Why am I here?

- **Informally gauge 802 interest in undertaking a new Man/Wan MAC standard**
- **Brief introduction to Spatial Reuse Protocol**

Spatial Reuse Protocol

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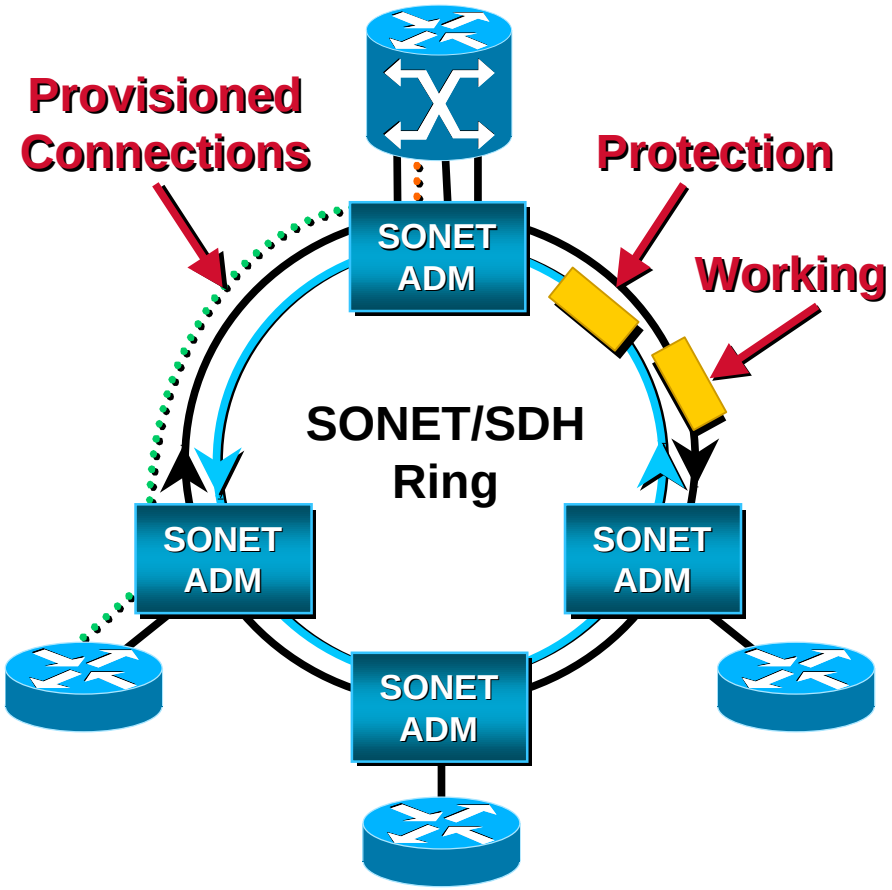
SRP Protocol Goals

- **Improve network economics via layer elimination and bandwidth multiplication**
- **Provide Fast Protection and Restoration against fiber and node failures**
- **Provide Infrastructure Transparency**
- **Provide Support for Priority and Multicast**
- **Enable Plug-and-Play Operations**

  distributed control -> no master node
- **Support LAN, MAN & WAN Applications**

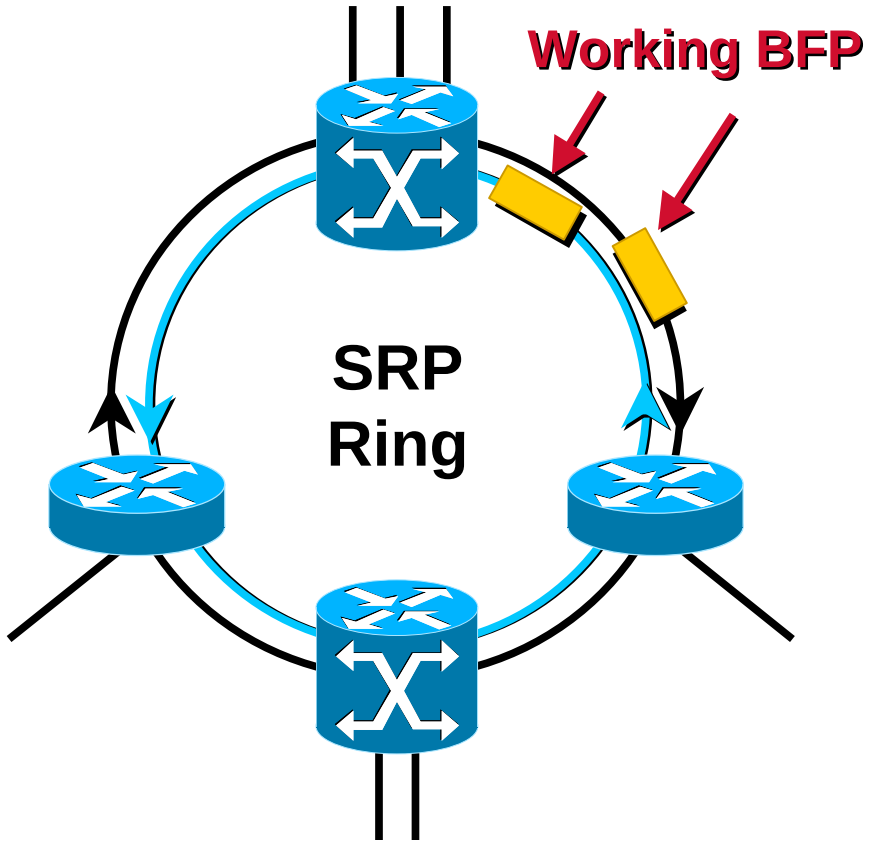
SONET/SDH-Based TDM Transport

- **Accepted transport architecture**
- **Performance monitoring and self-healing**
- **Expensive and inefficient for packets**
  - **Multiple equipment layers**
  - **Bandwidth inefficiency**



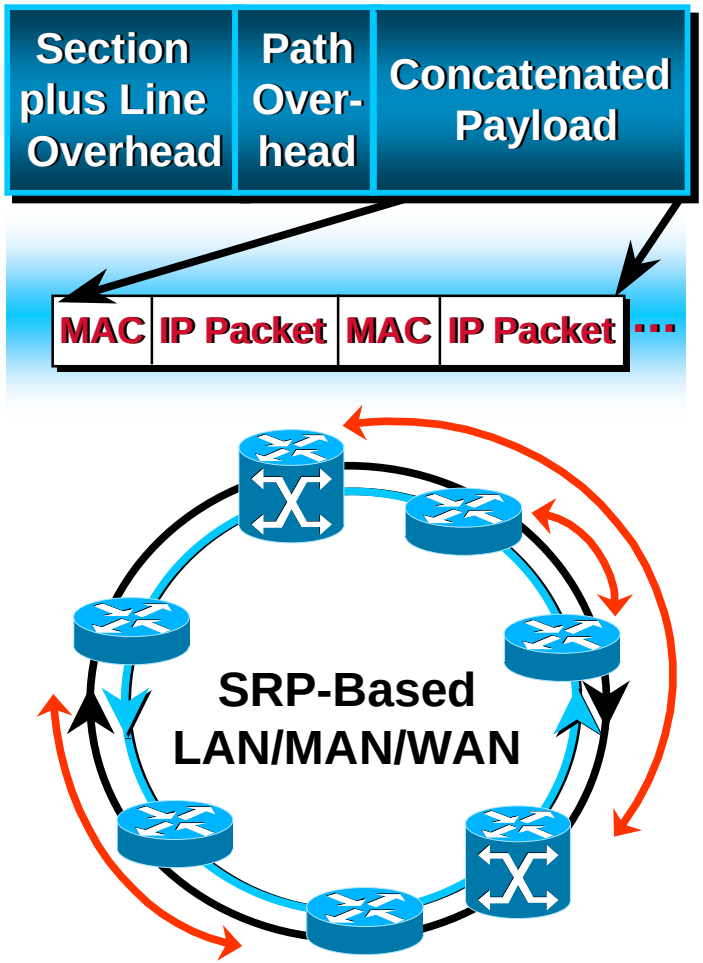
Ring-Based Packet Transport

- Eliminate SONET/SDH equipment while retaining benefits
- Maximize bandwidth efficiency
- Extend IP functionality over geographic area
- Minimize provisioning and configuration requirements



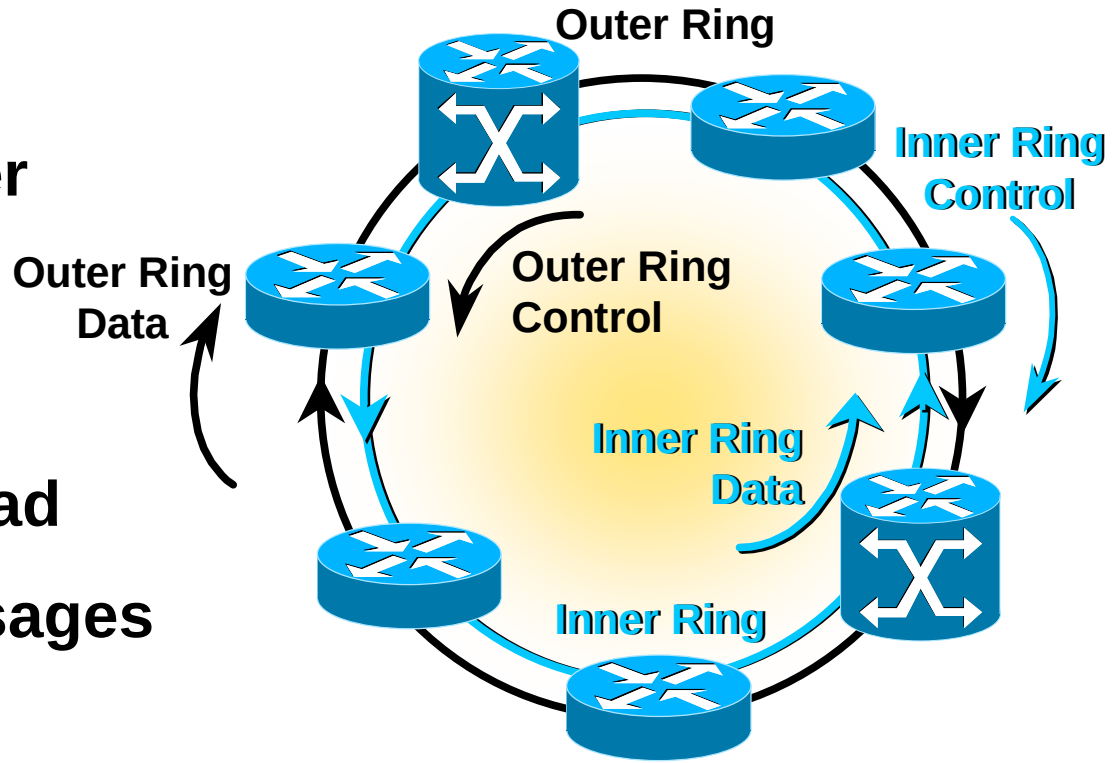
Spatial Reuse Protocol

- **New Layer 2 MAC technology SRP**
  - **Spatial Reuse Protocol**
    - **Currently runs on top of SONET/SDH framing**
    - **Bandwidth efficient**
    - **Fairness (SRP-fa)**
    - **Scalable**
    - **Fast protection switching and service restoration**
    - **Multicasting and priority**

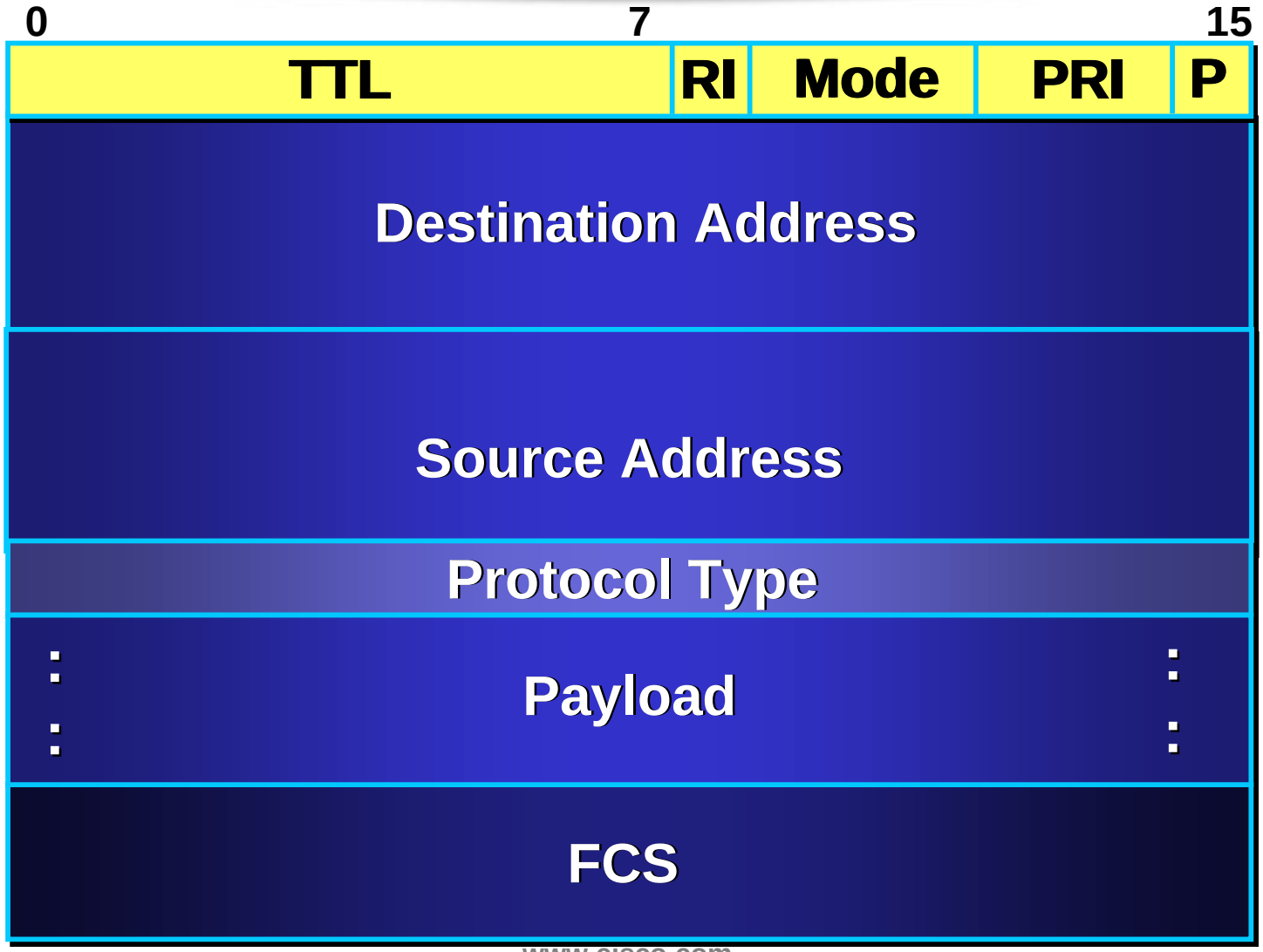


SRP Nomenclature

- **Basic terminology**
  - **Bidirectional counter rotating rings**
  - **Packet transport on both rings in concatenated payload**
  - **Usage Control messages carried in opposite direction from data**



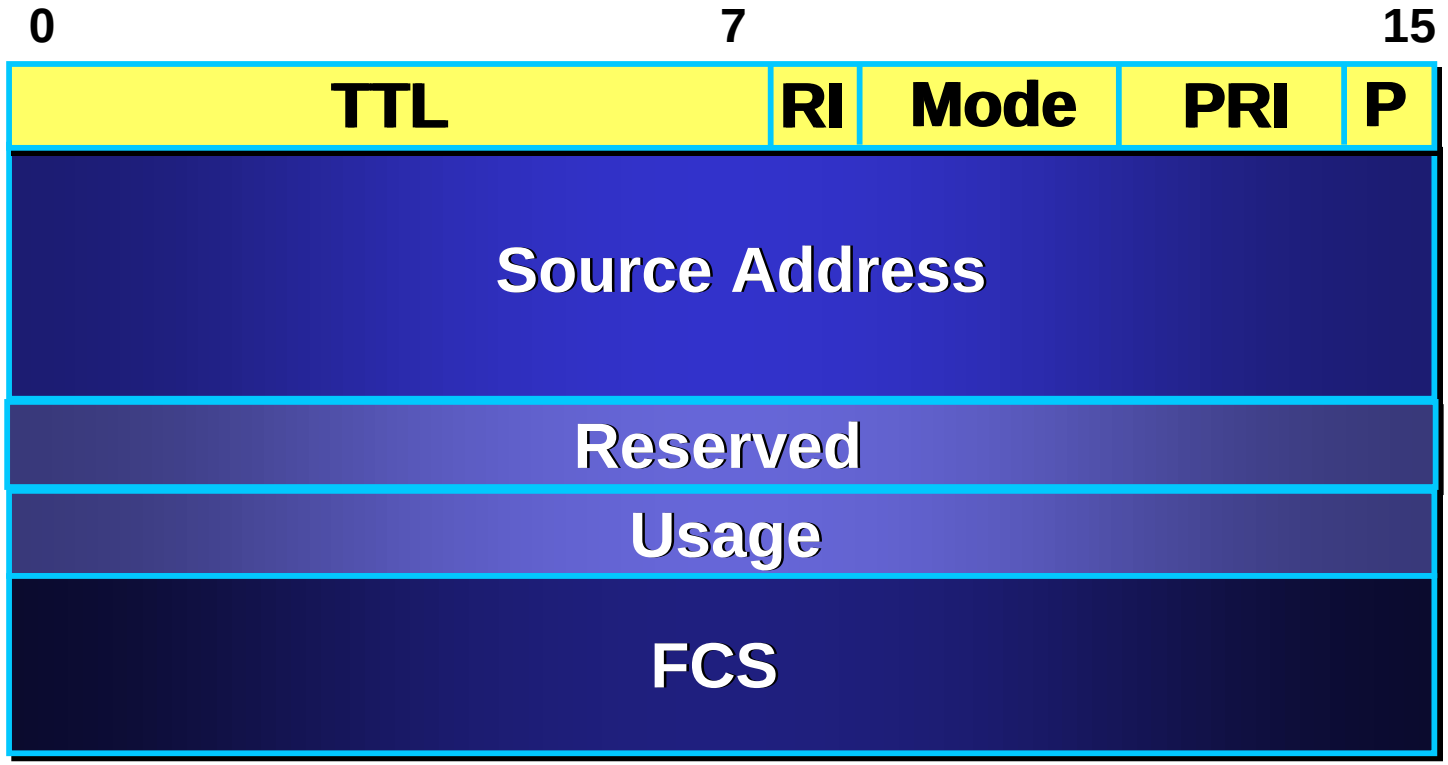
SRP V2 Packet Format



SRP Packet Modes

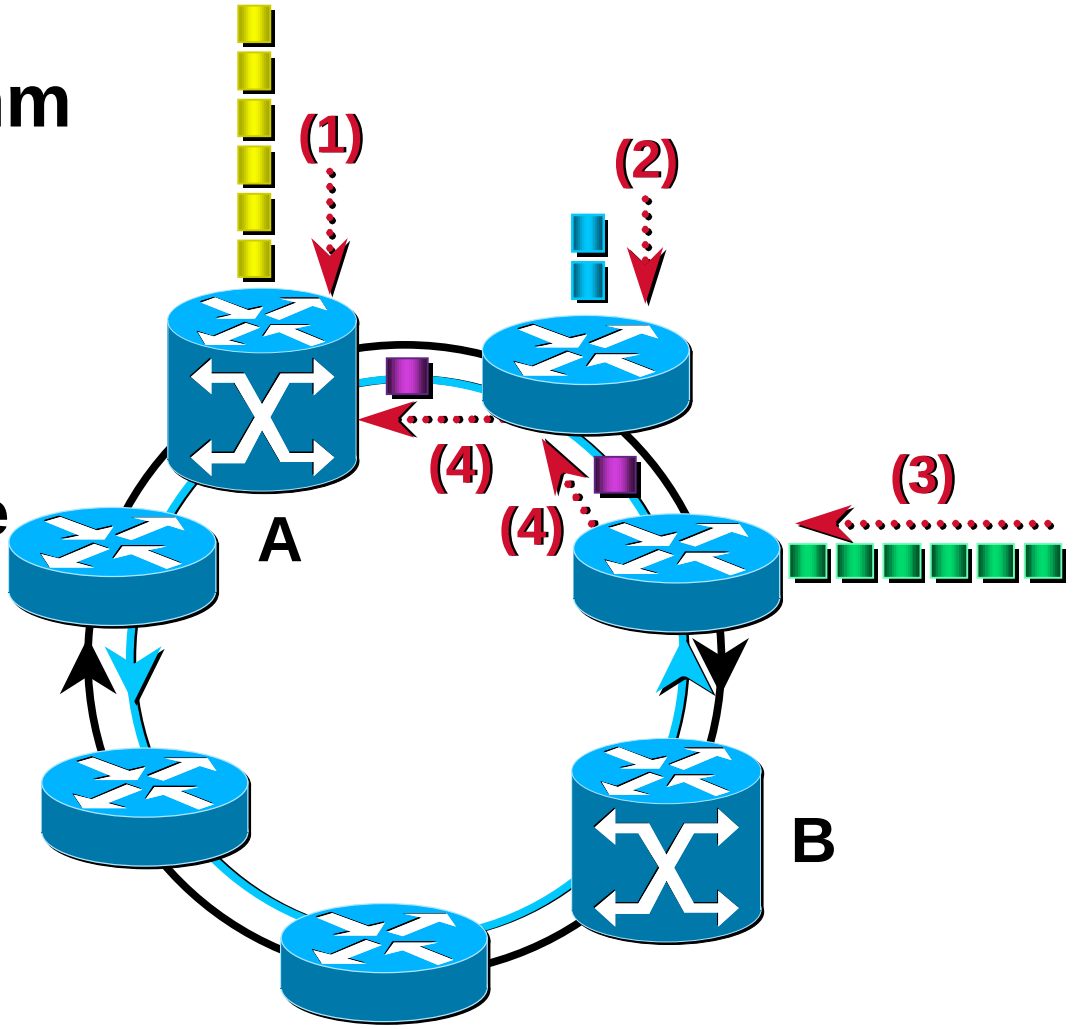
- **Data Packet**
- **IPS Packet**
- **Topology Packet**
- **Usage Packet**
  - **16 bytes including SRC address**
- *Cell Packet*

SRP V2 Usage Packet

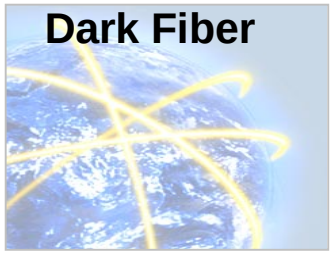


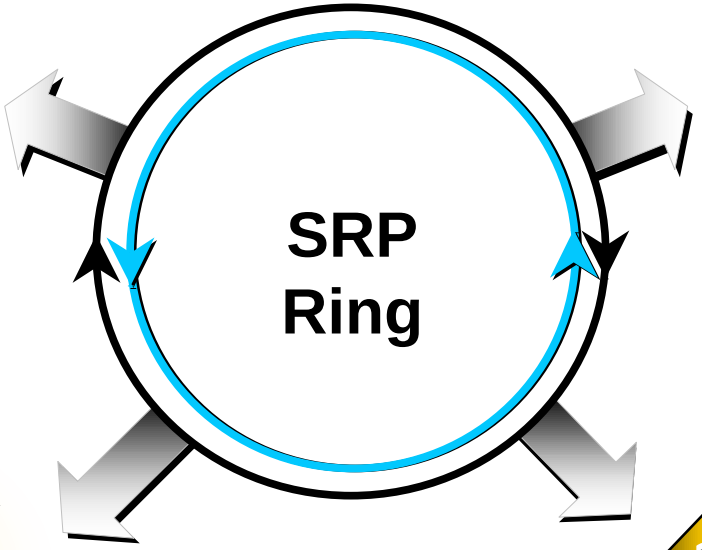
SRP Fairness Example

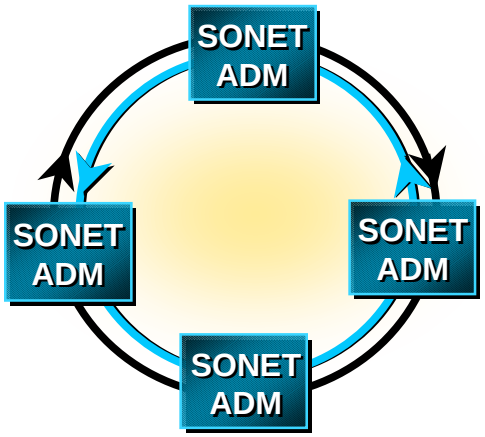
- **SRP fairness algorithm**
  - **Distributed algorithm**
  - **Propagates and uses MAC usage info**
  - **Source and forward rate controls**
  - **Rapid adaptation and convergence**
  - **Controls low priority packets**



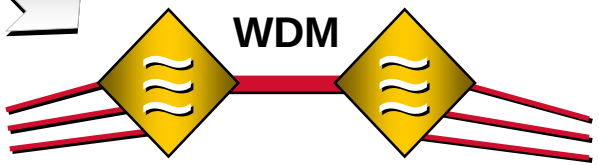
SRP Enables Transport Flexibility and Evolution





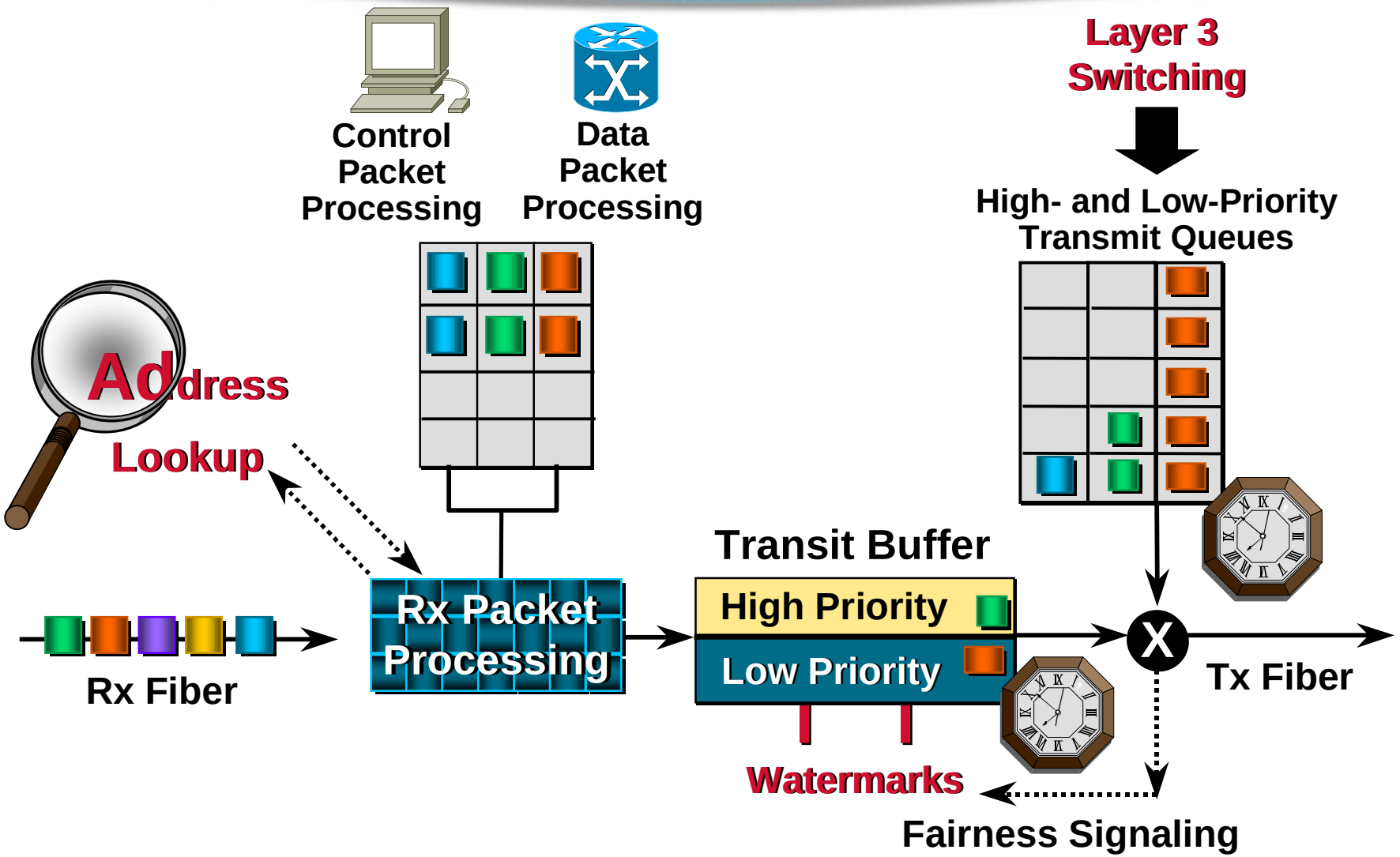


SONET/SDH Ring or
Linear Point to Point



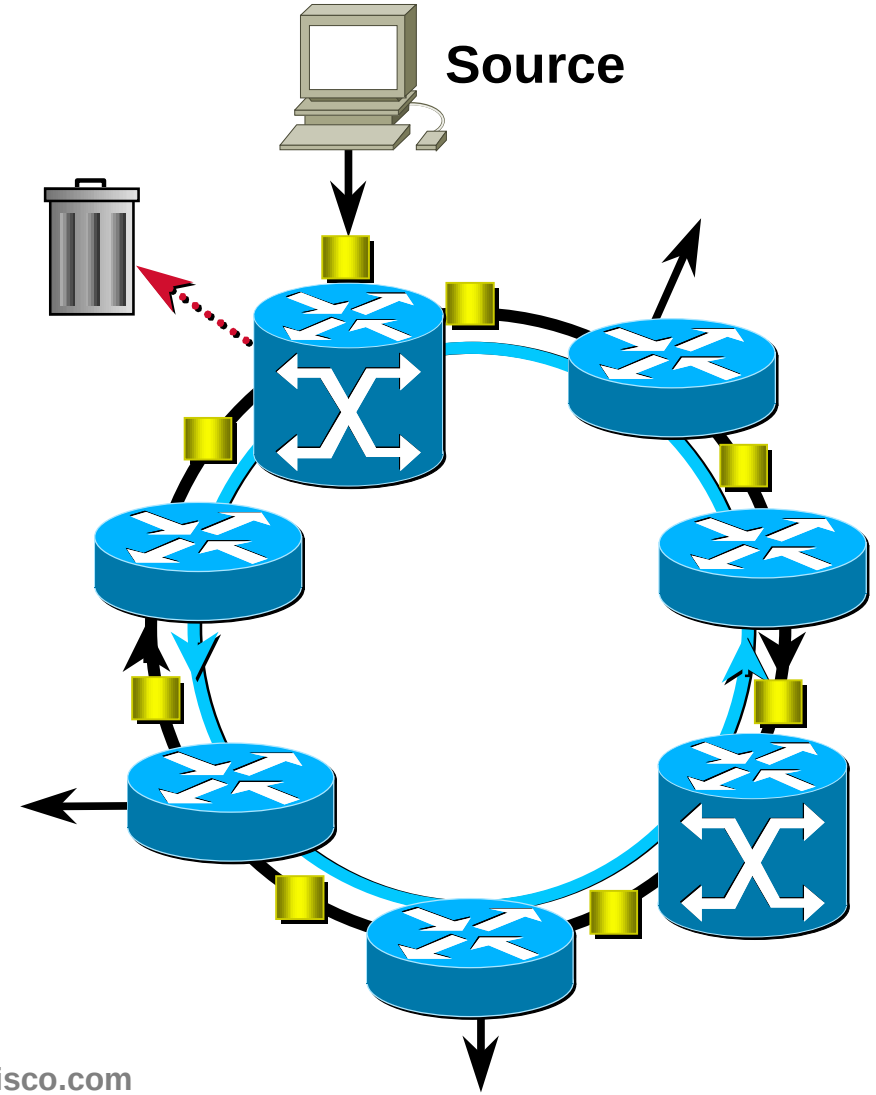
- Runs over dark fiber, SONET, or WDM
- Enables transport “mix and match”
- Provides efficient evolution path for incumbents
- Provides optimized transport for greenfield builds

SRP Packet Processing Flow



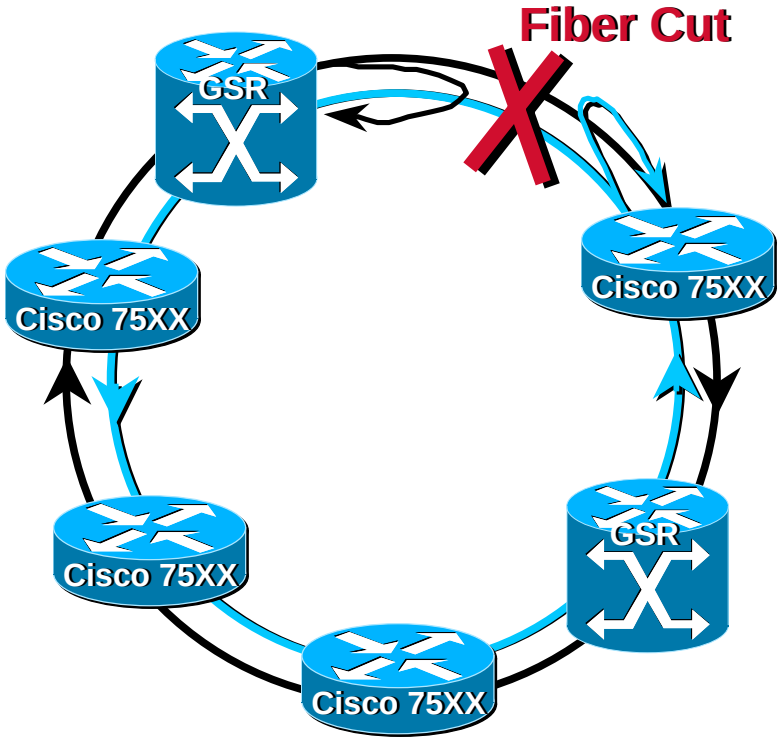
SRP Multicasting Support

- **Packet flow**
  - **Sourced onto ring with multicast bit set**
  - **Received by appropriate nodes on ring**
  - **Stripped from ring by source**



Intelligent Protection Switching

- **Like SONET/SDH, SRP provides**
  - Proactive performance monitor and self-healing via ring wrapping
  - Fast 50-ms restoration
  - Protection switching hierarchy
- **Unlike SONET/SDH, SRP provides**
  - signaling via explicit control messages
  - Multilayer awareness and elastic cooperation
  - differentiated handling by priority
  - enhanced pass-through mode
  - Fast IP service restoration on large rings
  - No dedicated protection bandwidth and intelligent rehoming after wrap
  - Minimal configuration and provisioning



Detects Alarms and Events and Wraps Ring ~50 ms