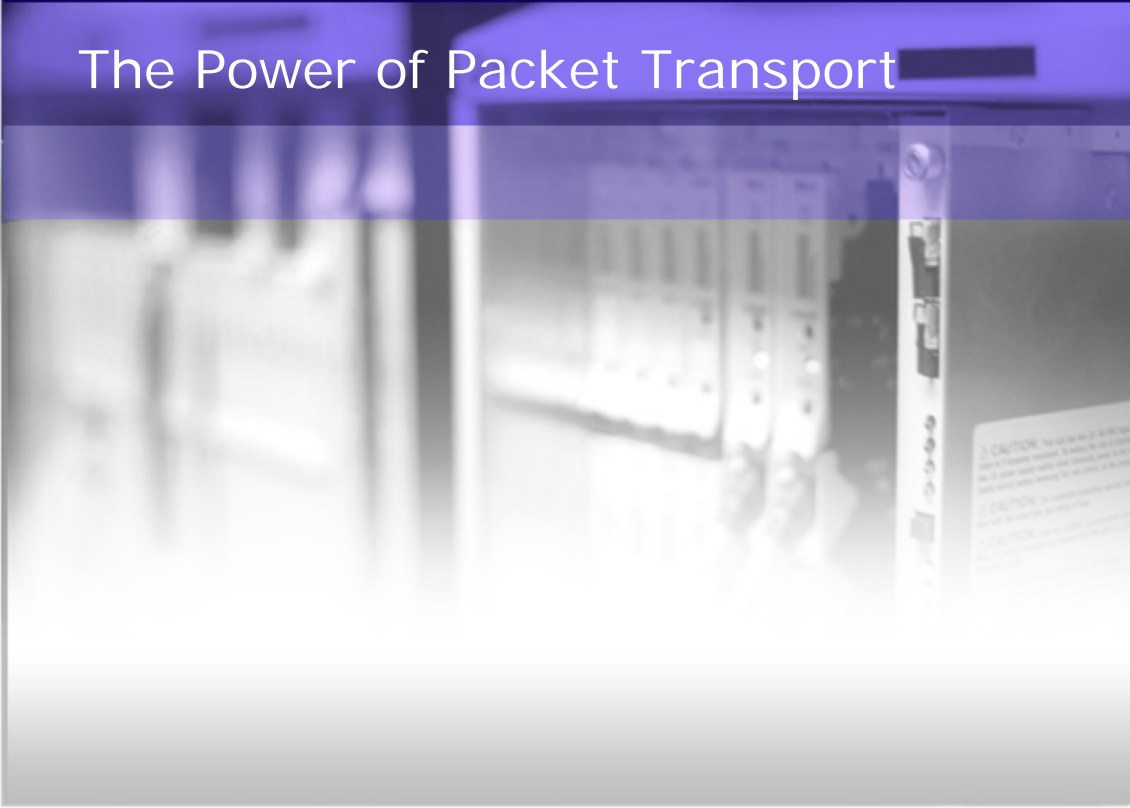




The Power of Packet Transport



## **Converging Circuits & Packets on Ethernet Networks**

**Future Networks, October 2007**

# Outline

- Corrigent Systems
- Packet Transport Overview
- Corrigent's Packet Transport Solution
- Network Services and Applications
- Success Story: KDDI in Japan
- Summary

# Corrigent Systems

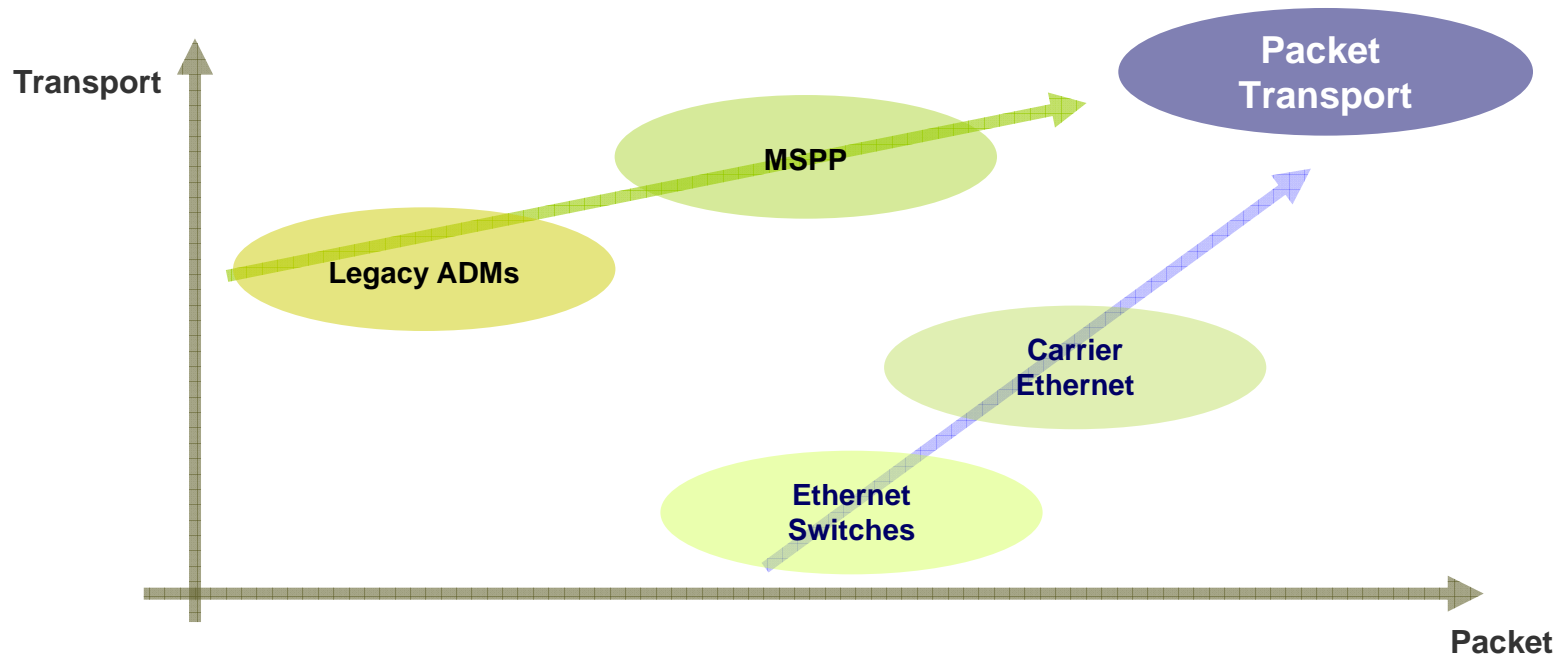
- Incorporated in September 2000
- R&D Center in Tel Aviv Israel
- Production and QA in Thailand
- Sales: US, Europe, Japan, Korea and India
- Packet Transport Products: CM-4000 PTS and CM-100 PTS
  - Multi-service packet optical transport
  - Advanced Ethernet and MPLS functionality
  - Guaranteed performance, QoS and availability
- Corrigent is a wholly-owned subsidiary of Orckit Communications (Nasdaq: ORCT)



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# Next Step for Carrier-Ethernet



## Compared to SONET/SDH

- 100% optimized for packets
- Scalable packet aggregation
- Packet-over-TDM processing and Interworking

## Compared to "Carrier Ethernet"

- Multi-service and general-purpose
- Transport quality, cost, form factor
- Cost-effective aggregation and simple provisioning

# The Economic Benefits of Packet Transport



## Cost Reduction

- CapEx and OpEx reduction through consolidation of infrastructure
- Introduction of new Ethernet access options
- Half the rack space of Carrier Ethernet
- Maximizing Revenue per Gbps using dynamic bandwidth management

- Service Awareness to overcome Net neutrality
- Service differentiation & awareness
- Distinguish services from competition
- Deliver advanced services directly over the packet transport network



## Increasing Revenue

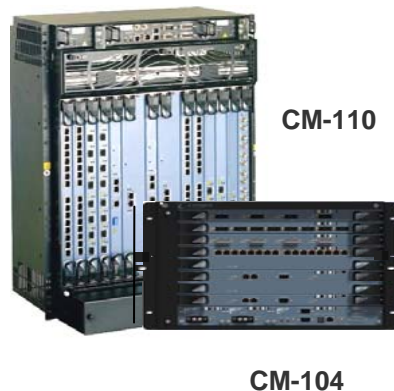
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# Corrigent's Packet Transport Product Family

- Carrier-class, packet-optimized optical transport solution
- High service availability (99.999%) and unsurpassed scalability
- High-density Ethernet and multi-service TDM interface (MSI) modules
- L1 and L2 Interworking functions facilitating migration towards all-IP
- Highly scalable and highly available universal network management system

## CM-100 PTS



CM-110

CM-104

## CM-4000 PTS



CM-4314

CM-4080

CM-4040

CM-4206

40G

160G – 320G

# Corrigent's Packet Transport Product Family

## CM-100 PTS



40G

Generally Available

- CM-110 – 14 RU, 40G, 10 user slots
- CM-106 – 14 RU, 40G, 6 user slots
- CM-104 – 6 RU, 40G, 4 user slots
- Full support for Ethernet and TDM
- 10G RPR integrated system
- Ethernet and RPR OAM
- PDH/SDH circuit emulation
- MEF Service Definition compliance

## CM-4000 PTS



80G - 160G – 320G

Available Dec/2007

- CM-4314 – 16 RU, 320G, 14 user slots
- CM-4206 – 8 RU, 160G, 6 user slots
- CM-4040 – 2 RU, 80G, 2 extension slots
- CM-4080 – 3 RU, 80G, 4 extension slots
- Full support for Ethernet and TDM
- 100G HC RPR and Ethernet system
- Ethernet, MPLS and RPR OAM
- Native and circuit emulated TDM options
- MEF Service Definition compliance

# CM-4314/4206 PTS Product Overview

- 320G/160G non-blocking switching capacity , scalable to 640G
- 14/6 Universal Interface Modules
  - Twelve 20G slots + two 40G, scalable to 100G
- Dimensions: 19"x24.5"/14"x11.2"
- Support for multiple topologies
- 100 Gbits/s HC RPR and Ethernet
- Ethernet, MPLS, RPR, SDH OAM
- Carrier-class service Availability



**CM-4314 PTS**

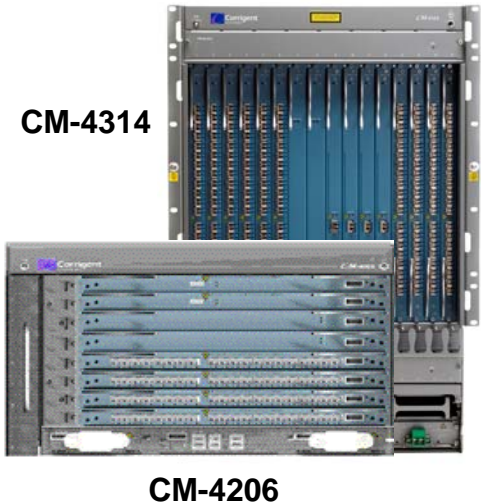


**CM-4206 PTS**

- Application-aware traffic management
  - 5 Classes of Service
  - 3 Traffic types

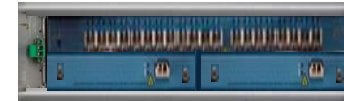
# CM-4314/4206 PTS Universal Interface Module (UIM)

- Ethernet
  - 20-port 1GE
  - 2-port 10GE (syncE/OTN)
  - 1-port 40GE
- TDM MSI (SW configurable)
  - 16-port STM-1/4/16
  - 36-port E3/DS3
- RPR
  - 1-port 40GE/OTN
  - 2-port 10GE (syncE/OTN)
  - 1-port STM-64

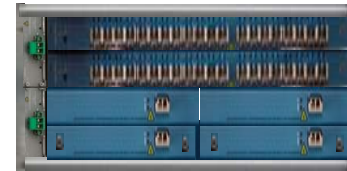


# CM-4040/80 PTS Product Overview

- 2 RU height , ANSI 19" compliance
- Two fixed configurations
  - Type 1 : 20 port GE + 2 port 10GE
  - Type 2 : 20 port GE + 2 port 10GE+ 8 E1/DS1
- Extension slots options:
  - 8-port STM1/4
  - 2-port STM16
  - 1-port 10GE
  - 10-port GE
  - 12-port DS3



**CM-4040 PTS**

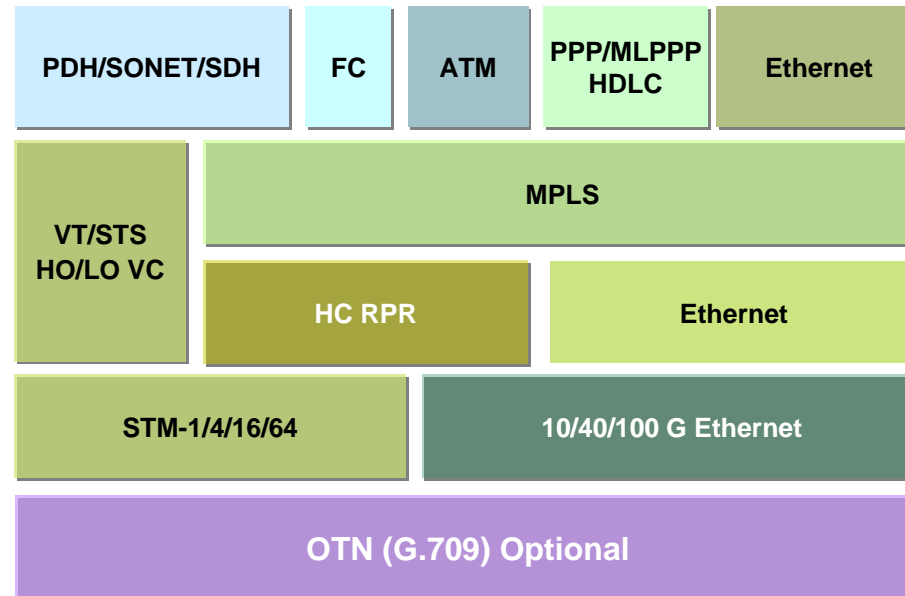


**CM-4080 PTS**

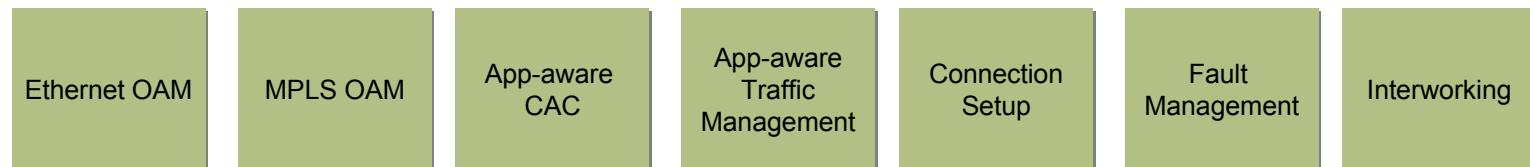
- 80G non-blocking switching capacity
- RPR over GE, 10GE and STM-16
- Redundant power supply
- Redundant CPU and fabric (CM-4080)
- Flexible configuration

# CM-4000 PTS Building Blocks

## Forwarding Plane

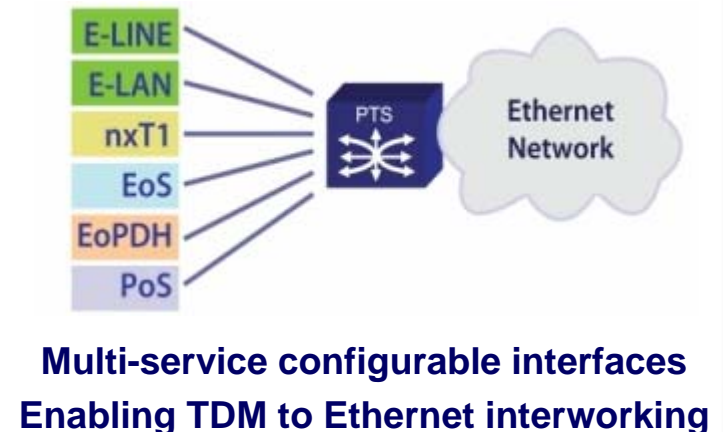
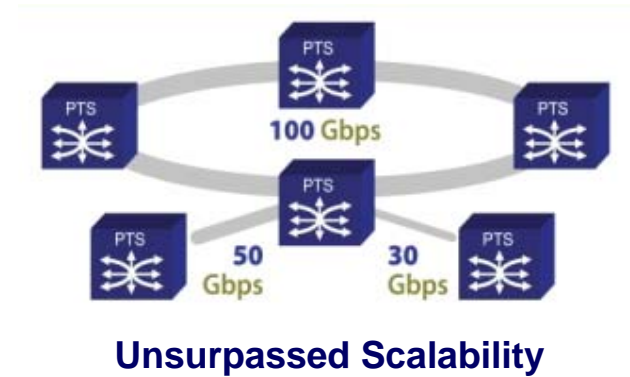


## Control and Management Plane



# CM-4000 PTS Key Benefits

- Universal packet transport
  - From 100% TDM to 100% Ethernet
  - Enabling migration from TDM to IP
- In-service scalability
  - High Capacity RPR and Ethernet
  - Scaling up to 100G transmission
- Viable path to migration to all-IP
  - TDM-to-Ethernet interworking
  - EoS and PPP/MLPPP Termination
- Multi-Service Interfaces (MSI)
  - Software configurable SONET/SDH and PDH interfaces

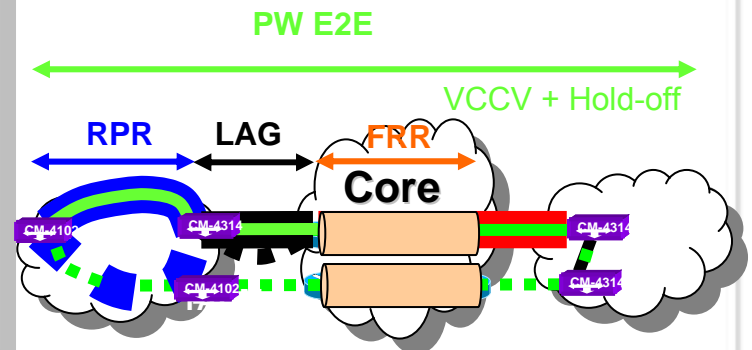


# CM-4000 PTS Benefits (cont)

- Application-aware traffic management and CAC
  - Carriers can benefit from higher margins on preferred services
- High Service availability
  - 99.999% availability
  - Ring, linear and end-to-end sub-50ms protection guaranteed
- Hierarchical, fully-correlated, multi-layer OAM
  - Transport-class performance monitoring, diagnostics and troubleshooting functionality



## Application and Service Awareness: Overcoming Net neutrality



## Guaranteed Carrier-Class Availability

# Universal Packet Transport

- From 100% Circuit to 100% Packet Switching
- Full TDM functionality

- Native TDM transport
- Cross-connect and path termination

- LO: VT1.5/VC11 and VC12
- HO: STS-1/VC3 and VC4
- Circuit-emulated TDM transport (Circuit Emulation over Packets RFC 4842)

*–Guaranteed delay and delay variation, with configurable jitter buffer*

- **Full Ethernet Switching functionality (E-Line, E-LAN and E-TREE)**

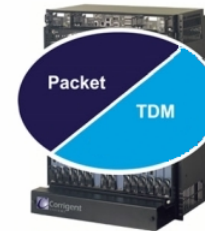
- **Layer 2 Service Interworking**

- PPP/MLPPP-to-Ethernet interworking
- Ethernet over SONET/SDH (EoS) termination and Ethernet switching
- Ethernet over PDH (EoPDH) termination and Ethernet switching

Circuit Switching



Packet & Circuit Switching



Packet Switching

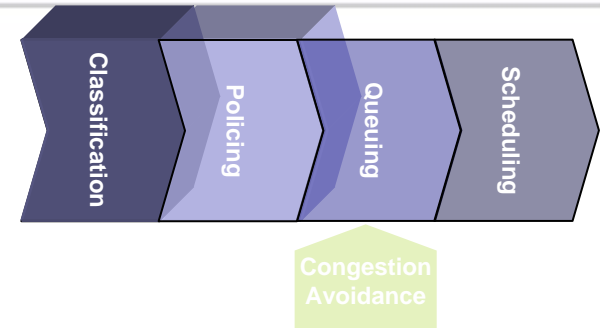


# Application Aware Traffic Management

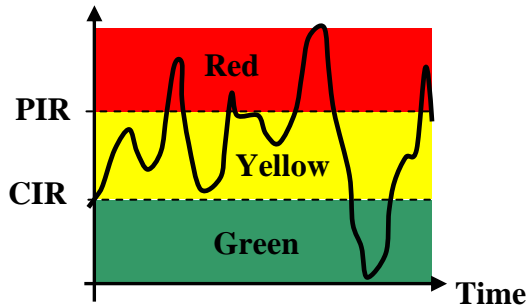
■ **2D Classification into 5 CoS \* 3 traffic types by:**

- L1: Per port
- L2: Per VLAN-ID, PRI (802.1p), Ether Type
- L3: DSCP, TOS
- L4: Application (TCP/UDP ports)
- L7: Video awareness

■ **Dedicated Class for TDM services**



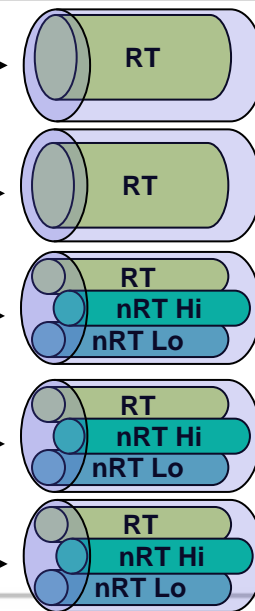
Service Meter



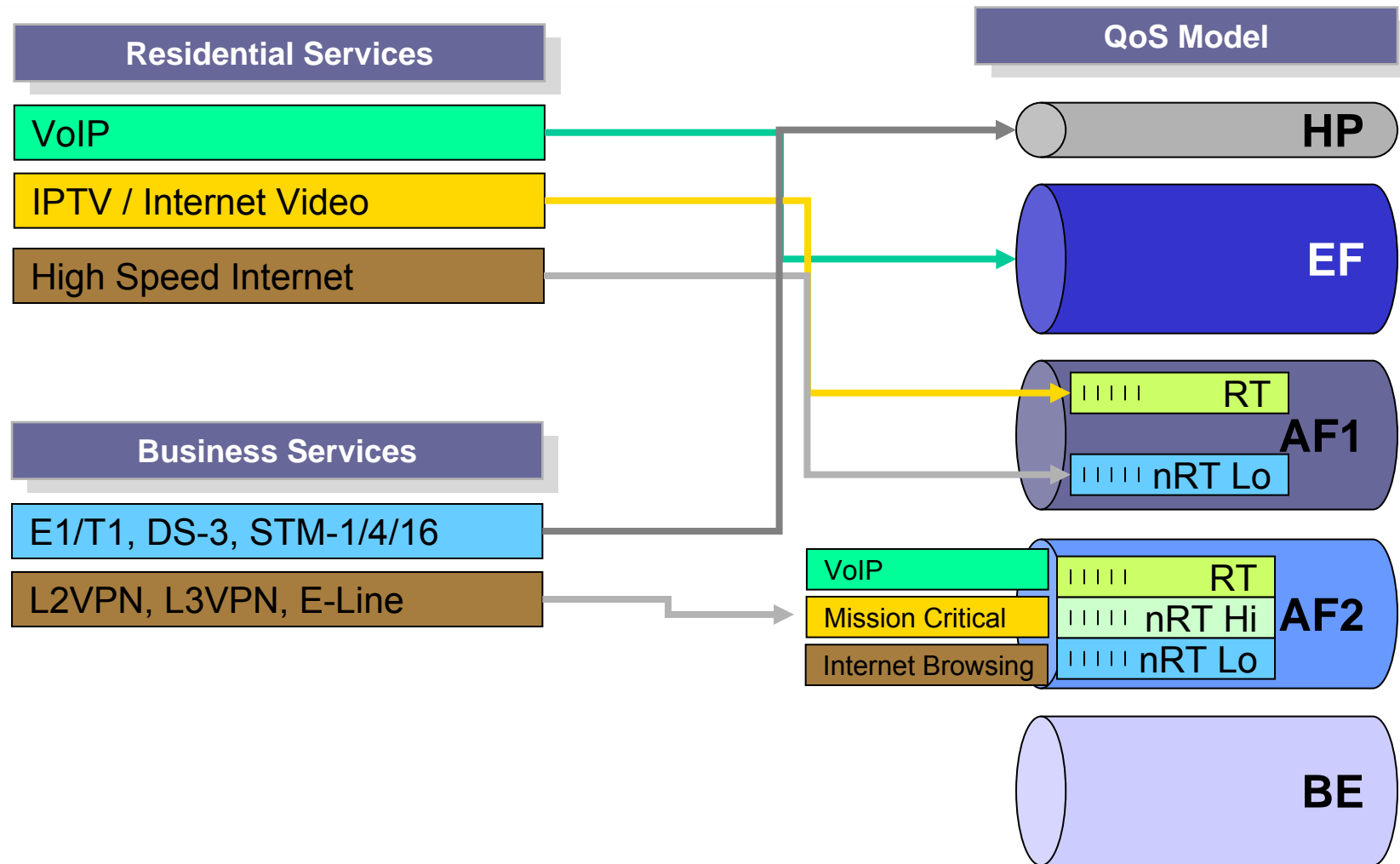
**5 Classes Of Service**



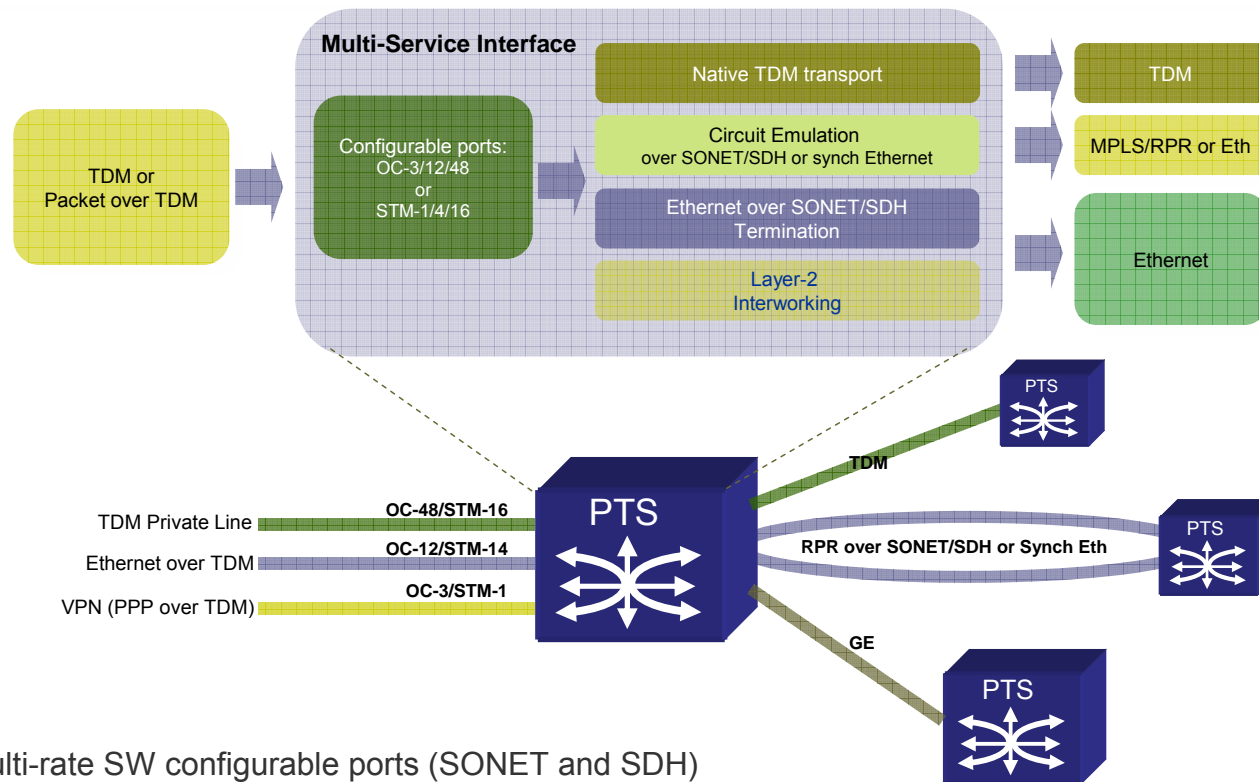
**3 Types Of Traffic**



# Service Model Example



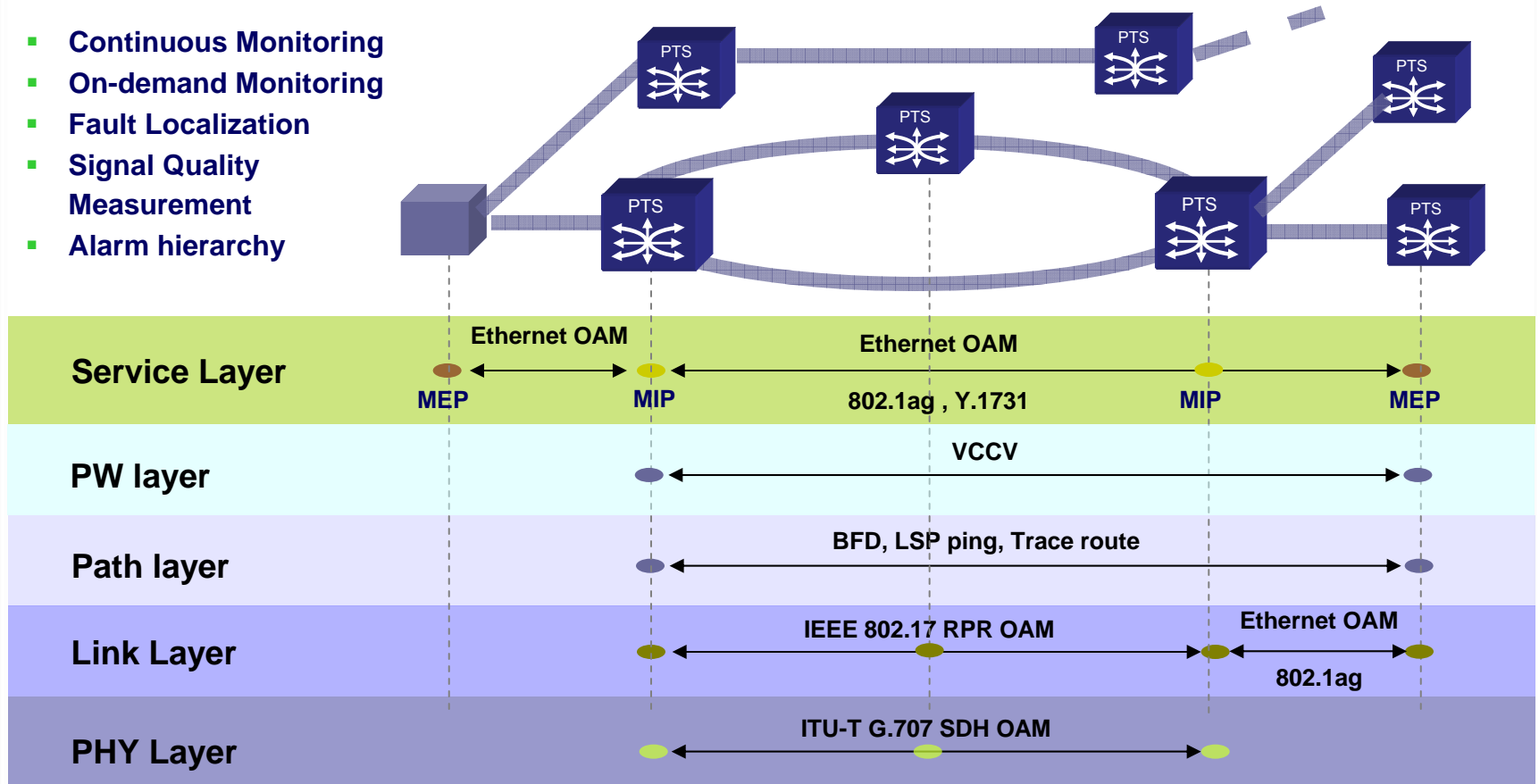
# Multi-Service Interfaces (MSI)



- 16 multi-rate SW configurable ports (SONET and SDH)
  - Up to 8xSTM-1 or 8xSTM-4 or 4xSTM-16
  - PPP to Ethernet interworking and inverse ARP
  - Ethernet over SONET/SDH termination with full Ethernet service interworking and 802.1ag OAM
  - CPE in-band management - management IP packets sent/received with or without VLAN

# Hierarchical OAM in the CM-4000 PTS

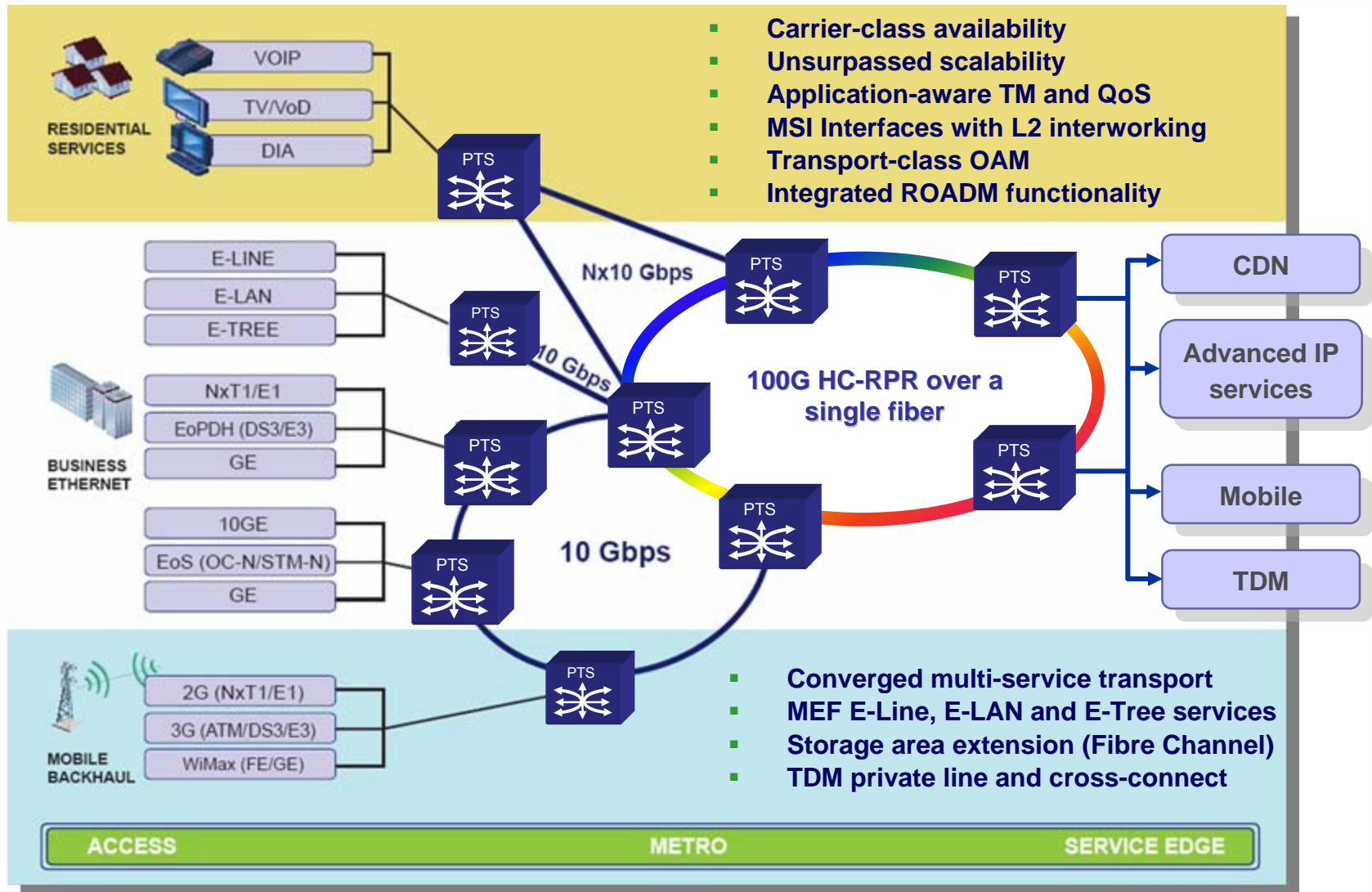
- Continuous Monitoring
- On-demand Monitoring
- Fault Localization
- Signal Quality Measurement
- Alarm hierarchy



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# Converged Multi-Service Packet Transport Solution



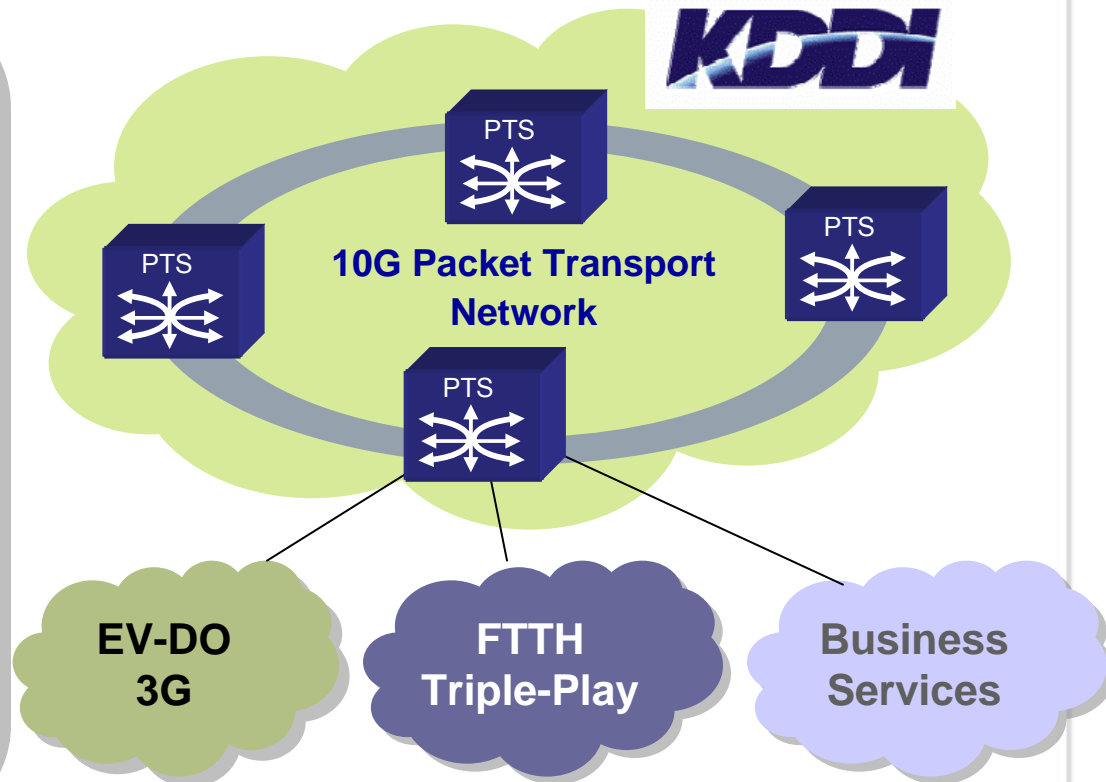
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# Packet Transport Success Story: KDDI

## The World's Largest Packet Transport Network

- KDDI – Japan's second largest service provider
- >200 10G PTS Rings
- Over 2,000 CM-100 PTS
- Multi-service Converged Packet Transport
  - Residential Triple-play
  - Business Ethernet
  - 3G Backhaul

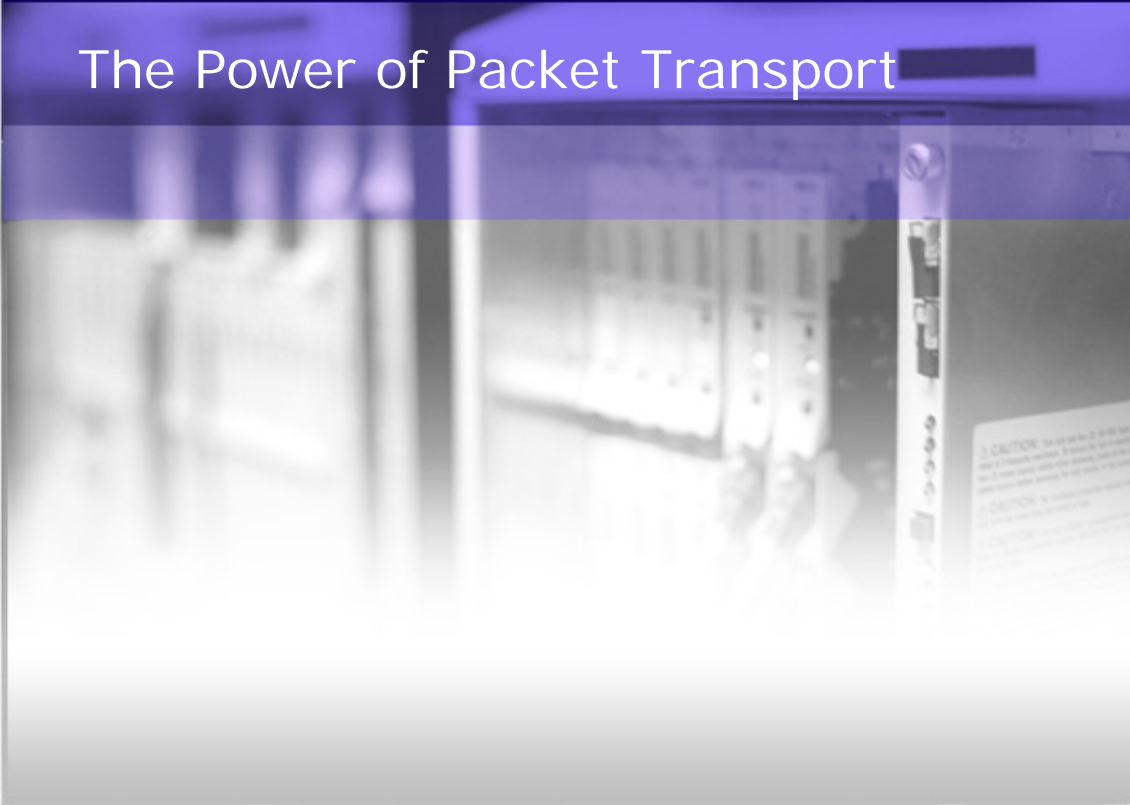


# Summary

- Corrigent offers field proven, mass-deployed packet transport product lines
- Superior capacity and scalability
- Simple point-and-click provisioning of VPLS and PtP services
- Scalable, layered protection guarantees sub-50ms protection for a huge number of services
- Multi-layer OAM
- Convergence of Ethernet and TDM into a single metro network



## The Power of Packet Transport



**For more information on Packet Transport  
please visit us at [www.corrigent.com](http://www.corrigent.com)**