IW-RJ424-03

User's Manual

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PREFACE

Thank you for choosing In Win IW-RJ424-03. This manual is written for system technicians who are responsible for installation, troubleshooting, managing, and repairing this server chassis. This document provides the overview of all the features of the chassis, a list of accessories or other components you may need to finish the installation, troubleshooting methods, and instructions of adding and removing components on the In Win IW-RJ424-03. For the latest version of this manual, you may visit In Win's server website to download the latest updated version.

SAFETY INFORMATION

To ensure safe and smooth operation of your In Win IW-RJ424-03, it is essential that you choose an appropriate location for the system, provide an appropriate operating environment, and adequate power for all components of the system. As you plan for installation, follow the guidelines below to ensure that the system and its environment are safely and appropriately positioned for efficient operation and service. Your system should be installed and serviced only by technically qualified persons.

Environment selection: The system is designed to operate in a typical office environment. The location should be a clean, dry, and free of airborne particles; a well-ventilated room and away from sources of heat including direct sunlight and radiators; it should keep the sources of vibration or physical shock away; the space should be with a properly grounded wall outlet, and with sufficient space to access the power supply cords. The operation environment temperature should be around 0°C to 40°C (32°F to 104°F).

Heed safety instructions: Before working with In Win IPC/Storage server/ System products, we strongly recommend you are using this guide as a reference and follow the safety instructions. The instructions in this manual will help you ensure and maintain compliance with existing product certifications and approvals. Follow the described, regulated components mentioned in this manual. Use of non UL listing products or other regulatory did not approvals will make non-compliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power button DOES NOT totally turn off the system AC power. To remove the power of system, you have to unplug the AC power cord from the outlet or system's power supply units. Make sure the power cord is unplugged before you open the chassis, add, or remove any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions usually present on power supply units, and communication cables. Disconnect the power cord, and any other device which attached to the server before opening the case. Otherwise, it will raise the risk of personal injury or equipment damage.

Electrostatic discharge (ESD) and ESD protection: In most cases, ESD damages disk drives, electronic boards, and other parts. We recommend that you work the installation only at an ESD free space. If the situation does not allow, perform ESD protection actions by wearing an anti-static wrist strap attached to ground any unpainted metal surface on your server during your operation.

Installing or removing jumpers: A jumper is a short length of conductor used to close, open or bypass part of an electronic circuit. Jumpers on In Win backplane have a small tab on top that you can pick up with your fingertips. Grip the jumper carefully, and plug the jumper to cover the jumper pins on the backplane. Once you need to remove the jumper, gripping the jumper, and carefully pull out without squeezing.

CAUTION

To avoid damage and prove your safety, please notice and following the terms listed below:

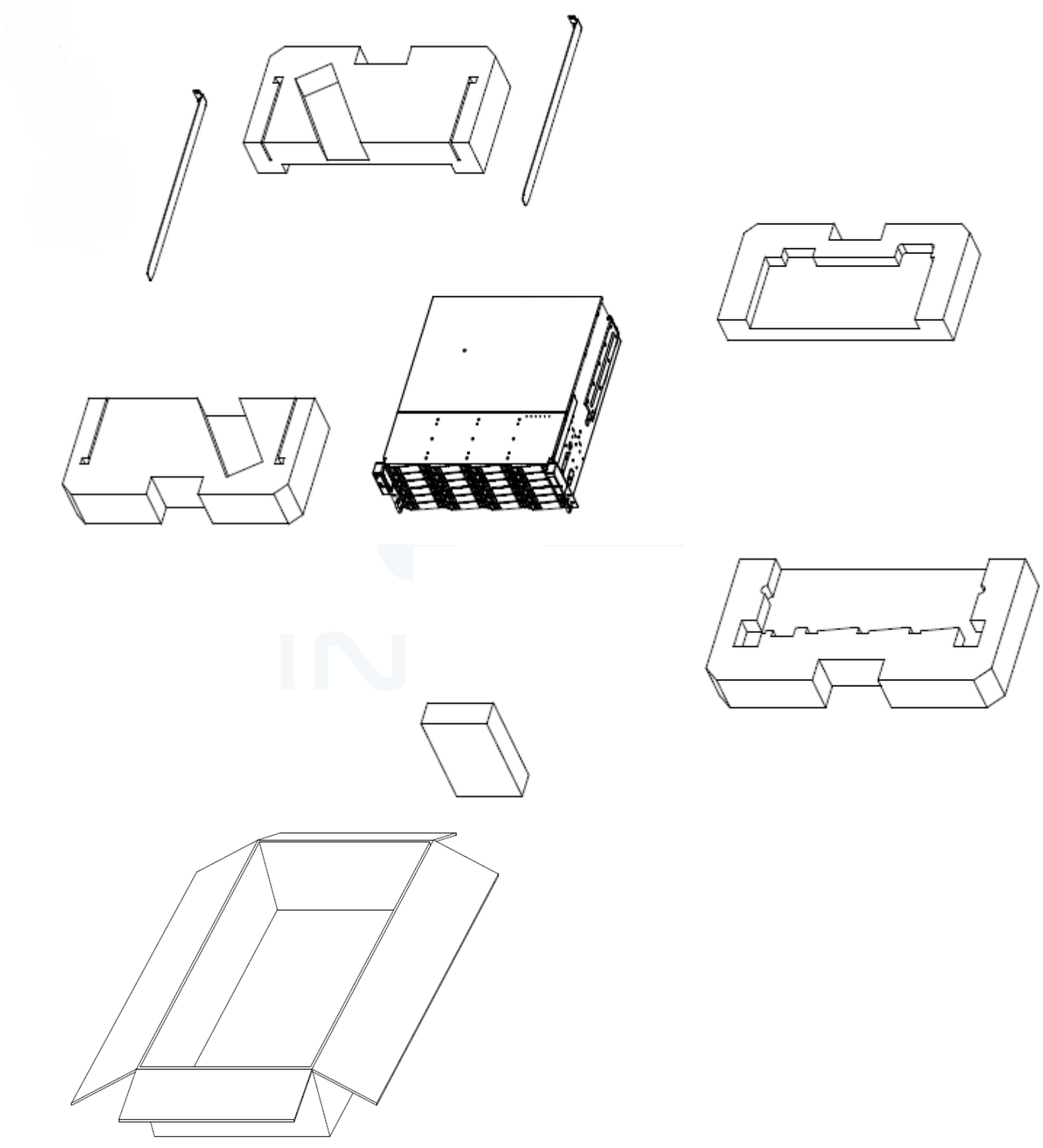
1. No to populate hard drives and turn on the power before the system is settle down.
2. Tighten or loosen all the screws, please use screw driver to operate.
3. Apply the correct screws which packed in the accessories box.
4. For your safety, it requires at least two persons lift, and place the unit.
5. Before mounting the unit to the cabinet, make sure the rail is installed correctly.
6. When installing and removing any module or parts, please operate by the handles.

SPECIFICATIONS

Model Name	IW-RJ424-03
Standard	EIA-RS310D
Dimensions (D x W x H)	520.7 x 482.6 x 176 mm (20.5" x 19" x 7")
Storage	External: Hot Swap 3.5” x 24 SAS 12Gbps
Maximum Capacity (per enclosure)	Cascading to 3 enclosures 72 PCS HDDs including Host Server
Power Supply	Supports ▪ Form Factor: Platinum CRPS Redundant ▪ Watt: 550W
Cooling Fan	Supports Up to 8038mm x4
12G Expender module	1 or 2
Connection	2 sets of 3 x 12Gbps port
Management	Smart Fan, Thermal Monitor, HDD Monitor, Voltage Monitor, Alarm warming
Host/Expansion port	3 x Mini SAS HD (SFF-8644)
SES support	Supports SES-2 (SCSI Enclosure Service)
Maintenance support	Maintenance and management by Ethernet(option) and RS-232
HDD Power management	HDD sequential power on
Temperature	0ºC to 35ºC
Material	Material: SGCC Thickness: 1.0 mm
Slide Rail	Support 30" screwless slide rail, Ball-bearing or Fixed rail

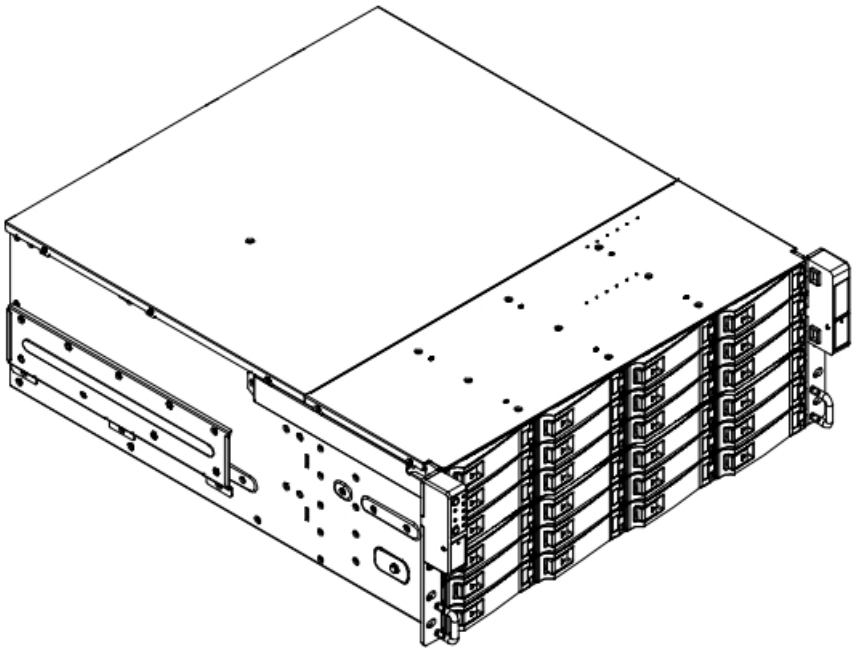
1 Product Introduction

1.1 Box Content



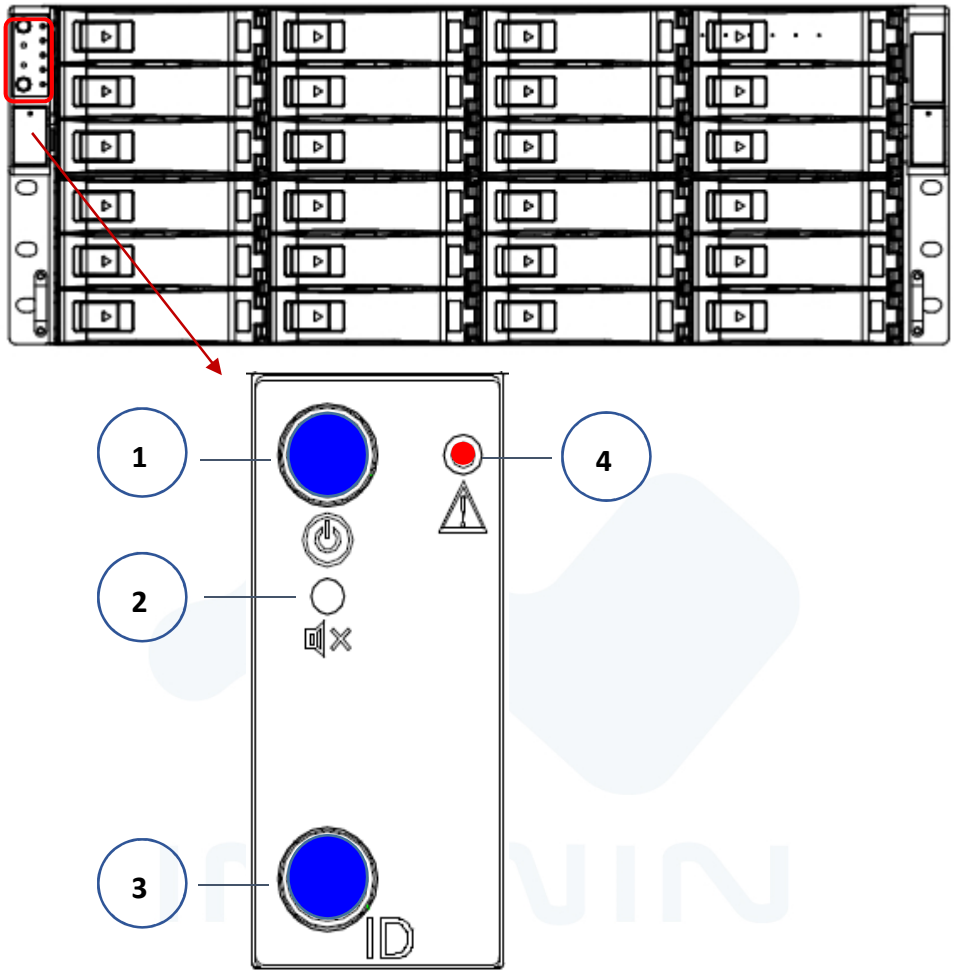
1.2 General Information

In Win IW-RJ424-03 JBOD Enclosure is a 4U rackmount storage chassis with 24 tray-less bays, dual expander module, dual fan module, and redundant 550W power supply. IW-RJ424-03 is capable to provide excellent performance and allowing users cascade the capacity with three more In Win IW-RJ series JBOD enclosure.



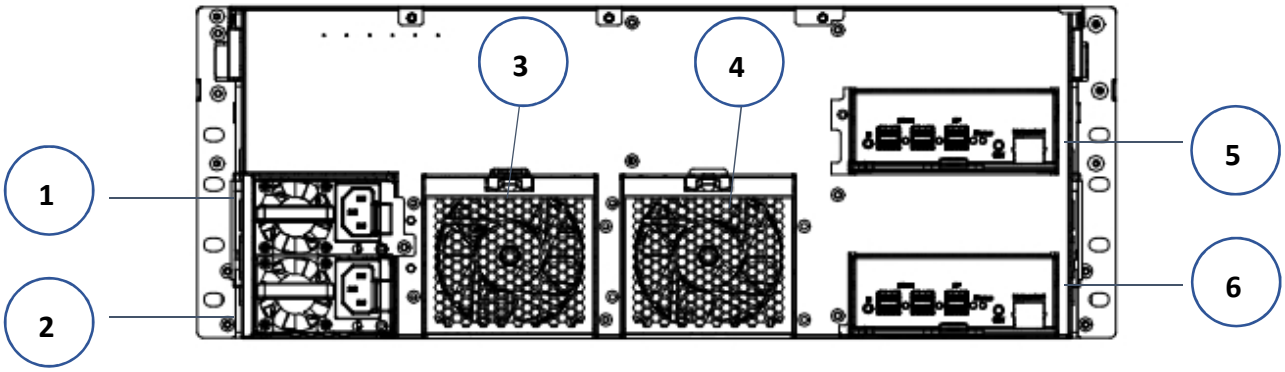
1.2.1 Front Panel

The front panel allocated on the upper left handle. The panel contains control buttons and LED indicators.



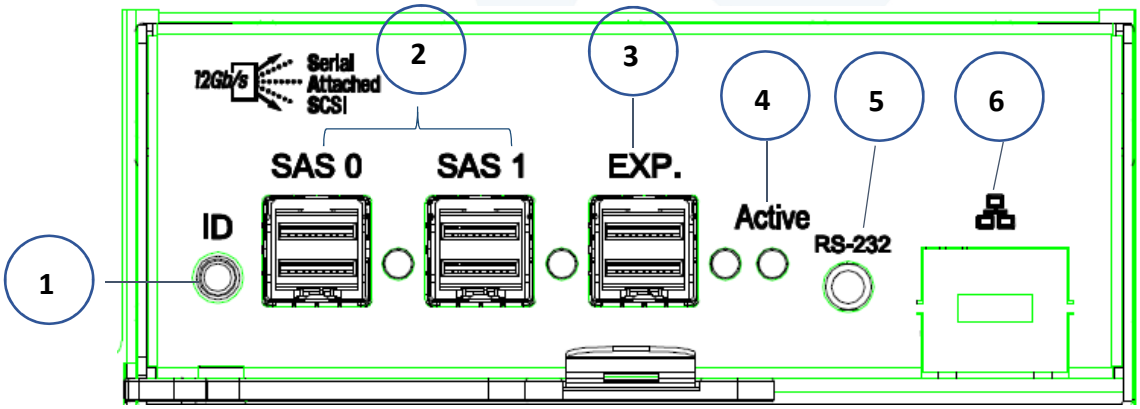
No.	Name	Color	Status	Description
1	Power ON/OFF Button with LED	Blue	Solid on	System is powered on
		N/A	Off	System is not powered on
2	Mute Button	N/A		Press the button to turn off the beeper
3	Chassis ID Button with LED	Blue	Solid on	Press the button to activate system identification
4	System Fail LED	Red	Solid on	System Fault (Beeper)

1.2.2 Rear Panel Configuration



No.	Name	No.	Name
1	Power Supply Module 1	4	Fan Module 2
2	Power Module 2	5	Secondary Expander Module
3	Fan Module 1	6	Primary Expander Module

1.2.2.1 Expander Configuration



No.	Name	Color	Status	Description
1	Chassis ID button with LED	Blue	Solid on	Press the button to activate system identification
2	Uplink SAS Port	N/A		Host HBA/RAID card connection
3	Downlink Expander Port	N/A		External cascading
4	Expander Module Status LED	Blue	Blink	Normal
		Blue	No Blinking	Abnormal
5	RS-232 Port	N/A		Debug console connection
6	LAN	N/A		Ethernet remote monitoring (optional)

2 Hardware Installation

2.1 Removing and Installing a Hard Drive

In Win IW-RJ series JBOD is featured tray-less disk population, users do not need to use screw to mount disks, and be able to perform quick hard disks replacement.

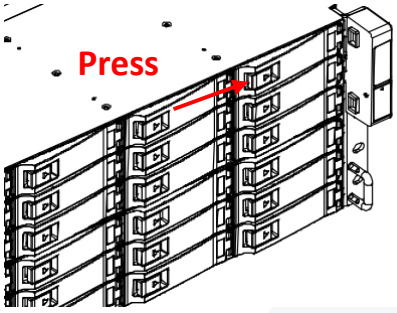
2.1.1 Installing a Hard Drive

Step 1: Press the release button then pull outward the handle.

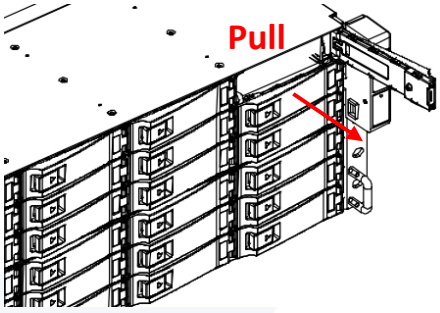
Step 2: Insert the hard drive to the slot.

Step 3: Push back the lever until it clicks.

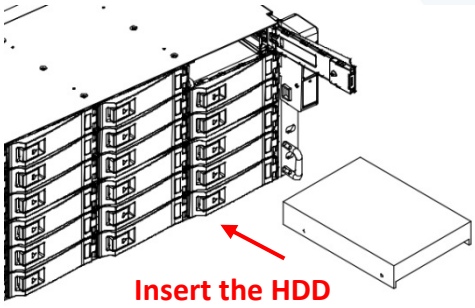
Step 1



Step 2



Step 3

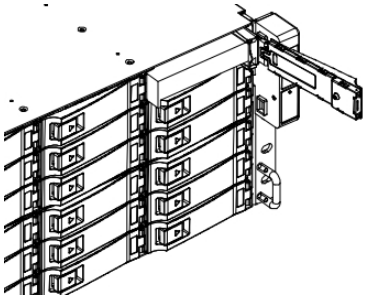


2.1.2 Removing a Hard Drive

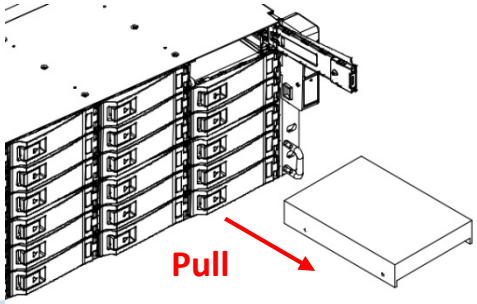
Step 1: Press the release button then pull outward the handle

Step 2: Pull out the hard drive

Step 1



Step 2



2.2 Removing and Installing a Fan Module

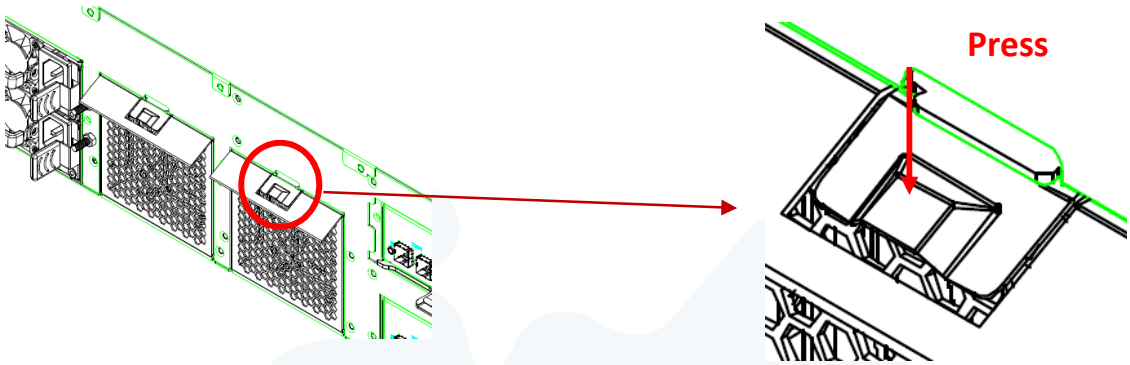
In Win IW-RJ series JBOD is equipped a pair of fan module. These fan modules support hot swap and redundancy. Once any of the fan fails, user can easily replace and maintain the system.

2.2.1 Removing a Fan Module

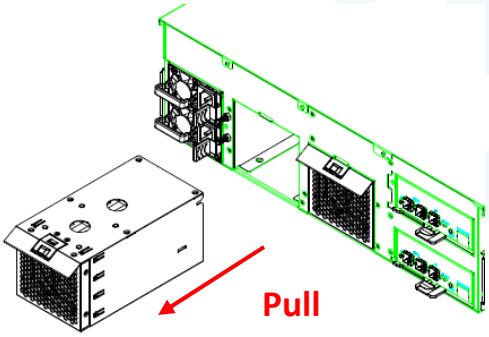
Step 1: Press the clip as Step 1 shows

Step 2: Pull out the fan module

Step1



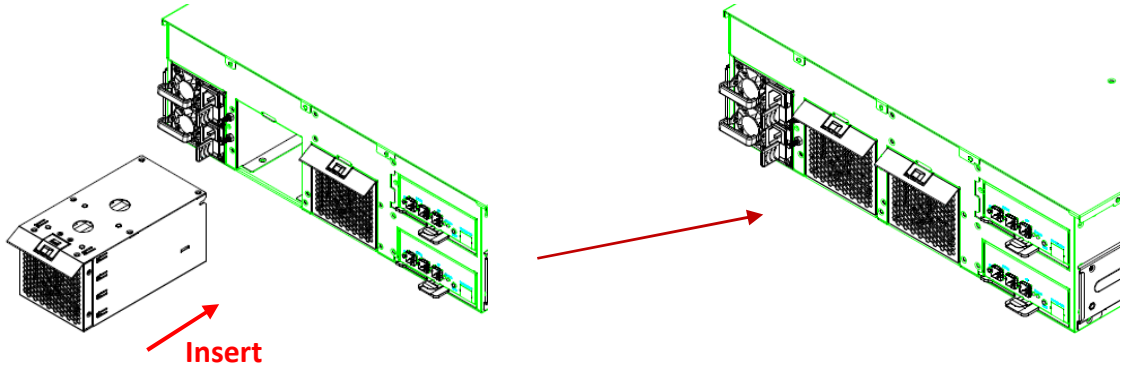
Step2



2.2.2 Installing a Fan Module

Step 1: Push the fan module into the cage until hearing “click”

Step 1



2.3 Removing and Installing a PSU Module

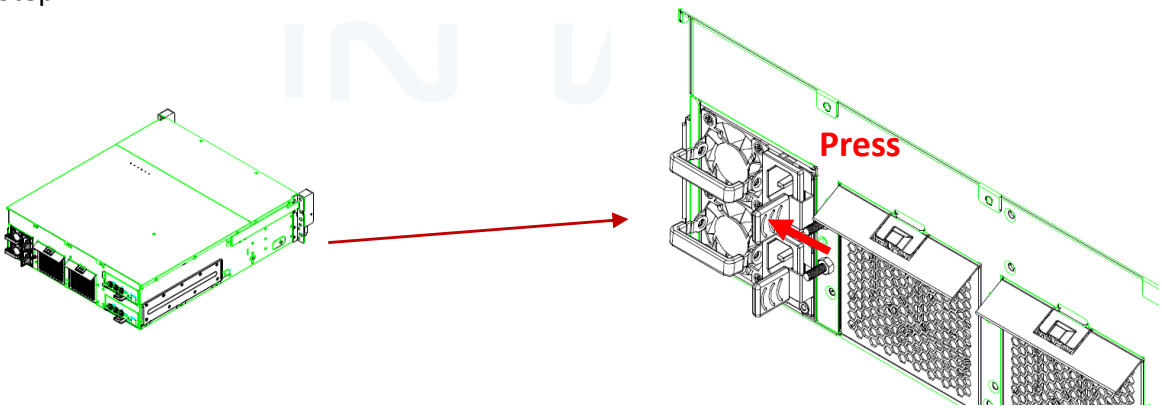
In Win IW-RJ series JBOD built-in a redundant power supply module. With this function, system is capable to keep working whether as one power supply unit is failure. To replace it, user only need to release the failure one then insert a good one.

2.3.1 Removing a PSU Module

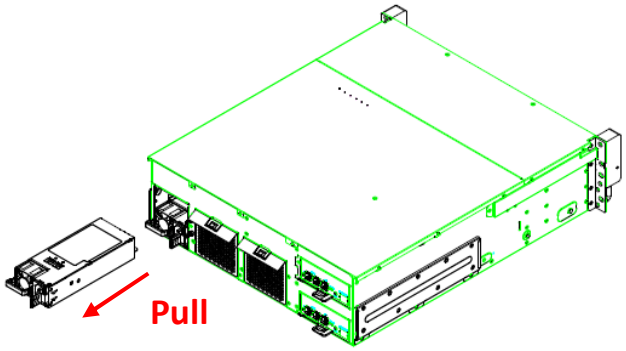
Step 1: Press the release tab on the back of power supply unit.

Step 2: Pull the power supply unit out using the handle.

Step 1



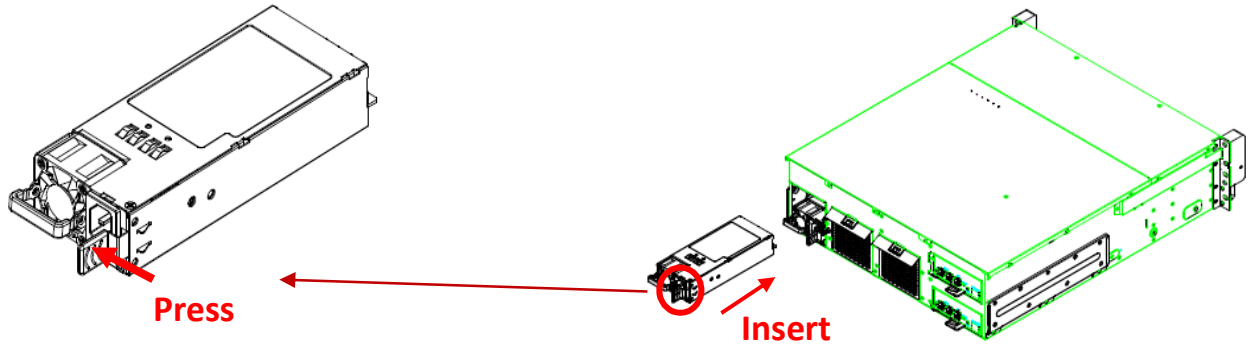
Step 2



2.3.2 Installing a PSU Module

Step 1: Push the power supply into the cage until you hear a click.

Step 1



2.4 Removing and Installing a Expander Module

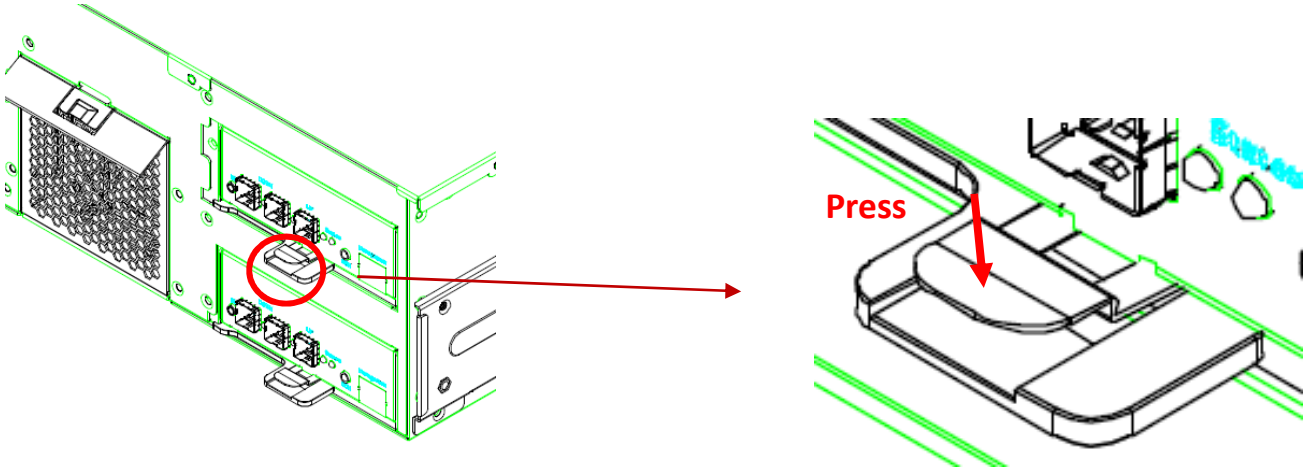
In Win IW-RJ series JBOD contains a set of redundant expander module. The bottom one is the primary expander and the upper one is the secondary. The primary expander module includes an Ethernet management module, which allow user monitor and manage the system through Ethernet. Also the redundant module can miniature the down time once any on the expander is fail.

2.4.1 Removing a Expander Module

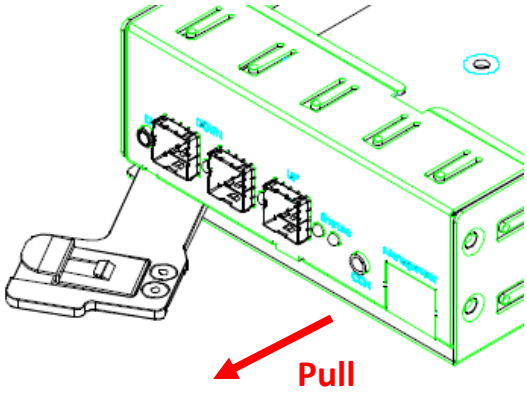
Step 1: Press the clip and pull the arm as Step 1 shows

Step 2: Pull out the expander module

Step 1



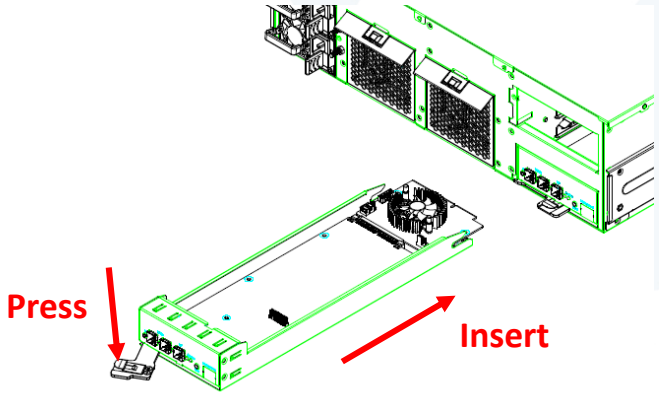
Step 2



2.4.2 Installing a Expander Module

Step 1: Push the expander module into the cage until you hear a click, and push the arm back the original location.

Step 1



2.5 Installing Rail

In Win IW-RJ series JBOD is a rackmount model, which support EIA-RS310D standard cabinet and chassis rack. In Win provides standard fixed slide rail to let users mount the JBOD enclosure on to the cabinet.

2.5.1 Identifying the slide Rail

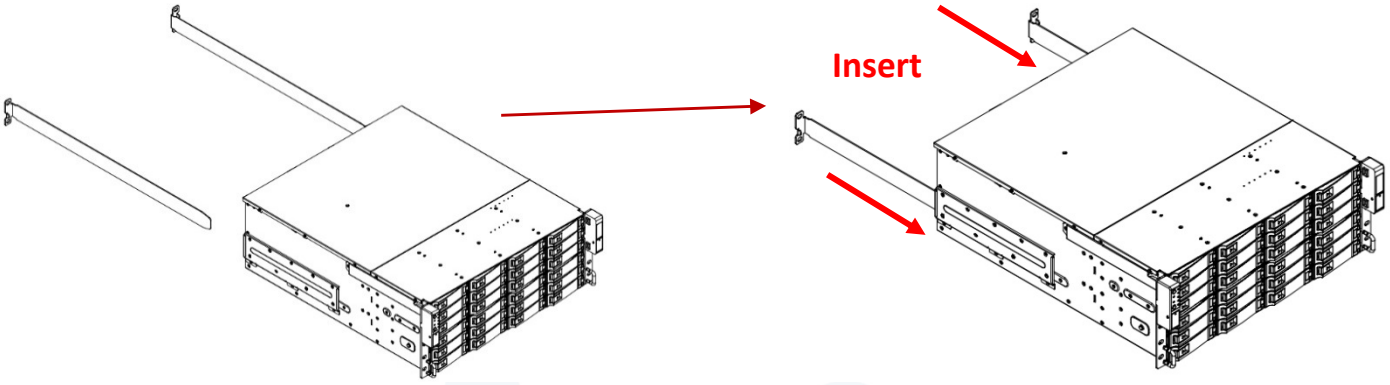
The slide rail by your order might be different. You can reference the quick installation guide inside the slide rail package and follow the instruction to mount the rail on to your cabinet or chassis rack.

2.5.2 Fixed Rail

Step 1: Insert the fixed rail from the rear side of chassis, and make sure the rail goes through the space between chassis and the bracket. Conduct the same action to the other side.

Step 2: Use the screws in the accessory box to fix the rail and chassis on the cabinet.

Step 1



2.5.3 Slide Rail

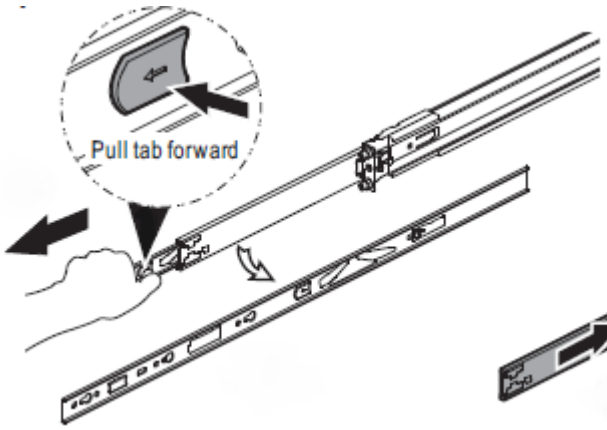
Make sure you have a pair of slide rail, each rail has inner and rail case.

2.5.3.1 Take out the inner rail and slide the intermediate rail back

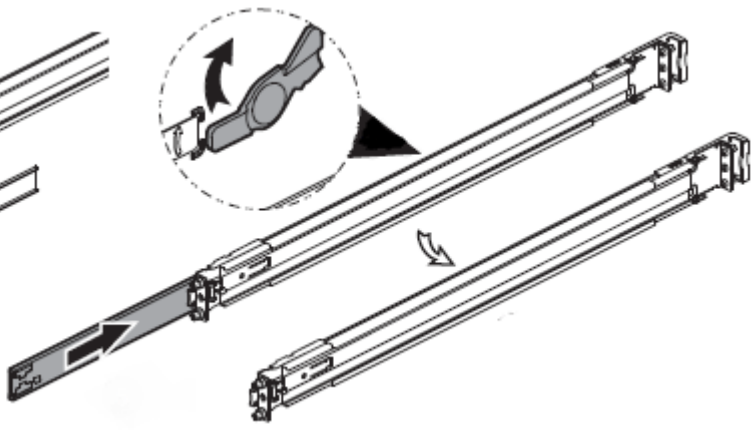
Step 1: Pull out the inner rail until it hits the terminal, then pull the release tab to unlock.

Step 2: Pull the latch on the medium rail and push back the medium rail back.

Step 1



Step 2



2.5.3.2 Attach the inner rail to the chassis

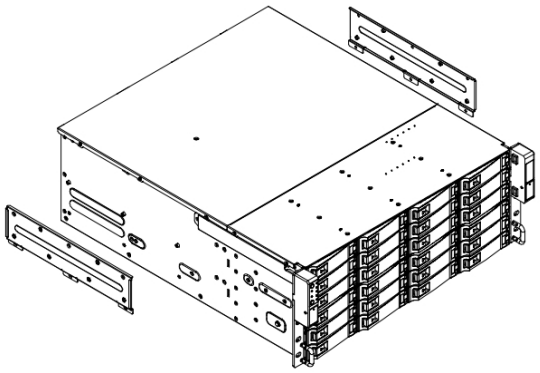
Step 1: Removing the bracket of the both sides to reveal the standoff.

Step 2: Install the inner rail onto the chassis. Make sure the key holes and the standoff are well locked which you will hear a click.

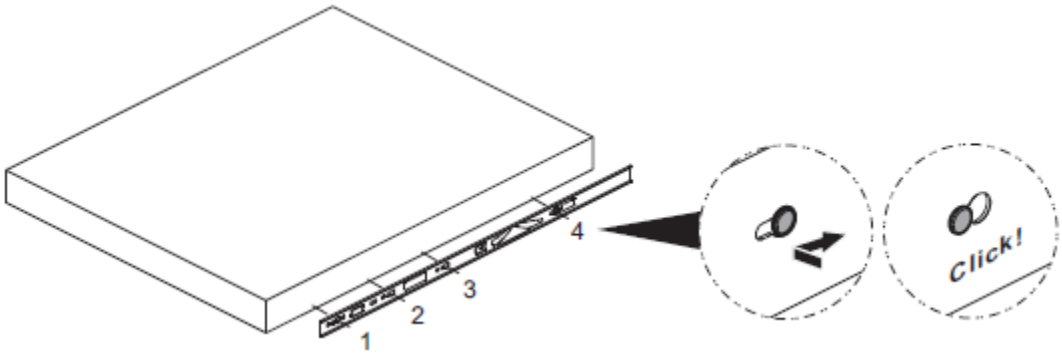
Step 3: Repeat the same action to the other side.

Step 4: When removing the inner rail, pulling the latch upward and release the keyhole from standoff to detach the inner rail. (Action ❶ and ❷ in the figure)

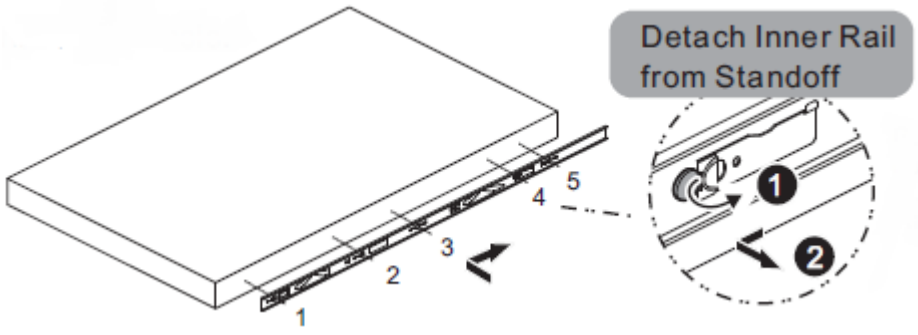
Step 1



Step 2



Step 4



2.5.3.3 Mount the rail bracket to the cabinet

Step 1: Extend the bracket over the rear rack of the cabinet.

Step 2: Pull back to and push bracket's standoff into the screw holes on the rack, if your action is correct, you will hear a click.

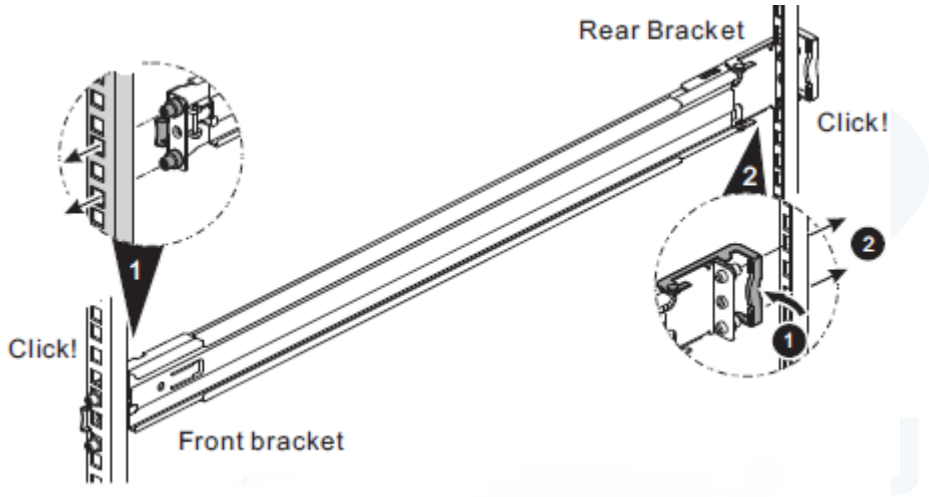
Step 3: Extend the opposite side of bracket to the front rack of the cabinet.

Step 4: Pull the bracket to let the standoff over the screw holes on the front rack until you hear a click.

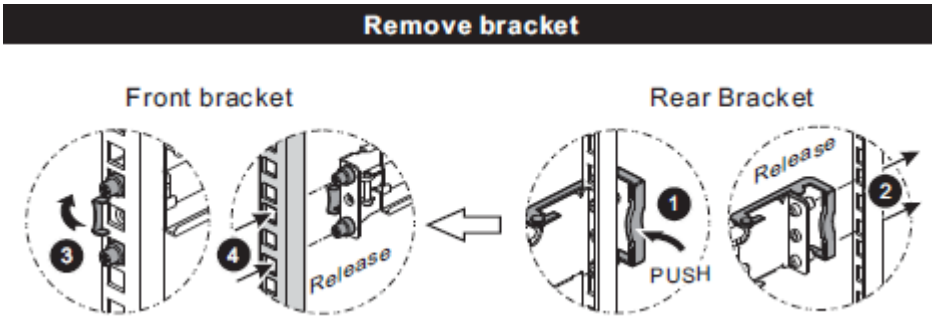
Step 5: The other side of rail is symmetrical, repeat the installation Step 1-4.

Step 6: Once you would like to detach the bracket, pull the release tab on the rear bracket and Pull the latch on the front bracket to release the bracket. Repeat the same action to the other side.

Step 1~4

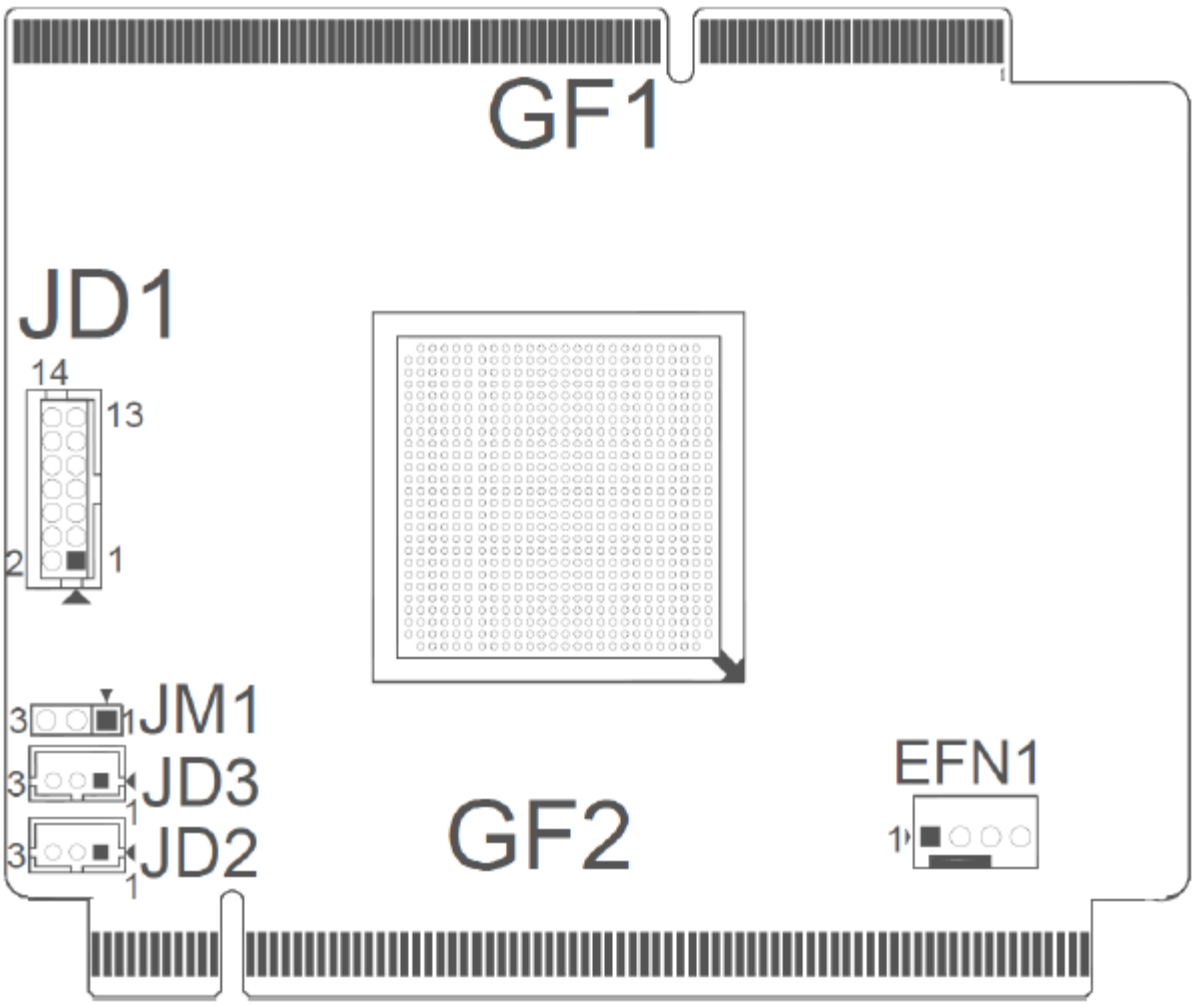


Step 6



3 Expander Board Introduction

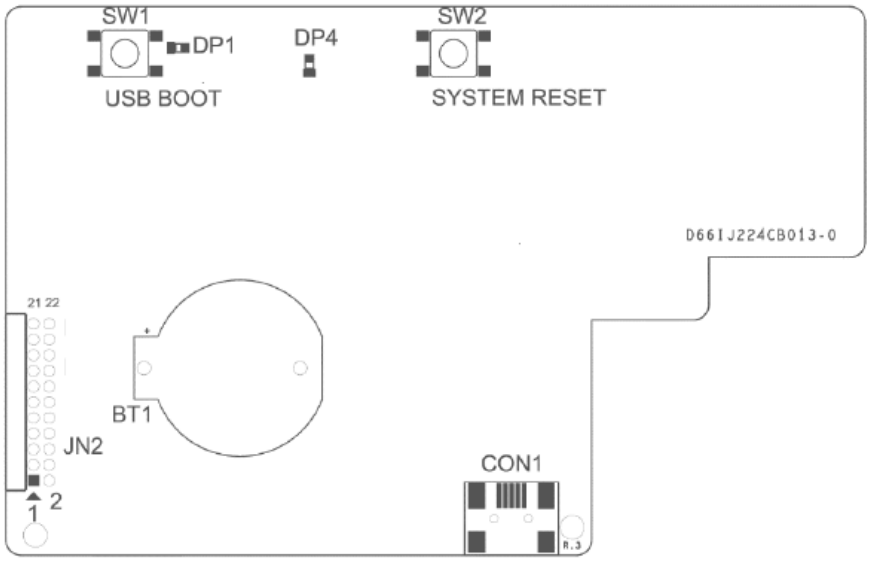
Top Side



Location	Description
GF1	BP Golden Finger Connector
GF2	IO Board Golden Finger Connector
EFN1	Expander FAN Connector
JM1	Single/Dual Power Module Select: Single: Jumper 1-2; Dual: Jumper 2-3
JD1	ICE Debug Port
JD2	Smart Console
JD3	Debug Port

4 Ethernet Management Card Introduction

Top Side



Bottom Side

Location	Description
SW1	USB Reboot
SW2	System Reset
DP1	Power LED
DP4	MCU Status LED
JN2	UART Port
CON1	USB Port
JN1	UART Port
CON2	Ethernet Port

5 Compatibility Lists

To reach best performance and avoid system failure, In Win strongly recommend users choosing the components from In Win's compatibility list. All the components are tested in In Win's lab and assured the components are working well with In Win's chassis. The compatibility lists include:

1. Hard Disk Compatibility List
2. HBA/ RAID Card Compatibility List

You can download the latest updated list from In Win's website:
https://www.in-win.com/en/ipc-server

6 User Interface Introduction

6.1 Overview

IN WIN JBOD System is a high performance, reliable storage system with sensors to monitor system health. We provide state-of-the-art management functionality for users to monitor and manage JBOD systems efficiently and flexibly. Users can manage JBOD systems through serial port and/or Ethernet according to the system configuration on the system. We support varieties of network protocols for network management including Telnet, SSH, Web-GUI, SNMP and SMTP. We also support active system alert function by sending information to the email addresses specified in the system so the users can be informed any changes of the systems in a timely manner.

This users' manual is for all IN WIN JBOD systems including RJ-212, RJ-224, RJ-316 and RJ-424. It provides the information and instruction of frequent use function. Users please refer to the table of contents to find the topics.

6.2 Key Features

- **Reliable High Data Rate support (up to 12Gbps)**
  SAS 12Gbps support and SATA3 6Gbps support to provide a reliable high performance data rate.
- **Dual Expanders Support**
  System can accommodate dual expanders to support data redundancy capability.
- **Power Redundancy**
  System can accommodate 2 PSUs with PMBus as redundancy. Either PSU can work independently while the other is failed.
- **PSU hot-swap-able**
  PSU is hot-swap-able. No need to shutdown system for PSU replacement in case either PSU failure happens.

- **Fan Modules hot-swap-able**

  Fan Module is hot-swap-able. No need to shutdown system for system fan module replace in case any of the system fans failure happens.

- **System Fault Alarm**

  System Fault red LED indicator on the front panel illuminates and Buzzer sounds while there is system fault.

  Buzzer sounds differently according to the system fault. Please see the below the definition

  - High Temperature : 1 short beep
  - PSU failure : 2 short beep
  - Fan failure : 3 short beep

  The beeps can be muted by pressing the mute button on the front panel.

- **HDDs hot-swap-able**

  HDD is hot-swap-able. No need to shutdown system for HDD installation and/or replacement while there is HDD failure happens or intend to add new HDD to the system.

- **Smart Fan Control**

  The Fan modules are smartly controlled by the firmware to provide 7 levels speeds according to the system temperature detected by the temperature sensors on Expander chips and Backplane.

- **Zoning**

  System support the feature to divide disk drives into 2 different groups. Each group can own users-configurable number of HDDs independently. This feature enables single JBOD serving 2 hosts.

- **Cascading**

  There is a cascading port on Expander for cascading another JBOD system to expand disk space whenever the system is running out of space.

6.3 Software Management

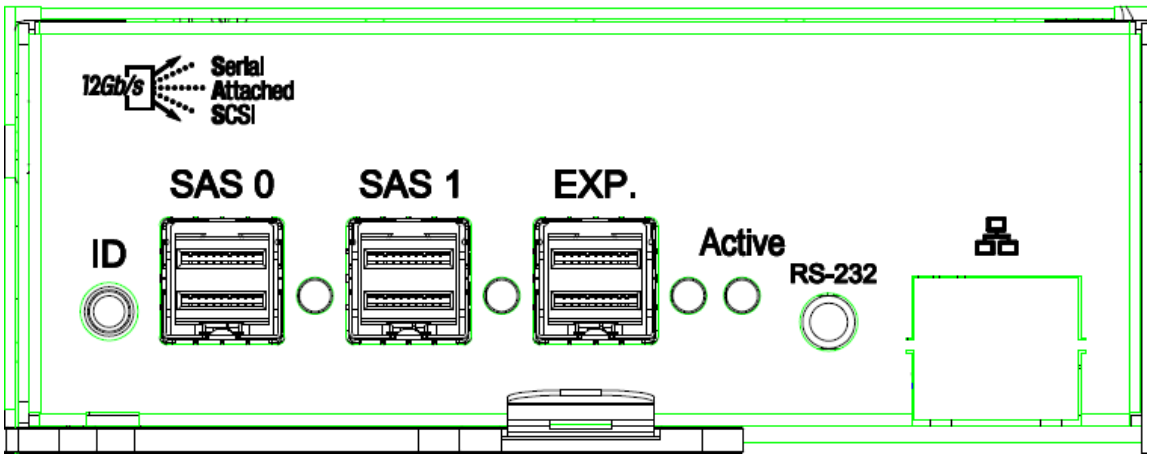
6.3.1 System Management Structure

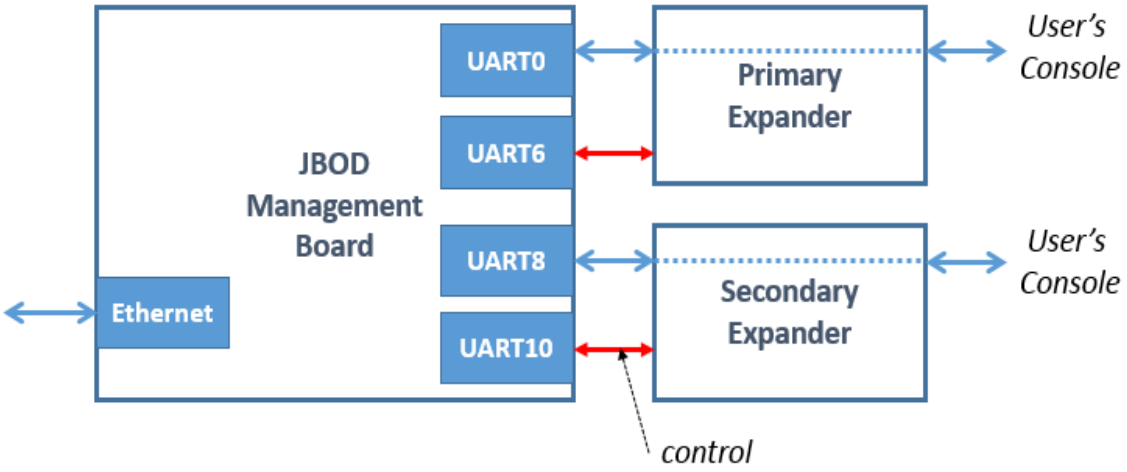
IN WIN JBOD Systems support out-of-band Network Management feature enabling rich set of protocols and a flexible way for SAS Expander management anytime from anywhere.

6.3.1.1 With Ethernet Management

In this configuration, when there is an Ethernet board on top of the Primary SAS Expander module, users can manage Primary and Secondary SAS expanders through RS-232 port no matter the serial console is connected to Primary or Secondary SAS Expander module.

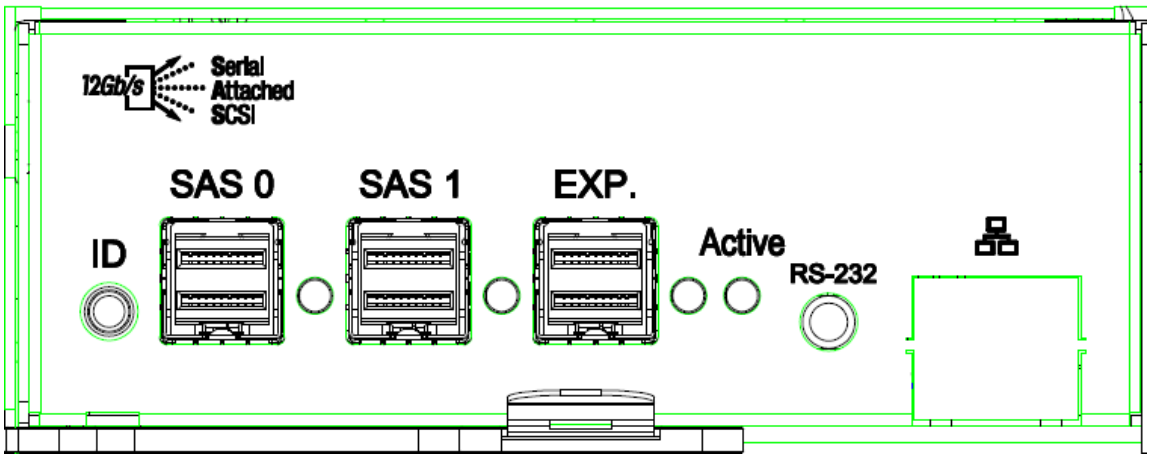
With proper IP address setting, Users can manage system through Telnet, SSH, Web-GUI and SNMP remotely.

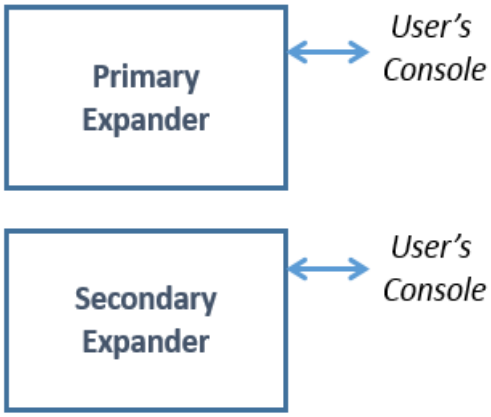




6.3.1.2 Without Ethernet Management

In this configuration, when there is no Ethernet board, Users can only manage Primary or Secondary SAS Expanders by connecting serial console cable to Primary or Secondary SAS Expander module separately. And, in such configuration, Users won't benefit from the rich set of network protocols management.





6.3.1.3 Network Protocols Support

As an Ethernet Management board exists, rich set of network protocols are leveraged for flexible remote management. The supported protocols are Telnet, SSH, Web-GUI, SNMP and SMTP.

Please be sure the IP address of the system is correctly configured to enable network management. Our systems support Static IP address or DHCP dynamic IP address as per users' configuration.

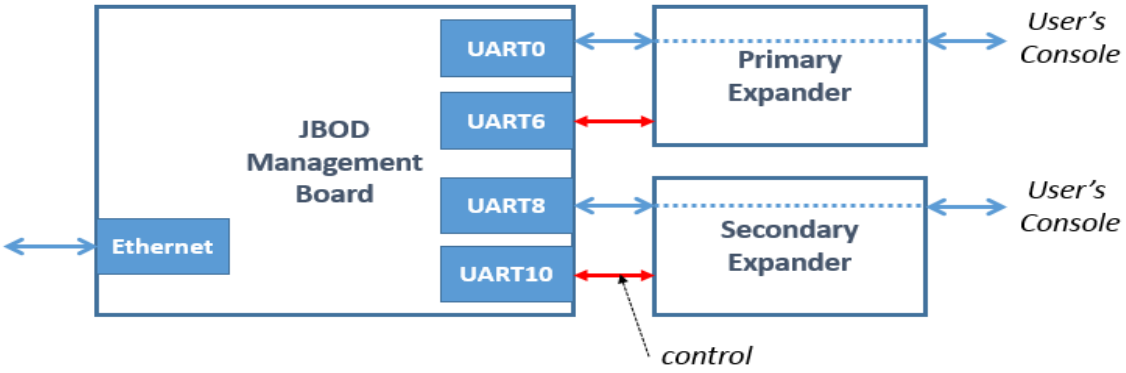
6.3.1.4 Operation Modes

IN WIN JBOD systems Ethernet Management provide a flexibility of modes for different scenarios by simply applying CLI commands to change.

Ethernet management support 2 modes – Normal Mode and Alone Mode.

Normal Mode:

One Ethernet board in a JBOD enclosure. It can be either only one SAS Expander or 2.



In this mode, users can manage both SAS Expander by only one Ethernet board. This is the default operation mode of the Ethernet mgmt. board. To check the operation mode, applying hidden command “save alone” to view. “save alone 0” for Normal mode.

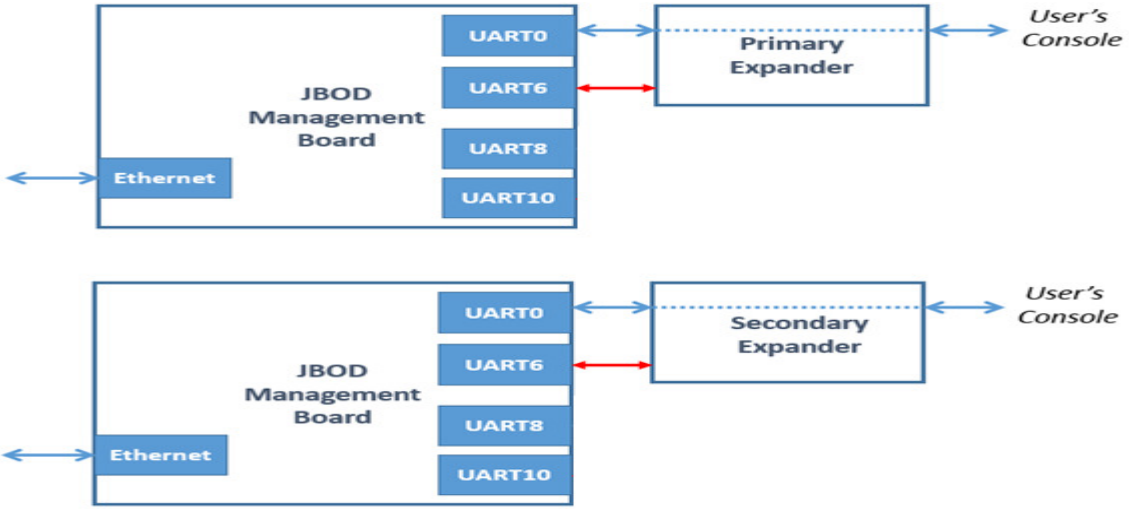
```
/mgmt.s#
/mgmt.s# save alone
Expander mode: 0
/mgmt.s#
/mgmt.s#
/mgmt.s# save alone 0
Expander mode: alone off
/mgmt.s#
/mgmt.s#
```

Whenever the Ethernet mgmt. board run in Normal mode. There are 2 sub-directories “Primary” and “Secondary” being seen and users can change directory to then for SAS Expander management.

```
/mgmt.s#
/mgmt.s# list
?           dns         ipaddr      ntp         primary     secondary   timezone    userdel
date        gateway     mail        passwd      reboot      service     upgrade     userlist
dhcp        help        netmask     ping        save        snmp        useradd     version
/mgmt.s#
/mgmt.s# cd primary/
/mgmt.s/primary#
/mgmt.s/primary# list
?               iicw            reset           sys
adcread         iicwr           rev             t.QA
buffsize        isrstat         rperm           t.SDP
c.pddl          led             rreg            t.alarm.count
c.syscfg        log             rtr             t.dslot
c.zone          memstat         sasaddr         t.fan
cableinfo       mirror          scedebug        t.fan.forcespeed
cfg             mr16            serdesinfo      t.fan.simu
clearlogs       mr32            sesdebug        t.temp.simu
cleartrace      mr8             sgpioinfo       t.thermal
coredump        mw16            sgxinfo         thread
counters        mw32            showlogs        trace
date            mw8             showmfg         tracecap
debuginfo       nvlogs          showpost        tracemask
edfbinfo        phyinfo         showtrace       tracesev
encinfo         phyop           smpireq         tracetimestamp
eyescope        phytest         sspiinq         wppminfo
flashtblinfo    rdcfg           sspir           xmem
help            reg             sspiw
iicr            regerase        ssptdebug
/mgmt.s/primary#
```

Discrete Mode:

Ethernet Board to manage the SAS Expander it resides. There should be Ethernet board on any SAS Expander so it provide Network Management capability.



In this mode, users can manage the SAS Expander the Ethernet board resides on. Users will need 2 Ethernet board to manage both SAS Expander through network.

To check the operation mode, apply hidden command “save alone” in /mgmt.s# layer to view.

```
/mgmt.s#
/mgmt.s#
/mgmt.s# save alone
Expander mode: 1
/mgmt.s#
```

To enable the Alone mode, simply apply a hidden command “save alone 1” in /mgmt.s# layer to enable.

```
/mgmt.s#
/mgmt.s#
/mgmt.s# save alone 1
Expander mode: alone on
/mgmt.s#
```

To disable the Alone mode (set to Normal mode), simply apply a hidden command “save alone 0” in /mgmt.s# layer to disable.

```
/mgmt.s#
/mgmt.s# save alone 0
Expander mode: alone off
/mgmt.s#
/mgmt.s#
```

Please be sure to enable Alone mode on both Ethernet mgmt. boards and do a system reboot so the Alone mode can work properly.

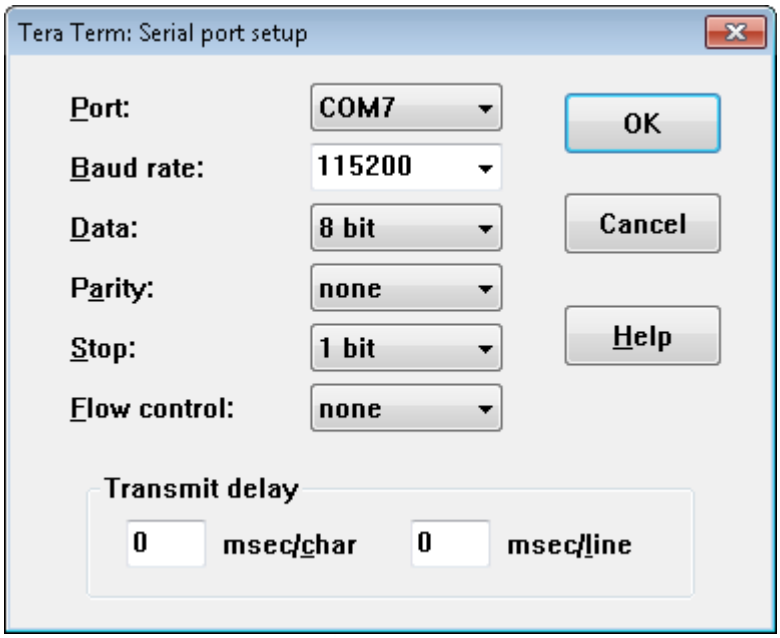
Whenever the Ethernet mgmt. board run in Alone mode. There is only one sub-directory “Expander” can be seen and jump to it for SAS Expander management.

```
/mgmt.s#
/mgmt.s#
/mgmt.s# list
?           dns         help        netmask     ping        service     upgrade     userlist
date        expander    ipaddr      ntp         reboot      snmp        useradd     version
dhcp        gateway     mail        passwd      save        timezone    userdel
/mgmt.s#
/mgmt.s# cd expander/
/mgmt.s/expander# list
?                   iicw                reset               sys
adcread             iicwr               rev                 t.QA
buffsize            isrstat             rperm               t.SDP
c.pddl              led                 rreg                t.alarm.count
c.syscfg            log                 rtr                 t.dslot
c.zone              memstat             sasaddr             t.fan
cableinfo           mirror              scedebug            t.fan.forcespeed
cfg                 mr16                serdesinfo          t.fan.simu
clearlogs           mr32                sesdebug            t.temp.simu
cleartrace          mr8                 sgpioinfo           t.thermal
coredump            mw16                sgxinfo             thread
counters            mw32                showlogs            trace
date                mw8                 showmfg             tracecap
debuginfo           nvlogs              showpost            tracemask
edfbinfo            phyinfo             showtrace           tracesev
encinfo             phyop               smpireq             tracetimestamp
eyescope            phytest             sspiinq             wppminfo
flashtblinfo        rdcfg               sspir               xmem
help                reg                 sspiw
iicr                regerase            ssptdebug
/mgmt.s/expander#
```

6.3.2 Serial Port Management

RS-232 port on Expander module provides a serial connection for users to manage JBOD system with terminal application such as Tera Term, Hyper Term…etc. To manage JBOD system through serial port, the settings below have to be properly configured to make it work.

Baud Rate : 115200
Data : 8 bit
Parity : None
Stop Bit : 1 bit
Flow Control : None



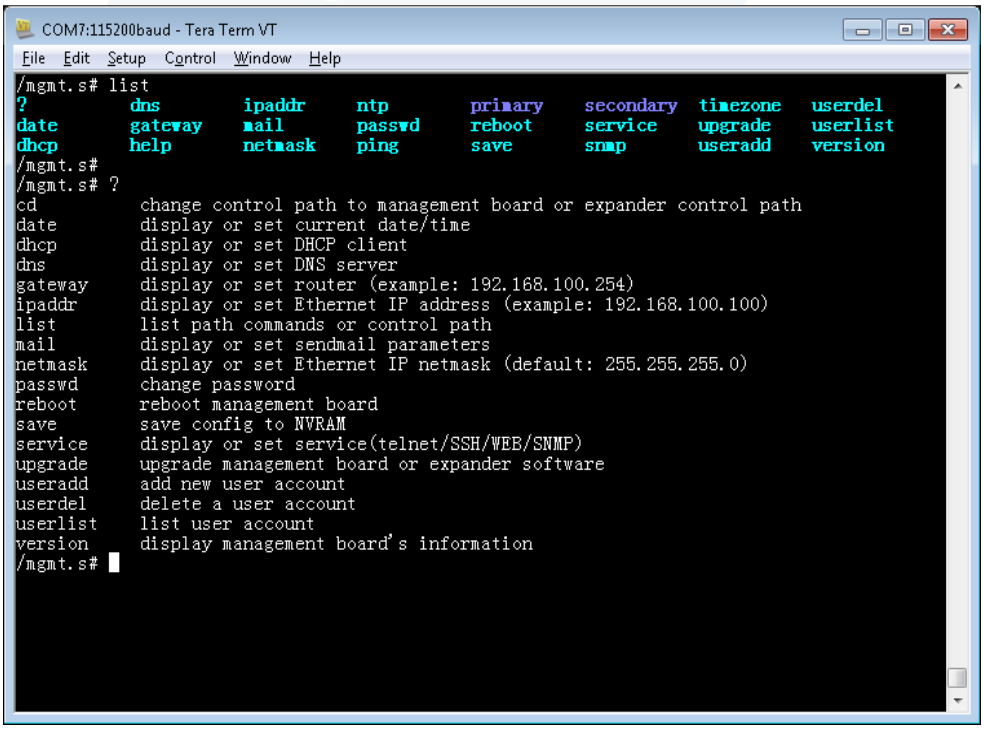
6.3.2.1 CLI

Depending on the system configuration, there are 2 scenarios of CLI usage will be met. One is Expander with Ethernet management board and the other is Expander w/o Ethernet management board.

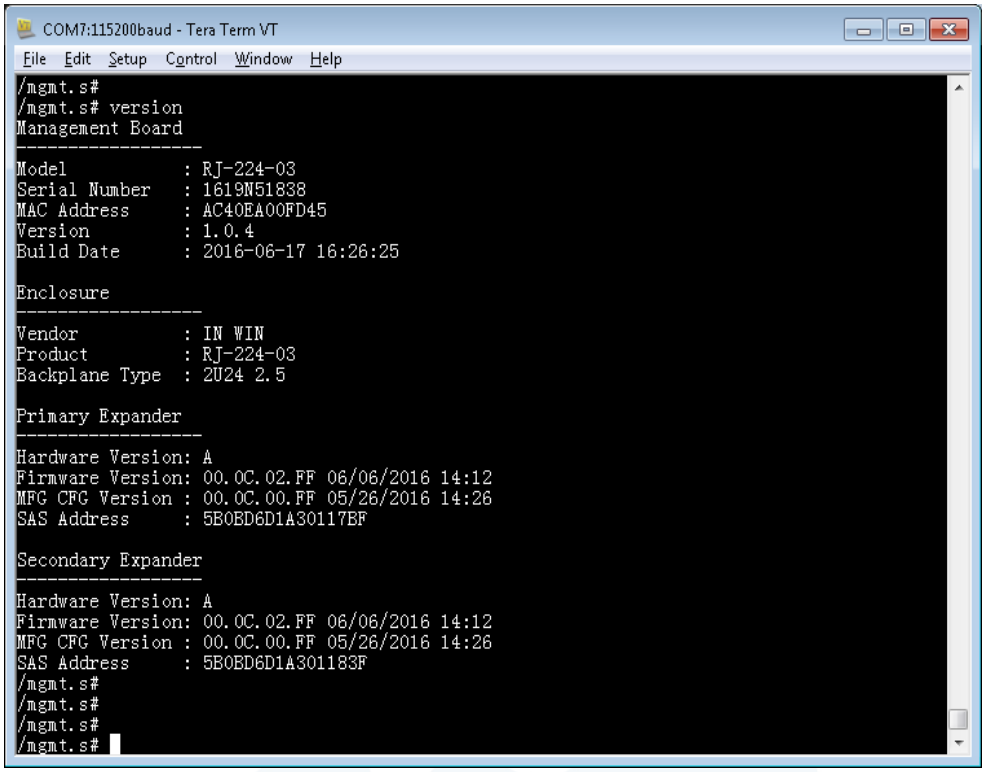
6.3.2.1.1 Scenario 1: Expander with Ethernet board

As an Ethernet Management board exists, rich set of network protocols are leveraged for flexible remote management. The supported protocols are Telnet, SSH, Web-GUI, SNMP and SMTP.

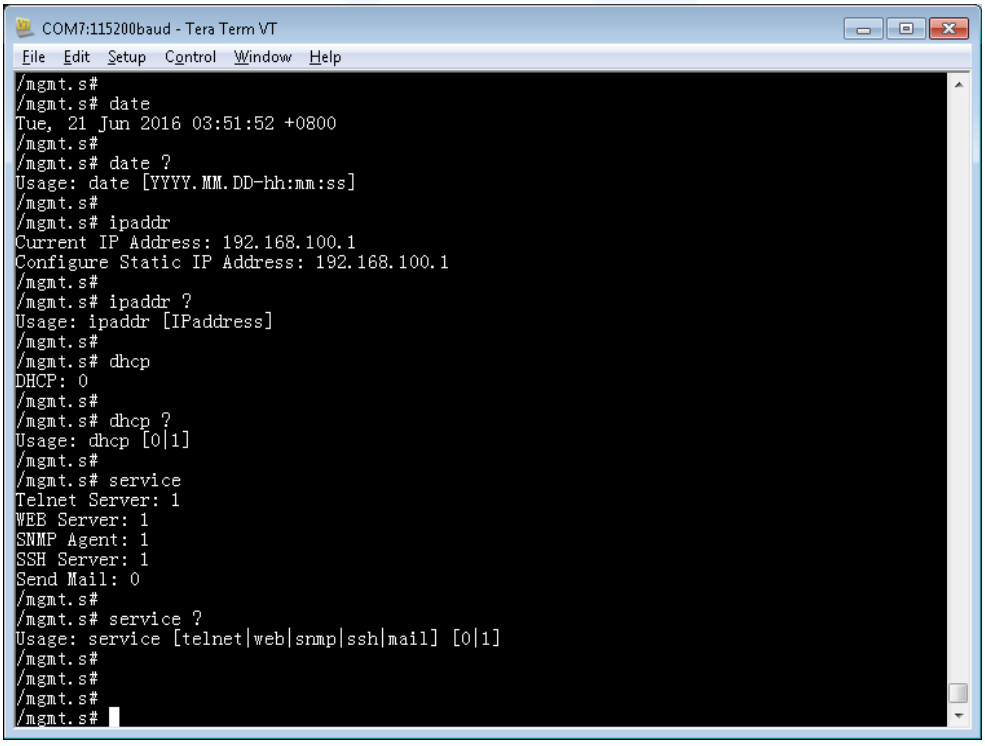
- "/mgmt.s#" prompts in Console Terminal means the system is with Ethernet board installed which supports Network management with properly configured IP address.
- When "/mgmt.s#" prompts, Users are on the layer of the Ethernet board configuration. Users can configure IP address, manage users account, control services, reboot system…etc. on this layer.
- "list" command to display all the Ethernet layer commands the system supports.
- "?" for Help.



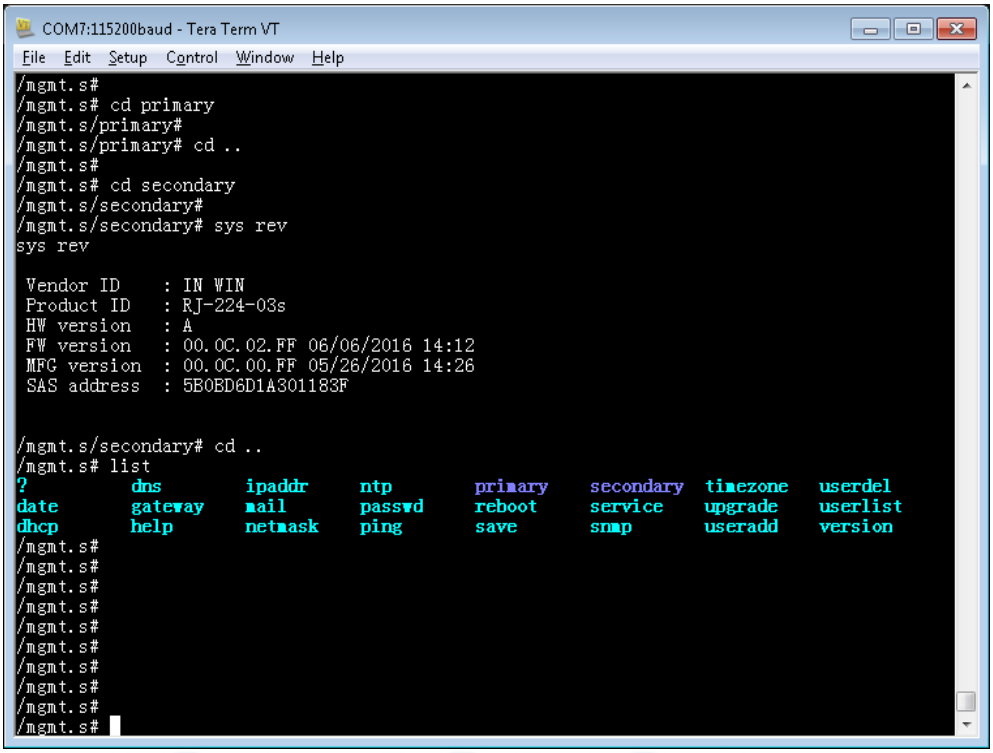
- "version" command to display system hardware, firmware version information.



- Type “<command>” for displaying the current setting of the specific command.
- Type “<command> ?” for displaying specific command usage.



- “cd primary” to change directory for primary expander management.
- “cd ..” to change directory back to upper layer. Usually used on changing from expander layer back to Ethernet layer.
- “cd secondary” to change directory for secondary expander management.

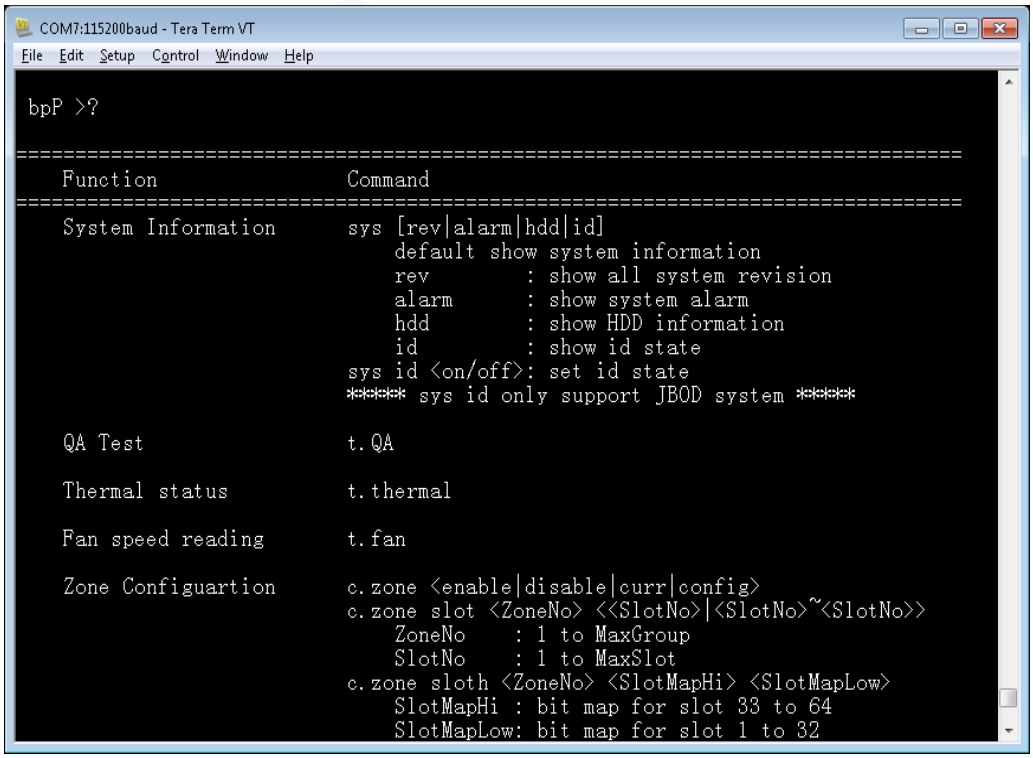


- The changes have been made would take effect immediately as the running-config.
- Please be sure to apply “save” command so the changes being made would be saved for use in next reboot as the start-config. Or, the changes would lose.

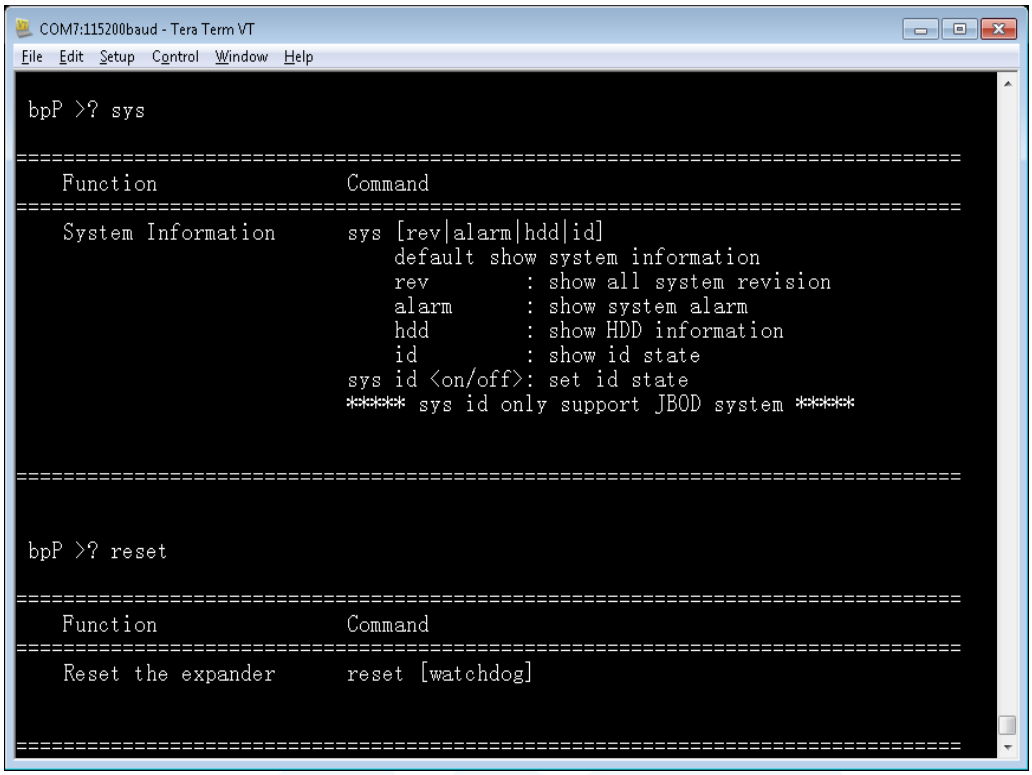
6.3.2.1.2 Scenario 2: Expander w/o Ethernet board

When there is no Ethernet Board on top of the Primary Expander module users need to connect serial console to Primary or Secondary Expander for managing them separately.

- "bpP >" or "bpS >" prompts in Console Terminal means the system is without Ethernet board installed and no network access support.
- "bpP >" prompts meaning serial console is connecting with Primary Expander.
- "bpS >" prompts meaning serial console is connecting with Secondary Expander.
- "?" or "help" command to display the commands help detailing how to use the console commands. For Example, "rev" to display firmware version, "sys" to display system status, "reset" to reset Expander watch dog.



- "? <command>" to display usage of the specific CLI command.



- Please note that the JBOD systems share the same Expander CLI commands no matter it is with or without Ethernet Management board inside unless otherwise specified.

6.3.3 Network Management

An Ethernet Board is required to support Network management. The Ethernet board sits on top of the Primary Expander module to provide Network Management in various protocols such as Telnet, SSH, Web-GUI, SNMP. It also provides email message sending while there is an alarm occurring by properly configuring the SMTP information.

While there is an Ethernet Board on top of the Primary Expander module it provides a flexible way to manage both Expanders through any physical RS-232 port on either Primary Expander or Secondary Expander by changing directory to /primary or /secondary.

The default setting of the Ethernet board is as below.

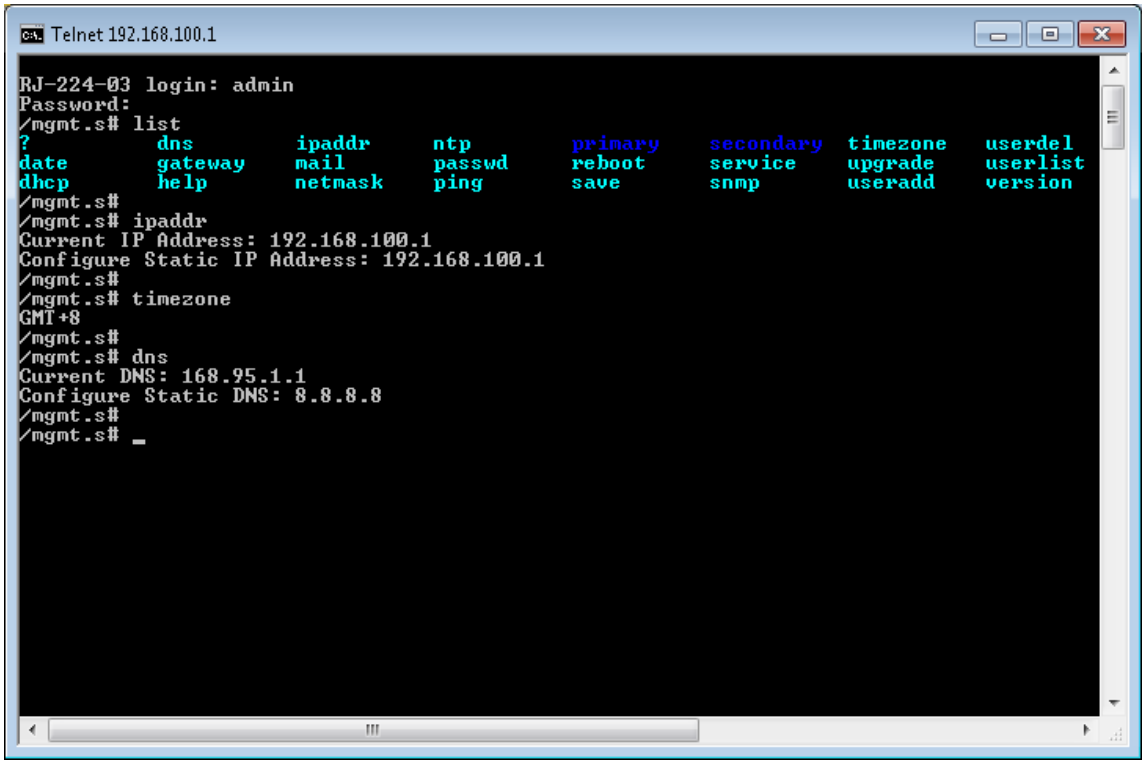
IP Address : 192.168.100.1
Subnet mask : 255.255.255.0
Gateway : 192.168.100.254
Username : admin
Password : default

* Please be sure the management host is in the same IP network domain as the system.
* Users can make changes of the settings to meet the network environment.

* For security reason, we strongly recommend users to make change of the password immediately right after the system is setup online.

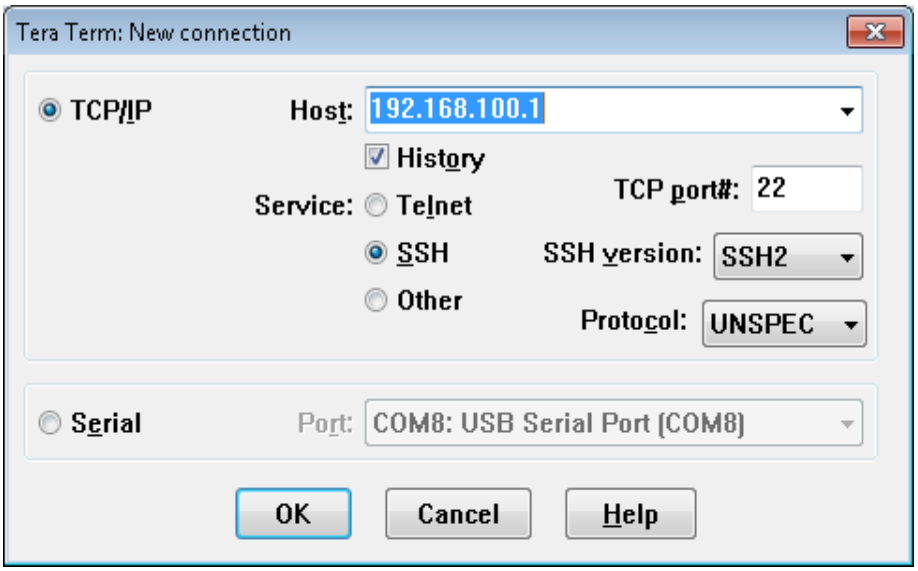
6.3.3.1 Telnet

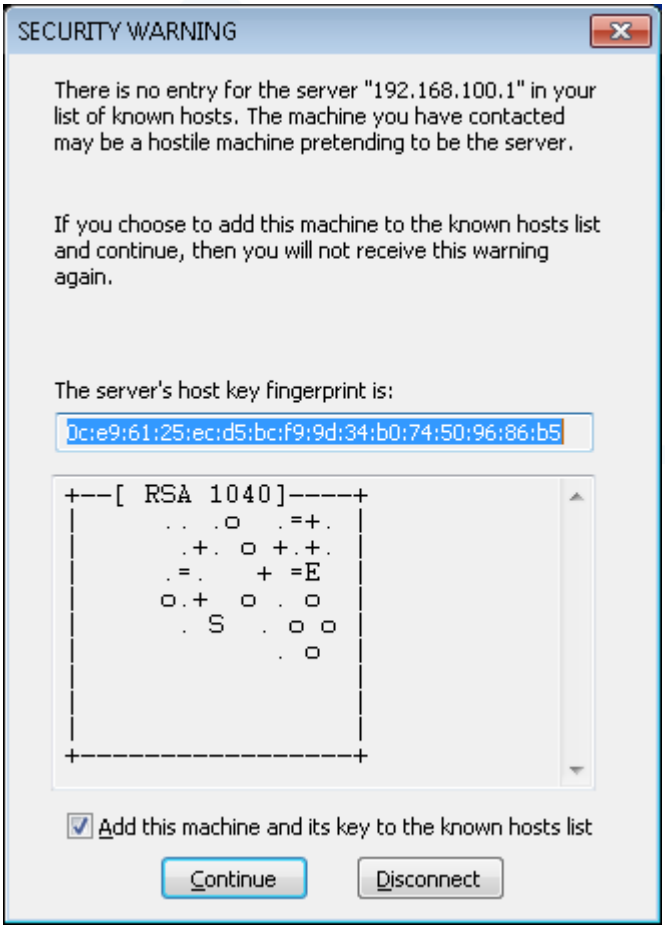
- Telnet is default enabled in Ethernet service. It provides the same level of CLI commands as it is through RS-232 console port.
- The difference from serial console is it requires Credential - Username and Password to gain access to Telnet session.

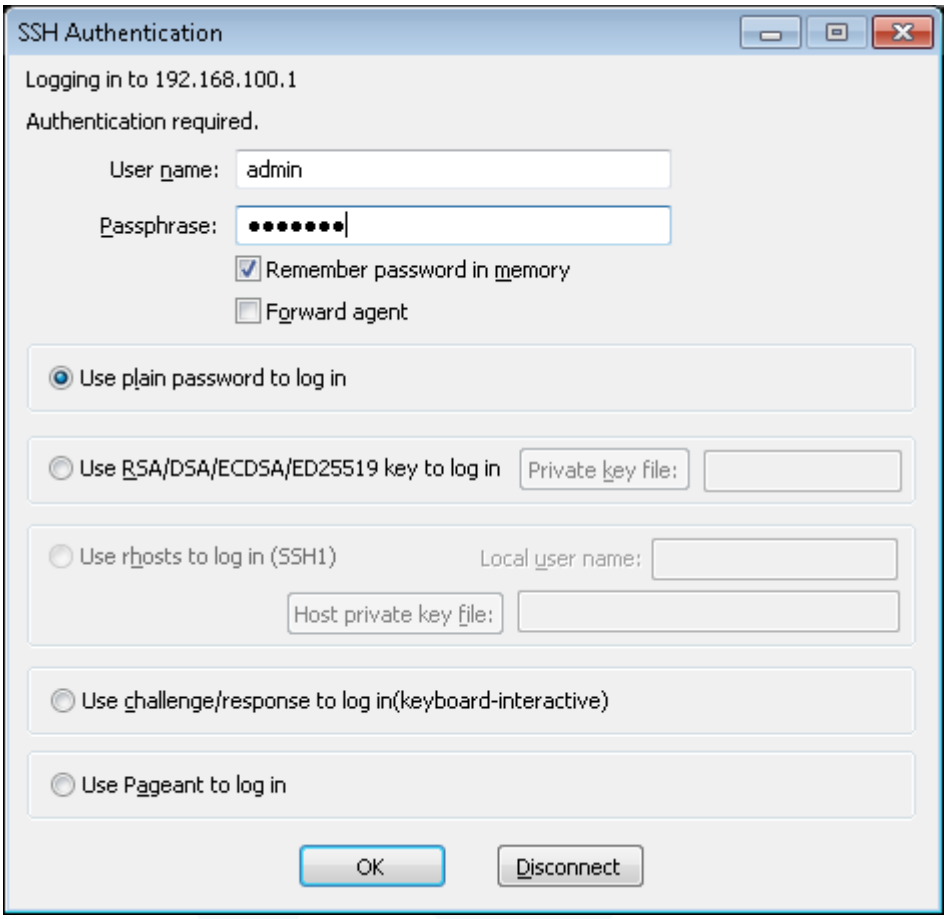


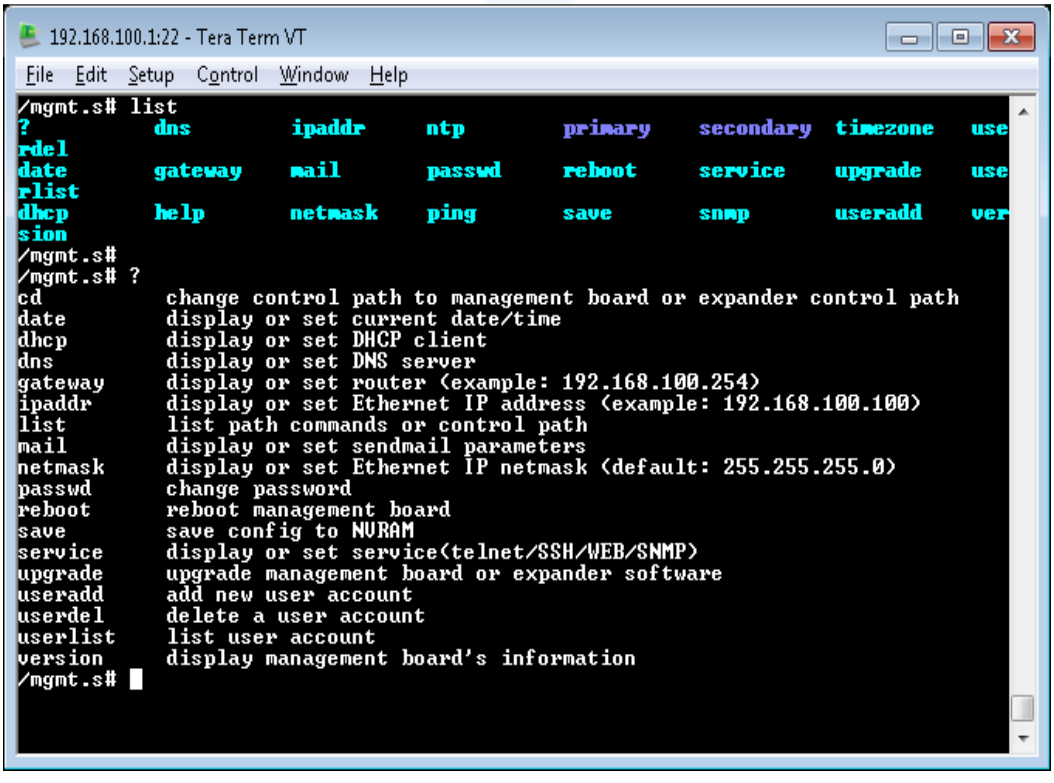
6.3.3.2 SSH

- SSH is default enabled in Ethernet service. It provides the same level of CLI command as it is through serial console or Telnet session.
- SSH provide a secure connection between host and JBOD system. It is default enabled on most Linux OSes. There are some freeware SSH tools for Windows to use such as Putty, Tera Term, …etc.
- Below is the Tera Term example to establish SSH session.


Tera Term: New connection
TCP/IP
Host: 192.168.100.1
History
Service: Telnet
SSH
Other
TCP port#: 22
SSH version: SSH2
Protocol: UNSPEC
Serial
Port: COM8: USB Serial Port (COM8)
OK
Cancel
Help


SECURITY WARNING
There is no entry for the server "192.168.100.1" in your list of known hosts. The machine you have contacted may be a hostile machine pretending to be the server.
If you choose to add this machine to the known hosts list and continue, then you will not receive this warning again.
The server's host key fingerprint is:
0c:e9:61:25:ec:d5:bc:f9:9d:34:b0:74:50:96:86:b5
+--[RSA 1040]----+
Add this machine and its key to the known hosts list
Continue
Disconnect

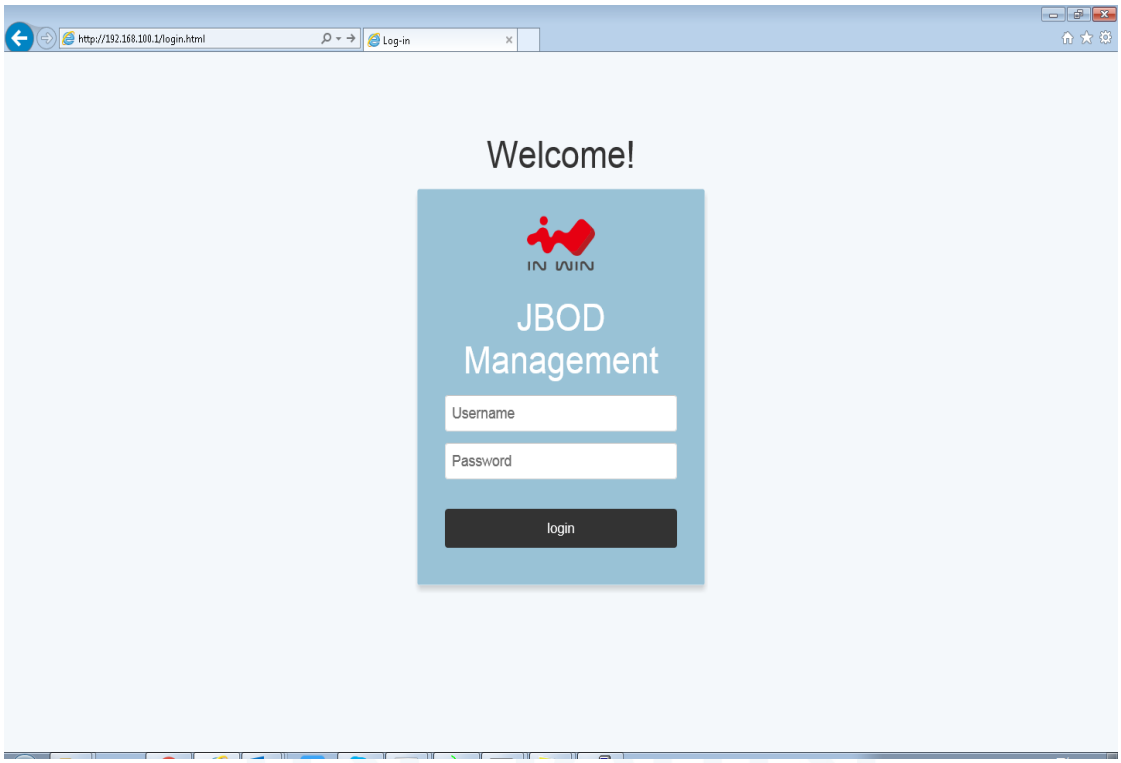

SSH Authentication
Logging in to 192.168.100.1
Authentication required.
User name: admin
Passphrase:
Remember password in memory
Forward agent
Use plain password to log in
Use RSA/DSA/ECDSA/ED25519 key to log in
Private key file:
Use rhosts to log in (SSH1)
Local user name:
Host private key file:
Use challenge/response to log in(keyboard-interactive)
Use Pageant to log in
OK
Disconnect


192.168.100.1:22 - Tera Term VT
File Edit Setup Control Window Help
/mgmt.s# list
? dns ipaddr ntp primary secondary timezone use
rdel
date gateway mail passwd reboot service upgrade use
rlist
dhcp help netmask ping save snmp useradd ver
sion
/mgmt.s#
/mgmt.s# ?
cd change control path to management board or expander control path
date display or set current date/time
dhcp display or set DHCP client
dns display or set DNS server
gateway display or set router (example: 192.168.100.254)
ipaddr display or set Ethernet IP address (example: 192.168.100.100)
list list path commands or control path
mail display or set sendmail parameters
netmask display or set Ethernet IP netmask (default: 255.255.255.0)
passwd change password
reboot reboot management board
save save config to NVRAM
service display or set service(telnet/SSH/WEB/SNMP)
upgrade upgrade management board or expander software
useradd add new user account
userdel delete a user account
userlist list user account
version display management board's information
/mgmt.s#

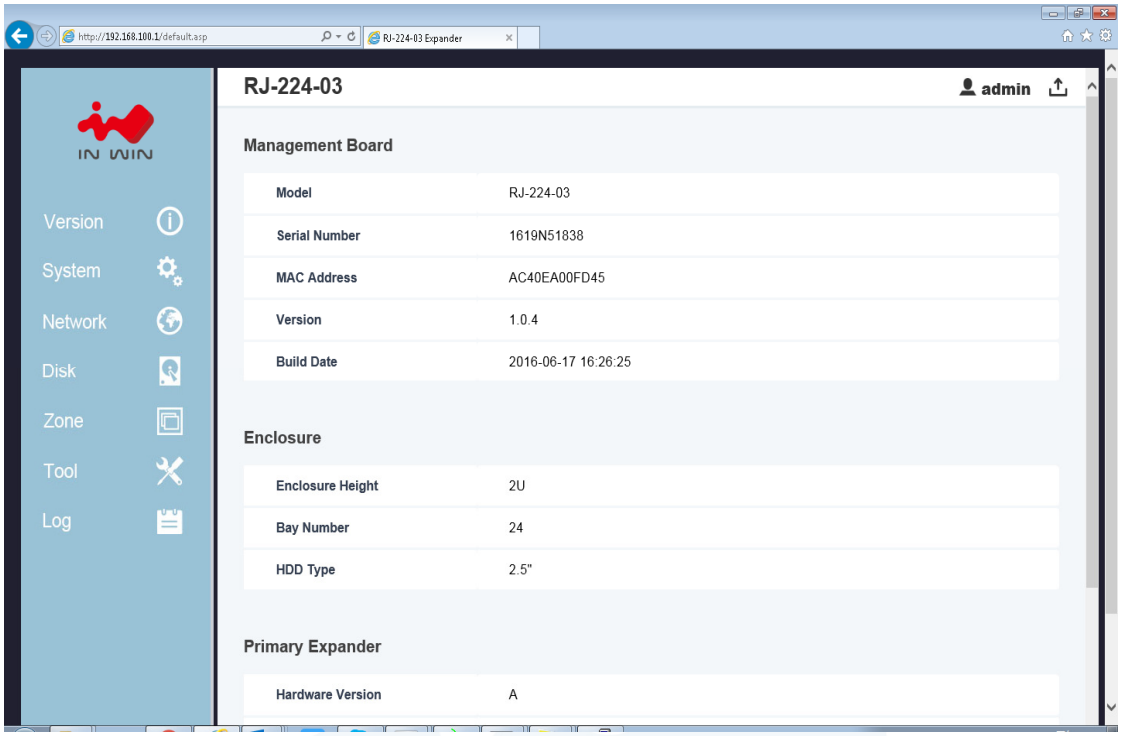
6.3.3.3 Web-GUI

- Web-GUI is the easiest way to manage JBOD system. It is default enabled on system.
- Users can simply open Web Browser and giving the JBOD management IP address in URL address field to start accessing system

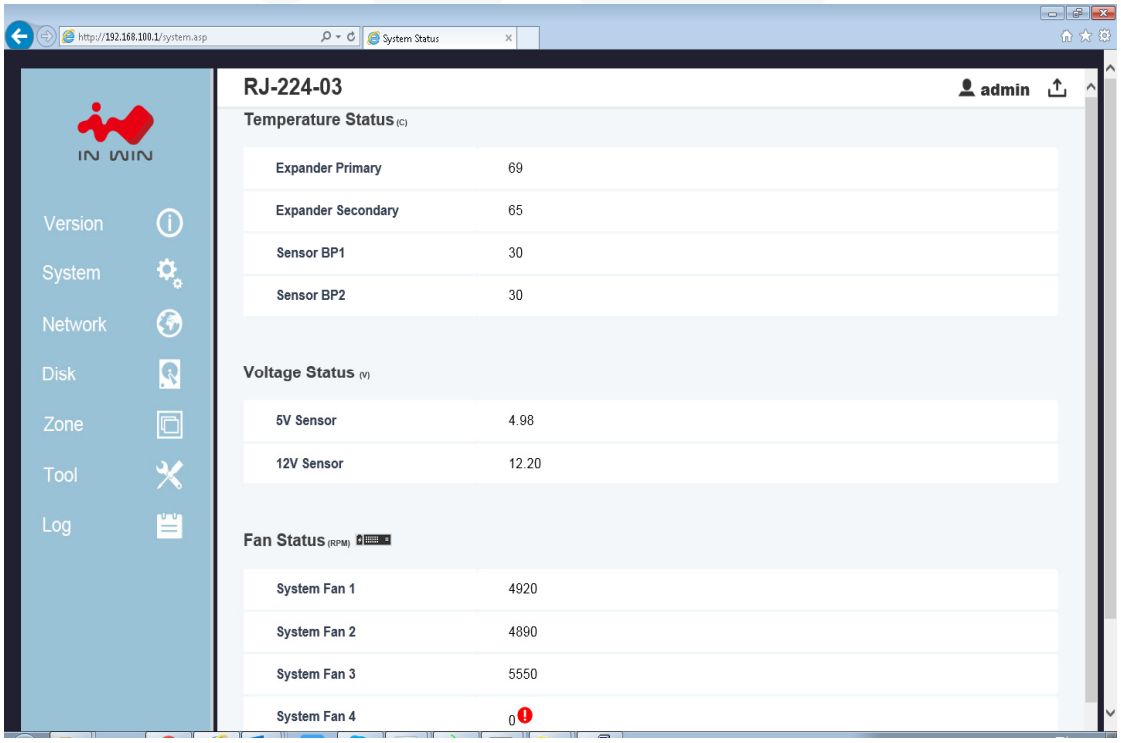
Login Page



Version Page



System Page



6.3.3.4 SNMP

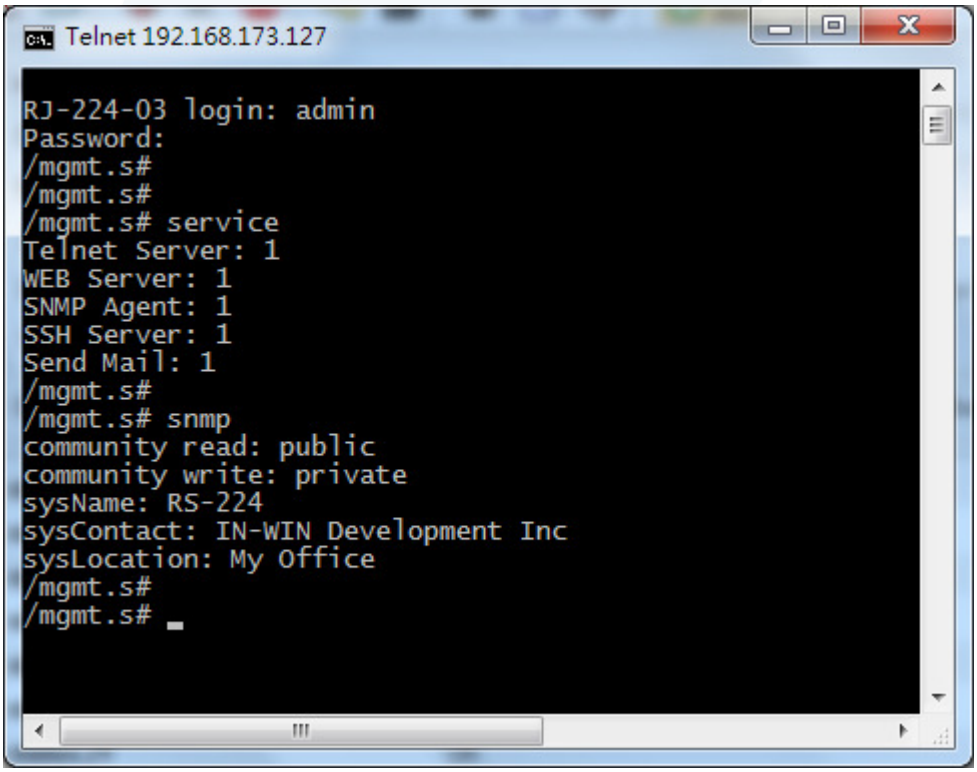
- SNMP is a popular network device management protocol that is widely used by IT people to manage systems, devices and equipment which are with SNMP support.
- IN WIN JBOD system has SNMP agent inside the network management board supporting SNMP v1 and v2c.
- Users need to configure the same read and write community string in JBOD system as the SNMP manager so the system can be managed by the SNMP Manager.
- An IN-WIN proprietary MIB which define system information is required to compile to SNMP Manager so the OID is able to be accessed properly.

inwin-jbod.mib

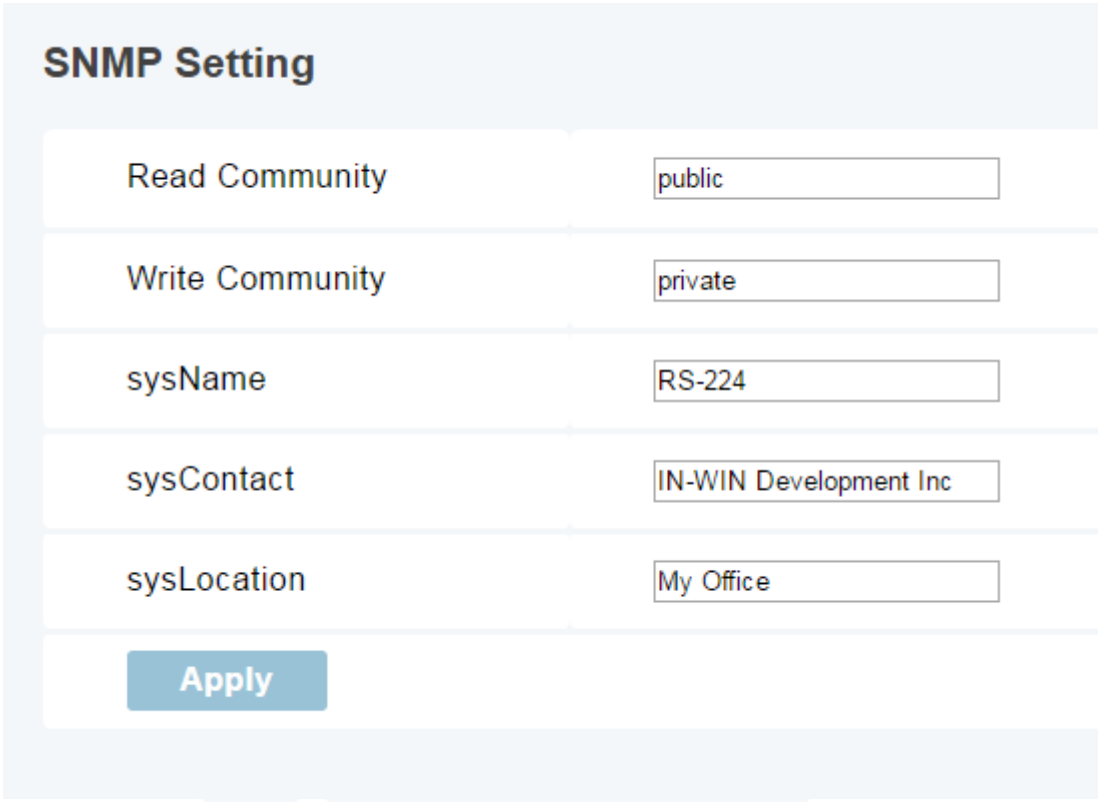
- SNMP Setting on System

  Users can change the setting through CLI and Web-GUI as necessary.

  - Check via CLI

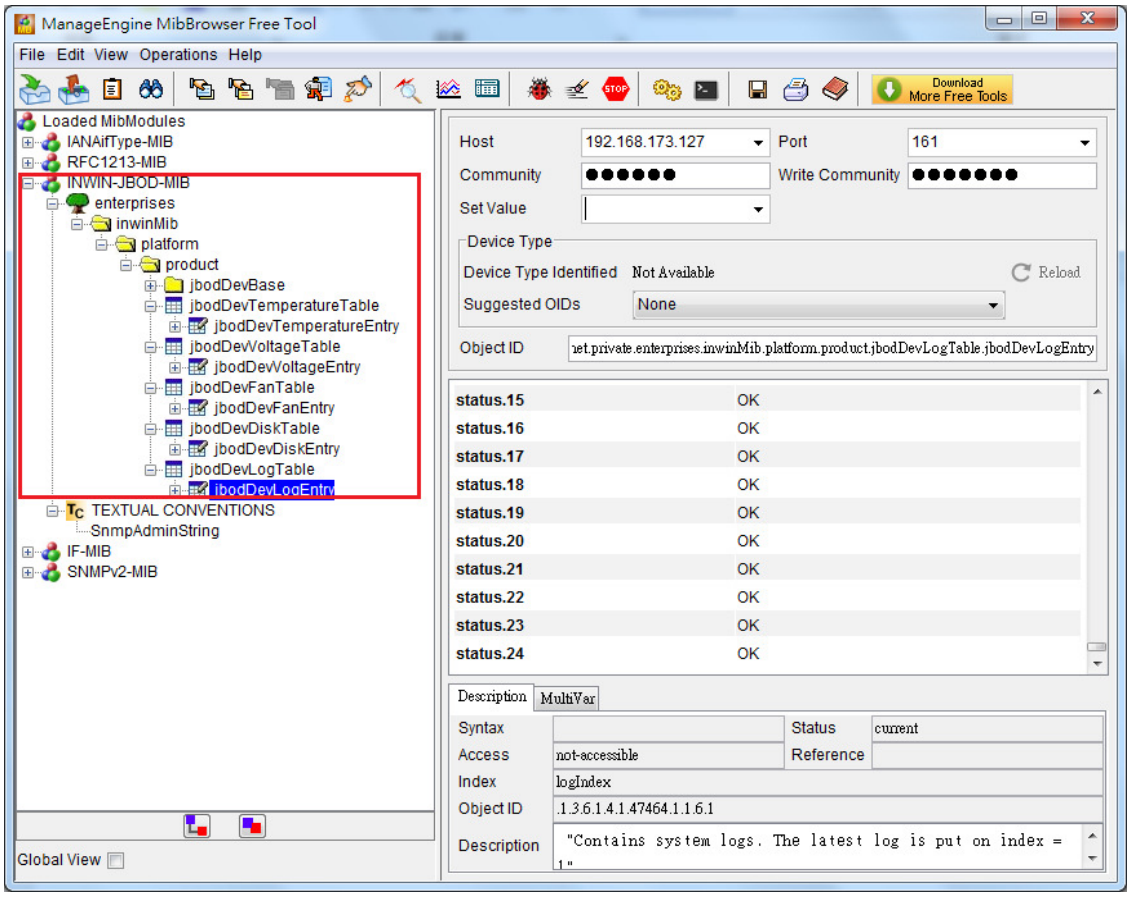


- Check via Web



- SNMP Manager

  Any SNMP Managers can be used to access system information by properly configuring system setting including IP address, Read community string, Write community string to match the setting on system. And compile IN WIN JBOD MIB file to the manager is necessary. Below an example to browse the system MIB with a free tool.

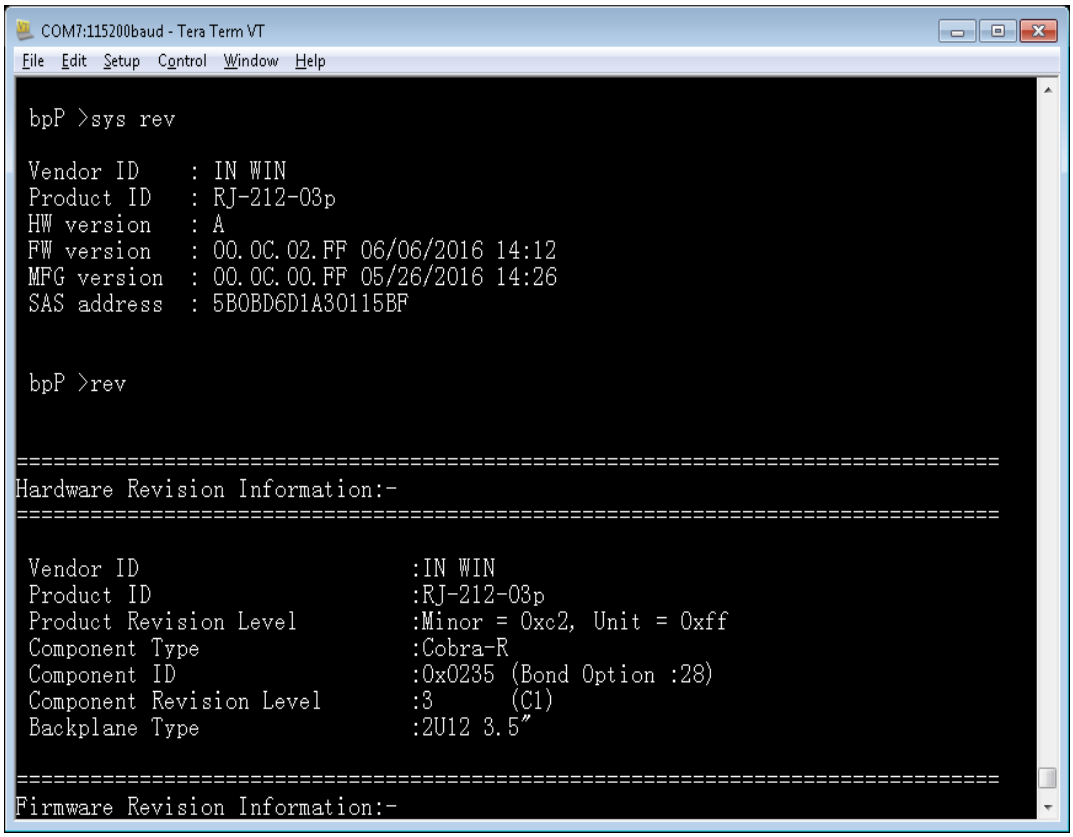


6.3.4 Version Information

Users can check the system hardware and firmware version through various ways.

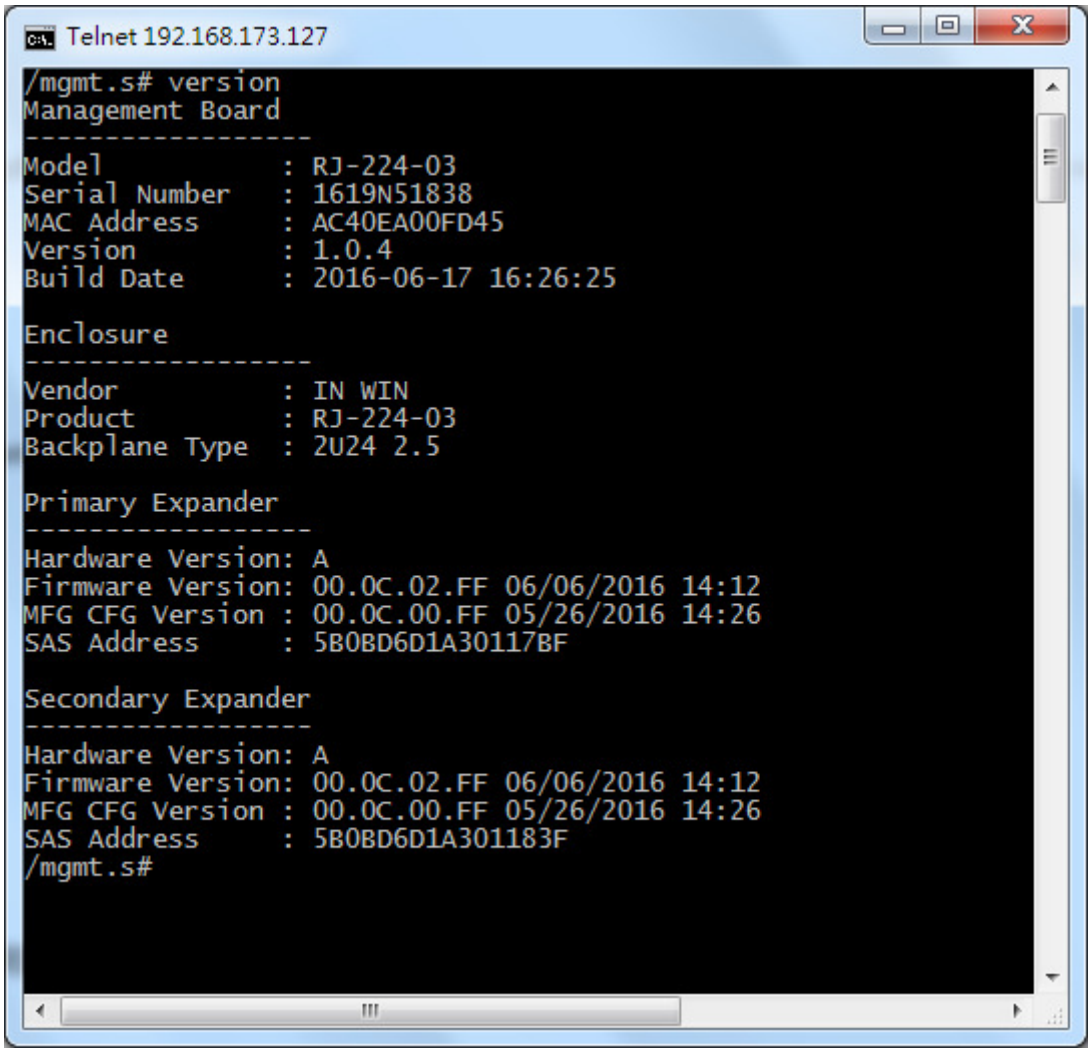
6.3.4.1 CLI (UART without Ethernet Board)

- “sys rev” display compact Expander hardware, firmware and MFG version.
- “rev” display verbose system version information.

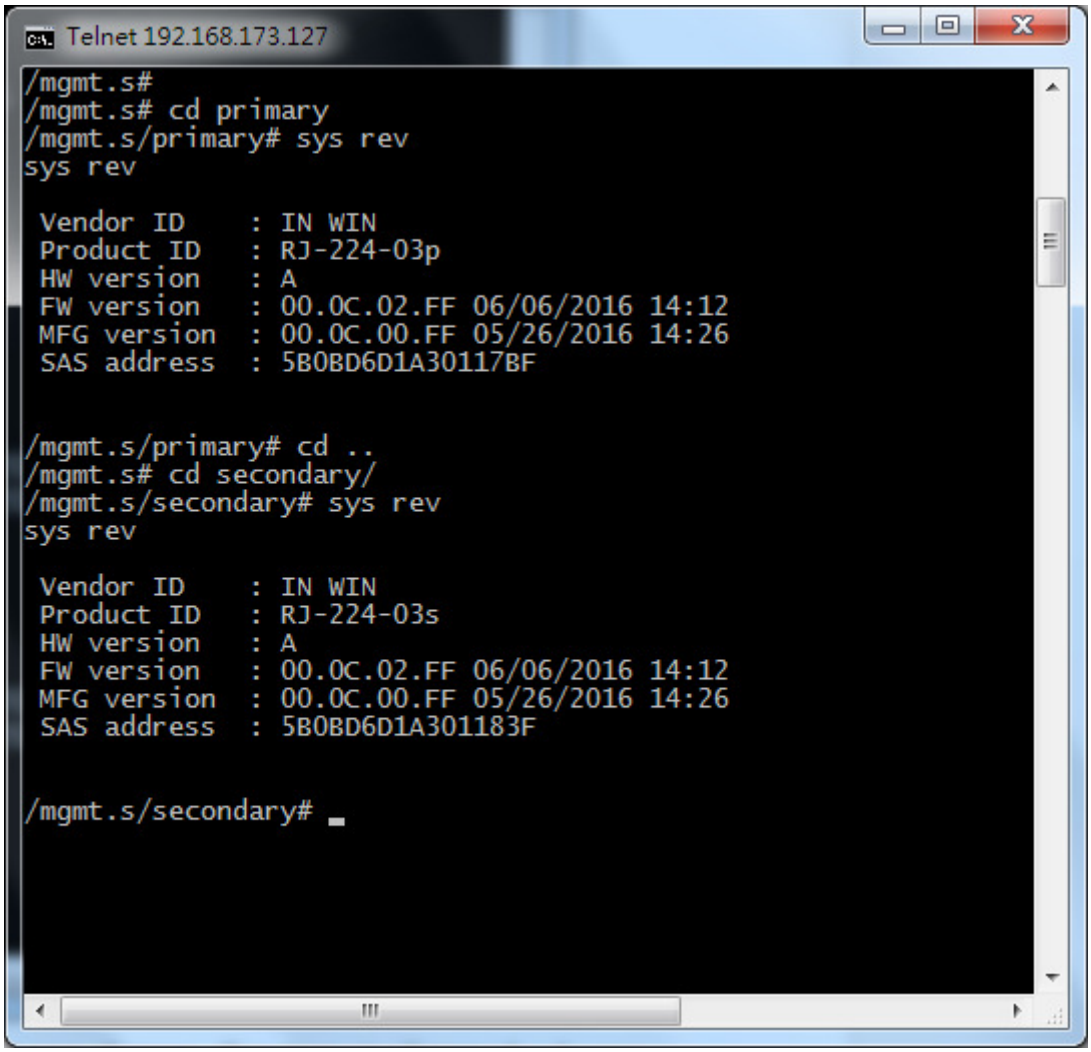


6.3.4.2 CLI (UART, Telnet and SSH with Ethernet Board)

- Type “version” command on Ethernet Layer to display all the version information including Ethernet firmware version, Expander HW version, Expander firmware version and MFG CFG file version

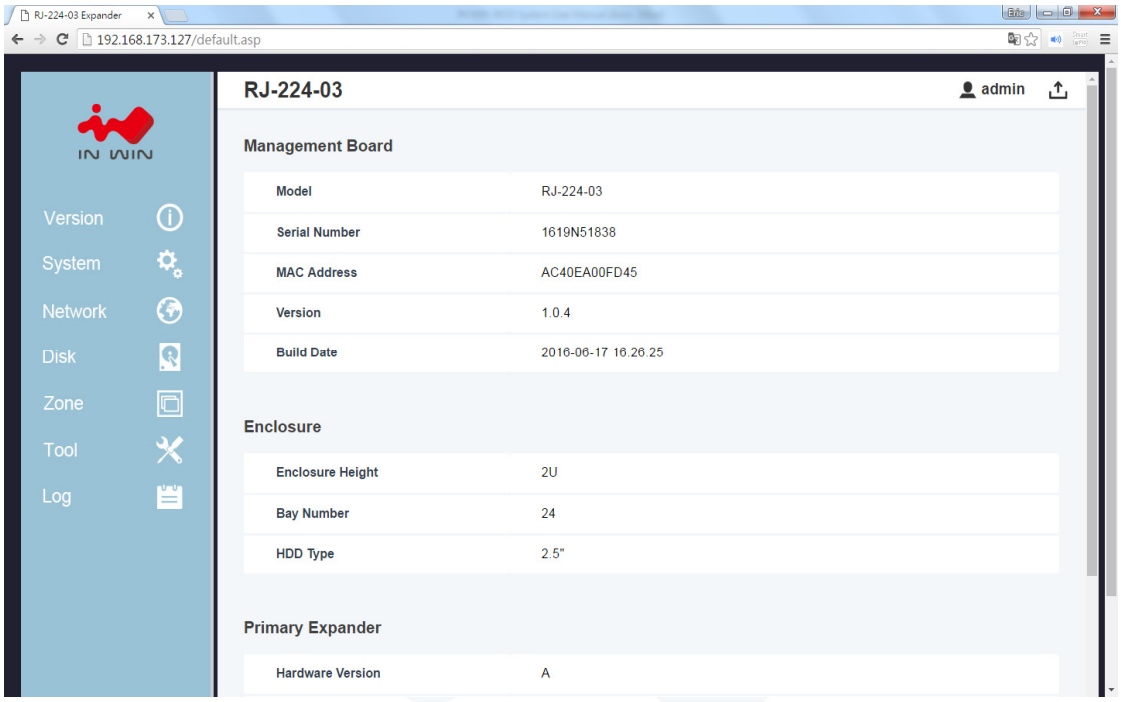


- To check SAS Expander versions only, users can change directory to Expander layer and type “sys rev” command to check Expander version information



6.3.4.3 Web-GUI

- Type system IP address on Web Browser URL address field to gain access to the system. After logging in, click “Version” button on the left pane to view the system version information on the right pane. Scroll down to view all information if the display is out of page.



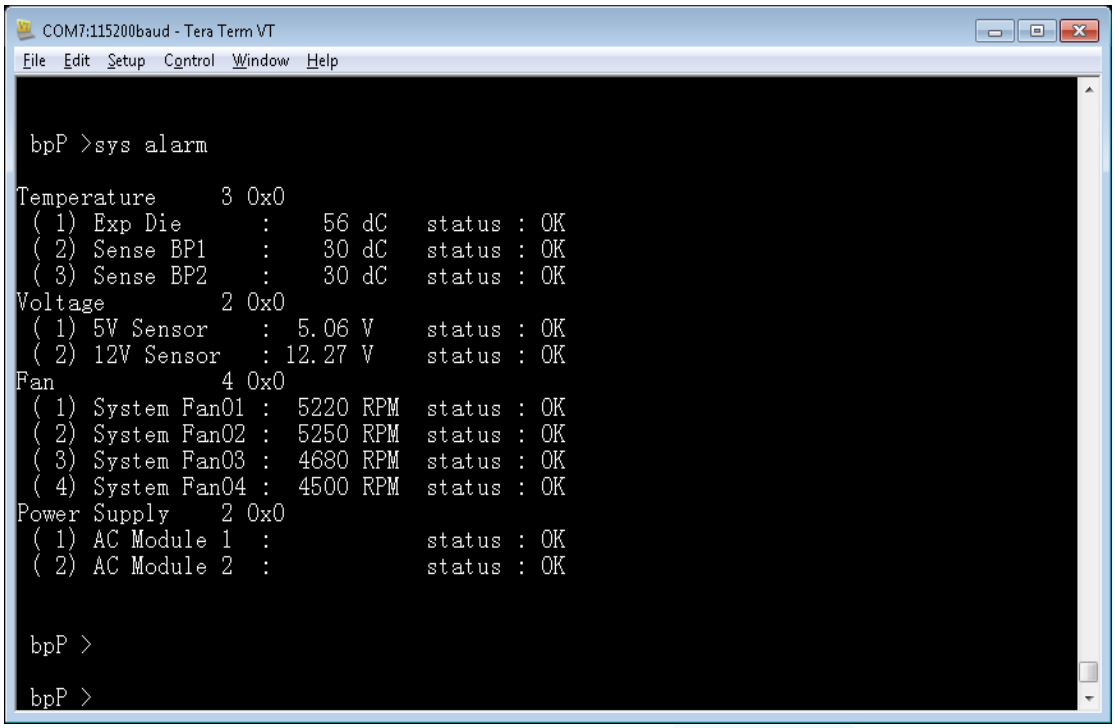
6.3.5 System Status

System Status is to display the status of the system sensors including temperature, voltage, fan speed and Power Supply.

There are 1 temperature sensor on each Expander, 2 system temperature sensors on Backplane, 5V and 12V voltage sensors on backplane, 4 Fan speed sensors on backplane and 2 Power Supply health sensors on PDB.

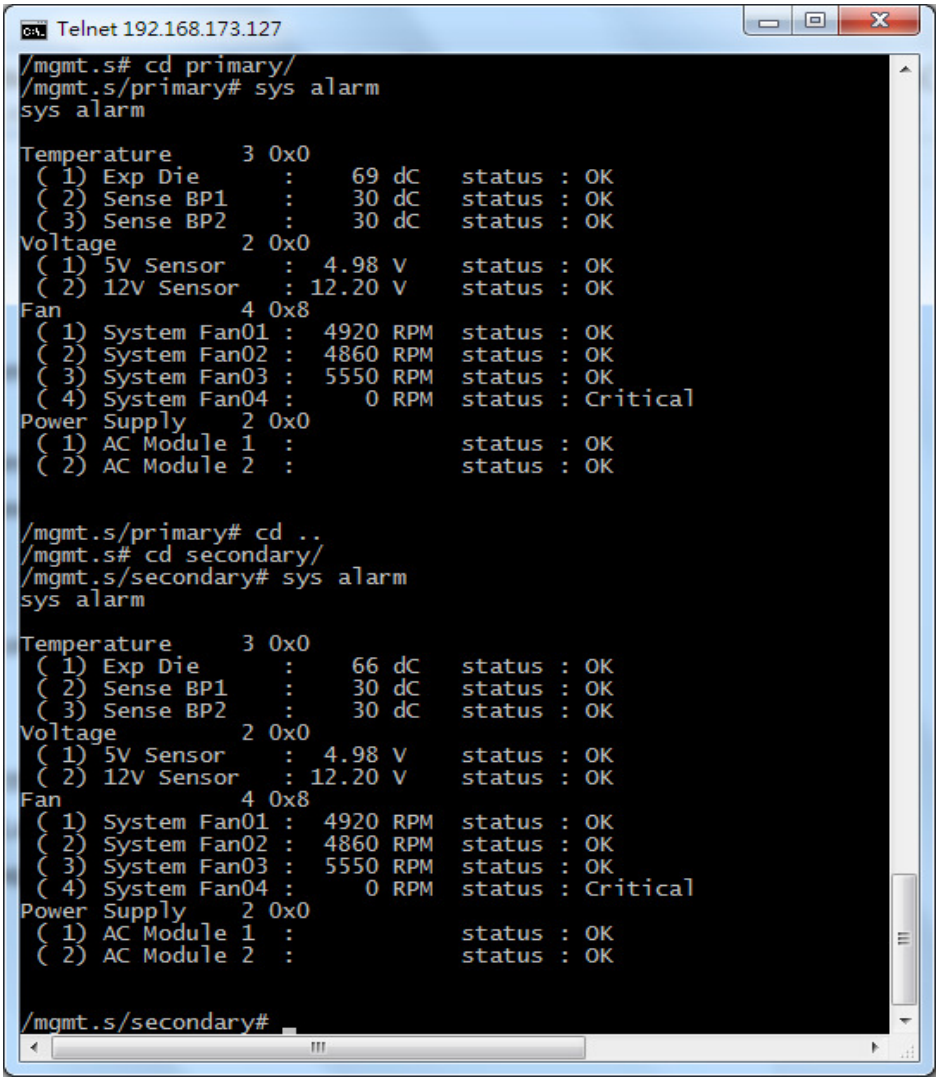
6.3.5.1 CLI (UART without Ethernet Board)

- Type “sys alarm” on console to check the system sensor’s readings and their status.
- Connect serial cable to Primary and Secondary Expander to check the status respectively. As the design, both Primary and Secondary Expanders would get the same reading and status (except Exp Die Temperature) since they are from the same sensors.


COM7:115200baud - Tera Term VT
File Edit Setup Control Window Help
bpP >sys alarm
Temperature 3 0x0
(1) Exp Die : 56 dC status : OK
(2) Sense BP1 : 30 dC status : OK
(3) Sense BP2 : 30 dC status : OK
Voltage 2 0x0
(1) 5V Sensor : 5.06 V status : OK
(2) 12V Sensor : 12.27 V status : OK
Fan 4 0x0
(1) System Fan01 : 5220 RPM status : OK
(2) System Fan02 : 5250 RPM status : OK
(3) System Fan03 : 4680 RPM status : OK
(4) System Fan04 : 4500 RPM status : OK
Power Supply 2 0x0
(1) AC Module 1 : status : OK
(2) AC Module 2 : status : OK
bpP >
bpP >

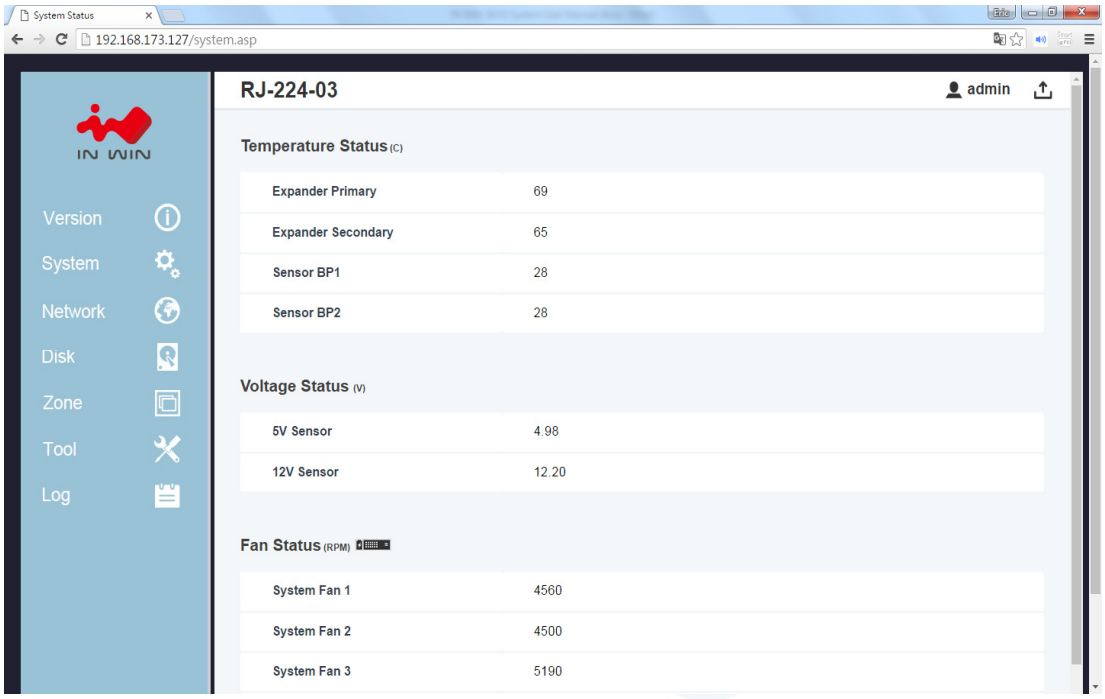
6.3.5.2 CLI (UART, Telnet and SSH with Ethernet Board)

- Type “sys alarm” command on Expander layer would display the System sensors’ reading and their status.
- Please note that the Expander temperature sensor “Exp Die” is located on the Expander chip so need to change directory to Primary and Secondary to read its status respectively.



6.3.5.3 Web-GUI

- Type system IP address on Web Browser URL filed to gain access to the system. After logging in, click “System” button on the left pane to view the system status information on the right pane. Scroll down to view all information if the display is out of page.

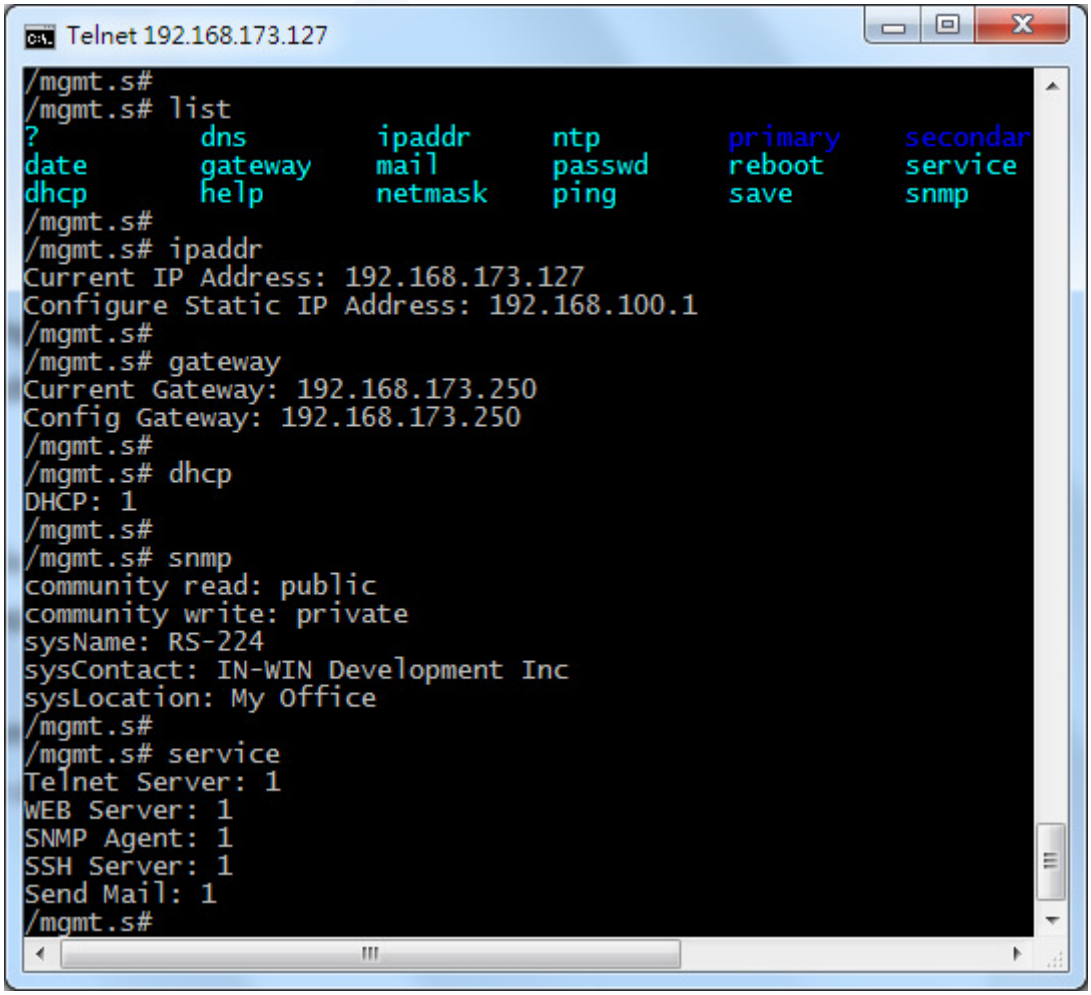


6.3.6 Network Settings

Network settings is for displaying and setting the system network information including Current Network Status, DHCP/Static IP Address selection, Network Services, Mail configuration, SNMP configuration.

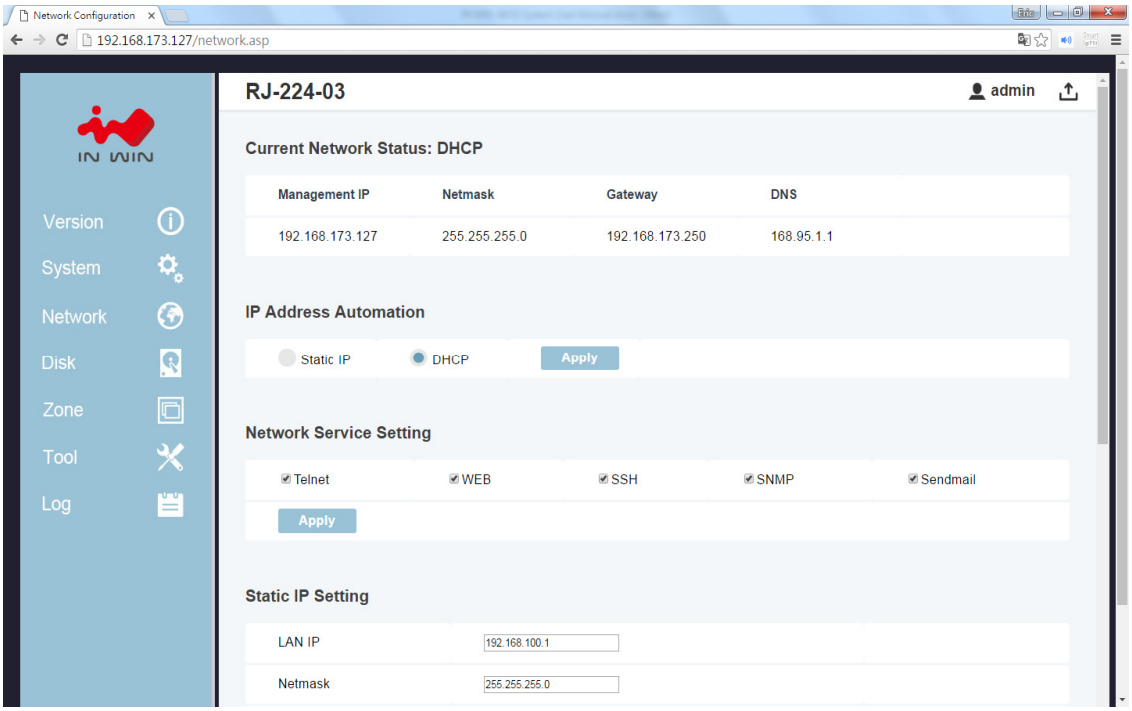
6.3.6.1 CLI (UART, Telnet and SSH with Ethernet Board)

- There are a couple network setting commands on Ethernet layer such as “ipaddr”, “gateway”, “netmask”, …etc. to view and configure the setting respectively. Please refer to Management\CLI session for more details in how to use the CLI commands.
- Please be sure to apply “save” command so the setting would be saved for next system reboot.



6.3.6.2 Web-GUI

- Type system IP address on Web Browser URL filed to gain access to the system. After logging in, click “Network” button on the left pane to view the network information on the right pane. Scroll down to view all information if the display is out of page.

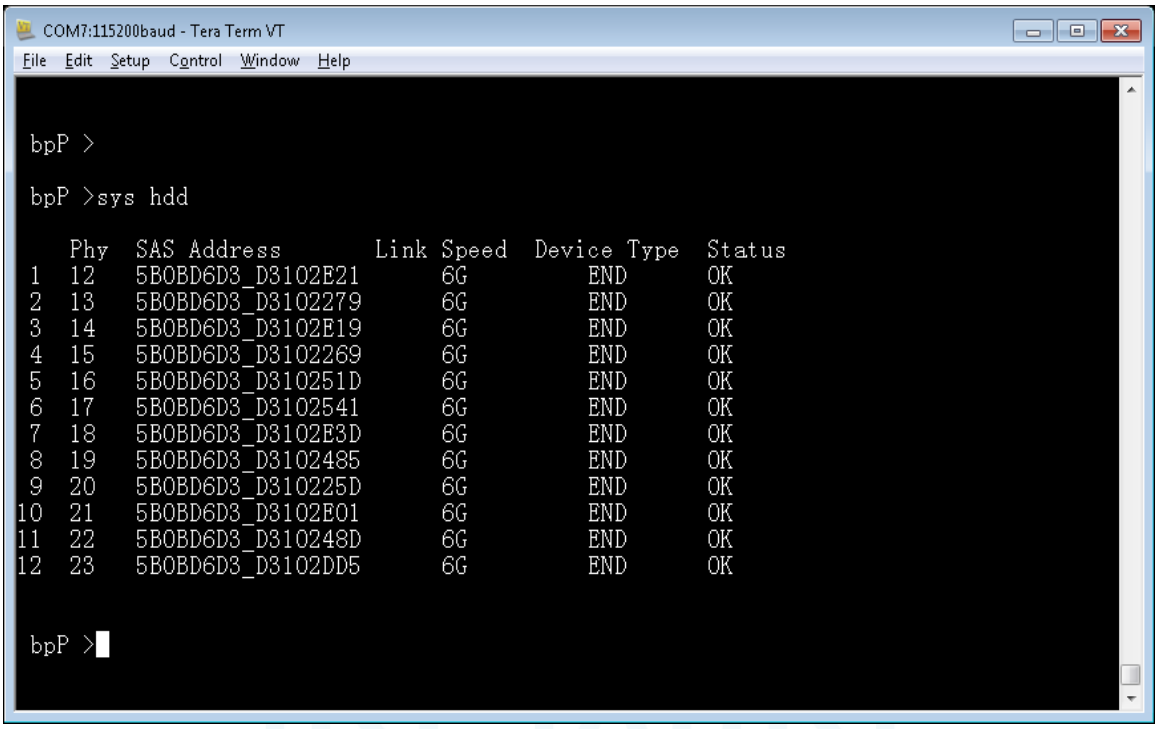


6.3.7 Disk Information

Disk information is to show the disk drives status on the system including Bay id, Phy id, SAS Address, Link speed and current status.

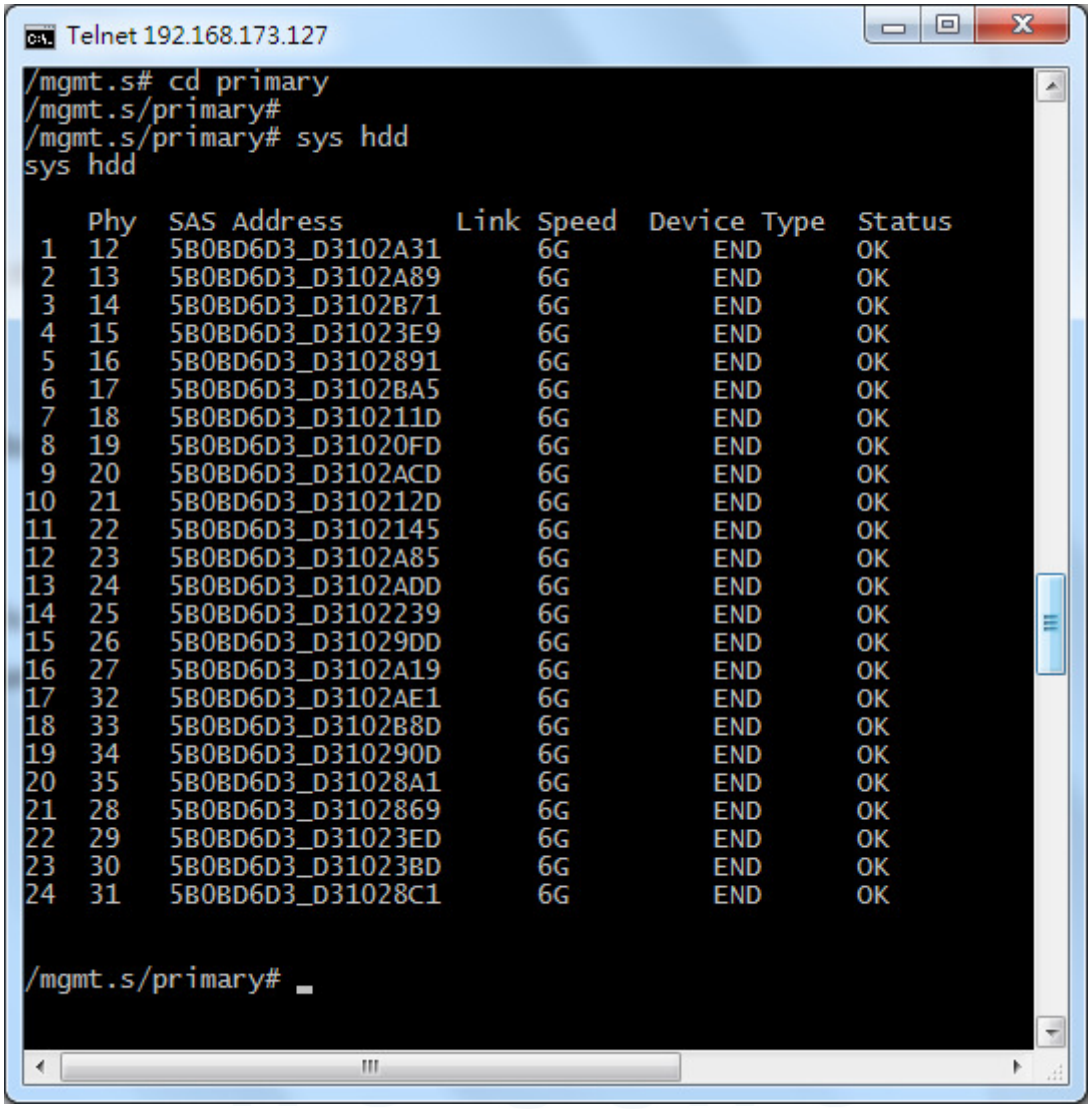
6.3.7.1 CLI (UART without Ethernet Board)

- Type “sys hdd” command to display the system hard disk drives status on the system.



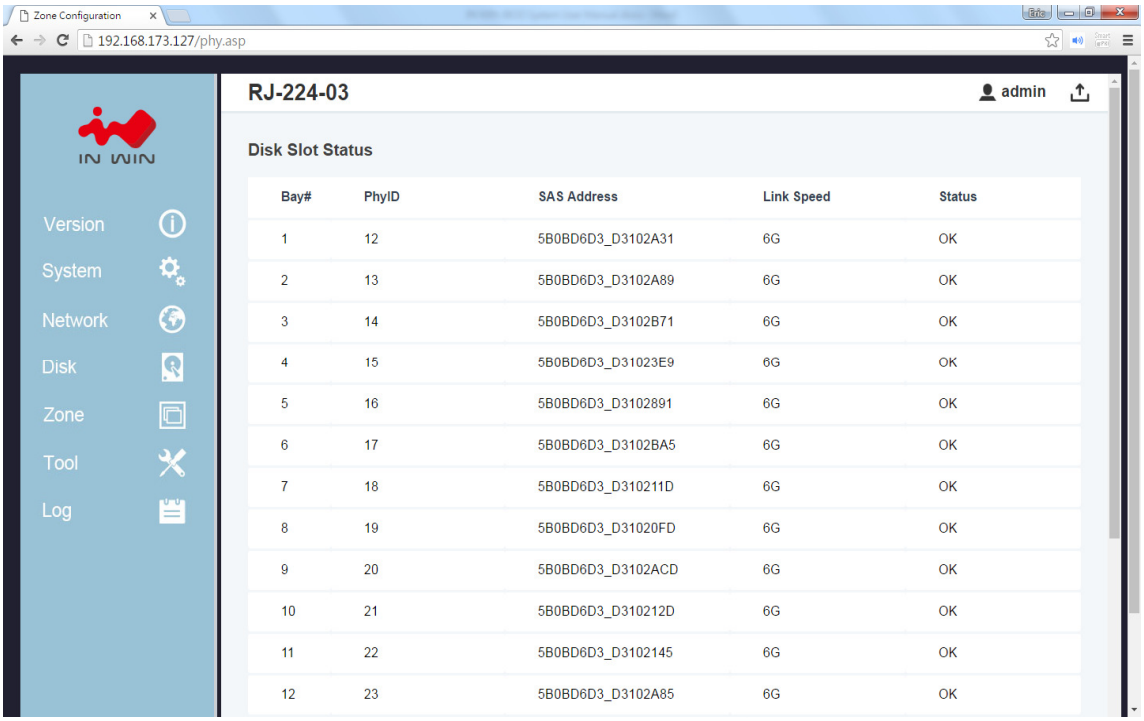
6.3.7.2 CLI (UART, Telnet and SSH with Ethernet Board)

- Type “sys hdd” command on Expander layer would display the system hard disk drives status on the system.


Telnet 192.168.173.127
/mgmt.s# cd primary
/mgmt.s/primary#
/mgmt.s/primary# sys hdd
sys hdd
Phy SAS Address Link Speed Device Type Status
1 12 5B0BD6D3_D3102A31 6G END OK
2 13 5B0BD6D3_D3102A89 6G END OK
3 14 5B0BD6D3_D3102B71 6G END OK
4 15 5B0BD6D3_D31023E9 6G END OK
5 16 5B0BD6D3_D3102891 6G END OK
6 17 5B0BD6D3_D3102BA5 6G END OK
7 18 5B0BD6D3_D310211D 6G END OK
8 19 5B0BD6D3_D31020FD 6G END OK
9 20 5B0BD6D3_D3102ACD 6G END OK
10 21 5B0BD6D3_D310212D 6G END OK
11 22 5B0BD6D3_D3102145 6G END OK
12 23 5B0BD6D3_D3102A85 6G END OK
13 24 5B0BD6D3_D3102ADD 6G END OK
14 25 5B0BD6D3_D3102239 6G END OK
15 26 5B0BD6D3_D31029DD 6G END OK
16 27 5B0BD6D3_D3102A19 6G END OK
17 32 5B0BD6D3_D3102AE1 6G END OK
18 33 5B0BD6D3_D3102B8D 6G END OK
19 34 5B0BD6D3_D310290D 6G END OK
20 35 5B0BD6D3_D31028A1 6G END OK
21 28 5B0BD6D3_D3102869 6G END OK
22 29 5B0BD6D3_D31023ED 6G END OK
23 30 5B0BD6D3_D31023BD 6G END OK
24 31 5B0BD6D3_D31028C1 6G END OK
/mgmt.s/primary#

6.3.7.3 Web-GUI

- Type system IP address on Web Browser URL filed to gain access to the system. After logging in, click “Disk” button on the left pane to view the disk drives information on the right pane. Scroll down to view all information if the display is out of page.



Bay#	PhyID	SAS Address	Link Speed	Status
1	12	5B0BD6D3_D3102A31	6G	OK
2	13	5B0BD6D3_D3102A89	6G	OK
3	14	5B0BD6D3_D3102B71	6G	OK
4	15	5B0BD6D3_D31023E9	6G	OK
5	16	5B0BD6D3_D3102891	6G	OK
6	17	5B0BD6D3_D3102BA5	6G	OK
7	18	5B0BD6D3_D310211D	6G	OK
8	19	5B0BD6D3_D31020FD	6G	OK
9	20	5B0BD6D3_D3102ACD	6G	OK
10	21	5B0BD6D3_D310212D	6G	OK
11	22	5B0BD6D3_D3102145	6G	OK
12	23	5B0BD6D3_D3102A85	6G	OK

6.3.8 Zone Setting

6.3.8.1 CLI (UART without Ethernet Board)

6.3.8.1.1 Type “c.zone curr” command to show the current zone running setting

6.3.8.1.2 Type “c.zone slot 1 1~6” to configure Zone 1 containing Slot 1 to Slot 6 disk drives.

6.3.8.1.3 Type “c.zone config” to show the zone configuration the users have made.

6.3.8.1.4 Type “c.zone down 1” to configure the Exp. Port of the 3 SAS ports belonging to zone group 1.

6.3.8.1.5 Type “c.zone enable” to enable Zoning setting of the system.

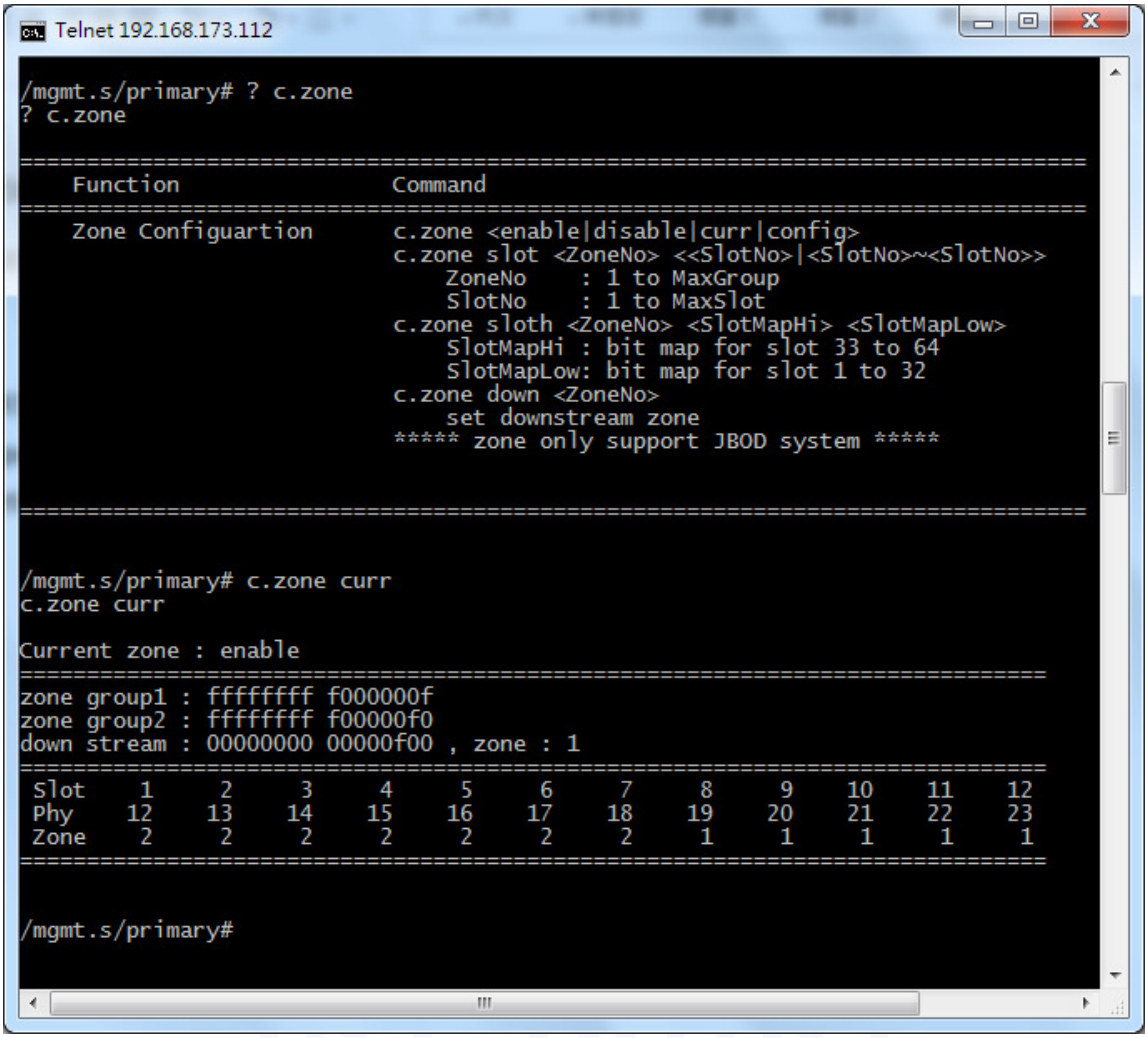
6.3.8.1.6 Type “c.zone disable” to disable Zoning setting of the system.

6.3.8.1.7 A system reboot is required to make the Zone configuration take effect.

6.3.8.1.8 Please note that the Zoning setting is only made for the expander the serial port is currently connected. To make both expander, please do it again on other Expander.

6.3.8.2 CLI(UART, Telnet and SSH with Ethernet Board)

6.3.8.2.1 Type “c.zone curr” command on Expander layer would display the current zone running setting



6.3.8.2.2 Type “c.zone slot 1 1~6” to configure Zone 1 containing Slot 1 to Slot 6 disk drives.

6.3.8.2.3 Type “c.zone config” to show the current zoning configuration. A system reboot is required to make the configuration take effect.

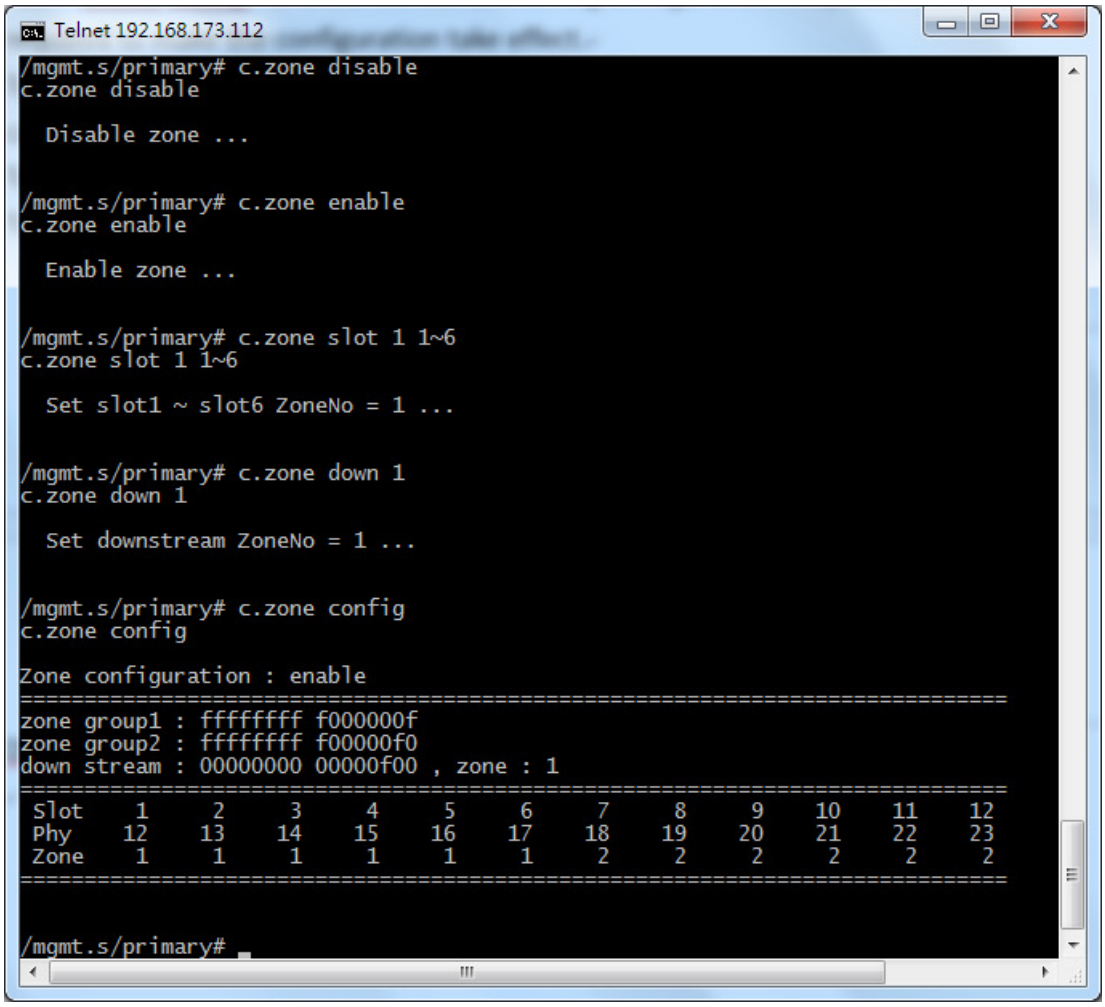
6.3.8.2.4 Type “c.zone down 1” to configure the Exp. Port of the 3 SAS ports belonging to zone group 1.

6.3.8.2.5 Type “c.zone enable” to enable Zoning setting of the system.

6.3.8.2.6 Type “c.zone disable” to disable Zoning setting of the system.

6.3.8.2.7 A system reboot is required to make the Zone configuration take effect.

6.3.8.2.8 Please note that the Zoning setting is only made for the expander the console is currently on. To make both expander, please do it again on other Expander.



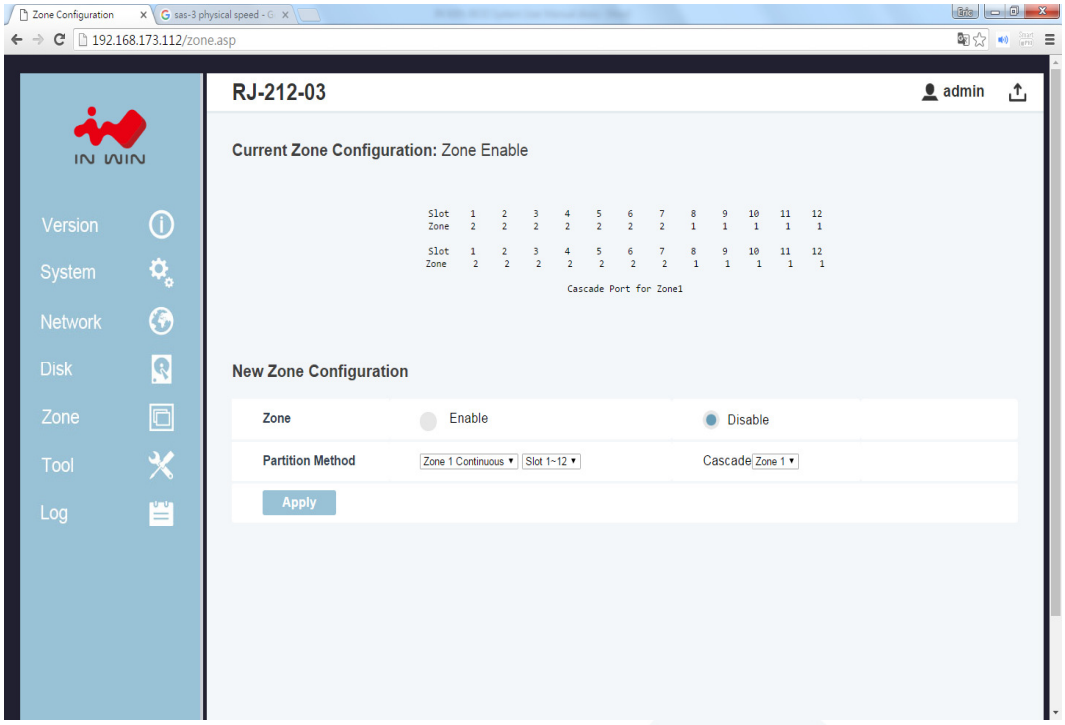
6.3.8.3 Web-GUI

6.3.8.3.1 Type system IP address on Web Browser URL filed to gain access to the system. After logging in, click “Zone” button on the left pane to view and configure the Zoning setting of the system

6.3.8.3.2 “Current Zone Configuration” session shows the current zone setting on the system including the disk bay assignment of zone and the cascading port zone group.

6.3.8.3.3 “New Zone Configuration” session allow users to configure zone setting on the system in an easy way by selecting the disk bays and the zone group the cascading port belonging to. Click “Apply” to make the configuration take effect.

6.3.8.3.4 Whenever there are 2 SAS Expanders on the system, the Zoning setting applies to both of them at once while configuring through Web-GUI.



6.3.9 Firmware Upgrade

Firmware upgrade function provides a way to update system firmware when necessary.

There are 3 firmware for IN WIN JBOD system:

1. Ethernet Management board Firmware (when there is Ethernet Management board)
2. SAS Expander Board Firmware
3. SAS Expander MFG CFG binary

There are a couple ways to upgrade system firmware according to the HW configurations. Please note that the upgraded firmware won't take effect immediately until a system reboot

6.3.9.1 CLI (UART without Ethernet Board)

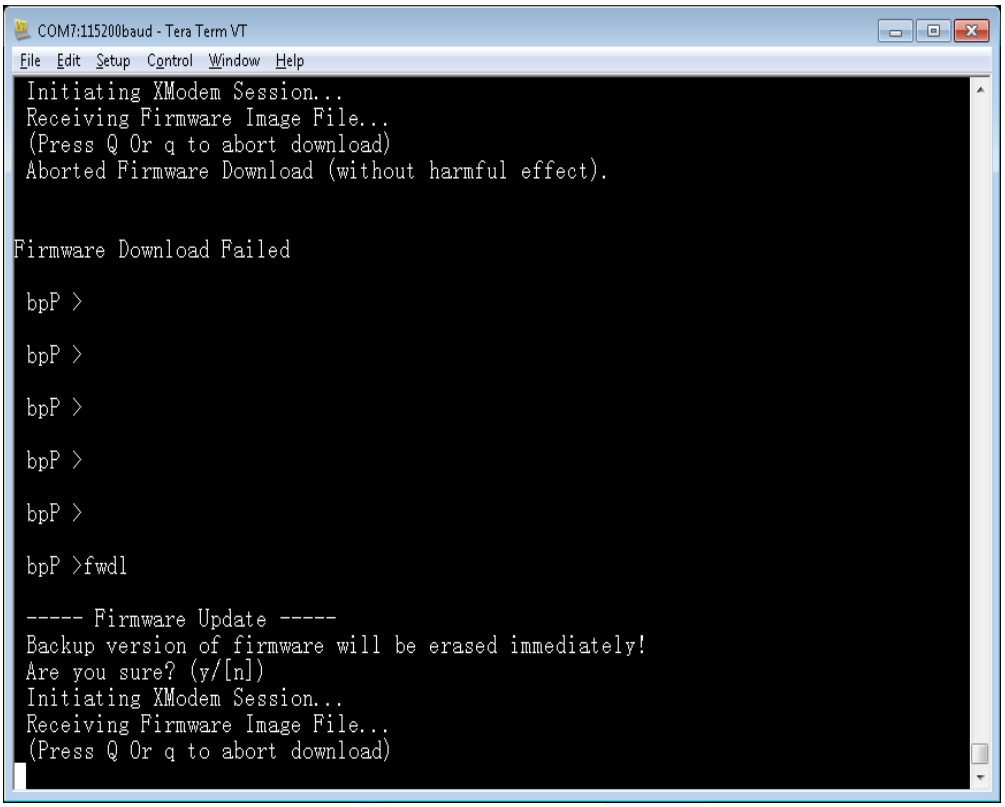
When there is no Ethernet Management board on the system users can upgrade SAS Expander firmware and MFG CFG file through Xmodem protocol. Most of serial console terminal tools such as Tera Term support Xmodem protocol for sending file to system.

The Firmware upgrade has to be done on both the Primary and Secondary SAS Expander separately whenever there is a Secondary SAS Expander on the system

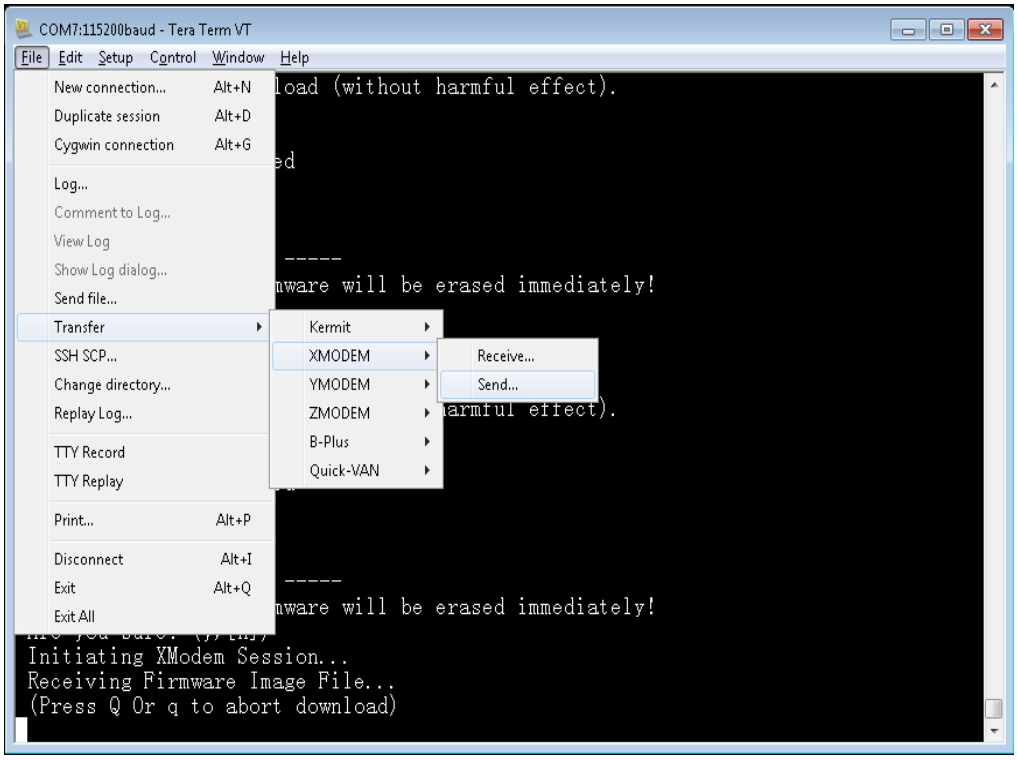
6.3.9.1.1 SAS Expander Firmware

A. “fwdl” command on serial console.

B. Type “y” to commit firmware upgrade.

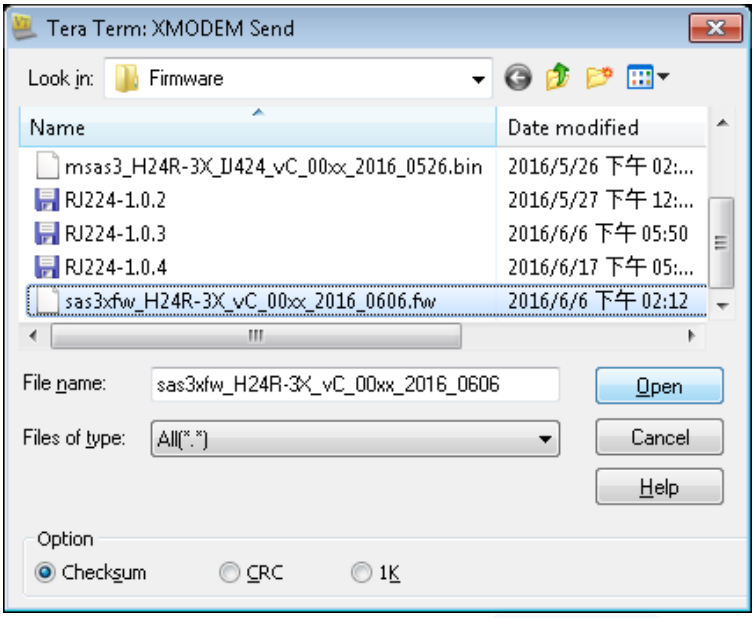


C. Select xmodem as the protocol to transfer file.

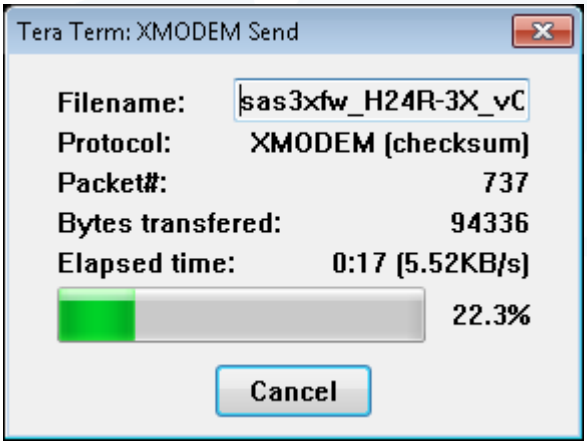


D. Select the correct SAS Expander firmware file.

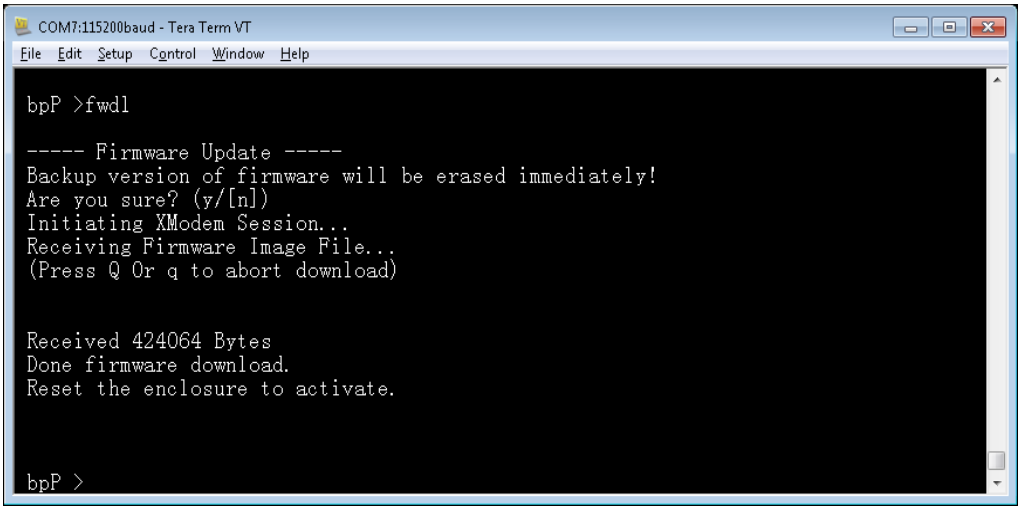
E. Click on “Open” to start the selected firmware transferring to SAS Expander.



F. Serial console would then start firmware transfer.

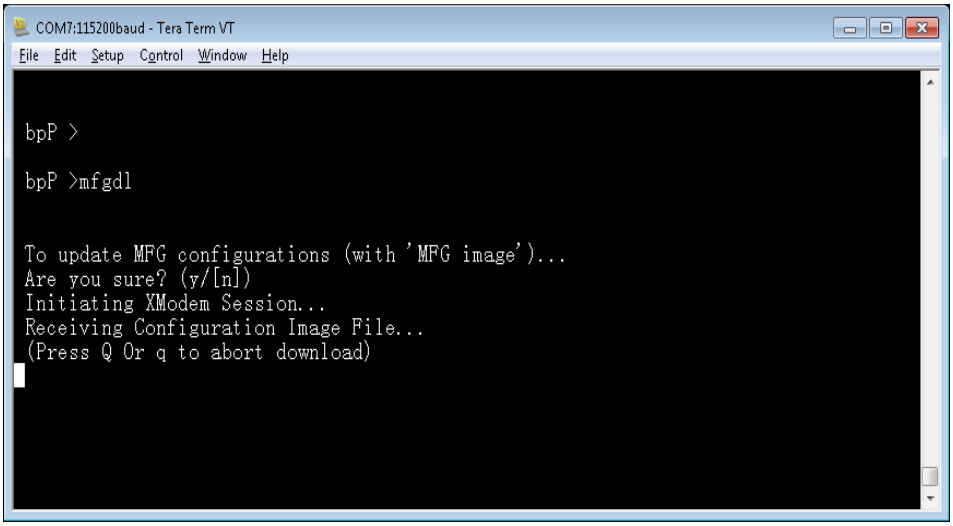


G. After firmware transfer completed, reboot Expander to activate new firmware.



6.3.9.1.2 SAS Expander MFG CFG binary

A. Similar to firmware upgrade, typing “mfgdl” on console.



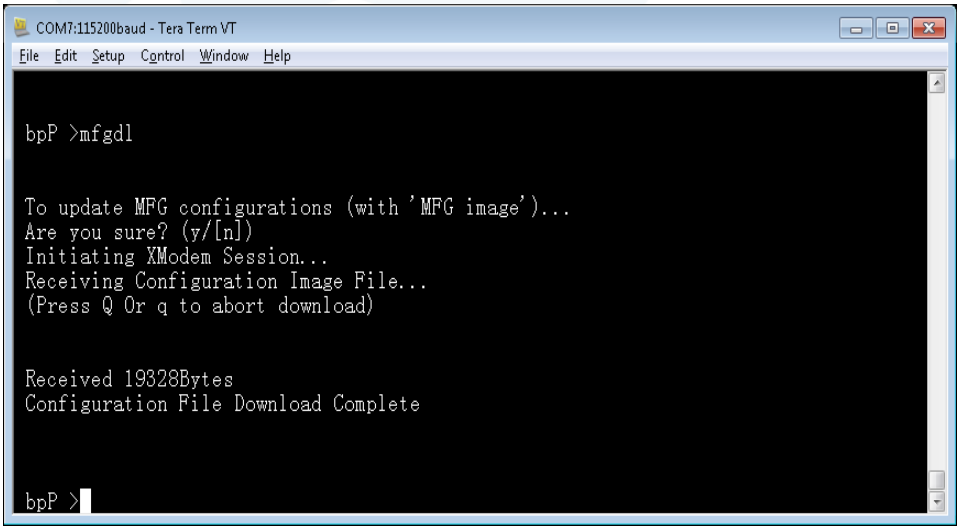
B. Type “y” to commit MFG file upgrade.

C. Select xmodem as the file transfer protocol.

D. Select the correct MFG CFG file from file browser.

E. Click “Open” to start file transfer.

F. Serial console would then start file transfer.



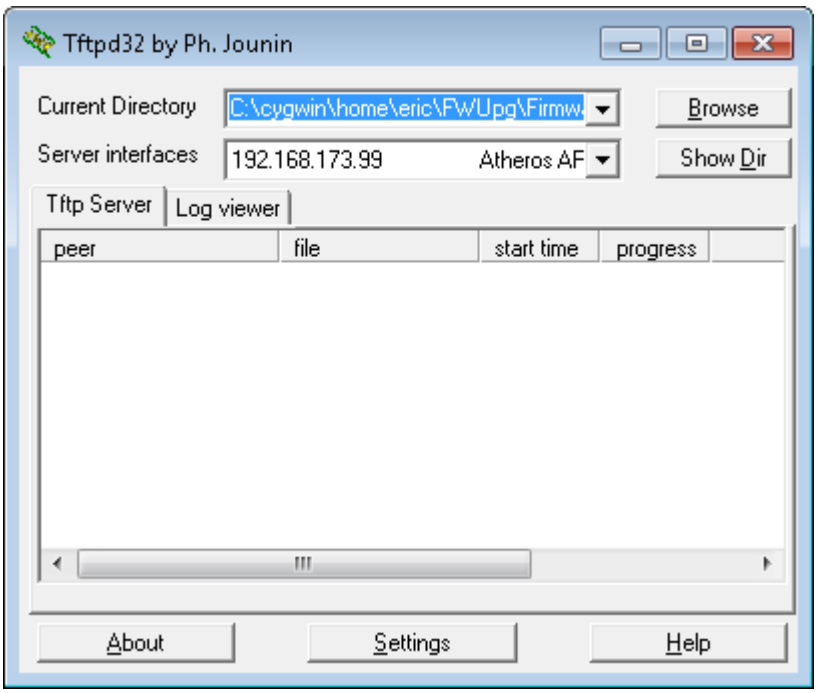
G. Reset Expander to activate MFG CFG file by applying “reset” command or power recycle the system.

6.3.9.2 CLI (Telnet or SSH with Ethernet board)

When there is an Ethernet Management board on the system users should upgrade Ethernet Board firmware, SAS Expander firmware and MFG CFG file through network instead of xmodem when using CLI commands.

All sort of firmware upgrade goes through TFTP and the system would intelligently upgrade firmware to the right hardware. More conveniently, both the Primary and Secondary SAS Expanders would be upgraded at the same time when upgrade command is applied.

Run a TFTP server on your computer and assign the “Current Directory” with the path to where the firmware is stored. Assign “Server interface” with the IP address in the same domain as JBOD system. (Please be sure to configure TFTP server accordingly if you are using different TFTP server from the one in the example)

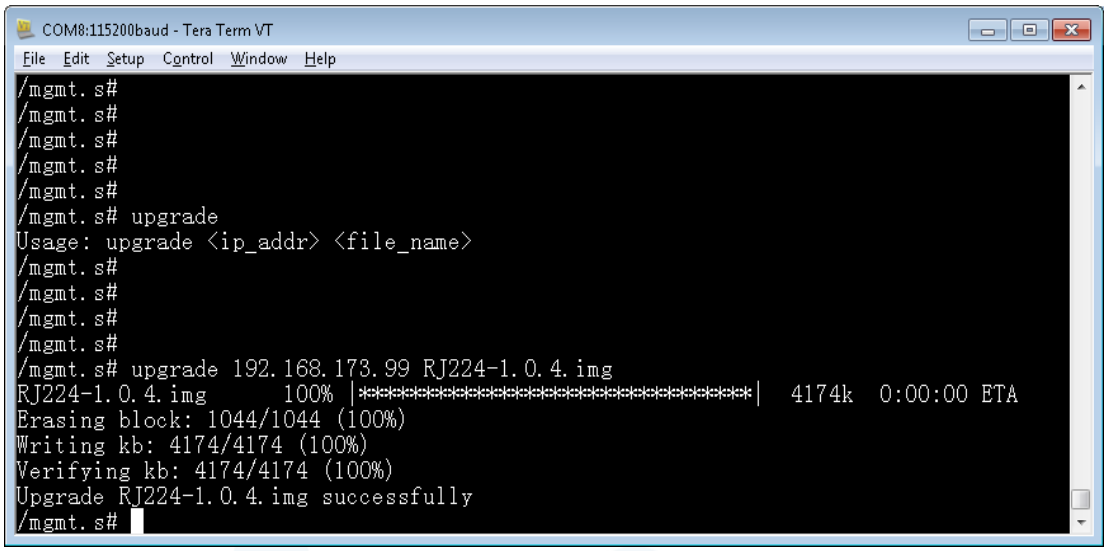


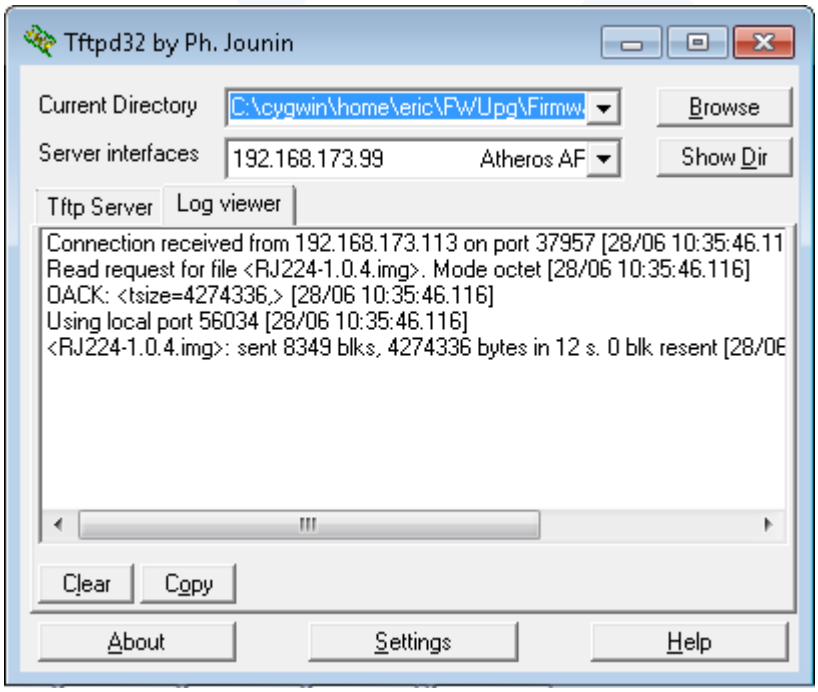
Do not power off system while firmware is upgrading or it might crash the system.

New firmware does not take effect until a system reboot.

6.3.9.2.1 Ethernet Management Board Firmware

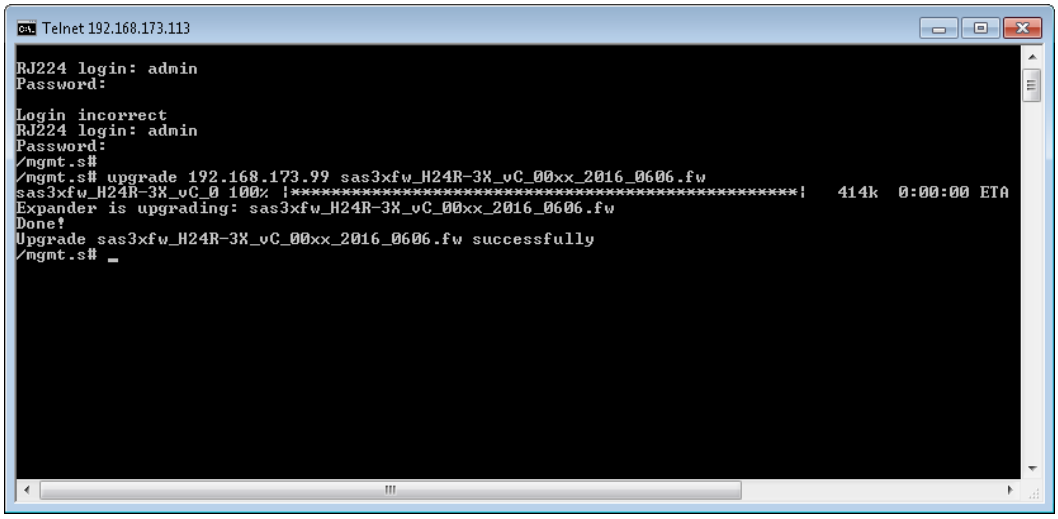
"upgrade <tftp_server_ip> <filename> command to start Ethernet Firmware upgrade.

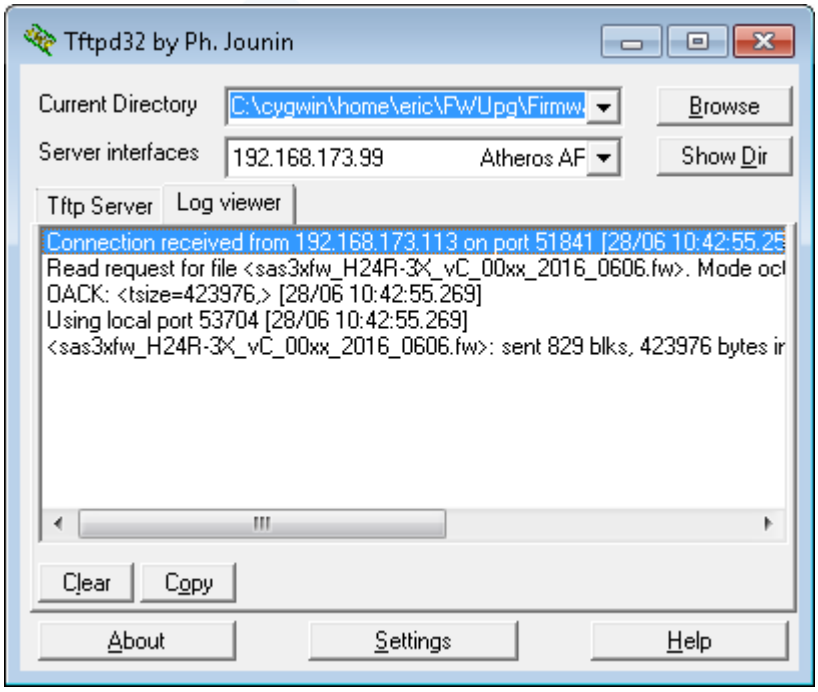




6.3.9.2.2 SAS Expander MFG CFG binary

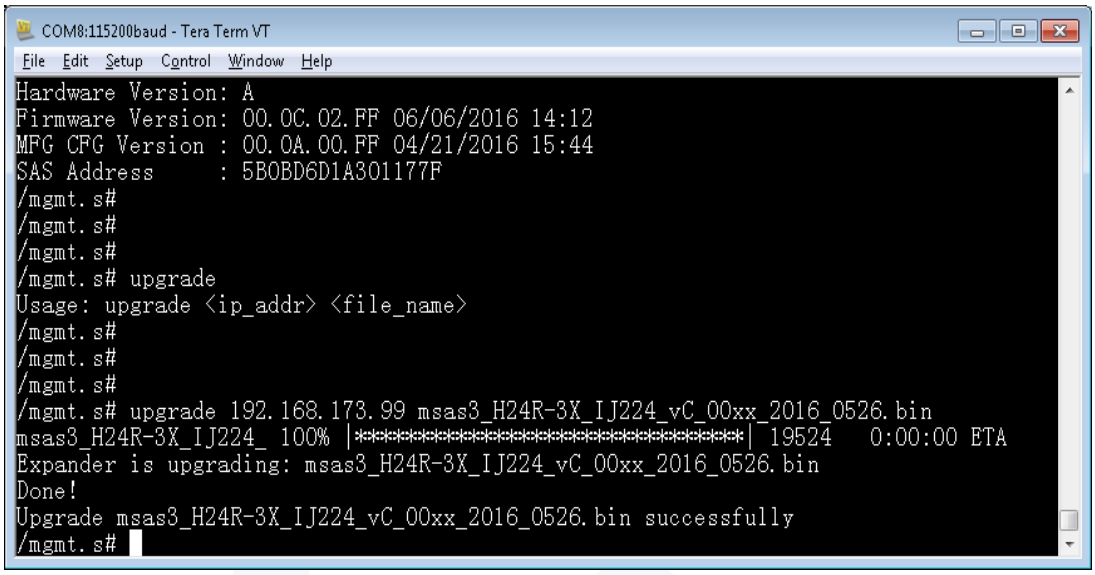
Same as above by using the Expander Firmware filename in command.

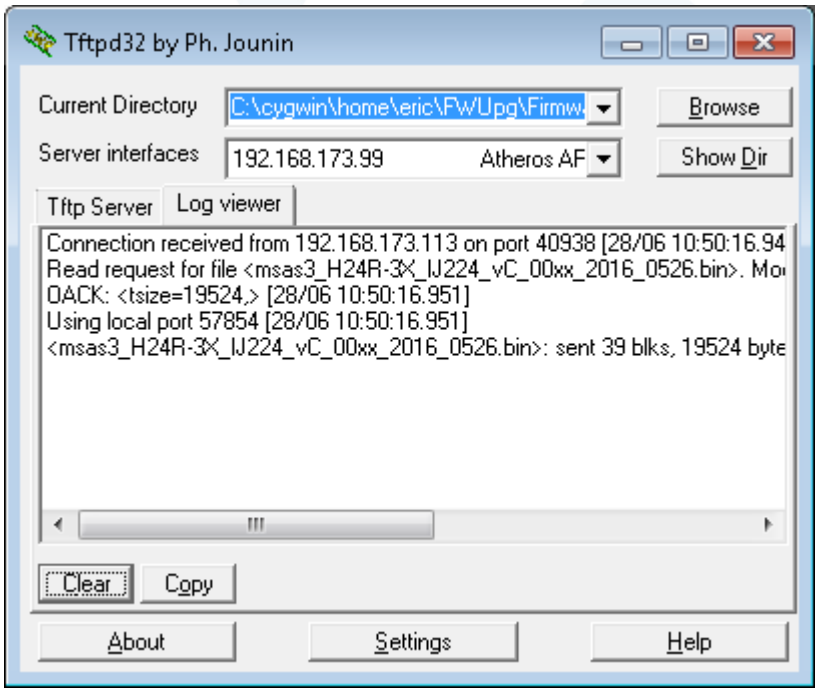




6.3.9.2.3 SAS Expander MFG CFG binary

Same as above by using the Expander MFG CFG binary filename in command.





6.3.9.3 Web-GUI (with Ethernet board)

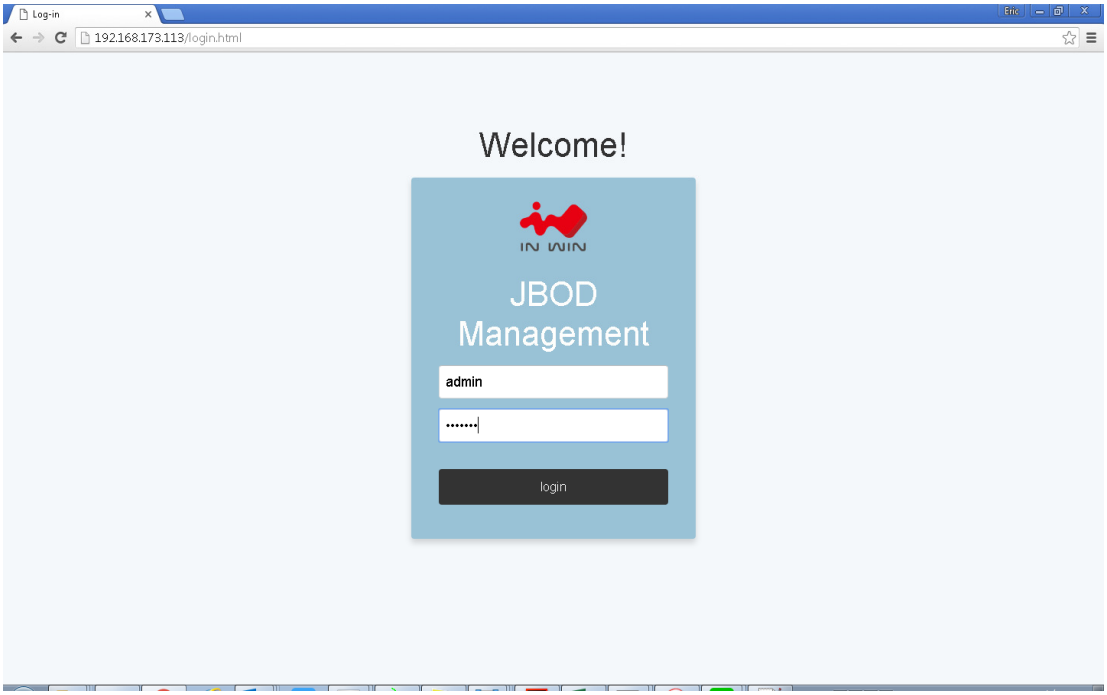
When there is an Ethernet Management board on the system users can upgrade system firmware through Web-GUI other than CLI in console or Telnet session. Upgrade system firmware through Web-GUI is much easier than other ways. Just simply select the firmware by file browser and click 'Apply' to start.

All the firmware including Ethernet board firmware, SAS Expander firmware and MFG CFG file apply the same way to upgrade.

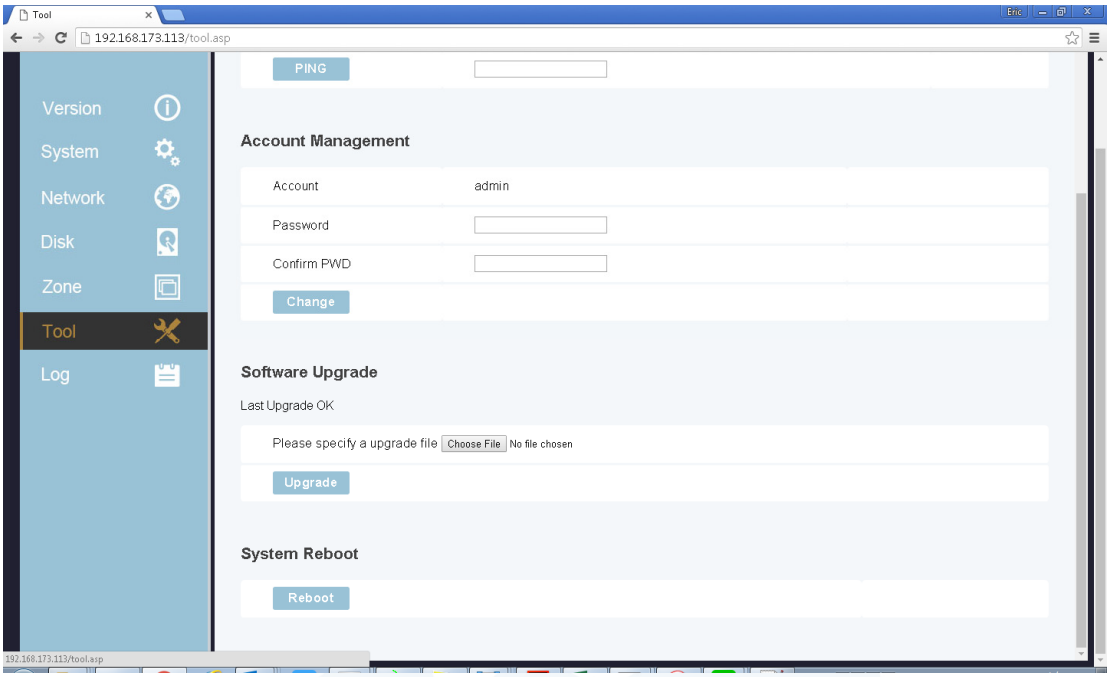
After system upgrade, be sure to reboot system to take effect the new firmware which has been upgraded to the hardware.

6.3.9.3.1 Open Web browser and give the URL filed with system IP address.

6.3.9.3.2 Given username and password on the Welcome page.

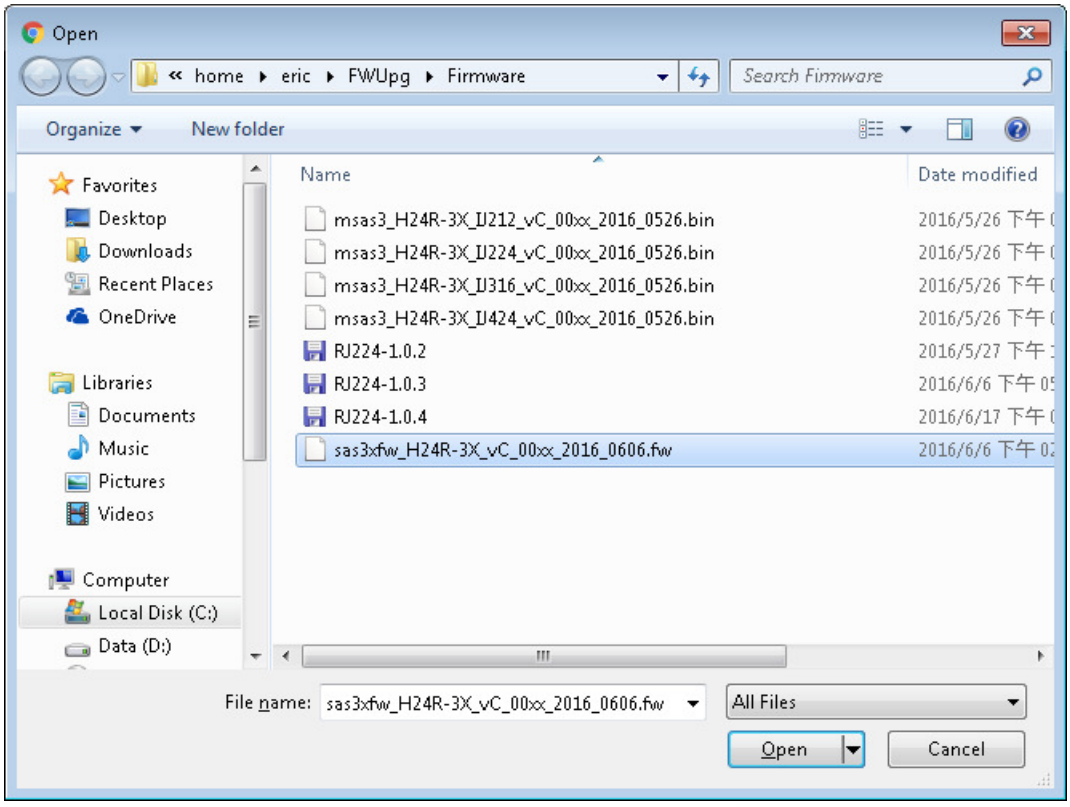


6.3.9.3.3 Click “Tool” button on the left pane and scroll down to “Software Upgrade” session on the right pane.

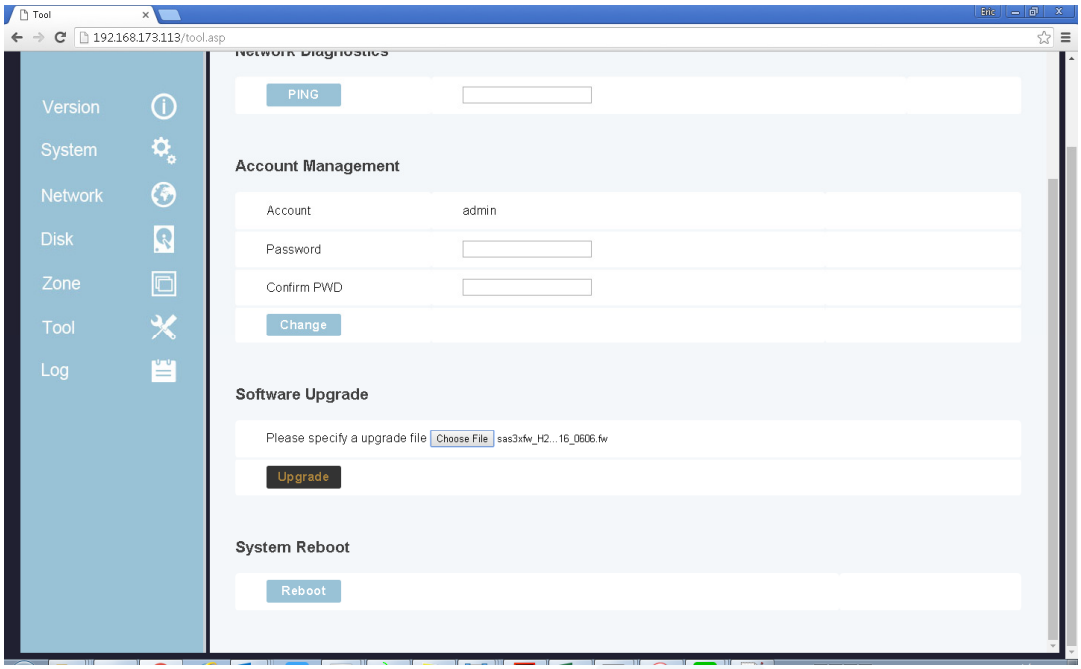


6.3.9.3.4 Click “Choose File” button to select the firmware being upgraded from file browser and click “Open” to commit.

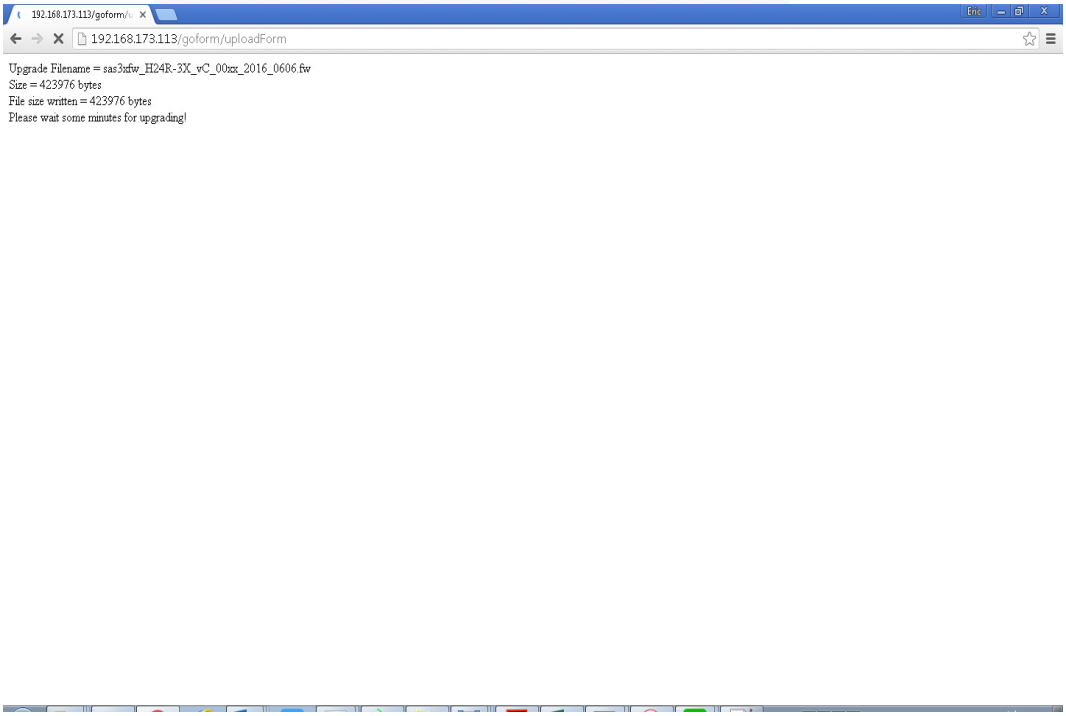
The firmware can be Ethernet board firmware, SAS Expander firmware or SAS Expander MFG CFG file. The system would intelligent detect the firmware type and upgrade to the right hardware.



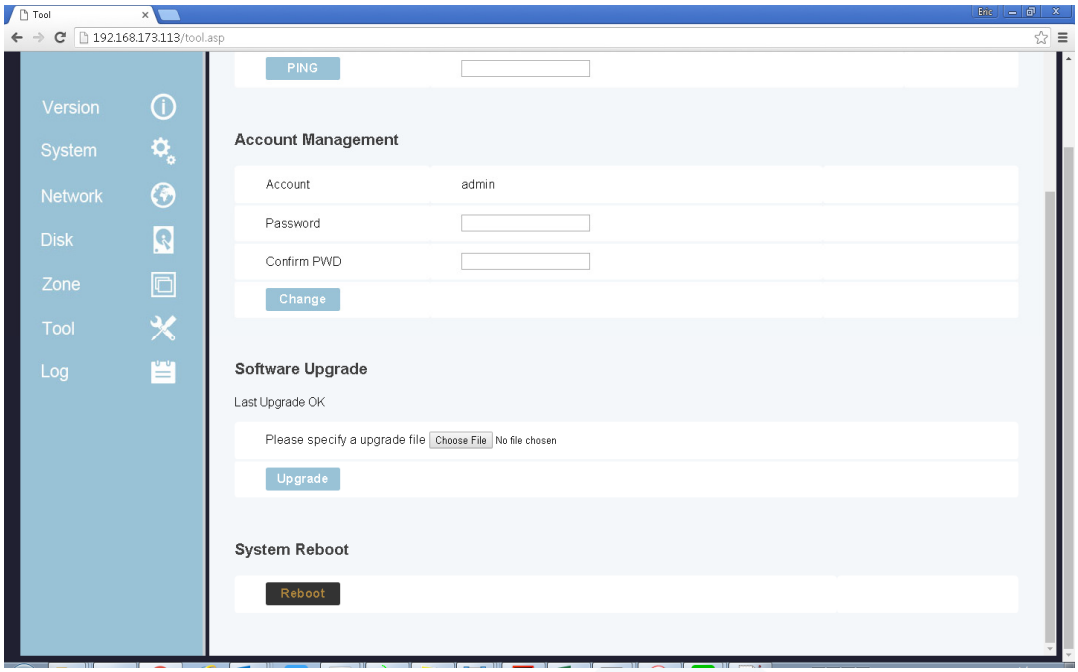
6.3.9.3.5 Click “Upgrade” button to start firmware upgrade.



6.3.9.3.6 Web would direct to a page telling firmware is upgrading.
After upgrade is done, Web will direct to the Login page.



6.3.9.3.7 A system reboot is require to make new firmware take effect.



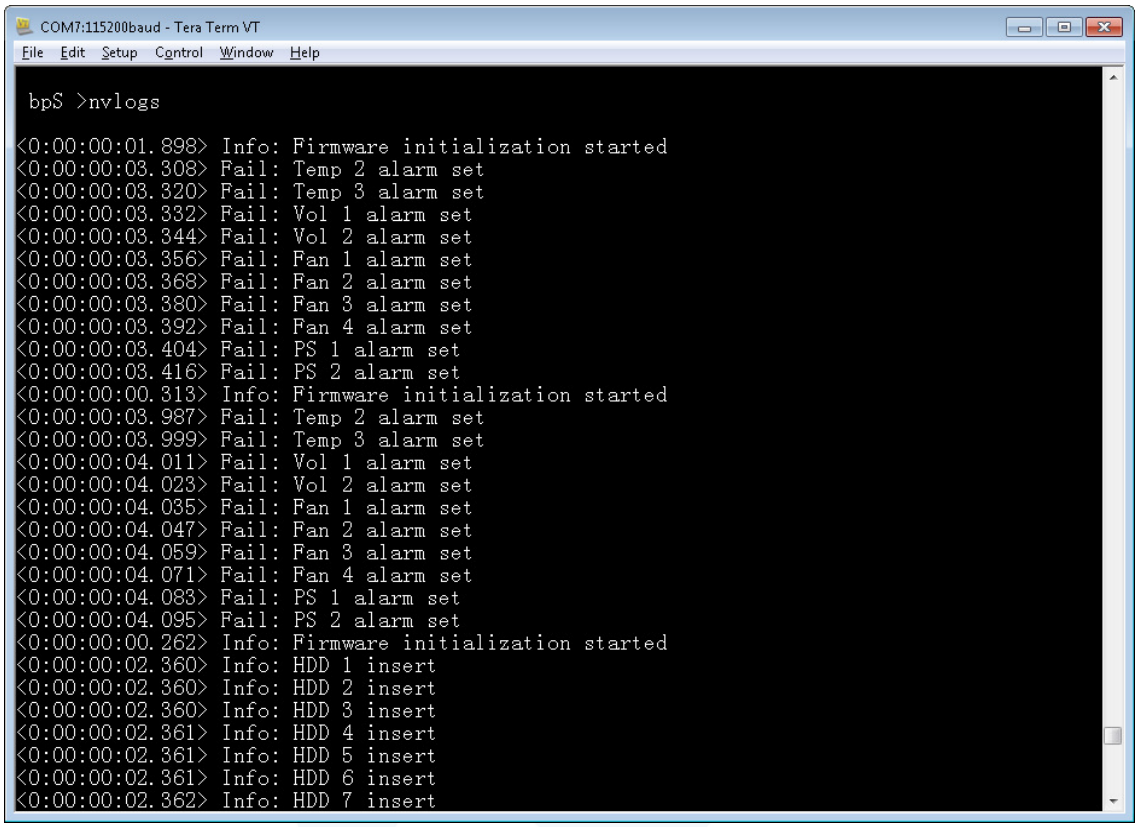
6.3.10 System Logs

IN WIN JBOD systems support the capability to record system information to NVRAM for the purpose of activities history monitoring. The recorded information will retain until users issue clear command to erase from NVRAM or the NVRAM is full. Two categories of system information - Info and Fail would be recorded when happens.

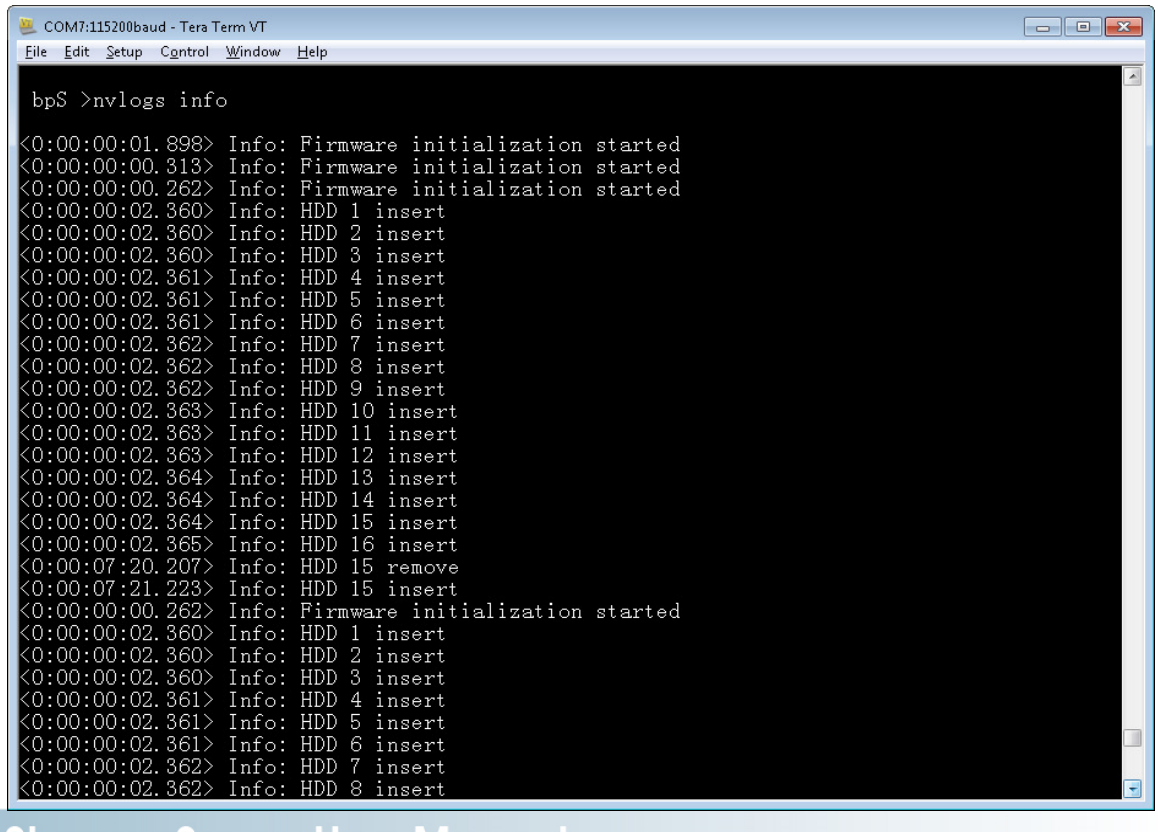
6.3.10.1 CLI (UART without Ethernet Board)

Users can check the system logs by connecting serial cable to Expander RS-232 port directly. Users will need to physically connect serial cable to Primary or Secondary SAS Expander to check the logs on it.

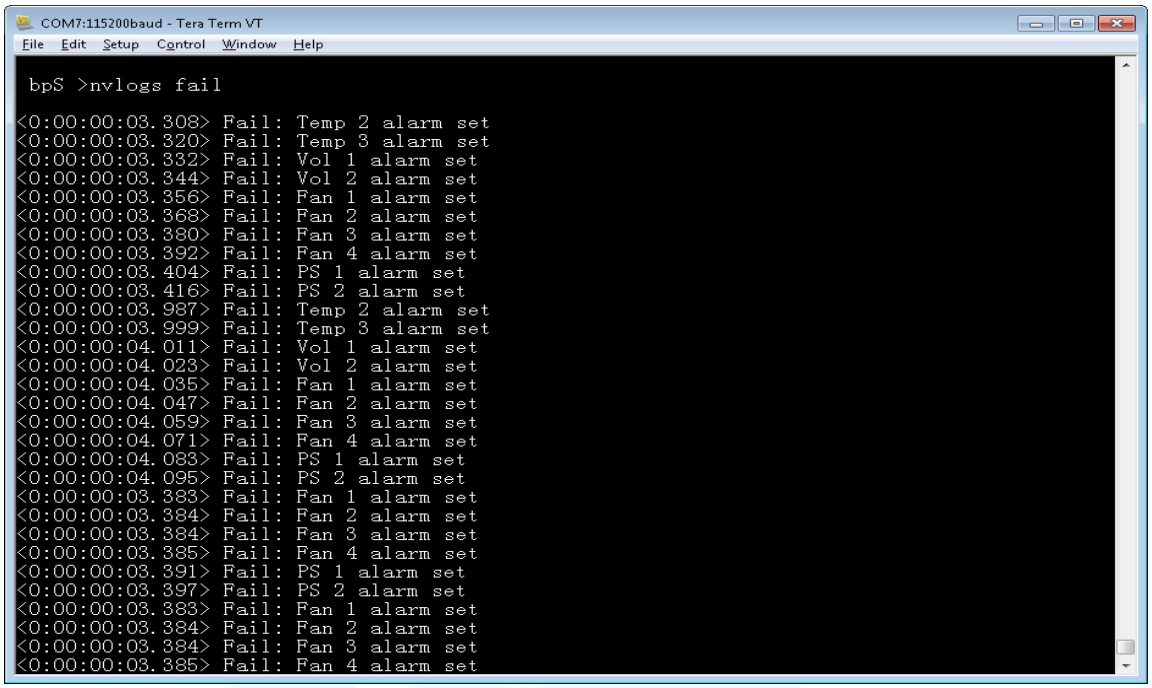
6.3.10.1.1 “nvlogs” command to display all logs



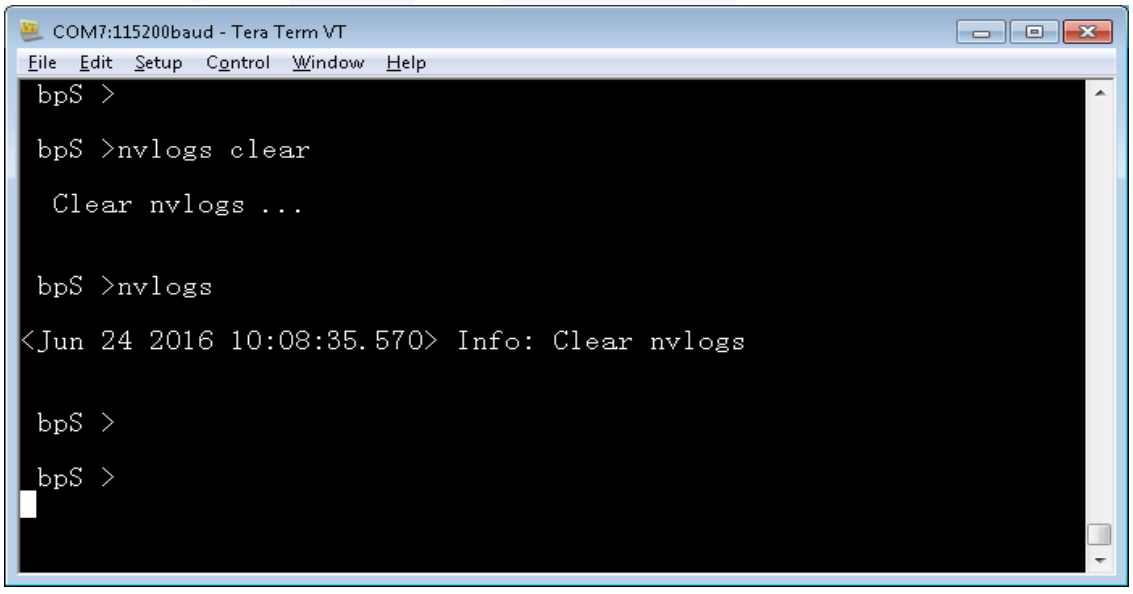
6.3.10.1.2 “nvlogs info” to display only the information category logs.



6.3.10.1.3 “nvlogs fail” to display only the Fail category logs.



6.3.10.1.4 “nvlogs clear” to erase all the logs from NVRAM



6.3.10.2 CLI (UART, Telnet, SSH with Ethernet Board)

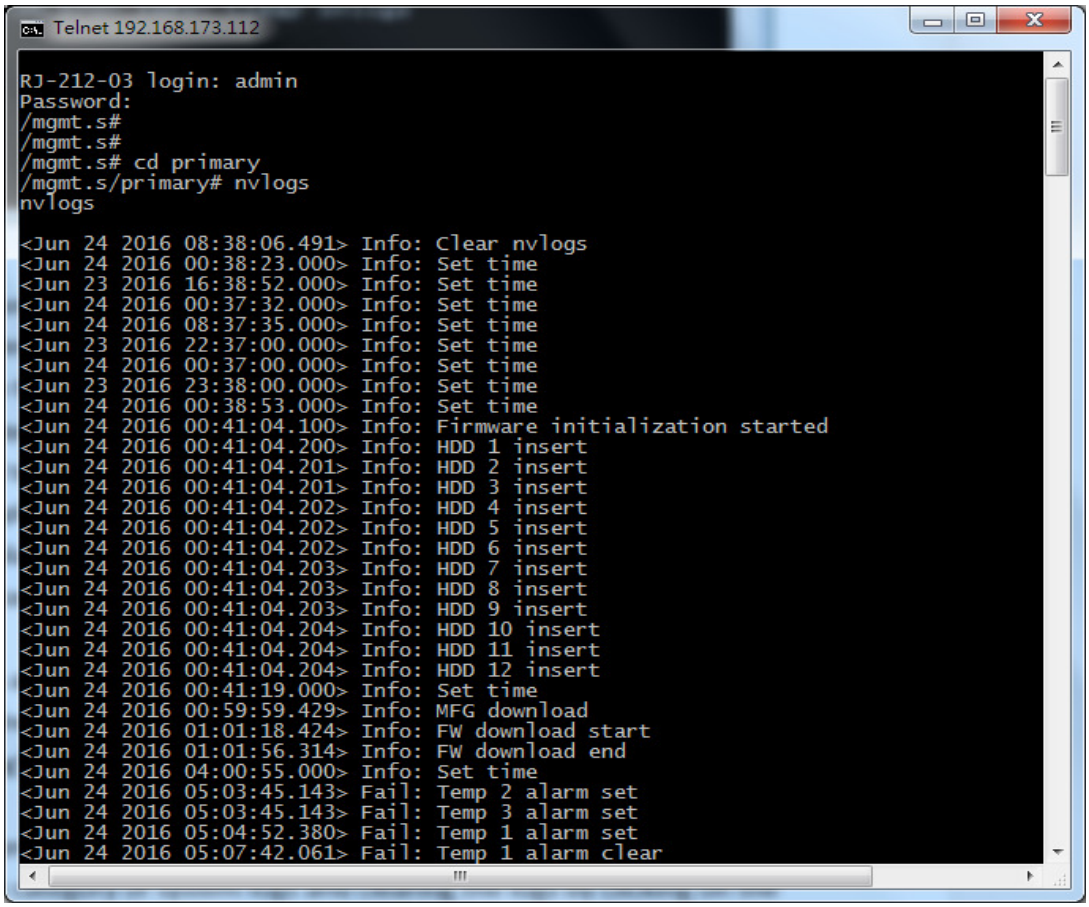
Users can check the system logs by connecting UART cable to Expander RS-232 port directly, Telnet or SSH to the system and change directory to Primary or Secondary (if existed) SAS Expander layer.

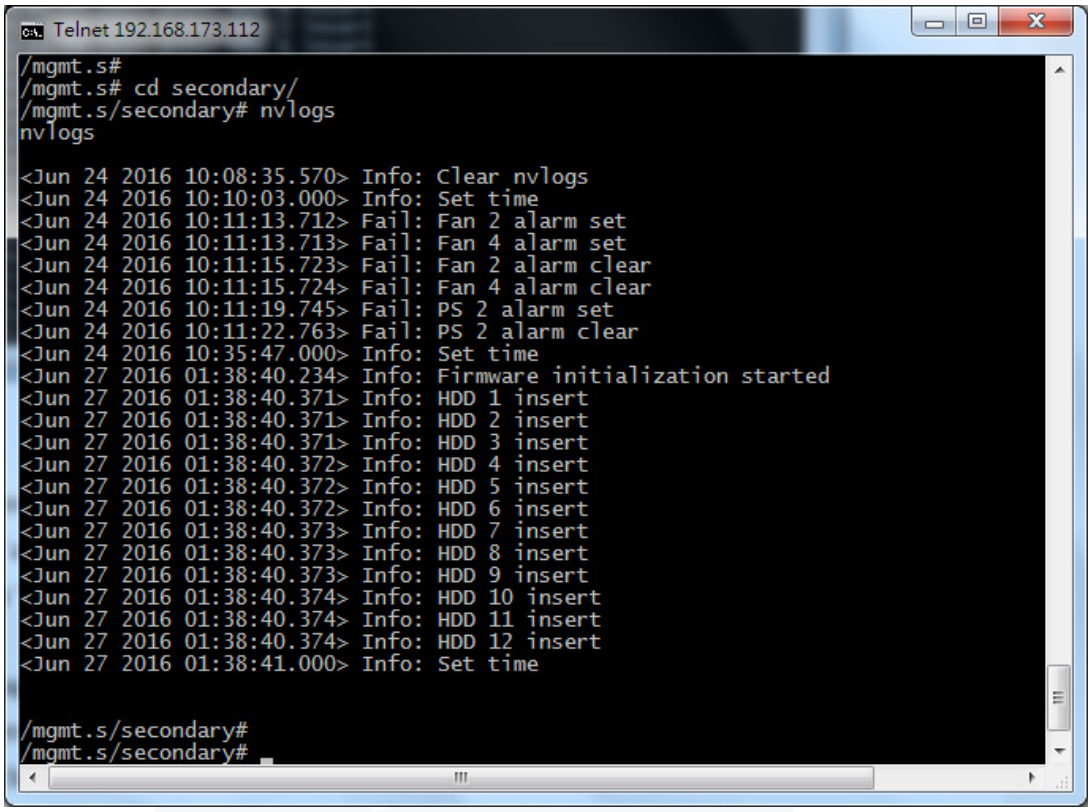
6.3.10.2.1 “nvlogs” command to display all logs

6.3.10.2.2 “nvlogs info” to display information category logs.

6.3.10.2.3 “nvlogs fail” to display Fail category logs.

6.3.10.2.4 “nvlogs clear” to erase all the logs from NVRAM





6.3.10.3 Web-GUI (With Ethernet Board)

6.3.10.3.1 Type system IP address on Web Browser URL filed to gain access to the system. After logging in, click “Log” button on the left pane to view and manage the Logs of the system.

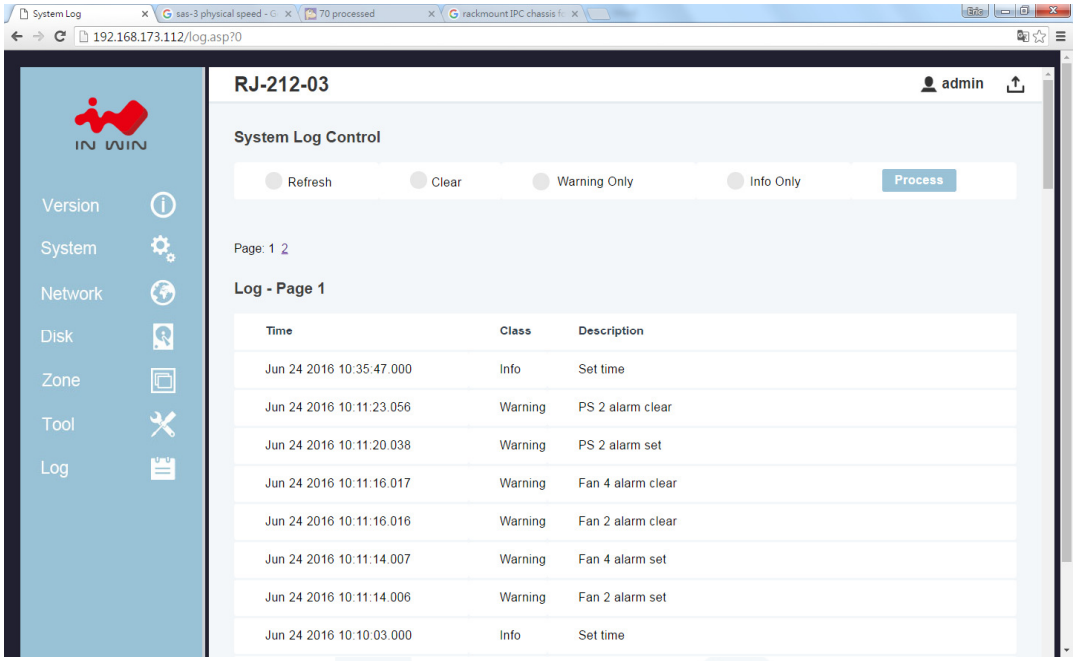
6.3.10.3.2 The Log web page provides an easier way for managing the system logs including displaying different category of system logs and clearing the logs by clicking on the corresponding buttons.

6.3.10.3.3 Click “Refresh” and then “Process” button to display most current system logs.

6.3.10.3.4 Click “Waning Only” and then “Process” button to display the Warning category system logs.

6.3.10.3.5 Click “Info Only” and then “Process” button to display the Information category system logs.

6.3.10.3.6 Click “Clear” and then “Process” button to erase all the system logs.



7 Q&A

Section 1: Expander

1. **What is the In Win Expander's function?**

   A: The expansion the capacity, the expander can manage more SAS drives via one SAS cable in the JBOD.

2. **Why IW-RS series storage server chassis are built-in expander board, and IW-RJ series JBOD enclosures uses expander module?**

   A: IW-RS chassis needs a motherboard to compose a system, the expander board can work seamlessly with motherboard to manager the drives. Different from the chassis, IW-RJ JBOD enclosure use hot swap expander modules to satisfy the requirement of both capacity expansion and JBOD redundancy.

3. **Why IW-RJ JBOD enclosure needs 2 expander modules?**

   A: It is for redundancy. If user does not need this function, single expander module also works out.

4. **What are the functions of the three connector ports on the expander module?**

   A: SAS 0 is the connecting port to Server 0/ RAID or HBA 0, SAS 1/ RAID or HBA 1 is to Server 1; EXP is the port to cascade another JBOD to expand the capacity.

5. **Can I add more ports to the expander module?**

   A: First of all, we have to understand that the ports are for cable connecting. Second, as only as the Phy quantity of the expander chip set allows, technically, this configuration works out. Yet, we also need to consider about the technical alignment. For example, an expander with a 3x36R chipset has totally 36 Phy, and each ports consumes 4 Phy; thus, we can design a 9-port expander (36/4 = 9) to connect 9 cable. However, once we use out all the Phy for connecting, we have no remaining Phy to connect HDD, this design will goes meaningless.

6. **Once I find the expander is failure, what can I do?**

   A: IW-RS series: Power off the system, and make sure the system is totally shut down. Unplug the SAS cable to replace the expander board.

   IW-RJ series: Remove the failure expander module, and replace a new expander module.

Section 2: Hard Disk

7. **What is the different between SAS and SATA disk, and how to choose?**

   A: SATA has only one throughput channel for data transmission, SAS has two. Once the system is designed with redundant function, SAS disk provides performance and reliability. SATA provide a choice of cost selective option.

8. **Are SAS and SATA disks are compatible with both In Win IW-RS series and IW-RJ series?**

   A: Yes, In Win IW-RS and IW-RJ support both SAS and SATA disks.

9. **Can I populate 2.5” disks to the 3.5” tray-less slots?**

   A: 3.5” tray-less slot does not support 2.5” disks at this moment, if this requirement is mandatory, please contact In Win sales for OEM service.

10. **Is the storage server or JBOD must be full populated to work?**

    A: No, you can populate partial bays and start the system. Once you need more storage space in the future, then add more disks.

11. **Can I populate both SAS and SATA disks in an enclosure?**

    A: Yes, it works. However, you may need to consider about the alignment issue.

12. **If my system drive is failure, can I replace the drive without shutting down the system?**

    A: In default, IW-RS series’ two internal disks doesn’t support hot-swap feature. You can order an optional 2bay hot-swap system disk module to reach your purpose.

Section 3: RAID/ Cascade

13. Is RAID card a requirement component for composing a RAID system?

A: If your motherboard featured on-board RAID function, or your OS support software RAID, you do not need a RAID card. For technical details, please contact your motherboard or software vendor.

14. How many units can IW-RJ series JBOD cascade?

A: In maximum, a daisy chain can stripe 48 disks.

15. If I would like to cascade the JBOD, what components do I need?

A: You will need a SFF-8644 to SFF-8644 SAS cable, which meets T10 standard. And the length we suggest less than 3M to reach the best performance.

16. If I only have an internal RAID controller card, and I would like to expand the capacity, how to add more disks?

A: IW-RJ series JBOD is for this purpose. If your RAID controller card does not have external connecting port, you can use a SFF-8643 to SFF-8644 adaptor cable to connect the JBOB enclosure.

Section 4: Others

17. Why PSU has two modules? What are these two modules for?

A: Two PSU modules are for redundancy, if you need this function, PSU with two modules is required.

18. Can I add or reduce the quantity of fans?

A: The quantity of fan is related to the radiating efficiency. Usually, the quantity of fans depends on the system loading and the heat generation. Unless you have tested, or we strong recommend not to change the default fans quantity.

19. Which parts support hot-swap feature.

A: IW-RS storage server: Fans, PSU, HDD
IW-RJ JBOD enclosure: Fans, PSU, Expander Modules, HDD

20. Can 12Gb SAS ports compatible with 6Gb SAS or 6Gb SATA ports? Any adaptor can convert?

A: 12Gb SAS does not align with 6Gb SAS, so In Win does not have adaptor for this case.

21. If the arm or handle is broken, how can I fix or replace it?

A: Please contact your local In Win partner, or support contact for replacing and repair service.

22. If I would like to modify the GUI, how can I access.

A: The copyright of the GUI is belonging to In Win. If you would like to amend anything of the GUI, please contact In Win sales for ODM service.

8 Technical Support

If you need help on installation or troubleshooting, you can contact your local In Win partner, or send email to In Win's local contact for technical assistance.