



# A Gentle Introduction to z/VM System Installation for the Inexperienced

Daniel P. Martin Rocket Software, Inc.

*Tuesday, August 11th, 2015 Session Number 17481* 





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#### Agenda



- Introductions
  - Who is this person, and why is he here?
- Getting Started
  - Materials, Methods, and The Bootstrapping Problem.
- Planning
  - Motive, means...
- Choices
  - ...and opportunity.
- Process
  - "...take the red pill: find out how deep the rabbit hole goes."
- Results
  - What did I just do, and where do I go from here?



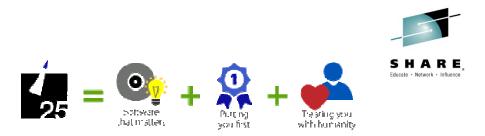
#### Agenda



- Additional Resources
  - IBM resources
  - User Community Resources
- Questions, Comments, and Feedback



#### Introduction About Rocket Software



http://www.rocketsoftware.com/about

#### We Build Software That Matters.

That's not rocket science. That's Rocket Software.

One day in 1990, one of our founders started writing assembler code in a spare bedroom in his house near Boston. The very first product he built helped large enterprises solve an important problem—how to process more database queries more efficiently. That was how Rocket Software started.

More than two decades later, our software engineers have built well over 100 products that solve problems across a broad spectrum of enterprise technology. Our engineers talk with you, our customers and partners, every day to discover new pain points and learn about the (hopefully really hard) problems and challenges you face.

We help you prevent outages, protect your data, store your data, share your data, virtualize your data, manage your networks, improve your service levels, discover insights, modernize your applications, access and connect users and applications, minimize risk and increase compliance, and so much more. We build and deliver products that matter to you so that you can deliver your best products, solutions, and services to your customers and grow your business.

#### We Put You First.

Rocket was founded on the premise that we would build products that matter for people—and we have never wavered from that. In fact, it's the cornerstone of our core values that we live every day—we put you, our customers and partners, first.

We treat all of our customers and partners as individuals rather than transactions. That's been our history. And that's why our customers and partners see us as a trusted partner.

We don't just sell software. We care about our customers' and partners' success—a win for you is a win for us. We spend our time solving the problems that keep you awake. We build software that matters—to you.

#### Treating You With Humanity.

This is the piece that almost every business today gets wrong. This is the piece that we talk about getting right at Rocket. We put you first and are committed to never letting you fail. We are committed to each other. Rocketeers don't let each other fail. We are people building software for people. We are people solving problems for people. We have worked really hard over the past 25 years to earn your trust. And for the past 25 years we have always tried to treat you with humanity.



# About your speaker



- As a customer:
  - 22 years at University of Arkansas
    - ...lots of VM, starting with VM/370 R6 PLC 3 (CDC Omega 480-III, anyone?)
    - ...lots of Unix / Linux (Solaris, HP-UX, AIX, NCR/Teradata, Various distros)
    - ...IT Security Weasel\*

\*Telling people things they didn't want to hear before it was cool.

- "A Certain Major Retailer"
  - Early 1980's "Distributed Systems"
- Since 2003: Senior Software Developer for Rocket Software, Inc.
  - Lead design / development
    - IBM Backup and Restore Manager for z/VM
    - IBM Archive Manager for z/VM
  - Co-conspirator
    - IBM Tape Manager for z/VM
    - IBM Operations Manager for z/VM
- Away From the Keyboard:
  - Certified Law Enforcement Officer, Search and Rescue Worker, Emergency Medical First Responder, and misplaced farm boy with a peculiar fondness for shiny things...



## **Target Audience**

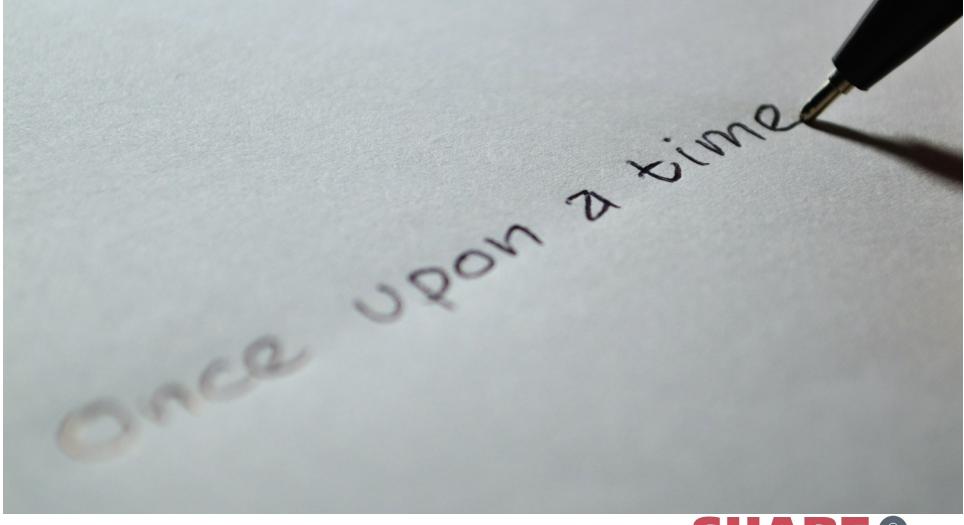


- Some familiarity with IBM z Systems Concepts, Facilities, and Terminology
- Some familiarity with IBM z/VM Concepts and Terminology
- Foundation-level, Introductory Overview
- Shameless Plug:
  - Tuesday, 13:45-17:30: Sessions 17468, 17469, & 17470, "z/VM Installation / Migration / Upgrade Hands-On Lab" (three parts, in room Asia 5)



# Starting out...







# Materials, methods, and What we're about to do...

- Goal: Provide basic instruction on how to perform the initial system installation for z/VM
- Objectives:
  - Define the basic requirements
  - Identify available options for z/VM installation packaging and distribution
  - Identify necessary system resources
  - Review the planning process
  - Navigate the installation process
  - Discuss post-installation configuration



# Materials and Methods: What you're going to need

- Our example scenario:
- You are using a currently supported processor.
- You are using a currently supported z/VM release.
  - This presentation uses z/VM 6.3 for all examples.
  - You have already ordered and received installation materials.



# Materials and Methods: Basic requirements



- Our example scenario:
- Goal is to produce a monolithic / non-SSI system:
   SSI installation procedure is functionally similar.
  - More decisions.
  - More hardware resources.
- Plan is to install a "Traditionally Managed" system:
   Not managed by OpenStack / xCAT / IBM Director.
- Why?
  - Simplicity.



# Materials and Methods: What's in the box?



- Make sure you received what you ordered.
  - Physical *or* Electronic Delivery
- Review the Packing List.
  - Otherwise, how do you know you actually received what you asked for?
  - If you didn't, where is it?
  - If the materials you received are inconsistent with the packing list, stop now – and don't resume until the situation is corrected.
    - » It's quite uncommon, but mistakes happen. Fix It Now.







- It all starts with hardware.
- Hardware is only useful once you add software. \*
  - \*Otherwise, you have a wheel with no hamster.
- "OK, the power is on... Now what?"







"The old days" (phrase of old; noun): Stuff that we don't have to do any more.







- The modern installation process relies on the presence of a starter system.
- If you do not have a starter system, one will be provided for you.







- Source media
  - Tape
    - ECKD DASD required
    - TCP/IP Network is not required
    - Starter system preloaded on tape.
  - DVD+RW or Digital Download
    - ECKD or FBA/SCSI DASD
    - TCP/IP infrastructure **is** required
    - Starter system preloaded on DVD+RW media
    - Digital download: You already have a starter system.

- Installation destination
  - 1<sup>st</sup> Level ("Bare LPAR")
    - No pre-existing z/VM system
    - ...or "clean sweep" desired
    - ...or migration coming later
    - ...starter system required.
  - 2<sup>nd</sup> Level (as z/VM guest)
    - 1<sup>st</sup>-level system IS your starter system
    - z/VM supports z/VM as a guest operating system
    - Migration, testing, education.





- Source media
  Tape

  ECKD DASD required
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Source media



- DVD+RW or Digital Download
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- Two stages:
  - (1) Deploy an initial installation ("starter") system if you do not already have one.
  - (2) Perform the actual system installation.
- Exact steps are determined by:
  - Type of installation media (Tape, optical media, download)
  - Initial system state (Bare LPAR, "Second-level" VM)





- Road map:
  - Steps are defined in one book: **z/VM Installation Guide**
- Assumptions for this exercise:
  - Not installing an SSI cluster ("Monolithic" z/VM system)
  - Not configuring for external management (xCAT / OpenStack)





## Materials and Methods: Getting past fear of commitment

- Decision time:
  - Second-level VM; install materials downloaded from DVD.
  - Assumptions:
    - FTP transfer from DVD to CMS minidisk has been done.
    - Second-level guest virtual machine has been created.
      - ...more in a moment...
    - We're just installing, not plumbing a network today.
- Following this path:
  - z/VM 6.3 Installation Guide Chapter 6
  - ...jumping in at "Step 3: Complete the installation worksheets"





- For this path:
  - Worksheet 1 (Table 7)
  - Worksheet 2 (Table 8)
  - Worksheet 3 (Table 9)
  - Worksheet 8 (Table 14)





- For this path:
  - Worksheet 1 (Table 7)
    - Second level install
    - Install to MDISK
    - Default language is AMENG
    - Destination media is ECKD 3390-3
    - Common service file pool name is VMPSFS
    - Non-SSI
    - System name: SHARE125





Record an "M" if you will load the product to a minidisk or an " pool in the Install To column. Install To Product Install To Produ	'F" if you will load the product to the VM				
Install To Product Install To Produ					
	act Install To Product				
M VM M DIRM	I M ICKDSF				
M OSA M PERF					
M RSCS M TCPIF	P M VMHCD				
SCSI volume size:	3390-3 VMPSFS				
Installation Type: X Non-SSI System	m Name- SHARE125				
S NOT-551 System	m Name*: SHARE125				
SSI Number of Members: SSI C	SSI Cluster Name:				





- For this path:
  - Worksheet 2 (Table 8)
    - Using xCAT or IBM Director? Not today.





Table 8. DVD Installation Worksheet 2

Would you like to have your system automatically configured to be managed by a SMAPI client for system management, such as xCAT or IBM Director? (Y/N)

Keep the following in mind:

If you say YES, you should not attempt to manage your system in any other way.

If you'd like to manage your own system, or use a purchased external security manager or a purchased directory manager, say NO.

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- For this path:
  - Worksheet 3 (Table 9)
    - DASD Assets VOLSERs and VDEVs
      - There's some recycling going on here...
  - Worksheet 8 (Table 14)





Volume Type	Default Label	New Label	Address
COMMON	VMCOM1	62DCM1	6301
COMMON2	VMCOM2	62DCM2	6302
RELVOL	630RL1	62DRL1	6303
RELVOL2	630RL2	62DRL2	6304
RES	M01RES	62DRES	6305
SPOOL	M01S01	62DS01	6306
PAGE	M01P01	62DP01	6307
WORK	M01W01	62DW01	6308
WORK	M01W02	62DW02	6309
WORK	M01W03	62DW03	630A

Table 9. DVD Installation Worksheet 3 (3390 Non-SSI Only)



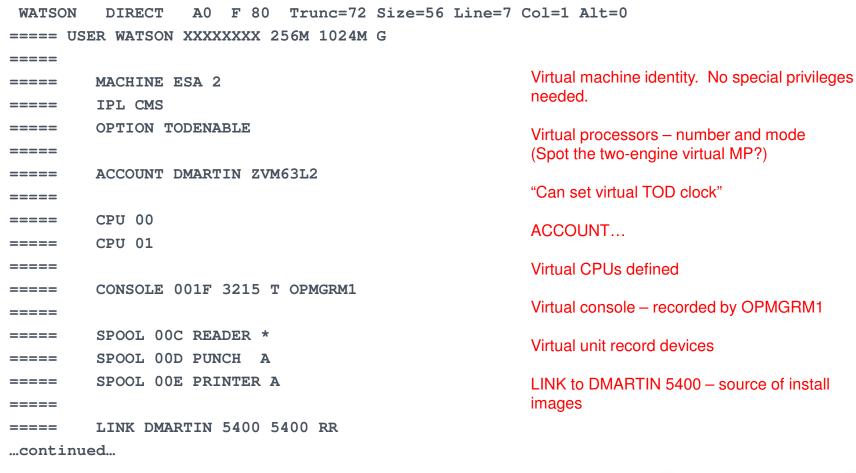


- For this path:
  - Worksheet 8 (Table 14)
    - Where's all this stuff coming from?

Table 14. DVD Installation Worksheet 8

IP address or host name:	
FTP server user ID and password:	
DVD/FTP directory path name:	
VM user ID and address of VM minidisk to upload DVD:	DMARTIN 5400











...continued...

=====	SPECIAL	1200	3270
=====	SPECIAL	1201	3270
=====	SPECIAL	1202	3270
=====	SPECIAL	1203	3270
=====	SPECIAL	1204	3270
=====	SPECIAL	1205	3270
=====	SPECIAL	1206	3270
=====	SPECIAL	1207	3270
=====	SPECIAL	1208	3270
=====	SPECIAL	1209	3270
=====	SPECIAL	120A	3270
=====	SPECIAL	120B	3270
=====	SPECIAL	120C	3270
=====	SPECIAL	120D	3270
=====	SPECIAL	120E	3270
=====	SPECIAL	120F	3270
continue	≥d		

A handful of virtual 3270 terminals, just because we can.

(See the CP **DIAL** command...)





...continued...

=====	MDISK	0191	3390	101	10	VM540A	WR	XXXXXXXX XXXXXXXX	
=====	MDISK	2222	3390	111	10	VM540A	WR	XXXXXXXX XXXXXXXX	
=====	MDISK	24CC	3390	9497	10	VM540B	MR	XXXXXX XXXXXX XXXXXX	
=====	MDISK	2CF0	3390	9507	120	VM540B	MR	XXXXXX XXXXXX XXXXXX	
continued									

**Required** MDISK definitions for this installation path:

191 – CMS "A" disk 2222, 24CC, 2CF0 – Required by bootstrapping tactics.



...continued...

====>

=====	MDISK	6301	3390	0	END	62DCM1	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	6302	3390	0	END	62DCM2	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	6303	3390	0	END	62DRL1	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	6304	3390	0	END	62DRL2	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	6305	3390	0	END	62DRES	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	6306	3390	0	END	62DS01	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	6307	3390	0	END	62DP01	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	6308	3390	0	END	62DW01	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	6309	3390	0	END	62DW02	MR	XXXXX	XXXXX	XXXXX
=====	MDISK	630A	3390	0	END	62DW03	MR	XXXXX	XXXXX	XXXXX
=====										
=====	LINK M	AINT	190 3	190	) RR					
=====	LINK M	AINT	19D 3	L 9I	D RR					
=====	LINK M	AINT	<b>19E</b> 3	L 91	E RR					
===== *	* * End	l of H	Tile '	k 1	* *					

And, finally...

Nine 3390-3 DASD volumes for the second-level system install (MDISKs 6301-630A)

...plus...

The stock set of first-level CMS MDISKs (MAINT 190, 19D and 19E)







### Action: Inspect the virtualized install setup



00:	qvo	la											
00:	DASD	2222	3390	VM540A	R/W	10	CYL	ON	DASD	AFB2	SUBCHANNEL	=	001C
00:	DASD	24CC	3390	VM540B	R/W	10	CYL	ON	DASD	AD35	SUBCHANNEL	=	001D
00:	DASD	2CF0	3390	VM540B	R/W	120	CYL	ON	DASD	AD35	SUBCHANNEL	=	001E
00:	DASD	5400	3390	<b>V54X00</b>	R/O	32767	CYL	ON	DASD	<b>AF</b> 00	SUBCHANNEL	=	0016
00:	DASD	6301	3390	62DCM1	R/W	3339	CYL	ON	DASD	<b>AE</b> 38	SUBCHANNEL	=	0020
00:	DASD	6302	3390	62DCM2	R/W	3339	CYL	ON	DASD	<b>AE</b> 39	SUBCHANNEL	=	0021
00:	DASD	6303	3390	62DRL1	R/W	3339	CYL	ON	DASD	AE3A	SUBCHANNEL	=	0022
00:	DASD	6304	3390	62DRL2	R/W	3339	CYL	ON	DASD	AE3B	SUBCHANNEL	=	0023
00:	DASD	6305	3390	62DRES	R/W	3339	CYL	ON	DASD	<b>AE</b> 37	SUBCHANNEL	=	0024
00:	DASD	6306	3390	62DS01	R/W	3339	CYL	ON	DASD	AE3D	SUBCHANNEL	=	0025
00:	DASD	6307	3390	62DP01	R/W	3339	CYL	ON	DASD	AE3E	SUBCHANNEL	=	0026
00:	DASD	6308	3390	62DW01	R/W	3339	CYL	ON	DASD	AE3F	SUBCHANNEL	=	0027
00:	DASD	6309	3390	VM5406	R/W	3339	CYL	ON	DASD	AD39	SUBCHANNEL	=	0017

CP READ VMLEVEL1



## Action: Log in, let CMS start, and invoke INSTPLAN:



x3270-4 rs54 <3> File Options z/VM INSTALLATION PLANNING \*\*\* Mark the product(s) selected to be installed into the filepool with an "F" and those selected to be installed to minidisks with an "M" VM OSA DIRM ICKDSF RACF VMHCD PERFTK RSCS TCPIP Select a System Default Language. AMENG UCENG KANJI Select a System DASD model. FBA size can be changed. \_ 3390 Mod 3 \_ 3390 Mod 9 \_ FBA [ FBA DASD 6.0 Enter the name of common service filepool. Filepool Name: Select a System Type: Non-SSI or SSI (SSI requires the SSI feature) \_\_\_\_Non-SSI Install: System Name \_\_\_\_\_ SSI Install: Number of Members SSI Cluster Name F1 = HELPF5 = ProcessENTER = Refresh F3/F12 = QUIT005/008 Complete your session evaluations online at www.SHARE.org/Orlando-Eval

Most of the actual thought is taken out of the process at this point, IF you completed the worksheets first.



## Action: Log in, let CMS start, and invoke INSTPLAN:



0				×	3270-4 rs54 <	3>			000
File	Options								
			***	z/VM IN	STALLAT	ION PLANN	VING ***		
Mark and	the pr those s M M	oduct(s) elected VM OSA RSCS	) select to be i	ed to b nstalle M M M	d to mi DI PE	nidisks w	o the filep with an "M" M M M M	ool with a ICKDSF RACF VMHCD	n "F"
Sele	ect a Sy X AMENG		fault La _ UCENC	inguage.	_ Kanj	I			
Sele	ct a Sy X 3390	stem DAS Mod 3	SD model	. FBA s 3390 M	ize can <mark>od 9</mark>	be chang _ F	jed. BA DASD 6	.0	
	er the n Filepoo	ame of o 1 Name:			filepoo	1.			
	ct a Sy X Non-S _ SSI I	stem Typ SI Insta nstall:	pe: Non- all:	SSI or System Number	SSI (SS Name <mark>SH</mark> of Memb	I require ARE125 ers _	es the SSI SSI Clust	feature) er Name	

Complete your session evaluations online at www.SHARE.org/Orlando-Eval

INSTPLAN fields are all filled in; we've pressed <ENTER> to validate the contents.



#### **Action:**



#### Log in, let CMS start, and invoke INSTPLAN:

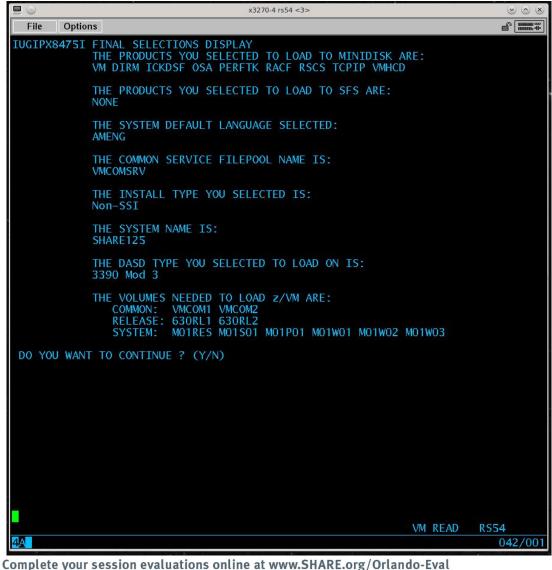
			x3270-4 rs54 <3	3>		$\odot$ $\odot$ $\otimes$
File	Options					
		*** z/VM ]	NSTALLATION F	PLANNING P	ANEL 2 ***	
Z	managed b	u like to have by a SMAPI cli ctor? (Y/N)	e your system ent for syste	automatic em managem	ally configure ent, such as X	ed to be (CAT or
	Keep The	Following in	Mind:			
	If yo any o	ou say YES, yo other way.	ou should not	attempt t	o manage your	system in
	If yo exter	ou'd like to m rnal security	nanage your ow manager or a	vn system, purchased	or use a purc directory mar	chased Tager say NO
	F1 = HELF	P F3/F12 = (	QUIT F5 = Pt	rocess	NTER = Refresh	004/006
Complete	VOUR SASSION	n evaluations o	nline at www.c	HAPE or	Orlando-Eval	004/000

INSTPLAN panel 2 filled in; We've declined the privilege of external systems management by responding **N**.



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## Log in, let CMS start, and invoke INSTPLAN:



INSTPLAN: We pressed PF5 after saying "N" to external management.

We get to review some of our choices now.

Note that the "generic" DASD volume names are still shown.

We'll fix that in a moment.



# Action: Log in, let CMS start, and invoke INSTPLAN:



0			x3270	4 rs54 <3>		$\odot$
File	Options					
		*** z/VM	INSTALLATION	VOLUME DEFINITION	***	
	ТҮРЕ	LABEL	ADDRESS		FORMAT (Y/N)	
	COMMON	62DCM1	6301			
	COMMON2	62DCM2	6302			
	RELVOL	62DRL1	6303			
	RELVOL2	62DRL2	6304			
	TYPE	LABEL	ADDRESS			
SHARE	125					
	RES	62DRES	6305			
	SPOOL	62DS01	6306			
	PAGE	620P01	6307			
	WORK	62DW01	6308			
	WORK	620W02	6309			
	WORK	62DW03	BUCO			
		E0 E0	/[12			
	F1 = HEI	LP F3	7FT2 = QU11	F5 = Process	ENTER = Refresh	
						003/0

Complete your session evaluations online at www.SHARE.org/Orlando-Eval

INSTPLAN: We've now supplied our own DASD volume names and (virtual – it's a second-level install...) device addresses.



## Action: Log in, let CMS start, and invoke INSTPLAN:

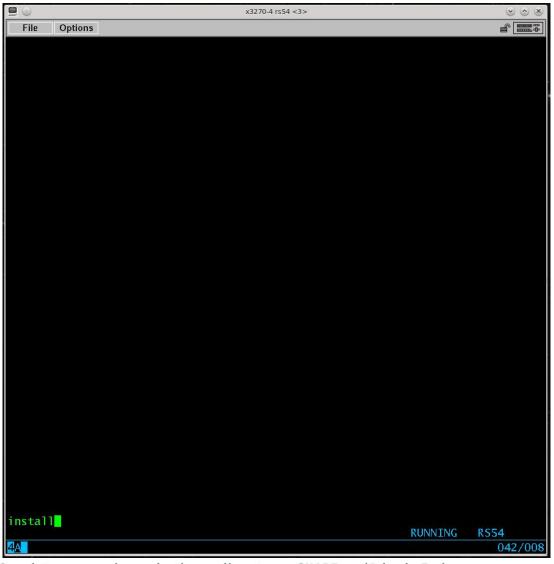


File         Options           UUGIIX83777 YOU HAVE SELECTED TO FORMAT YOUR DASD. DASD SELECTED ARE:         62DCM1         6301           62DCM2         6303         62DR1.2         6304           62DR12         6304         62DF0.1         6306           62DP01         6307         62DW02         6308           62DW02         6308         62DW02         6308           62DW02         6308         62DW02         6308           62DW02         6308         62DW02         6308           62DW01         308         630A         SUCCINP83921I INSTPLAN EXEC ENDED SUCCESSFULLY           keady; T=0.06/0.07 17:44:47         F         SUCCESSFULLY         SUCCESSFULLY									
UGIIX8377R YOU HAVE SELECTED TO FORMAT YOUR DASD. DASD SELECTED ARE: 62DCM1 6301 62DCM2 6303 62DRL2 6304 62DRES 6305 62DS01 6306 62DW01 6308 62DW02 6309 62DW03 630A UGINP8392ZI INSTPLAN EXEC ENDED SUCCESSFULLY keady; T=0.06/0.07 17:44:47	<b>=</b> 💿			x3270-4	rs54 <3>				$\odot$ $\odot$
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62DCM1 6301 62DRL2 6302 62DRL2 6304 62DRES 6305 62D901 6307 62DW01 6308 62DW03 630A 20W03 630A 20W03 630A 20W03 630A 20W03 630A 20W03 630A 20W03 630A 20W3 6	THCTTY8377R	YOU HAVE	SELECTED	TO FORMAT	VOUR D	ASD D		TED ARE-	
62DCM2 6302 62DRL2 6304 62DRES 6305 62DP01 6307 62DW01 6308 62DW02 6309 62DW03 630A UGINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY Ready; T=0.06/0.07 17:44:47	TOUTINOTAR	TOV TIAVE	JELECTED	TO TORMAT	TOON		NJU JEEC	TLU AKE.	
62DCM2 6302 62DRL2 6304 62DRES 6305 62DP01 6307 62DW01 6308 62DW02 6309 62DW03 630A UGINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY Ready; T=0.06/0.07 17:44:47		62DCM1	6301						
62DRL1 6303 62DRE5 6305 62DS01 6306 62DW01 6308 62DW02 6309 62DW03 630A CUGINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY keady; T=0.06/0.07 17:44:47		62DCM2							
62DRL2 6304 62DRES 6305 62DP01 6307 62DW01 6308 62DW02 6309 62DW03 630A UUGINP83921 INSTPLAN EXEC ENDED SUCCESSFULLY keady; T=0.06/0.07 17:44:47									
62DS01 6306 62DW01 6308 62DW02 6309 62DW03 630A UGINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY Ready; T=0.06/0.07 17:44:47									
62DP01 6307 62DW02 6309 62DW03 630A UGINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY Ready; T=0.06/0.07 17:44:47		62DRES	6305						
62DW01 6308 62DW03 630A CUGINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY leady; T=0.06/0.07 17:44:47			6306						
62DW02 6309 62DW03 630A UGINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY Ready; T=0.06/0.07 17:44:47			6307						
62DW03 630A IUGINP83921 INSTPLAN EXEC ENDED SUCCESSFULLY Ready; T=0.06/0.07 17:44:47									
GUGINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY Ready; T=0.06/0.07 17:44:47									
keady; T=0.06/0.07 17:44:47									
	IUGINP83921	INSTPLAN	EXEC ENDE	D SUCCESSI	FULLY				
RUNNING R\$54	Ready; $T=0.0$	06/0.07 17	7:44:47						
RUNNING R\$54									
RUNNING RS54									
RUNNING RS54									
Running RS54									
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mplate your session evaluations online at www.SHAPE.org/Orlando-Eval	1.7		1	1		1.0.5	101		

INSTPLAN: We pressed "PF5" to process DASD choices. The result is one last opportunity to check for correctness, and a CMS "Ready;" prompt.



# Action: Time to invoke INSTALL





INSTPLAN has finished.

You have double-checked your work.

It's all correct, so... ...it's time to execute **INSTALL** 



## Action: Time to invoke INSTALL

FileOptionsinstallUGLIS84901UGLIS84901UGLIS84901NOW FORMATTING VOLUME 6301 (1 OF 10)UGLIS84901UGLIS84901NOW FORMATTING VOLUME 6302 (2 OF 10)UGLIS84901UGLIS84901UGLIS84901NOW FORMATTING VOLUME 6303 (3 OF 10)UGLIS84901UGLIS84901NOW FORMATTING VOLUME 6305 (5 OF 10)UGLIS84901UGLIS84901NOW FORMATTING VOLUME 6306 (6 OF 10)UGLIS84901UGLIS84901NOW FORMATTING VOLUME 6307 (7 OF 10)UGLIS84901UGLIS84901NOW FORMATTING VOLUME 6308 (8 OF 10)UGLIS84901UGLIS84901NOW FORMATTING VOLUME 6304 (10 OF 10)UGLIS84911UAD OF THE SYSTEM IIS TO COMMON VOLUME COMPLETED SUCCESSFULLYUGLIS84311UGLIS84311UAD OF THE SYSTEM IIS TO MEMBER RES VOLUME COMPLETED SUCCESSFULLYUGLIS84901UGLIS84901VM ALLOCATING DASD 6301COMPLETED SUCCESSFULLYUGLIS84901UGLIS84901NOW ALLOCATING DASD 6305 (RES VOLUME)UGLIS84901UGLIS84901UGLIS84911WAILOCATING DASD 6305 (RES VOLUME)UGLIS84911UGLIS84911UGLIS84401NOW ALLOCATING DASD 6306 (SPOOLING)UGLIS84401UGLIS84401UGLIS84401NOW LOADING MAINTCF1 (CF1)DISK 2 0F 317UGLIS84401UGLIS84401NOW LOADING MAINT 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IUGILB8440I NOW LOADING BLDNUC 191 (8AD) DISK 12 OF 317 IUGILB8440I NOW LOADING BLDRACF 191 (8AC) DISK 13 OF 317	IUGILB8440I NOW LOADING MAINT 191 (923) DISK 15 OF 317



INSTALL takes off.

Once the 3390-3 volumes are initialized, things move along at a fairly brisk pace.



# Action: Time to invoke INSTALL

		x3270-4 rs54 <3>	$\odot \odot \otimes$
File	Options		
		LOADING 6VMRSC30 402 (858) DISK 304 OF 317	
		LOADING 6VMRSC30 406 (859) DISK 305 OF 317	
		LOADING 6VMRSC30 400 (856) DISK 306 OF 317 LOADING 6VMRSC30 493 (85C) DISK 307 OF 317	
		LOADING 6VMRSC30 493 (83C) DISK 307 0F 317	
		LOADING 6VMTCP30 2B2 (86E) DISK 308 OF 317	
		LOADING 6VMTCP30 2C4 (866) DISK 310 OF 317	
		LOADING 6VMTCP30 29D (867) DISK 311 OF 317	
		LOADING 6VMTCP30 2D2 (868) DISK 312 OF 317	
		LOADING 6VMTCP30 2A6 (869) DISK 313 OF 317	
		LOADING 6VMTCP30 2A2 (86A) DISK 314 OF 317 LOADING 6VMTCP30 2B3 (86F) DISK 315 OF 317	
		LOADING 6VMTCP30 283 (86F) DISK 313 OF 317	
		LOADING 6VMTCP30 492 (86C) DISK 317 OF 317	
		R DIRECTORY HAS BEEN BROUGHT ONLINE SUCCESSFULLY	
		IPL COMMAND HAS COMPLETED SUCCESSFULLY	
UGIWF	F8341I ECK	DDUMP OF 2CFO COMPLETED SUCCESSFULLY	
		RUNNING	RS54
A			042/001



And by "brisk" I mean "a few minutes, and 317 steps later..."





x3270-4 rs54 <3> V O X File Options 19:04:50 z/VM V6 R3.0 SERVICE LEVEL 0000 (64-BIT) 19:04:51 SYSTEM NUCLEUS CREATED ON 2013-05-29 AT 10:48:03, LOADED FROM 62DRES 19:04:51 19:04:51 19:04:51 \* LICENSED MATERIALS - PROPERTY OF IBM\* 19:04:51 \* 19:04:51 \* 5741-A07 (C) COPYRIGHT IBM CORP. 1983, 2013. ALL RIGHTS 19:04:51 \* RESERVED. US GOVERNMENT USERS RESTRICTED RIGHTS - USE, 19:04:51 \* DUPLICATION OR DISCLOSURE RESTRICTED BY GSA ADP SCHEDULE 19:04:51 \* CONTRACT WITH IBM CORP. 19:04:51 \* 19:04:51 \* \* TRADEMARK OF INTERNATIONAL BUSINESS MACHINES. 19:04:51 19:04:51 19:04:51 HCPZC06718I Using parm disk 1 on volume 62DCM1 (device 6301). 19:04:51 HCPZC06718I Parm disk resides on cylinders 1 through 120. 19:04:51 The directory on volume 62DRES at address 6305 has been brought online. 19:04:52 HCPWRS2513I 19:04:52 HCPWRS2513I Spool files available 29 19:04:52 HCPWRS2512I Spooling initialization is complete. 19:04:52 DASD 6306 dump unit CP IPL pages 10675 19:04:52 HCPMLM3016I Management by the Unified Resource Manager is not available for this system. 19:04:52 HCPAAU2700I System gateway SHARE125 identified. 19:04:52 HCPLNM101E DASD OCF1 forced R/O; R/O by SYSTEM; stable by SYSTEM 19:04:52 HCPLNM101E DASD OCF3 forced R/O; R/O by SYSTEM; stable by SYSTEM 19:04:52 z/VM Version 6 Release 3.0, Service Level 0000 (64-bit), 19:04:52 built on IBM Virtualization Technology 19:04:52 There is no logmsg data 19:04:52 FILES: NO RDR, NO PRT, NO PUN 19:04:52 LOGON AT 19:04:52 EDT SATURDAY 07/11/15 19:04:52 GRAF 0020 LOGON AS MAINT630 USERS = 1 19:04:52 HCPIOP952I 0256M system storage 19:04:52 FILES: 0000002 RDR, 0000001 PRT, NO PUN 19:04:52 HCPCRC8082I Accounting records are accumulating for userid DISKACNT. 2013-05-29 10:47 z/VM V6.3.0 19:04:53 AUTO LOGON \*\*\* USERS = 2OP1 BY MAINT630 19:04:53 HCPCLS6056I XAUTOLOG information for OP1: The IPL command is verified b v the IPL command processor. z/VM DASD DUMP/RESTORE PROGRAM HCPDDR698I DATA DUMPED FROM 0X0100 TO BE RESTORED MORE... SHARE125 4A042/00

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...INSTALL finishes loading MDISK images, and the initial boot of the installed system takes place.

Some housekeeping will ensue.





x3270-4 rs54 <3> V OX File Options HCPDDR697I NO VOL1 LABEL FOUND RESTORING 0X0100 DATA DUMPED 04/11/13 AT 18.12.19 GMT FROM 0X0100 RESTORED OUTPUT CYLINDER EXTENTS INPUT CYLINDER EXTENTS STOP START START STOP 3329 3329 END OF RESTORE BYTES RESTORED 2461676300 END OF JOB z/VM DASD DUMP/RESTORE PROGRAM ICPDDR698I DATA DUMPED FROM 0X0100 TO BE RESTORED HCPDDR697I NO VOL1 LABEL FOUND RESTORING 0X0100 DATA DUMPED 04/11/13 AT 18.12.19 GMT FROM 0X0100 RESTORED INPUT CYLINDER EXTENTS OUTPUT CYLINDER EXTENTS START STOP START STOP 3329 3329 END OF RESTORE BYTES RESTORED 2461676300 END OF JOB IUGPLD8341I POSTLOAD PROCESSING STARTED DMSACC724I 4CC replaces C (4CC) IUGIFP8493I ISSUING XAUTOLOG FOR VMSERVU AUTO LOGON \*\*\* VMSERVU USERS = 3 HCPCLS6056I XAUTOLOG information for VMSERVU: The IPL command is verified by the IPL command processor. IUGIFP8493I ISSUING XAUTOLOG FOR VMSERVR AUTO LOGON \*\*\* VMSERVR USERS = 4HCPCLS6056I XAUTOLOG information for VMSERVR: The IPL command is verified by the IPL command processor. IUGIFP8493I ISSUING XAUTOLOG FOR VMSERVS AUTO LOGON \*\*\* VMSERVS USERS = 5HCPCLS6056I XAUTOLOG information for VMSERVS: The IPL command is verified by the IPL command processor. RUNNING SHARE125 042/001

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Housekeeping: The POSTLOAD process restores some additional DASD, and SFS File Pool Servers are initialized...





#### After INSTALL, the first IPL of 2<sup>nd</sup>-level system:

			x3270-4 rs54 <3>			$\odot$ $\odot$ $\otimes$
File	Options					
USER D	SC LOGOFF #	AS VMSERVR USE	RS = 4	FORCED BY M	IAINT630	
AUTO LO	OGON ***	G XAUTOLOG FOR V VMSERVR USE OG information f ssor.	RS = 5	The IPL co	ommand is veri	ified by the
AUTO LO	OGON ***	G information f	RS = 6	The IPL co	ommand is veri	ified by the
USER D		NG SYSTEM TABLES AS VMSERVP USE				(ES
AUTO LO HCPCLSO IPL CO DASD 0 Z/VM VO	DGON *** 6056I XAUTOLO Dommand proces 193 DETACHED 6.3.0 2013	XAUTOLOG FOR V VMSERVP USE OG information f sor. -05-29 10:47 -STAT not avail	RS = 6 or VMSERVP:	The IPL co	mmand is veri	fied by the
HCPCFX0 HCPNSD4 023. BLDCMS	440I The Name : CONNECT= : LOGOFF AT	BLDCMS USE of BLDCMS init of Saved System 00:00:01 VIRTCP 19:12:10 EDT S S BLDCMS USE	(NSS) CMS w U= 000:00.00 ATURDAY 07/	as successf D TOTCPU= C 11/15 BY MA	ully defined 000:00.04 AINT630	in fileid O
					RUNNING	SHARE125
4 <u>A</u>						042/001

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More housekeeping: SFS file pool server initialization completes.

Shareable components of CMS on the newly-installed system are initialized.





#### After INSTALL, the first IPL of 2<sup>nd</sup>-level system:

	x3270-4 rs54 <3>	
File Optic		
	There are 0 parts with local modifications that need to be reprocessed. Creating 6VMLEN20 PSUPLAN file at service level RSU-1301 for	
VMFUTL2767I	component LE in PPF SERVP2P. VMFPSU processing completed successfully Reading VMFINS DEFAULTS B for additional options VMFINS processing started	
VMFINS2603I VMFREQ2805I	Processing product :PPF SERVP2P LE :PRODID 6VMLEN20%LE Product :PPF SERVP2P LE :PRODID 6VMLEN20%LE has passed requise checking	site
VMFREC27601 VMFREC18521	Installing product :PPF SERVP2P LE :PRODID 6VMLEN20%LE VMFREC processing started Volume 1 of 1 of INS ENVELOPE 6301 (1 of 5) VMFRCAXL processing AXLIST	
VMFRCX2159I VMFREC1851I VMFRCP2159I	Loading 4 part(s) to DELTA 4D2 (J) (2 of 5) VMFRCPTF processing PARTLST Loading 1 part(s) to DELTA 4D2 (J)	
VMFRCC2159I VMFREC1851I	<pre>(3 of 5) VMFRCCOM processing DELTA Loading 2 part(s) to DELTA 4D2 (J) (4 of 5) VMFRCALL processing APPLY Loading part(s) to APPLY 4A6 (G)</pre>	
VMFRCA2159I VMFREC1851I VMFRCA2159I	Loaded 8 part(s) to APPLY 4A6 (G) (5 of 5) VMFRCALL processing BUILDB Loading part(s) to BUILDO 49E (K) Loaded 4 part(s) to BUILDO 49E (K)	
VMFREC2189I	Updating Requisite table 6VMLEN20 SRVREQT, Description table 6VMLEN20 SRVDESCT and Receive Status table 6VMLEN20 SRVRECS with new PTFs from INS 6301	with 1
VMFINT2603I VMFINS2760I VMFAPP2760I	VMFREC processing completed successfully Product installed VMFINS processing completed successfully VMFAPPLY processing started	
VMFAPP2106I	Apply list CEEVM contains 0 PTFs that need to be applied and that are already applied VMFAPPLY processing completed successfully.	1 PTFs
	The Apply list CEEVM contains 1 PTFs. 1 PTFs were already applied. 0 PTFs applied successfully. 0 PTFs were included.	
	0 PTFs were excluded or require excluded PTFs. 0 PTFs failed	
	RUNNING SHA	ARE125
4 <u>A</u>		042/001

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More housekeeping:

Next, any pending service updates embedded with the installed system image are processed.





	x3270-4 rs54 <3>	$\odot$ $\odot$ $\otimes$
File	Options	
VMFP2P2 DMSACC7	<pre>service. 239I CMS was serviced. Re-IPL CMS in all virtual machines running use the new service. 760I PUT2PROD processing completed successfully 24I 4CC replaces C (4CC) ***********************************</pre>	CMS to
	INSTCOMP NOW ISSUING SHUTDOWN REIPL * ***********************************	
4A	RUNNING SHA	RE125
omplete	your session evaluations online at www.SHARE.org/Orlando-Eval	

Yet more housekeeping:

Services have been initialized, and pending service updates are tidied up. The initial installation process automatically shuts down the fresh system with the **REIPL** option specified.



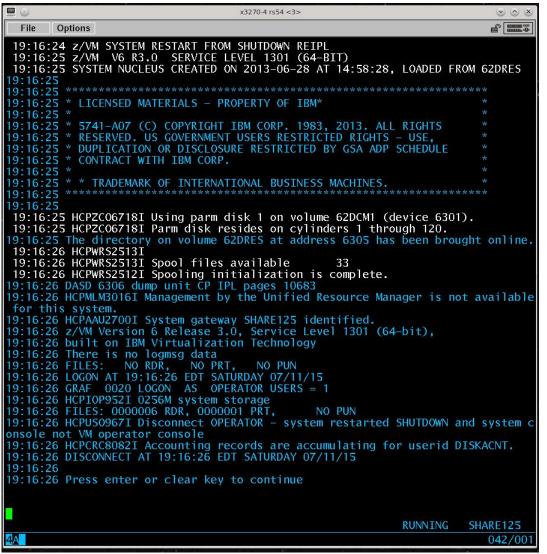


#### After INSTALL, the first IPL of 2<sup>nd</sup>-level system:

	x3270-4 rs54 <3>	$\odot$ $\odot$
File Optio	ns	
0: 19:15:3	2 HCPWRP963I SHUTDOWN STEP USOAC - JOURNAL USER TERMINATIO	)N
	2 HCPWRP963I SHUTDOWN STEP MFRSD - TERMINATE HARDWARE LOAD	
0: 19:15:33	3 HCPWRP963I SHUTDOWN STEP APISD - TERMINATE OTHER PROCESS	SORS
0: 19:15:34	4 HCPWRP963I SHUTDOWN STEP ENASD - DISABLE TERMINAL DEVICE	S
0: 19:15:34	4 HCPWRP963I SHUTDOWN STEP KCBSD - PERFORM ISFC SHUTDOWN 1	TASKS
	5 HCPWRP963I SHUTDOWN STEP ISHDN - SHUT DOWN I/O SUBSYSTEM	1
0: 19:15:3	5 HCPWRP963I SHUTDOWN STEP SGPST - STOP OTHER PROCESSORS	
	5 HCPWRP959I SHARE125 SYSTEM TERMINATION IN PROGRESS ON 20	015-07-11
0: 19:15:30	5 HCPWRP963I SHUTDOWN STEP TXTDS - TERMINATE DATA TRACES	
0: 19:15:30	5 HCPWRP963I SHUTDOWN STEP SVACV - ACTIVATE TERMINATION SA	AVE AREAS
0: 19:15:37	7 HCPWRP963I SHUTDOWN STEP CHMOF - DISABLE CHANNEL MEASURE	MENT
	7 HCPWRP963I SHUTDOWN STEP ISHDA – DISABLE ALL DEVICES	
	3 HCPWRP963I SHUTDOWN STEP CKPSH - TAKE A CHECKPOINT	
	3 HCPWRP963I SHUTDOWN STEP OPRCK - SAVE OPERATOR CONSOLE L	
	9 HCPWRP963I SHUTDOWN STEP MCWMD - DETERMINE MACHINE CHECK	
	9 HCPWRP963I SHUTDOWN STEP SDVRS - RESET IBM DASD CU CHAR∤	ACTERISTICS
	) HCPWRP962I VM SHUTDOWN COMPLETED IN 11 SEC	
	) HCPWRP963I SHUTDOWN STEP SGQXX - RESET OTHER PROCESSORS	
	I HCPWRP9277I SYSTEM TERMINATION COMPLETE, ATTEMPTING REST	FART
	HCPWRP9277I 2015-07-11 SYSTEM SHARE125	
0: 19:15:4	I HCPWRP963I SHUTDOWN STEP SVADV - DEACTIVATE TERMINATION	SAVE AKEAS
A	MORE	R\$54 042/00

The newly-installed system image has successfully shut down, and is about to re-IPL itself...





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Automatic SHUTDOWN has completed; automatic re-IPL has completed.

Note that OPERATOR has automatically disconnected from the system console.

This is normal for a WARM start where OPERATOR wasn't logged on to the console at the time of system shutdown.





## Finis

# Some observations about the install process:



- It takes more time to narrate the installation process than it does to actually execute it.
  - On our lab system, the actual "heads down" time was about 30 minutes.
  - Pay attention to details when completing the worksheets...
  - ...and when transcribing them to the install dialogs.
    - ... or don't, and enjoy the process of
       Coming to the Attention of Important People ...



- End result: A "second-level" z/VM 6.3 system
  - Not a cluster member (non-SSI)
    - ...although with multiple virtual machines, you could make a virtual SSI cluster.
  - "Traditionally" managed (i.e. not enabled for xCAT)
- What's the point?
  - Test / development environment established
    - First-level hypervisor protects other guests from "collateral damage" if something horrible happens to this new system.
  - Other uses: "Your mileage may vary" depending on need
    - Training; initial deployment of new service updates or OEM products; "safe playground" for systems programmer.



# Next Steps Where to from here?



- A: "It depends."
- Typical next steps:
  - Deploy in LPAR instead of as a 2<sup>nd</sup>-level guest:
    - Do <u>NOT</u> try to run same system volumes from two locations concurrently. At best, "results may be unpredictable."
  - Enable, configure and implement networking:
    - TCP/IP
    - RSCS (NJE)
  - Provision resources for other guest virtual machines:
    - Linux, z/OS, z/VSE, z/TPF, CMS
  - Provision systems management / security tools:
    - RACF, DIRMAINT, Automation, Tape Management, Backup...
    - Non-IBM OEM tools



## Next steps It's all about choices



- Except, perhaps, for the parts that are all about policy.
- "Next steps" are dictated by installation needs.
- Needs of the enterprise dictate the level of complexity
  - Mix of features and products
  - Cluster or monolithic system configuration?
    - Two-way? Four-way?
      - » Remote? How remote?
  - Traditional or xCAT-style system management?
- Goal: Keep it as simple as necessary but no more so.



# Additional Resources a/k/a "Things I wish I had known..."



- This week:
  - Tuesday afternoon: z/VM 6.3 Hands-On Lab
  - This week: Spot a ribbon wearer, ask questions!
- Online
  - http://www.vm.ibm.com/ "All Things z/VM"
  - http://listserv.uark.edu/archives/ibmvm.html IBMVM Listserv
  - http://www2.marist.edu/htbin/wlvindex?LINUX-VM Linux-390 Listserv



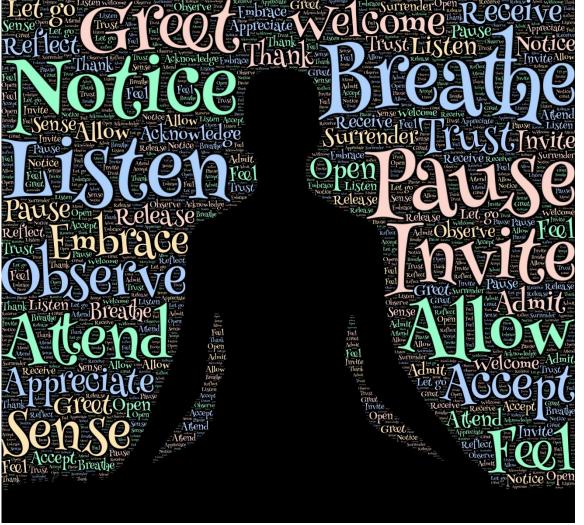
## A Gentle Introduction to z/VM System Install: Questions, comments, and feedback?







# THANK YOU! – Session 17481 Intro to z/VM System Installation



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