Bandwidth Demands

• Ever-increasing bandwidth demand has become a major challenge and opportunity for growth within the networking market
• The number of Internet users has skyrocketed alongside application bandwidth intensity
• Internet of Things is projected to exponentially strain networks
• Spectral efficiency gains take time and are expensive
• A solution lies in increasing efficiencies on the transport equipment that allocate traffic via bandwidth management
• Statistical multiplexing is a strategic approach to maximizing bandwidth
Layer 1 Statistical Multiplexing

• Statistical multiplexing can greatly increase network performance at Layer 1

• Layer 2+ equipment has traditionally leveraged time-division multiplexing, a mechanism in which all packet flows — even the idle ones — fill up a channel, leading to channel inefficiencies

• By allocating bandwidth for channels with valid data packets, statistical multiplexing intelligently combines input traffic to maximize channel efficiency
Channel Utilization

• Typical Channel Utilization
  • Large number of idle frames
  • Idle capacity cannot be reclaimed
  • 15% to 50% line utilization is typical, leaving 50% to 85% of capacity unused

• Statistical Mux Solution
  • Intelligent way of combining customer traffic
  • Use 100% of capacity
  • Minimize idle frames – Fill the Pipe

100G Line Utilization using TDM
Inefficient Line Utilization

100G Line Utilization using Stat Mux
Efficient Line Utilization

More Client Data can be added
Bandwidth Management

- Quality of Service using client priority classification
- Maximize line efficiency, reducing Idle characters
- Deficit Weighted Round Robin scheduling
- Priority is soft-configured during provisioning
- Traffic counters and monitoring
- Analyze traffic patterns

Configurable Percentage of Usage

- Highest Priority Customer: 50%
- 2nd Highest Priority Customer: 30%
- 3rd Highest Priority Customer: 15%
- 4th Highest Priority Customer: 5%
Client Classification

- Increasing the priority level on a client port will allocate more bandwidth to it.
- Class Priority is soft-assigned
- Class 3 is the default setting for all ports and is the lowest priority
- Class 0 is the highest priority
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