ASUS NUC Pro Software Suite

User Guide

V4.1

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NUC Group,
ASUSTeK COMPUTER INC.

Revision History

Version	Date	Description of Changes
4.0	June 18 2024	Initial Release
4.1	Sep 20 2024	Updated Arena Canyon and Liberty Canyon support

Table of Contents

1 Introduction

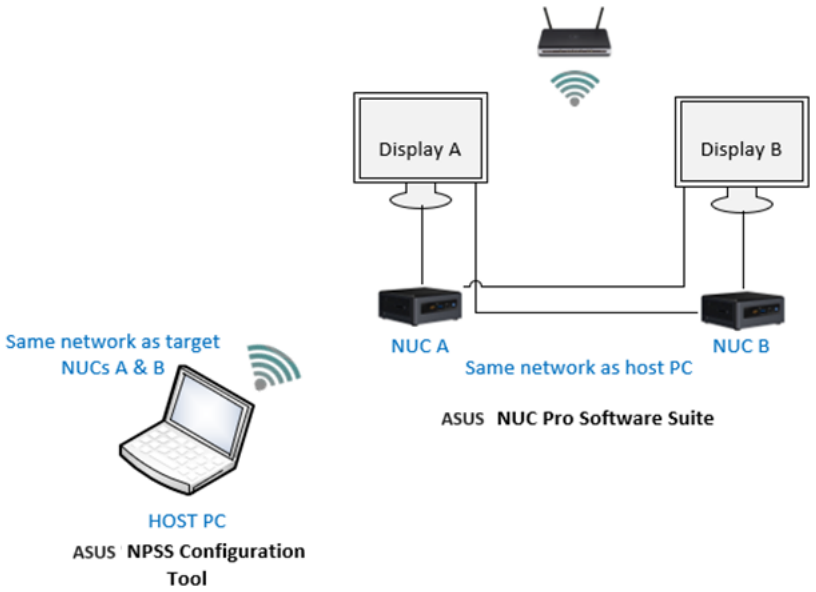
1.1 Overview

The **ASUS NUC Pro Software Suite** monitors unattended applications and provides redundant screen services for digital signage applications. Key capabilities of this tool include:

- Terminate and relaunch the application when targeted application becomes unresponsive.
- Gracefully shutdown or restart OS whenever it detects a target application failed x + times – as specified by the user, since the last Windows boot.
- Log application monitoring activity to easily accessible log file.
- This utility can enable hardware watchdog timer to execute a hard system reset if a monitored application causes system to become unresponsive.
- Manage Failover NUCs when a given NUC goes down due to power or network failure.
- Hardware Diagnostic feature runs diagnostics on HDMI-CEC WMI interfaces exposed by NUC ACPI BIOS
- Application monitoring LED capability (supported on **ASUS NUC 13 Rugged only)**
- Remote server monitoring (supported on **ASUS NUC 13 Rugged only)**

ASUS NUC Pro Software Suite – Configuration Tool provides step by step instructions to configure the target NUCs (primary and secondary) and the display between the NUCs. For the player failover feature to successfully work, it is critical to follow the instructions provided in the Installation and Configuration Guide. However, this configuration tool is not needed for basic application monitoring.

The below image explains the overall topology of the application and configuration tool.



Software components are:

1. ASUS NUC Pro Software Suite and drivers installed on the target NUC
2. ASUS NUC Pro Software Suite – Configuration Tool installed on the host PC

1.2 Supported NUC Products

1. ASUS NUC 13 Rugged NUC13BR
2. ASUS NUC 13 Pro Board / Kit / Mini PC NUC13AN
3. ASUS NUC 13 Pro Board / Kit NUC13L3, NUC13L5

1.3 Hardware and Network Requirements

1.3.1 Configuration Tool Host PC

The Configuration Tool host PC must be on the same managed IPv4/IPv6 network subnet as the two client NPSS NUCs.

1.3.2 NUC Clients and Host PC

1. Up to four NPSS Supported NUC Platforms from section 1.2 “Supported NUC Products”.
2. HDMI CEC-Use Consumer Electronics Control supported displays. Make sure to review specifications of televisions before buying them and make sure all HDMI ports support CEC specification. In hands-on lab tests, using two Samsung 1080P TVs, two Samsung 4K TVs, two LG 1080P, or two LG 4K televisions had the best support for HDMI CEC failover capabilities.
   NOTE: It is recommended to use the same resolution (1080P or 4K), same brand, and same model on both HDMI CEC compliant televisions for best NPSS results.
3. HDMI specification 2.0 or later compliant cables. Amazon Basics HDMI cables worked well in lab tests.
4. Keyboard & Mouse (Needed on all NUCs during NPSS Configuration Tool setup).
5. Both NPSS client NUCs and Configuration Tool host PC must be on the same managed network. This can be a wired or wireless connection to the same managed network router or switch.
6. A managed network environment. This means the environment needs an active router. The managed network can also include an active switch.
   NOTE: Non-managed passive hubs and passive switches are not supported.
7. Wired or wireless managed active network routers and switches are required using the TCP network protocol with DHCP to dynamically assign TCP IP addresses. The NUC Pro Software Suite depends on multicast packets to be actively broadcasted through a managed network router and switch so that NUCs can communicate with each other and the NPSS Configuration Tool host PC.
   a. NPSS supports both IPv4 and IPv6.
   b. Manual static addressing is not currently supported.
   c. Using a cell phone Wi-Fi hotspot is not currently supported. This is because the cell phone hotspot security can filter out NPSS network multicast packets.
8. Make sure both NUCs and Host PC, OS LAN and/or Wi-Fi network settings are set to “private network” mode so that ping commands can communicate between all PCs without being blocked by OS network settings.
9. Make sure OS firewall is not blocking multicast P2P traffic between NUCs and Configuration Tool host PC.
   a. Make sure multicast P2P messages are supported in your managed network router and not filtered out or blocked by the router or switch firmware.

1.4 Supported Operating Systems

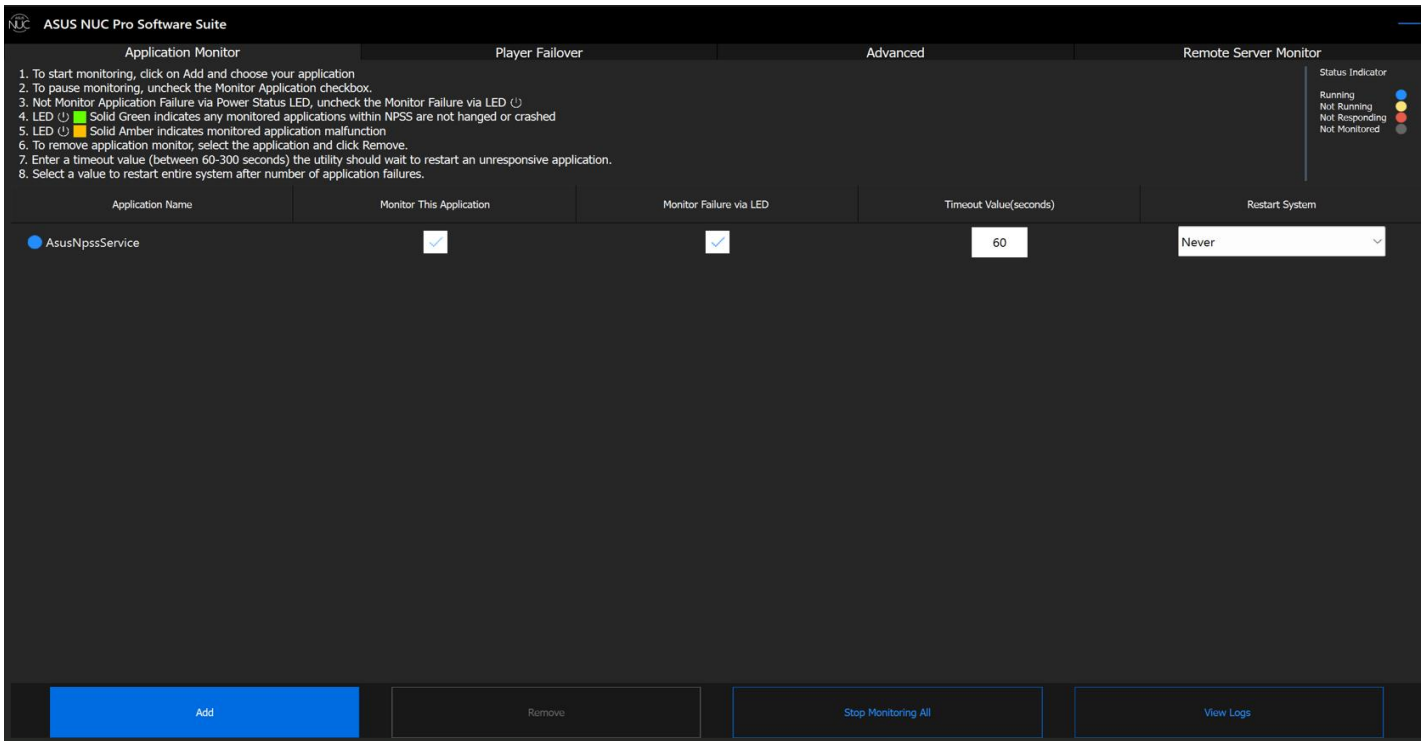
1. Windows 10 IOT Enterprise LTSC 2021
2. Windows 11 Pro 23H2
3. Ubuntu 22.04 LTS
   - Kernel versions 5.15.25, 5.15.28

2 ASUS NUC Pro Software Suite - Features

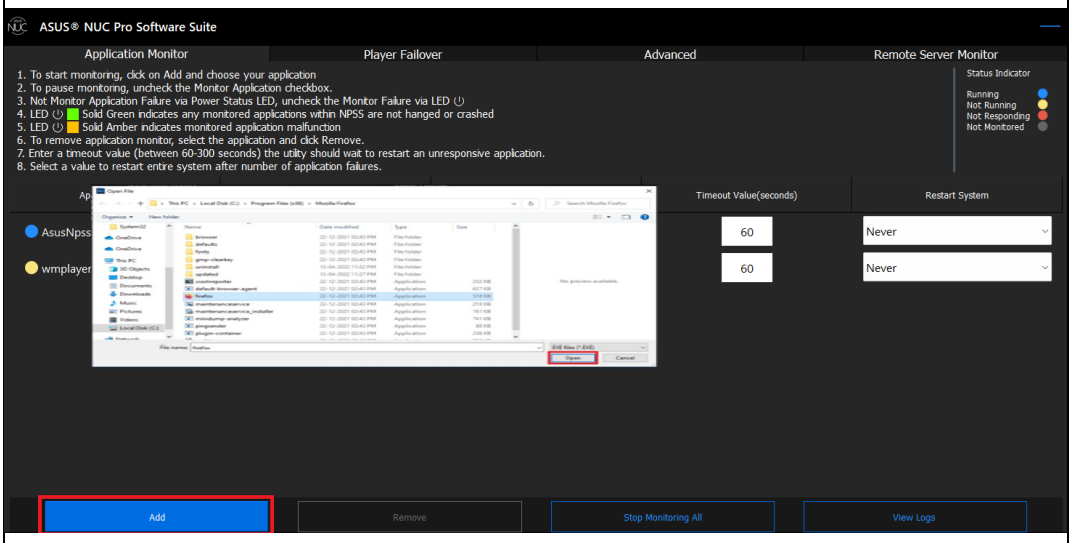
The ASUS NUC Pro Software Suite application supports the below key features:

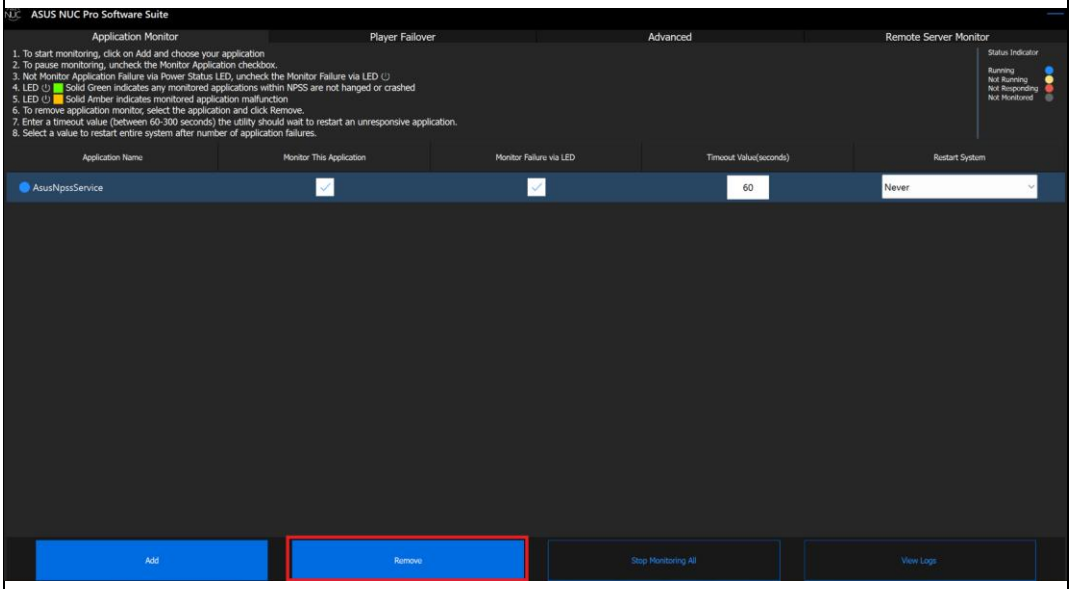
1. Application Monitor – to monitor the state of a running application.
2. Player Failover – where a backup NUC can take over a primary NUC.
3. Advanced features like HDMI diagnosis
4. Remote Server Monitor – configure and monitor remote server address (supported on **ASUS NUC 13 Rugged only)**

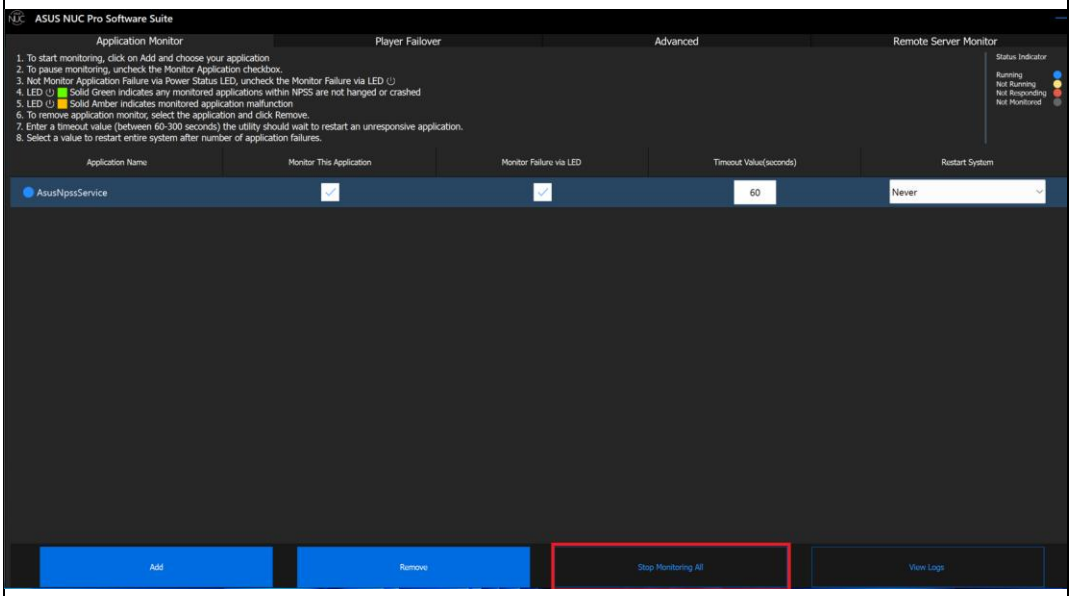
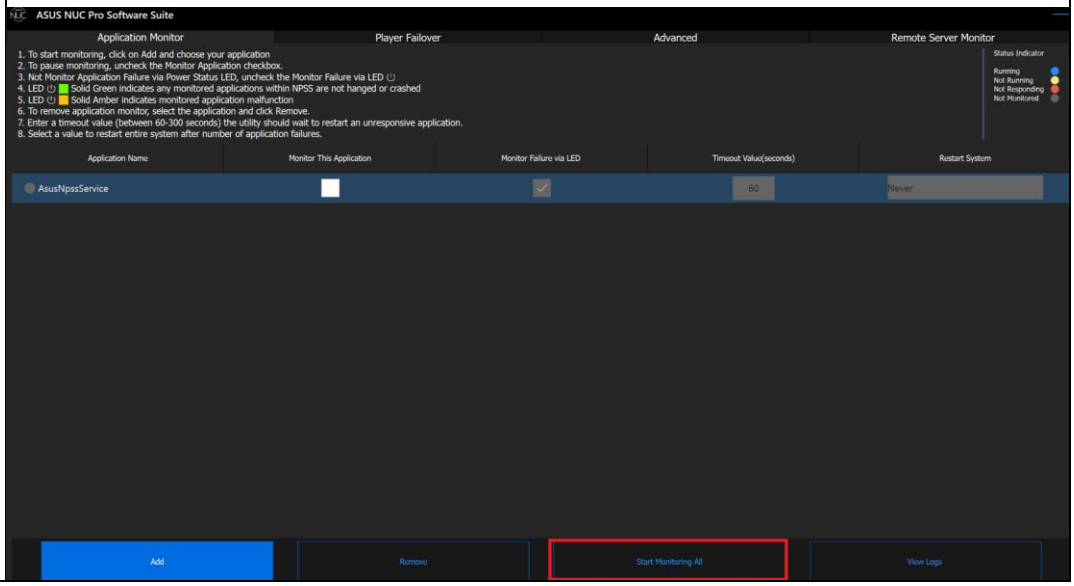
2.1 Application Monitor

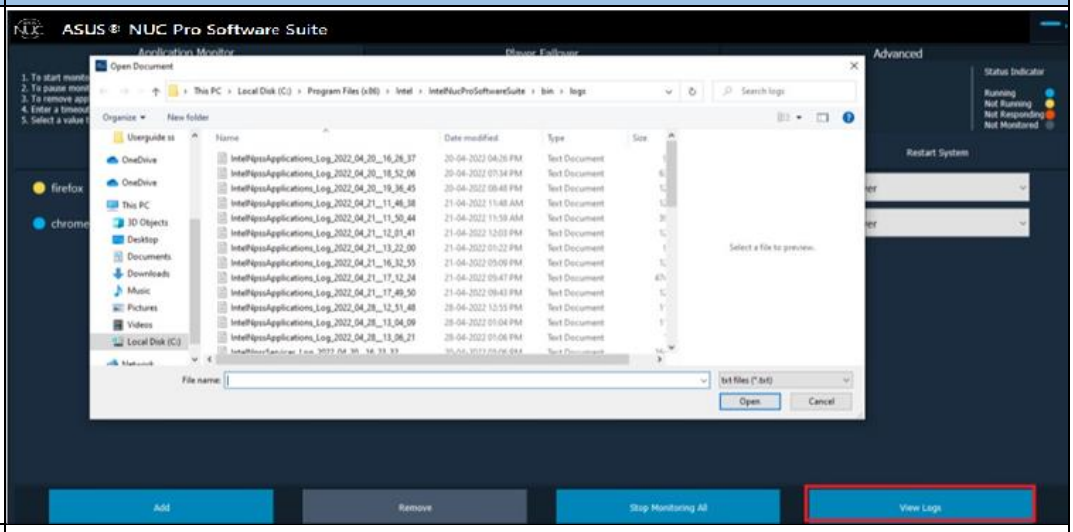
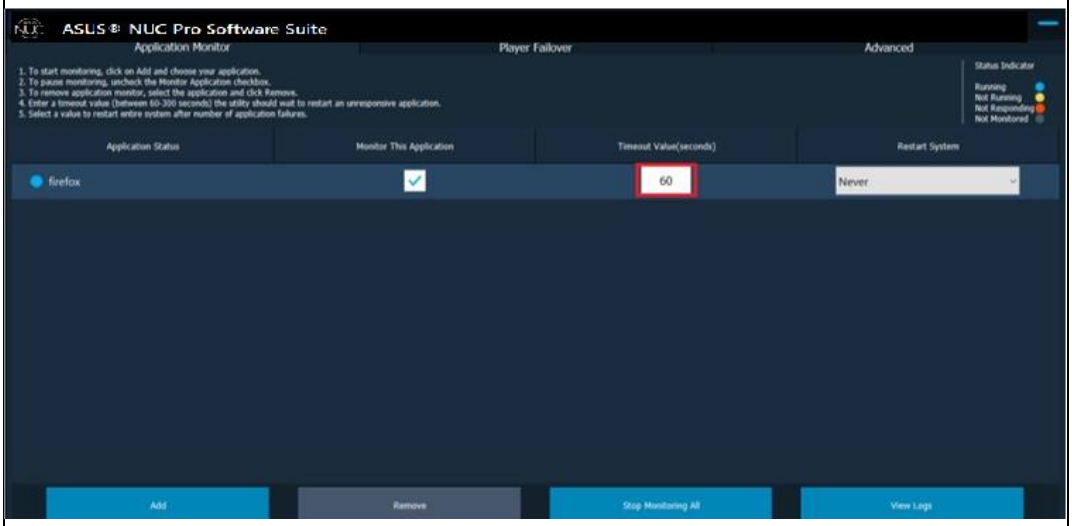
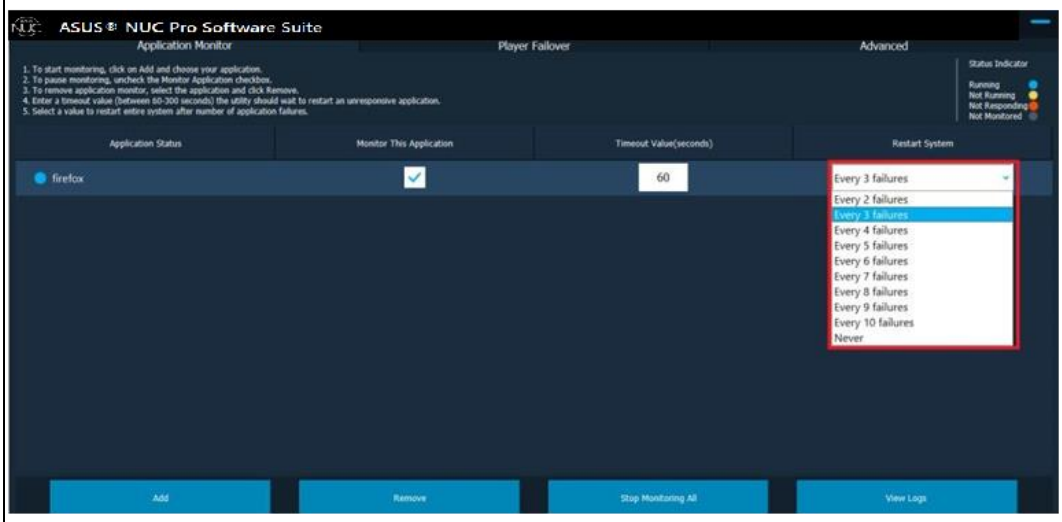


The Application Monitor tab monitors the running state of desktop applications based on four major status indicators. Below are the controls for Application Monitor tab:

Feature	User Interface
Add: Click 'Add' to add an application for monitoring.	

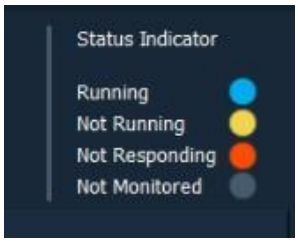
Remove: Select an application currently monitored and click 'Remove' to stop monitoring.	

Feature	User Interface
Start/Stop Monitoring All: Click this button to start/stop monitoring all added desktop applications at once.	 

Feature	User Interface
View Logs: Click View Logs to open the captured logs for every activity during runtime.	
Timeout Value (seconds): The user can enter the time in seconds in the Timeout textbox. When the application is not responding for the given time, the ASUS NUC Pro Software Suite will restart the application.	
Restart System: Click the Restart System dropdown to select the restart occurrence. When the application is not responding for the selected times, the system will restart.	

2.1.1 Application Monitor - Status Indicator

The Application Monitor can monitor a maximum of five applications at a time. The added applications are monitored based onfour major status indicators. The below table describes the status and corresponding color indicator.

Indicator	State
 These status along with the color indicators are displayed on the Application Monitor tab and also in the system tray of the ASUS NUC Pro Software Suite application.	Running status indicator helps identify the applications in the Running mode. (Cyancircle) Not Running status indicator helps identify the applications which are no longer running. (Yellow circle) Not Responding indicator helps identify an application in error state or when notresponding. (Red circle) Not Monitored indicator helps identify applications which are no longer monitored by the system. (Gray circle)

2.1.2 Application Monitor – LED Indicator (on ASUS NUC 13 Rugged only)

The 'Monitor Failure via LED' feature allows users to be notified of the status of the monitored application in the LED of the hardware.
ASUS NUC 13 RUGGED supports 6 rear panel RGB LEDs as indicated in the image below.

- LEDs A-C are located near Power Button.
- LEDs 1-3 are located above the LAN ports

Indicator	State	
System Status LED A	This LED indicates the power status of the NUC and supports tricolor(red/amber/green)	
	Condition	LED Color
	OS loaded successfully (normal operation)	Green
	All monitoring applications are running successfully.	Green
	No application added into monitoring	Green
	One of the monitored application malfunctions	Amber
	No bootable device error	Red

<table>
<tr><td>System Status LED B</td><td>This LED indicates persistent display emulation status and CANNOT be configured from the NPSS User Interface. This can be only programmed from the EC firmware.</td></tr>
<tr><td>System Status LED C</td><td>This LED indicates the Player Failover status of NPSS application and supports tricolor (red/amber/green).
If NPSS is not installed, LED C will remain in Off state.
<table><tr><th>Condition</th><th>LED Color</th></tr><tr><td>Cable disabled or unconfigured</td><td>Off</td></tr><tr><td>Normal operation of NUCs</td><td>Solid Green</td></tr><tr><td>One of the NUCs lost heartbeat of paired NUC</td><td>Solid Amber</td></tr><tr><td>Cannot transmit heartbeat</td><td>Solid Red</td></tr></table></td></tr>
<tr><td>Network Status LED 1 & 2</td><td>This LED indicates the LAN status of each port and supports tricolor(red/amber/green).
The goal of this indicator is to confirm if the remote system configured via NPSS UI in the network is alive.
<table><tr><th>Condition</th><th>LED Color</th></tr><tr><td>Cable disabled or unconfigured</td><td>Off</td></tr><tr><td>If the addresses listed in the NPSS UI > Monitor Remote Server are active</td><td>Solid Green</td></tr><tr><td>If the addresses listed in the NPSS UI > Monitor Remote Server are inactive or lost connection</td><td>Solid Amber</td></tr><tr><td>Cannot get valid IP address from listed addresses in the NPSS UI > Monitor Remote Server</td><td>Solid Red</td></tr></table></td></tr>
<tr><td>Network Status LED 3</td><td>This LED indicates Wi-Fi/WWAN status of the hardware and supports tricolor (red/amber/green).
<table><tr><th>Condition</th><th>LED Color</th></tr><tr><td>System is off or Wifi/WWAN card not detected.</td><td>Off</td></tr><tr><td>If the addresses listed in the NPSS UI > Monitor Remote Server are active</td><td>Solid Green</td></tr><tr><td>If the addresses listed in the NPSS UI > Monitor Remote Server are inactive or lost connection</td><td>Solid Amber</td></tr><tr><td>Cannot get valid IP address from listed addresses in the NPSS UI > Monitor Remote Server</td><td>Solid Red</td></tr></table></td></tr>
</table>

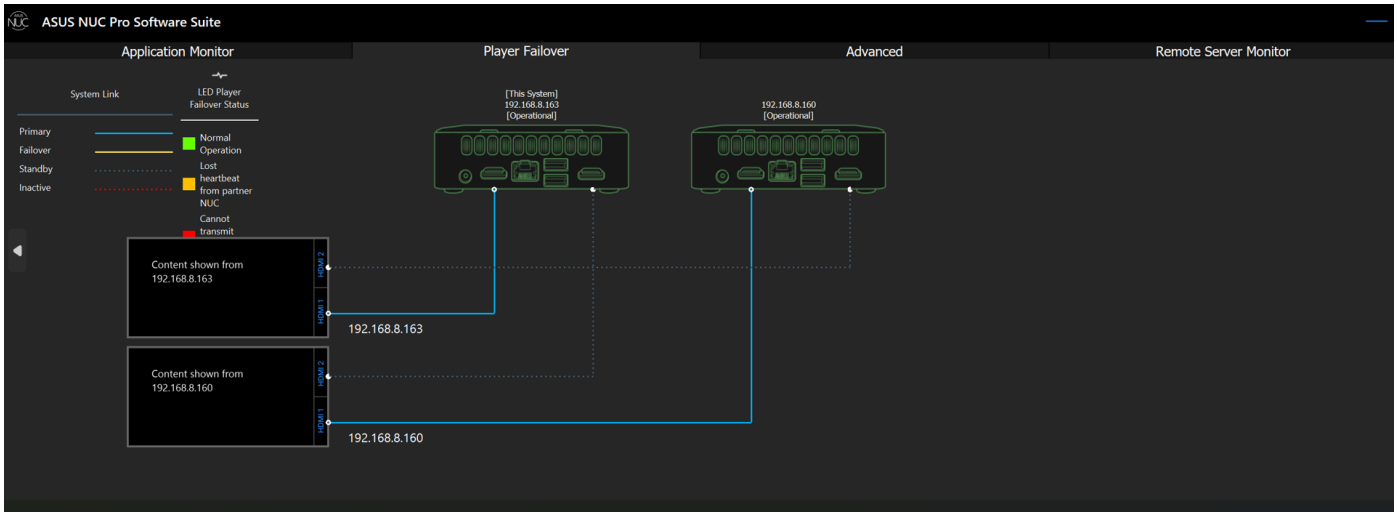
2.2 Player Failover

The Player Failover tab helps to manage the NUCs provided screen redundancy services to each other if a NUC encounters a system failure which may prevent it from continuing to operate.

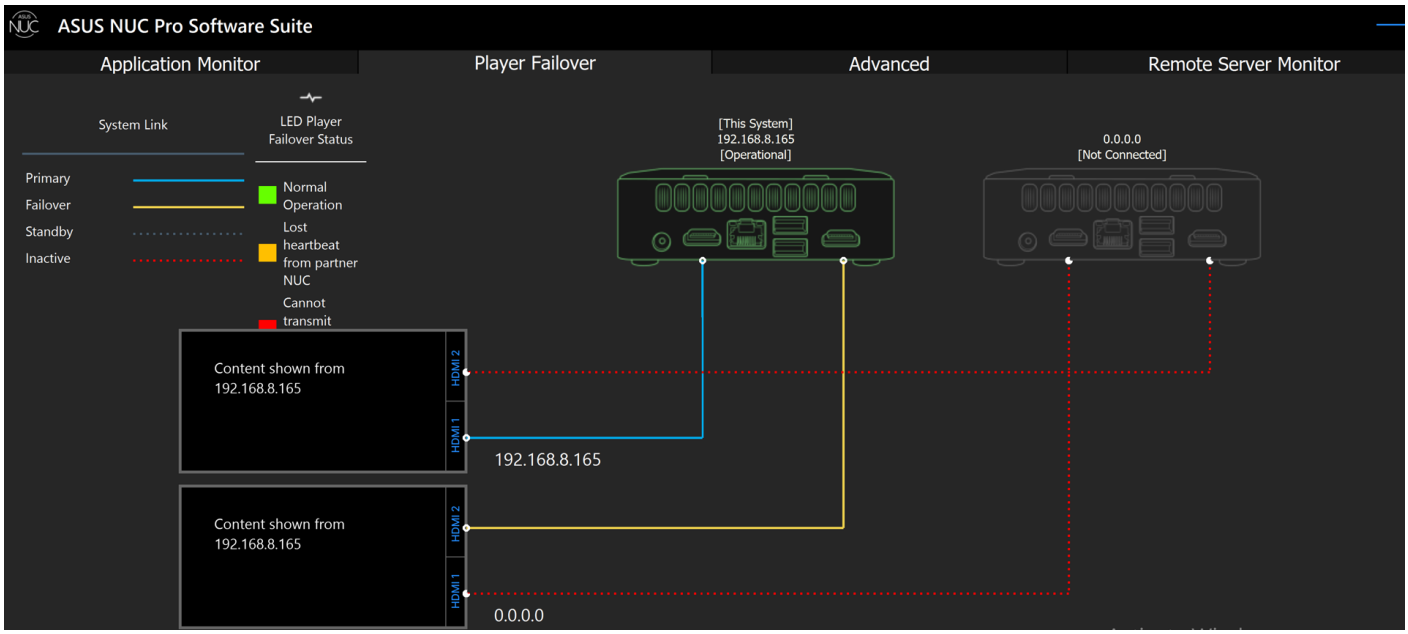
NOTE: To enable player failover functionality, ensure you complete all the steps under Configuration Tool Installation section in Installation and Configuration document**.**

2.2.1 System Links

1. **Primary (Solid Blue)** - Link between NUC and its primary display.
2. **Standby (Dotted Grey)** - Link between NUC and its secondary display.



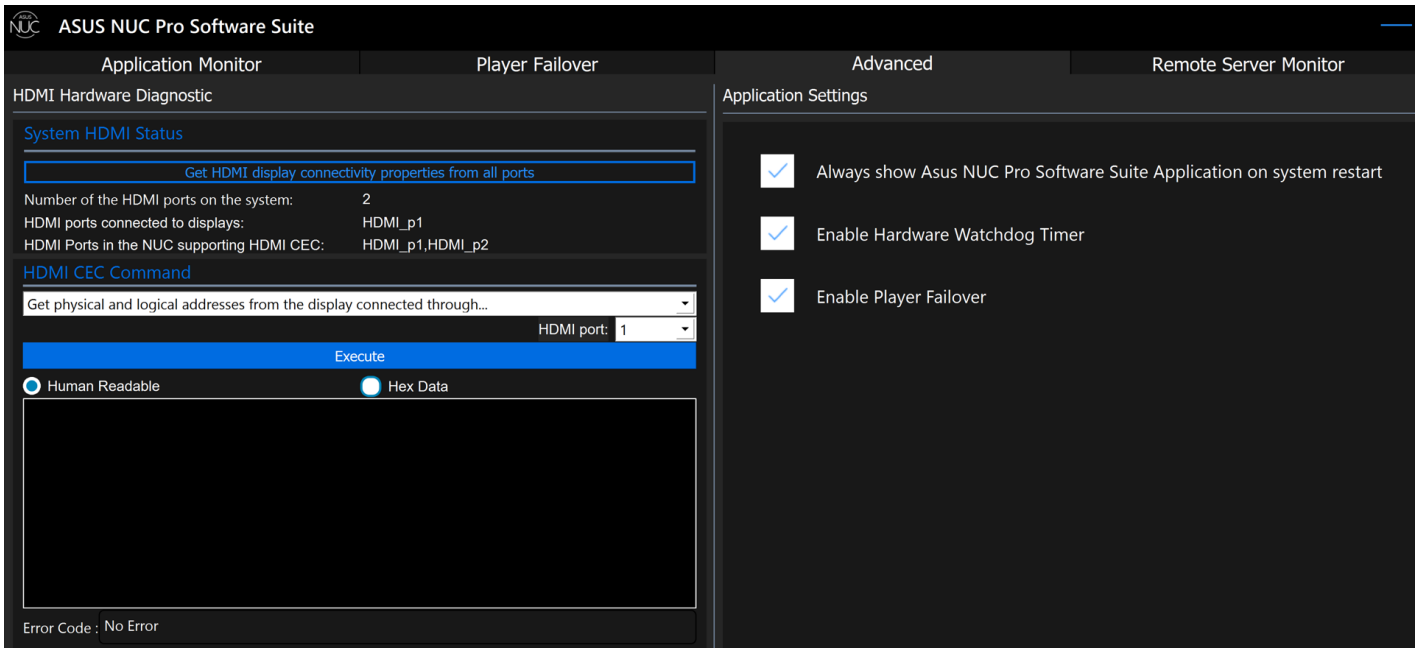
3. **Failover (Solid Yellow)** - In case of Failover, the Standby link connecting Active NUC, and its secondary display will become Failover.
4. **Inactive (Dotted Red)** - When a NUC goes down, system links coming out of Failover NUC should become inactive and NUC is shown as greyed out.



2.3 Advanced

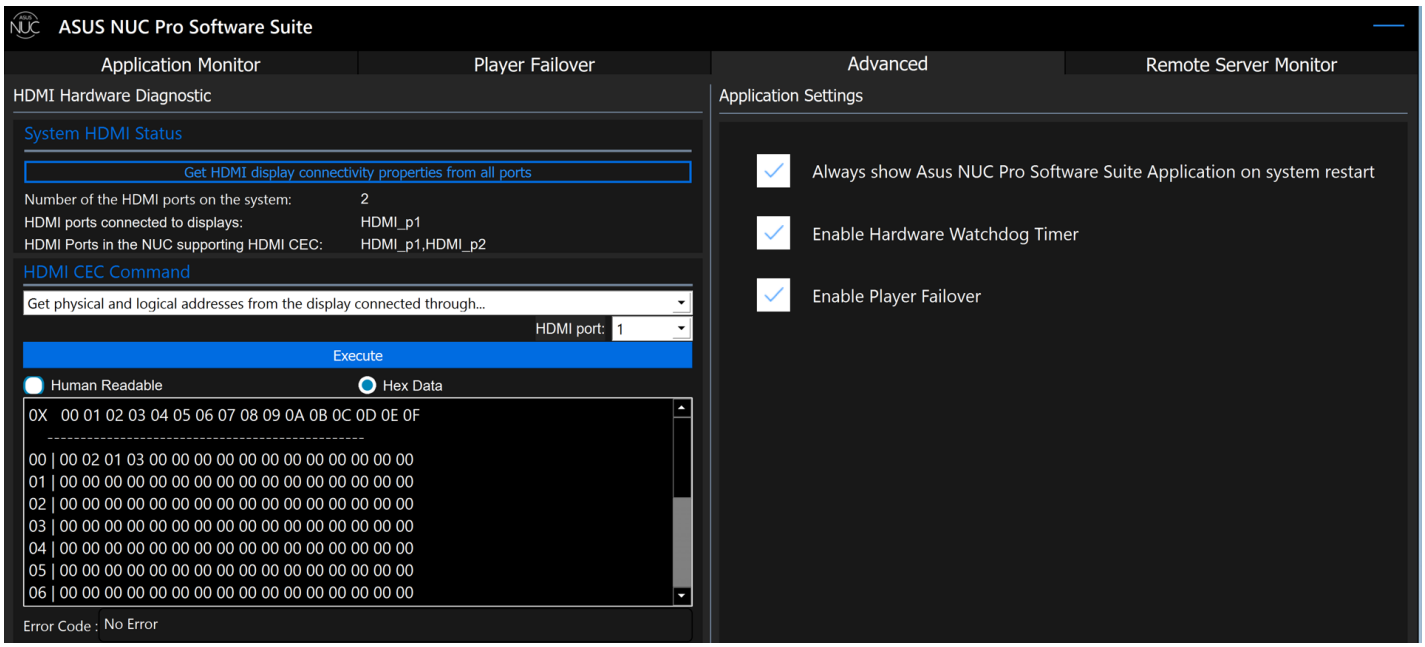
The Advanced tab allows user to configure system settings in addition to performing HDMI hardware diagnostics. The belowscreen shows all available options in the Advanced tab.

Enable Player Failover option will be shown as selected and greyed out during configuration.
After configuration it will be enabled.



2.3.1 HDMI Hardware Diagnostic

1. **System HDMI Status** Click "***Get HDMI display connectivity properties from all ports***" to get the current state informationof HDMI ports
   i. Number of the HDMI ports on the system
   ii. HDMI ports connected to displays.
   iii. HDMI ports in the NUC supporting HDMI CEC



The HDMI Diagnostic makes WMI calls and shows the response in Human Readable or Hex Data format on UI.

2. HDMI CEC Command

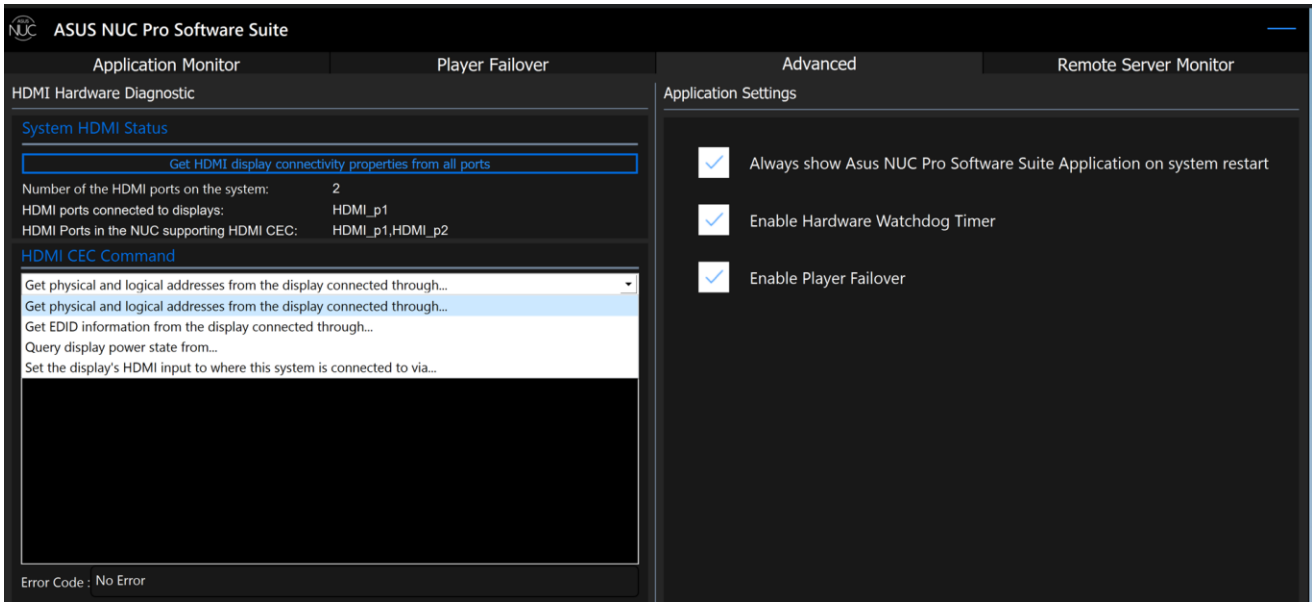
When a user clicks the HDMI CEC Command dropdown, the below mentioned commands are available. Select anycommand and click 'Execute' to view the results.

i. Get physical and logical addresses from the display connected through…
On Execute of this command, the user can get physical and logical address of the NUCs connected through HDMI.

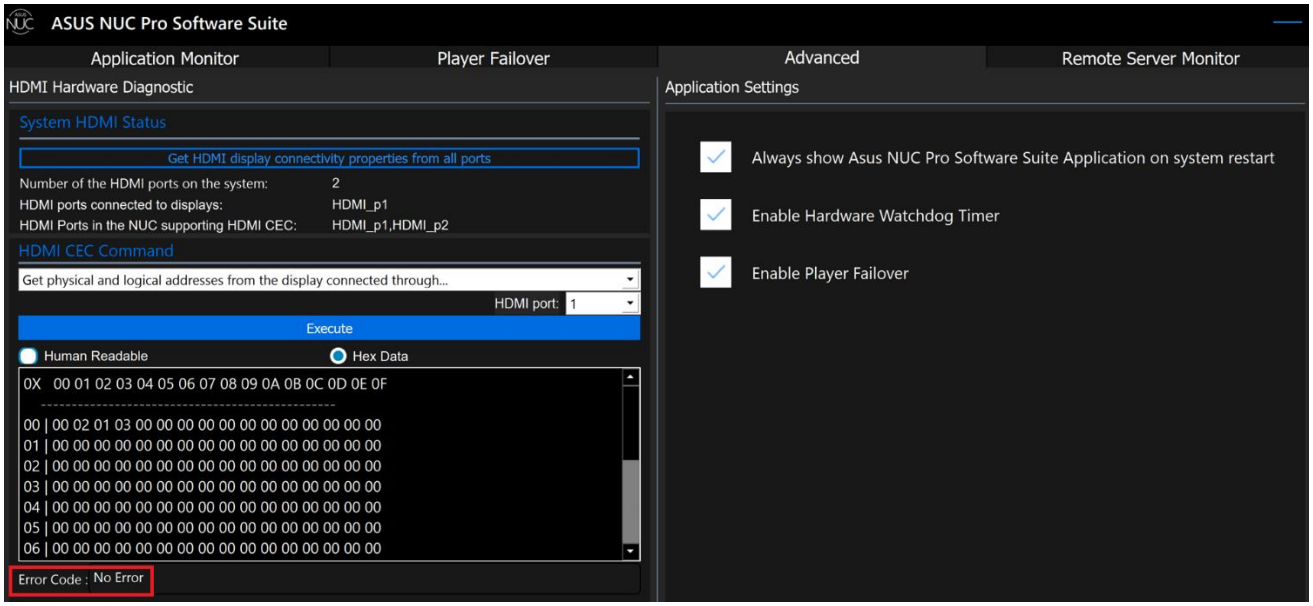
ii. Get EDID information from the display connected through…
On Execute this command, the user can get Product Name, Serial Number, Manufacturer ID of the connectedthrough HDMI port.

iii. Query display power state from…
On Execute this command, the user can get the power status of the display.

iv. Set the display's HDMI input to where this system is connected to via…
This command helps the user to switch display screen from to secondary port.



3. Error Codes



The user can get any of the error codes below in response to a HDMI CEC Command.

Error Code	Description
00h	No error
E1h	Function not supported
E2h	Undefined device
E3h	EC no respond
E4h	Invalid Parameter
E5h	Node busy. Command could not be executed because command processing resources are temporarily unavailable
E6h	Command execution failure. Parameter is illegal because destination device has been disabled or is unavailable
E7h	Invalid CEC Opcode
E8h	Data Buffer size is not enough
EFh	Unexpected error
Others	Reserved

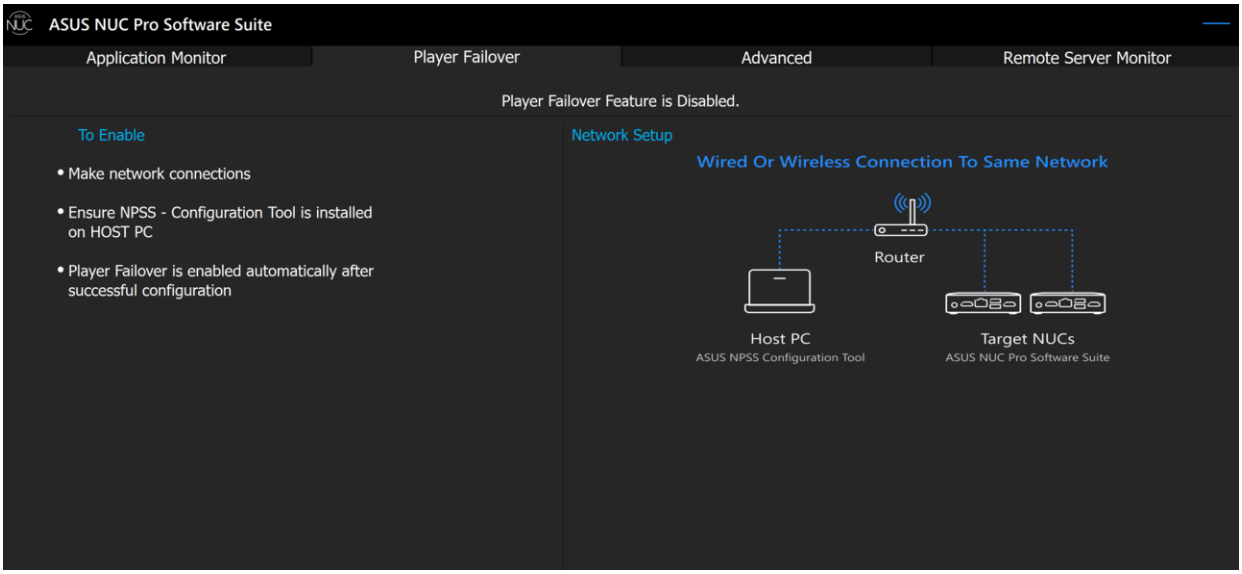
2.3.2 Application Settings

2.3.2.1 **Always show ASUS NUC Pro Software Suite on system restart** - Check this box to open the application on the desktop after every system restart. When this is not checked, the application will be displayed only in the system tray.

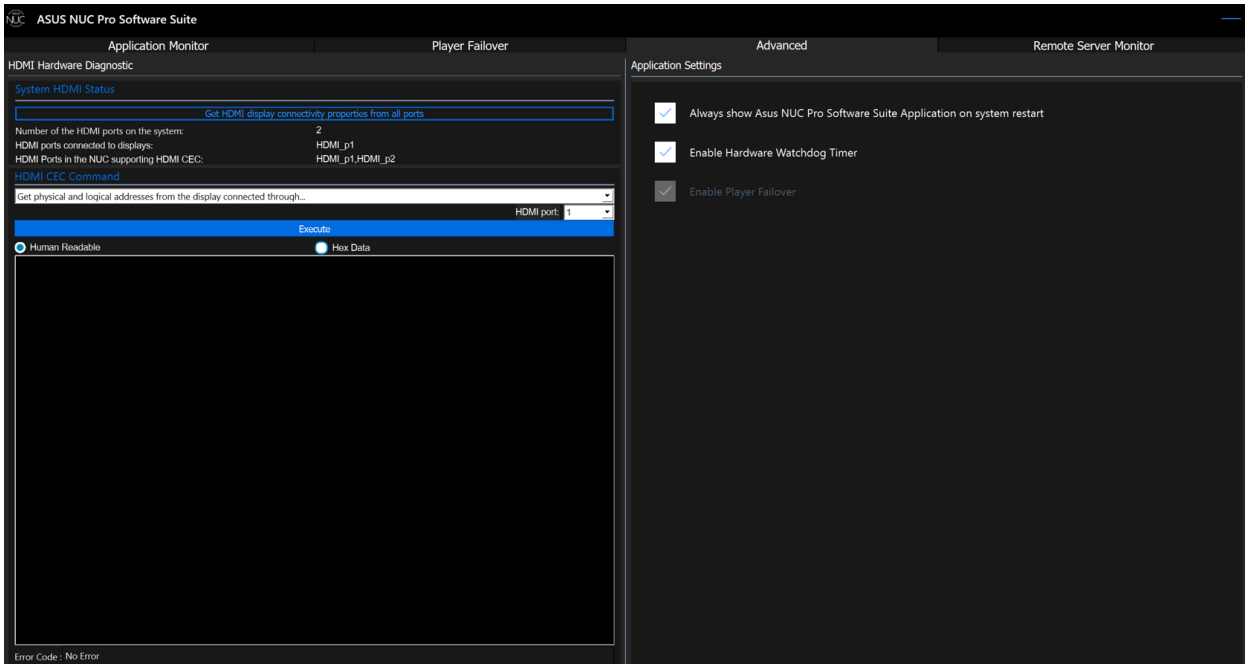
2.3.2.2 **Disable/Enable Hardware Watchdog Timer** – Default Hardware Watchdog Timer is enabled on launching the application. Whena user manually checks this box and if "AsusNPSSService" service stops, then after default time (300 sec), the system will restart.

2.3.2.3 **Enable/Disable Player Failover –**

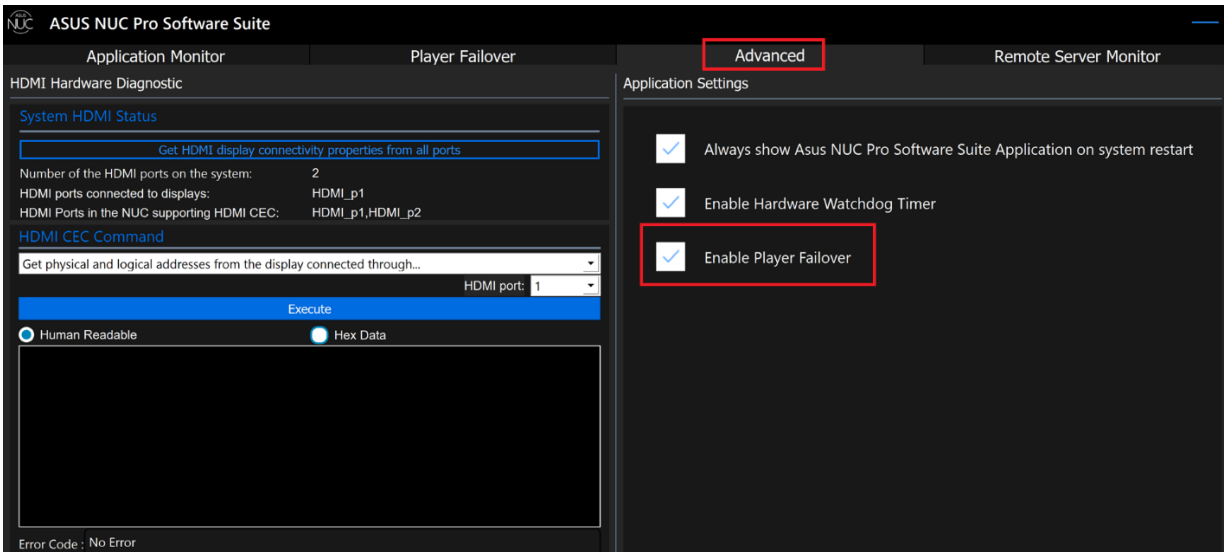
2.3.2.3.1 During first launch of ASUS NUC Pro Software Suite, until the NUCs and corresponding displays are successfully connected, the default player failover is disabled as indicated in the screen below. No NUC is visible in the 'Player Failover' section.

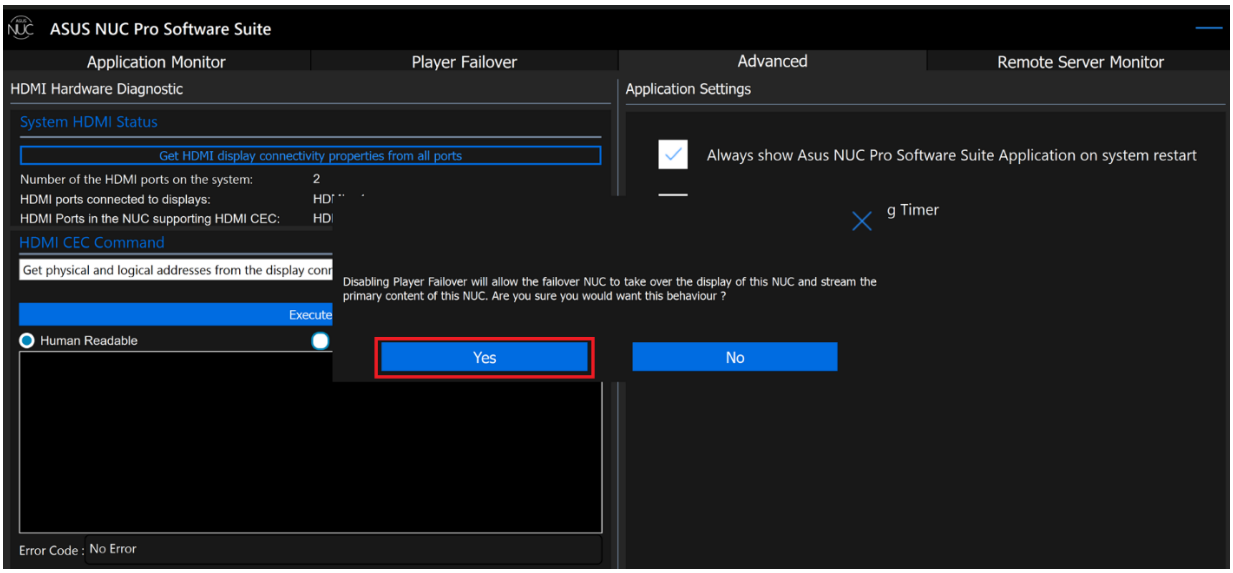


2.3.2.3.2 After Discovering the NUCs, User can see NUCs on Player Failover section and during the entire process of configuration "Enable Player Failover" is disabled and grayed out.



2.3.2.3.3 After the configuration is complete, user can uncheck the "Enable Player Failover" which will prompt for user confirmation.

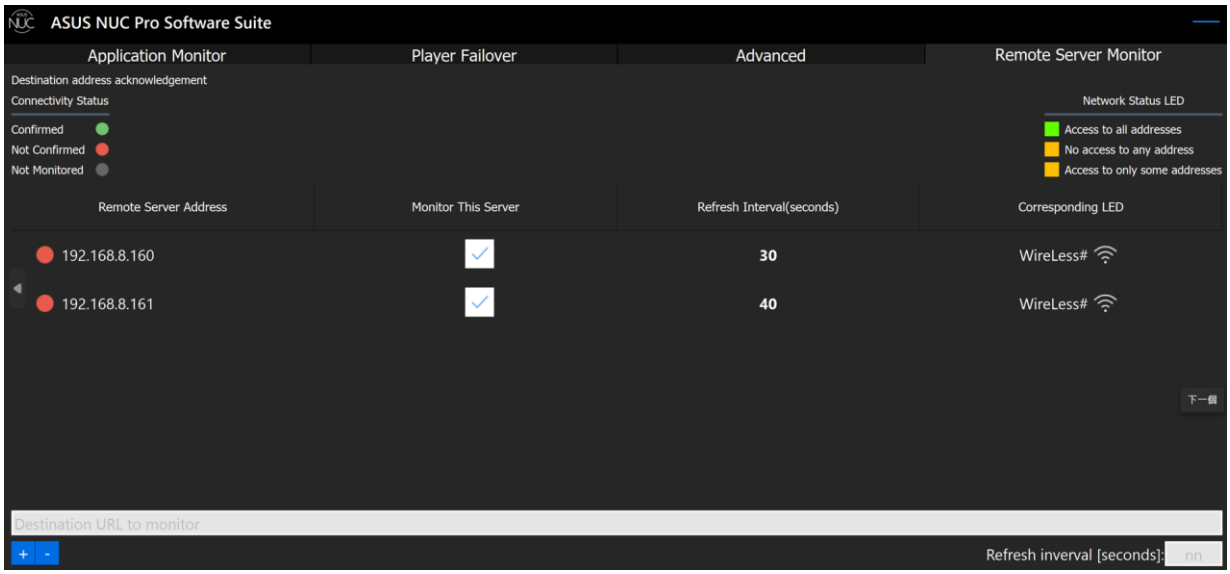




2.3.2.3.4 On click of **Yes**, Player failover is disabled and No NUC is visible in the 'Player Failover' section.

2.4 Remote Server Monitor

Remote server monitor tab provides the user capability to configure remote server list and monitor each server's address and its connectivity.

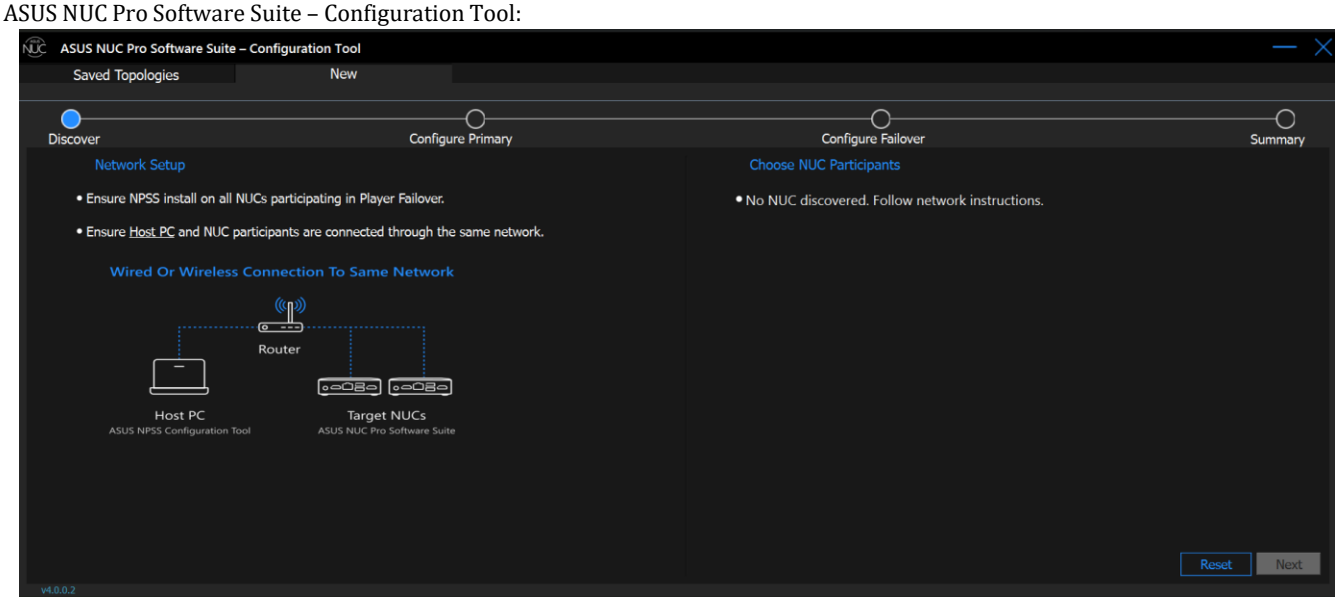

ASUS NUC Pro Software Suite
Application Monitor
Player Failover
Advanced
Remote Server Monitor
Destination address acknowledgement
Connectivity Status
Confirmed
Not Confirmed
Not Monitored
Network Status LED
Access to all addresses
No access to any address
Access to only some addresses
Remote Server Address
Monitor This Server
Refresh Interval(seconds)
Corresponding LED
192.168.8.160
30
WireLess#
192.168.8.161
40
WireLess#
下一個
Destination URL to monitor
+
-
Refresh inverval [seconds]:
nn

3 ASUS NUC Pro Software Suite - Configuration Tool

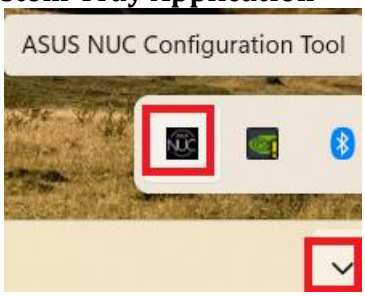
The **ASUS NUC Pro Software Suite - Configuration Tool** provides step by step instructions to configure the target NUCs and setup the primary and secondary connection between the target system and displays.

Do not install the configuration tool on the target NUCs. Instead, install the configuration tool on a host PC which is on the samenetwork as the target NUCs.
If you have not installed the configuration tool yet, download and install the tool from ASUS Support site.

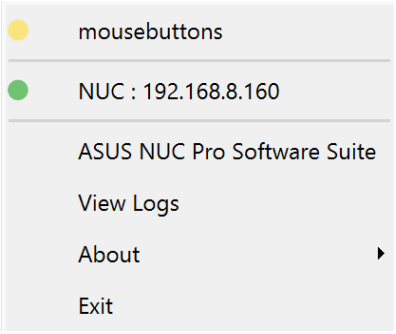
ASUS NUC Pro Software Suite – Configuration Tool:



4 System Tray Application



Open the system tray from desktop and right-click the application icon, the below options/status will be shown:



1. Applications added from Application Monitor along with their status.
2. Paired NUCs along with their status.
3. Application name to open the User Interface.
4. **View Logs** are used to open captured logs.
5. **About** shows the version of Application and service.
6. **Exit** closes the Application.

5 Known Errata

1. If user is not able to get discovered NUC on config tool's NUC discovery list, then user need to recheck network connection and then close config tool and launch it again. This will resolve this discovery NUC issue and User can go forward for player failover configuration.

2. Player Failover feature can behave unexpectedly if HDMI cables are unplugged and plugged-in during runtime.

3. To unselect a row on Application Monitor, the user needs to press the CTRL key and click the desired row at the same time.

4. During NPSS Configuration, there may be a chance when NUCs are not visible to each other and state message (like disconnect HDMI-2, persistent enable/disable etc.) are not updated on configuration tool.
    - **Work around 1**: The user needs to click start over to restart configuration tool.
    - **Work around 2**: If user still gets the issue, then verify successful network connectivity with all NUCs and the Configuration tool host. Reboot all systems.

5. In some scenarios few NUCs are in a pre-configured state and one NUC needs to be replaced, after replacement the user may get a wrong connection on the topology screen.
    - **Work around:** User can click start over and restart configuration for all the target NUCs.

6. During configuration if HDMI cable is plugged out from either NUC then NPSS application hides from both HDMI screens
    - **Work around:** User need to right click and select exit NPSS through system tray app and relaunch the NPSS app.

7. If ASUS NUC Pro Software Suite application is in use, user recommended not to uninstall the Watch Dog timer (WDT) Driver. If WDT driver gets uninstalled accidentally, then ASUS NUC Pro Software Suite application will stop working.
    - Work around: User must re-install Watchdog Driver again then restart system, ASUS NUC Pro Software Suite application will again start to work.

   Note: This point is only for Linux build

8. During the NPSS Configuration Tool host application's "Enable Persistent Display Emulation" step, it can sometimes take 3-5 minutes for the NPSS Configuration Tool host application to refresh and update the NPSS Configuration Tool host's status as successful.
    - Here is a work around if this step in the NPSS Configuration Tool is going beyond 3-5 minutes. In the operating system, select to software shutdown the NPSS client NUC which has enabled persistent display emulation, then power the NUC back on. This can force the client NPSS NUCs to resend multicast packets to update the NPSS Configuration Tool host PC that enabling persistent display emulation was successful.
    - This known issue is being addressed as a high priority improvement for the next release of NPSS on supported NUCs generation 12 and later.

9. NUC Persistent Display Emulation Firmware notifications and settings:
    - In BIOS Persistent Display Emulation settings, the user can set the "Inconsistent Display Warning" settings to "Countdown" instead of the NUC pausing on the persistent display emulation notification waiting for user input. Enabling the persistent display emulation "Countdown" setting in BIOS allows the NUC to automatically continue booting if the user does not need to update the persistent display emulation firmware.
    - When a completed NPSS configuration setup environment loses power (For example 1. a power outage, or 2. the AC power is unplugged) on the NPSS configured NUCs and televisions, the user may observe a persistent display emulation firmware notification when the AC power is restored and the NUC is powered back on. The user can select option "B" to update persistent display emulation firmware so that the persistent display firmware settings can be saved if necessary. If nothing has changed in the NPSS environment, then persistent display firmware option "B" selection may not be needed. The reason this persistent display emulation firmware notification occurs is because when power is lost the persistent display emulation firmware can be saved again.

10. Player Failover configuration completed between NUCs then if new NUC will appear in same network then user can get "incorrect Connection" popup may appear on either paired NUC.
    - User can restart system effected NUC and "incorrect Connection" popup will vanish.

11. During Player Failover Configuration if we observe that after system reboot Persistent not disabled or enabled during primary or secondary configuration and user observe Persistent message on NPSS UI then as a workaround user can do a **Startover** and restart the configuration.