

OpenBlockS266 Development Environment Guide

Ver. 2.00

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Table of Contents

1 Development Environment	1
1.1 Cross Development Environment	1
1.2 Native Development Environment	3
1.3 Customizing initrd	5

1 Development Environment

1.1 Cross Development Environment

Use SSD/Linux 0.4 for the cross development environment.

- * You can download SSD/Linux installation files and manuals from
<http://www.plathome.com/products/microserver/ssdlinux/>

- Installation

For information on how to install SSD/Linux, refer to the “SSD/Linux User's Guide” and “How to use SSD/Linux sysinst(8)”.

- Extracting the Source Code

For information concerning source expansion and package acquisition, refer to the SSD/Linux Developer's Note.

To update the development environment, get the latest src.tgz from

<ftp://ftp.plathome.co.jp/pub/ssdlinux/0.4-LATEST/source/>

and execute "bmake build" after installation.

You can get the latest source tree by the method described here:

Anonymous CVS Server: <http://www.plathome.co.jp/support/labo/cvsserver/>

The source found here, however, is still under development and may not be compiled correctly.

- Obtaining distfiles

A configuration that exactly mimics the source collection of NetBSD's pkgsrc is available for SSD/Linux, and the software package source (hereinafter referred to as “distfiles”) for 'bmake build' are available by ftp at /usr/src/dist/distfiles/.

If direct ftp is impossible, you should get an ISO image.

The ISO image includes all distfiles.

You can copy them to /usr/src/dist/distfiles/ from the ISO image.

- * Cross development requires at least 6 GB of free hard disk space including the native development portion.

If creating an image for OpenBlockS266, perform the following operation.

(1) Change /etc/mk.conf as follows:

```
#DESTDIR= /home/dest
#RELEASEDIR= /home/release
#RCS_LOCALID= ssdlinux
SSDCVSTAG=
#SSDCVSDATE= 20020420

# alternate kernel config which instead of
# mkdist/kernel/dot.config.* if required
#KERNEL_CONFIG= /any_dir/my_kernel_config

# Cross Compile for OpenBlockS
CROSS_BUILD= powerpc
```

```
DESTDIR= /home/dest
RELEASEDIR= /home/release-powerpc

# OPENBLOCKS 'obs50','obs200','obs266' or 'none'
OPENBLOCKS?= obs266

HAVE_CVS?= yes
DEVELOPTOOLS?= yes
USE_PAM?= yes
USE_PCMCIA?= yes
USE_EXT3FS?= yes
IPV6?= yes

SSDVERSION= 0.4

# MTA 'sendmail' or 'postfix'
MTA?= sendmail
```

[Option Settings]

HAVE_CVS: Specify “yes” if you can directly connect to the SSD/Linux CVS server or “no” if you can’t.

DEVELOPTOOLS: Specify “yes” in all cases.

USE_PAM: Specify “yes” in all cases.

USE_PCMCIA: Specify “yes” in all cases.

USE_EXT3FS: Specify “yes” in all cases.

IPV6: Specify “yes” if IPv6 is required. This enlarged kernel and firmware significantly.

- * If you are developing for an OBS model with 16 MB Flash ROM, add the line
SYSTEM_ROM_SIZE=16
- * The DMA mode of the internal hard drive slot is deactivated by default. To activate it, add the option
USE_HDA_DMA=yes

(2) Execute ‘bmake release’.

```
# export HOSTTYPE
# export MACHTYPE
# export SHELL
# cd /usr/src
# bmake release
```

With this command, various images are created under /home/release-powerpc.

```
distfiles                package source used
powerpc-obs266
|- binary                HD image
| |- base.tgz
| |- base.cf.tgz
| |- comp.tgz
```

```

|   |- contrib.tgz
|   |- etc.tgz
|   |- etc.cf.tgz
|   |- kern.tgz
|   └─ man.tgz
└─ installation          initrd image
|- ramdisk.image-product.gz
|- ramdisk.image.gz
|- zImage.initrd.treeboot
└─ zImage.initrd.treeboot-product
source                  Patches and others
└─ src.tgz

```

1.2 Native Development Environment

If you wish to develop software packages on the OpenBlockS itself, you need to insert a hard drive or a large CF card (minimum 4 GB) in the device. Partition and format the device, and install SSD/Linux on it. Include the compiler and sources in your installation. You can use the `sysinst` command for the installation.

For advice on how to prepare the HDD or CF card and how to use `sysinst`, refer to the OpenBlockS266 User's Guide.

- Retrieving the latest sources

To manually download the latest source code files for SSD/Linux, retrieve the file `src.tgz` from

```
ftp://ftp.plathome.co.jp/pub/ssdlinux/04-LATEST/source/
```

- Obtaining software source packages (distfiles)

SSD/Linux includes a package manager similar to NetBSD's `pkgsrc`. You can download software packages (distfiles) at

```
ftp://ftp.plathome.co.jp/pub/ssdlinux/distfiles/
```

Drop them at `/usr/src/dist/distfiles/`.

If you use `"bmake build"` and if the OpenBlockS is able to access the Plat'Home ftp server directly, packages will be retrieved automatically via `ftp(1)`.

Then perform the following:

(1) Configure `/etc/mk.conf` as follows:

```

#DESTDIR=    /home/dest
#RELEASEDIR= /home/release
#RCS_LOCALID= ssdlinux
SSDCVSTAG=
#SSDCVSDATE= 20020420

# alternate kernel config which instead of
# mkdist/kernel/dot.config.* if required
#KERNEL_CONFIG= /any_dir/my_kernel_config

# OPENBLOCKS  'obs50','obs200','obs266' or 'none'
OPENBLOCKS?= obs266

```

```
HAVE_CVS?=          yes
DEVELOPTOOLS?=     yes
USE_PAM?=           yes
USE_PCMCIA?=       yes
USE_EXT3FS?=       yes
IPV6?=             yes

SSDVERSION=        0.4

# MTA               'sendmail' or 'postfix'
MTA?=              sendmail
```

[Option Settings]

HAVE_CVS: Specify “yes” if you can directly connect to the SSD/Linux CVS server or “no” if you can’t.

DEVELOPTOOLS: Specify “yes” in all cases.

USE_PAM: Specify “yes” in all cases.

USE_PCMCIA: Specify “yes” in all cases.

USE_EXT3FS: Specify “yes” in all cases.

IPV6: Specify “yes” if IPv6 is required. This enlarged kernel and firmware significantly.

* If you are developing for an OBS model with 16 MB Flash ROM, add the line
SYSTEM_ROM_SIZE=16

* The DMA mode of the internal hard drive slot is deactivated by default. To activate it, add the option
USE_HDA_DMA=yes

(2) Saving the Environment

When you run ‘bmake build’, openblocks.conf will be initialized.
If you are using do_contrib_rc=YES, save /usr/contrib/etc/openblocks.conf.

```
# cp /usr/contrib/etc/openblocks.conf /usr/contrib/etc/\
openblocks.conf.save
```

(3) Run ‘bmake build’.

```
# export HOSTTYPE
# export MACHTYPE
# export SHELL
# cd /usr/src
# bmake build
```

This process will take approximately 16 hours to complete.
When it has finished, execute the following:

```
# bmake DESTDIR=/home/dest RELEASEDIR=/home/release -DSKIP\
```

BUILD release

Various types of images are made under /home/release.

```

distfiles                package source used
powerpc-obs266
|- binary                HD image
|  |- base.tgz
|  |- base.cf.tgz
|  |- comp.tgz
|  |- contrib.tgz
|  |- etc.tgz
|  |- etc.cf.tgz
|  |- kern.tgz
|  └─ man.tgz
└─ installation          initrd image
   |- ramdisk.image-product.gz
   |- ramdisk.image.gz
   |- zImage.initrd.treeboot
   └─ zImage.initrd.treeboot-product
source                   Patches and others
└─ src.tgz

```

Update the firmware.

```
# flashcfg -f /home/release/powerpc-obs266/installation/
zImage.initrd.treeboot-product
```

(5) Restore the environment

If you are using `do_contrib_rc=YES`, restore `/usr/contrib/etc/openblocks.conf`.

```
# cp /usr/contrib/etc/openblocks.conf.save /usr/contrib/etc/openblocks.conf
```

(6) Reboot.

```
# reboot
```

1.3 Customizing initrd

Build `zImage.initrd.treeboot`, the flash ROM's image file, as follows:

```
# cd /usr/src
# bmake build
```

The above operation creates `zImage.initrd.treeboot` in the following directories. `-product` is an image file that includes the web setup tool (`setup.cgi`).

```

/usr/src/distrib/powerpc-obs2xx/standard/treeboot/zImage.initrd.treeboot
/usr/src/distrib/powerpc-obs2xx/product/treeboot/zImage.initrd.treeboot-product

```

The ramdisk image (initrd file system) contained in `zImage.initrd.treeboot` is created in

the following directories:

```
/usr/src/distrib/powerpc-obs2xx/standard/initrd/ramdisk.image.gz  
/usr/src/distrib/powerpc-obs2xx/product/initrd/ramdisk.image-product.gz
```

If you want to add a file to initrd, proceed by mounting ramdisk.image-product as a loopfs device in /mnt as follows:

```
# cd /usr/src/distrib/powerpc-obs2xx/initrd-product  
# gunzip ramdisk.image-product.gz  
# losetup /dev/loop0 ramdisk.image-product  
# mount /dev/loop0 /mnt
```

Add the required files to /mnt.

Example: Include the du (disk usage) command

```
# cd /mnt/usr/bin  
# cp /usr/bin/du .  
# cd /usr/src/distrib/powerpc-obs2xx/product/initrd  
# umount /mnt  
# losetup -d /dev/loop0  
# gzip -9 ramdisk.image-product  
# cd /usr/src/distrib/powerpc-obs2xx/product/treeboot  
# bmake clean  
# bmake
```

This creates a firmware version that includes the du command.

If you want to remove any functions contained in initrd, you can edit LIST_S in /usr/src/distrib/powerpc-obs2xx/initrd-product/Makefile.

For example, to get rid of named, sendmail and dhcpd you would edit the Makefile as follows:

```
.include <bsd.own.mk>  
.include "../Makefile.inc"  
  
#LIST_S= common flashcfg bash dhcpd modules named ppp pppoe sendmail \  
#      useradd httpd setup_cgi  
  
LIST_S= common flashcfg bash modules ppp pppoe useradd httpd setup_cgi  
  
.include "${CURDIR}/../standard/initrd/Makefile.inc"
```

Execute bmake(1) and remake ramdisk.image-product.gz.

```
# cd /usr/src/distrib/powerpc-obs2xx/product  
# bmake clean  
# bmake
```

To add a function to initrd, add the file to /usr/src/distrib/powerpc-obs2xx/initrd/list_in

and add the filename to LIST_S in /usr/src/distrib/powerpc-obs2xx/initrd-product/Makefile.

If a new directory is needed at this time, add a file of the same name to /usr/src/distrib/powerpc-obs2xx/initrd/mtree.conf_in.

For configuration files and similar files that need to be saved before shutdown, add a file of the same name to /usr/src/distrib/powerpc-obs2xx/initrd/flashcfg_in.

To find out what files are taken in by initrd and what directories are made by LIST_S, refer to the following files:

/usr/src/distrib/powerpc-obs2xx/initrd/list_in

/usr/src/distrib/powerpc-obs2xx/initrd/mtree.conf_in

/usr/src/distrib/powerpc-obs2xx/initrd/flashcfg_in

- * We do not guarantee correct operation if the file contents listed in /usr/src/distrib/powerpc-obs2xx/initrd/list_in, /usr/src/distrib/powerpc-obs2xx/initrd/mtree.conf_in and /usr/src/distrib/powerpc-obs2xx/initrd/flashcfg_in are modified. Changes made are at the customer's own risk.
- * Take note of the size of the zImage.initrd.treeboot-product file created when a file is added. Up to 12,582,912 bytes can only be written to the flash ROM (for models with 16 MB flash ROM). If the size of zImage.initrd.treeboot-product exceeds this limit, the data can not be written to the flash ROM. (flashcfg for OpenBlockS266 can not write a zImage that exceeds a certain size.)