Kernel 2.6.18 compilation for COPPER CPU

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Since we found that the default kernel (2.6.18) is unstable on COPPER CPU unfortunately, we recommend you to configure and compile the kernel to obtain more stable OS.

1, Get kernel 2.6.18 source and build modules

[boot server] % wget https://www.kernel.org/pub/linux/kernel/v2.6/linux-2.6.18.tar.gz

[boot server] # mv linux-2.6.18 /usr/src/kernels/

Before compiling, check if the system time is correct, otherwise the compilation never ends.

% date

If it is not, correct by some commands.

date --set="2013/09:05 8:46" or ntpdate

Check gcc version. (I failed to boot Copper CPU when compiling kernel w/ gcc 4.7.3)

% which gcc

% /usr/bin/gcc

% gcc -dumpversion

4.1.2

2, Get network adapter driver for PCI-E Gigabit network connection

It is not available in the kernel tar ball.

2-1, Copy a driver directory

To compile e1000e driver, it seems that /lib/module/BUILD-KERNEL is needed. So compile modules w/o e1000e first.

Get a configuration file from svn, (use svn **rev. 6535** or later)

https://belle2.cc.kek.jp/svn/trunk/software/daq/copper/driver/kernel/config-130903

[boot server] # cp config-130903 /usr/src/kernels/linux-2.6.18/.config

[boot server] # cd /usr/src/kernels/linux-2.6.18

[boot server] # make clean

[boot server] # make modules -j10

"-j10" means use 10 threads for compiling. This option is not necessary.

[boot server] # make modules_install -j10

2-2, download and compile driver source

You can download it from

https://downloadcenter.intel.com/Detail_Desc.aspx?lang=jpn&DwnldID=15817

[boot server] % gtar xvf e1000e-2.4.14.tar.gz

[boot server] #　cp -r e1000e-2.4.14/src /usr/src/linux-2.6.18/drivers/net/e1000e

[boot server] # vi /usr/src/linux-2.6.18/drivers/net/e1000e/Makefile

Read Makefile and add a line that "BUILD_KERNEL=2.6.18" at a proper position so that it would not be overwritten afterwards.

2-3, Modify Kconfig and Makefile of kernel directory

● Add the following lines to /usr/src/kernels/linux-2.6.18/drivers/net/Kconfig

config E1000E

tristate "Intel(R) PRO/1000 PCI-Express Gigabit Ethernet support"

depends on PCI

---help---

This driver supports the PCI-Express Intel(R) PRO/1000 gigabit

ethernet family of adapters. For PCI or PCI-X e1000 adapters,

use the regular e1000 driver For more information on how to

identify your adapter, go to the Adapter & Driver ID Guide at:

<http://support.intel.com/support/network/adapter/pro100/21397.htm>

For general information and support, go to the Intel support

website at:

<http://support.intel.com>

More specific information on configuring the driver is in

<file:Documentation/networking/e1000e.txt>.

To compile this driver as a module, choose M here and read

<file:Documentation/networking/net-modules.txt>.   The module
will be called e1000e.

- Add an e1000e related line to /usr/src/kernels/linux-2.6.18/drivers/net/Makefile

obj-$(CONFIG_E1000) += e1000/
+ obj-$(CONFIG_E1000E) += e1000e/
obj-$(CONFIG_IBM_EMAC) += ibm_emac/

3, compile and install kernel
[boot server] # cd /usr/src/kernels/linux-2.6.18
[boot server] # sudo make bzImage -j10
Then you might be asked:
"Intel(R) PRO/1000 PCI-Express Gigabit Ethernet support (E1000E) [N/m/y/?] (NEW) "
Then type m.
After building, bzImage should be made.

[boot server] # make modules -j10
[boot server] # make modules_install -j10
[boot server] # make install
Check /etc/grub.conf if this kernel is not the default kernel for booting a PXE boot server,
otherwise you may fail to boot the server.

4, copy the kernel to tftpboot directory
[boot server] # cp -r /lib/modules/2.6.18 /tftpboot/copper/root/lib/modules/
[boot server] # cp -r /usr/src/kernels/linux-2.6.18 /tftpboot/copper/root/usr/src/kernels
[boot server] # cp /boot/initrd-2.6.18.img /tftpboot/copper/root/boot
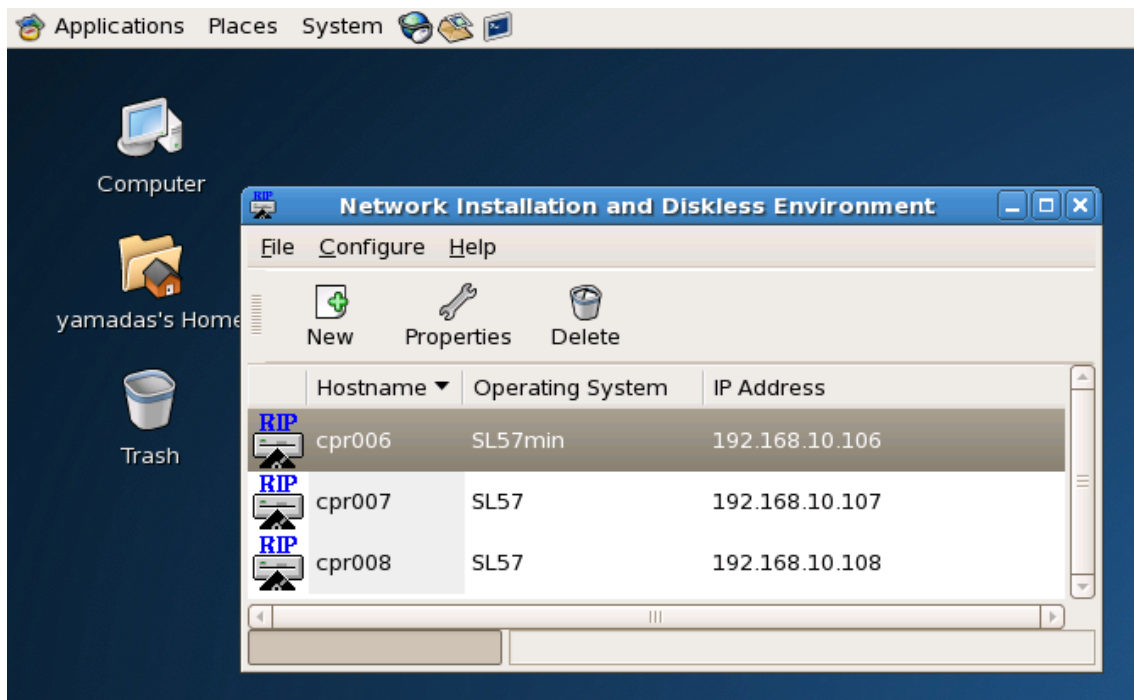[boot server] # cp /boot/System.map-2.6.18 /tftpboot/copper/root/boot
[boot server] # cp /boot/vmlinuz-2.6.18 /tftpboot/copper/root/boot
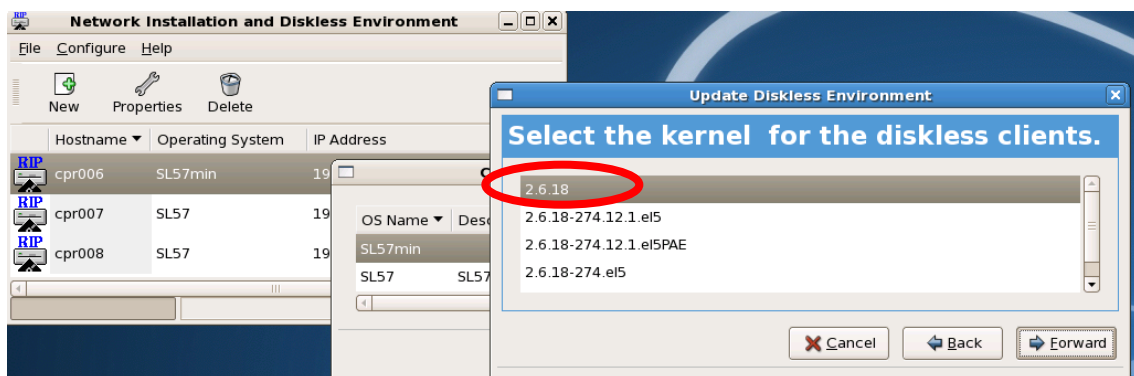
5, Modify diskless client setup on PXE boot server
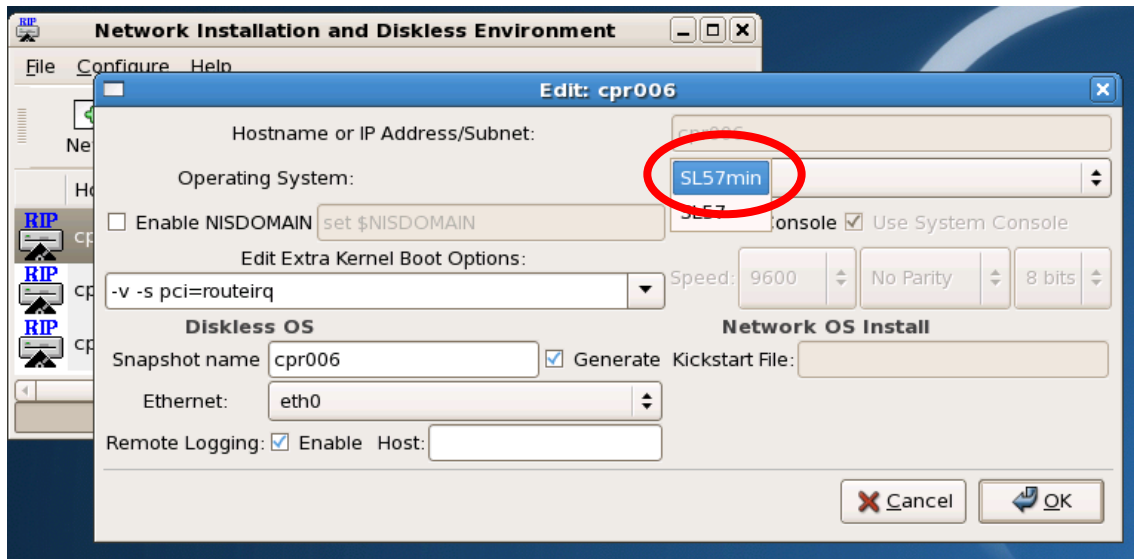System -> administration -> server setting
Configure->Diskless-> Add

Proceed in the same way as shown in
https://belle2.cc.kek.jp/svn/trunk/software/daq/copper/doc/SetupPocketDAQ_1_PXE_boo
tserver.pdf

A new kernel entry should appear on a kernel list.

After updating diskless environment, each COPPER CPU's setting also should be modified.

Please check /tftpboot/linux-install/pxelinux.cfg/C0A80A** files so that the modification is correctly applied.

6, Boot COPPER CPU