

## Kernel 2.6.18 compilation for COPPER CPU

Sep. 5, 2013

Satoru Yamada

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
```

### 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.

```
[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](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-p.q.r/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.

## 2-2, 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

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

```
[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] # sudo make bzImage -j10
```

Then you might be asked:

“Intel(R) PRO/1000 PCI-Express Gigabit Ethernet support (E1000E) [N/m/y/?] (NEW) ”

Type m.

```
[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
```

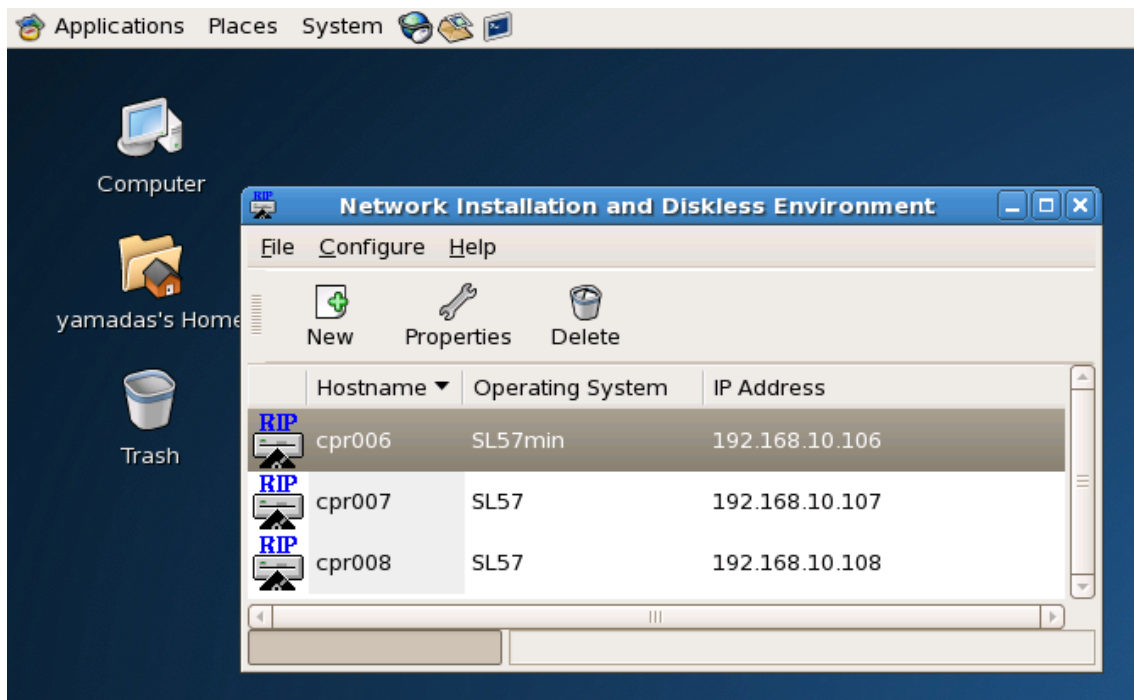
```
[boot server] # cp /boot/System.map-2.6.18 /tftpboot/copper/root/boot
```

```
[boot server] # cp /boot/vmlinuz-2.6.18 /tftpboot/copper/root/boot
```

#### **5, Modify diskless client setup on PXE boot server**

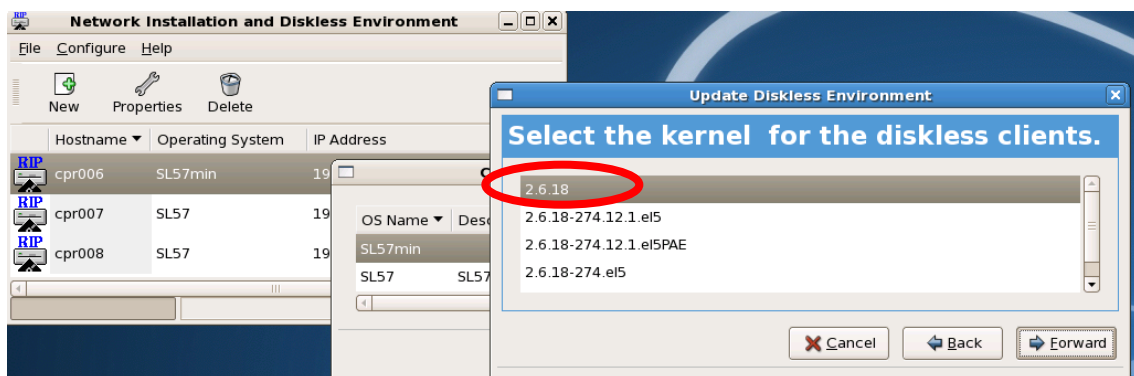
System -> administration -> server setting

Configure->Diskless-> Add

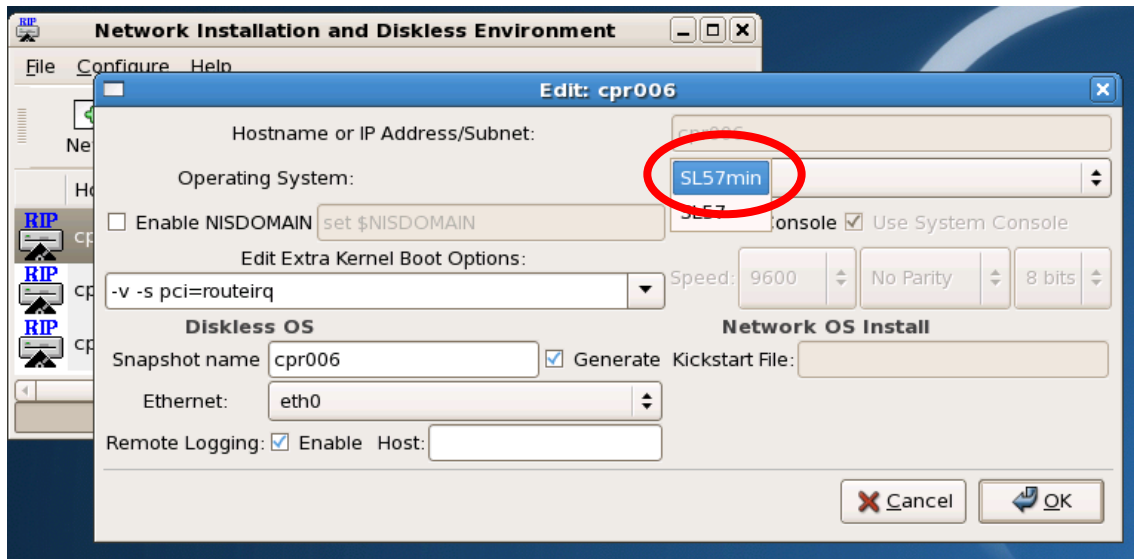


Proceed in the same way as shown in [https://belle2.cc.kek.jp/svn/trunk/software/daq/copper/doc/SetupPocketDAQ\\_1\\_PXE\\_bootsERVER.pdf](https://belle2.cc.kek.jp/svn/trunk/software/daq/copper/doc/SetupPocketDAQ_1_PXE_bootsERVER.pdf)

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