Program Directory for

IBM Ported Tools for z/OS

V1.3.0

Program Number 5655-M23

FMIDs HOS1130, HVFB111, HHAP85P

for Use with
z/OS V1.13 or higher

Document Date: January 20, 2015

GI10-0769-09

Note

Before using this information and the product it supports, be sure to read the general information under 7.0, “Notices” on page 37.

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1.0 Introduction

This program directory is intended for the system programmers who are responsible for program installation and maintenance. It contains information about the material and procedures associated with the installation of IBM Ported Tools for z/OS™, which includes the following features:

- IBM Ported Tools for z/OS
- Xvfb for z/OS
- IBM HTTP Server V8.5

The Program Directory contains the following sections:

- 2.0, “Program Materials” on page 7 identifies the basic and optional program materials and documentation for IBM Ported Tools for z/OS.
- 3.0, “Program Support” on page 11 describes the IBM support available for IBM Ported Tools for z/OS.
- 4.0, “Program and Service Level Information” on page 13 lists the APARs (program level) and PTFs (service level) that have been incorporated into IBM Ported Tools for z/OS.
- 5.0, “Installation Requirements and Considerations” on page 15 identifies the resources and considerations that are required for installing and using IBM Ported Tools for z/OS.
- 6.0, “Installation Instructions” on page 27 provides detailed installation instructions for IBM Ported Tools for z/OS, Xvfb for z/OS, and IBM HTTP Server V8.5. It also describes the procedures for activating the functions of IBM Ported Tools for z/OS, Xvfb for z/OS, and IBM HTTP Server V8.5, or refers to appropriate publications.

Before installing IBM Ported Tools for z/OS, 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 11 tells you how to find any updates to the information and procedures in this Program Directory.

IBM Ported Tools for z/OS 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 that is provided with your order. All service and HOLDDATA for IBM Ported Tools for z/OS are included on the CBPDO tape.

Do not use this program directory if you install IBM Ported Tools for z/OS with a SystemPac or ServerPac. When you use these offerings, use the jobs and documentation supplied with the offering. This program directory can point you to specific sections of it as required.

1.1 IBM Ported Tools for z/OS Description

IBM Ported Tools for z/OS base release contains the support for OpenSSH. OpenSSH provides secure encryption for both remote login and file transfer. The following are some of the utilities that it includes:

- **ssh**, a client program for logging into a z/OS shell. It can also be used to log into other platform's UNIX shells. It is an alternative to rlogin.
- **scp** for copying files between networks. It is an alternative to **rcp**.
- **sftp** for file transfers over an encrypted **ssh** transport. It is an interactive file transfer program similar to **ftp**.
- **sshd**, a daemon program for **ssh** that listens for connections from clients. The IBM Ported Tools for z/OS implementation of **sshd** supports both **SSH** protocol versions 1 and 2 simultaneously.

Other basic utilities such as **ssh-add**, **ssh-agent**, **ssh-keysign**, **ssh-keyscan**, **ssh-keygen** and **sftp-server** are also included.

To ensure secure encrypted communications, OpenSSH uses cyphers such as Blowfish and 3DES.

OpenSSH provides the following z/OS extensions:

- System Authorization Facility (SAF) key ring. OpenSSH can be configured to allow OpenSSH keys to be stored in SAF key rings.
- Multilevel security. It is a security policy that allows the classification of data and users based on a system of hierarchical security levels combined with a system of non-hierarchical security categories.
- System Management Facility (SMF). OpenSSH can be configured to collect SMF Type 119 records for both the client and the server.
- Hardware Crypto Support. OpenSSH can be configured to choose Integrated Cryptographic Service Facility (ICSF) callable serverice for implementing the applicable SSH session ciphers and HMACs.

1.1.1 Xvfb for z/OS Description

Xvfb is an X server that can run on machines with no display hardware and no physical input devices. It emulates a dumb framebuffer using virtual memory.

In IBM Ported Tools for z/OS V1.2, this code is delivered as a separate FMID, HVFB111, and is available only with the IBM Ported Tools for z/OS FMID HOS1130. The Xvfb for z/OS code in FMID HVFB111 is the same code that was available as PTFs UA21819 and UA32671 with IBM Ported Tools for z/OS V1.1. The Xvfb for z/OS code is delivered as a separate FMID in order to allow IBM to provide more efficient support.

1.1.2 IBM HTTP Server V8.5 Description

IBM HTTP Server is based on the open source Apache Web server (httpd.apache.org), The Apache Web server can be built with many different capabilities and configuration options. IBM HTTP Server includes a set of features from the available options. For information about Apache Web server features supported in IBM HTTP Server, see the information center topics about Apache modules (containing directives), programs, Apache Portable Runtime (APR) and APR-util libraries, and Multi-processing module (MPM) and addressing modes.

Key features added with IBM HTTP Server

- If using IBM HTTP Server V8.5 with WebSphere Application Server Version 8, you can use the administrative console to manage IBM HTTP Server.
- InstallShield for multiple platforms enables consistent installation of the IBM HTTP Server on different platforms (except the z/OS platform).
- Fast Response Cache Accelerator (FRCA) is available for AIX 5.x and certain Windows operating systems. It significantly improves HTTP Server performance when serving static content such as HTML files or image files.
- Dynamic content generation with FastCGI.

Functionality provided in IBM HTTP Server

- The LDAP authentication support from Apache is provided. The mod_ibm_ldap module is also supported.
- If you are using the mod_ibm_ldap module for your LDAP configuration consider migrating your mod_ibm_ldap directives to use the mod_ldap module. The mod_ibm_ldap module is provided with this release of IBM HTTP Server for compatibility with previous releases, however, you must migrate existing configurations to use the mod_authnz_ldap and mod_ldap modules to ensure future support for your LDAP configuration.
- The Global Security Toolkit (GSKit) is included in the IBM HTTP Server installation. GSKit is not installed or upgraded for the entire system.
  - The GSKit libraries are installed locally in the <ihsinst>/gsk7 directory.
  - The GSKit wrappers for certificate management tools, such as ikeyman and gsk7cmd, are installed in the <ihsinst>/bin/ directory.
  - GSKit maintenance for IBM HTTP Server must be installed by the IBM HTTP Server service process, and not system-wide GSKit updates.
- The new AddServerHeader directive controls whether or not a server response header is added for requests not proxied to another server. For more information about this directive, see the AddServerHeader directive Web page.

  `http://publib.boulder.ibm.com/httpserv/manual70/mod/core.html#addserverheader`
- The ihsdiag diagnostic plug-in modules are bundled with the product installation in the <ihsinst>/modules/debug directory. Previously, they were obtained from the ihsdiag distribution.

- The mod_backtrace diagnostic module is now supported.

IBM HTTP Server is powered by Apache and supports 64-bit architecture and IPv6.

You can configure Lightweight Directory Access Protocol (LDAP) to authenticate and protect files on IBM HTTP Server.

You can authenticate to the IBM HTTP Server using HTTP basic authentication or client certificates with the System Authorization

New functionality in IBM HTTP Server Version 8.5

- Improvements for IBM HTTP Server (IHS) 8.5 on z/OS
  - Federal Information Processing Standards (FIPS140-2) support
  - Scalability improvements (Event MPM)
- Improvements for IBM HTTP Server (IHS) 8.5.5 on z/OS
  - HTTP response translation improvements
  - 31-bit runtime support
  - MVS dataset support
  - z/OS Workload Management classification of requests
  - Systems Management Facility (SMF) logging
  - z/OS operator commands

These improvements help with migration from the Domino Go WebServer (DGW) on z/OS.

1.2 IBM Ported Tools for z/OS FMIDs

IBM Ported Tools for z/OS consists of the following FMIDs:

HOS1130 - IBM Ported Tools for z/OS - OpenSSH
HVFB111 - IBM Ported Tools for z/OS - Xvfb
HHAP85P - IBM Ported Tools for z/OS - IBM HTTP Server V8.5

1.3 IBM Ported Tools for z/OS Product Versus Function Levels

The last release in which an element or feature changed is considered its function level. Do not confuse the function level with the product level. All features are at the V1R3 product level but they are at various function levels. For example, the product level of IBM Ported Tools for z/OS: Xvfb for z/OS (FMID Xvfb for z/OS) is V1.3.0 but its function level is V1.1.0 because V1.1.0 was the last release in which it changed.

Figure 1. Functional Level for each Product Feature

Feature name	FMID	Functional Level
IBM Ported Tools for z/OS (OpenSSH)	HOS1130	V1.3.0
Xvfb for z/OS	HVFB111	V1.1.0
IBM HTTP Server V8.5	HHAP85P	V1.2.1

2.0 Program Materials

An IBM program is identified by a program number. The program number for IBM Ported Tools for z/OS is 5655-M23.

Basic Machine-Readable Materials are materials that are supplied under the base license and feature numbers, and are required for the use of the product. Optional Machine-Readable Materials are orderable under separate feature numbers, and are not required for the product to function.

The program announcement material describes the features supported by IBM Ported Tools for z/OS. Ask your IBM representative for this information if you have not already received a copy.

You will receive IBM Ported Tools for z/OS and Xvfb for z/OS (FMIDs HOS1130 and HVFB111) when you order IBM Ported Tools for z/OS V1R3. If you want to install IBM HTTP Server V8.5 (FMID HHAP85P) on z/OS V1R13 or z/OS V2R1, you must order the feature (IBM Ported Tools for z/OS: HTTP Serv) from ShopzSeries separately.

Also, if you do not have FMIDs HOS1130 or HVFB111 installed, there is no reason to install them unless you intend to use their functions. The HTTP Server feature does not require their functions. See sections1.1, “IBM Ported Tools for z/OS Description” on page 2 and 1.1.1, “Xvfb for z/OS Description” on page 2 for more information.

Note also that the IBM HTTP Server V8.5 feature (HHAP85P) that is included with IBM Ported Tools for z/OS is the same as that is included with WebSphere Application Server for z/OS (WAS). Therefore, if you have installed the IBM HTTP Server V8.5 feature that is included with WAS V8.5, you do not have to install this feature again.

2.1 Basic Machine-Readable Material

The distribution medium for this program is magnetic tape 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 27 for more information about how to install the program FMIDs HOS1130, HVFB111, and HHAP85P.

You can find information about the physical tape for the basic machine-readable materials for IBM Ported Tools for z/OS in the *CBPDO Memo To Users Extension*.

2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for IBM Ported Tools for z/OS.

2.3 Program Publications

The following sections identify the basic and optional publications for IBM Ported Tools for z/OS.

2.3.1 Basic Program Publications

The basic package includes a copy of the License Information Document (GA22-7986-03).

The basic publications and other information about the IBM Ported Tools for z/OS are available electronically at the IBM Ported Tools for z/OS Web site:

`http://www.ibm.com/systems/z/os/zos/features/unix/ported/`

2.3.2 Optional Program Publications

Figure 2 identifies the optional unlicensed program publications for IBM Ported Tools for z/OS. One copy of each of these publications is included when you order the optional materials for IBM Ported Tools for z/OS. For additional copies, contact your IBM representative.

Figure 2. Optional Material: Other Optional Publications

Publication Title	Form Number	Media Format
IBM Ported Tools for z/OS: OpenSSH User's Guide	SA23-2246	http://www.ibm.com/systems/z/os/zos/features/unix/ported/openssh/
IBM Ported Tools for z/OS: Xvfb User's Guide	SA23-2216	http://www.ibm.com/systems/z/os/zos/features/unix/ported/xvfb/
IBM Ported Tools for z/OS: IBM HTTP Server 8.5 Feature Information	NA	http://www-306.ibm.com/software/webservers/httpservers/library/

2.4 Program Source Materials

No program source materials or viewable program listings are provided for IBM Ported Tools for z/OS.

2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 3 during the installation of IBM Ported Tools for z/OS.

Figure 3. Publications Useful During Installation

Publication Title	Form Number	Media Format
IBM SMP/E for z/OS User's Guide	SA22-7773	http://www-03.ibm.com/systems/z/os/zos/library/bkserv/
IBM SMP/E for z/OS Commands	SA22-7771	http://www-03.ibm.com/systems/z/os/zos/library/bkserv/
IBM SMP/E for z/OS Reference	SA22-7772	http://www-03.ibm.com/systems/z/os/zos/library/bkserv/
IBM SMP/E for z/OS Messages, Codes, and Diagnosis	GA22-7770	http://www-03.ibm.com/systems/z/os/zos/library/bkserv/
z/OS Information Roadmap	SA22-7500	
z/OS MVS Initialization and Tuning Reference	SA22-7592	
z/OS UNIX System Services Planning	GA22-7800	
z/OS UNIX System Services Command Reference	SA22-7802	
z/OS UNIX System Services User's Guide	SA22-7801	
IBM Software Delivery Standard Packaging Rules for z/OS-Based Products	SC23-3695	
z/OS MVS JCL Reference	SA22-7597	
z/OS System Codes	SA22-7626	

3.0 Program Support

This section describes the IBM support available for IBM Ported Tools for z/OS. The service number for IBM Ported Tools for z/OS is 5655-M29.

3.1 Program Services

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

3.2 Preventive Service Planning

Before you install IBM Ported Tools for z/OS, 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 6.1.9, “Perform SMP/E APPLY” on page 31 for a sample APPLY command.

If you obtained IBM Ported Tools for z/OS as part of a CBPDO, HOLDDATA is included.

If the CBPDO for IBM Ported Tools for z/OS is older than two weeks old by the time you install the product materials, you should contact the IBM Support Center or use S/390 SoftwareXcel to obtain the latest PSP Bucket information. You can also obtain the latest PSP Bucket information by going to the following Web site:
https://techsupport.services.ibm.com/server/390.psp390

For program support, access the Software Support Web site at http://www-3.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 IBM Ported Tools for z/OS are shown as follows:

Figure 4. PSP Upgrade and Subset ID

UPGRADE	SUBSET	Description
PORTED4ZOS	HOS1130	IBM Ported Tools for z/OS (OpenSSH)
PORTED4ZOS	HVFB111	IBM Ported Tools for z/OS - Xvfb
IHSPT850	HHAP85P	IBM HTTP Server V8.5

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 12 identifies the component IDs (COMPID) for IBM Ported Tools for z/OS.

Figure 5. Component IDs

FMID	COMPID	Component Name	RETAIN Release
HOS1130	5655M2301	Ported Tools (OpenSSH)	130
HVFB111	5655M2302	Xvfb for z/OS	111
HHAP85P	5655I3510	IBM HTTP Server V8.5	85P

4.0 Program and Service Level Information

This section identifies the program and relevant service levels of IBM Ported Tools for z/OS. 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 APARs have been incorporated in IBM Ported Tools for z/OS (HOS1130):

OA34210	OA41247	OA43100
OA37278	OA41704	OA43934
OA39283	OA42286	OA44038
OA41089	OA42873	OA45001

The following APARs have been incorporated into Xvfb for z/OS (HVFB111):

OA10965
OA15752

4.2 Service Level Information

PTFs UA21819 and UA32671 have been repackaged as FMID HVFB111. No other PTFs have been incorporated into IBM Ported Tools for z/OS or its features.

It is highly recommended that you frequently check the IBM Ported Tools for z/OS PSP Buckets for HIPER and SPECIAL Attention PTFs against all FMIDs that you must install.

5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing and activating IBM Ported Tools for z/OS, Xvfb for z/OS, and IBM HTTP Server V8.5. The following terminology is used:

- *Driving system*: the system used to install the program; where SMP/E executes.

  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 access these impacts without disrupting your production system.

5.1 Driving System Requirements

This section describes the environment of the driving system required to install IBM Ported Tools for z/OS.

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?
5694-A01	z/OS	V1.13 or higher	N/A	No

Figure 7. Driving System Software Requirements for IBM HTTP Server V8.5

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in the shipped product?
5694-A01	z/OS	V1.13 or higher	N/A	No
5655-G44	IBM SMP/E for z/OS	V3.6 or higher	N/A	No
Either of the following products:				
5655-R31	IBM 31-bit SDK for z/OS Java 2 Technology Edition	V6.0.x or higher	N/A	No
5655-R32	IBM 64-bit SDK for z/OS Java 2 Technology Edition	V6.0.x 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.

IBM Ported Tools for z/OS installs in the z/OS Z038 SREL.

Notes:

1. The user ID under which the SMP/E installation jobs run must have the following characteristics:
   - Defined to use z/OS UNIX System Services (z/OS UNIX).
   - A superuser (UID=0) or have read access to the BPX.SUPERUSER resource in the RACF® FACILITY class.
   - Have READ access to the BPX.FILEATTR.PROGCTL, BPX.FILEATTR.APF, and BPX.SHARELIB FACILITY classes (or READ access to the BPX.FILEATTR.* generic FACILITY class).
2. z/OS UNIX must be available in full-function mode with the shell and utilities available.
3. Before you install IBM Ported Tools for z/OS, ensure that the file system of the target system is available (OMVS is active and the target file systems are mounted) for processing.
4. Additional requirements for IBM HTTP Server V8.5 are as follows:

- Because IBM HTTP Server V8.5 uses SDK as part of the SMP/E processing, configure the driving system to have SDK 6.0 or later. You can download a free copy of Java SDK 6.0 from www-03.ibm.com/systems/z/os/zos/tools/java/
- Ensure that the user ID that runs the HAPISMK2 installation job has the authority to mount file systems if you chose this option.

5.2 Target System Requirements

This section describes the environment of the target system required to install and use IBM Ported Tools for z/OS.

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 by and *must* be present on the system or products that are not required by 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.

Figure 8. Target System Mandatory Installation Requisites

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	V1.13 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.

IBM Ported Tools for z/OS 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.

Figure 9. Target System Mandatory Operational Requisites

Program Number	Product Name and Minimum VRM/Service Level
5694-A01	z/OS V1.13 or higher
5694-A01	Cryptographic Support for z/OS V1R12-R13(FMID HCR77A0) web deliverable

Note: This Crytopgraphic Support web deliverable is required if all of the following cases are true:

- Ported Tools 1.3 OpenSSH will run on z/OS V1.13,
- the ICSF random number generation function is required, and
- there is no cryptographic hardware installed.

If all of the above cases are true, then you must use at least the ICSF level of HCR77A0 which is available as a web deliverable and can be installed on z/OS V1.13.

This requirement is because ICSF's random number cache service, which will generate random numbers even when no crypto coprocessors are online, requires HCR77A0 or later.

Failure to satisfy this cryptographic requirement on z/OS V1.13 will result in this failure: FOTS1949 PRNG is not seeded. Please activate the Integrated Cryptographic Service Facility (ICSF).

The following z/OS elements, features, and components must be installed, enabled, and configured for IBM HTTP Server V8.5:

- z/OS Unix System Services and the hierarchical file system (HFS) or the zSeries File System (zFS)
- eNetwork Communications Server (TCP/IP) or equivalent
- Security Server (RACF) or equivalent SAF security management product

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.

Figure 10 (Page 1 of 2). Target System Conditional Operational Requisites

Program Number	Product Name and Minimum VRM/Service Level	Function
Any **one** of the following:		

Figure 10 (Page 2 of 2). Target System Conditional Operational Requisites

Program Number	Product Name and Minimum VRM/Service Level	Function
5625-DB2	DB2 UDB for z/OS Version 8 with PTFs UQ86844, UK20888, and UK25079 or later	APAR PQ85495 LOB locator-based support APAR PK31468 SQL EXTENDED FETCH fix APAR PK41730 BLOB data over 2G fix
5697-N29	DB2 VUE for z/OS V8.1 with PTFs UQ86844, UK20888, and UK25079 or later	APAR PQ85495 LOB locator-based support APAR PK31468 SQL EXTENDED FETCH fix APAR PK41730 BLOB data over 2G fix
5635-DB2	DB2 V9 for z/OS with PTF UK25080 or later	APAR PK41730 BLOB data over 2G fix
5697-P12	DB2 VUE for z/OS V9.1 with PTF UK25080 or later	APAR PK41730 BLOB data over 2G fix

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 sysplex), a shared DASD environment (such as test and production), or systems that reuse the same DASD environment at different time intervals.

IBM Ported Tools for z/OS 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.

IBM Ported Tools for z/OS has no negative requisites.

5.2.3 DASD Storage Requirements

IBM Ported Tools for z/OS libraries can reside on all supported DASD types.

Figure 11 to Figure 13 lists the total space that is required for each type of library.

Figure 11 (Page 1 of 2). Total DASD Space Required by IBM Ported Tools for z/OS

Library Type	Total Space Required in 3390 Trks
Target	8

Figure 11 (Page 2 of 2). Total DASD Space Required by IBM Ported Tools for z/OS

Library Type	Total Space Required in 3390 Trks
Distribution	2850
File System	2850

Figure 12. Total DASD Space Required by Xvfb for z/OS

Library Type	Total Space Required in 3390 Trks
Target	4
Distribution	600
File System	2000

Figure 13. Total DASD Space Required by IBM HTTP Server V8.5

Library Type	Total Space Required in 3390 Trks
Target	20
Distribution	364
File System	2050

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 29.

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 LNKLST.
   - The data set may be in the LNKLST.
   - 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 IBM Ported Tools for z/OS, Xvfb for z/OS, and IBM HTTP Server V8.5. The storage requirements of IBM Ported Tools for z/OS, Xvfb for z/OS, and IBM HTTP Server V8.5 must be added to the storage required by other programs having data in the same library or path.

Note: The data in these tables should be used when determining 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 14 (Page 1 of 2). Storage Requirements for IBM Ported Tools for z/OS Target Libraries

Library DDNAME	Member Type	Target Volume	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SAMPLIB	sample	TVOL2	E	PDS	FB	80	4	2

Figure 14 (Page 2 of 2). Storage Requirements for IBM Ported Tools for z/OS Target Libraries

Library DDNAME	Member Type	Target Volume	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
MACLIB	maclib	TVOL2	E	PDS	FB	80	4	2

Figure 15. Storage Requirements for Xvfb for z/OS Target Libraries

Library DDNAME	Member Type	Target Volume	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SAMPLIB	sample	TVOL2	E	PDS	FB	80	4	2

Figure 16. Storage Requirements for IBM HTTP Server V8.5 Target Libraries

Library DDNAME	Member Type	Target Volume	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SHAPEXE2	EXEC	TVOL1	U	PDS	VB	255	10	5
SHAPJCL2	sample	TVOL2	U	PDS	FB	80	10	5

Figure 17. IBM Ported Tools for z/OS File System Paths

DDNAME	TYPE	Path Name
SFSUMBIN	P	/bin/IBM/
SFSUSAMP	P	/samples/IBM/
SFSUSBIN	P	/usr/sbin/IBM/
SFOTSSH	N	/usr/lib/ssh/IBM/
SFOM1MNC	P	/usr/man/C/man1/IBM/
SFSUMMSC	P	/usr/lib/nls/msg/C/IBM/

Figure 18. Xvfb for z/OS File System Paths

DDNAME	TYPE	Path Name
SFOM1MNC	P	/usr/man/C/man1/IBM/
SFSUSAMP	P	/samples/IBM/
SEZABIN	P	/usr/lpp/tcpip/bin/IBM/

Figure 19. IBM HTTP Server V8.5 File System Paths

DDNAME	TYPE	Path Name
SHAPBIN2	N	/usr/lpp/IHSA/V8R5/IBM/
SMPJHOME	E	/usr/lpp/java/J6.0

Figure 20. Storage Requirements for IBM Ported Tools for z/OS Distribution Libraries

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AFOMHFS	E	PDS	VB	255	2830	3
AIGDVBS1	E	PDS	VB	4100	15	2
AMACLIB	E	PDS	FB	80	4	2
ASAMPLIB	E	PDS	FB	80	4	2

Figure 21. Storage Requirements for Xvfb for z/OS Distribution Libraries

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
ASAMPLIB	E	PDS	FB	80	4	2
AFOMHFS	E	PDS	VB	255	594	5

Figure 22. Storage Requirements for IBM HTTP Server V8.5 Distribution Libraries

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AHAPEXE2	U	PDS	VB	255	10	5
AHAPINC2	U	PDS	VB	255	344	5
AHAPJCL2	U	PDS	FB	80	10	5

Note: IBM HTTP Server V8.5 requires additional space for configuration information and run-time data. The amount of space that is required depends on the application server structure that is used, the applications that are run, and the amount of data storage that the applications require.

5.3 FMIDs Deleted

Installing IBM Ported Tools for z/OS 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 IBM Ported Tools for z/OS 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 for IBM Ported Tools for z/OS

If you use an unsupported version of OpenSSH, such as the version that you can download from http://www.ibm.com/servers/eserver/zseries/zos/unix/bpxa1toy.html, you must migrate to the supported version. See *IBM Ported Tools for z/OS: OpenSSH User's Guide*, SA23-2246 for the migration process. You can download this documentation from the following Web site:

http://www.ibm.com/systems/z/os/zos/features/unix/ported/

5.5 Special Considerations for IBM HTTP Server V8.5

IBM HTTP Server V8.5 does not delete the prior version of the IBM HTTP Server, namely IBM HTTP Server V7.0. Both IBM HTTP Server versions should be maintained until all applications have been migrated to IBM HTTP Server V8.5. For specific migration information, see IBM HTTP Server information center found at:

http://www.ibm.com/software/webservers/httpservers/library/

Select the IBM HTTP Server V8.0 Online Information Center. Then navigate to topic, *Migrating and installing IBM HTTP Server.*

6.0 Installation Instructions

This chapter describes the installation method and the step-by-step procedures to install and to activate the functions of IBM Ported Tools for z/OS.

Please note the following points:

- If you want to install IBM Ported Tools for z/OS 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.

  However, the IBM Ported Tools for z/OS FMID HOS1130 and Xvfb for z/OS HVFB111 must be installed into the system target and dlib zones. FMIDs HOS1130 and HVFB111 must be installed into the same zone as the z/OS base FMIDs. Note that requisite FMIDs can be satisfied by having these FMIDs or corresponding higher ones in the same zone as HVFB111.
- 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 IBM Ported Tools for z/OS

6.1.1 SMP/E Considerations for Installing IBM Ported Tools for z/OS and its features

Use the SMP/E RECEIVE, APPLY, and ACCEPT commands to install this release of IBM Ported Tools for z/OS.

Installation and maintenance of IBM HTTP Server V8.5 requires the availability of a Java Software Development Kit (SDK) to provide **jar** command used to unpack product files. SMP/E will use SMPJHOME to locate the Java SDK during APPLY and RESTORE processing. You can use either the following SMPJHOME DD statement during APPLY and RESTORE:

```
//SMPJHOME   DD   PATH='/usr/lpp/java/J6.0'
```

(NOTE: Use the correct directory for your system)

OR a DDDEF entry will be created for you when running the sample HAPDDDE2 job

OR manually create a DDDEF entry in the target zone.

```
SET BOUNDARY (<target zone>) .
UCLIN .
ADD DDDEF (SMPJHOME)
PATH('/usr/lpp/java/J6.0/').
ENDUCL.
```

(NOTE: Use the correct directory for your system)

See the *SMP/E for z/OS Reference* for more information about SMPJHOME.

Care must be taken that maintenance is applied to the proper file system. Be sure to verify that the correct file system is mounted at your service mountpoint(s) whenever maintenance is applied.

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 23. 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.

Figure 23. SMP/E Options Subentry Values

Subentry	Value	Comment
DSSPACE	800,500,100	No comments
PEMAX	SMP/E Default	IBM suggests using the SMP/E default for PEMAX.

6.1.3 SMP/E CALLLIBS Processing

There are no CALLLIBs requirements.

6.1.4 Sample Jobs

The following sample installation jobs are provided as part of the product to help you install IBM Ported Tools for z/OS, Xvfb for z/OS, and IBM HTTP Server V8.5.

Figure 24 (Page 1 of 2). Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
FOTISMKD	MKDIR	Sample job to invoke the supplied FOTMKDIR EXEC to allocate file system paths	IBM.HOS1130.F1
FOTISDDF	DDDEF	Sample job to define SMP/E DDDEFs	IBM.HOS1130.F1
FOTISAPY	APPLY	Sample SMP/E APPLY job	IBM.HOS1130.F1
FOTISACP	ACCEPT	Sample SMP/E ACCEPT job	IBM.HOS1130.F1
FNUISAPY	APPLY	Sample SMP/E APPLY job	IBM.HVFB111.F1

Figure 24 (Page 2 of 2). Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
FNUISACP	ACCEPT	Sample SMP/E ACCEPT job	IBM.HVFB111.F1
HAPALLO2	ALLOCATE	Sample job to allocate target and distribution libraries	IBM.HHAP85P.F1
HAPISMK2	MKDIR	Sample job to invoke the supplied HAPMKDI2 EXEC to create file system paths	IBM.HHAP85P.F1
HAPDDDE2	DDDEF	Sample job to define SMP/E DDDEFs	IBM.HHAP85P.F1
HAPAPPL2	APPLY	Sample SMP/E APPLY job	IBM.HHAP85P.F1
HAPACCE2	ACCEPT	Sample SMP/E ACCEPT job	IBM.HHAP85P.F1
HAPDMDEL	Delete FMID	Sample job to remove the IBM HTTP Server V7.0 FMID	IBM.HHAP85P.F1
HAPDELDF	Delete DDDEFs	Sample job to remove obsolete DDDEF entries	IBM.HHAP85P.F1
HAPDELET	Delete Data Sets	Sample job to delete obsolete data sets and file system	IBM.HHAP85P.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 29) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 24 on page 28 to find the appropriate relfile data set.

6.1.5 Perform SMP/E RECEIVE

If you have obtained IBM Ported Tools for z/OS as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the IBM Ported Tools for z/OS FMIDs, service, and HOLDDATA that are included on the CBPDO package. For more information, see the documentation that is included in the CBPDO.

6.1.6 Allocate SMP/E Target and Distribution Libraries

All data sets used by IBM Ported Tools for z/OS (FMID HOS1130) and Xvfb for z/OS (FMID HVFB111) are allocated by other products, so no new allocations are required.

Expected Return Codes and Messages: RC=0.

Edit and submit sample job HAPALLO2 to allocate the SMP/E target and distribution libraries for IBM HTTP Server V8.5 (FMID HHAP85P). Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: RC=0.

6.1.7 Allocate File system Paths

Mount the file system data set of the target system on the driving system when you run the sample MKDIR job because the job will create paths in the file system.

Before you run the sample job to create the paths in the file system, ensure that OMVS is active on the driving system, and that the file system of the target system is mounted to the driving system. If you install IBM Ported Tools for z/OS into a zFS file system, zFS must be active on the driving system.

IBM Ported Tools for z/OS (FMID HOS1130) installs into root directories and cannot reside in its own file system.

Edit and submit sample job FOTISMKD to allocate the file system paths for IBM Ported Tools for z/OS (FMID HOS1130). Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: RC=0.

Xvfb for z/OS (FMID HVFB111) installs into existing root directories and cannot reside in its own file system. There is no ISMKD job for this FMID.

If you plan to install IBM HTTP Server V8.5 into a new file system, you must create the mountpoint and mount the new file system to the driving system. For IBM HTTP Server V8.5, the recommended mountpoint is -PathPrefix-/usr/lpp/IHSA/V8R5.

Edit and submit the sample job HAPISMK2 to allocate the file system paths for IBM HTTP Server V8.5 (FMID HHAP85P). Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: RC=0.

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.

6.1.8 Create DDDEF Entries

Edit and submit sample job FOTISDDF to create DDDEF entries for the SMP/E target and distribution libraries for IBM Ported Tools for z/OS (FMID HOS1130). Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: RC=0

Xvfb for z/OS (FMID HVFB111) uses existing DDDEFs and there is no additonal DDDEF job for this FMID.

Edit and submit sample job HAPDDDE2 to create DDDEF entries for the SMP/E target and distribution libraries for IBM HTTP Server V8.5 (FMID HHAP85P). Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: RC=0

6.1.9 Perform SMP/E APPLY

1. Ensure that you have the latest HOLDDATA; then edit and submit sample job shown in Figure 25 on page 32 to perform an SMP/E APPLY CHECK for IBM Ported Tools for z/OS and its features.

   Here are the sample jobs that you can edit and submit to perform SMP/E APPLY CHECK for the features of IBM Ported Tools for z/OS:

   - IBM Ported Tools for z/OS: FOTISAPY
   - Xvfb for z/OS: FNUISAPY
   - IBM HTTP Server V8.5: HAPAPPL2

   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 FMIDs 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 FMIDs 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. This is because 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 two methods to install FMIDs when ++HOLDs for HIPERs exist for the FMIDs that you install:

   a. To ensure that all recommended and critical service is installed with the FMIDs, if you are using SMP/E 3.5 or higher and have received the latest HOLDDATA, add the FIXCAT operand to the APPLY command as shown below. If you are using a prior release of SMP/E, add the SOURCEID(HIPER,RSU*) operand to the APPLY command.

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

Some HIPER APARs might not have PTFs available yet. You have to analyze the symptom flags to determine if you want to bypass the specific ERROR HOLDs and continue the installation of the FMIDs.

This method requires more initial research, but can provide resolution for all HIPERs that have fixes 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 the HIPERs, you can add a BYPASS(HOLDCLASS(HIPER)) operand to the APPLY command. In this way, you can install FMIDs even though HIPER ERROR HOLDs against them still exist. Only the HIPER ERROR HOLDs are bypassed. After the FMIDs are installed, run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER maintenance.

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

This method is the quicker of the two, but requires subsequent review of the REPORT ERRSYSMODS to investigate any HIPERs. If you are running SMP/E V3.5 or higher and have received the latest HOLDDATA, you can also choose to run REPORT MISSINGFIX for Fix Category IBM.ProductInstall-RequiredService to investigate missing recommended service.

If you bypass HOLDs during the installation of the FMIDs because PTFs are not yet available, you can make yourself notified when the 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.

```
//APPLY JOB
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//SMPCSI DD DSN=csiname,DISP=SHR
//SMPCNTL DD *
   SET BOUNDARY(targetzone) .
   APPLY CHECK
   FORFMID(HOS1130,HVFB111,HHAP85P)
   SELECT(HOS1130,HVFB111,HHAP85P)
   GROUPEXTEND(NOAPARS,NOUSERMODS)
   SOURCEID(PT4ZFIX,HIPER)
   BYPASS(HOLDSYSTEM,
   HOLDUSER,HOLDCLASS(UCLREL,ERREL,HIPER)) .
/*
```

Figure 25. SMP/E APPLY CHECK sample

Required Updates

1. Update the job parameters.
2. Replace the csiname on the SMPCSI DD statement with your CSI name.
3. Update targetzone to your target zone name.
4. Remove any FMIDs that you do not wish to install from the FORFMID and SELECT keywords.
5. Update 'PT4ZFIX' with the name of the fixes that were required, as documented in the software PSP bucket upgrade (PORTED4ZOS) subsets HOS1130, HVFB111, and upgrade (IHSPT850) subset HHAP85P.

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.

6.1.10 Perform SMP/E ACCEPT

Edit and submit the sample job, as shown in Figure 26 on page 34, to perform an SMP/E ACCEPT CHECK for IBM Ported Tools for z/OS.

Here are the sample jobs that you can edit and submit to perform SMP/E ACCEPT CHECK for the features of IBM Ported Tools for z/OS:

- IBM Ported Tools for z/OS: FOTISACP
- Xvfb for z/OS: FNUISACP
- IBM HTTP Server V8.5: HAPACCE2

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 only *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.

```
//ACCEPT JOB
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//SMPCSI DD DSN=csiname,DISP=SHR
//SMPCNTL DD *
   SET BOUNDARY(dlibzone) .
   ACCEPT CHECK
   FORFMID(HOS1130,HVFB111,HHAP85P)
   SELECT(HOS1130,HVFB111,HHAP85P)
   GROUPEXTEND(NOAPARS,NOUSERMODS)
   SOURCEID(PT4ZFIX,HIPER)
   BYPASS(HOLDSYSTEM,
   HOLDUSER,HOLDCLASS(UCLREL,ERREL,HIPER)) .
/*
```

Figure 26. SMP/E ACCEPT CHECK sample

Required Updates

1. Update the job parameters.
2. Replace the csiname on the SMPCSI DD statement with your CSI name.
3. Update dlibzone to your dlib zone name.
4. Remove any FMIDs that you do not wish to install from the FORFMID and SELECT keywords.
5. Update PT4ZFIX with the name of the fixes that were required, as documented in the software PSP bucket upgrades (PORTED4ZOS) subsets HOS1130, HVFB111, and upgrade (IHSPT850) subset HHAP85P.

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: RC=0

If PTFs that contain replacement modules are accepted, SMP/E ACCEPT processing will link-edits or binds 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: RC=0

6.1.11 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 IBM Ported Tools for z/OS, Xvfb for z/OS, and IBM HTTP Server V8.5, 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 IBM Ported Tools for z/OS (OpenSSH)

6.2.1 File System Execution

If you mount the root file system in which you have installed IBM Ported Tools for z/OS in read-only mode during execution, then you do not have to take further actions to activate IBM Ported Tools for z/OS.

The publication *IBM Ported Tools for z/OS: OpenSSH User's Guide*, SA23-2246 contains the necessary information to customize and use IBM Ported Tools for z/OS. You can download this publication from the following Web site:

`http://www.ibm.com/systems/z/os/zos/features/unix/ported/`

6.3 Activating Xvfb for z/OS

6.3.1 File System Execution

If you mount the root file system in which you have installed Xvfb for z/OS in read-only mode during execution, then you do not have to take further actions to activate Xvfb for z/OS.

The publication *IBM Ported Tools for z/OS: Xvfb User's Guide*, SA23-2216 contains the necessary information to customize and use Xvfb for z/OS. You can download this publication from the following Web site:

`http://www.ibm.com/systems/z/os/zos/features/unix/ported/xvfb/`

6.4 Activating IBM HTTP Server V8.5

6.4.1 File System Execution

During customization and operation of IBM HTTP Server V8.5, the file system in which you installed IBM HTTP Server V8.5 must be mounted on the target system. The default mountpoint is:

```
/usr/lpp/IHSA/V8R5
```

IBM HTTP Server V8.5 must be configured once SMP/E installation is complete. Configuration and activation information is available in the IBM HTTP Server V8.5 information center located at:

```
http://www.ibm.com/software/webservers/httpservers/library/
```

After configuration, you can mount the file system in which you installed IBM HTTP Server V8.5 in read-only mode.

6.4.2 Migrating from Previous Versions of IBM HTTP Server

For specific migration information, see IBM HTTP Server information center for IBM HTTP Server found at:

```
http://www.ibm.com/software/webservers/httpservers/library/
```

Select the IBM HTTP Server V8.0 Online Information Center. Then navigate to topic, *Migrating and installing IBM HTTP Server.*

6.4.3 Cleanup Previous Versions of IBM HTTP Server

After migrating to IBM HTTP Server V8.5, you can remove IBM HTTP Server V7.0 by following these steps. You can find these sample jobs in SHAPJCL2 data set.

- Run HAPDMDEL sample job to delete the obsolete IBM HTTP Server V7.0 FMID.
- Run HAPDELET sample job to delete obsolete data sets and file system associated with IBM HTTP Server V7.0.
- Run HAPDELDF sample job to delete obsolete DDDEFs entries in the target and dlib zone of your CSI.

After you have successfully deleted IBM HTTP Server V7.0 FMID, you need to remove the mount statements for associated file systems from the BPXPRMxx parmlib member that was used to IPL your system.

If you are not migrating from IBM HTTP Server V7.0, then you can skip this step.

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 Ported Tools for z/OS, January 20, 2015

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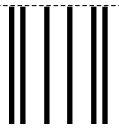

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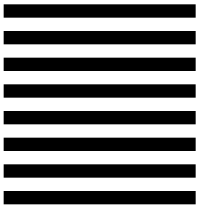

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