MultiSITE™ Edge 10
User Guide

Model number: PBASE10

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Tridium, Inc.

3951 Westerre Parkway, Suite 350

Richmond, Virginia 23233 U.S.A.

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ABOUT THIS GUIDE

This topic contains important information about the purpose, content, context, and intended audience for this document.

Product Documentation

This document is part of the Niagara technical documentation library. Released versions of Niagara software include a complete collection of technical information that is provided in both online help and PDF format. The information in this document is written primarily for Systems Integrators. In order to make the most of the information in this book, readers should have some training or previous experience with Niagara 4 software, as well as experience working with JACE network controllers.

Document Content

This document describes the initial Niagara 4 software installation and configuration for a QNX-based controller, using Workbench (versions Niagara 4.7 and later).

For physical mounting and wiring details for the device, refer to its specific hardware installation document.

This document does not cover station configuration or Niagara 4 components. For more information on these topics, please refer to online help and various other Niagara 4 software documents.

Related documentation

Additional information on Niagara system, devices and protocols is available in the following documents.

- MS-E10 Mounting and Wiring Guide
- JACE-8000 Install and Startup Guide
- Niagara Provisioning Guide
- Niagara Platform Guide

CHAPTER 1 OVERVIEW

Topics covered in this chapter

- Factory-shipped state

- Initial IP address

- IO Points

- MultiSITE Edge 10 (MS-E10) security considerations

MultiSITE E10 controllers are shipped from the factory with Niagara 4.7 software to run a platform daemon, along with a Tridium certificate, and a default Niagara station pre-installed.

Use the Niagara 4.7 Workbench to establish a platform connection to the MS-E10 device and commission it to install the selected modules, licenses, and to perform other platform configuration. Some important related tasks include setting the controller's:

- IP network address, and related IP networking parameters

- Platform daemon user(s), for platform login

- Time and date (or simply sync with your PC's time): To do this, use the platform Commissioning Wizard.

Note:

- The Commissioning Wizard is the only way to install the needed core software in the controller. Most steps in the Commissioning Wizard are also available as separate platform views. For example, there is a Software Manager, License Manager, and many others. Using these views individually may be useful after commissioning the device.

- For more details see the *Niagara Platform Guide*. Always use the Commissioning Wizard to commission a new MS-E10 device for Niagara, as well as to upgrade any controller from one Niagara point release to another. Make sure that a license file is available.

- In Niagara 4.8 and later, there is added support for the IEEE 802.1X wired authentication standard for JACE-8000 and MS-E10 platforms. For more details, see the Niagara IEEE 802.1X Configuration Guide.

Factory-shipped state

The factory-shipped state of the MS-E10 device has the following default settings for IP address, HTTPS port and Platform credentials.

Ethernet connectors

Two RJ-45 10/100Mb Ethernet connectors are labeled PRI for primary and SEC for secondary. Use a standard Ethernet patch cable to an Ethernet switch. These ports are suitable for daisy-chaining MS-E10 devices or for connection to either a JACE-8000 or directly to a network.

The MS-E10 device ships in daisy chain mode. When in daisy chain mode the PRI/SEC labels are inconsequential.

HTTPS port for platform access

There is no unsecure platform connection, only HTTPS secure connection is allowed.

When shipped, the MS-E10 platform daemon is configured to listen on HTTPS port 5011. Often this is left at default. However, if a different port is needed for a platform connection (possibly for firewall reasons), you can change this via the commissioning process.

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Software

The MS-E10 device ships with Niagara 4.7 and the drivers for BACnet, Modbus and SNMP. Note that it is the recommended security best practice to update to the latest software release.

Default platform daemon credentials

MS-E10 devices are shipped with default platform daemon (administrator) username and password credentials. The default credentials are:

- Username: `tridium`
- Password: `niagara`

Initially, you use the factory default credentials to open (login) a platform connection to the MS-E10 device. Default credentials are temporary. During your startup commissioning, you must replace the default platform admin account with at least one different platform admin user.

Note:

For security reasons, be sure to guard the credentials for such platform users closely.

Default system passphrase

In addition to the default platform daemon (administrator) credentials, MS-E10 devices are shipped with a default system passphrase. The default passphrase is:

- Passphrase: `niagara`

Default station details

The E10 device also ships with a default NiagaraStation pre-installed. By default, the network configuration for the station is set to the daisy chain mode. The default station name is a combination of the controller model and the unique hostid. For example, `Edge10_3F88_5ACB_C28A`.

The default station includes the EdgeIoNetwork already installed to access the physical I/Os. The default station credentials are:

- Username: `admin`
- Password: `Admin12345`
  Note:

  You are required to enter new credentials on the initial login.

Initial IP address

Previous controllers shipped with a static IP address. To facilitate bulk deployment, MS-E10 devices are shipped with a one-time feature enabled that allows the controller to initially attempt to connect to a DHCP server.

Upon first startup, when IP connectivity is detected, the MS-E10 initially requests an IP address via DHCP. If a DHCP address is not found, the controller reverts to a static IP address based on its serial number. See the following section for examples.

This feature only applies during the first power up cycle with an active Ethernet connection. At all other times the network settings are set or modified the same as on the JACE-8000.

Note that for this onetime feature to execute, there must be an active Ethernet connection. A flag is maintained that enables this feature. This feature will execute once and then the flag will be disabled.

During a factory restore the flag enabling this is reset to enabled.

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Fallback Static IP

The fallback static IP is built using the last four digits of the devices serial number. Route and subnet mask are set appropriately.

Static IP: `192.168.1xx.xx` where `xx.xx` are numbers lifted from the serial number, as shown in the following two examples.

For serial number : 01**0106** the resulting IP is: `192.168.1`**01.06**

For serial number: **106** the resulting IP is: `192.168.1`**01.06**

Route : `192.168.1.1`

> The default subnet mask is: `255.255.0.0`

Summary

The following behaviors apply to the factory state:

1. MS-E10 device power ups with no Ethernet cable connected.
    a. Maintains the factory shipped state
2. MS-E10 device power ups with the Ethernet cable connected and DHCP server on the network.
    a. The device obtains an IP address from the DHCP server
    b. Fallback mechanism is disabled
3. MS-E10 device power ups with Ethernet cable connected and no DHCP server or DHCP fails.
    a. Apply fallback static IP
    b. Fallback mechanism disabled

IO Points

The MultiSITE E10 device is designed with a mix of IO points: 5 universal inputs, 2 analog outputs and 3 digital outputs.

For more details on physical connection of IO points see the "Inputs" section of the Edge 10 Mounting and Wiring Guide.

Usage details

The EdgeIo driver provides proxy points to access these points.

To use the EdgeIo driver add an EdgeIoNetwork object to the station config folder (already installed in the default station). The EdgeIoNetwork contains a Local device with a Points folder. Invoking the Edge Io Point Manager Discover function shows a list of available points, as shown here.

Figure 1: MS-E10 Io Point Manager view
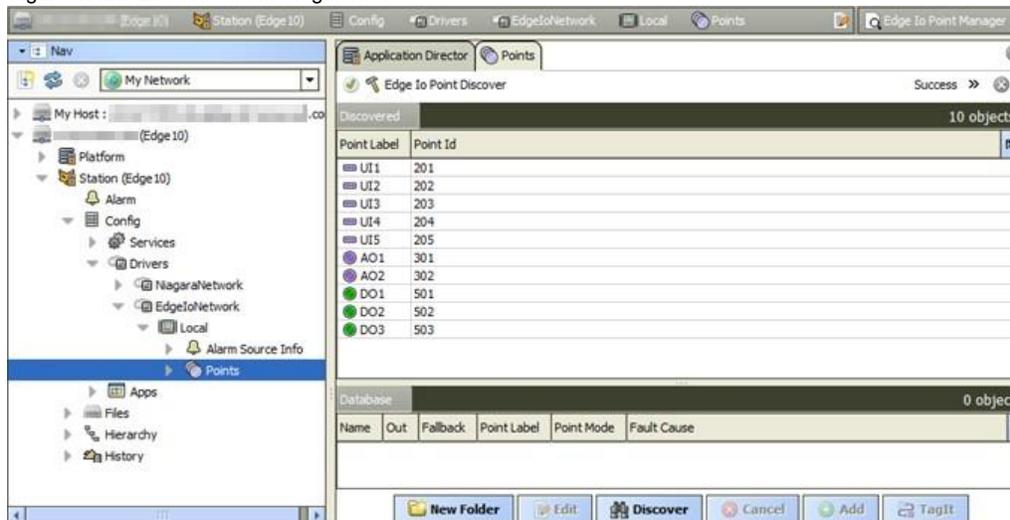
Point Configuration

Proxy points can be configured through the Add/Edit functions in the Edge Io Point Manager. For UI points set the

`Type` to an AI (NumericPoint), DI (BooleanPoint) or pulse counter (pulseInput).

For Pulse Counter type inputs, edit the proxy point to configure `Calc Type`, `Rate Scale`, `Rate Interval` and `Rate Windows` properties.

Io Defaults Values

The AO and DO points can have a configured default value which will be applied during the devices boot sequence. This value will be applied to points in less than 20 seconds of a reset or power cycle. This default value is stored in a writeable proxy Fallback property. The fallback value can be set in the Edge Io Point Manager via the Add/Edit windows. Similarly, a set operation on the proxy point will also set the fallback value.

MS-E10 security considerations

These topics include information about security issues that are important to consider when working with the MS-E10 platform.

Note:

Protect against unauthorized access by restricting physical access to the computers and devices that manage your building model. Set up user authentication with strong passwords, and secure components by controlling permissions. Failure to observe these recommended precautions could expose your network systems to unauthorized access and tampering.

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SSL/TLS commissioning notes

Note:

In Niagara 4, "SSL" is always implemented using the TLS (Transport Layer Security) protocol, supporting TLS versions 1.0, 1.1. and 1.2. See the Niagara Station Security Guide for complete details.

When using Workbench, note that default "Open Platform" and "Open Station" operations initially assume Platform TLS Connection and Fox TLS Connection types, respectively. This is intended to encourage this TLS usage for all Niagara 4 platforms and stations. If necessary, you can change either connection type, and Workbench "remembers" this type to use on your next connection. As needed, change back again.

Protection of source integrity

Niagara provides support on hardware platforms for connecting to external services. It is important to en- sure that any such service is either trusted or controlled by your organization. For example, when synchronizing the system clock with an NTP service, it is important to make sure that the selected NTP service is a trusted source. For more information related to source integrity, see "Security precautions" in the Niagara Station Security Guide.

Good network configuration measures in place

MS-E10 devices could be put in a network without good network configuration measures in place. There are a number of ISA 62443 requirements that deal with the configuration of the network that is beyond the scope of this product. Best practice documentation for network security is included in the Security best practices topic in the Niagara Networking and IT Guide.

Install hardware in a secure location

Restricting physical access to controllers is essential to security. If an attacker can physically connect to your hardware using a cable, they can gain complete control of the system. This could potentially be disastrous. Keep your controllers secure in a locked room with restricted access.

Related documentation

The following related documents provide more security-related information:

- Niagara Networking and IT Guide

- Niagara Station Security Guide

- Niagara 4 Hardening Guide located on the Tridium.com resources library (https://www.tridium.com/en/ resources/library#ReferenceMaterials).

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CHAPTER 2 PREPARATION

Topics covered in this chapter

- Provide power

- Provide connectivity

- Initial configuration and setup

- Setting up a single device using Commissioning

Consider the following areas to prepare before proceeding: Power, connectivity, software and PC requirements.

Provide power

Refer to the LG MultiSITE E10 Installation Manual for details on adding power wiring and Ethernet wiring connections to the controller.

Note:

The MS-E10 device is not compatible with a Power-Over-Ethernet (POE) network. Connecting the Edge device on a network segment which carries power causes the unit to fail (lockup). In that event, you must disconnect it from the POE network segment and cycle power to the unit.

Provide connectivity

This section provides an overview of several common connectivity options, and indicates which setup options should be used.

MS-E10 devices can be connected to each other and to other Ethernet devices in a variety of different ways. Depending on how the controllers are connected, the controllers will need to be configured using either the Workbench Commissioning, the Provisioning Service of a connected supervisor /JACE, or both.

Constructing a network with MS-E10 devices

MS-E10 devices have a built in two-port Real-Time Transport Protocol (RSTP) capable switch, enabling them to be interconnected in a variety different Ethernet topologies. The three basic topologies are described here.

MS-E10 devices can be connected to each other and to other Ethernet devices in a variety of different ways. Depending on how the MS-E10 devices are connected, they will need to be configured using either the Workbench Commissioning tool, the Provisioning Service of a connected Supervisor/JACE, or both.

Star

In this configuration, each MS-E10 device is connected to a central switch by a single Ethernet cable connected to its primary Ethernet port. This is what is commonly known as a "home run" deployment.

Figure 2: Star network topology
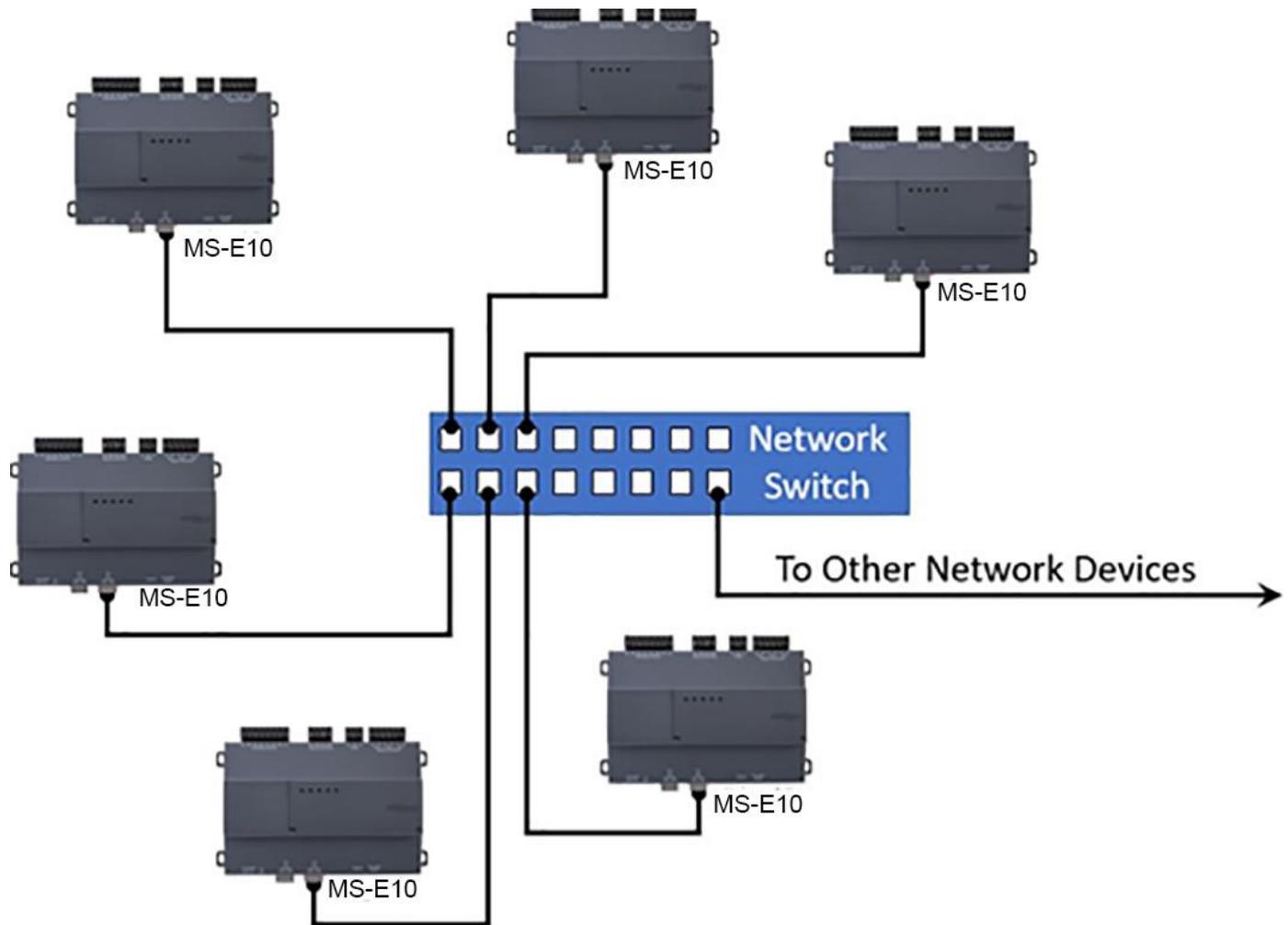
Daisy chain

In this configuration, the MS-E10 devices are connected to each other, with the primary Ethernet port on one device connected to the secondary Ethernet port on another. The first device in the chain is directly connected to a central switch via its primary port, and the last device in the chain has no connection to its secondary port.

Figure 3: Daisy chain network topology
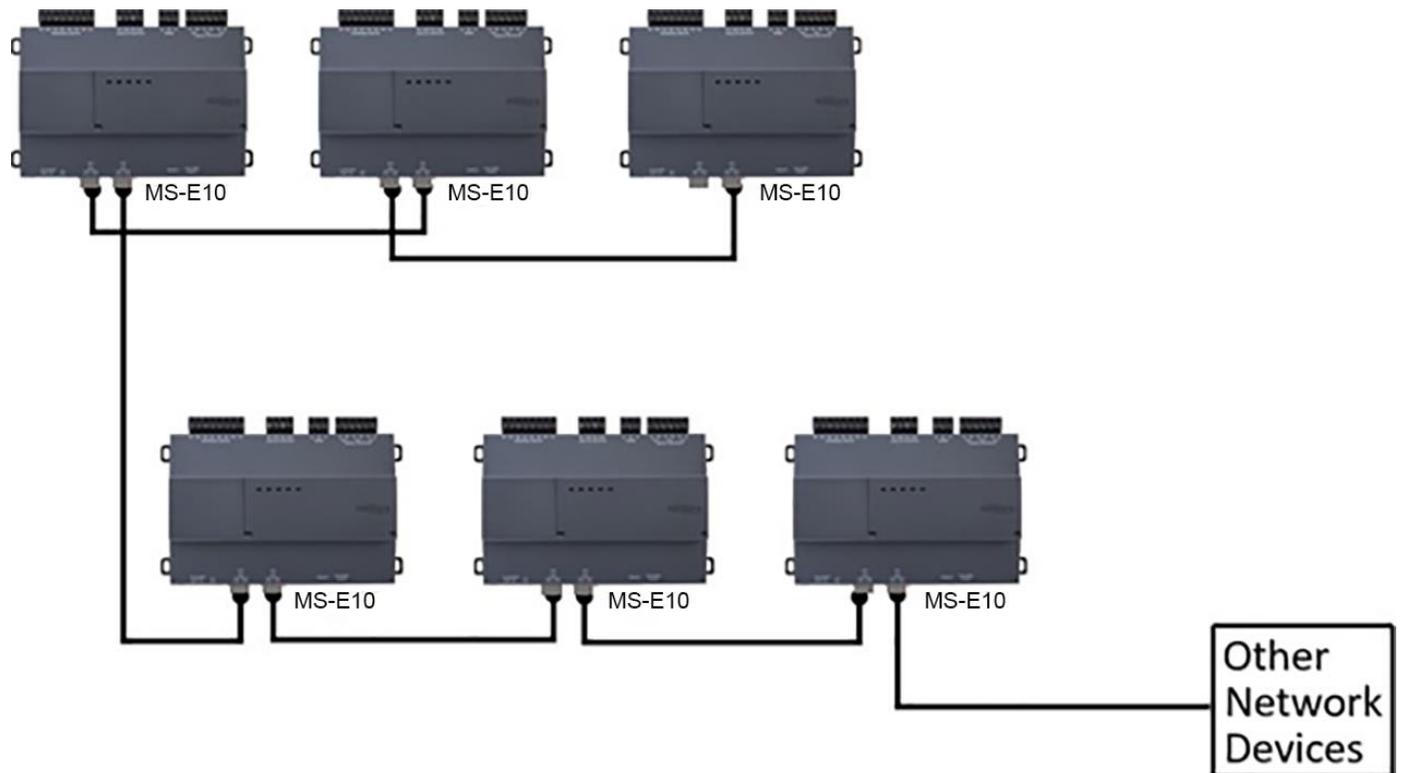
Ring

This configuration is the same as the daisy chained topology, except that the last controller in the chain is connected by its secondary port back into the same switch as the first controller. RSTP is used to prevent "packet storms" (i.e. excessive traffic) due to the connection loop.

Figure 4: Ring network topology
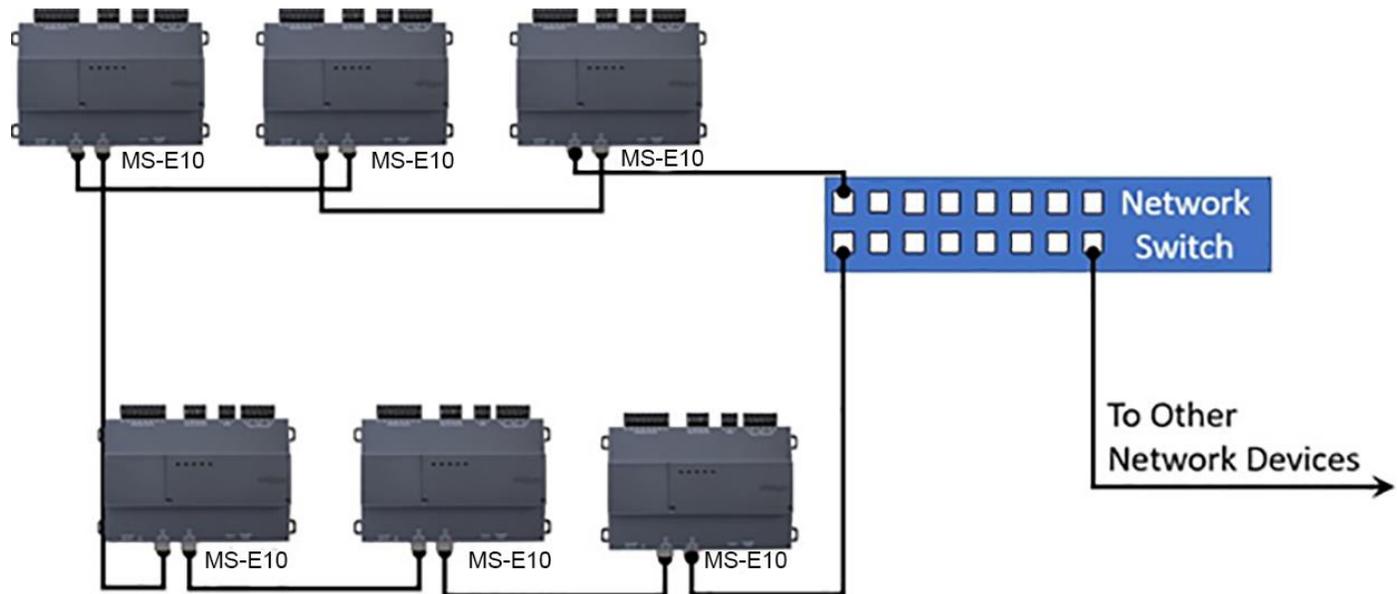
These basic topologies can be combined as necessary to construct larger networks of controllers. For example, multiple sets of daisy chained controllers could be connected back to central switch, forming a star of daisy chained controllers.

Connecting to a JACE

If a JACE is going to be incorporated into the MS-E10 device network, the devices can be connected to either the primary or secondary port of the JACE. Connecting the MS-E10 devices to the primary port of the JACE puts the MS-E10 devices on the same logical network as the JACE, sharing the same IP address range. In this arrangement, both the JACE and MS-E10 devices are directly reachable from the same network segment, and Workbench commissioning can be used to setup and manage all the devices.

It is also possible to connect the MS-E10 devices to the secondary port of the JACE. In this arrangement, the network of JACEs becomes a private network, isolated from the network to which the primary port of the JACE is connected. When connected to the secondary port, the JACEs are not directly reachable from the main network, and Niagara Network provisioning running on the JACE station must be used to setup and manage the controllers.

Note that prior to connecting JACEs to the secondary port of the JACE, you must either preconfigure the devices with static IP addresses, or enable the DHCP server on the JACE.

Initial configuration and setup

Depending on the chosen network configuration, you will be able to setup the device with commissioning, provisioning, or some combination of both. The following table summarizes which tools to use, based on the network configuration.

JACE connection	Static IP for Edge devices	Can setup with provisioning alone	Can setup with commissioning alone	Must use both commissioning and provisioning
Primary Port	No	No	Yes	No
Primary Port	Yes	Yes	Yes	No
Secondary Port	No	Yes (must be run on JACE)	No	No
Secondary Port	Yes	No	Yes	Yes - set static IP's with commissioning, configure other settings with provisioning or commissioning
None	No	Yes	Yes	No
None	Yes	Yes	Yes	No

Setting up a single device using Commissioning

These instructions assume that you have a PC running a licensed copy of Niagara 4.7 Workbench or later, installed with the "installation tool" option. That option copies distribution files needed for commissioning various models of controllers. This PC is referred to as "your PC."

> *Note:*

Your PC must meet minimum hardware/operating system requirements for the Workbench workstation. This includes a working Ethernet adapter with TCP/IP support (browser capable). An Ethernet TCP/IP connection to the MS-E10 device is required to install Niagara software and establish other parameters.

For this initial Ethernet connection, you can use either of the following:

- An Ethernet patch cable connected directly between your PC and the MS-E10 device (if your PC Ethernet port is not "auto-sensing", you will need an Ethernet crossover cable)

> *Note:*

If in daisy chain mode connect both the PC and the MS-E10 devices to a switch.

- A normal LAN connection, meaning that both your PC and the MS-E10 device are physically connected to the same Ethernet hub or switch.

Preparing for new device commissioning

To prepare for new E10 device commissioning, perform the following steps:

Prerequisites:

- Niagara 4.7 or later Workbench

Step 1: If not already installed, install the Niagara 4.7 or later software on your PC, including its permanent license.

Step 2: Typically, the license file for the MS-E10 device already resides on the licensing server, where (if you have Internet connectivity) it is automatically retrieved during the licensing step of the Commissioning Wizard.

> *Note:*

If you were emailed a license archive (.lar file) or .license file for the MS-E10 device, and you wish to use it instead of the online license server (for some reason, for example your Workbench PC will not have Internet connectivity when you are commissioning the device, make the file available to Workbench first, as follows:

Copy the file to your `!security/licenses/inbox` folder, then restart Workbench. For more details, refer to the section "Local license inbox" in the *Niagara Platform Guide*.

Step 3: Attach one end of a standard category-5 Ethernet unshielded twisted pair (UTP) patch cable to the RJ-45 Ethernet connector for LAN1 (labeled PRI) on the MS-E10 device.

Step 4: Attach the other end of the patch cable to a network port or directly to an Ethernet hub.

Step 5: Power up the MS-E10 device.

Step 6: Record your PC's current IP settings, then re-assign your PC's IP address for its Ethernet NIC (network interface card). If necessary, refer to Windows online Help for details on configuring TCP/IP settings.

Note:

As an alternative to re-assigning your PC's IP address, you can do one of the following:

- Obtain a USB-to-Ethernet network adapter (second network interface card, or NIC), and use it with an Ethernet crossover cable to commission MS-E10 devices. In this case, configure this second NIC to use the settings in the remainder of this step.

- Use a serial shell mode connection to the MS-E10 device to re-assign its factory IP address settings. After making this change and rebooting the device, you can continue commissioning using Workbench. This requires a USB-to-MicroUSB adapter cable, VCP driver, and a special power-up mode for the MS-E10 device.

- VCP (Virtual COM Port) drivers cause a USB device to appear as an additional COM port available to the PC. Using terminal emulation software, such as PuTTY or ClearTerminal, the PC can access the USB device in the same way as it would access a standard COM port. VCP driver downloads are available at www.ftdichip.com and other sites.

For this initial connection to a factory-shipped MS-E10 device, configure your PC's NIC to use an IP address in the same subnet as the MS-E10 device, as well as a matching subnet mask.

Set the IP address in the range: `192.168.1.1` to `192.168.1.254`

with a subnet mask of: `255.255.0.0`

Note:

⊘ Do not assign your PC the identical IP address as the MS-E10 device's factory-assigned IP address.

Step 7: From your PC, start Workbench. The Nav tree should be visible in the side bar area (left pane). If not, from the

menu bar, select Window→Side Bars→ Nav.

Opening a platform connection to the device

Once the MS-E10 device has powered up, connect to it with Workbench. A platform connection to any MS-E10 device is required for most host-level operations. This includes installing Niagara 4.7 core software and modules and performing various other platform tasks.

Step 1: From the menu bar, select File→Open→ Open Platform.

The Open Platform dialog box appears.

Step 2: Complete the fields in the Open Platform dialog box as follows:

- Type — Select Platform Connection, if not already selected.

Note:

By default, Workbench prompts for a Platform TLS Connection.

- Host — Leave at default IP, and type in the IP address of the new MS-E10 device.

- Port — Leave at default `5011`.

- Credentials, which may be:

    o Username — Type in default username, for example: `tridium`

    o Password — Type in default password, for example: `controls`

Step 3: Click the OK button to accept all settings.

Note:

If the Workbench detects factory default credentials when connecting to a remote platform it launches the Change Platform Defaults Wizard (shown here) which forces you to change the factory defaults prior to completing the platform connection.

Figure 5: Change Platform Defaults Wizard

If this wizard does not display the platform connection completes.

a. If the Change Platform Defaults Wizard displays, click Next to step through creating a system passphrase, creating a new platform account, and removing the default platform account, as shown below.

Figure 6: Change Platform Defaults Wizard

b. Click Finish to complete these changes.

On completion, the platform opens in the Nav tree, and its Nav Container View displays in the view pane.

Figure 7: Nav tree
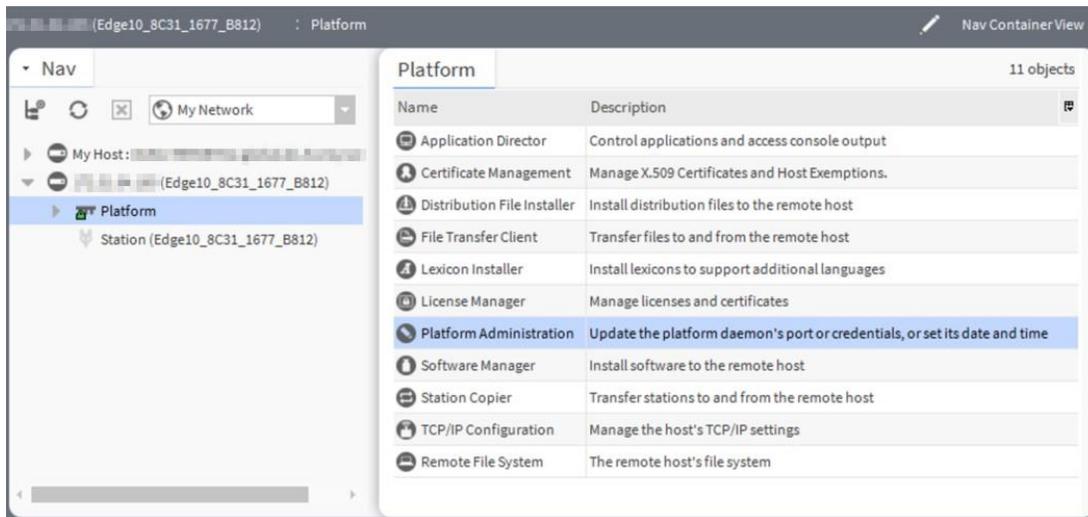
After you open the platform connection, you can run the Commissioning Wizard.

CHAPTER 3: RUN THE COMMISSIONING WIZARD

Topics covered in this chapter

- Starting the Commissioning Wizard

- Installing or updating licenses

- Installing or updating licenses from files

- Setting the enabled runtime profiles

- Specifying a station database to install

- Selecting modules to install or upgrade

- Install/upgrade core software

- TCP/IP configuration

- Configuring system passphrase

- Remove default platform user account

- Configuring additional platform daemon users

- Reviewing and finishing the Commissioning Wizard

As shown below, the Commissioning Wizard is a right-click option on any connected MS-E10 platform in the Nav tree. You can also launch the wizard from the Platform Administration view.

Figure 8: Commissioning Wizard as right-click platform option
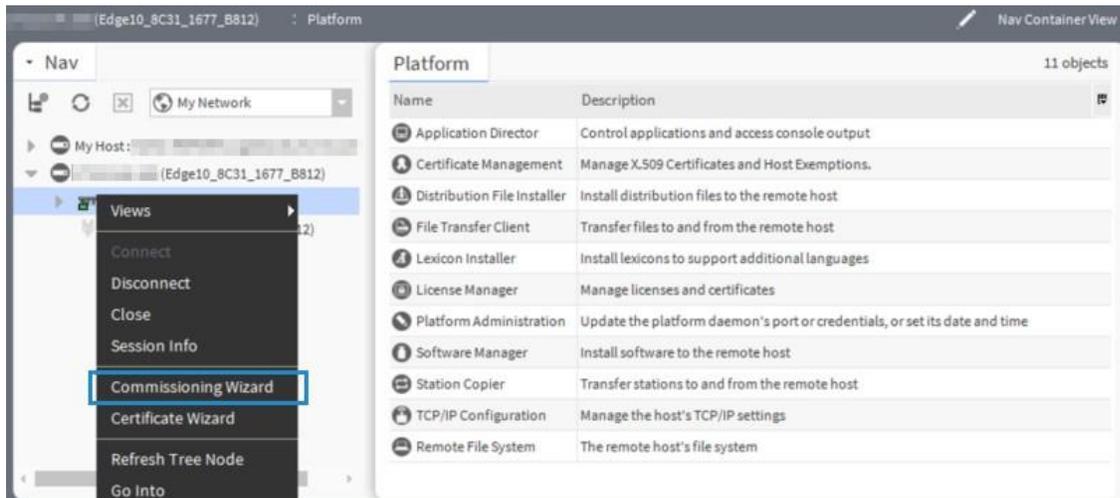
Use this wizard when installing a new MS-E10 device, as it provides a "checklist" method to perform essential (and often "one time") platform tasks. Also use this wizard whenever you upgrade the core Niagara 4 software in the MS-E10 device, at some future time. See the Niagara Platform Guide for more details.

Before starting the commissioning process, note the following points:

- Throughout the wizard's dialogs, use the buttons Back and Next, as needed, to retrace (or skip) steps. Also, the Cancel button exits the wizard after your confirmation—no operations are performed as a result.

- Before committing to the final sequence of steps, the wizard provides a summary for you to review.

Starting the Commissioning Wizard

The **Commissioning Wizard** runs a series of steps to guide you through all the needed information.

Prerequisites:

In Workbench on your PC, open a platform connection to the MS-E10 device.

Step 1: In the Nav tree, right-click Platform →Commissioning Wizard.

The dialog box Commissioning for "<IP address>" displays with default selections for a new MS-E10 device).

Figure 9: Commissioning dialog box
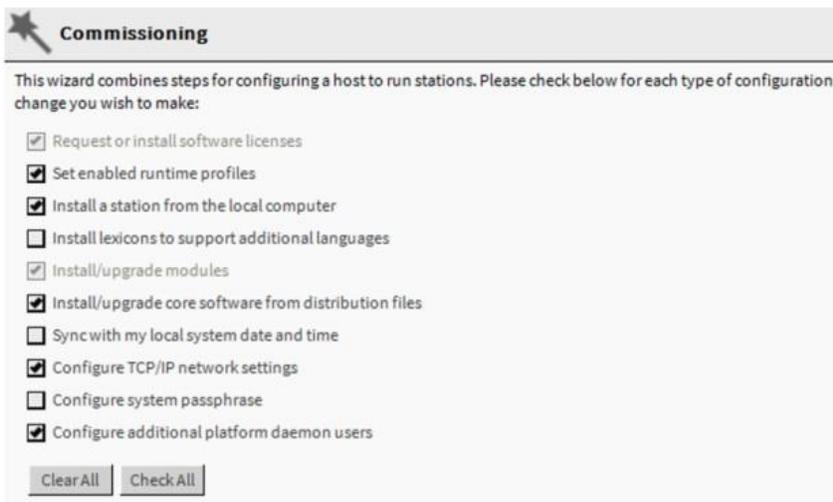
By default, all steps are preselected except lexicon installation. Steps are executed in the order listed.

   Note:

In Niagara 4.6 and later, if the Workbench FIPS Option to Show FIPS Options is set to "true" certain FIPS options become visible in this window. If selected, FIPS-strength password requirements are enforced.

Step 2: As needed, click to include or omit steps. For a new MS-E10 device, you typically accept all default selections.

Commissioning steps include:

- Request or install software licenses — Preselected for any new MS-E10 device.

- Set enabled runtime profiles — Preselected and read-only for any new unit.

- Install a station from the local computer — Recommended. Optionally, you can station(s) at a later time.

- Install lexicons to support additional languages — Option to install file-based lexicon sets (alternative to lexicon modules). Typically you leave this unselected since lexicon modules are required in N4.

- Install/upgrade modules — (always preselected, whenever wizard is run). To select the software modules, and optionally any lexicon modules.

- Install/upgrade core software from distribution files — Preselected and read-only for any new unit.

- Sync with my local system date and time — Preselected in most cases (new MS-E10 device for example, where controller time may greatly differ from actual time).

- Configure TCP/IP network settings — Recommended.

- Remove platform default user account — Preselected and read-only for a new unit. You cannot commission a unit with the factory default platform user.

- Configure additional platform daemon users — Recommended option if additional platform admin user accounts are required, with unique user names and passwords (all have full equal privileges).

Step 3   Click the Next button to continue.

Installing or updating licenses

At the License step, install one or more license files in a new MS-E10 device. You typically select the option to get and install licenses from the licensing server.

Prerequisites:

- A minimum of one license file is always needed. Typically, other license files are not needed unless you are using third-party module(s). In this case, you can also install those license files during this same commissioning step, either automatically, or by selecting to install from files.

Figure 10: Installing or updating licenses
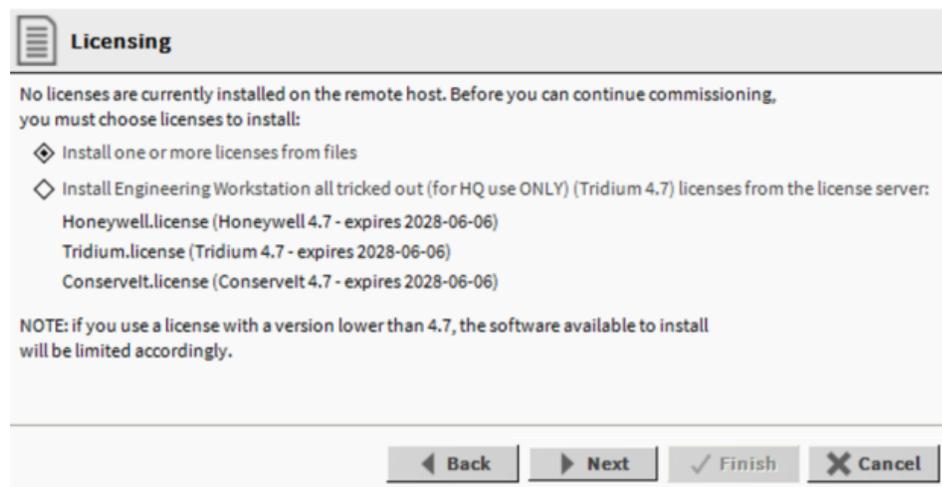
At least one license file specific to any MS-E10 device is stored on the licensing server. Providing you have Internet connectivity, this is the recommended method to install or update a license.

For license files validated against the Tridium certificate, installation can be automated from Workbench. All such purchased licenses (including MS-E10 device, Supervisor, or Workstation-only) are stored and available to Workbench through the licensing server.

If your PC currently has Internet connectivity while running a platform connection to any Niagara host, Workbench provides an install option to get and install the licenses for the host from the license server. When selected, Workbench silently searches the license server for a license with a matching "Host ID" of the target platform. When found, it selects the license(s) and advances to the next wizard step. For more details, refer to the section "About the licensing server" in the Niagara Platform Guide.

Step 1   Select "Install licenses from the license server."

Step 2   Workbench silently searches the licensing server, locates the license(s), and the wizard advances to the next step.

   Note:

If the "license server" option shown above does not appear, Workbench has not detected Internet connectivity, and so cannot contact the licensing server. In this case, you can either:

- If you already have a license for this MS-E10 device in your "local license database," select the last option shown to install from your "Workbench license database." (This option will be missing if your local license database does not include a license for this MS-E10 device.) Workbench locates the license, and the wizard advances to the next step.

- If you have the MS-E10 device license file(s), use the procedure, "Installing or updating licenses from files". If necessary, you can install license(s) later, either from your local license database or from license files.

Installing or updating licenses from files

During the license install step, the wizard checks to see if a Tridium certificate is installed. This certificate is required by any Niagara host, to verify the license file. If other licenses are installed, additional certificates may also be required.

Figure 11: License certificate

Step 1: Select Install these certificates and click Next to advance to the next step.

Step 2: At the License step, select "Install one or more licenses from files".

Step 3: Click the Next button.

The "Choose license files to install" step appears.

Step 4   Click the Add button.

A "Select File" dialog appears. By default, the contents of your licenses subfolder is listed (showing your Workbench license). If you previously pointed Workbench to another location, license files in that location are listed instead.

Figure 12: Select File dialog box
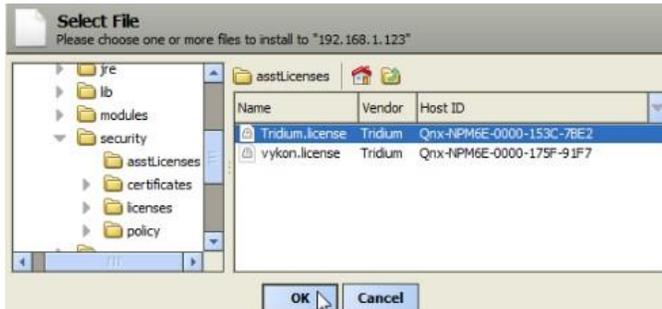
- If you see the license you need, click to select. If other licenses are also needed, you can select multiples by holding down the Ctrl key while you click.

- If a license is not listed, navigate to its location using the left-pane folder tree controls, and click the license to select it.

- Note: The licensing tool prevents selection of a wrong license (different hostid) to install in the MS-E10 device.

Step 5: Click the OK button.

Step 6: If necessary, click the Add button again to add additional license files.

Step 7: When all needed licenses are listed in the Choose license files window, click the Next button to go to continue.

Figure 13: Choose license files window
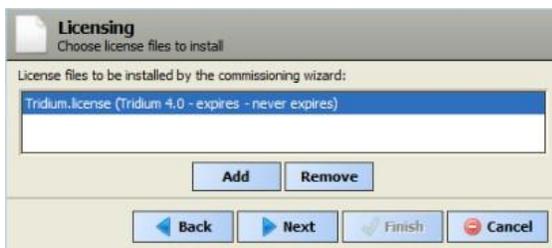
Setting the enabled runtime profiles

Enabled runtime profiles specify what types of N4 software module JAR are to be installed, as shown in the following image. This affects the total file space consumed by the installed module JAR files.

Figure 14: Enabled runtime profiles

All Niagara 4 platforms require the base "RUNTIME" (-rt) module JARs, so it is pre-selected/read-only.

For QNX-based MS-E10 devices, you can also select "UX" (-ux) and "WB" (-wb) module JARs, but not "SE" (- se) module JARs. Note that following commissioning, you can also change the enabled runtime profiles, working from the Platform Administration view. For details, see the Niagara Platform Guide.

At the Enabled Runtime Profiles step:

Step 1: Click all module profile types to be installed in this device, which include one or more of these: NOTE: The selection of UX automatically includes WB, and vice-versa.

RUNTIME — Always selected. Note if UX (or UX and WB) are not selected, the device will not support client Web browser access from its WebService—only client access from Workbench via Fox.

UX — Select to support Web client browser access, using HTML5, Javascript, and CSS technologies only (client does not need to run Java and download WbApplet from the device).

WB — Select (in addition to UX) if the device must also support client Web browser access from its WebService.

SE — Not available for QNX-based devices.

DOC — Selectable, but not recommended on the device for file space reasons.

Step 2   Click the Next button for the next step.

Specifying a station database to install

If you have a specific station database ready to install in the MS-E10 device, you can specify it at this step in the wizard. Or, simply accept the default "(Don't transfer a station)" and click Next. (You can create a station later using the New Station Wizard, and install it using the platform's Station Copier. Or you can simply select an existing station to install using the Station Copier.)

At the Station Installation step, do the following:

   Step 1: Click the Station drop-down control and click the name of a station database on your PC. Listed

         are station subfolders in your Workbench User Home.

   Step 2: If you select a station the following additional options are available, as shown below.

Figure 15: Station Installation step

- New Name

Either leave at same station name as local copy, or type in a new station name.

If the passphrase for the local copy of the station is different from the remote host's system passphrase, you are prompted to enter the local copy's passphrase. If there is no passphrase mismatch, you are not prompted to enter one.

- START AFTER INSTALL

If enabled (the default), and a reboot is *not* included at the end of commissioning, when commissioning completes the station is restarted, In cases where commissioning ends in a reboot, such as if commissioning a new MS-E10 device (installing core software) and/or changing TCP/IP settings, the next "AUTO-START" setting determines if the installed station is started following the reboot.

Note in Niagara 4, it is possible to start or restart a station without rebooting the host controller.

- AUTO-START

If enabled (the default), the station starts every time the device is rebooted. This is recommended.

Note:

In some commissioning scenarios, you may wish to disable (clear) both "Start" options when installing a station, especially if commissioning ends in a reboot. This way the software modules needed by the station will be installed (along with all station files), but the station will be "idle".

In this case, to start the station you must reopen a platform connection to the MS-E10 device following the reboot, starting the (now idle) station from the Application Director view. This allows you to see all standard output messages from the station, as it transitions from "idle" to "starting" to "started".

If doing this, in the Application Director be sure to enable "AUTO-START" on the selected station. Otherwise, it will remain "idle" after the next controller reboot.

Step 3: Click the Next button to continue.

- A dialog asks which station files to copy, where you can select one of the options:

- Copy files from selected directories

- Allows you to specify which subfolders under that local station to copy. It produces a "tree" selection dialog upon clicking Next .

- If you choose this, click folder controls to expand and contract as needed.

- Selected folders appear with an "X" and unselected folders show an empty folder box.

- Copy every file in the station directory and its subdirectories. The default is most typically used.

Note:

Copying identical alarm/history data to multiple MS-E10 devices is not recommended. For this reason, Alarm and History data are not included (by default) in the station copying process.

Copy only the "config.bog" station database file

Copy only the station configuration (components), and not any supporting folders/files like px files, html files, and so forth.

Step 4: Click the Next button for the next step (or if skipping that step, go to "Select modules".

Selecting modules to install or upgrade

At the select modules step, the Software Installation window appears as the dependencies of the MS-E10 device are compared against the available software modules in your Workbench PC's "software database." During commissioning, you can add to the software modules that are preselected for installation. Sometimes you may not make any changes, as the wizard preselects all necessary "core" modules, plus any additional modules needed by the station previously specified in the Install Station step.

However, you may need to select additional modules, including a few not directly related to the contents of the station selected for installation. Examples include lexicon module(s), or some modules related to Platform Services. Or, you may know that the MS-E10 device will need one or more modules in the future (say for a driver), and you wish to install them now.

- ⊘ In general, do not select modules if you are not sure they are needed. You can manage software modules anytime later, using the Software Manager. Also, if you install a station later, the Station Copier will automatically prompt for confirmation to install any additional modules deemed necessary.

Figure 16: Software installation window (default)

Software Installation

Please check each additional item you wish to have installed to the remote host. Any software known to be required for stations to run is already checked.

Current free space 1,225,280 KB   **To be installed** 0 KB   **Estimated free space after install** 1,225,280 KB

Software	Installed Version	Avail. Version	
☐ alarm-rt	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ alarm-ux	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ alarm-wb	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ app-rt	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ app-wb	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ backup-rt	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ backup-wb	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ bacnet-rt	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ bacnet-ux	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ bacnet-wb	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date
☐ bajaScript-ux	Tridium 4.7.109.8	Tridium 4.7.109.10	Out of Date

Upgrade All Out of Date   **Reset**

◀ Back   ▶ Next   ✓ Finish   ✗ Cancel

Note:

It is the recommended security best practice to update to the latest software release. For cases described below, install the following additional module(s) to enable options.

- Select either (or both) "theme"-related modules: `themeLucid-ux`, `themeZebra-ux`, depending on how station users are assigned to Web Profiles (for example, Default Hx Profile, HxTheme=Lucid).

- Note that "standard" lexicon modules appear listed using a module name convention of:

  `niagaraLexiconLc-rt`

  where `Lc` is a two-character language code, such as `Fr` for French or `Es` for Spanish. It is also possible to make custom lexicon modules using Workbench Lexicon Tools (which can use different naming).

Selecting modules for installation

At the Software Installation step, do the following:

Step 1: Review the list of available modules (this list is long and requires you to use the scroll bar).

Each selected module has an "X" in its selection box. Note the following:

- Modules preselected from "core" need or station database reasons each have a red text descriptor, which may read as:
  – Install required platform module
  – Install required for runtime profile
  – Install module required by station

By default, these modules are at the top of the list. You cannot deselect these modules.

You can select additional modules to install by clicking selection boxes. The description for each is in blue text, and displays as either:

  – Not Installed (if not selected)
  – Install (if selected)

To resort the list alphabetically, click the Module header in the table. To return to the default sort order, click the table's (blank) description header.

To reset the selection of modules to the original collection, click the Reset button.

Step 2: Click the Next button to go to the next step.

Install/upgrade core software

At the install/upgrade core software step, the dependencies of the MS-E10 device platform are compared against the distribution (dist) files available in your Workbench PC's "software database." For the initial commissioning the wizard determines what core distribution files are needed, selects the files automatically, and then informs you in a dialog, as shown.

Figure 17: Distribution file installation
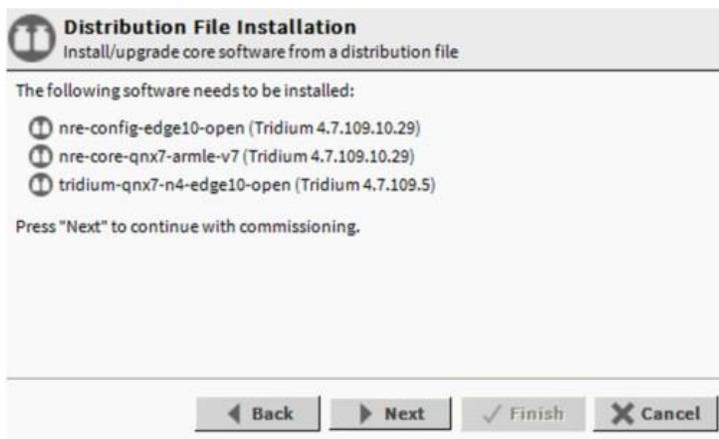
1. Click Next to continue.

TCP/IP configuration

The TCP/IP configuration step allows you to review and adjust the platform's TCP/IP settings.

Figure 18: TCP/IP Configuration dialog

Note:

Due to our policy of continuous product innovation, some specifications may change without notification.

IPv6 support is available; however this document focuses on IPv4 configuration. For details on IPv6, refer to the Niagara Platform Guide section on TCP/IP Configuration.

Daisy chain mode

By default the MS-E10 device is factory shipped in the daisy chain link mode. The Daisy Chain/STP settings are configured during the TCP/IP step of the Commissioning Wizard and during distribution file install procedure.

Note:

The STP settings are available only when Link Mode is configured for Daisy Chain.

Figure 19: Link Settings in TCP/IP Configuration

Configuring TCP/IP settings

Perform the following steps to configure the device's TCP/IP settings.

Step 1: Review the Interface 1 settings on the IPv4 Settings tab, which include the temporary factory- shipped IP address.

Step 2: Assign the MS-E10 device a unique IPv4 address for the network you are installing it on. No other device on this network should use this same IP address. Include the appropriate subnet mask used by the network.

Note:

If the MS-E10 device is in daisy chain mode, interface2 is not available for TCP/IP configuration.

If enabling more than one LAN port (applicable to PRI/LAN1, SEC/LAN2) then the IP address for each must be configured on different subnets, otherwise the ports will not function correctly.

For example, with a typical "Class C" subnet mask of `255.255.255.0,` setting `Interface 1= 192.168.1.99` and `Interface 2=192.168.1.188` is an invalid configuration, as both addresses are on the same subnet.

Alternatively, if the network supports DHCP, you can enable it (click DHCP Enabled). In this case, the IP Address and Subnet Mask fields become read only.

Note that in general (for stability, static IP addressing is recommended over DHCP. If DHCP is preferred, an IP Address 'Reservation' should be entered for the controller in the DHCP Server. The controller IP address should not change.

> $\oslash$ Do not enable DHCP unless you are certain that the network has DHCP servers! Other- wise, the controller may become unreachable over the network.

Step 3: Review and adjust other TCP/IP settings as needed, which (in usual order of importance) include:

- IPv4 Gateway — The IP address for the device that forwards packets to other networks or subnets.

- The MS-E10 device only supports one gateway for all adapters.

- DNS Domain Name — Enter the name of network domain, or if not applicable, leave blank.

- DNSv4 Servers — Click the ⊕ add button for a field to enter the IPv4 address of one or more DNS servers.

- Hostname — Default may be "localhost," or enter another name you want to use for this host. If a hostname is entered, typically the name is unique for the domain.

- In some installations, changing hostname may result in unintended impacts on the network, depending on how the DHCP or DNS servers are configured. If in doubt, leave hostname at default.

- Hosts File — Click control to expand edit field. Format is a standard TCP/IP hosts file, where each line associates a particular IP address with a known host name. Each entry should be on an individual line. The IP address should be placed in the first column, followed by the corresponding host name. The IP address and the host name should be separated by at least one space.

- To add a line, click at the end of the last line and press Enter.

- Type in the required data on the new line.

- To return to see all TCP/IP settings, click the control to collapse the edit field when done.

Note:

The Undo Changes button resets all settings (all Interfaces) back to the original pre-step values.

Step 4: Click the Next button to go to the next step.

Note:

MS-E10 devices have two Ethernet ports, where "`Interface 2`" is available for configuring the secondary (LAN2) Ethernet port (unless the device is in daisy chain mode). By default, this port is disabled, that is without a "default" address. The intended usage of this secondary port is for:

- Connecting multiple MS-E10 devices by daisy chaining one device to the next. In this scenario, each device's SEC port is used to connect to another MS-E10 device. Note that in daisy chain mode, Interface 2 (SEC/LAN2) is not available for TCP/IP configuration.

- Isolating a "driver's" Ethernet traffic from the primary (LAN1) interface, OR

- In some cases, LAN2 may be set up with a standard, fixed, IP address that is used only by a company's service technician, when on site. This allows access to the device without disconnecting it from the customer's network, or without connecting the technician's service PC to the customer's network (which might go against local IT security

policies).

- In any case, note that only one LAN port can be set as DHCP. If enabling LAN2, you must specify another (network) static IP address and the appropriate subnet mask, i.e. a different subnet mask for each enabled LAN port IP address.

- The device does not provide IP routing or bridging operation between different Interfaces.

Configuring system passphrase

In this Commissioning Wizard step, specify a passphrase to replace the factory default passphrase. A strong password is required (a minimum of 10 characters and include at least one uppercase character, at least one lowercase character, and at least one digit).

In Niagara 4.4 and later, Workbench requires that the user remove the default platform user account and change the default system passphrase prior to completing a platform connection. These requirements are configurable via the Platform Connections options under Tools→Options.

Figure 20: Platform connection options

These platform connection options are "true" by default, so that anytime Workbench detects either of the following conditions when making a platform connection it launches the Change Platform Defaults Wizard which steps you through the required changes:

- The system passphrase of the remote platform is the default value.

- The platform credentials of the remote platform are factory default values.

This view allows you to configure whether or not the system prompts the user to remove the default platform user account and/or to change the default system passphrase when making a platform connection. These options are offered as a convenience. For example, if another workflow already prompts for these changes, setting one or both of these options to false can prevent redundant prompts.

The system passphrase is used to protect sensitive information stored on all Niagara systems. The system passphrase is assigned as the file passphrase for "portable" files, such as backups and station copies, and is used to encrypt those files. During operations in which you transfer encrypted files to a system (restoring backups, transferring a station, etc.) you are prompted to enter the file passphrase if it doesn't match the system passphrase for the target system. For more details, see "System passphrase" in the Niagara Platform Guide.

Step 1   Enter the Current Passphrase for the MS-E10 device (typically the factory default passphrase).

Step 2   Enter a strong password in the New Passphrase and Confirm New Passphrase fields.

The entries in both of these fields must match.

Step 3   Click Next to continue.

Figure 21: System passphrase

Note:

When you create a system passphrase be sure to make a note of it and guard it carefully! If you lose the system passphrase, you will lose access to encrypted data. You can change the system passphrase using the Platform Administration tool.

Remove default platform user account

In this Commissioning Wizard step, you specify platform login credentials (user name and password) to replace the factory-default platform user in this MS-E10 device.

Figure 22: Initial dialog to replace the factory-default platform user account

Note:

The Commissioning Wizard in Niagara 4 prevents commissioning the MS-E10 device that retains the factory default platform user account. To proceed, you must enter a different user name, along with a "strong" password (this means a minimum of 10 characters including: at least one uppercase character, at least one lowercase character, and at least one digit).

Following your entry in this dialog, another step (if pre-selected) lets you create additional platform admin users, if needed. Each platform user must have a unique user name and use a "strong" password. Up to 20 total users are supported. Note each platform user account has the same (full) platform admin access—users can change their password, and even create additional platform admin accounts.

- User name and password entries are case sensitive.

If you are not changing the controller's IP address during commissioning, the credentials for your replacement platform user are "remembered" in the current session. This can simplify platform reconnection to the controller after it reboots from commissioning. This is useful in a "migration" scenario.

However, if changing the IP address in commissioning, you need to remember/re-enter the new credentials for a platform user in order to reconnect. Always make careful note of any changed platform credentials, and guard them closely—as they provide the highest security level access to any Niagara 4 platform.

Platform user rules and guidelines

When adding any N4 MS-E10 device platform admin user, the following rules apply:

- User Name

User Name can be a maximum of 14 alphanumeric characters (`a - z, A - Z, 0 - 9`), where the first character must be alphabetic, and following characters either alphanumeric or underscore (_).

- Password

A strong password is required (it must match in both password fields). Entry characters display only in asterisks (*). Password must be a minimum of 10 characters including: at least one uppercase character, at least one lowercase character, and at least one digit. An error popup reminds you if attempt to enter a password that does not meet minimum rules.

Note:

Some basic guidelines on strong passwords:

- Use both upper and lower case.

- Include numeric digits (a minimum of one). Include special characters.

- Don't use dictionary words. Don't use company name.

- Don't make the same as the user name.

- Don't use common numbers like telephone, address, birthday, and so on.

Comment

This is an optional alphanumeric field you can use when adding a new platform admin user, for description purposes only (note you cannot edit it after adding a user, unlike with a user's password).

Note:

Make note of your platform user credentials, and guard them carefully! Consider the platform daemon as the highest-level access to the MS-E10 device.

If you lose or forget these credentials, you may be unable to complete commissioning and startup of this controller. In this case, you can restore the factory default platform user, providing you can serially connect to the controller (make serial shell connection), and press a key at the prompted time during controller boot up following a power cycle.

Replacing the factory-default platform user

You see this dialog only in the initial commissioning of a new MS-E10 device, or possibly at some future point after installing a "clean dist" file.

Figure 23: Platform daemon

Step 1   In the User Name field, type in the desired user name for platform login.

Step 2   In the Password fields, type in a strong password (it must match in both password fields). Password must use a minimum of 10 characters including: at least one uppercase character, at least one lowercase character, and at least one digit.

Step 3   In the (optional) Comment field, you can enter an alphanumeric descriptor for this platform admin user, where it is seen in the "Users table" if there are more than one platform user.

Step 4   Click the Next button. You proceed either to the final commissioning (review changes) step, or if you selected to configure additional platform daemon users, you see your replacement user in the Users table of the Platform Daemon Authentication dialog.

Configuring additional platform daemon users

This step in the Commissioning Wizard lets you add additional platform admin users in the MS-E10 device, and also delete users and change passwords. Platform daemon authentication lets you create up to 20 (total) additional platform admin users.

Figure 24: Platform daemon authentication

You can access this same window via the User Accounts button in the Platform Administration view, available any time after commissioning.

Step 1   Click New User for the popup New User dialog, as shown above.

Step 2   In the User Name field, type in the desired user name for platform login.

Step 3   In the Password fields, type in a strong password (it must match in both password fields). Password must use a

minimum of 10 characters, using at least one uppercase character, at least one lowercase character, and at least one digit.

Step 4   In the (optional) Comment field, you can enter an alphanumeric descriptor for this platform admin user, where it is seen in the "Users table".

Step 5   Click OK. The user is added to the Users table.

Step 6   To add another user, repeat the previous steps or else click the Next button for the final step.

Reviewing and finishing the Commissioning Wizard

The final step in the Commissioning Wizard provides a summary of all the actions to be performed by the wizard.

Step 1   Read through the summary of changes, using the scroll bar to see those steps near the end.

If no change is needed, click Finish to initiate the rest of the Commissioning Wizard.

If any change is needed, click the Back button until the step dialog appears, then make the change. Then, click the Next button until this review dialog appears again.

Step 2   While the wizard is working, progress updates are posted in a "Completing Commissioning" dialog. When completed, the wizard reboots the MS-E10 device, and a "Close" button is available.

    ⊘   Do not remove power from the controller during this reboot, which may take up to 7 or more minutes to complete. Removing power could make the unit unrecoverable. If desired (and convenient), you can use a serial shell connection to the controller to monitor progress as files are installed and the unit is prepared (for details refer to the "System Shell" section in this guide).

Note that firmware upgrades occur before the platform daemon starts in the MS-E10 device. Therefore, it is safe to interrupt power any time after you can re-open a platform connection to the device.

Step 3   Click the Close button to exit the wizard.

When the MS-E10 device reboots, your platform connection to it closes. Notice that in the Nav tree, the platform instance for that device is now dimmed.

Step 4   Assuming that you changed the MS-E10 device's IP address in commissioning, right-click and close that platform instance in the Nav Tree, as this would make that connection instance invalid.

Figure 25: Nav Tree
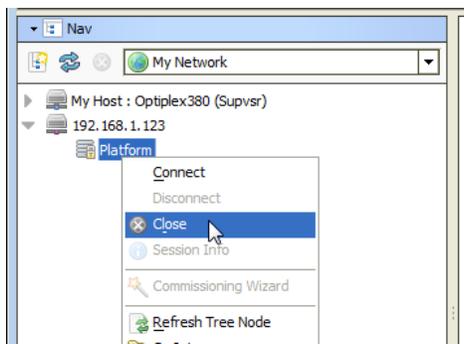
If you did not change its IP address, after several minutes you should be able to double-click the platform instance again to reconnect.

Note:

Going forward, you must access the MS-E10 device by its new (assigned) IP address. Note that your Workbench keeps a history of TCP/IP changes made.

Reopening a platform connection using the new (changed) IP address

Figure 26: Reopening a platform connection
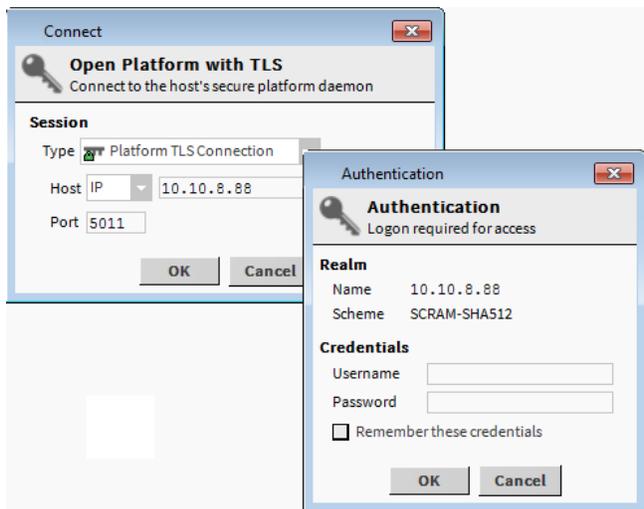
Also, you must use the credentials for the new platform user you created (to replace the factory-default platform user), or if you created additional platform users, credentials for one of them.

If you changed your PC's IP address in order to commission the MS-E10 device, you usually need to reconfigure your PC's TCP/IP settings back to appropriate settings (now) to communicate with it. Otherwise, you will be unable to connect to it for other commissioning.

CHAPTER 4 PLATFORM SERVICES (STATION) AND ADMINISTRATION

Topics covered in this chapter

- About Platform Services

- PlatformServices items of interest for device commissioning

- PlatformServices properties

- Controller-specific PlatformServices properties

A few platform configuration items in the MS-E10 device are not directly accessible in the Workbench platform connection to that controller—that is, via the Commissioning Wizard or any of the platform views. Instead, you must have a station installed and running on the controller (any station).

Then using Workbench, open a (Fox) connection to that station, and configure these platform-related items by accessing services under the station's PlatformServices container.

About Platform Services

Under its Services container, every station has a PlatformServices container.

In Niagara 4.8 and later, there is added support for the IEEE 802.1X wired authentication standard for JACE-8000 and MS-E10 platforms. For more details, see the Niagara IEEE 802.1X Configuration Guide.

Figure 27: Example device station's PlatformServices
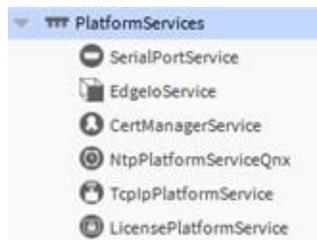
PlatformServices is different from all other components in a station in the following ways:

- It acts as the station interface to specifics about the host platform (whether MS-E10 device or a PC).

- It is built dynamically at station runtime—you do not see PlatformServices in an offline station.

- Any changes you make to PlatformServices or its child services are not stored in the station database. Instead, changes are stored in other files on the host platform, such as its `platform.bog` file.

Note:

⊘ Do not attempt to edit `platform.bog` directly; always use PlatformServices' views.

Included services are a TcpIpService and LicenseService, providing station (Fox) access to dialogs used in platform views, for instance the TCP/IP Configuration. These services support installations where all configuration must be possible using only a browser connection (and not Workbench connected to the MS-E10 device's platform daemon).

PlatformServices items of interest for device commissioning

For any QNX-based Niagara 4.7 or later MultiSITE E10, the following child platform services in the station's PlatformServices are of chief importance when commissioning a new controller.

- CertManagerService — For management of PKI certificate "stores" and/or allowed host exceptions, used in certificate-based SSL (TLS) connections between the station/platform and other hosts. For details, see the *Niagara Station SecurityGuide*.

Also, you may wish to review the parent container's PlatformServices properties and adjust, if needed.

PlatformServices properties

The default view of the PlatformServices container, the Platform Service Container Plugin, provides access to numerous properties, as shown below.

Figure 28: Platform Service Container Plugin

Name	EdgeBac
Host	▓▓▓▓ ▓ (EdgeBac)
Model	EDGE10
Product	EDGE10
Host ID	Qnx-EDGE10-BFDB-C630-BE65
Niagara Version	4.7.103.7.401
Java VM Name	OpenJDK Embedded Client VM
Java VM Vendor	Azul Systems, Inc.
Java VM Version	25.172-b112
OS Name	QNX
OS Arch	aarch32
OS Version	7.0.1
Platform Daemon Port	3011
Platform Daemon TLS Port	5011
Locale	en
System Time	16:18
Date	14-Jul-2018
Time Zone	America/New_York (-5/-4)
Engine Watchdog Policy	Terminate
Engine Watchdog Timeout	00000h 03m [0ms - +inf]
Enable Station Auto-Save	☑ Enable
Station Auto-Save Frequency	00024h 00m [1min - +inf]
Station Auto-Save Versions to Keep	0 [1 - 10]

Number of CPUs	1
Current CPU Usage	8%
Overall CPU Usage	7%

		Total	Free	Files	Max Files
Filesystem	/	1,355,760 KB	1,247,392 KB	340	42368
	/mnt/aram0	65,520 KB	62,968 KB	10	2048
	/mnt/ram0	4,080 KB	3,812 KB	10	128

	Total	Free
Physical RAM	523,264 KB	96,328 KB

Serial Number	107
Hardware Revision	0.0.0

Failure Reboot Limit	3	[1 - max]
Failure Reboot Limit Period	00000h 10m [0ms - +inf]	

	Min Free		Size		Status
RAM Disk	5	% [0 - 100]	64 MB		Ok

	Min Free		Max	Free	Status
Java Heap	8	MB	185 MB	148 MB	Ok

	Min Free		Max Open	Free	Status
Open File Descriptors	50	[50 - max]	2000	1911	Ok

	Min Free			Status
Free RAM	1024	[512 - max] KB		Ok

	Min Free			Status
Disk Space	10	% [0 - 100]		Ok

	Min Free			Status
Files	50	[50 - max]		Ok

Reviewing/adjusting PlatformServices properties for the device

Prerequisites:

A running station in the MS-E10 device, and that station opened in Workbench.

Step 1   In the Nav tree, double-click Services and then PlatformServices.

Its "Platform Service Container Plugin" displays in the view pane.

Some properties are read-only status types, similar to many seen in the Platform Administration view. Other configuration properties can be edited. A group of 3 config properties allow adjustment of the time, date, and time zone settings for the host MS-E10 device (alternately accessible using a platform connection to the MS-E10 device). Access to these properties is useful if the installation requires all setup access using a browser only.

Step 2   As needed, review other platform service configuration properties shown in the following.

Note:

You should leave the properties listed in the following table at default values unless otherwise directed by Systems Engineering.

Step 3   Click Save to write any configuration change to the host MS-E10 device platform.

Name	Value	Description
Locale	string	Determines locale-specific behavior such as date and time formatting, and also which lexicons are used. A string entered must use the form: language ["_" country["_" variant]] For example U.S. English is "en_US" and traditional Spanish would be "es_ES_Traditional". For related details, see Oracle documentation at *http://docs.oracle.com/javase/1.4.2/docs/api/java/util/Locale.html*
EngineWatch- dog Policy	LogOnly, Terminate (default), Reboot	Defines response taken by the platform daemon if it detects a station engine watchdog timeout. With the watchdog, the station periodically reports to the platform daemon its updated engine cycle count. The watchdog purpose is to detect and deal with a "hung" or "stalled" station, and is automatically enabled when the station starts. Log Only — Generates stack dump and logs an error message in the system log. (The station should ultimately be restarted if a watchdog timeout occurs with the "Log Only" setting). Terminate — (Default) Kills the VM process. If "restart on failure" is enabled for the station (typical), the station is restarted. Reboot — Automatically reboots the host MS-E10 device platform. If "auto-start" is enabled for the station, the station is restarted after the system reboots.
EngineWatch- dog Timeout	00000h03m(default)	In Niagara 4.x, the range is from 1 minute to many hours. If the station's engine cycle count stops changing and/or the station does not report a cycle count to the platform daemon within this defined period, the platform daemon causes the VM to generate a stack dump for diagnostic purposes, then takes the action defined by the Engine Watchdog Policy.
EnableStation Auto- Save	Enable(default)/disable	Allows for "auto save" of running station to "config_back-up_<YYMMDD>_<HHMM>.bog" file at the frequency defined in next property. Auto-saved backup files are kept under that station's folder.
Station Auto- Save Frequency	00024h 00m (default)	Default is every 24 hours for any embedded MS-E10 device, range is from 1 to many hours.
Station Auto- Save Versions to Keep	0	Range is 1–10. The oldest of kept backups is replaced upon next manual save or auto-save backup, once the specified limit is reached. Significant flash space is saved by keeping this 0 or perhaps 1.
RAMDisk	Min Free 5(default), Size, Status	Min Free — Default is 5. Sets the level at which Platform Services and Platform Admin show a warning. Size — Default is 64MB. Indicates the size of RAM disk used to store history and alarm files. Status — current status of RAM disk

For more details on these and other PlatformServices properties, refer to the "PlatformServiceContainer parameters" section in the Niagara Platform Guide.

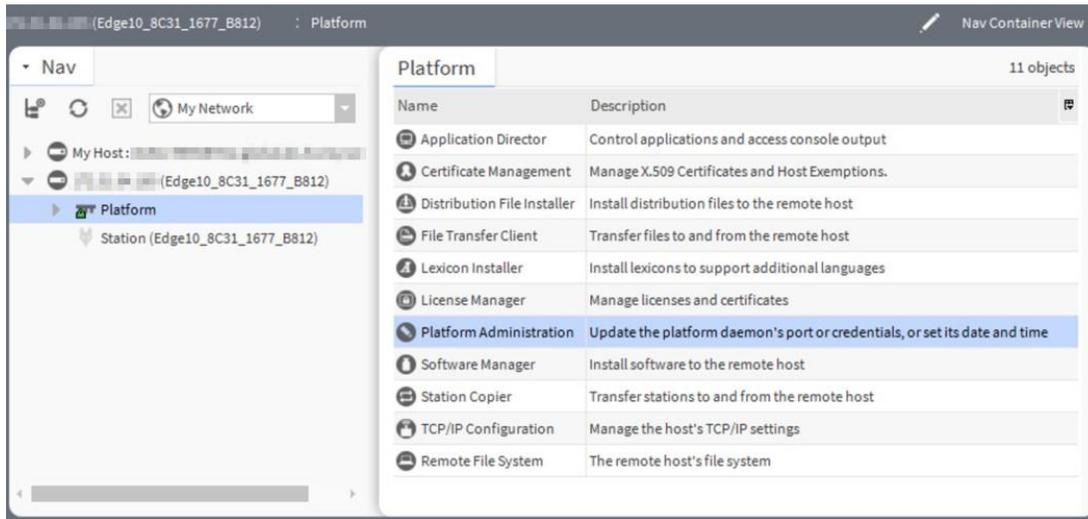# Controller specific PlatformServices properties

As newer MS-E10 device platforms are introduced, hardware-specific properties may be appended to the collection of a station's PlatformServices properties. Refer to the following examples.

Optional platform administration

The Commissioning Wizard performs most, but sometimes not all, needed configuration for a new MS-E10 platform. There are several items you should review (and optionally change) in a follow-up platform connection to each MS-E10 device, using the Platform Administration view.

As shown below, the Platform Administration view is one of several views for any platform, listed under the platform in the Nav tree and in the platform's Nav Container View. This view provides a text summary of the MS-E10 device's current software configuration, including its model number, OS level, JVM version, installed modules, lexicons, licenses, certificates, and so on.

Figure 29: Platform Administration is one of several platform views

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Included in this view are commands and related dialogs in which you can:

- Set the date and time in the MS-E10 device.

- Change TLS settings used by the MS-E10 device for secure "platformssl" access, including configured state, platformssl port (HTTPS Port), PKI certificate, and TLS protocol. The default port is 5011.

Note that in Niagara 4, "SSL" is always implemented using the TLS (Transport Layer Security) protocol. See the Niagara Station Security Guide for complete details.

- Enable or disable SFTP (Secure File Transfer Protocol) and SSH (Secure Shell) access to the MS-E10 device. By default, such access is disabled, where both protocols use TCP port 22.

Note:

Although SFTP and SSH are more secure than FTP and Telnet access, enabling still poses security risks. We strongly recommend that you keep this access disabled, unless otherwise directed by Systems Engineering. Upon completion of any use, such access should be disabled once again.

- View daemon output and change logging levels.

- Enable debug access for temporary browser access to platform daemon diagnostic tools

- Perform other platform tasks initially performed with the Commissioning Wizard, such as modifying platform admin users (User Accounts), configuring runtime profiles, and so on.

For more details, see the "Platform Administration" section in the Niagara Platform Guide.

Performing platform administration

Prerequisites:

- The MS-E10 device is already commissioned using the Commissioning Wizard.

Step 1   Using Workbench, open a platform connection to the MS-E10 device. Use the platform credentials you specified when creating a platform user while commissioning the device.

Step 2   In the MS-E10 device platform's Nav Container View, double-click Platform Administration.

Step 3   In the Platform Administration view, click any of the following to review or make changes:

- View Details — A platform summary that you can copy to the Windows clipboard.

- User Accounts — A platform daemon authentication dialog to add, delete, or manage platform users (initially performed as a step in the Commissioning Wizard).

- System Passphrase — A dialog to set or change the system passphrase used to encrypt sensitive information on the platform's filesystem.

- Change TLS Settings — A dialog to specify platform SSL settings, including enabling/disabling, port, PKI certificate to authenticate by, and secure protocol to use. Details are beyond the scope of this document. For an overview, see "Change SSL (TLS) Settings" in the *Niagara Platform Guide*. For complete information, refer to the *Niagara Station Security Guide*.

- Change Date / Time — A dialog to change the device's current date, time, and time zone (initially performed as a step in commissioning wizard).

- Advanced Options — A dialog to enable or disable the following advanced platform options
  - SFTP / SSH Enabled — A dialog to enable/disable SFTP and SSH access to the device, or change the default port number that these protocols use/share.
  - Daemon Debug Enabled — Temporarily enable the browser based daemon debugging tools. This is automatically turned off the next time the system boots.
  - USB Backup Enabled — Enable or disable the USB Backup port on the device's enclosure.
  - Change Output Settings — A dialog to change the log level of different processes that can appear in the platform daemon output
  - View Daemon Debug — A window in which you can observe debug messages from platform daemon processes in real time. Also includes ability to pause or load.
  - View System Log — A window for viewing system log(s) for the platform.
  - Configure Runtime Profiles — A dialog to change the types of runtime profiles for software modules installed on the device (initially performed in Commissioning Wizard).
  - Configure NRE Memory — A dialog to configure the memory allocation sizes of this platform's Niagara Runtime Environment.
  - Backup — Make a complete backup of all configuration on the connected host platform, including all station files, plus other Niagara configuration (typically unnecessary for any MS-E10 device just started up).
  - Commissioning — Another way to re-launch the Commissioning Wizard, as previously used in the initial commissioning of the device.
  - Reboot — A method to reboot the MS-E10 platform, which restarts all software including the OS and JVM, then the platform daemon, then if so configured in the Application Director (Station Director), the installed station. If you click this, a confirmation dialog appears.

    If you reboot, your platform connection is lost, and it is typically a few minutes until you can reconnect to this MS-E10 device.

CHAPTER 5 PROVISIONING TOOLS

Topics covered in this chapter

- Architectural considerations
- Device provisioning
- Provisioning configuration
- Configuration steps
- Executing the job
- Update system software
- Install device application
- Template setup
- Copying template and Excel files to Supervisor
- Deploy bulk template
- Update device application

MS-E10 devices in a factory out-of-the box state must be configured to install appropriate software modules and application components in order to be a productive part of a Niagara installation. It is possible to commission each device individually, but this would take quite a bit of time for a system with tens or hundreds of MS-E10 devices. In Niagara 4.6 and later, the Provisioning environment provides a workflow to configure devices in bulk.

Architectural considerations

The MS-E10 device can be connected in several different network topologies.

- MS-E10 devices connected to the secondary port of a JACE-8000.
    - With or without a switch.
    - With or without an isolated DHCP server.
- MS-E10 devices connected directly to the IT network.

For more details, see "Constructing a network with MS-E10 devices".

Device provisioning

In Niagara 4.6 and later, provisioning steps are available to simplify and enhance the provisioning workflow required to establish a functioning MS-E10 installation. These provisioning steps are all part of a complete workflow, and should be performed in the sequence in which they are described below.

In addition, the provisioning batch job management has been improved to enable provisioning jobs to concurrently run across multiple stations. By default, the number of parallel executions is derived based on the supervisor's hardware platform. This concurrency applies to any provisioning job, not just those containing these new device provisioning steps.

See the Niagara Provisioning Guide for details on existing Niagara provisioning capabilities, including the creation of a provisioning environment on a Supervisor, creating provisioning jobs to run a sequence of steps, monitoring the execution of these jobs on a set of devices, and reviewing job results.

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Provisioning configuration

Use NiagaraNetworkJobPrototype components copied into the Supervisor station to set up device provisioning. These job prototypes will persist in the Supervisor component space and can be edited and executed as many times as needed.

See "Prototype jobs" for details on creating and managing these components. Provisioning jobs are configured using the Niagara Network Prototype view on a job prototype component.

Provisioning job steps are added into the Initial steps to run only once and Steps to run for each station stages of the job prototype. Stations are added into the job to complete the prototype configuration. It can be saved and run using the buttons at the bottom of the view.

Figure 30: New Job Steps, Initial steps to run only once (top window) and Steps to run for each station (bottom window)
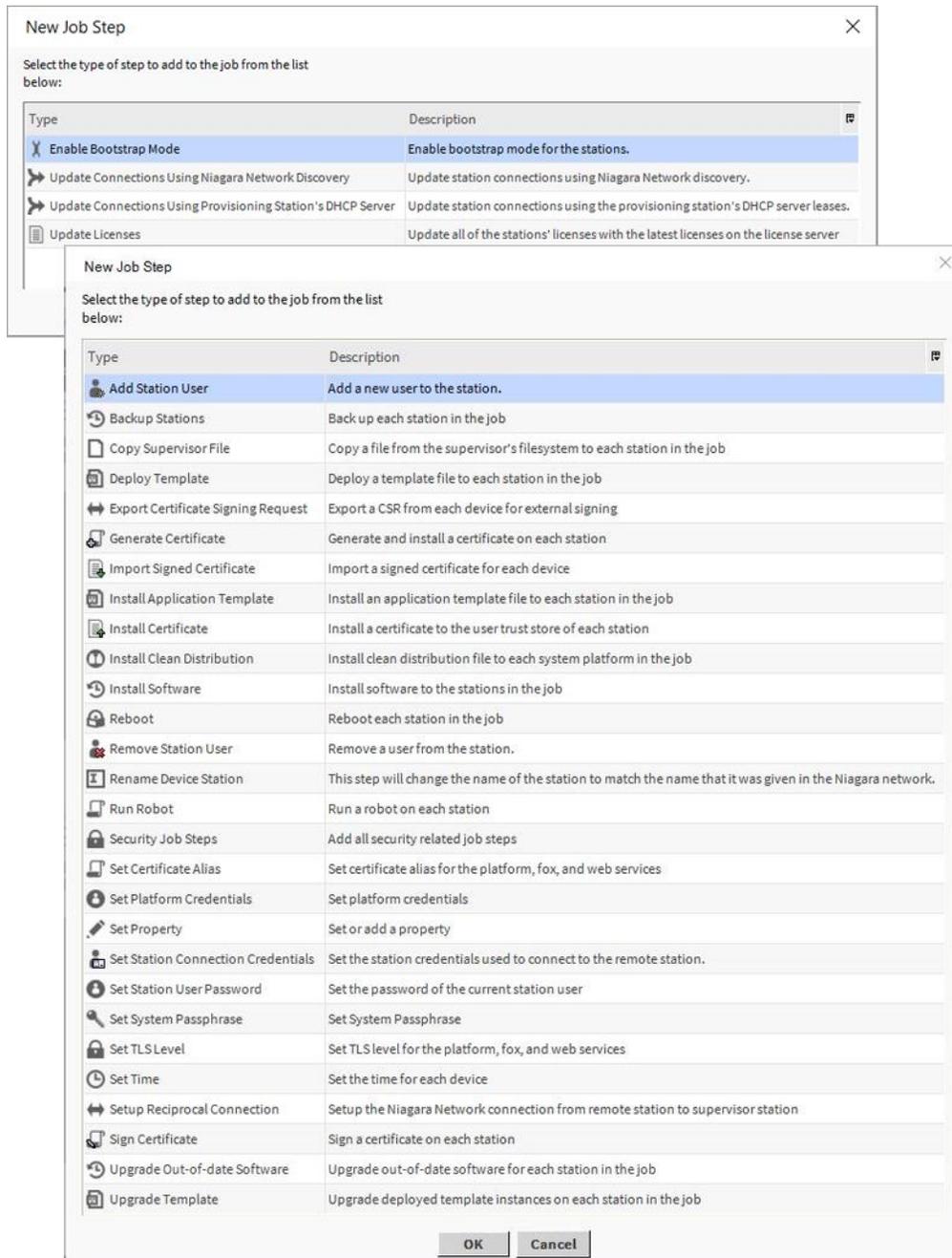
Figure 31: Example Provisioning Job Prototype
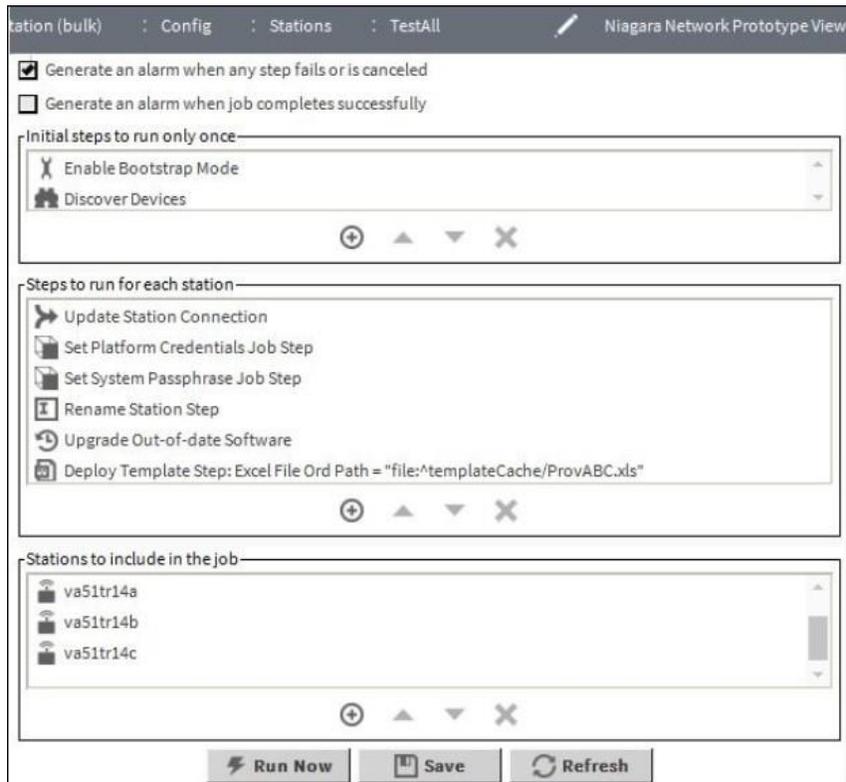
Run Results

When the job is initiated from the Niagara Network Prototype view, Workbench will automatically change to the Niagara Network Job view where job step results accumulate as the job proceeds. Each row in the table represents a single step execution on a single station. Clicking on the double arrow icon at the right end of a row will show the job execution details in the Batch Job Step Log File view. Entries in this table will display the first line of any progress update or failure messages for that job step. Double-click on a line to see the full text of the log message. This can be helpful in why a step might have succeeded or failed.

Figure 32: Provisioning Job Results

Figure 33: Job Step Success Example

Figure 34: Job Step Failure Example with Log Message Details

Configuration steps

Provisioning is a flexible tool, designed for both setting up new devices, and maintaining existing devices. Due to the number of possible network and device configurations, it is not possible to provide a list of steps for every scenario. However, for initial setup of an out-of-the-box device, the following list of steps is provided as a recommended starting point to setup the device, update the software, and establish the initial communications. Running a provisioning job containing these steps will setup the device in a similar way to commissioning.

Initial steps to run only once

Add the following step(s) to the top pane Initial Steps to Run Only Once section of the prototype job.

Step 1 Add the Enable Bootstrap Mode step.

Step 2 (Optional) If you have MS-E10 devices connected to a secondary port on a JACE, and would like to update the IP addresses of the station proxies in your NiagaraNetwork, add the Update Connections Using Provisioning Station's DHCP Server step.

Step 3 (Optional) If you have MS-E10 devices on the same network as the Supervisor (connected to the primary port of a JACE, or other Supervisor), and would like to update the IP addresses of the station proxies in your NiagaraNetwork, add the Update Connections Using Niagara Network Discovery step.

> ### Note:

Both of the optional steps match the devices based on the name of the station, or the host id set in the `targetHostId` property of the BootstrapExt of the NiagaraStation in the NiagaraNetwork.

Steps to run for each station

Add the following steps to the middle pane (Steps to run for each station) section of the job.

Prerequisites: The Niagara Network Prototype View (for a prototype job) is open.

Note:

The ordering of the steps is important. So, these steps should be added in the order indicated here.

Step 1   Add the Set System Passphrase step, enter the following:

- Enter the current passphrase: niagara (the default passphrase for out-of-the-box MS-E10 devices).

- Enter the new passphrase you would like to use.

Step 2   Add the Set Platform Credentials step, enter the platform credentials (username / password) that you would like to use.

Step 3   Add the Set Station User Password step, enter the password that you would like to use.

Step 4   Add the Upgrade Out-of-date Software step.

This step has no configuration options.

Step 5   Add the Rename Station step.

This step has no configuration options.

Step 6   Add the Setup Reciprocal Station step and enter the username / password of your Supervisor station.

You can enter the public IP address of your Supervisor station, or leave it blank to have the reciprocal connection auto-detect the IP address of the Supervisor.

Step 7   Add the Set Time step and do one of the following:

- Click the checkbox option to "Use supervisor time" to set the MS-E10 device to the same time as your Supervisor.

- Deselect the checkbox and enter a time manually to set the MS-E10 device to another time.

Step 8   Add the Generate Certificate step.

To setup secure communication with the MS-E10 devices, you need to create a self signed certificate for the device. At a minimum, you need to enter an alias for the certificate, an Organization, and a County Code. The Common Name (CN) should be left as "<hostname>".

Step 9   Add the Set Certificate Alias step and enter the certificate alias of the certificate you would like to use for your device. .

The alias should be the same alias entered for the certificate that was generated in the "Generate Certificate step".

You are finished adding steps to this provisioning job.

Executing the job

Once the job setup is complete, your provision job should appear as shown.

Figure 35: MS-E10 device provisioning job
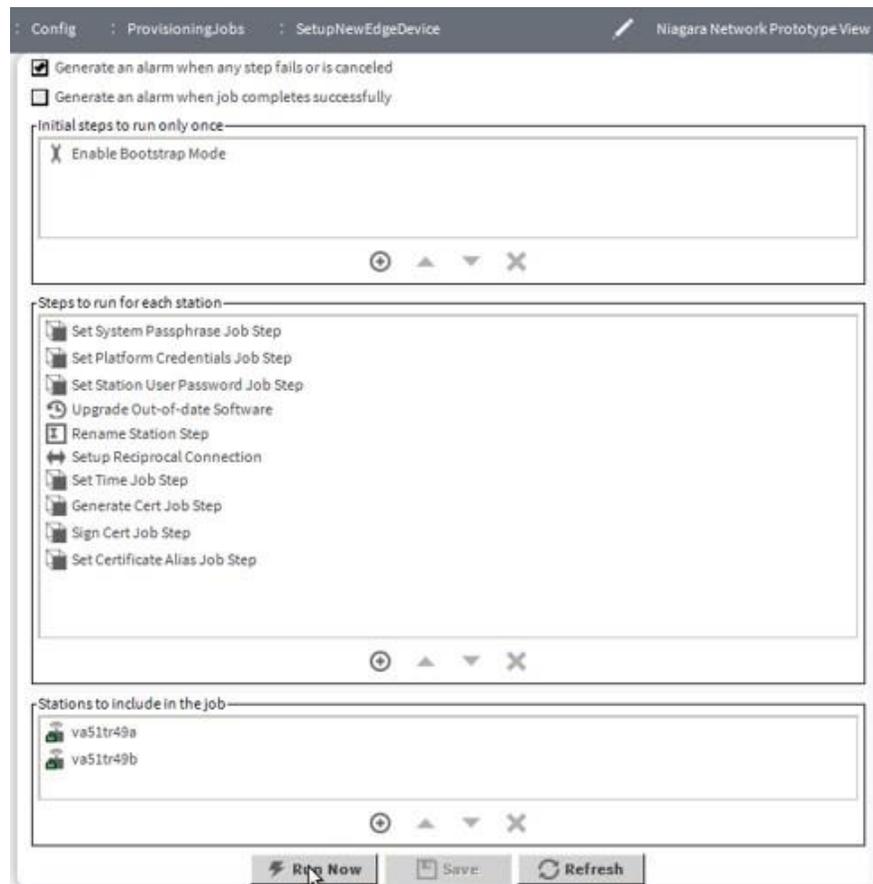
Update system software

Existing Niagara Provisioning includes a job step Upgrade Out-of-date Software. This will upgrade target devices with the latest versions of platform (.dist file) and module (.jar file) software available in the Supervisor's software database.

Also available is the Install Software job step which installs new modules not already running on the target device. All software MUST be installed on the device to support all dependencies required by the deployed station services, networks, templates, and any other components.

Remember to use the Sync Workbench button in the Supervisor Software Manager view to copy the latest software from the Workbench installation to the Supervisor station if needed. For details, see "provisioning Niagara-Supervisor Software Manager" in the "Components" chapter of the Niagara Provisioning Guide.

Install device application

MS-E10 devices ship with a default station installed. In Niagara 4.6 and later, customer applications can be deployed to multiple devices using templates.

A template contains a single component tree, so it is possible that multiple templates are needed to achieve a desired station component configuration. The provisioning steps allow templates to be deployed to a set of stations in a NiagaraNetwork, along with any defined inputs, outputs, relations, and configurations.

For more information on template creation and management, see the *Niagara Templates Guide*.

Template setup

Follow the process described in "Template Bulk Deployment" in the Niagara Templates Guide to generate and configure template bulk provisioning Excel files. These are used along with the associated template files to deploy templates in a provisioning job.

MS-E10 devices

One important feature useful for provisioning is the Unique Device column in the Excel file. This allows an individual template instance to be applied to a single device (IP address or device name), making it possible to apply unique template configurations to separate devices in one provisioning job.

Copying template and Excel files to Supervisor

The configured template bulk provisioning Excel files are used along with the associated template files to deploy templates in a provisioning job.

MS-E10 devices

Step 1   In your Supervisor, navigate to the Drivers→NiagaraNetwork→ProvisioningNwExt to open the Niagara Network Job Builder view.

Step 2   Click the Copy Templates button at the bottom of the view to open a File Chooser.

Step 3   In the Template Configuration File Chooser window, use multi-select (Shift + Control) to select the set of .xls and .ntpl files to be used for provisioning, and click OK.

The selected files are transferred from their source (typically inside your Niagara User Home /templates folder) to the Supervisor's templateCache folder.

Deploy bulk template

Add this job step the provisioning job prototype.

Prerequisites:

Step 1   In the Niagara Network Job Builder view, click + (Add) under the middle pane to add provisioning job steps.

Step 2   In the New Job Step window, click to select the Deploy Template step to open a File Chooser.

Step 3   In the Template Configuration File Chooser window, navigate to the templateCache folder and select the Excel file to use for this step.

Figure 36: Template configuration
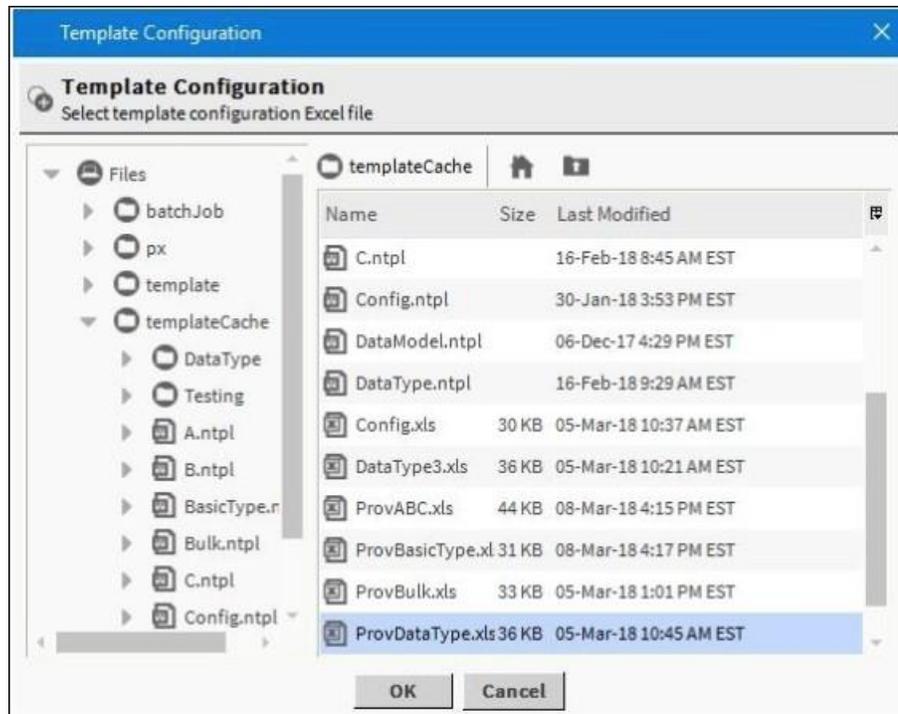
The step will be added to the job sequence and will show the file path ORD to use.

If more than one Excel file/template file combination is needed to complete an entire application installation, multiple templates can be exported to a single Excel file, where each template configuration is generated on a separate Excel worksheet tab. Template instances would be configured on each tab in the Excel workbook.

It is also possible to include multiple Deploy Bulk Template steps in a single provisioning job.

Update device application

Provisioned templates can be updated at some later time using the Upgrade Template job step. Multiple Upgrade Template steps can be included in a single provisioning prototype to upgrade multiple templates at the same time.

Prerequisites:

Step 1   Click the Copy Template button to copy the upgraded .ntpl file to the Supervisor station.

Step 2   Set up a provisioning prototype to include the Upgrade Template job step and the stations to be updated.

Step 3   Save and Run the prototype to apply the upgraded template.

The results will be the same as if you upgraded each template individually with each station's Template Manager.

Note:

Initial configurations on the template will be re-applied to the upgraded template.

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CHAPTER 6 REFERENCE INFORMATION

Topics covered in this chapter

- Reviewing TCP/IP changes history

- Recovering factory defaults

- System shell

During MS-E10 commissioning, it is possible to run into problems. For instance, you may type an IP address incorrectly when entering it, and as a result be unable to regain access. In this scenario, there are a couple of things you should know about:

Reviewing TCP/IP changes history

Your Workbench PC records "before and after" TCP/IP settings made from your platform connections in an `ipchanges.bog` file. If necessary, you can review changes made from your Workbench using the following procedure.

Step 1   In the Workbench Nav tree, expand "My Host" and then "My File System."

Step 2   Expand "User Home", then expand "ipchanges.bog."

Child folders are "date-named" using the following convention:

`<yyyymmddhhmmss>` for example, "`d20180113153640`" for 2018 Jan 13 3:36pm

Step 3   Expand any folder of interest (right-click, select Views→Property Sheet). Note the included decoded "modTime" value, for example, "`13-Jan-2018 03:36 PM EST`" (vs "`d20180113153640`").

Underneath each folder are two objects:

- priorValue — TCP/IP settings that existed before this change.

- newValue — TCP/IP settings that existed *after* this change.

Step 4   In the property sheet, expand a **`priorValue`** or **`newValue`** to see settings.

Note:

If you have a platform connection open (to any host), you can also review this same history of IP changes made from your Workbench to remote platforms. At the bottom of the TCP/IP Configuration view, click "Audit". This shows this same ipChanges.bog folder and all child change en- try folders in a property sheet view. Expand a change folder to see a decoded "modTime" value, for example, "13-Jan-2018 03:36 PM EST" (vs "d20180113153640"). Expand a "priorValue" or "newValue" in the view to see the settings.

Figure 37: Accessing ipchanges.bog in open platform connection
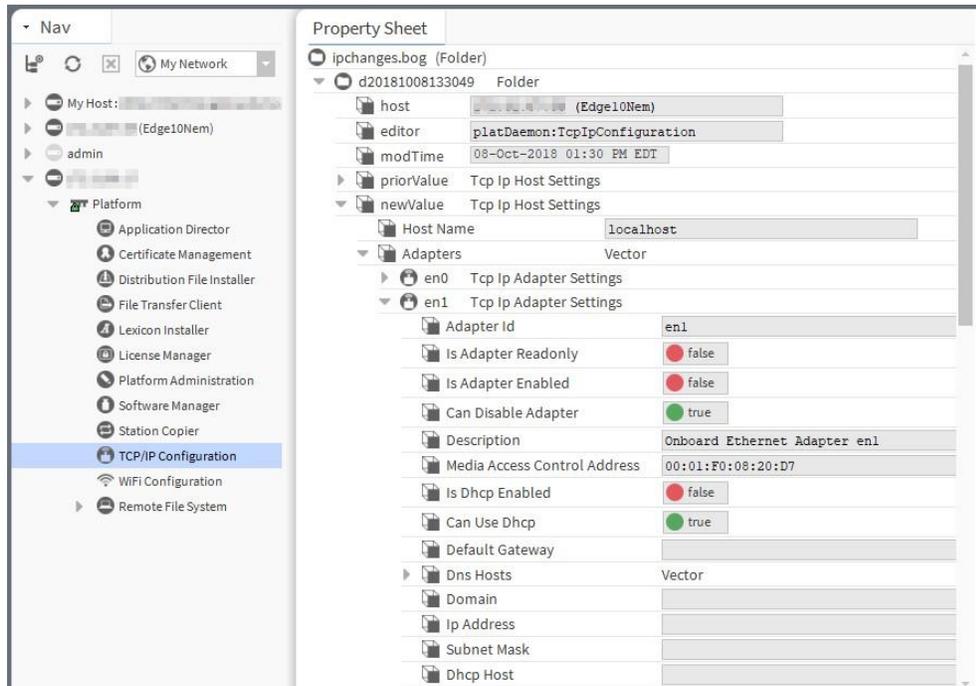
Recovering factory defaults

The process of recovering factory defaults returns the MS-E10 device to the state it was in when it shipped from the factory. This procedure describes the steps to recover factory defaults when using a terminal emulator program to access the device's system shell menu.

Prerequisites:

- A USB-to-micro USB cable (same cable as that used to connect a smart phone to a computer) connecting the controller to your PC. The Debug port on a controller is a standard Micro-A type USB port used to access the serial shell.

- A terminal emulator (system shell program), such as PuTTY, installed on your PC.

Note:

Recovering factory defaults removes all platform and station data in the device. Be sure to back- up data prior to performing this procedure.

Following are a couple of scenarios for which you might choose to recover factory defaults:

- While commissioning a brand new MS-E10 device, you make an error entering the default platform daemon credentials or passphrase. The result is that you cannot commission the controller. In this scenario, your only option is to recover the factory defaults.

- When decommissioning the MS-E10 device, a best practice to follow is recovering the factory defaults in order to wipe all of the platform and station data in the controller.

The figure with numbered call-outs, shown here, indicates the position of USB port and pushbutton switches.

Figure 38: Position of USB port and pushbutton switches

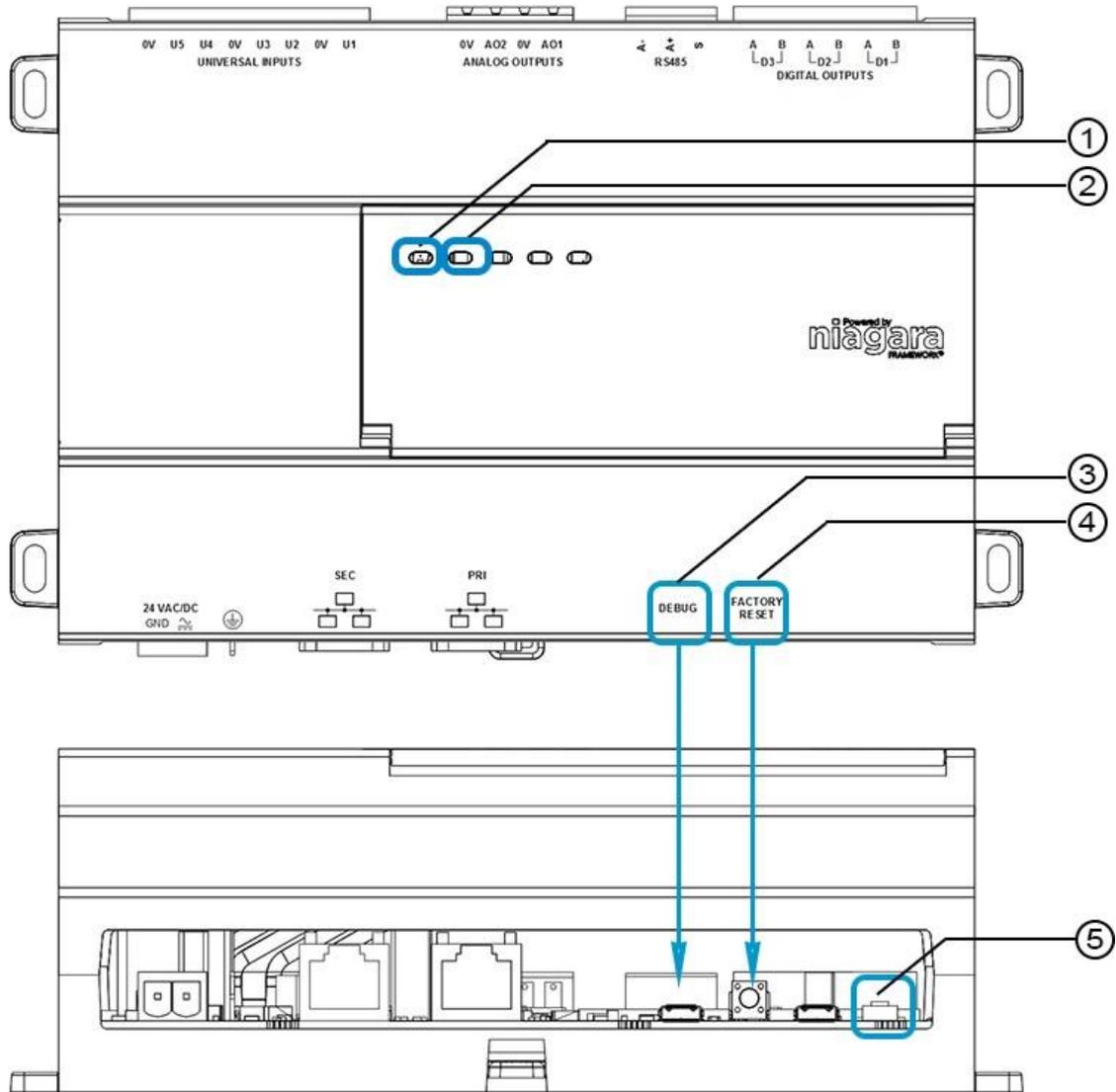| 1	STAT LED	Status LED, illuminated while controller is powered.
2	BEAT LED	Heartbeat LED, normally 5Hz, 50% duty cycle. Fast blink during boot process.
3	DEBUG	Micro-A USB port for serial debug communications
4	FACTORY RESET	Push-button switch to initiate a return to factory default settings
5	RESET	Unlabeled push-button switch (located in the recessed cavity) to initiate physical reset of the device.

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The DEBUG port is a standard Micro-A type USB port for serial debug communications to the device. NOTE: Login requires administrator level platform credentials.

The RESET button does an immediate shutdown of the device. It is the equivalent of removing power.

Step 1   Ensure that the device's power is off.

Step 2   Press and hold down the Factory Reset button as you power up the device. You will see one of the following:

> a. Status LED blinks at a fast rate (5Hz)
>
> b. If you have the serial shell you will see a prompt to release the button:
>
>   "Restore button press detected. Please release button to initiate factory restore.
>
>   Restore mode is set!

Step 3   Release the button to proceed with the factory restore process.

Note:

  The FACTORY RESET button must be released within 5 seconds of the fast blink.

Step 4   When the MS-E10 device powers up, login with default credentials to proceed.

Factory restore involves several reboots. During reboot, the BEAT LED blinks at a rapid rate. When the BEAT LED blinks at normal rate, login with default credentials.

Note:

> ⊘ Do not remove power from the device while the BEAT LED blinks at a rapid rate since this causes physical stress on the equipment and prevents good connections between the device and I/O modules.

System shell

Any QNX-based MS-E10 device has a "system shell," providing low-level access to a few basic platform settings. Using a special power-up mode and a serial connection via a USB-to-MicroUSB cable connected to the MS-E10 device's Debug port, you can access this system shell. Note that system shell is also available via SSH (providing that SSH is enabled in the MS-E10 device).

Typical usage is for troubleshooting. However, in the case of IP address misconfiguration, you can use the serial system shell in order to regain access to the unit.

Note:

Also, depending on your preference, you may wish to use the serial shell to set the MS-E10 device's IP address.

The following sections provide more details.

About the Edge system shell mode

To put the MS-E10 device into the debug system shell mode, plug-in the USB-to-MicroUSB cable. This makes the system shell available at the controller's Debug port, at a pre-defined serial rate: 115200, 8, N, 1.

Using a terminal emulation program, such as PuTTY, you can login with platform credentials and access the system shell menu. After changing platform IP address parameters, a reboot command from the menu is necessary, and you remove the USB cable. The MS-E10 device reboots using the changed IP address parameters.

Apart from physical access to the controller, you need the following items:

- A working USB port on your PC.
- VCOM or similar PC software (such as PuTTY) enabling the USB port to emulate a serial port
- A cable to connect your PC's USB port to the MS-E10 device's Debug port.

Connecting to the debug system shell

The following procedure provides steps to use the system shell. Examples provided use the PuTTY terminal emulation program.

Prerequisites:

- Physical access to the MS-E10 device controller
- Universal USB-to-MicroUSB connector cable

Step 1   Connect the USB cable between the controller's Debug port and the USB port you are using on your PC.

Step 2   On your PC, start your terminal emulation software. For example to start PuTTY from the Windows Start menu, this is typically Programs > PuTTY → PuTTY.

Step 3   In the tree in the PuTTY Configuration dialog, expand Connection and click Serial.

Step 4   Set the "Serial line to connect to" for your PC's (USB) COM port to use. For example, COM3.

- You can examine Ports in Windows Device Manager to determine which serial port is in use on the PC.

Step 5   Set the "Configure the serial line" fields as follows:

- Speed (baud): `115200`
- Data bits: `8`
- Stop bits: `1`
- Parity: None
- Flow control: None

Step 6   In the tree in the PuTTY Configuration dialog, click Session and then click/select the "Connection type" as Serial.

- (Optional) You can save this configuration to reuse (load) in future PuTTY to MS-E10 device serial sessions. To do this, type in a connection name in the "Saved Sessions" field (for example, "MS-E10 device"), and click Save.

When you start PuTTY again to serially connect to the device, select this name and click Load.

Step 7   At the bottom of the PuTTY Configuration dialog, click Enter.

Step 8   At the login prompt, enter a platform user name, and at the password prompt, the platform password.

a.   If prompted for system passphrase, enter the platform's system passphrase. If login is successful, the MS-E10 System Shell menu appears:

Step 9   When finished making platform changes from the system shell, do the following:

- If no changes, or reboot is not necessary, simply type `L` to Logout.

- If changes require rebooting, select the `Reboot` option.

Type "y" at the "Are you sure you want to reboot [y/n]" prompt, and press Enter. Shutdown-related text appears in the terminal (PuTTY) window.

Step 10   Click the Close control (upper right corner) in the terminal session (PuTTY) window.

Click OK in the "PuTTY Exit Confirmation" popup dialog.

Step 11   Unplug the USB connector from the MS-E10 device's Debug port.

About the system shell menu

The system shell of the MS-E10 device provides simple, menu-driven, text-prompt access to basic Niagara platform settings, including IP network settings, platform credentials, system time, and enabling/disabling SFTP/SSH and Telnet. Also, you can use it to perform a TCP/IP "ping" from the MS-E10 device to another host.

Changes issued in the system shell become immediately effective, except for IP address settings (Update Network Settings). You must reboot the MS-E10 device in order for any changed network settings to become effective.

Note:

- If SSH is enabled in the MS-E10 device, you can also access the controller's system shell using a remote terminal session using SSH. Platform login is still required (just as with the device powered up in serial shell mode).

- Be careful when changing items from the system shell, in particular platform account (login credentials, system passphrase) and network settings. If you change platform login credentials and then lose or forget them, you can restore the "factory default" platform login credentials—however, you will need to make a debug system shell connection, reboot the MS-E10 device, and then be careful to press a key at the appropriate time during boot up process.

Following is an example of the system shell menu.

Figure 39: System shell menu (serial shell or Telnet access)

```
 EDGE10 System Shell
------------------------------------------------------------------------
 hostid: Qnx-EDGE10-8C31-1677-B812
 serial number: 116
 build version: 4.7.105.1
 build date: built on 2018-07-17 18:31:49
 system time: Thu Jul 26 13:48:49 GMT 2018
 niagara daemon port: https 5011

 en0:  inet 172.31.64.165 netmask 0xfffffc00 broadcast 172.31.67.255
       inet6 fe80::201:f0ff:fe08:20e8%en0 prefixlen 64 scopeid 0x11
 en1: <disabled>
------------------------------------------------------------------------

    1.   Update System Time
    2.   Update Network Settings
    3.   Ping Host
    4.   Enable/Disable SSH/SFTP
    5.   Change Current User Password
    6.   Change System Passphrase
    7.   Configure STP Settings
    8.   Reboot

    L.   Logout

 Enter choice: []
```

To select a menu option, type the associated number (1 to 9) or "L" for logout, then press Enter. For example,

- type 2 (Update Network Settings) to recover IP access, or to set the IP settings of a new MS-E10 device.

- type 6 (Change System Passphrase) to change the system passphrase of the unit. You might do this if swapping in a microSD card from a previously configured unit, in order to change the passphrase of the unit to match the passphrase that is already stored on the SD card.

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Update Network Settings

Use system shell menu option '2' to access most of the same IP networking options available in the Commissioning Wizard step "TCP/IP configuration". When selected, you are prompted for each setting sequentially, starting with hostname (as shown below).

Use system shell menu option '7' to access the spanning tree protocol (STP) configuration settings to choose either standard or daisy chain network link mode. Selecting option 7 opens the following window:

Figure 40: System shell STP Configuration Utility

```
STP Configuration Utility

Enter new value, or '<cr>' to keep existing value

Network Mode
A) Daisy-Chain      B) Standard

Enter the letter for the new mode <daisychain>:B




                Mode: standard
Save these settings? (Y/n) : □
```

Note:

If you intend to use the secondary Ethernet port on the MS-E10 device you must first configure the device for Standard network link mode.

Standard link mode

The following example shows the system shell network settings for the standard link mode.

Figure 41: Example: System shell with network settings for Standard Link Mode

```
EDGE10 Network Configuration Utility

Enter new value, '.' to clear the field or '<cr>' to keep existing value

Hostname <localhost> : Edge10-standard
Domain <> : myDomain.net
Primary DNS Server <> : 8.8.8.8
Secondary DNS Server <> : 8.8.4.4
Route <> : 192.168.1.1
Primary IPv6 DNS Server <> :
Secondary IPv6 DNS Server <> :
IPv6 Route <> :

NET1 Ethernet interface (en0)
  IP address (clear to use DHCP) <> : 192.168.1.36
  Subnet mask <> : 255.255.255.0
  Enable IPv6 addressing on this adapter? (Y/n) :
  IPv6 address (clear to use IPv6 Autoconfiguration) <> :

Enable NET2 (en1) interface? (y/N) : Y
NET2 Ethernet interface
  IP address (clear to use DHCP) <> : 172.15.16.36
  Subnet mask <> : 255.255.255.0
  Enable IPv6 addressing on this adapter? (Y/n) :
  IPv6 address (only 1 adapter may use IPv6 Autoconfiguration) <> :

 **** IPv6 Autoconfiguration NOT supported on NET2 interface. IPv6 on NET2 will be disabled.


Confirm new configuration
Hostname             : Edge10-standard
Domain               : myDomain.net
Default Gateway      : 192.168.1.1
Primary DNS          : 8.8.8.8
Secondary DNS        : 8.8.4.4
Default IPv6 Gateway :
Primary IPv6 DNS     :
Secondary IPv6 DNS   :

NET1 settings (en0):
type                 : ethernet
IP Address           : 192.168.1.36
Subnet Mask          : 255.255.255.0
IPv6 Address         : assigned via Autoconfiguration

NET2 settings (en1):
type                 : ethernet
IP Address           : 172.15.16.36
Subnet Mask          : 255.255.255.0
IPv6 Address         : disabled

Save these settings? (Y/n) : [ ]
```

Daisy Chain link mode

The following example shows the system shell network settings for the daisy chain mode. This is the default network mode for the device.

Note:

If set up for Daisy Chain Mode, you cannot configure the secondary adapter, as shown below.

Figure 42: Example: System shell with network settings for Daisy Chain Mode

```
EDGE10 Network Configuration Utility

Enter new value, '.' to clear the field or '<cr>' to keep existing value

Hostname <localhost> : Edge10
Domain <> : myDomain.net
Primary DNS Server <> : 8.8.8.8
Secondary DNS Server <> : 8.8.4.4
Route <> : 192.168.1.1
Primary IPv6 DNS Server <> :
Secondary IPv6 DNS Server <> :
IPv6 Route <> :

NET1 Ethernet interface (en0)
  IP address (clear to use DHCP) <> : 192.168.1.36
  Subnet mask <> : 255.255.255.0
  Enable IPv6 addressing on this adapter? (Y/n) :
  IPv6 address (clear to use IPv6 Autoconfiguration) <> :


  *** Daisy Chain enabled for this host. NET2 will mirror primary adapter settings.


Confirm new configuration
Hostname             : Edge10
Domain               : myDomain.net
Default Gateway      : 192.168.1.1
Primary DNS          : 8.8.8.8
Secondary DNS        : 8.8.4.4
Default IPv6 Gateway :
Primary IPv6 DNS     :
Secondary IPv6 DNS   :

NET1 settings (en0):
type                 : ethernet
IP Address           : 192.168.1.36
Subnet Mask          : 255.255.255.0
IPv6 Address         : assigned via Autoconfiguration

NET2 disabled (en1)

Save these settings? (Y/n) : []
```

Update System Time

If the commissioning process hasn't been completed yet, it is often important to set the current date and time (YYYYMMDDHHMM.ss). For example: 201510231536 for 23-Oct-2015 at 3:36pm UTC or 11:36 EDT.

LIMITED WARRANTY

"The product's full Limited Warranty terms and conditions, and arbitration requirements are available at http://www.lghvac.com."

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