NSP Software Summit:

Enabling Next Generation Services

Tony Scarfo
VP Partner Management, Juniper Networks
Traffic Growth

source: Infonetics Research
IP Traffic Growth Drivers

Source: Infonetics Research
IP Revenue Growth vs Legacy Decline

source: RHK
Content Services Today: Dealing with Internet-Based Constraints

- **End Customers**
  - Business
  - Residential

- **Network Service Providers**
  - Revenues on Connectivity
  - Service/Internet Access Only
  - More Facilities Expense for Increased Content Access
  - Manual Service Activation and Provisioning
  - No Control over Bandwidth Use

- **Content Providers**
  - Music
  - Film/TV
  - Finance
  - Health
  - Books (Print)

- **Unpredictable Experience**
  - Fluctuating Bandwidth
  - Inaccessible Information
  - Limited/Static Service Options
  - Limited Content Quality
  - Multiple Content Transactions

- **Expensive “Accommodations” to Create Service Quality**
  - Local Caching
  - CPE Buffering
  - User Configurations
  - More Servers/Facilities

- **Limited User Reach Due to Inconsistent Bandwidth**
How can we deal with these Constraints?

- The network just delivers what it does
- Content or Services get what they can get
- What if we brought these two together to control the experience for specific sessions?

For some: Assured — Guaranteed Service
For some: Preferred — Enhanced Service
For some: Best Effort — No Guarantee’s
What if the Network was Intelligent?

- The network would no longer be oblivious to the applications or customers using it—it is responsive.
- The network would be able to respond to the needs of:
  - The customer
  - The application
- Deliver the proper experience and security at the proper time.
- Also address and support billing for delivering this responsiveness.
The Industry Has Two Options

Continue growing service-specific private networks & a commoditized Internet...

Private Networks
- Control over security, quality...
- Expensive
- No inter-carrier connectivity

Expensive

OR migrate to a single infrastructure that delivers quality, security & reach

IP/MPLS
- Private IP/VPNs
- FR/ATM
- TDM
- Metro Ethernet
- Gaming
- On-demand Computing

Single Network
- Segregated, uniquely managed virtual networks
- Assured end-to-end experience
- Per-service options increase revenues/customer

Global connectivity
- Low cost
- No control over security, quality...
Industry Conclusions

• All applications are/have converged onto IP

• Service Providers require a Core Network that can meet the Transport, Management, and Quality of Service (QOS) requirements of all these networks

• MPLS meets these requirements - Everything will connect to and run over a common IP/MPLS backbone.
  
  • It’s too expensive to build a network for each service

  • MPLS is universally accepted by Industry and Standards committees
Infranets - Best Attributes Of Public and Private Networking

- Single Network (IP/MPLS)
  - Robust environment for legacy customers on a consolidated network
  - Combines economics and reach of IP with assurance and security of private networks
  - Geographic extension for international customers through standard inter-carrier connections (future)
The Infranet Initiative
Beyond the Internet

The Situation Today
Providers presently support interconnection of enterprise networks within their own network/domain. However Inter-domain connections are either non-existent or piecemeal in their deployment. Also applications also have no means to signal for network requirements. Presently packets can be marked for coarse gain CoS with no guarantees...

User-Network Interface (UNI)
Applications need to be network aware and able to signal the provider domain for network requirements such as bandwidth and QoS...

Inter-Carrier Interface (ICI)
Providers need to ensure that enterprise application network requirements are honoured between provider domains. There also needs to be a mechanism for cross billing between providers for these connections.

Juniper is working with industry partners to define these solutions.
Current IIC Membership
MPLS Market Acceptance

- MPLS is now accepted as the key technology for deploying resilient multi-service IP networks
- Key Juniper customers have either deployed MPLS or have announced plans to do so
- 50+ MPLS VPN Customers Deployed

Represents 40+% of world’s top 25 providers
MPLS - what problem does it solve

- Reduce complexity in core network nodes
- Introduce flexible new routing services in the network
- New services or applications implemented in the edge without modifying the core
- Some of the new services that use MPLS
  - Virtual private networks (VPN)—many customers securely over a shared core network
  - Legacy transports over a common network
  - Differentiated service levels
  - Traffic engineering—ability to direct where traffic goes
MPLS - what problem does it create

- Provisioning can be complex
- Hard to map from network problems to the customer
- Network performance needs to be mapped to customer or service (Monitor SLA)
- Differentiated class of service introduce the need to monitor service levels
Multiservice MPLS Foundation

- Scale existing network infrastructure to support enhanced services including VPN services in addition to new IP enabled services
- Reduce costs by minimizing CapEx investments
- Preserve ATM QoS and SLAs across existing and new services
- Interwork ATM to MPLS networks seamlessly
- Minimize OpEx with End-to-end operations integration and simplification – Operational Expenses 60-70% of Cost
MPLS Manageability

- Configuration and provisioning, through features like flexible implementation of traffic engineering (TE) and resource reservation protocol (RSVP)
- Network visibility and monitoring, through interface accounting, packet sampling, real time MPLS path monitoring and others
- Operation, administration, and maintenance (OAM), thanks to features like LSP ping, path verification, and traceback
- Enforcement of service-level agreements (SLAs), with features like DiffServ TE and MPLS fast reroute
- Easing rollout of value-added services like Layer 2 VPNs, Layer 3 VPNs, and virtual private LAN services (VPLS)
Juniper Solutions

- Single Software Image across J, M & T- Series Products (Junos)
- Flexible support for FR, ATM, PPP, HDLC, and Ethernet over MPLS
- Leading VPLS implementation for Multipoint Ethernet over MPLS
- Interworking between L2 services
- Flexible QoS Mapping
- Per-class bandwidth reservation similar to ATM
- XML – API (Junoscript) to our MIBS
- Proven High Availability
- Graceful restart, multiple FRR approaches supported
- In service Software Upgrades
- Device Protection – Device, Control Plane, Architecture, User Data
Joint HP / Juniper Solution

- Allows for the management of larger, more complex networks of Juniper networking products.

- Provides multi-layered network management and correlation which is critical in accelerating faster migration to MPLS from legacy ATM/Frame networks over SONET/SDH infrastructure.

- Provides real time root cause and correlation capability for the Service control layer in Routing networks
  - QoS, ACL, Multiple class of Services etc...

- Allows for more complete ‘managed’ solutions for the enablement of high end content delivery, service control support and Service level agreements.
Solution Synergies

**Juniper**
- Leader in IP Routing & Security
- Leader in IP VPN
  - MPLS BGP/VPN, VPLS…
- Rich Set of Hardware Enablers for IP Value Added Services
- Strong partnerships / alliances:
  - Siemens, Ericsson…

**HP**
- Leader in IP Management
- Leader in OSS
- Integrated Service Management for MPLS & IP-VPN
- Flexible IP Service Activation & Assurance
- Multi-Vendor, Multi-Technology Service Activation & Management
Thank You

http://www.juniper.net/partners/

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