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## NiagaraAX-3.1 DDNS

**Note:** In late 2012, the company Dyn acquired TZO (Tzolkin Corporation), the sole DDNS provider that this NiagaraAX DDNS client was developed against. At the time of this document update, Dyn is not signing up any new accounts for the TZO service, although TZO servers appear to be working for existing accounts. Unless (or until) other DDNS provider options are available when using this platform configuration view, QNX-based JACE controllers that require Internet connectivity using DDNS may be best served by installing on a LAN with a router capable of DDNS, and working through some other DDNS provider. See “[Alternatives to Niagara DDNS](#)” on page 1-2. Another update to this document may occur if future functionality changes are made to this platform view.

This document provides details on the DDNS feature in NiagaraAX-3.1 and later, and includes the following sections:

- “[DDNS overview](#)” on page 1-1
- “[Example DDNS scenarios](#)” on page 1-2
- “[DDNS Configuration guidelines](#)” on page 1-4
- “[Document change log](#)” on page 1-6

## DDNS overview

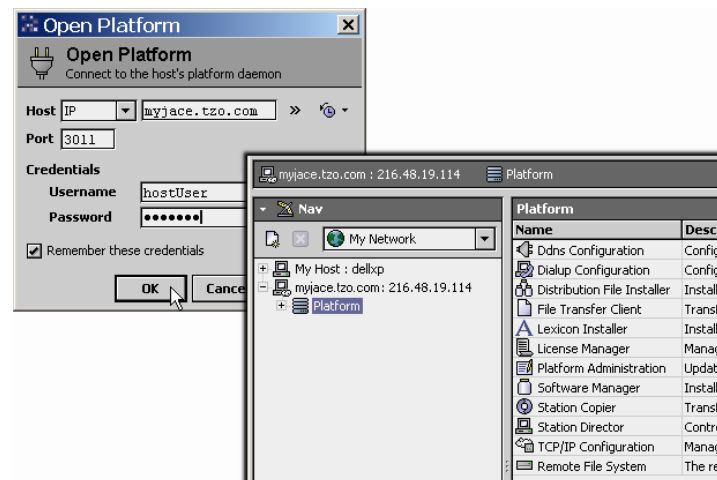
Starting in NiagaraAX-3.1, a Niagara host can be configured to use DDNS (Dynamic Domain Name Service), allowing it to be accessed over the Internet using a specific domain name (vs. a static IP address). Currently, a service account with TZO (Tzolkin Corporation) is required. (However, see opening [Note](#)).

For example, to use a browser to connect over the Internet to the station running on a JACE, you could use the browser URL:

`http://myjace.tzo.com`

Or, for a platform connection to that same JACE using Workbench platform tools, you would use that same domain name (instead of IP address), as shown in [Figure 1-1](#) below.

**Figure 1-1** Platform connection using DDNS address.



**Note:** *The actual IP address used by the JACE is “dynamically assigned” by the ISP, whether connected via a cable/DSL modem, or even using a dialup. Sometimes, this IP address may change from day-to-day, or possibly every few hours. The DDNS provider (TZO) does the necessary “lookup work” to resolve the currently assigned IP address to the static “known” domain name.*

### Why use DDNS?

Typically, DDNS is used to allow Internet connectivity without having to pay for a static public IP address—often an expensive item from most ISPs (Internet service providers). Less frequently, a static IP address may be an available option, but a more “recognizable name” (vs. an IP address) is preferred, specific to that host.

Niagara-configured DDNS may be used in different scenarios, including “dialup modem” access, or in cases where the host (almost always a QNX-based JACE) is Ethernet-connected, either directly to a cable/DSL modem, or as part of a LAN behind a router (which in turn, is connected to a cable/DSL modem).

Although platform configuration for any NiagaraAX-3.1 host, including Win32-based NiagaraAX hosts (JACE-NXS, Supervisor PC, etc.) also includes a “Ddns Configuration” view, please note that the Windows OS on these hosts is directly configurable for DDNS as well. Testing and usage of Niagara-configured DDNS has concentrated on the QNX-based JACEs (JACE-2, -4, and -5 series platforms).

### What you need for DDNS

To use the NiagaraAX implementation of DDNS you need to do the following:

- Buy a service account from TZO (Tzolkin Corporation), to-date the only approved DDNS provider. Accounts are available for 1- and 2-year durations—and a pre-purchase 30-day free trial is also offered. (At the update time of this document, this is no longer possible—see [Note](#) on page 1.)  
**Note:** *The JACE platform’s Niagara DDNS configuration is for the “DDNS client” that works with the TZO dynamic DNS servers—you do not need to download any additional DDNS client software.*
- At the JACE, you also require Internet connectivity via an ISP (Internet Service Provider). Depending on the installation scenario, this may range from a “dialup ISP” to an ISP provider via a cable or DSL modem (either directly connected to the JACE, or to a routed-LAN upon which the JACE sits). See “[Example DDNS scenarios](#)” on page 1-2 for more details.

### Alternatives to Niagara DDNS

If the JACE is installed on a LAN served by a router, often you can use “built-in” DDNS support of the router, with either TZO as the DDNS provider, or *another* DDNS provider (if supported by the router). In this case, you do *not* configure the JACE for Niagara DDNS. Instead, you must follow the necessary configuration for DDNS operation through the router, with the JACE as the “exposed” node on the LAN.

Refer to the router documentation for specific details on this configuration. Also, see the “[LAN connected DDNS scenario](#)” on page 1-4 for a topology diagram and related discussion about this configuration (when using Niagara DDNS).

## Example DDNS scenarios

The following three scenarios show different usage of Niagara-configured DDNS:

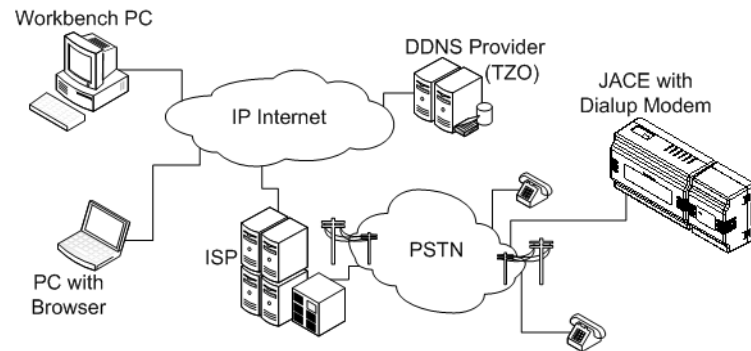
- [Dialup DDNS scenario](#)
- [Direct cable/DSL modem connect DDNS scenario](#)
- [LAN connected DDNS scenario](#)

### Dialup DDNS scenario

In this scenario ([Figure 1-2](#)), a JACE uses an onboard dialup modem for typical access (its Ethernet port is used only during on-site maintenance by the installing SI, when connected to the SI’s laptop PC). The slow response of a dialup connection is tolerated for some reason(s), such as unavailability of cable or DSL service at this location, or perhaps cost savings.

**Note:** *Starting in AX-3.7, dialup support was dropped in NiagaraAX, so this particular configuration is not supported in AX-3.7 or later.*

**Figure 1-2** Dialup DDNS scenario



Almost always in this scenario, the JACE has dialup operation set up for “Captive Network,” as configured in that section of its platform’s **Dialup Configuration** view. This forces the JACE to attempt to stay “dialup connected” to its ISP as much as possible. Dial out to the ISP occurs, for example, immediately after a reboot, or upon a loss of the dialup connection. Note that some ISPs limit the amount of “continuous time” for any dialup session—and so this is configurable in a “Max Connect Time” property, within the JACE’s captive network setup. See the [“Dialup”](#) section of the [“DDNS Configuration guide-lines”](#) for an example setup.

Upon making a dialup connection, the JACE receives a dynamically allocated IP address from the ISP, which usually varies for each dialup session. In turn, through its DDNS configuration, the JACE sends its IP address to the DDNS provider (TZO), where it is registered for dynamic DNS. At this point the JACE is now reachable at its DDNS “domain name” through any Internet connection, for example, “myjace.tzo.com”.

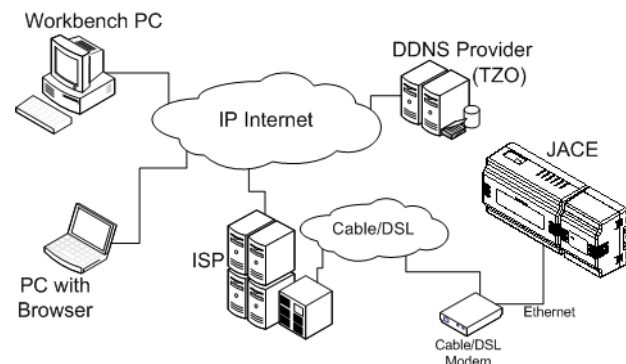
This is quite different from a “normal” dialup connection, in the following ways:

- Any Internet-connected browser or Workbench user can reach it, not just one dialing directly to the JACE modem (via *another* modem connection). However, note that connection response is still slow, because of the narrow bandwidth of the JACE dialup connection.
- *Multiple* connections can occur simultaneously through this IP connection (resolved by DDNS). For example, the JACE can be archiving history data to a remote Supervisor station and/or routing alarms to that station, at the same time being accessed by one or more browser users, or even hosting a platform connection in Workbench. However, again note that response is often quite slow, and even more so during multiple connections.

### Direct cable/DSL modem connect DDNS scenario

In this scenario (Figure 1-3), the JACE is Ethernet-connected directly to a cable or DSL modem, and its DDNS configuration is as mode “Internet,” associated with its onboard Ethernet adapter.

**Figure 1-3** Direct cable/DSL modem (Internet) DDNS scenario

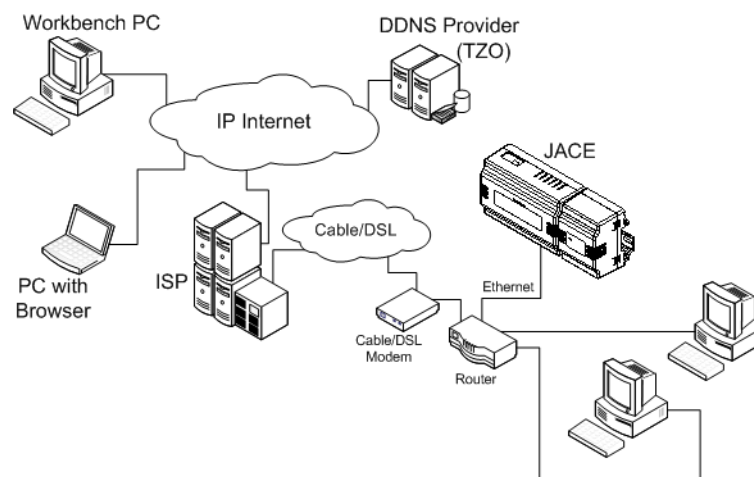


The cable or DSL ISP provides a dynamically-assigned IP address to the JACE. The JACE’s TCP/IP configuration for this port is enabled for DHCP, in order to use this IP address. Through its DDNS configuration, the JACE sends its IP address to the DDNS provider (TZO), where it is registered for dynamic DNS. This occurs upon any change in the ISP-assigned IP address. The JACE remains reachable at its DDNS “domain name” through any Internet connection, for example, “myjace.tzo.com.”

## LAN connected DDNS scenario

In this scenario (Figure 1-4), the JACE is Ethernet-connected to a LAN served by a router to the Internet. The JACE operates on the LAN using a static but “private” IP address, such as in the IP address range 192.168.x.x. or 10.10.x.x. The local router operates on both this “private LAN,” and is also assigned a WAN (public) IP address through the cable or DSL ISP that provides Internet connectivity.

**Figure 1-4** LAN connected (Intranet) DDNS scenario



Through its Niagara DDNS configuration (as mode “Intranet”), the JACE sends the IP address currently assigned to the router to the DDNS provider (TZO), where it is registered for dynamic DNS. The JACE remains reachable at its DDNS “domain name” through any Internet connection, for example, “myjace.tzo.com.”

In this scenario, the router may be configured for “port forwarding” for specific software ports used by the JACE, which may include ports such as 3011, 1911, 443, 80, and so on.

## DDNS Configuration guidelines

The following sections provide guidelines for configuring Niagara DDNS:

- [Required in all Niagara DDNS Modes](#)
- [Dialup](#)
- [Internet](#)
- [Intranet](#)

### Required in all Niagara DDNS Modes

All modes of Niagara DDNS (Dialup, Internet, Intranet) require the following [TCP/IP Configuration](#) and [DDNS Configuration](#):

#### TCP/IP Configuration

In the platform **TCP/IP Configuration** view of the JACE (Figure 1-5), you must specify the DNS servers used to access the Internet—typically, these are the ISP’s DNS servers.

**Figure 1-5** TCP/IP Configuration view of JACE platform

Values for the DNS servers may already appear—if not, contact your ISP for this information.

## DDNS Configuration

After you register and receive your confirmation from the DDNS provider (TZO), you have three pieces of data to enter in the “Provider” section of the JACE platform’s **Ddns Configuration** view (Figure 1-6).

**Figure 1-6** DDNS Configuration view of JACE platform

- **Key** — The TZO-generated string associated with your account.
- **Email** — The email address to which you requested TZO to use to send you this information.
- **Domain** — The requested static “name” (domain name) for this JACE, such as “myjace.tzo.com”.

All that remains in the **Ddns Configuration** view is to select the “Ddns Mode,” either [Dialup](#), [Internet](#), or [Intranet](#), according to the installation scenario.

**Note:** If a JACE-2 and configuring for “Internet” mode, select and use the “NET1” port for connection to the cable/DSL modem, as the NET2 port does not support DHCP, as required by the ISP.

## Dialup

In the platform **Dialup Configuration** view of the JACE, enable the “Captive Network” section, and configure it to dial the ISP at the appropriate number(s), with the user name and password used by the ISP to authenticate your dialup connection. See Figure 1-7 for an example.

**Figure 1-7** Example Dialup Configuration view of JACE using DDNS Dialup mode

If the ISP limits the continuous connection time, set the “Max Connect Time” to be within this duration.

**Note:** Typically, you also enable and configure the “Listener” section of **Dialup Configuration**. This permits “dial-in” access from **Workbench**, in case problems arise in the “always connected to ISP” operation of DDNS. In this case, you could call in during the “Min. Disconnect Time” as defined in the captive network setup.

Also see configuration “[Required in all Niagara DDNS Modes](#)” on page 1-4.

## Internet

In the platform **TCP/IP Configuration** view of the JACE ([Figure 1-8](#)), enable DHCP for the Interface (Ethernet) port connected to the cable/DSL modem.

**Figure 1-8** Example TCP/IP Configuration view of JACE using Internet DDNS

The screenshot shows the 'TCP/IP Configuration' window. The 'Hostname' field is set to 'StandaloneJ2'. The 'Hosts File' is a dropdown menu. The 'DNS Domain' is empty. The 'Gateway' field is empty. The 'DNS Servers' list contains two entries: '70.34.117.4' and '70.34.117.5'. Below the DNS Servers list are icons for adding, removing, and reordering servers. The 'Interfaces' section shows 'Interface 1' expanded, displaying details for 'en0' (Ethernet Adapter NET1). The 'Adapter Enabled' checkbox is checked. The 'DHCP' checkbox is also checked. The 'IP Address' and 'Subnet Mask' fields are empty. Below these are fields for 'DHCP Server', 'DHCP Lease Granted', and 'DHCP Lease Expires'. 'Interface 2' is collapsed.

Also see configuration [“Required in all Niagara DDNS Modes”](#) on page 1-4.

## Intranet

Typically, you do not need to do any further platform configuration in the JACE, apart from that [Required in all Niagara DDNS Modes](#). The JACE is already typically assigned a private (static) IP address, and uses the private IP address of the local router as its “Gateway.”

However, in the configuration of the local router, you may need to adjust firewall settings, and possibly establish port-forwarding rules.

## Document change log

Updates (changes/additions) to this *NiagaraAX-3.1 DDNS - Engineering Notes* document are listed below.

- Updated: May 24, 2013  
Added leading [Note](#) on page 1 that explains changes with the DDNS provider that this platform view was developed against. A future related update to this document may occur at a later time. In addition, another Note was added in the section [“Dialup DDNS scenario”](#) on page 1-2, relating to dialup support being discontinued in AX-3.7 and later releases.
- Updated: December 10, 2007  
Applied new formatting for printed document.
- Publication: December 4, 2006  
Initial “Engineering Notes” type document.