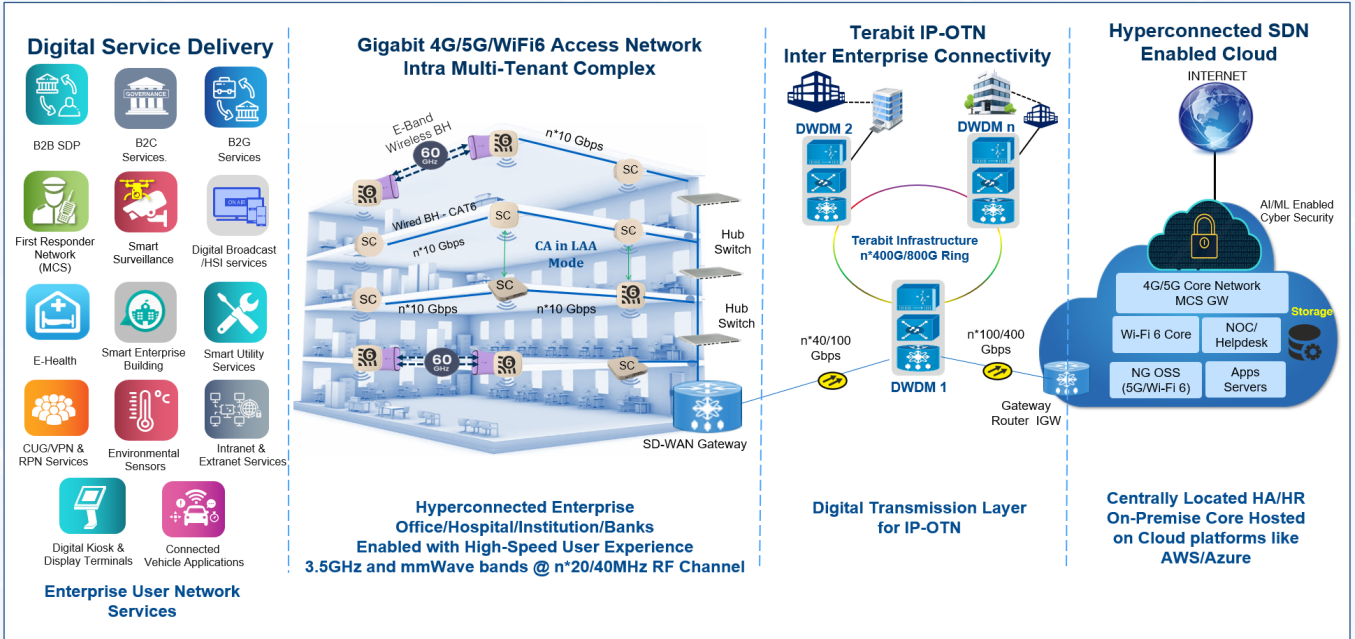


QuadGen  
WIRELESS SOLUTIONS

# QuadGen – Digital Private Network Solutions

## Digital Transformation Enterprise / Campus Services Delivery QuadGen Solution for 5G Hyperconnectivity Enterprise

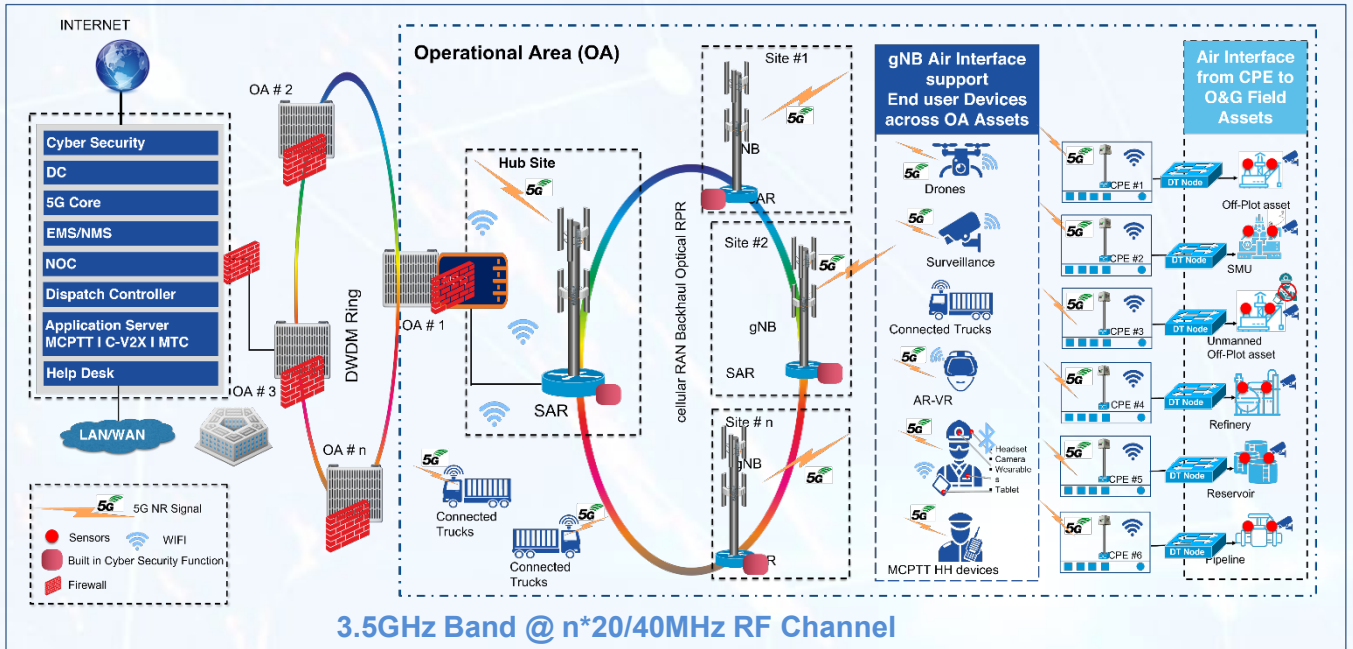


### Solution Highlights

- 1 State of the art technologies like 5G / 60GHz / Wi-Fi 6 / SD-WAN / IP-OTN & SDN-NFV Core form the evolution of the Hyper Enterprise connectivity solution. Ex: Dimensions: Over 1 to 3 M Sq ft, 10k subs, 20k IOT devices.
- 2 Digital transformation era-based range of services and applications with high bandwidths, low latency and high reliability and resilience as a built-in feature
- 3 QuadGen competency on Multiple E2E Access Network solution encompasses critical network element level design, deployment & Integration of SmallCells, Wi-Fi 6 WAPs, SD-WAN, 60GHz BH including Fiber Distributed Data Interface (FDDI), Structured cabling.
- 4 QuadGen private networking skills include design, dimensioning, provisioning, testing & integration of IP-OTN nodes with capacities of n\*40/100Gbps to n\*400/800Gbps.
- 5 Hyperconnected Enterprise complexes need either on-premises or hosted cloud based SDN-NFV Core network solution with built in cyber security to enable QOS/QOE enabled IP traffic irrespective of voice, text, data, video etc.
- 6 Hyperconnected enterprise solutions in the digital era requires NG-OSS solutions with AI-ML enablement for analytics performance monitoring & disaster recovery.

# Digital Transformation of Oil and Gas Fields

## QuadGen E2E 5G Network Architecture Solution



## Solution Highlights

**1** Technologies like 5G / Wireless 5G BH / IP-OTN & DWDM & SDN-NFV Core Hyperconnectivity Solution for thousands of Oil and Gas Field. POPs over tens of thousands of Sq ft.

**2** The Hyperconnectivity solution for O&G Operational area will serve 5G End user devices, Drones, Surveillance, connected trucks, ARVR, MCPTT, Smart connected Worker and provide connectivity to Industrial assets through 5G CPEs.

**3** The Hyperconnected Operational area coverage and capacity is provided by a group of 5G nodes interconnected by Optical Resilient Packet Rings (RPR) for backhaul and 5G CPEs for Industrial asset coverage and capacity requirements.

**4** All the hyperconnected 5G Network assets are proposed to be connected on the existing DWDM IP-OTN Ring topology over Oil & Gas field. These Tx network elements are proposed to meet the 5G high-capacity demands, application & services.

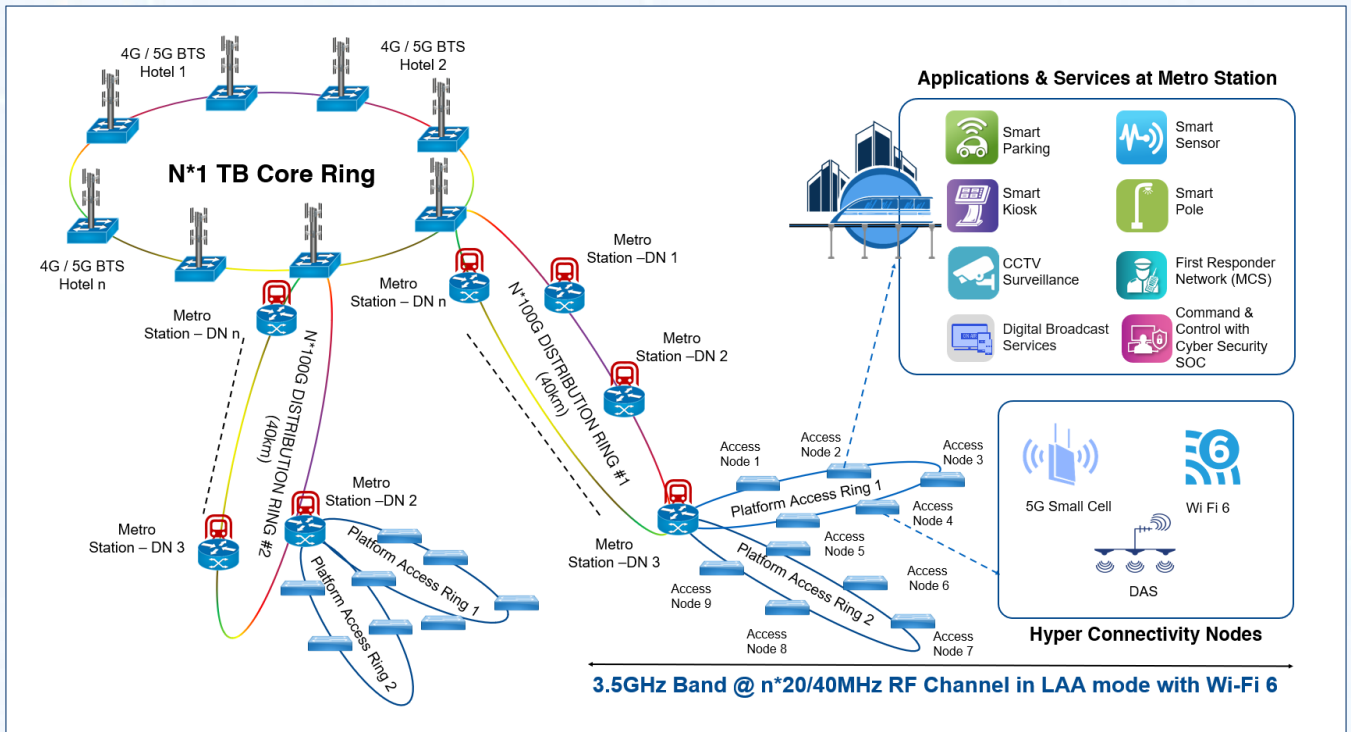
**5** The NFV-SDN 5G Core Network proposed supports functionalities of Cyber Security, DC, 5G SA Core, EMS/NMS, NOC, MCS Core & Application servers to host (MCS, CV2X & IIOT) with Help desk oriented OSS.

**6** All the devices, CPE, gNBs & associated access TX ring within all operational Areas are supported with built in cyber security function at every NE as seen above.

**7** Distributed Core network functionality using relevant VNFs like AMF, SMF AND UPF as MEC is an essential feature of the solution for Resilient traffic handling within the operational areas.

# Digital Transformation of Metro Rail Networks

## QuadGen Proposed 5G E2E Network Solution



## Solution Highlights

1

Hyperconnectivity of Metro Rail stations are proposed with 5G SmallCell, IBS-DAS, Wi-Fi 6 & its associated IP enabled Access rings to support eMBB, mMTC services and applications.

2

4G / 5G Connectivity of multiple telcos are extended for coverage in metro station areas through the support of distributed BTS hotel sites corresponding to telcos. 5G Digital Private Network for Metro Rail infrastructure interconnects distributed BTS hotel sites through a n\*Tbps optical ring.

3

Metro Distribution rings covers a cluster of metro stations for each distribution ring. IP Access rings are proposed for each metro station to carry 5G/4G/Wi-Fi traffic.

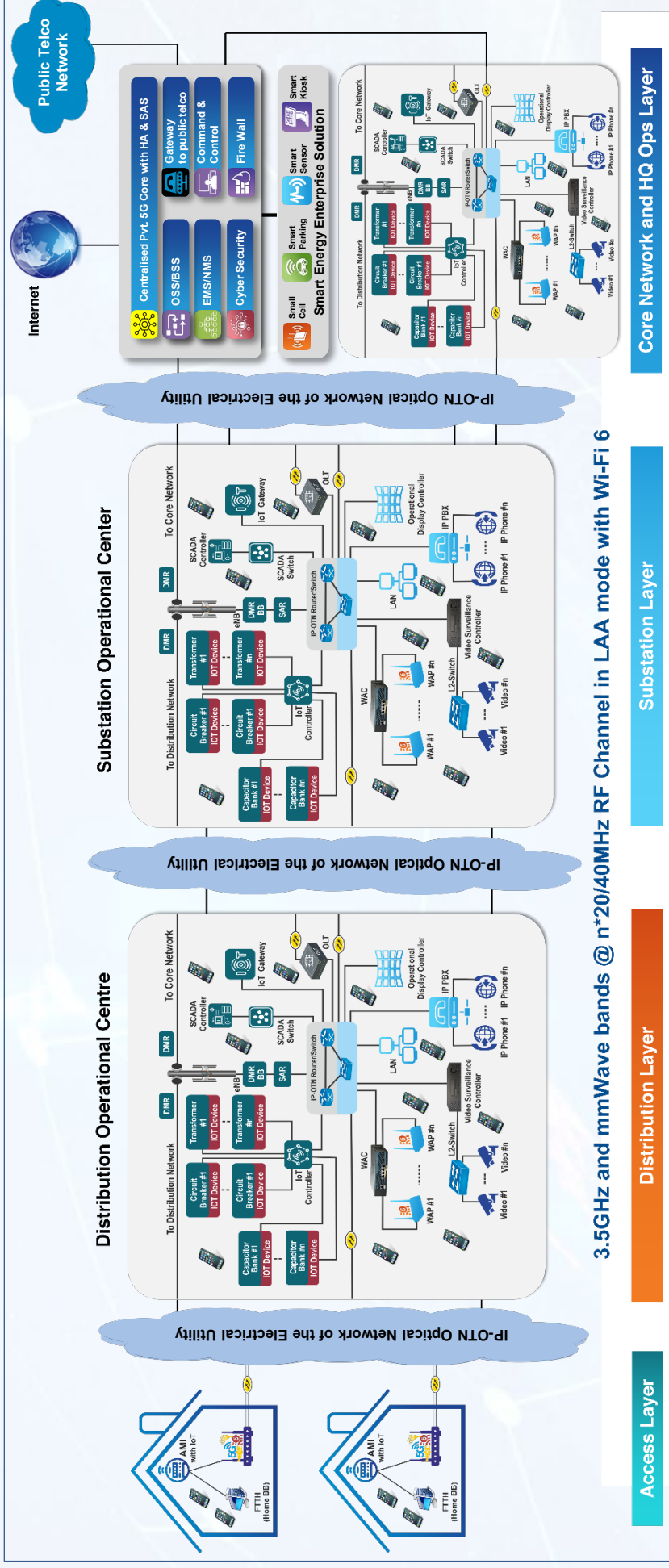
4

Digital transformation era of services & applications with high bandwidths, low latency and high reliability and resilience are supported for Smart Digital KIOSKS, Smart sensor network, Smart Lighting & HVAC Control, Smart parking services, First Responder network solutions, CCTV Surveillance, Smart Pole(with display, sensor & Wi-Fi enabled).

5

Command and Control centre with built in cyber security SOC, AI-ML based NG-OSS platform with IOT Gateway & Internet Gateway for part of the Metro Rail DPN Solution.

# Digital Transformation of Electrical Utility - Quadgen proposed 5G E2E Network Solution



3.5GHz and mmWave bands @ n\*20/40MHz RF Channel in LAA mode with Wi-Fi 6

## Solution Highlights

- E2E 5G Digital Private Network for Electric Utility infrastructure covers Homes, Distribution Ops centre, Substation Ops centre and Operational HQ with hyperconnectivity components of AMR (Automatic Meter Reading), FTTH, 5G FWT, IAB enabled 5G nodes, IIOT, SCADA elements, GPON infrastructure, enterprise routing and switching, Wi-Fi 6, MCS and Unified communications centre.
- Inter Layer hyper connectivity communication infrastructure involves high speed DMR / IP-OTN Backhaul with speeds of n\*40/100/400Gbps.
- Digital transformation era requires a range of services and applications with high bandwidths, low latency and high reliability and resilience.
- Hyperconnected & geographically distributed Electric Utility operational centre connected on IP-OTN is supported with distributed IOT Gateway, SCADA Command and Control centre, cyber security SOC with AI-ML based NG-OSS platform.
- Digital Transformation of electric utility network solution will have integral components of Smart grid enterprise solutions, Smart Digital KIOSKS, Smart sensor network, Smart Lighting & HVAC Control, Smart solid waste management, Smart connected vehicle and Smart parking services.
- Scale of 5G DPN solution for electric utility typically is in the order of tens of thousands of Sq.kms of area, Millions of Homes, hundreds of distributed operational centres, thousands of IIOT devices and operational workforce.



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