

IOTWeek

Dublin — June 20-23, 2022

5GMediaHUB: Technical Overview

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GLOBAL VISION:
IoT TODAY AND BEYOND



IOTForum

5GMediaHUB main objectives



- **Open up 5G infrastructures (experimental) and make it accessible to SMEs – Media**
- **Offer a set of NetApps implementing a PaaS layer similar to AWS & Azure clouds**
- **Includes DevOps tools to setup and manage experiments via automated testing pipelines**
- **Web-based Portals which simplify the process of service creation, validation and verification**
- **Supports automated on-boarding of NetApps providing the dedicated functionality directly within the core telecoms network**

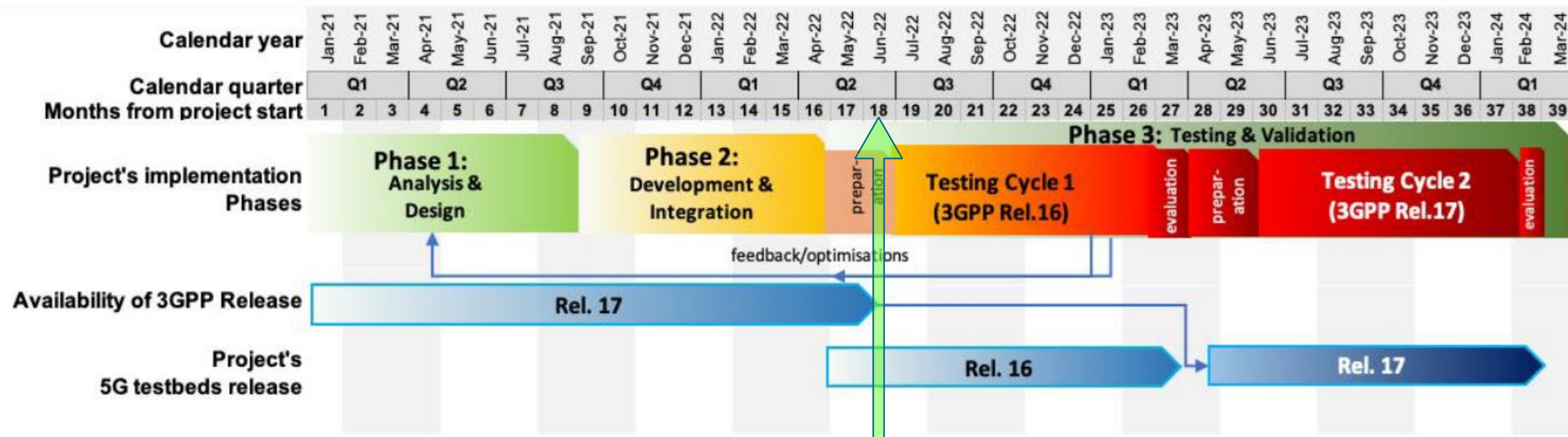
5GMediaHUB main objectives



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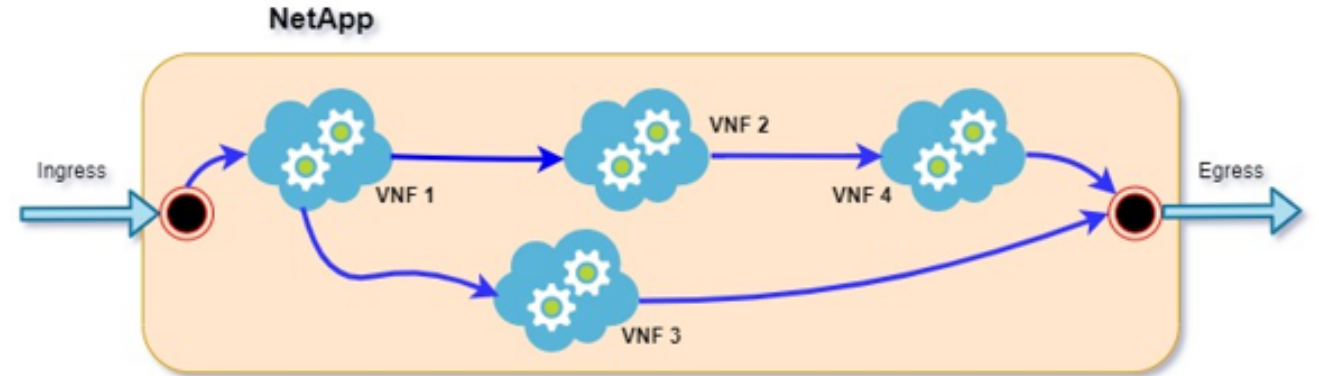
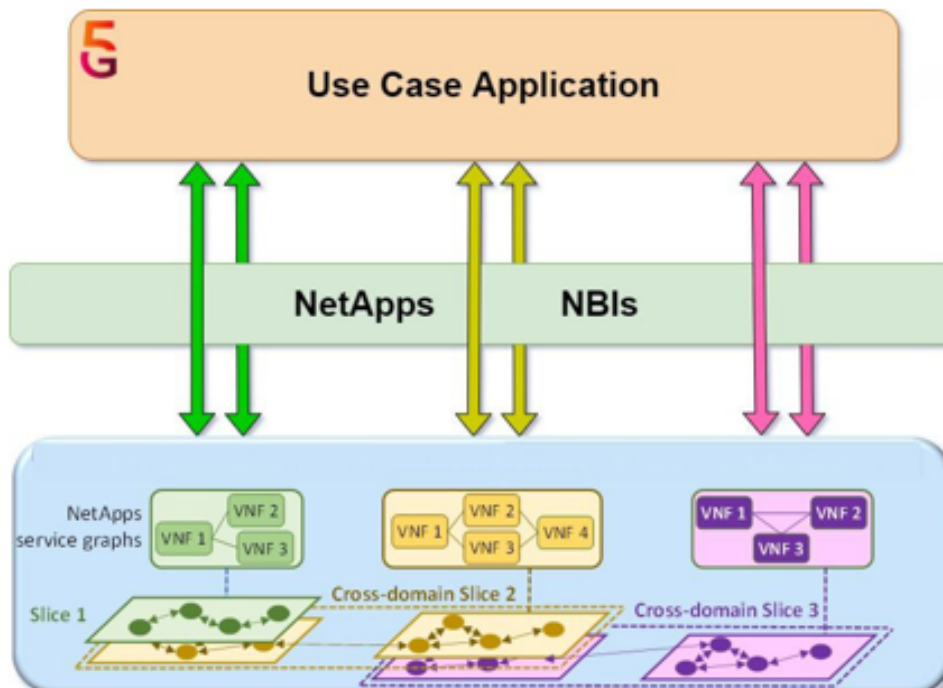
- Perform 2 test cycles, in 3GPP Rel-16 and Rel-17, in two federated testbeds

(CTTC in Barcelona  & Telenor in Oslo )



What is a NetApp?

- NetApps: Chains of VNFs, offering reusable functionality (e.g., video streaming)

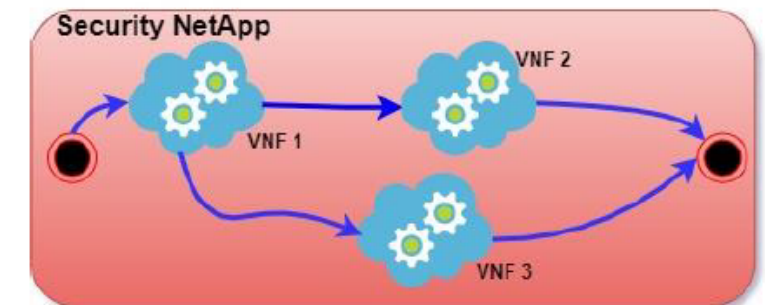
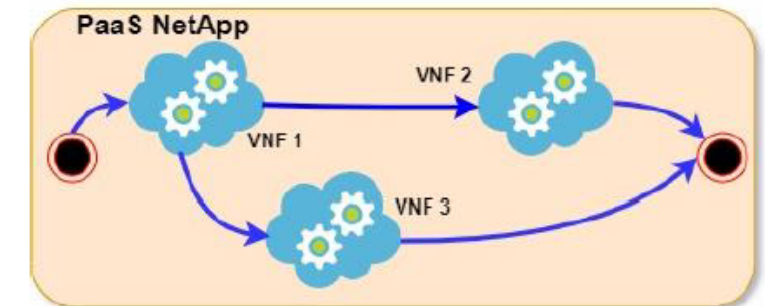
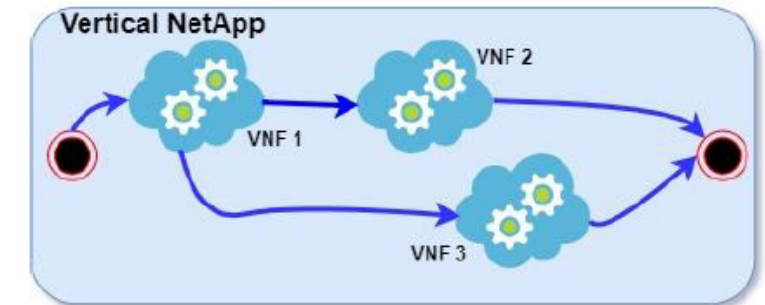


- NetApps are instantiated within Network Slice Subnet Instances (in line with 3GPP 5G management standards)
- NBIs: connecting UC Apps to NetApps via ingress / egress points to the VNF chain (e.g., video streaming APIs)

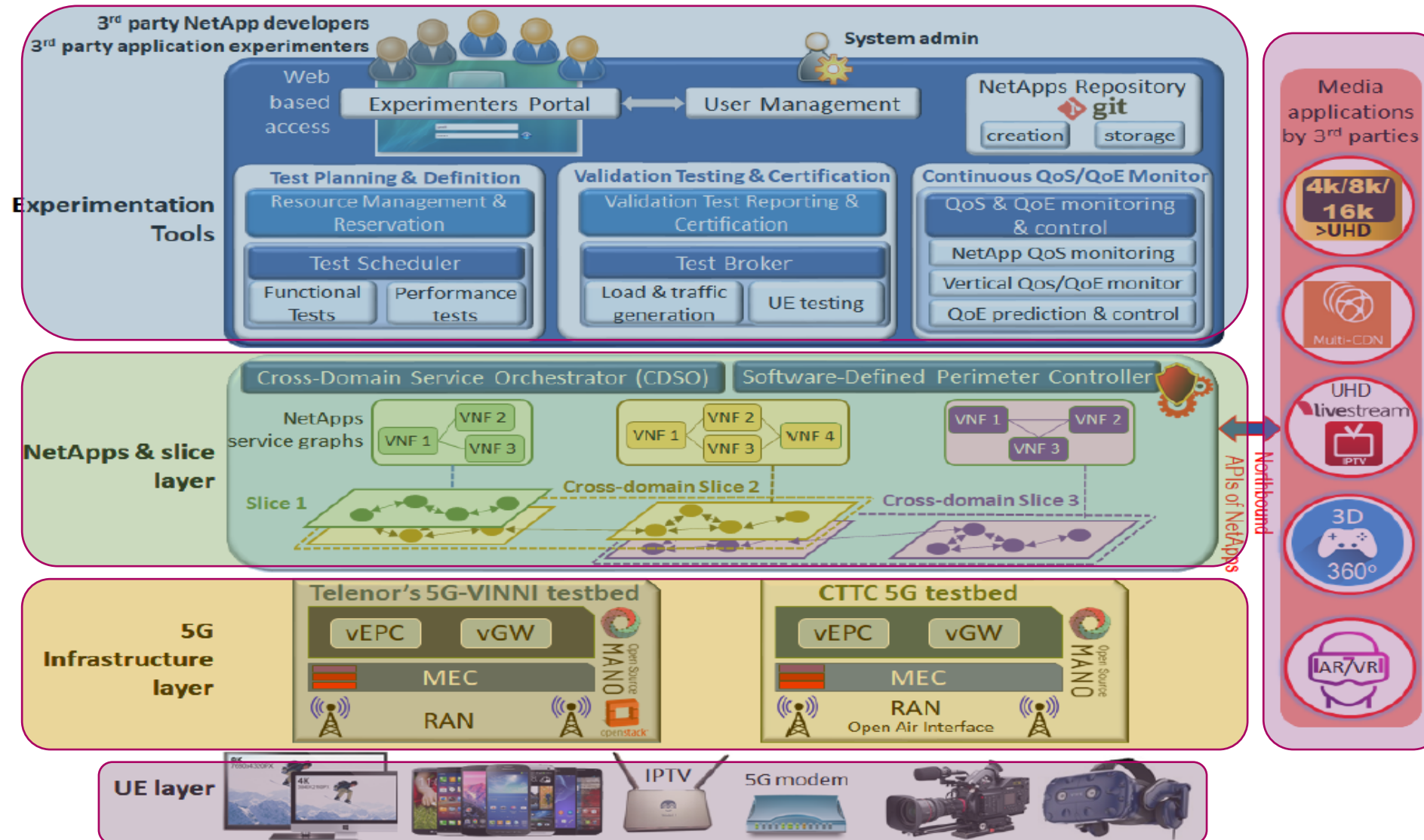
5GMediaHUB's NetApps

NetApps to be generated and their types:

- **Vertical** - ImmersiveMedia NetApp (assisted by NOR)
 - **Vertical** - MCDN NetApp
 - **Vertical** - StreamSelector NetApp
 - **Vertical** - Streaming NetApp
 - **Platform** - PaaS NetApp
 - **Security** - Web Application Firewall NetApp
 - IDS NetApp (based on Snort IDS)
-
- Disaggregation of “monoliths” in VNFs/CNFs underway
 - Design of Northbound APIs and real-time monitoring APIs for experiments



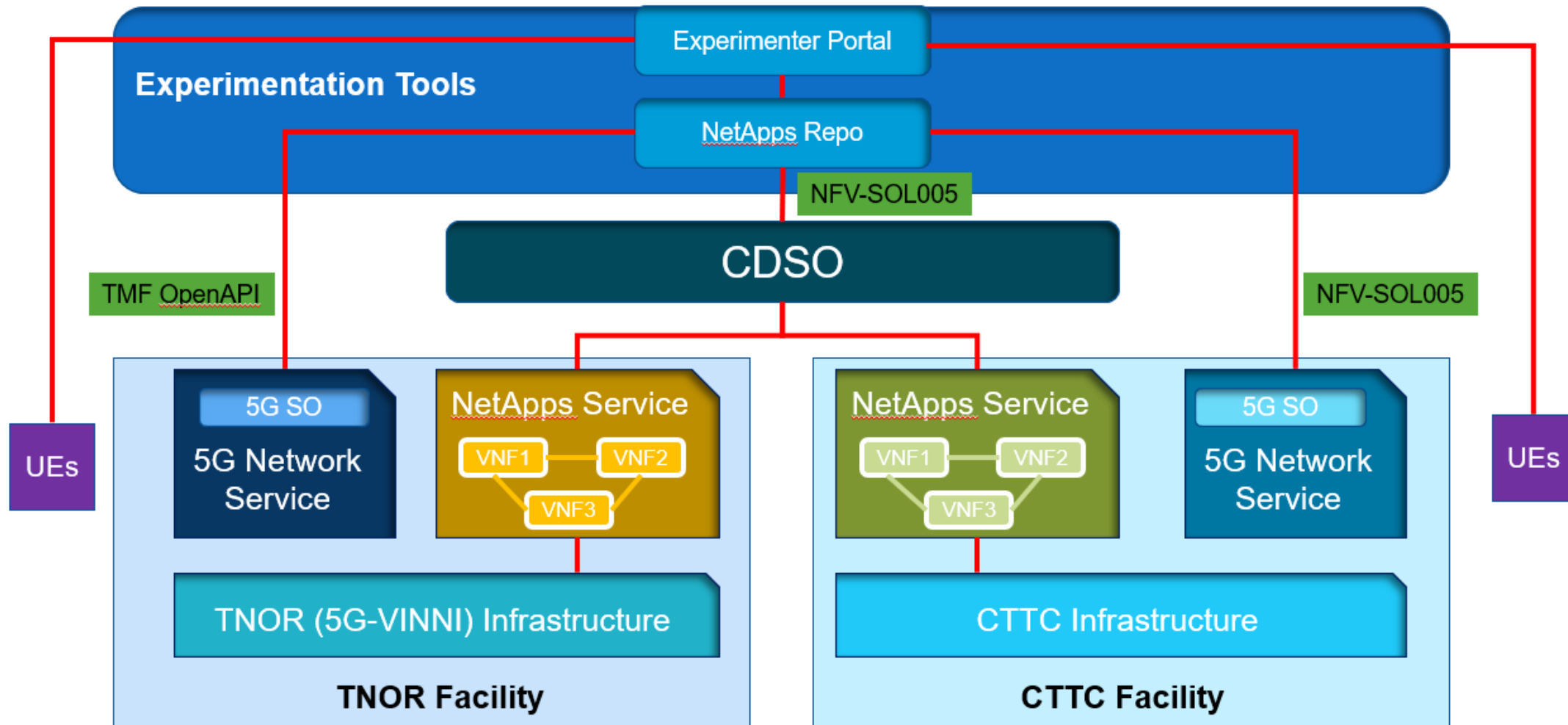
5GMediaHUB Within the 5G Infrastructure



5GMediaHUB main objectives and provisions



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5GMediaHUB Tools - Experimenters Portal

- Login page for the portal with options to (1) select UC, (2) select UC scenario, Description, (3) upload data file.
- iFrame functionality for integration of Web Interfaces of other Experimentation Tools

The screenshot displays the '5G Media Hub - Home' portal. On the left is a sidebar with a user profile (5GHUB), a search bar, and a 'MAIN MENU' containing 'Home', 'IFrame', 'Messages', 'Notification', 'Graph', and 'Location'. The main content area has a top navigation bar with a back arrow, envelope, bell, and 'Logout (5GHUB)' link. Below this, the '5G Media Hub - Home' section contains three main form areas. The first area, labeled '1' with a red arrow, is for 'UC Description' and includes fields for 'Use Case ID' (15), 'Use Case Description' (5G MEDIA HUB TEST), 'Responsible' (Christos S), 'Contact' (Christos S), and 'Date' (27/10/2021), along with an 'Edit' button. The second area, labeled '2' with a red arrow, is for 'Scenario Description' with a dropdown menu showing 'Scenario 1: 5G HUB TEST'. The third area, labeled '3' with a red arrow, is for 'Experiment Results' with a dropdown menu showing 'Select an Option', a 'Date' field with a placeholder 'dd/mm/yyyy', and an 'Add new Experiment Result +' button.

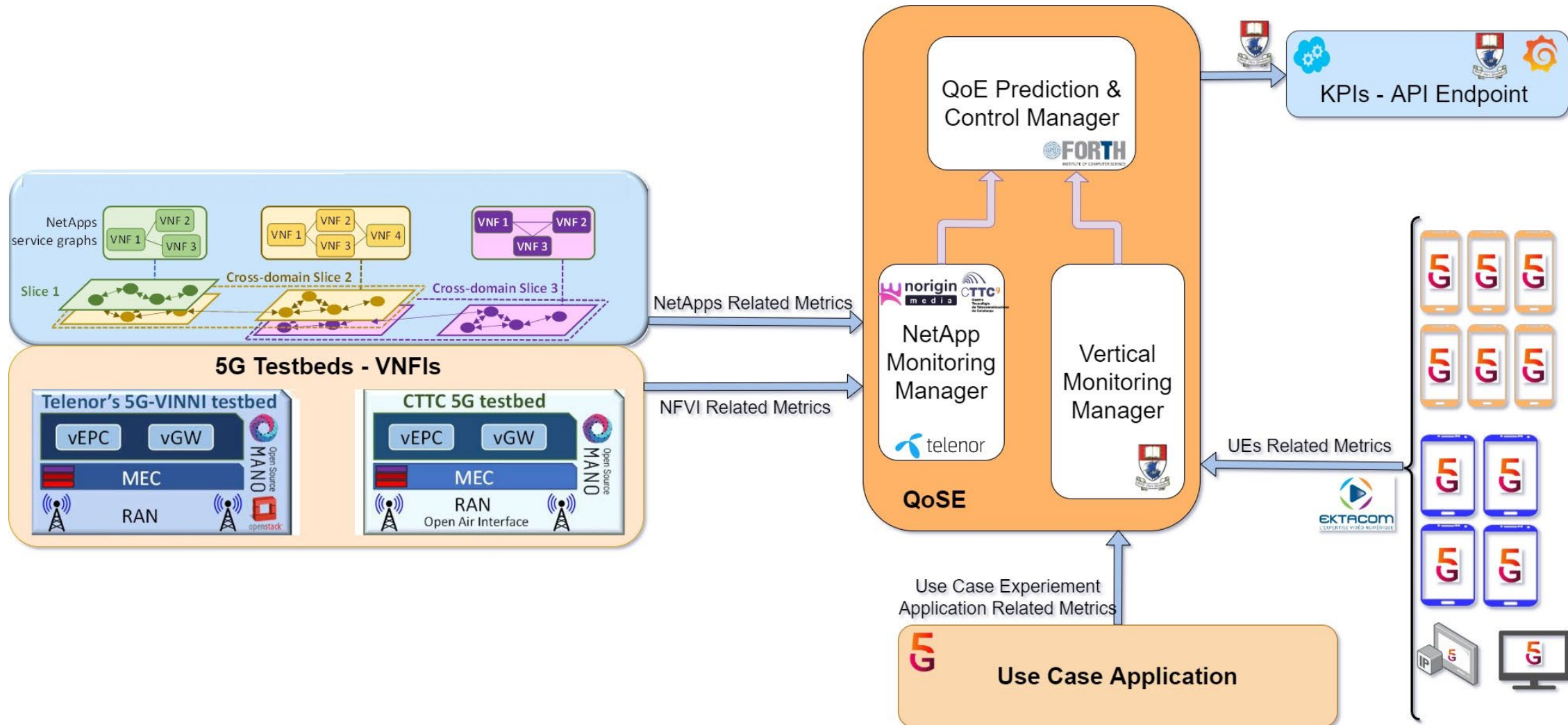
- Experimenters Portal
 - Test Planning & Definition Engine
 - Validation Testing and Verification Engine
 - Continuous QoS/QoE Monitoring Engine
- Secure User Management
- NetApps Repository Application
- Deliver a set of Media & Security NetApps
 - Vertical NetApps fulfil the set of Use Cases and their Related Scenarios
 - Security are agnostic to the vertical domain



5GMediaHUB QoS/E Engine



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5GMediaHUB - User Management Module



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The image displays three overlapping screenshots of the 5GMediaHUB User Management Portal. The top-left screenshot shows the 'Dashboard' (User Management Portal Home Page) with icons for Users, Groups, and Applications. The top-right screenshot shows the 'Dashboard' (User Management Portal Applications Page) with a table of applications. The bottom screenshot shows the 'Dashboard' (User Management Portal Users Page) with a table of users.

Dashboard (User Management Portal Home Page)

Users

Groups

Applications

Dashboard (User Management Portal Applications Page)

Application Name	Root URL	Enabled
my-umm-test-app	http://localhost:3000	True
my-umm-test-app-backend	http://localhost:8080	True
net-apps-portal	https://netapps-5gmediahub.eu	True
net-apps-portal-backend	https://api.netapps-5gmediahu...	True

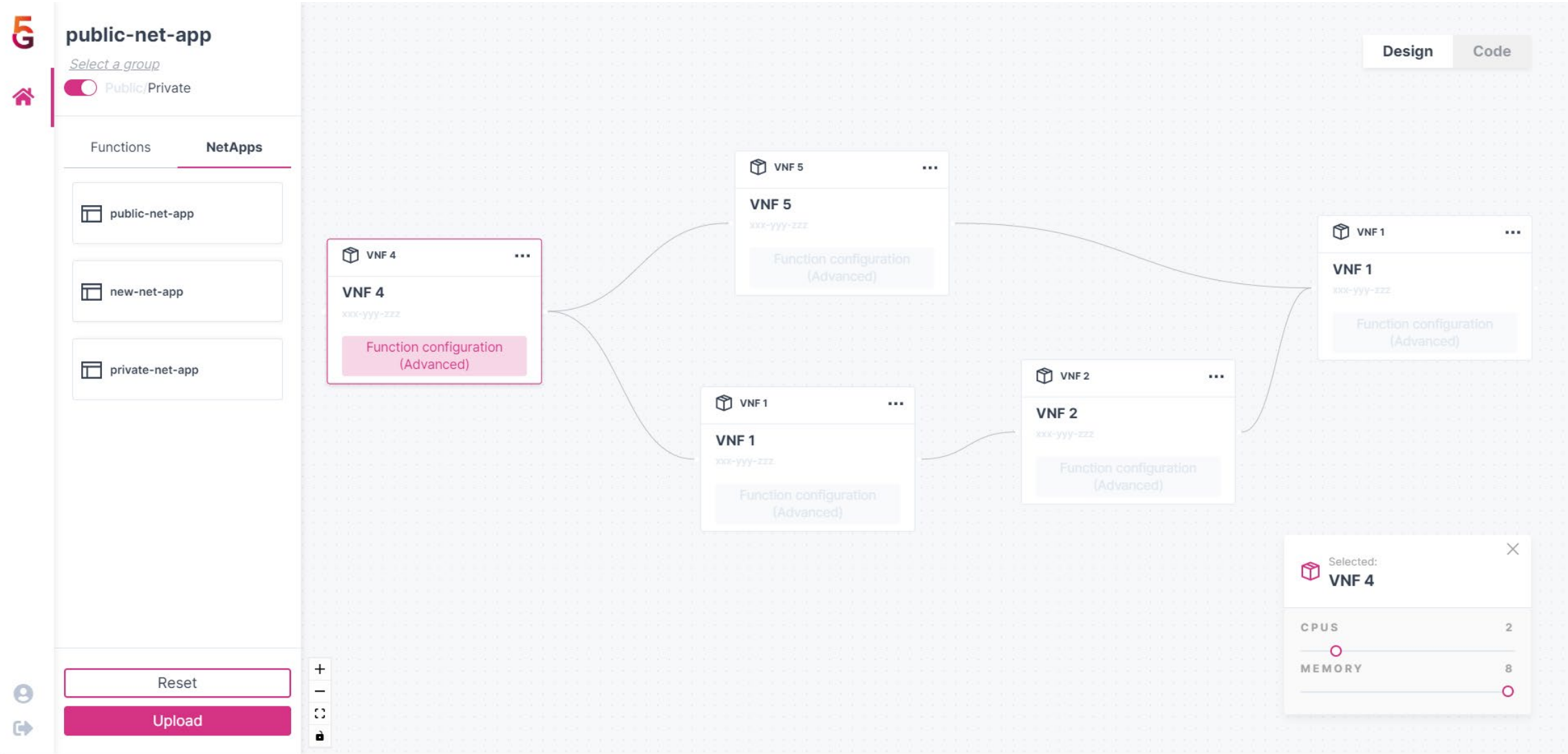
Dashboard (User Management Portal Users Page)

User Email	Name
admin@localhost	Nothing provided
dev@localhost	Dev User
eucnc@test.eu	EUCNC Test User
mtolan@wit.ie	Martin Tolan
newuser1@example.com	Nothing provided
newuser2@example.com	Nothing provided
newuser@example.com	New User
ryan.mccloskey@waltoninstitute.ie	Ryan McCloskey
testuser1@example.com	Test One
testuser2@example.com	Test Two

5GMediaHUB – NetApps Repository Application



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5GMediaHUB - NetApps Repository Application

The screenshot shows the 'public-net-app' interface. On the left, there's a sidebar with a home icon, a 'Select a group' dropdown, a 'Public/Private' toggle, and a list of functions: 'public-net-app', 'new-net-app', and 'private-net-app'. The 'NetApps' tab is selected. The main area displays a JSON configuration for a VNF. At the bottom, there are 'Reset' and 'Upload' buttons.

```
[
  {
    "data": {
      "label": "VNF 1",
      "node": {
        "name": "VNF 1",
        "cpus": 2
      }
    },
    "id": "dndnode_0",
    "position": {
      "x": 997,
      "y": 268
    },
    "type": "functionNode"
  },
  {
    "data": {
      "label": "VNF 3",
      "node": {
        "name": "VNF 3",
        "cpus": 2
      }
    },
    "id": "dndnode_1",
    "position": {
      "x": 1735,
      "y": 578
    },
    "type": "functionNode"
  },
  {
    "source": "dndnode_0",
    "sourceHandle": null,
    "target": "dndnode_1",
    "targetHandle": null,
  }
]
```

A modal dialog titled 'VNF 1' is shown, allowing the user to edit the configuration for the selected VNF. The configuration is displayed in a JSON format within a text area. At the bottom of the modal, there are 'Cancel' and 'Save' buttons.

```
{
  "id": "dndnode_0",
  "data": {
    "label": "VNF 1",
    "node": {
      "name": "VNF 1",
      "cpus": 2
    }
  },
  "type": "functionNode",
  "xPos": 997,
  "yPos": 268,
}
```

5GMediaHUB - NetApps Repository Application



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NetApps Repository Portal verification utilising the APIs exposed by the OSM NBI.

Provides APIs for SOL-006 compliance for the descriptors (all in YANG):

- VNFD
- NSD
- NST

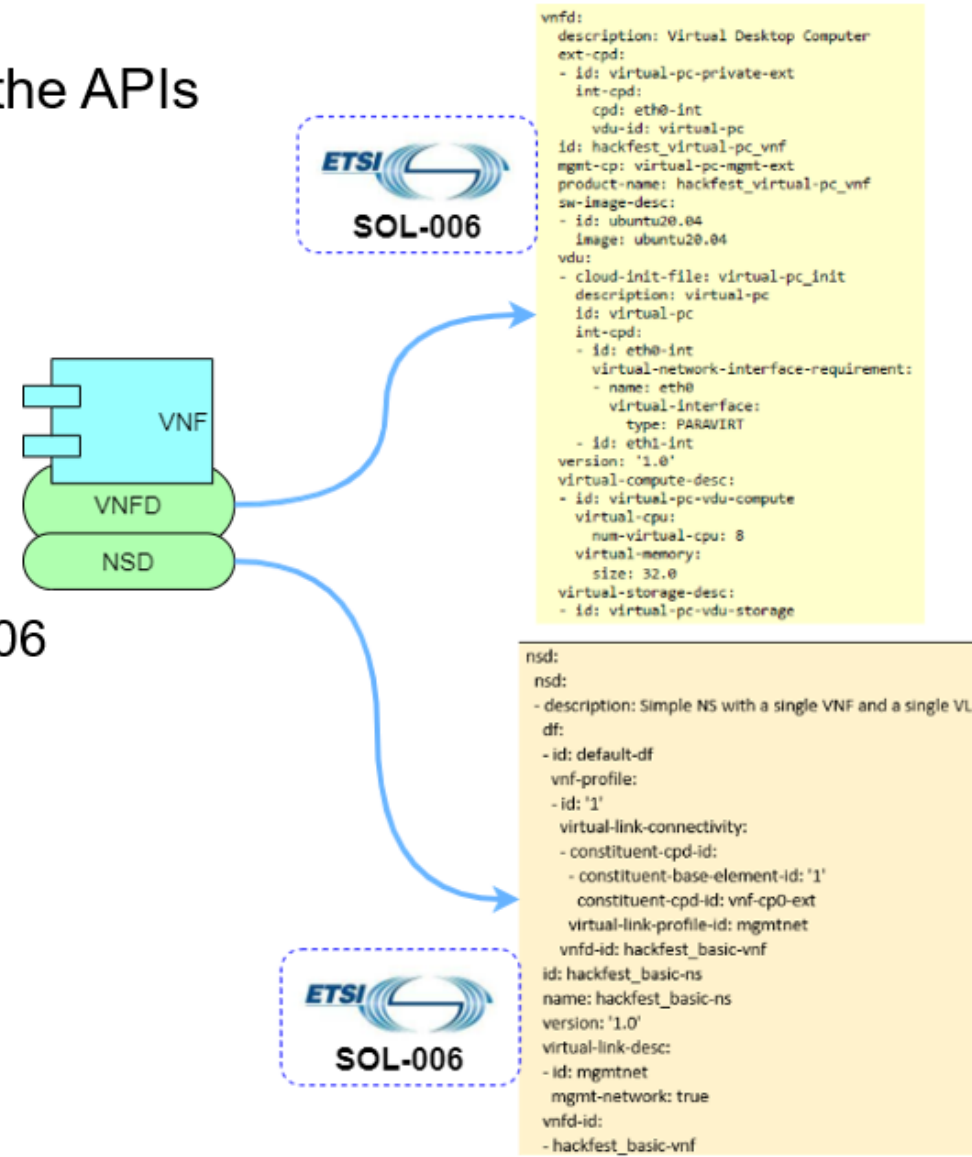
OSM IM aligned with ETSI NFV, derived from SOL006 (which, in turn, derives from IFA011 and IFA014).

VNF descriptor specification => IFA011

NS descriptor specification => IFA014

IFA (stage 2 specs) development of architecture, interfaces and information model aspects

SOL (stage 3 specs) specification of the implementable protocol and data model solutions



5GMediaHUB - NetApps Repository Application

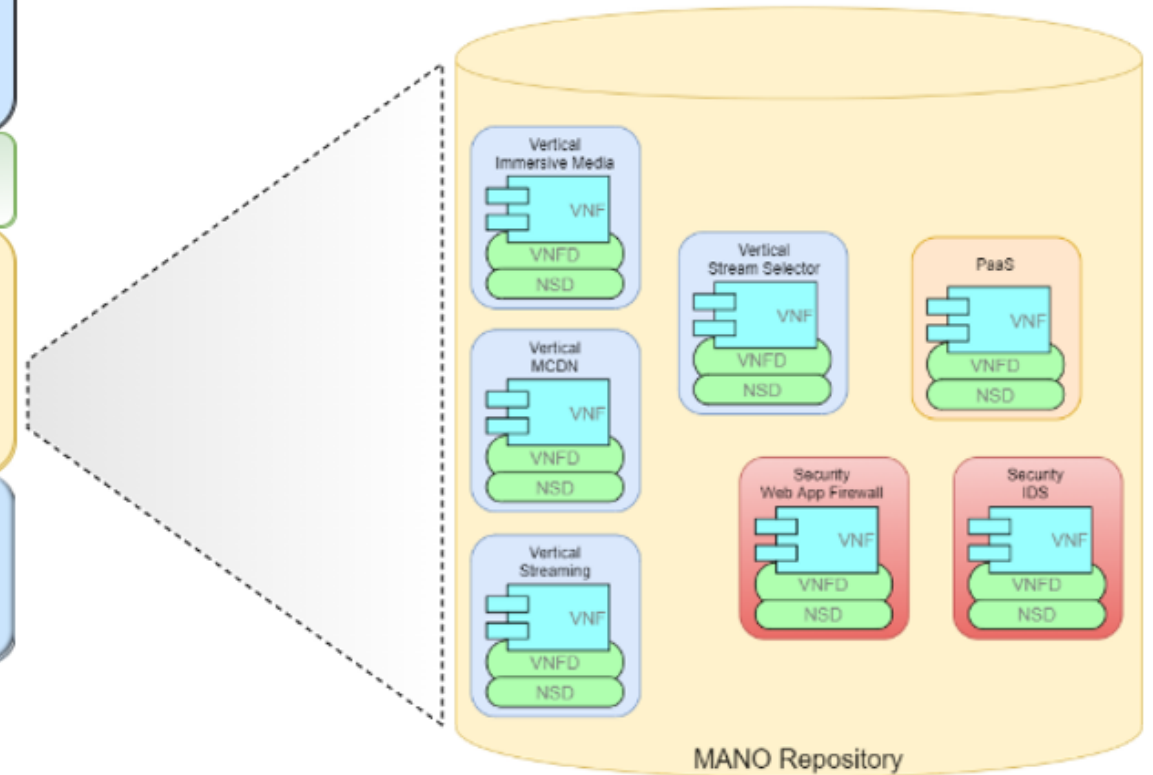
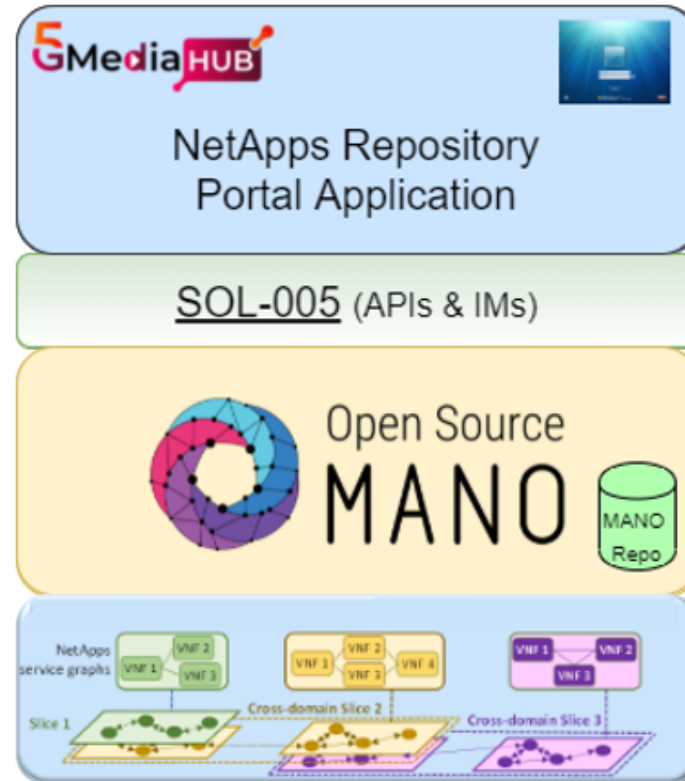


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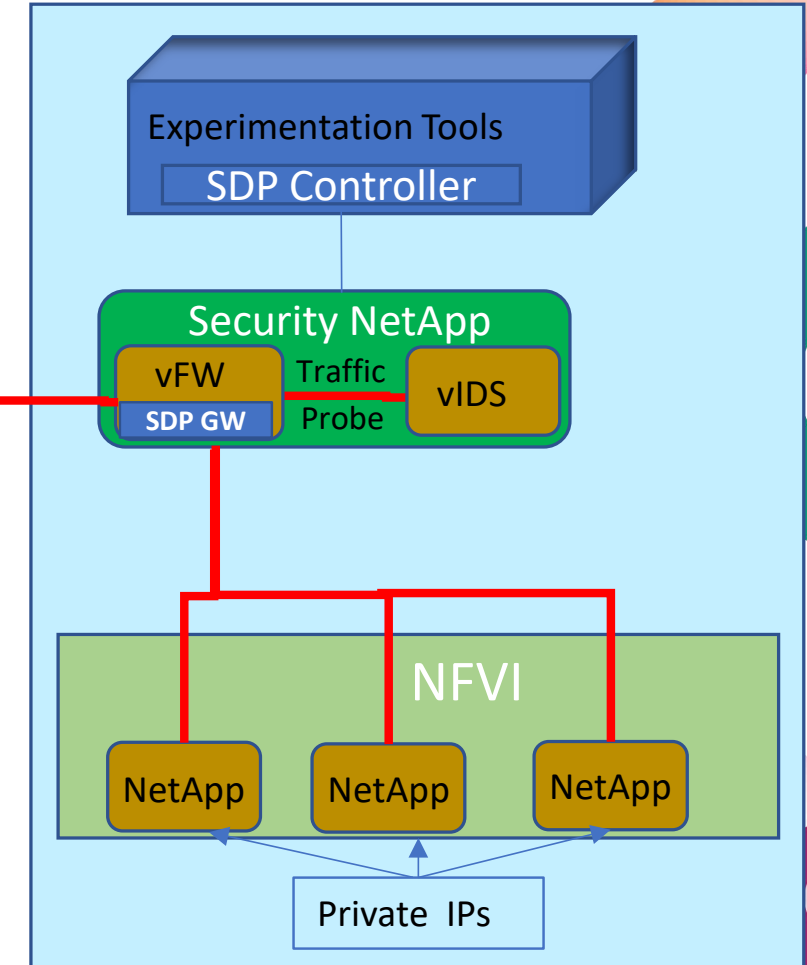
NetApps Repo Portal will make full use of the **SOL-005** specification for MANO communications

IMs & APIs

- Add
- Update
- Query
- Delete
- Verifv



- SDP – First use within 5G
- SDP Gateways control accessibility with the NetApps
- UMM Integrated for user access control
- Default firewall to drop all
- SPA packet to knock on the door



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Thank you!



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Find more:

<https://www.5gmediahub.eu/>

<https://waltoninstitute.ie/>



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