

Retrofit Board Niagara R2 Install & Startup Guide

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This document covers the initial Niagara R2 software installation and configuration for a JACE-403 or JACE-545 controller that has been upgraded with the NPM6E-based “retrofit board” (RB-603 or RB-645), using Workbench¹ AX 3.6.44 or later, as well as Niagara R2 installation of build 2.301.535v1 or later. It assumes that you are an engineer, technician, or service person who is performing control system installation. All information in this document is also online in Niagara Workbench help, providing that the docRetrofitBoardR2 module was installed.

Note: *Throughout this document, the terms “JACE-603” and “JACE-645” are used to refer to controllers that have been outfitted with a retrofit board. These controllers are also available as entire new units. If the upgraded (or new) JACE-603 or JACE-645 controller is to run NiagaraAX instead of Niagara R2, please refer to the JACE NiagaraAX Install & Startup Guide in place of this document.*

For physical mounting and wiring details, refer to the *RB-603 and RB-645 Retrofit Board Install Guide*.

Note this document does not cover Niagara R2 station access and configuration. Please refer to the Niagara R2 documentation and the Help in the Niagara R2 JDE (Java Desktop Environment).

The following main sections are in this document:

- “Overview” on page 1-2
- “Preparation” on page 1-3
- “Connect to the JACE-603 or JACE-645” on page 1-5
 - “Open a platform connection” on page 1-5
 - “Set system date and time” on page 1-7
 - “Navigating a platform connection” on page 1-6
- “Run the Install Niagara R2 wizard” on page 1-7
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1. Workbench described and shown in this document is a simplified, “profiled” version intended only for use with a retrofit board-equipped JACE-603 or JACE-645 being commissioned as a Niagara R2 host, using a NiagaraAX platform connection. This Workbench interface is simplified, and does not include a sidebar area for a Nav tree, or many other Workbench features, for example to support NiagaraAX station connections. However, if you are using the standard “non-profiled” NiagaraAX Workbench, the same platform operations described in this document also apply whenever performing Niagara R2 platform commissioning of a JACE-603 or JACE-645 controller.

- [“Distribution File Installer”](#) on page 1-37
- [“File Transfer Client”](#) on page 1-38
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- [“Document Change Log”](#) on page 1-44

Overview

The RB-603 or RB-645 retrofit board upgrades a Niagara R2 based JACE-403 and JACE-545 controller, respectively, to a unit with increased performance and the ability to run either Niagara R2 (build 2.301.535 or later) or NiagaraAX software, build 3.6.44 or later. Each retrofit board uses an NPM6E (Niagara Processor Module) that runs the QNX operating system and the Oracle Hotspot Java VM.

You no longer use the R2 “Admin Tool” for host-level configuration of an upgraded unit. Instead, you use Niagara Workbench 3.6.44 or later for all host (platform) configuration of a JACE-603 or JACE-645 controller—regardless if it will run Niagara R2 or NiagaraAX.

If you install Niagara R2 (the subject of this document), you continue to use the Niagara R2 JDE (Java Desktop Environment), build 2.301.535 or later, for all R2 *station access and configuration*. However, for ongoing host-level functions you use Niagara Workbench and a platform connection to the JACE-603 or JACE-645. This provides various platform views to change items like TCP/IP settings, date/time and time zone, host credentials (authentication), as well as an “R2 Platform Tool” view that provides numerous other functions formerly done in the R2 Admin Tool.

As shipped from the [factory](#), the JACE retrofit board contains only the bare minimum of software to run the NiagaraAX platform daemon (niagarad), a Tridium certificate file, and your upgraded Niagara R2 license file. Note the JACE does *not contain* a complete Niagara R2 (or NiagaraAX) runtime environment, or collection of software modules and other items needed to run any type of station.

Instead, using Niagara Workbench, you must connect to the JACE and *commission it*. For Niagara R2, you use the *Install Niagara R2* option to install the necessary Niagara R2 core software, plus software modules from your local (build 2.301.535 or later) R2 software files. This wizard option also lets you install your previously-saved Niagara R2 station, the updated R2 license, and any necessary R2 lexicon files.

You also do other platform configuration using Workbench. Related tasks include setting the JACE’s:

- IP network address, and related IP networking parameters
- Platform daemon credentials (for platform login)
- Time and date (or simply sync with your PC’s time)

This document provides step-by-step instructions for these and other tasks.

Note: For Niagara R2, you typically do not use¹ the standard platform “Commissioning Wizard” to configure a JACE-603 or JACE-645—as you would for a unit to run NiagaraAX, or to upgrade it to a newer AX release. Instead (and always for a new factory-shipped unit), you initially use the **Install Niagara R2** choice in the “**Platform Administration**” view, and thereafter the special “**R2 Platform Tools**” platform view in Workbench, which supersedes the R2 Admin Tool.

In addition, before starting the “Install Niagara R2” process, make sure that you have all required software and licenses on your installation PC. See [“Niagara \(AX and R2\) and PC Requirements”](#) on page 1-3.

We also recommend that you backup the R2 license shipped with the unit before doing any R2 Niagara or NiagaraAX commissioning. For a procedure, see [“Copy the installed R2 license file”](#) on page 1-38.

Retrofit board factory-shipped state

- [IP address](#)
- [HTTP port for platform access](#)
- [Platform daemon credentials](#)

IP address

When shipped, a new RB-603 or RB-645 retrofit board is pre-configured with an IP address (IPv4) as:

192.168.1.12*n* (primary “LAN1” port, the “LAN2” port is disabled)

where the last numeral (*n*) in the IP address matches the last numeral in the JACE’s *serial number*.

In all cases, the default subnet mask is: 255.255.255.0

You change these IPv4 network settings during your startup commissioning of the JACE.

1. The sole exception is if the JACE has had a “clean dist” file installed. In that case only, you must first install NiagaraAX build 3.6.44 or later in the unit, using the Commissioning Wizard in NiagaraAX. Then you can commission it for Niagara R2, following the procedures in this document. Note a “clean dist” install has other consequences. See [“Distribution File Installer”](#) on page 1-37 for related details.

HTTP port for platform access

When shipped, the platform daemon of a new RB-603 or RB-645 retrofit board is configured to listen on HTTP port 3011. Often, this is left at default. However, if a *different* port is needed for a platform connection (perhaps for firewall reasons), you can change this during the commissioning of the JACE.

Platform daemon credentials

Like any JACE controller, a new RB-603 or RB-645 retrofit board is shipped with these platform daemon (administrator) credentials:

Username: tridium Password: niagara

Initially, you use these default credentials to open (login) a platform connection to the JACE. Like the factory-assigned IP address, default credentials are intended to be *temporary*. During your startup commissioning, you should change these credentials to be something unique, and *guard them closely*.

Preparation

Three areas of preparation are required before proceeding:

- [Saving needed files from the old R2 JACE](#)
- [Retrofit board installation and connectivity](#)
- [Niagara \(AX and R2\) and PC Requirements](#)

Saving needed files from the old R2 JACE

Before removing the old controller board from the R2 JACE-403 or JACE-545, you should make sure you have all the R2 related files needed to restore to the retrofitted JACE-603 or JACE-645 as it was before. These files include:

- The R2 station database, in SNS and XML formats. Use the R2 Admin Tool and the “DB Admin” tab to get the database saved in these two formats to your local Niagara R2 release directory.
Note: Saving the remote database to local XML format is necessary if using an earlier Niagara R2.3.5 build than 2.301.535, for example 2.301.522 or 2.301.515. After installing the needed 2.301.535 build of Niagara, and copying over the saved station's subfolder, you can use the 2.301.535 Niagara console command `dbadmin` to upgrade the station's XML database to the needed 2.301.535 level. This command is included in “To prepare for new JACE-603 or JACE-645 R2 commissioning” on page 1-4.
- All other files under that station's folder. Use the R2 JDE (Java Desktop Environment) and open the remote library on the JACE, and copy any needed files to your local library's folder for that station.
- If applicable, the *text contents* of the following three “host-resident” R2 properties files, found in the R2 JACE's `/rel/nre/lib` folder:
 - `bacnet.properties`
 - `gx.properties`
 - `obix.properties`

Note: Other “host-resident” R2 properties files such as `system.properties` and `drivers.properties` are different in the newer QNX-based JACE. Do not save and copy them back to the JACE-603 or JACE-645.

After running the **Install Niagara R2** wizard when commissioning the new JACE, you will have an **R2 Platform Tool** view with a tab that allows editing of R2 property files such as `system.properties`, `driver.properties`, plus others, including those mentioned above.

Retrofit board installation and connectivity

If possible, you could perform the initial Niagara R2 software installation and startup of a RB-603 or RB-645 retrofit board (as described in this document) *in your office*, before physically swapping it in place in the JACE-403 or JACE-545 enclosure at a job site. Note this requires such an available enclosure to use in your office for this purpose. Otherwise, you can perform this commissioning at the existing job site. Please refer to the “Installation” section of the *RB-603 and RB-645 Retrofit Board Install Guide* document for details on installing the retrofit board in an existing JACE-403 or JACE-545 enclosure.

The remainder of this document assumes that you have the JACE nearby, and are able to power it on and off as needed. If you perform this Niagara R2 commissioning in your office, when done you can remove the retrofit board and re-install it in the controller enclosure at the job site, for final checkout.

Niagara (AX and R2) and PC Requirements

These instructions require that you have the following:

- A PC running a licensed copy of NiagaraAX Workbench 3.6.44 or later. This PC is referred to as

- “your PC.”
- A licensed copy of Niagara R2 2.301.535 or later installed on your PC. Although you don’t use the R2 Admin Tool for host-level configuration, you do “point” Workbench to this local Niagara R2 release directory, to install the necessary R2 software modules, and also a saved R2 station database and any other related files, as well as R2 lexicon files. Additionally, you do *need this R2 JDE* for subsequent *R2 station access/configuration* of the JACE-603 or JACE-645, after commissioning.
- Again, you need the saved R2 station database for the JACE-403 or JACE-545 being upgraded, as well as any other station-related files, saved to your PC. See [“Saving needed files from the old R2 JACE”](#).

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

For this initial Ethernet connection, you can use either:

- An Ethernet patch cable connected directly between your PC and the JACE (if your PC Ethernet port is not “auto-sensing”, you will need an Ethernet *crossover* cable),
or
- A normal LAN connection, meaning that both your PC and the JACE are physically connected to the same Ethernet hub or switch.

To prepare for new JACE-603 or JACE-645 R2 commissioning

To prepare for R2 commissioning of a new JACE-603 or JACE-645, do the following steps:

- Step 1 If not already installed, install the Niagara Workbench 3.6.44 or later software on your PC, including its permanent license.
- Step 2 If not already installed, install Niagara R2 build 2.301.535 or later software on your PC, including its permanent license.

Note: *After installing Niagara R2 build 2.301.535 or later, make sure to copy the previously-saved R2 station database files (XML), along with any other station-related files to the appropriate stations subfolder under this Niagara release directory. Copy any received R2 license file(s) for JACE-603 or JACE-645 hosts under this Niagara R2 release directory too.*

- Step 3 Open a Niagara 2.301.535 console window and use the `dbadmin` command to *upgrade* to saved XML database of the JACE station to the needed 2.301.535 schema level.

To do this:

1. From the Windows **Start** menu: **All Programs > Niagara 2.301.535.v1 > Console**
2. At the command prompt, type:
`dbadmin stationName up /v`
and press Enter. This upgrades the XML database to the needed level.
3. Next convert the XML format to the SNS format, by typing
`dbadmin stationName c xml sns`
and press Enter. This converts the XML database to the SNS format to be installed in the new JACE.
4. Close the Niagara 2.301.535 console window.

- Step 4 Attach one end of a standard category-5 Ethernet unshielded twisted pair (UTP) patch cable to the LAN1 (primary) RJ-45 Ethernet connector on the JACE.
- Step 5 Attach the other end of the patch cable to a network port or directly to an Ethernet hub.
- Step 6 Power up the JACE.
- Step 7 Record you 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 information about 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 JACEs. In this case, configure this second NIC to use the settings in the *remainder of this step*. This method offers an advantage over the serial shell method below, as you do not need to reboot a JACE in a special mode, i.e. change its serial shell jumper.
- Use a serial shell mode connection to the JACE to re-assign its factory [IP address](#) settings. After making this change and rebooting the JACE, you can continue commissioning using Workbench. This requires proper serial cabling and a special power-up mode for the JACE. For more details, see [“System shell”](#) on page 1-40.

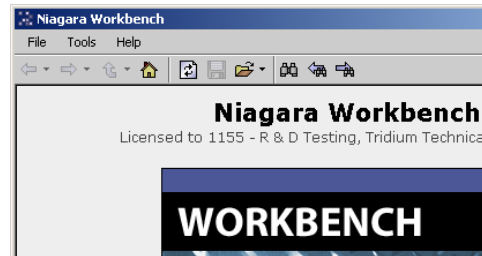
For this initial connection to a factory-shipped JACE, configure your PC’s NIC to use an IP address in the same subnet as the JACE, as well as a matching subnet mask.

Set the IP address in the range: 192.168.1.1 to 192.168.1.254
with a subnet mask of: 255.255.255.0

Note: Do not assign your PC the identical IP address as the JACE's factory-assigned *IP address*.

Step 8 From your PC, start Workbench. The Niagara Workbench splash screen should appear, with a minimum of the following three main menu items: **File**, **Tools**, **Help** (see [Figure 1](#)).

Figure 1 Workbench menu items (minimum of these three)



Connect to the JACE-603 or JACE-645

Once the JACE has powered up, connect to it with Workbench using “Open Platform.” A platform connection to any QNX-based JACE is required for *most host-level operations*. This includes installing Niagara core software and modules (in this case R2 software modules), establishing network and TCP/IP settings, and performing various other platform tasks.

After you open a platform connection, you can set the date and time and run the **Install Niagara R2** wizard.

- “[Open a platform connection](#)” on page 1-5
- “[Navigating a platform connection](#)” on page 1-6
- “[Set system date and time](#)” on page 1-7
- “[Run the Install Niagara R2 wizard](#)” on page 1-7

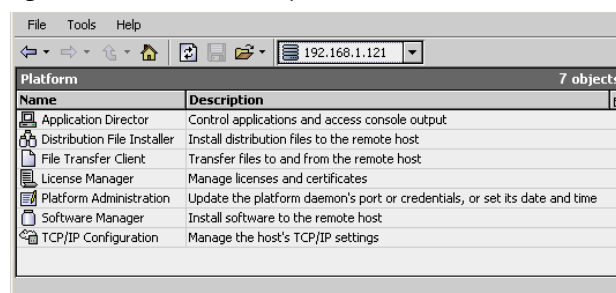
Open a platform connection

To open a platform connection to a JACE

To open a platform connection from Workbench to the JACE, do the following:

- Step 1 From the menu bar, select **File > Open > Open Platform** (Ctrl + Shift + P). The **Open Platform** dialog box appears.
- Step 2 Complete the fields in the **Open Platform** dialog box as follows:
- Host — Leave at default **IP**, and type in the default IP address of the retrofit board (see “[IP address](#)” on page 1-2)
 - Port — Leave at default 3011.
 - Credentials (see “[Platform daemon credentials](#)” on page 1-3), which include:
 - Username — Type in default username: `tridium`
 - Password — Type in default password: `niagara`
- Step 3 Click the **OK** button to accept all settings.

Figure 2 Connected JACE platform



The Platform opens in Workbench's view pane ([Figure 2](#)), showing available platform views in a table.

Note: If using standard NiagaraAX Workbench, such as used for NiagaraAX JACE commissioning, additional platform views are also listed. However, they are not applicable for a unit being configured for Niagara R2. Such views include **DDNS Configuration**, **Dialup Configuration**, **GPRS Modem Configuration**, **Lexicon Installer**, and **Station Copier**. Please ignore those platform views.

A few of these platform views you can use now, even before installing Niagara R2, if needed. For example, it is recommended that you *backup* the R2 license file installed in the JACE, even before doing any other commissioning. For a procedure, see “[Copy the installed R2 license file](#)” on page 1-38.

Also, you can select (double-click) the **TCP/IP Configuration** entry for the platform view used to change the JACE’s LAN1 IP address from factory defaults, and then reboot to make effective. For related details, see “[TCP/IP configuration](#)” on page 1-17.

Another early useful platform view is the **Platform Administration** view, in which you can set the system date and time (and time zone) for the JACE. This becomes effective immediately, without a controller reboot. Then you can run the Install Niagara R2 wizard, which can include installing an R2 station. Then you can change the default IP address, along with other JACE commissioning. This is the method used in this document.

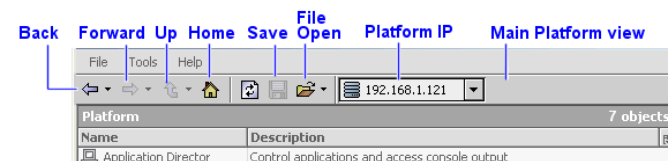
Or, you can leave all factory defaults in place and install Niagara R2 first, then continue with other platform commissioning (including IP address re-assignment) after the JACE reboots.

Note: After you reconfigure the JACE and it reboots, if you changed parameters like IP address, platform Credentials, or Port, you will need to login using any new (changed) parameters. If you changed your PC’s IP address in order to connect to the JACE’s factory-assigned IP address, you will also need to reconfigure your PC again as well.

Navigating a platform connection

When platform-connected to a JACE using the simplified, profiled Workbench (intended for Niagara R2 host support), you can use a few tools on the toolbar for navigation. See [Figure 3](#).

Figure 3 Toolbar in simplified Workbench



The tools are described as follows:

Tool	Description
Back	Returns to the previous view (like a browser’s Back). Click the drop-down control for a list of previous views to select from.
Forward	Jumps to the view before back (like a browser’s Forward). Click the drop-down control for a list of views to select from.
Up	Jumps to parent of present selection. Rarely seen in profiled Workbench toolbar (seen more inside platform views like the File Transfer Client).
Home	Changes view to Workbench splash screen.
Save	Available when in a view and an unsaved change has been, for example in the TCP/IP Configuration view.
File Open	Click to open a new platform connection (the same as menu bar File > Open > Open Platform , or Ctrl + Shift + P)
Platform IP	IP address of currently opened platform. Click the drop-down control for a IP list of other active (or past, inactive) platform connections to pick from.
Main platform	Icon to the right of the Platform IP tool when in any platform view <i>except</i> the Main platform view. Click to return to the Main platform view.

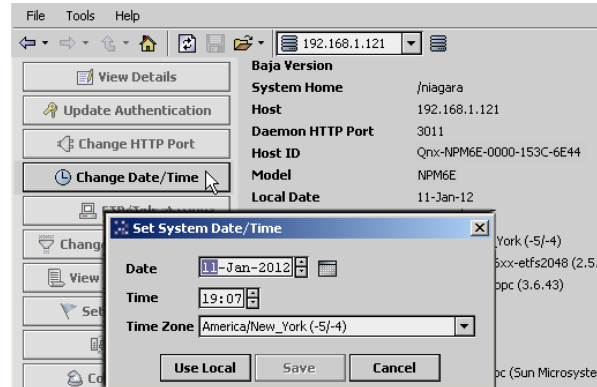
Set system date and time

Prior to running the **Install Niagara R2** wizard (in which you can install a saved R2 station), it is best to set the correct date, time, and time zone in the JACE, using the **Platform Administration** view.

To set system date and time

From Workbench with a platform connection to new JACE-603 or JACE-645, do the following:

- Step 1 Double-click **Platform Administration**. The **Platform Administration** view appears.
- Step 2 Click the **Change Date/Time** button. A **Set System Date/Time** popup dialog appears.



- Step 3 Set the proper date, time, and time zone in the popup dialog.
Typically, you click “**Use Local**” to synchronize the remote JACE’s date, time, and time zone with your Workbench PC (assuming that your Workbench PC’s current date/time setting are accurate). The date, time, and time zone fields all update to reflect those current values.

Alternatively, use controls for the three entry fields to set the current **Date**, **Time**, and **Time Zone**.

- **Date**
Click in a day-month-year position to select, then click up/down controls, or click and type in numerals directly, or click the calendar icon for a popup dialog to select the date from a calendar.
- **Time**
Always displays in 24-hour format. Click in a hour or minute position to select, then click up/down controls, or click and type in numerals directly.
- **Time Zone**
Provides a drop-down selection list of all available time zones in NiagaraAX. Each time zone provides a text description, and in parenthesis the “hour offset” from UTC (and if daylight savings time is used) the “offset plus daylight savings.” For example: `America/New_York (-5, -4)`.

- Step 4 When done, click **Save**. The remote host will immediately use those settings.

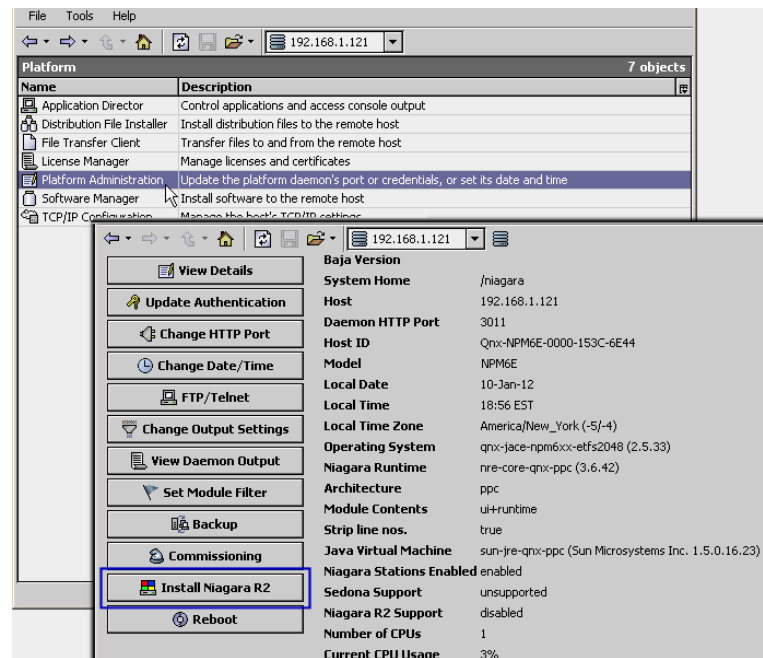
Run the Install Niagara R2 wizard

The following sections describe using the “**Install Niagara R2**” wizard option for a new RB-603 or RB-645 retrofit board.

- [About the Install Niagara R2 wizard](#)
- [Start the Install Niagara R2 wizard](#), with step dialogs as follows:
 - [Clean Niagara AX Installation](#) (skipped if a new unit)
 - [Install Niagara R2 Distribution Files](#)
 - [Select Local Niagara R2 Installation Directory](#)
 - [Install Local Niagara R2 Station](#)
 - [Install Local Niagara R2 Software Modules](#)
 - [Install Local Niagara R2 License](#)
 - [Install Local Niagara R2 Lexicons](#)
 - [Review and finish the Install Niagara R2 wizard](#)

About the Install Niagara R2 wizard

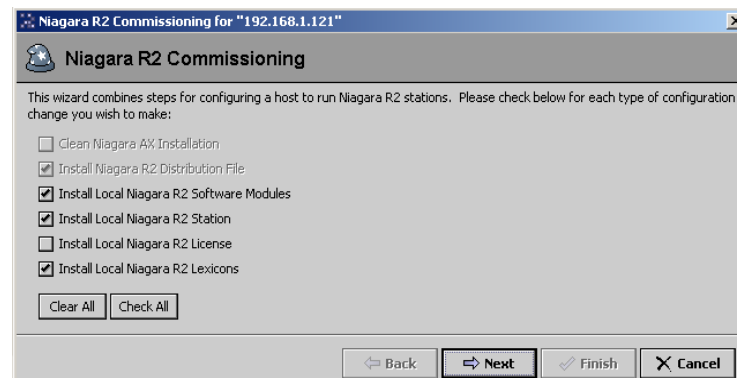
From the main Platform view, double-click **Platform Administration** to access the platform view with the option (button) to **Install Niagara R2**.

Figure 4 Install Niagara R2 as button in Platform Administration view

The **Install Niagara R2** button is available only when platform connected to a retrofit board type controller (JACE-603 or JACE-645) that is *new* (uncommissioned), or that was previously *configured for NiagaraAX*. In either case, the “Niagara R2 Support” property is listed as disabled.

Note: After you run the wizard launched by this button, future access of this platform view shows an “**Uninstall Niagara R2**” button instead (to reconfigure the unit as a NiagaraAX JACE, if desired). The “Niagara R2 Support” property is then listed as *enabled*.

When you click **Install Niagara R2**, the first of several wizard dialogs appears.

Figure 5 R2 Commissioning wizard (Install Niagara R2) start defaults

As shown in [Figure 5](#), most selectable options are checked by default.

Selected options appear as a separate steps in subsequent dialogs as you advance (Next) in the wizard. Note the following about using this wizard:

- 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 final summary for you to review. If necessary, you can step back in the wizard to make changes.

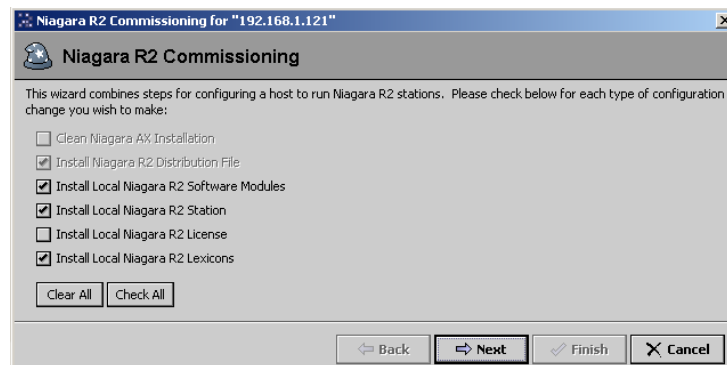
[Start the Install Niagara R2 wizard](#) after making a platform connection to the JACE-603 or JACE-645.

Start the Install Niagara R2 wizard

To start the Install Niagara R2 wizard

From Workbench with a platform connection to new JACE-603 or JACE-645, do the following:

- Step 1 Double-click **Platform Administration**.
The **Platform Administration** view appears (Figure 4 on page 8).
- Step 2 Click the **Install Niagara R2** button.
The first “Niagara R2 Commissioning” wizard dialog appears. By default, most steps are preselected. Steps are executed in the order listed in the wizard.



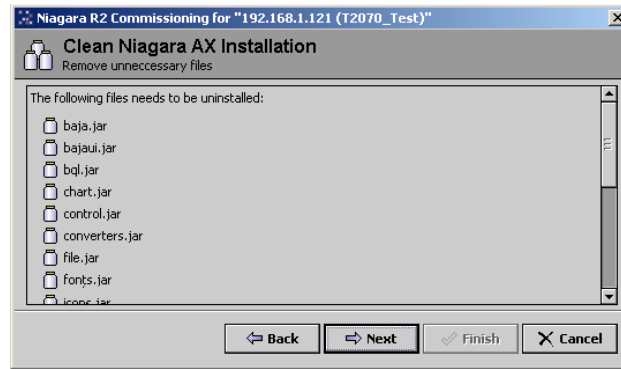
- Step 3 As needed, click to include or omit steps. For a unit with a *new* RB-603 or RB-645 retrofit board, you typically *accept all default selections*, except possibly the last (install R2 lexicons) one.
Niagara R2 Install steps include:

- **Clean Niagara AX Installation**
(read only) Not applicable for a new retrofit board. However, this step is automatically selected and executed if the unit was previously configured for NiagaraAX.
- **Install Niagara R2 Distribution File**
(read only) Always preselected. Installs the necessary Niagara R2 core software distribution files.
- **Install Local Niagara R2 Software Modules**
Required. You point the wizard to your Niagara R2 release directory, then select the R2 modules needed by your station.
- **Install Local Niagara R2 Station**
Recommended. Select the station from the stations folder in your Niagara R2 release directory.
- **Install Local Niagara R2 License**
(By default, not selected) This is unnecessary for a *new* retrofit board, which is shipped with an upgraded *R2 license file already installed*. However, if the unit was configured for Niagara R2 but then later “decommissioned for R2”, any saved upgraded Niagara R2 license will need to be reinstalled. In this case, select this to install the saved R2 license file. Note that after running the wizard, it is still possible to install the necessary R2 license file, using a tab in the **R2 Platform Tool** view.
- **Install Local Niagara R2 Lexicons**
Optional. Select R2 lexicon files needed, if any, from your Niagara R2 release directory.

- Step 4 Click the **Next** button to continue. For a new unit, the next step is “[Install Niagara R2 Distribution Files](#)”.

Clean Niagara AX Installation

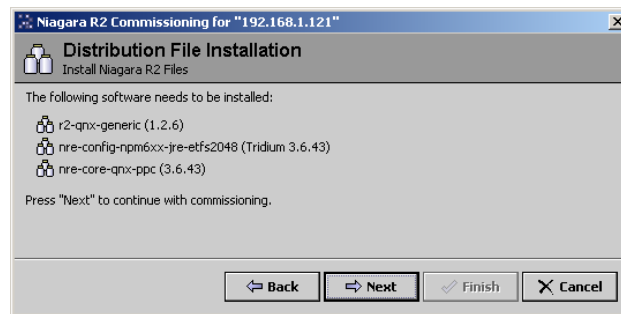
Note: *This step is skipped for a new RB-603 or RB-645 retrofit board, as NiagaraAX software modules are not already installed. However, if the unit was ever configured for NiagaraAX operation, this step will be automatically included, and appear similar to that shown in [Figure 6](#).*

Figure 6 Clean Niagara AX Installation step

- Click the **Next** button.
The next step appears, “Install Niagara R2 Distribution Files”.

Install Niagara R2 Distribution Files

This step installs the core distribution files needed by an R2-configured JACE-603 or JACE-645.

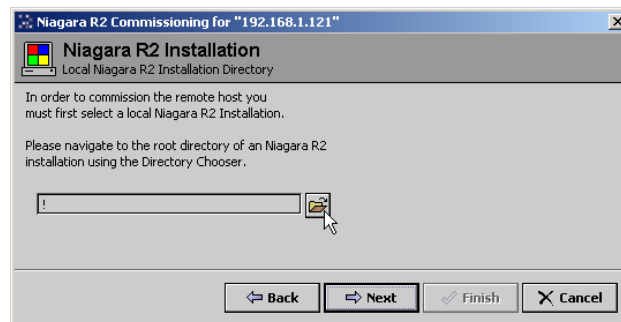
Figure 7 Install Niagara R2 Distribution Files step

This step is always executed when running the [Install Niagara R2](#) wizard.

- Click the **Next** button.
The next step appears, typically “Select Local Niagara R2 Installation Directory”.

Select Local Niagara R2 Installation Directory


This step in the [Install Niagara R2](#) wizard is where you specify the source Niagara R2 release directory (build 2.301.535 or later), from which you choose R2 items to install in the controller.

Figure 8 Select Local Niagara R2 Installation Directory (default)

This Niagara R2 release directory is used in subsequent steps, to install an R2 station, R2 software modules, R2 license, and R2 lexicon files.

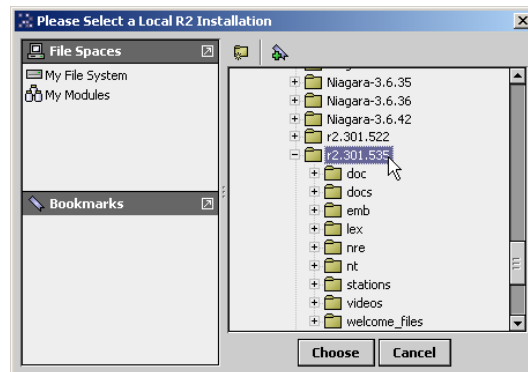
To specify the Niagara R2 directory

At the **Niagara R2 Installation** step ([Figure 8](#)), do the following:

- Step 1 Click the  open folder control. A popup dialog (directory chooser) appears.
- Step 2 Use navigation controls to select the root directory of the Niagara R2 installation.

To do this, click the **My File System** node, then expand the proper drive node to show the root directory for the Niagara R2 installation. For example, D:/niagara/r2.301.535.

Figure 9 Select root folder of Niagara R2 installation in popup dialog



Click the root folder to select (highlight) it, as shown in [Figure 9](#), and click **Choose**.

The popup dialog closes, returning to the **Niagara R2 Installation** step, now showing the path to source Niagara R2 installation. For example: /D:/niagara/r2.301.535

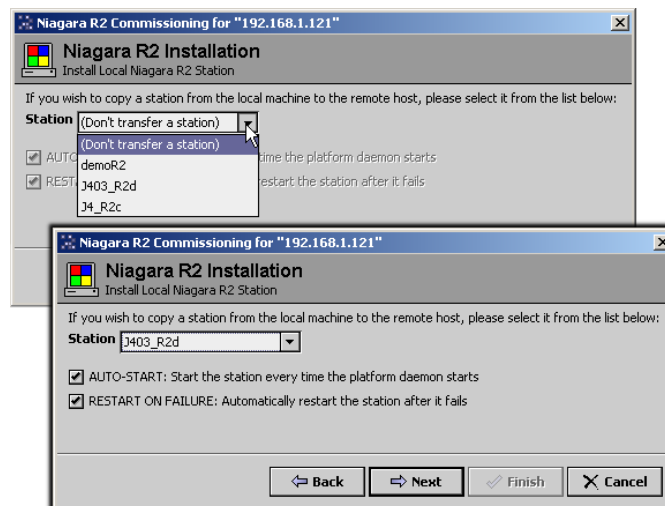
Step 3 Click the **Next** button to continue.

The next step appears, typically “[Install Local Niagara R2 Station](#)”.

Install Local Niagara R2 Station

At the install station step in the [Install Niagara R2](#) wizard, click the drop-down control for a list of stations in the named R2 Niagara Installation's stations folder.

Figure 10 Select station from stations folder of Niagara R2 installation



Click a station to select it, where by default both checkboxes below are pre-selected:

- **AUTO-START:** Start the station every time the platform daemon starts.
- **RESTART ON FAILURE:** Automatically restart the station after it fails.

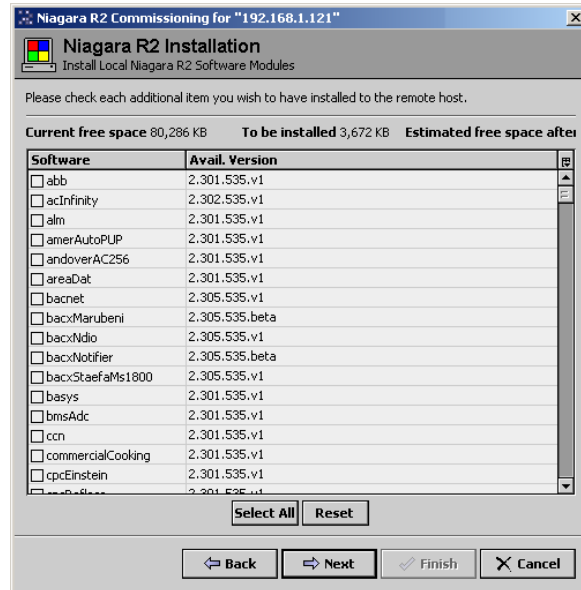
Typically, you retain these two settings. Note that after running the wizard, if needed you can change either station setting from the platform **Application Director** view.

- Click the **Next** button.
The next step appears, typically “[Install Local Niagara R2 Software Modules](#)”.

Install Local Niagara R2 Software Modules

In the modules step of the [Install Niagara R2](#) wizard, an alphabetical list of software modules in the “emb” folder of your selected Niagara R2 installation directory appears. None are preselected. See [Figure 11](#).

Figure 11 Select Local Niagara R2 Software Modules (default)



Click boxes to ☒ select or ☐ deselect software modules as needed, using the scroll bar to move down the list to select any software module that is needed by the station.

In general, you choose the identical collection of software modules previously used by the station (before the RB-603 or RB-645 retrofit board was installed), plus a few additional ones, if needed.

Note: Do not use the “Select All” button. Although the retrofit board has more memory for storing modules than the older JACE, installing modules not used by the station provides no benefit. This also increases station startup time.

Note the following other items:

- The “Reset” button deselects all modules, and can be useful to start over.
- If you are familiar with *NiagaraAX* software module selection using the platform Software Manager, note that the “automatic selection” of core modules, plus modules needed by the specific selected station is *not provided* in this R2 installation wizard. Instead, you must be knowledgeable about which software modules are needed by the station. However, note that you can still install R2 software modules after this wizard completes, using the “R2 Platform Tools” platform view.
- Some possible *additional* R2 module candidates to install, if not previously installed, include:
 - obix — useful for integration of the station to a NiagaraAX Supervisor station
 - tunnelAx — used for “VSerial” operation in this QNX-based JACE, via a TunnelAxService.

Note that in the final summary step of the wizard, you can review your list of selected modules, and if necessary step back to make changes in selections.

When done selecting modules:

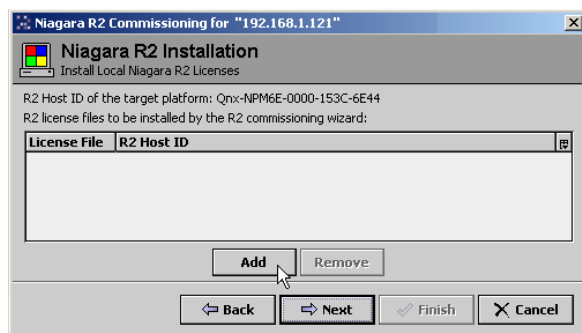
- Click the **Next** to continue.
The next wizard step appears, which could be “[Install Local Niagara R2 License](#)” (if selected), or “[Install Local Niagara R2 Lexicons](#)” (if selected), or the ending “[Review and finish the Install Niagara R2 wizard](#)”.

Install Local Niagara R2 License

Note: Usually you skip this step for a new RB-603 or RB-645 retrofit board, as it ships with the necessary R2 license already installed. However, if the unit was ever “decommissioned for Niagara R2”, this step can be useful, and appears similar as shown in [Figure 12](#).

At this step in the [Install Niagara R2](#) wizard, you can install an upgraded R2 license file for the JACE-603 or JACE-645, if saved on your PC. Typically, this license includes all the previous items in the original R2 license file, plus the obix feature (if not already included).

Figure 12 Install Local Niagara R2 License step



The R2 license file is a digitally-signed text file, which has a “hostId” entry that must match the unique R2 Host ID of the JACE-603 or JACE-645. The R2 Host ID for the JACE is shown at the top of this dialog.



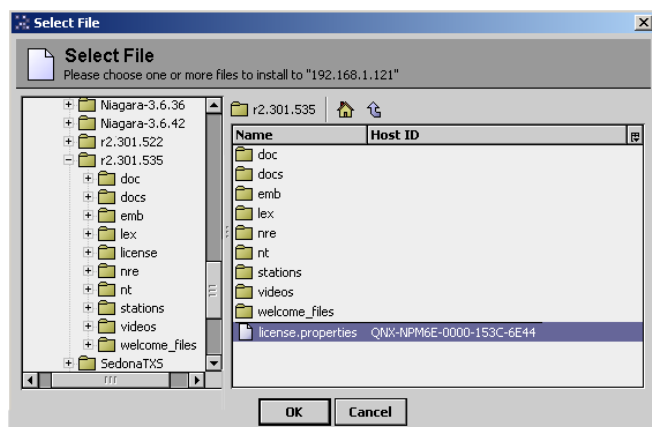
Caution Do not attempt to edit this license file. Doing so will invalidate its digital signature and disable Niagara R2 station operation.

Note: At the time of this document, R2 license files are not available via the online Licensing Server, unlike NiagaraAX license files. Note that after the R2 Installation wizard completes, if needed you can still install an R2 license file, using the “R2 Platform Tool” platform view.

To install the R2 license file

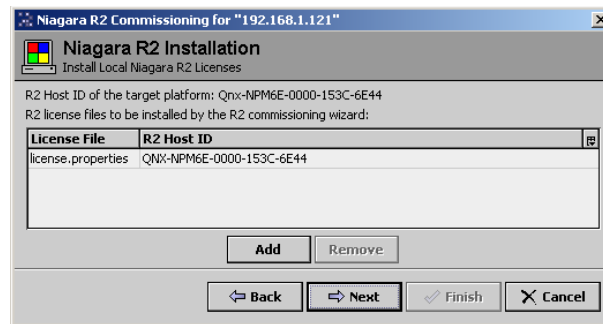
To install the R2 license file, do the following:

- Step 1 Click **Add**.
A popup “Select File” (file chooser) dialog appears.



Click on controls to navigate to the location of the license file, and click to select (highlight) the file. An example is shown above in .

- Step 2 Click **OK**.
The popup dialog closes, showing the R2 license step with the license file and its R2 Host ID value as shown in [Figure 13](#).

Figure 13 Example selected Niagara R2 license file in install license step

Ensure the license file's R2 Host ID value matches the "R2 Host ID of the target platform:" value shown in the dialog.

- If necessary, you can click the file to select it, then click **Remove** to remove it from the wizard.
- Then click **Add** (again) to look for the proper R2 license file, as shown in [Step 1](#).

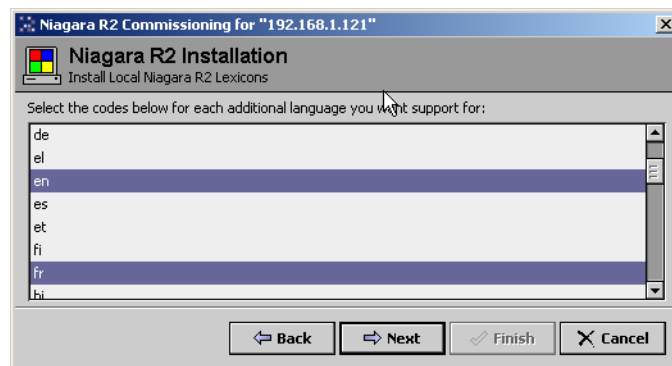
Step 3 Click **Next** to continue.

The next step appears, either "[Install Local Niagara R2 Lexicons](#)" (if selected), or the ending "[Review and finish the Install Niagara R2 wizard](#)".

Install Local Niagara R2 Lexicons

At this step in the [Install Niagara R2](#) wizard, you can install one or more local R2 lexicon files in the JACE. Lexicons can provide support for *non-English languages* in browser access (web applets) of R2 stations. Lexicons are identified by java locale codes, such as "fr" (French) or "de" (German).

Note: In some domestic (U.S.) installations, an English lexicon ("en") is configured to globally "customize" items such web applets and servlets hosted by the platform.

Figure 14 Lexicon Installation dialog

To install lexicons

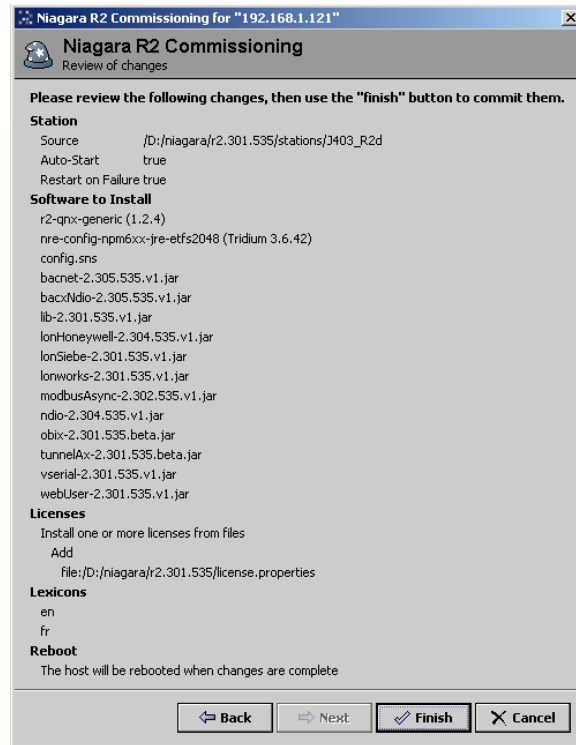
To install lexicons, do the following:

- Step 1 Click a language code to select (highlight) it.
If *multiple* lexicons are needed, press and hold the Ctrl key while you click.
- Step 2 When all needed R2 lexicons are selected, click the **Next** button to the last step, "[Review and finish the Install Niagara R2 wizard](#)".

Review and finish the Install Niagara R2 wizard

After the final step in the [Install Niagara R2](#) wizard, a "Review of changes" dialog appears, similar as shown in [Figure 15](#).

Figure 15 Review of changes in Niagara R2 Commissioning dialog



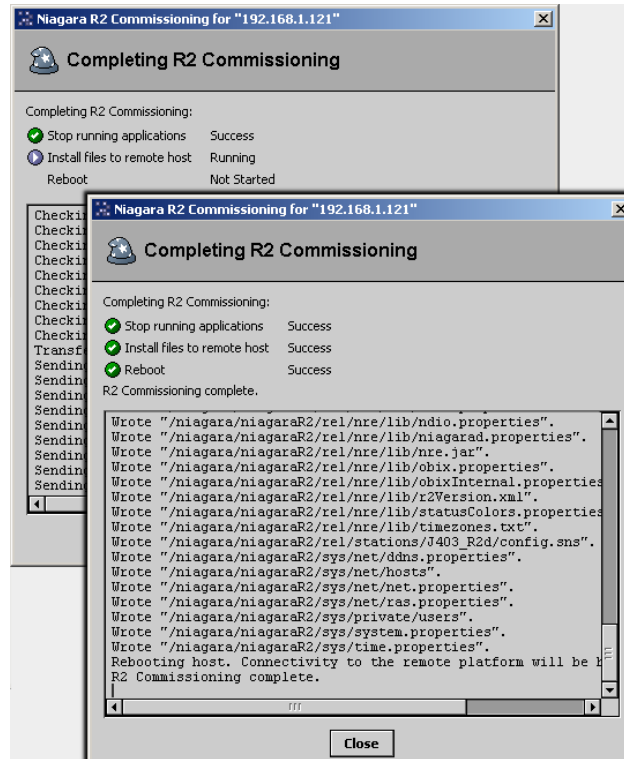
This dialog lists a summary of all the actions to be performed by the wizard.

To review and finish the Commissioning Wizard

Before proceeding:

- Step 1 Read through the summary of changes. If necessary, scroll down to see steps near the end.
- If no change is needed, click the **Finish** button to execute the 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 executes, progress updates are posted in a “Completing R2 Commissioning” dialog.

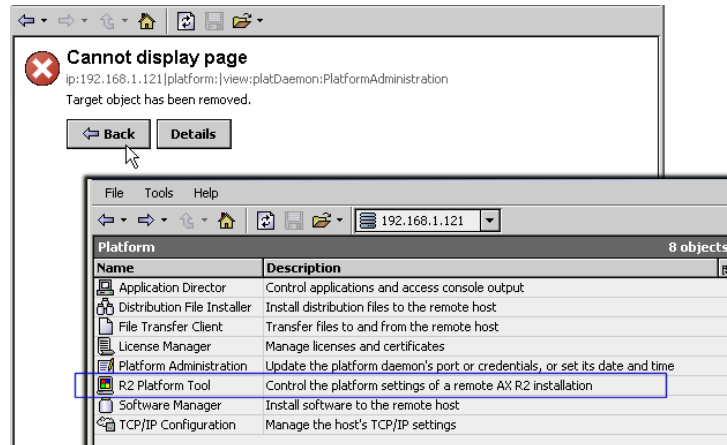


When completed, the wizard reboots the JACE, and a “Close” button is available.

- Step 3 Click the **Close** button to exit the wizard.

When the JACE reboots, your platform connection to it drops. In the Workbench view pane, a “**Cannot display page**” error message appears.

- Step 4 Wait several seconds (at least 30 seconds) for the OS to boot, then click the **Back** button (or tool) to reopen a platform connection to the JACE. The platform connection is re-established.



Now that you have run the **Install Niagara R2** wizard, note that a *new* platform view is now available in the list of platform views: **R2 Platform Tools**.

The **R2 Platform Tool** view is a multi-tabbed view that provides many of the same functions in the previous Niagara R2 Admin Tool. You it along with a few other platform views for ongoing platform support of an R2-configured JACE-603 or JACE-645. See “[R2 Platform Tool](#)” on page 1-23.

TCP/IP configuration

A new RB-603/RB-645 retrofit board ships with a factory default IP address for its primary LAN1 Ethernet port (see “[Retrofit board factory-shipped state](#)” on page 1-2). You should change this IP address during commissioning. You can do this either after or before running the **Install Niagara R2** wizard from a platform connection.


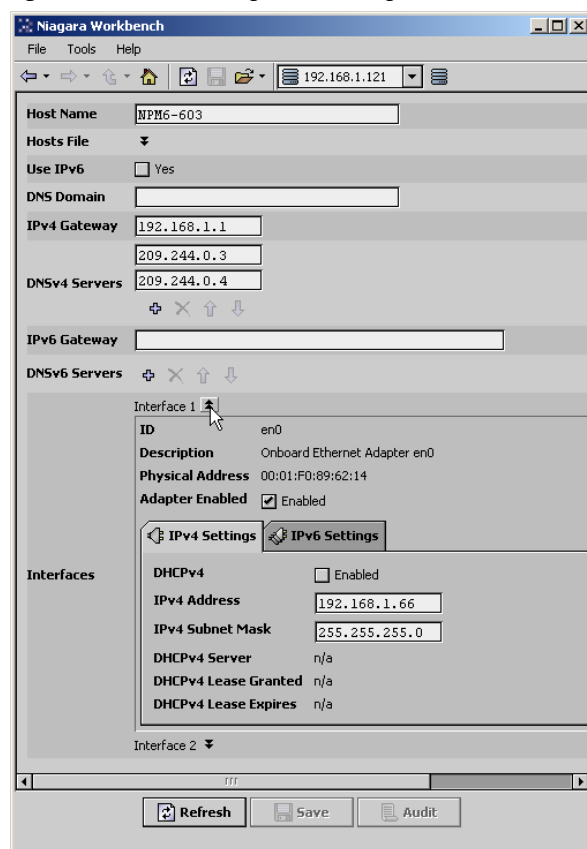
To do this, double-click  **TCP/IP Configuration** (see [Figure 16](#)).

Figure 16 TCP/IP Configuration dialog




Note: This document focuses on IPv4 configuration. The unit's NPM6E processor supports IPv6; however, Niagara R2 station operation cannot make use of IPv6. For more details on IPv6 in AX-3.6, refer to the Platform Guide section on **TCP/IP Configuration**, including the section “TCP/IP changes in AX-3.6”.

To configure TCP/IP settings

In the TCP/IP Configuration view ([Figure 16](#)), do the following:

- Step 1 Review the **Interface 1** settings on the **IPv4 Settings** tab, which include the temporary factory-shipped IP address (see “[Retrofit board factory-shipped state](#)” on page 1-2).
- Step 2 Assign the JACE 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. 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.

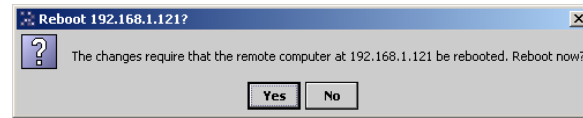
Note: In general (for stability), static IP addressing is recommended over DHCP.
Do not enable DHCP unless you are certain that the network has DHCP servers!
Otherwise, the JACE may become unreachable over the network.

- Step 3 Review, and if needed adjust other TCP/IP settings, which (in usual order of importance) include:
 - IPv4 Gateway — The IP address for the device that forwards packets to other networks or subnets.
 - 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.

- **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.
 5. To add a line, click at the end of the last line and press **Enter**.
 6. Type in the required data on the new line.
 7. To return to see all TCP/IP settings, click the control to contract the edit field when done.

Step 4 Click the **Save** button to save the changed configuration.

A popup confirmation dialog appears asking if it is OK to reboot the controller now.



- Click **No** if you wish to make additional platform changes in this platform session, such as to Interface 2 (see below). You return back to the **TCP/IP Configuration** view. Or,
- Click **Yes** to reboot the controller now with the saved changes. The platform connection will drop and another popup appears.



Click **OK**. The controller reboots and a “Cannot display page” error message appears in the Workbench view pane.

Typically, you need to reopen a platform connection from the Workbench menu again (**File > Open > Open Platform**), or Ctrl + Shift + P, this time entering the *newly changed IP* address. Then continue on with Niagara R2 commissioning as described in the rest of this document.

Note: On a JACE-603 or JACE-645, “**Interface 2**” is available, for configuring the LAN2 (secondary) Ethernet port. By default, this port is disabled, that is without a “default” address. Intended usage is for:

- 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 JACE 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 DHCP is not supported on LAN2—if enabled, you specify another (network) static IP address and the appropriate subnet mask.

Note: Also note the following:

- If enabling both LAN ports, note that the LAN1 IP address and LAN2 IP address must be 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.
- A JACE *does not* provide IP routing or bridging operation between different Interfaces (LAN ports).

Platform daemon authentication

A new RB-603/RB-645 retrofit board ships with factory-default login credentials for a platform connection (username and password, see [“Retrofit board factory-shipped state”](#) on page 1-2). You must enter these credentials to make a platform connection to the JACE.



Caution

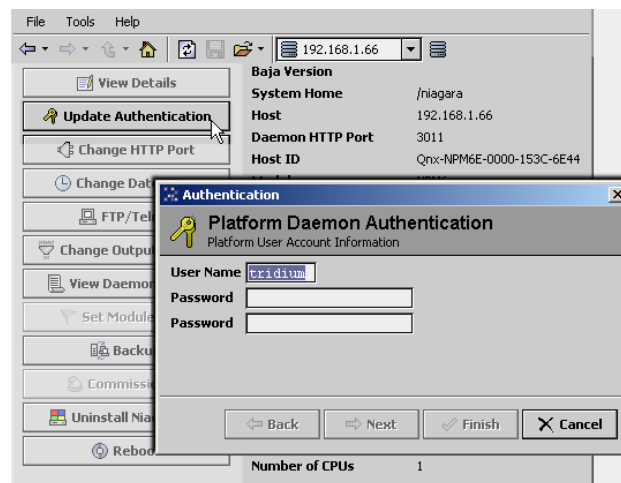
It is strongly recommended that you change from default platform credentials (user name=tridium, password=niagara). Consider the platform daemon as the highest-level access to the JACE.

Furthermore, make careful note of your entries. If you lose or forget these credentials, you may be unable to complete the commissioning and startup of this JACE. In this case, you can restore platform credentials to factory defaults, providing you can serially connect to the JACE (make serial shell connection)—pressing a key at the prompted time during JACE boot up. See [“About JACE serial shell mode”](#) on page 1-41.

To specify the platform daemon authentication

From Workbench with a platform connection to new JACE-603 or JACE-645, do the following:

- Step 1 Double-click **Platform Administration**.
The **Platform Administration** view appears.
- Step 2 Click the **Update Authentication** button.
An Authentication popup dialog appears.



- Step 3 In the **User Name** field, type in the desired user name for platform login.
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 (_).
- Note:** *User name and password are case sensitive. Thus, MyJACE603 and MyJace603 are not the same.*
- Step 4 In the **Password** fields, type in the desired password (it must *match* in both password fields).
Entry characters display only in asterisks (*).
Password can be any desired length and mix of characters (“strong” passwords are supported).
- Step 5 Click the **Finish** button.
These new credentials become immediately effective, and will be required on any future platform connection from Workbench.

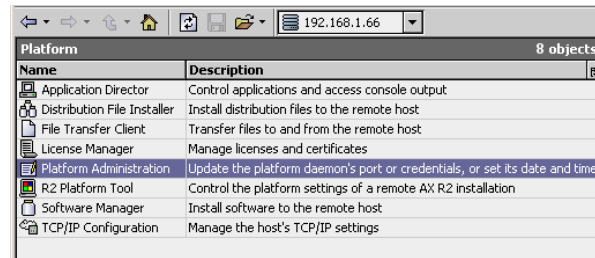
For additional details on the **Platform Administration** view for a Niagara R2 configured unit, see [“Additional R2 JACE platform administration”](#) on page 1-20.

Platform Administration view

This section applies to a JACE-603 or JACE-645 that has been configured for Niagara R2, using the [Install Niagara R2](#) wizard. When configuring a JACE-603 or JACE-645 for Niagara R2 operation, there are a few additional items you may wish to review (and possibly change), from the **Platform Administration** view. This is the same platform view you use to access the **Install Niagara R2** wizard, change date and time, and update platform credentials in a new unit.

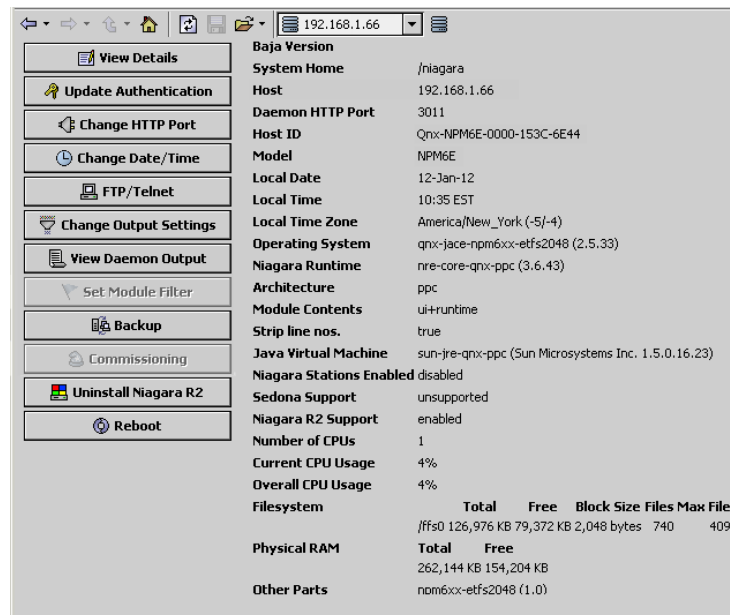
As shown in [Figure 17](#), the **Platform Administration** view is one of several platform views for any QNX-based JACE platform, listed in its main platform view.

Figure 17 Platform Administration is one of several platform views



Platform 8 objects	
Name	Description
Application Director	Control applications and access console output
Distribution File Installer	Install distribution files to the remote host
File Transfer Client	Transfer files to and from the remote host
License Manager	Manage licenses and certificates
Platform Administration	Update the platform daemon's port or credentials, or set its date and time
R2 Platform Tool	Control the platform settings of a remote AX R2 installation
Software Manager	Install software to the remote host
TCP/IP Configuration	Manage the host's TCP/IP settings

Figure 18 Platform Administration view for R2 configured JACE



Buttons		System Information	
View Details	Baja Version	/niagara	
Update Authentication	System Home	192.168.1.66	
Change HTTP Port	Host	3011	
Change Date/Time	Daemon HTTP Port	Qnx-NPM6E-0000-153C-6E44	
FTP/Telnet	Host ID	NPM6E	
Change Output Settings	Model	12-Jan-12	
View Daemon Output	Local Date	10:35 EST	
Set Module Filter	Local Time	America/New_York (-5/-4)	
Backup	Local Time Zone	qnx-jace-npm6xx-etfs2048 (2.5.33)	
Commissioning	Operating System	nre-core-qnx-ppc (3.6.43)	
Uninstall Niagara R2	Niagara Runtime	ppc	
Reboot	Architecture	ui+runtime	
	Module Contents	true	
	Strip line nos.	sun-jre-qnx-ppc (Sun Microsystems Inc. 1.5.0.16.23)	
	Java Virtual Machine	Niagara Stations Enabled disabled	
	Niagara Stations Enabled	unsupported	
	Sedona Support	enabled	
	Niagara R2 Support	1	
	Number of CPUs	4%	
	Current CPU Usage	4%	
	Overall CPU Usage	Total Free Block Size Files Max Files	
	Filesystem	/ffs0 126,976 KB 79,372 KB 2,048 bytes 740 4096	
	Physical RAM	Total Free	
	Other Parts	262,144 KB 154,204 KB	
		nom6xx-etfs2048 (1.0)	

Note: Two buttons in this view do not apply to a Niagara R2 configured JACE-603 or JACE-645, and are dimmed:

- **Set Module Filter** — Applies only to a JACE configured for NiagaraAX.
- **Commissioning** — A wizard that steps through many related NiagaraAX platform tasks, it also applies only for a JACE configured for NiagaraAX (not Niagara R2).
Exception: If a “clean dist” has been installed in a JACE-603 or JACE-645, you must subsequently use the Commissioning Wizard to install NiagaraAX build 3.6.44 or later—even the final configuration needs to be Niagara R2. For related details see [“Distribution File Installer”](#) on page 1-37.

The remaining buttons are described in [“Additional R2 JACE platform administration”](#).

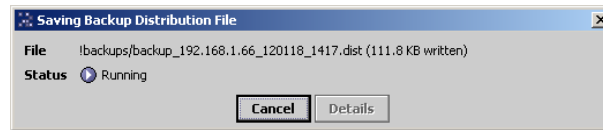
Additional R2 JACE platform administration

To perform additional R2 platform administration

After running the **Install Niagara R2** wizard:

- Step 1 Open a platform connection to the JACE and click on **Platform Administration**. The Platform Administration view appears ([Figure 18](#)).
- Step 2 As needed, click the following buttons to review or make changes:
 - **View Details** — For a platform summary that you can copy to the Windows clipboard.
 - **Update Authentication** — For a platform daemon authentication dialog to change platform login (previously covered in this document). See [“Platform daemon authentication”](#) on page 1-19.
 - **Change HTTP Port** — For a dialog to change the HTTP port for the JACE's platform daemon from port 3011 to some other port (optional). See [“Change HTTP Port”](#) on page 1-21.
 - **Change Date / Time** — For a dialog to change the JACE's current date, time, and time zone (previously covered in this document). See [“Set system date and time”](#) on page 1-7.

- **FTP / Telnet** — For a dialog to enable/disable both FTP and Telnet access to the JACE, or change the default port number used by each one. See [“Change FTP / Telnet”](#) on page 1-22.
- **Change Output Settings** — Provides a dialog to change the log level of different processes that can appear in the platform daemon output
- **View Daemon Output** — Provides a window in which you can observe debug messages from platform daemon processes in real time. Also includes ability to pause or load.
- **Backup** — Make a complete backup of all configuration on the connected host platform, including all station files, plus other Niagara R2 configuration (typically unnecessary for any JACE just started up), saved in a distribution (.dist) file—essentially a “zip” file, stored on your Workbench PC. A pop-up dialog asks you for the backup file location (and filename) before the backup begins. By default, the location for backups is the “backups” folder under your Workbench release directory. When the backup begins, a popup progress dialog appears, which you close upon successful finish.



If necessary, you can restore a backup dist file using another available platform view. See [“Distribution File Installer”](#) on page 1-37.

- **Uninstall Niagara R2** — To completely remove the Niagara R2 installation on the JACE-603 or JACE-645, including all station files, all Niagara R2 core software, modules, and lexicons, and its Niagara R2 license. *Choose this only if you intend to reconfigure the unit for NiagaraAX.*



Caution

Before choosing this, be sure to backup the R2 station and its R2 license. For more details, see [“Uninstall Niagara R2”](#) on page 1-22.

- **Reboot** — Provides a method to reboot the JACE platform, which restarts all software including the OS and JVM, then the platform daemon, then if so configured in the Application Director (Station Director), then the installed R2 station. If you click this, a confirmation dialog appears. If you reboot, your platform connection is lost, and it is typically a minute or more until you can re-connect to this JACE. Note that a reboot is necessary if you have *manually* stopped (“Halted” or “Killed”) the station in any QNX-based JACE from the Application Director, as the **Start** button will remain unavailable.

Change HTTP Port

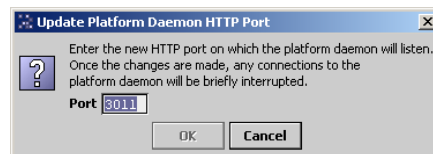
This step is optional, and the default port 3011 is typically used in many Niagara installations. However, for reasons of additional security or perhaps firewall issues, you may need to change the HTTP port used by the JACE’s platform daemon.

To change HTTP port

From the Platform Administrator view ([Figure 18](#)):

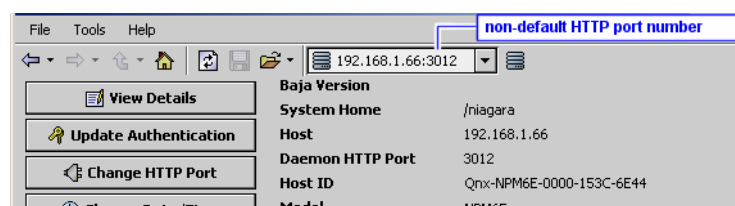
- Step 1 Click the **Change HTTP Port** button.

A dialog appears showing the current HTTP port number highlighted.



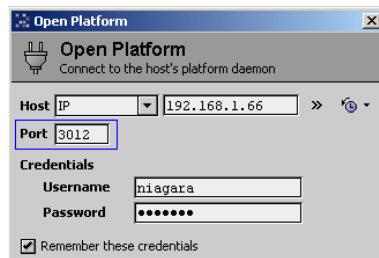
- Step 2 Type in the new HTTP port number, and click **Ok**.

Your current platform connection is re-established using the new HTTP port, with the platform view refreshed. This new HTTP port is immediately effective (and required) for any platform connection.



Any new (non-default) HTTP port now appears after the IP address of the platform connection.

Note: You must always specify that port number whenever reopening the JACE's platform in Workbench. For example, the platform login below is using Port 3012 (non-default).



Change FTP / Telnet

The default disabling of FTP (file transfer protocol) and Telnet access to the JACE prevents unauthorized access by either method. Generally, it is recommended that you *keep both disabled*.



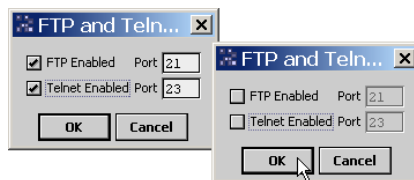
Caution

Do not enable FTP and Telnet unless requested by Systems Engineering to facilitate debugging. Enabling FTP or Telnet on a JACE that is exposed to the public Internet introduces a big security risk.

To verify or change FTP / Telnet access

From the Platform Administrator view (Figure 18):

- Step 1 Click the **FTP / Telnet** button.
A dialog shows an enabled checkbox by FTP and Telnet, with TCP/IP port numbers used.



- Step 2 If not already disabled, click each enabled checkbox to clear.
Step 3 Click **OK**. FTP and Telnet access to the JACE are now disabled.

Note: Unlike in the older R2 JACE, you do not need to modify the host's `system.properties` file to make changes to FTP or Telnet access. Configuration is always done solely from this platform view. Even with FTP disabled, you can transfer files between Workbench and the JACE using the platform's **File Transfer Client** view. See the Platform Guide section "File Transfer Client" for more details.

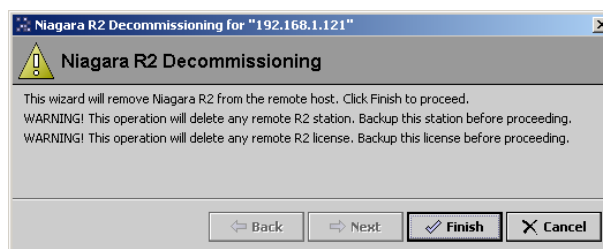
Uninstall Niagara R2

This Platform Administration view button launches a one-step wizard for "Niagara R2 Decommissioning".



Caution

As shown in the dialog below, you should backup the R2 license file and R2 station on the JACE before proceeding. Once you click **Finish**, the wizard deletes the entire R2 folder, and these items are gone!



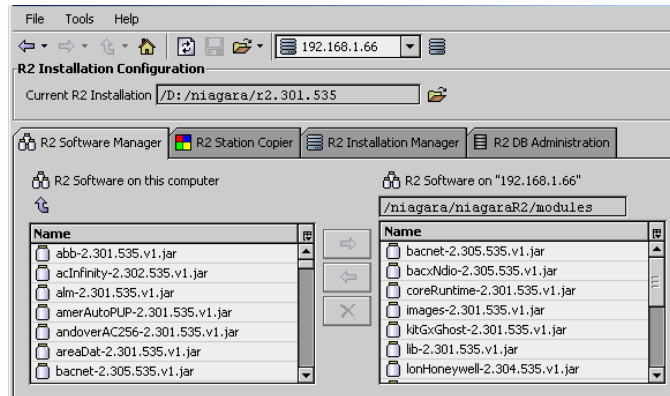
To backup the R2 license file, use the platform **File Transfer Client**. See "Copy the installed R2 license file" on page 1-38.

To backup the R2 station, you can use the **R2 Station Copier** in the **R2 Platform Tool** view. See “[R2 Station Copier](#)” on page 1-26. Or, use the “**Backup**” button in the **Platform Administration** view to save the entire R2 folder on the JACE, including station and license, as a “dist” file.

R2 Platform Tool

The **R2 Platform Tool** is a platform view available only in a Workbench platform connection to a JACE-603 or JACE-645 that has been configured for Niagara R2 (using the [Install Niagara R2](#) wizard).

Figure 19 R2 Platform Tool default view, showing 4 tabs



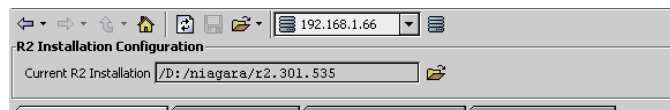
This view provides many of the same functions in the R2 “Admin Tool”, and may be useful for ongoing host platform maintenance of an R2-configured JACE-603 or JACE-645. As shown in [Figure 19](#), this view has a “Current R2 Installation” path at the top, and below that four selectable tabs.

These five parts of this view are explained in the following sections:

- “[Current R2 Installation](#)” on page 1-23
- “[R2 Software Manager](#)” on page 1-24
 - “[R2 Software Manager usage notes](#)” on page 1-25
- “[R2 Station Copier](#)” on page 1-26
 - “[R2 Station Copier usage notes](#)” on page 1-27
- “[R2 Installation Manager](#)” on page 1-28
 - “[R2 Property Files](#)” on page 1-28
 - “[R2 License Management](#)” on page 1-29
 - “[R2 Lexicon Management](#)” on page 1-30
- “[R2 DB Administration](#)” on page 1-31
 - “[Actions on local R2 station databases](#)” on page 1-32
 - “[Actions on platform-connected JACE station databases](#)” on page 1-33
 - “[Status and right-click actions on remote R2 station databases](#)” on page 1-34

Current R2 Installation

Near the top of the [R2 Platform Tool](#) view is the “Current R2 Installation” path on your Workbench PC.



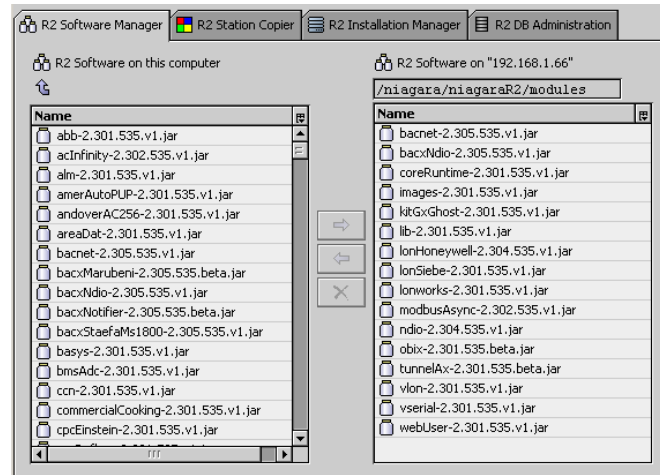
This path is initially set when you run the **Install Niagara R2** wizard for a selected JACE-603 or JACE-645. Typically, you leave this at that release directory, which should be 2.301.535 or later.

If necessary, you can change it by clicking the open folder icon. This opens a popup directory chooser dialog, which you can use to name another (say newer) Niagara R2 release folder.

R2 Software Manager

The left-most tab in the [R2 Platform Tool](#) view is the **R2 Software Manager**.

Figure 20 R2 Software Manager tab in R2 Platform Tool view



Here you can review those R2 software modules installed in the JACE, and if needed install (transfer) one or more modules from your local R2 Installation (PC). Or, you can delete modules in the JACE.

Note: Before you can use this tool to transfer modules to (or from) the target JACE, or to delete modules in it, you must stop its running station from another platform view. See [“To safely stop the R2 station”](#) on page 1-24. To use the R2 Software Manager to transfer or delete modules, you click on named modules to select. To select *multiple modules*, press and hold Ctrl and click.

Selecting one or more module activates the middle buttons: (to JACE) or (to PC), and (delete).

- The *left side* lists the R2 modules in your PC's Niagara R2 installation (“emb” subfolder). Typically, you click in the left side to select modules to transfer to the JACE.
- The *right side* lists the R2 modules currently installed in the remote JACE platform. Typically, you click in the right side to select modules to delete, but possibly also to transfer to the your local PC's Niagara R2 installation (from the JACE).

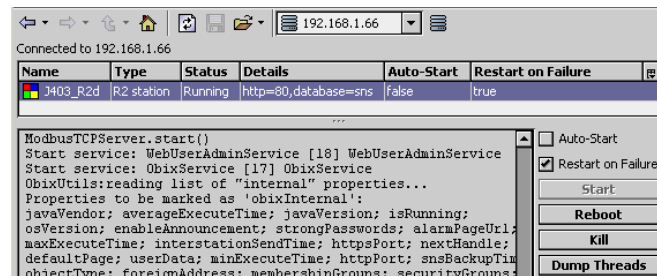
Note: The R2 Software Manager tool works in both directions. That is, you can transfer modules from the remote JACE (right side) to your PC's local Niagara R2 installation. Currently, this also applies when deleting modules. Be especially careful before deleting any modules selected on the left (local PC) side!

For further usage details, see [“R2 Software Manager usage notes”](#) on page 1-25.

To safely stop the R2 station

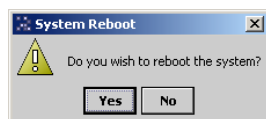
Before using the R2 Software Manager to transfer or delete modules on the JACE, follow this procedure:

- Step 1 From the main platform view, double-click the **Application Director**. The **Application Director** view displays.
- Step 2 In the right side, click to *clear* (uncheck) the **Auto-Start** checkbox.



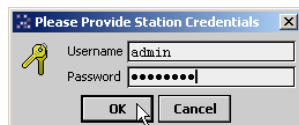
Normally you keep auto-start checked; however, you need to clear it to have the station stopped after a reboot (for an R2 unit, there is no available “Stop” command that also automatically saves the runtime database).

- Step 3 Click **Reboot**. A popup **System Reboot** confirmation dialog appears.

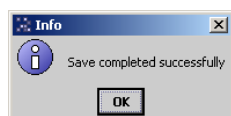


Click **Yes**. Another popup dialog appears, for the *station* Administrator's user name and password.

- Step 4 Enter the station's Administrator user name and password, and click **OK**.

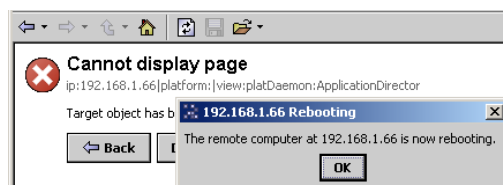


After several seconds, an "Info" popup appears.



This indicates the unit saved its runtime database before rebooting. Click **OK**.

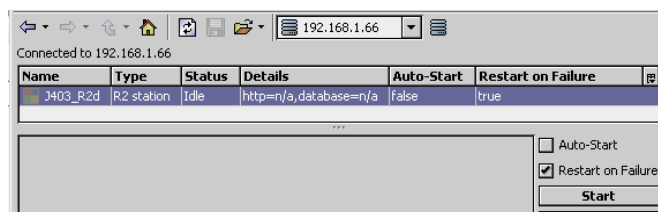
The reboot drops the platform connection, and a second "rebooting" popup appears, as shown below.



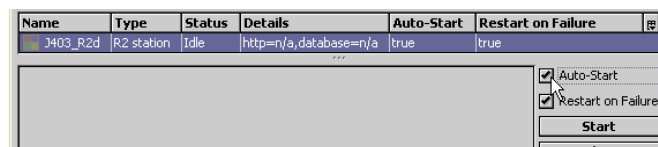
Click **OK** to close the popup dialog.

- Step 5 Wait at least 30 seconds, then click **Back** (button or toolbar icon) to reopen the platform connection. The main platform view appears.

If you return to the **Application Director**, you see the station status is now "Idle".



Note: After you complete platform tasks that require the R2 station to be stopped, make sure to enable (check) *Auto-Start* before restarting (rebooting) the station.

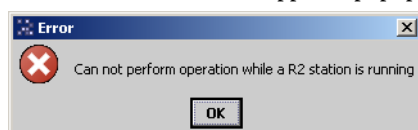


Otherwise, the station will become stopped unexpectedly on future reboots or power failures.

R2 Software Manager usage notes

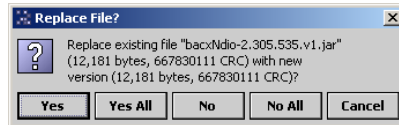
The following is a collection of notes on using the **R2 Software Manager** tab of the **R2 Platform Tool** view:

- If the station is not stopped, a popup appears if trying to transfer or delete JACE software modules.



See "To safely stop the R2 station" on page 1-24.

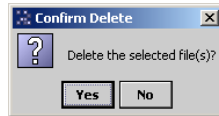
- A confirmation popup **Replace File** dialog appears whenever transferring an R2 software module that already exists on the receiving “target” side (typically, JACE side).



You should examine the dialog to verify differences.

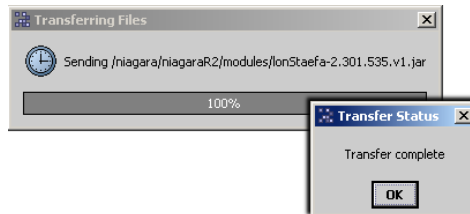
If transferring *multiple* modules, this dialog repeats for each module (unless you select **Yes All** or **No All**). In general, it may be best to answer **Yes** or **No** individually in the case of multiple modules.

- When ☒ deleting a module or modules, a popup Confirm Delete dialog appears.



Click **Yes** to continue with the delete, or else **No** to cancel. Again, be *especially careful with delete* if R2 software modules on the *left side* (local PC side) are selected.

- Transferring modules produces two popup dialogs, the second of which signals transfer complete.



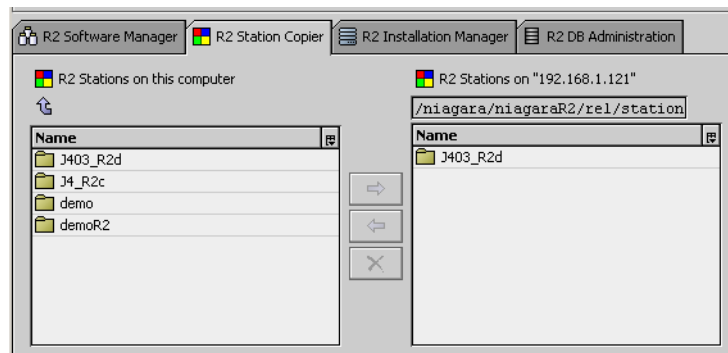
Click **OK** to return to the **R2 Software Manager**.

- After finishing transferring or deleting R2 software modules in a JACE, return to the **Application Director** platform view and re-enable (check) the “Auto-Start” option *before* starting the station.

R2 Station Copier

The second tab in the **R2 Platform Tool** view is the **R2 Station Copier**.

Figure 21 R2 Software Copier tab in R2 Platform Tool view



Use this tool to transfer an R2 station to (or from) a remote JACE, or to delete a station. Like the **R2 Software Manager**, this view works in *both directions*.

Note: Again, be careful with delete if a station is selected on the left (PC) side!

To use this tool to transfer or delete a station, you click on a named station to select.



Selecting a station activates the middle buttons: (to JACE or (to PC), and (delete).

- The *left side* lists the R2 stations in your PC’s Niagara R2 installation (“stations” subfolder).

Typically, you click in the left side to select a station to transfer (*install*) in the JACE.

Note: This completely deletes the entire existing station folder in the target JACE platform, after halting the running station. Be sure to copy the station first, in case it is ever needed again.

*In addition, after the new station is installed, it is not automatically started. You must go to the **Application Director** platform view and set its “Auto-Start” and “Restart on Failure” properties, then **Reboot** the station to start it.*

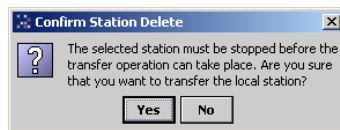
- The *right side* lists the single station currently installed in the remote JACE platform.
Typically, you click in the right side to transfer  (copy) the station to the your local PC's Niagara R2 installation (from the JACE), but might possibly select  delete (to remove any station).
The transfer selection copies the entire station folder contents, in addition to the current station database file in SNS format.

For further usage details, see “[R2 Station Copier usage notes](#)”.

R2 Station Copier usage notes

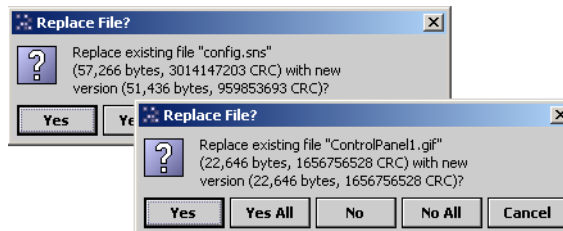
The following is a collection of notes on using the [R2 Station Copier](#) tab of the [R2 Platform Tool](#) view:

- If transferring a station to a JACE (installing station) that already has a station, a popup **Confirm Station Delete** dialog appears.




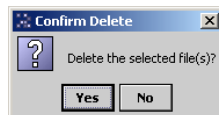
If you have not saved the existing station database, typically it is best to answer **No**, and first save (transfer) the station to you local R2 Niagara installation (if a different station).
If you select **Yes**, the entire station folder on the remote JACE is deleted before transferring the selected station in the R2 Station Copier.

- A confirmation popup **Replace File** dialog appears whenever transferring station files that already exists on the receiving “target” side (whether JACE side or PC side).



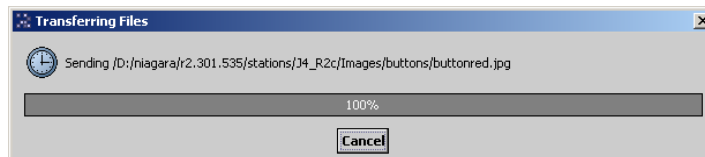
This dialog repeats for each file under the station directory (unless you select **Yes All** or **No All**).
In general, answering **Yes All** may be a valid choice.

- When  deleting a station, a popup Confirm Delete dialog appears.



Click **Yes** to continue with the delete, or else **No** to cancel. Again, be *especially careful with delete* if an R2 station on the *left side* (local PC side) is selected.

- Transferring a station produces a popup dialog, in which all the station files appear “Sending” while the progress bar moves from 0 to 100%.



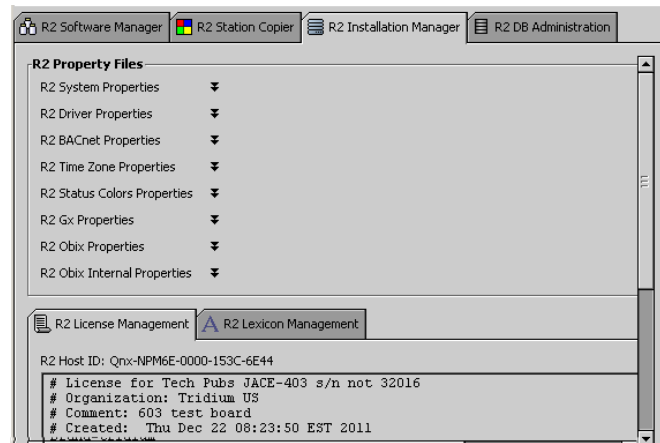
When all files are 100% complete, the popup is removed, returning to the **R2 Station Copier**.

- After finishing transferring an R2 station to a JACE, that station will be “halted”.
Go to the **Application Director** platform view and enable (check) both the “Auto-Start” and “Restart on Failure” options *before* starting the station with a **Reboot**.

R2 Installation Manager

The third tab in the [R2 Platform Tool](#) view is the **R2 Installation Manager**.

Figure 22 R2 Installation Manager tab in R2 Platform Tool view



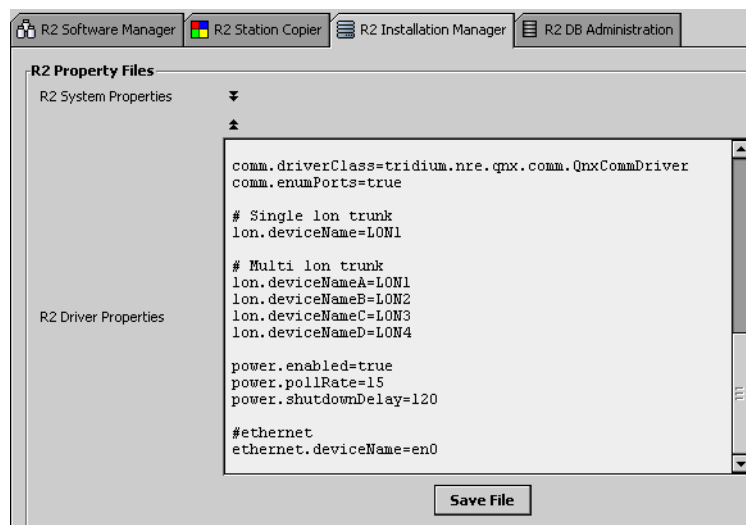
Use this tab for three different platform operations:

- Editing of R2 “properties files” on the remote JACE platform, such as `system.properties`, `driver.properties`, and so on. See [“R2 Property Files”](#) on page 1-28.
- Reviewing or installing the Niagara R2 license file in the remote JACE platform. See [“R2 License Management”](#) on page 1-29.
- Installing R2 lexicon sets on the remote JACE platform. See [“R2 Lexicon Management”](#) on page 1-30.

R2 Property Files

Available R2 property files are listed near the top of the [R2 Installation Manager](#) tab, where each has a control to expand or collapse the contents of this text file on the remote JACE platform.

Figure 23 Example `drivers.properties` file edit in R2 Installation Manager tab



At the bottom of the view, below any expanded properties file, is a **Save File** button. This button becomes enabled whenever you click in the file and change any text.

Files are listed with names similar to the actual file name, for example “**R2 Driver Properties**” for `driver.properties` or “**R2 Status Color Properties**” for `statusColor.properties`.

The following is a collection of notes about R2 Property Files on a JACE-603 or JACE-645 platform:

- The former `station.properties` file (only properties file in an R2 station’s folder) is no longer used, and does not appear in the list of R2 properties files.
- Because of the different QNX OS used in a JACE-603 or JACE-645 platform, many of the previous R2 property files on an older (VxWorks) JACE-403 or JACE-545 controller are *incompatible* with an

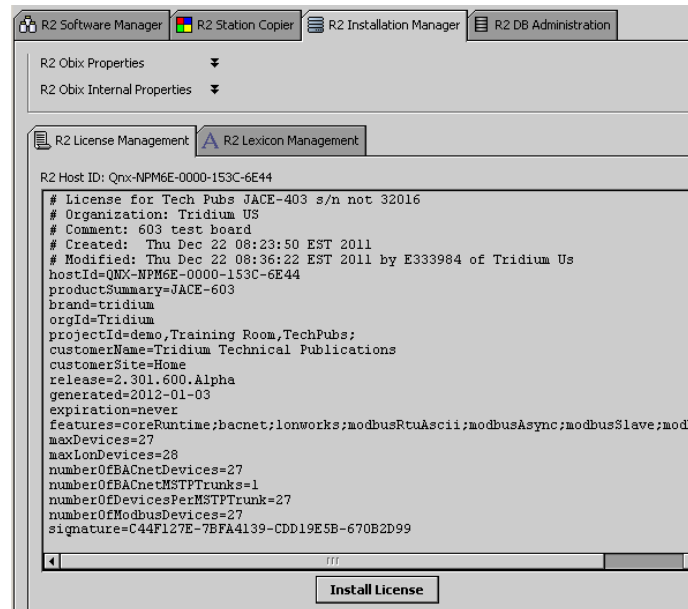
upgraded unit. For example, `system.properties` and `drivers.properties` are different. Do not transfer such (saved) files over to a new unit, for example using the platform **File Transfer Client**. Instead, make any needed changes in the existing files, by editing and clicking the **Save File** button at the bottom of this platform view.

- By default, several of the available R2 property files are initially *blank*. These include **R2 BACnet Properties** (`bacnet.properties`), **R2 Gx Properties** (`gx.properties`), and **R2 Obix Properties** (`obix.properties`). If your JACE-403 or JACE-545 was using such property files, you should re-enter the needed values and click the **Save File** button for each, as needed. Related, note the **R2 Status Colors Properties** (`statusColors.properties`) file uses standard defaults—if your JACE-403 or JACE-545 used non-defaults, you should edit as needed.
- Typically, any change to R2 properties files require a JACE *reboot* before they become effective.

R2 License Management

Below the R2 property files on the [R2 Installation Manager](#) tab are two subtabs.

Figure 24 Example contents of R2 License Management subtab of R2 Installation Manager tab

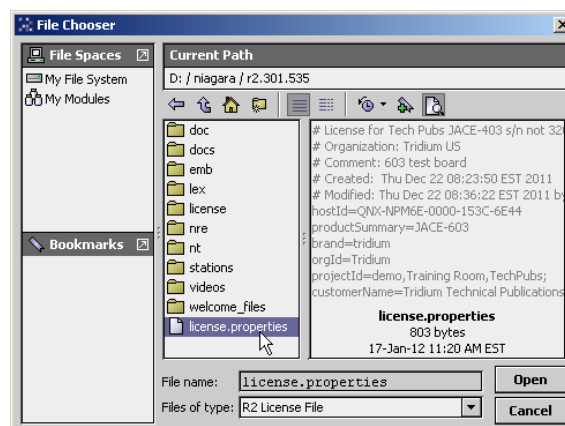


The *left* subtab is for **R2 License Management**, used to review and/or install the R2 license file in the remote JACE platform. Above the license file contents is the R2 Host ID for the current JACE.

To install a new R2 license file

To install a new R2 license, do the following:


- Step 1 Click the **Install License** button at the bottom of the view. This produces a popup **File Chooser** dialog, in which you can navigate to an R2 license file.



As shown above, you can click (select) a license file to see its text contents, including unique hostId, as well as date of generation.

- Step 2 Click **Open** to install the selected R2 license file, or else **Cancel** to close the File Chooser dialog without installing the license file.

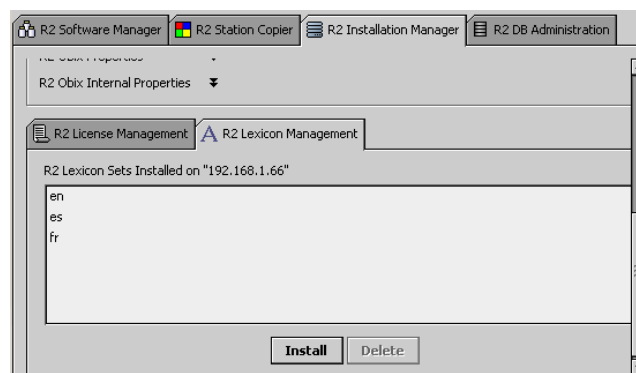
R2 License Management notes For a JACE-603 or JACE-645 platform configured for Niagara R2:


- For any new JACE-603 or JACE-645, it is recommended that you *copy* its installed R2 license file to your PC, using the **File Transfer Client** platform view. See “[Copy the installed R2 license file](#)” on page 1-38 for a procedure.
- Typically, any change to an R2 license file requires a JACE *reboot* before it becomes effective.
- Note the R2 license file is different than the NiagaraAX license file, which is managed in another platform view, the  License Manager view. That platform view offers more and different license management options, including updates from the online NiagaraAX “licensing server”. However, currently this is not available for Niagara R2 licenses.

R2 Lexicon Management

Below the R2 property files on the [R2 Installation Manager](#) tab are two subtabs.

Figure 25 Example contents of R2 Lexicon Management subtab of R2 Installation Manager tab

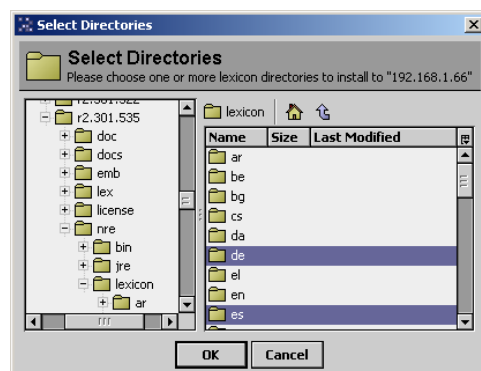


Click the *right* subtab for  **R2 Lexicon Management**, used to install or delete R2 lexicon sets in the remote JACE. Listed are all currently installed lexicon sets, by their 2-character lexicon folder name.

To install R2 lexicon sets

To install R2 lexicon sets, do the following:

- Step 1 Click the **Install** button at the bottom of the view. This produces a popup **Select Directories** dialog, in which you can navigate to select one or more lexicon directories.



By default, the lexicon folder under your Niagara R2 installation folder is the selected root folder.

- Step 2 Click a single lexicon directory folder to select it, or to select multiple lexicons, press and hold Ctrl while clicking lexicon directories.
- Step 3 Click **OK** to install the selected lexicon set(s), or else **Cancel** to close the directory chooser dialog.

To delete R2 lexicon sets

To delete R2 lexicon sets, do the following:

- Step 1 In the **R2 License Management** tab, click a single lexicon to select it, or to select multiple lexicons, press and hold Ctrl while clicking lexicons.
- Step 2 Click **Delete** at the view bottom. The lexicons are deleted on the JACE, and also removed from the view.

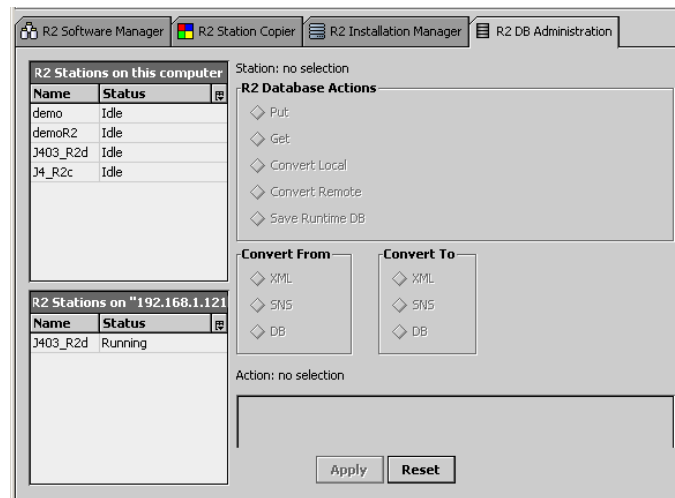
R2 Lexicon Management notes For a JACE-603 or JACE-645 platform configured for Niagara R2:

- Typically, any install or change to an R2 lexicon requires a JACE *reboot* before it becomes effective.
- If installing any lexicon set that already exists in the remote JACE, be aware this tool overwrites the existing lexicon set (without any confirmation dialog). Be sure your lexicon set in your Niagara R2 installation is the appropriate one for installation.

R2 DB Administration

The fourth tab in the **R2 Platform Tool** view is **R2 DB Administration**.

Figure 26 R2 DB Administration tab in R2 Platform Tool view



Use this tab for administering Niagara R2 databases, both in your local PC's R2 Niagara release folder, as well as in the remote JACE(s) opened in a platform connection. This view is similar to the "DB Admin" tab in the R2 Admin Tool.

- The left side of the window has two panes:
 - The *top* left pane reflects stations in your local R2 Niagara installation (stations folder of the current R2 installation). See ["Current R2 Installation"](#) on page 1-23 for related details.
 - Below that, *bottom* left pane(s) list the R2 station that resides on one or more JACE-603 or JACE-645 controllers, opened in a current Workbench platform connection.

To use this view, make your *first* selection on the left side (select a station).

- The right side of the window has three areas, from top-to-bottom:
 - The *top* "R2 Database Actions" area lists actions that may be enabled once you select (click on) a station in either the top left pane (R2 stations on this computer) or in the lower left pane (R2 station on remote JACE). After selecting a station, this is the *second* selection (select an action).
 - The *middle* "Convert From", "Convert To" area lists choices that may be enabled on a "Convert Local" action, or else change to a "Local", "Remote" choice if a "Get" or "Put" action. Depending on other selections, you may be able to choose among these, or they may be fixed.
 - The *bottom* area reflects the current action selected (at top). Once you click the **Apply** button, console output results display in this area.
- At the bottom of the view are two buttons:
 - Apply** — Click to invoke the selected action on the selected station database. Console output results display right above this button.
 - Reset** — Clears all selections (station on left, action on top right), and last console results, appearing as shown in [Figure 26](#).

For more details on using the R2 DB Admin tab, see the following sections:

- ["Actions on local R2 station databases"](#) on page 1-32
- ["Status and right-click actions on R2 Local station databases"](#) on page 1-33

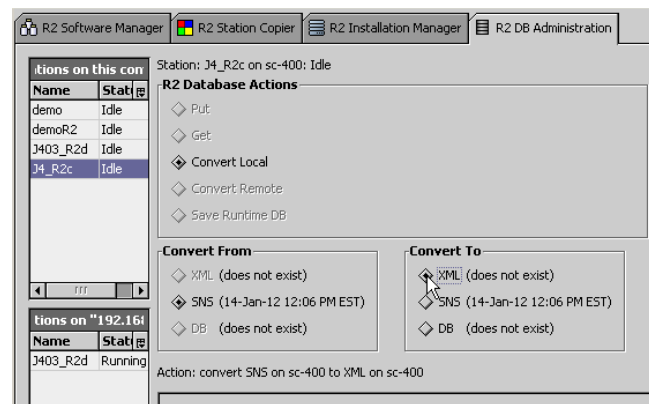
- “Actions on platform-connected JACE station databases” on page 1-33
 - “About Put” on page 1-33
 - “About Get” on page 1-34
 - “About Save Runtime DB” on page 1-34
 - “Status and right-click actions on remote R2 station databases” on page 1-34

Actions on local R2 station databases

When you select (click on) a station database in the top left pane (“R2 Stations on this computer”), only one action is available in the top “R2 Database Actions”: **Convert Local**. Do this to convert from one R2 database file format to another, for example SNS to XML, or DB to SNS.

When you select “Convert Local”, the tool looks at the local station directory for what types of station database file format exist—and if they exist, what file dates they have. This data is reflected in the “Convert From” and “Convert Local” options below the actions area.

Figure 27 Example Convert Local choice for selected local R2 station



In the Figure 27 example above, the local R2 station “J4_R2c” was selected, “Convert Local” selected, then in “Convert From” SNS selected (it was the only existing database format), then finally “Convert To” XML was chosen. When applied, this makes an XML format R2 database in this station’s directory.

Figure 28 Example console output from Convert Local SNS to XML

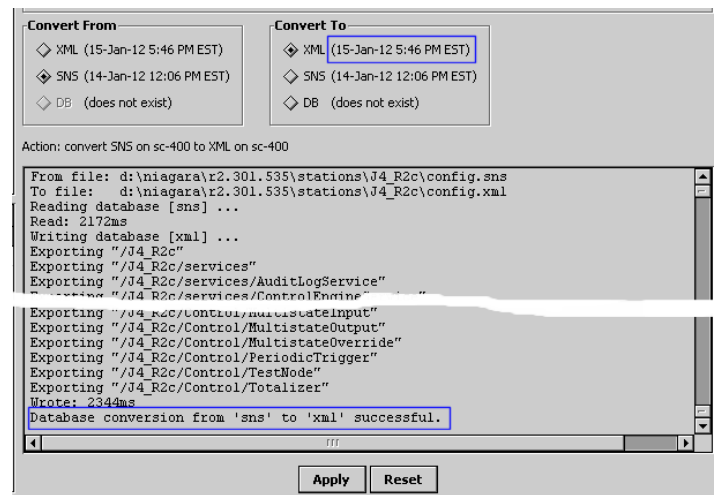
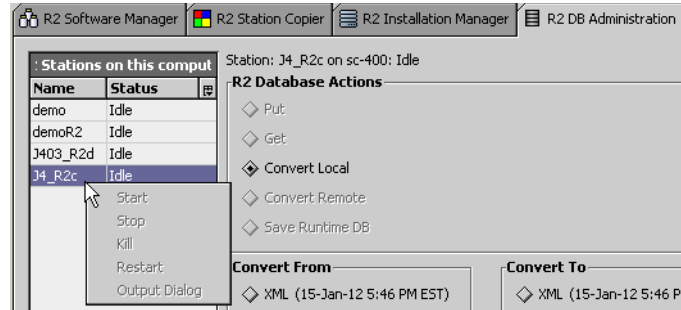


Figure 28 above shows the example console output from a Convert Local SNS to XML.

Status and right-click actions on R2 Local station databases As shown below, there are no available right-click actions on local R2 station databases, and status will always be “Idle”.



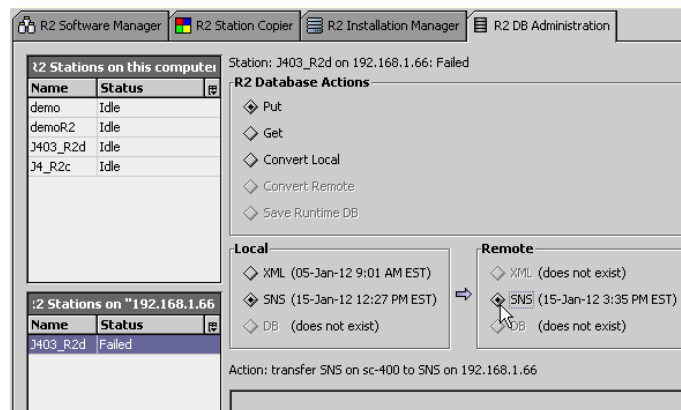
This is different from platform-connected R2 JACE-603 or JACE-645 station databases, where status is typically “running”.

Actions on platform-connected JACE station databases

When you select (click on) a station database in a lower left pane (“R2 Stations on *IPaddress*”), more actions are available in the top “R2 Database Actions”, with the following possible choices:

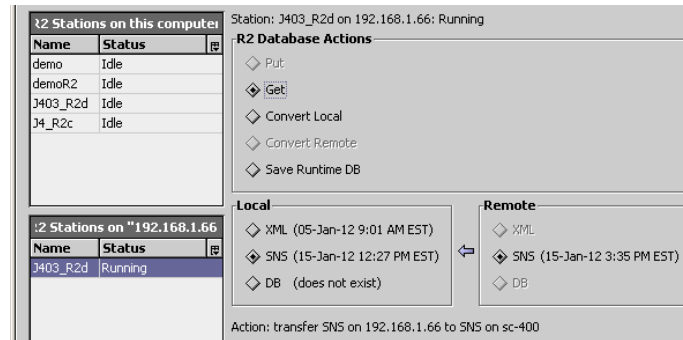
- **Put**
(*unavailable* if station has “running” status) To transfer (send) the local station database to the platform-connected JACE, in SNS format. See [“About Put”](#).
- **Get**
To transfer (receive) the remote station database from the platform-connected JACE, in whichever database format you select in the “Local” area below. See [“About Get”](#).
- **Convert Local**
Provides “Convert Local” operations on available R2 local station databases only (does not involve the remote platform-connected JACE). See [“Actions on local R2 station databases”](#) on page 1-32.
- **Save Runtime DB**
(available only if station has “running” status) Causes the remote platform-connected JACE to save its runtime station database to SNS format.

About Put Put is only available if the remote station selected *does not* have a “running” status.



As this action *replaces* the current SNS database in the platform-connected JACE, it may be useful in case recent operations resulted in a station failure or halt. You must have at least one of the three database format types (XML, SNS, DB) for that station in the corresponding local station directory—if only XML or DB exists, the tool automatically converts to SNS before the transfer. After a “put”, in order to start the station, you must go to the platform **Application Director** view and *reboot* the JACE.

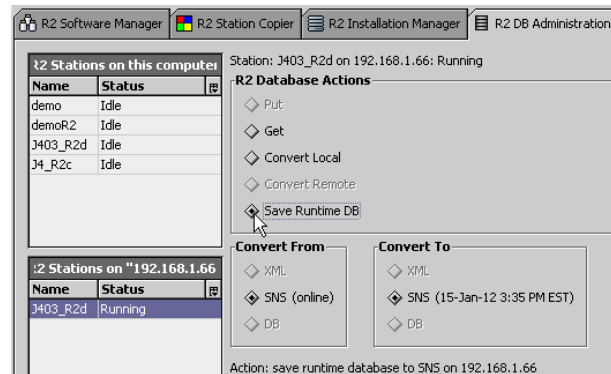
About Get Get is always available on a selected remote station, regardless of its station status.



The source database format on the remote JACE is always SNS. On the (receiving) local side, you can select any of the three types—if XML or DB, the tool automatically converts to that local format.

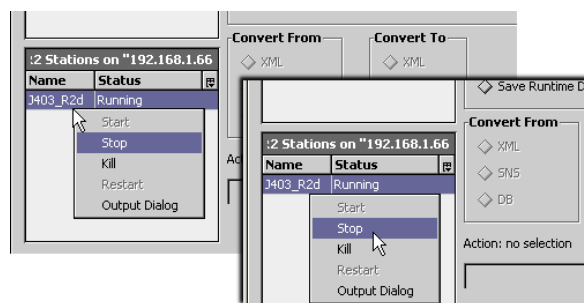
Typically you select Get for a running station without any known problems, perhaps converting to XML to perform some sort of “manual edit” (global change of station name, for example).

About Save Runtime DB Save Runtime DB is available only on a remote station with a “running” status.



This action is equivalent to the “**Save DB**” command (button) available in the platform **Application Director** view, causing the remote JACE to save its runtime database to SNS format. The “Convert From” and “Convert To” settings (both fixed at SNS), apply only to the remote JACE platform.

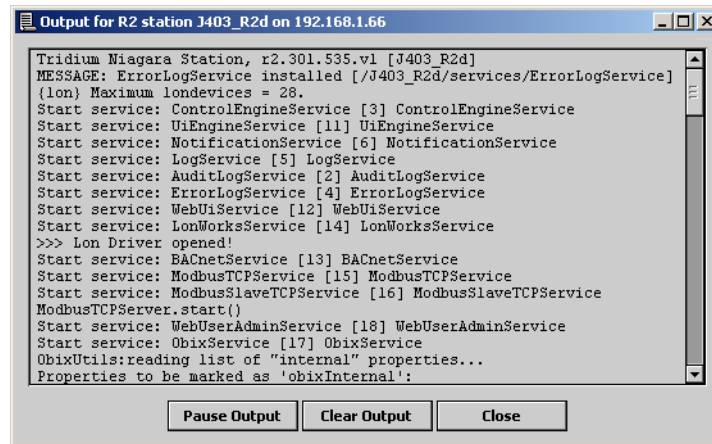
Status and right-click actions on remote R2 station databases As shown below, a remote platform-connected R2 JACE station offers some available actions.



The “Start” is action is available only if the station is stopped with an “Idle” status (“Restart” is always unavailable for any embedded JACE).

Currently, “Stop” and “Kill” are available with a running station, but both result in an eventual “Failed” status. For a recommended procedure to stop a remote R2 station, for example before using the **R2 Software Manager**, see [“To safely stop the R2 station”](#) on page 1-24.

The “Output Dialog” right-click action produces a separate window for station “standard output”.

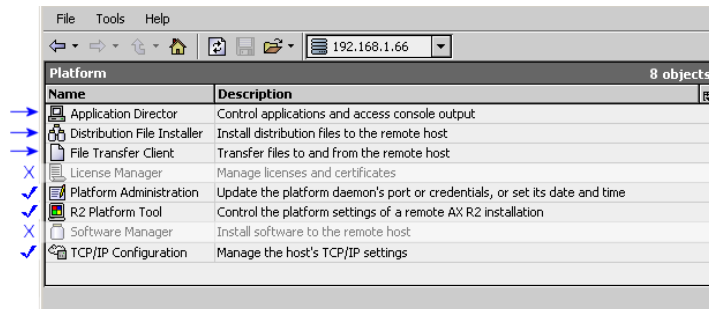


As shown above, buttons in this window allow you to pause (and reload) station output, clear output, and close the output dialog window. Station output is also available in the main area of the platform **Application Director**, where that view also provides the equivalent “Output Dialog” options, and more.

Other R2 JACE platform views

A Workbench platform connection to an R2-configured JACE-603 or JACE-645 provides *other platform views* apart from the few described in other sections of this document (“[Platform Administration view](#)” on page 1-19, “[TCP/IP configuration](#)” on page 1-17, and “[R2 Platform Tool](#)” on page 1-23). This section describes those additional platform views, and how they apply to a JACE configured for Niagara R2.

Figure 29 Other platform views for an R2-configured JACE



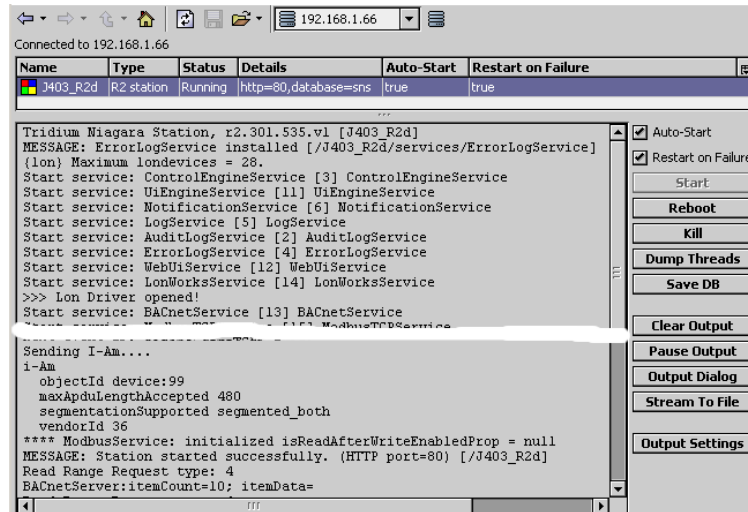
Note: The **License Manager** and **Software Manager** platform views are available for an R2-configured JACE, but do not affect its Niagara R2 configuration. Instead, use the [R2 Platform Tool](#) for these functions. In addition, if using “full Workbench” (able to commission NiagaraAX-configured JACEs) please ignore any additional platform views that may appear. These include the views **DDNS Configuration**, **Dialup Configuration**, **GPRS Modem Configuration**, **Lexicon Installer**, and **Station Copier**. These views do not apply to Niagara R2-configured platforms.

For a summaries on the other platform views that do apply to an R2-configured JACE, see the following:

- “[Application Director](#)” on page 1-35
- “[Distribution File Installer](#)” on page 1-37
- “[File Transfer Client](#)” on page 1-38

Application Director

The Application Director allows you to start, reboot, or kill an R2 station on the connected R2 platform. You also use it to examine standard station output, for troubleshooting and debug purposes. Station output appears in the main view pane, and is controlled by buttons in the lower-right area of the view.

Figure 30 Application Director when connected to R2-configured JACE-603 or JACE-645

Also, here you set an R2 station's "restart" properties (*instead* of editing "station.properties"), by using the "Auto-Start" and "Restart on Failure" checkboxes. Settings are applied on the *next* reboot.

The top of the view is the "installed station" area, showing the R2 station installed and its status.

Brief descriptions for the top group of right-side buttons for an R2 JACE are as follows:

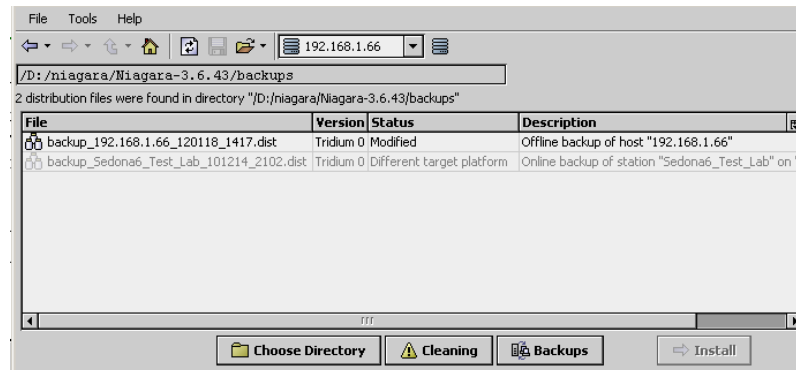
- Start**
 Available only for an R2 station that is stopped with an "Idle" status (otherwise, you must Reboot). For a related example of using, see ["To safely stop the R2 station"](#) on page 1-24.
- Reboot**
 Available for a station that is either running or stopped, including with a status of "Failed". A reboot restarts the host QNX OS, Java VM, platform daemon, and finally the Niagara R2 station (providing that it is configured to "Auto-restart"). If the station is running, after the initial reboot popup confirmation, a second popup dialog appears asking for station Administrator's login credentials. This is for the runtime station save (to SNS on that JACE), automatically performed right before the reboot.
 The reboot drops the Workbench platform connection, but after 30 seconds or so you should be able to reconnect, typically using the **Back** button.
- Kill**
 Enabled only if the R2 station has a status of "Starting", "Stopping", or "Running". If you affirm in the popup confirmation, the JACE's platform daemon terminates the station process immediately, without attempting a runtime database save. Standard output halts, and station status becomes "Failed".
Note: The original intent of "kill" was to stop the station in a case where it is stuck in a "Starting" or "Stopping" state, and is generally not recommended for any R2 station with a running status. However, because R2 stations cannot be "Stopped" from this view (unlike NiagaraAX stations), for a running station you could elect to kill it after you manually and successfully invoke a runtime database save (**Save DB** button). Together, these actions would resemble the "Stop" action for a NiagaraAX-configured JACE with a running station status. In this "Failed" (stopped) state, you could do R2 software module configuration if needed. See ["R2 Software Manager"](#) on page 1-24.
- Dump Threads**
 Enabled only if the station has a "Running" status. When pressed, the JACE's platform daemon has the station send a VM thread dump to its standard output.
- Save DB**
 Enabled only if the station has a "Running" status. When pressed, a popup dialog prompts for the R2 station's Administrator user name and password. Upon entry, the platform daemon has the station save its runtime database in SNS format. A second "Info" popup appears upon successful save.

For further details on the **Application Director** (although specific to NiagaraAX-configured platforms), refer to the "Application Director" section in the *NiagaraAX Platform Guide*.

Distribution File Installer

For a Niagara R2-configured JACE, the **Distribution File Installer** allows you to restore a JACE backup “dist” (distribution) file, previously made from the **Platform Administration** view, via its “**Backup**” button.

Figure 31 Distribution File Installer



This view displays only files of type “dist” (distribution). Each is essentially a zipped collection of files for a specific target platform. Dist files that are incompatible with the platform-connected JACE will appear “ghosted”, similar to the second one shown in the [Figure 31](#) example above.

Buttons at the bottom of the view are briefly described as follows:

- **Choose Directory**
For a popup directory chooser dialog, in which you can navigate to a particular location on your PC. Typically, you click the **Backups** button *first*, then this button if necessary.
- **Cleaning**
To change to a directory that holds NiagaraAX “clean dist” files for various platforms. If you select and install a clean dist file, this wipes clean *all Niagara R2 and NiagaraAX configuration* for the unit, including all its software modules along with its station and all station-related files. By default, only the unit’s NiagaraAX license and its current TCP/IP configuration settings are retained.



Caution

Cleaning also deletes the unit’s Niagara R2 license file! Do not install a clean dist file unless specifically directed to do so by Systems Engineering.

In addition, note if you do install a clean dist file in a JACE-603 or JACE-645, you cannot directly re-commission it for Niagara R2, that is, using the procedures in this document.

Instead, you must first install NiagaraAX build 3.6.44 or later in the unit, using the platform Commissioning Wizard in Niagara Workbench. Following the subsequent reboot of the JACE, you can then commission it for Niagara R2. For example, starting with “[Open a platform connection](#)” on page 1-5.

- **Backups**
Click this to point to the Workbench PC’s folder for storing backups. By default this is the backups folder under the Niagara Workbench release directory (as shown in [Figure 31](#)). If needed, you can further use the **Choose Directory** button (and dialog) to make new subfolder targets.
- **Install**
Enabled only if you select (click) a dist file in the view. When you install a dist file, a wizard with a series of dialogs informs you of any module dependencies, along with a confirmation dialog that the current station must be stopped. You are also asked if you want to retain the JACE’s current TCP/IP settings, or instead use those TCP/IP settings saved in the backup file.
After affirming, dialogs keep you informed of progress as the backup is restored in the JACE. The backup install ends with a JACE reboot, and the platform connection is dropped.

For further details on the **Distribution File Installer** (although specific to NiagaraAX platforms), refer to the “Distribution File Installer” section in the *NiagaraAX Platform Guide*.

File Transfer Client

The **File Transfer Client** is the platform view you can use to copy (transfer) files and entire folders between your Workbench PC and the remote R2-configured JACE, working in either direction needed. It can also be used to delete files and create new directories. You can use this view in place of the R2 “Local Library” and “Remote Library” nodes in the R2 JDE (Java Desktop Environment).

Note: *Unlike the R2 Remote Library, which requires a running station on a remote host, and further restricts you to only that station folder for access, the File Transfer Client works even if a station is not running. It also provides access to all folders/files on the remote platform—similar to enabling FTP access on the JACE. When using the File Transfer Client, you must be very careful about deleting files!*

Figure 32 File Transfer Client transferring R2 station files from PC to remote JACE

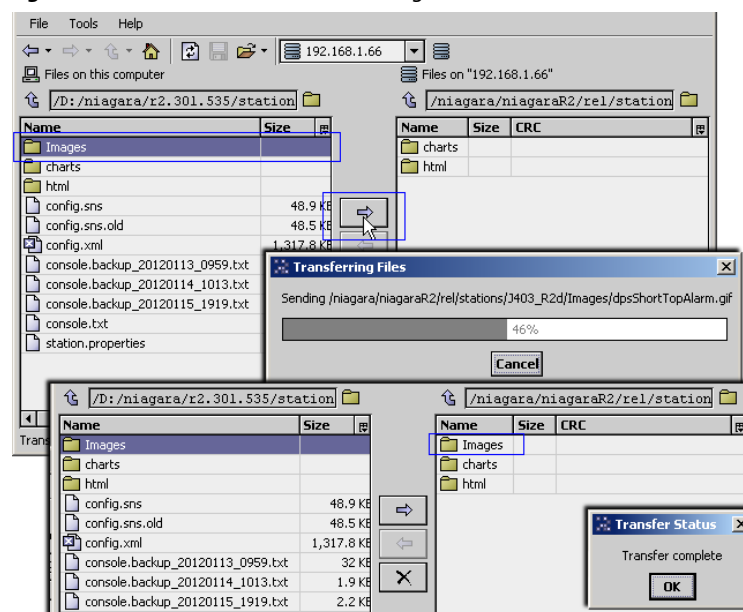


Figure 32 shows an example copy (transfer) of a station’s Images folder from the station directory for it from the left PC side (this computer) to that station folder on the remote R2-configured JACE. The target station path is too long to display in this screen capture, but in this case is:

/niagara/niagaraR2/rel/stations/J403_R2d

Noting the entire Niagara R2 configuration of a JACE is under the /niagara/niagaraR2 directory.

Controls in the File Transfer Client

Controls used for navigation in either side of the view, or for handling of selected folder/files, are below.

Control (click to)	Description
Go Up	Click to jump up one level in the directory structure.
Change Directory	Open a Change Directory popup dialog, with a directory tree you can traverse. Double-click any folder in the tree to change to that directory.
Copy to JACE	Enabled when a file or folder is selected on the left (PC) side.
Copy to PC	Enabled when a file or folder is selected on the right (JACE) side.
Delete Item	Enabled when a file or folder is selected on <i>either side</i> . <i>Be careful with this!</i>

Copy the installed R2 license file

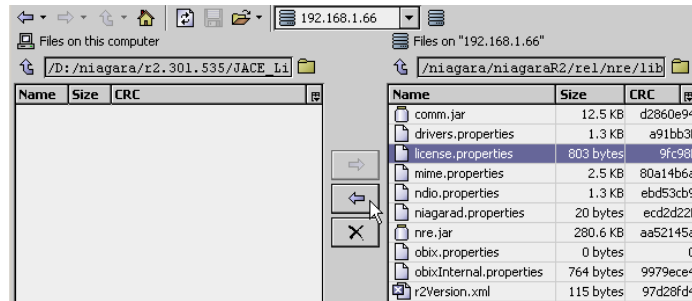
The following procedure provides a recommended first use of the [File Transfer Client](#), for any new R2-configured JACE-603 or JACE-645. A new retrofit board ships with the necessary upgraded Niagara R2 license file already installed. However, you should backup (copy) this license file to your PC, in case it ever needs to be reinstalled.

Note: *You must first make a platform connection to the JACE from Niagara Workbench to copy this license file. See “Open a platform connection” on page 1-5.*

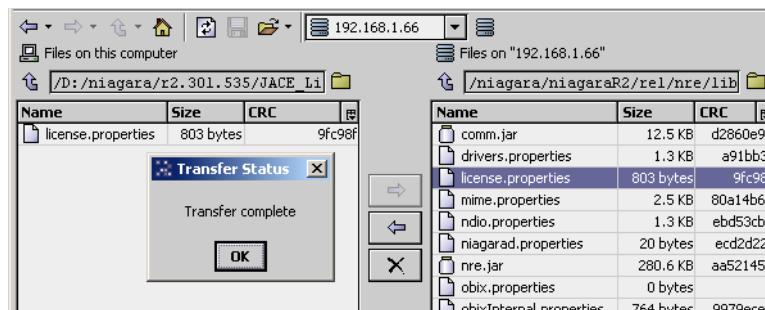
Backup the R2 license file installed in a new RB-603 or RB-645

Perform the following with a Workbench platform connection to the new JACE-603 or JACE-645:

- Step 1 From the main platform view, double-click the **File Transfer Client**. The **File Transfer Client** platform view appears.
- Step 2 In the left (local PC) side, use controls to navigate to a desired folder to store the JACE's R2 license file. If needed, right-click in a folder and select "**Create subdirectory**", naming the new folder as desired. After it is added, double-click it to open.
- Step 3 In the right (JACE) side, use controls to navigate to its `/niagara/niagaraR2/nre/rel/lib` folder, double-clicking the `lib` folder to open. Several files should appear, including `license.properties`.
- Step 4 In the right (JACE) side, select (click) the `license.properties` file.



- Step 5 Click the **Copy to PC** button to transfer a copy of the upgraded R2 license file to your PC. The license file is transferred, with an ending popup dialog.



- Step 6 Click **OK** to close the **Transfer Status** popup dialog. For further details on the **File Transfer Client** (although specific to NiagaraAX platforms), refer to the "File Transfer Client" section in the *NiagaraAX Platform Guide*.

Recovery tips

During JACE commissioning, it is possible to run into problems. For instance, you may mis-type an IP address 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:

- [IP changes history](#) (a Workbench feature)
- [System shell](#) (a feature of any QNX-based JACE)

IP changes history


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

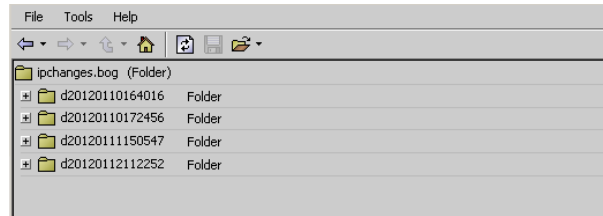
- [To review TCP/IP changes made \(platform connection to any host required\)](#)
- [To review TCP/IP changes made \(when a platform connection cannot be made\)](#)

To review TCP/IP changes made (platform connection to any host required)

From your PC with Workbench started, and a platform connection established (to *any* host):

- Step 1 From the main platform view, click **TCP/IP Configuration**. The TCP/IP Configuration view appears.

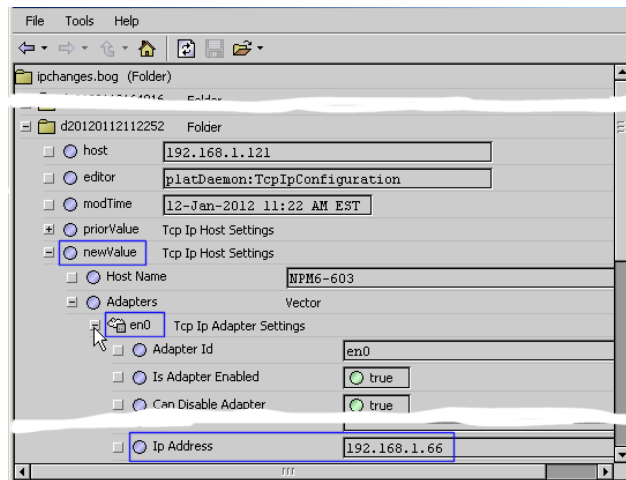
- Step 2 Click the  **Audit** button at the bottom of the **TCP/IP Configuration** view.
The view changes to an **ipchanges.bog** (Folder), with expandable, date-named child subfolders.



The newest date folder is at bottom, as date-naming uses the following convention:

d<yyyymmddhhmmss> for example, “d20120112141522” for 2012 Jan 12 2:15pm

- Step 3 In the **ipchanges.bog** folder view, click to expand a date folder, including containers of interest.
Underneath each container are two objects:
- **priorValue** — TCP/IP settings that existed before this change.
 - **newValue** — TCP/IP settings that existed *after* this change.
- Step 4 Click to expand the **newValue** container to see values and children, for example **Adapters**, and under that container, “**en0**” (LAN1) or “**en1**” (LAN2). You typically need to scroll down after expanding items.



The example above shows a new IP address value of 192.168.1.66 given to en0 (Interface 1 or LAN1), after originally connecting to it at host address 192.168.1.121.

To review TCP/IP changes made (when a platform connection cannot be made)

In case you made an IP change in a platform from Workbench, but now *cannot open* a platform connection (to *any* host), you can still see the IP changes information stored on your Workbench PC. Instead of using the **TCP/IP Configuration** view in a platform connection, you must look at the underlying **ipchanges.bog** (text file) in a text editor.

- Step 1 On your Workbench PC, open Windows Explorer and navigate to your NiagaraAX Workbench release folder, for example: Niagara-3.6.44
- Step 2 Under this release folder expand “users” and your user folder, to reveal “ipchanges.bog”
- Step 3 Use a text editor like Wordpad or Notepad++ to open **ipchanges.bog**.
This file is in xml format, where folder elements use the same date name (n=<value>) convention as that shown in the previous procedure. In the same way, child “priorValue” and “newValue” elements, and child container elements with values, can be read in your text editor.

System shell

Any QNX-based JACE has a “system shell,” providing low-level access to a few basic platform settings. Using a special JACE power-up mode, you can access this system shell using a *serial connection* to the JACE’s onboard RS-232 port. Note that system shell is also available via Telnet (providing that Telnet is enabled in the JACE).

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

Note: Also, depending on your preference, as an alternative to reconfiguring your PC's IP address in Windows (to initially connect to a new JACE), you may wish to use the serial system shell to set the JACE's IP address. If done as the first step, afterwards you could connect normally (Ethernet/IP) and perform all other Niagara software installation/platform configuration using Workbench and the [Install Niagara R2](#) wizard. This method would save you from having to re-configure your PC's IP address settings in Windows: first to connect to the JACE as shipped from the [factory](#), and then back again to its original settings.

The following sections provide more details:

- [About JACE serial shell mode](#)
- [Items needed for serial system shell](#)
- [Using serial system shell](#)
- [About the JACE system shell menu](#)

About JACE serial shell mode

Any JACE circuit board has a small 4-pin jumper header, commonly called the mode or "Serial Shell" jumper. To put the JACE in serial shell mode, you put a 2-pin jumper block on certain connector pins, and cycle power to the unit. Upon system boot, this makes the system shell available at the JACE's primary RS-232 (COM1) port, at a pre-defined serial rate (for the NPM6E processor, this 115200, 8, N, 1).

Using a serial terminal program such as Windows HyperTerminal, you can then login using 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 (or reposition) the mode jumper. The JACE reboots using the changed IP address parameters, and its COM1 port operates as normally configured.

Note: If using COM1 for any other application, be sure to remove the 2-pin jumper when rebooting from the serial system shell.

Items needed for serial system shell

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

- A working RS-232 port on your PC.
Usually this is a DB-9 connector with a specific Windows ComN assignment (say Com1 or Com2). However, newer notebook PCs may require a USB-to-RS-232 adapter, installed with a Windows driver.
- Terminal emulation software, such as Microsoft HyperTerminal (standard Windows app).
- A serial cable to connect between your PC's serial ComN port to the JACE's RS-232 port, plus any adapter, if necessary.
For a JACE-603 or JACE-645 that has one or more RS-232 ports that use RJ-45 connectors, the following parts, listed by Tridium part number, apply:
 - 10148 — Adapter, RJ-45 to DB-9, null modem type
 - 10181 — Silver satin RJ-45 patch cable, 10 ft. (connects adapter to RJ-45 type RS-232 port)
Patch cables are also available in lengths 4 ft. (10180) and 25 ft. (10182)
- A 2-pin jumper block for the JACE's "Serial Shell" jumper pins—this should already be installed on the "Normal" position pins.

Using serial system shell

The following procedure provides steps to use serial system shell.

To connect to the JACE serial system shell

To connect to the JACE's system shell using a serial connection, do the following:

- Step 1 Connect the necessary serial cable and adapter between the JACE's RS-232 port and the RS-232 COM port you are using on your PC. See ["Items needed for serial system shell"](#) on page 1-41.
- Step 2 On your PC, start HyperTerminal. From the Windows Start menu, this is typically **Programs > Accessories > Communications > HyperTerminal**.
- Step 3 In the **"Connection Description"** dialog, type a name for this session.
For example: Jace serial shell
Click **OK**.
- Step 4 In the **"Connect to"** dialog, use the **"Connect using"** drop-down list to select the COM port you are using on your PC, for example COM1.
Click **OK**.
- Step 5 In the **Comn Properties** dialog, choose the following settings:
 - Bits per second: 115200
 - Data bits: 8

- Parity: None
- Stop bits: 1
- Flow control: Hardware

Click **OK**. The HyperTerminal session is now set up.

- Step 6 On the JACE-603 or JACE-645 circuit board (NPM6E processor), locate the 4-pin jumper header and put the 2-pin jumper block on the two “Serial Shell” pins. See the label on the board’s NPM6E processor.
- Step 7 With your HyperTerminal session active, remove power from the JACE, let it cycle down, then reapply power.
- After some number of seconds, text should appear in the HyperTerminal window similar to:
- Press any key to stop auto-boot...
- Step 8 Do not press any key, wait for the login prompt.
- Note:** *If you did press a key to stop auto-boot, select option 1 (Boot from on-board nand flash).*
- Step 9 At the login prompt, enter the platform user name, and at the password prompt, the platform password. See “[Platform daemon credentials](#)” on page 1-3 for factory-default values.
- The system shell menu appears. See “[About the JACE system shell menu](#)” on page 1-42.
- Step 10 When finished making platform changes from the serial system shell, do the following:
- Move the 2-pin jumper block from the “Serial Shell” position back to the “Normal” position.
 - From the system shell menu, 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 HyperTerminal window, and then the connection is dropped.
- Step 11 Press the **Disconnect** button on the HyperTerminal tool bar.
- Step 12 Exit from the HyperTerminal application, selecting to **Save** if you wish to reuse this setup again.

About the JACE system shell menu

The system shell of a QNX-based JACE provides simple, menu-driven, text-prompt access to basic Niagara platform settings, including IP network settings, platform credentials, system time, and enabling/disabling FTP and Telnet. You can also perform a TCP/IP “ping” from the JACE to another host.

Changes issued in the system shell become immediately effective, except for IP address settings ([Update Network Settings](#)). You must reboot the JACE in order for any changed network settings to become effective.

Note: *If Telnet is enabled in a JACE, you can also access the JACE’s system shell using a Telnet session. Platform login is still required (just as with a JACE powered up in serial shell mode).*



Caution *Be careful when changing items from the system shell, in particular platform account (login credentials) 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 serial shell connection, reboot the JACE, and then be careful to press a key at the appropriate time during JACE boot up.*

[Figure 33](#) shows the main JACE system shell menu.

Figure 33 JACE system shell menu (serial shell or Telnet access)

```

NPM6E System Shell
-----
hostid: Qnx-NPM6E-0000-153C-6E44
serial number: 441634
build version: 2.5.33
build date: built on 2011-12-12 15:10:37
system time: Mon Jan 16 13:57:25 DST 2011
niagara daemon port: 3011
en0:  inet 192.168.1.121 netmask 0xffffffff broadcast 192.168.1.255
      inet6 fe80::201:f0ff:fe8d:7a44%en0 prefixlen 64 scopeid 0x2
en1:  <disabled>
-----
1.  Update System Time
2.  Update Network Settings
3.  Ping Host
4.  Enable/Disable Ftp
5.  Enable/Disable Telnet
6.  Update Platform Account
7.  Reboot

L.  Logout

Enter choice:

```

To select a menu option, type the associated number (1 to 7) or “L” for logout, then press Enter. For example, choose [Update Network Settings](#) to recover IP access, or to set the IP settings of a new JACE.

Update Network Settings

Use this menu option to access most of the same IP networking options as available in the platform TCP/IP Configuration view (see “[TCP/IP configuration](#)” on page 1-17). When selected, you are prompted for each setting sequentially, starting with hostname ([Figure 34](#)).

Figure 34 Update Network Settings example in JACE system shell

```

JACE Network Configuration Utility

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

Hostname <NPM6E-441634> : J603_T
Domain <Workgroup> :
Primary DNS Server <> : 68.87.73.246
Secondary DNS Server <> : 68.87.71.230
Route <192.168.1.1> :
Primary IPv6 DNS Server <> :
Secondary IPv6 DNS Server <> :
IPv6 Route <> :

NET1 Ethernet interface
  IP address (clear to use DHCP) <192.168.1.121> : 192.168.1.66
  Subnet mask <255.255.255.0> :
  Enable IPv6 addressing on this adapter? (Y/n) : n

Enable NET2 interface? (Y/n) : n

Confirm new configuration
Hostname      : J603_T
Domain       : Workgroup
Default Gateway : 192.168.1.1
Primary DNS   : 68.87.73.246
Secondary DNS : 68.87.71.230
Default IPv6 Gateway :
Primary IPv6 DNS :
Secondary IPv6 DNS :

NET1 settings:
IP Address      : 192.168.1.66
Subnet Mask     : 255.255.255.0
IPv6 Addressing disabled

NET2 disabled

Save these settings? (Y/n) :

```

Document Change Log

Updates (changes/additions) to this *Retrofit Board Niagara R2 Install & Startup Guide* document are listed below.

- Updated: April 16, 2013
Minor updates to note/caution that if you install a “clean dist” file in a JACE-603 or JACE-645, that you *cannot directly commission if for Niagara R2*. Instead, you must first install NiagaraAX build 3.6.44 or later, using the Commissioning Wizard in Niagara Workbench. Following the subsequent reboot of the JACE, you can then recommission it for Niagara R2. This was “footnoted” in the section “Overview” on page 1-2, mentioned in a [Note](#) in the section “Platform Administration view”, and also added to a [Caution](#) in the section “Distribution File Installer” on page 1-37.
The “as-shipped” description for an RB-603 or RB-645 retrofit board in the “Overview” section was modified to remove mention of any installed AX license—only the Niagara R2 license is installed in the unit. Related to this, it was recommended that you *backup* that installed Niagara R2 license to your Workbench PC, even before doing any other commissioning. Now, this is also mentioned in the section “Open a platform connection” on page 1-5, with the related procedure located in the section “Copy the installed R2 license file” on page 1-38.
- Initial Document: March 1, 2012
Document to support Niagara R2 commissioning of RB-603 and RB-645 “retrofit boards” installed in existing R2 JACE-403 and JACE-545 controllers (effectively then JACE-603 or JACE-645 controllers). Alternatively, these controllers can have NiagaraAX installed instead—in which case please refer to the *JACE NiagaraAX Install & Startup Guide* instead of this document.