

Scalability Analysis of Metro Ethernet

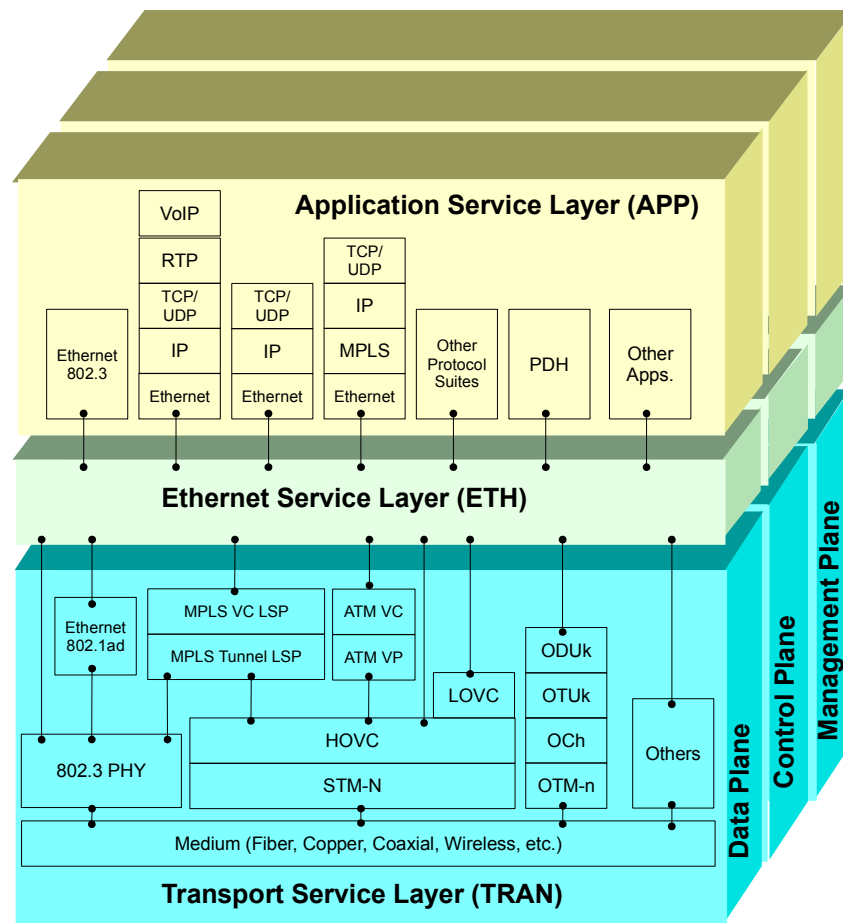
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Outline of Presentation

- Metro Ethernet Architecture
- Scalability Issues for Routed Ethernet
- Extending to Routed Ethernet
- Questions

Metro Ethernet Architecture

- Layered Network Model

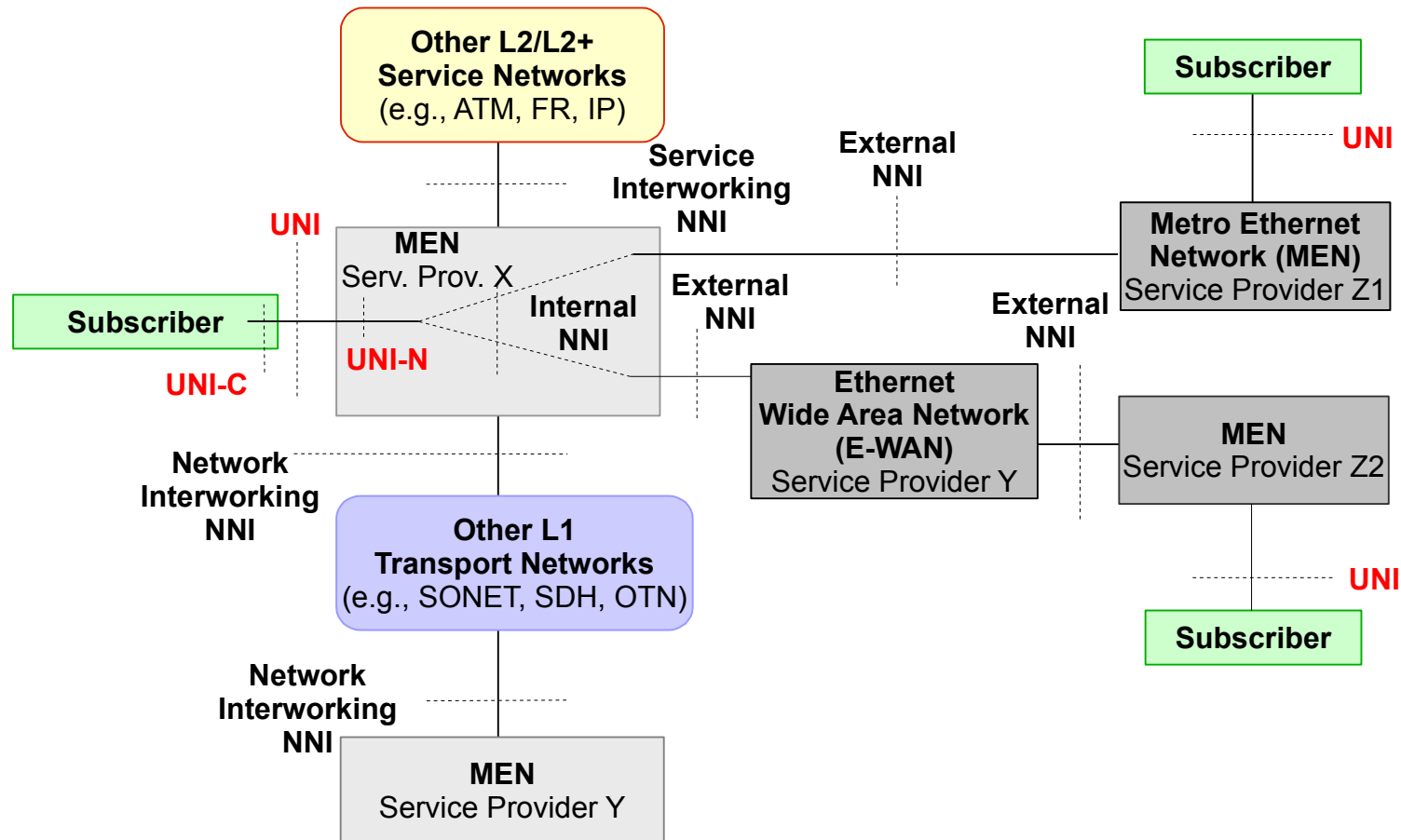


Metro Ethernet Architecture

- Reference Points
 - UNI (UNI-C & UNI-N) User Network Interface
 - Connects subscribers into the MEN of the provider
 - E-NNI (External Network-to-Network Interface)
 - Connects two MENs
 - I-NNI (Internal Network-to-Network Interface)
 - Connects NE inside MEN
 - NI-NNI (Network Interworking N2N Interface)
 - Interworking over external transport networks that don't provide end-to-end Ethernet service
 - SI-NNI (Service Interworking N2N Interface)
 - Interworking between MEF service and other service enabling technologies (ATM, IP, etc.)

Metro Ethernet Architecture

- Reference Points



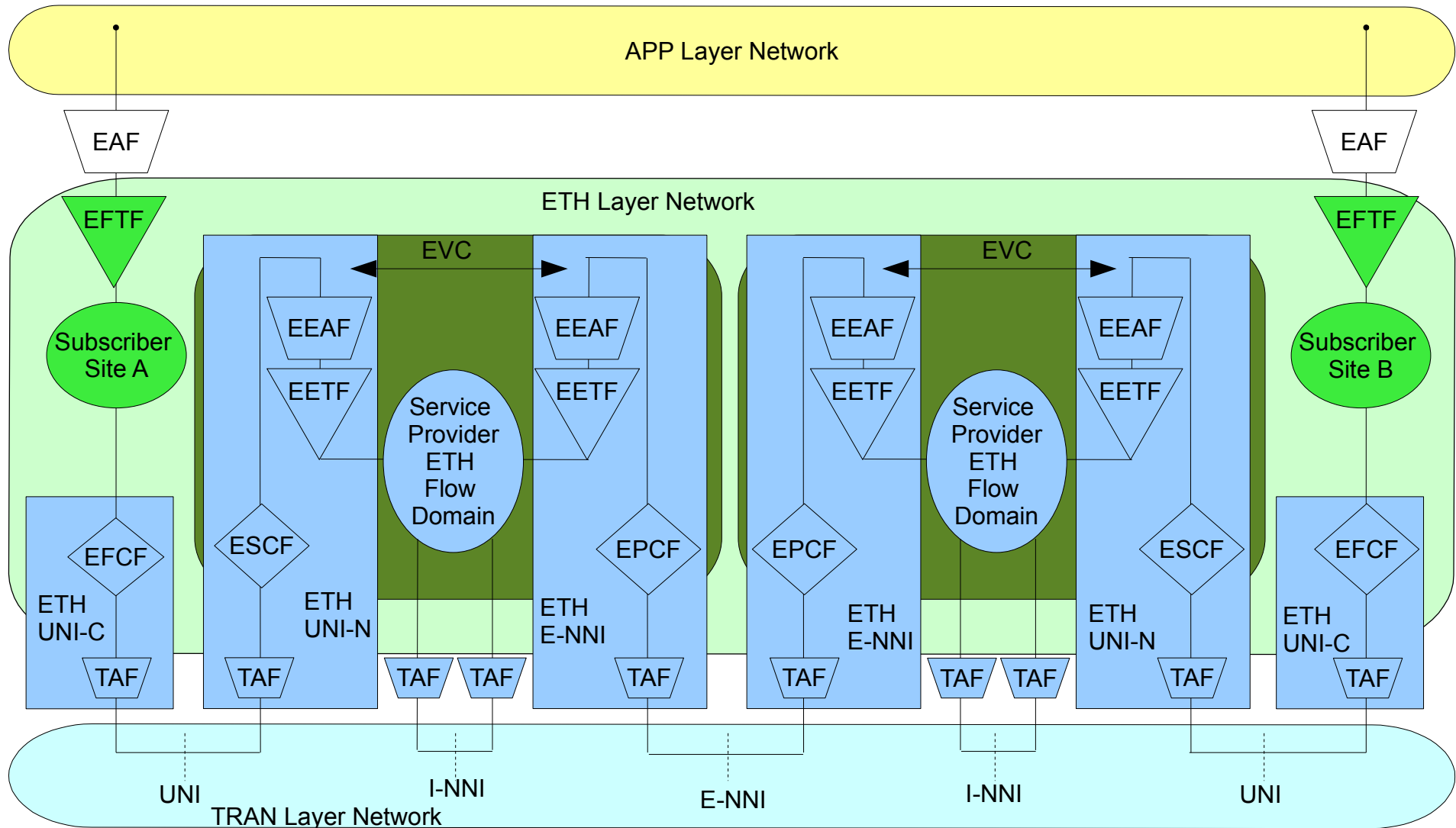
Metro Ethernet Architecture

- Functional Elements
 - EVC (Ethernet Virtual Connection)
 - Connects two or more UNIs
 - EAF (APP to ETH Adaptation Function)
 - logical interface between APP and ETH
 - EFTF (Ethernet Flow Termination Function)
 - Terminates/Creates ETH flows
 - EFCF (ETH Flow Conditioning Function)
 - Conditioning of traffic in UNI-C
 - ESCF (ETH Subscriber Conditioning Function)
 - Conditioning of traffic in UNI-N

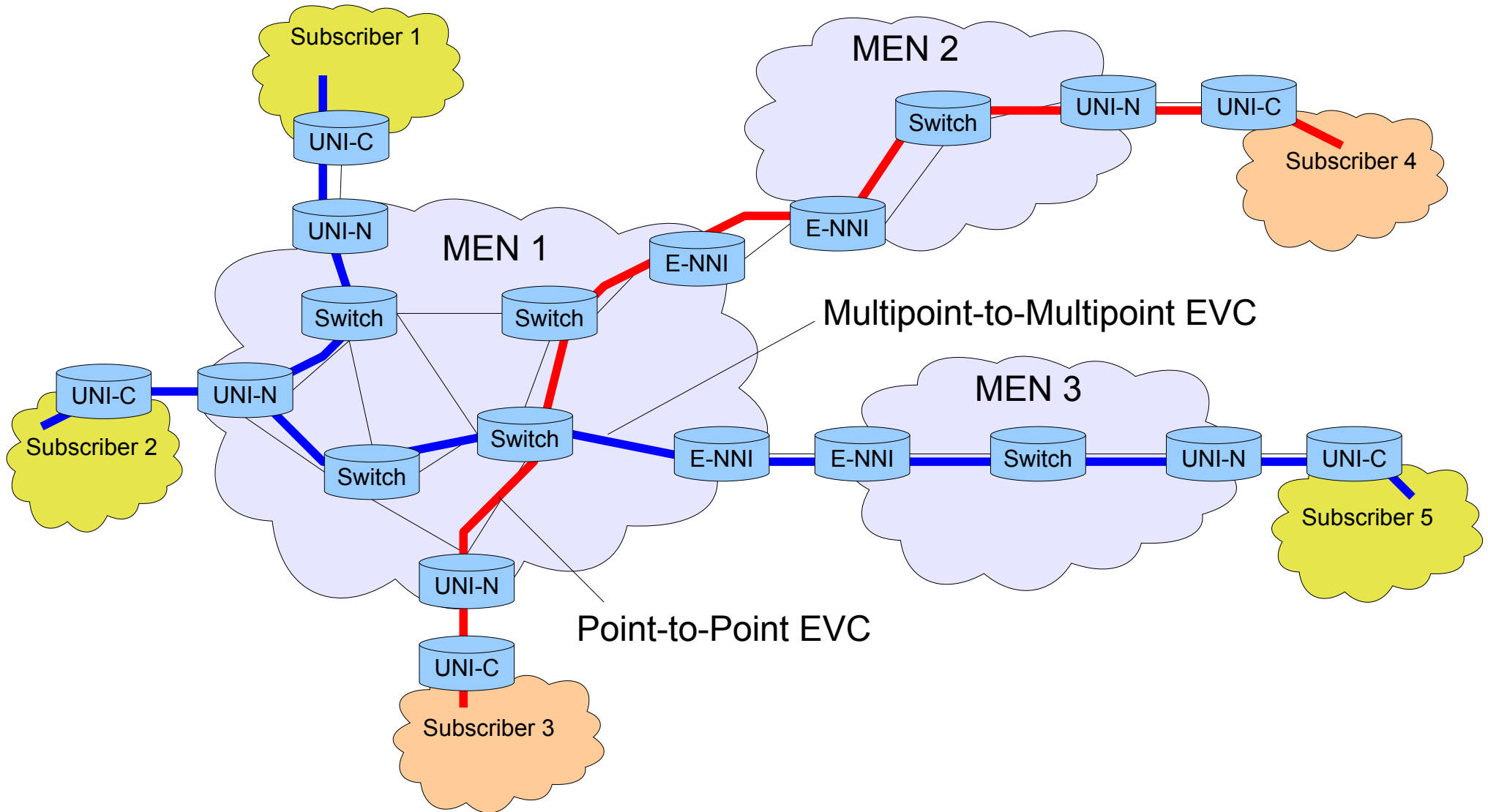
Metro Ethernet Architecture

- Functional Elements
 - EPCF (ETH Provider Conditioning Function)
 - Conditioning of traffic in E-NNI
 - EAAF (ETH EVC Adaptation Function)
 - Maps subscriber flows to EVCs
 - EETF (ETH EVC Termination Function)
 - Terminates/Creates EVC flows
 - ECF (ETH Conditioning Function)
 - Switching/bridging in the MEN
 - TAF (ETH to TRAN Adaptation Function)
 - logical interface between ETH and TRAN

Metro Ethernet Architecture



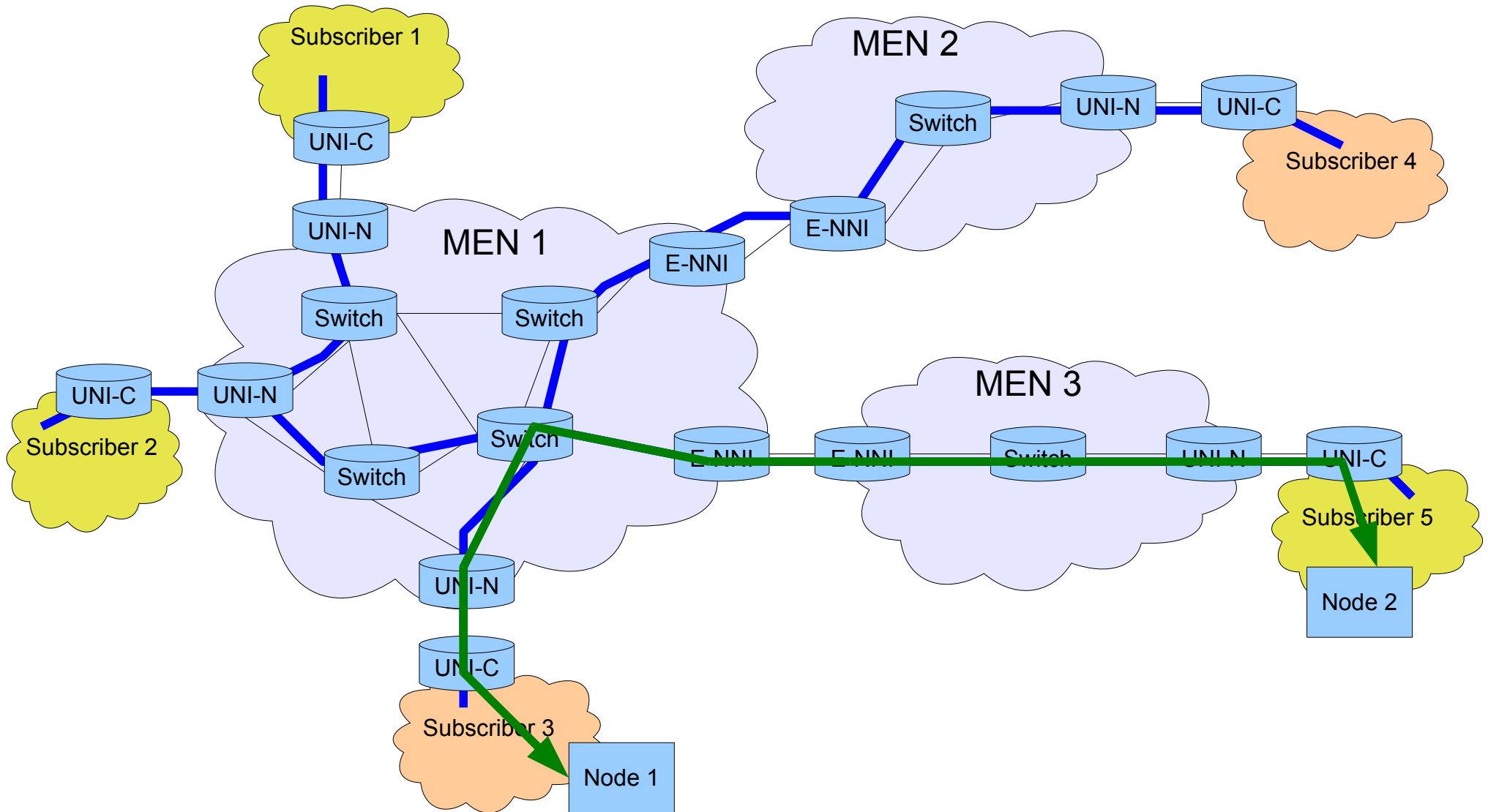
Scalability Issues for Routed Ethernet



Scalability Issues for Routed Ethernet

- Flat architecture (UNIs to EVC mapping)
- EVCs are static mappings
- MAC address
 - not globally routable
 - not globally unique
- Service multiplexing (CE-VLAN ID to EVC mapping)
 - 4095 CE-VLAN IDs for 802.1QTag
- TTL

Scalability Issues for Routed Ethernet



Extending to Routed Ethernet

- Node Attachment and Registration
 - Registration via UNI
 - Registration to Global Server (dynDNS, DHT, etc.)
- Node ID and Location Information
 - HIP
 - Global MEN identifiers
 - Unique UNI identifiers
- Ethernet Level Routing
 - Flat or hierarchical architecture
 - TRILL, HRA

Thank You!