CloudShell 7.1 GA Integration with Nagios

Solution Pack v1.5

CloudShell 7.1 GA

Release Date: February 2017

Document Version: 1.0

Legal notice

Information in this document is subject to change without notice. Without limiting the rights under copyright, no part of this document may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the express written permission of Quali Ltd.

Quali may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except if expressly provided in any written license agreement from Quali, the furnishing of this document does not give you any license to these patents, trademarks, copyrights, or other intellectual property.

Quali, CloudShell, CloudShell Authoring, CloudShell Resource Manager, CloudShell Remote Runner, CloudShell Runtime, CloudShell Monitor, CloudShell Spy, CloudShell Portal, the Quali logo, the CloudShell logo, and the CloudShell application logos, and all other Quali product names and logos are trademarks or registered trademarks of Quali Ltd. The absence of a trademark from this list does not constitute a waiver of Quali intellectual property rights concerning that trademark.

All other trademarks, brand and product names are property of their respective holders.

© 2016 Quali Ltd. All rights reserved.

Contents

Overview

The Nagios solution pack provides resources and services to enable integration with the Nagios monitoring platform to provide live monitoring of resources in CloudShell environments and the registration of new hosts in Nagios.

Features provided with the Nagios solution pack

The solution pack installs environments, resources and services into your CloudShell system, as follows:

- A CloudShell service is provided that integrates with the Nagios server. With this service, you can monitor the resources that are registered with Nagios and display the information in a CloudShell reservation.
- A CloudShell service is provided that can register new hosts into the Nagios server so that these resources can also be monitored.
- Numerical information provided by Nagios can be displayed graphically to assist you to monitor and analyze the data.

This guide describes how to prepare your CloudShell system to use the Nagios solution pack, how to download, import and then configure the Nagios solution pack. Sample demonstrations are included in the solution pack.

Installation preparation

Before installing and configuring the solution pack, ensure that you have the requirements and performed the procedures described in this section.

Requirements

Ensure that the following applications are installed:

- CloudShell 6.3 and up.
- Nagios Server that is based on Core 4.0.8 or later with JSON CGI 4.0.7 installed
- pynag installed on the Nagios server machine

Nagios registration package prerequisites

In order to automatically add and remove hosts to Nagios, the registration service requires that the Nagios configuration file be prepared as described in this topic. The registration service uses the Pynag open source library.

To prepare the Nagios configuration file to use registration service:

1. Install Pynag on your Nagios instance, using the following guide:

   https://github.com/pynag/pynag/wiki

2. (Optional) If Python and Pip are installed on the Nagios server, you can also install the package using the following syntax:

   ```
   sudo pip install pynag
   ```

3. If the following directories do not exist, create them:

   `$NAGIOS_HOME/etc/pynag/hosts$NAGIOS_HOME/etc/pynag/hostgroups$NAGIOS_HOME/etc/pynag/templates`

4. To ensure that Nagios is scanning the pynag directories for hosts, templates and hostgroups, add the following lines to the configuration file: `$NAGIOS_HOME/etc/nagios.cfg`.

   ```
   cfg_dir=$NAGIOS_HOME/etc/pynag/hosts
   ```

   ```
   cfg_dir=$NAGIOS_HOME/etc/pynag/hostgroups
   ```

   ```
   cfg_dir=$NAGIOS_HOME/etc/pynag/templates
   ```

5. Restart the Nagios service.

Download the Nagios solution pack

The Nagios solution pack is available from the [Quali's Download Center](#). Download and extract the Nagios Solution Pack.rar file into a temporary directory on your local drive.

Note: Registration to the Quali portal is required before you can download the solution pack, so if you have not already done so, register in advance.

Components of the Nagios solution pack

The Nagios Solution Pack.rar file comprises the following files:

Solution Pack	Description
`Nagios Monitoring Environment.zip`	Solution pack containing a Nagios process environment that communicates continuously with Nagios to retrieve monitoring information.
`AttributesMappingFileNew.xlsx`	Sample mapping file with basic attribute configuration.
`Nagios Example.zip`	Solution pack containing sample environments plus a Nagios monitoring example.
`Nagios Registration Example.zip`	Solution pack containing a sample environment plus a Nagios registration example.
`SetKibanaWithHTTPS_2.rar`	Files required to configure Kibana with https.

Configure CloudShell Portal to run Build environments

Before importing the monitoring solution packs into CloudShell, add the following key to Quali server to enable CloudShell Portal to run Build type environments.

To configure CloudShell Portal to run Build environments:

1. Navigate to the following path:

   `C:\Program Files (x86)\QualiSystems\CloudShell\Server`

2. Double-click the following file:

   `customer.config`

3. Add the following line:

```
<add key="EnableEnvironmentTypeBuild" value="True"/>
```

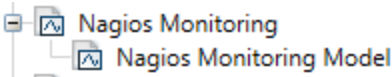4. Click **Save** .

Import the solution pack and configuration

This section describes how to import the solution pack into CloudShell Portal and the necessary configuration procedures.

Importing the Nagios solution pack

To import the monitoring solution pack into CloudShell:

1. Log into CloudShell Portal as administrator.

2. Click **Admin**.

3. Select **Import Package**.

4. Browse to the location where the Nagios solution pack was downloaded and extracted. Select the `Nagios Monitoring Environment.zip` solution pack file. Click **Open**. Alternatively, drag the `Nagios Monitoring Environment.zip` pack into the Web browser where CloudShell Portal is open.

   The contents of the `Nagios Monitoring Environment.zip` solution pack is imported and its components are displayed in the following locations:

Component	Location
New environment: Nagios Monitoring Environment	CloudShell Portal Environments Catalog
Nagios Service	CloudShell Portal services catalog. The service can be added to an environment using the Add Service pane.
Resources: Monitoring Resource (Admin Only): "Nagios Monitoring"	CloudShell Portal inventory
The Data Model (families and models):	CloudShell Resource Management Client

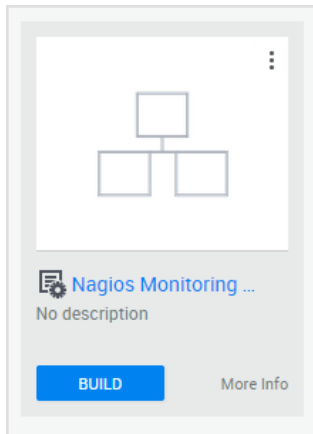Family -> Model of the resources

5. Press **F5** to refresh CloudShell Portal.

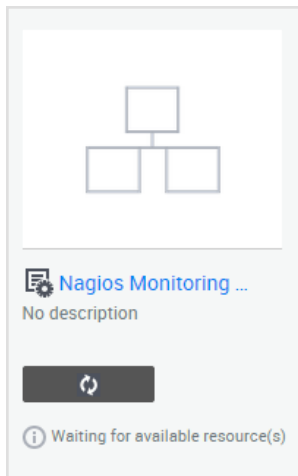# Configuring the monitoring environment

Use the steps in this procedure to set the Nagios Monitoring environment to run continuously.

To configure the monitoring environment:

1. Open CloudShell Portal.

2. Select the Nagios Monitoring environment.

3. Click **Build**.

The Nagios Monitoring process starts to run.

This environment is an administration background process that runs continuously. It logs all the monitoring requests, runs the monitoring commands and updates all the resources.

Configuring the Nagios integration definitions

To configure the Nagios integration definitions:

1. In CloudShell Portal, select **Lab Management > Reservations**.

2. Select the Nagios Monitoring Environment in the list of Reservations.

3. Open the **Attributes** panel for the Nagios monitor.

4. Update the following Nagios integration definitions:

Field	Description and value
Nagios Address	(Type: string, rules checked: Configuration) the address of the Nagios Client, as follows, http://<IP of the Nagios machine>/nagios/cgi-bin
Nagios Password	(Type: string, rules checked: Configuration) password of the Nagios Client
Nagios Sampling Interval	Type: numeric, rules checked: Configuration) the time interval for querying the Nagios Client
Monitoring Cleanup Interval	(Type: numeric, rules checked: Configuration) the time interval for removing non active reservation resources form the query list the Nagios Client
Nagios User	(Type: string, rules checked: Configuration) User Name of the Nagios Client
Mapping File Path	(Type: string, rules checked: Configuration) – address of the Excel mapping file: C:\AttributesMappingFileNew.xlx

5. In the **Attributes** panel for the Nagios monitor service, update the following Nagios attribute

definitions in the Service: (family: Nagios Services, model: Nagios Monitor Service):

Field	Description and value
CPU usage	(Type: numeric, rules checked: Setting, Available For abstract Resource, Monitor Modifications)
Nagios Host Name	(Type: string, rules checked: Configuration) the resource host name in the Nagios Client)

6. Click **Save**.

Related Topics

Update mapping file

Nagios monitoring command

Update mapping file

The Mapping File Path field contains the details of the path to the AttributesMappingFileNew.xlsx file. This Excel file contains values for the Nagios resource driver, indicating which attributes to be monitored and how to fetch the value for each of the entries.

Field	Description and value
MonitorName	The name of the Boolean attribute of Nagios service. For this example it is "Monitor CPU".
ResourceAttributeToUpdate	Name of the attribute in the Resource (host) you are monitoring. For this example it is "Monitor CPU".
NagiosDataService	Name of the service you are monitoring in Nagios client. In this example, use the JSON CGI in Nagios to see name.
NagiosDataNode	The line from which the Nagios resource driver gets the measurement data.
	For this example use "perf_data" (go to Nagios JSON CGI and see the line). In general you can use "plugin output". Make sure that you have an attribute of type "string" attached to it (it is used for getting data for services that can be numeric, like uptime or can have an empty perf_data line).
NagiosPerfDataParam	Use this field if you are using perf_data line. If used with any other line, it returns an error. Enter the value after the "=" and

Field	Description and value
	inside quotation marks in the perf_data line. For example, to enter the value 5 min avg Load
	Example: "perf_data": "'5 min avg Load'=12%;80;90;0;100" you put in: 5 min avg Load

Example of an Excel spreadsheet with mapping file fields.

	A	B	C	D	E
1	MonitorName	ResourceAttributeToUp	NagiosDataService	NagiosDataNode	NagiosPerfDataParam
2	Monitor CPU Load	CPU	Current Load	perf_data	5 min avg Load
3					
4					
5					
6					
7					
8					

Nagios monitoring command

Nagios Start resource command:

- `Start` – the administrator must execute this command to begin monitoring. Run this command after completing the initial build and configuration.

  Note: To avoid unnecessary overhead, do not execute multiple instances of this command. Only one instance should be active at a time.

  After executing the **Start** command, open the **Activity** pane. The **Start** command continues to work incessantly in the background.

Configuring https for Kibana

To configure https for Kibana:

1. In the server machine, browse to the location where the Nagios solution pack was downloaded and extracted. Select the `SetKibanaWithHTTPS_2.rar` file and extract its contents to a temporary directory.

2. Run the `Automatic Installation (Server).bat` file.

3. In the CloudShell portal machine, run the `Automatic Installation (Portal).bat` file.

Monitoring a new environment

This section describes the procedure to use the Nagios service to monitor an environment with resources.

When retrieving information from Nagios, the monitoring service must match the resource in Nagios with the resource in CloudShell. This is done automatically by the IP address. However, if the IP address does not match, you can specify the **Nagios Host Name** attribute manually and the match is made according to the host name in Nagios.

To monitor an environment:

1. In CloudShell Portal, prepare an environment with several resources.
2. Open the service catalog and add a Nagios monitoring service into the environment.
3. The system prompts you to mark which attributes you want to monitor (for example: ping duration, # of processes, CPU utilization, and so on).
4. Click the **Activate** command of the service and the environment starts to monitor the specified attributes of the selected resources.

Related Topics

Results after running the Activate command

Results after running the Activate command

The **Resource Attributes** side pane displays values that were generated by Nagios.

The live status icon displays in the environment diagram and provides a status indication of whether the resource has errors or critical measurements in Nagios.

To display an attribute's live chart:

- Click the attribute's **Watch** link. This feature uses Kibana to display the information.
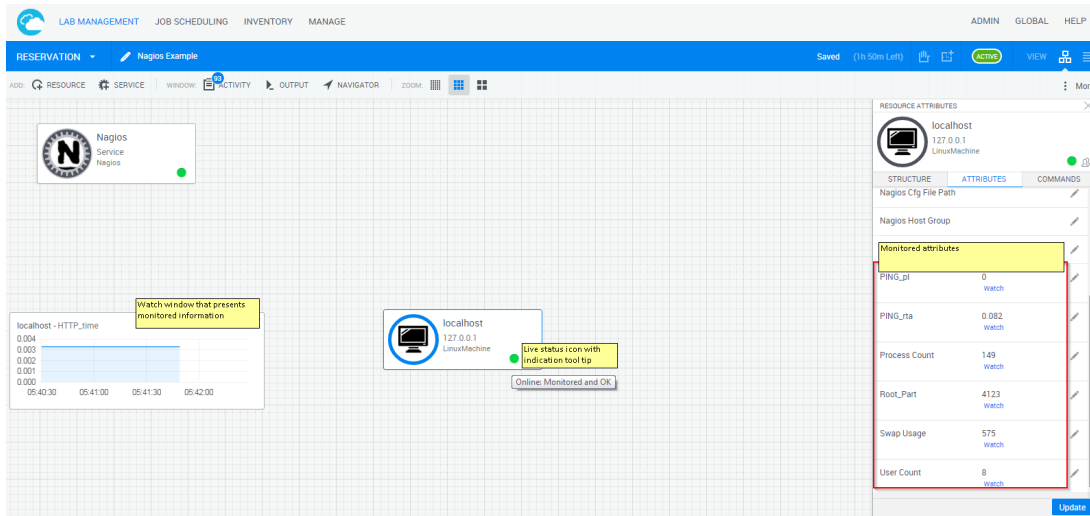
The Nagios sample environments

The sample environments that are provided in the Nagios solution pack are:

Nagios Example

Add this environment to a reservation to select which attributes to monitor. Once the monitoring begins, a live indication appears on all the environment resources.

Nagios Registration Example

Add this environment to a reservation to select resources that are new to Nagios and register them into Nagios client. After registration, you are able to monitor these resources.

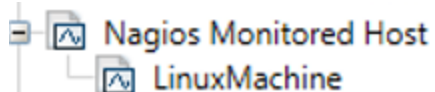# Importing the Nagios Sample Environment solution pack

To import the sample environment solution pack into CloudShell:

1. Log into CloudShell Portal as administrator.
2. In CloudShell Portal, click **Admin**.
3. Select **Import Package**.
4. Browse to the location where the Nagios solution pack was downloaded and select the `Nagios Example.zip` solution pack file. Click **Open**. Alternatively, drag the `Nagios`

`Example.zip` pack into the Web browser where CloudShell Portal is open.

The sample environment solution pack is imported and its components appear in the following locations:

Component	Location
Nagios Example	CloudShell Portal Environments Catalog
Sample Resource: "localhost"	CloudShell Portal inventory
The Data Model (families and models):	CloudShell Resource Management Client

5. Press **F5** to refresh CloudShell Portal.

Importing the Nagios Registration Example solution pack

To import the Nagios registration example solution pack into CloudShell:

1. Log into CloudShell Portal as administrator.

2. In CloudShell Portal, click **Admin**.

3. Select **Import Package**.

4. Browse to the location where the Nagios solution pack was downloaded and select the `Nagios Registration Example.zip` solution pack file. Click **Open**. Alternatively, drag the `Nagios Registration Example.zip` pack into the Web browser where CloudShell Portal is open.

The Nagios registration example solution pack is imported and its components appear in the following locations:

Component	Location
Nagios Registration Example	CloudShell Portal Environments Catalog
Nagios Registration service	CloudShell Portal services catalog. The service can be added to an environment using the Add Service pane.
Sample Resource: "localhost"	CloudShell Portal inventory

5. Press **F5** to refresh CloudShell Portal.

Nagios Environment Registration

This section describes how to use the Nagios service to register a resource that is new to Nagios.
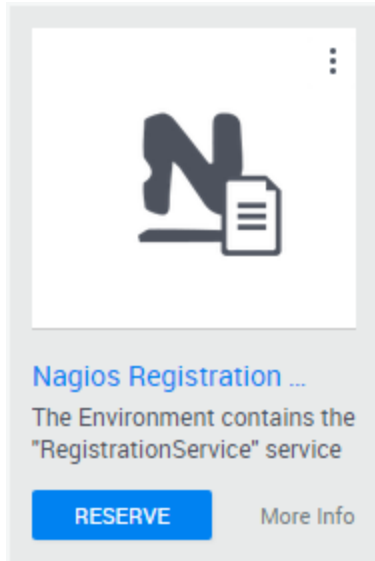
Note: This procedure requires administrator credentials.

To register new resources into Nagios:

1. Login to CloudShell Portal with administrator credentials.
2. Create an environment with a resource that has not been configured in Nagios.
3. Add the **Nagios Registration** service to a reservation.
4. Run the **Register Resources** command and when prompted, provide the resource name as an input to the command.
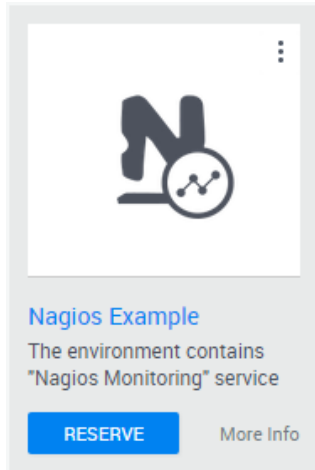
Related Topics

Results after running the Register command

Results after running the Register command

-   The resource is registered in Nagios.
-   You can add a monitoring service to start monitoring the resource.

Nagios Example environment

Nagios Example

The environment contains "Nagios Monitoring" service

RESERVE   More Info

This sample environment returns results when the Nagios process environment is running and the Do monitor command of the Nagios server is executing.

The Nagios Example environment includes the following resources:

- Nagios Monitoring service
- A sample resource that is monitored by the service

Enable monitoring

To enable monitoring of the environment resources:

1. Add the Nagios Monitoring service to a reservation.
2. Hover over the **Nagios Monitoring** service and click **Edit**.

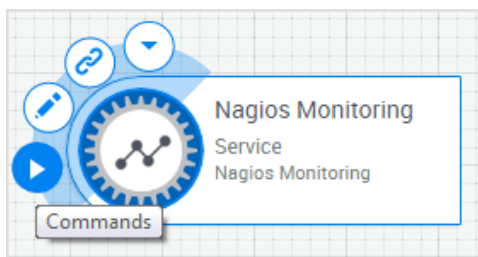   The service's **Service Details** dialog box is displayed.
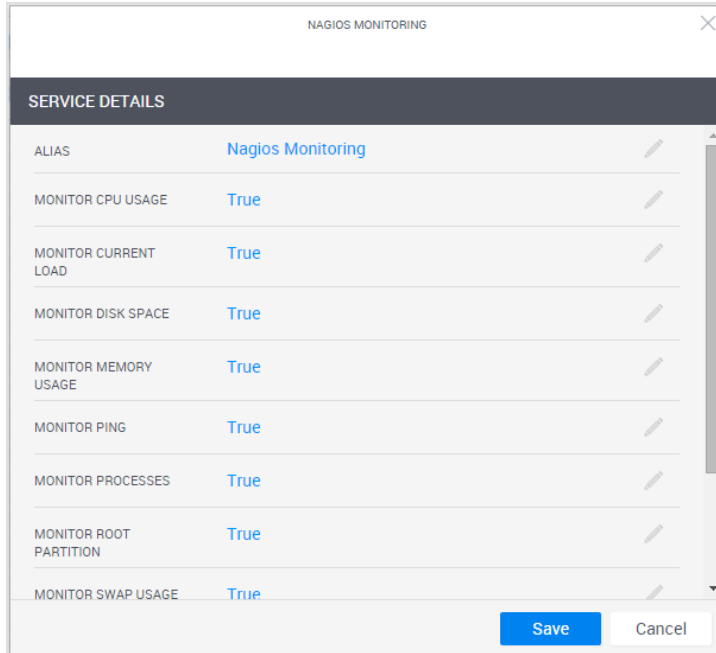
3. For each attribute you wish to monitor, set the value to **True**.

4. Click **Save**.
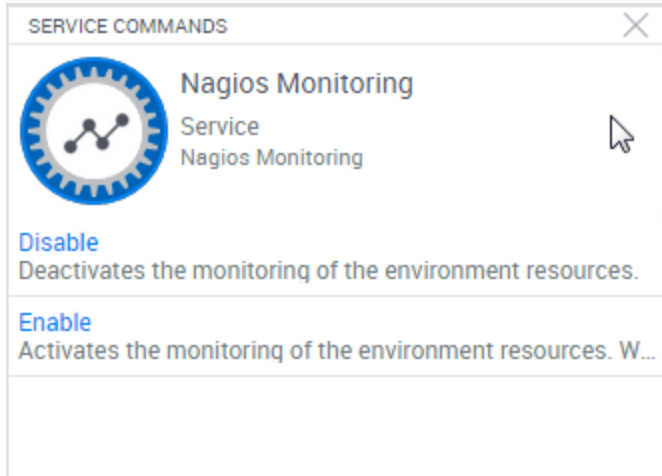
Start monitoring

To monitor the environment resources:

1. In the reservation, hover the cursor over the Nagios Monitoring service.

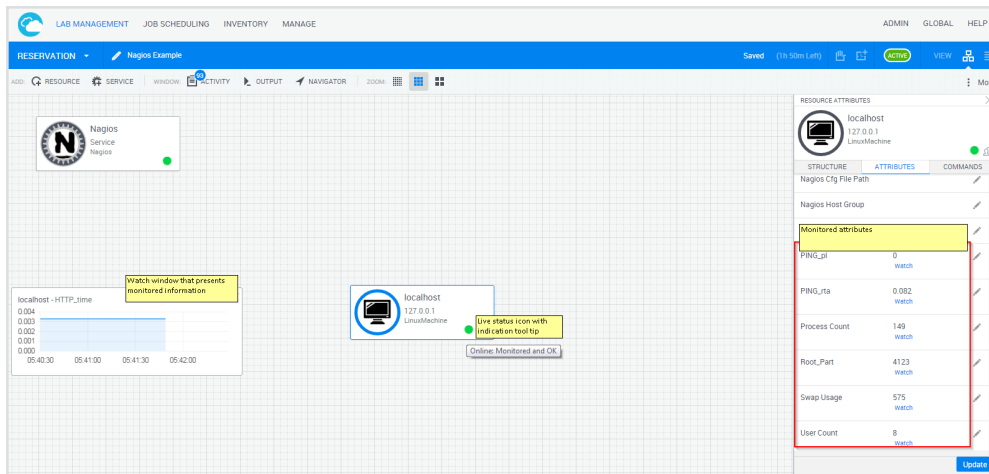

2. Click **Commands**.

The **Service Commands** side pane is displayed.

3. Click **Enable**.

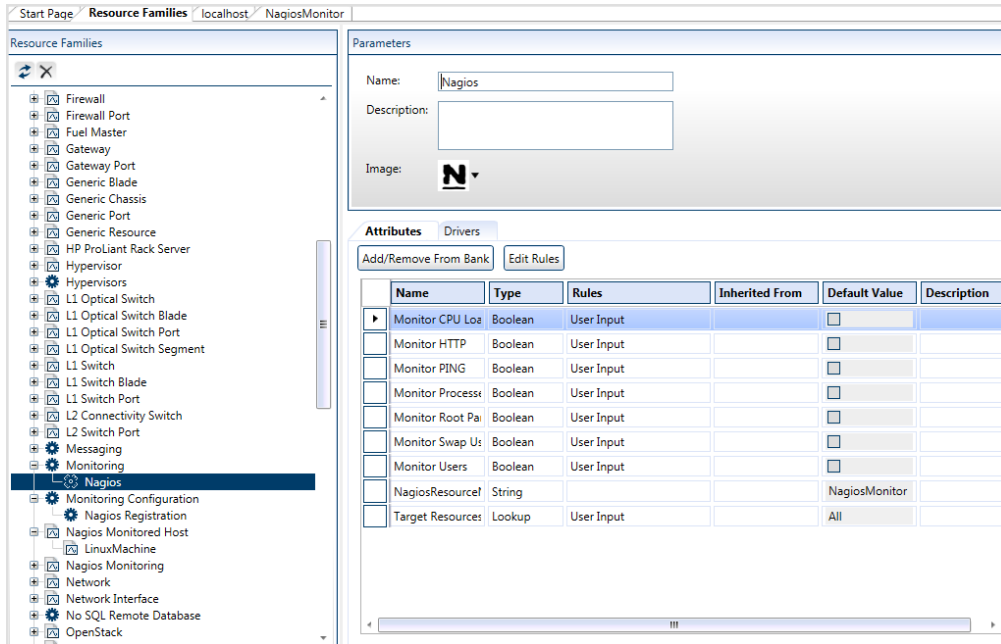   The Nagios service starts to monitor the selected resources.

4. To display a live chart of an attribute, click the attribute's **Watch** link. This feature uses Kibana to display the information.
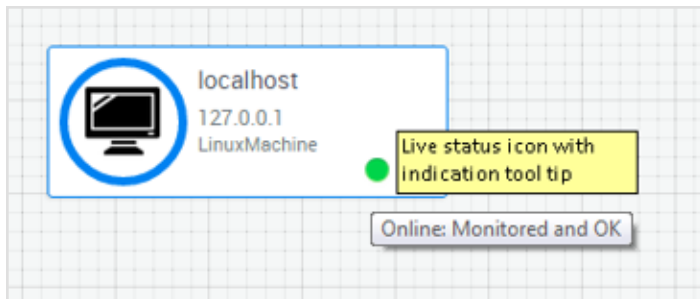

Configure Nagios Service in Resource Manager

The configuration of the Nagios service in Resource Manager Client is illustrated in the following image:

Status icon descriptions

The key to the status icon that displays in the environment diagram is described below:

Status icon	Description
Online (green)	All the services which are monitored by Nagios have Ok status and there is at least one such service.
Offline (grey)	One of the following problems is preventing data retrieval from Nagios: • communication errors (Nagios is offline) • resource was removed from Nagios • unexpected error The status is followed by some description of the problem

Status icon	Description
Error (red)	The result of one of the monitored services indicates an error.
Empty	Nothing to monitor. The resource does not exist in Nagios or no services can be monitored.

Configuration to display live charts

The attributes that are monitored by Nagios can be displayed in live charts using the Kibana features. Use the procedures described below to configure CloudShell Portal to enable charts to display live information and change the time interval of charts.
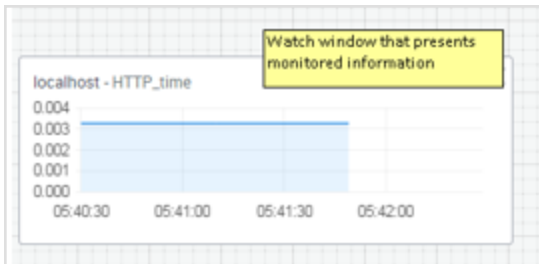
Related Topics

Enable charts to display live information

Change Kibana time interval

Edit elasticsearch configuration file

Chart characteristics

Enable charts to display live information

To configure CloudShell Portal to enable charts to display live information:

1. Navigate to the following path:

   `C:\Program Files (x86)\QualiSystems\CloudShell\Server`

2. Double-click the following file:

   `customer.config`

3. Add the following line:

```
<add key="MonitorTaggedAttributes" value="True"/>
```

4. Click **Save** .

Note: You must have an active reservation in order to display a live chart.

Change Kibana time interval

To configure CloudShell Portal to change the Kibana time interval:

1. Navigate to the following path:

   C:\Program Files (x86)\QualiSystems\CloudShell\Server

2. Double-click the following file:

   customer.config

3. Add the following line:

   ```
   <add key="KibanaMonitorTimespan" value="20m" />
   ```

4. Click **Save** .

Edit elasticsearch configuration file

After configuring the Kibana time interval, if you are using a portal that is not installed on the same PC as the Quali server or if you are connecting to the portal from another computer, you need to modify the Kibana configuration file so it can show the data.

To edit the elasticsearch configuration file:

1. Navigate to the following path:

   C:\Program Files (x86)\QualiSystems \CloudShell\Server-
   \QuickSearch\config\elasticsearch.yml

2. Change the network.host value to 127.0.0.1.

Chart characteristics

The following attributes relate to the Kibana charts:

- More than one Kibana chart can be opened at a time.
- Charts can be moved by dragging and dropping.
- Charts can be resized by drag the graphic controls.

- Charts can be positioned on top of other items, like, menus or resources. For example graph, if a resource is dragged onto a graph, the graph is still visible.

Tagging Attributes as Monitored

Use the steps in the following procedure to tag an attribute as Monitored to enable the Watch feature in that attribute. Attributes that are tagged as Watch can display its information in live charts using the Kibana feature.

To enable the Watch feature:

1. In **CloudShell Resource Manager Client**, in the **Attributes** tab, in the **Type** column, select an attribute of type **Numeric**.

2. Set the **Monitor Modifications** rule for the required attribute.
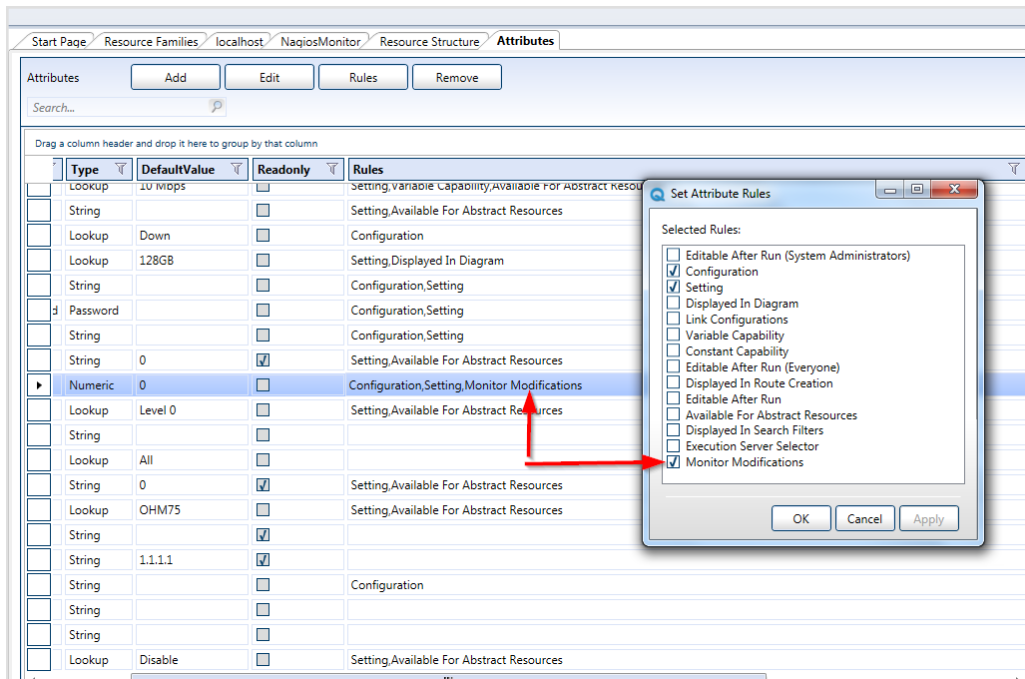
3. Click **OK**.

Nagios Registration Example environment

You can use the **Nagios Registration Example** environment in a reservation to run the **RegistrationService** service. This service enables you to configure a new resource as a host in the Nagios Client. After registration of the resource, you can monitor the resource.

To configure a new resource with RegistrationService:

1. In CloudShell Portal, select the **Nagios Registration Example** environment.

   Nagios Registration Example
   The Environment contains the
   "RegistrationService" service that enables

   RESERVE   More Info
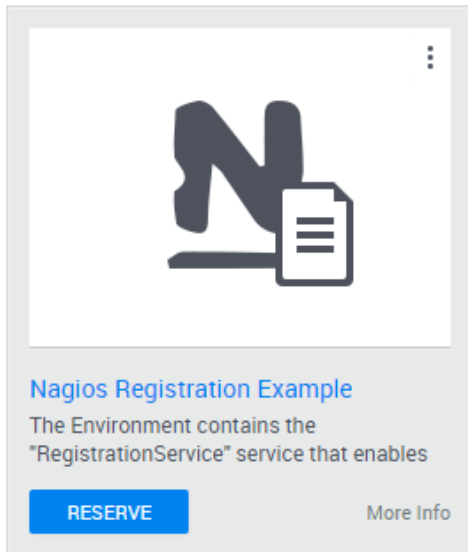
2. Click **Reserve**.

3. Specify the reservation parameters and click **Reserve**.

   The **Nagios Registration** service opens in the **Reservation** workspace.

   Nagios Registration
   Service
   Nagios Registration
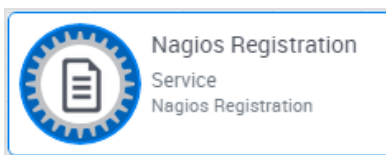
4. Hover over the Nagios Registration service.

5. Click **Commands** .

   The **Nagios Registration** commands are displayed in the **Service Commands** side pane.
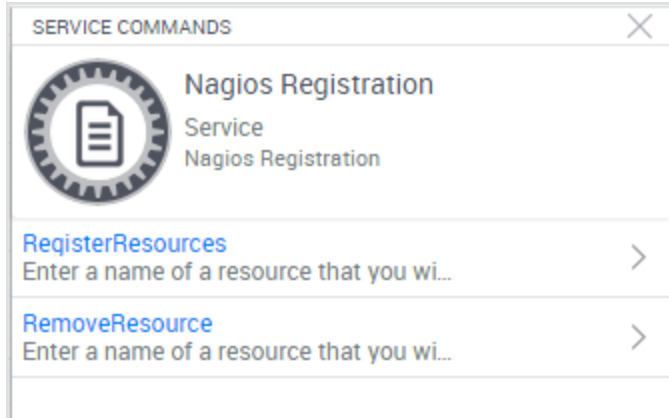
6. Click **RegisterResources** to run this command and register the new resources to Nagios client.

   By default, the resource host is configured as **Admin Only** in **CloudShell Resource Manager Client**.

Service Configuration

Use the steps in this procedure to update service attributes in CloudShell Resource Manager.

For a listing of the attributes and their descriptions, see Description of the service attributes .

To update service attributes:

1. In **Resource Manager Client**, select the **Nagios Registration** service.

2. Update the required attributes.
3. Click **Save**.

Description of the service attributes

The attributes for the service commands are listed in the following table:

Attribute	Description
NagiosMachineAddress	(Type: string, rules checked: setting) the address of the computer that the Nagios Client is installed is http://<IP of the Nagios machine>.
NagiosMachinePassword	(Type: string, rules checked: setting) the password of the computer that the Nagios Client is installed on.
NagiosRootFolder	(Type: numeric, rules checked: setting) the Nagios Client Installation folder of the.
NagiosMachineUsername	Type: string, rules checked: setting) User Name of the PC which the Nagios Client is installed on.

Service Commands

The service commands are listed in the following table:

Service com-mand	Description
RegisterResources	This command adds a resource to Nagios client. Enter the resource name in the text box.
	Make sure this resource is previously defined in the Resource Manager client.
RemoveResource	The command removes a resource that exists in CloudShell and Nagios client. Enter the resource name in the text box.

After adding the resource, a text file is added to the Nagios computer.

Registering a resource in Nagios

In **Resource Manager Client**, the resource model must have the attributes listed in the table below and contain the values pointing to the relevant Nagios group and template.

The attributes for the resource you are registering in Nagios are listed in the following table:

Attribute	Description
Nagios Cfg File Path	(Type: string, rules checked: setting) the address of the computer that the Nagios Client is installed is http://<IP of the Nagios machine>.
Nagios Host Group	(Type: string, rules checked: setting) the password of the computer that the Nagios Client is installed on.
Nagios Host Tem-plate	(Type: numeric, rules checked: setting) the Nagios Client Installation folder of the.

After registration, the Nagios server monitors the resource services according to the template defin-ition.

Note: The host agent must be installed on the host before registration. The service does not install the agent on the host.

Known limitations

This section lists known limitations.

- All resources in a reservation are monitored. Individual resources cannot be excluded.
- When monitoring a resource, all reservations that include that resource can see the monitored data for the resource.
- If a service name contains the slash symbol '\', for example, c:\drive space, then the JSON process cannot proceed.

  Workaround: Install the fix located at this link: https://github.com/NagiosEnterprises/nagioscore/issues/5
- In cases where Start is executed more than once, no error is issued. However, the resultant behavior is not as expected.
- Avoid using more than one Nagios service in the same reservation. When calling "Enable" on a service overrides the attributes being monitored for all the resources in the reservation.
- Avoid using more than one Nagios resource in the same reservation, as the Nagios driver uses the same attachment file.
- When you stop the "Start" command of the resource driver, all the resources that were being monitored continue to show the last live status that was updated. The live status of a service is cleared only by running "Disable" on the service or when the reservation ends.
- Dragging the screen above the workspace causes the Kibana graph to be remain there.
- The Kibana graph does not display units on the Y-axis.
- The Kibana graph no longer displays if you exit and then re-enter and refresh the reservation in which the graph was displayed.
- The appearance of the Kibana graph cannot be changed. However, it can be resized.
- Kibana shows only the data in the graph time frame, connecting the values with lines. However if a value, represented by a dot, is outside the graph, it will not connect it to the next dot, giving the appearance of a gap in the data.
- Kibana shows graphs based only on UTC time zone.

References

For further information, use the following links.

Description	Link
Operating systems supported by Nagios	http://www.nagios.com/solutions/operating-system-monitoring
Nagios support for agentless monitoring with SNMP	http://www.nagios.com/solutions/agentless-monitoring/