

Alcatel-Lucent 5620

SERVICE AWARE MANAGER | RELEASE 9.0 R3

RELEASE DESCRIPTION

3HE 06473 AAAC TQZZA Edition 01

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RELEASE 9.0 - AT A GLANCE

Target Schedule

Four releases with new content are planned.

9.0 R1 - April 20, 2011

- Nodal Program Support: 7x50 9.0R1, 7705, 9500, 7210, OMNI, 9412, eNodeB, 7750 MG, 9471 MME, 5780 DSC
- NSM content
- Platform Applications & New GUI Framework for Usability
- Scale @8.0 Limits & Long Lead Scale & Architecture work
- CPAM 5.0

9.0 R3 - July, 2011

- 1830 PSS-32/16 release 2.5 and 2.5.1, 3.5, 3.5.1, 3.5.2
- 1830 PSS-4 release 1.5
- 1830 PSS-1 GBEH release 2.5, 2.5.1, 2.7
- 1830 PSS-1 MD4H release 1.5, 1.7
- 1830 PSS-1 AHP release 1.0
- 5620 SAM Application and Security enhancements

9.0 R5 - October, 2011

9.0 R7 - January, 2012

There will also be maintenance releases scheduled in between content releases throughout the year.

Network Element Support

Please see the *5620 SAM Network Element Compatibility Guide* for information on release compatibility.

Feature List

The following table lists all candidates and committed nodal and NMS functionality to be supported in 5620 SAM along with expected target releases.

Note: This view is subject to change. Content targeted for releases later than R5 is not yet committed. View as of July 14, 2011. Ask your regional representative for an updated view if required.

Rel	Load	Feature Description	Status	Node Number	Node Rel	Node Load	Completed
Nodal Features							
9.0	R1	L2 uplink support on SAS-M. Requires 3.0 R2.	Committed	7210	3.0	R2	TRUE
9.0	R1	QOS support for L2 uplink on SAS-M. Requires 3.0 R2.	Committed	7210	3.0	R2	TRUE

9.0	R1	IGMP Snooping support for L2 uplink on SAS-M. Requires 3.0 R2.	Committed	7210	3.0	R2	TRUE
9.0	R1	802.1ag and EFM support on L2 uplink on SAS-M. Requires 3.0 R2.	Committed	7210	3.0	R2	TRUE
9.0	R1	IP interface support on L2 uplinks on SAS-M. Requires 3.0 R2.	Committed	7210	3.0	R2	TRUE
9.0	R1	7210 SAS-D-6F4T support	Committed	7210	3.0	R3	TRUE
9.0	R1	Support for Dot1q explicit NULL SAP	Committed	7210	3.0	R3	TRUE
9.0	R1	Out of Band management (SAS X)	Committed	7210	2.0	R1	TRUE
9.0	R1	G.8032 - Ethernet Ring Protection for SAS-X	Committed	7210	3.0	R2	TRUE
9.0	R1	VCCV Trace support in 7210 SAS 3.0R1	Committed	7210	3.0	R1	TRUE
9.0	R1	IGMP Snooping on SAS-X.	Committed	7210	3.0	R2	TRUE
9.0	R1	BFD for FRR (Network Mode in SAS-M)	Committed	7210	3.0	R3	TRUE
9.0	R1	MSTP on SAS-M/X	Committed	7210	3.0	R3	TRUE
9.0	R1	SAP-EgressAggRateLimit for SAS-X for 2.0 R7	Committed	7210	2.0	R7	TRUE
9.0	R1	SAR-18 HW Platform	Committed	7705	4.0	R1	TRUE
9.0	R1	IPv6 with IES (static routing)	Committed	7705	4.0	R1	TRUE
9.0	R1	VPLS - incl PPPoEoA into SAP	Committed	7705	4.0	R2	TRUE
9.0	R1	IEEE 802.1x EAP	Committed	7705	4.0	R1	TRUE
9.0	R1	DCR: Improve bring-up time for static LSP	Committed	7705	4.0	R1	TRUE
9.0	R1	32p T1/E1 adapter card	Committed	7705	4.0	R3	TRUE
9.0	R1	Spoke SDP termination into IES/VRPN	Committed	7705	4.0	R2	TRUE
9.0	R1	RSVP-TE Graceful Shutdown	Committed	7705	4.0	R1	TRUE
9.0	R1	802.1ab LLDP	Committed	7705	4.0	R1	TRUE
9.0	R1	Bridged ATM VPLS SAP (on 4p OC3)	Committed	7705	4.0	R2	TRUE
9.0	R1	PPP Relay (on Bridged ATM)	Committed	7705	4.0	R2	TRUE
9.0	R1	DCR: Increase number of "management" static-routes	Committed	7705	4.0	R1	TRUE
9.0	R1	16p T1/E1 ASAP MDA (de-stuffed 32p)	Committed	7705	4.0	R3	TRUE
9.0	R1	MAC Swap on Enet Port Loopback	Committed	7705	4.0	R1	TRUE
9.0	R1	Local LSR ID	Committed	7705	4.0	R1	TRUE
9.0	R1	Increase# of VRPN SDPs	Committed	7705	4.0	R1	TRUE
9.0	R1	DSC Alarms	Committed	5780 DSC	3.0	R1	TRUE
9.0	R1	DSC Geo-Redundancy	Committed	5780 DSC	3.0	R1	TRUE
9.0	R1	5780 DSC 3.0 Support	Committed	5780 DSC	3.0	R1	TRUE
9.0	R1	Graceful PGW shutdown	Committed	7750 MG	3.0	R5	FALSE
9.0	R1	SGW 3.0 R1 Support	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	3GPP R8 Compliance	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	3GPP Lawful Intercept Interface	Committed	7750 MG	3.0	R1	TRUE

9.0	R1	Support MG3.0 nodes at a MG2.0 level	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	S1-based HO with MME relocation and no SGW relocation	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	Piggyback Support	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	UE Initiated Procedures	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	Primary KPIs and KCIs	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	Idle Mode TAU with MME Change	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	IPv6 support in Reassembly Interfaces	Committed	7750 MG	3.0	R1	TRUE
9.0	R1	BFD Scalability improvements to 2.5K	Committed	7x50	8.0	R4	TRUE
9.0	R1	MC-APS service parity for Sonet/SDH channelized and non-channelized interfaces	Committed	7x50	8.0	R5	TRUE
9.0	R1	GRE termination in VPRN - Part 1	Committed	7x50	8.0	R4	TRUE
9.0	R1	Short keep-alive time for limited number of PPPoE sessions	Committed	7x50	8.0	R6	TRUE
9.0	R1	Tunable XFP support (JDSU's new c-band part)	Committed	7x50	9.0	R1	TRUE
9.0	R1	7450/7750 mixed mode support - phase 2 (7750 (IPv6 in chassis mode B) and additi	Committed	7x50	9.0	R1	TRUE
9.0	R1	CPM1/2 co-existing with CPM3 for upgrade purpose only (no downgrade or CPM4 supp	Committed	7x50	9.0	R1	TRUE
9.0	R1	VSM2 support - VSM2 MDA with XPL+ - Support for current and new provisioning mod	Committed	7x50	9.0	R1	TRUE
9.0	R1	G8032 --- multi-ring (completion from 8.0.R4)	Committed	7x50	9.0	R1	TRUE
9.0	R1	IP interface stats with SNMP access on network ports (RFE 65823)	Committed	7x50	9.0	R1	TRUE
9.0	R1	MEF SLM (Synthetic Loss Measurement)	Committed	7x50	9.0	R1	TRUE
9.0	R1	CFM Hold-Down Timer	Committed	7x50	9.0	R1	TRUE
9.0	R1	TWAMP server perf monitoring	Committed	7x50	9.0	R1	TRUE
9.0	R1	Facility MEP (includes V-UNI & Port level MEP)	Committed	7x50	9.0	R1	TRUE
9.0	R1	10k BGP Peers	Committed	7x50	9.0	R1	TRUE
9.0	R1	Flowspec	Committed	7x50	9.0	R1	TRUE
9.0	R1	mLDP in mVPN for I-PMSI (P2MP LDP I-PMSI)	Committed	7x50	9.0	R1	TRUE
9.0	R1	M-VPN: MDT AFI/SAFI	Committed	7x50	9.0	R1	TRUE
9.0	R1	MC-LAG support for IP services	Committed	7x50	9.0	R1	TRUE
9.0	R1	cflowd enhancements (IPFIX, IPv6 & mcast)	Committed	7x50	9.0	R1	TRUE
9.0	R1	multi-area adj OSPF (RFC 5185) - no support for OSPFv3	Committed	7x50	9.0	R1	TRUE
9.0	R1	RTM async / lockless design	Committed	7x50	9.0	R1	TRUE

9.0	R1	IPv6 BFD support: static, OSPFv3, BGP, VRRP	Committed	7x50	9.0	R1	TRUE
9.0	R1	T-LDP control plane support for Hash Label feature in PW-based services	Committed	7x50	9.0	R3	TRUE
9.0	R1	Converged TE database	Committed	7x50	9.0	R1	TRUE
9.0	R1	Inter-Area RSVP-TE using manually provisioned ABR and ABR FRR node protection us	Committed	7x50	9.0	R1	TRUE
9.0	R1	Scaling of RSVP, LDP, and BGP LSPs	Committed	7x50	9.0	R1	TRUE
9.0	R1	Uniform sub50msec fail-over for LER/LSR FRR	Committed	7x50	9.0	R1	TRUE
9.0	R1	VPLS & ISID Scale : 40k	Committed	7x50	9.0	R1	TRUE
9.0	R1	ISID level shaping on B-SAP	Committed	7x50	9.0	R1	TRUE
9.0	R1	LAG active/standby operation without LACP (RFE86488)	Committed	7x50	9.0	R1	TRUE
9.0	R1	Block on mesh failure in BGP VPLS + BGP MH (RFE 87517)	Committed	7x50	9.0	R1	TRUE
9.0	R1	IPVPN - Service Label per Next-hop operation	Committed	7x50	9.0	R1	TRUE
9.0	R1	GRE termination in VPRN - Part 2 (support for OSPF and IPsec)	Committed	7x50	9.0	R1	TRUE
9.0	R1	FIB prioritization per VPRN	Committed	7x50	9.0	R1	TRUE
9.0	R1	Carrier-serving-Carrier VPN (CsC VPRN)	Committed	7x50	9.0	R1	TRUE
9.0	R1	Support for BGP LSP type in mixed-LSP mode SDP (RFE 95794)	Committed	7x50	9.0	R1	TRUE
9.0	R1	Unified RADIUS interface	Committed	7x50	9.0	R1	TRUE
9.0	R1	NAT44 Enhancements	Committed	7x50	9.0	R1	TRUE
9.0	R1	NAT: dynamic port-range block allocation	Committed	7x50	9.0	R1	TRUE
9.0	R1	NAT: SIP ALGs	Committed	7x50	9.0	R1	TRUE
9.0	R1	DHCPv6 server for IPv6 ESM	Committed	7x50	9.0	R1	TRUE
9.0	R1	Enable uRPF check on subscriber interface for managed-route hosts. "uRPF on group interfaces" for BT	Committed	7x50	9.0	R3	TRUE
9.0	R1	IPsec IKEv2 (Part 2)	Committed	7x50	9.0	R1	TRUE
9.0	R1	Scale to 100G (simplex) IPsec per system	Committed	7x50	9.0	R1	TRUE
9.0	R1	ISA Capacity information	Committed	7x50	9.0	R1	TRUE
9.0	R1	Residential IP transit subs: static subs (CLI/SNMP) and dynamic subs (DHCP/RADIUS)	Committed	7x50	9.0	R1	TRUE
9.0	R1	App performance stats for VoIP/Video (UDP MOS scores) as defined in 8.0 PRD	Committed	7x50	9.0	R1	TRUE
9.0	R1	Improved overload handling (overall overload and cut-through)	Committed	7x50	9.0	R1	TRUE
9.0	R1	Unnumbered interfaces for PPPoE (IPv4 only)	Committed	7x50	9.0	R3	TRUE

9.0	R1	AA Policer Resource Alarms	Committed	7x50	9.0	R1	TRUE
9.0	R1	10-port GE HS-MDA2	Committed	7x50	9.0	R3	TRUE
9.0	R1	RADIUS Accounting (per subscriber, IPv4/v6 addresses)	Committed	7x50	9.0	R3	TRUE
9.0	R1	DSLAM and other stats	Committed	7x50	9.0	R3	TRUE
9.0	R1	host tracking (aggregate rate only)	Committed	7x50	9.0	R3	TRUE
9.0	R1	CoA on subscribers instead of hosts (aggr, pol, queue, root arbiter)	Committed	7x50	9.0	R3	TRUE
9.0	R1	Last-mile-aware shaping on HS-MDA2 using control plane implementation and PPPoE encaps only	Committed	7x50	9.0	R3	TRUE
9.0	R1	RADIUS-triggered LI for IPv6 PPPoE only	Committed	7x50	9.0	R4	TRUE
9.0	R1	Aggregate rate dynamic override	Committed	7x50	9.0	R3	TRUE
9.0	R1	Queue/Policer parameters (PIR/CIR/WRR) override	Committed	7x50	9.0	R3	TRUE
9.0	R1	New fc->q overrides (new SLA)	Committed	7x50	9.0	R3	TRUE
9.0	R1	New MDA type for HS-MDA2 BT QoS model	Committed	7x50	9.0	R3	TRUE
9.0	R1	Everything under Config QoS for HS-MDA2	Committed	7x50	9.0	R3	TRUE
9.0	R1	Everything under Config sub subscriber profile for HS-MDA2	Committed	7x50	9.0	R3	TRUE
9.0	R1	Exp Secondary Shaper for HS-MDA2	Committed	7x50	9.0	R3	TRUE
9.0	R1	Resource manager for HS-MDA2	Committed	7x50	9.0	R3	TRUE
9.0	R1	SAP stats for HS-MDA2	Committed	7x50	9.0	R3	TRUE
9.0	R1	SAP overrides for HS-MDA2	Committed	7x50	9.0	R3	TRUE
9.0	R1	PPP keepalive timers	Committed	7x50	9.0	R3	TRUE
9.0	R1	Route origin attribute for subscriber hosts used in routing policies	Committed	7x50	9.0	R3	TRUE
9.0	R1	Soft rest support on Magma IMMs	Committed	7x50	9.0	R1	TRUE
9.0	R1	HSMDA v2	Committed	7x50	9.0	R1	TRUE
9.0	R1	IGMP reporting of join/leave/expiry events (IGMP redirect)	Committed	7x50	9.0	R3	TRUE
9.0	R1	Service Size Reduction	Committed	7x50			TRUE
9.0	R1	Dimensioning and KPI eNB for LE3 - step 2	Committed	9412 eNodeB	LA3.0		FALSE
9.0	R1	wireless model infrastructure	Committed	9412 eNodeB	LA3.0		FALSE
9.0	R1	SAM support of eNB upgrade from TLA2.1 to TLA3.0	Committed	9412 eNodeB	TLA3		FALSE
9.0	R1	MPR Family DS1/E1 Synchronization	Committed	9500 MPR	2.0 A		TRUE
9.0	R1	Services over SDH	Committed	9500 MPR	9.0	r1	TRUE

9.0	R1	9500 R2.x A/E Stream Support	Committed	9500 MPR	2.x		TRUE
9.0	R1	9500 R3.0 ANSI / ETSI Equipment Management	Committed	9500 MPR	3.0		TRUE
9.0	R1	Path Management	Committed	9500 MPR			TRUE
9.0	R1	Port Segregation Usability	Committed	9500 MPR			TRUE
9.0	R1	Extended Backhaul Service	Committed	9500 MPR			TRUE
9.0	R1	9500 3.0 Dot1Q VLAN	Committed	9500 MPR	3.0		TRUE
9.0	R1	9500 3.0 STM support	Committed	9500 MPR	3.0		TRUE
9.0	R1	OS6855-U24X capability- including VRF capabilities	Committed	OmniSwitch	6.4.3		TRUE
9.0	R1	G8032/Ethernet Ring Protocol	Committed	OmniSwitch	6.4.3 / 6.6.2		TRUE
9.0	R1	AOS Release 6.4.4 Support for OS6850/OS6855/OS6400/OS9000	Committed	OmniSwitch	6.4.4		TRUE
9.0	R1	OS6850-E support with AOS 6.4.4 Support	Committed	OmniSwitch	6.4.4		TRUE
9.0	R1	Usability Improvements incl. Service Type for Access IF	Committed				TRUE
9.0	R2	SAM model updates for TLA2.1 and TLA3.0	Committed	9412 eNodeB	TLA3		FALSE
9.0	R3	Mib Stats support till 3.5	Committed	1830	PSS-32	3.5	TRUE
9.0	R3	1830 PSS-4 Release 1.5	Committed	1830	PSS-4	1.5	TRUE
9.0	R3	PSS1/16/32 new release support up to 3.5.2	Committed	1830	PSS-32	3.5	TRUE
9.0	R3	Backup/Restore support	Committed	1830	PSS-32	3.5	TRUE
9.0	R3	License support	Committed	1830	PSS-36	3.5	TRUE
9.0	R3	Fault Management support	Committed	1830			TRUE
9.0	R3	11DPE12E(Release 3.5)	Committed	1830	PSS-32	3.5	TRUE
9.0	R3	Provisioning and management of Y cable protection on all supporting service conf	Committed	1830			TRUE
9.0	R3	OPSA Provision	Committed	1830			TRUE
9.0	R3	Provisioning and management of Regen services on all supporting service configur	Committed	1830			TRUE
9.0	R3	Card support up to 3.5.2	Committed	1830			TRUE
9.0	R3	File based Stats till 3.5.2	Committed	1830			TRUE
9.0	R3	Unprotected Service support	Committed	1830			TRUE
9.0	R3	Subrate Service Provision	Committed	1830			TRUE
9.0	R3	Supported NE's as Service Endpoints	Committed	1830			TRUE
9.0	R3	1830 OT support - Power Graph Read Only	Committed	1830			TRUE
9.0	R3	SR WDM network port support - Power Graph Read Only	Committed	1830			TRUE

9.0	R3	Power Readings support for WTOCM card - Power Graph Read Only	Committed	1830			TRUE
9.0	R3	Support configurations including SVAC, MVAC, OPSA and Raman cards - Power Graph Ready Only	Committed	1830			TRUE
9.0	R3	Support for 1830 PSS-1 GBEH 2.7	Committed	1830	GBEH 2.7		TRUE
9.0	R3	Support for 1830 PSS-1 MD4H 1.7	Committed	1830	MD4H 1.7		TRUE
9.0	R3	VLL-PW Standby status bit signalling	Committed	7210	3.0	R3	TRUE
9.0	R3	Line Timing of Ethernet ports using synchE with SSM support on SAS M/X	Committed	7210	3.0	R3	TRUE
9.0	R3	BFD for static routes (Network Mode in SAS-M)	Committed	7210	3.0	R3	TRUE
9.0	R3	SAP-EgressAggRateLimit for SAS-X for 3.0 R3 enhancements	Committed	7210	3.0	R3	TRUE
9.0	R3	IEEE 1588 Boundary Clock	Committed	7705	4.0	R2	TRUE
9.0	R3	Fractional T1 PPP on NW port (super rate)	Committed	7705	4.0	R1	TRUE
9.0	R3	SAR-18 BITS clock (BASIC)	Committed	7705	4.0	R3	TRUE
9.0	R3	BFD for T-LDP	Committed	7705	4.0	R3	TRUE
9.0	R3	SAA Support for CFM	Committed	7705	4.0	R2	TRUE
9.0	R3	Multiple E1 multi-frames in a single PW	Committed	7705	4.0	R4	TRUE
9.0	R3	Standby Signalling Slave	Committed	7705	4.0	R2	TRUE
9.0	R3	BFD for V6 Static Routes	Committed	7705	4.0	R3	TRUE
9.0	R3	DCR: ML-PPP sequence number re-design	Committed	7705	4.0	R4	TRUE
9.0	R3	OSFP v3	Committed	7705	4.0	R4	TRUE
9.0	R3	Enhancements to External Alarm Monitoring	Committed	7705	4.0	R3	TRUE
9.0	R3	Dynamic ARP for Spoke SDP Termination	Committed	7705	4.0	R3	TRUE
9.0	R3	PTS 604519: LDP Tunnel-Down Damp-Timer	Committed	7705	4.0	R3	TRUE
9.0	R3	IPv6 Management	Committed	7705			TRUE
9.0	R3	Spanning tree Protocol (STP) with VPLS	Committed	7705			TRUE
9.0	R3	Trusted Peer Lists	Committed	7750 MG	3.0	R3	TRUE
9.0	R3	Lawful Intercept Enhancements	Committed	7750 MG	3.0	R1	TRUE
9.0	R3	IPSec - Discovery	Committed	7750 MG			TRUE
9.0	R3	RFE 110312: AES payload encrypt. required	Committed	7x50	9.0	R4	TRUE
9.0	R3	IPsec IKEv2	Committed	7x50	8.0	R5	TRUE
9.0	R3	PTP IEEE1588v2 master, slave	Committed	7x50	9.0	R4	TRUE
9.0	R3	Magma and BSX interaction	Committed	7x50	9.0	R1	TRUE
9.0	R3	ETH-CFM Redundancy	Committed	7x50	9.0	R1	TRUE
9.0	R3	VLAN in MAC filter inc. bitmask for ACL and QoS policies	Committed	7x50	9.0	R1	TRUE

9.0	R3	Percentage based BW in QoS policies	Committed	7x50	9.0	R1	TRUE
9.0	R3	Policer mapping to local-queue	Committed	7x50	9.0	R1	TRUE
9.0	R3	Mcast replication on sub-interfaces (ESM IPoE, IES & VPRN). Only "PPP multicast replication on HSM DA-2" for BT	Committed	7x50	9.0	R3	TRUE
9.0	R3	NAT: lawful intercept (on BB-ISA)	Committed	7x50	9.0	R1	TRUE
9.0	R3	DSLite support [IP in IP]	Committed	7x50	9.0	R1	TRUE
9.0	R3	PPPoE idle timeout	Committed	7x50	9.0	R1	TRUE
9.0	R3	IPCP subnet negotiation	Committed	7x50	9.0	R1	TRUE
9.0	R3	N:1with N>1 ATM mapping on ATM PWE3	Committed	7x50	9.0	R1	TRUE
9.0	R3	nxDS0 in E1 MLPPP access (RFE87309)	Committed	7x50	9.0	R1	TRUE
9.0	R3	MSS for Hpol(QoS enhancements)	Committed	7x50	9.0	R1	TRUE
9.0	R3	IOM soft reset for HS-MDA2	Committed	7x50	9.0	R4	TRUE
9.0	R3	SFM4 for 7-slot and 12-slot ESS & SR chassis to support all IOMs and IMM	Committed	7x50	9.0	R4	TRUE
9.0	R3	Facility MEP support within MEF SLM (Synthetic Loss Measurement)	Committed	7x50	9.0	R3	TRUE
9.0	R3	Vport stats	Committed	7x50	9.0	R3	TRUE
9.0	R3	9.0 R3 RFEs - OAM	Committed	7x50			TRUE
9.0	R3	SAP-2-SAP Connection	Committed	7x50			TRUE
9.0	R3	ATT Delete unused service	Committed	7x50			TRUE
9.0	R3	SFM4 for 7-slot and 12-slot ESS & SR chassis - PTP work	Committed	7x50	9.0	R3	TRUE
9.0	R3	RFE 102687: Raise trap - addr change in lpipe	Committed	7x50	7x50_7 OR19 7		TRUE
9.0	R3	RFE 104309: CPU Util over 1 & 5 min intervals	Committed	7x50	7x50_7 OR15 7		TRUE
9.0	R3	RFE 105119: CPM-1/2 co-existing with CPM-3	Committed	7x50	7x50_8 OR7		TRUE
9.0	R3	RFE 105338: Warn. msg on BFD sessions	Committed	7x50	7x50_9 OR4		TRUE
9.0	R3	RFE 107397: Respond with exact outgoing interface	Committed	7x50	7x50_8 OR7 7x		TRUE
9.0	R3	RFE 107684: allow FC option for ping	Committed	7x50	7x50_7 OR17 7		TRUE
9.0	R3	RFE 67002: Missing Cleared Alarm Trap for DDM	Committed	7x50	7x50_8 OR4		TRUE
9.0	R3	RFE 77633: Decoding of CMM failure frames	Committed	7x50	7x50_8 OR1		TRUE
9.0	R3	RFE 85491: Use of AIS reception - fault notificatn	Committed	7x50			TRUE

9.0	R3	RFE 91135: Increase flexibility - Event Throttling	Committed	7x50	7x50_8 OR4 7x		TRUE
9.0	R3	RFE 94001: Egress PE shouldn't reply - traceroute	Committed	7x50	7X50_7 OR10 7		TRUE
9.0	R3	HSMDAv2 Configurable Burst Thresholds	Committed	7x50			TRUE
9.0	R3	MME: LM4.0.1 Support	Committed	9471 MME	LM4.0. 1		TRUE
9.0	R3	MME: Netconf Support	Committed	9471 MME	LM4.0. 1		TRUE
9.0	R3	MME support for Warning Message Delivery - new SBc interface	Committed	9471 MME	LM4.0. 1		TRUE
9.0	R3	MME Support for Location Based Services - new SLs and SLg interfaces	Committed	9471 MME	LM4.0. 1		TRUE
9.0	R3	MME Support for Multimedia Broadcast/Multicast Service (MBMS or eMBMS)	Committed	9471 MME	LM4.0. 1		TRUE
9.0	R3	MME Support for Enhanced CALEA Functionality - exposing the X1_1 and X2 interfaces	Committed	9471 MME	LM4.0. 1		TRUE
9.0	R3	MME High Performance MME OAM Blade - Molene2 based	Committed	9471 MME	LM4.0. 1		TRUE
9.0	R3	MME Support for MIF and MAF Blade Commonality with SGSN	Committed	9471 MME	LM4.0. 1		TRUE
9.0	R3	OS9GNI-P24E Support (OS9000E devices)	Committed	OmniSwi tch	6.4.4		TRUE
9.0	R3	CPE Test Head Enhancements - AOS 6.6.2 R01 (Post GA/ Virgin Media Release	Committed	OmniSwi tch	6.6.2 R01		TRUE
9.0	R3	SFTP client support in SAM for OMNI Backup/Restore and Software upgrade	Committed	OmniSwi tch			TRUE
9.0	R4	7210 SAD-D 6F4T ETR support	Committed	7210	3.0	R3	TRUE
9.0	R5	Configurable Period for Writing A/C records into Flash 4.0 R1	Committed	7210	4.0	R1	FALSE
9.0	R5	G.8032 - Ethernet Ring Protection SAS-D 3.0 R5	Committed	7210	3.0	R5	FALSE
9.0	R5	IGMP Snooping SAS D 3.0 R5	Committed	7210	3.0	R5	FALSE
9.0	R5	IP Interface over VPLS for L2 Uplinks SAS-M 3.0 R5	Committed	7210	3.0	R5	FALSE
9.0	R5	MSTP on SAS-E / SAS-D	Committed	7210	3.0	R5	FALSE
9.0	R5	PBB for E-Pipe on SAS-M / SAS-X	Committed	7210	3.0	R5	FALSE
9.0	R5	PortLoopback without- MAC Swap SAS-E / SAS-D	Committed	7210	3.0	R5	FALSE
9.0	R5	SyncE on SAS-D 3.0 R5	Committed	7210	3.0	R5	FALSE
9.0	R5	7210 4.0 R1 Equipment Support	Committed	7210	4.0	R1	FALSE
9.0	R5	IP MTU support on L3 interfaces on SAS-M, SAS-X 4.0 R1	Committed	7210	4.0	R1	FALSE
9.0	R5	Pseudowire redundancy in VPLS on SAS-M Ntwk Mode 4.0 R1	Committed	7210	4.0	R1	FALSE

9.0	R5	Y.1731 for SAS D 3.0 R5	Committed	7210	3.0	R5	FALSE
9.0	R5	7705 SAR-M support @ 4.0 level	Committed	7705			FALSE
9.0	R5	5780 DSC 4.0 R1 Equipment Management Support	Committed	5780 DSC	4.0	R1	FALSE
9.0	R5	KPI/KCI Threshold configuration - policy based	Committed	7750 MG	3.0	r5	FALSE
9.0	R5	GGSN: Radius	Committed	7750 MG	3.0	R1	FALSE
9.0	R5	System Performance - Primary KPIs	Committed	7750 MG	3.0	R5	FALSE
9.0	R5	Disconnect (RADIUS changes)	Committed	7750 MG	3.0	R5	FALSE
9.0	R5	MG 3.0 R5 Node Support	Committed	7750 MG	3.0	R5	FALSE
9.0	R5	OC-48 POS ROHS MDAs (4-port only)	Committed	7x50	9.0	R4	FALSE
9.0	R5	Virtual MEP on VSI	Committed	7x50	9.0	R4	FALSE
9.0	R5	QPPB	Committed	7x50	9.0	R4	FALSE
9.0	R5	BGP Add Path	Committed	7x50	9.0	R4	FALSE
9.0	R5	BFD support for P2MP source redundancy	Committed	7x50	9.0	R4	FALSE
9.0	R5	Multi-segment PW routing (aka dynamic MS-PW)	Committed	7x50	9.0	R3	FALSE
9.0	R5	Extensions to ATM Aware QoS for Broadband Network Gateway	Committed	7x50	9.0	R4	FALSE
9.0	R5	ESM on ATM interfaces: PPPoA and PPPoEoA (Routed CO)	Committed	7x50	9.0	R4	FALSE
9.0	R5	NAT: RTSP ALGs	Committed	7x50	9.0	R4	FALSE
9.0	R5	PPPoE dual-chassis redundancy with MCS	Committed	7x50	9.0	R4	FALSE
9.0	R5	SRRP enhancements for PPPoE redundancy	Committed	7x50	9.0	R4	FALSE
9.0	R5	IOM3-XP with MultiCore CPU (aka Lava2)	Committed	7x50	9.0	R4	FALSE
9.0	R5	Multicore CPU-based 48-port GE SFP IMM (KrakaCroatia2)	Committed	7x50	9.0	R4	FALSE
9.0	R5	Multicore CPU-based 48-port GE TX IMM (KrakaCyprus2)	Committed	7x50	9.0	R4	FALSE
9.0	R5	V-port aggregate-rate-limit for Ethernet BNG	Committed	7x50	9.0	R5	FALSE
9.0	R5	Business prefix transits	Committed	7x50	9.0	R4	FALSE
9.0	R5	ETH-CFM Redundancy - part 2	Committed	7x50	9.0	R1	FALSE
9.0	R5	CLI command to display active card alarms (RFE 65299)	Committed	7x50	9.0	R4	TRUE
9.0	R5	Per-sub CPU protection for HTTP-redirect (WiFi access)	Committed	7x50	9.0	R4	TRUE
9.0	R5	mVPN fast-failover (Source redundancy)	Committed	7x50	9.0	R4	TRUE
9.0	R5	IPv6 FIB scale increase to 512k+	Committed	7x50	9.0	R4	TRUE
9.0	R5	Inter-AS option C and option B/C with multi-hop eBGP and RSVP-TE support, respectively	Committed	7x50	9.0	R4	TRUE
9.0	R5	Allow exclusion of RSVP LSP name from BGP next-hop resolution (RFE 88796)	Committed	7x50	9.0	R4	TRUE

9.0	R5	VPIN indirection for Edge resilience (aka. Edge Prefix Independent Convergence -	Committed	7x50	9.0	R4	TRUE
9.0	R5	ASM data MDT	Committed	7x50	9.0	R4	TRUE
9.0	R5	Increasing Primary Path Associations with Bypass LSP	Committed	7x50	9.0	R4	TRUE
9.0	R5	IS-IS lockless design	Committed	7x50	9.0	R4	TRUE
9.0	R5	multi-area adj OSPF (RFC 5185) - support for OSPFv3 (DTS 107137)	Committed	7x50	9.0	R4	TRUE
9.0	R5	Link LDP Hello Adjacency Tracking with BFD for LDP-FRR	Committed	7x50	9.0	R4	TRUE
9.0	R5	Service Label per next-hop for framed routes	Committed	7x50	9.0	R5	TRUE
9.0	R5	RFE 101290: Add SNMP support for tree trace output	Committed	7x50	7x50_9 OR1		TRUE
9.0	R5	Support of eNB LA4.0.1 (eNB models)	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	eNodeB Licensing improvement	Committed	9412 eNodeB	LA3.0		FALSE
9.0	R5	support of eUTRAN sharing (LTE RAN)	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	support of IRAT ANR for eNB	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	Wireless Equipment management improvement	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	support of eNB Counter selection	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	scalability tests - improvement for eNB	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	Support of eNB TLA4.0 (eNB release and backward compatibility)	Committed	9412 eNodeB	TLA4		FALSE
9.0	R5	SAM configuration evolution	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	NEM cross-launch over IPv6	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	5620 SAM framework for data transfer toward external tools (WPS, WTA, ...)	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	5620 SAM to SAM rehomeing procedure evolution	Committed	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	MME: LM 4.0.2 Support	Committed	9471 MME	LM 4.0.2		FALSE
9.0	R5	MME: Bulk Provisioning	Committed	9471 MME	LM 4.0.2		FALSE
9.0	R5	MME: EMS Based Pool Support	Committed	9471 MME	LM 4.0.2		FALSE
9.0	R5	MME: EMS Based Load Balancing	Committed	9471 MME	LM 4.0.2		FALSE
9.0	R5	9500 R3.0.1 A/E Support	Committed	9500 MPR	3.0.1		FALSE
9.0	R5	Service in Service: Auto Discovery	Committed	9500 MPR			FALSE

9.0	R5	Nx(1+0) Path Management	Committed	9500 MPR			FALSE
9.0	R5	Auto Tunnel Creation + N x (1+0)	Committed	9500 MPR			FALSE
9.0	R5	Software Management	Committed	9500 MPR			FALSE
9.0	R5	Common LOS Alarm	Committed	9500 MPR			FALSE
9.0	R5	9500 Time and Date Configuration	Committed	9500 MPR			FALSE
9.0	R5	HQAM	Committed	9500 MPR			FALSE
9.0	R5	MPTCore (Split Mount)	Committed	9500 MPR			FALSE
9.0	R5	Power Levels PM	Committed	9500 MPR			FALSE
9.0	R5	Radio LAG (3.01 I/F)	Committed	9500 MPR			FALSE
9.0	R5	SDH Channelization	Committed	9500 MPR			FALSE
9.0	R5	Virtual Protection (VCL) Links	Committed	9500 MPR			FALSE
9.0	R5	SDH 1+1 Support	Committed	9500 MPR			FALSE
9.0	R5	4+4 EAS Card (MPT HL Pheri)	Committed	9500 MPR			TRUE
9.0	R5	OmniSwitch 10K/AOS 7.1.1 R01 Equipment Support Only	Committed	OmniSwitch	7.7.1		FALSE
9.0	R5	OmniSwitch 6900/AOS 7.2.1 R01 Node Equipment Support Only	Committed	OmniSwitch	7.1.1		FALSE
9.0	R7	New 2.5G SAR-8 backplane	Candidate	7705	4.0	R3	FALSE
9.0	R7	1p 10GE XMDA card for SAR-18	Candidate	7705	5.0	R2	FALSE
9.0	R7	8p GE (WP3) MDA	Candidate	7705	5.0	R1	FALSE
9.0	R7	SAR-M Platform	Candidate	7705	5.0	R1	FALSE
9.0	R7	SAR-ME Platform	Candidate	7705	5.0	R1	FALSE
9.0	R7	SAR-M GPON Module	Candidate	7705	5.0	R1	FALSE
9.0	R7	SAR-M xDSL Module	Candidate	7705	5.0	R1	FALSE
9.0	R7	SAR-M DCM Module	Candidate	7705	5.0	R1	FALSE
9.0	R7	HDLC H-Pipes (on DS3, ASAP, SDI MDAs & SAR-M)	Candidate	7705	5.0	R1	FALSE
9.0	R7	ATM VT	Candidate	7705	5.0	R1	FALSE
9.0	R7	N:1 N>1 ATM PW	Candidate	7705	5.0	R1	FALSE
9.0	R7	TWAMP	Candidate	7705	5.0	R1	FALSE
9.0	R7	eBGP PE-CE	Candidate	7705	5.0	R1	FALSE
9.0	R7	Power injector card	Candidate	7705	5.0	R1	FALSE
9.0	R7	OSFP GR helper	Candidate	7705	5.0	R1	FALSE
9.0	R7	I-Pipes on channelized OC3	Candidate	7705	5.0	R1	FALSE
9.0	R7	I-pipes SAP-2-SAP	Candidate	7705	5.0	R1	FALSE
9.0	R7	increased 2P ch OC3 cards (to DS1) per SAR-8/18	Candidate	7705	5.0	R1	FALSE
9.0	R7	DS3/E3/OC3 C-pipes (CC & ch to DS1)	Candidate	7705	5.0	R2	FALSE

9.0	R7	Extensions for c-pipes	Candidate	7705			FALSE
9.0	R7	Auto tunnel enhancements	Candidate	7705			FALSE
9.0	R7	SAR-M Fanless WITH 16 T1/E1, 7 GIGE, -48/+24 VDC	Candidate	7705	5.0	R2	FALSE
9.0	R7	SAR-M Fanless WITH 7 GIGE, -48/+24 VDC	Candidate	7705	5.0	R2	FALSE
NMS Features							
9.0	R1	MAC and IPv6 Filter Policies	Committed	7705	4.0	R1	TRUE
9.0	R1	Other Policies for 7705	Committed	7705	4.0	R1	TRUE
9.0	R1	Ipipe Enhancements	Committed	7705	4.0	R1	TRUE
9.0	R1	Ethernet Port CFM Loopback	Committed	7705	4.0	R1	TRUE
9.0	R1	Displayed Card Names	Committed	7705	4.0	R1	TRUE
9.0	R1	Ethernet OAM Thresholds	Committed	7705	4.0	R1	TRUE
9.0	R1	OAM Ping and Trace Results	Committed	7705	4.0	R1	TRUE
9.0	R1	BGP Enhancements	Committed	7705	4.0	R1	TRUE
9.0	R1	Security permissions (MG changes)	Committed	7750 MG			TRUE
9.0	R1	MG Peer Stat Aggregation	Committed	7750 MG			TRUE
9.0	R1	horizontal integration protocol - enabler for CDMA or GSM horizontal integration with SAM	Committed		LA3.0		TRUE
9.0	R1	Map Move by Association	Committed				TRUE
9.0	R1	Security Improvements incl. Service Deletion Confirmation	Committed				TRUE
9.0	R1	Improvements of SAP management	Committed				TRUE
9.0	R1	SAR support for channelization card workflows	Committed				TRUE
9.0	R1	Attach # of user sessions to a user group	Committed				TRUE
9.0	R1	Auto database reinstantiation	Committed				TRUE
9.0	R1	Manager specific controlled parameters configurati	Committed	7x50			TRUE
9.0	R1	Composite Service Mgt - Configure with Flat Map	Committed	7x50			TRUE
9.0	R1	Customer level Apdex Thresholds	Committed	7x50			TRUE
9.0	R1	Config Forms: Add a lock, unlock and close buttons to forms	Committed				TRUE
9.0	R1	Config Forms: Undock to forms	Committed				TRUE
9.0	R1	Config Forms: Element Search	Committed				TRUE
9.0	R1	New Frameworks: Collapsible panel	Committed				TRUE
9.0	R1	New Frameworks: Configs and lists in same form	Committed				TRUE
9.0	R1	New Frameworks: Editable table/config	Committed				TRUE
9.0	R1	Trees: Add Component tree to config forms	Committed				TRUE
9.0	R1	Component Tree (left pane), Config Form (right pane) for Services	Committed				TRUE

9.0	R1	Attribute indication on collapsible panel and tabs	Committed				TRUE
9.0	R1	Add mouse over to trees	Committed				TRUE
9.0	R1	Column Ordering for users	Committed				TRUE
9.0	R1	Map Endpoint Enhancement	Committed				FALSE
9.0	R1	Bearer List Query Filtering	Committed				TRUE
9.0	R1	5620 SAM Supervision	Committed				TRUE
9.0	R1	Convert key generation to ASLM for SAM	Committed				TRUE
9.0	R1	Document 3rd party Tool list	Committed				TRUE
9.0	R1	Oracle 11	Committed				TRUE
9.0	R1	SSO Proxy and LSM Session Management	Committed				FALSE
9.0	R1	x86 Blade Perf Comparison (HP blade vs Oracle rack mount)	Committed				TRUE
9.0	R1	9.0 R1 Licensing	Committed				TRUE
9.0	R1	Automated SSL/SSO Configs for Upgrades	Committed				TRUE
9.0	R1	LogViewer enhancements	Committed				TRUE
9.0	R1	Beta key support	Committed				TRUE
9.0	R1	Include Network Element Type in Alarms	Committed				TRUE
9.0	R2	5620 SAM-CDMA Horizontal Integration	Committed		LA3.0		FALSE
9.0	R3	Bearer Stats UI - Post Filtering	Committed	7750 MG			TRUE
9.0	R3	Confirmation needed for ACL filter re-ordering	Committed	7x50			TRUE
9.0	R3	Compression of backup files via tar/gzip	Committed				TRUE
9.0	R3	Display of PEM and fan trays in the equipment tree	Committed				TRUE
9.0	R3	Reply function to SAM text messages	Committed				TRUE
9.0	R3	Ethernet layer added to bulk change	Committed				TRUE
9.0	R3	Usability Improvements of the GUI builder, script manager and bulk updates	Committed				TRUE
9.0	R3	Switch user account without stopping the SAM client	Committed				TRUE
9.0	R3	Clarify the scope of Override Tabs	Committed				TRUE
9.0	R3	Enhanced Channelization Support	Committed				TRUE
9.0	R3	Document applicable alarms for eNodeB	Committed				TRUE
9.0	R3	Document applicable alarms for MME	Committed				TRUE
9.0	R3	Gather applicable node alarm info automatically	Committed				TRUE
9.0	R3	Security DCRs	Committed				TRUE
9.0	R3	Alarm Statistics in SAM-S	Committed				TRUE
9.0	R5	TCAs for mib-based performance stats	Committed				FALSE

9.0	R5	Alarm Correlation - correlated alarm has highest s	Committed				FALSE
9.0	R5	Alarm Correlation - per alarm window enable/disabl	Committed				FALSE
9.0	R5	Shared MEG id	Committed	7x50			FALSE
9.0	R5	Testsuite for comp svc/seg svc	Committed				TRUE
9.0	R5	Path search - enhance svc tunnel selection	Committed	7x50			FALSE
9.0	R5	5670 RAM DCP Summarization Support	Committed				TRUE
9.0	R5	Generic Object Attributes	Committed				FALSE
9.0	R5	Filter on Topology Group	Committed				FALSE
9.0	R5	Expand only link groups with highlights or troubles	Committed				FALSE
9.0	R5	Increase JMS Filter flexibility	Committed				FALSE
9.0	R5	Target to increase 9500 max counts to 12K	Committed				FALSE
9.0	R5	Binding of scripts to service components	Committed				FALSE
9.0	R5	Script & Template Cascading	Committed				FALSE
9.0	R5	Composite Service Mgt - Alarms	Committed	7x50			TRUE
9.0	R5	Service Scale	Committed				FALSE
9.0	R5	CFM Test, Add AccountingFile and ContinuouslyExecution	Committed	7x50	9.0	R1	TRUE
9.0	R5	Use logToFile For Performance Stats	Committed				FALSE
9.0	R5	Infocenter for User Docs	Committed				FALSE
9.0	R5	Message for lists that don't autopopulate	Committed				TRUE
9.0	R5	New button model for config forms	Committed				FALSE
9.0	R5	Internal Improvements 9.0R5	Committed				FALSE
9.0	R5	Component refresh - JBoss 5	Committed				FALSE
9.0	R5	User Activity Logs Enhancements	Committed				FALSE
9.0	R5	9.0R5 Licensing	Committed				FALSE
9.0	R5	Indicate indexed columns on dialog box & column list	Committed				FALSE
9.0	R5	'Does Not Contain' filter option	Committed				FALSE
9.0	R5	Retain customized test attributes with re-generating tests	Committed				FALSE
9.0	R5	Add Port Descr Column during SAP creation	Committed				FALSE
9.0	R5	Listing Access port missing state info	Committed				FALSE
9.0	R5	Target to increase Performance stats (1M)	Committed				FALSE
9.0	R5	Usage Based Billing	Committed				TRUE

Table 1: 9.0 Feature Planning

1. ORDERING INFORMATION

Sales Engineering Information

5620 SAM H/W PLATFORM sizing web tool [link](#).

5620 SAM DVD-ROM Request [link](#).

5620 SAM License Key [link](#) (supported on IE browser only).

5620 SAM Pricing Information [link](#).

- New part numbers are added to the pricing book to support 7210 SAS-D network element and 5620 SAM-S option.
- Note that 7750 MDAs running in mixed mode on a 7450 will count as 7750 MDAs. 7450 MDAs running in mixed mode on a 7750 will count as 7450 MDAs.

Note that as of Release 7.0, Integrated Service Adapters no longer require a Premium license.

Note that if a customer reaches the limit of licensed Premium MDAs but still has spare Standard MDAs and wishes to add another Premium MDA, two standard MDAs will be counted.

5620 SAM Technical Support [link](#).

5620 SAM Documentation [link](#).

Licensing Information

The 7705 SAR-8 requires two license pools, one for the 7705 SAR-8 chassis count and one for the 7705 SAR-8 daughter card count. Each discovered 7705 SAR-8 chassis shall consume one 7705 SAR-8 chassis license; and each daughter card within a discovered 7705 SAR-8 shall consume one 7705 SAR-8 daughter card license. If either license pool is negative, no additional 7705 SAR-8 nodes can be managed.

The 7705 SAR-F requires a license pool, separate from those used for the 7705 SAR-8. The 7705 SAR-F license pool shall be handled similarly to the 7705 SAR-8 chassis license pool.

7210 SAS M & 7210 SAS MX[ETR] is supported as node based license. User has to buy separate license for SAS-M and SAS MX (ETR). It is to be noted that the license for SAS-MX is also shared with SAS-MX ETR. So if user has 5 SAS-MX licenses, one can manage 3 SAS-MX and 2 SAS-MX ETR or 1 SAS-MX and 4 SAS-MX ETR.

5620 SAM management of the 7x50 SR nodes are supported by licensing the quantity of the individual MDA cards. MDA cards fall into two licensing categories: "Premium" and "Standard". Generally, any non high performance MDA cards are considered "Standard". All IMM, High Speed MDA (HSM DA) and Extended Performance (XP) MDA cards are considered "Premium". In Release 9.0, the following two extended performance MDAs were downgraded to "Standard" category:

MDA 20-PT 1GE-XP SFP (mda_m20_1gb_xp_sfp)

MDA 20-PT 1GE-XP TX (mda_m20_1gb_xp_tx)

Upgrading 5620 SAM to release 9.0 requires adjustment to the license keys to avoid license keys warnings provided the above exception MDA cards are deployed in the network.

Release 9.0 has a total of four exceptions to the “Premium” category:

MDA 1-PT 10GE-XP XFP (m1_10gb_xp_xfp)
MDA 10-PT 1GE-XP SFP (m10_1gb_xp_sfp)
MDA 20-PT 1GE-XP SFP (mda_m20_1gb_xp_sfp)
MDA 20-PT 1GE-XP TX (mda_m20_1gb_xp_tx)

7450 Mixed Mode

In SROS release 8.0 and onwards 'Mixed Mode' capability was introduced on the 7450 ESS-6v, ESS-7 and ESS-12 platform. To enable 5620 SAM management of the IMM cards [L3BQ, L2HQ and L3HQ h/w RTU license types] on the 7450 ESS platform in 'Mixed Mode', 7750 Premium MDA license is required.

7750 Mixed Mode

In SROS release 9.0, mixed mode feature support has been extended to the 7750 SRs so that IPv6 can be enabled on a 7750 SR chassis that supports only "Chassis mode B" without having to upgrade the entire chassis. According to this capability supported MDAs, IMMs belonging to 7750 SR chassis in "Chassis Mode C" could be used in 7750 SR chassis that supports only "Chassis Mode B". There is no licensing impact according to this mixed mode feature.

Support for Beta Keys

5620 SAM 9.0 will have specific keys for Beta Releases of 5620 SAM. Production keys will no longer work with Beta software. Beta keys are controlled by 5620 SAM Product Management. To apply for the 5620 SAM Beta Program see your Alcatel-Lucent Account representative.

Convert key generation to ASLM for SAM

Alcatel-Lucent has retired AKG as a supported internal tool for key generation. As a result, 5620 SAM keys will be generated via ASLM as of 9.0R1. This poses a process change for internal teams wishing to order license keys on behalf of their customers.

Oracle Ordering Information

When purchasing the 5620 SAM application, sufficient licenses must be acquired for the utilization of the Oracle product, which is embedded into the 5620 SAM Database software. The licenses required to operate the Oracle product are computed based on the number of CPUs in the server workstation on which the 5620 SAM Database component will operate.

The table below provides examples of the type and possible number of CPUs that can be included in the servers that Alcatel-Lucent recommends for the operation of 5620 SAM.

The additional Oracle licensing requirements can be computed by looking at the number of CPUs that are included in the Server workstation on which the 5620 SAM Database component is installed. When a 5620 SAM installation is redundant, these Oracle licensing requirements must be doubled.

Sun Server	Number of CPUs	Additional Oracle Licensing Requirements
SPARC Single-core CPU Platforms (mono-core)		
SunFire v440 Server	4	Additional licensing for 2 CPUs
SunFire v445 Server	4	Additional licensing for 2 CPUs
SPARC Dual-core CPU Platforms		
SunFire v490 Server	2 or 4	If 2 CPUs, additional licensing for 1 CPUs (dual-core) If 4 CPUs, additional licensing for 3 CPUs (dual-core)
SunFire v890 Server	Up to 8	If 2 CPUs, additional licensing for 1 CPUs (dual-core) If 4 CPUs, additional licensing for 3 CPUs (dual-core) If 6 CPUs, additional licensing for 5 CPUs (dual-core) If 8 CPUs, additional licensing for 7 CPUs (dual-core)
Solaris x86 Platforms		
SunFire x4100, x4200	2 dual-core CPUs	No additional licensing requirements
SunFire x4200	2 dual-core CPUs	No additional licensing requirements
SunFire x4600, x4440	2 or 4 multi-core CPUs	If 4 dual-core CPUs, additional licensing for 2 CPUs (mono-core) If 2 quad-core CPUs, additional licensing for 2 CPUs (mono-core) If 4 quad-core CPUs, additional licensing for 6 CPUs (mono-core)
SunFire x4600	Up to 8 multi-core CPUs	If 2 dual-core CPUs, no additional licensing requirements If 4 dual-core CPUs, additional licensing for 2 CPUs (mono-core) If 6 dual-core CPUs, additional licensing for 4 CPUs (mono-core) If 8 dual-core CPUs, additional licensing for 6 CPUs (mono-core)
SunFire x4170, x4270	Up to 2 multi-core CPUs	If 1 quad-core CPU, no additional licensing requirements If 2 quad-core CPUs, additional licensing for 2 CPUs (mono-core) If 1 hex-core CPU, additional licensing for 1 CPU (mono-core) If 2 hex-core CPUs, additional licensing for 4 CPUs (mono-core)

Table 2: Platform CPU and Oracle Equivalent

2. SCALE & ARCHITECTURE

Scalability Targets

Aggressive network growth targets, entry of 5620 SAM into new markets, latency, and increased product functionality and usage are driving capacity requirements upward.

Table 2 below shows the scale achieved in 5620 SAM Release 9.0 R3.

Note that:

- These limits require particular hardware specifications and specific deployment architectures.
- Scale limits for network elements including GNEs, 7705s, and 7210s assume a maximum sustained trap rate of 40 traps/second.

The following table represents the scalability limits supported in 9.0R3.

Criteria	9.0 R3
Maximum network elements (excluding GNE)	12,000
Maximum number of GNEs (assumes 10 interfaces per)	18,000
Combined GNE/network elements (assumes 10 interfaces per GNE max)	18,000/3000
Combined network elements/GNE (assumes 10 interfaces per GNE max)	12,000/2,000
Maximum number of managed MDAs containing:	25,000
Max 7250 network elements	2,500 (= 5,000 MDAs)
Max 7705 network elements	12,000 (= 12,000 MDAs)
Max 9500 network elements	5,000 (=5,000 MDAs)
Max 7210 network elements	5,000 (= 5,000 MDAs)
Max 1830 PSS-32/16	250
Max 1830 PSS-1	5000
Number of Optical Transport Services	6000 service, 1200 endpoints
Max OMNISwitch 6000 series (1 MDA equivalent to 1 chassis)	6,000
Max OMNISwitch 9000 series (1 MDA equivalent to 1 NI)	1,000
Maximum number of SAPs	6,000,000
Maximum number of Services	2 Million
Maximum number of LSPs	50,000
Concurrent Clients	
Max OSS Clients [HTTP, JMS1]	30
Max GUI Clients	150
OAM Tests (10 minute interval)	

Standard Tests (not simultaneous with Lightweight)	6,000
Lightweight Tests (not simultaneous with Standard)	
Accounting Based Tests	50,000
Statistics (15 minute interval)	
Accounting Statistics	10,000,000
Performance Statistics	500,000
Combined Accounting/Performance	10,000,000/500,000
Alarms	
Outstanding Alarms	50,000
Alarm History (assumes 50,000 alarms per day)	One month

Table 3: Scaling Commitments & Targets for Release 9.0

Performance Targets

The following table represents the performance targets for 5620 SAM R9.0. Factors that may result in fluctuation of these targets include:

- SAM Server and SAM Database hardware platforms (faster platforms switch faster)
- Network Activity
- User/OSS Activity
- DB activity (i.e. database backups)
- Network size
- Latency

Performance Item Description	9.0 Performance Targets
5620 SAM Client GUI Performance	
Time to launch a 5620 SAM Client GUI	~30 seconds
Time to launch a 5620 SAM Client GUI configuration form	~2 seconds
Time to save a 5620 SAM Client GUI configuration form	~2 seconds
5620 SAM Server Performance	
Time to restart the 5620 SAM Server when managing the maximum number of devices	~10 minutes
Estimated time to resynchronize one new router in domain	<20 minutes (subject to size of new router)
SAM DB Backup (without stats)	Up to 60 minutes (subject to network size)
SAM DB Restore	~45 minutes
SAM Server activity switch	<10 minutes
SAM DB switchover (by invoking through the GUI)	<10 minutes
SAM DB failover (manually invoked)	<20 minutes until complete recovery, including SAM Server restart
SAM DB failover (automatic)	<20 minutes until complete recovery, including SAM Server restart

Recovery of standby SAM Database after failover (This assumes a workstation is available and properly configured before the recovery begins)	<75 minutes
5620 SAM-O Performance	
Number of services created per day by an OSS workflow for VLL Service type	Up to 25K per day (24 hours)
Average time to create 1 VLL service	~3.0 seconds
Average time to create 1 VPLS service (3 sites, 1 SAP/site)	~4.5 seconds
Average time to create 1 VPLS service (6 sites, 1 SAP/site, 30 circuits fully meshed)	~10 seconds
Average time to configure 100 VPLS Service on 3 Sites using one SAP	~16 minutes
Average time to add 1 IES interface to an existing service	~1.5 seconds
Average time to create 1 static route on a 7750 SR	~0.6 seconds
Average time to create 1 MAC ACL filter	~0.8 seconds
Average time to create 1 GRE SDP	~0.75 seconds
Average time to create 1 MPLS SDP	~1.0 seconds
Average time to create 1 MPLS path	~0.8 seconds
Upgrade Performance	
SAM Client Upgrade	<10 minutes
SAM Complex Upgrade (Server, Database, Auxiliaries) <i>Note:</i> The target includes the installation of the software on the existing servers and SAM database conversion. Solaris Installation/Upgrades, patching, pre/post-upgrade testing and file transfers are excluded from the target.	<6 hours
SAM Upgrade Maximum Visibility Outage with SAM Redundant system <i>Note:</i> Provided proper planning and parallel execution procedures were followed.	<15 minutes

Table 4: R9.0 Performance Targets

Oracle 11

5620 SAM release 9.0 R1 included an Oracle upgrade (from 10G to 11G). The upgrade is transparent to the end user; the upgrade is handled by the 5620 SAM installation.

3. NMS APPLICATIONS

GUI Frameworks

A number of fundamental frameworks have been developed for designers to improve the usability of the 5620 SAM GUI going forward. New items developed in 5620 SAM will use these options. There will be an ongoing effort in 2011 to move some legacy over as well. These efforts will be done on a case by case basis.

Collapsible Panel

Designers now have the option of adding a collapsible panel to a form. Collapsible panels are used to save space and reduce clutter. Often their use makes it possible to put more items on a single tab without forcing an unbearably long list to scroll. See diagram below:

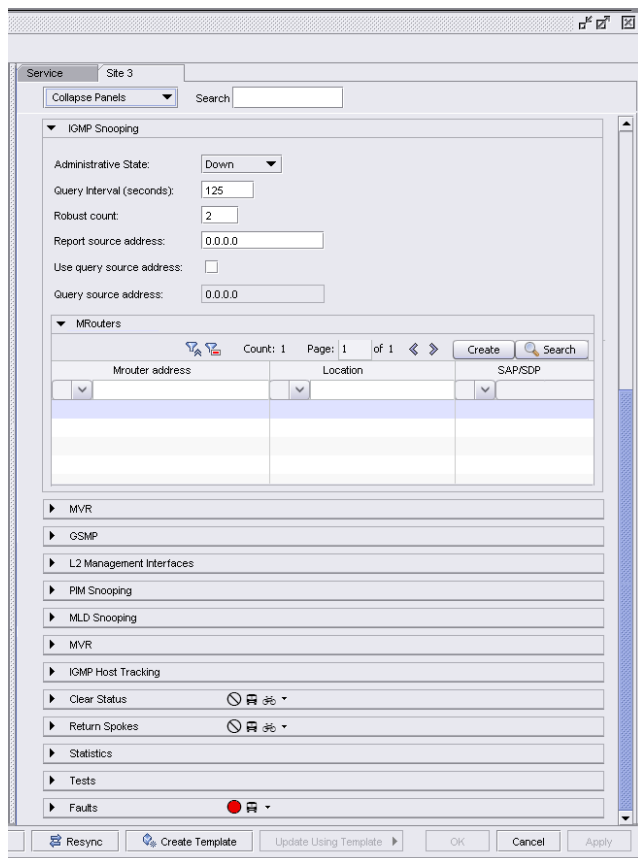


Figure 1: Collapsible Panel

Specific requirements include:

1. An operator must be able to “Open” and “Close” a collapsible panel
2. A designer must be able to specify the default (open or close)
3. May contain: configuration, lists, pictures, text, another collapsible panel, editable tables
4. A designer must be able to specify a label (default may be tab label)
5. Multiple panels shall be able to exist on a given tab.

All groups in 5620 SAM will appear in a collapsible panel in release 9.0.

Editable Element Lists

Designers now have the option of adding an editable table to a config form. The target usage of this option would be in cases where there is a list of very straightforward elements to configure or read (for example: eNodeB). See sample diagram below.

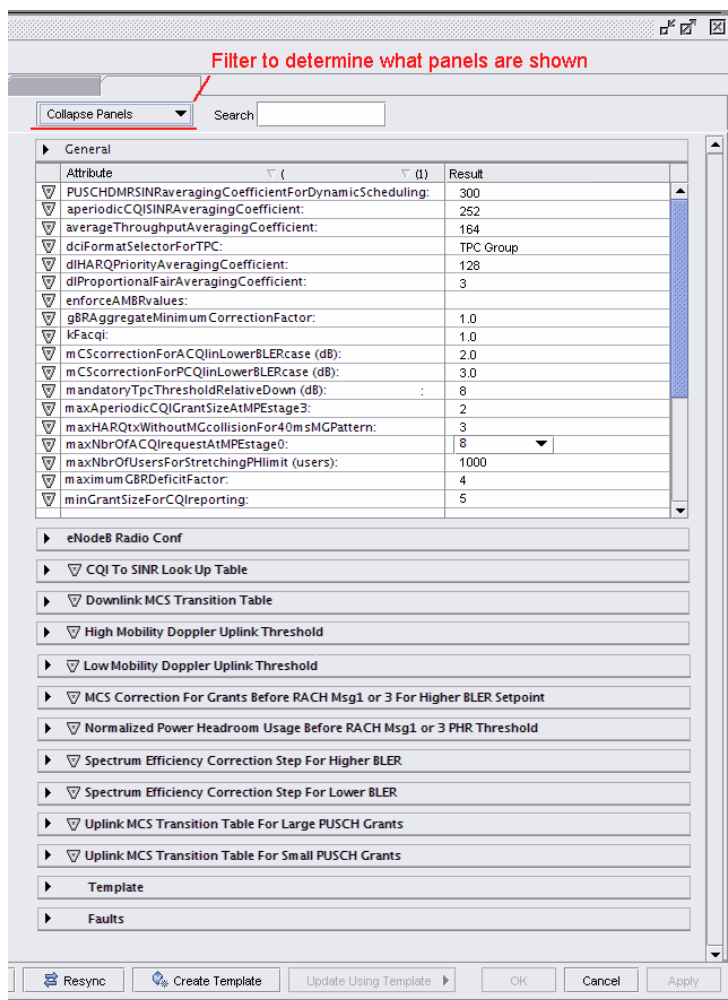


Figure 2: Sample Editable List

Specific requirements include:

1. Support all field types in the quick filter menu object.
2. Design controlled order of elements
3. Design controlled grouping of elements
4. Validation of the field
5. Mirrored properties
6. Display filters

Combine Configuration and List in a common tab

Designers now have the option of combining configuration and lists in a common tab. This will reduce the number of tabs.

Figure 3: Config and List in Single Tab

Parameter Search

Release 9.0 will offer an ability to search and navigate to specific parameters on a form.

Attribute Indication on Tabs and Collapsible Panels (9.0R1 stretch)

5620 SAM configuration forms will include visual indicators on configuration forms on tabs and collapsible panels. This is to assist in directing an operator's attention to a place in the form of most interest. Initial targets for indicators are:

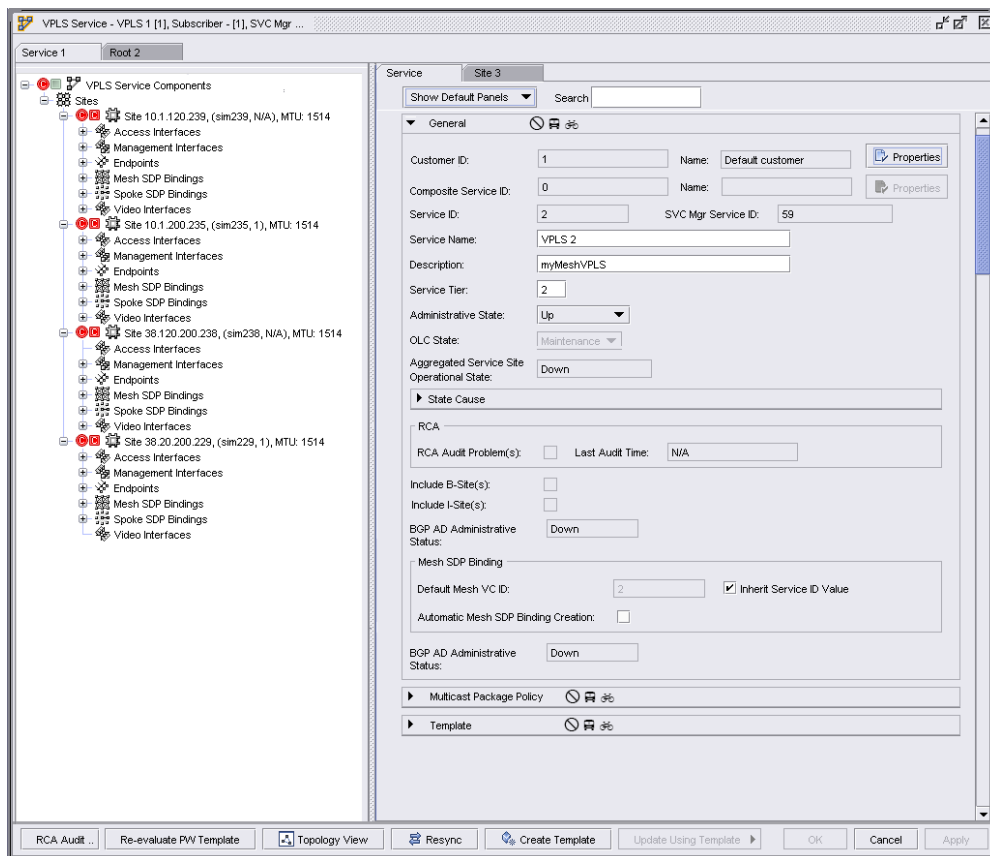
- Mandatory attributes
- Attributes that have changed from their default value.

Component Tree Navigation

To improve service navigation and to reduce the number of windows Release 9.0 changes the component tree/configuration form paradigm.

The Component Tree has been moved outside the configuration form into its own pane on the left (see diagram below). As a user clicks on an object, the corresponding configuration form appears on the right hand side. If a user clicks on a container (i.e. Access Interfaces, Endpoints, etc), a list of all

items in the container appears on the right. As a user clicks on another object, the right pane gets updated with the correct form.



Lock & Unlock of Service Configuration Forms

From time to time, as a user is navigating across various objects on a service component tree they may wish to lock one for reference later. A lock and unlock button will be available on the right pane for this. The flow is as follows:

- user clicks on SAP#1
- user locks SAP#1 configuration form
- user clicks on SAP#2
- a new tab appears in focus with the configuration form for SAP#2

Undocking Forms

From time to time, a user may wish to compare configuration forms. An undock button will be available on the right pane for this. The flow is as follows:

- user clicks on SAP#1
- user locks SAP#1 configuration form
- user clicks on SAP#2
- a new tab appears in focus with the configuration form for SAP#2
- user undocks the SAP#1 tab so this configuration form appears in its own window

- user has side by side comparison ability of SAP#1 and SAP#2

Flexible Tree Ordering (9.0R1 stretch)

Trees are typically sorted based on the left-most parameter per object. Depending on the object, various parameters exist per object in the tree. In some cases operators are really only interested in one of those parameters. In these cases that parameter should be in the left-most position and should be what the sort is based on. Release 9.0 will offer the ability for a user to customize the parameters that appear and their order which will implicitly control sorting.

Customizing Columns and Ordering in Lists (9.0 R1 stretch)

Currently 5620 SAM offers the ability to drag columns as a way to customize column order. For lists with many columns this method is difficult to use. Release 9.0 offers the ability for a user to easily customize the columns that appear in a list and their order. This will be available in all lists and the alarm window.

Reuse Service Component Tree/Configuration Form Paradigm For Equipment (9.0 R1 stretch)

To improve equipment navigation and to reduce the number of windows Release 9.0 reuses the new paradigm for service component tree/configuration form for the equipment and routing trees. Both will offer the same look and feel.

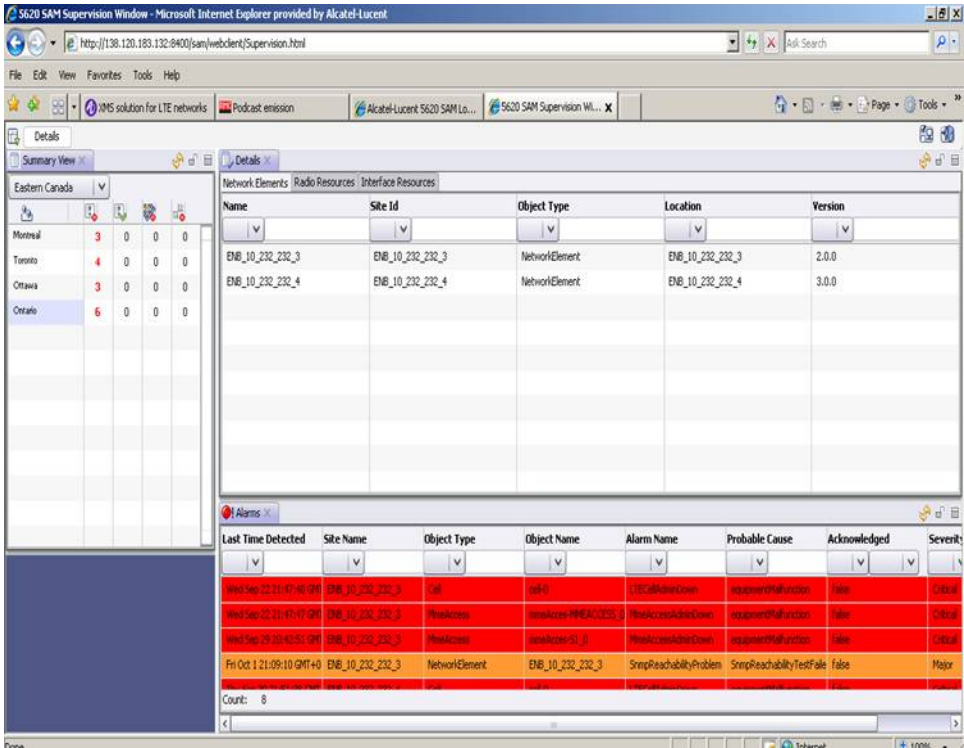
A right pane is added to the tree that holds the corresponding configuration form for the item that is highlighted. As a user clicks on an object, the corresponding configuration form appears on the right hand side. As a user clicks other objects, the right pane gets updated with the correct form.

5620 SAM Supervision

5620 SAM Supervision is a web-based tool that provides a user the ability to monitor alarms and object status of elements managed by a 5620 SAM.

The GUI has three components:

- Summary View
- Tabular View
- Detailed Alarm View



The Summary View displays the following data:

Location	Count	Disabled Cells	Disabled Links	Disabled Equipment	Disabled Services
Montreal	3	0	0	0	0
Toronto	4	0	0	0	0
Ottawa	3	0	0	0	0
Ontario	6	0	0	0	0

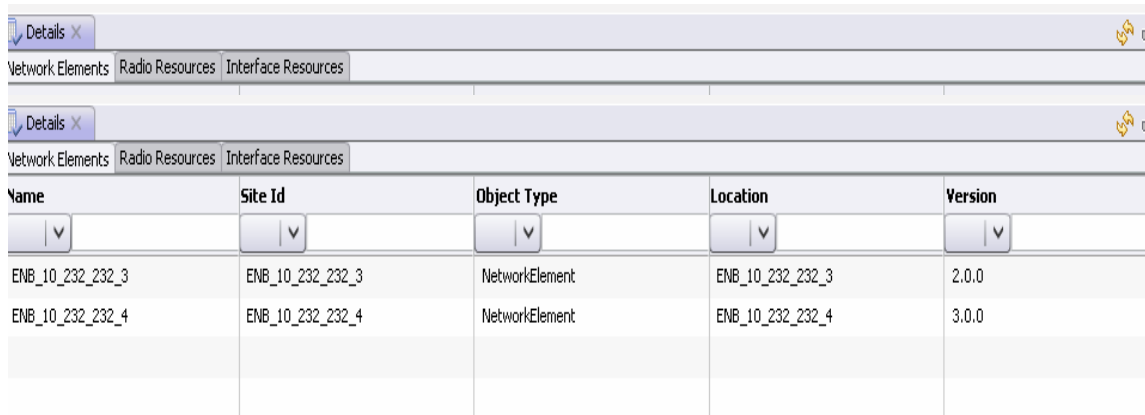
The Alarms View displays the following data:

Last Time Detected	Site Name	Object Type	Object Name	Alarm Name	Probable Cause	Acknowledged	Severity
Wed Sep 22 21:42:48 GMT	ENB_10_232_232_3	Cell	Cell	LTECellBannedDown	equipmentFailure	False	Critical
Wed Sep 22 21:47:47 GMT	ENB_10_232_232_3	NetworkElement	NetworkElement	NetworkElementDown	equipmentFailure	False	Critical
Wed Sep 22 21:47:47 GMT	ENB_10_232_232_3	NetworkElement	NetworkElement	NetworkElementDown	equipmentFailure	False	Critical
Wed Sep 22 21:47:47 GMT	ENB_10_232_232_3	NetworkElement	NetworkElement	NetworkElementDown	equipmentFailure	False	Critical
Fri Oct 1 21:09:10 GMT+0	ENB_10_232_232_3	NetworkElement	ENB_10_232_232_3	SnmpReachabilityProblem	SnmpReachabilityTestFailed	False	Major

Count: 8

Details				
Summary View				
Eastern Canada				
Montreal	3	0	0	0
Toronto	4	0	0	0
Ottawa	3	0	0	0
Ontario	6	0	0	0

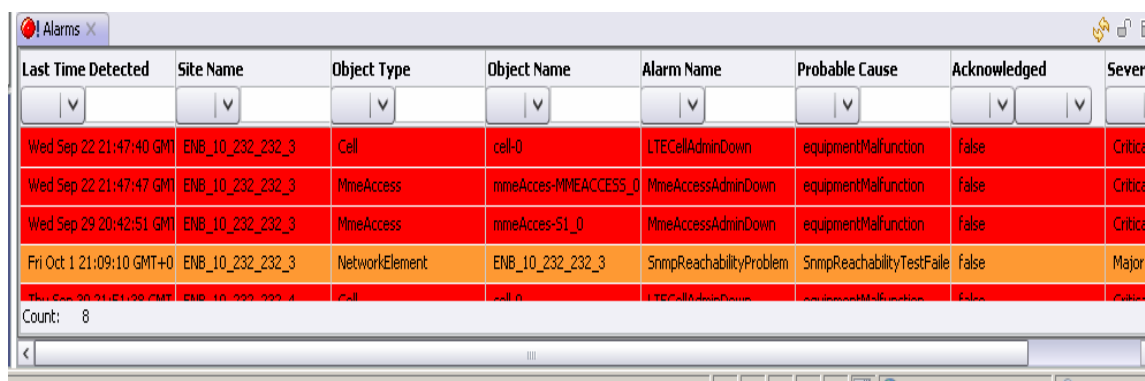
The Tabular View displays the list of the equipments that are declared into a group and displays info such as operational state and administrative state.



The screenshot shows a web interface with a 'Details' tab and three sub-tabs: 'Network Elements', 'Radio Resources', and 'Interface Resources'. The 'Network Elements' sub-tab is active, displaying a table with the following columns: Name, Site Id, Object Type, Location, and Version. Each column has a dropdown arrow. The table contains two rows of data:

Name	Site Id	Object Type	Location	Version
ENB_10_232_232_3	ENB_10_232_232_3	NetworkElement	ENB_10_232_232_3	2.0.0
ENB_10_232_232_4	ENB_10_232_232_4	NetworkElement	ENB_10_232_232_4	3.0.0

The Detailed Alarm view displays the list of alarms for the list of the equipments that are declared into a group and displays the details of the alarms.



The screenshot shows a web interface with an 'Alarms' tab. It displays a table with the following columns: Last Time Detected, Site Name, Object Type, Object Name, Alarm Name, Probable Cause, Acknowledged, and Severity. The table contains five rows of data, with the first four rows highlighted in red and the fifth in orange. A 'Count: 8' is shown at the bottom left of the table area.

Last Time Detected	Site Name	Object Type	Object Name	Alarm Name	Probable Cause	Acknowledged	Severity
Wed Sep 22 21:47:40 GMT	ENB_10_232_232_3	Cell	cell-0	LTECellAdminDown	equipmentMalfunction	false	Critical
Wed Sep 22 21:47:47 GMT	ENB_10_232_232_3	MmeAccess	mmeAcces-MMEACCESS_0	MmeAccessAdminDown	equipmentMalfunction	false	Critical
Wed Sep 29 20:42:51 GMT	ENB_10_232_232_3	MmeAccess	mmeAcces-S1_0	MmeAccessAdminDown	equipmentMalfunction	false	Critical
Fri Oct 1 21:09:10 GMT+0	ENB_10_232_232_3	NetworkElement	ENB_10_232_232_3	SnmpReachabilityProblem	SnmpReachabilityTestFaile	false	Major
Thu Sep 29 21:51:32 GMT	ENB_10_232_232_4	Cell	cell-0	LTECellAdminDown	equipmentMalfunction	false	Critical

In addition of those supervision functions, the user can launch in context with single sign-on the associated properties form of the 5620 SAM in order to pass in one click from the supervision view to the classical 5620 SAM configuration view.

Usability Improvements

There are a number of additional improvements of the usability. This includes additional and adequately sized description fields and the display of more information like software versions on individual cards.

A change of port types is allowed only, if there is no impact on Service Access Points, and vice versa, port descriptions are shown, when working on SAPs. This removes the need to jump from one screen to another, and avoids errors.

Horizontal Integration Protocol Support

5620 SAM introduces support for Horizontal Integration Protocol (HIP). This acts as an enabler for applications to integrate horizontally to 5620 SAM. Horizontal integration includes a common alarm feed (single northbound interface) and will provide the ability to navigate from 5620 SAM Supervision to the corresponding application's GUI interface.

Note: This is an enabler only. Requests to integrate applications into 5620 SAM must be presented to 5620 SAM Product Management as per normal feature request process as each requires additional test and possibly development work.

Display of PEM and fan trays in the equipment tree

PEM and fan trays will be shown in the equipment tree as follows:

Shelf

|_Fans

| | _Fan Tray x

| | _Fan Tray y

| | _...

|_ Power Supplies

| | _Power Supply Tray a

| | _Power Supply Tray b

| | _...

- 1) Fan Tray node is shown in the format "Fan Tray - <ID>, <Fan speed>, <Fan device state>"
- 2) The Power Supply Tray is shown in the format "Power Supply Tray -<ID>, <assigned type>, <power entry module type>"
- 3) The power entry module attribute is not supported by all the nodes, hence this attribute will be visible to only those nodes which support power entry module.

They will be listed under "Shelf", the slot information will be added. If there are trays in different slots, they will be sorted according to the slot.

Reply function to SAM text messages

The "Client ID" is added to text messages in SAM, in order to make sure that the sender of the text message can be uniquely identified. A reply function is taking that Client ID into account, so that an operator receiving a text message can send a response immediately.

Ethernet layer added to bulk change

LLDP Ethernet layer attributes are available now for bulk configuration change via the Bulk Change tool.

Clarify the scope of Override Tabs

The tab names "Override" in scheduler policies are modified to "Override Policy Items" to clarify the scope of the override context.

Usability Improvements of the GUI builder, script manager and bulk updates

New enhancements are made to the GUI builder:

- When renaming components that are target of an action, the GUI builder will automatically update the actions with the new name.
- The datetime property in scripting supports now the definition of "Current Time".
- In CLI scripts, the Result Manager displays now results for the selected target. Before, the Result Manger displayed results for all targets regardless of the selection.

Switch user account without stopping the SAM client

A new menu item is added to the Application menu named "Switch User". When this menu option is selected, the existing GUI is closed and a new one is opened for the user to relogin. The user can be switched quickly without the need to restart the client.

Enhanced Channelization Support

Enhanced Channelization Support now includes:

- Creation of DS0 sub-channels and the assignment of time slots.
- Consolidated view of the assignments of timeslots to DS0 sub-channels.

Confirmation needed for ACL filter re-ordering

When re-ordering the Ids of ACL filter entries, a confirmation pop-up dialog will be invoked before the change is implemented. This will be consisten with most other windows/forms in 5620 SAM application.

4. PLATFORM APPLICATIONS

x86 Blade Perf Comparison (HP blade vs. Oracle rack mount)

Comparison performance testing showed no significant performance differences between comparable Oracle Rack Mount Servers and HP Blade Servers.

For more information, please refer to the 5620 SAM Planning Guide.

Auto database reinstantiation

During SAM Server install, there is an option for

- 1) Automatic Re-instantiation (either on or off (default)) for **_DB failover only_**.
- 2) A delay time before kicking off the auto-reinstantiation (the default 60 minutes)

These parameters can be reconfigured at any time by re-running the server installer ['config' option].

On the SAM GUI Client, the three parameters are shown on the System Information form as read-only:

- 1) "Auto Re-instantiation Enabled"
- 2) "Delay Time"
- 3) "Next Auto Standby Reinstantiation Attempt Time"

After a database failure and the SAM server is back online, the auto re-instantiate delay timer starts and the Standby Re-instantiation State will be set to Pending. Once that time has expired, SAM will determine if it can connect to the standby DB proxy. Then the following happens:

IF SAM can connect to the standby DB proxy, it will initiate a re-instantiation. Once the re-instantiation is complete, it will be tagged as such. However, if the re-instantiation fails, it will be tagged as Failed and will not be attempted again.

ELSE, if SAM can't connect to the standby DB proxy, then the Standby Re-instantiation State will be set to Failed, the timer is re-started, and SAM will try again at the end of the next delay time. SAM will continue to try to connect to the standby DB proxy at the end of each interval. Once SAM can connect to the standby DB proxy, an auto re-instantiation is launched. Once the re-instantiation is complete, it will be tagged as such. However, if the re-instantiation fails, it will be tagged as Failed and will not be attempted again.

If a manual re-instantiation is In Progress, the auto-reinstantiation will not be launched and the "Next Auto-Standby Re-instantiation Launch Time" will be cleared in the GUI. While an auto-reinstantiation is In Progress, the manual Re-instantiate the Standby button in the SAM GUI will be disabled.

When an automatic standby DB re-instantiation will NOT be triggered:

Following a SAM DB installation or upgrade, an auto re-instantiation will not be launched. This feature is for DB failovers only.

A DB archivelog gap on the standby will not cause an auto re-instantiation.

Shutting down the standby DB or server and re-starting it again, will not cause an auto re-instantiation

A server or DB switchover will not cause an auto re-instantiation.

There is no SAM-O support.

Security DCRs

The security enhancements within the Oracle database include the following:

- The minimum allowed sqlnet logon version will be set to 10 or higher;
- Monitoring of DBMS access control bypass will be enabled;
- PUBLIC access to restricted packages will be removed; and,
- Oracle minimum object auditing will be enabled.

Security Improvements

The provided improvements of security include a minimum number of characters for the user name, the ability of the security administrator to force a user to change his password at next log-in.

Furthermore, the risk of accidental deletion of services will be reduced by assigning a service priority (low, medium or high). While the handling of services with a low service priority is exactly as it was so far, ensuring that there is no impact on current provisioning procedures unless really wanted, services can be explicitly protected.

When an operator wants to delete a set of services including a service of priority “medium” or “high”, it is required to confirm the deletion by typing in the highest priority level. This ensures that the operator does not just blindly tick the confirmation box, but has to check the priority level of the services about to be deleted and to confirm awareness of the implications. Services of protection level “high” can be removed only by operators with a specific access right. This prohibits unintended removal of business-critical services.

Automated SSL/SSO Configs for Upgrades

When a 5620 SAM server/client is installed, the set of parameters that are needed to configure SSL/SSO will be collected through the installer software and stored in a data file that will be backed-up and restored across software upgrades.

If, in moving from one release to another, additional changes to information are required, the information will be collected through the installer, and the data file will be updated. The data file would then be used by the installer post-upgrade to re-instantiate SSL/SSO configuration on 5620 SAM server. The end-user will not need to go through the process of reconfiguration across an upgrade.

To make 5620 SAM more secure, the installer has only two options: enable SSL for all communication channels between 5620 SAM components; or disable SSL for all channels. This includes the interface between 5620 SAM-O and OSI applications. Individual channel configuration for SSL is unsupported starting from Release 9.0 R1.

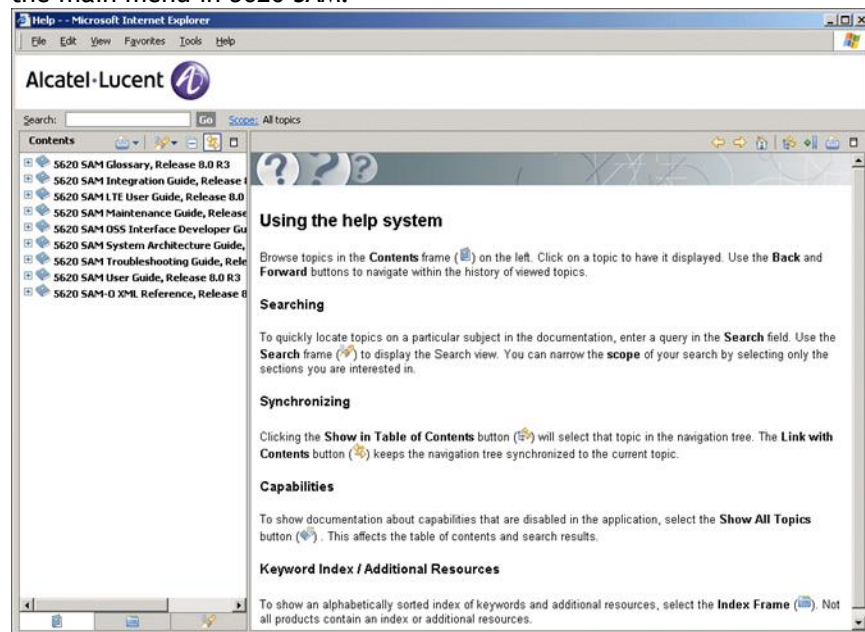
If, prior to Release 9.0 R1, the system configuration had only selected channels enabled for SSL, the installer for subsequent 9.0 Rloads will overwrite the option by enabling or disabling all channels for SSL as specified by the user.

Infocenter for User Docs

5620 SAM will move to an Info-center paradigm for user documentation in 9.0. Info-centers allow operators to:

- Import their choice of 5620 SAM docs
- Import their own custom docs, links, videos
- Search across all docs

The Info-center is triggered in the same way the current documentation is. A user selects Help from the main menu in 5620 SAM.



Compression of backup files via tar/gzip

From the Database Manager configuration form, users can now enable the compression the 5620 SAM database. Based on the selection, the backup files will be compressed using tar and gzip. Only the compressed files will be kept. Upon restoration, the files will be restored to their original format before starting the restore process.

5. EQUIPMENT MANAGEMENT

7x50 Mixed-Mode Chassis Support Phase 2

In release 8.0 support for a new capability was introduced on the 7450 ESS-7 and ESS-12 platform to support 7750 (SR) functionality through the support of 7750 IOM3-XP and MDAs or 7750 IMMs. This provides 7450 customer greater flexibility in the services they can offer namely a seamless transition to scalable IP services within existing 7450 footprints.

In 9.0, mixed mode is being extended to the 7750 so that IPv6 can be enabled on a 7750 chassis in chassis mode B without having to upgrade the entire chassis. This is done by selectively upgrading only the slots with network ports and those ports requiring IPv6 support to IOM3-XP's or IMMs.

Target Applications

There are a large number of customers with 7750 system populated with a mixture of IOM1, 2 and 3, upgrading these systems to replace all IOM1s so that the chassis mode can be changed to mode C or higher is cost prohibitive.

The intent of this feature is to use the mixed mode mechanism to allow 7750 chassis to be selectively upgraded with IOM3-XP or IMMs to allow certain features (namely IPv6) to be supported on a 7750 chassis without upgrading the entire chassis to support a new level. In release 9.0 the only feature to be supported is IPv6 under mixed mode.

7750 Mixed Mode

The primary goal of this feature is to use the mixed mode mechanism to allow 7750 chassis to be selectively upgraded with IOM3-XP or IMMs to allow certain features (namely IPv6) to be supported on a 7750 chassis without upgrading the entire chassis to support a new level.

When the mixed mode state is enabled on a 7750 chassis then IPv6 can be configured without replacing existing IOM1s or changing the chassis mode level for the system. However all IPv6 interfaces will be restricted to ports on the 7750 IOM3-XP or IMMs.

Basic Constraints

- In order to place a chassis into mixed mode all network interfaces must be on IOM3-XP and associated MDAs or IMMs
- The MDAs must match the IOM type (i.e. 7750 MDAs/MDA-XP with 7750 IOM3-XP & 77450 MDAs/MDA-XP with 7450 IOM3-XP)
- IPv6 support is the feature supported via this mechanism in 9.0
- All access interfaces with IPv6 interface may only reside on slots with an IOM3-XP or IMM

Hardware Support

This feature should be supported on all existing and future CFM/CPM. Only 7750 IOM3 and MDAs or IMMs will be supported in a 7450 (Not supported on ESS-6)

Note: Mixed mode is not applicable to the 7750 SR-1, 7450 ESS-1, 7710 SR-c4, 7710 SR-c12, 7750 SR-c4 or 7750 SR-c12

7750 MDA support in a 7450 mixed mode chassis

An additional part of this feature in 9.0 is to add support for additional 7750 MDAs in a 7450 chassis running in mixed mode. These should include:

- Any remaining Ethernet MDAs
- POS (SONET/SDH) MDAs
 - 7750 - 16/8 x OC-3c/OC-12c/STM-1c/STM-4c POS MDA
 - 7750 - 2/4 x OC-48c/STM-16c POS MDA
 - 7750 - 1x OC-192c/STM-64c POS MDA (SR, IR & LR optics)
- ATM MDAs
 - 7750 - 4 x OC-3c/OC-12c/STM-1c/STM-4c ATM MDA
 - 7750 - 16 x OC-3c/STM1c ATM MDA
- ASAP MDAs
 - 7750 - 12/4 x chDS3 ASAP MDA
 - 7750 - 4 x chOC-3/chSTM-1 ASAP MDA
 - 7750 - 1 x chOC-12/chSTM-4 ASAP MDA
- CES MDAs

OMNI Support

The following tables show functionalities as per OmniSwitch family of products supported by 5620 SAM releases.

OmniSwitch Product	SAM 6.0 R1	SAM 6.0 R3	SAM 6.1 R1	SAM 7.0 R1	SAM 7.0 R4	SAM 8.0 R1	SAM 8.0 R3 (candidate)
OS 6850 6.3.1	✓	✓	✓	✓	✓	✓	✓
OS 6400 6.3.3	-	-	✓	✓	✓	✓	✓
OS 6855 6.3.2	-	-	✓	✓	✓	✓	✓
OS 9000 6.3.1 R2	-	-	-	✓	✓	✓	✓
OS 6850, 6400, 6855 & 9000 6.3.4 R1					✓	✓	✓
OS6250, 6.6.1 (Metro & SME)						✓	✓
OS 9000E 6.4.2 R1						✓	✓
OS 6850, 6400, 6855 & 9000 6.4.2 R1							✓
OS 6855 U24X, 6.4.2							✓
OS6250, 6.6.2 (Metro & SME)							✓

Table 5: OMNI Support

Functionality	SAM 6.0 R1	SAM 6.0 R3	SAM 6.1 R1	SAM 7.0 R1	SAM 7.0 R3	SAM 7.0 R4	SAM 8.0 R1	SAM 8.0 R3 (candidate)
OmniSwitch Equipment Management	✓	✓	✓	✓	✓	✓	✓	✓
Stack Configuration ¹	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet Port Configuration	✓	✓	✓	✓	✓	✓	✓	✓
VLAN Service	✓	✓	✓	✓	✓	✓	✓	✓
QoS Management	✓	✓	✓	✓	✓	✓	✓	✓
NE Maintenance	✓	✓	✓	✓	✓	✓	✓	✓
AAA Security	✓	✓	✓	✓	✓	✓	✓	✓
Port Security	✓	✓	✓	✓	✓	✓	✓	✓
Protocols - Static Routing, IPv4 Multicasting (switching & routing)	✓	✓	✓	✓	✓	✓	✓	✓
IGMP Snooping	-	✓	✓	✓	✓	✓	✓	✓

Notifications - Traps & Alarms	/	/	/	/	/	/	/	/
Ethernet Interface Statistics	/	/	/	/	/	/	/	/
OSSI	/	/	/	/	/	/	/	/
OAM - ICMP Ping & Trace	/	/	/	/	/	/	/	/
Full Spanning Tree management	/	/	/	/	/	/	/	/
UDP Relay/DHCP Snooping ³	-	-	-	/	/	/	/	/
Switch Health Monitoring	-	-	-	/	/	/	/	/
Ethernet OAM - Connectivity Fault Management	-	-	-	/	/	/	/	/
LAG - Link Aggregation Group	-	-	-	-	/	/	/	/
LLDP - Link Layer Discovery Protocol	-	-	-	/	/	/	/	/
Service Templates	-	-	-	/	/	/	/	/
Scheduling	-	-	-	/	/	/	/	/
Routing Protocols: OSPF, RIP, PIM ²							/	/
MVRF-Multiple Virtual Routing & Forwarding ²							/	/
MPLS, LDP support ²							/	/
VPLS support ²							/	/

Table 6: Supported OMNI Features

¹Stack Configuration is not supported for the OS 6855 6.3.2 and OS 9000/9000E

² Applicable to AOS9000E nodes in 8.0 R1/R3.

³ UDP Relay/DHCP Snooping is not supported on AOS9000E nodes in 8.0 R1.

The 5620 SAM Release 8.0 supports the following OS6250 Chassis types:

Chassis Type	Description
OmniSwitch OS6250-8M	8 copper GigE Ports, 2 Fiber/Copper GigE combo ports, and 2 fiber ports for stacking.
OmniSwitch OS6250-24M	24 copper GigE Ports, 2 Fiber/Copper GigE combo ports, and 2 fiber ports for stacking.
OmniSwitch OS6250-24MD	24 copper GigE Ports, 2 Fiber/Copper GigE combo ports, and 2 fiber ports for stacking. internal DC power supply
OmniSwitch OS6250-24	24 copper GigE Ports, 2 Fiber/Copper GigE combo ports, and 2 fiber ports for stacking.
OmniSwitch OS6250-P24	24 copper PoE Ports, 2 Fiber/Copper GigE combo ports, and 2 fiber ports for stacking.

Table 7: Supported OS6250 Chassis Types

The 5620 SAM Release 8.0 supports the following OS9000E Chassis types:

Chassis Type	Description
OmniSwitch OS9700E	The OmniSwitch 9700E is a high performance switch offering eight slots for Gigabit Ethernet and/or 10-gigabit Ethernet Network Interface (NI) modules. Additional two slots are reserved for primary and redundant Chassis Management Modules (CMMs). The OmniSwitch 9700E supports a maximum of three power supplies.
OmniSwitch OS9800E	The OmniSwitch 9800E is a high performance switch offering 16 slots for Gigabit Ethernet and/or 10-Gigabit Ethernet Network Interface (NI) modules. An additional two slots are reserved for primary and redundant Chassis Management Modules (CMMs). The OmniSwitch 9800E supports a maximum of four power supplies.

Table 8: Supported 9000E Chassis Types

The OS9000E series share a family of common Network interfaces for 10 Gigabit Ethernet and Gigabit Ethernet connectivity:

NI Module	Description
OS9-GNI-C24E	Network Interface with 24 Ports 10/100/1000 with RJ-45 support
OS9-GNI-U24E	Network Interface with 24 Ports 1000Base-X with SFP/MiniGBIC support
OS9-XNI-U2E	Network Interface with 2 Ports Unpopulated 10Gigabit Ethernet with XFP support

Table 9: Supported OS9000E NI Modules

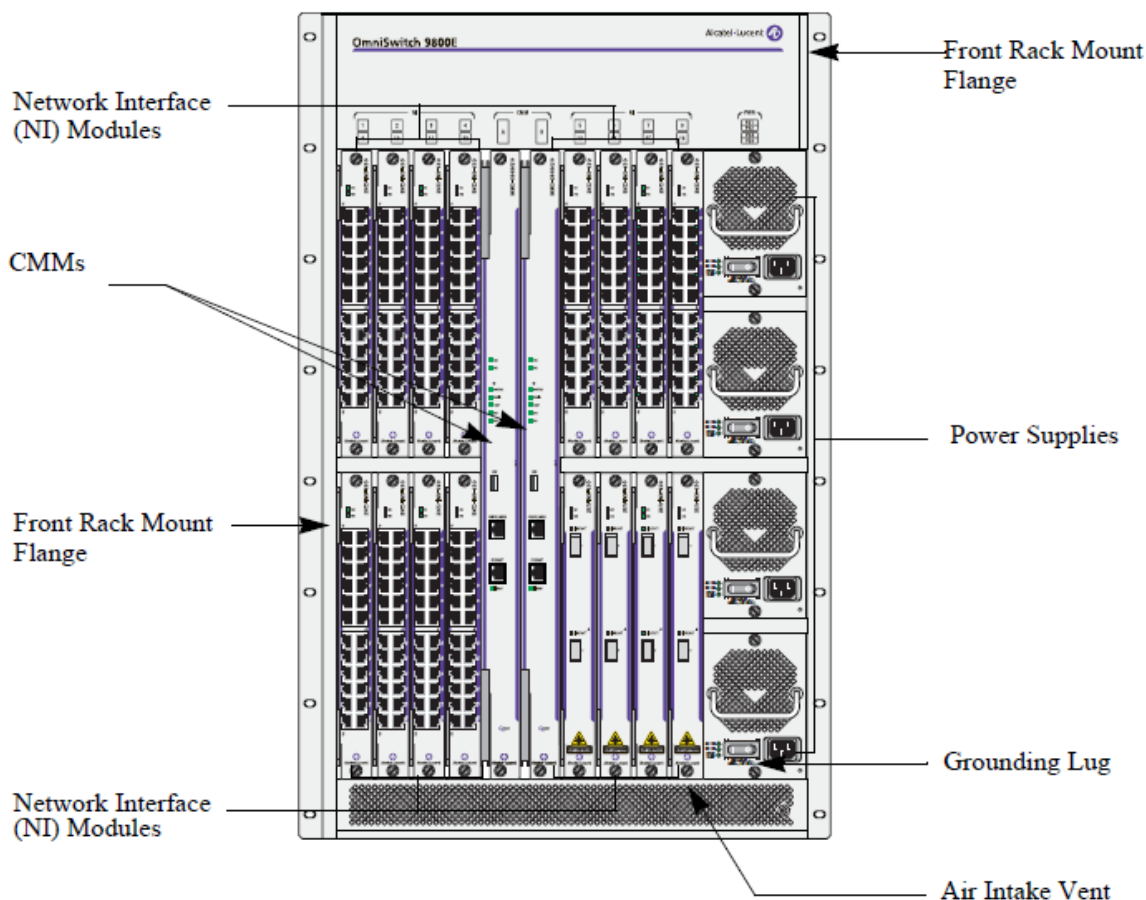


Figure 4: OMNISwitch OS9800E

In 8.0 R1, OSPFv2, RIP, and PIM protocol support is introduced only for AOS9000E nodes. The maximum number of OS9800E nodes supported by a SAM is 1000.

7210 SAS Support

This section describes the key 7210 SAS node features supported by 5620 SAM in 9.0 releases.

Access Uplink Support in 7210 SAS-M Platforms

5620 SAM Release 9.0 provides support for the 7210 SAS-M platforms running in access uplink mode (Pure L2 Ethernet switching mode without MPLS capability). Below section describes the brief details of the platforms which can have this capability & the feature.

7210 SAS-M Platforms

7210 SAS-M is capable of line-rate switching across all its ports and is targeted for use as a CPE device or for use in aggregation in small access aggregation networks.

It is available in three variants as listed below:

- 7210 SAS-M 24F – support 24 100/1000 SFP ethernet interfaces
- 7210 SAS-M 24F 2XFP – supports 24 100/1000 SFP ethernet interface and 2 x 10G XFP interfaces
- 7210 SAS-M 24F 2XFP ETR – supports 24 100/1000 SFP ethernet interface and 2 x 10G XFP interfaces and supports extended operating temperature ranges

Additionally, all the above platforms have an expansion slot and can support the following MDAs:

- 4 x T1/E1 CES MDA (Currently this MDA is not supported in Uplink mode)

- 2 x 10G XFP Ethernet MDA

All the platforms support SyncE and 1558v2 (hardware ready, software support in a future release), allowing these devices to be used in mobile backhaul networks.

Access Uplink Support in 7210 SAS-M

Access uplink support on 7210 SAS-M provides the capability to deploy 7210 SAS-M in L2 networks using QinQ uplinks. Operators who are agnostic to deploy MPLS to the edge prefer to use either QinQ/802.1ad or PBB/802.1ah in the access aggregation networks. With Access uplink (QinQ links) support, operators can use 7210 SAS-M. With the support of access uplink on 7210 SAS-M platforms, operators who want the 10G ethernet interface have an option to deploy these devices.

With the introduction of the access uplink feature, operators intending to use L2 access networks can use the 7210 SAS-M variants where operators have a requirement for the 10G ethernet interfaces and the additional capabilities (e.g. Y.1731 hardware timestamp, SyncE, 1588v2) of the 7210 SAS-M platform.

BFD for FRR (Bi-Directional Forwarding Detection for Fast Reroute)

5620 SAM Release 9.0 provides support to manage BFD sessions on the RSVP interfaces in 7210 SAS-M & SAS-X platforms. This would enable the use of bi-directional forwarding (BFD) to control the state of the associated RSVP interface. This causes RSVP to register the interface with the BFD session on that interface.

BFD (Bidirectional Forwarding Detection)

Bidirectional Forwarding Detection (BFD) is intended to be a light-weight low-overhead, short-duration detection of failures in the path between two systems. If a system stops receiving BFD messages for a long enough period (based on configuration) it is assumed that a failure along the path has occurred and the associated protocol or service is notified of the failure.

When a BFD session transitions to DOWN state, the following actions are triggered. For RSVP signalled LSPs, this triggers activation of FRR bypass/detour backup, global revertive, and switchover to secondary if any for affected LSPs with FRR enabled. It triggers switchover to secondary if any and scheduling of re-tries for signalling the primary path of the non-FRR affected LSPs.

MSTP (Multiple Instance Spanning Tree Protocol)

5620 SAM Release 9.0 provides support to manage MSTP support in 7210 SAS-M platforms, MSTP would enable individual STP per VLAN; this is supported in the similar way it is supported in SR nodes.

7210 SAS-D

5620 SAM Release 9.0 provides support for the 7210 SAS-D node. The 7210 SAS-D is a new device managed by SAM and has been modeled in SAM following the existing paradigm of management for 7210 SAS family of nodes. The configuration, provisioning will be inline with the existing 7210 nodes; a new license type for SAS-D has been introduced.

Note: Please refer the latest official roadmap / release notes / Compatibility Guide for the officially supported SAM release for 7210 SAS-D.

7210 SAS-D 6F4T & ETR

7210 SAS-D is an ethernet demarcation unit with support for 4 x 10/100/100 Base-T ports and 6 x 100/1000 SFP ports. Operators typically will use it as a customer premise unit (CPE). It is expected to support line-rate switching on all the ports. It will primarily provide services to single customer on one or more ports OR provides services to a very small group of customers. It supports transport of service

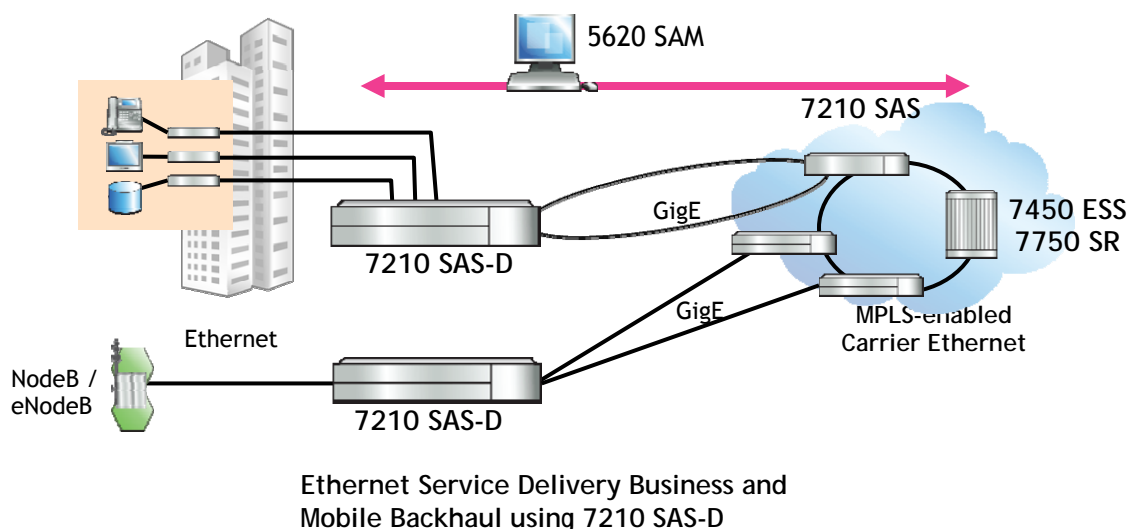
traffic primarily using ethernet QinQ uplinks. It allows for service differentiation with support for QoS per service. Additionally it supports designing highly reliable and available networks with use of G.8032 based Ethernet APS. It supports a rich set of ethernet OAM tools that allow for quick and centralized troubleshooting in case of any problems in the network minimizing truck rolls.

It will be available in two variants

- 7210 SAS-D supporting normal operating temperature range (i.e. 0C – 50C). Its primary application is for use as a CPE/demarc unit in delivery of business services.
- 7210 SAS-D ETR supporting extended temperature range (i.e. -20C – 65C), is targeted for use in outdoor installations (e.g. mobile tower, etc.). This unit has a stratum 3 Oscillator to allow for support of syncE and 1588v2. Its primary application is in use for mobile backhaul. 7210 SAS-D ETR will be available in three options (power supply being different)
 - DC unit supporting +48V DC power supply with an external backup power supply
 - DC unit supporting +24V power supply with an external backup power supply
 - AC unit with an external backup supply.

Target Applications

7210 SAS-D is an ethernet demarcation device used for carrier ethernet service delivery. It is targeted for use as a CPE device for use in business service delivery and mobile backhaul (the ETR version supports syncE and 1588v2). It supports service delivery with use of QinQ uplinks.



9500 Support

The 5620 SAM R9.0 R1 support the WTD 9500 MPR R3.00.00 load mobile back haul transport system load. Support includes the full node feature set with the potential exclusion of STM card support which is currently a stretch feature. In addition, the release extends support for MPR sync features introduced in previous ANSI / ETSI R2.X releases. The 5620 SAM R.9.0 R1 likewise supports the following MPR loads from prior releases: 9500 ETSI 1.03.01E, 1.04.00E, 2.01.01E & 9500 ANSI 1.02.00A, 2.02.00A, 2.02.01A

The 5620 SAM also improves the overall mobile back haul solution with the following NMS content in this release.

Port Segregation Usability

5620 SAM shall support admin up/down changes in the 9500 R3.X code base to make admin state IETF compliant. Note that this feature is 100% dependent on WTD committing the fix in the R3.00.00 time frame.

Extended Back Haul Service

The extended back haul service evolves existing powerful service-in-service features to be more in line with SAM evolution in the optical management space. This is done by adding a termination point to the service level that points at a far end port / near end port/sap. Termination points make it easier for a MBH service event to be correlated back to upper layer objects on other NEs such as a 7705 enhancing the overall solution as follows:

- 5620 SAM provides a service termination point (TP) associated with a far side device port such as 7705 port. Service TPs are automatically discovered as a side effect of configuring the physical port between a 9500 and IP/MPLS equipment like the SAR family.
- 5620 SAM provides support for both services terminating on 9500 or on a remote node like 7705. In cases where 9500 is the service termination a TP will point at the local service port.
- 5620 SAM correlates 9500 service faults to remote port side objects as a result of the new TP feature; eg. a service failure will correlate to port level protocols in the SAM correlation hierarchy.
- 5620 SAM service forms will display the termination end point making it easier to understand the potential impact of disabling a back haul service on microwave transport.
- 5620 SAM 9.0 R5 will extend service-in-service by discovering the association between the 9500 back haul transport service and upper layer IP/MPLS services in the SAR family. As a result of discovery service faults in either layer are cross correlated in SAM. *Note that existing manual mapping is still provided for forward compatibility and to cover some complex corner cases.*

SAP/XC Physical Link

The 5620 SAM shall enhance existing port work from 8.0 R5 that protected service instances when 9500 is terminated by a 77xx network port via a physical link. In this release extended back haul service will accommodate the access - network connection and will preserve service instances on the 9500 access port. This feature is delivered in conjunction with the extended back haul service.

Path Management: Auto Tunnel & Redundant Path Creation

The 5620 SAM supports MBH transport path creation as a VLAN path in R7.0 and R8.0 releases. Paths are constructed hop by hop and may then be re used during service creation on the 9500 MPR platforms. The 5620 SAM path record is very similar to LSP records recording a hop-by-hop path for the service. In this release the 5620 SAM will extend path management to automate the process of creating VLAN paths for service management:

- Discovery of redundant paths for 1 x (1+1) redundant links. Manual path management now will permit configuration of paths in these deployment scenarios on ANSI / ETSI 2.x and 3.x streams.
- Filtered listing of redundant paths appropriate to the service end points at service creation time.
- Creation support for 1+1 paths with improved hop by hop selection and UI filtering; eg. only appropriate candidates are presented in 1+1 cases.
- Support for 1+1 in the physical map by indicating active links and 1+1 state.

7705 Support

The 5620 SAM R9.0 R1 support the 7705 SAR R4.0 R1 load for SAR-F, SAR-8 and SAR-18 families of mobile back haul routers. Support also includes beta level content in 4.0 R1 that is hardened in the SAR 4.0 R2 load set. Note that the 5620 SAM currently excludes support of the new alarm TCA model delivered in the SAR-18 alarm model using the old alarm card model instead. Future loads of SAM will support the new card's model for TCA.

In addition to nodal feature support the 5620 SAM extends three NMS features into the mobile back haul environment.

802.1ab LLDP Support

In addition to standard SAM 802.1ab LLDP support the SAM platform accommodates the special nature of mobile back haul services via a 9500 transport. In such cases the 9500 back haul service represents a lower level link discovery that interacts with the edge-to-edge LLDP that may exist between SAR and SR family routers. Whenever a physical link exists between a 7705 running LLDP and a 9500 node the discovery process is modified for LLDP to avoid MAP clutter and to better represent the actual connectivity.

- The SAM discovery process is enhanced to re process LLDP adjacencies whenever a physical link exists between 7705 and 9500 ports.
- The MAP will not show edge-to-edge LLDP TPMR adjacencies treating them like 'non-TPMR' adjacencies; e.g. edge-to-edge adjacencies are dotted and hidden by default avoiding significant MAP clutter.
- The MAP is enhanced to show via link colouring that a 7705 - 9500 link has both the port level adjacency and edge-to-edge LLDP adjacency present when so discovered.
- The MAP allows highlighting of the LLDP adjacency by listing 'Upper Layer Adjacency Links' which results in a list of LLDP sessions that can be highlighted across the physical map. Highlights will traverse both 7705 and 9500 links.
- The MAP allows highlighting of the LLDP adjacencies via the menu system as well.

DCR 00597975 SAR Support for Channelized Automation

The 5620 SAM supports automated flows to make it easy to rapidly configure multiple channels on a channelized card. In this release the 5620 SAM extends the automation feature to the channelized cards on the SAR platform such as the STM line card. User may now easily create common channel configurations across a card in a small number of selections just as is supported for 7710/7450/7750 families.

DCR 00597975 - SAR support for channelization work flows

6. SERVICE & ROUTING ENHANCEMENTS

Service Site Reduction

The features enhances SAM services discovery by allowing the operator to manually move discovered sites under a common SAM service id: Previously SAM would discover all service sites with the same service id (local to the NE) as a single SAM service. The feature will allow SAM to discover these

services in a sandbox and then allow the operator to create a SAM service and only move the relevant sites to this service. The operator can also create a composite SAM service in this manner if the composite service automatic discovery toggle is on.

Services and Composite Services Management

1. Create and add services/service-sites from the composite service flat map - The service connectors and the spoke/mesh SDP bindings between the service sites/SAPs/Interfaces can also be created from the flat map.
2. System wide service specific behaviour can now be configured by the admin(s) (GUI and OSS). Four of the properties are available in 90R1: autodiscovery of composite service (default ON), default service priority (for deletion only - default is LOW), VPRN community alarm enabled (default is TRUE), maximum number of service sites can be manually moved from one service to another).
3. More flexibility for service creation and discovery
Prior to 9.0 service sites of the same triplet [type, NE service-id, and customer-id] are put into one SAM service. In some networks, service sites of the same triplet could be over a thousand and their (M-)SAPs could be in the millions range. Also, a large SAM service can be connected to other services to form a big composite service with thousands of sites and connections.

This feature enables the formation of multiple SAM services with service-sites of the same triplet. It also allows manual fragmentation a SAM service into multiple SAM services while retaining the service-site id, i.e. the triplet. The "break-up" shall have no effects on NE configurations. The operator can also create a composite SAM service in this manner if the composite service automatic discovery toggle is on.

ESM

SAM allows the creation of NAT static port forwarding entries via two methods, a synchronous method that will respond directly to the XML request and an asynchronous method that will convey the result of the XML request via JMS.

SAM maintains the NAT static port forwarding entries in its DB and also provides a method to synchronize these entries between two nodes. This can be done individually via an XML method or in batches via the GUI only.

7. TRIPLE PLAY ENHANCEMENTS

NAT44 Enhancements (Network Address Translation)

1. Provisioning Static Port Forwards (Carrier based, L2 Aware, DS Lite) via SAM /OSS (functionality not available via CLI)
2. Synchronization of Static Port Forwards to redundant nodes

DHCPv6 Server

1. Ability to specify IPv6 address pools in SAM

8. APPLICATION ASSURANCE

Residential IP transit subs: static subs (CLI/SNMP)

In many cases it is not possible or practical to implement application assurance at the edge of the network - either because the edge router does not support the AA-ISA, or because sparse subscriber density makes it commercially impractical to deploy the AA-ISA at the edge.

As of 9.0R1 the AA-ISA supports 'residential transit subscribers', which allows the AA-ISA to be deployed one-hop-back from the edge.

This feature is added to support residential transit subscriber policies, transit subscriber policing and transit subscriber accounting.

RFE 99246: ISA-AA Scale Config

An AA VPN policy is generally administered using a per-site (aa-subscriber) policy attribute assignment (ASO override), as opposed to a service profile based model commonly used for residential services. Due to this, the number of attributes and values of ASOs that can be needed in an AA VPN service will be much larger than ASO scale needed for residential uses.

On the other hand, the number of AA subscribers needed per node and per ISA is much smaller for VPN services, and the size of each in bandwidth is generally much larger than residential.

This feature is added to place an AA-group into a mode optimized for VPN scale requirements

- Max # AA subs per ISA = 8k
- ASO characteristics / partition = 128
- ASO values / partition = 1000
- ASO characteristics / group = 3000
- ASO values / group = 20000

In the default residential mode, the limits are unchanged from previous releases

AA Policer Resource Alarms

In some situations an AA policer may not be instantiated so network & service behaviour will not be as intended. This feature allows SAM to capture alarms about this condition and reflect it as a warning alarm within the Alarm Manager.

App performance stats for VoIP/Video/Audio

As part of the application assurance function in 9.0R1, the MS-ISA, is capable of providing performance and quality of experience measures for RDP/UTP voice/video and audio applications via cflowd.

This Application Performance Stats features allows the configuration of the flow sample, rate at an AA group level, as well as enabling/disabling cflowd publication for specific RTP/UDP applications and application groups at an AA partition level.

RFE 91494: TLS Certificate expression matching

The feature allows the configuration of app-filter expressions that string match on the TLS certificate Subject Name.

Improved overload handling

A mechanism is required protect against potential AA VPN discards when resources are exceeded on the ISA card

This feature allows configuration of AA-ISA traffic cut-through on a per-ISA group basis. There are two states of overload cut-through affecting AA traffic:

1. Normal operation - no cut-through
2. All traffic cut-through on subscriber context with default subscriber policy applied.

When enabled the WA-shared-buffer-wmark threshold values used for alarming will also be used to trigger overload cut-through.

ISA Capacity information

This feature allows improved visibility of ISA capacity by providing new ISA loading statistics to allow operational planning of ISA overload monitoring and mitigation. The table below shows previously supported, as well as new for 9.0R1, ISA capacity loading metrics.

Parameter	Current	Average(I)	Peak(I)
active flows	existing	existing	existing
flow setup rate	existing	existing	new
traffic rate	existing	existing	new
Packet rate	new	new	new
active subs	existing	existing	new
downloaded subs	existing	existing	new
flow resources in use (3M - #free flows = active flows + wildcard flows + ...)	new	n/a	n/a
ISA AA sub Stats count allocation	new	n/a	n/a
ISA Capacity cost	existing	n/a	n/a

In addition to the total flow threshold event currently supported (flow count threshold), the node is to raise traps when the current load exceeds configurable capacity thresholds (high and low watermarks) for:

- per-ISA total flow setup rate
- ISA traffic volume

RFE 101156: AA VPN Partitioned group scale increases

The node has implemented new scale limits for objects related to AA VPN partitions. The feature in SAM is to ensure previously enforced limits are re-aligned.

Customer level Apdex/MOS Thresholds

This features allows thresholds to be defined on a per business customer basis for MOS scores and Apdex scores independently. These thresholds, when used in conjunction with AA application performance reporting (TCP, and RTP/UDP respectively) allow the Apdex scores and MOS scores, collected by 5670 RAM, to be processed into an application state. The applicable states for Apdex and MOS scoring are detailed in the table below:

Apdex	MOS
Excellent	Excellent
Good	Good
Fair	Fair
Poor	Poor
Unacceptable	Bad

9. LTE

For more detailed information about 5620 SAM support for LTE, please see the *5620 SAM LTE ePC User Guide*, *5620 SAM LTE RAN User Guide* and 5620 SAM LTE LE3.0 Release Description document.

The 5620 SAM offers great ease and accuracy in managing the SR family of nodes (including SAR, SAS, and ESS nodes). With Alcatel-Lucent entering the 4G mobility market (through LTE) 5620 SAM supports this new facet of the 7750.

In its new form, the 7750 acts as a SGW or a PGW depending on the application given to the Groups managing the ISMMG Cards that have been inserted. The 5620 SAM will detect the mobility dedicated 7750s and will discover them as being a variant of the 7750 SR (this is based on the SysObjectID that is different on an SR MG node when compared to an SR node).

5620 SAM support includes the introduction for a new type of Service called the Mobile Service on which an operator can run diagnostics using existing 5620 SAM tools, the management of User Bearers and the EPS path discovery and the ability of relate to the underlying connectivity (routed network, physical links, ports) to offer a better view of the managed network and to quickly analyze the impact of certain events in the network (i.e. : port or card down, link broken, routing protocol errors, etc). Lastly, 5620 SAM will also offer the 5620 SAM operator a tool that will allow creation and AGW (SGW and PGW) in 10 mouse clicks; the AGW Creator Facilitator will guide the operators through every step of the way

Key Elements

The following are represented in the 3GPP Architecture example shown below.

SGW: It routes and forwards user data packets, while also acting as the mobility anchor for the user plane during inter-NodeB handovers and as the anchor for mobility between LTE and other 3GPP technologies (terminating S4 (not shown in the illustration above) interface and relaying the traffic between 2G/3G systems and PGW). For idle state UEs, the SGW terminates the DL data path and triggers paging when DL data arrives for the UE. It manages and stores UE contexts, e.g. parameters of the IP bearer service, network internal routing information. It also performs replication of the user traffic in case of lawful interception.

PGW: This gateway provides connectivity from the UE to external packet data networks by being the point of exit and entry of traffic for the UE. A UE may have simultaneous connectivity with more than one PGW for accessing multiple PDNs. The PGW performs policy enforcement, packet filtering for each user, charging support, lawful Interception and packet screening. Another key role of the PGW is to act as the anchor for mobility between 3GPP and non3GPP technologies such as WiMAX and 3GPP2 (CDMA 1X and EvDO).

PCRF: The Policy and Charging Rule Function component enables operators to have rules based, real time dynamic control over bandwidth, charging and usage.

HSS: The Home Subscriber Server is an integrated network for telecommunications carriers that use the IP protocol as its foundation for packetized voice, video and data.

MME: The Mobility Management Entity is the key control node for the LTE access network. It is responsible for idle mode UE tracking and paging procedure including retransmissions. It is involved in the bearer activation/deactivation process and is also responsible for choosing the SGW for a UE at the initial attach and at time of intraLTE Hand-over involving Core Network node relocation. It is responsible for authenticating the user (by interacting with the HSS).

SGSN: The Serving GPRS Support Node (SGSN) is responsible for the delivery of data packets from and to the mobile stations within its geographical service area. Its tasks include packet routing and transfer, mobility management (attach/detach and location management), logical link management, and authentication and charging functions.

eNB: The “Evolved NodeB (eNodeB)” is new enhanced base stations as per 3GPP standards. This enhanced BTS provides the LTE air interface and performs radio resource management for the evolved access system.

The figure below shows a series of Control (EPS) Bearers that must be present to allow communication between different components of the LTE network.

S1u: Between SGW and eNB (GTP based)

S5: SGW and PGW using GTPC, GTPU, or PMIPv6 (can be referred as S8)

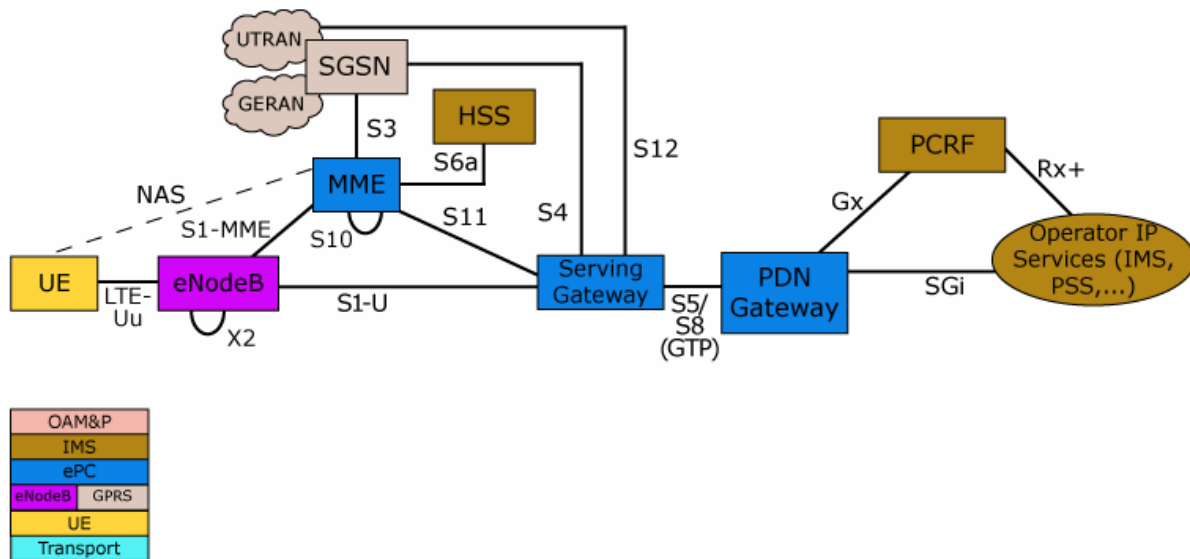
S11: SGW and MME using GTPC

S12: SGW and UTRAN

Gxc: SGW and PCRF

Gx: PGW and PCRF

S2a: PGW



Example of 3GPP Architecture

10. OPTICAL NODE MANAGEMENT

Release 9.0R3 Optical Support - At A Glance

Supported Network elements

- 1830 PSS-32/16 release 2.5 and 2.5.1, 3.5, 3.5.1, 3.5.2
- 1830 PSS-4 release 1.5
- 1830 PSS-1 GBEH release 2.5, 2.5.1, 2.7
- 1830 PSS-1 MD4H release 1.5, 1.7
- 1830 PSS-1 AHP release 1.0

Supported cards

OT's (and related)	Filters and WL routers	Amplifiers (and related)
112SCA1 no regen in 3.5	CWR8	A2325A
112SCX10	CWR8-88	AHPHG
112SA1L drop shelf	SFC2A - SFC2D	AHPLG
112SX10L drop shelf	SFC4A - SFC4B	ALPHG
43STA1P	SFC8	ALPFGT
43STX4	SFD5A - SFD5H	AM2017B
43STX4P	SFD8A - SFD8D	AM2125A
11DPE12		AM2325B
11DPE12E		RA2P
11QPA4		WTOCM
11STAR1		OSCT
11STGE12		
11STMM10		
4DPA2		
4DPA4		
SVAC		
MVAC		
OPSA		

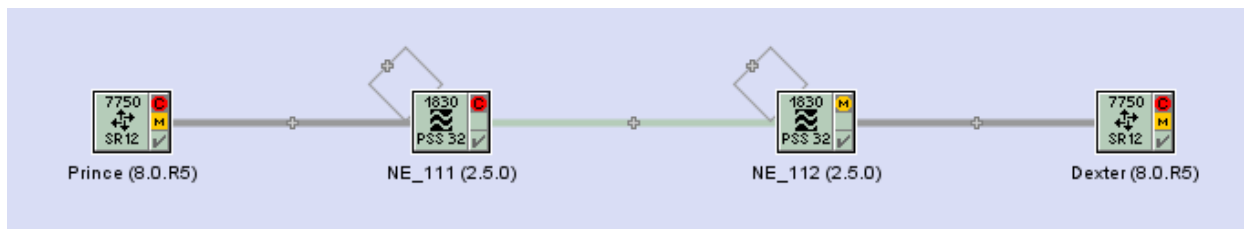
NMS features

- Discovery and Provisioning of Optical Transport Services
- Provisioning of optical transport services terminating on IPD routers
- Support for Span of control on optical network elements and optical transport services
- Support for physical map display of optical and IP network elements and links
- Support for alarm management of optical alarms
- Support for statistics collection and display
- Support for optical power graph of all measurement point on an optical transport service
- Support for optical power graph of all channels on an optical port
- Support for automated launch power management for optical transport services with dangling transponders on SR routers

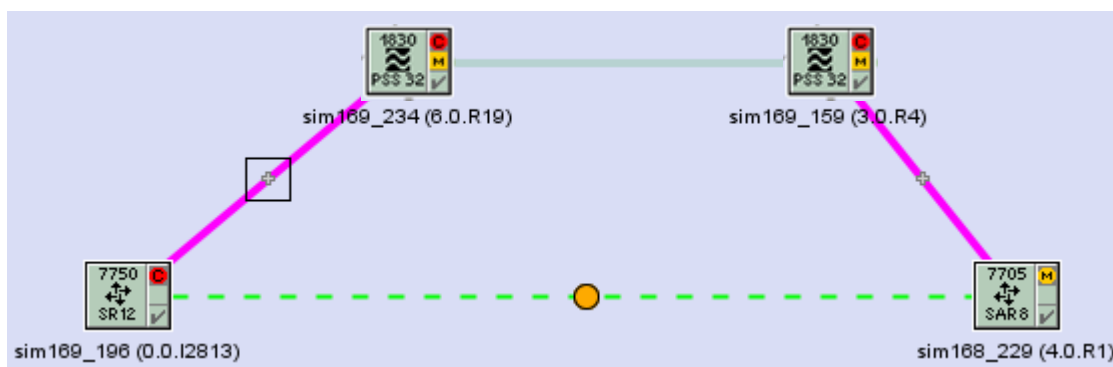
Platform

Physical Topology Map

The physical topology map will display 1830 PSS network elements.



If there are Ethernet adjacencies discovered between IP ports then the topology will look as follows:



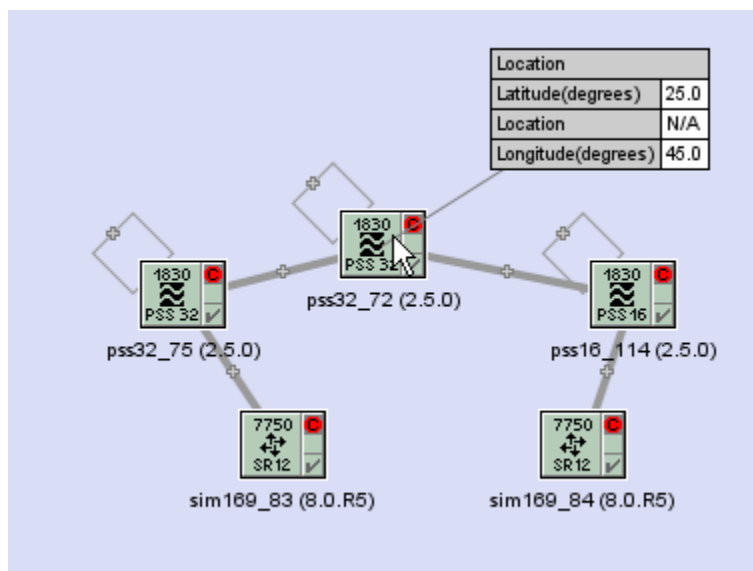
Links between 1830's (inter node) and links on 1830's between cards (intra-node) are manually provisioned from SAM or on the node. The latter can be discovered by SAM if they are provisioned onto the node during the commissioning phase. The typical scenario is for the intra-node links to be configured during the commissioning phase. Links configured on the NEs will be discovered by SAM. There is no link layer discovery protocol supported on the network elements.

Links that have at least one end (or both ends) on an 1830 are called Optical links. They are modeled, listed and managed as separate objects to Physical links which exist between routers. Fiber links internal to the network element are also shown as Optical links and look like a loopback on the network element.

Optical Links between 1830's and routers are manually provisioned from SAM.

By default the SAM physical topology map show routers and 1830's with physical and optical links. Using map filters the map can be changed to show only routers with the links between them or only optical NE's and the optical links with attached routers.

Info boxes with permanent or mouse over display are supported on the map for 1830 PSS network element.



Span of control

Optical NE management uses the SAM scope and span rules.

Optical NE's can be placed in a Router Span to restrict access and visibility to assigned user groups.

Optical transport services can be placed in an Optical Service span to restrict access and visibility to assigned user groups.

Other supported span classes such as scripts continue to be supported as before.

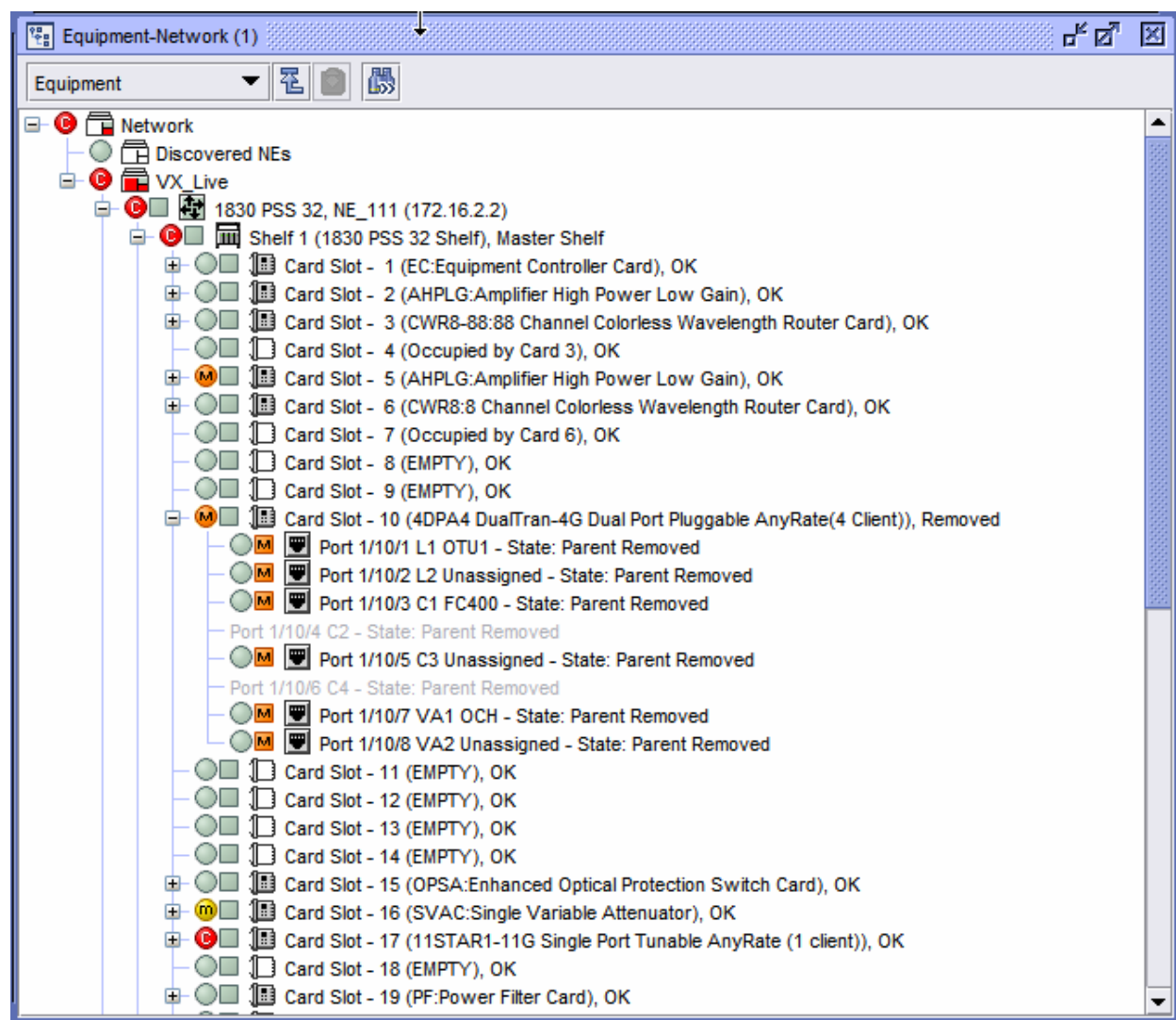
Equipment Management

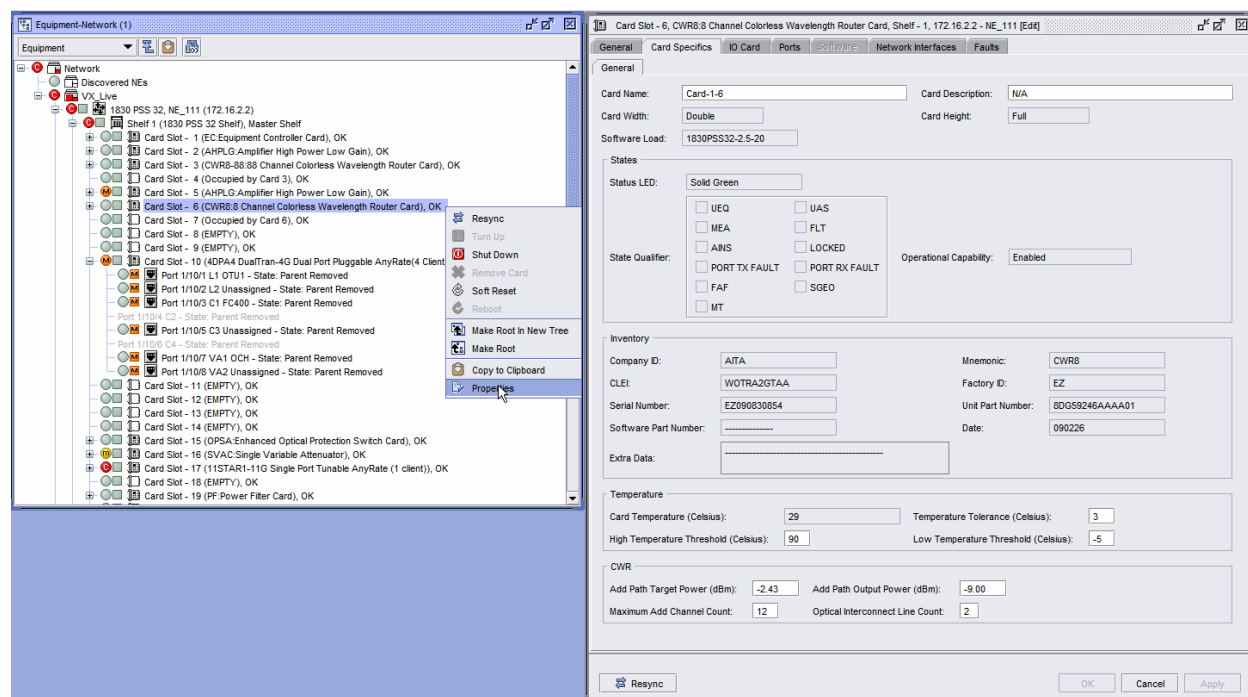
Network element discovery

The 5620 SAM discovery rule has been extended to discover supported 1830 PSS network elements. Discovery behaviour and placing discovered NE's on the physical topology map and in the equipment tree is unchanged from previous SAM releases.

Network element configuration

1830 network element shelves, cards, ports and sub ports can be viewed and configured from the 5620 SAM.





Statistics Collection

SAM supports the collection and display of statistics counters from the 1830 network elements.

Statistics can be collected in one of three ways

- On demand - on a specific object by pressing the Collect button the specified counters are retrieved once from the network element
- Scheduled collection - using a collection policy the specified bins on the specified network elements are retrieved at the rate specified in the policy
- Real Time - the specified counters are polled and displayed on the plotter

Statistics can be collected from 15 minute and 24 hour bins that are accumulated on the network element.

TCA (threshold crossing alerts) can be configured on the network element from SAM using the TCA policy configuration form. The TCA's appear as alarms in the SAM alarm window. The alarms are non self clearing and must be manually cleared.

1830 PSS TCA Profiles

Policy scope: Global Local Node IP Address:

No Filter

NE TCA Profiles (NE Threshold Crossing Alerts):

Count: 72 Page 1 of 1

TCA Profile Type (1)	TCA Profile ID (2)	Description	Configuration Mode	Discovery State	Origin
Ethernet	1	TCA PROFILE 1	Draft	Completed	172.16.2.3
Ethernet	2	TCA PROFILE 2	Draft	Completed	172.16.2.3
Ethernet	3	TCA PROFILE 3	Draft	Completed	172.16.2.3
Ethernet	4	TCA PROFILE 4	Draft	Completed	172.16.2.3
Ethernet	5	TCA PROFILE 5	Draft	Completed	172.16.2.3
Ethernet	6	TCA PROFILE 6	Draft	Completed	172.16.2.3
Ethernet	7	DEFAULT 15-MIN TCA ...	Draft	Completed	172.16.2.3
Ethernet	8	DEFAULT 1-DAY TCA ...	Draft	Completed	172.16.2.3
SONET	1	TCA PROFILE 1	Draft	Completed	138.120.200.72
SONET	2	TCA PROFILE 2	Draft	Completed	138.120.200.72
SONET	3	TCA PROFILE 3	Draft	Completed	138.120.200.72
SONET	4	TCA PROFILE 4	Draft	Completed	138.120.200.72
SONET	5	TCA PROFILE 5	Draft	Completed	138.120.200.72
SONET	6	TCA PROFILE 6	Draft	Completed	138.120.200.72
SONET	7	DEFAULT 15-MIN TCA ...	Draft	Completed	138.120.200.72
SONET	8	DEFAULT 1-DAY TCA ...	Draft	Completed	138.120.200.72
Card	1	TCA PROFILE 1	Draft	Completed	172.16.2.3

Last Search: 2010/12/10 12:12:28

Alarm Info: faultManager:network@172.16.2.2@shelf-1@cardSlot-16@card@port-1alarm-2098-6-12-TCA...

Alarm Affected Objects Affecting Objects Correlated Alarms

Info Severity Statistics Acknowledgement Details

Application Domain: Physical Equipment

Site ID: 172.16.2.2

Site Name: NE_111

Alarmed Object Type: Physical Port

Alarmed Object Name: Port 1/16/1 L1 OCH

Alarmed Object ID: network:172.16.2.2@shelf-1@cardSlot-16@card@port-1

Alarm Name: ThresholdCrossingAlarmPort

Alarm Type: thresholdCrossed

Severity: minor

OLC State: In Service

Probable Cause: thresholdCrossed

Acknowledged: ☐

Acknowledged By: N/A

Cleared By: N/A

Implicitly Cleared: ☐

First Time Detected: 2010/12/09 08:58:39 630 EST

Last Time Detected: 2010/12/10 12:13:38 426 EST

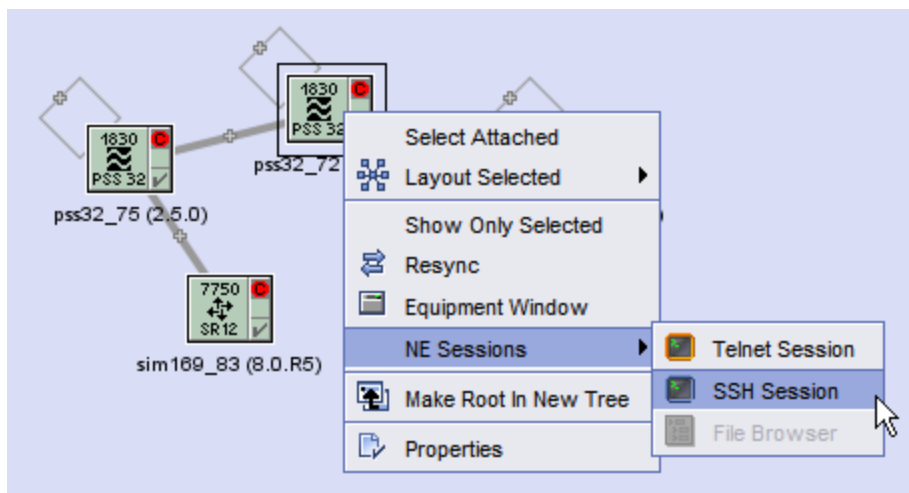
Number of Correlated Alarms: 0

Correlating Alarm ID: N/A

Additional Text: TCA=PM TCA, INTERVAL : 15 min , tnOptStatAveragePower = -31.31 dBm, Threshold: -26.68 dBm

Node Sessions

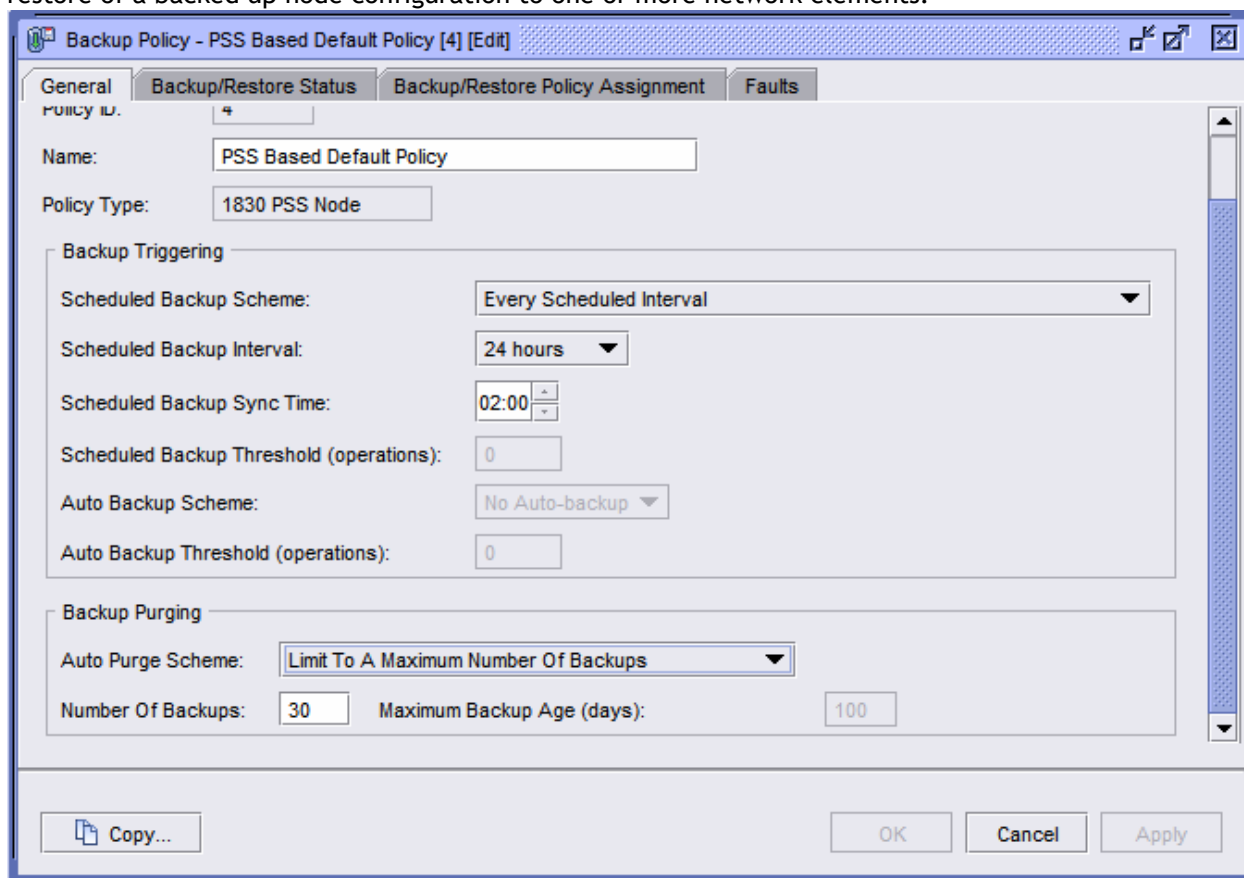
SAM provides the capability to telnet/SSH into the node directly from various places such as from the equipment window and the map.



WebUI login is not provided directly from the SAM interface but can be achieved directly from an Internet Explorer browser.

Node Configuration backup and restore

SAM supports the scheduled automated backup of 1830 PSS node configurations. SAM also supports the restore of a backed up node configuration to one or more network elements.



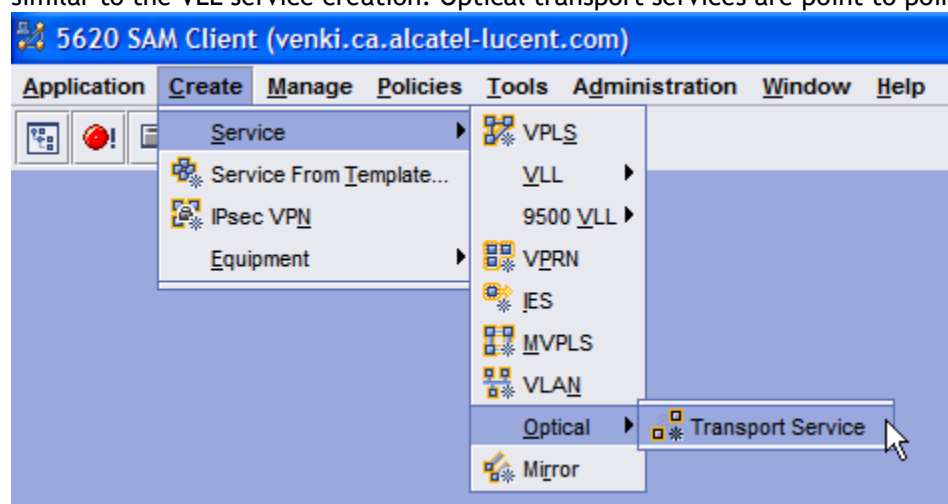
Dry Contacts

5620 SAM supports the configuration and reporting of Dry Contact alarms on the 1830 PSS family of network elements.

Service Management

Service Provisioning and discovery

SAM supports the creation of Optical Transport Services. The workflow to create these services is very similar to the VLL service creation. Optical transport services are point to point services.



SAM supports the provisioning of protected and unprotected optical transport services. Protection modes that are supported in SAM are:

- Y-Cable
- OPS

SAM supports the provisioning of diverse route services. In this case user specifies only the endpoints and SAM will provision two unprotected services with diverse routes.

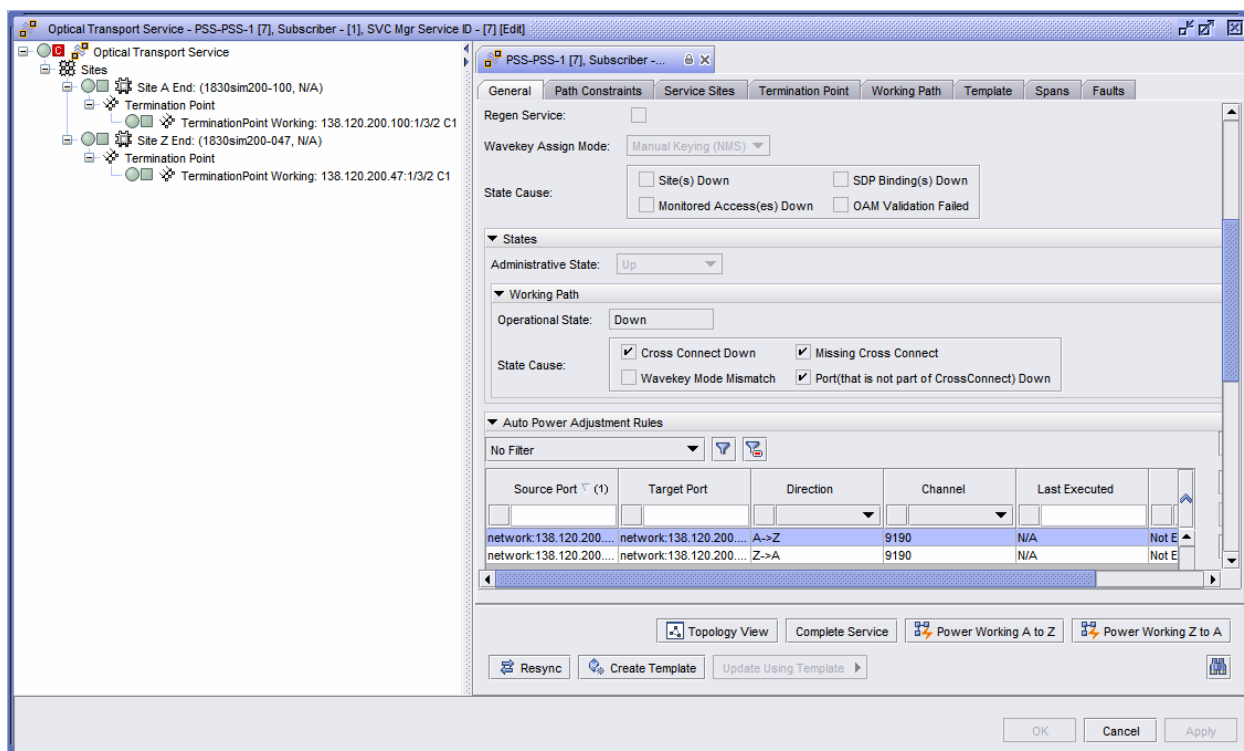
SAM supports the discovery of protected and unprotected optical transport services. The services could have been provisioned on the NE's via another management system or via CLI, WebUI etc. Protection schemes supported for discovery are Y-Cable, ESNCP and OPS.

Association of 2 discovered unprotected services into a single diverse route service is supported in SAM.

SAM supports the provisioning and discovery of regenerated optical transport services using the same or different wavelengths. SAM supports the provisioning and discovery of 3 configurations of regenerated services:

- DWDM-DWDM and CWDM-CWDM back to back OT's connected via their client ports
- DWDM-DWDM cross regen on OTs that support CrossRegen mode between their line ports
- DWDM-DWDM unidirectional single port regen

(not supported is CWDM-DWDM and B&W - DWDM regeneration)



Service configurations

SAM supports the provisioning of 2 major groups of Optical transport service configurations:

- Services that terminate on routers. The following non optical network elements are supported: 7750SR, 7450 ESS, 7705 SAR, 7210 SAS. All types within these families are supported, e.g. SR-7, SR-12 etc.
- Services that terminate on supported 1830's. These service configurations are based on the service types defined on the 1830 Product Information and Planning Guide.

The workflow in both cases is the same.

SAM supports the provisioning of hybrid optical transport services where one end is a router and the other termination is on a 1830 PSS.

SAM supports the provisioning of services where the port data rate of the two termination points is different e.g. in the case of aggregation services.

SAM supports the creation of DWDM, CWDM and B&W optical transport services in FOADM, TOADM and ILA configurations.

A more complete list of supported configurations is shown below:

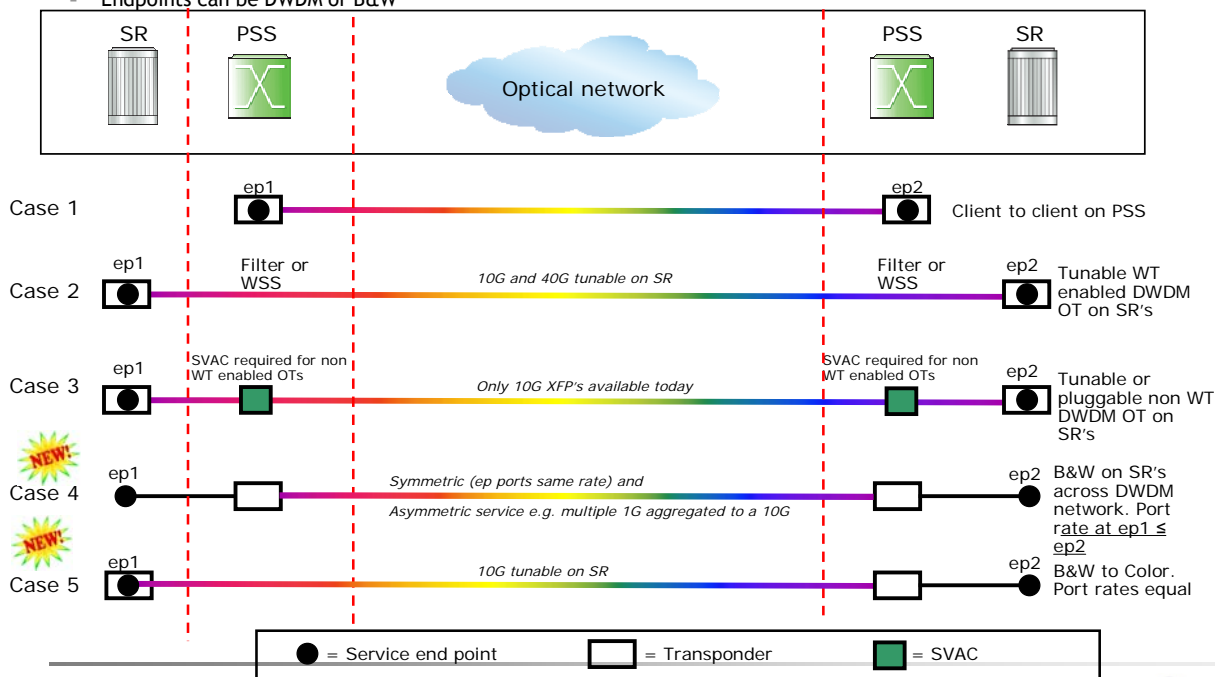
Supported optical transport service end points

- Endpoints can be on the SR/ESS or PSS
- Endpoints can be DWDM tunable or pluggable
- Endpoints can be DWDM or B&W

Note: SR/ESS includes 7750, 7450, 7710,



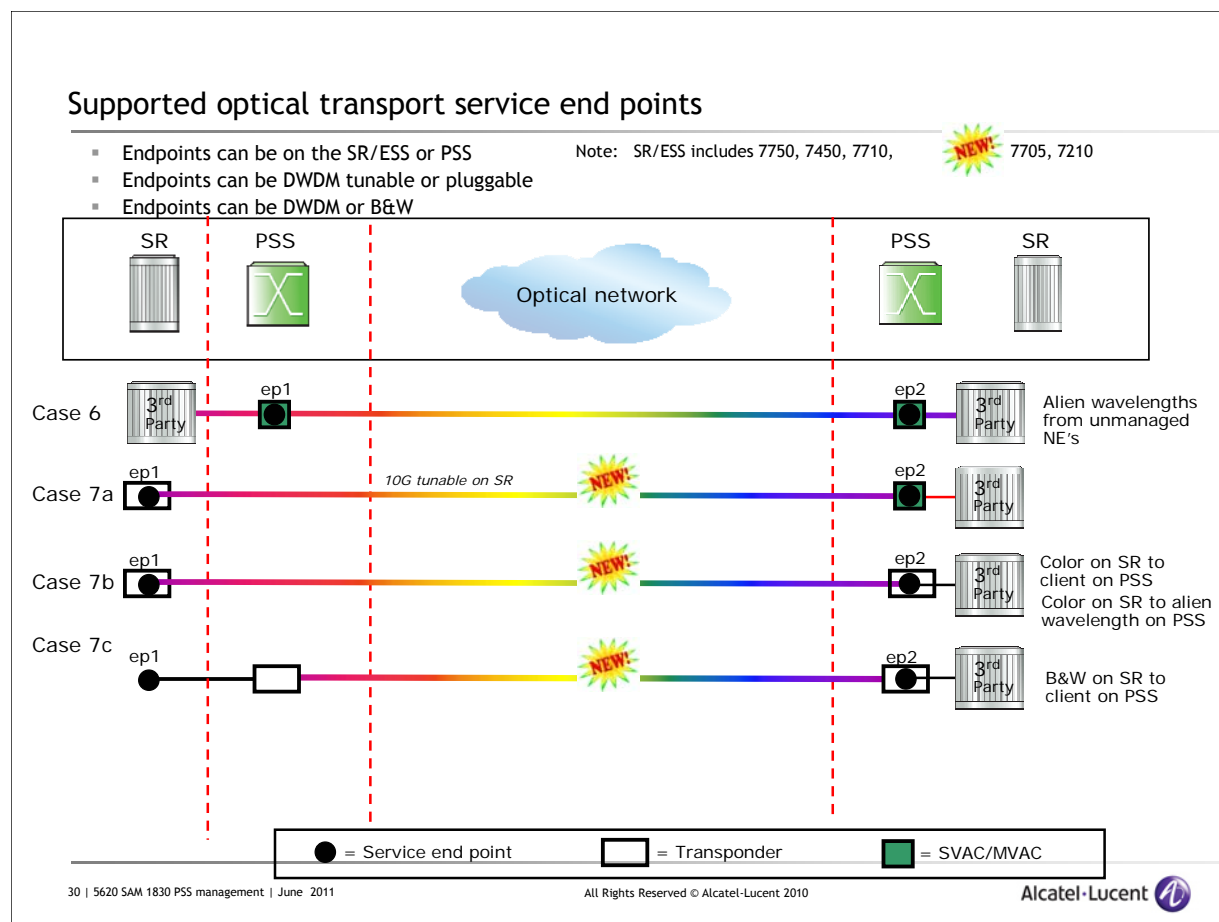
7705, 7210



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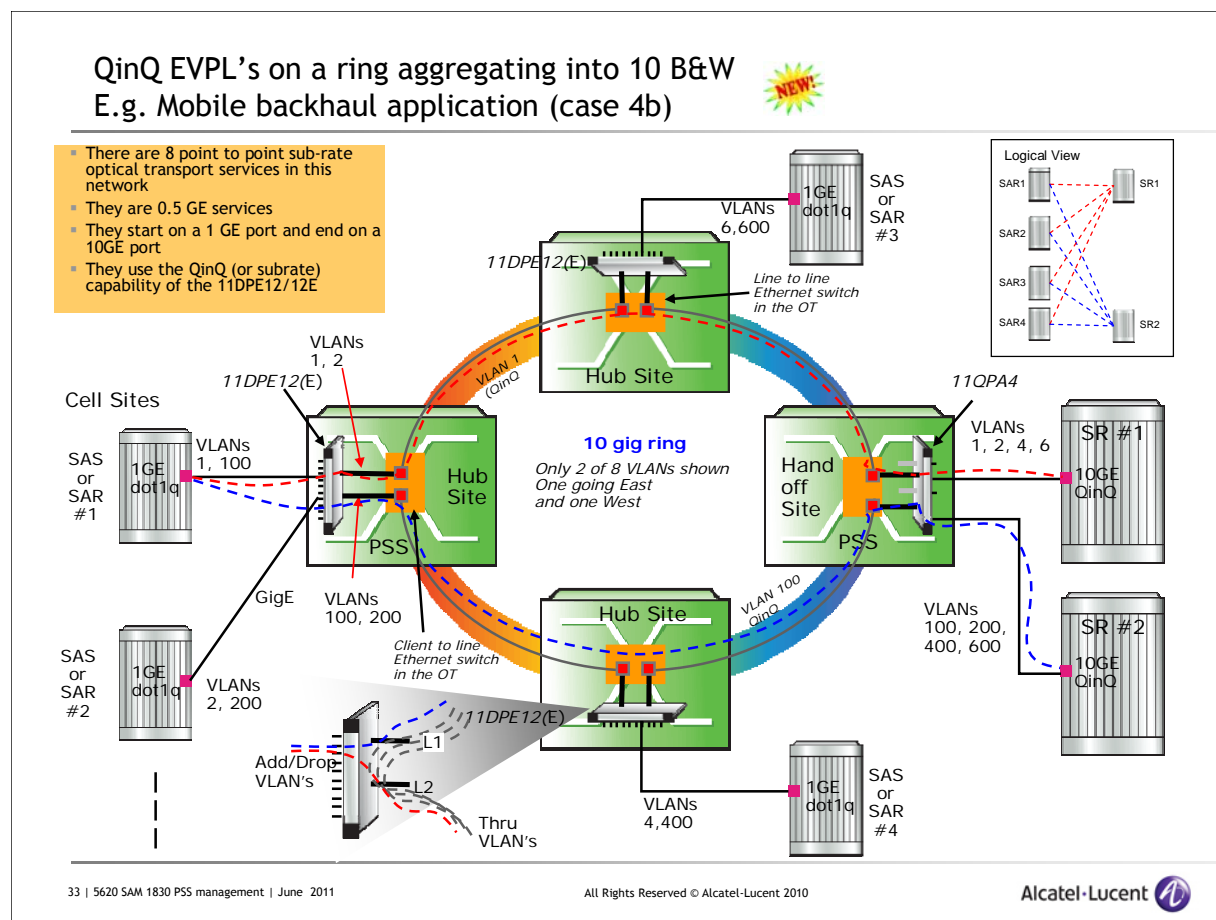
Alcatel-Lucent



EVPL Services

SAM supports the creation of EVPL based optical transport services using the 11DPE12 and 11DPE12E optical transponder.

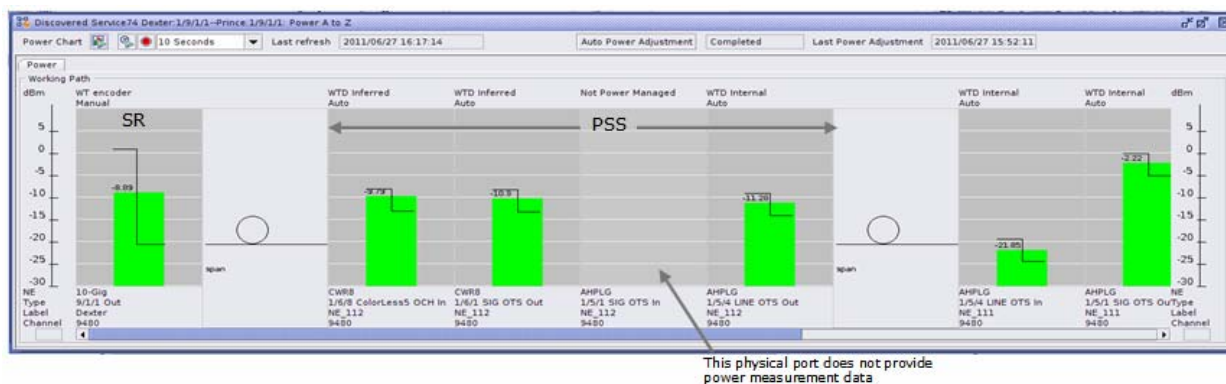
The figure below shows a typical example of such a service configuration:



Photonic power graphing

The 5620 SAM displays power graphs showing optical power levels obtained from the 1830 PSS and 7x50 network elements at every hop on the service including encode points, decode points and non power managed points. The power graphs display the measured power and the target high / low water marks. The latter are displayed as Z bars. Power levels are shown on a per optical transport service basis showing all the measurement points along the path. Multiple graph windows can be opened to show A-Z, Z-A power for the working and protection paths. The data on the graph is updated in real time while the graph is displayed (10 second updates)

A different power graph can also display on a single port the power levels of all channels passing through that port.



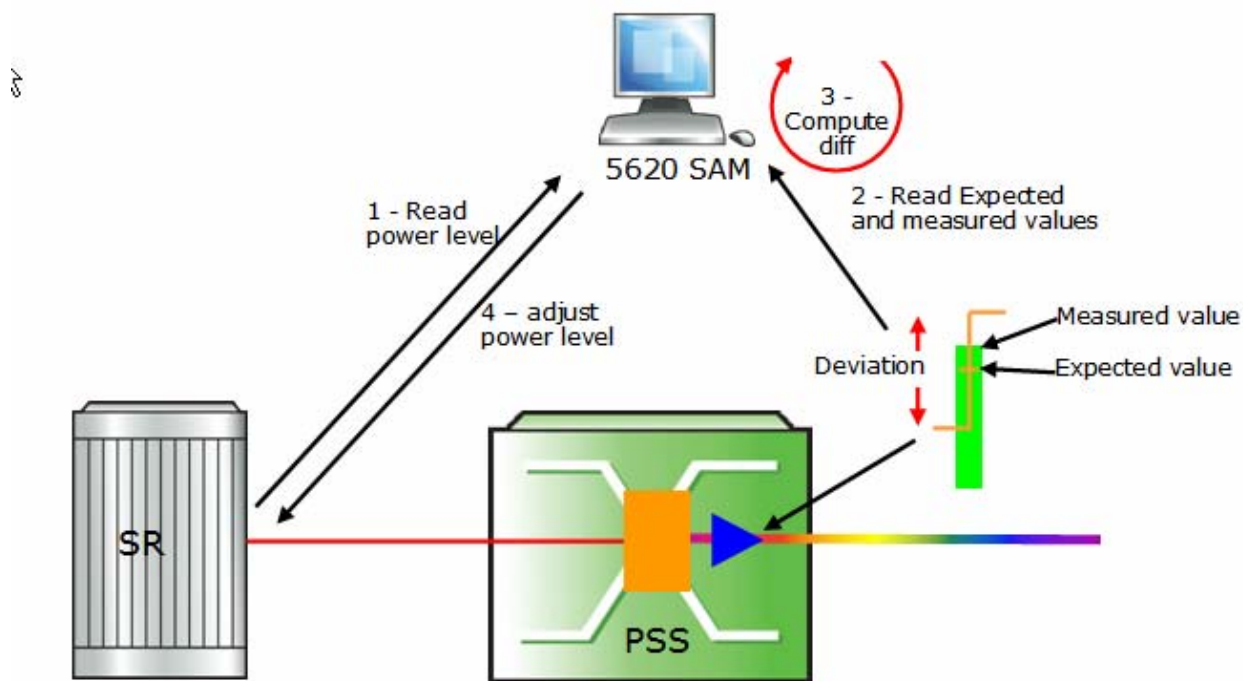
Service Power Launch Management for SR based termination points

Once commissioned, power levels between 1830 PSS's are maintained by an automatic power level adjustment algorithm running on the nodes based on EPT parameters passed to the nodes during commissioning. When connected to a non 1830 node such as the 7x50, the 1830 does not automatically adjust power on a service launch as there is no in-band communication.

Without SAM the operator must manually adjust power on the routers until the received powers on the PSS are within spec. With SAM this power adjustment is done automatically when requested by the operator. An automated algorithm is available in SAM to ramp up (or down) the SR power level to bring the target power level on the PSS into range.

Once a service is established if a TCA is received that the power has gone out of bounds during operation the operator can trigger a new power adjustment cycle

This feature reduces operator workload and chance of error when creating optical transport services from SR's



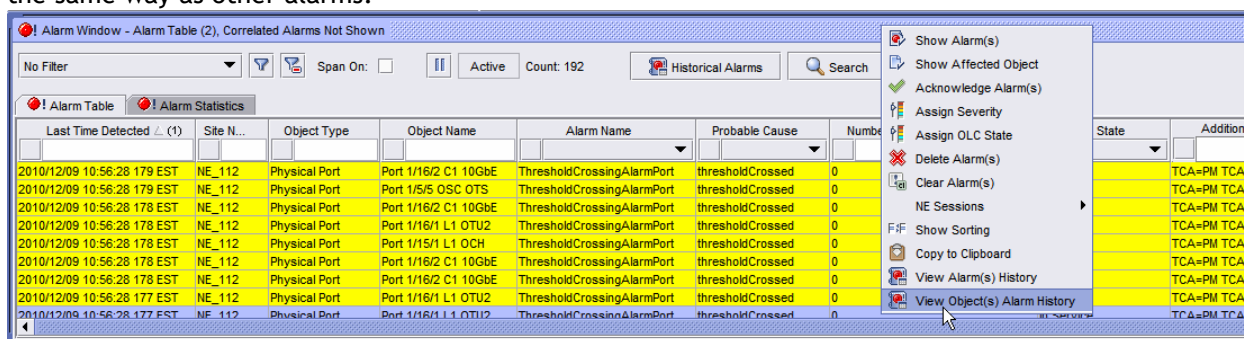
Service Templates

SAM supports the use of service templates to simplify the creation of Optical Transport Services.

Assurance

Alarm management

Alarms from the PSS family of network elements are managed in the SAM alarm management system in the same way as other alarms.

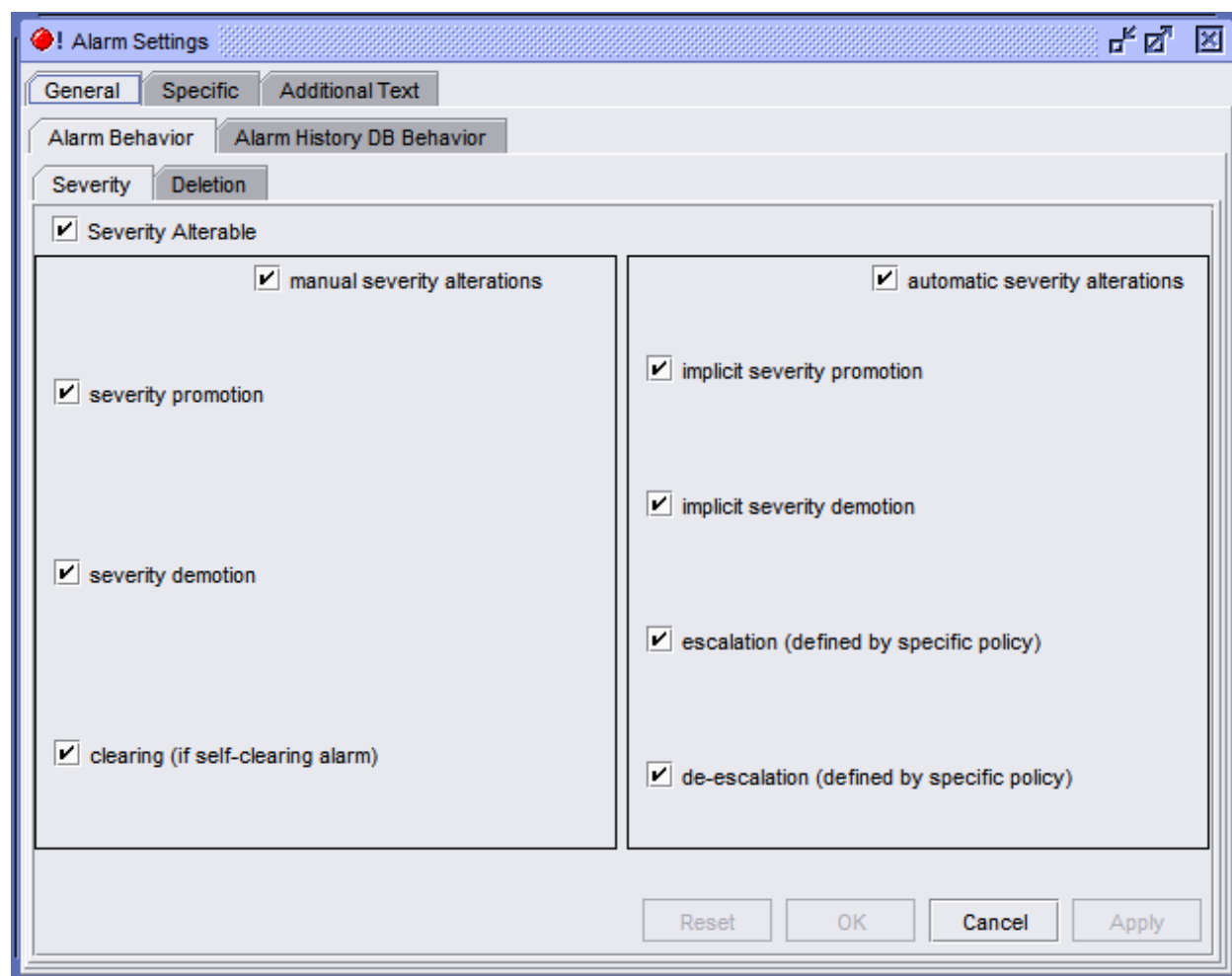


Alarms that are deleted or cleared appear in the alarm history.

The same alarm policies are available.

SAM does not directly read the alarm tables on the network element but responds to changes and creates alarms as required.

All alarms are available through the northbound open interface.



Optical Transport Service power trouble shooting

The wave-tracker features supported in SAM provide a powerful graphical means to clearly see the analog power from end to end on a service. SAM will graphically display the measured power as well as the expected power at each of the wave tracker measurement points including such points on IPD routers and of course on the PSS network elements.

SAM also displays the measured and target power levels for all channels on a specific WT enabled port. This provides a powerful graphical way to see if there are problems with individual channels or the port as a whole.

SAM Upgrade

SAM 9.0R3 does not support upgrade of 1830 PSS features from earlier versions of SAM. A user that has 1830 PSS NE's managed in SAM releases prior to 9.0R3 (8.0R7 or 9.0R1) should un-manage the PSS nodes and Optical transport services and re-discover them.

11. DEPRECATIONS

Deprecations This Release

Platform Deprecations

5620 SAM Release 9.0 no longer supports Windows on the 5620 SAM server and database.

5620 SAM Release 9.0 no longer supports Sun Microsystems T-series servers hosting either a 5620 SAM server or database.

2 CPU Core Workstations

As of 5620 SAM 9.0, workstations / servers containing 2 CPU cores or less are not supported. This includes servers such as for example: SPARC v240/v245, Ultra 20 M2, or v440/v445 with only 2 CPU sockets occupied.

Disk Space

Due to the increased space requirements of Oracle 11, 5620 SAM Database (both distributed and collocated) installations on a single 73GB disk are no longer supported. A minimum of either two 73GB disks or one 146GB disk is required.

Minimum Memory (RAM)

5620 SAM Server, 5620 SAM Database and 5620 SAM Collocated configurations are no longer supported on platforms with 4GB of RAM.

5620 SAM Server and 5620 SAM Collocated configurations are no longer supported on platforms with 8GB of RAM. Support for installations with less than 12GB of RAM is limited to non production environments with some functionality disabled (3GPSS). Installations on workstations with less than 8GB of RAM are blocked.

1830 OSSI model for Service and Equipment

The OSSI model for Services and Equipment from 8.0R7 is deprecated. Changes in the service and port modeling have taken place since the last release. (These were marked as deprecated in the 8.0R7 release).

Deprecations in Future Releases

Dynamic Shelf Drawings

5620 SAM Release 6.x was the first release that implemented static shelf drawings for newly supported NEs. The trend toward static drawings will continue, and in a future release of the 5620 SAM, the Equipment Manager will be removed and all functionality provided by it will be moved to individual equipment properties forms.

SAM-O Deprecations

The following jars are deprecated and will be removed in a future release. samOss.jar should be used to connect to the 5620 SAM server:

samOssJBoss.jar

samOssAnyServer.jar

The SchemaChanges80.html file on the product DVD-ROM contains information on deprecated XML API content. The file is available from an installed 5620 SAM client in the

<installation_directory>→client→nms→distribution→User_Documentation→5620_SAM-O_documentation/XML_Reference

Service Template Deprecations

5620 SAM 10.0 R1 will no longer support the conversion function for templates created in pre-6.0 releases of 5620 SAM.

Platform Deprecations

5620 SAM 10.0R1+ will no longer support 5620 SAM GUI client application on Windows 2000 platform.

12. REFERENCES

The following documents have been referenced:

N/A