

QuadGen
WIRELESS SOLUTIONS



5G Digital Private Network Solutions - QuadGen

RAN Nw Engg Services | **SMALL CELL & IBS-DAS** | **4G & 5G NR** | **IP-OTN** | **Smart City & Fiber Grid Nw**
| NDS , NTS, NIS & NOS Services | | NDS ,NPM & NOS Services | | NDS & NIS Services | | NDS ,NPM & MSP Services |

QuadGen MSP Engagement Model for 5G Public Network & Digital Pvt Networks (DPN)

QuadGen – Strategic partner - MSP SoW -NW

- Design and Engineer : **D&E**
- Build and Deploy. : **B&D**
- Install and Commission : **I&C**
- Integrate and Test : **I&T**
- Operate and Maintain : **O&M**
 - Real-time Network Performance Monitoring - NPM
 - Dynamic decision-making using SON
 - Network Performance Improvement - NPI

5G Public & Private Nw Segment

QuadGen



QuadGen Service Competencies

- **NPS** - Network Planning Service with Industry Standard tools like Atoll, iBWave, ASSET, RANPLAN & eQPT
- **NDS** - Network Design Services
- **NES** - Network Engineering Services
- **NPS** - Network Performance Services
- **NIS** - Network Integration Services
- **NTS** - Network Testing Services
- **NOS** – Network optimization Services
- **MSP** - Managed Services Provider

QuadGen as an MSP

Managed NW Engg Services (NES)



5G, LTE NIS, NPM & NOS Services



Small Cell /DAS/WiFi-6 NW NDS, NIS, NPM & NOS



Transmission Network – IP-OTN



Core Network(On-premise/Cloud) NoC & OSS operations

QuadGen Experience – 5G Digital Private Network Solutions

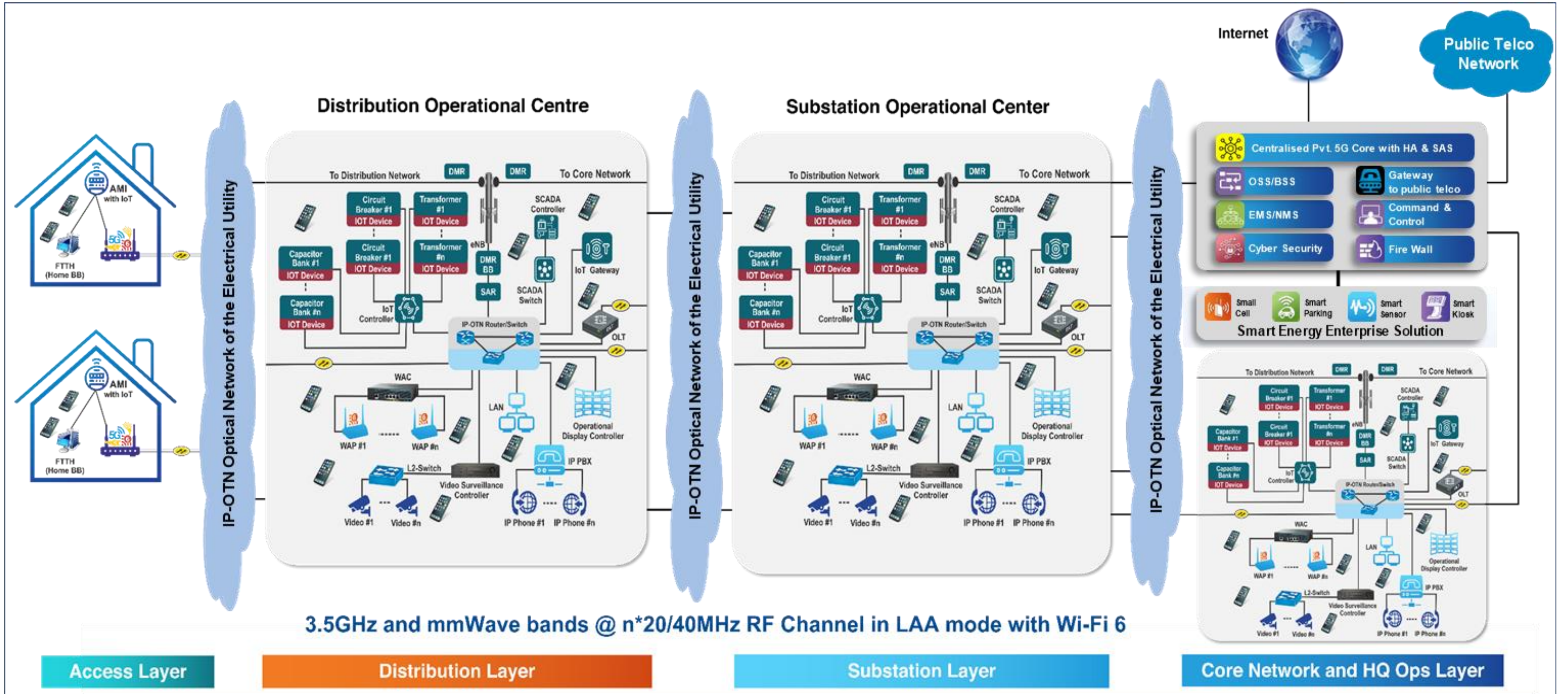
Utilities , Transportation, Multi-tenant enterprise buildings & Oil & Gas



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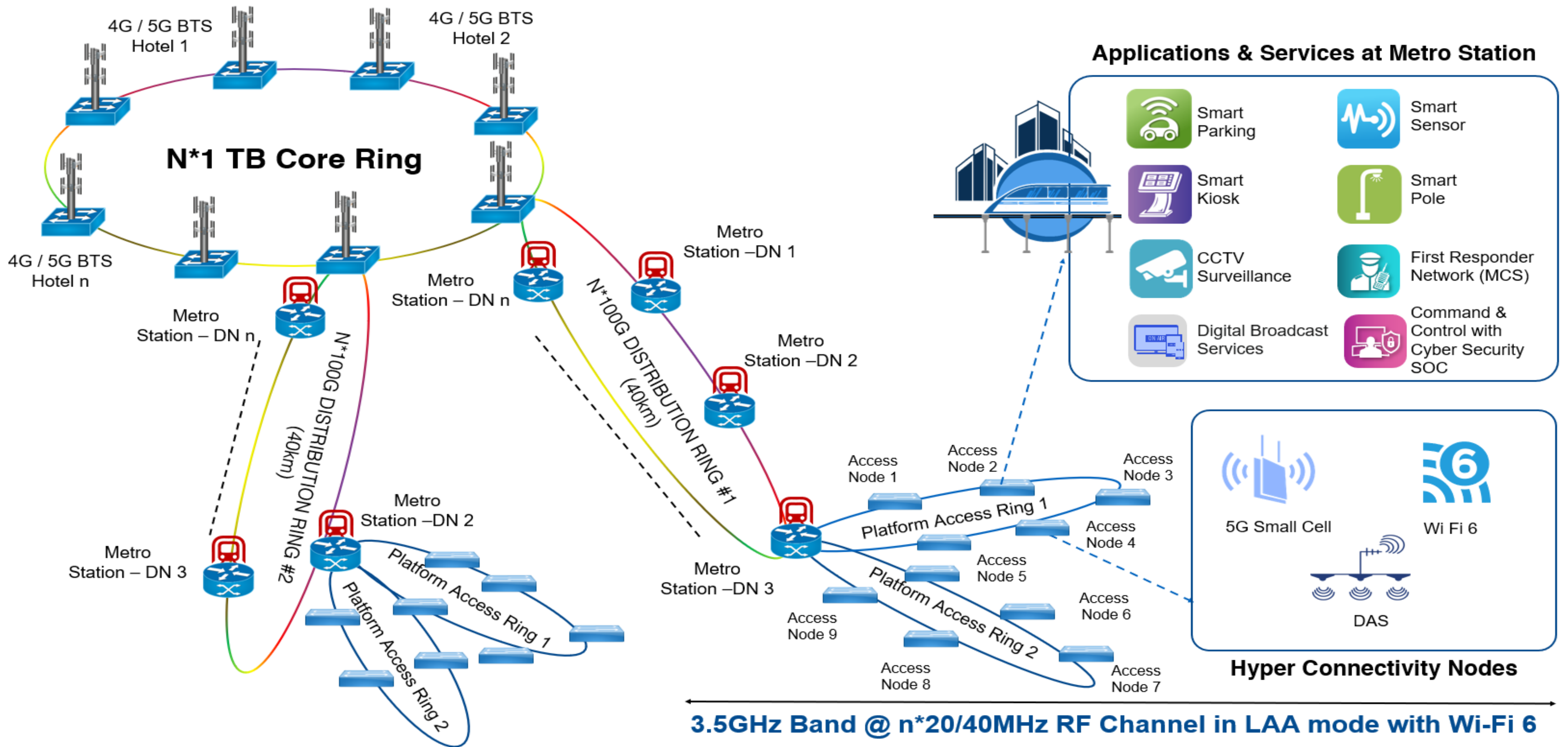
Digital Transformation of Electrical Utility

5G E2E Network Solution



Digital Transformation of Metro Rail Networks

5G E2E Network Solution





5G Coverage Prediction plot for Voice & Data Coverage of Typical Metro Rail Station



70% of station area is covered with 5G cellular standard coverage of -80dBm to -85dBm. However Platforms are covered 90% area



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Digital Transformation enabled Digital Service Delivery

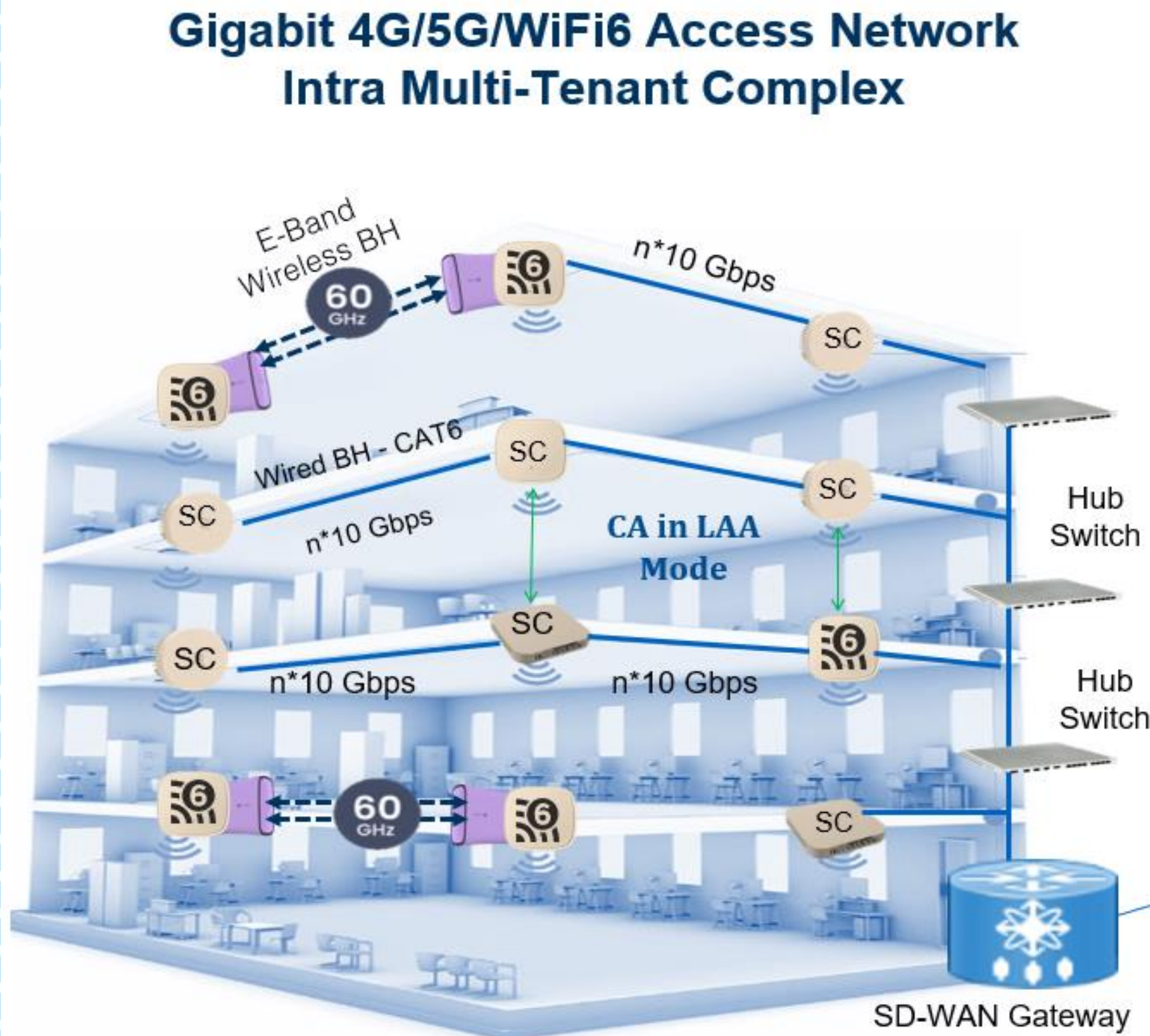
5G / 60GHz / Wi-Fi 6 & IP-OTN - Hyper Connectivity Solution

Multi-Tenant Complexes and Campus Networks

Digital Service Delivery

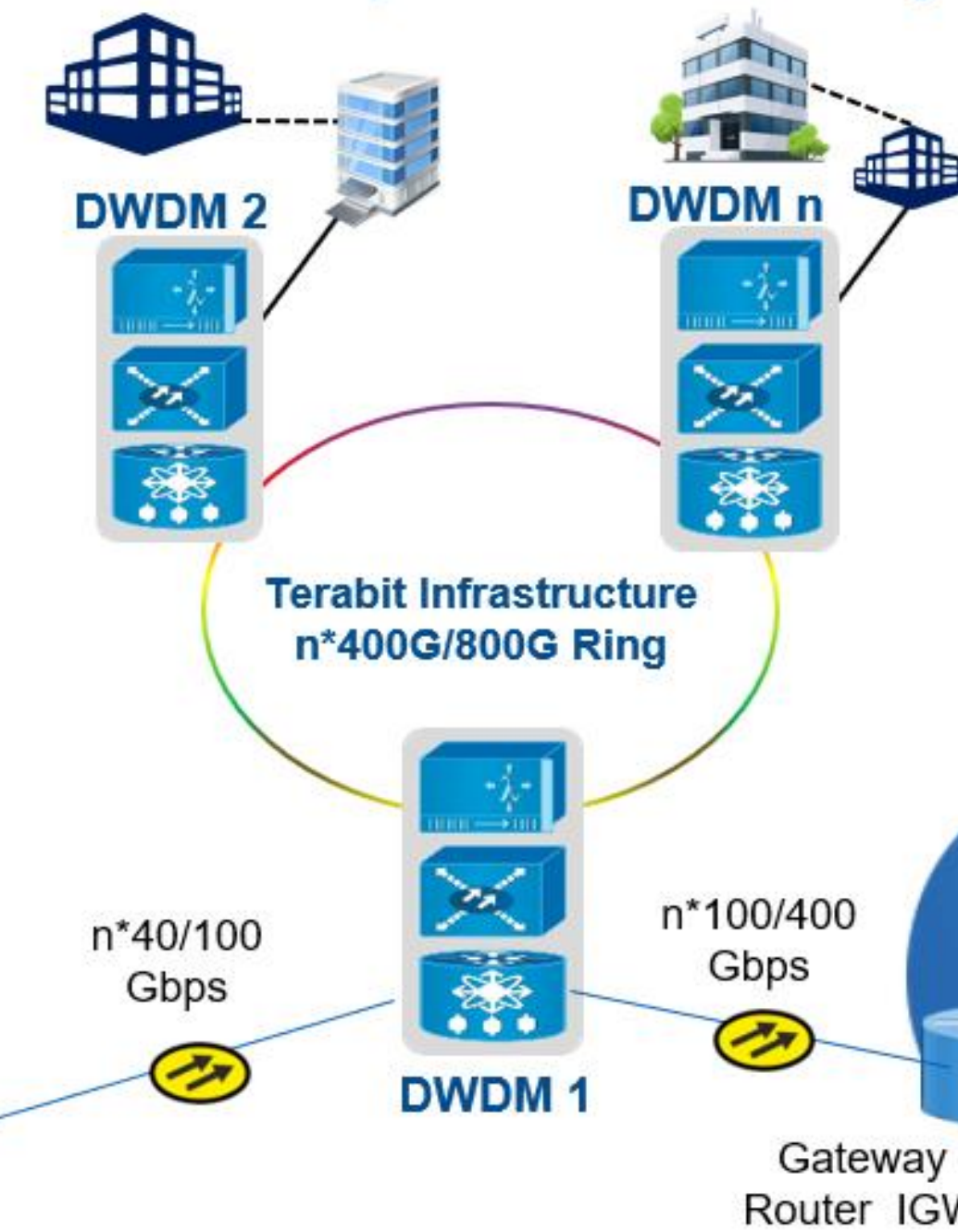
- B2B SDP
- B2C Services
- B2G Services
- First Responder Network (MCS)
- Smart Surveillance
- Digital Broadcast /HSI services
- E-Health
- Smart Enterprise Building
- Smart Utility Services
- CUG/VPN & RPN Services
- Environmental Sensors
- Intranet & Extranet Services
- Digital Kiosk & Display Terminals
- Connected Vehicle Applications

Enterprise User Network Services



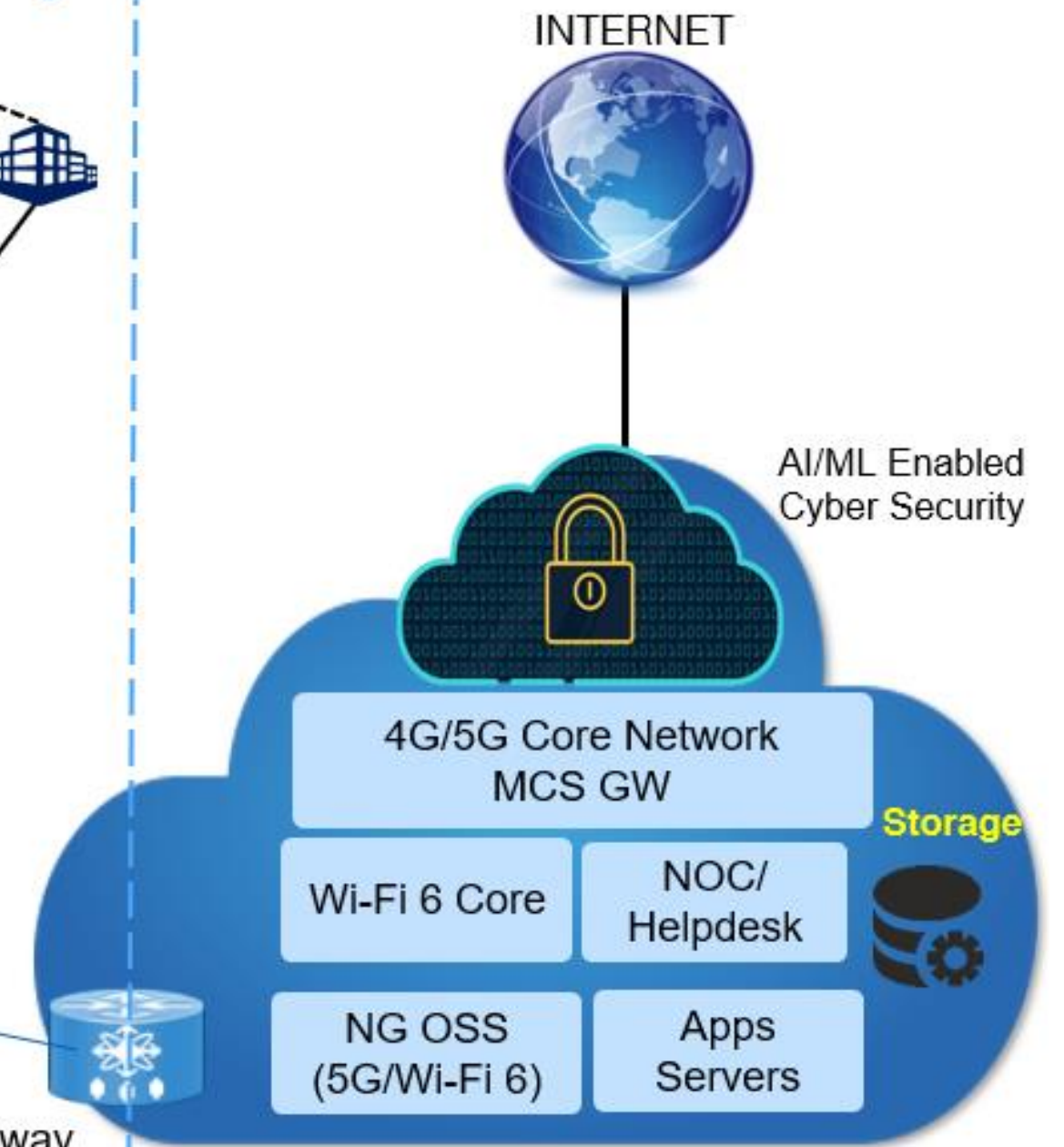
Hyperconnected Enterprise Office/Hospital/Institution/Banks Enabled with High-Speed User Experience
3.5GHz and mmWave bands @ n*20/40MHz RF Channel

Terabit IP-OTN Inter Enterprise Connectivity



Digital Transmission Layer for IP-OTN

Hyperconnected SDN Enabled Cloud

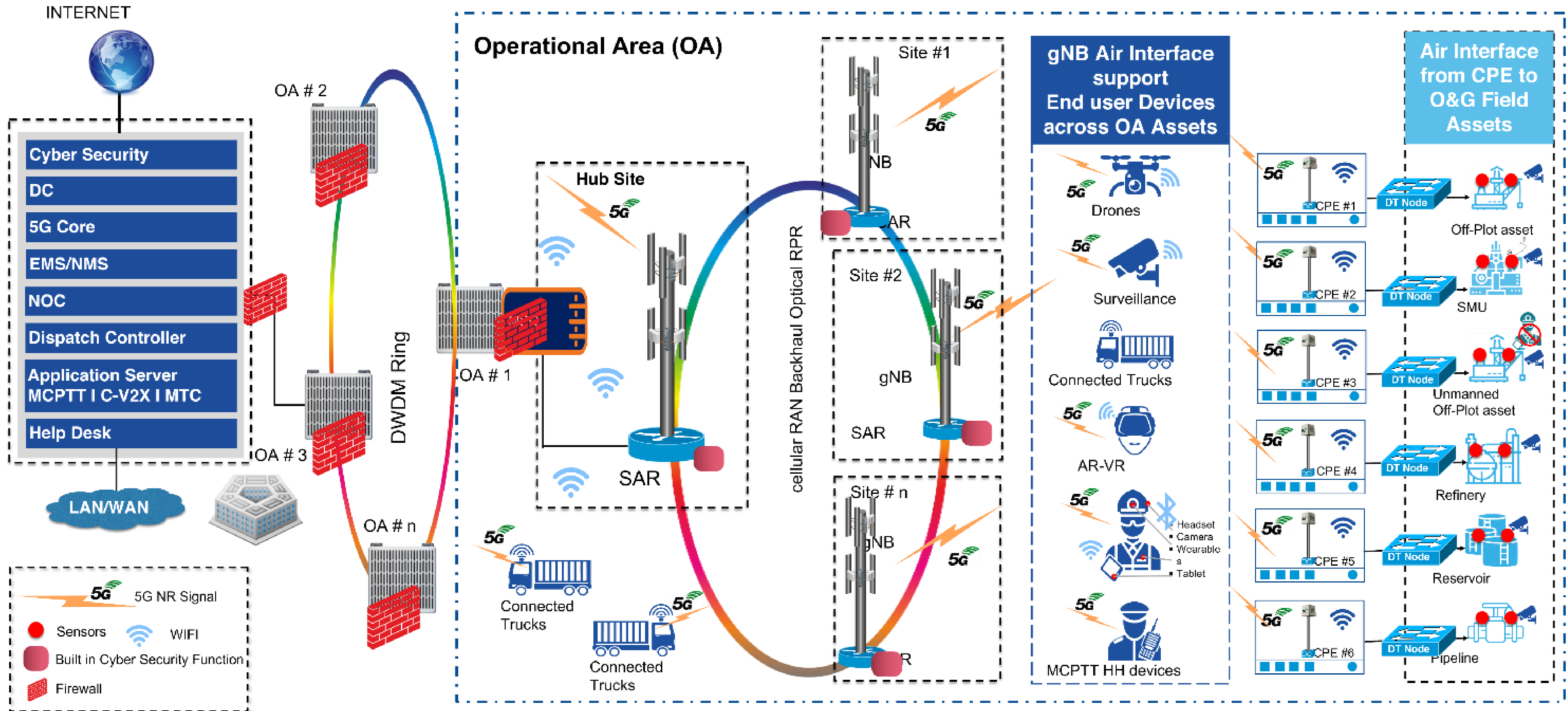


Centrally Located HA/HR On-Premise Core Hosted on Cloud platforms like AWS/Azure



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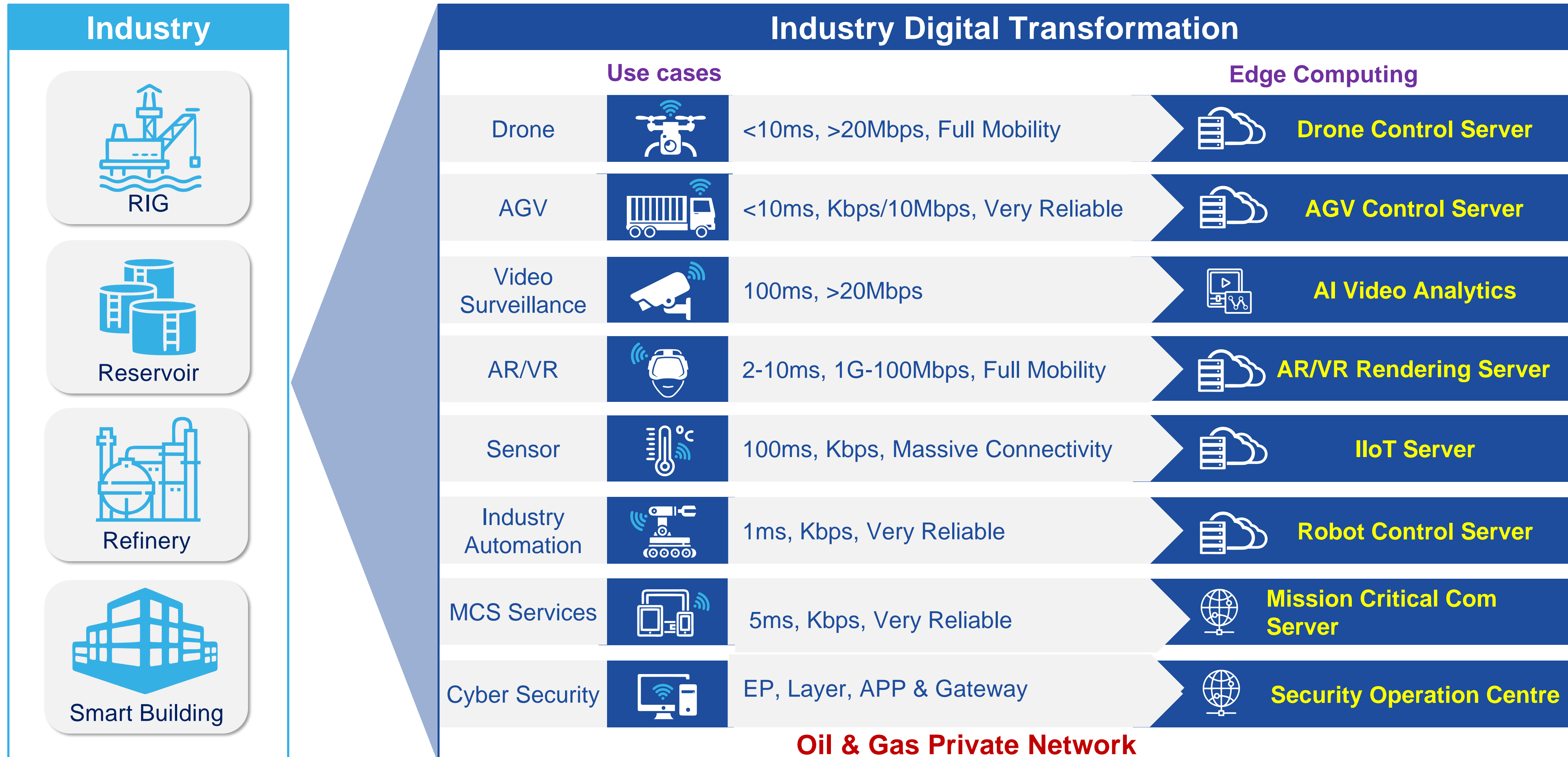
Digital Transformation of Oil and Gas Fields E2E Network Architecture Solution

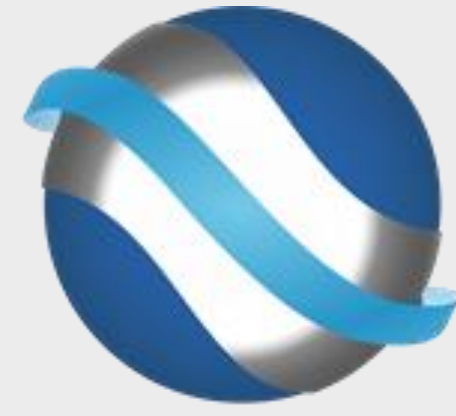


3.5GHz Band @ n*20/40MHz RF Channel



Use Cases – Industry 4.0 – Oil & Gas Pvt Networks





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QuadGen Corporate Credentials

RAN Nw Engg Services | **SMALL CELL & IBS-DAS** | **4G & 5G NR** | **IP-OTN** | **Smart City & Fiber Grid Nw**
| NDS , NTS, NIS & NOS Services | | NDS ,NPM & NOS Services | | NDS & NIS Services | | NDS ,NPM & MSP Services |



About QuadGen

QuadGen
WIRELESS SOLUTIONS



Founded
in 2007



Co-Founder &
Chairman



Co-Founder &
Global CEO



Cumulative Global
Revenues > \$ 635M



900+

TL9000



Experience of Concept to Cutover of large Cellular Nws

- AT&T NW for 4G for 12 states and 18M subs
- AT&T 5G NW for 20 states for 20M subs
- BSNL 25K WiFi
- State Fiber Grids involving 48K OFC NW and 7500 IP /GPON
- Smart City NW with Wi-Fi ,IP MPLS NW and City DataCentre
- High Speed Govt NW with 5G ,WiFi6 ,60Ghz and SDWAN

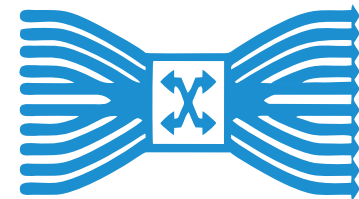
DEEP EXPERTISE IN DESIGN, ENGINEERING, BUILDING, OPTIMISATION & MANAGING OF



5G/4G/3G
NETWORKS



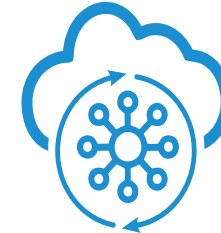
IP/MPLS
NETWORKS



OPTICAL
NETWORKING



5G SA core - SDN



5G - NFV



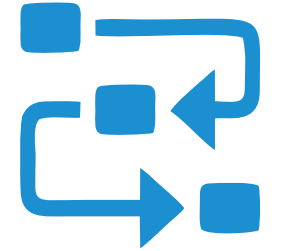
MULTI EDGE
COMPUTING



CLOUD DATA
CENTERS



IoT



5G - OSS

SOME OF OUR ESTEEMED CUSTOMERS



Since 2007



Since 2009



Since 2011



Since 2020



Since 2015



Since 2017



BHUBANESWAR
Smart

Since 2016



Since 2017



Since 2019

STRATEGIC PARTNERS



Financial
Partner



Technology
Partner



Project
Partner



GCC Partner

OEM PARTNERS





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Telco 5G Network Engineering Services (NES) Service Delivery Experience

QuadGen Value: QuadGen is Vendor Agnostic leader in E2E RAN, **Design, Engineering and Integration services** using **in house software tool suite** to offer Coverage and Capacity-based NW solutions with focus on faster deployment , efficient Nw performance monitoring, increased network utilization and improved NW-wide QoS and QoE for US Tier 1 Telcos like AT&T/T-MO/Verizon.

Experience of Digital Decade 2010-2020 ; Cumulative Global Revenue of US \$ 635M ; Talent Pool of 900+ ; 2021 Rev : \$131M

Design & Engineering

- Vendor Neutral **NW Design Services (NDS)** for Coverage & Capacity analysis and Modelling in LTE, **5G** & Wi-Fi 6 for RAN Macro, Small Cell , DAS & **Private enterprise Nw Solutions**
- **4G/5G NW Integration Services (NIS)** for RAN – Transport - Core
- Core IP-MPLS NW Design, Integration and Optimization
- Cyber Security Infrastructure Integration and SOC Governance

Testing, Deployment & Optimization

- Vendor-neutral **NW Testing Services (NTS)** for Functional and Parametric testing of Site and E2E Lab Based testing for **4G/5G** RAN/IP-OTN & Core
- **NW Testing Services (NTS)** at Deployment stage and OTA Site tests.
- Protocol level Analysis and Tuning.
- KPI correlation for E2E Performance Benchmarking
- Rule-based Coverage and Capacity **Nw Optimization Services (NOS)**

Performance Analysis and Service Assurance

- Carrier and Cluster level with Load Balancing & Interference Management
- **NW Perf Monitoring (NPM)** Services for Telcos with Sw tools like SON
- Acceptance testing with System & NW level functional parameters
- OSS Operations with IP, RAN, Access & Transport NEs
- IP NW Traffic Capacity monitoring and Rerouting

RAN

5G : 5K+ gNB Int
4G : 200K+ Int
Site Engg : 100K+
5G RF Opti : 8K+
4G RF Opti : 115K+

SmallCell & DAS

Area : 20M Sq.Ft.
Design & Int : 20K+
Stadiums : 60
Wi-Fi HS : 25K+

Optical Tx & IP Core

SAR : 30K+
TX Nodes : 15K+
Routers : 2K+
GPON : 10K+
RKM : 50K

Multi-Technology Expertise



Small Cell

Wi-Fi6

Cyber Security

IP/MPLS

Product & Systems Expertise

ERICSSON

NOKIA

SAMSUNG

ciena

CISCO

COMMSCOPE®

Esteemed Customers



AT&T

verizon

T-Mobile

dish

Since 2007

Since 2009

Since 2011

Since 2020

Certification Focus



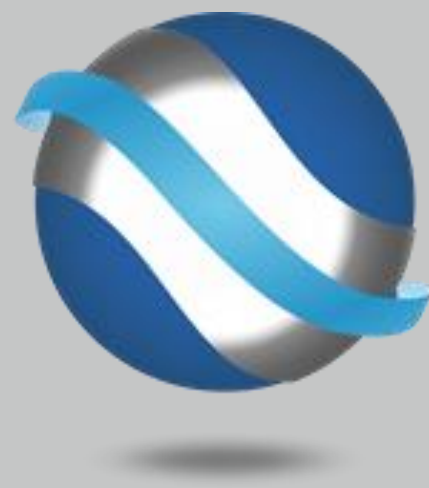
PLURALSIGHT



State of the Art Trends of Indian Telecom NW Growth - QuadGen well positioned to serve this Indian Market trends & TAM.

Trend	Indian Telecom NW Segments	Annual TAM in USD B
1	4G /5G/Wi-Fi 6 / 60 Ghz / SD-WAN - Access NW Solutions	1.5
2	IP-OTN Backhaul & NG- PON, MEC - Front/Mid/Backhaul Transmission NW Solution	0.3
3	Multi service Digital Pvt Networks - Enterprise & Sectoral NW Solutions	0.5
4	SDN - NFV - 5G Core NW Solutions	0.3
5	AI/ML, Cloud and NW Performance Monitoring & Analytics NW Solutions - SON	0.2
Total Indian NW Solutions covering all 5 Trends		2.8

Thank You



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