

## **Migrating from zManager to Native z/VM Management**

Migrating from zEnterprise Unified Resource Manager (zManager) to native support for z/VM virtual machine management may require converting virtual machine configuration data and reconfiguring existing virtual machines, as well as making changes to remove those virtual machines from zManager's control. In addition, it is possible to establish a Layer 2 connection from a z/VM logical partition (LPAR) to the zEnterprise IntraEnsemble Data Network (IEDN) that is outside zManager control, which can allow z/VM virtual machines to communicate with virtual servers in an Ensemble through a Virtual Switch. This document describes how to migrate zManager virtual machine configuration data to native z/VM, how to establish a Layer 2 connection to the IEDN without zManager, and how to remove virtual machines from zManager's control.

### **Use Cases**

There are four use cases to consider:

1. Environments using zManager to manage z/VM that do not have an IEDN or that include an IEDN but do not connect z/VM virtual machines to it.
2. Environments using zManager to manage z/VM that include an IEDN.
3. Environments planned to use zManager to manage z/VM that will not include an IEDN or that will include an IEDN but do not plan to connect z/VM virtual machines to it.
4. Environments planned to use zManager to manage z/VM that will include an IEDN.

### ***Environments Using zManager Without a z/VM IEDN Connection***

These environments may have some virtual machine configuration data to migrate but because they do not have an IEDN, there is no configuration data or connection to move.

Refer to the following sections below:

1. Save Configuration Data
2. Migrate zManager non-IEDN Configuration
3. Deactivate or Disengage SMAPI

## ***Environments Using zManager With a z/VM IEDN Connection***

These environments may have virtual machine configuration data to migrate, including for the IEDN, as well as an IEDN connection to move outside of zManager control. They also require procedures to maintain consistency between zManager and z/VM. Refer to the following sections below:

1. z/VM and the IEDN
2. z/VM and the INMN
3. Save Configuration Data
4. Reconfigure Existing Linux Virtual Machines
5. Reconfigure Existing z/OS Virtual Machines
6. Reconfigure SASP Load Balancing
7. Install Configuration Conversion Tool
8. Migrate zManager IEDN Configuration
9. Migrate zManager non-IEDN Configuration
10. Remove Virtual Machines from zManager Management
11. Connect z/VM to the IEDN Without zManager
12. Convert an OSX or OSM CHPID to OSD
13. Remove an OSX or OSM CHPID from z/VM
14. Deactivate or Disengage SMAPI
15. Maintain Consistency Between zManager and z/VM

## ***Environments Planned to Use zManager Without a z/VM IEDN Connection***

These environments have no migration requirements. However, a revised plan based on using native z/VM management facilities should be developed.

## ***Environments Planned to Use zManager With a z/VM IEDN Connection***

These environments require a plan to connect z/VM to the IEDN without zManager and a plan to maintain consistency between zManager and z/VM in the future. Refer to the following sections below:

1. z/VM and the IEDN
2. Connect z/VM to the IEDN without zManager
3. Maintain Consistency Between zManager and z/VM

## **z/VM and the IEDN**

The IEDN is designed to be a closed flat Layer 2 private network and zManager makes special provisions for ensuring this privacy using distinct network administration techniques such as VLANs, VMACs, and access controls. Deploying a firewall or router at the entry to this secure network is the best practice for meeting typical security requirements for isolation, logging, and auditing when crossing security zones.

In the closed network environment, zManager takes responsibility for

- network fabric configuration, monitoring and management;
- assuring network high availability by eliminating single points of failure;
- providing a single point of RAS by assuming network diagnosis responsibilities.

Blending a z/VM Layer 2 network with the IEDN can work, but the two separate fabrics have two separate network management entities – zManager and z/VM – introducing new security, administration, and service challenges. If these challenges can be managed then establishing a Layer 2 connection between z/VM and the IEDN is feasible. The alternative of establishing Layer 3 connections to the IEDN using a router is a standard approach that is not addressed in this document.

If a z/VM connection is required to the IEDN outside zManager control, the following considerations apply:

1. If the IEDN OSA devices (OSX CHPIDs) are used only by z/VM, they can be converted to type OSD CHPIDs and used to provide an IEDN connection.
2. If the IEDN OSA devices are used by other logical partitions and there are ports available on existing OSDs, they can be used to provide an IEDN connection.
3. If the IEDN OSA devices are used by other logical partitions and there are no ports available on existing OSDs, additional OSDs must be ordered and installed.

If additional OSDs are required, two should be ordered to provide redundant connectivity to the IEDN.

If a z/VM connection to the IEDN is not required, the following considerations apply:

1. If the IEDN OSA devices are used only by z/VM, they can be converted to type OSD CHPIDs and used to provide additional network connectivity or they can be removed from the machine and from the z/VM LPAR definition.
2. If the IEDN OSA devices are used by other logical partitions, they can be removed from the z/VM LPAR definition.

## **z/VM and the INMN**

When it is not participating in an Ensemble, z/VM does not require a connection to the IntraNode Management Network (INMN). The following considerations apply:

1. If the INMN OSA devices (OSM CHPIDs) are not used by other logical partitions, they can be converted to OSD CHPIDs or they can be removed from the machine and from the z/VM LPAR definition.

## Migration Procedures

The sections below describe different migration procedures that may be required. Which of the procedures is needed depends on the relevant use case, as outlined earlier.

### ***Save Configuration Data***

Before making any configuration changes, if there is virtual machine configuration data to migrate, save the z/VM files that contain this configuration data. The files are CMS files of type NOTEBOOK and reside in a Shared File System (SFS) directory named VMSYS:VSMWORK1.DATA. To save the files, proceed as follows:

1. Logon to the z/VM system as MAINT.
2. Access the VMSYS:VSMWORK1.DATA SFS directory:  
`ACCESS VMSYS:VSMWORK1.DATA Z`
3. Copy the NOTEBOOK files (this procedure uses the A-disk as an example):  
`COPY * NOTEBOOK Z = = A ( OLDDATE TYPE`
4. Make note of the names of the files that are copied by step 3.

Be sure to save the files as the last step before starting the migration process so that no configuration information is lost.

### ***Reconfigure Existing Linux Virtual Machines***

Linux virtual machines that are managed by zManager need to be reconfigured to stop using Ensemble resources. The following steps may need to be performed from Linux:

1. If the zManager Guest Platform Management Provider (GPMP) is installed and in use:
  - a. Stop the GPMP.
  - b. Remove the GPMP from any start up scripts.
  - c. Uninstall the GPMP if desired .
  - d. Shut down the RMC Ethernet (eth) connection (the one use by the GPMP) and vary the RMC virtual NIC offline.
  - e. Remove the RMC Ethernet connection from permanent configuration files (e.g., /etc/sysconfig/network).
2. If ARM instrumentation in middleware is enabled exclusively for use by the zManager Guest Platform Management Provider then deconfigure ARM from the middleware.
3. Shut down any IEDN Ethernet connections and vary the associated OSX (or OSDSIM) physical or virtual NICs offline.
  - a. If the NIC address will be reused for an OSD connection to the zBX TOR switch, modify its definition in permanent configuration files as needed (e.g., /etc/sysconfig/network).
  - b. If the NIC address will not be reused, remove it from permanent configuration files.
4. Shut down bridged IEDN hipersocket (hsi) connections and vary the associated NICs offline.
  - a. Also remove permanent configuration definitions, unless the vNICs will be converted for use as externally bridged hipersockets.

## ***Reconfigure Existing z/OS Virtual Machines***

z/OS virtual machines that are managed by zManager need to be reconfigured to stop using ensemble resources. The following steps may need to be performed from z/OS:

1. If the zManager Guest Platform Management Provided (GPMP) is in use:
  - a. Stop the GPMP.
  - b. If the WLM service definition has been configured to automatically start the GPMP, then disable this activation (z/OS V1 R12 and higher). Otherwise, remove the GPMP from any start up automation.
  - c. Shut down the RMC Ethernet connection (the one used by the GPMP) and vary the RMC virtual NIC offline.
  - d. Check the GPMP setup JOB in SYS1.SAMPLIB(HVEENV) to determine what actions should be taken to deconfigure the GPMP environment (for example, remove RACF STARTED and SERVAUTH CLASS profiles and remove USERS and GROUPs associated with running GPMP).
2. If ARM instrumentation in middleware is enabled exclusively for use by the GPMP then deconfigure ARM from the middleware.
3. Shut down any IEDN Ethernet connections and vary the associated OSX physical devices offline.
  - a. If the OSX devices will be reused for an OSD connection to the zBX TOR switch, modify its Communication Server configuration definitions appropriately.
  - b. If the OSX devices will not be reused, remove them from the Communication Server configuration.
4. Reconfigure the VTAM start option to ENSEMBLE=NO

## ***Reconfigure SASP Load Balancing***

If zManager is configured to feed SASP load balancing recommendations to an external load balancing network switch for balancing incoming requests to z/VM guests:

1. Reconfigure networking switches to remove the z/VM virtual servers from the SASP pool.
1. If load balancing recommendations are only for z/VM guests, disable sending them from zManager.

## ***Install Configuration Conversion Tool***

A sample conversion tool, FIXZMAN, is available to help turn a NOTEBOOK file into an EXEC that contains the commands that must be issued to establish a configuration equivalent to the one the NOTEBOOK file represents. Because zManager causes commands to be appended to a NOTEBOOK file, it can be quite large and redundant. FIXZMAN attempts to eliminate the redundancy and also to remove unnecessary configuration commands.

To obtain and install the configuration tool, go to the z/VM Download Library at

<http://www.vm.ibm.com/download>

and follow the instructions there.

## ***Migrate zManager IEDN Configuration***

The z/VM IEDN configuration is stored in file ENCONFIG NOTEBOOK and includes IEDN Virtual Switch (VSWITCH) definitions, IEDN VSWITCH and VLAN access authorizations, and HiperSockets Bridge definitions. Run the conversion tool against it by issuing the command

```
FIXZMAN ENCONFIG
```

Review the resulting ENCONFIG EXEC and make any necessary adjustments (e.g., to device numbers).

## ***Migrate zManager non-IEDN Configuration***

The z/VM configuration for resources that can be configured using zManager but are not controlled by it is stored in file RESTART NOTEBOOK and includes SCSI-based emulated device (EDEVICE) definitions, as well as non-IEDN VSWITCH definitions and access authorizations. The Systems Management API (SMAPI) server infrastructure in z/VM can continue to define these resources after zManager support is terminated. However, if the SMAPI server infrastructure will not be used or if the definitions would be more convenient to manage directly, the conversion tool can be invoked to extract this part of the configuration. Run the conversion tool by issuing the command

```
FIXZMAN RESTART
```

Review the resulting RESTART EXEC and make any necessary adjustments.

## ***Remove Virtual Machines from zManager Management***

z/VM virtual machines that are being managed by zManager should be removed from its management control. The following steps may need to be performed from zManager's user interface or using its API:

1. Make a backup copy of the z/VM User Directory.
2. Remove z/VM virtual machines from zManager workload resource groups.
3. Deallocate ensemble resources in use by each virtual machine (e.g., IEDN network adapters). Note that this does not include storage resources, which while they can be provisioned by zManager are not considered Ensemble resources.
4. Remove z/VM virtual machines from zManager management. Use the zManager "Choose z/VM Virtual Servers to Manage" task to deselect them.
5. Restore the backup copy of the z/VM User Directory.

## ***Connect z/VM to the IEDN Without zManager***

The following steps are required to connect a z/VM LPAR to the IEDN:

1. Connect a 10G OSD port to an external port on the IEDN Top Of Rack (TOR) switch in the zBX. To provide improved availability and automatic failover of the network connection, connect two OSD ports to external ports on the two IEDN TOR switches.
2. If there was no existing IEDN configuration converted, define a Layer 2 z/VM Virtual Switch and specify the device number(s) of the uplink OSD(s) connected

- to the TOR port(s). Commands to create the new definition or those produced by FIXZMAN can be issued from a CMS EXEC (e.g., by the PROFILE EXEC of user AUTOLOG1) or in some cases can be converted to statements in the z/VM System Configuration file.
3. If one is not already established, define a unique MACPREFIX for the z/VM system using the VMLAN system configuration file statement. This prefix allows z/VM to assign MAC addresses that do not conflict with others on the IEDN. It may be necessary to use the zManager “Manage Ensemble MAC Prefixes” task to reserve the z/VM MAC prefix and prevent collisions between zManager and z/VM.

### ***Convert an OSX or OSM CHPID to OSD***

To convert an OSX or OSM CHPID to an OSD CHPID, update IOCP or use HCD to change the CHPID TYPE to OSD. Restart z/VM to activate the change.

### ***Remove an OSX or OSM CHPID from z/VM***

To remove an OSX or OSM CHPID from z/VM, update IOCP or use HCD to delete the CHPID definition. Restart z/VM to put the change into effect.

### ***Deactivate or Disengage SMAPI***

The SMAPI infrastructure supports management solutions other than zManager, so leaving parts of it unrelated to zManager in place may be appropriate. However, if it is not required for other purposes, it can be completely deactivated. Also, as mentioned earlier, it may be appropriate to remove the connection between SMAPI and resources that were defined through zManager.

To deactivate the SMAPI infrastructure completely, shut down the VSMGUARD, VSMWORK1, VSMREQIM, and ZVMLXAPP virtual machines. Other SMAPI virtual machines described in the *z/VM Systems Management Application Programming* publication can also be shut down. Prevent SMAPI from starting by changing the VSMGUARD and VSMWORK1 virtual machine passwords to NOLOG or removing the AUTOLOG commands for these virtual machines from user AUTOLOG1’s PROFILE EXEC.

To deactivate the Ensemble-related portions of the SMAPI infrastructure, update the DMSSISVR NAMES file, as described in the *z/VM Systems Management Application Programming* publication, to comment out the definitions of the VSMREQIM, DTCENS1, DTCENS2, and ZVMLXAPP virtual machines.

To remove the connection between SMAPI and resources defined through zManager, erase files ENSEMBLE NOTEBOOK, ENCONFIG NOTEBOOK, and RESTART NOTEBOOK from SFS directory VMSYS:VSMWORK1.DATA.

## ***Maintain Consistency Between zManager and z/VM***

After zManager is no longer used to manage z/VM guests, its definitions must be kept consistent with those managed by z/VM. As zManager is used to make configuration changes, GRANT commands and virtual NIC definitions may need to be changed, added, or removed in the z/VM environment to enable Linux guests to communicate on the appropriate VLANs. Consider the following:

1. Authorize a Linux guest to connect to the VSWITCH and include the appropriate VLAN ID on the GRANT command so the guest does not need to be VLAN-aware. This is equivalent to a zManager-managed IEDN environment, in which ports used by operating systems are access ports and zManager manages the VLAN authorizations.
2. If a Linux guest needs to be part of several IEDN VLANs, make the VSWITCH port-based and give the guest a VNIC on each VLAN, once again using access ports and keeping the guest VLAN-unaware.



## **Support**

This document and the associated programs and procedures it describes have been reviewed and tested to some extent but there could be special situations that are not explained or that are handled incorrectly. While these materials are provided on an as-is basis, please report any problems and address any questions to

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