



SmartCow[®]
An AI Engineering Company

FleetTrackr

User's Manual

August 2022

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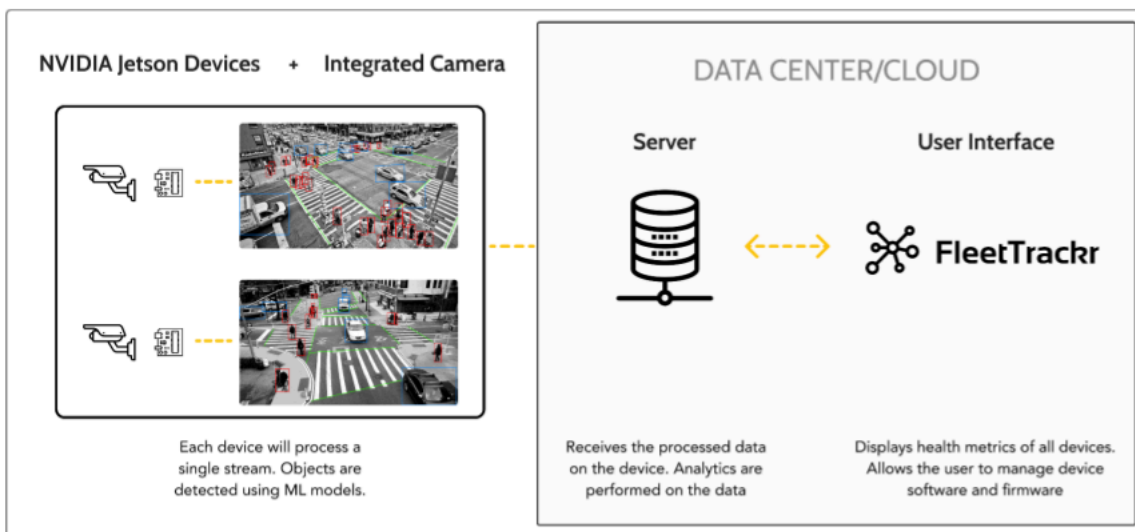
Topics:

- [Features and key benefits](#)
- [FleetTrackr architecture and components](#)
- [Creating a FleetTrackr admin user](#)
- [Sign in to FleetTrackr](#)

The section describes FleetTrackr, its architecture, and components.

FleetTrackr is an AIoT device management platform for SmartCow devices that enables administrators to remotely provision, manage, maintain, monitor, and update thousands of devices. It provides simplified deployment and centralized management of edge AI through a hybrid-cloud service.

The following figure illustrates the FleetTrackr workflow.



Features and key benefits

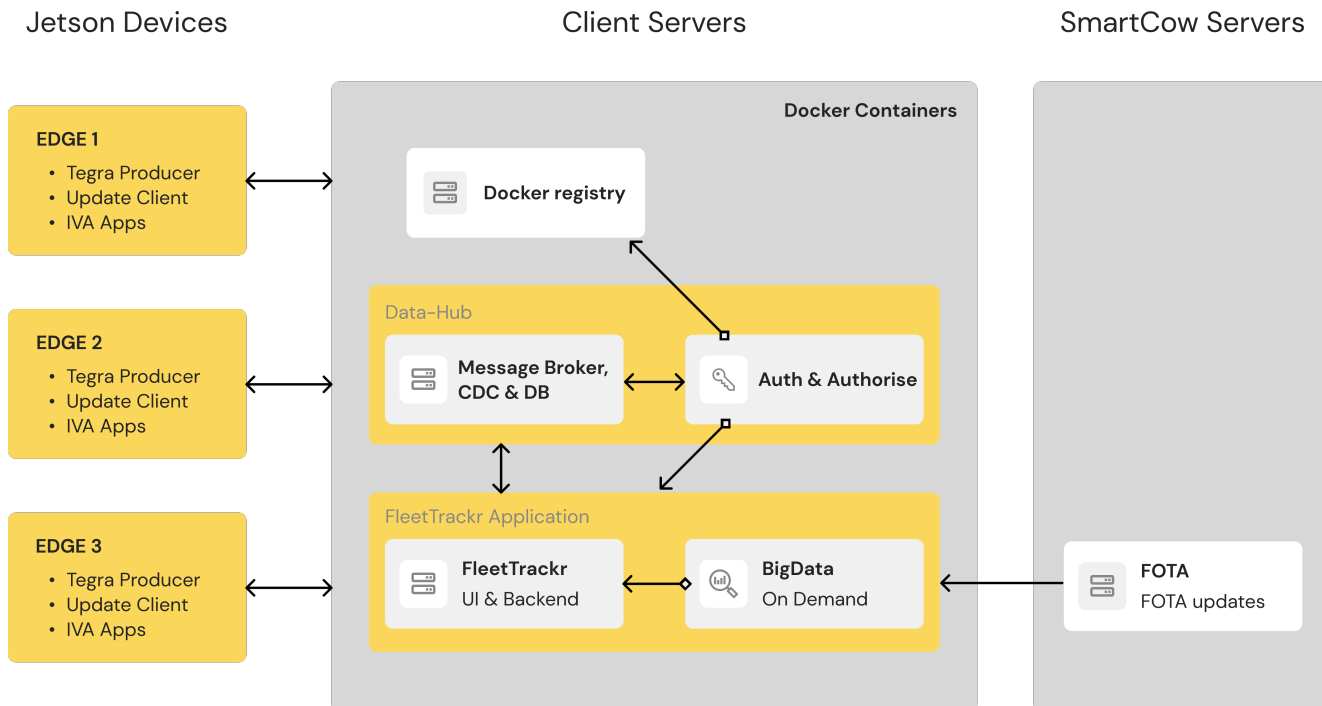
The following are the key benefits of FleetTrackr.

- Device management
 - Monitor device metrics and device status
 - Device performance KPIs
 - Access to all kinds of device documents
- Cloud native container management
 - Update or restart your container with a single click
 - Group fleets and provision containers easily
- Predictive maintenance
 - Detect hardware/software anomalies
 - Predict time-to-failure
- Firmware-Over-The-Air
 - Flash or re-flash devices via Over-The-Air
 - Recover Firmware remotely
- Issue management
 - Raise tickets when a device goes faulty
 - Manage teams to resolve tickets
 - Schedule regular maintenance tasks

- Track your issues

FleetTrackr architecture and components

The following diagram illustrates the FleetMap Trackr logical architecture and components.



SmartCow components

- **TegraProducer:** TegraProducer aggregates system metrics from an edge device, looks for anomalies in the data, and transmits filtered data that is critical to your solution to external servers or data repositories.
- **Update Client:** Update Client (UC) remotely pushes new containers or updates existing containers running on the edge device, which can be managed using the FleetTrackr dashboard.
- **FOTA:** The Firmware-Over-The-Air (FOTA) feature enables you to remotely program, reprogram, and push updates using the FleetTrackr UI.

Creating a FleetTrackr admin user

Follow these steps to create a FleetTrackr admin user using Keycloak.

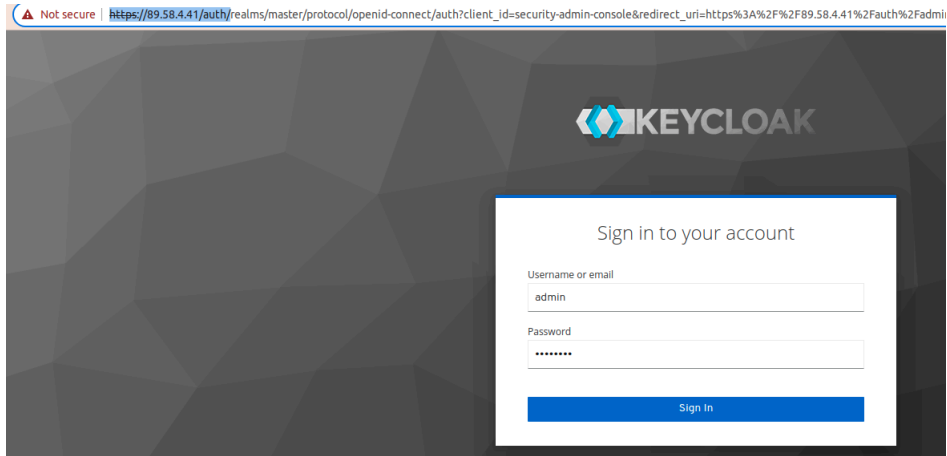
Procedure

1. Log into Keycloak.

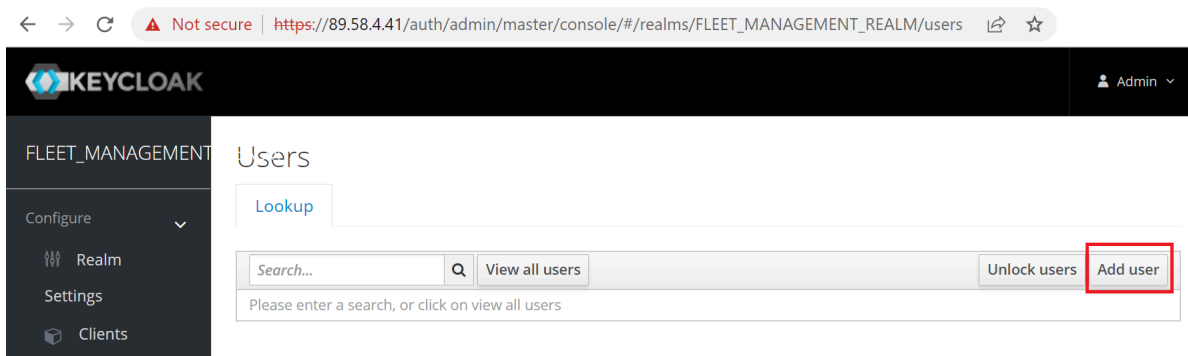
In your browser's address bar, type the following URL.

<https://89.58.4.41/auth/>

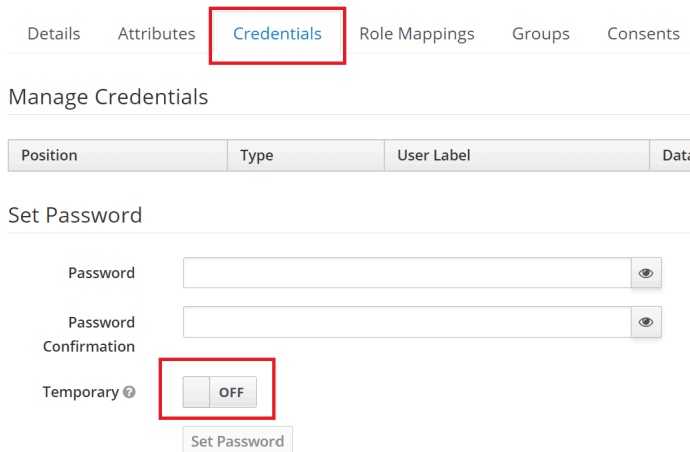
The *Sign in to your account* page appears.



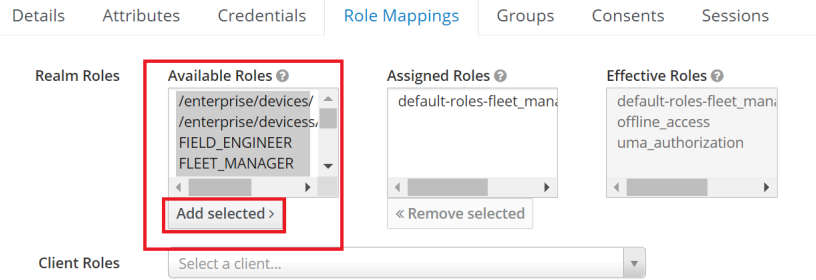
2. In the **Username or email** box, type `admin`.
3. In the **Password** box, type `Pa55w0rd`.
4. Click **Sign In**.
The *Users* page is displayed by default.



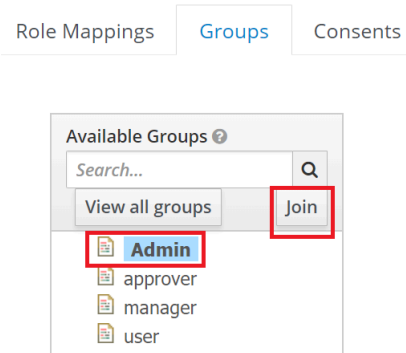
5. Click **Add user**.
6. In the **Username** box, type a username for the user you want to create.
7. Click **Save**.
The username is created and the system displays the *Details* tab by default.
8. Click the **Credentials** tab.



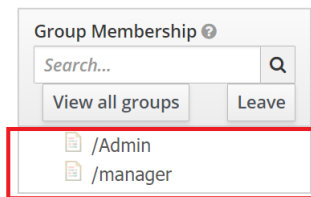
9. In the **Password** box, type the password for the admin user.
10. In the **Password Confirmation** box, retype the password.
11. Toggle the **Temporary** switch to **OFF** position.
12. Click the **Role Mappings** tab.
13. From the **Available Roles** list, select all roles.



14. Click **Add selected** to add roles to assigned roles.
15. Click the **Groups** tab.
16. In the *Available Groups* section, click **Admin** and then click **Join**.



17. Click **manager** and then click **Join**.
Both Admin and manager groups appear in the *Group Membership* section.

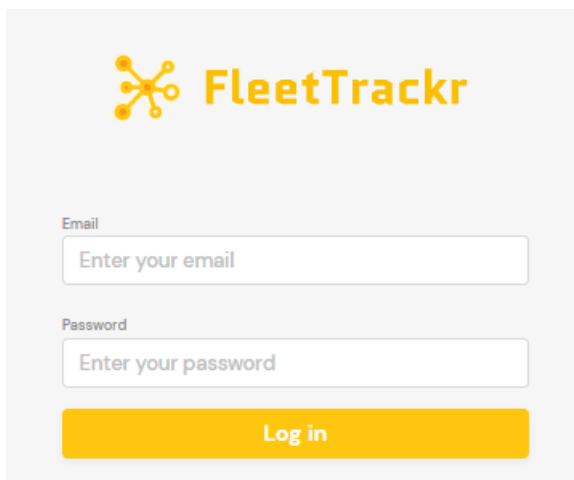


Sign in to FleetTrackr

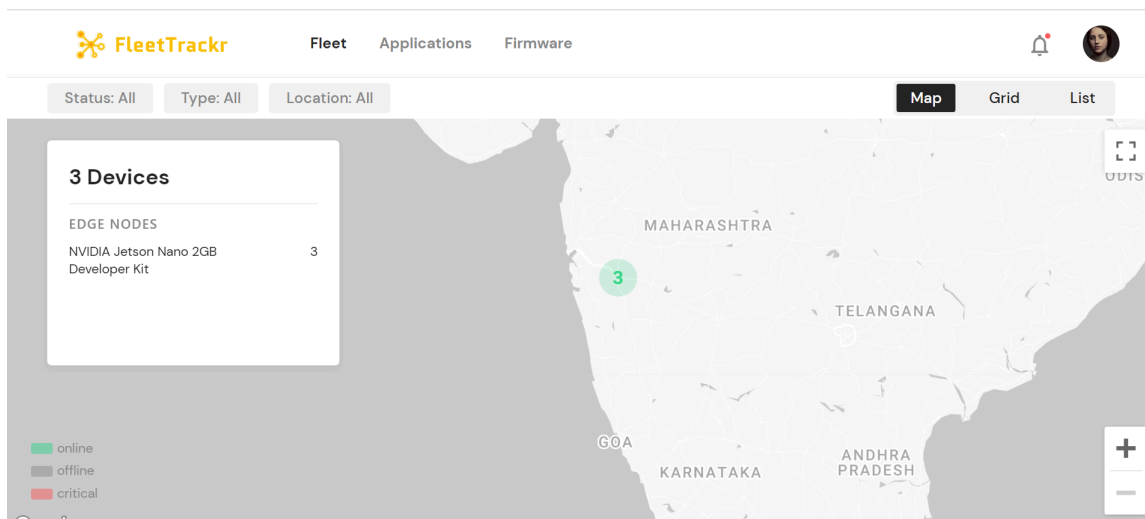
Follow these steps to Sign in to FleetTrackr.

Procedure

1. In your browser's address bar, type the FleetTrackr URL.
The login page appears.



2. In the **Email** box, type the email address.
3. In the **Password** box, type the password.
4. Click **Log in**.
The FleetTrackr home page (Fleet) appears.



Topics:

- [Concept topics](#)
- [Task topics](#)

This section describes how to use the FleetTrackr home (Fleet) and device management user interface.

Concept topics

About the FleetTrackr Fleet page

The FleetTrackr Fleet page enables you to gain a better understanding of your devices.

Table 1: FleetTrackr Fleet Home page

Section	Description
Home page main window	<p>FleetTrackr dashboard has three different views.</p> <ul style="list-style-type: none"> • Map: Shows an embedded responsive Google Maps to help you visualize the location of your active devices in real time. You can zoom in or out and click on a device to view its detailed information and related metrics. • Grid: Shows devices in rectangular cards. You can click on each device card to view its detailed information and related metrics. • List: Shows devices in a list. However, you cannot click on the device in the list to view its detailed information.
Fleet Status	<p>Displays the status of all devices in your network, whether they are online (green), critical (red), or inactive (gray). You can narrow down the list even further by clicking Status Status: All and then selecting Active, Critical, or InActive check boxes. You can click on a device to view its detailed information and related metrics in the following tabs.</p> <ul style="list-style-type: none"> • Overview: Shows Device ID, Hostname, IP address, MAC address, type of edge device, status, device location, uptime, system time, average idle time, priority logs, and total logs. • Health: Shows CPU utilization including temperature and speed, RAM/GPU utilization including in use and free space, EMMC utilization, NVMe utilization, and the status of NVENC, NVDEC, DLO, DL1, DLA0, DLA1, and FAN. • Tickets: Shows ticket information such as issue ID, device, category, priority, location, and assignee. • Applications: Shows release information and application information such as application name, status, and date updated.
Search bar	<p>You can search for devices by specifying any of the following options.</p> <ul style="list-style-type: none"> • Device: The device ID of the device. • Group: The fleet group name. • Ticket: The ticket number. • People: The user name of the Admin or Manager user.

Section	Description
Top bar	<p>The top navigation bar appears on all pages and enables you to perform the following tasks.</p> <ul style="list-style-type: none"> Navigate between the Fleet, Applications, Firmware, Tickets, and People screens. Check for device alerts. For more information, see Viewing notifications on page 10. Edit your profile, change your password, access the online help, and log out of FleetTrackr.

About device groups

A device group is a logical grouping of devices that facilitates viewing devices that share common characteristics, such as device type or device location. A device can belong to multiple groups.

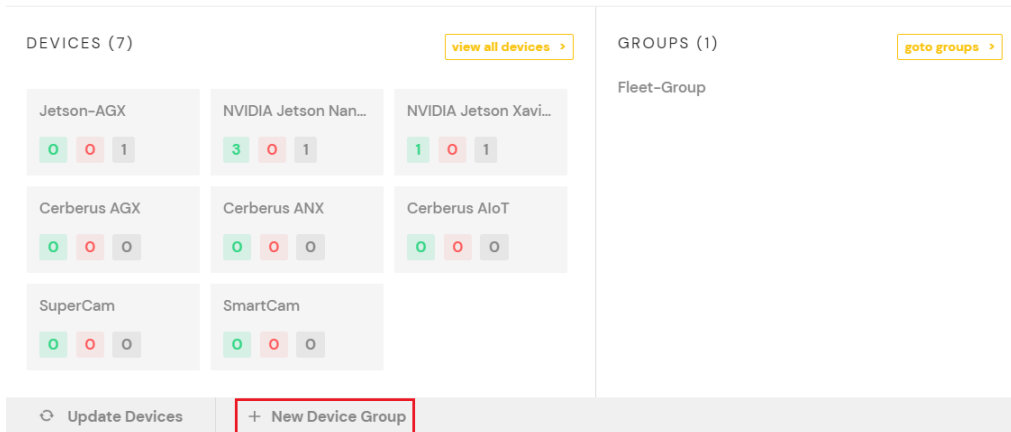
Task topics

Creating a device group

A device group can only be used for grouping devices in the Fleet section and is not visible in other areas of the application.

Procedure

- On the FleetTrackr application, click **Fleet**.
The Fleet dialog box appears.



- At the bottom of the dialog box, click **New Device Group**.
The *NEW DEVICE GROUP* dialog box appears.

NEW DEVICE GROUP
✕

New Group Name

Group Name

AVAILABLE DEVICES(7)

Host ▾ Search device ...

linux <small>0420119098038</small>	nx-dev-kit <small>1421621065463</small>	linux <small>1423221019472</small>
NNCO2 <small>1423720060285</small>	NNCO1 <small>1423820000908</small>	NNCO3 <small>1423820003189</small>
NNC20 <small>1424320071929</small>		

< 1 >

SELECTED DEVICES(0)

Remove All

This group can only be used for device groups and won't be visible in other areas of the app.

Create Group

3. In the **New Group Name** box, type a meaningful name for the device group.
4. In the **AVAILABLE DEVICES** section, you can perform one of the following actions.
 - Click **Add All** to select all edge devices to be selected to be added to the application group.
 - Search for edge devices using the hostname, serial number, MAC address, or IP address to select the edge devices.
 - a. Click the drop-down list to select the search criteria.
 - **Host**
 - **Serial**
 - **Mac**
 - **IP**
 - b. In the **Search device** box, type the keywords to search.
The search results are displayed below the search box.
 - c. Click the add icon to select the device to be added to the application group.
The device appears in the **SELECTED DEVICES** section.
 - In the section below the search bar, click the add icon on a device you want to select to be added to the application group.

Tip: To remove all selected devices, in the **SELECTED DEVICES** section, click **Remove All**.

5. Click **Create Group**.

Viewing notifications

View information about devices whose status is critical and requires your attention.


Procedure

1. On the top navigation bar's right-hand corner, click .
A list of notifications appears.


NOTIFICATIONS (6)


mark all as read





 Lisa (Engineer) added by Wilson 2m


[Create Ticket](#) [Ignore](#)

 **NNC000237** 5m
Temperature is near to critical (38°C)

 **NNC000237** 5m
Storage is running out (Only 256 MB Left)

 **NNC000237** 5m
Storage almost full (98%)

 **NNC000237** 5m
Storage is running out (Only 256 MB Left)

 **Mark replied in T-3872** 10m
Yes it looks exactly the same Do you need.....

2. You can do one of the following actions.

- **Create Ticket**
- **Ignore**

Topics:

- [Concept topics](#)
- [Task topics](#)

This section describes how to view the deployed application (container) packages, as well as their status, and how to deploy new applications on your edge devices.

Concept topics

About applications

The Applications section displays the various deployed applications (container packages), associated devices that are running an application, and device IDs that are associated with each application.

About application updates

The Applications Updates section enables you to perform firmware over-the-air (FOTA) updates on a group of edge devices.

An application group is a logical grouping of devices that facilitates updating application on devices that share common characteristics, such as device type, model, or version. A device can belong to multiple groups.



Note: Groups in this section are independent from device groups in the Fleets section. Create, edit, or delete without affecting core device groups.

Update Manager

You can check the status of the most recent update.

Schedule Manager

You can see when an update is scheduled for a specific group of edge devices.





Task topics

Viewing deployed applications and status of devices

View the deployed applications, associated devices that are running an application, and device IDs.

Procedure

1. On the FleetTrackr application, click **Applications**.
The *Applications* tab appears by default.

APPLICATIONS (4)								
Application Name	Application Status							
 centos:latest sha256:e6a0117ec169eda93dc5ca978c8ac87580e3...	1 device	0 running	1 stopped	0 paused	0 restarting	0 removing	0 dead	▼
 hello-world:latest sha256:46331d942d6350436f64e614d75725f6de3b...	3 devices	0 running	3 stopped	0 paused	0 restarting	0 removing	0 dead	▼
 harbor.dev.smartcow.cloud/ds- apps/random-logger:latest sha256:5b771db46f4add301f04f006082c499e3dbc...	1 device	0 running	1 stopped	0 paused	0 restarting	0 removing	0 dead	▼
 nginx:latest sha256:8f05d73835934b8220elabd2f157ea4e2260...	2 devices	1 running	1 stopped	0 paused	0 restarting	0 removing	0 dead	▲
<div style="border: 1px solid red; padding: 5px; display: inline-block;"> NNC02 1423720060285 </div>								

1. Number of devices running the application (container)
2. Device ID



The following table lists the application statuses and descriptions.

Table 2: Application status

Status	Description
running	Indicates the number of devices on which the application is currently running.
stopped	Indicates the number of devices on which the application has stopped.
paused	Indicates the number of devices on which the application's processes are paused.
restarting	Indicates the number of devices on which the application is in the process of being restarted.
removing	Indicates the number of devices on which the application is currently being removed.
dead	Indicates the number of devices on which the daemon attempted but failed to stop (usually due to a busy device or resource used by the application).

2. To view the device IDs of devices that are running a particular application, in the row corresponding to the application, click the downward arrow ▼.

The device IDs are displayed as shown in the following figure.

 harbor.dev.smartcow.cloud/ds- apps/random-logger:latest sha256:5b771db46f4add301f04f006082c499e3dbc...
 nginx:latest sha256:8f05d73835934b8220elabd2f157ea4e2260...
<div style="border: 1px solid red; padding: 5px; display: inline-block;"> NNC02 1423720060285 </div>

1. Device ID

Creating an application group

The application group can only be used for application updates and is not visible in other areas of the application.

Procedure

1. On the FleetTrackr application, click **Applications**.
The *Applications* tab appears by default.
2. Click **Application Updates**.
The *APPLICATION GROUPS* page appears.
3. Click **Add New Group**.
The *NEW APPLICATION GROUP* dialog box appears.

NEW APPLICATION GROUP X

New Group Name

Group Name

AVAILABLE DEVICES(6) + Add All

Host ▾ Search device ...

linux 0420119098038	nx-dev-kit 1421621065463	linux 1423221019472
NNC02 1423720060285	NNC01 1423820000908	NNC03 1423820003189

< 1 >

SELECTED DEVICES(0) - Remove All

This group can only be used for application updates and won't be visible in other areas of the app.

Create Group

4. In the **New Group Name** box, type a meaningful name for the application group.
5. In the *AVAILABLE DEVICES* section, you can perform one of the following actions.
 - Click **Add All** to select all edge devices to be selected to be added to the application group.
 - Search for edge devices using the hostname, serial number, MAC address, or IP address to select the edge devices.
 - a. Click the drop-down list to select the search criteria.
 - **Host**
 - **Serial**
 - **Mac**
 - **IP**
 - b. In the **Search device** box, type the keywords to search.
The search results are displayed below the search box.
 - c. Click the add icon to select the device to be added to the application group.
The device appears in the *SELECTED DEVICES* section.
 - In the section below the search bar, click the add icon on a device you want to select to be added to the application group.



Tip: To remove all selected devices, in the *SELECTED DEVICES* section, click **Remove All**.

6. Click **Create Group**.

Deploying an application to a group of devices

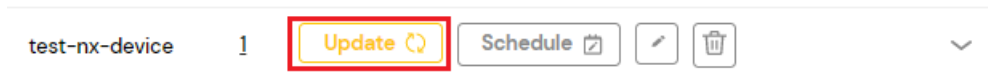
Follow these steps to deploy an application to a group of devices.

Before you begin

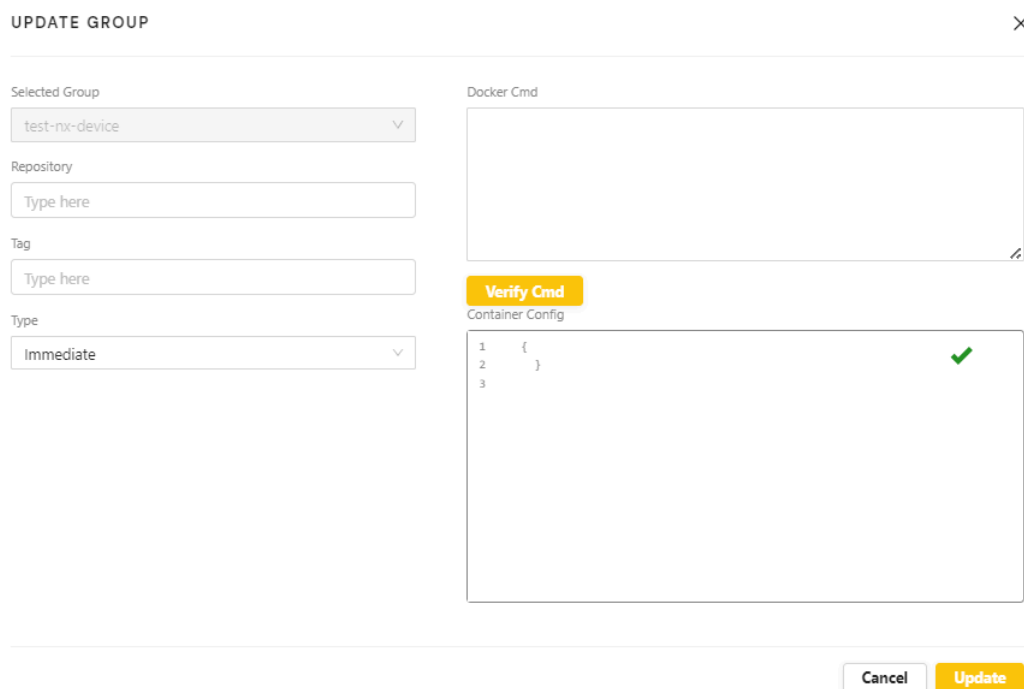
- Ensure that you have the repository (Docker image) and tag information from SmartCow.
- Created an application group. For more information see [Creating an application group](#) on page 14.

Procedure

1. On the FleetTrackr application, click **Applications**.
The *Applications* tab appears by default.
2. Click **Application Updates**.
The *APPLICATION GROUPS* page appears.
3. In the row corresponding to the application group you want to update, click **Update** as shown in the following figure.



The *UPDATE GROUP* dialog box appears.



4. You can perform one of the following actions.
 - In the **Repository** and **Tag** boxes, specify the repository (Docker image) path and tag respectively to pull the image.
 - In the **Docker Cmd** text area, type the Docker command to pull the Docker image and then click **Verify Cmd**.
5. From the Type drop-down list, select one of the following.
 - **Immediate**: To immediately pull the Docker image.
 - **As Scheduled**: To schedule the Docker image pull event until a later time.
6. Click **Update**.

Editing an existing application group

You can only add or remove edge devices from an application group.

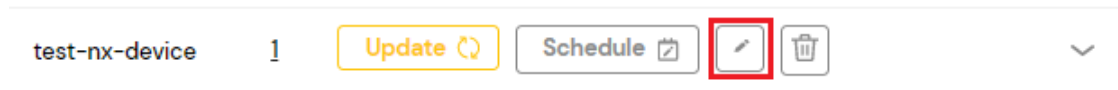
Procedure

1. On the FleetTrackr application, click **Applications**.
The *Applications* tab appears by default.

2. Click **Application Updates**.

The *APPLICATION GROUPS* page appears.

3. In the row corresponding to the application group you want to edit, click the edit icon as shown in the following figure.



The *EDIT APPLICATION GROUP* dialog box appears.

4. Add or remove edge devices from the application group.

5. Click **Update Group**.

Deleting an application group

Follow these steps to delete an application group.

Procedure

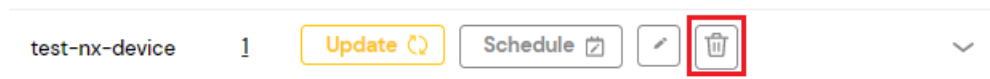
1. On the FleetTrackr application, click **Applications**.

The *Applications* tab appears by default.

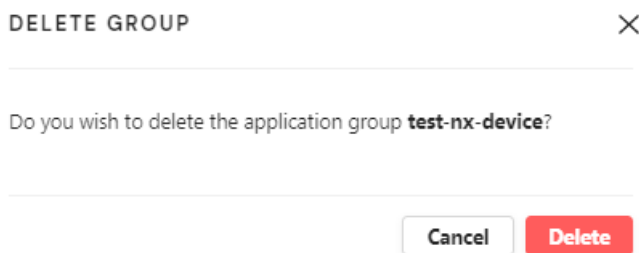
2. Click **Application Updates**.

The *APPLICATION GROUPS* page appears.

3. In the row corresponding to the application group you want to delete, click the delete icon as shown in the following figure.



The *DELETE GROUP* dialog box appears and displays the following message.



4. Click **Delete**.

Topics:

- [Concept topics](#)
- [Task topics](#)

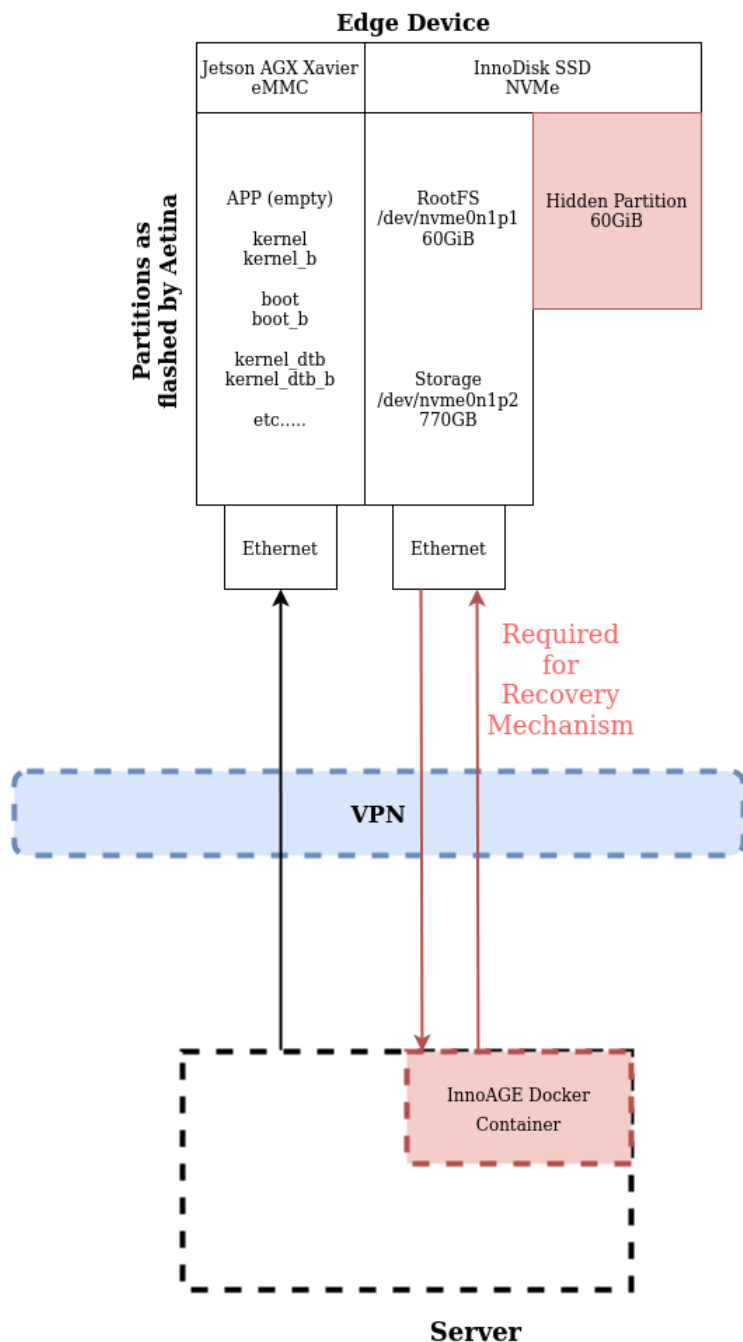
This section describes how to create, edit, and delete device groups as well as update firmware on device groups.

Concept topics

About firmware over-the-air (FOTA)

The Firmware-Over-The-Air (FOTA) feature enables users to remotely program, reprogram, and push updates using FleetTrackr. You can create a firmware group, which is a logical grouping of devices that facilitates reprogramming all devices that share common characteristics, such as device type, model, or version. A device can belong to multiple groups.

The following figure illustrates how the edge devices are flashed for FleetTrackr.



FOTA: General steps

This section describes the general steps involved in performing Firmware-Over-The-Air (FOTA) on edge devices.

1. After NVIDIA releases a new Linux for Tegra (L4T) release that includes support for DeepStream, Cuda, and so on, SmartCow's BSP engineers create a new BSP that includes SmartCow's custom drivers and product-specific applications. For example, TegraProducer, Update Client, and config script.
2. The SmartCow BSP Engineers create a FOTA payload package and make it available to the clients (for example, through an Amazon S3 bucket, or sent directly to the client to host on their own local server).
3. The Tahakom FleetMap Trackr user interface notifies the client that an update to the edge device BSP is available and which devices can be upgraded.
4. The user decides which devices to upgrade. The UI initiates update-client on each edge device that has been selected for the upgrade.
5. Update Client pulls the payload package to the edge device, as well as the tools package necessary to apply the update.
6. Update Client extracts the new BSP and prepares the edge device for the upgrade process.



Note: If there are any issues with the update process, the clients are notified.

- If `rootfs` redundancy is not enabled:
 - a. A reboot is required to begin the upgrade procedure.
 - b. The edge device reboots into a recovery kernel. The old partitions are overwritten with the new BSP using this kernel. This process takes approximately 10 to 15 minutes. The edge device remains offline in this stage.
 - c. After the upgrade is applied, the edge device reboots into the new BSP.
- If `rootfs` redundancy is enabled:
 - a. The current partition overwrites the redundant partitions with the new BSP. This process takes approximately 10 to 15 minutes. The edge device remains online in this stage.
 - b. After the upgrade is applied, the edge device reboots into the new secondary partition, containing the upgraded BSP.

The device then continues normal operation.


Task topics

Creating a firmware update group

The firmware update group can only be used for firmware updates and is not visible in other areas of the application.

Procedure

1. On the FleetTrackr application, click **Firmware**.
The *Firmware Update* page appears.
2. Click **Add New Group**.
The *NEW FIRMWARE GROUP* dialog box appears.

3. In the **New Group Name** box, type a meaningful name for the firmware group.
4. In the *AVAILABLE DEVICES* section, you can perform one of the following actions.
 - Click **Add All** to select all edge devices to be selected to be added to the firmware group.
 - Search for edge devices using the hostname, serial number, MAC address, or IP address to select the edge devices.
 - a. Click the drop-down list to select the search criteria.
 - **Host**
 - **Serial**
 - **Mac**
 - **IP**
 - b. In the **Search device** box, type the keywords to search.
The search results are displayed below the search box.
 - c. Click the add icon  to select the device to be added to the application group.

The device appears in the *SELECTED DEVICES* section.

- In the section below the search bar, click the add icon  on a device you want to select to be added to the firmware group.



Tip: To remove all selected devices, in the *SELECTED DEVICES* section, click **Remove All**.

5. Click **Create Group**.

Updating firmware for a group of devices

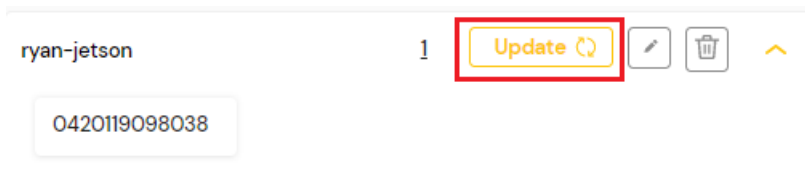
Follow these steps to update firmware for a group of devices.

Before you begin

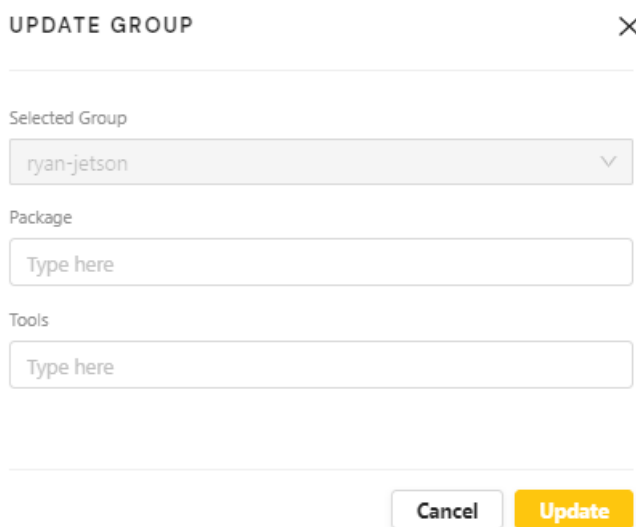
- Ensure that you have the package (Docker image) and tools (dependencies) information from SmartCow.
- Created a firmware update group. For more information see [Creating a firmware update group](#) on page 19.

Procedure

1. On the FleetTrackr application, click **Firmware**.
The *Firmware Update* page appears.
2. In the row corresponding to the firmware group you want to update, click **Update** as shown in the following figure.



The *UPDATE GROUP* dialog box appears.



The dialog box is titled 'UPDATE GROUP' and has a close button (X) in the top right corner. It contains three input fields: 'Selected Group' with a dropdown menu showing 'ryan-jetson', 'Package' with a text input field containing 'Type here', and 'Tools' with a text input field containing 'Type here'. At the bottom of the dialog box, there are two buttons: 'Cancel' and 'Update'.

3. In the **Package** box, specify the package (Docker image) details.
4. In the **Tools** box, specify the dependencies.
5. Click **Update**.

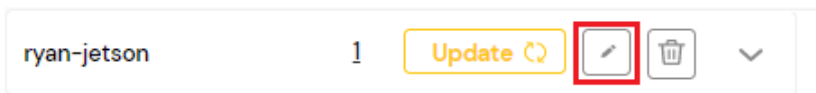
Editing a firmware group

You can only add or remove edge devices from a firmware group.

Procedure

1. On the FleetTrackr application, click **Firmware**.
The *Firmware Update* page appears.

2. In the row corresponding to the firmware group you want to edit, click the edit icon as shown in the following figure.



The *EDIT FIRMWARE GROUP* dialog box appears.

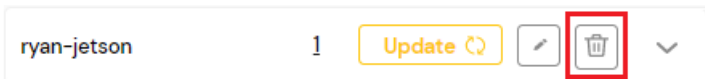
3. Add or remove edge devices from the firmware group.
4. Click **Update Group**.

Deleting a firmware group

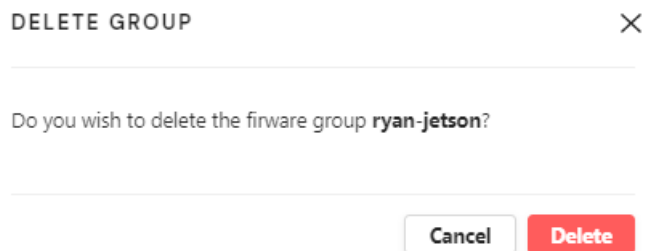
Follow these steps to delete a firmware group.

Procedure

1. On the FleetTrackr application, click **Firmware**.
The *Firmware Update* page appears.
2. In the row corresponding to the firmware group you want to delete, click the delete icon as shown in the following figure.



The *DELETE GROUP* dialog box appears and displays the following message.



3. Click **Delete**.

Document control

Document Version	Product Version	Release Date
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