The new F5G fibre network – a future proof architecture

The F5G Architecture

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Technical Aspects in Scope of F5G

Business Services: One fiber for multi-service
1. Business PON + Industry PON
2. Mobile + Fixed network synergy
3. FTTR + Wi-Fi + Smart home

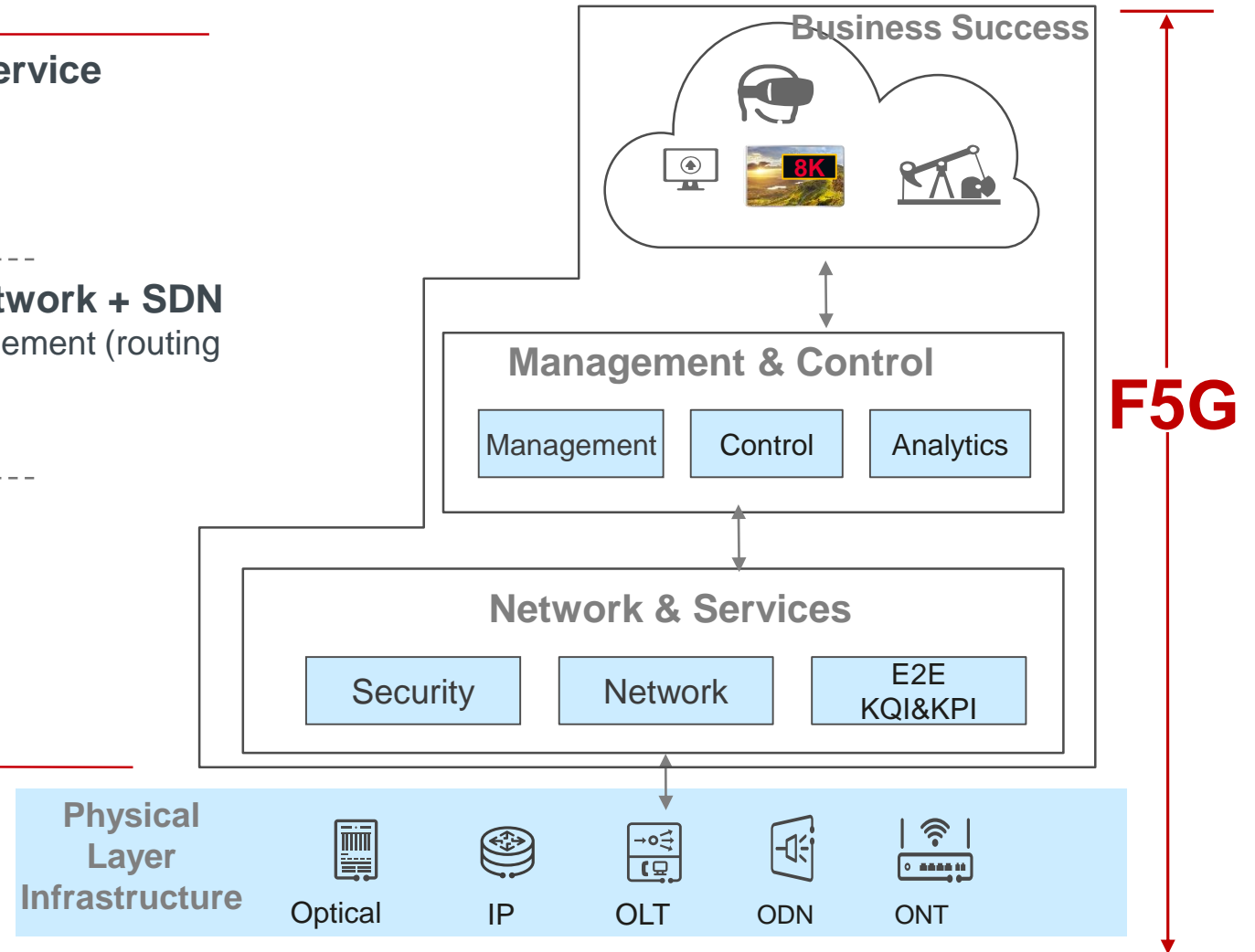**Management & Control: Autonomous network + SDN**
1. Autonomous provisioning, operation & management (routing planning, AI, Telemetry, Big Data…)
2. SDN

Network layer: Ultimate experience
1. FMC enhancement
2. E2E network KQI/KPI, telemetry
3. Full stack slicing
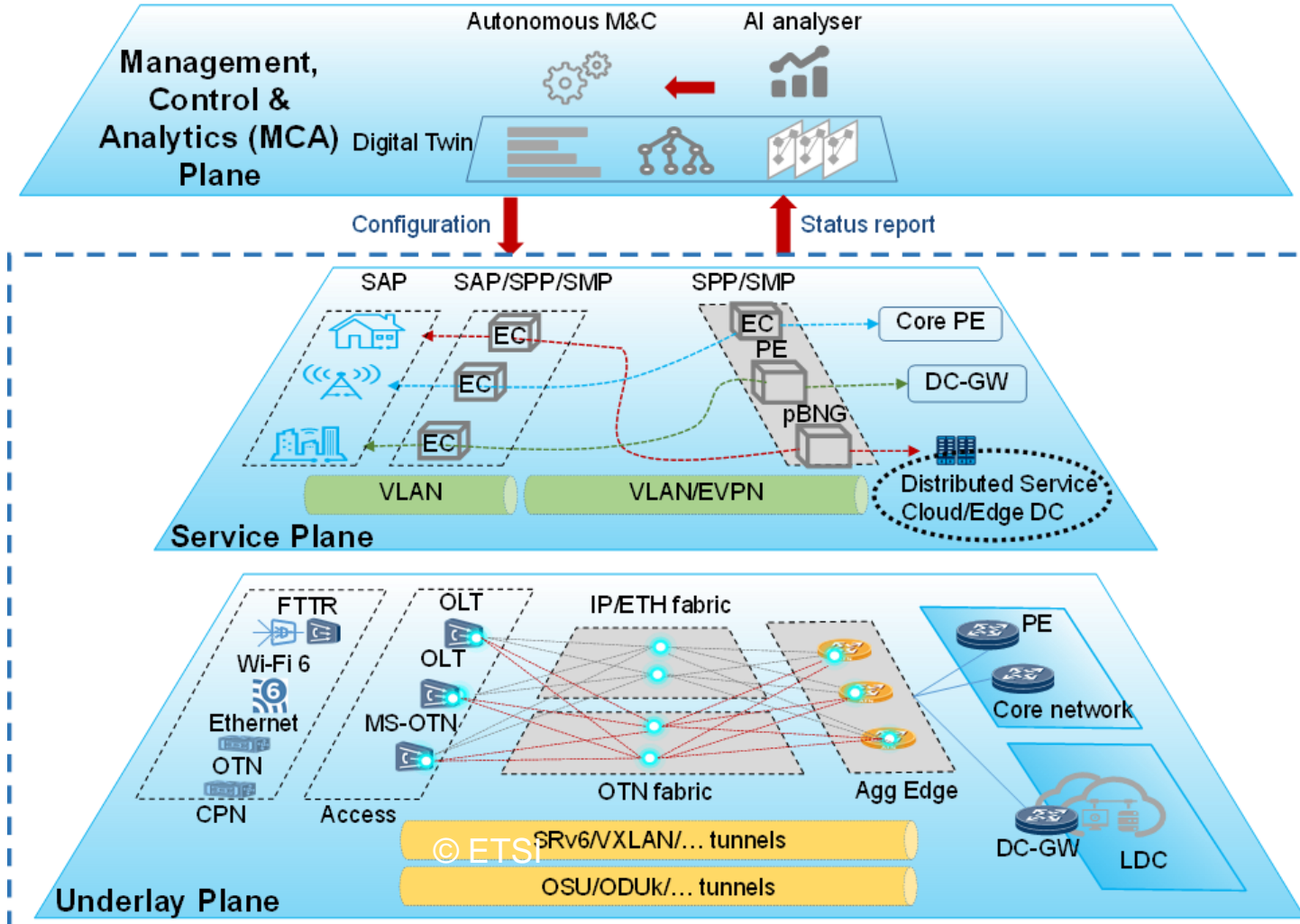4. Edge AI/Computing
5. OTN

Physical Layer: Flexible & Agile
1. Low latency PON, FTTR
2. Quick ODN, ODN visualization
3. Wi-Fi 6 enhancement
4. WDM network

Business Success

Management & Control

| Management | Control | Analytics |

F5G

Network & Services

| Security | Network | E2E KQI&KPI |

Physical Layer Infrastructure — Optical   IP   OLT   ODN   ONT

Business Drivers for the F5G Architecture

- Dual-Gigabit Networks (F5G & 5G)

- Rich set of Applications and Services for Different Market Segments

- F5G Infrastructure Convergence and Consolidation

- Converged Application Needs (Multi-service networks)

- Shift of Broadband Service Requirements towards Quality of Experience (QoE)

- Growing beyond Traditional Telecommunication (Vertical Industries)

- Increased Operational Efficiency

- Security and Privacy
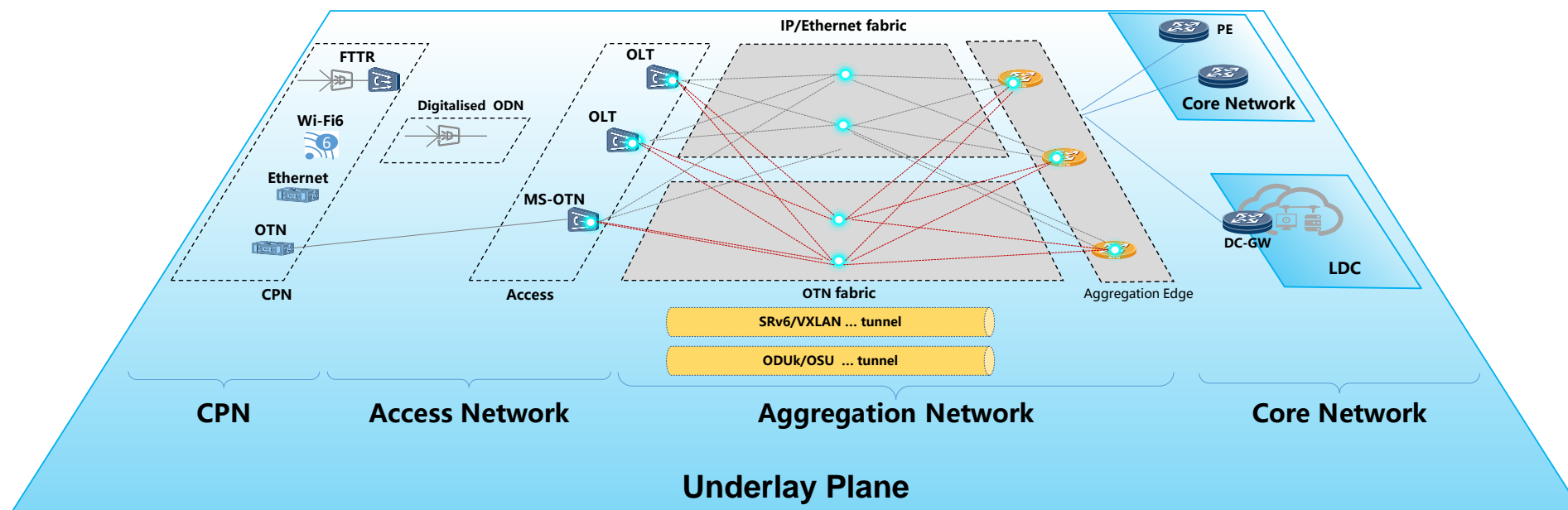
F5G E2E Architecture

Key enabling features
- Separation of Services Plane and Underlay Plane
- Aggregation Network Fabric
    - Dual IP/Ethernet & OTN Fabric
- Network Slicing
    - Wi-Fi, PON, OTN, IP AggN Slicing
    - User Group Oriented Slicing
    - Service-Oriented Slicing
- AI-embedded Traffic Steering
- Autonomous E2E Management

https://www.etsi.org/deliver/etsi_gs/F5G/001_099/004/01.01.01_60/gs_F5G004v010101p.pdf
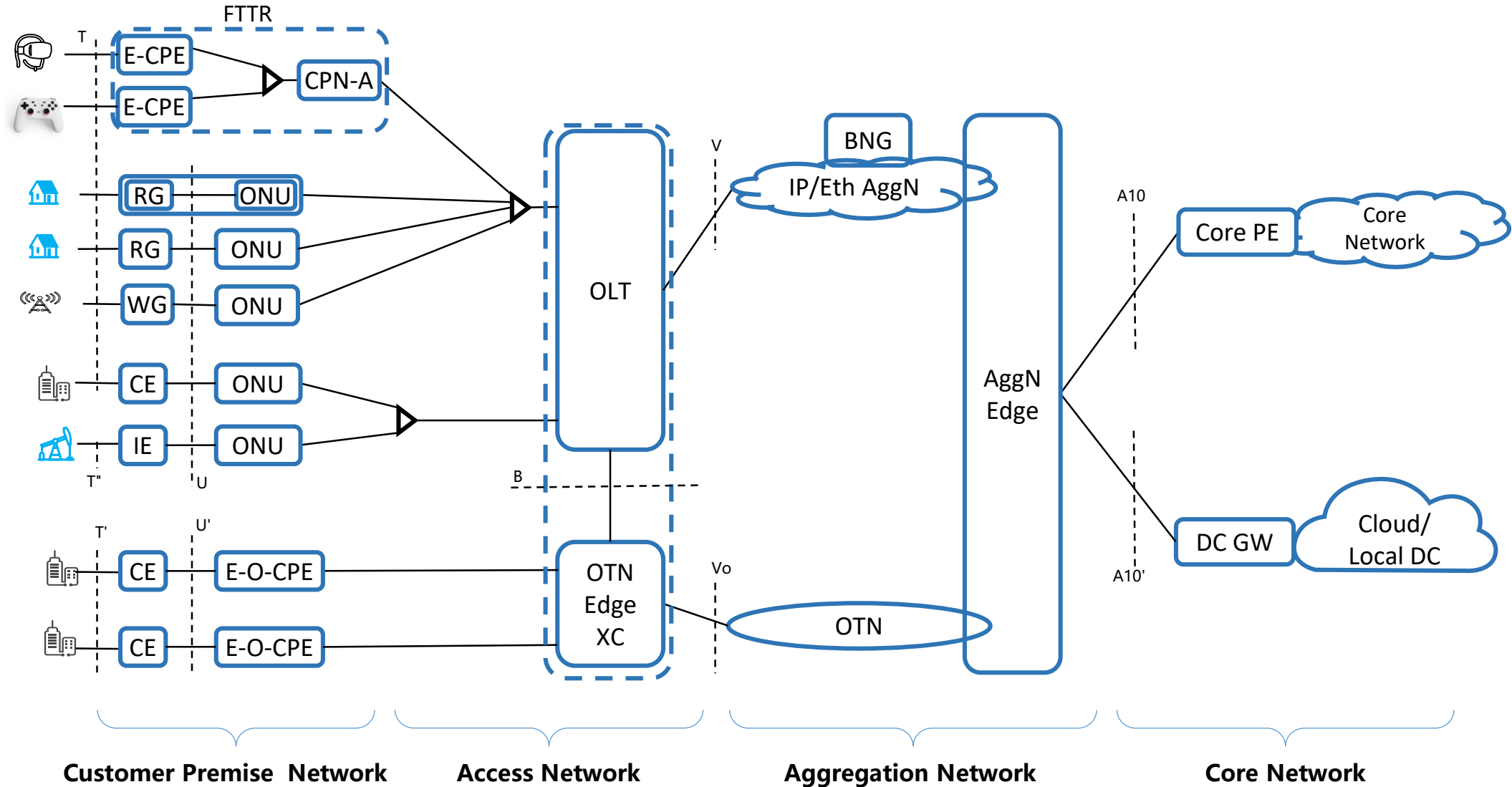
Underlay Plane

Fabric-based, dual plane Aggregation Network

Underlay Network Technologies include IP/ETH/OTN/PON

F5G Architecture: Topology Perspective
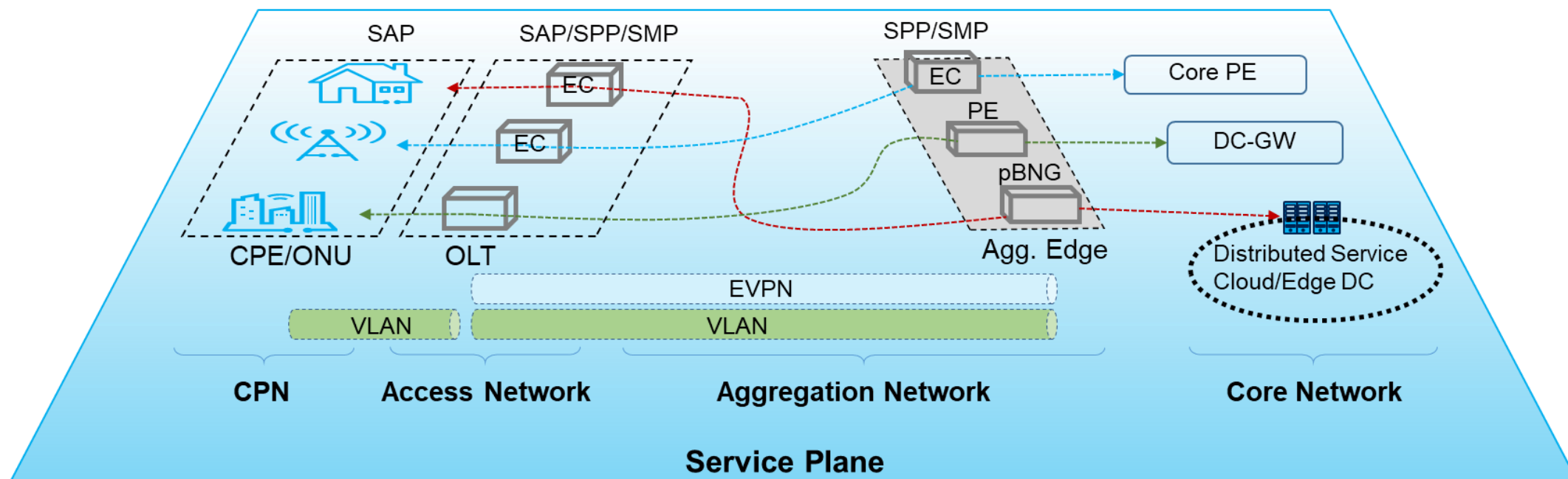

Customer Premise Network **Access Network** **Aggregation Network** **Core Network**
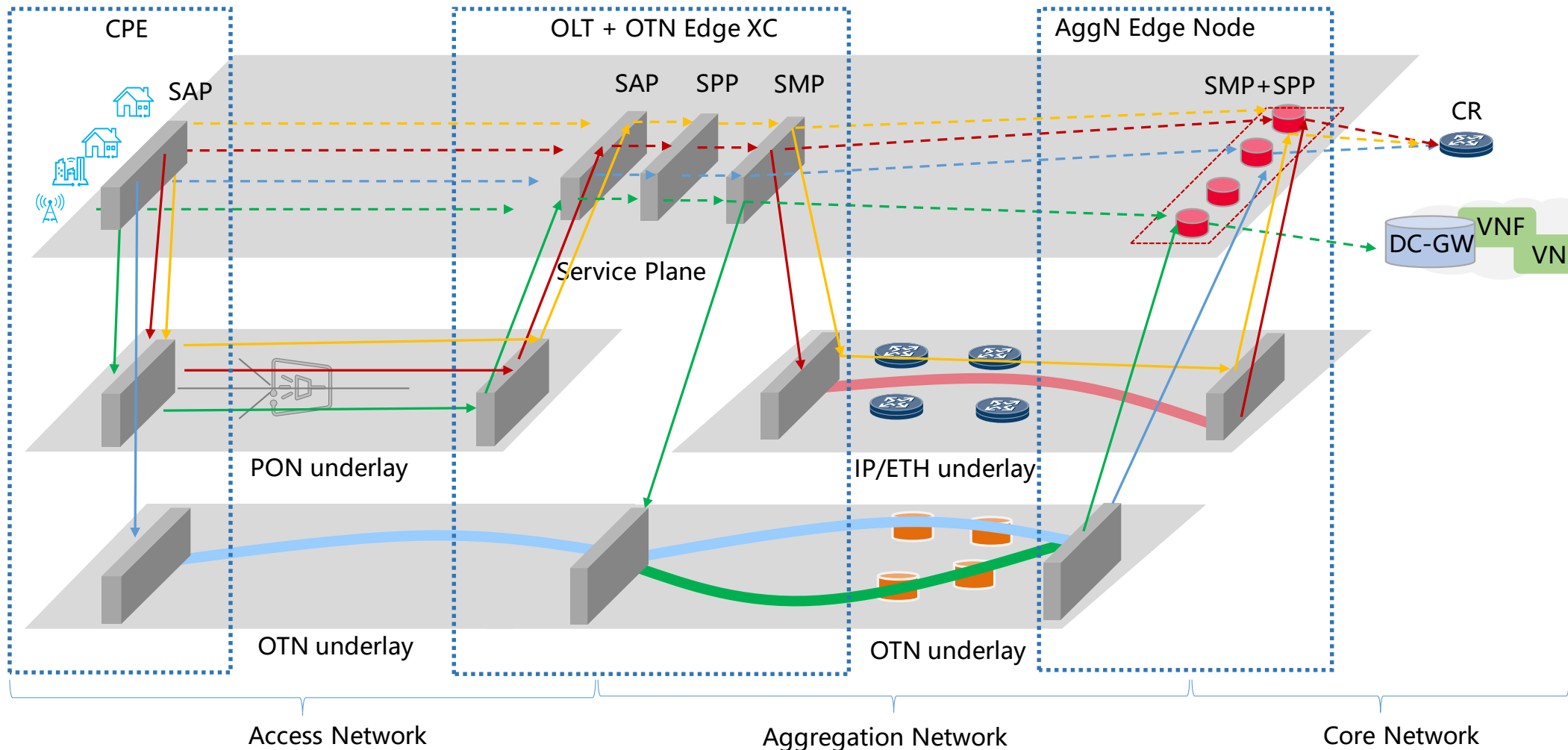
Service Plane

- Service Access Point
- Service Processing Point
- Service Mapping Point

Separation Underlay and Service Plane incl. Slicing and Traffic Steering

ETSI

CPE

SAP

OLT + OTN Edge XC

SAP SPP SMP

AggN Edge Node

SMP+SPP

CR

VNF
VNF

DC-GW

Service Plane

PON underlay

IP/ETH underlay

OTN underlay

OTN underlay

Access Network

Aggregation Network

Core Network

Legend

Best effort service	Best effort traffic path	IP/ETH Underlay Tunnel
Better service	Better traffic path	OTN Underlay Tunnel (guaranteed)
Guaranteed service	Guaranteed traffic path	OTN Underlay Tunnel (premium)
Premium Service	Premium traffic path	

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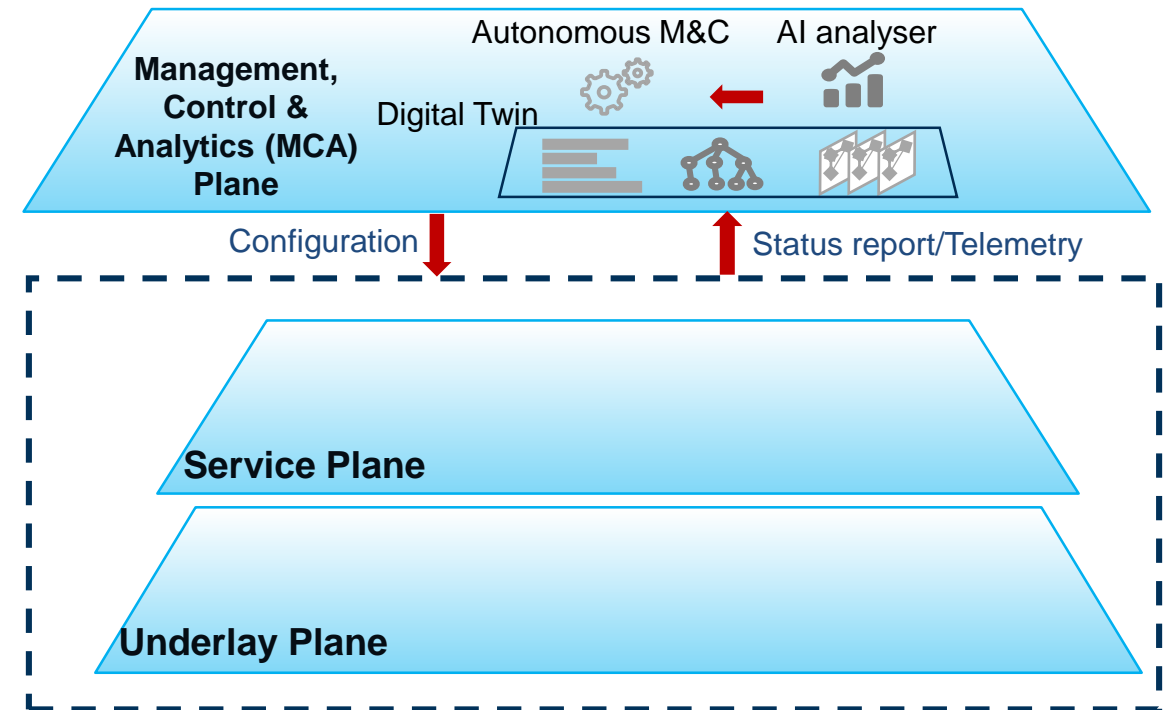# Management, Control & Analytics (MCA) Plane

AI-based Analytics

- Reasoning and training

- Analysing network data received through telemetry

- Predictive Maintance

- Smart Traffic Steering

Autonomous M&C

- Intend-driven Management

- Coordinated Management (S&U plane)

Digital Twin

- Status of running network

- Realtime view

Summary

- F5G Architecture is holistic end-to-end

- Meets the requirements of a plethora of different services and applications

- Service-oriented Architecture (more than connectivity)

- Agility and flexibility to adapt to customer needs from various market segments (residential, enterprise, verticals, mobile)

- Improved QoE through FTTR, premium service quality in the different segment of the fixed entwork

Thank you for your attention

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