DSL Product Update

Session 2906
Cisco DSL IP Switch

• Product Line Strategy
• Product Line Overview
• DSL Network Evolution
• Roadmap
• Feature Summary

Opportunities for Today’s DSL Service Providers

• Service reach—Expand DSL addressable market and service beyond current 50% reach
• Mass market scale—Reduce current long lead times to turn DSL service on
• Consumer services—Upsell from basic Internet access
• Business services—Migrate leased line business to DSL
• Regulation—Leverage the latest deregulation rulings
• Mobility—Real DSL interoperability
Cisco Global DSL Strategy

100% Service Reach
- Multi-DSL and multi-POP solutions to achieve 100% service and market coverage

DSL Mobility
- Mass market scale provisioning and fully interoperable DSL standards for rapid proliferation

IP DSL Switch

Multiservice IP+ATM Solutions
- Managed DSL services for business, scalable VoDSL, consumer entertainment

DSL Revolution

Smart DSLAM 1999
- Integrated ATM Switch Enables Traffic Prioritization Not Aware of IP Applications

“IP DSL Switch” 2000
- Integrated IP Router and ATM Switch Delivers IP+ATM Service for Managed IP Services, VoIP/VoATM, and Consumer Entertainment

Dumb DSLAM Pre-1998
- UBR or Frame Only Multiplexer Basic Internet Access Barrier to Multiservice
What Is an “IP DSL Switch”? 

- Future capability for integrated ATM switch+IP router
- Foundation for managed DSL services
  - MPLS and IPSec VPN
  - Aggregator for DSL subscribers
  - WebCache aware—Conserves WAN bandwidth
  - Multicast for video entertainment
  - Firewall, for enhanced security
  - Support baseband and derived VoDSL
- Multi-DSL support
- Multitrunk interfaces-nxE1, E3 to high-speed optical interfaces
- Carrier-class design

---

Cisco 6000 IP DSL Switch Foundation for Cisco GlobalDSL

- PPPoE/A.1483
- VC Termination
- PVC
- SVC/SoftPVC
- IDSL, ADSL G.shdsl
- ATM Switch
- IP Routing
- IP Multicast
- IP QoS
- WebCache Aware
- MPLS
- Fair Subtending
- VBR
- CBR
- Priority Queues
- UBR or Frame Only

- ... offers choice of privacy, QoS, flexibility and scalability with IP and/or ATM

---

Copper DSL Infrastructure

IP+ATM Core

---

Support baseband and derived VoDSL
Cisco GlobalDSL—Foundation for New World Services

- Local Voice Services
- Managed Voice and Data VPNs
- Private Line Replacement
- Video Conferencing
- Video-on-Demand
- Internet

IP+ATM MPLS

More Bandwidth = More Services = More Profits

Cisco GlobalDSL Leadership

- Over 10,000 Cisco 6000 DSLAMs installed worldwide; upgradable to IP DSL Switch
- Cisco DSL footprint exceeds one million subscriber ports
- Added 38 new customers in the last calendar quarter of 1999
- Strong growth in U.S. and internationally, including Europe, Asia and Latin America
Cisco IP DSL Switch

- Product Line Strategy
- Product Line Overview
- DSL Network Evolution
- Roadmap
- Feature Summary

Cisco 6000 IP DSL Switch
Product Family

<table>
<thead>
<tr>
<th>Products</th>
<th>Cisco 6015</th>
<th>Cisco 6100 family</th>
<th>Cisco 6260</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markets</td>
<td>N.A. CO, MTU, DLC</td>
<td>N.A. CO</td>
<td>W.W. CO, N.A. MTU</td>
</tr>
<tr>
<td>Applications</td>
<td>- Scalable VPN - Managed firewall service - Consumer entertainment - Voice over DSL - Distance learning</td>
<td>- Scalable VPN - Managed firewall service - Consumer entertainment - Voice over DSL - Distance learning</td>
<td>- Scalable VPN - Managed firewall service - Consumer entertainment - Voice over DSL - Distance learning</td>
</tr>
<tr>
<td>Certification</td>
<td>ETSI and NEBS</td>
<td>NEBS</td>
<td>ETSI</td>
</tr>
<tr>
<td>System Density</td>
<td>24 to 48 Subs</td>
<td>128 to 256 Subs</td>
<td>120 to 240 Subs</td>
</tr>
<tr>
<td>Investment Protection</td>
<td>Common IOS IP+ATM, DSL(ADSL, SDSL, G.shdsl, IDSL) and Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platform Availability</td>
<td>Q3 '00</td>
<td>Shipping</td>
<td>Shipping</td>
</tr>
</tbody>
</table>
Cisco 6160 Chassis

- North American ILECs, IXCs, and CLECs
- 128–256 subscriber density
- Scalable, high-performance ATM architecture
  - OC-3, DS3, nx DS1 IMA uplinks
  - Full CoS/QoS
  - Fairness-based subtending for up to 3,328 subscribers
  - ATM signaling support (SVCs, SPVCs)
- Carrier-class design and compliance
  - NEBS Level 3
- ADSL (CAP and DMT), SDSL, G.SHDSL (planned), IDSL
- Cisco IOS® and Cisco DSL Manager

Cisco 6015 Chassis

- North American and W.W. Small CO, MDU, and DLC
- 24–48 subscriber density
- Scalable, high-performance ATM architecture
  - DS1 IMA, OC-3, DS3 uplinks
  - Full CoS/QoS
  - ATM signaling support (SVCs, SPVCs)
- Carrier-class design and compliance
  - NEBS Level 3 and ETSI-300
- ADSL (CAP and DMT), SDSL, G.SHDSL (planned), IDSL (planned)
- Cisco IOS and Cisco DSL Manager
4x and 8x Line Card Summary

- **4xFlexi**
  - ITU G.992.1, G.992.2, and G.994.1
  - ANSI T1.413 issue 2
  - CAP RADSL

- **4xSDSL**
  - Rates to 1.1 Mbps
  - 2B1Q line encoding

- **8xIDSL**
  - FRF.8 and FRF.9
  - 56–144 kbps

- **8xG.SHDSL**
  - TC-PAM/multi-rate
  - ATM framing

- **8xADSL**
  - ITU G.992.1 (G.dmt), G.992.2 (G.lite), and G.994.1 (G.hs)
  - ANSI T1.413 Issue 2

100% Service Reach without Compromise

No "second-class" citizens in the network

SDSL/IDSL will be replaced by G.shdsl
Cisco IOS Software Overview

- Based on LightStream® 1010 code base
  Advanced and field proven
  Direct port to NI-2 system card
  Advanced ATM QoS and SVC support (UBR, ABR, VBR-nrt, VBR-rt, CBR)
  Added extensions for DSL
- Full-featured ATM service support
  ATM QoS and traffic management
  PVCs, SVCs, soft PVCs
  ILMI and OAM cell support
- MPLS VPN support (CY Q4 ’00)
- CLI and SNMP management

The Cisco 6000 Architecture

- Multirate DSL
  ADSL/SDSL/SHDSL*/IDSL*
  *Available 1H CY ’00
- OC-3, DS3, DS1, DS3, E1, E3
- WAN interface
- 660 Mbps Cell Switch Fabric
- 1 M+ Cell Buffer
- Premium (CBR)
- Medium (VBR)
- Economy (VBR-nrt)
- Standard (UBR)
- Subtend IF
- Port 1
- Port n
- Card 1
- STUC
- Card 3
- xTUC
- Card n
NI-2 Feature Summary

- ATM switch fabric with advanced ATM service support
- Multi-WAN interface support
- Subtending for 3328 ports/system (DSL services)
- Console/craft based
- Redundancy support
- Console/craft
- Cisco IOS software and Ethernet SNMP management
- SNMP agent/MIB support
- System timing and redundancy control
- Alarm relay interface
- Future capability for IP switching and MPLS

Cisco DSL CPE Solutions

- Entry Level
  - SOHO/Telecommuter
  - Bridge/Router
  - Cisco 670
- Residential Partners
  - Intel NIC and USB Modems
- Business Class
  - Small/Med Business
  - Small Branch
  - Cisco 800
  - Cisco 1700 with DSL WIC (Future)
- Small/Med Business_Final
  - Small Branch
  - Cisco 800
  - Cisco 1700 with DSL WIC (Future)
- Enterprise Branch
  - Cisco 2600/3600 with DSL WIC (Future)
  - SDSL with Cisco 633
  - ADSL with Cisco 627/677
- Cisco IOS: Business Class
  - Differentiated classes of service
  - Integrated toll quality voice
  - Business class security and VPN
  - Proven reliability
  - Manageability: Cisco IOS debug, CLI, etc.
Cisco DSL DSU Connectivity

- Multilink PPP:
- Multiply the transport speed of your DSL link
- ADSL—Two Cisco 2600/3600 ATM network modules plus two 627 ATM25/ADSL DSUs
- SDSL—Two serial interfaces plus two 633 serial/SDSL DSUs

Cisco IP DSL Switch

- Product Line Strategy
- Product Line Overview
- DSL Network Evolution
- Roadmap
- Feature Summary
Today’s End-to-End DSL Network

“Subscriber Management” aggregator addresses DSLAM problem with centralized ATM to IP mapping. Creates scaling and management challenge.

End-to-End Service Management

DSL Network Evolution...

Services Scale—Distributes ATM to IP mapping to IP DSL Switch. End-to-end centralized service management. No single point of failure.
Worldwide installed base of 10,000+ Cisco 6000 DSLAMs are upgradable to IP DSL switches

Cisco IP DSL Switch

- Product Line Strategy
- Product Line Overview
- DSL Network Evolution
- Roadmap
- Feature Summary
Product Line Evolution

- xDSL Expansion/Density Increases
- IP+ATM/SLA Feature Expansion
- Management/Platform Feature Expansion
- Service Point Expansion
- Voice Expansion

Cisco IP DSL Switch

- Product Line Strategy
- Product Line Overview
- DSL Network Evolution
- Roadmap
- Feature Summary
Cisco 6000
Signature Features

- Multi-DSL support
  ANSI T1.413, ITU DMT, G.lite, SDSL, G.SHDSL, IDSL

- 100% market reach with multi-POP coverage
  CO, MDU, DLC

- IP routing powered by Cisco IOS
  Scalable and secure MPLS VPN and business class IP services (CQ3 '00)
  Future layer 3/4 support for firewall, QoS, Webcache Aware...

- Mass market standards-based provisioning
  Extensible to 1M+ subscribers
  Automates CPE Config thus enabling rapid customer acquisition
  Integrates with full flow-through provisioning for e2e service provisioning

- Carrier-class ATM switch fabric
  Full spectrum of CoS/QoS to provide SLAs, voice, and video delivery
  Highly scalable SVCs/SPVCs for dynamic service selection
  Fairness-based subtending for cost effective network utilization

- Carrier-class design
  NEBS and ETSI certifications
  Scalable configuration, fault, and performance management

DSL Product Update
Session 2906
Please Complete Your Evaluation Form

Session 2906