FQA 5 – Building the System from Source

5.1 – Why should I build my system from source?

Some reasons why you might actually wish or need to build from source:
- Updates have been committed since you performed the installation.

- Test or develop new features.

5.2 – Building 9front from source

5.2.1 – Update sources

9front uses hg(1) to synchronize the system with the 9front repository:
```
cd /
bind -ac /dist/plan9front /
hg incoming
hg -v pull -u
```

which is consolidated in the command:
```
sysupdate
```

If hg refuses to update due to conflicts (e.g. if you installed something locally which was later incorporated into 9front), this is a quick workaround which discards local changes:
```
hg update -C --clean
```

After the tree is updated, recompile/build the updated programs as needed.

5.2.1.1 – hgrc

During installation, the 9front Mercurial repository is copied to /dist/plan9front/.hg, is chmod 775, and is owned by user glenda and group sys. To update the repository when logged in as a user other than glenda, add that user to group sys add then add the following to $home/lib/hgrc:

```
[trusted]
users=glenda
groups=glenda
```

To use Mercurial with webfs(4) instead of Python's built-in HTTP:

```
[extensions]
hgwebfs=
```

Note: The hgwebfs extension expects login credentials to be present in factotum(4), else Mercurial will abort when any attempt is made to access resources that require authentication. To add credentials to factotum:

```
echo ´key proto=pass realm=PAIN server=code.9front.org service=http n
        user=cinap_lenrek !password=FckG00gl!´ >>/mnt/factotum/ctl
```

Note: Depending on who you are and the repository being used, your credentials may differ.

Credentials may be saved permanently and loaded into factotum at boot time using *FQA 8.4.7 – secstore.*

5.2.2 – Building from source

Note: A minimum of 512MB RAM is needed to link some programs. If less than 512MB is available, be sure to turn on swap before building (Read: swap(8)).

```
# create any missing directories needed for the build
cd /
. /sys/lib/rootstub

# build everything
cd /sys/src
mk install
mk clean

# build manpage indices
cd /sys/man
mk

# build the papers and html (optional)
cd /sys/doc
mk
mk html
```

Build the kernel for 386:

```
cd /sys/src/9/pc
mk install
```

Build the kernel for amd64:

```
cd /sys/src/9/pc64
mk install
```

Build the kernel for Raspberry Pi:

```
cd /sys/src/9/bcm
mk install
```

Read: *FQA 7.2.5 – How do I install a new kernel?*

5.2.2.1 – Cross compiling

To cross compile, simply set the objtype environment variable prior to running the build. For example, to build all the amd64 binaries on a 386 system:

```
# create any missing directories needed for the build
cd /
. /sys/lib/rootstub
cd /sys/src
objtype=amd64 mk install
```


5.3 – Building an ISO

The 9front ISO is a livecd that also serves as install media.

Note: Currently, only the 386 architecture is built for the ISO. Read: *FQA 8.9 – Bootstrapping architectures not included on the ISO* for more information on booting other architectures.

```
# put your root file system into /n/src9
bind /root /n/src9

# put your hg repository there
bind -ac /dist/plan9front /n/src9

# build the iso
cd /sys/lib/dist
mk /tmp/9front.$objtype.iso
```


5.4 – Common Problems when Compiling and Building

Most of the time, problems in the build process are caused by not following the above directions carefully.

People who complained about this section of the FQA have so far not submitted anything better.

Good luck.

5.4.1 – Updating compilers

Changes to the compilers may necessitate updating the compiler before rebuilding the
rest of the system:

```
cd /sys/src/cmd/cc; mk install
cd /sys/src/cmd/6c; mk install  # choose the appropriate compiler for your archi
```