

SCTE CABLE-TEC
EXPO'13
OCTOBER 21-24 / ATLANTA, GA

**EPON AND EPOC:
A UNIFIED FIBER AND COAX NETWORK SOLUTION
FOR BUSINESS SERVICES**

Curtis Knittle

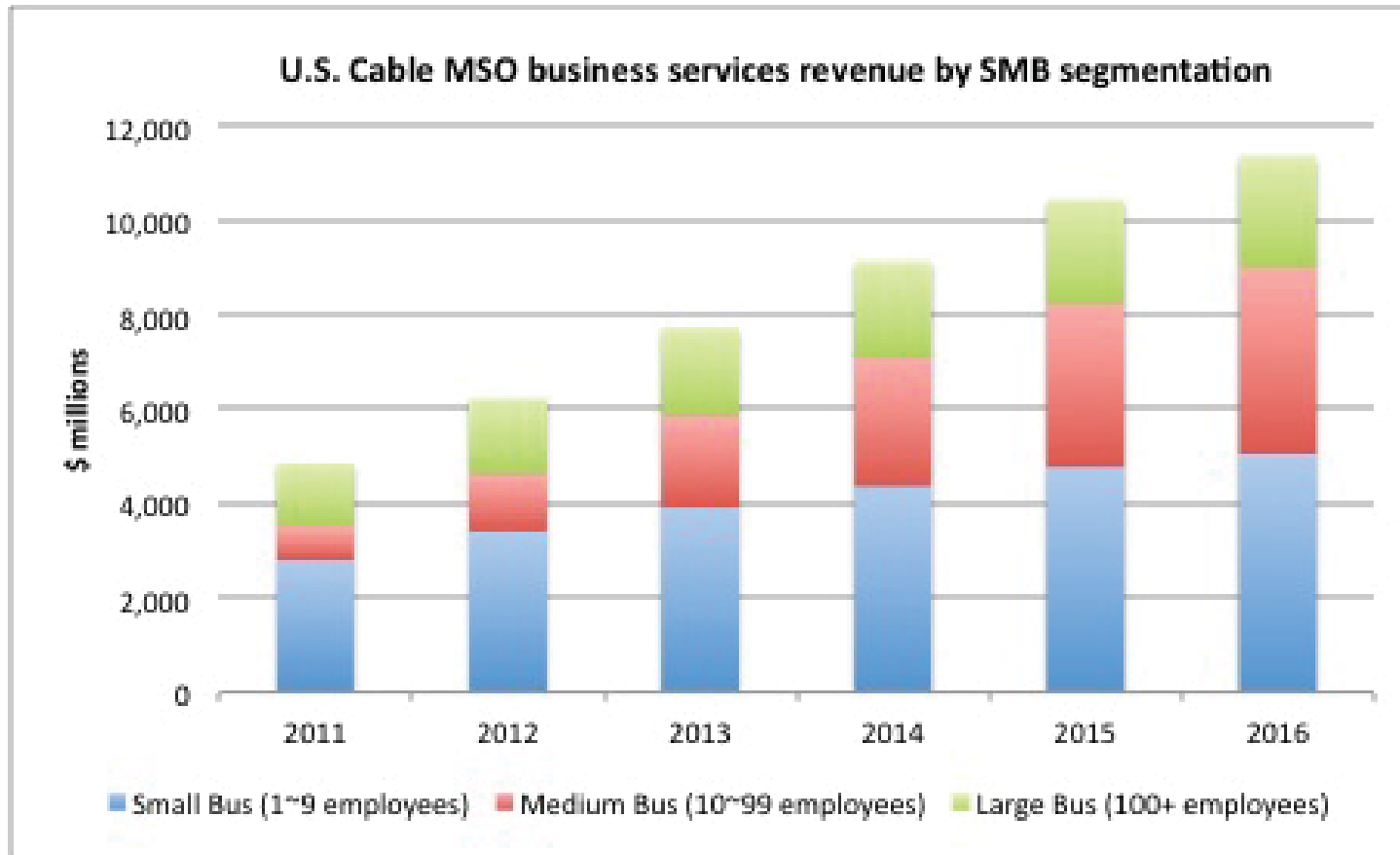
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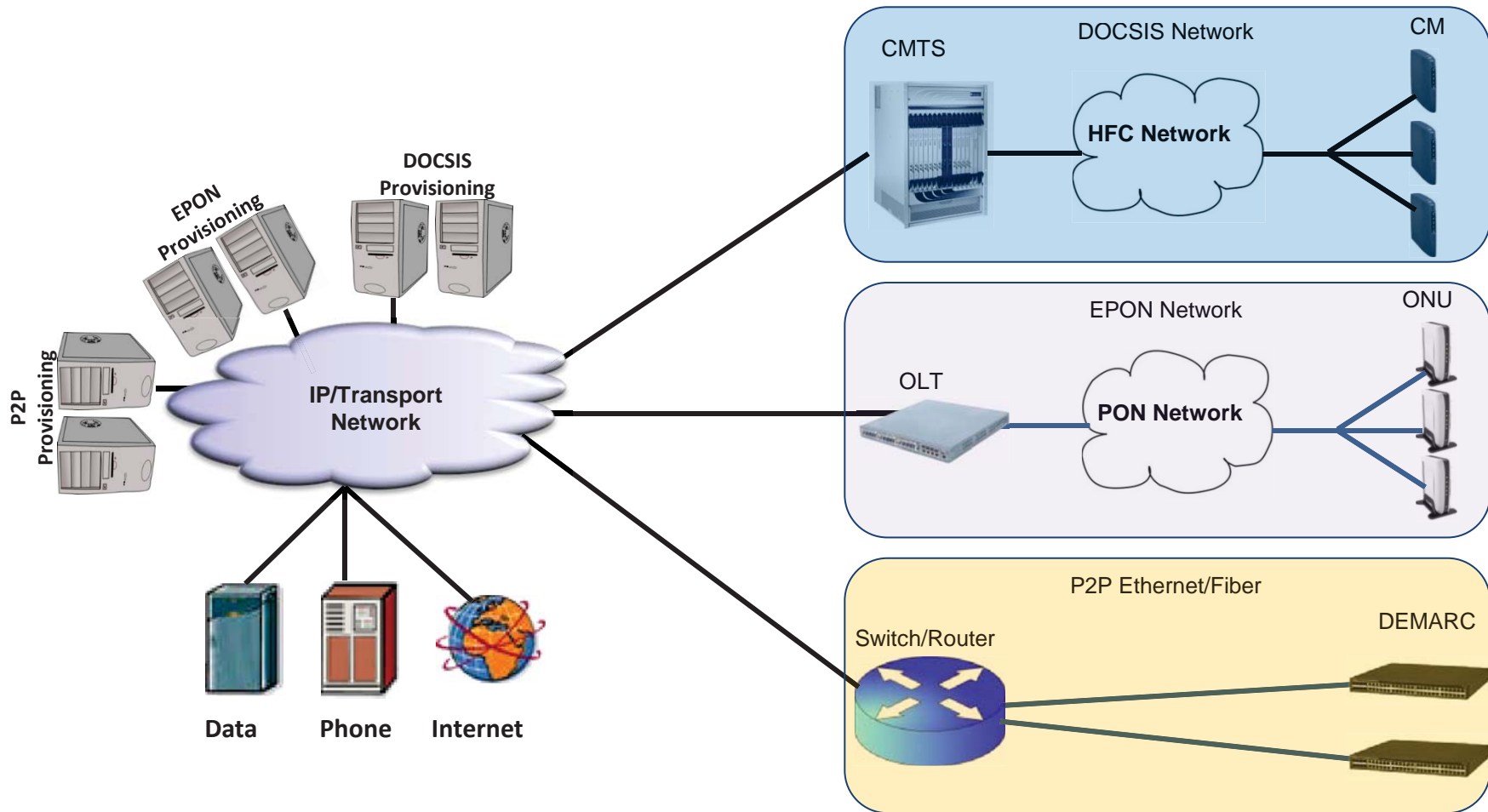
Cable Operator Projections



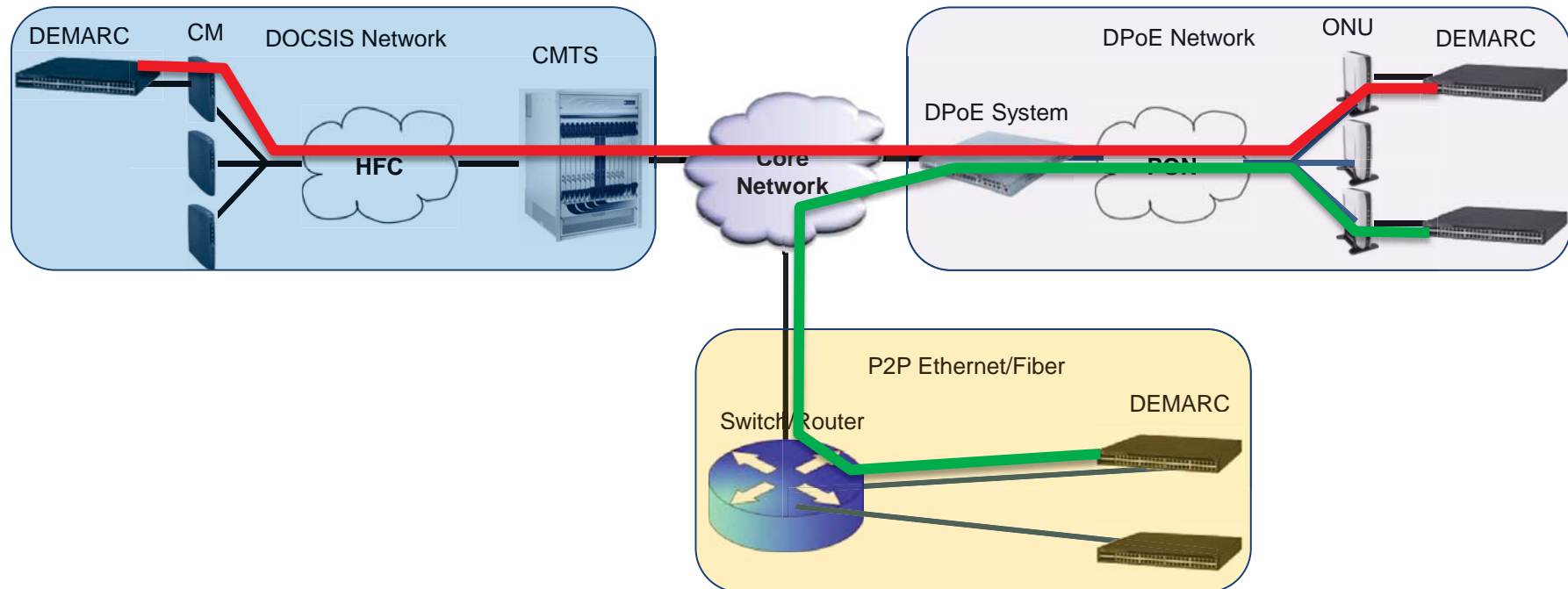
Source: SNL Kagan



Current Technology Solutions



Metro Ethernet Services



EVC "Red"

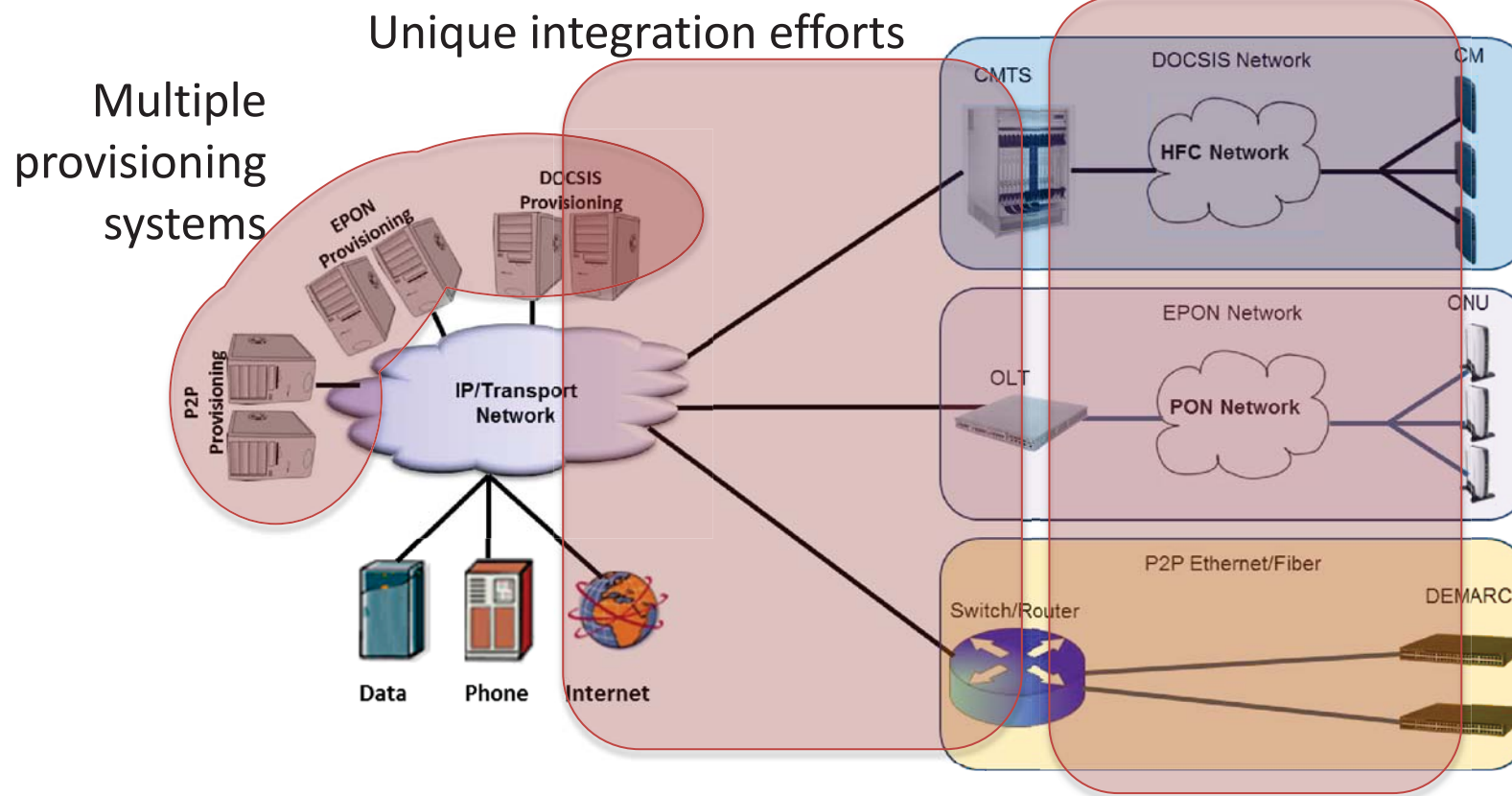
- UNI:1:DOCSIS, UNI:2: DPoE
- CIR: 50 Mbps CBS: 100 MB
- EIR: 10 Mbps EBS: 20 MB
- FD: < 10 ms FDV: < 3 ms
- PL: < exp(-10)

EVC "Green"

- UNI:1:DPoE, UNI:2:P2P
- CIR: 50 Mbps CBS: 100 MB
- EIR: 10 Mbps EBS: 20 MB
- FD: < 10 ms FDV: < 3 ms
- PL: < exp(-10)

The Challenge

Inconsistent QoS and SLA enforcement

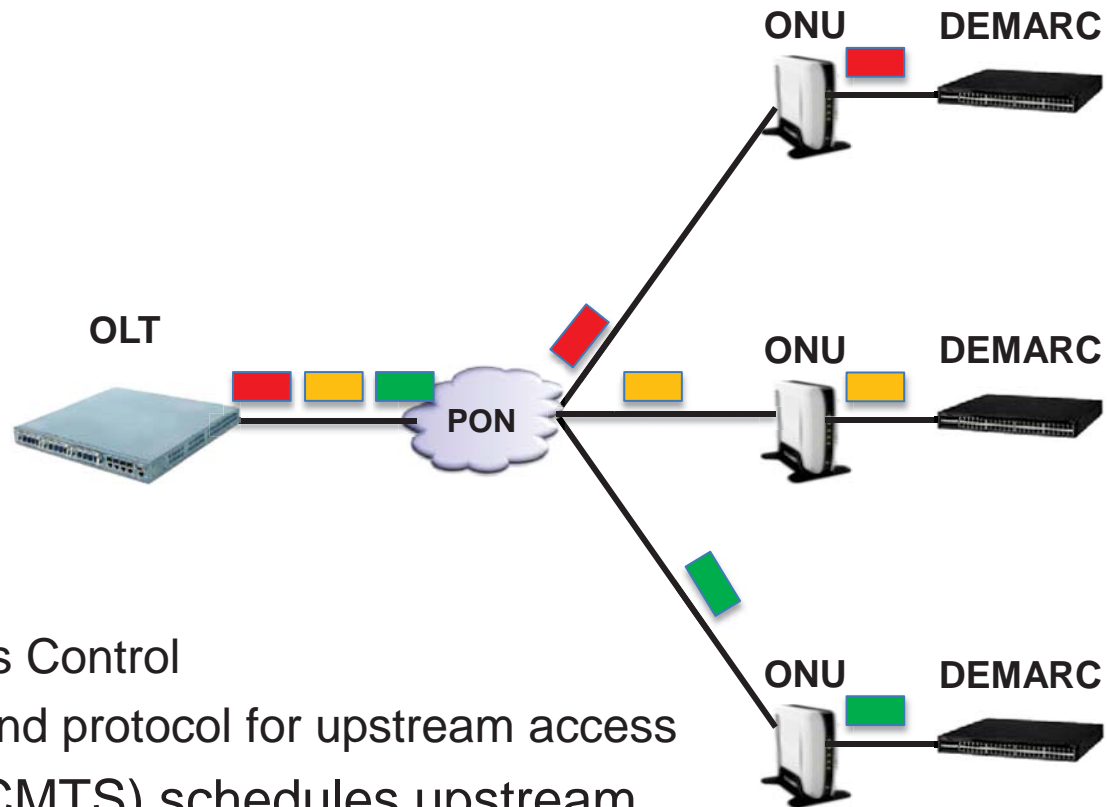


Disparate troubleshooting, terminology, processes, and interfaces



Who Enforces QoS and SLA?

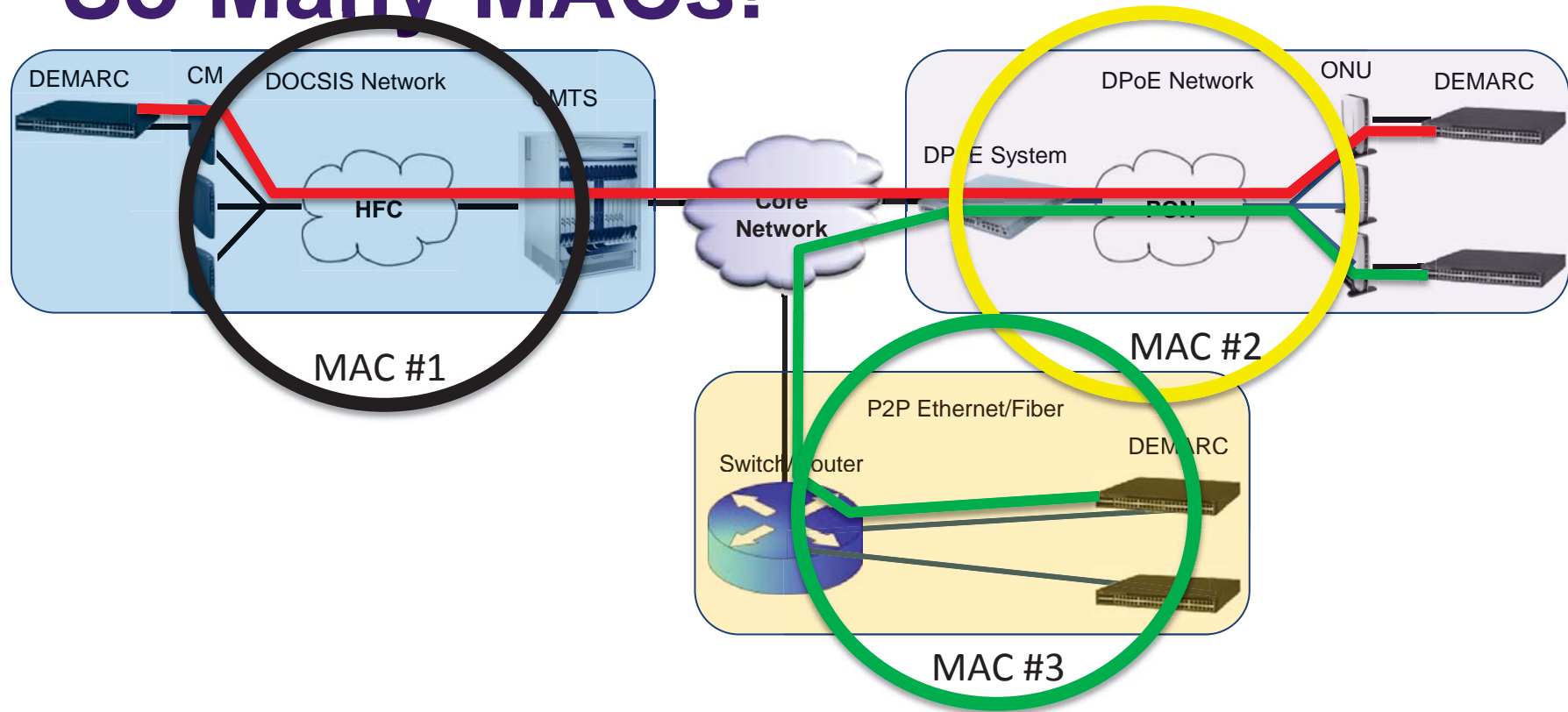
MAC does!



- ▶ Who is MAC?
 - MAC = Media Access Control
 - Includes scheduler and protocol for upstream access
- ▶ Scheduler in OLT (or CMTS) schedules upstream transmission such that there are no collisions
- ▶ MAC determines % bandwidth, frame delay and frame delay variation, across access network



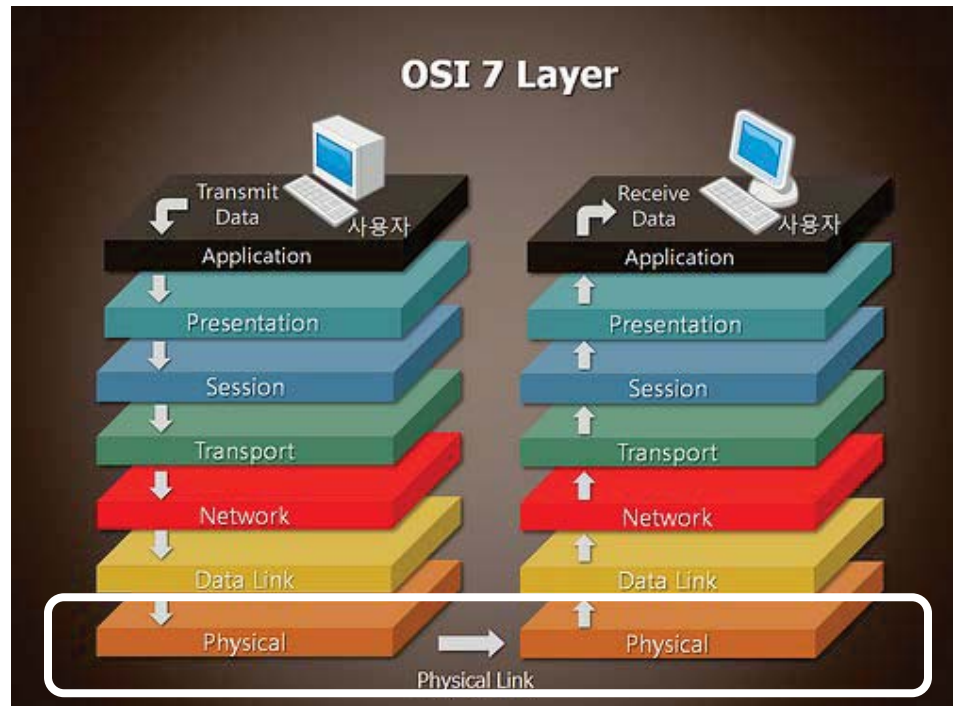
So Many MACs!



- ▶ With three different MACs in the network, how can one expect consistent QoS and SLA enforcement?

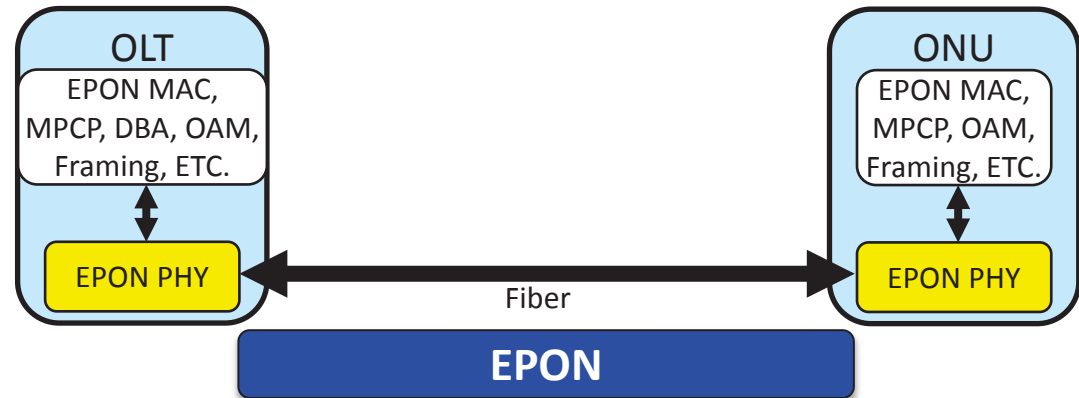
EPON Protocol over Coax (EPoC)

- ▶ EPoC is a new physical (PHY) layer technology for use **over coaxial cable**
- ▶ Reuses the **EPON protocol** for Media Access Control (MAC)
- ▶ Uses **advanced wideband modulation** techniques (OFDM) for high spectral efficiency.
- ▶ The EPoC PHY is being **standardized by IEEE 802.3**

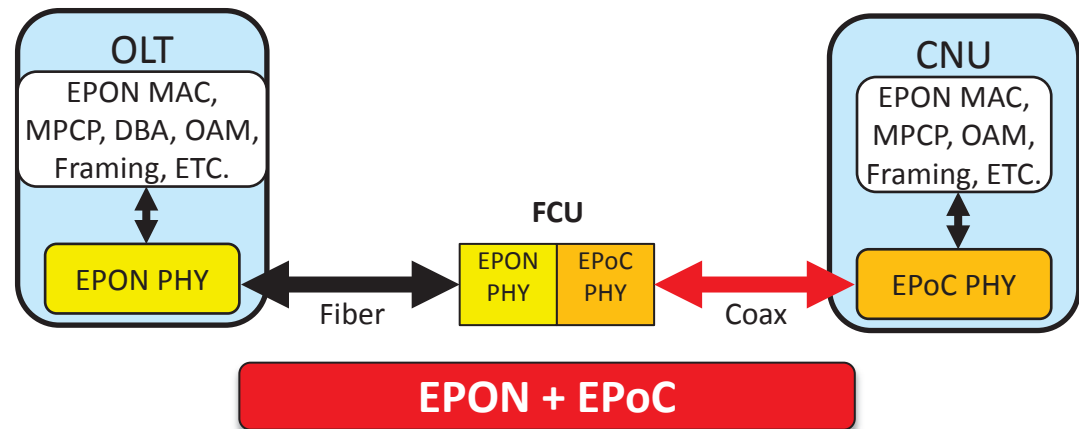


EPON and EPoC

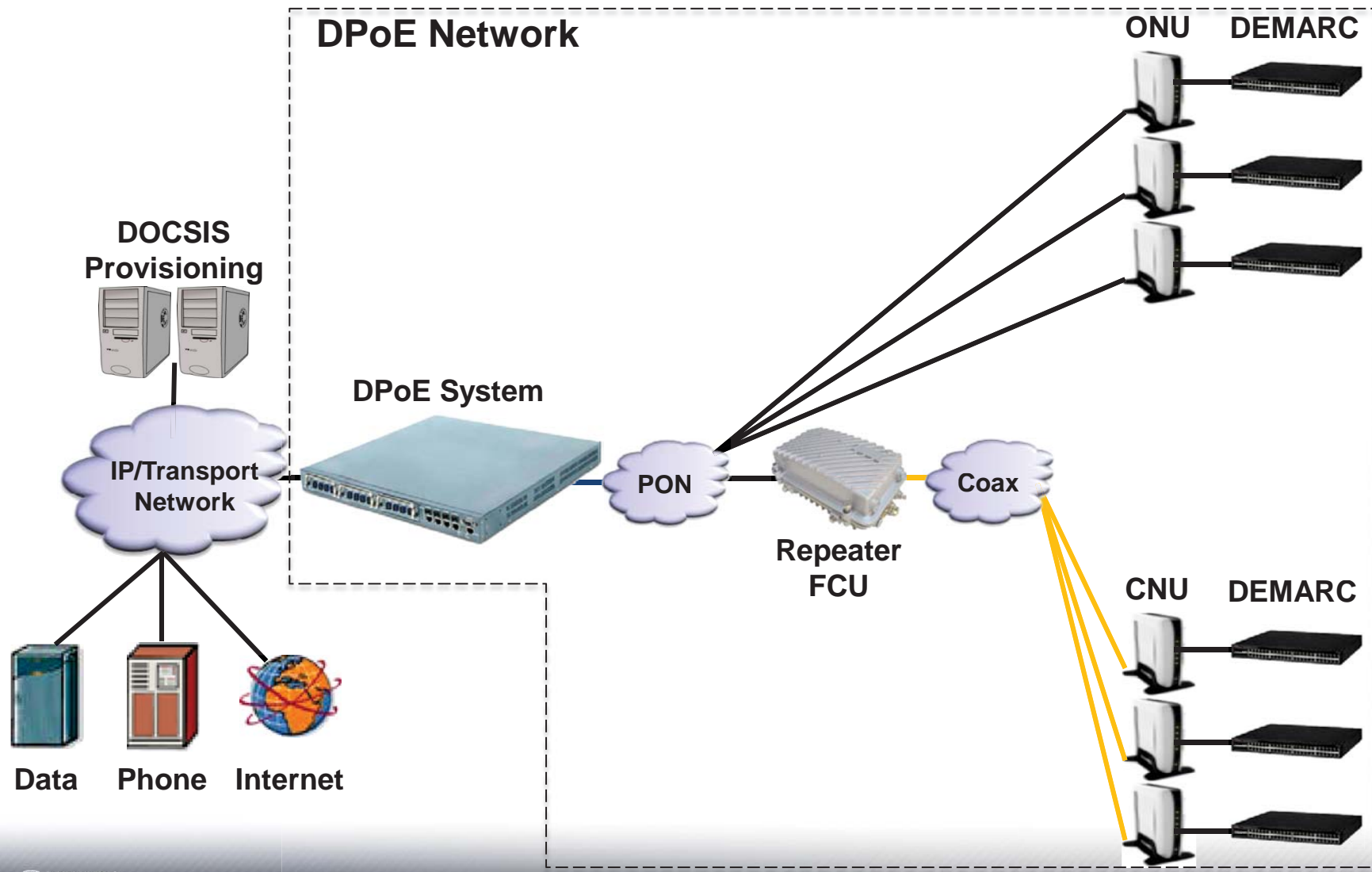
- End-to-end fiber
- Optical transmitters and receivers
- Standard EPON network



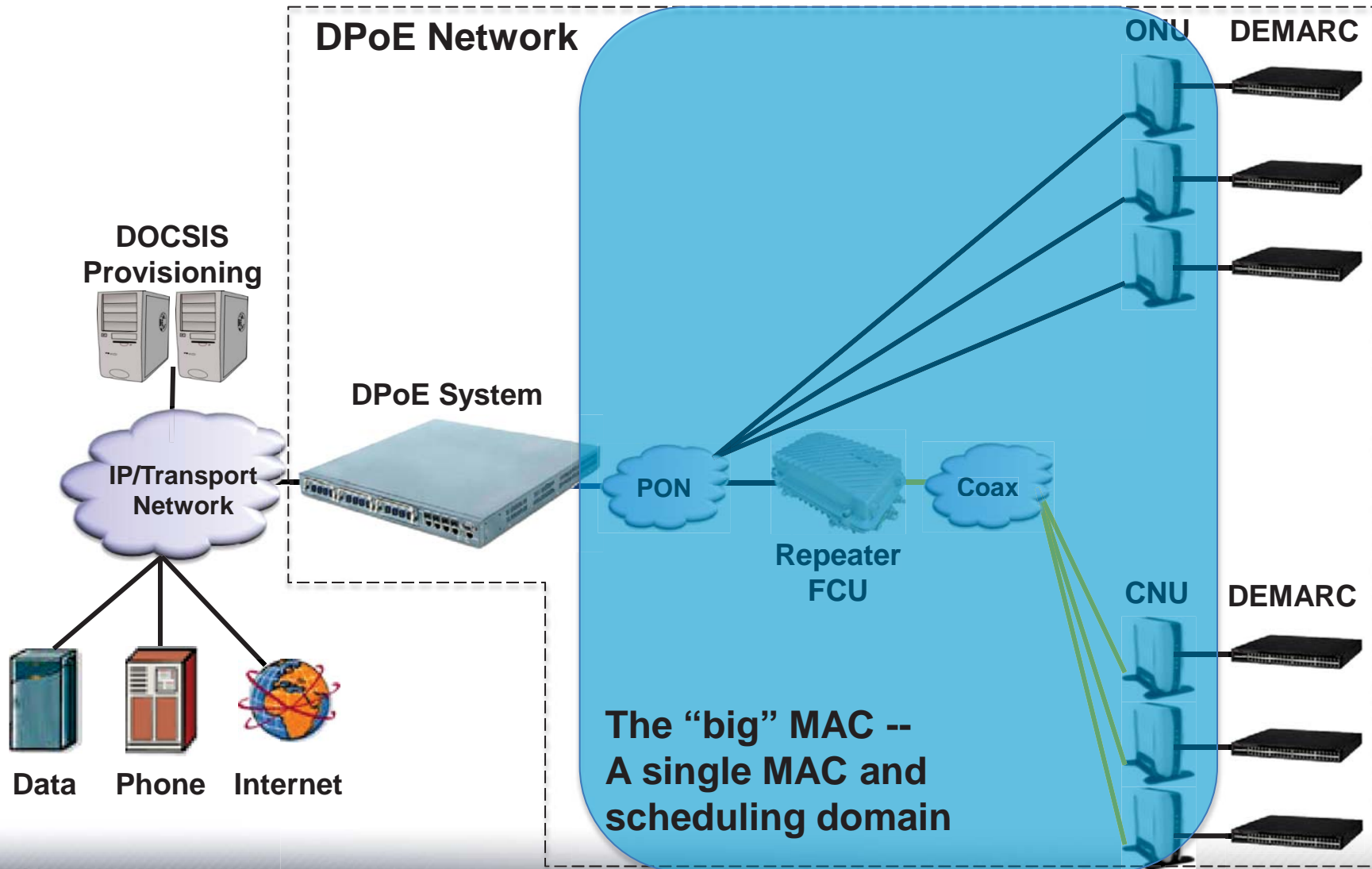
- FCU media converter “bridges” fiber and coax
- Same headend equipment as EPON
- Other than coax PHY, CNU is same as ONU



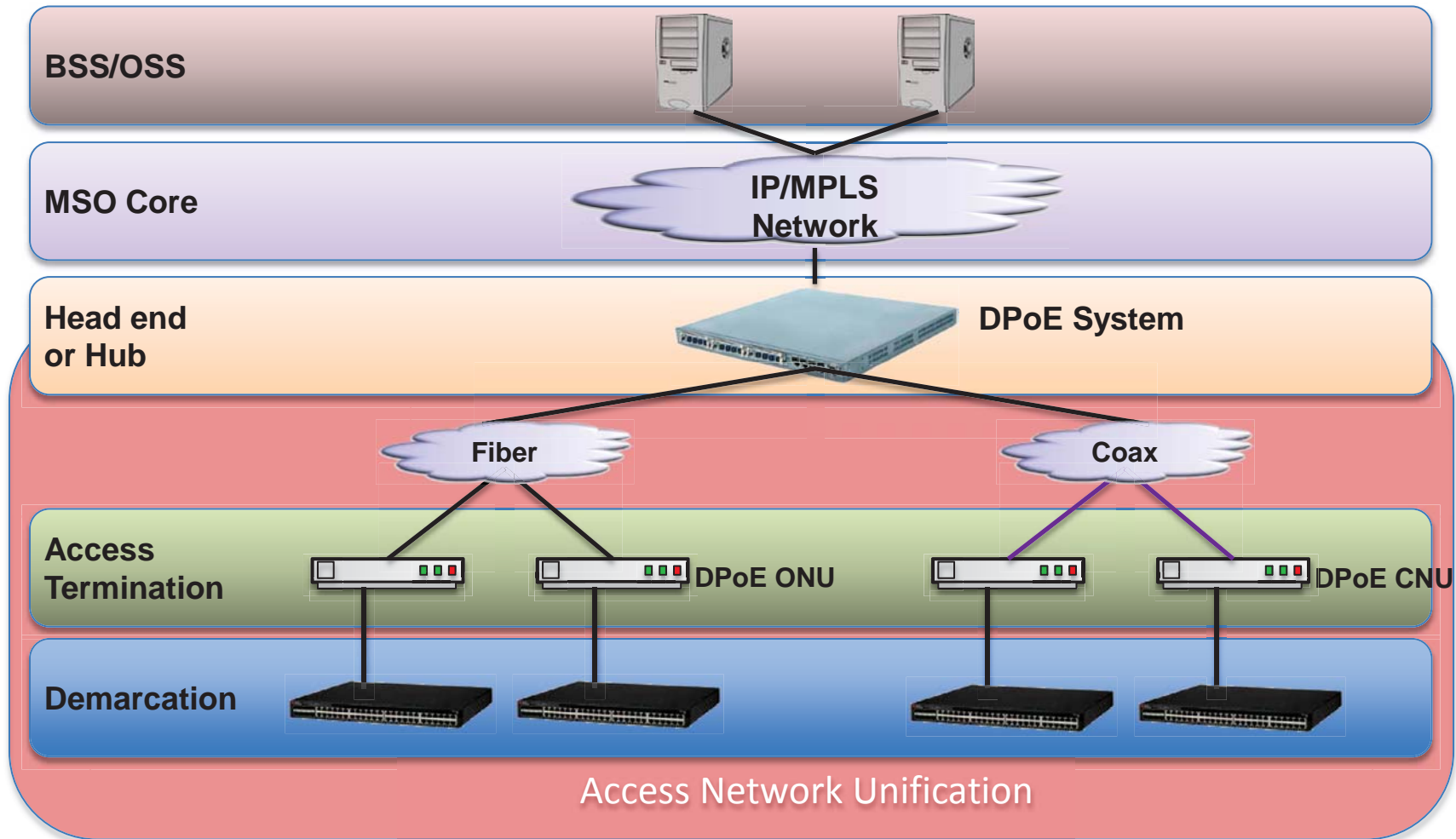
DPoE Provides the Glue



DPoE Network – MAC and Scheduling



Converged Network Segments





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