Alcatel-Lucent 5620

SERVICE AWARE MANAGER | RELEASE 9.0 R1

RELEASE DESCRIPTION

3HE 06473 AAAA TQZZA Edition 01

Alcatel-Lucent Proprietary
This document contains proprietary information of Alcatel-Lucent and is not to be disclosed or used except in accordance with applicable agreements.

Copyright 2011 © Alcatel-Lucent. All rights reserved.

Alcatel-Lucent assumes no responsibility for the accuracy of the information presented, which is subject to change without notice.

Alcatel, Lucent, Alcatel-Lucent, the Alcatel-Lucent logo, and TiMetra are registered trademarks of Alcatel-Lucent. All other trademarks are the property of their respective owners.

Copyright 2011 Alcatel-Lucent.
All rights reserved.

Disclaimers

Alcatel-Lucent products are intended for commercial uses. Without the appropriate network design engineering, they must not be sold, licensed or otherwise distributed for use in any hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life-support machines, or weapons systems, in which the failure of products could lead directly to death, personal injury, or severe physical or environmental damage. The customer hereby agrees that the use, sale, license or other distribution of the products for any such application without the prior written consent of Alcatel-Lucent, shall be at the customer's sole risk. The customer hereby agrees to defend and hold Alcatel-Lucent harmless from any claims for loss, cost, damage, expense or liability that may arise out of or in connection with the use, sale, license or other distribution of the products in such applications.

This document may contain information regarding the use and installation of non-Alcatel-Lucent products. Please note that this information is provided as a courtesy to assist you. While Alcatel-Lucent tries to ensure that this information accurately reflects information provided by the supplier, please refer to the materials provided with any non-Alcatel-Lucent product and contact the supplier for confirmation. Alcatel-Lucent assumes no responsibility or liability for incorrect or incomplete information provided about non-Alcatel-Lucent products.

However, this does not constitute a representation or warranty. The warranties provided for Alcatel-Lucent products, if any, are set forth in contractual documentation entered into by Alcatel-Lucent and its customers.

This document was originally written in English. If there is any conflict or inconsistency between the English version and any other version of a document, the English version shall prevail.

CONTENTS

Release 9.0 – At A Glance **5**

Target Schedule *5*
Network Element Support *5*
Feature List *5*

1. Ordering information **22**

Sales Engineering Information *22*
Licensing Information *22*
Support for Beta Keys *23*
Convert key generation to ASLM for SAM *23*
Oracle Ordering Information *23*

2. Scale & Architecture **25**

Scalability Targets *25*
Performance Targets *26*
Oracle 11 ..... *27*
Use logToFile For Performance Stats *28*

3. NMS Applications **28**

GUI Frameworks *28*
Collapsible Panel *28*
Editable Element Lists *29*
Combine Configuration and List in a common tab *30*
5620 SAM Supervision *32*
Usability Improvements *35*
Horizontal Integration Protocol Support *35*

4. Platform Applications **35**

x86 Blade Perf Comparison (HP blade vs. Oracle rack mount) *35*
Auto database reinstantiation *35*
(stretch) Security DCRs *37*
Security Improvements *37*
Automated SSL/SSO Configs for Upgrades *37*
Infocenter for User Docs *37*

5. Equipment Management **38**

7x50 Mixed-Mode Chassis Support Phase 2 ..... *38*
OMNI Support *39*
7210 SAS Support *43*
9500 Support *45*
7705 Support *46*

6. Service & Routing Enhancements **47**

Service Site Reduction *47*
Services and Composite Services Management *47*
ESM *48*

7. Triple Play Enhancements **48**

NAT44 Enhancements (Network Address Translation) *48*

DHCPv6 Server *48*

8. Application Assurance **48**

9. LTE **51**

10. Optical Node Management **54**

11. Deprecations **54**

Deprecations This Release *54*
Platform Deprecations 54
2 CPU Core Workstations 54
Disk Space 54
Minimum Memory (RAM) 54
Deprecations in Future Releases *54*
Dynamic Shelf Drawings 54
SAM-O Deprecations 55
Service Template Deprecations 55
Platform Deprecations 55

12. References **56**

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
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 April 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	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/VPRN	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 and IPv6 Filter Policies	Committed	7705	4.0	R1	TRUE
9.0	R1	Other Polcies 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	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 VPRN 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	Security permissions (MG changes)	Committed	7750 MG			TRUE
9.0	R1	SGW 3.0 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	MG Peer Stat Aggregation	Committed	7750 MG			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	FALSE
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/RADIU	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	Manager specific controlled parameters configurati	Committed	7x50			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	FALSE
9.0	R1	Customer level Apdex Thresholds	Committed	7x50			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	Composite Service Mgt - Configure with Flat Map	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	horizontal integration protocol - enabler for CDMA or GSM horizontal integration with SAM	Committed		LA3.0		TRUE
9.0	R1	Usability Improvements incl. Service Type for Access IF	Committed				TRUE
9.0	R2	7210 SAS-D-6F4T support	Committed	7210	3.0	R3	TRUE
9.0	R2	SAM model updates for TLA2.1 and TLA3.0	Committed	9412 eNodeB	TLA3		FALSE
9.0	R2	5620 SAM-CDMA Horizontal Integration	Candidate		LA3.0		FALSE
9.0	R3	Mib Stats support till 3.5	Committed	1830	PSS-32	3.5	
9.0	R3	1830 PSS-4 Release 1.5	Committed	1830	PSS-4	1.5	
9.0	R3	PSS1/16/32 new release support up to 3.5	Committed	1830	PSS-32	3.5	
9.0	R3	Backup/Restore support	Committed	1830	PSS-32	3.5	
9.0	R3	License support	Committed	1830	PSS-36	3.5	
9.0	R3	Fault Management support	Committed	1830			
9.0	R3	11DPE12E(Release 3.5)	Committed	1830	PSS-32	3.5	
9.0	R3	OPSA Provision	Committed	1830			FALSE
9.0	R3	Card support up to 3.5.x	Committed	1830			FALSE
9.0	R3	File based Stats till 3.5	Committed	1830			FALSE
9.0	R3	TCM support till 3.5	Committed	1830			FALSE
9.0	R3	Unprotected Service support	Committed	1830			FALSE
9.0	R3	Subrate Service Provision	Committed	1830			FALSE
9.0	R3	Supported NE's as Service Endpoints	Committed	1830			FALSE

9.0	R3	1830 OT support - Power Graph Read Only	Committed	1830			FALSE
9.0	R3	SR WDM network port support - Power Graph Read Only	Committed	1830			FALSE
9.0	R3	Power Readings support for WTOCM card - Power Graph Read Only	Committed	1830			FALSE
9.0	R3	Support configurations including SVAC, MVAC, OPSA and Raman cards - Power Graph Ready Only	Committed	1830			FALSE
9.0	R3	VLL-PW Standby status bit signalling	Committed	7210	3.0	R3	
9.0	R3	Line Timing of Ethernet ports using synchE with SSM support on SAS M/X	Committed	7210	3.0	R3	FALSE
9.0	R3	Port Loopback support (without MAC swap)	Committed	7210	3.0	R3	FALSE
9.0	R3	BFD for static routes (Network Mode in SAS-M)	Committed	7210	3.0	R3	FALSE
9.0	R3	SAP-EgressAggRateLimit for SAS-X for 3.0 R3 enhancements	Committed	7210	3.0	R3	FALSE
9.0	R3	7210 SAS-D 6F4T - Services - VPLS Mgmt i/f	Committed	7210			FALSE
9.0	R3	Multiple E1 multi-frames in a single PW	Candidate	7705	4.0	R4	FALSE
9.0	R3	OSFPv3 with BFDv6	Candidate	7705	4.0	R4	FALSE
9.0	R3	DCR: ML-PPP sequence number re-design	Candidate	7705	4.0	R4	FALSE
9.0	R3	Spanning Tree Protocol (STP) with Mgmt VPLS	Candidate	7705	4.0	R4	FALSE
9.0	R3	Multiple EI multi-frames in one PW	Candidate	7705	4.0	R4	FALSE
9.0	R3	ML-PPP Seq #	Candidate	7705	4.0	R4	FALSE
9.0	R3	OSFP v3	Candidate	7705	4.0	R4	FALSE
9.0	R3	IPv6 enhancement: OSPFv3, BFD, 255 /64 routes	Candidate	7705	4.0	R4	FALSE
9.0	R3	Enhancements to External Alarm Monitoring	Candidate	7705	4.0	R4	FALSE
9.0	R3	IEEE 1588 Boundary Clock	Committed	7705	4.0	R2	FALSE
9.0	R3	Fractional T1 PPP on NW port (super rate)	Committed	7705	4.0	R1	FALSE
9.0	R3	SAR-18 BITS clock (BASIC)	Committed	7705	4.0	R2	FALSE
9.0	R3	SAA Support for CFM	Committed	7705	4.0	R2	FALSE
9.0	R3	Standby Signalling Slave	Committed	7705	4.0	R2	FALSE
9.0	R3	VPLS MC Traffic Management (QoS)	Committed	7705	4.0	R2	FALSE
9.0	R3	New 2.5G SAR-8 backplane	Stretch	7705	4.0	R3	FALSE
9.0	R3	BFD for T-LDP	Stretch	7705	4.0	R3	FALSE
9.0	R3	BFD for V6 Static Routes	Stretch	7705	4.0	R3	FALSE
9.0	R3	Dynamic ARP for Spoke SDP Termination	Stretch	7705	4.0	R3	FALSE
9.0	R3	Bearer Stats UI - Post Filtering	Committed	7750 MG			FALSE

9.0	R3	PGW/GGSN: 1+1 MG Redundancy	Committed	7750 MG	3.0	R1	FALSE
9.0	R3	Trusted Peer Lists	Committed	7750 MG	3.0	R3	FALSE
9.0	R3	Virtual APN-VPRN Mapping	Committed	7750 MG	3.0	R1	FALSE
9.0	R3	Lawful Intercept Enhancements	Committed	7750 MG	3.0	R1	FALSE
9.0	R3	GGSN: Radius	Stretch	7750 MG	3.0	R1	FALSE
9.0	R3	IPSec - Discovery	Stretch	7750 MG			FALSE
9.0	R3	PTP IEEE1588v2 master, slave	Committed	7x50	9.0	R4	FALSE
9.0	R3	ETH-CFM Redundancy	Committed	7x50	9.0	R1	FALSE
9.0	R3	VLAN in MAC filter inc. bitmask for ACL and QoS policies	Committed	7x50	9.0	R1	FALSE
9.0	R3	Percentage based BW in QoS policies	Committed	7x50	9.0	R1	FALSE
9.0	R3	Policer mapping to local-queue	Committed	7x50	9.0	R1	FALSE
9.0	R3	Mcast replication on sub-interfaces (ESM IPoE, IES & VPRN). Only "PPP multicast replication on HSMDA-2" for BT	Committed	7x50	9.0	R3	FALSE
9.0	R3	NAT: lawful intercept (on BB-ISA)	Committed	7x50	9.0	R1	FALSE
9.0	R3	DSLite support [IP in IP]	Committed	7x50	9.0	R1	FALSE
9.0	R3	IPCP subnet negotiation	Committed	7x50	9.0	R1	FALSE
9.0	R3	nxDS0 in E1 MLPPP access (RFE87309)	Committed	7x50	9.0	R1	FALSE
9.0	R3	MSS for Hpol(QoS enhancements)	Committed	7x50	9.0	R1	FALSE
9.0	R3	IOM soft reset for HS-MDA2	Committed	7x50	9.0	R4	FALSE
9.0	R3	SFM4 for 7-slot and 12-slot ESS & SR chassis to support all IOMs and IMMs	Committed	7x50	9.0	R3	FALSE
9.0	R3	Facility MEP support within MEF SLM (Synthetic Loss Measurement)	Committed	7x50	9.0	R3	TRUE
9.0	R3	HSMDA follow-up work	Committed	7x50	9.0	R1-R4	FALSE
9.0	R3	MC-LAG & MC-APS Alarm management	Committed	7x50			FALSE
9.0	R3	9.0 R3 RFEs - Policies	Committed	7x50			FALSE
9.0	R3	Confirmation needed for ACL filter re-ordering	Committed	7x50			FALSE
9.0	R3	Sub. QoS overrides and aggregate rate limit work for BT	Committed	7x50			FALSE
9.0	R3	9.0 R3 RFEs - OAM	Committed	7x50			FALSE
9.0	R3	9.0 R3 RFEs - Services	Committed	7x50			FALSE
9.0	R3	More intuitive mVPN	Committed	7x50			FALSE
9.0	R3	SAP-2-SAP Connection	Committed	7x50			FALSE
9.0	R3	ATT Delete unused service	Committed	7x50			FALSE
9.0	R3	MVPN IPMSI SNMP MIB Tables	Committed	7x50			FALSE
9.0	R3	Magma and BSX interaction	Stretch	7x50	9.0	R1	FALSE
9.0	R3	Priority capability for subscriber profiles	Stretch	7x50	9.0	R1	FALSE
9.0	R3	PPPoE idle timeout	Stretch	7x50	9.0	R1	FALSE
9.0	R3	9.0 R3 RFEs - Bangalore	Stretch	7x50			FALSE
9.0	R3	9.0 R3 RFEs - ESM	Stretch	7x50			FALSE

9.0	R3	Delete multiple SPFs	Stretch	7x50			FALSE
9.0	R3	NAT Enhancements spillover from R1	Stretch	7x50			FALSE
9.0	R3	Nx(1+0) Path Management	Committed	9500 MPR			FALSE
9.0	R3	OS9GNI-P24E Support (OS9000E devices)	Committed	OmniSwitch	6.4.4		FALSE
9.0	R3	CPE Test Head Enhancements - AOS 6.6.2 R01 (Post GA/ Virgin Media Release	Committed	OmniSwitch	6.6.2 R01		FALSE
9.0	R3	Omniswitch 10K/AOS 7.1.1 node & AOS support - Eqpt mgmt support only	Stretch	OmniSwitch	7.7.1		FALSE
9.0	R5	support for sap-ingress policy with num-qos-resources set to arbitrary values	Candidate	7210	3.0	R5	FALSE
9.0	R5	LAG/LACP: on ACCESS links	Candidate	7705	5.0	R1	FALSE
9.0	R5	Add 7705 4.0 to Autoconfig	Candidate	7705			
9.0	R5	8p GE (WP3) MDA	Candidate	7705	5.0	R1	FALSE
9.0	R5	SAR-M Platform	Candidate	7705	5.0	R1	FALSE
9.0	R5	SAR-ME Platform	Candidate	7705	5.0	R1	FALSE
9.0	R5	SAR-M GPON Module	Candidate	7705	5.0	R1	FALSE
9.0	R5	SAR-M xDSL Module	Candidate	7705	5.0	R1	FALSE
9.0	R5	SAR-M DCM Module	Candidate	7705	5.0	R1	FALSE
9.0	R5	Frame Relay F-Pipes (on DS3, ASAP, SDI MDAs & SAR-M)	Candidate	7705	5.0	R1	FALSE
9.0	R5	HDLC H-Pipes (on DS3, ASAP, SDI MDAs & SAR-M)	Candidate	7705	5.0	R1	FALSE
9.0	R5	CAS/RBS at DS0 level	Candidate	7705	5.0	R1	FALSE
9.0	R5	BFD 10ms timers	Candidate	7705	5.0	R1	FALSE
9.0	R5	Differential Clock on ASAP	Candidate	7705	5.0	R1	FALSE
9.0	R5	ATM VT	Candidate	7705	5.0	R1	FALSE
9.0	R5	E3 ATM	Candidate	7705	5.0	R1	FALSE
9.0	R5	DS3 ATM	Candidate	7705	5.0	R1	FALSE
9.0	R5	OADM (Optical Add Drop Mux)	Candidate	7705	5.0	R1	FALSE
9.0	R5	N:1 N>1 ATM PW	Candidate	7705	5.0	R1	FALSE
9.0	R5	TWAMP	Candidate	7705	5.0	R1	FALSE
9.0	R5	eBGP PE-CE	Candidate	7705	5.0	R1	FALSE
9.0	R5	Power injector card	Candidate	7705	5.0	R1	FALSE
9.0	R5	I-pipes on F/R ports	Candidate	7705	5.0	R1	FALSE
9.0	R5	sub-rate X.21	Candidate	7705	5.0	R1	FALSE
9.0	R5	OSFP GR helper	Candidate	7705	5.0	R1	FALSE
9.0	R5	I-Pipes on channelized OC3	Candidate	7705	5.0	R1	FALSE
9.0	R5	I-pipes SAP-2-SAP	Candidate	7705	5.0	R1	FALSE
9.0	R5	4800bps X.21 and R232 on the SDI card	Candidate	7705	5.0	R1	FALSE
9.0	R5	600bps RS232 on the SDI card	Candidate	7705	5.0	R1	FALSE
9.0	R5	increased 2P ch OC3 cards (to DS1) per SAR-8/18	Candidate	7705	5.0	R1	FALSE

9.0	R5	DSC In Service Upgrade State Notifications	Candidate	5780 DSC			FALSE
9.0	R5	Call Trace - Signalled & NMS Initiated	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	New Ref Point - PMIP/Diameter	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	Combined SGW/PGW - same platform	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	Graceful PGW shutdown	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	LTE: EPC (CPAM) Monitored Path for IGP	Candidate	7750 MG			FALSE
9.0	R5	S8 GTP	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	IPSEC ISA IRI (Intercept Related Events)	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	IPSEC MS ISA	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	Minor (MG Behavour) Features	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	Gx Usage Monitoring (Policies & Offline Charging)	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	GGSN: Gy/Ro Online Charging	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	GGSN/PGW: IP address / IP Pool via Radius	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	Virtual APN	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	Mobile 2 Mobile Policy Routing	Candidate	7750 MG	3.0	R5	FALSE
9.0	R5	LTE: CPAM-EPC Correlation and Navigation	Candidate	7750 MG			FALSE
9.0	R5	LTE: EPC (CPAM) Monitored Path for BGP	Candidate	7750 MG			FALSE
9.0	R5	KPI/KCI Threshold configuration - policy based	Stretch	7750 MG	3.0	r5	FALSE
9.0	R5	submgmt in BGP policies with subhost advertizing s	Candidate	7x50			FALSE
9.0	R5	Increase SAM SDP binding limits	Candidate	7x50			FALSE
9.0	R5	3-port 40GE (possibly oversubscribed) Magma-based QSFP IMM	Candidate	7x50	9.0	R4	FALSE
9.0	R5	OC-3/12 POS ROHS MDAs (16-port only)	Candidate	7x50	9.0	R4	
9.0	R5	16-port OC-3 and 4-port OC-12 ATM ROHS MDAs	Candidate	7x50	9.0	R4	
9.0	R5	OC-48 POS ROHS MDAs (4-port only)	Candidate	7x50	9.0	R4	
9.0	R5	CLI command to display active card alarms (RFE 65299)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Virtual MEP on VSI	Candidate	7x50	9.0	R4	
9.0	R5	Per-sub CPU protection for HTTP-redirect (WiFi access)	Candidate	7x50	9.0	R4	
9.0	R5	APS Annex B	Candidate	7x50	9.0	R4	
9.0	R5	QPPB	Candidate	7x50	9.0	R4	
9.0	R5	BGP Add Path	Candidate	7x50	9.0	R4	FALSE
9.0	R5	LDP FRR	Candidate	7x50	9.0	R4	FALSE
9.0	R5	mVPN fast-failover (Source redundancy)	Candidate	7x50	9.0	R4	
9.0	R5	IPv6 FIB scale increase to 512k+	Candidate	7x50	9.0	R4	FALSE

9.0	R5	Inter-AS option C and option B/C with multi-hop eBGP and RSVP-TE support, respectively	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Allow exclusion of RSVP LSP name from BGP next-hop resolution (RFE 88796)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	BFD support for P2MP source redundancy	Candidate	7x50	9.0	R4	
9.0	R5	Multi-segment PW routing (aka dynamic MS-PW)	Candidate	7x50	9.0	R3	FALSE
9.0	R5	PW Scale 128k	Candidate	7x50	9.0	R4	
9.0	R5	VPRN indirection for Edge resilience (aka. Edge Prefix Independent Convergence -	Candidate	7x50	9.0	R4	FALSE
9.0	R5	ESM on ATM interfaces: PPPoA and PPPoEoA (Routed CO)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Scale increase: 128K SAPs	Candidate	7x50	9.0	R1	FALSE
9.0	R5	NAT: RTSP ALGs	Candidate	7x50	9.0	R4	
9.0	R5	PPPoE dual-chassis redundancy with MCS	Candidate	7x50	9.0	R4	
9.0	R5	SRRP enhancements for PPPoE redundancy	Candidate	7x50	9.0	R4	
9.0	R5	Increased scale to support 2K queue groups per system/IOM	Candidate	7x50	9.0	R1	FALSE
9.0	R5	Use separate profile for ACL and QoS; controlled from either Radius or LUDB (aka	Candidate	7x50	9.0	R4	
9.0	R5	BGP managed route with SubMgmt MCS (no SRRP) - RFE 91316	Candidate	7x50	9.0	R4	
9.0	R5	ESM support on Magma IMMs	Candidate	7x50	9.0	R4	FALSE
9.0	R5	N:1with N>1 ATM mapping on ATM PWE3	Candidate	7x50	9.0	R1	FALSE
9.0	R5	5 minute maximum throughput stats in per aa-sub accounting (holdover from 8.0)	Candidate	7x50	9.0	R1	FALSE
9.0	R5	ASM data MDT	Candidate	7x50	9.0	R4	
9.0	R5	Increasing Primary Path Associations with Bypass LSP	Candidate	7x50	9.0	R4	FALSE
9.0	R5	IS-IS lockless design	Candidate	7x50	9.0	R4	FALSE
9.0	R5	MMRP scaling increase: 40K	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Limited Generalization or grouping of QoS Policy	Candidate	7x50			FALSE
9.0	R5	Policy distribution enhancements	Candidate	7x50			FALSE
9.0	R5	QoS Policy Audit (Sematic not attribute comparison)	Candidate	7x50			FALSE
9.0	R5	Shared MEG id	Candidate	7x50			FALSE
9.0	R5	Composite Service Mgt - Alarms	Candidate	7x50			FALSE
9.0	R5	IOM3-XP with MultiCore CPU (aka Lava2)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Multicore CPU-based 48-port GE SFP IMM (KrakaCroatia2)	Candidate	7x50	9.0	R4	FALSE

9.0	R5	Multicore CPU-based 48-port GE TX IMM (KrakaCyprus2)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Last-mile-aware shaping on non-HSMDA2 using dataplane implementation and for PPPoX and DHCP	Candidate	7x50	9.0	R3	FALSE
9.0	R5	ISSU support for maintenance releases	Candidate	7x50	9.0	R4	FALSE
9.0	R5	X.509 certificate support for IPsec	Candidate	7x50	9.0	R4	FALSE
9.0	R5	multi-area adj OSPF (RFC 5185) - support for OSPFv3 (DTS 107137)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Down on CRC	Candidate	7x50	9.0	R4	FALSE
9.0	R5	V-port aggregate-rate-limit for Ethernet BNG	Candidate	7x50	9.0	R5	FALSE
9.0	R5	Multi-homing BGP site on Service Map	Candidate	7x50			FALSE
9.0	R5	Multiple differential clocks operating in independent timing domains on CES MDA	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Link LDP Hello Adjacency Tracking with BFD for LDP-FRR	Candidate	7x50	9.0	R4	FALSE
9.0	R5	CFM Test, Add AccountingFile and ContinuouslyExecution	Candidate	7x50	9.0	R1	FALSE
9.0	R5	Mixed-mode support for AA with ISA-MS/MS-E (DTS 109813)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Support IPv6 on AA	Candidate	7x50	9.0	R5	FALSE
9.0	R5	HTTP 404 Re-direct AQP Action	Candidate	7x50	9.0	R5	FALSE
9.0	R5	HTTP Proxy	Candidate	7x50	9.0	R5	FALSE
9.0	R5	Business prefix transits	Candidate	7x50	9.0	R4	FALSE
9.0	R5	AA on SR-c12	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Top websites + unknown port #s	Candidate	7x50	9.0	R4	FALSE
9.0	R5	WAN-PHY support for 12-port 10GE Magma IMMs (RFE 100388)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Arbor: TMS Integration	Candidate	7x50	9.0	R4	FALSE
9.0	R5	RSVP-TE inter-area manual bypass with XRO	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Facility MEP (auto-MEP generation)	Candidate	7x50	9.0	R1	FALSE
9.0	R5	APS parity work for ATM/POS Portugal MDAs	Candidate	7x50	9.0	R4	FALSE
9.0	R5	2500 OSPF adjacencies (IPv4/IPv6)	Candidate	7x50	9.0	R4	FALSE
9.0	R5	Service Label per next-hop for framed routes	Candidate	7x50	9.0	R5	FALSE
9.0	R5	Vport stats	Candidate	7x50	9.0	R3	FALSE
9.0	R5	Test Result Deletion	Candidate	7x50			FALSE
9.0	R5	9.0 R5 RFEs - Equipment	Candidate	7x50			FALSE
9.0	R5	9.0 R5 RFEs - AA	Candidate	7x50			FALSE
9.0	R5	Support of eNB LA4.0.1 (eNB models)	Candidate	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	eNodeB Licensing improvement	Candidate	9412 eNodeB	LA3.0		FALSE

9.0	R5	support of eUTRAN sharing (LTE RAN)	Candidate	9412 eNodeB	LA4.0.1		
9.0	R5	support of IRAT ANR for eNB	Candidate	9412 eNodeB	LA4.0.1		
9.0	R5	Wireless Equipment management improvement	Candidate	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	5620 SAM LTE NE Upgrade utility	Candidate	9412 eNodeB	LA4.0.1		
9.0	R5	eNB Traces improvement	Candidate	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	support of eNB Counter selection	Candidate	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	scaling improvement for eNB	Candidate	9412 eNodeB	LA4.0.1		FALSE
9.0	R5	Support of eNB TLA4.0 (eNB release and backward compatibility)	Candidate	9412 eNodeB	TLA4		FALSE
9.0	R5	5620 SAM support of sBBU configuration (TDD modem)	Candidate	9412 eNodeB	TLA3	drop 2	FALSE
9.0	R5	9500 R3.0.1 A/E Support	Candidate	9500 MPR	3.0.1		FALSE
9.0	R5	MSS-1C Support	Candidate	9500 MPR			FALSE
9.0	R5	SAP/XC (Physical Link) Completion	Candidate	9500 MPR			FALSE
9.0	R5	Service in Service: Auto Discovery	Candidate	9500 MPR			FALSE
9.0	R5	9500 3.0 LAG	Candidate	9500 MPR	3.0		FALSE
9.0	R5	9500 3.0 Radio Configuration	Candidate	9500 MPR	3.0		FALSE
9.0	R5	Auto Tunnel Creation + N x (1+0)	Candidate	9500 MPR			FALSE
9.0	R5	SAA interval Modification - AOS 6.6.2 R02 (Virgin Media Release)	Candidate	OmniSwitch	6.6.2 R02		FALSE
9.0	R5	5620 SAM-OMC-R Horizontal Integration	Candidate				FALSE
9.0	R7	1830 PSS-36 with null fabric module (no OTN switching)	Candidate	1830	PSS-36		
9.0	R7	Wavelength Matrix	Candidate	1830			
9.0	R7	Radius Server Support	Candidate	1830			
9.0	R7	SNMP / CLI User Creation	Candidate	1830			
9.0	R7	NTP Support	Candidate	1830			
9.0	R7	Topology and Logical View - generated by SAM	Candidate	1830	9.0	R1	
9.0	R7	Upgrade Support	Candidate	1830	9.0	R1	
9.0	R7	Provisioning and management of Y cable protection on all supporting service conf	Candidate	1830			FALSE
9.0	R7	Provisioning and management of ESNCP protection on all supporting service config	Candidate	1830			FALSE

9.0	R7	Provisioning and management of Regen services on all supporting service configur	Candidate	1830			FALSE
9.0	R7	OAM for 11DPE12	Candidate	1830			FALSE
9.0	R7	11DPM12(Release 3.5)	Candidate	1830			FALSE
9.0	R7	Card support for 3.6 Release	Candidate	1830			FALSE
9.0	R7	Mib Stats till 3.6	Candidate	1830			FALSE
9.0	R7	File Based Stats till 3.6	Candidate	1830			FALSE
9.0	R7	Dual Stage Multiplexing (R:CFG-1610)	Candidate	1830			FALSE
9.0	R7	1p 10GE XMDA card for SAR-18	Candidate	7705	5.0	R2	FALSE
9.0	R7	IEEE1588 Transparent Clock	Candidate	7705	5.0	R2	FALSE
9.0	R7	Extended MG / MME Templates + 9.0 SAM Templates	Candidate	7750 MG	3.0	R3	FALSE
9.0		7210 SAD-D 6F4T ETR support	Candidate	7210	3.0	R3	TRUE
NMS Features							
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	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	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	R3	Consolidated view of historical and active alarms	Stretch				FALSE
9.0	R3	Compression of backup files via tar/gzip	Committed				FALSE
9.0	R3	Display of PEM and fan trays in the equipment tree	Committed				FALSE
9.0	R3	Reply function to SAM text messages	Committed				FALSE
9.0	R3	Filter on Topology Group	Stretch				FALSE
9.0	R3	Ethernet layer added to bulk change	Stretch				FALSE
9.0	R3	Usability Improvements of the GUI builder, script manager and bulk updates	Committed				FALSE
9.0	R3	Switch user account without stopping the SAM client	Committed				FALSE
9.0	R3	Clarify the scope of Override Tabs	Stretch				FALSE
9.0	R3	Document applicable alarms for eNodeB	Committed				FALSE
9.0	R3	Document applicable alarms for MME	Committed				FALSE
9.0	R3	Gather applicable node alarm info automatically	Stretch				FALSE
9.0	R3	Security DCRs	Committed				FALSE
9.0	R5	OLC - Scheduling policies for OLC state	Candidate				FALSE
9.0	R5	Composite Services	Candidate				FALSE
9.0	R5	OAM to GNE	Candidate				FALSE
9.0	R5	Quadruple STM scale	Candidate				FALSE
9.0	R5	Testsuite for comp svc/seg svc	Candidate				FALSE
9.0	R5	View based Composite svc OAM	Candidate				FALSE
9.0	R5	GNE integration to service provisioning	Candidate				FALSE
9.0	R5	GNE alarm extensions	Candidate				FALSE
9.0	R5	Filter Manager	Candidate				FALSE
9.0	R5	LDAP Authentication	Candidate		LA4.0.1		
9.0	R5	SAP Copy/Move to Support Multi Service Sites	Candidate				FALSE
9.0	R5	Network Sync Mgr	Candidate				FALSE
9.0	R5	SAM enabler for WPS automatic data transfer	Candidate				FALSE

9.0	R5	SAM enabler for WPS user collaboration	Candidate				FALSE
9.0	R5	Script Scheduling	Candidate				
9.0	R5	Ability to lock a Node backup	Candidate				FALSE
9.0	R5	Compare Nodal Backups within SAM	Candidate				FALSE
9.0	R5	Increase JMS Filter flexibility	Candidate				FALSE
9.0	R5	Log Viewer available through Client GUI	Candidate				FALSE
9.0	R5	SAM Platform Dashboard	Candidate				FALSE
9.0	R5	SAM scheduler replacement	Candidate				FALSE
9.0	R5	save a backup if the config is different	Candidate				FALSE
9.0	R5	Use logToFile For STM	Candidate				FALSE
9.0	R5	3GPP R8 SOAP/XML support	Candidate				FALSE
9.0	R5	Template & Script Cascading	Candidate				FALSE
9.0	R5	Generic path search	Candidate				FALSE
9.0	R5	Complete G.8031	Candidate				FALSE
9.0	R5	Complete G.8032	Candidate				FALSE
9.0	R5	Complete service provisioning using G8032	Candidate				FALSE
9.0	R5	GNE in the service picture	Candidate				FALSE
9.0	R5	IP VPN map-based Provisioning	Candidate				FALSE
9.0	R5	mVPN	Candidate				FALSE
9.0	R5	RSVP CAC	Candidate				FALSE
9.0	R5	Tunnels for services	Candidate				FALSE
9.0	R5	Service Scale	Candidate				FALSE
9.0	R5	Network Resource Management	Candidate				FALSE
9.0	R5	L2+pL3 MBH CPAM	Candidate				FALSE
9.0	R5	enabler for NPO QoS Alerts display as alarms in SAM	Candidate				FALSE
9.0	R5	Add multi selection for Switch Mode for policy	Candidate				FALSE
9.0	R5	Use logToFile For Performance Stats	Candidate				FALSE
9.0	R5	Infocenter for User Docs	Candidate				FALSE
9.0	R5	GNE: LLDP & LLDP based Alarm Aggregation	Candidate				FALSE
9.0	R5	HIP Licencing and Encyrption	Candidate				FALSE
9.0	R5	Conextual menus to lists	Candidate				FALSE
9.0	R5	Create in tab in service navigator	Candidate				FALSE
9.0	R5	Composite Service support in service navigator	Candidate				FALSE
9.0	R5	Handling of child windows in tab in service navigator	Candidate				FALSE
9.0	R5	Assign Alarm Colors in GUI	Candidate				FALSE
9.0	R5	Template Support for Attribute Indicator	Candidate				FALSE
9.0	R5	Message for lists that don't autopopulate	Candidate				FALSE

9.0	R5	New button model for config forms	Candidate				FALSE
9.0	R5	Consolidate equipment window and NE property form	Candidate				FALSE

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 (HSMDA) 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 8.0 R7. The scale targets listed in 9.0R1 column are planned targets for 5620 SAM release 9.0 R1. The objective of this release is to ensure that 5620 SAM scales to the same level as in the 8.0 release. Commitment to increase some dimensions is made once tested and are expected in subsequent 9.0 releases. Initial focus will be placed on increasing network element counts.

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 targets for Release 9.0.

Criteria	8.0 R7	9.0 R1
Maximum network elements (excluding GNE)	12,000	12,000
Maximum number of GNEs (assumes 10 interfaces per)	18,000	18,000
Combined GNE/network elements (assumes 10 interfaces per GNE max)	18,000/3000	18,000/3000
Combined network elements/GNE (assumes 10 interfaces per GNE max)	12,000/2,000	12,000/2,000
Maximum number of managed MDAs containing:	25,000	25,000
Max 7250 network elements	2,500 (= 5,000 MDAs)	2,500 (= 5,000 MDAs)
Max 7705 network elements	12,000 (= 12,000 MDAs)	12,000 (= 12,000 MDAs)
Max 9500 network elements	5,000 (=5,000 MDAs)	5,000 (=5,000 MDAs)
Max 7210 network elements	5,000 (= 5,000 MDAs)	5,000 (= 5,000 MDAs)
Max OMNISwitch 6000 series (1 MDA equivalent to 1 chassis)	6,000	6,000
Max OMNISwitch 9000 series (1 MDA equivalent to 1 NI)	1,000	1,000
Maximum number of SAPs	6,000,000	6,000,000
Maximum number of Services	2 Million	2 Million
Maximum number of LSPs	50,000	50,000
Concurrent Clients		

Max OSS Clients [HTTP, JMS1]	30	30
Max GUI Clients	150	150
OAM Tests (10 minute interval)		
Standard Tests (not simultaneous with Lightweight)	6,000	6,000
Lightweight Tests (not simultaneous with Standard)		
Accounting Based Tests	50,000	50,000
Statistics (15 minute interval)		
Accounting Statistics	10,000,000	10,000,000
Performance Statistics	500,000	500,000
Combined Accounting/Performance	10,000,000/500,000	10,000,000/500,000
Alarms		
Outstanding Alarms	50,000	50,000
Alarm History (assumes 50,000 alarms per day)	One month	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) *Note*: 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 *Note*: 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 will include an Oracle upgrade (from 10G to 11G). Customer impact is minimized with the following. The 5620 SAM 9.0 upgrade procedure will include all considerations. Also 5620 SAM 9.0 upgrade licenses will include cost to Oracle as part of the base price.

Use logToFile For Performance Stats

Use the logToFile framework as an option for OSS to collect performance statistics.

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 allows supervising some key information of Groups of equipment, such as number of disabled cells, number of links disabled for the group. These Groups are configured in 5620 SAM.

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 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.

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.

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 two parameters appear in the nms-server.xml file under the <db> parameters as

1) dbAutoStandbyReinstantiate

2) dbReinstantiateTimeout (in minutes)

The parameters can be changed by issuing an nmsserver.bash read_config.

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.

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

If, in moving from one release to another, additional change of information were to require, 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 SAM server. The end-user will not need to go through the process of reconfiguration across an upgrade.

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.

LogViewer available through Client GUI + enhancements

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-XPs 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-XPs 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-XPs 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 restricted to ports on the 7750 IOM3-XPs 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-XPs with 7750 IOM3-XPs & 77450 MDAs/MDA-XPs with 7450 IOM3-XPs)
- 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 & Forwording[2]							√	√
MPLS, LDP support [2]							√	√
VPLS support [2]							√	√

Table 6: Supported OMNI Features

[1]Stack 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/demark 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.

Ethernet Service Delivery Business and Mobile Backhaul using 7210 SAS-D

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 Segreation 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 OSSI). 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

5620 SAM Release 8.0 R7 was a major content release for 1830 PSS optical network element support. For a detailed description of the functionality, please refer to the *5620 SAM Release 8.0 R7 Release Description*. New functionality is targeted to be added in 5620 SAM Release 9.0 R3.

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.

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