op5 Appliance System Manual

Version 3.5, Rev 2
Author: Martin Kamijo

This manual includes information on how to administer and configure op5 Appliance system and its components.
The manual is also written with the goal to give the reader help about how to use the different parts of op5 Appliance system.

The manual is targeted for a technical audience.

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Introduction

This document is intended for the System administrator that has the operational responsibility for the op5 system. You are expected to have good knowledge and understanding of computers but you don't have to have any prior UNIX or Linux knowledge.

This document will try to give you a brief overview of the underlying system that is the base for the op5 appliance and it will cover most basic things that are needed to manage the day to day operation.

Fundamentals

op5 System

op5 utilizes CentOS 5 as the operating system. CentOS is an Enterprise-class Linux Distribution derived from Red Hat Enterprise Linux sources. This means that CentOS 5 is binary compatible with Red Hat Enterprise Linux 5. The op5 System contain a basic but minimal CentOS server installation as a base. On top of that we add common tools and applications needed by op5 products. The op5 System also contain a number of custom, op5 made tools and applications.

All applications are distributed as RPM packages, and made available for customers on our support web www.op5.com/support and in our yum repositories.

System access

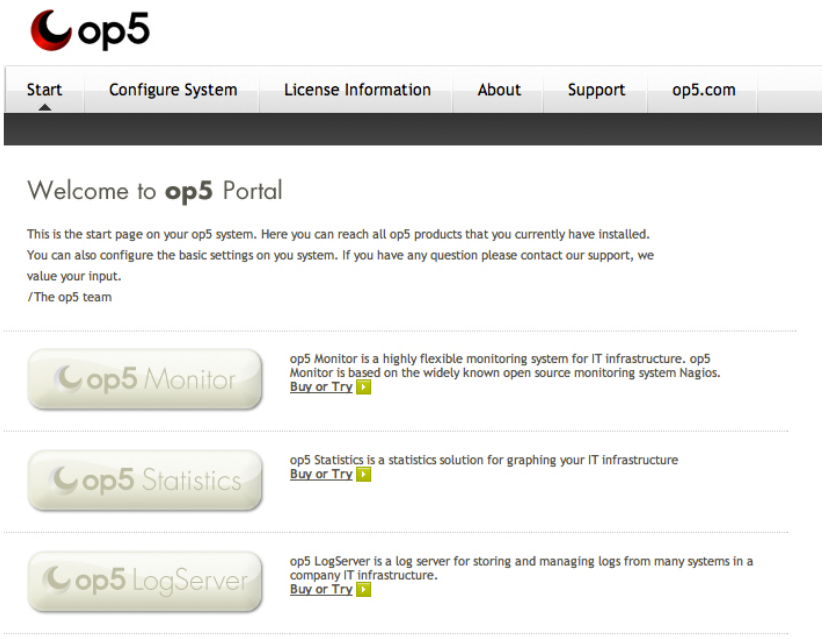
There are three ways to access an op5 System.

1. Direct access to console by connecting a monitor and a keyboard
2. By using SSH (Secure SHell)
3. By HTTPS using a standard web browser

The portal page

The third way, HTTPS access, is used to access the web interfaces for op5 products and the op5 System portal page. You can use the portal page to configure your system, gather information about installed software and retrieve information regarding new patches from op5 Support web. You find the portal by directing your web browser to the op5 System, https://<server-address>. The portal page also contains links to any installed op5 products.

The product logos on the portal page links to the respective products web page.



Console and SSH access

You can also administer the system by SSH. SSH is much like telnet but it is encrypted so that nobody can see or interfere with what you are typing. To use SSH you must install a SSH client software at your computer. Most Linux distributions comes with a SSH client included and there are several SSH clients available free of charge for Microsoft Windows.

We recommend putty that can be found on http://www.chiark.greenend.org.uk/~sgtatham/putty/

An other capable SSH client for Microsoft Windows can be found at http://www.ssh.com/. It is only free for non-commercial use though. This client also includes an interface to transfer files in a secure manner from and to the op5 server.

You need to access the system via the console or by SSH to install upgrades and patches.

System accounts

To change the configuration of a op5 System you need to log on. The root account is the superuser of the system and equal to the Administrator account in Windows.

The default password for user root is **monitor**.

Note: You should *Change password* as soon as possible after installation to block unauthorized access.

Be aware that when you are logged on the system as root you have the power to literally wipe the system out, so be careful and if unsure take a backup before performing any changes (read more on backups below Backing up the System).

Install / Restore

Install a new system

To install a new op5 System you need the **op5 Installation / Recovery CD**. If you have not received the cd with the system you can download it as an .iso file from www.op5.com/support/downloads/ and create a installation cd using your favorite cd-creation program.

Assure that you have console access by connecting a monitor and keyboard to the op5 System.

Insert the **op5 Installation / Recovery CD** and reboot the system (read more in the Shutdown or restart section). If the system already is powered off, simply power it on and insert the cd before the system bootup sequence has started.

Follow the instructions the on-screen instructions.

System configuration

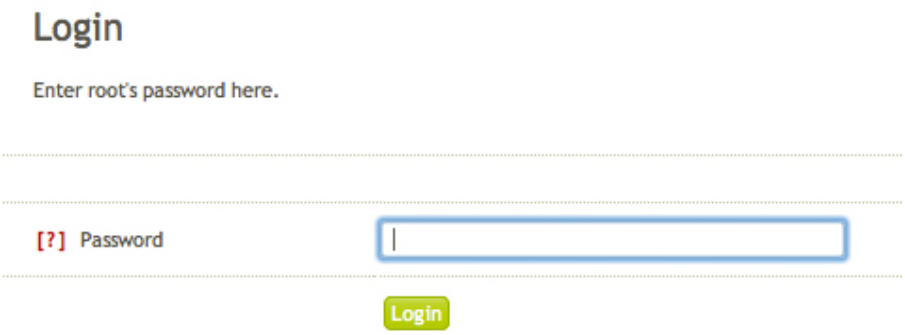
Using the web gui portal page

The easiest way to configure your op5 system is to use the web interface at https://<your ip>/ and click **Configure System**.

Note: This is only valid if you have enabled DHCP on the net where your op5 System is placed. If not you have to *setup your network from the console*.

To start configuring you need to log on using the password for the root account. Initial login information is:

```
password: monitor
```

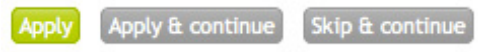


Settings

Configuring step by step

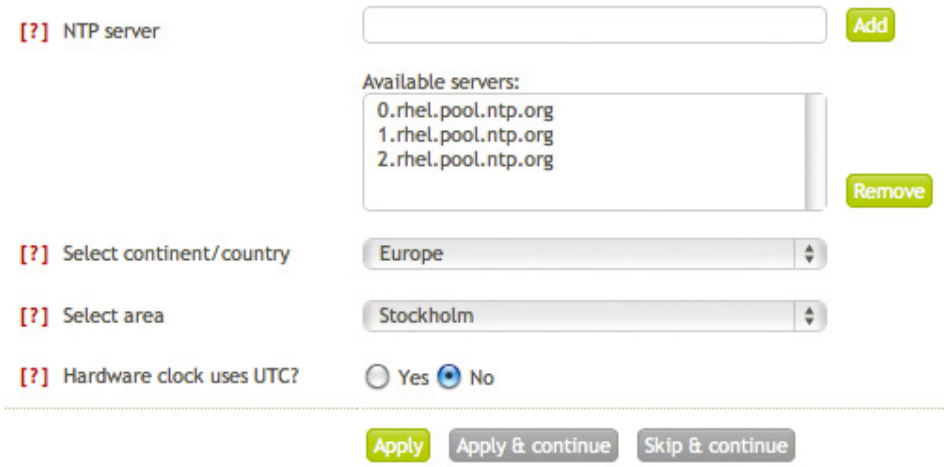
The settings can be configure step by step in a similar way as the old wizard. On every object, except for the last one (Network), you can click on either **Apply & continue** or **Skip & continue** to either save the new settings or leave them with the old value and continue.

To save the new value and stay in the same settings part click **Apply**.



Time Settings

Here you configure NTP (Network Time Protocol) and clock settings.



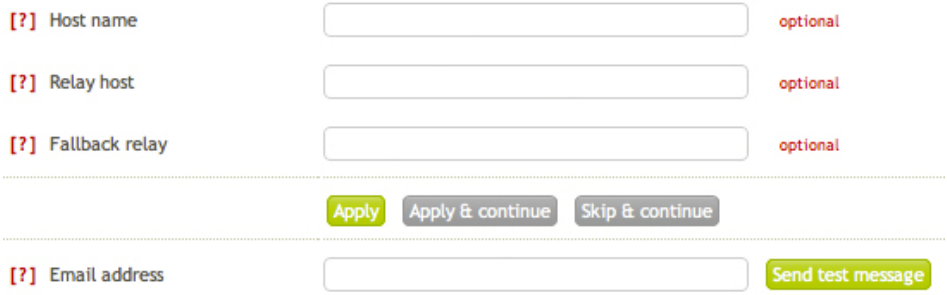
To add a new time server

Type in the new server name in the **NTP server** textfield and click on **Add**. Remember to click **Apply** to save the new settings.

Email

Here you configure settings for the email server on you op5 system.

Note: If you dont configure any relay host or fallback relay, then op5 system will act as a regular MTA and send the mails to whatever mail server that is responsible for the receiving mail domain.

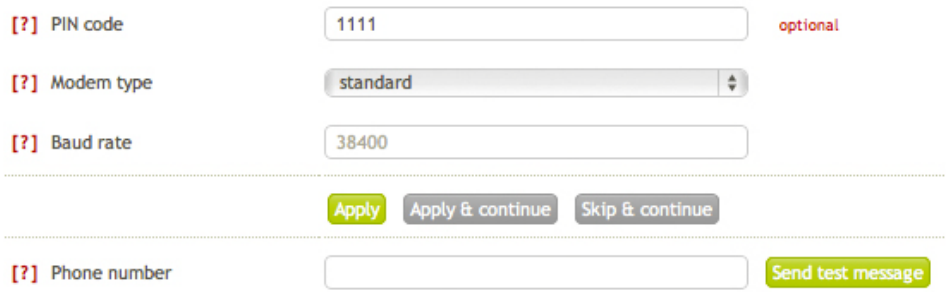


Beside adding a relay host, fallback relay host you can also send a test message.

To send a test message type in the recieving email address in the **Email Address** field and click **Send test message**.

SMS

Here you configure settings for the sms modem.



If you have a pin code on your sim card type in the code in **PIN code**.

Modem type

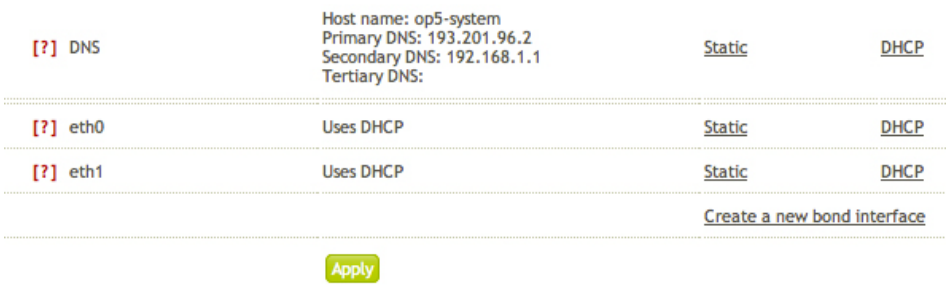
op5 have two types of modems. Depending on what modem type you have you should set the baud rate needed. The table below describes the diffrent settings.

Modem type	**Setting**
TC35	standard
TC65	TC65
Any other	other and type in the custom baud rate.

Network Settings

Here you can set up static address on your interfaces or turn on DHCP instead. You can also add a bonding interface here and decide wich interfaces to bond.

As default the op5 Appliance system uses DHCP on all network interfaces, this is also the case for the DNS settings.



To change the host name

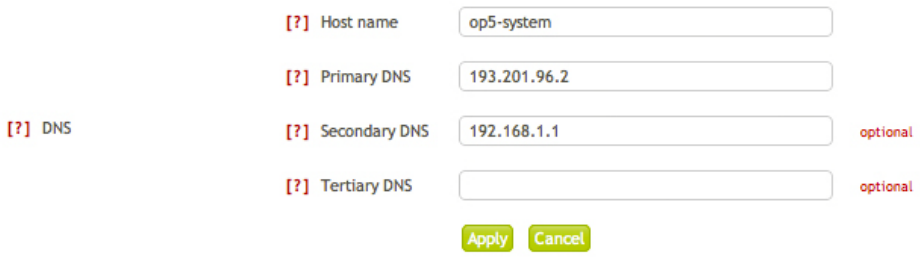
1 Click **Static** on the **DNS settings**.

2 Change the host name in the **Host name** text field.

3 Click **Apply** and then **Apply** at the bottom of the page.

Editing DNS settings

You can chose between static DNS settings or use DHCP to set the DNS settings.



To change the DNS settings

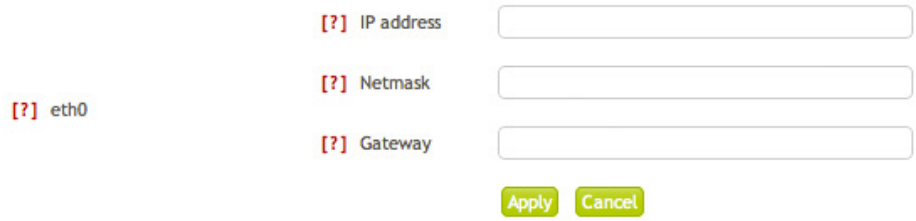
1 Click **Static** or **DHCP**, in this case we use **Static**.

2 Typ in the ip address of you primary, secondary and tertriary (the last two are optional) and click Apply.

Setting up static address

To setup a static address on an interface

1. Click on **Static** on the interface you like to configure.
2. Fill in **IP Address**, **Netmask**, **Gateway** and click **Apply**.



3. Click **Apply** on the bottom of the page.

To setup DHCP on an interface

1. Click **DHCP** on the interface you like to use DHCP.
2. Click **Apply**.
3. Click **Apply** on the bottom of the page.

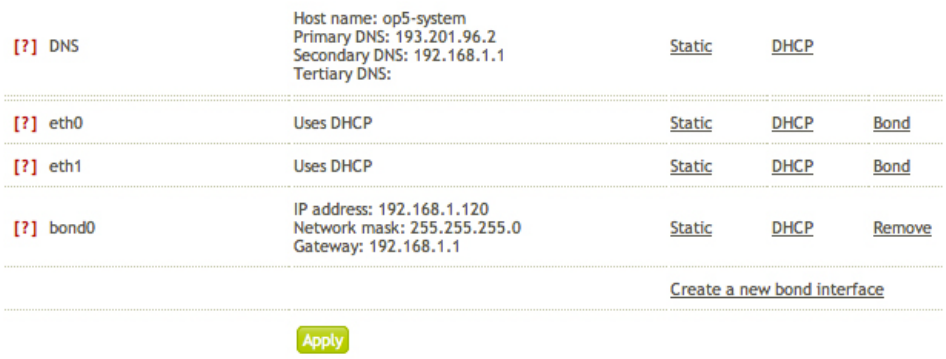
Setting up a bonding interface

Setting up a bonding interface is devided into two steps:

- Adding the new interface
- Assign physical interfaces to the newly created bonding interface.

To setup a bonding interface

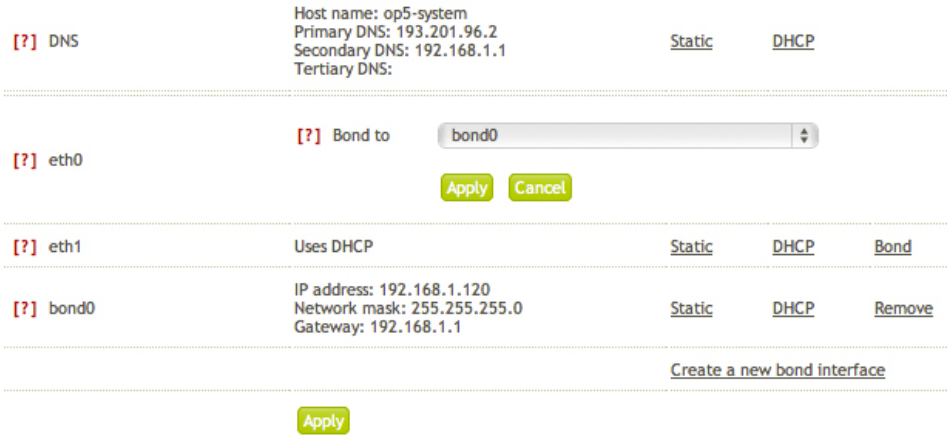
1. Click **Create a new bond interface**.
2. Click either **Static** or **DHCP**, in this case we use **Static**.
3. Fill in **IP Address**, **Netmask**, **Gateway** and click **Apply**.



To assign physical interfaces to a bonding interface.

1 Click on **Bond** on the interfaces you like to assign to this bonding interface.

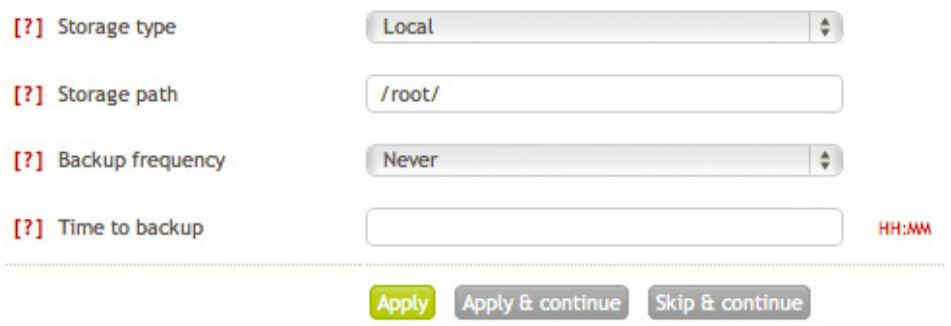
2 Chose bonding interface and click **Apply** repeat this for every interface you like to add.



3 Click **Apply** at the bottom of the page.

Backup

Here you configure automatic backup of your op5 system. A local storage path can also be set to a mount point for a mounted external file system, i.e. a shared folder at a remote server.



There are only two types of storage to chose between:

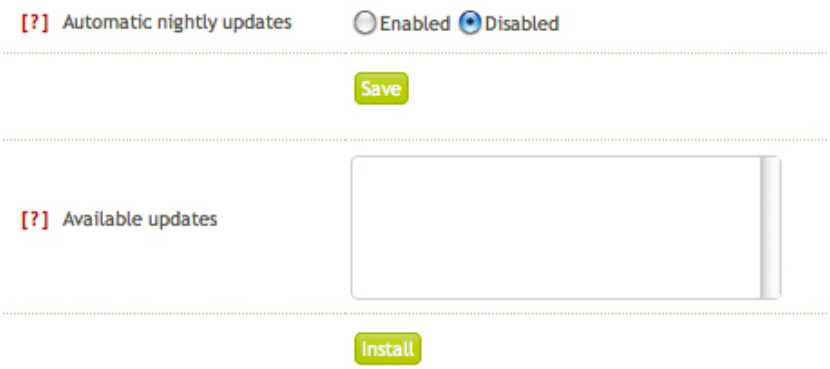
- local
- ftp

Note: op5 backup will not backup logs of op5-logserver, so you better have remote archive setuped for this, or backup them manually.

Maintenancse

Update system

If your server has got Internet access you can use this as a frontend to the comand line tool yum.



Enable nightly updates if you like the updates to be installed automatic as soon as they are released.

If you have any packages listed in Available updates select the one you like to install and click Install. During the update process you will not be able to start an other update.

Backup now

Starting from op5 Appliance system 3.5 you can make manual backups.

There are two types of backups that can be made here:

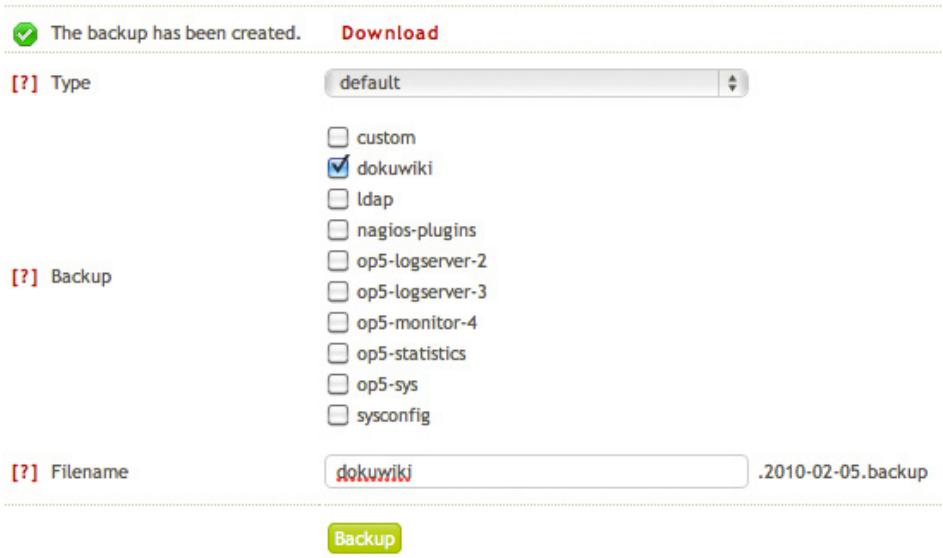
- default
- change arch

The **default** backup type will backup up the same things that are backed up in the automated one.

The **change arch** backup is excluding things like binaries and other archetecture dependet stuff. This make the arch backup perfect to use if you are changing from op5 appliance system 32 bits to 64 bits.

To make a manual backup

1. Click Backup now.
2. Chose what type of backup you like to perform.
3. Chose what parts you like to include in the backup.
4. Give the backup file a name and click Backup.



Now when your backup is done you should save your backupfile.

The backupfile is actually a normal tar file but with `.backup` as extension instead and it can be used with the normal op5-restore utillities.

The file will be saved in the filesystem (`/var/www/html/backups/`) on your op5 Appliance system so you migth download it over **scp**.

To save the newly created backupfile click **download** and save it where ever you like.

Services

Sometimes you might want to stop, start or restart a service on you op5 Appliance system. Here you have the possibility to do that without loggin in to server over ssh or directly on the console.

The list does not contains all services on the server.

To stop, start or restart a service

1. Click Services.
2. Click stop, restart or start on the same line as the service name of the service you like to change the state of. The service will change state at once.

Change password

Here you can change the password of the root user. Note that this is the root user of the system so its important to keep it safe.

License

Here you add your op5 license. Make sure that your license correspond to your usage. By adding your licence file you also gain access to updates using the 'yum update' command. Please see the sections *Update system* or *YUM update manager* , for more information.

To add a license file

1. Click **License Information** in the main menu.
2. Click **Browse** and chose the license file.
3. Click **Upload**.
4. Click **Install**.

Manually from the prompt

Using the setup tool

op5 System contains a menu based configuration tool called setup. With this tool you can configure some of the system base settings. Configuration options not supported by the setup tool are covered in the “fdsa” section below.

Note: All examples are from using the op5 System console. Using SSH should work the same but colors may differ.

The following configuration options are covered by the setup tool:

- Authentication configuration
- Firewall configuration
- Keyboard configuration
- System services
- Network configuration
- Timezone configuration

To run the setup tool log on as user root and run the command **setup**

```
monitor!root~:# setup
```

Use the arrow keys to navigate the setup tool. When you are done configuring, check that all settings are correct and exit the program. Don’t forget to save.

Note: Firewall/SELinux and Authentication settings should be altered with care. Creating a restrictive configuration might cause op5 products to malfunction.

For more information about how to use the seutp tool please take a look at the op5 Quick install guide that can be found on www.op5.com/support.

Editing configuration files

You can also setup an op5 System by using a text editor such as vim or jed.

Note: Note: this manual does not cover the usage of vim or jed, there are other manuals that does that. Check out the command vimtutor for an intruduction to the vim editor.

The following files needs to be edited if you configure the system by a text editor

To configure keyboard layout:

```
/etc/sysconfig/keyboard
```

To set root password run the command **passwd**.

```
monitor!root:~# passwd
```

To configure timezone

```
/etc/sysconfig/clock
```

The following files are used when changing the network settings:

File	Usage
`/etc/hosts`	FQDN, hostname and host aliases
`/etc/resolv.conf`	DNS resolving
`/etc/sysconfig/network`	Hostname, Domain, Default gateway
`/etc/sysconfig/network-scripts/ifcfg-<ifname>`	IP Address, Netmask

Kernel modules: /etc/modprobe.conf

Editing this file is optional, the default settings are usually sufficient.

This file sets options to modules (drivers) that is loaded into the kernel. You need to edit this file to configure duplex settings for the op5 System network cards or if you want to change or turn bonding support on or off.

Network time server: /etc/ntp.conf

Editing this file is optional but highly recommended by op5.

This file configures which server that the op5 System shall use as Network Time Server. Edit the variable ‘server’ to change the server to synchronize against. It is possible to add several server entries to get time from several NTP servers.

If you are unsure about if you have a NTP server to synchronize against you can always use pool.ntp.org which is a large pool of, free to use, NTP servers on the Internet.

Example:

```
server ntp.pool.org
```

When you have edited the file you can issue following commands to force a time syncronization and test your configuration.

```
service ntpd stop
ntpdate ntp1.sth.netnod.se
service ntpd start
```

You can replace ntp1.sth.netnod.se in the example above with the ipaddress or hostname of your own NTP server.

Note: NTP communicates over port 123/UDP, don’t forget to configure your firewalls.

E-mail settings: /etc/postfix/main.cf

Editing this file is mandatory.

This file configures postfix which is the MTA (Mail Transfer Agent) that comes with op5 System. The MTA is used primarily to send out notification and report emails from your op5 products.

To be able to deliver emails the following variables must be edited

myhostname, set itto the FQDN of your op5 System

If you want the MTA to use a relay host (ie forward all emails to a specific mail server) edit following variables.

relay_host, set this to the hostname of your mail server. This variable is optional.

fallback_relay, set this to the hostname of your fallback relay, in case your primary mailserver is down. This variable is optional.

Note: Don’t forget to change relay_host if you change hostname or IP on your email server.

SMS modem: /etc/smsd.conf

Editing this file is optional.

This file configures the smsd program that sends SMS messages. This file is only needed if your system is equipped with a GSM/GPRS modem.

If you don't want to edit this file make sure to disable the PIN-code control on your SIM card.

If you want to use a PIN code you need to uncomment and edit the variable 'pin'

Example:

```
pin=1234
```

Depending on what sms gateway you have you may need to change the baudrate.

```
baudrate=38400
```

The table below describes what baudrate need for each sms gateway.

Sms gateway	Baudrate
TC35	38400
TC65	115200

To test your settings you can issue the command 'sendsms'

```
monitor!root:~# sendsms
Destination: 46733123456
Text: Testing to send SMS.
```

If you want to see whats happening you can issue the command 'tail -f /var/log/smsd.log' which will show you the conversation between the sms program and the gsm modem.

NRPE: /etc/nrpe.conf

Editing this file is optional, but highly recommended.

NRPE is the UNIX/Linux agent that op5 products use to gather information about the op5 System. To allow an op5 System to communicate with NRPE the 'allowed_hosts' variable needs to be edited.

Example:

```
allowed_hosts=127.0.0.1,192.168.1.10
```

SSL certificates: /etc/httpd/mkssIcrt.sh

This is a script that can be used to generate a self signed SSL certificate for the op5 webbserver. Run the script by issuing the command **/etc/httpd/mkssIcrt.sh**

Note: If you select to encrypt the CA and SERVER keys on STEP 7 and 8 you will have to enter the pass phrase every time you start apache. op5 recommend you not to encrypt keys.

System backup: /etc/op5-backup/main.conf

op5 recommends that you configure backup for your system.

op5backup is a simple but efficient backup utility for the op5 System. It can backup the configuration of op5 System, op5 Monitor, op5 Statistics and op5 Logserver. If you configure op5backup it is very easy to restore a failed system. Read more on Backing up the System.

Static routes: /etc/sysconfig/network-scripts/route-<ifname>

This is optional.

Persistent routes are configured by creating a file for each interface that you wish to route traffic out from. The file should be named `/etc/sysconfig/network-scripts/route-<ifname>`

Example: `/etc/sysconfig/network-scripts/routes-eth0`

The syntax for this file is

```
<network> via <gateway>
```

Example:

```
172.27.76.0/24 via 192.168.1.1
```

Patch management

The op5 System is RPM based, therefore all patches is distributed as RPM packages. Starting with op5 System version 3.0 the yum update manager is supported and the recommended method to update your system. More information regarding yum is found at:

http://linux.duke.edu/projects/yum

YUM update manager

Yum is an automatic updater and package installer/remover for rpm based Linux systems. Yum is the default method used to update a number of major rpm based distributions, including CentOS and Red Hat Enterprise Linux 5. The op5 System is preconfigured to retreive all its updates via op5 repositories. To manage yum you need console access to the system or log on via SSH.

To check if there are any updates availabe for your system execute:

```
yum check-update
```

Issuing the command above might give a result looking like this:

```
Loading "installonlyn" plugin
Setting up repositories
Reading repository metadata in from local files

op5-system-upgrade.noarch   3.0.3-op5.1_RHEL5  op5-system-base
plugins.i386                2.2.0-op5.4_RHEL5  op5-system-addon
portal.noarch               1.4.4-op5.1_RHEL5  op5-system-addon
```

This means that there are three available updates. To download and install the 'plugins.i386' and 'portal.norach' packages issue:

```
yum update plugins.i386 portal.noarch
```

Yum have a built-in dependency checker that automatically fetches any other package that the chosen package(s) depend on.

To install all available updates you issue the same command but without specifying any package:

```
yum update
```

Note: The repositories provided by op5 is intended for op5 customers only. You therefor need to have a valid op5 license installed to be able to use yum.

Handling RPM packages manually

RPM is the package management software that op5 System utilizes. A RPM package consists of all files and information necessary to install or upgrade a software.

To install an RPM package use the command ‘rpm –Uvh’

Example:

```
monitor!root~# rpm -Uvh plugins-2.0.6.op5.4.rpm
Preparing…        ################################# [100%]
    1:plugins     ################################# [100%]
monitor!root~#
```

Here is a list of useful RPM commands

Command	Desription
`rpm -Uvh <package name>`	Installs or upgrades a package
`rpm -e <package name>`	removes an installed package
`rpm -qa | grep <part of package name>`	Search for a package where the search string is a part of the package name.
`rpm -qi <package name>`	Gives information about an installed package
`rpm -ql <package name>`	Lists files that the package provides

Administrative tasks

start / stop services

To control which programs that shall run on the system when it is started you can use following commands.

```
chkconfig
service
```

`chkconfig` can be used to control which programs that should be started during the boot sequence. It can also show you the current configuration.

A service can start and stop programs during runtime. This is for example useful if you would like to restart op5 Monitor.

```
chkconfig --list
```

List which programs that shall be started at boot time. This command first list the program name and then seven columns that represents different run-levels. All you have to care about is runlevel 3 which is the default runlevel for op5 System.

```
chkconfig smsd on
chkconfig smsd off
```

Tells the system to start or stop the smsd program during boot time.

```
service monitor stop
service monitor start
```

Turns on and off OP5 Monitor during runtime.

Shutdown or restart

To shutdown the system in a proper way you should log onto the system as root user and issue the following command.

```
shutdown -h now.
```

This means that the system will shutdown all running programs and then halt. After this it is safe to shut down the power to the system.

To restart the system issue the command `reboot` or press **Control-Alt-Delete** on the console.

Backing up the System

It is important to backup your op5 System to be able to restore configuration and important data in case of a system failure.

There are several ways to backup the system. Since op5 System is based on CentOS 5 most large providers of backup solutions has clients that can be installed on the op5 System.

For those cases where backup possibilities for linux systems does not exist we have created a backup utility called **op5backup** that can create backups of system configuration data and op5 product configurations and data.

op5backup consists of a backup script and a restore script. The backup script **op5-backup** can be scheduled to run using cron and it can place the backups in a local or remote mounted directory or transfer the file to another server over FTP.

Note: op5 backup will not backup logs of op5-logserver, so you better have remote archive setuped for this, or backup them manually.

Configuration

The main configuration file for op5backup is placed in the following file:

`/etc/op5-backup/main.conf`

Following variables needs to be set

`transfer=`, set this to `ftp` or `local`

if you use local as transfer location the configure this variable

`storagepath=`, set this to where the backup should be placed

If you use `ftp` as transfer mode then configure following variables

`backupserver=`, set this to a FQDN or ipaddress to you ftp server

`backuppath=`, set this to the path where you want your backups. Leave blank if no path is needed.

`backupuser=`, username for the ftp account

`backuppass=`, password for the ftp account

If you have added software or data to your op5 System that you want to be included in the backup you should add this to the `/etc/op5-backup/modules/custom` file.

The backup modules is written in bash uses a set of variables and functions. The table below describes the variables used in a backup module script

Variable	Description
DESCRIPTION	A short description of the module.
FILES_TO_BACKUP	The files and folders to backup with this module. It can contain both single files, filenames with wildcards like * and whole folders.
WORKDIR	This is set in the op5-backup and op5-restore scripts and can be used in the backup modules. Users should **not** change redefine this variable!

The following table describes the function used in a op5 backup module:

Function	Description
CHECK	Used to check if it is ok to performe the backup specified in this backup module. If it is ok it should return 0 if not it should return 1.
BACKUP_ACTION	Is used to specify actions performed before the actual backup is preformed.
RESTORE_ACTION	Is used to specify what to do after a restore is performed.

Here is an exemple of how a backup module could look like:

```
DESCRIPTION="Custom backup"
FILES_TO_BACKUP="
/opt/custom_app/etc/*.conf
/opt/custom_app/var/
"
function CHECK() {
    rpm -q custom_app
    return $?
}
function BACKUP_ACTION() {
    mysqldump --databases custom_app > $WORKDIR/custom_app.sql
}
function RESTORE_ACTION() {
    if [ -f $WORKDIR/custom_app.sql ]; then
        mysql monitor_reports < $WORKDIR/custom_app.sql
    fi
}
```

Schedule backups

To setup cron to execute this script you need to edit the following file.

```
/etc/cron.d/op5backup
```

For backups every day at 01.59 enter the following:

```
36 11 * * * root /usr/sbin/op5-backup >/dev/null 2>&1
```

For more information about the cron file execute the following command:

```
man 5 crontab
```

Restore backups

To restore a backup, execute the op5restore.sh script with the backup-file as argument:

```
/usr/sbin/op5-restore [-h] -b backup_file [ -f ] [module...]
```

Options:

-h, shows this help

-b, the path to backup file to restore from

-f, restore files only. Do not execute any post-restore actions, such as restoring DB from dump.

Upgrade system via Internet

If your op5 Appliance system has HTTP connection to the Internet you can perform your upgrades directly with the **yum** command. Yum will get the files and data from the op5 repos.

To upgrade with the op5 repos

1. Log in, as the root user, to the server either directly on the console or via ssh.
2. Perform the upgrade with
   ```
   yum upgrade
   ```

Upgrade system from iso file

If your op5 Appliance system hos no connection to the Internet you can still upgrade the system. All you have to do is to download the latest op5 Appliance system iso file.

To upgrade with the op5 Appliance system iso file

1. Create a CD-Rom from the iso file.
2. Insert the CD-Rom into your server.
3. Log in, as the root user, to the server either directly on the console or via ssh.
4. Create the folder /mnt/cdrom, if it does not exists.
   ```
   mkdir /mnt/cdrom
   ```
5. Mount the CD-Rom
   ```
   mount -o loop /dev/cdrom /mnt/cdrom
   ```
6. Execute the following command line to perform the upgrade
   ```
   yum --disablerepo=\* --enablerepo=op5-media \
   -c /mnt/cdrom/yum-media.conf update
   ```
7. Unmount and eject the CD-Rom
   ```
   umount /mnt/cdrom ; eject
   ```

Useful commands

cd	change directory
pwd	show current directory
ls	list directory contents
rm	delete file or directory
mv	move or rename file or directory
tail	show the 10 last rows in a file, useful for viewing logs, tail –f to follow/trace
less	show the contents of a file
man	manual
vi	A text editor
jed	another text editor

References

http://www.op5.com/support/
http://www.centos.org/
http://www.rpm.org/
http://www.chiark.greenend.org.uk/~sgtatham/putty/
http://www.ssh.com/
http://winscp.net
http://linux.duke.edu/projects/yum