



# MAGMA

**Network Management System (NMS)**

February 2019

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# Setup

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To setup access to the Magma NMS, enter the following commands at the command prompt on your laptop. Firefox is recommended.

```
git clone git@github.com:facebookexternal/magma.git
cd magma/nms/fbcnms-projects/magmalte/
docker-compose build magmalte
docker-compose up
docker-compose exec magmalte yarn run setAdminPassword
testuser@mydomain.com password1234
```

In the browser, go to <https://localhost/>. The Magma NMS opens.

The drop-down menu in the upper right corner of the screen lets you select the network you want to configure. In this example, it is MPK\_Test.



MPK\_TEST ▾



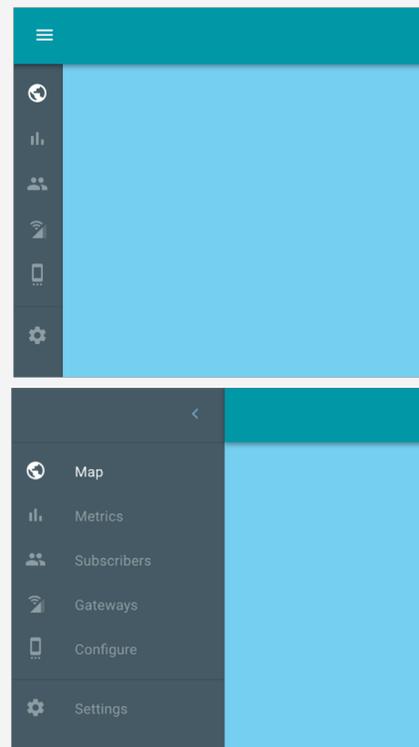
# Sidebar

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The sidebar has two views.

The sidebar provides tabs to the following configuration pages:

- Map
- Metrics
- Subscribers
- Gateways
- Configure
- Settings



# Map

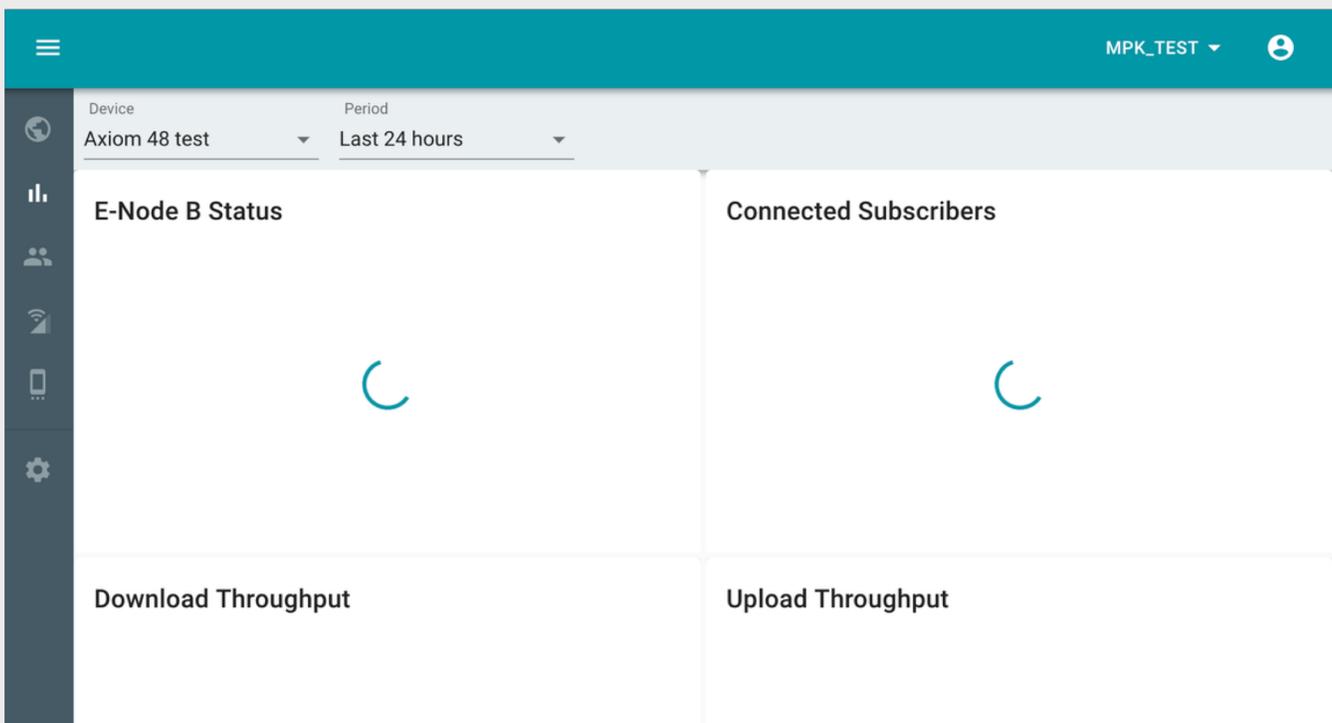
The **Map** page can show a map of the Magma network as its being implemented.



# Metrics

The **Metrics** page shows information about the Magma station, such as status, subscribers, and throughput.

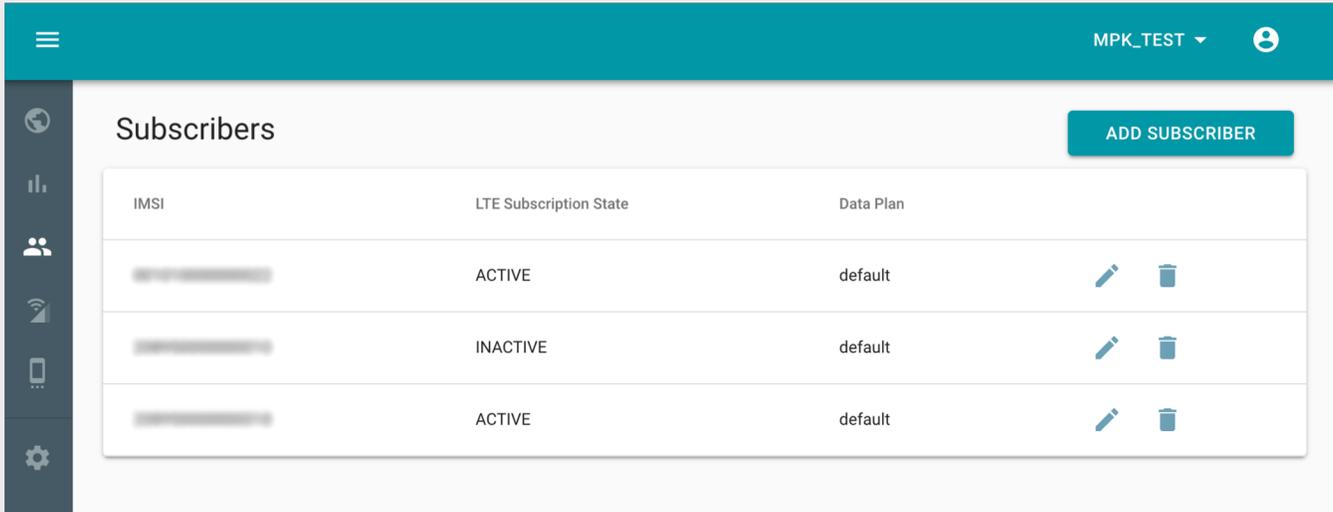
- From the **Device** menu, select the gateway you want.
- From the **Period** menu, select the time period you want



# Subscribers

The **Subscribers** page lets you add, configure, and edit Magma subscribers. To go to the **Subscribers** page:

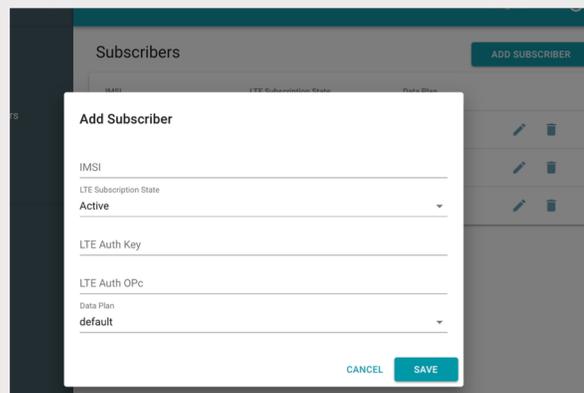
- On the sidebar, click the **Subscribers** icon



## Adding a Subscriber

To add a new subscriber:

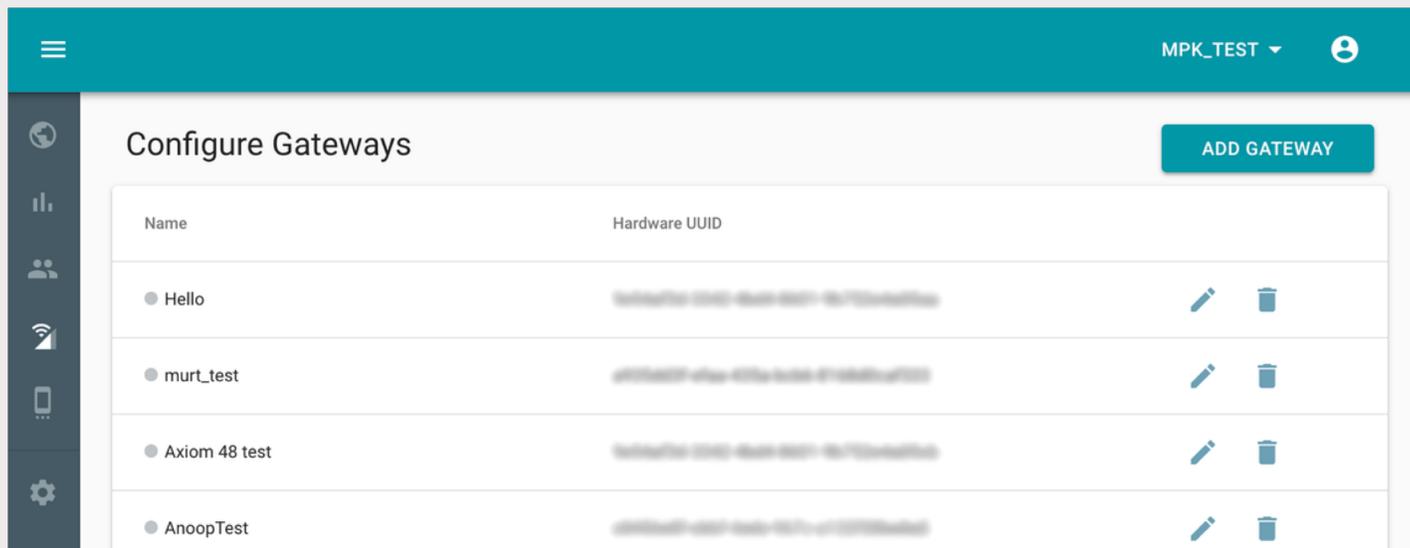
1. On the **Subscribers** page, click **ADD SUBSCRIBER**.
2. For **IMSI**, enter the International Mobile Subscriber Identity (IMSI) ID number.
3. For **LTE Subscription State**, select **Active**.
4. For **LTE Auth Key**, enter the LTE Authentication key.
5. For **LTE Auth OPc**, if OP is used instead of OPc, then this field should be left blank. OP is set in Network Configurations.
6. For **Data Plan**, enter **default**.



# Gateways

The **Gateways** page lets you add, configure, and edit gateways. To go to the **Configure Gateways** page:

- On the sidebar, select the **Gateways** icon. The **Configure Gateways** page appears.



## Adding a Gateway

Before you begin, get the Hardware ID and the Public Key from the gateway, using **show\_gateway\_info.py**.

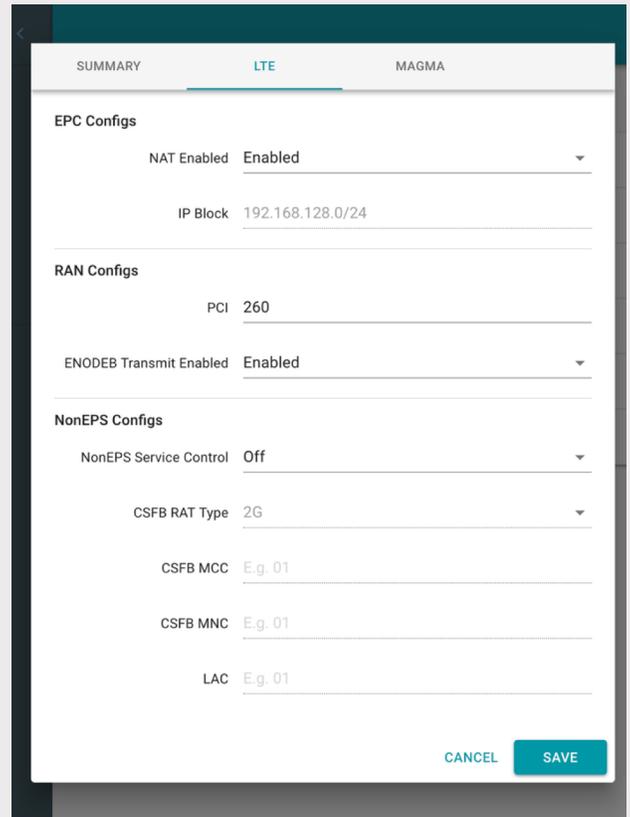
To add a gateway:

1. On the **Configure Gateways** page, click **ADD GATEWAY**. The **Add Gateway** screen appears.
2. For **Gateway Name**, enter a meaningful name that describes the gateway.
3. For the **Hardware UUID**, enter the Hardware ID for your gateway. Use the Hardware ID you got using **show\_gateway\_info.py**.
4. For **Gateway ID**, enter the gateway ID you want. Choose a meaningful name, such as country, organization, location, or site number.
5. For the **Challenge Key**, enter the gateway Public Key. Use the Public Key you got using **show\_gateway\_info.py**.
6. Verify that the new gateway appears on the **Configure Gateways** page.

# Editing a Gateway

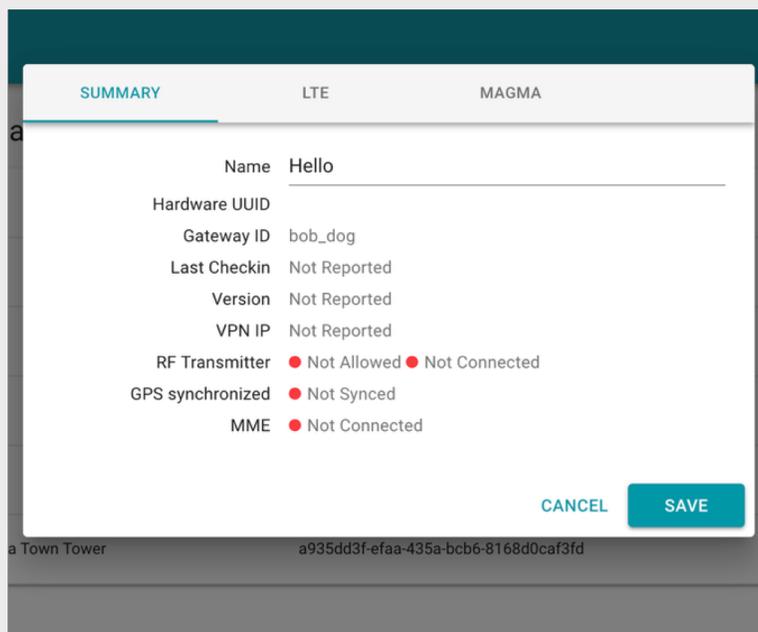
To edit a gateway configuration:

1. On the **Gateways** page, click the Edit icon to open the configuration dialog.
2. Select the **LTE** tab.
3. Under **EPC Configs**:
  1. Set **NAT enabled** to **Enabled**.
  2. Set **IP Block** to the IP address and mask you want, for example: 192.168.128.0/24.
4. Under **RAN Configs**:
  1. Set **PCI** to 260.
  2. Set **Enodeb Transmit Enabled** to **Enabled**.
5. Under **NonEPS Configs**:
  1. Set **NonEPS Service Control** to **Off**.
6. Click **Save**.



## Verifying Gateway Configuration

To verify a gateway configuration.



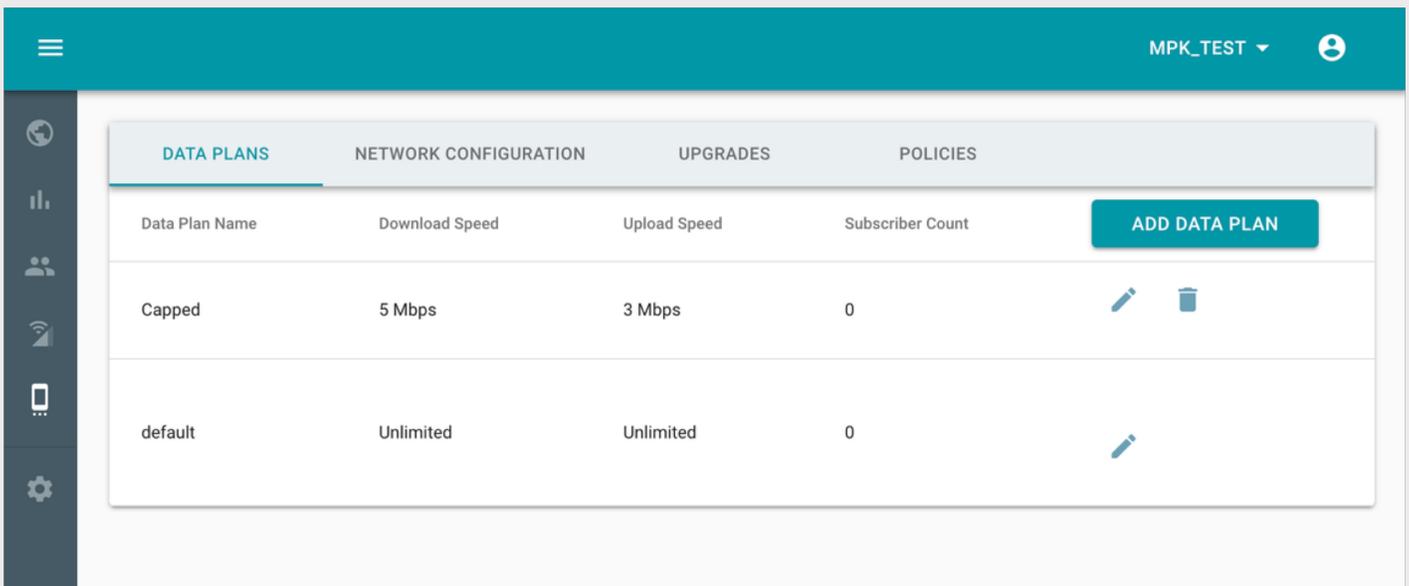
1. Click the **Summary** tab.
2. Verify that the gateway checks in to Orchestrator by verifying that the **Last Checkin** time was in the last few minutes. **Note:** This may take up to 10 minutes to update.
3. If the gateway does not check in to Orchestrator, use **checkin\_cli.py** on the gateway to debug.
4. Click on the **Magma** tab.
5. Verify that the **Autoupgrade** fields and the **Checkin** fields are set as you want them.

# Configure

To go to the **Configure** page, select the **Configure** icon on the sidebar.

The **Configure** page has four tabs:

- Data Plans
- Network Configuration
- Updates
- Policies



DATA PLANS	NETWORK CONFIGURATION	UPGRADES	POLICIES	
Data Plan Name	Download Speed	Upload Speed	Subscriber Count	ADD DATA PLAN
Capped	5 Mbps	3 Mbps	0	 
default	Unlimited	Unlimited	0	

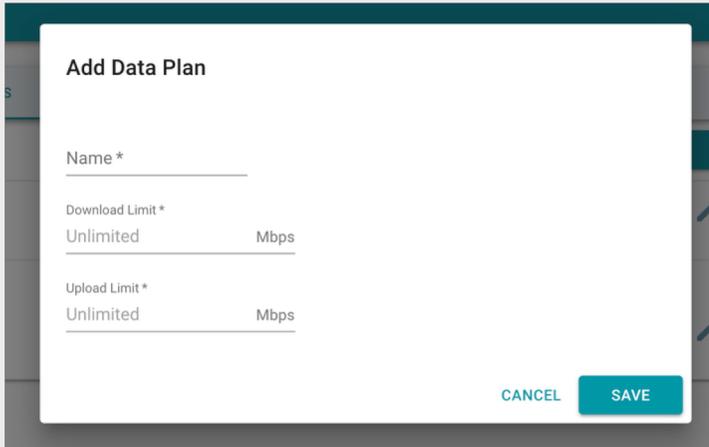
## Data Plans

A data plan is used to specify the rate limits for download and upload data transfers for subscribers. Users with administration level privileges can create and modify data plans, and can assign subscribers to existing data plans. The Download Limit(Mbps) and the Upload Limit (Mbps) fields specify the maximum data transfer rates for the subscriber that is assigned to the data plan.

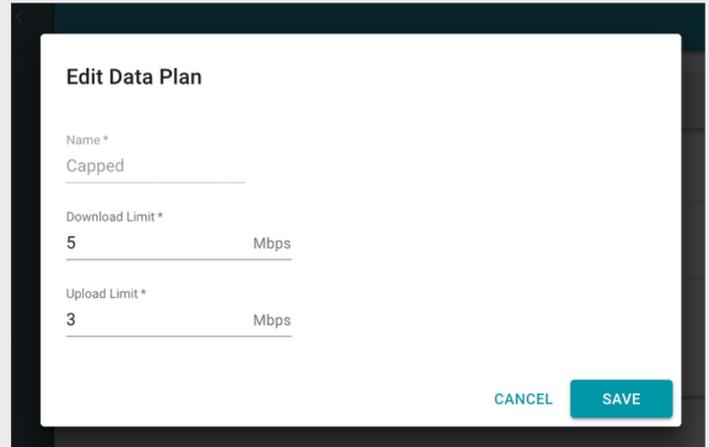
## Adding Data Plan

To add a Data Plan:

1. On the **Data Plan** page, click ADD DATA PLAN. The **Add Data Plan** screen appears.
2. For **Name**, enter the name you want for the Data Plan.
3. For **Download Limit**, enter the maximum transfer rate (in Mbps) for downloads that you want a UE to have under this plan. Zero (0) equals unlimited.
4. For **Upload Limit**, enter the maximum transfer rate (in Mbps) for uploads that you want a UE to have under this plan. Zero (0) equals unlimited.



The screenshot shows a white modal window titled "Add Data Plan" with a dark teal header. It contains three input fields: "Name \*" (empty), "Download Limit \*" (set to "Unlimited" with "Mbps" to the right), and "Upload Limit \*" (set to "Unlimited" with "Mbps" to the right). At the bottom right, there are "CANCEL" and "SAVE" buttons.



The screenshot shows a white modal window titled "Edit Data Plan" with a dark teal header. It contains three input fields: "Name \*" (set to "Capped"), "Download Limit \*" (set to "5" with "Mbps" to the right), and "Upload Limit \*" (set to "3" with "Mbps" to the right). At the bottom right, there are "CANCEL" and "SAVE" buttons.

## Editing A Data Plan

To edit a Data Plan:

1. On the **Data Plan** page, click the edit icon for the Data Plan you want to edit.  
The **Edit Data Plan** appears.
2. Enter the new values that you want.

## Removing a Data Plan

To remove a Data Plan:

- Click the trash icon for the Data Plan you want to delete.

## Network Configuration

On the **Network Configure** page, you can configure the network settings for a network.

The screenshot displays the 'Network Configuration' page within a mobile application. The interface includes a dark sidebar on the left with navigation options: Map, Metrics, Subscribers, Gateways, Configure, and Settings. The main content area has a teal header with 'MPK\_TEST' and a user icon. Below the header, there are four tabs: DATA PLANS, NETWORK CONFIGURATION (selected), UPGRADES, and POLICIES. The configuration fields are as follows:

Field	Value
MCC*	001
MNC*	01
TAC*	1
EARFCNDL*	39150
Auth OP	.....
Bandwidth (Mhz)	20
DL:UL Ratio	3:1

A teal 'SAVE' button is located at the bottom of the configuration form.

To configure a network, proceed as follows:

1. For **MCC**, enter the Mobile Country Code (MCC) for the network.
2. For **MNC**, enter the Mobile Network Code (MNC) for the network.
3. For **TAC**, enter the Tracking Area Code (TAC) for the network.
4. For **EARFCNDL**, enter the E-UTRA Absolute Radio Frequency Channel Number down link (EARFCNDL). The range is 0 to 65535.
5. For **Auth OP**, enter the authentication operation code.
6. For **Bandwidth**, select the bandwidth MHz block you want.
7. For **DL:UL Ratio**, select the downlink to uplink ratio you want.

# Upgrades

The **Gateway Upgrade Status** page displays information about currently supported releases and upgrade tiers. Upgrade tiers allow service providers to offer different levels of service to customers.

To assign a tier to a network:

- In the **Tier ID** column, select the tier you want from the pull down menu for that gateway.

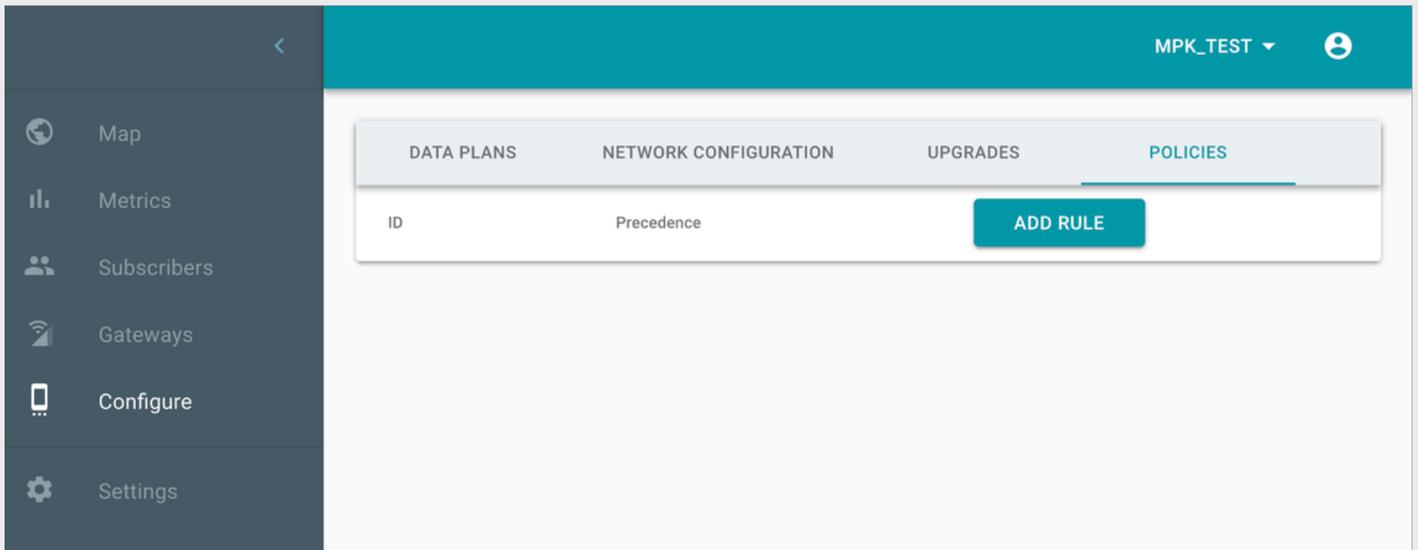
The screenshot shows a management console interface. On the left is a dark sidebar with navigation options: Map, Metrics, Subscribers, Gateways, Configure, and Settings. The main content area has a teal header with 'MPK\_TEST' and a user icon. Below the header are four tabs: DATA PLANS, NETWORK CONFIGURATION, **UPGRADES**, and POLICIES. The 'UPGRADES' tab is active, displaying the 'Gateway Upgrade Status' page. This page contains a table with the following data:

Name	Hardware UUID	Tier ID	Current Version
AnoopTest	[blurred]	tier1	Not Reported
Axiom 48 test	[blurred]	tier1	[blurred]
Hello	[blurred]	[blurred]	Not Reported
murt_test	[blurred]	[blurred]	Not Reported
South Park's CtPa Town Tower	[blurred]	[blurred]	0.0.0

Below the table is a section titled 'Current Supported Versions' with four rows of blurred text.

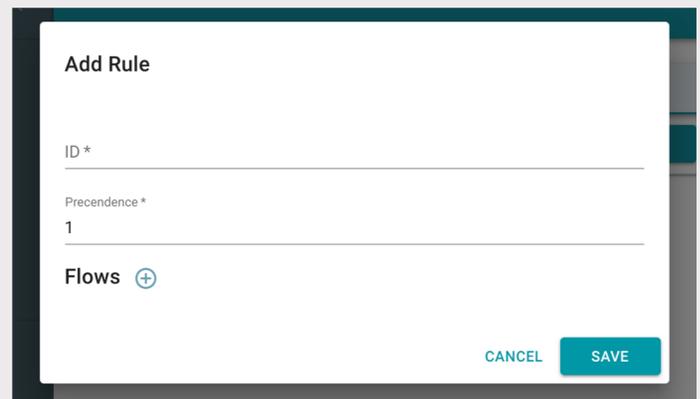
# Policies

The **Policies** page lets you add and define network flow policies for the gateway.



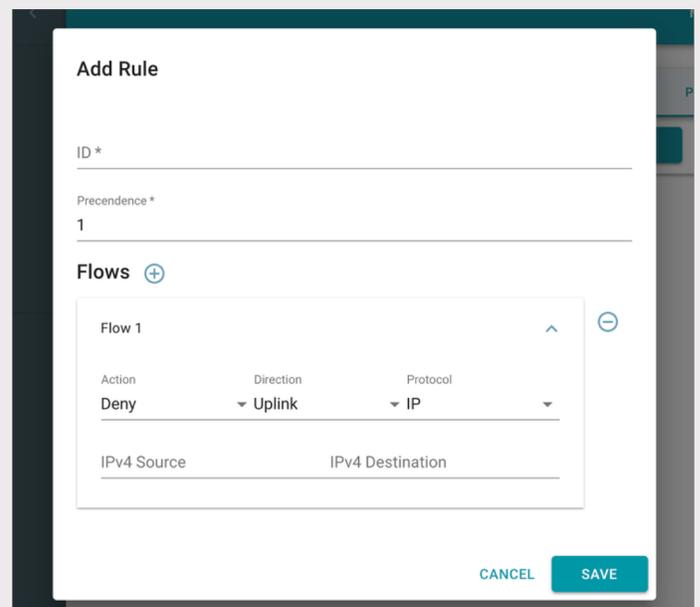
To add a new policy:

1. Click **ADD RULE**. The **Add Rule** screen appears.
2. Enter an **ID** for the rule.
3. Set the **Precedence** (priority) for the rule.



To configure a flow for the rule.

1. Click the plus sign after **Flows**.
2. For **Action**, select **Permit** or **Deny**.
3. For **Direction**, select **Uplink** or **Downlink**.
4. For **Protocol**, select **IP**, **UDP**, **TCP**, or **ICMP**.
5. Enter the **IPv4 Source** and **IPv4 Destination** addresses.
6. Click **SAVE**.



# Settings

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The **Settings Security** screen lets you change the password for the Magma Platform UI.

The screenshot shows the 'Settings Security' screen in the Magma Platform UI. The interface features a teal header bar with a menu icon on the left, the text 'MPK\_TEST' and a user profile icon on the right, and a dark grey sidebar on the left containing various system icons. The main content area is titled 'SECURITY' and contains a 'Change Password' section. This section includes three input fields: 'Current Password \*', 'New Password \*', and 'Confirm Password \*'. A teal 'SAVE' button is positioned below the input fields.



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