



Ahsay Universal Backup System v8

Administrator's Guide

Ahsay Systems
Corporation Limited

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Ahsay Universal Backup System

Administrator's Guide

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1 Release Announcement

1.1 Notes

1. AhsayUBS is bundled with the latest version of AhsayCBS. Starting from AhsayCBS v8.1.0.0 onwards:

All AhsayCBS installations will have the **Ahsay Cloud Backup Suite NFS services** installed and running by default listening on ports 111, 1058, and 2049. The NFS service is to facilitate VM Run Direct on AhsayCBS by allowing VMware vCentre/ESXi hosts to directly access the backed up VM files on AhsayCBS User Home as an NFS mount to access the guest VM for recovery.

2. AhsayUBS 8 runs only on machines installed with 64bit CPU
3. FreeBSD 11.2 is used by AhsayUBS v8.1.0.0 onwards.
4. OpenJDK8 is used by Ahsay v8.1.0.0 onwards.
5. The upgrade of AhsayUBS installations running on both the UFS storage model and the previous ZFS storage model.
6. Supports both iSCSI and Additional Storage features.
7. AhsayUBS 8 supports upgrade from AhsayUBS 2.29 (OBSR v6.29) or AhsayUBS 7.17 (CBS v7.17). It is advised you first upgrade your server to these latest released, and update your clients to matching versions; before upgrading to v8.

1.2 The UFS storage model

For backwards compatibility with older AhsayUBS versions, the UFS storage model is also supported. After upgrade, the 'geom_concat.ko', 'geom_stripe.ko', and 'geom_raid5.ko' module will be loaded by the FreeBSD to support the UFS storage model. To check if these kernel modules have been loaded correctly you can run the "kldstat" command, which will return the following output.

```
ahsayubs:~# kldstat
Id Refs Address      Size      Name
 1   12 0x80400000 a25a60   kernel
 2    1 0x80e26000 5594     vesa.ko
 3    1 0x80eec000 6124     geom_concat.ko
 4    1 0x80ef3000 163c0    geom_mirror.ko
 5    1 0x80f0a000 776c     geom_stripe.ko
 6    1 0x85f12000 17204    geom_raid5.ko
 7    1 0x8981e000 123000   zfs.ko
 8    1 0x89941000 3000     opensolaris.ko
 9    1 0x8a8ab000 11000    iscsi_initiator.ko
10   1 0x8a89c000 3000     splash_bmp.ko
```

The 'Master Storage Device' on AhsayUBS is preserved in UFS format which is mounted on '/ubs/mnt/eslsfw' upon system boot time. The following example shows a UFS filesystem mount as '/ubs/mnt/eslsfw'.

```
ahsayubs:~# df -h
Filesystem      Size  Used Avail Capacity  Mounted on
/dev/md0         77M   63M   15M    81%      /
devfs            1.0K   1.0K    0B   100%     /dev
/dev/mirror/40CF97AFxesfmfw 739M  219M  461M   32%     /ubs/mnt/esfmfw
/dev/raid5/40CF97AFxeslsfw  5.6G  1.3G  3.9G   25%     /ubs/mnt/eslsfw
/dev/mirror/40CF97AFxesosfw 186M   64M  107M   38%     /ubs/mnt/esosfw
```

The Optional Labelled Device in the legacy AhsayUBS will migrated in this version of AhsayUBS which is one of the storage types called "Optional Storage" inside the "Additional Storage". Volume status and UFS filesystem integrity checking (fsck) are also available in this AhsayUBS version. For details, please refer to the section [Storage].

1.3 The ZFS storage model

AhsayUBS is implemented with ZFS v5 and ZPOOL v28. The existing ZPOOL(s) will not be upgraded and only newly created ZPOOL will be applied with the ZIL (ZFS Intent Log).

As the ZFS storage model is based on a GMIRROR and ZFS design, therefore the 'geom_mirror.ko', 'opensolaris.ko', and 'zfs.ko' kernel modules will be loaded by the FreeBSD. The GEOM kernel modules used previously for UFS support 'geom_concat.ko', 'geom_stripe.ko', and 'geom_raid5.ko' will also be loaded. To check if these kernel modules have been loaded correctly you can run the "kldstat" command, which will return the following output.

```
ahsayubs:~# kldstat
Id Refs Address      Size      Name
 1  12 0x80400000 a25a60   kernel
 2   1 0x80e26000 5594     vesa.ko
 3   1 0x80eec000 6124     geom_concat.ko
 4   1 0x80ef3000 163c0    geom_mirror.ko
 5   1 0x80f0a000 776c     geom_stripe.ko
 6   1 0x85f12000 17204    geom_raid5.ko
 7   1 0x8981e000 123000   zfs.ko
 8   1 0x89941000 3000     opensolaris.ko
 9   1 0x8a8ab000 11000    iscsi_initiator.ko
10  1 0x8a89c000 3000     splash_bmp.ko
```

The 'Master Storage Device' on AhsayUBS is configured as a ZPOOL with the following pool name 'es/sfwx{UID}' format. The ZFS pool will be mounted on '/ubs/mnt/eslsfw' upon system boot time.

The following example shows a zpool volume of size 191GB "eslsfwx839830C2" mount as '/ubs/mnt/eslsfw'

```
ahsayubs:~# df -h
Filesystem      Size  Used Avail Capacity  Mounted on
/dev/md0        77M   65M   12M    84%      /
devfs           1.0K   1.0K    0B   100%     /dev
/dev/mirror/839830C2xesfmfw 739M  638M   42M    94%     /ubs/mnt/esfmfw
eslsfwx839830C2 191G  276M   191G    0%     /ubs/mnt/eslsfw
/dev/mirror/839830C2xesosfw 186M   61M   110M   36%     /ubs/mnt/esosfw
ahsayubs:~#
```

For volume status and ZFS filesystem integrity checking, please refer to the section [Storage] for details

```
ahsayubs:~# zpool status
pool: eslsfwx839830C2
state: ONLINE
scrub: scrub completed after 0h0m with 0 errors on Sun Apr  3 00:00:15 2011
config:

    NAME                                STATE     READ WRITE CKSUM
    eslsfwx839830C2                      ONLINE    0     0     0
        label/839830C2xd00p04            ONLINE    0     0     0

errors: No known data errors
ahsayubs:~#
```

The other "esgpbt", "esosfw", and "esfmfw" System Firmware Devices are still mounted from the */etc/fstab* file.

```
ahsayubs:~# cat /etc/fstab
/dev/md0 / ufs rw 0 0
/dev/mirror/839830C2xesosfw /ubs/mnt/esosfw ufs ro 1 1
/dev/mirror/839830C2xesfmfw /ubs/mnt/esfmfw ufs ro 1 1
ahsayubs:~# █
```

The ZFS storage model is used for the following AhsayCBS locations:

1. %USER_HOME%
2. %SYSTEM_HOME%
3. %POLICY_HOME%
4. %CONF_HOME%
5. %WEBAPPS_HOME%
6. %RECEIVER_HOME%

The other "System Firmware Devices" such as "esgpbt", "esosfw", and "esfmfw" will remain unchanged as GEOM MIRROR based UFS volumes. The GEOM device names are in the following formats:

1. GPT Boot - {UID}xesgpbt
2. Operating System Framework - {UID}xesosfw
3. Firmware Module Framework - {UID}xesfmfw

Note:

For production AhsayUBS servers configured with ZFS volume(s). It is strongly recommended to install at least [4 GB RAM](#), as ZFS volumes require relatively large amount of memory to run. The amount of memory required is dependent on the size of the ZFS volume and the amount of I/O activity.

1.4 ZFS Integrity Checking

In order to safeguard the data integrity of the files on the ZFS volume, a weekly “zpool scrub” (zpool volume data integrity check) is performed starting at 00:00 every Sunday morning, to verify the checksums of all the data in the specified ZFS pools are correct.

The scheduled started time of the “zpool scrub” is currently not user configurable and it cannot be disabled in this version of AhsayUBS.

Once the “zpool scrub” job has started it is not possible to stop it.

To check the status of the “zpool scrub”, you can use the “zpool status” command which will return the following output. For the following example the “zpool scrub” has checked 56.33% of the pool: eslsfwx839830C2

```
ahsayubs:~# zpool status
pool: eslsfwx839830C2
state: ONLINE
scrub: scrub in progress for 0h0m, 56.33% done, 0h0m to go
config:

    NAME                                STATE      READ WRITE CKSUM
    eslsfwx839830C2                      ONLINE    0     0     0
        label/839830C2xd00p04            ONLINE    0     0     0

errors: No known data errors
ahsayubs:~# █
```

If an additional data integrity check is required in between the scheduled weekly checks. It is possible to initiate a manual “zpool scrub” using the “zpool scrub {% POOL_NAME%}” command.

As with the weekly “zpool scrub”, the AhsayCBS service and backup/restore operations can continue to run as normal.

Note:

There may be some performance overhead associated with a “zpool scrub”, i.e. CPU utilization, memory, and increased I/O activity. The performance overhead is proportional to the amount of data on the ZFS volume.

1.5 FreeBSD and ZFS Implementation

The ZFS version 5 and ZPOOL v28 on AhsayUBS has undergone an extended period of intensive performance and load testing, which has consistently delivered superior performance and data integrity results in comparison to UFS.

```

ahsayubs:~#
ahsayubs:~# dmesg | grep ZFS
ZFS filesystem version: 5
ZFS storage pool version: features support (5000)
ahsayubs:~#
ahsayubs:~#
ahsayubs:~# zpool get version
NAME          PROPERTY  VALUE   SOURCE
eslsfwxEA675F1A  version  28      local
esms00xEA675F1A  version  28      local
ahsayubs:~#

```

```

da0: 204800MB (419430400 512 byte sectors: 255H 63S/T 26108C)
da1 at mpt0 bus 0 target 1 lun 0
da1: <VMware Virtual disk 1.0> Fixed Direct Access SCSI-2 device
da1: 320.000MB/s transfers (160.000MHz, offset 127, 16bit)
da1: Command Queuing Enabled
da1: 102400MB (209715200 512 byte sectors: 255H 63S/T 13054C)
SMP: AP CPU #3 Launched!
SMP: AP CPU #1 Launched!
SMP: AP CPU #2 Launched!
GEOM_MIRROR: Device mirror/839830C2xesgpb launched (1/1).
GEOM_MIRROR: Device mirror/839830C2xesosfw launched (1/1).
GEOM_MIRROR: Device mirror/839830C2xesfmfw launched (1/1).
Trying to mount root from ufs:/dev/md0
This module (opensolaris) contains code covered by the
Common Development and Distribution License (CDDL)
see http://opensolaris.org/os/licensing/opensolaris\_license/
WARNING: ZFS is considered to be an experimental feature in FreeBSD.
ZFS filesystem version 3
ZFS storage pool version 13

```

1.6 Storage Model Migration

For legacy AhsayUBS environments who wish to migrate from UFS to ZFS storage model, only a manual migration method is available where you need to offload your locally stored User Home data, AhsayUBS setting, and AhsayCBS settings; to another temporary storage device, then reinstall AhsayUBS from new, then reload your data and settings back.

The migration process will generally involve:

1. Copying the existing user data from AhsayUBS server to another storage device.
 - This refers to the data in all locally stored User Homes stored on the filesystem
2. Backup your AhsayUBS configuration via the AhsayUBS Management Console
 - [System] | [Backup/Restore] | [Backup Configuration]
3. Backup of your AhsayCBS configuration (conf/*), policies (system/obs/policies/*), export your branding properties, and any non-standard customizations. If you need to retain logs (logs/*) and (system/*), exclude (system/cbs/Installers/*) which contain old branded builds.
4. Use the latest AhsayUBS installer to install a **new** version of AhsayUBS on the existing machine, which will overwrite all existing data, returning your server to bare state.
5. Set the AhsayUBS IP, so that you can login to the management console.
6. Restore your AhsayUBS configuration
7. Stop AhsayCBS service
8. Restore your AhsayCBS configuration
9. Copy the user data from the temporary storage device back to the AhsayUBS server.
10. Startup the AhsayCBS service, and verify AhsayCBS state is normal.

2 Overview

The process to setup Ahsay Universal Backup System (AhsayUBS) firmware onto a machine is done in four stages:

1. Installer Image Deployment, installation to physical server.
Deploys Ahsay Universal Backup System Installer image (*ubs-installer.img*) on a removable USB storage device.
2. Firmware Installation/Upgrade.
Install/upgrade Ahsay Universal Backup System Firmware onto the machine.
3. Ahsay Universal Backup System Configuration.
Configure the Ahsay Universal Backup System Firmware (FreeBSD).
4. Backup Server Configuration.
Configure the Backup Server, Redirectors, or Replication Server (AhsayCBS)

There are different software/hardware requirements for each stage. Please ensure that all the requirements are met before deploying the Ahsay™ Universal Backup System to the machine. For information on the software/hardware requirements, please refer to [Chapter 4 System Requirements](#) of this document.

2.1 Ahsay Universal Backup System Firmware

AhsayUBS Firmware is based on a customized version of FreeNAS firmware with AhsayCBS bundled and is specifically optimized to run AhsayCBS. Apart from AhsayCBS, it also contains some basic features that system administrator require, e.g. SSH and system monitoring tools.

2.1.1 AhsayUBS Storage Concepts

The AhsayUBS installer will automatically detect all available local hard disk(s) during the installation progress. The selected hard disk(s) will be partitioned to form "System Storage". Several RAID devices will be created on the "System Storage":

1. GPT Boot (**GPBT**)
2. Operating System Framework (**OSFW**)
3. Firmware Module Framework (**FMFW**)
4. Logical Storage Framework (**LSFW**)

The **GPBT**, **OSFW** and **FMFW** volume are configured as RAID1 mirror in UFS file system to form the core system.

The **LSFW** *software* RAID device:

- Supports JBOD, RAID0, RAID1 and RAID5 in UFS format for old version of AhsayUBS.
- Supports RAID0, RAID1 and RAIDZ in ZFS format for the new version of AhsayUBS (The raid type depends on the number of hard disks installed and selected during AhsayUBS installation, for **RAID0 the minimum number of disks is required is 1** [data loss for any one failed drive], for **RAID1 and RAIDZ the minimum number of disks required is 2** [data loss if more than one failed drive]).

These volumes are named "System Storage". The **OSFW**, **FMFW** devices will be created on the Unix File System (UFS). **The firmware configuration files will be stored on OSFW and the AhsayCBS configuration files and backup data will be stored on LSF.**

HARDWARE RAID? For systems employing *hardware* RAID, you are limited to one hardware RAID presentable to the server at time of AhsyUBS installation (you may add additional hardware RAID volumes, after AhsayUBS new installation is completed.). If you have more than one hardware RAID volumes, then you will be prevented from installation. For such systems, you will not be presented with choice of RAID settings at time of AhsayUBS installation (you only present one volume).

If the **LSFW** file system runs out of disk space, extra storage can be added to the system by either:

1. Adding a new block device to the system hardware.
2. Creating an iSCSI connection to a remote storage server.

The added block devices will be partitioned and formatted to form "**Modular Storage (ZFS + ZIL)**".

The previously supported additional storages: 'Modular Storage (ZFS)', 'Expandable Storage (ZFS)' and 'Optional Storage (UFS);' will also be listed in the summary page. However, only removal of those additional storage is allowed.

Expandable Storage volumes (ZFS) can no longer be created.

There are three types of **Additional Storage**:

1. Modular Storage (ZFS / ZFS+ZIL)

can be created by one or more local block device to form a volume either in RAID0, RAID1 or RAIDZ (is dependent on the number of hard disks used to form the volume). Since this AhsayUBS version, the underlying ZPOOL will be added with a ZIL layer (ZIL = ZFS Intent Log).

2. Expandable Storage (ZFS) [legacy]

created in the former AhsayUBS versions with a hardware RAID volume or an iSCSI initiator session connected to this AhsayUBS machine. A RAID0 ZFS filesystem will be formed for each of the Expandable Storage. It is for supporting the old migrated AhsayUBS only and cannot be created in this version of AhsayUBS.

3. Optional Storage (UFS) [legacy]

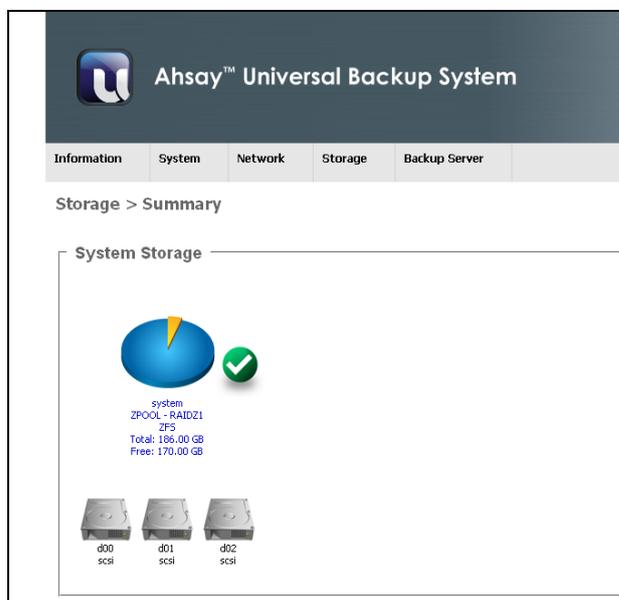
called "Optional Labelled Device" on earlier AhsayUBS versions. It is for supporting the older migrated AhsayUBS installations only and cannot be created in this version of AhsayUBS.

By configuring the AhsayCBS, the "Additional Storage" can be used as additional storage for storing server configuration files and backup data.

Note:

Minimum size 500GB is required for the AhsayUBS Backup System block devices (i.e. System Storage and Additional Storage). Otherwise, the added block device will not be allowed for fail disk replacement and additional storage.

The AhsayUBS WebAdmin page, under [Storage] > [Summary] will show the overview of the volumes created on AhsayUBS.



3 Important Notice

The Ahsay™ Universal Backup System provides console access to the "System Management Console" by connecting a keyboard and a VGA monitor to the physical machine.

To prevent unauthorized access to the AhsayUBS System Management Console, it is advised to change the default AhsayUBS administrator password.

4 System Requirements

This chapter describes the system requirements for the Installer Image Deployment, Backup System firmware Installation/ Upgrade, Backup System and Backup Server Configuration.

4.1 Backup System Requirements

The selected machine must meet the following requirements:

- CPU: At least 1 CPU that is FreeBSD i386 / amd64 compatible.
- Memory Size: 4 GB minimum. If the AhsayUBS installer detects the machine is installed with less than 2GB RAM the installation or upgrade process will be aborted.
- Disk Storage Space: 1000GB per disk minimum
(If your users will store backup data onto the AhsayUBS server, you should plan for the largest drives allowable by your system, as future drive upgrade will be difficult.)
- Network interface card (NIC): At least 1 NIC that is FreeBSD 11.2 i386/amd64 compatible.
- Motherboard: If the motherboard supports Unified Extensible Firmware Interface (UEFI) standard. The boot mode **must be set to BIOS boot manager** and the AhsayUBS installed hard disk specified as the first the boot device.

For production AhsayUBS servers configured with ZFS volume(s). It is strongly recommended to:

1. Install AhsayUBS on a 64bit machine.
2. Install at least 8 GB RAM, as ZFS volumes require relatively large amount of memory to run. The amount of memory required is dependent on the size of the ZFS volume and the amount of I/O activity.

For the list of FreeBSD 11.2 i386/amd64 compatible processors, please refer to Appendix A.

4.1.1 Firewall Settings

Please ensure you have updated your network firewall settings to allow network traffic through the following ports to your AhsayUBS server:

Port	Description
80	HTTP port for incoming backup and restore traffic, browsing the AhsayCBS web interface. [Port number can be customized]
443	HTTPS port for incoming backup and restore traffic, browsing the AhsayCBS web interface. [Port number can be customized]
25	Outgoing SMTP port to the SMTP server.
8080	AhsayUBS web administration console. [Port number can be customized]
111	Port Mapper
1058	Mount Port ** Required for Run Direct on AhsayCBS
2049	Port for NFS Service
Any incoming TCP port(s)	Any incoming TCP port(s) used by previous version of replication receiver(s), e.g. 9444, 9445...

4.1.2 AhsayUBS Processor Configuration

AhsayUBS supports up to a maximum of 32 virtual processors for both i386/amd64 compatible CPU's.

In order to comply with the maximum supported virtual processors limit on FreeBSD, the system administrator should verify the number of virtual processors enabled on the AhsayUBS machine and apply the correct processor setup on the machines BIOS before proceeding with AhsayUBS installation or upgrade.

The maximum number of virtual processors is calculated as:

(No. of sockets) * (No. of cores per processor) * (Hyper Threading).

The following are examples of processor configurations.

Supported Processor Configurations

- One Socket, Dual-Core Intel CPU, Hyper Threading Enabled

$$(1) * (2) * (2) = 4 \text{ virtual processors}$$

- Two Sockets, 6-Core Intel CPU, Hyper Threading Enabled

$$(2) * (6) * (2) = 24 \text{ virtual processors}$$

3. Two Sockets, 8-Core Intel CPU, Hyper Threading Enabled

$$(2) * (8) * (2) = 32 \text{ virtual processors}$$

4. Four Sockets, 4-Core Intel CPU, Hyper Threading Enabled

$$(4) * (4) * (2) = 32 \text{ virtual processors}$$

Non-supported Processor Configurations and workarounds

1. Two Sockets, 12-Core AMD CPU, Hyper Threading Enabled

$$(2) * (12) * (2) = 48 \text{ virtual processors}$$

It is recommended the number of cores per CPU be set at 8 on the machine BIOS:

$$(2) * (8) * (2) = 32 \text{ virtual processors}$$

2. Four Sockets, 8-Core Intel CPU, Hyper Threading Enabled

$$(4) * (8) * (2) = 64 \text{ virtual processors}$$

It is recommended that Hyper Threading is disabled on both CPU's on the machine BIOS:

$$(4) * (8) * (1) = 32 \text{ virtual processors}$$

3. Four Sockets, 10-Core Intel CPU, Hyper Threading Enabled

$$(4) * (10) * (2) = 80 \text{ virtual processors}$$

It is recommended that Hyper Threading is disabled on both CPU's and the number of cores per CPU be set at 8 on the machine BIOS:

$$(4) * (8) * (1) = 32 \text{ virtual processors}$$

WARNING:

If AhsayUBS is installed on a machine where the number of virtual processors configured exceeds the maximum supported value of 32. This will cause FreeBSD to become unstable and crash, which could result in data corruption on AhsayCBS.

4.2 Installer Media Requirements

AhsayUBS installer is available in *img* and *ISO* formats.

1. The ***img* format** is used for deployment on a USB flash drive (minimum 2GB), for installation to a physical server.
2. The ***ISO* format** is used for VMware installation/upgrades only; and is not for use on deployment to CD/DVD media.

4.3 Installer Deployment

For physical server deployment, please ensure the following requirements are met before deploying Ahsay™ Universal Backup System image to a USB flash drive.

1. The USB flash drive should meet the minimum 2GB storage size requirements.
2. Previous data stored on the USB flash drive should be backed up properly. **Once the deployment process begins, all data on the USB flash drive will be OVERWRITTEN.**
3. To avoid selecting the incorrect drive for deployment, it is advised to remove all other USB storage devices such as USB portable hard disk and other USB flash drive.

Note: When you reinstall AhsayUBS, please refer to the following link to perform [user storage migration](#).

4.4 AhsayUBS Firmware Installation / Upgrade

Please ensure the following requirements are met before installing / upgrading AhsayUBS Firmware:

- ▶ Connect a VGA Monitor and a keyboard to the target machine.
- ▶ Make sure that there are *local block devices* (e.g. "ide", "scsi" disk volumes) installed in the machine.
- ▶ The new installation process will destroy all the data in the local block devices installed in the machine. To protect the data in some of the local block devices, it is recommended to remove them before the installation of AhsayUBS Firmware.
- ▶ The upgrade process requires the existing hardware/software RAID storage configuration to be healthy. **The upgrade process will not be able to continue on system configuration with one or more DEGRADED RAID devices.**

5 Installer Image Deployment

This chapter describes how to prepare the installer source to deploy AhsayUBS on a physical server.

If you are deploying AhsayUBS as a Virtual Machine, you may skip this deployment section.

5.1 Removable Storage Device

WARNING: Please backup any data stored in the removable USB storage device before deploying the AhsayUBS Installer image onto it. Otherwise, all the data in the USB storage device will be DESTROYED.

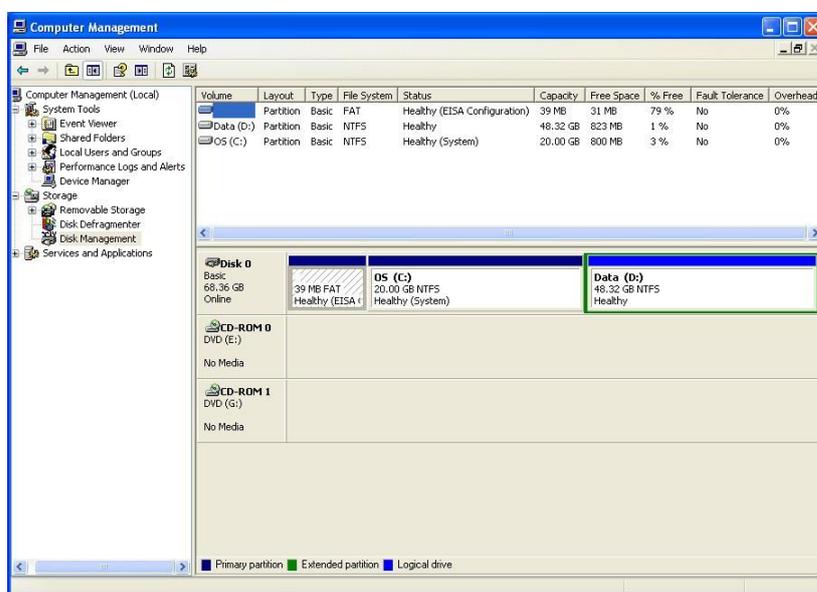
5.1.1 Step 1 Preparation

Please follow the instructions below to view the current disk configuration from [Computer Management] Console:

Right click on [My Computer] on desktop and select [Manage].

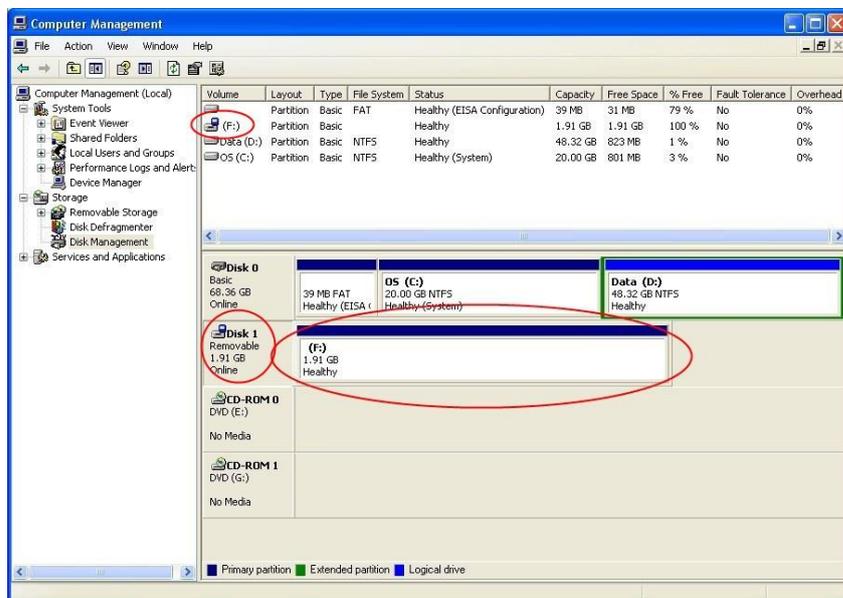


Click on [Disk Management] from the [Computer Management] MMC console. All connected storage device(s) will be listed and marked as [Disk *].



Attach the removable device to your computer and refresh the [Disk Management] console. This can be done by pressing the [F5] button on your keyboard.

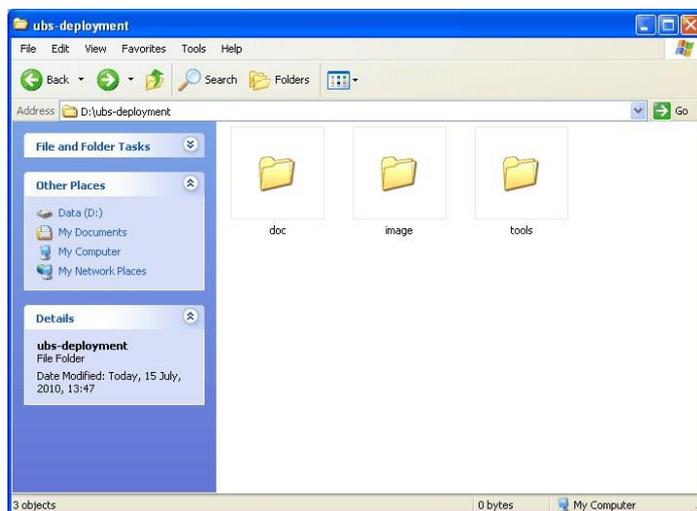
The new disk should be shown in the [Computer Management] console. In our example, it is shown as [Disk 1] with a drive letter "F".



5.1.2 Step 2 Deploy the Installer image with “AhsayUBS Deployment Utility”

1. Download the [AhsayUBS Deployment Utility](#) from our website and extract all files from the bundle to a temporary directory.

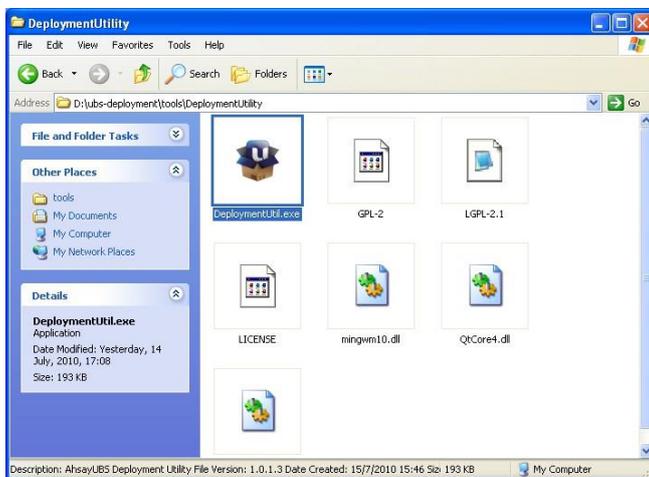
In this example, *D:\ubs-deployment*.



The deployment program is stored in Deployment Utility folder under `%UBS_DEPLOYMENT_DIR%\tools\`.

In this example, the path for the deployment utility is `D:\ubs-deployment\tools\DeploymentUtility`.

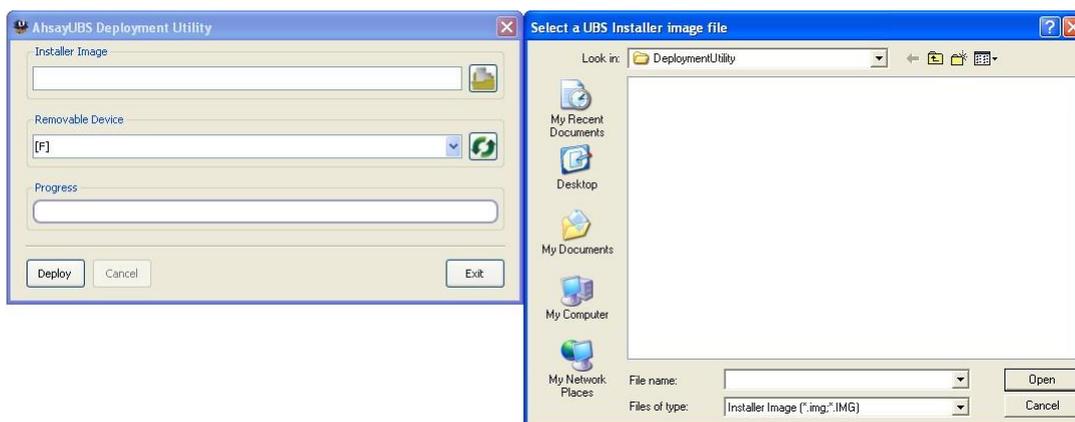
2. Double click the "`DeploymentUtil.exe`" icon to launch the utility.



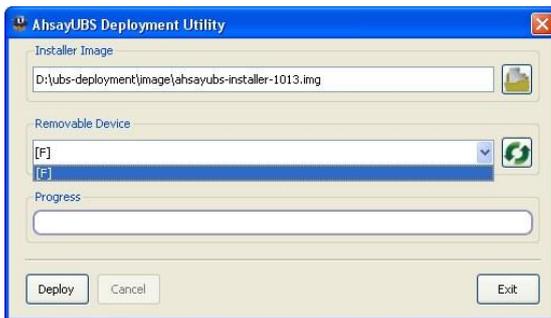
3. After launching the Deployment Utility software, click on the 'Image File' icon from the [Image File] to select the image file to copy.



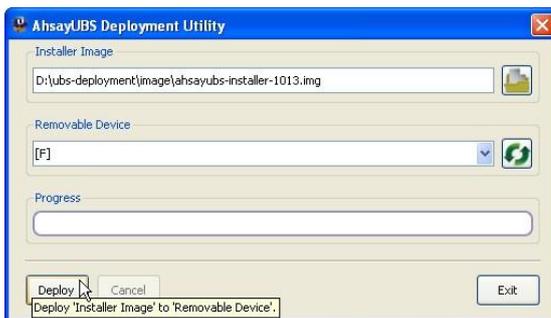
4. In the popup windows, select the AhsayUBS installer image: `ahsayubs-installer-*.img` from `%UBS_DEPLOYMENT_DIR%\image`, i.e. `D:\ubs-deployment\image`.



5. Select the target drive in the [Removable Device] drop down panel (i.e. drive-F in our case).



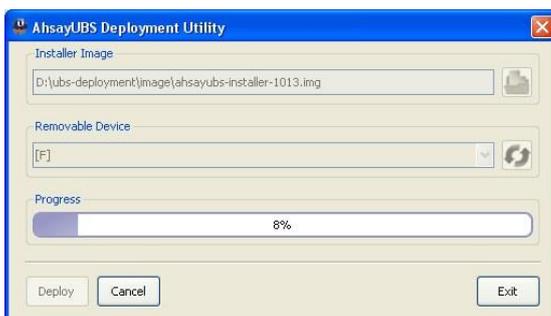
6. Click on the [Write] button to write the AhsayUBS installer image to the selected device.



7. After clicking the [Deploy] button, a warning dialog window will be displayed on the screen. Click the [Yes] button to continue. However, if you have chosen wrong image file/drive, please click the [No] button to abort the process and repeat steps 1-7 again.



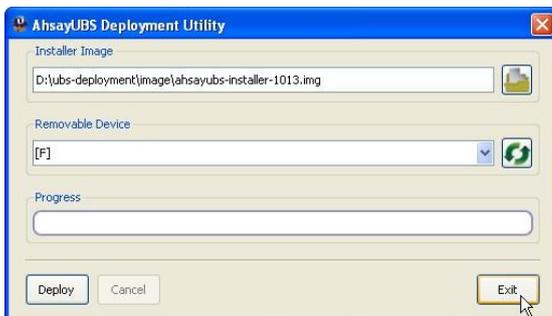
8. If you click the [Yes] button in step 8, the software will start writing the AhsayUBS image to your removable storage device. The write progress percentage will be shown in the Progress Bar. Please wait until all bytes are written to the selected removable storage device.



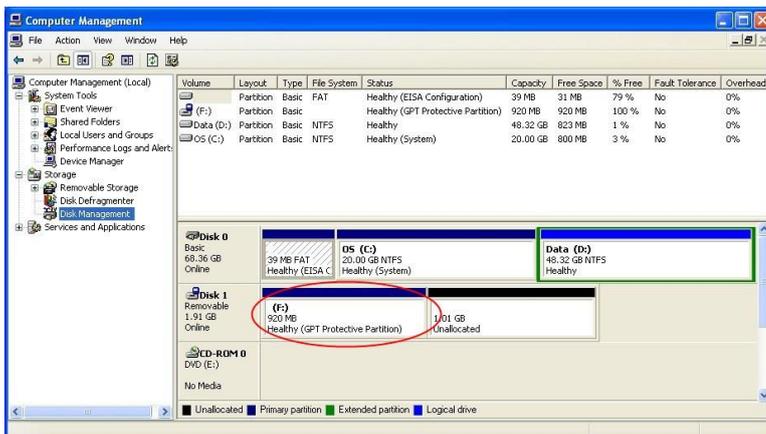
9. When it has completed the writing process, the following message will be shown on the screen.



10. The deployment process is now completed. You may close the software by clicking the [Exit] button.



11. To verify the results, please go to [Computer Management] Console and select [Action] -> [Refresh] from the menu. The selected removable storage device should contain a GPT partition.



12. Then remove the hardware safely by, click on the [Safely Remove Hardware] icon in the system tray (i.e. It is located in the bottom-right hand corner of Windows). If there are multiple removable devices, please select the one which has been used in the deployment (i.e. drive F in our case).



13. The AhsayUBS installer image has been deployed to the removable device.



6 Installing AhsayUBS Firmware

After the installer deployment, the AhsayUBS Installer is ready for deploying the firmware to the designated AhsayUBS machine. This chapter provides instructions on how to install AhsayUBS.

6.1 Pre-Installation

Before installing AhsayUBS on a machine, please verify if the followings tasks have been done:

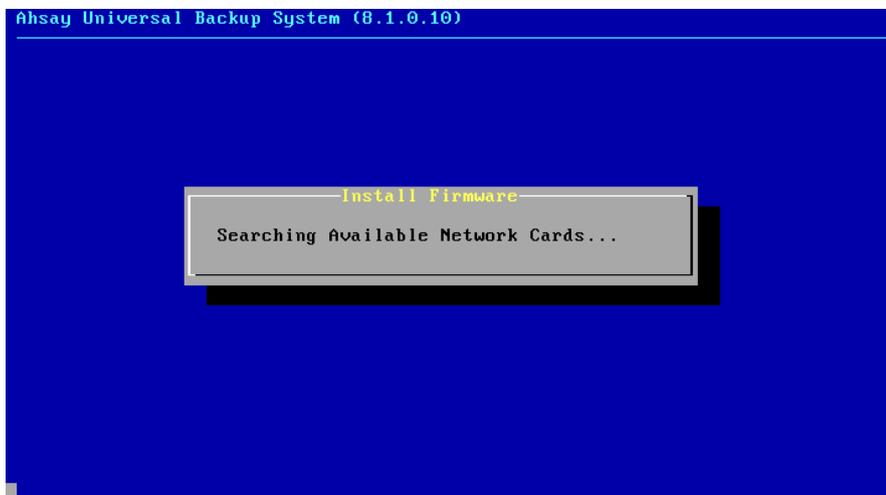
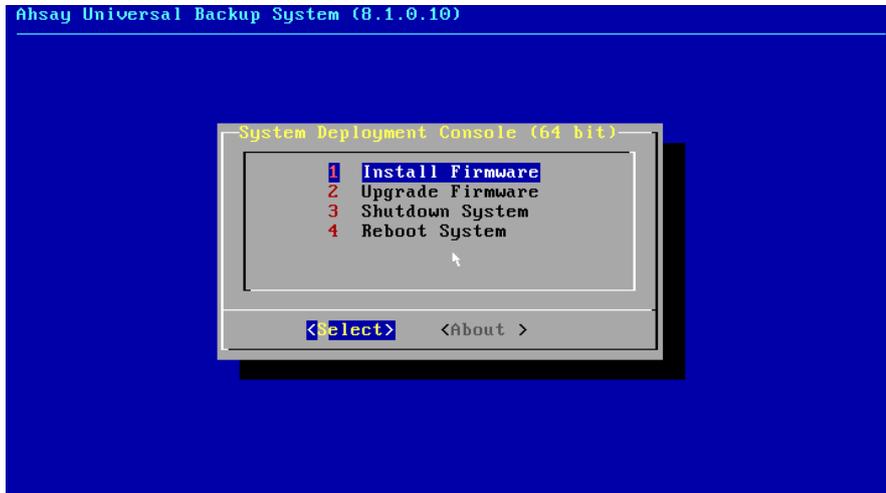
1. Physical server installation: Deploy the AhsayUBS image to USB removable storage device.

Virtual Machine installation: Download the AhsayUBS ISO from <http://www.ahsay.com/download>
2. The installation media is connected to the target machine.
3. Shutdown the target machine.
4. Power on the machine and enter the BIOS settings page. (Please refer to the motherboard manual for the instruction to enter BIOS settings page.)
5. Configure the boot priority of the AhsayUBS machine to boot from the USB removable storage device, or ISO.
6. Save the settings and exit the BIOS.
7. Reboot the machine and boot up from the installer device.

Note: When you reinstall AhsayUBS, please refer to the following link to perform [user storage migration](#).

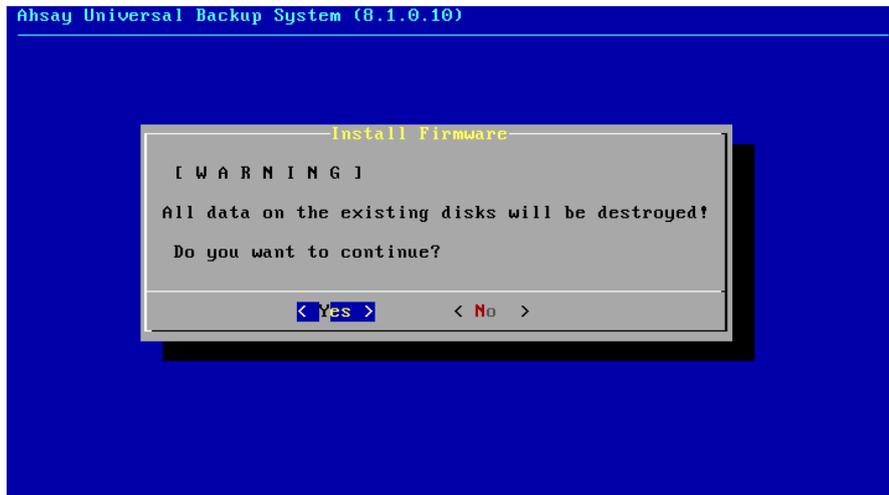
6.2 Installing AhsayUBS Firmware (New Install)

1. After booting up from the installer device, the main menu will be shown.
Select [1] to start the *New Installation* of the AhsayUBS firmware.



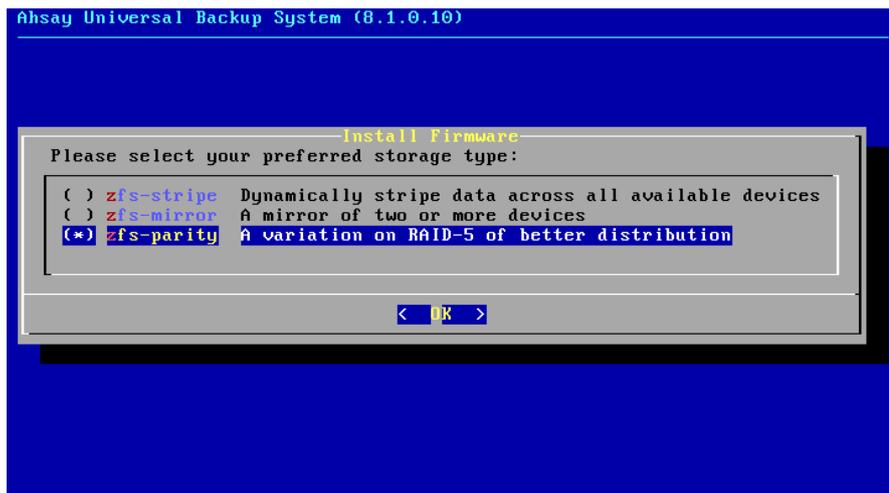
2. A warning message will be shown on the screen.

Select [Yes] if there is no data on the disk(s) or the data can be destroyed. Otherwise, select [No] to abort the installation process.



3. If your system has *multiple hard disks*, you will be presented with preferred storage type. If you are running with *one hard disk* or *hardware RAID with one volume presented*, this screen may not be shown.

Select the file system type for the file system LSFW and press the [Enter] key to continue.



zfs-stripe = RAID0 (data loss if any one drive failure)

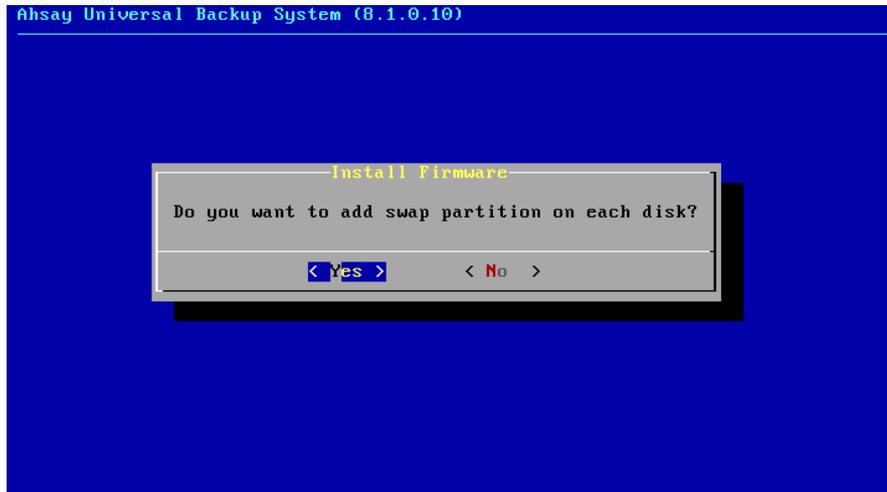
zfs-mirror = RAID1 (data loss if more than one drive failure)

zfs-parity = RAIDZ (data loss if more than one drive failure)

The file system LSFW will store the user data and the backup snapshots of AhsayCBS. For data redundancy purposes, it is highly recommended to configure this partition as a zfs-parity volume.

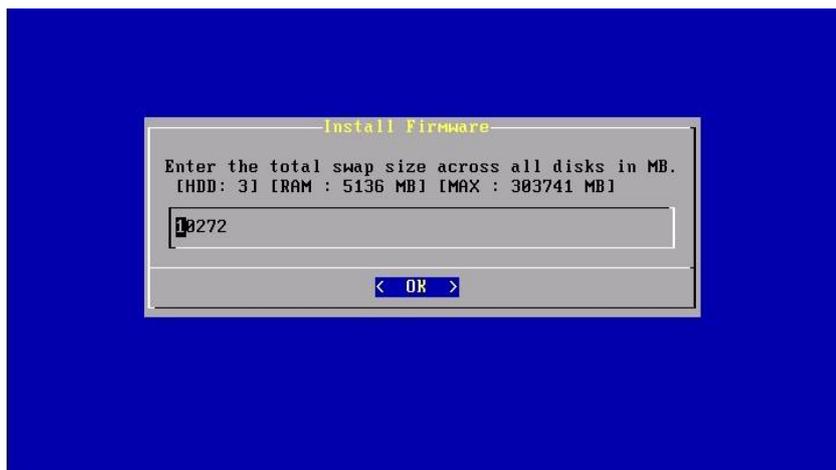
4. Select [Yes] to add swap partition(s) or choose [No] to skip this step.

Tip: Swap Partitions act as the virtual memory in the system. If there is not enough physical memory in the machine, the data will be swapped to the swap partition to store it temporary.



It is strongly recommended to create a swap partition for AhsayUBS.

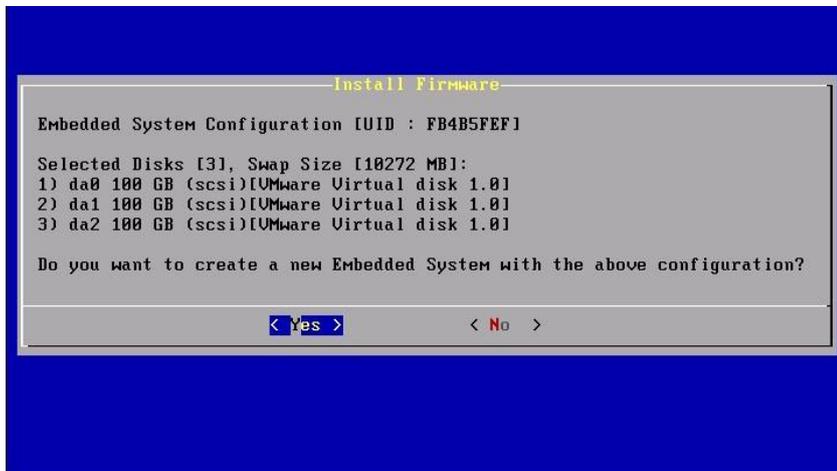
5. If you choose to create a swap partition in step 4, you will be asked to enter the size of the swap partition.



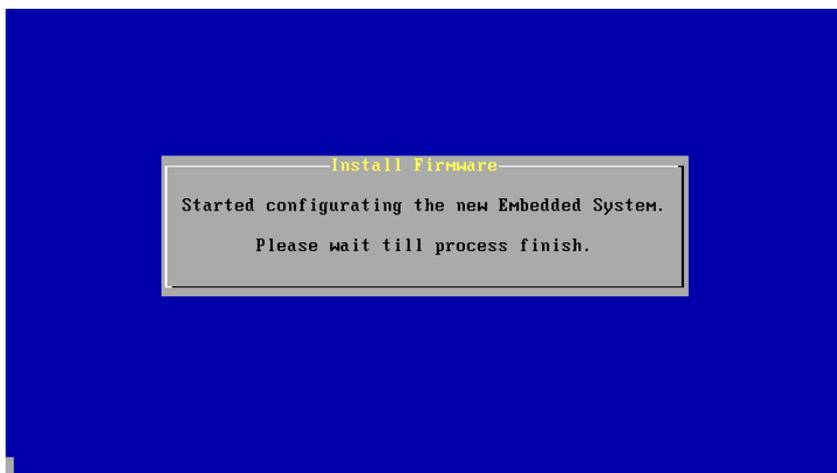
Note: The total swap file size should be at least double the size of the physical memory installed on the AhsayUBS machine.

6. After inputting the swap file size, a summary of the settings for the storage configuration will be shown.

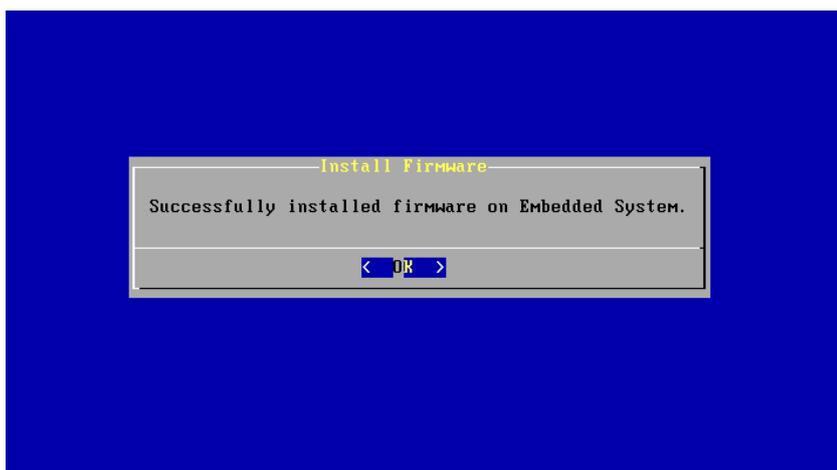
Select [Yes] to accept these settings and continue with the installation, select [No] if you would like to make any changes to the current configuration.



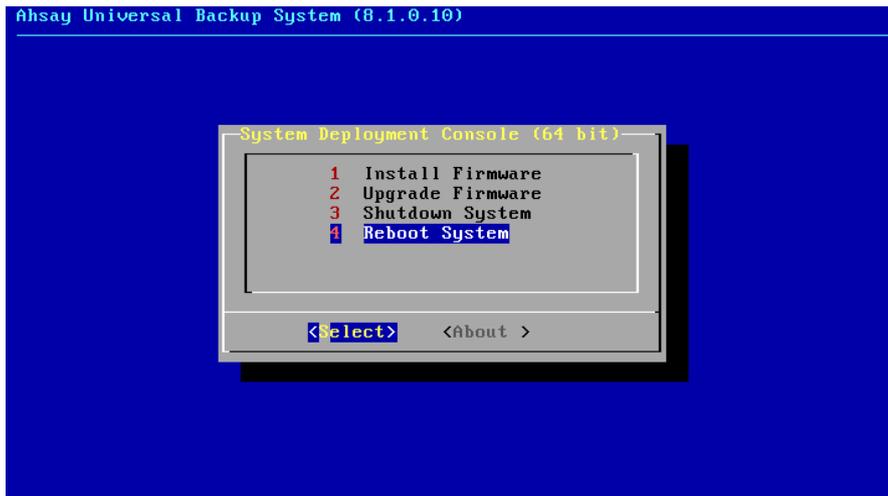
7. Once the settings have been confirmed the file system will be configured.



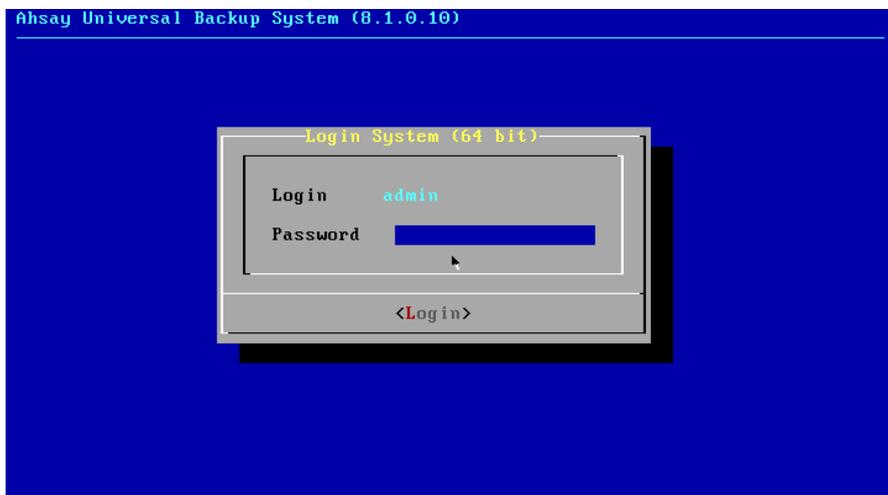
8. AhsayUBS Firmware is now installed on the target machine.



- Remove the installation media and press [OK]. Then select option [4] to restart AhsayUBS.



- After the system has restarted, logon to AhsayUBS using the default credentials; user id: *admin* and password: *ahsayubs*



- Please refer to [chapter 6.4 post-installation](#) to complete the installation.

6.3 Upgrading AhsayUBS Firmware

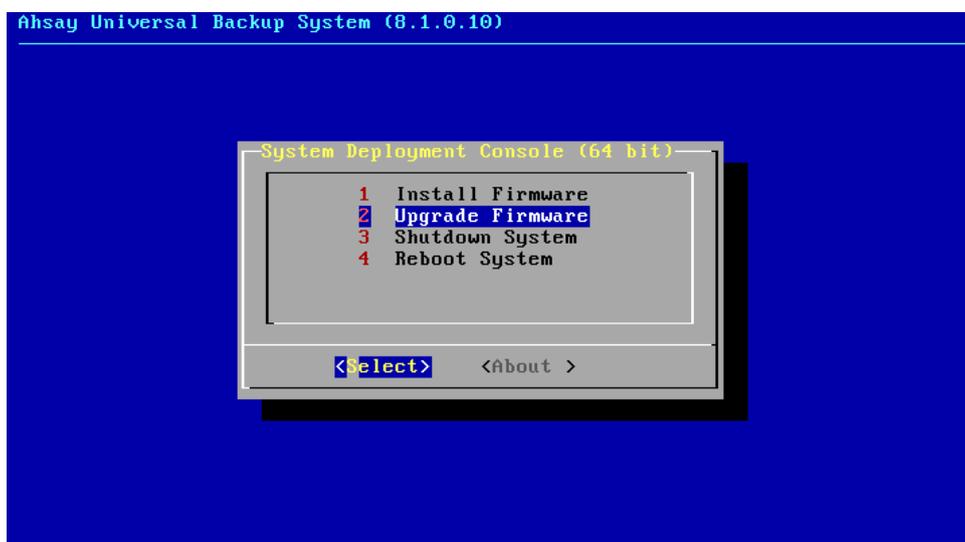
Please use the upgrade option if AhsayUBS is previously installed on the machine, and to preserve existing configuration and data:

Pre-Requisites:

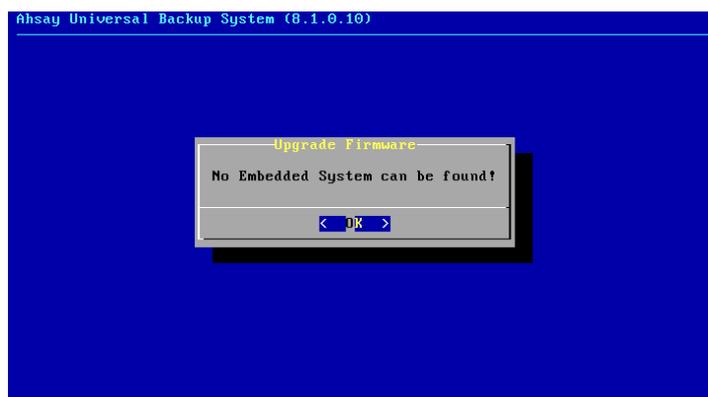
- You have enabled AhsayCBS AutoSave at least one full day prior to performing upgrade; or, you may make an offsite copy of the CBS "conf" folder, "system/obs/policies" folders
- You have exported your AhsayUBS Web Console settings

Important:

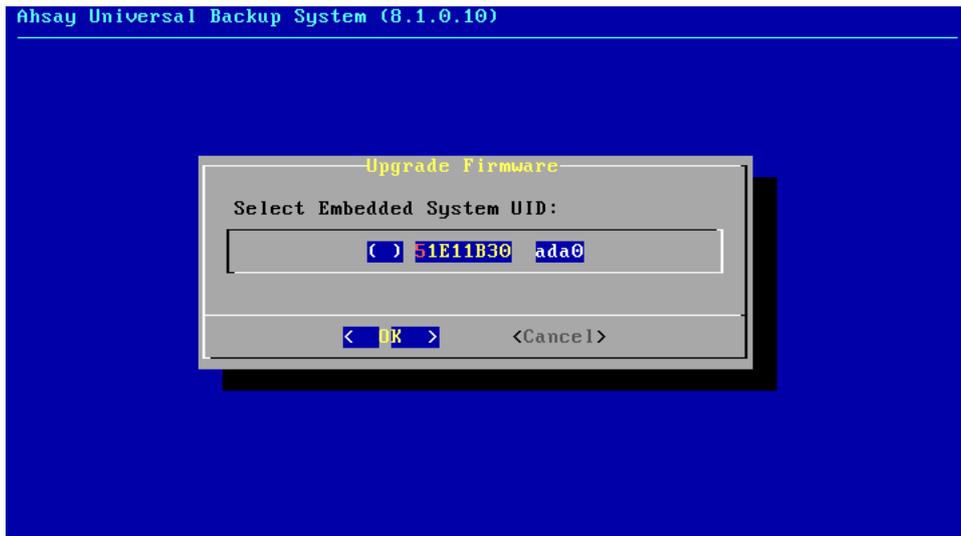
- Upgrade to AhsayUBS 8 cannot downgrade or rollback to earlier AhsayUBS v6 or v7 version. As a precaution, you may want to take a snapshot if your VM environment allows.
1. After booting, the main menu will appear on the screen. Select option [2] to start upgrading the AhsayUBS.



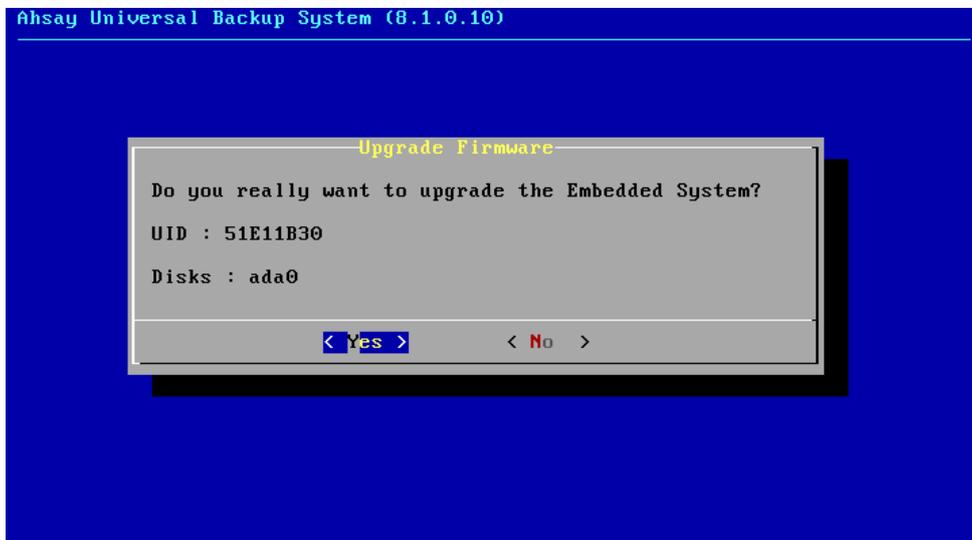
Note: If there are no embedded systems found inside the machine, please use the option [Install] instead of [Upgrade]. For the detailed steps to install, please refer to [Chapter 6.2 Installing AhsayUBS Firmware](#).



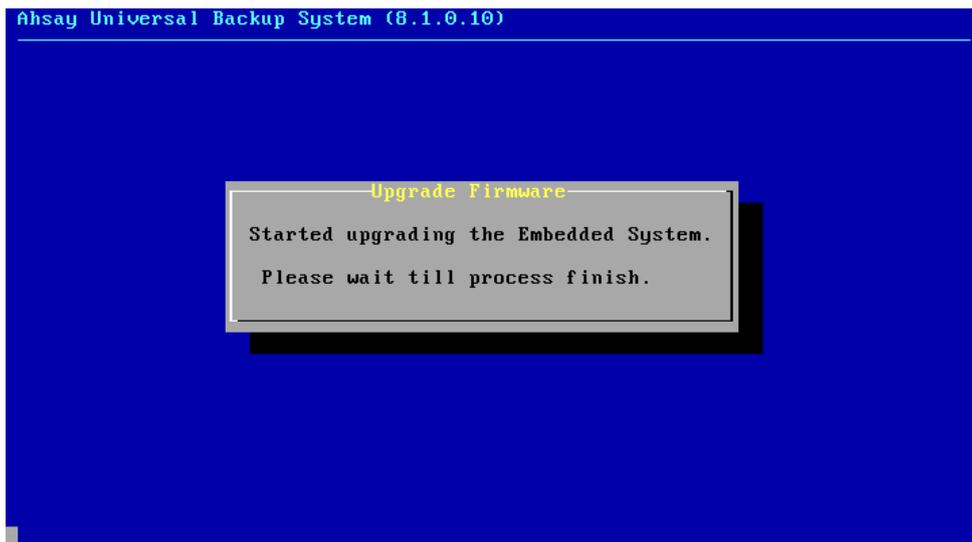
2. Select the system UID by pressing [Space] bar. Choose [OK] to continue.



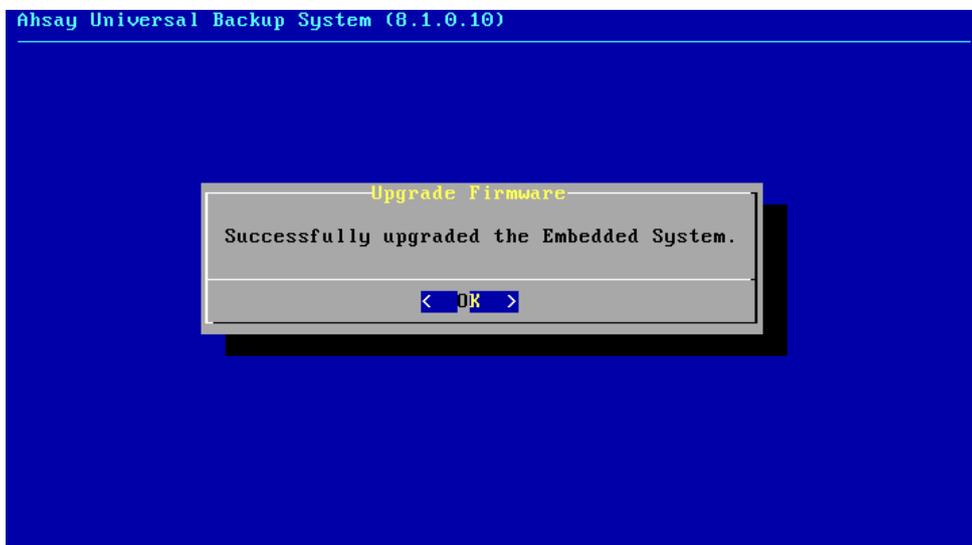
3. When the following message is shown, choose [Yes] to start the upgrade and [No] to abort.



4. Wait until the upgrade is completed.



5. The message "Successfully upgraded the Embedded System" is shown when the upgrade is completed successfully. Please choose [OK] to go back to the main menu.

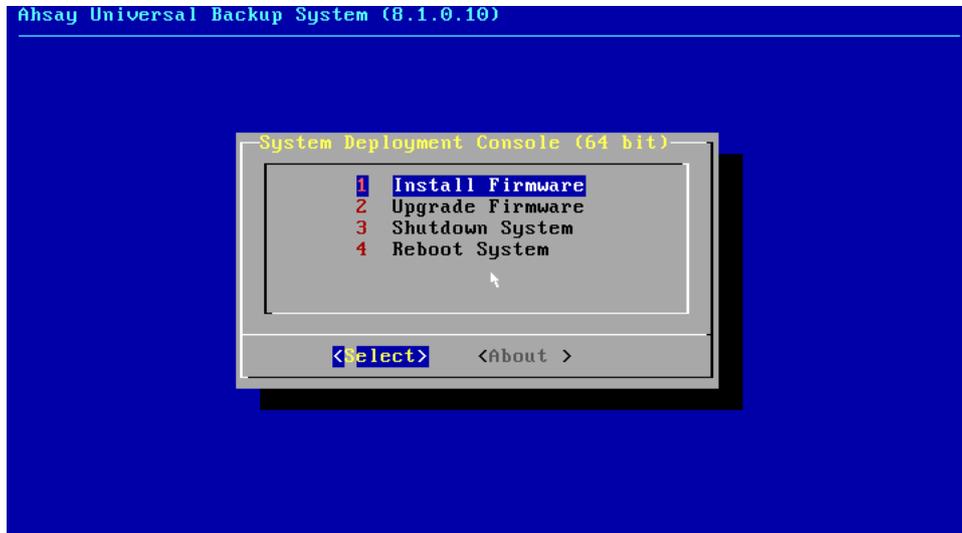


6. Refer to [Chapter 6.4 Post-Installation](#) to complete the upgrade process.

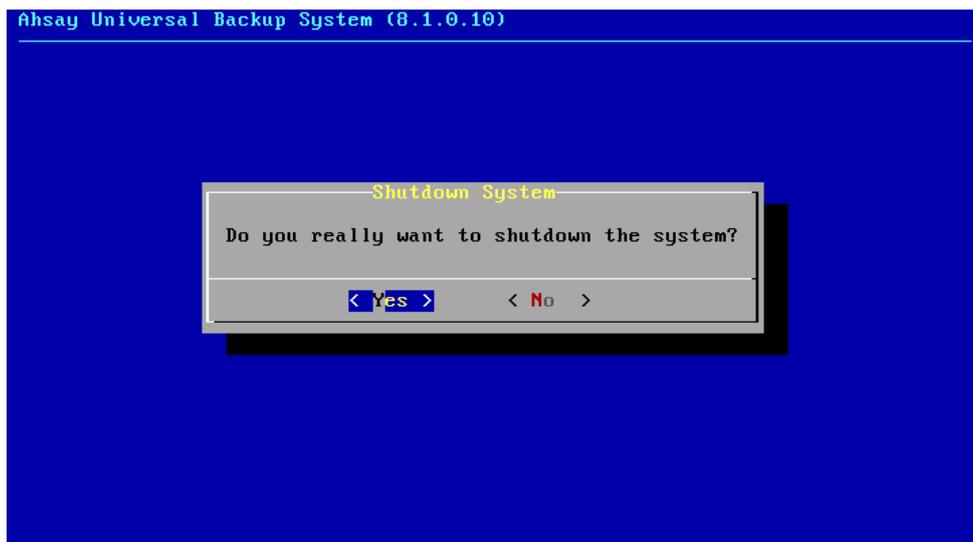
6.4 Post-installation

Please perform the following actions after the AhsayUBS is successfully installed / updated on the machine:

1. In the main menu, choose [3] to shutdown the system.



2. Choose [Yes] to confirm the shutdown.



3. Eject the installation media.
4. Power On the machine and enter BIOS settings.
5. Choose to boot from the local block devices.
6. Save and exit BIOS.

7. Login the System Management Console with the administrator password.
8. Configure AhsayUBS with your preferred network settings. (refer [Chapter 7.1.2](#))

(For software-RAID Configuration Only)

9. Login the AhsayUBS Web Administration Interface (web port 8080).
10. Go to page [Storage] > [Summary] and wait the status of the System Storage changes from rebuilding icon  to the healthy icon .
11. The Logical Storage Framework volume is healthy and the mount point is ready for use.
12. Go to [Backup Server] to enable the AhsayCBS service.

The installation/upgrade is now completed.

WARNING:

Please make sure the RAID build process is completed before AhsayCBS is put into production as a backup server.

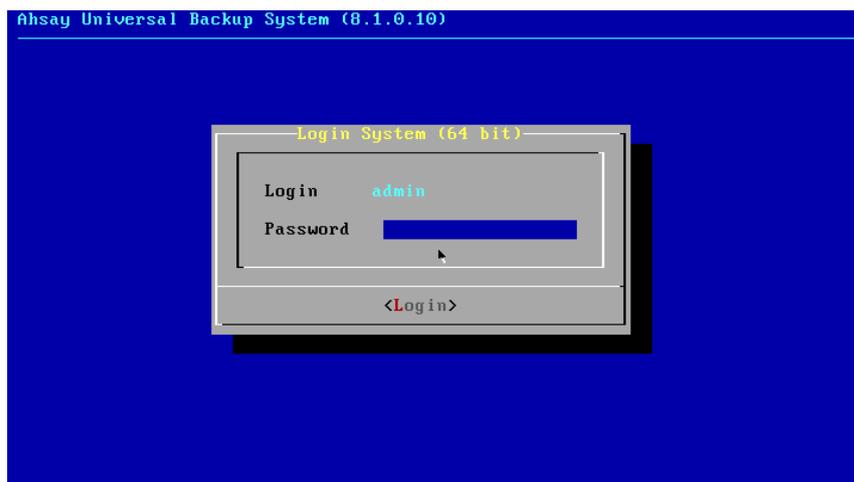
7 Basic AhsayUBS Firmware Configuration

This chapter describes the basic configuration of the AhsayUBS through the console and the WebAdmin.

7.1 System Console

7.1.1 Login to System Console

Before using the functions of AhsayUBS System Console, please login using the administration credentials to complete the configuration.

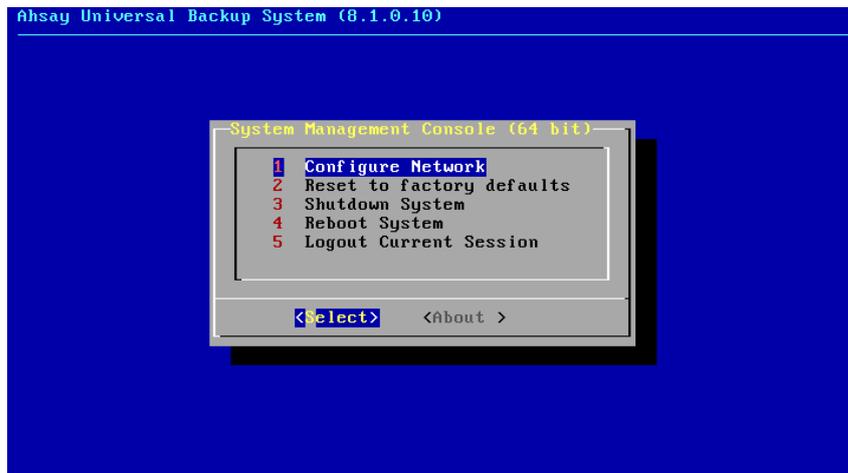


The default login credentials for AhsayUBS console are:

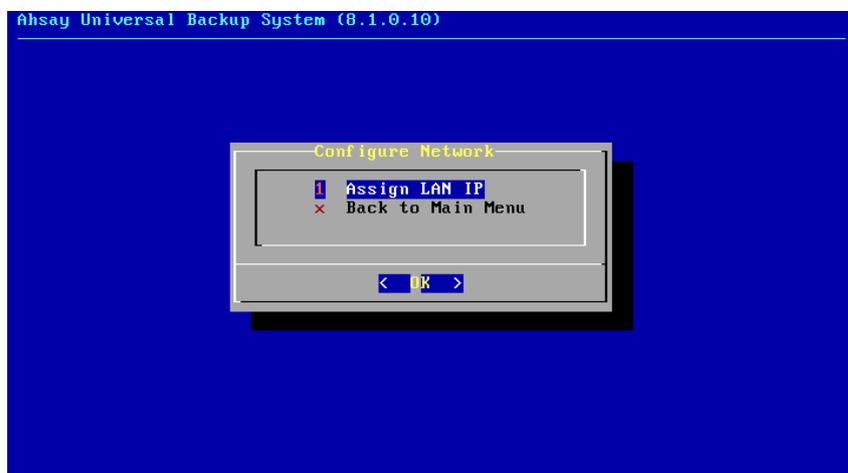
Username: admin
Password: ahsayubs

7.1.2 Configure Network Settings

In the main menu, choose [1] to configure the network.



Choose [1] to assign a LAN IP to the device.

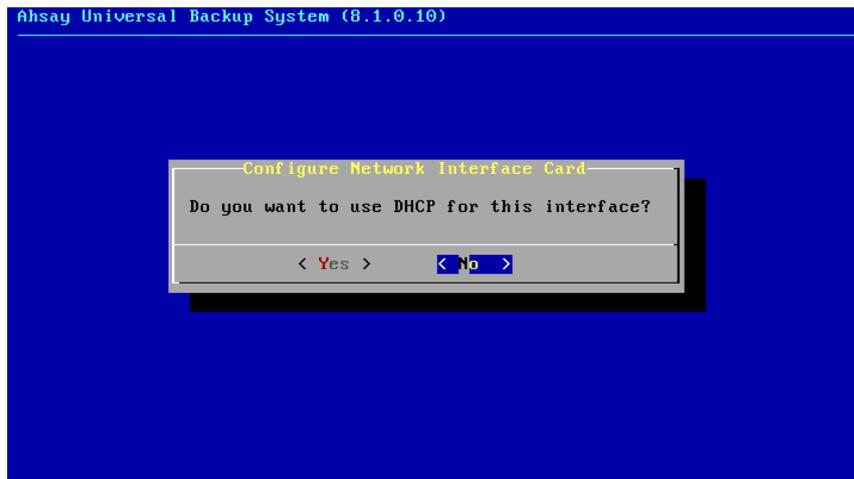


Select the method for setting up the IP Address on the device. There are two methods:

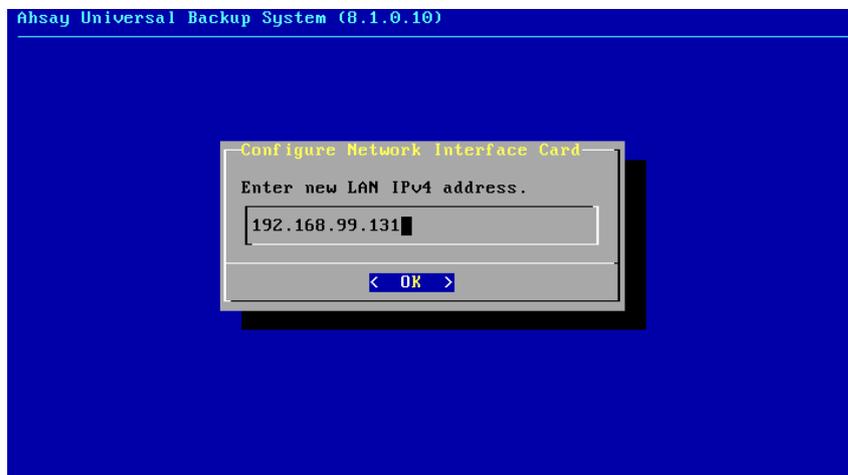
1. **DHCP** – stands for automatic setup. It will send a request to your DHCP server to get an IP Address. You must have a DHCP server in your network to use this option.
2. **Static** – stands for manual setup. You need to enter the network settings manually.

Note: You can press the [Esc] key to go back to the main menu if you selected the wrong option.

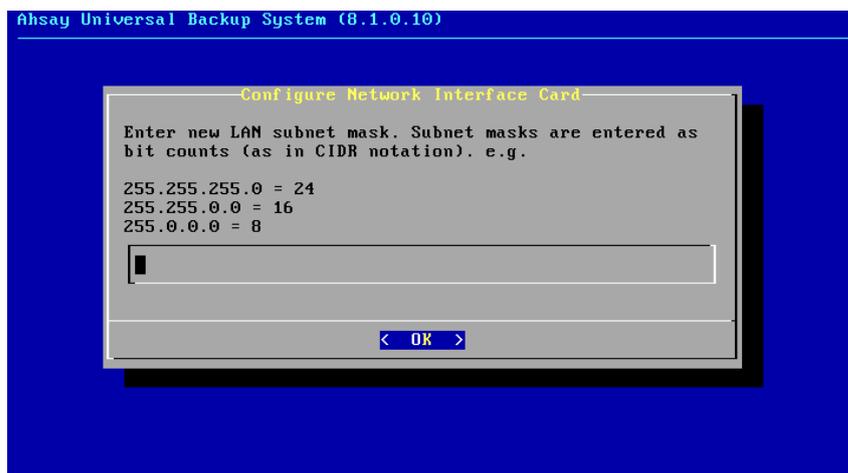
In this step, choose [Yes] for using DHCP or [No] to configure the network manually.



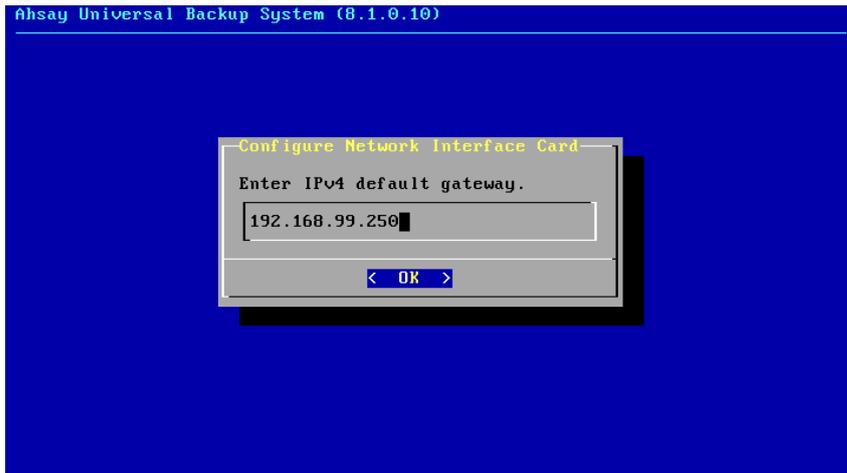
(Only shown when [No] is chosen in step 3) Enter the IPv4 IP address and choose [OK] to continue.



(Only shown when [No] is chosen in step 3) Enter the subnet and choose [OK] to continue.



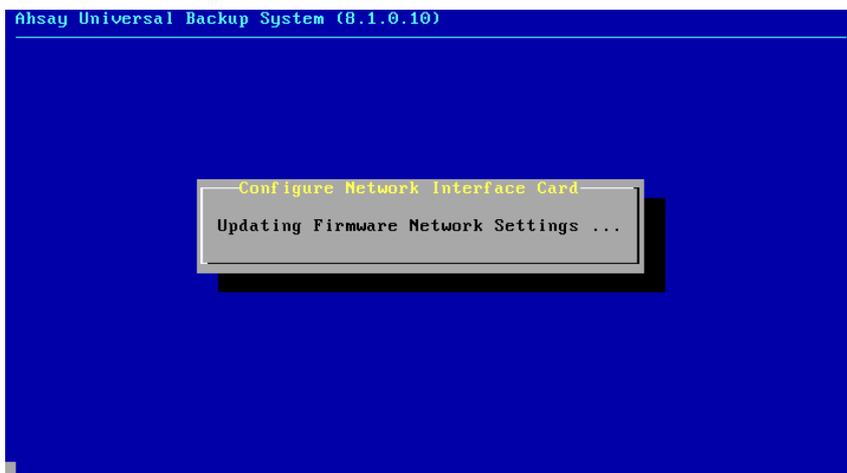
(Only shown when [No] is chosen in step 3) Enter the default gateway address and choose [OK] to continue.



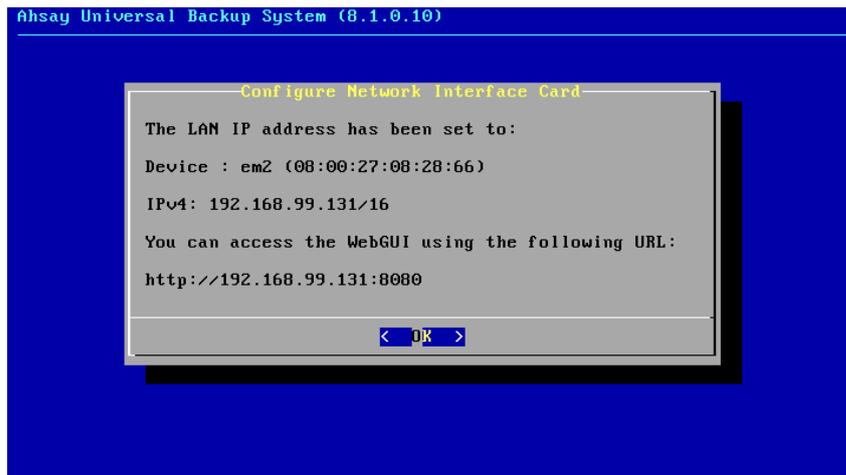
(Only shown when [No] is chosen in step 3) Enter the DNS address and choose [OK] to continue.



Wait for AhsayUBS Firmware to finish updating the network configuration.



Try to access the AhsayUBS WebAdmin by the following URL to verify the network settings.



If the verification, choose [OK] to back to the main console menu.

7.1.3 Login System

Launch your browser and type the AhsayUBS WebAdmin's IP address and AhsayUBS WebAdmin service port to the address bar.

For example, the AhsayUBS IP: 192.168.99.131 and the default WebAdmin server **port is 8080** (you can change this port later). The default URL address to access the AhsayUBS Web Admin would be: <http://192.168.99.131:8080> ; as shown in the previous screenshot.

After you have connected to the WebAdmin Login page, login to the AhsayUBS Webadmin with the correct username and password. The default login credentials for AhsayUBS WebAdmin are:

Username: admin
Password: ahsayubs



Ahsay Universal Backup System (3.1.0.10) © 2008-2018 by Ahsay Systems Corporation. All rights reserved.



Note: AhsayUBS WebAdmin console will automatically logout after 10 minutes of inactivity.

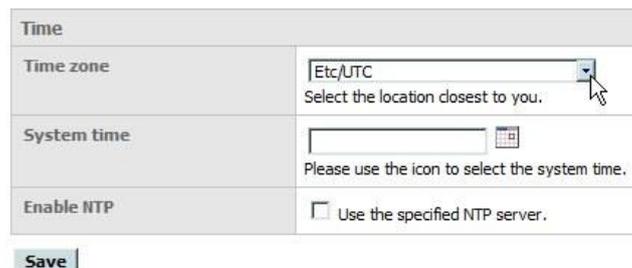
7.1.4 System Time and Time Zone Setup

Accurately configure the date and time settings of AhsayUBS. Without accuracy, logs and backup schedules may be incorrect.

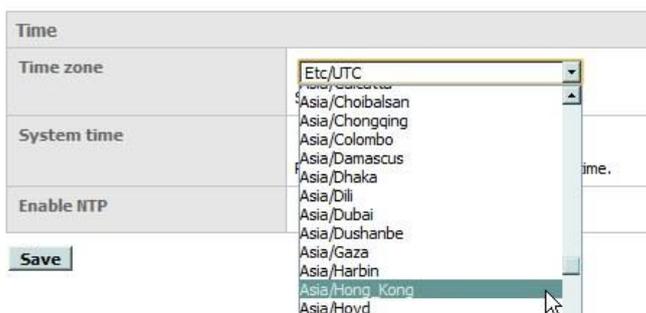
Login to the AhsayUBS WebAdmin and go to [System] > [Settings] > [General].



You can find the [Time] settings at the bottom of the page.



Select the appropriate time zone from the [Time zone] drop down menu.



You have selected the appropriate time zone. Click on the [Calendar] Icon and a small calendar will pop up. Select the current date and specify the current time.

Time	
Time zone	Asia/Hong_Kong Select the location closest to you.
System time	<input type="text"/>  Please use the icon to select the system time.
Enable NTP	<input type="checkbox"/> Use the specified NTP server.
<input type="button" value="Save"/>	



Time	
Time zone	Asia/Hong_Kong Select the location closest to you.
System time	06/07/2010 09:21  Please use the icon to select the system time.
Enable NTP	<input type="checkbox"/> Use the specified NTP server.
<input type="button" value="Save"/>	

You have provided the appropriate time. If you prefer NTP synchronization, please checked the [Use the specified NTP Server] checkbox.

Time	
Time zone	Asia/Hong_Kong Select the location closest to you.
System time	06/07/2010 09:21  Please use the icon to select the system time.
Enable NTP	<input checked="" type="checkbox"/> Use the specified NTP server.
NTP time server	pool.ntp.org Use a space to separate multiple hosts (only one required). Remove
Time update interval	300 Minutes between network time sync.
<input type="button" value="Save"/>	

Additional options will appear.

Specify your preferred NTP URL in the [NTP time server] text field. Specify the preferred update interval in unit of minutes in the [Time update Interval] text field.

Time	
Time zone	Asia/Hong_Kong Select the location closest to you.
System time	06/07/2010 09:21 Please use the icon to select the system time.
Enable NTP	<input checked="" type="checkbox"/> Use the specified NTP server.
NTP time server	stdtime.gov.hk Use a space to separate multiple hosts (only one re
Time update interval	300 Minutes between network time sync.
<input type="button" value="Save"/>	

Finally, click the [Save] button to apply the changes.

NTP time server	stdtime.gov.hk Use a space to se
Time update interval	300 Minutes between
<input type="button" value="Save"/>	

7.1.5 Change WebAdmin Password:

For security reasons, changing the default AhsayUBS WebAdmin password is recommended during the initial setup of the AhsayUBS WebAdmin.

Please follow the instructions below to change the AhsayUBS WebAdmin password:

The screenshot shows the AhsayUBS WebAdmin interface. At the top, there is a navigation bar with tabs for Information, System, Network, Storage, and Backup Server. Below this, the breadcrumb path is 'System > Settings > Password'. Underneath, there are sub-tabs for General, Password, Email, Proxy, SSHD, and sysctl.conf. The 'Password' section contains the following fields:

- Old password:** An empty text input field.
- Password:** A text input field.
- (Confirmation):** A text input field.

Below the fields, there is a note: "If you want to change the password for accessing the WebGUI, e". At the bottom left of the form, there is a 'Save' button.

Login to the AhsayUBS WebAdmin and go to [System] > [Settings] > [Password].

This screenshot is similar to the previous one, but the 'Old password' field is now filled with a masked password (represented by dots). The other fields remain empty.

Fill in the correct values in the appropriate fields.

This screenshot shows the 'Password' section with all three fields filled with masked passwords. The 'Old password' field is filled with dots, the 'Password' field is filled with dots, and the '(Confirmation)' field is also filled with dots. The 'Save' button is visible at the bottom left.

Click the [Save] button to update the new password.

System > Settings > Password

General Password Email Proxy SSH sysctl.conf

Password

Old password

Password (Confirmation)

If you want to change the password for accessing the WebGUI

Save

Logout the AhsayUBS WebAdmin and re-login using the new password.

Information System Network Storage Backup Server Logout

System > Settings > Password

General Password Email Proxy SSH sysctl.conf

The changes have been applied successfully.

Password

Old password

Password (Confirmation)

If you want to change the password for accessing the WebGUI, enter it here twice.

Save

7.1.6 Email Setup

The AhsayUBS is bundled with a sendmail SMTP server. It is designed for users who do not have their own mail server.

To configure the SMTP server, please do the followings:

1. Click [System] > [Settings] > [Email] -> [Settings] to go to the email settings page.
2. Enter "127.0.0.1" in the [Outgoing mail server] field if you want to use the local sendmail SMTP server. Otherwise, specify the domain name of your preferred SMTP Server in the [Outgoing mail server]. To use an external mail server, please ensure that the DNS server setting is entered correctly.

3. Enter the sender's email address for sending system status reports in the [From email] field, e.g. admin@mycompany.com
4. Click [Save General Email Settings] buttons to save the settings.
5. After you have completed the email setup, you are advised to verify it by sending a test email:
6. Go to [System] > [Settings] > [Email] > [Test].
7. Fill in the all the fields shown in the screen.

8. Click the [Send test email to[admin@mycompany.com]] button to send a test email. The email subject and contents will be saved in the system.

System > Settings > Email > Test

General Password **Email** Proxy SSH sysctl.conf

Settings **Test**

Test Email Settings

Subject System Email Test
Subject of the test email.

Email Content Test_email.
Contents to be written in the test email.

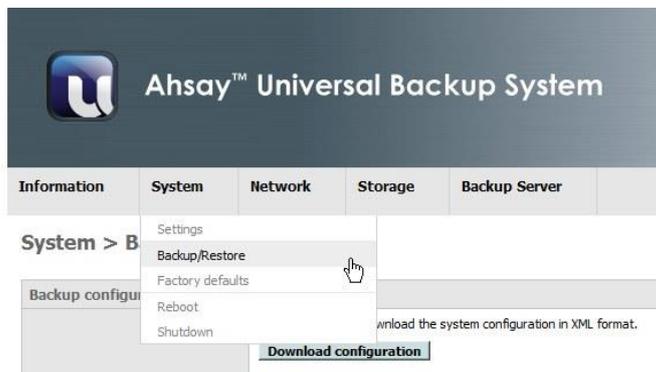
Save test email settings Send test email to [admin@mycompany.com]

7.1.7 Backup System Configuration

Once you have completed the system configuration on the AhsayUBS WebAdmin. It is recommended to backup the AhsayUBS system configuration settings.

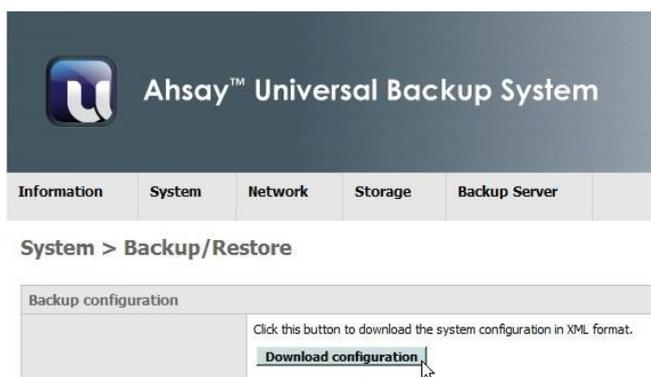
AhsayUBS provides a feature to export the system settings to an XML file.

Click [System] > [Backup/Restore]



Click the [Download configuration] button to save the current settings as a XML file on your machine.

This configuration file is useful for system upgrade and system recovery.



Any time you make configuration changes through the AhsayUBS WebAdmin, you should plan to make a backup of your configuration for disaster recovery.

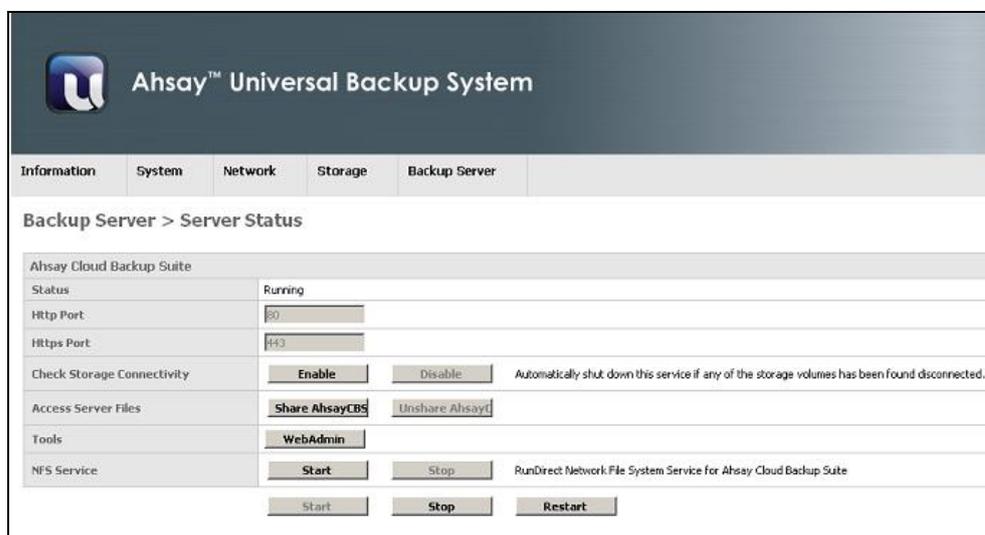
7.2 Backup Server Configuration

Ahsay Cloud Backup Suite (CBS) is bundled with Ahsay UBS Firmware. However, it must be configured properly before use.

7.2.1 Startup/Stop Services

Please follow the instructions to startup/stop the backup server and the NFS Service:

1. Login to AhsayUBS WebAdmin.
2. Go to [Backup Server] > [Server Status].
3. Click the [Start] button to startup the backup server. Once the backup server has started, you may click the [WebAdmin] button to go to the CBS login page. The default IP address of the backup server is the same as the UBS system and the default server port is 80 (you can reconfigure the connector port via AhsayCBS web admin console).



4. To start the NFS service, go to NFS Service and click on [Start].

As the NFS service is used for VM RunDirect on AhsayCBS if this service is not started VM RunDirect on AhsayCBS will not work.

7.2.2 Login to AhsayCBS

At the AhsayCBS login page, you can login with default AhsayCBS admin credentials. The default credential username: *system* , and the password: *system*.

For security, you are advised to change the default password.

Please refer to the [AhsayCBS Quick Start Guide](#) for further information on configuring AhsayCBS.

8 Advanced Configuration for AhsayUBS Firmware

This chapter describes how to use the all the features of AhsayUBS Firmware via AhsayUBS WebAdmin.

8.1 Information

All pages under this section provide useful information about the AhsayUBS Firmware.

When the mouse is pointed over the [Information] tag in the menu bar, the following menu will be shown:



The [Information] menu has been further divided in to the following sections:

- ▶ System Status (Current system status)
- ▶ System Logs (The cached system logs)
- ▶ Help (Other help resources for use)
- ▶ About (Information about this firmware)

8.1.1 System Status

This section provides information about the current system status in AhsayUBS.

8.1.1.1 System Status

Information	System	Network	Storage	Backup Server
Information > System Status				
System Status Processes Network Sockets Graph				
System Status				
Name	Ahsay Universal Backup System			
Version	2.2.2.0 (built on Mon May 23 15:42:09 HKT 2011)			
OS Version	FreeBSD 7.3-RELEASE-p3 (revision 199506)			
Platform	i386 on Intel(R) Xeon(R) CPU E5530 @ 2.40GHz (2393MHz)			
System UID	914C25B6			
Date	Tue May 31 17:11:37 HKT 2011			
Uptime	1 day, 01:07			
Last config change	Mon May 30 16:16:35 HKT 2011			
Load averages	0.08, 0.06, 0.01 [Show process information]			
CPU frequency	2393MHz			
CPU usage	 0%			
Memory usage	 6% of 931MB			
Disk space usage	/ubs/mnt/eslsfw  5% of 5.6GB Total: 5.6G Used: 272M Free: 5.3G			
	/ubs/mnt/esms00  0% of 23GB Total: 23G Used: 128K Free: 23G			
	/ubs/mnt/esms01  0% of 9.6GB Total: 9.6G Used: 0B Free: 9.6G			
	/ubs/mnt/esms02  0% of 9.6GB Total: 9.6G Used: 0B Free: 9.6G			
	/ubs/mnt/esms03  0% of 9.6GB Total: 9.6G Used: 0B Free: 9.6G			

The [System Information] table provides a summary about the system status. The table includes:

- **Name:** The name of this product. i.e. AhsayUBS
- **Version:** The version number and built time of this AhsayUBS Firmware.
- **OS Version:** The OS name and its version in this AhsayUBS
- **Platform:** Type of CPU and its speed in this AhsayUBS
- **System UID:** The ID for this AhsayUBS. The ID will be different with each installation of AhsayUBS.
- **Date: System** time and time zone on AhsayUBS. You can edit them in [System] > [Settings] > [General]
- **Uptime:** The time since last system boot.
- **Last config change:** The last time when you save your settings in this AhsayUBS System WebAdmin.

- **Load averages:** The three numbers show the average number of processes ready to run during the last 1, 5 and 15 minutes. If the load averages remain high in your production environment, it is advised to consider an upgrade in your hardware configuration or reduce the load in this AhsayUBS.
- **CPU frequency:** Actual CPU working in this AhsayUBS.
- **CPU usage:** Actual CPU usage now in percentage in this AhsayUBS.
- **Memory usage:** The percentage of memory in use with respect to the physical memory in this AhsayUBS.
- **Swap usage:** Provided swap path and its usage information in each of the swap partitions in this AhsayUBS. The swap space acts as the virtual memory, it allows this AhsayUBS to store extra data in the swap space if there are not enough physical memory exists. If the swap usage is always high, this indicates your AhsayUBS server is installed with insufficient RAM. Therefore, more RAM may be needed to improve the performance of this AhsayUBS. For more information about the usage of the swap partition, please refer to the FreeBSD Documentation.
- **Disk space usage:** Shows the disk space usage of the LSFW storage and the additional storages. For details, please refer to [Storage] section.

8.1.1.2 Processes

The table [Process information] shows the “top” command output in your AhsayUBS. It shows current running processes in your AhsayUBS. For more information about “top” command, please refer to the FreeBSD Documentation.

Information	System	Network	Storage	Backup Server																																																																																																																																																																																																																	
Information > System Status > Processes																																																																																																																																																																																																																					
<div style="display: flex; justify-content: space-between;"> System Status Processes Network Space Sockets Graph </div>																																																																																																																																																																																																																					
Processes information																																																																																																																																																																																																																					
last pid: 94793; load averages: 0.43, 0.25, 0.13 up 0+01:35:54 10:45:34 78 processes: 2 running, 76 sleeping																																																																																																																																																																																																																					
Mem: 111M Active, 15M Inact, 41M Wired, 128K Cache, 40M Buf, 226M Free Swap: 3072M Total, 3072M Free																																																																																																																																																																																																																					
<table border="1"> <thead> <tr> <th>PID</th> <th>USERNAME</th> <th>THR</th> <th>PRI</th> <th>NICE</th> <th>SIZE</th> <th>RES</th> <th>STATE</th> <th>TIME</th> <th>WCPU</th> <th>COMMAND</th> </tr> </thead> <tbody> <tr><td>94469</td><td>root</td><td>1</td><td>-8</td><td>0</td><td>17200K</td><td>12540K</td><td>pipepd</td><td>0:00</td><td>0.39%</td><td>php</td></tr> <tr><td>94629</td><td>root</td><td>1</td><td>20</td><td>0</td><td>17024K</td><td>12300K</td><td>lockf</td><td>0:00</td><td>0.39%</td><td>php</td></tr> <tr><td>94624</td><td>root</td><td>1</td><td>20</td><td>0</td><td>17024K</td><td>12300K</td><td>lockf</td><td>0:00</td><td>0.39%</td><td>php</td></tr> <tr><td>94377</td><td>root</td><td>1</td><td>96</td><td>0</td><td>17200K</td><td>12636K</td><td>RUN</td><td>0:00</td><td>0.29%</td><td>php</td></tr> <tr><td>2270</td><td>root</td><td>1</td><td>4</td><td>0</td><td>5036K</td><td>2932K</td><td>kqread</td><td>0:03</td><td>0.00%</td><td>lighttpd</td></tr> <tr><td>2350</td><td>root</td><td>60</td><td>44</td><td>0</td><td>484M</td><td>84760K</td><td>ucond</td><td>0:01</td><td>0.00%</td><td>java</td></tr> <tr><td>2361</td><td>root</td><td>1</td><td>-8</td><td>0</td><td>17024K</td><td>11452K</td><td>pipepd</td><td>0:00</td><td>0.00%</td><td>php</td></tr> <tr><td>1313</td><td>root</td><td>1</td><td>44</td><td>0</td><td>3212K</td><td>1080K</td><td>select</td><td>0:00</td><td>0.00%</td><td>syslogd</td></tr> <tr><td>1594</td><td>root</td><td>1</td><td>44</td><td>0</td><td>1888K</td><td>560K</td><td>select</td><td>0:00</td><td>0.00%</td><td>devd</td></tr> <tr><td>39595</td><td>root</td><td>1</td><td>44</td><td>0</td><td>4236K</td><td>1972K</td><td>select</td><td>0:00</td><td>0.00%</td><td>sendmail</td></tr> <tr><td>2356</td><td>root</td><td>1</td><td>8</td><td>0</td><td>3624K</td><td>1580K</td><td>wait</td><td>0:00</td><td>0.00%</td><td>login</td></tr> <tr><td>39580</td><td>root</td><td>1</td><td>8</td><td>0</td><td>3212K</td><td>1292K</td><td>nanslp</td><td>0:00</td><td>0.00%</td><td>cron</td></tr> <tr><td>2358</td><td>root</td><td>1</td><td>20</td><td>0</td><td>3480K</td><td>1744K</td><td>pause</td><td>0:00</td><td>0.00%</td><td>csh</td></tr> <tr><td>2374</td><td>root</td><td>1</td><td>44</td><td>0</td><td>3648K</td><td>1788K</td><td>select</td><td>0:00</td><td>0.00%</td><td>cdialog</td></tr> <tr><td>2373</td><td>root</td><td>1</td><td>8</td><td>0</td><td>3464K</td><td>1336K</td><td>wait</td><td>0:00</td><td>0.00%</td><td>sh</td></tr> <tr><td>2360</td><td>root</td><td>1</td><td>8</td><td>0</td><td>3464K</td><td>1388K</td><td>wait</td><td>0:00</td><td>0.00%</td><td>sh</td></tr> <tr><td>2357</td><td>root</td><td>1</td><td>5</td><td>0</td><td>3184K</td><td>1096K</td><td>ttyin</td><td>0:00</td><td>0.00%</td><td>getty</td></tr> <tr><td>94792</td><td>root</td><td>1</td><td>8</td><td>0</td><td>3464K</td><td>1404K</td><td>wait</td><td>0:00</td><td>0.00%</td><td>sh</td></tr> </tbody> </table>					PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	TIME	WCPU	COMMAND	94469	root	1	-8	0	17200K	12540K	pipepd	0:00	0.39%	php	94629	root	1	20	0	17024K	12300K	lockf	0:00	0.39%	php	94624	root	1	20	0	17024K	12300K	lockf	0:00	0.39%	php	94377	root	1	96	0	17200K	12636K	RUN	0:00	0.29%	php	2270	root	1	4	0	5036K	2932K	kqread	0:03	0.00%	lighttpd	2350	root	60	44	0	484M	84760K	ucond	0:01	0.00%	java	2361	root	1	-8	0	17024K	11452K	pipepd	0:00	0.00%	php	1313	root	1	44	0	3212K	1080K	select	0:00	0.00%	syslogd	1594	root	1	44	0	1888K	560K	select	0:00	0.00%	devd	39595	root	1	44	0	4236K	1972K	select	0:00	0.00%	sendmail	2356	root	1	8	0	3624K	1580K	wait	0:00	0.00%	login	39580	root	1	8	0	3212K	1292K	nanslp	0:00	0.00%	cron	2358	root	1	20	0	3480K	1744K	pause	0:00	0.00%	csh	2374	root	1	44	0	3648K	1788K	select	0:00	0.00%	cdialog	2373	root	1	8	0	3464K	1336K	wait	0:00	0.00%	sh	2360	root	1	8	0	3464K	1388K	wait	0:00	0.00%	sh	2357	root	1	5	0	3184K	1096K	ttyin	0:00	0.00%	getty	94792	root	1	8	0	3464K	1404K	wait	0:00	0.00%	sh
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8.1.1.3 Network

This page shows the [Network Information] in the AhsayUBS. Each network interfaces' information stores in each of the table. In this example, the title of the network interface refers to the network interface "LAN". If any modification of this network interface is needed, please go to [Network] > [LAN].

The following describes the information in the table:

- **Name:** The real name of the interface stated in the OS.
- **MAC address:** The physical address for this interface.
- **IP address:** The IP address currently set for this interface.
- **Subnet mask:** The subnet mask currently set for this interface.
- **MTU:** The maximum transfer unit currently set for this interface.
- **I/O packets:** The number of input/output packets and the size of data transferred through the interface from system uptime.
- **I/O errors:** Number of input/output errors in this interface from system uptime.
- **Collisions:** Number of collisions from system uptime.
- **Status:** State of this interface. Up or Down.

Information	System	Network	Storage	Backup Server
Information > System Status > Network				
System Status Processes Network Space Sockets Graph				
LAN interface				
Name	em0			
MAC address	00:0c:29:fc:a0:16			
IP address	10.10.3.41			
Subnet mask	255.255.0.0			
Gateway	10.10.0.1			
Media	1000baseTX <full-duplex>			
MTU	1500			
I/O packets	12226/6744 (1.28 MB/3.07 MB)			
I/O errors	0/0			
Collisions	0			
Status	up			

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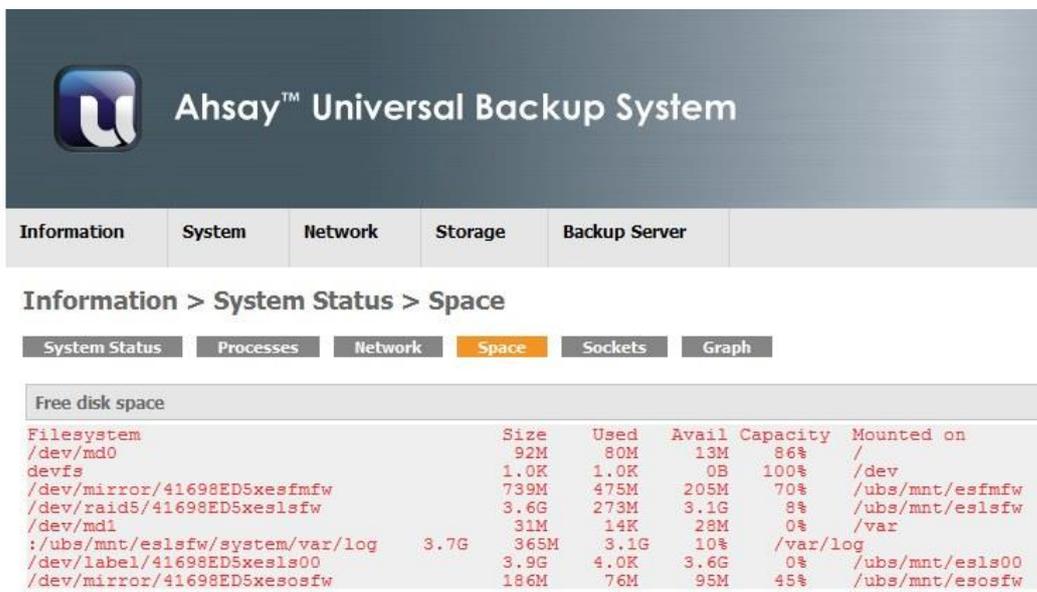


8.1.1.4 Space

This page provides the storage capacity for all mount points in the system. The information includes:

- ▶ Total Size of Corresponding File System
- ▶ Used Size of Corresponding File System
- ▶ Available Size of Corresponding File System
- ▶ Capacity Occupied in Corresponding File System

In the example below, a device name “/dev/md0” has been mounted at the root directory. It has 92MB in total and 80MB in use. The used capacity is 86% (80MB/92MB) and 13MB remains available for use.



Ahsay™ Universal Backup System

Information System Network Storage Backup Server

Information > System Status > Space

System Status Processes Network **Space** Sockets Graph

Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/md0	92M	80M	13M	86%	/
devfs	1.0K	1.0K	0B	100%	/dev
/dev/mirror/41698ED5xesfmfw	739M	475M	205M	70%	/ubs/mnt/esfmfw
/dev/raid5/41698ED5xeslsfw	3.6G	273M	3.1G	8%	/ubs/mnt/eslsfw
/dev/md1	31M	14K	28M	0%	/var
:/ubs/mnt/eslsfw/system/var/log	3.7G	365M	3.1G	10%	/var/log
/dev/label/41698ED5xesls00	3.9G	4.0K	3.6G	0%	/ubs/mnt/esls00
/dev/mirror/41698ED5xesosfw	186M	76M	95M	45%	/ubs/mnt/esosfw

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8.1.1.5 Sockets

This page provides the information of the [Active Internet connections] and [Active UNIX domain sockets].

Information > System Status > Sockets

System Status Processes Network Space **Sockets** Graph

Sockets

```

Active Internet connections (including servers)
Tcpcb  Proto Recv-Q Send-Q  Local Address           Foreign Address         (state)
892191d0 tcp4      0      0  ahsayubs.8080          10.10.0.1.3200         ESTABLISHED
891dc910 tcp4      0      0  localhost.submissi    *.*                     LISTEN
891dbae0 tcp4      0      0  localhost.smtp        *.*                     LISTEN
891db740 tcp4      0      0  localhost.8014        *.*                     LISTEN
891db000 tcp4      0      0  *.https               *.*                     LISTEN
891db1d0 tcp4      0      0  *.http                *.*                     LISTEN
891dc000 tcp4      0      0  *.8080                *.*                     LISTEN
89076a8c udp4      0      0  *.10000               *.*
Active UNIX domain sockets
Address Type  Recv-Q Send-Q  Inode      Conn      Refs  Nextref Addr
89078738 stream 0      0  89201114   0          0      0      /tmp//.java_pid2350
89078bd0 stream 0      0  8907333c   0          0      0      /var/run/devd.pipe
890789d8 dgram  0      0  0          89078dc8   0      89078690
89078690 dgram  0      0  0          89078dc8   0      89078888
89078888 dgram  0      0  0          89078dc8   0      0
89078dc8 dgram  0      0  8907233c   890789d8   0      /var/run/logpriv
89078e70 dgram  0      0  89072450   0          0      /var/run/log
    
```

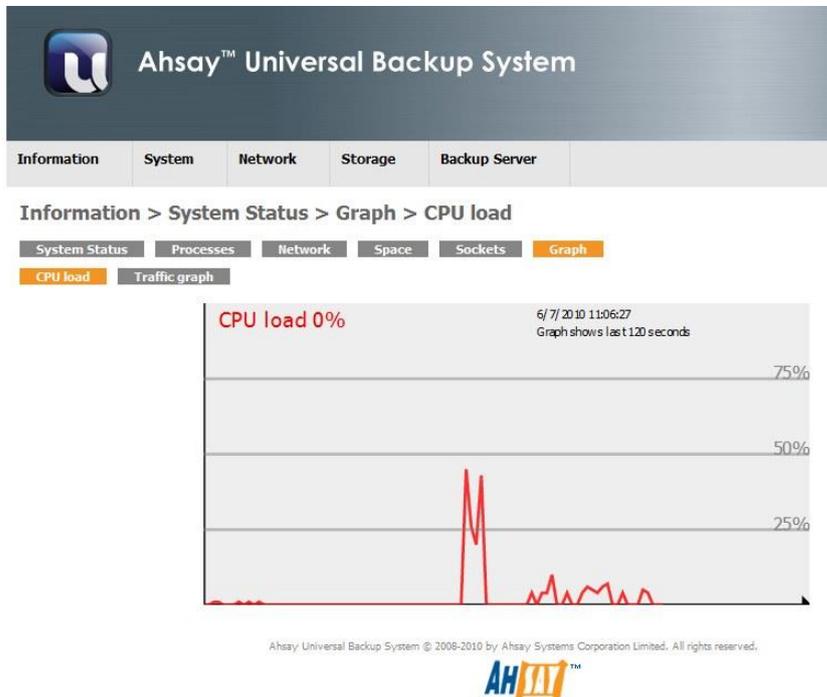
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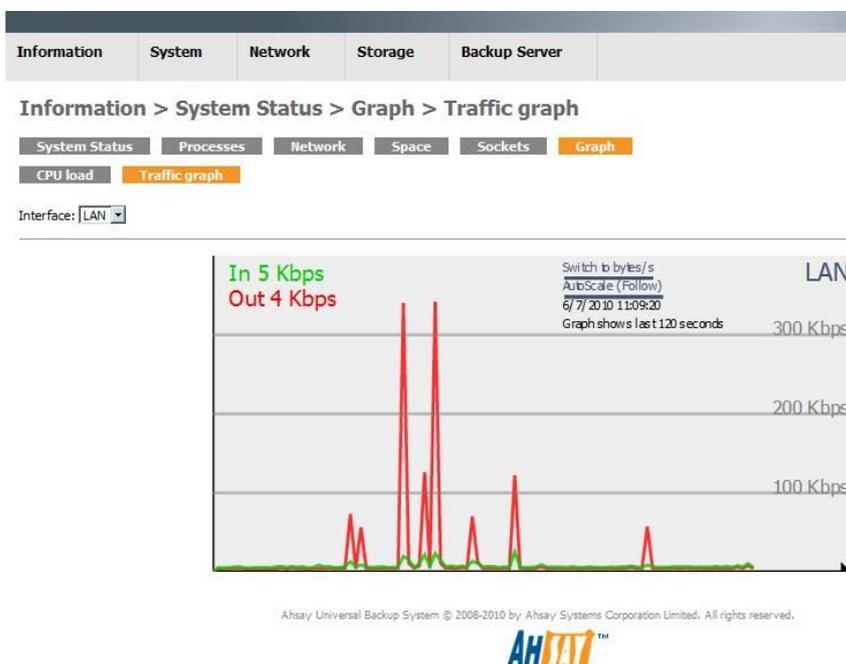
8.1.1.6 Graph

This page provides graphical information for the CPU loading and the traffic of the network interface.

CPU load: This current CPU load graph will be shown. The graph will be refreshed automatically.



Traffic graph: Select a network interface from the top-left drop down list and the graph of input /output via the interface will be shown. The graph will be refreshed automatically.



8.1.1.7 UPS Status

When NUT (Network UPS Tools) service is enabled successfully, the UPS status will be shown here as soon as the UPS' driver established connection with the UPS. For instance,

- ▶ UPS status [Running On Line Power / On Battery]
- ▶ Battery Charging Level
- ▶ UPS current temperature
- ▶ UPS machine manufacturing information

For more information about how to configure a connected UPS, please refer to the section related to UPS settings.

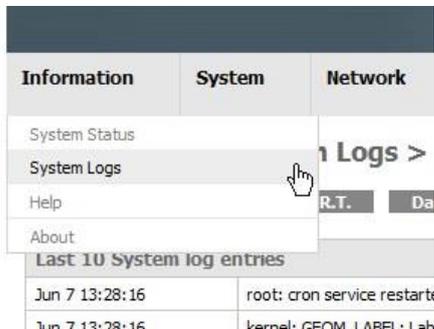
Information > System Status > UPS

System Status	Processes	Network	Space	Sockets	Graph	UPS
UPS status						
<pre> battery.charge: 100 battery.charge.low: 10 battery.charge.warning: 50 battery.mfr.date: 2008/11/04 battery.runtime: 7500 battery.runtime.low: 120 battery.temperature: 21.6 battery.type: PbAc battery.voltage: 55.4 battery.voltage.nominal: 48.0 device.mfr: American Power Conversion device.model: Smart-UPS 3000 RM device.serial: JS0845005189 device.type: ups driver.name: usbhid-ups driver.parameter.pollfreq: 30 driver.parameter.pollinterval: 2 driver.parameter.port: /dev/ugen1.2 driver.version: 2.6.1 driver.version.data: APC HID 0.95 driver.version.internal: 0.35 input.sensitivity: high input.transfer.high: 253 input.transfer.low: 208 input.voltage: 217.4 output.current: 0.58 output.frequency: 50.0 output.voltage: 217.4 output.voltage.nominal: 230.0 ups.beeper.status: enabled ups.delay.shutdown: 20 ups.delay.start: 30 ups.firmware: 666.6.I ups.firmware.aux: 7.3 ups.load: 4.5 ups.mfr: American Power Conversion ups.mfr.date: 2008/11/04 ups.model: Smart-UPS 3000 RM ups.productid: 0002 ups.serial: JS0845005189 ups.status: OL ups.test.result: No test initiated ups.timer.reboot: -1 ups.timer.shutdown: -1 ups.timer.start: -1 ups.vendorid: 051d </pre>						

8.1.2 System Logs

These pages contain logs and the display settings of the logs.

You may go to this page by the menu [Information] > [System Logs].

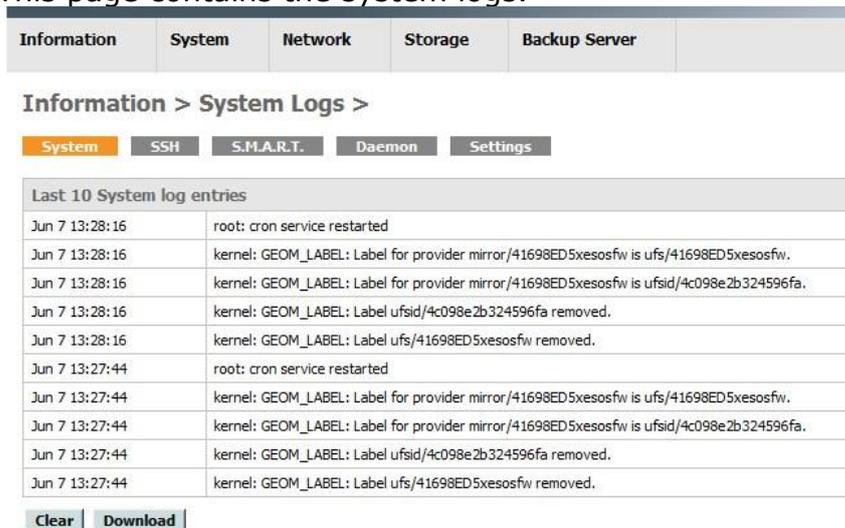


All the logs can be cleared by clicking the [Clear] button. Apart from this, the logs can be downloaded to your local computer by clicking the [Download] button.

WARNING: The logs CANNOT BE RECOVERED after clicking the [Clear] button.

8.1.2.1 System

This page contains the system logs.



8.1.2.2 SSH

This page contains the logs for all SSH traffic.

Information	System	Network	Storage	Backup Server
-------------	--------	---------	---------	---------------

Information > System Logs >

System **SSH** S.M.A.R.T. Daemon Settings

Last 10 SSH log entries

Jun 7 12:59:25	sshd[177]: SSH: Server;Ltype: Kex;Remote: 10.10.0.1-3242;Enc: aes256-ctr;MAC: hmac-sha1;Comp: none
Jun 7 11:59:24	sshd[177]: SSH: Server;Ltype: Kex;Remote: 10.10.0.1-3242;Enc: aes256-ctr;MAC: hmac-sha1;Comp: none
Jun 7 10:59:24	in openpam_dispatch(): pam_nologin.so: no pam_sm_setcred()
Jun 7 10:59:24	in openpam_dispatch(): pam_nologin.so: no pam_sm_setcred()
Jun 7 10:59:24	Accepted password for root from 10.10.0.1 port 3242 ssh2
Jun 7 10:59:24	in openpam_dispatch(): pam_nologin.so: no pam_sm_authenticate()
Jun 7 10:59:24	SSH: Server;Ltype: Version;Remote: 10.10.0.1-3242;Protocol: 2.0;Client: 1.85 sshlib: Tunnelier 4.31
Jun 7 10:59:16	Failed password for root from 10.10.0.1 port 3238 ssh2
Jun 7 10:59:16	in openpam_dispatch(): pam_nologin.so: no pam_sm_authenticate()
Jun 7 10:59:16	SSH: Server;Ltype: Version;Remote: 10.10.0.1-3238;Protocol: 2.0;Client: 1.85 sshlib: Tunnelier 4.31

Clear Download

8.1.2.3 S.M.A.R.T.

This page contains logs from S.M.A.R.T.

8.1.2.4 Daemon

This page contains logs related to daemons.

Information	System	Network	Storage	Backup Server
-------------	--------	---------	---------	---------------

Information > System Logs >

System SSH S.M.A.R.T. **Daemon** Settings

Last 10 Daemon log entries

Jun 7 17:09:58	(log.c.172) server started
Jun 7 17:09:55	changed to 'performance'
Jun 5 02:10:04	(server.c.1495) server stopped by UID = 0 PID = 0
Jun 4 23:44:36	(log.c.172) server started
Jun 4 23:44:33	changed to 'performance'

Clear Download

8.1.2.5 Settings

Modify these settings for the log showing in the log pages described above:

- ▶ Show log entries in reverse order (newest entries on top)
- ▶ Number of log entries to show: Enter a number for a maximum number of the log entries to show or email.
- ▶ Resolve IP addresses to hostnames

To save your settings, click the [Save] button, click the menus above to view the logs again and to verify for the change of the settings.

Information	System	Network	Storage	Backup Server
Information > System Logs > Settings				
System SSH S.M.A.R.T. Daemon Settings				
Settings				
Show log entries in reverse order (newest entries on top)	<input checked="" type="checkbox"/> Enable			
Number of log entries to show	<input type="text" value="10"/>			
Resolve IP addresses to hostnames	<input type="checkbox"/> Enable <small>Hint: If this is checked, IP addresses in Ahsay Universal Backup System logs are resolved to real hostnames where possible. Warning: This can cause a huge delay in loading the Ahsay Universal Backup System log page!</small>			
<input type="button" value="Save"/>				

8.1.3 Help

You can find other help information about AhsayUBS in this page.

8.1.4 About

About page for the AhsayUBS.

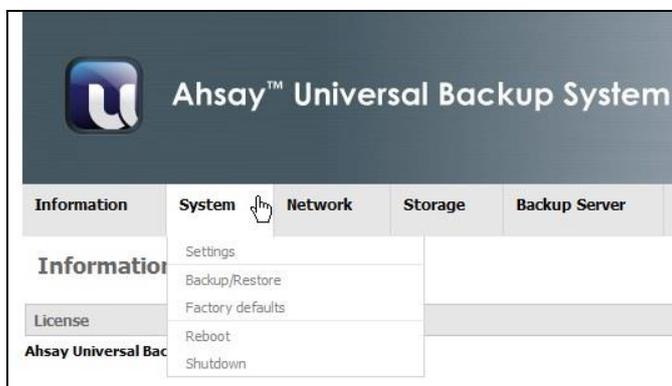
8.2 System

This section describes how to configure the AhsayUBS settings through the AhsayUBS WebAdmin.

When the mouse cursor is pointed over the word [System] in the menu bar, the menu will be shown as below:

The [System] menu has been further divided into the following sections:

- ▶ Settings (Edit system settings)
- ▶ Backup/Restore (Backup or restore system settings as a file)
- ▶ Factory default (Restore system settings to factory defaults)
- ▶ Reboot (Reboot system now or in a schedule time)
- ▶ Shutdown (Shutdown system now or in a schedule time)



8.2.1 Settings

The general system settings can be set here.

8.2.1.1 General

Hostname Table:

- ▶ **Hostname:** Sets the hostname of this AhsayUBS. It is advised to name in order to identify AhsayUBS System in the network.
- ▶ **Domain:** Sets the domain of this AhsayUBS.

DNS Settings:

- **IPv4 DNS servers:** Specify a maximum of 2 different IP addresses of DNS server for the AhsayUBS.

WebGUI:

- **Protocol:** Select WebAdmin protocol for this AhsayUBS WebAdmin. The supported protocols are HTTP/HTTPS and the default protocol is HTTP.
- **Port:** Change the WebAdmin port for this AhsayUBS WebAdmin.

Note: It is advised not to use the system service port 0-1023 for the WebAdmin port. Also, port 80 and port 443 has been reserved for the backup server. Please refer to the Prerequisites section for the default port configuration.

- **Certificate (for HTTPS only):** Paste a signed certificate in X.509PEM format to the textbox provided for this AhsayUBS.
- **Private key (for HTTPS only):** Paste a private key in PEM format to the textbox provided for this AhsayUBS.

Time:

- **Timezone:** Set the time zone for this AhsayUBS.
- **System time:** Set the system time for this AhsayUBS.
- **Enable NTP:** NTP standard for Network Time Protocol. If you have a time server for synchronization of the time, it is better to enable this service for keeping the time in your AhsayUBS.
- **NTP time server (Shows only when NTP is enabled):** Enter the IP address of time server(s) for time synchronization.
- **Time update interval (Shows only when NTP is enabled):** Enter the interval in minutes for synchronization from the AhsayUBS to the server.

Information	System	Network	Storage	Backup Server
System > Settings > General				
General Password Email Proxy SSHD sysctl.conf				
Hostname				
Hostname	<input type="text" value="ahsayubs"/> <small>Name of the NAS host, without domain part e.g. ahsayubs.</small>			
Domain	<input type="text" value="local"/> <small>e.g. com, local</small>			
DNS settings				
IPv4 DNS servers	<input type="text" value="192.168.5.14"/> <input type="text"/> <small>IPv4 addresses</small>			
WebGUI				
Protocol	<input type="text" value="HTTP"/>			
Port	<input type="text" value="8080"/> <small>Enter a custom port number for the WebGUI above if you want to override the default (8080 for HTTP, 8443 for HTTPS).</small>			
Time				
Time zone	<input type="text" value="Asia/Hong_Kong"/> <small>Select the location closest to you.</small>			
System time	<input type="text" value="06/07/2010 11:30"/> <small>Please use the icon to select the system time.</small>			
Enable NTP	<input checked="" type="checkbox"/> <small>Use the specified NTP server.</small>			
NTP time server	<input type="text" value="pool.ntp.org"/> <small>Use a space to separate multiple hosts (only one required). Remember to set up at least one DNS server if you enter a host name here!</small>			
Time update interval	<input type="text" value="300"/> <small>Minutes between network time sync.</small>			
<input type="button" value="Save"/>				

8.2.1.1 Password

This page allows you to set the password for the default administrator account of the AhsayUBS (i.e. **admin**). You need to provide old password to authenticate the change in password. It is required type the new password. Then you can click the [Save] button to save your settings.

Information	System	Network	Storage	Backup Server
System > Settings > Password				
General Password Email Proxy SSHD sysctl.conf				
Password				
Old password	<input type="password" value="....."/>			
Password	<input type="password" value="....."/>			
	<input type="password" value="....."/> (Confirmation)			
<small>If you want to change the password for accessing the WebGUI, enter it here twice.</small>				
<input type="button" value="Save"/>				
<small>Ahsay Universal Backup System © 2008-2010 by Ahsay Systems Corporation Limited. All rights reserved.</small> 				

8.2.1.3 Email

Settings

A status report helps you to check the AhsayUBS status. If you want to check the AhsayUBS regularly, please setup the [Email status report settings]. Then, you may receive the status report in HTML format through email attachment regularly.

To setup the [Email status report settings], you need to setup the [General Email Settings] first. Here are the fields that you need to enter inside the [General Email Settings] table:

- **Outgoing mail server:** Please enter the outgoing SMTP mail server address e.g. "smtp.mycompany.com".
- **Port:** Please enter the SMTP mail server port. The default port number for SMTP server is port **25**.
- **Security:** Please select the security protocol. You can choose **None**, **SSL** or **TLS**.
- **Authentication:** Click the checkbox for enabling the SMTP authentication.
- **Login Name (for Enabling Authentication only):** The login name for the SMTP name server.
- **Password (for Enabling Authentication only):** The password for the SMTP mail server.
- **Authentication Method (for Enabling Authentication only):** The authentication method for login the SMTP mail server. Here are the choices for the login methods:
 - Plain
 - Cram-MD5
 - Digest-MD5
 - GSSAPI
 - External
 - Login NTLM
 - NTLM
 - Best available
- **From email:** Set the sender's email.
- **To email:** Destination email address. Multiple email address can be set. Separate email address by semi-colon.

Please click the [Save] button to save the above settings if necessary. For verifying the email settings, please refer to the below section which describes how to send a test email by using the send test email feature included in AhsayUBS firmware (i.e. [System] > [Settings] > [Email] > [Test]).

Note 1: Setup DNS Server in the page [System] > [Settings] > [General] is required to resolve the SMTP server address.

After settings up the [General Email Settings], you may setup the [Email Status Report Settings] now. Please check the [Enable] checkbox on the top-right hand corner to enable this function.

The following fields can be set in the table [Email Status Report Settings]:

- **To email:** Show the status report recipients. The 'To email' settings can be set in the [General Email Settings].
- **Subject:** The email subject.
- **Report:** Select the reports you want to receive in the email.
- **Polling time:** Set the sending time of the email.

Please click the [Save Email Status Report Settings] button for saving the settings. Please refer to the page [System] > [Settings] > [Email] > [Test] for details to verify the settings.

Test

This page is for verifying the settings inside the page [System] > [Settings] > [Email] > [Settings].

The [Test Email Settings] table is for you to verify the settings inside the table [General Email Settings] in the page [System]> [Settings] > [Email] > [Settings]. To verify the settings, you can now send a test email to the [From email] inside the [General Email Settings] table by:

1. Entering the test email subject inside the [Subject] field.
2. Entering the test email contents inside the [Email Content] field.
3. Click the [Send test email to...] button to save the settings and send the test email to the email address entered in the [From email].

You may save the test email subject and contents by clicking [Save test email settings] WITHOUT sending any test email.

The screenshot shows the 'Test Email Settings' form within the 'System > Settings > Email > Test' navigation path. The form has two main sections: 'Subject' and 'Email Content'. The 'Subject' field contains the text 'System Email Test' with a sub-label 'Subject of the test email.' below it. The 'Email Content' field contains the text 'Test email to verify the General Email Settings.' with a sub-label 'Contents to be written in the test email.' below it. At the bottom of the form, there are two buttons: 'Save test email settings' and 'Send test email to [admin@mycompany.com]'.

You may also verify the settings inside the [Email Status Report Settings] by sending a test email to the email entered inside the [To email] field in the [Email Status Report Settings] table (i.e. [System] > [Settings] > [Email] > [Settings]).

To send a test status report email, you may click the [Send Status Report to ...] in the table [Test Send Status Report Email]. You may also click the [Status Report Email] link inside the table to set the settings.

The screenshot shows a table with the title 'Test Send Status Report Email'. The table contains one row with a button labeled 'Send Status Report to [admin@mycompany.com]'. Below the table, there is a text label 'Configure your Status Report Email Settings'.

8.2.1.4 Proxy

You may use this page to configure the HTTP proxy server if your AhsayUBS requires an outgoing proxy server. Please check the [Enable] checkbox on the top-right hand corner to enable the proxy server.

- ▶ **Address:** The address to the proxy server.
- ▶ **Port:** The port to access the proxy server.
- ▶ **Authentication:** If the proxy server is needed to login, please tick this checkbox.
- ▶ **Username (for Enabling Authentication only):** Enter the username for login to the proxy server.
- ▶ **Password (for Enabling Authentication only):** Enter the password for login to the proxy server.

Please click the [Save] button to save the above settings.

Note 1: Remember to configure the DNS server settings for resolving the address in the page [System] > [Settings] > [General].

Information	System	Network	Storage	Backup Server																		
System > Settings > Proxy																						
<div style="display: flex; justify-content: space-between;"> General Password Email Proxy SSHD sysctl.conf </div>																						
<table border="1" style="width: 100%;"> <thead> <tr> <th colspan="2">HTTP Proxy</th> <th style="text-align: right;"><input checked="" type="checkbox"/> Enable</th> </tr> </thead> <tbody> <tr> <td>Address</td> <td><input type="text" value="proxyserver.ahsay.com"/></td> <td></td> </tr> <tr> <td>Port</td> <td><input type="text" value="8080"/></td> <td></td> </tr> <tr> <td>Authentication</td> <td><input checked="" type="checkbox"/> Enable proxy authentication.</td> <td></td> </tr> <tr> <td>User</td> <td><input type="text" value="username-proxyserver"/></td> <td></td> </tr> <tr> <td>Password</td> <td><input type="password" value="*****"/></td> <td></td> </tr> </tbody> </table>					HTTP Proxy		<input checked="" type="checkbox"/> Enable	Address	<input type="text" value="proxyserver.ahsay.com"/>		Port	<input type="text" value="8080"/>		Authentication	<input checked="" type="checkbox"/> Enable proxy authentication.		User	<input type="text" value="username-proxyserver"/>		Password	<input type="password" value="*****"/>	
HTTP Proxy		<input checked="" type="checkbox"/> Enable																				
Address	<input type="text" value="proxyserver.ahsay.com"/>																					
Port	<input type="text" value="8080"/>																					
Authentication	<input checked="" type="checkbox"/> Enable proxy authentication.																					
User	<input type="text" value="username-proxyserver"/>																					
Password	<input type="password" value="*****"/>																					
<input type="button" value="Save"/>																						
<p>Note: If the server is behind a proxy set this parameters to give local services access to the internet via proxy.</p>																						

8.2.1.5 SSHD

SSHD daemon provides remote console access to the AhsayUBS. This feature is designed for troubleshooting purpose only, and not meant for 24x7 access. **The root access and SSL tunneling feature will be enabled by default.**

The default login account for SSH:

Username	root
Password	<The password of the admin account of AhsayUBS WebAdmin>

Here are the options that will be shown or can be configured in the [Secure Shell] table:

- ▶ Status:
 - ◉ Running: SSHD is enabled.
 - ◉ Stopped: SSHD is stopped.
- ▶ **TCP Port:** The port for the SSHD. Default is port 22.
- ▶ **Compression:** If the file is larger or the network is slow, the transfer of the files will be faster when enabling this option.
- ▶ **Private Key:** Paste a DSA PRIVATE KEY in PEM format.

If you want to Start/Stop/Restart SSHD in the AhsayUBS, please click the buttons under the table [Secure Shell].

When the SSHD service has been started, the options inside the [Secure Shell] table will be disabled. You need to [Stop] the SSHD in order to modify the settings.

System > Settings > SSHD

General Password Email Proxy **SSHD** sysctl.conf

Secure Shell

Status	Running
TCP port	22 <small>Alternate TCP port. Default is 22</small>
Compression	<input type="checkbox"/> Enable compression. <small>Compression is worth using if your connection is slow. The efficiency of the compression depends on the type of the file, and varies widely. Useful for internet transfer only.</small>
Private Key	<div style="border: 1px solid gray; height: 40px; width: 100%;"></div> <small>Paste a DSA PRIVATE KEY in PEM format here.</small>

8.2.1.5 UPS

UPS (Uninterrupted Power Supply) is an electrical apparatus which provides emergency power to a server when the main power source fails. UPS prevents power interruptions by supplying energy stored in its batteries. The UPS device can be connected to AhsayUBS machine through serial port or USB port. The UPS will notify the AhsayUBS machine in case of power failure events.

NUT (Network UPS Tools) is the system service which conducts communication between the AhsayUBS and the UPS device. It can:

- ▶ Initiate AhsayUBS shutdown sequence upon defined UPS power events.
- ▶ Monitoring and Log the UPS status [On Line Power / On Battery].

The port used by the NUT daemon is '3493'.

The daemon will be started once the UPS settings are saved in the page [System] > [Settings] > [UPS] > [Settings]. UPS status can be checked in the page [Information] > [System status] > [UPS status]. NUT daemon will also log the UPS triggered event in the AhsayUBS system log. The system log can be checked in the page [Information] > [System Logs].

UPS Settings

This is the main page for configure the connected UPS device.

System > Settings > UPS > Settings

General Password Email Proxy SSHD **UPS** sysctl.conf

Settings Driver List Device List

Uninterruptible Power Supply <input checked="" type="checkbox"/> Enable	
Status	Running
Driver	usbhid-ups <small>The driver used to communicate with your UPS. Get the list of available drivers.</small>
Port Device Path	/dev/lugen.1.2 <small>The serial or USB port where your UPS is connected. Get the list of available port device path.</small>
Auxiliary parameters	<div style="border: 1px solid gray; height: 20px; width: 100%;"></div> <small>Additional parameters to the hardware-specific part of the driver.</small>
Description	<div style="border: 1px solid gray; height: 15px; width: 100%;"></div> <small>You may enter a description here for your reference.</small>
Shutdown mode	UPS goes on battery <small>Defines system shutdown condition.</small>
Shutdown timer	300 <small>The time in seconds until shutdown is initiated. If the UPS happens to come back before the time is up the shutdown is cancelled.</small>
Email notification	<input checked="" type="checkbox"/> Enable <small>The email will be sent to [angela.cheung@ahsray.com]. [To email] configuration can be edited in General Email Settings.</small>

Save and Restart

Note:

- This configuration settings are used to generate the ups.conf configuration file which is required by the NUT UPS daemon. To get more information how to configure your UPS please check the NUT (Network UPS Tools) documentation.

Remarks:

- DO NOT connect the serial port and USB port between UPS device and AhsayUBS at the same time.
- Make sure A.C. power supply is connected to the UPS device when configuration in the AhsayUBS WebAdmin page. Otherwise, the AhsayUBS shutdown sequence will be initiated immediately once the UPS settings are saved (Shutdown mode: UPS goes on battery, Shutdown timeout: 0).

The NUT daemon can be configured by the following options:

- Enable 'checkbox': Enable / Disable the NUT daemon.
- Status: NUT daemon current status [Running / Cannot be enabled / Stopped].
- Driver: The UPS device driver name. The available driver name can be found from the [Driver List] according to the UPS manufacturer, model name and connecting port type.
- Port Device Path: The serial / USB port device path. The available serial / USB device can be found from the [Device List]. Please choose the appropriate device path by the UPS connection type.
- Auxiliary parameters (Optional): Additional hardware-specific parameters for the UPS driver which will be applied to the 'ups.conf' file. Please refer to the NUT official website (<http://www.networkupstools.org>) for more information.
- Description (Optional): Your customized message to describe the UPS connection.
- Shutdown mode: The AhsayUBS shutdown sequence will be triggered by one of the following UPS power events:
 - UPS reaches low battery: UPS runs on battery and the battery level is low. The low battery alert percentage is defined by the UPS driver.
 - UPS goes on battery: UPS runs on battery (i.e. A.C. power supply is disconnected in UPS) and shutdown sequence will be started after the countdown defined in 'Shutdown timeout'.
- Shutdown timeout: The countdown time (default: 300 seconds) to shutdown AhsayUBS when [UPS goes on battery]. This option is available only when the [UPS goes on battery] option is selected in the [Shutdown mode]. The timeout should NOT be larger than battery discharge time.

- Email notification: Send email to addresses defined by the [To email] in the [General Email Settings] when the UPS changes its status [On Line Power / On battery] or the UPS triggered the AhsayUBS shutdown event. Whenever the email notification is enabled or disabled, power event will always be logged to the system log in page [Information] > [System Logs].

Please click [Save and Restart] button to save the above settings.

UPS Driver List

This page lists the UPS drivers according to the manufacturer, model name and the connection type supported by the NUT daemon. To look for a suitable driver:

1. Check the UPS manufacturer, model name and the connecting port.
2. Search the driver in the page accordingly.

System > Settings > UPS > Driver List				
General Password Email Proxy SSHd UPS sysctl.conf				
Settings Driver List Device List				
Manufacturer	Device Type	Model name	Model extra information	Driver
AblereX	ups	MS-RT		blazer_ser
AblereX	ups	625L	USB	blazer_usb
AblereX	ups	Hope Office 400/600		blazer_ser
ActivePower	ups	400VA		blazer_ser
ActivePower	ups	1400VA		blazer_ser
ActivePower	ups	2000VA		blazer_ser
Advice	ups	TopGuard 2000		blazer_ser
AEC	ups	MiniGuard UPS 700	Megatec M2501 cable	genericups upstype=21
APC	ups	Back-UPS Pro		apcsmart
APC	ups	Matrix-UPS		apcsmart
APC	ups	Smart-UPS		apcsmart
APC	ups	Back-UPS Pro USB	USB	usbhid-ups
APC	ups	Back-UPS USB	USB	usbhid-ups
APC	ups	Back-UPS RS USB	USB	usbhid-ups
APC	ups	Back-UPS LS USB	USB	usbhid-ups
APC	ups	Back-UPS ES/CyberFort 350	USB	usbhid-ups
APC	ups	Back-UPS BP500	USB	usbhid-ups

Device List

The page lists the serial and USB device path in the system. The connected device path pattern for serial device and USB device are `"/dev/ttyu*"` and `"/dev/ugen*.*"` respectively. Since some other USB devices could be connected to the system, it is suggested to connect the system to UPS by serial port. Once the appropriate device path is found, administrator may copy the full path and fill it in the [Port Device Path] field in the [UPS settings].

System > Settings > UPS > Device List

General
Password
Email
Proxy
SSH
UPS
sysctl.conf

Settings
Driver List
Device List

Serial Device List

```
/dev/ttyu0
```

USB Device List

```
/dev/ugen1.2: <Smart-UPS 3000 RM FW666.6.I USB FW7.3 American Power Conversion>
/dev/ugen3.2: <Dell USB Keyboard Dell>
```

Note:

- Serial Port and USB Port should not be used at the same time.

8.2.1.7 SNMP

SNMP (Simple Network Management Protocol) is a protocol defined for managing the computer devices such as servers, workstations and desktop etc. through IP networks.

The software which monitors and configures the devices in the network is called NMS (Network Management Server).

When a SNMP agent daemon is enabled in the AhsayUBS, the AhsayUBS administrator may monitor the system status such as performance of CPU, memory, disk and network with a proper setup NMS from a remote machine.

The AhsayUBS has been bundled with the FreeBSD SNMP agent 'bsnmpd' daemon which supports up to SNMP v2c standard. The functions of this daemon include:

- report OID object value upon SNMP query from the NMS via UDP port '161'.
- send traps to the NMS upon defined events in the AhsayUBS.

It is better for the AhsayUBS administrator to install a 'bsnmpd' supported NMS for communication.

Here are the SNMP modules bundled with the 'bsnmpd' daemon:

- MIB-II
Implements parts of the internet standard MIB-II.
- Netgraph
Enable remote access to FreeBSD Netgraph subsystem.
- Host resources
Implements the HOST-RESOURCES-MIB as standardized in RFC 2790.
- UCD-SNMP-MIB
Retrieve system performance information and device detail.

The SNMP daemon will be started once the settings are saved in the page [System] > [Settings] > [SNMP]. SNMP triggered event can be found in the AhsayUBS system log at page [Information] > [System Logs].

SNMP Settings

AhsayUBS Administrator can configure the SNMP settings and check the SNMP daemon status in the page [System] > [Settings] > [SNMP].

System > Settings > SNMP

General Password Email Proxy SSHD UPS **SNMP** sysctl.conf

Simple Network Management Protocol Enable

Status Running

Location SNMP server
Location information, e.g. physical location of this system: Floor of building, Room xyz.

Contact SNMP server admin
Contact information, e.g. name or email of the person responsible for this system.

Community public
Enter read community string here.

Traps Enable traps.

Trap host snmp-server.ahsayhq.local
Enter trap host name.

Trap port 162
Enter the port to send the traps to (default 162).

Trap string jubs
Trap string.

SNMP Modules Download MIB files

Save and Restart

Please enter / select the fields below to configure the 'bsnmpd' daemon:

- ▶ Enable 'checkbox': Enable / Disable the 'bsnmpd' daemon.
- ▶ Status: 'bsnmpd' daemon current status [Running / Cannot be enabled / Stopped].
- ▶ Location: The physical location of the AhsayUBS machine.
- ▶ Contact: The textual identification of the contact person for this AhsayUBS machine, together with information on how to contact this person.
- ▶ Community: The community string acts as a password to communicate with the NMS. Default is 'public'. It is better to set a value different from the default one or any dictionary words in order to prevent brute force attack. Only read-only community is supported by AhsayUBS.
- ▶ Traps: Enable traps (notifications) send from the SNMP daemon.
- ▶ Trap host [shown when 'Traps' is enabled]: Enter hostname that the trap will be sent to.
- ▶ Trap port [shown when 'Traps' is enabled]: The listening port of the trap host for receiving traps. Default is UDP port '162'.
- ▶ Trap string [shown when 'Traps' is enabled]: The passcode for the trap. It should match the one defined in the NMS.

Please click [Save and Restart] button to save the above settings and update the status of the 'bsnmpd' daemon in the AhsayUBS.

Import MIB files to the NMS which are supported by this 'bsnmpd' daemon:

After the 'bsnmpd' is enabled, please download the MIB Zip Archive from the WebAdmin page. The zip file contains all the MIB files which are supported by the 'bsnmpd' daemon. Please extract the files and import them to the NMS / MIB browser.



Browse the OID in the MIB browser to get / monitor the information:

After importing the MIB files into the MIB browser, the system information can be browsed in the MIB tree. Administrators may configure the MIB browser to monitor AhsayUBS by selective OID. Please refer to the Appendix for the OID list and the OIDs' description.

For further details of how to use MIB browser, please refer to the Appendix for MIB browser example. If you are using a MIB browser other than that stated in the Appendix, please refer to the corresponding MIB browser user guide.

8.2.1.8 Sysctl.conf

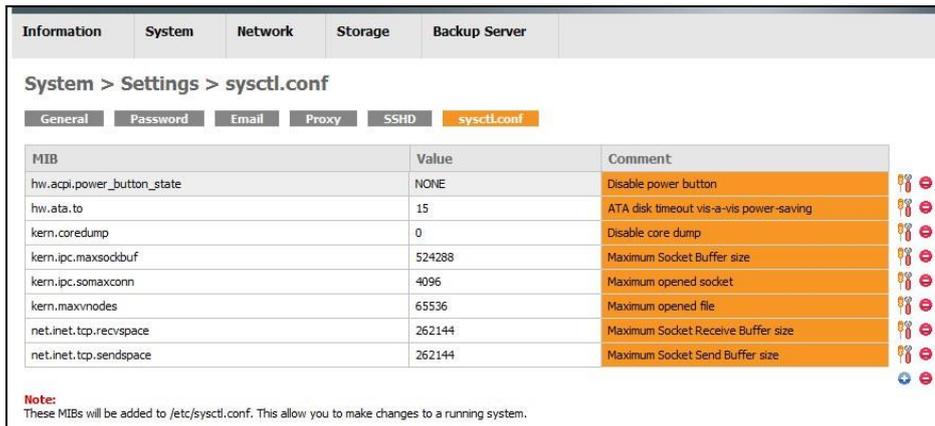
The "sysctl.conf" is located inside the "/etc" which is a configuration file for making changes of the FreeBSD (which is the OS of the AhsayUBS). This includes many advanced options of the TCP/IP stack and virtual memory system that can dramatically improve performance of the OS. For more information of "sysctl.conf", please refer to the FreeBSD documentation.

Here are the fields that you can set per MIB entry:

- **Name:** The MIB name.
- **Value:** The value with respect to the MIB name.
- **Comment:** Specify the human-readable description corresponding to this entry.

A screenshot of the [System] > [Settings] > [sysctl.conf] is captured below. It shows that all the MIB entries are enabled except the entry "hw.acpi.pwr_button_state".

Here are the guidelines to make change of the "sysctl.conf" file in the AhsayUBS.

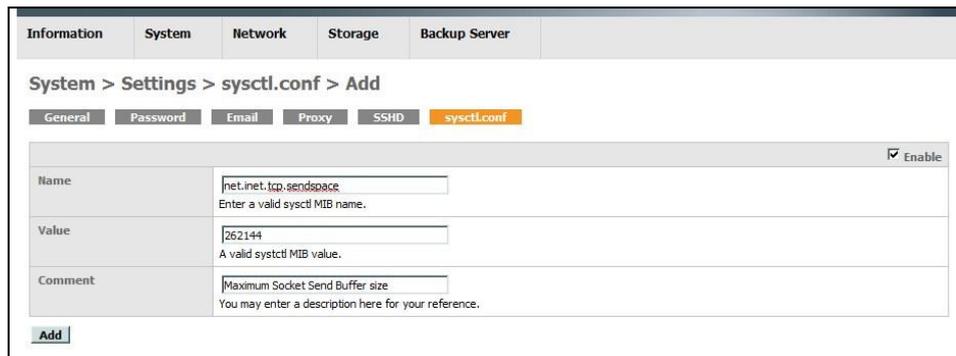


MIB	Value	Comment
hw.acpi.power_button_state	NONE	Disable power button
hw.ata.to	15	ATA disk timeout vis-a-vis power-saving
kern.coredump	0	Disable core dump
kern.ipc.maxsockbuf	524288	Maximum Socket Buffer size
kern.ipc.somaxconn	4096	Maximum opened socket
kern.maxvnodes	65536	Maximum opened file
net.inet.tcp.recvspace	262144	Maximum Socket Receive Buffer size
net.inet.tcp.sendspace	262144	Maximum Socket Send Buffer size

Note:
These MIBs will be added to /etc/sysctl.conf. This allow you to make changes to a running system.

Add a MIB entry:

1. Click the '+' icon.
2. Fill in the required fields in the table. Check the [Enable] checkbox to enable the MID. Leave it unchecked if you do not want the MIB to be enabled after adding.



Name	Value	Comment
net.inet.tcp.sendspace	262144	Maximum Socket Send Buffer size

Enable

Add

3. Click the [Add] button to add this MIB entry.
4. Click the [Apply Changes] button.
5. The MIB entry is added successfully.

Edit a MIB entry:

1. Look for the MIB entry to be edited.
2. Click the  icon.
3. Edit the fields in the page.

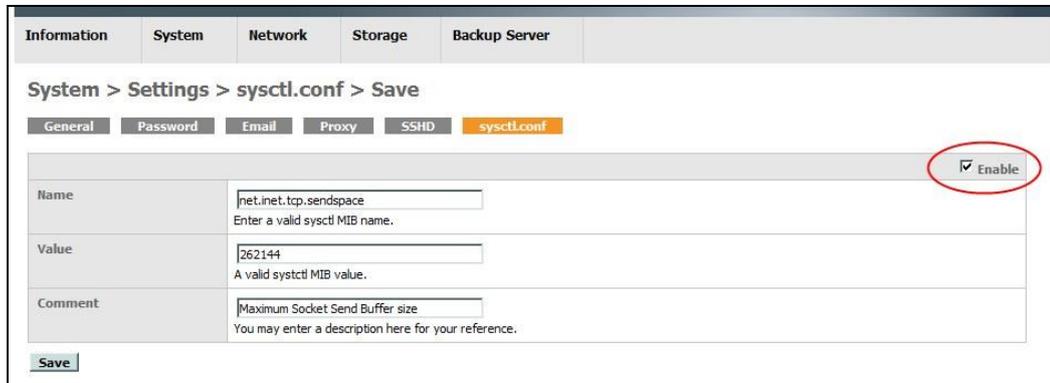


Information	System	Network	Storage	Backup Server
System > Settings > sysctl.conf > Save				
General Password Email Proxy SSHD sysctl.conf				
<input checked="" type="checkbox"/> Enable				
Name	<input type="text" value="net.inet.tcp.sendspace"/> Enter a valid sysctl MIB name.			
Value	<input type="text" value="262144"/> A valid sysctl MIB value.			
Comment	<input type="text" value="Maximum Socket Send Buffer size"/> You may enter a description here for your reference.			
<input type="button" value="Save"/>				

4. Click the [Save] button to add this MIB entry.
5. Click the [Apply Changes] button.
6. The MIB entry is updated successfully.

Enable/Disable a MIB entry:

1. Look for the MIB entry to be edited.
2. Click the  icon.
3. Check the checkbox [Enabled] to enable the MIB. Uncheck it to disable the MIB.



The screenshot shows the 'System > Settings > sysctl.conf > Save' page. The 'sysctl.conf' tab is active. The 'Enable' checkbox is checked and circled in red. The form contains the following fields:

System > Settings > sysctl.conf > Save	
General Password Email Proxy SSHD sysctl.conf	
<input checked="" type="checkbox"/> Enable	
Name	<input type="text" value="net.inet.tcp.sendspace"/> Enter a valid sysctl MIB name.
Value	<input type="text" value="262144"/> A valid sysctl MIB value.
Comment	<input type="text" value="Maximum Socket Send Buffer size"/> You may enter a description here for your reference.
<input type="button" value="Save"/>	

4. Click the [Save] button to add this MIB entry.
5. Click the [Apply Changes] button.
6. The MIB entry is edited successfully.

Delete a MIB entry:

1. Look for the MIB entry to be deleted.
2. Click the '✖' icon at the row that the MIB entry to be deleted.
3. In the alert box, click [OK] to confirm the delete of the entry. Click [Cancel] to abort.
4. Click the [Apply Changes] button.
5. The MIB entry is deleted successfully.

Delete all MIB entries:

1. Click the '🔴' icon next to the '🔵' icon.
2. In the alert box, click [OK] to confirm deleting all the MIB entries in the table. Click [Cancel] to abort.
3. Click the [Apply Changes] button.
4. All the MIB entries in the table are deleted successfully.

Information	System	Network	Storage	Backup Server																																				
System > Settings > sysctl.conf																																								
<div style="display: flex; justify-content: space-between; border-bottom: 1px solid #ccc; padding-bottom: 5px;"> General Password Email Proxy SSH sysctl.conf </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>MIB</th> <th>Value</th> <th>Comment</th> <th></th> </tr> </thead> <tbody> <tr> <td>hw.acpi.power_button_state</td> <td>NONE</td> <td>Disable power button</td> <td style="text-align: right;">🔴</td> </tr> <tr> <td>hw.ata.to</td> <td>15</td> <td>ATA disk timeout vis-a-vis power-saving</td> <td style="text-align: right;">🔴</td> </tr> <tr> <td>kern.coredump</td> <td>0</td> <td>Disable core dump</td> <td style="text-align: right;">🔴</td> </tr> <tr> <td>kern.ipc.maxsockbuf</td> <td>524288</td> <td>Maximum Socket Buffer size</td> <td style="text-align: right;">🔴</td> </tr> <tr> <td>kern.ipc.somaxconn</td> <td>4096</td> <td>Maximum opened socket</td> <td style="text-align: right;">🔴</td> </tr> <tr> <td>kern.maxvnodes</td> <td>65536</td> <td>Maximum opened file</td> <td style="text-align: right;">🔴</td> </tr> <tr> <td>net.inet.tcp.recvspace</td> <td>262144</td> <td>Maximum Socket Receive Buffer size</td> <td style="text-align: right;">🔴</td> </tr> <tr> <td>net.inet.tcp.sendspace</td> <td>262144</td> <td>Maximum Socket Send Buffer size</td> <td style="text-align: right;">🔴</td> </tr> </tbody> </table>					MIB	Value	Comment		hw.acpi.power_button_state	NONE	Disable power button	🔴	hw.ata.to	15	ATA disk timeout vis-a-vis power-saving	🔴	kern.coredump	0	Disable core dump	🔴	kern.ipc.maxsockbuf	524288	Maximum Socket Buffer size	🔴	kern.ipc.somaxconn	4096	Maximum opened socket	🔴	kern.maxvnodes	65536	Maximum opened file	🔴	net.inet.tcp.recvspace	262144	Maximum Socket Receive Buffer size	🔴	net.inet.tcp.sendspace	262144	Maximum Socket Send Buffer size	🔴
MIB	Value	Comment																																						
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net.inet.tcp.sendspace	262144	Maximum Socket Send Buffer size	🔴																																					
<p>Note: These MIBs will be added to /etc/sysctl.conf. This allow you to make changes to a running system.</p>																																								

8.2.2 Backup/Restore AhsayUBS Settings

The AhsayUBS runtime configuration is stored as an XML file. The XML file contains all settings information available in AhsayUBS WebAdmin.

In this page you can backup or restore the AhsayUBS runtime configuration in XML file format.

8.2.2.1 Backup Configuration

You can download the runtime configuration file of AhsayUBS WebAdmin by clicking the button [Download configuration].

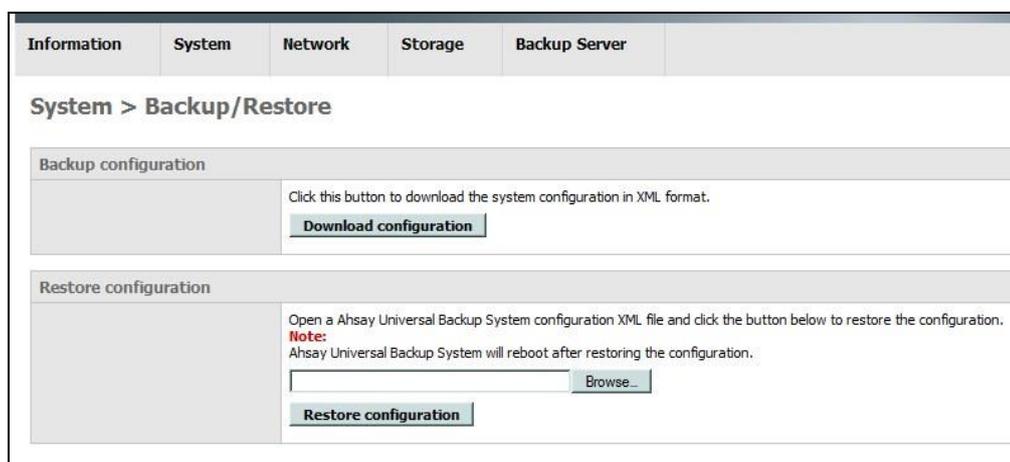
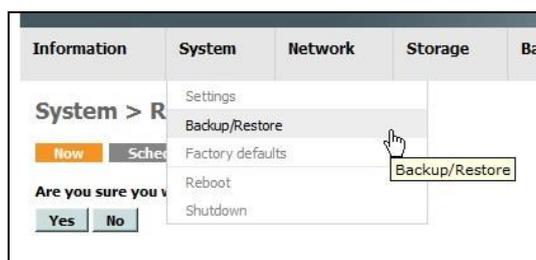
8.2.2.2 Restore Configuration

The configuration can be restored in one of the following situations:

1. Adapted a new AhsayUBS with the same configuration of hardware, IP settings
2. Mistakenly configure anything wrongly in the AhsayUBS WebAdmin.

The settings can be restored with your last downloaded configuration file:

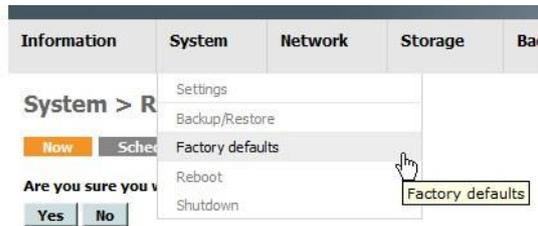
1. Click the [Browse...] button to select the configuration file to restore.
2. Click [Restore configuration] button to restore the previous configuration to your AhsayUBS.



Note: AhsayUBS will reboot after the configuration is restored.

8.2.3 Factory Defaults

You can restore AhsayUBS to factory defaults by clicking [Yes] or clicking [No] to cancel.



Note:

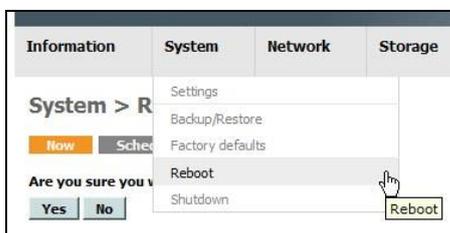
1. The data on the block devices will NOT be erased after AhsayUBS is reset to factory defaults.
2. You can restore the previous settings in AhsayUBS WebAdmin in the page [System] > [Backup/Restore]. Please refer to the section [System] > [Backup/Restore] for details.
3. After resetting AhsayUBS to factory defaults, all iSCSI sessions will be removed in the [Storage] > [iSCSI] page. The status of Expandable Storage will change to "Missing". The Expandable Storage can be re-configured for use by AhsayUBS:
 - i. Adding it back the iSCSI session inside the [Storage] > [iSCSI] page.
 - ii. Import the Expandable Storage. Note that the data in the Expandable Storage will not be erased after "factory defaults". For details, please refer to the [Storage] section.

8.2.4 Reboot

8.2.4.1 Now

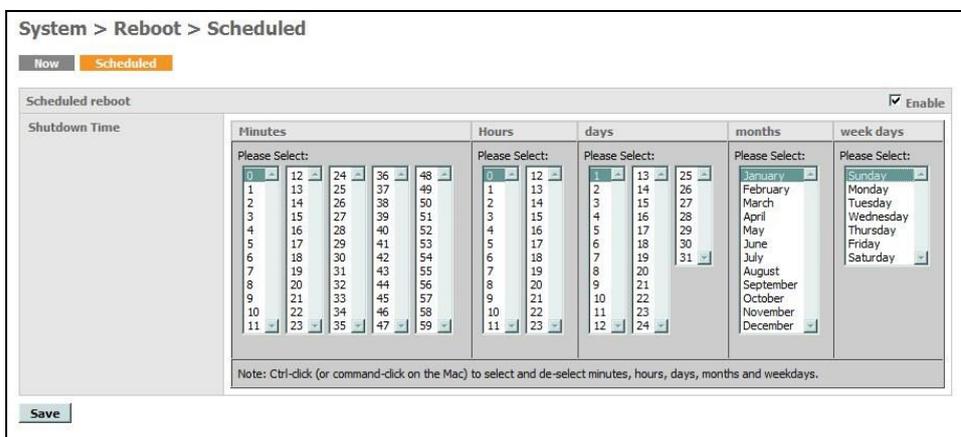
Click [Yes] button to reboot your AhsayUBS or [No] to cancel.

WARNING: Please ensure the system's condition is safe for reboot. Otherwise, the backup job could be interrupted if the backup server is in use.



8.2.4.2 Scheduled

You may check the [Enable] checkbox on the top-right hand corner to enable schedule shutdown and schedule the shutdown time by selection the lists in the table [Scheduled reboot] and click the [Save] button to save your settings.



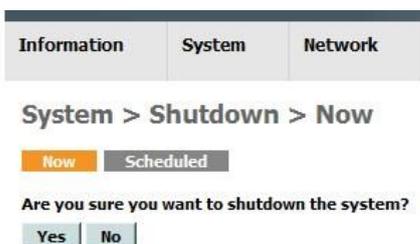
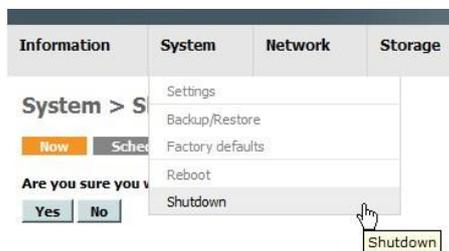
WARNING: Please do not select ALL the minutes for reboot, otherwise the AhsayUBS may need to restore to factory default for stopping the endless rebooting system!

8.2.5 Shutdown

8.2.5.1 Now

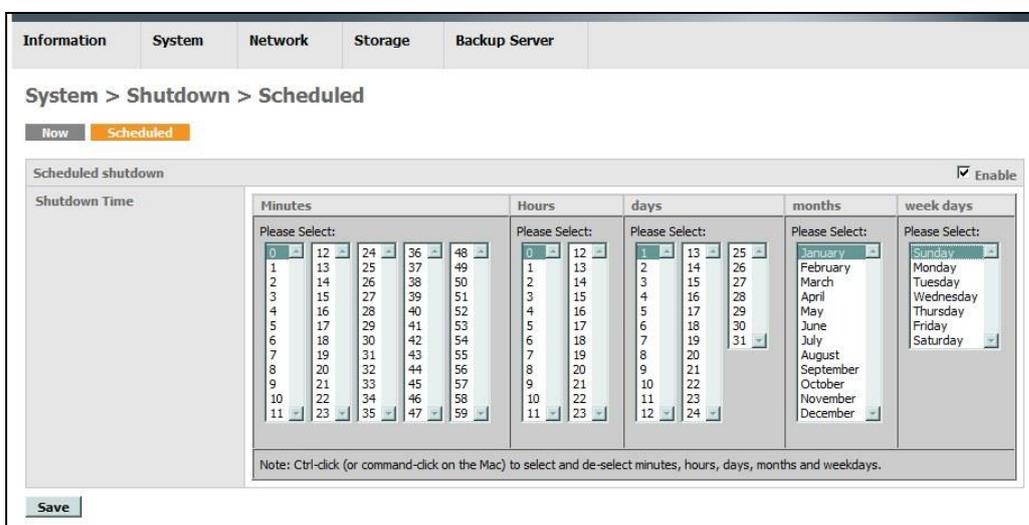
Click [Yes] button to shutdown the AhsayUBS or [No] to cancel.

WARNING: Please ensure the system's condition is safe for shutdown. Otherwise, the backup job could be interrupted if the backup server is in use.



8.2.5.2 Scheduled

You may check the [Enable] checkbox on the top-right hand corner to enable schedule shutdown and schedule the shutdown time by selecting the options in the table [Schedule shutdown] and click the [Save] button to save your settings.



WARNING: Please do not select ALL the minutes for shutdown, otherwise the AhsayUBS may need to restore to factory default for stopping the endless shutting down system!

8.3 Network

This section shows how to configure network settings, tools for network connectivity in the AhsayUBS through the AhsayUBS WebAdmin.

When the mouse cursor is over the word [Network] in the menu bar, the menu will be shown as below:



The [Network] menu has been further divided into the following sections:

- ▶ Interfaces (Assign the physical device with a configuration setting).
- ▶ LAN/OPT1/OPT2 (Configuration for interface LAN/OPT1/OPT2)
- ▶ Routes (Current routing information)
- ▶ Hosts (User defined Host – IP Address mapping)
- ▶ Static Routes (User defined routing setting)
- ▶ Ping/Traceroute (Network tools)

8.3.1 Interfaces

This page shows a summary of physical network devices in this AhsayUBS. The first column shows the interface name (e.g. LAN). The second column shows the network port's name and its physical address.

By default, there should be at least one network device which will be assigned as LAN in the system.

If there are other network interfaces available in the system, a '+' button will be shown next to the table for addition of other network interfaces.

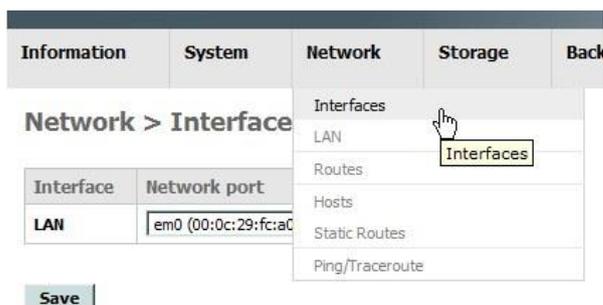
The additional network devices will be assigned as "OPT1", "OPT2" incrementally.

You can assign different network device to the interface name from the dropdown list at the second column. After selecting the interface, press the [Save] button to save your settings.

WARNING: You must select a network interface inside the drop-down list after clicking the '+' icon and click the [Save] button before rebooting the AhsayUBS may be unreachable from the network since there are no network interface selection for the LAN and OPT.

Once you have added an OPT1 network interface, a new configuration page [Network] > [Optional1 (OPT1)] will be added to the system after reboot.

The [Network] > [LAN] denotes the network device configuration for the network device which has been assigned at the [network] > [Interface] page. Additional network interfaces OPT1 can be configured at page [Network] > [OPT1] which is similar to the [LAN] interface.



In addition, a network interface can be deleted by clicking the '-' icon corresponding to the network interface that wants to be deleted. After rebooting the AhsayUBS, the network interface will be deleted successfully.

WARNING: When deleting a network interface, the network settings inside the network interface (e.g. IP address) will also be deleted permanently. You may need to set it again when the network interface is added again.

8.3.2 LAN

This page helps to set the configuration of the network interface labeled LAN in the AhsayUBS.

8.3.2.1 IPv4 Configuration

The fields for this section are listed below:

- **Type:** Select DHCP to obtain the IP address automatically. Select [Static] for entering the IP address manually.
- **IP Address:** This will be enabled only in STATIC mode. You need to enter the IP address for the AhsayUBS. Please make sure that the IP address entered can be reached from your computer. The drop down list after the "/" is the subnet mask. The value in here represents the number of bits of the subnet mask address. E.g. if the subnet mask is 255.255.255.0 (i.e. in binary form: 11111111.11111111.11111111.00000000), the subnet number is 24 bit.
- **Gateway:** This will be enabled only in STATIC mode. The default gateway must be entered correctly.

Note: For additional network interfaces, e.g. OPT1, there will be an additional [Activate] checkbox at the top-right hand corner. You may check this checkbox to enable the corresponding network interface.

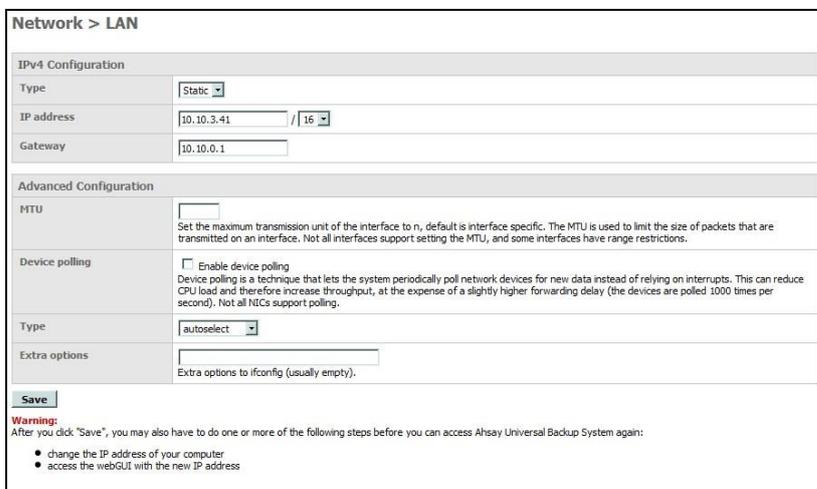
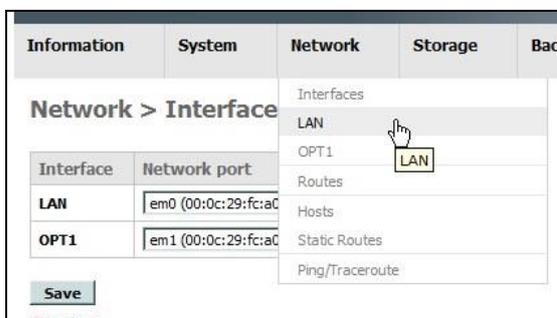
8.3.2.2 Advanced Configuration

The fields in this section are listed below:

- **MTU:** Set the maximum transmission unit of the interface to *n*, the default settings is leave to *n*, default is interface specific (i.e. blank). The MTU is used to limit the size of packets that are transmitted on an interface. Not all interfaces support setting the MTU, and some interfaces have range restrictions.
- **Device polling:** Device polling is a technique that lets the system periodically poll network devices for new data instead of relying on interrupts. This can reduce CPU load and therefore increase throughput, at the expense of a slightly higher forwarding delay (the devices are polled 1000 times per second). Not all NICs support polling.
- **Type:** Select the speed of network from the drop down list.
- **Extra options:** You can enter extra options for the FreeBSD command "ifconfig" here. For more information of this command, please refer to the FreeBSD documentation.

After the configuration is updated, the page is refreshed. If a reboot message is shown, please click the link [reboot] in the message to reboot the AhsayUBS for the changes to take effect.

WARNING: Before rebooting the AhsayUBS, please make sure the network settings (i.e. the IP address and the default gateway) in the above page(s) are correct. Otherwise, the AhsayUBS may be UNREACHABLE by the network after rebooting.



8.3.3 Routes

This page shows the routing table of your AhsayUBS which is used to trace the network routing to a target network destination.

The screenshot shows the 'Network > Routes' page with a navigation menu on the left. The 'Static Routes' tab is selected. Below the navigation menu is a table with the following data:

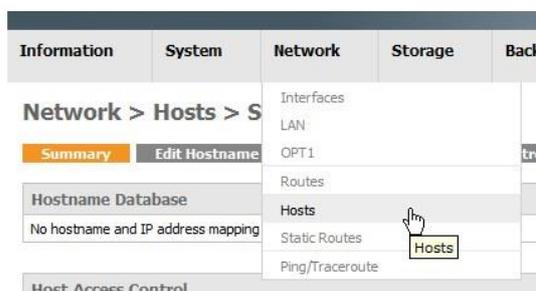
Destination	Gateway	Flags
default	10.2.0.254	UGS
10.2.0.0/16	link#1	U
10.2.3.50	link#1	UHS
127.0.0.1	link#3	UH

The screenshot shows the 'Network > Routes' page with a detailed table. The 'Static Routes' tab is selected. Below the navigation menu is a table with the following data:

Destination	Gateway	Flags	Refs	Use	Mtu	Netif	Expire
default	10.2.0.254	UGS	4	4665	1500	em0	
10.2.0.0/16	link#1	U	0	0	1500	em0	
10.2.3.50	link#1	UHS	0	0	16384	lo0	
127.0.0.1	link#3	UH	0	0	16384	lo0	

8.3.4 Hosts

This page is for the customization of hosts settings.



8.3.4.1 Summary

It contains a summary of the entire host settings inside the AhsayUBS.

The [Hostname Database] table contains the mapping of the hostname and IP address inside the AhsayUBS.

Here are the fields required for each of the hostname database entry:

- **Hostname:** The hostname you want to map with IP address in the [IP address] field.
- **IP Address:** The IP address you want to map with the hostname in the [Hostname] field.
- **Description (Optional):** Enter some description of the mapping for your reference.

You may edit the hostname database settings by the page [Network] > [Hosts] > [Edit Hostname Database].

The [Host Access Control] table contains the settings of the access control of the specific daemon.

The basic configuration usually takes the form of "daemon:address action", where daemon name of the service started. The address can be a valid hostname, and IP address enclosed in brackets. The action field can be either allow or deny to grant or deny access appropriately. Keep in mind that configuration works off a first rule match semantic, meaning that the configuration file is scanned in ascending order for a matching rule. When a matching result is found, and the rule will be applied. Then, the search process will halt. To get detailed information about TCP wrappers, please refer to the FreeBSD documentation.

The default settings of the [Host Access Control] are:

```
#ftpd : xxx.xxx.xxx.xxx : deny
#sshd : .example.com : deny
#in.tftpd : xxx.xxx.xxx.xxx : deny
#bsnmpd : xxx.xxx.xxx.xxx : deny
ALL : ALL : allow
```

Note: If you put the “#” character at the start of a line, then the line will become a comment line.

You may edit the host access control settings by the page [Network] > [Hosts] > [Edit Host Access Control].

Information	System	Network	Storage	Backup Server
Network > Hosts > Summary				
Summary Edit Hostname Database Edit Host Access Control				
Hostname Database				
Hostname		IP address	Description	
ahsayobm		192.168.6.230	ahsayobm	
Host Access Control				
<pre>#ftpd : xxx.xxx.xxx.xxx : deny #sshd : .example.com : deny #in.tftpd : xxx.xxx.xxx.xxx : deny #bsnmpd : xxx.xxx.xxx.xxx : deny ALL : ALL : allow</pre>				

8.3.4.2 Edit Hostname Database

Add a hostname database entry

To add a hostname to the database, please follow the steps below:

1. (Entry Exist) Click the '+' icon.
2. Fill in the required fields.
3. Click the [Add] button.
4. A new entry is added successfully into the hostname database.

Information	System	Network	Storage	Backup Server
Network > Hosts > Edit Hostname Database > Add				
Summary Edit Hostname Database Edit Host Access Control				
Hostname Database Entry				
Hostname	<input type="text" value="ahsayobm"/> <small>The hostname is case insensitive and it may only consist of the char (i.e. A hostname "AhsayUBS" is identical to the one named "ahsayu</small>			
IP address	<input type="text" value="192.168.6.230"/> <small>The IP address that this hostname represents.</small>			
Description	<input type="text" value="ahsayobm"/> <small>You may enter a description here for your reference.</small>			
<input type="button" value="Add"/>				

Edit a hostname database entry

To edit a hostname stored in the database, please follow the steps below:

1. Look for the entry to be edited.
2. Click the  icon.
3. Edit the fields.
4. Click the [Save] button.
5. The entry is edited successfully.

Information	System	Network	Storage	Backup Server
Network > Hosts > Edit Hostname Database > Edit				
Summary Edit Hostname Database Edit Host Access Control				
Hostname Database Entry				
Hostname	<input type="text" value="ahsayobm"/> <p>The hostname is case insensitive and it may only consist of the characters a-z, 0-9, and hyphen (-). A hostname "AhsayUBS" is identical to the one named "ahsayubs".</p>			
IP address	<input type="text" value="192.168.6.230"/> <p>The IP address that this hostname represents.</p>			
Description	<input type="text" value="ahsayobm"/> <p>You may enter a description here for your reference.</p>			
<input type="button" value="Save"/>				

Information	System	Network	Storage	Backup Server
Network > Hosts > Edit Hostname Database				
Summary Edit Hostname Database Edit Host Access Control				
Hostname Database				
Hostname	IP address	Description		
ahsayobm	192.168.6.230	ahsayobm	  	

Delete a hostname database entry

To delete a hostname from the database, please follow the steps below:

1. Look for the entry to be deleted.
2. Click the '🗑️' icon.
3. The entry is deleted successfully.

8.3.4.3 Edit Host Access Control

Edit the entries in the Host Access Control text area and click the [Save and Restart] button to update and restart the server. The new settings will take effect after restarting the services.

Information System Network Storage Backup Server

Network > Hosts > Edit Host Access Control

Summary Edit Hostname Database Edit Host Access Control

Host Access Control

```
#ftpd : xxx.xxx.xxx.xxx : deny
#sshd : .example.com : deny
#in.tftpd : xxx.xxx.xxx.xxx : deny
#rsyncd : xxx.xxx.xxx.xxx : deny
ALL : ALL : allow
```

Save and Restart

Usage:
 The basic configuration usually takes the form of 'daemon : address : action'. Where daemon is the daemon name.
 The address can be a valid hostname, an IP address or an IPv6 address enclosed in brackets.
 The action field can be either allow or deny to grant or deny access appropriately.
 Keep in mind that configuration works off a first rule match semantic, meaning that the configuration file is read from top to bottom and when a match is found the rule is applied and the search process will halt.
 To get detailed informations about TCP Wrappers check the FreeBSD documentation.

8.3.5 Static Routes

This page allows you to customize the static route. If there are several network interfaces in the AhsayUBS, additional routes can be added to allow directing network traffic to other networks.

If you want to add a static route, click the '+' icon to continue.



The static routes table will then appear on the browser. Here are the rows that you can choose for configuration.

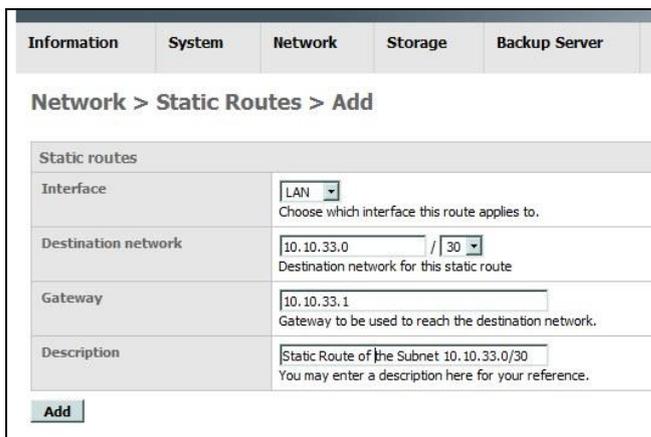
Interface: Select the interface that used for the static route.

Destination network: The network which the traffic should be directed to via the "Gateway".

Gateway: The IP address of the gateway which has been connected to the destination network.

Description (Optional): Enter some comment related to this static route entry.

Click the [Add] button after completing the table, then click the [Apply change] for the changes to take effect. The message "The changes have been applied successfully." will appear when the entry is added successfully.



Information	System	Network	Storage	Backup Server
Network > Static Routes				
Interface	Network	Gateway	Description	
LAN	10.10.33.0/30	10.10.33.1	Static Route of the Subnet 10.10.33.0/30	  

Ahsay Universal Backup System © 2008-2010 by Ahsay Systems Corporation Limited. All rights reserved.



Now you can click the  icon to configure the entry or click the  icon to remove the entry.

: Edit the entry and click the [Save] -> [Apply changes] button to save the changes.

: After clicking this icon, a pop-up dialog will appear to confirm the changes. Clicking the [OK] button to confirm or clicking the [Cancel] button to give up. After the dialog is closed, you need to click the [Apply Changes] button for the changes to take effect. The message of "The changes have been applied successfully." will be shown and it denotes that the entry is removed successfully.

8.3.6 Ping/Traceroute

This page contains the network tools: ping and traceroute. The first page contains the ping tool and the second page contains the traceroute tool.

8.3.4.1 Ping

It is the "ping" command in standard UNIX machines. It tests your AhsayUBS network interface whether it can reach the destination hosts specified. After you have entered the required information in the text box, click the [Ping] button to ping the destination host. The output below the [Ping] button will show the results whether the destination can be reached by the AhsayUBS or not.

Below is an example that the AhsayUBS can reach the destination successfully.

Information	System	Network	Storage	Backup Server
Network > Ping/Traceroute > Ping				
Ping Traceroute				
Ping				
Host	<input type="text" value="192.168.6.186"/> Destination host name or IP number.			
Interface	<input type="text" value="LAN"/> Use the following IP address as the source address in outgoing packets.			
Count	<input type="text" value="3"/> Stop after sending (and receiving) N packets.			
Ping				
<pre> Command output: PING 192.168.6.186 (192.168.6.186) from 10.10.3.41: 56 data bytes 64 bytes from 192.168.6.186: icmp_seq=0 ttl=126 time=20.162 ms 64 bytes from 192.168.6.186: icmp_seq=1 ttl=126 time=1.518 ms 64 bytes from 192.168.6.186: icmp_seq=2 ttl=126 time=1.135 ms --- 192.168.6.186 ping statistics --- 3 packets transmitted, 3 packets received, 0.0% packet loss round-trip min/avg/max/stddev = 1.135/7.605/20.162/8.881 ms </pre>				

Below is an example that the AhsayUBS failed to reach the destination "192.168.6.163".

Information	System	Network	Storage	Backup Server
Network > Ping/Traceroute > Ping				
Ping Traceroute				
Ping				
Host	<input type="text" value="192.168.6.163"/> Destination host name or IP number.			
Interface	<input type="text" value="LAN"/> Use the following IP address as the source address in outgoing packets.			
Count	<input type="text" value="3"/> Stop after sending (and receiving) N packets.			
Ping				
<pre> Command output: PING 192.168.6.163 (192.168.6.163) from 10.10.3.41: 56 data bytes --- 192.168.6.163 ping statistics --- 3 packets transmitted, 0 packets received, 100.0% packet loss </pre>				

8.3.4.2 Traceroute

It is another tool for testing your AhsayUBS network connection to a destination host you entered in the table below. It also shows the path of the packets travel from the AhsayUBS to the destination host.

Below is an example that the AhsayUBS can reach the destination successfully.

Information	System	Network	Storage	Backup Server
-------------	--------	---------	---------	---------------

Network > Ping/Traceroute > Traceroute

Ping **Traceroute**

Traceroute

Host	<input type="text" value="192.168.6.186"/> Destination host name or IP number.
Max. TTL	<input type="text" value="30"/> Max. time-to-live (max. number of hops) used in outgoing probe packets.
Resolve	<input type="checkbox"/> Resolve IP addresses to hostnames

Traceroute

```
Command output:
1 10.10.0.1 5.018 ms 5.200 ms 1.971 ms
2 * * *
3 192.168.6.186 0.655 ms 0.407 ms 0.372 ms
```

Below is an example that the AhsayUBS failed to reach the destination.

Information	System	Network	Storage	Backup Server
-------------	--------	---------	---------	---------------

Network > Ping/Traceroute > Traceroute

Ping **Traceroute**

Traceroute

Host	<input type="text" value="192.168.6.163"/> Destination host name or IP number.
Max. TTL	<input type="text" value="30"/> Max. time-to-live (max. number of hops) used in outgoing probe packets.
Resolve	<input type="checkbox"/> Resolve IP addresses to hostnames

Traceroute

```
Command output:
1 10.10.0.1 10.707 ms 4.958 ms 4.474 ms
2 * * *
3 * * *
4 * * *
5 * * *
6 * * *
7 * * *
8 * * *
9 * * *
10 * * *
11 * * *
12 * * *
13 * * *
14 * * *
15 * * *
16 * * *
17 * * *
18 * * *
19 * * *
20 * * *
21 * * *
22 * * *
23 * * *
24 * * *
25 * * *
26 * * *
27 * * *
28 * * *
29 * * *
30 * * *
```

8.4 Storage

8.4.1 Overview

The [Storage] > [Summary] page shows a summary of the volumes created in this AhsayUBS.

There are two types of storage volumes defined on the AhsayUBS:

1. **System Storage** – This is a core storage volume, which is created during AhsayUBS installation. The System Storage contains AhsayUBS system files. Therefore, it cannot be removed or unmounted when AhsayUBS is running.
2. **Additional Storage** – can be added when the LFW storage has run out of space. It is used for storing more backup user account data. As Additional Storage are not core storage volumes. They can be *removed* or *unmounted* when AhsayUBS is running.

Details of the storage model in AhsayUBS can be found in the section [AhsayUBS Storage Concepts].

Under this page, volume information will be shown, and the actions can be done include:

1. add or remove an Additional Storage
2. mount or unmount an Additional Storage
3. filesystem check on a volume
4. rebuild degraded LFW or Additional Storage inside this AhsayUBS.

The page [**Storage**] > [**iSCSI**] shows a summary of the iSCSI session created in this AhsayUBS. The iSCSI session can be created, edited their information, disconnected and removed in this AhsayUBS in this page.

After an iSCSI session is created, it can be used as a provider for the Expandable Storage (a type of Additional Storage).

8.4.2 [Storage] > [Summary]

8.4.2.1 Storage Information in the WebAdmin

A summary of the storages installed in the AhsayUBS will be shown in this page.

Information	System	Network	Storage	Backup Server
Storage > iSCSI			Summary	
			iSCSI	Summary
Target address		Target name		Initiator name

The [**Storage**] > [**Summary**] shows the summary of the storages inside the AhsayUBS with volume view. Here is the information that will be shown in the volume:

- **Volume Pie chart** - For the volume size distribution:
 1. Yellow means the approximate used space in a volume.
 2. Blue means the approximate the free space available in a volume.



- The **missing volume pie chart** means the volume is not available for the AhsayUBS. It may be due to factors such as:
 1. The volume is exported.
 2. Some of the providers (block devices or iSCSI session) are missing.



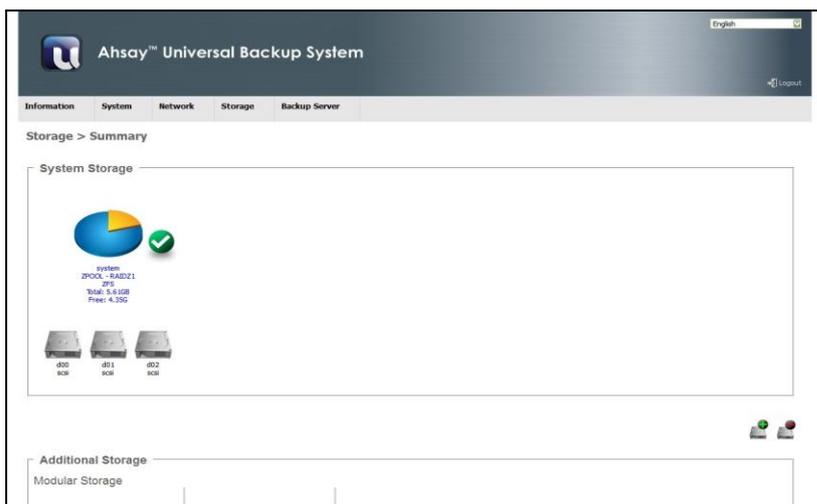
Volume status icons indicate the various statuses of the volume. It is put beyond the volume pie chart.

Description of the volume status icons:

	Healthy	The volume is healthy.
	Degraded	The volume is degraded. One or more providers (block devices) of the volume are missing though the volume can still be used. The volume can become healthy again with a rebuild after replacing the missing providers. For details, please refer to the [Troubleshooting] section.
	Rebuilding	This state will occur after the provider is replaced in the volume. After rebuilding completed, the status will become healthy again. The rebuilding state will not affect the read or write operation of the volume.
	Critical	The volume is not available. It is better to suspend all I/O activity before the volume has undergone further damage.
	Missing	The volume is missing. It cannot be accessed by the AhsayUBS. It may be caused by: <ul style="list-style-type: none"> • The volume is exported. • The local storage is disconnected. For details, please refer to the [Troubleshooting] section.
	Disconnected	The corresponding remote disk's connection is lost. Please bring the remote storage host up (e.g. iSCSI initiator) to reconnect the remote disk. In order to prevent any data access to the remote storage, the AhsayCBS and OBSR Share service will not be allowed to start. Do not try to access anything before reconnecting the remote volume.

The following **volume information** that will be shown below the volume pie chart:

- ▶ **Volume ID:** 'system' denotes system storage while 'es????' pattern denotes the volume identity.
- ▶ **RAID Type:** RAID type of the volume.
- ▶ **Filesystem Type:** Filesystem type of the volume (UFS or ZFS).
- ▶ **Total:** Total size available for the volume.
- ▶ **Free:** Free space available for the volume to use.



The **hard disk icons**  [disk_status_healthy.png](#) below the text shows number of the providers for the volume and its status:

	Healthy	The provider is healthy.
	Degraded	Part of the provider is not available. It is advised to backup the data in the volume and build a new volume again.
	Rebuilding	The state will occur after the provider is replaced in the volume. After rebuilding completed, the status will become healthy again.
	Disconnected	The connection of the remote disk is lost. Please bring the remote storage host up (e.g. iSCSI initiator) to reconnect the remote disk.

When the **volume pie chart icon is clicked**, the page will be redirected to the [**Storage**] > [**Summary**] > [**RAID Information**].

- ▶ **Description:** Description of the volume.
- ▶ **Volume ID:** The ID to identify the volume.
- ▶ **Storage Type:** RAID type of the volume.
- ▶ **Filesystem Type:** Filesystem type of the volume (UFS or ZFS).
- ▶ **Status:** State of the volume (ONLINE / DEGRADED / REBUILDING / CRITICAL / DISCONNECTED).
- ▶ **Total Size:** Total size available for the volume.
- ▶ **Available Size:** Free space available for the volume to use.
- ▶ **Used Size:** Used space of the volume.
- ▶ **Used Percentage:** Volume space used percentage.
- ▶ **Mount Point:** Dirpath where the volume is mounted.

Storage > Summary > RAID Information



Details	
Description	Modular Storage
Volume ID	esms00
Storage Type	ZPOOL - STRIPE
Filesystem Type	zfs
Status	ONLINE
Total Size	3.32 GB
Available Size	2.32 GB
Used Size	1.00 GB
Used Percentage	30.12%
Mount Point	/ubs/mnt/esms00

Action	
Unmount Volume	<input type="button" value="Unmount"/>
Filesystem check	<input type="button" value="Scrub"/>

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When the **hard disk icon is selected**, details of each provider will be shown. This page is called [**Storage**] > [**Summary**] > [**Block Device Information**].

Some Block Device Information will be shown in this page:

- ▶ **Volume ID:** 'system' denotes it is a System Storage provider. Others represent the volume it belongs to.
- ▶ **Device ID:** The logical ID that identifies the provider.
- ▶ **Device Name:** Physical name of the block device named by the kernel.
- ▶ **Device Path:** Block device physical path in the AhsayUBS.
- ▶ **Device Type:** Connection type of the device. e.g. ata, ide, scsi, hwraid, iscsi etc.
- ▶ **Device Size:** Physical size of the device.

Physical device information, such as [Model Family], [Model Name], [Serial Number] and [Device Firmware Version] are shown which is useful for the AhsayUBS admin to identify the physical block device.

Storage > Summary > Block Device Information



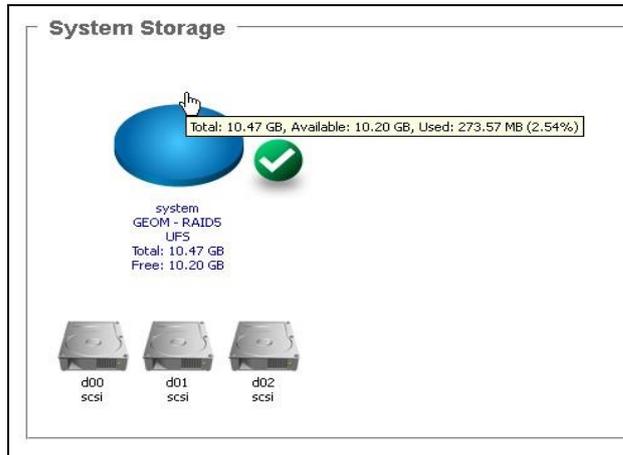
m00c00
scsi

Volume ID	esms00
Device ID	m00c00
Device Name	da0
Device Path	/dev/da0
Device Type	scsi
Device Size	8.00 GB
Model Family	1.0
Model Name	Virtual disk 1.0

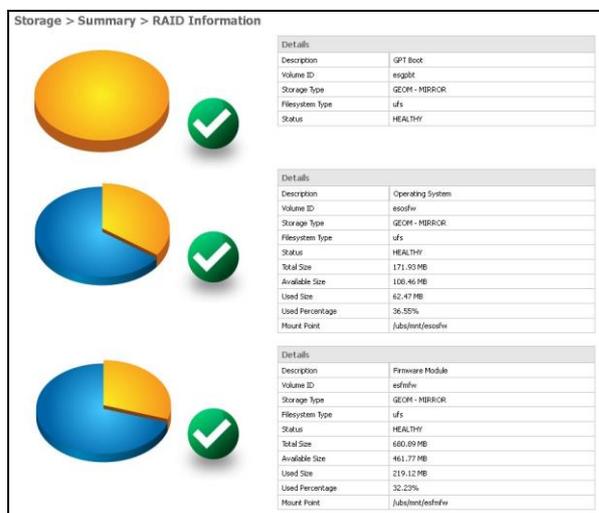
Back

System Storage

In the page [**Storage**] > [**Summary**], only the volume LSFW will be shown.



After clicking the volume pie chart, details of all System Storage will be shown in the page [**Storage**] > [**Summary**] > [**RAID Information**].



Additional Storage

All configured Additional Storage devices can be found in the page [**Storage**] > [**Summary**]. After clicking the volume pie chart icon, details of the Additional Storage will be displayed.

Additional Storage can be added when master storage LFSW runs out of space. Once created, the Additional Storage can be used for storing more user accounts data and their backup snapshots of AhsayCBS in this AhsayUBS.

Supported types of the Additional Storage in AhsayUBS:

1. Modular Storage:
 - Supports one or multiple physical block devices for building RAID0, RAID1 and RAIDZ in ZFS from local storage.
 - Supports one remote disk (i.e. iSCSI target) to build a RAID 0 ZFS remote storage.
2. Expandable Storage: Created with an iSCSI initiator session and hardware RAID volumes.

Only one iSCSI initiator session (one provider) can support creating an expandable storage only.

Since iSCSI target / hardware RAID volume can be expanded, the entire disk will be consumed by a single ZPOOL.

Note: The creation of the expandable storage will not be supported in the current and further releases of AhsayUBS.

8.4.2.2 Create Additional Storage

Additional Storage can be added by clicking the  icon in the [**Storage**] > [**Summary**] page.

If there are no available providers for creating the Additional Storage, the  icon will be hidden.

AhsayUBS admin may either:

1. Shutdown AhsayUBS and insert the block devices. Power on AhsayUBS on again. or
2. Connecting to the iSCSI target (Please refer to the section [**Storage**] > [**iSCSI**] for details.) for the  icon to appear again.

The provider which has been used by other AhsayUBS before will not be listed as an empty block device. It should be *zero out* before putting into this AhsayUBS.

WARNING:

Please note all data in the block device or the iSCSI initiator will be DESTROYED and CANNOT BE RECOVERED again after the Additional Storage is created.

Create Modular Storage (Physical Block Devices)

1. [Local Storage Provider] Make sure the block devices / hardware RAID volume are connected to the AhsayUBS server. If not, shutdown AhsayUBS. Insert a physical block device(s) / create a hardware RAID before booting to AhsayUBS again.

[Remote Storage Provider] Make sure an iSCSI initiator session is connected and enabled. To verify the existence of an iSCSI initiator, please refer to the section [Storage] > [iSCSI] for details.

2. Go to the page [Storage] > [Summary].
3. Click the  icon.
4. Select the provider(s) included in the volume in the drop-down list. Multiple providers can be selected by

[Windows] 'Ctrl + Mouse Left Click'

[Mac OS] 'Command + Mouse Left Click'.

5. [Local Storage Provider] Select the RAID type of the volume (RAID 0 / RAID 1 / RAID Z).
6. Click the button [Done].
7. Read the warning message in the alert box carefully. Confirm that 'All of the data will be destroyed in the provider(s)' by clicking [OK] button.
8. The page then will be redirected to the page [Storage] > [Summary] when the modular storage is created. A dialog box will show that whether creating modular storage action is done successfully or not. Click [OK] to close the dialog.

8.4.2.3 Remove Additional Storage

Please ensure that the volume is **NOT IN USE** before removing. Otherwise, the volume removal action will fail.

Please follow these steps for removing the Additional Storage:

1. Go to the page [Storage] > [Summary].
2. Click the icon .
3. Click the icon  beyond the volume to be removed.
4. Confirm the alert dialog to remove the Additional Storage.
5. The page will be refreshed. A dialog will be popped up to show that the volume is removed successfully. The volume will no longer exist in the AhsayUBS now.

WARNING:

All the data in the Additional Storage will be DESTROYED and CANNOT BE RECOVERED again.

8.4.2.4 Mount and Unmount Additional Storage

Unmount Additional Storage

Note:

1. System Storage volume is always in use and there cannot be unmounted.
2. Please ensure that the volume is **NOT IN USE** before unmounting. Otherwise, the unmount volume action will fail.

Please follow these steps for unmount a volume:

1. Go to the page [Storage] > [Summary].
2. Click the volume pie chart icon which is to be unmounted.
3. The page is redirected to [Storage] > [Summary] > [RAID Information]. Click the [Unmount] button to unmount the volume.
4. The page will be refreshed and shows the result that the volume is unmounted successfully or not. Click the button [OK] to close the dialog.

Mount Additional Storage

Storage volumes cannot be used by the AhsayUBS or the AhsayCBS when it is not mounted. To use the volume, please follow these steps for mount a volume:

1. Go to the page [Storage] > [Summary].
2. Click the volume pie chart icon which is to be mounted.
3. The page is redirected to [Storage] > [Summary] > [RAID Information]. Click the [Mount] button to mount the volume.
4. The page will be refreshed and shows the result that the volume is mounted successfully or not. Click the button [OK] to close the dialog.

8.4.2.5 Filesystem Check

To verify the data integrity of the files and recover the filesystem if there are defects inside the file system.

[ZFS] Scrub

Scrub is the filesystem check process for the ZFS volumes. It can be performed on a volume in either *mounted* or *un-mounted* state

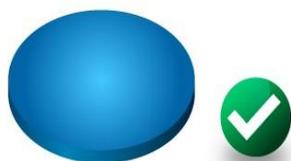
Note:

The performance of the mounted volume will be lowered during scrubbing process. Therefore, it is recommended to perform ZFS scrubbing operations during off peak hours, when there are no backup jobs running.

To trigger the filesystem check manually, please follow these steps:

1. Go to the page [Storage] > [Summary].
2. Click the volume pie chart icon which is going to scrubbing.
3. The page is redirected to [Storage] > [Summary] > [RAID Information]. Click the [scrub] button to start the scrubbing.
4. Read the alert dialog message and confirm it to start the scrubbing process.
5. The page will be refreshed. A dialog will be shown whether the scrubbing command can be issued successfully or not. Click the [OK] button to close the dialog.
6. Scrubbing message will be shown and refreshed at the bottom of the page during scrubbing.

Storage > Summary > RAID Information



Details	
Description	Modular Storage
Volume ID	esms00
Storage Type	ZPOOL - RAIDZ1
Filesystem Type	zfs
Status	ONLINE
Total Size	7.63 GB
Available Size	7.63 GB
Used Size	91.60 KB
Used Percentage	0.00%
ZFS Version	3
Mount Point	/ubs/mnt/esms00

Action	
Unmount Volume	<input type="button" value="Unmount"/>
Filesystem check	<input type="button" value="Scrub"/>

scrub completed after 0h0m with 0 errors on Tue May 31 04:15:35 2011

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[UFS] fsck

The "fsck" process is the filesystem check process for the UFS volumes. **The "fsck" process must be performed when the UFS volume is offline.** Therefore, "fsck" checks are only available for [Additional Storage] volumes, as the [System Storage] volumes cannot be unmounted. A "fsck" check for [System Storage] is performed during the AhsayUBS boot process.

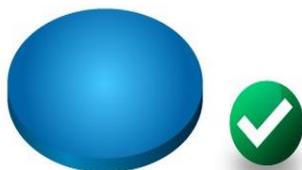
Note:

Please make sure the volume is not in use before unmounting the volume. It is also recommended that the AhsayCBS service is shutdown down before unmounting the volume.

To trigger the "fsck" process manually, please follow these steps:

1. Go to the page [Storage] > [Summary].
2. Click the volume pie chart icon which is going to start "fsck".
3. If the volume is not unmounted, please refer to the section [Mount and Unmount Additional Storage].
4. After the volume is unmounted, click the button [fsck] to start the "fsck" process.
5. Read the alert dialog message and confirm it to start the "fsck" process.
6. The page will be refreshed. A dialog will be popped up to show that whether the "fsck" is started successfully. Click the [OK] button to close the dialog.
7. "fsck" messages will be shown on the bottom of the page if the "fsck" process is started successfully.

Storage > Summary > RAID Information



Details	
Description	Optional Storage
Volume ID	esls00
Storage Type	GEOM - LABEL
Filesystem Type	ufs
Status	ONLINE

Action	
Mount Volume	<input type="button" value="Mount"/>
Filesystem check	<input type="button" value="fsck"/>

Command output:

```
** /dev/label/ESA6D6E1xesls00
** Last Mounted on /ubs/mnt/esls00
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
2 files, 2 used, 4061044 free (28 frags, 507627 blocks, 0.0% fragmentation)
```

8.4.2.6 Export and Import Additional Storage (ZFS)

1. When the corresponding block devices or the iSCSI target is undergoing maintenance or
2. [Expandable Storage] The iSCSI target / hardware RAID volume is expanded; the Additional Storage is needed to be exported and imported again to recognize the expanded size.

Notes:

1. The System Storage cannot be unmounted. So, the volume(s) in System Storage cannot be exported.
2. The volume is needed to be unmounted before exporting. Therefore, make sure that the volume is not in use.

Export the Additional Storage

To export an Additional Storage:

1. Unmount the volume first if it is mounted. For the steps to unmount a volume, please refer to the section [Mount and Unmount Additional Storage].
2. Go to the page [Storage] > [Summary].
3. Click the volume pie chart icon which is going to be exported.
4. Click the button [Export].
5. The page will be refreshed, and a dialog will be shown that the volume is exported successfully. Click [OK] to close the dialog box.
6. The volume is now exported. So, the volume is missing in the AhsayUBS now.

Storage > Summary > RAID Information



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Details	
Description	Modular Storage
Volume ID	esms00
Storage Type	ZPOOL - RAIDZ1
Filesystem Type	zfs
Status	MISSING

Action	
Import Volume	<input type="button" value="Import"/>

Import the Additional Storage

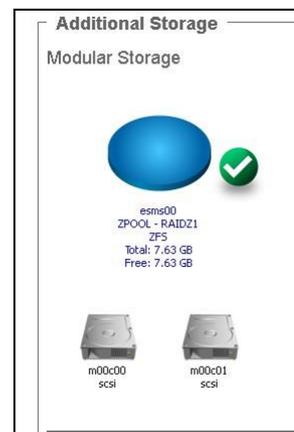
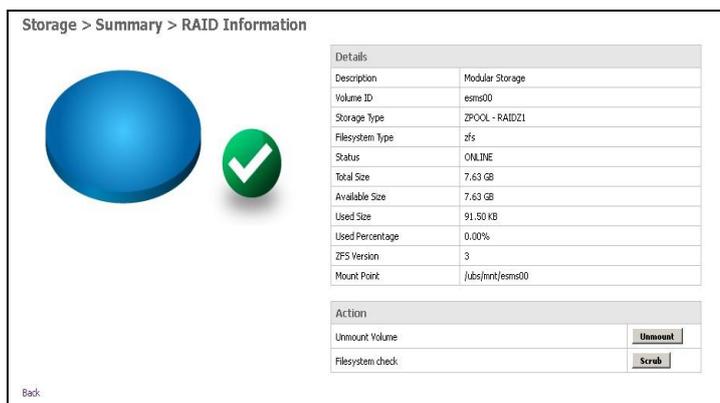
The volume needs to be imported again when it is going to be used by the AhsayUBS.

To import a volume:

1. Make sure the corresponding block device(s) (Modular Storage) or the iSCSI connection (Expandable Storage) is connected to the AhsayUBS before importing the volume.
2. Go to the page [Storage] > [Summary].
3. Click the volume pie chart icon which is going to be imported.



4. Click the button [Import].
5. The page will be refreshed and a dialog will be shown that the volume is imported successfully. Click [OK] to close the dialog box.
6. The volume information now can be shown in the AhsayUBS WebAdmin now. It means that the volume can be used again now by the AhsayUBS after mounting it.



8.4.3 [Storage] > [iSCSI]



Target address	Target name	Initiator name	Comment	Connected	Enable / Disable
10.3.0.98	iqn.2004-04.com:iscsi.ubsdisk00.bdd462	iqn.2004-04.com:iscsi.ubsdisk00.bdd462	ubsdisk00	No	Enable
10.3.0.98	iqn.2004-04.com:iscsi.ubsdisk01.bdd462	iqn.2004-04.com:iscsi.ubsdisk01.bdd462	ubsdisk01	Yes	Disable

Warning:

- The iSCSI initiator will be 'Enabled' automatically just after adding a new iSCSI initiator to the Ahsay Universal Backup System.
- The iSCSI initiator needs several seconds for disable itself. Please be patient to wait and **DO NOT REFRESH THE PAGE** when the page is loading.

In AhsayUBS, iSCSI can only be used for creating the Additional Storages.

The information that will be shown for each of the iSCSI session entry:

- **Target address:** The IP address / DNS name to the iSCSI target.
- **Target name:** The IQN name of the iSCSI target.*
- **Initiator name:** The IQN to identify the iSCSI target.*
- **Port:** The port of the iSCSI TARGET. Default value is "3260".
- **Comment:** The description of this entry.
- **Connected:** "Yes" when the iSCSI session is connected. "No" when the iSCSI session is disconnected.
- **Enable / Disable:** Enable/Disable the iSCSI session.

Note: The **IQN** format should be in:

"iqn.<yyyy-mm>.<reversed domain name>:<identifier>"

8.4.3.1 Rules for enable / disable / delete iSCSI session:

You may enable / disable the iSCSI initiator session for maintenance the iSCSI target server. When the corresponding Additional Storages are in use, the iSCSI initiator session cannot be disabled.

8.4.3.2 Difference between disable / delete an iSCSI initiator session

Disable:

The iSCSI initiator session entry still exists in the AhsayUBS. Use this function when you want to temporarily disable the session and reconnect it later.

Delete:

The iSCSI initiator session entry will no longer be used in this AhsayUBS.

8.4.3.3 Create a connection to an iSCSI target

Note: Please ensure that the iSCSI target should be greater than 2GB. Otherwise, it cannot be used as the AhsayUBS storage.

1. Go to the page [Storage] > [iSCSI]
2. Click the '+' icon.
3. Enter the required information inside the [iSCSI] TABLE.
4. Click the [Add] button.
5. An [iSCSI] initiator session is now enabled. The connected iSCSI disk is now ready to be added as Additional Storage for this AhsayUBS. Please refer to the section [Create Additional Storage] for details.

Note: If the iSCSI initiator session remains for a "Connecting..." state for a long time, incorrect connection information may have been used or the iSCSI target host/service could be down. You may destroy this entry and try again.

Storage > iSCSI					
Target address	Target name	Initiator name	Comment	Connected	Enable / Disable
10.10.0.45	iqn.2007-09.jp.ne.peach.istgt:test0	iqn.2007-09.jp.ne.peach.istgt:test0	test0	Yes	Mounted
10.10.0.45	iqn.2007-09.jp.ne.peach.istgt:test1	iqn.2007-09.jp.ne.peach.istgt:test1	test1	Yes	Mounted
10.10.0.45	iqn.2007-09.jp.ne.peach.istgt:test2	iqn.2007-09.jp.ne.peach.istgt:test2	test2	Yes	Mounted
10.10.0.46	iqn.2007-09.jp.ne.peach.istgt:test0	iqn.2007-09.jp.ne.peach.istgt:test0	test0	Yes	Mounted
10.10.0.46	iqn.2007-09.jp.ne.peach.istgt:test1	iqn.2007-09.jp.ne.peach.istgt:test1	test1	Yes	Mounted

8.4.3.4 Edit the configuration of an iSCSI entry

Note:

The corresponding Additional Storage should be *exported* or *removed* before proceeding.

Note that *removing* the Additional Storage will erase all the data in the storage.

For steps **to export an Additional Storage**, please refer to the section [Export and Import Addition Storage].

For steps **to remove an Additional Storage**, please refer to the section [Remove Additional Storage].

Please follow the steps below to change the configuration of an iSCSI initiator entry:

1. Go to the page [Storage] > [iSCSI]
2. Look for the iSCSI initiator entry that is going to be edited.
3. Click the icon .
4. Edit the fields under the [iSCSI] table. (Only the [Initiator name] and the [Comment] can be edited).
5. Click the [Save] button to save the changes.

Information	System	Network	Storage	Backup Server
Storage > iSCSI > Edit				
iSCSI				
Target address	<input type="text" value="10.3.0.98"/> The IP address or DNS name of the iSCSI target.			
Target name	<input type="text" value="iqn.2004-04.com.ubsdisk00:iscsi.ubsdisk00"/> The format should be in "iqn.<yyyy-mm>.<reversed domain name>:<identifier>". example: iqn.1994-04.org.netbsd.iscsi-target:target0.			
Initiator name	<input type="text" value="iqn.2004-04.com.ubsdisk00:iscsi.ubsdisk00"/> The format should be in "iqn.<yyyy-mm>.<reversed domain name>:<identifier>". example: iqn.2005-01.il.ac.huji.cs:somebody.			
Port	<input type="text" value="3260"/> The target port of the iSCSI initiator. Default port is "3260".			
Comment	<input type="text" value="ubsdisk00"/> The description of this entry.			
<input type="button" value="Save"/>				

8.4.3.5 Disable an iSCSI initiator entry

Note:

1. The corresponding modular / expandable storage should be exported, or Optional Storage should be unmounted before disabling any iSCSI initiator session. **The Additional Storage removal will result in destruction of all the data on the storage volume.**

For steps to export an Additional Storage, please refer to the section [Export and Import Addition Storage].

For steps to remove an additional storage, please refer to the section [Remove Additional Storage].

2. The corresponding Additional Storage should not be DELETED after disabling the iSCSI initiator entry. Otherwise, the data inside the Additional Storage may not be re-accessible again by this AhsayUBS after re-enabling this iSCSI initiator session.

Please follow the instructions below to disable an iSCSI initiator entry:

1. Go to the page [Storage] > [iSCSI]
2. Look for the iSCSI initiator entry that going to be disabled.
3. Click the [Disable] button.
4. The iSCSI initiator entry now disabled successfully.

8.4.3.6 Enable an iSCSI initiator entry

Please follow the steps below to enable an iSCSI initiator entry:

1. Go to the page [Storage] > [iSCSI]
2. Look for the iSCSI Initiator entry that going to be enabled.
3. Click the [Enable] button.
4. The iSCSI initiator session has been created successfully.
5. (Optional) The corresponding Additional Storage can be imported again to use. For details, please refer to the section [Export and Import Additional Storage].

8.4.3.7 Destroy an iSCSI initiator entry

WARNING: Please ensure that all the data in the iSCSI initiator will be erased after it is destroyed.

Please follow the steps below to destroy an iSCSI initiator entry:

1. Go to the page [Storage] > [iSCSI]
2. Look for the iSCSI initiator entry that going to deleted.
3. Click the icon .
4. The iSCSI initiator entry is destroyed successfully.

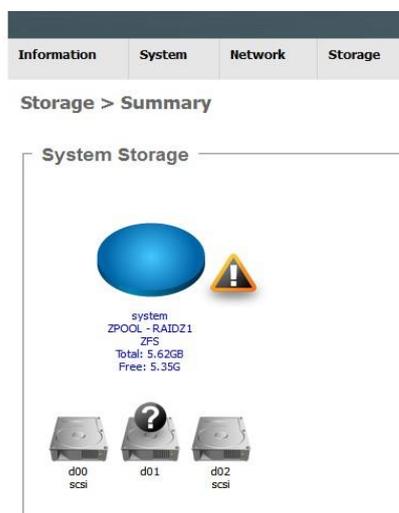
8.4.4 Troubleshooting

WARNING: On AhsayUBS systems using a software RAID setup, for example a four disk software RAID Z configuration. When a failure occurs on a disk located in slot 1. It is required to shift the rest of the disks in slots 2, 3, and 4 to the position 1, 2 and 3. Otherwise AhsayUBS will not be able to boot up properly until the disk in slot 1 is replaced and the software RAID is rebuilt.

8.4.4.1 Rebuild Degraded Storage

When one or more block devices have degraded in a volume, the volume can be rebuilt for recovery. The AhsayUBS administrator can get the latest status of the storage volumes by viewing the page [Storage] > [Summary].

The following example shows the System Storage is degraded:



The volume is degraded when the '⚠️' icon is shown next to the volume.

WARNING: The data inside the rebuilt local block device will be DESTROYED and CANNOT BE RECOVERED.

Notes:

The provider which has been used by other AhsayUBS before will not be listed as an empty block device. It should be *zero out* before putting it into this AhsayUBS.

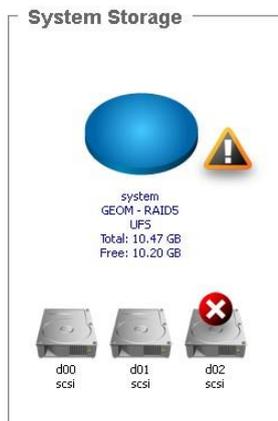
Only two kinds of degraded storage are supported for rebuilding their volume:

1. System Storage
2. (Additional) Modular Storage

Rebuild the System Storage

To rebuild the volume for [System Storage]:

1. Go to the page [Storage] > [Summary].
2. Note down the volume and block device which are degraded.



Storage > Summary > Block Device Information



Volume ID	system
Device ID	d02
Device Name	da5
Device Path	/dev/da5
Device Type	scsi
Device Size	8.00 GB
Model Family	1.0
Model Name	Virtual disk 1.0

Note: To locate any missing or degraded block devices in AhsayUBS, please refer to [Appendix J – Identifying Physical Local Block Devices on AhsayUBS] for details.

3. Shutdown the AhsayUBS in AhsayUBS WebAdmin.
4. Replace the block device with a healthy one.
5. Power on the AhsayUBS.
6. After the AhsayUBS is booted, login to the AhsayUBS WebAdmin again.
7. Go to the page [Storage] > [Summary].
8. Inside the degrade storage entry, click the storage icon 

9. Select a block device for rebuilt the volume.

Information System Network Storage Backup Server

Storage > Summary > Block Device Information



Volume ID	system
Device ID	d01
Device Name	Missing

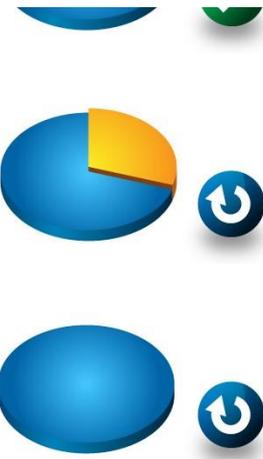
Rebuild RAID

Select a block device from the list

da 1 [4.00 GB] [1.0] Virtual disk 1.0	Rebuild
da 1 [4.00 GB] [1.0] Virtual disk 1.0	
da 10 [10.00 GB] [1.0] Virtual disk 1.0	
da 11 [10.00 GB] [1.0] Virtual disk 1.0	
da 12 [10.00 GB] [1.0] Virtual disk 1.0	

Back

10. Click the button [Rebuild] to start the rebuild volume process.
11. Warning message will be shown in the alert box. Read it CAREFULLY before proceeds. Click [OK] button to continue the rebuild process. Click [Cancel] to return to the page.
12. After the rebuilding process is started, the page will be redirected to the [Storage] > [Summary] > [RAID Information] page. A dialog will be popped up to shown that the rebuild process is started successfully. Click [OK] button after reading the message.
13. When the block device in the volume is synchronizing, the rebuild icon '🔄' will be shown in the volume like this:



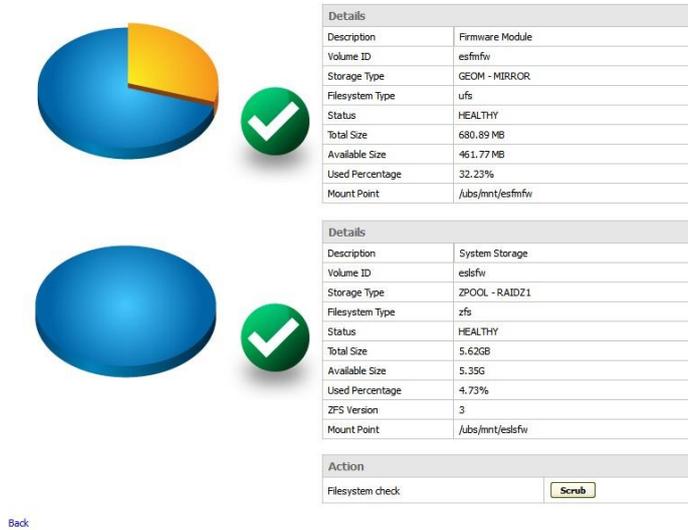
Available Size	108.42 MB
Used Percentage	36.57%
Mount Point	/ubs/mnt/esosfiv

Details	
Description	Firmware Module
Volume ID	esfmfv
Storage Type	GEOM - MIRROR
Filesystem Type	ufs
Status	REBUILDING 39%
Total Size	680.89 MB
Available Size	461.77 MB
Used Percentage	32.23%
Mount Point	/ubs/mnt/esfmfv

Details	
Description	System Storage
Volume ID	eslsfv
Storage Type	ZPOOL - RAIDZ1
Filesystem Type	zfs
Status	REBUILDING 59.25% 0h0m
Total Size	5.62GB
Available Size	5.35G
Used Percentage	4.73%
ZFS Version	3
Mount Point	/ubs/mnt/eslsfv

Back

The healthy icon '  ', will be shown again beyond the volume when the volume is synchronized completely.



The screenshot displays two storage volumes. The top volume is a pie chart with a yellow slice, and the bottom volume is a solid blue sphere. Both are accompanied by a green checkmark icon. Below each volume is a 'Details' table.

Details	
Description	Firmware Module
Volume ID	esfmfw
Storage Type	GEOM - MIRROR
Filesystem Type	ufs
Status	HEALTHY
Total Size	680.89 MB
Available Size	461.77 MB
Used Percentage	32.23%
Mount Point	/ubs/mnt/esfmfw

Details	
Description	System Storage
Volume ID	eslsfw
Storage Type	ZPOOL - RAIDZ1
Filesystem Type	zfs
Status	HEALTHY
Total Size	5.62GB
Available Size	5.35G
Used Percentage	4.73%
ZFS Version	3
Mount Point	/ubs/mnt/eslsfw

Below the second table is an 'Action' section with a 'Filesystem check' label and a 'Scrub' button.

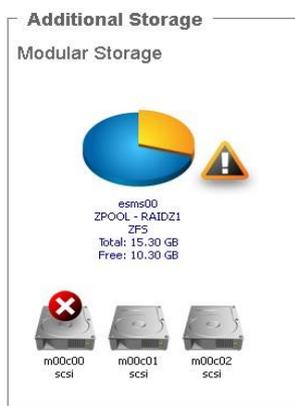
Back

The block device missing icon '  ', will be replaced by the block device healthy icon '  ', since the block device is replaced and it is not missing now.

Rebuild the Modular Storage

To rebuild the volume for [Modular Storage]:

1. Go to the page [Storage] > [Summary].
2. Jot down the volume and block device which are degraded.



Storage > Summary > Block Device Information



Volume ID	esms00
Device ID	m00c00
Device Name	da0
Device Path	/dev/da0
Device Type	scsi
Device Size	8.00 GB
Model Family	1.0
Model Name	Virtual disk 1.0

[Back](#)

For the method to look for the missing or degraded block devices in AhsayUBS, please refer to the [Appendix J – Identifying Physical Local Block Devices on AhsayUBS] for details.

3. Shutdown the AhsayUBS in AhsayUBS WebAdmin.
4. Replace the block device with a healthy one.
5. Power on the AhsayUBS.
6. After the AhsayUBS is booted, login to the AhsayUBS WebAdmin again.
7. Go to the page [Storage] > [Summary].
8. Inside the degrade storage entry, click the storage icon .

9. Select a block device for rebuilt the volume.

Storage > Summary > Block Device Information

Volume ID	esms00
Device ID	m00c00
Device Name	Missing

Rebuild RAID

Select a block device from the list

da0 [8.00 GB] [1.0] Virtual disk 1.0

da0 [8.00 GB] [1.0] Virtual disk 1.0

Rebuild

Back

- Click the button [Rebuild] to start the rebuild volume process.
- Warning message will be shown in the alert box. **Read it CAREFULLY before proceeds.** Click [OK] button to continue the rebuild process. Click [Cancel] to return to the page.
- After the rebuilding process is started, the page will be redirected to the [Storage] > [Summary] > [RAID Information] page. A dialog will be popped up to shown that the rebuild process is started successfully. Click [OK] button after reading the message.
- When the block device in the volume is synchronizing, the rebuild icon '🔄' will be shown in the volume like this:

Additional Storage

Modular Storage

esms00
ZPOOL - RAIDZ1
ZFS
Rebuilding (13.02% 0h3m)
Total: 15.30 GB
Free: 10.30 GB

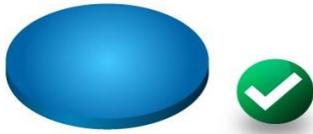
m00c00 scsi

m00c01 scsi

m00c02 scsi

The healthy icon '✓' will be shown again beyond the volume when the volume is synchronized completely.

Storage > Summary > RAID Information



Details	
Description	Modular Storage
Volume ID	esms00
Storage Type	ZPOOL - RAIDZ1
Filesystem Type	zfs
Status	ONLINE
Total Size	7.63 GB
Available Size	7.63 GB
Used Size	91.50 KB
Used Percentage	0.00%
ZFS Version	3
Mount Point	/jubs/mnt/esms00

Action	
Unmount Volume	<input type="button" value="Unmount"/>
Filesystem check	<input type="button" value="Scrub"/>

Back

The block device missing icon '⚠' will be replaced by the block device healthy icon '✓' since the block device is replaced and it is not missing now.

Additional Storage

Modular Storage

esms00
ZPOOL - RAIDZ1
ZFS
Total: 7.63 GB
Free: 7.63 GB

m00c00
scsi

m00c01
scsi

8.4.4.2 Additional Storage(s) in Disconnected State



The Additional Storage DISCONNECTED state will only appear in the volume which is created on a remote disk (i.e. iSCSI initiator session). This states that the Additional Storage corresponding remote disk provider (i.e. iSCSI initiator session) is disconnected from the AhsayUBS.

In order to identify disconnected Additional Storage, an additional schedule job has been added to AhsayUBS. When any Additional Storage has been detected in disconnected state, the following actions will be taken in order to prevent further loss of data:

- ▶ Service stop and prohibit the service start of the following services:
 - ◉ AhsayCBS
 - ◉ Share AhsayCBS
- ▶ The enabled Additional Storage volumes will remain mounted. The system will wait for iSCSI initiator reconnection. In case the iSCSI initiator exits due to session timeout, AhsayUBS administrator may create another iSCSI initiator sessions by the 'Retry' button at page "Storage > iSCSI".
- ▶ Email will be sent to AhsayUBS administrator (The 'To email' defined in the AhsayUBS 'General email setting').

At this stage,

- ▶ the corresponding remote disk's (i.e. the iSCSI initiator session) network connection to this UBS machine is lost.
- ▶ though the corresponding Additional Storage is still mounted, the data in this volume cannot be accessed nor written anything to the storage.

To fix the problem, login the AhsayUBS WebAdmin

- ▶ Alert dialog contains the disconnected Additional Storage and their corresponding iSCSI initiator information will be shown after AhsayUBS WebAdmin login.
- ▶ The loss of iSCSI connection may result from network connectivity issue. Try to use “[Network] > [Ping / Traceroute]” tool to test if the iSCSI target host is reachable. After resolving the network issue, the iSCSI target host will be reconnected with AhsayUBS machine and the data in the Additional Storage can be accessed again.
- ▶ After resolving the Additional Storage disconnection issue, service start will be allowed for the following services. Please refer to the section [Backup Server] for details.
 - ◉ AhsayCBS
 - ◉ Share AhsayCBS

8.4.5 Additional User Storage Migration

8.4.5.1 Introduction

AhsayUBS additional user storage migration is performed using a UNIX shell script. The migration process only supports additional user storage volumes, the system storage (firmware) volume, i.e. FreeBSD and AhsayCBS binaries are not supported. After a successful migration, the data on the file system can be used by the AhsayCBS service on the new AhsayUBS server.

Supported Hard Disk Interfaces:

- ▶ Local: IDE, SCSI, SATA, Hardware RAID
- ▶ Foreign: iSCSI

Supported Additional Storage Types:

The storage migration script only supports the migration of Additional Storage with only one provider (single hard disk). The storage volume to be migrated must in a healthy state. The support storage types include:

- ▶ Optional Storage (GPT Partition 6 with UFS)
- ▶ Expandable Storage (No Partition with ZPOOL on entire disk)
- ▶ Modular Storage with CLOG only (GPT Partition 7 with ZFS)
- ▶ Modular Storage with CLOG & SLOG (GPT Partition 11 / 13 with ZFS)

WARNING:

1. AhsayUBS System Storage (*esosfw*, and *es/sfw*) is NOT supported by the storage migration shell script.
2. After volume migration, the original storage label in the migrated storage volume will be updated. The previous AhsayUBS installation will no longer be able to use the migrated storage volume.
3. Since the *profile.ini* file (*/ubs/conf/profile.ini*) will be updated by this shell script. DO NOT perform any *add* or *remove* storage operations via the AhsayUBS webadmin console when the volume is migration is in progress.

8.4.5.2 Storage Migration Procedure

Assumptions

1. The volume to be migrated is in a healthy state.
2. There are no disk errors prior to migration.
3. SSH is enabled on AhsayUBS

To perform a migration of an existing Additional Storage volume to a new AhsayUBS server:

1. Connect ONE hard disk containing foreign storage volume to the new AhsayUBS machine.

For local hard disk:

- i. Shutdown the old AhsayUBS machine.
- ii. Remove the specific hard disk from the old AhsayUBS machine.
- iii. Shutdown the new AhsayUBS machine.
- iv. Connect the hard disk to the new AhsayUBS machine.
- v. Power on the new AhsayUBS machine.

Note:

- If the additional user volume is created on a hardware RAID, then the RAID card along with all the hard drives which make up the RAID logical volume must be installed onto the new AhsayUBS server.
- After connecting the RAID logical volume on the new AhsayUBS machine, please ensure the logical volume can be detected on the RAID card BIOS.

For iSCSI hard disk:

- i. Login to the old AhsayUBS machine webadmin console.
- ii. Umount specific iSCSI volume.
- iii. Disconnect the iSCSI hard disk from the old AhsayUBS machine.
- iv. Power on the new AhsayUBS machine.
- v. Create a new iSCSI session in the AhsayUBS webadmin to connect the iSCSI hard disk.

2. Login AhsayUBS via SSH.
3. Enter the following command to start the migration the Additional Storages:

```
#sh /ubs/bin/migrate-storage-single-disk.sh
```

The shell script will begin the process of 'discovering' any connected foreign user storage volumes. Once the user storage volume 'discovery' has completed, the storage volumes eligible for migration will be listed.

```
ahsayubs:/ubs/bin# sh migrate-storage-single-disk.sh
Loading UBS Framework information, please wait..

The following storage entries have been found available for migration:
1 : 76E7AAE1xesms00 [ad4]

Please select either one (1 - 1) : █
```

Choose from the listed storage entries and input the entry number. The shell script will then prompt to confirm before starting the storage migration. Enter 'y' to confirm and start the storage migration.

```
ahsayubs:/ubs/bin# sh migrate-storage-single-disk.sh
Loading UBS Framework information, please wait..

The following storage entries have been found available for migration:
1 : 76E7AAE1xesms00 [ad4]

Please select either one (1 - 1) : 1

Confirm you want to migrate [76E7AAE1xesms00] from [ad4] as [esms00]? (y/n) █
```

After confirming the volume to be migrated, the script will proceed with the migration process. The storage migration result will be shown when the process is completed.

```
ahsayubs:/ubs/bin# sh migrate-storage-single-disk.sh
Loading UBS Framework information, please wait..

The following storage entries have been found available for migration:
1 : 76E7AAE1xesms00 [ad4]

Please select either one (1 - 1) : 1

Confirm you want to migrate [76E7AAE1xesms00] from [ad4] as [esms00]? (y/n) y

Start migrating modular storage [76E7AAE1xesms00] to [873391A2xesms00]
ad4p11 labeled
ad4p13 labeled
Completed migrating modular storage [76E7AAE1xesms00] to [873391A2xesms00]
Successfully updated the profile.ini file on the current system!!!
ahsayubs:/ubs/bin# █
```

After completion AhsayUBS will automatically mount the migrated volume.

4. When the storage migration process is completed, please login to AhsayUBS WebAdmin. Go to the [Storage] > [Summary] page to check if the migrated storage is mounted.
5. The migrated storage volume is ready for use. Please update the new User Home path in AhsayCBS web console.

8.5 Backup Server

When the mouse point is pointed over the wordings [Backup Server] in the menu bar, the menu will be shown as below:



8.5.1 Server Status

The page [**Backup Server**] > [**Server Status**] allows you to start and stop the AhsayCBS. It will show a table named [Online Backup Server and Replication Server] which includes the information of AhsayCBS in the AhsayUBS.

Here are the information and settings provided in the table:

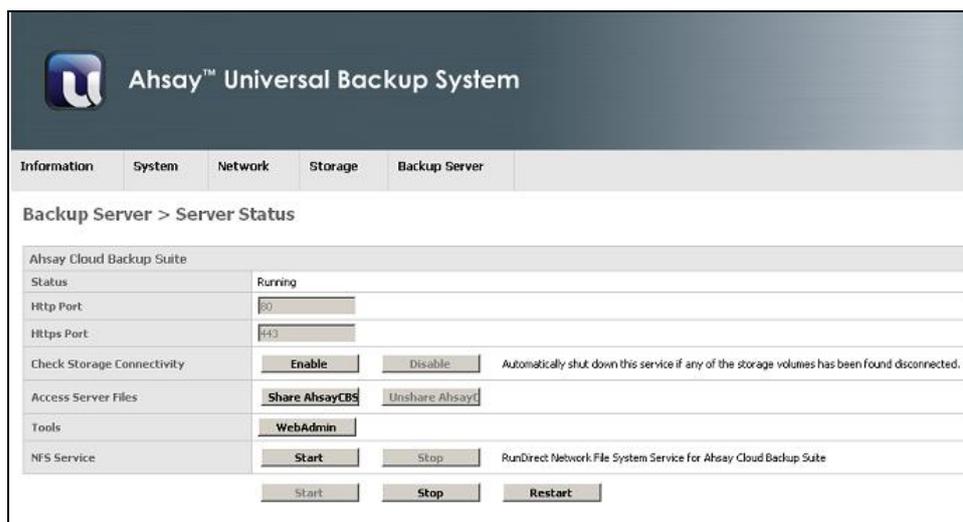
- **Status:** Show the service status of the AhsayCBS in this AhsayUBS.
- **HTTP Port:** The HTTP port used by the AhsayCBS. Default is 80. *1
- **HTTPS Port:** The HTTPS port used by the AhsayCBS. Default is 443. *1
- **Check Storage Connectivity:** The UBS system have included a schedule check on storage connectivity. Upon any disconnected storage scenario, it will shutdown the "AhsayCBS" and "Share AhsayCBS" if this option is enabled.
- **Access Server Files:** For admin to access the System and User Home in the AhsayUBS from their desktop machine. Please follow these steps to access the OBSR_HOME.
 - Click the [Share AhsayCBS] button
 - Connect to the shared SAMBA directory.
 - (For WINDOWS and MAC OS only) Type the "admin" credentials used in the AhsayUBS WebAdmin.
 - Now you can access the AhsayCBS Home. (NIX: Please access the AhsayCBS home in the directory, */mnt/obsr*).
 - For security, Enablement should be limited for temporary use, and disabled after use.

- **Tools (Only shown when AhsayCBS is started):** Click the [WebAdmin] button to open a new window for accessing the AhsayCBS in the AhsayUBS.

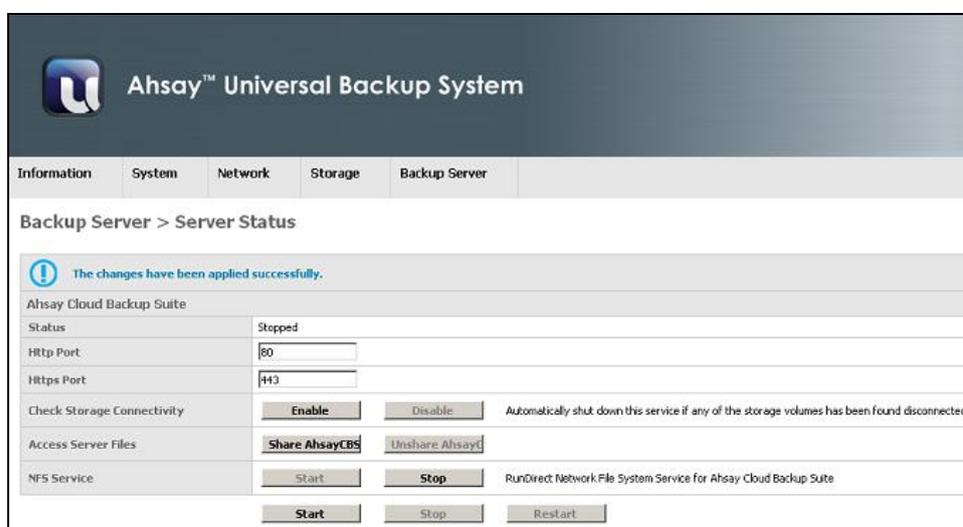
Note: Please do not set the port to the server port from "9-1023" except port 80 and port 443. Please check the default configuration from [chapter 7.3](#).

To Start/Stop/Restart AhsayCBS in this AhsayUBS System, please click the [Start] / [Stop] / [Restart] button.

The following is the screen capture when the AhsayCBS is started.



The following is the screen capture when the AhsayCBS is stopped.



The following is the screen capture of the failed storage dependency during service start of "AhsayCBS" or "Share AhsayCBS" service. It is caused by lost of iSCSI initiator connection of Additional Storage created on a remote disk provider (i.e. iSCSI initiator session). The failed storage dependency must be resolved before enabling these services. Please refer to the [Storage Summary] > [Troubleshooting] section for details.

Ahsay™ Universal Backup System

English

Logout

Information System Network Storage Backup Server

Backup Server > Server Status

✘ Some of the storage volumes have been found disconnected. Failed to start service.

Online Backup Server and Replication Server

Status	Stopped
Http Port	80
Https Port	443
Check Storage Connectivity	<input checked="" type="button" value="Enable"/> <input type="button" value="Disable"/> Automatically shut down this service if any of the storage volumes has been found disconnected.
Access Server Files	<input checked="" type="button" value="Share OBSR"/> <input type="button" value="Unshare OBSR"/>

8.5.2 Tape Utility

8.5.2.1 Introduction

The AhsayUBS administrator may backup selected user accounts to tape cartridge while the backup server remains online. The AhsayCBS user account data can be restored to the AhsayUBS server either to the original or an alternate location. The tape backup/restore operation is managed from the AhsayUBS webadmin console.

'User Home' setting in the Backup Server

For AhsayCBS that stores all user accounts locally under the 'User Home' directories. When a new user account is being created, AhsayCBS will create a directory with the user's login name under the assigned 'User Home' path. The created user directory is used for storing user configuration and backup files. The list of user names can also be found from the AhsayCBS WebAdmin.

Tape Device and Tape Standards

FreeBSD provides full support for SCSI-I, SCSI-II and SCSI-III tape drives. As AhsayUBS is built on top of the FreeBSD operating system, SCSI tape drives are therefore supported. The 'sa - SCSI Sequential Access device drive' will be used for accessing the tape device.

Note: Tape libraries and tape changers are NOT supported by AhsayUBS.

The following tape drive standards are supported by FreeBSD. Each tape standard has its own maximum data capacity and transfer rate. For each hardware type and supported tape standard, the cost of the tape drive and tape cartridge varies.

1. DAT - Digital Audio Tape (format: DDS - Digital Data Storage)
2. DLT - Digital Linear Tape (halted development since 2007)

3. LTO - Linear Tape Open

Tape Format	Release Date	Tape Drive Type	Media Type (R/W)	Native Capacity (GB)	Transfer Rate (MB/s)
DAT (DDS)	2007	DAT 160	DAT 160	80	6.9
	2009	DAT 320	DAT 320	160	12
DLT – value line	2001	DLT VS80	DLT IV	40	3
	2003	DLT VS160	VS1	80	8
	2005	DLT-V4	VS1	150-160	9-11
DLT – performance line	2002	SDLT 320	SDLT I	160	16
	2004	SDLT 600	SDLT II	300	36
	2006	DLT-S4	S4	800	60
LTO	2000	LTO-1	LTO-1	100	20
	2003	LTO-2	LTO-2, LTO-1	200	40
	2005	LTO-3	LTO-3, LTO-2	400	80
	2007	LTO-4	LTO-3, LTO-4	800	120
	2010	LTO-5	LTO-5, LTO-4	1500	140
	2012	LTO-6	LTO-6, LTO-5	2500	160

Before purchasing a tape drive, please consult your hardware vendor to confirm compatibility of the device with the FreeBSD 11.2 operating system.

The following factors should also be considered:

1. Compatible hardware interfaces with the AhsayUBS machine for connecting tape drive.
2. Tape cartridge capacity for storing user data.
3. Tape transfer rate.

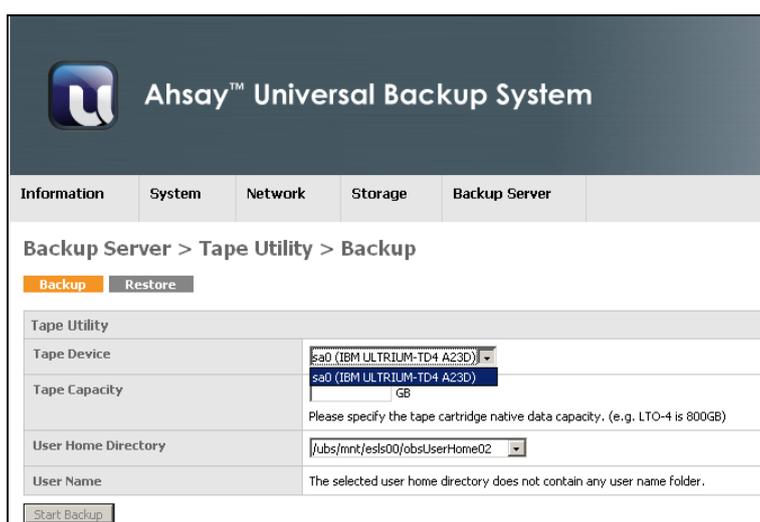
Note: Tape backup/restore on AhsayUBS has been developed and tested using a DELL PowerVault LTO-4 tape drive, connected to a DELL 6GB HBA SAS controller using 800GB LTO-4 tape cartridges.

Tape Backup/Restore Process via the AhsayUBS WebAdmin

An AhsayUBS administrator may backup/restore User Home data to/from tape cartridges via the AhsayUBS webadmin console [Backup Server] > [Tape Utility] menu option.

Before using the [Tape Utility] option, the tape device must be:

1. Connected with the AhsayUBS server.
2. The tape device must be powered on.
3. AhsayUBS must be able to detect the tape hardware. The identified tape device will be shown in the [Backup Server] > [Tape Utility] > [Tape Device] (As shown in the following example).



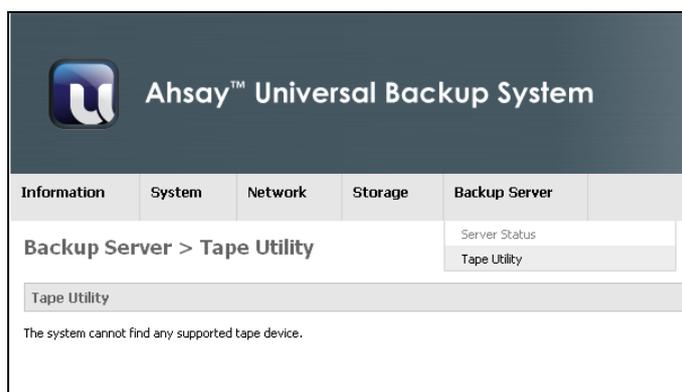
The screenshot shows the Ahsay Universal Backup System webadmin console. The breadcrumb navigation is "Backup Server > Tape Utility > Backup". There are two tabs: "Backup" (selected) and "Restore". The "Tape Utility" section contains the following fields:

- Tape Device:** A dropdown menu showing "sa0 (IBM ULTRIUM-TD4 A23D)".
- Tape Capacity:** A text input field with "GB" entered. Below it is a note: "Please specify the tape cartridge native data capacity. (e.g. LTO-4 is 800GB)".
- User Home Directory:** A dropdown menu showing "/ubs/mnt/esls00/obsUserHome02". Below it is a note: "The selected user home directory does not contain any user name folder."

At the bottom left, there is a "Start Backup" button.

In most cases, a single tape cartridge will not be sufficient to store all the data on a User Home volume. During a backup operation if the current tape cartridge is full, AhsayUBS will prompt for a new tape cartridge to be inserted into the tape drive. For tape restore operations if the data spans more than one tape cartridge, AhsayUBS will prompt for the insertion of the next tape cartridge.

If a tape device is not supported or no tape drive is installed on the AhsayUBS machine, the AhsayUBS webadmin [Backup Server] > [Tape Utility] menu option will be disabled, the following message **"The system cannot find any supported tape device."** (As shown in the following example).



Notes:

1. Please ensure the tape is rewind before use.
2. Tape cartridges must be managed, handled, and stored properly. Proper care by trained staff is important to prevent inadvertent errors and media damage.
3. Only ONE tape backup/restore process can be started at a time.
4. Only ONE tape cartridge can be used for tape backup/restore process at a time. Therefore, manual tape cartridge replacement is required when the current tape cartridge full.
5. Only ONE AhsayCBS 'User Home' path can be selected for backup at a time.
6. Only CONSECUTIVE tape cartridge can be used for restore.
7. Any corrupted or damaged intermediate tape cartridge(s) will result in the failure of the entire tape restore process.
8. The AhsayCBS service MUST BE stopped prior to a tape restore, if restoring to an existing AhsayCBS 'User Home' path.

Tape Backup Process

The screenshot shows the Ahsay Universal Backup System webadmin console. The breadcrumb navigation is 'Backup Server > Tape Utility > Backup'. There are two tabs: 'Backup' (active) and 'Restore'. The 'Tape Utility' section contains the following fields:

- Tape Device:** sa0 (IBM ULTRIUM-TD4 A23D)
- Tape Capacity:** 800 GB. Below the input field, it says: 'Please specify the tape cartridge native data capacity. (e.g. LTO-4 is 800GB)'
- User Home Directory:** /ubs/mnt/esdfw/obsUserHome01
- User Name:**
 - obm.user.04
 - obm.user.05
 - obm.user.06

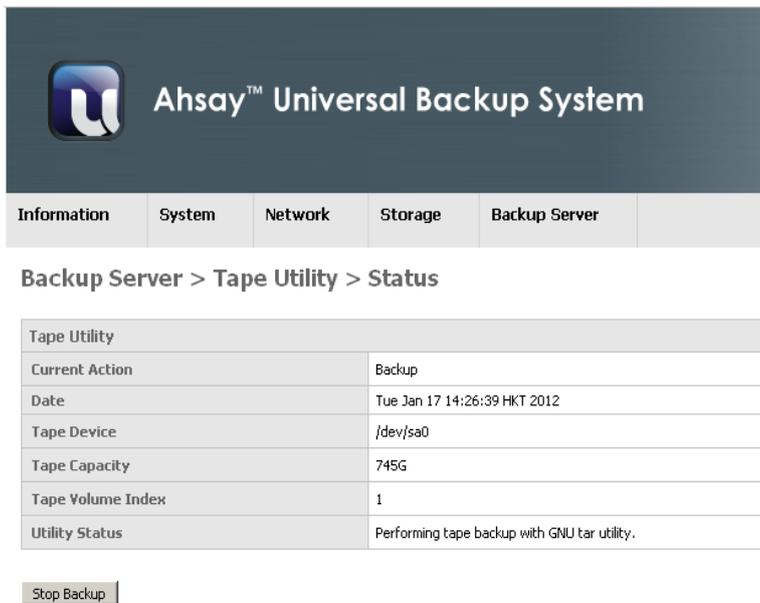
At the bottom left of the form is a 'Start Backup' button.

(Example: tape backup using 800GB LTO-4 tape cartridge)

WARNING: All the data on the tape cartridge(s) will be erased after the tape backup process is started.

1. Login to the AhsayUBS webadmin console.
2. Go to the [Backup Server] > [Tape Utility] > [Backup] page.
3. Select the [Tape Device] to be used for the tape backup process.
4. Insert a new tape cartridge to the tape device.
5. Enter the tape cartridge capacity in GB. (As stated on the tape cartridge)
The tape cartridge capacity is used for marking the end of a volume.
6. Select an AhsayCBS User Home path from the drop-down list.
7. Choose AhsayCBS user names selectively or select all AhsayCBS user names for backup.

8. Click the [Start Backup] button to start the tape backup process. When the tape backup process is started, you will be redirected to the [Backup Server] > [Tape Utility] > [Status] page.



The screenshot shows the Ahsay Universal Backup System interface. At the top, there is a navigation bar with the following tabs: Information, System, Network, Storage, Backup Server, and a partially visible tab. Below the navigation bar, the breadcrumb path is displayed as "Backup Server > Tape Utility > Status".

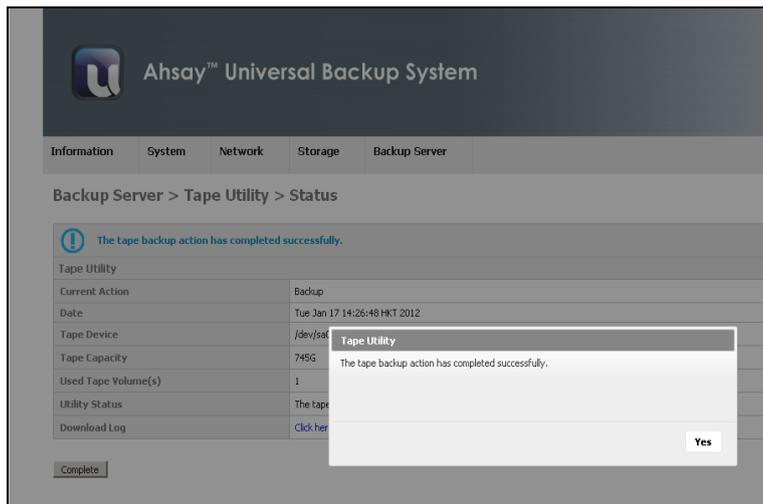
Tape Utility	
Current Action	Backup
Date	Tue Jan 17 14:26:39 HKT 2012
Tape Device	/dev/sa0
Tape Capacity	745G
Tape Volume Index	1
Utility Status	Performing tape backup with GNU tar utility.

Below the table, there is a button labeled "Stop Backup".

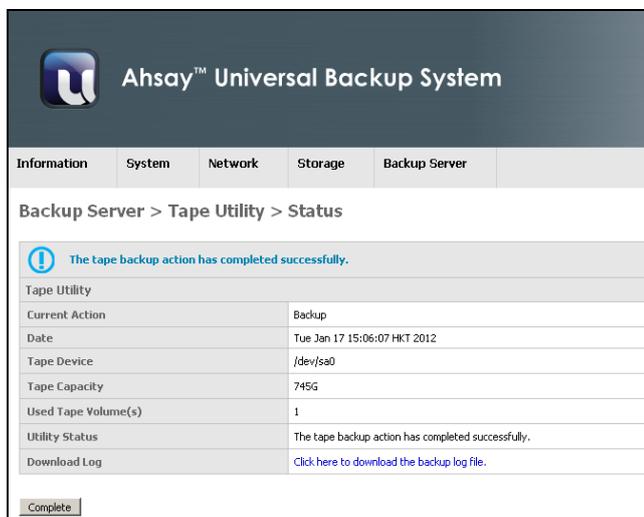
Note: A tape backup job can be stopped at anytime by pressing the [Stop Backup] button.

9. The tape backup process can be monitored from the [Backup Server] > [Tape Utility] > [Status] page.
10. When the backup tape cartridge reaches its volume size limit, a [Continue] button will be shown in the [Backup Server] > [Tape Utility] > [Status] page.
11. Eject the existing tape cartridge from the AhsayUBS server and insert a new tape cartridge.
12. Click the [Continue] button on the [Backup Server] > [Tape Utility] > [Status] page.
13. The tape backup process will continue if there are no errors after the new tape cartridge is inserted. The tape backup process will not continue if an already used tape is inserted.

14. Repeat step 9 – 13.



15. When the tape backup process is either completed. Press the "Yes" button to continue.



16. Download the log files from Tape Utility status page (if required)
17. Click the [Complete] button to start another Tape Backup/Restore Process.

Note: After pressing the [Complete] button the tape backup/restore logs will be cleared.

Tape Restore Process

The screenshot shows the Ahsay Universal Backup System web interface. At the top, there is a navigation menu with tabs for Information, System, Network, Storage, and Backup Server. Below the navigation, the breadcrumb path is 'Backup Server > Tape Utility > Restore'. There are two tabs: 'Backup' and 'Restore', with 'Restore' being the active tab. The main form area is titled 'Tape Utility' and contains the following fields:

- Tape Device:** A dropdown menu showing 'sa0 (IBM ULTRIUM-TD4 A23D)'.
- Restore Path:** Radio buttons for 'User Home Directory' (selected) and 'Alternative Path'. Below the radio buttons is a dropdown menu showing '/ubs/mnt/esls00/obsUserHome02'.
- Restore Option:** A checkbox labeled 'Remove directory content before restore', which is currently unchecked.

At the bottom of the form, there is a 'Start Restore' button.

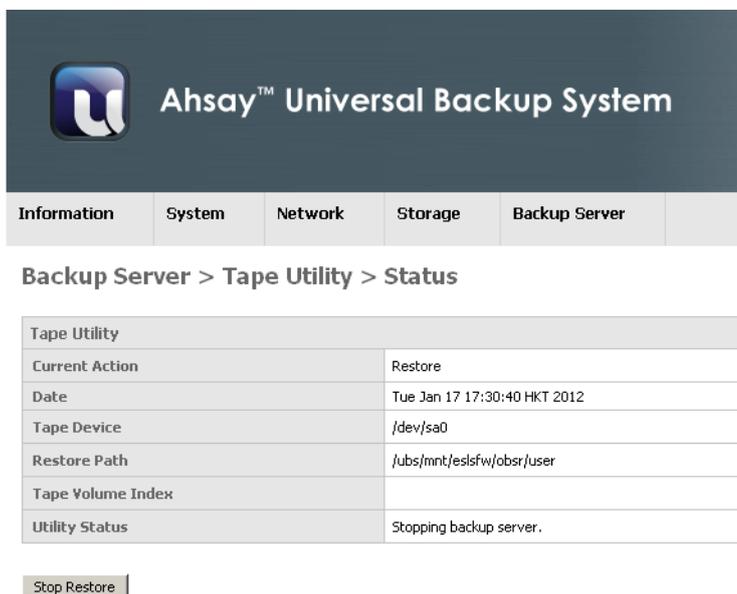
WARNING:

1. The data in the restore path will be erased or replaced by the data in the tape cartridge(s). Please ensure that the data in the restored directory path can be overwritten.
2. Before proceeding with a tape restore to "User Home Directory", it is strongly recommended to stop the AhsayCBS service.

1. Login to the AhsayUBS webadmin console.
2. Go to the page [Backup Server] > [Tape Utility] > [Restore].
3. Select the [Tape Device] to be used for the tape restore process.
4. Insert the first volume of the tape cartridge restore set into the tape device.
5. Select an AhsayCBS User Home path from the drop-down list or input an alternative restore path.
6. If you want to clean up the restore path, check the 'Remove the directory contents before restore' checkbox. **Use with caution.**

7. Click the [Start Restore] button to start the tape restore process. When the tape restore process is started, you will be redirected to the [Backup Server] > [Tape Utility] > [Status] page.

Note: If the AhsayCBS service is still running and restore to "User Home Directory" option is selected. The AhsayCBS service will be stopped before the restore process is initiated. During this stage the [Backup Server] > [Tape Utility] > [Status] will be "Stopping backup server". After the tape restore has completed the AhsayCBS service will be automatically restarted again.



The screenshot shows the Ahsay Universal Backup System interface. At the top, there is a navigation bar with tabs for Information, System, Network, Storage, and Backup Server. Below the navigation bar, the breadcrumb path is "Backup Server > Tape Utility > Status". A table displays the following information:

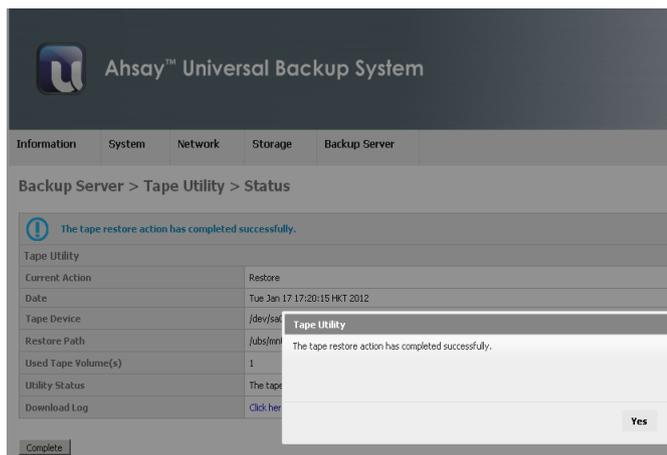
Tape Utility	
Current Action	Restore
Date	Tue Jan 17 17:30:40 HKT 2012
Tape Device	/dev/sa0
Restore Path	/ubs/mnt/eslsfw/obsr/user
Tape Volume Index	
Utility Status	Stopping backup server.

Below the table, there is a button labeled "Stop Restore".

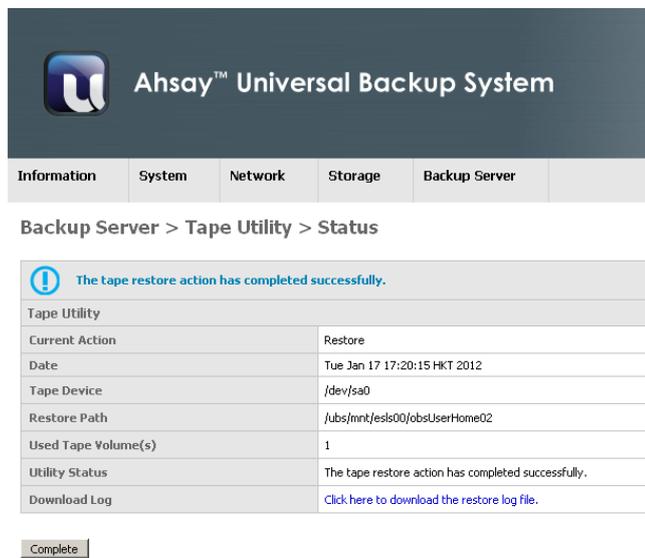
Note: A tape restore job can be stopped at anytime by pressing the [Stop Restore] button.

8. The tape restore process can be monitored from the [Backup Server] > [Tape Utility] > [Status] page.
9. When the restore operation on current tape cartridge is completed, a [Continue] button will be shown in the [Backup Server] > [Tape Utility] > [Status] page.
10. Eject the existing tape cartridge and insert the next tape cartridge into the tape device.
11. Click the [Continue] button in the [Backup Server] > [Tape Utility] > [Status] page.
12. The tape restore process will continue if there are no errors after the next tape cartridge is inserted. The tape restore process will not continue if an incorrect tape cartridge is inserted.

13. Repeat step 8 – 12.



14. When a tape restore process is completed. Press the "Yes" button to continue.



15. Download the log files from the Tape Utility status page (if required).
16. Click the [Complete] button to start another Tape Backup / Restore Process.

Note: After pressing the [Complete] button the tape backup/restore logs will be cleared.

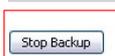
Stopping Tape Backup/Restore Job

The tape backup/restore process can be terminated at any time by pressing the [Stop Backup] or [Stop Restore] button at the bottom left corner on the AhsayUBS weadmin console [Backup Server] > [Tape Utility] > [Status] page.

Information	System	Network	Storage	Backup Server
-------------	--------	---------	---------	---------------

Backup Server > Tape Utility > Status

Tape Utility	
Current Action	Backup
Date	Wed Jan 18 03:25:40 UTC 2012
Tape Device	/dev/md10
Tape Capacity	100M
Tape Volume Index	1
Utility Status	Performing tape backup with GNU tar utility.



Information	System	Network	Storage	Backup Server
-------------	--------	---------	---------	---------------

Backup Server > Tape Utility > Status

Tape Utility	
Current Action	Restore
Date	Wed Jan 18 03:31:12 UTC 2012
Tape Device	/dev/md10
Restore Path	/ubs/mnt/eses00
Tape Volume Index	1
Utility Status	Performing tape restore with GNU tar utility.



Start another Tape Backup/Restore Process

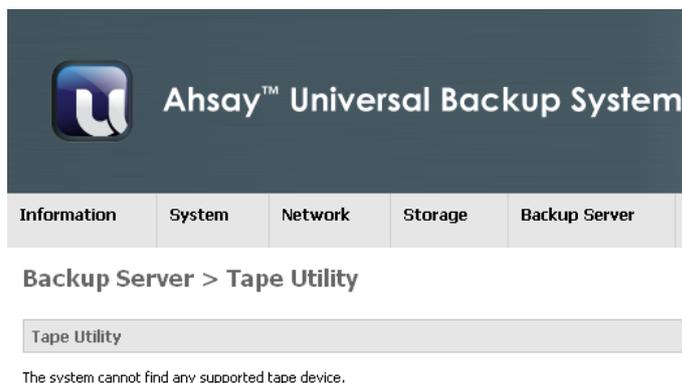
When the tape backup/restore job is completed successfully or if the job is terminated unexpectedly, a [Complete] button will be shown at the bottom left corner on the [Backup Server] > [Tape Utility] > [Status] page. The [Complete] button must be pressed in order to start another tape backup/restore Process.

Information	System	Network	Storage	Backup Server
Backup Server > Tape Utility > Status				
 The tape restore action has completed successfully.				
Tape Utility				
Current Action	Restore			
Date	Tue Jan 17 17:20:15 HKT 2012			
Tape Device	/dev/sa0			
Restore Path	/ubs/mnt/esls00/obsUserHome02			
Used Tape Volume(s)	1			
Utility Status	The tape restore action has completed successfully.			
Download Log	Click here to download the restore log file.			
<input type="button" value="Complete"/>				

Note: Once the [Complete] button is pressed the last tape backup/restore log files will be cleared.

Unsupported Tape Drive

If AhsayUBS cannot detect any tape device, i.e. the connected tape device is not shown on the [Backup Server] > [Tape Utility] backup/restore page.



Please check if the:

1. Tape device controller card is working properly.
2. Tape device is connected to the AhsayUBS hardware interface properly.
3. Tape device is powered on after it is connected to the AhsayUBS machine.

In addition, you can verify if the tape device is detected by FreeBSD.

1. Login to AhsayUBS using SSH.
2. Enter the command "camcontrol devlist". It should return the following results:

```
<TAPE_DRIVE_DEV_NAME> at scbus0 target 0 lun 0 (pass0,da0)
```

If a supported tape drive is connected to an AhsayUBS machine and powered on, a device name "sa*" will exist in the device path "/dev". The default device path for a tape device is "/dev/sa0", if the command "ls -la /dev/sa0" is entered the device will be listed.

If an installed tape device is not shown in the [Backup Server] > [Tape Utility] page and cannot be located via SSH on FreeBSD, then it may not be a supported tape device. Please contact your hardware vendor for further assistance.

Tape Cartridge Failure

If the tape cartridge spins continuously and never comes to a stop, the tape cartridge maybe damaged or inserted incorrectly. The tape cartridge should be ejected in order to prevent further damage to the tape device.

To eject the tape cartridge, use the eject button on the tape device. If it does not work, the tape cartridge can be ejected by via commandline using ssh. The following are the steps to issue the force eject command:

1. Login the AhsayUBS server via SSH.
2. Type the following command to eject the tape cartridge:

```
# mt -f "/dev/${TAPE_DEV_NAME}" offline
```

If AhsayUBS is undergoing a:

1. Multiple volume tape backup process, it can be continued by replacing with the existing cartridge with a new one. After that, you may click the [Continue] button to continue the tape backup process.
2. Multiple volume tape restore process, the tape cartridge failure may indicate the break down of restore cartridge chain. It is advised to terminate the tape restore process and seek support from the tape maintenance staff.

8.6 AhsayUBS Firmware Management Console

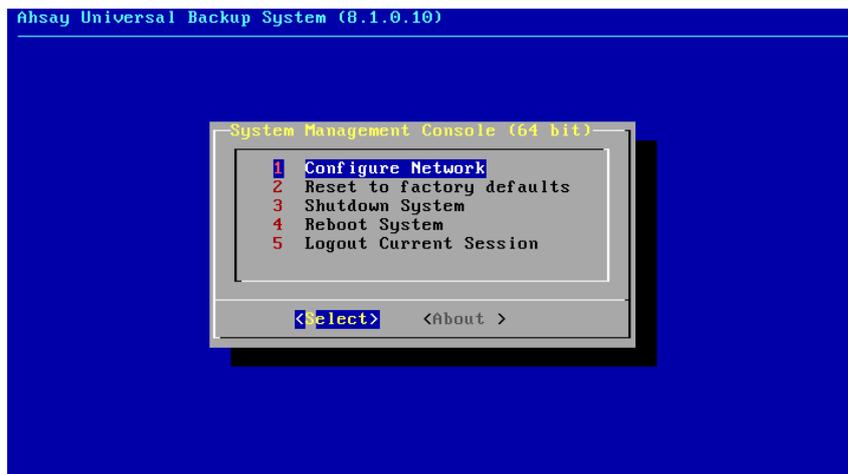
(For advanced users ONLY)

You can directly access the AhsayUBS the firmware management console by connecting your AhsayUBS server to a monitor and keyboard.

Press [Space] bar or [Shift] key to bypass the following splash screen.



The AhsayUBS Management Console menu:



Note:

Always press [Esc] to return to the main menu when the data is mistakenly entered.

8.6.1 Configure Network

After choosing this option, the following screen will appear. It will assign IP address to your AhsayUBS LAN network interface. You can set the network either with DHCP or a static IP address.



8.6.1.1 DHCP

To use [DHCP], choose [Yes]. Then the system will automatically determine the network information (IPv4 address, subnet, gateway and DNS server) itself. It will then display the IP address and the AhsayUBS WebAdmin's URL in the console.

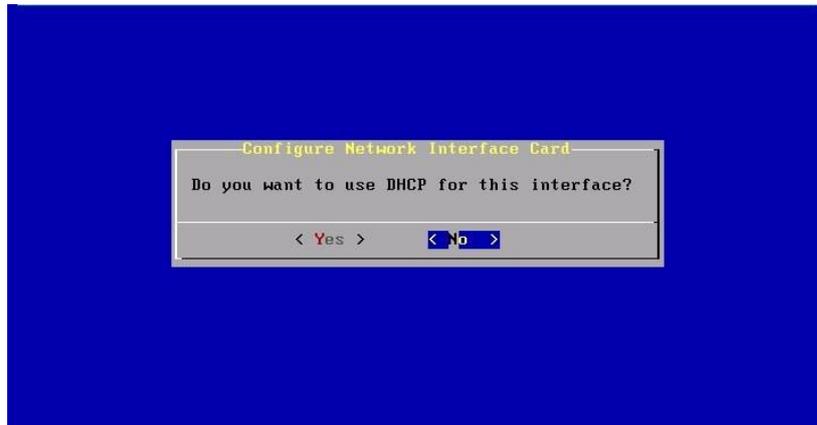
By default, You can use the address "*http://{SERVER_IP_ADDRESS}:8080*" to access the AhsayUBS WebAdmin in the browser.

Finally, choose [OK] to back to the main menu.

TIP: We do not recommend DHCP, as your client users may not be able to connect to the server, if the IP is reassigned a different IP.

8.6.1.2 Static IP

A [Static IP] can be assigned for the AhsayUBS. Choose [No] to set the IP address manually.



Enter an IPv4 address for this AhsayUBS. Choose [OK] to continue.



Enter the subnet for this IP Address. Choose [OK] to continue.



Enter the gateway for outgoing packet. Choose [OK] to continue.



Enter the DNS address and choose [OK] to continue.



After that, the below screen will be shown. Now you can access the AhsayUBS WebAdmin by the URL shown on the screen (i.e. <http://10.10.3.41:8080> in this example) for continue other configurations.



8.6.2 Reset AhsayUBS to Factory Defaults

Here is another way for you to reset the AhsayUBS to factory default.

After you choose this option, a confirming dialog will be shown as below. Choose [Yes] to reset the AhsayUBS to factory defaults. Choose [No] to cancel the operation.



Note:

1. The data on the block devices will NOT be erased after AhsayUBS is reset to factory defaults.
2. You can restore the previous settings in AhsayUBS WebAdmin in the page [System] > [Backup/Restore]. Please refer to the section [System] > [Backup/Restore] for details.
3. After resetting AhsayUBS to factory defaults, all iSCSI sessions will be removed in the [Storage] > [iSCSI] page. The status of Expandable Storage will change to "Missing". The Expandable Storage can be re-configured for use by AhsayUBS:
 - i. Adding it back the iSCSI session inside the [Storage] > [iSCSI] page.
 - ii. Import the Expandable Storage. Note that the data in the Expandable Storage will not be erased after "factory defaults". For details, please refer to the [Storage] section.

8.6.3 Shutdown System

Choose this option for shutting down the AhsayUBS.

Note: You can also shutdown your AhsayUBS inside the AhsayUBS WebAdmin. For more information, please refer to [Chapter 8.2.5](#) in this document.

On the below screen, choose [Yes] to reboot the system. Choose [No] to exit and cancel the request.



WARNING:

Please make sure the system is safe for reboot before clicking the [Yes] button. Otherwise, the backup job could be interrupted if the backup server is in use.

8.6.4 Reboot System

Choose this option for reboot the AhsayUBS.

Note: You can also reboot your AhsayUBS in the AhsayUBS WebAdmin. For more information, please refer to [Chapter 8.2.4](#).

On the below screen, choose [Yes] to reboot the system and choose [No] to abort the request.



WARNING:

Please make sure the system is safe for reboot before clicking the [Yes] button. Otherwise, the backup job could be interrupted if the backup server is in use.

8.6.5 Customizing AhsayUBS

Customization of the AhsayUBS is separated into two sections:

1. Customization of AhsayCBS.
2. Customization of the AhsayUBS Firmware.

8.7 Customization of the AhsayCBS

For the customization of the AhsayCBS, please refer to the [AhsayCBS Administrator's Guide](#).

8.8 Customization of AhsayUBS Firmware

For the customization of the AhsayUBS with AhsayCBS, please refer to the [AhsayCBS Administrator's Guide](#).

Appendix

Appendix A Supported Processors

Ahsay™ Universal Backup System only supports the "i386" and "amd64" processor architecture.

<https://www.freebsd.org/releases/11.2R/hardware.html>

For processor type "amd64", the following processors are supported:

- ▶ AMD Athlon™64 ("Clawhammer").
- ▶ AMD Opteron™ ("Sledgehammer").
- ▶ AMD Sempron™.
- ▶ AMD Turion™.
- ▶ AMD Phenom™.
- ▶ All multi-core Intel Xeon™ processors except Sossaman have EM64T support.
- ▶ The single-core Intel Xeon processors "Nocona", "Irwindale", "Potomac", and "Cranford" have EM64T support.
- ▶ All Intel Core 2 (not Core Duo) and later processors
- ▶ All Intel® Core™ i range of processors
- ▶ All Intel Pentium® D processors
- ▶ All Intel® Centrino® Duo and Centrino® Pro platforms
- ▶ Intel Pentium 4s and Celeron Ds using the "Cedar Mill" core have EM64T support.
- ▶ Some Intel Pentium 4s and Celeron Ds using the "Prescott" core have EM64T support. Please read the [Intel Processor Spec Finder](#) for the definitive answer about EM64T support in Intel processors.

Note:

AhsayUBS supports a maximum of 32 virtual processor cores. Please refer to Chapter 4.1 [Backup System Requirements](#) for details of processor core configuration.

For processor type "i386", the following processors are supported:

- ▶ FreeBSD/i386 runs on a wide variety of "IBM PC compatible" machines. Due to the wide range of hardware available for this architecture, it is impossible to exhaustively list all combinations of equipment supported by FreeBSD. Nevertheless, some general guidelines are presented here.
- ▶ Almost all i386™-compatible processors with a floating point unit are supported. All Intel® processors beginning with the 80486 are supported, including the 80486, Pentium®, Pentium® Pro, Pentium® II, Pentium® III, Pentium® 4, and variants thereof, such as the Xeon™ and Celeron® processors. All i386™-compatible AMD processors are also supported, including the Am486®, Am5x86®, K5, AMD-K6® (and variants), AMD Athlon™ (including Athlon-MP, Athlon-XP, Athlon-4, and Athlon Thunderbird), and AMD Duron™ processors. The AMD Élan SC520 embedded processor is supported. The Transmeta Crusoe is recognized and supported, as are i386™-compatible processors from Cyrix and NexGen.
- ▶ There is a wide variety of motherboards available for this architecture. Motherboards using the ISA, VLB, EISA, AGP, and PCI expansion buses are well-supported. There is some limited support for the MCA ("MicroChannel") expansion bus used in the IBM PS/2 line of PCs.

Appendix B Supported Disk Controllers

For an updated list of supported disk controllers drivers, please refer to the FreeBSD website

<https://www.freebsd.org/releases/11.2R/hardware.html#DISK>

MegaCli support

'MegaCli' is the Command Line Interface for the MegaRAID SAS family of RAID controllers, used to configure and manage connected storage devices. The 'MegaCli' utility files have been prepared by LSI and should be downloaded from the company's website.

1. Go to the following URL, and accept the license agreement

http://www.lsi.com/downloads/Public/MegaRAID%20Common%20Files/8.02.16_MegaCLI.zip

2. Download and extract the '8.02.16_MegaCLI.zip' to a temp directory. Read '8.02.16_MegaCLI.txt' for supported controllers
3. Browse 'FREEBSD' folder at the temp directory for 'MegaCli' and 'MegaCli64'
4. Login to UBS via SSH
5. Enable write option on UBS mount point '/ubs/mnt/esfmfw'

```
> mount -uw /ubs/mnt/esfmfw
```

6. Create module directories at '/ubs/mnt/esfmfw' . If you are using an i386 processor, you need to create the path with i386, otherwise you need to create the path amd64.

```
For i386
> mkdir -p /ubs/mnt/esfmfw/module/i386/bin

or

For amd64
> mkdir -p /ubs/mnt/esfmfw/module/amd64/bin
```

- Copy the 'MegaCli' or 'MegaCli64' files to UBS via WinSCP (if you are using Windows PC)

If you are using i386 processors, copy the file MegaCli to the following path

```
/ubs/mnt/esfmfw/module/i386/bin/MegaCli
```

If you are using AMD type processors, rename the file MegaCli64 to MegaCli and copy the file MegaCli to the following path

```
/ubs/mnt/esfmfw/module/amd64/bin/MegaCli
```

- Grant execution permission to the files

```
For i386
> chmod 755 /ubs/mnt/esfmfw/module/i386/bin/MegaCli

or

For amd64
> chmod 755 /ubs/mnt/esfmfw/module/amd64/bin/MegaCli
```

Select the correct command according to your CPU type.

- Test the 'MegaCli' utility by listing the help option

```
For i386
> /ubs/mnt/esfmfw/module/i386/bin/MegaCli -h -NoLog

or

For amd64
> /ubs/mnt/esfmfw/module/amd64/bin/MegaCli -h -NoLog
```

Select the correct command according to your CPU type.

Note:

For supported LSI products, please download the following document from LSI <http://kb.lsi.com/Attachment983.aspx>

For the full list of command options, please refer to chapter 5 of the following document <http://kb.lsi.com/Attachment902.aspx>

Appendix C Supported Ethernet Interfaces

For an updated list of supported Ethernet interfaces drivers, please refer to the FreeBSD website

<https://www.freebsd.org/releases/11.2R/hardware.html#ETHERNET>

Appendix D Supported Languages

Language Code	Language
ar	Arabic
ca	Catalan
cs	Czech
da	Danish
de	German
el	Greek Modern
en	English
es	Spanish
eu	Euskara/Basque
fr	French
iw	Hebrew
hu	Hungarian
id	Indonesian
it	Italian
ja	Japanese
ko	Korean
lt	Lithuanian
nl	Dutch
no	Norwegian
pl	Polish
pt_BR	Portuguese (Brazil)
pt_PT	Portuguese (Portugal)
ro	Russian
sl	Slovenian
sv	Swedish
th	Thai
tr	Turkish
vi	Vietnamese
zh_CN	Chinese (Simplified)
zh_TW	Chinese (Traditional)

Appendix E Message of the Day

"motd" stands for "Message of the Day". It is the message displayed just before login in the shell.

The default value is:

```
Ahsay Universal Backup System
```

After base64 decoding, it will become "QWhxYXkgVW5pdmVyc2FsIEJhY2t1cCBTeXN0ZW0NCg0K". The base64 encoder will preserve the new line character in the message. Therefore, multiple lines can be displayed in the message.

To generate the code and paste it in the XML tag in the config file, please type the motd to the base64 encoder and paste the output in the XML tag "<motd>" in the config file.

Appendix F Supported Time Zones

The following supported time zones that can be set in <timezone> XML tag.

Africa	America/Kentucky	America/Belize
Africa/Algiers	America/North_Dakota	America/Cayman
Africa/Luanda	America/Danmarkshavn	America/Costa_Rica
Africa/Porto-Novo	America/Scoresbysund	America/Havana
Africa/Gaborone	America/Godthab	America/Dominica
Africa/Ouagadougou	America/Thule	America/Santo_Domingo
Africa/Bujumbura	America/New_York	America/El_Salvador
Africa/Douala	America/Chicago	America/Grenada
Africa/Bangui	America/Denver	America/Guadeloupe
Africa/Ndjamena	America/Los_Angeles	America/Guatemala
Africa/Kinshasa	America/Juneau	America/Port-au-Prince
Africa/Lubumbashi	America/Yakutat	America/Tegucigalpa
Africa/Brazzaville	America/Anchorage	America/Jamaica
Africa/Abidjan	America/Nome	America/Martinique
Africa/Djibouti	America/Adak	America/Montserrat
Africa/Cairo	America/Phoenix	America/Managua
Africa/Malabo	America/Boise	America/Panama
Africa/Asmera	America/Indianapolis	America/Puerto_Rico
Africa/Addis_Ababa	America/Louisville	America/St_Kitts
Africa/Libreville	America/Detroit	America/St_Lucia
Africa/Banjul	America/Menominee	America/Miquelon
Africa/Accra	America/St_Johns	America/St_Vincent
Africa/Conakry	America/Goose_Bay	America/Grand_Turk
Africa/Bissau	America/Halifax	America/Tortola
Africa/Nairobi	America/Glace_Bay	America/St_Thomas
Africa/Maseru	America/Montreal	America/Aruba
Africa/Monrovia	America/Toronto	America/La_Paz
Africa/Tripoli	America/Thunder_Bay	America/Noronha
Africa/Blantyre	America/Nipigon	America/Belem
Africa/Bamako	America/Rainy_River	America/Fortaleza
Africa/Timbuktu	America/Winnipeg	America/Recife
Africa/Nouakchott	America/Regina	America/Araguaina
Africa/Casablanca	America/Swift_Current	America/Maceio
Africa/El_Aaiun	America/Edmonton	America/Bahia
Africa/Maputo	America/Vancouver	America/Sao_Paulo
Africa/Windhoek	America/Dawson_Creek	America/Campo_Grande
Africa/Niamey	America/Pangnirtung	America/Cuiaba
Africa/Lagos	America/Iqaluit	America/Porto_Velho
Africa/Kigali	America/Rankin_Inlet	America/Boa_Vista
Africa/Sao_Tome	America/Cambridge_Bay	America/Manaus
Africa/Dakar	America/Yellowknife	America/Eirunepe
Africa/Freetown	America/Inuvik	America/Rio_Branco
Africa/Mogadishu	America/Whitehorse	America/Santiago
Africa/Johannesburg	America/Dawson	America/Bogota
Africa/Khartoum	America/Cancun	America/Curacao
Africa/Mbabane	America/Merida	America/Guayaquil
Africa/Dar_es_Salaam	America/Monterrey	America/Cayenne
Africa/Lome	America/Mexico_City	America/Guyana
Africa/Tunis	America/Chihuahua	America/Asuncion
Africa/Kampala	America/Hermosillo	America/Lima
Africa/Lusaka	America/Mazatlan	America/Paramaribo
Africa/Harare	America/Tijuana	America/Port_of_Spain
Africa/Ceuta	America/Anguilla	America/Montevideo
America	America/Antigua	America/Caracas
America/Argentina	America/Nassau	America/Shiprock
America/Indiana	America/Barbados	America/North_Dakota/Center

America/Kentucky/Monticello	Asia/Almaty	Australia/Brisbane
America/Kentucky/Louisville	Asia/Qyzylorda	Australia/Lindeman
America/Indiana/Marengo	Asia/Aqtobe	Australia/Adelaide
America/Indiana/Knox	Asia/Aqtau	Australia/Hobart
America/Indiana/Vevay	Asia/Oral	Australia/Melbourne
America/Indiana/Indianapolis	Asia/Bishkek	Australia/Sydney
America/Argentina/Buenos_Aires	Asia/Seoul	Australia/Broken_Hill
America/Argentina/Cordoba	Asia/Pyongyang	Australia/Lord_Howe
America/Argentina/Tucuman	Asia/Kuwait	CET
America/Argentina/La_Rioja	Asia/Vientiane	CST6CDT
America/Argentina/San_Juan	Asia/Beirut	EET
America/Argentina/Jujuy	Asia/Kuala_Lumpur	EST
America/Argentina/Catamarca	Asia/Kuching	EST5EDT
America/Argentina/Mendoza	Asia/Hovd	Etc
America/Argentina/ComodRivadavia	Asia/Ulaanbaatar	Etc/GMT
America/Argentina/Rio_Gallegos	Asia/Choibalsan	Etc/UTC
America/Argentina/Ushuaia	Asia/Katmandu	Etc/UCT
Antarctica	Asia/Muscat	Etc/GMT-14
Antarctica/Casey	Asia/Karachi	Etc/GMT-13
Antarctica/Davis	Asia/Gaza	Etc/GMT-12
Antarctica/Mawson	Asia/Manila	Etc/GMT-11
Antarctica/DumontDUrville	Asia/Qatar	Etc/GMT-10
Antarctica/Syowa	Asia/Riyadh	Etc/GMT-9
Antarctica/Vostok	Asia/Singapore	Etc/GMT-8
Antarctica/Rothera	Asia/Colombo	Etc/GMT-7
Antarctica/Palmer	Asia/Damascus	Etc/GMT-6
Antarctica/McMurdo	Asia/Dushanbe	Etc/GMT-5
Antarctica/South_Pole	Asia/Bangkok	Etc/GMT-4
Arctic	Asia/Ashgabat	Etc/GMT-3
Arctic/Longyearbyen	Asia/Dubai	Etc/GMT-2
Asia	Asia/Samarkand	Etc/GMT-1
Asia/Kabul	Asia/Tashkent	Etc/GMT+1
Asia/Yerevan	Asia/Saigon	Etc/GMT+2
Asia/Baku	Asia/Aden	Etc/GMT+3
Asia/Bahrain	Asia/Yekaterinburg	Etc/GMT+4
Asia/Dhaka	Asia/Omsk	Etc/GMT+5
Asia/Thimphu	Asia/Novosibirsk	Etc/GMT+6
Asia/Brunei	Asia/Krasnoyarsk	Etc/GMT+7
Asia/Rangoon	Asia/Irkutsk	Etc/GMT+8
Asia/Phnom_Penh	Asia/Yakutsk	Etc/GMT+9
Asia/Harbin	Asia/Vladivostok	Etc/GMT+10
Asia/Shanghai	Asia/Sakhalin	Etc/GMT+11
Asia/Chongqing	Asia/Magadan	Etc/GMT+12
Asia/Urumqi	Asia/Kamchatka	Etc/Universal
Asia/Kashgar	Asia/Anadyr	Etc/Zulu
Asia/Hong_Kong	Asia/Istanbul	Etc/Greenwich
Asia/Taipei	Atlantic	Etc/GMT-0
Asia/Macau	Atlantic/Cape_Verde	Etc/GMT+0
Asia/Nicosia	Atlantic/St_Helena	Etc/GMT0
Asia/Tbilisi	Atlantic/Faeroe	Europe
Asia/Dili	Atlantic/Reykjavik	Europe/London
Asia/Calcutta	Atlantic/Azores	Europe/Belfast
Asia/Jakarta	Atlantic/Madeira	Europe/Dublin
Asia/Pontianak	Atlantic/Canary	Europe/Tirane
Asia/Makassar	Atlantic/Bermuda	Europe/Andorra
Asia/Jayapura	Atlantic/Stanley	Europe/Vienna
Asia/Tehran	Atlantic/South_Georgia	Europe/Minsk
Asia/Baghdad	Atlantic/Jan_Mayen	Europe/Brussels
Asia/Jerusalem	Australia	Europe/Sofia
Asia/Tokyo	Australia/Darwin	Europe/Prague
Asia/Amman	Australia/Perth	Europe/Copenhagen

Europe/Tallinn	MET	SystemV
Europe/Helsinki	MST	SystemV/AST4ADT
Europe/Paris	MST7MDT	SystemV/EST5EDT
Europe/Berlin	PST8PDT	SystemV/CST6CDT
Europe/Gibraltar	Pacific	SystemV/MST7MDT
Europe/Athens	Pacific/Rarotonga	SystemV/PST8PDT
Europe/Budapest	Pacific/Fiji	SystemV/YST9YDT
Europe/Rome	Pacific/Gambier	SystemV/AST4
Europe/Riga	Pacific/Marquesas	SystemV/EST5
Europe/Vaduz	Pacific/Tahiti	SystemV/CST6
Europe/Vilnius	Pacific/Guam	SystemV/MST7
Europe/Luxembourg	Pacific/Tarawa	SystemV/PST8
Europe/Malta	Pacific/Enderbury	SystemV/YST9
Europe/Chisinau	Pacific/Kiritimati	SystemV/HST10
Europe/Monaco	Pacific/Saipan	WET
Europe/Amsterdam	Pacific/Majuro	
Europe/Oslo	Pacific/Kwajalein	
Europe/Warsaw	Pacific/Yap	
Europe/Lisbon	Pacific/Truk	
Europe/Bucharest	Pacific/Ponape	
Europe/Kaliningrad	Pacific/Kosrae	
Europe/Moscow	Pacific/Nauru	
Europe/Samara	Pacific/Noumea	
Europe/Belgrade	Pacific/Auckland	
Europe/Madrid	Pacific/Chatham	
Europe/Stockholm	Pacific/Niue	
Europe/Zurich	Pacific/Norfolk	
Europe/Istanbul	Pacific/Palau	
Europe/Kiev	Pacific/Port_Moresby	
Europe/Uzhgorod	Pacific/Pitcairn	
Europe/Zaporozhye	Pacific/Pago_Pago	
Europe/Simferopol	Pacific/Apia	
Europe/Nicosia	Pacific/Guadalcanal	
Europe/Mariehamn	Pacific/Fakaofu	
Europe/Vatican	Pacific/Tongatapu	
Europe/San_Marino	Pacific/Palau	
Europe/Ljubljana	Pacific/Port_Moresby	
Europe/Sarajevo	Pacific/Pitcairn	
Europe/Skopje	Pacific/Pago_Pago	
Europe/Zagreb	Pacific/Apia	
Europe/Bratislava	Pacific/Guadalcanal	
Factory	Pacific/Fakaofu	
GMT	Pacific/Tongatapu	
HST	Pacific/Funafuti	
Indian	Pacific/Johnston	
Indian/Comoro	Pacific/Midway	
Indian/Antananarivo	Pacific/Wake	
Indian/Mauritius	Pacific/Efate	
Indian/Mayotte	Pacific/Wallis	
Indian/Reunion	Pacific/Honolulu	
Indian/Mahe	Pacific/Easter	
Indian/Kerguelen	Pacific/Galapagos	
Indian/Chagos		
Indian/Maldives		
Indian/Christmas		
Indian/Cocos		

Appendix G Example of config.xml

The following is one of the default sysctl entries in the factory default config file "/ubs/factory/config.xml".

```
<sysctl>
  <param>
    <enable/>
    <uuid>dc8e537a-34f2-4aa7-afe8-cd631a52005a</uuid>
    <name>hw.ata.timeout</name>
    <value>15</value>
    <comment>ATA disk timeout vis-a-vis power-
saving</comment>
  </param>
</sysctl>
```

Where:

XML Tag	Description
<param></param>	start / end tag of an entry
<enable/>	The entry is enabled. If the tag is missing, the entry is disabled.
<uuid></uuid>	The unique id for the WebAdmin. *****
<name></name>	The variable name of the entry
<value></value>	The value of the entry
<comment></comment>	Description of the entry

For the variable name in the "/etc/sysctl.conf", please refer to FreeBSD documentation.

Appendix H Identifying Physical Local Block Devices on AhsayUBS

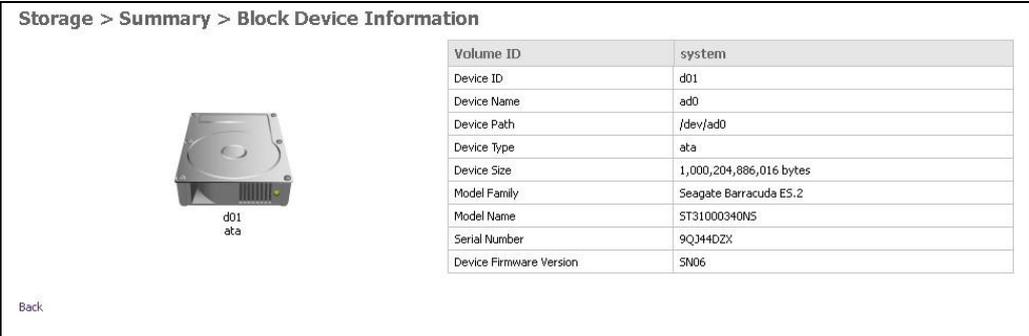
Method 1: Serial Number

The "Serial Number" is the unique identifier for a block device. Thus, the block device can be found physically in the machine by its serial number.

Here are the steps to look for the serial number in the AhsayUBS WebAdmin:

1. In the page [Storage] > [Summary], click on the block device icon  that looking for. The page then will be redirected to [Storage] > [Summary] > [Block Device Information].
2. If the "Serial Number" can be retrieved by the block device, the row "Serial Number" will exist in the table.

Storage > Summary > Block Device Information



Volume ID	system
Device ID	d01
Device Name	ad0
Device Path	/dev/ad0
Device Type	ata
Device Size	1,000,204,886,016 bytes
Model Family	Seagate Barracuda ES.2
Model Name	ST31000340NS
Serial Number	9QJ44DZX
Device Firmware Version	SN06

Back

Method 2: Device name

If a block device is connected to a specific controller e.g. 'ad' for ATA or 'da' for SCSI. The connector will be named and ordered starting from 0, e.g. ad0, ad1, da0, da1 ... etc. Therefore, the block device can be identified according to the controller name and the connector number.

To look for the device name, please follow the steps below:

1. In the page [Storage] > [Summary], click on the block device icon  that looking for. The page then will be redirected to [Storage] > [Summary] > [Block Device Information].

2. The "Device Name" exists in the information table.

Storage > Summary > Block Device Information



m00c00
scsi

Back

Volume ID	esms00
Device ID	m00c00
Device Name	da0
Device Path	/dev/da0
Device Type	scsi
Device Size	8.00 GB
Model Family	1.0
Model Name	Virtual disk 1.0

Appendix I SNMP OID List

The following OIDs are supported by AhsayUBS. By importing corresponding MIB definition files, those OID values are visible via MIB browser and Network Management Software (NMS). For the complete list of OIDs, please refer to the following MIB documentation:

U.C. Davis

<http://www.net-snmp.org/docs/mibs/ucdavis.html>

Fokus Begemot (Mib-II)

http://www.freebsd.org/cgi/man.cgi?query=snmp_mibII&sektion=3&manpath=FreeBSD+8.3-RELEASE+and+Ports

Fokus Begemot (Host Resource)

http://www.freebsd.org/cgi/man.cgi?query=snmp_hostres&sektion=3&manpath=FreeBSD+8.3-RELEASE+and+Ports

Fokus Begemot (NetGraph)

http://www.freebsd.org/cgi/man.cgi?query=snmp_netgraph&sektion=3&manpath=FreeBSD+8.3-RELEASE+and+Ports

Notes: Please refer to the page [System] > [Settings] > [SNMP] for a simplified OID list.

Trap string	<input type="text" value="ubs"/> Trap string.
SNMP Modules	Download MIB files
Save and Restart	

The following OIDs are supported by the FreeBSD SNMP service.
By importing the corresponding MIB definition files, the OID values can be retrieved by MIB browser and Network Management Software (NMS).

System Information	
OID Prefix	iso.org.dod.internet.mgmt.mib-2.system.
OID Name	OID Description
sysDescr	A textual description of the this node. It is denoted by the CPU and kernel information.
sysContact	The textual identification of the contact person for this managed node, together with information on how to contact this person. It is denoted by the above 'Contact' text field.
sysName	An administratively-assigned name for this managed node. It is denoted by the fully-qualified domain name.
sysLocation	The physical location of this node. It is denoted by the above 'Location' text field.
CPU Statistics	
OID Prefix	iso.org.dod.internet.private.enterprises.ucdavis.systemStats.
OID Name	OID Description
ssCpuUser	The percentage of CPU time spent processing user-level code over the last minute.
ssCpuSystem	The percentage of CPU time spent processing system-level code over the last minute.
ssCpuIdle	The percentage of CPU time spent idle over the last minute.

System	
OID Prefix: iso.org.dod.internet.mgmt.mib-2.system.	
sysName	An administratively-assigned name for this managed node. By convention, this is the node's fully-qualified domain name.
sysDescr	A textual description of the node. This value should include the full name and version identification of the system's hardware type, software operating-system, and networking software. It is mandatory that this only contain printable ASCII characters.
sysLocation	The physical location of this node (e.g., 'telephone closet, 3rd floor').
sysContact	The textual identification of the contact person for this managed node, together with information on how to contact this person.

Memory	
OID Prefix: iso.org.dod.internet.private.enterprises.ucdavis.memory.	
memTotalReal	The total amount of physical memory (kBytes) installed on this host.
memAvailReal	The amount of physical memory (kBytes) currently available.
memTotalSwap	The total amount of swap space (kBytes) configured for this host.
memAvailSwap	The amount of swap space (kBytes) currently available.
memTotalFree	The total amount of memory (kBytes) available for use on this host.

Storage	
Each storage entry in the AhsayUBS system has been indexed by the 'dskIndex' attribute (which is located in the attribute suffix). The corresponding 'dskPath', 'dskDevice', 'dskTotal', 'dskAvail', 'dskUsed' and 'dskPercent' attributes will be mapped by the same index. e.g. 'dskIndex.1' implies 'dskPath.1', 'dskDevice.1', 'dskTotal.1', 'dskAvail.1', 'dskUsed.1' and 'dskPercent.1'	
OID Prefix: iso.org.dod.internet.private.enterprises.ucdavis.dskTable.dskEntry.	
dskIndex	Integer reference number (row number) for the disk MIB.
dskPath	Logical path where the disk is mounted.
dskDevice	Logical path of the device for the partition.

dskTotal	Total size of the disk (kBytes).
dskAvail	Available space on the disk (kBytes).
dskUsed	Used space on the disk (kBytes).
dskPercent	Percentage of space used on disk.
<p>Each storage entry in the UBS system has been indexed by the 'hrStorageIndex' attribute (which is located in the attribute suffix). The corresponding 'hrStorageDescr', 'hrStorageSize' and 'hrStorageUsed' attributes will be mapped by the same index. e.g. 'hrStorageIndex.1' implies 'hrStorageDescr.1', 'hrStorageSize.1' and 'hrStorageUsed.1'</p>	
<p>OID Prefix: iso.org.dod.internet.mgmt.mib-2.host.hrStorage.hrStorageTable.hrStorageEntry.</p>	
hrStorageIndex	A unique key assigned by the MIB to represent a storage area in the host.
hrStorageDescr	A description of the type and instance of the storage described by this entry.
hrStorageSize	The storage size in units of 'hrStorageAllocationUnits'.
hrStorageUsed	Used storage space in units of 'hrStorageAllocationUnits'.

Network	
<p>Each network interface in the AhsayUBS system has been indexed by the 'ifIndex' attribute (which is located in the attribute suffix). The 'ifIndex' and 'ifAdEntIfIndex' correspond to the same indexed interface.</p>	
<p>The corresponding 'ifDescr', 'ifSpeed', 'ifPhysAddress', 'ifAdEntAddr' and 'ifAdEntNetMask' attributes will be mapped by the same index. e.g. 'ifIndex.1' implies 'ifDescr.1', 'ifSpeed.1', 'ifPhysAddress.1', 'ifAdEntAddr.1' and 'ifAdEntNetMask.1'</p>	
<p>OID Prefix: iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.</p>	
ifIndex	A unique key assigned to each interface from MIB. Its value ranges between 1 and the value of 'ifNumber'. The value for each interface must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization.
ifDescr	A textual string containing information about the interface. This string should include the name of the manufacturer, the product name and the version of the hardware interface.
ifSpeed	An estimate of the interface's current bandwidth in bits per second. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth.

ifPhysAddress	The interface's address at the protocol layer immediately 'below' the network layer in the protocol stack. For interfaces which do not have such an address (e.g., a serial line), this object should contain an octet string of zero length.
OID Prefix: iso.org.dod.internet.mgmt.mib-2.ip.ipAddrTable.ipAddrEntry.	
ipAdEntIfIndex	The index value which uniquely identifies the interface. The value is the same as 'ifIndex'.
ipAdEntAddr	IP address assigned to the interface.
ipAdEntNetMask	The subnet mask associated with the IP address to the interface. The value of the mask is an IP address with all the network bits set to 1 and all the hosts bits set to 0.

Routing

This entity's IP Routing table.

OID Prefix: iso.org.dod.internet.mgmt.mib-2.ip.ipForward.ipCidrRouteTable.

ipCidrRouteIfIndex	The 'ifIndex' value that identifies the local interface through which the next hop of this route should be reached.
ipCidrRouteNextHop	On remote routes, the address of the next system enroute; Otherwise, 0.0.0.0.

CPU Statistics

The following attributes provide measure to CPU usage in number of 'ticks' (typically 1/100s).

On a multi-processor system, the counter values are cumulative over all CPUs, so their sum will typically be N*100 (for N processors).

OID Prefix: iso.org.dod.internet.private.enterprises.ucdavis.systemStats.

ssCpuRawWait	The number of 'ticks' spent waiting for I/O.
ssCpuRawKernel	The number of 'ticks' spent processing in the kernel over the last minute.
ssCpuRawSystem	The number of 'ticks' spent processing system-level code over the last minute. This object may sometimes be implemented as the combination of the 'ssCpuRawWait(54)' and 'ssCpuRawKernel(55)' counters, so care must be taken when summing the overall raw counters.
ssCpuRawUser	The number of 'ticks' spent processing user-level code over the last minute.
ssCpuRawIdle	The number of 'ticks' spent idle over the last minute.

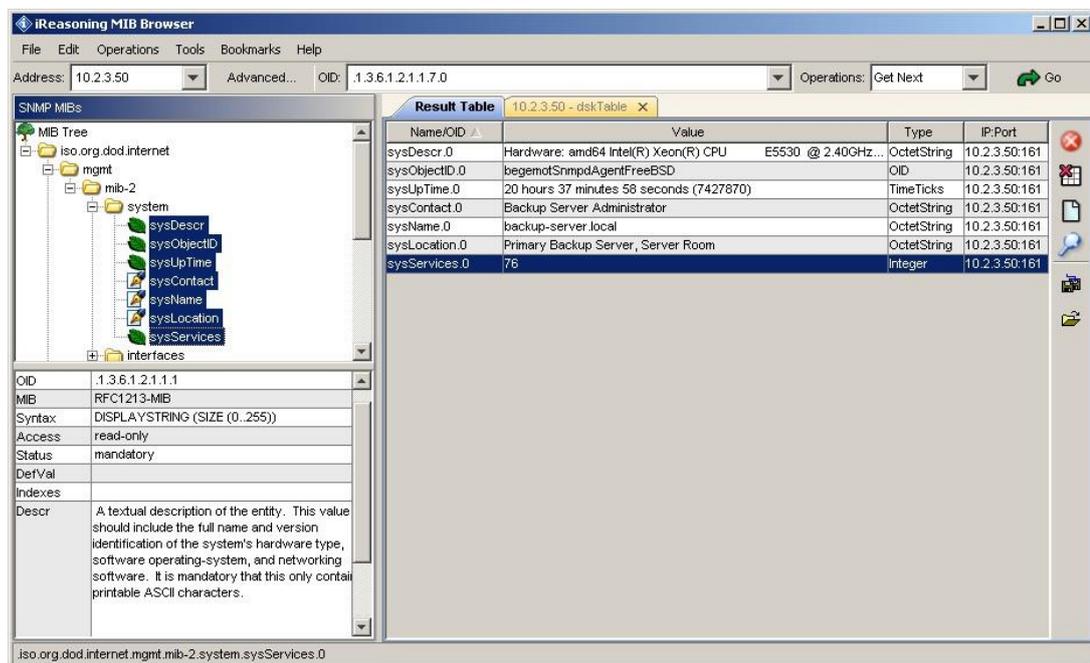
Disk I/O Statistics	
<p>Each storage device in the AhsayUBS system has been indexed by the 'diskIOIndex' attribute. The corresponding 'diskIODevice', 'diskIONRead' and 'diskIOWritten' attributes will be mapped by the same index. e.g. 'diskIOIndex.1' implies 'diskIODevice.1', 'diskIONRead.1' and 'diskIOWritten.1'</p>	
<p>OID Prefix: iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIO MIB.diskIOTable.diskIOEntry.</p>	
diskIOIndex	Reference index for each observed device.
diskIODevice	The name of the device we are counting / checking.
diskIONRead	The number of bytes read from this device since boot.
diskIOWritten	The number of bytes written to this device since boot.

Appendix J MIB Browser

MIB Browser allows administrators to load MIB definition files and connects to SNMP enabled network devices and applications. Some MIB browsers provide both text view and table view for the retrieved MIB values. In the following, we are going to demonstrate with the 'iReasoning MIB Browser Personal Edition'.

(<http://ireasoning.com/downloadmibbrowserfree.php>)

- The MIB Browser GUI includes the following views:
 - Address and Advanced (menu bar, for SNMP agent connection configuration)
 - MIB Tree (top left panel, presenting the supported MIB entities)
 - MIB Description (bottom left panel, presenting the MIB entity detail)
 - Result Table (top right panel, presenting the OID query result)

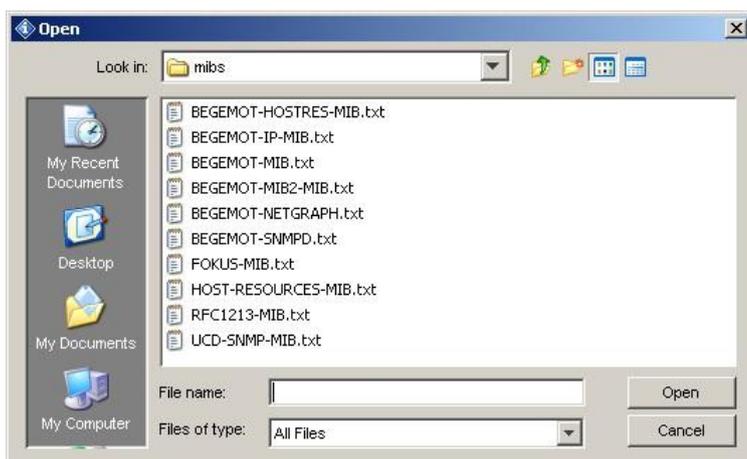


- Additional MIB definition files can be loaded to the MIB Browser. Download and extract the MIB archive from UBS [System -> Settings -> SNMP].

Simple Network Management Protocol	
Status	Running
Location	Primary Backup Server, Server Room Location information, e.g. physical location of this system: 'Floor of building, Room xyz'.
Contact	Backup Server Administrator Contact information, e.g. name or email of the person responsible for this system.
Community	public Enter read community string here.
Traps	<input checked="" type="checkbox"/> Enable traps.
Trap host	alex-cheng.ahsayhq.local Enter trap host name.
Trap port	162 Enter the port to send the traps to (default 162).
Trap string	ubs Trap string.
SNMP Modules	Download MIB files
Save and Restart	

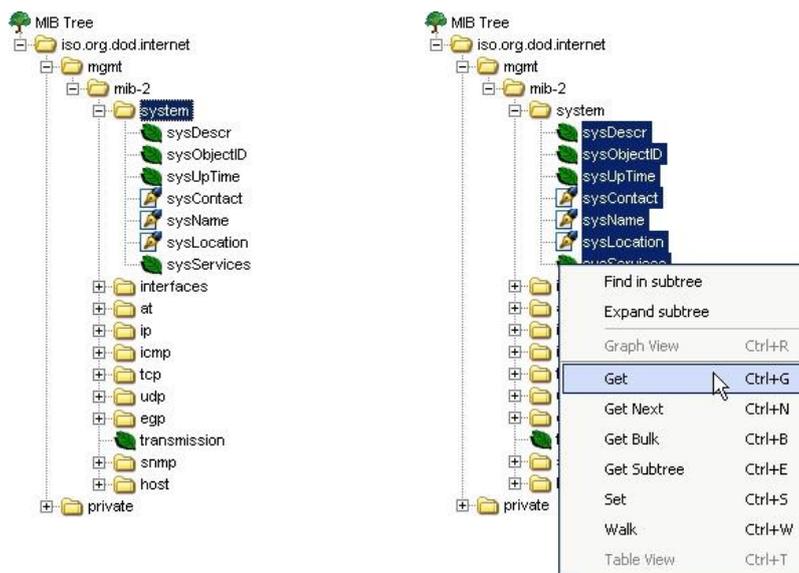
Click on 'File -> Load MIBs' to load the following MIB definition files:

- ⊙ BEGEMOT-HOSTRES-MIB.txt
- ⊙ BEGEMOT-IP-MIB.txt
- ⊙ BEGEMOT-MIB.txt
- ⊙ BEGEMOT-MIB2-MIB.txt
- ⊙ BEGEMOT-NETGRAPH.txt
- ⊙ BEGEMOT-SNMPD.txt
- ⊙ FOKUS-MIB.txt
- ⊙ HOST-RESOURCES-MIB.txt
- ⊙ RFC1213-MIB.txt
- ⊙ UCD-SNMP-MIB.txt



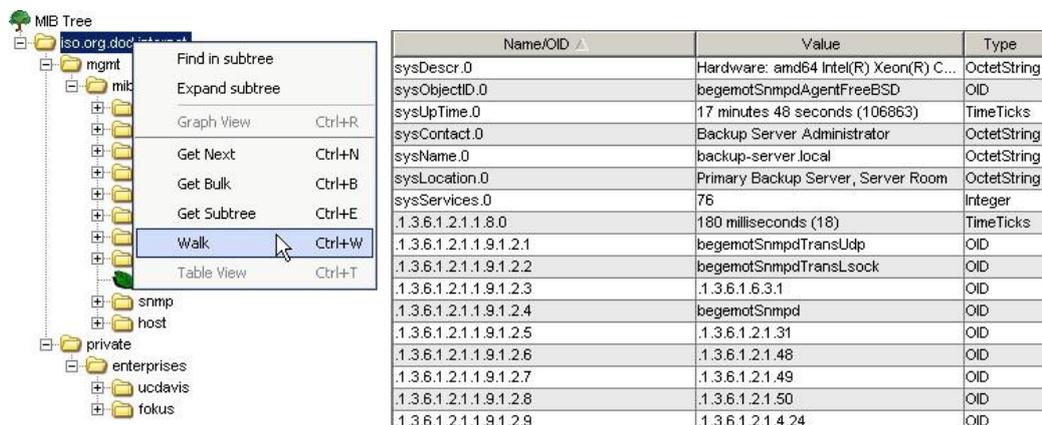
3. SNMP 'Get' and 'Walk' operation

By selecting specific OID entities, the SNMP 'Get' operation will retrieve the selected OID values. The OID entities will be mapped with the corresponding name defined in the MIB files. For example, we may retrieve the all entity values under the OID 'iso.org.dod.internet.mgmt.mib-2.system' via the MIB Browser.



Name/OID	Value	Type
sysUpTime.0	20 hours 28 minutes 39 seconds (7371999)	TimeTicks
sysName.0	backup-server.local	OctetString
sysLocation.0	Primary Backup Server, Server Room	OctetString
sysDescr.0	Hardware: amd64 Intel(R) Xeon(R) CPU E5530 @ 2.40GHz running at 2393 Software: FreeBSD 8.3-RELEASE (revision 199506)	OctetString
sysContact.0	Backup Server Administrator	OctetString
sysObjectID.0	begemotSnmpdAgentFreeBSD	OID
sysServices.0	76	Integer

On the other hand, the MIB Browser may walk through the entire MIB Tree by the SNMP 'Walk' operation. All OID entities will be retrieved from the SNMP agent. If the corresponding MIB definition file is not found, the retrieved OID will be displayed in numeric format.

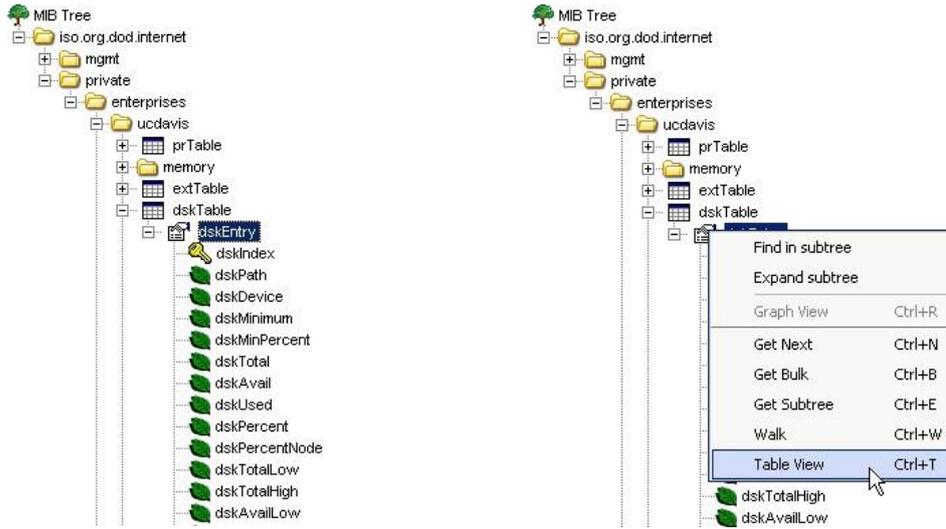


4. MIB Browser Table View

Some OID may exist as customized entry type. Multiple instances of entity value may exist under certain OID. For example, a system may contain multiple disks that each disk could be indexed by a unique index value. In such case, the MIB Browser may provide the 'Table View' that all supported entity values can be presented in table format.

Name	dskEntry
OID	.1.3.6.1.4.1.2021.9.1
MIB	UCD-SNMP-MIB
Syntax	DskEntry
Access	not-accessible
Status	current
DefVal	
Indexes	dskIndex
Descr	An entry containing a disk and its statistics.

From OID 'iso.org.dod.internet.private.ucdavis.dskTable.dskEntry', we may retrieve the system disk detail in table view with the corresponding 'dskPath', 'dskDevice', 'dskTotal', 'dskUsed' and 'dskPercent' entity values.



	dskindex	dskPath	dskDevice	dskTotal	dskAvail	dskUsed	dskPercent	dskPercentNode
1	1	/	/dev/md0	126702	29324	97378	77	11
2	2	/dev	devfs	1	0	1	100	100
3	3	/ubs/mnt/eslsmfw	/dev/mirror/48555C78xeslsmfw	756748	485064	211146	30	2
4	4	/ubs/mnt/eslsfw	eslsfwx48555C78	5515463	5220355	295128	5	0
5	5	/var	/dev/md1	15598	14178	174	1	2
6	6	/ubs/mnt/esosfw	/dev/mirror/48555C78xeosfw	190252	83140	91892	53	0

Appendix K VMware Tools Support

AhsayUBS bundles support of the VMware tools.

To check if VMware tool is installed and running on AhsayUBS, login to AhsayUBS using a ssh client and use the **kldstat** or **top** command.

```
# kldstat
Id Refs Address          Size      Name
 1   37 0xffffffff80100000 dd3650    kernel
 2    1 0xffffffff80ed4000 7148     vesa.ko
 3    1 0xffffffff80f9c000 7a78     geom_concat.ko
 4    1 0xffffffff80fa4000 21080    geom_mirror.ko
 5    1 0xffffffff80fc6000 9078     geom_stripe.ko
 6    1 0xffffffff88fd0000 1fb18    geom_raid5.ko
 7    1 0xffffffff89212000 133ce4   zfs.ko
 8    1 0xffffffff89346000 4fb3     opensolaris.ko
 9    1 0xffffffff8934b000 a253     iscsi_initiator.ko
10   1 0xffffffff89356000 1418     splash_bmp.ko
11   1 0xffffffff89358000 15a8     vmmemctl.ko
12   1 0xffffffff8935a000 22f8     vmxnet.ko
13   1 0xffffffff8935d000 2900     vmblock.ko
14   1 0xffffffff89360000 83d4     vmhgfs.ko
15   1 0xffffffff89369000 5ebc     aio.ko
```

```
PID USERNAME  THR PRI NICE   SIZE    RES STATE  C  TIME  WCPU COMMAND
1752 root        41  49   0 1422M   256M ucond  1 26:48 0.00% java
1288 root         2  76   0 32568K 6536K piperd  3  7:15 0.00% vmttoolsd
1528 root         1  44   0 16440K 3512K kqread  1  0:13 0.00% lighttpd
1537 root         1  44   0 7976K  2408K select  0  0:08 0.00% sendmail
1276 root         1  44   0 6948K  1364K select  0  0:01 0.00% syslogd
1483 root         1  44   0 7976K  1600K nanslp  1  0:01 0.00% cron
1777 root         1  44   0 42984K 22852K piperd  1  0:00 0.00% php
42330 root         1  44   0 42984K 22512K wait    0  0:00 0.00% php
43776 root         1  44   0 16848K 4080K select  3  0:00 0.00% sshd
43845 root         1  44   0 9372K  2160K CPU1    1  0:00 0.00% top
42319 root         1  44   0 21740K 2072K wait    0  0:00 0.00% login
42320 root         1  44   0 8312K  2848K pause   0  0:00 0.00% csh
1768 root         1  76   0 8312K  2736K pause   0  0:00 0.00% csh
43778 root         1  44   0 8312K  2836K pause   1  0:00 0.00% csh
1766 root         1  73   0 21740K 2000K wait    2  0:00 0.00% login
```

The module is installed in `/usr/local/lib/vmware-tools/modules/drivers`

Appendix L AhsayUBS Tape Drive Commands

Description	Command
Rewind tape	mt -f /dev/sa0 rewind
Check tape status	mt -f /dev/sa0 status
Erase tape	mt -f /dev/sa0 erase

Note: Please ensure the tape is rewind before use.

Appendix M Miscellaneous Commands

Accessing shell from physical console:
Press ALT+F2 (or "PrtScr" key)
Login with SSH credentials

From shell, to check if CBS service is running:
ps `cat /var/run/obsr.pid`

From shell, to manually start/stop CBS service
sh /ubs/mnt/esfwfm/obsr/system/obsr/bin/shutdown.sh
sh /ubs/mnt/esfwfm/obsr/system/obsr/bin/startup.sh

From shell, check bootup message:
dmesg | more

From shell, check on FreeBSD version:
uname -mrs