

DASH Configuration Guide

ThinkStation P8



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Section 1 - Introduction

DASH, also known as desktop and mobile architecture for system hardware, is a set of specifications developed by DMTF aims to provide open standards-based web service management for desktop and mobile client systems. DASH is a comprehensive framework that provides a new generation of standards to protect the security of out of band and remote management of desktop and mobile systems in multi-vendor, distributed enterprise environments. DASH uses the same tools, syntax, semantics, and interfaces across the product line (traditional desktop systems, mobile and laptop computers, blade PCs, and thin clients).

The new Lenovo P8 platform offers this remote management solution called DASH. The DASH software enables users to remotely change power state settings, remote into their desktop, as well as boot the system into the BIOS setup menu.

For more information, please refer to the following link:

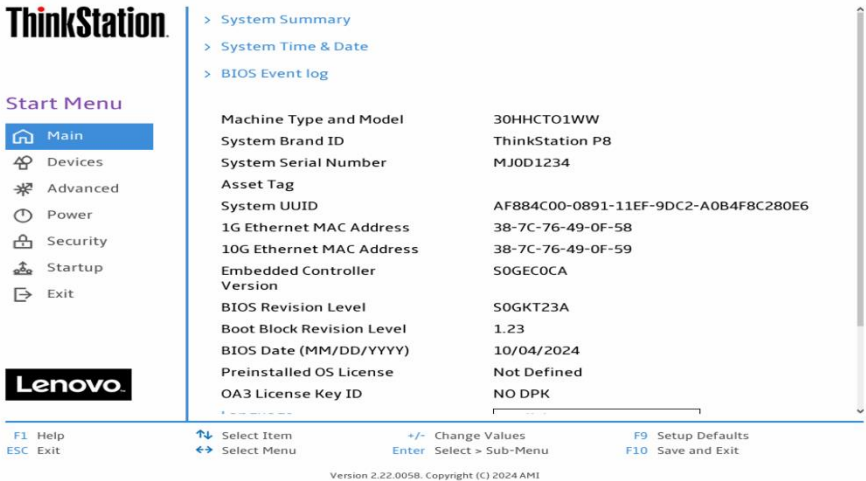
<https://www.dmtf.org/standards/dash>

ThinkStation P8 – DASH Configuration Requirements	
Operating System(s) Supported	Windows 11 Windows 10 RHEL 9.3 Ubuntu 22.04 LTS
LAN Chip Model	Realtek RTL8111EPP
BIOS Version	S0GKT24A (or later)
EC / SIO Version	S0GEC0AA (or later)

Section 2 - DASH Enablement in BIOS

As a first step, DASH will need to be enabled from within the BIOS setup menu. Here are some instructions on how to enable DASH from within the BIOS setup menu.

- As the P8 system is booting, press the function F1 key at the Lenovo splash screen to enter BIOS setup.

ThinkStation

Start Menu

- Main
- Devices
- Advanced
- Power
- Security
- Startup
- Exit

System Summary

- > System Summary
- > System Time & Date
- > BIOS Event log

Machine Type and Model	30HHCTO1WW
System Brand ID	ThinkStation P8
System Serial Number	MJOD1234
Asset Tag	
System UUID	AF884C00-0891-11EF-9DC2-A0B4F8C280E6
1G Ethernet MAC Address	38-7C-76-49-0F-58
10G Ethernet MAC Address	38-7C-76-49-0F-59
Embedded Controller Version	S0GEC0CA
BIOS Revision Level	S0GKT23A
Boot Block Revision Level	1.23
BIOS Date (MM/DD/YYYY)	10/04/2024
Preinstalled OS License	Not Defined
OA3 License Key ID	NO DPK

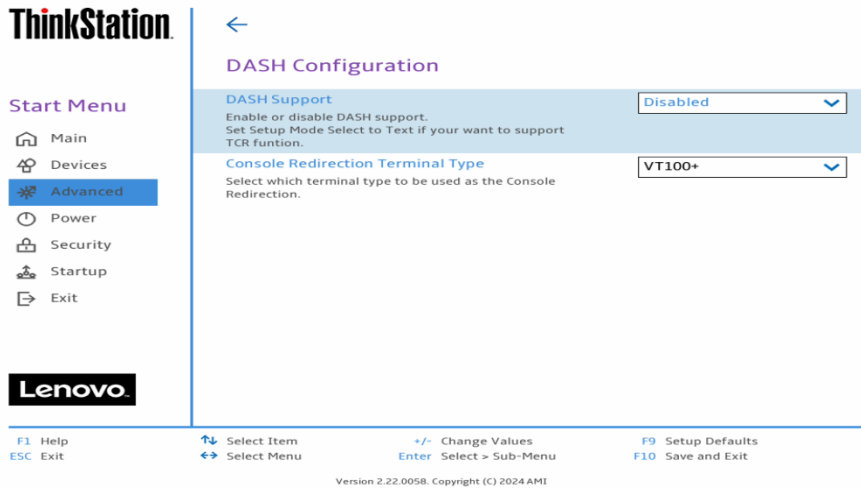
F1 Help F2 Select Item +/- Change Values F9 Setup Defaults
 ESC Exit ← Select Menu Enter Select > Sub-Menu F10 Save and Exit

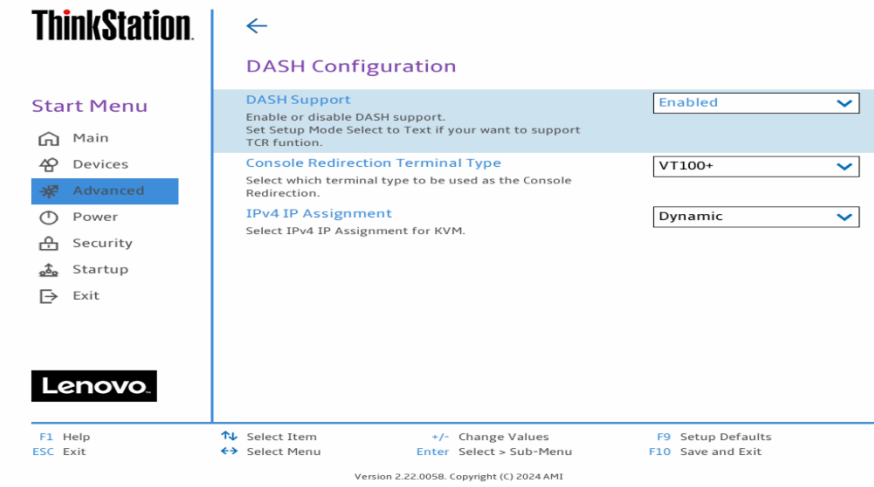
Version 2.22.0058. Copyright (C) 2024 AMI

- Select the “Advanced” menu option, followed by the “DASH Configuration” option.

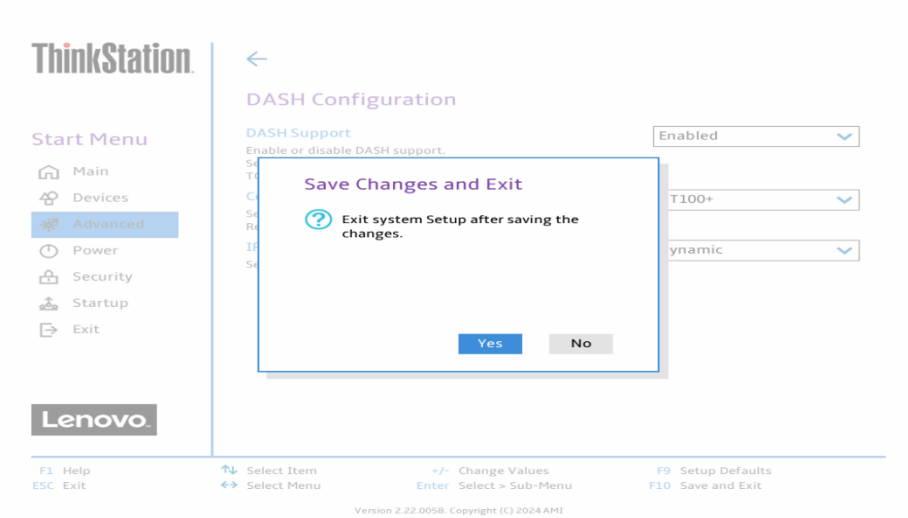


- Select the drop-down menu for 'DASH Support' and set this to 'Enabled'.





- Press F10 to Save and Exit the BIOS setup menu.



Section 3 - Installing the Windows DASH Driver and Client Tool

Before configuring DASH, it is critical to make sure the Realtek NIC device driver is up to date. Here are some quick instructions on how to update the Realtek NIC driver onto the system.

- Download and install the appropriate Realtek LAN driver from the Lenovo Support site.

<https://pcsupport.lenovo.com/us/en/products/workstations/thinkstation-p-series-workstations/thinkstation-p8/downloads/driver-list/component?name=Networking%3A%20LAN%20%28Ethernet%29&id=FCAD05FA-A8F0-4C7B-8ED0-7EF35BB6B2BC>

- Download and install the DASH for Windows Client Tool from the Lenovo Support site.

<https://pcsupport.lenovo.com/us/en/products/workstations/thinkstation-p-series-workstations/thinkstation-p8/downloads/driver-list/component?name=Software%20and%20Utilities&id=156BE23F-B536-4320-B35C-2F67EBDD9242>



Section 4 - Installing the Linux DASH Driver

Before configuring DASH, it is critical to make sure the Realtek NIC device driver is up to date. Here are some quick instructions on how to update the Realtek NIC driver onto the system.

- Before installing the Realtek Driver package, it is essential that the development tools packages must be installed. To do so, run the following Linux commands to install the necessary prerequisites:

```
# sudo apt-get install build-essential
# sudo apt-get install net-tools
```

- Additionally, it may be essential to upgrade the gcc compiler version in Ubuntu to gcc-12.

```
# sudo apt update
# sudo apt install software-properties-common
# sudo add-apt-repository ppa:ubuntu-toolchain-r/test
# sudo apt install gcc-12 g++-12
# sudo update-alternatives --install /usr/bin/gcc gcc /usr/bin/gcc-12 100 --
slave /usr/bin/g++ g++ /usr/bin/g++-12
```

- Download and extract the Realtek Driver package from the ThinkStation P8 support site:

<https://pcsupport.lenovo.com/us/en/products/workstations/thinkstation-p-series-workstations/thinkstation-p8/downloads/driver-list/component?name=Networking%3A%20LAN%20%28Ethernet%29&id=FCAD05FA-A8F0-4C7B-8ED0-7EF35BB6B2BC>

- Within the extracted driver package, browse to the 'DashDriver' directory and run the following command and reboot the system for the new driver changes to take effect.

```
# sudo ./autorun.sh  
# sudo reboot
```

```
lenovo@lenovo-ThinkStation-P8:~/Downloads/DashDriver$ sudo ./autorun.sh  
Check old driver and unload it.  
Build the module and install  
warning: the compiler differs from the one used to build the kernel  
  The kernel was built by: x86_64-linux-gnu-gcc-12 (Ubuntu 12.3.0-1ubuntu1~22.04) 12.3.0  
  You are using:          gcc-12 (Ubuntu 12.3.0-1ubuntu1~22.04) 12.3.0  
Skipping BTF generation for /home/lenovo/Downloads/DashDriver/src/r8168.ko due to unavailability of vmlinux  
Warning: modules_install: missing 'System.map' file. Skipping depmod.  
Backup r8169.ko  
rename r8169.ko to r8169.bak  
DEPMOD 6.8.0-48-generic  
load module r8168  
Updating initramfs. Please wait.  
update-initramfs: Generating /boot/initrd.img-6.8.0-48-generic  
Completed.  
lenovo@lenovo-ThinkStation-P8:~/Downloads/DashDriver$ █
```

Section 5 - Configuring DASH in Windows

Once the Realtek driver has been properly installed, it is now time to properly configure the appropriate DASH settings. Here are some instructions on how to properly configure DASH settings in Linux:

- Download and extract the DASH Configuration Tool attached.

<https://pcsupport.lenovo.com/us/en/products/workstations/thinkstation-p-series-workstations/thinkstation-p8/downloads/driver-list/component?name=Software%20and%20Utilities&id=156BE23F-B536-4320-B35C-2F67EBDD9242>

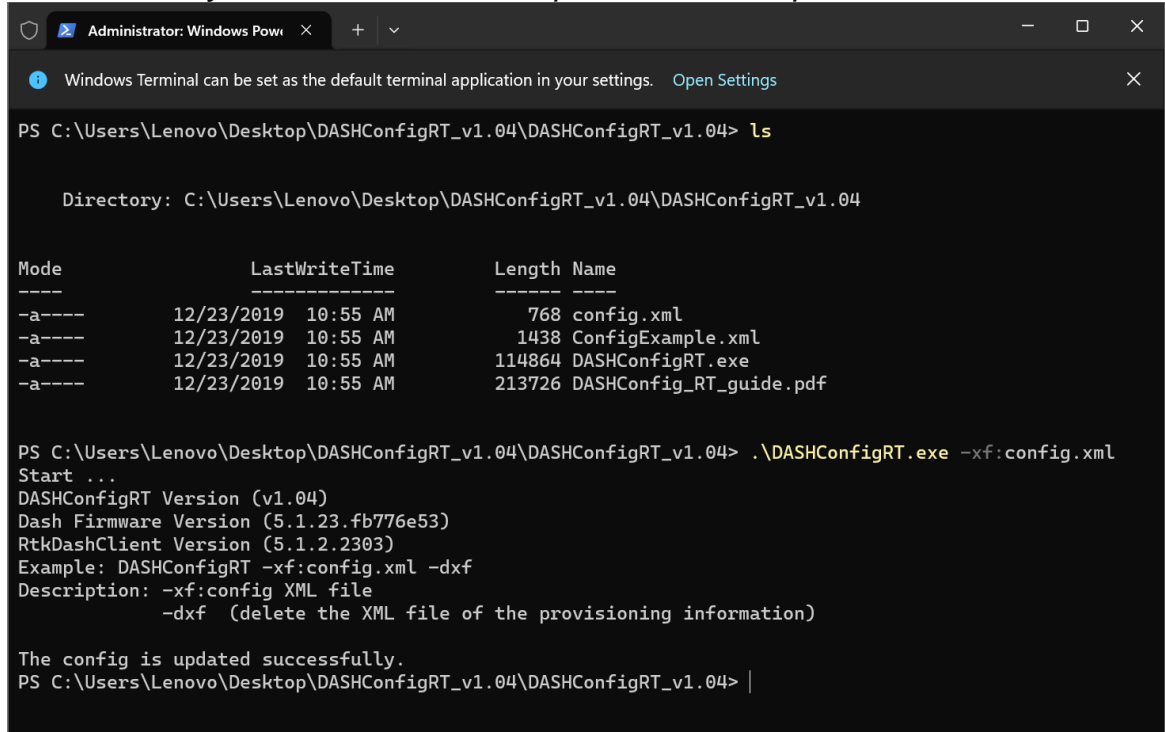
- Within the extracted DASH Configuration Tool directory, open the 'config.xml' file using a text editor of choice and modify the userid and password of choice. Otherwise, note the userid and password that is listed there. *Note, the userid and password fields may be empty and will need to be configured to use DASH.*

```
<?xml version="1.0" encoding="utf-8" ?>
<DASHPROVISIONSETTINGS>
  <MANAGEMENTTARGET>
    <GLOBAL>
      <HTTPS>
        <ENABLESUPPORT>true</ENABLESUPPORT>
        <TCPIPSPORT>664</TCPIPSPORT>
      </HTTPS>
      <HTTP>
        <ENABLESUPPORT>true</ENABLESUPPORT>
        <TCPIPSPORT>623</TCPIPSPORT>
      </HTTP>
    </GLOBAL>
    <USERS>
      <USER>
        <USERID>Administrator</USERID>
        <PASSWORD>password</PASSWORD>
        <ENABLE>true</ENABLE>
        <ROLES>
          <ROLE>Administrator Role</ROLE>
        </ROLES>
      </USER>
    </USERS>
  </MANAGEMENTTARGET>
</DASHPROVISIONSETTINGS>
```

- Open a command prompt (or powershell) as administrator and run the following command from within the DASH Configuration Tool directory.

DASHConfigRT.exe -xf:config.xml

Note: This may take some time to complete. Please be patient!



```

Administrator: Windows Powe...
Windows Terminal can be set as the default terminal application in your settings. Open Settings
PS C:\Users\Lenovo\Desktop\DASHConfigRT_v1.04\DASHConfigRT_v1.04> ls

Directory: C:\Users\Lenovo\Desktop\DASHConfigRT_v1.04\DASHConfigRT_v1.04

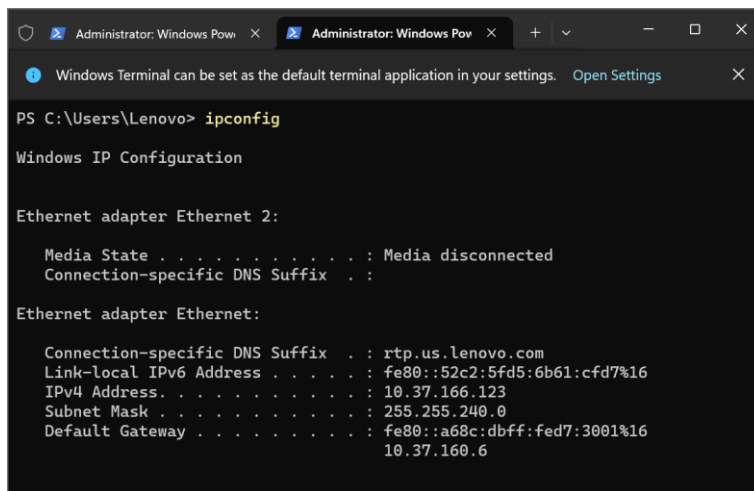
Mode                LastWriteTime         Length Name
----                -
-a----            12/23/2019 10:55 AM           768 config.xml
-a----            12/23/2019 10:55 AM          1438 ConfigExample.xml
-a----            12/23/2019 10:55 AM        114864 DASHConfigRT.exe
-a----            12/23/2019 10:55 AM        213726 DASHConfig_RT_guide.pdf

PS C:\Users\Lenovo\Desktop\DASHConfigRT_v1.04\DASHConfigRT_v1.04> .\DASHConfigRT.exe -xf:config.xml
Start ...
DASHConfigRT Version (v1.04)
Dash Firmware Version (5.1.23.fb776e53)
RtkDashClient Version (5.1.2.2303)
Example: DASHConfigRT -xf:config.xml -dxf
Description: -xf:config XML file
             -dxf (delete the XML file of the provisioning information)

The config is updated successfully.
PS C:\Users\Lenovo\Desktop\DASHConfigRT_v1.04\DASHConfigRT_v1.04> |
  
```

- Run the following command to note the IP address of the system.

ipconfig



```

Administrator: Windows Powe...
Windows Terminal can be set as the default terminal application in your settings. Open Settings
PS C:\Users\Lenovo> ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : rtp.us.lenovo.com
    Link-local IPv6 Address . . . . . : fe80::52c2:5fd5:6b61:cf7%16
    IPv4 Address. . . . . : 10.37.166.123
    Subnet Mask . . . . . : 255.255.240.0
    Default Gateway . . . . . : fe80::a68c:dbff:fed7:3001%16
                               10.37.160.6
  
```

Section 6 - Configuring DASH in Linux

Once the Realtek driver has been properly installed, it is now time to properly configure the appropriate DASH settings. Here are some instructions on how to properly configure DASH settings in Linux:

- Within the extracted '*I7etn001fa*' driver directory from the previous step, browse to the 'DASHConfigRT' directory and modify the 'config1.xml' file using a text editor of choice.

```
# sudo nano config1.xml
```

- Modify the following username and password to something unique. In this example, the username and password were changed to 'lenovo'. *Note, the userid and password fields may be empty and will need to be configured to use DASH.*

```
GNU nano 6.2 config1.xml
<?xml version="1.0" encoding="utf-8" ?>
<DASHPROVISIONSETTINGS>
  <MANAGEMENTTARGET>
    <GLOBAL>
      <HTTPS>
        <ENABLESUPPORT>true</ENABLESUPPORT>
        <TCPIPPORT>664</TCPIPPORT>
      </HTTPS>
      <HTTP>
        <ENABLESUPPORT>true</ENABLESUPPORT>
        <TCPIPPORT>623</TCPIPPORT>
      </HTTP>
    </GLOBAL>
    <USERS>
      <USER>
        <USERID>lenovo</USERID>
        <PASSWORD>lenovo</PASSWORD>
        <ENABLE>true</ENABLE>
        <ROLES>
          <ROLE>Administrator Role</ROLE>
        </ROLES>
      </USER>
    </USERS>
  </MANAGEMENTTARGET>
</DASHPROVISIONSETTINGS>
```

- Run the following command to update the DASH configuration.

```
# sudo ./DASHConfigRT -xf:config1.xml
```

Note: The default username and password are as follows:

- Username: Administrator
- Password: Password

```
lenovo@lenovo-ThinkStation-P8:~/Desktop/DASHConfigRT$ sudo ./DASHConfigRT -xf:config1.xml
Start ...
DASHConfigRT Version (v1.05)
Dash Firmware Version (5.1.23.fb776e53)
RtkDashClient Version (0.9.3.0)
<Please confirm the existing account>
Input username:lenovo
Input password:*****
Start ...

The config is updated successfully.
lenovo@lenovo-ThinkStation-P8:~/Desktop/DASHConfigRT$ █
```

Section 7 - Start DASH Client Service in Linux

After successfully configuring the DASH configuration file, it is now time to start the DASH Client Service so endpoint users can connect to the system. Here are some instructions on how to start the DASH Client Service in Linux on the system:

- Determine the network device name in Linux for the Realtek network device. In this example, the Realtek network device name is “eno1”.

```
lenovo@lenovo-ThinkStation-P8:~/Desktop/ClientTool$ ifconfig -a
eno1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.37.166.123 netmask 255.255.240.0 broadcast 10.37.175.255
    inet6 fe80::6ae5:53b2:5c93:68ec prefixlen 64 scopeid 0x20<link>
    ether 38:7c:76:49:0f:58 txqueuelen 1000 (Ethernet)
    RX packets 3680725 bytes 781093766 (781.0 MB)
    RX errors 0 dropped 194529 overruns 0 frame 0
    TX packets 26414 bytes 2183423 (2.1 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
    device interrupt 71 base 0x1000

eno2: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 38:7c:76:49:0f:59 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 375 bytes 41921 (41.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 375 bytes 41921 (41.9 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp15s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 10:6f:d9:b2:2b:a5 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

- Within the extracted “*l7etn001f*” driver directory from the previous step, browse to the ‘ClientTool’ directory and run the following command to start the DASH client service.

```
# sudo ./clienttool eno1
```

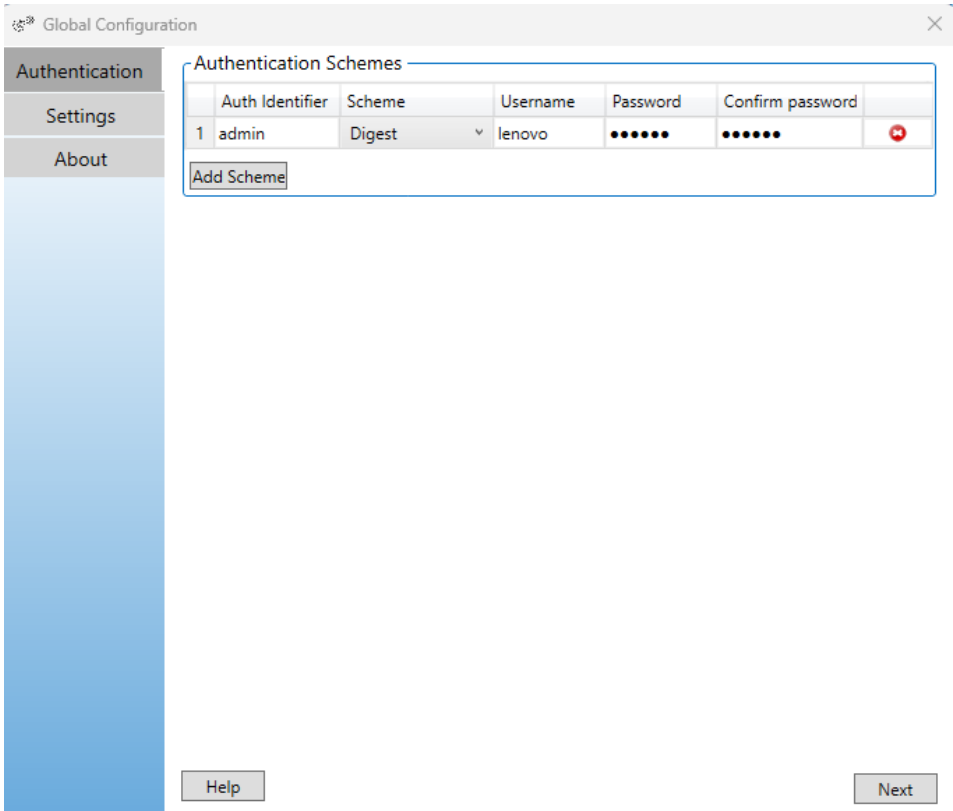
Note: “eno1” is the name of the Realtek network device in Linux.

```
lenovo@lenovo-ThinkStation-P8:~/Desktop/ClientTool$ sudo ./clienttool eno1
[main] Client tool start with NIC interface eno1 (0) ...
[enable00BReq] (RTL00L_READ_MAC), g_ifname = eno1
[readFwVer] Requiring FW Version...
[main] FwVersion = 5.1.23.fb776e53
[getIpInfoFromOS] Set IPv6 fe80::6ae5:53b2:5c93:68ec
[main] IB IP is : [0x7ba6250a]
[setFWIpInfo] Setting IPv4...
[sendDataTo00B] SET Data success(Linux Send)!!!
[main] setFWIpInfo done
[setFWIp6Info] Setting IPv6...
[sendDataTo00B] SET Data success(Linux Send)!!!
[main] setFWIp6Info done
[reqFWIpInfo] Requiring IPv4 Info...
[reqDataFrom00B] SET Data success(Linux Send)!!!
```

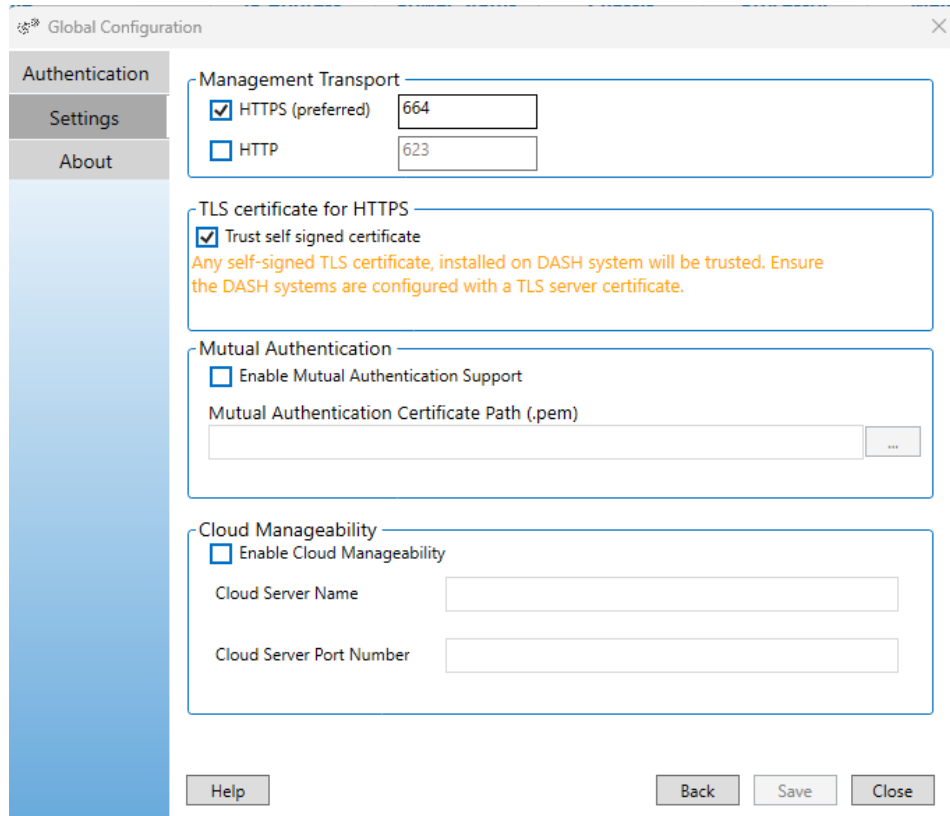
Section 8 - AMD Management Console

Once DASH has been properly configured and the DASH client service has been started, it is now time to add the system from within the AMD Management Console. Here are some instructions on how to add the P8 system to the AMD Management Console.

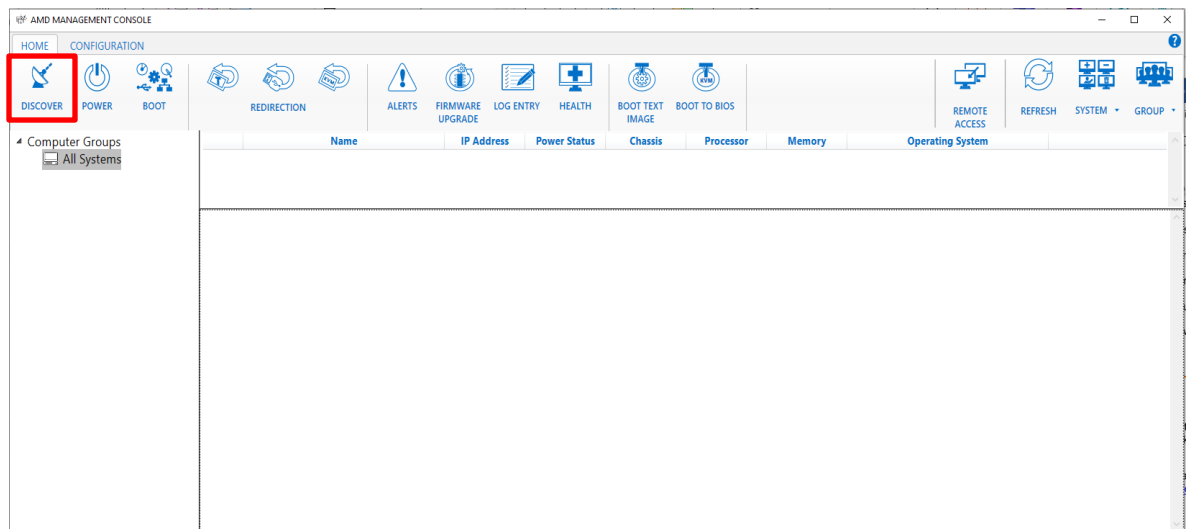
- Download and install the AMD Management Console from AMD’s website:
<https://developer.amd.com/tools-for-dmtf-dash/>
- Launch the AMD Management Console and select “CONFIGURATION”. Add the username and password created within the DASH ‘config1.xml’ from the previous sections and select ‘Next’.



- Optional setting changes here. In this example, I left these default settings. Select 'Close' when finished.



- Go back to the 'HOME' tab at the top of the AMD Management Console and select "DISCOVER".



- Input either the P8 hostname or IP Address into the text field and select 'Next >'.

Discovery

Discovery Criteria

Result

Discovery Criteria

Hostname

IP Address 10.37.166.123

TCP/IP Range

Start IP Address

End IP Address

Active Directory

Help < Back Next > Finish

- Verify if the system is DASH capable and select 'Finish'.

Discovery

Discovery Criteria

Result

Result

'10.37.166.123' is DASH capable.

Discovery Port : 664

DASH Version : 1.2.0

Product Vendor : Realtek

Product Version : 5.1.23.fb776e53

Protocol Version : http://schemas.dmtf.org/wbem/wsman/1/wsman.xsc

Security Profiles : 1. http://schemas.dmtf.org/wbem/wsman/1/wsman/
2. http://schemas.dmtf.org/wbem/wsman/1/wsman/
3. http://schemas.dmtf.org/wbem/wsman/1/wsman/

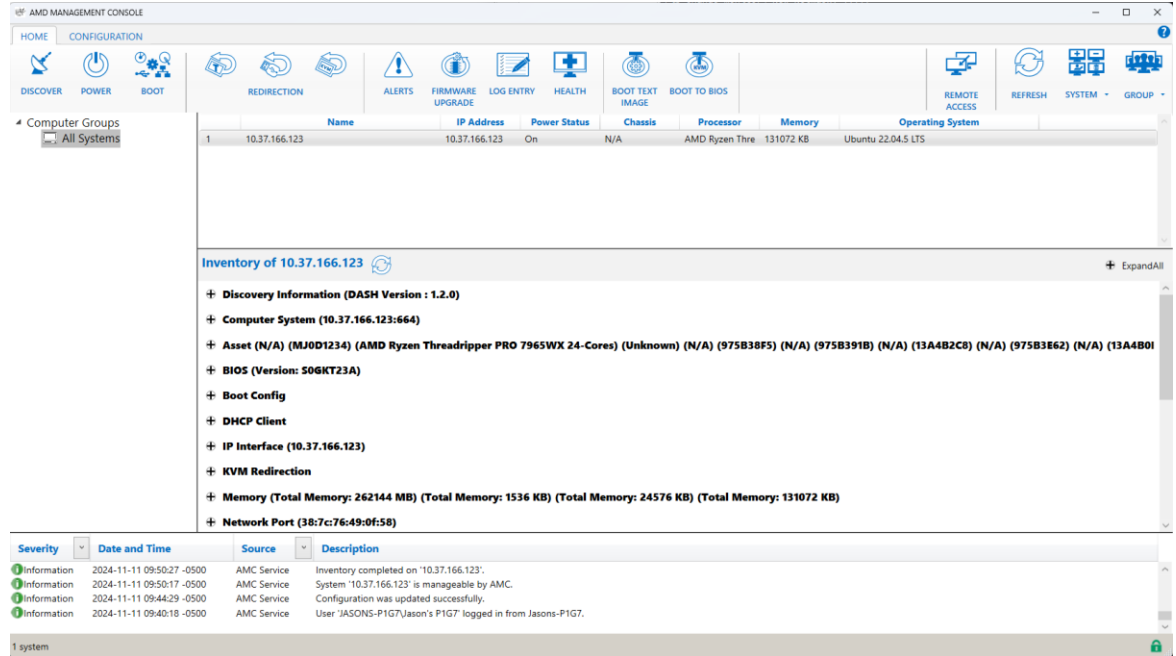
< >

This system will be available under 'All Systems' group.

Help < Back Next > Finish

- The P8 system should eventually appear at the top with inventory status near the bottom. DASH should now be setup and ready to manage the P8 system!

Note: This may take several minutes for the system to show up in the AMC Management Console.



The screenshot displays the AMD Management Console (AMC) interface. The top navigation bar includes 'HOME' and 'CONFIGURATION' tabs, along with various system management icons such as Discover, Power, Boot, Redirection, Alerts, Firmware Upgrade, Log Entry, Health, Boot Text Image, Boot to BIOS, Remote Access, Refresh, System, and Group.

Under 'Computer Groups', the 'All Systems' group is expanded, showing a table with the following data:

Name	IP Address	Power Status	Chassis	Processor	Memory	Operating System
1	10.37.166.123	On	N/A	AMD Ryzen Thre	131072 KB	Ubuntu 22.04.5 LTS

Below the table, the 'Inventory of 10.37.166.123' section is expanded, showing the following details:

- Discovery Information (DASH Version : 1.2.0)**
- Computer System (10.37.166.123:664)**
- Asset (N/A) (MJ0D1234) (AMD Ryzen Threadripper PRO 7965WX 24-Cores) (Unknown) (N/A) (975B38F5) (N/A) (975B391B) (N/A) (13A4B2C8) (N/A) (975B3E62) (N/A) (13A4B01)**
- BIOS (Version: 506KT23A)**
- Boot Config**
- DHCP Client**
- IP Interface (10.37.166.123)**
- KVM Redirection**
- Memory (Total Memory: 262144 MB) (Total Memory: 1536 KB) (Total Memory: 24576 KB) (Total Memory: 131072 KB)**
- Network Port (38:7c:76:49:0f:58)**

At the bottom, an event log table shows the following entries:

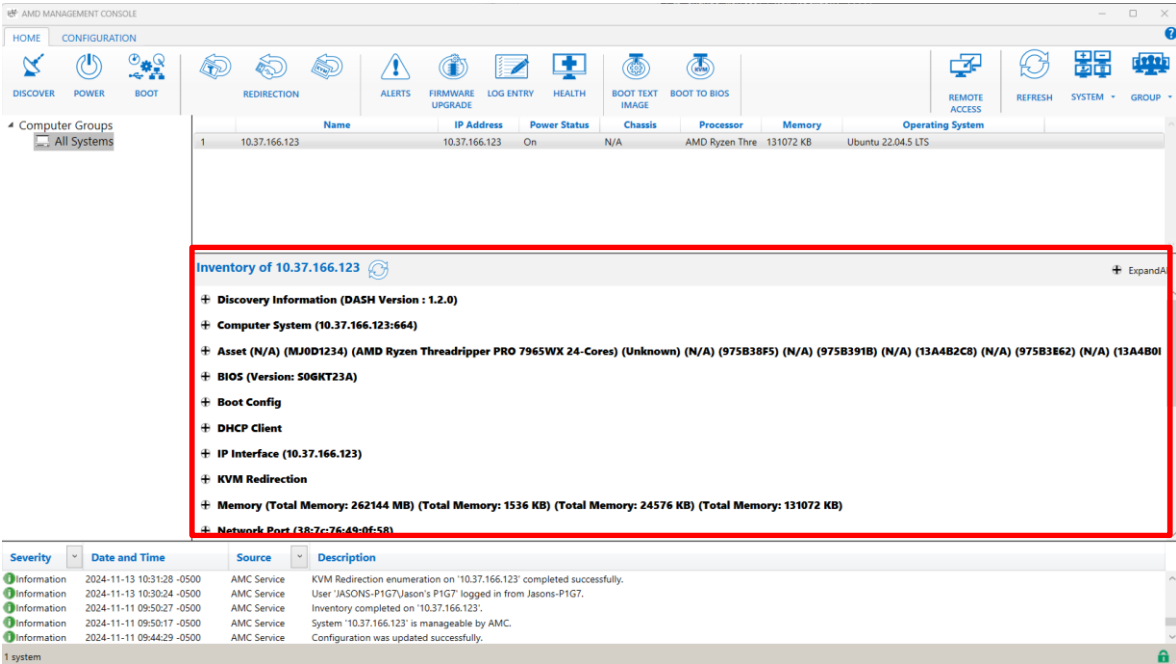
Severity	Date and Time	Source	Description
Information	2024-11-11 09:50:27 -0500	AMC Service	Inventory completed on '10.37.166.123'.
Information	2024-11-11 09:50:17 -0500	AMC Service	System '10.37.166.123' is manageable by AMC.
Information	2024-11-11 09:44:29 -0500	AMC Service	Configuration was updated successfully.
Information	2024-11-11 09:40:18 -0500	AMC Service	User 'JASONS-P1G7\Jason's P1G7' logged in from Jasons-P1G7.

Section 9 - AMD DASH Features

Once DASH has been properly configured and setup, here are a few supported features within the AMD Management Console. Feel free to reach out on options not covered here.

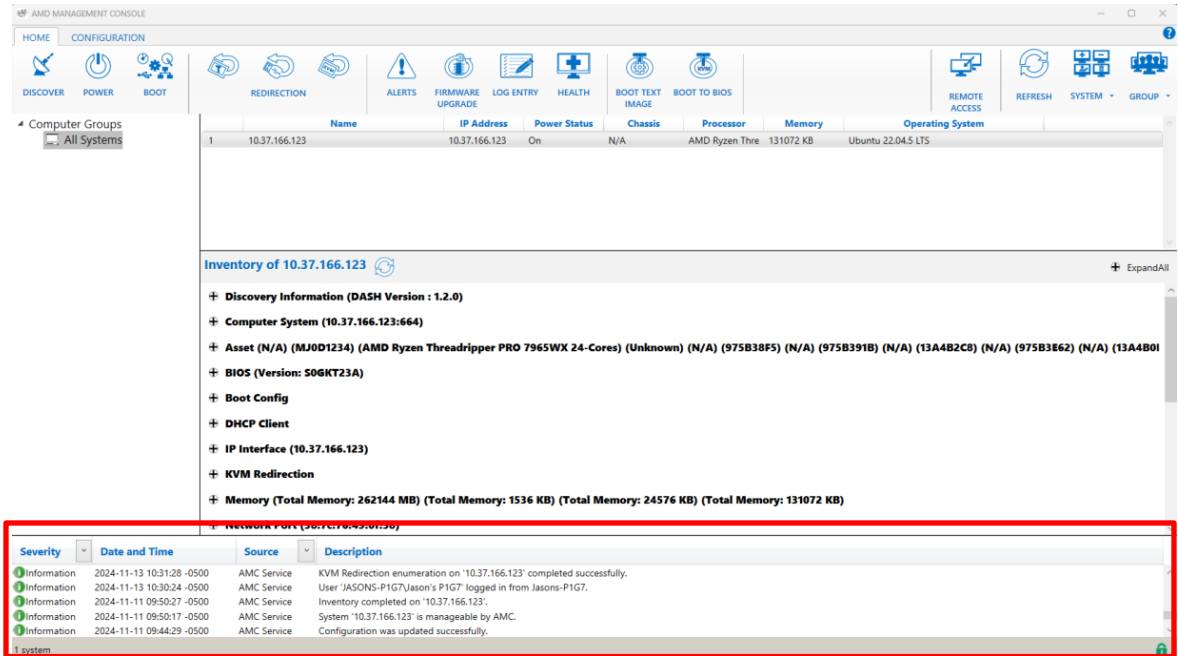
- Inventory Status

This is the middle section of the AMD Management Console. It can show the user different settings of the P8 system such as BIOS version, IP address, CPU and memory information, etc.



- Informational Log

This is the bottom section of the AMD Management Console. It basically is a running log of everything the user does within the AMD Management Console.



The screenshot displays the AMD Management Console interface. At the top, there is a navigation bar with tabs for 'HOME' and 'CONFIGURATION'. Below this is a toolbar with various icons for system management: DISCOVER, POWER, BOOT, REDIRECTION, ALERTS, FIRMWARE UPGRADE, LOG ENTRY, HEALTH, BOOT TEXT IMAGE, BOOT TO BIOS, REMOTE ACCESS, REFRESH, SYSTEM, and GROUP.

The main content area shows a table of 'Computer Groups' with columns for Name, IP Address, Power Status, Chassis, Processor, Memory, and Operating System. A single system is listed with IP 10.37.166.123, running Ubuntu 22.04.5 LTS.

Below the table is an 'Inventory of 10.37.166.123' section, which is expanded to show detailed system information:

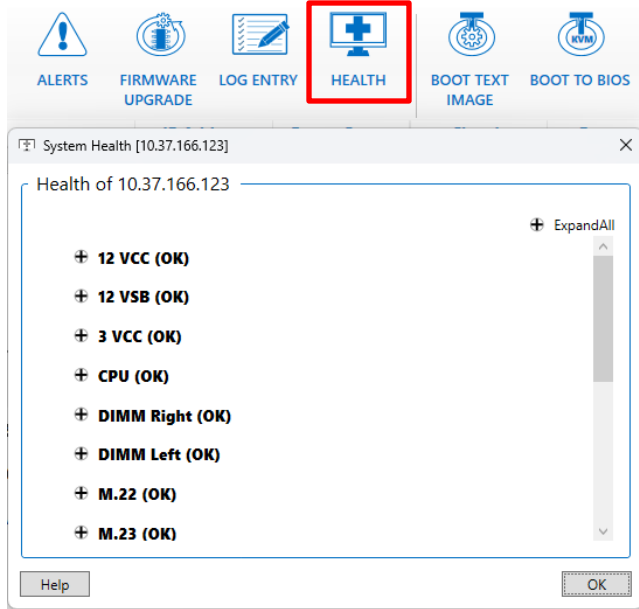
- Discovery Information (DASH Version : 1.2.0)
- Computer System (10.37.166.123:664)
- Asset (N/A) (MJ0D1234) (AMD Ryzen Threadripper PRO 7965WX 24-Cores) (Unknown) (N/A) (975B38F5) (N/A) (975B391B) (N/A) (13A4B2C8) (N/A) (975B3E62) (N/A) (13A4B01)
- BIOS (Version: 50GKT23A)
- Boot Config
- DHCP Client
- IP Interface (10.37.166.123)
- KVM Redirection
- Memory (Total Memory: 262144 MB) (Total Memory: 1536 KB) (Total Memory: 24576 KB) (Total Memory: 131072 KB)

At the bottom, a red-bordered box highlights the 'Network Ports (2024-11-13 09:50:27)' section, which contains an informational log:

Severity	Date and Time	Source	Description
Information	2024-11-13 10:31:28 -0500	AMC Service	KVM Redirection enumeration on '10.37.166.123' completed successfully.
Information	2024-11-13 10:30:24 -0500	AMC Service	User 'JASONS-P1G7,Jason's P1G7' logged in from Jasons-P1G7.
Information	2024-11-11 09:50:27 -0500	AMC Service	Inventory completed on '10.37.166.123'.
Information	2024-11-11 09:50:17 -0500	AMC Service	System '10.37.166.123' is manageable by AMC.
Information	2024-11-11 09:44:29 -0500	AMC Service	Configuration was updated successfully.

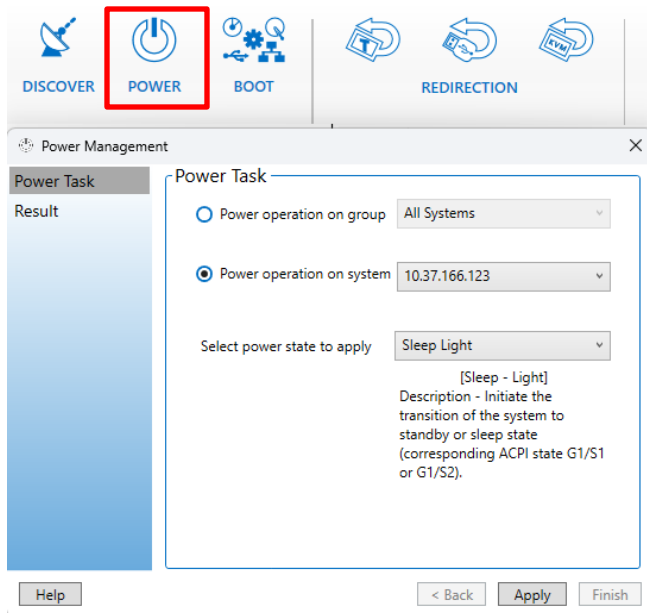
- Health

This option is located within the top ribbon menu that views different sensor states of the system.



- Power

This option is located within the top ribbon menu that allows the user to shut down, reboot, wake the system, etc.



Section 10 - Removing and Disabling the DASH Service

In Linux, it is relatively easy to stop the Linux DASH service running on the Linux platform.

- At the Linux command prompt, press “CONTROL + C” on the keyboard to stop the DASH service protocol from running.

```
[setFWIpInfo] Setting IPv4...
[sendDataTo00B] SET Data success(Linux Send)!!!
[ip_change_monitor] Set IPv6 fe80::6ae5:53b2:5c93:68ec
[setFWIp6Info] Setting IPv6...
[sendDataTo00B] SET Data success(Linux Send)!!!
[ip_change_monitor] New IPv4 10.37.166.123
[ip_change_monitor] New Netmask: fffff
[setFWIpInfo] Setting IPv4...
[sendDataTo00B] SET Data success(Linux Send)!!!
[ip_change_monitor] Set IPv6 fe80::6ae5:53b2:5c93:68ec
[setFWIp6Info] Setting IPv6...
[sendDataTo00B] SET Data success(Linux Send)!!!
[ip_change_monitor] New IPv4 10.37.166.123
[ip_change_monitor] New Netmask: fffff
[setFWIpInfo] Setting IPv4...
[sendDataTo00B] SET Data success(Linux Send)!!!
[ip_change_monitor] Set IPv6 fe80::6ae5:53b2:5c93:68ec
[setFWIp6Info] Setting IPv6...
[sendDataTo00B] SET Data success(Linux Send)!!!
^C
```

- Remove the DASH Client Service by running the command:

`# sudo ./install.sh /delete`
- Reboot the system and boot into BIOS F1 setup to disable the DASH feature. This can be found under BIOS F1 setup -> “Advanced” menu -> “DASH Configuration” menu -> “DASH Support” drop-down menu. Set this drop-down menu from “Enabled” to “Disabled” and press F10 to Save and Exit BIOS setup.

Revision History

Version	Date	Author	Changes/Updates
1.0	12/2/2024	Jason M.	Initial release.