IEI Integration Corp.

10 Gbps Network Based PCIe Computing Accelerator Card with Two Intel® Core™ i5/i7 or Celeron® Processors, 32 GB / 8 GB RAM, SSD, QTS-Lite, SDK, RoHS

Rev. 1.00 - January 8, 2018

RoHS Lead Free

Revision

Date	Version	Changes
January 8, 2018	1.01	Added software installation guide for Microsoft Windows 10 Added economic version (Mustang-200-C-8G) information
October 27, 2017	1.00	Initial release

Copyright

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TRADEMARKS

Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

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Introduction

1.1 Introduction

Figure 1-1: Mustang-200

The Mustang-200 is a 10 Gbps network based computing accelerator for speeding up computations, calculations and applications in an affordable and scalable way. Equipped with two Intel® Core™ i5/i7 processors, 32 GB (four 8GB) / 8 GB (four 2 GB) RAM, and with/without 1TB (two 512GB) SSDs, the Mustang-200 PCIe card can be used with the existing system, enabling high-performance computing without costing a fortune. Multiple Mustang-200 can be installed into one system to further boost the computing capabilities.

The integrated QTS-Lite operating system supports various virtualization technologies such as containers and virtual machines, making it easy to convert the physical system into a virtual one (P2V) and assign it to one of the nodes on the Mustang-200.

SDK and a Web Application are also come with the Mustang-200. The Web Application is capable of VOD (file to live), Live (live to live) and File (file to file) transcoding scenarios. Each transcoding scenario can be created using simple wizard steps. It was developed based on the Host API, allowing developers to modify it to meet their requirements.

1.2 Model Variations

The model variations of the Mustang-200 series are listed below.

Model No.	Processor	Memory	SSD
Standard Version			
Mustang-200-i5-1T/32G	Intel® Core™ i5-7267U	32 GB DDR4	1 TB
Mustang-200-i7-1T/32G	Intel® Core™ i7-7567U	32 GB DDR4	1 TB
Economic Version			
Mustang-200-C-8G	Intel® Celeron® 3865U	8 GB DDR4	N/A

Table 1-1: Mustang-200 Model Variations

1.3 Features

Some of the Mustang-200 motherboard features are listed below:

- Two Intel® Core™ i7-7567U, i5-7267U or Celeron® 3865U processors, up to 4.00 GHz
- Support Intel® Iris™ Plus Graphics 650.
- Compatible with PCI Express x4, x8, and x16 slots
- Decentralized computing architecture for independent tasks based on 10Gbps network transmission
- Increasing computing power without changing or adding servers
- Achieve higher densities computing
- Lower capital expense and operation expense costs

1.4 Connectors

The connectors on the Mustang-200 are shown in the figures below.

Figure 1-2: Connectors (Front Side)

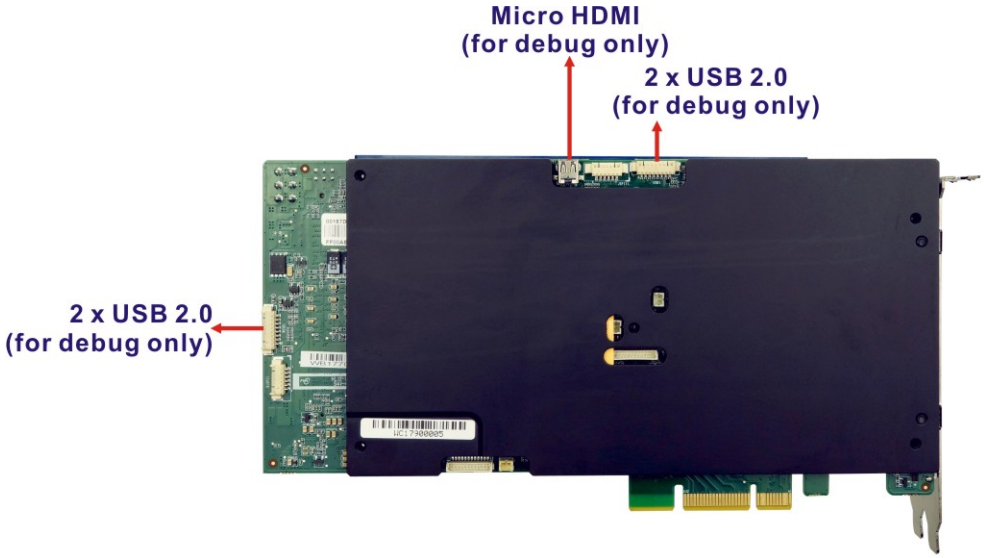


Figure 1-3: Connectors (Rear Side)

1.5 Dimensions

The dimensions of the board are listed below:

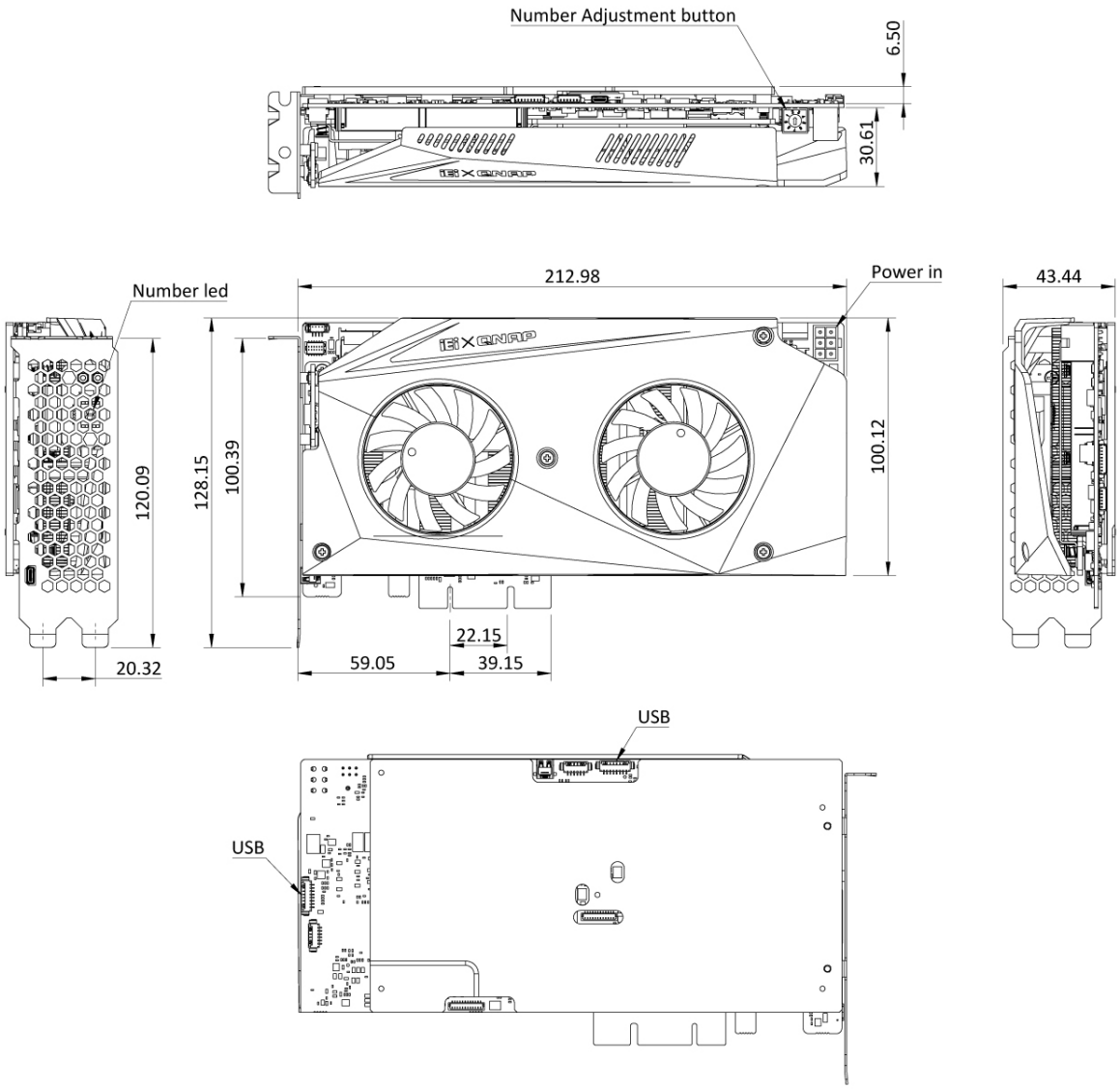


Figure 1-4: Dimensions (mm)

1.6 Data Flow

Figure 1-5 shows the data flow between the CPU and other components installed on the Mustang-200.

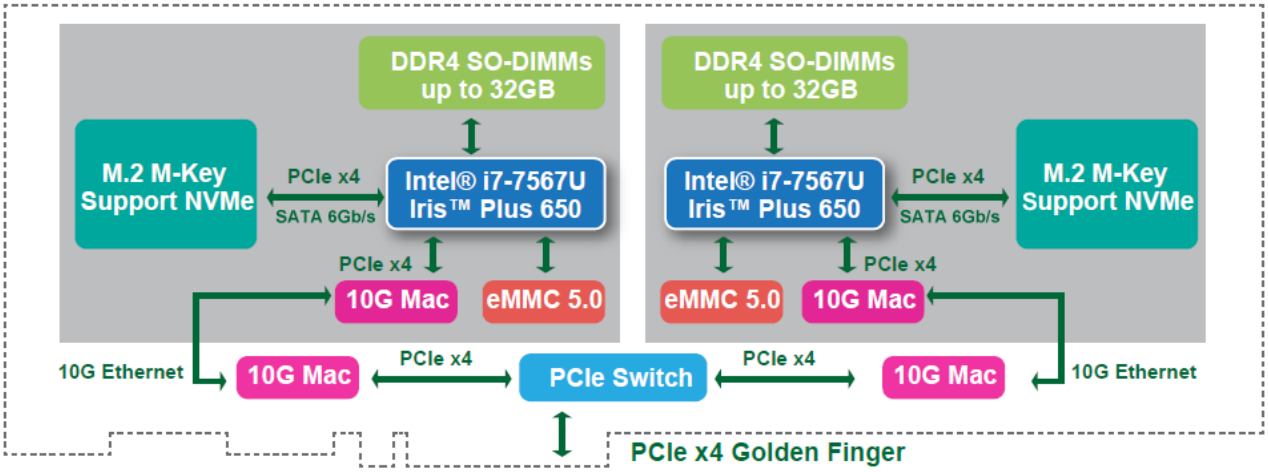


Figure 1-5: Data Flow Diagram

1.7 Technical Specifications

Mustang-200 technical specifications are listed below.

Specification	Mustang-200
Processor	Intel® Core™ i5-7267U (up to 3.5 GHz, dual-core, 4 MB cache, TDP=28 W) Intel® Core™ i7-7567U (up to 4.0 GHz, dual-core, 4 MB cache, TDP=28 W) Intel® Celeron® 3865U (up to 1.8 GHz, dual-core, 2 MB cache, TDP=10 W)

Specification	Mustang-200
Memory	Standard version: 4 x 8 GB DDR4 SO-DIMM (two 8 GB DDR4 SO-DIMMs per CPU) Economic version: 4 x 2 GB DDR4 SO-DIMM (two 2 GB DDR4 SO-DIMMs per CPU)
Processor Graphics	Intel® Iris™ Plus Graphics 650 (GT3e) Graphics base frequency: 300 MHz Graphics max dynamic frequency: 1.05 GHz Embedded graphics DRAM per GPU: 64 MB
Hardware Video Decode	H.264, H.265/HEVC MPEG2, M/JPEG VC-1 VP8 (8-bit) / VP9 (10-bit)
Hardware Video Encode	H.264, H.265/HEVC MPEG2, M/JPEG VC-1 VP8 (8-bit)
Display Output	2 x Micro HDMI for debugging
USB Ports	4 x USB 2.0 (pin header) for debugging
Storage	Standard version: 2 x Intel® SSD 600P series (512 GB, M.2 80mm PCIe 3.0 x4, 3D1, TLC) Economic version: 2 x M.2 Socket 3 (M key, type 2280, PCIe) Minimum capacity - 128 GB or above
Physical PCIe Interface	PCI Express x8
Data Plane Interface	PCI Express x4 Compliant with PCI Express Specification V2.0 Compatible with PCI Express x4, x8 and x16 slots

Specification	Mustang-200
External Interface	Reset button Power button
Indicator	7-segment LED display for card ID and debug code
Fan	Dual fan
Power Consumption	120 W, 12 V @ 10 A
Operating Temperature	0°C ~ 40°C
Operating Humidity	10% ~ 90%
Dimensions (WxHxD)	210 mm x 111 mm x 40 mm
Remark	There is no support for UPnP (Universal Plug and Play). This is because Mustang-200 is not connected to router directly, and its connection to external network can only be established via the host server.

Table 1-2: Technical Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the Mustang-200 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the Mustang-200 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The Mustang-200 is shipped with the following components:

Quantity	Item and Part Number	Image
1	Mustang-200 computing accelerator	
1	4-pin to 6-pin PCIe power adapter	
1	Quick Installation Guide	

2.4 Optional Item

The following is optional component which may be separately purchased:

Item	Image
Dual-port USB cable kit for debug (includes two cables) (**P/N**: 19B00-000396-00-RS)	

Chapter

3

Hardware Installation

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the Mustang-200 may result in permanent damage to the Mustang-200 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the Mustang-200. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the Mustang-200 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding*** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the Mustang-200, place it on an anti-static pad. This reduces the possibility of ESD damaging the Mustang-200.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

3.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the Mustang-200, Mustang-200 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  The user manual provides a complete description of the Mustang-200 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Turn all power to the system off:
  When installing the Mustang-200, make sure that the system to be connected is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the Mustang-200 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

3.3 SSD Installation (Economic Version Only)

The Mustang-200-C-8G must be installed with two M.2 SSDs before hardware installation. The M.2 sockets located on the rear side of the Mustang-200 are keyed in the M position and provide mounting screw position for 2280-size SSD. To install a 2280-size SSD, please follow the steps below.

WARNING:

Please make sure the purchased SSD complies with the SSD specifications of the Mustang-200. SSD specifications compliant with the Mustang-200 are listed in Section 1.7.

Step 1: Locate the SSD socket.

Figure 3-1: SSD Socket Locations

Step 2: Remove the on-board retention screw as shown in **Figure 3-2**.

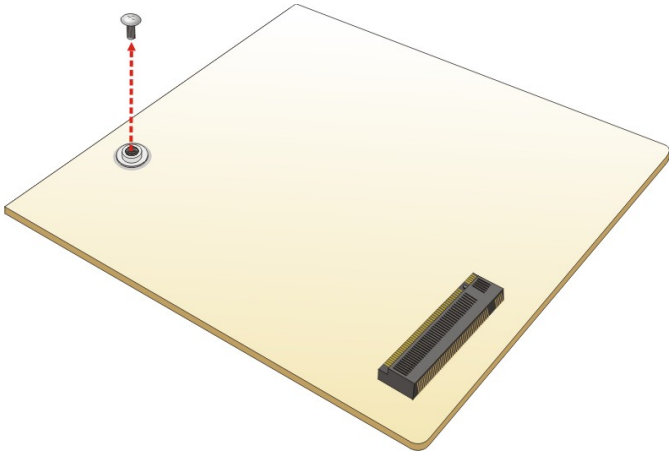


Figure 3-2: Removing the SSD Retention Screw

Step 3: Line up the notch on the SSD with the notch on the socket. Slide the SSD into the socket at an angle of about 20º (**Figure 3-3**).

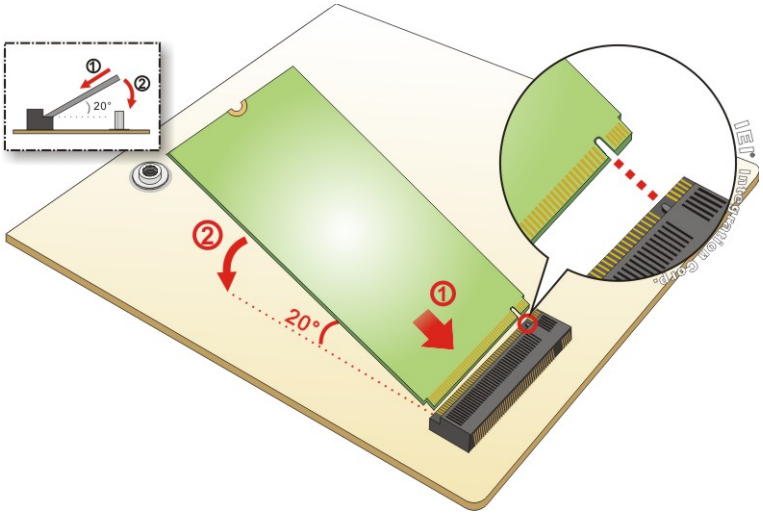


Figure 3-3: Inserting SSD into the Socket at an Angle

Step 4: Push the SSD down and secure it with the previously removed retention screw (**Figure 3-4**).

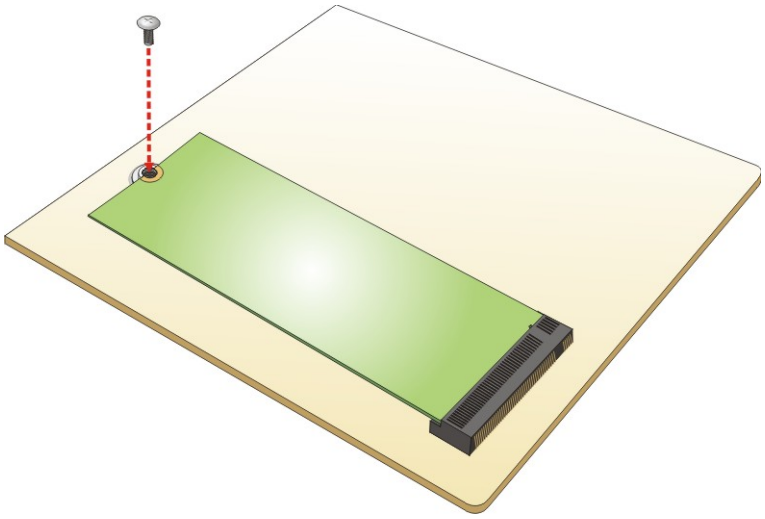


Figure 3-4: Securing the SSD

3.4 Hardware Installation

To install the Mustang-200, please follow the steps below.

Step 1: **Prepare the computer.** Turn off the computer, and remove the power cord from the rear of the power supply.

WARNING:

Disconnect the computer from the power supply and from any networks to which you will install the Mustang-200, or you risk damaging the system or experiencing electrical shock.

Step 2: **Remove the cover from the chassis.**

Step 3: **Locate available PCIe slots and remove the blank brackets.** The Mustang-200 is compatible with PCIe x4, x8 and x16 slots, and needs two side-by-side PCIe slots for installation. Remove two blank bracket panels on the back of the computer that align with the PCIe slot (right side in **Figure 3-5**) for installing the Mustang-200. Save the bracket screws.

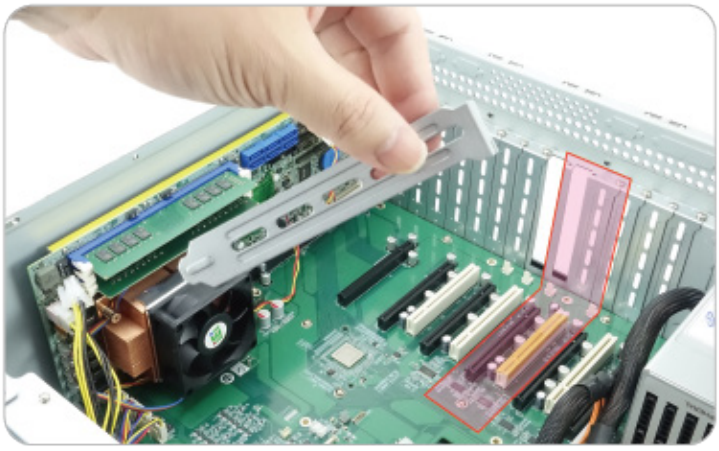


Figure 3-5: Remove Two Blank Brackets

Step 4: **Install and secure the Mustang-200 to the system.** Align the Mustang-200 to the PCIe slot. Press down gently, but firmly, to seat the Mustang-200 correctly in the slot. Install two bracket screws to secure the Mustang-200 to the system's chassis.

Figure 3-6: Install and Secure Mustang-200

Step 5: **Connect a power cable to the Mustang-200.** The Mustang-200 requires 12V 10A DC power. Use a power cable with 6-pin connector from the system, if applicable, or add the 4-pin to 6-pin PCIe power adapter to connect to the power connector of the Mustang-200.

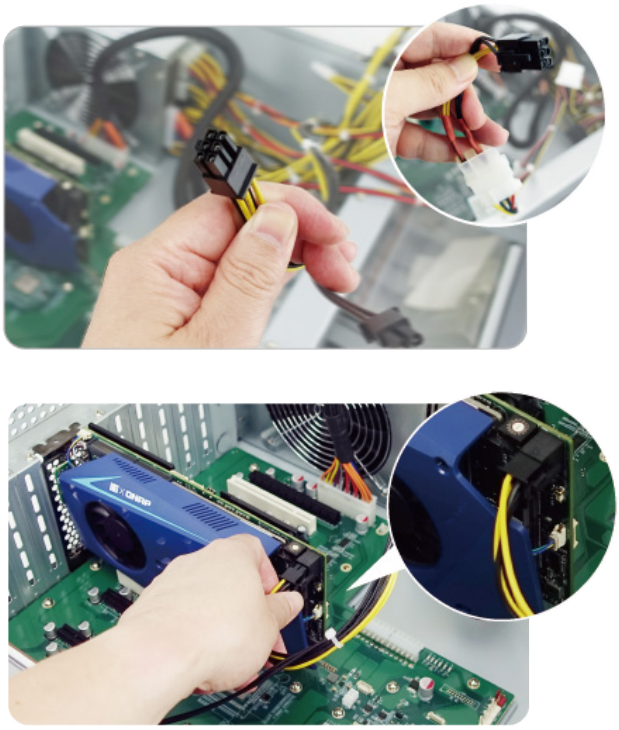


Figure 3-7: Power Cable Connection

Step 6: **Assign a card ID to the Mustang-200** by adjusting the rotary switch. The card ID number assigned here will be shown on the LED display of the card after power-up.

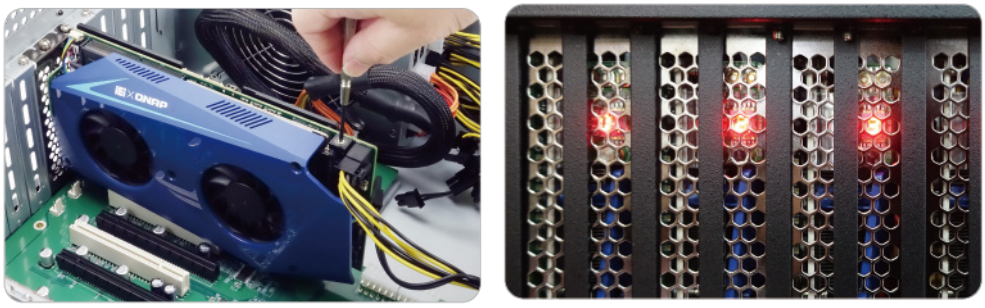


Figure 3-8: Assign a Card ID

Step 7: **Repeat Step 3 ~ Step 6 to install multiple Mustang-200 into the system** if available.

Figure 3-9: Multiple Mustang-200 Installed

Step 8: **Replace the cover of the chassis**.

Step 9: **Reconnect any power cords and any network cables to the system.** Power up the system.

Chapter

4

Software Installation (Linux)

4.1 System Requirements

- Linux Ubuntu 16.04

4.2 Prerequisites

- Make sure the system installed with the Mustang-200 is connected to the network
- Please run all the following installation steps as the root user.
- Go to https://download.ieiworld.com. Search for Mustang-200, and download **MVT_Host_Linux_V1.xx.zip**. Unzip and save the **MVT_Host_Linux** folder inside a path in the system. The folder can be renamed.
  WARNING: DO NOT change the file path of the project or delete any project files after installation.

4.3 Host SDK Installation

To install the Mustang-200 host SDK in Linux, follow the steps below.

NOTE:

For the economic version users, please follow the instruction described in **Section 4.4** to perform software installation.

Step 1: Install NodeJS in the system with the following commands:

```
sudo apt-get update
curl -sL https://deb.nodesource.com/setup_7.x | bash - && apt-get install -y nodejs
```

Step 2: cd to the MVT Host root directory:

```
cd MVT_Host_Linux
```

If the original root folder (MVT_Host_Linux) is renamed, be sure to change the directory name in the command.

Step 3: Inside the MVT Host root directory, run the following command to install npm:

```
sudo npm install
```

Step 4: Inside the MVT Host root directory, run the following command to execute the MVT Host:

```
sudo node mvt_host.js
```

NOTE:

If, by any chance, the Linux kernel has been re-installed, the Mustang-200 driver must be installed again.

4.4 Software Installation for Economic Version

The Mustang-200 economic version requires more setup procedures before the Host SDK installation. Please follow the following steps to install driver, setup network bridge connection and initialize the Mustang-200 in Linux environment.

Step 1: **Install the Mustang-200 driver**:

cd to the driver directory

```
cd MVT_Host_Linux/driver
```

If the original root folder (MVT_Host_Linux) is renamed, be sure to change the directory name in the command.

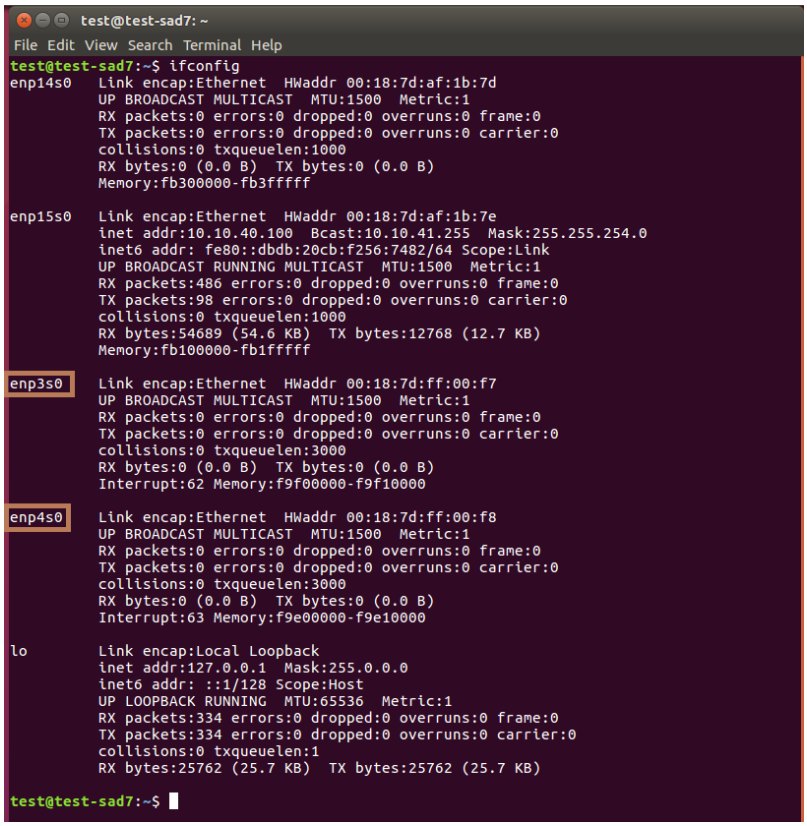
Inside the driver directory, run the following command to install driver:

```
make; make install
```

Step 2: Setup network bridge connection:

Run the following command to list the network interfaces:

```
ifconfig
```



```
test@test-sad7: ~
File  Edit  View  Search  Terminal  Help
test@test-sad7:~$ ifconfig
enp14s0   Link encap:Ethernet  HWaddr 00:18:7d:af:1b:7d
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Memory:fb300000-fb3fffff

enp15s0   Link encap:Ethernet  HWaddr 00:18:7d:af:1b:7e
          inet addr:10.10.40.100  Bcast:10.10.41.255  Mask:255.255.254.0
          inet6 addr: fe80::dbdb:20cb:f256:7482/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:486 errors:0 dropped:0 overruns:0 frame:0
          TX packets:98 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:54689 (54.6 KB)  TX bytes:12768 (12.7 KB)
          Memory:fb100000-fb1fffff

enp3s0    Link encap:Ethernet  HWaddr 00:18:7d:ff:00:f7
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:3000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:62 Memory:f9f00000-f9f10000

enp4s0    Link encap:Ethernet  HWaddr 00:18:7d:ff:00:f8
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:3000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:63 Memory:f9e00000-f9e10000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:334 errors:0 dropped:0 overruns:0 frame:0
          TX packets:334 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:25762 (25.7 KB)  TX bytes:25762 (25.7 KB)

test@test-sad7:~$
```

Run the following command to setup bridge connection:

```
brctl addbr temp
```

Run the following command to bridge the two network interfaces listed above (e.g. enp3s0 and enp4s0):

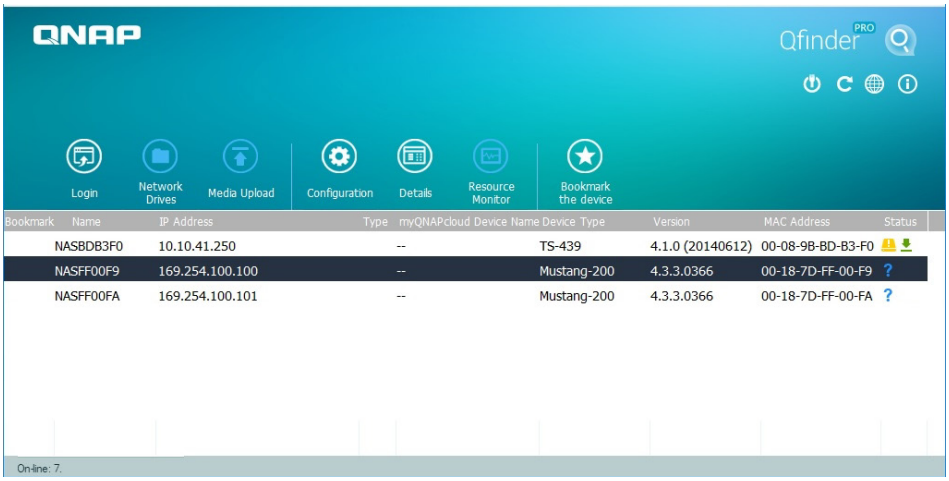
```
brctl addif temp enp3s0
brctl addif temp enp4s0
```

Run the following command to give bridge IP:

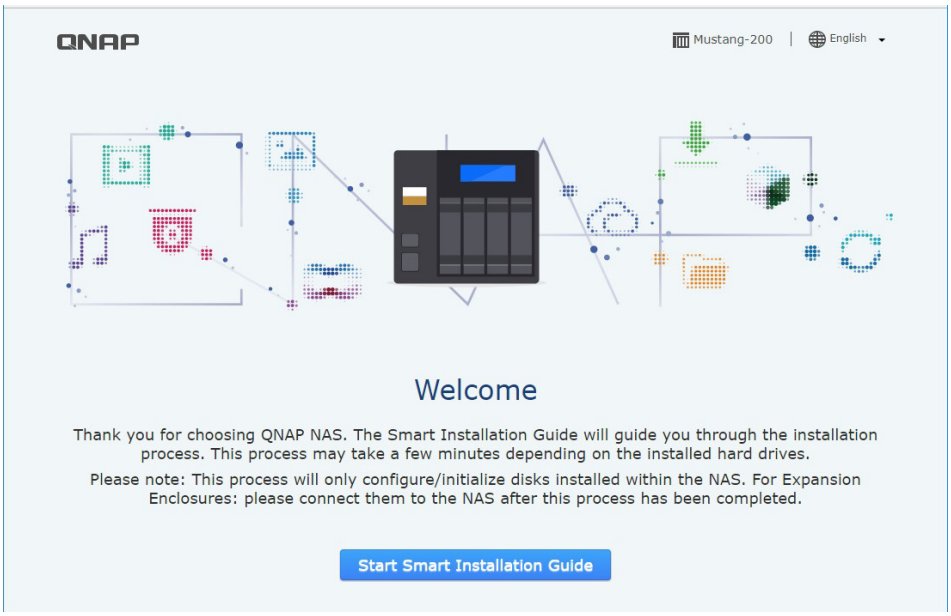
```
ifconfig temp 169.254.100.1 netmask 255.255.0.0
```

Step 3: **Initialize Mustang-200 economic version.** Go to https://www.qnap.com/en/utilities. Download and install **Qfinder Pro**.

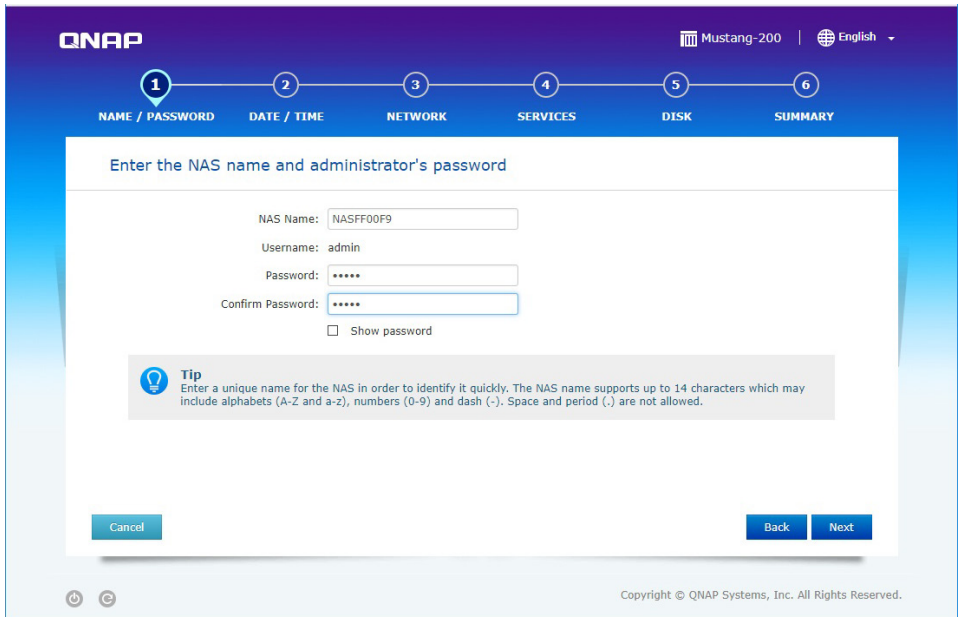
Step 4: Run the Qfinder Pro to search for Mustang-200. Two Mustang-200 will be found for each physical Mustang-200 card. If there are two Mustang-200 installed in the system, the Qfinder Pro will find four Mustang-200. Double click on one of the Mustang-200 in the Qfinder Pro to start initializing.



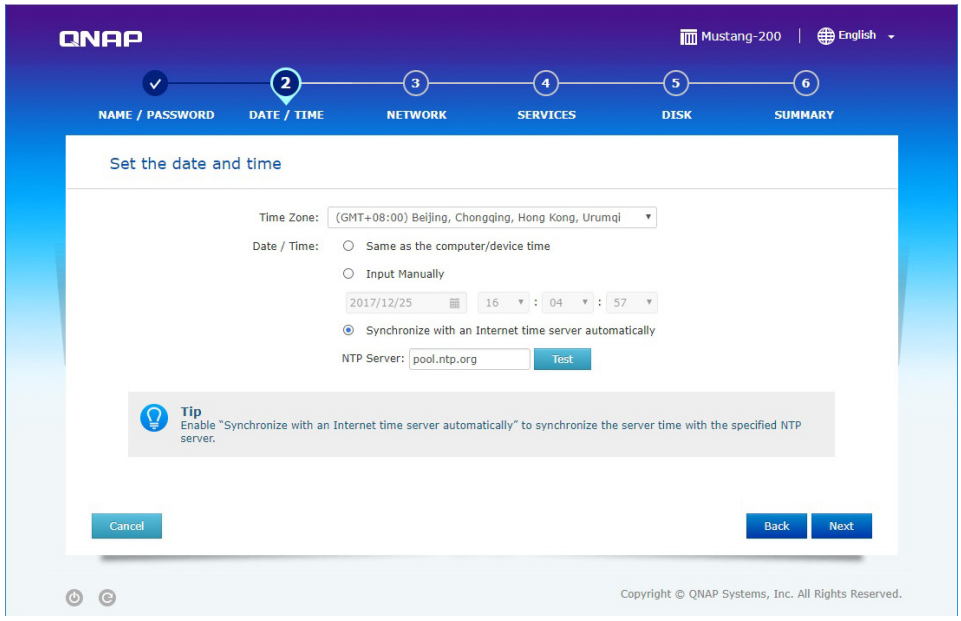
Step 5: The Qfinder Pro setup wizard welcome page appears in a web browser. Click **Start Smart Installation Guide**.



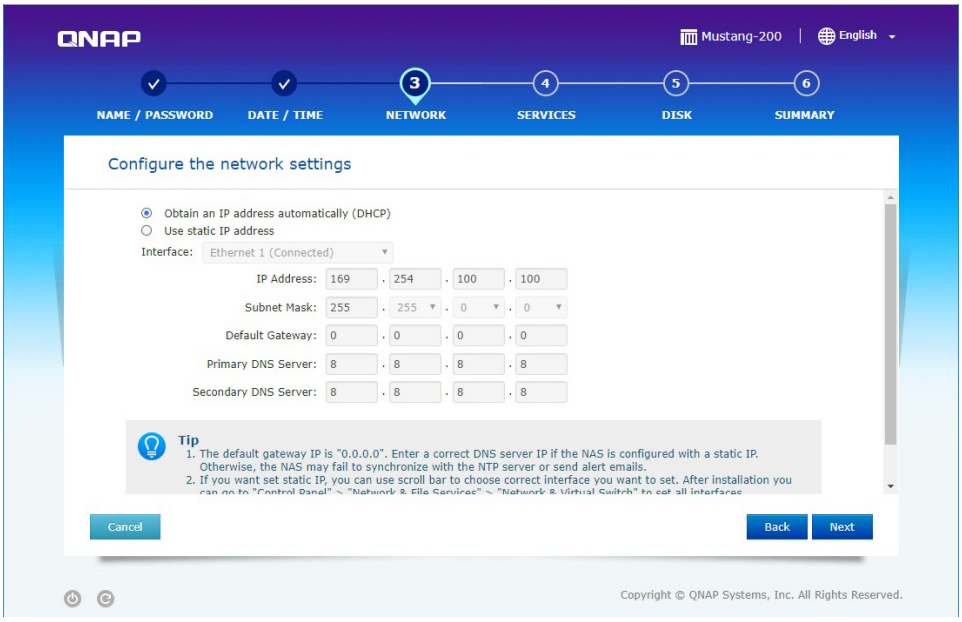
Step 6: The following page appears. Name the NAS and enter the password. The default password is **admin**. Click **Next** to continue.



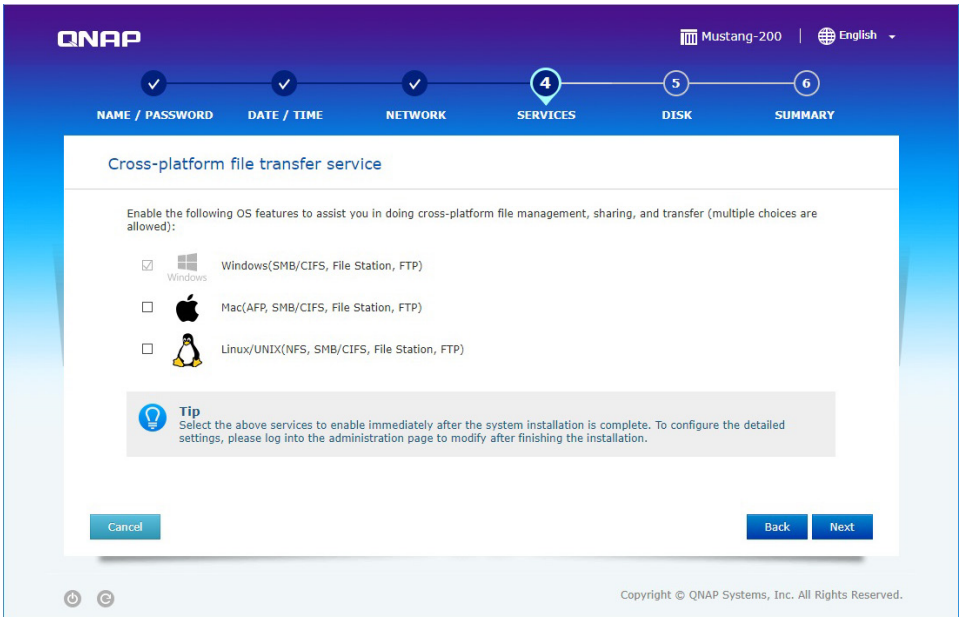
Step 7: Set the date and time. Click **Next** to continue.



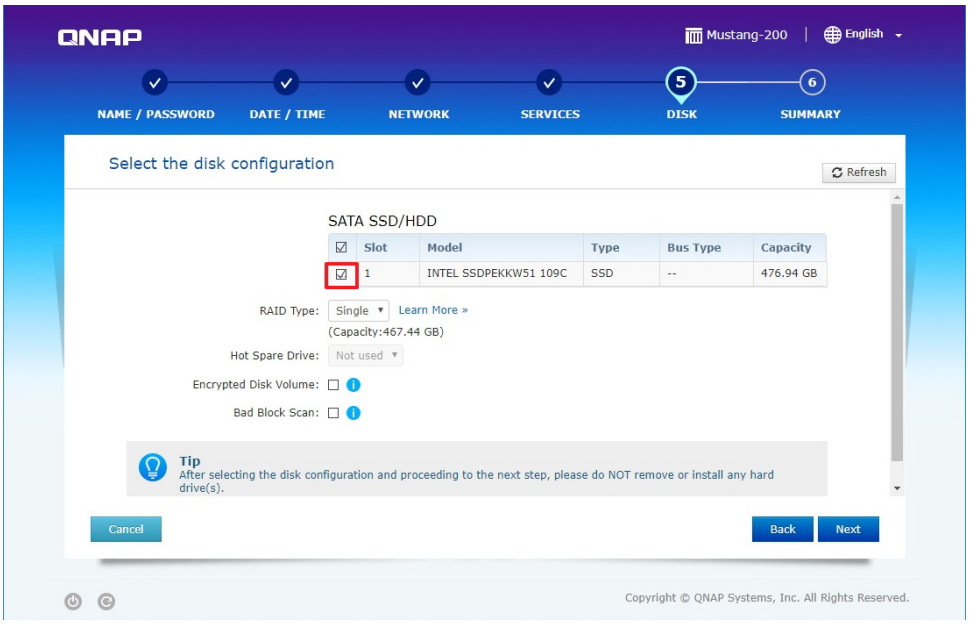
Step 8: Configure the network settings. It is recommended to select **Obtain an IP address automatically (DHCP)**. Click **Next** to continue.



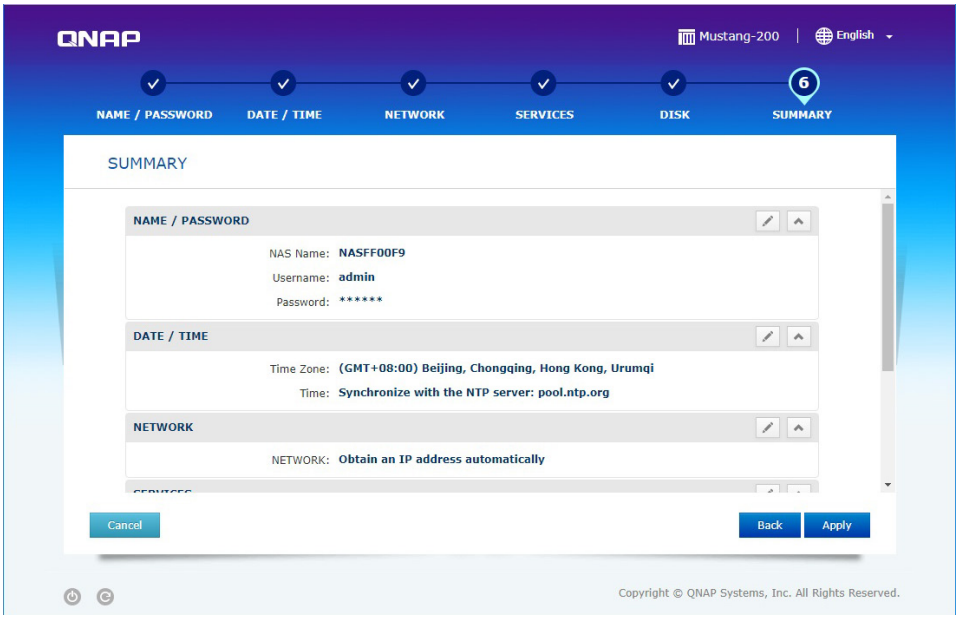
Step 9: Select cross-platform file transfer services if needed. Click **Next** to continue.



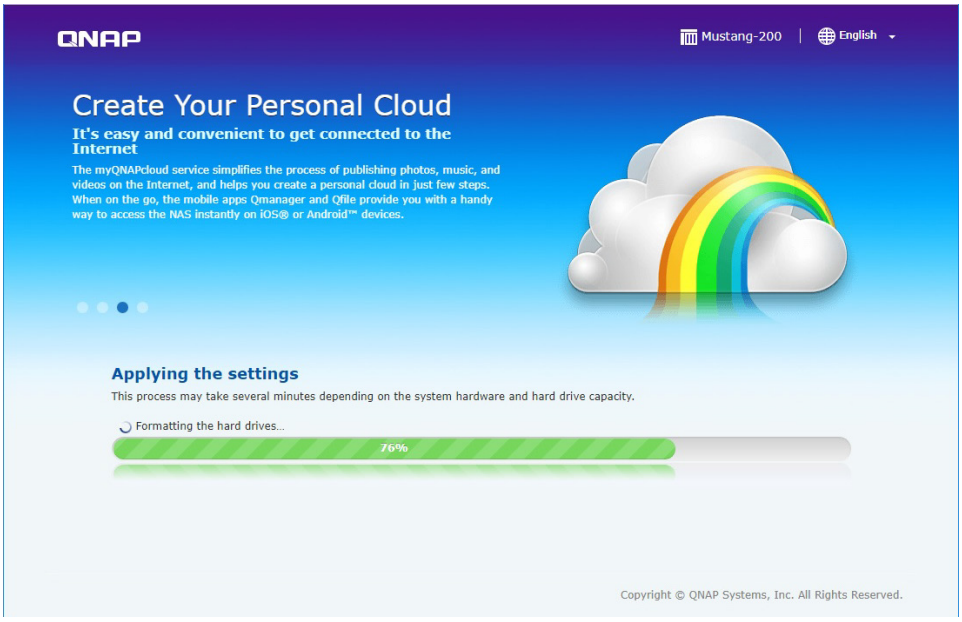
Step 10: Select the disk configuration. Check to select the installed SSD. Click **Next** to continue.



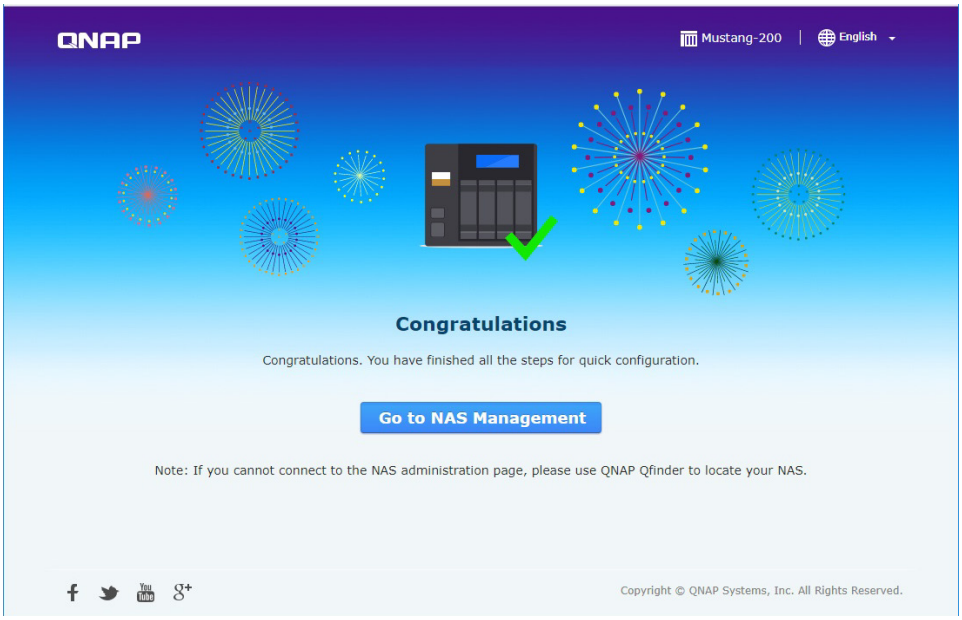
Step 11: The summary page appears with configuration information set in the previous steps. Click **Apply** to continue.



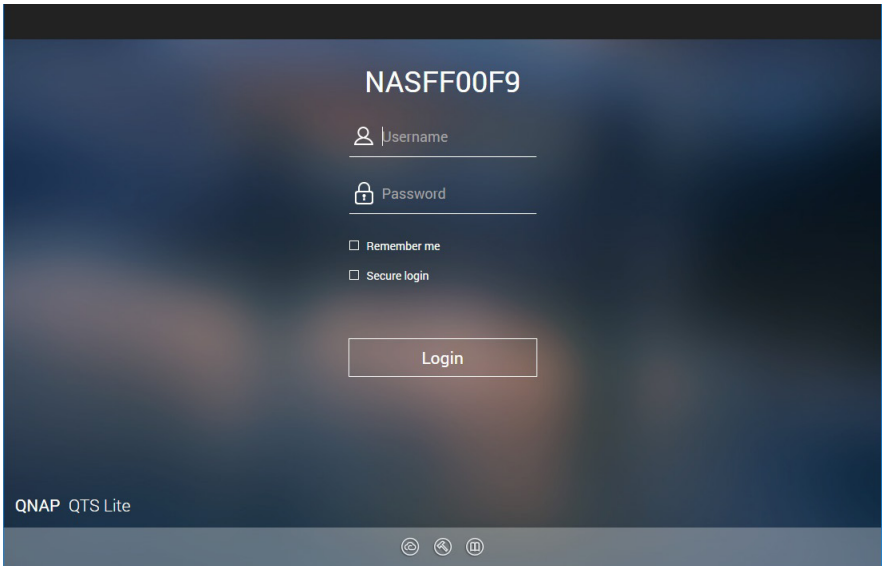
Step 12: The Qfinder Pro setup wizard starts initializing and applying the settings. This process may take several minutes.



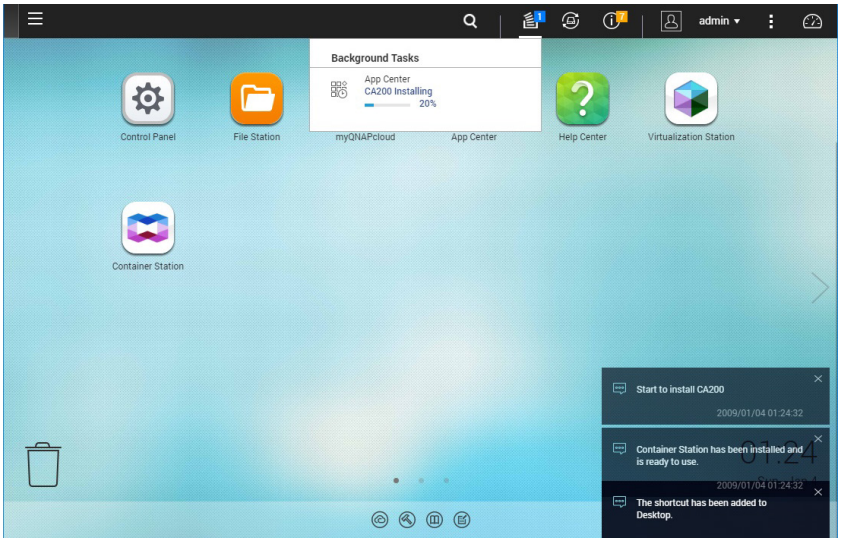
Step 13: The following page appears when the process is complete. Click **Go to NAS Management** to continue.



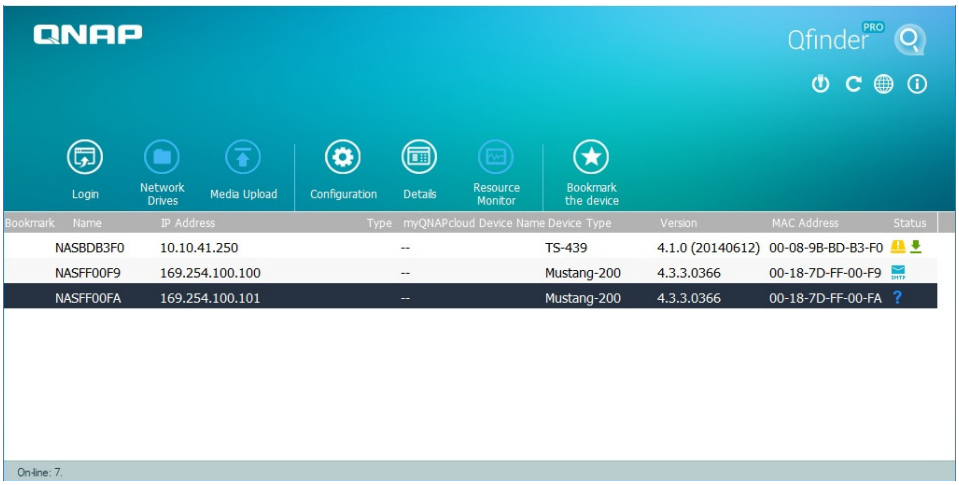
Step 14: Use QTS Lite account username and password to log in (QTS Lite is the operating system for the Mustang-200). The default username and password are both **admin**.



Step 15: After login, the system automatically starts to install container station and CA200 (MVT) apps. Both container station and MVT program must be installed to complete the initializing process. The following figure shows the Container Station app has been installed and a shortcut has been added to Desktop, and CA200 is being installing.



Step 16: Go back to Qfinder Pro. Double click on another Mustang-200 and follow **Step 5 ~ Step 15** to complete the initializing process. All Mustang-200 listed in Qfinder Pro have to be initialized to finish the entire initializing process.



Step 17: Install Mustang-200 Host SDK. See Section **4.3**.

Chapter

5

Software Installation (Windows)

5.1 System Requirements

- Microsoft Windows 10

5.2 Prerequisites

- Make sure the system installed with the Mustang-200 is connected to the network
- Go to https://download.ieiworld.com. Search for Mustang-200, and download the **MVT_Host_Windows_V1.xx.zip** file. Unzip and save the files in the system.

5.3 Installation and Configuration Steps

The following installation steps must be followed.

Step 1: Install the driver and MVT software. See **Section 5.3.1**.

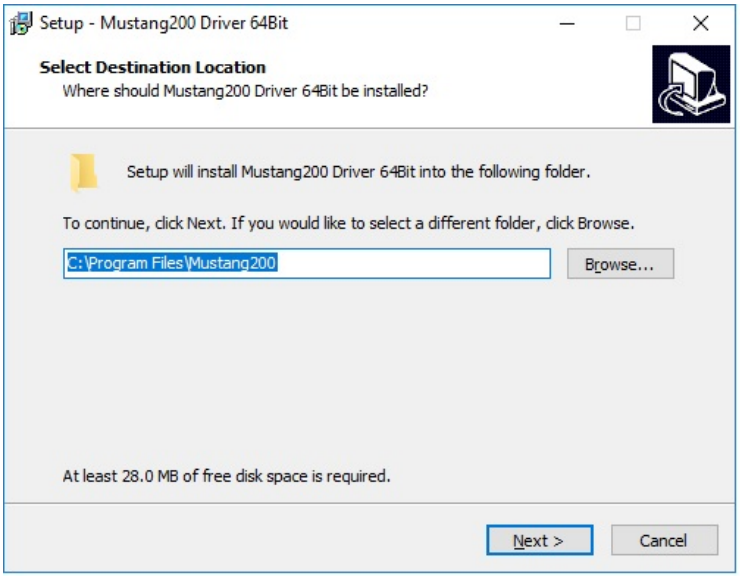
Step 2: Initialize Mustang-200 economic version (skip this procedure for standard version). See **Section 5.3.2**.

Step 3: Install Mustang-200 utility and setup network. See **Section 5.3.3**.

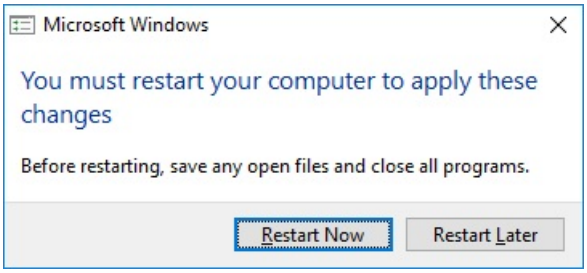
5.3.1 Driver and MVT Software Installation

Step 1: Run the Mustang-200 driver file (Mustang200_Driver_64Bit_v1xx.exe). The driver installation wizard will guide you along the way to complete driver

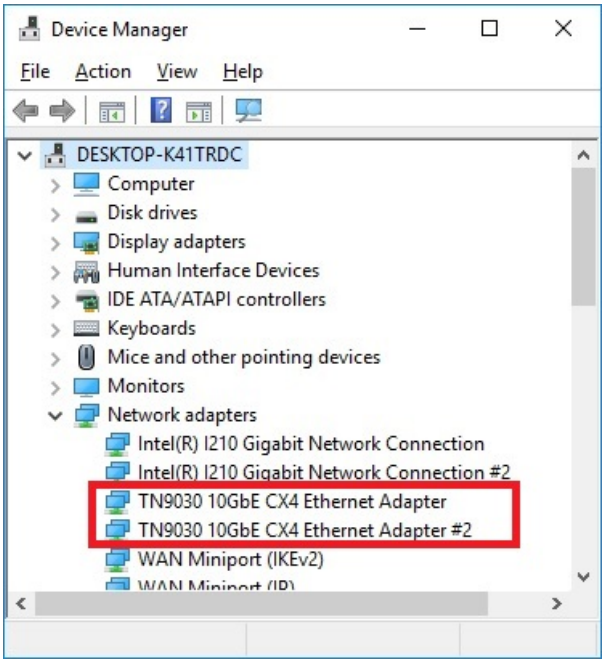
installation.

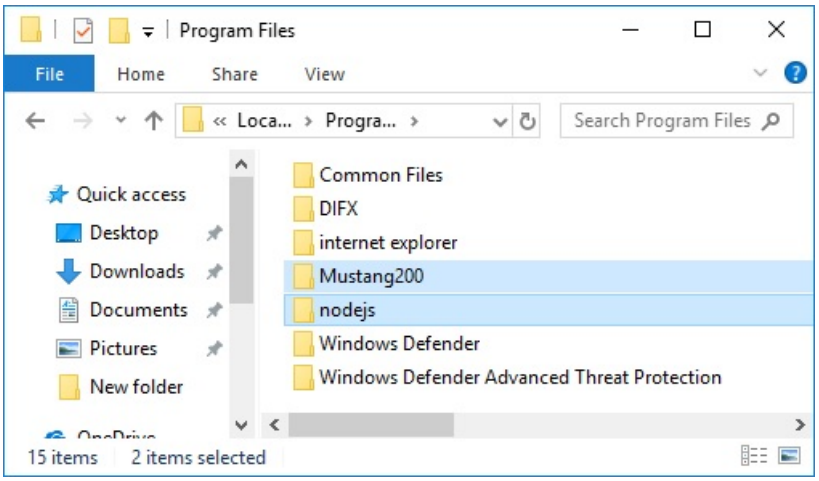


Step 2: Restart the computer to complete the installation.



Step 3: After the installation, two TN9030 Ethernet Adapters will appear in the device manager, and two folders, Mustang200 and nodejs, will be created.



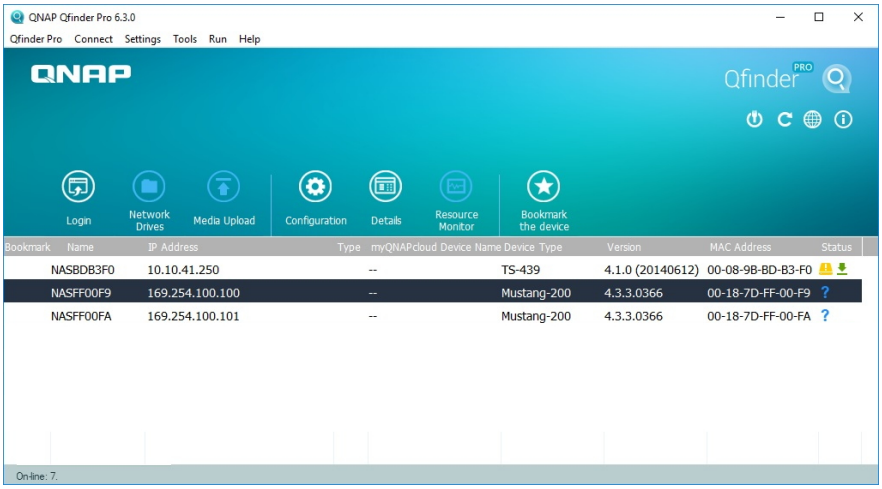


5.3.2 Initializing (only needed for economic version)

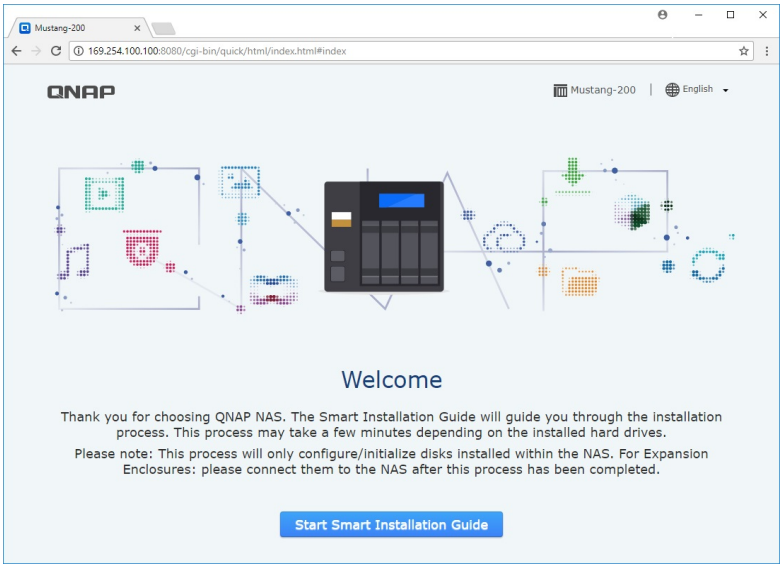
Step 1: Go to https://www.qnap.com/en/utilities. Download and install **Qfinder Pro**.

Step 2: Run the Qfinder Pro to search for Mustang-200. Two Mustang-200 will be found for each physical Mustang-200 card. If there are two Mustang-200 installed in the system, the Qfinder Pro will find four Mustang-200. Double click on one of

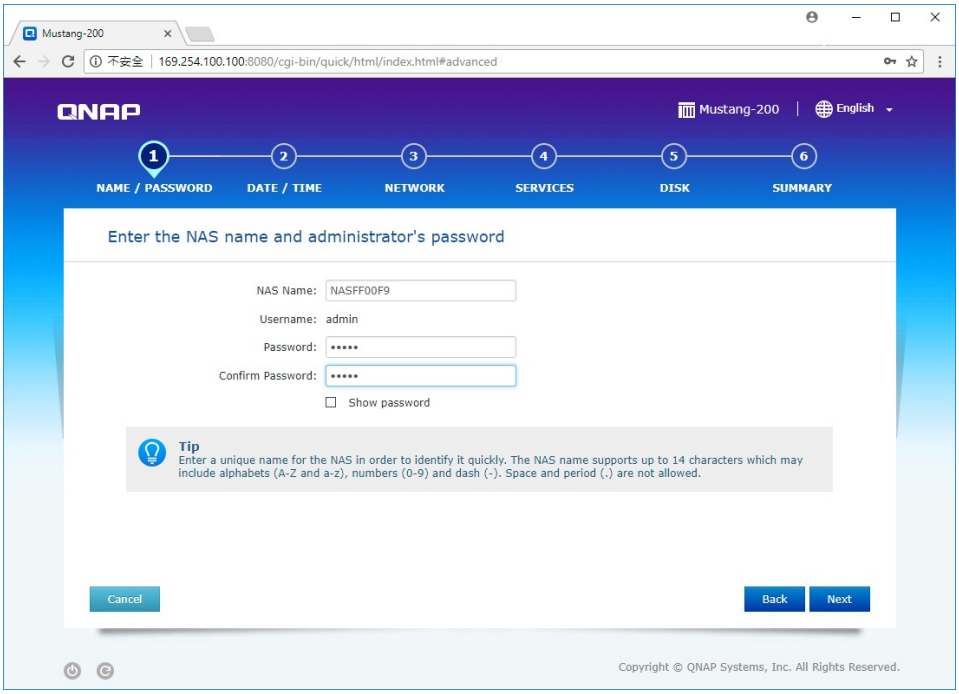
the Mustang-200 in the Qfinder Pro to start initializing.



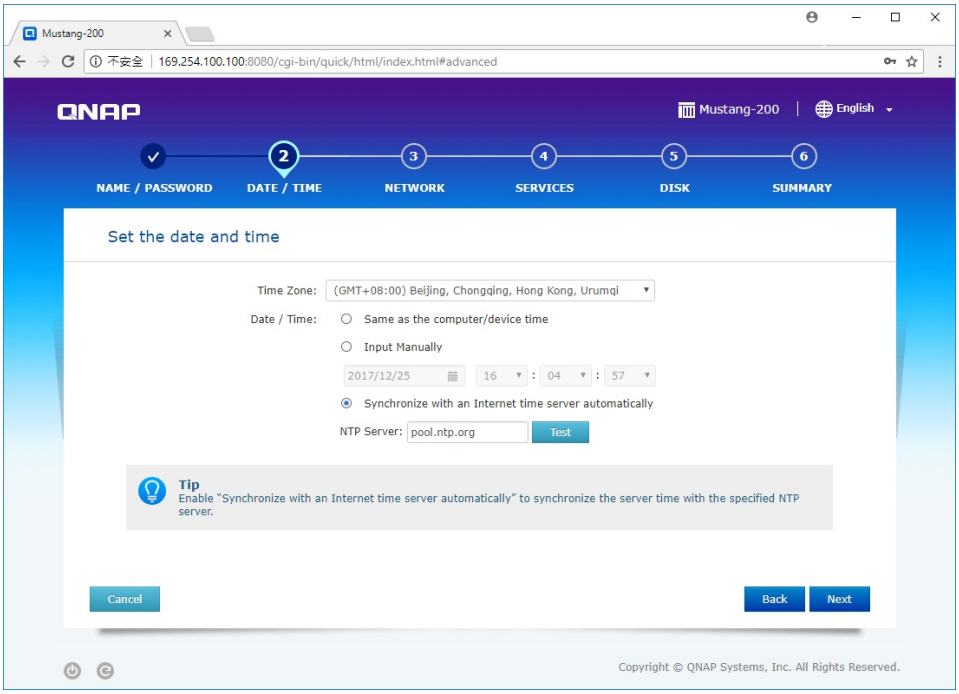
Step 3: The Qfinder Pro setup wizard welcome page appears in a web browser. Click **Start Smart Installation Guide**.



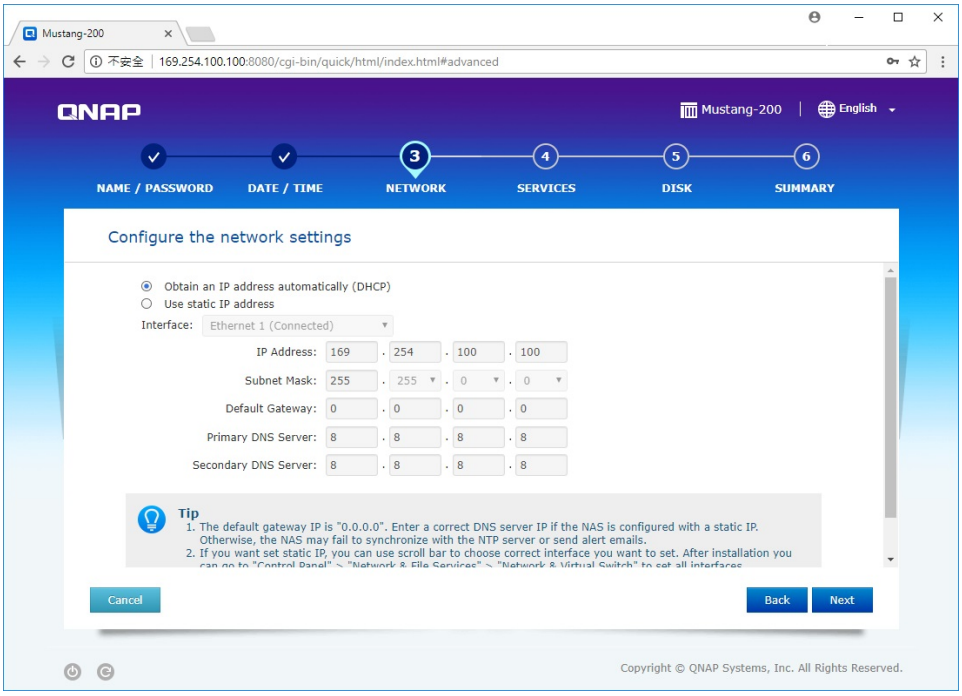
Step 4: The following page appears. Name the NAS and enter the password. The default password is **admin**. Click **Next** to continue.



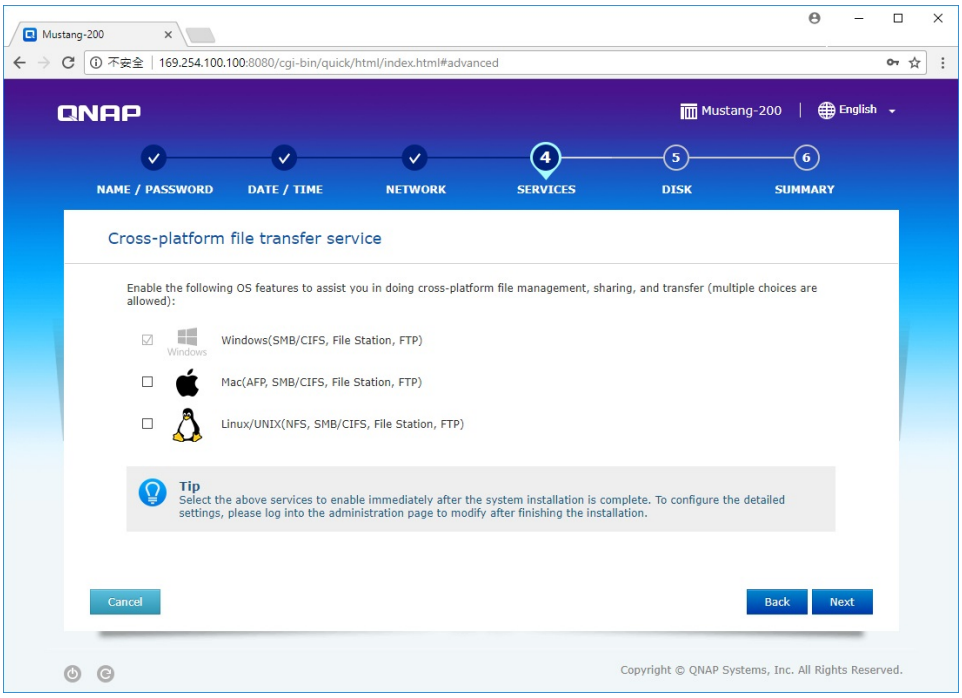
Step 5: Set the date and time. Click **Next** to continue.



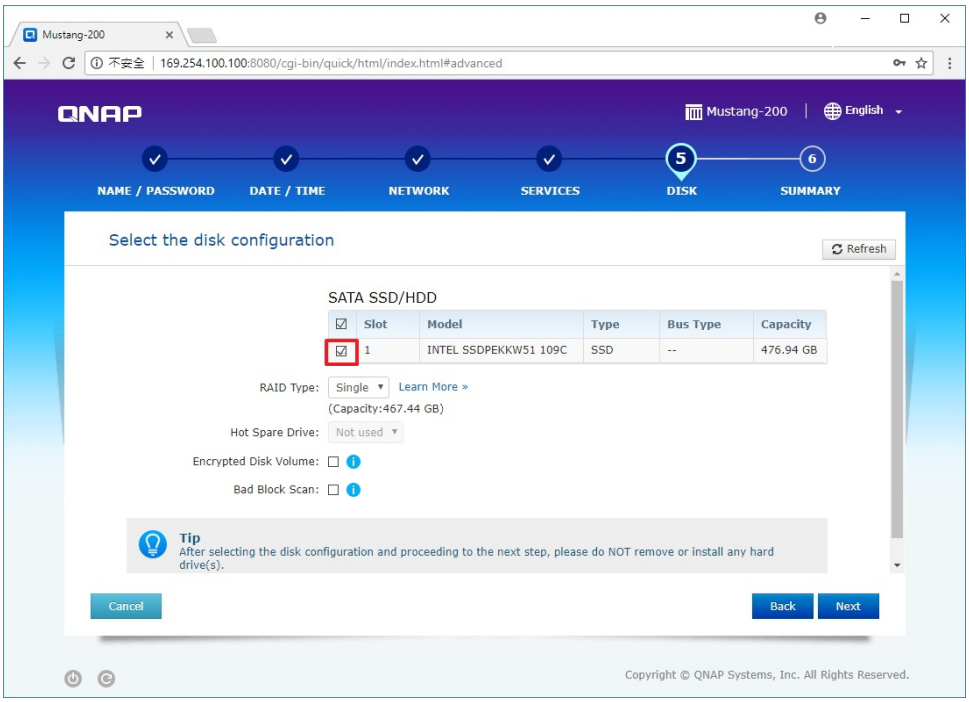
Step 6: Configure the network settings. It is recommended to select **Obtain an IP address automatically (DHCP)**. Click **Next** to continue.



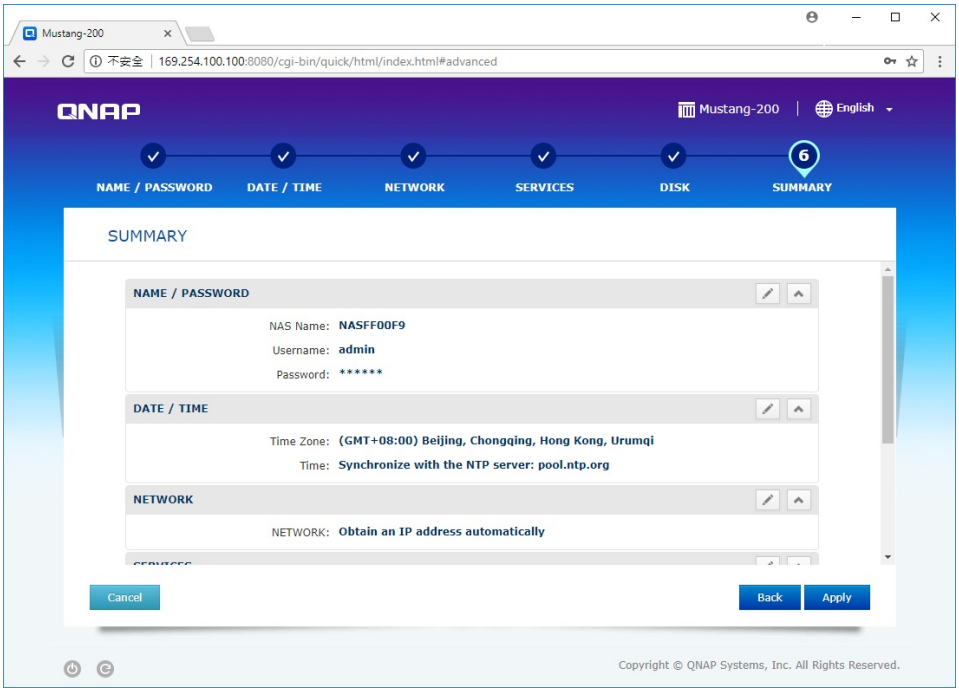
Step 7: Select cross-platform file transfer services if needed. Click **Next** to continue.



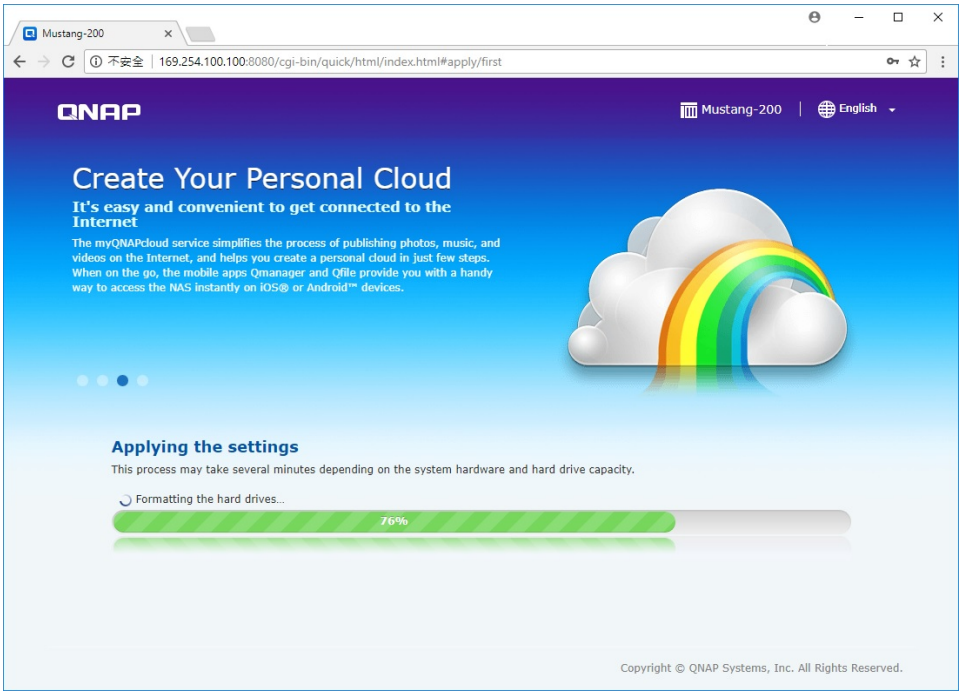
Step 8: Select the disk configuration. Check to select the installed SSD. Click **Next** to continue.



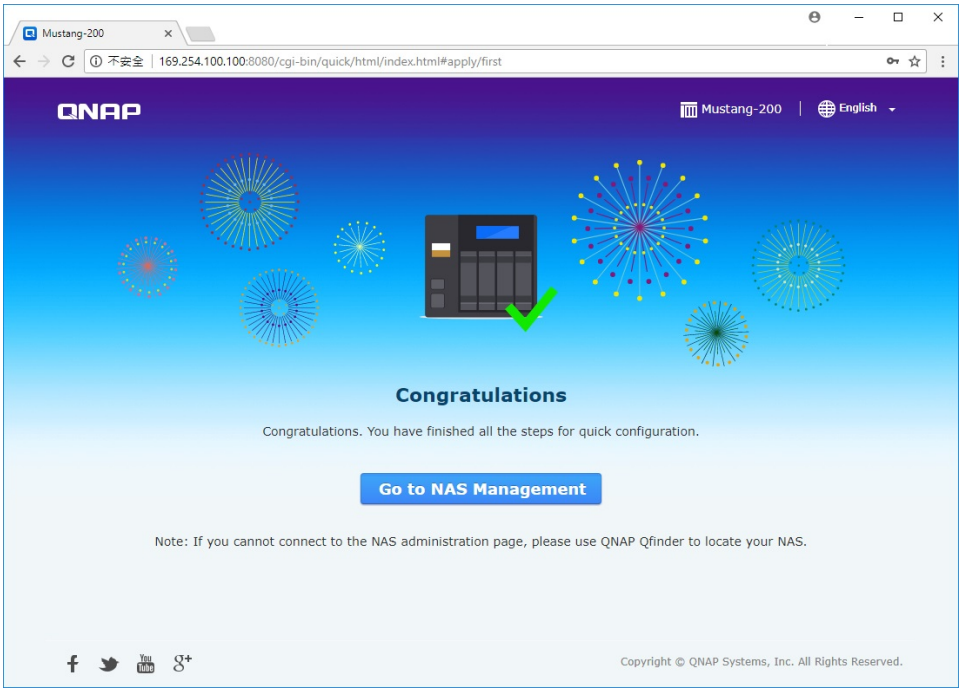
Step 9: The summary page appears with configuration information set in the previous steps. Click **Apply** to continue.



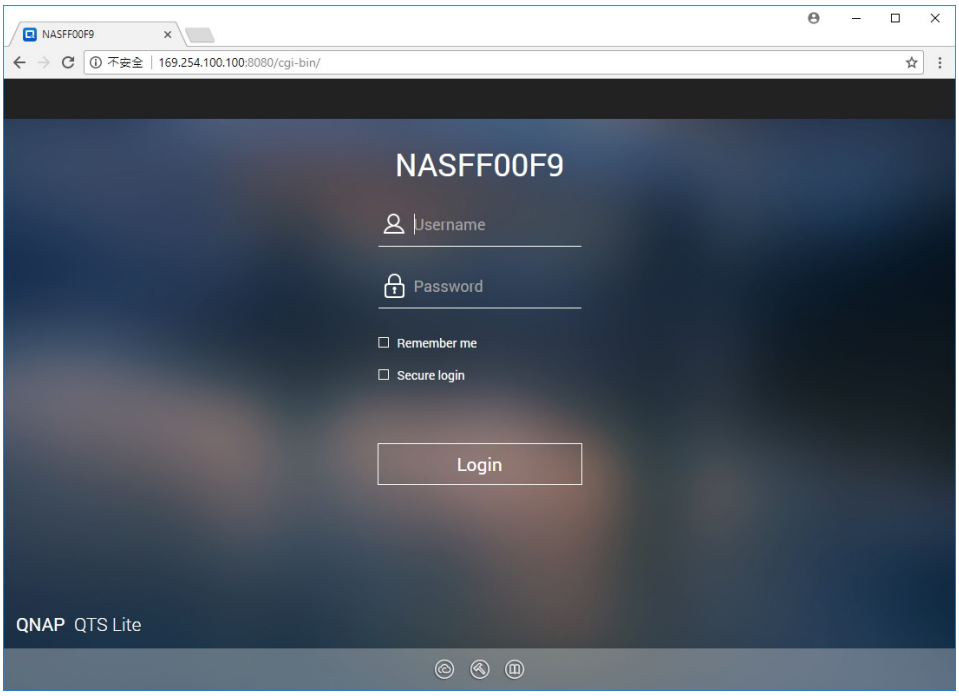
Step 10: The Qfinder Pro setup wizard starts initializing and applying the settings. This process may take several minutes.



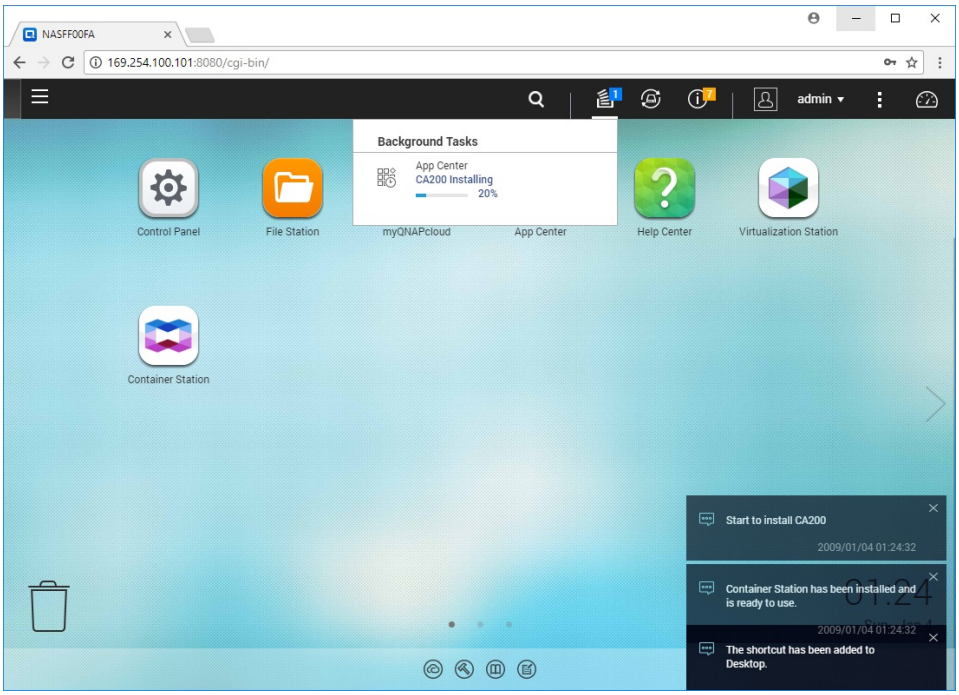
Step 11: The following page appears when the process is complete. Click **Go to NAS Management** to continue.



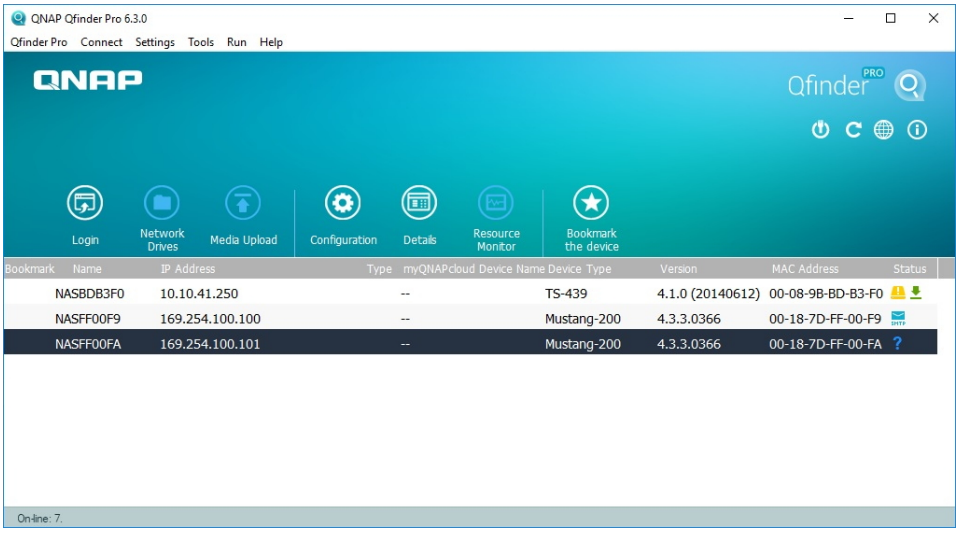
Step 12: Use QTS Lite account username and password to log in (QTS Lite is the operating system for the Mustang-200). The default username and password are both **admin**.



Step 13: After login, the system automatically starts to install container station and CA200 (MVT) apps. Both container station and MVT program must be installed to complete the initializing process. The following figure shows the Container Station app has been installed and a shortcut has been added to Desktop, and CA200 is being installing.

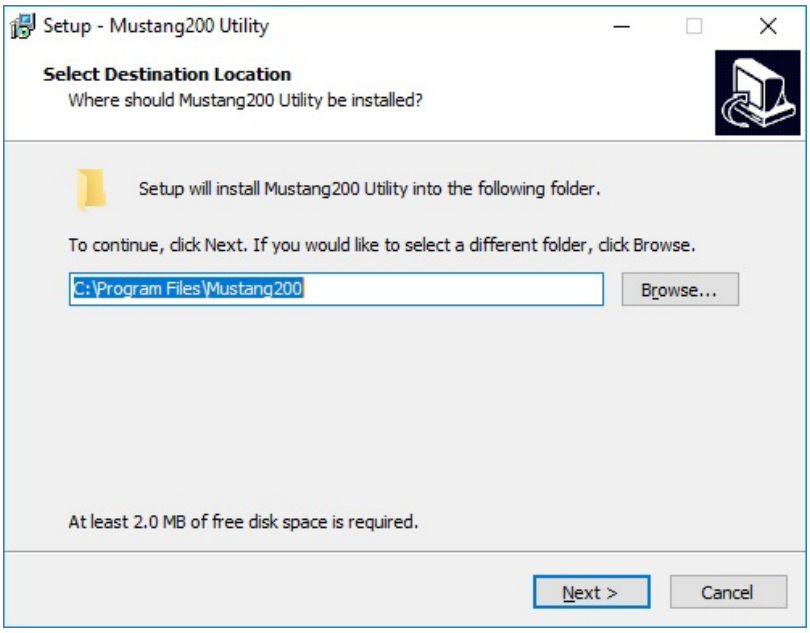


Step 14: Go back to Qfinder Pro. Double click on another Mustang-200 and follow **Step 3 ~ Step 13** to complete the initializing process. All Mustang-200 listed in Qfinder Pro have to be initialized to finish the entire initializing process.

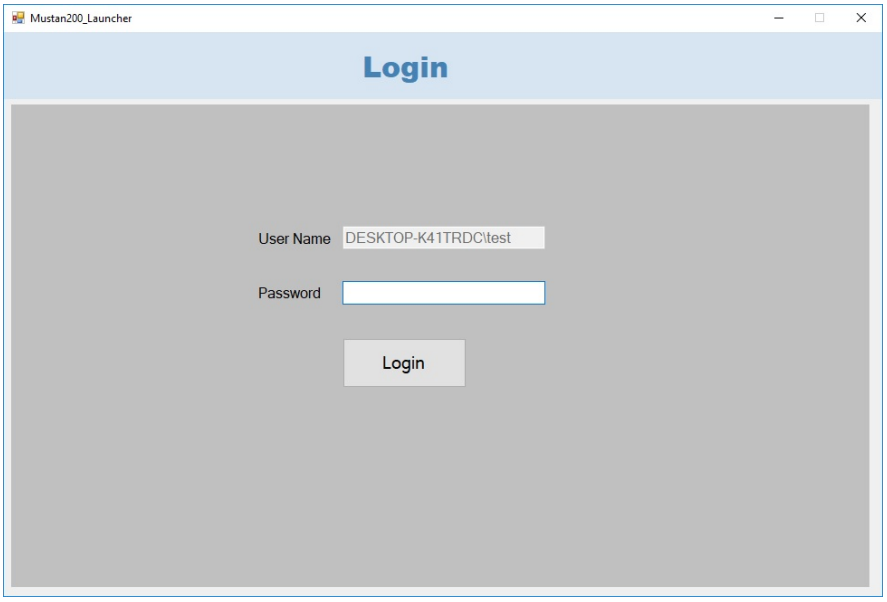


5.3.3 Mustang-200 Utility Installation and Network Setup

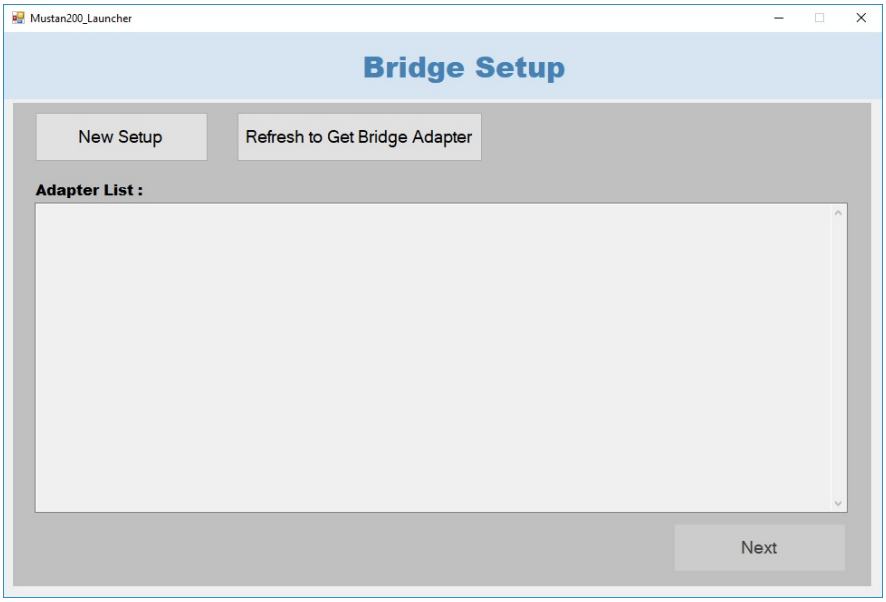
Step 1: Run the Mustang-200 utility file (Mustang200_Utility_v1xx.exe). The utility installation wizard will guide you along the way to complete the installation.



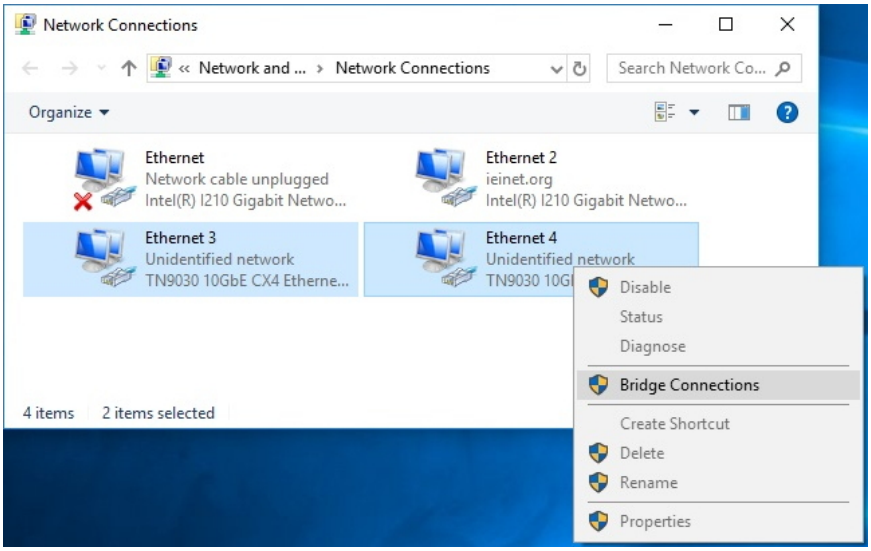
Step 2: Run the utility and log in using the password of the computer installed with Mustang-200. The password field should not be left blank. If there is no password for the computer, create one for it.



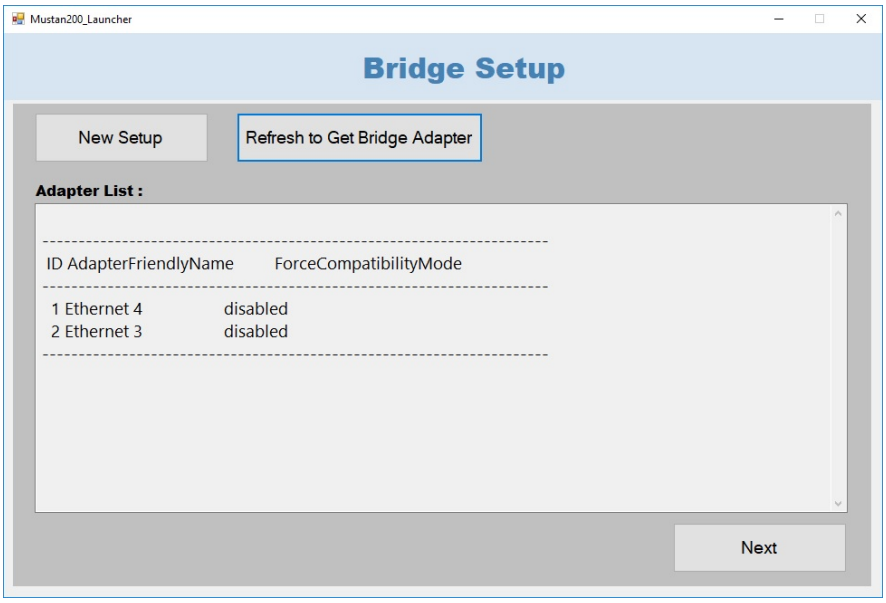
Step 3: The following window appears.



Step 4: For the first time user, please setup network bridge by following the procedures below. Use the **Windows key + X** to open the Power User menu and select Network Connections. Select both TN9030 Ethernet adapters. Right click the selection and click **Bridge Connections**.

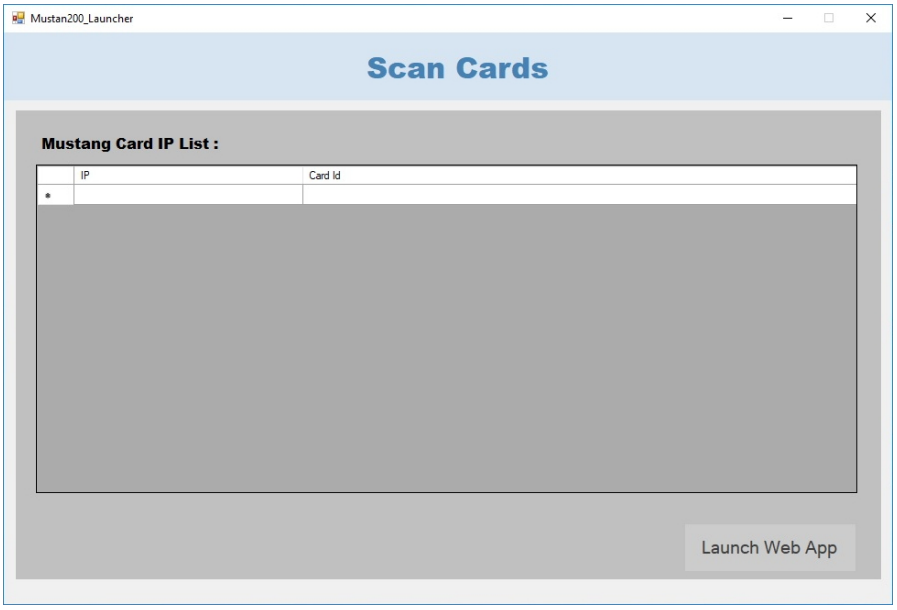


Step 5: Click **Refresh to Get Bridge Adapter**. The two Ethernet adapters are added in the list. Click **Next** to continue.

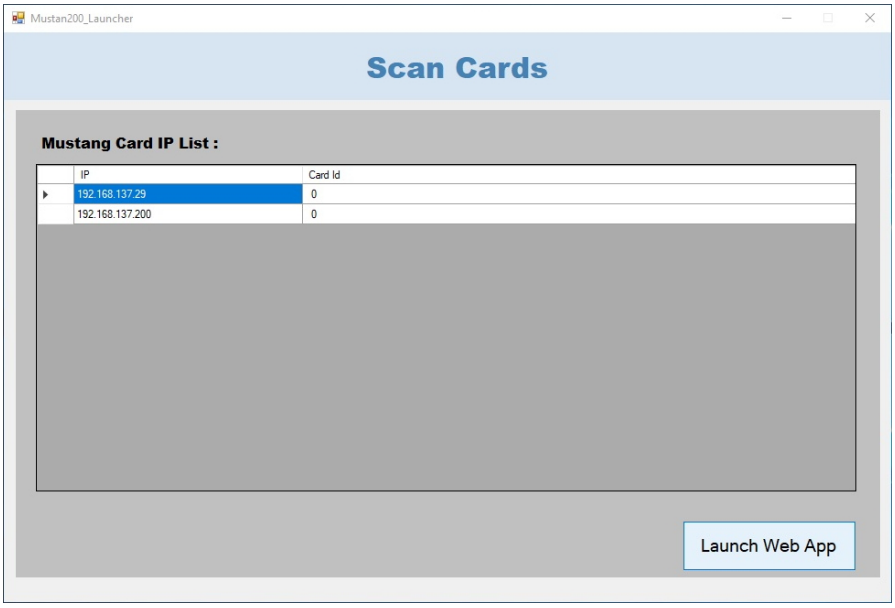


Step 6: Select a interface (Ethernet) for public connection; select the bridge (Network Bridge) setup in the previous steps for private connection. Click the **Enable ICS** button. Then, click **Next** to continue.

Step 7: The following screen appears. The program automatically starts getting the IP address of the Mustang-200.

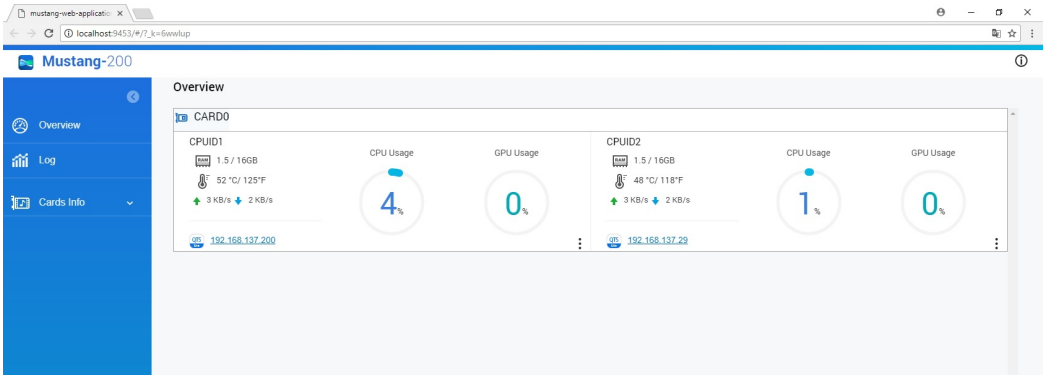


Step 8: The IP addresses of all Mustang-200 cards installed in the computer will be listed (two IP addresses per card). Click the **Launch Web App** button.



Step 9: The Mustang-200 web application will be opened automatically in a web page.

Refer to **Chapter 6** for more detail about the web application.



Chapter

6

Web Application

6.1 Web Application Introduction

The Mustang-200 Web Application handles all the features of Mustang-200. It was developed based on the Host API. So developers can refer to this application to call APIs in their application. It is released under open source license, allowing users to modify it to meet their requirements.

The Web Application is capable of handling multiple Mustang-200 cards. The user can manage and monitor all of the cards using this application. Also you can navigate to the Mustang-200 operating system named QTS Lite by clicking the QTS icon in the application. QTS Lite is a lightweight custom operation system developed by QNAP.

The Web Application is capable of VOD (file to live), Live (live to live) and File (file to file) scenarios. Each transcoding scenario can be created using simple wizard steps. The Web Application also builds with Media Player to view the video when VOD or Live job that is running.

6.2 Developer Installation Guide

The IEI Web Application is developed based on React JS and Node JS Frameworks. It allows developers to modify it to meet their requirements. To modify the application, follow the guide below.

Step 1: Install Mustang-200 Host SDK as described in **Chapter 4**.

Step 2: Go to https://download.ieiworld.com. Search for Mustang-200, and download **MVT_Web application_V1.xx.zip**. Unzip and save the **MVT_Web application_V1.xx** folder inside a path in the system.

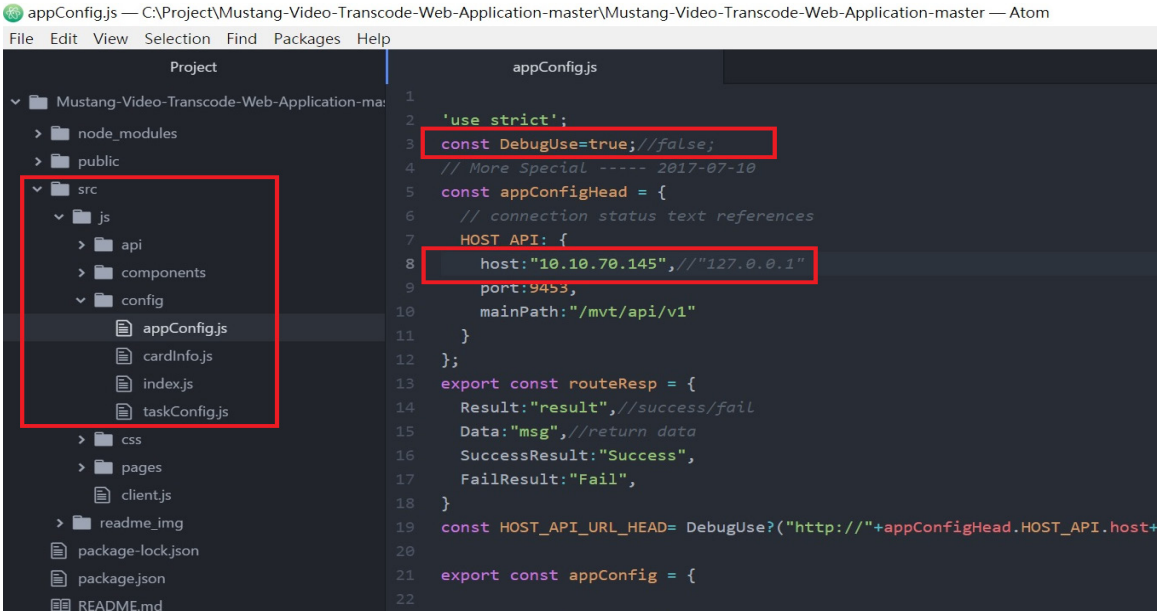
Step 3: Run with debug mode (developer's PC).

1) Set file: "/src/js/config/appConfig.js" parameter→ "const DebugUse=true;"

appConfigHead.HOST_API.host = host Ip appConfigHead.HOST_API.port = host port

2) npm run dev

3) Open local web page: url is localhost:8080



Step 4: Run in host sever

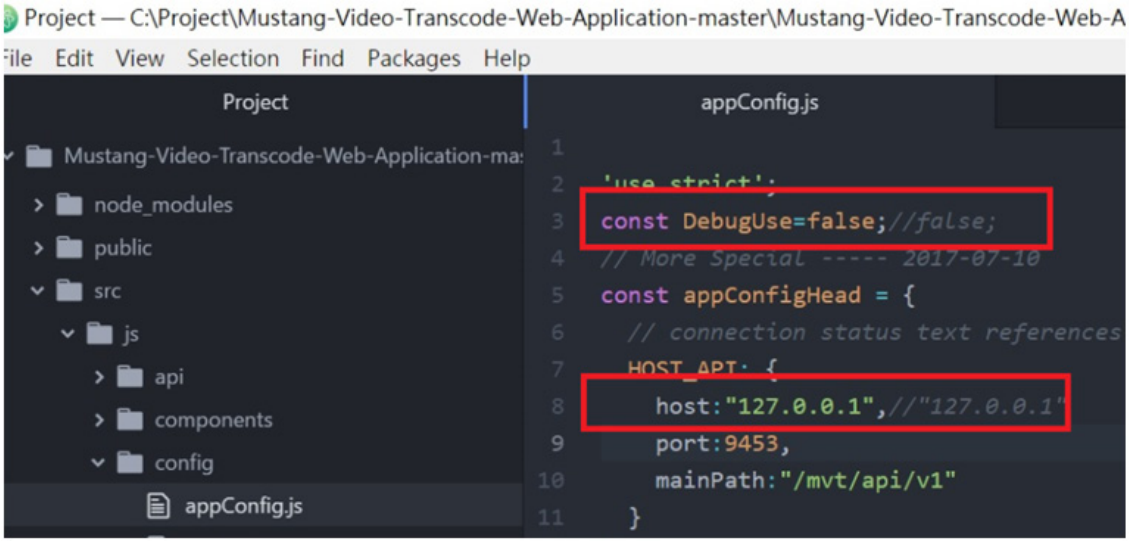
1) Set file: "/src/js/config/appConfig.js" parameter → "const DebugUse=false;"

2) Modify DebugUse and host IP

3) npm run build_dev

4) Copy the application's "/mustang-web-application-master/public" folder to replace the "/mvt_host/public" folder of Host SDK.

5) Open web page: url is hostIP:hostPort



6.3 How to Access

To access IEI web application without changing its function, follow the guide below.

6.3.1 Linux System

Prerequisites:

Install Mustang-200 Host SDK as described in **Chapter 4**.

How to:

Open a web page in Google Chrome browser and type the URL which is **hostIP:hostPort** (e.g. 10.10.70.42:9453)

6.3.2 Windows System

Prerequisites:

Install Mustang-200 driver and utility as described in **Chapter 5**.

How to:

Open a web page in Google Chrome browser and type the URL which is **hostIP:hostPort** (e.g. 10.10.70.42:9453)

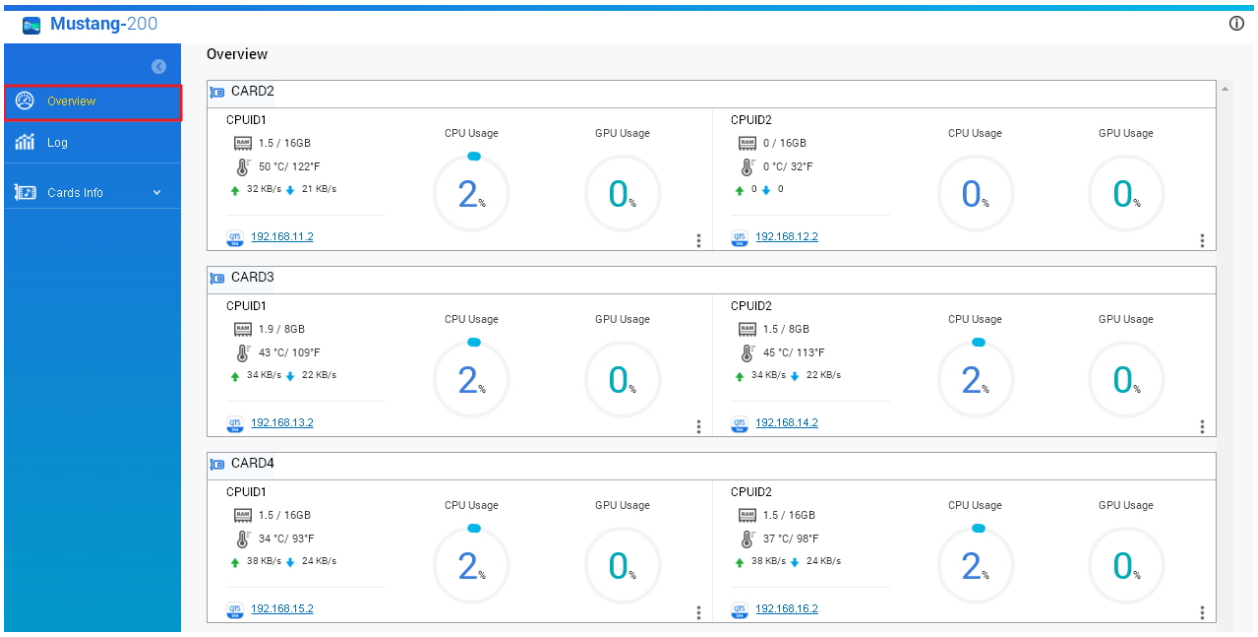
6.4 Interface Overview

The Web Application has four main pages that provide users entire streaming application needs.

6.4.1 Overview

The Overview page provides a whole picture of system status which include

- Number of cards installed in the system.
- Individual CPU and GPU usage.
- System information (including RAM, temperature, speed and IP addresses).
- Navigating to individual CPU



NOTE:

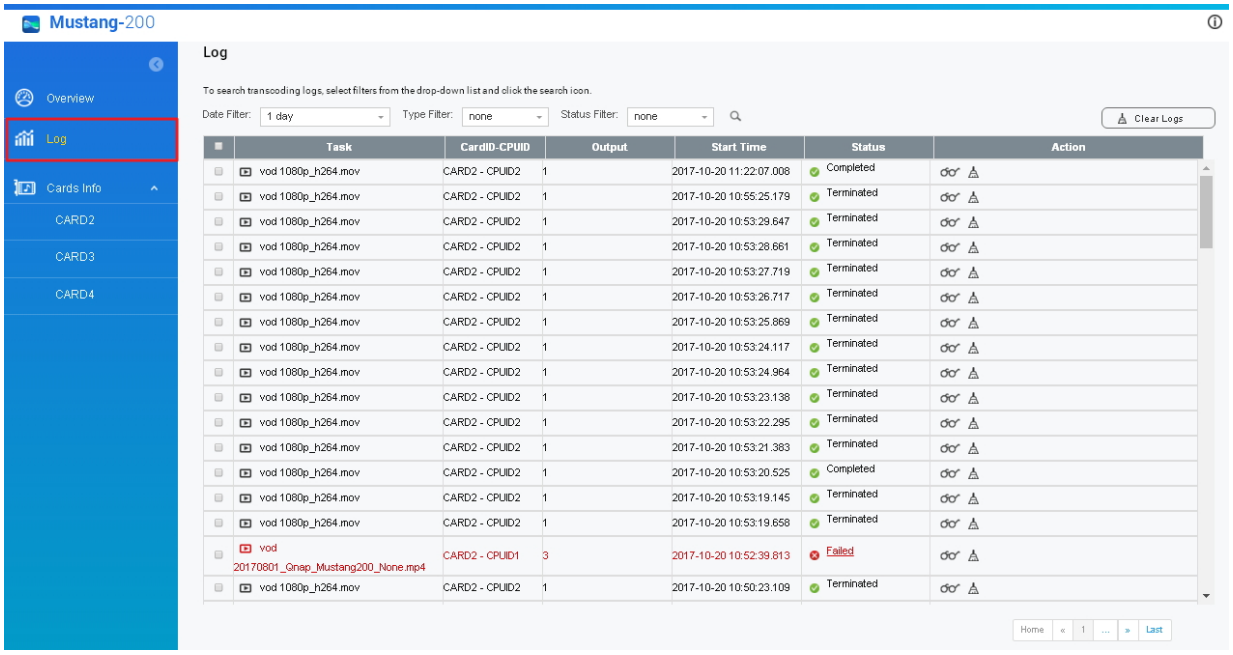
Users can login to QTS Lite OS by clicking the IP address link. The default username and password for QTS login are:

- **Username**: admin
- **Password**: admin

6.4.2 Log

The Log page shows the log of the tasks. The user can search a log by using the filter and clicking on the page. The History page gives the following task information:

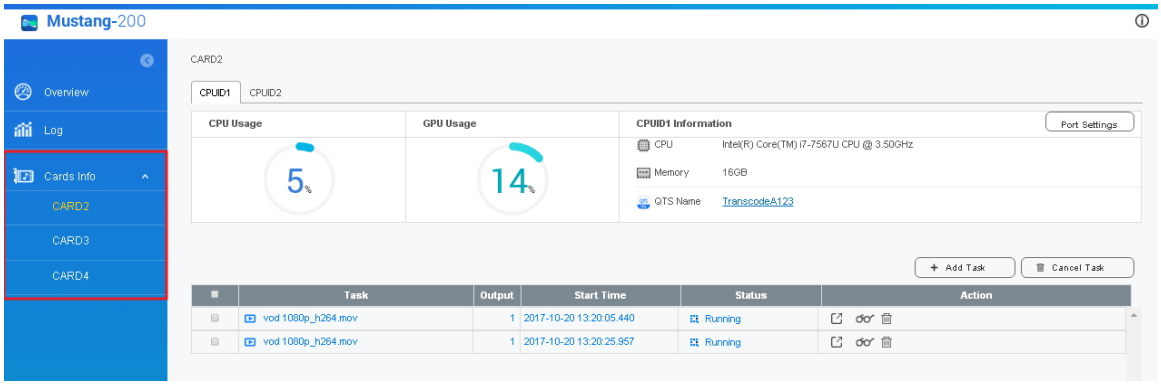
- Task name
- Card ID
- Output
- Start time
- Status
- Action (click to view the transcoding summary; click icon to clear the log)



6.4.3 Cards Info

The Cards Info pages show information about individual cards. The user can also assign task in this page. It card page gives the following information:

- Card ID
- CPU and GPU usage
- CPU information:
  - CPU
  - Memory
  - QTS Name: Login to QTS OS by clicking the link. Name can be edited by rolling over the original name and clicking icon.
- Port settings (see **Section 6.4.3.1**)
- Tasks and task status
- Add/Cancel tasks (see **Section 6.4.3.2**) and clear logs



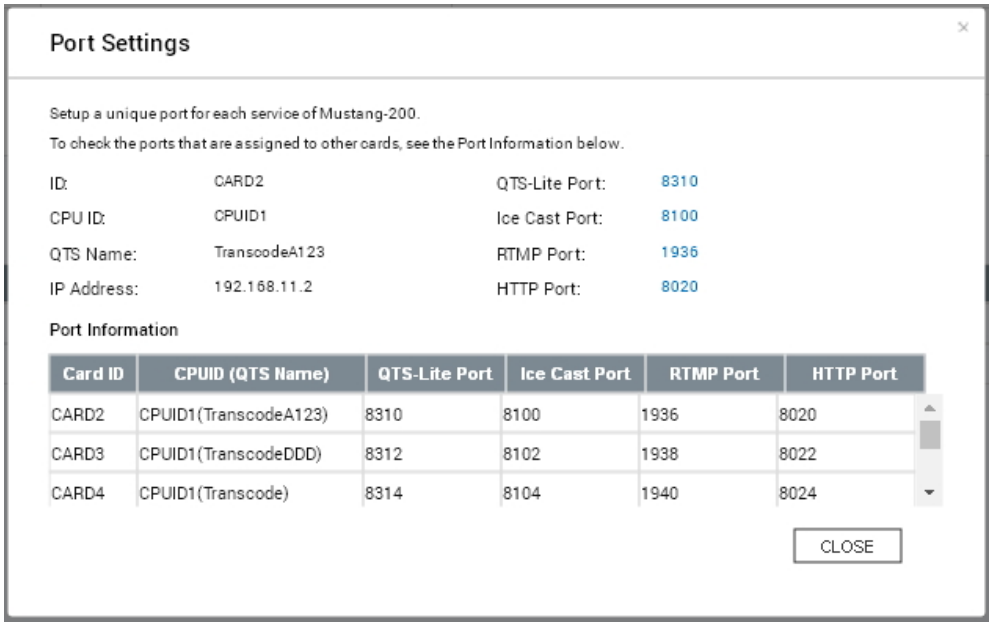
NOTE:

The task logs displayed on this page will be eliminated automatically after few minutes. To check the log history, please go to the Log page.

6.4.3.1 Port Settings

This is a sub page from the card page. After clicking the **Port Settings** button, the Port Settings page will appear with the network information regarding how this card is connected to host system. The Port Settings page contains the following information:

- Card ID and CPU ID
- QTS name
- IP addresses
- Port information for QTS and protocols (Icecast, RTMP, HTTP)



NOTE:

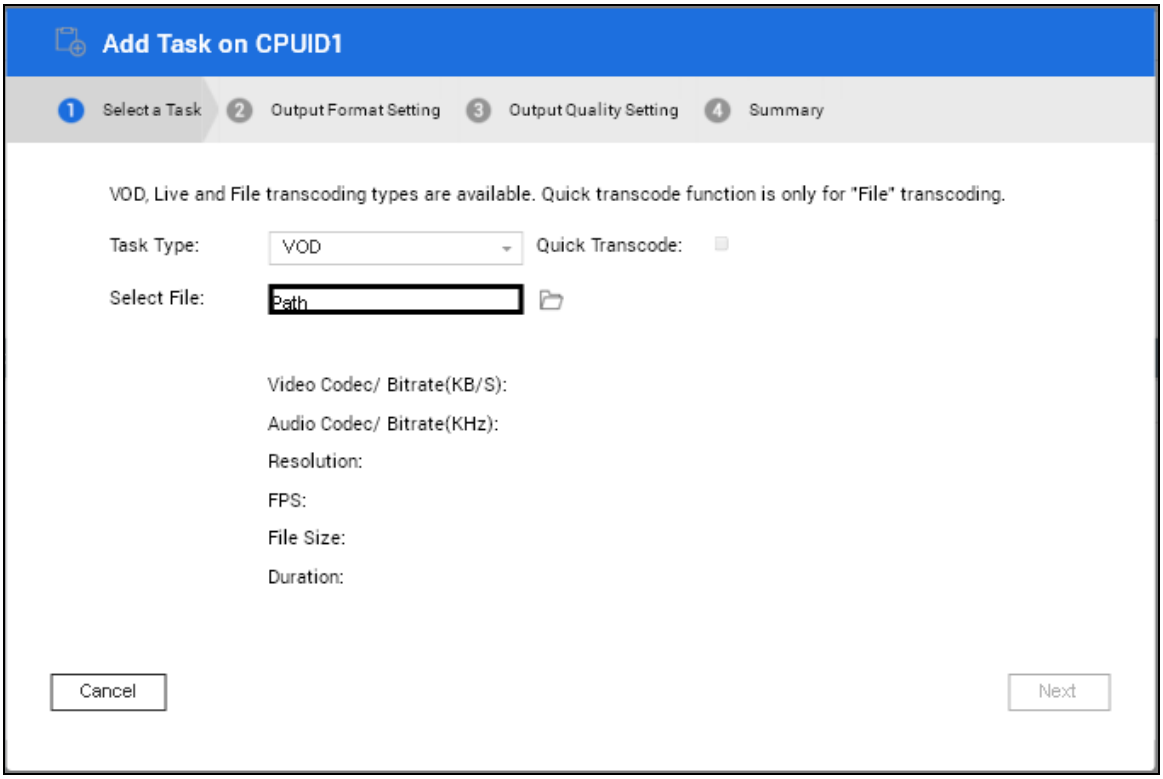
The Icecast, RTMP, HTTP and QTS ports can be changed by rolling over the blued port numbers on the page and clicking icon. Please be noted that setup a unique port for each service of the card. To check the ports that are assigned to other cards, see the Port Information table.

6.4.3.2 Add Task

This is a sub page from the card page. After clicking the Add Task button to add new task, this wizard page will appear. A sequence of wizard steps will guide the user to setup transcoding tasks.

- Select the task type and the file path
- Output Format Setting (including protocols, file type, video & audio codec information)
- Output Quality Settings (including resolution, frame rate and bitrate / QP value)
- Summary

Detailed description of adding a transcoding task can be found in **Section 6.6**.



6.5 Transcoding Specifications

The table below lists the transcoding specifications supported by the web application of the Mustang-200.

Video File Format	H.264/MPEG-4/AVC H.265/HEVC /UHD/4K VP8 VP9 MPEC2
Audio File Format	AAC MP3 Vorbis Copy Disable
Streaming Format	RTMP HLS MPEG-DASH ICECAST
Resolutions	3840 x 2160 2560 x 1440 1920 x 1080 1280 x 720 858 x 480 640 x 360 426 x 249
Video Bit Rate	1 Mbps ~25 Mbps
Frame Rate	24 fps ~ 60 fps
QP Value	1 ~ 50

Table 6-1: Transcoding Specifications

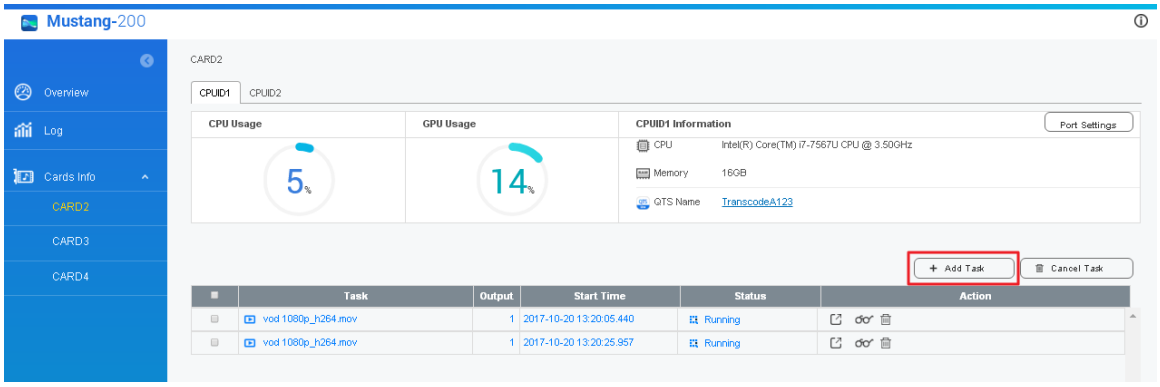
6.6 Examples

The following sections give step-by-step examples to help users learn to use the web application to assign transcoding tasks.

6.6.1 VOD Transcoding

The following example will teach you how to transcoding 4K HEVC to 4K H.264 codec for VOD RTMP streaming.

Step 1: Click **Add Task** on Card Page.

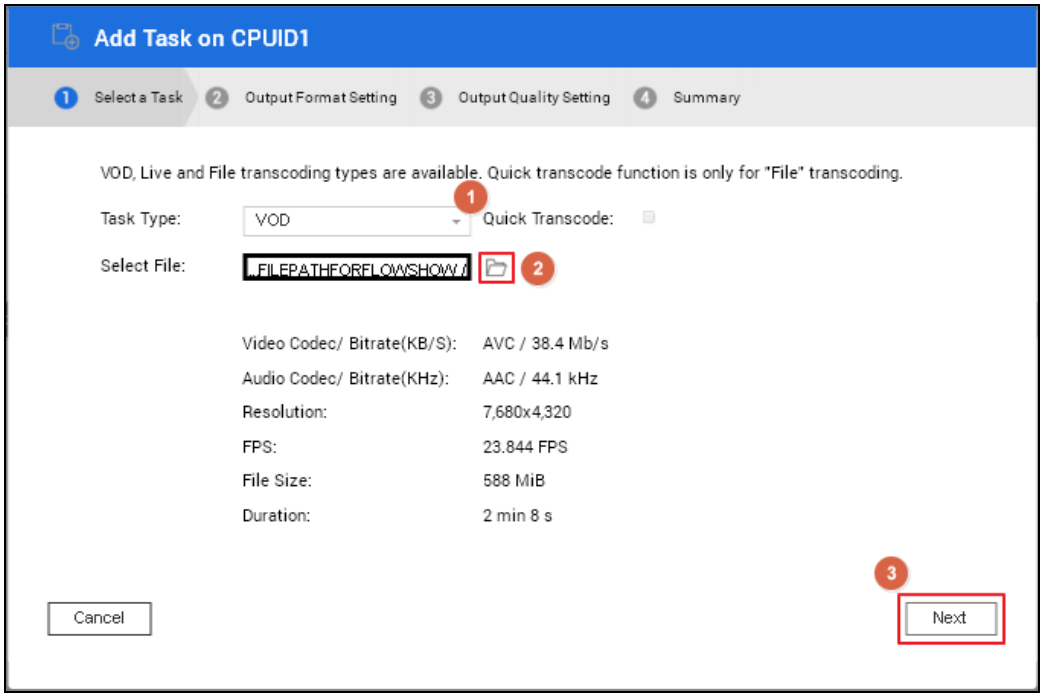


Step 2: Select a Task

1) Select Task Type as VOD

2) Browse and choose 4K input file (To select a folder, double-click on it). Once a file is selected it will display the file information.

3) Click **Next** to continue.



Step 3: Output Format Setting:

1) Choose output streaming RTMP

2) Video Codec: H.264

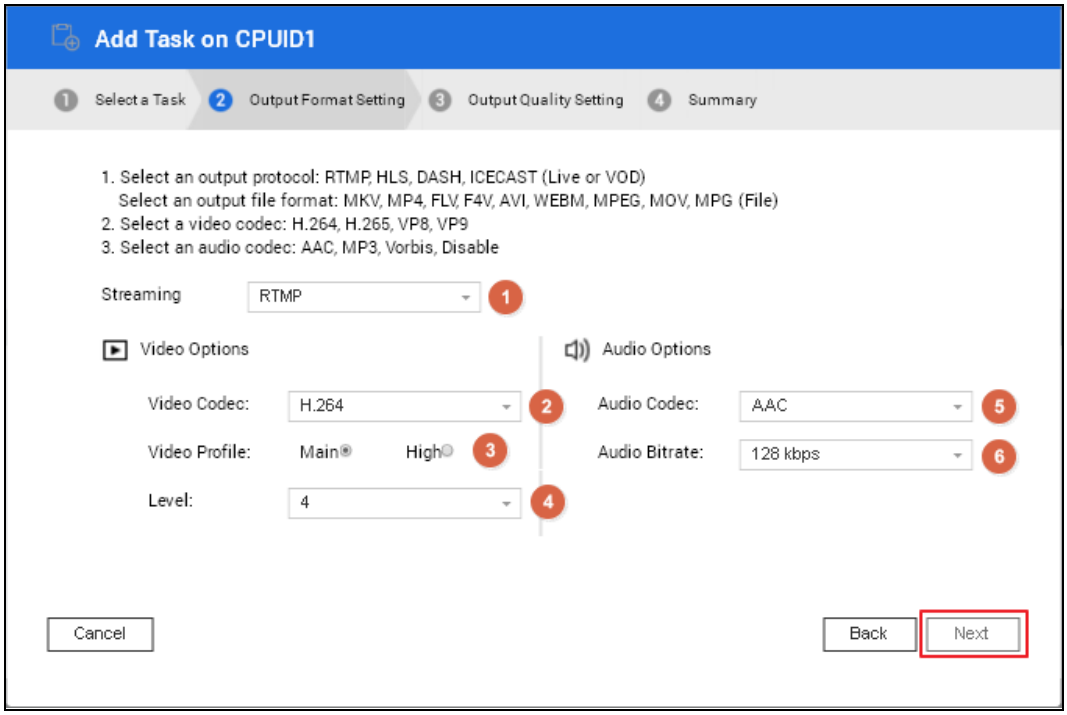
3) Profile: Main

4) Level: 4

5) Audio Codec: AAC

6) Audio Bitrate: 128 Kbps

Click **Next** to continue.



Step 4: Output Quality Settings:

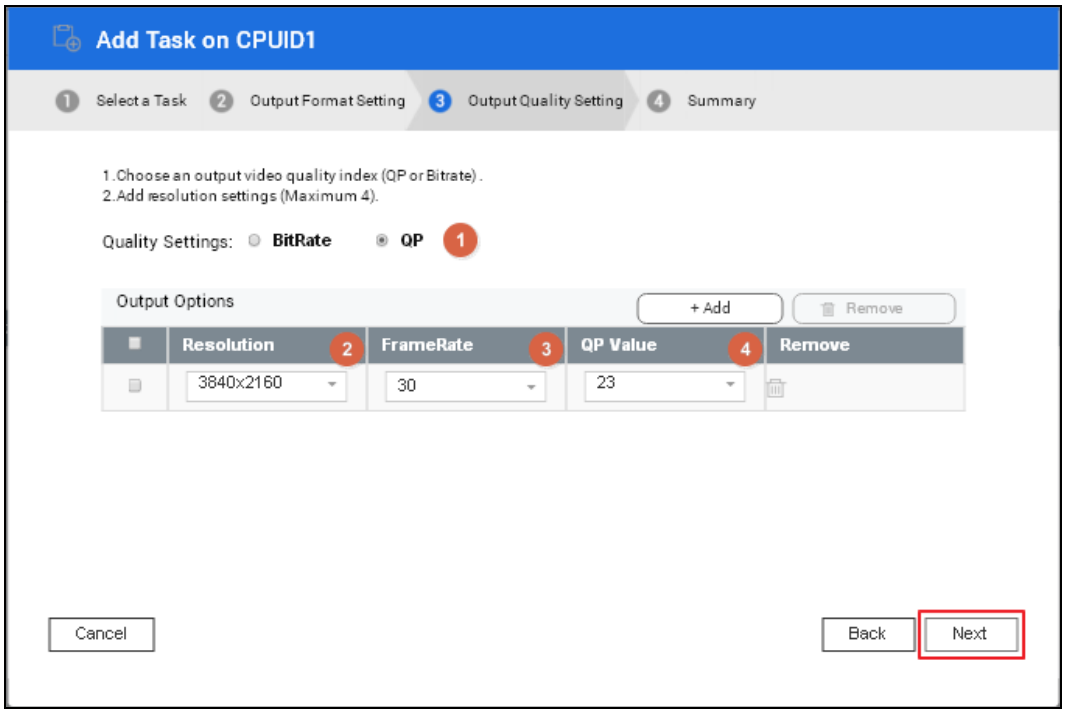
1) Select quality as **QP**

Select the number of outputs by adding the following settings:

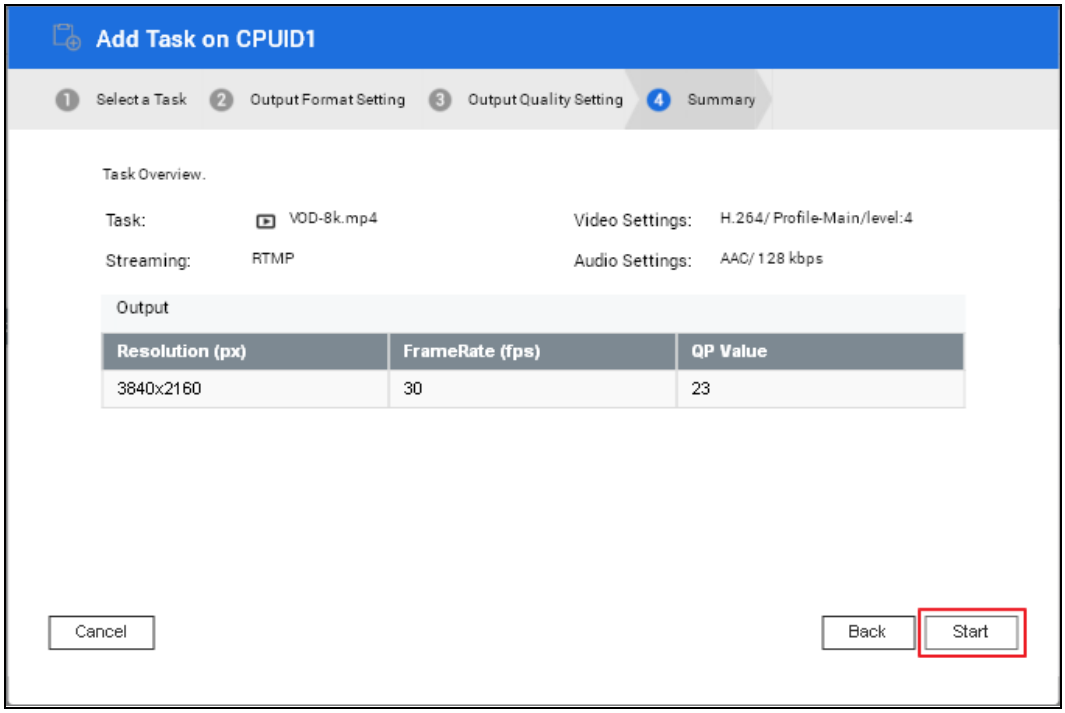
2) Resolution: 3840x2160 (4K)

3) Frame Rate: 30

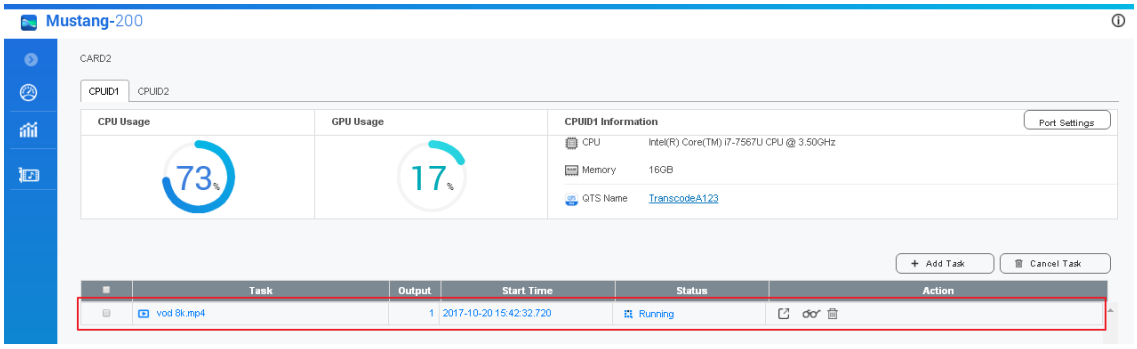
4) QP Value: 23



Step 5: The Summary page displays all the selected information. Transcoding will begin after clicking the **Start** button.

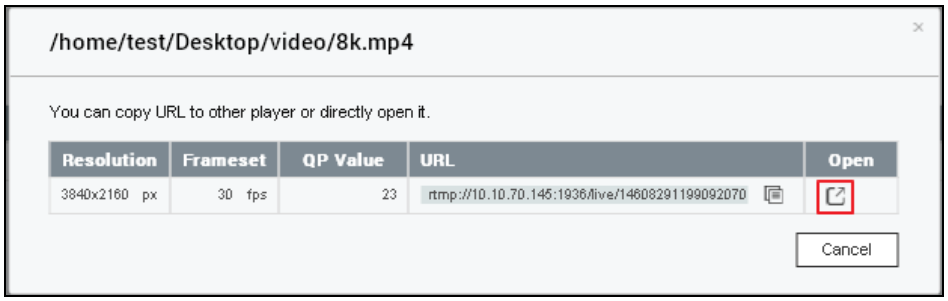


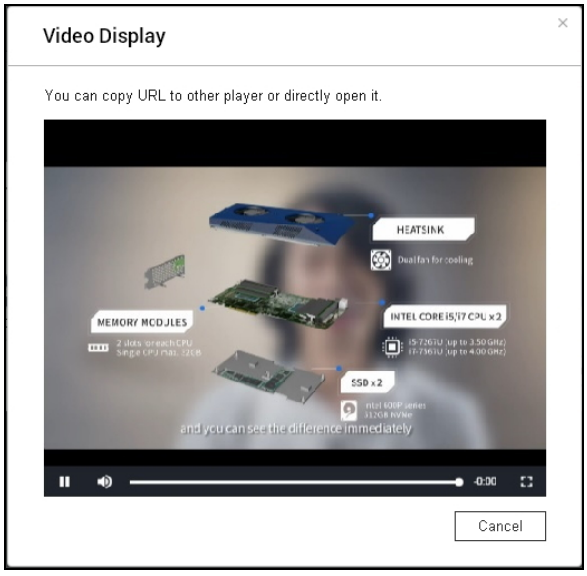
Step 6: The transcoding task is added to the list.



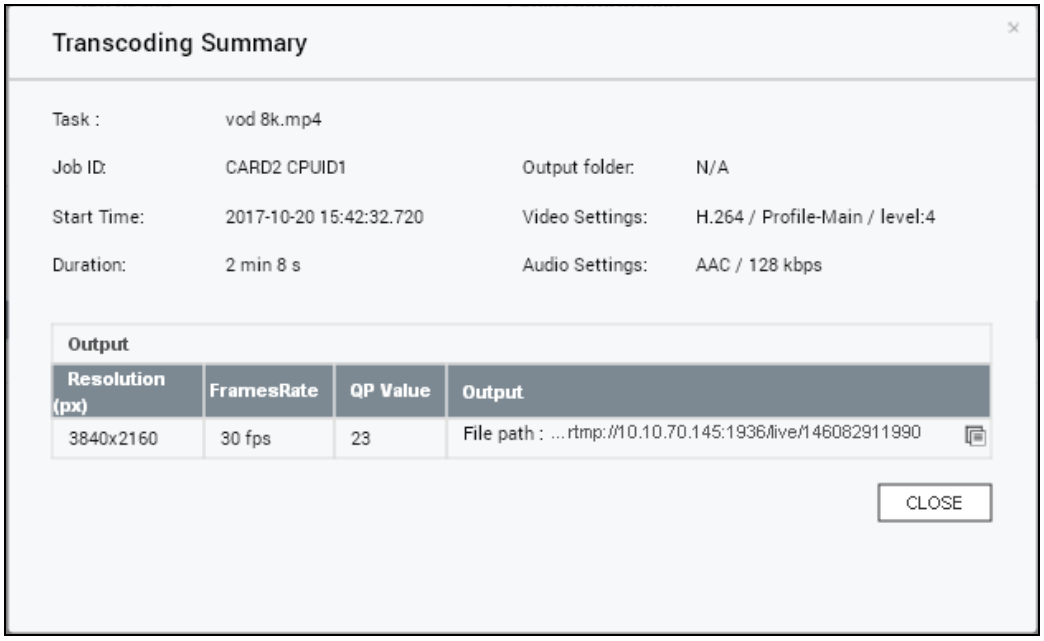
Step 7: Click on the card page. The following page with task information appears.

Click the icon to preview the video in media player.





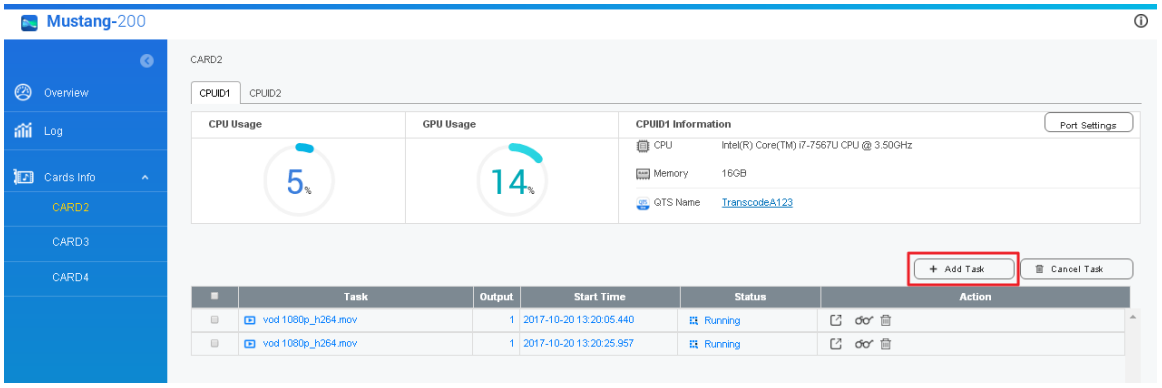
Step 8: Click on the card page to view the transcoding summary.



6.6.2 File Transcoding

The following example will teach you how to transcoding H.264 4K to 4K H.265 (HEVC) codec.

Step 1: Click **Add Task** on Card Page.



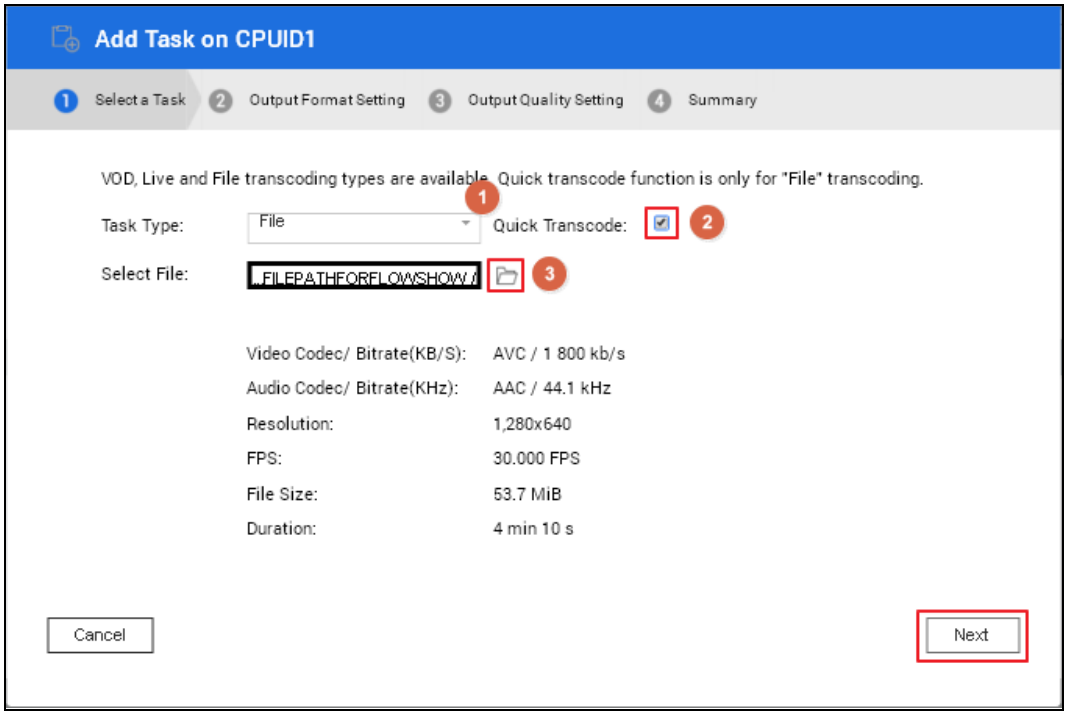
Step 2: 1) Select "**File**" as the Task Type.

2) Enable "**Quick Transcode**" to complete transcoding process quicker. Quick Transcode uses maximum GPU resources to transcode faster.

3) Browse and choose a 4K input file. Once a file is selected, its information will

be displayed.

Click **Next** to continue.



Step 3: Output Format Setting:

1) Choose output file format: MKV

2) Video Codec: H.265

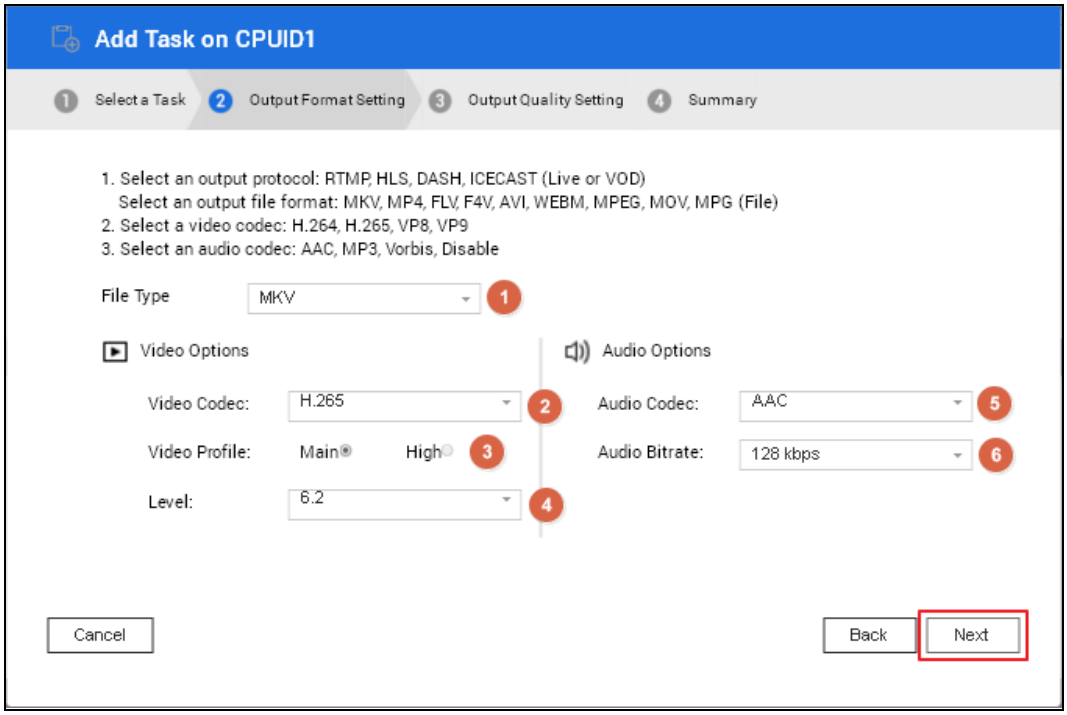
3) Profile: Main

4) Level: 6.2

5) Audio Codec: AAC

6) Audio Bitrate: 128 Kbps

Click **Next** to continue.



Step 4: Output Quality Setting:

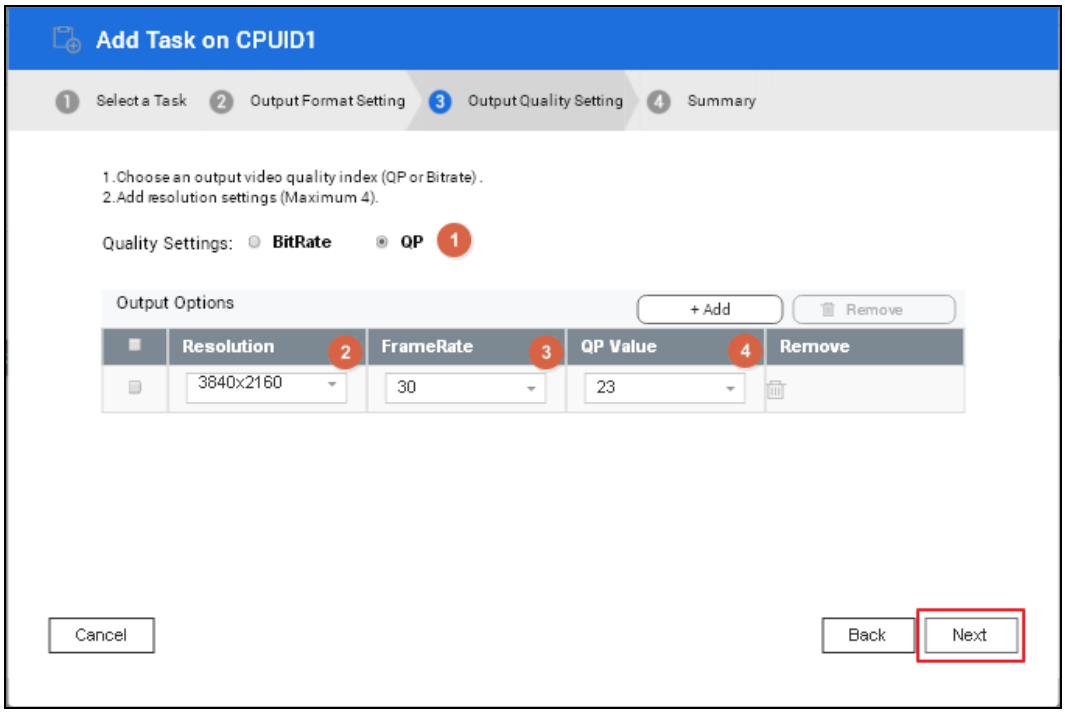
1) Select quality as **QP**

Select the number of outputs by adding the following settings:

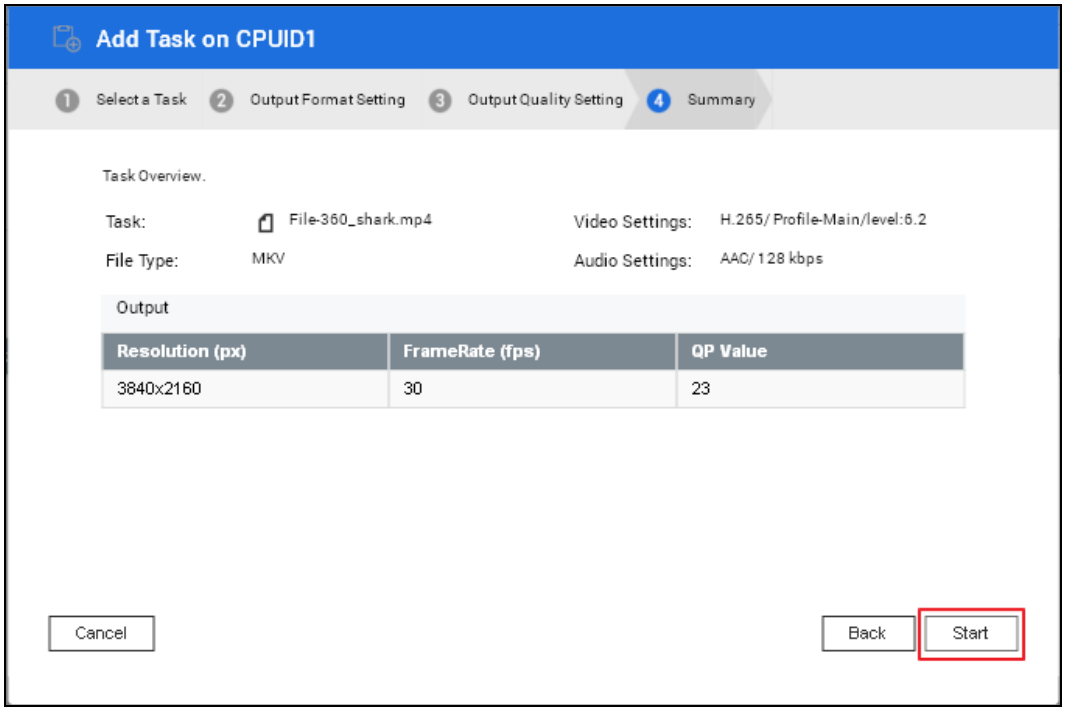
2) Resolution: 3840x2160 (4K)

3) Frame Rate: 30

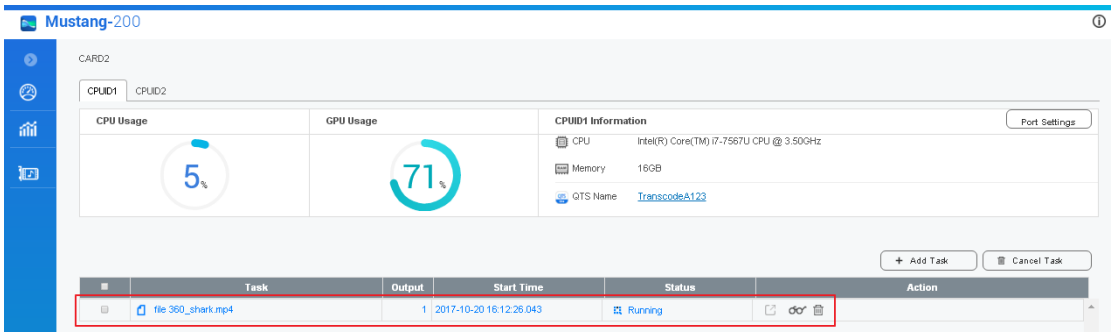
4) QP Value: 23



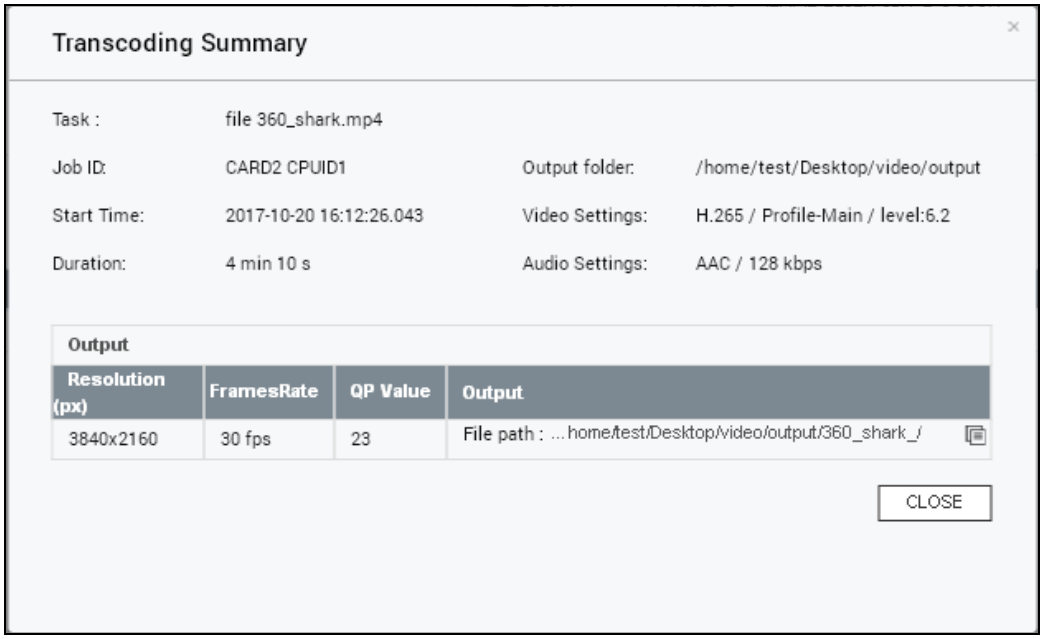
Step 5: The Summary page displays all the selected information. Transcoding will begin after clicking the **Start** button.



Step 6: The transcoding task is added to the list.



Step 7: Click on the card page to view the transcoding summary.



Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

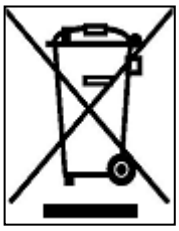
Product Disposal

CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union – If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union – The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

Hazardous Materials Disclosure

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。