

# OpenNaaS vCPE

## Virtual CPE Network Service



### KEY BENEFITS

- **Save Hardware**

Accommodate new or current customer CPE through a pure network virtualization solution, avoiding new hardware deployments.

- **Faster Operations**

Adding and removing customers, as well as changing the CPE topology, become fully automated actions, with the possibility to roll-back undesired changes.

- **Delegate to Customer**

Control the level of network management delegated to the user. Empower the customer with an automated interface, without needing NOC intervention for regular configuration requests.

- **Gradual Deployment**

Compatible with legacy CPE solutions, decide by yourself and at your pace which customers you want to serve with the new vCPE service.

- **Flexible**

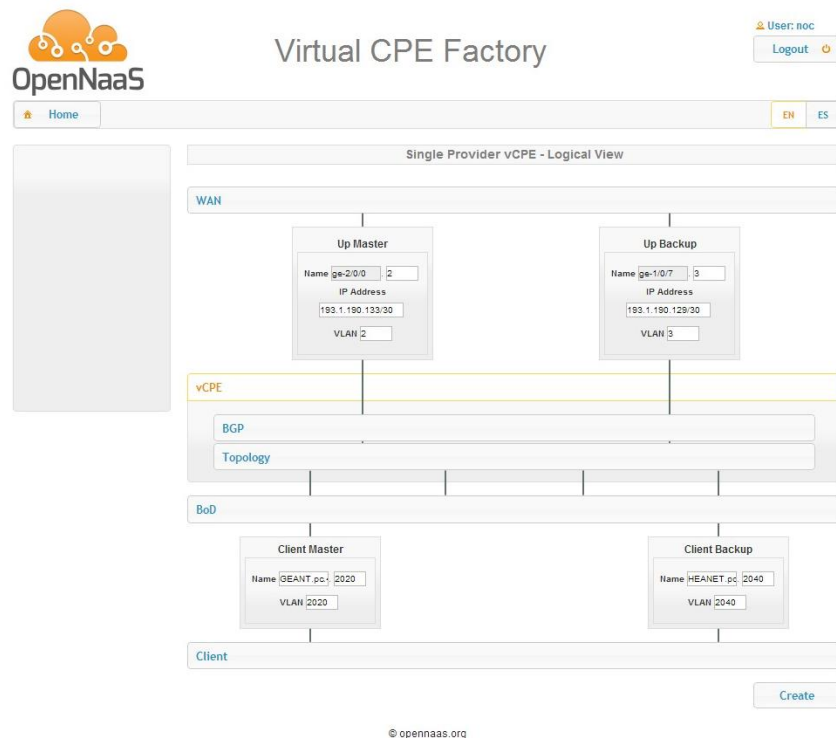
Maintain several vCPE templates that reflect your institutional policy, create new ones to accommodate new requirements and smoothly migrate to them.



### Overview

OpenNaaS is a platform for provisioning network resources that allows the deployment of dynamic network infrastructures by network operators, supporting many different types of application, each with their own access and network resource usage patterns.

This platform offers a robust and extensible Network as a Service (NaaS) open source framework where network virtualization can be achieved. The NaaS paradigm is the foundation on which OpenNaaS works as a key enabler to address this challenge by offering virtual infrastructures to third party through this platform web services. OpenNaaS allows the creation of a virtual representation of a physical resource (e.g. network, router, switch, optical device or computing server), based on an abstract model of that which is often achieved by partitioning (aka slicing) and/or aggregation.



### Virtual Customer Premises Equipment

On traditional hardware-based CPE (Customer Premises Equipment), deploying fiber-based connectivity to an institution requires several layers of equipment to be deployed, much of it on site at the institution. Some of this equipment is needed in order to provide a network boundary between the provider and the client institution. The goal of the virtual CPE is to rationalize that equipment, by leveraging virtualization so that a single device at the client institution can share the role, or that it can be provided by a small number of aggregating devices at a central location.

## Benefits

The main benefit of Virtual CPE scenarios is the reduction on cost of extraneous equipment at the border between the NREN and the client. This is possible where this equipment is needed to provide a logical demarcation but not a physical conversion. As shown, this is accomplished by the virtualization-enabled possibility of having several customers to consume virtualized instances on the same physical equipment.

The fact that this physical equipment is not only concentrated but also co-located, allows for several secondary but relevant benefits on operational expenses. This allows for reducing space, power and cooling needed due to physical equipment, and therefore the cost and environmental impact of the same.

OpenNaaS interface makes easier to networks operators to maintain several vCPE templates that reflect your institutional policy and smoothly migrate to them. You can also create new templates to accommodate new requirements by using the API. The web client allows you to control the level of network management delegated to the user and empowers the customer with an automated interface, without needing NOC intervention for regular configuration requests. Even more, it helps you define the demarcation between provider and user or demarcation between multiple providers towards a single user.

## Features and Capabilities

The network administrator can operate the network through a simple client web application that abstracts the complexity of the configuration and minimizes the risks of committing an error. OpenNaaS offers a coherent user experience:

- A single CLI, where the operator has all the control.
- Unified management of resources and its capabilities.
- Combined application/resource lifecycle.
- Unified security and ACL management.
- Enterprise-level base technologies mean:
  - Server monitoring.
  - Remote management.
  - Easy upgrade management.
  - Extensibility and template customization.
  - Out-of-band reporting of errors.

### About i2CAT

i2CAT is a Technological Center with a wide experience in multiple national and international R+D+i projects, leading the introduction and integration of ICT and Future Internet technologies in the main economic sectors (Health, Education, Culture, Industry, Media, ICT) with the aim to improve the business competitiveness and the citizens' welfare.

- Lightweight abstracted operational model:
  - Decoupled from vendor-specific details.
  - Flexible enough to accommodate different designs and orientations.
  - Fixed enough so common tools can be build and reused across plugins.
- Support of different protocols over IPv4 and IPV6:
  - BGP, OSPF, VRRP...

## Usage

The creation of a vCPE is very simple: choose a template from the current predefined configurations and network structure; verify physical infrastructure to use, and enter parameters (such as IP addresses and VLANs) where needed, or just accept the suggested values.

Once created, the network operator can modify an existing vCPE and the client user can also modify their IP addresses, internal routing protocol and/or firewalling rules.

## Technology

OpenNaaS is open source with a LGPL version 3 license. It makes use of the latest software technologies which provides reusable building blocks for the development of new templates.

It offers a powerful RESTful web-service interface, which allows an easy integration with existing middleware applications already deployed in organizations.

OpenNaaS platform: the framework which gives access to the resources and capabilities in order to manage the network.

Client web application: interface connected to the platform that allows the management of vCPEs.

## Goal

On traditional hardware-based CPE, deploying fiber-based connectivity to an institution requires several layers of equipment to be deployed, much of it on site at the institution. The goal of virtual CPE is to use virtualization so that a single device at the client institution can share the role, or that it can be provided by a small number of aggregating devices at a central location.