

IBM z/VM *Express System Install*

What is it

What's new

What's next



2026 VMWorkshop
www.vmworkshop.org

IBM®

z/VM ESI

Express System Install

The world's finest pocket-sized mainframe hybrid cloud

Topics Covered

Agenda

z/VM in a nutshell

The z/VM ESI concept

Standard z/VM installation

- History and current method

A new z/VM system

- What is there
- What would be better?

z/VM installation system

- Modifying it
- Creating disk images
- Restoring the images

Customization

- System
- Network
- Input panel

z/VM ESI: Our install process

- Booting LPAR
- Network
- Input fields
- System restore
- Automated customization

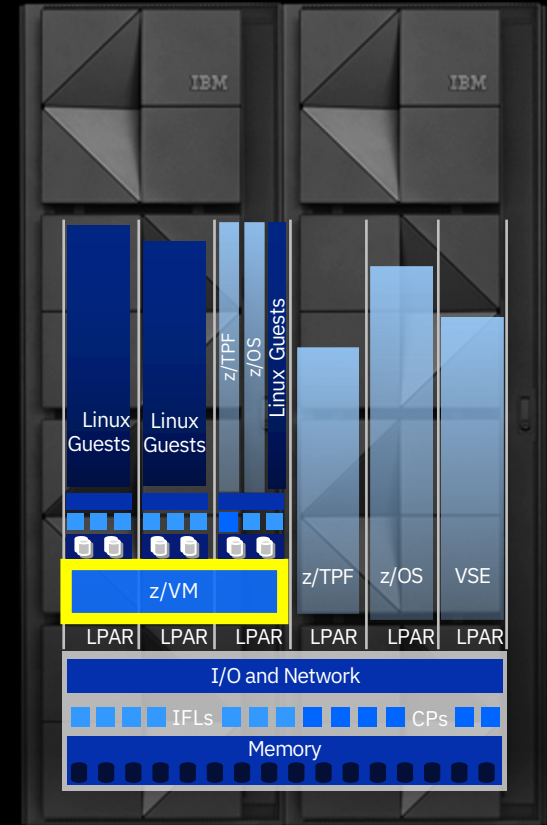
IPL new system

Other items

- ...like SSI
- Demonstration

IBM z/VM in a nutshell: what is it?

- IBM's premier, enterprise-class, flagship virtualization hypervisor
- Capable of supporting more virtual servers than any other platform
- Known situations where Linux performance under z/VM exceeds native LPAR



Arguably the most capable and functionally rich hypervisor

- Legendary stability and qualities of service
- The only supported hypervisor for production Oracle databases on z/Architecture
- Was the first choice of the Red Hat OpenShift development team for s390x
- The only hypervisor with high-performance memory overcommitment
- The only hypervisor with memory-speed virtual disks available for paging
- Highly granular resource sharing, simulation, and restrictability



Arguably the most capable and functionally rich hipervisor

The concept: What is z/VM ESI?

E. pluribus Unum
out of many, one

Standardize z/VM software bundle based on IBM expertise and good practices



RACF/VM

Identity, access, and security management



z/VM LDAP

OpenShift and Linux security management



Performance Toolkit

Performance management



DirMaint

Directory configuration management



Operations Manager

Monitoring, automation, and log management

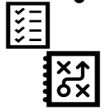
Red Hat Installation Support System

Express Linux Automation and Networking – ELAN

Ansible playbooks to create supporting infrastructure



Ansible playbooks to install



- OpenShift Container Platform
- IBM Cloud Infrastructure Center

Speedy,

secure...

Ready;

Unified System based on z/VM

Simplified deployment and setup of Red Hat OpenShift Container Platform or IBM Cloud Infrastructure Centre



Hybrid cloud platform

Rapid deployment and time to value

z/VM ESI value-added packaging

Enterprise grade virtualization

IBM z/VM

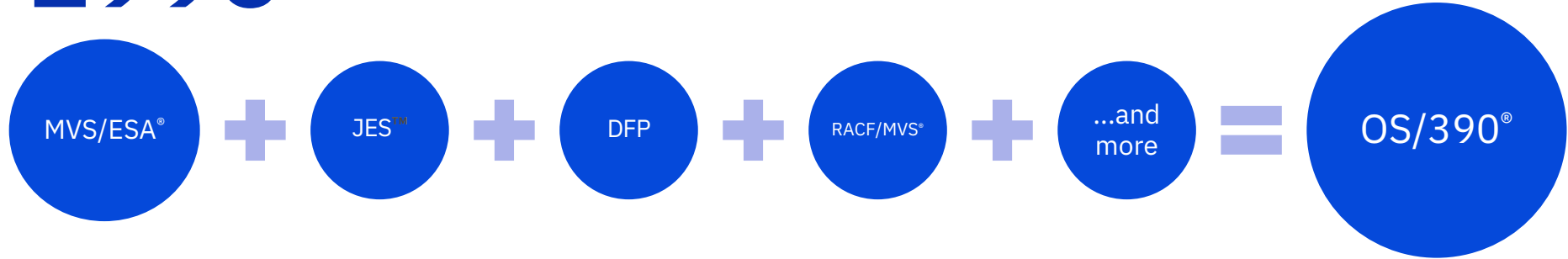
Legendary hardware

IBM Z or LinuxONE hardware

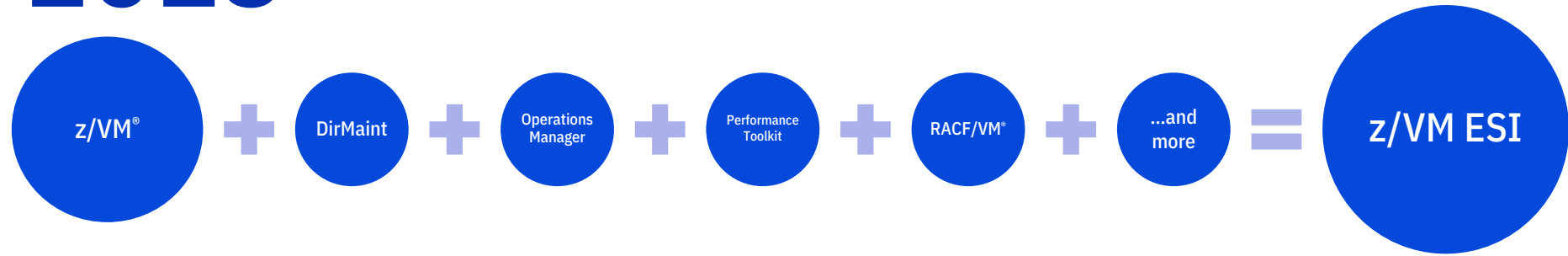


The z/VM ESI stack

1995

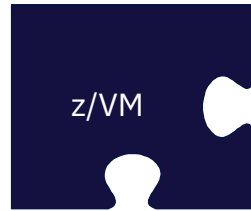


2018



Not a new concept for an IBM z/Architecture Operating System!

Similar to how MVS/ESA plus common features were bundled to create OS/390.



- Obtained from ShopZ

Not a special build



- RACF/VM

Identity, access, and security management

- z/VM LDAP

OpenShift and Linux security management

- Performance Toolkit

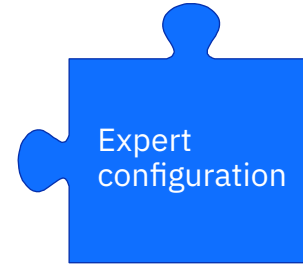
Performance management

- DirMaint

User & disk configuration management

- Operations manager

Monitoring, automation, and log management

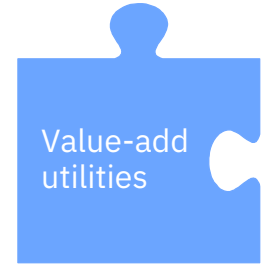


- Functional as shipped

- Secure

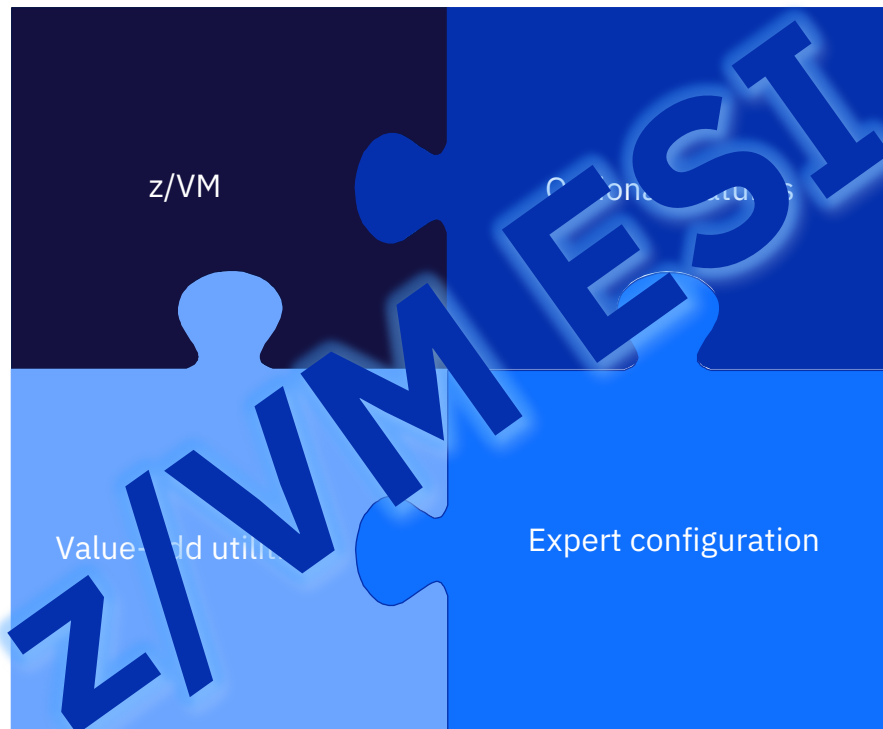
- Reasonable defaults

- Good practices from IBM experts baked in



- Automation

- Rapid setup of features



What is z/VM ESI

z/VM Installation

- Overview
- Historically
- Presently



Load VM nucleus and
Ramdisk; Start LPAR



Use HMC 3270 to fill in fields



Start installation

Format, label, and
allocate disks

Load minidisk image
files

Pipeline stages created
to do this
(Not documented, for
installation only)

Restores initial part of
RES disk, initial spool

Restores minidisk by
minidisk



IPLs restored system (2nd
level)

Initialize spool

Initialize SFS filepools

Apply service (RSU)



Install complete!

z/VM Installation: history

- Originally tape based
- Restore a starter system using DDR
- The system must match your DASD!
(3330, 3350, 3380, 3390, FB-512)
- IPL that system
- Restore minidisks from tape (VMFPLC2 format)
- Problems with tape formats and compatibility



- Now based on capabilities of the HMC
- Read files from DVD, USB, or server
 - Read the ISO right from the HMC if DPM-enabled
- Load images into memory
- ”Restart” the LPAR
- Documented in the Hardware library
”Installing software by using Load from Removable Media or FTP server support”

How did we get from a
standard z/VM system to
z/VM ESI?

What do we have? A “starter” z/VM system

- One spool volume and one page volume
- No volumes defined to add workload
- Minimal security (no RACF or TLS/SSL)
- No system automation, little monitoring
- Minimal performance monitoring
- Minimal network setup with no virtual switch
- No API capability
- No framework for Linux

In short, you want more than just this.

Installation Has Finished

- Maybe you've done this before?
 - Did you take notes?
 - Maybe you followed an IBM Redbooks publication (cookbook)
 - Maybe you used instructions from a class or workshop?
 - Maybe you attended a hands-on lab and snarfed the workbook?
 - If you have not attended the hands-on lab that Richard Lewis is offering here at the workshop, you should!
- Fortunately, we upgrade systems more often than performing fresh installs.
- But, what if this is your first z/VM system?

So, how do you proceed?

Let's Do Something Different!

Create a system ready to be used – a.k.a. a “Usable System”

First, we must create that system

Install the basic system

Configure networking, configure a vswitch

Activate RACF, Dirmaint, Perfkit & configure

Install z/VM Operations Manager & configure

Install Linux

Configure TLS/SSL, LDAP

Configure and enable SMAPI

Add some users

Enable monitor data collection

Lots of other miscellaneous customization

If you were going to deploy multiple systems,
how would you build the “golden” system?

OK, once you've built the “golden” system...

- Dump it to tape?
- Send it in the mail?
- Run standalone DDR

Or...

Use the IBM installation z/VM system as the basis for a new installation process!

- Apply customisations to your “golden” system after it's been restored
- Include extra products and packages

Customizing the Cloned System

The system must be tailored to the environment

What may need to be changed after the restore?

- Real addresses (DASD and OSA)
- Disk labels
- System name
- IPL parameters
- IP info (IP address, VLAN, etc.)

Other changes we can make

- Add paging and spooling disks
- Add disks ready for Linux workloads
- Adjust to different size DASD or LUNs

Bruce developed an XEDIT based panel for INSTPROD EXEC; and used that idea

- Ask for the values to be customized
- Verify values as valid, issue errors, etc.

```
5697-J10 Operations Manager for z/VM Installation
Please enter or update the fields highlighted below

Product: 5697J10F
Component: OPMGR                               Envelope file name on MAINT730 500:
                                                _____ SERVLINK

Use DirMaint?: YES                               DirMaint allocation: AUTOG
                                                Enter: AUTOG - allocation by group name
Configure Logon-By?: YES                         AUTOR - allocation by region name
Logon-By user ID: IBMVM1                         AUTOV - allocation by volume id

The allocation name is a volume label, group, or region name that has been
defined to DirMaint. Use the correct name corresponding to the allocation
unit selected above. See the program directory for space requirements.

Common allocation name: _____
System allocation name: _____

Number of worker userIDs: 4 (Worker servers for Operations Manager)

PF1=HELP    PF3=QUIT    PF5=Process    ENTER=Refresh
```

Please enter or update the fields highlighted below

System Name: WSCVML67

System Group Name: _____

Installation Destinations:Volume: M01RES Address: _____ z/VM IPL (boot) VolumeVolume: VMCOM1 Address: _____ z/VM Common VolumeVolume: 740RL1 Address: _____ z/VM Product Release VolumeVolume: M01U01 Address: _____ z/VM Additional Product VolumeVolume: M01S01 Address: _____ z/VM Spool VolumeVolume: M01S02 Address: _____ z/VM Dump Volume (Optional)

A sequence number (01, 02...) is added to each Label Prefix to form a label

Linux Volumes (Minimum of 150 GB total Linux space is required)

Label Prefix: ZVML Beginning Address: _____ Number of Addresses: _____

Paging Volumes (Minimum of 1 paging volume is required.)

Label Prefix: M01P Beginning Address: _____ Number of Addresses: _____

Networking (Addresses are used in triplets, 3 at a time.)

Primary OSA Device Address: 4100 Port: 0 VLAN: _____Failover OSA Device Address: _____ Port: 0MAC Address Prefix: 02xxxxxx Must begin with 02

Restore using z/VM FTP Client? YES "NO" uses the HMC media support (slower)

PF1=HELP

PF3=QUIT

PF4=Select

PF5=Process

Enter=Refresh

RESTORESIS panel*The information needed to restore and customize the system*

Alternate Restore Option

We can restore using the Pipelines ftp stage

Did you notice?

Restore using z/VM FTP client?: YES "NO" uses the HMC media support

- Because we created a network connection
 - we can use the ftp stage directly to a server
- This is MUCH faster than loading via HMC!
 - Restore in less than 10 minutes vs. an hour or so
- Some additional fields if this is enabled:

```
z/VM Express System Installation
Please enter or update the fields highlighted below

Installation FTP Server:      This is the same server used to boot this
                             partition with the installation image files.

Host name or IP Address:    _____

FTP User ID:                _____

FTP Password:               _____

Path or directory:         _____
```

IPWIZARD, the sequel

- IPWIZARD works, but it is several screens
- We had a few more requirements:
 - Ask for a Linux IP address
 - Force layer 3
 - Ask if Telnet server should be disabled
- Bruce created a single panel to ask all in one place
 - Called SETUPNET EXEC
- It still calls the z/VM TCP/IP utility for the setup
 - Same thing that IBM-supplied code does
 - It still creates log and trace files (like IPWIZARD \$FILE\$ C)

**What is
Customized?**

User Directory

DirMaint

VMSES/E

TCPIP

Disks

SYSTEM CONFIG

What is Customized?

Directory:

- DASD labels
- VLAN (if used)

Update the source as USER INPUT
(erase Dirmaint's USER DIRECT file)

Write the object directory

Dirmaint:

- Create EXTENT CONTROL

VMSES/E:

- Change the system name

TCPIP:

- IP address, MTU, netmask, default route
- TCPIP DATA: Host name and domain
- Name server addresses

Disks:

- Format page and spool
- Label volumes and set owner
- Erase or release residual data at end (ECKD)
- Update IPL parms on RES disk

System config:

- Update DASD labels
- Add spool or page as specified
- Add EDevice definitions (SCSI)
- Update VSwitch (OSA addresses, VLAN)
- MAC prefix
- System name
- Threads (1 or 2), STP enabled (if available)
- CP variables with our z/VM ESI level

The installation process

Assumptions:

1. You have an LPAR defined and ready, or a partition created (DPM mode)
2. You have the ESI installation bundle (.iso or files) on one of these:
 - On a server accessible through your network by the HMC (and both SEs for older systems)
 - Loaded as an ISO file (*Boot from: ISO Image* only available in DPM)
 - On a USB inserted into the HMC

To start:

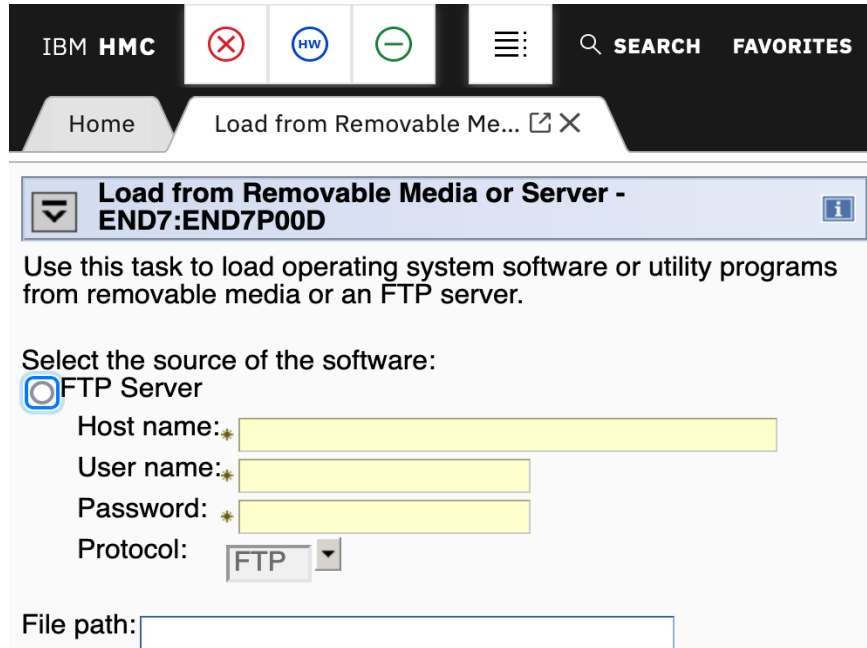
- “Load from Removable Media or Server”

Protocols FTP, SFTP, and FTPS supported

The Install Process: where it starts

PR/SM

Load from Removable Media or Server



IBM HMC

Home Load from Removable Me... X

Load from Removable Media or Server - END7:END7P00D

Use this task to load operating system software or utility programs from removable media or an FTP server.

Select the source of the software:

FTP Server

Host name: *

User name: *

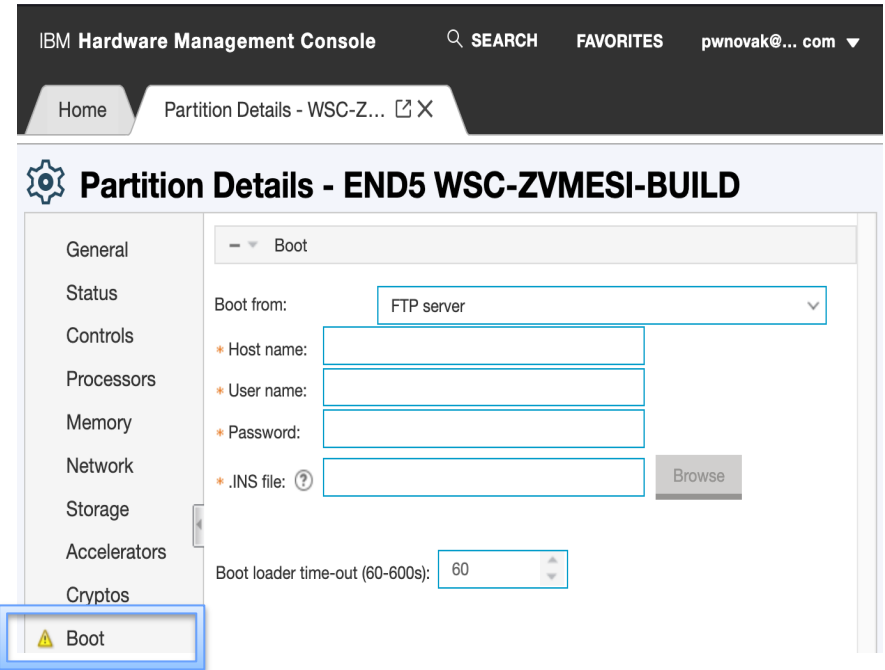
Password: *

Protocol: FTP

File path:

Dynamic Partition Manager (DPM)

Boot heading of your partition configuration panel



IBM Hardware Management Console

Home Partition Details - WSC-Z... X

Partition Details - END5 WSC-ZVMESI-BUILD

General

Status

Controls

Processors

Memory

Network

Storage

Accelerators

Cryptos

Boot

Boot from: FTP server

* Host name:

* User name:

* Password:

* .INS file: ? Browse

Boot loader time-out (60-600s): 60

The Install Process: where it starts

The Integrated 3270 Console is required

- It displays the fields required to gather system parameters and allows input
- This is just like a normal z/VM install... with one exception
 - We implemented a mechanism to handle the situation where the Integrated 3270 task isn't started prior to invoking the load operation.
 - Under a standard installation, if you've forgotten to start the Integrated 3270 task, you need to start your Load operation over again.
 - If you are using the DPM load from ISO, this is especially frustrating!
 - Unlike a standard installation, you are not required to start Integrated 3270 first. Under z/VM ESI, if you've forgotten to start it, messages are shown under the *Operating System Messages* task. (next slide)
- To proceed, launch the Integrated 3720 task and log on to the userid MAINT.

Elimination of the Integrated 3270 before Load pitfall

- Notice that you can optionally log on to user id *LOG* here in the *Operating System Messages* task
- This is truly a line mode interface
 - Remember the typewriter consoles?
- The install process will send messages to this console to track progress
- This is helpful if there is a login timeout on your HMC

Operating System Messages - END7:END7P00D

Actions

<input type="checkbox"/>	Message
<input type="checkbox"/>	16:58:57 FILES: NO RDR, NO PRT, NO PUN
<input type="checkbox"/>	16:58:57 LOGON AT 16:58:57 UTC TUESDAY 06/20/23
<input type="checkbox"/>	16:58:57 SYSC LOGON AS MAINT USERS = 1
<input type="checkbox"/>	16:58:57 FILES: 0000001 RDR, 0000001 PRT, NO PUN
<input type="checkbox"/>	16:58:57 HCPIOP952I 10G system storage: Permanent = 10G Reconfigurable = 0
<input type="checkbox"/>	16:58:57 HCPCRC8082I Accounting records are accumulating for userid OPERACCT.
<input type="checkbox"/>	16:58:57 HCPCRC8082I EREP records are accumulating for userid OPEREREP.
<input type="checkbox"/>	16:58:57 XAUTOLOG OPMGRM1
<input type="checkbox"/>	16:58:57 Command accepted
<input type="checkbox"/>	16:58:57 AUTO LOGON *** OPMGRM1 USERS = 2 BY MAINT
<input type="checkbox"/>	16:58:57 AUTO LOGON *** OPERATOR USERS = 3 BY OPMGRM1
<input type="checkbox"/>	HCPCF06776I OPERATOR removed your userid as the system operator ID.
<input type="checkbox"/>	z/VM V7.3.0 2022-06-27 12:57
<input type="checkbox"/>	HCPCLS6056I XAUTOLOG information for OPMGRM1: The IPL command is verified by the

```

***-----***
*** The HMC Integrated 3270 Console is REQUIRED for installation.
***
*** Please start the Integrated 3270 Console task on the HMC for this
*** LPAR or Partition and log on to user MAINT (do not enter a password.)
***
*** This session will now log off.
***
*** You may log on to user ID LOG to view a real time log of the
*** installation process.
*** Enter LOGON LOG in the Command input area and press Send.

```

<input type="checkbox"/>	LOGOFF AT 16:58:59 UTC TUESDAY 06/20/23
<input type="checkbox"/>	z/VM ONLINE--ZVMESI

```
      / /VVV      /VVV /MMMMM\      /MMMMM
     / /VVV      /VVV /MMMMMM\     /MMMMMM
    / /VVV\     /VVV /MMM/MMM\    /MMM/MMM
   / /VVV\     /VVV /MMM /MMM\MMM /MMM
ZZZZZ /      /VVV\ /VVV /MMM /MMMMM /MMM
  ZZ /      /VVV\VVV /MMM /MMM /MMM
   ZZ /      /VVVVVV /MMM /M /MMM
  ZZ /      /VVVV /MMM // /MMM
ZZZZZZ /      /// /// ///
```

Built on IBM Virtualization Technology

Fill in your USERID and PASSWORD and press ENTER

(Your password will not appear when you type it)

USERID ==> MAINT

PASSWORD ==>

COMMAND ==>

RUNNING ZVMESI

Login via Integrated 3270 Console if not started before LOAD

First interaction with z/VM ESI under CMS

- Notice that we have chosen to use full-screen CMS.
 - This provides an improved user experience that includes the ability to scroll backward and forward so that you can review console output.
- Installation under z/VM ESI is a two-phase process:
 - Phase 1: Networking
 - Phase 2: System restoration (installation)

Next step is to issue the command `SETUPNET`, which will walk you through Phase 1.

```
ZVMESI Installation System          Columns 1- 79 of 81

Partition END7P00D is running on system END7 (8561-708)
IFL cores: 2 on-line, 5 standby.  Memory 10G configured, 110G maximum.
Ready; T=0.01/0.01 12:00:00

===> SETUPNET
F7 = Backward  F8 = Forward  F10 = Left  F11 = Right  F12 = Retrieve
```

Network Setup

Setting up the network – Run SETUPNET

- All the values are on 1 screen
- The native z/VM IPWIZARD can also be used

z/VM Express System Installation

Please enter your network information in the fields below

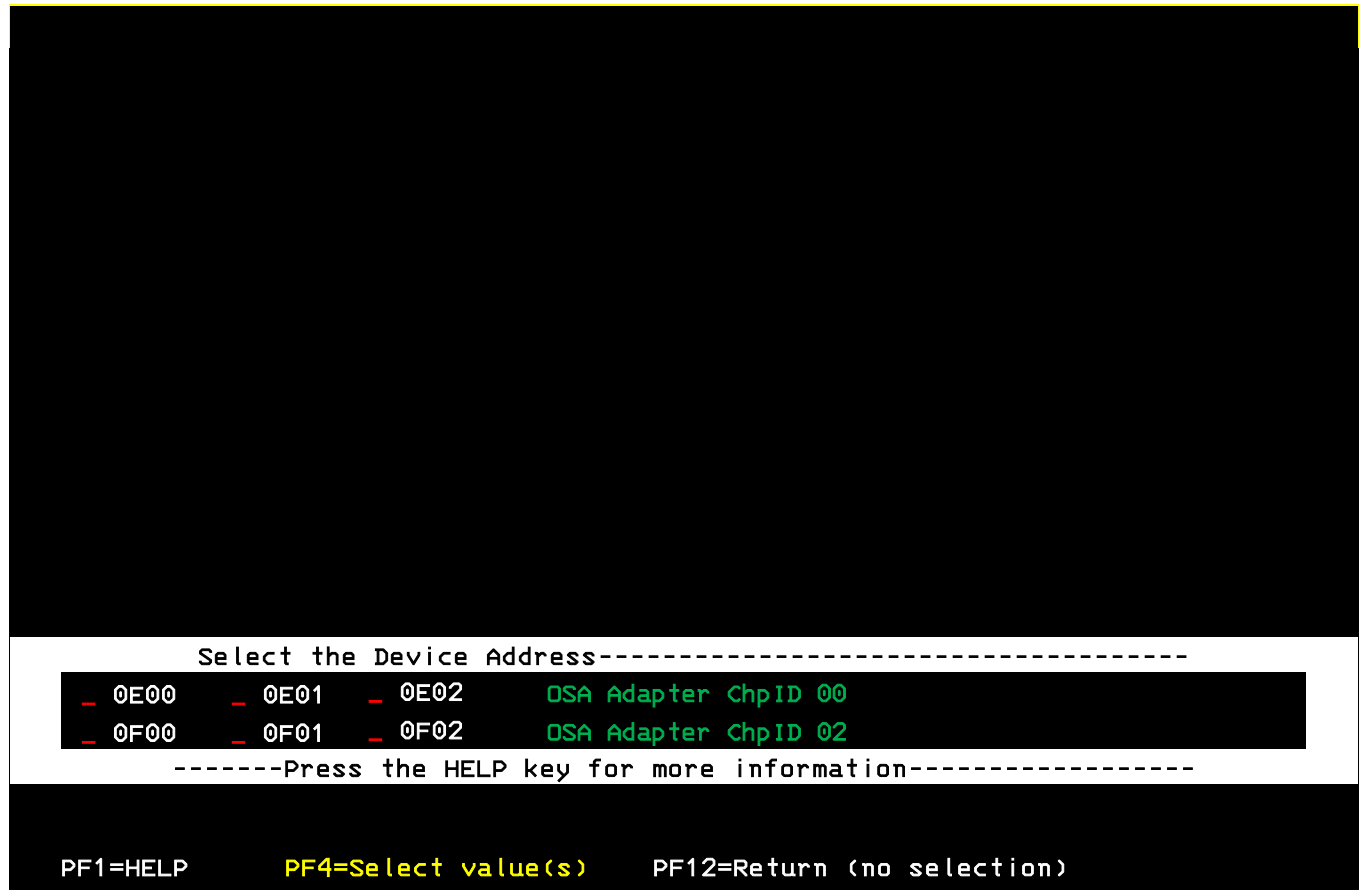
z/VM Host Name:	<u>WSCVML67</u>	
Domain Name:	<u>Wslab.Endicott.ibm.com</u>	
z/VM IP Address:	<u>9.60.86.200</u>	
Subnet Mask:	<u>/24</u>	/nn CIDR mask or x.x.x.x
Gateway IP Address:	<u>9.60.86.1</u>	Router address
Linux Host Name:	<u>lxocpb01</u>	(Default shown)
Linux IP Address:	<u>9.60.86.201</u>	(Default is next IP)
DNS Addresses:	<u>9.60.86.6</u>	One DNS server reqd
	<u>9.60.86.7</u>	Additional optional
VLAN Id:	<u>1701</u>	VLAN number optional
MTU Size:	<u>8992</u>	1492 or 8992
Device Address:	<u></u>	Press PF4 for list
OSA Port Number:	<u>0</u>	(0 or 1)
Install Connection Type:	<u>IP</u>	(Installation only)
Enable the TELNET server?	<u>NO</u>	

PF1=HELP PF3=QUIT PF4=Select PF5=Process Enter=Refresh

Network Setup

Setting up the network – Run SETUPNET

- All the values are on 1 screen
- The native z/VM IPWIZARD can also be used
- Ability to use PF4 for a listing of discovered options.



Network Setup

Setting up the network – Run SETUPNET

- All the values are on 1 screen
- IPWIZARD can also be used
- After all values are entered, press PF5 to validate input and process.
- DTCIPWIZ is invoked and sets up TCPIP.

z/VM Express System Installation

Please enter your network information in the fields below

z/VM Host Name:	<u>WSCVML67</u>	
Domain Name:	<u>Wslab.Endicott.ibm.com</u>	
z/VM IP Address:	<u>9.60.86.200</u>	
Subnet Mask:	<u>/24</u>	/nn CIDR mask or x.x.x.x
Gateway IP Address:	<u>9.60.86.1</u>	Router address
Linux Host Name:	<u>lxocpb01</u>	(Default shown)
Linux IP Address:	<u>9.60.86.201</u>	(Default is next IP)
DNS Addresses:	<u>9.60.86.6</u>	One DNS server reqd
	<u>9.60.86.7</u>	Additional optional
VLAN Id:	<u>1701</u>	VLAN number optional
MTU Size:	<u>8992</u>	1492 or 8992
Device Address:	<u>0E00</u>	Press PF4 for list
OSA Port Number:	<u>0</u>	(0 or 1)
Install Connection Type:	<u>IP</u>	(Installation only)
Enable the TELNET server?	<u>NO</u>	

PF1=HELP PF3=QUIT PF4=Select **PF5=Process** Enter=Refresh

Network setup validation and processing

Configuration complete; connectivity has been verified

- From this point forward, it is no longer necessary to be constrained by continued use of the Integrated 3270. 😊
- Connect via TCPIP using your full-function 3270 emulator.
- Especially nice if your HMC has mandatory re-authorization timeouts.

```
ZVMESI Installation System          Columns 1- 79 of 81

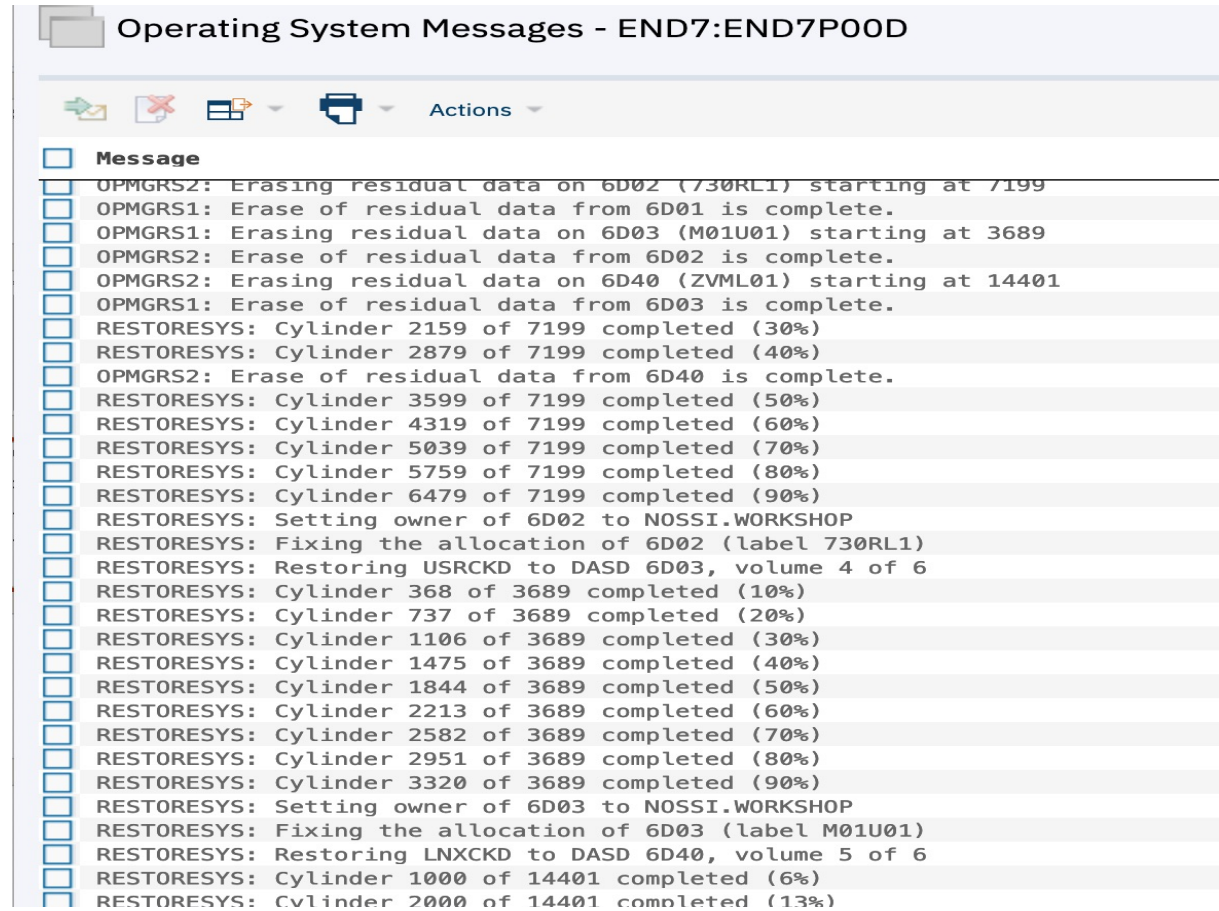
** NOTE: ** You do not need to respond to the prompt to restart TCPIP.
           It is restarted automatically.
DTCIPW2508I DTCIPWIZ EXEC is attempting to create the necessary
DTCIPW2508I configuration files
The TCP/IP stack (TCPIP) must be restarted as part of this procedure. Would
you like to restart TCPIP and continue?
Enter 0 (No), 1 (Yes)
USER DSC      LOGOFF AS TCPIP      USERS = 8 FORCED BY MAINT
USER DSC      LOGOFF AS TCPIP      USERS = 8 FORCED BY MAINT
Successfully PINGed Interface (9.60.86.200)
Successfully PINGed Gateway (9.60.86.1)
Successfully PINGed DNS (9.60.86.6)
Successfully PINGed DNS (9.60.86.7)
DTCIPW2519I Configuration complete; connectivity has been verified
DTCIPW2506E interface ETH did not start properly
DTCIPW2520I File PROFILE TCPIP created on TCPIP 198
DTCIPW2520I File TCPIP DATA created on TCPIP 592
DTCIPW2520I File SYSTEM DTCPARMS created on TCPIP 198
Ready; T=0.06/1.41 12:00:00

F7 = Backward  F8 = Forward  F10 = Left  F11 = Right  F12 = Retrieve
```

Operating System Messages shows a log

We logged on to a user id named LOG to see this

These are the same messages seen on the 3270 display



Operating System Messages - END7:END7P00D

Message

```
OPMGRS2: Erasing residual data on 6D02 (730RL1) starting at 7199
OPMGRS1: Erase of residual data from 6D01 is complete.
OPMGRS1: Erasing residual data on 6D03 (M01U01) starting at 3689
OPMGRS2: Erase of residual data from 6D02 is complete.
OPMGRS2: Erasing residual data on 6D40 (ZVML01) starting at 14401
OPMGRS1: Erase of residual data from 6D03 is complete.
RESTORESIS: Cylinder 2159 of 7199 completed (30%)
RESTORESIS: Cylinder 2879 of 7199 completed (40%)
OPMGRS2: Erase of residual data from 6D40 is complete.
RESTORESIS: Cylinder 3599 of 7199 completed (50%)
RESTORESIS: Cylinder 4319 of 7199 completed (60%)
RESTORESIS: Cylinder 5039 of 7199 completed (70%)
RESTORESIS: Cylinder 5759 of 7199 completed (80%)
RESTORESIS: Cylinder 6479 of 7199 completed (90%)
RESTORESIS: Setting owner of 6D02 to NOSSI.WORKSHOP
RESTORESIS: Fixing the allocation of 6D02 (label 730RL1)
RESTORESIS: Restoring USRCKD to DASD 6D03, volume 4 of 6
RESTORESIS: Cylinder 368 of 3689 completed (10%)
RESTORESIS: Cylinder 737 of 3689 completed (20%)
RESTORESIS: Cylinder 1106 of 3689 completed (30%)
RESTORESIS: Cylinder 1475 of 3689 completed (40%)
RESTORESIS: Cylinder 1844 of 3689 completed (50%)
RESTORESIS: Cylinder 2213 of 3689 completed (60%)
RESTORESIS: Cylinder 2582 of 3689 completed (70%)
RESTORESIS: Cylinder 2951 of 3689 completed (80%)
RESTORESIS: Cylinder 3320 of 3689 completed (90%)
RESTORESIS: Setting owner of 6D03 to NOSSI.WORKSHOP
RESTORESIS: Fixing the allocation of 6D03 (label M01U01)
RESTORESIS: Restoring LNXCKD to DASD 6D40, volume 5 of 6
RESTORESIS: Cylinder 1000 of 14401 completed (6%)
RESTORESIS: Cylinder 2000 of 14401 completed (13%)
```

Customizing the Restored System

This is done automatically once the restore is complete

The list of customization tasks was shown earlier

The installed system is booted 2nd level

The spool disks have changed

- The size and maybe the label

It is necessary to perform a FORCE start

- It starts then shuts down

The final messages help with the next steps

- Shutdown the installer system
- How to IPL the new system

```
ZVMESI Installation System          Lines 262 - 300 of 300
                                   Columns 1 - 79 of 81

Customizing the restored system.

Updating SAPL IPL parameters.
Writing SAPL...
HCPSAL6803I ENTER UP TO 3 LINES OF IPLPARMS
HCPSAL6797I MINIDISK VOLID AT OFFSET 39 IS MNTCF1

Updating the SYSTEM CONFIG file.
CONFIGURATION FILE PROCESSING COMPLETE -- NO ERRORS ENCOUNTERED.

Updating the System Logo file.

Updating the User Directory.
z/VM USER DIRECTORY CREATION PROGRAM - VERSION 7 RELEASE 3.0
EOJ DIRECTORY UPDATED
HCPDIR494I User directory occupies 62 disk pages

Updating the VMSES configuration.

Updating the TCP/IP configuration. _

Creating file for Linux TCP/IP configuration.

Updating Operations Manager configuration.

Testing the start up of the restored system.
AUTO LOGON ***          ZVMBOOT  USERS = 10

Checking that the initial system IPL is finished.

System customization is complete!

Next steps:
- Shutdown the installer system by entering this command:
  SHUTDOWN SYSTEM ZVMESI
- Load or boot the Partition from address: 6D00

Ready; T=55.50/59.09 18:35:00
====>
F7 = Backward  F8 = Forward  F10 = Left  F11 = Right  F12 = Retrieve
```

Now IPL Your New System!

Some of us know what that looks like

Some details about the restored system:

RACF/VM is active

- IDs have Password Phrases
- All are expired
- List of IDs and initial phrases in document

Operations Manager for z/VM is installed

- Monitoring consoles of running VMs
- Cleaning up spool and log files

Passwords are removed from several IDs

- Some are revoked – no need to log on
- LOGON BY enabled for some others

CP Monitor data collection is active

- Collects 5 to 6 days of data
- Automatically erases old files

TLS/SSL is configured and active

- We created our own small CA to issue cert
 - CA is Certificate Authority
 - Certificates can be downloaded from the included Linux system
- Secure Telnet is enabled
 - Unsecure is allowed for initial logon
- LDAP is configured

We have a document that describes the differences.

Some Additional Features

We've added some options for special situations

Configuration using a Spreadsheet

For planning in advance or multiple installs

- Fill out a spreadsheet we provide
- Values are the same as you see on the 3270
- Save it in CSV format
- Put it in the same directory as install files

Fills in the fields on the 3270 panels

- Otherwise, the process is the same

Then we took that one step further

Fully automatic installation

No need to log on to a 3270

- (assuming all input data is correct)

See progress on Operating System Messages

```
 Message
ECKD DASD 7904 M01S01, new label will be M01S01

 These volumes will be initialized and formatted for Paging or Dump space:
ECKD DASD 7905 M01S02, new label will be M01S02
ECKD DASD 7990 ZVMP01, new label will be ZVMP01
ECKD DASD 7991 ZVMP02, new label will be ZVMP02

 These volumes will be initialized and allocated for the Linux:
ECKD DASD 7940 ZVML01, new label will be ZVML01
ECKD DASD 7941 ZVML02, new label will be ZVML02

 Labeling all the restore disks.
 Labeling address 7900 with label M01RES
DASD 7900 ATTACHED TO SYSTEM M01RES
 Labeling address 7901 with label VMCOM1
DASD 7901 ATTACHED TO SYSTEM VMCOM1
 Labeling address 7902 with label 730RL1
DASD 7902 ATTACHED TO SYSTEM 730RL1
 Labeling address 7903 with label M01U01
DASD 7903 ATTACHED TO SYSTEM M01U01
 Labeling address 7940 with label ZVML01
DASD 7940 ATTACHED TO SYSTEM ZVML01
 Labeling address 7941 with label ZVML02
DASD 7941 ATTACHED TO SYSTEM ZVML02
 Starting background format of CP volumes.

 Restoring the z/VM system, 6 volumes.
 Restoring RESCKD to DASD 7900, volume 1 of 6
 PDDRMS309I Restoring data to MAINT 2000 from Pipelines

Total: 94 Selected: 0

Command:  
```

z/VM Express System Installation

Please enter or update the fields highlighted below

System Name: WORKSHOP System Group Name: WRKGROUP
Enable SSI?: YES SSI Cluster Name: SHOPSSI

Installation destinations:

Volume: M01RES Address: IPL volume for z/VM
Volume: VMCOM1 Address: z/VM Common volume
Volume: 730RL1 Address: z/VM Release 7.3 product volume
Volume: M01U01 Address: z/VM Additional Products
Volume: M01S01 Address: Spool volume
Volume: RACFDB Address: RACF Primary database volume
Volume: RACFBK Address: RACF Backup database volume
Volume: M01S02 Address: Dedicated dump space (optional)

A sequence number (01, 02) is added to each Label Prefix to form a Label

Linux volumes: (Minimum of 1 volumes required, minimum 30051 cylinders)

Label prefix: ZVML Beginning address: Number of addresses: 1

Paging volumes: (You must specify at least 1 paging device)

Label prefix: M01P Beginning address: Number of addresses:

Networking: (Addresses are used in triples, 3 at a time)

Primary OSA device address: 4100 Port: 0 VLAN: (optional)
Failover OSA device address: Port: 0 Failover OSA is optional

MAC Address Prefix: 02 Must begin with 02

SSI is great, but setting up the CTCs is harder

The CTC connections are required!

We hope DPM will offer configuration help

Converting an “SSI-ready” z/VM system to a single “SSI-enabled” one is documented

Could it be done automatically?

Maybe after restoring our system?

Sure!

- It needs more disks for RACF
- SSI cluster name is needed
- SYSTEM CONFIG and directory changes
- Create the PDR
- SFS config, VMSES/E

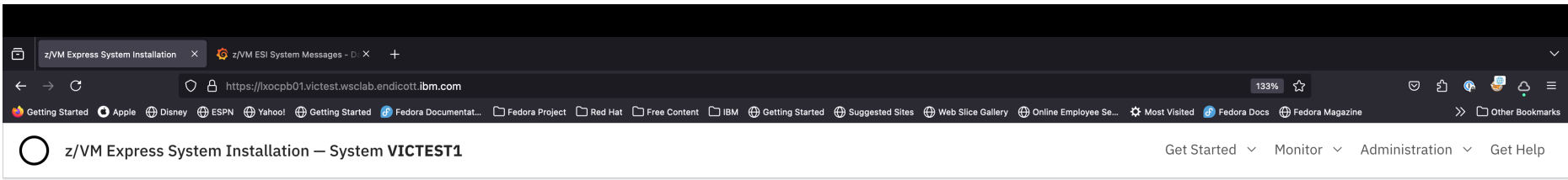
Use the cloning process for more members

- Documented in the z/VM Library

What About z/VM SSI?

Our target customers usually install a single system

**How about a
demonstration?**



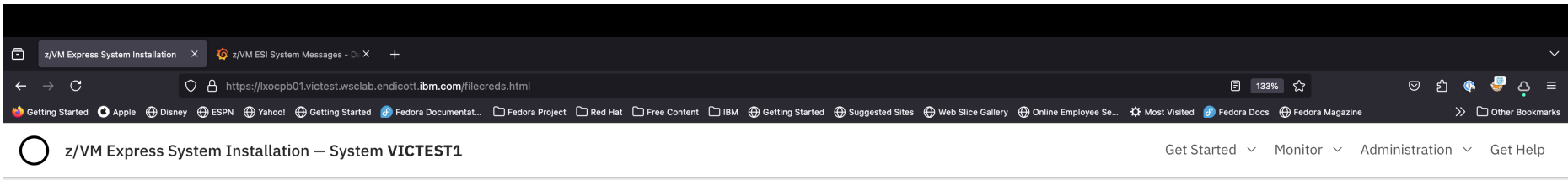
Get Started with Hybrid Cloud on LinuxONE

You are using z/VM Express System Installation (*ESI*), the world's finest pocket-sized private cloud solution for IBM Z and LinuxONE! Click on the tabs for more details on what you can build using z/VM ESI.

[Openshift Container Platform](#)

[IBM Cloud Infrastructure Center](#)

[Management Utilities](#)



Get Started with extra modules for z/VM *ESI*

We just can't fit all of the great functions available to you with z/VM ESI in the one download! Some capabilities come as additional download files.

ESI Modules already accessible

Module name	Description	Date Uploaded	Size
icic-1.2.1.0-fba	ICIC 1.2.1.0 module (FBA)	05/08/2024, 2:48:08 pm	1.97G
rhocp-install-4.14.9	RHOCP Installation for 4.14.9	05/08/2024, 2:48:18 pm	1.39G
+ Upload content to the ELAN			

Get Started with OpenShift Container Platform on LinuxONE

Manage OCP clusters from this page — click the tabs below for details.

OCP Pull Secrets OCP Builds

OpenShift Container Platform Pull Secrets

To successfully build the OCP cluster you will need a special file (known as the *pull secret*) from Red Hat.

Pull secrets uploaded

E-Mail	Date Uploaded	Status
viccross@au.ibm.com	August 05 2024 21:45:18	Good

Upload a pull secret



Get Started with OpenShift Container Platform on LinuxONE

Manage OCP clusters from this page — click the tabs below for details.

OCP Pull Secrets

OCP Builds

OpenShift Container Platform Clusters

No cluster currently configured, click the button to start:

Configure

The **OCP Cluster Build Log** tab will show the log of the build, and the **Metrics** pages will show information on system activity.

Get started with OpenShift Container Platform on LinuxONE

Manage OCP clusters from this page — click the tabs below for details.

OCP Pull Secrets

OCP Builds

OpenShift Container Platform

No cluster currently configured.

The **OCP Cluster Build Log** tab v

OCP Cluster Details

✕

Cluster Name:	<input type="text" value="ocp-z-sharekc"/>	→	Cluster fully-qualified name:	<input type="text" value="ocp-z-sharekc.wsclab.endicott.ibm.com"/>	
OCP Version:	<input type="text" value="4.14.9"/>	Build Type:	<input type="text" value="Standard"/>	Disconnected Install:	<input type="text" value="No"/>
Pull Secret:	<input type="text" value="viccross@au.ibm.com"/>				

Save

Get started with OpenShift Container Platform on LinuxONE

Manage OCP clusters from this page — click the tabs below for details.

OCP Pull Secrets

OCP Builds

OpenShift Container Platform

No cluster currently configured.

The **OCP Cluster Build Log** tab v

OCP Cluster Details ✕

Cluster Name: → **Cluster fully-qualified name:**

OCP Version: **Build Type:** **Disconnected Install:**

Pull Secret:

Details saved!



Get Started with OpenShift Container Platform on LinuxONE

Manage OCP clusters from this page — click the tabs below for details.

OCP Pull Secrets OCP Builds

OpenShift Container Platform Clusters

Cluster name	Build Type	OCP Version	Status	
ocp-z-sharekc	Standard	4.14.9	Defining 	Details Build Log

[Add a cluster](#)

The **OCP Cluster Build Log** tab will show the log of the build, and the **Metrics** pages will show information on system activity.



Dashboards

Manage dashboards and folders



Browse



Playlists



Snapshots



Library panels

New ▾

Filter by tag ▾

Starred



Sort (Default A-Z) ▾

General ▾

z/VM Logging dashboards ▲

ICIC Build Log

z/VM Logging dashboards

z/VM ESI System Messages

z/VM Logging dashboards

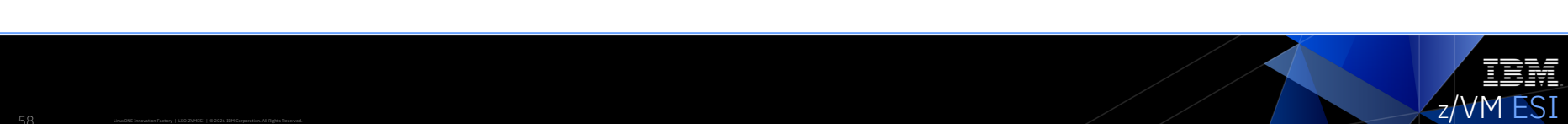
z/VM guest name: All ▾

Log messages

Console Messages

>	2024-08-07	09:38:01	LXELAN03	[2534594.547431]	alloc_contig_range: [7fc01, 7fd01] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547412]	alloc_contig_range: [7fc00, 7fd00] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547441]	alloc_contig_range: [7fc02, 7fd02] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547407]	alloc_contig_range: 58870 callbacks suppressed
>	2024-08-07	09:38:01	LXELAN03	[2534594.547452]	alloc_contig_range: [7fc03, 7fd03] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547462]	alloc_contig_range: [7fc04, 7fd04] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547483]	alloc_contig_range: [7fc06, 7fd06] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547472]	alloc_contig_range: [7fc05, 7fd05] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547495]	alloc_contig_range: [7fc07, 7fd07] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547515]	alloc_contig_range: [7fc09, 7fd09] PFNs busy
>	2024-08-07	09:38:01	LXELAN03	[2534594.547505]	alloc_contig_range: [7fc08, 7fd08] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185337]	alloc_contig_range: [7fc02, 7fd02] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185329]	alloc_contig_range: [7fc01, 7fd01] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185304]	alloc_contig_range: [7fc00, 7fd00] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185300]	alloc_contig_range: 58870 callbacks suppressed
>	2024-08-07	09:39:02	LXELAN03	[2534655.185344]	alloc_contig_range: [7fc03, 7fd03] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185362]	alloc_contig_range: [7fc05, 7fd05] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185354]	alloc_contig_range: [7fc04, 7fd04] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185374]	alloc_contig_range: [7fc06, 7fd06] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185391]	alloc_contig_range: [7fc08, 7fd08] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185383]	alloc_contig_range: [7fc07, 7fd07] PFNs busy
>	2024-08-07	09:39:02	LXELAN03	[2534655.185404]	alloc_contig_range: [7fc09, 7fd09] PFNs busy

VMEVENT entries



z/VM Logging dashboards / z/VM ESI System Messages ☆ 🔊

📊 🗄️ ⚙️ ⌚ Last 24 hours 🔍 ↺ 5s 🗨️

z/VM guest name

Log messages

Selected (1)

- All
- ICICOMP1
- ICICMGTO
- LXELAN01
- LXELAN02
- LXELAN03
- LXOCPB01
- OPERATOR
- RACFSMF

Console Messages

```
> 2024-08-07 09:38:01 LXELAN03 [2534594.547505] alloc_contig_range: [7fc08, 7fd08] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185337] alloc_contig_range: [7fc02, 7fd02] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185329] alloc_contig_range: [7fc01, 7fd01] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185304] alloc_contig_range: [7fc00, 7fd00] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185300] alloc_contig_range: 58870 callbacks suppressed
> 2024-08-07 09:39:02 LXELAN03 [2534655.185344] alloc_contig_range: [7fc03, 7fd03] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185362] alloc_contig_range: [7fc05, 7fd05] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185354] alloc_contig_range: [7fc04, 7fd04] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185374] alloc_contig_range: [7fc06, 7fd06] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185391] alloc_contig_range: [7fc08, 7fd08] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185383] alloc_contig_range: [7fc07, 7fd07] PFNs busy
> 2024-08-07 09:39:02 LXELAN03 [2534655.185404] alloc_contig_range: [7fc09, 7fd09] PFNs busy
> 2024-08-07 09:40:01 LXELAN03 [2534714.816011] alloc_contig_range: [7fc02, 7fd02] PFNs busy
```

VMEVENT entries



- Attend the Express Linux Automation and Network (ELAN) session here at the VMWorkshop
- Thursday, June 11 2026 at 15:30
- Room 2201

For more information about the ELAN

```

      /  /VVV      /VVV /MMMM\      /MMMM
     /  /VVV      /VVV /MMMMMM\     /MMMMMM
    /  /VVV\      /VVV /MMM/MMM\    /MMM/MMM
   /  /VVV\      /VVV /MMM /MMM\MMM /MMM
  ZZZZZ /        /VVV\ /VVV /MMM /MMMMM /MMM
   ZZ /         /VVV\ /VVV /MMM /MMM /MMM
  ZZ /         /VVVVVV /MMM /M /MMM
  ZZ /         /VVVV /MMM // /MMM
 ZZZZZZ /      ///    ///    ///

```

EXPRESS

SYSTEM

INSTALL

With help from

Alan Altmark : Z/VM Development Lab
 Jay Brenneman : LinuxONE Integration Test Lab
 Richard Lewis : Worldwide System Center
 Stephanie Rivero : z/VM Development Lab

RUNNING IBMZVM

Thanks for Listening!



Thanks
for
listening!



Contact your IBM Z representative
for more information or
email ehorn@us.ibm.com