



Linux for S/390 - It's cool Part 2

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Agenda - Part 2

Linux for S/390

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- **System Setup - Installation**
 - **Configuration Options**
 - **Connecting to VM/VSE systems**
 - **Outlook ...**
 - **Demo ...**
 - **Questions and Answers ...**

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System Setup

Linux for S/390

- **Installation based on Marist code, SuSE and TurboLinux distributions may differ ...**
 - ▶ **Installation requires 3 files**
 - Kernel image
 - Kernel parameter file
 - Initial RAM disk image file
 - ▶ **Installation via VM - block size : 80 bytes**
 - ▶ **Installation via tape - block size : 1024**
 - Tape needs to be built in a OS/390, VSE, or VM system

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System Setup

Linux for S/390

- **Installation ...**
 - ▶ **During IPL the devices recognized are displayed**
 - Detected device 0590 on subchannel 000B - PIM = 80, PAM = 80, POM = FF
 - Detected device 0591 on subchannel 000C - PIM = 80, PAM = 80, POM = FF
 - Detected device 0640 on subchannel 003D - PIM = 80, PAM = 80, POM = FF
 - Detected device 0641 on subchannel 003E - PIM = 80, PAM = 80, POM = FF
 - Detected device 0642 on subchannel 003F - PIM = 80, PAM = 80, POM = FF
 - Highest subchannel number detected: 63
 - Device 0590 reports: CU Type/Mod = 3490/10, Dev Type/Mod = 3490/40
 - Device 0591 reports: CU Type/Mod = 3490/10, Dev Type/Mod = 3490/40
 - Device 0640 reports: Dev Type/Mod = 3088/1F
 - Device 0641 reports: Dev Type/Mod = 3088/1F
 - Device 0642 reports: Dev Type/Mod = 3088/1F

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System Setup

Linux for S/390

- Installation ... You are prompted for
 - ▶ ... network attachments
 - CTC
 - Ethernet (LCS)
 - Token Ring (LCS)
 - ▶ ... network parameters, like ...
 - IP address
 - subnet mask
 - network address
 - broadcast address

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System Setup

Linux for S/390

- Installation ... once having a network connection ...
 - ▶ Choose a disk for the supplied root file system
 - ▶ Format the disk with "dasdfmt"
 - **dasdfmt -b 4096 -f /dev/dasda**
 - **dasdfmt -b 4096 -n <device number>**
 - ▶ Put the ext2 file system on the disk
 - **mke2fs -b 4096 /dev/dasda1**
 - ▶ FTP to the system hosting your file system

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System Setup

Linux for S/390

- Installation ... once have an ext2 file system ...
 - ▶ Unpack the tar file
 - `tar -xzf initfs_big.tgz`
 - ▶ Prepare the disk for boot support (ECKD, FBA)
 - change into /boot, update "parmfile"
e.g. `dasd=193 root=/dev/dasda1 /ro noinitrd`
 - write boot record
e.g. `silosilo -d /dev/dasda -p parmfile -b ipleckd.boot`
 - ▶ Shutdown the system and reboot ...

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System Setup

Linux for S/390

- IPL / Boot Support
 - ▶ IPL for installation from ...
 - VM reader,
 - tape, may be emulated by Optical Media Attach
 - CD-ROM from HMC / SE (**new**) - requires MCL upgrade
 - ▶ IPL for run-time from ...
 - VM reader
 - disk (DASD driver : ECKD, and FBA)

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System/Device Options **Linux for S/390**

- **Memory**
 - ▶ Required, when running with 2GB
 - ▶ e.g. `mem=1900m`, depending on # of modules used
- **3215 Console**
 - ▶ Required, when using a P/390, R/390, or IS/390 native
 - ▶ e.g. `condev=0x01f`
- **Expanded Storage *** new *****
 - ▶ Allows to use expanded storage as block device, e.g. swap device or fast volatile DASD (**survives IPL, but not IML**)
 - ▶ e.g. `xpram_parts=2,512M,512M` (2 partitions, 512MB each)

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Device Options **Linux for S/390**

- **VM reserved Minidisks**
 - ▶ Special option; lets VM run the disk I/O; no boot (IPL) support, though
 - ▶ obsolete, replaced by integrated MDISK support by the DASD driver.
 - ▶ e.g. `mdisk=192,193`
- **DASD device driver**
 - ▶ Integrated support for ECKD, FBA (***** new *****), and VM reserved minidisks (***** new *****)
 - ▶ Raw device : e.g. `/dev/dasda`, `/dev/dasdb`
 - ▶ Partitions : e.g. `/dev/dasda1`, `/dev/dasda2`
 - ▶ e.g. `dasd=100-108,200,409`

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Network Options

Linux for S/390

- **CTC adapter device driver**
 - ▶ block multiplexer channels, "ctc" device mapping
 - e.g. "ctc0"
 - ▶ ESCON channels, "escon" device mapping
 - e.g. "escon0"
- **LCS - LAN Channel Station - device driver**
 - ▶ object module, not published under GNU GPL
 - ▶ supports : 3172, OSA-2, OSAE, 2216, ...
 - ▶ networks : Ethernet, Fast Ethernet, Token Ring, FDDI, and ATM LAN Emulation

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Network Options

Linux for S/390

- **LCS device driver (cont)**
 - ▶ Avoid LCS driver autosensing devices ...
 - ▶ LCS driver can't distinguish between native 3172 and CTCA, not recognized by CTC driver
 - ▶ Loaded by kernel module loader
 - ▶ parameters, ...
 - e.g. `noauto=1, devno_portno_pairs=0x1c00,0,0x1c02,1`
 - e.g. `devno_portno_pairs=0x1c00,0,0x1c02,1,0x1d00,-1`

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Linux with VM/VSE

Linux for S/390

- **Network Connections**
 - ▶ VM : IP over (V)CTCA, or IUCV
 - ▶ VSE : IP over (V)CTCA

- **Data Access**
 - ▶ FTP
 - ▶ NFS (CMS, VSE/Librarian, VSAM, POWER)
 - ▶ DB2 Connect
 - ▶ CICS Transaction Gateway
 - ▶ Apache/Websphere
 - ▶ VSE Connector Beans
 - ▶ MQSeries

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Outlook

Linux for S/390

Outlook ...

- Further platform exploitation
- More devices (Tape, Gigabit Ethernet)
- Enhanced platform interoperability (VM-LPAR, LPAR-LPAR)
 - ▶ Linux-to-Linux
 - ▶ Linux-to-OS/390
- Further tools / applications,
 - ▶ e.g. Tivoli Storage Manager
- Enhanced system management capabilities
- Performance improvements
- Open source support, e.g.
 - ▶ Linux 2.4 (production), and Linux 2.5 (development)
 - ▶ binutils upgrade, compiler upgrades, etc.

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Demo

Linux for S/390

Demo ...

- **Linux native**
 - ▶ shell access
 - ▶ package compile
- **Linux over the net with X-Windows**
 - ▶ Gnome desktop environment
 - ▶ tools
- **S/390 interoperability**
 - ▶ Linux connecting to upcoming VSE/ESA 2.5 connector server

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Questions and Answers **Linux for S/390**

Questions and answers ...

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