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Installing the Novell SLES 10 Starter System without a Net(work)

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Agenda

- Why use it? What does it do? What does it NOT do?
- How the “Novell SUSE Linux Enterprise Server Starter System for System z” ... came to life
- How long does it take to download from Novell and upload to a z/VM system? (YMMV)
- Things learned to even get the Starter System downloaded (properly)
- How difficult was it to actually install?
- Creating the NOVSTART userid
- Install a “real” server (e.g. NOVCLNT1) from the Starter System (NOVSTART)
- If time and the wireless network permits, a live demo

Pause For Some Background



- This session was initially created and presented by Mike Walter of Hewitt Associates
- I didn't want to remove everything Mike said in terms of his experience with the Starter System
- Until I figure out a better way to do it, that makes some of the slides appear as though I'm talking about my experience, when it's really Mike.
- Sorry if that gets confusing.

Why Use It?

- Historically, one of the biggest hurdles to implementing Linux on the mainframe is gaining network access to the installation media from the mainframe.
 - Installation routines cannot access built-in DVD reader
 - The interface is not documented, and it's horribly slow
 - Access to another system with enough space to store the installation files
 - Firewall rule changes needed
- The SUSE Linux Enterprise Server Starter System eliminates this hurdle for shops running z/VM. This is done via a pre-built installation server running on z/VM.

What Does It Do?



- The SUSE Linux Enterprise Server Starter System for System z is a **pre-built installation server** for SUSE Linux Enterprise Server for System z that can be installed on your z/VM system using CMS tools, **eliminating the need for coordinating access to a separate Linux or UNIX system elsewhere on your network** and minimizing the impact of network-based installation on your internal and external networks.
- Acts as a "rescue" system (by booting the IPL decks from the virtual reader).
- Can be used for upgrading pre-SP2 systems as well as new installs.

What Does It Not Do?

- The starter system image has been highly customized for **use as an installation server** for other SUSE Linux Enterprise Server for System z servers running in virtual machines or in an LPAR. The starter system is **NOT suitable for general use** and you should not attempt to use it for any other purpose.
 - It should be easy to adapt it to being a maintenance mirror/update server, but that would be as much extra that I would recommend doing with it.
- It doesn't help z/OS-only shops.
 - A working z/VM system is absolutely required to install the Starter System. If you don't have it, contact your IBM rep for an evaluation copy.

How the Starter System Came About



- From day one (early 2000), mainframe systems programmers have been baffled by the fact that Linux doesn't install the same way as z/OS, z/VM, etc.
 - No tape cartridges
 - Network connectivity required
- Late in 2006, Mike Walter of Hewitt Associates started lobbying in public for a way to do an install using only native z/VM tools.
- Sine Nomine Associates approached Novell at about the same time as I started working there in early 2007.
- I lobbied internally for, and eventually helped win approval.
 - It took some input from the mainframe Linux user community to make the case.

How the Starter System Came About



- From the time we got approval until the public release, was 10 weeks.
- A good part of that time was spent testing the documentation against reality and recreating new versions.
- The reaction was very good, so a second version was to be done when SLES 10 SP2 came out.
- The SLES10 SP2 version of the Starter System was available for download on July 18, 2008.

How long does it take to download from Novell and upload to a z/VM system?



- The amount of data to be downloaded for the SP2 version is about 3.3GB
 - How big of a network pipe do you have?
 - How busy are your firewalls and Internet proxies?
- Mike Walter reported
 - At the office, using Firefox: approximately 2 ½ hours for all pieces,
 - Another 2 hours to FTP from his laptop to z/VM. (YMMV)
- We do provide an ISO image that can be burned to a DVD
 - So if you get better download speeds at home, it might be a good idea to burn it there and take it to work.

Things learned to even get the Starter System downloaded (properly)

- Do not download with Microsoft Internet Explorer
 - At least not with IE Version 6; maybe Version 7 would be better but I'm not going to waste my time testing
 - IE caused file download corruption which was not detectable
 - No reported download errors from Internet Explorer
 - Allegedly, no reported errors reported during MD5 checksum verification on VM and the MD5 checksums verified on VM matched those in the NOVELL web site
 - But when booting the NOVSTART server the first time, it never completed, instead ending with messages:
`request_module: runaway loop modprobe binfmt-feab`
(5 lines repeated)
- Use Firefox or Seamonkey, or a command-line tool such as curl or wget. There are versions available for Windows.

Things learned to even get the Starter System downloaded (properly)

- It's always a good idea to verify the MD5 checksums on anything you download
- For most mainframe folks, this is a foreign concept.
- Download and install the latest CMS Pipelines RunTime Library from:
<http://vm.marist.edu/~pipeline/>
- Also download and install PICKPIPE EXEC from:
<http://www.vm.ibm.com/download/packages/>
- To display the MD5 checksum on a file which has been FTPed to z/VM, on the z/VM system enter:
PICKPIPE UPLEVEL (NOSEGMENT
PIPE < fn ft fm | DIGEST MD5 | SPECS 1-* C2X 1 | CONSOLE

How Difficult Was It To Actually Install?

- After getting past the download issue, it was a piece of cake for Mike, who's an experienced z/VM'er. (YMMV)
- Define the z/VM userid (NOVSTART) as specified in the manual and downloaded NOVSTART SAMPDIR. *If you have a Directory Manager product, by all means... use it!*
- Only if you have no Directory Manager (e.g. CA's VM:Secure, or IBM's DIRMAINT – both “priced products”; meaning “NOT free”):
 - Logon to MAINT
 - Run DISKMAP or DIRMAP to find free disk space cylinders as required in the Installation Guide

How Difficult Was It To Actually Install?

- COPYFILE USER DIRECT fm BACKUP DIRECT fm (OLDDATE (creating a backup copy, just in case...))
- XEDIT USER DIRECT
- Perhaps issue 'BOTtom' to get to the bottom of existing entries and add the new directory entry for NOVSTART.
- From the XEDIT command line after adding NOVSTART to the "USER DIRECT", enter: FFILE
- **Very important:**
 - Run DISKMAP and or DIRMAP, then XEDIT the resulting files, hint: FILELIST (TODAY)
 - Examine all disk "OVERLAP" records (generally "BAD" things unless done for a very specific reason). Another hint: ALL /OVERLAP/

How Difficult Was It To Actually Install?

- As long as there are no unintended disk “OVERLAP”s, enter the command: DIRECTXA
- Remember that you have a “BACKUP DIRECT fm” in case of errors.

Creating the NOVSTART userid

An example:

```
USER NOVSTART PASSWORD 512M 512M G
  IPL CMS PARM AUTOCR
  MACHINE XA 2 ('2' specifies the max. number of virtual CPUs on this virtual machine)
  CPU 0
  CONSOLE 0009 3215 T CONLOG
  SPOOL 000C 2540 READER *
  SPOOL 000D 2540 PUNCH A
  SPOOL 000E 1403 A
  LINK MAINT 0190 0190 RR
  LINK MAINT 019E 019E RR
  LINK MAINT 019D 019D RR
  NICDEF 0340 TYPE QDIO LAN SYSTEM GLAN1
* MDISK 0191 3390 startcyl 0005 USER01 MR READPW WRITEPW MULTIPW
* MDISK 019F 3390 startcyl 0050 USER01 MR ALL WRITEPW MULTIPW
* MDISK 0150 3390 startcyl 3283 USER01 MR READPW WRITEPW MULTIPW
* MDISK 0151 3390 startcyl 3338 USER02 MR READPW WRITEPW MULTIPW
* MDISK 0F00 3390 startcyl 3338 TEMP01 MR READPW WRITEPW MULTIPW
```

NOVSTART Boots, Now What?

- The Starter System has been designed so its first boot will read the “NETWORK PARMS A” file (which you edited with XEDIT before you had any Linux editors available), automatically reconfigure the Linux network to match, and automatically reboot using those parms.
 - If you make a mistake, jump a page ahead to “Recovering from a Damaged or Misconfigured Network Configuration”.
- Log in to the starter system as root from a SSH client such as PuTTY or another Linux system using the SSH command
 - Remember, SSH connects to port 22
 - From another Linux server, one would enter something like:
`ssh -l root nnn.nnn.nnn.nnn`

Install a “real” server (e.g. NOVCLNT1) from the Starter System (NOVSTART)

- Follow “Starting the Install Process” documentation.
 - Steps in *green italics* are documented in the manual. The rest are documented in other places, and may change based upon your site requirements.
 - *Using the “CLIENT SAMPDIR” downloaded from Novell, create a new userid (SLCLTEST in this example) in the USER DIRECT (or using your ESM)*
 - *Logon SLCLTEST*
 - *Format the 191 disk*
 - *Copy the PROFILE EXEC from NOVSTART 19F*
 - *Access the NOVSTART 19F disk (contains SLES EXEC and SWAPGEN EXEC)*
 - *Type: SLES*

Install a “real” server (e.g. NOVCLNT1) from the Starter System (NOVSTART)

- *Respond to install prompts with (in our demo):*
 - *4 - Start Installation of System*
 - *1 - Start Installation or Update*
 - *2 - Network*
 - *1 - FTP install network protocol (our choice)*
 - *2 - QDIO LAN connection (our choice)*
 - *0.0.0340, 0.0.0341, 0.0.0342 – three prompts for NIC addresses*
 - *2 - No DHCP*
 - *nnn.nnn.nnn.nnn - Your new client server's IP address (SLCLTEST in this demo)*
 - *255.255.255.0 – Netmask*
 - *nnn.nnn.nnn.nnn - Gateway's IP address (SLCLTEST in this demo)*
 - *nnn.nnn.nnn.nnn - Name server' IP address (SLCLTEST in this demo)*
 - *nnn.nnn.nnn.nnn - FTP server's IP address (NOVSTART in this demo)*

Install a “real” server (e.g. NOVCLNT1) from the Starter System (NOVSTART)

- 2 - Anonymous FTP
- 2 - No HTTP proxy
- / - *the FTP server directory*
- *At this point the following appears on the new server console:*
 - *** *login using 'ssh -X root@192.168.230.231' ****
 - *** *run 'yast' to start the installation ****
 - If you're running Windows on your desktop, and you don't have an X server running there, either make sure your SSH client is *not* set up to do X-11 forwarding, or do an “unset DISPLAY” command before proceeding.
- *Begin the full-service server SLES 10 SP2 installation, by entering:*
yast

Install a “real” server (e.g. NOVCLNT1) from the Starter System (NOVSTART)

- At this point, you’re on your own. YaST is YaST is YaST, with every site requiring a different local installation specification.
- But...
 - You have not used an existing UNIX or Linux system for the installation.
 - You have not used a production network except for the FTP to z/VM. (And you won't for all further installs.)
 - You did not require lots of Linux expertise to get this far.

“How to Report Problems With the Starter System” (page 36)

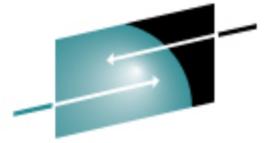


- Unfortunately, this section is wrong, and it's all my fault
- The Starter System is considered evaluation software, and that comes with **no** support at all.
- Even so:
 - Gather the documentation as requested
 - Send a report to linux-390@vm.marist.edu
 - You *will* get support there, whether from me, the good folks at Sine Nomine Associates, or other people who've had experience with the Starter System.
 - Problem reports from the SP1 version made the SP2 version much better, so please do speak up if you have problems.

Live Demo?

- If the wireless network permits
 - Unpacking the 19F disk (small enough for a live example)
 - Configuring the “NETWORK PARMS” file
 - Booting the first time
 - Correcting the inevitable “NETWORK PARMS” typo
 - Oh, you mean RTM **before** starting!!??
 - What else? “Common Problems and Solutions” (way back on page 34)
 - PING the Starter (Installation) System
 - Install a new (full service) server from NOVSTART
 - Exploring ... as time permits

Questions?



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