Intelligent Switch Solution (ISS) NOS

# Overview

CapGemini Engineering’s Intelligent Switch Solution (ISS) is a comprehensive NOS (Network Operating System) for a variety of applications using Ethernet switching, IP routing, MPLS transport, SDN (Software Defined Networking), Telemetry, Timing and Synchronization. It facilitates equipment manufacturers and network administrators to include these standard capabilities in their devices and networks rapidly. The software allows users to focus on advanced network automation and service rollouts, by removing the barriers in assembling standard networking capabilities using custom designed or white box hardware. The truly disaggregated, hardware agnostic and platform agnostic architecture, proven over years in the market, provides an interoperable, mature and stable platform to build advanced networks with.

**Wide ecosystem**

CapGemini works with a variety of partners towards a competitive and vibrant ecosystem to offer the best value to the leaders and innovators in networking. Current partners include:

White box collaborations

* Broadcom
* Intel
* Marvell
* RealTek

ASIC collaborations

Supported CPUs

* Alpha
* Delta
* Edgecore
* Inventec
* Pegatron
* Ufispace
* Wistron
* Zyxel
* ARM
* MIPS
* PowerPC
* X86

**Target applications**

A wide range of network elements have been created and deployed using the software, including the following.

|  |  |
| --- | --- |
| * Carrier Ethernet and Metro Ethernet devices | * Industrial Ethernet switches |
| * Cellular / mobile backhaul, cell site routers | * Optical transport |
| * Packet microwave switches / routers | * Secure routers, VPN / security gateways |
| * Campus, Datacenter and Enterprise switches | * OLT, BNG |

**Disaggregated solutions for specific network applications / deployments**

CapGemini continually creates application specific variants to further accelerate innovation and time to deployment. Current application specific variants for disaggregated networking solutions include:

* Broadband Network Gateway (BNG / vBNG)
* CU router / DU router / vRouter
* Datacenter leaf / spine / ToR switches
* Disaggregated Cell Site Gateway (CSG / CSR)
* Fronthaul Gateway
* Optical Line Termination (OLT / vOLT)

The software has a comprehensive set of features including the following. Select features are available integrated on specific select white box or reference hardware models.

Ethernet switching

Traffic management

Switch / router management and base infrastructure

* L2, L3 and L4 ACLs
* Traffic filtering
* Rate limiting, Storm control, Flow control
* QoS – metering, marking, queuing, shaping, 802.1p, DiffServ, traffic prioritization, H-QoS
* QoS profiles
* PCP
* OpenFlow
* Transparent bridging, 802.1Q VLANs
* RSTP, MSTP, PVRST+
* Link aggregation, LACP, MC-LAG
* 802.1x authentication
* IGMP snooping, filtering, proxy, MLD snooping
* LLDP, LLDP-MED
* GARP, GVRP, GMRP
* MRP, MVRP, MMRP
* DHCP snooping
* IP source guard, ARP guard, IPv6 RA guard
* Root guard, BPDU guard
* Loop prevention
* CLI (console, Telnet, SSH)
* SNMP (v1, v2c, v3), full MIB support
* Netconf, Yang models for all features
* Configuration persistency
* Software upgrade with SFTP or TFTP
* Syslog, Email alerts
* TCP/IP IPv4 & IPv6, UDP, ARP, ND, ping, traceroute
* DHCP client, server, relay – IPv4 & IPv6
* DNS client – IPv4 & IPv6
* Radius based authentication - IPv4 & IPv6
* Tacacs+ based authentication - IPv4 & IPv6
* RMON, DSMON
* IP authorized managers
* System resource monitoring
* Uplink failure detection, Link up delay
* OpenFlow
* Switch stacking and switch / router redundancy

Timing and synchronization

* IEEE 1588v2 PTP, 802.1AS
* SyncE
* Time of Day, Frequency & Phase synchronization
* Transparent Clock
* Boundary Clock
* ITU-T G.8273.2, G.8273.3
* NTP – client, server, IPv4 & IPv6
* SNTP – client server, IPv4 & IPv6

Data center bridging

* Priority flow control
* Enhanced transmission selection
* Congestion notification, Pause flood
* DCBX – IEEE, CEE
* TRILL
* FIP Snooping
* Ethernet virtual bridging

Carrier Ethernet

* MEF management, CE 2.0
* E-LAN, E-Line, E-Tree, P2P & P2MP EVCs
* Provider bridging, Q-in-Q
* Ethernet OAM 802.3ah
* Ethernet CFM 802.1ag, Y.1731
* G.8031 path protection, G.8032 ring protection
* ELMI, L2GP
* PBB, PBB-TE
* RFC 2544 performance test
* Y1564 service activation test

Cyber security and network security

* 802.1x authentication
* Radius and Tacacs+ based auhentication
* User privilege levels, authorization
* DoS attack protection, stateful firewall
* IPSec, IKE
* IP authorized managers, secure management
* Root guard, BPDU guard

MPLS

IP / routing

* IPv4 & IPv6 static routing
* IS-IS – IPv4 & IPv6, graceful restart
* BGP – IPv4 & IPv6, graceful restart
* OSPFv2, OSPFv3, graceful restart, OSPF-TE
* Authenticated router neighborship
* Route redistribution, route maps
* Policy based routing
* IPv4 multicast – IGMP v1/v2/v3, PIM-SM, PIM-SSM, DVMRP, MSDP
* IPv6 multicast – MLD v1/v2, PIM-SM, PIM-SSM
* Router ports
* Virtual routing
* VRF
* VRRP router redundancy – IPv4 & IPv6
* BFD – per IP destination or routing protocol peer
* IP-MPLS, MPLS-TP
* Provisioned LSPs & pseudowires (sans signaling)
* LDP, T-LDP
* RSVP-TE
* Fast ReRoute
* P2P and P2MP provisioned LSPs
* L2VPN, PWE3, VPWS, VPLS, BGP auto discovery
* L3VPN, BGP MPLS VPN
* MPLS-TP OAM – BFD, Y.1731, VCCV, LSP ping
* MPLS-TP resiliency – end-to-end path protection and instant recovery
* MPLS PM – LM / DM

Segment Routing

Network virtualization and overlays

* VxLAN, EVPN
* L2TPv3
* Segment routing with MPLS datapath (SR-MPLS)
* OSPFv2 extensions for segment routing
* OSPFv3 extensions for segment routing
* IS-IS extensions extensions for segment routing
* LFA, R-LFA
* L2VPN services over segment routed paths
* L3VPN services over segment routed paths

**Revision History**

| Ver. No: | Date of Issue | Author | Approver | Remarks |
| --- | --- | --- | --- | --- |
| * 1.0 | * 15.05.2002 | * GGourishankar |  | * Original version |
| * 2.0 | * 8.08.2002 | * Sreela K |  | * Updated to new combined logo template |
| * 3.0 | * 24.12.2002 | * Sreela K |  | * Updated Tel no, Fax no & Mktg Text. |
| * 4.0 | * 26.02.2003 | * Ganesh S * Sreela K |  | * Updated by Ganesh. * Authorized document. |
| * 5.0 | * 17.05.2003 | * Rajesh Kumar |  | * Corrected BGP RFC from 1777 to 1771. Included ethernet mib support in table. |
| * 6.0 | * 11.08.2003 | * Varadarajan S * Sreela K |  | * FS is updated for 802.1v & SSL/SSH * Authorised document |
| * 7.0 | * 18May04 * 18.5.2004 | * GaneshS * Regina Grace |  | * Updated Feature sheet to reflect:  1. new positioning statement 2. Modified the language of the key benefits 3. Introduced a section on Target Applications 4. Modified the Feature Details section to reflect the correct details of the features we support in the product 5. Added a new component architecture diagram  * Authorized Document (updated the release number from 2.4.0.14 to 2.4.1.0 & release date changed to 16th July 2004) |
| * 8.0 | * 25.10.2004 | * Rajesh Kumar * Regina Grace |  | * Updated for SNMPv3 support * Changed to the new logo “FutureSoft – Transforming Networks” – A Flextronics Company * Authorized document |
| * 9.0 | * 1.3.2005 | * Rajesh Kumar |  | * Updated for release 3.0.0.0 |
| * 10.0 | * 28.03.2005 | * Regina Grace |  | * Changed FCS Address. |
| * 11.0 | * 7.06.2005 | * Raj Jayaram * Neela Priya * Regina Grace |  | * Updated for Release 3.1.0.0. * Authorized document |
| * 12.0 | * 4/08/2005 | * Regina Grace |  | 1. Changed to Flextronics Logo 2. Applied the coloured band 3. Updated footer text to “FSS Confidential” 4. Removed SDD from the deliverables list 5. Changed the address – Flex Gurgaon  * Authorized document |
| * 13.0 | * 5/9/2005 * 8/9/2005 | * Neela Priya/Vanitha * Rajaj |  | * Updated for RIPv6 /OSPFv3 * Updated for other features in Rel 3.2.0.0 |
| * 14.0 | * 13/3/2006 | * S. Rajesh Kumar * Krithikal * Regina Grace |  | * Updated for Rel 4.0.0.0 * Documentation Review done * Authorized document |
| * 15.0 | * 6/6/2006 | * Regina Grace / RajeshKumar |  | * Changed Monta Vista Hard Hat Linux to Monta Vista Linux. * Authorized document |
| * 16.0 | * 4/7/2006 * 7/7/2006 | * Saravanan M * KalaivaniG |  | * Included MPLS Component * Documentation Review done. |
| * 17.0 | * 27/7/2006 | * Krithika L |  | * Documentation Review done (for the entire document) |
| * 18.0 | * 19/10/2006 * 7/11/2006 | * S. Rajesh Kumar * Krithikal L * Regina Grace |  | * Updated for release 5.0.0.0 – addition of provider bridging, high availability and multiple instances features * Documentation Review Done * Authorized document |
| * 19.0 | * 09/10/2007 * 26.11.2007 * 28.11.2007 | * S. Rajesh Kumar * Varalaksshmi.CV * Varalaksshmi.CV | * Regina Grace * Regina Grace | * Updated for release 5.2.0 – addition of ECFM, ELMI and LLDP * Reviewed the updates. * Formatted the document. |
| * 20.0 | * 12.09.2008 * 06.03.2009 | * Rajesh Kumar * L.P.Navaneethan * Rajesh Kumar * S.Muralidaran | * Regina Grace | * Updated for Rel 6.1.0 * Reviewed the updates, formatted and converted the doc to PDF. * Updated for Switch stacking support * Formatted and converted to PDF. |
| * 21.0 | * 11-May-2009 | * Regina Grace / Maha |  | * Updated the doc for the following: * Correction of the PBB standard as 802.1Qay * Reference to RMOnv2 and DSMON in the diagram and feature details list. * Ethernet EOAM to be set as Y in the Workgroup and N for Metro * xCAT Marvell to be updated for the Silicon Reference Platform |
| * 22.0 | * 13-Apr-2009 * 04-Jun-2009 | * Rajesh Kumar * S.Muralidaran |  | * Updated for Rel 6.2.0 * Reviewed the updates, formatted and converted to PDF. |
| * 23.0 | * 7-Sep-2009 * 25-Sep-2009 * 25-Sep-2009 | * Rajesh Kumar * Regina Grace * Rajesh Kumar * S.Muralidaran |  | * added linear protection switching, ring protection switching, priority flow control and enhanced transmission selection; modified “port mirroring” to “traffic mirroring * Reviewed the document * Updated for minor corrections. * Reviewed the updates. |
| * 24.0 | * 30-Sep-2009 | * Rajesh Kumar |  | * Updated to be in sync with 620 feature. |
| * 25.0 | * 31-Dec-2009 | * Rajesh Kumar |  | * Updated for system resource monitoring, PTP, DCBX. * Changed chassis management to multi board system management |
| * 26.0 | * 14-June-2010 | * Rajesh Kumar |  | * Added datacenter bridging features – CN and DCBX * Added MPLS-TP features – protection switching, BFD, VCCV and LSP-Ping * Added MLDv2 feature * Changed all Enterprise features as Y is Metro column, since ISS-Metro will henceforth be a superset containing all Enterprise features also. |
|  | * 13-July-2010 | * Deepika Datta |  | * Language & Format Reviewed |
| * 27.0 | * 16-Sep-2010 * 27-Sep-2010 | * Rajesh Kumar * Navaneethan |  | * Added IS-IS feature in hot standby redundancy row * Added row for private VLAN feature * Added row for MPLS – static provisioning of H-LSP, multi segment pseudowire and point to multipoint LSP * Language reviewed, formatted and converted to PDF |
| * 28.0 | * 17-Jan-2010 | * Rajesh * Deepika/TWG |  | * Updated Ref. Platform info for Intel x86 instead of Pentium * Updated Architectural Diagram to include: * DCBX,Congestion notification, MPLS-TP, LSP-Ping, OAM (BFD, Y.1731), IP security – IKE, IPSec, intrusion detection,stateful firewall,NAT,MSDP,IEEE 1588(PTP) * Updated Feature Details table for: * Metro E package details * Advanced layer 2 switching updated for Y.1731 * Added IP Security & Media Interfaces feature details * Reviewed and updates made to baseline document |
| * 29.0 | * 14-Feb-2011 * 18-Feb-2011 | * Rajesh Kumar Sundararajan/ Kalaiselvi K * Sabna.P.K |  | * Added DNS client feature. * Added “Syslog – email alerts with authentication support” feature. * Reviewed and converted to PDF. |
| * 30.0 | * 9-Mar-2011 * 14-Mar-2011 | * Rajesh * Deepika/TWG |  | * Added IS-IS in the text box for “Layer 3 suite” in the block diagram * Removed “Y” in the cells for the routing features under the Metro column * Reviewed and updates made to baseline document |
| * 31.0 | * 30-May-2011 * 3-Jun-2011 | * Rajesh * Deepika/ TWG |  | * Removed Y from Metro column for IPSec, IKE, Stateful firewall, IDS * Removed Y from Metro column for datacenter bridging features * These are to be present in ISS-Enterprise and ISS-Metro\_E but not in ISS-Metro. * Updates reviewed.. & baselined. |
| * 32.0 | * 2-Aug-2011 * 03-Oct-2011 | * Rajesh Kumar Sundararajan/ * Sabna. P.K |  | * Added hitless restart support. * Added more applications that ISS can be used for. * Added a new section for high availability, redundancy and resilience. * Updates reviewed and baselined. |
| * 33.0 | 03-Nov-2011  08-Nov-2011 | Rajesh Kumar Sundararajan  Sabna. P.K |  | Updated for GMPSL and TRILL   * Updates reviewed.. & baselined. |
| * 33.1 | * 02-Dec-11 | * Pradeep P | * - | * Migrated to New Aricent Template |
| * 34.0 | * 29-Dec-2011 | Muthulakshmi V   * Sabna. P.K | * Rajesh Kumar Sundararajan | * Updated for PIM-Bidirectional, Telnet client and SSH client. * Updated to clarify Radius & Tacacs+ support for IPv4 & IPv6. * Updated to clarify DNS client support only for IPv4. * Updates reviewed.. & baselined. |
| * 35.0 | * 28-Feb-2012 | * Manjunatha GR * Sabna. P.K | * Jeeva Sethuraman | * Updated for Distributed LAG and Multi-chassis lag feature support in LA. * Updates reviewed and baselined. |
| * 36.0 | * 13-Mar-2012 | * Rajesh Kumar Sundararajan * Sabna. P.K | Muthulakshmi V | * Added support for MEF 6.1, MEF 10.2 and Wintegra. * Updates reviewed.. & baselined. |
| * 37.0 | * 14-May-2012 | * Gnanapriya S * Sabna. P.K | Varadharajan. P | * Added support for Clear configuration. * Updates reviewed.. & baselined |
| * 38.0 | * 07-Aug-12 | * Pandi Priya S * Manisha Maheshwari (TWG) | Jeeva Sethuraman | * Updated for G8261 test simulator enhancement * Updates reviewed & baselined |
| * 39.0 | * 03-Oct-12 | * Deepika/TWG | Rajesh Kumar Sundararajan | * Removed row from IP security section – Intrusion detection (signature based) * Removed intrusion detection from architectural diagram |
| * 40.0 | * 08-Jan-13 | * Manisha/TWG | Rajesh Kumar Sundararajan/ Varadharajan Parthsarathy | * Updated for SyncE Feature * Removed row from Basic Layer 2 Switching section – PTP Test Simulator |
| * 41.0 | * 12-Feb-13 | * Rajesh Kumar Sundararajan * Manisha/TWG | Muthulakshmi. R | * Updated for BGP and TCP virtual routing support * Updates reviewed & baselined |
| * 42.0 | * 21-May-13 | * Kishore * Deepika | Kalimani | * Link Layer Discovery Protocol – LLDP updated as Link Layer Discovery Protocol – LLDP (v1,v2) |
| * 43.0 | * 15-Jul-13 | * Muthulakshmi R * Manisha Maheshwari (TWG) | Kalimani Venkatesan G | * Updated for Redundancy support in L3 modules ( BGP, RIPv2/RIPng, ARP, RTM, ND6,VRRP,RTM6, IGMP, IGMP-PROXY) * Updates reviewed and baselined |
| * 44.0 | * 18-Sep-13 | * Sunil Manohar Pradhan   Sudeepta Ray   * MLV * Lija Nair (TWG) | Sudeepta Ray  Kalimani | * Updated for BFD for IPv4 and OSPF v2 Single Hop; * Updated for Openflow.; * ELPS RFC 6378 support added * Updates reviewed and baselined |
| * 45.0 | * 11-Dec-13 | * Vathsala Narayanan. | Kalimani Venkatesan G | * DPRF id:Dec017 RFC 64718 * Added Dual Unit Stacking and Redundancy support for VLAN (excluding PB), RSTP/STP, MSTP, PVRST, IP/RTM, PNAC, VCM, LA and OSPF |
| * 45.1 |  | * Singaravelan M. | Kalimani Venkatesan G | * Updated ISS System feature sheet to include Metro and Metro\_E support for clearconfig |
| * 46.0 | * 5-Feb-14 | * Senthil Guruswamy | Sudeepta Ray | * Updated for VPNv4 route support for VPN service |
| * 6-Feb-14 | * Pradeep P | - | * Updates Reviewed and baselined |
| * 46.1 | * 12-Dec-13 | * K.Kalaiselvi | Senthil Gurusamy | * Updated for BGP BFD, BFDv6. |
| * 12- Feb-14 | * Lija Nair (TWG) |  | * Updates baselined |
| * 47.0 | * 21-Feb-14 | * Neeraj Bansal | Sudeepta Ray | * Updated for VPLS Auto-Discovery and Signaling feature |
| * 27-Feb-14 | * Pradeep P | - | * Updates reviewed and baselined |
| * 48.0 | * 28-Feb-14 | * Saravanan Narasimhan | Kalimani Venkatesan G | * Updated for VRRPv3 |
| * 17-Mar-14 | * Vathsala Narayanan | Kalimani Venkatesan G | * Updated for Dual Stacking feature |
| * 21-Mar-14 | * Gnana Priya S | Kalimani Venkatesan G | * Updated for Redirect Action support in L2/L3 ACL’s, Out filter support extended for L2/L3 ACL’s |
| * 20-Mar-14 | * Pradeep P/ Manisha Maheshwari | - | * Updates reviewed and baselined |
| * 49.0 | * 21-Mar-14 | * Sunil Manohar Pradhan | Kalimani Venkatesan G | * Updated for BFD High Availability Feature. |
| * 25-Mar-14 | * Pradeep P | - | * Updates reviewed and baselined |
| * 50.0 | * 03-May-14 | * Dhivya Vijayakumar | Kalimani Venkatesan G | * Updated for Dual Node Stacking |
| * 12-May-14 | * Pradeep P | - | * Updates reviewed and baselined |
| * 51.0 | * 23-May-14 | * Sunil Manohar Pradhan | Kalimani Venkatesan | * Updated for M-ISIS feature |
| * 28-May-14 | * Pradeep P | - | * Updates reviewed and baselined |
| * 52.0 | * 18-Jul-14 | * Varadharajan P | Kalimani Venkatesan | * Updated for ISS 7.2.0 release * Removed M-ISS from the feature list * DNS client – IPv6 (RFC 3596) * ND proxy (RFC 4389) * Dual unit sacking support & IPv6 applications CFA, ND, RTM6, ECMP for static IPv6 route, ICMPv6, DHCPv6 relay(stateless), SNTP for IPv6, SNMP for IPv6, Syslog for IPv6, TACACS+ for IPv6, RADIUS for IPv4/v6, * Static MPLS (VPWS) – IPv4, Static MPLS (VPLS) – IPv4 * BFD for IPv4/IPv6, BFD for OSPFv2 * ACL, QoS on Alta with SDK 3.3.5 |
| * Pradeep P | - | * Updates reviewed and baselined |
| * 53.0 | * 19-Nov-14 | * Varadharajan P | Kalimani Venkatesan | * Updated for ISS 7.3.0 release * VXLAN Feature Control Plane * Dx167 * Y.1564 (ESAT) * ISIS/M-ISIS HA * PIM Enhancements * Redistribution of routes added through DHCPv6PD * DU Stacking Testing for L3 Features * BFD for OSPFv3 * PPPoE Client, Server Integration * BFD for LDP (IPv4, IPv6) * VPLS Graceful Restart (IPv4, Ipv6) * VPWS with LDP (IPv4, IPv6) * LDP Graceful Restart (IPv4, Ipv6) * HA/Redundancy – LDP for VPWS & BGP for L2VPNs * Dual Stacking – MPLS (IPv6) * IPv6 support for MPLS – LDP |
| * 54.0 | * 16-Apr-15 | * Abirama Sundari S/ Abiramesundari T |  | * Updated for porting Vitesse (Serval2) integration * Updated for OSPFv3 AT Feature * Removed protocol list from the Dual Unit Stacking row item |
| * 55.0 | * 24-Jul-15 | * Vathsala N/ Vijayendiran G/ Abirama Sundari/ Gaurav Agarwal/ Varadharajan P/ Ravi Gupta | * Varadharajan P/ Kalimani Venkatesan G/ Saro Velrajan | * updated for LINUX IP VRF support (OSPF, DHCP, BGP, IPv4 annd IPv6 Static Routes * updated Re-distribution of secondary routes via OSPF and M-ISIS * Updated for UFD and Split horizon feature * Updated for RFC 4762 (VPLS) * Updated for MC-LAG feature * Updated for BFD-IS-IS feature * Updated for Netconf |
| * 56.0 | * 14-Dec-15 | * Jeeva S/ Anusha Mule/ Subbu/ Sakthimai/ Gnana Priya/ Rajesh Kidambi | * Varadha | * Updated for MCLAG on VLAN, PB, IGS, LLDP, ERPS, ECFM * Updated for LLDP MED * Updated for AD feature * Updated for EVPN feature * Updated for Katana2 & Triumph3 claimed features * Updated for Intel RRC |
| * 57.0 | * 22-Apr-16 | * Varadharajan P | * - | * Updated for the following features; (12797) * Katana2 – Phase3a features – Added chipsets for which porting is done in XGS family * Triumph3 – Phase3b features – Added chipsets for which porting is done in XGS family * RFC 2544 * Y1564 * MCLAG – L3 * Multihop BFD RFC 5883 * FIPS Snooping * CEE * EVB * HVPLS * VPLS Resiliency |
| * Gaurav Agarwal | * Kalimani | * Updated for MCLAG, LSP Re-Optimization (13411) |
| * Sudipta Das | * Kalimani | * Static L3vpn (13721) |
| * Sunil Manohar Pradhan | * Varadha | * Updated for Dynamic Host Name RFC 5301 (14098) |
| * Sethupathy N | * Varadha | * Updated for RFC2544 and Y.1564 (13106) |
| * Pradeep | * - | * Reviewed, formatted and baselined. |
| * 58.0 | * 20-Jul-16 | * Arundathi | * Varadha | * Updated for CLI based Config Save Restore feature (Bug: 16366) |
| * Santhiya M |  | * Updated for L2TPv3 feature (Bug: 15719) |
| * Pradeep | * - | * Reviewed, formatted and baselined. |
| * 59.0 | * 3-Aug-16 | * Abirami Raja/ Gnana Priya/ Siva Shalini/ Sanjay | * Varadha | * Updated for the following features; * FSB. (17260) * PCP - QoS Enhancements - 5P3D implementation – Phase 2 (17254) * Router Port Over LAG for BGP and OSPF () * LM & DM RFC6374 * IGMPv2 SSM (17494) * RIP Secondary IP (17596) |
| * 60.0 | * 10-Mar-17 | * Sathya * Divya Vij/ Utkarsh Malik * Uma Maheshwari * Varadha * Aravinda | * Varadha | * Updated for the following; * LM DM phase 2 (20030) * MPLS Support over Router Port over Link Aggregated Ports (22159) * Updated for poncat3 * Corrected Syslog client claim in metro and metro\_e confirmed by Rajesh * Changed Package details; * Multi board system management * Priority flow control * Enhanced transmission selection * Congestion notification * Datacenter Bridging Exchange protocol (DCBX) – IEEE,CEE * TRILL – Rbridge management and provisioning * TRILL – Rbridge control protocol – ISIS extension * MPLS -– static LSPs, LDP, T-LDP, RSVP-TE, PWE3 VCs for L2 VPNs (VPWS), * MPLS – static provisioning for Hierarchical-LSP, Multi Segment Pseudo Wire, Point to Multi Point LSP * MPLS – resiliency – LDP, T-LDP ,Graceful restart, RSVP-TE Graceful restart, redundant pseudowires / RSVP-TE LSPs with protection switching and Re-optimization * GMPLS – RSVP-TE signaling extension, OSPF-TE routing extension, TELM (Traffic Engineering Link Management) * MPLS-TP – OAM – BFD, Y.1731 * MPLS-TP – OAM – VCCV * MPLS-TP – OAM – LSP-Ping * MPLS-TP – resiliency – Linear protection switching * Static VPLS – Ethernet switching over MPLS pseudowires * VPLS Auto-Discovery And Signaling (using BGP) * TTL Processing in MPLS Network * Pseudowire Redundancy for AC and PE Protection, Extension to PW Control Plane to support PW Redundancy * Added: * DHCP Snooping * IP Source Guard |
| * 62.0 | 16-Nov-18 | Ashok Kumar P | * Umamaheswari Muthumalai / Varadha | * Updated for the following: [Bug 34973] * Sub Interface IPv6 * MPLS QoS * Black Hole Static Route   Updated chipsets:   * Alleycat3   Removed   * CLI based Save and Restore * Experimental version note from NETCONF |