

Ahsay Universal Backup System v9

Administrator's Guide

Ahsay Systems Corporation Limited

17 March 2022

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Revision History

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17 March 2022	▪ Ch. 8.1.5 – added warning when changing password ▪ Ch. 9 – updated links and screenshots	9.1.0.0

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1 Release Announcement

1. AhsayUBS is bundled with the latest version of AhsayCBS v9. Starting from AhsayCBS v9.1.0.0 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. OpenJDK8 is used by AhsayCBS v9.1.0.0 onwards.
3. Tomcat v8 is used by AhsayCBS v9.1.0.0 onwards.
4. AhsayUBS 9 runs only on machines installed with 64bit CPU.
5. AhsayUBS v9 is supported on VMware ESXi v6.5 or above. As AhsayUBS v9 uses FreeBSD 11.2 and FreeBSD 11.x is only supported on VMware ESXi v6.5 or above.

For information on compatibility between FreeBSD 11.x and VMware ESXi versions, please refer to the [VMware Compatibility Guide](#).

6. AhsayUBS 9 includes support for Open VM Tools on FreeBSD. For more information please refer to [Appendix K](#).
7. Upgraded ZFS filesystem version v5 and ZPOOL storage version v28.
8. Expanded hardware support on FreeBSD 11.2. For more information please refer to [Appendix A](#), [Appendix B](#) and [Appendix C](#).
9. Supports both iSCSI and Additional Storage features.
10. AhsayUBS 9 supports upgrade from AhsayUBS 2.29 (OBSR v6.29), AhsayUBS 7.17 (CBS v7.17) or AhsayUBS 8.5 (CBS v8.5). It is advised you first upgrade your server to these latest releases and update your clients to matching versions before upgrading to v9.

2 Storage Models

2.1 The UFS storage model

For backwards compatibility with AhsayUBS v6, 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   46 0xffffffff80200000 10d1490 kernel
 2    1 0xffffffff812d2000 8cf0      vesa.ko
 3    1 0xffffffff8139c000 17378     ahci.ko
 4    1 0xffffffff813b4000 f108      mvs.ko
 5    1 0xffffffff8c3c4000 7b68      geom_concat.ko
 6    1 0xffffffff8c3cc000 8f60      geom_stripe.ko
 7    1 0xffffffff8c3d5000 25ae8     geom_mirror.ko
 8    1 0xffffffff8c3fb000 25c38     geom_raid5.ko
 9    1 0xffffffff8c611000 221398    zfs.ko
10    1 0xffffffff8c833000 7500      opensolaris.ko
11    1 0xffffffff8c83b000 11150     krpc.ko
12    1 0xffffffff8c84d000 9afc      iscsi_initiator.ko
13    1 0xffffffff8c857000 14bd      splash_bmp.ko
```

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

```
ahsayubs:/# df -h
Filesystem                Size      Used    Avail Capacity  Mounted on
/dev/md0                   170M      152M      18M      90%        /
devfs                      1.0K      1.0K        0B     100%      /dev
/dev/mirror/9689F4EFxesosfw 186M      108M      63M      63%        /ubs/mnt/esosfw
/dev/mirror/9689F4EFxesfmfw 744M       20K      684M       0%        /ubs/mnt/esfmfw
eslsfwx9689F4EF           87G       87G      66M     100%      /ubs/mnt/eslsfw
/dev/md1                   15M       2.5M      11M      18%        /var
```

The Optional Labelled Device in AhsayUBS v6 will be 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](#).

2.2 The ZFS storage model

AhsayUBS v9 is implemented with ZFS v5 and ZPOOL v28. The existing ZPOOL(s) created on AhsayUBS v6 using ZPOOL v13 will not be upgraded to ZPOOL v28, only newly created ZPOOLS 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   46 0xfffffffff8020000 10d1490 kernel
 2    1 0xfffffffff812d2000 8cf0      vesa.ko
 3    1 0xfffffffff8139c000 17378     ahci.ko
 4    1 0xfffffffff813b4000 f108      mvs.ko
 5    1 0xfffffffff8c3c4000 7b68      geom_concat.ko
 6    1 0xfffffffff8c3cc000 8f60      geom_stripe.ko
 7    1 0xfffffffff8c3d5000 25ae8     geom_mirror.ko
 8    1 0xfffffffff8c3fb000 25c38     geom_raid5.ko
 9    1 0xfffffffff8c611000 221398    zfs.ko
10    1 0xfffffffff8c833000 7500      opensolaris.ko
11    1 0xfffffffff8c83b000 11150     krpc.ko
12    1 0xfffffffff8c84d000 9afc      iscsi_initiator.ko
13    1 0xfffffffff8c857000 14bd      splash_bmp.ko
```

The 'Master Storage Device' on AhsayUBS is configured as a ZPOOL with the following pool name 'eslsfwx{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 87GB "eslsfwx9689F4EF" mount as '/ubs/mnt/eslsfw'.

```
ahsayubs:/# df -h
Filesystem              Size      Used    Avail Capacity  Mounted on
/dev/md0                 170M      152M      18M      90%        /
devfs                   1.0K      1.0K        0B     100%      /dev
/dev/mirror/9689F4EFxesosfw 186M      108M      63M      63%      /ubs/mnt/esosfw
/dev/mirror/9689F4EFxesfmfw 744M       20K     684M       0%      /ubs/mnt/esfmfw
eslsfwx9689F4EF         87G      87G     66M    100%    /ubs/mnt/eslsfw
/dev/md1                 15M       2.5M     11M       18%      /var
```

For volume status and ZFS filesystem integrity checking, please refer to [Chapter 9.4 Storage](#) for details.

```
ahsayubs:/# zpool status
pool: eslsfwx9689F4EF
state: ONLINE
  scan: scrub repaired 0 in 0h42m with 0 errors on  Sun Mar  6 00:00:07
2022
config:

    NAME                                STATE        READ  WRITE CKSUM
    eslsfwx9689F4EF                     ONLINE             0      0      0
      label/9689F4EFxd00p09             ONLINE             0      0      0
    logs
      label/9689F4EFxd00p07             ONLINE             0      0      0

errors: No known data errors
```

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/9689F4EFxesosfw /ubs/mnt/esosfw ufs ro 1 1
/dev/mirror/9689F4EFxesfmfw /ubs/mnt/esfmfw ufs ro 1 1
```

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

1. /ubs/mnt/eslsfw/obsr/user
2. /ubs/mnt/eslsfw/obsr/system
3. /ubs/mnt/eslsfw/obsr/system/obs/policies
4. /ubs/mnt/eslsfw/obsr/conf
5. /ubs/mnt/esfmfw/obsr/system/obsr/webapps
6. /ubs/mnt/eslsfw/obsr/rcvshome

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.

2.3 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 start 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 14.51% of the pool: `eslsfwx9689F4EF`

```
ahsayubs:/# zpool status
pool: eslsfwx9689F4EF
state: ONLINE
scan: scrub in progress since Mon Apr 26 08:31:27 2021
      12.6G scanned out of 86.6G at 35.9M/s, 0h35m to go
      0 repaired, 14.51% done
config:

      NAME                                STATE      READ WRITE CKSUM
      eslsfwx9689F4EF                     ONLINE      0    0    0
        label/9689F4EFxd00p09             ONLINE      0    0    0
      logs
        label/9689F4EFxd00p07             ONLINE      0    0    0

errors: No known data errors
```

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.

2.4 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:/# dmesg | grep ZFS
ZFS filesystem version: 5
ZFS storage pool version: features support (5000)
ZFS filesystem version: 5
ZFS storage pool version: features support (5000)
ahsayubs:/# zpool get version
NAME                PROPERTY  VALUE      SOURCE
eslsfwx9689F4EF     version   -          default
```

```
ahsayubs:/# dmesg | tail -20
SMP: AP CPU #11 Launched!
SMP: AP CPU #13 Launched!
SMP: AP CPU #2 Launched!
SMP: AP CPU #8 Launched!
SMP: AP CPU #9 Launched!
SMP: AP CPU #4 Launched!
SMP: AP CPU #6 Launched!
SMP: AP CPU #15 Launched!
SMP: AP CPU #7 Launched!
SMP: AP CPU #12 Launched!
SMP: AP CPU #5 Launched!
random: unblocking device.
Trying to mount root from ufs:/dev/md0 []...
GEOM_MIRROR: Device mirror/9689F4EFxesgpb launched (1/1).
GEOM_MIRROR: Device mirror/9689F4EFxesosfw launched (1/1).
GEOM_MIRROR: Device mirror/9689F4EFxesfmfw launched (1/1).
ZFS filesystem version: 5
ZFS storage pool version: features support (5000)
iscsi: version 2.3.1
```

2.5 Storage Model Migration

For AhsayUBS v6 environments that 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 settings, and AhsayCBS settings; to a temporary storage device, reinstall AhsayUBS from new, then copy the data and settings from the temporary storage to the new AhsayUBS installation.

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.

3 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 5 System Requirements](#) of this document.

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 requires, e.g. SSH and system monitoring tools.

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 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 AhsayUBS 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]

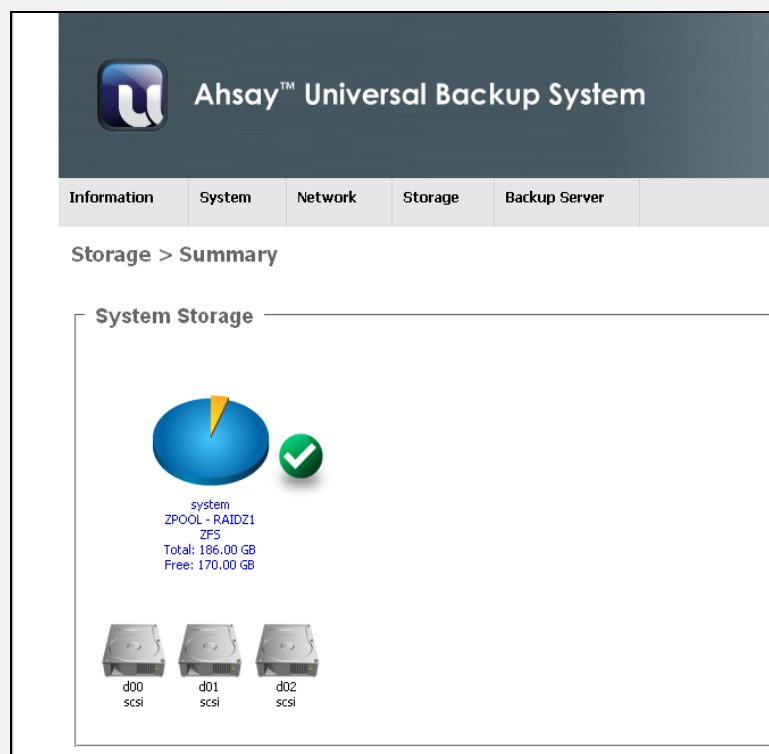
called “Optional Labelled Device” on earlier AhsayUBS versions. It is for supporting the older migrated AhsayUBS installations only and cannot be created in this version of AhsayUBS.

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.



4 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.
- If AhsayUBS is running on a VMware host, the tape backup utility is not supported.

As VMware does not support Tape Drives connected directly to ESXi 5.x or above

For more information please refer to this article <https://kb.vmware.com/s/article/2007904>.

- Expansion of existing disk volumes is not supported running on either software or hardware backed RAID. Doing so will destroy the volume and cause permanent data loss.

In case you have accidentally expanded an existing disk volume you can try the steps discussed in [Appendix N](#) to repair it. However, even though the damaged volume is repaired there may still be significant data loss.

- The existing ZPOOL(s) created on AhsayUBS v6 using ZPOOL v13 will not be upgraded to ZPOOL v28, only newly created ZPOOLS will be applied with the ZIL (ZFS Intent Log).
- For AhsayUBS v6 environments who wish to migrate from UFS to ZFS storage model, only a manual migration method is available. For more information kindly refer to [Chapter 2.5 Storage Model Migration](#).

5 System Requirements

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

5.1 Backup System Requirements

The selected machine must meet the following requirements:

- CPU that is FreeBSD 11.2 i386 / amd64 compatible.

For the list of FreeBSD 11.2 i386 / amd64 compatible processors, please refer to [Appendix A](#).

- 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 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 sufficient RAM as ZFS volumes require relatively large amount of memory.
 - i. If an AhsayUBS server will be used for agent-based backup jobs, it is recommended to install at least 8 GB RAM.
 - ii. If an AhsayUBS server will be used for agentless backup jobs, it is recommended to install at least 32 GB RAM.

The actual amount of RAM required will be dependent on the size of the ZFS volume, the number of concurrent backup jobs running and the amount of I/O activity on the ZFS volume.

5.2 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...

5.3 AhsayUBS Processor Configuration

AhsayUBS supports up to a maximum of 256 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:

$$(\text{No. of sockets}) * (\text{No. of cores per processor}) * (\text{Hyper Threading})$$

5.4 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.

5.5 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](#).

5.6 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. For more information kindly refer to [Rebuild Degraded Storage](#) for instructions on how to rebuild the device.

6 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 on VMware, you may skip this deployment section.

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.

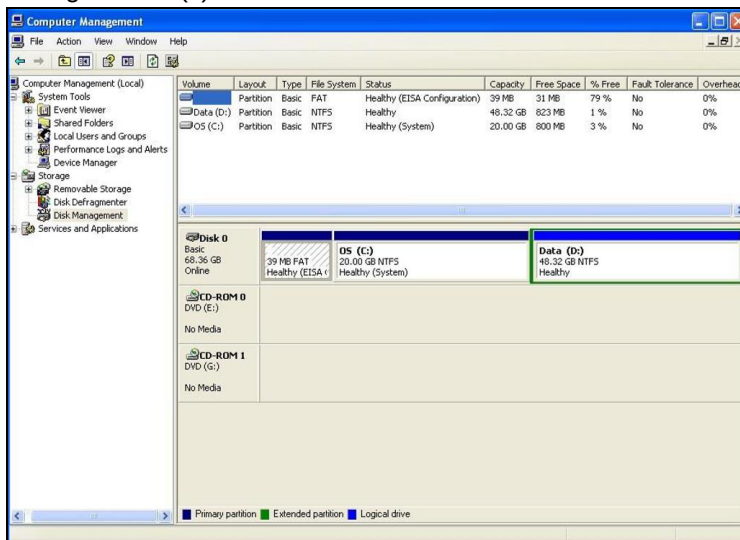
Step 1: Preparation

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

1. Right click on **My Computer** on the desktop and select **Manage**.

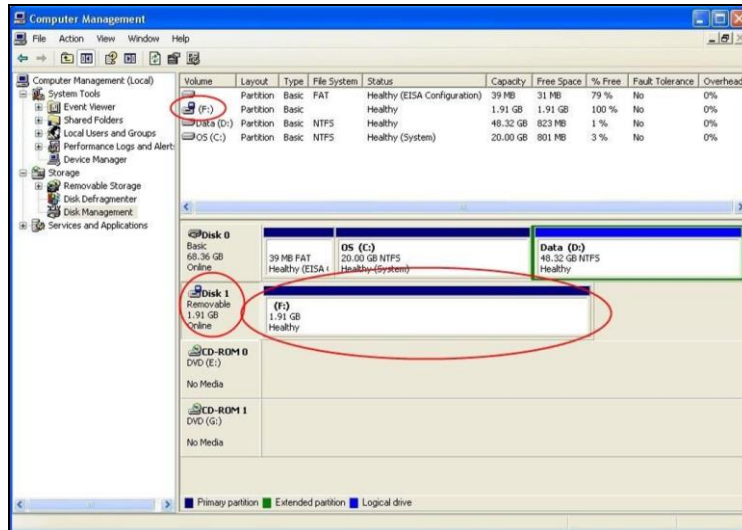


2. Click on **Disk Management** from the Computer Management MMC console. All connected storage device(s) will be listed and marked as Disk *.



3. 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.

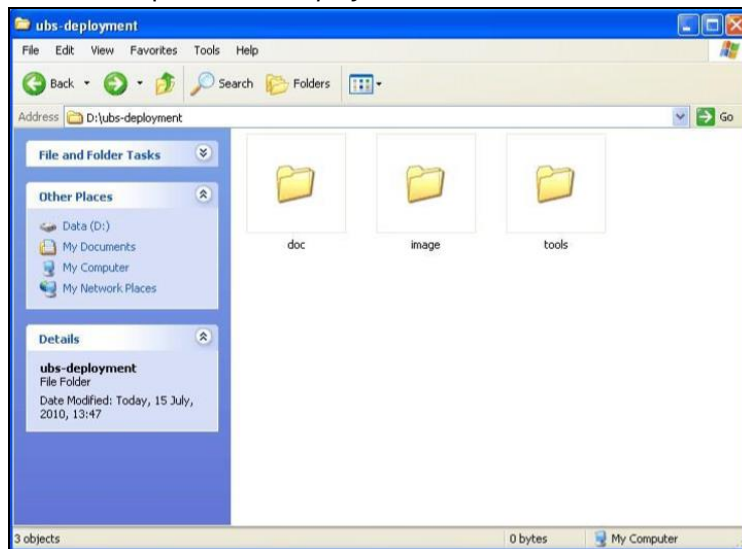
The new disk should be shown in the Computer Management console. In our example, it is shown as Disk 1 with a drive letter “F”.



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.

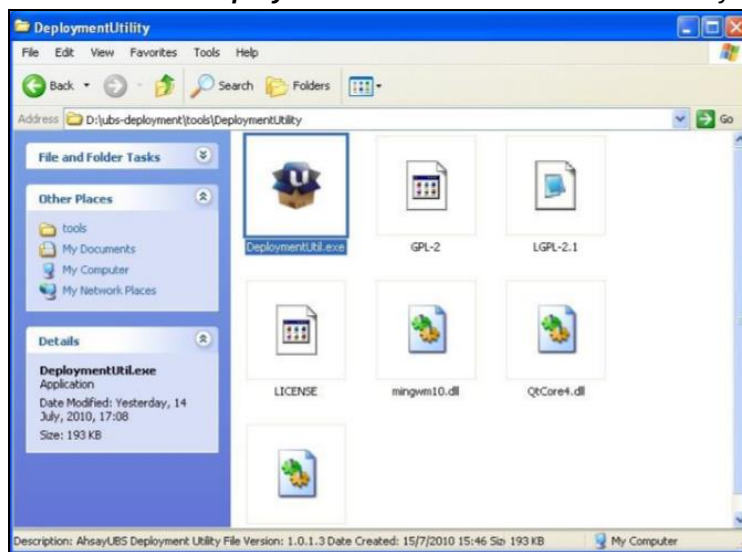
In this example, *D:\ubs-deployment*.



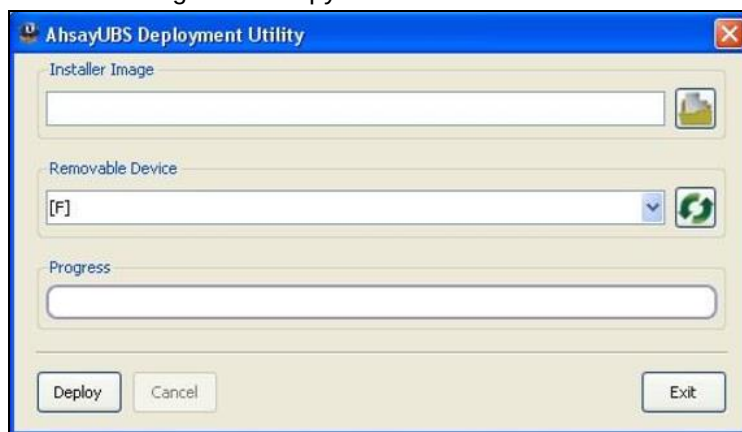
The deployment program is stored in Deployment Utility folder under `%UBS_DEPLOYMENT_DIR%\tools\`.

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

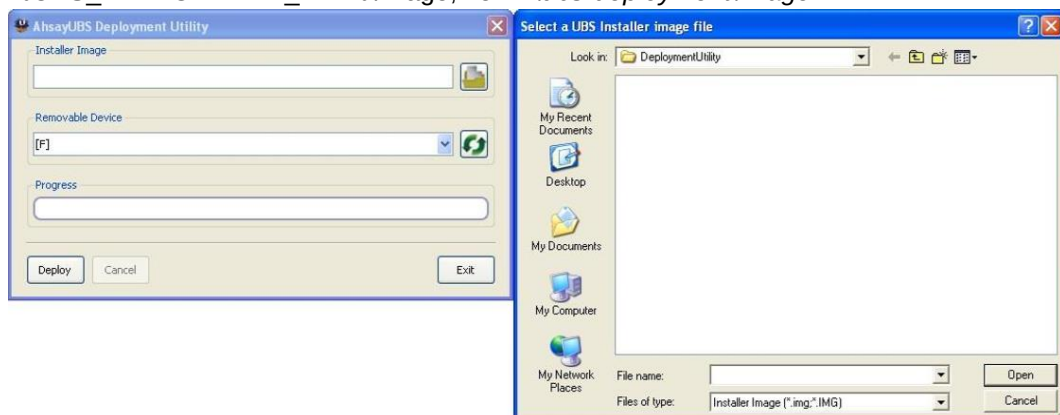
2. Double click the **DeploymentUtil.exe** icon to launch the utility.



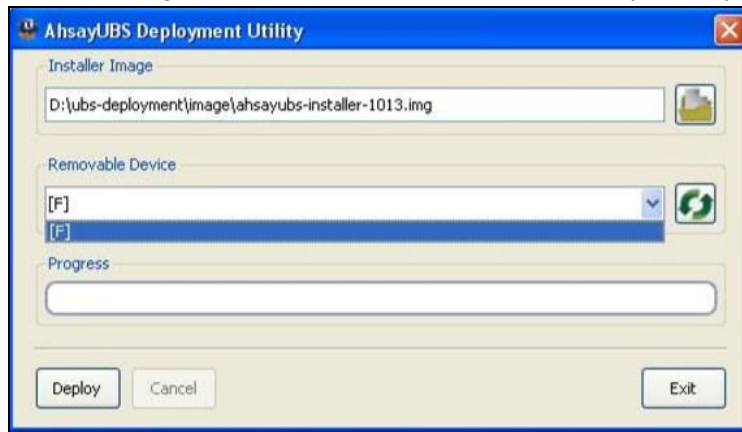
3. After launching the Deployment Utility software, click on the  from the "Installer Image" to select the image file to copy.



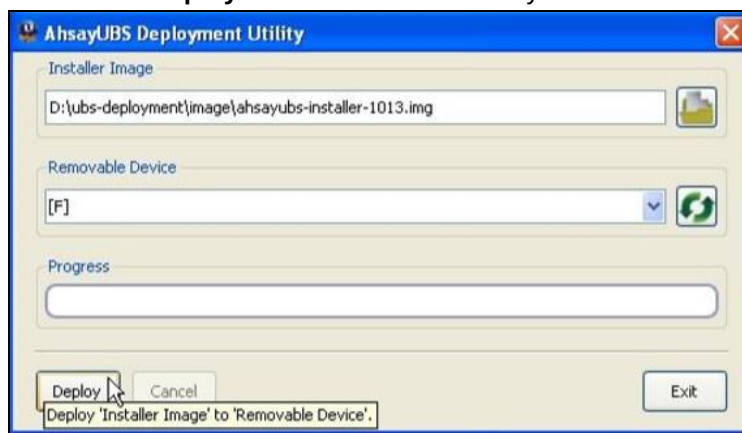
4. In the popup windows, select the AhsayUBS installer image: ahsayubs-installer-*.img from %UBS_DEPLOYMENT_DIR%\image, i.e. *D:\ubs-deployment\image*.



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



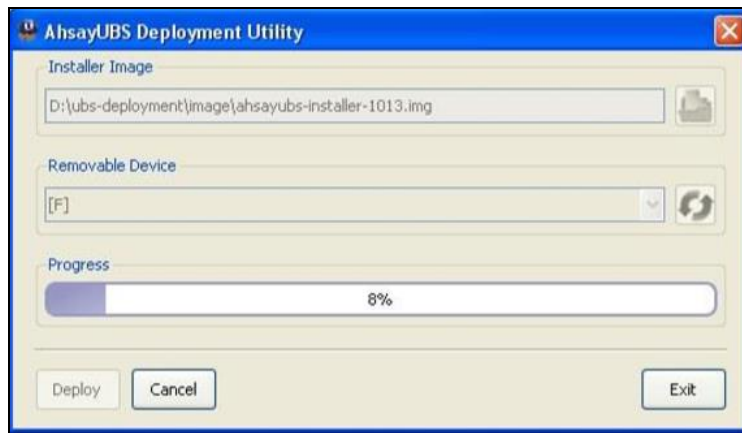
6. Click on the **Deploy** button to write the AhsayUBS installer image to the selected device.



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 the wrong image file/drive, please click the **No** button to abort the process and repeat steps 1-7 again.



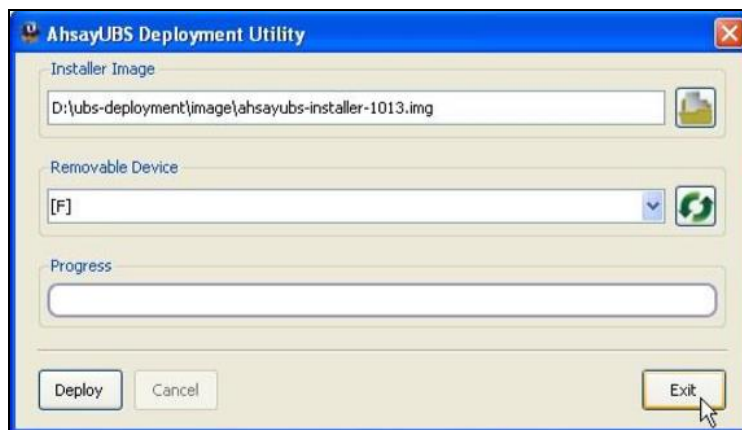
8. If you clicked the Yes button in step 7, the software will start writing the AhsayUBS image to your removable storage device. The write progress percentage will be shown in the Progress Bar. Please wait until all bytes are written to the selected removable storage device.



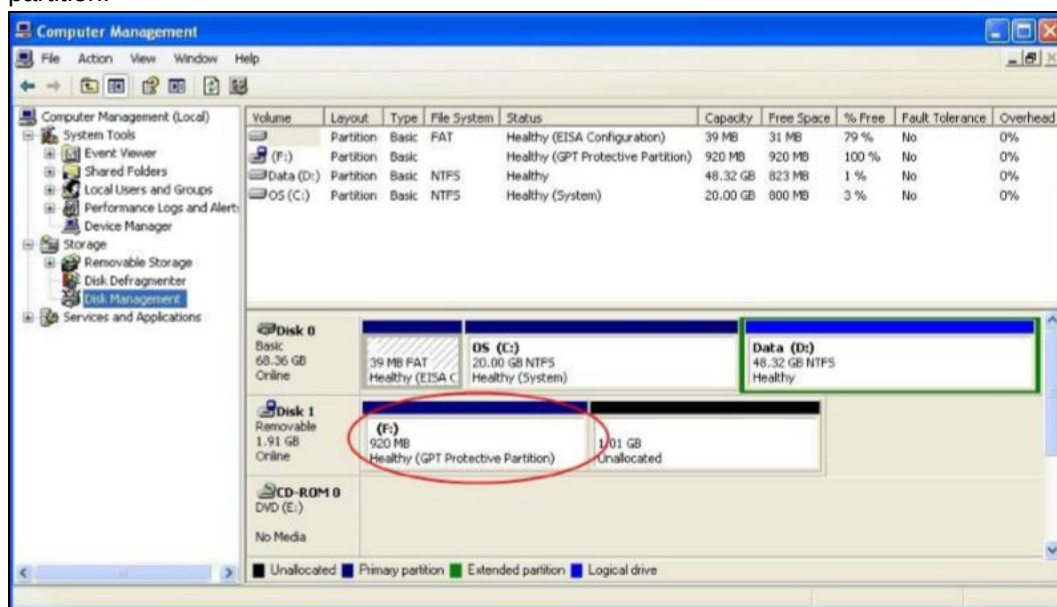
9. When it has completed the writing process, the following message will be shown on the screen.



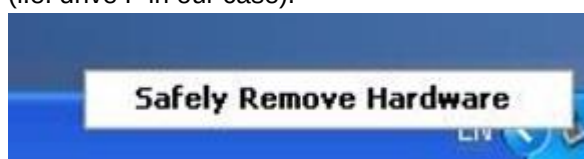
10. The deployment process is now completed. You may close the software by clicking the **Exit** button.



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 clicking 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.



7 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.

7.1 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.
2. Virtual Machine installation: Download the AhsayUBS ISO from https://www.ahsay.com/jsp/en/downloads/ahsay-downloads_latest-software_ahsayubs.jsp.
3. The installation media is connected to the target machine.
4. Shutdown the target machine.
5. Power on the machine and enter the BIOS settings page. (Please refer to the motherboard manual for the instruction to enter BIOS settings page.)
6. Configure the boot priority of the AhsayUBS machine to boot from the USB removable storage device, or ISO.
7. Save the settings and exit the BIOS.
8. Reboot the machine and boot up from the installer device.

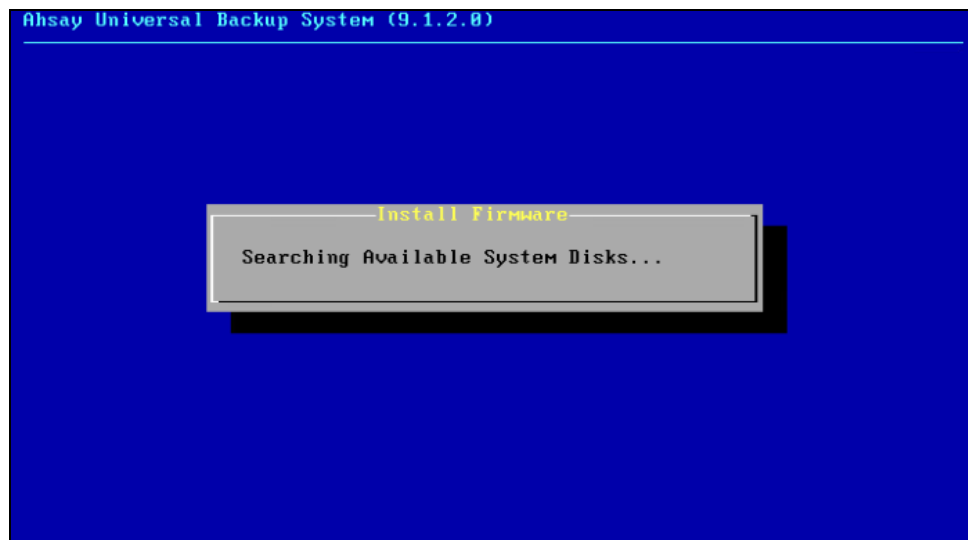
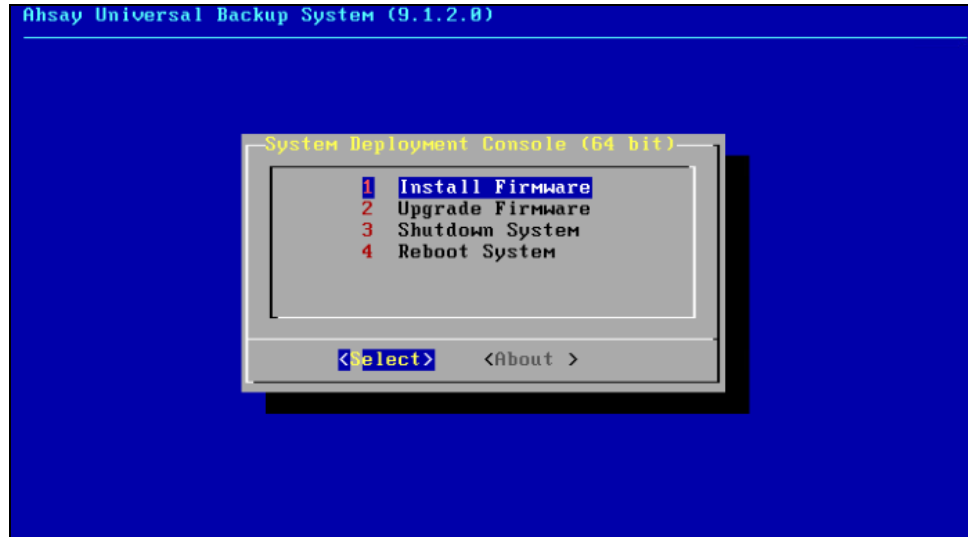
NOTE

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

7.2 Installing AhsayUBS Firmware (New Install)

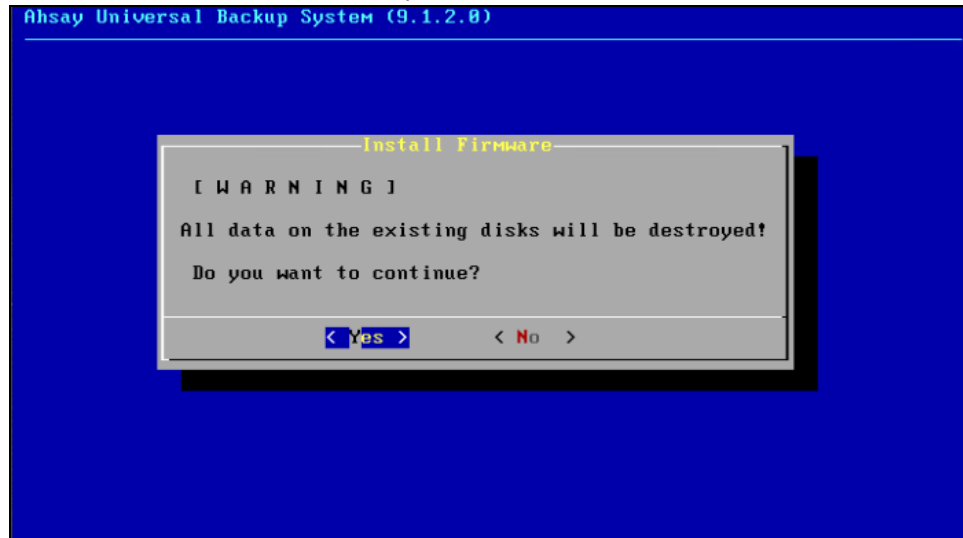
1. After booting up from the installer device, the main menu will be shown.

Select **1** to start the *New Installation* of the AhsayUBS firmware.



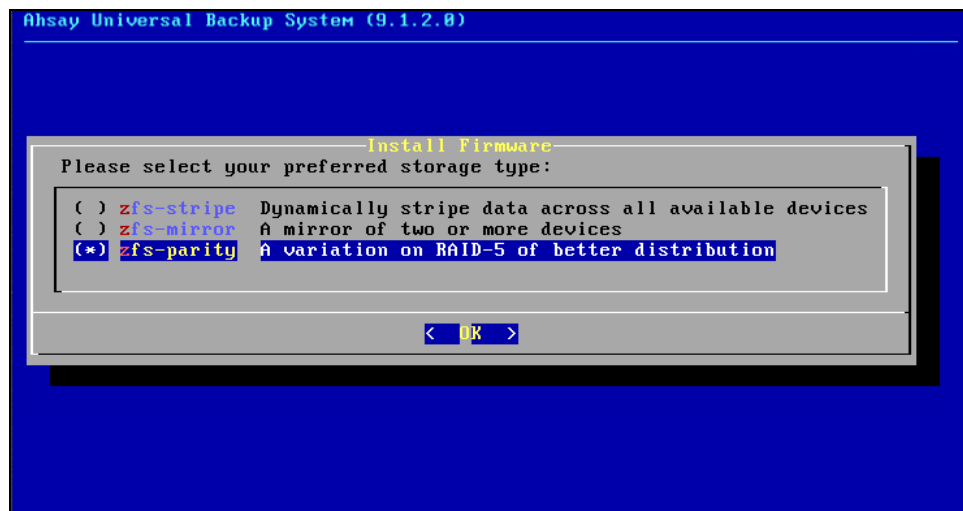
2. A warning message will be shown on the screen.

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)

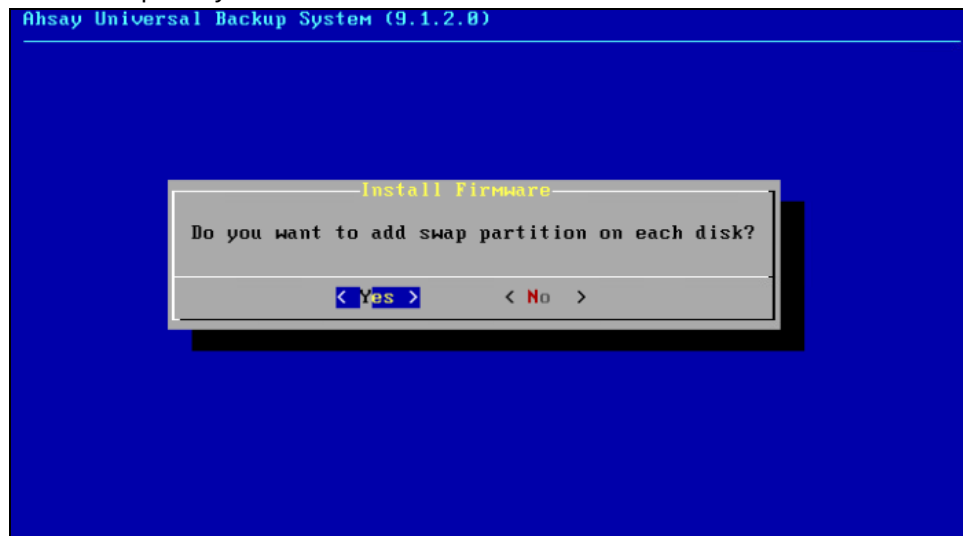
zfs-mirror = RAID1 (data loss if more than one drive failure)

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.

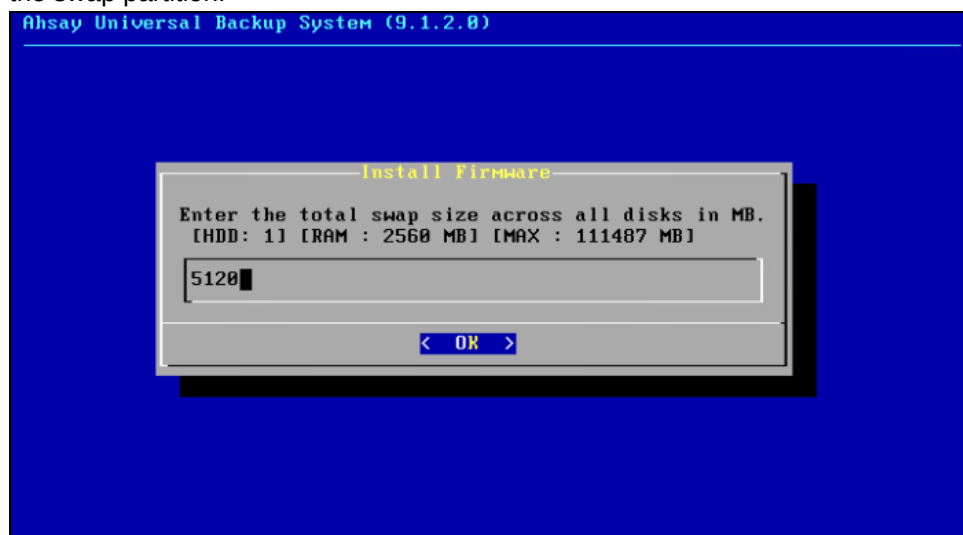
Tip: Swap Partitions act as the virtual memory in the system. If there is not enough physical memory in the machine, the data will be swapped to the swap partition to store it temporarily.



It is strongly recommended to create a swap partition for AhsayUBS. As a rule of thumb, the swap partition should be about double the size of physical memory (RAM). Systems with minimal RAM may perform better with more swap. Configuring too little swap can lead to inefficiencies in the VM page scanning code and might create issues later if more memory is added.

For details refer to the [FreeBSD Guide on Designing the Partition Layout](#).

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

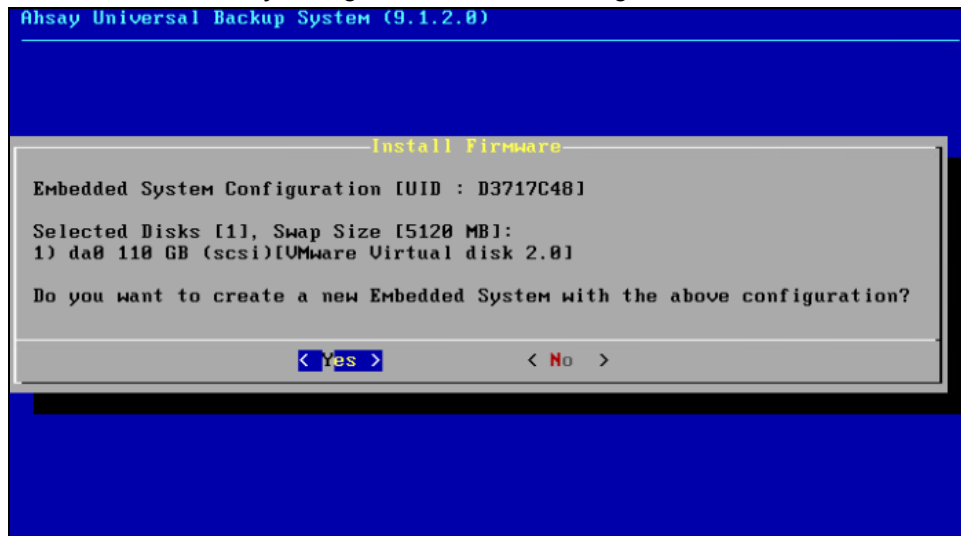


NOTE

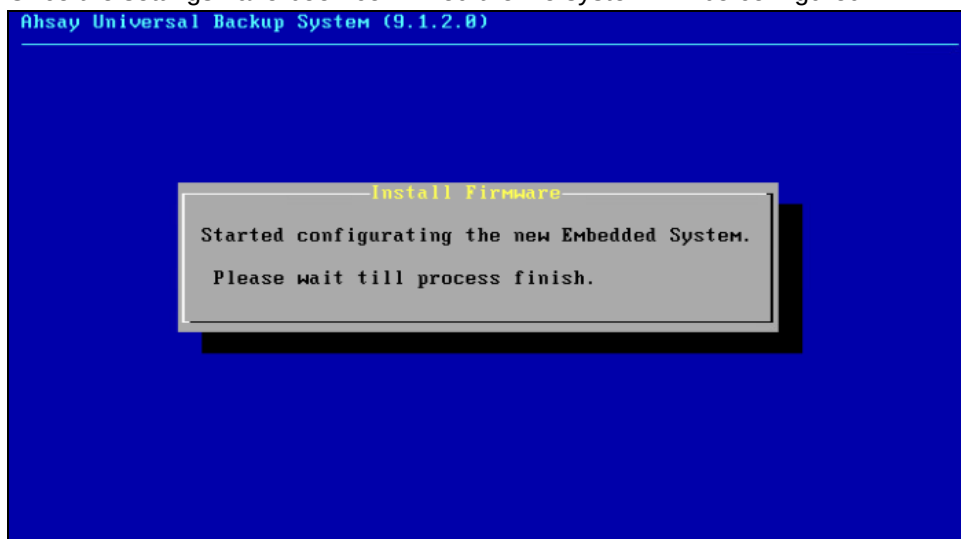
The total swap file size should be at least double the size of the physical memory installed on the AhsayUBS machine.

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

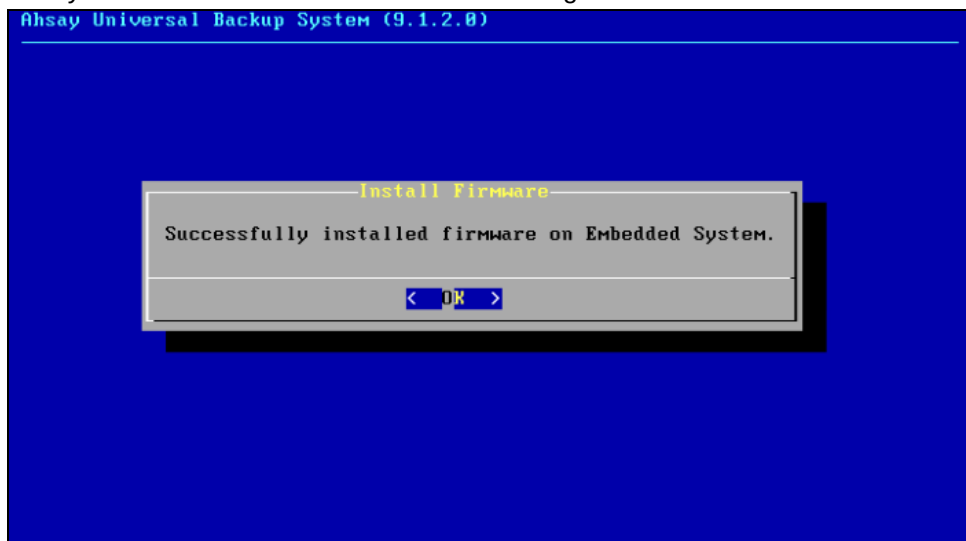
Select **Yes** to accept these settings and continue with the installation, select **No** if you would like to make any changes to the current configuration.



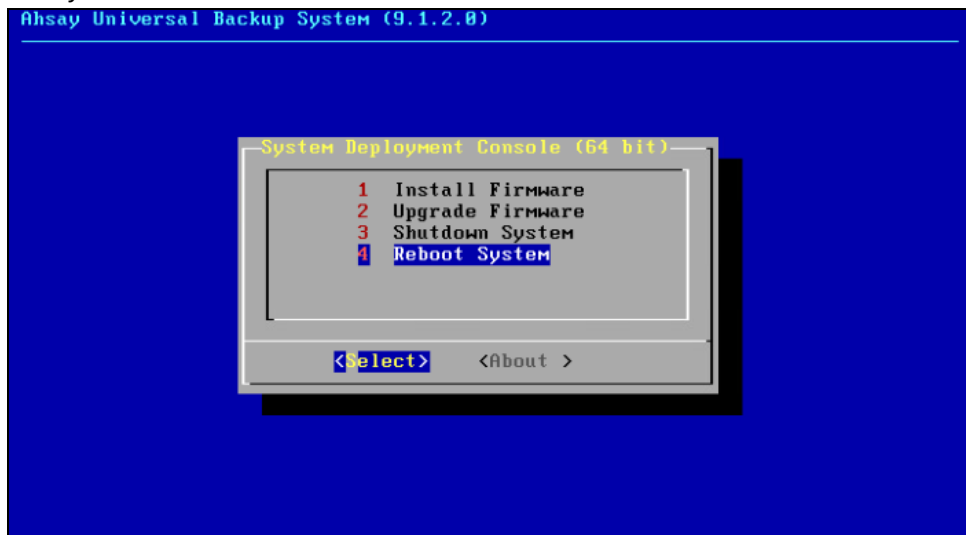
7. Once the settings have been confirmed the file system will be configured.



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



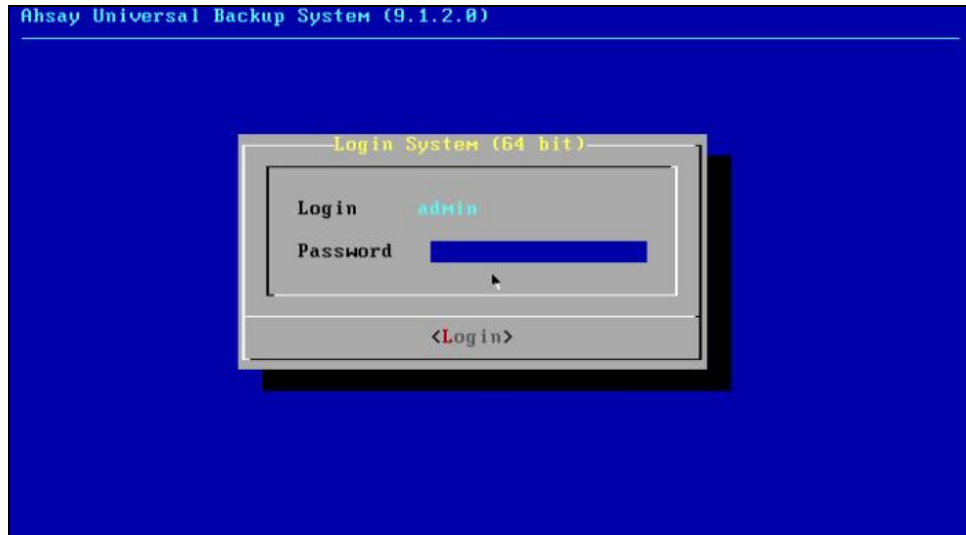
9. Remove the installation media and press **OK**. Then select option **4** to restart AhsayUBS.



10. After the system has restarted, logon to AhsayUBS using the default credentials:

User ID: *admin*

Password: *ahsayubs*



11. Please refer to [Post-Installation](#) to complete the installation.

7.3 Upgrading AhsayUBS Firmware

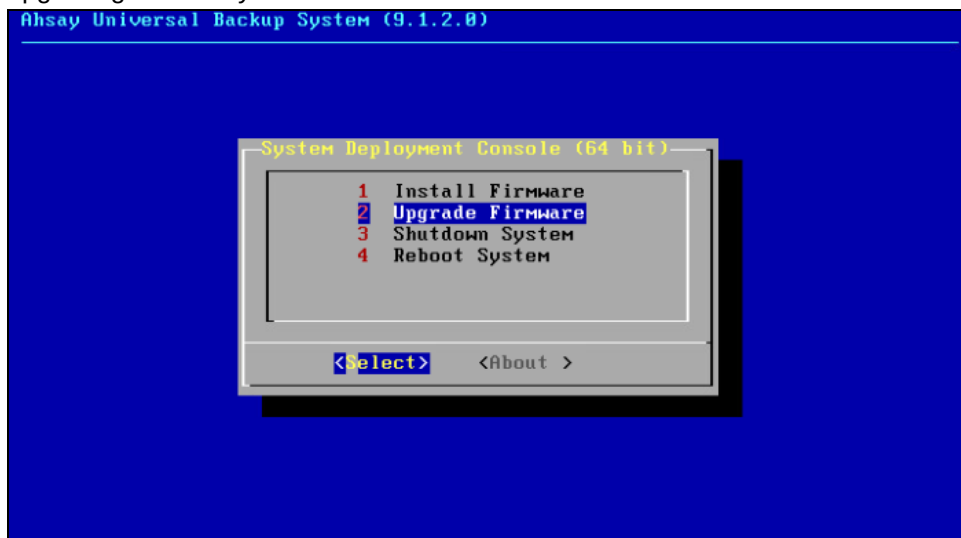
Please use the upgrade option if AhsayUBS is previously installed on the machine, and to preserve existing configuration and data:

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, please refer to [Ch. 8.1.7 Backup System Configuration](#) on how to do this.

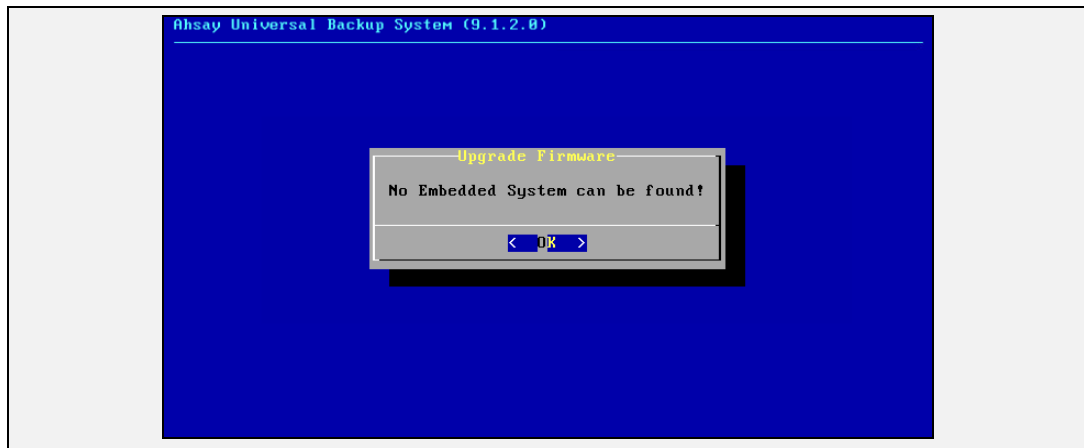
Important:

- Upgrade to AhsayUBS 9 cannot downgrade or rollback to earlier AhsayUBS v6, v7 or v8 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.

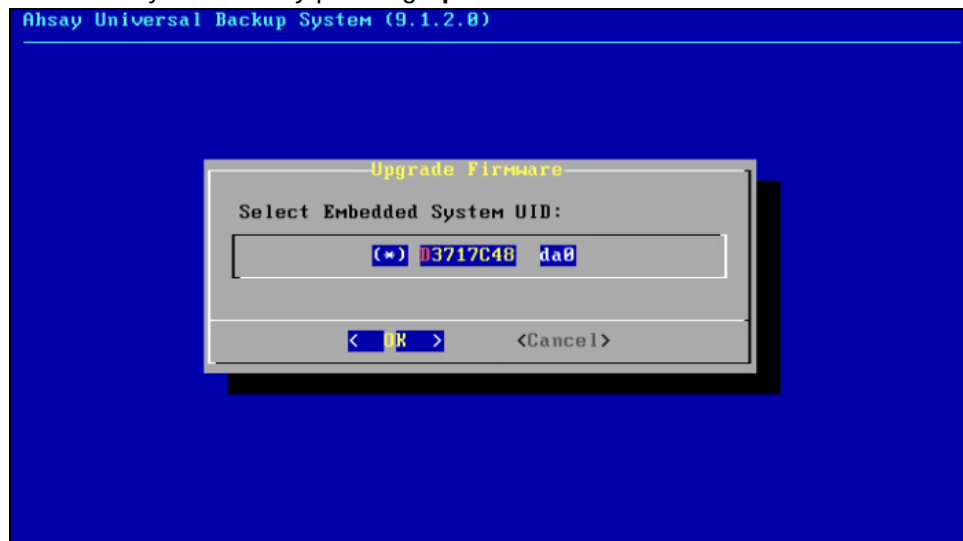


NOTE

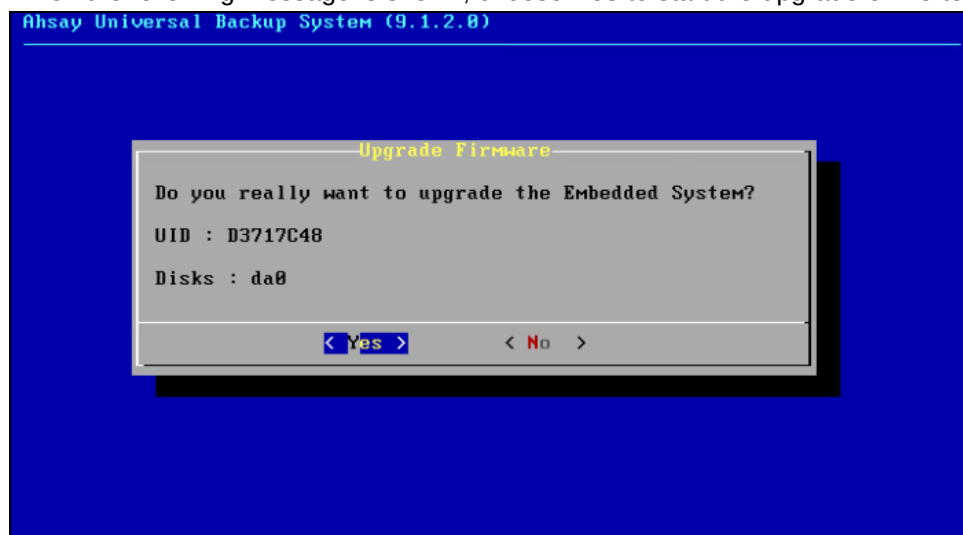
If there are no embedded systems found inside the machine, please use the option **Install** instead of Upgrade. For the detailed steps to install, please refer to [Installing AhsayUBS Firmware \(New Install\)](#).



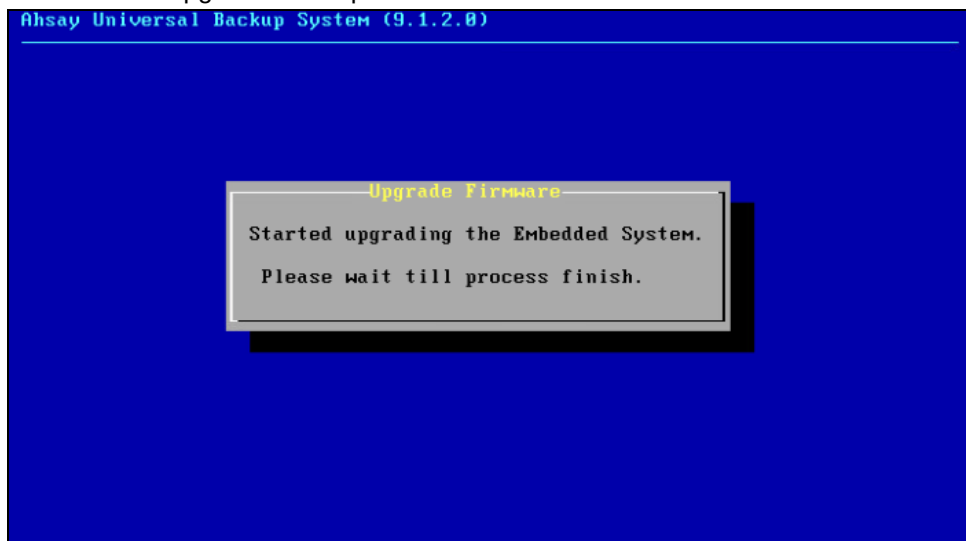
2. Select the system UID by pressing **Space** bar. Choose **OK** to continue.



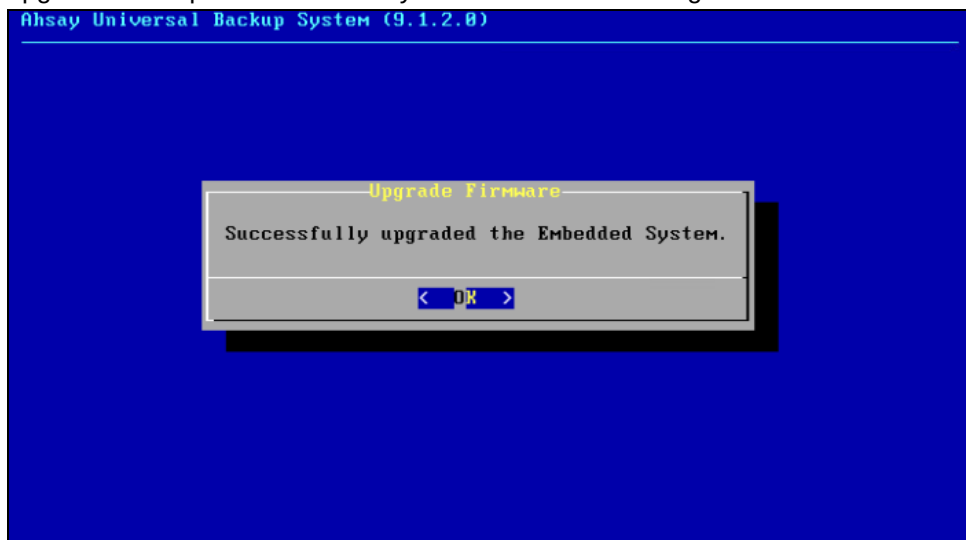
3. When the following message is shown, choose **Yes** to start the upgrade or **No** to abort.



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.

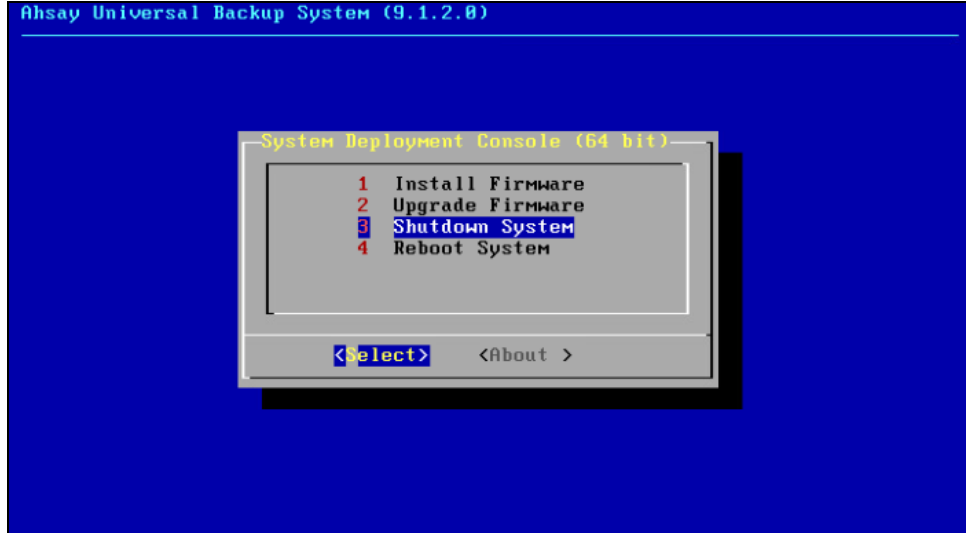


6. Refer to [Post-Installation](#) to complete the upgrade process.

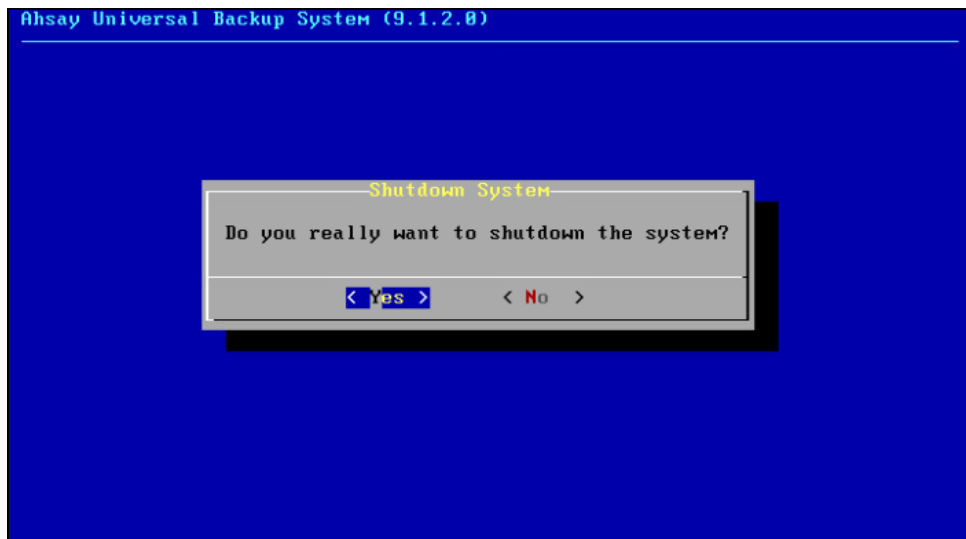
7.4 Post-installation

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 to the System Management Console with the administrator password.
8. Configure AhsayUBS with your preferred network settings. (refer to [Configure Network Settings](#))

(For software-RAID Configuration Only)

9. Login the AhsayUBS Web Administration Interface (web port 8080).
10. Go to page **Storage > Summary** and wait for the status of the System Storage to change 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.

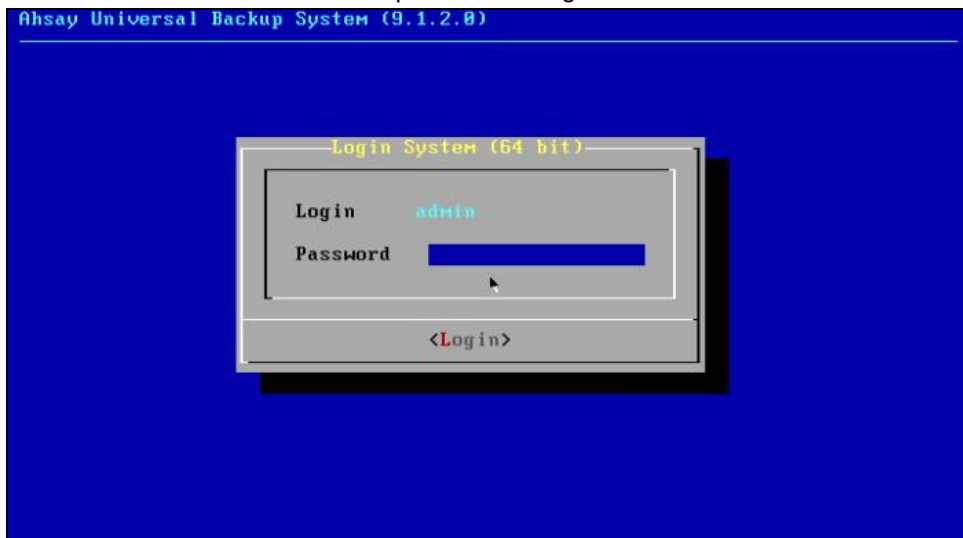
8 Basic AhsayUBS Firmware Configuration

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

8.1 System Console

8.1.1 Login to System Console

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



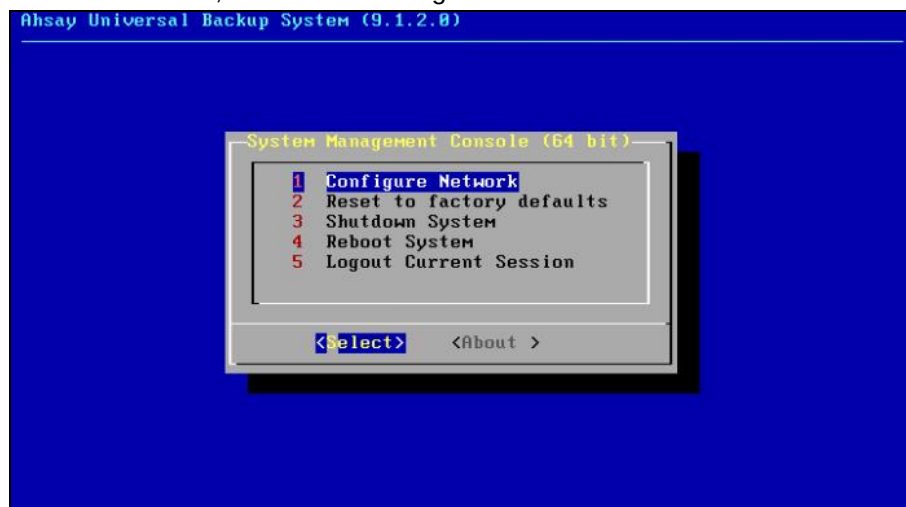
The default login credentials for AhsayUBS console are:

Login: admin

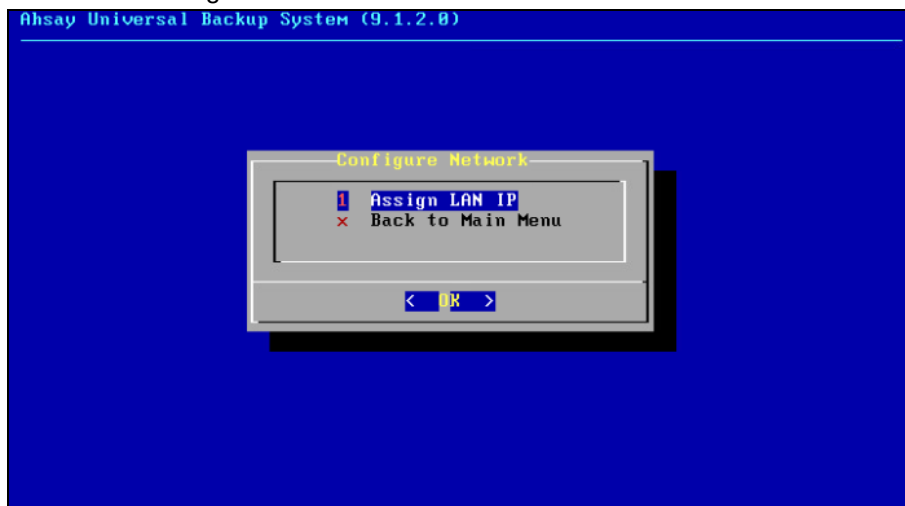
Password: ahsayubs

8.1.2 Configure Network Settings

1. In the main menu, choose **1** to configure the network.



2. Choose **1** to assign a LAN IP to the device.



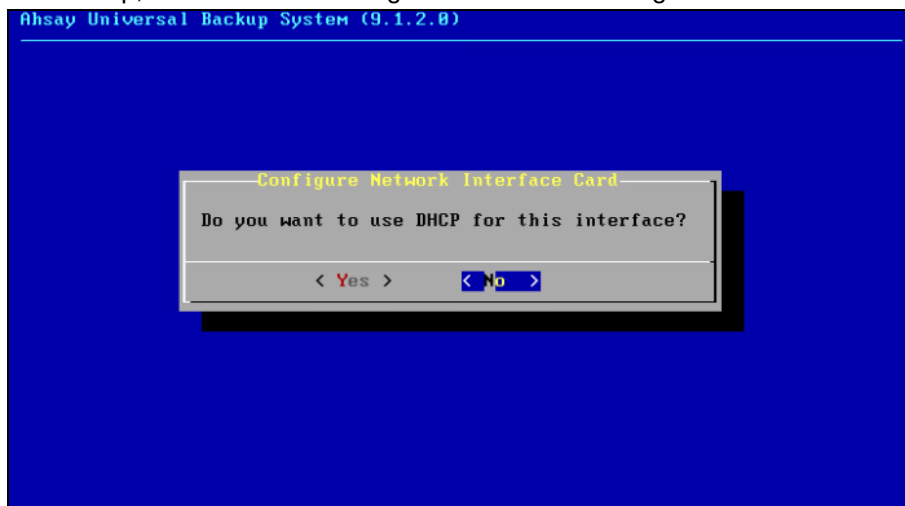
Select the method for setting up the IP Address on the device. There are two methods:

- **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.
- **Static** – stands for manual setup. You need to enter the network settings manually.

NOTE

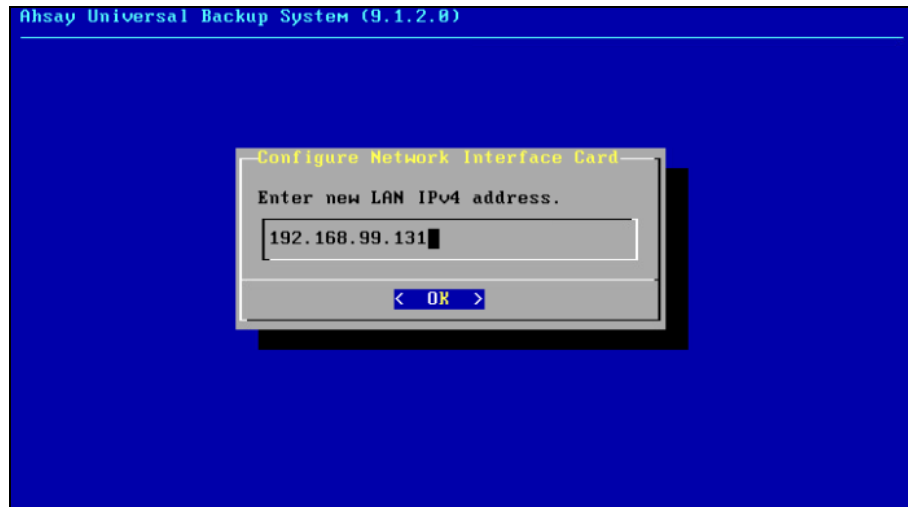
You can press the **Esc** key to go back to the main menu if you selected the wrong option.

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

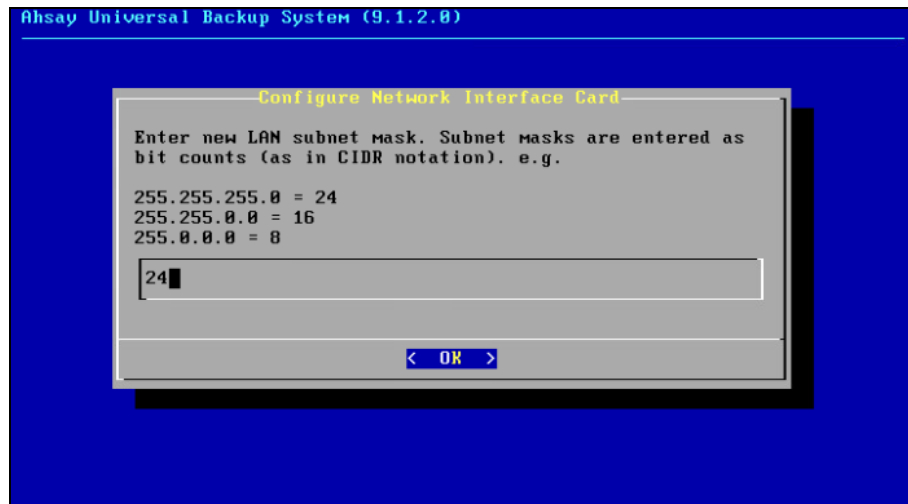


The following steps will only be displayed when No is chosen in step 3:

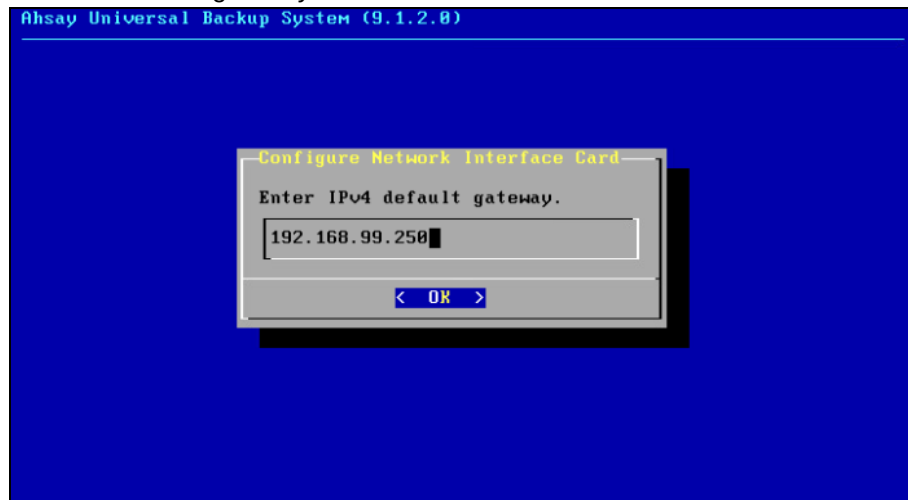
- i. Enter the IPv4 IP address and choose **OK** to continue.



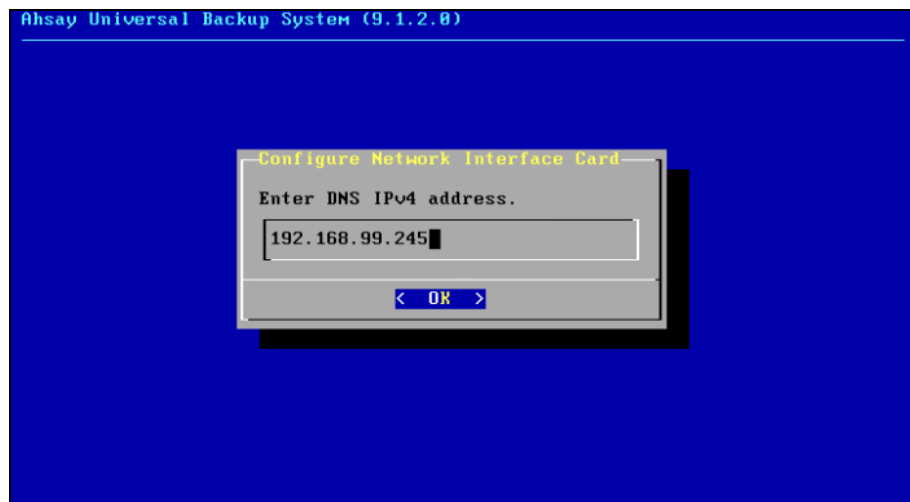
- ii. Enter the subnet and choose **OK** to continue.



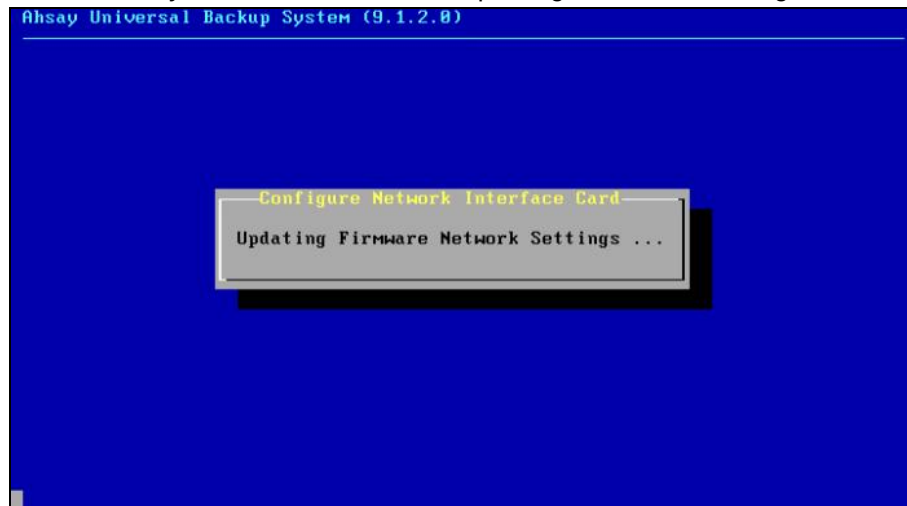
- iii. Enter the default gateway address and choose **OK** to continue.



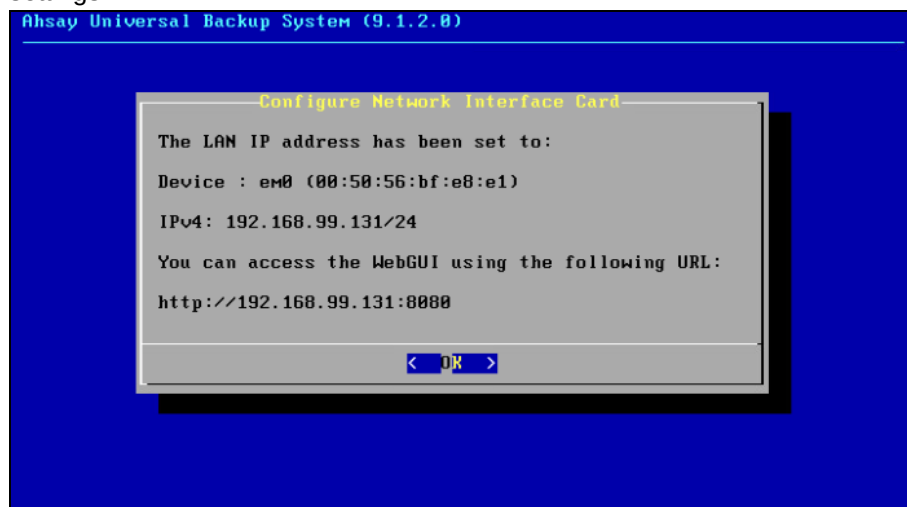
- iv. Enter the DNS address and choose **OK** to continue.



4. Wait for AhsayUBS Firmware to finish updating the network configuration.



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



In the verification, choose **OK** to go back to the main console menu.

8.1.3 Login System

Launch your browser and type the AhsayUBS WebAdmin's IP address and AhsayUBS WebAdmin service port in 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 Login Name and Password. The default login credentials for AhsayUBS WebAdmin are:

Login Name: admin

Password: ahsayubs



Ahsay™ Universal Backup System

Language

Login Name

Password

Login

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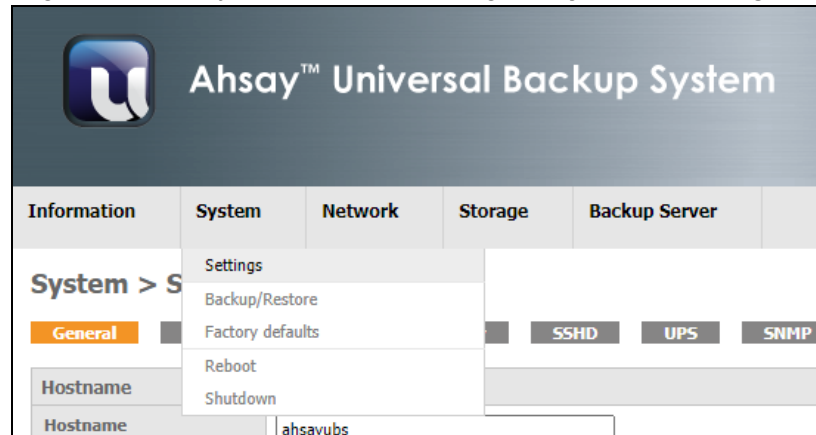
NOTE

- When logging in using a web browser, you can only use admin for the Login Name. But if using a ssh, you may use either root or admin for the Login Name.
- AhsayUBS WebAdmin console will automatically logout after 10 minutes of inactivity.

8.1.4 System Time and Time Zone Setup

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

1. Login to the AhsayUBS WebAdmin and go to **System > Settings > General**.



2. You can find the “Time” settings at the bottom of the page.

3. Select the appropriate time zone from the “Time zone” drop down menu.

4. After 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.

The screenshot shows the 'Time' configuration window. The 'Time zone' is set to 'Asia/Hong_Kong'. The 'System time' field is empty, and a calendar icon is visible. A calendar popup is displayed, showing the month of March 2022. The date '10' is selected. The time is set to '4:39 PM'. The 'Enable NTP' checkbox is unchecked. A 'Save' button is at the bottom left.

Time

Time zone: Asia/Hong_Kong
Select the location closest to you.

System time: [Empty field] [Calendar icon]
Please use the icon to select the system time.

Enable NTP: ☐ Use the specified NTP server.

Save

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The screenshot shows the 'Time' configuration window. The 'Time zone' is set to 'Asia/Hong_Kong'. The 'System time' field now displays '03/10/2022 16:39'. The 'Enable NTP' checkbox is unchecked. A 'Save' button is at the bottom left.

Time

Time zone: Asia/Hong_Kong
Select the location closest to you.

System time: 03/10/2022 16:39
Please use the icon to select the system time.

Enable NTP: ☐ Use the specified NTP server.

Save

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

The screenshot shows the 'Time' configuration window. The 'Time zone' is set to 'Asia/Hong_Kong'. The 'System time' field displays '03/10/2022 16:39'. The 'Enable NTP' checkbox is checked. The 'NTP time server' field displays 'pool.ntp.org'. The 'Time update interval' field displays '300'. A 'Save' button is at the bottom left.

Time

Time zone: Asia/Hong_Kong
Select the location closest to you.

System time: 03/10/2022 16:39
Please use the icon to select the system time.

Enable NTP: ☒ Use the specified NTP server.

NTP time server: pool.ntp.org
Use a space to separate multiple hosts (only one record server if you enter a host name here!)

Time update interval: 300
Minutes between network time sync.

Save

6. 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	03/10/2022 16:39 Please use the icon to select the system time.
Enable NTP	☒ Use the specified NTP server.
NTP time server	stdtime.gov.hk Use a space to separate multiple hosts (only one req server if you enter a host name here!)
Time update interval	300 Minutes between network time sync.
Save	

7. Finally, click the **Save** button to apply the changes.

NTP time server	stdtime.gov.hk Use a space to separate multiple hosts (only one req server if you enter a host name here!)
Time update interval	300 Minutes between network time sync.
Save	

8.1.5 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:

1. Login to the AhsayUBS WebAdmin and go to **System > Settings > Password**.

Information System Network Storage Back

System > Settings > Password

General Password Email Proxy SSHD

Password

Old password

Password

(Confirmation)

If you want to change the password for accessing t

Save

2. Fill in the correct values in the appropriate fields.

System > Settings > Password

General Password Email Proxy SSHD

Password

Old password

Password

(Confirmation)

If you want to change the password for accessing t

Save

WARNING

The new password should have a maximum of 15 characters. Anything greater may result in access problems for both web console and system console.

3. Click the **Save** button to update the new password.

The screenshot shows a 'Password' form with two input fields: 'Old password' and 'Password'. The 'Password' field has a '(Confirmation)' label next to it. Below the fields is a 'Save' button. A message at the bottom reads: 'If you want to change the password for accessing the WebAdmin, enter it here twice.'

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

The screenshot shows the AhsayUBS WebAdmin interface. The top header includes the Ahsay logo, the text 'Ahsay™ Universal Backup System', and a language dropdown set to 'English'. A 'Logout' button is highlighted with a red box. Below the header is a navigation bar with tabs: 'Information', 'System', 'Network', 'Storage', and 'Backup Server'. The main content area shows the breadcrumb 'System > Settings > Password' and a sub-tab bar with 'General', 'Password', 'Email', 'Proxy', 'SSH', 'UPS', 'SNMP', and 'sysctl.conf'. A message box states: 'The changes have been applied successfully.' Below this is the same password change form as in the previous screenshot, with a 'Save' button at the bottom.

NOTE

Once you have changed the default AhsayUBS WebAdmin password, keep a record of your new password as there is no way to recover it once lost/forgotten.

8.1.6 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 following:

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.

System > Settings > Email > Settings

General **Password** **Email** **Proxy** **SSHD** **UPS**

Settings **Test**

General Email Settings

Outgoing mail server	127.0.0.1 Outgoing SMTP mail server address, e.g. smtp.mycorp.com.
Port	25 The default SMTP mail server port, e.g. 25 or 587.
Security	None
Authentication	☐ Enable SMTP authentication.
From email	admin@mycompany.com Your own email address.
To email	 Destination email address. Separate email addresses by semi-colon.

Save General Email Settings

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** button 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

SSHD

Settings

Test

Test Email Settings

Subject	System Email Test Subject of the test email.
Email Content	Test email. Email Content

Save test email settings

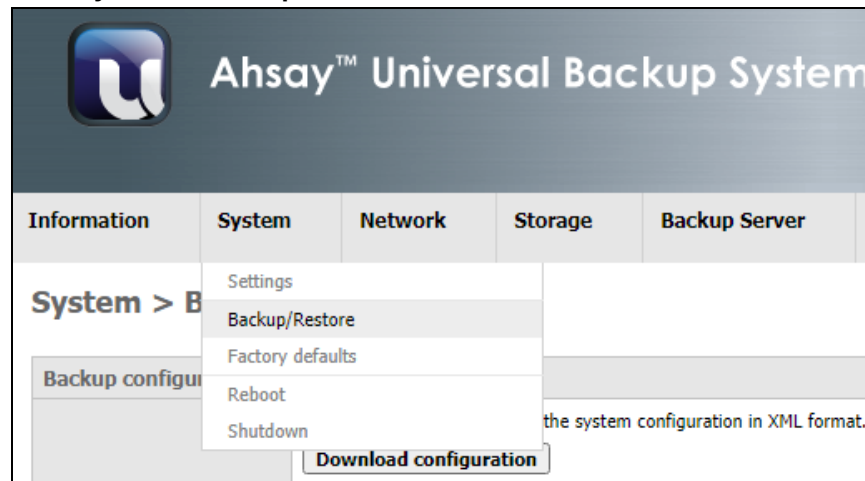
Send test email to [admin@mycompany.com]

8.1.7 Backup System Configuration

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

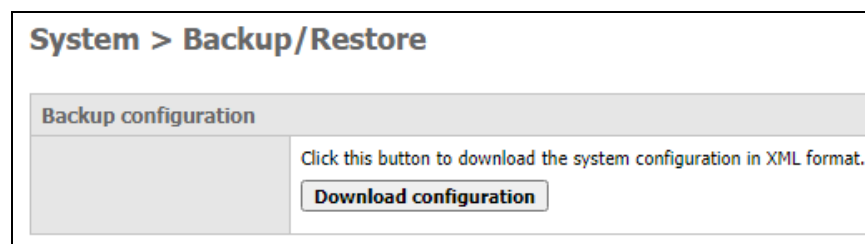
AhsayUBS provides a feature to export the system settings to an XML file.

1. Click **System > Backup/Restore**



2. Click the **Download configuration** button to save the current settings as an 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.

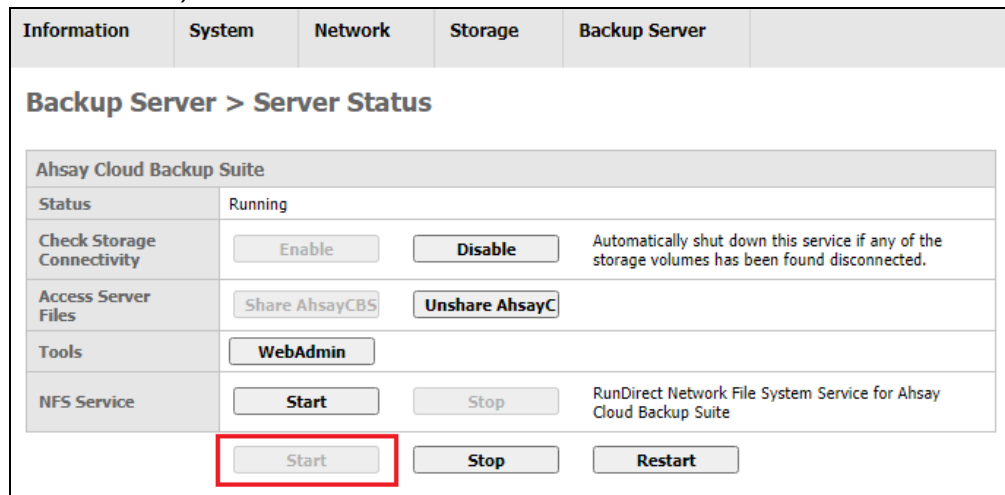
8.2 Backup Server Configuration

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

8.2.1 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 AhsayCBS 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.

8.2.2 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 first time login, you will be asked to change the password before you can proceed.

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

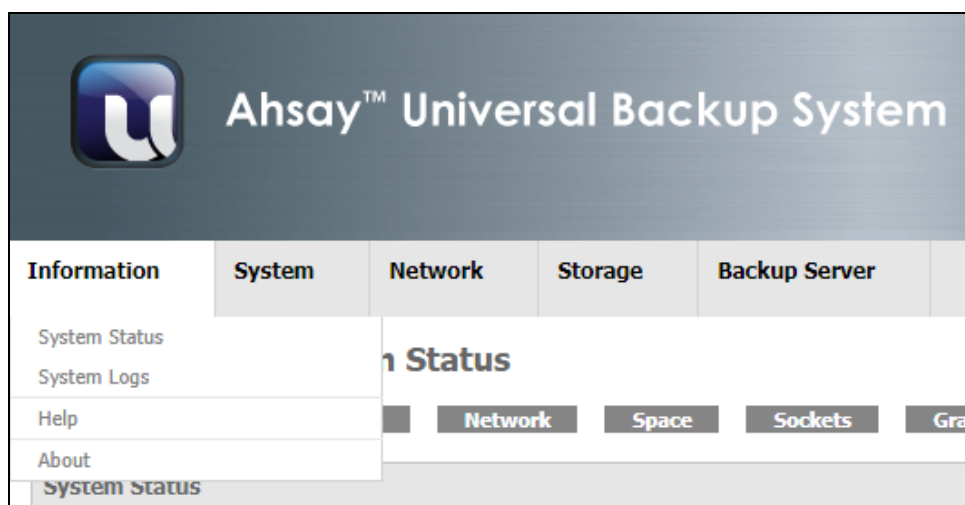
9 Advanced Configuration for AhsayUBS Firmware

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

9.1 Information

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

When the mouse is pointed over the word “Information” in the menu bar, the following menu will be shown:



The **Information** menu has been further divided into 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)

9.1.1 System Status

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

System Status

Information	System	Network	Storage	Backup Server	
Information > System Status					
System Status Processes Network Space Sockets Graph UPS					
System Status					
Name	Ahsay Universal Backup System				
Version	9.1.2.0 (built on Wed Feb 23 21:54:06 HKT 2022)				
OS Version	FreeBSD 11.2-RELEASE (revision 199506)				
Platform	amd64 on Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz x 2 (2095MHz)				
System UID	A9B95319				
Hostname	ahsayubs.local				
Date	Fri Mar 4 09:32:29 UTC 2022				
Uptime	2 days, 07:56				
Last config change	Fri Mar 4 9:32:20 UTC 2022				
Load averages	0.04, 0.03, 0.00 [Show process information]				
CPU usage	0%				
Memory usage	24% of 2363MB				
Swap usage	0% of 5120MB Device: /dev/label/A9B95319xd00p03 Total: 5120M Used: 5120M Free: 5120M				
Disk space usage	1% of 100GB /ubs/mnt/eslsfw Total: 100G Used: 1.0G Free: 99G				

The **System Status Information** table provides a summary about the system status. The table includes:

- **Name:** The name of the product. i.e. AhsayUBS
- **Version:** The version number and built time of the AhsayUBS Firmware.
- **OS Version:** The OS name and its version in the AhsayUBS.
- **Platform:** Type of CPU and its speed in the AhsayUBS.
- **System UID:** The ID of the AhsayUBS. The ID will be different with each installation of AhsayUBS.
- **Hostname:** The hostname of the 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 saved your settings in the 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 the AhsayUBS.
- **CPU usage:** Actual CPU usage now in percentage in the AhsayUBS.
- **Memory usage:** The percentage of memory in use with respect to the physical memory in the AhsayUBS.
- **Swap usage:** Provided swap path and its usage information in each of the swap partitions in the AhsayUBS. The swap space acts as the virtual memory, it allows the AhsayUBS to store extra data in the swap space if there is not enough physical memory. 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 the 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.

Processes

The **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

System Status

Processes

Network

Space

Sockets

Graph

UPS

Processes information

last pid: 27782; load averages: 0.02, 0.09, 0.07 up 10+20:58:26 06:34:45

19 processes: 1 running, 18 sleeping

Mem: 11M Active, 64M Inact, 414M Wired, 12M Buf, 3280M Free

ARC: 157M Total, 144M MFU, 9418K MRU, 32K Anon, 1522K Header, 1751K Other

114M Compressed, 656M Uncompressed, 5.76:1 Ratio

Swap: 8192M Total, 8192M Free

PID	USERNAME	THR	PRI	NICE	SIZE	RES	STATE	C	TIME	WCPU	COMMAND
1174	root	1	20	0	15416K	9416K	select	10	13:03	0.00%	vmtoolsd
1136	root	1	20	0	7680K	3508K	select	2	2:05	0.00%	devd
1162	root	1	20	0	6448K	2336K	select	10	0:51	0.00%	syslogd
1382	root	1	23	0	12736K	7116K	kqread	11	0:33	0.00%	lighttpd
1391	root	1	20	0	10784K	6164K	select	0	0:20	0.00%	sendmail
1324	root	1	20	0	6468K	2452K	nanslp	2	0:03	0.00%	cron
1504	root	1	20	0	33700K	18120K	wait	12	0:01	0.00%	php
62937	root	1	20	0	9832K	5368K	select	15	0:01	0.00%	sshd
27780	root	1	46	0	33820K	19556K	pipe	1	0:00	0.00%	php
2348	root	1	20	0	9832K	5372K	select	2	0:00	0.00%	sshd
62939	root	1	52	0	7504K	3816K	ttyin	8	0:00	0.00%	cs
2350	root	1	23	0	7504K	3852K	ttyin	10	0:00	0.00%	cs
1497	root	1	52	0	7504K	3708K	pause	15	0:00	0.00%	cs
1495	root	1	52	0	6956K	2940K	wait	11	0:00	0.00%	login
1359	root	1	20	0	9832K	5092K	select	5	0:00	0.00%	sshd
27039	root	1	20	0	7048K	3276K	select	1	0:00	0.00%	cdialog
27782	root	1	45	0	7916K	3108K	CPU15	15	0:00	0.00%	top
1496	root	1	52	0	6408K	2164K	ttyin	15	0:00	0.00%	getty

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**.

Information	System	Network	Storage	Backup Server	
Information > System Status > Network					
System Status Processes Network Space Sockets Graph UPS					
LAN interface					
Name	em0				
MAC address	00:0c:29:35:91:f5				
IP address	10.1.0.228				
Subnet mask	255.255.0.0				
Gateway	10.1.0.254				
IPv6 address	fe80::20c:29ff:fe35:91f5				
IPv6 Prefix	64				
Media	1000baseT <full-duplex>				
MTU	1500				
I/O packets	180633/15777 (14.86 MB/5.75 MB)				
I/O errors	0/0				
Collisions	0				
Status	up				

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 the interface.
- **IP address:** The IP address currently set for the interface.
- **Subnet mask:** The subnet mask currently set for the interface.
- **Gateway:** The gateway currently set for the interface.
- **IPv6 address:** The IPv6 address currently set for the interface.
- **IPv6 Prefix:** The network prefix currently set for the interface.
- **Media:** The shared media currently set for the interface.
- **MTU:** The maximum transfer unit currently set for the 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 the interface from system uptime.
- **Collisions:** Number of collisions from system uptime.
- **Status:** State of the interface. Up or Down.

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 170MB in total and 152MB in use. The used capacity is 90% (152MB/170MB) and 18MB remains available for use.

Information	System	Network	Storage	Backup Server	
Information > System Status > Space					
System Status Processes Network Space Sockets Graph UPS					
Free disk space					
Filesystem	Size	Used	Avail	Capacity	Mounted on
/dev/md0	170M	152M	18M	90%	/
/dev/md1	15M	2.5M	11M	18%	/var
/dev/mirror/9689F4EFxesfmfw	744M	20K	684M	0%	/ubs/mnt/esfmfw
/dev/mirror/9689F4EFxesosfw	186M	108M	63M	63%	/ubs/mnt/esosfw
devfs	1.0K	1.0K	0B	100%	/dev
eslsfwx9689F4EF	87G	87G	66M	100%	/ubs/mnt/eslsfw

Sockets

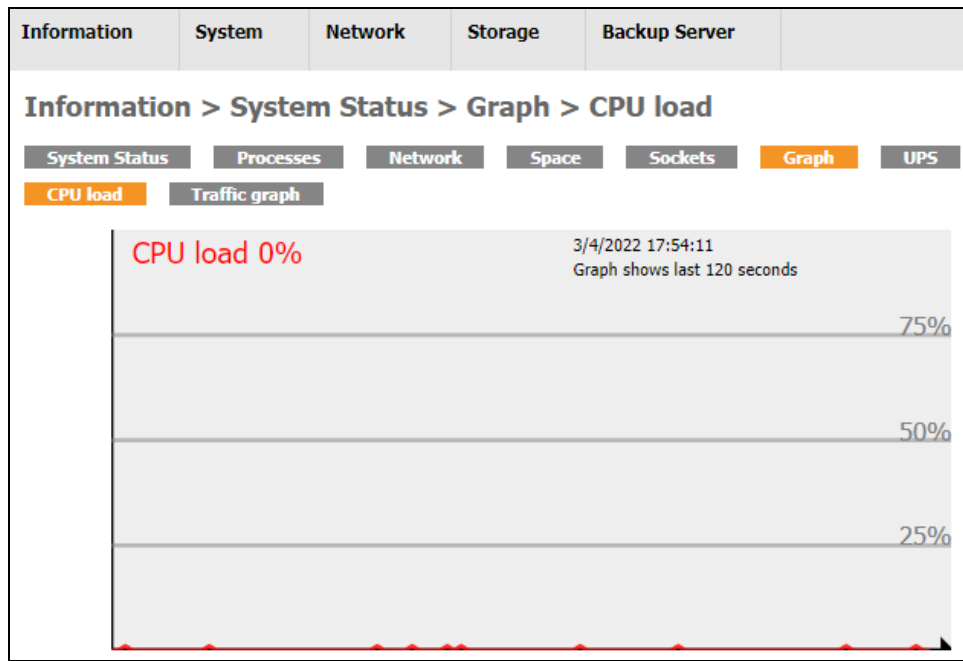
This page provides the information of the Active Internet connections and Active UNIX domain sockets.

Information	System	Network	Storage	Backup Server	
Information > System Status > Sockets					
System Status Processes Network Space Sockets Graph UPS					
Sockets					
Active Internet connections (including servers)					
tcp4	Proto	Recv-Q	Send-Q	Local Address	Foreign Address (state)
ffff8007b173820	tcp4	0	0	ahsayubs.8080	192.168.12.1.61754 ESTABLISHED
ffff80044c7f820	tcp4	0	0	ahsayubs.8080	192.168.12.1.61753 ESTABLISHED
ffff8007b174820	tcp4	0	0	ahsayubs.ssh	192.168.12.1.58548 ESTABLISHED
ffff8007b175820	tcp4	0	0	ahsayubs.ssh	10.3.1.8.51672 ESTABLISHED
ffff80021d1e410	tcp4	0	0	localhost.submissi	.* LISTEN
ffff80021d1e820	tcp4	0	0	localhost.smtp	.* LISTEN
ffff800218c5000	tcp4	0	0	.*.8080	.* LISTEN
ffff800218c5410	tcp4	0	0	.*.ssh	.* LISTEN
ffff800218c5820	tcp6	0	0	.*.ssh	.* LISTEN
Active UNIX domain sockets					
Address	Type	Recv-Q	Send-Q	Inode	Conn Refs Nextref Addr
ffff80021820b40	stream	0	0	0	0 0 0
ffff8007b699690	stream	0	0	0	0 0 0
ffff800217e7000	stream	0	0	ffff8000f39a3b0	0 0 0 /var/run/devd.pipe
ffff800217f5960	dgram	0	0	0	ffff800218ca2d0 0 fffff800218bd870
ffff800218bd870	dgram	0	0	0	ffff800218ca2d0 0 fffff80021cc0d20
ffff80021cc0d20	dgram	0	0	0	ffff800218ca2d0 0 fffff800218cale0
ffff800218cale0	dgram	0	0	0	ffff800218ca2d0 0 0
ffff800218ca2d0	dgram	0	0	ffff8000f63b588	0 fffff800217f5960 0 /var/run/logpriv
ffff800218ca3c0	dgram	0	0	ffff8000f63b760	0 0 /var/run/log
ffff800217e6e10	seqpac	0	0	ffff8000f39ald8	0 0 /var/run/devd.seqpacket.pipe

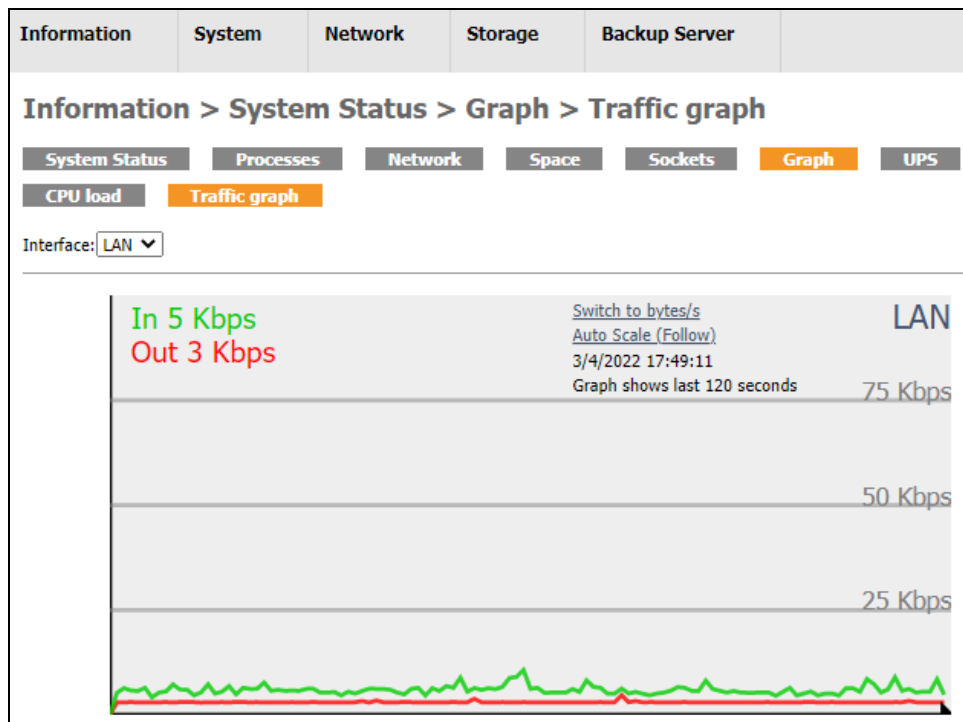
Graph

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.



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	Network	Storage	Backup Server
-------------	--------	---------	---------	---------------

Information > System Status > UPS

System Status

Processes

Network

Space

Sockets

Graph

UPS

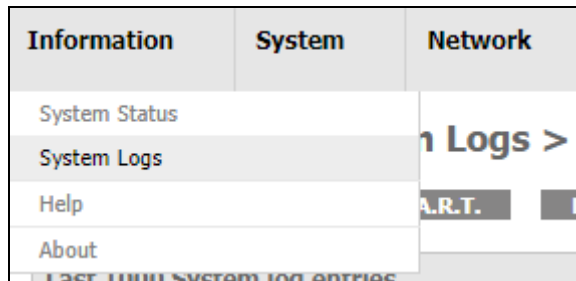
UPS status

```
battery.charge: 100
battery.charge.low: 10
battery.mfr.date: 2020/11/04
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: JS08450005189
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: 2020/11/04
ups.model: Smart UPS 3000 RM
ups.productid: 0002
ups.serial: JS08450005189
ups.status:OL
ups.test.result: No test initiated
ups.timer.reboot: -1
ups.time.shutdown: -1
ups.timer.start: -1
ups.vendorid: 051d
```

9.1.2 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 system log types 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.

InformationSystemNetworkStorageBackup Server

Information > System Logs >

SystemSSH S.M.A.R.T.DaemonSettings

Last 10 System log entries

Mar 4 09:56:49	root: syslogd service restarted
Mar 4 09:56:49	syslogd: kernel boot file is /boot/kernel/kernel
Mar 4 09:56:47	syslogd: exiting on signal 15
Mar 4 09:32:20	root: msmtmp service executed
Mar 4 09:32:16	root: msmtmp service executed
Mar 2 01:36:31	login: login on ttyv0 as root
Mar 2 01:36:30	sm-mta[1410]: starting daemon (8.15.2): SMTP
Mar 2 01:36:30	sendmail[1408]: /etc/mail/aliases: 0 aliases, longest 0 bytes, 0 bytes total
Mar 2 01:36:30	sendmail[1408]: alias database /etc/mail/aliases rebuilt by root
Mar 2 01:36:30	lighttpd[1401]: (server.c.1423) server started (lighttpd/1.4.49)

ClearDownload

WARNING

The logs **CANNOT BE RECOVERED** after clicking the **Clear** button.

System

This page contains the system logs.

Information	System	Network	Storage	Backup Server	
Information > System Logs >					
System SSH S.M.A.R.T. Daemon Settings					
Last 10 System log entries					
Mar 4 09:56:49	root: syslogd service restarted				
Mar 4 09:56:49	syslogd: kernel boot file is /boot/kernel/kernel				
Mar 4 09:56:47	syslogd: exiting on signal 15				
Mar 4 09:32:20	root: msmtmp service executed				
Mar 4 09:32:16	root: msmtmp service executed				
Mar 2 01:36:31	login: login on ttyv0 as root				
Mar 2 01:36:30	sm-mta[1410]: starting daemon (8.15.2): SMTP				
Mar 2 01:36:30	sendmail[1408]: /etc/mail/aliases: 0 aliases, longest 0 bytes, 0 bytes total				
Mar 2 01:36:30	sendmail[1408]: alias database /etc/mail/aliases rebuilt by root				
Mar 2 01:36:30	lighttpd[1401]: (server.c.1423) server started (lighttpd/1.4.49)				

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 1000 SSH log entries					
Mar 7 07:13:55	sshd[13083]: Received signal 15; terminating.				
Mar 7 07:09:06	sshd[13092]: Accepted password for root from 172.16.99.24 port 55546 ssh2				
Mar 7 07:08:34	sshd[13083]: Server listening on 0.0.0.0 port 22.				
Mar 7 07:08:34	sshd[13083]: Server listening on :: port 22.				

S.M.A.R.T.

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

Information	System	Network	Storage	Backup Server	
Information > System Logs >					
System SSH S.M.A.R.T. Daemon Settings					
Last 1000 S.M.A.R.T. log entries					
Clear Download					

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 1000 Daemon log entries

Mar 7 01:31:51	dhclient[1092]: exiting.
Mar 7 01:31:51	dhclient[1092]: connection closed
Mar 7 01:25:29	lighttpd[1419]: (server.c.1423) server started (lighttpd/1.4.49)
Mar 7 01:23:53	lighttpd[1401]: (server.c.2016) server stopped by UID = 0 PID = 40182
Mar 7 01:21:27	dhclient[39621]: No working leases in persistent database - sleeping.
Mar 7 01:21:27	dhclient[39621]: No DHCP OFFERS received.
Mar 7 01:21:22	dhclient[39621]: DHCPDISCOVER on em0 to 255.255.255.255 port 67 interval 5
Mar 7 01:21:08	dhclient[39621]: DHCPDISCOVER on em0 to 255.255.255.255 port 67 interval 14
Mar 7 01:20:48	dhclient[39621]: DHCPDISCOVER on em0 to 255.255.255.255 port 67 interval 20
Mar 7 01:20:38	dhclient[39621]: DHCPDISCOVER on em0 to 255.255.255.255 port 67 interval 10
Mar 7 01:20:32	dhclient[39621]: DHCPDISCOVER on em0 to 255.255.255.255 port 67 interval 6
Mar 7 01:20:26	dhclient[39621]: DHCPDISCOVER on em0 to 255.255.255.255 port 67 interval 6
Mar 2 01:36:30	lighttpd[1401]: (server.c.1423) server started (lighttpd/1.4.49)

Clear

Download

Settings

Modify these settings for the log displayed 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 if the settings had been changed.

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)	☒ Enable			
Number of log entries to show	1000			
Resolve IP addresses to hostnames	☐ Enable 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!			
Save				

9.1.3 Help

Contains a link to the [Ahsay Support Centre](#) if you require to contact Ahsay for technical support.

Information	System	Network	Storage	Backup Server
Information > Help				
Help				
Support				

9.1.4 About

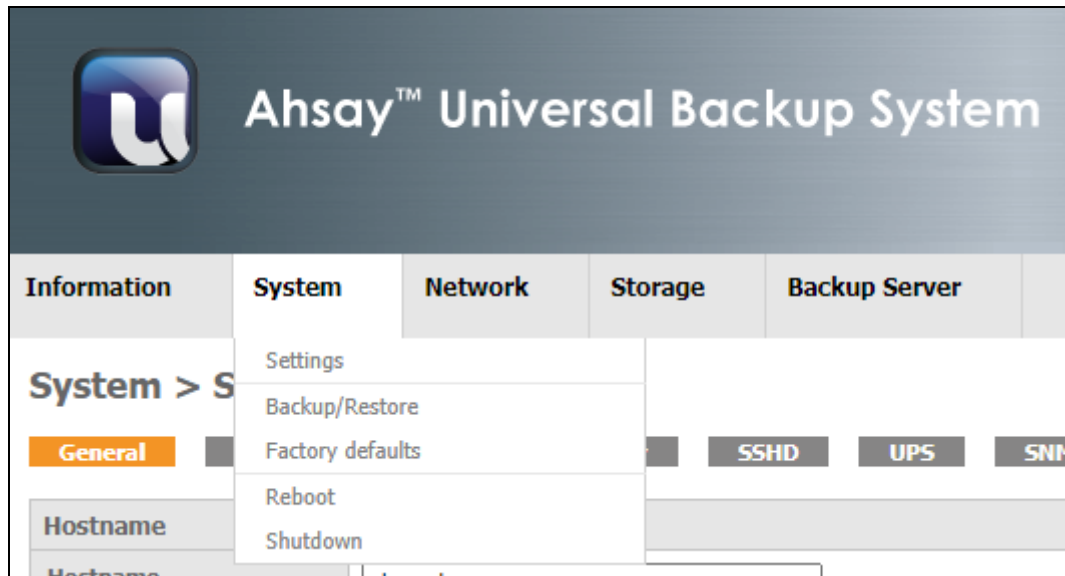
About page for the AhsayUBS.

Information	System	Network	Storage	Backup Server
Information > About				
License				
Ahsay Universal Backup System				
Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:				
1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.				
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.				
THIS SOFTWARE IS PROVIDED "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.				

9.2 System

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

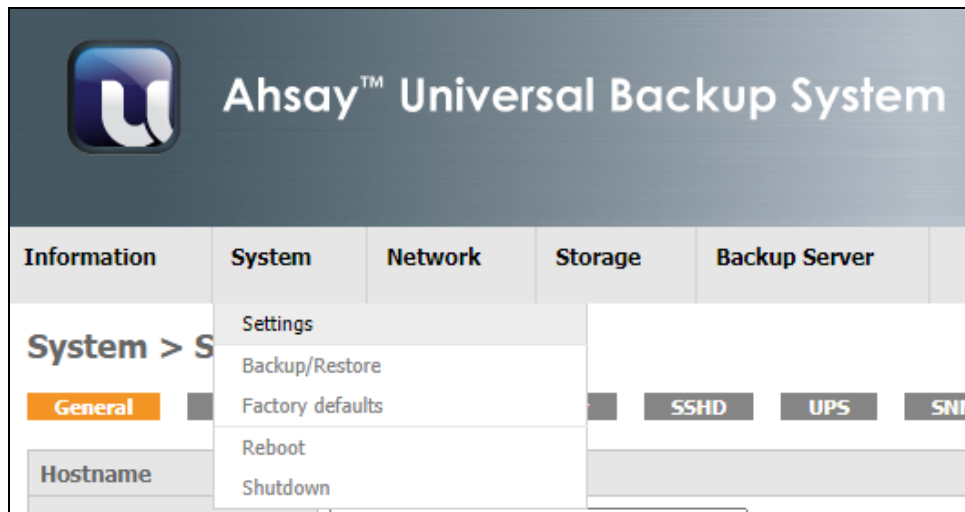
When the mouse cursor is pointed over the word “System” in the menu bar, the menu will be shown as below:



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)

9.2.1 Settings



The general system settings can be set here.

Information	System	Network	Storage	Backup Server
System > Settings > General				
General Password Email Proxy SSHD UPS SNMP sysctl.conf				
Hostname				
Hostname	ahsayubs Name of the NAS host, without domain part e.g. <i>ahsayubs</i> .			
Domain	local e.g. <i>.com, .local</i>			
DNS settings				
IPv4 DNS servers	192.168.5.1 IPv4 addresses			
WebAdmin				
Protocol	HTTP			
Port	8080 Enter a custom port number for the WebAdmin above if you want to override the default (8080 for HTTP, 8443 for HTTPS).			
Time				
Time zone	Etc/UTC Select the location closest to you.			
System time	 Please use the icon to select the system time.			
Enable NTP	☒ Use the specified NTP server.			
NTP time server	pool.ntp.org 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!			
Time update interval	300 Minutes between network time sync.			
Save				

General

Hostname:

- **Hostname:** Sets the hostname of this AhsayUBS. It is advised to use a 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.

WebAdmin:

- **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 [Firewall Settings](#) 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.

Password

This page allows you to set the password for the default administrator account of the AhsayUBS (i.e. **admin**). You need to provide the old password to authenticate the change in password. It is required to 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 UPS SNMP sysctl.conf				
Password				
Old password				
Password	 (Confirmation) If you want to change the password for accessing the WebAdmin, enter it here twice.			
Save				

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.

Information	System	Network	Storage	Backup Server
System > Settings > Email > Settings				
General Password Email Proxy SSHD UPS SNMP sysctl.conf				
Settings Test				
General Email Settings				
Outgoing mail server	127.0.0.1 Outgoing SMTP mail server address, e.g. smtp.mycorp.com.			
Port	25 The default SMTP mail server port, e.g. 25 or 587.			
Security	None ▾			
Authentication	☐ Enable SMTP authentication.			
From email	admin@mycompany.com Your own email address.			
To email	test@mycompany.com Destination email address. Separate email addresses by semi-colon.			
Save General Email Settings				

To setup the Email Status Report Settings, you need to setup the General Email Settings first. Here are the fields that you need to configure in the General Email Settings:

- **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/TLS** or **STARTTLS**.
- **Authentication:** Click the checkbox to enable the SMTP authentication.
- **Username (Shows only when Authentication is enabled):** The login name for the SMTP name server.
- **Password (Shows only when Authentication is enabled):** The password for the SMTP mail server.
- **Authentication Method (Shows only when Authentication is enabled):** The authentication method to login to the SMTP mail server. Here are the choices for the login methods:
 - Plain
 - Cram-MD5
 - Digest-MD5
 - GSSAPI
 - External
 - Login
 - 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

Setup DNS Server in the page **System > Settings > General** is required to resolve the SMTP server address.

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

Email Status Report Settings

☒ Enable

To email

test@mycompany.com
[To email] configuration can be edited in [General Email Settings](#).

Subject

System Status Report [%d] [%h]

The subject of the email. You can use the following parameters for substitution:

- %d - Date
- %h - Hostname

Reports

☒ System info
☒ System message buffer
☒ System log ([Settings](#))
☒ SSHD log ([Settings](#))
☒ S.M.A.R.T. log ([Settings](#))
☒ Daemon log ([Settings](#))

Polling time

Minutes

Please Select:

0

12

24

36

48

1

13

25

37

49

2

14

26

38

50

3

15

27

39

51

4

16

28

40

52

5

17

29

41

53

6

18

30

42

54

7

19

31

43

55

8

20

32

44

56

9

21

33

45

57

10

22

34

46

58

11

23

35

47

59

Hours

Please Select:

0

12

1

13

2

14

3

15

4

16

5

17

6

18

7

19

8

20

9

21

10

22

11

23

days

Please Select:

1

13

25

2

14

26

3

15

27

4

16

28

5

17

29

6

18

30

7

19

31

8

20

9

21

10

22

11

23

12

24

Months

Please Select:

January

February

March

April

May

June

July

August

September

October

November

December

Week Days

Please Select:

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

Note: Ctrl-click (or command-click on the Mac) to select and de-select minutes, hours, days, months and weekdays.

Select All:

☐

Save Email Status Report Settings

The following fields can be set in the 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.
- **Reports:** 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.

www.ahsay.com

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Test

This page is for verifying the settings in the General Email Settings.

The screenshot shows a web interface with a top navigation bar containing tabs: Information, System, Network, Storage, Backup Server, and a dropdown menu. The 'System' tab is selected, leading to 'System > Settings > Email > Test'. Below this, there are several sub-tabs: General, Password, Email (highlighted), Proxy, SSHD, UPS, SNMP, and sysctl.conf. Under the 'Email' tab, there are 'Settings' and 'Test' sub-tabs, with 'Test' being the active one. The main content area is titled 'Test Email Settings' and contains two input fields: 'Subject' with the value 'System Email Test' and a description 'Subject of the test email.', and 'Email Content' with the value 'Test email to verify the General Email Settings.' and a description 'Email Content'. At the bottom, there are two buttons: 'Save test email settings' and 'Send test email to [admin@mycompany.com]'.

The Test Email Settings is for verifying the settings in the 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” entered in the General Email Settings by:

1. Entering the test email subject in the Subject field.
2. Entering the test email contents in 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.

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 dialog box titled 'Test Send Status Report Email'. It contains a button labeled 'Send Status Report to [test@mycompany.com]' and a link labeled 'Configure your Status Report Email Settings'.

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.

Information	System	Network	Storage	Backup Server
System > Settings > Proxy				
General Password Email Proxy SSHD UPS SNMP sysctl.conf				
HTTP Proxy ☒ Enable				
Address	proxy			
Port	8080			
Authentication	☒ Enable proxy authentication.			
User	username			
Password				
Save				

- **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.
- **User (Shows only when Authentication is enabled):** Enter the username for login to the proxy server.
- **Password (Shows only when Authentication is enabled):** Enter the password for login to the proxy server.

Please click the **Save** button to save the above settings.

NOTE

Remember to configure the DNS server settings for resolving the address in the page System > Settings > General.

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.**

Information	System	Network	Storage	Backup Server
System > Settings > SSHD				
General Password Email Proxy SSHD UPS SNMP sysctl.conf				
Secure Shell				
Status	Running			
TCP port	22 Alternate TCP port. Default is 22			
Compression	☐ Enable compression. 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.			
Private key	Paste a DSA PRIVATE KEY in PEM format here.			
Start Stop Restart				

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 Secure Shell table.

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.

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**. 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**.

Settings

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

Information	System	Network	Storage	Backup Server
System > Settings > UPS > Settings				
General Password Email Proxy SSHD UPS SNMP sysctl.conf				
Settings Driver List Device List				
Uninterruptible Power Supply ☒ Enable				
Status	Stopped			
Driver	 The driver used to communicate with your UPS. Get the list of available drivers .			
Port Device Path	 The serial or USB port where your UPS is connected. Get the list of available port device path .			
Auxiliary parameters	 Additional parameters to the hardware-specific part of the driver.			
Description	 You may enter a description here for your reference.			
Shutdown mode	UPS reaches low battery v Defines system shutdown condition.			
Email notification	☐ Enable The email will be sent to [test@mycompany.com]. [To email] configuration can be edited in General Email Settings .			
Save and Restart				

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 configuring 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.

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.

InformationSystemNetworkStorageBackup Server

System > Settings > UPS > Driver List

General

Password

Email

Proxy

SSH

UPS

SNMP

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
AEG Power Solutions	ups	PROTECT HOME		blazer_ser / blazer_usb
AEG Power Solutions	ups	PROTECT NAS		usbhid-ups
AEG Power Solutions	ups	PROTECT B		usbhid-ups
APC	ups	Back-UPS 1200BR (Microsol)		solis

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.

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**.

Information	System	Network	Storage	Backup Server
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	ubs Trap string.			
SNMP Modules	Download MIB files			
Save and Restart				

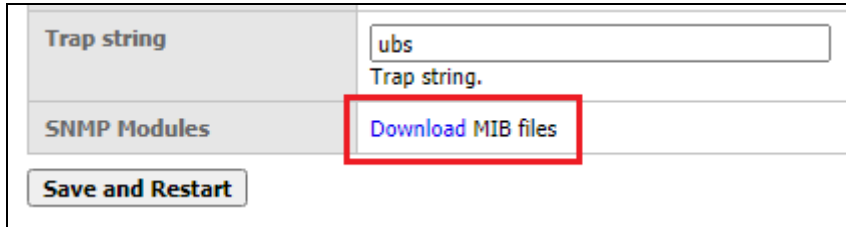
Please enter / select the fields below to configure the 'bsnmpd' daemon:

- 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 the 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.



The image shows a web interface for configuring SNMP. It has three main sections: 'Trap string', 'SNMP Modules', and a 'Save and Restart' button. In the 'Trap string' section, there is a text input field containing 'ubs' and a label 'Trap string.' below it. In the 'SNMP Modules' section, there is a button labeled 'Download MIB files' which is highlighted with a red rectangular box.

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.

Sysctl.conf

The “sysctl.conf” is located inside the “/etc” which is a configuration file for making changes in FreeBSD (which is the OS of the AhsayUBS). This includes many advanced options for 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”.

Information	System	Network	Storage	Backup Server	
System > Settings > sysctl.conf					
General Password Email Proxy SSHD UPS SNMP sysctl.conf					
MIB	Value	Comment			
hw.acpi.pwr_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			

Here are the guidelines to make changes in the “sysctl.conf” file in the AhsayUBS.

Add MIB entry:

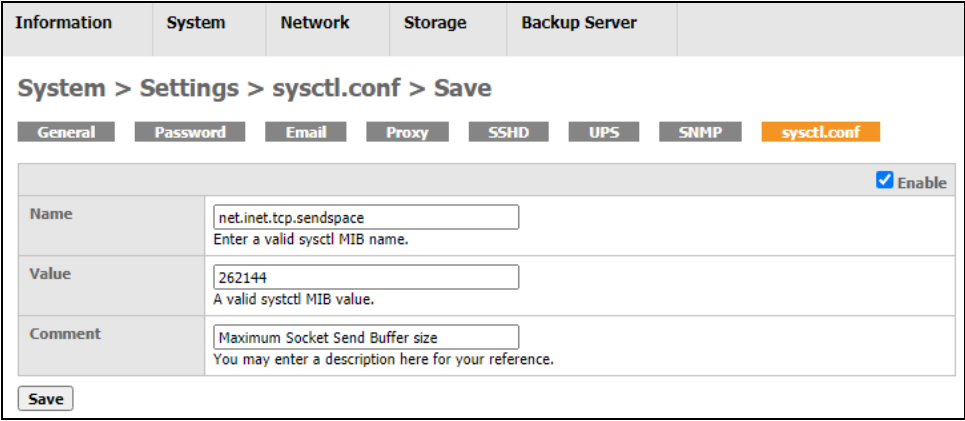
1. Click the ‘+’ icon.
2. Fill in the required fields in the table. Check the **Enable** checkbox to enable the MIB. Leave it unchecked if you do not want the MIB to be enabled after adding.

Information	System	Network	Storage	Backup Server	
System > Settings > sysctl.conf > Add					
General Password Email Proxy SSHD UPS SNMP sysctl.conf					
					☒ Enable
Name	net.inet.tcp.sendspace Enter a valid sysctl MIB name.				
Value	262144 A valid sysctl MIB value.				
Comment	Maximum Socket Send Buffer Size You may enter a description here for your reference.				
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 MIB entry:

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



The screenshot shows the 'System > Settings > sysctl.conf > Save' page. At the top, there are tabs for 'General', 'Password', 'Email', 'Proxy', 'SSH', 'UPS', 'SNMP', and 'sysctl.conf'. Below the tabs, there is a form with the following fields:

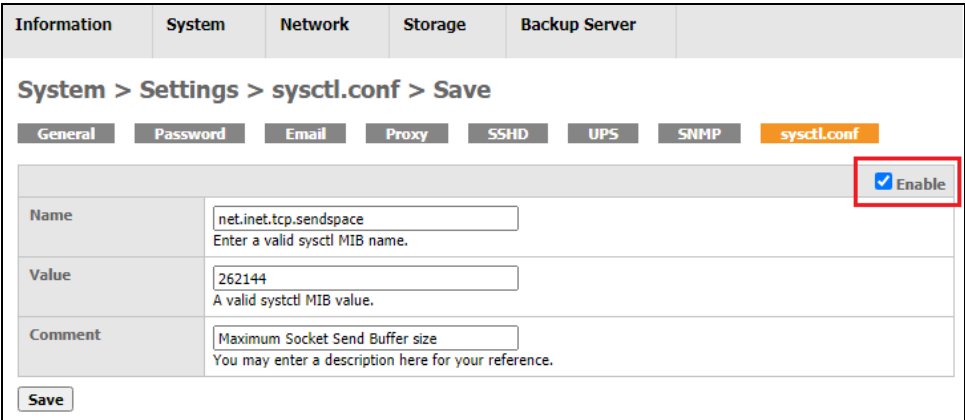
- Name:** A text input field containing 'net.inet.tcp.sendspace'. Below it, a hint says 'Enter a valid sysctl MIB name.'
- Value:** A text input field containing '262144'. Below it, a hint says 'A valid sysctl MIB value.'
- Comment:** A text input field containing 'Maximum Socket Send Buffer size'. Below it, a hint says 'You may enter a description here for your reference.'

At the bottom left of the form is a 'Save' button. At the bottom right is a checkbox labeled 'Enable' which is checked.

4. Click the **Save** button to update this MIB entry.
5. Click the **Apply Changes** button.
6. The MIB entry is updated successfully.

Enable/Disable 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.



This screenshot is identical to the previous one, showing the 'System > Settings > sysctl.conf > Save' page. The 'Enable' checkbox is checked. A red rectangular box is drawn around the 'Enable' checkbox and its label.

4. Click the **Save** button to update this MIB entry.
5. Click the **Apply Changes** button.
6. The MIB entry is edited successfully.

Delete MIB entry:

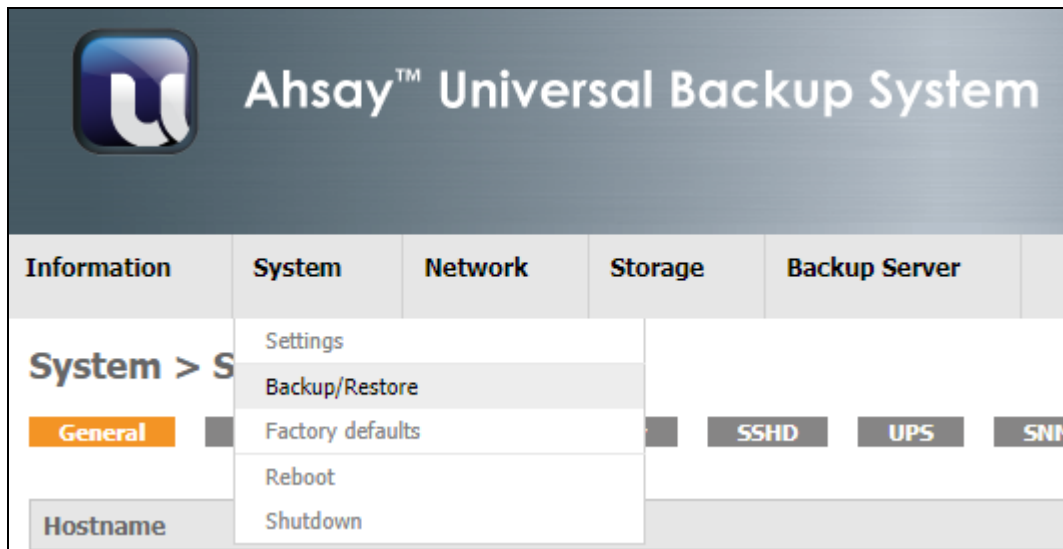
1. Look for the MIB entry to be deleted.
2. Click the '⊖' icon at the row that the MIB entry to be deleted.
3. In the alert box, click **OK** to confirm the delete of the entry. Click **Cancel** to abort.
4. Click the **Apply Changes** button.
5. The MIB entry is deleted successfully.

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.

9.2.2 Backup/Restore AhsayUBS Settings

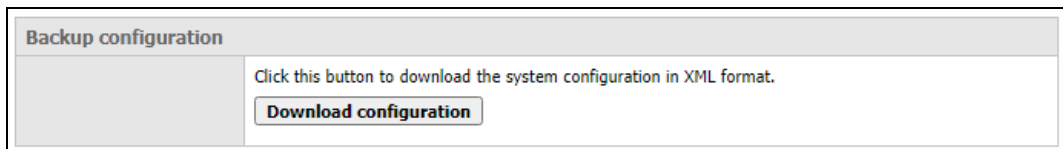
The AhsayUBS runtime configuration is stored as an XML file. The XML file contains all settings information available in AhsayUBS WebAdmin.



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

Backup Configuration

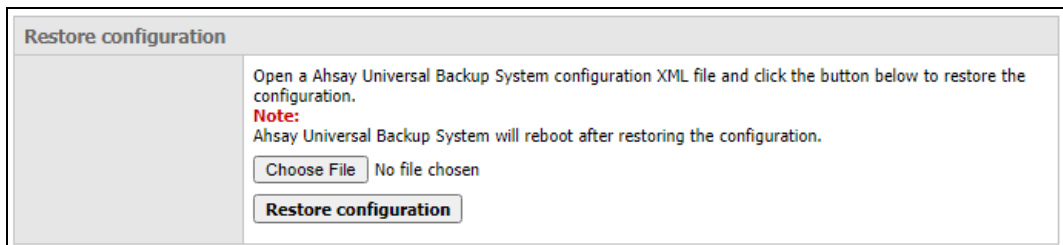
You can download the runtime configuration file of AhsayUBS WebAdmin by clicking the **Download configuration** button.



Restore Configuration

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

- Adapted a new AhsayUBS with the same configuration of hardware, IP settings.
- Mistakenly configured anything wrongly in the AhsayUBS WebAdmin.

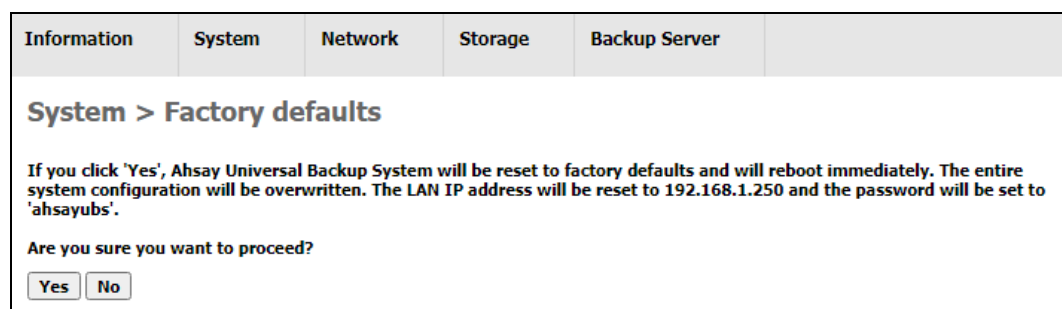
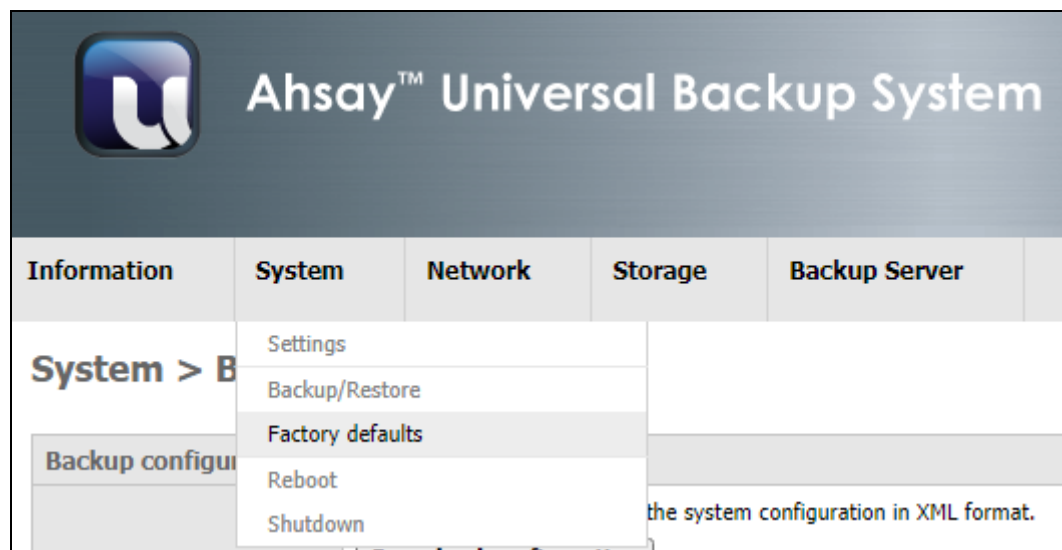


The settings can be restored with your last downloaded configuration file:

1. Click the **Choose File** button to select the configuration file to restore.
2. Click **Restore configuration** button to restore the previous configuration to your AhsayUBS.

9.2.3 Factory Defaults

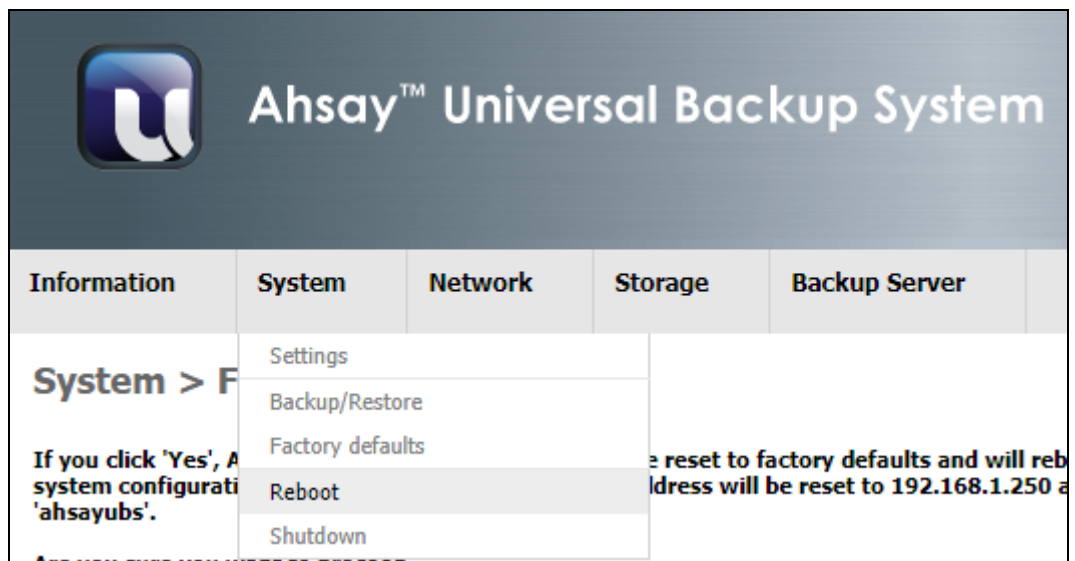
You can restore AhsayUBS to factory defaults by clicking **Yes** or clicking **No** to cancel.



NOTE

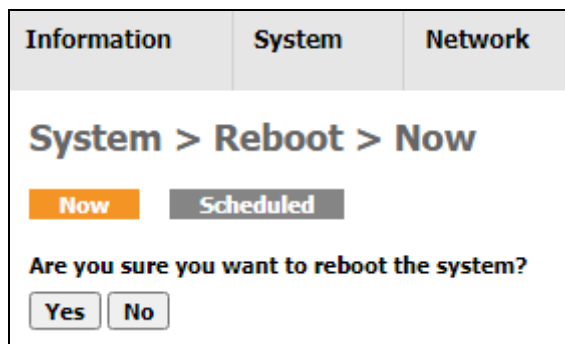
1. The data on the block devices will NOT be erased after AhsayUBS is reset to factory defaults.
2. You can restore the previous settings in AhsayUBS WebAdmin in the page **System > Backup/Restore**. Please refer to the section [System > Backup/Restore](#) for details.
3. After resetting AhsayUBS to 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:
 - a. Adding it back the iSCSI session inside the Storage > iSCSI page
 - b. 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.

9.2.4 Reboot



Now

Click **Yes** 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.

Scheduled

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

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

System > Reboot > Scheduled

Now **Scheduled**

Scheduled reboot ☒ Enable

Reboot Time	Minutes	Hours	days	Months	Week Days
	Please Select:	Please Select:	Please Select:	Please Select:	Please Select:
	0 1 2 3 4 5 6 7 8 9 10 11	0 1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12	January February March April May June July August September October November December	Sunday Monday Tuesday Wednesday Thursday Friday Saturday

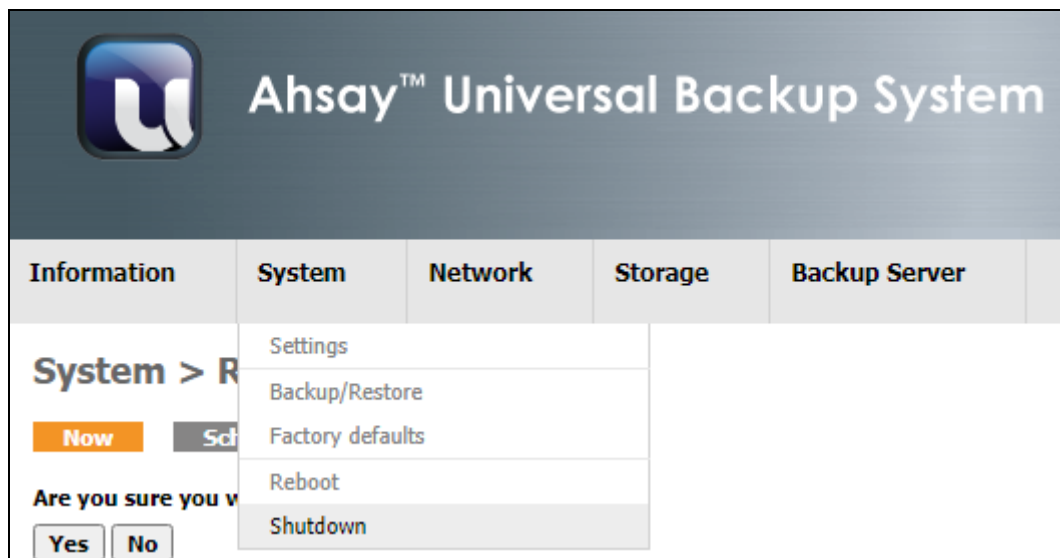
Note: Ctrl-click (or command-click on the Mac) to select and de-select minutes, hours, days, months and weekdays.

Save

WARNING

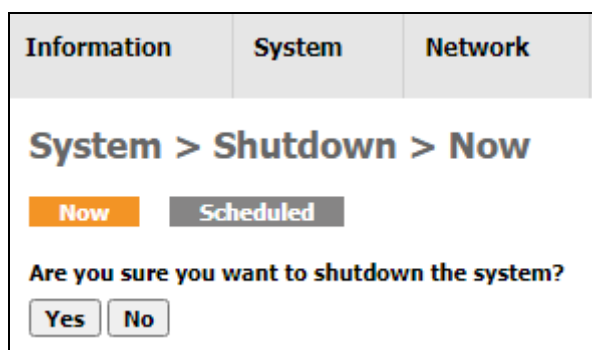
Please do not select ALL the minutes for reboot, otherwise the AhsayUBS may need to restore to factory default for stopping the endless rebooting system!

9.2.5 Shutdown



Now

Click **Yes** 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.

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.

Information	System	Network	Storage	Backup Server
System > Shutdown > Scheduled				
Now Scheduled				
Scheduled shutdown ☒ Enable				
Shutdown Time	Minutes	Hours	days	Months
	Please Select:	Please Select:	Please Select:	Please Select:
	0 1 2 3 4 5 6 7 8 9 10 11	0 1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12	January February March April May June July August September October November December
	12 14 15 16 17 18 19 20 21 22 23	13 14 15 16 17 18 19 20 21 22 23	13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Sunday Monday Tuesday Wednesday Thursday Friday Saturday
Note: Ctrl-click (or command-click on the Mac) to select and de-select minutes, hours, days, months and weekdays.				
Save				

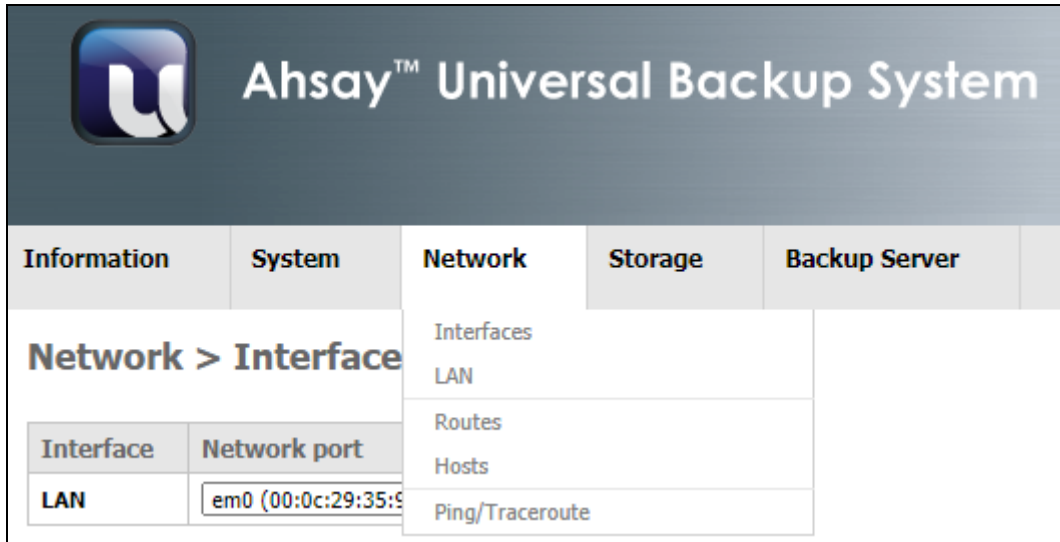
WARNING

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

9.3 Network

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

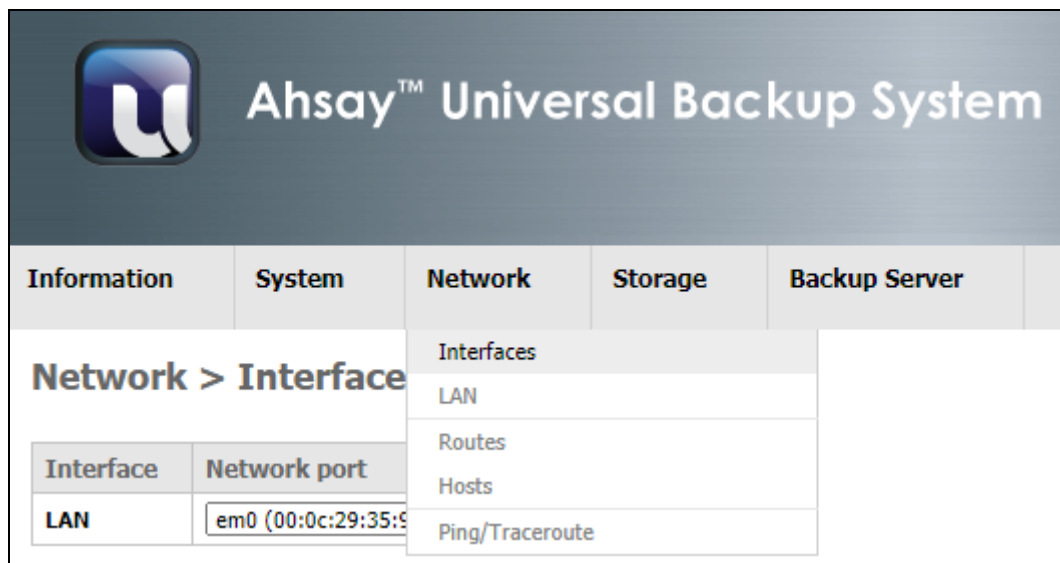
When the mouse cursor is over the word “Network” in the menu bar, the menu will be shown as below:



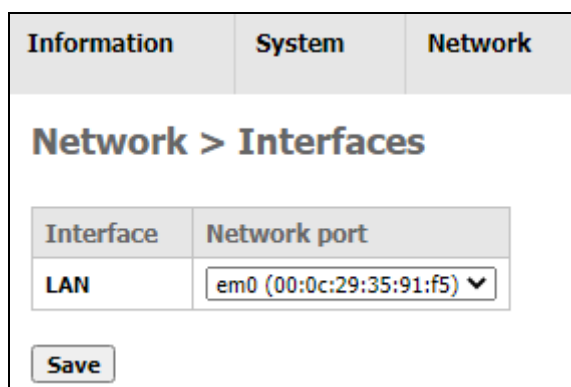
The **Network** menu has been further divided into the following sections:

- [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)
- [Ping/Traceroute](#) (Network tools)

9.3.1 Interfaces



This page shows a summary of physical network devices in the 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 drop-down 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.

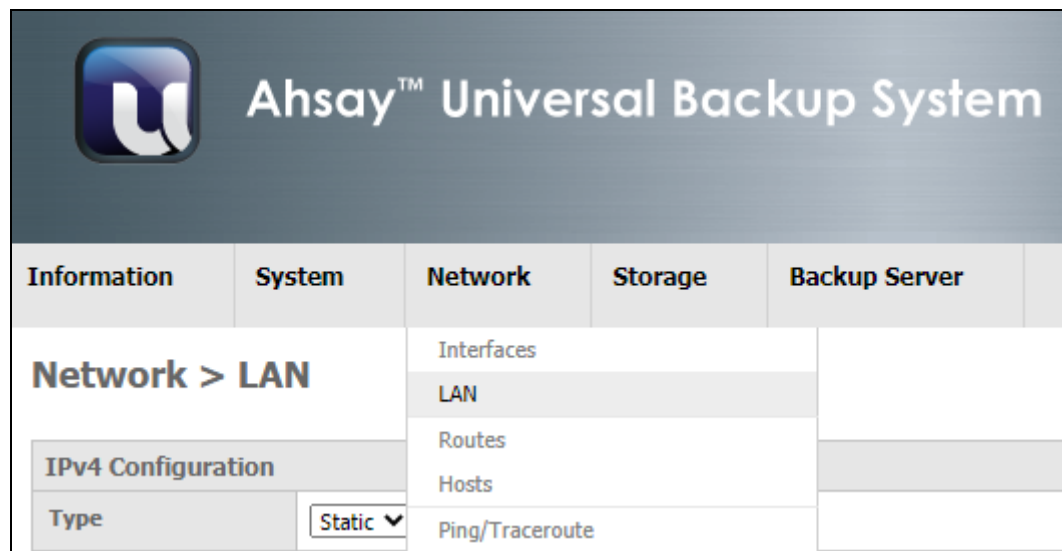
The Network > LAN denotes the network device configuration for the network device which has been assigned at the Network > Interface page. Additional network interfaces OPT1 can be configured at page Network > OPT1 which is similar to the LAN interface.

In addition, a network interface can be deleted by clicking the '🗑️' icon corresponding to the network interface that you want to delete. 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.

9.3.2 LAN



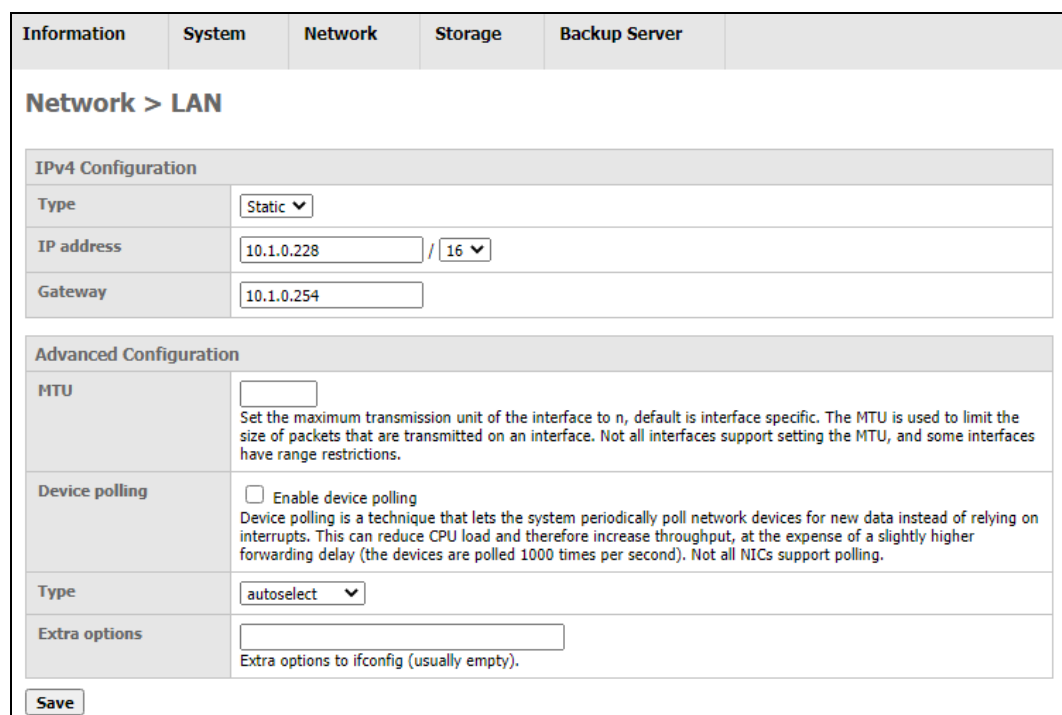
Ahsay™ Universal Backup System

Information	System	Network	Storage	Backup Server
Network > LAN		Interfaces		
		LAN		
		Routes		
		Hosts		
		Ping/Traceroute		

IPv4 Configuration

Type: **Static** ▼

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



Network > LAN

IPv4 Configuration

Type: **Static** ▼

IP address: **10.1.0.228** / **16** ▼

Gateway: **10.1.0.254**

Advanced Configuration

MTU:

Device polling: ☐ Enable 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: **autoselect** ▼

Extra options:
Extra options to ifconfig (usually empty).

Save

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.

Advanced Configuration

The fields in this section are listed below:

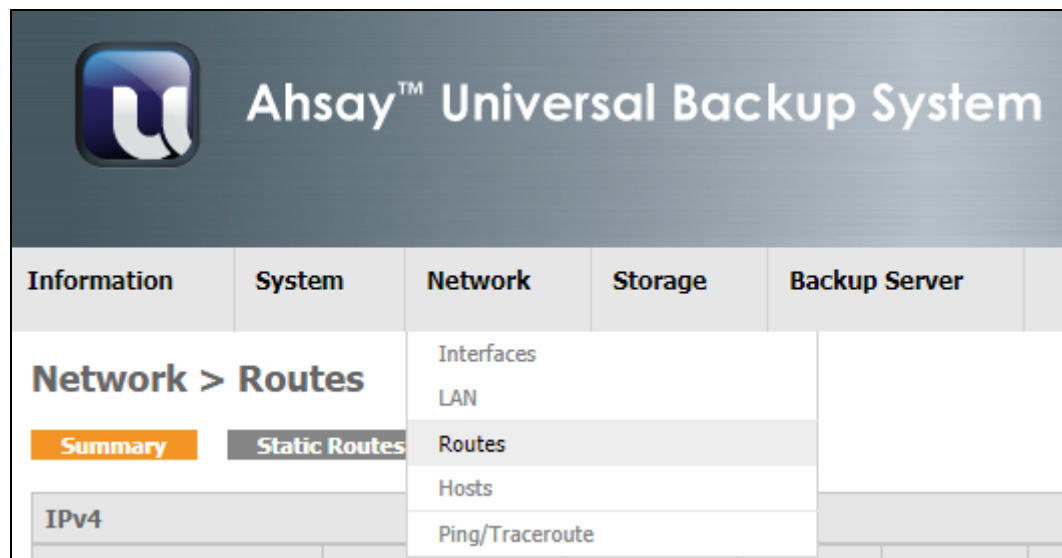
- **MTU:** Set the maximum transmission unit of the interface to *n*, the default setting is leave to *n*, default is interface specific (i.e. blank). The MTU is used to limit the size of packets that are transmitted on an interface. Not all interfaces support setting the MTU, and some interfaces have range restrictions.
- **Device polling:** Device polling is a technique that lets the system to 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 on 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.

9.3.3 Routes



Summary

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

Information

System

Network

Storage

Backup Server

Network > Routes

Summary

Static Routes

IPv4

Destination	Gateway	Flags	Use	Mtu	Netif	Expire
default	10.1.0.254	UGS	25656	1500	em0	
10.1.0.0/16	link#1	U	0	1500	em0	
10.1.0.228	link#1	UHS	0	16384	lo0	
127.0.0.1	link#2	UH	0	16384	lo0	

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.

InformationSystemNetworkStorageBackup Server

Network > Static Routes

SummaryStatic Routes

Interface	Network	Gateway	Description
-----------	---------	---------	-------------

If you want to add a static route, click the ‘’ icon to continue.

Information	System	Network	Storage	Backup Server
Network > Static Routes > Edit				
Static Routes				
Interface	LAN ▼ Choose which interface this route applies to.			
Destination network	10.1.0.0 / 30 ▼ Destination network for this static route			
Gateway	10.1.0.254 Gateway to be used to reach the destination network.			
Description	Static Route of the subnet 10.1.0.0/30 You may enter a description here for your reference.			
Add				

The static routes table will then appear on the browser. Here are the rows that you can configure:

- **Interface:** Select the interface that will be 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, the message “The configuration has been changed.” will appear when the entry is added successfully.

Information	System	Network	Storage	Backup Server
Network > Static Routes				
Summary Static Routes				
 The configuration has been changed. You must apply the changes in order for them to take effect. Apply changes				
Interface	Network	Gateway	Description	
LAN	10.1.0.0/30	10.1.0.254	Static Route of the subnet 10.1.0.0/30	  

Click **Apply changes** for the changes to take effect.

Information

System

Network

Storage

Backup Server

Network > Static Routes

Summary

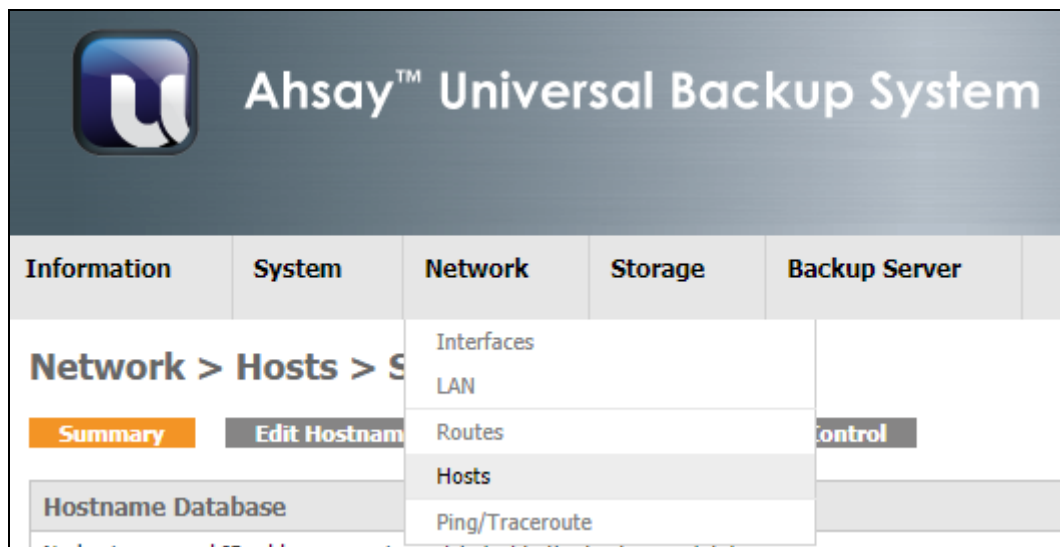
Static Routes

Interface	Network	Gateway	Description
LAN	10.1.0.0/30	10.1.0.254	Static Route of the subnet 10.1.0.0/30

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

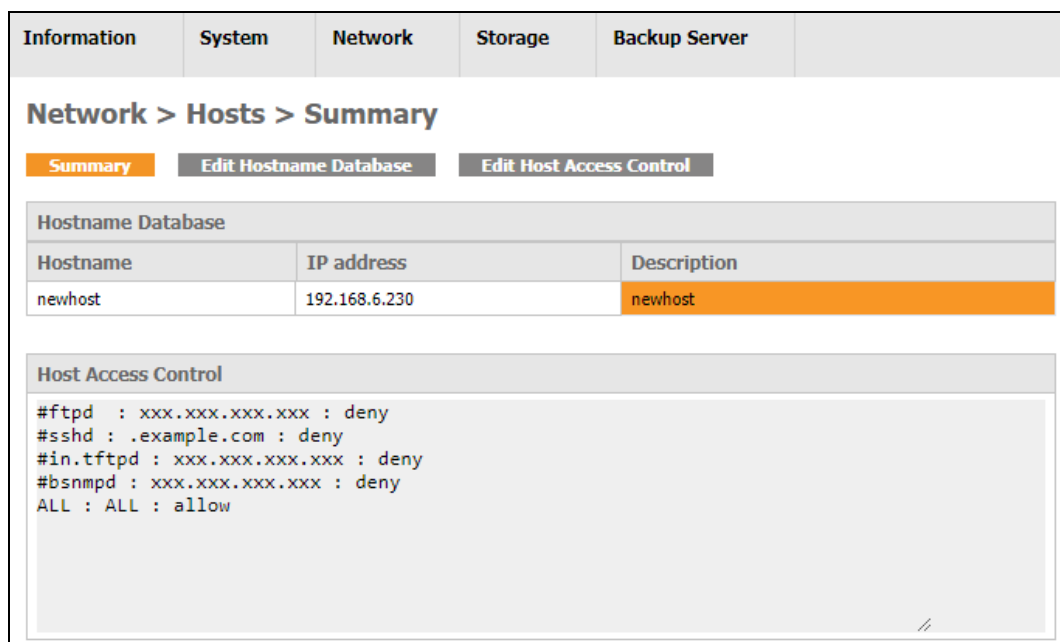
- '' : Edit the entry and click the **Save > Apply changes** button to save the changes
- '' : After clicking this icon, a pop-up dialog will appear to confirm the changes. Click the **OK** button to confirm deletion or click the **Cancel** button to abort. After the dialog is closed, the message "The configuration has been changed." will be displayed. You need to click the **Apply Changes** button to delete the entry.

9.3.4 Hosts



This page is for the customization of hosts settings.

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 in 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 in the page **Network > Hosts > Edit Host Access Control**.

Edit Hostname Database

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
ahsayhost	192.168.6.230	ahsayhost

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.

Network > Hosts > Edit Hostname Database > Add

Summary **Edit Hostname Database** Edit Host Access Control

Hostname Database Entry	
Hostname	 The hostname is case insensitive and it may only consist of the characters [a-z, A-Z, 0-9, - and .]. (i.e. A hostname "AhsayUBS" is identical to the one named "ahsayubs".)
IP address	 The IP address that this hostname represents.
Description	 You may enter a description here for your reference.

Add

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

Summary **Edit Hostname Database** Edit Host Access Control

 The changes have been applied successfully.

Hostname Database		
Hostname	IP address	Description
ahsayhost	192.168.6.230	ahsayhost

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.

Information	System	Network	Storage	Backup Server
Network > Hosts > Edit Hostname Database > Edit				
Summary Edit Hostname Database Edit Host Access Control				
Hostname Database Entry				
Hostname	ahsayhost The hostname is case insensitive and it may only consist of the characters [a-z, A-Z, 0-9, - and .]. (i.e. A hostname "AhsayUBS" is identical to the one named "ahsayubs".)			
IP address	192.168.6.230 The IP address that this hostname represents.			
Description	ahsayhost You may enter a description here for your reference.			
Save				

4. Click the **Save** button.
5. The entry is edited successfully.

Information	System	Network	Storage	Backup Server
Network > Hosts > Edit Hostname Database				
Summary Edit Hostname Database Edit Host Access Control				
 The changes have been applied successfully.				
Hostname Database				
Hostname	IP address	Description		
newhost	192.168.6.230	newhost		

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. Click **OK** to confirm deletion.

10.1.0.228:8080 says

Do you really want to delete this hostname?

OKCancel

4. The entry is deleted successfully.

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

Network > Hosts > Edit Hostname Database

SummaryEdit Hostname DatabaseEdit Host Access Control

The changes have been applied successfully.

Hostname Database		
Hostname	IP address	Description
newhost	192.168.6.230	newhost

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

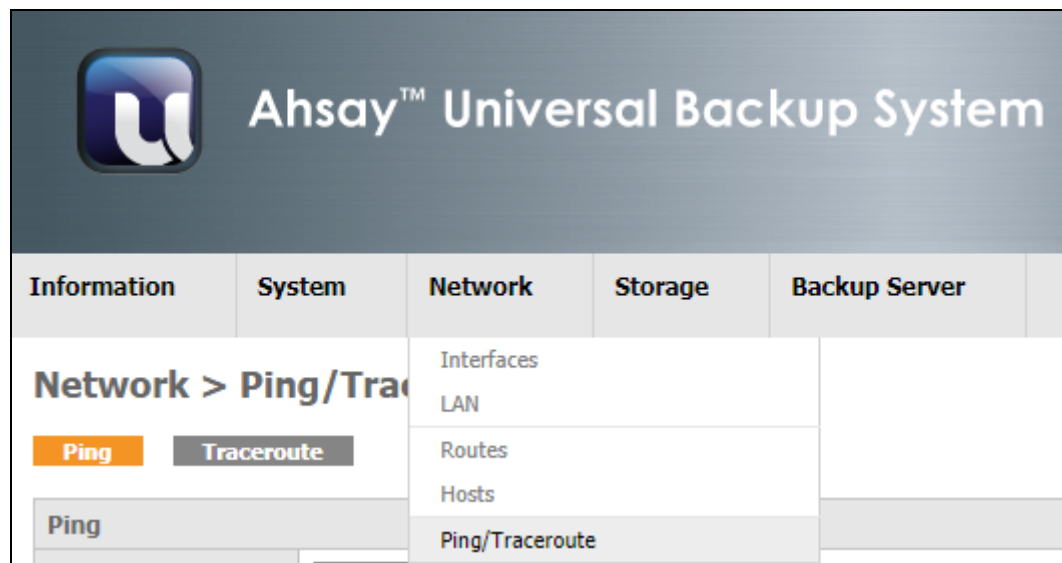
SummaryEdit Hostname DatabaseEdit Host Access Control

Host Access Control

```
#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
```

Save and Restart

9.3.5 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.

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 results will be shown below 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	10.1.0.220 Destination host name or IP number.			
Interface	LAN Use the following IP address as the source address in outgoing packets.			
Count	3 Stop after sending (and receiving) N packets.			
Ping				
<pre>Command output: PING 10.1.0.220 (10.1.0.220) from 10.1.0.228: 56 data bytes 64 bytes from 10.1.0.220: icmp_seq=0 ttl=64 time=0.090 ms 64 bytes from 10.1.0.220: icmp_seq=1 ttl=64 time=0.093 ms 64 bytes from 10.1.0.220: icmp_seq=2 ttl=64 time=0.098 ms --- 10.1.0.220 ping statistics --- 3 packets transmitted, 3 packets received, 0.0% packet loss round-trip min/avg/max/stddev = 0.090/0.094/0.098/0.003 ms</pre>				

Below is an example that the AhsayUBS failed to reach the destination “192.168.6.186”.

Information	System	Network	Storage	Backup Server
Network > Ping/Traceroute > Ping				
Ping Traceroute				
Ping				
Host	192.168.6.186 Destination host name or IP number.			
Interface	LAN Use the following IP address as the source address in outgoing packets.			
Count	3 Stop after sending (and receiving) N packets.			
Ping				
<pre>Command output: PING 192.168.6.186 (192.168.6.186) from 10.1.0.228: 56 data bytes --- 192.168.6.186 ping statistics --- 3 packets transmitted, 0 packets received, 100.0% packet loss</pre>				

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	10.1.0.220 Destination host name or IP number.			
Max. TTL	18 Max. time-to-live (max. number of hops) used in outgoing probe packets.			
Resolve	☐ Resolve IP addresses to hostnames			
Traceroute				
<pre>Command output: traceroute to 10.1.0.220 (10.1.0.220), 18 hops max, 40 byte packets 1 10.1.0.220 0.089 ms 0.114 ms 0.095 ms</pre>				

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	192.168.6.186 Destination host name or IP number.			
Max. TTL	18 ▼ Max. time-to-live (max. number of hops) used in outgoing probe packets.			
Resolve	☐ Resolve IP addresses to hostnames			
Traceroute				
<pre>Command output: traceroute to 192.168.6.186 (192.168.6.186), 18 hops max, 40 byte packets 1 * * * 2 * * * 3 * * * 4 * * * 5 * * * 6 * * * 7 * * * 8 * * * 9 * * * 10 * * * 11 * * * 12 * * * 13 * * * 14 * * * 15 * * * 16 * * * 17 * * * 18 * * *</pre>				

9.4 Storage

When the mouse cursor is over the word “Storage” in the menu bar, the menu will be shown as below:



The **Storage** menu has been further divided into the following sections:

- [Summary](#) (Summary of volumes created)
- [iSCSI](#) (Summary of iSCSI sessions created)

Overview

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

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

1. **System Storage** – This is the 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 LSFW 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 that 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 LSFW or Additional Storage inside the AhsayUBS

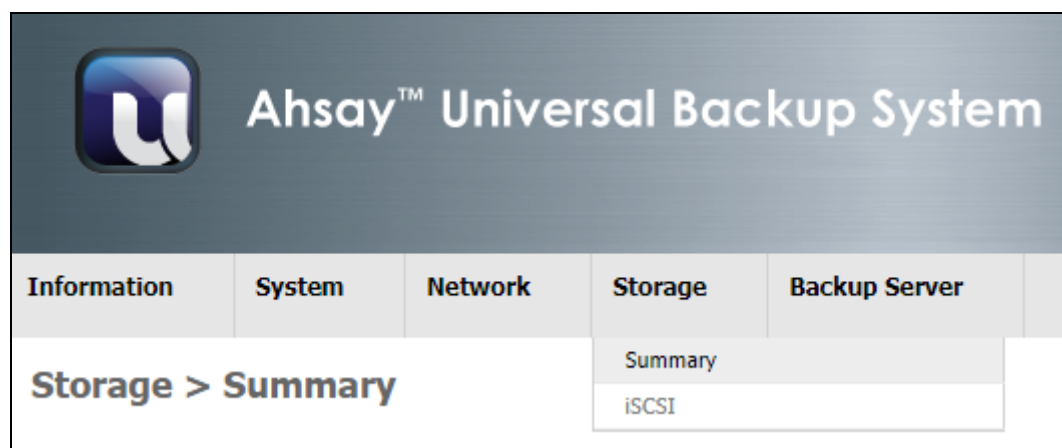
The page Storage > iSCSI shows a summary of the iSCSI session created in the AhsayUBS. The iSCSI session can be created, information be edited, disconnected and removed in the AhsayUBS in this page.

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

9.4.1 Summary

Storage Information in the WebAdmin

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



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:
 - Yellow means the approximate used space in a volume.
 - Blue means the approximate 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:
 - The volume is exported.
 - Some of the providers (block devices or iSCSI session) are missing.



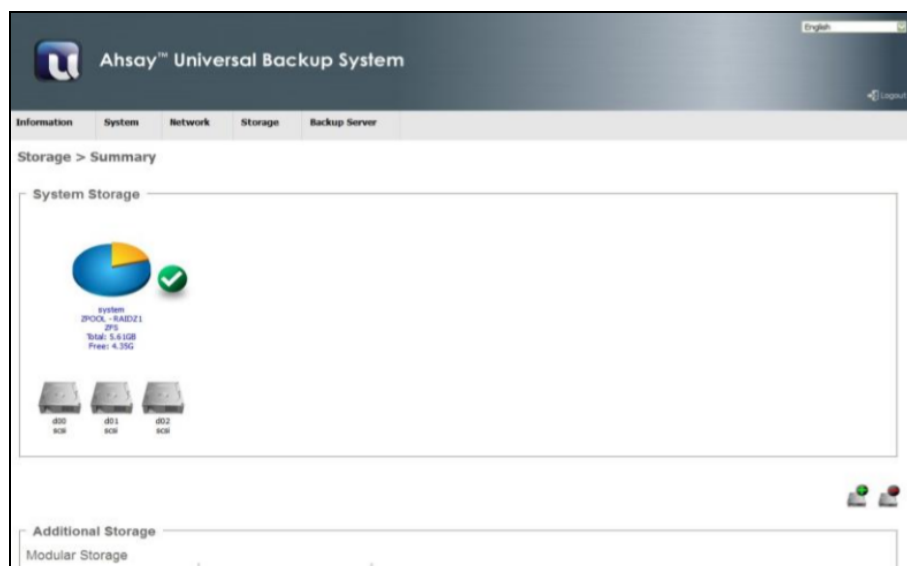
Volume status icons indicate the various statuses of the volume. It is put beyond the volume pie chart.

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 undergoes further damage.
	Missing	The volume is missing. It cannot be accessed by the AhsayUBS. It may be caused by: • 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** 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** '

	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	/ufs/mnt/esms00

Action	
Unmount Volume	Unmount
Filesystem check	Scrub

Back

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

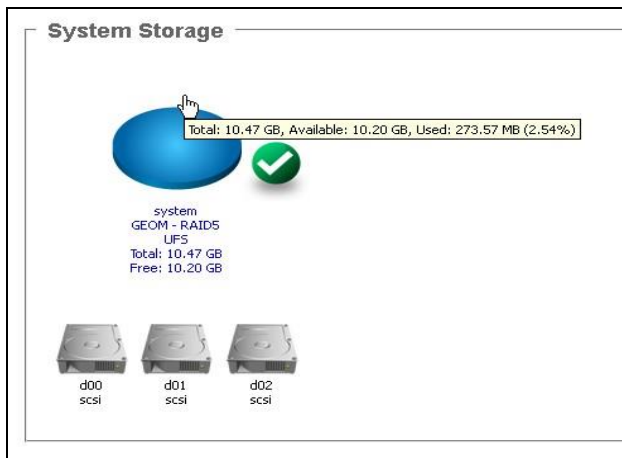


Volume ID	esms00
Device ID	m00c00
Device Name	da0
Device Path	/dev/da0
Device Type	scsi
Device Size	8.00 GB
Model Family	1.0
Model Name	Virtual disk 1.0

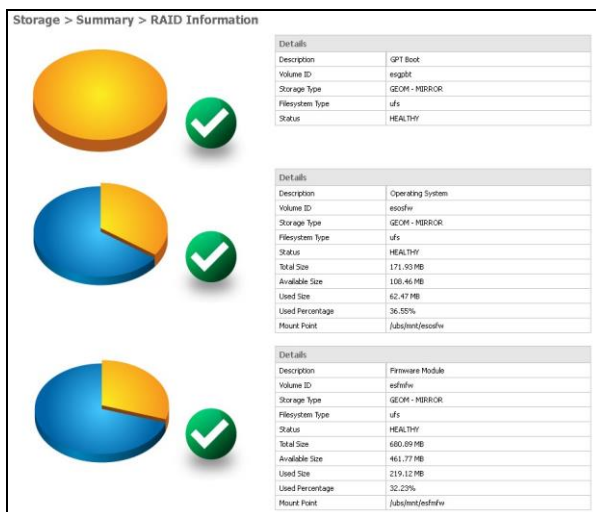
Back

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 LSFW 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 the AhsayUBS.

Supported types of 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

Expanding an AhsayUBS volume is not supported as it will cause some of the volume information to be removed which will result in some mount points such as "/tmp" to not mount properly. The AhsayCBS service will no longer startup.

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:

- Shutdown AhsayUBS and insert the block devices. Power on AhsayUBS on again. or
- 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 the 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 is connected to the AhsayUBS server. If not, shutdown AhsayUBS. Insert a physical block device(s) / create a hardware RAID before booting 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:
5. [Local Storage Provider] Select the RAID type of the volume (RAID 0 / RAID 1 / RAID Z).
6. Click the **Done** button.
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 the **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.

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 box will pop up to show that the volume was removed successfully. The volume will no longer exist in the AhsayUBS now.

WARNING

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

Mount and Unmount Additional Storage

Unmount Additional Storage

NOTES

1. System Storage volume is always in use and it 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 to 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 **OK** button 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 to 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 if the volume was mounted successfully or not. Click the button **OK** to close the dialog.

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.

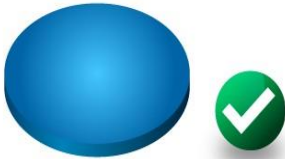
NOTE

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	91.50 KB
Used Percentage	0.00%
ZFS Version	3
Mount Point	/jubs/mnt/esms00

Action

Unmount Volume	Unmount
Filesystem check	Scrub

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

[Back](#)

[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 pop 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	<button>Mount</button>
Filesystem check	<button>fsck</button>

Command output:

```
** /dev/label/ESls00
** Last Mounted on /ufs/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)
```

Export and Import Additional Storage (ZFS)

- When the corresponding block devices or the iSCSI target is undergoing maintenance or
- [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.

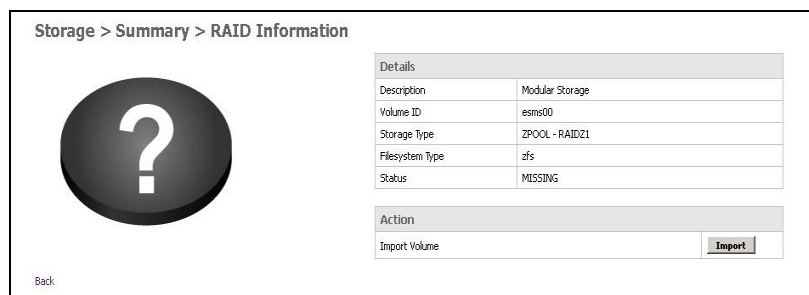
NOTES

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.

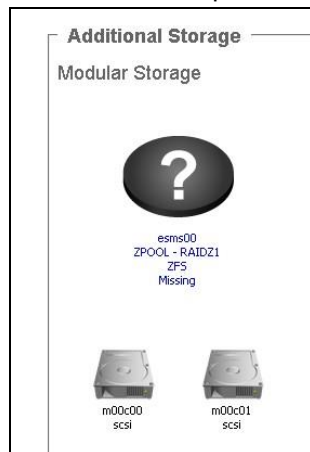


Import the Additional Storage

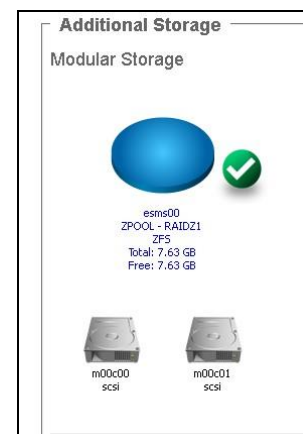
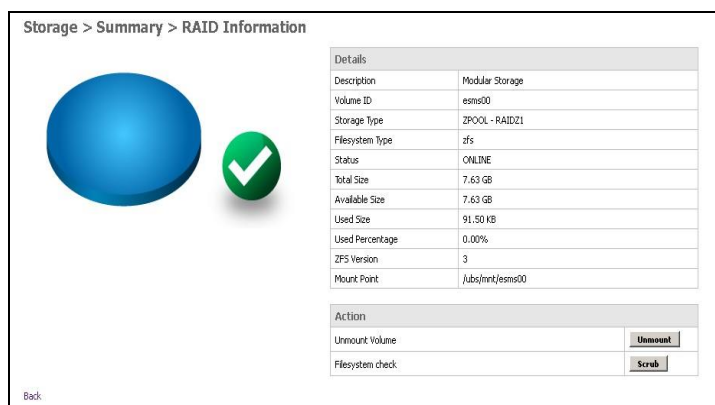
The volume needs to be imported again when it is going to be used by the AhsayUBS.

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.



9.4.2 iSCSI



Information

System

Network

Storage

Backup Server

Storage > iSCSI

Target address	Target name	Initiator name	Comment	Connected	Enable / Disable
10.3.0.98	iqn.2004-04.com.ubdsd00.bdd462	iqn.2004-04.com.ubdsd00.bdd462	ubdsd00	No	Enable
10.3.0.98	iqn.2004-04.com.ubdsd01.bdd462	iqn.2004-04.com.ubdsd01.bdd462	ubdsd01	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>"

Rules for enable / disable / delete iSCSI session:

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

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.

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.

Storage > iSCSI > Add

iSCSI	
Target address	10.1.0.228 The IP address or DNS name of the iSCSI target.
Target name	iqn.2021-04-ubsdisk00 The format should be in "iqn.<yyyy-mm>.<reversed domain name>:<identifier>". example: iqn.1994-04.org.netbsd.iscsi-target:target0.
Initiator name	iqn.2021-04-ubsdisk00 The format should be in "iqn.<yyyy-mm>.<reversed domain name>:<identifier>". example: iqn.2005-01.il.ac.huji.cs:somebody.
Port	3260 The target port of the iSCSI initiator. Default port is "3260".
Comment	ubsdisk00 The description of this entry.

Add

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 in 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



The changes have been applied successfully.

Target address	Target name	Initiator name	Comment	Connected	Enable / Disable
10.1.0.228	iqn.2021-04.██████████:ubsdisk00	iqn.2021-04.██████████:ubsdisk00	ubsdisk00	Yes	Connecting...
10.1.0.228	iqn.2021-04.██████████:ubsdisk01	iqn.2021-04.██████████:ubsdisk01	ubsdisk01	Yes	Connecting...



Edit the configuration of an iSCSI entry

NOTES

1. The corresponding Additional Storage should be *exported* or *removed* before proceeding.
2. *Removing* the Additional Storage will erase all the data in the storage.
3. For steps **to export an Additional Storage**, please refer to the section [Export and Import Addition Storage](#).
4. 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).

Storage > iSCSI > Edit

iSCSI	
Target address	10.1.0.228 The IP address or DNS name of the iSCSI target.
Target name	iqn.2021-04.ubsdisk00 The format should be in "iqn.<yyyy-mm>.<reversed domain name>:<identifier>". example: iqn.1994-04.org.netbsd.iscsi-target:target0.
Initiator name	iqn.2021-04.ubsdisk00 The format should be in "iqn.<yyyy-mm>.<reversed domain name>:<identifier>". example: iqn.2005-01.il.ac.huji.cs:somebody.
Port	3260 The target port of the iSCSI initiator. Default port is "3260".
Comment	ubsdisk00 The description of this entry.

Save

5. Click the **Save** button to save the changes.

Disable an iSCSI initiator entry

NOTES

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.**
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 accessible again by the AhsayUBS after re-enabling the iSCSI initiator session.
3. For steps to export an Additional Storage, please refer to the section [Export and Import Addition Storage](#).
4. For steps to remove an Additional Storage, please refer to the section [Remove Additional Storage](#).

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.

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 enabled 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](#).

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 will be deleted.
3. Click the icon '⊖'.
4. Click **OK** in the dialog box that will appear.

10.1.0.228:8080 says

Do you really want to delete this iSCSI initiator? All elements that still use it will become invalid (e.g. share)!

OK

Cancel

5. The iSCSI initiator entry is destroyed successfully.

Troubleshooting

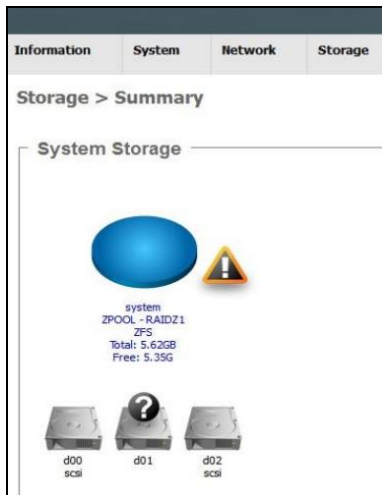
WARNING

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.

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.

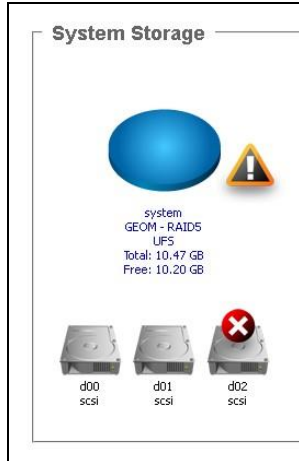
NOTES

1. 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
2. Only two kinds of degraded storage are supported for rebuilding their volume:
 - System Storage
 - (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

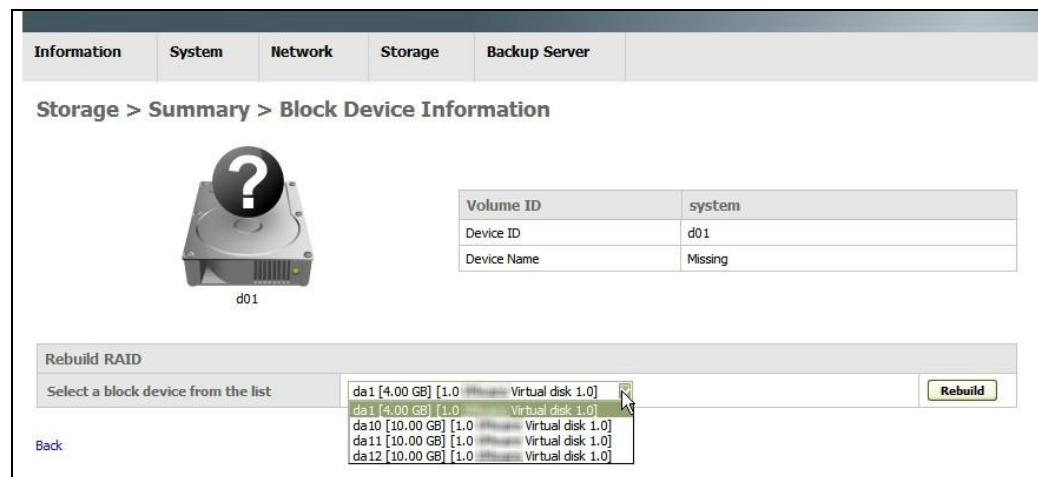
Volume ID	system
Device ID	d02
Device Name	da5
Device Path	/dev/da5
Device Type	scsi
Device Size	8.00 GB
Model Family	1.0
Model Name	Virtual disk 1.0

NOTE

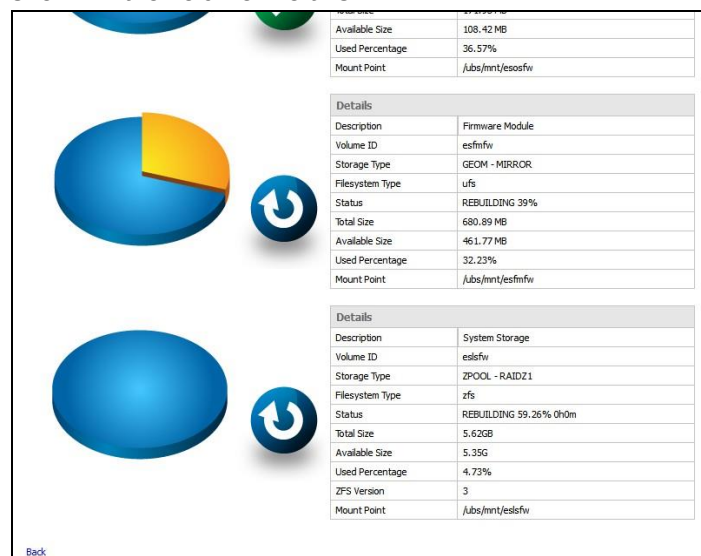
To locate any missing or degraded block devices in AhsayUBS, please refer to [Appendix H – Identifying Physical Local Block Devices on AhsayUBS](#) for details.

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

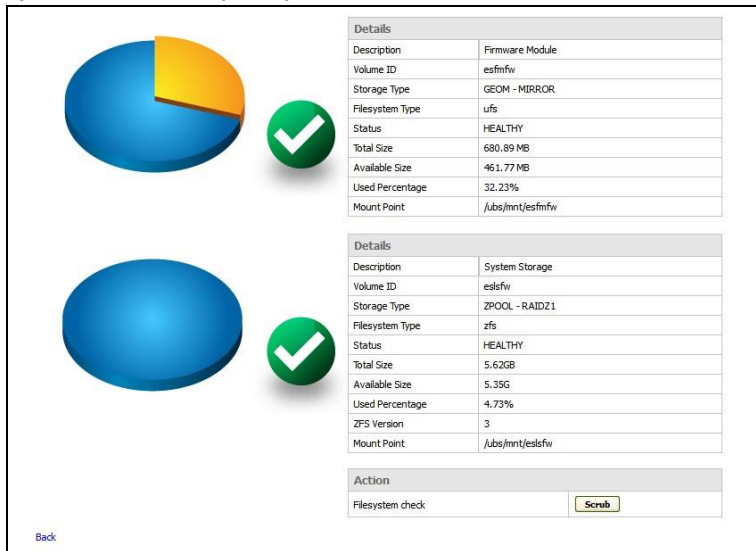
9. Select a block device to rebuild the volume.



10. Click the **Rebuild** button to start the rebuild volume process.
11. Warning message will be shown in the alert box. Read it CAREFULLY before proceeding. Click the **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 pop up to show that the rebuild process is started successfully. Click the **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:



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



The screenshot shows a storage management interface with two volumes. Each volume is represented by a pie chart and a green checkmark icon, indicating a healthy status. To the right of 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

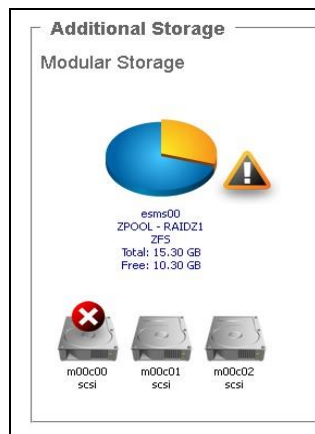
Below the details tables is an 'Action' section with a 'Filesystem check:' label and a 'Scrub' button.

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.



The screenshot shows the 'Additional Storage' section with a 'Modular Storage' subsection. It features a pie chart with a warning icon, indicating a degraded state. Below the chart, the following information is displayed:

- esms00
- ZPOOL - RAIDZ1
- ZFS
- Total: 15.30 GB
- Free: 10.30 GB

Below this information are three block device icons labeled m00c00, m00c01, and m00c02, all identified as SCSI. The m00c00 icon has a red 'X' over it, indicating it is degraded.

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

NOTE

To locate any missing or degraded block devices in AhsayUBS, please refer to [Appendix H – 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 to rebuild the volume.

Storage > Summary > Block Device Information



m00c00

Volume ID	esms00
Device ID	m00c00
Device Name	Missing

Rebuild RAID

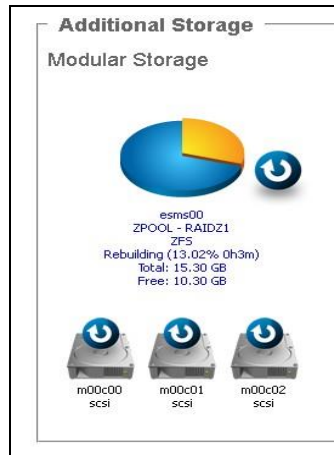
Select a block device from the list

da0 [8.00 GB] [1.0] Virtual disk 1.0	Rebuild
da0 [8.00 GB] [1.0] Virtual disk 1.0	

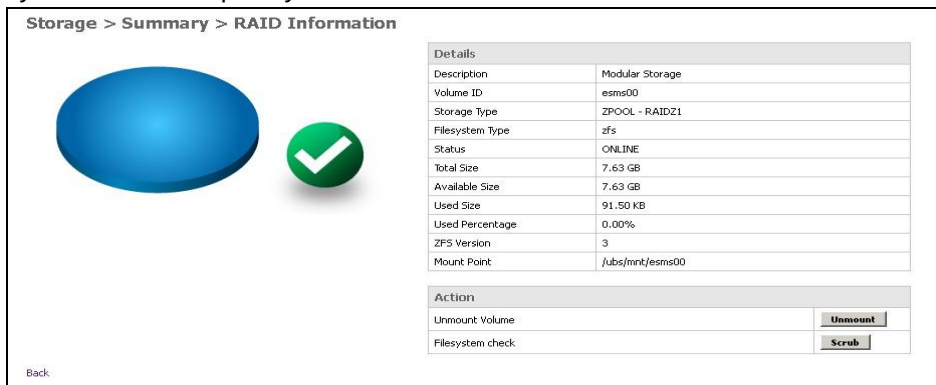
Back

10. Click the **Rebuild** button to start the rebuild volume process.
11. Warning message will be shown in the alert box. **Read it CAREFULLY before proceeding.** Click the **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 pop up to show that the rebuild process is started successfully. Click the **OK** button after reading the message.

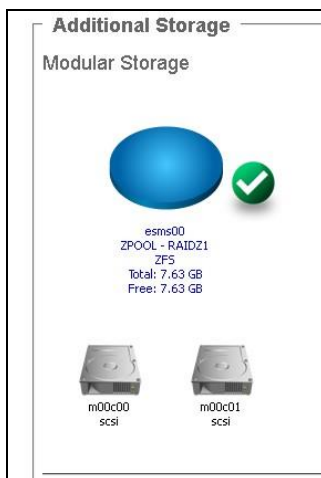
13. When the block device in the volume is synchronizing, the rebuild icon '  ', will be shown in the volume like this:



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



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(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 session by clicking 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 anything can be written 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

Additional User Storage Migration

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:

- 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 migration is in progress.

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.

NOTES

1. 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.
2. 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. Unmount 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 migrating 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:/# sh /ubs/bin/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:/# sh /ubs/bin/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) :

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:/# sh /ubs/bin/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) :

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

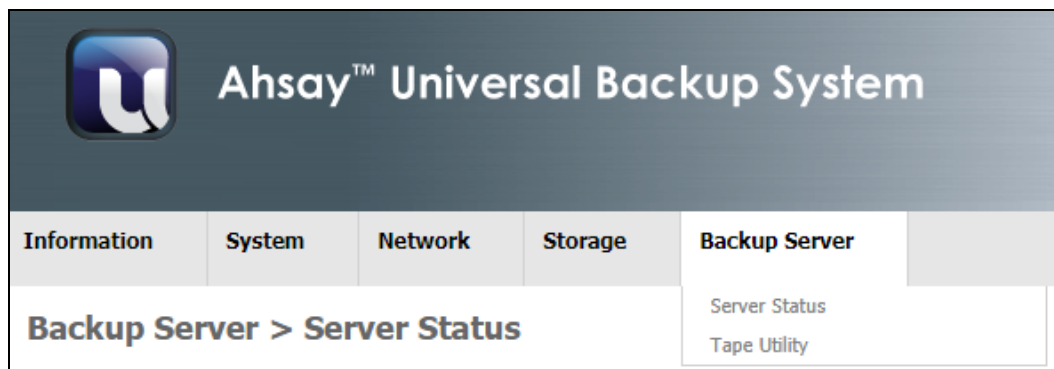
```
Start migrating modular storage [76E7AAE1xesms00] to  
[873391A2xesms00]  
ad4p11 labeled  
ad4p13 labeled  
Completed migrating modular storage [76E7AAE1xesms00] to  
[873391A2xesms00]  
Successfully updated the profile.ini file on the current system!!!
```

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.

9.5 Backup Server

When the mouse pointer is pointed over the word “Backup Server” in the menu bar, the menu will be shown as below:



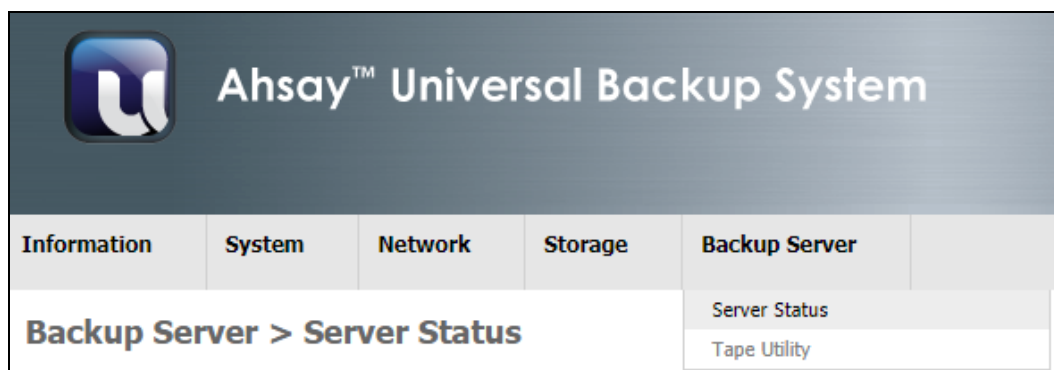
The **Backup Server** menu has been further divided into the following sections:

- [Server Status](#) (Start and Stop AhsayCBS)
- [Tape Utility](#) (Backup and Restore of tape device)

9.5.1 Server Status

The page Backup Server > Server Status allows you to:

- Start and stop the AhsayCBS service
- Start and stop the NFS service
- Enable or disable Access Server Files.



Here are the information and settings provided in the table:

- **Status:** Show the service status of the AhsayCBS in the AhsayUBS.
- **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.

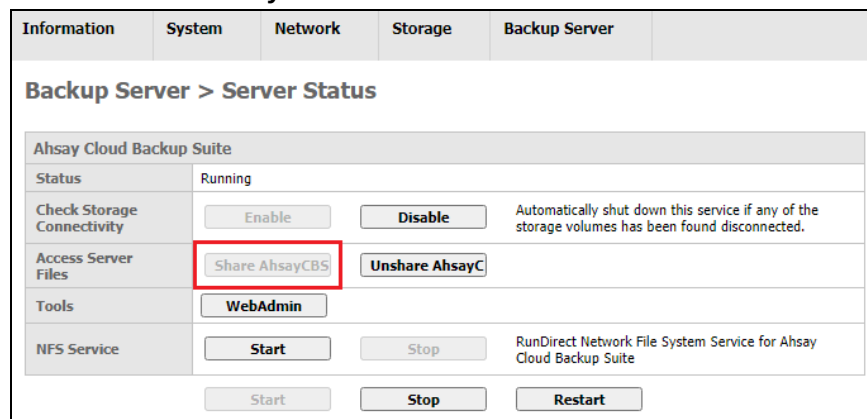
- **Access Server Files:** Allows the AhsayUBS administrator a convenient way to access the file system on the AhsayUBS server. And also gain access to folders/files such as the System and User Home folder from their Windows, macOS or Linux desktop machine. The AhsayUBS folders are shared using SAMBA.

This is useful on the following scenarios:

- Copying user data to/from the AhsayCBS user home.
- Access the AhsayCBS logs folder to view the server logs.
- Directly access configuration files from the conf folder.
- Copying AhsayCBS hotfix files to the AhsayUBS server.
- Copying AhsayOBM/AhsayACB seed load data to AhsayCBS user home. For more information on how to do this please refer to the following articles: [FAQ: How to perform backup to a local destination then import the data to a cloud storage destination \(seedload to a cloud destination\)?](#) and [FAQ: How to perform the initial backup to a removable drive then import the data \(seedload\) onto its backup destination \(Windows\).](#)

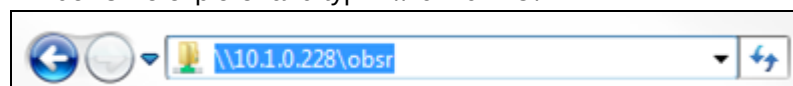
Please follow these steps to access the AhsayUBS file system:

- Click the **Share AhsayCBS** button.

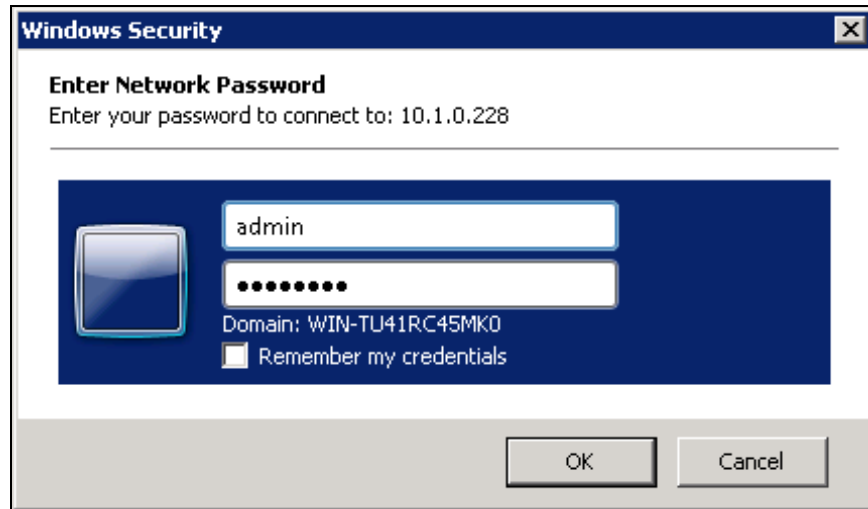


- Connect to the shared directory by using a UNC path `\\server_name\obsr` or `\\IP_Address\obsr`. For a Linux desktop, access the AhsayUBS server folders from the mount point `/mnt/obsr`.

For example, on a Windows machine to access the AhsayUBS server folders and files where the IP Address of the AhsayUBS server is 10.1.0.228, use Windows file explorer and type “\\10.1.0.228\obsr”.



- iii. Type the “admin” credentials used for the AhsayUBS WebAdmin (default user is **admin** and password is **ahsayubs**).



- iv. Now you can access the following folders on the AhsayUBS file system.

Network > 10.1.0.228 > obsr >				
Open Burn New folder				
Name	Date modified	Type	Size	
conf	5/6/2021 10:27 AM	File folder		
download	4/29/2021 3:48 PM	File folder		
logs	5/6/2021 10:20 AM	File folder		
nfs	4/29/2021 11:54 PM	File folder		
obsr-system	4/29/2021 11:53 PM	File folder		
pns	4/29/2021 3:48 PM	File folder		
rcvshome	4/30/2021 12:03 AM	File folder		
rps-system	4/29/2021 11:53 PM	File folder		
system	4/29/2021 11:56 PM	File folder		
temp	5/6/2021 10:18 AM	File folder		
user	5/6/2021 10:27 AM	File folder		
work	5/6/2021 10:20 AM	File folder		

- v. 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.
 - **NFS Service:** To Start or Stop the NFS Service in AhsayCBS.

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

The status when the AhsayCBS service is started.

Information	System	Network	Storage	Backup Server
Backup Server > Server Status				
Ahsay Cloud Backup Suite				
Status	Running			
Check Storage Connectivity	Enable	<input checked="" type="button" value="Disable"/>	Automatically shut down this service if any of the storage volumes has been found disconnected.	
Access Server Files	Share AhsayCBS		Unshare AhsayC	
Tools	WebAdmin			
NFS Service	Start	Stop	RunDirect Network File System Service for Ahsay Cloud Backup Suite	
Start Stop Restart				

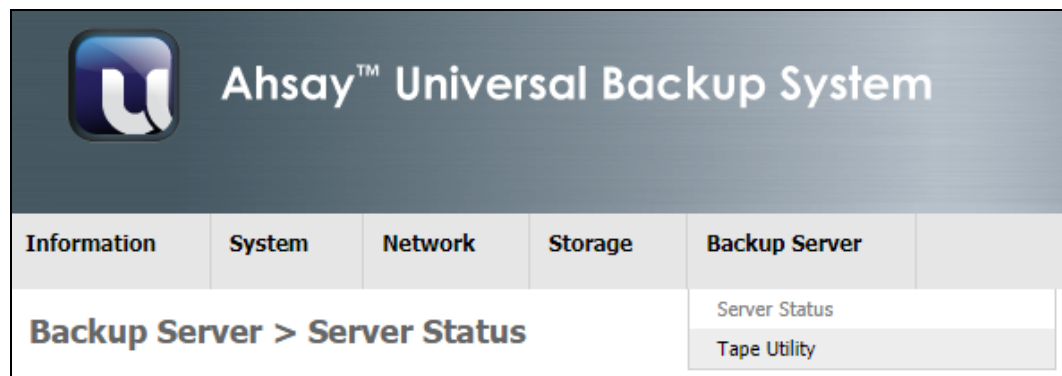
The status when the AhsayCBS service is stopped.

Information	System	Network	Storage	Backup Server
Backup Server > Server Status				
Ahsay Cloud Backup Suite				
Status	Stopped			
Check Storage Connectivity	Enable	<input checked="" type="button" value="Disable"/>	Automatically shut down this service if any of the storage volumes has been found disconnected.	
Access Server Files	Share AhsayCBS		Unshare AhsayC	
NFS Service	Start	Stop	RunDirect Network File System Service for Ahsay Cloud Backup Suite	
Start Stop Restart				

The following is the screen capture of the failed storage dependency during service start of “AhsayCBS” or “Share AhsayCBS” service. It is caused by loss 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 Troubleshooting](#) section for details.

Information	System	Network	Storage	Backup Server	
Backup Server > Server Status					
 Some of the storage volumes have been found disconnected. Failed to start service.					
Ahsay Cloud Backup Suite					
Status	Stopped				
Check Storage Connectivity	Enable <input checked="" type="button" value="Disable"/>		Automatically shut down this service if any of the storage volumes has been found disconnected.		
Access Server Files	Share AhsayCBS <input checked="" type="button" value="Unshare AhsayC"/>				
NFS Service	Start Stop		RunDirect Network File System Service for Ahsay Cloud Backup Suite		
Start Stop Restart					

9.5.2 Tape Utility



Introduction

The Tape Backup Utility will be used to archive the data of AhsayOBM/AhsayACB user accounts hosted on an AhsayCBS server to tape cartridge(s). The AhsayUBS administrator may backup selected user accounts to tape cartridge while the backup server remains online. Therefore, no downtime is required and the backup and restore service is not affected.

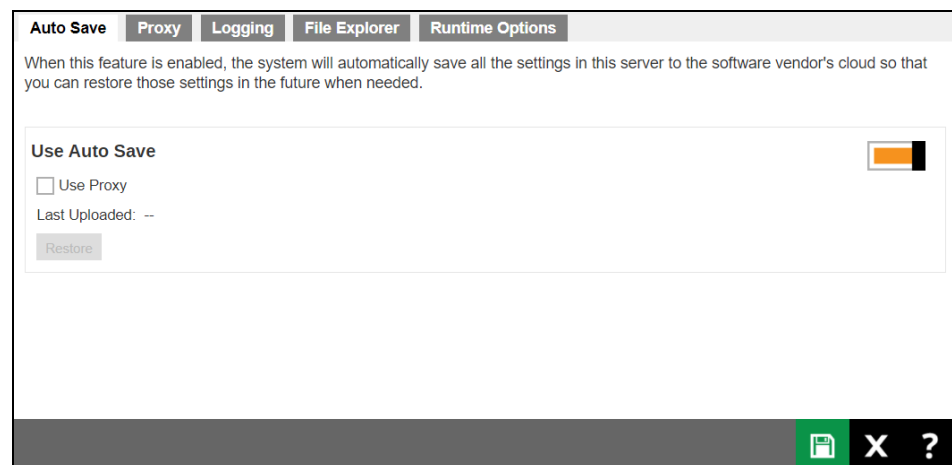
The Tape Backup Utility is integrated into the AhsayUBS which is based on FreeNAS firmware (FreeBSD 11.2). The tape backup and restore operation leverages the FreeBSD 'mt' utility ([magnetic tape manipulating program](#)), which is fully managed from within the AhsayUBS webadmin console. The AhsayCBS user account data can be restored to the AhsayUBS server either to the original or an alternate location.

Requirements

- AhsayUBS and AhsayCBS v9.1.0.0 or later
- AhsayCBS Auto Save must be enabled.

As Auto Save will backup the users.xml file, since this file is required if the archived tape data needs to be recovered:

1. If the user account has been deleted or
2. Need to be restored to another AhsayUBS machine



Limitations

- All tape backup jobs must be performed manually through the AhsayUBS webadmin console. **Scheduled tape backups are not supported.**
- No API support for Tape Backup Utility as it is a FreeBSD system level operation.
- Only **one** AhsayCBS 'user home' path can be selected for backup at a time.
- Only **one** tape backup or restore job can be run at a time.
- Both tape libraries and tape changers are not supported, so 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 is full.
- The AhsayCBS service must be stopped prior to a tape restore, if restoring to an existing AhsayCBS 'User Home' path.
- If AhsayUBS is running on a VMware host, the tape backup utility is not supported. As VMware does not support Tape Drives connected directly to ESXi 5.x or above. For more information please refer to this article <https://kb.vmware.com/s/article/2007904>.

Licensing

There are no additional license modules required to use the Tape Backup Utility, as this feature is integrated into AhsayUBS. However, an AhsayUBS license module is required to use AhsayUBS.

'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.

Supported Tape Devices and Standards

The FreeBSD 11.2 operating system provides full support for SCSI-I, SCSI-II and SCSI-III tape drives. As AhsayUBS is built using FreeBSD 11.2, all SCSI tape drives are therefore supported. The 'sa – SCSI Sequential Access device drive' will be used for accessing the tape device.

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

Summary of Supported Standards

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
	2015	LTO-7	LTO-7, LTO-6	6000	300
	2017	LTO-8	LTO-8, LTO-7	12000	360

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 the following:

- DELL PowerVault LTO-4 tape drive, connected to a DELL 6GB HBA SAS controller using 800GB LTO-4 tape cartridges
- DELL PowerVault LTO-7 tape drive, connected to a SAS2008 PCI-Express Fusion-MPT SAS-2 Falcon controller using 6TB LTO-7 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.

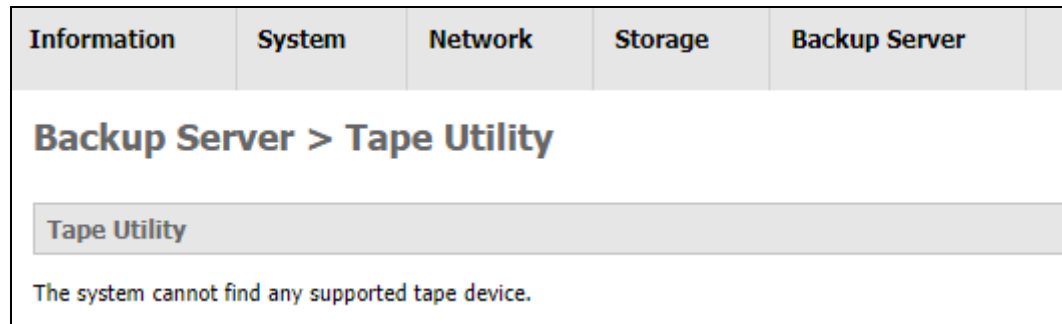
Before using the Tape Utility option, the tape device must be:

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 displays the Ahsay Universal Backup System webadmin interface. At the top, there's a header with the Ahsay logo and the text 'Ahsay™ Universal Backup System'. Below this is a navigation bar with tabs: Information, System, Network, Storage, Backup Server, and a partially visible 'Tape Utility' tab. The main content area is titled 'Backup Server > Tape Utility > Backup'. There are two buttons: 'Backup' (highlighted in orange) and 'Restore'. Below these is a 'Tape Utility' section with several fields: 'Tape Device' (a dropdown menu showing 'sa0 (IBM ULTRIUM-TD4 A23D)' and 'sa0 (IBM ULTRIUM-TD4 A23D)' as options), 'Tape Capacity' (a text input field with 'GB' as a unit), 'User Home Directory' (a dropdown menu showing '/ubs/mnt/esls00/obsUserHome02'), and 'User Name' (a text input field with a warning message: 'The selected user home directory does not contain any user name folder.'). At the bottom left of this section 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, with the following message displayed “**The system cannot find any supported tape device.**” (As shown in the following example).



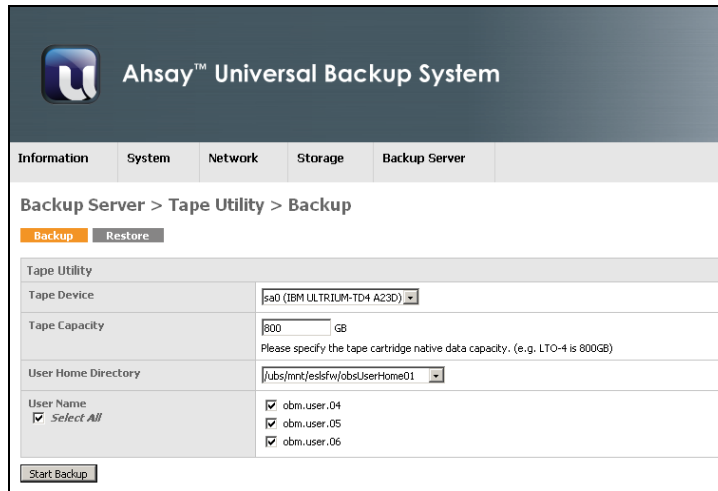
NOTES

1. Please ensure the tape is rewinded 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 is 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 Tape Backup Utility supports the backup of AhsayOBM/AhsayACB user accounts either on:

- The entire user home volume to another UBS server
- Selective user accounts on a user home volume to another UBS server



The screenshot shows the Ahsay Universal Backup System web interface. The top navigation bar includes tabs for Information, System, Network, Storage, and Backup Server. The current page is 'Backup Server > Tape Utility > Backup'. Below the navigation bar, 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 '800' and a unit dropdown set to 'GB'. Below the field, a note reads: 'Please specify the tape cartridge native data capacity. (e.g. LTO-4 is 800GB)'.
- User Home Directory:** A dropdown menu showing '/ubs/min/eshfw/obsUserHome01'.
- User Name:** A section with a 'Select All' checkbox and three individual checkboxes for 'obm.user.04', 'obm.user.05', and 'obm.user.06', all of which are checked.

At the bottom 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.

 **Ahsay™ Universal Backup System**

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

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.

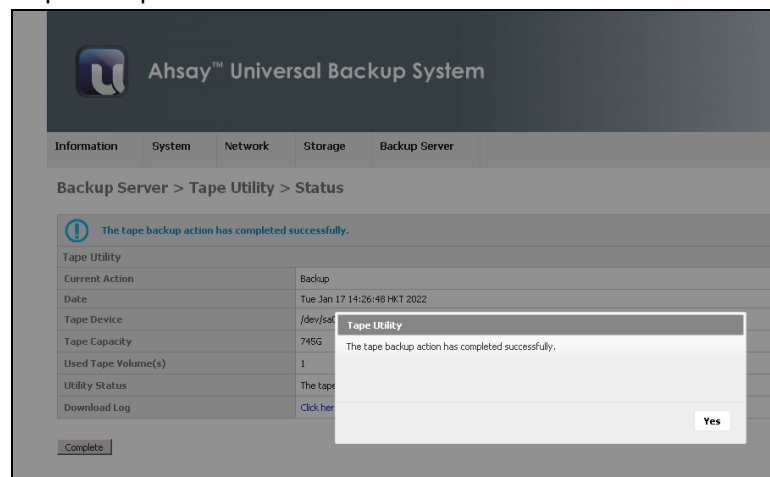
Stop Backup

NOTE

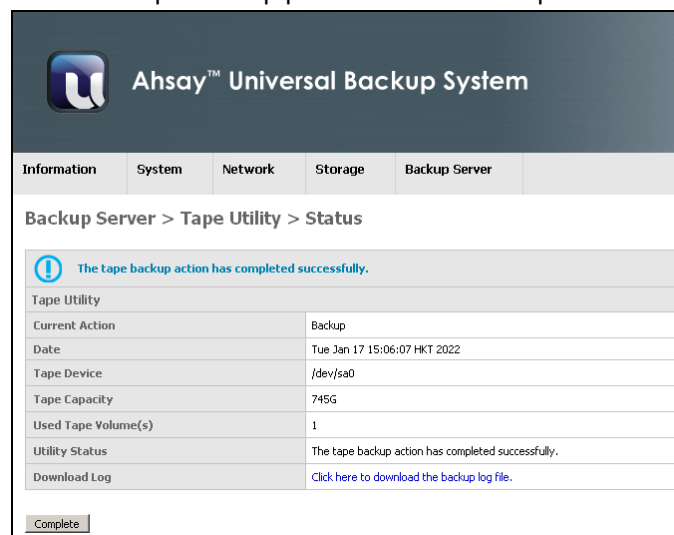
A tape backup job can be stopped at anytime by pressing the **Stop Backup** button.

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 AhsayOBM/AhsayACB user account data is restored to the AhsayCBS server either to:

- Original user home location
- An alternate user home location
- The data on tape backups can be restored to another AhsayUBS machine

NOTE

Restore of original users.xml file may also be required, if the AhsayOBM/AhsayACB user account and or backup set(s) restored from tape have already been deleted from AhsayCBS.

The screenshot shows the Ahsay Universal Backup System web interface. The top navigation bar includes tabs for Information, System, Network, Storage, and Backup Server. The main content area is titled 'Backup Server > Tape Utility > Restore'. Below the title, there are two buttons: 'Backup' and 'Restore'. The 'Restore' button is highlighted. The 'Tape Utility' section contains the following fields:

Tape Device	sa0 (IBM ULTRIUM-TD4 A23D)
Restore Path	☒ User Home Directory ☐ Alternative Path /ubs/mnt/esls00/obsUserHome02
Restore Option	☐ Remove directory content before restore

At the bottom of the form 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 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 has 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 display the message “Stopping backup server”. After the tape restore has completed the AhsayCBS service will be automatically restarted again.



Ahsay™ Universal Backup System

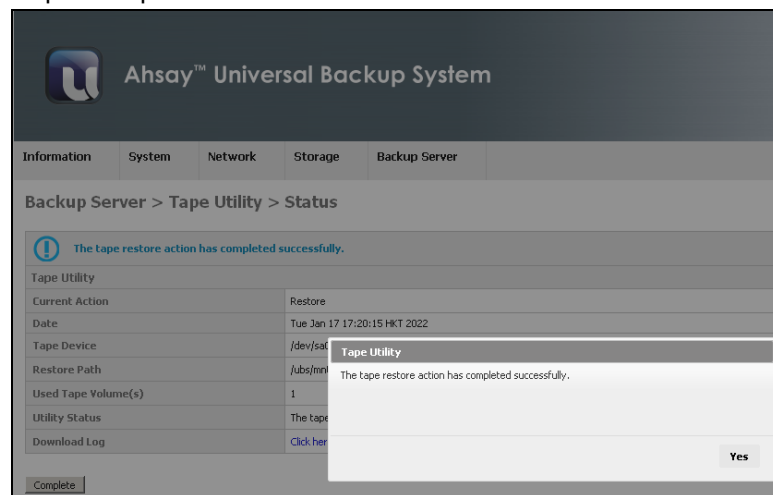
Information	System	Network	Storage	Backup Server
Backup Server > Tape Utility > Status				
Tape Utility				
Current Action	Restore			
Date	Tue Jan 17 17:30:40 HKT 2022			
Tape Device	/dev/sa0			
Restore Path	/ubs/mnt/eslsfw/obsr/user			
Tape Volume Index				
Utility Status	Stopping backup server.			
Stop Restore				

NOTE

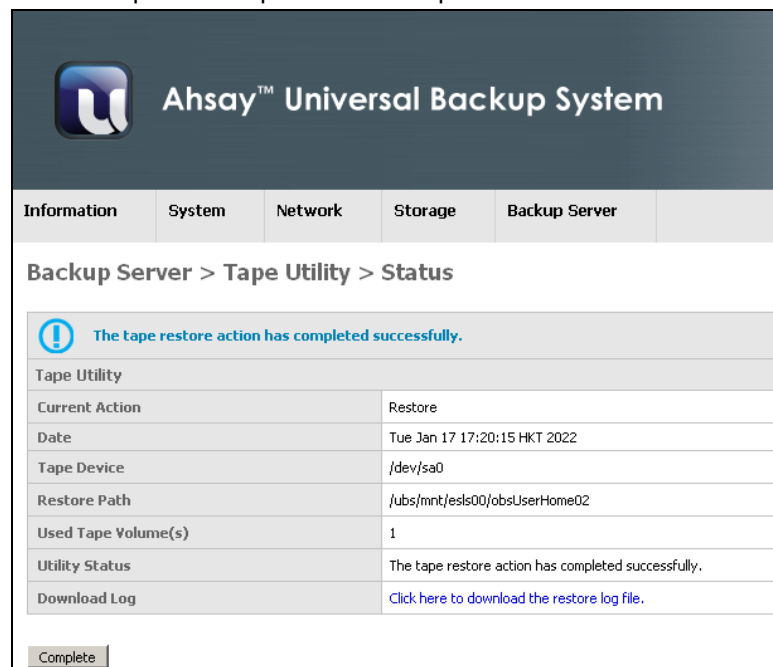
A tape restore job can be stopped at any time by pressing the **Stop Restore** button.

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 and Restore Jobs

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 web admin 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 2022		
Tape Device		/dev/md10		
Tape Capacity		100M		
Tape Volume Index		1		
Utility Status		Performing tape backup with GNU tar utility.		
Stop Backup				

Information	System	Network	Storage	Backup Server
Backup Server > Tape Utility > Status				
Tape Utility				
Current Action		Restore		
Date		Wed Jan 18 03:31:12 UTC 2022		
Tape Device		/dev/md10		
Restore Path		/ubs/mnt/eses00		
Tape Volume Index		1		
Utility Status		Performing tape restore with GNU tar utility.		
Stop Restore				

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 2022		
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.		
Complete				

NOTE

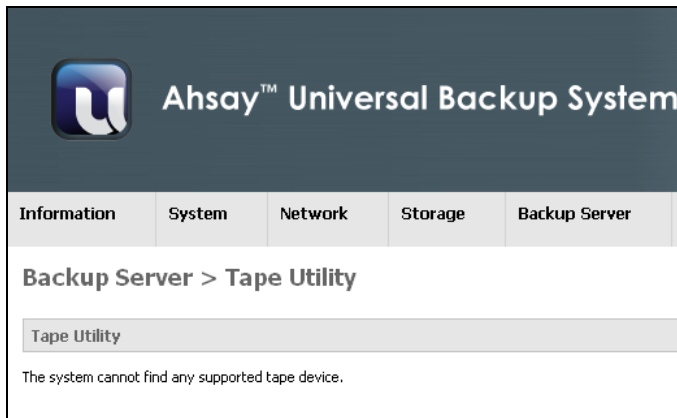
Once the **Complete** button is pressed the last tape backup/restore log files will be cleared.

Monitoring and Reporting

- The backup and restore job status can be monitored using the AhsayUBS webadmin console.
- Each tape backup and restore job will generate a separate log file, they can be downloaded from the AhsayUBS webadmin console.

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 come to a stop, the tape cartridge may be 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 via the command line 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 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.

9.6 AhsayUBS Firmware Management Console

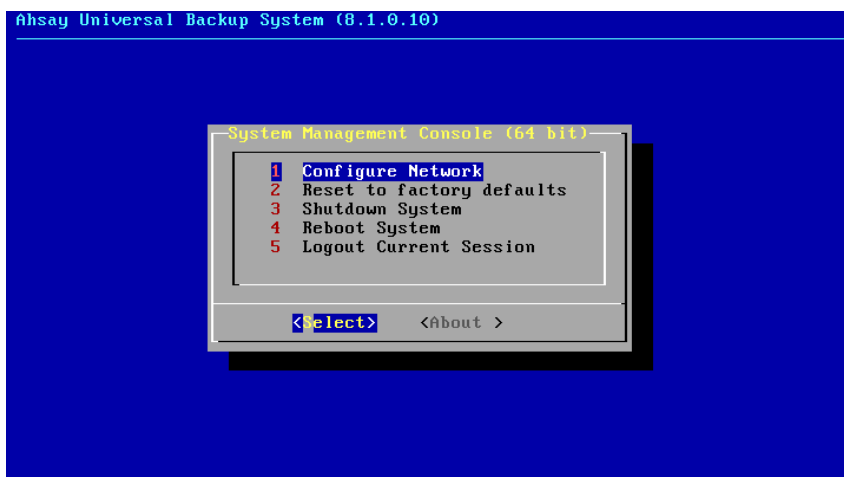
(For advanced users ONLY)

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.

9.6.1 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.



DHCP

1. 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.
2. By default, you can use the address "http://{SERVER_IP_ADDRESS}:8080" to access the AhsayUBS WebAdmin in the browser.
3. Finally, choose **OK** to go 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.

Static IP

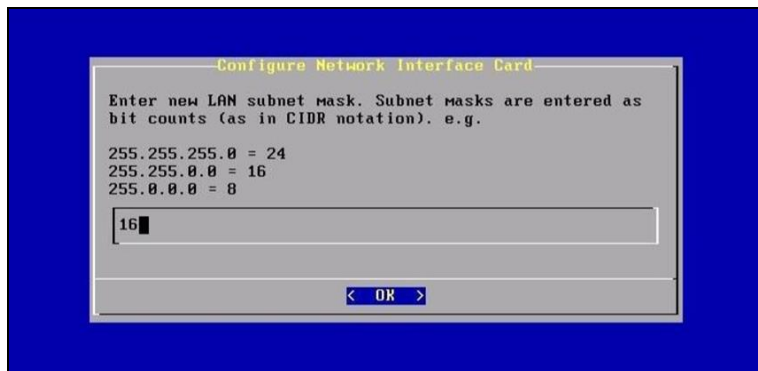
1. A Static IP can be assigned for the AhsayUBS. Choose **No** to set the IP address manually.



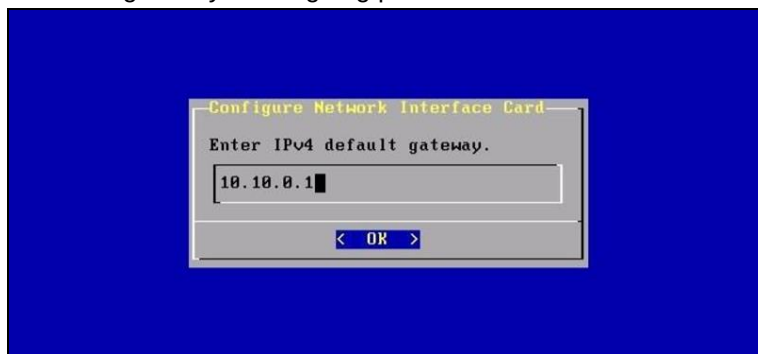
2. Enter an IPv4 address for this AhsayUBS. Choose **OK** to continue.



3. Enter the subnet for this IP Address. Choose **OK** to continue.



4. Enter the gateway for outgoing packet. Choose **OK** to continue.



5. Enter the DNS address and choose **OK** to continue.



6. 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) to continue other configurations.



9.6.2 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.



NOTES

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.
 - a. Adding it back the iSCSI session inside the Storage > iSCSI page.
 - b. 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.

9.6.3 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 [Shutdown](#) 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.

9.6.4 Reboot System

Choose this option to reboot the AhsayUBS.

NOTE

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

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.

10 Customizing AhsayUBS

Customization of AhsayUBS is separated into two sections:

1. Customization of AhsayCBS

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

2. Customization of AhsayUBS Firmware

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

11 Contacting Ahsay

11.1 Technical Assistance

To contact Ahsay support representatives for technical assistance, visit the Partner Portal:
<https://www.ahsay.com/partners/>

Also use the Ahsay Wikipedia for resource such as Hardware Compatibility List, Software Compatibility List, and other product information:
<https://wiki.ahsay.com>

11.2 Documentation

Documentations for all Ahsay products are available at:
https://www.ahsay.com/jsp/en/downloads/ahsay-downloads_documentation_guides-cbs.jsp

You can send us suggestions for improvements or report on issues in the documentation by contacting us at:
<https://www.ahsay.com/partners/>

Please specify the specific document title as well as the change required/suggestion when contacting us.

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 256 virtual processor cores. Please refer to Chapter 5.1 [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/#disk>

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/#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
fi	Finnish
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 are the supported time zones that can be set in <timezone> XML tag.

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

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

Asia/Hong_Kong	Asia/Magadan	Etc/GMT+8
Asia/Taipei	Europe/Mariehamn	Pacific/Palau
Etc/GMT+9	Europe/Vatican	Pacific/Port_Moresby
Etc/GMT+10	Europe/San_Marino	Pacific/Pitcairn
Etc/GMT+11	Europe/Ljubljana	Pacific/Pago_Pago
Etc/GMT+12	Europe/Sarajevo	Pacific/Apia
Etc/Universal	Europe/Skopje	Pacific/Guadalcanal
Etc/Zulu	Europe/Zagreb	Pacific/Fakaofu
Etc/Greenwich	Europe/Bratislava	Pacific/Tongatapu
Etc/GMT-0	Factory	Pacific/Funafuti
Etc/GMT+0	GMT	Pacific/Johnston
Etc/GMT0	HST	Pacific/Midway
Europe	Indian	Pacific/Wake
Europe/London	Indian/Comoro	Pacific/Efate
Europe/Belfast	Indian/Antananarivo	Pacific/Wallis
Europe/Dublin	Indian/Mauritius	Pacific/Honolulu
Europe/Tirane	Indian/Mayotte	Pacific/Easter
Europe/Andorra	Indian/Reunion	Pacific/Galapagos
Europe/Vienna	Indian/Mahe	SystemV
Europe/Minsk	Indian/Kerguelen	SystemV/AST4ADT
Europe/Brussels	Indian/Chagos	SystemV/EST5EDT
Europe/Sofia	Indian/Maldives	SystemV/CST6CDT
Europe/Prague	Indian/Christmas	SystemV/MST7MDT
Europe/Copenhagen	Indian/Cocos	SystemV/PST8PDT
Europe/Tallinn	MET	SystemV/YST9YDT
Europe/Helsinki	MST	SystemV/AST4
Europe/Paris	MST7MDT	SystemV/EST5
Europe/Berlin	PST8PDT	SystemV/CST6
Europe/Gibraltar	Pacific	SystemV/MST7
Europe/Athens	Pacific/Rarotonga	SystemV/PST8
Europe/Budapest	Pacific/Fiji	SystemV/YST9
Europe/Rome	Pacific/Gambier	SystemV/HST10
Europe/Riga	Pacific/Marquesas	WET
Europe/Vaduz	Pacific/Tahiti	
Europe/Vilnius	Pacific/Guam	
Europe/Luxembourg	Pacific/Tarawa	
Europe/Malta	Pacific/Enderbury	
Europe/Chisinau	Pacific/Kiritimati	
Europe/Monaco	Pacific/Saipan	
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	

Appendix G Example of config.xml

The following is one of the default sysctl entries in the factory default config file “/usr/local/etc/sysctl.conf”.

```
<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 ‘’ you are 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



d01
ata

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 ‘’ you are 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

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

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

NOTE

Please refer to the page System > Settings > SNMP for a simplified OID list.

Trap string	jubs 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.
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'	
OID Prefix: iso.org.dod.internet.mgmt.mib-2.host.hrStorage.hrStorageTable.hrStorageEntry.	
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	
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.	
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'	
OID Prefix: iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.	
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.

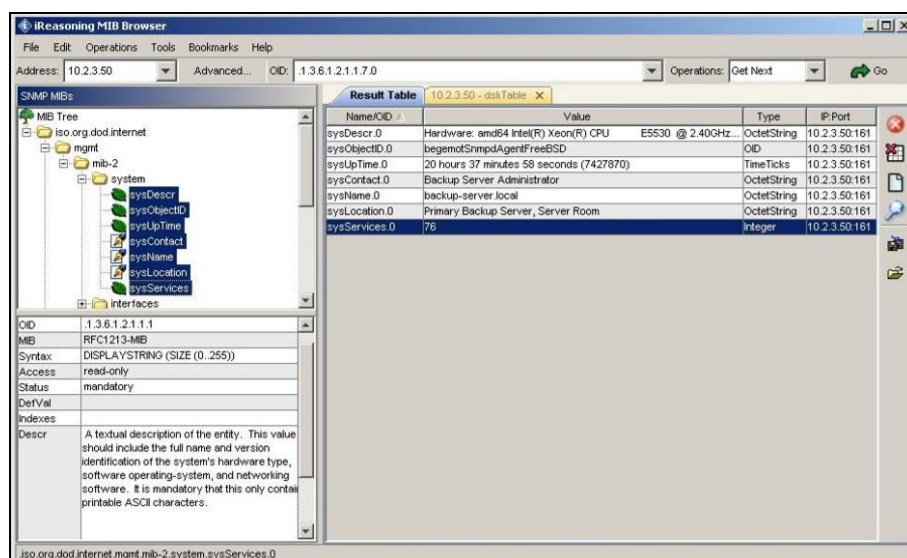
Disk I/O Statistics	
Each storage device in the AhsayUBS system has been indexed by the 'diskIOIndex' attribute. The corresponding 'diskIODevice', 'diskIONRead' and 'diskIOWritten' attributes will be mapped by the same index. e.g. 'diskIOIndex.1' implies 'diskIODevice.1', 'diskIONRead.1' and 'diskIOWritten.1'	
OID Prefix: iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOMIB.diskIOTable.diskIOEntry.	
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>)

1. 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)

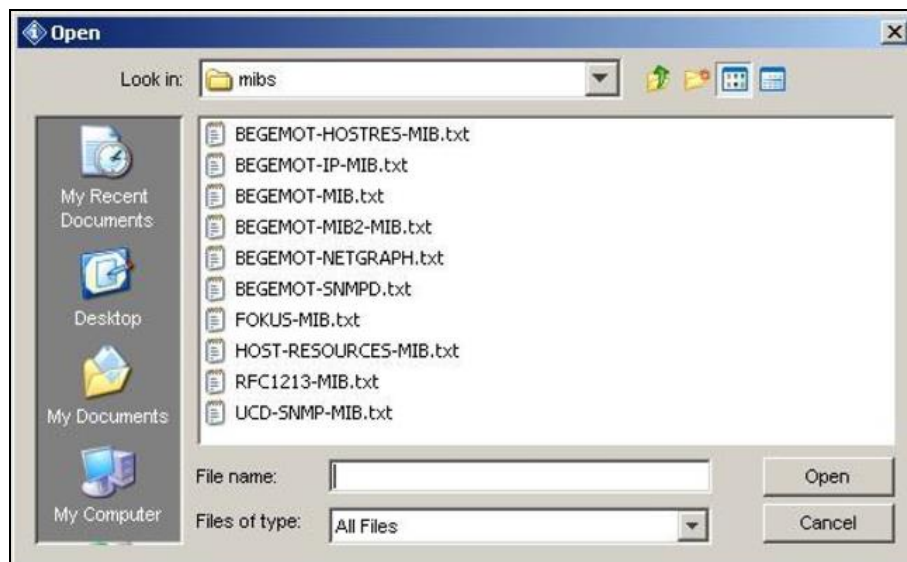


2. Additional MIB definition files can be loaded to the MIB Browser.
Download and extract the MIB archive from UBS System > Settings > SNMP.

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	☒ 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.

The screenshot shows the MIB Browser interface. On the left, the MIB Tree is expanded to show the 'system' subtree under 'iso.org.dod.internet.mgmt.mib-2'. A context menu is open over the 'system' node, showing options like 'Find in subtree', 'Expand subtree', 'Graph View', 'Get', 'Get Next', 'Get Bulk', 'Get Subtree', 'Set', 'Walk', and 'Table View'. The 'Get' option is selected. On the right, a table displays the retrieved system information.

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.

The screenshot shows the MIB Browser interface. On the left, the MIB Tree is expanded to show the 'system' subtree under 'iso.org.dod.internet.mgmt.mib-2'. A context menu is open over the 'system' node, showing options like 'Find in subtree', 'Expand subtree', 'Graph View', 'Get Next', 'Get Bulk', 'Get Subtree', 'Walk', and 'Table View'. The 'Walk' option is selected. On the right, a table displays the retrieved system information.

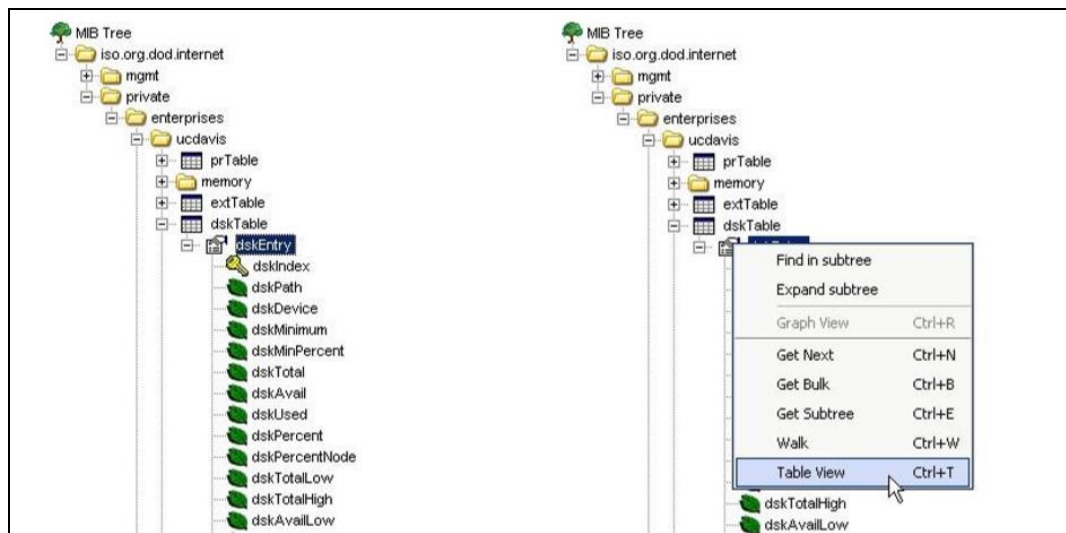
Name/OID	Value	Type
sysDescr.0	Hardware: amd64 Intel(R) Xeon(R) C...	OctetString
sysObjectID.0	begemotSnmpdAgentFreeBSD	OID
sysUpTime.0	17 minutes 48 seconds (106863)	TimeTicks
sysContact.0	Backup Server Administrator	OctetString
sysName.0	backup-server.local	OctetString
sysLocation.0	Primary Backup Server, Server Room	OctetString
sysServices.0	76	Integer
1.3.6.1.2.1.1.8.0	180 milliseconds (18)	TimeTicks
1.3.6.1.2.1.1.9.1.2.1	begemotSnmpdTransUdp	OID
1.3.6.1.2.1.1.9.1.2.2	begemotSnmpdTransLsock	OID
1.3.6.1.2.1.1.9.1.2.3	1.3.6.1.6.3.1	OID
1.3.6.1.2.1.1.9.1.2.4	begemotSnmpd	OID
1.3.6.1.2.1.1.9.1.2.5	1.3.6.1.2.1.31	OID
1.3.6.1.2.1.1.9.1.2.6	1.3.6.1.2.1.48	OID
1.3.6.1.2.1.1.9.1.2.7	1.3.6.1.2.1.49	OID
1.3.6.1.2.1.1.9.1.2.8	1.3.6.1.2.1.50	OID
1.3.6.1.2.1.1.9.1.2.9	1.3.6.1.2.1.4.24	OID

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
DerVal	
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.



The screenshot shows two instances of the MIB Tree. The left instance shows the path: iso.org.dod.internet > mgmt > private > enterprises > ucdavis > dskTable > dskEntry. The right instance shows the same path, but with a context menu open over dskEntry. The menu options are: Find in subtree, Expand subtree, Graph View (Ctrl+R), Get Next (Ctrl+N), Get Bulk (Ctrl+B), Get Subtree (Ctrl+E), Walk (Ctrl+W), and Table View (Ctrl+T). The 'Table View' option is highlighted by the mouse.

	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	/usr/mnt/estmfsw	/dev/mirror/48555C78xestmfsw	756748	485064	211146	30	2
4	4	/usr/mnt/eststfw	eststfwx48555C78	5515483	5220355	295128	5	0
5	5	/var	/dev/md1	15598	14178	174	1	2
6	6	/usr/mnt/esostfw	/dev/mirror/48555C78xesostfw	190252	83140	91892	53	0

Appendix K Open VM Tools Support

AhsayUBS includes support for Open VM Tools on FreeBSD.

To check if Open VM Tools is installed and running on AhsayUBS, login to AhsayUBS server using a ssh client and use the **kldstat** or **ps** command.

```
# kldstat
Id Refs Address          Size      Name
Id Refs Address          Size      Name
1   49 0xffffffff80200000 10d1490  kernel
2    1 0xffffffff812d2000  8cf0    vesa.ko
3    1 0xffffffff8139c000 17378    ahci.ko
4    1 0xffffffff813b4000  f108     mvs.ko
5    1 0xffffffff8c3c4000  7b68     geom_concat.ko
6    1 0xffffffff8c3cc000  8f60     geom_stripe.ko
7    1 0xffffffff8c3d5000 25ae8    geom_mirror.ko
8    1 0xffffffff8c3fb000 25c38    geom_raid5.ko
9    1 0xffffffff8c611000 221398   zfs.ko
10   1 0xffffffff8c833000  7500     opensolaris.ko
11   1 0xffffffff8c83b000 11150    krpc.ko
12   1 0xffffffff8c84d000  9afc     iscsi_initiator.ko
13   1 0xffffffff8c857000 14bd     splash_bmp.ko
14   1 0xffffffff8c859000 2798     vmmemctl.ko
15   1 0xffffffff8c85c000 23e0     vmxnet.ko
16   1 0xffffffff8c85f000 2cf8     vmblock.ko
17   1 0xffffffff8c862000 2f20     procfs.ko
```

```
# ps -fU root | grep vmtotalsd
1186  -  S          1:09.43 /usr/local/bin/vmtotalsd -c
/usr/local/share/vmware-tools/tools.conf -p /usr/local/lib/open-vm-
tools/plugins/vmsvc
29990  1  S+         0:00.00 grep vmtotalsd
```

The module is installed in `/usr/local/lib/open-vm-tools/`

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 has been rewinded 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 AhsayCBS service is running:

```
# ps `cat /var/run/obsr.pid`
```

From shell, to manually start/stop/restart AhsayCBS service

```
# sh /ubs/mnt/esfmfw/obsr/system/obsr/bin/shutdown.sh
```

```
# sh /ubs/mnt/esfmfw/obsr/system/obsr/bin/startup.sh
```

```
# sh /ubs/mnt/esfmfw/obsr/system/obsr/bin/restart.sh
```

From shell, check bootup message:

```
# dmesg | more
```

From shell, check on FreeBSD version:

```
# uname -mrs
```


Appendix N How to repair an AhsayUBS volume after it has been damaged due to expanding the volume

Expanding an AhsayUBS volume is not supported as it will cause some of the volume information to be removed which will result in some mount points such as “/tmp” to not mount properly. As a result the AhsayCBS service will no longer startup.

See error that will be encountered below once you try to access AhsayCBS.

```
Warning: session_start(): open(/tmp/sess_cf7a1f17d862813e7032a927d87acdbf, O_RDWR) failed: No such file or directory (2) in /ubs/webadmin/www/inc/language.inc on line 75
Warning: session_start(): Failed to read session data: files (path: /tmp) in /ubs/webadmin/www/inc/language.inc on line 75
Warning: session_start(): Cannot start session when headers already sent in /ubs/webadmin/www/inc/login.inc on line 50
Warning: Cannot modify header information - headers already sent by (output started at /ubs/webadmin/www/inc/language.inc:75) in /ubs/webadmin/www/inc/login.inc on line 57
```

The following instructions will allow the repair of the damaged volume and resolve the missing volume label and failed mount point issue.

1. Check the pool ID.

```
ahsayubs:~# zpool status
pool: eslsfwxDA5CB17E
state: ONLINE
scan: scrub repaired 0 in 0h0m with 0 errors on Wed Mar 9 00:00:39 2022
config:

    NAME                                STATE      READ  WRITE CKSUM
    eslsfwxDA5CB17E                     ONLINE      0     0     0
        da0p10                          ONLINE      0     0     0
    logs
        label/DA5CB17Exd00p07           ONLINE      0     0     0
```

2. Check the status.

```
ahsayubs:~# glabel status
      Name      Status  Components
label/DA5CB17Exd00p00    N/A    da0p1
label/DA5CB17Exd00p01    N/A    da0p2
label/DA5CB17Exd00p02    N/A    da0p3
label/DA5CB17Exd00p07    N/A    da0p8
ufs/DA5CB17Exesosfw      N/A    mirror/DA5CB17Exesosfw
ufs/DA5CB17Exesfmfw      N/A    mirror/DA5CB17Exesfmfw
```

3. Unmount the disk pool for label updates.

```
ahsayubs: ~# zpool export eslsfwxDA5CB17E
```

4. Create label.

```
ahsayubs:~# glabel create DA5CB17Exd00p09 da0p10
```

NOTE

Refer to your normal AhsayUBS to know the correct naming format. In our example, the naming format is **DA5CB17Exd00p**. So DA5CB17Exd00p09 da0p10 was used to create the label.

5. Check the changes made.

```
ahsayubs:~# glabel status
```

Name	Status	Components
label/DA5CB17Exd00p00	N/A	da0p1
label/DA5CB17Exd00p01	N/A	da0p2
label/DA5CB17Exd00p02	N/A	da0p3
label/DA5CB17Exd00p07	N/A	da0p8
ufs/DA5CB17Exesosfw	N/A	mirror/DA5CB17Exesosfw
ufs/DA5CB17Exesfmfw	N/A	mirror/DA5CB17Exesfmfw
label/DA5CB17Exd00p09	N/A	da0p10

6. Remount the disk pool.

```
ahsayubs:~# zpool import eslsfwxDA5CB17E -d /dev/label
```

7. Check the changes.

```
ahsayubs:~# zpool status
```

```
pool: eslsfwxDA5CB17E
state: ONLINE
scan: scrub repaired 0 in 0h0m with 0 errors on Wed Mar 9
00:00:39 2022
config:
```

NAME	STATE	READ	WRITE	CKSUM
eslsfwxDA5CB17E	ONLINE	0	0	0
label/DA5CB17Exd00p09	ONLINE	0	0	0
logs				
label/DA5CB17Exd00p07	ONLINE	0	0	0

8. Manually mount the disk.

```
ahsayubs:~# zfs set mountpoint=/ubs/mnt/eslsfw eslsfwxDA5CB17E
```

9. Confirm if the disk is mounted.

```
ahsayubs:~# zfs get mountpoint
```

NAME	PROPERTY	VALUE	SOURCE
eslsfwxDA5CB17E	mountpoint	/ubs/mnt/eslsfw	local

10. Restart AhsayUBS and manually start AhsayCBS and NFS services.

NOTES

- If the AhsayUBS machine has more than one partition, repeat steps 7 – 10 to map the other mount point(s). Keep repeating this until all the mount point(s) for each partition is mounted.
- It is advisable to migrate to another disk to have a larger storage instead of expanding the current disk. For instructions on how to migrate for additional storage please refer to [Additional User Storage Migration](#).