



Program Directory for IBM Multi-site Workload Lifeline

V2.5.0

Program Number 5655-UM4

FMID HAQS250

for Use with
z/OS and Linux on System z

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Note

Before using this information and the product it supports, be sure to read the general information under 7.0, "Notices" on page 25.

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1.0 Introduction

This program directory is intended for system programmers who are responsible for program installation and maintenance. It contains information about the material and procedures associated with the installation of IBM Multi-site Workload Lifeline for z/OS and Linux on System z. This publication refers to IBM Multi-site Workload Lifeline for z/OS as Multi-site Workload Lifeline.

The Program Directory contains the following sections:

- 2.0, “Program Materials” on page 3 identifies the basic program materials and documentation for Multi-site Workload Lifeline.
- 3.0, “Program Support” on page 6 describes the IBM support available for Multi-site Workload Lifeline.
- 4.0, “Program and Service Level Information” on page 8 lists the APARs (program level) and PTFs (service level) that have been incorporated into Multi-site Workload Lifeline.
- 5.0, “Installation Requirements and Considerations” on page 9 identifies the resources and considerations that are required for installing and using Multi-site Workload Lifeline.
- 6.0, “Installation Instructions” on page 16 provides detailed installation instructions for Multi-site Workload Lifeline. It also describes the procedures for activating the functions of Multi-site Workload Lifeline, or refers to appropriate publications.

Before installing Multi-site Workload Lifeline, read the *CBPDO Memo To Users* and the *CBPDO Memo To Users Extension* that are supplied with this program in softcopy format and this program directory; then keep them for future reference. Section 3.2, “Preventive Service Planning” on page 6 tells you how to find any updates to the information and procedures in this program directory.

Multi-site Workload Lifeline is supplied in a Custom-Built Product Delivery Offering (CBPDO, 5751-CS3). The program directory that is provided in softcopy format on the CBPDO tape is identical to the hardcopy format if one was included with your order. All service and HOLDDATA for Multi-site Workload Lifeline are included on the CBPDO tape.

Do not use this program directory if you install Multi-site Workload Lifeline with a SystemPac or ServerPac. When you use one of those offerings, use the jobs and documentation supplied with the offering. The offering will point you to specific sections of this program directory as needed.

1.1 Multi-site Workload Lifeline Description

With Multi-site Workload Lifeline, you can load balance TCP/IP-based workload connection requests across two sites at nearly unlimited distances, when both sites are running the same server applications and have the same data sources. As a result, it is designed to deliver:

- Increased performance: Response time can be reduced by aligning new workload connections with the most capable applications and systems.

- Increased availability: New workload connections can be routed to other available applications in the event of application, system, or site outages. Outages for maintenance updates or other planned events can be minimized.
- Increased scalability: Application instances can be added on-demand.
- Analytic capability: Network Management Interface (NMI) provides access to workload, application, and site status information.
- Improved recovery time: Recovery time can be reduced from hours to minutes.
- Workload migration: Workloads can be routed from one site to another with minimal disruption.
- Improved system utilization: Connections for query workloads can be distributed to both sites simultaneously.
- Verification of disaster recovery procedures: Simpler, non-disruptive testing of disaster recovery procedures by validating workloads remain accessible on the recovery site without requiring a site outage on the production site.

1.2 Multi-site Workload Lifeline FMID

Multi-site Workload Lifeline consists of the following FMID:

HAQS250

2.0 Program Materials

An IBM program is identified by a program number. The program number for Multi-site Workload Lifeline is 5655-UM4.

Basic Machine-Readable Materials are materials that are supplied under the base license and are required for the use of the product.

The program announcement material describes the features supported by Multi-site Workload Lifeline. Ask your IBM representative for this information if you have not already received a copy.

2.1 Basic Machine-Readable Material

The distribution medium for this program is physical media or downloadable files. This program is in SMP/E RELFILE format and is installed by using SMP/E. See 6.0, "Installation Instructions" on page 16 for more information about how to install the program.

You can find information about the physical media for the basic machine-readable materials for Multi-site Workload Lifeline in the *CBPDO Memo To Users Extension*.

Figure 1 describes the program file content for Multi-site Workload Lifeline.

Notes:

1. The data set attributes in this table must be used in the JCL of jobs that read the data sets. However, because the data sets are in IEBCOPY unloaded format, their actual attributes might be different.
2. If any RELFILEs are identified as PDSEs, ensure that SMPTLIB data sets are allocated as PDSEs.

Figure 1. Program File Content

Name	O R G	R E C F M	L R E C L	BLK SIZE
SMPMCS	SEQ	FB	80	8800
IBM.HAQS250.F1	PDSE	FB	80	8800
IBM.HAQS250.F2	PDSE	VB	231	27998
IBM.HAQS250.F3	PDSE	U	0	6144

2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for Multi-site Workload Lifeline.

2.3 Program Publications

The following sections identify the basic publications for Multi-site Workload Lifeline.

Figure 2 identifies the basic unlicensed publications for Multi-site Workload Lifeline. Those that are in softcopy format publications can be obtained from the IBM Publications Center website at <http://www.ibm.com/shop/publications/order/>.

<i>Figure 2. Basic Material: Unlicensed</i>		
Publication Title	Form Number	Media Format
IBM Multi-site Workload Lifeline V2.5 User's Guide	SC27-4653-02	

2.3.1 Optional Program Publications

No optional publications are provided for Multi-site Workload Lifeline.

2.4 Program Source Materials

No program source materials or viewable program listings are provided for Multi-site Workload Lifeline.

2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 3 during the installation of Multi-site Workload Lifeline.

<i>Figure 3 (Page 1 of 2). Publications Useful During Installation</i>		
Publication Title	Form Number	Media Format
<i>IBM SMP/E for z/OS User's Guide</i>	SA23-2277	http://www.ibm.com/shop/publications/order/
<i>IBM SMP/E for z/OS Commands</i>	SA23-2275	http://www.ibm.com/shop/publications/order/
<i>IBM SMP/E for z/OS Reference</i>	SA23-2276	http://www.ibm.com/shop/publications/order/

Figure 3 (Page 2 of 2). Publications Useful During Installation

Publication Title	Form Number	Media Format
<i>IBM SMP/E for z/OS Messages, Codes, and Diagnosis</i>	GA32-0883	http://www.ibm.com/shop/publications/order/

3.0 Program Support

This section describes the IBM support available for Multi-site Workload Lifeline.

3.1 Program Services

Contact your IBM representative for specific information about available program services.

3.2 Preventive Service Planning

Before you install Multi-site Workload Lifeline, make sure that you have reviewed the current Preventive Service Planning (PSP) information. Review the PSP Bucket for General Information, Installation Documentation, and the Cross Product Dependencies sections. For the Recommended Service section, instead of reviewing the PSP Bucket, it is recommended you use the `IBM.ProductInstall-RequiredService` fix category in SMP/E to ensure you have all the recommended service installed. Use the **FIXCAT(IBM.ProductInstall-RequiredService)** operand on the **APPLY CHECK** command. See 6.1.10, "Perform SMP/E APPLY" on page 20 for a sample APPLY command

If you obtained Multi-site Workload Lifeline as part of a CBPDO, HOLDDATA is included.

If the CBPDO for Multi-site Workload Lifeline is older than two weeks by the time you install the product materials, you can obtain the latest PSP Bucket information by going to the following website:

<http://www14.software.ibm.com/webapp/set2/psearch/search?domain=psp>

You can also use S/390 SoftwareXcel or contact the IBM Support Center to obtain the latest PSP Bucket information.

For program support, access the Software Support Website at <http://www-01.ibm.com/software/support/>.

PSP Buckets are identified by UPGRADEs, which specify product levels; and SUBSETs, which specify the FMIDs for a product level. The UPGRADE and SUBSET values for Multi-site Workload Lifeline are included in Figure 4

Figure 4. PSP Upgrade and Subset ID

UPGRADE	SUBSET	Description
LIFELN250	HAQS250	IBM Multi-site Workload Lifeline V2.5

3.3 Statement of Support Procedures

Report any problems which you feel might be an error in the product materials to your IBM Support Center. You may be asked to gather and submit additional diagnostics to assist the IBM Support Center in their analysis.

Figure 5 on page 7 identifies the component IDs (COMPID) for Multi-site Workload Lifeline.

<i>Figure 5. Component IDs</i>			
FMID	COMPID	Component Name	RETAIN Release
HAQS250	5655U2400	IBM Multi-site Workload Lifeline V2.5	250

4.0 Program and Service Level Information

This section identifies the program and relevant service levels of Multi-site Workload Lifeline. The program level refers to the APAR fixes that have been incorporated into the program. The service level refers to the PTFs that have been incorporated into the program.

4.1 Program Level Information

The following APAR fixes against previous releases of Multi-site Workload Lifeline have been incorporated into this release. They are listed by FMID.

- FMID HAQS250

PI07620
PI11110

PI14404
PI17989
PI24176

4.2 Service Level Information

No PTFs against this release of Multi-site Workload Lifeline have been incorporated into the product package.

Frequently check the Multi-site Workload Lifeline PSP Bucket for HIPER and SPECIAL attention PTFs against the FMID that you must install. You can also receive the latest HOLDDATA, then add the **FIXCAT(IBM.PRODUCTINSTALL-REQUIRESERVICE)** operand on your APPLY CHECK command. This will allow you to review the recommended and critical service that should be installed with your FMID.

5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing and activating Multi-site Workload Lifeline. The following terminology is used:

- *Driving system*: the system on which SMP/E is executed to install the program.
The program might have specific operating system or product level requirements for using processes, such as binder or assembly utilities during the installation.
- *Target system*: the system on which the program is configured and run.
The program might have specific product level requirements, such as needing access to the library of another product for link-edits. These requirements, either mandatory or optional, might directly affect the element during the installation or in its basic or enhanced operation.

In many cases, you can use a system as both a driving system and a target system. However, you can make a separate IPL-able clone of the running system to use as a target system. The clone must include copies of all system libraries that SMP/E updates, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB.

Use separate driving and target systems in the following situations:

- When you install a new level of a product that is already installed, the new level of the product will replace the old one. By installing the new level onto a separate target system, you can test the new level and keep the old one in production at the same time.
- When you install a product that shares libraries or load modules with other products, the installation can disrupt the other products. By installing the product onto a separate target system, you can assess these impacts without disrupting your production system.

5.1 Driving System Requirements

This section describes the environment of the driving system required to install Multi-site Workload Lifeline.

5.1.1 Machine Requirements

The driving system can run in any hardware environment that supports the required software.

5.1.2 Programming Requirements

Figure 6. Driving System Software Requirements

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in the shipped product?
Any one of the following:				
5694-A01	z/OS	V01.13.00	N/A	No
5650-ZOS	z/OS	V02.01.00	N/A	No

Note: SMP/E is a requirement for Installation and is an element of z/OS but can also be ordered as a separate product, 5655-G44, minimally V03.05.00.

Note: Installation might require migration to new z/OS releases to be service supported. See http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html.

Multi-site Workload Lifeline is installed into pds/pdse datasets as well as into a file system, either HFS or zFS. Before installing Multi-site Workload Lifeline, you must ensure that the target system file system data sets are available for processing on the driving system. OMVS must be active on the driving system and the target system file data sets must be mounted on the driving system.

If you plan to install Multi-site Workload Lifeline in a zFS file system, this requires that zFS be active on the driving system. Information on activating and using zFS can be found in z/OS Distributed File Service zSeries File System Administration, SC24-5989.

5.2 Target System Requirements

This section describes the environment of the target system required to install and use Multi-site Workload Lifeline.

Multi-site Workload Lifeline installs in the z/OS (Z038) SREL.

5.2.1 Machine Requirements

The target system can run in any hardware environment that supports the required software.

5.2.2 Programming Requirements

5.2.2.1 Installation Requisites

Installation requisites identify products that are required and *must* be present on the system or products that are not required but *should* be present on the system for the successful installation of this product.

Mandatory installation requisites identify products that are required on the system for the successful installation of this product. These products are specified as PREs or REQs.

<i>Figure 7. Target System Mandatory Installation Requisites</i>				
Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in the shipped product?
5694-A01	z/OS	V1.13.0 or higher	N/A	No

Note: Installation might require migration to new z/OS releases to be service supported. See http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html.

Conditional installation requisites identify products that are *not* required for successful installation of this product but can resolve such things as certain warning messages at installation time. These products are specified as IF REQs.

Multi-site Workload Lifeline has no conditional installation requisites.

5.2.2.2 Operational Requisites

Operational requisites are products that are required and *must* be present on the system or products that are not required but *should* be present on the system for this product to operate all or part of its functions.

Mandatory operational requisites identify products that are required for this product to operate its basic functions. These products are specified as PREs or REQs.

<i>Figure 8. Target System Mandatory Operational Requisites</i>	
Program Number	Product Name and Minimum VRM/Service Level
5694-A01	z/OS V1.13.0 or higher
5694-A01	z/OS Communications Server V1.13.0 or higher

Conditional operational requisites identify products that are *not* required for this product to operate its basic functions but are required at run time for this product to operate specific functions. These products are specified as IF REQs.

5.2.2.3 Toleration/Coexistence Requisites

Toleration/coexistence requisites identify products that must be present on sharing systems. These systems can be other systems in a multisystem environment (not necessarily a sysplex), a shared DASD environment (such as test and production), or systems that reuse the same DASD environment at different time intervals.

Multi-site Workload Lifeline has no toleration/coexistence requisites.

5.2.2.4 Incompatibility (Negative) Requisites

Negative requisites identify products that must *not* be installed on the same system as this product.

Multi-site Workload Lifeline has no negative requisites.

5.2.3 DASD Storage Requirements

Multi-site Workload Lifeline libraries can reside on all supported DASD types.

Figure 9 lists the total space that is required for each type of library.

<i>Figure 9. Total DASD Space Required by Multi-site Workload Lifeline</i>		
Library Type	Total Space Required in 3390 Trks	File System Description
Target	125	
Distribution	150	
File System	75	

Notes:

1. For non-RECFM U data sets, IBM recommends using system-determined block sizes for efficient DASD utilization. For RECFM U data sets, IBM recommends using a block size of 32760, which is most efficient from the performance and DASD utilization perspective.
2. Abbreviations used for data set types are shown as follows.
 - U** Unique data set, allocated by this product and used by only this product. This table provides all the required information to determine the correct storage for this data set. You do not need to refer to other tables or program directories for the data set size.
 - S** Shared data set, allocated by this product and used by this product and other products. To determine the correct storage needed for this data set, add the storage size given in this table to those given in other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.

- E** Existing shared data set, used by this product and other products. This data set is *not* allocated by this product. To determine the correct storage for this data set, add the storage size given in this table to those given in other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.

If you currently have a previous release of this product installed in these libraries, the installation of this release will delete the old release and reclaim the space that was used by the old release and any service that had been installed. You can determine whether these libraries have enough space by deleting the old release with a dummy function, compressing the libraries, and comparing the space requirements with the free space in the libraries.

For more information about the names and sizes of the required data sets, see 6.1.6, "Allocate SMP/E Target and Distribution Libraries" on page 19.

3. Abbreviations used for the file system path type are as follows.

- N** New path, created by this product.
X Path created by this product, but might already exist from a previous release.
P Previously existing path, created by another product.

4. All target and distribution libraries listed have the following attributes:

- The default name of the data set can be changed.
- The default block size of the data set can be changed.
- The data set can be merged with another data set that has equivalent characteristics.
- The data set can be either a PDS or a PDSE.

5. All target libraries listed have the following attributes:

- These data sets can be SMS-managed, but they are not required to be SMS-managed.
- These data sets are not required to reside on the IPL volume.
- The values in the "Member Type" column are not necessarily the actual SMP/E element types that are identified in the SMPMCS.

6. All target libraries that are listed and contain load modules have the following attributes:

- These data sets can be in the LPA, but they are not required to be in the LPA.
- These data sets can be in the LNKLIST.
- These data sets are not required to be APF-authorized.

The following figures describe the target and distribution libraries and file system paths required to install Multi-site Workload Lifeline. The storage requirements of Multi-site Workload Lifeline must be added to the storage required by other programs that have data in the same library or path.

Note: Use the data in these tables to determine which libraries can be merged into common data sets. In addition, since some ALIAS names may not be unique, ensure that no naming conflicts will be introduced before merging libraries.

Figure 10. Storage Requirements for Multi-site Workload Lifeline Target Libraries

Library DDNAME	Member Type	Target Volume	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SAQSSAMP	SAMP	TVOL2	U	PDS	FB	80	4	1
SIEALNKE	LMOD	TVOL1	E	PDSE	U	0	50	n/a

Figure 11. Multi-site Workload Lifeline File System Paths

DDNAME	T Y P E	Path Name
SAQSMSG	X	/usr/lpp/lifeline/lib/nls/msg/C/IBM
SAQSLINX	N	/usr/lpp/lifeline/zlinux/IBM

Figure 12. Storage Requirements for Multi-site Workload Lifeline Distribution Libraries

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
AAQSLINX	U	PDS	VB	256	5	1
AAQSMODS	U	PDSE	U	0	45	n/a
AAQSSAMP	U	PDS	FB	80	5	1
AAQSUSS	U	PDS	VB	231	15	1

5.3 FMIDs Deleted

Installing Multi-site Workload Lifeline might result in the deletion of other FMIDs. To see which FMIDs will be deleted, examine the ++VER statement in the SMPMCS of the product.

If you do not want to delete these FMIDs at this time, install Multi-site Workload Lifeline into separate SMP/E target and distribution zones.

Note: These FMIDs are not automatically deleted from the Global Zone. If you want to delete these FMIDs from the Global Zone, use the SMP/E REJECT NOFMID DELETEFMID command. See the SMP/E Commands book for details.

5.4 Special Considerations

Multi-site Workload Lifeline has no special considerations for the target system.

6.0 Installation Instructions

This chapter describes the installation method and the step-by-step procedures to install and to activate the functions of Multi-site Workload Lifeline.

Please note the following points:

- If you want to install Multi-site Workload Lifeline into its own SMP/E environment, consult the SMP/E manuals for instructions on creating and initializing the SMPCSI and the SMP/E control data sets.
- You can use the sample jobs that are provided to perform part or all of the installation tasks. The SMP/E jobs assume that all DDDEF entries that are required for SMP/E execution have been defined in appropriate zones.
- You can use the SMP/E dialogs instead of the sample jobs to accomplish the SMP/E installation steps.

6.1 Installing Multi-site Workload Lifeline

6.1.1 SMP/E Considerations for Installing Multi-site Workload Lifeline

Use the SMP/E RECEIVE, APPLY, and ACCEPT commands to install this release of Multi-site Workload Lifeline.

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 13. Using values lower than the recommended values can result in failures in the installation. DSSPACE is a subentry in the GLOBAL options entry. PEMAX is a subentry of the GENERAL entry in the GLOBAL options entry. See the SMP/E manuals for instructions on updating the global zone.

Subentry	Value	Comment
DSSPACE	200,50,75	
PEMAX	SMP/E Default	IBM recommends using the SMP/E default for PEMAX.

6.1.3 SMP/E CALLLIBS Processing

Multi-site Workload Lifeline uses the CALLLIBS function provided in SMP/E to resolve external references during installation. When Multi-site Workload Lifeline is installed, ensure that DDDEFs exist for the following libraries:

- SYS1.CSSLIB
- CEE.SCEELKED
- CEE.SCEELKEX
- CEE.SCEE OBJ

Note: CALLLIBS uses the previous DDDEFs only to resolve the link-edit for Multi-site Workload Lifeline. These data sets are not updated during the installation of Multi-site Workload Lifeline.

6.1.4 Sample Jobs

The following sample installation jobs are provided as part of the product to help you install Multi-site Workload Lifeline:

<i>Figure 14. Sample Installation Jobs</i>			
Job Name	Job Type	Description	RELFILE
AQSRECV	RECEIVE	Sample RECEIVE job	IBM.HAQS250.F1
AQSALLOC	ALLOCATE	Sample job to allocate target and distribution libraries	IBM.HAQS250.F1
AQSALZFS	ALLOMZFS	Sample job to allocate, create mountpoint, & mount zFS data sets	IBM.HAQS250.F1
AQSISMKD	MKDIR	Sample job to invoke the supplied AQSMKDIR EXEC to allocate file system paths	IBM.HAQS250.F1
AQSDDDEF	DDDEF	Sample job to define SMP/E DDDEFs	IBM.HAQS250.F1
AQSAPPLY	APPLY	Sample APPLY job	IBM.HAQS250.F1
AQSACPT	ACCEPT	Sample ACCEPT job	IBM.HAQS250.F1
AQSFTRPM	Post-Install	Sample Batch FTP Job	IBM.HAQS250.F1

You can access the sample installation jobs by performing an SMP/E RECEIVE (refer to 6.1.5, “Perform SMP/E RECEIVE” on page 18) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 14 to find the appropriate relfile data set.

You can also copy the sample installation jobs from the tape or product files by submitting the following job. Depending on your distribution medium, use either the //TAPEIN or the //FILEIN DD statement and comment out or delete the other statement. Before you submit the job, add a job card and change the lowercase parameters to uppercase values to meet the requirements of your site.

```

//STEP1 EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//TAPEIN DD DSN=IBM.HAQS250.F1,UNIT=tunit,
// VOL=SER=volser,LABEL=(x,SL),
// DISP=(OLD,KEEP)
//FILEIN DD DSN=IBM.HAQS250.F1,UNIT=SYSALLDA,DISP=SHR,
// VOL=SER=filevol
//OUT DD DSNAME=jcl-library-name,
// DISP=(NEW,CATLG,DELETE),
// VOL=SER=dasdvol,UNIT=SYSALLDA,
// SPACE=(TRK,(15,1,7))
//SYSUT3 DD UNIT=SYSALLDA,SPACE=(CYL,(1,1))
//SYSIN DD *
COPY INDD=xxxxIN,OUTDD=OUT
/*

```

See the following information to update the statements in the previous sample:

TAPEIN:

- tunit** is the unit value that matches the product package.
- volser** is the volume serial that matches the product package.
- x** is the tape file number that indicates the location of the data set name on the tape.
- See the documentation that is provided by CBPDO for the location of IBM.fmid.Fy on the tape.

FILEIN:

- filevol** is the volume serial of the DASD device where the downloaded files reside.

OUT:

- jcl-library-name** is the name of the output data set where the sample jobs are stored.
- dasdvol** is the volume serial of the DASD device where the output data set resides.

SYSIN:

- xxxxIN** is either TAPEIN or FILEIN depending on your input DD statement.

6.1.5 Perform SMP/E RECEIVE

If you have obtained Multi-site Workload Lifeline as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the Multi-site Workload Lifeline FMID, service, and HOLDDATA that are included on the CBPDO package. For more information, see the documentation that is included in the CBPDO.

You can also choose to edit and submit sample job AQSRECV to perform the SMP/E RECEIVE for Multi-site Workload Lifeline. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.6 Allocate SMP/E Target and Distribution Libraries

Edit and submit sample job AQSALLOC to allocate the SMP/E target and distribution libraries for Multi-site Workload Lifeline. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.7 Allocate, create and mount zFS Files (Optional)

This job allocates, creates a mountpoint, and mounts zFS data sets.

If you plan to install Multi-site Workload Lifeline into a new z/OS UNIX file system, you can edit and submit the optional AQSALZFS job to perform the following tasks:

- Create the z/OS UNIX file system
- Create a mount point
- Mount the z/OS UNIX file system on the mount point

Consult the instructions in the sample job for more information.

The recommended z/OS UNIX file system type is zFS. The recommended mount point is */usr/lpp/lifeline*.

Before running the sample job to create the z/OS UNIX file system, you must ensure that OMVS is active on the driving system. zFS must be active on the driving system if you are installing Multi-site Workload Lifeline into a file system that is zFS.

If you create a new file system for this product, consider updating the BPXPRMxx PARMLIB member to mount the new file system at IPL time. This action can be helpful if an IPL occurs before the installation is completed.

```
MOUNT FILESYSTEM('#dsn')
MOUNTPOINT('/usr/lpp/lifeline')
MODE(RDRW) /* can be MODE(READ) */
TYPE(ZFS) PARM('AGGRGROW') /* zFS, with extents */
```

See the following information to update the statements in the previous sample:

#dsn is the name of the data set holding the z/OS UNIX file system.

/usr/lpp/lifeline is the name of the mount point where the z/OS UNIX file system will be mounted.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.8 Allocate File System Paths

The target system HFS or zFS data set must be mounted on the driving system when running the sample AQSISMKD job since the job will create paths in the HFS or zFS.

Before running the sample job to create the paths in the file system, you must ensure that OMVS is active on the driving system and that the target system's HFS or zFS file system is mounted to the driving system. zFS must be active on the driving system if you are installing Multi-site Workload Lifeline into a file system that is zFS.

If you plan to install Multi-site Workload Lifeline into a new HFS or zFS file system, you must create the mountpoint and mount the new file system to the driving system for Multi-site Workload Lifeline.

The recommended mountpoint is */usr/lpp/lifeline*.

Edit and submit sample job AQSISMKD to allocate the HFS or zFS paths for Multi-site Workload Lifeline. Consult the instructions in the sample job for more information.

If you create a new file system for this product, consider updating the BPXPRMxx PARMLIB member to mount the new file system at IPL time. This action can be helpful if an IPL occurs before the installation is completed.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.9 Create DDDEF Entries

Edit and submit sample job AQSDDDEF to create DDDEF entries for the SMP/E target and distribution libraries for Multi-site Workload Lifeline. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.10 Perform SMP/E APPLY

1. Ensure that you have the latest HOLDDATA; then edit and submit sample job AQSAPPLY to perform an SMP/E APPLY CHECK for Multi-site Workload Lifeline. Consult the instructions in the sample job for more information.

Perform an SMP/E APPLY CHECK for Multi-site Workload Lifeline.

The latest HOLDDATA is available through several different portals, including <http://service.software.ibm.com/holdata/390holddata.html>. The latest HOLDDATA may identify HIPER and FIXCAT APARs for the FMID you will be installing. An APPLY CHECK will help you determine if any HIPER or FIXCAT APARs are applicable to the FMIDs you are installing. If there are any applicable HIPER or FIXCAT APARs, the APPLY CHECK will also identify fixing PTFs that will resolve the APARs, if a fixing PTF is available.

You should install the FMID regardless of the status of unresolved HIPER or FIXCAT APARs. However, do not deploy the software until the unresolved HIPER and FIXCAT APARs have been

analyzed to determine their applicability. That is, before deploying the software either ensure fixing PTFs are applied to resolve all HIPER or FIXCAT APARs, or ensure the problems reported by all HIPER or FIXCAT APARs are not applicable to your environment.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do *not* bypass the PRE, ID, REQ, and IFREQ on the APPLY CHECK. The SMP/E root cause analysis identifies the cause only of *errors* and not of *warnings* (SMP/E treats bypassed PRE, ID, REQ, and IFREQ conditions as warnings, instead of errors).

Here are sample APPLY commands:

- a. To ensure that all recommended and critical service is installed with the FMIDs, receive the latest HOLDDATA and use the APPLY CHECK command as follows

```
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU*)
FIXCAT(IBM.ProductInstall-RequiredService)
GROUPEXTEND .
```

Some HIPER APARs might not have fixing PTFs available yet. You should analyze the symptom flags for the unresolved HIPER APARs to determine if the reported problem is applicable to your environment and if you should bypass the specific ERROR HOLDS in order to continue the installation of the FMIDs.

This method requires more initial research, but can provide resolution for all HIPERs that have fixing PTFs available and are not in a PE chain. Unresolved PEs or HIPERs might still exist and require the use of BYPASS.

- b. To install the FMIDs without regard for unresolved HIPER APARs, you can add the BYPASS(HOLDCLASS(HIPER)) operand to the APPLY CHECK command. This will allow you to install FMIDs even though one or more unresolved HIPER APARs exist. After the FMIDs are installed, use the SMP/E REPORT ERRSYSMODS command to identify unresolved HIPER APARs and any fixing PTFs.

```
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU*)
FIXCAT(IBM.ProductInstall-RequiredService)
GROUPEXTEND
BYPASS(HOLDCLASS(HIPER)) .
..any other parameters documented in the program directory
```

This method is quicker, but requires subsequent review of the Exception SYSMOD report produced by the REPORT ERRSYSMODS command to investigate any unresolved HIPERs. If you have received the latest HOLDDATA, you can also choose to use the REPORT MISSINGFIX command and specify Fix Category IBM.ProductInstall-RequiredService to investigate missing recommended service.

If you bypass HOLDS during the installation of the FMIDs because fixing PTFs are not yet available, you can be notified when the fixing PTFs are available by using the APAR Status Tracking (AST) function of ServiceLink or the APAR Tracking function of ResourceLink.

2. After you take actions that are indicated by the APPLY CHECK, remove the CHECK operand and run the job again to perform the APPLY.

Note: The GROUPEXTEND operand indicates that SMP/E applies all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

Expected Return Codes and Messages from APPLY CHECK: You will receive a return code of 0 if this job runs correctly.

Expected Return Codes and Messages from APPLY: You will receive a return code of 0 if this job runs correctly.

6.1.11 FTP Lifeline Agent to Linux on System z (Optional)

The Linux on System z Management Guest is a privileged z/VM guest IPLed with Linux on System z. A Linux on System z Management Guest is required for each z/VM system that participates in a Linux on System z workload. The Linux on System z Management Agent runs as a daemon on this Management Guest.

The Linux on System z Management Agent is a Linux on System z application which runs on a Linux on System z Management Guest. It monitors the availability of server applications running on Linux on System z Guests within the same z/VM system and reports that information to the Advisor.

The RPM for the Agent was installed into the default path, */usr/lpp/lifeline/zlinux/lifeline-2-5.0.s390x.rpm*. The RPM will have to be sent to the Linux on System z Management Guest and installed.

You may choose to enter the FTP commands manually from TSO/E or you may use the supplied batch job, AQSFTTRPM, to FTP the RPM into your Linux on System z Management Guest.

Once the RPM has been successfully stored, go to the Linux on System z Management Guest and use the RPM tool to install the Linux on System z Lifeline Agent and associated files.

Example to manually FTP:

TSO FTP *ipaddress or machine_name*

USING 'SYS1.TCPPARMS(FTPDATA)' FOR LOCAL SITE CONFIGURATION PARAMETERS.

IBM FTP CS V2R1

FTP: USING TCPIP

CONNECTING TO: x.xx.xxx.xxx PORT: 21.

220 (vsFTPd 2.0.7)

NAME (x.xx.xxx.xxx:userid):

inuser

>>> USER INUSER

331 Please specify the password.

PASSWORD:

```
>>> PASS
230 Login successful.
COMMAND:
cd /tmp
>>> CWD /TMP
250 Directory successfully changed.
COMMAND:
bin
>>> TYPE I
200 Switching to Binary mode.
COMMAND:
put /usr/lpp/lifeline/zlinux/lifeline-2-5.0.s390x.rpm
>>> PORT x,xx,xxx,xx,x,xx
200 PORT command successful. Consider using PASV.
>>> STOR LIFELINE-2-5.0.S390X.RPM
150 Ok to send data.
226 File receive OK.
3028920 BYTES TRANSFERRED IN 0.870 SECONDS.  TRANSFER RATE 3481.52 KBYTES/SEC.
COMMAND:
quit
>>> QUIT
221 Goodbye.
***
```

Login to the Linux on System z Management Guest, and install the RPM.

```
rpm -Uvh lifeline-2-5.0.s390x.rpm
```

6.1.12 Perform SMP/E ACCEPT

Edit and submit sample job AQSACCPT to perform an SMP/E ACCEPT CHECK for Multi-site Workload Lifeline. Consult the instructions in the sample job for more information.

Perform an SMP/E ACCEPT CHECK for Multi-site Workload Lifeline.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do *not* bypass the PRE, ID, REQ, and IFREQ on the ACCEPT CHECK. The SMP/E root cause analysis identifies the cause of *errors* but not *warnings* (SMP/E treats bypassed PRE, ID, REQ, and IFREQ conditions as warnings rather than errors).

Before you use SMP/E to load new distribution libraries, it is recommended that you set the ACCJCLIN indicator in the distribution zone. In this way, you can save the entries that are produced from JCLIN in the distribution zone whenever a SYSMOD that contains inline JCLIN is accepted. For more information about the ACCJCLIN indicator, see the description of inline JCLIN in the SMP/E Commands book for details.

After you take actions that are indicated by the ACCEPT CHECK, remove the CHECK operand and run the job again to perform the ACCEPT.

Note: The GROUPEXTEND operand indicates that SMP/E accepts all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

Expected Return Codes and Messages from ACCEPT CHECK: You will receive a return code of 0 if this job runs correctly.

If PTFs that contain replacement modules are accepted, SMP/E ACCEPT processing will link-edit or bind the modules into the distribution libraries. During this processing, the Linkage Editor or Binder might issue messages that indicate unresolved external references, which will result in a return code of 4 during the ACCEPT phase. You can ignore these messages, because the distribution libraries are not executable and the unresolved external references do not affect the executable system libraries.

Expected Return Codes and Messages from ACCEPT if no PTFs are being installed: You will receive a return code of 0 if this job runs correctly.

6.1.13 Run REPORT CROSSZONE

The SMP/E REPORT CROSSZONE command identifies requisites for products that are installed in separate zones. This command also creates APPLY and ACCEPT commands in the SMPPUNCH data set. You can use the APPLY and ACCEPT commands to install those cross-zone requisites that the SMP/E REPORT CROSSZONE command identifies.

After you install Multi-site Workload Lifeline, it is recommended that you run REPORT CROSSZONE against the new or updated target and distribution zones. REPORT CROSSZONE requires a global zone with ZONEINDEX entries that describe all the target and distribution libraries to be reported on.

For more information about REPORT CROSSZONE, see the SMP/E manuals.

6.2 Activating Multi-site Workload Lifeline

If you mount the file system in which you have installed Multi-site Workload Lifeline in read-only mode during execution, use the step-by-step procedures found in the IBM Multi-site Workload Lifeline V2.5 User's Guide SC27-4653-02, to activate the product functions.

7.0 Notices

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APAR numbers are provided in this document to assist in locating PTFs that may be required. Ongoing problem reporting may result in additional APARs being created. Therefore, the APAR lists in this document may not be complete. To obtain current service recommendations and to identify current product service requirements, always contact the IBM Customer Support Center or use S/390 SoftwareXcel to obtain the current "PSP Bucket".

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Reader's Comments

Program Directory for IBM Multi-site Workload Lifeline for z/OS, November 2014

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