Datonis Gateway 1.2

PURPOSE

This document describes the procedure to employ the Datonis IOT Gateway in your environment.

SYSTEM REQUIREMENTS

Operating System

The Datonis Gateway is certified to run on:

- Windows 7 or above
- Linux 3.x kernel or above

Supported Protocols

- http (80)
- https (443)
- mqtt (1883)
- mqtts (8883)

Internet connectivity

Internet connectivity is required so that the gateway can do outbound connections to either of the ports (80 - http, 443 - https, 1883 - mqtt, 8883 - mqtts)
For http/https, you can also configure a http proxy if there is no direct internet connectivity available.

JAVA

Gateway needs **JAVA 1.7** or higher to work. Please download from Oracle site.

SUPPORTED ENVIRONMENTS

The Datonis Gateway supports following environments (via configurable adapters) to collect data and push it to the Altizon’s Datonis Platform

OPC DA

This adapter can be used to point to a OPC DA server either running alongside the gateway on the same machine or on a different machine on the LAN.
Detailed instructions are provided in the OPC DA CONFIGURATION section.
Certified OPC DA servers include: Matrikon, Kepware, Proface, Acromag

OPC UA

OPC UA servers are supported via a small nodejs OPC UA client program that acts as a middleman between the OPC UA server and the Datonis Gateway. It exposes a small http URL over which the Datonis Gateway requests the tag values. Detailed instructions are provided in the OPC UA CONFIGURATION section
Certified OPC UA servers include: Kepware OPC UA server

MTConnect Agent

Data can be queried from MTConnect agents that expose a XML based interface. Detailed instructions are provided in MTCONNECT AGENT CONFIGURATION section

PACKAGE STRUCTURE

```
datonis-gateway-1.2/
        |
        |--- bin
        |--- conf
        |--- lib
        |--- commons-daemon-1.0.15-bin-windows
```

- bin directory contains all the scripts required to install/run the datonis gateway.
- conf directory contains:
    - A bunch of configuration templates for configuring the datonis gateway e.g. opc da, http poller, mtconnect etc. that would help you get started
    - log4j.properties where logging of the gateway can be controlled
- lib directory contains all dependent java libraries required for the gateway to work
- commons-daemon-1.0.15-bin-windows contains program to install/run/uninstall the gateway as a service on Windows

INSTALLATION

Windows

On windows, you there are a couple of files in the bin directory

- install-windows-service.bat
  This file installs a Windows service that lets you start stop the Datonis IOT Gateway via the Windows Service Control Manager.
  In the root folder of the package, just run **bin\install-windows-service.bat**
- uninstall-windows-service.bat
  This file uninstalls the Windows service for the Datonis IOT gateway. Invoke this script similar to above in case you need to remove the Datonis gateway from your machine

Linux

There is a script **start-datonis-gateway.sh** in the bin directory. Invoking this from the shell launches the agent

NOTE: Make sure to do the configurations below before starting the Datonis Gateway

GATEWAY CONFIGURATION

The Datonis Gateway needs a file called **datonis-gateway.properties** to be present in the conf directory. When you unzip the package, you will find a few templates to help you get started for a particular environment. It is a **JSON** file so make sure that the JSON is parseable at all times. You can do that by pasting the contents of this file at: http://jsonlint.com/ and clicking validate.

This part of the configuration defines how the gateway connects to the platform and identifies itself. Configuration options required by the Gateway are as described below. Commonly configured are those in highlighted background. Others you may not need to explicitly specify unless otherwise necessary:

Parameter	**Description**	**Data type**	**Default value**	**Mandatory**
access_key	Access key associated with a key pair that identifies the customer account on the Datonis Platform. This can be downloaded from the platform UI at: http://www.datonis.io	String	None	Yes
secret_key	Secret key associated with the key pair. Note that this key should not be compromised. It is supposed to be private.	String	None	Yes
bulk_transmit	Whether to transmit events in a batch manner or immediately as they get generated. Transmitting in batch manner saves bandwidth.	Boolean	true	Yes
heartbeat_interval	How often to send heartbeats for sensors to the platform. This is to make the platform know that the sensors are alive (even if they are not actively transmitting data). Unit is milliseconds	Integer	120000	No
request_timeout	Timeout while connecting/receiving response from the platform. Unit is milliseconds	Integer	10000	No

thread_pool_size	Number of worker threads	Integer	5	No
bulk_transmit_interval	If bulk_transmit is true, how long to batch requests before finally sending the batch. Unit is milliseconds	Integer	60000	No
bulk_max_elements	How many events to batch before finally sending the batch. Unit is milliseconds	Integer	25	No
protocol	Which protocol to use to send data: HTTP/HTTPS/MQTT/MQTTS	String	HTTPS	No
proxy_host	In case of HTTP/HTTPS, http proxy server name in case of indirect Internet connectivity	String	None	None
proxy_port	proxy server port	Integer	None	None
proxy_username	proxy server username	String	None	None
proxy_password	proxy server password	String	None	None

ADAPTER SENSOR CONFIGURATION

This part of the configuration defines how sensors on the Datonis platform are mapped to the tags in your environment. All the environments (OPC DA/UA, MTconnect etc.) mentioned above are supported via some sort of an adapter. All types of adapters have a sensor configuration where you specify the mapping between - the Datonis Sensors - and - the tags/metric values collected and available in your environment.
Each adapter in the **datonis-gateway.properties** file has a **sensor_configuration** section which is an array. Each element describes a Sensor on the datonis platform and its attributes. Each attribute maps to a tag in your environment

Sensor Configuration

Parameter	**Description**	**Data type**	**Default value**	**Mandatory**
sensor_key	Key of the sensor obtained from the Datonis Platform UI: http://www.datonis.io	String	None	Yes

sensor_name	Name of the sensor associated with above sensor key	String	None	Yes
sensor_type	Type of the sensor associated with the above sensor key	String	None	Yes
refresh_interval	How frequently you want the tags configured this sensor’s attributes to be probed/queried. Value to be specified in milliseconds	Integer	None	Yes
sensor_attributes	List of attributes for this sensor having their own configuration. Please refer table below for sensor attribute configuration	List	None	Yes

Sensor Attribute configuration

Parameter	**Description**	**Data type**	**Default value**	**Mandatory**
name	Name that identifies the attribute for a sensor	String	None	Yes
tag_id	Id of the tag in a target system like an OPC server. In case of MTconnect, it is the Xpath of the agent that provides value for a certain Macro	String	None	Yes
diff	If the tag represents an ever increasing number, and you want to send the diff since last reading, then set this to true. So in case there is a “counter” tag that increases like this: 31234, 31235, 31238, 31240 then, the values transmitted for this attribute would be 0, 1, 3, 2,..	Boolean	false	No

OPC DA CONFIGURATION

There are two parts to this configuration.

- Configuring the OPC server DCOM settings so that the Datonis Gateway can query data from it
- Configuring the OPC server details in the **datonis-gateway.properties** file

DCOM configuration on the OPC Server

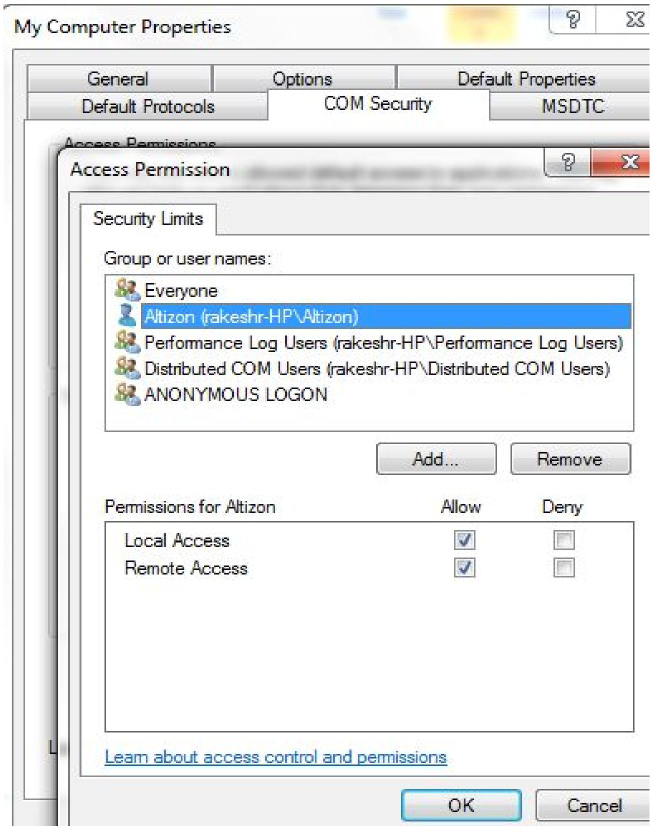
The Datonis Gateway acts as a OPC client while fetching data from an OPC server. The default DCOM settings for a Windows host do not permit this communication. Thus it becomes necessary to make appropriate configuration changes so that this communication goes through.

1. Create a local Windows user called “altizon” on the OPC server machine.
    a. Right click **Computer** and click **Manage**
    b. Under **Computer Management** -> **Users and Groups** -> **Users**, right click and select **New User…**
    c. Set an appropriate password
    d. Uncheck all options and then only check the **Password never expires** option
    e. Also, add it to the **Administrators** group

2. In the start menu, in search/run, enter **dcomcnfg**

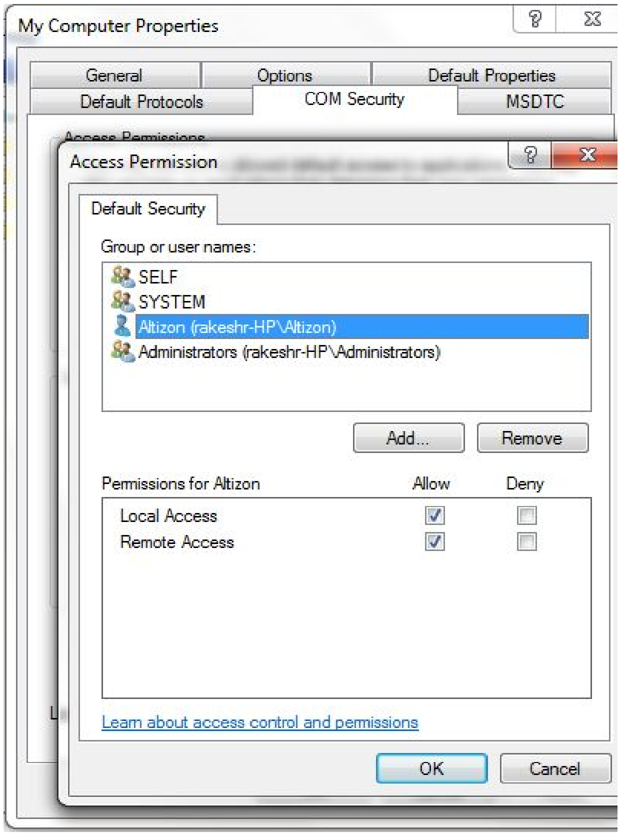
3. Under **Console Root** -> **Component Services** -> **Computers** -> **My Computer**, right click and select properties

4. In the **COM Security** tab, under **Access Permissions**
    a. click **Edit Limits…,** In the pop up window that opens, click **Add…** and select the user we added in step 1.
    b. Select both checkboxes **Local Access** and **Remote Access** under **Allow**
    c. click **Edit Defaults…** In the pop up window that opens, click **Add…** and select the user we added in step 1.
    d. Select both checkboxes **Local Access** and **Remote Access** under **Allow**



Group or user names:
- Everyone
- Altizon (rakeshr-HP\Altizon)
- Performance Log Users (rakeshr-HP\Performance Log Users)
- Distributed COM Users (rakeshr-HP\Distributed COM Users)
- ANONYMOUS LOGON

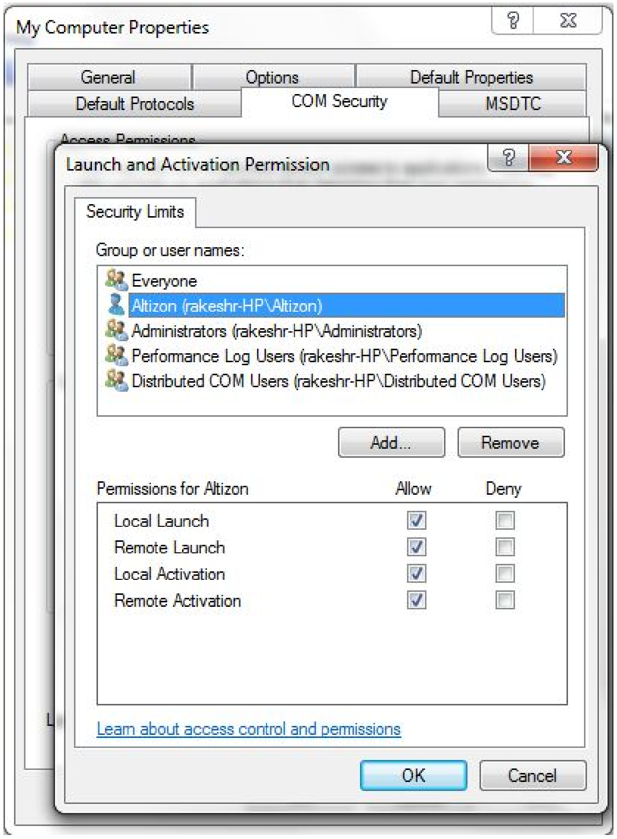
Permissions for Altizon	Allow	Deny
Local Access	☑	□
Remote Access	☑	□



Group or user names:
- SELF
- SYSTEM
- Altizon (rakeshr-HP\Altizon)
- Administrators (rakeshr-HP\Administrators)

Permissions for Altizon	Allow	Deny
Local Access	☑	□
Remote Access	☑	□

5. In the **COM Security** tab, under **Launch and Activation Permissions**
   a. click **Edit Limits…** In the pop up window that opens, click **Add…** and select the user we added in step 1.
   b. Select all checkboxes under **Allow**
   c. click **Edit Defaults…** In the pop up window that opens, click **Add…** and select the user we added in step 1.
   d. Select all checkboxes under **Allow**



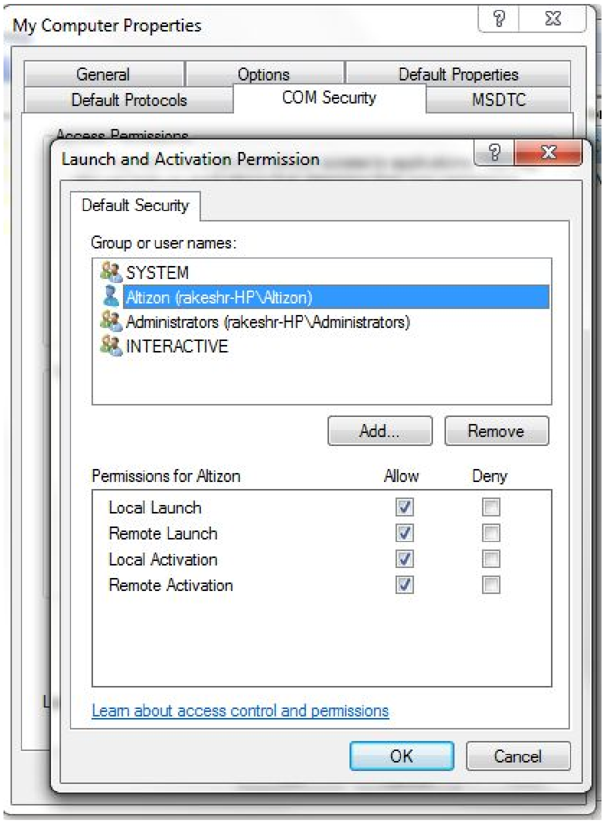
Launch and Activation Permission

Security Limits

Group or user names:

- Everyone
- Altizon (rakeshr-HP\Altizon)
- Administrators (rakeshr-HP\Administrators)
- Performance Log Users (rakeshr-HP\Performance Log Users)
- Distributed COM Users (rakeshr-HP\Distributed COM Users)

Permissions for Altizon	Allow	Deny
Local Launch	☑	□
Remote Launch	☑	□
Local Activation	☑	□
Remote Activation	☑	□



Launch and Activation Permission

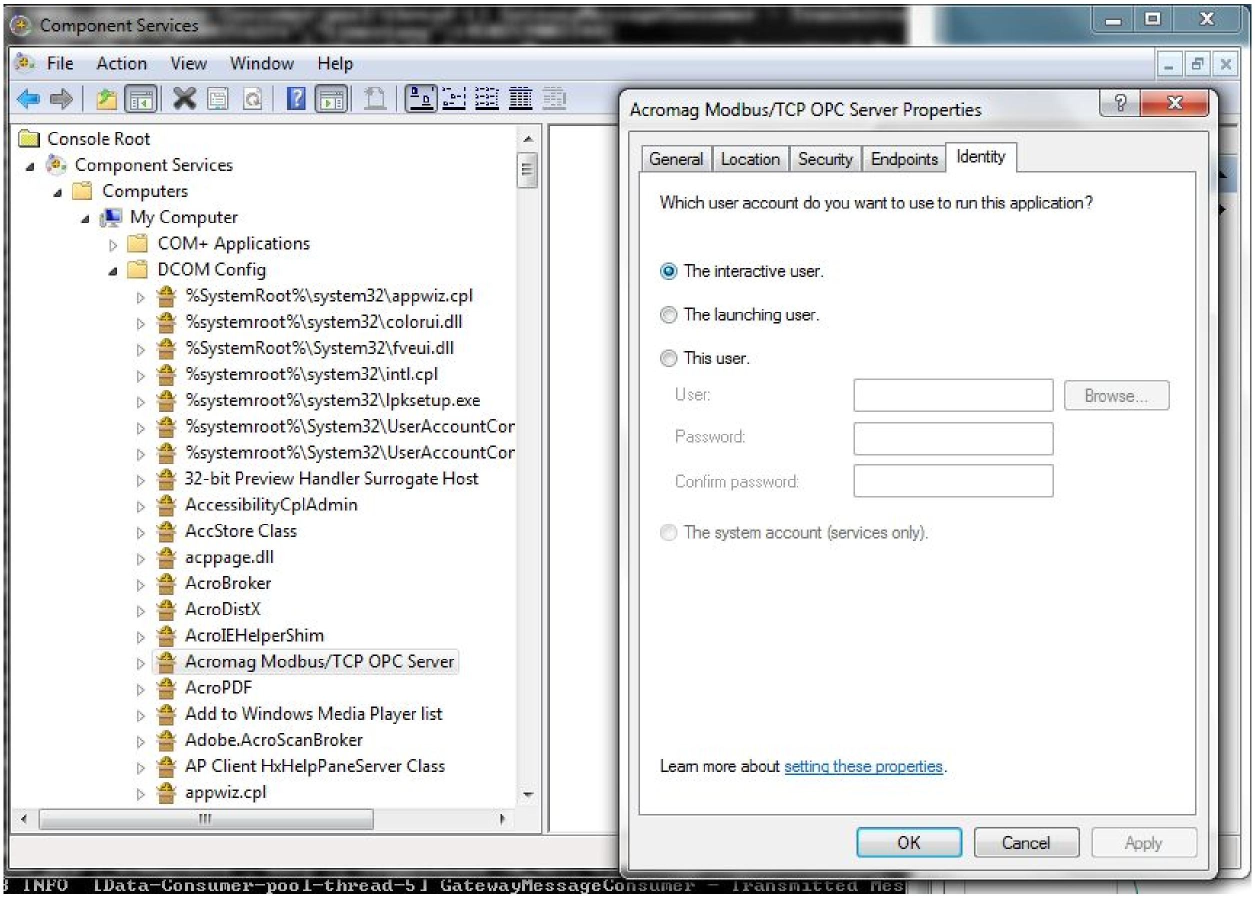
Default Security

Group or user names:

- SYSTEM
- Altizon (rakeshr-HP\Altizon)
- Administrators (rakeshr-HP\Administrators)
- INTERACTIVE

Permissions for Altizon	Allow	Deny
Local Launch	☑	□
Remote Launch	☑	□
Local Activation	☑	□
Remote Activation	☑	□

6. Under **Console Root** -> **Component Services** -> **Computers** -> **My Computer** -> **DCOM Config**
   look for the entry corresponding to your OPC server. Right click and select **Properties**
7. In the Identity tab, select the user to **The Interactive user**.


Component Services
File
Action
View
Window
Help
Console Root
Component Services
Computers
My Computer
COM+ Applications
DCOM Config
%SystemRoot%\system32\appwiz.cpl
%systemroot%\system32\colorui.dll
%SystemRoot%\System32\fveui.dll
%systemroot%\system32\intl.cpl
%systemroot%\system32\lpksetup.exe
%systemroot%\System32\UserAccountCor
%systemroot%\System32\UserAccountCor
32-bit Preview Handler Surrogate Host
AccessibilityCplAdmin
AccStore Class
acppage.dll
AcroBroker
AcroDistX
AcroIEHelperShim
Acromag Modbus/TCP OPC Server
AcroPDF
Add to Windows Media Player list
Adobe.AcroScanBroker
AP Client HxHelpPaneServer Class
appwiz.cpl
General
Location
Security
Endpoints
Identity
OK
Cancel
Apply
Browse...

Acromag Modbus/TCP OPC Server Properties

Which user account do you want to use to run this application?

● The interactive user.

○ The launching user.

○ This user.

User:

Password:

Confirm password:

○ The system account (services only).

Learn more about setting these properties.

```
3 INFO  [Data-Consumer-pool-thread-5] GatewayMessageConsumer - Transmitted Mes
```

8. **Reboot** the machine. Reboot is required for these changes to take effect

Datonis Gateway configuration for OPC DA

As mentioned in the ADAPTER SENSOR CONFIGURATION section, each adapter in the **datonis-gateway.properties** file has its own section. For OPC-DA, we need to configure the **opc_da** adapter. Please refer the datonis-gateway.properties.opc-da-template for a sample. Under this adapter, there is a **opc_server** section where we need to configure the OPC server details

Parameter	**Description**
opc_server_ip	IP Address of the OPC server
opc_server_cls_id	DCOM class id for the OPC server. Details of how to get it are mentioned below
opc_server_username	Specify the user we added in the DCOM configuration section above
opc_server_password	Specify the corresponding password

How to find the OPC server's DCOM class id?

1. In the start menu, type **regedit**.
2. expand **HKEY_CLASSES_ROOT** and look for the name that matches your OPC server.
3. Once found, expand it and you will find a key named **CLSID**
4. Copy the corresponding value. This is your class id. Note that you need to ignore the curly braces around the ID.

OPC UA CONFIGURATION

TBD

MTCONNECT CONFIGURATION

TBD