COMP 3400 Mainframe Administration[1]

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[1]These slides are based in part on materials provided by IBM's Academic Initiative.

Today

- Linux on z/VM

Why?

- IFL / cost
- Availability of applications
- Availability of administrators

Configuration

- Linux on top of LPAR (native)
- Linux on top of z/VM on top of LPAR (guest)
- Linux on top of z/VM on top of z/VM on top of LPAR

Our Setup

1. LPAR, running...
2. z/VM with CMS guests for instructor, running...
3. z/VM with CMS guests for students

$\Rightarrow$ We will use one of these guests to run Debian GNU/Linux!

Step One: Space

GNU/Linux requires space, so we put in to USER DIRECT:

```
USER LINUXDU PASSWORD 64M 64M G
 MACH XA
 CONSOLE 009 3215
 SPOOL 00C 2540 READER *
 SPOOL 00D 2540 PUNCH A
 SPOOL 00E 1403 A
 LINK MAINT 0190 0190 RR * CMS system disk
 LINK TCPMAINT 0592 0592 RR
 MDISK 191 3390 1 10 VPWRKA MR READ WRITE MULTIPLE
 MDISK 201 3390 11 2188 VPWRKA MR
```

Step Two: Network

We need to give non-CMS guests their own network address; the 1st-level VM administrator gave us and IP address and network interface:

```
DEDICATE 1D00 1D00
DEDICATE 1D01 1D01
DEDICATE 1D02 1D02
```

Step Three: Activate Configuration

As "MAINT" on the guest under CMS:

```
DIRECTXA USER DIRECT
```

Step Four: Prepare CMS

As "LINUXDU" on the guest under CMS:

```
IPL CMS
RELEASE A
FORMAT 191 A
ACCESS 191 A
```

We also need to get FTP to work:

```
ACCESS 592 T
```

Step Five: Download Boot Files

As "LINUXDU" on the guest under CMS:

```
FTP 64.50.238.52
CD debian/dists/etch/main/installer-s390/current/
GET PARMFILE.DEBIAN
BINARY f 80
MGET INITRD.DEBIAN KERNEL.DEBIAN
QUIT
```

Step Six: Write REXX Boot Script

Use XEDIT to write DEBIAN EXEC:

```
/* REXX EXEC TO IPL DEBIAN GNU/LINUX  */
'CP CLOSE RDR'
'PURGE RDR ALL'
'SPOOL PUNCH * RDR'
'PUNCH KERNEL    DEBIAN   * (NOHEADER'
'PUNCH PARMFILE  DEBIAN   * (NOHEADER'
'PUNCH INITRD    DEBIAN   * (NOHEADER'
'CHANGE RDR ALL KEEP NOHOLD'
'CP IPL 000C CLEAR'
```

Step Seven: Boot Linux from CMS

As "LINUXDU" on the guest under CMS:

```
DEBIAN
```

$\Rightarrow$ Now we are in a text-based Debian installer!

Step Eight: Configure Network (1/3)

```
Please choose the type of your primary network interface t
installing the Debian system (via NFS or HTTP). Only the l
supported.
Network device type:
  1. ctc: Channel to Channel (CTC) or ESCON connection
  2. qeth: OSA-Express in QDIO mode / HiperSockets
  3. iucv: Inter-User Communication Vehicle - available fo
Prompt: '?' for help> 2
Please select the OSA-Express QDIO / HiperSockets device.
Device:
  1. 0.0.1d00-0.0.1d01-0.0.1d02 *¨
Prompt: '?' for help, default=1> 1
```

Step Eight: Configure Network (2/3)

```
By default OSA-Express cards use layer3 mode. In that mode
removed from incoming IPv4 packets. Using the card in laye
keep the MAC addresses of IPv4 packets.
Use this device in layer2 mode?
  1. Yes      2. No *¨
Prompt: '?' for help, default=2> 2
Configure a network using static addressing
-----------------------------------------
The IP address is unique to your computer and consists of
separated by periods.  If you don't know what to use here,
administrator.
IP address: 192.86.33.139
```

Step Eight: Configure Network (3/3)

```
The gateway is an IP address (four numbers separated by periods) that indicates
the gateway router, also known as the default router.  All traffic that goes
outside your LAN (for instance, to the Internet) is sent through this router.

In rare circumstances, you may have no router; in that case, you can leave this
blank.  If you don't know the proper answer to this question, consult your
network administrator.
Gateway:
Prompt: '?' for help, default=192.86.33.1> 192.86.33.3

The name servers are used to look up host names on the network. Please enter
the IP addresses (not host names) of up to 3 name servers, separated by spaces.
Do not use commas. The first name server in the list will be the first to be
queried. If you don't want to use any name server, just leave this field blank.

Name server addresses:
Prompt: '?' for help, default=192.86.33.1> 192.86.33.2
```

Step Nine: Install Debian

- Debian prompts for a password for the installer
- After that, `ssh install@192.86.33.139`

$\Rightarrow$ Well-known menu-driven Debian installer!

$\Rightarrow$ Download packages as usual.

Step Ten: Reboot and IPL

- IPL 201
- ALT-F1 (to get to CP)
- DISC (disconnect)
- `ssh root@192.86.33.139`

Questions

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