ChangeMan® ZMF 8.2 Readme

18 September 2018

This Readme file contains information you should know before you install or use ChangeMan ZMF 8.2.

You can download the installer for ChangeMan ZMF 8.2 from the Product Updates section of the `Micro Focus SupportLine` website. The ChangeMan ZMF 8.2 installer installs a full version of ChangeMan ZMF 8.2. See "Installation" on page 21 for details.

> **IMPORTANT!** ChangeMan ZMF 8.1.4, 8.1.4.01, and 8.2 run on all currently supported z/OS operating systems. However, earlier versions of ChangeMan ZMF are not supported to run on z/OS 2.3. If you want to run ChangeMan ZMF on z/OS 2.3, you must install ChangeMan ZMF 8.1.4, 8.1.4.01, or 8.2.

General Information

Product Description

ChangeMan ZMF is a comprehensive and fully integrated solution for software change, configuration, and release management systems in z/OS® environments. It provides reliable and streamlined implementation of software changes from development through all quality gates and into production. ChangeMan ZMF manages and automates the application life cycle, protects the integrity of the code migration process, and results in higher quality delivered code to each QA/test environment and to the production environment.

Release Summary

See New Features in ChangeMan ZMF 8.2 on page 3 for a list of the enhancements in ChangeMan ZMF 8.2. See "Fixes in ChangeMan ZMF 8.2" on page 20 for links to the defects that have been fixed in ChangeMan ZMF 8.2.

Customer Care

- **Online Support** — The Micro Focus SupportLine website at `http://supportline.microfocus.com` provides an easy way for customers to manage their support cases, download software patches, or search the Knowledgebase for the latest technical information about our products at any time.

- A user ID and password are required to access the Micro Focus SupportLine website. To obtain a user ID and password, sign up online or contact Customer Care by email or telephone.

- **Telephone Support** — Telephone contact numbers for Customer Care are posted by region at the following URL:

    `https://www.microfocus.com/serena/support/`

No password is needed to access Customer Care contact information.

- **Email Support** — Customers can send support requests by email to customercare@microfocus.com.

- **Authorized Support Representative** — Some support contracts specify that support calls will be centrally managed within the customer organization. This practice enables related issues to be aggregated across multiple customer sites or functional groups, and it ensures accountability for the satisfactory resolution of open issues. You should determine whether you have such a support contract before contacting Customer Care. If you do have such a contract, submit your support request to the designated support manager within your organization and arrange for that person to contact Customer Care.

New Features and Fixes

This section describes the new features in ChangeMan ZMF 8.2 and provides a link to the defects that have been fixed in release 8.2.

> **NOTE** You can obtain a summary of the enhancements and fixes in the previous ChangeMan ZMF 8.1.*x* releases from the ZMF 8.1.4.01 or ZMF 8.1.4 Readme files, which you can access from the following URL:
>
> https://www.microfocus.com/support-and-services/documentation/

New Features in ChangeMan ZMF 8.2

ZMF Support for the zMobile Web Application

zMobile is a web application for ZMF approvers. Package approvers can access this application from any device without signing on to TSO/ISPF. The mobile web application functions from a desktop browser or from a mobile phone (for example, Android™ or iPhone®) that can connect through your company firewall.

You specify the email notification links for the zMobile application through ZMF global administration on the **Global Parameters - Part 8 of 8** (CMNGGP08) panel. You define the list of approvers for a given application through the ZMF application administration function. Refer to the *ChangeMan ZMF Administrator's Guide* for details on configuring these global and application administration functions.

If your site has customized ChangeMan ZMF to send email notifications with an embedded link to package approvers, package approvers can click on the link in the email notification, or copy the link and paste it into a browser. Refer to the chapter on "Approving or Rejecting a Package" in the *ChangeMan ZMF User's Guide* for details on using the zMobile application.

The zMobile application is distributed in the zmobile.zip file. The zip file contains two files:

- zmobile.war - You deploy this web archive file to a web application server such as Tomcat or WebSphere.

- zmobileconfig.jar - You use this configuration tool to edit the ZMF server definitions that are contained in the zmobile.war file.

Refer to the section titled "Configure zMobile" in the *ChangeMan ZMF Installation Guide* for detailed information about configuring the zMobile application.

The Build, Impact Analysis, and Audit Functions Can Now Process Assembler Macros

This enhancement addresses two mechanisms:

1   Macro identification during build time.

2   Macro usage during mass baseline scanning.

<u>Build-Time Processing</u>

For straightforward assembler code there is no need to execute CMNWRITE. A new build procedure called CMNHLASM invokes the assembler directly following the SERCOPY step and enforces the ADATA assembler option. It also provides the SYSADATA DD as a temporary file, which is passed to the next step. (See the CMNHLASM member of the CMNZMF.V8R2M0.SKELS distribution library.)

The next step (see the CMN$$WPP skeleton) executes the new post-processing program CMNSRCPP which analyses the passed SYSADATA file and writes source-to-copy records for all copybooks and macros as indicated by the library ADATA record type.

This process works for all straightforward assemblies.

The only time that CMNWRITE is needed is:

- If copybooks need to be extracted from some external repository in a way that the assembler cannot handle, for example, from Panvalet or Librarian libraries.

- If the source component uses a COPY statement for copybooks that contain host variables and requires a Db2 precompile.

In those cases, CMNWRITE needs to perform its standard processing, followed with an execution of CMNSRCPP which extracts only macro references.

To achieve this, instead of using ADATA, ZMF supplies an assembler library exit (CMNHLALX) with the assembler option EXIT(LIBEXIT(CMNHLALX)). CMNHLALX writes a sidefile of macros used in the assembly which CMNSRCPP picks up and adds as source-to-copy records.

The CMNASM and CMN$$ASM skeletons have been updated so that the library exit method is always used. A new skeleton called CMNMLASM drives the ADATA method. You can use either method, as appropriate.

<u>Mass Baseline Scanning</u>

CMNIA000 is the impact analysis data extract program that is executed from job IMPACT. (See the IMPACT member of the CMNZMF.V8R2M0.CNTL distribution library.) You can file tailor the IMPACT job with skeleton CMN$$IAX. (See member CMN$$IAX of the CMNZMF.V8R2M0.SKELS distribution library.)

Program CMNIA000 has new SYSIN parameters that you can specify to discover macros as source-to-copy relationships in baseline library members:

New SYSIN Parameters for CMNIA000	Description
MACRO=YES	If you specify MACRO=YES, any source components that are parsed will also make use of the macro detection process for assembler language components.
	If a component does not need to be parsed, no macro detection will take place. This option will ensure that new components (not previously processed by ZMF) parsed by CMNIA000 will also have macros detected.
	This option could be used as the standard option for customers with assembler code in their baselines.
	You can specify the MACRO= parameter before any applications are selected for processing, in which case it applies globally. Or, you can specify this parameter following one or more specific application inclusions (that is, with the APPL=*xxxx* parameter) where it will only apply to the preceding application.
MACRO=INIT	Use this parameter if you want to populate your impact analysis database with macro information for the first time. The MACRO=INIT process will make use of information in the component master to determine if a component is written in assembler language. By default, the process considers a language of either ASM or BAL to indicate that the component is written in assembler. The customer can change these settings by using the new CMNIA000 SYSIN parameter ASMLANG=*xxxxx*.
	Note that using this option is going to significantly increase the run time for CMNIA000; however, any results so obtained will be propagated in the next standard run of CMNIA000. So this option can be used on an application-by-application basis instead of globally for all applications at once.
ASMLANG=*xxxxx*	If you specify one or more ASMLANG= parameters, the ASM and BAL defaults are discarded and the list of assembler languages will be built from ASMLANG= parameters. If no ASMLANG= parameter is specified, the default languages ASM and BAL will be used. ASMLANG= is a global parameter and should be specified ahead of application exclusion/inclusion parameters.

IMPORTANT! Customers who want to make use of the new macro support in ZMF 8.2 need to request and apply ZMF 8.2 Hotfix 1 to fix problems discovered too late to fix in ZMF 8.2.

ZMF Now Supports the Development of CICS Web Services

Four new build procedures are supplied to support the development of CICS web services. The four new procedures are supplied as sample skeletons (members of the CMNZMF.V8R2M0.SKELS distribution library), as follows:

Sample Skeleton	Description
CMNDFHJS	Drives the IBM-supplied utility DFHLS2JS (copybook to JSON schema) build.
CMNDFHWS	Drives the IBM-supplied utility DFHLS2WS (copybook to WSDL) build
CMNDFHJL	Drives the IBM-supplied utility DFHJS2LS (JSON schema to copybook) build.
CMNDFHWL	Drives the IBM-supplied utility DFHWS2LS (WSDL to copybook) build.

Refer to the *ChangeMan ZMF Customization Guide* for more detailed information about the skeletons and processing that supports the development of CICS web services.

ZMF Now Supports CICS JSON REST Bundles

ZMF now supports the creation and maintenance of CICS JSON REST bundles. The new build process is provided by member CMNBUNJL (of the CMNZMF.V8R2M0.SKELS distribution library). The CMNBUNJL skeleton calls the IBM-supplied utility DFHJS2LS with the BUNDLE= parameter to process a specified JSON schema.

The output from this process is a number of zFS files (the *bundle*), which are generated in the target directory. Typically, the build process creates a copybook, a listing, and the bundle, which are components that CICS uses to implement the Application Program Interface (API).

Skeletons CMN30 and CMN30I have been enhanced with the SUBDIRS=Y parameter to enable the development libraries to be cleaned up after the package installation and baselining steps have been performed.

Refer to the *ChangeMan ZMF Customization Guide* and to the code in the specified skeletons for more detailed information about this processing.

New Functionality Is Now Available on the Query Component and Query History Panels

This enhancement provides a shortcut to enable you to perform package staging and check-out functions from the Query Component Parameters (CMNQCMP1) panel.

In base ZMF, the CMNQCMP1 panel is displayed if you enter the Q.C option on the command line of the ChangeMan ZMF Primary Option (CMN@PRM) panel. The CMNQCMP1 panel has two new line commands:

- The P (process or package staging) line command enables you to perform package staging functions.

- The C (checkout) line command enables you to perform check-out functions.

In ERO, the same line commands are enabled if you specify the QC function against a release.

A new Q line command has been added to the Component History (CMNCMPH1) panel to enable you to query for package information from this panel.

Processing Type Field on the Component History Panel Has Been Updated

The following three processing codes have been added to the Processing Type (P) field on the Component History (CMNCMPH1) panel:

P Code	Description
B	Build
I	Checkin
O	Checkout

The date and time displayed in the Last Action field identify the last date/time that the associated P code function was performed against the target component/package.

CMNPMLOD Program Output Has Been Enhanced

The data extract CMNPMLOD program (formerly called SERPMLOD) uses XML Services to provide you with access to package master and component master data.

A new LIST parameter has been added to CMNPMLOD to show which services are currently supported. For example:

```
//*
//PMLOD EXEC PGM=CMNPMLOD,PARM='LIST'
//*
```

Output is routed to SYSPRINT which is either pre-allocated in the JCL or, if not, is dynamically allocated to SYSOUT.

Other PARM= parameters can be used to produce output from CMNPMLOD in a format that can be loaded into a Db2 table. See member EXEPMUNL in the CMNZMF.V8R2M0.CNTL distribution library for an example of how to extract CMNPMLOD output, create a table, and load the output into the table in one job.

QUALIFIER and OWNER Templating Has Been Added for UDF

Program CMNDB2DD is enhanced to enable templating for both QUALIFIER and OWNER for Db2 User Defined Functions (UDF).

The Process for Moving an ERO Package from One Release to Another Release Has Been Simplified

The current steps for detaching a package from a release include:

- Demote the package (if the package is not in DEV status).

- Retrieve all package components from the release area.

- Detach the package from the release.

After the above steps have occurred, the following steps move the target package to another release:

- Adjust the package install date/time to conform to the new release install date/time range.

- Attach the package to the new release and starting area.

You can perform all of these steps from a single new *release - Package Detach* (CMNRMPD1) panel. The target package and release must both be in DEV status for this functionality to be performed.

If you specify the Detach Package (DP) line command against a package that is listed on the *release - Release Package List* ((CMNRMPLF) panel, the new *release - Package Detach* (CMNRMPD1) panel is displayed:

```
CMNRMPD1                        DAVE820A - Package Detach
 Command ===>                                              Scroll ===> CSR

          Package: DAVE000131      Status: DEV     Install date: yyyymmdd

 Enter "/" to select option
     Validate package detach only
     Auto demote retrieve with detach
     Attach to a different release

   New Package Install    Time
              Date        From To


Job statement information:
   //USERABC JOB (X170,134),'JOHN DOE',
   //           CLASS=A,MSGCLASS=X,TIME=4,NOTIFY=USERABC,
   //           REGION=4M
   //*
```

The three selectable options on this panel (shown in red above) perform the following actions:

- Validate package detach only.

  Selecting this option will not detach the target package, but will let you know if the package has components that have been promoted and/or checked into the release. If you do not select this option, the package will be detached from the current release if both the package and release are in DEV status.

- Auto demote retrieve with detach.

  Selecting this option will automatically demote package components if they have been promoted and retrieve the components from the release if the package is checked into the release prior to the detach.

- Attach to a different release.

  Selecting this option will attach the package to another release.

Refer to the *ERO Getting Started Guide* for a complete description of the panel navigation sequence and processing to enable this functionality.

Security Entities Have Been Added to Each Function in the ZMF Workflow

A new security entity check has been added for each of the following functions. The name of the security entity is the name of the ISPF function program, as follows:

Function	Security Entity Name
Create	CMNCREAT
Checkout	CMNCKOUT
Stage	CMNSTGER
Scratch	CMN$UTIL
Rename	CMN$UTIL
Recompile	CMNRCOMP
Rebind	CMNRBIND
Freeze	CMNFREZE
Promote	CMNPROMO
Approve	CMNAPPRV

If the security entity for the function is not defined, the function works as before, that is, access for all users. If the security entity is defined, the user must have Update access to the security entity to access the function. If security entity is defined and user does not have update access, an error message is issued and the function is not performed.

This enhancement applies to functions that are access through the ISPF interface and XML services.

Empty Packages Can Now Be Processed in a Release

The following new selectable option on the release Release Management Parameters Part 1 of 2 (CMNRMRC0) panel enables you to specify how empty packages will be processed during the release cycle:

```
Allow empty packages to process in release
```

If selected, empty packages will be ignored and processed through the release cycle, and can be baselined.

If not selected, empty packages cannot be processed in a release (the default).

Native SQL Stored Procedures Can Now Be Staged from a Remote Db2 Subsystem

ZMF now supports 3-part names for native SQL stored procedures that are staged from development, which enables ZMF to extract the stored procedure from any (local or remote) Db2 instance that can be contacted from the local Db2 to which ZMF can connect.

To this end, a new field named **Location** has been added to the Stage Native SQL SP from Db2 (CMNSTG25) panel. **Location** identifies the name of the Db2 subsystem that runs on a different LPAR.

Templating Is Now Applied to CALL Statements in Trigger Code

In previous ZMF releases, templating was not applied to CALL statements in Trigger Code in the Db2 SQL templating process. This has been fixed in ZMF 8.2. CALL statements are now included in the templating process.

The package.list.syslib Service Can Now Be Used To Generate Syslib Lists

The following new selectable option on the **Global Parameters Part 4 of 8** (CMNGGP04) panel and *application* **Parameters - Part 4 of 4** (CMNGLP04) panel determines whether the package.list.syslib service is used to generate syslib lists during package audit and build (stage, recompile, and relink) file tailoring. You can select this option globally (to set the model for applications) and set the operational value at the application level:

    _ Use package syslib service

If selected, the package.list.syslib service is used to generate syslib lists. If not selected, standard lifecycle library concatenation is used to generate syslib lists for these functions.

Audit Details

A new sysin parameter has been added for package audit, namely PSY=YES (or NO, the default is NO). Skeleton CMN$$AUD has been changed to set PSY=YES if the ISPF variable &AUDPSYL is set to YES. This ISPF variable is set to YES by the audit submission process if the 'Use package syslib service' admin option is selected for the current application.

HLLX Details

A new High-Level Language Exit Definition can be specified to affect how this enhancement works. You specify this exit definition by selecting the following new function on the HLL Exit Definition - Function Selection (CMNHLLMM) administration panel:

    S Package Syslib

The functional area is Package Syslib and the 4 character exit name identifier is SYSL.

There is only a single exit point, namely SYSL00XM, which is taken from the package.list.syslib service. The exit may be used to alter the default syslib concatenation generated by ZMF, or it may be used to prevent any result being returned to the service caller. (A user specified message can be delivered in this case.)

The following three sample exits are provided in the CMNZMF.V8R2M0.SAMPLES distribution library, which show how to list all the information incoming to the exit:

Member	Description
HXCSYSL	COBOL sample.
HXPSYSL	PL/I sample.
HXRSYSL	REXX sample.

NOTE This enhancement does not affect ERO syslib generation. ERO has its own methods for controlling the generation of syslibs.

You Can Now Store the Audit Output Listing in a Package and Baseline It

You can now store the audit output listing in a package and baseline it when the package is installed. The following new fields on the Global Parameters - Part 2 of 8 (CMNGGP02) and *application* Parameters Part 2 of 4 (CMNGLP02) panel enable you to request this function globally or at the application level:

Field	Description
Store audit report	Determines if the audit report generated by package audit is to be stored in the package staging library. The report is stored in compressed listing format.
	On panel CMNGGP02, this sets the default value to be used in application administration. Valid values are:
	Value **Meaning**
	Y Store the report.
	N Do not store the report.
	D Store the report only if the package is in DEV status.
Audit report library type	Library type in which to store the report. On panel CMNGGP02, this sets the default value to be used in application administration.

You Can Now Display a List of Like-Source Components Affected by a Like-Copy Component and Recompile Them

You access this function by selecting a like-copy library type from the main Recompile Source (CMNRCMPR) panel. Recompile will display a list of copylib members. You can then select a copylib member. Recompile will do a query impact for the selected copylib member and display a list of source members that reference it. You can then select a source member to be recompiled.

ZMF 8.2 Supports z/OSMF

ZMF 8.2 supports the creation and processing of z/OS Management Facility (z/OSMF) workflows through the ZMF lifecycle.

ZMF 8.2 Supports z/OS Connect

z/OS Connect is IBM's mechanism for exposing mainframe resources (such as a batch program, CICS transaction, and so on) to web applications and desktop clients as Representational State Transfer (REST) APIs, using GET/PUT/POST/DELETE actions along with JavaScript Object Notation (JSON) message bodies.

You can stage the RESTful API that you have developed into a ZMF package and process it through the package lifecycle. A new utility program (delivered as a load module) and two new skeletons (delivered as members of the CMNZMF.V8R2M0.SKELS distribution library) enable this process:

Module	Description
CMNBAQLJ	Skeleton to generate z/OS Connect JSON schema and binding.
CMNBAQJL	Skeleton to generate z/OS Connect copybooks and binding from JSON schema
CMNBAQ00	Program to generate input and CMNBATCH activation transactions.

You Can Now Change the CMNZMF Qualifier on the ATTRIB Table

You can now use exit CMNEX102 (in the CMNZMF.V8R2M0.ASMSRC distribution library) to change the CMNZMF qualifier on the ATTRIB table to a value of your choice. There are two consequences of this change for existing customers migrating to this release:

1   ERO calls to CMNEX102 now pass CMNx (where x is the ZMF subsystem character) in the exit field CMN$PKGI whereas they used to pass blank. This should not adversely affect a customer's exit code.

2   The bind of the CMNDB2AT package now requires the QUALIFIER(CMNZMF) clause (per the updated DB2OPTN and DB2OPTNR members of the CMNZMF.V8R2M0.CNTL distribution library). This package is only used for Native SQL Stored Procedure management. However, the bind will fail if the qualifier is not present.

A Batch Option Has Been Added to the package.service.freeze Service

The following tags have been added to the package.service.freeze XML service to enable the package freeze function to be submitted as a batch job:

Tag	Description
<batchMode></batchMode>	If set to Y: **1** Performs normal package.service.freeze validation. **2** Creates a file tailoring address space using the default file tailoring task procedure name to file tailor and submit the batch freeze job. The batch job is file tailored using new skeleton CMN$$FRZ.
<suppressNotify></suppressNotify>	If set to Y, prevents the "job submitted" message from being sent to the requesting user. If set to N, the "job submitted" message is sent to the requesting user.
<jobCard01></jobCard01> <jobCard02></jobCard02> <jobCard03></jobCard03> <jobCard04></jobCard04>	Job statement information.

ZMF Now Provides Utility Functions for CICS To Communicate with XSDBIND and JSON Processing

ZMF now provides utility functions for CICS to communicate with XSDBIND and JavaScript Object Notation (JSON) processing. Refer to the CMNCICS1 utility in the *ZMF Customization Guide* for details.

New Command Has Been Added To Process the Delay File

The following new operator command has been implemented to enable you to process the contents of the Delay file without the need to recycle the started task:

```
F stcname,CMN,RELEASE,DELAY
```

You Can Now Update the Complex/Super Package ID of a Participating Package in DEV Status

You can now update the ID of a complex or super package associated with a participating package on the UPDATE: Affected Applications (CMNPGNL5) panel if the participating package is in DEV status. If changed, the participating package is added to the new complex/super package and removed from the old package.

Data Set Allocation Definitions Have Been Enhanced

Several global, application, ERO panels (of the CMNZMF.V8R2M0.PANELS distribution library) where you can specify data set allocation parameters, as well as exit CMNEXINS (of the CMNZMF.V8R2M0.ASMSRC distribution library) have been enhanced to enable you to specify management and storage class in addition to generic unit, volume serial, space, and DCB attributes.

JCL Comments To Display the .X Data Set Name Have Been Added to Install Job Members

The following skeletons have been updated to include JCL comments that display the .X data set name for the install job JCL that is built. These comments enable you to easily answer the question "Where's the JCL (for the failed ChangeMan batch process)?" when a job restart/rerun is needed.

The comments are added to the following members of the CMNZMF.V8R2M0.SKELS distribution library:

- CMN$$D2J

- CMN$$JNM

- CMN$$SJN

ERO Can Now Recognize Custom Like-K Link Deck Types

With this enhancement you will be able to define link decks for associated loads, NCALs, and objects. Prior to this change, ERO only generated a link deck for LCT library types.

You may need to customize member CMNEX034 (CMNZMF.V8R2M0.ASMSRC distribution library) to define other LCTs as a like-K library types.

Relevant HLL Exit Points Have Been Enabled for a P Site

Option 8 - HLL Exits is now displayed on the **Update Global Administration** (CMNGAMN2) panel. If you select this option, the **HLL Exit Definition (P-site) - Function Selection** (CMNHLLPS) panel is displayed, which lists the High-Level Language (HLL) exits that you can specify for a Production (P) site:

```
CMNHLPS        HLL Exit Definition (P-site) - Function Selection


Option ===>

R  Revert/Backout  Package revert and backout
M  Miscellaneous   HLLX procedure name
Z  Modify          Issue Reload, Detach, or Attach modify commands
```

Panel Where HLLX Procedure Name Is Specified Has Changed

The HLL Exit Definition - Function Selection (CMNHLLMM) panel has a new Miscellaneous field:

```
CMNHLLMM           HLL Exit Definition - Function Selection
Option ===>

1  All             Full list

2  Build           Component checkin, build, recompile, relink, delete
3  Package Create  Initial create of a package
4  Package Update  Subsequent update of package attributes
5  File Tailoring  Define customized ISPF variables for file tailoring
6  Checkout        Component Checkout from baseline/promotion
7  Promote/Demote  Promotion and demotion of components
8  Audit           Audit job submission and audit process
9  Freeze          Package freeze and selective unfreeze/refreeze
A  Approve/Reject  Package approve and reject
R  Revert/Backout  Package revert and backout
S  Package Syslib  Package syslib list service
U  Scratch/Rename  Utility functions

M Miscellaneous    HLLX procedure name
Z Modify           Issue Reload, Detach, or Attach modify commands
```

If you select option M, the HLL Exit Miscellaneous Parameters (CMNHLLMP) panel is displayed. This panel enables you to specify or change the name of the HLLX procedure that is to be used with the current ZMF instance:

```
CMNHLLMP           HLL Exit Miscellaneous Parameters

Command ===>                                    Scroll ===>

HLLX procedure name . . SERDHLLI
```

The HLLX procedure name field has been removed from the HLL Exit Definition (CMNHLLMN) panel.

The Component Cleanup Process Has Been Enhanced Following Component Promotion

The CMNMODTB single table has been replaced by a table for each library type that needs to be cleaned (that is, CLNTB*ltp*, where *ltp* is the component library type) after components have been promoted to a higher level. This split of CMNMODTB into separate tables is similar to RPMTB*lyp* (where *ltp* identifies the library type in question).

Unlike RPMTB*ltp*, which creates a table for each library type/level entry in the promotion administration definition, CLNTB*ltp* tables exist for only library types that have clean-up requirements. The tables are controlled by the value of variable CLNCNT (clean count) in table RPMLIBTB, similar to the MODCNT (module count) variable that counts the number of components to be promoted.

If CLNCNT in RPMLIBTB is 0 for a library type/promotion level combination, the associated CLNTB*ltp* will not exist.

Skeletons have been modified to check the value of &CLNCNT before generating clean-up JCL Additional tests for promotion level match, &CLNUPLVL in administration definitions, and library type match have all been removed from the skeletons, as they are now checked in the promotion file tailoring code, and are redundant in the skeletons.

Refer to the code and comments in members CMN$$CLN, CMNRPMCL, CMNRPICL, and CMNRPIPC of the CMNZMF.V8R2M0.SKELS distribution library, which have been modified for this enhancement.

Skeleton Variables Are Now Available to Batch Freeze Processing

The ZMF administrator can use the ***release-ID - Skeleton Variables*** (CMN3DSM2) panel to display, update, or add variables that are associated with the specified release ID. These variables are now made available to batch freeze processing.

Db2 Templating Has Been Extended

The SQL templating processes (as implemented by the CMNDB2DD program) already enable you to specify a general text string, which represents an SQL clause, and have the value following the clause subjected to the associated templating rules. This process has been enhanced to work with parameter lists so that the template is applied to each value in the list. Values can also be removed from the list.

These enhancements extend this templating support to the BIND process (as implemented by the CMNDB2PL program). In this case the general text string must exactly match a valid bind parameter. This allows all valid BIND parameters to be templated and also implements the mechanism for templating and/or removing multiple values in a parameter list.

To understand these enhancements, you should review the following components in the ZMF 8.2 product distribution libraries:

CMNZMF.V8R2M0.SKELS	
CMN$$PSQ CMN$$RSQ CMN$$SQL	Db2 Option: Routines to present SQL/DDL components to Db2.
CMN$$PRB	Db2 Option: Routine to bind Db2 plans during promotion or demotion.

CMNZMF.V8R2M0.SKELS	
CMN$$RPB	Db2 Option: Routine to perform promote/demote Db2 binds.
CMN$$SPB	Db2 Option: Sample bind routine using local shadow libraries.
CMN21	Db2 Option: Job to perform Db2 binds for production libraries.
CMN32	Db2 Option: Job to perform Db2 binds for baseline ripple.
CMN49	Db2 Option: Job to perform Db2 binds at production library backout.
CMN56	Db2 Option: Job to perform Db2 binds at reverse baseline ripple.

CMNZMF.V8R2M0.CNTL	
DB2ADMGT	Job to introduce general token templates to bind process at ZMF release 8.2.
DB2OPTN	Steps to define the objects required by the ZMF Db2 option for the local Db2 subsystem to which a D/DP/ALL ZMF started task connects.

And the following panels:

Panel ID	Panel Title
CMNGD2L2	Db2 Logical Subsystem *nickname* BIND Process Templates
CMNGD2L3	Db2 Logical Subsystem *nickname* SQL Process Templates (Named)
CMNGD2L4	Db2 Logical Subsystem *nickname* SQL Process Templates (General)
CMNGD2L5	Db2 Logical Subsystem *nickname* BIND General Templates
CMNGD2LN	Db2 Logical Subsystems (global admin)
CMNLD2G4	Global Model for *db2logicalsubsysnickname* SQL General Templates
CMNLD2G5	Global Model for *db2logicalsubsysnickname* BIND General Templates
CMNLD2L4	Db2 Logical Subsystem *nickname* SQL General Templates
CMNLD2L5	Db2 Logical Subsystem *nickname* BIND General Templates
CMNLD2LN	Db2 Logical Subsystems (application admin)

Refer to the *ChangeMan ZMF Db2 Option Getting Started Guide* for detailed information about these enhancements.

Additional Reports Available for ERO

The following additional reports for ERO have been supplied with ZMF 8.2 and are delivered in the CMNZMF.V8R2M0.REX distribution library. All ERO reports are in the 700 range:

Report (Member Name)	Description
CMN700	Release Configuration and Status Report This report contains the configuration of the release plus the current status of any actions on it.
CMN710	Release Contents Report This report contains a list of components by release and area either checked in or not checked in to the release area. If not checked in, there is limited information. If the check-in date is blank, a component is not checked in.
CMN720	Release Package Report This report lists packages in a release and whether they are checked in or not with associated information.
CMN730	Release Component History Report This report contains a list of releases, release areas, and release component history information.
CMN740	Release Area Discrepancy Report This reports documents any problems with any components by area, and gives a reason why a component has been flagged.

The Release ID and Release Area fields have been added to the **Report Selection List** (CMNREPT6) panel as well as the new report names.

The report print line length is controlled by variable LINELEN in the REXX reports, which is currently defined as 132 for existing reports. However, the size specification for the SYSTSPRT DD statement has been expanded (see member CMN$$RPT of the CMNZMF.V8R2M0.SKELS distribution library) to accommodate a larger report output line length, as follows:

```
//SYSTSPRT DD  SYSOUT=*,DCB=(RECFM=VBA,LRECL=2044,BLKSIZE=2048)
```

This expansion enables 256-byte component names and 1024-byte file names to fit on a single line. Truncation may occur if you do not define the SYSTSPRT DD statement as recommended above.

You Can Now Include All Applications in an Audit

You can now include all applications in the cross-application function of package audit. To do this, you must replace the following code in skeleton member CMN$$AUD (in the CMNZMF.V8R2M0.SKELS distribution library):

```
)DOT SCOPTABL
XAP=&APPLMNE
)ENDDOT SCOPTABL
```

with:

```
XAP=****
```

Migrated Data Sets Can Now Be Recalled in an Address Space Outside of the Sernet Started Task

The Sernet started task can now initiate the recall of an ML2 migrated data set in an address space outside of the address space in which the Sernet started task runs. Refer to the sample JCL in member SERDRT in the SERCOMC.V8R2M0.CNTL distribution library.

The number of these procedures is defined by the ASIDS4RECALL parameter in the SERSYSIN DD statement of the started task JCL. The range of address spaces permitted is from 2 to 16. If this parameter is omitted, the default is 4. The limit can be changed by an operator command.

Refer to the *ChangeMan ZMF Installation Guide* for more information about the SERDRT job and relevant operator commands.

The Performance of the Scan Function Has Been Improved

A new scan option A - Alt Batch has been added to the Library Scan Utility (CMNSCN01) panel.

This enhancement retains the functionality of options O - Online and B - Batch, but shifts the overhead of the actual scan to the batch address space. (The scan operations for options O and B take place in the server.) Therefore, if the baselines are large, the performance of the server is not affected.

Security is based on the server started class as the job is submitted with the authority of the ChangeMan server.

The REFRESH Modify Command Now Displays the Details of the Old and New Modules

The REFRESH modify command refreshes load modules that are loaded by the Sernet started task, and uses SER1405I messages to display details of the old and new modules. In previous ZMF releases, the details about the old module prolog were not displayed.

SERSYSIN DD NETTRACE Parameter

The NETTRACE command provides essential debugging information but can currently only be activated with an operator command after the Sernet started task is running. Thus, started task start-up processing cannot be traced.

You can now specify a new NETTRACE parameter on the SERSYSIN DD statement of the start-up JCL of the Sernet started task. When set to Y (yes), it is functionally equivalent to issuing the following command against a running Sernet started task:

```
/F stcname,NT,Y,U=*,SIZE=512
```

The Timestamps for Sernet Upload Services Have Been Changed

In previous releases, the dates associated with PDS and Unix file uploads would be set to the date of the upload. Now, the Changed time is set to the file modification time and the Access Time is set to the time of the upload.

This change is reflected in the ZMF 8.2 Client Pack and in Sernet upload XML services.

Access to XML Services Can Now Be Secured with SAF Entities

You can now secure the access to XML services with SAF entities. You specify profile names in the following format:

color.service.scope.message

For example:

- You can secure all yellow services as follows:

  `rdef $CMNDEV YELLOW.* OWNER(CMNDEV) UACC(NONE)`

- Then, pick a yellow service and define its resource definition as follows:

  `rdef $CMNDEV YELLOW.BASELIB.SERVICE.CREATE OWNER(CMNDEV) UACC(NONE)`

- Then, permit a user to allow access:

  `PERMIT YELLOW.BASELIB.SERVICE.CREATE CLASS($CMNDEV) ACCESS(UPDATE) ID(WSER258)`

The result is that only user WSER258 is allowed to do a BASELIB SERVICE CREATE in XML services.

If no security entities are defined, only Green services are displayed. Password requirements to access Yellow services are not changed. That is, you still need a password to access Yellow services. (A password is not required to access Green services.)

For more information, refer to member XMLSERV in the SERCOMC.V8R2M0.CLIST distribution library. XMLSERV no longer uses member SERLCSEC in the SERCOMC.V8R2M0.ASMSRC distribution library. However, XMLSERV now requires a ZMF/Sernet started task to be running to obtain a list of XML services.

New XML Service To List Users Attached to a ZMF Task

The new system.users.product XML service returns a list and number of users who are attached to a specified ZMF task. The input to the service is <productName>, which can have one of the following 3-byte character values:

Value	Meaning
ALL	List all users.
XCH	List all users of the XCH port.
CMN	List all users of the CMN port.
ZMF	List all users of ZMF (on any port).
RLM	List all users of Release Manager (RLM) client (on any port).
ZDD	List all users of ZDD client (on any port).
ECL	List all users of ZMF for Eclipse (ECL) client (on any port).
CLP	List all users of ZMF Client Pack (ZDD & ECL) (on any port).

This service corresponds to the following operator command:

```
F  started_task,USERS,product
```

Fixes in ChangeMan ZMF 8.2

Access the following links for a list of defects that have been fixed in ChangeMan ZMF 8.2. You must be logged in to the Micro Focus SupportLine website to access these links.

http://knowledgebase.serena.com/InfoCenter/
index?page=content&cat=CMZMF_8.2_RESOLVED&channel=DEFECTS

http://knowledgebase.serena.com/InfoCenter/
index?page=content&cat=SERNET_8.2_RESOLVED&channel=DEFECTS

Installation

You must install the products that you have licensed in the following order, as appropriate:

- ZMF Web Services. If you are running customized applications using ZMF Web Services, perform the actions discussed in the section titled Upgrading to ChangeMan ZMF 8.2 Web Services on page 26.

- ZDD and/or ZMF for Eclipse Clients.

- ZMF P sites.

- ZMF ALL, D, and DP sites.

You can download the ChangeMan ZMF 8.2 product from the Product Updates section of the Micro Focus SupportLine website at:

https://supportline.microfocus.com/

A customer ID and password are required to access the site. After logging in to the site:

- Select the **Product Updates** tab.

- Select the appropriate search option and click **Find Updates**.

- Select the check box to accept the licensing agreement.

- Click the plus sign (+) to the left of ChangeMan ZMF to expand the entries for ChangeMan ZMF.

- Select the desired ChangeMan ZMF version and release number.

- Click the plus sign (+) to the left of ChangeMan ZMF 8.2 to expand the entries for ChangeMan ZMF 8.2.

- Select **ChangeMan ZMF 8.2 Installer**.

The installer will install the full version of ChangeMan ZMF 8.2.

- Follow the instructions in the *ChangeMan ZMF Installation Guide* to install a new instance of ChangeMan ZMF 8.2.

- Follow the instructions in the *ChangeMan ZMF Migration Guide* to upgrade an existing instance of ChangeMan ZMF to version 8.2.

Upgrade Notes

The following table identifies the conversion jobs that you must run to convert master files from the specified ZMF version to ZMF 8.2. All jobs are members of the CMNZMF.V8R2M0.CNTL distribution library. Customize the job's JCL as indicated in the comments within each member before you run it.

Job Name	Description
ZMF 8.1.2 or 8.1.3 or 8.1.4 or 8.1.4.01 to ZMF 8.2	
CMVCONVC	For non P-sites. Run the job in member CMVCONVC to convert the ZMF 8.1.2, ZMF 8.1.3, ZMF 8.1.4 or ZMF 8.1.4.01 Package Master files for ALL-, D-, and DP-sites to a format that supports ZMF 8.2.
CMVCONPC	For P-sites. Run the job in member CMVCONPC to convert the ZMF 8.1.2, ZMF 8.1.3 or ZMF 8.1.4 Package Master file for a P-site to a format that supports ZMF 8.2.
ZMF 8.1.1 to ZMF 8.2	
CMVCONVB	For non P-sites. Run the job in member CMVCONVB to convert the ZMF 8.1.1 Package and Component Master files for ALL-, D-, and DP-sites to a format that supports ZMF 8.2.
CMVCONPB	For P-sites. Run the job in member CMVCONPB to convert the ZMF 8.1.1 Package Master file for a P-site to a format that supports ZMF 8.2.
ZMF 8.1 to ZMF 8.2	
CMVCONVA	For non P-sites. This job converts the ZMF 8.1 package and component master files for ALL-, D-, and DP-sites to a format that can be used to support v8.2.
CMVCONPA	For P-sites. This job converts the ZMF 8.1.0 package master file to a format that can be used to support v8.2.

If you are upgrading from a version 7.*x.x* release, run the following conversion jobs, as appropriate:

Job Name	Description
CMVCONV7	Converts ZMF 7.1, 7.1.1, and 7.1.2 Package, Component, and SSV master files; and creates a new recovery file for ZMF 8.2 for ALL-, DP-, and D-sites.
CMVCONP7	Converts ZMF 7.1, 7.1.1, and 7.1.2 Package Master files and creates a new recovery file for ZMF 8.2 for P-sites.
CMVCONV8	Converts ZMF 7.1.3, 7.1.3.01, and 7.1.3.02 Package Master and Saved Staging Versions (SSV) master files; and creates a new recovery file for ZMF 8.2 for ALL-, DP-, and D-sites.
CMVCONP8	Converts ZMF 7.1.3, 7.1.3.01, 7.1.3.02, and 7.1.3.03 Package Master files to ZMF 8.2 for P-sites.
CMVCONV9	Converts the ZMF 7.1.3.03 Package Master data set and creates a new recovery file for ZMF 8.2 for ALL-, DP-, and D-sites.
CMVCONP9	Converts the ZMF v7.1.3.03 Package Master data set and creates a new recovery file for ZMF 8.2 for P-sites.

Upgrade Notes for ERO Customers

- ERO customers who are upgrading to ZMF 8.2 from a pre-8.1.*x* release need to run member CMNZMF.V8R2M0.CNTL(CMNRPKSN) with input of RLS=* after all other upgrade activities are complete and your 8.2 task has been started. Failure to do so will result in the following message if you attempt to access a release package:

    CMR6504I - No information found for Package search request

    This utility creates a new Package Master record for each package in an ERO release.

- ERO customers who are upgrading from a pre-8.1.3 versions of ChangeMan ZMF must run the job in member CIMALTR5 of the CMNZMF.V8R2M0.CNTL distribution library to avoid having to recycle ChangeMan ZMF during the Autumn time change.

ISPF Panel Changes

All members of the CMNZMF.V8R2M0.PANELS distribution library contain the statements that are highlighted in red below. The exit and copybook that are referenced in these statements are for company use only and you should not attempt to change them.

```
******************************* Top of Data *********************************
)INEXIT PGM,&EPAPATTR,CACHE
)PANEL KEYLIST(CMNELSK,CMN)
)ATTR
*INCLUDE CMNPATTR                    /* embed common panel attributes */
)BODY EXPAND(!!)
.
.
.
```

Changes to XML Services

Some XML Services are new or changed in ZMF 8.2. To apply these changes:

- Reload your XMLSPACE LDS with the XMLDATA member that is delivered in the SERCOMC.V8R2M0.CNTL distribution library.

- XMLSERV now requires a ZMF/Sernet started task to be running to obtain the list of XML Services.

- If you are currently using XML Services and/or have written programs that use XML Services, contact Customer Care for the XML Services Delta Report that identifies the XML Services that have changed since the version of ChangeMan ZMF from which you are migrating. You can use this report to determine if you are using any of the XML Services that have changed and plan this part of your upgrade accordingly.

Optimization Considerations

We strongly recommend that you use IBM's Batch Local Shared Resource (BLSR) or System- Managed Buffering (SMB) to optimize the VSAM KSDS Package Master, Component Master, and long name Component Master files where delivered JCL shows BLSR sample code. Currently, that includes these ZMF components:

Member	Library	Description
CMN$$IAX	CMNZMF.SKELS	Impact analysis data extract submitted online.
IMPACT	CMNZMF.CNTL	Impact analysis data extract submitted manually.
STARTJCL	CMNZMF.CNTL	ZMF portion of the started procedure.

Failure to use the BLSR or SMB performance optimization tool may cause unacceptable performance issues for users and/or processes.

See Solution S100960 in the Knowledgebase for more information.

Enabling the ZMF Db2 Option

This section is important if you are upgrading to ChangeMan ZMF 8.2 from a release prior to 8.1.1. If you are currently running ZMF 8.1.1, 8.1.1.01, 8.1.2, 8.1.3, 8.1.4, or 8.1.4.01, you have already performed these steps during your upgrade.

The Database Request Modules (DBRMs) that are delivered in the CMNZMF.V8R2M0.DBRM distribution library have been generated under Db2 version 10. Db2 version 10 is the minimum level of Db2 that is supported by IBM and ZMF 8.2. (Note that IBM's end of support for Db2 version 10 was announced for September 30, 2017.)

Note that ChangeMan ZMF 8.1.1 and later releases contain many changes to support Native SQL Stored Procedures that require Db2 version 11. There are new packages to be bound; all existing packages have been changed and so must be rebound.

The steps that are required to enable the ZMF Db2 option have been gathered together into two new sample members, together with a conversion sample for existing customers.

❗ IMPORTANT! Customize and execute the jobs in the following members of the CMNZMF.V8R2M0.CNTL distribution library, as appropriate. Run these jobs before you bring up the started task for ChangeMan ZMF 8.2. The system may hang with unpredictable results if you bring up the started task for ChangeMan ZMF 8.2 before you run these jobs.

IMPORTANT! The new tables created by DB2OPTN will contain SQL process admin definitions for the ZMF started task. Take regular image copies of these tables in conjunction with the backups performed for ZMF master files. See the BACKUP JCL for an example.

CMNZMF.V8R1M4.CNTL Member	Description
DB2OPTN	Run this sample JCL for D, DP, or ALL sites. It shows all the steps required to define, to the local Db2 subsystem to which the ZMF started task connects, all of the objects required to make use of the ZMF Db2 option. **NOTE** The local Db2 subsystem is the first physical Db2 system defined on the Db2 Physical Subsystems (CMNGD2S0) panel under ZMF Global Administration. The SITE field for this subsystem definition must be blank. Ensure this site is defined before you run the DB2OPTN job. **CAUTION!** This job contains a DROP DATABASE statement. Carefully consider the job steps before you run this job.
DB2OPTNC	Run this sample JCL to convert admin values that relate to Db2 admin for SQL-based components from Package Master records to the Db2 tables used in ZMF 8.1.1 and later releases. This job is required for all customers who are migrating from a release prior to ZMF 8.1.1. **NOTE** Run this job after you have run the DB2OPTN job to define the tables. This job applies only to customers upgrading an existing system, not to fresh installs. **NOTE** Modify the JOBLIB statement of member DB2OPTNC of the CMNZMF.V8R2M0.CNTL distribution library before you customize and run the job to avoid getting an S806 abend on the CONVERT job step: ```\n//JOBLIB DD DISP=SHR,DSN=somnode.CMNZMF.LOAD\n// DD DISP=SHR,DSN=somnode.SERCOMC.LOAD\n// DD DISP=SHR,DSN=DSNvrm.SDSNEXIT\n// DD DISP=SHR,DSN=DSNvrm.SDSNLOAD\n```
DB2OPTNR	Run this sample JCL for Db2 subsystems that are targeted either via remote promote or via remote P-site install for which automatic bind processing is required (that is, the site contains the rebind of CMNDB2SQ). CMNDB2SQ makes use of a generic collection id when searching for an appropriate package. It is immaterial whether you use CMNx or CMNZMF as the collection id for CMNDB2SQ. However, if you use CMNDB2AT, its collection id must be CMNZMF. **NOTE** The CMNDB2_ATTRIBS table is only necessary if you wish to make use of ZMF support for Db2 versioning of native SQL Stored Procedures at the target remote Db2 subsystem. The same is true of the CMNDB2AT package.

For more details about enabling Db2 in ChangeMan ZMF, refer to:

- Solution S141663.

- *ChangeMan ZMF Db2 Option Getting Started Guide*.

Upgrading to ChangeMan ZMF 8.2 Web Services

If you are running customized ZMF Web Service-based applications, you should rebuild those applications using the ZMF 8.2 Web Services, regardless of the release from which you are upgrading, and redeploy your applications in production prior to or alongside updating your ZMF Server software.

Rerunning the PassTicket Generation Routine

The PassTicket-generation routine was changed in ZMF 8.1.3. Therefore, you will need to run the SERSET routine with a different, unique token value to implement this change if you are upgrading from a ZMF release prior to 8.1.3.

Take these steps:

1 Copy the SERSET JCL supplied in the SERCOMC.V8R2M0.CNTL distribution library to a private library, update the STEPLIB (or JOBLIB) as necessary, and change the TOKEN parameter to a value of 'B'.

2 Customize this JCL as appropriate, and execute it on all LPARs that are either hosting the Server started task or from which you can connect to the Server started task. It will produce messages similar to the following:

```
00.40.42 J0553644   SER1704I CSVDYLPA loaded SERXPTIK @ 922E9000, Vers 20170320 10.39
00.40.42 J0553644   SER1708I SerNet.PtickB    token created
00.40.42 J0553644   SER1708I SerNet.PtickTok  token created
00.40.42 J0553644   SER1709I Passticket support enabled
```

The Server started tasks will now point to the new token and will produce messages similar to the following at start up:

```
06.41.36 S0553755   SER1701I Passticket support previously enabled under 'B' suffix
```

> **NOTE** This JCL is a one-off task required to update these particular software components in place. Do not change your existing SERSET procedures to point to the new token. When your systems are next IPLed you will automatically revert to token/suffix 'A', which is correct.

Software Compatibility

For a complete list of software requirements and product compatibility, refer to the Platform Matrix for ChangeMan ZMF 8.2 at the following location on the Micro Focus SupportLine website:

https://supportline.microfocus.com/prodavail.aspx

Known Issues

- To see known ZMF issues with z/OS versions, if any, go to the following location on the Micro Focus SupportLine website:

  https://supportline.microfocus.com/prodavail.aspx

- Different versions of ChangeMan ZMF are incompatible in ISPF split screen mode. User abend 44 blocks you from opening a second session with a different version and can also signify incomplete SEREX006 exit information.

- To avoid version conflicts, do not run the XMLSERV prototype tool for XML Services concurrently in ISPF split screen mode with a ChangeMan ZMF instance.

- The routines to stop/start/refresh an IBM® WebSphere® application in promotion, install, and backout consume excessive z/OS memory and elapsed time. Customers report that this behavior is not unique to the ChangeMan ZMF use of the WebSphere API. Customers using the ZMF WebSphere interface should include REGION=0M in jobs that include the CMN$$WSB, CMN$$WSI, and CMN$$WSP skeletons.

- SYNCSORT customers who encounter the following message during SORT processing in the CMNVCON*xx* conversion jobs delivered in the CMNZMF.V8R2M0.CNTL distribution library (or any steps involving SORT):

  WER175A - INCORE SORT CAPACITY EXCEEDED

  can add SORTWORK*xx* DD statements to steps to explicitly allocate work data sets.

Documentation Updates

All ChangeMan ZMF documentation is provided in Adobe® Portable Document Format (PDF) and may be downloaded from the Micro Focus SupportLine website at `https://www.microfocus.com/support-and-services/documentation/`.

- Adobe® Reader® is available for free download at `http://get.adobe.com/reader/`. Version 9 or higher is recommended.

- Updates to documentation are frequently issued after the product release date. Updated ChangeMan ZMF Readme files and user manuals are published on the Micro Focus SupportLine website with the rest of the documentation for the product release. Updated Readme files and user manuals are flagged with an **Updated** date in the file name or description.

> **NOTE** Change bars in the left margin of ChangeMan ZMF documentation identify substantive changes from the last published version, unless otherwise noted.

- Enhancements that are delivered with ZMF 8.2 are summarized in this Readme file in the section titled New Features in ChangeMan ZMF 8.2 on page 3. If you want to see a summary of enhancements that have been delivered in ZMF 8.1.*x* releases, consult the ChangeMan ZMF 8.1.4.01 Readme, which you can download from the Micro Focus SupportLine website at: `https://www.microfocus.com/support-and-services/documentation/`.

Searching the Documentation

There is no cross-book index for the ChangeMan ZMF documentation suite. You can use the Advanced Search facility in Adobe Reader to search all ZMF manuals in the same or subordinate folders for information that you want. See topic "Searching the ChangeMan ZMF Documentation Suite" in the "Welcome to..." chapter of each ZMF manual.