

How to Register a LoRa Node with RAK Gateway built-in LoRaServer?

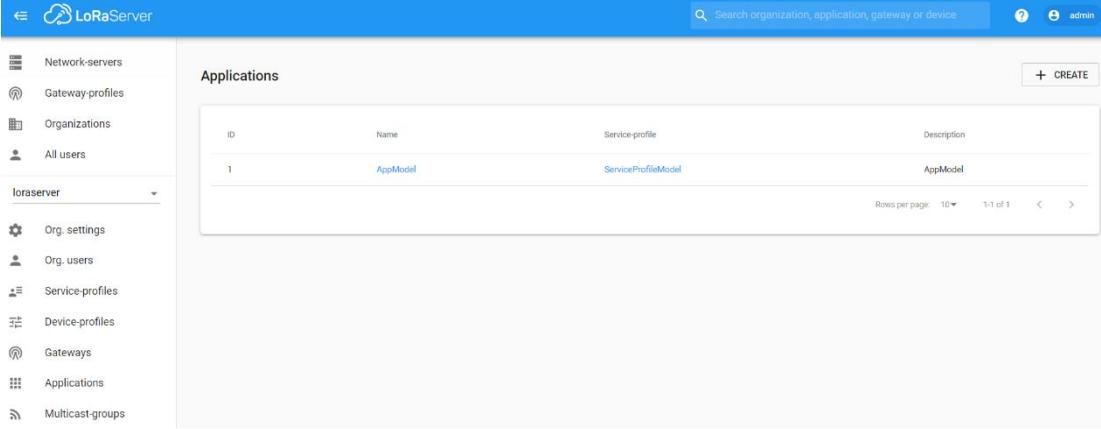
This document is used to guide users to register a LoRa node with RAK LoRa gateway built-in LoRaServer.

If you want to use RAK cloud LoRaServer, please have a look at another document:

https://downloads.rakwireless.com/en/LoRa/LoRa-Server-Cloud/Guide/How_to_use_RAK_cloud_LoRaServer_for_testing.pdf

OK, let's get start!

Open the web page of the built-in LoRaServer. The link is “Gateway IP:8080”.

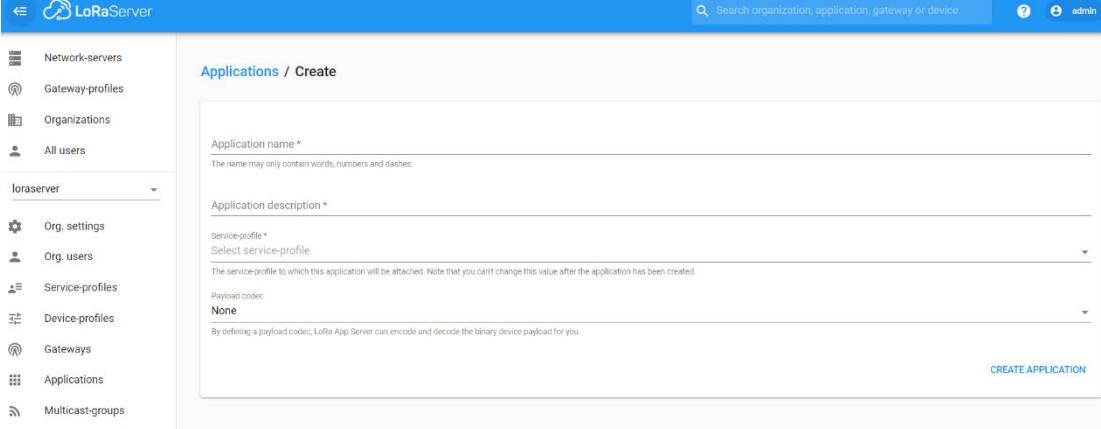


The screenshot shows the RAK LoRaServer web interface. The left sidebar has a tree view with nodes like Network-servers, Gateway-profiles, Organizations, All users, loraserver (selected), Org. settings, Org. users, Service-profiles, Device-profiles, Gateways, Applications, and Multicast-groups. The main content area is titled "Applications". It shows a table with one row:

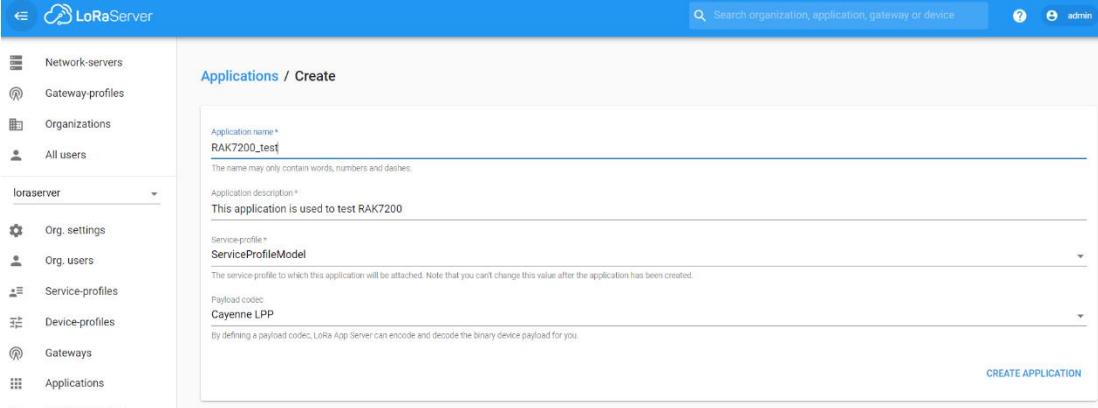
ID	Name	Service-profile	Description
1	AppModel	ServiceProfileModel	AppModel

Below the table are buttons for "Rows per page" (10), "1-1 of 1", and navigation arrows. A "CREATE" button is located in the top right corner of the table header.

By default, there is already one or more items in this page, you can use it or create a new item. Now, let's create a new item by click the “CREATE” button, and fill in them.



The screenshot shows the RAK LoRaServer web interface with the "Applications / Create" page open. The left sidebar is identical to the previous screenshot. The main content area has fields for "Application name" (with placeholder "The name may only contain words, numbers and dashes."), "Application description", "Service-profile" (with dropdown "Select service-profile" and note "The service-profile to which this application will be attached. Note that you can't change this value after the application has been created."), and "Payload codec" (with dropdown "None" and note "By defining a payload codec, LoRa App Server can encode and decode the binary device payload for you"). At the bottom right is a "CREATE APPLICATION" button.



Applications / Create

Application name *
RAK7200_test

The name may only contain words, numbers and dashes.

Application description *
This application is used to test RAK7200

Service-profile *
ServiceProfileModel

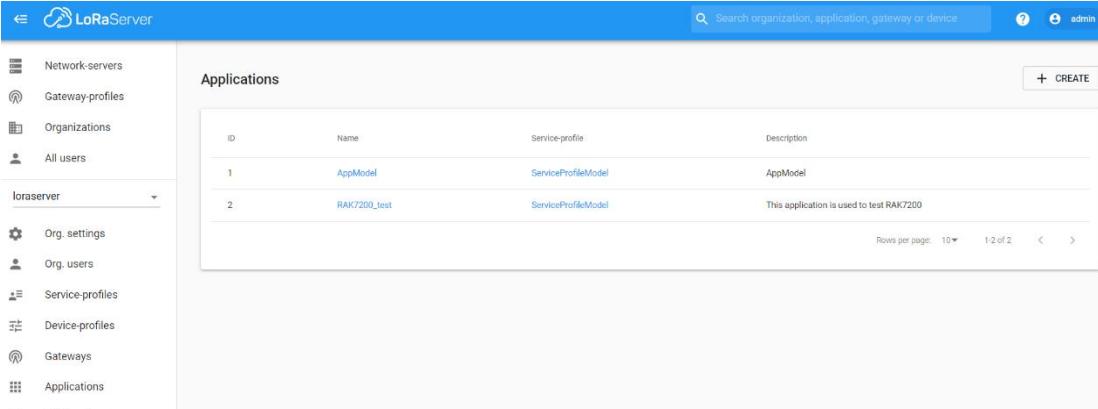
The service-profile to which this application will be attached. Note that you can't change this value after the application has been created.

Payload codec
Cayenne LPP

By defining a payload codec, LoRa App Server can encode and decode the binary device payload for you.

CREATE APPLICATION

“CREATE APPLICATION”.

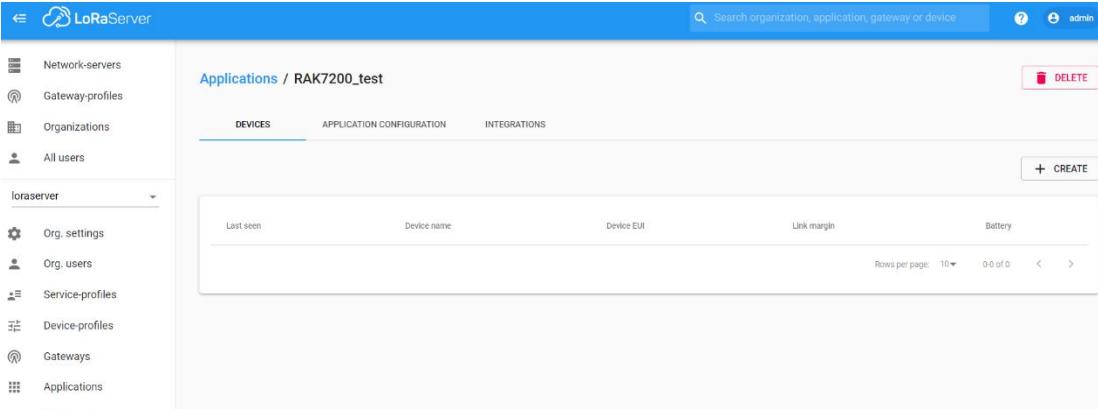


Applications

ID	Name	Service-profile	Description
1	AppModel	ServiceProfileModel	AppModel
2	RAK7200_test	ServiceProfileModel	This application is used to test RAK7200

Rows per page: 10 ▾ 1-2 of 2 < >

Click the new item name “RAK7200_test”:



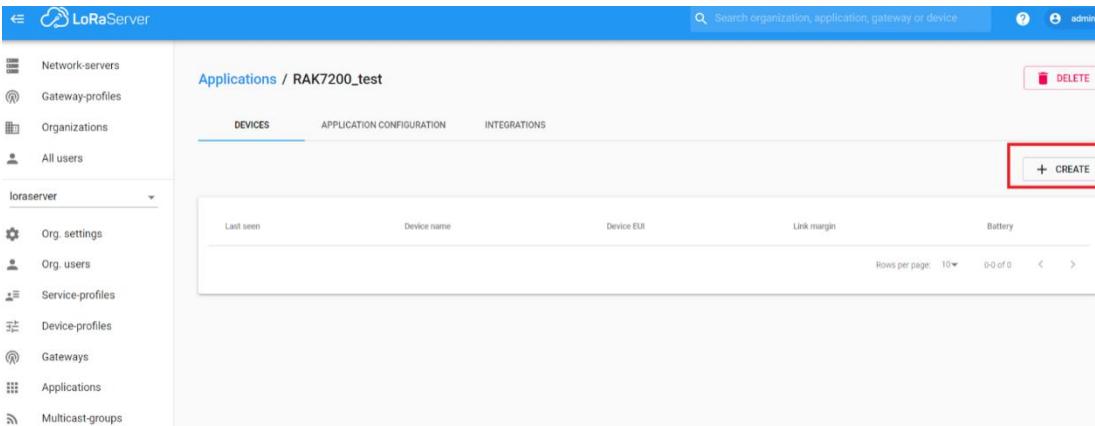
Applications / RAK7200_test

DEVICES APPLICATION CONFIGURATION INTEGRATIONS

Last seen	Device name	Device EUI	Link margin	Battery
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Rows per page: 10 ▾ 0-0 of 0 < >

Add a LoRa node device into LoRaServer by clicking the “CREATE” button:



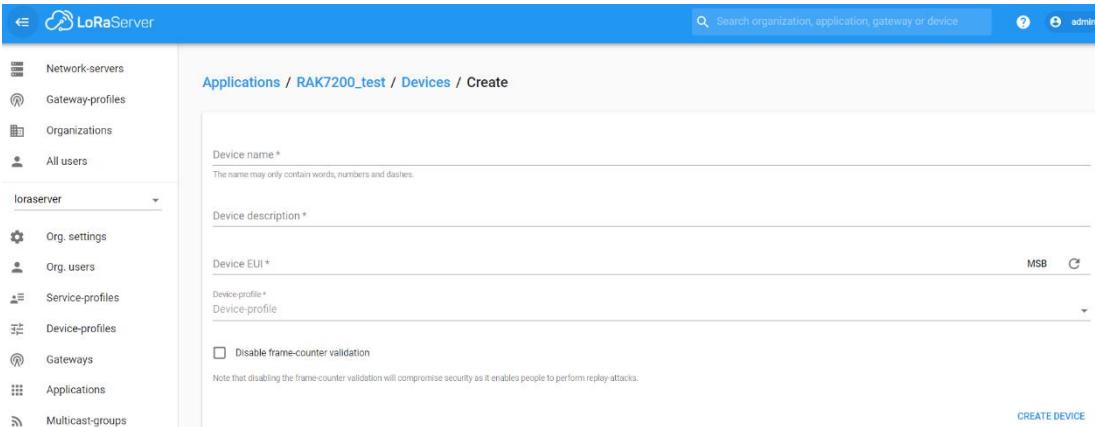
Applications / RAK7200_test

DEVICES APPLICATION CONFIGURATION INTEGRATIONS

+ CREATE

Last seen	Device name	Device EU	Link margin	Battery

Rows per page: 10 | 0-0 of 0 < >



Applications / RAK7200_test / Devices / Create

Device name *
RAK7200 test

Device description *
the first RAK7200 to test

Device EU *
85 ad da b5 11 19 d9 cb

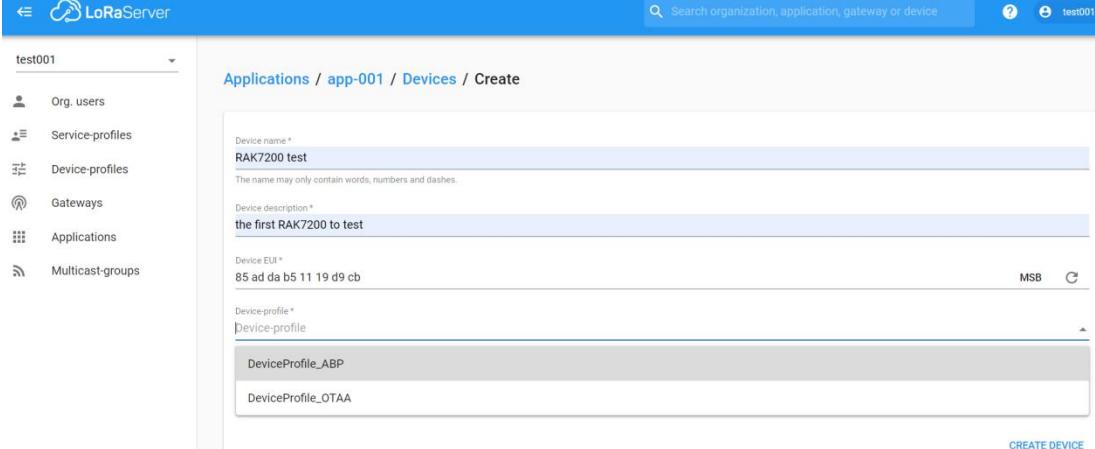
Device-profile *
Device-profile

Disable frame-counter validation

Note that disabling the frame-counter validation will compromise security as it enables people to perform replay attacks.

CREATE DEVICE

Fill in them. You can generate a Device EUI automatically by click the following icon, or you can write a correct Device EUI in the edit box.



Applications / app-001 / Devices / Create

Device name *
RAK7200 test

Device description *
the first RAK7200 to test

Device EU *
85 ad da b5 11 19 d9 cb

Device-profile *
Device-profile

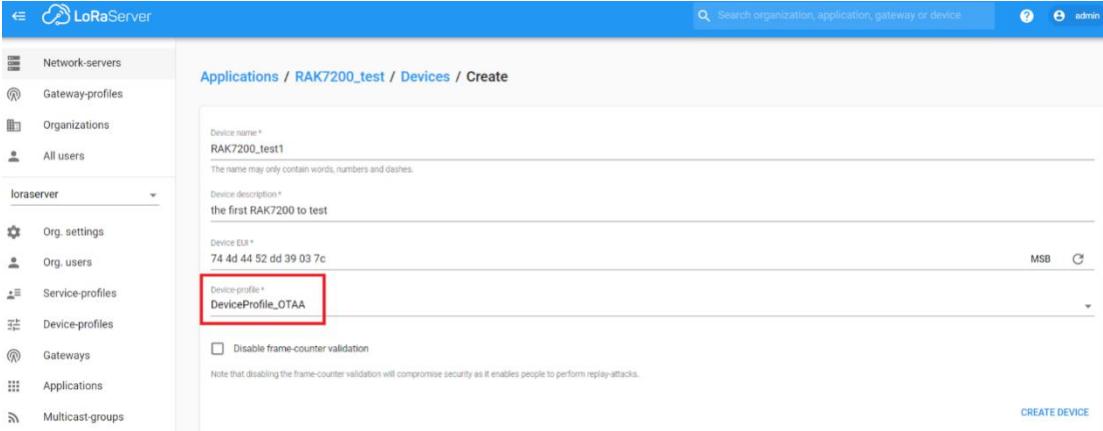
DeviceProfile_ABP
DeviceProfile_OTAA

CREATE DEVICE

Note: If you want to join in OTAA mode, you should select “**DeviceProfile_OTAA**” in the “Device-profile” item. If you want to join in ABP mode and other frequencies except AS923 and CN470, you should select “**DeviceProfile_ABP**” in the “Device-profile” item. What about AS923 in ABP mode? Sorry! LoRaServer can not support it now.

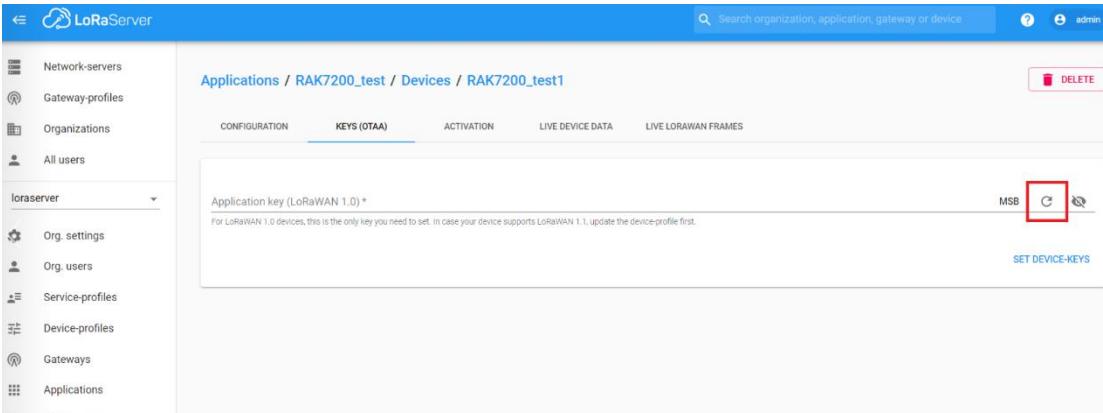
5.1 Register a LoRa node in OTAA mode

If you select “DeviceProfile_OTAA”, it means you want to join LoRaServer in OTAA mode.

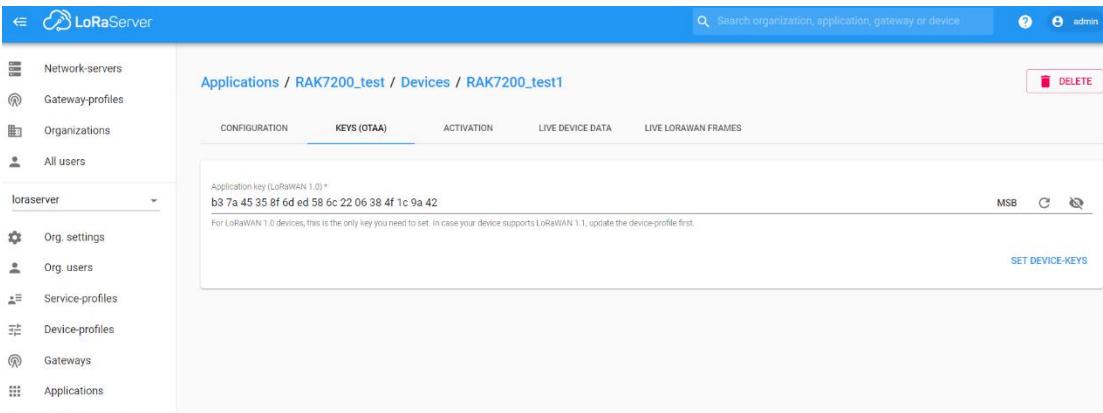


The screenshot shows the 'Create' page for a new device. The 'Device profile' field is highlighted with a red box, containing the value 'DeviceProfile_OTAA'. Other fields include 'Device name' (RAK7200_test1), 'Device description' (the first RAK7200 to test), and 'Device EUI' (74 4d 44 52 dd 39 03 7c). A note about frame-counter validation is present. A 'CREATE DEVICE' button is at the bottom.

"CREATE DEVICE". Then generate the application key in this page. You can write it by yourself or generate it automatically by clicking the following icon:

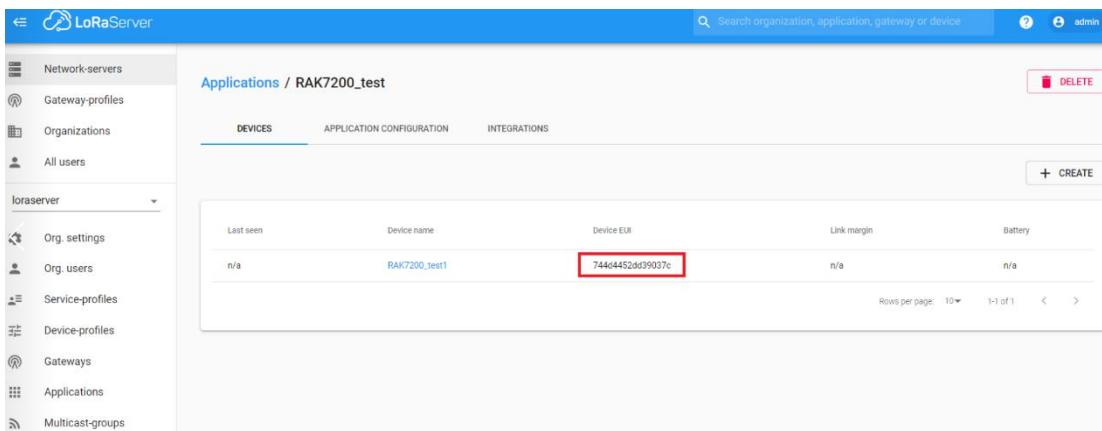


The screenshot shows the 'KEYS (OTAA)' tab for the device 'RAK7200_test1'. The 'Application key (LoRaWAN 1.0)' field is highlighted with a red box, containing the value 'b3 7a 45 35 8f 6d ed 5b 6c 22 06 38 4f 1c 9a 42'. A 'SET DEVICE-KEYS' button is visible at the bottom right.

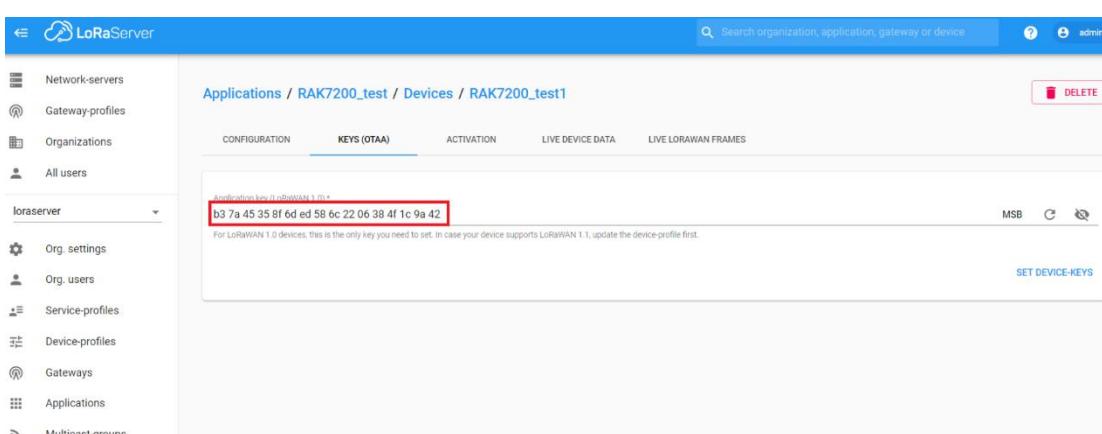


This screenshot shows another view of the 'KEYS (OTAA)' tab for the same device. The application key value is identical: 'b3 7a 45 35 8f 6d ed 5b 6c 22 06 38 4f 1c 9a 42'. The 'SET DEVICE-KEYS' button is again visible.

**"SET DEVICE-KEYS". That's OK! You've complete the configuration on LoRaServer.
As you see, the Device EUI which will be set into your LoRa node as "dev_eui" is this one:**



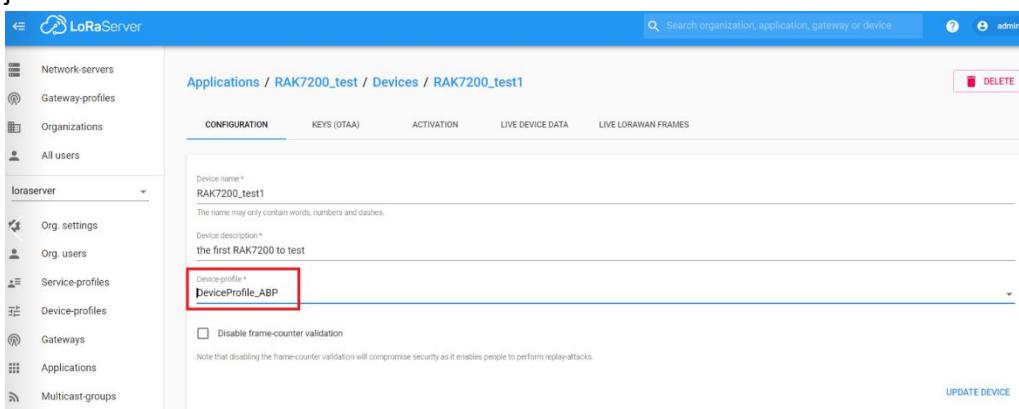
The Application Key which will be set into your LoRa node as “app_key” is this one:



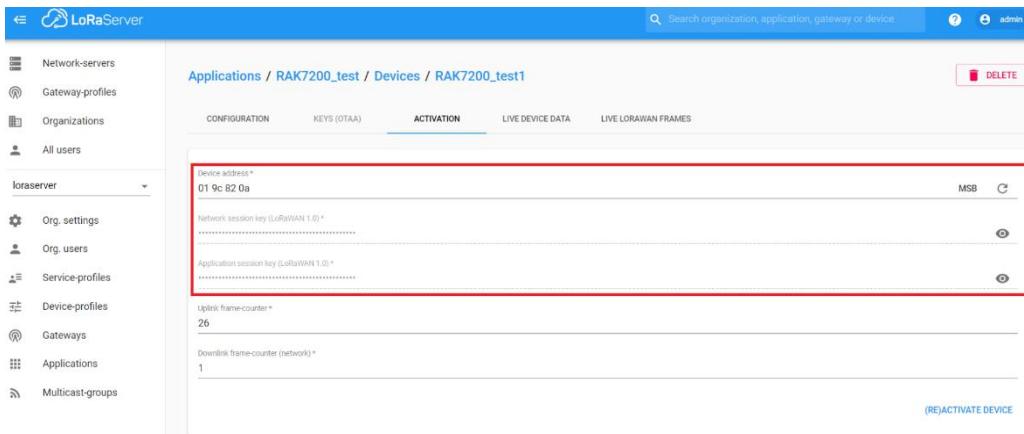
The Application EUI which will be set into your LoRa node as “app_eui” is useless for LoRaServer, and you can set it to any value with a correct format, for example: 7083D57ED001C1CF.

5.2 Register a LoRa node in ABP mode

If you select “DeviceProfile_ABP” or “DeviceProfile_ABP_CN470”, it means you want to join LoRaServer in OTAA mode.



Then you can see that there are some parameters for ABP in the “ACTIVATION” item:



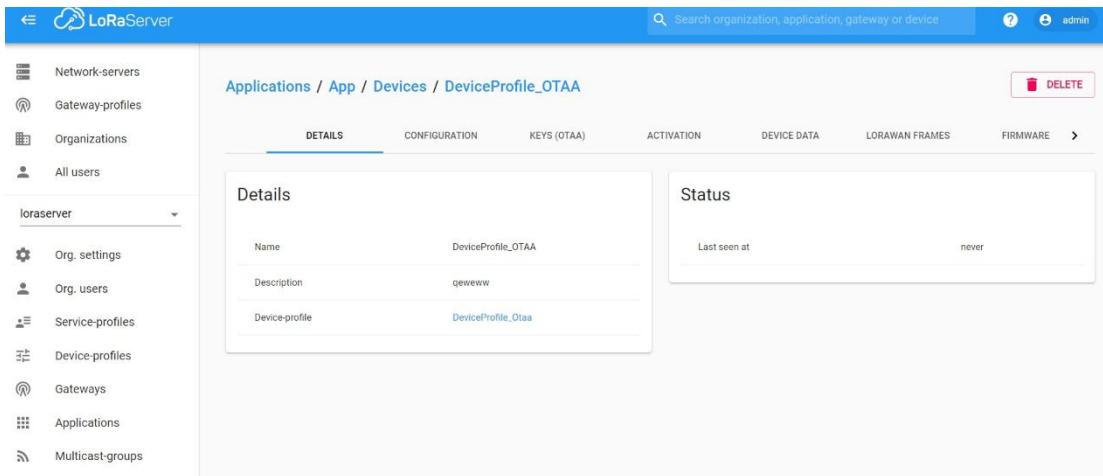
The screenshot shows the LoRaServer interface for activating a device. The left sidebar is for managing the 'loraserver' organization. The main area shows the 'ACTIVATION' tab for device 'RAK7200_test1'. Key parameters highlighted with a red box include:

- Device address*: 01 9c 82 0a
- Network session key (LoRaWAN 1.0)*: (redacted)
- Application session key (LoRaWAN 1.0)*: (redacted)
- Uplink frame-counter*: 26
- Downlink frame-counter (network)*: 1

Buttons at the bottom right include '(RE)ACTIVATE DEVICE' and 'DELETE'.

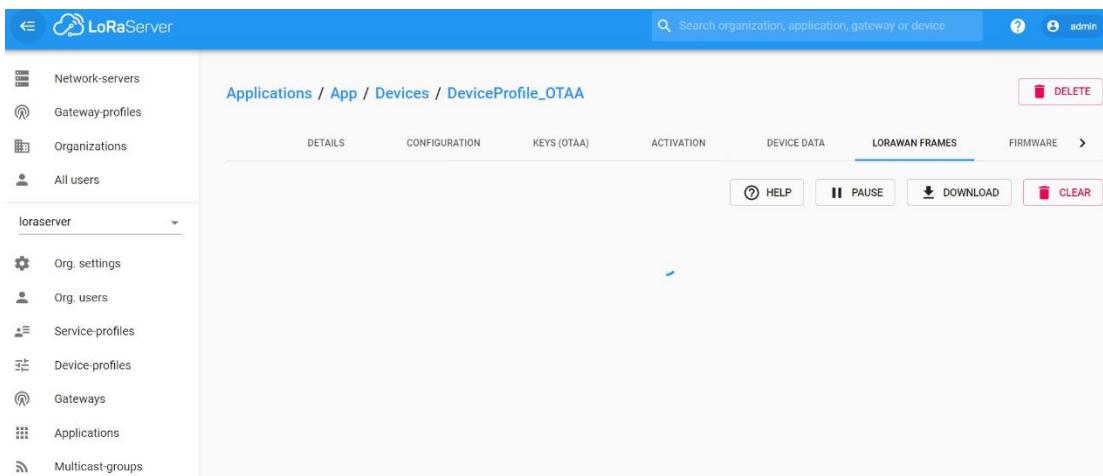
Next, let's use these parameters to set your LoRa node by using AT command.

Finally, if your LoRa node has joined successfully, you can check the status here:



The screenshot shows the LoRaServer interface for viewing device status. The left sidebar is for managing the 'loraserver' organization. The main area shows the 'DETAILS' tab for device 'DeviceProfile_OTAA'. The 'Status' section indicates the device was last seen at 'never'.

Or you can see the LoRa frames sending from LoRa node in this page:



The screenshot shows the LoRaServer interface for monitoring LoRa frames. The left sidebar is for managing the 'loraserver' organization. The main area shows the 'LORAWAN FRAMES' tab for device 'DeviceProfile_OTAA'. It includes controls for HELP, PAUSE, DOWNLOAD, and CLEAR.

Please contact us if you need technical support or want to know more information.

Support center: <https://forum.rakwireless.com/>

Email us: info@rakwireless.com