a C sample program demonstrating extraction of a content access stream.
install\samples\pdfini	Contains the initialization file used to extract custom metadata from PDF documents.
install\samples\tstxtract	Contains a C sample program demonstrating the File Extraction interface.
install\samples\utf8sr	Contains the source for the sample document reader for UTF-8 files. You can use this to create your own custom document readers.

Installed directory structure, continued

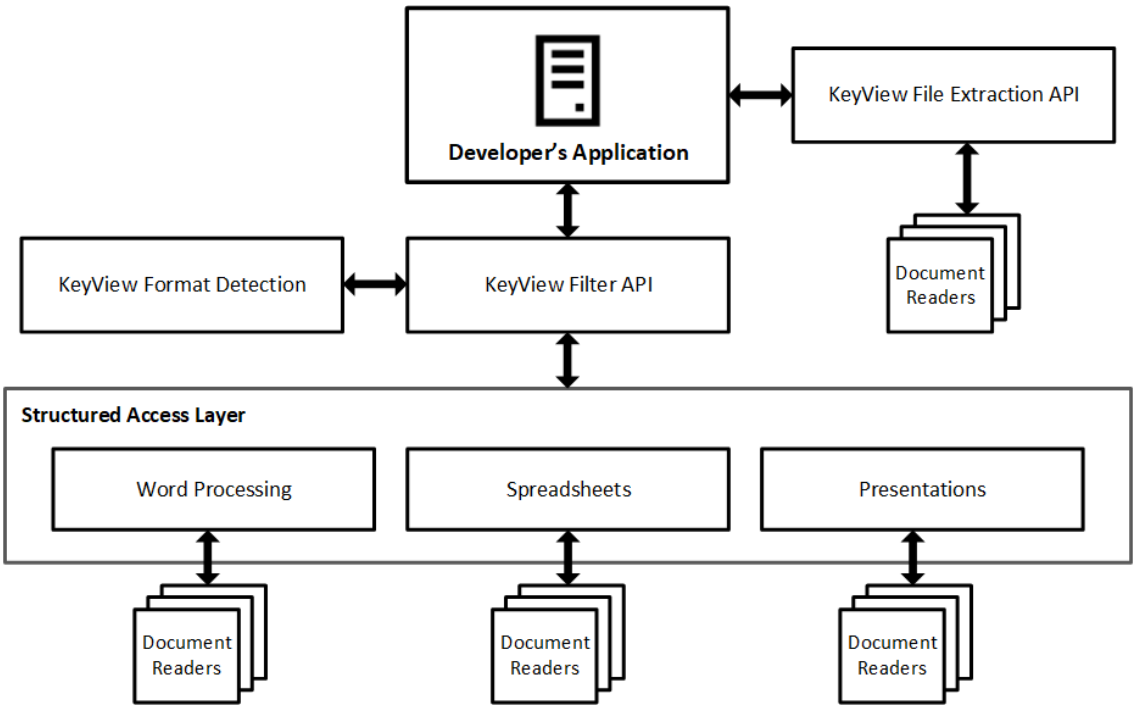
Directory	Description
install\samples\utf8sr\bin	Contains the C program `filtertest`. You can use this program to test your custom document readers. See Develop a Custom Reader, on page 345.

Chapter 2: Getting Started

This section provides an overview of Filter SDK, and describes how to use the C implementation of the API.

Architectural Overview

The general architecture of the KeyView Filter technology is the same across all supported platforms and is illustrated in the following diagram:



Each component is described in the following table.

Architectural Components

Component	Description
Developer's Application	The developer's application interfaces directly with the Filter API through either a C-language or Java implementation.
File Extraction API	The File Extraction API opens a file and extracts the file's subfiles so that they are exposed for filtering. See Use the File Extraction API, on page 35.
Filter API	The Filter API exposes the filtering functionality and controls all other modules during the filtering process. See Use the Filter API, on page 58.
Format Detection	This module determines the file type of the input stream, allowing the Filter API to return that information to the developer's application, or to load the appropriate structured access layer for further processing. See File Format Detection, on page 328 for more information on format detection.
Structured Access Layer	There are three modules that reside in the structured access layer—one each for word processing, spreadsheet, and presentation formats. The file detection result determines which structured access layer module is used during the filtering process. That module loads the appropriate document reader and proceeds with text extraction or metadata retrieval.
Document Readers	Each document reader reads a specific file format and sends a text stream of the document to the structured access layer. Each filter is loaded as required by the structured access layer. See Document Readers, on page 338 for a complete list of document readers.

File Caching

To reduce the frequency of I/O operations, and consequently improve performance, the KeyView readers load file data into memory. The readers then read the data from the cache rather than the physical disk. You can configure the amount of memory used for file caching through the `formats.ini` file. Generally, when you increase the memory, performance improves.

By default, KeyView uses a maximum of 1 MB of memory for each thread—assuming a thread contains only one instance of `pContext` that is returned from the session initialization (see fpInit(), on page 150 or fpInitWithLicenseData(), on page 152). If the file data is larger than 1 MB, up to 1 MB of data is cached and the data beyond 1 MB is read from disk. The minimum amount of memory that can be used for file caching is 64 KB.

To determine a reasonable value, divide the maximum amount of memory you want KeyView to use for file caching by the total number of threads. For example, if you want KeyView to use a maximum of 50 MB of memory and have 10 threads, set the value to 5 MB.

To modify the memory allocated for file caching, change the value for the following parameter in the `[DiskCache]` section of the `formats.ini` file:

```
DiskCacheSize=1024
```

The value is in kilobytes. If this parameter is not set or is set to 0 (zero), the minimum value of 64 KB is used.

Filtering

Filter SDK enables you to *filter* many different types of documents. Filtering is the process of extracting the text from a document without the application-specific markup. However, the filtering process can also include the following:

- Subfile extraction—this process exposes all subfiles for filtering. See Use the File Extraction API, on page 35.
- File format extraction—this process detects a file's format, and reports the information to the API, which in turn reports the information to the developer's application. See File Format Detection, on page 328.
- Metadata extraction—this process extracts selected metadata (document properties) from a file. See Extract Metadata, on page 61.
- Character set conversion—this process controls the character set of both the input and the output text. See Convert Character Sets, on page 64.

Subfile Extraction

To filter a file, you must first determine whether the file contains any subfiles (attachments, embedded OLE objects, and so on). A file that contains subfiles is called a *container* file. Archive files (such as ZIP), mail messages with attachments (such as Microsoft Outlook Express), mail stores (such as Microsoft Outlook Personal Folders), and compound documents with embedded OLE objects (such as a Microsoft Word document with an embedded Excel chart) are examples of container files.

If the file is a container file, the container must be opened and its subfiles extracted using the File Extraction interface. The extraction process is done repeatedly until all subfiles are extracted and exposed for filtering. After a subfile is extracted, you can use the Filter API to filter the file.

If a file is not a container, you should pass it directly to the Filter API for filtering without extraction.

The tstxtract sample program demonstrates the application logic for extracting and filtering files. See Use the File Extraction API, on page 35 for more information.

Memory Abstraction

Dynamic memory allocations in the Filter modules are abstracted through a C interface. This memory allocation interface is defined in the `KVMemoryStream` structure in `kvtypes.h`. You can override all memory allocations by providing a C structure that contains pointers to functions identical in nature to their standard ANSI C counterpart.

Use the C-Language Implementation of the API

The C-language implementation of the Filter API is divided into the following function suites:

- File Extraction API Functions—Open and extract subfiles in a container file. These functions also extract metadata and file format information, and control character set conversion on extraction. The tstxtract sample program demonstrates these functions.
- Filter API Functions—Extract document information (metadata character set, format), create an input/output stream, and filter a file or stream. The filter sample program demonstrates these functions.

Input/Output Operations

In Filter, the source input can be either a physical file accessed through a file path, or a filter stream created from a data source. A *filter stream* in the C API implementation is a C data structure that contains pointers to I/O functions similar to their standard ANSI C counterparts. This structure is passed to filter functions in place of the standard input source. See KVInputStream.

You can create an input stream by using the fpFiletoInputStreamCreate() function, or by using code similar to the code in the Filter sample program. The `fpFiletoInputStreamCreate()` function assigns C equivalent I/O functions to `fpOpen()`, `fpRead()`, `fpSeek()`, `fpTell()`, and `fpClose()`. The code in the Filter sample program is shown below. This code assigns the file I/O functions (`myOpen`, `myRead`, and so on) to `KVInputStream`.

```
typedef struct
{
   char  *pszName;
   FILE  *fp;
}
MyOpenInfo;

 KVInputStream  IO;
 MyOpenInfo     o;

/* Initialize the input stream */
o.pszName = pszFileIn;
IO.pInputStreamPrivateData = (void *)&o;
IO.fpOpen  = myOpen;
IO.fpRead  = myRead;
IO.fpSeek  = mySeek;
IO.fpTell  = myTell;
IO.fpClose = myClose;
```

The output for extracted content is either a physical file accessed through a file path and specified in the call to fpFilterFile(), or an *output buffer* specified in the call to fpFilterStream(). The buffer is defined by the KVFilterOutput data structure in `kvtypes.h`.

Filtering in File Mode

To use the Filter file-based I/O

1. Load the `kvfilter` library and obtain the `KV_GetFilterInterfaceEx()` entry point by calling KV_GetFilterInterfaceEx(). The `filter` sample program contains sample code for all platforms.
2. Initialize a filter session by calling fpInit(), on page 150 or fpInitWithLicenseData(), on page 152. This function's return value, `pContext`, is passed as the first argument to the File Extraction interface and all other Filter functions.
3. Pass the context pointer from fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 and the address of a structure that contains pointers to the File Extraction API functions in the call to KVGetExtractInterface().
4. Declare the file path in the KVOpenFileArg structure.
5. Open the file by calling fpOpenFile() and passing the `KVOpenFileArg` structure. This call defines the parameters necessary to open a file for extraction.
6. Determine whether the source file is a container file (that is, whether it contains subfiles) by calling fpGetMainFileInfo().
7. If the call to `fpGetMainFileInfo()` determined that the source file contains subfiles, proceed to step 8; otherwise, proceed to step 11.
8. Determine whether the subfile is a container file by calling fpGetSubFileInfo().
9. Extract the subfile or subfiles to a file by calling fpExtractSubFile() and setting `filePath` and `extractDir` in the `KVExtractSubFileArg` structure.
10. If the call to `fpGetSubFileInfo()` determined that the subfile is a container file, repeat step 4 through step 9 until all subfiles are extracted; otherwise, proceed to step 11.
11. Filter the file by calling fpFilterFile().
12. Close the file by calling fpCloseFile().
13. Repeat step 4 through step 12 as required for additional source files.
14. Terminate the filter session by calling fpShutdown().

Filtering in Stream Mode

To use the Filtering stream-based I/O

1. Load the `kvfilter` library and obtain the KV_GetFilterInterfaceEx() entry point. The `filter` sample program contains sample code for all platforms.
2. Initialize a filter session by calling fpInit(), on page 150 or fpInitWithLicenseData(), on page 152. This function's return value, `pContext`, is passed as the first argument to all other Filter functions.

3. Pass the context pointer from fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 and the address of a structure that contains pointers to the File Extraction API functions in the call to `KVGetExtractInterface()`. See KVGetExtractInterface(), on page 94.
4. Create an input stream (`KVInputStream`) by calling fpFiletoInputStreamCreate() or by using code similar to the example code in the `Filter` sample program.
5. Open the stream by calling fpOpenStream().
6. Declare the input stream in the KVOpenFileArg structure.
7. Open the source file by calling fpOpenFile() and passing the `KVOpenFileArg` structure. This call defines the parameters necessary to open a file for extraction.
8. Determine whether the source file is a container file (that is, whether it contains subfiles) by calling fpGetMainFileInfo().
9. If the call to `fpGetMainFileInfo()` determined that the source file is a container file, proceed to step 10; otherwise, proceed to step 13.
10. Determine whether the subfile is a container file by calling fpGetSubFileInfo().
11. Extract the subfile to a stream by calling fpExtractSubFile().
12. If the call to `fpGetSubFileInfo()` determined that the subfile is a container file, repeat step 4 through step 11 until all subfiles are extracted; otherwise, proceed to step 13.
13. Filter the stream by calling fpFilterStream(). Call `fpFilterStream()` repeatedly until the entire output buffer is processed. After each call to `fpFilterStream()`, call fpFreeFilterOutput() to free the text buffer returned.
14. Close the stream by calling fpCloseStream().
15. Free the memory allocated for the input stream by calling fpFileToInputStreamFree().
16. Close the file by calling fpCloseFile().
17. Repeat Step 4 through Step 16 as required for additional source files.
18. Terminate the filter session by calling fpShutdown().

Multithreaded Filtering

To make sure that multithreaded filter processes are thread-safe, you must create a unique context pointer for every thread by calling fpInit(), on page 150 or fpInitWithLicenseData(), on page 152. In addition, threads must not share context pointers, and the same context pointer must be used for all API calls in the same thread. This applies to in-process and out-of-process API calls. Creating a context pointer for every thread does not affect performance because the context pointer uses minimal resources.

For example, C code for file filtering must have the following logic in a thread:

```
fpInit()
   KVGetExtractInterface()
   fpOpenFile()
   fpGetMainFileInfo()            /* container file */
   fpGetSubFileInfo()
```

```
   fpExtractSubFile
   fpGetSubFileMetadata()
   fpFilterFile()
   fpCloseFile()

   fpOpenFile()
   fpGetMainFileInfo()            /* not a container file */
   fpGetDocInfoFile()
   fpGetOLESummaryInfoFile()
   fpFilterFile()
   fpCloseFile()
   ...
fpShutdown()
```

The Filter Process Model

By default, Filter runs independently from the calling application process. This is called *out-of-process* filtering. Out-of-process filtering protects the stability of the calling application in the rare case when a malformed document causes Filter to fail. You can configure Filter to run in the same process as the calling application. This is called *in-process* filtering. However, Micro Focus strongly recommends that you run Filter out of process whenever possible.

The creation of child processes on UNIX usually adheres to Portable Operating System Interface (POSIX) standards. AIX uses different thread semantics. If required, a version of `kvfilter` with POSIX thread semantics is available for AIX. This file is `kvfilter_nsl.a`. It must be renamed to `kvfilter.a` to be used by Filter.

To monitor and debug filtering operations during out-of-process filtering, you can generate an error log at run time. See Generate an Error Log, on page 58.

The following functions can run both in process or out of process:

Filter API

`fpCanFilterFile()`	`fpCanFilterStream()`
`fpFilterFile()`	`fpFilterStream()`
`fpGetDocInfoFile()`	`fpGetDocInfoStream()`
`fpGetOLESummaryInfo()`	`fpGetOLESummaryInfoFile()`
`fpGetDocInfoFile()`	`fpGetDocInfoStream()`
`fpGetXmpInfoFile()`	`fpGetXmpInfo()`

File Extraction API

`fpCloseFile()`	`fpExtractSubFile()`

`fpFreeStruct()`	`fpGetMainFileInfo()`
`fpGetSubFileInfo()`	`fpGetSubFileMetaData()`
`fpOpenFile()`	`KVGetExtractInterface()`

Other Filter API functions always run in process.

Persist the Child Process

By default, in out-of-process filtering, the parent process maintains a persistent connection with the child server after each file is filtered. When the connection is preserved in this way, subsequent filtering requests are processed more quickly because the server is already prepared to receive data.

You can restart the server at regular intervals by using a function or a configuration setting.

In the API

To force KeyView to restart, call the fpRefreshFilterKVOOP() function.

In the formats.ini File

To control whether Filter persists the server, use the `kvoopRefresh` parameter in the `[FilterSDK_Config]` section of the `formats.ini` file:

`kvoopRefresh=0`	When you set `kvoopRefresh` to **`0`** (zero), the connection to the server persists for as long as the parent process is running or until the server fails. This is the default.
`kvoopRefresh=n`	When you set `kvoopRefresh` to ***n*** (where *n* is a positive number), the connection persists for *n* filter requests. After the *n*th request, the server is shut down and restarted before processing the next request. For example, if you set `kvoopRefresh` to **`5`**, the connection to the server persists for five filter requests. For the sixth request, the server is shut down and restarted.

To control whether the parent process attempts to filter a file after the file has caused the server to fail, use the `kvoopRetry` parameter in the `[FilterSDK_Config]` section of the `formats.ini` file:

`kvoopRetry=0`	When you set `kvoopRetry` to **`0`** and the server fails, the parent process does not resend the file to a new server.
`kvoopRetry=n`	When you set `kvoopRetry` to ***n*** (where *n* is a positive number) and the server fails, the parent process resends the file to a new server *n* times. By default, `kvoopRetry` is set to **`1`**, and the file is resent to a server once.

NOTE: The `kvoopRefresh` and `kvoopRetry` parameters do not apply when you run the File Extraction functions out of process. See Run File Extraction Functions Out of Process, on the next page.

Run Filter In Process

By default, Filter runs out of process. However, you can enable in-process filtering through the API or in the `formats.ini` file. If the type of process is not specified in the `formats.ini` or in the API, Filter is run out of process. If the type of process is specified in the `formats.ini` *and* in the API, the setting in the API takes precedence.

In the API

To run Filter in process

1. Set the final argument (`dwFlags`) of either fpInit(), on page 150, fpInitWithLicenseData(), on page 152 or fpOpenStreamEx2() to `KVF_INPROCESS`.

   ```
   dwFlags |= KVF_INPROCESS
   ```

2. Call a filtering function or a metadata extraction function. See Filter API Functions, on page 121.
3. Optionally, call a metadata extraction function if a filter function was called in the previous step. See fpGetDocInfoFile(), on page 140 or fpGetDocInfoStream(), on page 141.

In the formats.ini File

To run Filter in process, set the `default_inprocess` parameter in the `[FilterSDK_Config]` section of the `formats.ini` file to **`1`**.

By default this parameter is set to **`0`** (zero), which enables out-of-process filtering.

Run File Extraction Functions Out of Process

The out-of-process setting specified in the call to fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 or in the `formats.ini` file is automatically propagated to the File Extraction API in the call to `KVGetExtractInterface()`. In `KVGetExtractInterface()`, you pass a context pointer from fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 and the address of a structure that contains pointers to the File Extraction functions.

When you extract subfiles from container files and pass the files for filtering out of process, Filter generates a server called `kvoop.exe` for filtering and a duplicate server (also called `kvoop.exe`) for file extraction. These servers are independent, so that if the filtering service stops responding, the file extraction service can continue extracting files.

Restart the File Extraction Server

If the file extraction server fails with either the `KVError_InvalidOopDriverSignature` error, or the `KVError_InvalidOopServiceSignature` error, you must restart the server by calling `KVGetExtractInterface()` and passing the original extraction structure. (Restarting the server in this way does not affect performance beyond the cost of restarting the server.)

If you restart the file extraction server before the recursive extraction of subfiles is complete, the new server has no history of the subfiles extracted prior to the restart. If you then call a File Extraction function on one of the extracted files, the `KVError_InvalidOopServiceSignature` error is generated, because the server that extracted the files is no longer running and was replaced with a new `kvoop` server. Micro Focus recommends that you do not make calls to the File Extraction functions by using an invalid container context structure (`KVContainerContext`) after you restart the server.

Out-of-Process Logging

Logging is available for out-of-process filtering. The `kvoop` server can now create a log file that captures information on the files being processed, storing one entry per process. The generated log file is called *xxxx*`_kvoop.log`, where *xxxx* is a unique number identifying the process.

In the rare case when the `kvoop` server fails, you can use the log files to determine which file caused the failure. After processing is complete and the system shuts down, the logs are automatically deleted. To keep the log files after processing is successfully completed, see Keep Log Files, on the next page.

> **NOTE:** Out-of-process logging is not supported on AIX.

Enable Out-of-Process Logging

To enable out-of-process logging, set the `KVOOP_LOGS_DIR` environment variable to the directory in which you want the log files to be stored. By default, logging is not enabled.

On UNIX, set the variable as follows:

```
setenv KVOOP_LOGS_DIR /tmp
```

On Windows, set the variable as follows:

```
set KVOOP_LOGS_DIR=c:\tmp
```

The following log file is created in the directory:

process_id`_kvoop.log`

where *process_id* is a numeric value that represents the logged process. New messages are appended to the file, and truncation is disabled by default.

If KeyView terminates unexpectedly and Windows minidump is enabled, a *process_id*`_crash_info.txt` file is generated (see Enable Windows Minidump, on the next page). If logging was not enabled at the time of termination, this file contains instructions on how to enable logging.

Set the Verbosity Level

You can control how much information is written to the file by setting the `KVOOP_LOG_VERBOSITY` environment variable.

Set the variable to one of the following options:

1 Include only error messages.

2 Include errors and warnings.

3 Include errors, warnings, and general information. This is the default.

4 Include all possible information. This setting is useful for debugging purposes.

Enable Windows Minidump

KeyView can use the Windows minidump feature to provide additional logging information, which can be useful for debugging purposes.

The Windows minidump is disabled by default. To enable the Windows minidump, set `KVOOP_DUMP_ENABLE` to **`1`**. If an unexpected termination occurs after the minidump is enabled, three files are generated:

- ***`process_id`*`_crash_info.txt`**. This file contains `KVOOP` state and runtime information at the time of termination. If logging was not enabled at the time of termination, this file contains instructions on how to enable logging.
- ***`process_id`*`_process_list.txt`**. This file contains information from the DLLs that were loaded at the time of the termination.
- ***`process_id`*`_report.dmp`**. The Windows dump file, which contains further information about the termination. You can open it with either a Windows debugger or `autnhelper.exe` (you must copy this file to the same directory).

You can control the amount of information presented in the Windows dump file by creating the following files in the directory:

```
dumper.NORMAL
dumper.WITHDATASEGS
dumper.WITHFULLMEMORY
dumper.WITHHANDLEDATA
```

Keep Log Files

After processing is complete and the system is shut down, the log files are automatically deleted from the directory. To keep the log files after a successful run, set the `KVOOP_KEEP_LOGS` environment variable.

On UNIX, set the variable as follows:

```
setenv KVOOP_KEEP_LOGS 1
```

On Windows, set the variable as follows:

```
set KVOOP_KEEP_LOGS=1
```

Run File Detection In or Out of Process

By default, detection runs in out-of-process mode. However, you can enable in-process detection through the API or in the `formats.ini` file. If the type of process is not specified in the `formats.ini` or

in the API, detection runs in out-of-process mode. If the type of process is specified in the `formats.ini` *and* in the API, the setting in the API takes precedence.

Specify the Process Type In the formats.ini File

Add the `default_detect_inprocess` flag to a `[FilterSDK_Config]` section in the `formats.ini` file to control the default behavior for detection. Set the flag to **`0`** for out-of-process detection, and **`1`** for in-process detection. For example,

```
[FilterSDK Config]
default_detect_inprocess=0
```

If this flag is not specified, the file detection behavior is determined by the `default_inprocess` flag for filtering. For example, if you set `default_inprocess` to **`1`**, filtering and file detection runs in in-process mode by default; if you set `default_inprocess` to **`0`**, filtering and file detection runs in out-of-process mode by default.

If you set both the `default_inprocess` and `default_detect_inprocess` flags, `default_inprocess` controls the default filtering behavior and `default_detect_inprocess` controls the default file detection behavior.

Specify the Process Type In the API

Set the final argument (`dwFlags`) of either fpInit(), on page 150, fpInitWithLicenseData(), on page 152 or fpOpenStreamEx2() to **`KVF_DETECT_INPROCESS`** or **`KVF_DETECT_OUTOFPROCESS`**.

Stream Data to Filter

By default, when you run Filter out-of-process, and pass file streams to the API (instead of file names), Filter uses temporary files during communication.

When running out-of-process, you can configure KeyView to stream the file data while it processes it, rather than creating temporary files, by modifying the `formats.ini` file. This method is particularly beneficial if you do not want to process the whole file (for example, if you want to stop after filtering only some of the text, or extract only some of the subfiles).

> **NOTE:** This option is disabled by default because for some files it might result in a longer processing time when you do need to process the whole file.

To turn on streaming mode, set the `streaming_method` parameter in the `[FilterSDK_Config]` section of the `formats.ini` file to **`pipe`**.

By default this parameter is set to **`temp`**, which uses temporary files during the filter process.

The streaming method has a number of advantages:

- It reduces the disk space used for temporary files.
- It improves the responsiveness for partial filtering. When using the `temp_file` method your first call to `fpFilterStream` does not return until the entire file has been processed. When using the `pipe` method, `fpFilterStream` returns the first block of text as soon as it is available.

- It reduces the I/O for partial filtering. When you use the pipe method, it might not be necessary for KeyView to read the whole input file, especially if you choose to stop filtering before all the text has returned.
- For many formats, it reduces the amount of the input file that is read during extraction, especially if you extract only a subset of the files.

Part II: Use Filter SDK

This section explains how to perform some basic tasks by using the File Extraction and Filter APIs, and describes the sample programs.

Chapter 3: Use the File Extraction API

This section describes how to extract subfiles from a container file by using the File Extraction API.

Introduction

To filter a file, you must first determine whether the file contains any subfiles (attachments, embedded OLE objects, and so on). A file that contains subfiles is called a *container* file. A container file has a main file (parent) and subfiles (children) embedded in the main file.

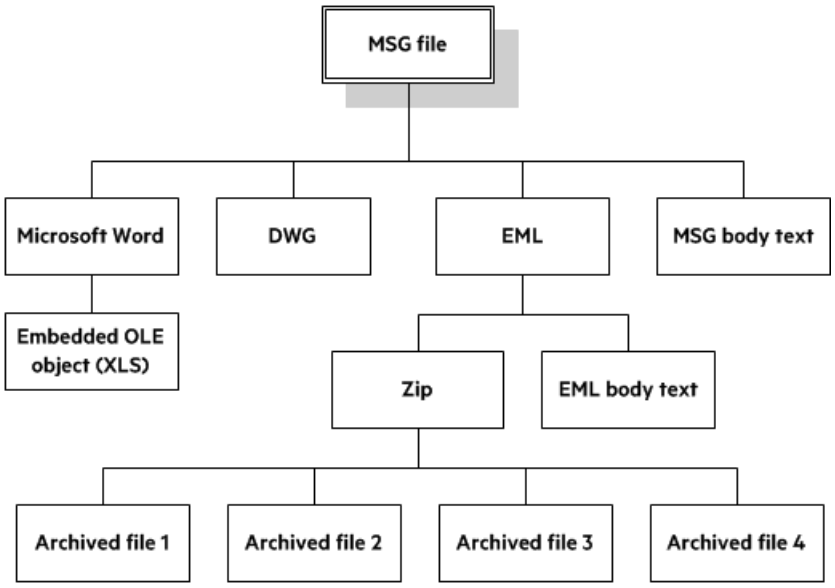
The following are examples of container files:

- Archive files such as ZIP, TAR, and RAR.
- Mail messages such as Outlook (MSG) and Outlook Express (EML).
- Mail stores such as Microsoft Outlook Personal Folders (PST), Mailbox (MBX), and Lotus Notes database (NSF).
- PDF files that contain file attachments.
- Compound documents with embedded OLE objects such as a Microsoft Word document with an embedded Excel chart.

> **NOTE:** Document Readers, on page 271 indicates which formats are treated as container files and are supported by the File Extraction API.

The subfiles might also be container files, creating a file hierarchy of multiple levels. For example, an MSG file (the root parent) might contain three attachments:

- a Microsoft Word document that contains an embedded Microsoft Excel spreadsheet.
- an AutoCAD drawing file (DWG).
- an EML file with an attached Zip file, which in turn contains four archived files.



NOTE: The parent MSG file contains four first-level children. The body text of a message file, although not a standalone file in the container, is considered a child of the parent file.

Extract Subfiles

To filter all files in a container file, you must open the container and extract its subfiles by using the *File Extraction API*. The extraction process is done repeatedly until all subfiles are extracted and exposed for filtering. After a subfile is extracted, you can call Filter API functions to filter the file.

If you want to filter a container file and its subfiles to a single file, you must extract all files from the container, filter the files, and then append each filtered output file to its parent.

To extract subfiles

1. Pass the context pointer from `fpInit()` or `fpInitWithLicenseData()` and the address of a structure that contains pointers to the File Extraction API functions in the call to KVGetExtractInterface().
2. Declare the input stream or file name in the KVOpenFileArg structure.
3. Open the source file by calling fpOpenFile() and passing the `KVOpenFileArg` structure. This call defines the parameters necessary to open a file for extraction.

4. Determine whether the source file is a container file (that is, whether it contains subfiles) by calling fpGetMainFileInfo().
5. If the call to `fpGetMainFileInfo()` determined that the source file is a container file, proceed to step 6; otherwise, filter the file.
6. Determine whether the subfile is itself a container (that is, whether it contains subfiles) by calling fpGetSubFileInfo().
7. Extract the subfile by calling fpExtractSubFile().
8. If the call to `fpGetSubFileInfo()` determined that the subfile is a container file, repeat step 2 through step 7 until all subfiles are extracted and the lowest level of subfiles is reached; otherwise, filter the file.

Sanitize Absolute Paths

When you extract a subfile from a container and write it to disk, you specify an extract directory and a path to extract the file to.

To set the path, you might use the path in the container file that you are extracting from, as returned from the function fpGetSubFileInfo(), on page 99. However, if the path is an absolute path, the file could be created outside the directory you have chosen as the extract directory. Your application might then contain a vulnerability that could be exploited to write files to unexpected locations in the file system. This section discusses some KeyView features that can help you secure your application by sanitizing paths.

KeyView always sanitizes relative paths that you pass in when extracting files, so that the paths remain within the extract directory you specify. For example, KeyView does not allow the use of "`..`" to move outside the extract directory.

KeyView can update absolute paths so that they remain within the extract directory. You can instruct KeyView to sanitize absolute paths programmatically (through the API), or by setting a parameter in the configuration file.

The following table shows the effect on some example paths.

Requested path	Path of extracted file (not sanitized)	Path of extracted file (sanitized)
`file.txt`	*extractDir*`/file.txt`	*extractDir*`/file.txt`
`dir/file.txt`	*extractDir*`/dir/file.txt`	*extractDir*`/dir/file.txt`
`../file.txt`	*extractDir*`/file.txt`	*extractDir*`/file.txt`
`/dir/file.txt`	`/dir/file.txt`	*extractDir*`/dir/file.txt`

To sanitize absolute paths

- In the KVExtractSubFileArg struct that you pass in to fpExtractSubFile, set the flag `KVExtractionFlag_SanitizeAbsolutePaths`. When KeyView sanitizes a path and the resulting directory does not exist, extraction fails unless you instruct KeyView to create the directory, so

you might also want to set the flag `KVExtractionFlag_CreateDir`. You can find the path that a file was actually extracted to from the KVSubFileExtractInfo structure.

To sanitize absolute paths (through configuration)

- In the `formats.ini` configuration file, set the parameter `SanitizeAbsoluteExtractPaths`, for example:

  ```
  [Options]
  SanitizeAbsoluteExtractPaths=TRUE
  ```

Extract Images

You can use the File Extraction API to extract images within the file by specifying the following in the `formats.ini` file:

```
[Options]
ExtractImages=TRUE
```

If you set this option, images within the file behave in the same way as any other subfile. Extracted images have the name `image[X].[Y]`, where `[X]` is an integer, and `[Y]` is the extension. The format of the image is the same as the format in which it is stored in the document.

This option can also be enabled by passing `KVFLT_EXTRACTIMAGES` to the `fpFilterConfig` function.

> **NOTE:** Turning on `ExtractImages` can reduce the speed of the filtering operation.

Recreate a File's Hierarchy

When you extract a container file, any relationships between the subfiles in the container are not maintained. However, the File Extraction interface provides information that enables you to recreate the hierarchy. You can use the hierarchy to create a directory structure in a file system, or to categorize documents according to their relationship to each other. For example, if you use KeyView to generate text for a search engine, the hierarchical information enables your users to search for a document based on the document's parent or sibling. In addition, when the document is returned to the user, the parent and sibling documents can be returned as recommendations.

The information needed to recreate a file's hierarchy is provided in the call to fpGetSubFileInfo(). The members `KVSubFileInfo->parentIndex` and `KVSubFileInfo->childArray` provide information about a subfile's parent and children. Because you can only retrieve the first-level children in the subfile, you must call `fpGetSubFileInfo()` repeatedly until information for the leaf-node children is extracted.

Create a Root Node

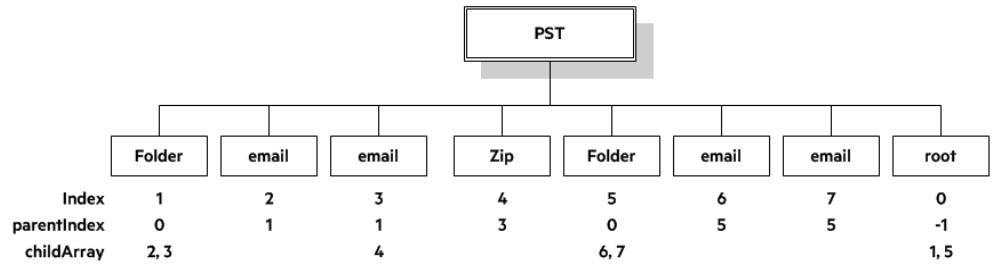
Because of their structure, some container files do not contain a subfile or folder which acts as a root directory on which the hierarchy can be based. For example, subfiles in a Zip archive can be extracted, but none of the subfiles represent the root of the hierarchy. In this case, you must create an artificial

root node at the top of the file hierarchy as a point of reference for each child, and ultimately to recreate the relationships. This artificial root node is an internal object, and is extracted to disk as a directory called `root`. Its index number is 0.

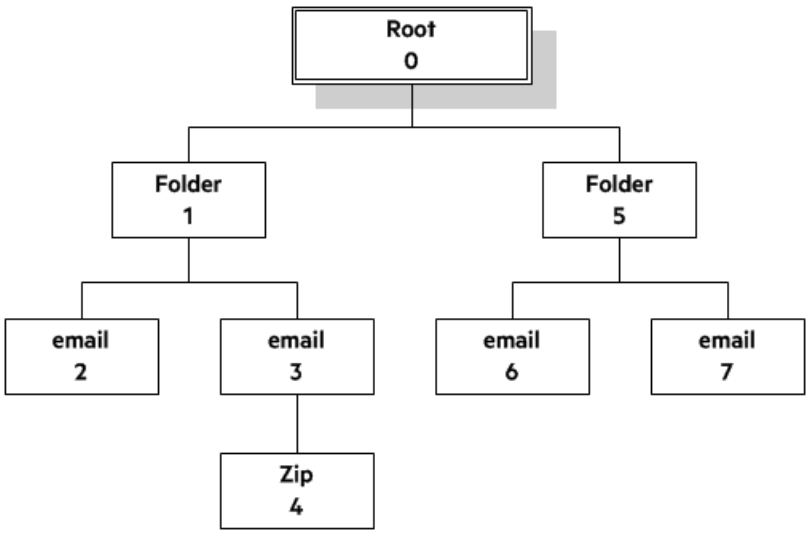
To create the root node, set `openFlag` to **`KVOpenFileFlag_CreateRootNode`** in the call to fpOpenFile(). When you create a root node, the value of `numSubFiles` in KVMainFileInfo includes the root node. For example, when you call `fpGetMainFileInfo()` on a Microsoft Word document with three embedded OLE objects and the root node is disabled, `numSubFiles` is `3`. If you create a root node, `numSubFiles` is 4.

Recreate a File's Hierarchy—Example

For example, you might extract a PST file that contains seven subfiles with a root node enabled. The call to `fpGetMainFileInfo()`returns the number of subfiles as eight (seven subfiles and one root node). The following diagram shows the structure and the available hierarchy information after the subfiles are extracted:



The `parentIndex` specifies the index number of a subfile's parent. The `childArray` specifies an array of a subfile's children. With this information, you can recreate the hierarchy shown in the following diagram.



Extract Mail Metadata

You can extract metadata, such as subject, sender, and recipient, from subfiles of mail formats, by calling the fpGetSubFileMetaData() function. You can extract a predefined set of common metadata fields, a list of metadata fields by their names or MAPI properties, or, for some subfile types, all the metadata in the file.

Default Metadata Set

KeyView internally defines a set of common mail metadata fields that you can extract as a group from mail formats. This default metadata set is listed in the following table.

Default Mail Metadata List

Field Name (string to specify)	Description
`From`	The display name and email address of the sender.
`Sent`	The time that the message was sent.
`To`	The display names and email addresses of the recipients.
`Cc`	The display names and email addresses of recipients who receive copies of the email.
`Bcc`	The display names and email addresses of recipients who received blind copies of the email.
`Subject`	The text in the subject line of the message.
`Priority`	The priority applied to the message.

Because mail formats use different terms for the same fields, the format's reader maps the default field name to the appropriate format-specific name. For example, when retrieving the default metadata set, the NSF field *Importance* is mapped to the name *Priority* and is returned.

You can also extract the default field names individually by passing the field name (such as *From*, *To*, and *Subject*); however, in this case, the string is not mapped to the format-specific name. For example, if you pass *Priority* in the call, you retrieve the contents of the *Priority* field from an MBX file, but do not retrieve the contents of the *Importance* field from an NSF file.

> **NOTE:** You cannot pass the field names listed in the table individually for PST files. However, you can pass either the MAPI tag number or the MAPI tag name as integers. See Microsoft Personal Folders File (PST) Metadata, on page 45.

Extract the Default Metadata Set

To extract the default metadata set, call the fpGetSubFileMetaData() function, and pass in `0` for `metaArg->metaNameCount`, and `NULL` for `metaArg->metaNameArray`.

```
KVGetSubFileMetaArgRec metaArg;
KVSubFileMetaData pMetaData = NULL;
KVStructInit(&metaArg);

metaArg.index = subFileIndex;
metaArg.metaNameCount = 0;
metaArg.metaNameArray = NULL;

error = extractInterface->fpGetSubFileMetaData(pFile, &metaArg, &pMetaData);
...
extractInterface->fpFreeStruct(pFile,pMetaData);
pMetaData = NULL;
```

Extract All Metadata

KeyView can extract all metadata from EML, MBX, MIME, NSF, ICS, and DXL subfiles. You can extract all metadata in a similar way to extracting the default metadata set, but when you call the fpGetSubFileMetaData() function, pass in `-1` for `metaArg->metaNameCount` and `NULL` for `metaArg->metaNameArray`.

Microsoft Outlook (MSG) Metadata

In addition to the default metadata set, you can extract the metadata fields listed in the following table for MSG files. You must pass the field name to `metaNameArray` in the call to the `fpGetSubFileMetadata()` function.

MSG-specific Metadata List

Field Name (string to specify)	Description
`AttachFileName`	An attachment's long file name and extension, excluding the path.
`ConversationTopic`	The topic of the first message in a conversation thread. A conversation thread is a series of messages and replies. This is the first message's subject with any prefix removed.
`CreationTime`	The time that the message or attachment was created. This value is displayed in the **Sent** field in the message's **Properties** dialog in Outlook.
`InternetMessageID`	The identifier for messages that come in over the Internet. This is the MAPI property `PR_INTERNET_MESSAGE_ID`. This property is not in the MAPI headers or MAPI documentation.

MSG-specific Metadata List, continued

Field Name (string to specify)	Description
`LastModificationTime`	The time that the message or attachment was last modified. This value is displayed in the **Modified** field in the message's **Properties** dialog in Outlook.
`Location`	The physical location of the event specified in the Outlook calendar entry.
`MessageID`	The message transfer system (MTS) identifier for the message transfer agent (MTA). This value is displayed on the **Message ID** tab in the message's **Properties** dialog in Outlook.
`Received`	The date and time a message was delivered. This value is displayed in the **Received** field in the message's **Properties** dialog in Outlook.
`Sender`	The name and email address of the message sender. This value is a concatenation of two MAPI properties in the following format: `"PR_SENDER_NAME" <PR_SENDER_EMAIL_ADDRESS>` The `Sender` value might be the same as or different than the default metadata `From` value (see Default Metadata Set, on page 40), depending on which MAPI properties exist in the MSG file.
`Sensitivity`	The value indicating the message sender's opinion of the sensitivity of a message. For example, Personal, Private, or Confidential. This value is displayed in the **Sensitivity** field in the message's **Properties** dialog in Outlook.
`TransportMsgHeaders`	Transport-specific message envelope information. This value corresponds to the MAPI property `PR_TRANSPORT_MESSAGE_HEADERS`.
`StartDate`	An appointment start date. This value corresponds to the `PR_START_DATE` MAPI property.
`EndDate`	An appointment end date. This value corresponds to the `PR_END_DATE` MAPI property.

Extract MSG-Specific Metadata

To extract specific metadata fields from an MSG file, call the fpGetSubFileMetaData() function, and pass the field name defined in Default Metadata Set, on page 40 to `metaNameArray` (the string is not case sensitive).

For example, the following code extracts the contents of the `ConversationTopic` and `MessageID` fields:

```
KVGetSubFileMetaArgRec metaArg;
KVSubFileMetaData pMetaData = NULL;
KVStructInit(&metaArg);
```

```
KVMetaNameRec names[2];
KVMetaName    pname[2];

names[0].type = KVMetaNameType_String;
names[0].name.sname = "conversationtopic";
names[1].type = KVMetaNameType_String;
names[1].name.sname = "MessageID";

pname[0] = &names[0];
pname[1] = &names[1];

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pname;
metaArg.index = subFileIndex;

error = extractInterface->fpGetSubFileMetaData(pFile, &metaArg, &pMetaData);
...
extractInterface->fpFreeStruct(pFile,pMetaData);
pMetaData = NULL;
```

Microsoft Outlook Express (EML) and Mailbox (MBX) Metadata

In addition to the default metadata set, you can extract any metadata field that exists in the header of an EML or MBX file by passing the field's name. If the name is a valid field in the file, the content of the field is returned. For example, to retrieve the name of the last mail server that received the message before it was delivered, you can pass the string "`Received`".

Extract EML- or MBX-Specific Metadata

To extract specific metadata fields from an EML or MBX file, call the fpGetSubFileMetaData() function, and pass the metadata name to `metaNameArray` (the string is *not* case sensitive).

For example, the following code extracts the contents of the `Received` and `Mime-version` fields:

```
KVGetSubFileMetaArgRec metaArg;
KVSubFileMetaData pMetaData = NULL;
KVStructInit(&metaArg);
KVMetaNameRec names[2];
KVMetaName    pname[2];

names[0].type = KVMetaNameType_String;
names[0].name.sname = "Received";
names[1].type = KVMetaNameType_String;
names[1].name.sname = "Mime-version";

pname[0] = &names[0];
pname[1] = &names[1];

metaArg.metaNameCount = 2;
```

```
metaArg.metaNameArray = pname;
metaArg.index = subFileIndex;
error = extractInterface->fpGetSubFileMetaData(pFile, &metaArg, &pMetaData);
...
extractInterface->fpFreeStruct(pFile,pMetaData);
pMetaData = NULL;
```

Lotus Notes Database (NSF) Metadata

In addition to the default metadata set, you can extract any Lotus field name that exists in an NSF file by passing the field's name. (You can extract fields from mail NSF files and non-mail NSF files.) If the name is a valid field in the file, the field is returned. For example, to retrieve the date when a document in an NSF file was last accessed, you would pass the string "`$LastAccessedDB`".

> **NOTE:** A complete list of NSF fields is provided in the Lotus Notes file `stdnames.h`. This header file is available in the Lotus API Toolkit.

Extract NSF-Specific Metadata

To extract specific metadata fields from an NSF file , call the fpGetSubFileMetaData() function, and pass the metadata name to `metaNameArray` (the string is *not* case sensitive).

For example, the following code extracts the contents of the `Description` and `Categories` fields:

```
KVGetSubFileMetaArgRec metaArg;
KVSubFileMetaData pMetaData = NULL;
KVStructInit(&metaArg);
KVMetaNameRec names[2];
KVMetaName    pname[2];

names[0].type = KVMetaNameType_String;
names[0].name.sname = "description";
names[1].type = KVMetaNameType_String;
names[1].name.sname = "Categories";

pname[0] = &names[0];
pname[1] = &names[1];

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pname;
metaArg.index = subFileIndex;

error = extractInterface->fpGetSubFileMetaData(pFile, &metaArg, &pMetaData);
...
extractInterface->fpFreeStruct(pFile,pMetaData);
pMetaData = NULL;
```

Microsoft Personal Folders File (PST) Metadata

In addition to the default metadata set, you can extract Messaging Application Programming Interface (MAPI) properties from a PST file. These properties describe all elements of an Outlook item in a PST file (such as subject, sender, recipient, and message text). Because the properties are stored in the PST file itself, you can retrieve them *before* you extract the contents of the PST. This enables you to determine whether an Outlook item should be extracted based on its attributes. Some MAPI properties are also stored for Outlook attachments that are *not* mail messages (such as an attached Microsoft Word document or Lotus 1-2-3 file).

NOTE: Because all elements of a message (except non-mail attachments) are represented by MAPI properties, you can extract all components of a subfile, including the header and message text, by calling the `fpGetSubFileMetadata()` function.

MAPI Properties

Each MAPI property is identified by a property tag, which is a constant that contains the property type and a unique identifier. For example, the property that indicates whether a message has attachments has the following components:

Property	`PR_HASATTACH`
Identifier	`0x0E1B`
Property type	`PT_BOOLEAN (000B)`
Property tag	`0x0E1B000B`

The Microsoft MAPI documentation on the Microsoft Developer Network website lists all available MAPI properties, their tags, and types.

You can retrieve any MAPI property that is of one of the MAPI property types listed below:

`PT_I2`	`PT_DOUBLE`	`PT_STRING8`
`PT_I4`	`PT_FLOAT`	`PT_TSTRING`
`PT_BINARY`	`PT_LONG`	`PT_SYSTIME`
`PT_BOOLEAN`	`PT_SHORT`	`PT_UNICODE`

NOTE: Properties with a `PT_TSTRING` type have the property type recompiled to either a Unicode string (`PT_UNICODE`) or to an ANSI string (`PT_STRING8`) depending on the operating system's character set. To retrieve the Unicode property, pass in the Unicode version of the tag. For example, the property tag for `PR_SUBJECT` is either `0x0037001E` for an ANSI string, or `0x0037001F` for a Unicode string.

Extract PST-Specific Metadata

In the call to extract subfile metadata, you can pass either the MAPI tag number (such as `0x0070001e`) or the MAPI tag name (such as `PR_CONVERSATION_TOPIC`). If you specify the MAPI tag name, you must include the `mapitags.h` and `mapidefs.h` Windows header files, in which the MAPI tag name is defined as a tag number.

To extract specific MAPI properties from a PST file, call the fpGetSubFileMetaData() function, and pass the property tag to `metaNameArray`. The tag is passed as an integer.

For example, the following code extracts the MAPI properties `PR_SUBJECT` and `PR_ALTERNATE_RECIPIENT`:

```
KVGetSubFileMetaArgRec metaArg;
KVSubFileMetaData pMetaData = NULL;
KVMetaNameRec names[2];
KVMetaName    pName[2];

names[0].type = KVMetaNameType_Integer;
names[0].name.iname = PR_SUBJECT;

names[1].type = KVMetaNameType_Integer;
names[1].name.iname = 0x3A010102;

pName[0] = &names[0];
pName[1] = &names[1];

KVStructInit(&metaArg);

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pName;
metaArg.index = SubFileIndex;

error = extractInterface->fpGetSubFileMetaData (pFile,&metaArg,&pMetaData);
...
extractInterface->fpFreeStruct(pFile,pMetaData);

pMetaData = NULL;
```

> **NOTE:** You must include the `mapitags.h` and `mapidefs.h` Windows header files, in which `PR_SUBJECT` is defined as `0x0037001E`.

Exclude Metadata from the Extracted Text File

When you extract a mail message, the message text and header information (`To`, `From`, `Sent`, and so on) is also extracted. You can prevent the header information from appearing in the text file.

To exclude the header information, set `extractFlag` to **`KVExtractionFlag_ExcludeMailHeader`** in the call to fpExtractSubFile().

Extract Subfiles from Outlook Files

When you extract an Outlook file (MSG) to disk, the message text and header information (`To`, `From`, `Sent`, and so on) is extracted to a text file. (If you do not want the header information to appear in the text file, see Exclude Metadata from the Extracted Text File, on the previous page.) If the Outlook file contains a non-mail attachment, the attachment is extracted in its native format to a subdirectory. If the Outlook file contains a mail attachment, the attachment's message text is extracted to a subdirectory.

Extract Subfiles from Outlook Express Files

When you extract an Outlook Express (EML) file to disk, the message text and header information (`To`, `From`, `Sent`, and so on) is extracted to a text file. (If you do not want the header information to appear in the text file, see Exclude Metadata from the Extracted Text File, on the previous page.) If the Outlook file contains a non-mail attachment, the attachment is extracted in its native format to the same directory as the message text file. If the Outlook file contains a mail attachment, the complete attachment (including message text and attachments), the message text file, and any non-mail attachments are extracted to the same directory as the main message.

> **NOTE:** When the MBX reader (`mbxsr`) is enabled, it is used to filter MBX *and* EML files. If the MBX reader is not enabled, the EML reader (`emlsr`) is used.

Extract Subfiles from Mailbox Files

A Mailbox (MBX) file is a collection of individual emails compiled with RFC 822 and RFC 2045 - 2049 (MIME), and divided by message separators. There are many mail applications that export to an MBX format, such as Eudora Email and Mozilla Thunderbird.

When an MBX file is extracted to disk, the message text and header information (`To`, `From`, `Sent`, and so on) from each mail file is extracted to text files. (If you do not want the header information to appear in the text file, see Exclude Metadata from the Extracted Text File, on the previous page.)

In Eudora MBX files, attachments are inserted as a link and are stored externally from the message. These attachments are not extracted, but the path to the attachment is returned in the call to the fpGetSubFileInfo() function. You can write code to retrieve the attachment based on the returned path.

For MBX files from other clients, KeyView extracts attachments when they are embedded in the message.

The Mailbox (MBX) reader is an advanced feature and is sold and licensed separately. To enable this reader in a KeyView SDK, you must obtain the appropriate license key from Micro Focus. See Pass License Information to KeyView, on page 17 for information on adding a new license key to an existing installation.

Extract Subfiles from Outlook Personal Folders Files

KeyView can extract Outlook items such as messages, appointments, contacts, tasks, notes, and journal entries from a PST file. When a PST file is extracted to disk, the text and header information (`To`, `From`, `Sent`, and so on) from each Outlook item is extracted to a text file. (If you do not want the header information to appear in the text file, see Exclude Metadata from the Extracted Text File, on page 46.)

You can also extract messages from PST files as MSG files, including all their attachments, by setting the `KVExtractionFlag_SaveAsMSG` flag in the KVExtractSubFileArg structure when you call `fpExtractSubFile()`.

If an Outlook item contains a non-mail attachment, the attachment is extracted in its native format to a subdirectory. If an Outlook item contains an Outlook attachment, the attached item's text and any attachments are extracted to a subdirectory.

> **NOTE:** The Microsoft Outlook Personal Folders (PST) readers are an advanced feature and are sold and licensed separately. To enable these readers in a KeyView SDK, you must obtain an appropriate license key from Micro Focus. For information about adding a new license key to an existing installation, see Pass License Information to KeyView, on page 17.

Choose the Reader to use for PST Files

KeyView provides several ways of processing PST files:

- Indirectly, using the Microsoft Messaging Application Programming Interface (MAPI). MAPI is a Microsoft interface that enables different applications to exchange messages and attachments with each other. MAPI allows KeyView to open a PST file, traverse the folders, and extract items. The `pstsr` reader uses MAPI, but works only on Windows and requires that Microsoft Outlook is installed.
- Directly, without relying on the Microsoft interface to the PST format. Accessing the file directly does not require Microsoft Outlook. The `pstxsr` reader is available for Windows (32-bit and 64-bit) and Linux (64-bit only). The `pstnsr` reader is an alternative native reader, for the platforms not supported by `pstxsr`.

On Windows, the MAPI-based reader is used by default but you can choose `pstxsr` if you prefer. On UNIX platforms, only one of the native readers is available (`pstxsr` on Linux x64 and `pstnsr` on other platforms).

The differences between the readers are summarized in the following table.

Feature	Native Reader (pstxsr)	Native Reader (pstnsr)	MAPI-based Reader (pstsr)
Platforms supported	Windows x86 and x64 Linux x64	All platforms not supported by `pstxsr`	Windows x86 and x64
Outlook required	No	No	Yes

Feature	Native Reader (pstxsr)	Native Reader (pstnsr)	MAPI-based Reader (pstsr)
MAPI properties supported	Yes. All properties defined in `mapitags.h`. Object properties are not supported.		
Password protection supported	Yes	Yes	Yes (using `KVCredential` structure)
Compressible encryption supported	Yes	Yes	Yes
High encryption supported	No	No	Yes

To change the reader used to process PST files, change the PST entry (file category value `297`) in the `formats.ini` file. For example, to use `pstxsr`:

`297=`**`pstx`**

> **NOTE:** You must make sure that the PST that you are extracting is not open in the Outlook client, and that the Outlook process is not running.

> **NOTE:** When extracting subfiles from PST files, information on the distribution list used in an email is extracted to a file called `emailname.dist`. This applies to the MAPI reader (`pstsr`) only.

System Requirements

MAPI is supported on Windows platforms only and relies on functionality in Outlook. If you want to use the MAPI-based reader, `pstsr`, Microsoft Outlook must be installed on the same machine as your application. Outlook must also be the default email application. KeyView supports the following PST formats and Outlook clients:

- Outlook 97 or later PST files

  > **NOTE:** The Outlook client must be the same version as, or newer than, the version of Outlook that generated the PST file.

- Outlook 2002 or later clients

  > **NOTE:** You must install an edition of Microsoft Outlook (32-bit or 64-bit) that matches the KeyView software. For example, if you use 32-bit KeyView, install 32-bit Outlook. If you use 64-bit KeyView, install 64-bit Outlook.
  >
  > If the editions do not match, KeyView returns `Error 32: KVError_PSTAccessFailed` and an error message from Microsoft Office Outlook is displayed: `Either there is a no default mail client or the current mail client cannot fulfill the messaging request. Please run Microsoft Outlook and set it as the default mail client.`

MAPI Attachment Methods

The way in which you can access the contents of a PST message attachment is determined by the MAPI *attachment method* applied to the attachment. For example, if the attachment is an embedded OLE object, it uses the ATTACH_OLE attachment method. KeyView can access message attachments that use the following attachment methods:

ATTACH_BY_VALUE

ATTACH_EMBEDDED_MSG

ATTACH_OLE

ATTACH_BY_REFERENCE

ATTACH_BY_REF_ONLY

ATTACH_BY_REF_RESOLVE

Attachments using the ATTACH_BY_VALUE, ATTACH_EMBEDDED_MSG, or ATTACH_OLE attachment methods are extracted automatically when the PST file is extracted. An "attach by reference" method means that the attachment is not in Outlook, but Outlook contains an absolute path to the attachment. Before you can extract these types of attachments, you must retrieve the path to access the attachment.

To extract "attach by reference" attachments

1. Determine whether the attachment uses an ATTACH_BY_REFERENCE, ATTACH_BY_REF_ONLY, or ATTACH_BY_REF_RESOLVE method by retrieving the MAPI property PR_ATTACH_METHOD.
2. If the attachment uses one of the "attach by reference" methods, get the fully qualified path to the attachment by retrieving the MAPI properties PR_ATTACH_LONG_PATHNAME or PR_ATTACH_PATHNAME.
3. You can then either copy the files from their original location to the path where the PST file is extracted, or use the Filter API functions to filter the attachment.

Open Secured PST Files

KeyView enables you to specify a user name and password to use to open a secured PST file for extraction.

> To open password-protected PST files that use high encryption, you must use the MAPI-based PST reader (pstsr). The native PST readers (pstxsr and pstnsr) return the error message KVERR_PasswordProtected if a PST file is encrypted with high encryption.

Detect PST Files While the Outlook Client is Running

If you are running an Outlook client while running the File Extraction API, the KeyView format detection module (kwad) might not be able to open the PST file to determine the file's format because Outlook has

the file locked. In this case, you can do one of the following:

- Close Outlook when using the Extraction API.
- Detect PST files by extension only and bypass the format detection module. To enable this option, add the following lines to the `formats.ini` file:

  ```
  [container_flags]
  detectPSTbyExtension=1
  ```

  > The `detectPSTbyExtension` option applies only when you are using the MAPI reader (`pstsr`).

  > If you use this option, you must make sure in your code that valid PST files are passed to KeyView, because the format detection module is not available to verify the file type and pass the file to the appropriate reader.

Extract Subfiles from Lotus Domino XML Language Files

When you extract a Lotus Domino XML Language (.DXL) file, the message text and header information (*To*, *From*, *Sent*, and so on) is extracted to a text file.

> **NOTE:** To prevent header information from being extracted, see Exclude Metadata from the Extracted Text File, on page 46.

You can make sure that dates and times extracted from Lotus Domino .DXL files are displayed in a uniform format.

To extract custom date/time formats

- In the `formats.ini` file, set the `DateTimeFormat` option in the `[dxlsr]` section. For example:

  ```
  [dxlsr]
  DateTimeFormat=%m/%d/%Y %I:%M:%S %p
  ```

  In this example, dates and times are extracted in the following format:

  02/11/2003 11:36:09 AM

  The format arguments are the same as those for the `strftime()` function. See http://msdn.microsoft.com/en-us/library/fe06s4ak%28VS.71%29.aspx for more information.

Extract .DXL Files to HTML

You can use the file extraction API to process .DXL files with an XSLT engine. The XSLT engine then transforms the extracted .DXL to .mail HTML files.

To extract .DXL files to HTML

- Set the following options in the `formats.ini` file:

```
[nsfsr]
ExportDXL=1
ExportDXL_PureXML=1

[dxlsr]
LNDParser=2
```

Extract Subfiles from Lotus Notes Database Files

A Lotus Notes database is a single file that contains multiple documents called *notes*. Notes include design notes (such as forms, views, folders, navigators, outlines, pages, framesets, agents, and resources), data document notes, profile document notes, access control list notes, and collection (index) notes. KeyView can extract text items, attachments, and OLE objects from *data document notes* only. Data document notes include emails, journal entries, discussion threads, documents (Microsoft Office and Lotus SmartSuite), and so on.

All components of a note are prefixed by field names such as "`SendTo:`", "`Subject:`", and "`Body:`". When a note is extracted, the field names are not included in the extracted output; only the field values are extracted.

When a mail message in an NSF file is extracted to disk, the body text and header information (such as the values from the `SendTo`, `From`, and `DeliveredDate` fields) in each message is extracted to a text file. (If you do not want the header information to appear in the message text file, see Exclude Metadata from the Extracted Text File, on page 46.)

> **NOTE:** The Lotus Notes Database (NSF) reader is an advanced feature and is sold and licensed separately. To enable this reader in a KeyView SDK, you must obtain the appropriate license key from Micro Focus. See Pass License Information to KeyView, on page 17 for information on adding a new license key to an existing installation.

System Requirements

The NSF format is proprietary. Therefore, KeyView accesses NSF files indirectly by using the Lotus Notes API. Because the NSF reader relies on functionality in Lotus Notes, a Lotus Notes client or Lotus Domino server must be installed and configured on the same machine as the application filtering NSF files. On UNIX and Linux, the Lotus Domino server is required. On Windows, the Lotus Notes client or Lotus Domino server is required.

KeyView supports the following Lotus Notes clients and Domino servers:

- Lotus Notes 6.5.1
- Lotus Domino 6.5.1

KeyView supports NSF files on the same platforms supported by Lotus Notes and Lotus Domino:

- Windows XP x86 (Service Pack 1 and 2)
- Windows 2000 x86 (Service Pack 2)
- Solaris 8.0 and 9.0 (built on Solaris 8.0)
- Red Hat Enterprise Linux AS 3.0 (x86)
- SuSE Linux Enterprise Server 8 and 9 (x86)
- IBM AIX 5.1, 5L version 5.2

Installation and Configuration

Before KeyView can filter NSF files, you must set up the Lotus Notes client or Lotus Domino server. Full configuration is not required. The following steps outline the minimal setup for NSF filtering:

Windows

1. Install the Lotus Notes client or Lotus Domino server. You do not need to configure the client or server.
2. Make sure that the `notes.ini` file is in the proper location.
   - If Lotus Notes is installed, the file should appear in the *`install`*`\lotus\notes` directory, where *`install`* is the installation directory.
   - If only Lotus Domino is installed, the file should appear in the *`install`*`\lotus\domino` directory, where *`install`* is the installation directory.

   If the file does not exist, create an ASCII file named `notes.ini`, and add the following text:

   ```
   [Notes]
   ```
3. Add the KeyView `bin` directory and the *`install`*`\lotus\notes` or *`install`*`\lotus\domino` directory to the `PATH` environment variable (the KeyView `bin` directory must be first in the path). Micro Focus recommends that you add the KeyView `bin` directory because the Lotus Notes or Domino server installation might contain older KeyView OEM libraries.

Solaris

1. Install Lotus Domino server. You do not need to configure the server.
2. Make sure that the `notes.ini` file is in the *`install`*`/lotus/notes/latest/sunspa` directory, where *`install`* is the directory where Lotus Notes is installed. If the file does not exist, create an ASCII file named `notes.ini`, and add the following text:

   ```
   [Notes]
   ```
3. Add the *`install`*`/lotus/notes/latest/sunspa` directory to the `PATH` environment variable:

   ```
   setenv PATH install/lotus/notes/latest/sunspa:$PATH
   ```
4. Add the *`install`*`/lotus/notes/latest/sunspa` and the KeyView `bin` directory to the `LD_LIBRARY_PATH` environment variable:

```
setenv LD_LIBRARY_PATH keyview_bin:install/lotus/notes/latest/sunspa:$LD_
LIBARY_PATH
```

where *keyview_bin* is the location of the KeyView `bin` directory. Micro Focus recommends that you add the KeyView `bin` directory because the Lotus Notes installation might contain older KeyView OEM libraries.

AIX 5.x

1. Install the `bos.iocp.rte` file set if it is not already installed, and reboot the machine. See the Lotus Domino server documentation for more information.
2. Install Lotus Domino server. You do not need to configure the server.
3. Make sure that the `notes.ini` file is in the *install*`/lotus/notes/latest/ibmpow` directory, where *install* is the directory where Lotus Notes is installed. If the file does not exist, create an ASCII file named `notes.ini`, and add the following text:

   ```
   [Notes]
   ```

4. Add the *install*`/lotus/notes/latest/ibmpow` directory to the `PATH` environment variable:

   ```
   setenv PATH install/lotus/notes/latest/ibmpow:$PATH
   ```

5. Add the *install*`/lotus/notes/latest/ibmpow` and the KeyView `bin` directory to the `LIBPATH` environment variable:

   ```
   setenv LIBPATH keyview_bin:install/lotus/notes/latest/ibmpow:$LIBPATH
   ```

   where *keyview_bin* is the location of the KeyView `bin` directory. Micro Focus recommends that you add the KeyView `bin` directory because the Lotus Notes installation might contain older KeyView OEM libraries.

Linux

1. Install Lotus Domino server. You do not need to configure the server.
2. Make sure that the `notes.ini` file is in the *install*`/lotus/notes/latest/linux` directory, where *install* is the directory where Lotus Notes is installed. If the file does not exist, create an ASCII file named `notes.ini`, and add the following text:

   ```
   [Notes]
   ```

3. Add the *install*`/lotus/notes/latest/linux` directory to the `PATH` environment variable:

   ```
   setenv PATH install/lotus/notes/latest/linux:$PATH
   ```

4. Add the *install*`/lotus/notes/latest/linux` and the KeyView `bin` directory to the `LD_LIBRARY_PATH` environment variable:

   ```
   setenv LD_LIBRARY_PATH keyview_bin:install/lotus/notes/latest/linux:$LD_
   LIBRARY_PATH
   ```

   where *keyview_bin* is the location of the KeyView `bin` directory. Micro Focus recommends that you add the KeyView `bin` directory because the Lotus Notes installation might contain older KeyView OEM libraries.

Open Secured NSF Files

KeyView enables you to specify a user ID file and password to use to open a secured NSF file for extraction.

Format Note Subfiles

The KeyView NSF reader uses XML templates to format note subfiles. You can customize the templates to approximate the look and feel of the original notes as closely as possible. For more information, see Extract and Format Lotus Notes Subfiles, on page 315.

Extract Subfiles from PDF Files

KeyView can extract document-level and page-level attachments from a PDF document. Document-level attachments are added by using the **Attach A File** tool, and can include links to or from the parent document or to other file attachments. Page-level attachments are added as comments by using various tools. Page-level or comment attachments display the File Attachment icon or the Speaker icon on the page where they are located. KeyView can also extract the files from Portfolio PDFs.

When a PDF's attachments are extracted to disk, the attachments are saved in their native format.

Improve Performance for PDFs with Many Small Images

To improve performance when processing PDF files that contain many small images, you can choose to ignore images unless they exceed a minimum width and/or height. If an image is smaller than the minimum width or height, KeyView does not extract the image.

For example, to ignore images that are less than 16 pixels wide or less than 16 pixels in height, add the following to the `[pdf_flags]` section of the `formats.ini` file:

```
[pdf_flags]
process_images_with_min_width=16
process_images_with_min_height=16
```

Extract Embedded OLE Objects

The File Extraction API can extract embedded OLE objects from the following types of documents:

- Lotus Notes (DXL)
- Microsoft Excel
- Microsoft Word
- Microsoft PowerPoint
- Microsoft Outlook

- Microsoft Visio
- Microsoft Project
- OASIS Open Document
- Rich Text Format (RTF)

When an embedded OLE object is extracted from its parent file, the location of the embedded file in the original document is not available. The parent and child are extracted as separate files.

Extract Subfiles from ZIP Files

You can extract ZIP files that are not password-protected by using the general method (see Extract Subfiles, on page 36). However, some ZIP files use password protection, in which case you must use a different method to enter the required credentials. See Password Protected Files, on page 365 for more information.

Default File Names for Extracted Subfiles

When you do not specify a file name in the call to fpExtractSubFile(), in some cases a default file name is applied to the extracted subfile.

Default File Name for Mail Formats

To avoid naming conflicts and problems with long file names, KeyView applies its own names to the extracted mail items when you do not supply a name in the call to `fpExtractSubFile()`. A non-mail attachment retains its original file name and extension.

When the contents of a mail store or the message body of a mail message are extracted, the extracted file names can include the following:

- The first valid eight characters of the original folder name or "Subject" line of the mail message. If the "Subject" line is empty, the characters `kvext` are used, where `ext` is the format's extension. For example, the characters would be "`kvmsg`" for MSG and "`kvnsf`" for NSF.

  For notes, the file name is derived from the first 24 characters of the note text. For contact entries, the file name is derived from the full name of the contact.

  The following special characters are considered invalid and are ignored:

any non-printing character with a value less than `0x1F`	
angle brackets (< >)	double quotation marks (")
asterisk (*)	forward slash (/)
back slash (\)	pipe (|)
colon (:)	question mark (?)

- The characters `_kv`*n*, where *n* is an integer incremented from 0 for each extracted item.
- One of the following extensions:

Type	File Extension
email message	`.mail`
calendar appointment	`.cal`
contact entry	`.cont`
task entry	`.task`
note	`.note`
journal entry	`.jrnl`
distribution list	`.dist`
posting note	`.post`

  - If the type cannot be determined for an MSG or PST file, the file is given a `.mail` extension.
  - If the type cannot be determined for a NSF file, the file is given a `.tmp` extension.
  - The format of a MAIL file is plain text by default, but can be set to RTF with the `KVExtractionFlag_GetFormattedBody` flag.

For example, an MSG mail message with the subject line *RE: Product roadmap* that contains the Microsoft Excel attachment `release_schedule.xls` is extracted as:

```
RE produ_kv0.mail
release_schedule.xls
```

If an extracted message contains an embedded OLE object or any attachment that does not have a name, the object or attachment is extracted as `_kv#.tmp`.

Default File Name for Embedded OLE Objects

KeyView can apply a default name to an extracted embedded OLE object when you do not supply a name in the call to `fpExtractSubFile()`. When an embedded OLE object is extracted, the extracted file name can include the following:

- The characters `subfile_kv`*n*, where *n* is an integer incremented from 0 for each extracted object.
- If KeyView can determine the embedded OLE is a Microsoft Office document, the original extension is used. If the file type cannot be determined, the file is given a `.tmp` extension.

For example, a Microsoft Word document (`sales_quarterly.doc`) might contain two embedded OLE objects: a Microsoft Excel file called `west_region.xls`, and a bitmap created in the Word document. The embedded objects are extracted as `subfile_kv0.xls` and `subfile_kv1.tmp`.

Chapter 4: Use the Filter API

This section describes how to perform some basic filtering tasks by using the Filter API.

Generate an Error Log

You can monitor and debug filtering operations by enabling a detailed error log. This enables you to see errors that are generated at run time, and to track problem files in stream or file mode.

> **NOTE:** Error logs are not generated when in-process filtering is enabled.

The error log might include the following information:

- Generated error codes.
- A time stamp.
- The path and file name of the file in which the error occurred.
- The length of the file in which the error occurred. If the name of the original file or the name of the temporary file are not obtained in stream mode, the file length is reported.

The following is a sample log file:

```
-KVOOPE 12 # Time: 11:14:32 # File Len = 68140
-KVOOPE 13 # Time: 11:23:05 # H:\files\WP\Word97\fnldmsa.doc
-KVOOPE  5 # Time: 12:15:54 # H:\files\SS\XL2000\corporate.xsl
-KVOOPE  5 # Time: 12:45:19 # H:\files\WP\WPerf5\wp501.doc
-KVOOPE 12 # Time: 14:25:33 # H:\files\PG\PPoint95\95.ppt
```

```
-KVOOPE 26 # Time: 16:26:04 # File Len = 19117568
-KVOOPE 10 # Time: 20:27:40 # File Len = 19117568
```

You can specify the information that is written to the log file by using either the API or environment variables. To configure a log file for a single filtering session, use environment variables. To configure a log file for all filtering sessions, use the API. Configuring the log file by using the API overrides the same settings in the environment variables. You can also specify additional settings in the `formats.ini` file.

You can configure the following features of the log file:

- Enable or disable logging. See Enable or Disable Error Logging, below.
- Change the default path and file name of the log file. See Change the Path and File Name of the Log File, below.
- Include memory errors in the log file. See Report Memory Errors, on the next page.
- Specify a memory guard that is used to generate memory overwrite errors in the log. See Specify a Memory Guard, on the next page.
- Include the input file name in the log file when filtering a stream. See Report the File Name in Stream Mode, on the next page.
- Include extended error codes that provide more detail on a general error (`KVERR_General`). See Report Extended Error Codes, on page 61.
- Specify the maximum size of the log file. See Specify the Maximum Size of the Log File, on page 61.

Enable or Disable Error Logging

You can enable or disable error logging by using either the API or environment variables. By default, a file called `kvoop.log` is created in the system temporary directory; however, you can change the path and file name of this file (see Change the Path and File Name of the Log File, below).

Use the API

To enable or disable logging, set the final argument (`dwFlags`) of fpInit(), on page 150, fpInitWithLicenseData(), on page 152 or fpOpenStreamEx2() to either **`KVF_OOPLOGON`** or **`KVF_OOPLOGOFF`**.

Use Environment Variables

To enable logging, add the `KVOOPLOGON` environment variable, and set the variable value to **`1`**. To disable logging, do not set the `KVOOPLOGON` environment variable.

Change the Path and File Name of the Log File

You can change the default path and file name of the log file. The default is `C:\temp\kvoop.log` on Windows and `/tmp/kvoop.log` on UNIX.

To change the path and file name of the log file, add the following to the `formats.ini` file:

```
[kvooplog]
KvoopLogName=filepath
```

Report Memory Errors

You can report memory leaks and memory overwrites in the log file by enabling the memory trace system, either by using the API or environment variables. If the memory trace system is enabled, the extended error codes for memory leaks and memory overwrites (`26` and `27`, respectively) are reported in the log file when they are generated. The extended error codes are defined in `KVErrorCodeEx` in `kverrorcodes.h`.

> **NOTE:** To report memory overwrites, you must also set a memory guard. See Specify a Memory Guard, below.

Use the API

To enable or disable the memory trace system, set the final argument (`dwFlags`) of fpInit(), on page 150, fpInitWithLicenseData(), on page 152 or fpOpenStreamEx2() to either **`KVF_OOPMEMTRACEON`** or **`KVF_OOPMEMTRACEOFF`**.

Use Environment Variables

To enable the memory trace system, add the `KVOOPMT` environment variable, and set its value to **`1`**. To disable the memory trace system, do not set the `KVOOPMT` environment variable.

Specify a Memory Guard

To report memory overwrites in the log file, you must set a memory guard that protects against memory overwrites. Normally, this is set in the range of 100-200 bytes. For example, if a memory guard of 100 is set and 20 bytes of memory are specified, a total of 120 bytes of memory are allocated. The additional memory is used to monitor and identify memory overwrites.

To configure the memory guard, add the following section to the `formats.ini` file:

```
[Kvooplog]
mg=100
```

Report the File Name in Stream Mode

When you run Filter in file mode, the file name is always reported in the log file. To report the file name in stream mode, you must extract it through the API.

To add the input file name to the log, call the fpFilterConfig() function with the following arguments:

Argument	Parameter
nType	KVFLT_SETOOPSRCFILE
nValue	TRUE
pData	*input_filename*

For example:

```
char      inputfile[250];
(*fpFilterConfig)(pKVFilter, KVFLT_SETOOPSRCFILE, TRUE, input_filename);
```

Report Extended Error Codes

When a general error (KVERR_General) is generated during out-of-process filtering, *extended* error codes can also be generated and reported in the error log. The extended error codes provide more information about the error, and are defined in KVErrorCodeEx in kverrorcodes.h.

To report extended errors, call the function fpGetKvErrorCodeEx(). Extended error codes are generated in the C sample program, Filter.

Specify the Maximum Size of the Log File

You can specify the maximum size of the log file. When this size is reached and new entries are logged, either the first entry in the file is overwritten or the new entries are not reported.

To configure the maximum log size and whether old entries are overwritten, add the following section to the formats.ini file:

```
[Kvooplog]
LogFileSize=10
OverWriteLog=1
```

Option	Description
LogFileSize	This option specifies the maximum size of the log file in KB. The minimum is 1 K. If you do not specify a size, the default of 2 MB is used.
OverWriteLog	This option determines whether the log file is overwritten when the maximum log file size (LogFileSize) is reached. If you set this option to **1**, the first entry in the log file is overwritten. If you set this option to **0**, new entries are not reported in the log file.

Extract Metadata

When a file format supports metadata, KeyView can extract and process that information. Metadata includes document information fields such as title, author, creation date, and file size. Depending on the file's format, metadata is referred to in a number of ways: for example, "summary information," "OLE summary information," "file information," and "document properties."

The metadata in mail formats (MSG and EML) and mail stores (PST, NSF, and MBX) is extracted differently than other formats. For information on extracting metadata from these formats, see Extract Mail Metadata, on page 40.

> **NOTE:** KeyView can only extract metadata from a document if metadata is defined in the document, and if the document reader can extract metadata for the file format. The section Document Readers, on page 271 lists the file formats for which metadata can be extracted. KeyView does not generate metadata automatically from the document contents.

The sample program `filter` demonstrates how to extract metadata. See Sample Programs, on page 88.

Extract Metadata for File Filtering

To extract metadata for file filtering

1. Call fpFilterFile().
2. Declare a pointer to the KVSummaryInfoEx structure.
3. Call fpGetOLESummaryInfoFile() to extract the metadata.
4. Call fpFreeOLESummaryInfo() to free the memory allocated for metadata extraction.

Extract Metadata for Stream Filtering

To extract metadata for stream filtering

1. Call fpOpenStream() or fpOpenStreamEx2() to open a stream.
2. Call fpFilterStream() to filter the stream.
3. Call fpCloseStream() to close the input stream.
4. Declare a pointer to the KVSummaryInfoEx structure.
5. Call fpGetOLESummaryInfo() to extract the metadata.
6. Call fpFreeOLESummaryInfo() to free the memory allocated for metadata extraction.

Example

Below is an example of a call to `fpGetOLESummaryInfo()`:

```
{
  KVSummaryInfoEx    si;
  memset( &si, 0, sizeof(si) );
  if ( KVERR_Success != (*pInterface->fpGetOLESummaryInfo)( pKVFilter, pInput, &si
) )
  {
      fprintf( fpOut, "Error obtaining summary information\n" );
```

```
        return;
    }
    if ( si.nElem == 0 )
    {
        fprintf( fpOut, "No summary information\n" );
        goto end;
    }
    PrintSummaryInfo(&si, fpOut);
end:
    (*pInterface->fpFreeOLESummaryInfo)( pKVFilter, &si );
}
```

where:

`pKVFilter`	A pointer returned from fpInit(), on page 150 or fpInitWithLicenseData(), on page 152.
`pInput`	A pointer to the developer-assigned instance of KVInputStream. The structure `KVInputStream` defines the input stream that contains the source.
`si`	Points to the structure KVSummaryInfoEx. In the structure, `nElem` provides a count of the number of metadata elements, and `pElem` points to the first element of the array of individual elements, as defined by the structure KVSumInfoElemEx.

To interpret the metadata after `fpGetOLESummaryInfo()` is called and returns a non-zero status:

- If `si.nElem` is zero, the document did not contain metadata. If `si.nElem` is not zero, `si.nElem` is the number of metadata elements contained in the array.
- Each `KVSumInfoElemEx` structure contains the following information for each metadata element:

`si.pElem[n].isValid`	Specifies whether the data value is present in the document. `1` specifies that the value is valid. For example, if the "Title" element was not populated in the document, `si.pElem[1].isValid == 0` would evaluate to true.
`si.pElem[n].type`	Specifies the data type of the metadata element. The types are defined in the structure KVSumInfoType in `kvtypes.h`.
`si.pElem[n].data`	A pointer to the content of the element. If `type` is `KV_Int4` or `KV_Bool`, then `data` contains the actual value. Otherwise, `data` is a pointer to the actual value. `KV_DateTime` and `KV_IEEE8` point to an 8-byte value. `KV_String` and `KV_Unicode` point to the beginning of the string that contains the text. `KV_Unicode` is replaced with `KV_String` when the UNICODE value has been character mapped to the desired output character set, as specified in the call to `fpInit()`.
`si.pElem[n].pcType`	The name of the metadata field.

Convert Character Sets

Filter can convert the character set of a document to an arbitrary character set specified in the API, or to the character set of the operating system on which the output text is viewed. For this conversion to occur, a source character set *must* be identified. The source character set can either be determined by the document reader, or can be set in the API. The section Document Readers, on page 271 lists file formats for which character set information can be determined by the document reader. The character sets are enumerated in `KVCharSet` in `kvcharset.h`.

Determine the Character Set of the Output Text

To determine the output character set of a filtered document, Filter considers the following:

- Whether the document reader can determine the character set of the file format. If the document reader cannot determine the character set information for the document type, set the source character set in the API.
- Whether the *source* character set is specified in the API.
- Whether the *target* character set is specified in the API.

Guidelines for Character Set Conversion

Below are some rules for the determination of character set mapping:

- If the source is not determined by the document reader or configured in the API, the character set of the output text is always unknown, regardless of the target character set configuration. The document cannot be converted to a target character set or the operating system's code page unless the source character set is known.
- If the target character set is *not* specified in the API, and the source character set is identified, the operating system's code page is used for the output text.
- If the source character set is identified, and the target character set is specified in the API, the target character set specified in the API is used for the output text.
- For documents that contain multiple character sets, Micro Focus recommends that the target character set be forced to UNICODE or UTF-8.

The following table illustrates how Filter determines the character set of the output text.

Determining the Output Character Set—Example

Source charset read by Filter	Source charset specified in API	Target charset specified in API	Output charset
No	No	No	no conversion
No	KVCS_936	No	OS code

Determining the Output Character Set—Example, continued

Source charset read by Filter	Source charset specified in API	Target charset specified in API	Output charset
			page
No	No	UNICODE	no conversion
No	KVCS_936	UNICODE	UNICODE
Yes	No	No	OS code page
Yes	KVCS_936	No	OS code page
Yes	No	UNICODE	UNICODE
Yes	KVCS_936	UNICODE	UNICODE

Set the Character Set During Filtering

You can convert the character set of a file at the time the file is filtered.

To specify the source character set of a file, after calling fpInit(), on page 150 or fpInitWithLicenseData(), on page 152, call fpSetSrcCharSet(), and set the `eCharSet` argument to any value in the enumerated list in `KVCharSet` in `kvcharset.h`.

To determine the final output character set, call the `fpGetTrgCharSet()` function after filtering is complete.

To specify the target character set, set the `outputCharSet` argument of fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 to any value in the enumerated list in `KVCharSet` in `kvcharset.h`.

Not all values of the enumerated list can be used as a target character set. Coded Character Sets, on page 309 lists character sets that can be used as output.

Set the Character Set During Subfile Extraction

You can convert the character set of a subfile at the time the subfile is extracted from the container and before it is filtered. This is most often used to set the character set of a mail message's body text. See Filter PDF Files, on page 67 for more information.

To specify the source character set of a subfile, call the fpExtractSubFile() function, and set the `KVExtractSubFileArg->srcCharset` argument to any value in the enumerated list in `KVCharSet` in `kvcharset.h`.

To specify the target character set of a subfile, call the `fpExtractSubFile()` function, and set the `KVExtractSubFileArg->trgCharSet` argument to any value in the enumerated list in `KVCharSet` in `kvcharset.h`.

Customize Character Set Detection and Conversion

KeyView attempts to detect the character set of an input file by default. Some character sets (including ANSI, UTF-8, and UTF-16) can be detected by core KeyView functionality but others can only be detected if your license includes advanced character set detection.

If your license includes advanced character set detection, it is enabled by default. However, it can increase the time required to filter some documents. You can disable advanced character set detection on a file-by-file basis, by calling fpFilterConfig() and setting the flag `KVFLT_CHARSETDETECTION` to **`FALSE`**. Before setting this flag, be aware that KeyView can not perform character set conversion unless it detects the character set of the source file, or you call fpSetSrcCharSet().

When the character set of the input file is known, KeyView performs character set conversion. You can prevent the default conversion of text to the operating system code page, and specify that Filter retain the original character encoding of the document. Any document identified as containing more than one character encoding is converted to the first encoding encountered in the file.

To prevent the default conversion, set the flag `KVF_NODEFAULTCHARSETCONVERT` as the last argument of the call to fpInit(), on page 150 or fpInitWithLicenseData(), on page 152. This setting overrides any source or target character set specified through the API.

Extract Deleted Text Marked by Tracked Changes

The revision tracking feature in applications—such as Microsoft Word's **Track Changes**—marks changes to a document (typically, strikethrough for deleted text and underline for inserted text) and tracks each change by reviewer name and date.

If revision tracking was enabled when text was deleted from a source document, you can configure Filter to extract the deleted text. Filter does not extract the reviewer name and revision date.

To extract deleted text from a document and include it in the filtered output

1. Call the fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 function.
2. Call the fpFilterConfig() function with the following arguments:

Argument	Parameter
`nType`	`KVFLT_INCLREVISIONMARK`
`nValue`	`TRUE`
`pData`	`NULL`

   For example:

   ```
   (*fpFilterConfig)(pKVFilter, KVFLT_INCLREVISIONMARK, TRUE, NULL);
   ```

3. Call the fpFilterFile() or fpFilterStream() function.

Filter PDF Files

Filter has special configuration options that allow greater control over the conversion of Adobe Acrobat PDF files.

Filter PDF Files to a Logical Reading Order

The PDF format is primarily designed for presentation and printing of brochures, magazines, forms, reports, and other materials with complex visual designs. Most PDF files do not contain the *logical structure* of the original document—the correct reading order, for example, and the presence and meaning of significant elements such as headers, footers, columns, tables, and so on.

KeyView can filter a PDF file either by using the file's internal unstructured paragraph flow, or by applying a structure to the paragraphs to reproduce the logical reading order of the visual page. Logical reading order enables KeyView to output PDF files that contain languages that read from right-to-left (such as Hebrew and Arabic) in the correct reading direction.

> **NOTE:** The algorithm used to reproduce the reading order of a PDF page is based on common page layouts. The paragraph flow generated for PDFs with unique or complex page designs might not emulate the original reading order exactly.
>
> For example, page design elements such as drop caps, callouts that cross column boundaries, and significant changes in font size might disrupt the logical flow of the output text.

By default, KeyView produces an *unstructured* text stream for PDF files. This means that PDF paragraphs are extracted in the order in which they are stored in the file, not the order in which they appear on the visual page. For example, a three-column article could be output with the headers and title at the end of the output file, and the second column extracted before the first column. Although this output does not represent a logical reading order, it accurately reflects the internal structure of the PDF.

You can configure KeyView to produce a *structured* text stream that flows in a specified direction. This means that PDF paragraphs are extracted in the order (logical reading order) and direction (left-to-right or right-to-left) in which they appear on the page.

The following paragraph direction options are available:

Paragraph Direction Option	Description
Left-to-right	Paragraphs flow logically and read from left to right. You should specify this option when most of your documents are in a language that uses a left-to-right reading order, such as English or German.
Right-to-left	Paragraphs flow logically and read from right to left. You should specify this option when most of your documents are in a language that uses a right-to-left reading order, such as Hebrew or Arabic.
Dynamic	Paragraphs flow logically. The PDF filter determines the paragraph direction for each

Paragraph Direction Option	Description
	PDF page, and then sets the direction accordingly. Filter uses this option when a paragraph direction is not specified.

NOTE: Filtering might be slower when logical reading order is enabled. For optimal speed, use an unstructured paragraph flow.

The paragraph direction options control the direction of paragraphs on a page; they do not control the text direction in a paragraph. For example, a PDF file might contain English paragraphs in three columns that read from left to right, but 80% of the second paragraph might contain Hebrew characters. If the left-to-right logical reading order is enabled, the paragraphs are ordered logically in the output—title paragraph, then paragraph 1, 2, 3, and so on—and flow from the top left of the first column to the bottom right of the third column. However, the *text* direction of the second paragraph is determined independently of the page by the PDF filter, and is output from right to left.

NOTE: Extraction of metadata is not affected by the paragraph direction setting. The characters and words in metadata fields are extracted in the correct reading direction regardless of whether logical reading order is enabled.

Enable Logical Reading Order

You can enable logical reading order by using either the API or the `formats.ini` file. Setting the paragraph direction in the API overrides the setting in the `formats.ini` file.

Use the C API

To enable PDF logical reading order in the C API, call the fpFilterConfig() function with the following arguments:

Argument	Parameter
`nType`	`KVFLT_LOGICALPDF`
`nValue`	Set to one of the following flags which are defined in `kvtypes.h` (see LPDF_DIRECTION, on page 193): • **LPDF_LTR**. Logical reading order and left-to-right paragraph direction. • **LPDF_RTL**. Logical reading order and right-to-left paragraph direction. • **LPDF_AUTO**. Logical reading order. The PDF reader determines the paragraph direction for each PDF page, and then sets the direction accordingly. Filter uses this option when a paragraph direction is not specified. • **LPDF_RAW**. Unstructured paragraph flow. This is the default behavior. If logical reading order is enabled, and you want to return to an unstructured paragraph flow,

Argument	Parameter
	set this flag.
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_LOGICALPDF, LPDF_LTR, NULL);
```

Use the formats.ini File

To enable logical reading order by using the formats.ini file

1. Change the PDF reader entry in the `[Formats]` section of the `formats.ini` file as follows:

   ```
   [Formats]
   200=lpdf
   ```

2. Optionally, add the following section to the end of the `formats.ini` file:

   ```
   [pdf_flags]
   pdf_direction=paragraph_direction
   ```

   where *paragraph_direction* is one of the following:

Flag	Description
LPDF_LTR	Left-to-right paragraph direction.
LPDF_RTL	Right-to-left paragraph direction.
LPDF_AUTO	The PDF reader determines the paragraph direction for each PDF page, and then sets the direction accordingly. Filter uses this option when a paragraph direction is not specified.
LPDF_RAW	Unstructured paragraph flow. This is the default behavior. If logical reading order is enabled, and you want to return to an unstructured paragraph flow, set this flag.

Rotated Text

When a PDF that contains rotated text is filtered, the rotated text is extracted after the text at the end of the PDF page on which the rotated text appears. If the PDF is filtered with logical order enabled, and the amount of rotated text on a page surpasses a predefined threshold, the page is automatically output as an unstructured text stream. You cannot configure this threshold.

Extract Custom Metadata from PDF Files

You can extract custom metadata from PDF files either by specifying individual metadata tag names, or by extracting all custom metadata at once.

Extract Custom Metadata by Tag

To extract custom metadata by metadata tag, add the custom metadata names to the `pdfsr.ini` file provided, and copy the modified file to the `bin` directory. You can then extract metadata as you normally would.

The `pdfsr.ini` is in the directory `samples\pdfini`, and has the following structure:

```
<META>
<TOTAL>total_item_number</TOTAL>,
/metadata_tag_name datatype,
</META>
```

Parameter	Description
total_item_number	The total number of metadata tags that are listed.
metadata_tag_name	The metadata tag name used in the PDF files.
datatype	The data type of the metadata field. Data types are defined in KVSumInfoType.

For example:

```
<META>
<TOTAL>4</TOTAL>
/part_number      INT4
/volume           INT4
/purchase_date    DATETIME
/customer         STRING
</META>
```

Extract All Custom Metadata

You can extract all metadata through the API.

To extract all metadata by using the API

1. Call the fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 function.
2. Call the fpFilterConfig() function with the following arguments:

Argument	Parameter
nType	KVFLT_EXPORTALLMETADATA
nValue	TRUE
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_EXPORTALLMETADATA, TRUE, NULL);
```

3. Call the fpGetOLESummaryInfo() or fpGetOLESummaryInfoFile() function.

Filter Tagged PDF Content

A tagged PDF contains an additional layer of text for visually impaired readers. This text is used in text-to-speech features in various PDF viewing programs. You can enable filtering of tagged PDF text in the API.

Filtering the extra layer of tagged content might result in duplicate text in the output. This is the expected behavior.

To filter tagged PDF content

1. Call the fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 function.
2. Call the fpFilterConfig() function with the following arguments:

Argument	Parameter
nType	KVFLT_EXPORTTAGGEDCONTENT
nValue	TRUE
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_EXPORTTAGGEDCONTENT, TRUE, NULL);
```

Skip Embedded Fonts

Text in PDF files sometimes contains embedded fonts. If you experience difficulties filtering embedded fonts, there are options in the API, the `formats.ini` file, and the filter sample program that enable you to skip this type of text.

> **NOTE:** If you skip embedded fonts, none of the content that contains embedded fonts is included in the output.

Use the formats.ini File

When you use `formats.ini` to skip embedded fonts, you can also specify an *embedded font threshold*, which is an arbitrary percentage probability that the glyph in the embedded text maps to a character value in the output character set (ASCII, UTF-8, and so on).

For example, if you specify a threshold of **75**, embedded text glyphs that have a 75% or greater probability of correctly matching the character in the output character set are included in the output; glyphs that have a probability of less than 75% of matching the output character set are omitted from the output.

To skip embedded fonts by using the formats.ini file

- Set the following parameters:

  ```
  [pdf_flags]
  skipembeddedfont=TRUE
  embedded_font_threshold=threshold
  ```

  where *`threshold`* is a value between `0` and `100`. A threshold of `100` skips all embedded font text; a threshold of `0` retains all embedded font text. Set `skipembeddedfont` to **`TRUE`** to enable the `embedded_font_threshold` parameter.

  The default value of `embedded_font_threshold` is `100`. if you set `skipembeddedfont` to **`TRUE`** and do not specify the `embedded_font_threshold` parameter, Filter skips all embedded text.

Use the C API

To skip embedded fonts by using the C API, call the fpFilterConfig() function with the following arguments:

Argument	Parameter
`nType`	`KVFLT_SKIPEMBEDDEDFONT`
`nValue`	`TRUE`
`pData`	`NULL`

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SKIPEMBEDDEDFONT, TRUE, NULL);
```

Control Hyphenation

There are two types of hyphens in a PDF document:

- A *soft hyphen* is added to a word by a word processor to divide the word across two lines. This is a discretionary hyphen and is used to ensure proper text flow in justified text.

- A *hard hyphen* is intentionally added to a word regardless of the word's position in the text flow. It is required by the rules of grammar or word usage. For example, compound words (such as *three-week vacation* and *self-confident)* contain hard hyphens.

By default, KeyView skips the source document's soft hyphens in the Filter output to provide more searchable text content. However, if you want to maintain the document layout, you can keep soft hyphens in the Filter output. To keep soft hyphens, you must enable the soft hyphen flag in `formats.ini` or in the API.

Use the formats.ini File

To keep soft hyphens by using the `formats.ini` file, set the following parameter:

```
[pdf_flags]
keepsofthyphen=TRUE
```

Use the C API

To keep soft hyphens by using the C API, call the fpFilterConfig() function with the following arguments:

Argument	Parameter
`nType`	`KVFLT_KEEPSOFTHYPHEN`
`nValue`	`TRUE`
`pData`	`NULL`

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_KEEPSOFTHYPHEN, TRUE, NULL);
```

Filter Portfolio PDF Files

Portfolio PDF files contain subfiles and an ActionScript interface for navigating between them. You can use the extraction API to extract the subfiles. See Extract Subfiles from PDF Files, on page 55.

Filter Spreadsheet Files

Filter has special configuration options that enable greater control over the conversion of spreadsheet files.

Filter Worksheet Names

Normally, Filter does not extract worksheet names from a spreadsheet because it is assumed that the text should not be exposed. To extract worksheet names, add the following lines to the `formats.ini` file:

```
[Options]
getsheetnames=1
```

Filter Hidden Text in Microsoft Excel Files

Normally, Filter does not filter hidden text from a Microsoft Excel spreadsheet because it is assumed that the text should not be exposed. To extract text from hidden rows, columns, and sheets from Excel spreadsheets, add the following lines to the `formats.ini` file:

```
[Options]
gethiddeninfo=1
```

> **NOTE:** You can also set an API flag to filter text from hidden sheets. See Hidden Data in Microsoft Excel Documents, on page 83 for more information.

Specify Date and Time Format on UNIX Systems

In Microsoft Excel you can choose to format dates and times according to the system locale. On Windows, KeyView uses the system locale settings to determine how these dates and times should be formatted. In other operating systems, KeyView uses the U.S. short date format (*mm/dd/yyyy*). You can change this by specifying the formats you wish to use in the `formats.ini` file.

To specify the system date and time format on UNIX systems

- In the `formats.ini` file, specify the following options:
  - `SysDateTime`. The format to use when a cell is formatted using the system format including both the date and the time.
  - `SysLongDate`. The format to use when a cell is formatted using the system long date format.
  - `SysShortDate`. The format to use when a cell is formatted using the system short date format.
  - `SysTime`. The format to use when a cell is formatted using the system time format.

  > **NOTE:** These values cannot contain spaces.

  For example, if you specify `SysDateTime=%d/%m/%Y`, dates and times are extracted in the following format:

  28/02/2008

  The format arguments are the same as those for the `strftime()` function.

  See http://linux.die.net/man/3/strftime for more information.

Filter Very Large Numbers in Spreadsheet Cells to Precision Numbers

By default, numbers are extracted in the format specified by the Excel file (for example, *General, Currency* and *Date*). Spreadsheets might contain cells that have very large numbers in them. Excel displays the numbers in a scientific notation that rounds or truncates the numbers.

To extract numbers without formatting, add the following options in the `formats.ini` file:

```
[Options]
ignoredefnumformats=1
```

Extract Microsoft Excel Formulas

Normally, the actual value of a formula is extracted from an Excel spreadsheet; the formula from which the value is derived is not included in the output. However, KeyView enables you to include the value as well as the formula in the output. For example, if Filter is configured to extract the formula and the formula value, the output might look like this:

```
245 = SUM(B21:B26)
```

The calculated value from the cell is `245` and the formula from which the value is derived is `SUM (B21:B26)`.

> **NOTE:** Depending on the complexity of the formulas, enabling formula extraction might result in slightly slower performance.

To set the extraction option for formulas

- Add the following lines to the `formats.ini` file:

```
[Options]
getformulastring=option
```

where *option* is one of the following:

Option	Description
`0`	Extract the formula value only. This is the default. If formula extraction is enabled, and you want to return to the default, set this option.
`1`	Extract the formula only.
`2`	Extract the formula and the formula value.

> **NOTE:** You can also set an API flag to filter formulas and formula values. See Hidden Data in Microsoft Excel Documents, on page 83 for more information.

If a function in a formula is not supported or is invalid, and option 1 or 2 is specified, only the calculated value is extracted. See Supported Microsoft Excel Functions, below for a list of supported functions.

When formula extraction is enabled, Filter can extract Microsoft Excel formulas that contain the functions listed in the following table.

Supported Microsoft Excel Functions

=ABS()	=ACOS()	=AND()	=AREAS()
=ASIN()	=ATAN2()	=ATAN2()	=AVERAGE()
=CELL()	=CHAR()	=CHOOSE()	=CLEAN()
=CODE()	=COLUMN()	=COLUMNS()	=CONCATENATE()
=COS()	=COUNT()	=COUNTA()	=DATE()
=DATEVALUE()	=DAVERAGE()	=DAY()	=DCOUNT()
=DDB()	=DMAX()	=DMIN()	=DOLLAR()
=DSTDEV()	=DSUM()	=DVAR()	=EXACT()
=EXP()	=FACT()	=FALSE()	=FIND()
=FIXED()	=FV()	=GROWTH()	=HLOOKUP()
=HOUR()	=ISBLANK()	=IF()	=INDEX()
=INDIRECT()	=INT()	=IPMT()	=IRR()
=ISERR()	=ISERROR()	=ISNA()	=ISNUMBER()
=ISREF()	=ISTEXT()	=LEFT()	=LEN()
=LINEST()	=LN()	=LOG()	=LOG10()
=LOGEST()	=LOOKUP()	=LOWER()	=MATCH()
=MAX()	=MDETERM()	=MID()	=MIN()
=MINUTE()	=MINVERSE()	=MIRR()	=MMULT()
=MOD()	=MONTH()	=N()	=NA()
=NOT()	=NOW()	=NPER()	=NPV()
=OFFSET()	=OR()	=PI()	=PMT()
=PPMT()	=PRODUCT()	=PROPER()	=PV()
=RATE()	=REPLACE()	=REPT()	=RIGHT()
=ROUND()	=ROUND()	=ROW()	=ROWS()
=SEARCH()	=SECOND()	=SIGN()	=SIN()

```
=SLN()        =SQRT()      =STDEV()      =SUBSTITUTE()
=SUM()        =SYD()       =T()          =TAN()
=TEXT()       =TIME()      =TIMEVALUE()  =TODAY()
=TRANSPOSE()  =TREND()     =TRIM()       =TRUE()
=TYPE()       =UPPER()     =VALUE()      =VAR()
=VLOOKUP()    =WEEKDAY()   =YEAR()
```

Standardize Cell Formats

This options enables the standardization of cell formats within Microsoft Excel files. KeyView formats any cell where a number has been entered according to the following rules.

Numbers

These include:

- rounded numbers
- exponentials
- fractions
- percentages

Numbers are printed to the maximum length entered–that is, the full number put into the cell, without any rounding. Negative numbers are printed with a dash in front of them (as opposed to, for example, bracket form).

Text

All text that is part of the format string is stripped, including currency symbols.

Dates

All dates are printed in full ISO-8601 format (that is `YYYY-MM-DDTHH:MM:SS`). There are two exceptions to this rule:

- Cases where the date format contains a time delta (that is, `"[h]"`, `"[m]"`, or `"[s]"`). In this case, the time is displayed as an interval, which is the number of days (where a day is defined as a period of 24 hours). The time is printed in the ISO-8601 time interval form, for example `P1.234D`.
- Cases where the absolute value of the cell is less than `1.0`, and the date format contains only time components. In Excel, values between `0.0` and `1.0` correspond to the fictional date `1900-01-00`, and are used to express times without an associated date. For example:

Value	Date format	KeyView output
0.5	hh:mm:ss	12:00:00
0.5	dd hh	1900-01-00 12:00:00
1.5	hh:mm:ss	1900-01-01 12:00:00
1.5	dd hh	1900-01-01 12:00:00

You can enable this option by adding the following to the `formats.ini` file:

```
[Options]
StandardizeCellFormats=TRUE
```

Alternatively, iyou can enable this option programatically by passing `KVFLT_STANDARDIZECELLFORMATS` to `fpFilterConfig`.

Filter XML Files

KeyView can detect many types of XML file, including:

- Generic XML
- Microsoft Office 2003 XML (Word, Excel, and Visio)
- StarOffice/OpenOffice XML (text document, presentation, and spreadsheet)

KeyView automatically filters text from these formats, using default settings that are defined internally.

If necessary, you can customize how to filter text from XML, including the "known" formats such as Microsoft Office XML. In most cases you should not need to modify the settings for the known formats. However, this feature might be useful when you are filtering generic XML files, where the structure of the XML is unknown to KeyView, and you want to extract specific elements but ignore others.

Configure Element Extraction for XML Documents

When filtering XML files, you can specify which elements and attributes to extract according to the file's format ID or *root element*. This is useful when you want to extract only relevant text elements, such as abstracts from reports, or a list of authors from an anthology.

A root element is an element in which all other elements are contained. In the following XML sample, `book` is the root element:

```
<?xml version="1.0" encoding="UTF-8"?>
<book>
    <title>XML Introduction</title>
    <product id="33-657" status="draft">XML Tutorial</product>
    <chapter>Introduction to XML
        <para>What is HTML</para>
        <para>What is XML</para>
    </chapter>
```

```
    <chapter>XML Syntax
        <para>Elements must have a closing tag</para>
        <para>Elements must be properly nested</para>
    </chapter>
</book>
```

For example, you could specify that when filtering files with the root element `book`, the element `title` is extracted as metadata, and only `product` elements with a `status` attribute value of `draft` are extracted. When you extract an element, the child elements within the element are also extracted. For example, if you extract the element `chapter` from the previous sample, the child element `para` is also extracted.

Modify Element Extraction Settings

You can use the C API to modify the settings for the standard XML document types or add configuration settings for your own XML document types.

To modify settings

1. Call the fpInit(), on page 150 or fpInitWithLicenseData(), on page 152 function.
2. Define the KVXConfigInfo structure.
3. Call the fpFilterConfig() function with the following arguments:

Argument	Parameter
`nType`	`KVFLT_SETXMLCONFIGINFO`
`nValue`	`0`
`pData`	the address of the `KVXConfigInfo` structure

   For example:

```
KVXConfigInfo  xinfo;
/* populate xinfo */

(*fpFilterConfig)(pKVFilter, KVFLT_SETXMLCONFIGINFO, 0, &xinfo);
```

4. Repeat step 2 and step 3 until the settings for all the XML document types that you want to customize are defined.
5. Call the fpFilterFile() function.

Explore XML Extraction Settings with the Sample Program

The filter sample program reads XML extraction settings from a configuration file that you specify with the `-x` argument. This lets you try XML extraction settings without programming.

An example configuration file, `kvxconfig.ini`, is provided with the Filter SDK. The file is in the directory *`install`*`\`*`OS`*`\bin`, where *`install`* is the installation directory and *`OS`* is the name of the operating system.

The file contains the default element extraction settings for some XML formats. Sections from `[config0]` to `[config99]` show the default settings defined internally in KeyView. For example, the section `[config3]` shows the default extraction settings for the format `MS_Visio_XML_Fmt`. You can modify these if you wish, but in most cases you should not need to modify the settings for these formats.

To define custom extraction settings for a generic XML document, add a new section. For example, if you have an XML file you can define custom settings so that KeyView extracts specific information. The sample program expects custom sections to be named `[config`*`N`*`]`, where *`N`* is an integer starting at 100 and increasing by 1 for each additional file type, for example `[config100]`, `[config101]`, `[config102]`, and so on.

To define custom settings for processing an XML file with the root element `book`, you could add the following:

```
[config100]
eKVFormat=
szRoot=book
szInMetaElement=
szExMetaElement=
szInContentElement=*
szExContentElement=para
szInAttribute=
```

This is a simple example that extracts text from all elements, except `para` elements.

The following table describes the configuration options in `kvxconfig.ini`. These are based on the structure KVXConfigInfo.

Configuration Option	Description
`eKVFormat`	The format ID as detected by the KeyView detection module. This determines the file type to which these extraction settings apply. See File Format Detection, on page 328 for more information on format ID values. If you are adding configuration settings for a custom XML document type, this option is not defined.
`szRoot`	The file's root element. When the format ID is not defined, the root element is used to determine the file type to which these settings apply. To further qualify the element, specify its namespace. See Specify an Element's Namespace and Attribute, on the next page.
`szInMetaElement`	The elements extracted from the file as metadata. All other elements are extracted as text. Separate multiple entries with commas. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's

Configuration Option	Description
	Namespace and Attribute, on the next page.
`szExMetaElement`	The child elements in the included metadata elements that are not extracted from the file as metadata. For example, the default extraction settings for the Visio XML format extract the `DocumentProperties` element as metadata. This element includes child elements such as `Title`, `Subject`, `Author`, `Description`, and so on. However, the child element `PreviewPicture` is defined in `szExMetaElement` because it is binary data and should not be extracted. You cannot exclude any metadata elements from the output for StarOffice files. All metadata is extracted regardless of this setting. Separate multiple entries with commas. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, below.
`szInContentElement`	The elements extracted from the file as content text. Enter an asterisk (*) to extract all elements including child elements. Separate multiple entries with commas. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, below.
`szExContentElement`	The child elements in the included content elements that are not extracted from the file as content text. Separate multiple entries with commas. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, below.
`szInAttribute`	The attribute values extracted from the file. If attributes are not defined here, attribute values are not extracted. Enter the namespace (if used), element name, and attribute name in the following format: *`namespace:elementname@attributename`* For example: `keyview:division@name` Separate multiple entries with commas.

Specify an Element's Namespace and Attribute

To further qualify an element, you can specify that the element must exist in a certain namespace, must contain a specific attribute, or both. To define the namespace *and* attribute of an element, enter the following:

`ns_prefix:elemname@attribname=attribvalue`

> **NOTE:** Attribute values that contain spaces must be enclosed in quotation marks.

For example, the entry `bg:language@id=xml` extracts a `language` element in the namespace `bg` that contains the attribute name `id` with the value of `"xml"`. This entry extracts the following element from an XML file:

```
<bg:language id="xml">XML is a simple, flexible text format derived from
SGML</bg:language>
```

but does not extract:

```
<bg:language id="sgml">SGML is a system for defining markup
languages.</bg:language>
```

or

```
<adv:language id="xml">The namespace should be a Uniform Resource Identifier
(URI).</adv:language>
```

Configure Headers and Footers

You can configure custom header and footer tags for word processing and spreadsheet documents by editing the `formats.ini` file.

To configure headers and footers

1. Open the `formats.ini` file.
2. In the `[Options]` section, add the following items:

   ```
   header_start_tag=HeaderStart
   header_end_tag=HeaderEnd
   footer_start_tag=FooterStart
   footer_end_tag=FooterEnd
   ```

   For example:

   ```
   header_start_tag=<myHeaderTag>
   header_end_tag=</myHeaderTag>
   footer_start_tag=<myFooterTag>
   footer_end_tag=</myFooterTag>
   ```

> **NOTE:** You must encode custom tags in UTF-8.

Filter Hidden Data

Some documents contain hidden information, which is not filtered by default. Depending on the type of hidden data that you want to filter and the type of document that you are filtering, you can either use the API or set parameters in the `formats.ini` file.

Hidden Data in Microsoft Excel Documents

There are several types of hidden data in Microsoft Excel documents, each of which has a corresponding flag in the KV_CONFIG_Arg structure, which you can toggle to determine whether the hidden data is shown.

The following table lists each data type, its default behavior, and its corresponding configuration API flag.

Hidden data settings

Hidden Data Type	Default Behavior	KV_CONFIG_Arg flag
Hidden sheets	Not output	`KV_SS_SHOWHIDDENINFOR`
Formulas	Calculated value	`KV_SS_SHOWFORMULA`
Values and formulas	Calculated value	`KV_SS_SHOWVALUESANDFORMULAS`

To toggle the display of any type of hidden data

1. Define the configurable argument variable to use in the KV_CONFIG_Arg structure. For example:

   ```
   KV_CONFIG_Arg setArg = {0}
   ```

2. Set the `KV_ALL_OVERWRITECONFIGFILE` flag to overwrite the configuration file settings. For example:

   ```
   setArg.keyID = KV_ALLFLAGS;
   setArg.keyType = KV_INT32ARG;
   setArg.keyData.intArg = KV_ALL_OVERWRITECONFIGFILE;
   ```

   > **NOTE:** To re-enable configuration file settings later, set `!KV_ALL_OVERWRITECONFIGFILE`.

3. Assign values to the members of the variable. For example:

   ```
   setArg.keyID = KV_SSFLAGS;
   setArg.keyType = KV_INT32ARG;
   setArg.keyData.intArg = KV_SS_SHOWHIDDENINFOR;
   ```

4. Call fpFilterConfig() with the following arguments to set the variable:

Argument	Parameter
`nType`	`KVFLT_SetConfigurableArguments`
`nValue`	`TRUE`
`pData`	The variable defined in step 1.

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SetConfigurableArguments, TRUE, &setArg)
```

Example

The following example overwrites the configuration file settings and enables filtering of formulas.

```
KV_CONFIG_Arg setArg = {0};

setArg.keyID = KV_ALLFLAGS;
setArg.keyType = KV_INT32ARG;
setArg.keyData.intArg = KV_ALL_OVERWRITECONFIGFILE;

fpKV_FilterConfig(pFilter, KVFLT_SetConfigurableArguments, TRUE, &setArg);

setArg.keyID = KV_SSFLAGS;
setArg.keyType = KV_INT32ARG;
setArg.keyData.intArg = KV_SS_SHOWFORMULAS;

fpKV_FilterConfig(pFilter, KVFLT_SetConfigurableArguments, TRUE, &setArg);
```

Toggle Hidden Excel Data Settings in the formats.ini File

You can control Microsoft Excel hidden data settings through parameters in the `formats.ini` file.

To toggle hidden Excel data settings in the formats.ini file

1. Open the `formats.ini` file in a text editor.
2. Under `[Options]`, set one or both of the following parameters.
   - To filter text from hidden sheets, set `gethiddeninfo` to **`1`**. See Filter Hidden Text in Microsoft Excel Files, on page 74 for more information.
   - To filter formulas and formula values, set `getformulastring` to the appropriate value. See Extract Microsoft Excel Formulas, on page 75 for more information.

Hidden Data in HTML Documents

KeyView can filter comments from HTML documents. To enable comment filtering, you must set a flag in the `formats.ini` file.

To enable filtering of comments from HTML files

1. Open the `formats.ini` file in a text editor.
2. Under `[Options]`, set the following flag.

   ```
   GetHTMLHiddenInfo=1
   ```

Tab Delimited Output for Embedded Tables

You can use KeyView to convert embedded tables in Word Processing documents (for example, Microsoft Word) to tab-delimited form, by specifying the following option in the `formats.ini` file:

```
[Options]
TabDelimited=TRUE
```

This option inserts a tab character between each cell, and a line break between each row. Tab and line break characters in the cells are replaced with spaces.

Table Detection for PDF Files

PDF files often contain data presented in a tabular form. However, there is no information about the table stored within the PDF itself – the text is simply placed in an arrangement that looks like a table to the human eye. When this data is filtered, it can be very difficult to reconstruct the table.

If table detection is enabled, KeyView attempts to recognize tables within PDF pages, and to reconstruct them before they are output. For each page of the document, KeyView outputs the contents of each table first, and then outputs all remaining text on the page.

Micro Focus recommends that tab delimited output is also enabled when using table detection. This means that any tables detected appear in the output text in tab delimited format.

To enable table detection and tab delimited output, specify the following in the `formats.ini` file:

```
[Options]
TableDetection=TRUE
TabDelimited=TRUE
```

Alternatively, you can enable these options programmatically by setting `KVFLT_TABLEDETECTION` and `KVFLT_TABDELIMITED` to true in `fpFilterConfig()`.

> **NOTE:** Table detection is only available with the `pdf2sr` reader. To enable this reader, set the following configuration parameter:
>
> ```
> [Formats]
> 200=pdf2
> ```

Exclude Japanese Guide Text

This option prevents output of Japanese phonetic guide text when Microsoft Excel (`.xlsx`) files are processed.

To prevent output of Japanese phonetic guide text

- Set `NoPhoneticGuides` to **`TRUE`** in the `formats.ini` file:

  ```
  [Options]
  NoPhoneticGuides=TRUE
  ```

You can also enable this option programatically when filtering by passing `KVFLT_NOPHONETICGUIDES` to `fpFilterConfig`.

Source Code Identification

When KeyView auto-detects a file that contains source code, it can attempt to identify the programming language that it is written in.

> **NOTE:** Source code identification is available only on Windows 64-bit, Linux 64-bit, and macOS 64-bit platforms.

You can set source code identification to different levels.

Option	Description
`KVSOURCECODE_OFF`	Do not enable source code identification.
`KVSOURCECODE_ENABLED`	Enable source code identification for the most common source code formats.
`KVSOURCECODE_EXTENDED`	Enable source code identification for all supported source code formats. This option might lead to false positives in some cases (for example, a C++ file might get identified as a rarer format).

For the complete list of source code formats supported for both options, see Supported Formats, on page 197.

You can enable source code identification by setting the appropriate level in the `formats.ini` file. For example:

```
[Options]
SourceCodeDetection=KVSOURCECODE_ENABLED
```

You can also enable this option by passing `KVFLT_SOURCECODEIDENTIFICATION` to the `fpFilterConfig()` function. For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SOURCECODEDETECTION, KVSOURCECODE_ENABLED,
NULL);
```

Setting the option through `fpFilterConfig` overrides any settings in `formats.ini`.

For more information, see fpFilterConfig(), on page 130.

Configure the Proxy for RMS

When KeyView needs to access contents that are protected by the Microsoft Rights Management System (RMS), it must make HTTP requests. By default, KeyView uses the system proxy settings for these requests.

To use different proxy settings, you can configure them in the `[RMS]` section of the `formats.ini` configuration file. The following table describes the available options.

Parameter	Description
`UseSystemProxy`	Whether to obtain details about your HTTP proxy from the system. By default, this parameter is set to **`TRUE`**, which means: • On Microsoft Windows platforms, KeyView reads the proxy settings that are configured in the Windows Control Panel. • On Linux, KeyView reads the proxy settings from environment variables such as `HTTP_PROXY` and `HTTPS_PROXY`. You can use `UseSystemProxy` instead of setting the other proxy parameters (`ProxyHost`, `ProxyPort`, `ProxyUsername`, and `ProxyPassword`). When `UseSystemProxy` is set to **`TRUE`**, you must remove these other parameters from your configuration. Set `UseSystemProxy` to **`FALSE`** to use different proxy settings. In this case you must set at least `ProxyHost` and `ProxyPort`.
`ProxyHost`	The host name or IP address of the proxy server.
`ProxyPassword`	The password to use to authenticate with the proxy server.
`ProxyPort`	The port of the proxy server to use to access the repository. This port must be greater than 0, and less than 65535.
`ProxyUsername`	The user name to use to authenticate with the proxy server.

Chapter 5: Sample Programs

This section describes the sample programs provided with Filter SDK.

Introduction

The C sample programs demonstrate how to use the C implementation of the Filter API. The sample code is intended to provide a starting point for your own applications or to be used for reference purposes.

The following C sample programs are provided:

- tstxtract
- filter

The source code and makefile (*program_name_platform*`.mak`) for the programs are in the directory *`install`*`\samples\`*`program_name`*, where *`install`* is the path of the Filter installation directory, and *`program_name`* is the name of the sample program.

The sample programs pass license information to KeyView using fpInitWithLicenseData(). This is the method recommended by Micro Focus. Before the sample programs can be compiled, you must replace the parameters `YOUR_LICENSE_ORGANIZATION` and `YOUR_LICENSE_KEY` in the `fpInitWithLicenseData()` function call with your license information.

To compile the sample programs, use the makefile provided for the appropriate platform. Make sure that the Filter `include` directory is specified in the include path of the project. After the executable is compiled and built, you must place it in the same directory as the Filter libraries.

> **NOTE:** Compiled binaries are provided for some of the sample programs, in the *`PLATFORM`*`/bin` folder. These have an embedded trial license, which expires approximately five months after release.

tstxtract

The `tstxtract` sample program demonstrates the File Extraction API. It opens a file, extracts subfiles from the file, and repeats the extraction process until all subfiles are extracted. It also demonstrates how to extract the default set of metadata and pass integer or string names to extract specific metadata. After the files are extracted, you can filter the files by using the `filter` sample program. The `filter` sample program demonstrates the functionality of the Filter API.

The source code for the `tstxtract` sample program is the same for the Filter and Export SDKs. A flag in the makefile specifies whether the program is compiled for Filter, HTML Export, or XML Export.

To run `tstxtract`, type the following at the command line:

`tstxtract [options] input_file output_directory bin_directory`

where:

- *`options`* is one or more of the following:

Option	Description
`-c charset`	Specify the target character set, for example `KVCS_SJIS`. See Coded Character Sets, on page 309 for a full list of supported character sets.
`-cf keyfile1, keyfile2,...`	Specify one or more credential files (private keys) to use to decrypt encrypted .EML, .MBX, .PST, or .MSG files.
`-l logfile`	Specify the path and file name of the log file in which metadata is written.
`-lm`	Retrieve metadata and write the data to the log file.
`-lms metaname1, metaname2,...`	Retrieve metadata with string metanames and write the data to the log file for .MSG, .EML, .MBX, and .NSF files.
`-lmi metaint1, metaint2,...`	Retrieve metadata with integer (hexadecimal) metanames and write the data to the log file for .PST files.
`-lma`	Retrieve all metadata from an .NSF file and write the data to the log file.
`-to <value in seconds>`	Specify the timeout value in seconds. This timeout allows for large files that take longer than the default 7 minute timeout.
`-i`	Run the file extraction in-process.
`-r`	Recursively extract second-level subfiles to the specified output directory. For example, if a .ZIP file contains a Microsoft Word file and the Word file contains an embedded Microsoft Excel file, set the `-r` option to extract both the Word and Excel files. If this option is not set, only first-level subfiles are extracted. In this case, only the Word file would be extracted.
`-msg`	Extract mail messages in a .PST file as an .MSG file, including all of its attachments. If this flag is not set, the mail message is extracted as text. This applies to PST files on Windows only.
`-f`	Extract the formatted version of the message body (HTML or RTF) from mail files when possible. If neither an HTML nor RTF version of the message body exists in the mail file, it is extracted as plain text. If you do not set this flag, the message body is extracted as plain text when possible.
`-e`	Run the file extraction in stream mode.
`-p password1,`	Specify one or more passwords to open the input or credential file or files.

Option	Description
`password2,...`	
`-t`	Preserve the timestamp of embedded files when possible.
`-h`	Extract hidden text.

- *`input_file`* is the full path and file name of the source document.
- *`output_directory`* is the directory to which the files are extracted.
- *`bin_directory`* is the path to the Filter `bin` directory. This is required if you do **not** run the program from the *`install`*`\Filter SDK\bin` directory.

filter

The `filter` sample program demonstrates the advanced functionality of the Filter API. It is composed of the following files:

- `filter.c`—command line interface
- `filtersupport.c`—contains core functionality, such as file filtering, stream filtering, metadata extraction, and format detection.
- `filtersupport.h`—structure and variable definitions

To run `filter`, type the following at the command line:

`filter [`*`options`*`]` *`input_file output_file`*

where:

`options` is one or more of the options listed in Options for the Filter Sample Program , below.

`input_file` is the full path and file name of the source document.

`output_file` is the full path and file name of the output file.

Options for the Filter Sample Program

Option	Description
`-i`	Extract metadata. See Extract Metadata, on page 61.
`-c`	Run Filter in the same process as the calling application (in process). See Run Filter In Process, on page 29.
`-e`	Run Filter in stream mode. See Filtering in Stream Mode, on page 25.
`-h`	Extract headers and footers, as well as the body text. See fpInit(), on page 150 or fpInitWithLicenseData(), on page 152.
`-d`	Extract the file format information using the fpGetDocInfoFile() function.

Options for the Filter Sample Program , continued

Option	Description
`-mt`	Enable the memory trace system in error logs. The memory trace system reports memory leaks and memory overwrites in the log file. See Report Memory Errors, on page 60. Error logs are not generated when in-process filtering is enabled.
`-mtN`	Disable the memory trace system in error logs. The memory trace system reports memory leaks and memory overwrites in the log file. See Report Memory Errors, on page 60. Error logs are not generated when in-process filtering is enabled.
`-L`	Enable error logging. See Enable or Disable Error Logging, on page 59. Error logs are not generated when in-process filtering is enabled.
`-LN`	Disable error logging. See Enable or Disable Error Logging, on page 59. Error logs are not generated when in-process filtering is enabled.
`-AF`	Include the input file name in an error log. See Report the File Name in Stream Mode, on page 60.
`-r`	Filter a container file and the subfiles in the container file to a single output file. This option uses the Container API, which is obsolete.
`-rm`	If you set this option, text that was deleted from a document with revision tracking enabled is extracted from the document and included in the filtered output. See Extract Deleted Text Marked by Tracked Changes, on page 66.
`-x` *`xmlconfigfile`*	Filter an XML file by using customized extraction settings defined in the `kvxconfig.ini` file. If you do not enter the full path to the INI file, the program looks for the file in the current working directory. See Filter XML Files, on page 78 for more information.
`-z` *`tempdirectory`*	Specify a temporary directory where temporary files generated by the filtering process are stored. The default is the current working directory. On Windows systems, there is a 64 K size limit to the temporary directory. When the limit is reached, you must either create a new directory or delete the contents of the existing directory; otherwise, you might receive an error message.
`-ps` *`password`*	Specify a password to open a password-protected PST file. This option uses the Container API, which is obsolete.
`-pdfauto`	Specify that PDF files are output in a logical reading order. The PDF filter determines the paragraph direction (left-to-right or right-to-left) for each PDF page, and then sets the direction accordingly. See Filter PDF Files, on page 67.
`-pdfltr`	Specify that PDF files are output in a logical reading order, and that the paragraph direction is left to right. See Filter PDF Files, on page 67.
`-pdfrtl`	Specify that PDF files are output in a logical reading order, and that the paragraph direction is right to left. See Filter PDF Files, on page 67.

Options for the Filter Sample Program , continued

Option	Description
`-pdfraw`	Specify that PDF files are output in an unstructured paragraph flow. This is the default option . If logical reading order is enabled, and you want to return to an unstructured paragraph flow, set this flag. See Filter PDF Files, on page 67.
`-xmp`	Parse and return XMP metadata as path and value pairs, and include the original XMP packet. See fpGetXmpInfoFile(), on page 148 and fpGetXmpInfo(), on page 146.
`-xmpr`	Return XMP metadata as a raw XMP packet. See fpGetXmpInfoFile(), on page 148 and fpGetXmpInfo(), on page 146.
`-embeddedfont`	If you use this option, text that contains embedded fonts is not filtered from PDF documents. See fpFilterConfig(), on page 130.

Part III: C API Reference

This section provides detailed reference information for the C-language implementation of the File Extraction and Filter APIs.

Chapter 6: File Extraction API Functions

This section describes the functions in the File Extraction API. The File Extraction functions open a container file, and extract the container's subfiles so that the subfiles are exposed and available for filtering. Subfiles can be files within a Zip archive, messages in a mail store, attachments in a mail message, or OLE objects embedded in a compound document.

Each function appears as a function prototype followed by a description of its arguments, its return value, and a discussion of its use.

KVGetExtractInterface()

This function is the entry point to obtain the file extraction functions. It supplies pointers to the file extraction functions, and in the case of out-of-process mode starts the `kvoop.exe` server and initializes out-of-process extraction services. When `KVGetExtractInterface()` is called, it assigns the function pointers in the structure `KVExtractInterface` to the functions described in this section.

Syntax

```
int pascal KVGetExtractInterface (
    void                    *pContext,
    KVExtractInterface       pIextract);
```

Arguments

`pContext`	A pointer returned from `fpInit()` or `fpInitWithLicenseData()`.
`pIextract`	A pointer to the KVExtractInterface structure, which contains function pointers that `KVGetExtractInterface()` assigns to all other file extraction functions. Before you initialize the `KVExtractInterface` structure, use the macro `KVStructInit` to initialize the `KVStructHead` structure.

Returns

- If the call is successful, the return value is `KVERR_Success`.
- If the call is not successful, the return value is an error code.

Example

```
fpKVGetExtractInterface =
(int (pascal *)( void *, KVExtractInterface))myGetProcAddress(hKVFilter,
(char*)"KVGetExtractInterface");
/*Initialize file extraction interface structure using KVStructInit*/
KVStructInit(&extractInterface);
/* Retrieve file extraction interface */
error = (*fpKVGetExtractInterface)(pFilter,&extractInterface))
```

Discussion

You can define only one extraction structure for one context pointer. For example, the following is not allowed:

```
fpInit()
   KVGetExtractInterface(pFilter, &extractInterface1)

   fpOpenFile()
   fpGetMainFileInfo()
   fpGetSubFileInfo()
   fpExtractSubFile
   fpGetSubFileMetadata()
   fpFilterFile()
   fpCloseFile()
   ...

   KVGetExtractInterface(pFilter, &extractInterface2)
   fpOpenFile()
   fpGetMainFileInfo()
   fpGetDocInfoFile()
   fpGetOLESummaryInfoFile()
   fpFilterFile()
   fpCloseFile()
   ...
fpShutdown()
```

fpCloseFile()

This function frees the memory allocated by fpOpenFile() and closes the file.

Syntax

```
int (pascal *fpCloseFile) (void *pFile);
```

Arguments

`pFile`	The identifier of the file. This is a file handle returned from `fpOpenFile()`.

Returns

- If the file is closed, the return value is `KVERR_Success`.
- If the file is not closed, the return value is an error code.

Example

```
extractInterface->fpCloseFile(pFile);
pFile = NULL;
```

fpExtractSubFile()

This function extracts a subfile from a container file to a user-defined path or output stream. This call returns file format information when file is extracted to a path.

Syntax

```
int (pascal *fpExtractSubFile)  (
                  void                          *pFile,
                  KVExtractSubFileArg            extractArg,
                  KVSubFileExtractInfo          *extractInfo);
```

Arguments

`pFile`	The identifier of the file. This is a file handle returned from fpOpenFile().
`extractArg`	A pointer to the structure KVExtractSubFileArg, which defines the subfile to be extracted. Before you initialize the `KVExtractSubFileArg` structure, use the macro `KVStructInit` to initialize the `KVStructHead` structure.
`extractInfo`	A pointer to the structure `KVSubFileExtractInfo`, which defines information about the extracted subfile.

Returns

- If the subfile is extracted from the container file, the return value is `KVERR_Success`.
- If the subfile is not extracted from the container file, the return value is an error code.

Discussion

- After the file is extracted, call fpFreeStruct() to free the memory allocated by this function.
- If the subfile is embedded in the main file as a link and is stored externally, `extractInfo->infoFlag` is set to **`KVSubFileExtractInfoFlag_External`**.

  For example, the subfile might be an object that was embedded in a Word document by using "Link to File," or an attachment that is referenced in an MBX message. This type of subfile cannot be extracted. You must write code to access the subfile based on the path in the member `extractInfo->filePath` or `extractInfo->fileName`. See KVSubFileExtractInfo, on page 115.

Example

```
KVSubFileExtractInfo   extractInfo = NULL;

KVStructInit(&extractArg);

extractArg.index = index;
extractArg.extractionFlag = KVExtractionFlag_CreateDir | KVExtractionFlag_
Overwrite;
extractArg.filePath = subFileInfo->subFileName;

/*Extract this subfile*/
error=extractInterface->fpExtractSubFile(pFile,&extractArg,&extractInfo);
if ( error )
{
   extractInterface->fpFreeStruct(pFile,extractInfo);
   subFileInfo = NULL;
}
```

fpFreeStruct()

This function frees the memory allocated by `fpGetMainFileInfo()`, `fpGetSubFileInfo()`, `fpGetSubFileMetadata()`, and `fpExtractSubFile()`.

Syntax

```
int (pascal *fpFreeStruct) (
    void      *pFile,
```

```
    void      *obj);
```

Arguments

`pFile`	The identifier of the file. This is a file handle returned from fpOpenFile().
`obj`	A pointer to the result object returned by `fpGetMainFileInfo()`, `fpGetSubFileInfo()`, `fpGetSubFileMetaData`, or `fpExtractSubFile()`.

Returns

- If the allocated memory is freed, the return value is `KVERR_Success`.
- Otherwise, the return value is an error code.

Example

The example below frees the memory allocated by `fpGetSubFileInfo()`:

```
if ( subFileInfo )
    {
        extractInterface->fpFreeStruct(pFile,subFileInfo);
        subFileInfo = NULL;
    }
```

fpGetMainFileInfo()

This function determines whether a file is a container file—that is, whether it contains subfiles—and should be extracted further.

Syntax

```
int (pascal *fpGetMainFileInfo) (
    void               *pFile,
    KVMainFileInfo     *fileInfo);
```

Arguments

`pFile`	The identifier of the file. This is a file handle returned from fpOpenFile().
`fileInfo`	A pointer to the structure KVMainFileInfo. This structure contains information about the file.

Returns

- If the file information is retrieved, the return value is `KVERR_Success`.
- If the file information is not retrieved, the return value is an error code.

Discussion

- After the file information is retrieved, call fpFreeStruct() to free the memory allocated by this function.
- If the file is a container (`fileInfo->numSubFiles` is non-zero), call fpGetSubFileInfo() and fpExtractSubFile() for each subfile.
- If the file is not a container (`fileInfo->numSubFiles` is `0`) and contains text (`fileInfo->infoFlag` is set to **`KVMainFileInfoFlag_HasContent`**), pass the file directly to the filtering functions.

Example

```
KVMainFileInfo   fileInfo    = NULL;
if( (error=extractInterface->fpGetMainFileInfo(pFile,&fileInfo)))
{
    /* Free result object allocated in fileInfo */
    extractInterface->fpFreeStruct(pFile,fileInfo);
    fileInfo = NULL;
}
```

fpGetSubFileInfo()

This function gets information about a subfile in a container file.

Syntax

```
int (pascal *fpGetSubFileInfo)  (
    void                    *pFile,
    int                      index,
    KVSubFileInfo           *subFileInfo);
```

Arguments

`pFile`	The identifier of the main file. This is a file handle returned from fpOpenFile().
`index`	The index number of the subfile for which to retrieve information.
`subFileInfo`	A pointer to the KVSubFileInfo structure, which defines information about the subfile.

Returns

- If the file information is retrieved, the return value is `KVERR_Success`.
- If the file information is not retrieved, the return value is an error code.

Discussion

- After the subfile information is retrieved, call fpFreeStruct() to free the memory allocated by this function.
- If the root node is *not* enabled, the first subfile is index `0`. If the root node is enabled, the first subfile is index `1`. The root node is required to recreate a file's hierarchy. See Create a Root Node, on page 38.
- The members `subFileInfo->parentIndex` and `subFileInfo->childArray` enable you to recreate a file's hierarchy. Because `childArray` retrieves only the first-level children in the subfile, you must call `fpGetSubFileInfo()` repeatedly until information for the leaf-node children is extracted. See Recreate a File's Hierarchy, on page 38.
- If the subfile is embedded in the main file as a link and is stored externally, `subFileInfo->infoFlag` is set to **`KVSubFileInfoFlag_External`**. For example, the subfile might be an object that was embedded in a Word document by using "Link to File," or an attachment that is referenced in an MBX message. This type of subfile cannot be extracted. You must write code to access the subfile based on the path in the member `subFileInfo->subFileName`. See KVSubFileInfo, on page 116.
- The `KVSubFileInfoFlag_External` flag is not set for an OLE object that is embedded as a link in a Microsoft PowerPoint file. KeyView can detect linked objects in a Microsoft PowerPoint file only when the object is extracted. See fpExtractSubFile(), on page 96.

Example

```
KVSubFileInfo    subFileInfo = NULL;
for ( index = 0; index < fileInfo->numSubFiles; index++)
{
  error=extractInterface->fpGetSubFileInfo(pFile,index,&subFileInfo);
  if ( error )
  {
     extractInterface->fpFreeStruct(pFile,subFileInfo);
     subFileInfo = NULL;
  }
```

fpGetSubFileMetaData()

This function extracts metadata from mail stores, mail messages, and non-mail items. See Extract Mail Metadata, on page 40.

Syntax

```
int (pascal *fpGetSubFileMetaData)  (
       void                      *pFile,
       KVGetSubFileMetaArg        metaArg,
       KVSubFileMetaData         *metaData);
```

Arguments

`pFile`	The identifier of the file. This is a file handle returned from fpOpenFile().
`metaArg`	A pointer to the KVGetSubFileMetaArg structure, which defines metadata tags whose values are retrieved. Before you initialize the `KVGetSubFileMetaArg` structure, use the `KVStructInit` macro to initialize the `KVStructHead` structure.
`metaData`	A pointer to the KVSubFileMetaData structure, which contains the retrieved metadata values.

Returns

- If the metadata is retrieved, the return value is `KVERR_Success`.
- If the metadata is not retrieved, the return value is an error code.

Discussion

- KeyView can extract a predefined set of common subfile metadata fields for all mail formats, and can extract all metadata from EML, MBX, MIME, NSF, ICS, and DXL files. To extract the common metadata fields, pass in `0` for `metaArg->metaNameCount`, and `NULL` for `metaArg->metaNameArray`. To extract all metadata, pass in `-1` for `metaArg->metaNameCount` and `NULL` for `metaArg->metaNameArray`. For more information, see Extract Mail Metadata, on page 40.
- After the metadata is retrieved, call fpFreeStruct() to free the memory allocated by this function.
- If a field is repeated in an EML or MBX mail header, the values in each instance of the field are concatenated and returned as one field. The values are separated by five pound signs (#####) as a delimiter.

Example

```
KVSubFileMetaData  metaData = NULL;

KVStructInit(&metaArg);

/* retrieve all the default metadata elements */
```

```
metaArg.metaNameCount = 0;
metaArg.metaNameArray = NULL;
metaArg.index = Index;

error = extractInterface->fpGetSubFileMetaData(pFile,&metaArg,&metaData);
...

extractInterface->fpFreeStruct(pFile,metaData);
metaData = NULL;


/* retrieve specific metadata fields */
KVMetaName   pName[2];
KVMetaNameRec names[2];

names[0].type = KVMetaNameType_Integer;
names[0].name.iname = KVPR_SUBJECT;

names[1].type = KVMetaNameType_Integer;
names[1].name.iname = KVPR_DISPLAY_TO;

pName[0] = &names[0];
pName[1] = &names[1];

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pName;
metaArg.index = Index;

error = extractInterface->fpGetSubFileMetaData (pFile,&metaArg,&metaData);
...
extractInterface->fpFreeStruct(pFile,metaData);
metaData = NULL;
```

fpOpenFile()

This function opens a file to make the file accessible for subfile extraction or filtering.

Syntax

```
int (pascal *fpOpenFile) (
    void                      *pContext,
    KVOpenFileArg              openArg,
    void                      **pFile);
```

Arguments

`pContext`	A pointer returned from `fpInit()` or `fpInitWithLicenseData()`.
`openArg`	A pointer to the KVOpenFileArg structure. This structure defines the input parameters necessary to open a file for extraction, such as credentials, and the default extraction directory. Before you initialize the `KVOpenFileArg` structure, use the macro `KVStructInit` to initialize the `KVStructHead` structure.
`pFile`	A handle for the opened file. This handle is used in subsequent file extraction calls to identify the source file.

Returns

- If the file is opened, the return value is `KVERR_Success`.
- If the file is not opened, the return value is an error code and `pFile` is `NULL`.

Discussion

Call fpCloseFile() to free the memory allocated by this function.

Example

```
KVOpenFileArgRec    openArg;

/*Initialize the structure using KVStructInit*/
KVStructInit(&openArg);
openArg.extractDir = destDir;
openArg.filePath   = srcFile;

/*Open the main file */
if ( (error = extractInterface->fpOpenFile(pFilter,&openArg,&pFile)))
{
   extractInterface->fpCloseFile(pFile);
   pFile = NULL;
}
```

fpSetExtractionTimeout()

This function specifies the length of time that should elapse before assuming that out-of-process extraction has stopped responding.

Syntax

```
BOOL pascal fpSetExtractionTimeout( void *pContext,
long lTimeout );
```

Arguments

`pContext`	A pointer returned from `fpInit()` or `fpInitWithLicenseData()`.
`lTimeout`	The length of time, in seconds, that must elapse before assuming that out-of-process extraction has stopped responding.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

If this API is not used in out-of-process mode, the filter timeout duration is used on the fpOpenFile() call. See fpSetTimeout(), on page 160.

Example

```
/* set extraction timeouts to 10 minutes */

if (FALSE == extractInterface->fpSetExtractionTimeout(pContext, 600))
{
   /* could not set the extraction timeout */
}
```

Chapter 7: File Extraction API Structures

This section provides information on the structures used by the File Extraction API. These structures define the input and output parameters required to extract subfiles from a container file, and are defined in `kvxtract.h`.

KVCredential

This structure contains a count of the number of credential elements, and a pointer to the first element of the array of individual elements. The structure is initialized by calling fpOpenFile(), and is defined in `kvxtract.h`.

```
typedef struct  tag_KVCredential
{
    int                          itemCount;
    KVCredentialComponent     *items;
}
KVCredentialRec, *KVCredential;
```

Member Descriptions

`itemCount`	The number of credentials defined for this file.
`items`	A pointer to the KVCredentialComponent structure. This structure contains the individual credential elements used to open a protected file.

KVCredentialComponent

This structure contains the value of a credential item. The structure is defined in `kvxtract.h`.

```
typedef struct  tag_KVCredentialComponent
{
    KVCredKeyType      keytype;
    union
    {
        void           *pkey;
        char           *skey;
        unsigned int    ikey;
    }
    keyobj;
}
KVCredentialComponentRec, *KVCredentialComponent;
```

Member Descriptions

`keytype`	The type of credential (such as a user name or password). The types are defined by the KVCredKeyType enumerated type.
`pkey`	A pointer to a structure defining credentials. Reserved for future use.
`skey`	A pointer to a string credential key.
`ikey`	An integer credential key.

KVExtractInterface

The members of this structure are pointers to the file extraction functions described in File Extraction API Functions, on page 94. When you call the KVGetExtractInterface() function, this structure assigns pointers to the functions. The structure is defined in `kvxtract.h`.

```
typedef struct  tag_KVExtractInterface
{
KVStructHeader;
  int  (pascal *fpOpenFile) (void *pContext,KVOpenFileArg openArg, void
**pFileHandle);
  int  (pascal *fpCloseFile)   (void *pFileHandle);
  int  (pascal *fpGetMainFileInfo) (void *pFile, KVMainFileInfo *MainFileInfo);
  int  (pascal *fpGetSubFileInfo)  (void *pFile, int index, KVSubFileInfo
*subFileInfo);
  int  (pascal *fpGetSubFileMetaData)  (void *pFile, KVGetSubFileMetaArg metaArg,
KVSubFileMetaData *metaData);
  int  (pascal *fpExtractSubFile)  (void *pFile, KVExtractSubFileArg extractArg,
KVSubFileExtractInfo *extractInfo);
```

```
  int  (pascal *fpFreeStruct) (void *pFile, void *obj);
}
KVExtractInterfaceRec, *KVExtractInterface;
```

Member Descriptions

The member functions are described in File Extraction API Functions, on page 94.

Discussion

Before you initialize a File Extraction structure, use the `KVStructInit` macro to initialize the `KVStructHead` structure. This process sets the revision number of the File Extraction API and supports binary compatibility with future releases.

KVExtractSubFileArg

This structure defines the input parameters required to extract a subfile. See fpExtractSubFile(), on page 96. The structure is defined in `kvxtract.h`.

```
typedef struct tag_KVExtractSubFileArg
{
    KVStructHeader;
    int                 index;
    KVCharSet           srcCharset;
    KVCharSet           trgCharset;
    int                 isMSBLSB;
    DWORD               extractionFlag
    char               *filePath;
    char               *extractDir;
    KVOutputStream     *stream;
}
KVExtractSubFileArgRec, *KVExtractSubFileArg;
```

Member Descriptions

`KVStructHeader`	The KeyView version of the structure. See KVStructHead, on page 172.
`index`	The index number of the subfile to be extracted.
`srcCharset`	Specifies the source character set of the subfile when the file format's reader cannot determine the character set. The character sets are enumerated in `KVCharSet` in `kvcharset.h`. See Discussion, on page 109.
`trgCharset`	If the file type is `KVFileType_Main`, this is the target character set of the extracted file. Otherwise, this is ignored. The character sets are enumerated in `KVCharSet` in `kvcharset.h`. See Discussion, on page 109.

`isMSBLSB` This flag indicates whether the byte order for Unicode text is Big Endian (MSBLSB) or Little Endian (LSBMSB).

`extractionFlag` A bitwise flag that defines additional parameters for file extraction. The following flags are available:

- `KVExtractionFlag_CreateDir`

  This flag indicates whether the directory structure of a subfile should be created. If you set this flag, the path defined in `filePath` is created if it does not already exist. If you do not set this flag, the path is not created, and the function returns `FALSE`.

- `KVExtractionFlag_Overwrite`

  If you set this flag, and the file being extracted has the same name as a file in the target path, the file in the target path is overwritten without warning. If you do not set this flag, and a subfile has the same name as a file in the target path, the error `KVError_OutputFileExists` is generated.

- `KVExtractionFlag_ExcludeMailHeader`

  If you set this flag, header information (`To`, `From`, `Sent`, and so on) in a mail file is not included in the extracted data. If you do not set this flag, the extracted data contains header information and the message's body text. See Exclude Metadata from the Extracted Text File, on page 46.

- `KVExtractionFlag_GetFormattedBody`

  If you set this flag, the formatted version of the message body (HTML or RTF) is extracted from mail files when possible. If neither an HTML nor RTF version of the message body exists in the mail file, it is extracted as plain text. If you do not set this flag, the message body is extracted as plain text when possible.

  > **NOTE:** When an HTML or RTF message body is extracted, the message's mail headers (such as "From," "To," and "Subject,") are extracted, saved in the same format, and added to the beginning of the subfile. This applies to PST (MAPI-based reader), MSG, and NSF files only.

- `KVExtractionFlag_SaveAsMSG`

  If you set this flag, the mail message is extracted as an MSG file, including all of its attachments. If you do not set this flag, the mail message is extracted as text. This applies to PST files on Windows only.

  > **NOTE:** In file mode, when the application sets this flag in fpExtractSubFile(), it must also check the KVSubFileExtractInfo structure's `filePath` parameter to verify the file name used for extraction.

- `KVExtractionFlag_SanitizeAbsolutePaths`

  If you set this flag, KeyView ensures that the file is extracted to a location

within the extract directory (`extractDir`), even if an absolute path is supplied using `filePath`. When KeyView sanitizes a path and the resulting directory does not exist, extraction fails unless you instruct KeyView to create the directory, so you might also want to set the flag `KVExtractionFlag_CreateDir`. For more information, see Sanitize Absolute Paths, on page 37.

`filePath`	A pointer to the suggested path or file name to which the subfile is extracted. This can be a file name, partial path, or full path. You can use this in conjunction with `extractDir` to create the full output path. See Discussion, below.
`extractDir`	A pointer to the directory to which subfiles are extracted. This directory must exist. If you set this flag, the path specified in `KVOpenFileArg->extractDir` is ignored. You can use this in conjunction with `filePath` to create the full output path.
`stream`	A pointer to an output stream defined by KVOutputStream. See Discussion, below.

Discussion

- If the document character set is detected and is also specified in `srcCharset`, the detected character set is overridden by the specified character set. If the source character set is *not* detected and is *not* specified, character set conversion does not occur. The Document Readers, on page 271 section lists the formats for which the source character set can be determined.
- The `KVSubFileExtractInfoFlag_CharsetConverted` flag in the KVSubFileExtractInfo structure indicates whether the character set of the subfile was converted during extraction.
- The following applies when the output is to a file:
  - If `filePath` is a valid absolute path, the file is extracted to the specified path and `extractDir` is ignored. However, if you have set the flag `KVExtractionFlag_SanitizeAbsolutePaths` the output path is modified to ensure it is within the `extractDir`. For more information, see Sanitize Absolute Paths, on page 37.
  - If `filePath` is a file name or partial path, the target directory specified in either `KVExtractSubFileArg->extractDir` or `KVOpenFileArg->extractDir` is used to create the full path. See KVOpenFileArg, on page 114.
  - If `filePath` is a full path or partial path, and `createDir` is `TRUE`, the directory is created if it does not already exist.
  - If `filePath` is not specified, a default name and the target directory specified in either `KVExtractSubFileArg->extractDir` or `KVOpenFileArg->extractDir` are used to create a full path.
  - If both `filePath` and `extractDir` are not specified or are invalid, an error is returned.
  - If `filePath` is valid, but `extractDir` is not valid, an error is returned.
- The following applies when the output is to a stream:

- Set `filePath` and `extractDir` to **`NULL`**.
- The file format (`docInfo`) and extraction file path (`filePath`) are not returned in KVSubFileExtractInfo.
- The `KVExtractionFlag_CreateDir` and `KVExtractionFlag_Overwrite` flags are ignored.

KVGetSubFileMetaArg

This structure defines the metadata tags whose values are retrieved by fpGetSubFileMetaData(). This structure is defined in `kvxtract.h`.

```
typedef struct  tag_KVGetSubFileMetaArg
{
    KVStructHeader;
    int                 index;
    int                 metaNameCount;
    KVMetaName         *metaNameArray;
    KVCharSet           srcCharset;
    KVCharSet           trgCharset;
    int                 isMSBLSB;
}
KVGetSubFileMetaArgRec, *KVGetSubFileMetaArg;
```

Member Descriptions

`KVStructHeader`	The KeyView version of the structure. See KVStructHead, on page 172.
`index`	The index number of the subfile for which metadata is extracted.
`metaNameCount`	The number of metadata fields to be extracted.
`metaNameArray`	A pointer to the KVMetaName structure that contains an array of metadata tags whose values are retrieved.
`srcCharset`	Specifies the source character set of the metadata when the format's reader cannot determine the character set. The character sets are enumerated in `KVCharSet` in `kvcharset.h`. See Discussion, below.
`trgCharset`	The target character set of the extracted metadata. The character sets are enumerated in `KVCharSet` in `kvcharset.h`.
`isMSBLSB`	This flag indicates whether the byte order for Unicode text is Big Endian (MSBLSB) or Little Endian (LSBMSB).

Discussion

- If the character set is detected and is also specified in `srcCharset`, the detected character set is overridden by the specified character set. If the source character set is *not* detected and is *not*

specified, character set conversion does not occur. The section Document Readers, on page 271 lists the formats for which the source character set can be determined.

- KeyView can extract a predefined set of common subfile metadata fields for all mail formats, and can extract all metadata from EML, MBX, MIME, NSF, ICS, and DXL files. To extract the common metadata fields, pass in `0` for `metaArg->metaNameCount`, and `NULL` for `metaArg->metaNameArray`. To extract all metadata, pass in `-1` for `metaArg->metaNameCount` and `NULL` for `metaArg->metaNameArray`. For more information, see Extract Mail Metadata, on page 40.

KVMainFileInfo

This structure contains information about a main file that is open for extraction. It is initialized by calling fpGetMainFileInfo(). This structure is defined in `kvxtract.h`.

```
typedef struct  tag_KVMainFileInfo
{
    KVStructHeader;
    int             numSubFiles;
    ADDOCINFO       docInfo;
    KVCharSet       charset;
    int             isMSBLSB;
    unsigned long   infoFlag;
}
KVMainFileInfoRec, *KVMainFileInfo;
```

Member Descriptions

`KVStructHeader`	The KeyView version of the structure. See KVStructHead, on page 172.
`numSubFiles`	The number of subfiles in the main file.
`docInfo`	The file's major format (such as Microsoft Word or Corel Presentation), as defined by the structure `ADDOCINFO`. See ADDOCINFO, on page 166.
`charset`	The character set of the main file.
`isMSBLSB`	This flag indicates whether the byte order for Unicode text is Big Endian (MSBLSB) or Little Endian (LSBMSB).
`infoFlag`	A bitwise flag that provides additional information about the main file. The following flag is available: `KVMainFileInfoFlag_HasContent`—The main file contains text that can be filtered. Below are some examples of how this flag is used: • For an MSG file without attachments, `numSubFiles` is `1` (message body text), and this flag is `FALSE` because the MSG file itself does not contain text. • For a Zip file with three files, `numSubFiles` is `3`, and this flag is `FALSE`

because a Zip file does not contain text.

- For a Microsoft Word file with an embedded OLE object, `numSubFiles` is `1` (OLE object), and this flag is `TRUE` (Word file contains text to be filtered).

Discussion

- If `numSubFiles` is non-zero, get information on the subfile by calling fpGetSubFileInfo(), and then extract the subfiles by using fpExtractSubFile().
- If `numSubFiles` is `0`, the file does not contain subfiles and does not need to be extracted further. If the `KVMainInfoFlag_HasContent` flag is set, the file contains body text and can be passed directly to the filtering functions. See Filter API Functions, on page 121.
- If `openFlag` is set to **`KVOpenFileFlag_CreateRootNode`** in the call to `fpOpenFile()`, `numSubFiles` also includes the root object (index `0`) which is created by KeyView for reconstructing the file's hierarchy. See KVOpenFileArg, on page 114.

KVMetadataElem

This structure contains metadata field values extracted from a mail file. This structure is defined in `kvtypes.h`.

```
typedef struct tag_KVMetadataElem
{
    int              isDataValid;
    int              dataID;
    KVMetadataType   dataType;
    char*            strType;
    void*            data;
    int              dataSize;
}
KVMetadataElem;
```

Member Descriptions

`isDataValid`	Specifies whether the metadata returned from the API is valid data.
`dataID`	The integer name of the extracted metadata field.
`dataType`	The data type of the metadata field. The types are defined in KVMetadataType in `kvtypes.h`.
`strType`	A pointer to the string name of the metadata field.
`data`	The contents of the metadata field. If the `type` member is `KVMetadata_Int4` or `KVMetadata_Bool`, this member contains the actual value. Otherwise, this member is a pointer to the actual value.

	`KVMetadata_DateTime` points to an 8-byte value. `KVMetadata_String` and `KVMetadata_Unicode` point to the beginning of the string that contains the text. The strings are `NULL` terminated. `KVMetadata_Binary` points to the first element of a byte array.
`dataSize`	The byte count of data when the type is `KVMetadata_Binary`, `KVMetadata_Unicode`, or `KVMetadata_String`.

KVMetaName

This structure defines the names of the metadata fields to be extracted from a mail file. This structure is defined in `kvxtract.h`.

```
typedef struct tag_KVMetaName
{
    KVMetaNameType    type;
    union
    {
        void         *pname;
        int           iname;
        char         *sname;
    }name;
}
KVMetaNameRec, *KVMetaName;
```

Member Descriptions

`type`	The type of metadata name (such as integer or string). The types are defined by the KVMetaNameType enumerated type. **NOTE:** MAPI property names are of type integer.
`pname`	A pointer to a structure defining the metadata fields to be retrieved.
`iname`	The name of a metadata field of type integer.
`sname`	A pointer to the name of a metadata field of type string.

Discussion

If you specify the MAPI tag name (for example, `PR_CONVERSATION_TOPIC`), you must include the `mapitags.h` and `mapidefs.h` Windows header files, in which `PR_CONVERSATION_TOPIC` is defined as `0x0070001e`.

KVOpenFileArg

This structure defines the input arguments necessary to open a file for extraction. It is initialized by calling fpOpenFile(). This structure is defined in `kvxtract.h`.

```
typedef struct  tag_KVOpenFileArg
{
    KVStructHeader;
    KVCredential    cred;
    KVInputStream  *stream;
    char           *filePath;
    char           *extractDir;
    DWORD           openFlag;
    DWORD           reserved;
    void           *pReserved;
}
KVOpenFileArgRec, *KVOpenFileArg;
```

Member Descriptions

`KVStructHeader`	The KeyView version of the structure. See KVStructHead, on page 172.
`cred`	The credentials required to open a protected PST or NSF file. This is a pointer to the KVCredential structure. Your application can define multiple credentials to this member for multiple formats.
`stream`	A pointer to the developer-assigned instance of `KVInputStream`. The `KVInputStream` structure defines the input stream that contains the source. See KVInputStream, on page 169. If you are using a file as input, this is `NULL`.
`filePath`	A pointer to the full file path to the source file. If you are using a stream as input, this is `NULL`.
`extractDir`	A pointer to the default directory to which subfiles are extracted. This directory must exist. You can use this in conjunction with `KVExtractSubFileArg->filePath` to create the full output path. See KVExtractSubFileArg, on page 107.
`openFlag`	A bitwise flag that defines additional parameters for opening the file. The following flag is available: `KVOpenFileFlag_CreateRootNode`—If you set this flag, KeyView creates a root object when extracting this file's subfiles. This root node does not have a parent and is at the highest level of the file's tree structure. It is used internally to provide a reference point from which all other child nodes are determined, and the file's hierarchy is created.

	If you want to maintain the file's hierarchy when you extract subfiles from a container, you must set this flag. See Recreate a File's Hierarchy, on page 38 for more information. The root node has an index of zero. Although not all container formats require an artificial root node, the root is created for all container formats regardless of whether the file itself contains a root directory or file.
`reserved`	Reserved for future use. It must be `NULL`.
`pReserved`	Reserved for future use. It must be `NULL`.

KVOutputStream

This structure defines an output stream for the extracted subfile. The structure is defined in `kvstream.h`.

```
typedef struct tag_OutputStream
{
 void  *pOutputStreamPrivateData;
 BOOL (pascal *fpCreate)(struct tag_OutputStream *,TCHAR *);
 UINT (pascal *fpWrite) (struct tag_OutputStream *, BYTE *, UINT);
 BOOL (pascal *fpSeek)  (struct tag_OutputStream *, long, int);
 long (pascal *fpTell)  (struct tag_OutputStream *);
 BOOL (pascal *fpClose) (struct tag_OutputStream *);
}
KVOutputStream;
```

Member Descriptions

All member functions are equivalent to their counterparts in the ANSI standard library.

KVSubFileExtractInfo

This structure contains information about an extracted subfile. It is initialized by calling fpExtractSubFile(). This structure is defined in `kvxtract.h`.

```
typedef struct tag_KVSubFileExtractInfo
{
    KVStructHeader;
    char            *filePath;
    char            *fileName;
    unsigned long    infoFlag;
    ADDOCINFO        docInfo;
}
KVSubFileExtractInfoRec, *KVSubFileExtractInfo;
```

Member Descriptions

`KVStructHeader`	The KeyView version of the structure. See KVStructHead, on page 172.
`filePath`	The full path to which the subfile was extracted. If the subfile is embedded in the main file as a link, this is the external path to the subfile. If you output the data to a stream, the extraction path is not returned.
`fileName`	The original path, file name, or path and file name of the subfile. If the subfile is embedded in the main file as a link, this is the external path to the subfile.
`infoFlag`	A bitwise flag that provides additional information about the extracted subfile. The following flags are available: • `KVSubFileExtractInfoFlag_NeedsExtraction`—The file might contain subfiles and should be extracted further. • `KVSubFileExtractInfoFlag_FileCreated`—The file was created on disk. • `KVSubFileExtractInfoFlag_CharsetConverted`—The subfile's character set was converted. • `KVSubFileExtractInfoFlag_External`—The subfile is embedded in the main file as a link and is stored externally. For example, the subfile might be an object that was embedded in a Word document using "Link to File," or an attachment that is referenced in an MBX message. This type of file cannot be extracted. You must write code to access the subfile based on the path in the member `filePath` or `fileName`. • `KVSubFileExtractInfoFlag_FolderCreated`—A folder was created. • `KVSubFileExtractInfoFlag_NonFormattedBodyExtracted`—Indicates that a plain text version of the message was extracted due to an error extracting the formatted version of the message.
`docInfo`	The file's major format (such as Microsoft Word or Corel Presentation), as defined by the structure `ADDOCINFO`. See ADDOCINFO, on page 166. If you output the data to a stream, the file format is not returned.

KVSubFileInfo

This structure contains information about a subfile in a container file. It is initialized by calling fpGetSubFileInfo(). This structure is defined in `kvxtract.h`.

```
typedef struct  tag_KVSubFileInfo
{
    KVStructHeader;
    char            *subFileName;
```

```
    int             subFileType;
    long            subFileSize;
    unsigned long   infoFlag;
    KVCharSet       charset;
    int             isMSBLSB;
    BYTE            fileTime[8];
    int             parentIndex;
    int             childCount;
    int            *childArray;
}
KVContainerSubFileInfoRec, *KVSubFileInfo;
```

Member Descriptions

`KVStructHeader` The KeyView version of the structure. See KVStructHead, on page 172.

`subFileName` The path, file name, or path and file name of the subfile.

If the subfile is the body text of a mail file or is an embedded OLE object, KeyView provides a default file name. See Default File Names for Extracted Subfiles, on page 56.

`subFileType` The subfile's position in the container file's hierarchy.

- `KVSubFileType_Main` The subfile is at the top level of the main file. This is the default subfile type. See Discussion, on page 119.
- `KVSubFileType_Attachment` The subfile is an attachment in a file.
- `KVSubFileType_OLE` The subfile is an embedded OLE object in a compound document.
- `KVSubFileType_Folder` The subfile is a folder or the artificial root node (see Create a Root Node, on page 38).
- `KVSubFileType_UncategorisedImage` An embedded image that has not been categorized by the reader.
- `KVSubFileType_EmbeddedImage` An embedded image.
- `KVSubFileType_EmbeddedIcon` An icon used to represent an embedded file.
- `KVSubFileType_EmbeddedContent` An image used to represent content for an embedded file. This could be an preview image of the actual content, or another representation such as an icon.
- `KVSubFileType_EmbeddedPreview` A preview of an embedded file. This is usually an image that shows part of the embedded file.
- `KVSubFileType_XrML` The subfile contains the XrML that describes the RMS protection used on an RMS-encrypted main file.

> **NOTE:** The classification of embedded images into images, icons, content, and previews is supported only for some Microsoft Office file formats (DOC, DOCX, XLSX, PPT, PPTX).

`subFileSize` The size of the subfile in bytes. This information might be useful if you do not want to extract very large files.

This value is approximate and is the maximum size of the subfile. The subfile is usually smaller than this value when it is extracted.

`infoFlag` A bitwise flag that provides additional information about the subfile. The following flags are available:

- `KVSubFileInfoFlag_NeedsExtraction`—The subfile might contain subfiles. It must be extracted further to conclusively determine whether it contains subfiles.
- `KVSubFileInfoFlag_Secure`—The subfile is secured and credentials (such as user name and password) are required to extract it. This flag applies to ZIP, RAR, and PDF files only.
- `KVSubFileInfoFlag_SMIME`—The subfile is S/MIME-encrypted and credentials are required to extract it. This applies to .eml and .pst files only.
- `KVSubFileInfoFlag_External`—The subfile is embedded in the main file as a link and is stored externally. For example, the subfile might be an object that was embedded in a Word document by using "Link to File," or an attachment that is referenced in an MBX message. This type of file cannot be extracted. You must write code to access the subfile based on the path in the member `subFileName`.
- `KVSubFileInfoFlag_MailItem`—When the subfile type is `KVSubFileType_Attachment`, this indicates that the attachment is a mail item. This flag applies to PST, MSG, and NSF files only.

`charset` If the subfile is not an attachment, this is the character set of the subfile. If the subfile is an attachment, the character set is `KVCS_UNKNOWN`.

`isMSBLSB` This flag indicates whether the byte order for Unicode text is Big Endian (MSBLSB) or Little Endian (LSBMSB).

`fileTime` When the subfile is a mail message, this is the file's `Sent` time. Otherwise, it is the last modified time. The file time is not available for the following file types:

- EML attachments
- OLE objects in a Microsoft Office document
- Embedded images

`parentIndex` The index number of this file's parent. For example, the index of a folder in which the subfile is stored, or the file to which the subfile is attached. If a file does not have a parent, the `parentIndex` is `-1`.

`childCount`	The number of first-level children in the subfile.
`childArray`	A pointer to an array of first-level children in the subfile.

Discussion

- Embedded images (`subFileType` matching `KVSubFileType_EmbeddedImage`, `KVSubFileType_EmbeddedIcon`, `KVSubFileType_EmbeddedContent`, and `KVSubFileType_EmbeddedPreview` are not extracted unless you set `ExtractImages=TRUE` in the configuration file (or the flag `KVFLT_EXTRACTIMAGES`). However, text contained in these objects *is* present in the filter output from the container file. As a result, if you filter a document but also extract and filter its embedded images, the output from KeyView will contain duplicate content.

  If you prefer not to see the duplicate content, you can modify your application so that it ignores these sub-files based on their `subFileType`. Alternatively, in the Filter API, you can set the flag `KVFLT_NOEMBEDDEDOBJECT` using the function `fpFilterConfig()`. This instructs KeyView to exclude information from embedded previews (`subFileType` matching `KVSubFileType_EmbeddedPreview`) in the filter output for the container file.
- The `KVSubFileType_Main` type applies to the following for each file format:

File format	KVSubFileType_Main applies to...
MSG and EML	The message body.
Zip files	A file inside the archive.
PST files	An item that is not an attachment, an OLE object, or a root node.
MBX files	A message in the MBX file.
NSF files	An item that is not an attachment, an OLE object, or a root node.
PDF files	An item that is not an attachment or a root node.

- If you set the `KVSubFileInfoFlag_NeedsExtraction` flag, open the subfile and extract its children. See fpOpenFile(), on page 102 and fpExtractSubFile(), on page 96.
- The `parentIndex` and `childArray` members provide information about the subfile's parent and children. You can use this information to recreate the file hierarchy on extraction. Because `childArray` retrieves only the first-level children in the subfile, you must call `fpGetSubFileInfo()` repeatedly until information for the leaf-node children is extracted. See Recreate a File's Hierarchy, on page 38.

KVSubFileMetaData

This structure contains a count of the number of metadata elements extracted from a mail file, and a pointer to the first element of the array of elements. It is initialized by calling fpGetSubFileMetaData(). This structure is defined in `kvxtract.h`.

```
typedef struct  tag_KVSubFileMetaData
{
```

```
    KVStructHeader;
    int                nElem;
    KVMetadataElem**   ppElem;
    unsigned long      infoFlag;
}
KVSubFileMetaDataRec, *KVSubFileMetaData;
```

Member Descriptions

`KVStructHeader`	The KeyView version of the structure. See KVStructHead, on page 172.
`nElem`	The number of metadata fields contained in the array.
`ppElem`	A pointer to an array of pointers that are the memory addresses of metadata field values in the KVMetadataElem structure.
`infoFlag`	A bitwise flag that defines additional properties of the extracted metadata. The following flag is available: `KVSubFileMetaInfoFlag_CharsetConverted`—Indicates that the metadata's character set was converted.

Chapter 8: Filter API Functions

This section describes the functions in the Filter API. Each function appears as a function prototype followed by a description of its arguments, its return value, and a discussion of its use.

KV_GetFilterInterfaceEx()

This function supplies pointers to other Filter functions. When `KV_GetFilterInterfaceEx()` is called, it assigns the function pointers in the structure `KVFltInterfaceEx` to other functions described in this chapter. For example, `KVFltInterfaceEx.fpInit` is assigned to point to the function `Init()`.

> **NOTE:** This is used as an entry point to Filter API versions 7.4 and higher.

Syntax

```
KVErrorCode pascal KV_GetFilterInterfaceEx(
    KVFltInterfaceEx   *pInterfaceEx,
    int                 version );
```

Arguments

`pInterfaceEx`	A pointer to the structure KVFltInterfaceEx, which contains function pointers that `KV_GetFilterInterfaceEx()` assigns to all other API functions.
`version`	The version number of the current Filter interface. This is a symbolic constant (`KVFLTINTERFACE_REVISION`) defined in `kvfilt.h`.

Returns

If the revision number of the Filter interface API is unknown, this function returns a general error (`KVERR_General`).

Discussion

- One of the initial steps in using the Filter API is to create an instance of a `KVFltInterfaceEx` structure and use this function to gain access to all other functions. The sample programs provide examples of how to do this.
- You can call the API functions directly. For example, you can call `GetOLESummaryInfo()` instead of using `fpGetOLESummaryInfo()` in `KVFltInterfaceEx`. However, Micro Focus recommends that you assign the function pointers in `KVFltInterfaceEx` to the functions for efficiency.

Example

```
void               *pKVFILTER;
KVFltInterfaceEx   FilterFunc;
KVErrorCode        nRet = KVERR_Success;
KVErrorCode (pascal *fpGetFilterInterfaceEx)( KVFltInterfaceEx *FilterFunc, int
version );
```

```
pKVFILTER = myLoadLibrary(szDllName);

fpGetFilterInterfaceEx = (KVErrorCode (pascal *)( KVFltInterfaceEx *, int ) )
myGetProcAddress(pKVFILTER, "KV_GetFilterInterfaceEx");
```

fpCanFilterFile()

This function determines whether a file's format is supported by KeyView. The supported formats are listed in Document Readers, on page 271.

If `KVERR_ General` is returned, you can retrieve the extended error code by using fpGetKvErrorCodeEx (), on page 142.

Syntax

```
KVErrorCode pascal fpCanFilterFile(
    void    *pContext,
    char    *szFile );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`szFile`	The name of the input file to be filtered.

Returns

- If the file format is supported, the return value is `KVERR_Success`.
- If the file format is not supported, the return value is an error code. See KVErrorCode, on page 181.

fpCanFilterStream()

This function determines whether the format of the file to which a stream points is supported by KeyView.

Syntax

```
KVErrorCode pascal fpCanFilterStream(
    void    *pcontext,
    void    *pStreamContext );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pStreamContext`	A pointer returned from fpOpenStream() or fpOpenStreamEx2().

Returns

- If the file format is supported, the return value is `KVERR_Success`.
- If the file format is not supported, the return value is an error code. See KVErrorCode, on page 181.

fpCloseStream()

This function closes a document stream opened by using `fpOpenStream()`.

Syntax

```
BOOL pascal fpCloseStream( void *pContext, void *pStreamContext );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pStreamContext`	A pointer returned from fpOpenStream() or fpOpenStreamEx2().

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

After filtering is complete, call this function to free the memory allocated by `fpOpenStream()` or `fpOpenStreamEx2()`.

fpConfigureRMS()

This function provides a way to set the credentials required to access RMS protected files. After you set these credentials, the Filter and File Extraction API functions can operate on the contents of the RMS files.

Syntax

```
KVErrorCode pascal *fpConfigureRMS(
    void*             pContext,
    KVRMSCredentials* credentials);
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`credentials`	A pointer to a `KVRMSCredentials` structure that contains the required credentials.

See KVRMSCredentials, on page 170.

Set this value to NULL to discard the existing credentials. You can call the function again with new credentials to override the existing configuration.

Before you fill out the `KVRMSCredentials` structure, use the macro `KVStructInit` to initialize the `KVStructHead` structure.

Returns

The return value is an error code. See KVErrorCode, on page 181.

If the function returns `KVERR_General`, you can retrieve the extended error code by using the `fpGetKvErrorCodeEx()` function (see fpGetKvErrorCodeEx(), on page 142).

Discussion

- This function runs in process or out of process. See The Filter Process Model, on page 27.
- RMS decryption is licensed as an additional product. If your license does not allow for RMS decryption, this function returns the extended error code `KVError_ReaderUsageDenied`.
- To access the protected content, KeyView must make an HTTP request. The time required to do so means that KeyView processes protected files slower than unprotected files.
- By default, KeyView uses the system proxy when it makes HTTP requests to obtain the key. You can also specify the proxy manually in the configuration file. See Configure the Proxy for RMS, on page 87.
- This function is supported only on Windows 64-bit, Linux 64-bit, Solaris SPARC 64-bit, and Solaris x86 64-bit. On Linux 64-bit, the minimum supported versions of particular distributions are:
  - Red Hat Enterprise Linux (RHEL) 6
  - CentOS 6
  - SuSE Linux Enterprise Server (SLES) 12
  - Ubuntu 14.04
  - Debian 8

CAUTION: When Filter or File Extraction API functions access the protected contents of RMS-protected files, KeyView may place decrypted contents into the temporary directory. If you want to manage the security of such files, you might want to change the temporary directory, by using fpFilterConfig().

fpFiletoInputStreamCreate()

This function creates an input stream from a file.

Syntax

```
BOOL pascal fpFileToInputStreamCreate(
    void            *pContext,
    char            *pszFileName,
    KVInputStream   *pInput)
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pszFileName`	A pointer to the name of the input file to be filtered.
`pInput`	A pointer to the developer-assigned instance of KVInputStream. The structure `KVInputStream` defines the input stream that contains the source.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

- After filtering is complete, call `fpFileToInputStreamFree()` to free the memory allocated by this function.
- You can access this function through the KV_GetFilterInterfaceEx() function, or call it directly.

fpFileToInputStreamFree()

This function frees the memory allocated for the input stream created from a file.

Syntax

```
BOOL pascal fpFileToInputStreamFree(
    void             *pContext,
    KVInputStream    *pInput)
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pInput`	A pointer to the developer-assigned instance of KVInputStream. The structure `KVInputStream` defines the input stream that contains the source.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

- After filtering is complete, call this function to free the memory allocated by `fpFileToInputStreamCreate()`.
- You can access this function through the KV_GetFilterInterfaceEx() function, or call it directly.

fpFilterConfig()

This function provides a way to enable and configure various options prior to document filtering, such as providing a password for a file, or enabling hidden text extraction.

Syntax

```
BOOL pascal fpFilterConfig(
    void   *pContext,
    int     nType,
    int     nValue,
    void   *pData );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`nType`	The configuration flag. This is a symbolic constant defined in `kvtypes.h`. The available options are described in the Filter Configuration Flags, below table.
`nValue`	The integer value defined for the flags above.
`pData`	The data for the configuration flag.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

- You must call this function after the call to fpInit() or fpInitWithLicenseData() and before the call to fpFilterStream(), on page 136 or fpFilterFile(), on page 135.
- Although `fpFilterConfig()` does not run out of process, any configuration flags that are set through `fpFilterConfig()` are passed to the out-of-process session.
- The configuration flags are described in the following table.

Filter Configuration Flags

Flag	Description
`KVFLT_SETOOPSRCFILE`	If you set this flag to **`TRUE`**, the input file name is reported in the out-of-process error log when the file generates an error in stream mode.

Filter Configuration Flags, continued

Flag	Description
	See Report the File Name in Stream Mode, on page 60. The default is `FALSE`. `nValue` is `TRUE` or `FALSE`. `pData` is the name of the input file generating errors.
`KVFLT_SETTEMPDIRECTORY`	This flag enables you to specify the directory where temporary files created during filtering processes are stored. `nValue` is set to **`0`**. `pData` is the path name of the directory where temporary files are stored. This value must be null terminated.
`KVFLT_LOGICALPDF`	This flag extracts paragraphs from a PDF file in the order in which they appear on the page (logical reading order). The `nValue` argument specifies the paragraph direction. See Filter PDF Files, on page 67. `nValue` is one of the paragraph direction options defined in the LPDF_DIRECTION enumerated type in `kvtypes.h`. `pData` is `NULL`.
`KVFLT_SETXMLCONFIGINFO`	This flag enables you to define which elements and attributes are extracted from XML documents with a specified format ID or root element. You can use this option to override the default settings for the supported XML formats (see Filter XML Files, on page 78), or to define settings for custom XML document types. The settings are defined in the KVXConfigInfo structure. To set custom settings for more than one document type, call the `fpFilterConfig()` function once for each type. You can also modify element extraction settings by using the `kvxconfig.ini` file. See Configure Element Extraction for XML Documents, on page 78. `nValue` is set to **`0`**. `pData` is a pointer to the KVXConfigInfo structure.
`KVFLT_INCLREVISIONMARK`	If you set this flag to **`TRUE`**, text that was deleted from a document with revision tracking enabled is extracted from the document and included in the filtered output. To reset the flag and exclude deleted text from the filtered output, set the flag to **`FALSE`** (the default). See Extract Deleted Text Marked by Tracked Changes, on page 66. `nValue` is `TRUE` or `FALSE`.

Filter Configuration Flags, continued

Flag	Description
	`pData` is `NULL`.
`KVFLT_SETSRCPASSWORD`	This flag enables you to define a password used to open a password-protected file for filtering. See Filter Password Protected Files, on page 366. `nValue` is the length of the password. `pData` is the source file password, which can have a maximum length of 255 characters.
`KVFLT_NOEMBEDDEDOBJECT`	If you set this flag to **`TRUE`**, the text of embedded previews in Microsoft Word (DOC, DOCX), Excel (XLSX), PowerPoint (PPT, PPTX), and Visio (VSDX) documents is not included in the filter output. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_SHOWHIDDENTEXT`	If you set this flag to **`TRUE`**, hidden text from Microsoft Word, Excel, and PowerPoint documents is extracted. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_NOCOMMENTS`	If you set this flag to **`TRUE`**, comments from Microsoft Word, PowerPoint, or Excel documents are not extracted. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_SKIPEMBEDDEDFONT`	If you set this flag to **`TRUE`**, text that contains embedded fonts is not filtered from PDF documents. See Filter PDF Files, on page 67. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_SHOWDATEFIELDCODE`	If you set this flag to **`TRUE`**, date/time field codes are extracted from Microsoft Word, PowerPoint, and Rich Text Format documents instead of the date/time values. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_ SHOWFILENAMEFIELDCODE`	If you set this flag to **`TRUE`**, file name field codes are extracted from Microsoft Word documents. `nValue` is `TRUE` or `FALSE`.

Filter Configuration Flags, continued

Flag	Description
	`pData` is `NULL`.
`KVFLT_KEEPSOFTHYPHEN`	If you set this flag to **`TRUE`**, soft hyphens are retained when text is filtered from PDF documents. See Filter PDF Files, on page 67. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_EXPORTALLMETADATA`	If you set this flag to **`TRUE`**, all custom metadata is filtered from PDF documents when the metadata APIs are used. See Extract Custom Metadata from PDF Files, on page 70. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_ EXPORTTAGGEDCONTENT`	If you set this flag to **`TRUE`**, tagged PDF content is filtered from PDF documents. See Filter Tagged PDF Content, on page 71. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_ SetConfigurableArguments`	If you set this flag to **`TRUE`**, the `pData` is a variable of configurable arguments. `nValue` is `TRUE` or `FALSE`. `pData` is a variable of configurable arguments.
`KVFLT_SETOUTPUTCHARSET`	This flag enables the output character set to be changed. `pData` is one of the character encodings defined in the `KVCharSet` enumerated type in `kvcharset.h`.
`KVFLT_SHOWHIDDENTEXT`	If you set this flag to **`TRUE`**, hidden text from Microsoft Word, Excel, PowerPoint, and PDF documents is extracted. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_EXTRACTIMAGES`	If you set this flag to **`TRUE`**, the extract API also extracts images contained within the file. See Extract Images, on page 38 for more details. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_TABDELIMITED`	If you set this flag to **`TRUE`**, tables in word processing formats are output in tab delimited formats. See Tab Delimited Output for Embedded Tables, on page 85 for more details.

Filter Configuration Flags, continued

Flag	Description
	`nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_STANDARDIZECELLFORMATS`	If you set this flag to **`TRUE`**, standardization of cell formats in Microsoft Excel files is enabled. See Standardize Cell Formats, on page 77. `nValue` is `TRUE` or `FALSE`. `pData` is `NULL`.
`KVFLT_SOURCECODEDETECTION`	If you enable this option, KeyView attempts to identify the programming language of any source code files that it finds. The `nValue` argument specifies the level of identification to attempt. See Source Code Identification, on page 86. `nValue` is `KVSOURCECODE_OFF`, `KVSOURCECODE_ENABLED`, or `KVSOURCECODE_EXTENDED`. `pData` is `NULL`.
`KVFLT_CHARSETDETECTION`	KeyView attempts to detect the character set of an input file. Some character sets (including ANSI, UTF-8, and UTF-16) can be detected by core KeyView functionality but others can only be detected if your license includes advanced character set detection. If your license includes advanced character set detection, it is enabled by default. However, it can increase the time required to filter some documents. To disable advanced character set detection, set this flag to **`FALSE`**. KeyView cannot perform character set conversion unless it detects the character set of the source file, or you call fpSetSrcCharSet(). For more information see Convert Character Sets, on page 64.

Examples

- To specify a password to open a password-protected file for filtering:

  ```
  (*fpFilterConfig)(pKVFilter, KVFLT_SETSRCPASSWORD, TRUE, password);
  ```

  where *password* is a null-terminated string of 255 or fewer characters.
- To extract hidden text from Microsoft Word, Excel, or PowerPoint files:

  ```
  (*fpFilterConfig)(pKVFilter, KVFLT_SHOWHIDDENTEXT, TRUE, NULL);
  ```
- To extract all custom metadata fields from PDF documents:

  ```
  (*fpFilterConfig)(pKVFilter, KVFLT_EXPORTALLMETADATA, TRUE, NULL);
  ```

fpFilterFile()

This function filters text from an input file to an output file.

If the output file path refers to an existing directory, an extended error code is set in `pContext` and returns `KVERR_General`. If `KVERR_ General` is returned, you can retrieve the extended error code by using fpGetKvErrorCodeEx(), on page 142.

Syntax

```
KVErrorCode pascal fpFilterFile(
    void             *pContext,
    char             *szInputFile,
    char             *szOutputFile,
    KVSummaryInfoEx  *pSummaryInfo );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`szInputFile`	A pointer to the input file.
`szOutputFile`	A pointer to the output file.
`pSummaryInfo`	This argument is reserved. It must be `NULL`.

Returns

The return value is an error code. See KVErrorCode, on page 181.

Discussion

This function runs in process or out of process. See The Filter Process Model, on page 27.

Example

```
error = (int)(*pFilterInterface->fpFilterFile)( pFilter, srcFile, outFile, NULL );
```

fpFilterStream()

This function filters text from an input stream to an output buffer.

Syntax

```
KVErrorCode pascal fpFilterStream(
    void            *pContext,
    void            *pStreamContext
    KVFilterOutput  *pFilterOutput,
    KVSummaryInfoEx *pSummaryInfo);
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pStreamContext`	A pointer returned from fpOpenStream() or fpOpenStreamEx2().
`pFilterOutput`	A pointer to the KVFilterOutput structure. This structure defines the output buffer.
`pSummaryInfo`	This argument is reserved. It must be `NULL`.

Returns

The return value is an error code. See KVErrorCode, on page 181.

Discussion

- This function processes data in chunks. To return the entire output stream, you must call this function repeatedly until the entire output buffer is processed, that is, until the following condition occurs:

  `pFilterOutput-> cbText == 0`

- This function runs in process or out of process. See The Filter Process Model, on page 27.
- After each call to `fpFilterStream`, once the data in the `pFilterOutput` argument is no longer required, call fpFreeFilterOutput to free the memory allocated by this function.

Example

```
error = (int)(*pFilterInterface->fpFilterStream)( pFilter, pStream, &filterOut,
NULL );
```

fpFreeFilterOutput()

This function frees the memory allocated in the `pFilterOutput` argument of fpFilterStream().

Syntax

```
BOOL pascal fpFreeFilterOutput(
    void *pContext,
    KVFilterOutput *pFilterOutput);
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pFilterOutput`	A pointer to the KVFilterOutput structure.

Returns

If the call is successful, the return value is TRUE. If the call is unsuccessful, the return value is FALSE.

Discussion

Call this function after each chunk of filter output is returned by fpFilterStream, after the data is no longer required, before calling fpFilterStream again. It is not necessary to call this function for the final call to fpFilterStream (when `pFilterOutput->cbText == 0`).

This function does not free `pFilterOutput` itself.

fpFreeOLESummaryInfo()

This function frees the memory allocated by `fpGetOLESummaryInfoFile()` or `fpGetOLESummaryInfo()` for metadata extraction.

Syntax

```
BOOL pascal fpFreeOLESummaryInfo(
    void               *pContext ,
    KVSummaryInfoEx    *pSummaryInfo );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pSummaryInfo`	A pointer to the KVSummaryInfoEx structure.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

Call this function after `fpGetOLESummaryInfo()` or `fpGetOLESummaryInfoFile()` has successfully filled `pSummaryInfo`, and the data is no longer required.

fpFreeXmpInfo()

This function frees the memory allocated by `fpGetXmpInfoFile()` or `fpGetXmpInfoStream()` for metadata extraction.

Syntax

```
BOOL pascal fpFreeXmpInfo(
    void               *pContext ,
    KVXmpInfo          *pXmpInfo );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pXmpInfo`	A pointer to the structure KVXmpInfo.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

Call this function after `fpGetXmpInfoFile()` or `fpGetXmpInfoStream()` has successfully filled `pXmpInfo`, and the data is no longer required.

fpGetDocInfoFile()

This function gets the following format information for a file and populates the `ADDOCINFO` structure:

- File format
- File class
- Major version
- Other attributes

The possible values are defined in `adinfo.h`.

An extended error code is set in `pContext` if an invalid input file is provided. You can retrieve the error code by using fpGetKvErrorCodeEx(), on page 142.

Syntax

```
BOOL pascal fpGetDocInfoFile(
    void       *pContext,
    char       *szFile,
    ADDOCINFO  *pADDocInfo );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`szFile`	A pointer to the input file.
`pADDOCINFO`	The format, file class, and version of the source document. A pointer to the ADDOCINFO structure. The structure of `ADDOCINFO` is defined in `adinfo.h`.

Returns

- If the format information is extracted, the return value for this function is `TRUE`.
- If the format information is not extracted, the return value is `FALSE`. If `FALSE` is returned, you can retrieve the extended error code by using fpGetKvErrorCodeEx(), on page 142.

Discussion

This function runs in process or out of process. See The Filter Process Model, on page 27.

fpGetDocInfoStream()

This function gets the following format information for a stream and populates the ADDOCINFO structure:

- Format
- File Class
- Major version
- Other attributes

The possible values are defined in adinfo.h.

Syntax

```
BOOL pascal fpGetDocInfoStream(
    void           *pContext,
    KVInputStream  *pInput,
    ADDOCINFO      *pADDocInfo );
```

Arguments

pContext	A pointer returned from fpInit() or fpInitWithLicenseData().
pInput	A pointer to the input stream.
pADDOCINFO	The format, file class, and version of the source document. A pointer to the ADDOCINFO structure. The structure of ADDOCINFO is defined in adinfo.h.

Returns

- If the format information is extracted, the return value for this function is TRUE.
- If the format information is not extracted, the return value is FALSE.

Discussion

This function runs in process or out of process. See The Filter Process Model, on page 27.

fpGetKvErrorCodeEx()

This function gets an extended error code defined in `KVErrorCodeEx`. It is called to provide additional information when `fpFilterFile()` or `fpFilterStream()` returns the error `KVERR_General`. See KVErrorCode, on page 181.

Syntax

```
KVErrorCodeEx pascal fpGetKvErrorCodeEx ( void *pContext )
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().

Returns

The return value is an error code from `KVErrorCodeEx`.

Discussion

You can access this function through the KV_GetFilterInterfaceEx() interface.

Example

```
KVErrorCode    nReturnCode = 0;
if ( nReturnCode == KVERR_General )
    { int kvErrorEx;
      if ( lsv->fpKV_GetKvErrorCodeEx )
      {
        kvErrorEx = (*lsv->fpKV_GetKvErrorCodeEx)( pFilter );
        if ( kvErrorEx != KVError_Last)
          printf("KvErrorCodeEx = %d \n ", kvErrorEx );
...
```

fpGetOLESummaryInfo()

This function extracts document metadata from an input stream.

Syntax

```
KVErrorCode pascal fpGetOLESummaryInfo(
    void               *pContext,
    KVInputStream      *pInput,
    KVSummaryInfoEx    *pSummaryInfo );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pInput`	A pointer to the developer-assigned instance of KVInputStream. The structure `KVInputStream` defines the input stream that contains the source.
`pSummaryInfo`	A pointer to the structure KVSummaryInfoEx. In the structure, `nElem` provides a count of the number of metadata elements, and `pElem` points to the first element of the array of individual elements as defined by the structure KVSumInfoElemEx.

Returns

The return value is an error code. See KVErrorCode, on page 181.

Discussion

- After the `pSummaryInfo` argument is successfully filled, and its data is no longer required, call fpFreeOLESummaryInfo() to free the memory allocated by this function.
- This function runs in process or out of process. See The Filter Process Model, on page 27.

fpGetOLESummaryInfoFile()

This function extracts document metadata from a file.

Syntax

```
KVErrorCode pascal fpGetOLESummaryInfoFile(
    void               *pContext,
    char               *szFile,
    KVSummaryInfoEx    *pSummaryInfo);
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`szFile`	The name of the input file.
`pSummaryInfo`	A pointer to the KVSummaryInfoEx structure. In the structure, `nElem` provides a count of the number of metadata elements, and `pElem` points to the first element of the array of individual elements as defined by the KVSumInfoElemEx structure.

Returns

The return value is an error code. See KVErrorCode, on page 181.

Discussion

- After the `pSummaryInfo` argument is successfully filled, and its data is no longer required, call fpFreeOLESummaryInfo() to free the memory allocated by this function.
- This function runs in process or out of process. See The Filter Process Model, on page 27.

fpGetTrgCharSet()

This function verifies that the character set requested was actually used.

Syntax

```
KVCharSet pascal fpGetTrgCharSet(void *pContext);
```

Arguments

`pContext` A pointer returned from fpInit() or fpInitWithLicenseData().

Returns

The return value is one of the character sets listed in `kvcharset.h`.

fpGetXmpInfo()

This function extracts XMP metadata in stream mode.

Syntax

```
KVErrorCode pascal fpGetXmpInfo(
    void *pContext,
    KVInputStream *pInput,
    KVXmpInfo *pXmpInfo,
    DWORD dwXmpOptions );
```

Arguments

`pContext`	The pointer returned by fpInit() or fpInitWithLicenseData().
`pInput`	A pointer to the input stream.
`pXmpInfo`	A pointer to the KVXmpInfo structure.
`dwXmpOptions`	Set this argument to **1** to return charset information, the raw XMP packet, and the path and value pairs of all XMP elements. Set this argument to **2** to return the raw XMP packet.

Returns

The return value is an error code. See KVErrorCode, on page 181.

Discussion

- After the `pXmpInfo` argument is successfully filled, and its data is no longer required, call fpFreeXmpInfo() to free the memory allocated by this function.
- This function runs in process or out of process. See The Filter Process Model, on page 27.
- XMP extraction is supported only for certain platforms and formats.
  - On Windows, Linux, AIX, FreeBSD, and macOS platforms, XMP extraction is supported for the following formats:
    - PDF (PDF_Fmt)
    - PNG (PNG_Fmt)
    - PSD (PSD_Fmt)
    - JPG (JPEG_File_Interchange_Fmt)
    - TIFF (TIFF_Fmt)

- XML (XML_Fmt)
- pFile (RMS_Protected_Fmt)

- On Windows, Linux, and macOS platforms, XMP extraction is additionally supported for the following formats:
  - GIF (GIF_87a_Fmt / GIF_89a_Fmt)
  - jpeg2000 (JPEG_2000_JP2_File_Fmt)
  - SVG (SVG_Fmt)
  - MOV (QuickTime_Fmt)
  - AIFF (AIFF_Fmt)
  - FLV (Flash_Video_Fmt)
  - SWF (Macromedia_Flash_Fmt)
  - MP3 (MPEG_Audio_Fmt)
  - MPEG4 (ISO_IEC_MPEG_4_Fmt)
  - WAV (MS_WAVE_Audio_Fmt)
  - AVI (MS_Video_Fmt)
  - EPS (EPSF_Fmt, Preview_EPSF_Fmt)
  - INDD (InDesign_Fmt)
  - WMA (WMA_Fmt)
  - WMV (WMV_Fmt)
  - HTML (HTML_Fmt)

fpGetXmpInfoFile()

This function extracts XMP metadata from a file.

Syntax

```
KVErrorCode pascal fpGetXmpInfoFile(
    void            *pMainContext,
    char            *szInputFile,
    KVXmpInfo       *pXmpInfo,
    DWORD            dwXmpOptions );
```

Arguments

`pMainContext`	A pointer to the `TPMainContext` structure, which is defined in `kvtypes.h`.
`szInputFile`	A pointer to the input file.
`pXmpInfo`	A pointer to the KVXmpInfo structure.
`dwXmpOptions`	Set this argument to **1** to return charset information, the raw XMP packet, and the path and value pairs of all XMP elements. Set this argument to **2** to return the raw XMP packet.

Returns

The return value is an error code. See KVErrorCode, on page 181.

Discussion

- After the `pXmpInfo` argument is successfully filled, and its data is no longer required, call fpFreeXmpInfo() to free the memory allocated by this function.
- This function runs in process or out of process. See The Filter Process Model, on page 27.
- XMP extraction is supported only for certain platforms and formats.
  - On Windows, Linux, AIX, FreeBSD, and macOS platforms, XMP extraction is supported for the following formats:
    - PDF (PDF_Fmt)
    - PNG (PNG_Fmt)
    - PSD (PSD_Fmt)
    - JPG (JPEG_File_Interchange_Fmt)
    - TIFF (TIFF_Fmt)

- XML (XML_Fmt)
- pFile (RMS_Protected_Fmt)

- On Windows, Linux, and macOS platforms, XMP extraction is additionally supported for the following formats:
  - GIF (GIF_87a_Fmt / GIF_89a_Fmt)
  - jpeg2000 (JPEG_2000_JP2_File_Fmt)
  - SVG (SVG_Fmt)
  - MOV (QuickTime_Fmt)
  - AIFF (AIFF_Fmt)
  - FLV (Flash_Video_Fmt)
  - SWF (Macromedia_Flash_Fmt)
  - MP3 (MPEG_Audio_Fmt)
  - MPEG4 (ISO_IEC_MPEG_4_Fmt)
  - WAV (MS_WAVE_Audio_Fmt)
  - AVI (MS_Video_Fmt)
  - EPS (EPSF_Fmt, Preview_EPSF_Fmt)
  - INDD (InDesign_Fmt)
  - WMA (WMA_Fmt)
  - WMV (WMV_Fmt)
  - HTML (HTML_Fmt)

fpInit()

This function initializes a Filter session. Its return value, `pContext`, is passed as the first argument to the File Extraction interface and all other Filter functions.

> **DEPRECATED:** The `fpInit()` function is deprecated in KeyView 12.7.0 and later. Micro Focus recommends that you use fpInitWithLicenseData() instead, so that your license key is passed to KeyView through the API. You should not include license information in your application as a file (`kv.lic`).
>
> This function is still available for existing implementations, but it might be incompatible with new functionality. The function might be removed in future.

Syntax

```
void * pascal fpInit(
    KVMemoryStream  *pMemAllocator,
    KVDynLink       *pDynLink,
    char            *pszKeyViewDir,
    KVCharSet        outputCharSet,
    DWORD            dwFlags );
```

Arguments

`pMemAllocator`	A pointer to a developer-defined memory allocator. If `NULL` is passed, the default C run-time memory allocation is used.
`pDynLink`	This argument is reserved. It must be `NULL`.
`pszKeyViewDir`	A pointer to the directory where the Filter components (such as the `formats.ini` file, license key file (`kv.lic`), and file filters) are located. This is normally the *`install`*`\`*`OS`*`\bin` directory.
`outputCharSet`	The character set to use for textual output when the source character set can be determined from the document or is specified by fpSetSrcCharSet(). The character sets are enumerated in `KVCharSet` in `kvcharset.h`.
`dwFlags`	Instructions on how to process a file or stream. See Flags for dwFlags, below for more information.

Flags for dwFlags

`KVF_CONTENTACCESS`	Reserved for internal use.
`KVF_METADATA`	Reserved for internal use.

KVF_OUTOFPROCESS	Enables out-of-process filtering. This is enabled by default. See The Filter Process Model, on page 27.
KVF_INPROCESS	Enables in-process filtering. See The Filter Process Model, on page 27.
KVF_HEADERFOOTERTAGS	Puts tags around header and footer data.
KVF_HEADERFOOTER	Extracts headers and footers.
KVF_UNICODEMSBLSB	Uses the byte order for Big Endian systems (MSBLSB) for Unicode text. MSBLSB is the "Most Significant Byte Least Significant Byte."
KVF_UNICODELSBMSB	Uses the byte order for Little Endian systems (LSBMSB) for Unicode text. LSBMSB is the "Least Significant Byte Most Significant Byte."
KVF_UNICODEMARKER	Generates the byte order marker for Unicode text.
KVF_ NODEFAULTCHARSETCONVERT	Prevents default conversion of document character encoding. See Customize Character Set Detection and Conversion, on page 66.
KVF_OOPLOGON	Enables the out-of-process error log. See Enable or Disable Error Logging, on page 59.
KVF_OOPMEMTRACEON	Enables memory trace for the out-of-process error log. See Report Memory Errors, on page 60.
KVF_OOPLOGOFF	Disables the out-of-process error log. Enable or Disable Error Logging, on page 59.
KVF_OOPMEMTRACEOFF	Disables memory trace for the out-of-process error log. See Report Memory Errors, on page 60.
KVF_ FILTERCONTAINERCONTENT	This flag is used by the Container API which is obsolete. It filters the main file and subfiles of a container file by using the standard filtering functions, and extracts the text to a single file.
KVF_DETECT_OUTOFPROCESS KVF_DETECT_INPROCESS	Set these flags in `fpInit()` or `fpOpenStreamEx2()` to specify whether files are detected out of process or in process for a filtering session. These flags override the `default_detect_inprocess` flag in `formats.ini`. If you set neither of these flags, file detection behavior is determined by the `KVF_OUTOFPROCESS` or `KVF_INPROCESS` flags in these calls. If you do not set these flags, behavior is determined by `default_ detect_inprocess` in `formats.ini`. See Run File Detection In or Out of Process, on page 31.

Returns

- If the call is successful, the return value is the pointer `pContext` which is passed as the first argument to all other File Extraction API and Filter API functions.

- If the call is unsuccessful, the return value is `NULL`.

Discussion

- If this function returns `NULL`, check `stderr` for the KeyView installation error messages "`KeyView Filter SDK License Key has Expired`" and "`KeyView Filter SDK License Key is Invalid`", and pass them to your application.
- To make sure that multithreaded filter processes are thread-safe, you must create a unique context pointer for every thread by calling `fpInit()`. In addition, threads must not share context pointers, and you must use the same context pointer for all API calls in the same thread. Creating a context pointer for every thread does not affect performance because the context pointer uses minimal resources.
- When the filtering context is no longer required, call fpShutdown() to terminate it.

fpInitWithLicenseData()

This function initializes a Filter session with license information passed in function parameters rather than a license file. Its return value, `pContext`, is passed as the first argument to the File Extraction interface and all other Filter functions.

This function is similar to fpInit(), but it uses a different licensing method. You can use either fpInit() or `fpInitWithLicenseData` to initialize your Filter session. However, these functions are mutually exclusive. That is, neither takes the context pointer from the other as an argument. If you call both functions, you initialize two distinct Filter sessions, in the same way as calling fpInit() twice.

Syntax

```
void * pascal fpInitWithLicenseData(
    KVMemoryStream  *pMemAllocator,
    KVDynLink       *pDynLink,
    char            *pszKeyViewDir,
    const char*      const pszLicenseOrganization,
    const char*      const pszLicenseKey,
    KVCharSet        outputCharSet,
    DWORD            dwFlags );
```

Arguments

`pMemAllocator`	A pointer to a developer-defined memory allocator. If `NULL` is passed, the default C run-time memory allocation is used.
`pDynLink`	This argument is reserved. It must be `NULL`.
`pszKeyViewDir`	A pointer to the directory where the Filter components (such as the `formats.ini` file and file filters) are located. This is normally the

	*install**OS*\bin directory.
pszLicenseOrganization	A pointer to a string that contains the organization name under which this installation of KeyView is licensed. This value is the company name that appears at the top of the license key provided by Micro Focus. Add the text exactly as it appears in this file.
pszLicenseKey	A pointer to a string that contains the license key for this installation of KeyView. This value is the appropriate license key provided by Micro Focus. The key is a string that contains 31 characters, for example 2TQD22D-2M6FV66-2KPF23S-2GEM5AB. Type these characters exactly as they appear in the license key file, including the dashes, but do not include any leading or trailing spaces.
outputCharSet	The character set to use for textual output when the source character set can be determined from the document or is specified by fpSetSrcCharSet(). The character sets are enumerated in KVCharSet in kvcharset.h.
dwFlags	Instructions on how to process a file or stream. See Flags for dwFlags, below for more information.

Flags for dwFlags

KVF_CONTENTACCESS	Reserved for internal use.
KVF_METADATA	Reserved for internal use.
KVF_OUTOFPROCESS	Enables out-of-process filtering. This is enabled by default. See The Filter Process Model, on page 27.
KVF_INPROCESS	Enables in-process filtering. See The Filter Process Model, on page 27.
KVF_HEADERFOOTERTAGS	Puts tags around header and footer data.
KVF_HEADERFOOTER	Extracts headers and footers.
KVF_UNICODEMSBLSB	Uses the byte order for Big Endian systems (MSBLSB) for Unicode text. MSBLSB is the "Most Significant Byte Least Significant Byte."
KVF_UNICODELSBMSB	Uses the byte order for Little Endian systems (LSBMSB) for Unicode text. LSBMSB is the "Least Significant Byte Most Significant Byte."
KVF_UNICODEMARKER	Generates the byte order marker for Unicode text.
KVF_NODEFAULTCHARSETCONVERT	Prevents default conversion of document character encoding. See Customize Character Set Detection and Conversion, on page 66.
KVF_OOPLOGON	Enables the out-of-process error log. See Enable or Disable Error Logging, on page 59.

KVF_OOPMEMTRACEON	Enables memory trace for the out-of-process error log. See Report Memory Errors, on page 60.
KVF_OOPLOGOFF	Disables the out-of-process error log. Enable or Disable Error Logging, on page 59.
KVF_OOPMEMTRACEOFF	Disables memory trace for the out-of-process error log. See Report Memory Errors, on page 60.
KVF_FILTERCONTAINERCONTENT	This flag is used by the Container API which is obsolete. It filters the main file and subfiles of a container file by using the standard filtering functions, and extracts the text to a single file.
KVF_DETECT_OUTOFPROCESS KVF_DETECT_INPROCESS	Set these flags in fpInit(), `fpInitWithLicenseData()` or fpOpenStreamEx2(), on page 156 to specify whether files are detected out of process or in process for a filtering session. These flags override the `default_detect_inprocess` flag in `formats.ini`. If you set neither of these flags, file detection behavior is determined by the `KVF_OUTOFPROCESS` or `KVF_INPROCESS` flags in these calls. If you do not set these flags, behavior is determined by `default_detect_inprocess` in `formats.ini`. See Run File Detection In or Out of Process, on page 31.

Returns

- If the call is successful, the return value is the pointer `pContext` which is passed as the first argument to all other File Extraction API and Filter API functions.
- If the call is unsuccessful, the return value is `NULL`.

Discussion

- If this function returns `NULL`, check `stderr` for the KeyView installation error messages "`KeyView Filter SDK License Key has Expired`" and "`KeyView Filter SDK License Key is Invalid`", and pass them to your application.
- To make sure that multithreaded filter processes are thread-safe, you must create a unique context pointer for every thread by calling fpInit(), on page 150 or `fpInitWithLicenseData()`. In addition, threads must not share context pointers, and you must use the same context pointer for all API calls in the same thread. Creating a context pointer for every thread does not affect performance because the context pointer uses minimal resources.
- When the filtering context is no longer required, call fpShutdown() to terminate it.

fpOpenStream()

This function opens a stream for filtering.

Syntax

```
void * pascal fpOpenStream(
    void             *pContext,
    KVInputStream    *pInput );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pInput`	A pointer to the developer-assigned instance of KVInputStream. The structure `KVInputStream` defines the input stream that contains the source.

Returns

- If the call is successful, the return value is a `void *` pointer passed to fpFilterStream(), fpCanFilterStream(), and fpCloseStream().
- If the call is unsuccessful, the return value is `NULL`.

Discussion

- Before you call this function, you must create an input stream either by using the fpFiletoInputStreamCreate() function, or by using code similar to the coding example in the Filter sample program. See Use the C-Language Implementation of the API, on page 24 for more information.
- After filtering is complete, call fpCloseStream() to free the memory allocated by this function.

fpOpenStreamEx2()

This function opens a stream for filtering and enables you to set bitwise flags for each stream.

Syntax

```
void * pascal fpOpenStreamEx2(
    void             *pContext,
    KVInputStream    *pInput,
    DWORD             dwFlags);
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`pInput`	A pointer to the developer-assigned instance of KVInputStream. The `KVInputStream` structure defines the input stream that contains the source.
`dwFlags`	Instructions on how to process a stream. See Flags for dwFlags, on page 150.

Returns

- If the call is successful, the return value is a `void *` pointer passed to fpFilterStream(), fpCanFilterStream(), and fpCloseStream().
- If the call is unsuccessful, the return value is `NULL`.

Discussion

- Before you call this function, you must create an input stream either by using the fpFiletoInputStreamCreate() function, or by using code similar to the coding example in the Filter sample program. See Use the C-Language Implementation of the API, on page 24 for more information.
- After filtering is complete, call fpCloseStream() to free the memory allocated by this function.

fpRefreshFilterKVOOP()

This function forces the out-of-process filtering server (`kvoop.exe`) to restart. This function is optional.

Syntax

```
int (pascal *fpRefreshFilterKVOOP)( void *pContext );
```

Arguments

`pContext` A pointer returned from fpInit() or fpInitWithLicenseData().

Returns

- If the restart is successful, the return value is `KVERR_Success`.
- If the restart is unsuccessful, the return value is an error code.

> **NOTE:** There are several different error codes.

fpSetReplacementChar()

This function specifies a replacement character to use when a character cannot be mapped. This function is optional.

Syntax

```
BOOL pascal fpSetReplacementChar( void *pContext, char c );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`c`	The replacement character to use when a character cannot be mapped. If you do not call this function, the default character is used. The default is a question mark ("?").

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

fpSetSrcCharSet()

This function specifies a character set for the source document. Use this function if the character set information cannot be determined from the source document.

Syntax

```
BOOL pascal fpSetSrcCharSet( void *pContext, KVCharSet eCharSet );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`eCharSet`	Specifies the source character set when the document reader for the document type cannot determine the character set. The character sets are enumerated in `KVCharSet` in `kvcharset.h`.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

fpSetTimeout()

This function specifies the length of time that should elapse before assuming that the filtering process has stopped responding.

Syntax

```
BOOL pascal fpSetTimeout( void *pContext, long lTimeout );
```

Arguments

`pContext`	A pointer returned from fpInit() or fpInitWithLicenseData().
`lTimeout`	The length of time, in seconds, that must elapse before assuming that the filtering process has stopped responding.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

fpShutdown()

This function terminates a filtering session that was initialized by fpInit() or fpInitWithLicenseData(), and frees allocated system resources. It is called when the filtering context is no longer required.

Syntax

```
void pascal fpShutdown( void *pContext );
```

Arguments

`pContext` A pointer returned from fpInit() or fpInitWithLicenseData().

Returns

None.

Chapter 9: Filter API Structures

This section describes the data structures used by the Filter API. These structures are defined in `kvflt.h`, `kwautdef.h`, and `adinfo.h`.

KVFltInterfaceEx

The members of this structure are pointers to the functions described in Filter API Functions, on page 121. When you call the KV_GetFilterInterfaceEx() function, this structure assigns pointers to the functions. The structure is defined in `kvfilt.h`.

```
typedef struct tag_KVFltInterfaceEx
{
  void *      (pascal *fpInit) ( KVMemoryStream *, KVDynLink *, char *, KVCharSet,
DWORD );
  void        (pascal *fpShutdown) (void *);
  void *      (pascal *fpOpenStream)( void *, KVInputStream * );
  void *      (pascal *fpOpenStreamEx2) (void *, KVInputStream *, DWORD);
  BOOL        (pascal *fpCloseStream)( void *, void * );
  BOOL        (pascal *fpCanFilterCharMap)( void *, adDocDesc * );
  KVErrorCode (pascal *fpCanFilterFile)( void *, char * );
  KVErrorCode (pascal *fpCanFilterStream) (void *, void *);
  KVErrorCode (pascal *fpFilterStream)( void *, void *, KVFilterOutput *,
KVSummaryInfoEx * );
  KVErrorCode (pascal *fpFilterFile)( void *, char *, char *, KVSummaryInfoEx * );
  KVErrorCode (pascal *fpGetOLESummaryInfo)( void *, KVInputStream *,
KVSummaryInfoEx * );
  KVErrorCode (pascal *fpGetOLESummaryInfoFile)( void *, char *, KVSummaryInfoEx *
);
  BOOL        (pascal *fpFreeOLESummaryInfo)( void *, KVSummaryInfoEx * );
  KVCharSet   (pascal *fpGetTrgCharSet)( void * );
  BOOL        (pascal *fpSetTimeout)( void *, long );
  BOOL        (pascal *fpSetSrcCharSet)( void *, KVCharSet );
  BOOL        (pascal *fpSetReplacementChar)( void *, char );
  BOOL        (pascal *fpGetDocInfoStream)( void *, KVInputStream *, ADDOCINFO * );
  BOOL        (pascal *fpGetDocInfoFile)( void *, char *, ADDOCINFO * );
  BOOL        (pascal *fpIsArchiveFile)( void *, char * );
  BOOL        (pascal *fpIsArchiveFileSupported)( void *, char * );
  void *      (pascal *fpOpenArchiveFile)( void *, char * );
  int         (pascal *fpGetNumFilesInArchiveFile)( void * );
  KVErrorCode (pascal *fpGetArchiveFileInfo)( void *, int, TPArchiveFileInfo * );
  KVErrorCode (pascal *fpExtractArchiveFile)( void *, int, char * );
  BOOL        (pascal *fpCloseArchiveFile)( void * );
/* Revision 1 of Filter Interface API starts here (#define KVFLTINTERFACE_
REVISION). */
  BOOL        (pascal *fpFileToInputStreamCreate)(void *, char *, KVInputStream *);
  BOOL        (pascal *fpFileToInputStreamFree)(void *, KVInputStream *);
  KVErrorCode (pascal *fpCanFilterAsContainer)(void *, KVInputStream *);
  void *      (pascal *fpOpenContainerStream)(void *, KVInputStream *);
  BOOL        (pascal *fpCloseContainerStream)( void *, void *);
  int         (pascal *fpGetNumFilesInContainer)( void *, void *);
  KVErrorCode (pascal *fpGetContainerSubFileInfo)( void *, void *, int,
TPContainerSubFileInfo *);
```

```
  BOOL        (pascal *fpSetExtractionPath)(void *, void *, char *, BOOL);
  void        (pascal *fpSetExtractionOverwrite)( void *, void *, BOOL);
  KVErrorCode (pascal *fpExtractContainerSubFile)( void *, void *, int,
TPContainerSubFileInfo *);
  KVErrorCode (pascal *fpGetContainerContent)( void *, void *, KVFilterOutput *,
BOOL * );
  KVErrorCodeEx (pascal *fpGetKvErrorCodeEx)( void *pContext );
  BOOL        (pascal *fpFilterConfig)( void *pContext, int nType, int nValue, void
*p );
/* Revision 2 of Filter Interface API starts here (#define KVFLTINTERFACE_REVISION)
*/
  KVErrorCode (pascal *fpGetSubFileMetadada)( void *, void *, int, int *, int,
KVSummaryInfoEx *, int );
  KVErrorCode (pascal *fpFreeSubFileMetadada)( void *, void *, KVSummaryInfoEx * );
}
KVFltInterfaceEx;
KVErrorCode pascal KV_GetFilterInterfaceEx( KVFltInterfaceEx *pInterfaceEx, int
version );
```

Member Descriptions

The member functions are described in Filter API Functions, on page 121.

Discussion

The following functions are deprecated:

- `fpIsArchiveFile`
- `fpIsArchiveFileSupported`
- `fpOpenArchiveFile`
- `fpGetNumFilesInArchiveFile`
- `fpGetArchiveFileInfo`
- `fpExtractArchiveFile`
- `fpCloseArchiveFile`
- `fpCanFilterCharMap`
- `fpCanFilterAsContainer`
- `fpCloseContainerStream`
- `fpGetNumFilesInContainer`
- `fpGetContainerSubFileInfo`
- `fpSetExtractionPath`
- `fpSetExtractionOverwrite`

- `fpExtractContainerSubFile`
- `fpGetContainerContent`
- `fpFreeSubFileMetadada`

ADDOCINFO

This structure contains the format, file class, and version number of the source document. The structure is defined in `adinfo.h`, and is initialized by calling the fpGetDocInfoFile() or fpGetDocInfoStream() functions.

```
typedef struct
{
    ENdocClass        eClass;
    ENdocFmt          eFormat;
    long              lVersion;
    unsigned long     ulAttributes;
}
ADDOCINFO, *ADDOCINFOPTR;
```

Member Descriptions

`eClass`	The file class of the source document (for example, spreadsheet, word processor, or encapsulation format), as defined by the enumerated type `ENDocClass` in `adinfo.h`.
`eFormat`	The major format of the source document (for example Microsoft Word XML format or Corel Presentation), as defined by the enumerated type `ENdocFmt` in `adinfo.h`. The `ENdocFmt` type provides a unique ID for each major format.
`lVersion`	The version number of the file format. The number is multiplied by 1,000 (for example, 1.02 is represented by 1020).
`ulAttributes`	Other attributes of the document, as defined by the enumerated type ENDocAttributes, on page 180 in `adinfo.h`.

Discussion

When format detection is enhanced in future releases, new format IDs might be added to the `ENdocFmt` enumerated type. When using this type, your code should ensure binary compatibility with future releases. For example, if you use an array to access format information based on a format ID, your code should check that the format ID is less than `Max_Fmt` before accessing the data. This ensures that new format codes are detected when you add KeyView binary files from new releases to your existing installation.

KV_CONFIG_Arg

This structure defines configurable arguments to use as the data in the fpFilterConfig() function when you set the `KVFLT_SetConfigurableArguments` flag to **`TRUE`**. The structure is described in `kvtypes.h`.

Use this structure to control the filtering of hidden data from Microsoft Excel documents. See Filter Hidden Data, on page 82.

```
typedef struct _KV_CONFIG_ARG_TAG
{
    unsigned int       keyID;
    int                keyType;
    KV_CONFIG_DATA     keyData;
    unsigned int       keyDataSize;
}
KV_CONFIG_Arg;
```

Member Descriptions

`keyID`	Determines the kind of configuration flags that you can use as values of `keyData`. If you use the same `keyID` more than once, the most recent setting overrides the previous setting.
`keyType`	The type of data for the `keyData` element. Set to **`KV_INT32ARG`**.
`keyData`	`KV_CONFIG_DATA` is a union defined in `kvtypes.h`. Only `intArg` is supported, where the value of `intArg` is one of the flags in the corresponding `keyID`.
`keyDataSize`	The size of `keyData`. This is reserved for future use.

KVFilterOutput

This structure defines an output buffer for filtering. The structure is defined in `kvtypes.h`.

```
typedef struct tag_KVFilterOutput
{
    BYTE        *pcText;
    int          cbText;
}
KVFilterOutput;
```

Member Descriptions

`pcText`	A pointer to the text returned from fpFilterStream().
`cbText`	The number of valid bytes in `pcText`.

KVInputStream

This structure defines an input stream for filtering. The structure is defined in `kvstream.h`.

```
typedef struct tag_InputStream
{
   void  *pInputStreamPrivateData;
   long  lcbFilesize;
   BOOL (pascal *fpOpen) (struct tag_InputStream *);
   UINT (pascal *fpRead) (struct tag_InputStream *, BYTE *, UINT);
   BOOL (pascal *fpSeek) (struct tag_InputStream *, long, int);
   long (pascal *fpTell) (struct tag_InputStream *);
   BOOL (pascal *fpClose)(struct tag_InputStream *);
}
KVInputStream;
```

Member Descriptions

- All member functions are equivalent to their counterparts in the ANSI standard library, except `fpOpen()`, which returns `FALSE` on failure.
- On `fpOpen()`, if the size of the stream is known, assign that value to `lcbFilesize`. Otherwise, set `lcbFilesize` to **`0`**.

KVMemoryStream

This structure defines an optional memory allocator to be used by Filter. Behavior for all functions is the same as for their C run-time equivalents. The structure is defined in `kvtypes.h`.

```
typedef struct tag_MemoryStream
{
   void *pMemoryStreamPrivateData;
   void * (pascal *fpMalloc)  (struct tag_MemoryStream*, size_t );
   void   (pascal *fpFree)    (struct tag_MemoryStream*, void *);
   void * (pascal *fpRealloc) (struct tag_MemoryStream*, void *, size_t);
   void * (pascal *fpCalloc)  (struct tag_MemoryStream*, size_t, size_t);
}
KVMemoryStream;
```

Member Descriptions

- All member functions are equivalent to their counterparts in the ANSI standard library.
- `fpRealloc()` must handle a `NULL` pointer.

KVRMSCredentials

This structure defines each element of the RMS credentials. This structure is defined in `kvdecryptionsettings.h`.

```
typedef struct _KVRMSCredentials
{
    KVStructHeader;

    const char* tenantID;
    const char* clientID;
    const char* clientSecret;
}
KVRMSCredentials;
```

Member Descriptions

`KVStructHeader`	The KeyView version of the structure. See KVStructHead, on page 172.
`tenantID`	The tenant ID of the domain.
`clientID`	The client ID of the application.
`clientSecret`	The client secret for the application.

For KeyView to access the protected contents of Microsoft Rights Management System (RMS) protected files, your end-user application must be registered on the relevant Azure domain. For more information about how to register an app, refer to the Microsoft documentation: https://docs.microsoft.com/en-us/azure/active-directory/develop/quickstart-register-app.

After you register an application, you can find the client and tenant IDs in the Azure Portal, in the Overview section. You can find the client secret in the Certificates & Secrets section.

> **CAUTION:** This information is linked to the domain itself, rather than to a specific user. Providing this information allows KeyView to access the contents of all files protected by this domain. Therefore you must handle these three pieces of information securely.

KVStructHead

This structure contains the current KeyView version number, and is the first member of other structures. It enables Micro Focus to modify the structures in future releases, but to maintain backward compatibility. Before you initialize a structure that contains the `KVStructHead` structure, use the macro `KVStructInit` to initialize `KVStructHead`. The structure and macro are defined in `kvstructhead.h`.

```
typedef struct _KVStructHead
{
    WORD        version;
    WORD        size;
    DWORD       reserved;
    void        *internal;
}
KVStructHeadRec, *KVStructHead;
```

Member Descriptions

`version`	The current KeyView version number. This is a symbolic constant (`KeyviewVersion`) defined in `kvxtract.h`. This constant is updated for each KeyView release.
`size`	The size of the `KVStructHeadRec`.
`reserved`	Reserved for internal use.
`internal`	Reserved for internal use.

Example

```
KVOpenFileArgRec      openArg;
KVStructInit(&openArg);
```

KVSumInfoElemEx

This structure contains the individual metadata elements. The structure is defined in `kvtypes.h`.

```
typedef struct tag_KVSumInfoElemEx
{
    int                    isValid;
    KVSumInfoType          type;
    void                  *data;
    char                  *pcType;
}
KVSumInfoElemEx;
```

Member Descriptions

`isValid`	Specifies whether the data value is present in the document. The setting `1` specifies that the value is valid and exists. For example, if the "Title" element is not populated in the document, `pSummaryInfo.pElem[1].isValid == 0` evaluates to true.
`type`	The data type of the metadata element. The types are defined in KVSumInfoType in `kvtypes.h`.
`data`	The content of the metadata field. If the `type` member is `KV_Int4`, or `KV_Bool`, this member contains the actual value. Otherwise, this member is a pointer to the actual value. `KV_DateTime` and `KV_IEEE8` point to an 8-byte value. `KV_String` and `KV_Unicode` point to the beginning of the string that contains the text. `KV_Unicode` is replaced with `KV_String` when the UNICODE value has been character mapped to the desired output character set as specified in the call to fpInit(), on page 150 or fpInitWithLicenseData(), on page 152.
`pcType`	A pointer to the name of the metadata field.

KVSummaryInfoEx

This structure contains a count of the number of metadata elements, and a pointer to the first element of the array of individual elements. The structure is defined in `kvtypes.h`.

```
typedef struct tag_KVSummaryInfoEx
{
    int                 nElem;
    KVSumInfoElemEx    *pElem;
}
KVSummaryInfoEx;
```

Member Descriptions

`nElem` The number of metadata elements contained in the array. A value of zero indicates that the document did not contain metadata, such as an ASCII text document.

`pElem` A pointer to the first element of the array of metadata elements defined by the structure KVSumInfoElemEx.

KVXConfigInfo

This structure defines an XML document type and the element extraction settings for that type. You can apply the settings based on the file format ID, or the root element of the file. This structure is in `kvtypes.h`.

```
typedef struct TAG_KVXConfigInfo
{
    ENdocFmt    eKVFormat;
    char*       pszRoot;
    char*       pszInMeta;
    char*       pszExMeta;
    char*       pszInContent;
    char*       pszExContent;
    char*       pszInAttribute;
}
KVXConfigInfo;
```

Member Descriptions

`eKVFormat`	The format ID as detected by the KeyView detection module. This determines the file type to which these extraction settings apply. The format ID is defined by the enumerated type `ENdocFmt`. See File Format Detection, on page 328 for more information on format ID values. If you are adding configuration settings for a custom XML document type, this is not defined.
`pszRoot`	The root element of the file. If the format ID is not defined, the root element is used to determine the file type to which these settings apply. To further qualify the element, specify its namespace. See Specify an Element's Namespace and Attribute, on page 81.
`pszInMeta`	The elements extracted from the file as metadata. All other elements are extracted as text. Separate multiple entries with commas. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on page 81.
`pszExMeta`	The child elements in the included metadata elements that are not extracted from the file as metadata. For example, the default extraction settings for the Visio XML format extract the `DocumentProperties` element as metadata. This element includes child elements such as `Title`, `Subject`, `Author`, `Description`, and so on. However, the child element `PreviewPicture` is defined in `pszExMeta` because it is binary data and should not be extracted. You cannot exclude any metadata elements from the output for StarOffice files. All metadata is extracted regardless of this setting.

To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on page 81.

`pszInContent` The elements extracted from the file as content text. An asterisk (*) extracts all elements including child elements.

To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on page 81.

`pszExContent` The child elements in the included content elements that are not extracted from the file as content text.

To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on page 81.

`pszInAttribute` The attribute values extracted from the file. If attributes are not defined, attribute values are not extracted. You must define the namespace (if used), element name, and attribute name in the following format:

namespace:*elementname*@*attributename*

For example:

```
microfocus:division@name
```

KVXmpInfo

This structure contains the XMP metadata, and is defined in `kvtypes.h`.

```
typedef struct tag_KVXmpInfo
{
    KVCharSet         encoding;
    BOOL              bIsLittleEndian;
    UINT              nNoOfElements;
    KVXmpInfoElem    *pXmpInfoElems;
    KV_I18NSTR        usXpacketData;
    void             *pExtension;
}
KVXmpInfo;
```

Member Descriptions

`encoding`	The type of encoding.
`bIsLittleEndian`	Indicates whether little-endian byte ordering is used.
`nNoOfElements`	The total number of elements.
`pXmpInfoElems`	A pointer to the KVXmpInfoElems structure.
`usXpacketData`	A copy of the XMP data.
`pExtension`	A reserved pointer.

KVXmpInfoElems

This structure contains the individual XMP metadata elements, and is defined in `kvtypes.h`.

```
typedef struct tag_KVXmpInfoElem
{
    KV_I18NSTR        usXPathToElement;
    KV_I18NSTR        usValue;
}
KVXmpInfoElem;
```

Member Descriptions

`usXPathToElement`	The path to the XMP element.
`usValue`	The value of the XMP element.

Chapter 10: Enumerated Types

This section provides information on some of the enumerated types used by the Filter API.

Introduction

The enumerated types are in `adinfo.h`, `kvcharset.h`, `kverrorcodes.h`, `kvtypes.h`, `kv.h`, and `kvxtract.h`. These header files are in the `include` directory. The first entry in an enumerated type structure should be set to zero (0). Each subsequent entry is increased by 1. For example, the first five entries of `KVCharSet` in `kvcharset.h` are:

```
KVCS_UNKNOWN

KVCS_SJIS

KVCS_GB

KVCS_BIG5

KVCS_KSC
```

They would be set in the following way:

Enumerated Type	Setting
`KVCS_UNKNOWN`	`0`
`KVCS_SJIS`	`1`
`KVCS_GB`	`2`
`KVCS_BIG5`	`3`
`KVCS_KSC`	`4`

You can also set many enumerated types by entering the appropriate symbolic constant, or `TRUE` or `FALSE`.

Programming Guidelines

When KeyView is enhanced in future releases, some enumerated types might be expanded. For example, new format IDs might be added to the `ENdocFmt` enumerated type, or new error codes might be added to the `KVErrorCodeEx` enumerated type. When you use these expandable types, your code should ensure binary compatibility with future releases.

For example, if you use an array to access error messages based on an error code, your code should check that the error code is less than `KVError_Last` before accessing the data. This ensures that new error codes are detected when you add KeyView binary files from new releases to your existing installation.

The following enumerated types are expandable:

`KVErrorCodeEx`

`KVMetadataType`

`KVCharSet`

`KVLanguageID`

`KVSubfileType`

`ENdocFmt`

ENDocAttributes

This enumerated type provides additional information about a file during auto-detection. This enumerated type is defined in `adinfo.h`.

> **NOTE:** The attributes in this enumerated type are set when a particular characteristic is detected. However, if the attribute is not set it does not necessarily mean that the characteristic is not present. For example, KeyView sets `kEncrypted` when it detects encryption on the file, but if it does not detect encryption it does not necessarily mean the file is not encrypted.

Enumerators

`kEncrypted`	The file is encrypted.
`kWindowRMSEncrypted`	The file is encrypted with Windows RMS encryption.
`kBigEndian`	Where a format has big and little endian variants, this value indicates that this file is in the big endian variant.
`kLittleEndian`	Where a format has big and little endian variants, this value indicates that this file is in the little endian variant.
`k32Bit`	Where a format has 64- and 32-bit variants, this value indicates that this file is in the 32-bit variant.

`k64Bit`	Where a format has 64- and 32-bit variants, this value indicates that this file is in the 64-bit variant.

KVCredKeyType

This enumerated type defines the type of credential used to open a protected file. See KVCredentialComponent, on page 106. This enumerated type is defined in `kvxtract.h`.

Definition

```
typedef enum tag_KVCredKeyType
{
    KVCredKeyType_UserName,
    KVCredKeyType_UserIdFile,
    KVCredKeyType_Password,
}
KVCredKeyType;
```

Enumerators

`KVCredKeyType_UserName`	The credential in `KVCredentialComponent` is a user name.
`KVCredKeyType_UserIdFile`	The credential in `KVCredentialComponent` is a path to a file that contains user IDs.
`KVCredKeyType_Password`	The credential in `KVCredentialComponent` is a password.

KVErrorCode

This enumerated type defines the type of error generated if Filter fails. This enumerated type is defined in `kverrorcodes.h`.

Definition

```
typedef enum tag_KVErrorCode
{
KVERR_Success,             /* 0  Success*/
KVERR_DLLNotFound,         /* 1  DLL or shared library not found*/
KVERR_OutOfCore,           /* 2  memory allocation failure*/
KVERR_processCancelled,    /* 3  fpContinue() returns FALSE*/
KVERR_badInputStream,      /* 4  Invalid/corrupt input stream*/
KVERR_badOutputType,       /* 5  Invalid output type requested*/
KVERR_General,             /* 6  General error....   */
```

```
KVERR_FormatNotSupported,  /* 7  Format not supported*/
KVERR_PasswordProtected,   /* 8  File is Password Protected*/
KVERR_ADSNotFound,         /* 9  Adobe Document Server not found*/
KVERR_AutoDetFail,         /* 10 Autodetect error*/
KVERR_AutoDetNoFormat,     /* 11 Unable to detect file format*/
KVERR_ReaderInitError,     /* 12  Error initializing the reader*/
KVERR_NoReader,            /* 13 No reader available for this format*/
KVERR_CreateOutputFileFailed,    /* 14 Unable to create output file*/
KVERR_CreateTempFileFailed,      /* 15 Unable to create temp file*/
KVERR_ErrorWritingToOutputFile,  /* 16 Error writing to output file*/
KVERR_CreateProcessFailed, /* 17 Error creating a child process*/
KVERR_WaitForChildFailed,  /* 18 Wait for child process failed*/
KVERR_ChildTimeOut,        /* 19 Child process hung / timed out*/
KVERR_ArchiveFileNotFound, /* 20 Attempt to extract nonexistent file*/
KVERR_ArchiveFatalError    /* 21 Fatal error processing archive - should abort*/
}
KVErrorCode;
```

Enumerators

`KVERR_SUCCESS`	The function completed successfully.
`KVERR_DLLNotFound`	A DLL or shared library was not found.
`KVERR_OutOfCore`	Memory allocation failure.
`KVERR_processCancelled`	The callback function `fpContinue()` returns `FALSE`.
`KVERR_badInputStream`	Invalid or corrupt input stream.
`KVERR_badOutputType`	Invalid output is requested.
`KVERR_General`	General error. To return a more detailed message for `KVERR_General`, call fpGetKvErrorCodeEx().
`KVERR_FormatNotSupported`	The file format is not supported.
`KVERR_PasswordProtected`	The file is encrypted or password-protected. KeyView supports only secure PST files.
`KVERR_ADSNotFound`	Adobe Document Server not found. This error is obsolete.
`KVERR_AutoDetFail`	Autodetect error.
`KVERR_AutoDetNoFormat`	Unable to detect file format.
`KVERR_ReaderInitError`	Error initializing the reader.
`KVERR_NoReader`	No reader is available for this format.
`KVERR_`	Unable to create output file.

	This error is generated if the overwrite flag in KVExtractSubFileArg is `FALSE`, and a subfile has the same name as a file in the target path.
`KVERR_CreateTempFileFailed`	Unable to create temporary file.
`KVERR_ErrorWritingToOutputFile`	There was an error writing to the output file.
`KVERR_CreateProcessFailed`	There was an errror creating a child process.
`KVERR_WaitForChildFailed`	The wait for child process failed.
`KVERR_ChildTimeOut`	The child process hung or timed out.
`KVERR_ArchiveFileNotFound`	Attempt to extract nonexistent file.
`KVERR_ArchiveFatalError`	A fatal error occurred processing an archive file.

KVErrorCodeEx

This enumerated type defines extended error codes. The type is defined in `kverrorcodes.h`.

Some of these error codes provide more information when `fpFilterFile()` or `fpFilterStream()` returns the error `KVERR_General`. To return these error codes, call fpGetKvErrorCodeEx().

Definition

```
typedef enum tag_KVErrorCodeEx
{
	KVError_OpenStreamFailure = KVERR_ArchiveFatalError + 1,	/* 22 */
	KVError_InterfaceFunctionNotFound,				/* 23 */
	KVError_InputFileNotFound,					/* 24 */
	KVError_OpenOutputFileFailed,					/* 25 */
	KVError_MemoryLeak,						/* 26 */
	KVError_MemoryOverwrite,					/* 27 */
	KVError_GPF,							/* 28 */
	KVError_OopCore,						/* 29 */
	KVError_KVoopLogFailed,						/* 30 */
	KVError_OverNestedFileLimit,					/* 31 */
	KVError_PSTAccessFailed,					/* 32 */
	KVError_PasswordRequired,					/* 33 */
	KVError_InvalidArgs,						/* 34 */
	KVError_ReaderUsageDenied,					/* 35 */
	KVError_OopBadConfig,						/* 36 */
	KVError_OopBrokenPipe,						/* 37 */
	KVError_OopPipeOEF,						/* 38 */
	KVError_IPCTimeOut,						/* 39 */
```

```
        KVError_InvalidOopDriverSignature,                  /* 40 */
        KVError_InvalidOopServiceSignature,                 /* 41 */
        KVError_ZeroFile,                                   /* 42 */
        KVError_CompressionNotSupported,                    /* 43 */
        KVError_NoTemplates,                                /* 44 */
        KVError_NoMainTemplate,                             /* 45 */
        KVError_InvalidTemplate,                            /* 46 */
        KVError_TemplateError,                              /* 47 */
        KVError_IsADirectory,                               /* 48 */
        KVError_RMSDecryptionFailed,                        /* 49 */
        KVError_InvalidLicense,                             /* 50 */
        KVError_Last                                        /* 51 */
}
KVErrorCodeEx;
```

Enumerators

`KVError_OpenStreamFailure`	Failed to open a stream during out-of-process filtering. This is an extended error for the `KVERR_General` code.
`KVError_InterfaceFunctionNotFound`	An interface function was not found during out-of-process filtering. This is an extended error for the `KVERR_General` code.
`KVError_InputFileNotFound`	Could not find the input file during out-of-process filtering. This is an extended error for the `KVERR_General` code.
`KVError_OpenOutputFileFailed`	Could not open the output file during out-of-process filtering. This is an extended error for the `KVERR_General` code.
`KVError_MemoryLeak`	A memory leak occurred during out-of-process filtering. This is an extended error for the `KVERR_General` code.
`KVError_MemoryOverwrite`	A memory overwrite occurred during out-of-process filtering. This is an extended error for the `KVERR_General` code.
`KVError_GPF`	An exception occurred during out-of-process filtering. This is an extended error for the `KVERR_General` code.
`KVError_OopCore`	A memory dump was generated in a child process during out-of-process filtering. This is an extended error for the `KVERR_General` code.
`KVError_KVoopLogFailed`	The creation of the out-of-process error log failed. This is an extended error for the `KVERR_General` code.
`KVError_OverNestedFileLimit`	The container file has more than the allowable number of child documents. One or more child documents were not converted. Currently, this enumerator is not used.
`KVError_PSTAccessFailed`	The PST file could not be converted. This error might be returned

	when a call to `fpOpenFile()` returns `NULL` for one of the following reasons: • A Microsoft Outlook client is not installed. • A Microsoft Outlook client is installed, but is not the default email client. • A Microsoft Outlook client is installed, but is not configured correctly. • The PST file is corrupt. • The PST file is read-only (PST files must allow read and write access). • The MAPI call fails. • The bit editions of Microsoft Outlook do not match the bit editions of the KeyView software. For example, if 32-bit KeyView is used, 32-bit Outlook must be installed. If 64-bit KeyView is used, 64-bit Outlook must be installed.
`KVError_PasswordRequired`	To open the file, you must provide credentials. This error might be returned when a call to `fpOpenFile()` returns `NULL`.
`KVError_InvalidArgs`	The input argument or structure is invalid. This error is generated by the File Extraction APIs.
`KVError_ReaderUsageDenied`	The current license key does not enable the document reader required to filter the file. This error might be returned when a call to `fpOpenFile()` returns `NULL`. Some document readers are considered advanced features and are licensed separately from the KeyView SDK (for example, the PST and MBX readers). Contact your Micro Focus sales representative to get an updated license key.
`KVError_OopBadConfig`	Information in the `kvxconfig.ini` file is incomplete and cannot be used to filter the XML file.
`KVError_OopBrokenPipe`	Data was not transferred between the parent and child processes during out-of-process filtering because either the parent or child failed.
`KVError_OopPipeOEF`	Data was not transferred between the parent and child processes during out-of-process filtering because the parent process was shut down.
`KVError_IPCTimeOut`	Either the parent or child process is waiting for a reply or request during out-of-process filtering.
`KVError_`	A client sent a request to an out-of-process server, but the context

	driver does not exist on the server.
`KVError_InvalidOopServiceSignature`	A client sent a request to a File Extraction service that does not exist. If this error is generated on the call to `fpClose()`, you can ignore it.
`KVError_ZeroFile`	The input file is empty or zero bytes.
`KVError_CompressionNotSupported`	The file or subfile is compressed with an unsupported compression method.
`KVError_NoTemplates`	
`KVError_NoMainTemplate`	
`KVError_InvalidTemplate`	
`KVError_TemplateError`	
`KVError_IsADirectory`	
`KVError_RMSDecryptionFailed`	KeyView was not able to access the protected contents of an RMS file.
`KVError_InvalidLicense`	The license used to initialize KeyView is not valid for this operation.
`KVError_Last`	

Discussion

- When error reporting is enhanced in future releases, new error messages might be added to this enumerator type. When you use this type, your code must ensure binary compatibility with future releases. See Programming Guidelines, on page 180.
- If an extended error code is called for a format to which the error does not apply, the `KVError_Last` code is returned.

KVMetadataType

This enumerated type defines the data type of metadata that can be extracted from a subfile in a mail message or mail store. If a metadata field has a corresponding KeyView type in `KVMetadataType`, the metadata is converted to the KVMetadataElem structure, and the structure member `isDataValid` is `1`. This enumerated type is defined in `kvtypes.h`.

Definition

```
typedef enum
{
```

```
  KVMetadata_Unknown       = 0,
  KVMetadata_Bool          = 1,
  KVMetadata_Binary        = 2,
  KVMetadata_Int4          = 3,
  KVMetadata_UInt4         = 4,
  KVMetadata_Int8          = 5,
  KVMetadata_UInt8         = 6,
  KVMetadata_String        = 7,
  KVMetadata_Unicode       = 8,
  KVMetadata_DateTime      = 9,
  KVMetadata_Float         = 10,
  KVMetadata_Double        = 11,
  KVMetadata_Last
}
KVMetadataType;
```

Enumerators

`KVMetadata_Unknown`	The value in the property is of an unknown type.
`KVMetadata_Bool`	The value in the property is a Boolean value. The corresponding MAPI type is `PT_BOOLEAN`.
`KVMetadata_Binary`	The value in the property is a byte array. The corresponding MAPI type is `PT_BINARY`.
`KVMetadata_Int4`	The value in the property is a signed 4-byte integer. The corresponding MAPI types are `PT_I2`, `PT_SHORT`, `PT_I4`, and `PT_LONG`.
`KVMetadata_UInt4`	The value in the property is an unsigned 4-byte integer. This type is not currently supported.
`KVMetadata_Int8`	The value in the property is a signed 8-byte integer. This type is not currently supported.
`KVMetadata_UInt8`	The value in the property is an unsigned 8-byte integer. This type is not currently supported.
`KVMetadata_String`	The value in the property is a string. The corresponding MAPI type is `PT_STRING8`.
`KVMetadata_Unicode`	The value in the property is a Unicode string. The corresponding MAPI type is `PT_UNICODE`.
`KVMetadata_DateTime`	The value in the property is a date and time. The corresponding MAPI type is `PT_SYSTIME`.
`KVMetadata_Float`	The value in the property is a 4-byte float. The corresponding MAPI type is `PT_FLOAT`.

`KVMetadata_Double`	The value in the property is an 8-byte double. The corresponding MAPI type is `PT_DOUBLE`.

Discussion

New types might be added to this enumerated type. When you use this type, your code should ensure binary compatibility with future releases. See Programming Guidelines, on page 180.

KVMetaNameType

This enumerated type defines the type of metadata fields extracted from a subfile in a mail message or mail store. See KVMetaName, on page 113. This enumerated type is defined in `kvxtract.h`.

Definition

```
typedef enum
{
    KVMetaNameType_Integer = 0,
    KVMetaNameType_String  = 1
}
KVMetaNameType;
```

Enumerators

`KVMetaNameType_Integer`	The metadata field is an integer.
`KVMetaNameType_String`	The metadata field is a string.

KVSumInfoType

This enumerated type defines the data type of the metadata field extracted from a document. This enumerated type is defined in `kvtypes.h`.

Definition

```
typedef enum tag_KVSumInfoType
{
    KV_String        = 0x1,
    KV_Int4          = 0x2,
    KV_DateTime      = 0x3,
    KV_ClipBoard     = 0x4,
    KV_Bool          = 0x5,
    KV_Unicode       = 0x6,
    KV_IEEE8         = 0x7,
```

```
    KV_Other          = 0x8
}
KVSumInfoType;
```

Enumerators

KV_String	The value in the metadata field is a string.
KV_Int4	The value in the metadata field is an integer.
KV_DateTime	The value in the metadata field is a date and time. This type is a 64-bit value representing the number of 100-nanosecond intervals since January 1, 1601 (Windows FILETIME EPOCH). You might need to convert this value into another format. The Filter sample program demonstrates how to convert this value to another format. The program translates KV_DATETIME to a UNIX timestamp, that is, the number of seconds since 00:00:00 (UTC), January 1, 1970. It then uses the ctime system library call, which works on UNIX and Windows, to print the date in the following format: Thu Aug 22 16:19:07 2002
KV_ClipBoard	Currently not supported.
KV_Bool	The value in the metadata field is a Boolean value.
KV_Unicode	The value in the metadata field is a Unicode string.
KV_IEEE8	The value in the metadata field is an IEEE 8-byte integer.
KV_Other	The value in the metadata field is user-defined.

KVSumType

This enumerated type defines the metadata fields that can be extracted from a document. This enumerated type is defined in kvtypes.h.

- Types 0 to 34 and type 42 are Office summary fields.
- Types 35 to 40 are computer-aided design (CAD) metadata fields.
- Type 41, KV_OrigAppVersion, is shared by Office software and CAD.

Types 43 or greater are reserved for any non-standard metadata field defined in a document.

Definition

```
typedef enum tag_KVSumType

   KV_CodePage           = 0,
   KV_Title              = 1,
```

```
    KV_Subject            = 2,
    KV_Author             = 3,
    KV_Keywords           = 4,
    KV_Comments           = 5,
    KV_Template           = 6,
    KV_LastAuthor         = 7,
    KV_RevNumber          = 8,
    KV_EditTime           = 9,
    KV_LastPrinted        = 10,
    KV_Create_DTM         = 11,
    KV_LastSave_DTM       = 12,
    KV_PageCount          = 13,
    KV_WordCount          = 14,
    KV_CharCount          = 15,
    KV_ThumbNail          = 16,
    KV_AppName            = 17,
    KV_Security           = 18,
    KV_Category           = 19,
    KV_PresentationTarget = 20,
    KV_Bytes              = 21,
    KV_Lines              = 22,
    KV_Paragraphs         = 23,
    KV_Slides             = 24,
    KV_Notes              = 25,
    KV_HiddenSlides       = 26,
    KV_MMClips            = 27,
    KV_ScaleCrop          = 28,
    KV_HeadingPairs       = 29,
    KV_TitlesofParts      = 30,
    KV_Manager            = 31,
    KV_Company            = 32,
    KV_LinksUpToDate      = 33,
    KV_HyperlinkBase      = 34,
    KV_Layouts            = 35,
    KV_Objects            = 36,
    KV_FileVersion        = 37,
    KV_LastFileVersion    = 38,
    KV_OrigFileVersion    = 39,
    KV_OrigFileType       = 40,
    KV_OrigAppVersion     = 41,
    KV_ContentStatus      = 42,
    KV_UserDefined        = 43
}
KVSumType;
```

Enumerators

KV_CodePage	The code page of the document.
KV_Title	The contents of the "Title" property field taken from the source document.
KV_Subject	The contents of the "Subject" property field taken from the source document.
KV_Author	The contents of the "Author" property field taken from the source document.
KV_Keywords	The contents of the "Keywords" property field taken from the source document.
KV_Comments	The contents of the "Comments" property field taken from the source document.
KV_Template	The contents of the "Template" property field taken from the source document.
KV_LastSavedby	The contents of the "Last saved by" property field taken from the source document.
KV_RevNumber	The contents of the "Revision number" property field taken from the source document.
KV_EditTime	The contents of the "Total editing time" property field taken from the source document.
KV_LastPrinted	The contents of the "Printed" property field taken from the source document.
KV_Create_DTM	The contents of the "Created" property field taken from the source document.
KV_LastSave_DTM	The contents of the "Modified" property field taken from the source document.
KV_PageCount	The contents of the "Pages" property field taken from the source document. The field provides the number of pages in the document.
KV_WordCount	The contents of the "Words" property field taken from the source document. The field provides the number of words in the document.
KV_CharCount	The contents of the "Characters" property field taken from the source document. The field provides the number of characters in the document.
KV_ThumbNail	A thumbnail image of a document.
KV_AppName	The contents of the "Type" property field taken from the source document. This field identifies the application used to read the document.
KV_Security	The contents of the "Attributes" property field taken from the source document.

KV_Category	The contents of the "Category" property field taken from the source document.
KV_PresentationTarget	The target format for presentations (35mm, printer, video, and so on).
KV_Bytes	The contents of the "Size" property field taken from the source document. The field provides the size of the file in bytes.
KV_Lines	The contents of the "Lines" property field taken from the source document. The field provides the number of lines in the document.
KV_Paragraphs	The contents of the "Paragraphs" property field taken from the source document. The field provides the number of paragraphs in the document.
KV_Slides	The contents of the "Slides" property field taken from a presentation document. The field provides the number of slides in the document.
KV_Notes	The contents of the "Notes" property field taken from a presentation document. The field provides the number of notes in the document.
KV_HiddenSlides	The contents of the "Hidden slides" property field taken from a presentation document. The field provides the number of hidden slides in the document.
KV_MMClips	The contents of the "Multimedia clips" property field taken from a presentation document. The field provides the number of multimedia clips in the document.
KV_ScaleCrop	A Boolean value that specifies whether thumbnails are cropped or scaled.
KV_HeadingPairs	An internally-used property indicating the grouping of different document parts and the number of items in each group.
KV_TitlesofParts	The contents of the "Document Contents" property field taken from the source document. The field contains a list of the parts of the file, such as the names of macro sheets in Microsoft Excel or the headings in Word.
KV_Manager	The contents of the "Manager" property field taken from the source document.
KV_Company	The contents of the "Company" property field taken from the source document.
KV_LinksUpToDate	A Boolean value that specifies whether links in the document are resolved and current.
KV_HyperlinkBase	The base address used for all relative links in the file.
KV_Layouts	The number of layouts in the AutoCAD drawing.
KV_Objects	The approximate number of objects in the AutoCAD drawing.
KV_FileVersion	The AutoCAD version (for example, R13, R14) of the drawing.
KV_LastFileVersion	The AutoCAD version (for example, R13, R14) that the AutoCAD drawing

	was last saved as.
KV_OrigFileVersion	The AutoCAD version (for example, R13, R14) of the original source file.
KV_OrigFileType	The AutoCAD file type (for example, DWG, DXF, or DWB) of the original source file.
KV_OrigAppVersion	The AutoCAD version (for example, R13, R14) of the application that created the original source file.
KV_ContentStatus	The status of the content, for example *Draft*, *Reviewed*, or *Final*.
KV_UserDefined	The contents of the first entry in the array of non-standard metadata. This could be user-defined metadata, or metadata unique to a file type.

LPDF_DIRECTION

This enumerated type defines the paragraph direction of extracted paragraphs from a PDF file when logical order is enabled. This enumerated type is defined in `kvtypes.h`.

Definition

```
typedef enum{
    LPDF_RAW = 0,
    LPDF_LTR,
    LPDF_RTL,
    LPDF_AUTO
} LPDF_DIRECTION ;
```

Enumerators

LPDF_RAW	Unstructured paragraph flow. This is the default behavior.
LPDF_LTR	Logical reading order and left-to-right paragraph direction.
LPDF_RTL	Logical reading order and right-to-left paragraph direction.
LPDF_AUTO	Logical reading order. The PDF reader determines the paragraph direction for each PDF page, and then sets the direction accordingly. This is the default when logical order is enabled.

Appendixes

This section lists supported formats, supported character sets, and redistributed files, and provides information on format detection and developing a custom document reader.

Appendix A: Supported Formats

This section lists the file formats that KeyView can detect.

Key to Supported Formats Table

The supported formats table includes the following information:

Column	Description
Format Name	The format name that is returned by KeyView format detection. • In the C API, these values are defined in the `ENdocFmt` enumeration in `adDocFmt.h`. • In the .NET API these values are defined in the `Autonomy.API.Filter.DocFormat` enumeration. • In the Java API these values are defined in the `com.verity.api.DocFormat` enumeration. • In the C++ API these values are defined in `keyview::Format`, used in `DetectionInfo` which is returned by `Session::detect()`.
Number	The format number that is returned by KeyView format detection. This is the value associated with the Format Name in the relevant enumeration.
Category	This value is used in the KeyView configuration file `formats.ini` to specify the reader to use to filter, export, or view the format. Several formats might have the same category value.
Description	A short description of the file format.
MIME Type	The MIME type (if any).
Extension	A list of common file extensions for the file format. **NOTE:** This is not a complete list of file extensions. KeyView does not distinguish between file types based on their extension. Instead, it detects the file format based on the file content. This is more reliable because content cannot always be predicted from the file extension, and because some file extensions are associated with multiple formats.
File Class	The KeyView file class. • In the C API, these values are defined in the `ENdocClass` enumeration in

	`adinfo.h`. • In the .NET API these values are defined in the `Autonomy.API.Filter.DocClass` enumeration. • In the Java API these values are defined in the `com.verity.api.DocClass` enumeration. • In the C++ API these values are defined in `keyview::Category`, used in `DetectionInfo` which is returned by `Session::detect()`.

Supported Formats

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Reserved__Fmt	-1	-1				AutoDetNoFormat	
Unknown_Fmt	0	0				AutoDetNoFormat	
AES_Multiplus_Comm_ Fmt	1	1	Multiplus (AES)		PTF	adWORDPROCESSOR	
ASCII_Text_Fmt	2	2	Plain Text file	text/plain	TXT	adWORDPROCESSOR	afsr
MSDOS_Batch_File_Fmt	3	2	MS-DOS Batch File	application/x-bat	BAT	adEXECUTABLE	afsr
Applix_Alis_Fmt	4	3	Applix Asterix		AX	adWORDPROCESSOR	axsr
BMP_Fmt	5	4	Windows Bitmap Image (BMP)	image/bmp	BMP	adRASTERIMAGE	bmpsr, kpbmprdr
CT_DEF_Fmt	6	5	Convergent Technologies DEF Comm. Format			adWORDPROCESSOR	cdsr
Corel_Draw_Fmt	7	6	CorelDRAW (up to version 13/X3)	application/coreldraw	CDR	adVECTORGRAPHIC	kpcdrrdr
CGM_ClearText_Fmt	8	8	Computer Graphics Metafile (CGM)		CGM	adVECTORGRAPHIC	kpcgmrdr
CGM_Binary_Fmt	9	8	Computer Graphics Metafile (CGM)	image/cgm	CGM	adVECTORGRAPHIC	kpcgmrdr
CGM_Character_Fmt	10	8	Computer Graphics Metafile (CGM)		CGM	adVECTORGRAPHIC	kpcgmrdr
Word_Connection_Fmt	11	9	Word Connection		CN	adWORDPROCESSOR	stringssr
COMET_TOP_Word_Fmt	12	10	Nixdorf COMET TOP Financial Accounting software			adWORDPROCESSOR	
CEOwrite_Fmt	13	11	CEOwrite		CW	adWORDPROCESSOR	stringssr
DSA101_Fmt	14	12	DSA101 (Honeywell Bull)			adWORDPROCESSOR	stringssr
DCA_RFT_Fmt	15	13	IBM DCA-RFT (Revisable Form)	application/dca-rft	RFT, DC	adWORDPROCESSOR	dcasr
CDA_DDIF_Fmt	16	14	CDA / DDIF		DDIF	adWORDPROCESSOR	
DG_CDS_Fmt	17	16	DG Common Data Stream		CDS	adWORDPROCESSOR	stringssr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			(CDS)				
Micrografx_Draw_Fmt	18	18	Windows Draw (Micrografx)		DRW	adVECTORGRAPHIC	
Data_Point_VistaWord_Fmt	19	19	Vistaword		DV	adWORDPROCESSOR	stringssr
DECdx_Fmt	20	20	DEC WPS Plus DX format		DX	adWORDPROCESSOR	
Enable_WP_Fmt	21	21	Enable Word Processing		WPF	adWORDPROCESSOR	stringssr
EPSF_Fmt	22	22	Encapsulated PostScript	application/postscript	EPS	adRASTERIMAGE, adVECTORGRAPHIC	kpepsrdr
Preview_EPSF_Fmt	23	22	Encapsulated PostScript	application/postscript		adRASTERIMAGE, adVECTORGRAPHIC	kpepsrdr
MS_Executable_Fmt	24	23	MSDOS/Windows executable	application/x-msdownload	EXE	adEXECUTABLE	exesr
G31D_Fmt	25	24	CCITT G3 1D			adRASTERIMAGE	
GIF_87a_Fmt	26	25	Graphics Interchange Format (GIF87a)	image/gif	GIF	adRASTERIMAGE	gifsr, kpgifrdr
GIF_89a_Fmt	27	25	Graphics Interchange Format (GIF89a)	image/gif	GIF	adRASTERIMAGE	gifsr, kpgifrdr
HP_Word_PC_Fmt	28	26	HP Word PC		HW	adWORDPROCESSOR	stringssr
IBM_1403_LinePrinter_Fmt	29	27	IBM 1403 Line Printer		I4	adWORDPROCESSOR	
IBM_DCF_Script_Fmt	30	28	DCF Script		IC	adWORDPROCESSOR	stringssr
IBM_DCA_FFT_Fmt	31	29	DCA-FFT (IBM Final Form)		IF, FFT	adWORDPROCESSOR	
Interleaf_Fmt	32	30	Interleaf			adWORDPROCESSOR	
GEM_Image_Fmt	33	31	GEM Bit Image		IMG	adRASTERIMAGE	
IBM_Display_Write_Fmt	34	32	IBM DisplayWrite		IP	adWORDPROCESSOR	dw4sr
Sun_Raster_Fmt	35	33	Sun Raster image	image/x-cmu-raster	RAS, RS, SUN	adRASTERIMAGE	kpsunrdr
Ami_Pro_Fmt	36	35	Lotus Ami Pro	application/x-lotus-amipro	SAM	adWORDPROCESSOR	lasr
Ami_Pro_StyleSheet_Fmt	37	35	Lotus Ami Pro Style Sheet			adWORDPROCESSOR	lasr
MORE_Fmt	38	36	MORE Database MAC			adOUTLINE	
Lyrix_Fmt	39	37	Lyrix Word Processing			adWORDPROCESSOR	stringssr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MASS_11_Fmt	40	38	MASS-11		M1	adWORDPROCESSOR	stringssr
MacPaint_Fmt	41	39	MacPaint		PNTG	adRASTERIMAGE	kpmacrdr
MS_Word_Mac_Fmt	42	40	Microsoft Word for Macintosh (up to version 3)	application/msword	DOC	adWORDPROCESSOR	mbsr
SmartWare_II_Comm_ Fmt	43	41	SmartWare II			adCOMMUNICATION	
MS_Word_Win_Fmt	44	42	Microsoft Word for Windows (up to version 6)	application/msword	DOC, WPS	adWORDPROCESSOR	misr
Multimate_Fmt	45	43	MultiMate		MM	adWORDPROCESSOR	stringssr
Multimate_Fnote_Fmt	46	43	MultiMate Footnote File		MMFN	adWORDPROCESSOR	stringssr
Multimate_Adv_Fmt	47	43	MultiMate Advantage			adWORDPROCESSOR	stringssr
Multimate_Adv_Fnote_ Fmt	48	43	MultiMate Advantage Footnote File			adWORDPROCESSOR	stringssr
Multimate_Adv_II_Fmt	49	43	MultiMate Advantage II			adWORDPROCESSOR	stringssr
Multimate_Adv_II_Fnote_ Fmt	50	43	MultiMate Advantage II Footnote File		FBX, FNX	adWORDPROCESSOR	stringssr
Multiplan_PC_Fmt	51	44	Multiplan (PC)			adSPREADSHEET	
Multiplan_Mac_Fmt	52	44	Multiplan (Mac)			adSPREADSHEET	
MS_RTF_Fmt	53	45	Rich Text Format (RTF)	application/rtf	RTF	adWORDPROCESSOR	rtfsr
MS_Word_PC_Fmt	54	46	Microsoft Word for PC (up to version 6)	application/x-ms-wordpc	MW	adWORDPROCESSOR	mwsr
MS_Word_PC_ StyleSheet_Fmt	55	46	Microsoft Word for PC (up to version 6) Style Sheet			adWORDPROCESSOR	mwsr
MS_Word_PC_Glossary_ Fmt	56	46	Microsoft Word for PC (up to version 6) Glossary			adWORDPROCESSOR	mwsr
MS_Word_PC_Driver_ Fmt	57	46	Microsoft Word for PC (up to version 6) Driver			adWORDPROCESSOR	mwsr
MS_Word_PC_Misc_Fmt	58	46	Microsoft Word for PC (up to version 6) Miscellaneous File			adWORDPROCESSOR	mwsr
NBI_Async_Archive_Fmt	59	47	NBI Async Archive Format			adWORDPROCESSOR	
Navy_DIF_Fmt	60	48	Navy DIF (document interchange format)		ND	adWORDPROCESSOR	stringssr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
NBI_Net_Archive_Fmt	61	49	NBI OASys Net Archive Format		NN	adWORDPROCESSOR	nnsr
NIOS_TOP_Fmt	62	50	NIOS TOP			adWORDPROCESSOR	
FileMaker_Mac_Fmt	63	51	Filemaker MAC		FP5, FP7	adDATABASE	
ODA_Q1_11_Fmt	64	52	ODA / ODIF Q1 11		OD	adWORDPROCESSOR	stringssr
ODA_Q1_12_Fmt	65	52	ODA / ODIF Q1 12		OD	adWORDPROCESSOR	stringssr
OLIDIF_Fmt	66	53	OLIDIF (Olivetti)			adWORDPROCESSOR	
Office_Writer_Fmt	67	55	Office Writer		OW	adWORDPROCESSOR	stringssr
PC_Paintbrush_Fmt	68	56	PC Paintbrush Graphics (PCX)	image/vnd.zbrush.pcx	PCX	adRASTERIMAGE	kppcxrdr
CPT_Comm_Fmt	69	57	CPT Corporation word processor		PF	adWORDPROCESSOR	stringssr
Lotus_PIC_Fmt	70	58	Lotus PIC	image/x-pict	PIC	adVECTORGRAPHIC	kppicrdr
Mac_PICT_Fmt	71	59	Macintosh Raster / QuickDraw Picture	image/x-pict	PCT	adRASTERIMAGE, adVECTORGRAPHIC	kppctrdr
Philips_Script_Word_Fmt	72	60	Philips Script			adWORDPROCESSOR	
PostScript_Fmt	73	61	PostScript	application/postscript	PS	adVECTORGRAPHIC	
PRIMEWORD_Fmt	74	62	PRIMEWORD			adWORDPROCESSOR	pwsr
Quadratron_Q_One_v1_Fmt	75	63	Q-One V1.93J		Q1, QX	adWORDPROCESSOR	stringssr
Quadratron_Q_One_v2_Fmt	76	64	Q-One V2.0		Q1, QX	adWORDPROCESSOR	stringssr
SAMNA_Word_IV_Fmt	77	65	SAMNA Word		SAM	adWORDPROCESSOR	stringssr
Ami_Pro_Draw_Fmt	78	66	Lotus Ami Pro Draw		SDW	adRASTERIMAGE, adVECTORGRAPHIC	kpsdwrdr
SYLK_Spreadsheet_Fmt	79	67	SYmbolic LinK (SYLK) format		SLK	adSPREADSHEET	
SmartWare_II_WP_Fmt	80	68	Informix SmartWare II word processor		DOC, SMT	adWORDPROCESSOR	swsr
Symphony_Fmt	81	69	Lotus Symphony spreadsheet		WR1	adSPREADSHEET	
Targa_Fmt	82	70	Truevision Targa image	image/x-tga	TGA	adRASTERIMAGE	kpTGArdr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
TIFF_Fmt	83	71	Tagged Image File Format (TIFF)	image/tiff	TIF, TIFF	adRASTERIMAGE, adFAXFORMAT	kptifrdr, tifsr
Targon_Word_Fmt	84	72	Targon Word		TW	adWORDPROCESSOR	stringssr
Uniplex_Ucalc_Fmt	85	73	Uniplex Ucalc		SS	adSPREADSHEET	
Uniplex_WP_Fmt	86	74	Uniplex word processor		UP	adWORDPROCESSOR	stringssr
MS_Word_UNIX_Fmt	87	75	Microsoft Word UNIX	application/msword		adWORDPROCESSOR	
WANG_PC_Fmt	88	76	WANG PC			adWORDPROCESSOR	
WordERA_Fmt	89	77	WordERA		DC, GL, FR	adWORDPROCESSOR	stringssr
WANG_WPS_Comm_ Fmt	90	78	WANG WPS		WF	adWORDPROCESSOR	stringssr
WordPerfect_Mac_Fmt	91	79	WordPerfect MAC	application/x-corel-wordperfect		adWORDPROCESSOR	wpmsr
WordPerfect_Fmt	92	86	WordPerfect version 4	application/x-corel-wordperfect	WP, WP4	adWORDPROCESSOR	stringssr
WordPerfect_VAX_Fmt	93	139	WordPerfect VAX	application/x-corel-wordperfect		adWORDPROCESSOR	
WordPerfect_Macro_Fmt	94	139	WordPerfect Macro	application/vnd.wordperfect	MRS	adWORDPROCESSOR	
WordPerfect_Dictionary_ Fmt	95	139	WordPerfect Spelling Dictionary	application/vnd.wordperfect	SPW	adWORDPROCESSOR	
WordPerfect_Thesaurus_ Fmt	96	139	WordPerfect Thesaurus	application/vnd.wordperfect		adWORDPROCESSOR	
WordPerfect_Resource_ Fmt	97	139	WordPerfect Resource File	application/vnd.wordperfect	WWK, PRS	adWORDPROCESSOR	
WordPerfect_Driver_Fmt	98	139	WordPerfect Driver	application/vnd.wordperfect	IRS, VRS	adWORDPROCESSOR	
WordPerfect_Cfg_Fmt	99	139	WordPerfect Configuration File	application/vnd.wordperfect	PFX	adWORDPROCESSOR	
WordPerfect_ Hyphenation_Fmt	100	139	WordPerfect Hyphenation Dictionary	application/vnd.wordperfect	HYC	adWORDPROCESSOR	
WordPerfect_Misc_Fmt	101	139	WordPerfect Miscellaneous File	application/vnd.wordperfect		adWORDPROCESSOR	
WordMARC_Fmt	102	82	WordMARC Composer	video/x-ms-wm	WM, PW	adWORDPROCESSOR	stringssr
Windows_Metafile_Fmt	103	83	Windows Metafile	image/wmf	WMF	adRASTERIMAGE, adVECTORGRAPHIC	kpwmfrdr
Windows_Metafile_ NoHdr_Fmt	104	83	Windows Metafile (no header)	image/wmf	WMF	adVECTORGRAPHIC	kpwmfrdr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
SmartWare_II_DB_Fmt	105	84	Informix SmartWare II database			adDATABASE	
WordPerfect_Graphics_Fmt	106	195	WordPerfect Graphics (version 2 and higher)	application/vnd.wordperfect	WPG, QPG	adRASTERIMAGE, adVECTORGRAPHIC	kpwg2rdr, kpwpgrdr
WordStar_Fmt	107	87	WordStar		WS, WSD	adWORDPROCESSOR	stringssr
WANG_WITA_Fmt	108	88	WANG WITA		WT	adWORDPROCESSOR	stringssr
Xerox_860_Comm_Fmt	109	89	Xerox 860			adWORDPROCESSOR	stringssr
Xerox_Writer_Fmt	110	91	Xerox Writer			adWORDPROCESSOR	stringssr
DIF_SpreadSheet_Fmt	111	92	Data Interchange Format (DIF)	application/dif+xml	DIF	adSPREADSHEET	difsr
Enable_Spreadsheet_Fmt	112	93	Enable Spreadsheet	application/vnd.epson.ssf	SSF	adSPREADSHEET	
SuperCalc_Fmt	113	94	Sorcim SuperCalc spreadsheet		CAL	adSPREADSHEET	
UltraCalc_Fmt	114	95	UltraCalc spreadsheet			adSPREADSHEET	
SmartWare_II_SS_Fmt	115	96	Informix SmartWare II spreadsheet			adSPREADSHEET	
SOF_Encapsulation_Fmt	116	97	Serialized Object Format (SOF)	application/java-serialized-object	SOF	adENCAPSULATION	
PowerPoint_Win_Fmt	117	98	Microsoft PowerPoint PC (up to version 4)	application/x-ms-powerpoint	PPT	adPRESENTATION	kpp40rdr
PowerPoint_Mac_Fmt	118	99	Microsoft PowerPoint MAC (up to version 4)	application/x-ms-powerpoint	PPT	adPRESENTATION	
PowerPoint_95_Fmt	119	212	Microsoft PowerPoint 95	application/x-ms-powerpoint	PPT	adPRESENTATION	kpp95rdr
PowerPoint_97_Fmt	120	272	Microsoft PowerPoint 97	application/x-ms-powerpoint	PPT	adPRESENTATION	kpp97rdr
PageMaker_Mac_Fmt	121	100	PageMaker for Macintosh			adDESKTOPPUBLSH	
PageMaker_Win_Fmt	122	101	PageMaker for Windows			adDESKTOPPUBLSH	
MS_Works_Mac_WP_Fmt	123	103	Microsoft Works Word Processor for MAC	application/x-msworks	MWK	adWORDPROCESSOR	stringssr
MS_Works_Mac_DB_Fmt	124	104	Microsoft Works Database for MAC	application/x-msworks		adDATABASE	
MS_Works_Mac_SS_Fmt	125	105	Microsoft Works Spreadsheet for MAC	application/x-msworks		adSPREADSHEET	mwssr
MS_Works_Mac_Comm_	126	106	Microsoft Works	application/x-msworks		adCOMMUNICATION	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Fmt			Communication for MAC				
MS_Works_DOS_WP_Fmt	127	107	Microsoft Works Word Processor for DOS	application/x-msworks	WPS	adWORDPROCESSOR	stringssr
MS_Works_DOS_DB_Fmt	128	108	Microsoft Works Database for DOS	application/x-msworks	WDB	adDATABASE	
MS_Works_DOS_SS_Fmt	129	109	Microsoft Works Spreadsheet for DOS	application/x-msworks		adSPREADSHEET	mwssr
MS_Works_Win_WP_Fmt	130	227	Microsoft Works Word Processor for Windows (up to 2000)	application/x-msworks	WPS, W40	adWORDPROCESSOR	msw6sr, mswsr
MS_Works_Win_DB_Fmt	131	231	Microsoft Works Database for Windows	application/x-msworks		adDATABASE	
MS_Works_Win_SS_Fmt	132	228	Microsoft Works Spreadsheet for Windows	application/x-msworks	WKS, S30, S40	adSPREADSHEET	mwssr
PC_Library_Fmt	133	111	DOS/Windows Object Library	application/x-archive	LIB, A	adLIBRARY	
MacWrite_Fmt	134	112	MacWrite	application/macwriteii		adWORDPROCESSOR	stringssr
MacWrite_II_Fmt	135	113	MacWrite II	application/macwriteii		adWORDPROCESSOR	stringssr
Freehand_Fmt	136	114	Freehand MAC	image/x-freehand		adVECTORGRAPHIC	
Disk_Doubler_Fmt	137	115	Disk Doubler			adENCAPSULATION	
HP_GL_Fmt	138	116	HP Graphics Language	vector/x-hpgl	HPGL, HPG	adVECTORGRAPHIC	
FrameMaker_Fmt	139	136	FrameMaker	application/vnd.framemaker	FM, FRM	adDESKTOPPUBLSH	
FrameMaker_Book_Fmt	140	136	FrameMaker Book	application/vnd.framemaker	BOOK	adDESKTOPPUBLSH	
Maker_Markup_Language_Fmt	141	174	Maker Markup Language	application/vnd.mif		adDESKTOPPUBLSH	
Maker_Interchange_Fmt	142	117	Adobe FrameMaker Interchange Format (MIF)	application/x-mif	MIF	adWORDPROCESSOR	mifsr
JPEG_File_Interchange_Fmt	143	118	JPEG Interchange Format	image/jpeg	JPG, JPEG	adRASTERIMAGE	jpgsr, kpjpgrdr
Reflex_Fmt	144	119	Borland Reflex database			adDATABASE	
Framework_Fmt	145	276	Framework office suite			adMIXED	
Framework_II_Fmt	146	120	Framework II office suite		FW3	adMIXED	
Paradox_Fmt	147	121	Borland Paradox database		DB	adDATABASE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MS_Windows_Write_Fmt	148	123	Microsoft Windows Write	application/x-ms-write	WRI	adWORDPROCESSOR	mwsr
Quattro_Pro_DOS_Fmt	149	124	Corel Quattro Pro for DOS	application/x-quattropro	WQ1	adSPREADSHEET	
Quattro_Pro_Win_Fmt	150	184	Corel Quattro Pro for Windows	application/x-quattro-win	WB1, WB2, WB3	adSPREADSHEET	qpssr
Persuasion_Fmt	151	126	Adobe Persuasion			adPRESENTATION	
Windows_Icon_Fmt	152	128	Windows Icon Format	image/vnd.microsoft.icoN	ICO	adRASTERIMAGE	kpicordr
Windows_Cursor_Fmt	153	133	Windows Cursor	image/x-win-bitmap	CUR	adRASTERIMAGE	
MS_Project_Activity_Fmt	154	129	Microsoft Project (up to version 3) activity file			adSCHEDULE	
MS_Project_Resource_Fmt	155	129	Microsoft Project (up to version 3) resource file			adSCHEDULE	
MS_Project_Calc_Fmt	156	129	Microsoft Project (up to version 3) calc file			adSCHEDULE	
PKZIP_Fmt	157	132	ZIP Archive	application/zip	ZIP, ZIPX	adENCAPSULATION, adEXECUTABLE	unzip
Quark_Xpress_Fmt	158	134	Quark Xpress MAC			adDESKTOPPUBLSH	
ARC_PAK_Archive_Fmt	159	135	PAK/ARC Archive		ARC, PAK	adENCAPSULATION	
MS_Publisher_Fmt	160	137	Microsoft Publisher (up to version 3)	application/x-mspublisher	PUB	adDESKTOPPUBLSH	mspubsr
PlanPerfect_Fmt	161	138	PlanPerfect			adSCHEDULE	
WordPerfect_Auxiliary_Fmt	162	139	Corel WordPerfect auxiliary file		WPW	adMISC, adENCAPSULATION	
MS_WAVE_Audio_Fmt	163	141	Microsoft Wave audio	audio/wav	WAV	adSOUND	MCI, riffsr
MIDI_Audio_Fmt	164	142	MIDI audio	audio/mid	MID, MIDI	adSOUND	MCI
AutoCAD_DXF_Binary_Fmt	165	143	Autodesk AutoCAD DXF binary format	image/x-dxf	DXF	adVECTORGRAPHIC	kpDXFrdr, kpODArdr
AutoCAD_DXF_Text_Fmt	166	143	Autodesk AutoCAD DXF text format	image/x-dxf	DXF	adVECTORGRAPHIC	kpDXFrdr, kpODArdr
dBase_Fmt	167	144	dBase Database III+/IV	application/x-dbf	DBF, VCX	adDATABASE	dbfsr
OS_2_PM_Metafile_Fmt	168	145	OS/2 PM Metafile		MET	adVECTORGRAPHIC	
Lasergraphics_Language_Fmt	169	146	Lasergraphics Language			adVECTORGRAPHIC	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
AutoShade_Rendering_Fmt	170	147	AutoShade Rendering			adVECTORGRAPHIC	
GEM_VDI_Fmt	171	148	GEM VDI Metafile image		GEM, GDI	adVECTORGRAPHIC	
Windows_Help_Fmt	172	149	Windows Help File	application/winhlp	HLP	adMISC	
Volkswriter_Fmt	173	150	Volkswriter word processor		VW4	adWORDPROCESSOR	stringssr
Ability_WP_Fmt	174	151	Ability Word Processor			adWORDPROCESSOR	
Ability_DB_Fmt	175	151	Ability Database			adDATABASE	
Ability_SS_Fmt	176	151	Ability Spreadsheet			adSPREADSHEET	
Ability_Comm_Fmt	177	151	Ability Presentation			adCOMMUNICATION	
Ability_Image_Fmt	178	151	Ability Image			adRASTERIMAGE	
XyWrite_Fmt	179	152	XYWrite / Nota Bene		XY4	adWORDPROCESSOR	xywsr
CSV_Fmt	180	153	CSV (Comma Separated Values)	text/csv	CSV	adSPREADSHEET	csvsr
IBM_Writing_Assistant_Fmt	181	154	IBM Writing Assistant		IWA	adWORDPROCESSOR	stringssr
WordStar_2000_Fmt	182	155	WordStar 2000		WS2	adWORDPROCESSOR	stringssr
HP_PCL_Fmt	183	157	HP Printer Control Language	application/pcl	PCL	adVECTORGRAPHIC	
UNIX_Exe_PreSysV_VAX_Fmt	184	158	UNIX executable (PDP-11/pre-System V VAX)	application/octet-stream		adEXECUTABLE	
UNIX_Exe_Basic_16_Fmt	185	158	UNIX executable (Basic-16)	application/octet-stream		adEXECUTABLE	
UNIX_Exe_x86_Fmt	186	158	UNIX executable (x86)	application/octet-stream		adEXECUTABLE	
UNIX_Exe_iAPX_286_Fmt	187	158	UNIX executable (iAPX 286)	application/octet-stream		adEXECUTABLE	
UNIX_Exe_MC68k_Fmt	188	158	UNIX executable (MC680x0)	application/octet-stream		adEXECUTABLE	
UNIX_Exe_3B20_Fmt	189	158	UNIX executable (3B20)	application/octet-stream		adEXECUTABLE	
UNIX_Exe_WE32000_Fmt	190	158	UNIX executable (WE32000)	application/octet-stream		adEXECUTABLE	
UNIX_Exe_VAX_Fmt	191	158	UNIX executable (VAX)	application/octet-stream		adEXECUTABLE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
UNIX_Exe_Bell_5_Fmt	192	158	UNIX executable (Bell 5.0)	application/octet-stream		adEXECUTABLE	
UNIX_Obj_VAX_ Demand_Fmt	193	159	UNIX object module (VAX Demand)			adOBJECTMODULE	
UNIX_Obj_MS8086_Fmt	194	159	UNIX object module (old MS 8086)			adOBJECTMODULE	
UNIX_Obj_Z8000_Fmt	195	159	UNIX object module (Z8000)			adOBJECTMODULE	
AU_Audio_Fmt	196	161	NeXT/Sun Audio Data	audio/basic	AU, SND	adSOUND	MCI
NeWS_Font_Fmt	197	162	NeWS bitmap font			adFONT	
cpio_Archive_CRChdr_ Fmt	198	163	cpio archive (CRC Header)	application/x-cpio		adENCAPSULATION	
cpio_Archive_CHRhdr_ Fmt	199	163	cpio archive (CHR Header)	application/x-cpio		adENCAPSULATION	
PEX_Binary_Archive_Fmt	200	164	SUN PEX Binary Archive			adENCAPSULATION	
Sun_vfont_Fmt	201	165	SUN vfont Definition			adFONT	
Curses_Screen_Fmt	202	166	Curses Screen Image			adRASTERIMAGE	
UUEncoded_Fmt	203	167	UU-encoded text	text/x-uuencode	UUE	adENCAPSULATION	uudsr
WriteNow_Fmt	204	168	WriteNow MAC			adWORDPROCESSOR	stringssr
PC_Obj_Fmt	205	169	DOS/Windows Object Module	application/octet-stream	OBJ	adOBJECTMODULE	
Windows_Group_Fmt	206	170	Windows Group			adMISC	
TrueType_Font_Fmt	207	171	TrueType Font	application/x-font-ttf	TTF	adFONT	
Windows_PIF_Fmt	208	172	Program Information File (PIF)	application/octet-stream	PIF	adMISC	
MS_COM_Executable_ Fmt	209	173	PC (.COM)	application/octet-stream	COM	adEXECUTABLE	
StuffIt_Fmt	210	175	StuffIt (MAC)	application/x-stuffit	HQX	adENCAPSULATION	
PeachCalc_Fmt	211	176	PeachCalc		CAL	adSPREADSHEET	
Wang_GDL_Fmt	212	177	WANG Office GDL Header			adENCAPSULATION	
Q_A_DOS_Fmt	213	179	Q & A for DOS			adWORDPROCESSOR	stringssr
Q_A_Win_Fmt	214	180	Q & A for Windows		JW	adWORDPROCESSOR	stringssr
WPS_PLUS_Fmt	215	181	WPS-PLUS	application/vnd.ms-wpl	WPL	adWORDPROCESSOR	stringssr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
DCX_Fmt	216	182	DCX FAX Format(PCX images)	image/dcx	DCX	adFAXFORMAT	kpdcxrdr
OLE_Fmt	217	183	OLE Compound Document		OLE	adENCAPSULATION	olesr
EBCDIC_Fmt	218	186	EBCDIC Text			adWORDPROCESSOR	
DCS_Fmt	219	187	DCS			adWORDPROCESSOR	
UNIX_SHAR_Fmt	220	190	SHAR shell archive format	application/x-shar	SHAR	adENCAPSULATION	
Lotus_Notes_BitMap_Fmt	221	191	Lotus Notes Bitmap			adRASTERIMAGE	
Lotus_Notes_CDF_Fmt	222	193	Lotus Notes CDF	application/cdf	CDF	adWORDPROCESSOR	stringssr
Compress_Fmt	223	192	UNIX Compress archive	application/x-compress	Z	adENCAPSULATION	kvzee, kvzeesr
GZ_Compress_Fmt	224	198	GZ Compress archive	application/gzip	GZ	adENCAPSULATION	kvgz, kvgzsr
TAR_Fmt	225	194	TAR (tape archive)	application/tar	TAR	adENCAPSULATION	tarsr
ODIF_FOD26_Fmt	226	196	Open Document Architecture (ODA / ODIF) FOD26	application/oda	F26	adWORDPROCESSOR	
ODIF_FOD36_Fmt	227	196	Open Document Architecture (ODA / ODIF) FOD36	application/oda	F36	adWORDPROCESSOR	
ALIS_Fmt	228	197	ALIS			adWORDPROCESSOR	
Envoy_Fmt	229	199	WordPerfect Envoy	application/envoy	EVY	adWORDPROCESSOR	
PDF_Fmt	230	200	Adobe PDF (Portable Document Format)	application/pdf	PDF	adWORDPROCESSOR	kppdf2rdr, kppdfrdr, pdf2sr, pdfsr
BinHex_Fmt	231	206	BinHex	application/mac-binhex40	HQX	adENCAPSULATION	kvhqxsr
SMTP_Fmt	232	207	SMTP (Text Mail / Outlook Express)	message/rfc822	SMTP	adENCAPSULATION	emlsr
MIME_Fmt	233	208	MIME (EML / MBX email)[1]	message/rfc822	EML, MBX	adENCAPSULATION	mbxsr
USENET_Fmt	234	264	USENET	message/news		adWORDPROCESSOR	
SGML_Fmt	235	209	SGML	text/sgml	SGML	adWORDPROCESSOR	afsr
HTML_Fmt	236	210	HTML	text/html	HTM, HTML	adWORDPROCESSOR	htmsr
ACT_Fmt	237	211	ACT! CRM software		ACT	adWORDPROCESSOR	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
PNG_Fmt	238	213	Portable Network Graphics (PNG)	image/png	PNG	adRASTERIMAGE	kppngrdr, pngsr
MS_Video_Fmt	239	214	Video for Windows (AVI)	video/avi	AVI	adMOVIE	MCI
Windows_Animated_ Cursor_Fmt	240	215	Windows Animated Cursor		ANI	adRASTERIMAGE	kpanirdr
Windows_CPP_Obj_ Storage_Fmt	241	216	Windows C++ Object Storage			adMIXED	
Windows_Palette_Fmt	242	217	Windows Palette		PAL	adRASTERIMAGE	
RIFF_DIB_Fmt	243	218	RIFF Device Independent Bitmap			adRASTERIMAGE	
RIFF_MIDI_Fmt	244	219	RIFF MIDI	audio/midi	RMI	adSOUND	
RIFF_Multimedia_Movie_ Fmt	245	220	RIFF Multimedia Movie		MMM	adMOVIE	
MPEG_Fmt	246	221	MPEG Movie	video/mpeg		adMOVIE	
QuickTime_Fmt	247	222	QuickTime Movie, MPEG-4 audio	video/quicktime	MOV, QT, MP4	adMOVIE	MCI, mpeg4sr
AIFF_Fmt	248	223	Audio Interchange File Format (AIFF)	audio/aiff	AIF, AIFF, AIFC	adSOUND	MCI, aiffsr
Amiga_MOD_Fmt	249	224	Amiga MOD		MOD	adSOUND	
Amiga_IFF_8SVX_Fmt	250	225	Amiga IFF (8SVX) Sound	audio/x-8svx	IFF	adSOUND	
Creative_Voice_Audio_ Fmt	251	226	Creative Voice (VOC)		VOC	adSOUND	
AutoDesk_Animator_FLI_ Fmt	252	229	AutoDesk Animator FLIC	video/x-fli	FLI	adANIMATION	
AutoDesk_AnimatorPro_ FLC_Fmt	253	230	AutoDesk Animator Pro FLIC	video/x-flc	FLC	adANIMATION	
Compactor_Archive_Fmt	254	233	Compactor / Compact Pro	application/mac-compactpro		adENCAPSULATION	
VRML_Fmt	255	234	VRML	model/vrml	WRL	adVECTORGRAPHIC	
QuickDraw_3D_Metafile_ Fmt	256	235	QuickDraw 3D Metafile			adVECTORGRAPHIC	
PGP_Secret_Keyring_ Fmt	257	236	PGP Secret Keyring	application/pgp		adENCAPSULATION	
PGP_Public_Keyring_Fmt	258	237	PGP Public Keyring	application/pgp		adENCAPSULATION	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
PGP_Encrypted_Data_Fmt	259	238	PGP Encrypted Data	application/pgp		adENCAPSULATION	
PGP_Signed_Data_Fmt	260	239	PGP Signed Data	application/pgp		adENCAPSULATION	
PGP_SignedEncrypted_Data_Fmt	261	240	PGP Signed and Encrypted Data	application/pgp		adENCAPSULATION	
PGP_Sign_Certificate_Fmt	262	241	PGP Signature Certificate	application/pgp-signature	SIG	adENCAPSULATION	
PGP_Compressed_Data_Fmt	263	246	PGP Compressed Data	application/pgp		adENCAPSULATION	
PGP_ASCII_Public_Keyring_Fmt	264	242	ASCII-armored PGP Public Keyring	application/pgp	PGP	adENCAPSULATION	
PGP_ASCII_Encoded_Fmt	265	243	ASCII-armored PGP encoded	application/pgp		adENCAPSULATION	
PGP_ASCII_Signed_Fmt	266	244	ASCII-armored PGP signed	application/pgp		adENCAPSULATION	
OLE_DIB_Fmt	267	245	OLE DIB object			adRASTERIMAGE	
SGI_Image_Fmt	268	247	SGI RGB Image	image/sgi	RGB	adRASTERIMAGE	kpsgirdr
Lotus_ScreenCam_Fmt	269	248	Lotus ScreenCam	application/vnd.lotus-screencam	SCM	adANIMATION	
MPEG_Audio_Fmt	270	249	MPEG-1 Audio layer3 (MP3)	audio/mpeg	MPEGA, MPG, MP3	adSOUND	MCI, mp3sr
FTP_Software_Session_Fmt	271	250	FTP Session Data		STE	adCOMMUNICATION	
Netscape_Bookmark_File_Fmt	272	210	Netscape Bookmark File	text/html		adWORDPROCESSOR	htmsr
Corel_Draw_CMX_Fmt	273	252	Corel CMX	application/cmx	CMX	adVECTORGRAPHIC	
AutoDesk_DWG_Fmt	274	253	AutoDesk AutoCAD Drawing (DWG)	image/x-dwg	DWG	adVECTORGRAPHIC	kpDWGrdr, kpODArdr
AutoDesk_WHIP_Fmt	275	254	AutoDesk WHIP		WHP	adVECTORGRAPHIC	
Macromedia_Director_Fmt	276	255	Macromedia Shockwave/Adobe Director	application/x-director	DCR, DXR, DIR	adANIMATION	
Real_Audio_Fmt	277	256	Real Audio	audio/x-pn-realaudio	RM, RA	adSOUND	
MSDOS_Device_Driver_Fmt	278	257	MSDOS Device Driver	application/octet-stream	SYS	adEXECUTABLE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Micrografx_Designer_ Fmt	279	258	Micrografx Designer		DSF	adVECTORGRAPHIC	
SVF_Fmt	280	259	Simple Vector Format (SVF)	image/x-svf	SVF	adVECTORGRAPHIC	
Applix_Words_Fmt	281	261	Applix Words	application/x-applix-word	AW	adWORDPROCESSOR	awsr
Applix_Graphics_Fmt	282	262	Applix Graphics		AG	adPRESENTATION	kpagrdr
MS_Access_Fmt	283	263	Microsoft Access (versions 1 and 2)	application/x-msaccess	MDB	adDATABASE	mdbsr
MS_Access_95_Fmt	284	263	Microsoft Access 95	application/msaccess	MDB	adDATABASE	mdbsr
MS_Access_97_Fmt	285	263	Microsoft Access 97	application/msaccess	MDB	adDATABASE	mdbsr
MacBinary_Fmt	286	265	MacBinary	application/x-macbinary	BIN	adENCAPSULATION	macbinsr
Apple_Single_Fmt	287	266	Apple Single			adENCAPSULATION	
Apple_Double_Fmt	288	267	Apple Double	multipart/appledouble	AD	adENCAPSULATION	
Enhanced_Metafile_Fmt	289	270	Enhanced Metafile	image/x-emf	EMF	adVECTORGRAPHIC	kpemfrdr
MS_Office_Drawing_Fmt	290	271	Microsoft Office Drawing			adVECTORGRAPHIC	kpmsordr
XML_Fmt	291	285	XML	text/xml	XML	adWORDPROCESSOR	xmlsr
DeVice_Independent_ Fmt	292	274	DeVice Independent file (DVI)	application/x-dvi	DVI	adVECTORGRAPHIC	
Unicode_Fmt	293	275	Unicode text file	text/plain	UNI	adWORDPROCESSOR	unisr
Lotus_123_Worksheet_ Fmt	294	81	Lotus 1-2-3	application/x-lotus-123	WKS, WK1, WK3, WK4	adSPREADSHEET	wkssr
Lotus_123_Format_Fmt	295	81	Lotus 1-2-3 Formatting	application/x-123	FM3	adSPREADSHEET	l123sr
Lotus_123_97_Fmt	296	81	Lotus 1-2-3 97	application/x-lotus-123	123	adSPREADSHEET	l123sr
Lotus_Word_Pro_96_Fmt	297	268	Lotus Word Pro 96	application/vnd.lotus-wordpro	LWP, MWP	adWORDPROCESSOR	lwpsr
Lotus_Word_Pro_97_Fmt	298	268	Lotus Word Pro 97	application/vnd.lotus-wordpro	LWP, MWP	adWORDPROCESSOR	lwpsr
Freelance_DOS_Fmt	299	140	Lotus Freelance for DOS	application/x-freelance	PRZ	adPRESENTATION	kpprzrdr
Freelance_Win_Fmt	300	140	Lotus Freelance for Windows	application/x-freelance	PRE, FLW	adPRESENTATION	kpprerdr
Freelance_OS2_Fmt	301	140	Lotus Freelance for OS/2	application/x-freelance	PRS	adPRESENTATION	kpprerdr
Freelance_96_Fmt	302	140	Lotus Freelance 96	application/x-freelance	PRZ	adPRESENTATION	kpprzrdr
Freelance_97_Fmt	303	140	Lotus Freelance 97	application/x-freelance	PRZ	adPRESENTATION	kpprzrdr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MS_Word_95_Fmt	304	189	Microsoft Word 95	application/msword	DOC	adWORDPROCESSOR	mw6sr
MS_Word_97_Fmt	305	269	Microsoft Word 97	application/msword	DOC, WPS, WBK	adWORDPROCESSOR	mw8sr
Excel_Fmt	306	90	Microsoft Excel (up to version 5)	application/x-ms-excel	XLS	adSPREADSHEET	xlssr
Excel_Chart_Fmt	307	90	Microsoft Excel (up to version 5) chart	application/x-ms-excel	XLC	adSPREADSHEET	xlssr
Excel_Macro_Fmt	308	90	Microsoft Excel (up to version 5) macro	application/vnd.ms-excel	XLM	adSPREADSHEET	xlssr
Excel_95_Fmt	309	188	Microsoft Excel 95	application/x-ms-excel	XLS	adSPREADSHEET	xlssr
Excel_97_Fmt	310	188	Microsoft Excel 97	application/x-ms-excel	XLS, XLR	adSPREADSHEET	xlssr
Corel_Presentations_Fmt	311	127	Corel Presentations	application/x-corelpresentations	XFD, XFDL	adPRESENTATION	kpshwrdr
Harvard_Graphics_Fmt	312	131	Harvard Graphics		PR4	adPRESENTATION	
Harvard_Graphics_ Chart_Fmt	313	131	Harvard Graphics Chart		CH3, CHT	adVECTORGRAPHIC	
Harvard_Graphics_ Symbol_Fmt	314	131	Harvard Graphics Symbol File		SY3	adVECTORGRAPHIC	
Harvard_Graphics_Cfg_ Fmt	315	131	Harvard Graphics Configuration File			adVECTORGRAPHIC	
Harvard_Graphics_ Palette_Fmt	316	131	Harvard Graphics Palette			adVECTORGRAPHIC	
Lotus_123_R9_Fmt	317	81	Lotus 1-2-3 Release 9	application/x-lotus-123	123	adSPREADSHEET	l123sr
Applix_Spreadsheets_ Fmt	318	278	Applix Spreadsheets	application/x-applix-spreadsheet	AS	adSPREADSHEET	assr
MS_Pocket_Word_Fmt	319	45	Microsoft Pocket Word		PWD	adWORDPROCESSOR	rtfsr
MS_DIB_Fmt	320	279	Microsoft Device Independent Bitmap	image/bmp	DIB	adRASTERIMAGE	
MS_Word_2000_Fmt	321	269	Microsoft Word 2000	application/msword	DOC	adWORDPROCESSOR	mw8sr
Excel_2000_Fmt	322	188	Microsoft Excel 2000	application/x-ms-excel	XLS	adSPREADSHEET	xlssr
PowerPoint_2000_Fmt	323	272	Microsoft PowerPoint 2000	application/x-ms-powerpoint	PPT	adPRESENTATION	kpp97rdr
MS_Access_2000_Fmt	324	263	Microsoft Access 2000	application/x-msaccess	MDB	adDATABASE	mdbsr
MS_Project_4_Fmt	325	281	Microsoft Project 4		MPP	adSCHEDULE	mppsr
MS_Project_41_Fmt	326	281	Microsoft Project 4.1		MPP	adSCHEDULE	mppsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MS_Project_98_Fmt	327	281	Microsoft Project 98	application/vnd.ms-project	MPP	adSCHEDULE	mppsr
Folio_Flat_Fmt	328	282	Folio Flat File		FFF	adWORDPROCESSOR	foliosr
HWP_Fmt	329	283	Haansoft Hangul HWP (Arae-Ah Hangul)	application/x-hwp	HWP	adWORDPROCESSOR	hwposr, hwpsr
ICHITARO_Fmt	330	284	ICHITARO (v4-10)		JTD	adWORDPROCESSOR	jtdsr
IS_XML_Fmt	331	273	Extended or Custom XML	text/xml	XML	adWORDPROCESSOR	
Oasys_Fmt	332	286	Fujitsu OASYS	application/vnd.fujitsu.oasys	OAS, OA2, OA3	adWORDPROCESSOR	oa2sr
PBM_ASC_Fmt	333	287	Portable Bitmap Utilities ASCII format (PBM)	image/pbm	PBM	adRASTERIMAGE	
PBM_BIN_Fmt	334	287	Portable Bitmap Utilities BINARY format (PBM)	image/pbm	PBM	adRASTERIMAGE	
PGM_ASC_Fmt	335	288	Portable Greymap Utilities ASCII format (PGM)	image/x-pgm	PGM	adRASTERIMAGE	
PGM_BIN_Fmt	336	288	Portable Greymap Utilities BINARY format (PGM)	image/x-pgm	PGM	adRASTERIMAGE	
PPM_ASC_Fmt	337	289	Portable Pixmap Utilities ASCII format (PPM)	image/x-portable-pixmap	PPM	adRASTERIMAGE	
PPM_BIN_Fmt	338	289	Portable Pixmap Utilities BINARY format (PPM)	image/x-portable-pixmap	PPM	adRASTERIMAGE	
XBM_Fmt	339	290	X Bitmap format (XBM)	image/x-xbitmap	XBM	adRASTERIMAGE	
XPM_Fmt	340	291	X Pixmap format (XPM)	image/xpm	XPM	adRASTERIMAGE	
FPX_Fmt	341	292	Kodak FlashPix FPX Image format	image/fpx	FPX	adRASTERIMAGE	
PCD_Fmt	342	293	PCD Image format	image/pcd	PCD	adRASTERIMAGE	
MS_Visio_Fmt	343	294	Microsoft Visio (up to version 11)	image/x-vsd	VSD	adPRESENTATION	kpVSD2rdr, vsdsr
MS_Project_2000_Fmt	344	281	Microsoft Project 2000	application/vnd.ms-project	MPP	adSCHEDULE	mppsr
MS_Outlook_Fmt	345	295	Microsoft Outlook message	application/vnd.ms-outlook	MSG, OFT	adENCAPSULATION	msgsr
ELF_Relocatable_Fmt	346	159	ELF Relocatable	application/octet-stream	O	adOBJECTMODULE	
ELF_Executable_Fmt	347	158	ELF Executable	application/octet-stream		adEXECUTABLE	
ELF_Dynamic_Lib_Fmt	348	160	ELF Dynamic Library	application/octet-stream	SO	adLIBRARY	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MS_Word_XML_Fmt	349	285	Microsoft Word 2003 XML	text/xml	XML	adWORDPROCESSOR	xmlsr
MS_Excel_XML_Fmt	350	285	Microsoft Excel 2003 XML	text/xml	XML	adWORDPROCESSOR	xmlsr
MS_Visio_XML_Fmt	351	285	Microsoft Visio 2003 XML	text/xml	VDX	adWORDPROCESSOR	xmlsr
SO_Text_XML_Fmt	352	314	OpenDocument format (OpenOffice 1/StarOffice 6,7) Text XML	application/vnd.sun.xml.writer	SXW	adWORDPROCESSOR	odfwpsr
SO_Spreadsheet_XML_Fmt	353	315	OpenDocument format (OpenOffice 1/StarOffice 6,7) Spreadsheet XML	application/vnd.sun.xml.calc	SXC, STC	adSPREADSHEET	sosr
SO_Presentation_XML_Fmt	354	316	OpenDocument format (OpenOffice 1/StarOffice 6,7) Presentation XML	application/vnd.sun.xml.impress	SXD, SXI	adPRESENTATION	kpodfrdr
XHTML_Fmt	355	296	XHTML	text/xhtml	XML, XHTML, XHT	adWORDPROCESSOR	
MS_OutlookPST_Fmt	356	297	Microsoft Outlook Personal Folders File (.pst)	application/vnd.ms-outlook-pst	PST	adENCAPSULATION	pstnsr, pstsr, pstxsr
RAR_Fmt	357	298	RAR archive format	application/x-rar-compressed	RAR, REV, R00, R01	adENCAPSULATION, adEXECUTABLE	rarsr
Lotus_Notes_NSF_Fmt	358	299	IBM Lotus Notes Database NSF/NTF	application/x-lotus-notes	NSF	adENCAPSULATION	nsfsr
Macromedia_Flash_Fmt	359	300	Macromedia Flash (.swf)	application/x-shockwave-flash	SWF, SWD	adWORDPROCESSOR	swfsr
MS_Word_2007_Fmt	360	301	Microsoft Word 2007 XML - Docx	application/x-ms-word07	DOCX, DOTX	adWORDPROCESSOR	mwxsr
MS_Excel_2007_Fmt	361	302	Microsoft Excel 2007 XML	application/x-ms-excel07	XLSX, XLTX	adSPREADSHEET	xlsxsr
MS_PPT_2007_Fmt	362	303	Microsoft PowerPoint 2007 XML	application/x-ms-powerpoint07	PPTX, POTX, PPSX	adPRESENTATION	kpppxrdr
OpenPGP_Fmt	363	304	OpenPGP Message Format (with new packet format)	application/pgp-encrypted	PGP	adENCAPSULATION	
Intergraph_V7_DGN_Fmt	364	305	Intergraph Standard File Format (ISFF) V7 DGN (non-OLE)		DGN	adVECTORGRAPHIC	
MicroStation_V8_DGN_Fmt	365	306	MicroStation V8 DGN (OLE)		DGN	adVECTORGRAPHIC	
MS_Word_Macro_2007_Fmt	366	307	Microsoft Word Macro 2007 XML	application/x-ms-word07m	DOCM, DOTM	adWORDPROCESSOR	mwxsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MS_Excel_Macro_2007_Fmt	367	308	Microsoft Excel Macro 2007 XML	application/x-ms-excel07m	XLSM, XLTM, XLAM	adSPREADSHEET	xlsxsr
MS_PPT_Macro_2007_Fmt	368	309	Microsoft PPT Macro 2007 XML	application/x-ms-powerpoint07m	PPTM, POTM, PPSM, PPAM	adPRESENTATION	kpppxrdr
LZH_Fmt	369	310	LZH Archive	application/x-lzh-compressed	LZH, LHA	adENCAPSULATION	lzhsr
Office_2007_Fmt	370	311	Office 2007 document		XLSB	adMISC	
MS_XPS_Fmt	371	312	Microsoft Open XML Paper Specification (XPS/OXPS)	application/vnd.ms-xpsdocument	XPS, OXPS	adWORDPROCESSOR	xpssr
Lotus_Domino_DXL_Fmt	372	313	IBM Domino Data in XML format (.dxl)	text/xml	DXL	adENCAPSULATION	dxlsr
ODF_Text_Fmt	373	314	ODF Text	application/vnd.oasis.opendocument.text	ODT	adWORDPROCESSOR	odfwpsr
ODF_Spreadsheet_Fmt	374	315	ODF Spreadsheet	application/vnd.oasis.opendocument.spreadsheet	ODS	adSPREADSHEET	odfsssr
ODF_Presentation_Fmt	375	316	ODF Presentation	application/vnd.oasis.opendocument.presentation	ODP	adPRESENTATION	kpodfrdr
Legato_Extender_ONM_Fmt	376	317	Legato Extender Native Message ONM	application/x-lotus-notes	ONM	adENCAPSULATION	onmsr
bin_Unknown_Fmt	377	318	Bin unknown format (.xxx)			adWORDPROCESSOR	
TNEF_Fmt	378	319	Transport Neutral Encapsulation Format (TNEF)	application/vnd.ms-tnef		adENCAPSULATION	tnefsr
CADAM_Drawing_Fmt	379	320	CADAM Drawing		CDD	adVECTORGRAPHIC	
CADAM_Drawing_Overlay_Fmt	380	321	CADAM Drawing Overlay		CDO	adVECTORGRAPHIC	
NURSTOR_Drawing_Fmt	381	322	NURSTOR Drawing		NUR	adVECTORGRAPHIC	
HP_GLP_Fmt	382	323	HP Graphics Language (Plotter)	vector/x-hpgl2	HPG	adVECTORGRAPHIC	
ASF_Fmt	383	324	Advanced Systems Format (ASF)	application/x-ms-asf	ASF	adMISC	asfsr
WMA_Fmt	384	325	Windows Media Audio Format (WMA)	audio/x-ms-wma	WMA	adSOUND	asfsr
WMV_Fmt	385	326	Windows Media Video Format (WMV)	video/x-ms-wmv	WMV	adMOVIE	asfsr
EMX_Fmt	386	327	Legato EMailXtender Archives Format (EMX)		EMX	adENCAPSULATION	emxsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Z7Z_Fmt	387	328	7-Zip archive (7z)	application/7z	7Z	adENCAPSULATION, adEXECUTABLE	z7zsr
MS_Excel_Binary_2007_Fmt	388	329	Microsoft Excel Binary 2007	application/vnd.ms-excel.sheet.binary.macroenabled.12	XLSB	adSPREADSHEET	xlsbsr
CAB_Fmt	389	330	Microsoft Cabinet File (CAB)	application/vnd.ms-cab-compressed	CAB	adENCAPSULATION	cabsr
CATIA_Fmt	390	331	CATIA Formats (CAT*)		CATPART, CATPRODUCT[2]	adVECTORGRAPHIC	kpCATrdr
YIM_Fmt	391	332	Yahoo! Instant Messenger History		DAT	adWORDPROCESSOR	yimsr
ODF_Drawing_Fmt	392	316	ODF Drawing/Graphics	application/vnd.oasis.opendocument.graphics	ODG	adVECTORGRAPHIC	kpodfrdr
Founder_CEB_Fmt	393	333	Founder Chinese E-paper Basic (ceb)	application/ceb	CEB	adWORDPROCESSOR	cebsr
QPW_Fmt	394	334	Corel Quattro Pro 9+ for Windows	application/quattro-pro	QPW	adSPREADSHEET	qpwsr
MHT_Fmt	395	335	MIME HTML MHTML format (MHT)[1]	multipart/related	MHT, MHTML	adWORDPROCESSOR	mhtsr
MDI_Fmt	396	336	Microsoft Document Imaging Format	image/vnd.ms-modi	MDI	adRASTERIMAGE	
GRV_Fmt	397	337	Microsoft Office Groove Format	application/vnd.groove-injector	GRV	adWORDPROCESSOR	
IWWP_Fmt	398	338	Apple iWork Pages format	application/vnd.apple.pages	PAGES	adWORDPROCESSOR	iwwpsr
IWSS_Fmt	399	339	Apple iWork Numbers format	application/vnd.apple.numbers	NUMBERS	adSPREADSHEET	iwsssr
IWPG_Fmt	400	340	Apple iWork Keynote format	application/vnd.apple.keynote	KEY	adPRESENTATION	kpIWPGrdr
BKF_Fmt	401	341	Microsoft Windows Backup File		BKF	adENCAPSULATION	bkfsr
MS_Access_2007_Fmt	402	342	Microsoft Access 2007	application/msaccess	ACCDB	adDATABASE	mdbsr
ENT_Fmt	403	343	Microsoft Entourage Database Format			adENCAPSULATION	entsr
DMG_Fmt	404	344	Mac Disk Copy Disk Image File	application/x-apple-diskimage	DMG	adENCAPSULATION	dmgsr
CWK_Fmt	405	345	AppleWorks (Claris Works) File	application/appleworks	CWK	adWORDPROCESSOR	stringssr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
OO3_Fmt	406	346	Omni Outliner V3 File		OO3	adWORDPROCESSOR	oo3sr
OPML_Fmt	407	347	Omni Outliner OPML File		OPML	adWORDPROCESSOR	oo3sr
Omni_Graffle_XML_Fmt	408	348	Omni Graffle XML File		GRAFFLE	adVECTORGRAPHIC	kpGFLrdr
PSD_Fmt	409	349	Adobe Photoshop Document	image/vnd.adobe.photoshop	PSD, PSB	adRASTERIMAGE	psdsr
Apple_Binary_PList_Fmt	410	350	Apple Binary Property List format		PLIST	adMISC	
Apple_iChat_Fmt	411	351	Apple iChat format		ICHAT	adWORDPROCESSOR	ichatsr
OOUTLINE_Fmt	412	352	OOutliner File		OOUTLINE	adWORDPROCESSOR	oo3sr
BZIP2_Fmt	413	353	Bzip 2 Compressed File	application/x-bzip2	BZ2	adENCAPSULATION	bzip2sr
ISO_Fmt	414	354	ISO-9660 CD Disc Image Format	application/x-iso9660-image	ISO	adENCAPSULATION	isosr
DocuWorks_Fmt	415	355	DocuWorks Format	application/vnd.fujixerox.docuworks	XDW	adWORDPROCESSOR	
RealMedia_Fmt	416	356	RealMedia Streaming Media	application/vnd.rn-realmedia	RM, RA	adMOVIE	
AC3Audio_Fmt	417	357	AC3 Audio File Format	audio/ac3	AC3	adSOUND	
NEF_Fmt	418	358	Nero Encrypted File		NEF	adENCAPSULATION	
SolidWorks_Fmt	419	359	SolidWorks Format Files		SLDASM, SLDPRT, SLDDRW, SLDDRT	adVECTORGRAPHIC	
XFDL_Fmt	420	366	Extensible Forms Description Language	application/x-xfdl	XFDL, XFD	adPRESENTATION	kpXFDLrdr
Apple_XML_PList_Fmt	421	367	Apple XML Property List format		PLIST	adMISC	
OneNote_Fmt	422	368	Microsoft OneNote Note Format	application/onenote	ONE	adWORDPROCESSOR	kpONErdr
IFilter_Fmt	423	369	iFilter			adWORDPROCESSOR	
Dicom_Fmt	424	370	Digital Imaging and Communications in Medicine (Dicom)	application/dicom	DCM	adRASTERIMAGE	dcmsr
EnCase_Fmt	425	371	Expert Witness Compression Format (EnCase)		E01, L01, Lx01	adENCAPSULATION	encase2sr, encasesr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Scrap_Fmt	426	372	Shell Scrap Object File		SHS	adENCAPSULATION	olesr
MS_Project_2007_Fmt	427	373	Microsoft Project 2007	application/vnd.ms-project	MPP	adSCHEDULE	mppsr
MS_Publisher_98_Fmt	428	374	Microsoft Publisher from version 98	application/x-mspublisher	PUB	adDESKTOPPUBLSH	mspubsr
Skype_Fmt	429	375	Skype Log File		DBB	adWORDPROCESSOR	skypesr
HI7_Fmt	430	377	Health level7 message		HL7	adWORDPROCESSOR	hl7sr
MS_OutlookOST_Fmt	431	378	Microsoft Outlook Offline Folders File (OST)	application/vnd.ms-outlook-pst	OST	adENCAPSULATION	pffsr
Epub_Fmt	432	379	Open Publication Structure electronic publication	application/epub+zip	EPUB	adWORDPROCESSOR	epubsr
MS_OEDBX_Fmt	433	380	Microsoft Outlook Express DBX Message Database		DBX	adENCAPSULATION	dbxsr
BB_Activ_Fmt	434	381	BlackBerry Activation File		DAT	adWORDPROCESSOR	
DiskImage_Fmt	435	382	Disk Image		DMG	adENCAPSULATION	
Milestone_Fmt	436	383	Milestone Document		MLS, ML3, ML4, ML5, ML6, ML7, ML8, ML9, MLA	adRASTERIMAGE	
E_Transcript_Fmt	437	384	RealLegal E-Transcript File		PTX	adWORDPROCESSOR	
PostScript_Font_Fmt	438	385	PostScript Type 1 Font	application/x-font	PFB	adFONT	
Ghost_DiskImage_Fmt	439	386	Ghost Disk Image File		GHO, GHS	adENCAPSULATION	
JPEG_2000_JP2_File_Fmt	440	387	JPEG-2000 JP2 File Format Syntax (ISO/IEC 15444-1)	image/jp2	JP2, JPF, J2K, JPWL, JPX, PGX	adRASTERIMAGE	jp2000sr, kpjp2000rdr
Unicode_HTML_Fmt	441	388	Unicode HTML	text/html	HTM, HTML	adWORDPROCESSOR	unihtmsr
CHM_Fmt	442	389	Microsoft Compiled HTML Help	application/x-chm	CHM	adENCAPSULATION	chmsr
EMCMF_Fmt	443	390	Documentum EMCMF format		EMCMF	adENCAPSULATION	msgsr
MS_Access_2007_Tmpl_Fmt	444	391	Microsoft Access 2007 Template		ACCDT	adDATABASE	
Jungum_Fmt	445	392	Samsung Electronics Jungum Global document		GUL	adWORDPROCESSOR	
JBIG2_Fmt	446	393	JBIG2 File Format	image/jbig2	JB2, JBIG2	adRASTERIMAGE	kpJBIG2rdr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
EFax_Fmt	447	394	eFax file		EFX	adRASTERIMAGE	
AD1_Fmt	448	395	AD1 Evidence file		AD1	adENCAPSULATION	ad1sr
SketchUp_Fmt	449	396	Google SketchUp		SKP	adVECTORGRAPHIC	
GWFS_Email_Fmt	450	397	GroupWise FileSurf email		GWFS	adENCAPSULATION	gwfssr
JNT_Fmt	451	398	Windows Journal format		JNT	adWORDPROCESSOR	
Yahoo_yChat_Fmt	452	399	Yahoo! Messenger chat log		YCHAT	adWORDPROCESSOR	
PaperPort_MAX_File_Fmt	453	400	PaperPort MAX image file	image/max	MAX	adRASTERIMAGE	
ARJ_Fmt	454	402	ARJ (Archive by Robert Jung) file format	application/arj	ARJ	adENCAPSULATION	multiarcsr
RPMSG_Fmt	455	403	Microsoft Outlook Restricted Permission Message	application/x-microsoft-rpmsg-message	RPMSG	adENCAPSULATION	
MAT_Fmt	456	404	MATLAB file format	application/x-matlab-data	MAT, FIG	adWORDPROCESSOR	
SGY_Fmt	457	405	SEG-Y Seismic Data format		SGY, SEGY	adWORDPROCESSOR	
CDXA_MPEG_PS_Fmt	458	406	MPEG-PS container with CDXA stream	video/mpeg	MPG	adMOVIE	
EVT_Fmt	459	407	Microsoft Windows NT Event Log		EVT	adMISC	
EVTX_Fmt	460	408	Microsoft Windows Vista Event Log		EVTX	adMISC	
MS_OutlookOLM_Fmt	461	409	Microsoft Outlook for Macintosh format		OLM	adENCAPSULATION	olmsr
WARC_Fmt	462	410	Web ARChive	application/warc	WARC	adENCAPSULATION	
JAVACLASS_Fmt	463	411	Java Class format	application/x-java-class	CLASS	adWORDPROCESSOR	
VCF_Fmt	464	412	Microsoft Outlook vCard file format	text/vcard	VCF	adWORDPROCESSOR	vcfsr
EDB_Fmt	465	413	Microsoft Exchange Server Database file format		EDB	adENCAPSULATION	
ICS_Fmt	466	414	Microsoft Outlook iCalendar file format	text/calendar	ICS, VCS	adENCAPSULATION	icssr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MS_Visio_2013_Fmt	467	415	Microsoft Visio 2013	application/vnd.visio	VSDX, VSTX, VSSX	adPRESENTATION	ActiveX components, kpVSDXrdr
MS_Visio_2013_Macro_Fmt	468	415	Microsoft Visio 2013 macro	application/vnd.visio	VSDM, VSTM, VSSM	adPRESENTATION	kpVSDXrdr
ICHITARO_Compr_Fmt	469	417	ICHITARO Compressed format	application/x-js-taro	JTDC	adWORDPROCESSOR	jtdsr
IWWP13_Fmt	470	418	Apple iWork 2013 Pages format		IWA, PAGES	adWORDPROCESSOR	iwwp13sr
IWSS13_Fmt	471	419	Apple iWork 2013 Numbers format		IWA, NUMBERS	adSPREADSHEET	iwss13sr
IWPG13_Fmt	472	420	Apple iWork 2013 Keynote format		IWA, KEY	adPRESENTATION	kpIWPG13rdr, kpIWPGrdr
XZ_Fmt	473	421	XZ archive format	application/x-xz	XZ	adENCAPSULATION	multiarcsr
Sony_WAVE64_Fmt	474	422	Sony Wave64 format	audio/wav64	W64	adSOUND	
Conifer_WAVPACK_Fmt	475	423	Conifer Wavpack format	audio/x-wavpack	WV	adSOUND	
Xiph_OGG_VORBIS_Fmt	476	424	Xiph Ogg Vorbis format	audio/ogg	OGG	adSOUND	
MS_Visio_2013_Stencil_Fmt	477	415	MS Visio 2013 stencil format	application/vnd.visio	VSSX	adPRESENTATION	kpVSDXrdr
MS_Visio_2013_Stencil_Macro_Fmt	478	415	MS Visio 2013 stencil Macro format	application/vnd.visio	VSSM	adPRESENTATION	kpVSDXrdr
MS_Visio_2013_Template_Fmt	479	415	MS Visio 2013 template format	application/vnd.visio	VSTX	adPRESENTATION	kpVSDXrdr
MS_Visio_2013_Template_Macro_Fmt	480	415	MS Visio 2013 template Macro format	application/vnd.visio	VSTM	adPRESENTATION	kpVSDXrdr
Borland_Reflex_2_Fmt	481	425	Borland Reflex 2 format		R2D	adDATABASE	
PKCS_12_Fmt	482	426	PKCS #12 (p12) format	application/x-pkcs12	P12, PFX	adWORDPROCESSOR	
B1_Fmt	483	427	B1 format	application/x-b1	B1	adENCAPSULATION	b1sr
ISO_IEC_MPEG_4_Fmt	484	428	ISO/IEC MPEG-4 (ISO 14496) format	video/mp4	MP4	adMOVIE	mpeg4sr
RAR5_Fmt	485	429	RAR5 Format	application/x-rar-compressed	RAR	adENCAPSULATION	multiarcsr
Unigraphics_NX_Fmt	486	362	Unigraphics (UG) NX CAD Format		PRT	adVECTORGRAPHIC	kpUGrdr
PTC_Creo_Fmt	487	430	PTC Creo CAD Format		ASM, PRT	adVECTORGRAPHIC	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
KML_Fmt	488	431	Keyhole Markup Language	application/vnd.google-earth.kml+xml	KML	adWORDPROCESSOR	xmlsr
KMZ_Fmt	489	432	Zipped Keyhole Markup Language	application/vnd.google-earth.kmz	KMZ	adWORDPROCESSOR	unzip
WML_Fmt	490	433	Wireless Markup Language	text/vnd.wap.wml	WML	adWORDPROCESSOR	xmlsr
ODF_Formula_Fmt	491	434	ODF Formula	application/vnd.oasis.opendocument.formula	ODF	adWORDPROCESSOR	unzip
SO_Text_Fmt	492	435	Star Office 4,5 Writer Text	application/vnd.stardivision.writer	SDW, SGL, VOR	adWORDPROCESSOR	kpsdwrdr, starwsr
SO_Spreadsheet_Fmt	493	436	Star Office 4,5 Calc Spreadsheet	application/vnd.stardivision.calc	SDC	adSPREADSHEET	starcsr
SO_Presentation_Fmt	494	437	Star Office 4,5 Impress Presentation	application/vnd.stardivision.draw	SDD, SDA	adPRESENTATION	kpsddrdr
SO_Math_Fmt	495	438	Star Office 4,5 Math	application/vnd.stardivision.math	SMF	adMISC	
STEP_Fmt	496	439	ISO 10303-21 STEP format			adMISC	
STL_Fmt	497	364	3D Systems STL ASCII format			adMISC	
AppleScript_Fmt	498	440	AppleScript Source Code[3]	text/x-applescript	APPLESCRIPT	adSOURCECODE	afsr
Assembly_Fmt	499	441	Assembly Code[3]	text/x-assembly		adSOURCECODE	afsr
C_Fmt	500	442	C Source Code[3]	text/x-c	C, H	adSOURCECODE	afsr
Csharp_Fmt	501	443	C# Source Code[3]	text/x-csharp	CS	adSOURCECODE	afsr
CPlusPlus_Fmt	502	444	C++ Source Code[3]	text/x-c++	CPP, HPP	adSOURCECODE	afsr
Css_Fmt	503	445	Cascading Style Sheet[3]	text/css	CSS	adSOURCECODE	afsr
Clojure_Fmt	504	446	Clojure Source Code[3]	text/x-clojure	CLJ, CL2	adSOURCECODE	afsr
CoffeeScript_Fmt	505	447	CoffeeScript Source Code[3]	text/x-coffeescript	COFFEE, CAKE	adSOURCECODE	afsr
Lisp_Fmt	506	448	Common Lisp Source Code[3]	text/x-common-lisp	EL	adSOURCECODE	afsr
Dockerfile_Fmt	507	449	Dockerfile[3]	text/x-dockerfile		adSOURCECODE	afsr
Eiffel_Fmt	508	450	Eiffel Source Code[3]	text/x-eiffel	E	adSOURCECODE	afsr
Erlang_Fmt	509	451	Erlang Source Code[3]	text/x-erlang	ERL, ES	adSOURCECODE	afsr
Fsharp_Fmt	510	452	F# Source Code[3]	text/x-fsharp	FS	adSOURCECODE	afsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Fortran_Fmt	511	453	Fortran Source Code[3]	text/x-fortran	F	adSOURCECODE	afsr
Go_Fmt	512	454	Go Source Code[3]	text/x-go	GO	adSOURCECODE	afsr
Groovy_Fmt	513	455	Groovy Source Code[3]	text/x-groovy	GRT, GVY	adSOURCECODE	afsr
Haskell_Fmt	514	456	Haskell Source Code[3]	text/x-haskell	HS	adSOURCECODE	afsr
Ini_Fmt	515	457	Initialization (INI) file[3]	text/x-ini		adSOURCECODE	afsr
Java_Fmt	516	458	Java Source Code[3]	text/x-java-source	JAVA	adSOURCECODE	afsr
Javascript_Fmt	517	459	Javascript Source Code[3]	text/javascript	JS	adSOURCECODE	afsr
Lua_Fmt	518	460	Lua Source Code[3]	text/x-lua	LUA	adSOURCECODE	afsr
Makefile_Fmt	519	461	Makefile[3]	text/x-makefile	MAKE	adSOURCECODE	afsr
Mathematica_Fmt	520	462	Wolfram Mathematica Source Code[3]	text/x-mathematica	M	adSOURCECODE	afsr
ObjC_Fmt	521	464	Objective-C Source Code[3]	text/x-objc		adSOURCECODE	afsr
ObjCpp_Fmt	522	465	Objective-C++ Source Code[3]	text/x-objectivec++		adSOURCECODE	afsr
ObjJ_Fmt	523	466	Objective-J Source Code[3]	text/x-objectivej	J	adSOURCECODE	afsr
PHP_Fmt	524	467	PHP Source Code[3]	text/x-php	PHP	adSOURCECODE	afsr
PLSQL_Fmt	525	468	PLSQL Source Code[3]	text/x-plsql		adSOURCECODE	afsr
Pascal_Fmt	526	469	Pascal Source Code[3]	text/x-pascal	PASCAL	adSOURCECODE	afsr
Perl_Fmt	527	470	Perl Source Code[3]	text/x-perl	PL	adSOURCECODE	afsr
Powershell_Fmt	528	471	PowerShell Source Code[3]	text/x-powershell	PS1	adSOURCECODE	afsr
Prolog_Fmt	529	472	Prolog Source Code[3]	text/x-prolog	PRO, PROLOG	adSOURCECODE	afsr
Puppet_Fmt	530	473	Puppet Source Code[3]	text/x-puppet	PP	adSOURCECODE	afsr
Python_Fmt	531	474	Python Source Code[3]	text/x-python	PY	adSOURCECODE	afsr
R_Fmt	532	475	R Source Code[3]	text/x-rsrc	R	adSOURCECODE	afsr
Ruby_Fmt	533	476	Ruby Source Code[3]	text/x-ruby	RB	adSOURCECODE	afsr
Rust_Fmt	534	477	Rust Source Code[3]	text/x-rust	RS	adSOURCECODE	afsr
Scala_Fmt	535	478	Scala Source Code[3]	text/x-scala	SC	adSOURCECODE	afsr
Shell_Fmt	536	479	Shell Script[3]	application/x-sh	SH	adSOURCECODE	afsr
Smalltalk_Fmt	537	480	Smalltalk Source Code[3]	text/x-stsrc	ST	adSOURCECODE	afsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
ML_Fmt	538	481	Standard ML Source Code[3]	text/x-ml	ML	adSOURCECODE	afsr
Swift_Fmt	539	482	Swift Source Code[3]	text/x-swift	SWIFT	adSOURCECODE	afsr
Tcl_Fmt	540	483	Tool Command Language (Tcl) Source Code[3]	text/x-tcl	TM	adSOURCECODE	afsr
Tex_Fmt	541	484	TeX Typesetting File[3]	application/x-tex		adSOURCECODE	afsr
TypeScript_Fmt	542	485	TypeScript Source Code[3]	text/x-typescript	TS	adSOURCECODE	afsr
Verilog_Fmt	543	486	Verilog Source Code[3]	text/x-verilog	V	adSOURCECODE	afsr
YAML_Fmt	544	487	YAML File[3]	text/x-yaml	YML	adSOURCECODE	afsr
Wiki_Fmt	545	488	MediaWiki File	text/x-mediawiki		adWORDPROCESSOR	afsr
MS_Word_2007_Flat_XML_Fmt	546	301	Microsoft Word 2007 XML - Flat xml	text/xml	XML	adWORDPROCESSOR	mwxsr
Matroska_Fmt	547	489	Matroska video File	video/x-matroska	MKV	adMOVIE	
SVG_Fmt	548	490	Scalable Vector Graphics image	image/svg+xml	SVG	adVECTORGRAPHIC	xmlsr
Shapefile_Fmt	549	491	Shapefile	application/x-shapefile	SHP, SHX	adGIS	
Flash_Video_Fmt	550	492	Flash video File	video/x-flv	FLV	adMOVIE	
Embedded_OpenType_Fmt	551	493	Embedded OpenType font	application/vnd.ms-fontobject	EOT	adFONT	
Web_Open_Font_Fmt	552	494	Web Open Font Format	font/woff	WOFF, WOFF2	adFONT	
OpenType_Fmt	553	495	OpenType Font	font/otf	OTF	adFONT	
MNG_Fmt	554	496	Multiple-image Network Graphics	video/x-mng	MNG	adANIMATION	
JNG_Fmt	555	497	JPEG Network Graphics	image/x-jng	JNG	adRASTERIMAGE	
AppleScript_Binary_Fmt	556	498	AppleScript Binary Source Code		SCPT	adSOURCECODE	
Maya_Binary_Fmt	557	499	Autodesk Maya binary file		MB	adCAD	
Jupiter_Tesselation_Fmt	558	363	UGS Jupiter Tesselation file		JT	adCAD	
OGV_Fmt	559	500	Ogg Theora Video format	video/ogg	OGV	adMOVIE	
OGG_Container_Fmt	560	501	General Ogg Container format	application/ogg	OGG	adMISC	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
GNU_Message_Catalog_Fmt	561	502	GNU Message Catalog format		MO	adMISC	
Windows_Shortcut_Fmt	562	503	Windows shortcut file	application/x-ms-shortcut	LNK	adMISC	
Apple_Typedstream_Fmt	563	504	Apple/NeXT typedstream data format			adMISC	
XCF_Fmt	564	505	GIMP XCF image	image/x-xcf	XCF	adRASTERIMAGE	
PaintShop_Pro_Fmt	565	506	PaintShop Pro image		PSP, PSPIMAGE	adRASTERIMAGE	
SQLite_Database_Fmt	566	507	SQLite database format	application/x-sqlite3	QHC	adDATABASE	
MySQL_Table_Fmt	567	508	MySQL table definition file		FRM	adDATABASE	
Microsoft_Program_DB_Fmt	568	509	Microsoft Program Database format		PDB	adDATABASE	
OpenEXR_Fmt	569	510	OpenEXR image format		EXR	adRASTERIMAGE	
XMV_Fmt	570	511	4X Movie File		4XM	adMOVIE	
AMV_Fmt	571	512	AMV video file		AMV	adMOVIE	
NIFF_Fmt	572	513	Notation Interchange File Format		NIF	adSOUND	
CuBase_Fmt	573	514	Steinberg CuBase file			adSOUND	
SoundFont_Fmt	574	515	SoundFont file			adSOUND	
WebP_Fmt	575	516	WebP image	image/webp	WEBP	adRASTERIMAGE	
ICC_Fmt	576	517	International Color Consortium files	application/vnd.iccprofile	ICC, ICM	adMISC	
PCF_Fmt	577	518	X11 Portable Compiled Font file	application/x-font-pcf	PCF	adFONT	
WebM_Fmt	578	519	WebM video file	video/webm	WEBM	adMOVIE	
AMFF_Fmt	579	520	Amiga Metafile		AMF	adVECTORGRAPHIC	
ANBM_Fmt	580	521	IFF Animated Bitmap			adRASTERIMAGE	
ANIM_Fmt	581	522	IFF Amiga animated raster graphics format			adRASTERIMAGE	
DEEP_Fmt	582	523	IFF-DEEP TVPaint image		DEEP	adRASTERIMAGE	
FAXX_Fmt	583	524	IFF-FAXX Facsimile image			adRASTERIMAGE	
ICON_Fmt	584	525	IFF Glow Icon image			adRASTERIMAGE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
ILBM_Fmt	585	526	Interleaved BitMap image		IFF	adRASTERIMAGE	
LWOB_Fmt	586	527	LightWave Object format		LWOB	adMISC	
MAUD_Fmt	587	528	IFF-MAUD MacroSystem audio format			adSOUND	
PBM_Fmt	588	529	IFF Planar BitMap			adRASTERIMAGE	
TDDD_Fmt	589	530	IFF TDDD and Imagine Object animation format		TDD	adRASTERIMAGE	
DjVu_Fmt	590	531	AT&T DjVu format	image/vnd.djvu	DJVU	adWORDPROCESSOR	
InDesign_Fmt	591	532	Adobe InDesign document	application/x-indesign	INDD	adDESKTOPPUBLSH	
Calamus_Fmt	592	533	Calamus Desktop Publishing			adDESKTOPPUBLSH	
Adaptive_MultiRate_Fmt	593	534	Adaptive Multi-Rate audio format	audio/amr	AMR	adSOUND	
FLAC_Fmt	594	535	Free Lossless Audio Codec format	audio/flac	FLAC	adSOUND	
Ogg_FLAC_Fmt	595	536	Ogg Container FLAC audio format		OGG	adSOUND	
SAS7BDAT_Fmt	596	537	SAS7BDAT database storage format		SAS7BDAT	adDATABASE	
Design_Web_Format_ Fmt	597	538	Autodesk Design Web Format	model/vnd.dwf	DWF	adCAD	
Adobe_Flash_Audio_ Book_Fmt	598	539	Adobe Flash Player audio book	audio/mp4	F4B	adSOUND	mpeg4sr
Adobe_Flash_Audio_Fmt	599	540	Adobe Flash Player audio	audio/mp4	F4A	adSOUND	mpeg4sr
Adobe_Flash_Protected_ Video_Fmt	600	541	Adobe Flash Player protected video	video/mp4	F4P	adMOVIE	mpeg4sr
Adobe_Flash_Video_Fmt	601	542	Adobe Flash Player video	video/x-f4v	F4V	adMOVIE	mpeg4sr
Audible_Audiobook_Fmt	602	543	Audible Enhanced Audiobook	audio/vnd.audible.aax	AAX	adSOUND	mpeg4sr
Canon_Camera_Fmt	603	544	Canon Digital Camera image			adRASTERIMAGE	
Canon_Raw_Fmt	604	545	Canon Raw image		CR3	adRASTERIMAGE	
Casio_Camera_Fmt	605	546	Casio Digital Camera image			adRASTERIMAGE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Convergent_Design_Fmt	606	547	Convergent Design file			adRASTERIMAGE	
DMB_MAF_Audio_Fmt	607	548	DMB MAF audio			adSOUND	
DMB_MAF_Video_Fmt	608	549	DMB MAF video			adMOVIE	
DMP_Content_Fmt	609	550	Digital Media Project Content Format			adMISC	
DVB_Fmt	610	551	Digital Video Broadcast format	video/vnd.dvb.file	DVB	adMOVIE	
Dirac_Wavelet_ Compression_Fmt	611	552	ISO-BMFF Dirac Wavelet compression			adMISC	
HEICS_Image_ Sequence_Fmt	612	553	High Efficiency Image Format HEVC image sequence	image/heic-sequence	HEICS	adRASTERIMAGE	
HEIC_Image_Fmt	613	554	High Efficiency Image Format HEVC image	image/heic	HEIC	adRASTERIMAGE	
HEIFS_Image_ Sequence_Fmt	614	555	High Efficiency Image Format image sequence	image/heif-sequence	HEIFS	adRASTERIMAGE	
HEIF_Image_Fmt	615	556	High Efficiency Image Format image	image/heif	HEIF	adRASTERIMAGE	
ISMACryp_Fmt	616	557	ISMACryp 2.0 Encrypted format			adENCAPSULATION	
ISO_3GPP2_Fmt	617	558	3GPP2 video file	video/3gpp2	3G2	adMOVIE	mpeg4sr
ISO_3GPP_Fmt	618	559	3GPP video file	video/3gpp	3GP	adMOVIE	mpeg4sr
ISO_JPEG2000_JP2_ Fmt	619	560	ISO-BMFF JPEG 2000 image	image/jp2	JP2	adRASTERIMAGE	jp2000sr, kpjp2000rdr
ISO_JPEG2000_JPM_ Fmt	620	561	ISO-BMFF JPEG 2000 compound image	image/jpm	JPM	adRASTERIMAGE	jp2000sr, kpjp2000rdr
ISO_JPEG2000_JPX_ Fmt	621	562	ISO-BMFF JPEG 2000 with extensions	image/jpx	JPX	adRASTERIMAGE	jp2000sr, kpjp2000rdr
ISO_QuickTime_Fmt	622	563	Apple ISO-BMFF QuickTime video	video/quicktime	QT, MOV	adMOVIE	MCI
KDDI_Video_Fmt	623	564	KDDI Video file	video/3gpp2		adMOVIE	mpeg4sr
MAF_Photo_Player_Fmt	624	565	MAF Photo Player			adMISC	
MPEG4_AVC_Fmt	625	566	ISO-BMFF MPEG-4 with AVC extension	video/mp4		adMOVIE	mpeg4sr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MPEG4_M4A_Fmt	626	567	Apple MPEG-4 Part 14 audio	audio/x-m4a	M4A	adSOUND	mpeg4sr
MPEG4_M4B_Fmt	627	568	Apple MPEG-4 Part 14 audio book	audio/mp4	M4B	adSOUND	mpeg4sr
MPEG4_M4P_Fmt	628	569	Apple MPEG-4 Part 14 protected audio	audio/mp4	M4P	adSOUND	mpeg4sr
MPEG4_M4V_Fmt	629	570	Apple MPEG-4 Part 14 video	video/x-m4v	M4V	adMOVIE	mpeg4sr
MPEG4_Sony_PSP_Fmt	630	571	Sony PSP MPEG-4	audio/mp4	MP4	adSOUND	mpeg4sr
MPEG_21_Fmt	631	572	MPEG-21	audio/mp4		adMISC	mpeg4sr
Mobile_QuickTime_Fmt	632	573	Mobile QuickTime video	video/quicktime	MQV	adMOVIE	MCI
Motion_JPEG_2000_Fmt	633	574	Motion JPEG 2000	video/mj2	MJ2, MJP2	adMOVIE	jp2000sr, kpjp2000rdr
NTT_MPEG4_Fmt	634	575	NTT MPEG-4	video/mp4		adMOVIE	mpeg4sr
Nero_MPEG4_AVC_ Profile	635	576	Nero MPEG-4 profile with AVC extension	video/mp4		adMOVIE	
Nero_MPEG4_Audio_Fmt	636	577	Nero AAC audio	audio/mp4		adSOUND	mpeg4sr
Nero_MPEG4_Profile	637	578	Nero MPEG-4 profile	video/mp4		adMOVIE	
OMA_DRM_Fmt	638	579	OMA DRM (ISOBMFF) Format			adMISC	
Panasonic_Camera_Fmt	639	580	Panasonic Digital Camera image			adRASTERIMAGE	
Ross_Video_Fmt	640	581	Ross video			adMOVIE	
SDA_Video_Fmt	641	582	SDA SD Memory Card video			adMOVIE	
Samsung_Stereoscopic_ Fmt	642	583	Samsung stereoscopic stream			adMISC	
Sony_XAVC_Fmt	643	584	Sony XAVC video			adMOVIE	mpeg4sr
JPEG_2000_PGX_Fmt	644	585	JPEG 2000 PGX Verification Model image		PGX	adRASTERIMAGE	jp2000sr, kpjp2000rdr
Apple_Desktop_ Services_Store_Fmt	645	586	Apple Desktop Services Store file		DS_Store	adMISC	
Core_Audio_Fmt	646	587	Apple Core Audio Format	audio/x-caf	CAF	adSOUND	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
VICAR_Fmt	647	588	VICAR image format		IMG	adRASTERIMAGE	
FITS_Fmt	648	589	Flexible Image Transport System FITS image	image/fits	FIT	adRASTERIMAGE	
DIF_Fmt	649	590	Digital Interface Format (DIF) DV video		DV	adMOVIE	
MPEG_Transport_ Stream_Fmt	650	591	MPEG Transport Stream data	video/MP2T	TS	adMISC	
MPEG_Sequence_Fmt	651	592	MPEG Sequence format	video/mpeg		adMISC	
Ogg_OGM_Fmt	652	593	Ogg OGM video format	video/ogg	OGM	adMOVIE	
Ogg_Speex_Fmt	653	594	Ogg Speex audio format	audio/ogg	SPX	adSOUND	
Ogg_Opus_Fmt	654	595	Ogg Opus audio format	audio/ogg	OGG	adSOUND	
Musepack_Audio_Fmt	655	596	Musepack audio format	audio/x-musepack	MPC	adSOUND	
ART_Image_Fmt	656	597	ART image format		ART	adRASTERIMAGE	
Vivo_Fmt	657	598	Vivo audio-video format	video/vnd.vivo	VIV	adMOVIE	
QCP_Fmt	658	599	Qualcomm QCP audio	audio/qcelp	QCP	adSOUND	
CSP_Codec_Fmt	659	600	Creative Signal Processor codec		CSP	adMISC	
TwinVQ_Fmt	660	601	NTT TwinVQ audio format		VQF	adSOUND	
Interplay_MVE_Fmt	661	602	Interplay MVE video format		MVE	adMOVIE	
IRIX_Moviemaker_Fmt	662	603	IRIX Silicon Graphics moviemaker video file	video/x-sgi-movie	MV, MOVIE	adMOVIE	
Sega_FILM_Fmt	663	604	Sega FILM video format		CPK, CAK	adMOVIE	
SMAF_Fmt	664	605	Synthetic music Mobile Application Format	application/vnd.smaf	MMF	adSOUND	
NIST_SPHERE_Fmt	665	606	NIST SPeech HEader REsources format		NIST	adSOUND	
Chinese_AVS_Fmt	666	607	Chinese AVS video format			adMOVIE	
VQA_Fmt	667	608	Westwood Studios Vector Quantized Animation video file		VQA	adANIMATION	
YAFA_Fmt	668	609	Wildfire YAFA animation		YAFA	adANIMATION	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Origin_MVE_Fmt	669	610	Origin Wing Commander III MVE movie format		MVE	adMOVIE	
BBC_Dirac_Fmt	670	611	BBC Dirac video format	video/x-dirac	DRC	adMOVIE	
Maya_ASCII_Fmt	671	612	Autodesk Maya ASCII file format		MA	adCAD	
RenderMan_Fmt	672	613	Pixar RenderMan Interface Bytestream file		RIB	adVECTORGRAPHIC	
NOFF_Binary_Fmt	673	614	NOFF 3D Object File Format		NOFF	adVECTORGRAPHIC	
VTK_ASCII_Fmt	674	615	Visualization Toolkit VTK ASCII format		VTK	adVECTORGRAPHIC	
VTK_Binary_Fmt	675	616	Visualization Toolkit VTK Binary format		VTK	adVECTORGRAPHIC	
Wolfram_CDF_Fmt	676	617	Wolfram Mathematica Computable Document Format	application/cdf	CDF	adMISC	
Wolfram_Notebook_Fmt	677	618	Wolfram Mathematica Notebook Format		NB	adMISC	
HDF4_Fmt	678	619	Hierarchical Data Format HDF4	application/x-hdf	HDF, H4	adMISC	
HDF5_Fmt	679	620	Hierarchical Data Format HDF5	application/x-hdf	HDF, H5	adMISC	
ARMovie_Fmt	680	621	Acorn RISC ARMovie video format		RPL	adMOVIE	
Windows_TV_DVR_Fmt	681	622	Windows Television DVR format		WTV	adMOVIE	
InstallShield_Z_Fmt	682	623	InstallShield Z archive format	application/x-compress	Z	adENCAPSULATION	
MS_DirectDraw_ Surface_Fmt	683	624	Microsoft DirectDraw Surface container format		DDS	adENCAPSULATION	
Bink_Fmt	684	625	Bink audio-video container format		BIK, BK2	adMOVIE	
LZMA_Fmt	685	626	LZMA compressed data format	application/x-lzma	LZMA	adENCAPSULATION	
True_Audio_Fmt	686	627	True Audio format	audio/x-tta	TTA	adSOUND	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Keepass_Fmt	687	628	Keepass Password file		KDB, KDBX	adMISC	
RPM_Fmt	688	629	RPM Package Manager file	application/x-rpm	RPM	adENCAPSULATION	
Printer_Font_Metrics_ Fmt	689	630	Adobe Printer Font Metrics format	application/x-font-printer-metric	PFM	adFONT	
Adobe_Font_Metrics_ Fmt	690	631	Adobe Font Metrics ASCII format	application/x-font-adobe-metric	AFM	adFONT	
Printer_Font_ASCII_Fmt	691	632	Adobe Printer Font ASCII format	application/x-font-type1	PFA	adFONT	
Netware_Loadable_ Module_Fmt	692	633	Netware Loadable Module format		NLM	adMISC	
TCPdump_pcap_Fmt	693	634	TCPdump packet stream capture savefile format	application/vnd.tcpdump.pcap	PCAP	adMISC	
Multiple_Master_Font_ Fmt	694	635	Adobe Multiple master font format		MMM	adFONT	
TrueType_Font_ Collection_Fmt	695	636	TrueType font collection format	application/x-font-ttf	TTC	adFONT	
Shapefile_Spatial_Index_ Fmt	696	637	Shapefile binary spatial index format	application/x-shapefile	SBX, SBN	adGIS	
Java_Key_Store_Fmt	697	638	Java Key Store format	application/x-java-keystore	KS	adMISC	
Java_JCE_Key_Store_ Fmt	698	639	Java JCE Key Store format	application/x-java-jce-keystore		adMISC	
Quark_Xpress_Intel_Fmt	699	640	QuarkXPress Intel format	application/vnd.quark.quarkxpress	QXB	adDESKTOPPUBLSH	
Windows_Imaging_Fmt	700	641	Microsoft Windows Imaging Format WIM		WIM	adMISC	
VMware_Virtual_Disk_ Fmt	701	642	VMware Virtual Disk Format 5.0	application/x-vmdk	VMDK	adMISC	
XPConnect_Typelib_Fmt	702	643	XPConnect Typelib Format		XPT	adMISC	
MS_DOS_Compression_ Fmt	703	644	Microsoft MS-DOS installation compression (SZDD, KWAJ)	application/x-ms-compress	EX_	adENCAPSULATION	
DLS_Fmt	704	645	DLS Downloadable Sounds format		DLS	adSOUND	
MS_Windows_Registry_	705	646	Microsoft Windows			adMISC	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Fmt			Registry format				
Microsoft_Help_2_Fmt	706	647	Microsoft Help 2.0 format	application/x-ms-reader	HXD, HXW, HXH	adENCAPSULATION	
Qt_Translation_Fmt	707	648	Qt binary translation file format		QM	adMISC	
PEM_SSL_Certificate_Fmt	708	649	PEM-encoded SSL certificate	application/pkix-cert	CRT, PEM, CER, KEY	adENCAPSULATION	
PostScript_Printer_Description_Fmt	709	650	Adobe PostScript Printer Description file	application/vnd.cups-ppd	PPD	adMISC	
Speedo_Font_Fmt	710	651	Speedo Font format		SPD	adFONT	
InstallShield_Cabinet_Fmt	711	652	InstallShield Cabinet Archive format		CAB, HDR	adENCAPSULATION	
InstallShield_Uninstall_Fmt	712	653	InstallShield Uninstall format		ISU	adENCAPSULATION	
MS_OEDBX_Folder_Fmt	713	654	Outlook Express DBX folder database format		DBX	adENCAPSULATION	
LabVIEW_Fmt	714	655	National Instruments LabVIEW file format		VI	adMISC	
SAP_Archive_SAR_Fmt	715	656	SAP compression archive SAR format		SAR	adENCAPSULATION	
Netscape_Address_Book_Fmt	716	657	Netscape Address Book format		NAB	adMISC	
Universal_3D_Fmt	717	658	Universal 3D file format		U3D	adVECTORGRAPHIC	
Open_Inventor_ASCII_Fmt	718	659	Open Inventor ASCII format		IV	adVECTORGRAPHIC	
Open_Inventor_Binary_Fmt	719	660	Open Inventor Binary format		IV	adVECTORGRAPHIC	
X_Window_Dump_Fmt	720	661	X Window Dump image	image/x-xwindowdump	XWD	adRASTERIMAGE	
Git_Packfile_Fmt	721	662	Git Packfile format		PACK	adENCAPSULATION	
Xara_Xar_Fmt	722	663	Xara X Xar image format	application/vnd.xara	XAR	adVECTORGRAPHIC	
Internet_Archive_ARC_Fmt	723	664	Internet Archive ARC format	application/x-ia-arc	ARC	adENCAPSULATION	
Applix_Builder_Fmt	724	665	Applix Builder format		AB	adMISC	
Applix_Bitmap_Fmt	725	666	Applix Bitmap image format		IM	adRASTERIMAGE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
PEM_RSA_Private_Key_Fmt	726	667	PEM-encoded RSA private key		PEM	adENCAPSULATION	
MIFF_Fmt	727	668	Magick Image File Format		MIFF	adRASTERIMAGE	
Subversion_Dump_Fmt	728	669	Subversion Dump format			adENCAPSULATION	
Virtual_Hard_Disk_Fmt	729	670	Microsoft Virtual Hard Disk format	application/x-vhd	VHD	adENCAPSULATION	
Direct_Access_Archive_Fmt	730	671	PowerISO Direct Access Archive format		DAA	adENCAPSULATION	
Debian_Binary_Fmt	731	672	Debian binary package format	application/x-debian-package	DEB	adENCAPSULATION	
XUL_Fastload_Fmt	732	673	Mozilla XUL Fastload format		MFL	adMISC	
Nastran_OP2_Fmt	733	674	Nastran OP2 format		OP2	adCAD	
Binary_Logging_Fmt	734	675	CAD Binary Logging Format		BLF	adCAD	
Measurement_Data_Fmt	735	676	CAD Measurement Data Format		MDF	adCAD	
Abaqus_ODB_Fmt	736	677	Abaqus ODB Format		ODB	adCAD	
Open_Diagnostic_Data_Exchange_Fmt	737	678	Vector Open Diagnostic Data Exchange format		ODX	adCAD	xmlsr
Vector_ASCII_Fmt	738	679	Vector CAD ASCII ASC format		ASC	adCAD	
LSDYNA_State_Database_Fmt	739	680	LS-DYNA State Database format			adCAD	
LSDYNA_Binary_Output_Fmt	740	681	LS-DYNA binary output (binout) format			adCAD	
MS_Power_BI_Fmt	741	682	Microsoft Power BI Desktop format		PBIX	adANALYTICS	pbixsr
Tableau_Workbook_Fmt	742	683	Tableau Workbook format		TWB	adANALYTICS	xmlsr
Tableau_Packaged_Workbook_Fmt	743	684	Tableau Packaged Workbook format		TWBX	adANALYTICS	unzip
Tableau_Extract_Fmt	744	685	Tableau Extract format		TDE	adANALYTICS	
Tableau_Data_Source_Fmt	745	686	Tableau Data Source format		TDS	adANALYTICS	xmlsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Tableau_Packaged_ Data_Source_Fmt	746	687	Tableau Packaged Data Source format		TDSX	adANALYTICS	unzip
Tableau_Preferences_ Fmt	747	688	Tableau Preferences format		TPS	adANALYTICS	xmlsr
Tableau_Map_Source_ Fmt	748	689	Tableau Map Source format		TMS	adANALYTICS	xmlsr
ABAP_Fmt	749	690	ABAP Source Code[4]	text/x-abap	ABAP	adSOURCECODE	afsr
AMPL_Fmt	750	691	AMPL Source Code[4]		AMPL	adSOURCECODE	afsr
APL_Fmt	751	692	APL Source Code[4]		APL	adSOURCECODE	afsr
ASN1_Fmt	752	693	ASN.1 Source Code[4]		ASN	adSOURCECODE	afsr
ATS_Fmt	753	694	ATS Source Code[4]			adSOURCECODE	afsr
Agda_Fmt	754	695	Agda Source Code[4]	text/x-agda	AGDA	adSOURCECODE	afsr
Alloy_Fmt	755	696	Alloy Source Code[4]	text/x-alloy	ALS	adSOURCECODE	afsr
Apex_Fmt	756	697	Apex Source Code[4]		CLS	adSOURCECODE	afsr
Arduino_Fmt	757	698	Arduino Source Code[4]	text/x-arduino	INO	adSOURCECODE	afsr
AsciiDoc_Fmt	758	699	AsciiDoc Source Code[4]	text/x-asciidoc	ASC	adSOURCECODE	afsr
AspectJ_Fmt	759	700	AspectJ Source Code[4]	text/x-aspectj	AJ	adSOURCECODE	afsr
Awk_Fmt	760	701	Awk Source Code[4]	text/x-awk	AWK	adSOURCECODE	afsr
BlitzMax_Fmt	761	702	BlitzMax Source Code[4]	text/x-bmx	BMX	adSOURCECODE	afsr
Bluespec_Fmt	762	703	Bluespec Source Code[4]		BSV	adSOURCECODE	afsr
Brainfuck_Fmt	763	704	Brainfuck Source Code[4]	text/x-brainfuck	B, BF	adSOURCECODE	afsr
Brightscript_Fmt	764	705	Brightscript Source Code[4]		BRS	adSOURCECODE	afsr
CLIPS_Fmt	765	706	CLIPS Source Code[4]		CLP	adSOURCECODE	afsr
CMake_Fmt	766	707	CMake Source Code[4]	text/x-cmake	CMAKE	adSOURCECODE	afsr
COBOL_Fmt	767	708	COBOL Source Code[4]	text/x-cobol	CBL, CCP, COB, CPY	adSOURCECODE	afsr
CWeb_Fmt	768	709	CWeb Source Code[4]		W	adSOURCECODE	afsr
CartoCSS_Fmt	769	710	CartoCSS Source Code[4]		MSS	adSOURCECODE	afsr
Ceylon_Fmt	770	711	Ceylon Source Code[4]	text/x-ceylon	CEYLON	adSOURCECODE	afsr
Chapel_Fmt	771	712	Chapel Source Code[4]		CHPL	adSOURCECODE	afsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Clarion_Fmt	772	713	Clarion Source Code[4]		CLW	adSOURCECODE	afsr
Clean_Fmt	773	714	Clean Source Code[4]		DCL, ICL	adSOURCECODE	afsr
Component_Pascal_Fmt	774	715	Component Pascal Source Code[4]	text/x-component-pascal	CP	adSOURCECODE	afsr
Cool_Fmt	775	716	Cool Source Code[4]		CL	adSOURCECODE	afsr
Coq_Fmt	776	717	Coq Source Code[4]	text/x-coq	V	adSOURCECODE	afsr
Creole_Fmt	777	718	Creole Source Code[4]		CREOLE	adSOURCECODE	afsr
Crystal_Fmt	778	719	Crystal Source Code[4]		CR	adSOURCECODE	afsr
Csound_Fmt	779	720	Csound Source Code[4]		ORC	adSOURCECODE	afsr
Csound_Document_Fmt	780	721	Csound Document Source Code[4]		CSD	adSOURCECODE	afsr
Cuda_Fmt	781	722	Cuda Source Code[4]	text/x-cuda	CU	adSOURCECODE	afsr
D_Fmt	782	723	D Source Code[4]	text/x-d	DCL, ICL	adSOURCECODE	afsr
DIGITAL_Command_ Language_Fmt	783	724	DIGITAL Command Language Source Code[4]		COM	adSOURCECODE	afsr
DTrace_Fmt	784	725	DTrace Source Code[4]		D	adSOURCECODE	afsr
Dart_Fmt	785	726	Dart Source Code[4]	text/x-dart	DART	adSOURCECODE	afsr
E_Fmt	786	727	E Source Code[4]		E	adSOURCECODE	afsr
ECL_Fmt	787	728	ECL Source Code[4]	application/x-ecl	ECL	adSOURCECODE	afsr
Elm_Fmt	788	729	Elm Source Code[4]	text/x-elm	ELM	adSOURCECODE	afsr
Emacs_Lisp_Fmt	789	730	Emacs Lisp Source Code[4]	text/x-emacs-lisp	EL	adSOURCECODE	afsr
EmberScript_Fmt	790	731	EmberScript Source Code[4]		EM	adSOURCECODE	afsr
Fantom_Fmt	791	732	Fantom Source Code[4]	application/x-fantom	FAN	adSOURCECODE	afsr
Forth_Fmt	792	733	Forth Source Code[4]	text/x-forth	FOR, FORTH	adSOURCECODE	afsr
FreeMarker_Fmt	793	734	FreeMarker Source Code[4]		FTL	adSOURCECODE	afsr
Frege_Fmt	794	735	Frege Source Code[4]		FR	adSOURCECODE	afsr
G_code_Fmt	795	736	G-code Source Code[4]		G	adSOURCECODE	afsr
GAMS_Fmt	796	737	GAMS Source Code[4]		GMS	adSOURCECODE	afsr
GAP_Fmt	797	738	GAP Source Code[4]			adSOURCECODE	afsr
GDScript_Fmt	798	739	GDScript Source Code[4]		GD	adSOURCECODE	afsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
GLSL_Fmt	799	740	GLSL Source Code[4]	text/x-glslsrc	GLSL	adSOURCECODE	afsr
Game_Maker_Language_Fmt	800	741	Game Maker Language Source Code[4]		GML	adSOURCECODE	afsr
Gnuplot_Fmt	801	742	Gnuplot Source Code[4]	text/x-gnuplot	GNU, GP	adSOURCECODE	afsr
Golo_Fmt	802	743	Golo Source Code[4]		GOLO	adSOURCECODE	afsr
Gosu_Fmt	803	744	Gosu Source Code[4]	text/x-gosu	GS	adSOURCECODE	afsr
Gradle_Fmt	804	745	Gradle Source Code[4]		GRADLE	adSOURCECODE	afsr
GraphQL_Fmt	805	746	GraphQL Source Code[4]		GRAPHQL	adSOURCECODE	afsr
Graphviz_DOT_Fmt	806	747	Graphviz (DOT) Source Code[4]		DOT	adSOURCECODE	afsr
HLSL_Fmt	807	748	HLSL Source Code[4]		HLSL	adSOURCECODE	afsr
Hack_Fmt	808	749	Hack Source Code[4]			adSOURCECODE	afsr
Haml_Fmt	809	750	Haml Source Code[4]	text/x-haml	HAML	adSOURCECODE	afsr
Handlebars_Fmt	810	751	Handlebars Source Code[4]		HBS	adSOURCECODE	afsr
Hy_Fmt	811	752	Hy Source Code[4]	text/x-hy	HY	adSOURCECODE	afsr
IDL_Fmt	812	753	IDL Source Code[4]	text/x-idl	PRO	adSOURCECODE	afsr
IGOR_Pro_Fmt	813	754	IGOR Pro Source Code[4]	text/ipf	IPF	adSOURCECODE	afsr
Idris_Fmt	814	755	Idris Source Code[4]	text/x-idris	IDR	adSOURCECODE	afsr
Inform_7_Fmt	815	756	Inform 7 Source Code[4]		I7X	adSOURCECODE	afsr
Ioke_Fmt	816	757	Ioke Source Code[4]	text/x-iokesrc	IK	adSOURCECODE	afsr
Isabelle_Fmt	817	758	Isabelle Source Code[4]	text/x-isabelle		adSOURCECODE	afsr
J_Fmt	818	759	J Source Code[4]	text/x-j	IJS	adSOURCECODE	afsr
JSONiq_Fmt	819	760	JSONiq Source Code[4]		JQ	adSOURCECODE	afsr
JSX_Fmt	820	761	JSX Source Code[4]		JSX	adSOURCECODE	afsr
Jasmin_Fmt	821	762	Jasmin Source Code[4]		J	adSOURCECODE	afsr
Jolie_Fmt	822	763	Jolie Source Code[4]			adSOURCECODE	afsr
Julia_Fmt	823	764	Julia Source Code[4]	text/x-julia	JL	adSOURCECODE	afsr
KiCad_Layout_Fmt	824	765	KiCad Layout Source Code[4]			adSOURCECODE	afsr
KiCad_Schematic_Fmt	825	766	KiCad Schematic Source		SCH	adSOURCECODE	afsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			Code[4]				
Kotlin_Fmt	826	767	Kotlin Source Code[4]		KT	adSOURCECODE	afsr
LFE_Fmt	827	768	LFE Source Code[4]	text/x-kotlin	LFE	adSOURCECODE	afsr
LOLCODE_Fmt	828	769	LOLCODE Source Code[4]		LOL	adSOURCECODE	afsr
Lasso_Fmt	829	770	Lasso Source Code[4]	text/x-lasso	LAS, LASSO	adSOURCECODE	afsr
Limbo_Fmt	830	771	Limbo Source Code[4]	text/limbo		adSOURCECODE	afsr
LiveScript_Fmt	831	772	LiveScript Source Code[4]	text/x-livescript	LS	adSOURCECODE	afsr
M_Fmt	832	773	M Source Code[4]		M	adSOURCECODE	afsr
MAXScript_Fmt	833	774	MAXScript Source Code[4]		MS	adSOURCECODE	afsr
Markdown_Fmt	834	775	Markdown Source Code[4]		MD	adSOURCECODE	afsr
Matlab_Fmt	835	463	Matlab Source Code[4]	text/x-matlab	M	adSOURCECODE	afsr
Max_Code_Fmt	836	776	Max Source Code[4]		MXT	adSOURCECODE	afsr
Mercury_Fmt	837	777	Mercury Source Code[4]			adSOURCECODE	afsr
Modelica_Fmt	838	778	Modelica Source Code[4]	text/x-modelica	MO	adSOURCECODE	afsr
Modula_2_Fmt	839	779	Modula-2 Source Code[4]	text/x-modula2	MOD	adSOURCECODE	afsr
Monkey_Fmt	840	780	Monkey Source Code[4]	text/x-monkey	MONKEY	adSOURCECODE	afsr
Moocode_Fmt	841	781	Moocode Source Code[4]	text/x-moocode	MOO	adSOURCECODE	afsr
NL_Fmt	842	782	NL Source Code[4]		NL	adSOURCECODE	afsr
NSIS_Fmt	843	783	NSIS Source Code[4]	text/x-nsis	NSI	adSOURCECODE	afsr
NetLogo_Fmt	844	784	NetLogo Source Code[4]		NLOGO	adSOURCECODE	afsr
NewLisp_Fmt	845	785	NewLisp Source Code[4]	text/x-newlisp	NL	adSOURCECODE	afsr
Nginx_Fmt	846	786	Nginx Source Code[4]	text/x-nginx-conf	VHOST	adSOURCECODE	afsr
Nix_Fmt	847	787	Nix Source Code[4]	text/x-nix	NIX	adSOURCECODE	afsr
Nu_Fmt	848	788	Nu Source Code[4]		NU	adSOURCECODE	afsr
OCaml_Fmt	849	789	OCaml Source Code[4]	text/x-ocaml		adSOURCECODE	afsr
OpenCL_Fmt	850	790	OpenCL Source Code[4]		CL	adSOURCECODE	afsr
OpenEdge_ABL_Fmt	851	791	OpenEdge ABL Source Code[4]	text/x-openedge		adSOURCECODE	afsr
OpenSCAD_Fmt	852	792	OpenSCAD Source Code[4]		SCAD	adSOURCECODE	afsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Ox_Fmt	853	793	Ox Source Code[4]		OX	adSOURCECODE	afsr
Oxygene_Fmt	854	794	Oxygene Source Code[4]		OXYGENE	adSOURCECODE	afsr
Oz_Fmt	855	795	Oz Source Code[4]		OZ	adSOURCECODE	afsr
PAWN_Fmt	856	796	PAWN Source Code[4]	text/x-pawn	PWN	adSOURCECODE	afsr
PLpgSQL_Fmt	857	797	PLpgSQL Source Code[4]	text/x-plpgsql	PLSQL	adSOURCECODE	afsr
Pan_Fmt	858	798	Pan Source Code[4]		PAN	adSOURCECODE	afsr
Parrot_Assembly_Fmt	859	799	Parrot Assembly Source Code[4]		PASM	adSOURCECODE	afsr
PicoLisp_Fmt	860	800	PicoLisp Source Code[4]			adSOURCECODE	afsr
Pike_Fmt	861	801	Pike Source Code[4]	text/x-pike	PIKE	adSOURCECODE	afsr
Pony_Fmt	862	802	Pony Source Code[4]		PONY	adSOURCECODE	afsr
Processing_Fmt	863	803	Processing Source Code[4]		PDE	adSOURCECODE	afsr
PureBasic_Fmt	864	804	PureBasic Source Code[4]		PB	adSOURCECODE	afsr
QMake_Fmt	865	805	QMake File[4]			adSOURCECODE	afsr
RAML_Fmt	866	806	RAML Source Code[4]		RAML	adSOURCECODE	afsr
RDoc_Fmt	867	807	RDoc Source Code[4]		RDOC	adSOURCECODE	afsr
REXX_Fmt	868	808	REXX Source Code[4]	text/x-rexx	REXX	adSOURCECODE	afsr
Racket_Fmt	869	809	Racket Source Code[4]	text/x-racket		adSOURCECODE	afsr
Ragel_Fmt	870	810	Ragel Source Code[4]			adSOURCECODE	afsr
Rascal_Fmt	871	811	Rascal Source Code[4]		RSC	adSOURCECODE	afsr
Rebol_Fmt	872	812	Rebol Source Code[4]	text/x-rebol	REB, REBOL	adSOURCECODE	afsr
Red_Fmt	873	813	Red Source Code[4]	text/x-red	RED	adSOURCECODE	afsr
RenPy_Fmt	874	814	Ren'Py Source Code[4]		RPY	adSOURCECODE	afsr
RenderScript_Fmt	875	815	RenderScript Source Code[4]		RS	adSOURCECODE	afsr
Ring_Fmt	876	816	Ring Source Code[4]		RING	adSOURCECODE	afsr
RobotFramework_Fmt	877	817	RobotFramework Source Code[4]	text/x-robotframework	ROBOT	adSOURCECODE	afsr
SAS_Fmt	878	818	SAS Source Code[4]		SAS	adSOURCECODE	afsr
SPARQL_Fmt	879	819	SPARQL format[4]	application/sparql-query		adSOURCECODE	afsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
SQL_Fmt	880	820	SQL format[4]	text/x-sql		adSOURCECODE	afsr
SQLPL_Fmt	881	821	SQLPL Source Code[4]			adSOURCECODE	afsr
SaltStack_Fmt	882	822	SaltStack Source Code[4]		SLS	adSOURCECODE	afsr
Scheme_Fmt	883	823	Scheme Source Code[4]	text/x-scheme		adSOURCECODE	afsr
Scilab_Fmt	884	824	Scilab Source Code[4]	text/scilab	SCI	adSOURCECODE	afsr
Squirrel_Fmt	885	825	Squirrel Source Code[4]		NUT	adSOURCECODE	afsr
Stan_Fmt	886	826	Stan Source Code[4]		STAN	adSOURCECODE	afsr
Stata_Fmt	887	827	Stata Source Code[4]			adSOURCECODE	afsr
Stylus_Fmt	888	828	Stylus Source Code[4]		STYL	adSOURCECODE	afsr
SuperCollider_Fmt	889	829	SuperCollider Source Code[4]	text/supercollider	SC	adSOURCECODE	afsr
SystemVerilog_Fmt	890	830	SystemVerilog Source Code[4]	text/x-systemverilog	SV	adSOURCECODE	afsr
TXL_Fmt	891	831	TXL Source Code[4]		TXL	adSOURCECODE	afsr
Turing_Fmt	892	832	Turing Source Code[4]		T	adSOURCECODE	afsr
Turtle_Fmt	893	833	Turtle Source Code[4]	text/turtle	TTL	adSOURCECODE	afsr
UrWeb_Fmt	894	834	UrWeb Source Code[4]		UR, URS	adSOURCECODE	afsr
Vim_script_Fmt	895	835	Vim script File[4]	text/x-vim	VIM	adSOURCECODE	afsr
Visual_Basic_Fmt	896	836	Visual Basic Source Code[4]	text/x-vbasic	VB	adSOURCECODE	afsr
WebAssembly_Fmt	897	837	WebAssembly Source Code[4]		WAT	adSOURCECODE	afsr
WebIDL_Fmt	898	838	WebIDL Source Code[4]		WEBIDL	adSOURCECODE	afsr
X10_Fmt	899	839	X10 Source Code[4]	text/x-x10	X10	adSOURCECODE	afsr
XQuery_Fmt	900	840	XQuery Source Code[4]	text/xquery	XQM	adSOURCECODE	afsr
Xojo_Fmt	901	841	Xojo Source Code[4]			adSOURCECODE	afsr
Xtend_Fmt	902	842	Xtend Source Code[4]	text/x-xtend	XTEND	adSOURCECODE	afsr
YANG_Fmt	903	843	YANG Source Code[4]		YANG	adSOURCECODE	afsr
Zephir_Fmt	904	844	Zephir Source Code[4]		ZEP	adSOURCECODE	afsr
eC_Fmt	905	845	eC Source Code[4]	text/x-ecsrc	EC	adSOURCECODE	afsr
reStructuredText_Fmt	906	846	reStructuredText Source	text/x-rst		adSOURCECODE	afsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			Code[4]				
xBase_Fmt	907	847	xBase Source Code[4]			adSOURCECODE	afsr
Windows_Installer_Fmt	908	848	MSI Windows Installer format	application/x-ole-storage	MSI	adENCAPSULATION	olesr
Autodesk_3ds_Max_Fmt	909	849	Autodesk 3ds Max format		MAX	adCAD	
PhotoDraw_Mix_Fmt	910	850	PhotoDraw MIX image	image/vnd.mix	MIX	adRASTERIMAGE	
Softimage_SCN_Fmt	911	851	Softimage Scene SCN format		SCN	adCAD	
Parasolid_XT_Fmt	912	852	Parasolid ascii XT format		X_T	adCAD	
Parasolid_XB_Fmt	913	853	Parasolid binary XB format		X_B	adCAD	
IGES_Fmt	914	854	Initial Graphics Exchange Specification format	model/iges	IGS	adCAD	
ACE_Archive_Fmt	915	855	ACE archive format	application/x-ace-compressed	ACE	adENCAPSULATION	
Grasshopper_GHX_Fmt	916	856	Grasshopper GHX format		GHX	adCAD	xmlsr
MS_FrontPage_Macro_Fmt	917	857	Microsoft FrontPage macro file format		FPM	adWORDPROCESSOR	
MS_AtWork_Fax_Fmt	918	858	Microsoft AtWork Fax format		AWD	adFAXFORMAT	
MS_Image_Composer_Fmt	919	859	Microsoft Image Composer format		MIC	adRASTERIMAGE	
MS_Visual_InterDev_Fmt	920	860	Microsoft Visual InterDev web project items file		WDM	adMISC	
Macromedia_Flash_FLA_OLE_Fmt	921	861	Macromedia Flash FLA Project File OLE format		FLA	adWORDPROCESSOR	
Corel_Draw_X4_Fmt	922	862	CorelDRAW version X4 onwards	application/x-vnd.corel.zcf.draw.document+zip	CDRX	adVECTORGRAPHIC	
Ogg_Daala_Fmt	923	863	Ogg Daala video format	video/daala	OGV	adMOVIE	
Ogg_BBC_Dirac_Fmt	924	864	Ogg BBC Dirac video format	video/x-dirac	OGV	adMOVIE	
PKCS_7_Fmt	925	865	PKCS #7 cryptographic format	application/pkcs7-signature	P7S	adWORDPROCESSOR	
Time_Stamped_Data_Fmt	926	866	Time-stamped data format	application/timestamped-data	TSD	adENCAPSULATION	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Sereal_Fmt	927	867	Sereal data serialization format	application/sereal	SRL	adMISC	
Associated_Signature_Simple_Fmt	928	868	Associated Signature Container Simple format	application/vnd.etsi.asic-s+zip	ASICS	adENCAPSULATION	
Associated_Signature_Extended_Fmt	929	869	Associated Signature Container Extended format	application/vnd.etsi.asic-e+zip	ASICE	adENCAPSULATION	
iBooks_Fmt	930	870	Apple iBooks format	application/x-ibooks+zip	IBOOKS	adWORDPROCESSOR	
PDF_Forms_Data_Fmt	931	871	PDF Forms Data Format	application/vnd.fdf	FDF	adWORDPROCESSOR	
PDF_XML_Forms_Data_Fmt	932	872	PDF XML Forms Data Format	application/vnd.adobe.xfdf	XFDF	adWORDPROCESSOR	xmlsr
AxCrypt_Fmt	933	873	AxCrypt encrypted document	application/x-axcrypt	AXX	adENCAPSULATION	
Unix_Archive_Fmt	934	874	Unix Archive ar format	application/x-archive	AR	adENCAPSULATION	
Berkeley_Btree_Database_Fmt	935	875	Berkeley DB btree database format	application/x-berkeley-db	DB	adDATABASE	
Berkeley_Hash_Database_Fmt	936	876	Berkeley DB hash database format	application/x-berkeley-db	DB	adDATABASE	
Berkeley_Log_Database_Fmt	937	877	Berkeley DB log database format	application/x-berkeley-db		adDATABASE	
Berkeley_Queue_Database_Fmt	938	878	Berkeley DB queue database format	application/x-berkeley-db		adDATABASE	
BitTorrent_Fmt	939	879	BitTorrent file format	application/x-bittorrent	TORRENT	adMISC	
Chrome_Extension_Fmt	940	880	Google Chrome Extension format	application/x-chrome-package	CRX	adENCAPSULATION	
Dalvik_Executable_Fmt	941	881	Dalvik Executable dex format	application/x-dex	DEX	adEXECUTABLE	
Foxmail_Fmt	942	882	Foxmail email format	application/x-foxmail	BOX	adWORDPROCESSOR	
GRIB_Fmt	943	883	General Regularly-distributed Information in Binary form GRIB format	application/x-grib	GRB, GRIB2	adMISC	
Zstandard_Fmt	944	884	Zstandard compression format	application/zstd	ZSTD	adENCAPSULATION	
LZ4_Fmt	945	885	LZ4 compressed file	application/x-lz4	LZ4	adENCAPSULATION	
MS_Money_Fmt	946	886	Microsoft Money format	application/x-msmoney	MNY	adSPREADSHEET	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
NetCDF_Fmt	947	887	Network Common Data Form NetCDF format	application/x-netcdf	NC	adMISC	
SAS6_Data_Fmt	948	888	SAS 6 Data storage format	application/x-sas-data-v6	SD2	adDATABASE	
SAS_Transport_Fmt	949	889	SAS Transport File XPORT format	application/x-sas-xport	XPT, XPORT	adDATABASE	
Snappy_Framed_Fmt	950	890	Snappy Framed compression format	application/x-snappy-framed	SZ	adENCAPSULATION	
Stata_Data_Fmt	951	891	Stata Data Format	application/x-stata-dta	DTA	adDATABASE	
SPSS_SAV_Fmt	952	892	SPSS Statistics Data File Format		SAV	adDATABASE	
Zoo_Archive_Fmt	953	893	Zoo Compressed Archive Format	application/x-zoo	ZOO	adENCAPSULATION	
CDX_Fmt	954	894	ChemDraw CDX format	chemical/x-cdx	CDX	adSCIENTIFIC	
CDXML_Fmt	955	895	ChemDraw CDXML format	application/vnd.chemdraw+xml	CDXML	adSCIENTIFIC	xmlsr
BPG_Fmt	956	896	Better Portable Graphics BPG format	image/x-bpg	BPG	adRASTERIMAGE	
Apple_Icon_Fmt	957	897	Apple Icon image format	image/icns	ICNS	adRASTERIMAGE	
NITF_Fmt	958	898	National Imagery Transmission Format NITF image	image/nitf	NTF, NITF	adRASTERIMAGE	
ERDAS_Imagine_Fmt	959	899	ERDAS Imagine image format	application/x-erdas-hfa	HFA, RRD, AUX	adRASTERIMAGE	
MS_Office_Temporary_Owner_Fmt	960	900	Microsoft Office temporary owner file	application/x-ms-owner		adMISC	
EAC3_Audio_Fmt	961	901	Enhanced-AC3 (EAC3) Audio File format	audio/eac3	AC3	adSOUND	
COFF_Relocatable_Fmt	962	902	Common Object File Format (COFF) relocatable object	application/x-object-file	O	adOBJECTMODULE	
COFF_Executable_Fmt	963	903	Common Object File Format (COFF) executable	application/x-executable-file		adEXECUTABLE	
COFF_Dynamic_Lib_Fmt	964	904	Common Object File Format (COFF) dynamic library	application/x-library-file		adLIBRARY	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
ELF_Core_Fmt	965	905	ELF Core file	application/x-coredump		adMISC	
Purify_Fmt	966	906	Rational Purify data file		PFY	adMISC	
Kryptel_Fmt	967	907	Kryptel encrypted file		EDC	adENCAPSULATION	
Windows_Core_Dump_Fmt	968	908	Windows heap or mini core dump file	application/x-dmp	DMP	adMISC	
Qt_Prerendered_Font_Fmt	969	909	Qt Prerendered Font format		QPF2	adFONT	
AIX_Relocatable_Fmt	970	910	AIX/RISC COFF relocatable object	application/x-object-file		adOBJECTMODULE	
AIX_Executable_Fmt	971	911	AIX/RISC COFF executable	application/x-executable-file		adEXECUTABLE	
AIX_Dynamic_Lib_Fmt	972	912	AIX/RISC COFF dynamic library	application/x-library-file	A	adLIBRARY	
HPUX_Relocatable_Fmt	973	913	HPUX/PA-RISC COFF relocatable object	application/x-object-file		adOBJECTMODULE	
HPUX_Executable_Fmt	974	914	HPUX/PA-RISC COFF executable	application/x-executable-file		adEXECUTABLE	
HPUX_Dynamic_Lib_Fmt	975	915	HPUX/PA-RISC COFF dynamic library	application/x-library-file	SL	adLIBRARY	
XML_EBCDIC_Fmt	976	916	EBCDIC-encoded XML file	application/xml	XML	adWORDPROCESSOR	
MPEG_JVT_H264_Fmt	977	917	MPEG JVT-NAL sequence H264 video	video/h264	264	adMOVIE	
Material_Exchange_Fmt	978	918	Material Exchange Format audio-video container format	application/mxf	MXF	adMOVIE	
MS_Agent_Character_Fmt	979	919	Microsoft Agent Character file		ACS	adMOVIE	
Quicken_Fmt	980	920	Quicken data file		QDF	adMISC	
MS_Outlook_Address_Fmt	981	921	Microsoft Outlook address file		WAB	adMISC	
MS_Answer_Wizard_Fmt	982	922	Microsoft Answer Wizard file			adMISC	
ADX_Fmt	983	923	ADX audio file		ADX	adSOUND	
System_Deployment_	984	924	Microsoft System		SDI	adMISC	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Image_Fmt			Deployment Image SDI format				
Free_Lossless_Image_Fmt	985	925	Free Lossless Image Format (FLIF)	image/flif	FLIF	adRASTERIMAGE	
DPX_Fmt	986	926	Digital Picture Exchange (DPX) image format	image/dpx	DPX	adRASTERIMAGE	
Avro_Fmt	987	927	Apache Avro binary format		AVRO	adMISC	
InstallShield_Archive_Fmt	988	928	InstallShield archive (early versions) format		EX_	adENCAPSULATION	
Mac_Executable_Fmt	989	929	Mac OS-X (Mach-O) executable format			adEXECUTABLE	
GDSII_Fmt	990	930	GDSII data format		GDS, GDS2	adCAD	gdsiisr
ActiveMime_Fmt	991	931	Microsoft ActiveMime (mso) documents	application/x-mso	MSO	adMISC	
SmartCharts_Fmt	992	932	BizInt SmartCharts data format		CHP, CHRR	adMISC	
Webex_ARF_Fmt	993	933	Webex advanced network ARF recordings		ARF	adMOVIE	
Webex_WRF_Fmt	994	934	Webex local WRF recordings		WRF	adMOVIE	
PGP_NetShare_Fmt	995	935	Symantec PGP NetShare encrypted file			adENCAPSULATION	
Ability_WP_OLE_Fmt	996	936	Ability Write later versions format		AWW	adWORDPROCESSOR	
Ability_SS_OLE_Fmt	997	937	Ability Spreadsheet later versions format		AWS	adSPREADSHEET	
InDesign_IDML_Fmt	998	938	Adobe InDesign IDML format	application/vnd.adobe.indesign-idml-package	IDML	adDESKTOPPUBLSH	
Executable_JAR_Fmt	999	939	Executable Java Archive (jar) file	application/java-archive	JAR	adENCAPSULATION	unzip
IDOL_IDX_Fmt	1000	940	IDOL Server IDX file		IDX	adENCAPSULATION	
Android_Package_Kit_Fmt	1001	941	Android Package Kit (APK) format	application/vnd.android.package-archive	APK	adEXECUTABLE	
Android_Binary_XML_Fmt	1002	942	Android Binary XML (compressed by aapt)	application/xml	XML	adWORDPROCESSOR	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			format				
Java_WAR_Fmt	1003	943	Java WAR file format		WAR	adENCAPSULATION	
Java_EAR_Fmt	1004	944	Java EAR file format		EAR	adENCAPSULATION	
Atom_Syndication_Fmt	1005	945	Atom Syndication Format	application/atom+xml	ATOM	adWORDPROCESSOR	xmlsr
RSS_Fmt	1006	946	RSS syndication XML format	application/rss+xml	RSS	adWORDPROCESSOR	xmlsr
SMIL_Fmt	1007	947	Synchonized Multimedia Integration Language (SMIL) XML format	application/smil+xml	SMIL	adWORDPROCESSOR	xmlsr
XSLT_Fmt	1008	948	Extensible Stylesheet Language Transformations (XSLT) format	application/xslt+xml	XSL, XSLT	adWORDPROCESSOR	xmlsr
XML_Shareable_Playlist_Fmt	1009	949	XML Shareable Playlist Format (XSPF)	application/xspf+xml	XSPF	adWORDPROCESSOR	xmlsr
FictionBook_Fmt	1010	950	FictionBook e-book XML format	application/x-fictionbook+xml	FB2	adWORDPROCESSOR	xmlsr
Adobe_Premiere_Project_Fmt	1011	951	Adobe Premiere project format	image/vnd.adobe.premiere	PPJ	adMISC	
RDF_XML_Fmt	1012	952	RDF/XML format	application/rdf+xml	RDF	adWORDPROCESSOR	xmlsr
Really_Simple_Discovery_Fmt	1013	953	Really Simple Discovery (RSD) XML format	application/rsd+xml	RSD	adWORDPROCESSOR	xmlsr
SBML_Fmt	1014	954	Systems Biology Markul Language (SBML) XML format	application/sbml+xml	SBML	adWORDPROCESSOR	xmlsr
SRU_Fmt	1015	955	Search/Retrieve via URL (SRU) XML format	application/sru+xml	SRU	adWORDPROCESSOR	xmlsr
SSML_Fmt	1016	956	Speech Synthesis Markup Language (SSML) XML format	application/ssml+xml	SSML	adWORDPROCESSOR	xmlsr
PLS_Fmt	1017	957	Pronunciation Lexicon Specification (PLS) XML format	application/pls+xml	PLS	adWORDPROCESSOR	xmlsr
TEI_Fmt	1018	958	Text Encoding Initiative (TEI) XML format	application/tei+xml	TEI	adWORDPROCESSOR	xmlsr
METS_Fmt	1019	959	Metadata Encoding and Transmission Standard	application/mets+xml	METS	adWORDPROCESSOR	xmlsr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			(METS) XML format				
MODS_Fmt	1020	960	Metadata Object Description Schema (MODS) XML format	application/mods+xml	MODS	adWORDPROCESSOR	xmlsr
Metalink_Fmt	1021	961	Metalink XML format	application/metalink4+xml	METALINK	adWORDPROCESSOR	xmlsr
Open_eBook_Fmt	1022	962	Open eBook (OEBPS) XML format	application/oebps-package+xml	OPF	adWORDPROCESSOR	xmlsr
SRGS_Fmt	1023	963	Speech Recognition Grammar Specification (SRGS) XML format	application/srgs+xml	SRGS	adWORDPROCESSOR	xmlsr
SPARQL_Results_Fmt	1024	964	SPARQL Query Results XML format	application/sparql-results+xml	SRX	adWORDPROCESSOR	xmlsr
Adobe_XML_Data_ Package_Fmt	1025	965	Adobe XML Data Package format	application/vnd.adobe.xdp+xml	XDP	adWORDPROCESSOR	xmlsr
ESzigno_Fmt	1026	966	e-Szigno signed xml document	application/vnd.eszigno3+xml	ES3	adWORDPROCESSOR	xmlsr
Mozilla_XUL_Fmt	1027	967	Mozilla XML User Interface Language (XUL) XML format	application/vnd.mozilla.xul+xml	XUL	adWORDPROCESSOR	xmlsr
SyncML_Fmt	1028	968	Synchronization Markup Language (SyncML) XML format	application/vnd.syncml+xml	XML	adWORDPROCESSOR	xmlsr
VoiceXML_Fmt	1029	969	VoiceXML (VXML) XML format	application/voicexml+xml	VXML	adWORDPROCESSOR	xmlsr
TI_Target_Configuration_ Fmt	1030	970	Texas Instruments CCXML target configuration XML format		CCXML	adWORDPROCESSOR	
LZFSE_Fmt	1031	971	Lempel-Ziv Finite State Entropy (LZFSE) compression format		LZFSE	adENCAPSULATION	
Kindle_eBook_Fmt	1032	972	Amazon Kindle or Mobipocket eBook format	application/vnd.amazon.ebook	AZW, PRC	adWORDPROCESSOR	
Oasis_Stream_Fmt	1033	973	Open Artwork System Interchange Standard (OASIS) format		OAS	adMISC	
Amazon_KFX_Fmt	1034	974	Amazon KFX eBook format		KFX	adWORDPROCESSOR	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
KTX_Fmt	1035	975	KTX image format	image/ktx	KTX	adRASTERIMAGE	
GMSH_Mesh_Fmt	1036	976	GMSH Mesh polygon format	model/mesh	MSH	adCAD	
Collada_DAE_Fmt	1037	977	Collada Digital Asset Exchange (DAE) format	model/vnd.collada+xml	DAE	adCAD	xmlsr
YIN_Fmt	1038	978	YIN XML format	application/yin+xml	YIN	adWORDPROCESSOR	xmlsr
MPEG_Playlist_Fmt	1039	979	MPEG audio playlist format	audio/mpegurl	M3U	adSOUND	
Windows_Audio_Playlist_Fmt	1040	980	Windows Audio playlist format	audio/x-ms-wax	WAX	adSOUND	xmlsr
DTS_Audio_Fmt	1041	981	DTS Coherent Acoustics audio format	audio/vnd.dts	DTS	adSOUND	
Chemical_Markup_Language_Fmt	1042	982	Chemical Markup Language (CML) XML format	chemical/x-cml	CML	adWORDPROCESSOR	xmlsr
CrystalMaker_Fmt	1043	983	CrystalMaker chemical format	chemical/x-cmdf	CMDF	adSCIENTIFIC	
VTK_XML_Fmt	1044	984	Visualization Toolkit VTK XML format	model/vnd.vtu	VTU	adVECTORGRAPHIC	xmlsr
IPFIX_Fmt	1045	985	IP Flow Information Export (IPFIX) format	application/ipfix	IPFIX	adMISC	
Portable_Font_Resource_Fmt	1046	986	Portable Font Resource font format	application/font-tdpfr	PFR	adFONT	
MARC_Fmt	1047	987	Machine-Readable Cataloging (MARC21) format	application/marc	MARC	adDATABASE	
MARC_XML_Fmt	1048	988	Machine-Readable Cataloging (MARC) XML format	application/marcxml+xml	XML	adWORDPROCESSOR	xmlsr
XAR_Fmt	1049	989	Extensible Archive (XAR) format			adENCAPSULATION	
Symbian_Installer_Fmt	1050	990	Symbian installer format	application/vnd.symbian.install	SIS	adENCAPSULATION	
SO_Drawing_XML_Fmt	1051	316	OpenDocument format (OpenOffice 1/StarOffice 6.7) Drawing XML	application/vnd.sun.xml.draw	SXD	adVECTORGRAPHIC	kpodfrdr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
SO_Text_Global_XML_Fmt	1052	991	OpenDocument format (OpenOffice 1/StarOffice 6.7) Writer Master document XML	application/vnd.sun.xml.writer.global	SXG	adWORDPROCESSOR	
ODF_Chart_Fmt	1053	992	ODF Chart	application/vnd.oasis.opendocument.chart	ODC	adVECTORGRAPHIC	
ODF_Database_Fmt	1054	993	ODF Database	application/vnd.sun.xml.base	ODB	adDATABASE	
ODF_Image_Fmt	1055	994	ODF Image	application/vnd.oasis.opendocument.image	ODI	adRASTERIMAGE	
ODF_Text_Master_Fmt	1056	995	ODF Text Master	application/vnd.oasis.opendocument.text-master	ODM	adWORDPROCESSOR	
ODF_Text_Web_Fmt	1057	996	ODF Text Web	application/vnd.oasis.opendocument.text-web	OTH	adWORDPROCESSOR	
ODF_Chart_Template_Fmt	1058	997	ODF Chart Template	application/vnd.oasis.opendocument.chart-template	OTC	adVECTORGRAPHIC	
ODF_Formula_Template_Fmt	1059	998	ODF Formula Template	application/vnd.oasis.opendocument.formula-template	OTF	adWORDPROCESSOR	unzip
ODF_Drawing_Template_Fmt	1060	316	ODF Drawing/Graphics Template	application/vnd.oasis.opendocument.graphics-template	OTG	adVECTORGRAPHIC	kpodfrdr
ODF_Image_Template_Fmt	1061	999	ODF Image Template	application/vnd.oasis.opendocument.image-template	OTI	adRASTERIMAGE	
ODF_Presentation_Template_Fmt	1062	316	ODF Presentation Template	application/vnd.oasis.opendocument.presentation-template	OTP	adPRESENTATION	kpodfrdr
ODF_Spreadsheet_Template_Fmt	1063	315	ODF Spreadsheet Template	application/vnd.oasis.opendocument.spreadsheet-template	OTS	adSPREADSHEET	odfsssr
ODF_Text_Template_Fmt	1064	314	ODF Text Template	application/vnd.oasis.opendocument.text-template	OTT	adWORDPROCESSOR	odfwpsr
ODF_Chart_XML_Fmt	1065	1000	ODF Chart flat XML format	application/vnd.oasis.opendocument.chart.xml	FODC	adVECTORGRAPHIC	
ODF_Drawing_XML_Fmt	1066	1001	ODF Drawing/Graphics flat XML format	application/vnd.oasis.opendocument.formula.xml	FODG	adWORDPROCESSOR	
ODF_Formula_XML_Fmt	1067	1002	ODF Formula flat XML format	application/vnd.oasis.opendocument.graphics.xml	FODF	adVECTORGRAPHIC	
ODF_Image_XML_Fmt	1068	1003	ODF Image flat XML format	application/vnd.oasis.opendocument.image.xml	FODI	adRASTERIMAGE	
ODF_Presentation_XML_Fmt	1069	1004	ODF Presentation flat XML format	application/vnd.oasis.opendocument.presentation.xml	FODP	adPRESENTATION	
ODF_Spreadsheet_XML_Fmt	1070	1005	ODF Spreadsheet flat XML format	application/vnd.oasis.opendocument.spreadsheet.xml	FODS	adSPREADSHEET	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
ODF_Text_XML_Fmt	1071	1006	ODF Text flat XML format	application/vnd.oasis.opendocument.text.xml	FODT	adWORDPROCESSOR	
ODF_Extension_Fmt	1072	1007	ODF Extension format	application/vnd.openofficeorg.extension	OXT	adMISC	
StarView_Metafile_Fmt	1073	1008	OpenOffice StarView MetaFile format	image/x-svm	SVM	adRASTERIMAGE	
BBeB_LRF_eBook_Fmt	1074	1009	Broad Band eBook (BBeB) in LRF format	application/x-ext-lrf	LRF	adWORDPROCESSOR	
GPG_Trust_DB_Fmt	1075	1010	GPG trust database format		GPG	adMISC	
VICE_Emulator_Fmt	1076	1011	VICE (Versatile Commodore Emulator) format		VSF	adMISC	
Portable_Game_ Notation_Fmt	1077	1012	Portable Game Notation chess format	application/vnd.chess-pgn	PGN	adWORDPROCESSOR	
Doom_WAD_Fmt	1078	1013	Doom IWAD/PWAD format	application/x-doom	WAD	adMISC	
Device_Tree_Blob_Fmt	1079	1014	Linux Device Tree Blob format		DTB	adMISC	
BDF_Font_Fmt	1080	1015	Glyph Bitmap Distribution Format	application/x-font-bdf	BDF	adFONT	
PC_Screen_Font_Fmt	1081	1016	PC Screen Font format	application/x-font-psf	PSF	adFONT	
JNLP_Fmt	1082	1017	Java Network Launching Protocol	application/x-java-jnlp-file	JNLP	adWORDPROCESSOR	xmlsr
XAML_Browser_ Application_Fmt	1083	1018	XAML Browser Application (XBAP) format	application/x-ms-xbap	XBAP	adWORDPROCESSOR	xmlsr
MS_Binder_Fmt	1084	1019	Microsoft Office Binder format	application/x-msbinder	OBP	adENCAPSULATION	
XAP_Fmt	1085	1020	Microsoft Silverlight application (XAP) format	application/x-silverlight-app	XAP	adENCAPSULATION	
StuffIt_X_Fmt	1086	1021	StuffIt X (SITX) archive format	application/x-stuffitx	SITX	adENCAPSULATION	
FIG_Fmt	1087	1022	Facility for Interactive Generation of figures (FIG) image format	application/x-xfig	FIG	adVECTORGRAPHIC	
XPInstall_Fmt	1088	1023	XPInstall Cross-Platform Installer Module (XPI) format	application/x-xpinstall	XPI	adENCAPSULATION	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
XDF_Fmt	1089	1024	Extensible Data Format (XDF) XML format		XDF	adWORDPROCESSOR	xmlsr
MXML_Fmt	1090	1025	MXML UI markup language XML format		MXML	adWORDPROCESSOR	xmlsr
MusicXML_Fmt	1091	1026	MusicXML format	application/vnd.recordare.musicxml	MXL	adENCAPSULATION	xmlsr
Finale_Fmt	1092	1027	Finale audio format		MUS	adSOUND	
Spotfire_DXP_Fmt	1093	1028	TIBCO Spotfire DXP data format	application/vnd.spotfire.dxp	DXP	adANALYTICS	
MS_Office_Theme_ 2007_Fmt	1094	1029	Microsoft Office theme format	application/vnd.ms-officetheme	THMX	adMISC	
Adobe_AIR_Installer_Fmt	1095	1030	Adobe AIR application installer package	application/vnd.adobe.air-application-installer-package+zip	AIR	adENCAPSULATION	
Flex_Project_Fmt	1096	1031	Adobe Flash Flex project file format	application/vnd.adobe.fxp	FXP	adENCAPSULATION	
FoxPro_Fmt	1097	1032	FoxPro compiled source format		FXP	adLIBRARY	
VST_Preset_Fmt	1098	1033	Virtual Studio Technology (VST) preset format		FXP	adSOUND	
Mischief_Image_Fmt	1099	1034	Mischief vector graphics image format		ART	adVECTORGRAPHIC	
FreeArc_Fmt	1100	1035	FreeArc archive format	application/x-freearc	ARC	adENCAPSULATION	
Autodesk_3ds_Fmt	1101	1036	Autodesk 3ds format	application/x-3ds	3DS	adCAD	
Monkeys_Audio_Fmt	1102	1037	Monkey's Audio format		APE	adSOUND	
CALS_Fmt	1103	1038	CALS raster image format		CAL	adRASTERIMAGE	
Dr_Halo_PAL_Fmt	1104	1039	Dr Halo raster image PAL file format		PAL	adRASTERIMAGE	
DPG_Fmt	1105	1040	Nintendo DS DPG video format		DPG	adMOVIE	
JPEG_XR_Fmt	1106	1041	JPEG XR (extended range) image format	image/vnd.ms-photo	JXR, HDP	adRASTERIMAGE	
TCR_eBook_Fmt	1107	1042	TCR/ZVR (Text Compression for Reader) eBook format		TCR, ZVR	adWORDPROCESSOR	
IHEX_Fmt	1108	1043	Intel Hex format		IHEX	adENCAPSULATION	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
QCOW_Fmt	1109	1044	QEMU Copy On Write		QCOW	adENCAPSULATION	
VDI_Fmt	1110	1045	VirtualBox Disk Image		VDI	adENCAPSULATION	
OneNote_Alternate_Fmt	1111	1046	OneNote Alternative Packaging Format			adWORDPROCESSOR	onealtsr
RMS_Protected_Fmt	1112	1047	Rights Management Services (RMS)-protected format		PFILE, PPDF, PJPG, PTXT	adWORDPROCESSOR	pfilesr
Portfolio_PDF_Fmt	1113	1048	Portfolio PDF File	application/pdf	PDF	adWORDPROCESSOR	pdfsr
Crystal_Reports_Fmt	1114	1049	SAP Crystal Reports format	application/x-rpt	RPT	adANALYTICS	
Thumbs_db_Fmt	1115	1050	Microsoft Windows thumbs.db format		DB	adENCAPSULATION	
PagePlus_Fmt	1116	1051	Serif PagePlus format		PPP	adDESKTOPPUBLSH	
MS_Project_Exchange_Fmt	1117	1052	Microsoft Project Exchange format		MPX	adSCHEDULE	
MS_Management_Pack_MPX_Fmt	1118	1053	Microsoft Systems Center Operation Manager (SCOM) management pack MPX format		MPX	adMISC	xmlsr
AutoCAD_VBA_Project_Fmt	1119	1054	AutoCAD VBA project format		DVB	adMISC	
PLY_ASCII_Fmt	1120	1055	Polygon File Format (PLY) ASCII format		PLY	adCAD	
PLY_Binary_Fmt	1121	1056	Polygon File Format (PLY) binary format		PLY	adCAD	
JavaView_JVX_Fmt	1122	1057	JavaView XML (JVX) format		JVX	adCAD	xmlsr
X3D_Fmt	1123	1058	Extensible 3d Graphics (X3D) XML format	model/x3d+xml	X3D	adCAD	
ZBrush_Project_Fmt	1124	1059	ZBrush ZProject (ZPR) format		ZPR	adCAD	
ZBrush_Tool_Fmt	1125	1060	ZBrush ZTtool (ZTL) format		ZTL	adCAD	
Windows_Installer_Patch_Fmt	1126	1061	Microsoft Windows Installer Patch Package (MSP) format		MSP	adENCAPSULATION	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Windows_Installer_ Transform_Fmt	1127	1062	Microsoft Windows Installer Transform (MST) format		MST	adENCAPSULATION	
Lotus_Approach_Fmt	1128	1063	Lotus Approach format	application/vnd.lotus-approach	APR, MPR	adDATABASE	
Outlook_SendRcv_ Settings_Fmt	1129	1064	Microsoft Outlook 2002 Send-Receive Settings		SRS	adMISC	
MS_Publisher_Scheme_ Fmt	1130	1065	Microsoft Publisher colour scheme		SCM	adMISC	
SO_Chart_Fmt	1131	1066	Star Office 4,5 Chart	application/vnd.stardivision.chart	SDS	adVECTORGRAPHIC	
SO_Database_Fmt	1132	1067	Star Office 4,5 Database	application/vnd.stardivision.base	SDB	adDATABASE	
SO_Library_Fmt	1133	1068	Star Office 4,5 Library		SBL	adLIBRARY	
PageMaker_Document_ Fmt	1134	1069	Adobe PageMaker document	application/pagemaker	PMD	adDESKTOPPUBLSH	
MS_DTS_Fmt	1135	1070	Microsoft Data Transformation Services (DTS) package file		DTS	adMISC	
Cognos_PowerPlay_ PPR_Fmt	1136	1071	Cognos PowerPlay up to version 7 (PPR) format		PPR	adANALYTICS	
Visual_Studio_SUO_Fmt	1137	1072	Microsoft Visual Studio solution user options (suo) file		SUO	adMISC	
MS_GraphEdit_Fmt	1138	1073	Microsoft GraphEdit File format		GRF	adMISC	
ArcGIS_Graph_Fmt	1139	1074	ArcGIS Graph format		GRF	adGIS	
SID_Audio_Fmt	1140	1075	SID Audio format	audio/prs.sid	SID	adSOUND	
MrSID_Fmt	1141	1076	LizardTech MrSID image format	image/x-mrsid	SID	adRASTERIMAGE	
Cardfile_Fmt	1142	1077	Microsoft Windows Cardfile address book format	application/x-mscardfile	CRD	adWORDPROCESSOR	
MS_Word_Mac_4_Fmt	1143	205	Microsoft Word for Macintosh (version 4,5)	application/msword	DOC	adWORDPROCESSOR	mbsr
WordPerfect_5_Fmt	1144	80	WordPerfect (version 5)	application/x-corel-wordperfect	WOP, DOC	adWORDPROCESSOR	wosr
WordPerfect_6_Fmt	1145	178	Corel WordPerfect (version 6 and higher)	application/x-corel-wordperfect	WPD	adWORDPROCESSOR	wp6sr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
WordPerfect_Graphics_1_Fmt	1146	85	WordPerfect Graphics (version 1)	application/vnd.wordperfect	WPG, QPG	adRASTERIMAGE, adVECTORGRAPHIC	
Organization_Chart_Fmt	1147	1078	OrgPlus Organization Chart	application/orgplus	OPX	adDATABASE	
Lotus_Organizer_Fmt	1148	1079	Lotus Organizer documents	application/vnd.lotus-organizer	OR2, OR3, OR4, OR5, OR6	adSCHEDULE	
MS_DBML_Fmt	1149	1080	Microsoft Database Markup Language XML document		DBML	adWORDPROCESSOR	
XMind_Fmt	1150	1081	XMind document	application/xmind	XMIND	adPRESENTATION	
MSI_Cerius_Fmt	1151	1082	MSI Cerius chemical formula document	chemical/x-cerius	MSI	adSCIENTIFIC	
GenBank_Fmt	1152	1083	GenBank DNA character sequence document	chemical/x-genbank	GB	adSCIENTIFIC	
GIS_World_File_Fmt	1153	1084	ESRI GIS World file		BPW, GFW, JGW, J2W, PGW, SDW, TFW, WLD	adGIS	afsr
GIS_Projection_Metadata_Fmt	1154	1085	ESRI Projection Metadata (PRJ) file		PRJ	adGIS	
PowerWorld_Binary_Fmt	1155	1086	PowerWorld Binary (PWB) file		PWB	adCAD	
PowerWorld_Display_Fmt	1156	1087	PowerWorld Display (PWD) file		PWD	adCAD	
ArcXML_Fmt	1157	1088	ESRI ArcIMS project XML file (ArcXML)		AXL	adGIS	
GAMS_GDX_Fmt	1158	1089	General Algebraic Modeling System (GAMS) Data Exchange (GDX) format		GDX	adSCIENTIFIC	
ArcMap_MXD_Fmt	1159	1090	ArcMap Map Exchange Document project (MXD)		MXD	adGIS	
RRDtool_Fmt	1160	1091	RRDtool (Round Robin Database) data file		RRD	adDATABASE	
HWPX_Fmt	1161	1092	Hangul HWPX document	application/hwp+zip	HWPX	adWORDPROCESSOR	
SolidWorks_2015_Fmt	1162	1093	SolidWorks (2015 onwards) file		SLDPRT, SLDDRW,	adCAD	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
					SLDASM		
MS_Photo_Editor_Fmt	1163	1094	Microsoft Photo Editor 'embedded GIF' file	application/vnd.ms-photo-editor		adRASTERIMAGE	
MS_Word_HTML_Fmt	1164	1095	Microsoft Word HTML format		DOC, HTM	adWORDPROCESSOR	
MS_Excel_HTML_Fmt	1165	1096	Microsoft Excel HTML format		XLS, HTM	adWORDPROCESSOR	
Portable_FloatMap_Fmt	1166	1097	Portable FloatMap (PFM) image	image/x-portable-floatmap	PFM	adRASTERIMAGE	
RGBE_Fmt	1167	1098	Radiance RGBE (HDR) image	image/vnd.radiance	HDR, PIC, RGBE, XYZE	adRASTERIMAGE	
APNG_Fmt	1168	1099	Animated Portable Network Graphics (Animated-PNG)	image/apng	APNG, PNG	adANIMATION	kppngrdr
Enhanced_Compressed_Wavelet_Fmt	1169	1100	Enhanced Compressed Wavelet image	image/ecw	ECW	adRASTERIMAGE	
Ensoniq_Waveset_Fmt	1170	1101	Ensoniq Waveset audio data file		ECW	adSOUND	
Corel_Photo_Paint_Fmt	1171	1102	Corel Photo Paint (version 7 and higher)	image/x-corelphotopaint	CPT	adRASTERIMAGE	
OpenRaster_Fmt	1172	1103	OpenRaster image	image/openraster	ORA	adRASTERIMAGE	
Krita_Fmt	1173	1104	Krita image	application/x-krita	KRA	adRASTERIMAGE	
Gerber_Fmt	1174	1105	Gerber image format	application/vnd.gerber	GBR	adVECTORGRAPHIC	
PGML_Fmt	1175	1106	Precision Graphics Markup Language		PGML	adVECTORGRAPHIC	
Away3D_Fmt	1176	1107	Away3D scene file		AWD	adCAD	
CAD_3MF_Fmt	1177	1108	3D Manufacturing Format document	application/vnd.ms-package.3dmanufacturing-3dmodel+xml	3MF	adCAD	
AMF_Fmt	1178	1109	Additive manufacturing file format (AMF) document	application/x-amf	AMF	adCAD	xmlsr
C3D_Fmt	1179	1110	Coordinate 3D (C3D) format		C3D	adCAD	
CAD_3DSystems_BFF_Fmt	1180	1111	3D Sprint (3D Systems) SLA Build file		BFF	adCAD	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
NRRD_Fmt	1181	1112	NRRD (nearly raw raster data) image format		NRRD	adRASTERIMAGE	
Cinema_4D_Fmt	1182	1113	Cinema 4D model		C4D	adCAD	
FBX_ASCII_Fmt	1183	1114	Kaydara FBX project (ASCII)		FBX	adCAD	
FBX_Binary_Fmt	1184	1115	Kaydara FBX project (binary)		FBX	adCAD	
Wavefront_OBJ_Fmt	1185	1116	Wavefront OBJ geometry definition file		OBJ	adCAD	
Wavefront_MTL_Fmt	1186	1117	Wavefront Material Template Library (MTL)		MTL	adCAD	
MS_Power_BI_ Template_Fmt	1187	1118	Microsoft Power BI Desktop template format		PBIT	adANALYTICS	
Windows_Sticky_Notes_ Fmt	1188	1119	Microsoft Windows Sticky Notes format		SNT	adWORDPROCESSOR	
BlakHole_Fmt	1189	1120	BlakHole compression format		BH	adENCAPSULATION	
PowerArchiver_Fmt	1190	1121	PowerArchiver PA compression format		PA	adENCAPSULATION	
PageMagic_Fmt	1191	1122	NEBS PageMagic format		DTP	adDESKTOPPUBLSH	
PIM_Archiver_Fmt	1192	1123	PIM Archiver format		PIM	adENCAPSULATION	
Softdisk_Text_ Compressor_Fmt	1193	1124	Softdisk Text Compressor format		CTX	adENCAPSULATION	
Ability_PhotoPaint_Fmt	1194	1125	Ability Office PhotoPaint image		APX	adRASTERIMAGE	
Softlib_Fmt	1195	1126	Softdisk Softlib compression format		SLB	adENCAPSULATION	
Timeworks_Publisher_ Fmt	1196	1127	Timeworks Publisher (Publish It) format		DTP	adDESKTOPPUBLSH	
Scribe_Fmt	1197	1128	Scribe markup language and word processing system		MSS	adWORDPROCESSOR	afsr
SQLite_Write_Ahead_ Log_Fmt	1198	1129	SQLite Write-Ahead Log file		WAL	adDATABASE	
SQLite_WAL_Index_Fmt	1199	1130	SQLite WAL-index (shm)		SHM	adDATABASE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			file				
AutoForm_Design_Fmt	1200	1131	AutoForm Design file		AFD	adCAD	
TSV_Fmt	1201	1132	Tab-separated values (TSV) file	text/tab-separated-values	TSV, TAB	adWORDPROCESSOR	afsr, afsr
OpenStreetMap_XML_Fmt	1202	1133	OpenStreetMap XML data		OSM	adGIS	
OpenStreetMap_PBF_Fmt	1203	1134	OpenStreetMap Protocolbuffer Binary Format data file (.osm.pbf)		PBF	adGIS	
Nero_Audio_Compilation_Fmt	1204	1135	Nero Audio-CD compilation file		NRA	adMISC	
Nero_ISO_Compilation_Fmt	1205	1136	Nero ISO compilation file		NRI	adMISC	
WordStar_for_Windows_Fmt	1206	1137	WordStar for Windows file		WSD	adWORDPROCESSOR	stringssr
MS_Outlook_PAB_Fmt	1207	1138	Microsoft Outlook Personal Address Book (PAB)		PAB	adMISC	
HLSL_FXO_Fmt	1208	1139	DirectX High-Level Shader Language (HLSL) pre-compiled shader		FXO	adCAD	
HLSL_CSO_Fmt	1209	1140	DirectX High-Level Shader Language (HLSL) compiled shader object		CSO	adCAD	
Oberon_Document_Fmt	1210	1141	Component Pascal / Oberon Document file		ODC	adSOURCECODE	
Oberon_Symbol_Fmt	1211	1142	Component Pascal / Oberon Symbol file		OSF	adOBJECTMODULE	
Oberon_Code_Fmt	1212	1143	Component Pascal / Oberon Code (executable and loadable object) file		OCF	adEXECUTABLE	
Python_Bytecode_Fmt	1213	1144	Python compiled bytecode	application/x-bytecode.python	PYC	adEXECUTABLE	
PCPaint_Fmt	1214	1145	PCPaint / Pictor Paint image format		PIC	adRASTERIMAGE	
PCRaster_Map_Fmt	1215	1146	PCRaster Map / Cross System Format		MAP, CSF	adGIS	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			geographical data				
COM_Type_Library_Fmt	1216	1147	Microsoft Component Object Model (COM) Type library		TLB	adLIBRARY	
MS_Visual_C_Export_ Fmt	1217	1148	Microsoft Visual C++ Export file		EXP	adLIBRARY	
Lotus_Organizer_Report_ Fmt	1218	1149	Lotus Organizer report document		REP	adSCHEDULE	
Audible_Audiobook_AA_ Fmt	1219	1150	Audible Audiobook (AA) file	audio/audible	AA	adSOUND	
DOS_RED_Fmt	1220	1151	MS-DOS RED installer library format		RED	adLIBRARY	
CA_ZIPXP_Fmt	1221	1152	CA Technologies ZIPXP compressed document		CAZ	adENCAPSULATION	
Kindle_Topaz_Fmt	1222	1153	Amazon Kindle Topaz eBook		AZW, AZW1, TPZ	adWORDPROCESSOR	
Windows_Shim_ Database_Fmt	1223	1154	Microsoft Windows Shim Database file		SDB	adDATABASE	
MS_Incremental_Linker_ Fmt	1224	1155	Microsoft Visual Studio incremental linker file		ILK	adMISC	
Lotus_Smart_Icon_Fmt	1225	1156	Lotus Smart Icon image file		SMI	adRASTERIMAGE	
Lotus_Organizer_Layout_ Fmt	1226	1157	Lotus Organizer print/paper layout file		PLT	adSCHEDULE	
CMZ_Fmt	1227	1158	CMZ compression format		CMZ	adENCAPSULATION	
RFFlow_Fmt	1228	1159	RFFlow flowchart document		FLO	adPRESENTATION	
InstallShield_Script_Fmt	1229	1160	InstallShield script document		INS	adENCAPSULATION	
InstallShield_Rules_Fmt	1230	1161	InstallShield Compiled Rules file		INX	adENCAPSULATION	
Windows_FTS_Fmt	1231	1162	Microsoft Windows 95/NT help full-text-search file		FTS	adDATABASE	
DVD_Info_Fmt	1232	1163	DVD Information (IFO) file	content/dvd	IFO	adDATABASE	
Emacs_Lisp_Bytecode_	1233	1164	Byte-compiled Lisp	application/x-bytecode.elisp	ELC	adEXECUTABLE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Fmt			(Emacs/XEmacs)				
Windows_Resource_Fmt	1234	1165	Microsoft Windows binary resource file		RES	adMISC	
MS_Precompiled_ Header_Fmt	1235	1166	Microsoft Visual C/C++ binary pre-compiled header		PCH	adMISC	
Borland_Turbo_Project_ Fmt	1236	1167	Borland Turbo C project file		PRJ	adMISC	
PS_Font_Descriptor_Fmt	1237	1168	PostScript binary Font Descriptor file		NTF	adFONT	
MySQL_Index_Fmt	1238	1169	MySQL MyISAM Table index		MYI	adDATABASE	
MS_SQL_Fmt	1239	1170	Microsoft SQL Server primary database file		MDF	adDATABASE	
DNL_eBook_Fmt	1240	1171	DNAML DNL eBook		DNL	adWORDPROCESSOR	
GD_Image_Fmt	1241	1172	GD Library image		GD, GD2	adRASTERIMAGE	
ITunes_Library_Fmt	1242	1173	Apple iTunes music library		ITL	adDATABASE	
MS_SQM_Fmt	1243	1174	Microsoft Windows Live Messenger/Mail log file		SQM	adMISC	
VIFF_Fmt	1244	1175	Khoros Visualization Image File Format (VIFF)	image/x-viff	XV, VIF, VIFF	adRASTERIMAGE	
JBIG_Fmt	1245	1176	JBIG (JBIG1) image	image/jbig	JBG, JBIG, BIE	adRASTERIMAGE	
CodeWarrior_Project_ Fmt	1246	1177	CodeWarrior C/C++ project		MCP	adMISC	
PaintShop_Pro_JBF_Fmt	1247	1178	PaintShop Pro JBF image cache file	image/jbf	JBF	adMISC	
Delphi_Diagram_ Portfolio_Fmt	1248	1179	Delphi Diagram Portfolio file		DDP	adMISC	
Adobe_Swatch_ Exchange_Fmt	1249	1180	Adobe Swatch Exchange Format		ASE, ASEF	adRASTERIMAGE	
ASCII_Scene_Exporter_ Fmt	1250	1181	Autodesk 3ds Max ASCII Scene Exporter file		ASE	adCAD	
AVR_Fmt	1251	1182	AVR (Audio Visual Research) format		AVR	adSOUND	
Winamp_AVS_Fmt	1252	1183	Winamp AVS (Advanced		AVS	adSOUND	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			Visualization Studio) plug-in file				
After_Effects_Project_Fmt	1253	1184	Adobe After Effects project		AEP	adMOVIE	
Anfy_Applet_Generator_Fmt	1254	1185	Anfy (Java) Applet Generator file		AJP	adMISC	
SmartCipher_Fmt	1255	1186	SmartCipher encrypted file			adENCAPSULATION	
General_Exchange_Fmt	1256	1187	General Exchange Format (GXF)	application/gxf	GXF	adMOVIE	
Maxis_XA_Fmt	1257	1188	Maxis XA audio file		XA	adSOUND	
NUT_Fmt	1258	1189	NUT Open Container Format		NUT	adMOVIE	
OpenMG_Audio_Fmt	1259	1190	Sony OpenMG Audio (OMA) container file		OMA, OMG	adSOUND	
TXD_Fmt	1260	1191	Renderware Texture Dictionary (TXD) file		TXD	adRASTERIMAGE	
DFA_Fmt	1261	1192	DreamForge DFA FMV format		DFA	adMOVIE	
FunCom_ISS_Fmt	1262	1193	FunCom ISS audio		ISS	adSOUND	
Sony_MSV_Fmt	1263	1194	Sony Compressed Audio (MSV/DVF)		DVF, ICS, MSV	adSOUND	
THP_Fmt	1264	1195	GameCube THP Video		THP	adMOVIE	
Smush_Animation_Fmt	1265	1196	Smush Animation Format (SAN)		SAN, NUT	adANIMATION	
SIFF_Audio_Fmt	1266	1197	Beam Software SIFF audio file		SON	adSOUND	
SNES_SPC_Fmt	1267	1198	SNES SPC700 audio file		SPC	adSOUND	
Sierra_VMD_Fmt	1268	1199	Sierra Video and Music Data format		VMD	adMOVIE	
VTech_MJP_Fmt	1269	1200	VTech MHP video format		MJP	adMOVIE	
Nullsoft_Video_Fmt	1270	1201	Nullsoft Video format (NSV)		NSV	adMOVIE	
Shorten_Fmt	1271	1202	Shorten audio file		SHN	adSOUND	
Leitch_Video_Fmt	1272	1203	Leitch Exchange Format		LXF	adMOVIE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			video (LXF)				
ETV_Fmt	1273	1204	ETV video file		ETV	adMOVIE	
TAK_Audio_Fmt	1274	1205	TAK audio file		TAK	adSOUND	
Maelstrom_ANM_Fmt	1275	1206	Maelstrom ANM animation		ANM	adANIMATION	
SW_ANM_Fmt	1276	1207	Savage Warriors ANM animation		ANM	adANIMATION	
DeluxePaint_Animation_Fmt	1277	1208	DeluxePaint animation		ANM	adANIMATION	
Crack_Art_Fmt	1278	1209	Crack Art image		CA1	adRASTERIMAGE	
Time_Shift_Video_Fmt	1279	1210	Time Shift Video (TSV) format		TSV	adMOVIE	
XBV_Fmt	1280	1211	XBV video		XBV	adMOVIE	
HNM4_Fmt	1281	1212	CRYO HNM4 video		HNM	adMOVIE	
HNM6_Fmt	1282	1213	CRYO HNM6 video		HNM, HNS	adMOVIE	
NXV_Fmt	1283	1214	NXV video		NXV	adMOVIE	
VP5_Fmt	1284	1215	On2 VP5 video		VP5	adMOVIE	
FutureVision_FST_Fmt	1285	1216	FutureVision FST video		FST	adMOVIE	
Electronic_Arts_Audio_Fmt	1286	1217	Electronic Arts audio file		STR	adSOUND	
YOP_Fmt	1287	1218	Psygnosis YOP video		YOP	adMOVIE	
Matrox_Setup_Program_Fmt	1288	1219	Matrox Setup Program Archive MVA file		MVA	adMISC	
Vivado_Design_Suite_Fmt	1289	1220	Xilinx Vivado Design Suite file		VDS	adMISC	
Meridian_Lossless_Packing_Fmt	1290	1221	Meridian Lossless Packing Audio file		MLP	adSOUND	
Electronic_Arts_SEAD_Fmt	1291	1222	Electronic Arts SEAD audio		TGV	adSOUND	
Electronic_Arts_MPC_Fmt	1292	1223	Electronic Arts MPC video		MPC	adMOVIE	
PMP_Fmt	1293	1224	PMP video		PMP	adMOVIE	
DEGAS_Fmt	1294	1225	DEGAS (Design &		PI1, PI2, PI3	adRASTERIMAGE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			Entertainment Graphic Arts System) image				
DEGAS_Compressed_Fmt	1295	1226	DEGAS (Design & Entertainment Graphic Arts System) compressed image		PC1, PC2, PC3	adRASTERIMAGE	
AutoCAD_Plotter_Fmt	1296	1227	AutoCAD Plot Style and Configuration files		CTB, STB, PC3, PMP	adCAD	
Tiny_Stuff_Fmt	1297	1228	Tiny Stuff image		TNY, TN1, TN2, TN3.TN4.TN5.TN6	adRASTERIMAGE	
JV_Video_Fmt	1298	1229	Bitmap Brothers JV video		JV	adMOVIE	
REDCode_Fmt	1299	1230	REDCode video format		R3D	adMOVIE	
SIFF_Video_Fmt	1300	1231	Beam Software SIFF video file		VB	adMOVIE	
VP6_Fmt	1301	1232	On2 VP6 video		VP6	adMOVIE	
MTV_Fmt	1302	1233	Chinese MP4/MTV video		MTV	adMOVIE	
RSO_Fmt	1303	1234	Mindstorm RSO audio		RSO	adSOUND	
Star3_Fmt	1304	1235	Creative Labs Star 3 audio		ST3	adSOUND	
DXA_Fmt	1305	1236	Runesoft DXA video		DXA	adMOVIE	
MTH_Fmt	1306	1237	Nintendo GameCube video file		MTH	adMOVIE	
MAD_Fmt	1307	1238	Electronic Arts MAD video file		MAD	adMOVIE	
Bink2_Fmt	1308	1239	Bink Video 2 audio-video container		BIK, BK2	adMOVIE	
PVA_Fmt	1309	1240	TechnoTrend PVA video		PVA	adMOVIE	
Interplay_ACMP_Fmt	1310	1241	Interplay ACMP audio			adSOUND	
Ipix_Fmt	1311	1242	Ipix spherical image		IPX	adRASTERIMAGE	
IVR_Fmt	1312	1243	RealNetworks Internet Video Recording (IVR) file		IVR	adMOVIE	
NuppelVideo_Fmt	1313	1244	NuppelVideo file		NUV	adMOVIE	
VFlash_PTX_Fmt	1314	1245	VTech V.Flash VTX image		PTX	adRASTERIMAGE	
PMD_Ringtone_Fmt	1315	1246	Polyphonic Ringtone PMD	application/x-pmd	PMD	adSOUND	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			audio				
RoQ_Fmt	1316	1247	RoQ video		ROQ	adMOVIE	
CRYO_APC_Fmt	1317	1248	CRYO Interactive APC audio		APC, HNM, BF, ZIK	adSOUND	
VGZ_Fmt	1318	1249	VGZ video		VGZ	adMOVIE	
Novastorm_Video_Fmt	1319	1250	Novastorm Media video file		FA, FLM	adMOVIE	
UTalk_Fmt	1320	1251	MicroTalk/UTalk audio		UTK	adSOUND	
Xbox_XMV_Fmt	1321	1252	Microsoft Xbox XMV video		XMV	adMOVIE	
AbiWord_Fmt	1322	1253	AbiWord document	application/x-abiword	ABW	adWORDPROCESSOR	
AbiWord_Template_Fmt	1323	1254	AbiWord template		ABT	adWORDPROCESSOR	
Psion_Word_Fmt	1324	1255	Psion EPOC Word document		PSI, PSITEXT	adWORDPROCESSOR	stringssr
Psion_Sheet_Fmt	1325	1256	Psion EPOC Sheet spreadsheet		PSISHEET	adSPREADSHEET	
Psion_Sketch_Fmt	1326	1257	Psion EPOC Sketch image			adRASTERIMAGE	
Psion_Record_Fmt	1327	1258	Psion EPOC Record audio			adSOUND	
Psion_MBM_Fmt	1328	1259	Psion EPOC Multi-Bitmap (MBM) image		MBM	adRASTERIMAGE	
Psion_TextEd_Fmt	1329	1260	Psion EPOC TextEd file			adWORDPROCESSOR	stringssr
Psion_AIF_Fmt	1330	1261	Psion EPOC Application Information File (AIF)		AIF	adRASTERIMAGE	
Psion_PIC_Fmt	1331	1262	Psion 3 PIC bitmap		PIC	adRASTERIMAGE	
Psion_Object_Fmt	1332	1263	Psion 3 OPL Object File		OPA, OPO	adENCAPSULATION	
Psion_Executable_Fmt	1333	1264	Psion 3 IMG/APP executable		IMG, APP	adEXECUTABLE	
Psion_Sound_Fmt	1334	1265	Psion 3 Sound file		WVE	adSOUND	
Psion_Database_Fmt	1335	1266	Psion EPOC Database			adDATABASE	
Psion_Word_3_Fmt	1336	1267	Psion 3 Word document		WRD	adWORDPROCESSOR	stringssr
Psion_Sheet_3_Fmt	1337	1268	Psion 3 Sheet spreadsheet		SPR	adSPREADSHEET	
Zoner_Draw_Fmt	1338	1269	Zoner Draw / Zoner Callisto Metafile (ZMF)		ZMF	adVECTORGRAPHIC	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Zoner_BMI_Fmt	1339	1270	Zoner BMI image		BMI	adRASTERIMAGE	
TealDoc_Fmt	1340	1271	TealDoc PalmOS eBook		PDB	adWORDPROCESSOR	
TealPaint_Fmt	1341	1272	TealPaint PalmOS eBook		PDB	adWORDPROCESSOR	
PalmDOC_Fmt	1342	1273	PalmDOC / Aportis DOC eBook	application/x-aportisdoc	PRC, PDB	adWORDPROCESSOR	
QiOO_Fmt	1343	1274	QiOO mobile eBook		JAR	adWORDPROCESSOR	
Plucker_Fmt	1344	1275	Plucker eBook	application/prs.plucker	PDB	adWORDPROCESSOR	
eReader_Fmt	1345	1276	eReader (Palm Reader/ Peanut Reader) eBook		PDB	adWORDPROCESSOR	
Quickword_Fmt	1346	1277	PalmOS Quickword document		PRC	adWORDPROCESSOR	stringssr
Quicksheet_Fmt	1347	1278	PalmOS Quicksheet document		PRC	adSPREADSHEET	
Quickpoint_Fmt	1348	1279	PalmOS Quickpoint document		PRC	adPRESENTATION	
TealMeal_Fmt	1349	1280	TealMeal PalmOS database		PDB	adDATABASE	
zTXT_Fmt	1350	1281	zTXT eBook	application/x-pdb-ztxt-ebook	PDB	adWORDPROCESSOR	
TomeRaider_Fmt	1351	1282	TomeRaider eBook		TR	adWORDPROCESSOR	
TomeRaider_PDB_Fmt	1352	1283	TomeRaider PDB eBook		TR2, TR3	adWORDPROCESSOR	
WordSmith_Fmt	1353	1284	PalmOS Wordsmith document			adWORDPROCESSOR	
iSilo_Fmt	1354	1285	PalmOS iSilo document	application/x-pdb-isilo-ebook	PDB	adWORDPROCESSOR	
SuperMemo_Fmt	1355	1286	PalmOS SuperMemo document		KNO, PDB	adWORDPROCESSOR	
BDicty_Fmt	1356	1287	PalmOS BDicty document		PDB	adWORDPROCESSOR	
PalmOS_Executable_Fmt	1357	1288	PalmOS executable	application/vnd.palm	PRC	adEXECUTABLE	
PalmOS_Library_Fmt	1358	1289	PalmOS dynamic library		PRC	adLIBRARY	
Shanda_Bambook_Fmt	1359	1290	Shanda Bambook eBook	application/x-snb-ebook	SNB	adWORDPROCESSOR	
PMLZ_Fmt	1360	1291	Palm Markup Language (PMLZ) eBook		PMLZ	adWORDPROCESSOR	
Rocket_eBook_Fmt	1361	1292	Rocket eBook	application/x-rocketbook	RB	adWORDPROCESSOR	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
iBooks_Author_Fmt	1362	1293	Apple iBooks Author eBook	application/vnd.apple.ibauthor	IBA	adWORDPROCESSOR	
Statistica_Spreadsheet_Fmt	1363	1294	Statsoft Statistica Spreadsheet		STA	adSPREADSHEET	
Statistica_Graph_Fmt	1364	1295	Statsoft Statistica Graph File		STG	adVECTORGRAPHIC	
Statistica_Scrollsheet_Fmt	1365	1296	Statsoft Statistica Scrollsheet		SCR	adSPREADSHEET	
Apple_Newton_Package_Fmt	1366	1297	Apple Newton executable/installer/file		PKG	adEXECUTABLE	
Adobe_Zip_Extension_Fmt	1367	1298	Adobe Zip Format Extension Package (ZXP)	application/vnd.adobe.air-ucf-package+zip	ZXP	adENCAPSULATION	
Uniform_Office_Fmt	1368	1299	Uniform Office Format document		UOF	adWORDPROCESSOR	
Uniform_Office_Text_Fmt	1369	1300	Uniform Office Format word processing document	application/vnd.uof.text	UOF, UOT	adWORDPROCESSOR	
Uniform_Office_Spreadsheet_Fmt	1370	1301	Uniform Office Format spreadsheet	application/vnd.uof.spreadsheet	UOF, UOS	adSPREADSHEET	
Uniform_Office_Presentation_Fmt	1371	1302	Uniform Office Format presentation	application/vnd.uof.presentation	UOF, UOP	adPRESENTATION	
Uniform_Office_Zip_Fmt	1372	1303	Uniform Office Format document, zip format		UOF	adWORDPROCESSOR	
Uniform_Office_Text_Zip_Fmt	1373	1304	Uniform Office Format word processing document, zip format	application/vnd.uof.text+zip	UOF, UOT	adWORDPROCESSOR	
Uniform_Office_Spreadsheet_Zip_Fmt	1374	1305	Uniform Office Format spreadsheet, zip format	application/vnd.uof.spreadsheet+zip	UOF, UOS	adSPREADSHEET	
Uniform_Office_Presentation_Zip_Fmt	1375	1306	Uniform Office Format presentation, zip format	application/vnd.uof.presentation+zip	UOF, UOP	adPRESENTATION	
MacDraft_Fmt	1376	1307	MacDraft drawing		DRW, MDD	adCAD	
RagTime_Fmt	1377	1308	RagTime document		RAG, RTD	adDESKTOPPUBLSH	
MacDraw_Fmt	1378	1309	MacDraw drawing			adVECTORGRAPHIC	
Wingz_Fmt	1379	1310	Wingz spreadsheet		WKZ	adSPREADSHEET	
Claris_Draw_Fmt	1380	1311	Claris Draw document			adVECTORGRAPHIC	
BeagleWorks_Word_Fmt	1381	1312	BeagleWorks (later		BW, WPW	adWORDPROCESSOR	stringssr

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
			WordPerfect Works) Word Processor document				
BeagleWorks_Database_Fmt	1382	1313	BeagleWorks (later WordPerfect Works) Database document		BW, WPW	adDATABASE	
BeagleWorks_Spreadsheet_Fmt	1383	1314	BeagleWorks (later WordPerfect Works) Spreadsheet document		BW, WPW	adSPREADSHEET	
BeagleWorks_Paint_Fmt	1384	1315	BeagleWorks (later WordPerfect Works) Paint document		BW, WPW	adRASTERIMAGE	
BeagleWorks_Draw_Fmt	1385	1316	BeagleWorks (later WordPerfect Works) Draw document		BW, WPW	adVECTORGRAPHIC	
GreatWorks_Word_Fmt	1386	1317	Symantec GreatWorks Word Processor document			adWORDPROCESSOR	stringssr
GreatWorks_Outline_Fmt	1387	1318	Symantec GreatWorks Outline document			adOUTLINE	
GreatWorks_Database_Fmt	1388	1319	Symantec GreatWorks Database document			adDATABASE	
GreatWorks_Spreadsheet_Fmt	1389	1320	Symantec GreatWorks Spreadsheet document			adSPREADSHEET	
GreatWorks_Draw_Fmt	1390	1321	Symantec GreatWorks Draw document			adVECTORGRAPHIC	
GreatWorks_Chart_Fmt	1391	1322	Symantec GreatWorks Chart document			adVECTORGRAPHIC	
MS_Works_3_Mac_WP_Fmt	1392	1323	Microsoft Works for Mac, version 3 and 4, Word Processor document	application/x-msworks	MSW, WPS	adWORDPROCESSOR	
MS_Works_3_Mac_DB_Fmt	1393	1324	Microsoft Works for Mac, version 3 and 4, Database	application/x-msworks	WDB	adDATABASE	
MS_Works_3_Mac_SS_Fmt	1394	1325	Microsoft Works for Mac, version 3 and 4, Spreadsheet	application/x-msworks	WKS	adSPREADSHEET	
MS_Works_3_Mac_Comm_Fmt	1395	1326	Microsoft Works for Mac, version 3 and 4, Communications document	application/x-msworks		adCOMMUNICATION	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MS_Works_3_Mac_ Draw_Fmt	1396	1327	Microsoft Works for Mac, version 3 and 4, Draw document	application/x-msworks	MSW	adVECTORGRAPHIC	
SAP_VDS_Fmt	1397	1328	SAP 3d Visual Enterprise VDS document		VDS	adCAD	
ZIPVFS_Fmt	1398	1329	ZIPVFS SQLite compressed read/write database		SQLITE	adDATABASE	
Right_Hemisphere_ Material_Fmt	1399	1330	Right Hemisphere Material file		RH, RHM	adCAD	
RH_Thumbnails_Fmt	1400	1331	Right Hemisphere thumbnail collection file		$RH	adCAD	
Westwood_Studios_ Audio_Fmt	1401	1332	Westwood Studios Audio file		AUD	adSOUND	
Shockwave_Stream_Fmt	1402	1333	Shockwave Stream audio-video file		STREAM	adMOVIE	
EGG_Video_Fmt	1403	1334	EGG video file		EGG	adMOVIE	
IRCAM_Fmt	1404	1335	IRCAM audio file		IRCAM	adSOUND	
Sierra_Audio_Fmt	1405	1336	Sierra Entertainment audio file		SOL	adSOUND	
TiVo_Video_Fmt	1406	1337	TiVo video		TY+	adMOVIE	
OptimFROG_Fmt	1407	1338	OptimFROG audio		OFR, OFS	adSOUND	
LPAC_Fmt	1408	1339	Lossless Predictive Audio Compression file		PAC	adSOUND	
RK_Audio_Fmt	1409	1340	RK Audio lossless compressed audio		RKA	adSOUND	
Asylum_Music_Fmt	1410	1341	Asylum Music Format		AMF	adSOUND	
Novastorm_Audio_Fmt	1411	1342	Novastorm Media audio file		SMP	adSOUND	
HHE_Fmt	1412	1343	HHE video		HHE	adMOVIE	
Portable_Voice_Fmt	1413	1344	Portable Voice Format audio		PVF	adSOUND	
CNM_Video_Fmt	1414	1345	Arxel CNM audio-video format		CNM	adMOVIE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Phantom_Cine_Fmt	1415	1346	Phantom Cine video file		CINE	adMOVIE	
MPEG2_Transport_ Stream_Fmt	1416	1347	MPEG-2 Transport Stream video		M2TS	adMOVIE	
Audacity_Project_Fmt	1417	1348	Audacity audio project file	application/x-audacity-project	AUP	adSOUND	
Voltage_VSF_Fmt	1418	1349	Micro Focus Voltage VSF encrypted file		VDF	adENCAPSULATION	
XLIFF_Fmt	1419	1350	XML Localization Interchange File Format (XLIFF)	application/xliff+xml	XLF	adWORDPROCESSOR	
XBRL_Fmt	1420	1351	Extensible Business Reporting Language (XBRL)		XBRL	adWORDPROCESSOR	
AuditXPressX_Fmt	1421	1352	AuditXPressX file		AXPX	adWORDPROCESSOR	
Box_Note_Fmt	1422	1353	Box Note document		BOXNOTE	adWORDPROCESSOR	
Hikvision_DVR_Fmt	1423	1354	Hikvision DVR video			adMOVIE	
Electronic_Arts_TGV_ Fmt	1424	1355	Electronic Arts TGV video		TGV	adMOVIE	
Electronic_Arts_TGQ_ Fmt	1425	1356	Electronic Arts TGQ video		TGQ	adMOVIE	
Reaper_Video_Fmt	1426	1357	Reaper Video		FMV	adMOVIE	
Lightweight_Video_Fmt	1427	1358	Lightweight Video Format (LVF)		LVF	adMOVIE	
Liquid_Audio_Fmt	1428	1359	Liquid Audio		LQT	adSOUND	
Extended_Instrument_ Fmt	1429	1360	eXtended Instrument generic audio tracker		XI	adSOUND	
MAML_Fmt	1430	1361	Microsoft Assistance Markup Language		AML	adWORDPROCESSOR	
MS_Chat_Character_Fmt	1431	1362	Microsoft Comic Chat Character		AVB	adRASTERIMAGE	
MS_Border_Fmt	1432	1363	Microsoft Office Border images		BDR	adRASTERIMAGE	
MS_Binary_Log_Fmt	1433	1364	Microsoft Binary Log file		BLG	adMISC	
MS_Reader_eBook_Fmt	1434	1365	Microsoft Reader eBook file		LIT	adWORDPROCESSOR	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
MS_Reader_ Annotations_Fmt	1435	1366	Microsoft Reader annotation file		EBO	adWORDPROCESSOR	
Amazon_KFX_Aux_Fmt	1436	1367	Amazon KFX eBook auxiliary format (2015)		KFX, AZW	adWORDPROCESSOR	
Amazon_KFX_Ion_Fmt	1437	1368	Amazon KFX eBook Ion format (2015)		KFX, AZW, ION	adWORDPROCESSOR	
MS_DPAPI_Fmt	1438	1369	Microsoft Data Protection API (DPAPI) data			adMISC	
MS_Streets_Fmt	1439	1370	Microsoft Streets & Trips map		EST	adGIS	
MS_Fast_Find_Index_ Fmt	1440	1371	Microsoft Office Fast Find Index		FFX	adMISC	
MS_Fresh_Paint_Fmt	1441	1372	Microsoft Fresh Paint image		FPPX	adRASTERIMAGE	
MS_Mathematics_Fmt	1442	1373	Microsoft Mathematics worksheet		GCW	adSCIENTIFIC	
MS_Instrument_ Definition_Fmt	1443	1374	Microsoft MIDI Instrument Definition File		IDF	adSOUND	
MS_Pocket_Streets_Fmt	1444	1375	Microsoft Pocket Streets map		MPS	adGIS	
Obfuscated_OpenType_ Fmt	1445	1376	Obfuscated OpenType font (ODTTF)	application/vnd.ms-package.obfuscated-opentype	ODTTF	adFONT	
Pfaff_PCS_Fmt	1446	1377	Pfaff PCS embroidery image		PCS	adVECTORGRAPHIC	
Janome_JEF_Fmt	1447	1378	Janome JEF embroidery format		JEF	adVECTORGRAPHIC	
Husqvarna_HUS_Fmt	1448	1379	Husqvarna Viking HUS embroidery format		HUS	adVECTORGRAPHIC	
Husqvarna_VIP_Fmt	1449	1380	Husqvarna Viking-Pfaff VIP embroidery format		VIP	adVECTORGRAPHIC	
Brother_PEC_Fmt	1450	1381	Brother PEC embroidery format		PEC	adVECTORGRAPHIC	
Brother_PES_Fmt	1451	1382	Brother PEC embroidery format		PES	adVECTORGRAPHIC	
Viking_SHV_Fmt	1452	1383	Viking SHV embroidery format		SHV	adVECTORGRAPHIC	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
VP3_Fmt	1453	1384	VP3 embroidery format		VP3	adVECTORGRAPHIC	
SEW_Fmt	1454	1385	SEW embroidery format		SEW	adVECTORGRAPHIC	
Data_Stitch_Tajima_Fmt	1455	1386	Data Stitch Tajima (DST) embroidery image		DST	adVECTORGRAPHIC	
Singer_XXX_Fmt	1456	1387	Singer XXX embroidery image		XXX	adVECTORGRAPHIC	
Bernina_ART_Fmt	1457	1388	Bernina ART embroidery image		ART	adVECTORGRAPHIC	
MS_Prefetch_Fmt	1458	1389	Microsoft Windows Prefetch (uncompressed) file		PF	adMISC	
MS_Prefetch_ Compressed_Fmt	1459	1390	Microsoft Windows Prefetch (compressed) file		PF	adMISC	
MS_MapPoint_Fmt	1460	1391	Microsoft MapPoint map		PTM	adGIS	
MS_Live_Meeting_Fmt	1461	1392	Microsoft Office Live Meeting Connection		RTC	adSCHEDULE	
MS_Speech_Definitions_ Fmt	1462	1393	Microsoft text-to-speech Speech Definitions File		SDF	adMISC	
MS_Speech_Data_Fmt	1463	1394	Microsoft text-to-speech Speech Data File		SPD	adDATABASE	
MS_SQL_CE_Fmt	1464	1395	Microsoft SQL Server Compact (CE) edition database		SDF	adDATABASE	
MS_ICE_Project_Fmt	1465	1396	Microsoft Image Composite Editor (ICE) Project		SPJ	adMISC	
MS_DVR_Fmt	1466	1397	Microsoft Digital Video Recording (DVR-MS)	video/x-ms-dvr	DVR-MS	adMOVIE	
Symbol_Dynamics_EXP_ Fmt	1467	1398	Symbol Dynamics EXP document		WXP	adWORDPROCESSOR	stringssr
XNA_Compiled_Fmt	1468	1399	Microsoft XNA Compiled Format		XNB	adENCAPSULATION	
Outlook_Shortcut_Fmt	1469	1400	Microsoft Outlook or Exchange folder shortcut		XNK	adMISC	
ChiWriter_Fmt	1470	1401	ChiWriter document (up to version 3)		CHI	adWORDPROCESSOR	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
ChiWriter4_Fmt	1471	1402	ChiWriter document (version 4)		CHI	adWORDPROCESSOR	
Lightning_Strike_Fmt	1472	1403	Lightning Strike image	image/cis-cod	COD	adRASTERIMAGE	
Blackberry_Executable_Fmt	1473	1404	Blackberry executable		COD	adEXECUTABLE	
EndNote_Library_Fmt	1474	1405	EndNote Library (up to version 9)	application/x-endnote-library	ENL	adDATABASE	
EndNote_Library_X_Fmt	1475	1406	EndNote Library (version X onwards)		ENL, ENLX	adDATABASE	
EndNote_Filter_Fmt	1476	1407	EndNote Filter	application/x-puid-fmt-327	ENF	adDATABASE	
EndNote_Style_Fmt	1477	1408	EndNote Style	application/x-endnote-style	ENS	adDATABASE	
EndNote_Connection_Fmt	1478	1409	EndNote Connection	application/x-endnote-connect	ENZ	adDATABASE	
Camtasia_Recording_Fmt	1479	1410	Camtasia Recording		CAMREC	adMOVIE	
Camtasia_Project_Fmt	1480	1411	Camtasia XML Project		CAMPROJ	adWORDPROCESSOR	
TechSmith_Project_Fmt	1481	1412	TechSmith JSON Project		TSCPROJ	adWORDPROCESSOR	
ABIF_Fmt	1482	1413	Applied Biosystems Inc. Format (ABIF)		AB1, FSA	adSCIENTIFIC	
CIF_Fmt	1483	1414	Crystallographic Information File	chemical/x-cif	CIF	adSCIENTIFIC	
Sibelius_Fmt	1484	1415	Sibelius musical score		SIB	adSOUND	
Geogebra_Worksheet_Fmt	1485	1416	Geogebra worksheet	application/vnd.geogebra.file	GGB	adSCIENTIFIC	
Geogebra_Tool_Fmt	1486	1417	Geogebra tool		GGT	adSCIENTIFIC	
Polynomial_Texture_Map_Fmt	1487	1418	Polynomial Texture Map (PTM)		PTM	adRASTERIMAGE	
Poly_Tracker_Fmt	1488	1419	Poly Tracker audio		PTM	adSOUND	
PC_Outline_Fmt	1489	1420	PC-Outline document		PCO	adWORDPROCESSOR	
Spline_Font_Database_Fmt	1490	1421	Spline Font Database (SFD) font		SFD	adFONT	
QuickTime_Image_Fmt	1491	1422	QuickTime (QTIF) image	image/x-quicktime	QTIF, QIF, QTI	adRASTERIMAGE	
XBin_Image_Fmt	1492	1423	XBin image		XB	adRASTERIMAGE	

Format Name	Number	Category	Description	MIME Type	Extension	File Class	Readers
Segmented_ Hypergraphics_Fmt	1493	1424	MS Segmented Hypergraphics image		SHG	adRASTERIMAGE	
LEADTools_CMP_Fmt	1494	1425	LEADTools CMP image		CMP	adRASTERIMAGE	
WBMP_Fmt	1495	1426	Wireless Bitmap image (WBMP)	image/vnd.wap.wbmp	WBMP	adRASTERIMAGE	
Blender_Fmt	1496	1427	Blender (v2) CAD file	application/x-blender	BLEND	adCAD	
Blender_v1_Fmt	1497	1428	Blender (v1) CAD file	application/x-blender	BLEND	adCAD	
Scribus_Fmt	1498	1429	Scribus document	application/vnd.scribus	SLA	adDESKTOPPUBLSH	
LyX_Fmt	1499	1430	LyX document	application/x-lyx	LYX	adWORDPROCESSOR	
NZB_Fmt	1500	1431	NewzBin NZB format	application/x-nzb	NZB	adWORDPROCESSOR	
KWord_Fmt	1501	1432	KOffice KWord document	application/vnd.kde.kword	KWD	adWORDPROCESSOR	
KSpread_Fmt	1502	1433	KOffice KSpread document	application/vnd.kde.kspread	KSP	adSPREADSHEET	
KPresenter_Fmt	1503	1434	KOffice KPresenter document	application/vnd.kde.kpresenter	KPR	adPRESENTATION	
KWord_GZ_Fmt	1504	1435	KOffice (up to v1.1) kWord document	application/x-kword	KWD	adWORDPROCESSOR	
KSpread_GZ_Fmt	1505	1436	KOffice (up to v1.1) kSpread document	application/x-kspread	KSP	adSPREADSHEET	
KPresenter_GZ_Fmt	1506	1437	KOffice (up to v1.1) kPresenter document	application/x-kpresenter	KPR	adPRESENTATION	
Karbon_Fmt	1507	1438	KOffice Karbon document	application/vnd.kde.karbon	KARBON	adVECTORGRAPHIC	
KChart_Fmt	1508	1439	KOffice KChart document	application/vnd.kde.kchart	CHRT	adSPREADSHEET	
KPlato_Fmt	1509	1440	KOffice KPlato document	application/x-vnd.kde.kplato	KPLATO	adSCHEDULE	
GIMP_Pattern_Fmt	1510	1441	GIMP Pattern file		PAT	adRASTERIMAGE	
GIMP_Brush_Fmt	1511	1442	GIMP Brush file		GBR	adRASTERIMAGE	
GIMP_Animated_Brush_ Fmt	1512	1443	GIMP Animated Brush file		GIH	adRASTERIMAGE	
Git_Pack_Index_Fmt	1513	1444	Git Pack Index format		IDX	adENCAPSULATION	
Git_Index_Fmt	1514	1445	Git Index format		INDEX	adENCAPSULATION	

[1]MHT, EML, and MBX files might return either format 2, 233, or 395, depending on the text in the file. In general, files that contain fields such as **To**, **From**, **Date**, or **Subject** are considered to be email messages; files that contain fields such as **content-type** and **mime-version** are considered to be MHT files; and files that do not contain any of those fields are considered to be text files.

[2]All CAT file extensions, for example CATDrawing, CATProduct, CATPart, and so on.

[3]This format is returned only if you enable source code identification. See Source Code Identification, on page 86.

[4]This format is returned only if you enable extended source code identification. See Source Code Identification, on page 86.

Appendix B: Document Readers

This section lists the KeyView document readers that are available to filter, export, and view supported file formats.

Key to Document Readers Table

The document readers table includes the following information.

Column	Description
Reader	The name of the reader.
Description	A description of the reader.
Filter	Shows whether KeyView can filter text from the main content of the file.
Export	Shows whether KeyView supports export to HTML, XML, and PDF.
View	Shows whether KeyView provides viewing capability.
Extract	Shows whether KeyView can extract sub-files.
Metadata	Shows whether KeyView can extract metdata (properties such as title, author, and subject).
Charset	Shows whether KeyView can detect and extract the character set. Even though a file format might be able to provide character set information, some documents might not contain character set information. Therefore, the document reader would not be able to determine the character set of the document.
H/F	Shows whether KeyView can extract headers and footers.
Associated File Formats	The file formats that are supported by the reader.

Key to Symbols

Symbol	Description
Y	The feature is supported.
N	The feature is not supported.

Key to Symbols, continued

Symbol	Description
P	Partial metadata is extracted from this format. Some non-standard fields are not extracted.
T	Only text is extracted from this format. Formatting information is not extracted.
M	Only metadata (title, subject, author, and so on) is extracted from this format. Text and formatting information are not extracted.

Document Readers

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
ActiveX components	Microsoft Visio (2013)	N	N	Y[1]	N	Y	N	N	MS_Visio_2013_Fmt
ad1sr	AD1 Evidence file	N	N	Y	Y	N	n/a	N	AD1_Fmt
afsr	ASCII Text	Y	Y	Y	N	N	N	N	ABAP_Fmt, AMPL_Fmt, APL_Fmt, ASCII_Text_Fmt, ASN1_Fmt, ATS_Fmt, Agda_Fmt, Alloy_Fmt, Apex_Fmt, AppleScript_Fmt, Arduino_Fmt, AsciiDoc_Fmt, AspectJ_Fmt, Assembly_Fmt, Awk_Fmt, BlitzMax_Fmt, Bluespec_Fmt, Brainfuck_Fmt, Brightscript_Fmt, CLIPS_Fmt, CMake_Fmt, COBOL_Fmt, CPlusPlus_Fmt, CWeb_Fmt, C_Fmt, CartoCSS_Fmt, Ceylon_Fmt, Chapel_Fmt, Clarion_Fmt, Clean_Fmt, Clojure_Fmt, CoffeeScript_Fmt, Component_Pascal_Fmt, Cool_Fmt, Coq_Fmt, Creole_Fmt, Crystal_

[1]Visio 2013 is supported in Viewing only, with the support of ActiveX components from the Microsoft Visio 2013 Viewer. Image fidelity is supported but other features, such as highlighting, are not.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
									Fmt, Csharp_Fmt, Csound_Document_Fmt, Csound_Fmt, Css_Fmt, Cuda_Fmt, DIGITAL_Command_Language_Fmt, DTrace_Fmt, D_Fmt, Dart_Fmt, Dockerfile_Fmt, ECL_Fmt, E_Fmt, Eiffel_Fmt, Elm_Fmt, Emacs_Lisp_Fmt, EmberScript_Fmt, Erlang_Fmt, Fantom_Fmt, Forth_Fmt, Fortran_Fmt, FreeMarker_Fmt, Frege_Fmt, Fsharp_Fmt, GAMS_Fmt, GAP_Fmt, GDScript_Fmt, GIS_World_File_Fmt, GLSL_Fmt, G_code_Fmt, Game_Maker_Language_Fmt, Gnuplot_Fmt, Go_Fmt, Golo_Fmt, Gosu_Fmt, Gradle_Fmt, GraphQL_Fmt, Graphviz_DOT_Fmt, Groovy_Fmt, HLSL_Fmt, Hack_Fmt, Haml_Fmt, Handlebars_Fmt, Haskell_Fmt, Hy_Fmt, IDL_Fmt, IGOR_Pro_Fmt, Idris_Fmt, Inform_7_Fmt, Ini_Fmt, Ioke_Fmt, Isabelle_Fmt, JSONiq_Fmt, JSX_Fmt, J_Fmt, Jasmin_Fmt, Java_Fmt, Javascript_Fmt, Jolie_Fmt, Julia_Fmt, KiCad_Layout_Fmt, KiCad_Schematic_Fmt, Kotlin_Fmt, LFE_Fmt, LOLCODE_Fmt, Lasso_Fmt, Limbo_Fmt, Lisp_Fmt, LiveScript_Fmt, Lua_Fmt, MAXScript_Fmt, ML_Fmt, MSDOS_Batch_File_Fmt, M_Fmt, Makefile_Fmt, Markdown_Fmt, Mathematica_Fmt, Matlab_Fmt, Max_Code_Fmt, Mercury_Fmt, Modelica_

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
									Fmt, Modula_2_Fmt, Monkey_Fmt, Moocode_Fmt, NL_Fmt, NSIS_Fmt, NetLogo_Fmt, NewLisp_Fmt, Nginx_Fmt, Nix_Fmt, Nu_Fmt, OCaml_Fmt, ObjC_Fmt, ObjCpp_Fmt, ObjJ_Fmt, OpenCL_Fmt, OpenEdge_ABL_Fmt, OpenSCAD_Fmt, Ox_Fmt, Oxygene_Fmt, Oz_Fmt, PAWN_Fmt, PHP_Fmt, PLSQL_Fmt, PLpgSQL_Fmt, Pan_Fmt, Parrot_Assembly_Fmt, Pascal_Fmt, Perl_Fmt, PicoLisp_Fmt, Pike_Fmt, Pony_Fmt, Powershell_Fmt, Processing_Fmt, Prolog_Fmt, Puppet_Fmt, PureBasic_Fmt, Python_Fmt, QMake_Fmt, RAML_Fmt, RDoc_Fmt, REXX_Fmt, R_Fmt, Racket_Fmt, Ragel_Fmt, Rascal_Fmt, Rebol_Fmt, Red_Fmt, RenPy_Fmt, RenderScript_Fmt, Ring_Fmt, RobotFramework_Fmt, Ruby_Fmt, Rust_Fmt, SAS_Fmt, SGML_Fmt, SPARQL_Fmt, SQLPL_Fmt, SQL_Fmt, SaltStack_Fmt, Scala_Fmt, Scheme_Fmt, Scilab_Fmt, Scribe_Fmt, Shell_Fmt, Smalltalk_Fmt, Squirrel_Fmt, Stan_Fmt, Stata_Fmt, Stylus_Fmt, SuperCollider_Fmt, Swift_Fmt, SystemVerilog_Fmt, TSV_Fmt, TSV_Fmt, TXL_Fmt, Tcl_Fmt, Tex_Fmt, Turing_Fmt, Turtle_Fmt, TypeScript_Fmt, UrWeb_Fmt, Verilog_Fmt, Vim_script_Fmt, Visual_Basic_Fmt, WebAssembly_Fmt, WebIDL_Fmt,

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
									Wiki_Fmt, X10_Fmt, XQuery_Fmt, Xojo_Fmt, Xtend_Fmt, YAML_Fmt, YANG_Fmt, Zephir_Fmt, eC_Fmt, reStructuredText_Fmt, xBase_Fmt
aiffsr	Audio Interchange File Format	M	N	N	N	Y	N	N	AIFF_Fmt
asfsr	Advanced Systems Format (1.2)	N	N	N	N	Y	N	N	ASF_Fmt, WMA_Fmt, WMV_Fmt
assr	Applix Spreadsheets (4.2, 4.3, 4.4)	Y	Y	Y	N	N	Y	N	Applix_Spreadsheets_Fmt
awsr	Applix Words (3.11, 4, 4.1, 4.2, 4.3, 4.4)	Y	Y	Y	N	N	Y	Y	Applix_Words_Fmt
axsr	Applix Asterix	Y	T	T	N	N	N	N	Applix_Alis_Fmt
b1sr	B1	N	N	Y	Y	N	n/a	N	B1_Fmt
bkfsr	Microsoft Backup File	N	N	Y	Y	N	n/a	N	BKF_Fmt
bmpsr	Windows Bitmap Image	M	M	N	N	Y	N	N	BMP_Fmt
bzip2sr	Bzip2 Compressed File	N	N	Y	Y	N	n/a	N	BZIP2_Fmt
cabsr	Microsoft Cabinet File (1.3)	N	N	Y	Y	N	n/a	N	CAB_Fmt

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
cdsr	Convergent Technologies DEF Comm. Format	Y	T	T	N	N	N	N	CT_DEF_Fmt
cebsr[1]	Founder Chinese E-paper Basic (3.2.1)	Y	N	N	N	N	N	N	Founder_CEB_Fmt
chmsr	Microsoft Compiled HTML Help (3)	N	N	Y	Y	N	n/a	N	CHM_Fmt
csvsr	CSV (Comma Separated Values)	Y	Y	Y	N	N	N	N	CSV_Fmt
dbfsr	dBase Database (III+, IV)	Y	Y	Y	N	N	N	N	dBase_Fmt
dbxsr	Microsoft Outlook Express DBX Message Database (5.0, 6.0)	N	N	Y	Y	Y	Y	N	MS_OEDBX_Fmt
dcasr	IBM DCA/RFT (Revisable Form Text) (SC23-0758-1)	Y	Y	Y	N	N	Y	N	DCA_RFT_Fmt
dcmsr	Digital Imaging &	M	N	N	N	Y	N	N	Dicom_Fmt

[1]This reader is only supported on Windows 32-bit platforms.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
	Communications in Medicine (DICOM)								
difsr	Data Interchange Format	Y	Y	Y	N	N	N	N	DIF_SpreadSheet_Fmt
dmgsr	Mac Disk Copy Disk Image	N	N	Y	Y	N	n/a	N	DMG_Fmt
dw4sr	DisplayWrite (4)	Y	Y	Y	N	N	Y	N	IBM_Display_Write_Fmt
dxlsr	IBM Domino Data in XML format[1]	N	N	Y	Y	Y	N	N	Lotus_Domino_DXL_Fmt
emlsr[2]	Text Mail (MIME) / Microsoft Outlook Express (Windows 6, MacIntosh 5)	Y	T	T	Y	Y	Y	N	SMTP_Fmt
emxsr	Legato EMailXtender Archives	N	N	Y	Y	N	n/a	N	EMX_Fmt
encase2sr	Expert Witness Compression Format (EnCase) (7)	N	N	Y	Y	N	n/a	N	EnCase_Fmt

[1]Supports non-encrypted embedded files only.
[2]This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
encasesr	Expert Witness Compression Format (EnCase) (6)	N	N	Y	Y	N	n/a	N	EnCase_Fmt
entsr	Microsoft Entourage Database (2004)	N	N	Y	Y	Y	Y	N	ENT_Fmt
epubsr	Open Publication Structure eBook (2.0, 3.0)	Y	Y	Y	N	Y	Y	N	Epub_Fmt
exesr	MSDOS/Windows Executable	N	N	Y	N	N	n/a	N	MS_Executable_Fmt
foliosr	Folio Flat File (3.1)	Y	Y	Y	N	Y	Y	Y	Folio_Flat_Fmt
gdsiisr	GDSII data format	Y	T	T	N	N	N	N	GDSII_Fmt
gifsr	GIF (87, 89)	M	M	N	N	Y	N	N	GIF_87a_Fmt, GIF_89a_Fmt
gwfssr	GroupWise FileSurf email	N	N	Y	Y	Y	N	N	GWFS_Email_Fmt
hl7sr	Health level7 message (2.0)	Y	Y	Y	N	Y	Y	N	Hl7_Fmt
htmsr	HTML/XHTML (3, 4)	Y	Y	Y	N	Y[1]	Y	N	HTML_Fmt, Netscape_Bookmark_File_Fmt

[1] HTML only supports partial metadata extraction

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
hwposr	Haansoft Hangul HWP (2002, 2005, 2007, 2010)	Y	Y	Y	Y	Y	Y	N	HWP_Fmt
hwpsr	Haansoft Hangul HWP (97)	Y	Y	Y	N	Y	Y	N	HWP_Fmt
ichatsr	Apple iChat Log (1, AV 2, AV 2.1, AV 3)	Y	Y	Y	N	N	N	N	Apple_iChat_Fmt
icssr	Microsoft Outlook iCalendar (1.0, 2.0)	N	N	Y	Y	Y	Y	N	ICS_Fmt
isosr	ISO-9660 CD Disc Image	N	N	Y	Y	N	n/a	N	ISO_Fmt
iwss13sr[1]	Apple iWork Numbers ('13, '16, '18, iCloud 2018)	Y	T	T	N	N	Y	N	IWSS13_Fmt
iwsssr	Apple iWork Numbers ('08, '09)	Y	Y	Y	N	Y	Y	N	IWSS_Fmt
iwwp13sr[2]	Apple iWork Pages ('13, '16, '18, iCloud 2018)	Y	T	T	N	N	N	N	IWWP13_Fmt

[1]This reader is available only on Windows (32-bit and 64-bit), Linux (32-bit and 64-bit), and Solaris x86-64.
[2]This reader is available only on Windows (32-bit and 64-bit), Linux (32-bit and 64-bit), and Solaris x86-64.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
iwwpsr	Apple iWork Pages ('08, '09)	Y	Y	Y	N	Y	Y	N	IWWP_Fmt
jp2000sr	JPEG (2000)	M	M	N	N	Y	N	N	ISO_JPEG2000_JP2_Fmt, ISO_JPEG2000_JPM_Fmt, ISO_JPEG2000_JPX_Fmt, JPEG_2000_JP2_File_Fmt, JPEG_2000_PGX_Fmt, Motion_JPEG_2000_Fmt
jpgsr	JPEG Interchange Format (JFIF)	M	M	N	N	Y	N	N	JPEG_File_Interchange_Fmt
jtdsr	JustSystems Ichitaro (8 to 2013, 2018)	Y	Y	Y	N	P	N	Y	ICHITARO_Compr_Fmt, ICHITARO_Fmt
kpagrdr	Applix Presents/Graphics (4.0, 4.2, 4.3, 4.4)	Y	Y	Y	N	N	N	N	Applix_Graphics_Fmt
kpanirdr	Windows Animated Cursor	N	Y	Y	N	N	N	N	Windows_Animated_Cursor_Fmt
kpbmprdr	Windows Bitmap Image	N	Y	Y	N	N	N	N	BMP_Fmt
kpCATrdr	CATIA formats (5)	Y	N	N	N	Y	N	N	CATIA_Fmt
kpcdrrdr	CorelDRAW[1] (through 9.0, 10, 11, 12, X3)	N	Y	Y	N	N	N	N	Corel_Draw_Fmt

[1]CDR/CDR with TIFF header.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
kpcgmrdr[1]	Computer Graphics Metafile	Y	Y	Y	N	N	N	N	CGM_Binary_Fmt, CGM_Character_Fmt, CGM_ClearText_Fmt
kpchtrdr	Microsoft Excel (2-7) and Lotus 1-2-3 Charts (2-5)	N	Y	Y	N	N	N	N	
kpdcxrdr	DCX Fax System	N	Y	Y	N	N	N	N	DCX_Fmt
kpDWGrdr[2]	Autodesk AutoCAD DWG Drawing (R13 onwards)	Y	Y	Y	N	Y	Y	N	AutoDesk_DWG_Fmt
kpDXFrdr[3]	Autodesk AutoCAD DXF Drawing (R13 onwards)	Y	Y	Y	N	Y	Y	N	AutoCAD_DXF_Binary_Fmt, AutoCAD_DXF_Text_Fmt
kpemfrdr	Enhanced Metafile	Y	Y	Y	N	Y	N	N	Enhanced_Metafile_Fmt
kpepsrdr	Encapsulated PostScript (raster) (TIFF header)	N	Y	Y	N	N	N	N	EPSF_Fmt, Preview_EPSF_Fmt
kpGFLrdr	Omni Graffle	Y	N	N	N	Y	Y	N	Omni_Graffle_XML_Fmt

[1]Files with non-partitioned data are supported.

[2]The kpODArdr reader can filter, export, and view all versions but is supported only on Windows, Linux, and macOS. The kpDWGrdr reader is used on AIX, FreeBSD, Solaris, and SPARC platforms, but does not support graphics for versions after 2004 or text for versions after 2013.

[3]The kpODArdr reader can filter, export, and view all versions but is supported only on Windows, Linux, and macOS. The kpDXFrdr reader is used on AIX, FreeBSD, Solaris, and SPARC platforms, but does not support graphics for versions after 2004.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
kpgifrdr	GIF (87, 89)	N	Y	Y	N	N	N	N	GIF_87a_Fmt, GIF_89a_Fmt
kpicordr	Windows Icon Cursor	N	Y	Y	N	N	N	N	Windows_Icon_Fmt
kpIWPG13rdr[1]	Apple iWork Keynote ('13, '16, '18, iCloud 2018)	Y	T	N	N	N	N	N	IWPG13_Fmt
kpIWPGrdr	Apple iWork Keynote (2, 3, '08, '09)	Y	Y	Y	N	Y	Y	N	IWPG13_Fmt, IWPG_Fmt
kpJBIG2rdr	JBIG2	N	Y	Y	N	N	N	N	JBIG2_Fmt
kpjp2000rdr	JPEG (2000)	N	Y	Y	N	N	N	N	ISO_JPEG2000_JP2_Fmt, ISO_JPEG2000_JPM_Fmt, ISO_JPEG2000_JPX_Fmt, JPEG_2000_JP2_File_Fmt, JPEG_2000_PGX_Fmt, Motion_JPEG_2000_Fmt
kpjpgrdr	JPEG Interchange Format (JFIF)	N	Y	Y	N	N	N	N	JPEG_File_Interchange_Fmt
kpmacrdr	MacPaint	N	Y	Y	N	N	N	N	MacPaint_Fmt
kpmsordr	Microsoft Office Drawing	N	Y	Y	N	N	N	N	MS_Office_Drawing_Fmt
kpODArdr	ODA	Y	Y	Y	N	Y	Y	N	AutoCAD_DXF_Binary_Fmt, AutoCAD_DXF_Text_Fmt, AutoDesk_DWG_Fmt

[1]This reader is available only on Windows (32-bit and 64-bit), Linux (32-bit and 64-bit), and Solaris x86-64.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
kpodfrdr	OASIS Open Document Format (1, 2[1])	Y	Y	Y	Y[2]	Y	Y	N	ODF_Drawing_Fmt, ODF_Drawing_Template_Fmt, ODF_Presentation_Fmt, ODF_Presentation_Template_Fmt, SO_Drawing_XML_Fmt, SO_Presentation_XML_Fmt
kpONErdr	Microsoft OneNote (2007, 2010, 2013, 2016)	Y	Y	Y	Y	N	Y	N	OneNote_Fmt
kpp40rdr	Microsoft PowerPoint (98)	Y	Y	Y	N	P[3]	N	N	PowerPoint_Win_Fmt
kpp95rdr	Microsoft PowerPoint Windows (95)	Y	Y	Y	N	P	Y	N	PowerPoint_95_Fmt
kpp97rdr	Microsoft PowerPoint (97-2004)	Y	Y	Y	N	P	Y	Y[4]	PowerPoint_2000_Fmt, PowerPoint_97_Fmt
kppctrdr	Macintosh Raster / QuickDraw (2)	N	Y	Y	N	N	N	N	Mac_PICT_Fmt
kppcxrdr	PC PaintBrush (3)	N	Y	Y	N	N	N	N	PC_Paintbrush_Fmt

[1]Generated by OpenOffice Impress 2.0, StarOffice 8 Impress, and IBM Lotus Symphony Presentation 3.0.
[2]Supported using the olesr embedded objects reader.
[3]Microsoft PowerPoint Windows only
[4]Microsoft PowerPoint Windows only

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
kppdf2rdr[1]	Adobe PDF (1.1 to 1.7, 2.0)	N	N	Y	N	N	N	N	PDF_Fmt
kppdfrdr	Adobe PDF (1.1 to 1.7, 2.0)	N	Y	Y	N	N	N	N	PDF_Fmt
kppicrdr	Lotus PIC	Y	Y	Y	N	N	N	N	Lotus_PIC_Fmt
kppngrdr	Portable Network Graphics	N	Y	Y	N	N	N	N	APNG_Fmt, PNG_Fmt
kpppxrdr	Microsoft PowerPoint Windows XML (2007 onwards)	Y	Y	Y	Y	Y	Y	Y	MS_PPT_2007_Fmt, MS_PPT_Macro_2007_Fmt
kpprerdr	Lotus Freelance Graphics 2 (2)	Y	Y	Y	N	N	N	N	Freelance_OS2_Fmt, Freelance_Win_Fmt
kpprzrdr	Lotus Freelance Graphics (96, 97, 98, R9, 9.8)	Y	Y	Y	N	N	N	N	Freelance_96_Fmt, Freelance_97_Fmt, Freelance_DOS_Fmt
kpsddrdr	StarOffice Impress (3, 4, 5)	Y	T	N	N	N	N	N	SO_Presentation_Fmt
kpsdwrdr	Lotus AMIDraw Graphics	N	Y	Y	N	N	N	N	Ami_Pro_Draw_Fmt, SO_Text_Fmt
kpsgirdr	SGI RGB Image	N	Y	Y	N	N	N	N	SGI_Image_Fmt

[1]kppdf2rdr is an alternate graphic-based reader that produces high-fidelity output but does not support other features such as highlighting or text searching.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
kpshwrdr	Corel Presentations (6, 7, 8, 9, 10, 11, 12, X3)	Y	Y	Y	N	N	N	N	Corel_Presentations_Fmt
kpsunrdr	Sun Raster Image	N	Y	Y	N	N	N	N	Sun_Raster_Fmt
kpTGArdr	Truevision Targa (2)	N	Y	Y	N	N	N	N	Targa_Fmt
kptifrdr	TIFF Tagged Image File (through 6.0[1])	N	Y	Y	N	N	N	N	TIFF_Fmt
kpUGrdr	Unigraphics (UG) NX	Y	N	N	N	N	N	N	Unigraphics_NX_Fmt
kpVSD2rdr	Microsoft Visio (4, 5, 2000, 2002, 2003, 2007, 2010[2])	Y	Y	Y	N	Y	Y	N	MS_Visio_Fmt
kpVSDXrdr	Microsoft Visio (2013)	Y	Y	Y	Y	Y	Y	N	MS_Visio_2013_Fmt, MS_Visio_2013_Macro_Fmt, MS_Visio_2013_Stencil_Fmt, MS_Visio_2013_Stencil_Macro_Fmt, MS_Visio_2013_Template_Fmt,

[1]The following compression types are supported: no compression, CCITT Group 3 1-Dimensional Modified Huffman, CCITT Group 3 T4 1-Dimensional, CCITT Group 4 T6, LZW, JPEG (only Gray, RGB and CMYK color space are supported), and PackBits.
[2]Viewing and Export use the graphic reader, kpVSD2rdr for Microsoft Visio 2003, 2007, and 2010, and vsdsr for all earlier versions. Image fidelity in Viewing and Export is therefore only supported for versions 2003 and above. Filter uses the graphic reader kpVSD2rdr for Microsoft Visio 2003, 2007, and 2010, and vsdsr for all earlier versions.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
									MS_Visio_2013_Template_Macro_Fmt
kpwg2rdr	WordPerfect Graphics 2 (2, 7)	N	Y	Y	N	N	N	N	WordPerfect_Graphics_Fmt
kpwmfrdr	Windows Metafile (3)	Y[1]	Y	Y	N	N	N	N	Windows_Metafile_Fmt, Windows_Metafile_NoHdr_Fmt
kpwpgrdr	WordPerfect Graphics 1 (1)	N	Y	Y	N	N	N	N	WordPerfect_Graphics_Fmt
kpXFDLrdr	Extensible Forms Description Language	Y	Y	Y	N	Y	Y	N	XFDL_Fmt
kvgz	GZIP archive (2)	N	N	Y	N	N	n/a	N	GZ_Compress_Fmt
kvgzsr	GZIP archive (2)	N	N	N	Y	N	n/a	N	GZ_Compress_Fmt
kvhqxsr	BinHex	N	N	Y	Y	N	n/a	N	BinHex_Fmt
kvzee	UNIX Compress	N	N	Y	N	N	n/a	N	Compress_Fmt
kvzeesr	UNIX Compress	N	N	N	Y	N	n/a	N	Compress_Fmt
l123sr	Lotus 1-2-3 (96, 97, R9, 9.8)	Y	Y	Y	N	P	Y	N	Lotus_123_97_Fmt, Lotus_123_Format_Fmt, Lotus_123_R9_Fmt

[1]Windows Metafiles can contain both raster images (KeyView file class 4) and vector graphics (KeyView file class 5). Filtering is supported only for vector graphics (class 5).

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
lasr	Lotus AMI Pro and Write Plus (2, 3)	Y	Y	Y	N	P[1]	Y[2]	Y	Ami_Pro_Fmt, Ami_Pro_StyleSheet_Fmt
lwpsr	Lotus Word Pro and SmartMaster (96, 97, R9)	Y	Y	Y	N	P[3]	N	Y[4]	Lotus_Word_Pro_96_Fmt, Lotus_Word_Pro_97_Fmt
lzhsr	Microsoft LZH Compressed Folder	N	N	N	Y	N	n/a	N	LZH_Fmt
macbinsr	MacBinary	N	N	Y	Y	N	n/a	N	MacBinary_Fmt
mbsr	Microsoft Word Macintosh (4, 5, 6, 98)	Y	Y	Y	N	Y	N	Y	MS_Word_Mac_4_Fmt, MS_Word_Mac_Fmt
mbxsr[5]	Text Mail (MIME), Microsoft Outlook Express (Windows 6, MacIntosh 5),	Y[7]	N	T	Y	Y	Y	N	MIME_Fmt

[1]Lotus AMI Pro only
[2]Lotus AMI Pro only
[3]Lotus Word Pro only
[4]Lotus Word Pro only
[5]This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

[7]Text Mail only

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
	Mailbox[1] (Thunderbird 1.0, Eudora 6.2)								
MCI	Microsoft Media Control Interface	N	N	Y	N	N	N	N	AIFF_Fmt, AU_Audio_Fmt, ISO_QuickTime_Fmt, MIDI_Audio_Fmt, MPEG_Audio_Fmt, MS_Video_Fmt, MS_WAVE_Audio_Fmt, Mobile_QuickTime_Fmt, QuickTime_Fmt
mdbsr	Microsoft Access (95 onwards)	Y	T	T	N	N	Y[2]	N	MS_Access_2000_Fmt, MS_Access_2007_Fmt, MS_Access_95_Fmt, MS_Access_97_Fmt, MS_Access_Fmt
mhtsr	MIME HTML (MHTML)	Y	Y	Y	N	Y	Y	N	MHT_Fmt
mifsr	Adobe FrameMaker Interchange Format (5, 5.5, 6, 7)	Y	Y	Y	N	N	Y	N	Maker_Interchange_Fmt
misr	Microsoft Word Windows (1.0, 2.0)	Y	Y	Y	N	N	N	Y	MS_Word_Win_Fmt
mp3sr	MPEG-1 Audio layer3 (ID3 v1 and v2)	M	M	Y	N	Y	N	N	MPEG_Audio_Fmt

[1]KeyView supports MBX files created by Eudora Email and Mozilla Thunderbird. MBX files created by other common mail applications are typically filtered, converted, and displayed.
[2]Charset is not supported for Microsoft Access 95 or 97.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
mpeg4sr	MPEG video	M	N	N	N	Y	N	N	Adobe_Flash_Audio_Book_Fmt, Adobe_Flash_Audio_Fmt, Adobe_Flash_Protected_Video_Fmt, Adobe_Flash_Video_Fmt, Audible_Audiobook_Fmt, ISO_3GPP2_Fmt, ISO_3GPP_Fmt, ISO_IEC_MPEG_4_Fmt, KDDI_Video_Fmt, MPEG4_AVC_Fmt, MPEG4_M4A_Fmt, MPEG4_M4B_Fmt, MPEG4_M4P_Fmt, MPEG4_M4V_Fmt, MPEG4_Sony_PSP_Fmt, MPEG_21_Fmt, NTT_MPEG4_Fmt, Nero_MPEG4_Audio_Fmt, QuickTime_Fmt, Sony_XAVC_Fmt
mppsr	Microsoft Project (2000 onwards)	Y	Y	Y	Y	Y	Y	N	MS_Project_2000_Fmt, MS_Project_2007_Fmt, MS_Project_41_Fmt, MS_Project_4_Fmt, MS_Project_98_Fmt
msgsr[1]	Microsoft Outlook (97 onwards), Documentum EMCMF	Y[2]	T[3]	Y[4]	Y	Y	Y[5]	N	EMCMF_Fmt, MS_Outlook_Fmt
mspubsr	Microsoft Publisher (98 to 2016)	Y	T	T	Y	Y	Y	N	MS_Publisher_98_Fmt, MS_Publisher_Fmt

[1]This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

[2]Except Documentum EMCMF
[3]Except Documentum EMCMF
[4]For Outlook this is Text only
[5]Returns "Unicode" character set for Outlook version 2003 and up, and "Unknown" character set for previous versions.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
msw6sr	Microsoft Works Word Processor for Windows (6, 2000)	Y	Y	Y	N	N	N	Y	MS_Works_Win_WP_Fmt
mswsr	Microsoft Works Word Processor for Windows (1, 2, 3, 4)	Y	Y	Y	N	N	N	Y	MS_Works_Win_WP_Fmt
multiarcsr[1]	Compressed formats	N	N	Y[2]	Y	N	n/a	N	ARJ_Fmt, RAR5_Fmt, XZ_Fmt
mw6sr	Microsoft Word for Windows (6, 7, 8, 95)	Y	Y	Y	N	Y	Y	Y	MS_Word_95_Fmt
mw8sr	Microsoft Word (97-2004)	Y	Y	Y	Y[3]	Y	Y	Y[4]	MS_Word_2000_Fmt, MS_Word_97_Fmt
mwsr	Microsoft Word PC (4-6) and Windows Write (1-3)	Y	Y	Y	N	N	Y[5]	Y[6]	MS_Windows_Write_Fmt, MS_Word_PC_Driver_Fmt, MS_Word_PC_Fmt, MS_Word_PC_Glossary_Fmt, MS_Word_PC_Misc_Fmt, MS_Word_PC_StyleSheet_Fmt

[1]7zip is supported with the multiarcsr reader on some platforms for Extract.
[2]7-zip and SUN PEX archives only
[3]Supported using the embedded objects reader olesr.
[4]Microsoft Word for Windows only
[5]Microsoft Windows Write only
[6]Microsoft Word PC only

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
mwssr	Microsoft Works Spreadsheet (2, 3, 4)	Y	Y	Y	N	N	Y	N	MS_Works_DOS_SS_Fmt, MS_Works_Mac_SS_Fmt, MS_Works_Win_SS_Fmt
mwxsr	Microsoft Word XML (2007 onwards)	Y	Y	Y	Y	Y	Y	Y	MS_Word_2007_Flat_XML_Fmt, MS_Word_2007_Fmt, MS_Word_Macro_2007_Fmt
nnsr	NBI OASys Net Archive	Y	T	T	N	N	N	N	NBI_Net_Archive_Fmt
nsfsr	IBM Lotus Notes database (4, 5, 6.0, 6.5, 7.0, 8.0)	N	N	Y	Y	Y	N	N	Lotus_Notes_NSF_Fmt
oa2sr	Fujitsu Oasys (7)	Y	Y	Y	N	P	N	N	Oasys_Fmt
odfsssr	OASIS Open Document Format (1, 2[1])	Y	Y	Y	Y[2]	Y	Y	N	ODF_Spreadsheet_Fmt, ODF_Spreadsheet_Template_Fmt
odfwpsr	OASIS Open Document Format (1, 2[3])	Y	Y	Y	Y[4]	Y	Y	Y	ODF_Text_Fmt, ODF_Text_Template_Fmt, SO_Text_XML_Fmt
olesr	Windows Scrap File	N	N	N	Y	N	n/a	N	OLE_Fmt, Scrap_Fmt, Windows_Installer_Fmt

[1]Generated by OpenOffice Calc 2.0, StarOffice 8 Calc, and IBM Lotus Symphony Spreadsheet 3.0.
[2]Supported using the embedded objects reader olesr.
[3]Generated by OpenOffice Writer 2.0, StarOffice 8 Writer, and IBM Lotus Symphony Documents 3.0.
[4]Supported using the embedded objects reader olesr.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
olmsr	Microsoft Outlook for Macintosh (2011)	N	N	Y	Y	N	Y	N	MS_OutlookOLM_Fmt
onealtsr	Microsoft OneNote Alternative Packaging Format (2007 onwards)	Y	T	T	Y	N	N	N	OneNote_Alternate_Fmt
onmsr	Legato Extender	N	N	Y	Y	Y	N	N	Legato_Extender_ONM_Fmt
oo3sr	Omni Outliner (v3, OPML, OOutline)	Y	Y	Y	N	N	Y	N	OO3_Fmt, OOUTLINE_Fmt, OPML_Fmt
pbixsr	Microsoft Power BI Desktop (1.11)	Y	T	T	N	N	Y	N	MS_Power_BI_Fmt
pdf2sr	Adobe PDF (1.1 to 1.7, 2.0)	N	Y	N	N	N	N	N	PDF_Fmt
pdfsr	Adobe PDF (1.1 to 1.7, 2.0)	Y	Y	N	Y[1]	Y	Y	N	PDF_Fmt, Portfolio_PDF_Fmt
pffsr[2]	Microsoft Outlook Offline Storage File (97 onwards)	N	N	Y	Y	Y	Y	N	MS_OutlookOST_Fmt

[1] Includes support for extraction of subfiles from PDF Portfolio documents.
[2] The reader pffsr is available only on Windows and Linux.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
pfilesr	Rights Management Services (RMS)-protected format	Y[1]	T[2]	T[3]	N	Y	N	N	RMS_Protected_Fmt
pngsr	Portable Network Graphics	M	M	N	N	Y	N	N	PNG_Fmt
psdsr	Adobe Photoshop	N	N	N	N	Y[4]	N	N	PSD_Fmt
pstnsr	Microsoft Outlook Personal Folder[5] (97 onwards)	N	N	Y	Y	Y	Y	N	MS_OutlookPST_Fmt
pstsr[6]	Microsoft Outlook Personal Folder[7]	N	N	Y	Y	Y	N	N	MS_OutlookPST_Fmt

[1]KeyView filters only the internal redirection text. The underlying document text is not accessible without the decryption key.

[2]KeyView filters only the internal redirection text. The underlying document text is not accessible without the decryption key.

[3]KeyView filters only the internal redirection text. The underlying document text is not accessible without the decryption key.

[4]Only XMP metadata is extracted for this format.

[5]KeyView provides several readers capable of processing PST files. The pstsr reader uses the Microsoft Messaging Application Programming Interface (MAPI), works only on Windows, and requires that you have Microsoft Outlook installed. The pstxsr reader is available for Windows (32-bit and 64-bit) and Linux (64-bit only) and does not require Microsoft Outlook. The pstnsr reader is an alternative reader that does not require Microsoft Outlook, for all platforms not supported by pstxsr. For more information about these readers, see "Extract Subfiles from Outlook Personal Folders Files" in Chapter 3.

[6]This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

[7]KeyView provides several readers capable of processing PST files. The pstsr reader uses the Microsoft Messaging Application Programming Interface (MAPI), works only on Windows, and requires that you have Microsoft Outlook installed. The pstxsr reader is available for Windows (32-bit and 64-bit) and Linux (64-bit only) and does not require Microsoft Outlook. The pstnsr reader is an alternative reader that does not require Microsoft Outlook, for all platforms not supported by pstxsr. For more information about these readers, see "Extract Subfiles from Outlook Personal Folders Files" in Chapter 3.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
	(97 onwards)								
pstxsr	Microsoft Outlook Personal Folder[1] (97 onwards)	N	N	Y	Y	Y	Y	N	MS_OutlookPST_Fmt
pwsr	PRIMEWORD	Y	T	T	N	N	N	N	PRIMEWORD_Fmt
qpssr	Corel Quattro Pro (5, 6, 7, 8)	Y	Y	Y	N	P	Y	N	Quattro_Pro_Win_Fmt
qpwsr	Corel Quattro Pro (X4)	Y	N	Y	N	P	Y	N	QPW_Fmt
rarsr	RAR archive (2.0 through 3.5)	N	N	N	Y	N	n/a	N	RAR_Fmt
riffsr	Microsoft Wave Sound	M	N	N	N	Y	N	N	MS_WAVE_Audio_Fmt
rtfsr	Rich Text Format (1 through 1.7)	Y	Y	Y	N	P	Y	Y	MS_Pocket_Word_Fmt, MS_RTF_Fmt
skypesr	Skype Log (3)	Y	Y	Y	N	N	N	N	Skype_Fmt
sosr	OpenOffice, LibreOffice(1-5), StarOffice (6-9)	Y	T	T	N	Y	Y	N	SO_Spreadsheet_XML_Fmt

[1]KeyView provides several readers capable of processing PST files. The pstsr reader uses the Microsoft Messaging Application Programming Interface (MAPI), works only on Windows, and requires that you have Microsoft Outlook installed. The pstxsr reader is available for Windows (32-bit and 64-bit) and Linux (64-bit only) and does not require Microsoft Outlook. The pstnsr reader is an alternative reader that does not require Microsoft Outlook, for all platforms not supported by pstxsr. For more information about these readers, see "Extract Subfiles from Outlook Personal Folders Files" in Chapter 3.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
starcsr	StarOffice Calc (3, 4, 5)	Y	T	T	N	N	N	N	SO_Spreadsheet_Fmt
starwsr	StarOffice Writer (3, 4, 5)	Y	T	T	N	N	N	N	SO_Text_Fmt
stringssr	Generic 'strings' reader	Y	T	T	N	N	N	N	BeagleWorks_Word_Fmt, CEOwrite_Fmt, CPT_Comm_Fmt, CWK_Fmt, DG_CDS_Fmt, DSA101_Fmt, Data_Point_VistaWord_Fmt, Enable_WP_Fmt, GreatWorks_Word_Fmt, HP_Word_PC_Fmt, IBM_DCF_Script_Fmt, IBM_Writing_Assistant_Fmt, Lotus_Notes_CDF_Fmt, Lyrix_Fmt, MASS_11_Fmt, MS_Works_DOS_WP_Fmt, MS_Works_Mac_WP_Fmt, MacWrite_Fmt, MacWrite_II_Fmt, Multimate_Adv_Fmt, Multimate_Adv_Fnote_Fmt, Multimate_Adv_II_Fmt, Multimate_Adv_II_Fnote_Fmt, Multimate_Fmt, Multimate_Fnote_Fmt, Navy_DIF_Fmt, ODA_Q1_11_Fmt, ODA_Q1_12_Fmt, Office_Writer_Fmt, Psion_TextEd_Fmt, Psion_Word_3_Fmt, Psion_Word_Fmt, Q_A_DOS_Fmt, Q_A_Win_Fmt, Quadratron_Q_One_v1_Fmt, Quadratron_Q_One_v2_Fmt, Quickword_Fmt, SAMNA_Word_IV_Fmt, Symbol_Dynamics_EXP_Fmt, Targon_Word_Fmt, Uniplex_WP_Fmt, Volkswriter_Fmt, WANG_WITA_Fmt, WANG_WPS_Comm_Fmt, WPS_PLUS_Fmt, WordERA_Fmt, WordMARC_Fmt, WordPerfect_Fmt,

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
									WordStar_2000_Fmt, WordStar_Fmt, WordStar_for_Windows_Fmt, Word_Connection_Fmt, WriteNow_Fmt, Xerox_860_Comm_Fmt, Xerox_Writer_Fmt
swfsr	Macromedia Flash (through 8.0)	Y	Y	Y	N	N	Y[1]	N	Macromedia_Flash_Fmt
swsr	Informix SmartWare II Word Processor	Y	T	T	N	N	N	N	SmartWare_II_WP_Fmt
tarsr	TAR Tape Archive	N	N	Y	Y	N	n/a	N	TAR_Fmt
tifsr	TIFF Tagged Image File (through 6.0[2])	M	M	N	N	Y	N	N	TIFF_Fmt
tnefsr	Transport Neutral Encapsulation Format	N	N	Y	Y	Y	Y	N	TNEF_Fmt
unihtmsr	Unicode HTML	Y	Y	Y	N	Y	Y	N	Unicode_HTML_Fmt
unisr	Unicode Text (3, 4)	Y	Y	Y	N	N	Y	N	Unicode_Fmt
unzip	PKZIP/Zip	N	N	Y[3]	Y	N	n/a	N	Executable_JAR_Fmt, KMZ_Fmt, ODF_

[1]The character set cannot be determined for versions 5.x and lower.
[2]The following compression types are supported: no compression, CCITT Group 3 1-Dimensional Modified Huffman, CCITT Group 3 T4 1-Dimensional, CCITT Group 4 T6, LZW, JPEG (only Gray, RGB and CMYK color space are supported), and PackBits.
[3]PKZIP, WinZip, and Java Archive only

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
	Compression								Formula_Fmt, ODF_Formula_Template_Fmt, PKZIP_Fmt, Tableau_Packaged_Data_Source_Fmt, Tableau_Packaged_Workbook_Fmt
uudsr	UU-Encoding (all versions)	N	N	Y	Y	N	n/a	N	UUEncoded_Fmt
vcfsr	Microsoft Outlook vCard Contact (2.1, 3.0, 4.0)	Y	Y	T	N	Y	N	N	VCF_Fmt
vsdsr	Microsoft Visio (4, 5, 2000, 2002, 2003, 2007, 2010[1])	Y	Y	Y	Y[2]	Y	Y	N	MS_Visio_Fmt
wkssr	Lotus 1-2-3 (2, 3, 4, 5)	Y	Y	Y	N	N	Y	N	Lotus_123_Worksheet_Fmt
wosr	Corel WordPerfect Windows (5, 5.1)	Y	Y	Y	N	P	Y	Y	WordPerfect_5_Fmt
wp6sr	Corel WordPerfect (6 onwards)	Y	Y	Y	N	P	Y	N	WordPerfect_6_Fmt
wpmsr	Corel WordPerfect Macintosh (1.02, 2, 2.1, 2.2, 3, 3.1)	Y	Y	Y	N	N	Y	N	WordPerfect_Mac_Fmt

[1]Viewing and Export use the graphic reader, kpVSD2rdr for Microsoft Visio 2003, 2007, and 2010, and vsdsr for all earlier versions. Image fidelity in Viewing and Export is therefore only supported for versions 2003 and above. Filter uses the graphic reader kpVSD2rdr for Microsoft Visio 2003, 2007, and 2010, and vsdsr for all earlier versions.
[2]Extraction of embedded OLE objects is supported for Filter on Windows platforms only.

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
xlsbsr	Microsoft Excel Binary Format (2007 onwards)	Y	Y	Y	N	Y	N	N	MS_Excel_Binary_2007_Fmt
xlssr	Microsoft Excel (2.2 to 2004)	Y	Y	Y	Y[1]	Y	Y	Y[2]	Excel_2000_Fmt, Excel_95_Fmt, Excel_97_Fmt, Excel_Chart_Fmt, Excel_Fmt, Excel_Macro_Fmt
xlsxsr	Microsoft Excel Windows XML (2007 onwards)	Y	Y	Y	Y	Y	Y	Y	MS_Excel_2007_Fmt, MS_Excel_Macro_2007_Fmt
xmlsr	XML	Y	T	T	N	Y	Y	N	AMF_Fmt, Adobe_XML_Data_Package_Fmt, Atom_Syndication_Fmt, CDXML_Fmt, Chemical_Markup_Language_Fmt, Collada_DAE_Fmt, ESzigno_Fmt, FictionBook_Fmt, Grasshopper_GHX_Fmt, JNLP_Fmt, JavaView_JVX_Fmt, KML_Fmt, MARC_XML_Fmt, METS_Fmt, MODS_Fmt, MS_Excel_XML_Fmt, MS_Management_Pack_MPX_Fmt, MS_Visio_XML_Fmt, MS_Word_XML_Fmt, MXML_Fmt, Metalink_Fmt, Mozilla_XUL_Fmt, MusicXML_Fmt, Open_Diagnostic_Data_Exchange_Fmt, Open_eBook_Fmt, PDF_XML_Forms_Data_Fmt, PLS_Fmt, RDF_XML_Fmt, RSS_Fmt, Really_Simple_Discovery_Fmt, SBML_Fmt, SMIL_Fmt, SPARQL_

[1]Supported using the embedded objects reader olesr.
[2]Microsoft Excel for Windows only

Reader	Description	Filter	Export	View	Extract	Metadata	Charset	H/F	Associated File Formats
									Results_Fmt, SRGS_Fmt, SRU_Fmt, SSML_Fmt, SVG_Fmt, SyncML_Fmt, TEI_Fmt, Tableau_Data_Source_Fmt, Tableau_Map_Source_Fmt, Tableau_Preferences_Fmt, Tableau_Workbook_Fmt, VTK_XML_Fmt, VoiceXML_Fmt, WML_Fmt, Windows_Audio_Playlist_Fmt, XAML_Browser_Application_Fmt, XDF_Fmt, XML_Fmt, XML_Shareable_Playlist_Fmt, XSLT_Fmt, YIN_Fmt
xpssr	Microsoft XML Paper Specification	Y	T	T	N	N	N	N	MS_XPS_Fmt
xywsr	XyWrite / Nota Bene (4.12)	Y	Y	Y	N	N	N	N	XyWrite_Fmt
yimsr[1]	Yahoo! Instant Messenger	Y	Y	Y	N	N	N	N	YIM_Fmt
z7zsr	7-Zip archive (4.57)	N	N	Y	Y	N	n/a	N	Z7Z_Fmt

[1]To successfully use this reader, you must set the KV_YAHOO_ID environment variable to the Yahoo user ID. You can optionally set the KV_OTHER_YAHOO_ID environment variable to the other Yahoo user ID. If you do not set it, "Other" is used by default. If you enter incorrect values for the environment variables, erroneous data is generated.

Appendix C: Character Sets

This section provides information on the handling of character sets in the KeyView suite of products, which includes KeyView Filter SDK, KeyView Export SDK, and KeyView Viewing SDK.

Multibyte and Bidirectional Support

The KeyView SDKs can process files that contain multibyte characters. A multibyte character encoding represents a single character with consecutive bytes. KeyView can also process text from files that contain bidirectional text. Bidirectional text contains both Latin-based text which is read from left to right, and text that is read from right to left (Hebrew and Arabic).

The following table indicates which character encodings are supported by KeyView for each format.

Multibyte and bidirectional support

Format	Single-byte	Multibyte	Bidirectional
Archive			
7-Zip (7Z)	n/a	n/a	n/a
AD1 Evidence file	n/a	n/a	n/a
ADJ	n/a	n/a	n/a
B1	n/a	n/a	n/a
BinHex (HQX)	n/a	n/a	n/a
Bzip2 (BZ2)	n/a	n/a	n/a
EnCase – Expert Witness Compression Format (E01)	n/a	n/a	n/a
GZIP (GZ)	n/a	n/a	n/a
ISO (ISO)	n/a	n/a	n/a
Java Archive (JAR)	n/a	n/a	n/a
Legato EMailXtender Archive (EMX)	n/a	n/a	n/a
MacBinary (BIN)	n/a	n/a	n/a
Mac Disk Copy Disk Image (DMG)	n/a	n/a	n/a
Microsoft Backup File (BKF)	n/a	n/a	n/a

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Microsoft Cabinet format (CAB)	n/a	n/a	n/a
Microsoft Compiled HTML Help (CHM)	n/a	n/a	n/a
Microsoft Compressed Folder (LZH)	n/a	n/a	n/a
PKZip (ZIP)	n/a	n/a	n/a
Microsoft Outlook DBX (DBX)	Y	Y	Y
Microsoft Outlook Offline Storage File (OST)	Y	Y	Y
RAR Archive (RAR)	n/a	n/a	n/a
Tape Archive (TAR)	n/a	n/a	n/a
UNIX Compress (Z)	n/a	n/a	n/a
UUEncoding (UUE)	n/a	n/a	n/a
Windows Scrap File (SHS)	n/a	n/a	n/a
WinZip (ZIP)	n/a	n/a	n/a
Binary			
Executable (EXE)	n/a	n/a	n/a
Link Library (DLL)	n/a	n/a	n/a
Computer-aided Design			
AutoCAD Drawing (DWG)	Y	Y	Y
AutoCAD Drawing Exchange (DXF)	Y	Y	Y
CATIA formats (CAT)	Y	N	N
Microsoft Visio (VSD)	Y	Y	Y
Database			
dBase Database	Y	N	N
Microsoft Access (MDB)	Y	Y	N
Microsoft Project (MPP)	Y	Y	N
Desktop Publishing			
Microsoft Publisher	N	Y	N

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Display			
Adobe Portable Document Format (PDF)	Y	Y[1]	Y
Graphics			
Computer Graphics Metafile (CGM)	Y	N	N
Corel DRAW (CDR)	n/a	n/a	n/a
DCX Fax System (DCX)	Y	N	N
DICOM – Digital Imaging and Communications in Medicine (DCM)	n/a	n/a	n/a
Encapsulated PostScript (EPS)	Y	N	N
Enhanced Metafile (EMF)	Y	Y	N
Graphic Interchange Format (GIF)	n/a	n/a	n/a
JBIG2	n/a	n/a	n/a
JPEG	n/a	n/a	n/a
JPEG 2000	n/a	n/a	n/a
Lotus AMIDraw Graphics (SDW)	n/a	n/a	n/a
Lotus Pic (PIC)	n/a	n/a	n/a
Macintosh Raster (PICT/PCT)	n/a	n/a	n/a
MacPaint (PNTG)	n/a	n/a	n/a
Microsoft Office Drawing (MSO)	n/a	n/a	n/a
Omni Graffle (GRAFFLE)	Y	N	N
PC PaintBrush (PCX)	n/a	n/a	n/a

1 Multibyte PDFs are supported, provided the PDF document is created by using either Character ID-keyed (CID) fonts, predefined CJK CMap files, or `ToUnicode` font encodings, and does not contain embedded fonts. See the Adobe website and the Adobe Acrobat documentation for more information. Any multibyte characters that are not supported are displayed using the replacement character. By default, the replacement character is a question mark (?).

To determine the type of font encodings that are used in a PDF, open the PDF in Adobe Acrobat, and select File > Document Info > Fonts. If the Encoding column lists Custom or Embedded encodings, you might encounter problems converting the PDF.

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Portable Network Graphics (PNG)	n/a	n/a	n/a
SGI RGB Image (RGB)	n/a	n/a	n/a
Sun Raster Image (RS)	n/a	n/a	n/a
Tagged Image File (TIFF)	Y	N	N
Truevision Targa (TGA)	n/a	n/a	n/a
Windows Animated Cursor (ANI)	n/a	n/a	n/a
Windows Bitmap (BMP)	n/a	n/a	n/a
Windows Icon Cursor (ICO)	n/a	n/a	n/a
Windows Metafile (WMF)	Y	Y	N
WordPerfect Graphics 1 (WPG)	Y	N	N
WordPerfect Graphics 2 (WPG)	Y	N	N
Mail			
Documentum EMCMF Format	Y	Y	Y
Domino XML Language (DXL)	Y	Y	N
GroupWise FileSurf	Y	N	N
Legato Extender (ONM)	Y	Y	N
Lotus Notes database (NSF)	Y	Y	Y
Mailbox (MBX)	Y	Y	Y
Microsoft Entourage Database	Y	Y	Y
Microsoft Outlook (MSG)	Y	Y	Y
Microsoft Outlook Express (EML)	Y	Y	Y
Microsoft Outlook iCalendar	Y	Y	Y
Microsoft Outlook for Macintosh	Y	Y	Y
Microsoft Outlook Offline Storage File	Y	Y	Y
Microsoft Outlook Personal File Folders (PST)	Y	Y	Y
Microsoft Outlook vCard Contact			
Text Mail (MIME)	Y	Y	Y

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Transport Neutral Encapsulation Format	Y	Y	Y
Multimedia			
Advanced Systems Format (ASF)	n/a	n/a	n/a
Audio Interchange File Format (AIFF)	n/a	n/a	n/a
Microsoft Wave Sound (WAV)	n/a	n/a	n/a
MIDI (MID)	n/a	n/a	n/a
MPEG 1 Audio Layer 3 (MP3)	n/a	n/a	n/a
MPEG 1 Video (MPG)	n/a	n/a	n/a
MPEG 2 Audio (MPEGA)	n/a	n/a	n/a
MPEG 4 Audio (MP4)	n/a	n/a	n/a
NeXT/Sun Audio (AU)	n/a	n/a	n/a
QuickTime Movie (QT/MOV)	n/a	n/a	n/a
Windows Video (AVI)	n/a	n/a	n/a
Presentations			
Apple iWork Keynote (GZ)	Y	Y	N
Applix Presents (AG)	character set 1252 only	N	N
Corel Presentations (SHW)	character set 1252 only	N	N
Extensible Forms Description Language (XFD)	Y	Y	N
Lotus Freelance Graphics 2 (PRE)	character set 850 only	N	N
Lotus Freelance Graphics (PRZ)	Y	Japanese, Simple Chinese, Traditional Chinese, Thai only	N
Macromedia Flash (SWF)	Y	Y	N
Microsoft OneNote	Y	Y	N
Microsoft PowerPoint PC (PPT)	character set 1252 only	Traditional Chinese only	N

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Microsoft PowerPoint Windows (PPT)	Y	Japanese, Simple Chinese, Traditional Chinese, Korean only	Hebrew only
Microsoft PowerPoint Macintosh (PPT)	Y	N	N
Microsoft PowerPoint Windows XML 2007 and 2010 (PPTX)	Y	Y	Y
OASIS Open Document (ODP)	Y	Y	N
OpenOffice Impress (ODP)	Y	Y	N
StarOffice Impress (ODP)	Y	Y	N
Spreadsheets			
Apple iWork Numbers (GZ)	Y	Y	N
Applix Spreadsheets (AS)	character set 1252 only	N	N
Comma Separated Values (CSV)	character set 1252 only	N	N
Corel Quattro Pro (QPW/WB3)	Y	N	N
Data Interchange Format (DIF)	Y	Y	Y[1]
Lotus 1-2-3 (123)	Y	Y	Y
Lotus 1-2-3 (WK4)	Y	Y	N
Lotus 123 Charts (123)	Y	Y	N
Microsoft Excel Charts (XLS)	Y	Y	N
Microsoft Excel Macintosh (XLS)	Y	N	N
Microsoft Excel Windows (XLS)	Y	Y	Y [2]
Microsoft Excel Windows XML 2007 (XLSX)	Y	Y	N
Microsoft Office Excel Binary Format (XLSB)	Y	Y	N
Microsoft Works Spreadsheet (S30/S40)	Y	N	N
OASIS Open Document (ODS)	Y	Y	N

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
OpenOffice Calc (ODS)	Y	Y	N
StarOffice Calc (ODS)	Y	Y	N
Text and Markup			
ANSI (TXT)	Y	Y	Y[2]
ASCII (TXT)	Y	Y	Y[2]
HTML (HTM)	Y	Y	Y[2], [2]
Microsoft Excel Windows XML 2003	Y	Y	Y
Microsoft Word for Windows XML 2003	Y	Y	Y
Microsoft Visio XML 2003	Y	Y	Y
Rich Text Format (RTF)	Y	Y	Y [3]
Unicode HTML	Y	Y	Y [2,3]
Unicode Text (TXT)	Y	Y	Y[2]
XHTML	Y	Y	Y[3]
XML	Y	Y	Y
Word Processing			
Adobe Maker Interchange Format (MIF)	character set 1252 only	N	N
Apple iChat Log (ICHAT)	Y	Y	N
Apple iWork Pages (GZ)	Y	Y	N
Applix Words (AW)	character set 1252 only	N	N
DisplayWrite (IP)	character set 500, 1026 only	N	N
Folio Flat File (FFF)	character set 1252 only	N	N
Founder Chinese E-paper Basic (CEB)	Y	Y	N
Fujitsu Oasys (OA2)	Y	Y	N

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Hangul (HWP)	Y	Y	N
Health level7 (HL7)	Y	Y	Y
IBM DCA/RTF (DC)	character sets 500, 1026 only	N	N
JustSystems Ichitaro (JTD)	Y	Y	N
Lotus AMI Pro (SAM)	Y	Simple Chinese, Traditional Chinese, Japanese, Thai only	Y
Lotus AMI Professional Write Plus (AMI)	Y	Simple Chinese, Traditional Chinese, Japanese, Thai only	N
Lotus Word Pro (LWP)	Y	Y	Y[3]
Lotus SmartMaster (MWP)	Y	Y	N
Microsoft Word PC (DOC)	character set 1252 only	N	N
Microsoft Word Windows V1-2 (DOC)	Y	N	N
Microsoft Word Windows V6, 7, 8, 95 (DOC)	Y	Y	Hebrew only[3]
Microsoft Word Windows V97 through 2003 (DOC)	Y	Y	Y[3]
Microsoft Word Windows XML 2007 and 2010 (DOCX)	Y	Y	Y[3]
Microsoft Word Macintosh (DOC)	Y	N	Y[3]
Microsoft Works (WPS)	Y	Japanese only	N
Microsoft Write (WRI)	Y	Japanese only	N
OASIS Open Document (ODT)	Y	Y	N
Omni Outliner (OO3)	Y	Y	N
OpenOffice Writer (ODT)	Y	Y	N
Open Publication Structure eBook (EPUB)	Y	Y	Y
StarOffice Writer (ODT)	Y	Y	N
Skype Log (DBB)	Y	Y (null-terminated charsets)	N

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
WordPad (RTF)	Y	Y	Y
WordPerfect Linux (WPS)	Y	N	N
WordPerfect Macintosh (WPS)	Y	N	N
WordPerfect Windows (WO)	Y	N	N
XML Paper Specification (XPS)	Y	Y	N
XYWrite Windows (XY4)	character set 1252 only	N	N
Yahoo! Instant Messenger (DAT)	Y	Y (null-terminated charsets)	N

[1]The text direction in the output file might not be correct.

[2]In Export SDK, a bidirectional right-to-left (`RTL`) tag is extracted from this format and included in the direction element (`<dir=RTL>`) of the output.

Coded Character Sets

This section lists which character set you can use to specify the target character set. The coded character sets are enumerated in `kvcharset.h` and defined in the Filter class.

Code Character Sets

Coded Character Set	Description	Can be set as target charset?
KVCS_ UNKNOWN	Unknown character set	N
KVCS_SJIS	Japanese (uses multibyte encoding), cp932	Y
KVCS_GB	Simplified Chinese (China, Singapore, Malaysia) cp936	Y
KVCS_BIG5	Traditional Chinese (Taiwan, Hong Kong, Macaw) cp950	Y
KVCS_KSC	Korean, cp949	Y
KVCS_1250	Windows Latin 2 (Central Europe)	Y
KVCS_1251	Windows Cyrillic (Slavic)	Y

Code Character Sets, continued

Coded Character Set	Description	Can be set as target charset?
KVCS_1252	Windows Latin 1 (ANSI)	Y
KVCS_1253	Windows Greek	Y
KVCS_1254	Windows Latin 5 (Turkish)	Y
KVCS_1255	Windows Hebrew	Y
KVCS_1256	Windows Arabic	Y
KVCS_1257	Windows Baltic Rim	Y
KVCS_1258	Windows Vietnamese	Y
KVCS_8859_1	ISO 8859-1 Latin 1 (Western Europe, Latin America)	Y
KVCS_8859_2	ISO 8859-2 Latin 2 (Central Eastern Europe)	Y
KVCS_8859_3	ISO 8859-3 Latin 3 (S.E. Europe)	Y
KVCS_8859_4	ISO 8859-4 Latin 4 (Scandinavia/Baltic)	Y
KVCS_8859_5	ISO 8859-5 Latin/Cyrillic	Y
KVCS_8859_6	ISO 8859-6 Latin/Arabic	Y
KVCS_8859_7	ISO 8859-7 Latin/Greek	Y
KVCS_8859_8	ISO 8859-8 Latin/Hebrew	Y
KVCS_8859_9	ISO 8859-9 Latin/Turkish	Y
KVCS_8859_14	ISO 8859-14	Y
KVCS_8859_15	ISO 8859-15	Y
KVCS_437	DOS Latin US	Y
KVCS_737	DOS Greek	Y
KVCS_775	DOS Baltic Rim	Y
KVCS_850	DOS Latin 1	Y
KVCS_851	DOS Greek	Y
KVCS_852	DOS Latin 2	Y
KVCS_855	DOS Cyrillic	Y

Code Character Sets, continued

Coded Character Set	Description	Can be set as target charset?
KVCS_857	DOS Turkish	Y
KVCS_860	DOS Portuguese	Y
KVCS_861	DOS Icelandic	Y
KVCS_862	DOS Hebrew	Y
KVCS_863	DOS Canadian French	Y
KVCS_864	DOS Arabic	Y
KVCS_865	DOS Nordic	Y
KVCS_866	DOS Cyrillic Russian	Y
KVCS_869	DOS Greek 2	Y
KVCS_874	Thai	Y
KVCS_ PDFMACDOC	PDF MAC DOC	N
KVCS_ PDFWINDOC	PDF WIN DOC	N
KVCS_STDENC	Adobe Standard Encoding	N
KVCS_PDFDOC	Adobe standard PDF character set	N
KVCS_037	EBCDIC code page 037	Y
KVCS_1026	EBCDIC code page 1026	Y
KVCS_500	EBCDIC code page 500	Y
KVCS_875	EBCDIC code page 875	Y
KVCS_LMBCS	Lotus multibyte character set Group 1 and Group 2	N
KVCS_UNICODE	Unicode, UCS-2	Y
KVCS_UTF16	16-bit Unicode transformation format	Y
KVCS_UTF8	8-bit Unicode transformation format	Y
KVCS_UTF7	7-bit Unicode transformation format	Y
KVCS_2022_JP	ISO 2022-JP, Japanese mail and news safe encoding (JIS-7)	N

Code Character Sets, continued

Coded Character Set	Description	Can be set as target charset?
KVCS_2022_CN	ISO 2022-CN, Chinese mail and news safe encoding	N
KVCS_2022_KR	ISO 2022-KR, Korean mail and news safe encoding	N
KVCS_WP6X	Word Perfect 6.x and higher character mapping	N
KVCS_10000	Western European (Macintosh)	Y
KVCS_KSC5601	Unified Hangul	Y
KVCS_GB2312	Simplified Chinese (China, Singapore, Hong Kong)	Y
KVCS_GB12345	Traditional Chinese (China) - analogue of GB2312	Y
KVCS_CNS11643	Traditional Chinese - Taiwan. Supplement to Big5	Y
KVCS_JIS0201	Japanese - contains ASCII character set (JIS-Roman)	N
KVCS_JIS0212	Japanese. Supplement to JIS0208.	Y
KVCS_EUC_JP	Japanese Extended UNIX Code	Y
KVCS_EUC_GB	Simplified Chinese Extended UNIX Code	Y
KVCS_EUC_ BIG5	Traditional Chinese Extended UNIX Code	N
KVCS_EUC_KSC	Korean Extended UNIX Code	N
KVCS_424	EBCDIC Hebrew	N
KVCS_856	PC Hebrew (old)	N
KVCS_1006	IBM AIX Pakistan (Urdu)	N
KVCS_KOI8R	Cyrillic (Russian)	Y
KVCS_PDF_ JAPAN1	Adobe-Japan1-2 character collection	N
KVCS_PDF_ KOREA1	Adobe-Korea1-0 character collection	N
KVCS_PDF_GB1	Adobe-GB1-3 character collection	N
KVCS_PDF_	Adobe-CNS1-2 character collection	N

Code Character Sets, continued

Coded Character Set	Description	Can be set as target charset?
CNS1		
KVCS_2022_JP_8	ISO 2022-JP, Japanese mail and news safe encoding (JIS8)	N
KVCS_720	Arabic DOS-720	Y
KVCS_VISCII	Vietnamese VISCII	Y
KVCS_8859_10	ISO 8859-10 (Latin 6 Nordic)	Y[1]
KVCS_8859_13	ISO 8859-13 (Latin 7 Baltic)	Y [1]
KVCS_57002	ISCII Devanagari (x-iscii-de)	Y [1]
KVCS_57003	ISCII Bengali (x-iscii-be)	Y [1]
KVCS_57004	ISCII Tamil (x-iscii-ta)	Y[1]
KVCS_57005	ISCII Telugu (x-iscii-te)	Y[1]
KVCS_57006	ISCII Assamese (x-iscii-as)	Y[1]
KVCS_57007	ISCII Oriya (x-iscii-or)	Y[1]
KVCS_57008	ISCII Kannada (x-iscii-ka)	Y[1]
KVCS_57009	ISCII Malayalam (x-iscii-ma)	Y[1]
KVCS_57010	ISCII Gujarathi (x-iscii-gu)	Y[1]
KVCS_57011	ISCII Panjabi (x-iscii-pa)	Y [1]
KVCS_GB18030b2	Reserved for internal use	n/a
KVCS_GB18030	GB18030 (Chinese 4-byte character set)	Y
KVCS_8859_11	ISO 8859-11 (Thai)	Y
KVCS_8859_16	ISO 8859-16 (Latin-10 South-Eastern Europe)	Y
KVCS_ARABICMAC	Arabic Mac (x-mac-arabic)	Y
KVCS_KOI8U	Cyrillic (KOI8U Ukrainian)	Y
KVCS_HZGB2312	The 7-bit representation of GB 2312 / RFC 1842	n/a
KVCS_UTF32	32-bit Unicode transformation format	Y

[1]The character set cannot be forced as output in Export SDK and Viewing SDK because the character set is not supported by the major browsers.

Appendix D: Extract and Format Lotus Notes Subfiles

This section describes how to create XML templates to alter the appearance of extracted Lotus mail note subfiles so that they maintain the look and feel of the original notes.

Overview

KeyView uses the NSF reader, nsfsr, to extract Lotus database files, and places Lotus mail notes in subfiles. The NSF reader uses a set of default XML templates to extract the notes and apply formatting, thereby approximating the look and feel of the original notes.

In some cases, you might need to customize the XML templates, for instance if your notes contain custom data. In such cases, you can modify the existing XML templates or create your own.

During extraction, the NSF reader loads all XML files in the `NSFtemplates` directory and its subdirectories (except for the `NSFtemplates\images` directory, which is reserved for images). During initialization, the KeyView XML parser verifies the XML templates. If the templates contain any invalid XML, elements, or attributes, initialization fails and errors are recorded in the `nsfsr.log` file.

Customize XML Templates

XML templates are enabled by default. In most cases, the default templates should be sufficient; however, you can customize them or create your own as required.

To customize XML templates for Lotus note extraction

1. Modify the template files in the following directory.

   install`\`*OS*`\bin\NSFtemplates`

   The `main.xml` file must exist in the `NSFtemplates` directory. It is the top-level template file that extracts all subfiles, usually by calling other templates.

2. Make sure that any modifications or additional XML files conform to the supported elements and attributes described in Template Elements and Attributes, on page 317.

3. Extract the Lotus database file.

Use Demo Templates

For testing purposes, you can extract notes by using a set of demo templates, which are provided to demonstrate the proper usage of all the XML elements and attributes, because the default templates do not use all the XML elements.

The demo templates are available at:

*install**OS*\bin\NSFtemplates

To use the demo XML templates

1. In the `formats.ini` file, set the following parameter.

   ```
   [nsfsr]
   UseDemoTemplate=1
   ```

2. In the `main.xml` file, uncomment the following section.

   ```
   <ifini name="UseDemoTemplate" text="1">
     <call file="demo.xml"/>
     <quit/>
   </ifini>
   ```

Use Old Templates

For testing purposes, you can extract notes by using legacy templates, which produce MHTML output. You can generate similar output by disabling the XML templates, but using the old templates enables you to see the XML code and compare it to the standard and demo templates.

To use the old XML templates

1. In the `formats.ini` file, set the following parameter.

   ```
   [nsfsr]
   UseOldTemplate=1
   ```

2. In the `main.xml` file, uncomment the following section.

   ```
   <ifini name="UseOldTemplate" text="1">
     <call file="default_old.xml">
     <quit>
   </ifini>
   ```

Disable XML Templates

For testing purposes, you can disable XML templates; KeyView extracts the notes in MHTML format. You can compare the MHTML output directly by the NSF reader with the MHTML output indirectly by the NSF reader through the XML templates.

To disable XML templates

1. In the `formats.ini` file, set the following parameter.

```
[nsfsr]
ExtractByTemplate=0
```

Template Elements and Attributes

This section lists the valid XML elements and attributes that you can use when creating or modifying templates. See the demo templates for examples.

Conditional Elements

The following table lists the valid conditional elements.

Conditional elements

Element	Description
`<keyview>`	The KeyView XML template container ("root") element
`<if*>`	If the condition from the comparison is true, process the XML. Conditions can be nested up to 25 levels deep. **Attributes** • `name`. (Required) The name of the main item to compare to `item` or `text`. • `item`. (Required if no `text`) The name of the item to compare to the item specified by `name`. • `text`. (Required if no `item`) The text to compare to the item specified by `name`.
`<ifex>, <ifnx>`	If `name` item exists and has a `text` value or not. The Notes item might have a value that cannot be converted to text, such as an image.
`<ifeq>, <ifne>, <iflt>, <ifle>, <ifgt>, <ifge>`	Respectively, if `text` ==, !=, <, >, <=, >, >=. Text comparison uses a case-insensitive string compare.
`<iftdeq>, <iftdne>, <iftdlt>, <iftdle>, <iftdgt>, <iftdge>`	Respectively, if time/date ==, !=, <, >, <=, >, >=. Time/date comparison converts dates to text in local time using the Notes default, `TZFMT_NEVER`, because Notes also sometimes converts fields to text internally. For example: `text="06/30/2005 02:52:04 PM"`

Conditional elements, continued

Element	Description
<iftzeq>, <iftzne>	Respectively, if the time zone equals or does not equal the comparison text, for example CDT, EST, and so on.
<ifini>	If the value of the INI option specified in name equals the text value.
<else>	If the condition from the last <if> or <switch> was false, process XML.
<switch>	If a name value exists, process XML. **Attributes** • name. (Required) The name of the main item to compare in <case> subelements.
<case>	If the comparison condition is true, process XML, then stop processing the rest of <switch>. **Attributes** • text. (Required) The text to compare to the name item of <switch>.
<default>	If all <case> conditions were false, process XML. This element must be the last element in <switch>, after all the <case> elements. Any <case> elements after the <default> element are ignored.
<for>	If a name value exists, process XML. Process for each part of the name item. **Attributes** • name. (Required) The name of the main item. • max. (Optional) The maximum index to process. By default, all are processed.
<index>	Output <for> loop index (1-based). <index> is only valid within a <for> element.

Control Elements

The following table lists the valid control elements.

Control Elements

Element	Description
<call>	Call another XML template. You can nest templates up to 10 levels deep. **Attributes**

Control Elements, continued

Element	Description
	• `file`. (Required) The template file name. This name must be unique.
`<log>`	Log message to the NSF log file. **Attributes** • `text`. (Required) The text to log. • `type`. (Optional) The type of log message. The following values are valid: ◦ `ERROR` ◦ `WARN` ◦ `INFO` ◦ `DIAG` (the default option) ◦ `DEBUG` ◦ `DUMP`
`<quit>`	Stop processing the template. Exits without error. **Attributes** • `text`. (Optional) The text to log. • `type`. (Optional) The type of log message. See <log>, above.
`<stop>`	Stop processing the template. Exits with an `ERROR` log message. **Attributes** • `text`. (Required) The text to log.

Data Elements

The following table lists the valid data elements.

Data elements

Element	Description
`<text>`	Output text. **Attributes** • `name`. (Required if there is no parent) The name of the item to output.
`<rich>`	Output rich text (MHTML). Images are output in the next part or parts of the MHTML, after the first `<HTML>` part.

Data elements, continued

Element	Description
	Attributes • `name`. (Required if there is no parent) The name of the item to output.
`<body>`	Output the message body in rich text (MHTML). As with <rich>, on the previous page, images are output in the next part or parts of the MHTML.
`<form>`	Output the message form (usually `$Body` field) in rich text (MHTML). **Attributes** • `name`. (Required if there is no parent) The name of the item to output.
`<addr>`	Output an address. **Attributes** • `name`. (Required if there is no parent) The name of the item to output. • `type`. (Optional) The type of address to output. Set this attribute to **`CN`** (Common Name), which is the only supported type.
`<name>`	Output the name of the last `name` item, or in other words the current main item. The item must exist.
`<format>`	Set the default format for `<date>` and `<date_kv>`. This element does not set the `<text>` format. See Date and Time Formats, on page 322 for a list of all Notes and KeyView date and time formats and integer values. **Attributes** • `format`. (Optional. Omit to reset to defaults) The Notes and KeyView date and time format. You can set the following formats: ◦ `TD=int`. The Time Date format (`TDFMT_*`) ◦ `TS=int`. The Time Show format (`TSFMT_*`) ◦ `TT=int`. The Time Time format (`TTFMT_*`) ◦ `TZ=int`. The Time Zone format (`TZFMT_*`) ◦ `KV=int`. The KeyView date and time format where `int` is an integer value that corresponds to the desired format. Separate multiple formats with commas. For example: `format="TD=0,TS=2,TT=1,TZ=1,KV=55"`
`<date>`	Output a Notes date. **Attributes** • `name`. (Required if there is no parent) The name of the item to output.

Data elements, continued

Element	Description
	• `format`. (Optional) See <format>, on the previous page. You can set the following values: ◦ `TD` ◦ `TS` ◦ `TT` ◦ `TZ`
`<date_kv>`	Output a KeyView date. **Attributes** • `name`. (Required if there is no parent) The name of the item to output. • `format`. (Optional) See <format>, on the previous page. You can set the following values: ◦ `TZ` ◦ `KV`
`<time>`	Output a time range, for example 1 hour, 30 minutes. **Attributes** • `name`. (Required if there is no parent) The item name of the start date or time. • `item`. (Required) The item name of the end date or time.
`<zone>`	Output a Notes time zone mnemonic, for example `MST`. **Attributes** • `name`. (Required if there is no parent) The name of date item to output.
`<zone_utc>`	Output a time zone as UTC, for example `(UTC-06:00)`.
`<logo>`	Output the mail header logo. The image link is included in the output; the actual image is output to a different part of the MHTML subfile.
`<image>`	Output an image. The image link is included in the output; the actual image is output to the MHTML next part, as with <rich>, on page 319 and <body>, on the previous page.
`<image_uri>`	Output an image URI, in quotation marks. The actual image is output to a different part of the MHTML subfile. **Attributes**

Data elements, continued

Element	Description
	• `link`. (Required if there is no `file`) The image link, such as a form or title name. For example: • `link="StdNotesLtr0"` • `file`. (Required if there is no `link`) The name of the image file. The file must exist in the `../../templates/images` directory. For example: • `file="boxcheck.gif"`

Date and Time Formats

This section lists the supported Notes and KeyView date and time formats for use with <format>, <date>, and <date_kv>.

Lotus Notes Date and Time Formats

This section lists supported Lotus Notes date and time formats, and the integer values that specify each one.

Lotus Notes date and time formats

Format	Integer Value	Description
`TDFMT_FULL`	0	(The Notes default) Year, month, and day
`TDFMT_CPARTIAL`	1	Month and day, year if not this year
`TDFMT_PARTIAL`	2	Month and day
`TDFMT_DPARTIAL`	3	Year and month
`TDFMT_FULL4`	4	Four-digit year, month, and day
`TDFMT_ CPARTIAL4`	5	Month and day, four-digit year if not this year
`TDFMT_ DPARTIAL4`	6	Four-digit year and month
`TTFMT_FULL`	0	(Notes default) Hour, minute, and second
`TTFMT_PARTIAL`	1	Hour and minute
`TTFMT_HOUR`	2	Hour

Lotus Notes date and time formats, continued

Format	Integer Value	Description
TZFMT_NEVER	0	(Notes default) All time zones are converted to the current time zone
TZFMT_ SOMETIMES	1	Show only when outside the current time zone
TZFMT_ALWAYS	2	Show for all time zones
TSFMT_DATE	0	Date
TSFMT_TIME	1	Time
TSFMT_DATETIME	2	(The Notes default) Date and time
TSFMT_ CDATETIME	4	Date and time, or time today or time yesterday

KeyView Date and Time Formats

This section lists KeyView date and time formats. The KeyView formats use the following syntax:

Month	`Month` = full month name
	`Mon` = abbreviated month name
	`m` = month (number)
	`mm` = two-digit month (leading 0)
Weekday	`Weekday` = full weekday name
	`Wday` = abbreviated weekday name
Year	`yy` = two-digit year
	`yyyy` = four-digit year
>Day	`d` = day (number)
	`dd` = two-digit day (leading 0)
Time	`h` = 12-hour
	`H` = 24-hour
	`m` = minutes
	`s` = seconds
	`P` = AM/PM
	`p` = am/pm

Separators _ = space

c = comma

s = slash

a = dash

o = dot

KeyView date and time formats

Format	Output	Integer Value
12-Hour and 24-Hour Time Formats		
KVDTF_P	P	1
KVDTF_P_hmm	P h:mm	2
KVDTF_hmm_P	h:mm P	3
KVDTF_P_hhmm	P hh:mm	4
KVDTF_hhmm_P	hh:mm P	5
KVDTF_P_hmmss	P h:mm:ss	6
KVDTF_hmmss_P	h:mm:ss P	7
KVDTF_P_hhmmss	P hh:mm:ss	8
KVDTF_hhmmss_P	hh:mm:ss P	9
KVDTF_Hmm	H:mm	10
KVDTF_HHmm	HH:mm	11
KVDTF_mmss	mm:ss	12
KVDTF_Hmmss	H:mm:ss	13
KVDTF_HHmmss	HH:mm:ss	14
Numerical Date Formats with Slashes		
KVDTF_mmsdd	mm/dd	15
KVDTF_msdsyy	m/d/yy	16
KVDTF_mmsddsyy	mm/dd/yy	17
KVDTF_mmsddsyyyy	mm/dd/yyyy	18
KVDTF_ddsmm	dd/mm	19

KeyView date and time formats, continued

Format	Output	Integer Value
KVDTF_ddsmmsyy	dd/mm/yy	20
KVDTF_ddsmmsyy_Hmm	dd/mm/yy H:mm	21
KVDTF_ddsmm_P_hmm	dd/mm P h:mm	22
KVDTF_ddsmm_hmm_P	dd/mm h:mm P	23
KVDTF_ddsmm_P_hhmm	dd/mm P hh:mm	24
KVDTF_ddsmm_hhmm_P	dd/mm hh:mm P	25
KVDTF_ddsmmsyy_P_hmm	dd/mm/yy P h:mm	26
KVDTF_ddsmmsyy_hmm_P	dd/mm/yy h:mm P	27
KVDTF_ddsmmsyy_P_hmmss	dd/mm/yy P h:mm:ss	28
KVDTF_ddsmmsyy_hmmss_P	dd/mm/yy h:mm:ss P	29
KVDTF_ddsmmsyy_P_hhmmss	dd/mm/yy P hh:mm:ss	30
KVDTF_ddsmmsyy_hhmmss_P	dd/mm/yy hh:mm:ss P	31
KVDTF_yysmmsdd_P_hhmmss	yy/mm/dd P hh:mm:ss	32
KVDTF_yysmmsdd_hhmmss_P	yy/mm/dd hh:mm:ss P	33
KVDTF_msdsyy_Hmm	m/d/yy H:mm	34
KVDTF_mmsddsyy_Hmm	mm/dd/yy H:mm	35
KVDTF_msdsyy_P_hmm	m/d/yy P h:mm	36
KVDTF_msdsyy_hmm_P	m/d/yy h:mm P	37
KVDTF_mmsddsyy_hmm_P	mm/dd/yy h:mm P	38
KVDTF_mmsdd_P_hhmm	mm/dd P hh:mm	39
KVDTF_mmsdd_hhmm_P	mm/dd hh:mm P	40
KVDTF_mmsddsyy_P_hhmmss	mm/dd/yy P hh:mm:ss	41
KVDTF_mmsddsyy_hhmmss_P	mm/dd/yy hh:mm:ss P	42
KVDTF_msd	m/d	43
KVDTF_yysm	yy/m	44
KVDTF_yysmm	yy/mm	45

KeyView date and time formats, continued

Format	Output	Integer Value
KVDTF_yysmsd	yy/m/d	46
KVDTF_yysmmsdd	yy/mm/dd	47
KVDTF_yyyysmmsdd	yyyy/mm/dd	48
Numerical Date Formats with Dashes		
KVDTF_ddammayy	dd-mm-yy	49
KVDTF_mmadd	mm-dd	50
KVDTF_mmayy	mm-yy	51
KVDTF_yyammadd	yy-mm-dd	52
KVDTF_yyyyammadd	yyyy-mm-dd	53
KVDTF_yyyyammaddaHHmmss	yyyy-mm-dd-HH:mm:ss	54
Numerical Date Formats with Dots		
KVDTF_yyomod	yy.m.d	55
KVDTF_yyommodd	yy.mm.dd	56
KVDTF_mod	m.d	57
KVDTF_mmodd	mm.dd	58
Numerical and String Date Formats with Dashes, Commas, and Spaces		
KVDTF_ddaMon	dd-Mon	59
KVDTF_daMonayy	d-Mon-yy	60
KVDTF_ddaMonayy	dd-Mon-yy	61
KVDTF_ddaMonayyyy	dd-Mon-yyyy	62
KVDTF_Mon	Mon	63
KVDTF_Monayy	Mon-yy	64
KVDTF_Monayyyy	Mon-yyyy	65
KVDTF_Monaddayy	Mon-dd-yy	66
KVDTF_yyammadd_P_hhmmss	yy-mm-dd P hh:mm:ss	67
KVDTF_mmadd_P_hhmm	mm-dd P hh:mm	68

KeyView date and time formats, continued

Format	Output	Integer Value
KVDTF_Mon_yy	Mon yy	69
KVDTF_Monc_yy	Mon, yy	70
KVDTF_Month	Month	71
KVDTF_Monthayy	Month-yy	72
KVDTF_Month_yy	Month yy	73
KVDTF_Monthc_yy	Month, yy	74
KVDTF_Monthayyyy	Month-yyyy	75
KVDTF_Month_yyyy	Month yyyy	76
KVDTF_Monthc_yyyy	Month, yyyy	77
KVDTF_Mon_dc_yyyy	Mon d, yyyy	78
KVDTF_d_Monc_yyyy	d Mon, yyyy	79
KVDTF_yyyy_Mon_d	yyyy Mon d	80
KVDTF_Month_dc_yyyy	Month d, yyyy	81
KVDTF_d_Monthc_yyyy	d Month, yyyy	82
KVDTF_yyyy_Month_d	yyyy Month d	83
Weekday Date Formats		
KVDTF_Wday	Wday	84
KVDTF_Weekday	Weekday	85
KVDTF_Wdayc_Mon_dc_yyyy	Wday, Mon d, yyyy	86
KVDTF_Weekdayc_Month_dc_yyyy	Weekday, Month d, yyyy	87
KVDTF_Weekdayc_d_Monthc_yyyy	Weekday, d Month, yyyy	88

Appendix E: File Format Detection

This section describes how file formats are detected in Filter SDK.

Introduction

The KeyView format detection module (`kwad`) detects a file's format, and reports the information to the API, which in turn reports the information to the developer's application. If the detected format is supported by the KeyView SDK, the detection module also loads the appropriate structured access layer and document reader for further processing. For a list of supported formats, see Document Readers, on page 271.

Extract Format Information

You can extract format information from a document by using either the `fpGetDocInfoStream()` or `fpGetDocInfoFile()` functions. If required, you can then report this information to the developer's application.

The `fpGetDocInfoStream()` and `fpGetDocInfoFile()` functions extract the major format, file class, version, and document attributes, and populate the ADDOCINFO structure. This structure and values are defined in the header file `adinfo.h`. See Filter API Functions, on page 121 for more information.

For information on how to translate the extracted format information, see Translate Format Information, on page 331.

Determine Format Support

After the file format is extracted, the detection module uses the `formats.ini` file to determine whether the format is supported by KeyView, and the appropriate structured access layer and reader to load.

The `formats.ini` file is in the directory *`install`*`\`*`OS`*`\bin`, where *`install`* is the path name of the Filter installation directory and *`OS`* is the name of the operating system. It contains the following information:

- Coded format information. To translate this information, see Translate Format Information, on page 331.
- The reader associated with each format. See Determine a Document Reader, on page 332.

- Configuration parameters.
- Locale settings for internal use.

Example formats.ini file entries

```
123=mw
152=xyw
178=wp6
189=mw6
2=af
200=pdf
205=mb
210=htm
251=htm
```

> **NOTE:** The `formats.ini` file applies to all formats except graphics. Detection of graphics formats is handled by an internal module named KeyView Picture Interchange Format (KPIF).

Refine Detection of Text Files

During text detection, KeyView analyses the first 1 kB and last 1 kB of data in a document. If less than 10% of that data consists of non-ASCII characters, KeyView detects the document as a text file.

However, depending on the type of documents you are working with, the default settings might not provide the desired level of accuracy. Configuration flags enable you to change the amount of data to read at the end of a file, the percentage of non-ASCII characters permitted in a text file, and whether to use or ignore the file extension to determine the document format.

Change the Amount of File Data to Read

During file detection, KeyView reads characters from the beginning and end of a file—by default, it reads the first and last 1,024 bytes of data. Large text files might contain many irrelevant characters at the end of a file, so KeyView might not accurately detect the file format. You can set a configuration flag to increase the amount of data to read from the end of a file during detection.

To change the amount of data to read during detection

- In the `formats.ini` file, set the following flag in the `detection_flags` section:

  ```
  [detection_flags]
  non_ascii_chars_end_block_size=kB
  ```

  where *kB* is the number of kilobytes to read from the end of the file, from 0 to 10. The default value is 1.

  > **NOTE:** The file size must be greater than the value specified in the flag. If the flag value is greater than the file size, KeyView does not use the flag.

Change the Percentage of Allowed Non-ASCII Characters

By default, if less than 10% of the analyzed data in a document consists of non-ASCII characters, it is detected as a text file. Depending on the type of files that you are working with, changing the default percentage might increase detection accuracy.

To change the percentage of non-ASCII characters allowed in text files

- In the `formats.ini` file, set the following flag in the `detection_flags` section:

  ```
  [detection_flags]
  non_ascii_chars_in_text=N
  ```

  where *N* is the percentage of non-ASCII characters to allow in text files. Files that contain a lower percentage of non-ASCII characters than *N* are detected as text files. The default value is `10`.

Allow Consecutive NULL Bytes in a Text File

By default, if a document contains consecutive `NULL` bytes, it is not detected as text. Depending on the type of files that you are working with, changing the default might increase detection accuracy.

To allow consecutive NULL bytes of ASCII characters in text files

In the `formats.ini` file, set the following flag in the `detection_flags` section:

```
[detection_flags]
ascii_allow_null_bytes=1
```

The default value is 0 (do not allow consecutive NULL bytes).

Use the File Extension for Detection

Sometimes KeyView detects certain file formats, such as CSV, as ASCII because of the content of the documents. In such cases, you can configure KeyView to use the file extension to determine the document format. Using the file extension can improve detection of formats such as CSV, but might not detect text files successfully if they have incorrect file extensions.

To use the file extension for ASCII files during detection

- In the `formats.ini` file, set the following flag in the `detection_flags` section:

  ```
  [detection_flags]
  use_extension_for_ascii=1
  ```

  The default is 0 (do not use the file extension).

Translate Format Information

Format information can include file attributes in the following categories:

- Major format
- File class
- Minor format
- Major version
- Minor version

Not all categories are required. Many formats only include major format and file class, or major format only.

The format information has the following structure:

MajorFormat.FileClass.MinorFormat.MajorVersion.MinorVersion

For example:

`81.2.0.9.0`

Each number in the format information represents a file attribute. The entry `81.2.0.9.0` represents a Lotus 1-2-3 Spreadsheet file version 9.0, where

`81`= Lotus 1-2-3 Spreadsheet (major format)

`2` = Spreadsheet (file class)

`0` = not defined (minor format)

`9` = 9 (major version)

`0` = 0 (minor version)

This example applies to the `formats.ini` file. When extracting format information using the `fpDocInfoFile()` or `fpDocInfoStream()` functions, the same format is represented as `294.2.9.0`.

> **NOTE:** The format values returned from `fpDocInfoFile()` or `fpDocInfoStream()` differ from those in `formats.ini` because the former defines a unique ID for each major format, while the latter uses a major version, minor version, and minor format to distinguish between formats.

Distinguish Between Formats

The `ADDOCINFO` structure provides a unique ID for each major format. For example, a call to `fpGetDocInfoFile()` or `fpGetDocInfoStream()` would return `351.1.0` for a Microsoft Word XML format. The major format `351` is unique to this format.

Unlike `ADDOCINFO`, the `formats.ini` file distinguishes between formats by using the major version number. For example, in the `formats.ini` file, a Microsoft Word 2003 XML format is defined as `285.1.0.100.0`. The major format `285` and file class `1` are the same values for generic XML. The major version `100` distinguishes the format as Microsoft Word 2003 XML.

The major version is used to specify the following formats:

- Microsoft Office 2003 XML. This format has the same major format and file class as generic XML (`285.1`). It is distinguished from generic XML by using the following major versions:
  - Word: `100`
  - Excel: `101`
  - Visio: `110`
- The XHTML format has the same major format and file class as HTML (`210.1`). It is distinguished from HTML by using the major version `100`.

Determine a Document Reader

The format detection module uses the `formats.ini` file to determine whether a format is supported, and to determine the reader to use to parse a format. The entries in the `formats.ini` file list each format's coded value, and an abbreviation for the format's reader.

The reader abbreviation is a truncated version of the reader's library name. Adding "`sr`" to the end of an abbreviation creates the name of the reader. For example, this example entry specifies that a Lotus 1-2-3 Spreadsheet file version 9.0 is parsed by the Lotus 1-2-3 filter, `l123sr`:

```
81.2.0.9.0=l123
```

List of Required Files for Redistribution, on page 336 lists the readers provided with KeyView.

Category Values in formats.ini

The Supported Formats section lists all of the file formats that can be detected by KeyView, with associated category values for use in the `formats.ini` file. The following tables provide the list of possible file classes and minor formats.

- File Classes
- Minor Formats

File Classes

Attribute Number	Description	File class
0	No file class	AutoDetNoFormat
01	Word processor	adWORDPROCESSOR
02	Spreadsheet	adSPREADSHEET
03	Database	adDATABASE
04	Raster image	adRASTERIMAGE

File Classes, continued

Attribute Number	Description	File class
05	Vector graphic	adVECTORGRAPHIC
06	Presentation	adPRESENTATION
07	Executable	adEXECUTABLE
08	Encapsulation	adENCAPSULATION
09	Sound	adSOUND
10	Desktop publishing	adDESKTOPPUBLSH
11	Outline/planning	adOUTLINE
12	Miscellaneous	adMISC
13	Mixed format	adMIXED
14	Font	adFONT
15	Time scheduling	adSCHEDULE
16	Communications	adCOMMUNICATION
17	Object module	adOBJECTMODULE
18	Library module	adLIBRARY
19	Fax	adFAXFORMAT
20	Movie	adMOVIE
21	Animation	adANIMATION
22	Source Code	adSOURCECODE
23	Computer-Aided Design	adCAD
24	BI and analysis tools	adANALYTICS
25	Scientific data	adSCIENTIFIC
26	Geographic Info System	adGIS

Minor Formats

Attribute Number	Minor Format
00	Minor format not defined

Minor Formats, continued

Attribute Number	Minor Format
01	Standard
02	Book
03	Chart
04	Macro
05	Text
06	Binary
07	PC
08	Windows
09	DOS
10	Macintosh
11	RGB
12	TIFF
13	IFF
14	Experimental
15	Format Information
16	RLE
17	Symbol
18	Old
19	Footnote
20	Style
21	Palette
22	Configuration
23	Activity
24	Resource
25	Calculation
26	Glossary

Minor Formats, continued

Attribute Number	Minor Format
27	Spelling
28	Thesaurus
29	Hyphenation
30	Miscellaneous
31	UNIX
32	VAX
33	Driver
34	Archive

Appendix F: List of Required Files for Redistribution

This section lists the Filter files that can be redistributed in your applications under the licensing agreement. Unless noted, these files are in the directory *install**OS*\bin, where *install* is the path of the Filter installation directory and *OS* is the operating system platform.

> **NOTE:** On Windows systems, the libraries are `.dll` files. On UNIX systems, the libraries are `.so`, `.a`, or `.sl` files.

Core Files

The following core files can be redistributed with your application.

File	Description
`formats.ini`	Initialization file. For more information on this file, see Determine Format Support, on page 328.
`FilterDotNet.dll`	The .NET API.
`filterfordotnet.dll`	Required by the .NET API.
`KeyView.jar`	The Java API. **NOTE:** This file can be found at the path *install*`/javaapi/KeyView.jar` where *install* is the Filter SDK installation directory.
`*KeyViewFilter.*`	Required by the Java API.
`kpifcnvt.*`	For presentation graphics, converts from one picture format to another.
`kpifutil.*`	Utility for handling the internal picture interchange format for presentation graphics.
`kvfilter_nsl.a`	(AIX platforms only.) Alternative Filter API implementation using POSIX standards for starting new processes. See The Filter Process Model, on page 27.
`kvxtract.*`	File Extraction API.
`kvfilter.*`	Filter API.
`kvolefio.*`	Embedded OLE object writer.
`kvutil.*`	Internal KeyView utility functions.
`kvxpgsa.*`	Interface between presentation readers and `kvfilter`. Required to extract

File	Description
	metadata from AutoCAD files.
`kvxsssa.*`	Interface between spreadsheet readers and `kvfilter`.
`kvxwpsa.*`	Interface between word processing readers and `kvfilter`.
`kvzip.*`	Zip writer.
`kwad.*`	File auto-recognition module.
`txtcnv.*`	Converter for document token stream.
`vcredist\*`	(Windows platforms only) Microsoft Visual C++ Redistributable Packages. **NOTE:** This folder can be found in the Filter SDK installation directory.

Support Files

The following support files can be redistributed with your application.

File	Description
`datafiles\*`	(Folder) Required by `kvlangdetect`
`NSFtemplates\*`	(Folder) Templates used by `nsfsr` to format Lotus mail notes
`7z.*`	Required by `z7zsr` and `multiarcsr`
`bentofio.*`	Required by `l123sr` and `kpprzrdr`.
`cbmap.map`	Character mappings for Adobe Portable Document Format (PDF).
`CEBDLL.dll`	Required by `cebsr`.
`chartbls.ux`	Character mappings.
`chmdll.*`	Required by `chmsr`.
`codeidentifierplugin.*`	Required for source code identification
`cpstsdk.*`	Required by `pstxsr`.
`DFECore.dll`	Required by `cebsr`.
`Filter.dll`	Required by `cebsr`.
`kpbmpwrt.*`	Required for processing bmp files.
`kppng.*`	Required for ZLIB decompression.
`kvdecrypt.*`	Decryption utility functions.

File	Description
kvlangdetect.*	Utility functions for language and character set detection.
kvxconfig.ini	Contains element extraction settings for XML files.
kvoop.*	Required for out-of-process filtering.
kvthread.*	Required for multithreaded out-of-process filtering.
kv.lic	Contains license information for KeyView products. This file is opened and validated when a KeyView API is used.
langdetectext.	Required by kvlangdetect.*.
libpff.*	Required by pffsr.
libcrypto*	SSL utility functions used by KeyView mail format readers.
libstlport.so.1	(Solaris platforms only) Solaris Studio Redistributable. This file is located in *install*/*OS*/lib.
tabledata.dat	Required for table detection.
unzipjpg.*	Required for JPEG decompression.
wpmap.*	Extended character mapping for WordPerfect and Corel Presentation.
xmlsh.*	Contains a library of content handlers for each XML file type. Required by the Expat XML parser.

Document Readers

The following readers can be redistributed with your application.

File	Description
ad1sr.*	AD1 Evidence file reader
afsr.*	ASCII reader
aiffsr.*	Audio Interchange Format File (AIFF) reader
asfsr.*	Advanced Systems Format reader
assr.*	Applix Spreadsheet reader
awsr.*	Applix Word reader
b1sr.*	B1 archive reader
bkfsr.*	Microsoft Backup File reader

File	Description
bmpsr.*	Windows bitmap (BMP) reader
bzip2sr.*	Bzip2 reader
cabsr.*	Microsoft Cabinet format reader
cebsr.*	Founder Chinese E-paper Basic reader
chmsr.*	Microsoft Compiled HTML Help reader
csvsr.*	Comma-Separated Values reader
dbfsr.*	dBase Database reader
dbxsr.*	Microsoft Outlook Express DBX reader
dcasr.*	Document Content Architecture/Revisable Form Text (DCA/RFT) reader
dcmsr.*	Digital Imaging and Communications in Medicine (DICOM) reader
difsr.*	Data Interchange Format reader
dmgsr.*	Mac Disk Copy Disk Image File reader
dw4sr.*	DisplayWrite reader
dxlsr.*	Domino XML Language reader
emlsr.*	Microsoft Outlook Express (EML) reader. This is used to filter EML files when the MBX reader is not licensed.
emxsr.*	Legato EMailXtender (EMX) reader
encasesr.*	Expert Witness Compression Format (EnCase) v6 reader
encase2sr.*	Expert Witness Compression Format (EnCase) v7 reader
entsr.*	Microsoft Entourage Database Format reader
epubsr.*	Open Publication Structure eBook reader
foliosr.*	Folio Flat File reader
gdsiisr.*	Graphic Database System (GDSII) reader
gifsr.*	Graphics Interchange Format (GIF) reader
gwfssr.*	GroupWise FileSurf reader
hl7sr.*	Health level7 reader (metadata only)
htmsr.*	HTML and XHTML reader
hwpsr.*	Hangul 97 reader

File	Description
hwposr.*	Hangul 2002, 2005, 2007 reader
ichatsr.*	Apple iChat Log reader
icssr.*	Microsoft Outlook iCalendar reader
isosr.*	ISO-9660 CD Disc Image Format reader
iwss13sr.*	iWork 13 Numbers reader
iwwp13sr.*	iWork 13 Pages reader
iwwpsr.*	Apple iWork Pages reader
iwsssr.*	Apple iWork Numbers reader
jp2000sr.*	JPEG 2000 metadata reader
jpgsr.*	JPEG metadata reader
jtdsr.*	JustSystems Ichitaro reader
kpagrdr.*	Applix Presentations reader
kpcatrdr.*	CATIA format reader
kpcgmrdr.*	Computer Graphics Metafile reader
kpdwgrdr.*	AutoCAD Drawing format reader
kpdxfrdr.*	AutoCAD Drawing Exchange format reader
kpemfrdr.*	Enhanced Metafile reader
kpgflrdr.*	Omni Graffle reader
kpgifrdr.*	Graphic Interchange Format (GIF) reader
kpiwpg13rdr.*	iWork 13 keynote reader
kpiwpgrdr.*	Apple iWork Keynote reader
kpjbig2rdr.*	JBIG2 reader
kpjp2000rdr.*	JPEG 2000 reader
kpmsordr.*	Microsoft Office Drawing Objects (office 97, 2000, and XP) reader
kpnbmprdr.*	Notes Bitmap reader (for embedded images in DXL files)
kpodardr.*	AutoCAD reader (Windows only)
kpodfrdr.*	Oasis Open Document Format presentation (ODP) reader

File	Description
kpoxdrdr.*	Open Office XML Diagram Graphics reader.
kpp40rdr.*	Microsoft PowerPoint PC 4.0 and PowerPoint Mac reader
kpp95rdr.*	Microsoft PowerPoint 95 reader
kpp97rdr.*	Microsoft PowerPoint 97 and higher reader
kppctrdr.*	Macintosh Quick Draw Picture (PICT) reader
kppicrdr.*	Pictor PC Paint (PIC) reader
kppngwrt.*	Portable Network Graphics (PNG) reader
kpppxrdr.*	Microsoft PowerPoint XML reader 2007
kpprerdr.*	Lotus Freelance Graphics for Windows V2.0 reader
kpprzrdr.*	Lotus Freelance Graphics 96/97/98 reader
kpsddrdr.*	StarOffice Impress reader
kpsdwrdr.*	Lotus Ami Pro Graphics reader
kpshwrdr.*	Corel Presentations reader
kptifrdr.*	Tagged Image File (TIF) reader
kpugrdr.*	Unigraphics (UG) NX reader
kpvsd2rdr.*	Microsoft Visio reader
kpvsdxrdr.*	Microsoft Visio 2013 reader
kpwg2rdr.*	WordPerfect Graphics 2 reader
kpwmfrdr.*	Windows Metafile reader
kpwpgrdr.*	WordPerfect Graphics 1 reader
kpxfdlrdr.*	Extensible Forms Description Language reader
kvgzsr.*	GZIP reader
kvhqxsr.*	BinHex reader
kvzeesr.*	UNIX Compress reader
l123sr.*	Lotus 123 v96/97/98 reader
lasr.*	Lotus AMI Pro reader
ltbenn30.dll	Lotus Word Pro support (supported on Windows x86 platform only)

File	Description
ltscsn10.dll	Lotus Word Pro support (supported on Windows x86 platform only)
lwpapin.dll	Lotus Word Pro support (supported on Windows x86 platform only)
lwppann.dll	Lotus Word Pro support (supported on Windows x86 platform only)
lwpsr.dll	Lotus Word Pro reader (supported on Windows x86 platform only)
lzhsr.*	Microsoft Compression Folder reader
macbinsr.*	MacBinary reader
mbsr.*	Microsoft Word Macintosh reader
mbxsr.*	Mailbox (MBX) and Microsoft Outlook Express (EML) reader[1]
mdbsr.*	Microsoft Access reader
mhtsr.*	MIME HTML reader
mifsr.*	Adobe Maker Interchange reader
misr.*	Microsoft Word 2 reader
mp3sr.*	MP3 reader for metadata extraction reader
mpeg4sr.*	MPEG-4 Audio file reader
mppsr.*	Microsoft Project reader
msgsr.*	Microsoft Outlook (MSG) reader
mspubsr.*	Microsoft Publisher reader
msw6sr.*	Microsoft Works 6 and 2000 reader
mswsr.*	Microsoft Works V1 and 2 reader
multiarcsr.*	ARJ Reader
mw6sr.*	Microsoft Word 95 reader
mw8sr.*	Microsoft Word 97, 2000, and XP reader
mwsr.*	Microsoft Word for DOS and Microsoft Write reader
mwssr.*	Microsoft Works Spreadsheet reader
mwxsr.*	Microsoft Word 2007 XML reader

[1]This reader is an advanced feature and is sold and licensed separately from KeyView Filter SDK. See License Information, on page 17

File	Description
nsfsr.*	Lotus Notes database reader 1
oa2sr.*	Fujitsu Oasys reader
odfsssr.*	Oasis Open Document Format spreadsheets (ODS) reader
odfwpsr.*	Oasis Open Document Format word processing (ODS) reader
olesr.*	Embedded OLE object reader
olmsr.*	Microsoft Outlook for Macintosh reader
onealtsr.*	Microsoft OneNote Alternate Format reader
onesr.*	Microsoft OneNote Format reader
pmesr.*	Plazmic Media Engine data file reader
onmsr.*	Legato EMailXtender Native Message reader
oo3sr.*	Omni Outliner reader
pbixsr.*	Microsoft Power BI file (PBIX) reader
pdf2sr.*	Alternative Adobe Portable Document Format file (PDF) reader
pdfsr.*	Adobe Portable Document Format file (PDF) reader
pfilesr.*	Microsoft Rights Management System encryption file reader
pffsr.*	Microsoft Outlook Offline Storage File reader
pngsr.*	Portable Network Graphics (PNG) reader
psdsr.*	Adobe Photoshop Document (PSD) reader
pstsr.dll	Microsoft Outlook Personal Folders file MAPI-based reader (supported on Windows platform only)1
pstnsr.*	Microsoft Outlook Personal Folders file native reader1
pstxsr.*	Microsoft Outlook Personal Folders file native reader1
qpssr.*	Corel Quattro Pro spreadsheet reader
qpwsr.*	Corel Quattro Pro version X4 spreadsheet reader
rarsr.*	RAR Archive reader
riffsr.*	Microsoft WAVE reader
rtfsr.*	Microsoft Rich Text reader
skypesr.*	Skype log file reader

File	Description
sosr.*	StarOffice/OpenOffice reader
starcsr.*	StarOffice Calc reader
starwsr.*	StarOffice Writer reader
sunadsr.*	Sun Audio Data reader
swfsr.*	Macromedia Flash reader
tarsr.*	Tape archive reader
tifsr.*	TIFF reader (metadata only)
tnefsr.*	Transfer Neutral Encapsulation Format
unihtmsr.*	Unicode HTML reader
unisr.*	Unicode reader
unzip.*	Zip file reader
utf8sr.*	UTF-8 reader
uudsr.*	UUEncoding reader
vcfsr.*	Microsoft Outlook vCard Contact reader
vsdsr.*	Microsoft Visio reader
wkssr.*	Lotus 123 v2.0 through 5.0 reader
wosr.*	WordPerfect 5.x reader
wp6sr.*	WordPerfect 6.0 through 10.0 reader
wpmsr.*	WordPerfect for Macintosh reader
xlsbsr.*	Microsoft Office 2007 Excel Binary Format reader
xlssr.*	Microsoft Excel reader
xlsxsr.*	Microsoft Excel 2007 XML reader
xmlsr.*	Generic XML reader
xpssr.*	XML Paper Specification reader
xywsr.*	XYWrite reader
yimsr.*	Yahoo! Instant Messenger reader
z7zsr.*	7-Zip reader

Appendix G: Develop a Custom Reader

This section describes how to develop a reader for a format not supported by KeyView.

Introduction

The Filter SDK enables you to write custom readers for formats not directly supported by KeyView. A reader is required to parse the file format and generate a KeyView token stream, which represents the content and format of the document. Filter can then use this token stream to generate a text version of the original document. The readers interact with a structured access layer and a writer to generate a text file in Filter, an HTML file in HTML Export, an XML file in XML Export, and a near-to-original view of the document in the Viewing SDK.

The complexity of a custom reader depends on the file format used by the source document type. A simple reader extracts only the textual content, but ignores formatting and all other non-textual content. Readers of increasing complexity must address one or more of the following:

- formatting (including fonts, foreground and background colors, paragraph borders and shading, character and paragraph styles)
- tables
- lists
- headers
- footers
- footnotes
- endnotes
- graphics
- bookmarks to internal links
- hyperlinks to external documents or webpages
- other structures, such as a table of contents or index

Even a simple reader might have to parse the following components of a document:

- word processing commands or tags
- encrypted or encoded text
- multiple character sets

- text modified, but retained within the file
- text displayed in an order other than its physical occurrence within the source file

It is very important to fully understand the file specification for the file format used by the document. This is essential in determining how to parse the source file and generate a token stream that accurately and effectively represents the original document.

Within Filter, the custom reader must interact with a structured access layer and the format detection API, which in turn interacts with the top-level API. For a description of the Filter architecture, see Architectural Overview, on page 21.

The custom reader must have a module definition file (`*.def`) that defines the exported API function calls. In addition, the `formats.ini` file must be modified to identify the custom reader and its associated format detection function.

See the source code for the sample custom reader (`utf8sr`), which parses plain text files encoded in UTF-8. The source code is in the directory *`install`*`/samples/utf8sr`, where *`install`* is the path name of the Filter installation directory.

How to Write a Custom Reader

Two include files define the requirements for a custom reader: `kvcfsr.h` and `kvtoken.h`. The definitions of the KeyView tokens are in `kvtoken.h`. For more information on tokens, see Token Buffer, on the next page. The file `kvcfsr.h` defines two structures: `TPReaderInterface` and `adTPDocInfo`.

The `TPReaderInterface` structure defines the API functions implemented by the custom reader. For basic readers, only the first four functions must be implemented. These functions are called by the structured access layer to parse the source file and generate the token stream.

All readers must be threadsafe. This means that global variables must not be used. To pass information between functions, it is necessary to define a "global" context structure that stores all information required throughout the life of the DLL. The initial parameter of all but one of the `TPReaderInterface` functions is a pointer to a global context structure defined for the custom reader.

The `adTPDocInfo` structure defines the information required for the format detection API, which associates the custom reader with the required file format.

Naming Conventions

Use the following naming conventions for functions and files:

- The initial letters of the custom reader file name should identify the file format being parsed. For example, `pdf` for Adobe PDF files, `rtf` for RTF files, and `xls` for Microsoft Excel files. In the examples in this appendix, this is represented by `xxx`.
- The name of the shared library must end with the letters `sr`.
- The name of the exported functions in the module definition file must be `xxxGetReaderInterface` and `xxxsrAutoDet`.

> **NOTE:** The letters `sr` are excluded from `xxxGetReaderInterface`, but are included in `xxxsrAutoDet`.

Basic Steps

The basic steps for developing a custom reader are as follows.

To develop a custom reader

1. Design the global context structure.
2. Write the basic API functions:
   - xxxAllocateContext()
   - xxxInitDoc()
   - xxxFillBuffer()
   - xxxFreeContext()
   - xxxCharSet()
   - xxxsrAutoDet()

   From within the `xxxFillBuffer()` function, it is necessary to call other functions that repeatedly read a chunk of a source file, parse the chunk, and generate a token stream until the entire source file is processed.
3. Map all but the last function to the `TPReaderInterface` structure.
4. Write the module definition file (`*.def`), exporting the reader interface and format detection functions.
5. Modify the `formats.ini` file to identify the custom reader and its associated format detection function. See xxxsrAutoDet(), on page 357. For example, the following lines would be added to the `[Formats]` section of the `formats.ini` file for the UTF-8 reader:

   ```
   456.1.0.0=utf8
   [CustomFilters]
   1=utf8sr
   ```

Token Buffer

Filter technology parses the native file structure to generate an intermediate stream called a *token buffer*. The token buffer consists of multiple sequences of tokens, which are defined in `kvtoken.h` and listed below.

```
#define KVT_TEXT         0x00 /* PutText() */
#define KVT_PARAINFO     0x01 /* SetParaInfo() */
#define KVT_SETTABS      0x02 /* SetTabs() */
#define KVT_TAB          0x03 /* Tab() */
#define KVT_MODE         0x04 /* SetMode() */
```

```
#define KVT_PARASPACE    0x05 /* SetParaSpace() */
#define KVT_ROWDEFN      0x06 /* DefineRow(), EndTable() */
#define KVT_COLUMNS      0x07 /* StartColumns(), etc. */
#define KVT_CELLSTART    0x08 /* NextCell() */
#define KVT_BITMAP       0x09 /* Reserved for annotations. */
#define KVT_PAGEOBJ      0x0A /* PutHeader(), PrintPage(), etc.*/
#define KVT_NOOP         0x0B /* Just skip a BYTE. */
#define KVT_PAGE_BREAK   0x0C /* PageBreak() */
#define KVT_PARA_BREAK   0x0D /* ParaEnd() */
#define KVT_LINE_BREAK   0x0E /* LineBreak() */
#define KVT_SET_FONT     0x0F /* SetFont() */
#define KVT_PAGE         0x10 /* SetPageInfo() */
#define KVT_HOTSPOT      0x11 /* StartHotSpot() */
#define KVT_LINESPACE    0x12 /* SetLineSpacing() */
#define KVT_COLOR        0x13 /* VESetTextColor(),VESetBkColor()*/
#define KVT_PICTURE      0x14 /* PutPicture() */
#define KVT_CELLMERGE    0x15 /* MergeCells() */
#define KVT_RULE         0x16 /* HorzRule() */
#define KVT_PATTERN      0x17 /* StartPattern(), etc. */
#define KVT_BORDER       0x18 /* StartParaBorder(), etc. */
#define KVT_HEADING      0x19 /* PutParaHeading() */
#define KVT_LISTING      0x1A /* StartList(), etc. */
#define KVT_CHARSET      0x1B /* SetCharSet() */
#define KVT_STYLE        0x1C /* PutCharStyle(), PutParaStyle()*/
#define KVT_BIDI         0x1D /* Set Bidirectional text */
#define KVT_LOCALE       0x1E /* Set locale of a document */
#define KVT_ZONE         0x1F /* StartZone(), EndZone() */
#define KVT_POSITION     0x20 /* SetPosition(), etc. */
#define KVT_AUTOREC      0x21 /* Reserved for Internal Use */
#define KVT_METADATA     0x22 /* Rsserved for Internal Use */
#define KVT_BYTEORDER    0x23 /* SetByteOrder() */
#define KVT_PARASPACEAUTO 0x24 /* SetParaSpaceAuto() */
#define KVT_ATTACH        0x25 /* PutAttachment() */
#define KVT_TOCPRINTIMAGE 0x26 /* StartTOCPrintImage(), etc. */
#define KVT_STREAM        0x27 /* PutStream(),Reserved */
#define KVT_REVISIONMARK  0x28 /* StartRevisionMark(),
EndRevisionMark(), SetRMAuthor(), SetRMDateTime() */
#define KVT_DOCXTRINFO    0x29 /* SetDocXtrInfo() */
#define KVT_PCTEMDFT      0x30 /* SetPctEmdFt() */
```

A token is a single-byte identifier that corresponds to attributes in a document. Each token has one or more associated macros that provide detailed information about an attribute. Many of these tokens define components of the document, such as page margins, line indentation, and foreground and background color. Collectively, these are referred to as the *state* of the document. This state changes as the document is parsed.

Macros

Some of the macros are simple while others are complicated. An example of a simple macro is `ParaEnd (pcBuf)` which terminates the current paragraph.

```
#define ParaEnd(pcBuf)                                  \
        {                                               \
            *pcBuf++ = KVT_PARA_BREAK;                  \
             KVT_PUTINT(pcBuf, KVTSIZE_PARA_BREAK);     \
        }
```

In Filter SDK, this generates an `0x0d`, `0x0a` pair of bytes on a Windows machine. In HTML Export this can generate a `<p style="…">` element, depending on the value of other paragraph attributes.

One of the more complicated macros is `PutPictureEx()`.

```
#define PutPictureEx(pcBuf, lpszKey, cx, cy, flags,             \
             scaleHeight, scaleWidth,                           \
             cropFromL, cropFromT, cropFromR, cropFromB,        \
             anchorHorizontal, anchorVertical, offsetX, offsetY)\
          {                                                     \
             PutPic(pcBuf, lpszKey, cx, cy, flags,              \
             scaleHeight, scaleWidth,                           \
             cropFromL, cropFromT, cropFromR, cropFromB,        \
             anchorHorizontal, anchorVertical, offsetX, offsetY,\
             180, 0, 180, 0, -1, 0, 0, 0, 0)                    \
          }
```

You can generate a representation of the token stream by running `filtertest.exe` with the `-d` command-line option. This stream does not include the tokens generated for headers or footers. The `filtertest.exe` is in the directory *`install`*`\samples\utf8\bin`, where *`install`* is the path name of the Filter installation directory.

Reader Interface

All custom readers use the reader interface defined in `kvcfsr.h`. The members of this structure are:

```
fpAllocateContext()
fpInitDoc()
fpFillBuffer()
fpFreeContext()
fpHotSpothit()
fpGetSummaryInfo()
fpOpenStream()
fpCloseStream()
fpGetURL()
fpGetCharSet()
```

> **NOTE:** `fpHotSpothit()` and `fpGetURL()` are currently reserved and must be `NULL`.

Function Flow

The structured access layer calls the functions as follows:

1. `fpAllocateContext()` is called and returns a pointer to the global context structure.
2. After further processing within the structured access layer, `fpInitDoc()` is called. This function performs all required initialization for the global context structure and then returns control to the structured access layer.
3. After further processing within the structured access layer, the `fpFillBuffer()` function is called repeatedly until the document is completely parsed.
4. Finally, `fpFreeContext()` is called. This function frees all memory allocated within the custom reader and then returns control to the structured access layer.

Related Topics

- Functions, on page 357

Example Development of fffFillBuffer()

The following is an example of how the `fpFillBuffer()` function in `foliosr` could be developed. The example demonstrates how the code changes as limitations of the implementation are identified. With each implementation, code revisions are shown in bold.

Implementation 1—fpFillBuffer() Function

```
/*****************************************************************
*Function: fffFillBuffer()
*Summary: Read fff input from stream and parse into kvtoken.h codes
*****************************************************************/
int pascal _export fffFillBuffer(
    void    *pCFContext,
    BYTE    *pcBuf,
    UINT    *pnBufOut,
    int    *pnPercentDone,
    UINT    cbBufOutMax )
{
    BOOL bRetVal;
    TPfffGlobals *pContext = (TPfffGlobals *)pCFContext;
    pContext->pcBufOut = pcBuf;
    fffReadSourceFile(pContext);
    bRetVal = fffProcessBuffer(pContext, pcBuf);
    *pnPercentDone = (int)(pContext->unTotalBytesProcessed *
    (UINT)100 / pContext->unFileSize);
    *pnBufOut = (UINT)(pContext->pcBufOut - pcBuf);
    return (bRetVal ? KVERR_Success : KVERR_General);
}
```

The parameters in `fffFillBuffer()` are as follows:

Parameter	In/Out	Description
pCFContext	In	A pointer to the context structure of the custom reader.
pcBuf	In/Out	A pointer to the token output buffer.
pnBufOut	Out	A pointer to the number of bytes written to the output buffer.
pnPercentDone	Out	A pointer to the percentage complete.
cbBufOutMax	In	The maximum number of bytes that the token output buffer can hold.

Structure of Implementation 1

1. The local variable pContext is set to the address of the pCFContext void pointer, cast to a pointer to the global context structure for the reader. This provides access to all members of this structure.
2. After setting the pContext variable, a call is made to read the source file.
3. Next, a call is made to fffProcessBuffer(). The second parameter in the call is a pointer to the token output buffer. If this call fails, usually because of memory allocation errors, it returns FALSE.
4. The percentage complete is calculated.
5. The number of BYTES written to the token output buffer is calculated. This is based on the value of pContext->pcBufOut, which is increased each time a token is written to the buffer.
6. The function returns to the structured access layer.
7. Subsequent calls to fffFillBuffer() are made by the structured access layer until the percentage complete is 100.

Problems with Implementation 1

- There is a limit to the size of the token output buffer, typically 4 KB. If fffProcessBuffer() generates a token stream larger than this, there is a memory overflow. If fffProcessBuffer() generates a small token stream and the entire file has not been read, the output token buffer is underutilized.
- It might not be possible to process the entire input buffer from the source file because of boundary conditions. An example of a "boundary condition" is when the input buffer terminates part way through a control sequence in the original document. Another file read operation is required before the complete control sequence can be parsed.
- This function might be interrupted by other calls from the structured access layer to process headers, footers, footnotes, and endnotes, or to retrieve the document summary information. This can cause values of variables in the global context to change, and the source file to be repositioned.

Implementation 2—Processing a Large Token Stream

Implementation 2 addresses the problem of processing a token stream that is larger than the output buffer size limit.

```
/*****************************************************************
* Function:   fffFillBuffer()
* Summary:    Read fff input from stream and parse into kvtoken.h codes
*****************************************************************/
int pascal _export fffFillBuffer(
    void    *pCFContext,
    BYTE    *pcBuf,
    UINT    *pnBufOut,
    int    *pnPercentDone,
    UINT    cbBufOutMax )
{
    BOOL bRetVal  = TRUE;
    TPfffGlobals *pContext = (TPfffGlobals *)pCFContext;
    pContext->pcBufOut      = pcBuf;
    pContext->cbBufOutMax   = 9 * cbBufOutMax / 10;  /* Process the portion of the
fff file that is in the input buffer but do   * not return from the fffFillBuffer()
function unless the output buffer is   * at least 90% full. If any of the memory
allocations fail during the   * execution of fffProcessBuffer(), bRetVal will be
set to FALSE, resulting   * in this conversion failing "gracefully".
                */
    do

{
        if( pContext->bBufOutFull )

{
            pContext->bBufOutFull = FALSE;
        }
        else

{
            fffReadSourceFile(pContext);
        }
        bRetVal = fffProcessBuffer(pContext, pcBuf);
        *pnPercentDone = (int)(pContext->unTotalBytesProcessed *
        (UINT)100 / pContext->unFileSize);
    }while( bRetVal && !pContext->bBufOutFull && *pnPercentDone < 100 );
    *pnBufOut = (UINT)(pContext->pcBufOut - pcBuf);
    return (bRetVal ? KVERR_Success : KVERR_General);
}
```

Structure of Implementation 2

1. `cbBufOutMax` is used to set `pContext->cbBufOutMax`. This is used in `fffProcessBuffer()` to monitor how full the token output buffer becomes as the source file is processed.
2. When the source file input buffer has been processed, `fffProcessBuffer()` returns, and the percentage complete is calculated.
3. If the token output buffer is not filled to a value greater than `pContext->cbBufOutMax`, `pContext->bBufOutFull` remains set to **`FALSE`**, and if the percentage complete is less than 100, the `do-while` loop is re-entered without returning from this function to the structured access layer. There is another call to `fffReadSourceFile()`, followed by `fffProcessBuffer()`.
4. When the token output buffer is filled to a value greater than `pContext->cbBufOutMax`, `pContext->bBufOutFull` is set to **`TRUE`**. In this case, the `do-while` loop ends, the number of bytes written to the token output buffer is calculated, and control returns to the structured access layer.
5. The structured access layer continues to make calls to `fffFillBuffer()` until the entire source file is processed.
6. Each time the structured access layer calls `fffFillBuffer()`, another empty token output buffer is provided for the custom reader to use.
7. If the previous call to `fffFillBuffer()` exited because the previous token output buffer exceeded allowable capacity, `pContext->bBufOutFull` is reset to **`FALSE`** and no call is made to read the next buffer from the input source file.

Problems with Implementation 2

- It might not be possible to process the entire input buffer from the source file because of boundary conditions.
- This function might be interrupted by other calls from the structured access layer to process headers, footers, footnotes, or endnotes, or to retrieve the document summary information. This can cause values of variables in the global context to change, and the source file to be repositioned.

Boundary Conditions

A boundary condition can result from many situations arising from input file processing. For example, the input buffer might end with an incomplete command. In Folio flat files, this could be an incomplete element. In other word processing documents, a boundary condition might result from an incomplete control sequence, a split double-byte character, or a partial UTF-7 or UTF-8 sequence. These can be handled jointly by `fffProcessBuffer()`, which must detect the boundary condition, and `fffReadSourceFile()`.

The following example shows partial code used in `fffReadSourceFile()`:

```
/*****************************************************************
 *
 * Function:    fffReadSourceFile()
```

```
 *
 ************************************************************/
int pascal fffReadSourceFile(TPfffGlobals *pContext)
{
    int nBytes;
    /* Transfer remaining data to beginning of buffer prior to next read */
    if( pContext->nResidualBytes )
    {
        memcpy(pContext->cInputBuf, pContext->pcBufIn, pContext->nResidualBytes);
    }
    /* Read from file, without over-writing any text from the previous buffer */
    nBytes = (*pContext->pIO->kwReadFunc)(pContext->pIO,
            pContext->cInputBuf + pContext->nResidualBytes,
            BUFFERSIZE - pContext->nResidualBytes);
    /* Update input buffer control parameters */
    pContext->unTotalBytesRead += (UINT)nBytes;
    pContext->pcBufIn = pContext->cInputBuf;
    pContext->pcBufInMax = pContext->pcBufIn + pContext->nResidualBytes + nBytes;
    pContext->nResidualBytes = 0;
    return nBytes;
}
```

If `fffProcessBuffer()` is unable to process the entire input source file buffer, it sets the value for `pContext->nResidualBytes`. When the next call to `fffReadSourceFile()` is made, any residual bytes are copied to the beginning of the input source file buffer, and the number of bytes to be read is reduced to make sure that this buffer does not overflow.

A good way to test the code for boundary conditions is to vary the size of `BUFFERSIZE` and make sure that the results remain consistent.

> **NOTE:** With `ReadSourceFile()`, the source file can be read by calls to retrieve header or footer information. If this occurs, the value for `pContext->unTotalBytesRead` is incorrect.

Implementation 3—Interrupting Structured Access Layer Calls

Implementation 3 addresses the problem of boundary conditions and interrupting calls from the structured access layer.

```
/*****************************************************************************
* Function:   fffFillBuffer()
* Summary:    Read fff input from stream and parse into kvtoken.h codes
*****************************************************************************/
int pascal _export fffFillBuffer(
    void    *pCFContext,
    BYTE    *pcBuf,
    UINT    *pnBufOut,
    int    *pnPercentDone,
    UINT    cbBufOutMax )
{
    double dTotalBytesProcessed, dFileSize;
```

```
    BOOL bRetVal = TRUE;
    TPfffGlobals *pContext = (TPfffGlobals *)pCFContext;
    pContext->pcBufOut = pcBuf;
    pContext->cbBufOutMax = 9 * cbBufOutMax / 10;
/* Process the portion of the fff file that is in the input buffer but do
* not return from the fffFillBuffer() function unless the output buffer is
* at least 90% full. If any of the memory allocations fail during the
* execution of fffProcessBuffer(), bRetVal will be set to FALSE, resulting
* in this conversion failing "gracefully". */
    do
    {
         if( pContext->bBufOutFull )
        {
            pContext->bBufOutFull = FALSE;
        }
         else
        {
            fffReadSourceFile(pContext);
        }
         bRetVal = fffProcessBuffer(pContext, pcBuf);
         if( pContext->bHeaderCompleted )

{
            *pnPercentDone = 100;
            pContext->bHeaderCompleted = FALSE;
        }
         else if( pContext->bFooterCompleted )

{
            *pnPercentDone = 100;
            pContext->bFooterCompleted = FALSE;
        }
         else

{
            if( pContext->unTotalBytesProcessed >= pContext->unFileSize )
            {
                *pnPercentDone = 100;
            }
            else if( pContext->unFileSize < FFF_MAX_ULONG )
            {
                *pnPercentDone = (int)(pContext->unTotalBytesProcessed *
    (UINT)100 / pContext->unFileSize);
            }
             else

{
                dTotalBytesProcessed = pContext->unTotalBytesProcessed;
               dFileSize = pContext->unFileSize;
```

```
                *pnPercentDone = (int)(dTotalBytesProcessed * 100 / dFileSize);
            }
        }
        }while( bRetVal && !pContext->bBufOutFull && *pnPercentDone < 100 );
        *pnBufOut = (UINT)(pContext->pcBufOut - pcBuf);
        return (bRetVal ? KVERR_Success : KVERR_General);
}
```

Structure of Implementation 3

- The most significant change in Implementation 3 is the addition of the code that checks whether the processing of the header or footer is complete. The variables for `pContext->bHeaderCompleted` and `pContext->bFooterCompleted` are set to **`TRUE`** in `fffProcessBuffer()` when a header or footer is processed and the end of that portion of the document is reached.
- The other piece of code added in Implementation 3 is unique to `foliosr`. Folio files can be 50 MB or larger. Therefore, an unsigned integer is too small to accurately calculate the percentage complete. If the file size exceeds `FFF_MAX_ULONG`, which is defined as `(UINT)(0xFFFFFFFF / 0x64)`, the doubles are used for that calculation.
- Prior to returning, the token output buffer is as full as possible and never overflows. The minimum number of calls is made.

Development Tips

- Avoid unnecessary initialization.

  The context variable is allocated in `fpAllocateContext()`. This structure must be immediately `memset()` to zero. This sets all `BOOL` values to **`FALSE`**, all pointers to **`NULL`**, and all integers to **`0`**. Only non-zero, non-`NULL` and `BOOL`s that must be **`TRUE`** need to be initialized. This is best done in `fpInitDoc()`.

- Know where you are in the input source file.

  If you are processing headers, footers, notes, or (in the case of `rtfsr`) tables, you must be able to reposition the file pointer as required.

- Check buffer boundaries continuously.

  Whenever you advance through the buffer, you need to know whether there is enough of the input stream to completely process the current command. If not, you need to append the next section of the input file before continuing.

- Strive for a "clean" token stream.

  Use `filtertest` with the `-d` command-line option to generate a *token* version of the document. If there are redundant tokens, the reader is producing an inefficient token stream. You can keep the token stream free from redundancies by storing the state of the document and then applying the changes only when content is encountered. Content can be text, tabs, or picture objects. The `filtertest.exe` is in the directory *`install`*`\samples\utf8\bin`, where *`install`* is the path name of the Filter installation directory.

- Avoid large `switch()` statements whenever possible. They make both development and debugging more complicated than necessary. If there is a fixed set of commands, consider using a hash table that enables you to quickly identify a pointer to the function that handles that command.
- Filtering document metadata is a separate process.

  Remember that `fpGetSummaryInfo()` is a completely separate process from the rest of your code. It creates its own context variable structure. It does not have to call `fpFillBuffer()`.
- Use caution when processing headers, footers, and notes.

  If you need to process these items, the structured access layer calls `fpOpenStream()` and `fpCloseStream()`. It is critical that you save the state of your document and the file pointer position prior to returning from `fpOpenStream()`. Prior to returning from `fpCloseStream()`, you must restore the file pointer and the previous state of your document.
- Test your code.

  The structured access layer for each SDK is unique. Test your code in Filter SDK, Export SDK, and Viewing SDK.

Functions

This section describes the functions used by custom readers to manage the source file and generate token streams required to convert a document.

xxxsrAutoDet()

This function analyzes the source document and determines whether the detected file format requires the custom reader. It is called only when the `[CustomFilters]` section of the `formats.ini` file contains an entry identifying the complete file name of the custom reader. For more information on the `formats.ini` file, see File Format Detection, on page 328.

Syntax

```
Bool pascal _export xxxsrAutoDet(
    adTPDocInfo    *pTPDocInfo,
    KPTPIOobj      *pIO)
```

Arguments

`pTPDocInfo`	A pointer to the `adTPDocInfo` structure provided by the structured access layer.
`pIO`	A pointer to the I/O stream object for the document processed.

Returns

- `TRUE` if the file format matches that of the custom reader.
- `FALSE` if the file format does not match that of the custom reader.

Discussion

- Typically, only the first 1 KB of the file is read into a buffer and analyzed to determine if it matches the file format of the custom reader. If a match is determined, the following four members of the `adTPDocInfo` structure must be assigned before returning `TRUE`:

`adClass`	Must be set to **`1`**.
`adFormat`	A numerical value assigned to this reader in the `[Formats]` section of the `formats.ini` file.
`descStr`	A string describing the file format.
`mMnmemStr`	The initial part of the custom reader file name with the "`sr`" excluded.

- If the return value is `TRUE`, the custom reader is used to parse the file and generate the token stream.
- If the return value is `FALSE`, all other readers in the `[CustomFilters]` section of the `formats.ini` file are tried. If no match is found, the file detection process continues checking for the formats supported by Filter SDK.
- The entry in the `[Formats]` section of the `formats.ini` file should be of the form *`aaa.bbb.ccc.ddd`*, where *aaa* is the value used for the `adFormat` parameter, *bbb* is the value of the file class, *ccc* is the value of the minor format, and *ddd* is the value of the major version.

xxxAllocateContext()

This function allocates a global memory block for a data context. A handle to this memory is returned to the structured access layer. The structured access layer passes this handle back to all reader entry points.

Syntax

```
void * pascal _export xxxAllocateContext(
    void                    *pSALContext,
    LPARAM (pascal *fp)(void *,
    UINT                     LPARAM),
    Bool                    *pbOpenDoc,
    TPVAPIServices          *pVapi,
    DWORD                    dwFlags)
```

Arguments

`pSALContext`	A pointer to the global data context structure of the structured access layer.
`fp`	A pointer to a structure of callback functions supported by the structured access layer.
`pbOpenDoc`	You must set this `BOOL` value to **`TRUE`** if the allocation of memory for the global data context structure is successful.
`pVapi`	A pointer to a structure providing memory management and character conversion functions. Because this functionality is proprietary to Micro Focus, `TPVAPIServices` is redefined as `void` in `kvcfsr.h`.
`dwFlags`	Run-time flags controlled by the structured access layer.

Returns

- Upon success, a pointer to the global data context structure for the custom reader. This pointer is passed back to all other custom reader entry points.
- Upon error, a `NULL` pointer. This causes the structured access layer to shut down the process.

Discussion

The global context structure should be `memset()` to zero in this function.

xxxFreeContext()

This function terminates an instance of the custom reader.

Syntax

```
int pascal _export xxxFreeContext(void *pCFContext)
```

Arguments

`pCFContext`	A pointer to the global context structure for the custom reader.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code.

Discussion

All memory that still remains allocated within the custom reader must be freed within this function.

xxxInitDoc()

This function initializes non-zero, non-null members of `pContext`.

Syntax

```
int pascal _export xxxInitDoc(
    void             *pCFContext,
    adDocDesc        *pAutoInfo,
    long              lcbFileSize,
    KPTPIOobj        *pIO  )
```

Arguments

`pCFContext`	A pointer to the global context structure for the custom reader.
`pAutoInfo`	A pointer to an `adDocDesc` structure defined in `kwautdef`.
`lcbFileSize`	The length of the source file in bytes.
`pIo`	A pointer to a `KPTPIOobj` structure defined in `kvioobj.h`.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code. This causes the structured access layer to shut down the process.

Discussion

- For custom readers, the `pAutoInfo` variable can be ignored.
- If the structured access layer has determined the length of the source file, that value is provided by the `lcbFileSize` parameter. If it is zero, the file size must be determined in this function.
- The pointer `pIO` provides access to file management functions defined in `kvioobj.h`.
- In this function, all non-zero, non-`NULL` members of the global context structure should be initialized.

xxxFillBuffer()

This function controls parsing of the source file and generation of tokens defined in `kvtoken.h`.

Syntax

```
int  pascal _export xxxFillBuffer(
    void    *pCFContext,
    BYTE    *pcBuf,
    UINT    *pnBufOut,
    int     *pnPercentDone,
    UINT     cbBufOutMax)
```

Arguments

`pCFContext`	A pointer to the global context structure for the custom reader.
`pcBuf`	A pointer to a memory buffer to which the tokens are written.
`pnBufOut`	A pointer to a variable that specifies the actual number of bytes written to the token buffer.
`pnPercentDone`	A pointer to a variable that specifies the percentage completed of the file parsing.
`cbBufOutMax`	A pointer to a variable that specifies the maximum number of bytes written to the token buffer.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code. This causes the structured access layer to shut down the process.

Discussion

- Calls are made to read and parse the source file within this function.
- This function is called repeatedly by the structured access layer until either the return value is `FALSE` or the percentage complete is 100.
- The actual number of bytes written to the token buffer must not exceed the value of `cbBufOutMax`.

xxxGetSummaryInfo()

This function is required to extract document summary information.

Syntax

```
int  pascal _export xxxGetSummaryInfo(
    void                *pCFContext,
```

```
    KVSummaryInfoEx      *pInfo,
    BOOL                  bFreeInfo)
```

Arguments

`pCFContext`	A pointer to the global context structure for the custom reader.
`pInfo`	A pointer to a `KVSummaryInfoEx` structure defined in `kvtypes.h`.
`bFreeInfo`	A `BOOL` value indicating whether to free memory allocated for summary information.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code.

Discussion

This function uses an instance of the global context structure that is different from the one used by all other reader interface functions.

This function can call the same functions used by `xxxFillBuffer()` or can be completely independent.

For more information, see Extract Metadata, on page 61.

xxxOpenStream()

This function is required when initiating processing of peripheral elements such as document headers, footers, footnotes, and endnotes.

Syntax

```
int pascal _export xxxOpenStream(
    void    *pCFContext,
    int      type,
    int      nOrdinal)
```

Arguments

`pCFContext`	A pointer to the global context structure for the custom reader.
`type`	An integer identifying a specific header, footer, footnote, or endnote. Options are defined in `kvcfsr.h`.
`nOrdinal`	An integer identifying a specific header, footer, footnote, or endnote. See the associated macros in `kvtoken.h`.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code.

Discussion

A call to this function results in a call to `xxxFillBuffer()`. The function `xxxFillBuffer()` provides a new empty output buffer and a new token stream input buffer to process the alternate stream for peripheral elements. In this alternate stream, paragraph and character style properties are likely different from the main body. Therefore, as the document is parsed, the existing values from the main body must be saved. When the processing of the alternate stream is completed and processing of the main body resumes, these values must be restored in `xxxCloseStream()`.

xxxCloseStream()

This function is required when terminating processing for document headers, footers, footnotes, and endnotes.

Syntax

```
int pascal _export xxxCloseStream(
    void    *pCFContext,
    int      type)
```

Arguments

`pCFContext`	A pointer to the global context structure for the custom reader.
`type`	An integer identifying a specific header, footer, footnote, or endnote. Options are defined in `kvcfsr.h`.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code.

Discussion

Prior to exiting this function, the previously saved values in the global context structure must be restored. This ensures that processing of the main body resumes with the correct document state.

xxxCharSet()

This function identifies the character encoding used within the source document.

Syntax

```
KVCharSet pascal _export xxxCharSet(
    void    *pCFContext,
    BOOL    *bMSBLSB)
```

Arguments

`pCFContext`	A pointer to the global context structure for the custom reader.
`bMSBLSB`	The `BOOL` value required for Unicode text. Set this argument to **`TRUE`** for Big Endian and **`FALSE`** for Little Endian.

Returns

One of the enumerated values defined in the `KVCharSet` structure in `kvcharset.h`.

Discussion

If the custom reader can determine the character encoding of the document, the corresponding enumerated value is returned. If the character encoding cannot be determined, `KVCS_UNKNOWN` is returned.

Appendix H: Password Protected Files

This section lists supported password-protected container and non-container files and describes how to open them.

Supported Password Protected File Types

The following table lists the password-protected file types that KeyView supports.

Key to support table

Symbol	Description
Y	Format is supported.
N	Format is not supported.
S	Support for viewing subfiles.
V	Support for viewing content.
P	Password required.
C	Password and certificate or User ID file required.

Supported password-protected file types

File Type	Version	Filter	Export	Extract	View	Credentials
PST (Windows)	n/a	N	N	Y	S	P
PST (non-Windows)[1]	n/a	N	N	Y	S	N
ZIP	n/a	N	N	Y	S	P
7-Zip	n/a	N	N	Y	S	P
RAR	n/a	N	N	Y	S	P
SMIME in MSG, EML, MBX	n/a	N	N	Y	N	C

[1]The native PST readers, `pstxsr` and `pstnsr`, do not require credentials to open password-protected PST files that use compressible encryption.

Supported password-protected file types, continued

File Type	Version	Filter	Export	Extract	View	Credentials
Lotus Notes NSF	n/a	N	N	Y	N	C
Adobe PDF	n/a	Y	Y	Y	V	P
Microsoft Office	97-2003 2007 2010	Y	Y	Y	V	P

Open Password Protected Container Files

This section describes how to extract password-protected container files by using the C API. The following guidelines apply to specific file types.

- **Lotus Notes NSF files**. If you are running a Notes client with an active user connected to a Domino server, you must specify the user's password as a credential regardless of whether the NSF files you are opening are protected. This enables KeyView to access the Notes client and the Lotus Notes API. If the Notes client is not running with an active user, KeyView does not require credentials to access the client.
- **PST files**. To open password-protected PST files that use high encryption (Microsoft Outlook 2003 only), you must use the MAPI-based PST reader (`pstsr`). The native PST readers (`pstxsr` and `pstnsr`) do not support files that use high encryption and return the error message `KVERR_PasswordProtected` if a PST file is encrypted with high encryption.

To open container files

1. Define the credential information in the `KVOpenFileArg` data structure.
2. Pass `KVOpenFileArg` to the `fpOpenFile()` function.
3. Call `fpCloseFile()`.

Filter Password Protected Files

This section describes how to filter password-protected non-container files with the C API.

To filter password-protected files

1. Call the fpInit() or fpInitWithLicenseData() function.
2. Call the fpFilterConfig(), on page 130 function with the following arguments:

Argument	Parameter
nType	KVFLT_SETSRCPASSWORD
nValue	TRUE
pData	The source file password. The password is a null-terminated string with a maximum length of 255 characters (the final byte is null).

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SETSRCPASSWORD, TRUE, password);
```

where *password* is a null-terminated string of 255 or fewer characters.

3. Call the fpFilterFile(), on page 135 or fpFilterStream(), on page 136 function.

Appendix I: Microsoft Rights Management Service Protected Files

This section contains information about KeyView support for Microsoft Rights Management Service (RMS).

Microsoft Rights Management Service

The Microsoft Rights Management Service (RMS) allows you to classify and optionally encrypt documents. This service forms the rights management part of Microsoft Azure Information Protection (AIP).

For many of the files that RMS can classify and encrypt, KeyView can identify whether they have been encrypted with RMS encryption. It can also extract metadata (including the RMS classification) and XrML associated with the document.

For the KeyView Filter C SDK, you can provide the credentials required to access protected files by using the `fpConfigureRMS` function (see fpConfigureRMS(), on page 126). This function allows the Filter and File Extraction API functions to operate on the protected data of the file.

Supported Formats

KeyView support for RMS files depends on the encryption method that RMS uses for each file type, and on whether the file is classified or protected. In RMS, classified files have additional labels to inform users of their sensitivity, while protected files are encrypted so that only authorized users can view them.

In some cases, KeyView format detection returns a different file type depending on whether the file is classified or protected.

The following sections provide information about the RMS support for different file types, and metadata support.

For more information about XrML extraction, see the `subFileType` member of the KVSubFileInfo structure.

Microsoft Office Files

The following table describes KeyView detected formats for Microsoft Office files that RMS encrypts by creating an OLE container.

For these files:

- KeyView can get classification metadata.
- KeyView can detect whether the file is RMS encrypted (the `kWindowsRMSEncrypted` flag).
- When you configure credentials through `fpConfigureRMS`, Filter and File Extraction API functions can operate on the protected data of the file (see fpConfigureRMS(), on page 126). In this case, you can filter, extract, and get summary information.

In most cases, KeyView can also extract the XrML file for these files when they are protected, and identify the XrML files as `KVSubFileType_XrML`.

File extensions	Format detected when file is classified but not protected	Format detected when file is protected	XrML extraction
docx, dotx	MS_Word_2007_Fmt	MS_Office_2007_Fmt	Yes
docm, dotm	MS_Word_Macro_2007_Fmt	MS_Office_2007_Fmt	Yes
pptx, potx, ppsx	MS_PPT_2007_Fmt	MS_Office_2007_Fmt	Yes
pptm, potm, ppsm	MS_PPT_Macro_2007_Fmt	MS_Office_2007_Fmt	Yes
vsdx	MS_Visio_2013_Fmt	MS_Office_2007_Fmt	Yes
vsdm, vssm, vssx, vstm, vstx	MS_Visio_2013_Macro_Fmt MS_Visio_2013_Stencil_Fmt MS_Visio_2013_Stencil_Macro_Fmt MS_Visio_2013_Template_Fmt MS_Visio_2013_Template_Macro_Fmt	MS_Office_2007_Fmt	Yes
xlsx, xltx	MS_Excel_2007_Fmt	MS_Office_2007_Fmt	Yes
xlsm, xlsb, xltm	MS_Excel_Macro_2007_Fmt MS_Excel_Binary_2007_Fmt	MS_Office_2007_Fmt	Yes
xps	MS_XPS_Fmt	MS_Office_2007_Fmt	Yes
doc, dot	MS_Word_95_Fmt MS_Word_97_Fmt MS_Word_2000_Fmt	MS_Word_95_Fmt MS_Word_97_Fmt MS_Word_2000_Fmt	Yes
ppt, pot, pps	PowerPoint_95_Fmt PowerPoint_97_Fmt	PowerPoint_95_Fmt PowerPoint_97_Fmt	Yes
xls, xla, xlam, xlt	Excel_Fmt Excel_Macro_Fmt Excel_95_Fmt Excel_97_Fmt Excel_2000_Fmt	Excel_Fmt Excel_Macro_Fmt Excel_95_Fmt Excel_97_Fmt Excel_2000_Fmt	Yes

Implemented as pFile

The following table describes the KeyView detected formats for files that RMS encrypts by creating a pFile around the document.

For these files:

- KeyView can get classification metadata.
- KeyView can detect whether the file is RMS encrypted (the `kWindowsRMSEncrypted` flag).
- KeyView can extract the XrML if the file is protected.
- When you configure credentials through `fpConfigureRMS`, Filter and File Extraction API functions can operate on the protected data of the file (see fpConfigureRMS(), on page 126). In this case, you can filter, extract, and get summary information.

File extensions	Format detected when file is classified but not protected	Format detected when file is protected	Notes
pfile	n/a	RMS_ Protected_ Fmt	
vsd	MS_Visio_Fmt	RMS_ Protected_ Fmt	
vdw, vss, vst	MS_Visio_Fmt	RMS_ Protected_ Fmt	
mpp, mpt	MS_Project_4_Fmt MS_Project_41_Fmt MS_Project_98_Fmt MS_Project_2000_Fmt MS_Project_2007_Fmt	RMS_ Protected_ Fmt	
pub	MS_Publisher_98_Fmt	RMS_ Protected_ Fmt	
jpg	JPEG_File_Interchange_Fmt	RMS_ Protected_ Fmt	Protected format has extension pjpg. When classified but not protected, the classification metadata is XMP.

File extensions	Format detected when file is classified but not protected	Format detected when file is protected	Notes
png	PNG_Fmt	RMS_ Protected_ Fmt	Protected format has extension ppng.
gif	GIF_89a_Fmt	RMS_ Protected_ Fmt	Protected format has extension pgif. When classified but not protected, the classification metadata is XMP.
tif	TIFF_Fmt	RMS_ Protected_ Fmt	Protected format has extension ptif. When classified but not protected, the classification metadata is XMP.
dng	TIFF_Fmt	RMS_ Protected_ Fmt	When classified but not protected, the classification metadata is XMP.
dwfx	MS_XPS_Fmt	RMS_ Protected_ Fmt	When classified but not protected, dwfx is detected and treated as XPS.
psd, psb	PSD_Fmt	RMS_ Protected_ Fmt	When classified but not protected, the classification metadata is XMP.

PDF Files

The following table describes the KeyView detected formats for PDF documents, which RMS encrypts by creating an encrypted PDF (in which each stream and metadata value is encrypted), wrapped in a container PDF. KeyView allows you to extract the encrypted PDF from the container, and then for the extracted file:

- KeyView can detect whether the file is RMS encrypted (the `kWindowsRMSEncrypted` flag).
- KeyView can extract the XrML if the file is protected.
- When you configure credentials through `fpConfigureRMS`, Filter and File Extraction API functions can operate on the protected data of the file (see fpConfigureRMS(), on page 126). In this case you can filter, extract, and get summary information for PDF formats.

File extensions	Format detected when file is classified but not protected	Format detected when file is protected
pdf	PDF_Fmt PDF_Portfolio_Fmt	PDF_Fmt PDF_Portfolio_Fmt

Restricted Permission Messages

Email clients such as Microsoft Outlook can protect email messages as rights-managed email messages. In these cases, it stores the contents of the original message as an encrypted `rpmsg` attachment. KeyView does not support detection or processing of these encrypted attachments.

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