



Enabling Smarter Networks

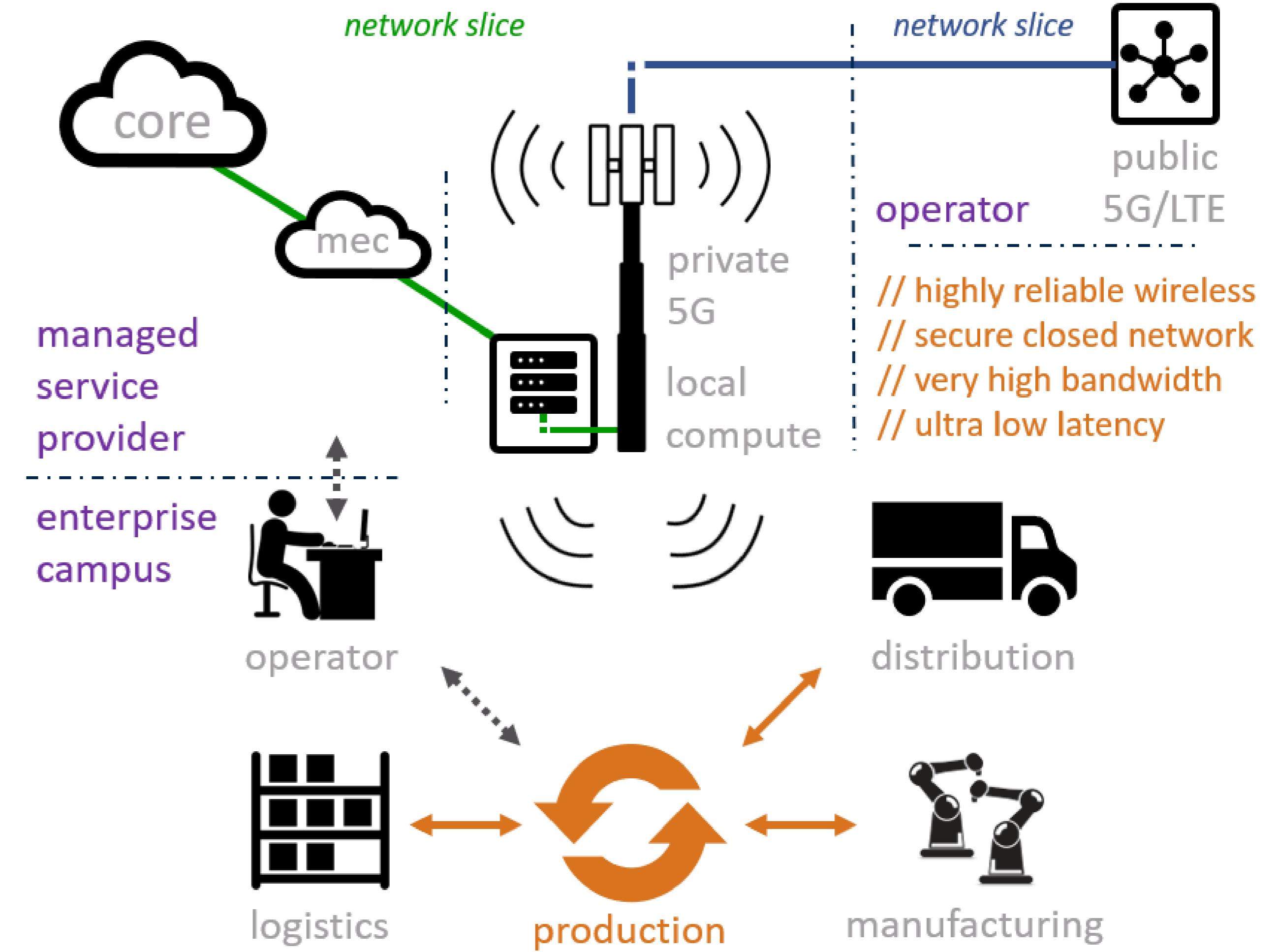
# KATANA Platform – NPN Operations

A large, abstract network graph is visible in the background, composed of numerous small blue dots (nodes) connected by thin blue lines (edges). The graph is highly interconnected, forming a complex web-like structure.

# Private Networks Overview

# What is Private Network

- **Definition**  
Private networks are dedicated communication networks built for a specific organization or use case
- **Benefits**
  - Enhanced security and data privacy
  - Improved network performance and reliability
  - Customized coverage and capacity
  - Integration with existing systems and infrastructure
- A private (mobile) network is where **network** infrastructure is used exclusively by **devices authorized** by the end-user **organization**.
- Typically, this infrastructure is deployed in one or more specific locations which are owned or occupied by the end-user organization.
- Devices that are registered on public mobile networks will not work on the private network except where specifically authorized.
- Formally these are known as 'non-public networks' however the term private network is more commonly used across vertical industries.



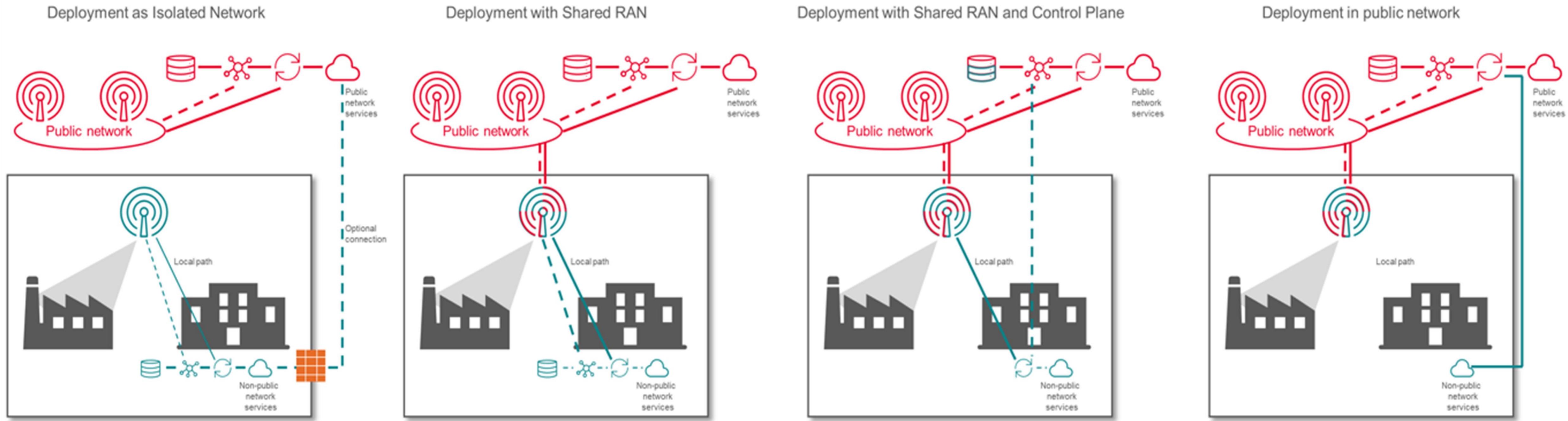
# Private network deployment models

## SNPN, Standalone Non-Public Network

- Operated by an NPN operator that does not rely on MNO
- Access to the public network is possible under certain conditions (Firewall)

## PNI-NPN: Public Network Integrated – Non Public Network

- NPN deployed with MNO support: hosted completely or partially on public network infrastructure
- e.g. using Network Slicing

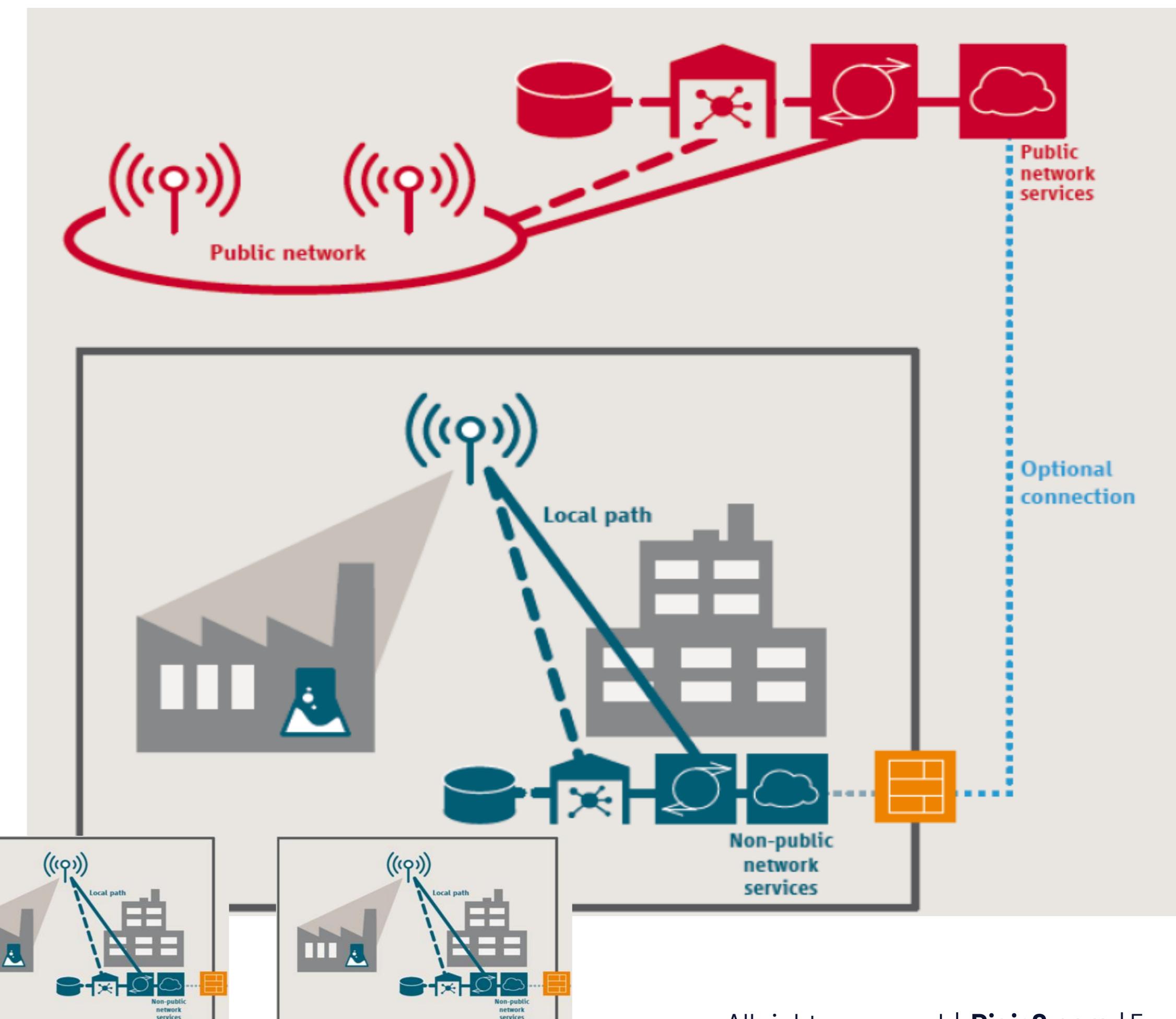


# SNPN: Standalone Non-Public Network

- NPN is deployed as an independent, standalone network
- Private company has exclusive responsibility for operating the NPN and for all service attributes
- The only communication path between the NPN and the public network can be done optionally via a firewall

standalone network. Under this deployment model, all network functions are located within the facility where the network operates, including the radio access network (RAN) and control plane elements. Standalone, isolated private networks would typically use dedicated spectrum (licensed or unlicensed) purchased through a mobile network operator (MNO) or, in some cases, directly from government agencies.

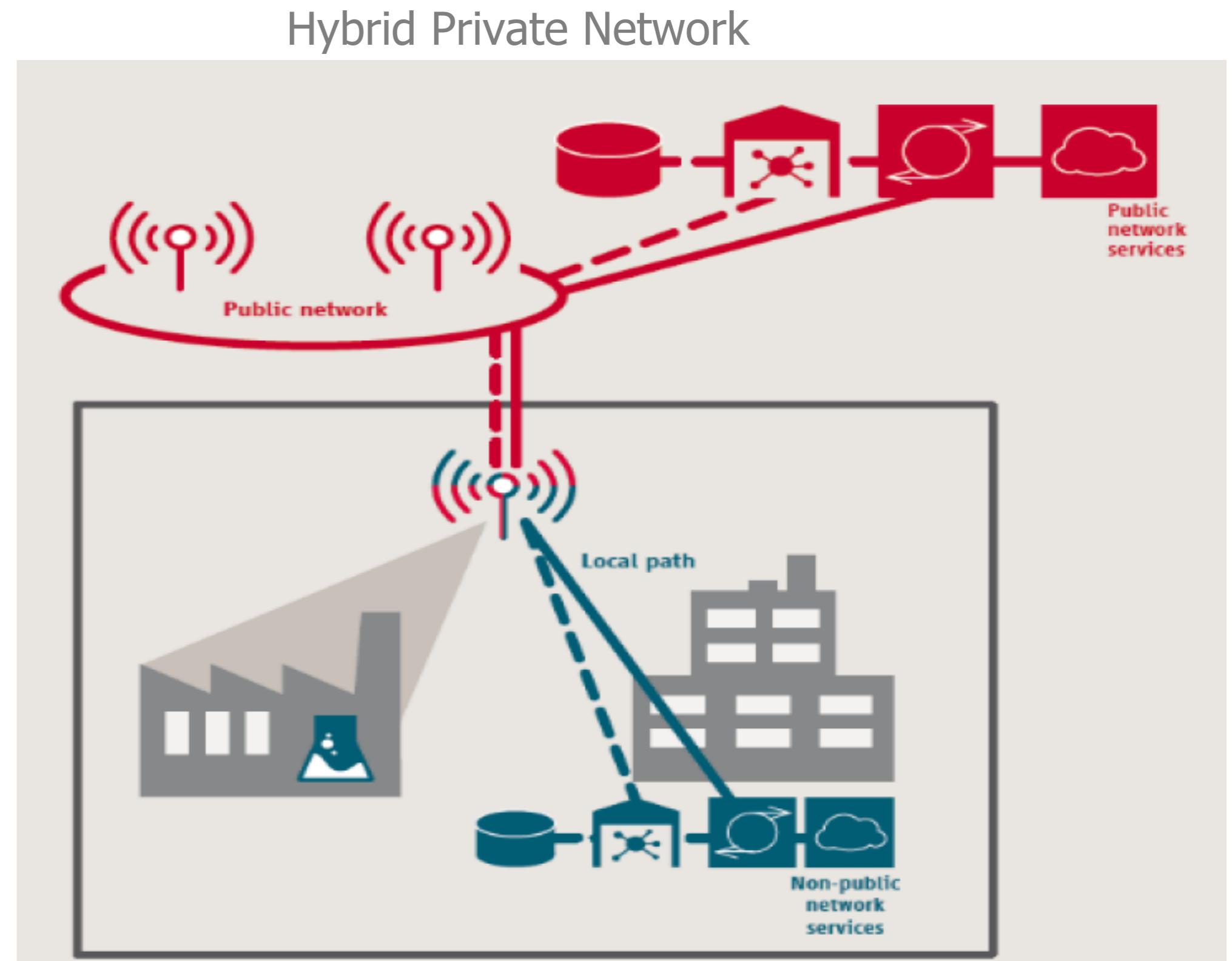
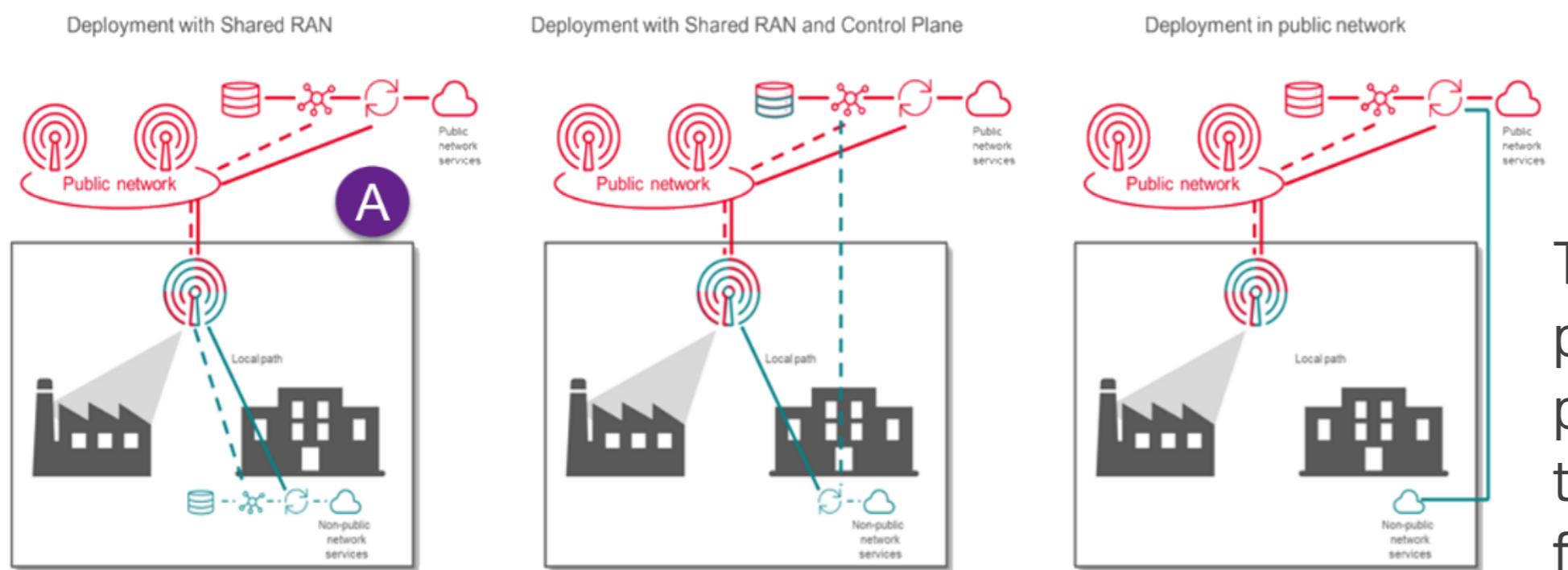
Network Isolated Private 5G Network



# PNI-NPN: Deployment with shared RAN

- Shared ran with dedicated Core
- NPN and the public network share part of the radio access network, while other network functions remain separated

This scenario involves an NPN sharing a radio-access network (RAN) with the service provider. Under this scenario, control plane elements and other network functions physically reside at the NPN site.

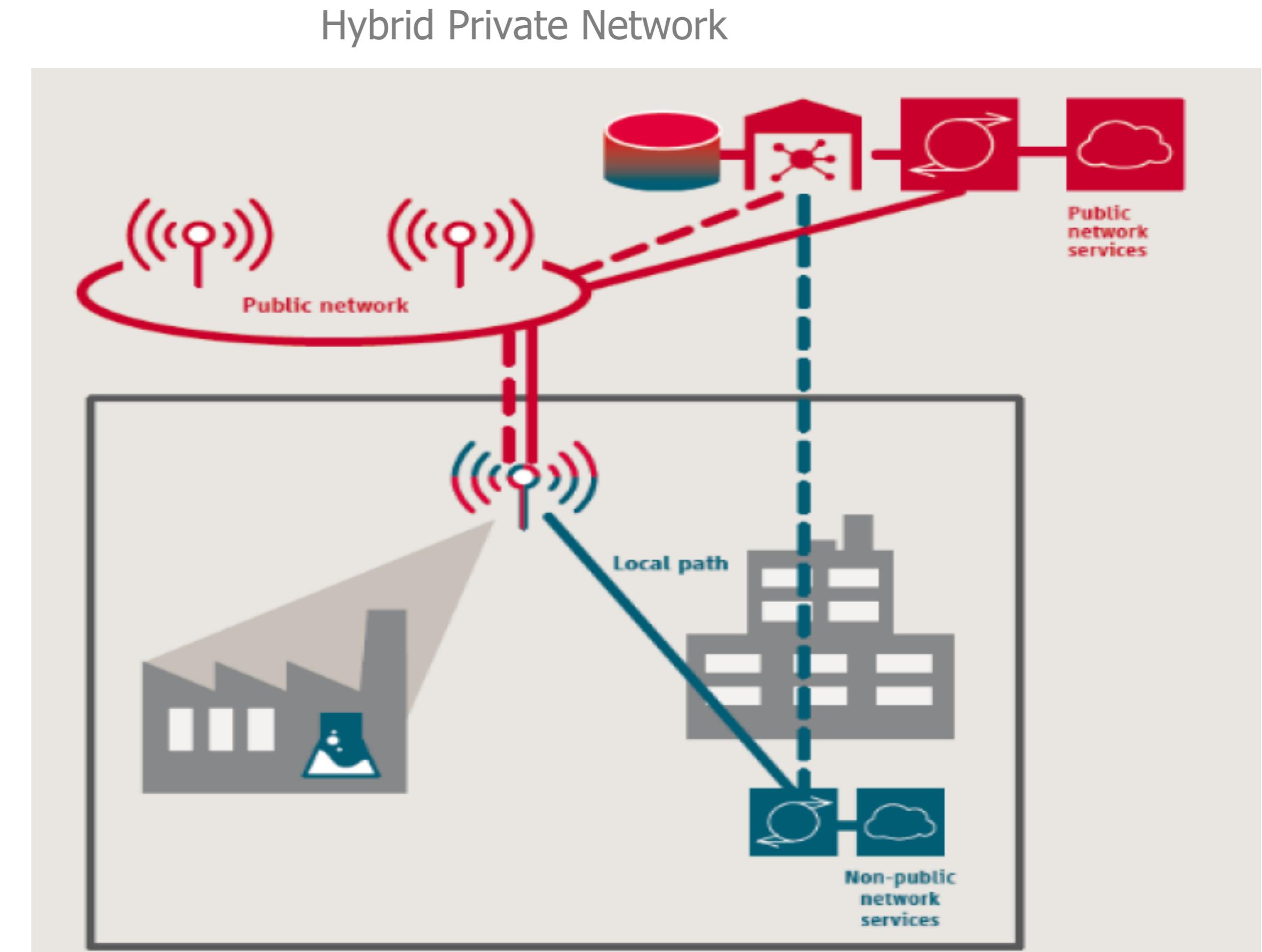
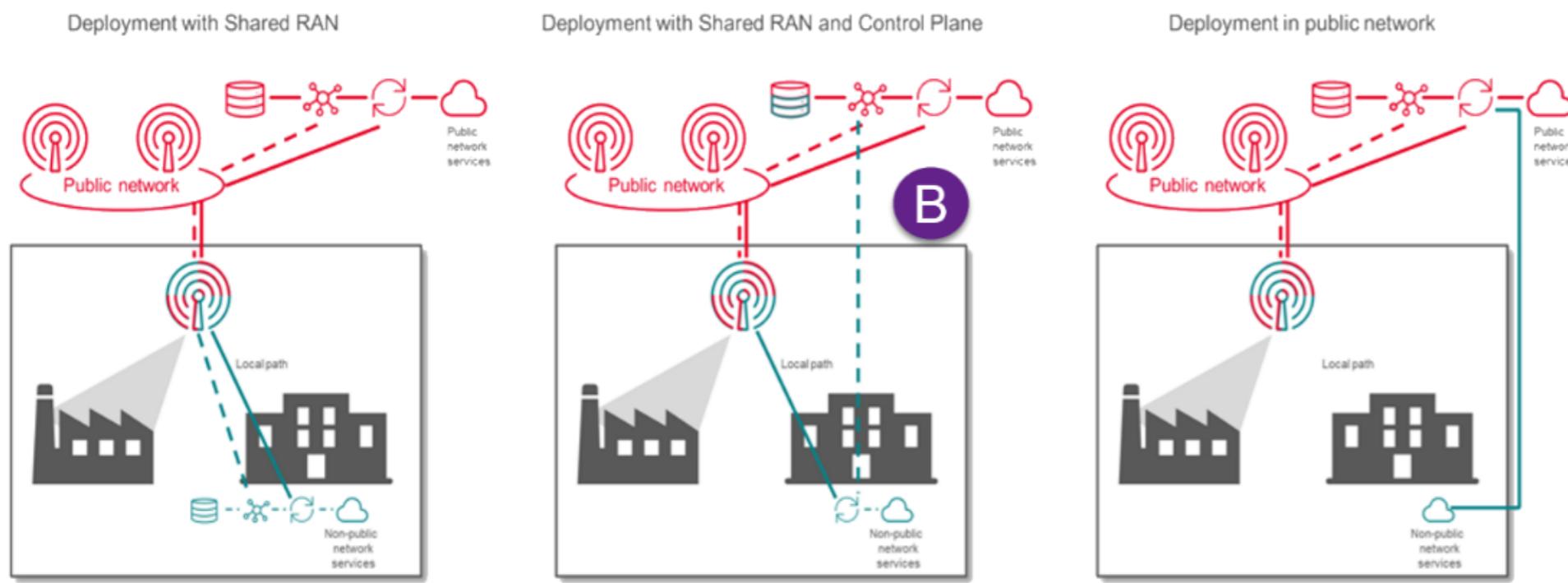


This type of deployment enables local routing of network traffic within the NPN's physical premises, while data bound for outside premises is routed to the service provider's network. 3GPP has specifications that cover network sharing. (A variation of this deployment scenario involves the NPN sharing both the RAN and control plane functions, but with the NPN traffic remaining on the site where the NPN is located and not flowing out to the public network.)

# PNI-NPN: Deployment with shared RAN and Control Plane

- Shared RAN and core control Plane
- Both RAN and Core Sharing from control side, with the RAN and Core elements managed by the Public 5G network.
- NPN only handles user plane connectivity

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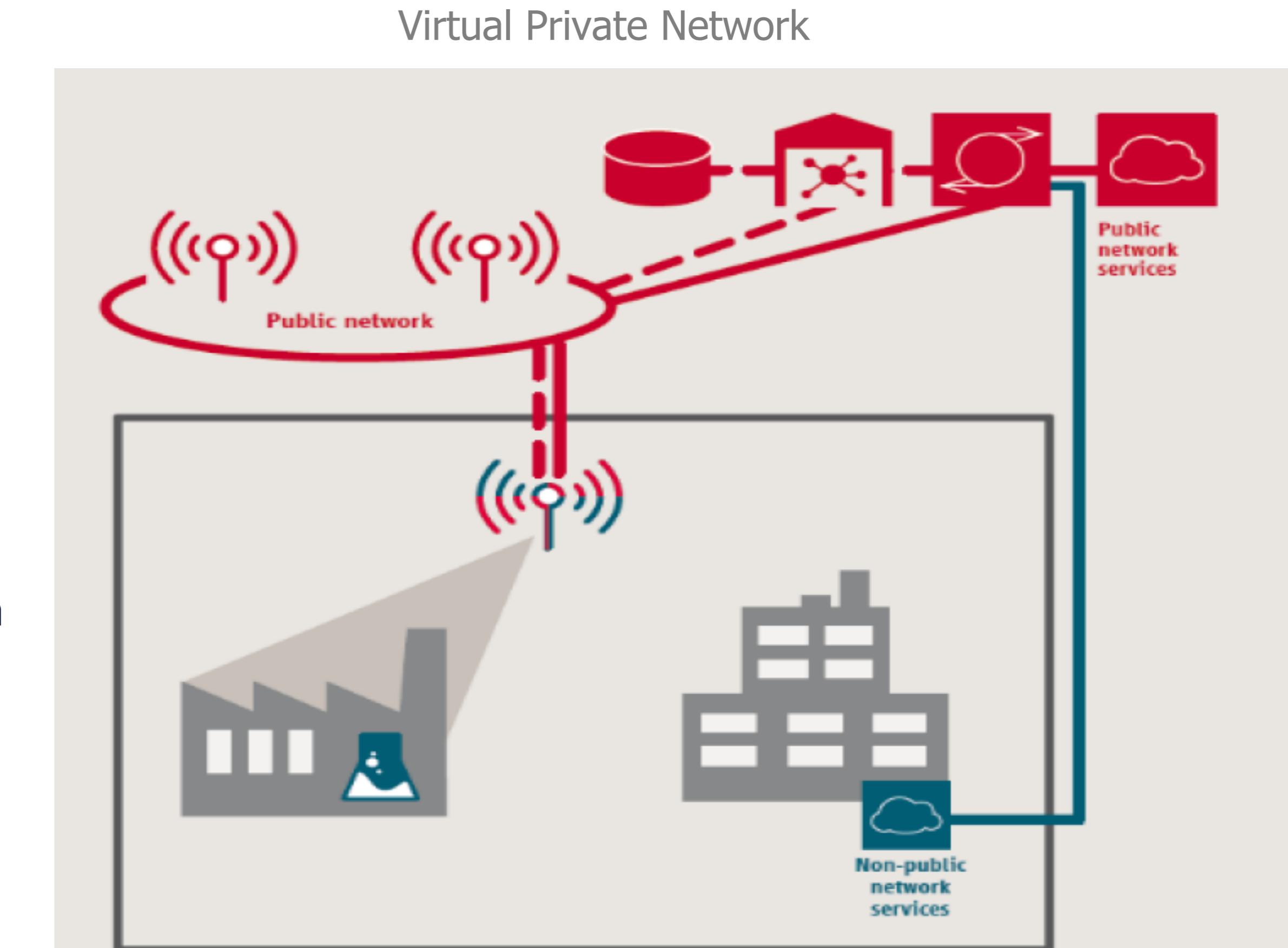
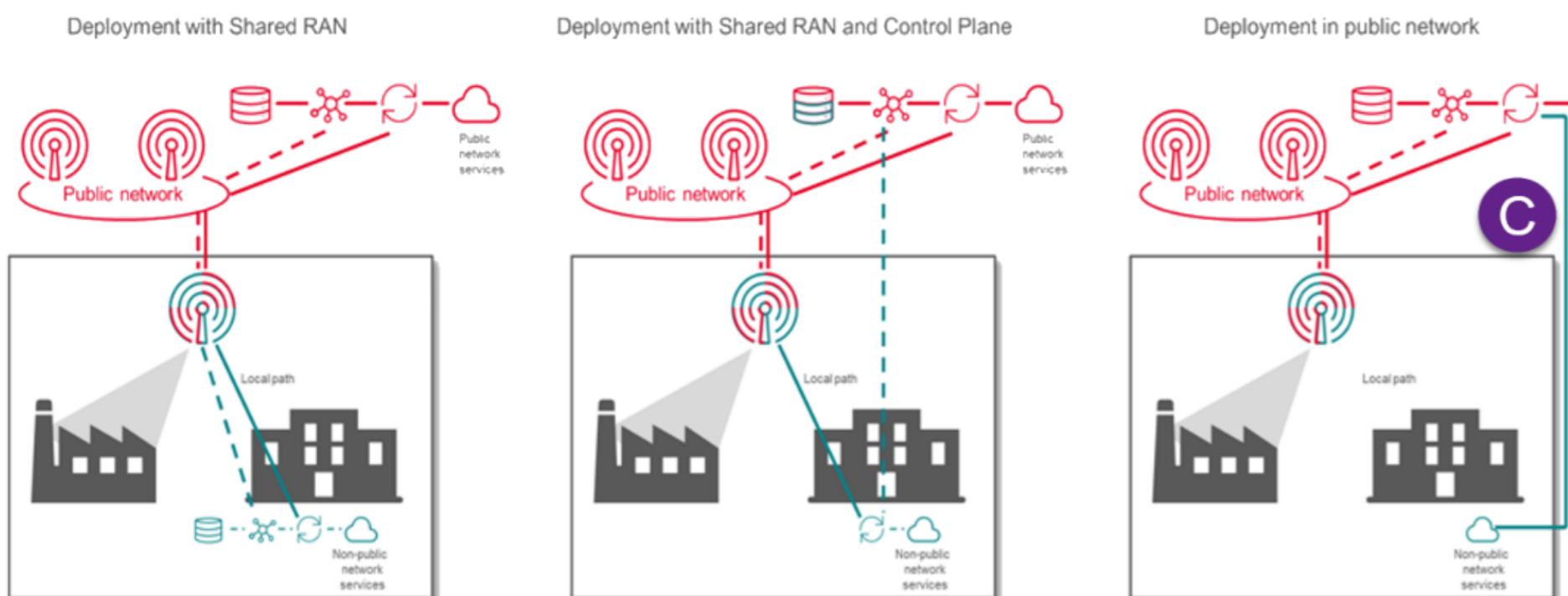


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# PNI-NPN: NPN Deployment in public network

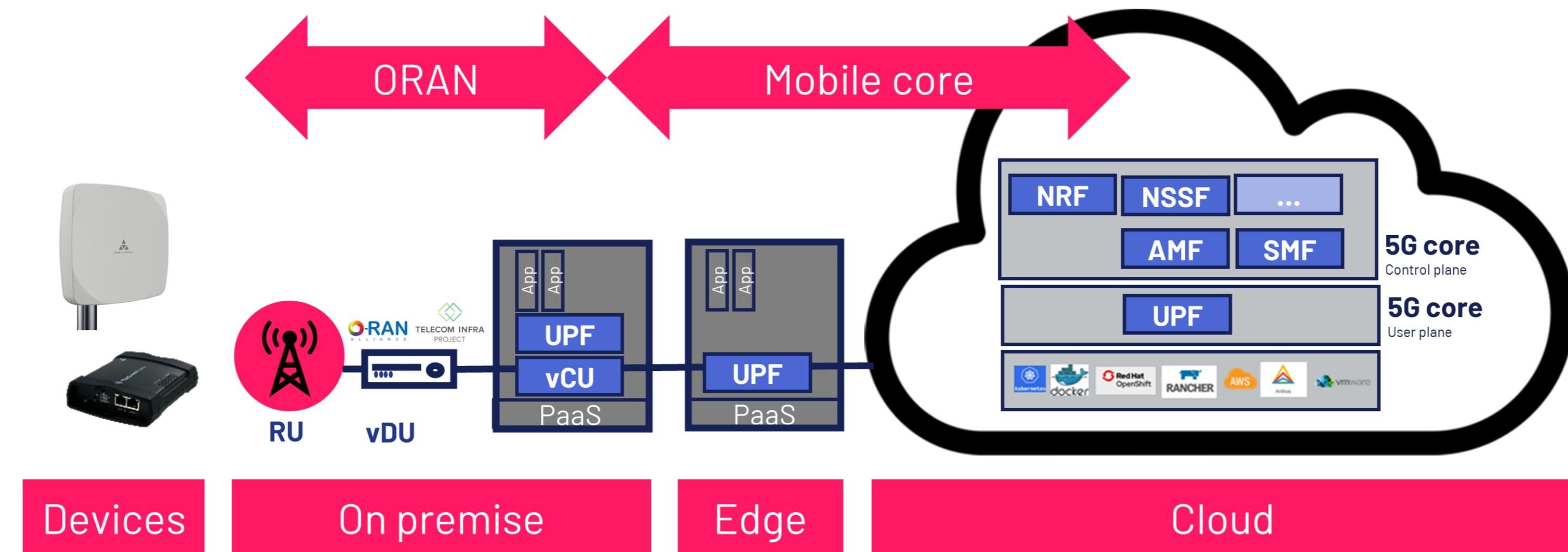
- 5G Public-Private Network Slice
- NPN hosted by the public network
- Complete outsourcing of the network, where devices on the private network utilize the Public 5G network RAN.
- This scenario can be implemented by means of network slicing

The third primary type of NPN deployment is where the NPN is hosted directly on a public network. In this type of deployment, both the public network and private network traffic are located off-site."



Through virtualization of network functions and in a technique known as network slicing, the public-network operator of the private network partitions between the public network and the NPN, keeping them completely separate.

# Private Network implementation example



- Fully Cloud Native / Containerized solution
- Multi Technology CUPS solution:
  - 3G/4G/5G combo microservices
- Lightweight NFs:
  - Minimum of 0,5vCPU for 2Gbps for the UPF, performance of 5-6Gbps/CPU
  - Network in a Box: Complete 4G/5G
- DPI / Local breakout included
- Deployment MODEL: On Premises, Hybrid (EDGE + Central), Cloud.



# Product Overview

# PRODUCT PHILOSOPHY

Our products are **Vendor Agnostic**, **Multi-technology**, and **Multi-Domains** which enables us to pave the road toward cognitive operations, SOC operations, and INOC



Data Driven  
Decision-Making



Faster response  
Times



Deploy Anywhere



Enhanced Overall  
MTTD and MTTR



Efficient Resource  
Utilization

# KATANA PLATFORM APPLICATIONS



**iPM**  
Performance Management



**NetEye**  
Configuration Management



**UFM**  
Faults Management



**iSight**  
Network OptimAlization



**iMaster**  
Autonomous Networks



**SkyView**  
Driveless Optimization



**3<sup>rd</sup> Party**  
Application Integration

# CHALLENGES – VALUE PROPOSITION



## DATA INGESTION

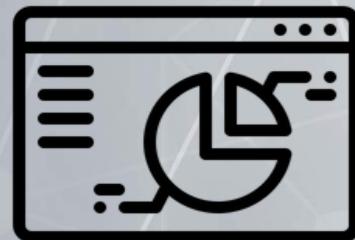
### Challenges

ETL Jobs with a predefined schedule and interval limited by performance and costs.



## DATA TRANSFORMATION

Data is coming from different Vendors' OSS sources reducing the flexibility.



## DATA CONSUMPTION

Slow Dashboards with old web technologies and no API Access.

### KATANA Solution

Streaming data ingestion from customer OSS to KATANA provides near real-time data availability

Data is aggregated in real-time giving the needed flexibility for each application

API-Based micro services architecture enables live data integration to other applications and dashboards

SMEs Logics to process all the given data from different sources to give you the best settings you need to have excellent customer centricity

# KATANA as an AIOps enabler

**KATANA** integrates AIOps in both Operations and Performance fronts, enabling big telco to unlock the AI capabilities in MTTD/MTTR enhancement as well as CAPEX/OPEX reduction

## AI based Fault Management

- Automated Ticketing - Alerting
- AI-based Fault Detection
- Fault Isolation
- AI-based alarm correlation
- Topology Viewer

## AI based degradation detection & Impact Analysis

- Anomaly Detection & Impact Assessment

## Network insights and troubleshooting

- AI-based forecasting
- TopN assessment
- Worst Degraded List analysis
- Worst Node List analysis

## Capacity Management & Performance Forecasting

- AI-based Capacity Assessment & Load Forecasting

# KATANA USE CASES



KPIs & KQIs Performance Monitoring

AI based Degradation detection & Impact Analysis

Capacity Management & Performance Forecasting

Multi-Technology Customized Audits

Network Topology View

Automated Alerting & Ticketing

New Nodes Detection

Operation Commander

Automated Front Office

Activity log viewer

AI Network Insights and troubleshooting

AI based Network Studies

# KEY ADVANTAGES

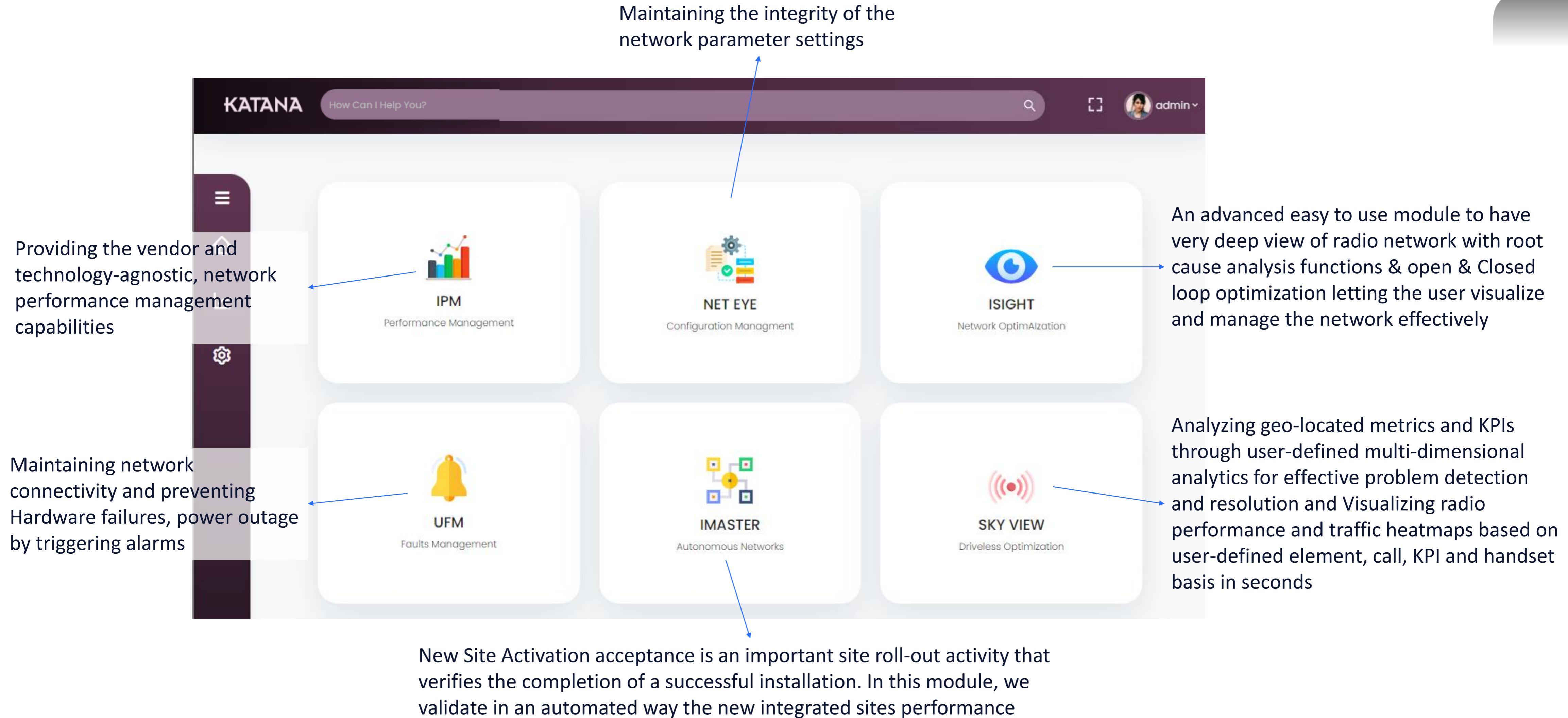
- 1 Cloud Native Solution
- 2 Vendor and technology agnostic solution
- 3 Enhancing MTTD and MTTR
- 4 Cornerstone of Cognitive Operations
- 5 Near-RT Operations
- 6 Bridge the gaps between ORAN & traditional RAN operations
- 7 Increasing staff efficiency
- 8 Gen Ai adoption
- 9 Automated Dashboard Analytics



# Main Product Modules

# PLATFORM APPLICATIONS

\*Snapshot from the production platform





# IPM MODULES

KATANA      How Can I Help You?     

Home / IPM

DASHBOARDS

REPORTING SUITE

ON THE FLY REPORTS

ANALYTICS

PHYSICAL DATA

SCHEDULER

Last data update: 2023-10-26 02:17:29

iPM

Performance Management

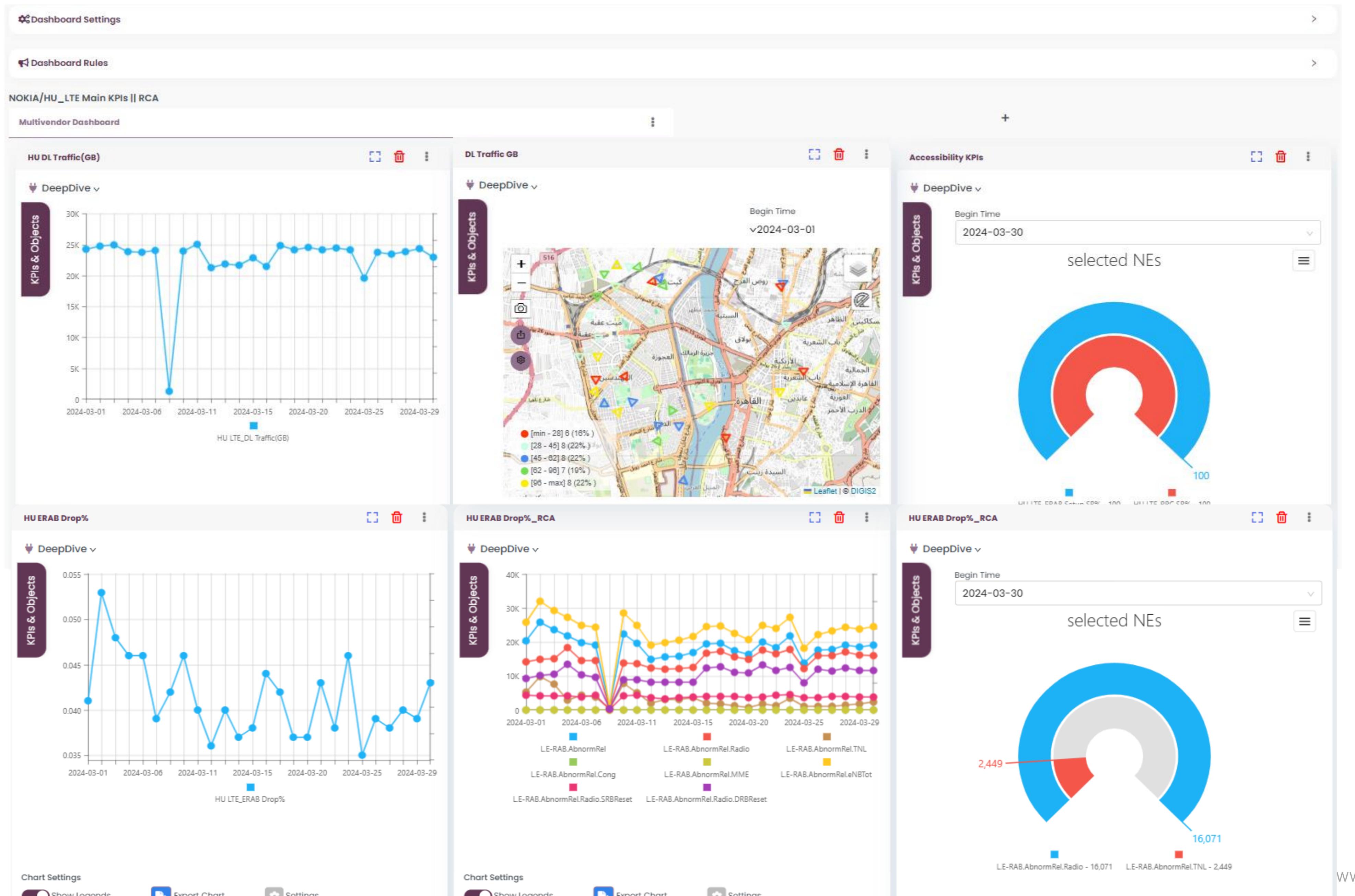
KATANA

# IPM MODULES (Dashboards)



**IPM**

Performance  
Management





# IPM MODULES (KPI Creation Single Vendor)

Reporting Suite / KPI Manager

### Add New KPI Vendor A

KPI Name: NOKIA LTE\_DL Traffic(GB) | KPI Privacy: public | Unit: None | Format: fx

Description: DL Traffic NOKIA\_LTE

Formula:  $(\text{sum}(\text{"PDCP\_SDU\_VOL\_DL"}) / (1024 * 1024 * 1024)) / (\text{sum}(\text{"PDCP\_SDU\_VOL\_DL"}) / (1024 * 1024 * 1024))$

F(x) is correct | F(y) is correct

PDCP\_SDU\_VOL\_DL  
Huawei  
Nokia  
Ericsson

Reporting Suite / KPI Manager

### Add New KPI Vendor B

KPI Name: HU LTE\_DL Traffic(GB) | KPI Privacy: public | Unit: None | Format: fx

Description: DL Traffic Huawei\_LTE

Formula:  $((\text{sum}(\text{"LThrp.bits.DL"}) / (8 * 1024 * 1024 * 1024)) / ((\text{sum}(\text{"LThrp.bits.DL"}) / (8 * 1024 * 1024 * 1024)) / 1))$

F(x) is correct | F(y) is correct

L.Thrp.bits.DL  
Huawei  
Nokia  
Ericsson

Check Formula | Clear

test 7752 | None | sum("VS.Gtpu.TxPkts") | custom | 2/9/2024, 17:45:27... | 2/9/2024, 17:45:27...

**iPM**  
Performance  
Management

**KATANA**



# IPM MODULES (KPI Creation Multi Vendor)

**iPM**

Performance  
Management

**KATANA**

Reporting Suite / KPI Manager

### Add New KPI

KPI Name: NOKIA/HU DL Traffic\_LTE | KPI Privacy: public | Unit: None | Format: fx/fy

Description: LTE DL Traffic\_Multivendor KPI

Formula:

( sum("L.Thrp.bits.DL") + sum("PDCP\_SDU\_VOL\_DL") ) / ( 8\* 1024\* 1024\* 1024 )

F(x) is correct | F(y) is correct

Check Formula | Clear

Vendor A + Vendor B

Search:  (x)  (y)

- Huawei
- Nokia
- Ericsson

Calculator icons:

(	)	*	+
-	/	Avg	Ceil
Curr	Floor	Log	Max
Min	Mod	Power	Sum



# UFM MODULES

KATANA How Can I Help You? Search User Profile

UFM

OP COMMANDER

ALARM VIEWER

FAULTMETRIC ENGINE

RULE DESIGNER

Last data update: 2023-10-26 02:17:29

(Bell)

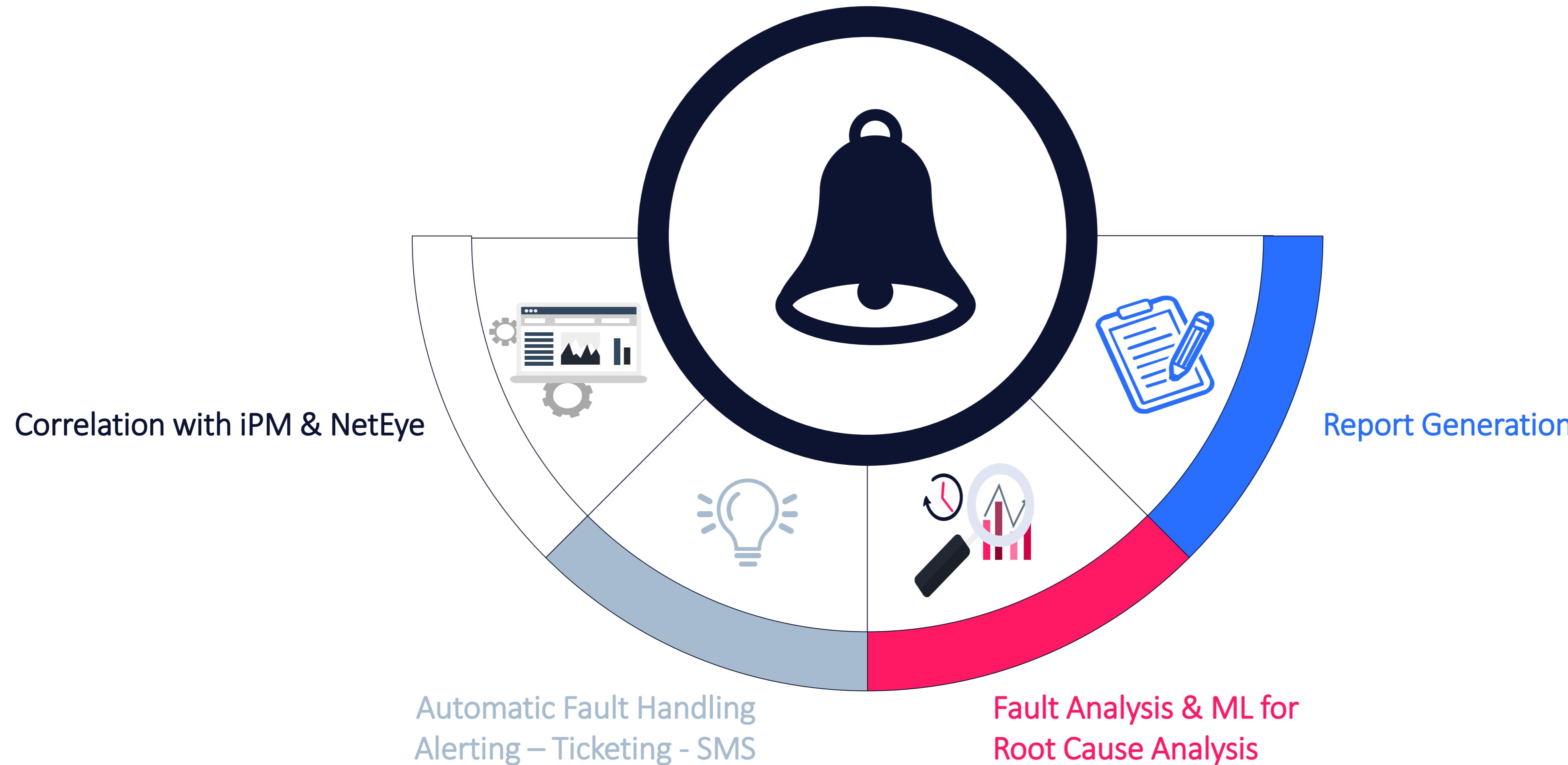
The screenshot shows the KATANA UFM interface. At the top, there's a purple header bar with the KATANA logo and a search bar. Below the header, a dark sidebar on the left contains icons for navigation: a house (Home), three horizontal lines (List), a house with a red border (Dashboard), a left arrow (Back), a right arrow (Forward), an eye (View), a location pin (Location), and a gear (Settings). The main area displays four rounded rectangular cards, each representing a module: 'OP COMMANDER' with a monitor icon, 'ALARM VIEWER' with a chart and alarm icon, 'FAULTMETRIC ENGINE' with a brain and gear icon, and 'RULE DESIGNER' with a puzzle piece icon. At the bottom of the main area, it says 'Last data update: 2023-10-26 02:17:29'. In the bottom right corner, there's a small circular button with a bell icon.

UFM  
Faults  
Management

KATANA

# UFM Module Features

UFM is an End-to-End Solution for managing network events used in collecting event data, receiving alerts, diagnosing and investigating network issues, analyzing network events, correlating faults, proposing actions & automating their resolution





# NetEye Module Basic Features

KATANA How Can I Help You?

Net Eye

**PARAMETER**  
**BROWSER**

**PARAMETER**  
**AUDITS**

**ACTIVITY LOGS**

**TOPOLOGY**  
**VIEWER**

Last data update: 2023-10-26 02:17:29

**NetEye**  
Configuration  
Management

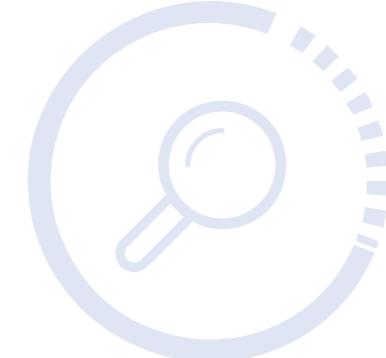
**KATANA**



# NetEye Module Basic Features

## Parameter Browser

Searching for needed parameters values on Cell Level or Relation Level for different vendors and technologies



## Activity Log

Viewing activity logs of various nodes showing the actions taken or error logs collected on a specific node, or searching for a given log item or looking into a time range for any changes or errors.



## Topology Viewer

Parameter values are represented geographically for selected network zone and time period.



## Parameter Penetration & Network Discrepancies

Network discrepancies are presented in a single view, with intuitive filtering and drill down capabilities. NetEye can automatically generate report to help the user quickly identify the inconsistent configuration parameters and their penetration for a selected zone such as missing neighbor definition, incorrect external cell definitions, etc. and update parameter values and resolve discrepancies ensuring no human error is introduced

A large, abstract network graph is visible in the background, composed of numerous small blue dots connected by thin blue lines, representing a complex system or data structure.

# INOS Platform Overview

# INOS PLATFORM APPLICATIONS



**INOS** paves MNOs way toward proper field intelligence as a service approach

## CBTP

Cloud-based testing platform module is responsible for Scripting, handling the logfiles, and controlling all kinds of drive testing kits as well as user and SIM management.

## NXI

Next generation Investigation module is our on-screen postprocessing and robotics postprocessing module built on KPIs engine and events engine

## ARP

Automatic Reporting Module provides users three types of reporting: automated, customized and high-level overall reporting. In only 15 minutes you will have your DT reports.

## Octomind

Intricately constructed upon a robust artificial intelligence engine, seamlessly incorporating machine learning and deep learning models. It synergizes with INOS DT data and Katana IPM KPIs, effectively providing you with comprehensive PCI, RSI, Frequency, PSC, and BSIC that are meticulously planned . It excels in delivering pinpoint accuracy in terms of Automatic Cell Planning (ACP) and Accurate Site Planning(ASP).

## Connectsphere

SOC and KPIs Dashboard that comes to you on different aggregation level starting of 1 minute aggregation, 15 Minutes aggregations, 1 Hour aggregation, daily aggregation, weekly and monthly aggregations.

Edge



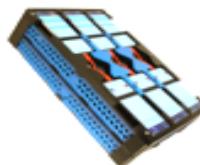
Watcher



Lite



Compact



Gauge



Air



1

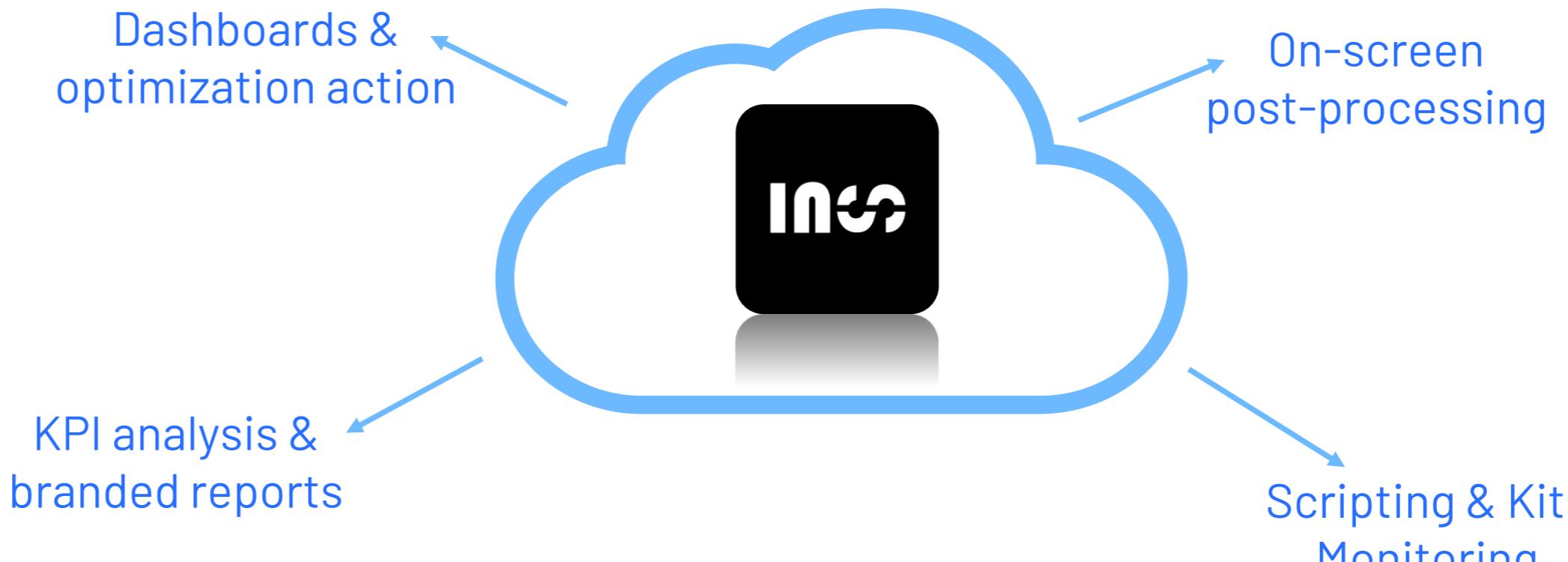
Cloud Scripting X Mins

2

Data collection in Field X Hours

3

Upload Data to cloud Real Time



Single Site  
Verification

Cluster  
Benchmarking

Indoor Testing

SOC - Active  
Probing

Customer  
Complaint  
Handling

IoT Testing

OpenRAN

## SUPPORTED TECHNOLOGIES



2G - 3G - 4G - 5G



WiFi - VoWiFi



VoLTE

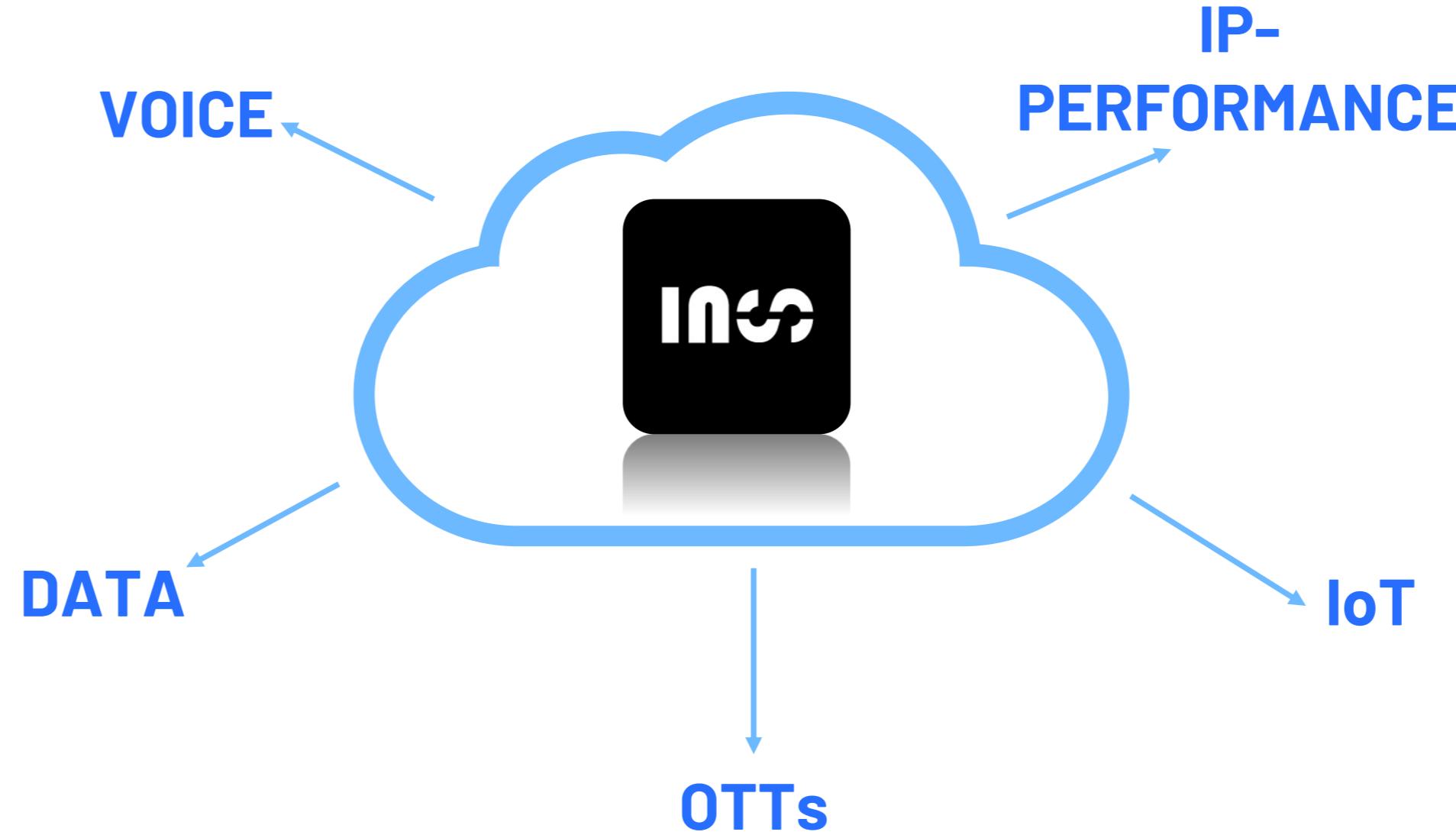


Fixed Broadband



IOT

## KPIs



## KEY BENEFITS

1. Simplified equipment – No laptop or external controller is needed
2. Compatible with Commercially available handsets (all Chipsets)
3. Deep Layers capturing L1/L2/L3/PCAP
4. Over the Air Script updates
5. Logfiles are uploaded in near Real-time
6. Processing and investigation fully based on the Cloud
7. Fast Post-processing & reporting (Onscreen in 15 minutes)
8. Robotics-based post-processing saves the Operations team from manual tasks
9. Purpose-built SOC Dashboard improves response time significantly

Video & Voice Quality Standards:

# Dashboard Flexibility

## Flexible Dashboards

- Tailored to user requirements
- Widgets include Time Charts (Line, Bar, Day to Day), Timetables, **Real-time** Tables

## Live Location Maps

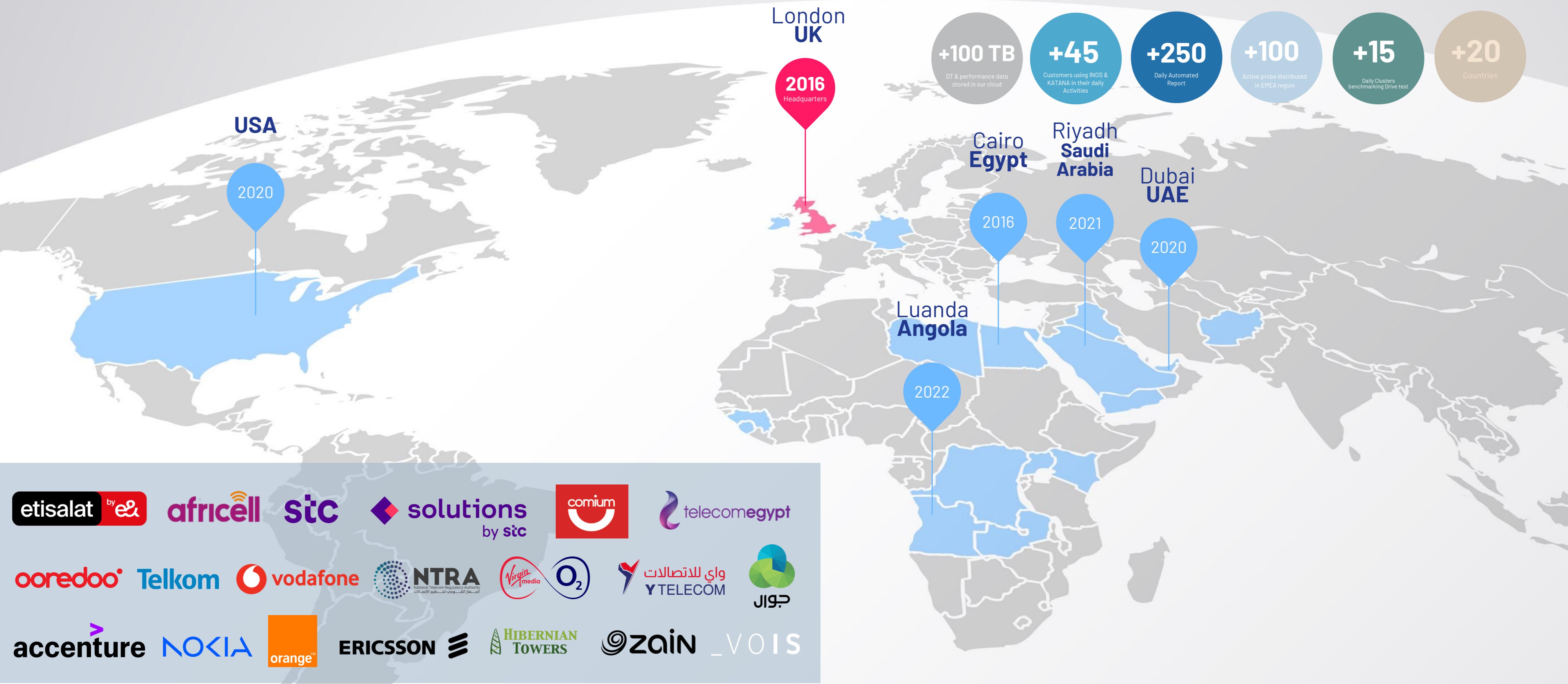
- visualization of probe locations.

The dashboard is divided into four main sections:

- Live location:** A map of the United Kingdom and Ireland showing probe locations. Probes are marked with red pins labeled "Probe\_1", "Probe\_2", "Test\_2", and "VIP\_2".
- Radio Conditions:** A table showing radio parameters for PCC and NBR0. The table includes columns for Type, Band, ARFCN, LCI, Power, and Quality.
- Layer 3 Messages:** A table listing Layer 3 messages with columns for Timestamp, direction, category, title, and Detail.
- Realtime Status:** A table displaying real-time status for multiple devices. Columns include IMSI, IMSI Area, Status, Last Update, Script Status, Script Name, Free Storage, Number of Logs, Auto Upload, WiFi Status, DL Throughput, Battery, Temperature, Speed, Manufacturer, Model, and IP. The table shows various device details such as battery levels, temperatures, and download throughput.



# OUR PRESENCE & KEY CUSTOMERS



# Thank you

## Digis Squared HQ

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