



# Deploying z Systems Development and Test Environment for Parallel Sysplex and the coupling facility



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## Deploying z Systems Development and Test Environment for Parallel Sysplex and the coupling facility

z Systems™ Development and Test Environment can be used to enable a Sysplex environment that is running within z/VM®. To run a Sysplex environment, you must first purchase entitlement to z Systems Development and Test Environment with Parallel Sysplex®. A z/VM distribution for z Systems Development and Test Environment is made available to customers entitled to this product. You then must obtain, install, and configure the z/VM distribution and the z/OS® guests that run on it.

Configuring and using z/PDT in an IBM® Parallel Sysplex environment with a coupling facility is complex. The following sections describe only the basics of licensing and starting a z/VM environment on which the sysplex environment can be built. For detailed instructions on configuring your system to use the coupling facility, see Chapter 9, “Other z Systems Operating Systems”, and Part 5, “IBM Parallel Sysplex” in the zPDT Guide and Reference and the zPDT 2016 Sysplex Extensions.

To enable the coupling facility after you purchase entitlement to z Systems Development and Test Environment with Parallel Sysplex, do the steps that are described in these topics. For reference information about the z/VM 6.3 distribution that is supplied with z Systems Development and Test Environment, see “z/VM 6.3 for z Systems Development and Test Environment notes” on page 5. For a list of the products that are contained in the z/VM 6.3 distribution and a list of z/VM user IDs and passwords available with the product, see “Products contained in this release” on page 6.

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## Installing z Systems Development and Test Environment with Parallel Sysplex and z/OS guests

Before you install this z/VM 6.3 distribution, you must first install Rational® Development and Test Environment for z Systems with Parallel Sysplex and any z/OS distributions that run as guests on this z/VM system and in the sysplex. You can install either your own migrated z/OS distribution or a z/OS ADCD for z Systems Development and Test Environment.

The installation of the Parallel Sysplex product and the z/OS guests has the same initial steps for the sysplex and non-sysplex offerings of the product.

- Do the steps in Installing z Systems Development and Test Environment.
- Do the steps in Enabling product operation. The license key must have Parallel Sysplex capability. Beginning with z Systems Development and Test Environment with Parallel Sysplex V10.0, software-based licensing must be used to run Parallel Sysplex.
- Do the steps in Installing an operating system on z Systems Development and Test Environment for the z/OS guests that run in the sysplex.
- Do the steps in Configuring an instance of z Systems Development and Test Environment.

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## Downloading a z/VM distribution

The coupling facility feature is available to z/OS only when z/OS is running within virtual machines under z/VM. All the images that comprise z/VM 6.3 are available if you have entitlement to IBM z Systems Development and Test Environment with Parallel Sysplex.

For the steps to download z/VM 6.3 for z Systems Development and Test Environment, select the appropriate version tab and follow the instructions in the z Systems Development and Test Environment download information technote. All volume images that are downloaded from Passport Advantage® are compressed (gzip) files in the emulated 3390 format compatible with zPDT®. Volumes from your z/OS distribution can then be added to create as many virtual z/OS systems as needed. For specific instructions on downloading available z/VM distributions, and the customizations made available with it, such as z/VM user IDs, see *z/VM for IBM Rational Development and Test Environment for z Systems Installation and Configuration (SC27-4618)*, available by following the instructions in the download information technote.

A sample Parallel Sysplex configuration is available for download through Passport Advantage. This sample system, which is supplied on two DVDs, consists of a z/VM 6.2 system that hosts two virtual coupling facilities and two z/OS 1.13 systems. For information on how to obtain this media pack through Passport Advantage, see the download information technote.

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## Enabling the coupling facility

To enable the coupling facility, do these steps.

### Enabling the coupling facility in the device map

Configuration of each instance of z Systems Development and Test Environment is done through a file that is called a device map or devmap. The device map can be created manually or use the `create_devmap.pl` sample that is included with z Systems Development and Test Environment to create the device map semi-automatically.

To enable the use of the coupling facility, you must modify your device map:

### Modifying the [system] stanza

In the [system] stanza, add this line: `cpuopt zvm_couplingfacility` .

If you start a z Systems Development and Test Environment instance with `cpuopt zvm_couplingfacility` specified in the [system] stanza and are unable to obtain a license, your USB hardware device might not be activated to enable the coupling facility.

Any instance that is defined with `cpuopt zvm_couplingfacility` in the device map requires one coupling facility license from the USB hardware device for each CP in the instance. If `cpuopt zvm_couplingfacility` is not specified in the device map, then a standard, non-coupling license activation is required from the USB hardware device.

Device maps that include the `cpuopt zvm_couplingfacility` definition can define up to eight processors in the [system] stanza. The number of processors cannot exceed the number of physical cores available on your system.

### Tip:

The `cpuopt zVM_coupling` facility definition affects the output of the **token** command. In particular, if `cpuopt zVM_coupling` facility is not specified in the devmap, the **token** command does not display a license for sysplex activation, even if an update file with parallel sysplex support enabled was successfully installed on your USB hardware device. Ensure that your devmap coupling facility setting matches the type of license activation on your USB hardware device before you perform any operations that use the USB hardware device.

### Adding z/VM volumes to an [awsckd] stanza

You must add the z/VM volumes to an `awsckd` stanza in your device map. These volumes must be in addition to your z/OS volume definitions in the device map. Typically, the z/VM volumes are assigned device addresses in a different range from the z/OS volumes. Following is a sample of the volume images for z/VM.

```
device 0200 3390 3390 /home/ibmsys1/z1090/disks/M01RES
device 0201 3390 3390 /home/ibmsys1/z1090/disks/630RL1
device 0202 3390 3390 /home/ibmsys1/z1090/disks/630RL2
device 0203 3390 3390 /home/ibmsys1/z1090/disks/M01W01
device 0204 3390 3390 /home/ibmsys1/z1090/disks/M01S01
device 0205 3390 3390 /home/ibmsys1/z1090/disks/M01P01
device 0206 3390 3390 /home/ibmsys1/z1090/disks/VMCOM1
device 0207 3390 3390 /home/ibmsys1/z1090/disks/VMCOM2
device 0208 3390 3390 /home/ibmsys1/z1090/disks/M01W02
device 0209 3390 3390 /home/ibmsys1/z1090/disks/M01W03
```

In addition to these changes, you might need to add more 3270 device addresses for consoles to your `[aws3274]` stanza. z/VM requires a console, in addition to needing an MVS™ console for each z/OS guest, and 3270 device addresses for any TSO sessions.

## Starting IBM z Systems Development and Test Environment and IPLing z/VM

Issue `awsstart` to start IBM z Systems Development and Test Environment.

**Restriction:** You cannot use the `runzpd` script when you perform a sysplex activation.

After you start the zPDT emulator with `awsstart`, at a minimum start the 3270 sessions you will use for the z/VM console and each z/OS system. This sample command starts these 3270 sessions from a Linux console by using `x3270`

```
x3270 -port 3270 <session_name_in_devmap>@localhost &
```

**Tip:** 3270 emulators can also be used for the z/VM and MVS console that are installed remotely, and remove the need to have a 3270 emulator on the native Linux. For more information, see [IPLing z Systems Development and Test Environment from a remote emulated terminal for the system console](#).

IPL the z/VM system by entering this command, where address 200 is the device address in the devmap of the system residence volume for z/VM (M01RES), and address 700 is the device address of the console to use.

```
$ ipl 200 parm 0700
```

The initial IPL might produce the Stand-alone Program Loader window, or it might go directly to the OPERATOR session, depending on z/VM customization. The Stand-alone Program loader requires that you enter the z/VM console address (700

in the example) and the z/VM configuration volume (parameter pdvol, which with the z/VM for z Systems Development and Test Environment with Parallel Sysplex is set to volume VMCOM1). Other IPL parameters might need to be set. For more information, see “IPL and logon” in the zPDT Guide and Reference.

During z/VM startup, you are prompted to “warm start” or “cold start” the system. Use warm start unless you have a specific reason for cold-starting z/VM. Reply warm when prompted.

This 3270 session now becomes the z/VM master console, also known as the OPERATOR session.

**Tip:**

- Do not confuse z/VM cold start with the z/OS cold start function.
- When z/VM is IPLing, if the **More** indicator is shown, use the clear button to scroll to the next page.

## IPLing the z/OS guests

After z/VM is IPLed, you can IPL a z/OS guest. Since each z/OS guest is started from a 3270 session that is logged in with a valid z/VM user ID, start this process by logging in as a z/VM user from one of your 3270 sessions. If the 3270 sessions are active, they will switch to the z/VM logo display after z/VM was IPLed. If they do not, enter the ENABLE ALL command from the z/VM operator console. After the z/VM logo appears, log in with a valid z/VM user ID and password. Then, enter the TERM CONMODE 3270 command to place the console in 3270 mode. Now you can IPL the z/OS guest. From the command line of the z/VM 3270 session, enter an IPL command similar to the following example.

```
$ ipl 0A80 loadparm 0A82xx
```

0A80 is the device address of the system volume for z/OS, 0A82 is the device address of the volume that contains the SYS1.IPLPARM loadparms, and xx is the two character load parm to be IPLed. While the command syntax is slightly different from the IPL command that IPLs z/OS without z/VM, the device addresses have the same meaning, and must match the device addresses of the z/OS system in your devmap. This 3270 session becomes the z/OS console.

**Note:** You cannot run the script runzpdtd to start z/OS in this environment

Multiple guests can be started by logging on as a different z/VM user, and IPLing another z/OS system.

## Starting a TSO session

You start a TSO session to a z/OS guest from an active 3270 session that is connected to z/VM.

From the 3270 session with the z/VM logo display, in the command field enter this command:

Dial <userid> where <userid> is the z/VM userid used to IPL the z/OS guest

This 3270 session is now connected to the z/OS guest system, and the standard z/OS UNIX System Services message prompt to log in to TSO is displayed.

## Configuring a working z/OS 2.2 ADCD

You can customize any z/OS distribution that runs as a guest on z/VM.



For the steps to customize a z/OS ADCD, see Customizing the July 2016 Edition z/OS 2.2 ADCD for z Systems Development and Test Environment . If you are importing your own z/OS distribution, see Customizing a migrated z/OS system.

## Shutting down all systems and stopping IBM z Systems Development and Test Environment

Follow these steps to properly shut down all operating systems and stop IBM z Systems Development and Test Environment.

- From each z/OS master console, shut down the z/OS system as described in Stopping the z Systems Development and Test Environment .
- Issue the QUIESCE command from each z/OS master console after all z/OS systems are stopped. This command returns each session to the z/VM user ID session that you originally logged in to.
- Issue the logoff command from all z/VM user IDs except the z/VM master console
- From the z/VM master console, enter the SHUTDOWN command
- After this command completes, from the Linux console where you performed the original awstart, issue awsstop

## USB hardware device considerations when you use the coupling facility

You can mix multiple USB hardware devices on the same product license server, such as one with Sysplex and others with non-Sysplex activations. However, it is best to serve such activations from separate product license servers to control which product instances get Sysplex activations and which product instances get non-Sysplex activations.

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## z/VM 6.3 for z Systems Development and Test Environment notes

The z/VM 6.3 distribution provides a base z/VM 6.3 operating system with software maintenance. A sample Parallel Sysplex configuration is not available for this z/VM 6.3 distribution. However, a sample Parallel Sysplex system based on a z/VM 6.2 distribution is available for download through Passport Advantage. This sample system, which is supplied on two DVDs, consists of a z/VM 6.2 system that hosts two virtual coupling facilities and two z/OS 1.13 systems.

For information on how to obtain this media pack through Passport Advantage, see z Systems Development and Test Environment download information technote .

**Note:** The z/VM 6.3 functions of Single System Image (SSI) and Live Guest Relocation (LGR) were not tested on the zPDT and are not supported.

### Required Prerequisites

To use the z/VM 6.3 distribution, you need to be at the zPDT Version 1 Release 6 level of zPDT code that is shipped with z Systems Development and Test Environment v9.5.

### User IDs

The user IDs that are configured with this distribution have the initial password SS11, except for BASEAD, S0W1, S0W2, and so on. Each has an initial password that is the same as the user name. You can see which user IDs are configured by logging on as the MAINT user ID, and browsing the z/VM directory named USER DIRECT.

## Products contained in this release

Lists the products contained in this release.

| Component ID | Release | Component Name   | Product ID |
|--------------|---------|--|------------|
| 568411201    | 630     | Conversational Monitoring System (CMS)                   | 6VMCMS30   |
| 568411202    | 630     | Control Program (CP)                                     | 6VMCPR30   |
| 568411204    | 630     | AVS  | 6VMAVS30   |
| 568411205    | 630     | REstructured eXtended eXecutor (REXX)                    | 6VMREX30   |
| 568411206    | 630     | Transparent Services Access Facility (TSAF)              | 6VMTSA30   |
| 568411208    | 630     | Dump Viewing Facility (DVF)                              | 6VMDVF30   |
| 568411209    | 630     | VM Serviceability Enhancements Staged/Extended (VMSES/E) | 6VMSES30   |
| 568411211    | 630     | Group Control System (GCS)                               | 6VMGCS30   |
| 568411220    | 620     | Language Environment® (LE)                               | 6VMLEN20   |
| 568819802    | 620     | LE COBOL RTL   | 6VMLEN20   |
| 568819803    | 620     | LE PL/I RTL  | 6VMLEN20   |
| 568411201    | A63     | CMS JAPANESE KANJI                                       | 6VMCMS30   |
| 568411202    | A63     | CP JAPANESE KANJI  | 6VMCPR30   |
| 568411204    | A63     | AVS JAPANESE KANJI                                       | 6VMAVS30   |
| 568411205    | A63     | REXX JAPANESE KANJI                                      | 6VMREX30   |
| 568411206    | A63     | TSAF JAPANESE KANJI                                      | 6VMTSA30   |
| 568411208    | A63     | DVF JAPANESE KANJI                                       | 6VMDVF30   |
| 568411209    | A63     | VMSES/E JAPANESE KANJI                                   | 6VMSES30   |
| 568411211    | A63     | GCS JAPANESE KANJI                                       | 6VMGCS30   |
| 568411220    | A62     | LE JAPANESE KANJI  | 6VMLEN20   |
| 568819802    | A62     | LE COBOL RTL JAPANESE KANJI                              | 6VMLEN20   |
| 568819803    | A62     | LE PL/I RTL JAPANESE KANJI                               | 6VMLEN20   |

| Component ID | Release | Component Name  | Product ID |
|--------------|---------|---|------------|
| 568411219    | 620     | HCD and HCM for z/VM  | 6VMHCD20   |
| 565510400    | 440     | Open Systems Adapter/Support Facility (OSA/SF) for VM             | 4OSASF40   |
| 5735FAL00    | 630     | Transmission Control Protocol/Internet Protocol (TCP/IP) for z/VM | 6VMTCP30   |
| 568411218    | 630     | Performance Toolkit for VM  | 6VMPTK30   |
| 5749DVH00    | 630     | DirMaint™   | 6VMDIR30   |
| 576700201    | 630     | Resource Access Control Facility (RACF®)                          | 6VMRAC30   |
| 568409601    | 630     | RSCS  | 6VMRSC30   |
| 569623401    | 36A     | VM HLASM TOOLKIT  | 5696234K   |
| 569623400    | 360     | VM HILEVEL ASSMBLR  | 5696234J   |
| 5654A2200    | 130     | C/C++ COMP Z/VM   | 5654A22A   |
| 569501304    | 140     | REXX COMPILER   | 5695013H   |
| 569501404    | 140     | REXX LIBRARY  | 5695014H   |



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