

THE EVOLUTION OF PRIVATE NETWORKS: EXPLORING HYBRID MODELS AND OWNERSHIP STRUCTURES

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Elements Shaping Private Networks

Public MNO coverage, use of DAS, small cells, and Wi-Fi for indoor coverage



Local/Guest IT LAN & Internet access, mostly Wi-Fi



Local IoT (fixed), sensors, other fixed IoT mix of Wi-Fi, BT, LoRa, NB-IoT, etc.



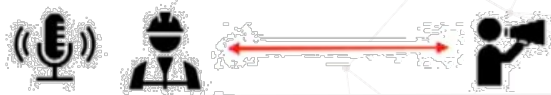
Local IoT (mobile), devices that move or need indoor/outdoor coverage



Local OT (operational / critical / industrial) Very high reliability / low latency / deterministic



Local voice & data communication, PTT, walkie-talkies, 2-way radios, etc.



Hybrid Networks

Shared Infrastructure

- Neutral Host Networks (Single Operator / Multi-Operator)
- Multi-Operator Radio Access Networks (MORAN)
- Multi-Operator Core Networks (MOCN)

Dedicated Infrastructure

- Enterprise owned Core + RAN

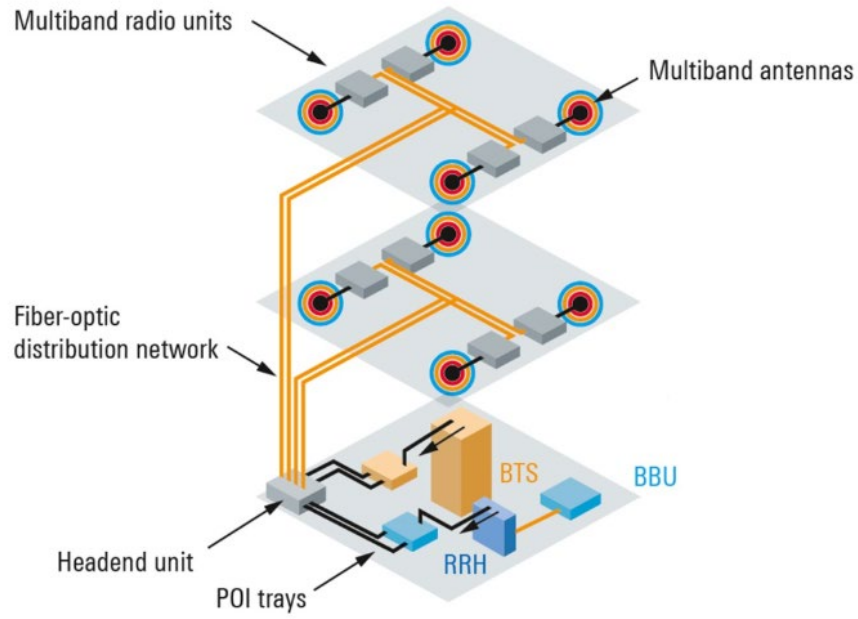
Spectrum

- Shared Licensed
- Dedicated Licensed
- Unlicensed (B48/n48)

Technology & Features

- LTE / 5G / Wi-Fi
- Devices
- Throughput, Ultra Low Latency, Speed

DAS & Small Cell Solutions

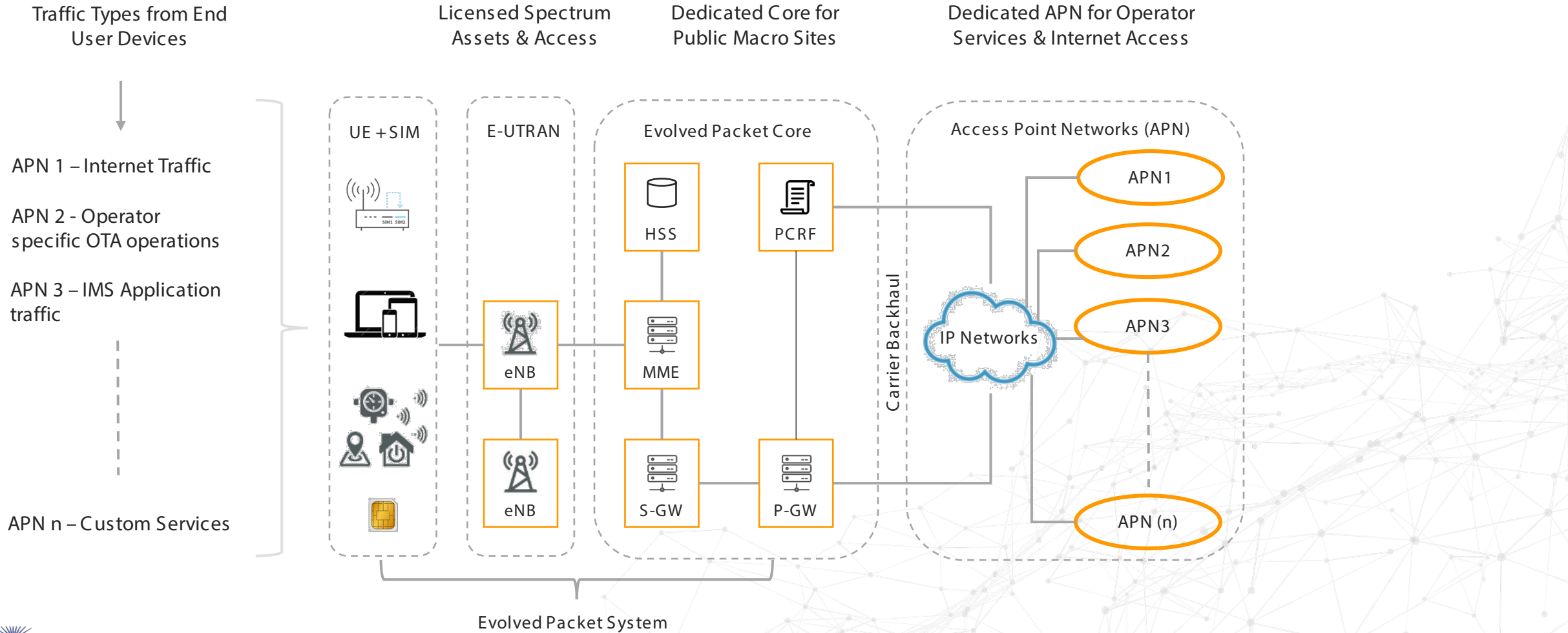


Distributed Antenna Systems (DAS)

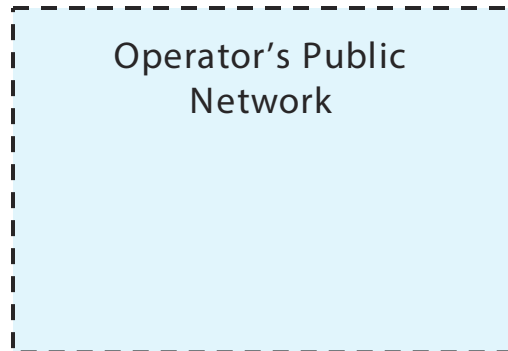


Small Cells

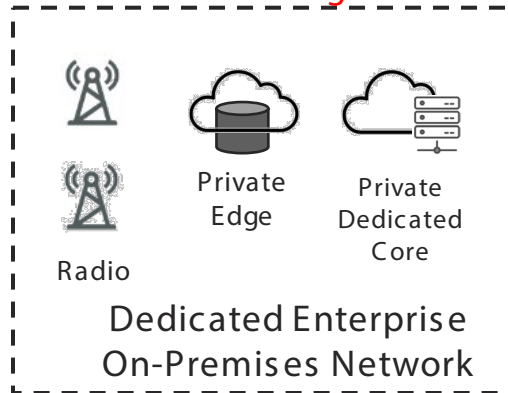
Public Cellular Networks - 4G LTE



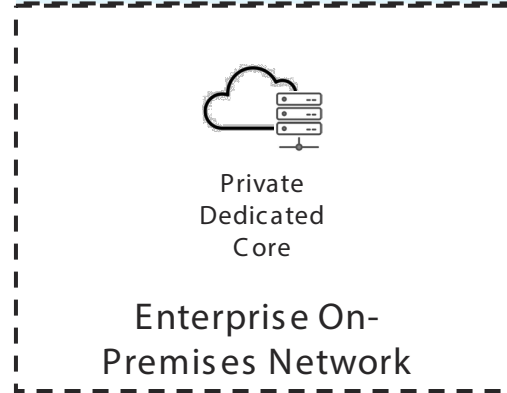
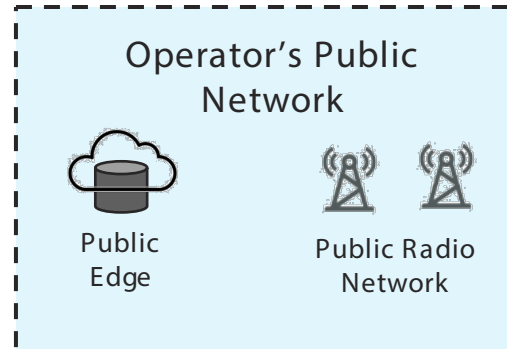
Private LTE Network Deployment Models



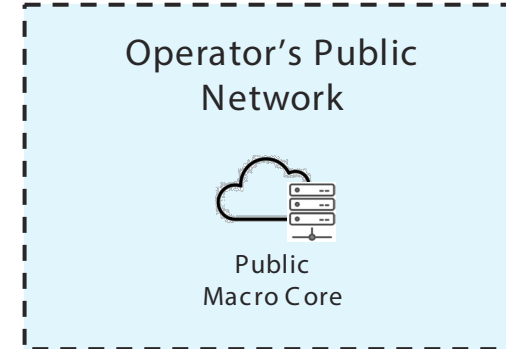
No Sharing



Dedicated / On-premises Model
(Unlicensed Spectrum)



Private / Public Hybrid Model
(Option 1)
(Licensed Spectrum)



Private / Public Hybrid Model
(Option 2)
(Licensed/Unlicensed – Multi-Carrier Spectrum)

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Spectrum

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Public Cellular Networks - 5G Standalone Network

Traffic Types from End User Devices (URSP Rules)

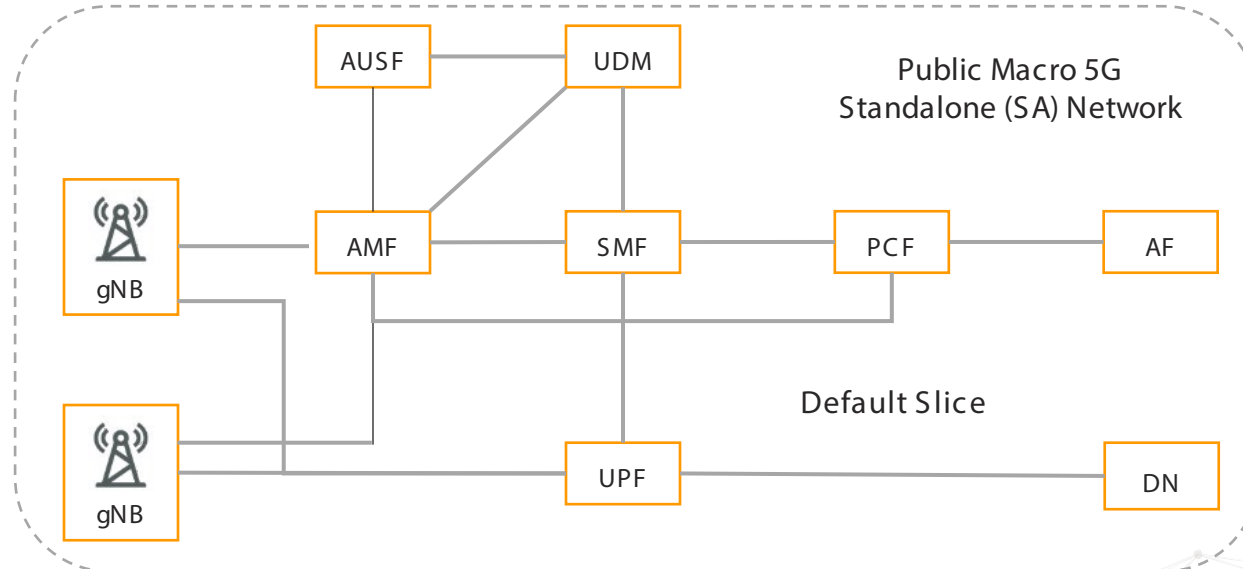
Broadband Internet user traffic – eMBB Slice

IoT traffic – mMTC Slice

Public Safety – SST eMBB, SD - Custom

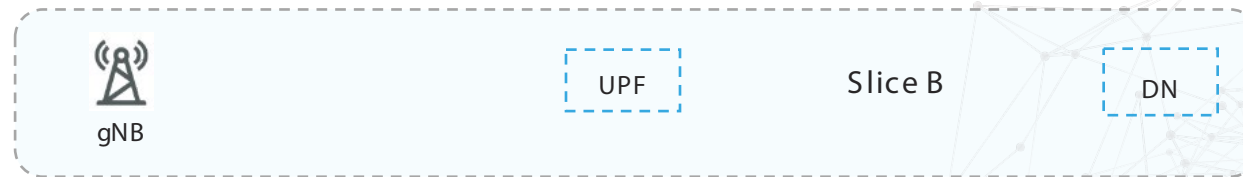
Public Safety – SST eMBB, SD - Custom

Enterprise Users – Custom Slice

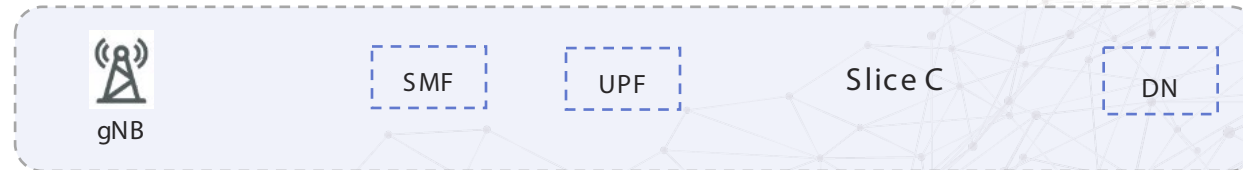


Licensed Spectrum Assets & Access

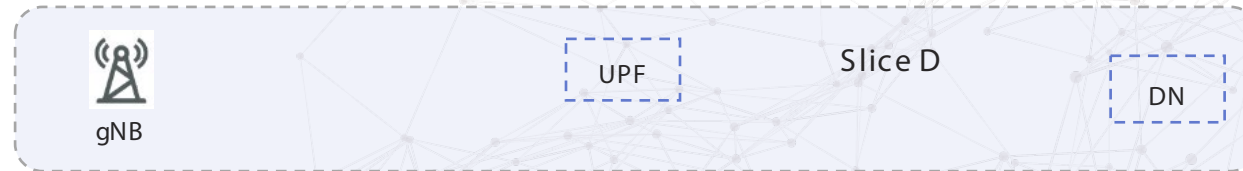
Dedicated Core (eMBB Default Slice)



Dedicated Slice per Service Type (mMTC)



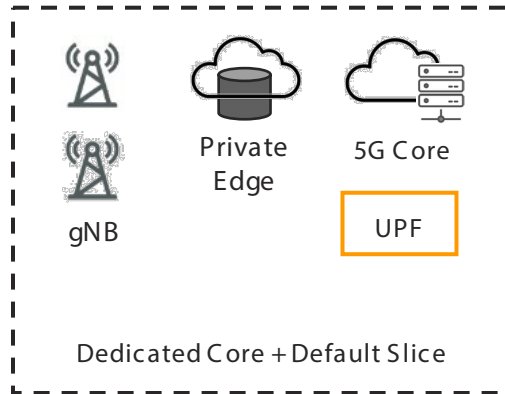
Enterprise Slice



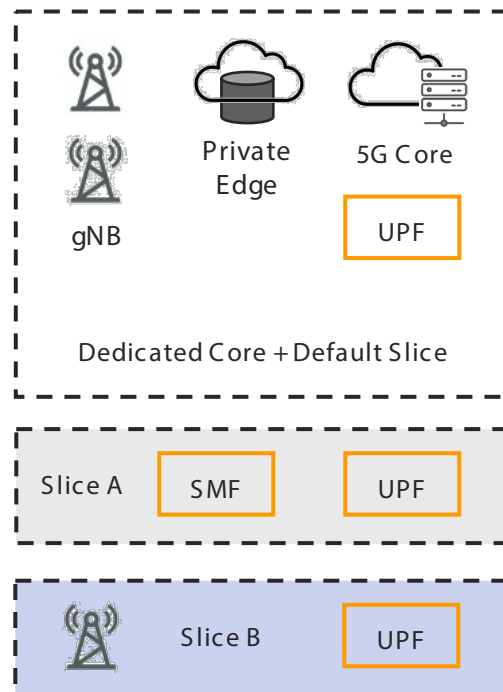
Public Safety Slice

Private 5G Deployments

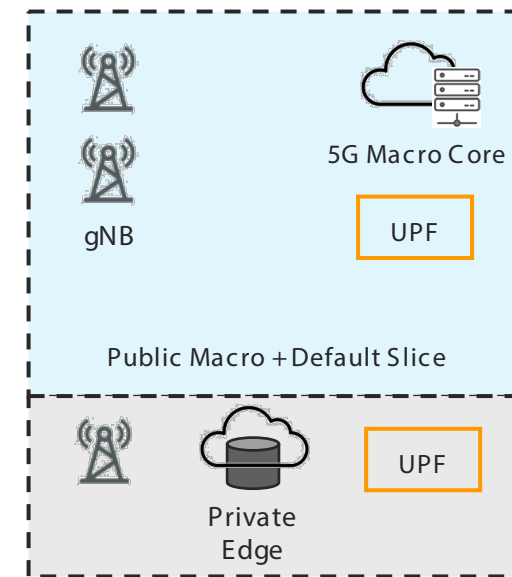
Enterprise On-Premises Network (1)



Enterprise On-Premises Network (2)



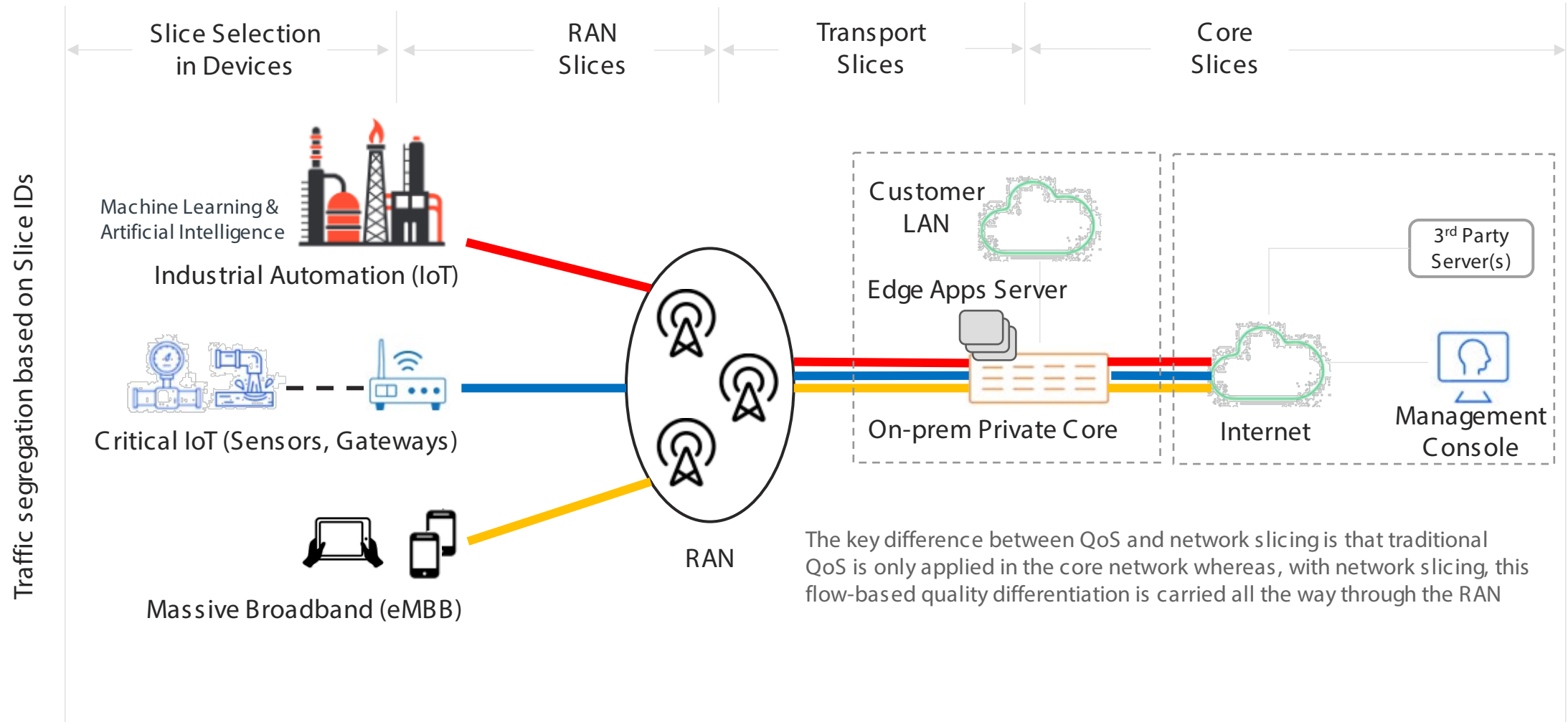
Public Core + RAN with dedicated Enterprise Network Slice



Enterprise Slice (RAN and Core Sharing, Dedicated UPF)

Applying 5G SA Networking & Network Slicing in Private Networks

Future State



A Bundle of Models

	DAS In-Building Solution	Network Slicing	Private Cellular Networks
History	Pre-3G	5G	LTE/5G
Form Factor	Passive – Coax & Antennas Active – Fiber / Cat5 & APs	Macro (Virtual Slice)	Access Point
Ownership	Enterprise/Operator	Operator	Enterprise
Neutral Host / Shared Infrastructure	Supported	-	Supported
Spectrum	Carrier Licensed	Carrier Licensed	Licensed / Unlicensed (B48/n48)
MOCN	-	-	Supported
MORAN	-	-	Supported

CASE STUDIES

CLIENT FORTUNE 100
INDUSTRY MANUFACTURING

ADVANCED USE CASES

- *Autonomous Mobile Robots*
- *X,000,000 Square Feet Total Coverage*

CLIENT FORTUNE 500
INDUSTRY UTILITY

COVERAGE & ADVANCED USE CASES

- *Industrial Automation*
- *Connected Worker*
- *Fleet Management*

CLIENT FORTUNE 5000
INDUSTRY Chemical

COVERAGE & ADVANCED USE CASES

- *Connected Worker*
- *Remote Worker*
- *Industrial Automation*

CLIENT FORTUNE 500
INDUSTRY OIL & GAS

COVERAGE & ADVANCED USE CASES

- *Industrial Automation*
- *Connected Worker*

CLIENT FORTUNE 5000
INDUSTRY PORTS

COVERAGE & ADVANCED USE CASES

- *Industrial Automation*
- *Connected Worker*
- *Lift Device Automation & Connectivity*

CLIENT U.S. DEPT OF DEFENSE
INDUSTRY TEST & TRAINING

COVERAGE & ADVANCED USE CASES

- *2,500 Miles of Private Network Coverage*
- *Connected Warfighter & Augmented Reality*
- *Drone Solutions*

THANK YOU

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