



The Pente Networks HyperCore Cloud Demo Kit Deployment Guide

Version 5.53

www.PenteNetworks.com

About This Guide

This guide is intended for Pente Partners, who will be using the HyperCore Cloud private cellular orchestration and management solution to set up, provision, and provide private LTE and 5G network services.

The [Pente HyperCore Cloud Platform](#) simplifies the provisioning, integration, and management of everything on the network – making it possible to deploy faster than any other solution. Our friendly and intuitive web portal enables anyone to set up and control every aspect of their private network.

This demo kit was created to enable you to experience this first-hand and to demonstrate the solution quickly and easily. The exciting part is that at the end of this deployment, you will have an actual working Pente HyperCore private cellular network you can test, add devices, monitor, generate reports, and more.

We highly recommend that you read this entire user guide and then review and configure the settings in the HyperCore Control Center according to your requirements and preferences.

This user guide contains the following chapters –

- **Chapter 1, [Introduction](#)**, introduces HyperCore, the audience for which it is intended, and provides a simple description of its architecture.
- **Chapter 2, [Demo Kit Deployment](#)**, provides a short workflow for getting up and running as quickly as possible and then provides a quick tour through the user interface. All these descriptions provide a clickable page reference that will take you to the detailed explanation in this user guide.

If needed, for additional information, please contact your sales representative or email support@pentenetworks.com

Note – *This guide assumes the reader is familiar with standard mobile networks and communication management and integration. This user guide also assumes that the Pente Networks HyperCore servers and the equipment (such as edges and base stations) of the locally deployed Radio Access Network (RAN) have already been installed, connected, and set up. Pente Networks may do this in collaboration with the system integrator or partner.*

Table of Contents

About This Guide 2

1 INTRODUCTION..... 6

1.1 Introducing The Pente HyperCore Cloud 6

 1.1.1 What is The HyperCore Cloud? 6

 1.1.2 Who Uses HyperCore? 7

1.2 How Does HyperCore Work? 8

2 DEMO KIT QUICKSTART..... 9

2.1 Demo Kit Contents..... 9

2.2 Connecting the HyperCore Edge 10

2.3 Getting Started with the HyperCore Cloud Demo Kit 10

 2.3.1 Installation of the RAN Mobile Network 10

 2.3.2 Logging in to the HyperCore Cloud Control Center 11

 2.3.3 Setting Up Your First Customer 12

List of Figures

Figure 1 – HyperCore Architecture 8

Figure 2 - Set Password 11

Figure 3 – Logging in to HyperCore 11

Figure 4 – Verification Code for Logging In 12

Figure 5 – Customers Page 12

Figure 6 - Customer Portal Dashboard 13

Figure 7 - Edges Table 13

Figure 8 - Edge page 14

Figure 9 - Edge IP Addresses Settings 15

Figure 10 - Edge Services Settings 16

Figure 11 - Edge Service Alarms 17

Figure 12 - Edge in Connected Status 17

Figure 13 - Networks List 18

Figure 14 - Network Page 18

Figure 15 - Thing Groups 19

Figure 18 - Things in Group 20

Figure 19 - Thing Page 21

Revision History

5.53	March 2024	Adoption to version 5.53 changes
------	------------	----------------------------------

Support and Contact Information

support@pentenetwork.com

www.pentenetworks.com

Proprietary Information

Copyright © 2023 Pente Networks, Inc. All rights reserved. Pente Networks is a registered trademark of Pente Networks, Inc.

Pente Networks, its logo and certain names, product and service names referenced herein may be registered trademarks, trademarks, trade names or service marks of Pente Networks, Inc. in certain jurisdictions.

The material contained herein is proprietary, privileged, and confidential and owned by Pente Networks or its third-party licensors. The information herein is provided only to the person or entity to which it is addressed, for its own use and evaluation; therefore, no disclosure of the content of this document will be made to any third parties without specific written permission from Pente Networks, Inc. The content herein is subject to change without further notice.

THE INFORMATION SPECIFIED HEREIN IS PROVIDED "AS IS" AND Pente Networks MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, WITH RESPECT TO THE INFORMATION IN THIS PUBLICATION, AND SPECIFICALLY DISCLAIMS IMPLIED WARRANTIES OF ACCURACY, COMPLETENESS, MERCHANTABILITY, TITLE, NON-INFRINGEMENT AND/OR FITNESS FOR A PARTICULAR PURPOSE.

Pente Networks reserves the right to make changes in or to the said information, or any part thereof, in its sole judgment, without the requirement of giving any notice prior to or after making such changes to the information. Pente Networks shall not be expected to update or revise these statements to reflect subsequent occurring events or circumstances, or changes in its actual results, level of activity, performance or achievements.

All other trademarks are the property of their respective owners. Other company and brand products and service names are trademarks or registered trademarks of their respective holders.

Limitation of Liability

Pente Networks, Inc. shall not be liable.

1

Introduction

This chapter introduces HyperCore, the audience for which it is intended and provides a simple description of its architecture.

1.1 Introducing The Pente HyperCore Cloud

1.1.1 What is The HyperCore Cloud?

The Pente HyperCore Cloud is a cloud-based core, Edge, and network control software solution. The HyperCore Cloud simplifies the provisioning, integration, and management of everything on the network. HyperCore's fast and easy orchestration enables mobile network service providers, system integrators, site owners, and IT departments in any industry to deploy and manage their own independent 5G/LTE (4G) private cellular network. HyperCore Cloud software allows for multiple layers of control and access.

HyperCore uses a locally deployed Radio Access Network (RAN) (mobile network) to provide a secure, high-performance, low-latency network. HyperCore provides each customer with their own frequency range (spectrum).

Integrators and enterprises can leverage the HyperCore Control Center to manage multiple networks, groups of devices, and more. The services utilizing this mobile network are enabled and orchestrated through HyperCore's Control Center. Handover between public networks and private networks can also be defined here. Functionality can be extended or customized by utilizing RESTful API functions to integrate quickly and easily with almost any IT system.

From the Control Center, integrators can also control what end users can view and do through the HyperCore Customer Portal - granting customers the ability to generate reports, monitor, and even self-manage their own mobile services.

1.1.2 Who Uses HyperCore?

HyperCore Service Providers

A HyperCore Service Provider is a mobile operator, system integrator, or enterprise that uses Pente Networks HyperCore to set up, support, and provide 5G/LTE cellular private network as a service to site owners and/or the enterprise itself.

Service providers own the system, set it up, provision part of it for one or more customer enterprises, and ensure the functionality and health of customer sites.

Customers

A Customer is a site owner or an enterprise who has installed the RAN at their location and who uses the mobile services provided by a HyperCore Service Provider (described above).

Subscribers

Subscribers are the actual end-users or devices who use the wireless private network to communicate and transfer data when they are at the customer's location (described above).

Organizations

An Organization is a service provider that gets service from a HyperCore service provider (described above) in order to offer services over HyperCore to their customers. It can also refer to Enterprises that have multiple entities that they want to provide the same functionality to have multiple "customers" that they in turn manage. HyperCore Service Providers can have multiple organizations and allocate network resources to them as they see fit.

Mobile Service Providers can offer each enterprise that uses their services to have their own private network, while enabling them to self-service. Alternatively, site owners and enterprises can deploy and manage the entire solution themselves.

1.2 How Does HyperCore Work?

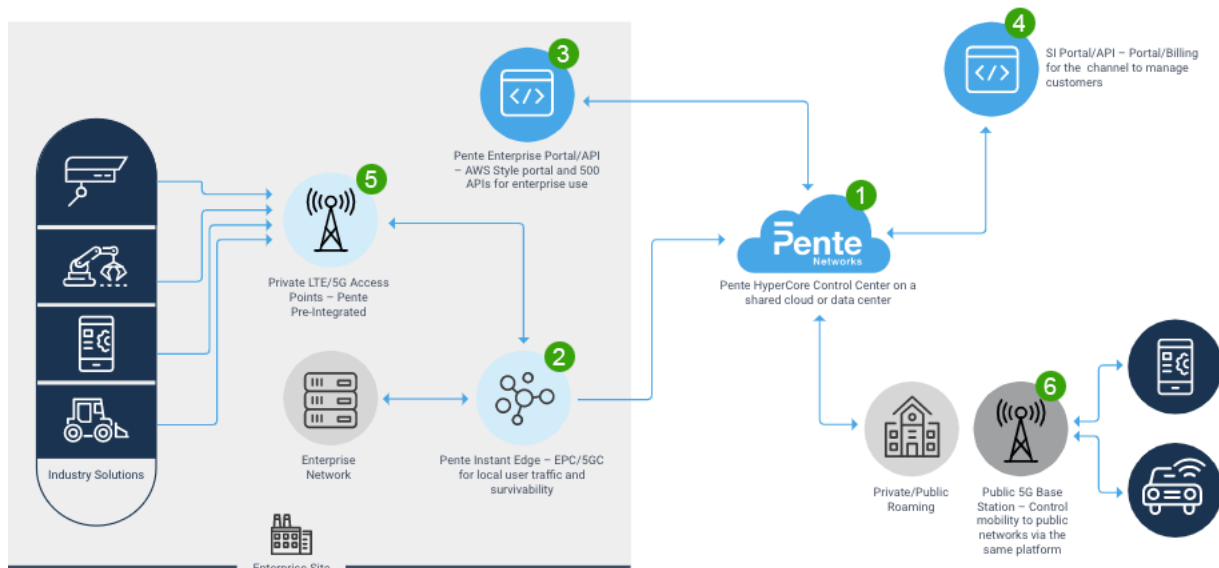


Figure 1 – HyperCore Architecture

► HyperCore is comprised of the following architectural components –

❶ Pente Networks HyperCore Cloud – Enables multitenant, multisite central orchestration. HyperCore is installed in a shared cloud.

❷ HyperCore Survivable Edge – EPC/5GC software components that can be located off-premises or on-premises in order to enable local user traffic and survivability.

❸ HyperCore Control Center – A simple portal for Service Providers to orchestrate the setup, billing, management, and support of Customers from a standard web browser, as described in the *Pente Networks Service Provider's User Guide*.

❹ HyperCore Customer Portal – A simple portal for enterprise self-service use from a standard web browser, as described in this user guide. 400 APIs are also provided for enterprise use.

❺ LTE/5G Base Stations – Third-party base stations connected to the Pente Networks Edge and or cloud are installed locally in order to enable coverage. According to your service agreement, Pente Networks may provide pre-integrated base stations.

❻ Public Base Station – Enables controlled roaming connection to public networks and other private Networks.

Note – A wide variety of APIs (over 700) are available for integration of both the Control Center and the Customer Portal.

2

Demo Kit QuickStart

This chapter provides a short workflow for getting up and running as quickly as possible and then provides a quick tour through the user interface.

2.1 Demo Kit Contents

1 The HyperCore Edge



2 Edge Power Cable



3 Starter SIM Cards and eSIMs



2.2 Connecting the HyperCore Edge

- 1 Connect the Edge to the power. A blue led will light up like This:



Note – In case the led does not power up, press the button to start it (and check the power cable)

- 2 Connect the Edge to a network that provides a DHCP lease and access to the internet. **Make sure to connect the right-most port designated by 2.5**



2.3 Getting Started with the HyperCore Cloud Demo Kit

The following will take you through steps to set up a customer with an edge and enable the starter SIM cards. It is intended to take you through a journey demonstrating some of the capabilities of HyperCore.

2.3.1 Installation of the RAN Mobile Network

This user guide assumes that the Radio Access Network (RAN) (antennas, base stations, edges, and so on) has already been installed and connected at the location.

2.3.2 Logging in to the HyperCore Cloud Control Center

Pente Networks will invite you to the HyperCore Control Center by email.

The easiest way to get started with the Control Center is to simply log in with the user's email that Pente Networks first invited. That user has **Organization Admin** permissions and can access all the functions in the portal.

► To log in to the HyperCore Control Center

- 1 Click the provided link to log in to the HyperCore Control Center. You will be asked to create a password for the first time. Remember this password for future logins:

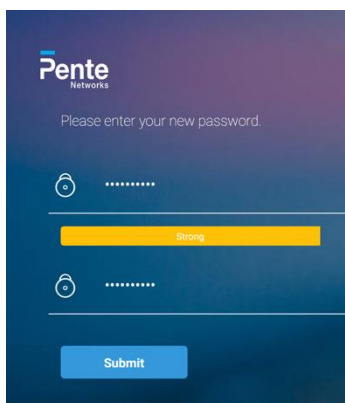



Figure 2 - Set Password

- 2 Press Submit and continue to the login page



Figure 3 – Logging in to HyperCore

- 3 Enter or select your username (email).
- 4 Click .

The first Service Provider user is given Organization Admin permissions and therefore can invite additional users to the Control Center.

Note – If two-factor authentication (2FA) has been defined for you by Pente Networks, then in addition to the above, then the first time you use the portal, you will be requested to scan a QR code using an authenticator app. Afterward, every subsequent time that you log in, you will be prompted to enter a code that is sent to your phone and/or authenticator app, such as Google Authenticator.

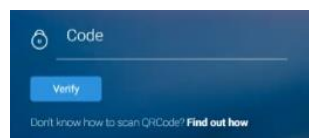


Figure 4 – Verification Code for Logging In

2.3.3 Setting Up Your First Customer

After logging in as an Organization admin, the first display lists the Customers defined in the system under your organization. You will see the My Demo Customer # listed as your customer under "Demo Kit Organization."

The screenshot shows the Pente HyperCore Cloud interface. On the left is a dark navigation menu with options: Customers, Inventory, Insights, Network Settings, Provision, System, Price Plans Lifecycle, and API. The main content area is titled 'CUSTOMERS' and features a search bar, a green 'Add New Customer' button, and a 'Delete 0 Customer(s)' button. Below these is a table with the following data:

	Organization	Customer Name	Address	Customer ID	Currency	Number of Active Thi	
<input type="checkbox"/>	Pente Networks	Jonathan Home Lab	NJ	cid_bb98b967-53c9-4	USD	7	
<input type="checkbox"/>	Pente Networks	Pente HQ Lab	411 Hackensack Ave	cid_c5df3f1d-2cbd-4c	USD	57	
<input type="checkbox"/>	Pente Networks	ACME Corporation	New York, NY	cid_7d10459f-9a18-4	USD	159	

At the bottom of the table, there are navigation controls: a left arrow, a right arrow, a page indicator '1 / 1', a dropdown menu for '10 items per page', and a status indicator '1 - 3 of 3 items'. The version number '5.53.0' is visible in the bottom left corner of the interface.

Figure 5 – Customers Page

- 1 Open the customer page** – Press the customer's name (in blue). It will open the HyperCore Customer Portal view – so you will be viewing it as a customer "My Demo Customer #" would (but with Organization Admin privileges).

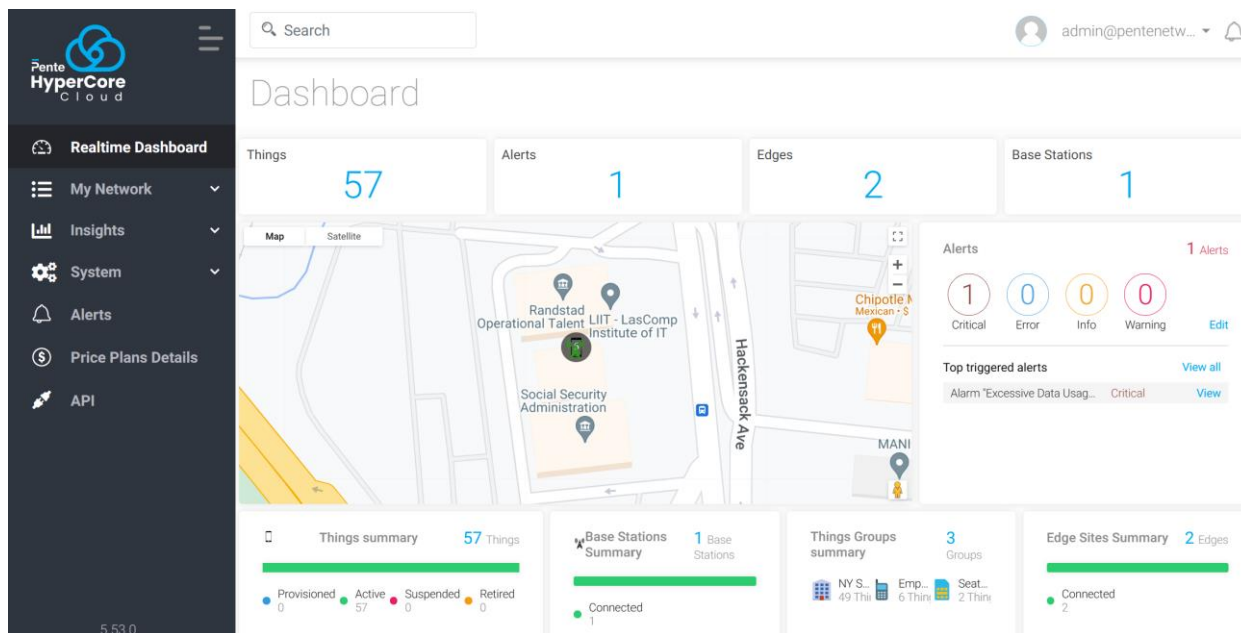


Figure 6 - Customer Portal Dashboard

The customer portal dashboard opens, showing the 4 SIM cards that came with your demo kit and are currently provisioned, but not yet active.

Note – True to the spirit of IoT (Internet of Things), end devices in the platform are referred to as "Things"

- Open the Edge** – Click the **My Network->Edges**  button in the left pane. A list that will show the Edge is shown:

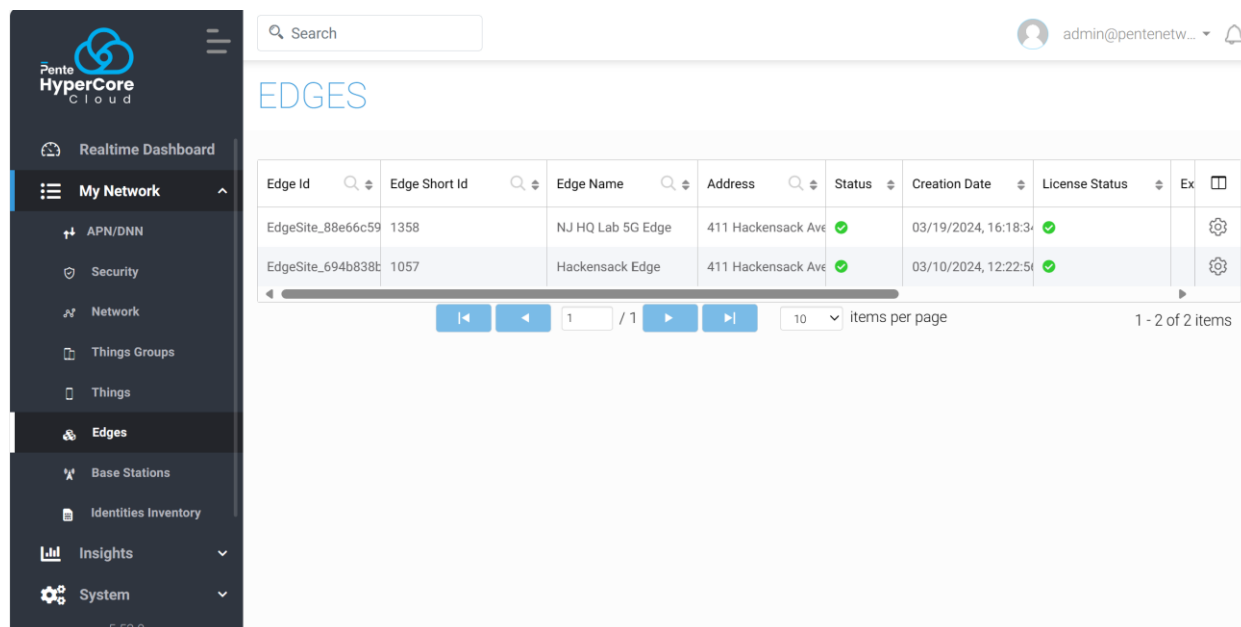


Figure 7 - Edges Table

Select the  button on the right of the Edge's row and select the **Edit**  option to open the Edge page:

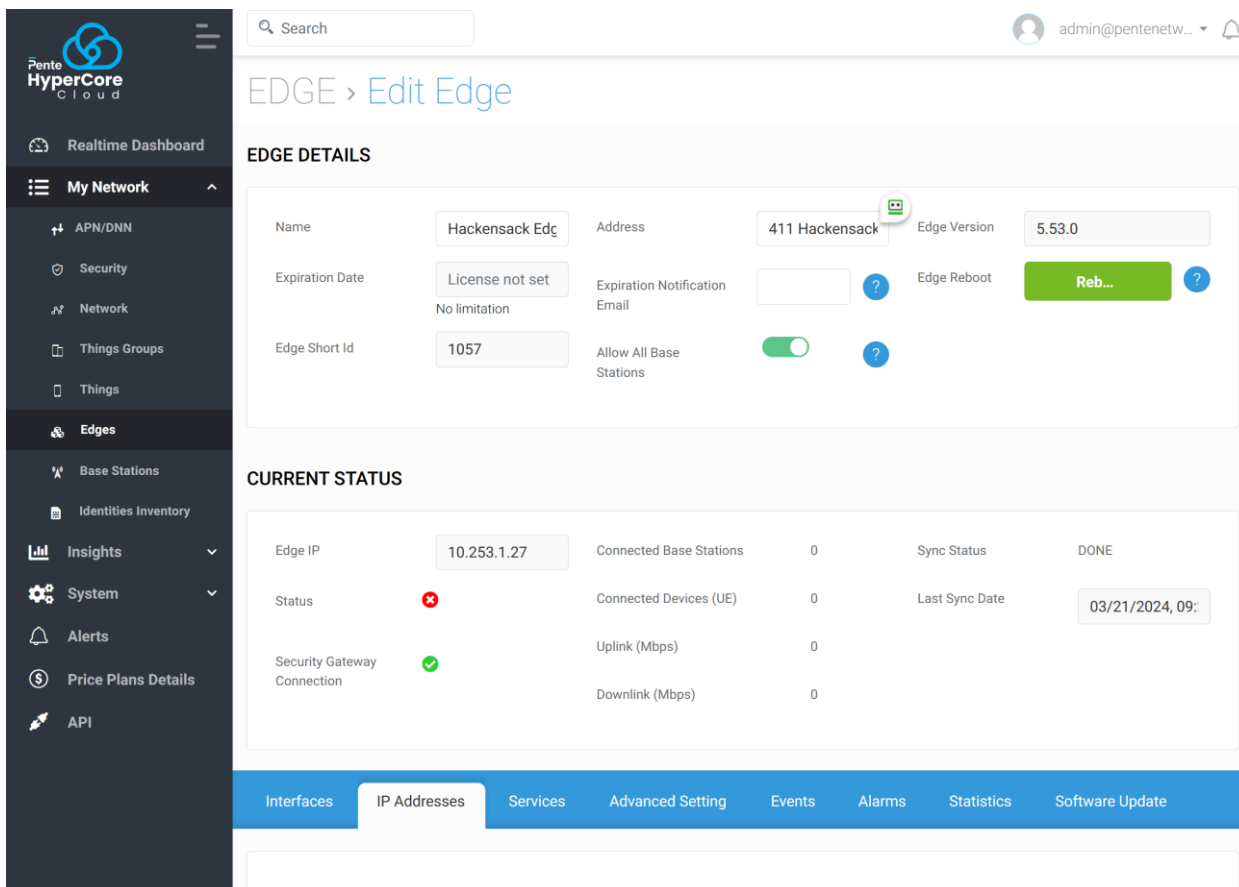


Figure 8 - Edge page

The "Security Gateway Connection" should be green, noting that the Edge is properly connected to the cloud.

The "Status" will remain red until all services in the Edge are up. At the bottom of the screen, you can see the three virtual ethernet interfaces defined on the Edge.


3 Define the IP Addresses – Scroll down and press the "IP Addresses" tab:

Interface	Mode	IP Address	Gateway
ether3	<input checked="" type="radio"/> DHCP <input type="radio"/> Manual	10.220.0.74/2	10.220.0.1
ether4	<input checked="" type="radio"/> DHCP <input type="radio"/> Manual	10.220.0.75/2	10.220.0.1
ether5	<input checked="" type="radio"/> DHCP <input type="radio"/> Manual	10.220.0.73/2	10.220.0.1

Buttons: PING, Apply, Cancel, SAVE

Figure 9 - Edge IP Addresses Settings

Please review that the DHCP IP allocated to the interfaces is ok. If manual IP addresses are required, this is the place to define them.

Make sure to press . In case you have made any changes. This may take a minute to complete the first time.

4 Define the Services IP Addresses –

An EPC requires three interfaces:

1. S1-AP/N2 – This is the interface used for control interaction between the RAN and the core. **Note – This is the IP Address to set as MME/AMF IP in the RAN unit configuration**
2. S1-U/N3 – This is the interface used to transfer the data between the radio and the core
3. Sgi/N6 – This is the interface used by the core to access the outside world.

Select the "Services" tab:

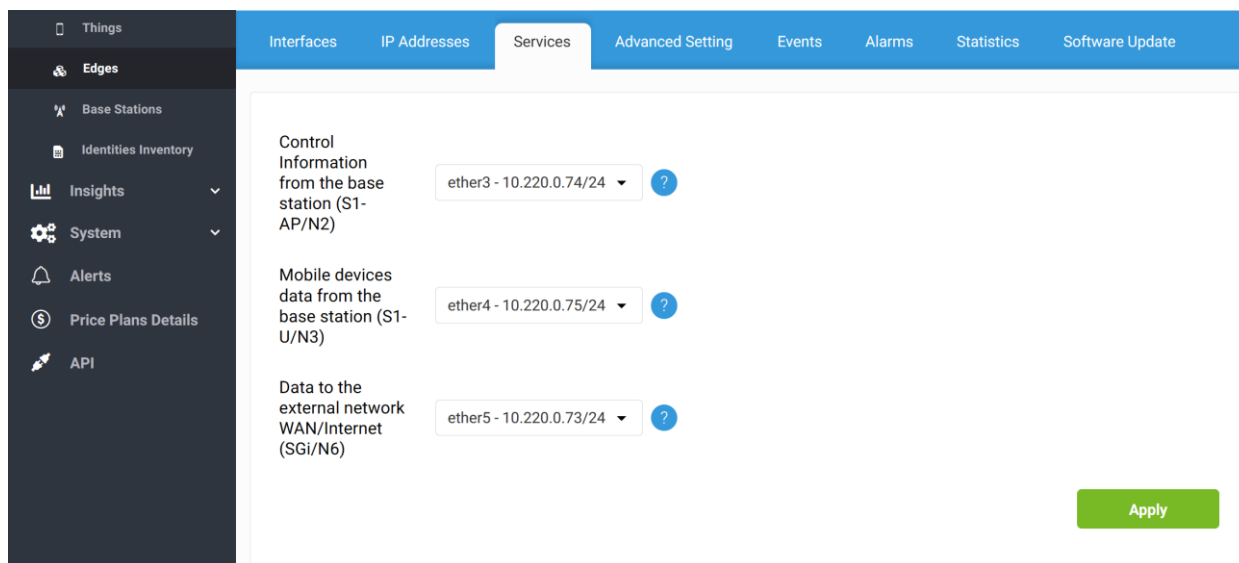



Figure 10 - Edge Services Settings

Assign an IP address to each of the services.

Make sure to press . In case you have made a change. This may take a minute to complete the first time.

- 5 **Wait for the Edge to come up** – In the very first time, the Edge downloads the latest software, and it may take a few minutes for it to go into full operation. You can refresh the page. Notice the "Alarms" tab that shows the EPC services are not yet up.

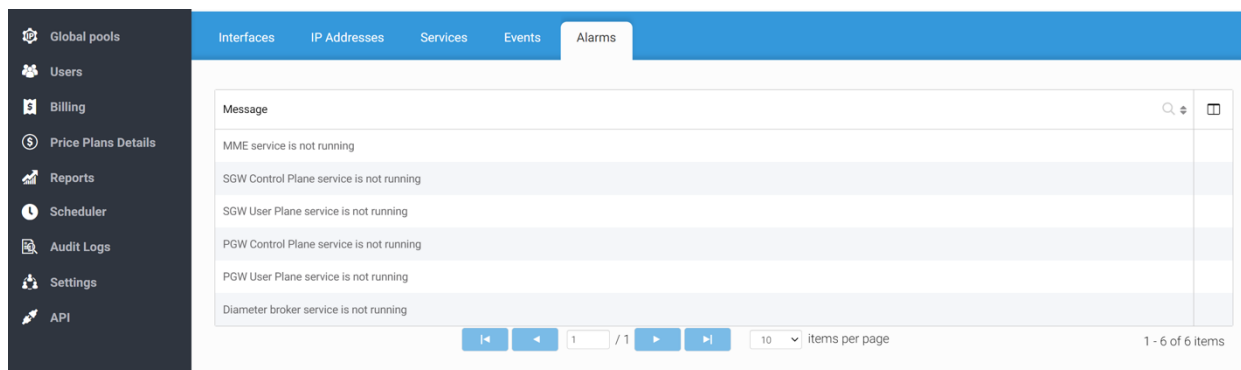


Figure 11 - Edge Service Alarms

Wait for all alarms to clear and the "Connected" color to turn green.

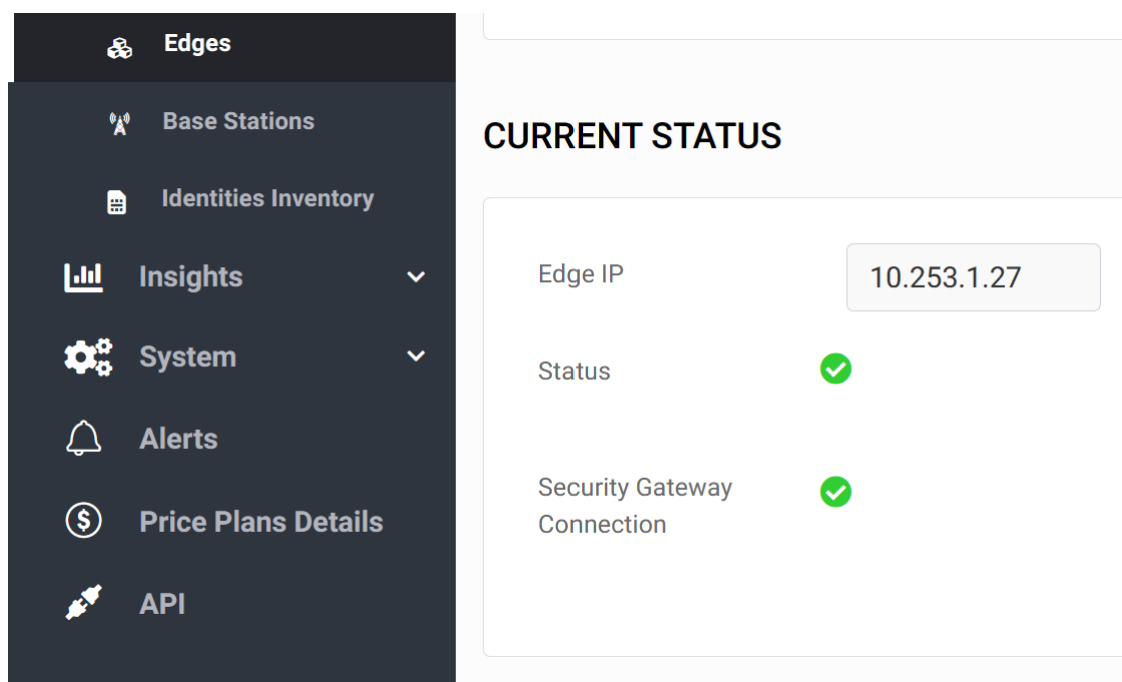



Figure 12 - Edge in Connected Status

6 Define a Network – HyperCore creates an independent virtual network. In HyperCore, a network is a set of IP and mobile network-related policies that enable you to define various rules and policies. A network can be attached to one or more thing groups to define the IP pools and IP security profile of the things in those thing groups.

HyperCore is provided with default networks that are automatically created for Access Point Network (APN) "internet."

Click the **Networks**  button in the left pane. A list of the existing Networks is displayed, as shown below –

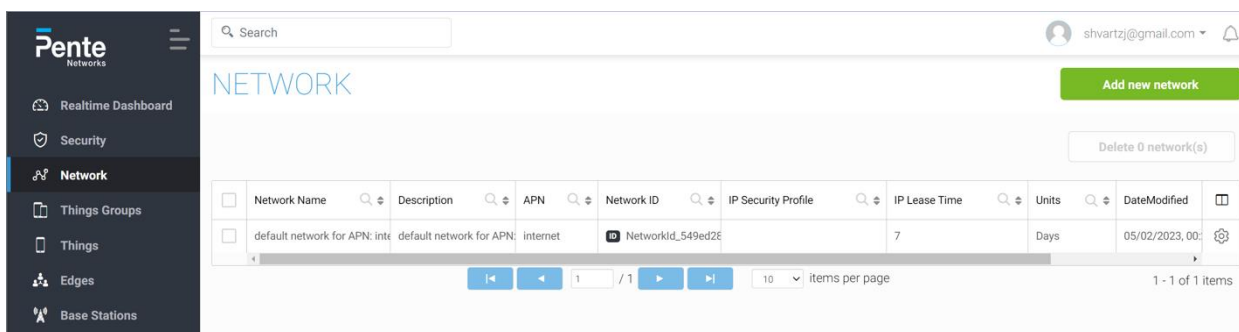


Figure 13 - Networks List

Select the  button on the right of the network's row and select the **Edit**  option.

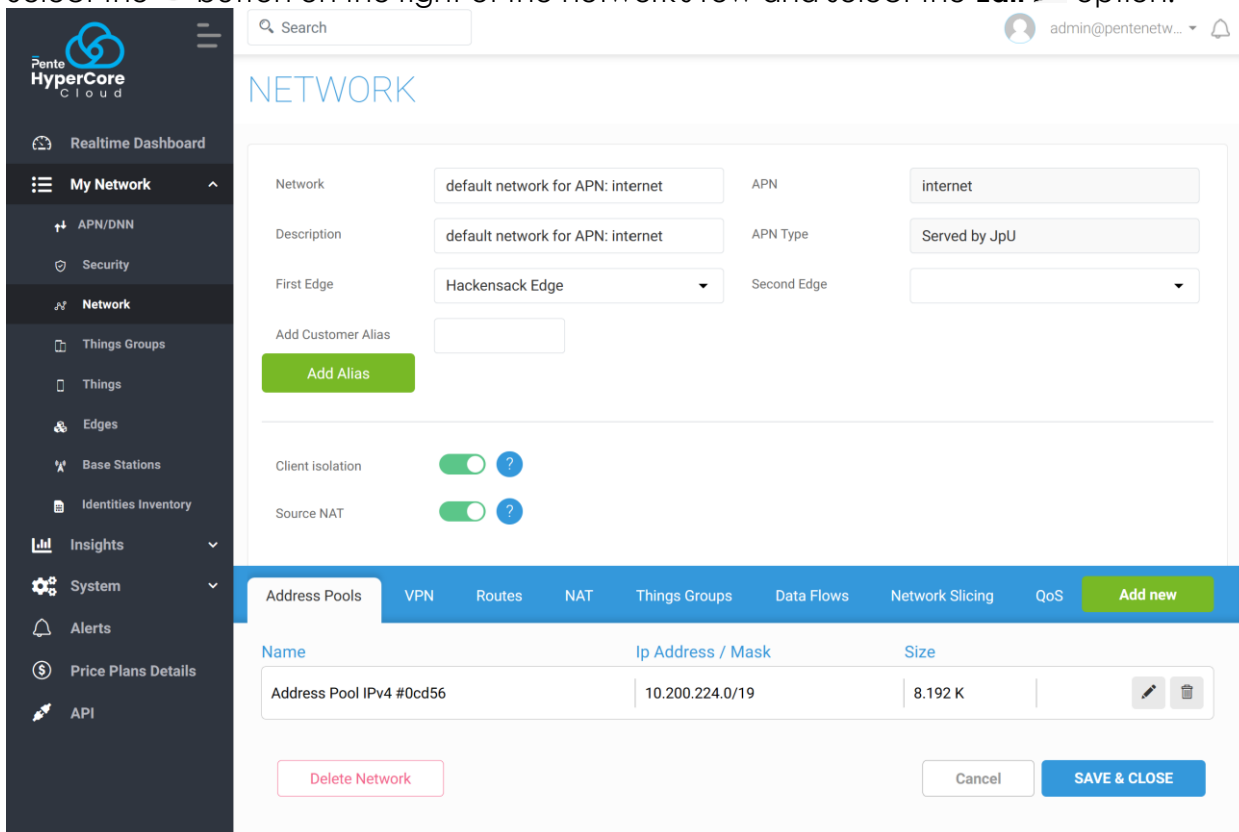


Figure 14 - Network Page

At this point, ensure the "First Edge" is assigned to the network and select an IP security profile (the default for now). Then save & close.

- 7 Checkout the Thing Groups** – Things such as light sensors, gas meters or mobile phones can be grouped into various categories for management purposes as needed. You can also create a single thing group for all the things in your organization, a different thing group for each department in your organization, or for each user type.

Click **My Network->Thing Group**  button in the left pane –

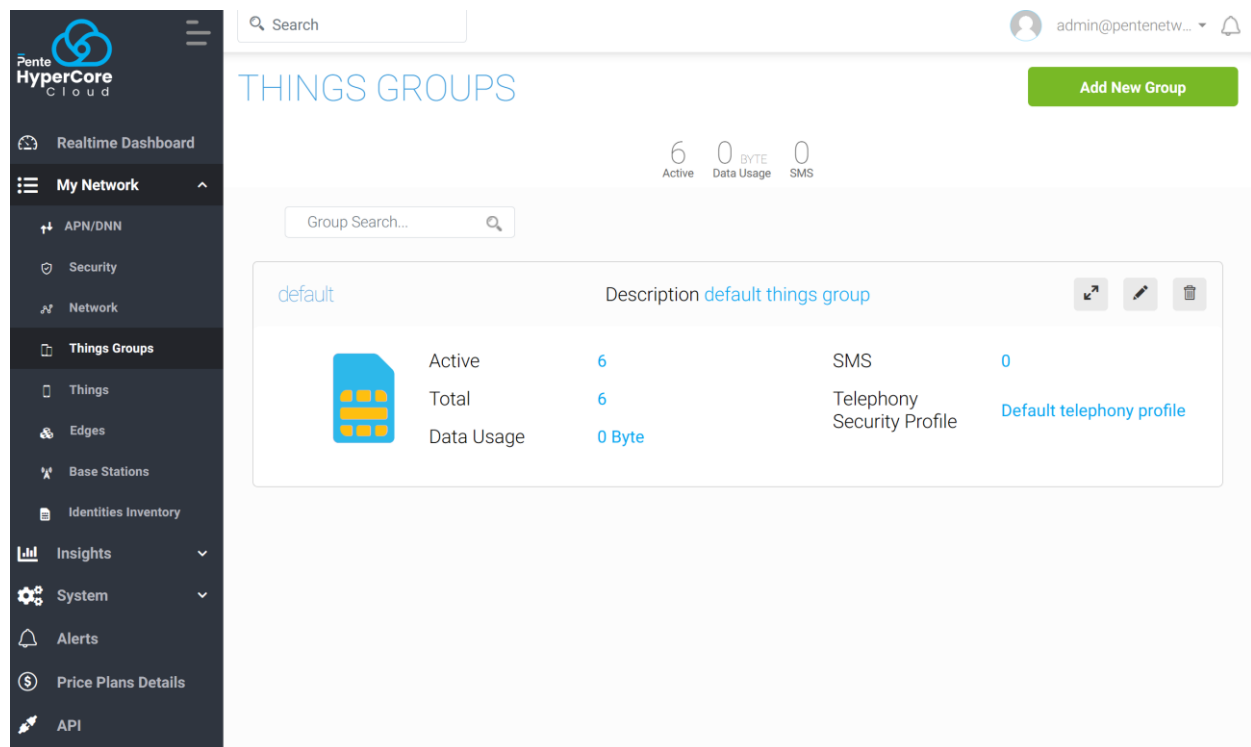


Figure 15 - Thing Groups

select the **Edit**  option.

At this point, you should see 6 SIM cards (things) assigned to your group (4 physical and 2 eSIM):

The screenshot shows the Pente HyperCore Cloud interface. On the left is a dark sidebar with navigation options: Realtime Dashboard, My Network (with sub-items APN/DNN, Security, Network), Things Groups (with sub-items Things, Edges, Base Stations, Identities Inventory), Insights, System, Alerts, Price Plans Details, and API. The main content area has a 'Telephony Security Profile' dropdown set to 'Default telephony profile'. Below this are four summary cards: 'Active Things' (6), 'Available Things' (0), 'SMS Consumption' (0), and 'Data Usage' (0 Byte). A blue navigation bar contains tabs: Things (selected), Networks (1), Webhooks, Add New Bundle, Price Plan, Roaming, and Radio Profile. A green 'Assign more Things' button is visible. Below the navigation bar is a table of things:

Thing name	Data Usage	SMS	
ICCID 89972114251107578854	0 Byte		⚙️
ICCID 89972114251107578839	0 Byte		⚙️
ICCID 8997211425012500055	0 Byte		⚙️
ICCID 8997211425012500054	0 Byte		⚙️
ICCID 89972114251107578847	0 Byte		⚙️
ICCID 89972114251107578821	0 Byte		⚙️

At the bottom of the table, there are pagination controls: 1 / 1, 10 items per page, and 1 - 6 of 6 items. At the bottom right, there are 'Cancel' and 'SAVE & CLOSE' buttons.

Figure 16 - Things in Group

- 8 **Activate Things** – Open one of the newly defined things (Select the  button on the right of the things' row and select the **Edit**  option) –

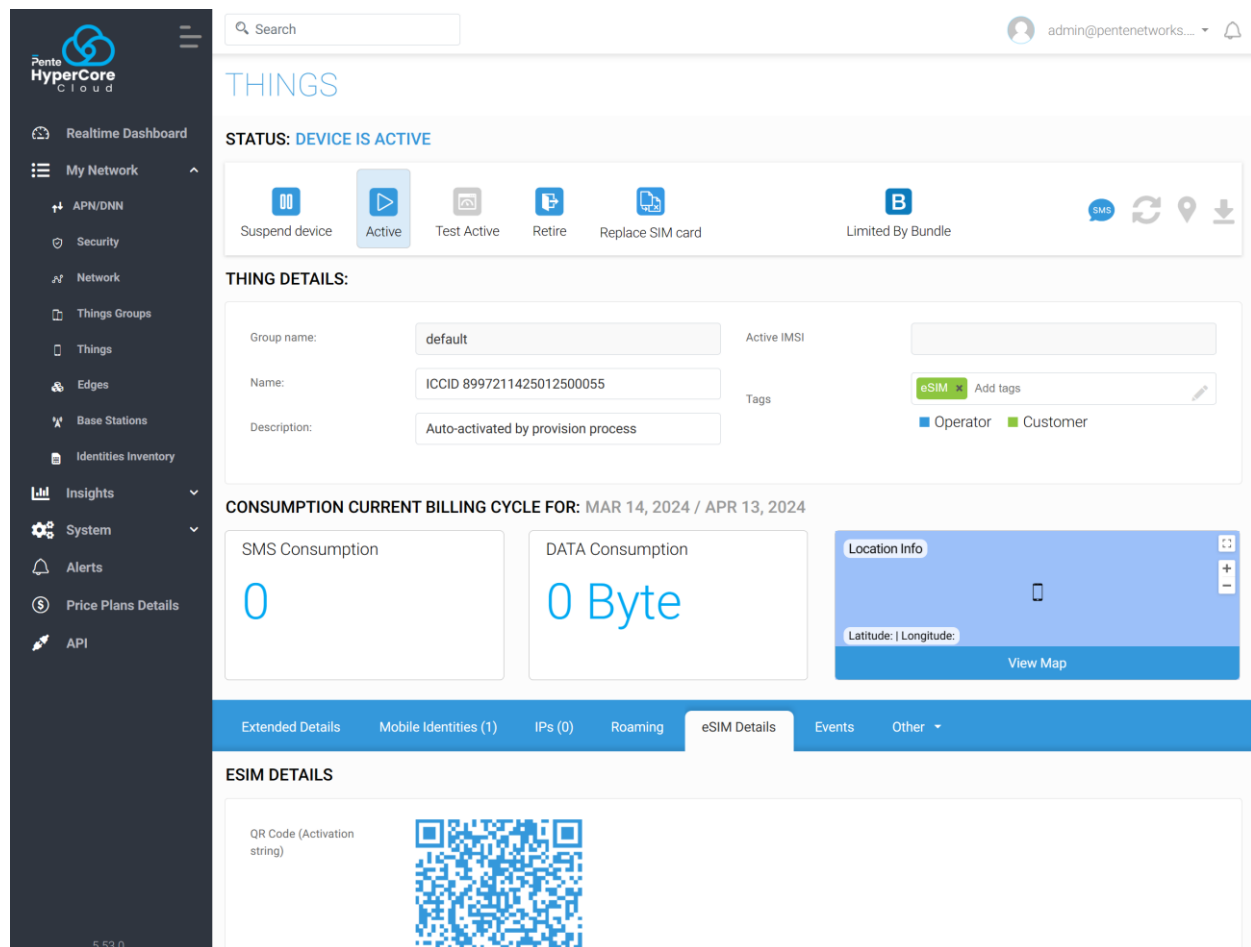


Figure 17 - Thing Page

Press the "Active" button at the top of the page. This will make the SIM card active and ready to use!

Note – You can activate all the SIM cards in a batch operation from the "Things" section in the left pane and select Apply the action on Things button

- 9 **Point the RAN to the MME/AMF IP set in step 4** – Go to the RAN vendor manual for help with this step.

▶ **YOU ARE NOW READY TO GO!**

- **Pop the SIM card in a phone** – The system is ready for your first test drive. Contact us, and we can show you different ways you can test or showcase the network to others.
- **Explore the Control Center and Customer Portal** – There are lots of options, customizations, and features to explore. Check out our over 700 APIs! Contact your sales representative to schedule a deeper tour of the platform and ways you can demonstrate the capabilities.
- **Reach out for in-depth training** – We can provide in-depth and advanced training sessions for you or anyone on your team. Contact your sales representative for more details.



About Pente Networks

Pente's mission is to make private cellular networking accessible to everyone, not just those who understand complex telecom systems.

Since 2017, Pente has been delivering private LTE & 5G cellular core and network solutions, currently managing millions of SIMs for customers around the globe. And Pente's solutions always have IT in mind - with more than 700 APIs for seamless integration.

Today, Pente puts the planning, deployment and orchestration of private cellular networks into everyone's hands.

