Excite@Home View of IEEE 802.17

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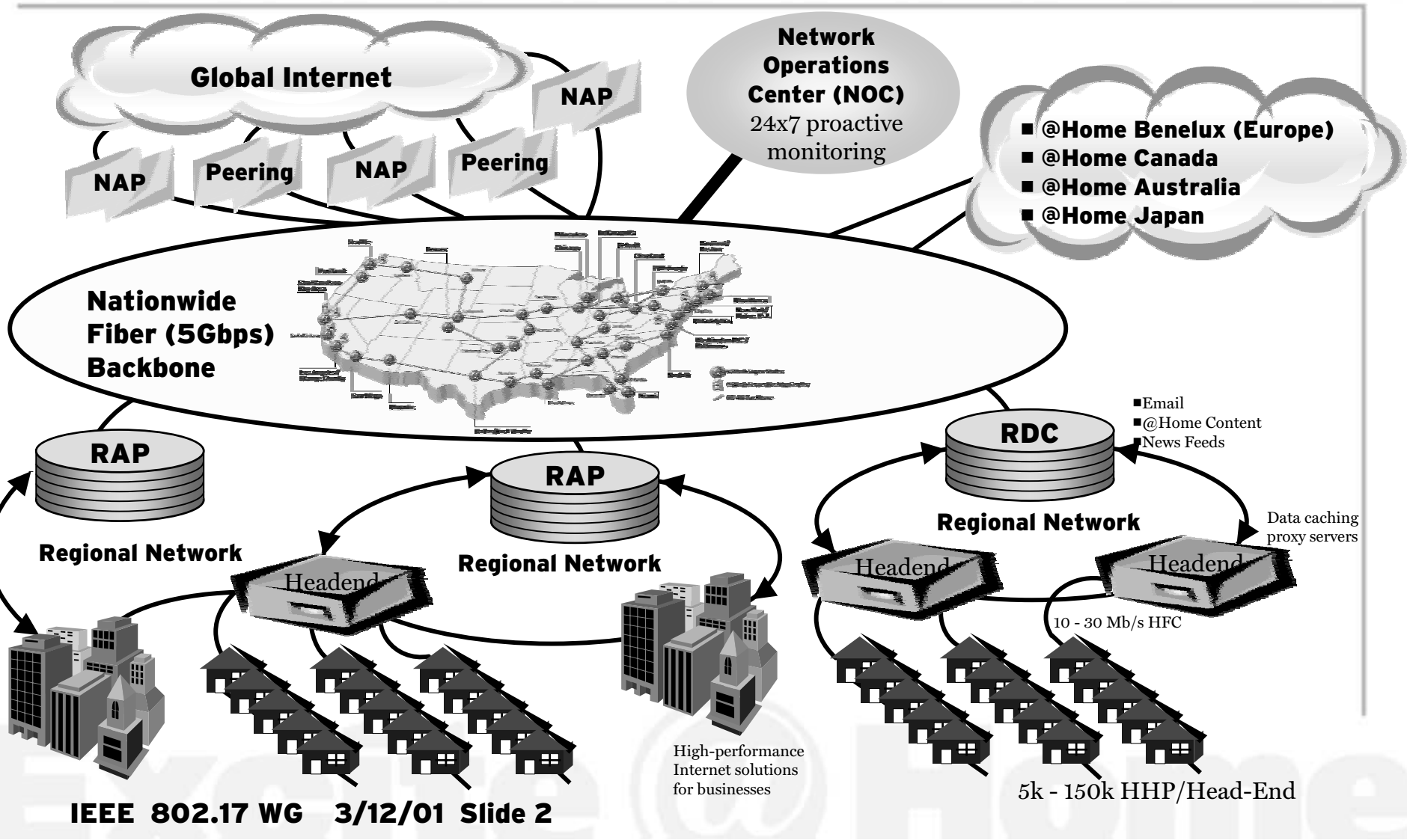
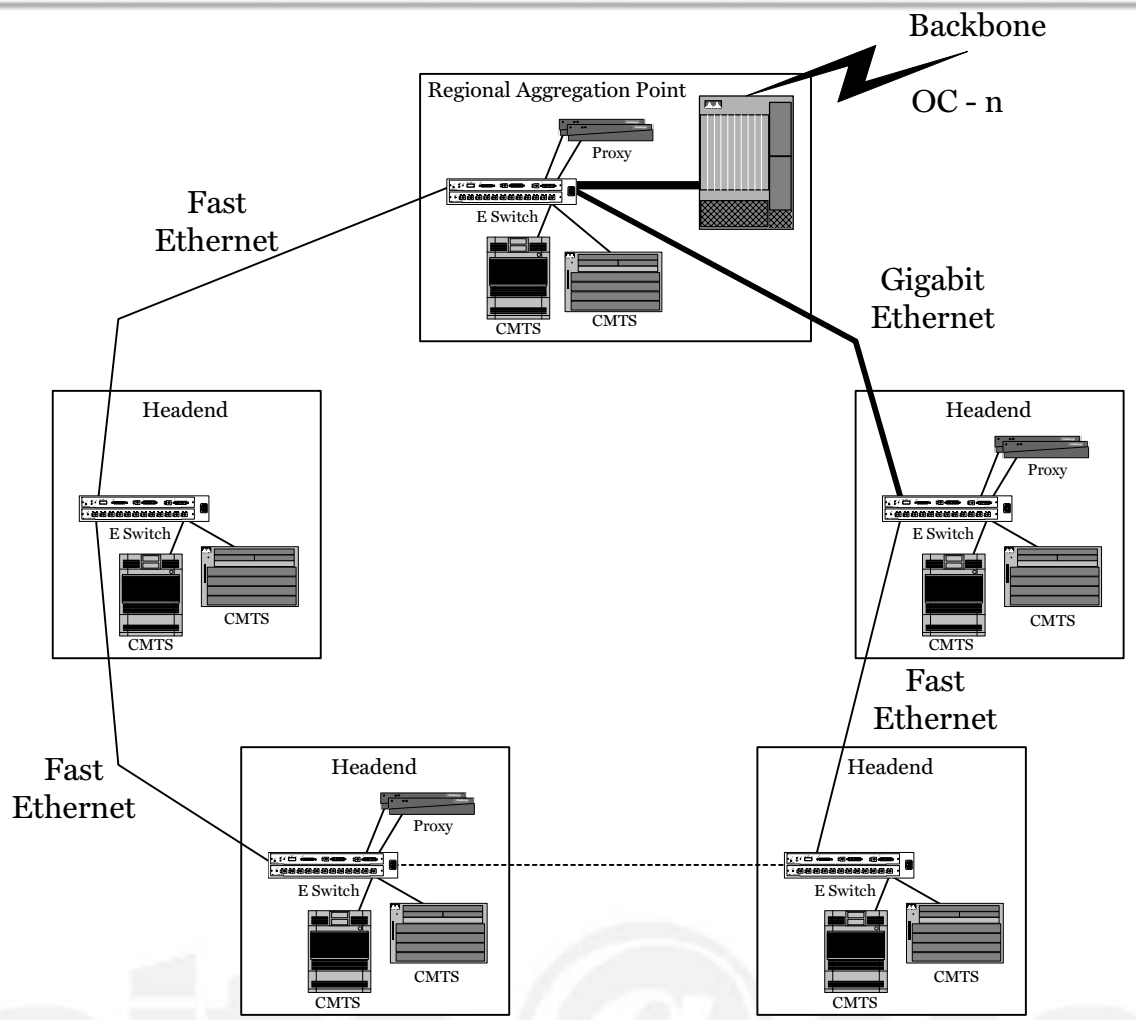
@Home Network Architecture



Current Regional Architecture



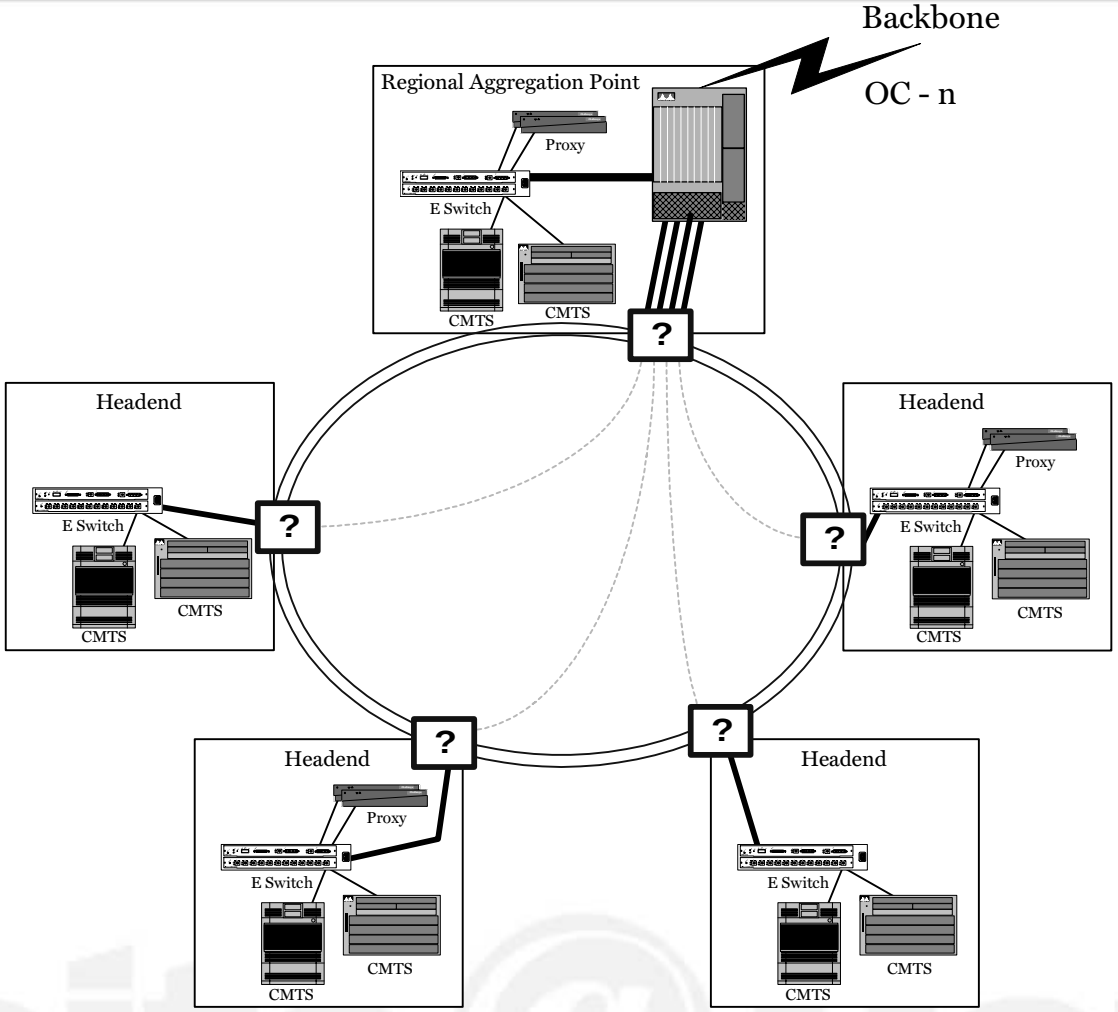
Requirements that may influence the standard

- Low price of admission (to the ring)
- Small size
- Path protection with "fast" recovery (sub second)
- ~~"Dumb" (ie. transparent) pipes are better~~
- ~~- L1, maybe L2, not L3~~
- *Ability to aggregate parallel links*
- Scales to 10+ Gbps aggregate (protected)
- Capability of redundant ingress/egress points
- (and server locations)
- Up to 2,000 Km ring circumference
- Up to 80 Km between nodes
- Up to 30 nodes per ring

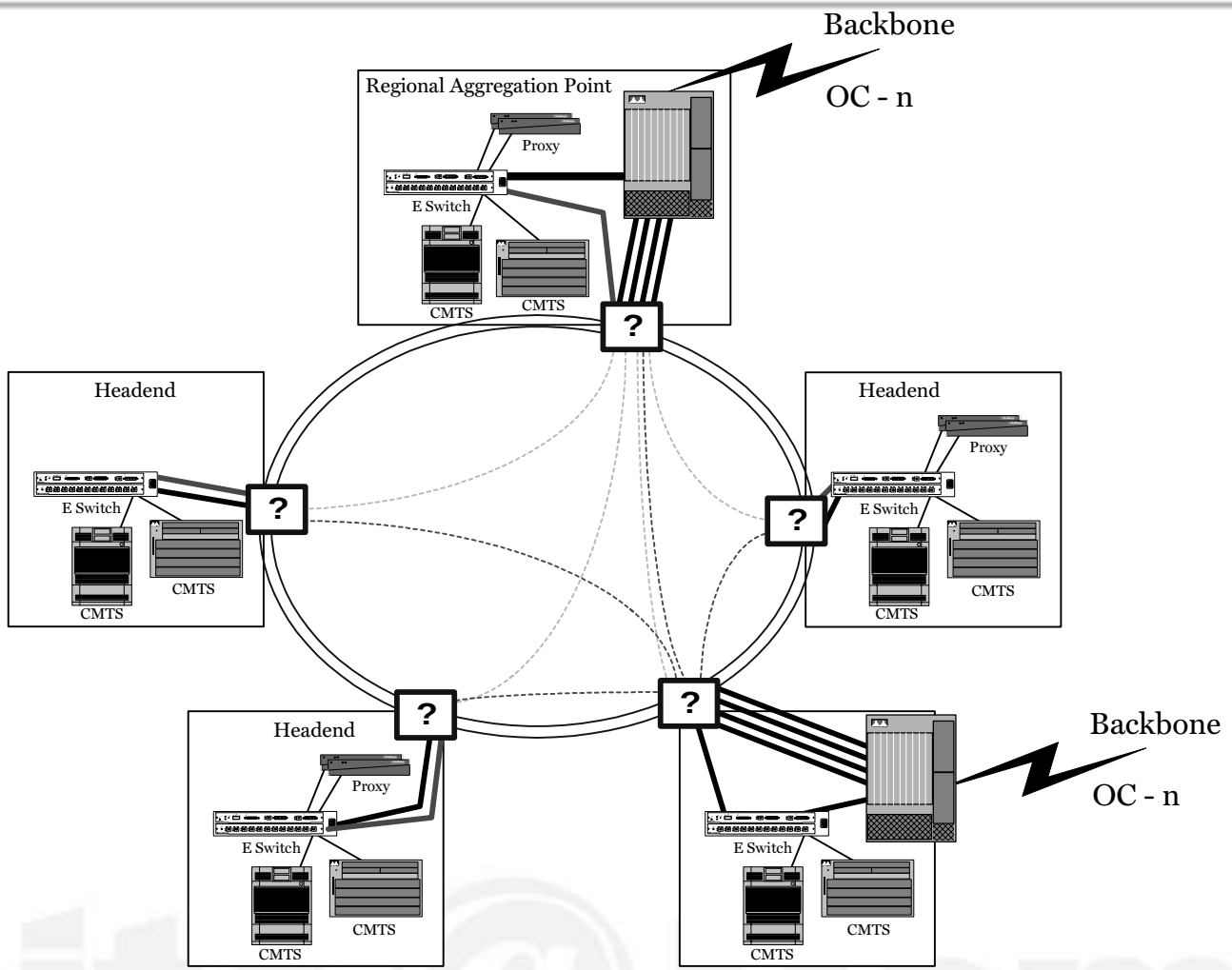
Implementation Requirements

- 19" rack mount
- Small size- 8 RU *maximum*
- 110 v. AC or -48 v. DC power options
- Drop 50 Mbps to ~~2~~ *10* Gbps per node
- *Tributary* handoff at node is ethernet (100 Mb, Gb)
- Tributary connections are multimode (low cost)
- Ring allows ITU-T G.692 gridded optics
- SNMP management
- NEBS option

July's Desired Architecture



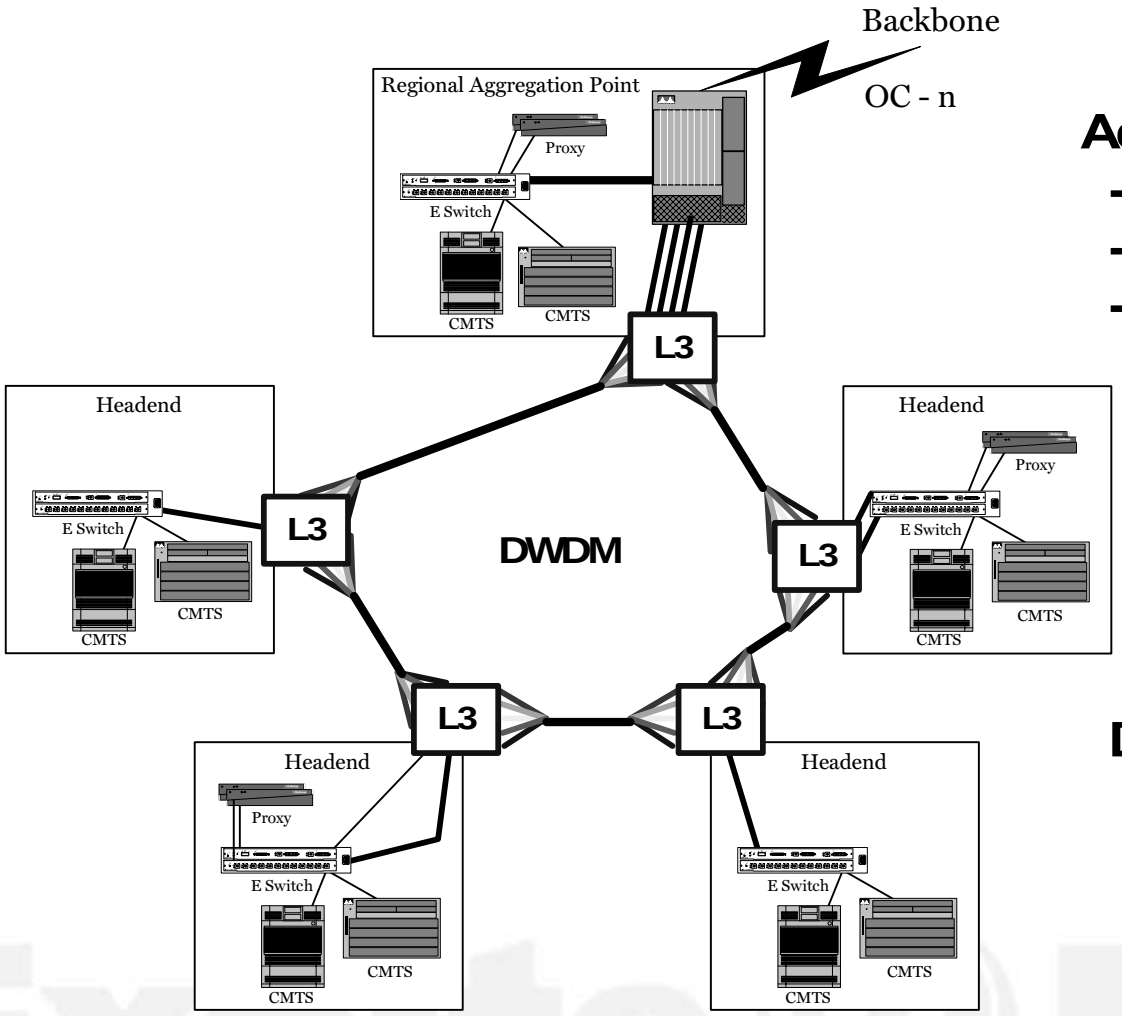
July's Desired Architecture (2)



3 Ways to Build That Today

- Current RPR implementations
  - Proprietary
- All Optical
  - Too expensive
  - May not scale to circumference of "Regional" Rings
- TDM Over SONET
  - Too complex
  - Too expensive

Today's Competing Architecture



Advantages:

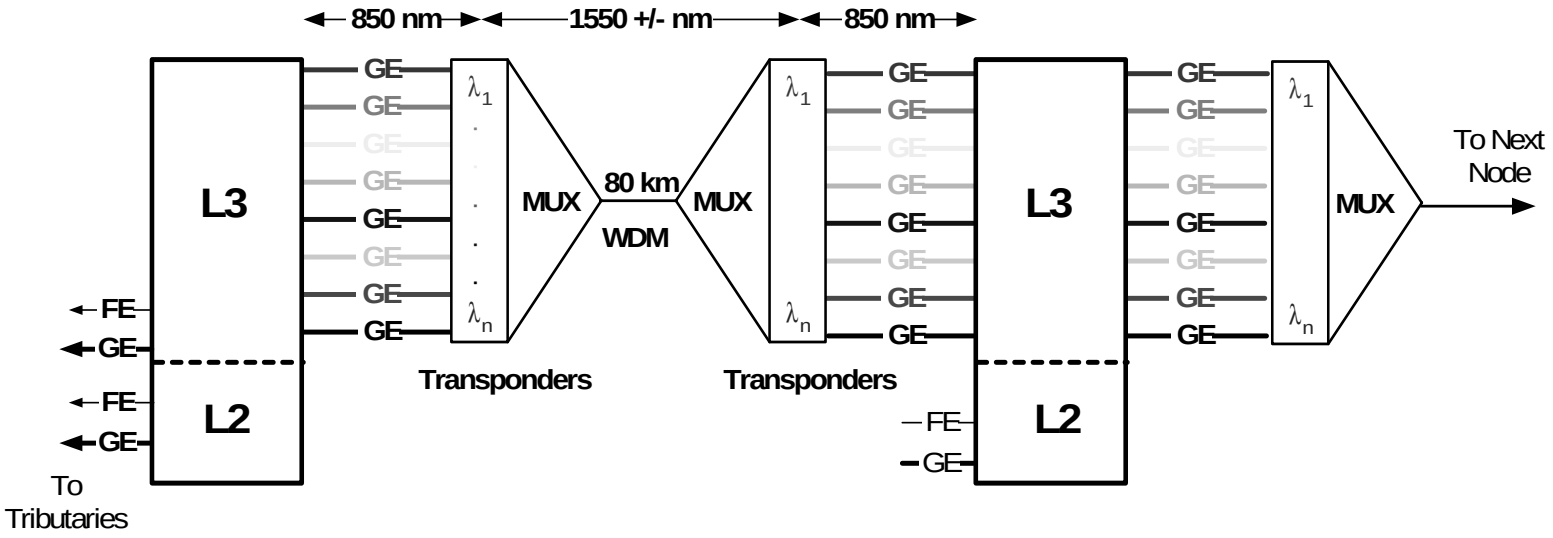
- Low Cost
- Incremental Scalability
- L3 (and L4?) in each node

Disdvantages:

- L3 Reconvergence
- Connection Complexity
- Fairness

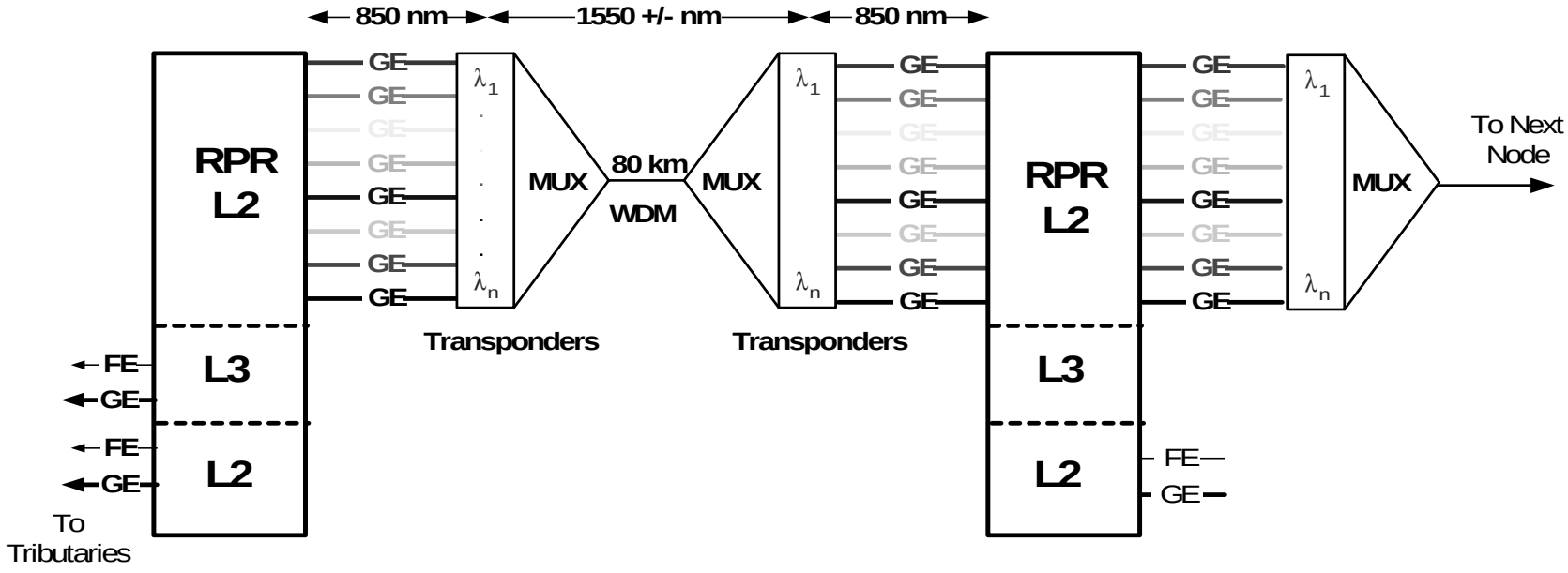
Competing Architecture - Details

Multiple Gigabit Ethernets



RPR with Parallel Links

RPR Over Multiple Gigabit Ethernets



RPR Needs to Accommodate Parallel Paths

- Ethernet is more cost effective than SONET ($/Mbps)
  - Can size links with more granularity (GE)
- Physics has its' limits
  - Just making fatter pipes will not scale
    - Bit rate squared dispersion issues
  - There will be a limit to how fast we can re-frame between MACs (needs to be in hardware)
- Our needs are <u>between</u> MAN and WAN

Desired Additional Features

- QoS support
- ~~-- Can use external router~~
- ~~-~~ need (simple) policing in/out of ring
- Multicast
- Integrated ~~(optional) router~~ *L3 function*
- *POS tributary connections*
- *MPLS*
- *L4 functions (control of individual flows)*

Summary & Conclusions

- Keep it simple
- Use existing, commonplace standards where possible
- Don't try to solve all the world's problems
- Evolve the standard so compliant products can be produced ASAP