

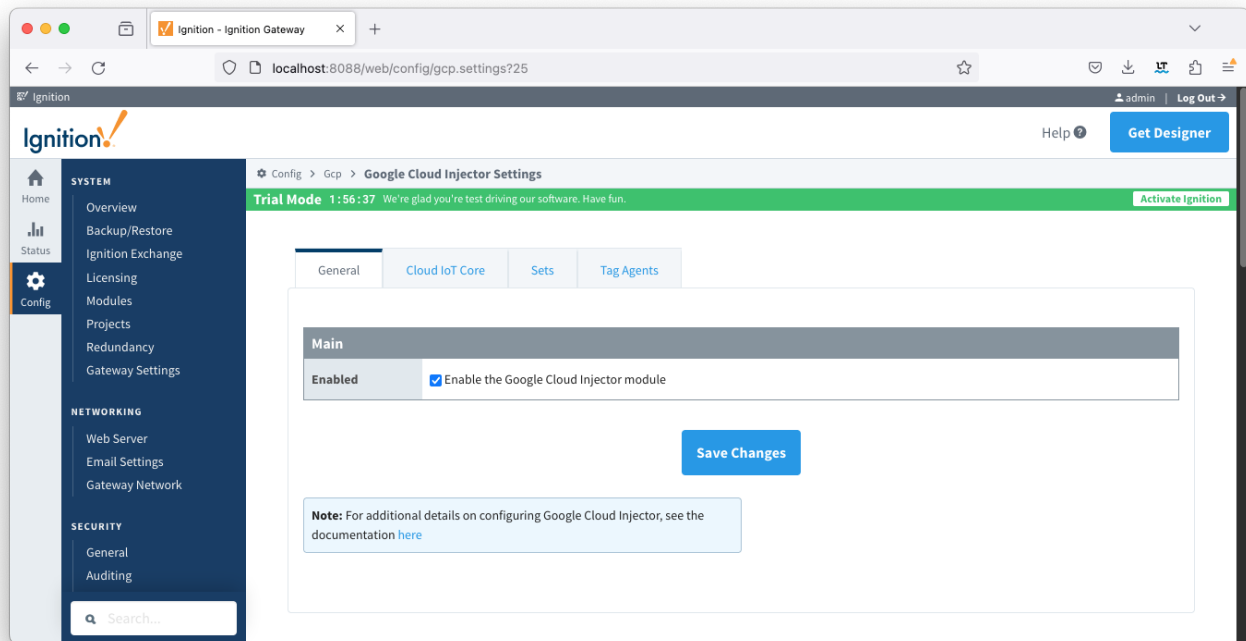
GCI: Configuration

i Google IoT Core was retired in the summer of 2023. Clearblade IoT Core provides a drop-in replacement for the MQTT Server endpoint. As a result, Clearblade IoT Core works with Cirrus Link's Google Cloud Injector and the Google Cloud. More information is available here: <https://iot.clearblade.com>.

The Google Cloud Injector module provides the ability to push Tag data to a Clearblade IoT Core. The settings configuration for this module are located under the Configure tab of the Ignition Gateway web UI. Once in the configuration section there are four tabs: General, Cloud IoT Core, Sets, and Tag Agents. Each of these tabs is described in detail in the following sections.

General

The first tab contains the general settings for the Google Cloud Injector module.



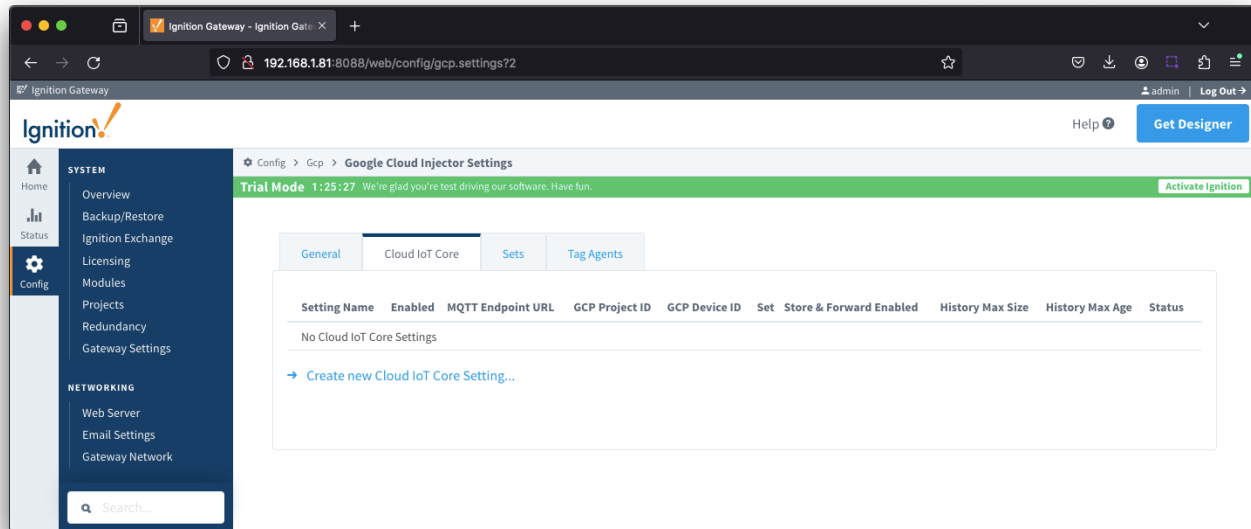
The general configurations options available on this tab are listed below:

Main

- **Enabled**
 - Sets whether the module is enabled or disabled. If disabled, the Tag Agents will not run and now data will be pushed to any configured endpoints.

Cloud IoT Core

The next tab is the list of Cloud IoT Core endpoints that the module will connect to. This is where data from the Tag Agents will be pushed.



One or more Cloud IoT Core endpoints can be configured on this tab. The configuration options for a Cloud IoT Core connection are listed below.

Main

- **Setting Name**
 - This is a friendly name of the Clearblade IoT Core used to easily identify it. This must also be unique.
- **Enabled**
 - Whether or not this Injector Setting is enabled to push data to the endpoint
- **MQTT Endpoint URL**
 - The Endpoint URL. Note this can be modified to support the correct ClearBlade endpoint for your configuration
 - Default: [ssl://us-central1.clearblade.com:1884](https://us-central1.clearblade.com:1884)
- **GCP Project ID**
 - The Google Cloud Platform project under which this device is provisioned
- **GCP Cloud Region**
 - The Google Cloud Platform cloud region under which this device is provisioned
- **GCP Registry ID**
 - The Clearblade Platform registry ID under which this device is provisioned
- **GCP Device ID**
 - The Clearblade Platform device ID under which this device is provisioned
- **Private Key File**
 - The private key file associated with the public key provisioned for the device in Clearblade Registry
 - The key needs to be in PKCS8 format
- **Algorithm**
 - The algorithm type used by the key file
- **Set**
 - The Set this Cloud IoT Core Setting is associated with

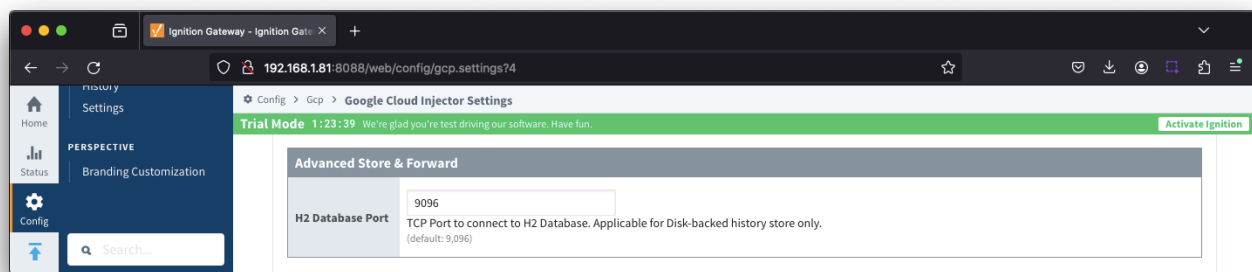
Store & Forward

- **Store & Forward Enabled**
 - Whether to enable Store & Forward capabilities for this endpoint
- **Store & Forward Type**
 - The type of the Store & Forward mechanism options: In_Memory and Disk_Backend (available in release 4.0.17 and higher)
 - Data stored with an In_Memory Store & Forward will not be persisted across a module configuration change, module disable/enable, module restart or power loss
 - Data stored with a Disk_Backend Store & Forward will persist across a module configuration change, module disable/enable, module restart or power loss
- **Message Capacity - deprecated in 4.0.19**
 - The maximum number of messages to store before dropping the oldest historical messages
- **History Max Size**
 - The maximum number of megabytes history can use before dropping the data
 - In_Memory Store & Forward will use the Ignition Java Heap memory
- **History Max Age - added in 4.0.19**
 - The maximum number of minutes to store history before dropping the data
- **Flush Period**
 - The period of time to wait (in milliseconds) between sending when flushing messages

Advanced

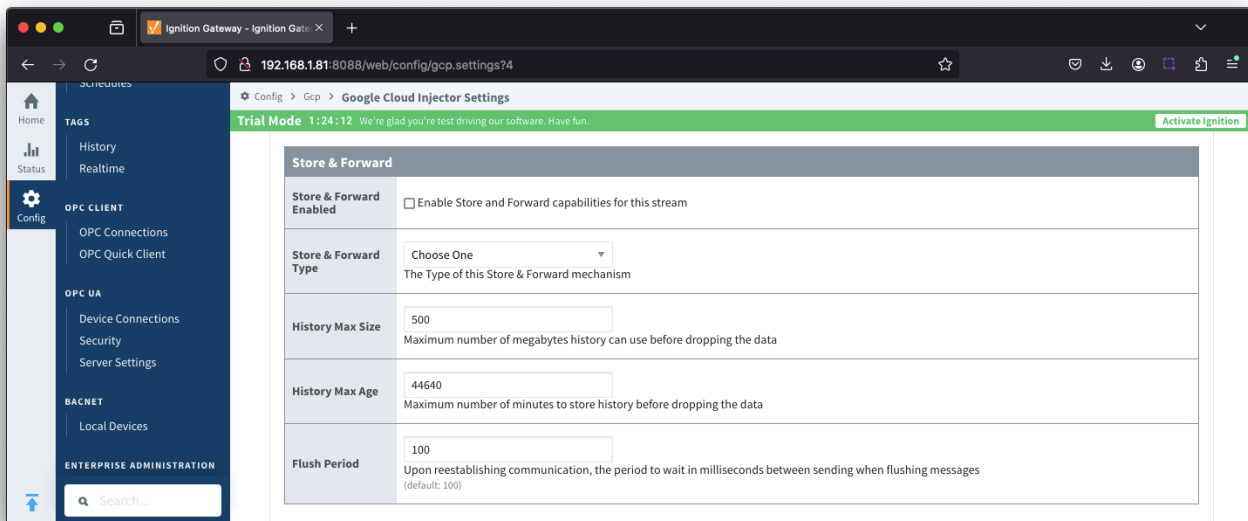
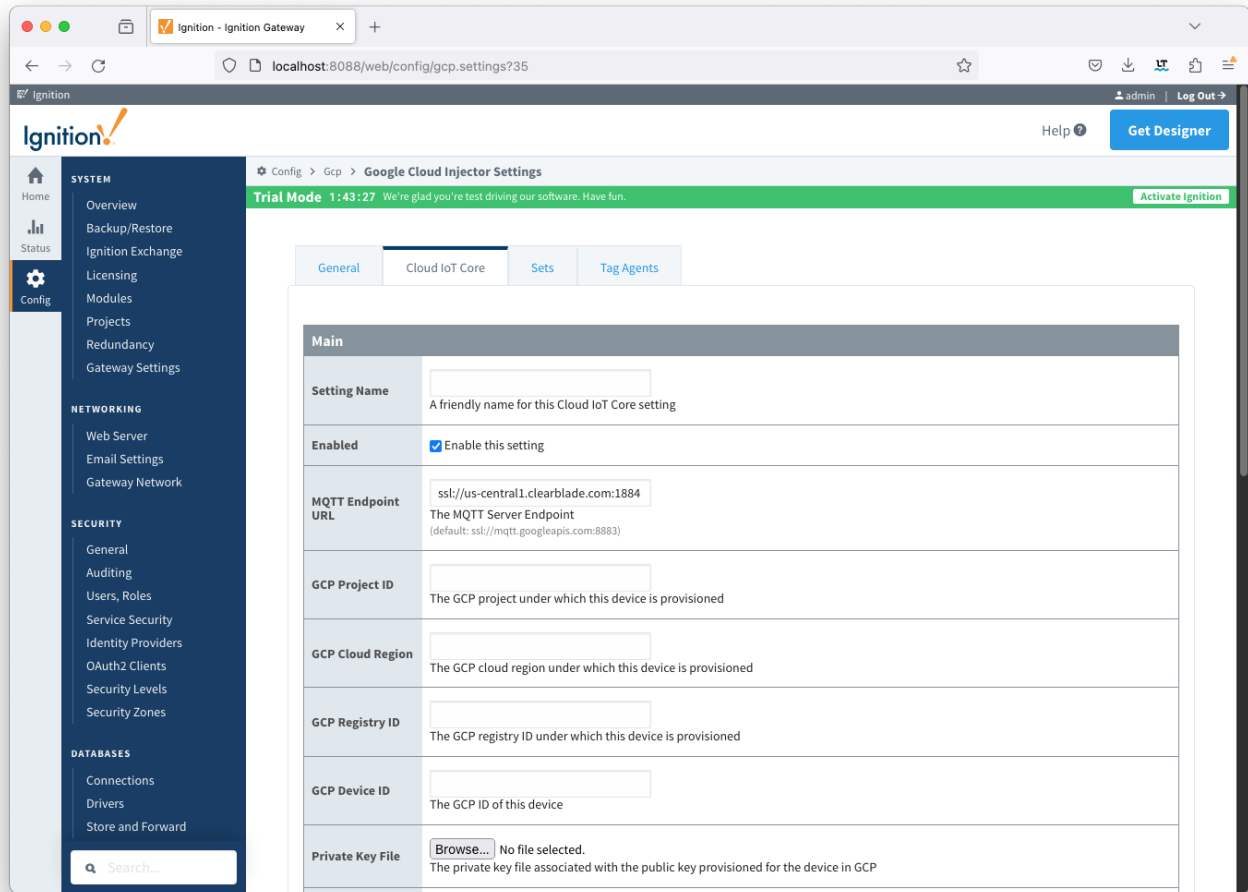
- **Port**
 - TCP Port number to use. Default is 8883
- **Proxy Type**
 - The proxy type if a proxy server is being used. Default is NONE
 - Options are NONE, HTTP, HTTPS
- **Proxy Hostname**
 - The Proxy Hostname if a proxy server is being used
- **Proxy Port**
 - The Proxy port number if a proxy server is being used
- **Keep Alive**
 - The MQTT Keep Alive timeout for the MQTT Connection
- **Max Message Size**
 - The maximum message size allowed for an MQTT message before the message will be broken up into smaller messages
- **Max Throughput**
 - Maximum throughput per second in bytes. The modules will throttle messages to prevent exceeding this max limit. Default is 524,288
- **Session Expiration**
 - The number of minutes before the session token expires. Default is 1440

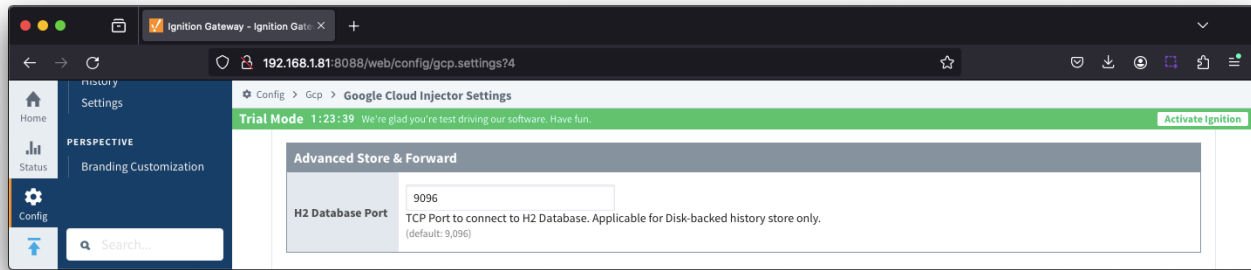
Advanced Store & Forward



- **H2 Database Port**
 - TCP Port to connect to H2 Database for Disk_Backed Store & Forward

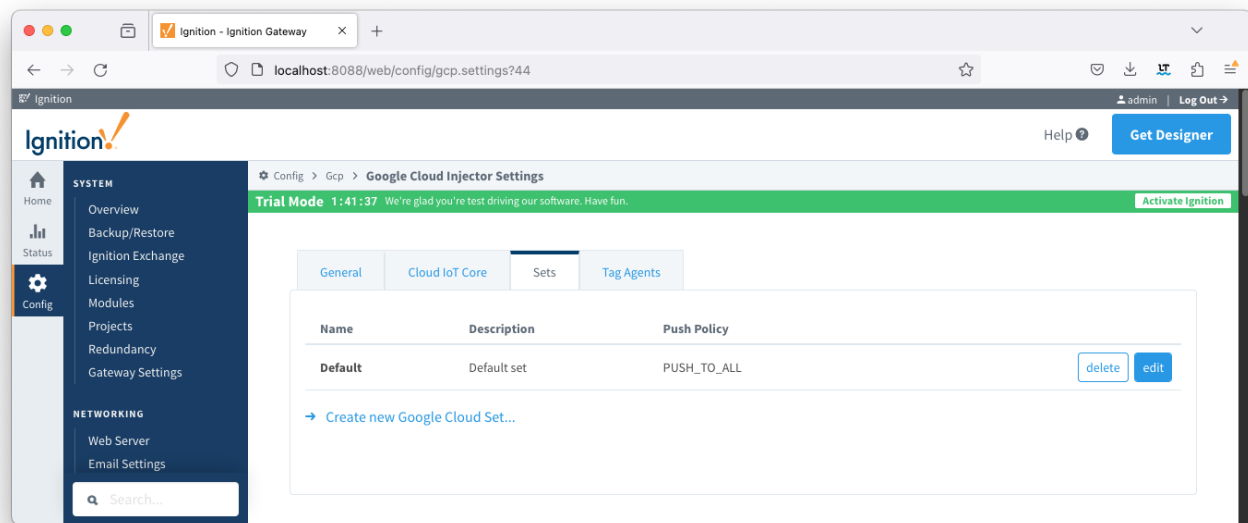
Clicking on the "Create new Cloud IoT Core Setting..." link will bring up the following form for adding a new Clearblade IoT Core endpoint.





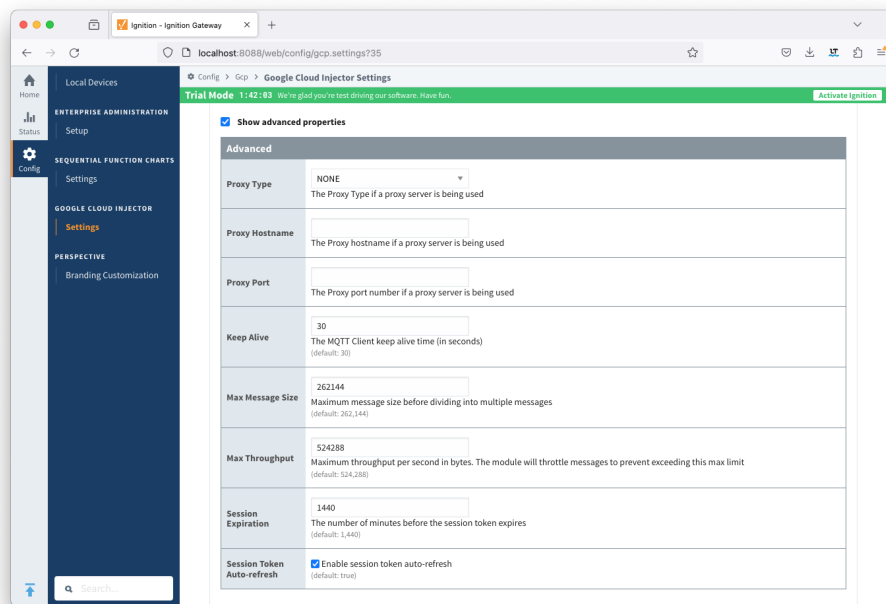
Sets

The Sets tab contains a list of Google Cloud Sets. Each set represents a grouping of Clearblade IoT Core endpoints. When a set is referenced by a Tag Agent the Agent will push Tag data to all Clearblade IoT Core endpoints contained within that Set. The Sets are disjoint, meaning that a single Clearblade IoT Core endpoint cannot be in more than one set. Out of the box the Google Cloud Injector module will have one "Default" set defined.



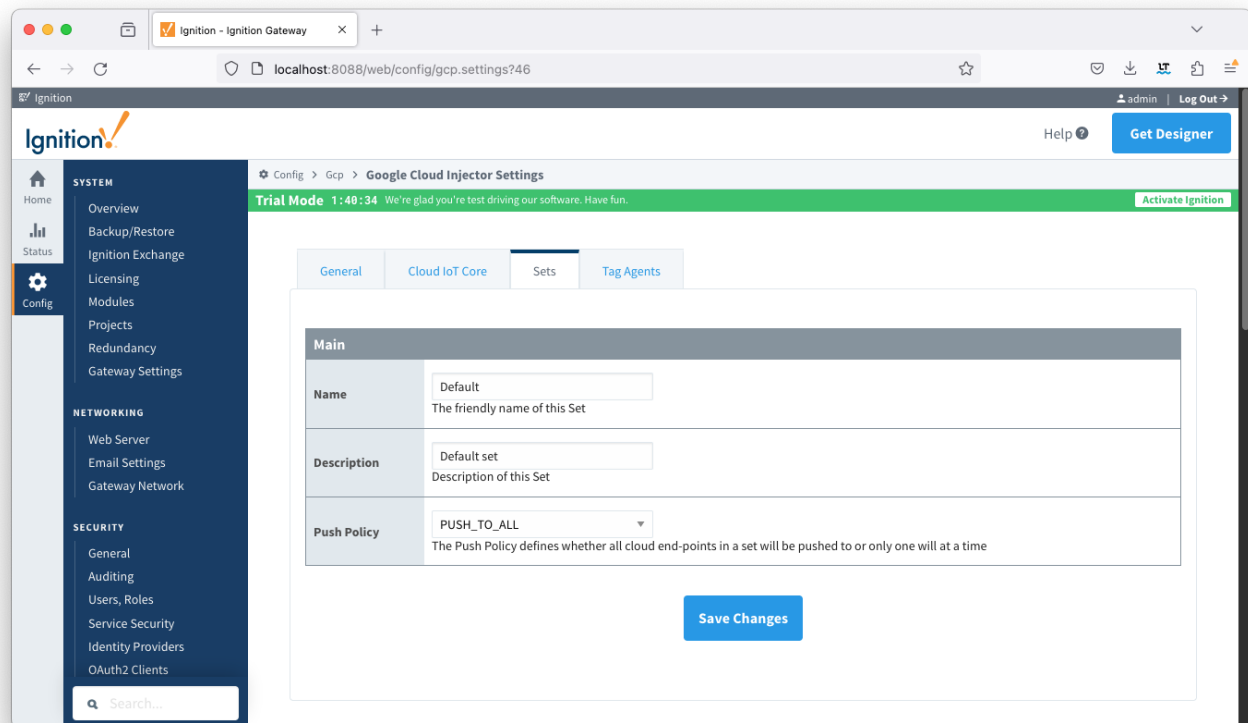
Additional Sets can be configured for situations where multiple Tag Agents will need to push to different Cloud IoT Core endpoints. The configuration options for Sets are listed below.

Main



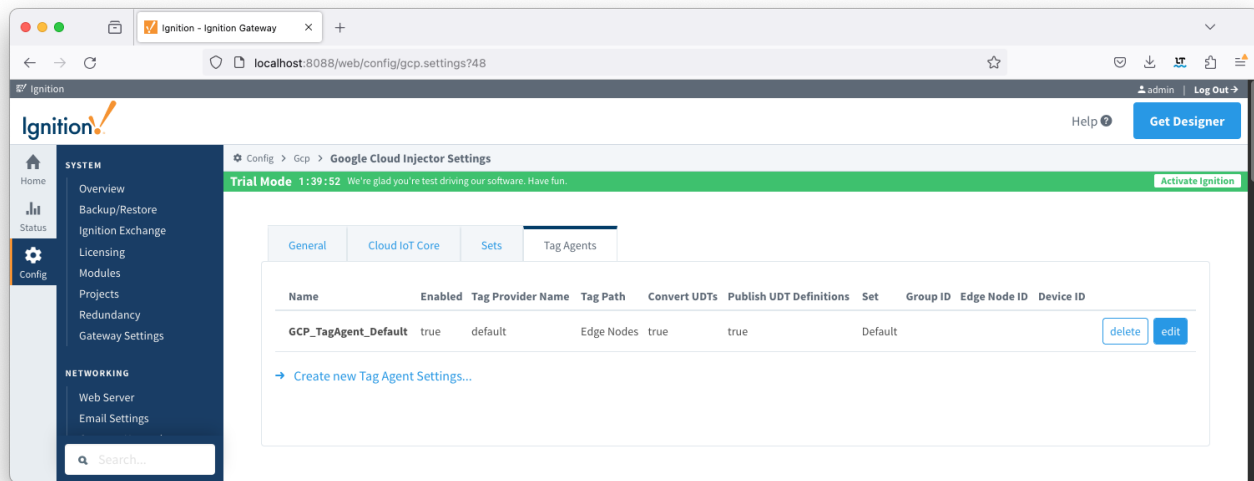
- **Name**
 - This is the friendly name of the set used to easily identify it.
- **Description**
 - This is a friendly description of the set.
- **Push Policy**
 - This defines which endpoints to push to. If PUSH_TO_ALL is selected, every endpoint that is part of this set will receive all messages. If PUSH_TO_ANY is selected, only one of the endpoints that is part of this set will receive any given message. PUSH_TO_ANY is useful when adding endpoint configurations to increase the throughput of the Injector.

Clicking on the 'Create new Google Cloud Set...' link will bring up the following form to add a new Set.



Tag Agents

Tag Agents are the workers within Google Cloud Injector that monitor tag events, convert them to a [JSON representation](#), and push them to one or more Clearblade IoT Core endpoints. Out of the box the Google Cloud Injector module will have one "default" Tag Agent defined.



Tag Agents are configured to point to a single folder. All Tags within that folder will be monitored by the Tag Agent.

Agent Settings

- **Name**
 - A unique name for the tag agent.
- **Enabled**
 - Sets whether the Tag Agent is enabled or disabled. If disabled, the Tag Agent will not run and no data will be pushed to any configured endpoints.
- **Tag Provider Name**
 - The name of the Tag provider containing the tags.
- **Tag Path**
 - An optional folder path under the Tag provider where the root folder of the Tags can be found.
- **Push Trigger**
 - The trigger to use when pushing data. EVENT_DRIVEN (default) means to push on change events. PERIODIC means to push all data on a periodic basis.
- **Tag Pacing Period**
 - The buffer period, in milliseconds, that Tag events will be aggregated into a single payload before pushing.
- **Convert UDTs**
 - Whether to convert UDT members to normal Tags before publishing. If enabled the Tags representing the UDT member will retain their member path prefixed by the UDT Instance name.
 - **Publish UDT Definitions**
 - This can only be set if 'Convert UDTs' is false
 - Whether or not to push the UDT Definitions in the the NBIRTH messages
 - **Optimize UDTs**
 - This can only be set if 'Convert UDTs' is false
 - Whether or not to 'convert UDTs' only for DATA messages.
- **Set**
 - The Set of Clearblade IoT Core endpoints that the Tag Agent will push to.

Sparkplug Settings

- **Group ID**
 - An ID representing a logical grouping of MQTT Edge Of Network (EoN) Nodes and Devices into the infrastructure.
- **Edge Node ID**
 - An ID that uniquely identifies the MQTT Edge Of Network (EoN) Node within the infrastructure.
- **Device ID**
 - An optional ID that uniquely identifies a Device within the infrastructure.

The Sparkplug settings are optional and allow for an additional customization of how the Tag Agent scans and discovers tag within the specified Tag Path. Here is a brief description of how the Agent scans/discovers folders based on the different combinations of potential Sparkplug Settings.

- If all three IDs are left blank the Agent will assume the following folder structures follow the Tag Path:
 - `<groupFolder>/<edgeNodeFolder>/<deviceFolder>/<tags>`
 - `<groupFolder>/<edgeNodeFolder>/<tags>`
- If only the Group ID is specified the Agent will assume the following folder structure follows the Tag Path:
 - `<edgeNodeFolder>/<deviceFolder>/<tags>`
 - `<edgeNodeFolder>/<tags>`

- If the Group ID and the Edge Node ID are specified the Agent will assume the following folder structure follows the Tag Path:
 - `<deviceFolder>/<tags>`
 - `<tags>`
- If the Group ID, Edge Node ID, and the Device ID are specified the Agent will assume the following folder structure follows the Tag Path:
 - `<tags>`

As you can see, the Sparkplug settings can be defined by setting these IDs in this configuration page, or leave them blank so that the Agent will scan and discover them based on the tag tree layout.

Advanced

- **Filtered Properties**
 - A semicolon delimited list of Tag properties to filter/block from being published. These should typically not be modified unless there is an explicit requirement that a specific property is needed to be added or removed from the default.

Clicking on the 'Create new Tag Agent Settings..' link will bring up the following form to add a new Tag Agent.

The screenshot shows the Ignition Gateway configuration interface. The left sidebar contains navigation links for Overview, Backup/Restore, Ignition Exchange, Licensing, Modules, Projects, Redundancy, Gateway Settings, NETWORKING, SECURITY, DATABASES, and ALARMING. The main content area is titled 'Google Cloud Injector Settings' and includes a 'Trial Mode' banner. The 'Tag Agents' tab is selected, displaying the 'Agent Settings' form.

Agent Settings	
Name	GCP_TagAgent_Default A unique name for the Tag Agent
Enabled	<input checked="" type="checkbox"/> Enable Tag Agent (default: true)
Tag Provider Name	default The Name of the tag provider
Tag Path	Edge Nodes A path to the root folder where the tag tree starts (optional)
Push Trigger	EVENT_DRIVEN The trigger to use when pushing data. EVENT_DRIVEN (default) means to push on change events. PERIODIC means to push all data on a periodic basis.
Tag Pacing Period	1000 If using an EVENT_DRIVEN Push trigger, the waiting period in milliseconds after an initial tag change event before pushing all changed tags. If using PERIODIC, the number of milliseconds to wait between pushing all data. (default: 1,000)
Convert UDTs	<input checked="" type="checkbox"/> Converts UDT members to normal Tags
Publish UDT Definitions	<input checked="" type="checkbox"/> Publish UDT Definitions in BIRTH
Optimize UDTs	<input checked="" type="checkbox"/> Optimizes UDT payload sizes in NDATA and DDATA payloads
Set	Default The Set this Agent is associated with

