



SCTE CABLE-TEC
EXPO'13
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SDN IN CABLE ACCESS NETWORKS

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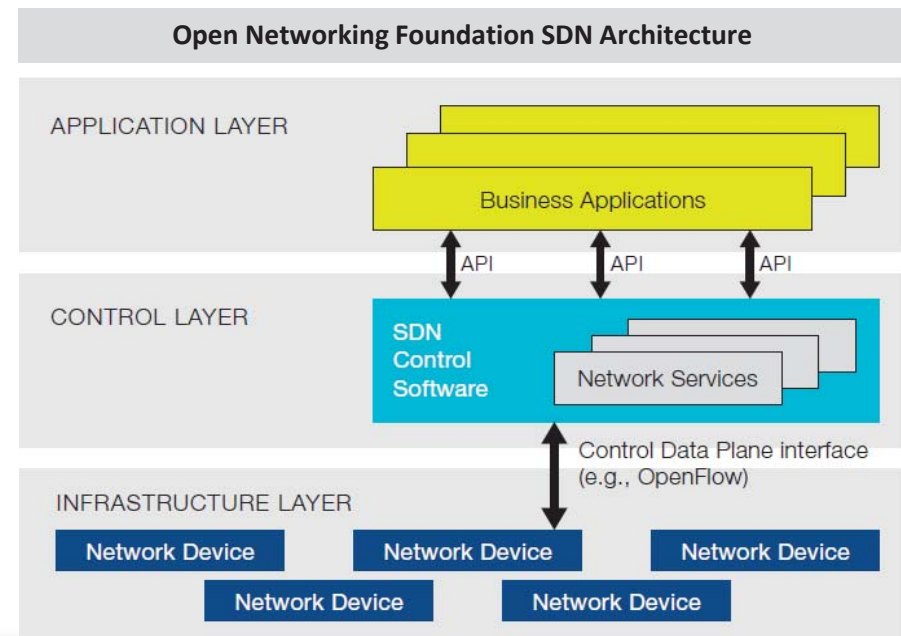
Aurora Networks

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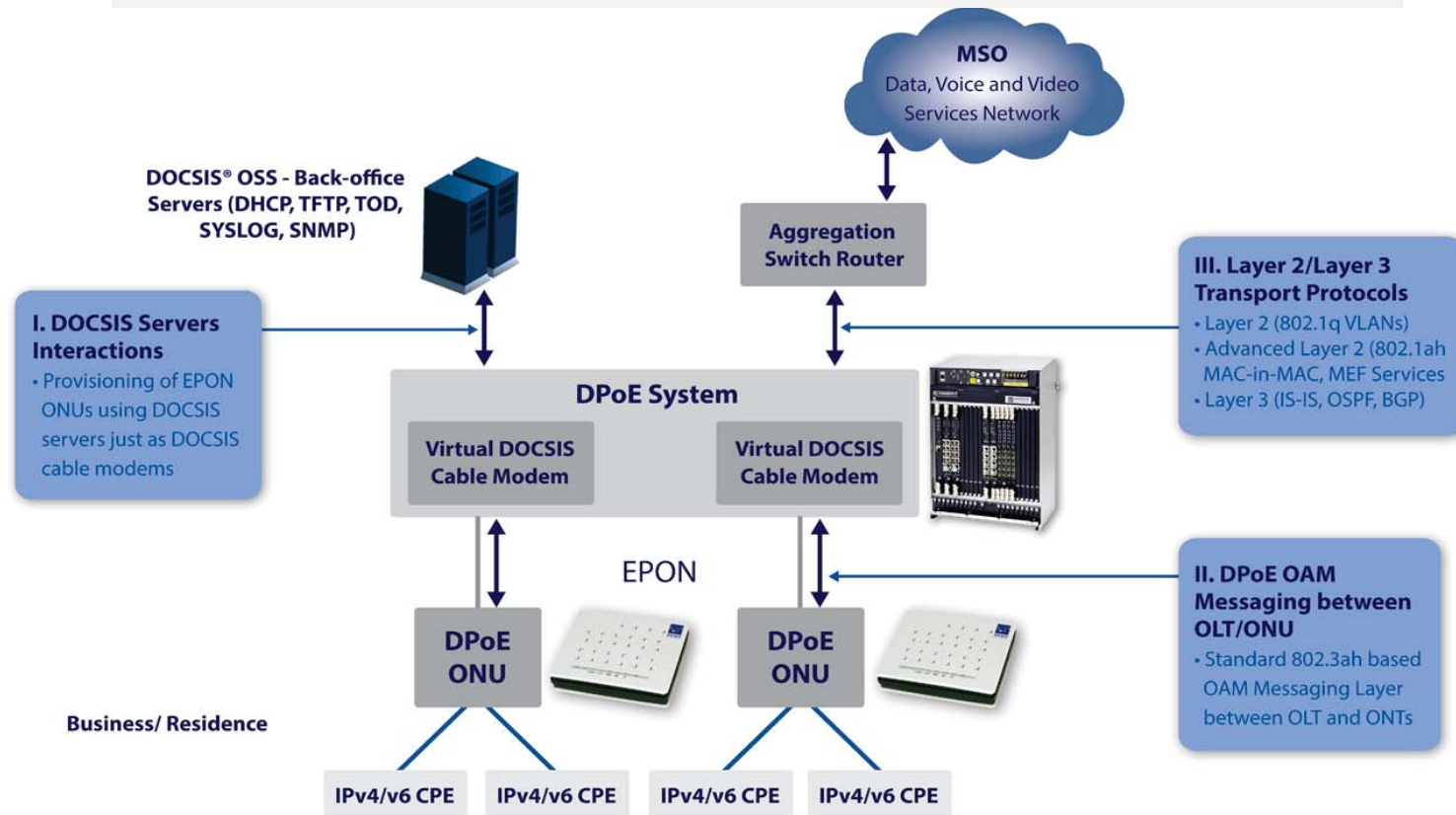
Concept of SDN

- Traditional Networking Gear - Integrated Control, Data and Management Plane
 - Network Rigidity
 - Closed Network Environments
 - Proprietary vendor technology lock-ins with slower innovation cycles
 - High equipment CAPEX
- SDN or Software-Defined Networking is a brand new network paradigm
 - De-couple Control and Forwarding Planes
 - Control protocol intelligence logically centralized in the software controller
 - Forwarding plane resides in highly optimized switching hardware
 - Standard API between controller and network hardware



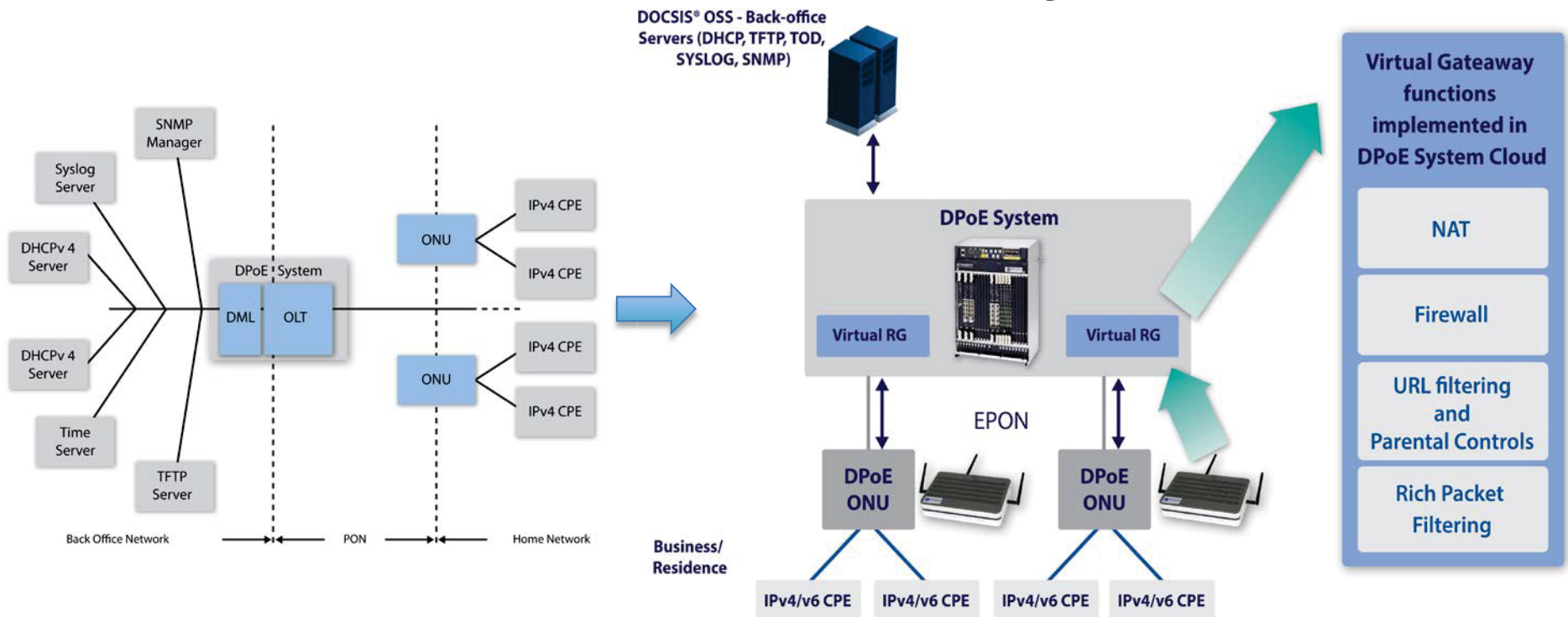
Cable Operator Access Network – FTTH and DPoE™

DOCSIS Provisioning of EPON (DPoE) System Architecture



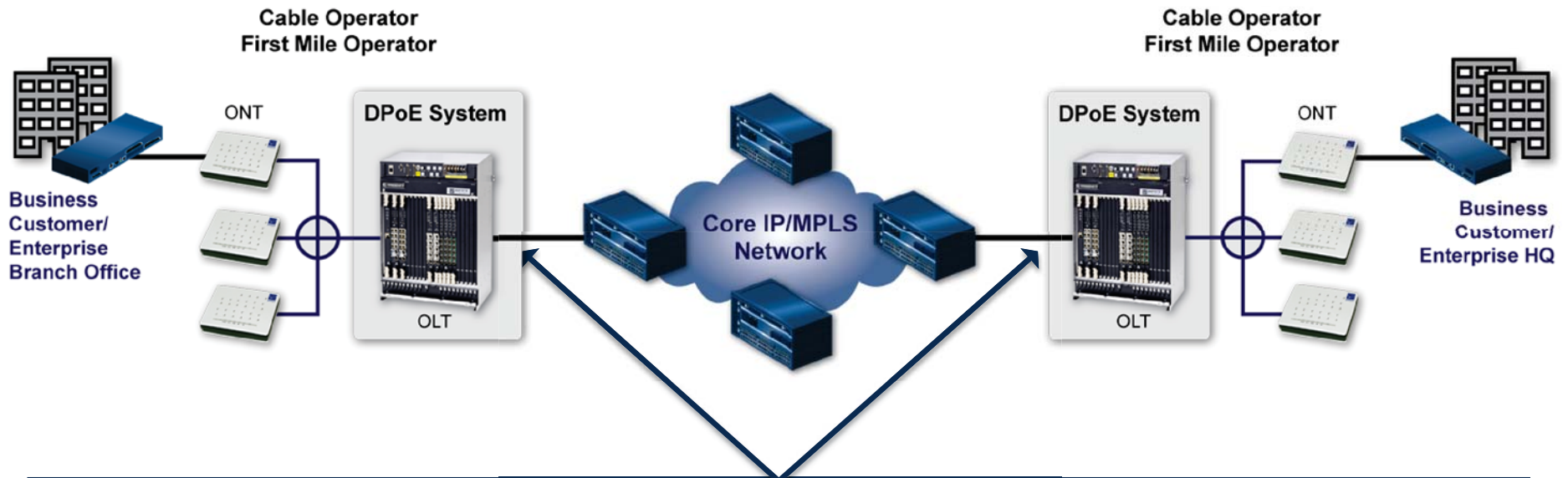
Several areas of DPoE amenable for SDN concepts application

SDN (DPoE) Application: Virtual Residential Gateway



- Enhanced sharing of computing resources – CAPEX savings
- Offload complexity to cloud – CPE hardware functional simplicity
- Operational ease – Simplified troubleshooting and maintenance, configuration and firmware upgrades, and truck-rolls – OPEX Savings

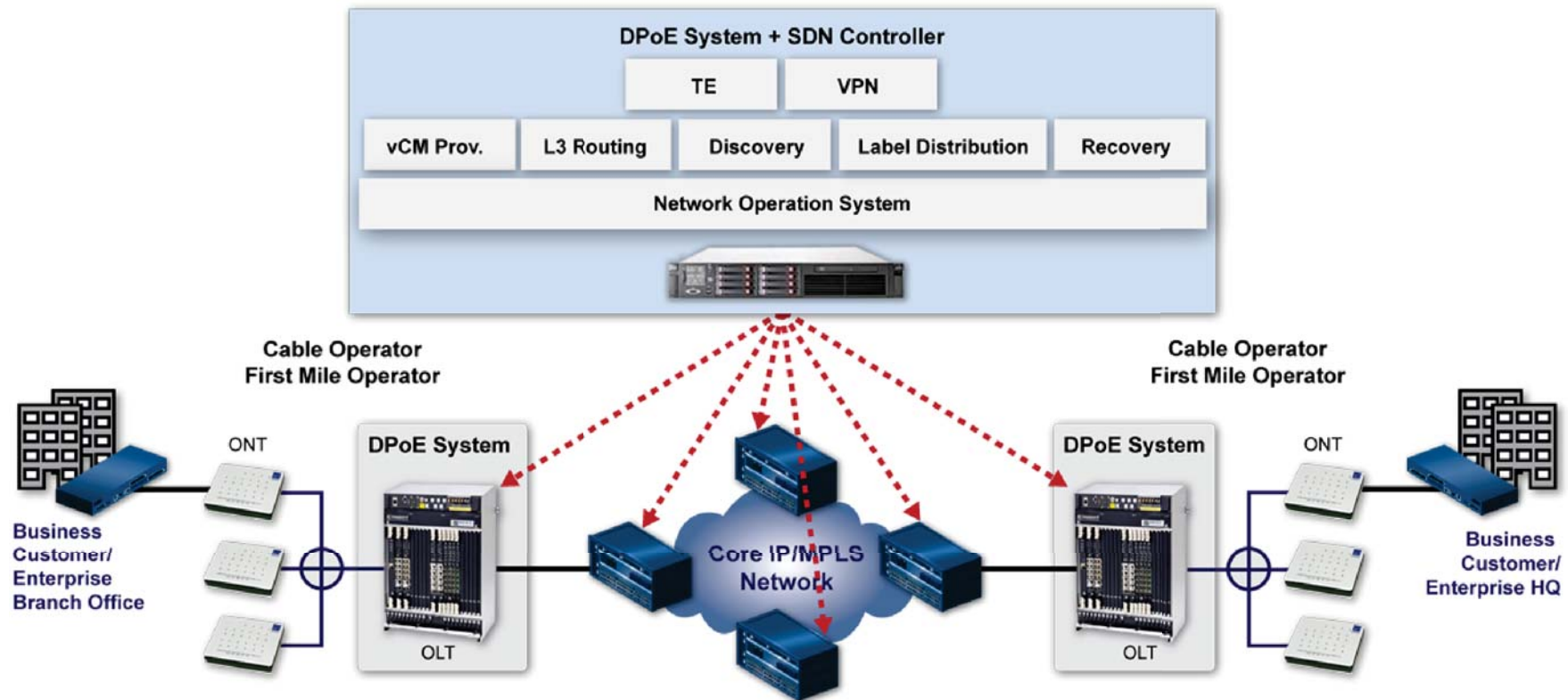
DPoE System: Network Side Control Protocols



DPoE System EPON OLT

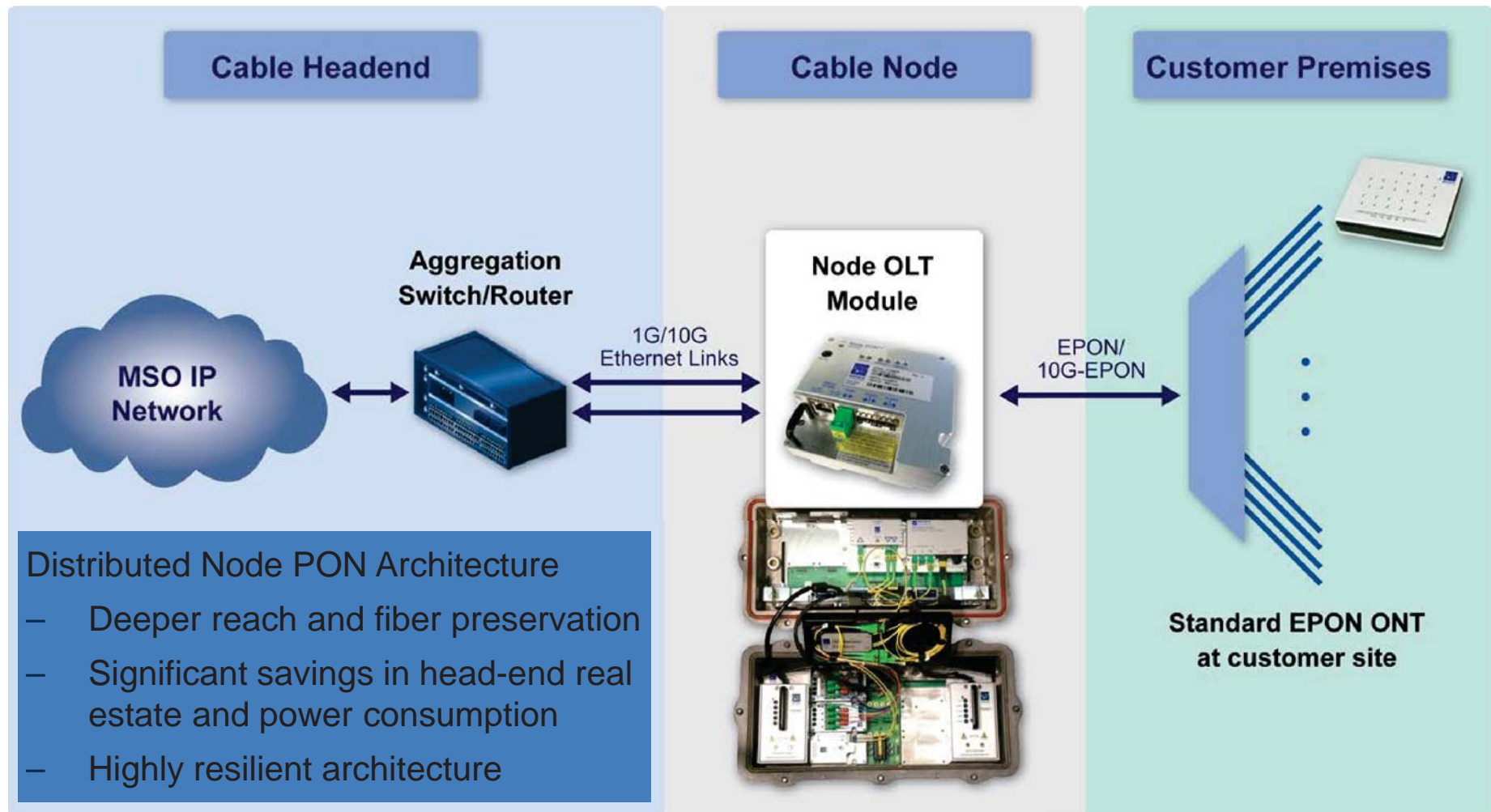
- Functions as an advanced L3 Router and MPLS LER
- L3 Routing Control Protocol Complexity (L3 Routing: IS-IS, OSPF, BGP)
- MPLS LER Control Protocol Complexity (MP-BGP, VPLS, LDP, RSVP-TE)

SDN (DPoE) Application: Logically Centralized Control plane



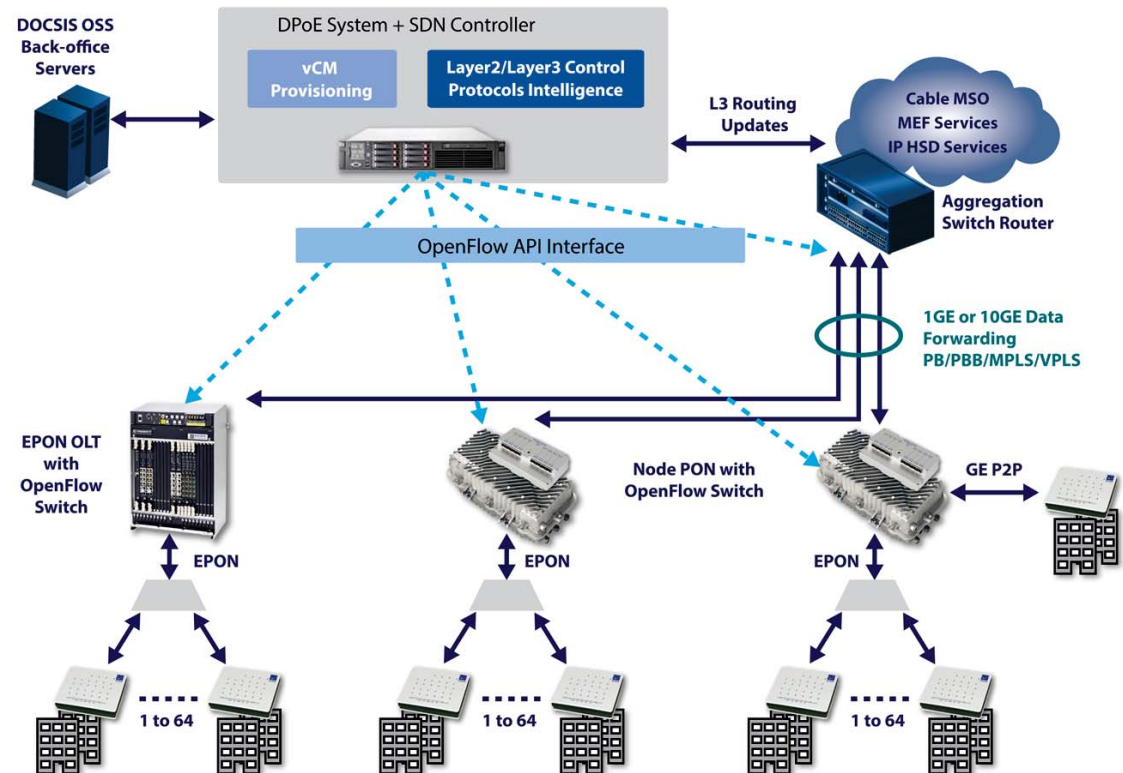
- Logically Centralized Controller with Global View of Network
- More Efficient routing and Traffic Engineering as compared to traditional SPF or policy-based routing

Distributed Broadband Access Architecture: Node PON



SDN Application: SDN-enabled Node PON

- Cable Node PON
 - Highly Optimized Low Power Node OLT Module
 - Optimized for Efficient Data Forwarding
 - SDN-enabled DPoE System in the Cloud
 - DOCSIS Provisioning
 - L3 Routing Intelligence

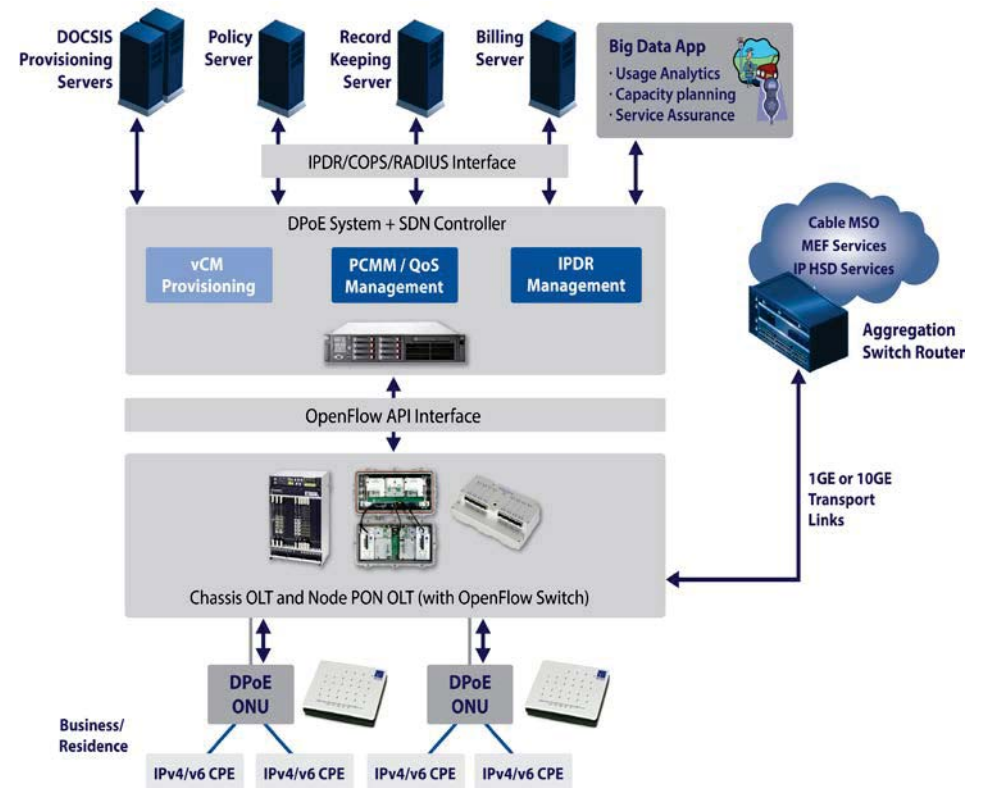


- SDN-Enabled Resilient Node PON Architecture
- Maximally Leverage HFC Infrastructure/Fiber for High Speed PON Services



SDN (DPoE) Application: Policy Control and Big-Data Analytics

- Enhanced Policy Control with SDN
 - Dynamically allocate network resources such as bandwidth and QoS
 - SDN-enhanced DPoE with PCMM and IPDR
- Big Data Analytics
 - Network Capacity Planning, Usage Analytics and Service Assurance
 - New business models for future – Social Networking/Targeted advertising

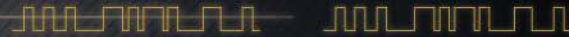


- Seamless integration with cable's existing policy control/OSS frameworks
- SDN-enabled framework for building rich software ecosystem and apps based support for big data applications

Conclusion

- SDN comes with the promise of highly service-agile and programmable networks
- High applicability in Cable's emerging Access architectures such as FTTP and DPoE
 - DPoE enables seamless migration of FTTP EPON technologies into Cable's DOCSIS-based infrastructures
- DPoE areas amenable to applying SDN
 - Virtual Residential Gateway
 - Logically Centralized L3 routing/MPLS control-plane
 - SDN-enabled Node PON
 - SDN for Policy Control and Big Data Analytics





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