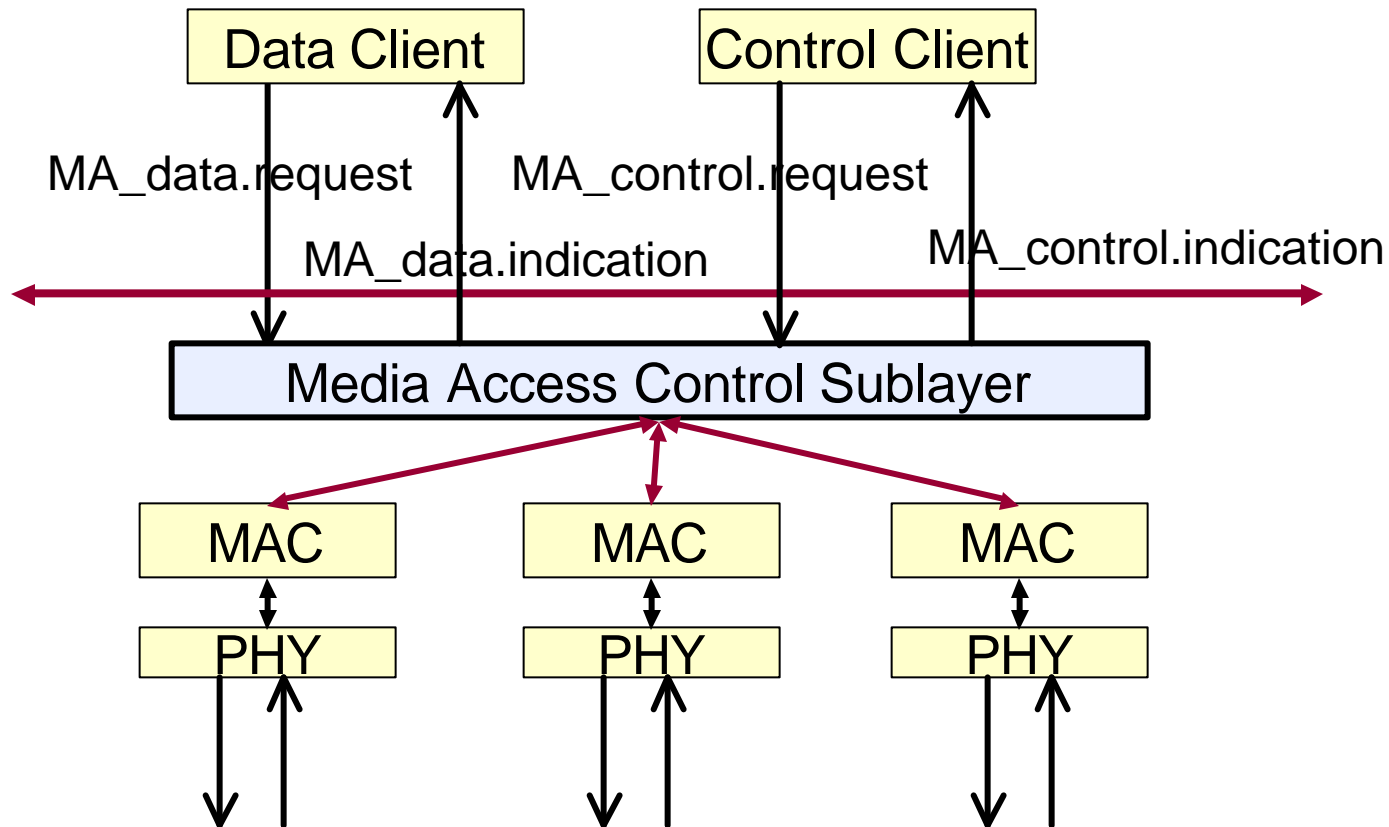


Ring/Mesh Network Configurations

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- **One or more RPRs connected by common node(s) and point-to-point links**
- **Any Combinations of Ring and Mesh Networks**
- **Network Topology and Packet Routes determined at L2 Layer**

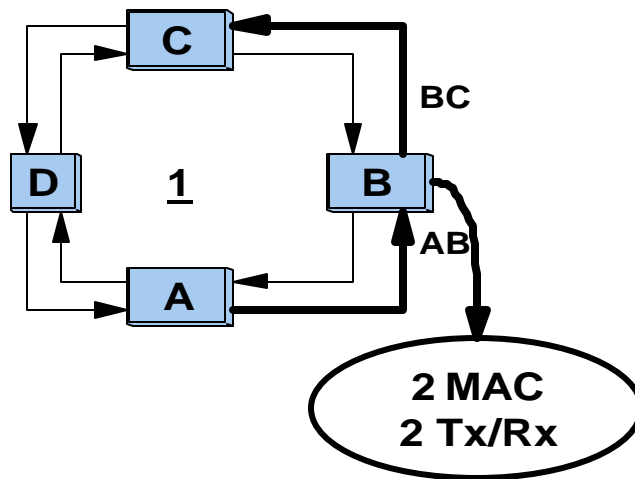
- **RPR Node manages Network Topology through simple port mapping at MAC**
- **Once L2 Topology is determined, Nodes perform minimal lookups on ports.**
- **Data Transfers based on simple <In Port, Out Port> Switching.**
- **Fault recovery and restoration in any Topology**



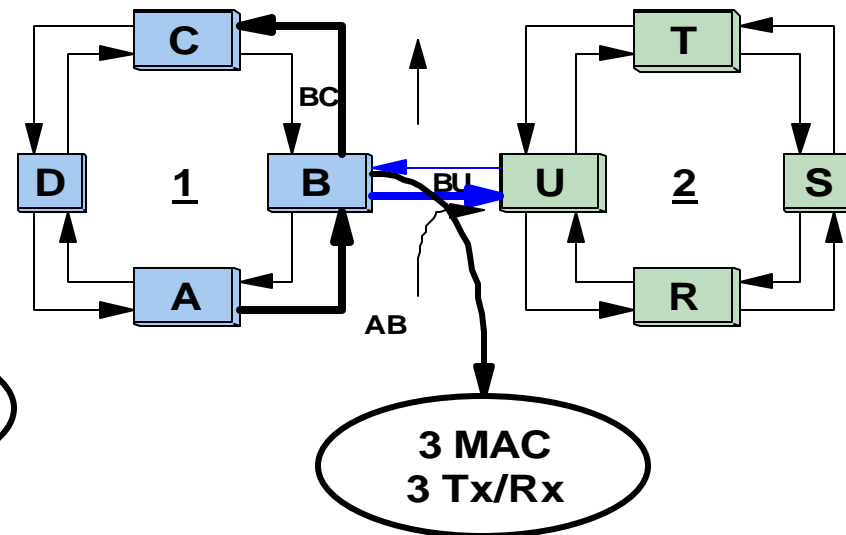
- A unified MAC interface to MAC clients.
- Network interfaces transparent to MAC clients

- **A MAC Sub-layer provides a unified interface to MAC client**
- **Individual MACs handle Tx/Rx links.**
- **Lower part of MAC sub-layer manages different MACs.**
- **MAC clients need only one interface regardless of number of MACs below the sub-layer.**
- **Ring/Mesh Topology is hidden by MAC sub-layer**
- **Topology discovery concludes shortest paths for reaching a destination node**

An RPR RING

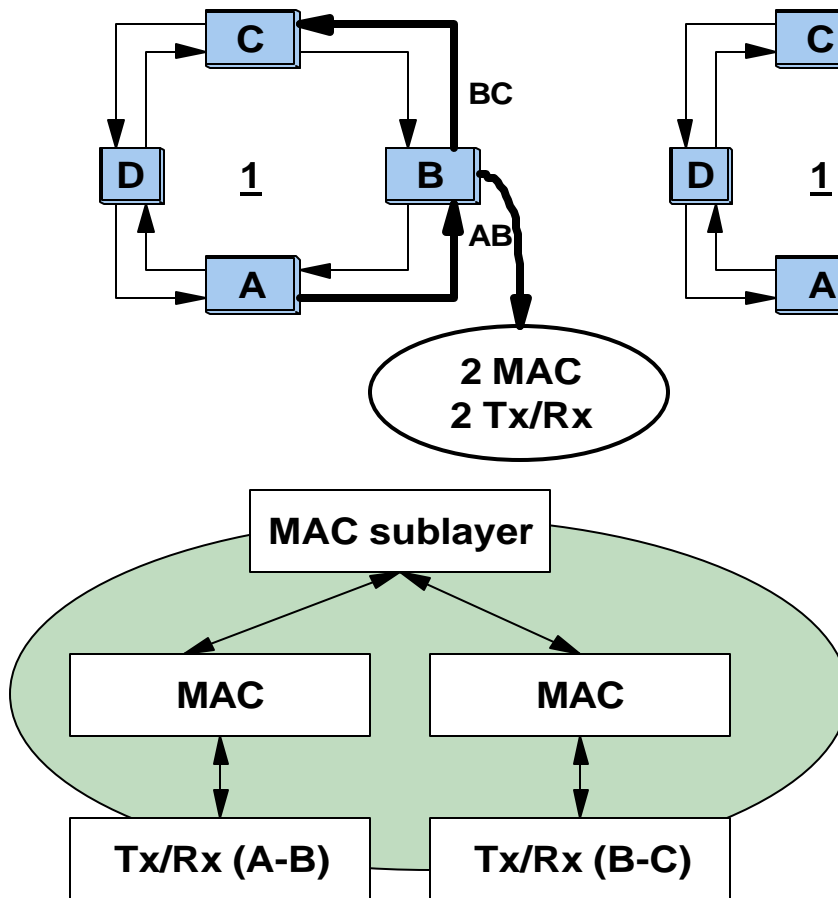


HYBRID NETWORK

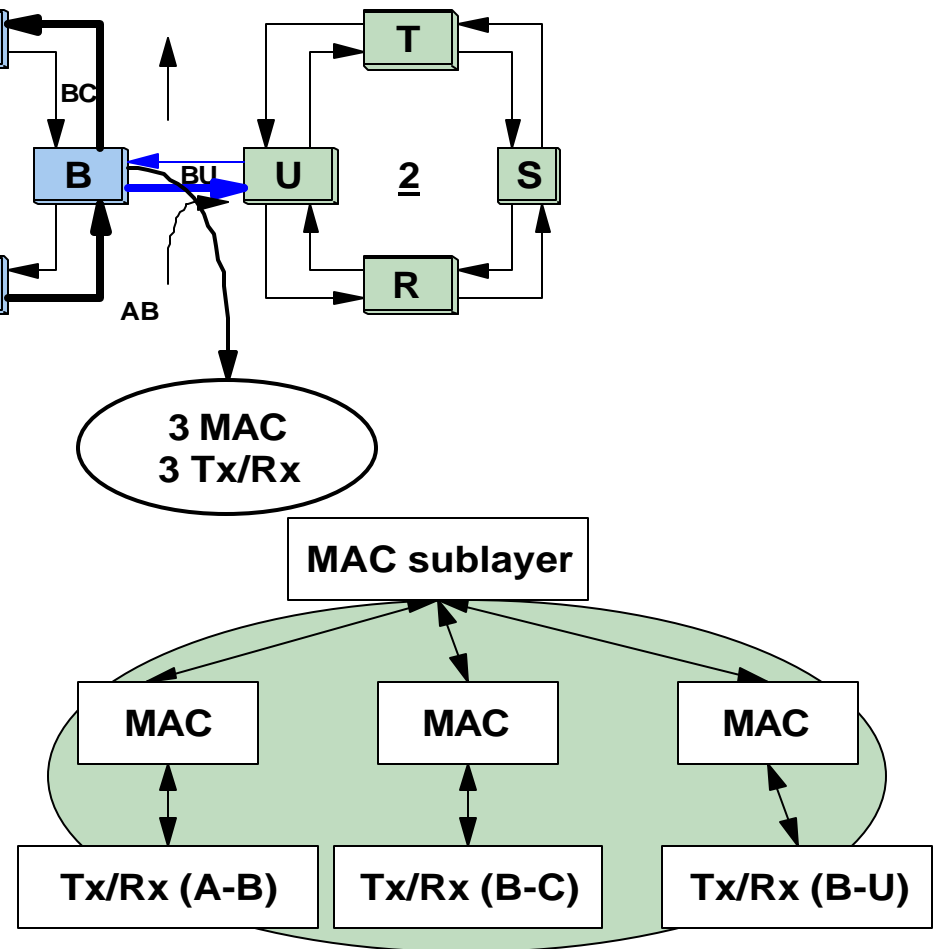


- Networks are built by associating MACs and Ports
- L2 Topology Discovery and Port Associations can allow any mix of Ring and Mesh Networks
- Once Associations are made, a simple “CAM” function takes packets from network to network.

An RPR RING



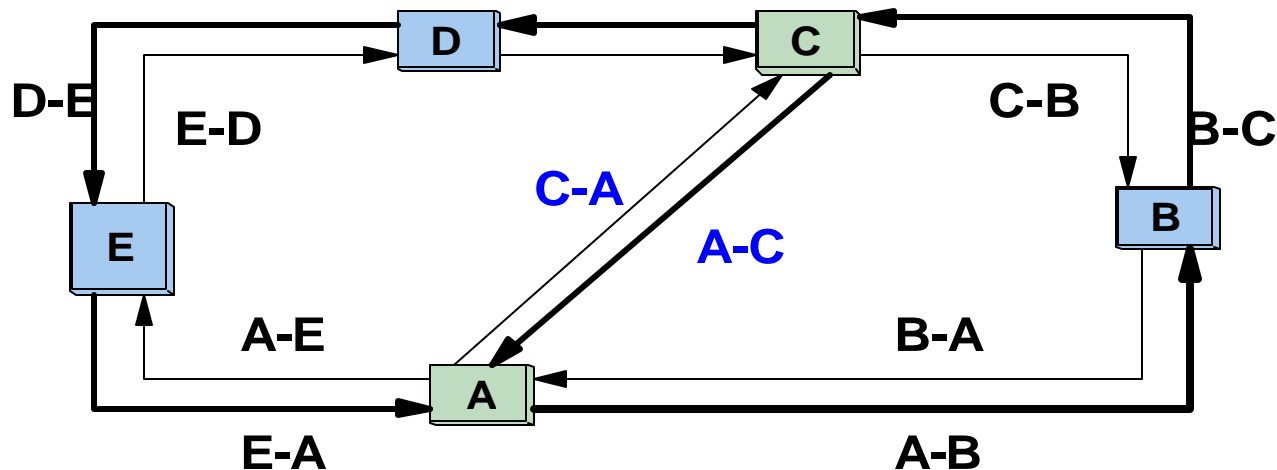
HYBRID NETWORK



- **L2 Topology Discovery Control Packets are used to map network.**
- **Path costs are determined, according to Topology, User-assigned values, and Link Rates**
- **RPR MAC builds an Internal <In Port, Out Port> association for Data Packet Flow**
- **Shortest paths across rings, or ring/mesh for any pair of nodes can be determined using L2 means.**
- **Similarly, Protection Paths for each of the Links are determined.**
- **In case of Failure, Packets follow Protection Routes**

- **At each Node, Lookup “CAM” Tables are simple and based on Destination MAC Address (Shortest Path to the Destination, as determined by L2 Topology)**
- **Data Paths are fast and simple at any node**
- **<Source MAC, Destination MAC> provide endpoints for data transport.**
- **Data Path can carry multiple types of data**
- **Protection can be provided for any type of data over any link.**

Example of a Hybrid Network



- Nodes A, C have three links associated with them
- Nodes B, D, and E have two links
- Every node knows Topology and switching lookup on all the links
- Shortest path determination can take a packet on any of the links.
- Protection for any ring-mesh combination.

- **Proper L2 Topology Discovery can help create Multi-port Network Associations at any Node**
- **This allows creation of any mix of Ring and Mesh Network without undue Complexity at a Node**
- **<Source MAC, Destination MAC> provide endpoints for data transport.**
- **Protection Switching beyond just Ring-based**