



IP + Optical Big Bang Seminar 2001

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Ethernet Access Solution (EAS)

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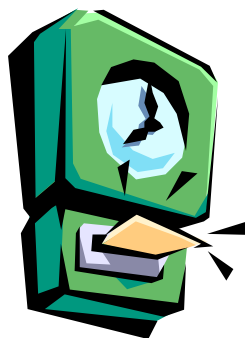
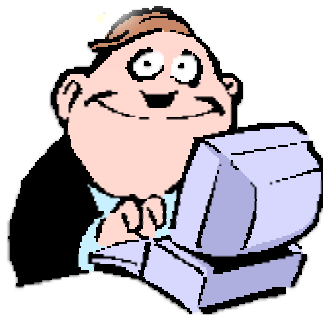
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Agenda

- EAS Choices
- EAS over Ethernet Switch
- Summary

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EAS Choices

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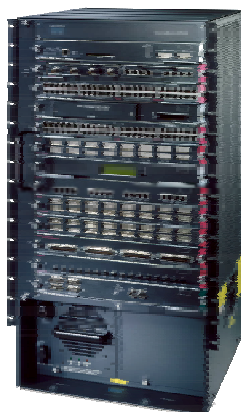
- **Ethernet Switch Solutions**
- **MSPP(Multi Service Provisioning Platform) Solutions**
- **DPT(Dynamic Packet Transport) Based Solutions**

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Ethernet Switch Solutions

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Ethernet Switch Application Positioning

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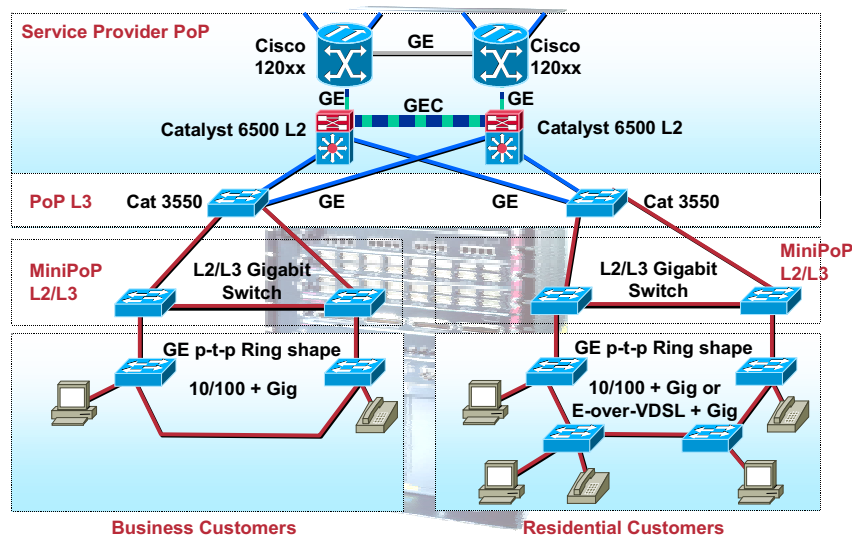
- Supports Data only Application
- Relies on Layer-2 STP for redundancy (no 50ms like protection)
- Today Need Adjunct DWDM for metro fiber relief
- Plug-n-Play
- No Native TDM Services

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Ethernet Switch Applications

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MSPP(Multi Service Provisioning Platform) Solutions

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MSPP(Multi Service Provisioning Platform) Solutions

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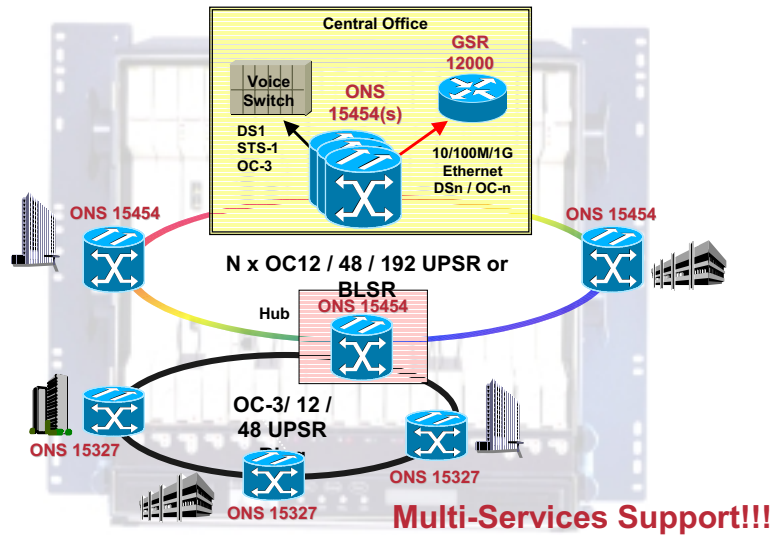
- **Multi-Service TDM & Data Support**
- **SONET/SDH Protection Schemes (BLSR/UPSR,etc.)**
- **Integrated DWDM for Metro Fiber Relief**
- **Radical Economics**
- **Supports Smooth Migration from TDM ->Data Centric Environments**
- **Rapid Service Velocity**

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Supercharged MSPP Networks

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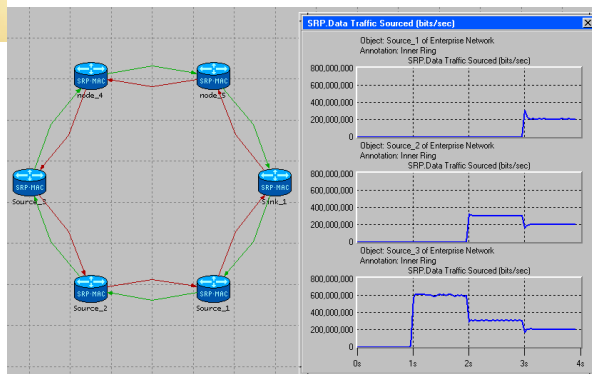


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DPT(Dynamic Packet Transport) Based Solutions

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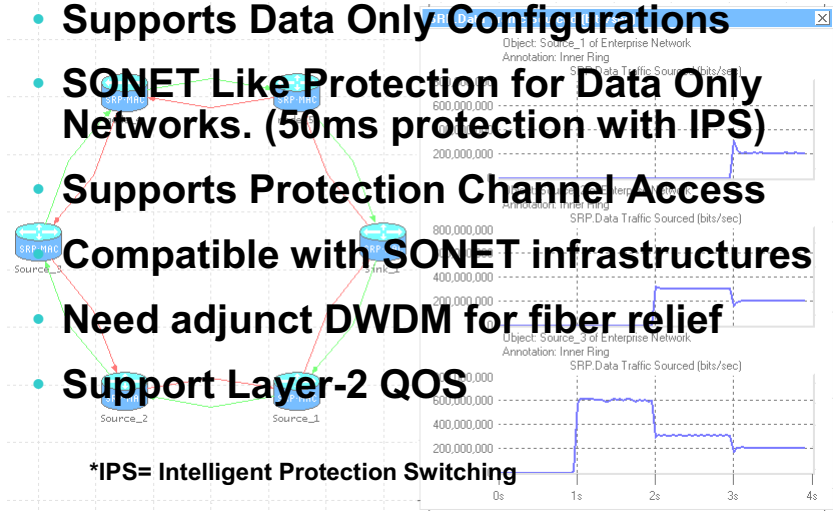
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DTP Positioning

- Supports Data Only Configurations
- SONET Like Protection for Data Only Networks. (50ms protection with IPS)
- Supports Protection Channel Access
- Compatible with SONET infrastructures
- Need adjunct DWDM for fiber relief
- Support Layer-2 QOS

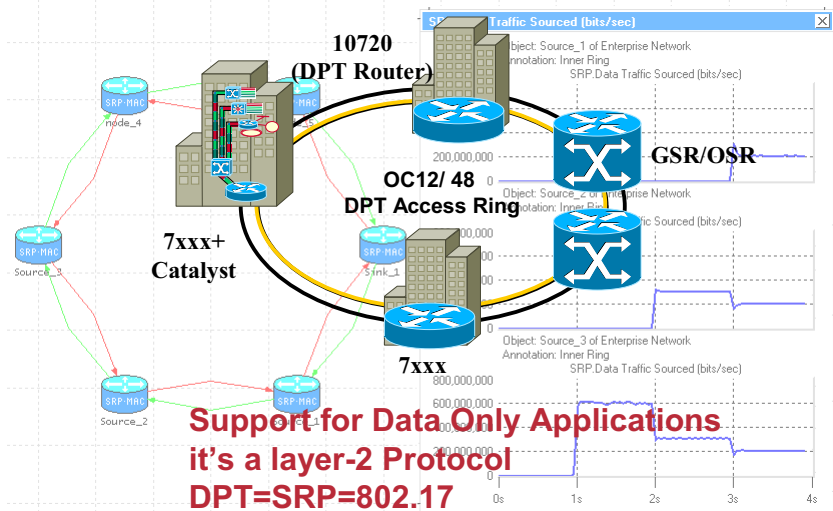
*IPS= Intelligent Protection Switching



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DPT Based Metro's



Support for Data Only Applications
it's a layer-2 Protocol
DPT=SRP=802.17

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Metro Technology Cheat-Sheet

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	MSPP	DPT	Ethernet Switch
Native TDM Support	Yes	No	No
SONET/SDH like survivability	High (<50ms)	High (<50ms)	Low (<sub-second)
Ethernet Support	Yes	Yes	Yes
Internet Service	Moderate	High	High
EAS Service	Yes	Yes	Yes
Ethernet Bandwidth Control	Yes	Yes	Yes

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Metro Technology Cheat-Sheet

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		MSPP	DPT	Ethernet Switch
Bandwidth Utilization		Moderate	Optimal	Moderate
SONET/SDH like survivability		High (<50ms)	High (<50ms)	Low (<sub-second)
Fiber Utilization		High	High	Moderate
Service Efficient	Data Service	Moderate	High	High
	TDM Service	High	Moderate	Moderate
	Traffic and Congestion Control	High	Very High	High

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EAS Solutions Summary

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	MSPP	DPT	Ethernet Switch
서비스 측면	Data, TDM, native Voice 동시 구현에 바람직	Data 전용 서비스	Data전용 서비스
기존 Infra의 확장	기존 TDM망에서 Data서비스 구현 용이	신규 Data망 구축이 필요	신규 Data망 구축이 필요
서비스 안정성	< 50ms 망 복구로 장애 손실 최소화	< 50ms 망 복구로 장애 손실 최소화	< 10 s 망 복구로 장애 대책 제한적
고려사항	<ul style="list-style-type: none"> Multi service에 최적화. 안정적인 EAS 서비스 구현 	<ul style="list-style-type: none"> DPT를 지원하는 장비가 제한적임 인터넷/EAS 서비스 구현 용이 	<ul style="list-style-type: none"> EoMPLS를 통한 TLS서비스 인터넷/EAS서비스 구현 용이
Application	기존의 TDM서비스에 추가로 Data 서비스로 확장하는 SP의 경우	안정적이며, 대규모로 Data서비스를 구축하는 SP의 경우	기존 Ethernet장비를 통한 소규모의 Data 서비스를 구축하는 SP의 경우

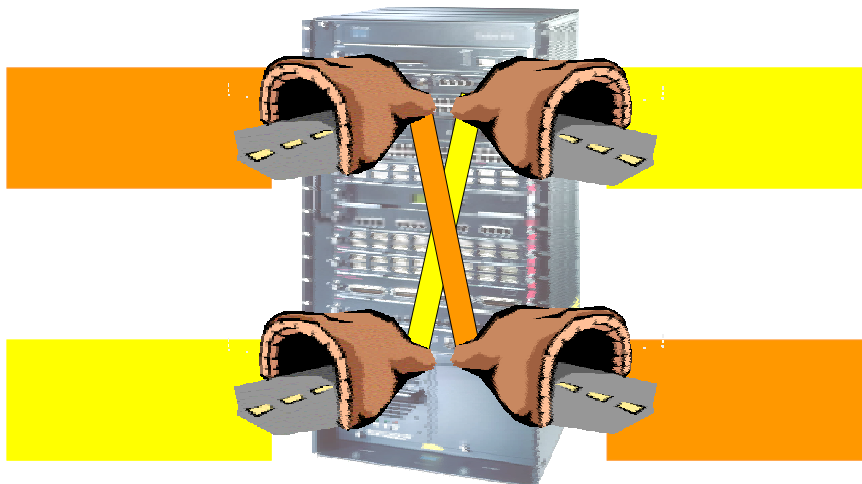
- Customer의 Network환경에 따라서 각각의 Solution이 통합되어 구현이 필요
- Ethernet의 Broad Bandwidth를 활용한 Value-Add서비스 개발이 필요

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EAS over L2

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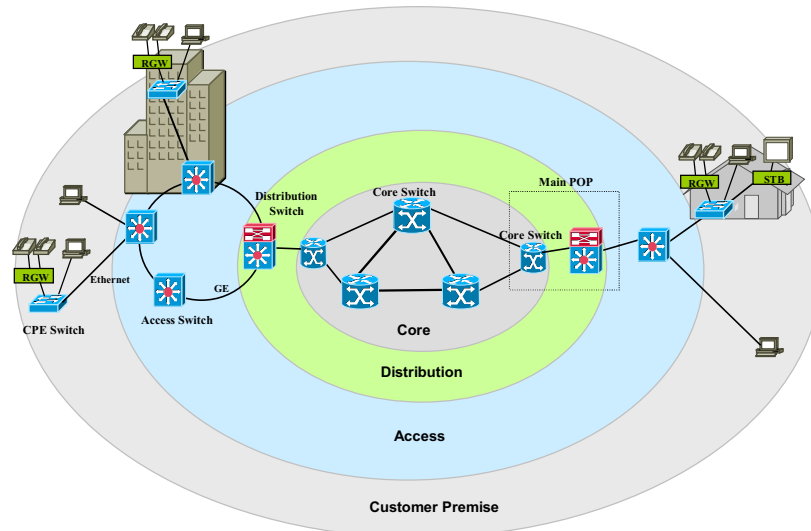


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Generic EAS Architecture

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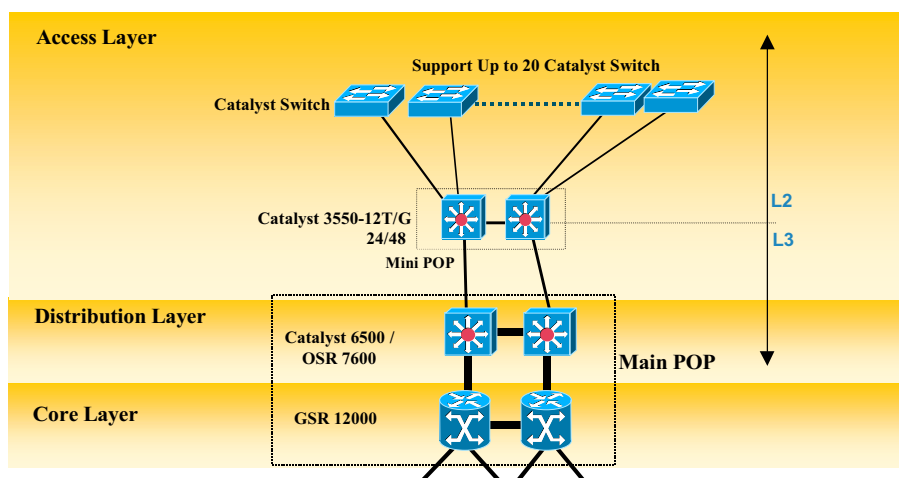


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Hub & Spoke

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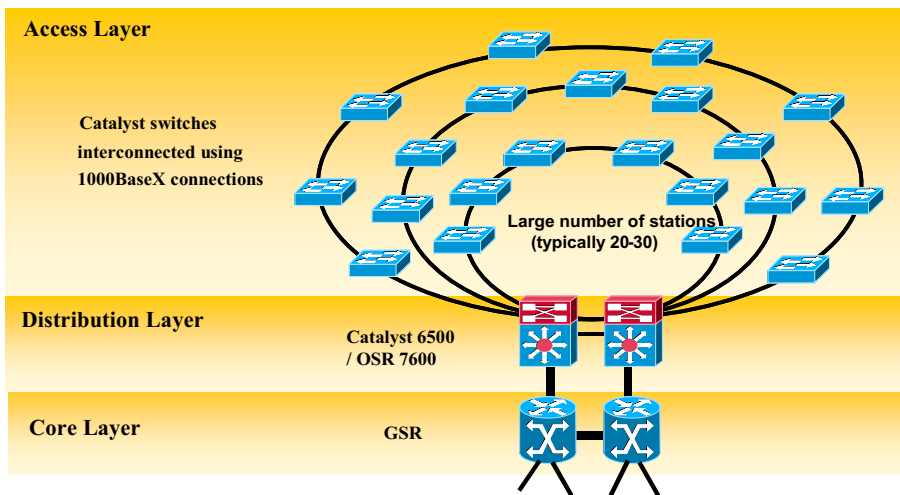


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Layer 2 Access p-t-p Ring shape

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Considerations

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- **Bandwidth utilization.**
- **VLAN Reuse**
- **Flapping by user ports**
- **Convergency**
- **Miss-operations**
- **Security**

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Solution

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➤ Bandwidth utilization.

- ➔ PVST (Per VLAN Spanning Tree)
- ➔ MISTP – IEEE draft 802.1s
(Multi- Instance Spanning tree Protocol)

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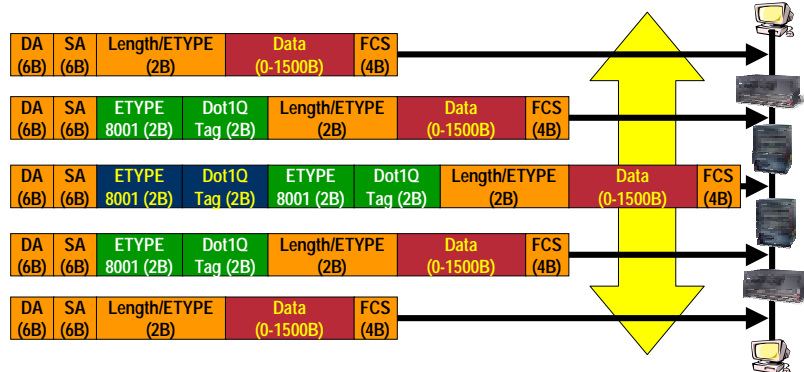
Solution

- 계속 -

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➤ VLAN Reuse.

➔ 802.1Q Tunnelling (802.1Q in 802.1Q)



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Solution

- 계속 -

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➤ Flapping by user ports.

➡ Portfast

➤ Convergency.

➡ Uplinkfast

➡ Backbonefast

➡ RSTP - IEEE draft 802.1w



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Solution

- 계속 -

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➤ Miss-operations.

➡ UDLD (Uni-Directional Link Detection)

➡ Loop Guard

➡ Root Guard



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Solution

- 계속 -

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➤ Security

➔ Secure Shell - Secure telnet



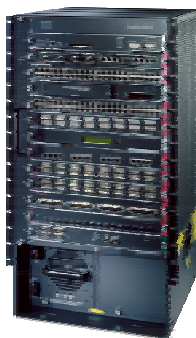
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Catalyst 6513

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13 Slot Chassis



WS-C6513

New Higher Density Chassis

13 Slots (Up to 12 for line cards)

Supports existing line cards

Requires Supervisor 2

Minimum CatOS 6.2 version of software

Supports **NEW SFM2 for 256Gb Crossbar**

Requires 2500W Power Supply as minimum

Supports new 4000W power supply

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SFM2

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Switch Fabric Module



WS-X6500-SFM2

Single Slot Module

Must sit in slot 5 or 6 (6506/6509)

Must sit in slot 7 or 8 (6513)

Enables 256Gb Crossbar

2 x 8Gb traces to each line card (6506/6509)

1 x 8Gb trace to slots 1-8 (6513 only)

2 x 8Gb traces to slots 9-13 (6513 only)

X3 Over-speed

Ingress and egress line rate buffering per trace

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CatOS 6.x Summary

Catalyst 6500



Catalyst OS 6.1

2 port OC12 POS
OSM
4 port OC12 POS
OSM
8 port OC3 POS
OSM
16 port OC3 POS
OSM
Supervisor 2
SFM
WS-X6516-GBIC
WS-X6381-IDS

Hardware

CEF for PFC2
Jumbo Frames
Etherchannel enhancements
VMPS Server
4096 VLAN's
Reduced MAC address usage
MISTP
STP Rootguard
Dot1Q Tunnelling
Private VLAN's and enhanced ACL's
Secure Shell (SSH)
Console Login Limit
IOS like Ping
L2 Traceroute
Write Tech Support

Software

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CatOS 6.x Summary

Catalyst 6500



Catalyst OS 6.2

<p>WS-C6513 (13 Slot Chassis)</p> <p>WS-X6500-SFM2</p> <p>WS-X6516-GE-TX</p> <p>WS-X6548-RJ45</p>	<p>QoS Minimum Threshold for WRED</p> <p>QoS Queuing for port type 1p1q0t and 1p3q1t</p> <p>Non RPF MPD</p> <p>Multicast Suppression for GE Modules</p> <p>QoS Data Export</p> <p>VACL Logging of Access Denied</p> <p>Bi-Directional VACL for Private VLAN</p> <p>TCAM Test on boot up</p> <p>Per port utilisation of QoS Statistics</p> <p>Dynamic VLAN for Auxiliary VLAN's</p> <p>BPDU Packet Filtering</p> <p>BPDU Skew Detection</p> <p>Loop Guard</p> <p>Local Command Accounting</p> <p>Core Dump for Debugging</p> <p>New MIBS</p>
Hardware	Software

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CatOS 6.x Summary

Catalyst 6500



Catalyst OS 6.3

<p>No New Hardware</p>	<p>Policy Based Forwarding</p> <p>Private VLANs on sc0</p> <p>System Warnings on Port Counters</p> <p>Etherchannel enhancements</p> <p>Text File Configuration Mode</p> <p>Support for Netflow V8</p> <p>CDP Enhancements</p> <p>Increased QoS ACL</p> <p>Ethernet Link Debounce Timer Feature</p> <p>SNMP V3</p> <p>New MIBS</p>
Hardware	Software

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Software Feature Set



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- **3550-12T**

Boot as Layer 2 device and has same feature set as current 3508G XL running 12.0(5) XU

Plus DTP, PAgP, BPDU Guard and Backbone Fast

Plus 1K VLAN, IGMP Snooping and VACL

Plus Aggregate QoS (L2-L4 Classification, Ingress and Egress Policing , Marking, 4 egress queues with WRR and WRED)

Plus IP Unicast Routing (RIP v1 and 2, OSPF, IGRP, EIGRP) and Multicast Routing (PIM, DVMRP Tunneling, CGMP Server) via SVI and Routed Port

Plus RACL Support and HSRP

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Summary

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EMPOWERING THE INTERNET GENERATIONSM

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