

# Linux on p670 and p690 Release Notes

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## Document Objectives

With the general availability of the IBM @server pSeries™ 670 and 690, customers have the ability to configure multiple logical partitions running Linux®. Customers can purchase the SuSE Linux Enterprise Server 7 (SLES 7) Linux distribution that includes all functionality necessary to run Linux in a p670/p690 partition.

This document contains information specific to running Linux in a partition, but is not a substitute for any documentation which ships with the p670 or p690 hardware, or is available on-line for a customer who has purchased a p670/p690 system. Customers who choose to run Linux in a partition must be *very familiar* with the Hardware Management Console (HMC), along with specific hardware configuration management techniques for high availability.

This document also contains information regarding tested hardware configurations, including memory, processors, and I/O capabilities that have been tested with Linux. The list of supported adapters is short due to the fact that many of the pSeries adapter device drivers are not currently ported to Linux. Also, some adapters that are not on the supported list may have device drivers for Linux on pSeries.

Due to the lack of certain Availability and Serviceability capabilities in Linux today, compared to AIX, it is very pertinent to discuss hardware and software support and services. One of the key value propositions of the p670 and the p690 system is high availability. Therefore, not only must the distinction between hardware and software problems be addressed, but also where a system administrator should go once he/she has determined the type of problem being seen.

Finally, this document will contain the installation procedures and any outstanding issues that a customer installing a partition with Linux may encounter. Again, it is not the objective of this document to teach the user how to configure a highly available Linux partition. It is also not the objective of this document to teach the system administrator how to use the HMC to partition the p670/p690. Rather, this document should be used to help customer's understand the importance of running Linux in a well-defined configuration to minimize any impacts to other Linux or AIX partitions on the same machine.

## Configuring the LPAR Environment for High Availability

The customer should follow the IBM @server pSeries 690 Availability Best Practices paper ([http://www.ibm.com/servers/eserver/pseries/hardware/whitepapers/p690\\_avail.html](http://www.ibm.com/servers/eserver/pseries/hardware/whitepapers/p690_avail.html)), Configuring the LPAR Environment for High Availability section. This section gives instructions with regard to I/O Adapter slot order placement.

## Tested Hardware Configurations and Supported I/O Adapters

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The availability of the 64-bit PowerPC Linux kernel allows for large operating system data structures. This, in turn, allows Linux to support larger SMP configurations and larger memory configurations. However, Linux does not scale well today on large SMP machines. This does not mean Linux will not work on large SMP machines but rather a statement of expected performance. The optimal CPU and memory configurations that have been formally tested for p670 and p690 are 1-4 CPUs with up to 32 GB RAM per partition.

Here is the list of supported adapters:

Feature Codes	Description
6204	Ultra SCSI Differential
6203	Ultra 3 SCSI
4962	Ethernet 10/100
2969	Gigabit Ethernet - Fiber
2975	Gigabit Ethernet - UTP

There are many different hardware and software levels on the p670 and p690. These involve actual hardware parts, firmware upgrades, and software on the HMC. For a customer to successfully run Linux in a partition on the p670/p690, the system must be configured following the high availability configuration guide (as noted above), and the system's firmware and HMC levels *must* be at GA2 or higher level

## Installation and Update Procedures

As noted above, this document assumes the system administrator has configured the Linux partition for high availability. This includes setting up the partition profiles on the HMC in preparation for installing SLES 7. System administrators who have Linux experience will find installing Linux in a highly available partition a very simple task. System administrators who have very little or no experience with Linux installation should attempt to familiarize themselves with the SuSE install tool (YaST2) before continuing with an installation.

When the customer purchases SLES 7, he/she will be entitled to quarterly updates. These update CDs are usually shipped along with a copy of SLES 7. If there is no update CD present with your purchase, please contact SuSE or visit:

<http://www.suse.com/us/support/download/updates/index.html>

The customer will want to get a copy of the update #2 patch CD before getting started with the installation.

1. Make sure the SCSI adapter controlling the CD drive is allocated to the Linux partition. If the SCSI adapter controlling the CD drive belongs to another partition, this will require the owning partition to be powered down before the CD can be allocated to the Linux partition.
2. Place the SuSE SLES 7 CD 1 install CD into the CD drive.
3. Activate the partition.
  - a. Click on the box to open the virtual terminal (May take several minutes)
4. At the SMS Menu, Select #6 Multiboot (May take several minutes)
5. Select #3 Install Device (May take several minutes)
6. Choose CD device
  - a. If no bootable CD device is an option, be sure the proper CD is in the drive.
7. Choose #1 ->SuSE Linux SLES 7 (ppc)
8. Type 'install' or hit enter
  - a. Wait a few minutes for Linux to boot and YaST (the SuSE configuration tool) to start.

- b. **Red** and **green** colors are used during the YaST installation.
  - c. Selected choices are depicted in **Red** while other choices are depicted in **Green**.
  - d. System administrators should use the < up and down arrow > keys for highlighting choices, <enter> key when making choices, and the < tab > key for switching context.
9. When presented with a choice of which YaST to use, choose YaST2. (Hit enter by default to use YaST2).  
**Do not choose YaST as it does not work!**
10. What type of terminal do you have? Choose #9 VT320
11. Warning message appears about no graphical display available. Hit enter.
12. Select Language Menu.
- a. Use the up and down arrow keys to select the appropriate language. Default is English.
  - b. Use the <tab> key to go to [Next]
  - c. Hit <enter>
13. Choose your Mouse
- a. Use the <tab> key to go to the choices.
  - b. Use the <down arrow> or <Page Down> keys to go to the bottom of the page.
  - c. Select NONE <enter>
  - d. Use the <tab> key to go to [Next] menu.
14. Keyboard Layout and Time Zone Menu
- a. Use the <tab> key to toggle to Time Zone Menu. There is no keyboard support so that part of the menu is blank,
  - b. Use the <up and down keys> to select the appropriate time zone.
  - c. Set hardware clock mode time zone using the arrow keys then hit enter.
15. Installation Menu.
- a. Select New Installation and hit enter.
16. Preparing Hard Drives - Step 1 Menu
- a. The system administrator can choose to allow SuSE to setup the hard drives and prepare for installation.
  - b. Or, the system administrator can choose to partition his/her hard drive by using the customized selection. (This option should only be used by experienced Linux system administrators.)
  - c. Choose the disk you want to install Linux on. <enter>
  - d. <tab> to [Next]
17. Preparing Hard Drives - Step 2 Menu
- a. Choose installation disk
  - b. Use <tab> to select using the entire disk.
18. Software Selection Menu
- a. The system administrator can choose the default system packages or detailed selection to install more packages.
  - b. Default system is selected
  - c. Hit <enter>
19. System Boot Configuration Menu
- a. Use the default settings.
  - b. Make sure console=hvc0
  - c. Hit <enter>
20. Password Menu (choose a root password)
- a. Use <tab> and <backspace> keys for going forward or erasing characters.
21. Personal Menu (Linux requires the system administrator to create a non-root user account)
- a. Use <tab> and <backspace> keys for going forward or erasing characters.
22. Confirm Installation Menu (System administrator should confirm installation choices then hit <enter>)
23. Warning message appears to confirm starting of installation. Select 'yes'. Hit <enter>
24. Installation begins. (This usually takes about 15 minutes)

25. Finishing Basic Installation
  - a. Now booting your system message appears. (Hit enter)
26. If system administrator chose to install extra packages in Step #18, the installation routine will ask for second CD.
27. Configure Hardware or Finish Installation Menu
  - a. The system administrator can setup other hardware, for example network adapters, other users, etc., at this time.
  - b. Or choose Finish Installation and the system will boot to the Linux login prompt.
28. Remove the install media from the CD-ROM drive.
29. Place the update #2 patch CD into the CD-ROM drive.
30. Login as root and type 'yast2' to install the patches from the media.
31. Once the patches have been upgraded, shutdown the partition via a "shutdown -r now" command at the root login prompt.
32. At the HMC, activate the Linux partition and open a virtual terminal.
33. At the SMS menus select the boot device to be the installed hard drive
  - a. Choose #6 Multiboot
  - b. Choose #4 Select Boot Device
  - c. Choose #3 Configure first boot device
  - d. Choose appropriate hard drive
  - e. Use multiple 'x' keys to completely exit SMS. At this point the partition will always boot directly from hard drive.
34. Place the partition in non-SMS mode for normal booting.
  - a. On the HMC, at the partition profile, hit the right button and select Properties.
  - b. Choose the "Other" tab.
  - c. Select Normal.
  - d. Select OK
35. Set up the rlogin capability on next reboot. This will make remote administration much easier for the system administrator.
  - a. Execute "rcinetd start" to start the inetd daemon.
  - b. Edit the /etc/inetd.conf file to automatically start the inetd daemon upon future reboots.
    - i. Change the START\_INETD variable from 'no' to "yes".
36. Edit the /etc/inittab file and replace the HVC console line with the following:
  - a. V0:123:respawn:/sbin/agetty -L 9600 hvc0 vt320

## Software Service and Support Procedures

IBM provides source code for platform functionality to the open source community. IBM works closely with Linux Distribution Partners (LDPs). SLES 7 is currently the only Linux distribution that supports p670 and p690 hardware. Service and support procedures for p670/p690 customers are very different from AIX service and support procedures.

Customers can get software service and support in two ways. First, customers get an automatic 30 day installation service and support with a 1 year maintenance cycle, and 2 years of support when they purchase a copy of SLES 7. Customers can also purchase other service and support options via SuSE customer service contracts.

See SuSE's Web site at <http://www.suse.com/us/services/support/index.html> for details.

Secondly, IBM Global Services is now offering a support line contract for the Linux operating system that can help customers with usage and installation questions, compatibility and inter operability questions, diagnostic information, and more. See the Web site at <http://www.ibm.com/linux/services/index.html> for more details.

## Hardware Service and Support Scenarios

Due to the lack of “AIX-like” RAS features in Linux, the following scenarios will help the system administrator determine the possible causes of particular failures before contacting their software or hardware support centers.

Note, in each instance the system administrator will use the HMC to view the Linux boot sequence for the partition in question. When starting the partition check the box to start terminal window to see the boot progress.

Linux/Yaboot (Linux boot loader) does not load:

- This is a hardware issue or code installation issue.
- Normal pSeries problem determination procedures should be used.

Yaboot prompts for a Linux kernel but the kernel fails to load:

- Check /etc/yaboot.conf on the system by booting the installation CD-ROM in “rescue” mode
- This could be down level firmware. Make sure the hardware is at GA2 level firmware.

Linux displays messages but stops after printing “returning from prom\_init”:

- This could be due to down level firmware. Make sure the hardware is at GA2 level firmware.
- This may be a kernel problem. Make an alternate profile for the partition that reduces the memory configuration, number of processors and eliminate I/O adapters. Report the problem to the distributor or service provider.

Linux displays messages but stops after printing “<chrp\_progress>Linux 2.4.x”:

- An invalid console device is configured in /etc/yaboot.conf. The systems probably booted fine so wait to see if a login prompt appears, or check if the network connection works, login and fix the problem.
- If the system did not boot, reset the partition and type “linux console=hvc” at the yaboot prompt to force the console onto the HMC.

Linux displays hardware errors during boot:

- Make sure the device producing the hardware errors is in the supported device list. If it is not, remove the device from the partition.
- Otherwise, this is typically due to bad hardware, or an I/O adapter card not being seated properly.
- If the system fully boots, the system administrator should examine the Linux syslog in /var/log/messages for additional messages to determine why the adapter is having problems.
- Via the standard IBM support agreement, a CE will be needed to run stand-alone diagnostics
  - ◆ If the stand-alone diagnostics find a problem with the hardware, the CE should fix the issue
  - ◆ If the stand-alone diagnostics can not find the hardware issues, this is possibly a Linux operating system issue.
  - ◆ NOTE: Standalone diagnostics will require the CD-ROM drive to be in the partition. Create an alternate profile for this Linux partition that includes the SCSI I/O adapter that drives the CD-ROM. Any partition currently owning the CD-ROM will need to do the same.

The Linux boot sequence completed, the Linux operating system has fully initialized, and is operating properly when the Linux operating system stops:

- Linux may have crashed. A panic message appears on the vterm so it is wise to leave a vterm open when running Linux so the message may be captured. The problem may be hardware or a Linux defect. If the panic clearly refers to hardware (typically an I/O adapter) then pursue it as a hardware problem first, and if the problem persists then pursue it as a software problem.
- Linux may be hung (no panic message) due to a hardware problem or a Linux defect. Pursue it initially as a software problem. If the partition is normally on the network, the fact that a ping does or does not work is useful information. Be sure to also check the vterm in case the network is the cause of the failure.
- Otherwise this is most likely due to a Linux operating system defect. The customer will have to use a special support contract, either with IBM Global Services or possibly SuSE, in order to get further resolution to their issue.

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