
IBM WebSphere Application Server V8.5

Installation on z/OS



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This presentation describes the installation of IBM WebSphere® Application Server V8.5 on the z/OS® operating system.

Overview

This section will contain an overview covering what has changed in z/OS installation for WebSphere Application Server since Version 8.0, and what has remained the same.



What is new in WebSphere Application Server V8.5?

- Optional non-SMP/E install
- Lightweight Liberty profile
- Optional Java SDK 7.0

IBM Installation Manager 1.5.2 is required

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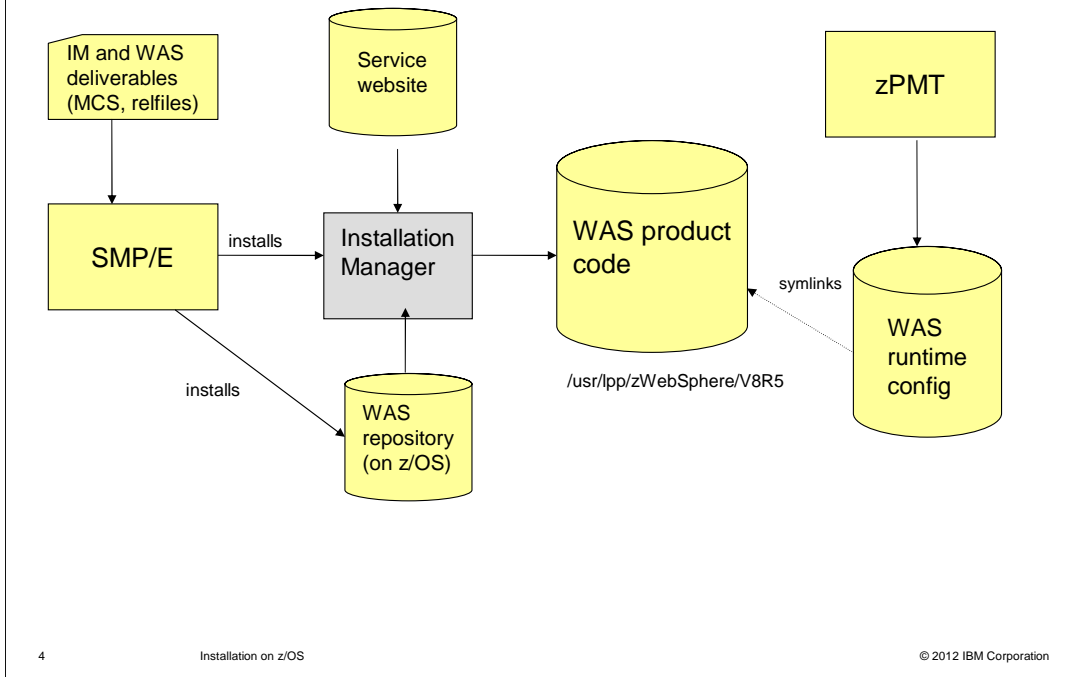
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The new features in this release include: an new, optional install path using compressed repositories on DVD, instead of using SMP/E; a lightweight application server model called the WebSphere Liberty profile; and an addition Java software development kit that allows WebSphere Application Server customers to move to Java 7.

Note that WebSphere Application Server Version 8.5 requires a minimum Installation Manager version of 1.5.2. Since IBM Installation Manager is upward compatible, current users of IBM Installation Manager on z/OS can upgrade to version 1.5.2 at any time before installing WebSphere Application Server Version 8.5.

The overall installation flow remains unchanged from Version 8



At a high level, the installation of WebSphere Application Server Version 8.5 is the same as for Version 8.0. The initial product repository, containing program objects and metadata, is installed with the z/OS maintenance tool SMP/E. The IBM Installation Manager takes the material in this repository, along with data from web-based or downloaded fix pack and iFix repositories, and creates new copies of the WebSphere Application Server product at any desired level that is present in the collection of repositories.

Once the product file system is created, it is remounted at the desired target location, and the z/OS Profile Management Tool is used to create cell, node, and server configurations.

The Installation Manager can create any number of copies of the product, at any service level that is present in the repositories. For example, a single Installation Manager can manage copies of WebSphere Application Server at several fix pack levels, or separate copies for specific environments such as test, quality assurance, and production. Fix packs and interim fixes or iFixes can be installed on any of these copies of the product code, independently of one another.



What is there for IBM Installation Manager to install?

WebSphere Application Server (including Liberty profile)	com.ibm.websphere.zOS.v85	/usr/lpp/zWebSphere/V8R5
ND Secure Proxy Server	com.ibm.websphere.NDDMZ.zOS.v85	/usr/lpp/zWebSphere_SPS/V8R5
Web server plugins	com.ibm.websphere.PLG.zOS.v85	/usr/lpp/zWebSphere_Plugins/V8R5
IBM HTTP Server	com.ibm.websphere.IHS.zOS.v85	/usr/lpp/IHSA/V8R5
WebSphere SDK Java Technology Edition V7.0	com.ibm.websphere.IBMJAVA.v70	(any Application Server or Secure Proxy Server install location)
WebSphere Adapters	com.ibm.websphere.adapters.v75	/opt/IBM/WebSphereAdapters
Web 2.0 and Mobile Toolkit	com.ibm.websphere.W2MTK.v11	/opt/IBM/WebSphere/Web20Mobile

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Here's a table showing the various components of WebSphere Application Server for z/OS. The second column gives the Installation Manager package name or offering name for each component, while the third column provides the *default* installation location. (Normally you would choose an installation location to meet your own system standards, and any need you may have to distinguish several installed copies of each component.)

The first four items in the table are direct upgrades of the equivalent components in WebSphere Application Server Version 8.5, and part of the SMP/E-installed repository, SBBOIMR.

The WebSphere SDK Java Version 7.0 is new; it is packaged in a separate repository, described later in this presentation.

In WebSphere Application Server Version 8.0, the WebSphere Adapters repository was on one of the product DVD's, and had to be compressed and moved to z/OS before it could be installed there; and the Web 2.0 Feature Pack was a downloadable repository.

In WebSphere Application Server Version 8.5, the compressed repositories for both Adapters and the Web 2.0 and Mobile Toolkit are on the WebSphere for z/OS compressed repositories disk. They are not part of the Version 8.5 SMP/E deliverable.

What is there for IBM Installation Manager to install?

→ Optional features

WebSphere Application Server:

- core.feature The full WebSphere Application Server profile
 - ejbdeploy
 - embeddablecontainer
 - thinclient
 - samples
- liberty The new lightweight profile

→ Initial choice of core.feature, liberty, or both cannot be modified for a particular install

DMZ Secure Proxy Server

- thinclient

The optional features for the Application Server component is a bit more complicated in Version 8.5 than in Version 8.0.

Customers have a choice of installing the Application Server “full profile”, the new lightweight Liberty profile, or both. The two associated features, core.feature and liberty, cannot be added or removed once the initial install is complete. If core.feature is chosen, then the ejbdeploy, thinclient, and samples features can be added or removed at any time.

The install process for any component:

1. Obtain access to the initial product repository, along with any desired service repositories
2. Choose an installation location for the new install
3. If necessary, allocate and mount a new file system, and set appropriate permissions
4. Choose component level and optional features, if appropriate
5. Install the component from the repositor(ies) into the new location with Installation Manager
6. Unmount the file system and mount it at the desired production location

Reminder: from Installation Manager's point of view, every installed component needs its own installation location – you can't "re-use" a path for a new install unless you uninstall the previous component at that location

Installation Manager console mode (**imcl -c**) provides a line-mode install environment that allows you to select product features and language packs and set installation values interactively, rather than on the command line

Once an Installation Manager is created – an existing one can be used – the process to install a WebSphere Application Server component is fairly straightforward.

First, you need access to the initial product repository, along with any necessary service repositories for fix packs and iFixes.

Next, choose an installation location; this location will be associated by Installation Manager with this particular component install, and any service must be applied at the same location. An installation location cannot be reused for a different install unless the originally installed component is first uninstalled.

Then identify the package name to be installed, along with the product level and any desired optional features. If no product level is specified, then the latest level present in the repositories will be installed; if no features are specified, then the default feature list will be used. Note that if any optional features are specified on the command line, then otherwise default features must also be explicitly requested.

Once the install is complete, unmount the new product file system and remount it in read-only mode at the desired path at which servers will access it.

You may also want to try using the Installation Manager console mode. Once you have entered your repository paths, Installation Manager running in console mode can display available packages and levels, prompt you for optional features, desired language packs, and other install settings, then either launch the installation or create a response file for later silent installs.

Installing the initial repository with SMP/E

This section will cover the SMP/E install of the initial repository.



Installing the initial repository with SMP/E

FMID HBBO850 WebSphere Application Server V8.5 base components (SBBOIMR)

repository: /usr/lpp/InstallationManagerRepository/HBBO850

contains Application Server, DMZ Secure Proxy, plugins, IBM HTTP Server

FMID HBJA700 WebSphere SDK Java Technology Edition V7.0 (SBJAIMR)

repository: /usr/lpp/InstallationManagerRepository/HBJA700

contains the “pluggable” Java SDK 7.0

These are provided as part of a ServerPac or CBPDO when you order the product

Use the sample jobs in SBBOJCL and SBJAJCL to install the initial repositories, and invoke Installation Manager to complete the product install

The initial repositories for WebSphere Application Server Version 8.5 can be installed with the z/OS maintenance tool, SMP/E.

Function HBBO850 provides the initial repositories for the Application Server, Secure Proxy Server, web server plugins, and IBM HTTP Server. This composite repository is installed into the SBBOIMR data set (IMR stands for Installation Manager Repository) and mounted at /usr/lpp/InstallationManagerRepository/HBBO850, with an optional service prefix to the path.

Function HBJA700 provides the initial repository for the WebSphere SDK Java Technology Edition Version 7.0.

These function sysmods are provided as part of a ServerPac or CBPDO when you order the WebSphere Application Server for z/OS Version 8.5 product.

The SBBOJCL and SBJAJCL data sets contain sample jobs to install the repositories, create necessary product file systems, and install product components with IBM Installation Manager.

Servicing the SMP/E-installed repository

- Applying PTFs to the initial product repositories adds *one* fix pack level (corresponding to the PTF level) to the SMP/E-managed repository. Applying a new PTF set replaces the previous fix pack level with the new one
- To maintain the capability to install product components at any level:
 - save a copy of SBBOIMR (and SBJAIMR) at each level, or
 - use IBM Packaging Utility to create a local repository with all levels
- Alternatives to servicing the initial repository:
 - use the Web-based service repository
 - download fix pack repositories to z/OS
- IBM Packaging Utility can combine repositories from all these sources, and delete the levels you know longer need

When you apply a set of fix pack PTFs to either of the initial repositories, a fix pack level is added corresponding to the level of the PTFs, and replacing any previous fix pack level in the repository. Thus, at any given time, the SMP/E-installed repository contains the initial product repository, and one fix pack level of your choice.

You can continue to service installed copies of product components at other service levels, but some functions such as rollback may require access to the service repository at a specific level. Therefore, it is wise to make sure you have access to the fix pack repository for each product level you are currently running.

You could do this by making a copy of SBBOIMR at each level, but this means you will be managing redundant copies of the initial level as well. You could also use IBM Packaging Utility to merge several levels of the product into a single product repository that you maintain yourself, outside of SMP/E.

On the other hand, you may decide to leave the initial repository “as is”, and either download service from the IBM-provided service repository, accessed from an IBM server, or else download repositories for specific fix packs, and maintain them on your system manually or with IBM Packaging Utility.

Installing the initial repository without SMP/E

Since the release of WebSphere Application Server Version 8.5, several z/OS customers who rely on web-based or downloaded service repositories have asked for a way to install WebSphere Application Server completely independently of SMP/E. This section explains how we have satisfied these requests in Version 8.5.



Installing the initial repository without SMP/E (1 of 2)

WebSphere Application Server for z/OS V8.5 provides two new z/OS-specific DVDs:

Compressed repositories for Application Server

was.repo.8500.zOS.zip	AppServer, Secure Proxy Server (1.7 GB)
was.repo.8500.PLG.zOS.zip	Web server plug-ins (32 MB)
was.repo.8500.IHS.zOS.zip	IBM HTTP Server (27 MB)
was.repo.7501.adapters.zip	WebSphere Adapters (18 MB)
was.repo.1100.w2mtk.zip	Web 2.0 and Mobile Toolkit (60 MB)

Compressed repositories for SDK Java Technology Edition

was.repo.8500.java7.zip	SDK Java 7.0 (600 MB)
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Customers who order WebSphere Application Server for z/OS also receive a number of additional DVDs, either as physical media or DVD images (that is, downloadable .iso files on ShopzSeries).

You get two additional DVDs or DVD images with WebSphere Application Server for z/OS V8.5 orders.

The first DVD, the **WebSphere Application Server for z/OS compressed repositories** disk, contains initial repositories for the Application Server and Secure Proxy Server; the web server plugins; the IBM HTTP Server; the WebSphere Adapters; and the Web 2.0 and Mobile Toolkit.

The second DVD contains a compressed repository (in 3 parts, due to size constraints) for the IBM WebSphere SDK Java Technology Edition Version 7.0.

Installing the initial repository without SMP/E (2 of 2)

To use the initial repositories from media:

1. Upload the zip files (binary FTP or any other method) to z/OS
2. Uncompress each repository into its own directory
 - unzip tool for z/OS: [IBM Unix System Services ported tools](#)
3. Use the uncompressed initial repositories, along with any desired service repositories, to install WebSphere Application Server components
4. (Optional) Merge initial and service repositories into a single enterprise repository with IBM Packaging Utility

To use these repositories, simply upload them to your z/OS system as binary files, and unzip them into separate directories. (With one exception: the three parts of the SDK 7.0 repository must be unzipped into a single directory.)

Then point IBM Installation Manager to the uncompressed service repositories and any necessary service repositories, and install the product components you need.

This method of obtaining the initial repositories results in a 60% savings of disk space when compared to the SMP/E-managed repositories.

You can also use IBM Packaging Utility to copy or merge the uploaded and compressed initial repositories into your enterprise repository, then delete the uploaded repositories.

The lightweight Liberty profile on z/OS

This section will look at the installation of the new lightweight application server profile, known as Liberty.

The Liberty profile on z/OS

When the `liberty` optional feature is selected during install of `com.ibm.websphere.zOS.v85`:

```
/usr/lpp/zWebSphere/V8R5          (or whatever you choose for install loc)
  /java
  /java64
  /wlp          WebSphere Liberty Profile
```

- If you also select `core.feature`, then the full Application Server product is installed as well
- If you select only `core.feature`, then the Liberty profile is not installed
- The Liberty profile is serviced as part of `com.ibm.websphere.zOS.v85`
- Liberty server configurations can be quite small, and use configuration variables to point to the copy of Liberty profile runtime code to be used
- Note: On z/OS, create your Liberty server configurations in a location independent of the installed Liberty profile. Do not use the `usr` subdirectory (`wlp/usr`) for this purpose.

The product components for the Liberty profile are delivered as an optional feature of the WebSphere Application Server offering. If you select the `liberty` optional feature during install, then the Liberty files are placed in a subdirectory of the installation location named `wlp` (for WebSphere Liberty profile).

You can install both the full Application Server profile and the Liberty profile by installing both the `core.feature` and `liberty` features. If you select ONLY `core.feature`, whether explicitly or by default, then Liberty is not installed.

The Java SDK 6.0 is always installed with either the full Application Server profile or the Liberty.

Liberty server configurations are quite small, and should be placed in their own directory, outside the product file system.

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WebSphere SDK Java Technology Edition V7.0

This section will contain more details on the new SDK Java Technology Edition Version 7.0.



The IBM WebSphere SDK Java Technology Edition V7.0 (1 of 2)

This is an OPTIONAL Java SDK, which can be installed along with the current SDK 6.0.

`com.ibm.websphere.IBMJAVA.v70`

installs into a location containing Application Server V8.5 or Secure Proxy Server V8.5

new directories:

`<install location>/java_1.7_31`

`<install location>/java_1.7_64`

install repository: via SMP/E (HBJA700) or compressed repository on product DVD

Sizeable additional footprint

Use **manageSdk.sh** to set the SDK to be used by a particular node or server – this can be done during profile creation (after BBOxHFSA and before BBOWWPFx) or at a later time

The Java SDK V7.0 can also be used with the Liberty profile

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The IBM WebSphere Software Development Kit for Java Technology Edition, Version 7.0, is an optional Java SDK, which is installed as a new Installation Manager offering, `com.ibm.websphere.IBMJAVA.v70`.

It must be installed into or along with a copy of the WebSphere Application Server or DMZ Secure Proxy Server. The Version 6.0 SDK will thus always be available, the Version 7.0 SDK is optional.

When the new SDK is installed, directories `java_1.7_31` and `java_1.7_64` are added to the installation tree.

The product repository for this offering can be installed with SMP/E (as function `sysmod HBJA700`) or uploaded to z/OS from the product DVD set and uncompressed.

Note that the new SDK requires a significant amount of additional space in the product file system into which it is installed.

Once the SDK is installed, you can use the `manageSdk.sh` command to set the default SDK for a WebSphere Application Server node, or make it the current SDK for a particular server. The new SDK can also be used with the Liberty profile.

The IBM WebSphere SDK Java Technology Edition V7.0 (2 of 2)

```

WITVM
File Edit View Communication Actions Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT SUIMGWM.PRIVATE.WAS85000.NMBAASE.CNTL(BBOSSINS) Columns 00009 00080
Command ==> Scroll ==> CSR
000551 ----+
000552 By default the WebSphere Application Server node will be
000553 configured to use the IBM SDK for Java 6 with 64-bit
000554 addressing. To configure with a different SDK enter the
000555 following commands:
000556
000557 cd /wasv85config/bbobase/bbonode/
000558 AppServer/bin
000559
000560 ./managesdk.sh -setNewProfileDefault -sdkName XXXXXX
000561
000562 where XXXXXX is set to one of the following values:
000563
000564 1.6_31 (IBM SDK for Java 6 with 31-bit addressing)
000565 1.6_64 (IBM SDK for Java 6 with 64-bit addressing)
000566 1.7_31 (IBM SDK for Java 7 with 31-bit addressing)
000567 1.7_64 (IBM SDK for Java 7 with 64-bit addressing)
000568
000569 Note that you must have the IBM WebSphere SDK for
000570 Java(TM) Technology Edition Version 7.0 installed to
000571 specify one of the Java 7 SDKs. Use the following
000572 commands to determine which SDKs are available:
000573
000574 cd /wasv85config/bbobase/bbonode/
000575 AppServer/bin
000576
000577 ./managesdk.sh -listAvailable
000578
M d 04/015
[3] Connected to remote server/host witvm.pdl.ibm.com using port 23

```

The configuration instructions generated by the z/OS Profile Management Tool or the **zpmt.sh** command include the necessary directions to choose a specific SDK for the cell or node being created. These instructions can be used to switch to the new Version 7.0 SDK, or to the 31-bit Version 6.0 SDK. Because of the flexibility, the 31-bit check box has been removed from the z/OS Profile Management Tool panels for WebSphere Application Server Version 8.5.

Section

Summary

This sections contains a summery of this presentation.

Summary

- Same basic install approach as V8.0 – be sure to upgrade to Installation Manager 1.5.2
- Non-SMP/E path for installation to support customers who want the simplest possible install
- New Liberty profile can be installed separately, or as part of complete Application Server product code
- New Java SDK 7.0 comes with a simple way to switch between several Java levels

Installation of WebSphere Application Server for z/OS Version 8.5 is very similar to that for Version 8.0; just be sure to upgrade Installation Manager to at least Version 1.5.2.

Customers who desire to manage their product repositories independently of SMP/E can use the new compressed initial repositories found in the product DVD set.

The Liberty profile and Java SDK Version 7.0 provide additional function, and are installed along with the WebSphere Application Server offering.

References

- WebSphere Application Server for z/OS V8.5 information center
<http://www14.software.ibm.com/webapp/wsbroker/redirect?version=phil&product=was-nd-zos>
- Installation Manager V1.5 information center
<http://publib.boulder.ibm.com/infocenter/install/v1r5/index.jsp>

See these references for additional information about the installation of IBM WebSphere Application Server V8.5 on the z/OS operating system.

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