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

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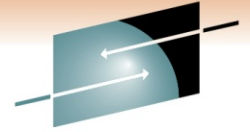
Agenda

- Introductions
- Goals & Objectives
- Things you should have: Raw Materials
- Things you need to decide: Choices
- Things you need to do: First Steps
- Things you will create: Procedure
- What you just did: Results
- Things to do next: Now what?
- Additional Resources

Introductions

- ## About Rocket Software:

- Rocket Software was founded in 1990 with an initial focus on developing and delivering software solutions to IBM mainframe customers deploying IBM DB2. Within the first five years, Rocket licensed all of its intellectual property to IBM, and all of Rocket's products were rebranded and licensed to enterprises through IBM's worldwide sales channel.

- Since those early years, Rocket has expanded its software OEM business to cover a wide spectrum of enterprise infrastructure products in the areas of Business Intelligence, Storage, Networks, Terminal Emulation, Integration, Security, and Database. And in addition to IBM, Rocket has licensed its products to a number of major OEMs that include Microsoft, RSA, EMC, Nortel, Motorola, and HP.

- In parallel with a significant R&D investment in developing software products, Rocket Software began a series of strategic acquisitions in 2000. As a result, Rocket now has well over 100 software products that are licensed both through OEM partners and resellers, and via direct sales through Rocket's acquired branded sales channels, such as Mainstar, Servergraph, CorVu, BlueZone, and Seagull.

- Rocket values the technical skills and deep domain expertise of the employees at the companies we acquire. We endeavor to keep the teams intact and entrust them to manage and expand the product lines that they initially created. This philosophy has allowed Rocket to grow to more than 700 employees around the world, including Eastern and Western Europe, Australia, Asia and North America.

  More at: http://www.rocketsoftware.com/about

Introditions

- ## About your speaker

  - ### Life as a customer…
    - z/VM System Programmer starting some time around VM/370 R6 PLC 3
      - *i.e., "For a while…"*
    - University of Arkansas
      - *"VM Workshop" speaker and tools tape contributor; IBMVM (nee VMESA-L) List Moderator*
      - *Knights of VM: "Sir Dan, Keeper of the List"*
      - *Unix/Linux sysadmin; Open systems / IT security Manager*
      - *See above, re: "For a while…"*
    - Multiple platforms
      - *z/OS ancestors, MUSIC, UTS, OS/2, Unix, Solaris, Linux, HPC Clustering*
      - *Assorted strange and fierce creatures: Teradata, DPCX, DPPX, Amoeba*
      - *s/370 et cetera, 3650, 8100; Intel, POWER, SPARC, MIPS, PA-RISC, other…*
      - *i.e, "I've done some weird stuff…"*

  - ### Life as a developer…
    - Senior Software Developer for Rocket Software, Inc since 2003
    - Lead developer, IBM Backup and Restore Manager for z/VM (5697-J06)
      and IBM Archive Manager for z/VM (5697-J05)
    - Team Member for development of IBM Tape Manager for z/VM (5697-J08)
      and IBM Operations Manager for z/VM (5697-J10)

  - ### Life away from the keyboard…
    - Active duty law enforcement officer and first responder
      - *Because a P1S1 call at 4:45 on a Friday afternoon isn't exciting enough…*

Goals & Objectives

- Goal: 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

Significant assumptions

- You are using a currently supported processor

- You are using a currently supported z/VM release
  - z/VM 6.1 is used in examples; same basic steps apply to 5.x

- You are authorized to access and use any of the resources you need to perform these tasks…
  - …otherwise, you should use your powers for good…
    - …instead of evil…
      - *…even if it would highly educational…*
        - *…or just <u>really</u> funny.*

Things you should have:
Verify you have the right materials

- Make sure you received what you ordered.

  - Review the Packing List.

    - Otherwise, how do you know you actually received what you asked for?

    - If you didn't, did somebody else?

    - If the materials you received are inconsistent with the packing list, stop now – and don't resume until the situation is corrected.
      - *It's not common, but mistakes happen. Fix It Now.*

Things you should have: Instructions

- Program Directories
  - GI11-4339 – Program Directory for z/VM System Delivery Offering for z/VM SDO *version 6 release 1*
  - GI11-4319 – Program Directory for z/VM *version 6 release 1*

- "The Book"

  GC24-6197 – z/VM Guide for Automated Installation and Service – *version 6 release 1*

  download from http://www.vm.ibm.com/library

Things you should have:
Raw Materials

- "Basic Machine-Readable Material"
    - Tape (3590 or 3592) *(Installation for ECKD DASD)*
    - DVD *(Installation for ECKD DASD –or– or SCSI/FBA)*
    - Digital Download *(Installation for ECKD or SCSI/FBA)*

- Directions
    - …are not just for sissies. Please do not treat this as a matter of pride…
        - …really…
            - *…there will be consequences…*
                - *…just trust me.*

Choices:
Installation methods

- First, some terminology *

    - "First level"
        - You're installing to a bare LPAR
            - *"Because when I was a youngster, we couldn't AFFORD virtual machines…"*

    - "Second level"
        - You're installing to a virtual machine environment
            - *…as implemented by the z/VM Control Program…*
                - *…because your non-z virtualization is not cool enough to do this.*

    - ** Those committing puns will be severely taunted.*

Moving forward:
Several paths, one destination.

- Initial hands-on procedures will differ, according to the choice of installation media.

- Initial steps will converge toward a common set of tasks as the installation process moves forward.

- Step away from the digital media and go back to the worksheets.
  - Do not proceed beyond this point until instructed to do so.

Moving forward:
A Footnote on Recommended Service

- RSU – The Recommended Service Update

  - Ships as part of SDO
  - Can be ordered separately
  - Includes <u>recommended</u> service updates

    - …which implies less than <u>all</u> service updates
      - *…but is likely more than sufficient for installation purposes.*

  - File for later action: RSUs are updated periodically. If there's a time lag between installation and production deployment, you may want to check for a new RSU…

Things to do: Worksheets

- Refer to "Guide for Automated Installation and Service"

  - Path is determined by choice of media.

    - Tape: Refer to the "z/VM System DDR Installation" section

    - DVD: Refer to the "z/VM System Image DVD Installation" section

    - Download: Refer to instructions provided with the download.
      - *Converges toward same steps as the DVD-based method.*
        - *Filed away under "Advanced Topics" and not further discussed here.*

In the beginning…

- …there were two worksheets:
  - Installation and Basic IP Connectivity

  - Published in "Guide for Automated Installation and Service"

  - "Choose one from column A, one from column B…"

	Media Type	Installation Method
•	System DDR (Tape)	First Level ("Bare LPAR")
•	System Image DVD	Second Level ("virtual machine")

  - *Any combination is acceptable. There are no "wrong" choices, but each approach brings its challenges…*
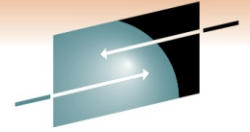
In general terms…

- The installation process consists of these steps:
  - Complete the planning process
    - Failure to do so is akin to standing on a mountain top…
      - *…during a thunderstorm…*
        - *…while clad in wet copper armor, and swinging from a lightning rod.*

  - Identify and allocate resources
  - Load supplied machine-readable materials
  - Deploy the Initial Installation System to DASD
  - Apply any additional service updates
  - Post-installation housekeeping

"First Level" Installation Resources

- An LPAR ("…on a supported processor…")
  - *256MB (or more) real storage and 1 (or more) processor*

- Some DASD
  - *3390-3   (Five [or six…] volumes)*
  - *3390-9   (Three [or four…] volumes)*
    - *Caveat: For either case, choices may require 1 additional volume*
    - *Caveat: Beware DASD volume labeling requirements*

- A terminal
  - *"Local, non-SNA 3270" … or equivalent.*

- Access to the HMC

"Second Level" Installation Resources

- A Virtual Machine (i.e. some z/VM login credentials)
  - *At least 64MB virtual storage and one virtual CPU (CP or IFL)*

- Some DASD
  - *5 * 3390-3, 3 * 3390-9, or equivalent*
  - *Virtual Machine 191 minidisk (minimum of 500 4K EDF blocks)*
    - *Caveat: For either case, choices may require 1 additional volume*
    - *Caveat: Beware DASD volume labeling requirements IF using REAL DASD volumes.*

- A terminal
  - *Anything sufficient to provide connectivity to first-level z/VM.*

- Some CP Privileges (See documented requirements)

Things you will create:
What the installation process generates

- All routes through installation ultimately create:

  - For "5 x 3390-3"
    - 610RES, 610SPL, 610PAG, 610W01, 610W02, *610W03 **

  - For "3 x 3390-9"
    - 610RES, 610SPL, 610PAG, *610W01**

    - vrmRES: Sysres / IPL volume
    - vrmSPL: Spool area (guest "unit record"; system data)
    - vrmPAG: Page area (non-resident guest pages)
    - vrmW0n   Non-volatile minidisk (CMS / guest DASD)

Caveat:
DASD Labels, Migration Considerations

- Recommendations

  - Use the provided default volume labels.
    - Mandatory for first-level install process anyhow.
    - Be mindful of volume label collisions, especially in shared DASD scenarios.
    - Know what you're shooting at before you pull the trigger.

  - Do NOT use volumes created by the install process for anything else.
    - Best practice: Separate "your stuff" from "their stuff".
    - Requirement for release-to-release automated migration.

Example:
Installation Worksheet (Tape method)

Table 1. DDR Installation Worksheet

Installation method (first-level or second–level): _____

Install To column: record an "M" if you will load the product to a minidisk or an "F" if you will load the product to the VMSYS file pool.

Install To	Product	Install To	Product	Install To	Product
	VM		OSA		PERFTK
	VMHCD		RACF®		DIRM
	RSCS		ICKDSF		TCPIP

System default language: _____

DASD type and model: _____

Pack Type	DASD Label	New Label	DASD Address
RES	610RES	610RES	
SPOOL	610SPL		
PAGE	610PAG		
USER1	610W01		
USER2	610W02		
USER3	610W03		

"First" or "Second"

"M" (minidisk) or "F" (SFS – Shared File System)

Personal bias: Use "M"

"vrmXXX", "vrmXXX", rdev #
…
…
…
…
…
"vrmXXX", "vrmXXX", rdev #

Example:
TCP/IP Configuration Work Sheet
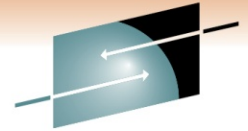
Table 2. DDR Installation TCP/IP Configuration Worksheet

z/VM user ID of the z/VM TCP/IP stack virtual machine: (Default value is TCPIP. If you change this user ID, you must define the user ID in your user directory before running IPWIZARD.)	
Host name (20):	
Domain name (40):	
DNS IP address (up to three addresses):	1) _____ 2) _____ 3) _____
Gateway IP address :	
Interface name (16):	
Device number:	
IP address:	
IPv4 subnet mask (15) or IPv6 prefix length (3):	
Path MTU discovery (IPv4 interfaces):	__ Enabled __ Disabled
Choose the interface you will be using (check one):	__ QDIO __ LCS __ HiperSockets __ CLAW __ CTC See the appropriate interface worksheet to record more information. IPv6 is available only for QDIO and HiperSockets devices.
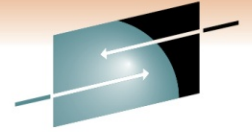
Process:
First-level, via Tape

- Mount the tape

- First IPL: Load stand-alone ICKDSF from tape
  - Initialize, CP Format, and Label DASD volumes

- Second IPL: Load stand-alone DDR from tape
  - "DASD Dump Restore" CP utility
  - Restore "canned" volume images from tape

- IPL restored Initial Installation System from DASD

- *Details: z/VM Guide for Automated Installation & Service*

Process:
Second-level, via Tape

- Log on to second-level install user ("Turn on the machine")

- Attach tape drive, mount tape

- Load and run installation tools
  - INSTPLAN – "plug in" planning choices
  - INSTIIS – Load initial install system to DASD

- IPL restored Initial Installation System from DASD
  - *Footnote: You could also run the First-Level installation process in a virtual machine. Think about it…*

SHARE
in Anaheim
2011

Process:
Second-level, via Tape – load tool set

Process:
Second-level, via Tape – Run INSTPLAN

```
Session B - [43 x 80]

                        *** z/VM INSTALLATION PLANNING ***

Mark the product(s) selected to be installed into the VMSYS filepool with an
"F" and those selected to be installed to minidisks with an "M"

Install To     Product      Install To     Product      Install To     Product
----------     ---------    ----------     ---------    ----------     ---------
    M          VM               M          RSCS             M          TCPIP
    M          OSA              M          ICKDSF           M          DIRM
    M          RACF             M          PERFTK           M          VMHCD


Place a nonblank character in front of the System Default Language you would
like for your system.

    x AMENG          _ UCENG          _ KANJI          _ GERMAN

Place a nonblank character in front of the DASD model onto which your
z/VM system will be loaded. Only one model may be selected.


    x 3390 Mod 3          3390 Mod 9




        PF1 = HELP     PF3/PF12 = QUIT     PF5 = Process     ENTER = Refresh

MA    b                                  ⇑                           22/029
```

Time: 00:03

Process:
Second-level, via Tape – INSTPLAN done

```
Session B - [43 x 80]

          HCPIPX8475I THE PRODUCTS YOU SELECTED TO LOAD TO MINIDISK ARE:
                      VM RSCS TCPIP OSA ICKDSF
                      DIRM RACF PERFTK VMHCD

                      THE PRODUCTS YOU SELECTED TO LOAD TO SFS ARE:
                      NONE

                      THE SYSTEM DEFAULT LANGUAGE SELECTED:
                      AMENG

                      THE DASD TYPE YOU SELECTED TO LOAD ON IS:
                      3390 Mod 3

                      THE DASD NEEDED TO LOAD z/VM ARE:
                      530RES 530SPL 530PAG 530W01 530W02

          HCPINP8392I INSTPLAN EXEC ENDED SUCCESSFULLY
          Ready; T=0.05/0.06 18:16:22















                                                         RUNNING   RS54

MA     b                              ⇧                         42/001
```

Time: 00:04

Process:
Second-level, via Tape – Run INSTIIS

Process:
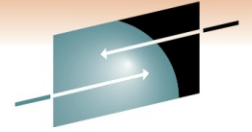# Second-level, via Tape – Run INSTIIS

Process:
Second-level, via Tape – INSTIIS complete

Process:
Install from DVD or Downloadable Image

- Used to install system to ECKD or FBA/SCSI DASD
  - Tape only applies to ECKD…
  - …but not everybody has tape drives.

- Procedurally more complex due to greater number of "moving parts".
  - First-level requirements for communication between HMC and SE.
  - Network infrastructure requirement for FTP server.

- *See "z/VM Guide to Automated Installation and Service" for detailed requirements.*

Process:
First-level via DVD

- Make DVD available
  - …via HMC or network-attached server

- IPL RAMDISK
  - Special build of z/VM intended for install bootstrap

```
ERROR: stackunderflow
OFFENDING COMMAND: ~

STACK:
```