Niagara Cloud Backup as a Service

User Guide

DISTECH CONTROLS™

Innovative Solutions for Greener Buildings

Niagara Cloud Backup as a Service

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Legal Notice

Contents

About this guide

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

Product Documentation

This document is part of the EC-Net^{TM} technical documentation library. Released versions of EC-Net software include a complete collection of technical information that is provided in both online help and PDF format. The information in this document is written primarily for Systems Integrators. In order to make the most of the information in this book, readers should have some training or previous experience with EC-Net^{TM} 4 or EC-Net^{AXTM} software.

Document Content

This document describes how to connect to Niagara Cloud to manage device/station backups for station and enterprise systems. Sections in this guide include chapters about cloud-based backup tasks, concepts, and reference information. Also included are images and descriptions of the primary software user interface windows involved when working with cloud backups.

Document change log

Updates (changes and additions) to this document are listed below.

November 13, 2019

Minor changes to facilitate online help content, plus updated image in the “CloudConnector” component topic.

August 12, 2019

Edited the “Requirements” topic to include mention of the transparent proxy server requirement.

May 23, 2019

Added valid SMA to the “Requirements” topic.

November 1, 2018

- Edited the topics, “Requirements” and “cloudBackup_CloudBackupService”, to include Supervisor platforms in statements on platform requirements.
- Edited prerequisites section in the procedure, “Restoring an unencrypted backup”.

April 2, 2018

Minor changes throughout for branding purposes only.

December 7, 2017

- In the Components section edited the topic, “cloudConnector-CloudConnector”, to revise content throughout.
- Added the topic, “cloudIotHubDep-MessageClientUpgrader” and related procedure, “Upgrading the Cloud-Connector to use nCloudDriver”.

September 20, 2017

- In the following topics, added content indicating that manually initiated backups can be flagged for data retention: “Backup as a Service”, “Making a manual backup”, “cloud-CloudBackupService”, and “Cloud Backup Manager view”.
- Added the procedure, “Making a cloud master backup”.

August 30, 2017

- In the topic, “Backup as a Service,” added a note regarding management of user access to controllers configured with the CloudBackupService.

- In the topics, “Backup as a Service” and “Frequently asked questions,” added the statement that there is no backup storage limit.

July 18, 2017

- Revised the following topics to include the recommendation to remove the local BackupService when installing the CloudBackupService: “Installing cloud components in the station” and “Best practices for cloud backups”.
- In the “Frequently asked questions” topic, added information about having both the local Backup Service and the Cloud Backup Service in a station.
- Added alarm alerts information to the topics describing the CloudConnector and CloudBackupService components.

July 11, 2017

Initial publication.

Related documentation

Additional information is available in the following documents.

- *EC-Net 4 Hardening Guide*, available on *SmartSource*
- *Asset Manager Guide*

Chapter 1 Overview

Topics covered in this chapter

♦ Niagara Cloud Services
♦ Secure controller-to-internet communications
♦ About the Asset Manager tool
♦ Backup as a Service

The emergence of "the cloud" and related technologies has enabled new delivery models for connected systems. In EC-Net 4 v4.3, expanding EC-Net platform services into the cloud enables OEMs to provide traditional and new application services through modern "Internet of Things" (IoT) delivery models.

What is "cloud computing"

The term "cloud computing," often referred to as "the cloud," indicates the use of computing resources that are located somewhere else and accessed in the "cloud" of remote networks via Internet connectivity. These computing resources include applications, data storage centers, and other IT resources, which are accessed via self-service, on-demand, 24 x 7.

The main features of cloud computing are:

- Flexibility — You can scale services to meet your needs, customize applications, and access cloud services from anywhere via an Internet connection.
- Efficiency — Enterprise users can get applications to market quickly without developing or supporting the underlying infrastructure.
- Strategic value — Cloud services give enterprises a competitive advantage by providing the most innovative technology available.

What are cloud services

"Cloud services" refers to a broad category of cloud-based IT resources that a service provider delivers to customers via the Internet. Several types of services are offered via the cloud.

Infrastructure as a service offers basic computing blocks (compute, block storage, and network resources) from the cloud provider. These services provide the hardware capabilities on-demand to users to run their own software and services.

Platform as a service provides services (load balancers, identity services, message queues, managed databases, billing services, etc.) that allow a third party to build and run applications without having to develop or maintain the software or invest in hardware.

Software as a service is basically any type of application (content, analytic, communication, or backup) which runs in the cloud. This allows the user to use a web application without installing and maintaining software or storing data on a local computer or other type of device.

Niagara Cloud Services

Prior to the development of cloud technology, EC-Net systems typically fit one of a few architectures, with a Supervisor serving as the hub of the architecture, if present at all. In a EC-Net system that includes a Supervisor, the Supervisor centralizes many system level functions (user access, system navigation, alarm management, historical data, etc.).

Niagara Cloud Services extend the capabilities of the EC-Net application platform into "the cloud" by leveraging the capabilities of existing third party cloud platforms (for example Microsoft Azure) and adding new services to those platforms. This enables the creation of new applications that leverage the unique capabilities of any cloud platform. Additionally, the availability of Niagara Cloud Services in multiple clouds allows developers to choose the best cloud platform and combination of services to meet their application needs.

The goal of Niagara Cloud Services is to provide a new software distribution model for supervisory and application services to new and existing EC-Net systems.

Secure controller-to-internet communications

For the current implementation of Niagara Cloud Services running on the Sentience cloud platform, the EC-BOS embedded controller makes a secure one-way TLS Internet connection to Niagara Cloud Services. Note that the controller is never exposed to Internet-initiated communications.

The device authentication and authorization workflow occurs in this way:

- The device connects to the Sentience Identity Service, and conducts an RPK negotiation over TLS to establish device identity
- The identity service signs a short-lived JavaScript Object Notation Web Token (JWT) for the device to use to take to the provisioning service
- The provisioning service validates the token and returns a longer-lived JWT and Shared Access Signature (SAS) token for the device to use in communication with subsequent services

Additionally, the Cloud Backup Service ensures encryption of all communications, as well as integrity in transit via TLS 1.2. The encrypted backups in the cloud require the source station's system passphrase (the one in use at the time the backup was created) from EC-Net™ 4 in order to restore the backup. Finally, the system ensures storage of sensitive data at rest (via RPK private key) by utilizing the Java KeyStore (JKS).

Security features summarized

Niagara Cloud Services protects your data via the following methods:

- User authentication provides fine grained permissions for each backup operation: view, create, download, delete
- Device authentication uses raw public key (RPK) key exchange over a one-way TLS transport
- Device authorization utilizes short-lived tokens for service-based authorizations
- Encryption of all communications and integrity in transit with TLS 1.2
- Backups in the cloud are encrypted with the source station's system passphrase
- Storage of sensitive data at rest (RPK private key) utilizes Java KeyStore

About the Asset Manager tool

The Asset Manager manages users, organizations, and devices in preparation for interacting with any of the Niagara Cloud Services. Additionally, Asset Manager provides automated Niagara Service Maintenance Agreement (SMA) management and notifications.

It is accessed via either of these methods:

- In a web browser connection to Niagara Community (*www.niagara-community.com*), click the Asset Manager link
- In a browser/EC-Net 4 Pro connection to a station configured for cloud connectivity, click on the CloudConnector service. Note that a station connection to Asset Manager is solely for purposes of device registration and authenticating with Niagara Cloud Services.

The tool is organized by groups of related activities used to set up and maintain users, organizations, and devices. They are logically grouped by functionality.

- Organization Management - manage aspects of an organization's account. For example, the company name and address, and primary/secondary contact information.
- User Management - manage users within the organization. For example, add new users and assign roles.
- Device Management - manage device licensing maintenance and notifications, as well as user access to device backups via assigned role.

Services

Following are a few of the device-related services:

- Device Registration

  Registering a device in the Asset Manager generates a System GUID (globally unique identifier) for the device. Both the device's host ID and System GUID are in the asset manager and associated with a particular organization.

- Maintenance management

  Monitors device licensing and asset details.

- Notifications

  Notifies Organization Managers of imminent license expirations, pending user requests, pending organization affiliation requests, as well as tagged devices

Tagged devices

Tags are metadata markers which are associated with a device in order to facilitate grouping and searching.

Roles

Roles determine which activities are authorized for a user within the Asset Manager, as shown in the following table. By default, a new user is assigned the User role which has the lowest permission level. Note that a user may be assigned multiple roles.

Role	Description
Organization Manager	Performs both user and organization management activities. Adds users, assigns user role(s), adds organization affiliations, adds devices (single or multiple), provides approvals (affiliation and user) via notifications
Device Manager	Performs device management activities including device registration and device backup. May submit business affiliation requests.
User	The default user role, the user can view basic organization and device information but cannot perform other organization- or device-related actions. Also, allows the user to manage his or her own contact information.

Backup as a Service

Niagara Cloud Backup as a Service (BaaS) provides easy, secure, and scalable backups of a device from the EC-BOS station to Niagara Cloud.

Using either EC-Net 4 Pro or a browser connection to the EC-BOS station, you can configure automated backups by time or event triggers, or initiate a backup manually, as well as flag backups for data retention. You are able to view, download or delete your cloud backups, as well as add notes to new manually initiated backups.

Backup transmissions are streamed, so there are no block space requirements on the device. The streaming approach means that each segment of a backup is sent immediately and not saved anywhere on the device. The platform only needs to have enough space to hold that one segment, usually much smaller in size than an entire backup.

By default, backups includes all of the same elements that are included in a local backup (config.bog file, station files, graphics, licenses, and certificates). Note that the alarm and history databases are excluded by default (as in the legacy local Backup Service) mainly because these files can be very large. Cloud backups can be configured for additional exclusions if desired.

NOTE: It is possible to remove the default exclusions of history and alarm databases should you wish to include them in your backups. For example, if preparing to migrate a station, you may wish to make a more complete backup that includes the history and alarm databases for that station. For details on how to do this, see cloudBackup_CloudBackupService, page 35.

In Niagara Cloud, a backup file is chunked, encrypted (in transit and at rest) and posted to the cloud. Once a backup is committed, it must be decrypted using the source station's system passphrase (the one in use at the time the backup was created). All backup files are encrypted so that the data is secure, and stored in Windows Azure in Microsoft’s Data Centers. The encryption means that your data is safe.

NOTE: The management of users with admin privileges and access to EC-BOS embedded controllers configured with the CloudBackupService is the sole responsibility of the customer.

The backup service is geo-located which means that the CloudBackupService will connect to a “traffic manager” that will automatically route the station’s backup service to a cloud service that is closest to the site, to minimize the latency (i.e. delays) in the communication while uploading the backup. Storage servers are synced in the background.

The current storage limit for cloud backups is 1GB for EC-BOS controllers, and 5GB for Supervisors, regardless of the number of backups.

Should a hardware failure or corruption occur, any cloud backup (the last known good or historic) can be downloaded at any time (24x7x365) by authorized individuals from a secure cloud login. The backup can be downloaded in encrypted format (EDIST). Or, using the source station's system passphrase (in use at the time the backup was created), it can be downloaded in decrypted format (DIST).

If a backup is downloaded in encrypted format (EDIST), the EC-Net 4 Pro File System provides a utility to decrypt the file using the source station's system passphrase (requires the passphrase in use at the time the backup was created).

Once decrypted the backup DIST file can then be installed on a new embedded controller, thereby minimizing disruption of operations.

Chapter 2 Getting started

Topics covered in this chapter

♦ Requirements
♦ Basic workflow for getting started
♦ Registering your organization

Requirements

Requirements include hardware, software and licensing.

Platform requirements

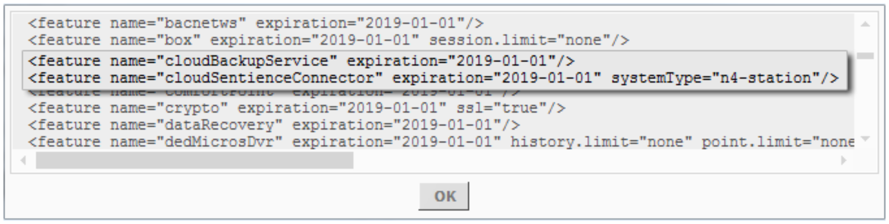
The Cloud Backup Service functions on any EC-BOS or Supervisor platform capable of running EC-Net 4 v4.3 or later.

License requirements

For a station to connect to Niagara Cloud Services and use the Cloud Backup Service, the following features must be licensed for your platform, as shown.

- cloudBackupService
- cloudSentienceConnector

Figure 1 Cloud licensing features



```
<feature name="bacnetws" expiration="2019-01-01"/>
<feature name="box" expiration="2019-01-01" session.limit="none"/>
<feature name="cloudBackupService" expiration="2019-01-01"/>
<feature name="cloudSentienceConnector" expiration="2019-01-01" systemType="n4-station"/>
<feature name="comfortPoint" expiration="2019-01-01"/>
<feature name="crypto" expiration="2019-01-01" ssl="true"/>
<feature name="dataRecovery" expiration="2019-01-01"/>
<feature name="dedMicrosDvr" expiration="2019-01-01" history.limit="none" point.limit="none
```

NOTE: The cloudSentienceConnector license feature includes a “systemType” attribute with the value: “n4-station”. This specifies the system type that is registered by the connector.

Additional software requirements

- A valid Software Maintenance Agreement (SMA) is required to use Backup as a Service.
- The following modules must be installed on your system:
  - cloudBackup (-rt, -ux, -wb)
  - cloudConnector (-rt)
  - cloudSentienceConnector (-rt -ux)
- Internet access for all stations and clients.

NOTE: If your local network uses a proxy server to provide Internet access, work with your on-site IT department to configure the proxy server to allow access to the Niagara Cloud. The Cloud Connector requires that any intermediate proxy server be a fully transparent proxy; named proxy servers, also known as explicit proxy servers, are not supported at this time. The station requires unauthenticated proxy access to the following domains which are part of the Niagara Cloud ecosystem:

- *.scm.azurewebsites.net
- *.azurewebsites.net
- *.cloud.tridium.com
- *.tridium.com
- *.dsentience.net
- *.honeywell.com
- *.force.com
- *.niagara-community.com
- *.trafficmanager.net
- *.azure-devices.net

- Web browser that supports HTML5

Basic workflow for getting started

Use this checklist as a guide to help you get started using Niagara Cloud Services.

In the Niagara Community web portal...

1. Sign up to join Asset Manager. On the sign-up form:
   - Enter your organization’s information
   - Accept the Electronic Users License Agreement
   - Enter your user account information
2. Access **Niagara Licensing** and add the cloud features to your EC-BOS license.

In your EC-Net 4 Pro PC...

1. Install the cloud software modules

In a platform connection to the EC-BOS...

1. Set up the device for internet access
2. Install cloud connectivity software, updated license, and updated core software dist files

In a connection to the EC-BOS station...

1. Copy the cloud services components to the station’s Services node
2. Connect to Niagara Cloud and register the device (if not already preregistered).

Registering your organization

Signing up to join the Asset Manager on the Niagara Community portal also registers your organization.

Prerequisites:

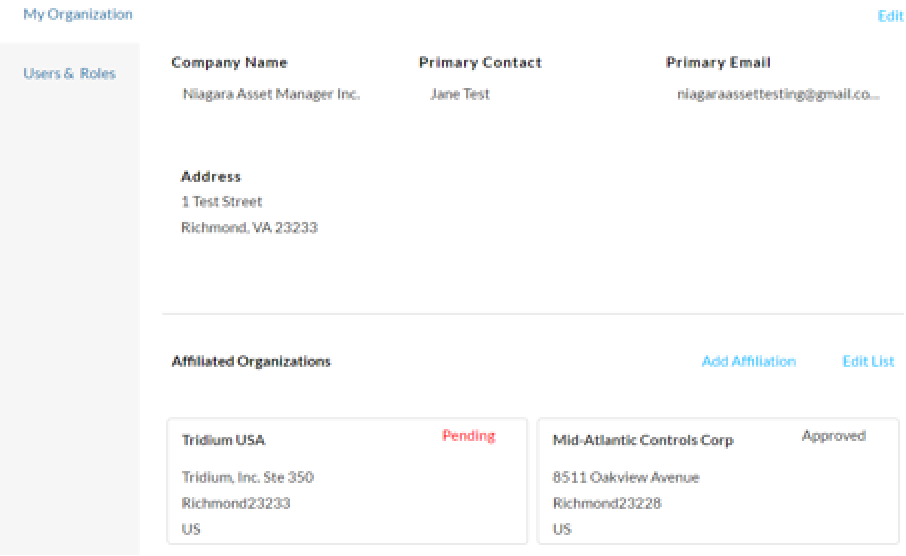
- Existing user account on Niagara Community

Step 1 Log in to Niagara Community (*www.niagara-community.com*) and click on **Get Started** (located lower right corner).

Step 2 Review the Niagara Cloud Services license agreement and click **Accept** to proceed.

Step 3 On the **Organization** view, click **My Organization**.

Step 4 Review your organization data and if necessary click **Edit** (located right side) to make changes:



Company Name
Niagara Asset Manager Inc.

Primary Contact
Jane Test

Primary Email
niagaraassettesting@gmail.co...

Address
1 Test Street
Richmond, VA 23233

Affiliated Organizations

Tridium USA Pending
Tridium, Inc. Ste 350
Richmond23233
US

Mid-Atlantic Controls Corp Approved
8511 Oakview Avenue
Richmond23228
US

Step 5 If desired, click **Add Affiliation** to search for additional applicable organizations.

Step 6 Click **Register** to complete the process.

Chapter 3 Setting up for cloud connectivity

Topics covered in this chapter

♦ Setting up device internet access
♦ Installing cloud software on the device
♦ Installing cloud components in the station
♦ Registering the device

The following procedures describe how to set up a device and station for interaction with Niagara Cloud Services. This includes configuring DNS settings on the device, installing core and cloud software on the device, copying the necessary components to the station, and registering the device in the Asset Manager.

Additionally, where the device is on an internal (closed) network an essential prerequisite of setting up for cloud connectivity is coordinating with the on-site IT department in configuring the proxy server to allow access to Niagara Cloud servers.

Setting up device internet access

Internet access is required for all stations and clients. If your device is on an internal (closed) network this is done by setting up proxy server settings, typically handled by the on-site IT department. Additionally, you must enter the proper DNS Server and DNS Host configuration for your network on the device.

Prerequisites:

- A platform connection to the remote device
- For a device behind a network firewall, appropriate DNS Host name and DNS Server IP address(es) for your network.
- If your local network uses a proxy server to provide Internet access, work with your on-site IT department to configure the proxy server to allow access to the Niagara Cloud. The Niagara station requires unauthenticated proxy access to the following domains which are part of the Niagara Cloud ecosystem:
  - *.scm.azurewebsites.net
  - *.azurewebsites.net
  - *.cloud.tridium.com
  - *.tridium.com
  - *.dsentience.net
  - *.honeywell.com
  - *.force.com
  - *.niagara-community.com
  - *.trafficmanager.net
  - *.azure-devices.net

Step 1 In the platform **TCP/IP Configuration** view, enter the appropriate values for the following properties:

- DNS Domain (ex: company.net)
- DNSv4Servers (add a field for one or more DNS Servers, enter the appropriate IP address for each)

Step 2 Click **Save**.

Upon saving your changes you are prompted to reboot the device.

CAUTION: From a cybersecurity perspective, it is crucial that your station is not exposed on the Internet. Communications via the CloudConnector component require an outbound connection *from* your station to the Internet, but it is important that your network is configured in such a way to not allow incoming connections *to* your stations from the Internet. For this reason, we strongly recommend following the best practices and steps in the *EC-Net 4 Hardening Guide* which is available on: SmartSource.

Installing cloud software on the device

This procedure describes using the **Commissioning Wizard** to install upgraded core software .dists and cloud connectivity software on the remote device.

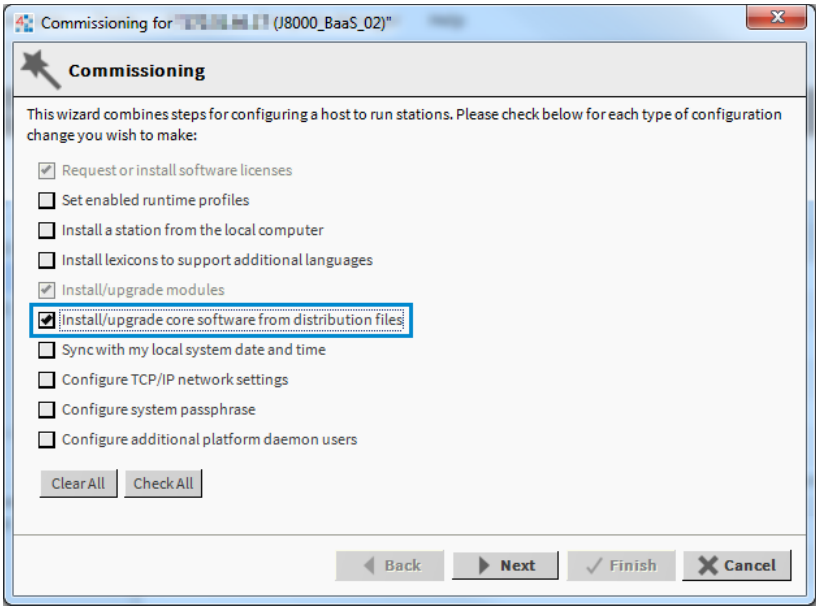
Prerequisites:

- Appropriate administrative access to the EC-Net 4 Pro PC
- A platform user account for the EC-BOS

Step 1 In EC-Net 4 Pro, open a platform connection to the remote device.

Step 2 In the Nav tree, right-click the Platform node and then click on the **Commissioning Wizard** option.

Step 3 In the **Commissioning** dialog, click **Clear All** and then (if not already selected) click the option to **Install/upgrade core software from distribution files**, as shown here:



Commissioning for [redacted] (J8000_BaaS_02)"

Commissioning

This wizard combines steps for configuring a host to run stations. Please check below for each type of configuration change you wish to make:

☑ Request or install software licenses
☐ Set enabled runtime profiles
☐ Install a station from the local computer
☐ Install lexicons to support additional languages
☑ Install/upgrade modules
☑ Install/upgrade core software from distribution files
☐ Sync with my local system date and time
☐ Configure TCP/IP network settings
☐ Configure system passphrase
☐ Configure additional platform daemon users

The wizard steps you through the process and on completion, reboots the device.

NOTE: The "Request or install software licenses" option must also be checked (if not selected by default). This is necessary if the license has been updated to include the new cloud features and the license is not yet installed on the EC-BOS. However, if the cloud-enabled license is already installed, then it is not necessary to update the license at this time. Additionally, the "Install/upgrade modules" option must also be checked (if not selected by default).

Installing cloud components in the station

This procedure describes the steps to remove the local backup service, and copy the cloud components to the station.

Prerequisites:

- Platform connection to the device which is already commissioned with cloud-related software

- The **`cloudBackup`** and **`cloudSentienceConnector`** palettes

Step 1 In a platform connection to the device, open the **Application Director** and start the station.

Step 2 Connect to the station and in the Nav tree, expand the station Services node and delete the local BackupService (which is included in the installation by default).

NOTE: Always remove the local Backup Service when installing the Cloud Backup Service. The reason for this is that station operation depends upon interacting with a single backup service. The Cloud Backup Service provides all of the behavior of the local Backup Service, including local and provisioned backups, in addition to backing up to the Niagara Cloud. Leaving the local Backup Service in place when installing the Cloud Backup Service may cause confusion for users and yield unintended results when accessing and performing backups.

Step 3 Open each of the cloud-related palettes and drag the following components to the station's Services container.

- **`CloudConnector`** (from the **`cloudSentienceConnector`** palette)
- **`CloudBackupService`** (from the **`cloudBackup`** palette)

The station is set up to connect to Niagara Cloud Services. You can proceed to register the device or if the device is already registered you can proceed to make cloud backups.

Registering the device

Registering the device is required in order to make the device known to the Niagara Cloud application, as well as successfully authenticating the device. Even if the device was previously added in the Asset Manager (via the "Add Single Device" procedure), that merely tells the asset manager tool about the existence of this device. You must still complete this Device Registration procedure, initiating it from the station/device, in order to provide the secure connection information so that the device can connect to the cloud securely. This procedure describes the steps to register a device using EC-Net 4 Pro.

Prerequisites:

- An existing user account for Niagara Community
- An existing user on the Asset Manager tool with Device Manager permissions
- Connected to a running station, already configured for cloud connectivity
- The client interface (EC-Net 4 Pro/browser) requires internet connectivity

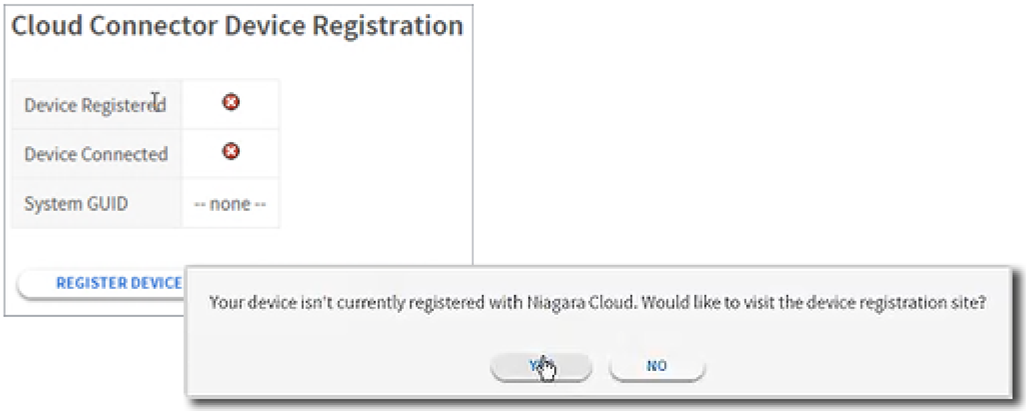
  NOTE: Even if the EC-BOS/device has internet connectivity, a client EC-Net 4 Pro/browser only connected to the private side (without internet access through the proxy) for example, will not be able to complete device registration.

Device registration may be initiated using either a browser or EC-Net 4 Pro EC-BOS station connection to Niagara Cloud via the Cloud Connector Service.

Step 1 In the Nav tree, expand the station's Services container and double-click the **`CloudConnector`** component to connect to Niagara Cloud.

This invokes the **Device Registration** view. The view shows that the device is not registered.

Step 2 A popup appears confirming that the device is not registered and prompts you to go to the Device Registration site, as shown. Click **Yes** to proceed.

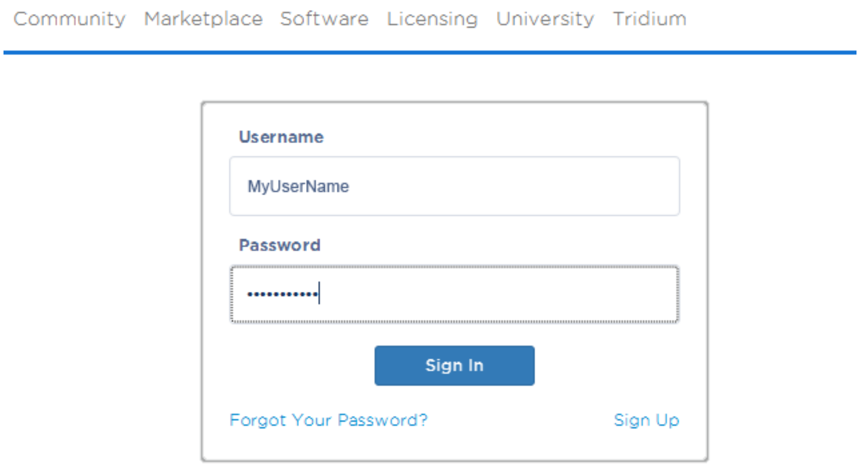


Cloud Connector Device Registration

Device Registered	☒
Device Connected	☒
System GUID	-- none --

Your device isn't currently registered with Niagara Cloud. Would like to visit the device registration site?

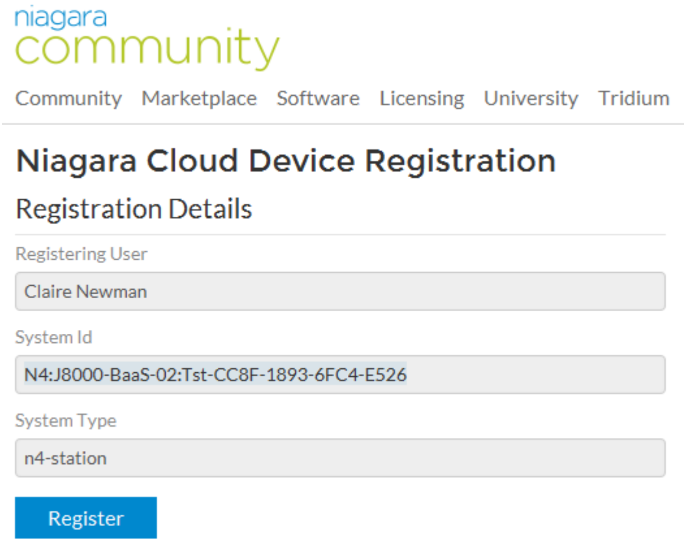
Step 3 In the **Sign In** view, enter your user credentials for the Asset Manager tool and click **Sign In**.



Username: MyUserName

Password: ••••••••••••

Step 4 The **Niagara Cloud Device Registration** view appears displaying your Registration Details (as shown), click **Register** to proceed.



Niagara Cloud Device Registration

Registration Details

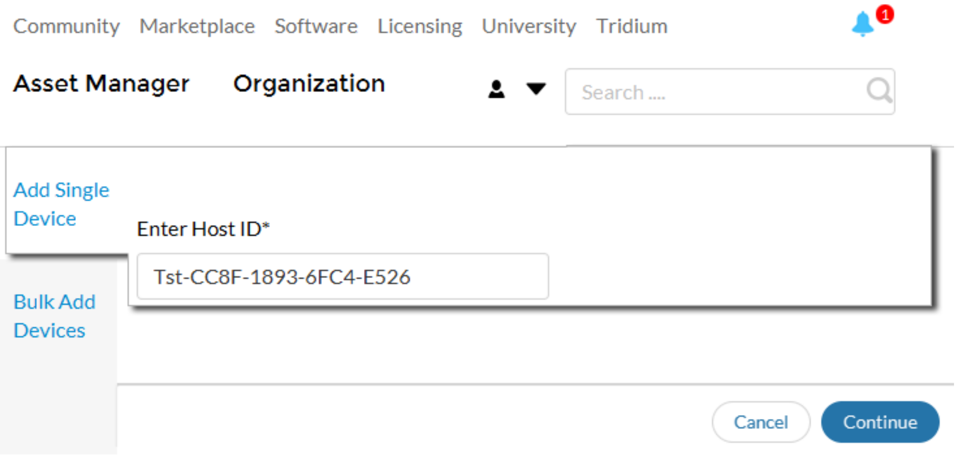
Registering User: Claire Newman

System Id: N4:J8000-BaaS-02:Tst-CC8F-1893-6FC4-E526

System Type: n4-station

Step 5 In the certificate **Identity Verification** window, click **Accept** to accept the site certificate and proceed.

Step 6 The **Add Single Device** view appears displaying the Host ID for your EC-BOS, click **Continue** to proceed.



Enter Host ID*

Tst-CC8F-1893-6FC4-E526

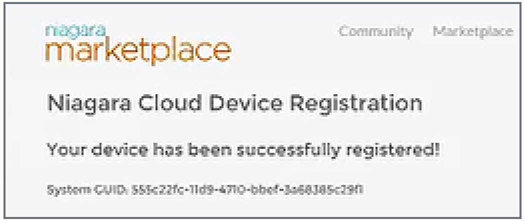
A message appears confirming that the device has been successfully added to Asset Manager.

Step 7 The **Niagara Cloud Device Registration** view reappears displaying your Registration Details, click **Register** to proceed.

NOTE: Taking longer than 15 minutes to complete the **Add Single Device** workflow causes an added security measure to prevent cross-site request forgery (CSRF) attacks to be invoked. When the application focus returns to the **Device Registration** window it will not proceed automatically. If this happens, simply click the **Register** button a second time.

Step 8 Click **Done**.

On completion, the site displays a confirmation message, as shown here.



Niagara Cloud Device Registration

Your device has been successfully registered!

System GUID: 555c22fc-11d9-4710-bbef-3a68385c29f1

The station is registered as a device which can use the Niagara Cloud application. You can proceed to make cloud backups.

Chapter 4 Using Backup as a Service

Topics covered in this chapter

♦ Making a manual cloud backup
♦ Making a cloud master backup
♦ Setting up a time triggered backup
♦ Setting up a schedule triggered backup
♦ Downloading a cloud backup
♦ Restoring a cloud backup
♦ Deleting a backup

This section describes how to use the Cloud Backup Service to make cloud backups manually, make master backups, configure time triggered interval backups and schedule triggered backups, download and restore cloud backups as well as delete cloud backups.

Refer to the following procedures.

Making a manual cloud backup

By default, the Cloud Backup Service is configured for manually triggered backups. Using either EC-Net 4 Pro or a browser connection to the remote station, you can easily initiate a manual backup on a registered device. This procedure describes the steps to create a manual cloud backup using a EC-Net 4 Pro connection to the station.

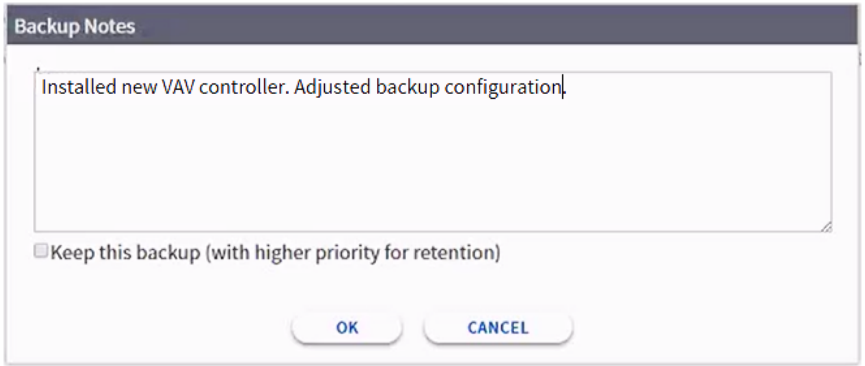
Prerequisites:

- EC-Net 4 Pro connection to the EC-BOS station
- The station is already set up for cloud connectivity and is registered in the asset manager

Step 1 In the Nav tree, expand station Services and double-click on Cloud Backup Service.

Step 2 In the **Cloud Backup Manager** view, click **Backup Now** (located at the bottom of the view).

Step 3 Optionally, in the **Backup Notes** dialog. Enter a descriptive backup note (max. limit is 1024 characters) and click **OK**.



Backup Notes

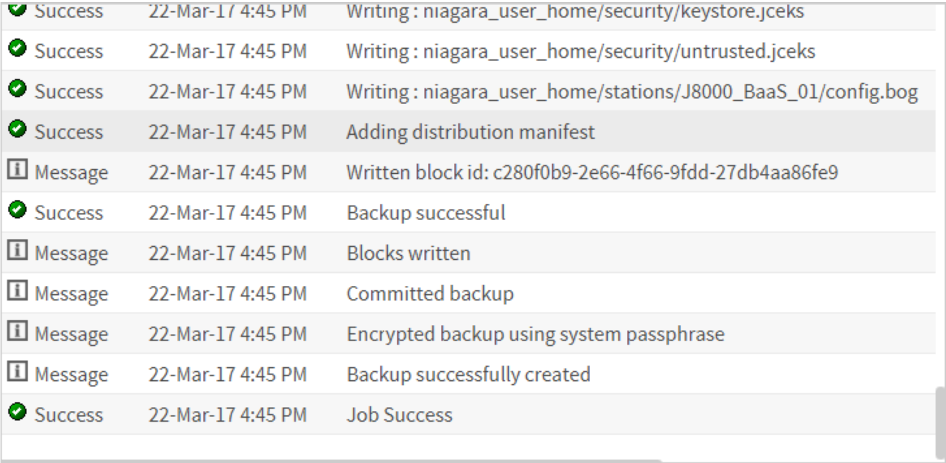
Installed new VAV controller. Adjusted backup configuration

□ Keep this backup (with higher priority for retention)

NOTE: Adding Backup Notes is not required to complete a manual backup.

This invokes a blue progress bar that displays at the top of the view:

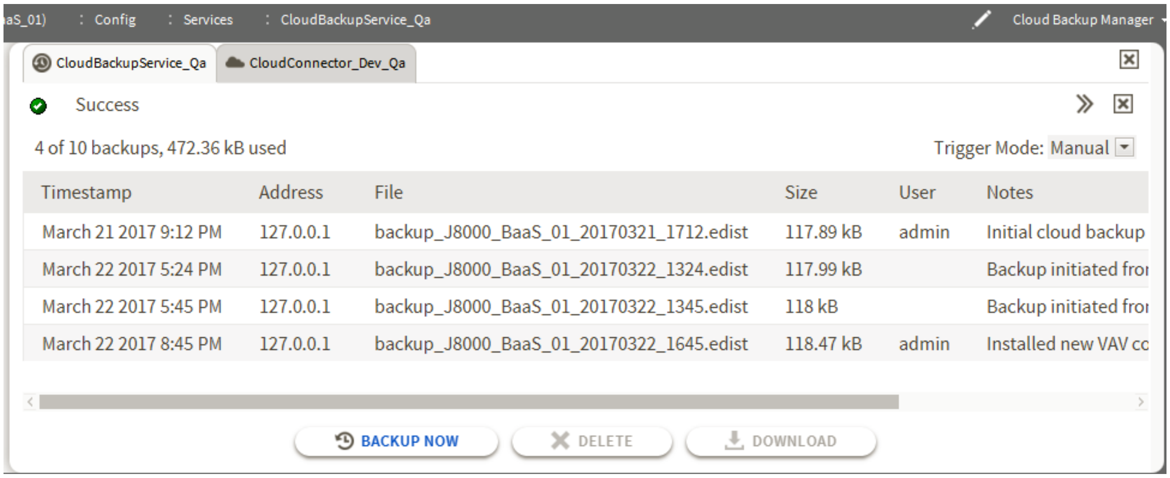
Additionally, you can click the chevron icon » (located at right) to open the backup Job bar dialog to view status messages as the backup runs. You can also double-click on items in the job log to get additional information about an entry which can be useful when diagnosing a problem.



✓ Success	22-Mar-17 4:45 PM	Writing : niagara_user_home/security/keystore.jceks
✓ Success	22-Mar-17 4:45 PM	Writing : niagara_user_home/security/untrusted.jceks
✓ Success	22-Mar-17 4:45 PM	Writing : niagara_user_home/stations/J8000_BaaS_01/config.bog
✓ Success	22-Mar-17 4:45 PM	Adding distribution manifest
ℹ Message	22-Mar-17 4:45 PM	Written block id: c280f0b9-2e66-4f66-9fdd-27db4aa86fe9
✓ Success	22-Mar-17 4:45 PM	Backup successful
ℹ Message	22-Mar-17 4:45 PM	Blocks written
ℹ Message	22-Mar-17 4:45 PM	Committed backup
ℹ Message	22-Mar-17 4:45 PM	Encrypted backup using system passphrase
ℹ Message	22-Mar-17 4:45 PM	Backup successfully created
✓ Success	22-Mar-17 4:45 PM	Job Success

Note that this backup Job bar dialog displays only a limited number of rows (2048). The complete job log is available through the Job Service. Also note that you can click **OK** in the Job log to close the window.

On backup completion, a “Success” notification replaces the progress bar and the backup details are listed in the view, as shown.



✓ Success

4 of 10 backups, 472.36 kB used

Trigger Mode: Manual

Timestamp	Address	File	Size	User	Notes
March 21 2017 9:12 PM	127.0.0.1	backup_J8000_BaaS_01_20170321_1712.edist	117.89 kB	admin	Initial cloud backup
March 22 2017 5:24 PM	127.0.0.1	backup_J8000_BaaS_01_20170322_1324.edist	117.99 kB		Backup initiated fror
March 22 2017 5:45 PM	127.0.0.1	backup_J8000_BaaS_01_20170322_1345.edist	118 kB		Backup initiated fror
March 22 2017 8:45 PM	127.0.0.1	backup_J8000_BaaS_01_20170322_1645.edist	118.47 kB	admin	Installed new VAV cc

Making a cloud master backup

There are two types of cloud backups, Regular and Master. Master backups have a higher priority for retention than regular backups. The differentiated retention policy means that if an older backup must be replaced (deleted) due to space constraints, a regular backup will be replaced before any master backup is. A master backup will be replaced only when no regular backup exists. This procedure describes steps to make a master backup.

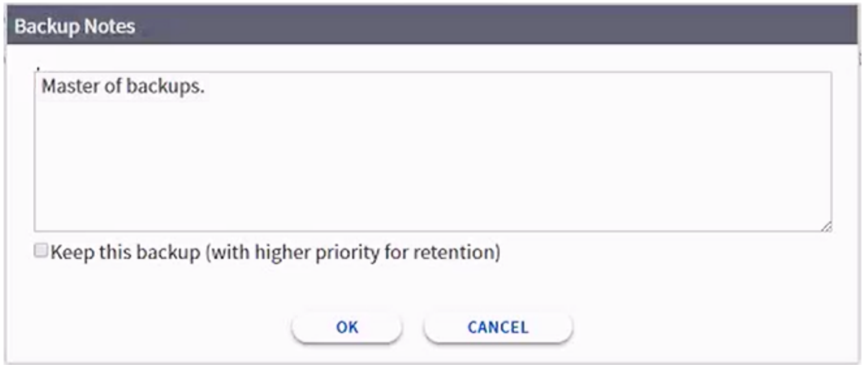
Prerequisites:

- EC-Net 4 Pro connection to the EC-BOS station
- The station is already set up for cloud connectivity and is registered in the asset manager

NOTE: Only a manually initiated backup can be set as a master backup. Also once the master designation is applied to a backup, it cannot be changed.

Step 1 In the **Cloud Backup Manager** view, click **Backup Now** (located at the bottom of the view).

Step 2 In the **Backup Notes** dialog. Enter a descriptive backup note if desired, click the checkbox to **Keep this backup (with higher priority for retention)**, and click **OK**.

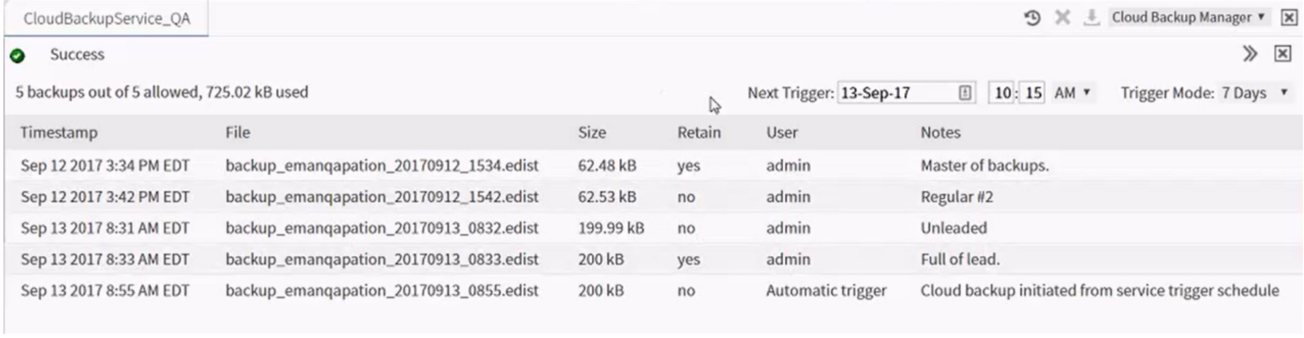


Backup Notes

Master of backups.

□ Keep this backup (with higher priority for retention)

A progress bar displays at the top of the view while the backup is being created. On completion, a “Success” notification replaces the progress bar and the backup details are listed in the view, as shown.



Success

5 backups out of 5 allowed, 725.02 kB used

Next Trigger: 13-Sep-17 10 : 15 AM Trigger Mode: 7 Days

Timestamp	File	Size	Retain	User	Notes
Sep 12 2017 3:34 PM EDT	backup_emanqapation_20170912_1534.edist	62.48 kB	yes	admin	Master of backups.
Sep 12 2017 3:42 PM EDT	backup_emanqapation_20170912_1542.edist	62.53 kB	no	admin	Regular #2
Sep 13 2017 8:31 AM EDT	backup_emanqapation_20170913_0832.edist	199.99 kB	no	admin	Unleaded
Sep 13 2017 8:33 AM EDT	backup_emanqapation_20170913_0833.edist	200 kB	yes	admin	Full of lead.
Sep 13 2017 8:55 AM EDT	backup_emanqapation_20170913_0855.edist	200 kB	no	Automatic trigger	Cloud backup initiated from service trigger schedule

Note that the “yes” value in the **Retain** column indicates a Master backup. The “no” value indicates a Regular backup.

Setting up a time triggered backup

You can automate station backups via the randomized Time Triggered interval backups to the cloud. The randomizer selects a random time for the first interval of the backup to occur. After the first backup invoked by the Trigger Mode, the subsequent backups will be triggered exactly at the set interval (7, 30 or 90) days later, at the same randomized time. Although not recommended, you can set a specific time for the Next Trigger to occur. Afterwards, the cloud backups will occur according to the set interval.

Prerequisites:

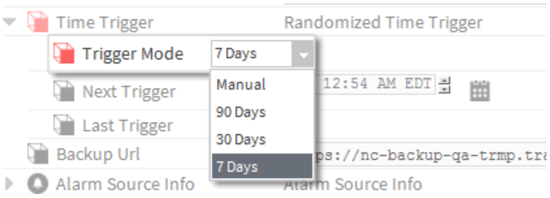
- User role(s) already assigned to you in the asset manager
- Connected to a running station, already configured for cloud connectivity
- The device is already registered in the asset manager

NOTE: You can use either EC-Net 4 Pro or a browser connection to the remote station to configure the randomized time triggered interval backups. Also, configuring the time trigger can be accomplished either in the **Cloud Backup Manager** view or in the **Property Sheet** view for the Cloud Backup Service.

This procedure describes how to set up a time triggered backup using a EC-Net 4 Pro connection to the remote station.

Step 1 In the Nav tree, expand station Services and double-click on the Cloud Backup Service to invoke the **Cloud Backup Manager** view.

Step 2 Click on the `Trigger Mode` dropdown list and select one of the following preset periods: 90 Days, 30 Days, or 7 Days.



Time Trigger Randomized Time Trigger

Trigger Mode 7 Days

Next Trigger 12:54 AM EDT

Last Trigger

Backup Url ps://nc-backup-qa-trmp.tra

Alarm Source Info Alarm Source Info

For example, if you choose 7 Days, the station will initiate a cloud backup every 7 days.

Step 3 In the **`Next Trigger`** field, enter the desired date and time for the next backup to occur, and click **Save**.

NOTE: Entering a specific time for the Next Trigger somewhat negates the purpose of the randomizer, which is to balance demand.

Automated cloud backups will occur at the set interval starting on the specified date and time. Note that automated backups have a lower priority for retention, preventing the inadvertent replacement of manually created master backups.

Setting up a schedule triggered backup

If you require a more specific time trigger than the standard 90-, 30-, and 7-day options, you can configure the Cloud Backup Service to initiate a backup via trigger schedule. This procedure describes using EC-Net 4 Pro to set up a trigger schedule that causes the Cloud Backup Service to run a backup at midnight each night.

Prerequisites:

- User role(s) already assigned to you in asset manager
- Connected to a running station, already configured for cloud connectivity
- The device is already registered in the asset manager
- Schedule palette

Step 1 Open a **Property Sheet** view on the Cloud Backup Service.

Step 2 From the schedule palette, drag a **`Trigger Schedule`** to the top of the property sheet.

Step 3 In the **Name** dialog, enter a name for this event trigger, for example: Midnight_Backup.

Step 4 In the property sheet, click on the new trigger property to open the **Trigger Scheduler** view.

Step 5 Click to **Add** a new event trigger, configure the event name, date, and time as needed and click **Save**. For this example, the new MidnightBackupTrigger is set to occur every day at 12:00 AM.

Step 6 In the Nav tree, expand the Cloud Backup Service, and link the new event trigger (ex: Midnight_Backup) to the Cloud Backup Service. To do this:

a. Right-click on the new event trigger (ex: Midnight_Backup) and click **Link Mark**.

b. Right click on the Cloud Backup Service and click **Link From (ex: Midnight_Backup)** .

c. In the **Link** dialog, click on the source slot Trigger and the target slot Backup, and click **OK**.

The added event trigger will trigger the service to run a cloud backup each night at midnight. Note that although useful as an example, this degree of frequency may not be preferable in an actual production environment.

Downloading a cloud backup

Prerequisites:

- EC-Net 4 user role that permits access to the Cloud Backup Service's category
- Device is already registered in the asset manager
- Connected to a running station, already configured for cloud connectivity

- Existing cloud backups

Step 1 In the **Cloud Backup Manager** view, select the desired backup and click **Download**.

Step 2 In the **Choose Backups Directory** dialog, browse to select a directory on the local PC to store the downloaded backup, as shown.

Step 3 In the **Download** dialog, select the desired download option:

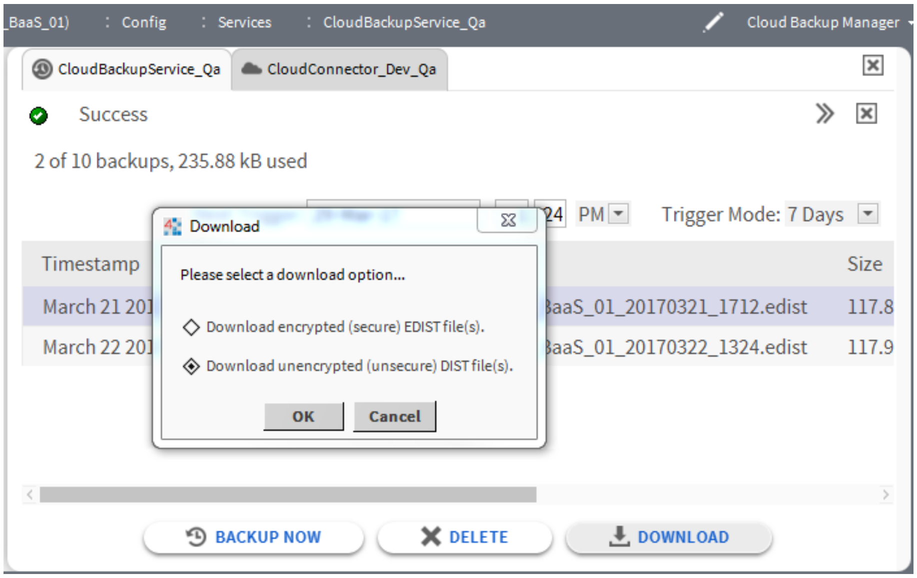
- Download encrypted (secure) EDIST file
- Download decrypted (non secure) DIST file

NOTE: In order to restore and decrypt a downloaded encrypted EDIST backup file you are prompted to provide the source station's system passphrase. That would be the passphrase in use at the time the backup was created, which may not be the current passphrase. The same is true when downloading an unencrypted DIST file (download and decrypt “on the fly”) you are prompted to provide the source station's system passphrase in order for the download to complete.

On completion a **Success** dialog appears letting you know the file(s) were successfully downloaded.

Restoring a cloud backup

As shown here, a cloud backup file can be downloaded in two different forms. The downloaded backup is either an encrypted (EDIST) file which must be decrypted (using EC-Net 4 Pro) prior to installing it, or a decrypted (DIST) file which has been decrypted during the download process.



Success

2 of 10 backups, 235.88 kB used

24 PM Trigger Mode: 7 Days

Download

Please select a download option...

◇ Download encrypted (secure) EDIST file(s).

◈ Download unencrypted (unsecure) DIST file(s).

Timestamp		Size
March 21 201	3aaS_01_20170321_1712.edist	117.8
March 22 201	3aaS_01_20170322_1324.edist	117.9

Restoring an encrypted backup

This procedure describes the steps to restore a downloaded encrypted cloud backup (EDIST) file on a remote controller using EC-Net 4 Pro.

Prerequisites:

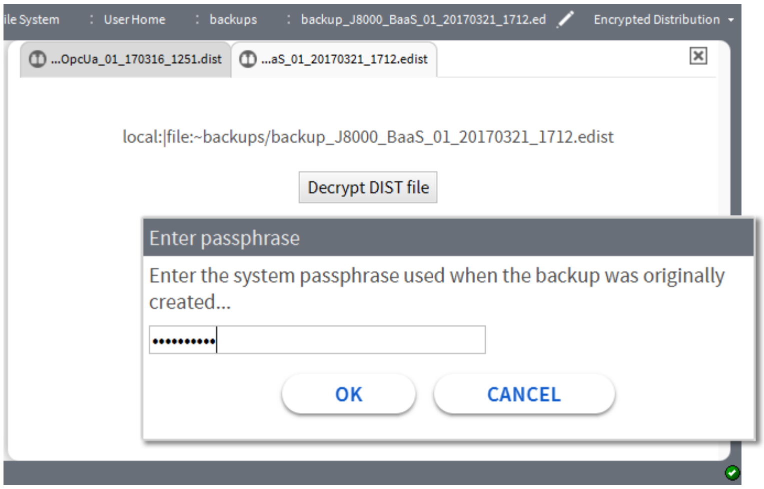
- Connected to a running station, already configured for cloud connectivity
- Appropriate administrative access to the EC-Net 4 Pro PC
- A platform user account for the EC-BOS
- One or more encrypted cloud backups already downloaded
- The source station's system passphrase.

Step 1 In the Nav tree, navigate to your stored cloud backups.

Step 2 Double-click on an encrypted (*.edist) backup file to invoke the **Encrypted Distribution** view, and click **Decrypt DIST file**.

Step 3 In the **Enter Passphrase** dialog, enter the source station's system passphrase and click **OK**.

NOTE: You must enter the system passphrase that was in use at the time the backup was created, which may not be the current passphrase.



ile System
User Home
backups
backup_J8000_BaaS_01_20170321_1712.ed
Encrypted Distribution
...OpcUa_01_170316_1251.dist
...aS_01_20170321_1712.edist

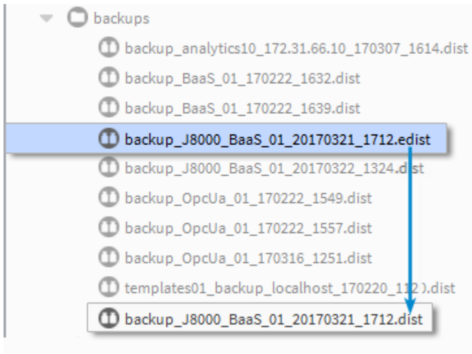
local:|file:~backups/backup_J8000_BaaS_01_20170321_1712.edist

Enter passphrase

Enter the system passphrase used when the backup was originally created...

••••••••••

During decryption the EDIST file is converted to an unencrypted DIST file of the same name, and is stored at the same location, as shown.



backups
- backup_analytics10_172.31.66.10_170307_1614.dist
- backup_BaaS_01_170222_1632.dist
- backup_BaaS_01_170222_1639.dist
- backup_J8000_BaaS_01_20170321_1712.edist
- backup_J8000_BaaS_01_20170322_1324.dist
- backup_OpcUa_01_170222_1549.dist
- backup_OpcUa_01_170222_1557.dist
- backup_OpcUa_01_170316_1251.dist
- templates01_backup_localhost_170220_1120.dist
- backup_J8000_BaaS_01_20170321_1712.dist

Step 4 A confirmation dialog appears, notifying you of the successful decryption and prompts whether you want go to the DIST file. Click **Yes** to continue.

The dist file appears in the **Distribution View**, listing the file details as well as software dependencies and exclusions.

NOTE: If you click **No** in the confirmation dialog, the view remains focused on the EDIST file (selected in Step 2) in the **Encrypted Distribution** view.

You can proceed to install the newly decrypted DIST file using the platform **Distribution File Installer**. Refer to the procedure, Restoring an unencrypted backup, page 26.

Restoring an unencrypted backup

This procedure describes the steps to install an unencrypted cloud backup (DIST) file on a remote controller using EC-Net 4 Pro.

Prerequisites:

- Connected to a properly licensed platform commissioned with the same version of EC-Net as that of the downloaded backup
- One or more decrypted cloud backups already downloaded and stored in your User Home Backups folder.

NOTE: If your controller has suffered a hardware failure, you can download the cloud backup via the asset manager tool in the Niagara Community portal, and save it to the EC-Net 4 Pro PC that is commissioning the replacement EC-BOS.

Step 1 Open a platform connection to the controller.

Step 2 Double-click on the **Distribution File Installer** option.

Step 3 In the **Distribution File Installer** view, click **Backups**.

Step 4 Select the desired unencrypted DIST file and click **Install**.

Deleting a backup

You can easily delete one or more existing backups listed in the **Cloud Backup Manager** view.

Prerequisites:

- Device is already registered inasset manager
- Connected to a running station, already configured for cloud connectivity
- Existing cloud backups

Step 1 In the Nav tree, click to expand the station **Config→Services** nodes and double-click on the `CloudBackupService`.

Step 2 In the **Cloud Backup Manager** view, select the backup to be removed and click **Delete** (located at the bottom of the view).

Step 3 In the confirmation dialog, click **Yes** to proceed.

On completion, the view refreshes with the deleted backups removed.

Chapter 5 BaaS reference

Topics covered in this chapter

♦ Frequently asked questions
♦ Best practices for cloud backups
♦ Components
♦ Plugins
♦ Troubleshooting

This section provides information on frequently asked questions, best practices for cloud backups, components and plugins, as well as troubleshooting tips.

Refer to the following topics.

Frequently asked questions

- **What are the version compatibilities of BaaS?**

  Backup as a Service is compatible with EC-Net 4 v4.3 and later.

- **Can I have both the local Backup Service and the Cloud Backup Service in a station?**

  Always remove the local Backup Service when installing the Cloud Backup Service. The reason for this is that station operation depends upon interacting with a single backup service. The Cloud Backup Service provides all of the behavior of the local Backup Service, including local and provisioned backups, in addition to backing up to the Niagara Cloud. Leaving the local Backup Service in place when installing the Cloud Backup Service may cause confusion for users and yield unintended results when accessing and performing backups.

- **Where is my data actually stored? Are the data centers in the U.S.?**

  Your cloud backups are stored in the Microsoft Azure cloud platform, geo-located in the nearest Microsoft data center (either US east coast or US west coast). The data is encrypted at all times and only your authenticated users can see the data.

- **How secure is BaaS? Is my data safe?**

  The data is encrypted end-to-end, which means in transit and at rest. This makes it impossible for anyone other than your authenticated users to view your data. The EC-BOS is connected to the Internet but makes only outgoing connections. The controller will not accept incoming messages from the Internet.

- **What cloud backup actions can I perform while logged in to the Asset Manager tool in Niagara Community?**

  In the Asset Manager tool, while viewing the **Asset Details** for a particular Host Id, you can click the link to **View All Backups** for that device. While viewing the list of backups you can download encrypted backup EDIST files, or view the full text of a backup note, as well as delete selected backups. Note that you cannot initiate a backup from the Asset Manager.

- **How can I automate cloud backups?**

  Set up time triggered cloud backups. Using the Trigger Mode dropdown list in the **Cloud Backup Manager** view you can schedule backups to occur periodically.

- **What if my EC-BOS doesn't have connectivity?**

  The unit must have internet connectivity in order to connect to Niagara Cloud.

- **What are the space requirements for the cloud modules?**

  The cloud-related modules listed here require an additional 150k disk space on the controller:

  - cloudBackup (-rt, -ux, -wb)
  - cloudConnector (-rt)
  - cloudSentienceConnector (-rt -ux)

- **What is the backup storage capacity?**

  The current storage limit for cloud backups is 1GB for EC-BOS controllers, and 5GB for Supervisors, regardless of the number of backups.

  Using the FIFO (First In First Out) file rotation method, when the storage limit is reached the first backup made is the first backup to be deleted. This automatically makes space for your most recent backups.

Best practices for cloud backups

Following is a list of recommended best practices for cloud backup usage.

- For Systems Integrators, it can be difficult to keep track of the last known good backup for a particular customer. A best practice is to always use the Cloud Backup Service to safely store the latest backups to the cloud. This practice makes the same set of backups, including the last known good backup, available to the SIs.
- For an established fully configured EC-BOS station, a 30 or 90 day backup is sufficient to retain configuration data.
- Always remove the local Backup Service when installing the Cloud Backup Service. The reason for this is that station operation depends upon interacting with a single backup service. The Cloud Backup Service provides all of the behavior of the local Backup Service, including local and provisioned backups, in addition to backing up to the Niagara Cloud. Leaving the local Backup Service in place when installing the Cloud Backup Service may cause confusion for users and yield unintended results when accessing and performing backups.
- Using the randomized Trigger Mode is recommended. The randomizer selects a random time for the first interval of the backup to occur. After the first backup invoked by the Trigger Mode, the subsequent backups will be triggered exactly at the set interval (7, 30 or 90) days later, at the same randomized time.

Components

cloudConnector-CloudConnector_Sentience

The CloudConnector component enables a NiagaraStation running in a localhost connection or on a EC-BOS embedded controller to securely connect to a specific cloud platform.

For example, the CloudConnector_Sentience nCloudDriver component provides device registration and secure connection to the Honeywell Sentience Cloud Platform for use with Niagara Cloud Honeywell Sentience Driver and other Cloud services.

NOTE: CloudConnector is a licensed feature.

In addition to enabling cloud connectivity, the CloudConnector handles device authentication to Niagara Cloud; maintains a message queue that can be used to send messages to and from the Cloud; raises an alarm if a connectivity problem occurs; and provides a bearer token to other services to identify those as coming from a properly registered device.

The CloudConnector Service generates alerts for the fault state, i.e. `Cannot connect to Cloud`. Alerts are routed to the alarm class specified in the service's **`Alarm Source Info`** property.

Device Registration is the default view which enables a user to register a device.

This component is found in the **`cloudSentienceConnector`** palette.

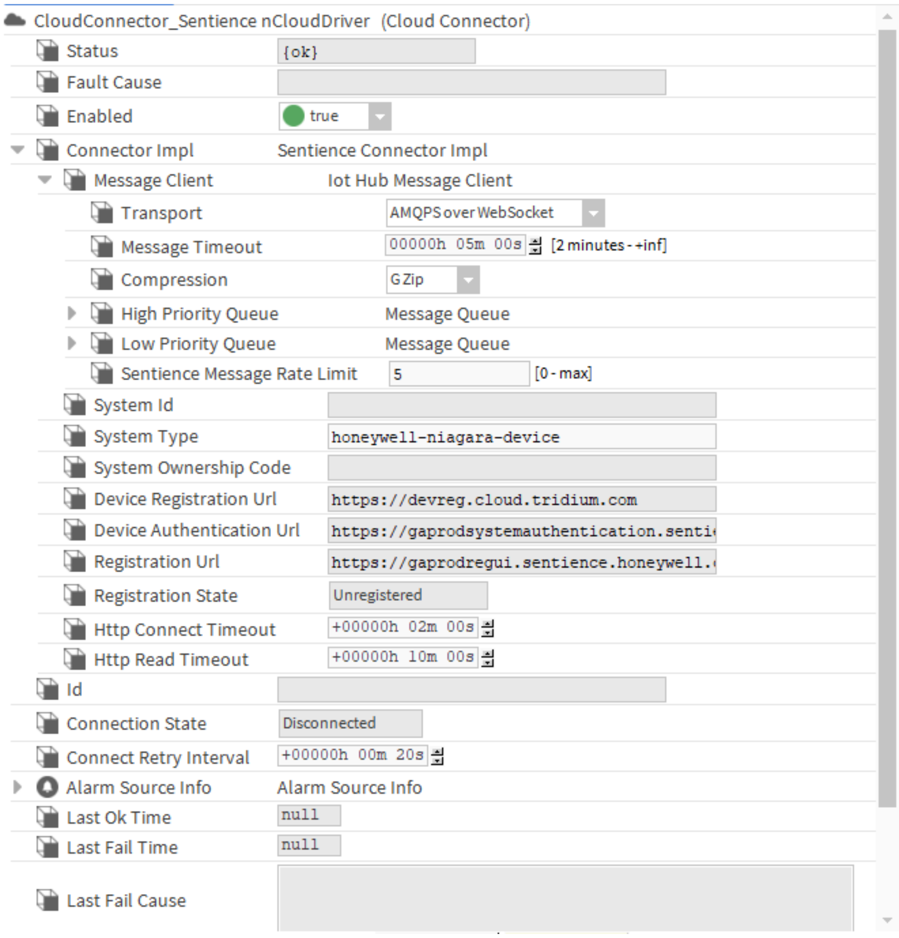
NOTE: In the Niagara Cloud Honeywell Sentience Driver release 2018_4 and later, the connectors in the **`cloudSentienceConnector`** palette are renamed for clarity. The intended use for each one is as follows:

- Use “CloudConnector_Sentience nCloudDriver” for Niagara Cloud Honeywell Sentience Driver and Cloud-BackupService (EC-BOS-8 and above).
- Use “CloudConnector_Sentience cloudBackup Only” for CloudBackupService when nCloudDriver is not supported (EC-BOS-7AX and older).
- Use ”Upgrade From cloudBackup Only to nCloudDriver” only if you initially added a connector that was for cloud backups only, or if you had an older connector that pre-dates the release of Niagara Cloud Honeywell Sentience Driver.

  Place “Upgrade From cloudBackup Only to nCloudDriver” under CloudConnector/Connector Impl and select the action **Switch To Iot Hub Message Client**. A EC-BOS-8 or above, as well as the CloudIotHubDep-rt.jar module are required for this upgrade.

For legacy EC-BOS platforms (EC-BOS-3AX, EC-BOS-6AX, and EC-BOS-7AX) and for EC-BOS-8 platforms that are only used for cloud backups, only use the CloudConnector_Sentience cloudBackup Only component. Note that this component, does not support the Niagara Cloud Honeywell Sentience Driver, so this driver should not be used with legacy EC-BOS platforms or with EC-BOS-8 platforms that are only used for cloud backups.

Figure 2 CloudConnector_Sentience nCloudDriver Property Sheet



CloudConnector_Sentience nCloudDriver (Cloud Connector)

Status	{ok}
Fault Cause	
Enabled	true
Connector Impl	Sentience Connector Impl
Message Client	Iot Hub Message Client
Transport	AMQPS over WebSocket
Message Timeout	00000h 05m 00s [2 minutes - +inf]
Compression	GZip
High Priority Queue	Message Queue
Low Priority Queue	Message Queue
Sentience Message Rate Limit	5 [0 - max]
System Id	
System Type	honeywell-niagara-device
System Ownership Code	
Device Registration Url	https://devreg.cloud.tridium.com
Device Authentication Url	https://gaprodsystemauthentication.senti
Registration Url	https://gaprodregui.sentience.honeywell.
Registration State	Unregistered
Http Connect Timeout	+00000h 02m 00s
Http Read Timeout	+00000h 10m 00s
Id	
Connection State	Disconnected
Connect Retry Interval	+00000h 00m 20s
Alarm Source Info	Alarm Source Info
Last Ok Time	null
Last Fail Time	null
Last Fail Cause	

Properties

Name	Value	Description
Status	read-only	Indicates the condition of the connector at the last check. • `{ok}` indicates that the CloudConnector component is licensed, registered with Sentience and Niagara Cloud, and successfully connected. • `{down}` indicates that the CloudConnector is not connected to the Niagara Cloud, perhaps it is not registered, or possibly loss of network connection. • `{disabled}` indicates that the Enable property is set to `false`. • `{fault}` indicates another problem. Check the Fault Cause property for more information.
Fault Cause	read-only	Indicates the reason why the CloudConnector component is in fault. This field is empty unless a fault exists. Check the Fault Cause property for more information.
Enabled	`true` or `false`	Activates (`true`) and deactivates (`false`) use of the network, device, point and component.
Connector Impl	additional properties	A frozen slot on the CloudConnector component, this contains read only fields that show registration and connection URLs which determine how the device will be registered and connected.See the following section on SentienceConnectorImpl properties.
Id	text string	This is a globally unique identifier for each host, supplied by the Identity Provider with which the connector is registered. For the Sentience cloud platform, this is a “System GUID” that uniquely identifies the station within the Niagara Cloud.
Connection State	`Disconnected`, `Connected`, `Pending Connect`	Indicates whether or not the CloudConnector is currently connected to the specified cloud platform.
Connect Retry Interval	00000h 00m 20s (default)	Amount of time between attempts to establish a connection upon a failure to connect.
Alarm Source Info	additional properties	Contains a set of properties for configuring and routing alarms generated relating to CloudConnector connection problems.
Last OK Time	`date time`	Displays the last date and time the CloudConnector health was OK.
Last Fail Time	`date time`	Displays the last date and time the CloudConnector health failed.
Last Fail Cause	text string	Displays the reason for the last failure of the CloudConnector health.

SentienceConnectorImpl properties

All of these properties are specific to SentienceConnectorImpl. Another ConnectorImpl, such as "AWSConnectorImpl", or "BluemixConnectorImpl", would not have these same properties.

Name	Value	Description
Message Client	additional properties	This slot describes properties used to control messaging to the cloud platform. For legacy EC-BOSs, this client is not used, and will be a NullMessageClient. For EC-BOS-8 and Supervisor platforms configured for Niagara Cloud Honeywell Sentience Driver, this will be an IotHubMessageClient, which can be configured to optimize messaging to the IotHub. Note that for EC-BOS-8 and Supervisor platforms, installing the cloudIotHubDep-rt module and the CloudConnector_Sentience nCloudDriver connector ensures that the IotHubMessageClient is available.
System Id		Contains a logical identifier for the station outside of the provisioning lifecycle, and is used in registering the system with the cloud platform's identity provider.
System Type		Specifies identity for the station in the cloud, outside of the provisioning lifecycle. This property is required to be configured before registration. The System Type is used to group systems of similar origin/brand for data segregation purposes. **NOTE:** In the 2018.2 pre-release (and later), the System Type property value is determined by the installed software image. **IMPORTANT:** It is very important that you register with the correct system type. If using the “built-in” cloudConnector palette, by default the System Type property is blank. Although it is possible to manually enter the system type, a best practice is to use the external palette provided in the software image download. This software image contains one palette with the System Type property already correctly configured for your brand.
System Ownership Code	text string	A unique code used to prove physical ownership and/or possession of the device in question.
Device Registration Url		Endpoint for the Niagara Cloud web service that will register this device's identity with the cloud identity provider.
Device Authentication Url		Endpoint for authenticating the device; i.e., establishing that this device is the device whose identity was previously registered with the identity provider.
Registration Url		Endpoint of the cloud platform identity provider for device registration.
Registration State	Unregistered, Registered, Needs Provisioning	Current state of device's registration with the identity provider.
Http Connect Timeout	00000h 02m 00s (default)	**NOTE:** This property is used in configuring the CloudConnector for the Niagara Cloud Honeywell Sentience Driver, not for Backup as a Service.
Http Read Timeout	00000h 10m 00s (default)	**NOTE:** This property is used in configuring the CloudConnector for the Niagara Cloud Honeywell Sentience Driver, not for Backup as a Service.

Actions

- **Switch To Iot Hub Message Client** — Used in conjunction with the CloudConnector named ”Upgrade From cloudBackup Only to nCloudDriver”. Use this action only if you initially added a connector that was for cloud backups only, or if you had an older connector that pre-dates the release of Niagara Cloud Honeywell Sentience Driver

IotHubMessageClient properties

These properties pertain only to the IotHubMessageClient. The NullMessageClient has no properties.

Name	Value	Description
Transport	AMQPSoverWebSocket (default), AMQPS	The Transport mechanism is used for sending messages to the IotHub. The AMQPSoverWebSocket (AMQPS/WS) option connects to Sentience using the HTTPS web port, typically 443. The AMQPS transport option connects to Sentience on port 5671. **NOTE:** You will need to configure firewalls to allow outbound connections from NiagaraStations to the hosts specified in the prerequisites for the procedure, “Setting up device internet access”, and for the port indicated by the selected Transport value (either AMQPSoverWebSocket or AMQPS).
Message Timeout	00000h 05m 00s (default)	Specifies how long to wait for a response for a message sent to the cloud platform. **CAUTION:** The Message Timeout value should remain at the default value. Adjust this value only upon recommendation by your Support channel.
Compression	GZip (default)	When configured, this is used to compress messages.
High Priority Queue	additional properties	See the following section, High/Low Priority Queues.
Low Priority Queue	additional properties	See the following section, “High/Low Priority Queues”.
Sentience Message Rate Limit	5 (default), 0 (no limit)	Maximum number of messages/second from station to Sentience. Default is recommended for Sentience starter environment instance. **NOTE:** This property is used in configuring the CloudConnector for the Niagara Cloud Honeywell Sentience Driver, not for Backup as a Service.

High/Low Priority Queues

Data is sent to the cloud by taking messages from the priority queues in a round robin fashion, according to the Weight property value for each queue. For example if the High Priority Queue has a weight of 2 and the Low Priority Queue has a weight of 1 then assuming both queues have data to send the IotHubMessageClient will send the two high priority messages first followed by the 1 low priority message.

Name	Value	Description
Queue Size	1048576 (default)	The amount of data that can be placed in the queue before it will stop accepting new messages.
Weight	1 (default)	The weight property sets this queue’s relative weight for message selection. A higher weight value will cause the queue to consume a larger share of the available bandwidth.

Actions

When you right-click on the service you can invoke the following action(s):

- **Reconnect** — reconnects to Device Registration site.

cloudIotHubDep-MessageClientUpgrader

Once installed, this component makes a slight change to the installed CloudConnector in order to use the modules for the Niagara Cloud Honeywell Sentience Driver. For details, see the procedure, “Upgrading the CloudConnector to use Niagara Cloud Honeywell Sentience Driver”.

This component is available in the **`cloudSentienceConnector`** palette.

Actions

- **Switch To Iot Hub Message Client** — replaces the ConnectorImpl’s MessageClient with an Iot Hub Message Client

Upgrading the Cloud Connector to use Niagara Cloud Honeywell Sentience Driver

This procedure is only necessary if your EC-Net 4 v4.3 installation included the cloudConnector/cloudSentienceConnector modules for Backup as a Service, and you have subsequently upgraded to EC-Net 4 v4.4.

Prerequisites:

- The cloudSentienceConnector palette is required.

NOTE: If either of the following is true, then you do NOT need to perform this procedure:

- If you installed the cloudConnector/cloudSentienceConnector modules in EC-Net 4 v4.4 or greater.
- If you are using a “legacy” EC-BOS (i.e., EC-BOS-3^{AX}, EC-BOS-6^{AX}, or EC-BOS-7^{AX}; basically anything other than a EC-BOS-8 or Supervisor), then you cannot use the Niagara Cloud Honeywell Sentience Driver, so this procedure is not necessary. Also, if you are not configuring the EC-BOS-8 or Supervisor for Niagara Cloud Honeywell Sentience Driver then it is not necessary to perform this procedure.

Step 1 In the **Open Palette** window, click **Browse** to locate and open the cloudSentienceConnector palette.

Step 2 Drag the MessageClientUpgrader onto the **`ConnectorImpl`** child of the installed CloudConnector service.

Step 3 Right-click on the MessageClientUpgrader, and select **Actions→Switch To Iot Hub Message Client**

The CloudConnector is upgraded. Typically, this is done only once and afterwards you can delete the MessageClientUpgrader component.

cloudBackup_CloudBackupService

This component provides the functionality for a registered device to initiate cloud backups. **Cloud Backup Manager** is the default view for this component. The Cloud Backup Service component is found in the **`cloudBackup`** palette.

The Cloud Backup Service is licensed for EC-BOS and Supervisor platforms capable of running EC-Net 4 v4.3 or greater.

Via the service, you can manage your cloud backups as follows:

- view existing backup details
- download backups (encrypted and decrypted)
- manually initiate backups and if desired, flag them for data retention
- configure randomized time triggered backups
- delete backups

The Cloud Backup Service generates alerts for the fault state, i.e. `Cloud backup failed`. Alerts are routed to the alarm class specified in the service’s **`Alarm Source Info`** property.

Cloud Backup Service properties

Name	Value	Description
Status	read-only	Indicates the condition of the network, device or component at the last check. `{ok}` indicates that the component is licensed and polling successfully. `{down}` indicates that the last check was unsuccessful, perhaps because of an incorrect property, or possibly loss of network connection. `{disabled}` indicates that the **Enable** property is set to `false`. `{fault}` indicates another problem. Refer to **Fault Cause** for more information.
Fault Cause	read-only	Indicates the reason why a system object (network, device, component, extension, etc.) is not working properly (in fault). This property is empty unless a fault exists.
Enabled	`true` or `false`	Activates (`true`) and deactivates (`false`) use of the network, device, point and component.
Exclude Files	*.hdb;*.adb;*.lock;*backup*;console.*;config.bog.b*;config_backup*	Specifies the types of files to omit from backups.
Exclude Directories	file:^^alarm; file:^^history	Specifies the directories to omit from backups.
Offline Exclude Files	*.hdb;*.adb;*.lock;*backup*;console.*;config.bog.b*;config_backup*	Specifies the types of files to omit from backups that are created when performing an offline backup, i.e., the station is not running on the controller.
Offline Exclude Directories	*.lock;*backup*;console.*;config.bog.b*;config_backup*	Specifies the directories to omit from backups that are created when performing an offline backup, i.e., the station is not running on the controller.
Trigger Mode	7–days (default), 30–days, 90-days, Manual	Specifies whether to initiate backups using one of the randomized time trigger intervals or to initiate backups manually.
Next Trigger	date, time, AM/PM, time zone	Specifies the next scheduled trigger firing time.
Last Trigger		Displays the timestamp of the last firing of the trigger firing time.
Backup URL		Specifies the URL used to connect to the BaaS application in Niagara Cloud Services.

Name	Value	Description
Alarm Source Info	additional properties	Contains a set of properties for configuring and routing alarms when this component is the alarm source.
Block Size	4MB (default)	Defines the block size for backup files being written to the cloud. A cloud backup is split into and streamed to the cloud in blocks. For example, a 360MB backup file will comprise 90 4MB blocks. There is no limit on the number of blocks for a backup file (as many as it takes)

NOTE: It is possible to remove the default exclusions of history and alarm databases, should you wish to include them in your backups. This would require modifying the default configuration on the Cloud Backup Service, removing both of the entries listed in the `excludeDirectories` property, as well as removing the entries (*.hdb and *.adb) listed in the `excludeFiles` property.

Actions

When you right-click on the service you can invoke the following action(s):

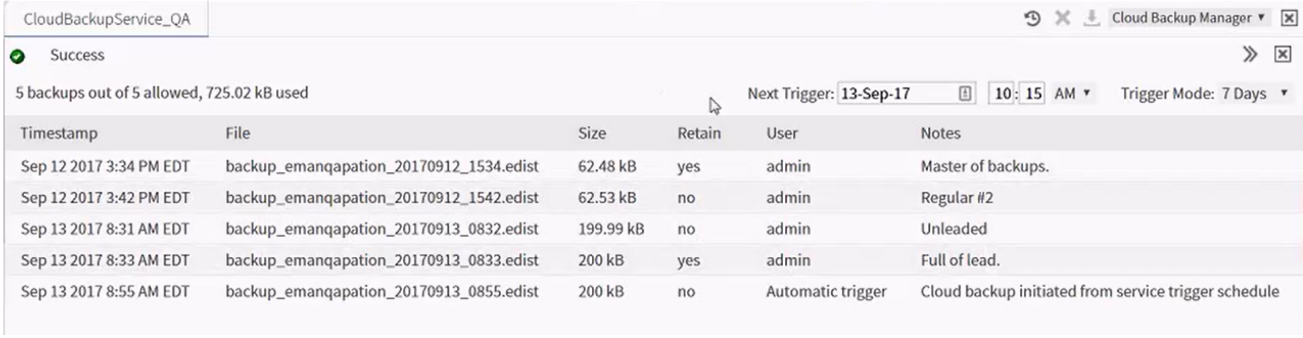
- Backup — initiates a backup

Plugins

Cloud Backup Manager view

The **Cloud Backup Manager** is the default view for the Cloud Backup Service. The view lists the cloud backups for the station and allows you to perform backup-related functions.

Figure 3 Cloud Backup Manager view



Success

5 backups out of 5 allowed, 725.02 kB used

Next Trigger: 13-Sep-17 10: 15 AM ▾ Trigger Mode: 7 Days ▾

Timestamp	File	Size	Retain	User	Notes
Sep 12 2017 3:34 PM EDT	backup_emanqapation_20170912_1534.edist	62.48 kB	yes	admin	Master of backups.
Sep 12 2017 3:42 PM EDT	backup_emanqapation_20170912_1542.edist	62.53 kB	no	admin	Regular #2
Sep 13 2017 8:31 AM EDT	backup_emanqapation_20170913_0832.edist	199.99 kB	no	admin	Unleaded
Sep 13 2017 8:33 AM EDT	backup_emanqapation_20170913_0833.edist	200 kB	yes	admin	Full of lead.
Sep 13 2017 8:55 AM EDT	backup_emanqapation_20170913_0855.edist	200 kB	no	Automatic trigger	Cloud backup initiated from service trigger schedule

The view enables you to do the following:

- Initiate manual backups
- Configure automated time triggered backups (7-, 30-, or 90-day)
- Download backup files (encrypted EDIST or unencrypted DIST)
- View the date when a backup was made
- View the size of a backup
- View which user created the backup (providing the backup was created manually)
- View backup notes
- View retention priority on backups (the “yes” value in the **Retain** column indicates a master backup which has a higher retention priority. The “no” value indicates a regular backup.)
- Delete a backup

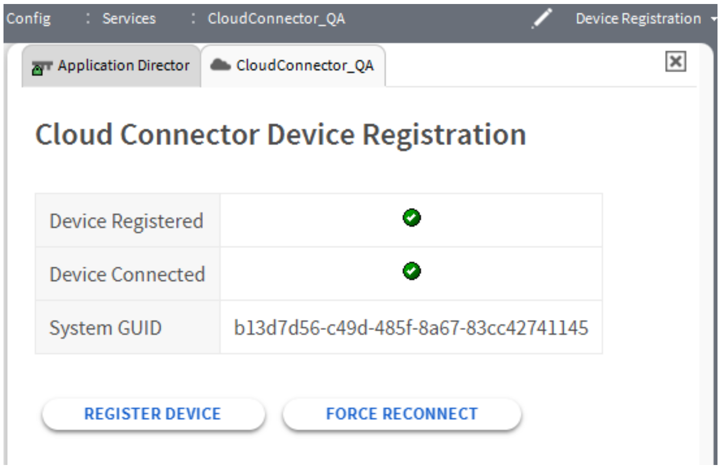
NOTE: An unsuccessful Cloud backup does not raise an alarm. The job status is marked as failed (indicated in red on the **Cloud Backup Manager** view's job bar at the top of the page).

Device Registration

Device Registration, is the default view for the Cloud Connector Service component. Double-clicking the component invokes this view which queries the device to determine if it is registered to access Niagara Cloud Services.

If the device is already registered, the view displays as shown here, indicating the device is both registered and connected to Niagara Cloud. Also listed is the assigned System GUID for the device. The System GUID is a unique identifier assigned during device registration, and is never changed.

Figure 4 View for a registered device

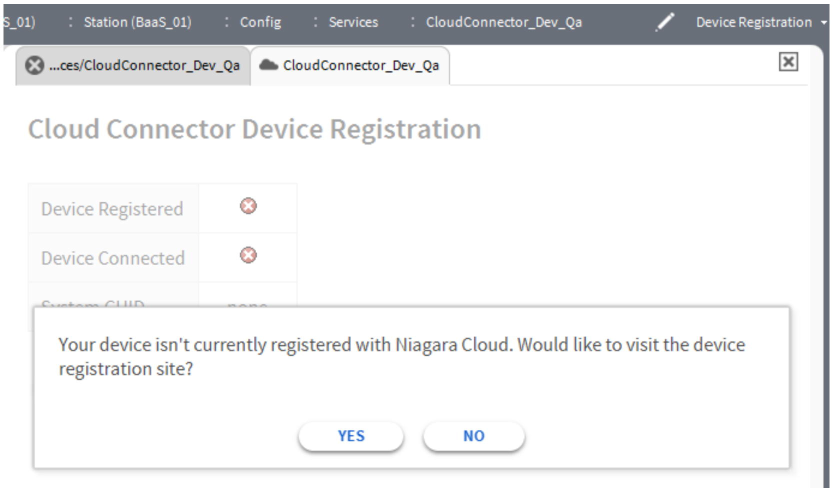


Cloud Connector Device Registration

Device Registered	✓
Device Connected	✓
System GUID	b13d7d56-c49d-485f-8a67-83cc42741145

If the device is not registered, a notification message appears with a prompt that redirects you to **Device Registration** view in the Asset Manager tool in Niagara Community, as shown.

Figure 5 Notification that device is not registered


S_01) : Station (BaaS_01) : Config : Services : CloudConnector_Dev_Qa
Device Registration
...ces/CloudConnector_Dev_Qa
CloudConnector_Dev_Qa
YES
NO

Cloud Connector Device Registration

Device Registered	⊗
Device Connected	⊗
System GUID	none

Your device isn't currently registered with Niagara Cloud. Would like to visit the device registration site?

For more details see Registering the device, page 17.

Troubleshooting

This topic covers general issues that may occur during a backup to the cloud.

Failed backup

The exception, “`Cannot connect to the cloud backup server`,” is visible in the **Cloud Backup Manager** view (and concurrently in the station output for the backup process) if the Niagara Cloud Backup Service becomes unavailable while a backup is occurring. Additionally, there is a “`failed`” status in the Job Bar for the backup, upon reconnecting to the cloud service.

NOTE: This type of failure in a production environment is a rare occurrence. Typically, you are informed ahead of time if the service will not be available.

Glossary

Asset Manager	The Asset Manager tool is a web-based tool in Niagara Community which provides a means of managing users, organizations, and devices in preparation for interacting with any of the Niagara Cloud Services. Additionally, the Asset Manager provides automated software maintenance management and notifications.
BaaS	Backup as a Service (BaaS), the first cloud-based service provided by Niagara Cloud Services. provides seamless, secure, and scalable backups of the device from EC-Net stations to the Niagara Cloud.
CSRF	Cross-Site Request Forgery (CSRF) is a type of attack that occurs when a malicious web site, email, blog, instant message, or program causes a user's web browser to perform an unwanted action on a trusted site for which the user is currently authenticated.
Device Manager	One of three roles (i.e. permission sets) which may be assigned to users of the Asset Manager tool. A Device Manager performs device management activities including adding devices, device registration, and device backup. May submit business affiliation requests.
GUID	A globally unique identifier (GUID) is a system ID number assigned to a device during the device registration process in the Asset Manager tool.
Niagara Cloud application	This term refers to a web application that is running within the Distech Controls-provided Azure cloud space. A few examples are: Niagara Cloud Device Registration, Niagara Cloud Backup Service, and Niagara Cloud Device Details.
Niagara Cloud Services	Niagara Cloud Services is a collection of user-facing (and some non-user-facing) web applications, running within the Distech Controls-provided Azure cloud space, providing a known set of service features.
Niagara Community	Niagara Community is a portal for the cloud-based services and tools available at: *http://www.niagara-community.com*.
Organization Manager	One of three roles (i.e. permission sets) which may be assigned to users of the Asset Manager tool. An Organization Manager performs both user and organization management activities. Adds users, assigns user role(s), adds organization affiliations, adds devices (single or multiple), provides approvals (affiliation and user) via notifications.
registered device	This term refers to an embedded EC-BOS controller registered with the Asset Manager tool and assigned a global identifier for purposes of tracking software maintenance management and authenticating with Niagara Cloud Services.

SaaS	The term "software as a service" (SaaS) is part of the nomenclature of cloud computing. SaaS is a software distribution model in which software is licensed on a subscription basis and is centrally hosted. It is sometimes referred to as "on-demand software". SaaS is typically accessed by users using a thin client via a web browser.
the Cloud	Simply put, the term refers to a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling on-demand access to a shared pool of resources (e.g., computer networks, servers, storage, applications and services). Cloud computing and cloud storage solutions provide users and enterprises with capabilities to store and process their data in third-party data centers. In traditional computing systems, users run software applications installed on a physical computer or corporate server. Cloud computing enables users to access the same kinds of applications through the Internet, paying a subscription fee for individual services, thereby paying only for what they use. If an organization quickly needs access to more resources, it can scale quickly in the cloud. If it needs to scale down resources, it can do so just as easily.

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