Avaya IP Telephony Solution Overview

Goran Šehović
Zoran Slović

ALGOTECH
Company presentation
1992. - Founded in Belgrade

Today regional European company with offices in 6 countries

1996. - AT&T Business Partner

Avaya PLATINUM Business Partner since 2006

FY2006, 2007, 2008 - The best Avaya Business Partner for the Adriatic region

28th on Deloitte Fast 50 technology comp. in Central Europe
Profile

- Employs 110 professionals
- 40 experienced employees in Serbia
- Group revenue in 2006: $14.5M
- Pioneer in Call Centres and IP telephony
- Serbian Market leader in Contact Centers
Portfolio

- Call & Contact Centers
- IP telephony solutions
- Interactive Voice Response (IVR)
- Compliance & Quality monitoring
- Unified messaging
- CTI Applications
- Ticketing applications
Market share

- Traditional telephony: >20%
- IP telephony: >30%
- Call/Contact center: >90%
- Compliance & Quality monitoring: >70%
- IVR applications: > 20%

Algotech 88%
Strategic Partnerships

- **Avaya** ([www.avaya.com](http://www.avaya.com))
- **NI CE** ([www.nice.com](http://www.nice.com))
- **Altitude software** ([www.altitude.com](http://www.altitude.com))
- **Teleopti** ([www.teleopti.com](http://www.teleopti.com))
- **ExtremeNetworks** ([www.extremenetworks.com](http://www.extremenetworks.com))
- **LifeSize** ([www.lifesize.com](http://www.lifesize.com))
Our Customers – Financial Industry

- Raiffeisen bank
- Al K bank
- Banca Intesa
- Delta Generali Insurance
- EFG bank
- Erste bank
- Findomestic bank
- First Data
- Hypo Alpe Adria Bank
- Komercijalna bank
- Laiki bank
- National bank of Serbia
- Srpska bank
- Volks bank
Our Customers - Financial Industry

- Telekom Srbija
- Telenor
- CePP
- EUnet
- Huawei
- MTS
- Pošta
- RATEL
- Trizma
Our Customers

- DHL
- Belgrade Airport “Nikola Tesla”
- Belgrade Fair
- Sava Center
- Energoprojekt
- Hemofarm
- TetraPak
- City of Niš

Hemofarm koncern
Our Customers

- UPC
- American Express
- Citi bank
- General Electric
- HVB bank
- ING bank
- Vodafone
- Transcom
- Unicredit bank
- Telefonica O2
- T-Mobile
- E-ON
- T-Mobile
- e.on
- upc live
- imagination at work
- citi
- Transcom
- UniCredit Group
Avaya Global Overview
Avaya Global Footprint

17,500 employees

Headquarters: Basking Ridge, NJ

Presence in 54 countries

2500 Business Partners

32 Global Delivery Support Centers

17 Exec Briefing Centers

24 Training Centers
Annual Revenues Exceed $5B

42% International
57% through 2,500+ partners worldwide

Sources: IDC, Synergy, Infotech, Frost and Sullivan and others
(1) Worldwide patents, including pending applications
AVAYA Strengths

- Strong Product Reputation
- Known for Reliability
- Respected Brand
- Leading Market Position in CC
- Best User Interface
- Great Channel
- Great People
Avaya Innovation & Research

**Avaya Labs Rich In Heritage**

- Industry leading 4400+ patents or patents pending
  - ~75% of R&D is software based
  - 60% of these patents are in the Unified Communications field
- Avaya Labs Locations in Australia, Germany, India, Israel, Japan, Singapore, U.K., U.S.

4,200+ Independent Software Vendors who build applications on Avaya

*Note: Product revenue excludes Rental and AFS/IP*
**Leadership Positions**

Avaya Named to the 2008 World’s Most Ethical Companies List

### Unified Communications

- **Gartner Magic Quadrant**
  - *Enterprise Comm Leader*
  - *UC Challenger*
  - #1 Converged Telephony 25% share
  - #2 IP Telephony 20% share
  - #1 Unified Messaging 21% share
  - #1 Audio Conferencing 28% share

### Contact Center

- **Gartner Magic Quadrant**
  - *Customer Service Leader*
  - #1 Call Center/ACD 40% share
  - #1 Outbound Dialers 28% share
  - #1 Voice Response 23% share
  - #2 CTI 16% share

### Small & Mid Enterprise

- **#1 Communications Solution**
  - measured by lines shipped for companies <100 users
- **#1 in Key-Hybrid Revenue Worldwide**
  - for companies <100 users

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**Notes:** *Results are North America** **Results are Asia Pacific**

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IP Communications Architecture Evolution

- Three Layer Functional Model
Communication System Functions

- Application
- Connection Mgmt
- Access
Evolution of Communication Architecture

Pre-2001

- Application
- Connection Mgmt
- Access

2002-2007

- Application
- Connection Mgmt
- Access

2008+

- App
- Connection Mgmt
- Access
- App
Evolution of Communication Architecture

Pre-2001
- Application
- Connection Mgmt
- Access

2002-2007
- Application
- Connection Mgmt
- Access

2008+
- App
- Connection Mgmt
- Access
- App
2001 and Earlier

Key Enablers

- Circuit Switching
- ISDN Signaling
- IN/SS7
- CTI based Pre-Routing
- Standalone ACD
- Standalone PBX
2001 and Earlier: The “3-Tier, Best of Breed” Model
Evolution of Communication Architecture

Pre-2001
- Overlay Signaling
  - Application
  - Connection Mgmt
  - Access
  - TDM/ISDN

2002-2007
- Application
- Connection Mgmt
- Access

2008+
- App
  - Connection Mgmt
  - Access
2002-2007

Key Enablers

- Voice over IP
- H.323 Signaling
- Integrated ACD/PBX
- CPU Power
- CTI based Applications

- PSTN
- Media Gateway
- ACD/PBX
- Quality
- WFMS
- Reporting
- IVR
- Dialer
- CTI
- Voice Mail
- IP WAN
- Regional/National Offices
- Branch Location
- Small Office, Home Office, Telecommuter
- Telecommuters
- Offshore/Nearshore/Outsourced Offices
Evolution of Communication Architecture

- **Pre-2001**: Overlay Signaling
  - Application
  - Connection Mgmt
  - Access
  - TDM/ISDN

- **2002-2007**: Overlay Apps
  - Application
  - Connection Mgmt
  - Access
  - H.323
  - IP

- **2008+**: Connections
  - Application
  - Connection Mgmt
  - Access
  - IP
Key Enablers

- SIP and Web Services
- Session Management
- Internet Architectures
- VXML and CCXML
- ECLIPSE Tooling
- Low Cost Bandwidth
2008+: Transform Connection Mgmt and CTI with SIP
2008+: Compose and Orchestrate

Distributed Office

G860

Regional/National Offices

Branch Location

Session Border Controller

SIP

Connect

ACD/PBX

Schedule

WFMS

Interact

IVR

Locate

CTI

Record

Quality

Report

Reporting

Contact

Dialer

Message

Voice Mail

Session Manager

IP WAN

Home Office

Telecommuter

Mobile Worker

Offshore/Nearshore

Outsourced Offices

Contact Ctr

IP Comms

Mobility

Collaborate

Application Composition

Business Orchestration

SIP/ SOA SDP

Integrated Communications Suite

Application Composition

Business Orchestration

ACD/PBX

Voice Mail

Contact

Record

Schedule

Interact

Locate

Connect

Session Manager

Session Border Controller

SIP

IP WAN

Regional/National Offices

Branch Location

Distributed Office

G860

Home Office

Telecommuter

Mobile Worker

Offshore/Nearshore

Outsourced Offices

Contact Ctr

IP Comms

Mobility

Collaborate
2008+: Transform Connection Mgmt, Compose Applications, and Orchestrate Business Processes
Rich Virtual Enterprise Foundation Today
Building Blocks, Scale/Security/Availability, Customer Evolution

Communication Manager Software ▶ SIP Enablement Services

Servers
- S8300 / S8400 Embedded Communication Server
- S8500 / MultiVantage Express® Communication Server
- S8720 / S8730 High Reliability Communication Server
- S8500 Server
- S8300 Server

Media Gateways
- G250 Branch Gateways for very small offices
- IG550 Integrated Gateway for Juniper Routers
- G350 Branch Gateway for small offices
- G450 Gateway for medium offices
- G650 High-Density Gateway
- G860 High-Density Trunk Gateway

Communication Devices
- Unified Communications - Mobility Solutions
  Extension to Cellular, Softphones, Clients
- 16xx Series Value Edition / 16CC
- 36ox Series - Wireless
- 96ox Series - H.323 / SIP

Services
- Network Assessments
- SMB & Branch Solutions
- CM Solutions
- Phone Apps
- Nw Readiness
- Empirix Performance Assurance
- Software Support + Upgrades
- Proactive IP Support
- Remote Mgd Services
- IP Converged Services
- Software Support Plus Upgrades
Avaya Application Solutions

1. Avaya Communication Manager
2. Avaya Servers
3. Avaya Media Gateways
4. Avaya Integrated Management
5. Avaya Communication Manager applications
6. Avaya SIP solutions
7. Avaya SIP application enablement
1. Avaya Communication Manager

Communication Manager is the next generation of Avaya call processing software. Communication Manager is an open, scalable, highly reliable, and secure telephony application.
Communication Manager Key Features and Benefits

- **Convergence**—uses Internet Protocol (IP) to enable a natural migration path from today’s separate data and voice networks to a converged network environment using IP
- **Enterprise-Wide Communication Features**—allow customers to centralize call processing and administration onto powerful servers while they extend the full breadth of applications to survivable gateways in campus environments or remote branch office locations
- **Wide-Ranging Protocol Support**—replaces networks of multiple switches with a centrally administered server that controls a network of gateways or port networks, all managed as a single system
• **High Scalability**—can grow along with a business with no need to change an entire system (e.g., can scale to over a million extensions.

• **Business Continuity**—powers solutions that can achieve up to 99.999% reliability through the use of duplicated server interfaces and network links:
  - The Avaya Enterprise Survivable Server solution gives businesses the flexibility of consolidation by providing increased survivability options.
  - A variety of new enhancements to enhance availability and survivability include Inter-Gateway Alternate Routing (IGAR), Locally Sourced Announcements and Music, Auto Fallback to Primary for H.248 Gateways, and Modem Dial-up the G350 and G250 Media Gateways.
  - Uninterrupted branch communications are improved with Standard Local Survivability on the G250 Media Gateways and Connection Preserving Failover/Failback for H.248 Media Gateways.
2. Avaya servers

An Avaya server provides centralized, enterprise-class call processing. This call processing can be distributed across a multi-protocol network (including IP) to support a highly diversified network architecture that consists of headquarters, branch, remote, small, and home offices.
The Avaya servers (S8300, S8400, S8500, S8700 series, and SES-SIP) are Linux-based servers. These servers support:

- Distributed IP Networking and centralized call processing across multi-service networks
- Dual server design with hot fail-over (S8700-series Server only)
- Redundant LAN Interfaces and remote survivable call processing
3. Avaya Media Gateways

Are stackable and modular hardware elements that deliver application enabling voice, data, fax, video, and messaging capabilities to network. They house hardware elements such as control interfaces and port interfaces routing both bearer and signaling traffic routed between packet-switched and circuit switched networks.
Communication Manager running on Avaya servers controls voice and signaling over a variety of stackable and modular Media Gateways:

- Avaya G150 Media Gateway
- Avaya G250 Media Gateway
- Avaya G350 Media Gateway
- Avaya G700 Media Gateway
- Avaya G450 Media Gateway
- Avaya G650 Media Gateway
- Avaya G860 High Density Media Gateway
- Avaya IG550 Integrated Gateway

The Media Gateways contain the network and the endpoint interfaces, as well as call classification, announcement boards, and so on. Through these interfaces, Communication Manager performs gateway/gatekeeper functions.
4. Avaya Integrated Management

Avaya Integrated Management is systems-management software for managing converged voice and data networks.
5. Avaya Communication Manager applications

Avaya Communication Manager supports the following communication capabilities and applications:

- Call Center
- Messaging
- Unified Communication Center
- Conferencing systems
- Video Telephony Solutions
- Computer Telephony Integration (CTI)
- Application Programming Interfaces (APIs)

Etc.
Session Initiation Protocol (SIP) is an endpoint-oriented messaging standard defined by the Internet Engineering Task Force (IETF). SIP is a text-based protocol, similar to HTTP and SMTP, for initiating interactive communication sessions between users.

6. Avaya SIP solutions

*SIP “trunking” functionality* - allows Avaya Communication Manager to communicate with SIP endpoints and gateways across an IP network.

*SIP endpoints* - Avaya Communication Manager supports SIP endpoints.
7. Avaya SIP application enablement

Avaya Communications Process Manager is middleware software that uses customizable web services to integrate Avaya communications solutions into customer business processes.
Avaya Call Processing
Communication Manager traffic flow
**Avaya Call Processing**

**IP Port Network / Media Gateway connectivity**

IP PNC allows S8700-series Servers and G650 Media Gateways to be connected over IP networks.

Communication Manager uses the standards-based H.248 media gateway control protocol to perform call control of Avaya G700, G350, and G250 Media Gateways.
• **Intelligent networking and call routing**

With Avaya Communication Manager, servers can use IP trunks across an IP network to communicate between switches without the need for dedicated leased lines.
• **Communication Manager implements the gatekeeper routed call model of H.323.**

The registration process allows the endpoint and the Communication Manager gatekeeper to exchange addresses to establish a TCP connection for a “call signaling” channel (the H.323/H.225 channel). Once the TCP connection is established for call signaling, the H.225.0/Q.931 signaling protocol is used over that connection to route the call and exchange addresses necessary to establish a second TCP connection. This second TCP connection is used for “media control” (the H.245 channel).
- Media stream handling - Media processor circuit packs (VoIP resources)

**MedPro Card: Media Processor Card**
- Converts TDM based media in IP based and IP to TDM (PCM audio)
- Supports Codecs: G.711, G.729, G.723, G.726
- Supports from 32 to 280 simultaneous sessions
- Dynamically allocated resource
- Encryption and decryption of media
Separation of Bearer and Signaling (SBS)

In an Avaya IP Telephony system, call signaling and bearer traffic may be routed over separate paths. This is useful for a remote branch office with only limited WAN bandwidth back to headquarters. Call signaling traffic can be routed across the WAN, while bearer traffic is sent over the PSTN.
• **Sip Enablement Service server - SES**

- Deployed on IBM x305/x306 servers
- provide SIP networking capabilities and support SIP endpoints
- The main processes on SES are a SIP proxy server, SIP registrar, SIP Event and Presence Server, profile services, and a built-in centralized administration system for all SES servers in a network.
• Two terms describe an SES server: Edge Server and Home Server.

An "Edge Server" communicates with external SIP networks, and a "Home Server" provides service to endpoints.
Communication Manager as the SIP Feature Server

• Communication Manager implements SIP trunk and the Advanced SIP Telephony (AST) feature set utilizing OPTIM capabilities in Communication Manager. This allows a SIP endpoint to signal feature using Feature Name URIs, and retrieving state through event packages.

• Advanced SIP users must be provisioned both on SES as a SIP user and as an OPTIM station on Communication Manager. There must be a SIP trunk configured on Communication Manager, and a corresponding server configured on SES.
Avaya S8730 Server

- **S8730 is the next generation of the S8700 series Server**
  - Avaya Branded 2U AMD Dual-Core Server
  - Operating System: RHEL4.0
  - CM 5.0 or later
  - DAL2 Card
    - Hardware Memory Duplication
- **CM Performance**
  - Same as on the S8720
- **Capacities**
  - Same as that of S8720 in XL Configuration

New Hardware redundancy
Features increases the availability of the system

- **Equipped with RAID 1 Controller**
  - Optional Redundant Hard Disk Drives
  - No further Administration Required
- **Optional support for Dual Power Supplies**
  - No further Administration Required
Scalability

- With Communication Manager, Release 5.0, the S8730 Server or the S8720 XL configuration support the following scalability:
  - 36,000 stations
  - 12,000 Trunks
  - 8,000 Tone Detectors
  - 9,000 System Announcements
  - 128 Voice Announcement LAN (VAL) boards
  - 414 Attendant Groups
  - 106 CLAN Boards
  - 108,000 Extension to Cellular Enhanced CLID off-PBX station-mappings
  - 600,000 BHCC
S87x0 Duplex Reliability Configuration

- Duplex Servers
- Availability 99.9%
- <9 hours downtime/yr
S87x0 High Reliability Configuration

- Duplex Servers
- Duplex Control Networks and Duplex IPSIs
- 99.99% Availability
- < 53 minutes downtime/yr
• Duplex Servers
• Duplex Control Networks and Duplex IPSIs
• Duplex Bearer Networks
• 99.999% Availability
• < 6 minutes downtime/yr

S87x0 Critical Reliability Configuration
Increased Reliability for IP Telephony

- TN2602AP “Crossfire” module enables Voice bearer duplication over IP
  - Up to 5x9 Critical reliability over IP
  - Close gap with best TDM solutions
- Hot-standby duplication strategy
  - 2 x TN2602AP boards
    - One active, one standby
    - Share single virtual IP address
      - Transparency for other ends
- Very fast switchover (1sec)
  - Calls & features preserving
  - Supports encryption

Unique Redundancy Feature
Protect in real time the Voice path
• **Includes RAID 1 controllers & 2 HDD**
  - RAID 1 utilizes disk mirroring – creates a set of data on 2 disks
  - Each disk is independent and contains complete copy of data
  - RAID 1 reduces time to service a system
    - Services can replace disk w/o powering down the system
  - Previous versions of S8500A/B/C used RAM disk

• **Supports up to 2400 stations, 800 trunks**

• **Survivability**
  - Can be deployed as LSP w/Processor Ethernet – no CLANs/IPSIs
  - ESS

• **Optional:**
  - 2nd Power Supply
S8300C Server

- Now includes embedded SES server for complete all-in-one SIP, H.323, and TDM telephony solution
- Reduces cost and footprint
- Exact same SIP functionality as larger CM Media Servers with standalone SES server
- Scale with SIP networking between S8300-based remote offices
- Leverages centralized SIP-based apps
- 200 (encrypted), 400 (no encrypted) SIP users limit
**S8400B Platform**

- **S8400B** - Linux server blade supporting Communication Manager
  - 1GB of DRAM memory and 4G Solid State Device
  - Includes applications such as:
    - Integrated messaging
    - ACD functionality
    - DHCP & TFTP for deploying IP
- “Gentle” evolution to IP for ProLogix customers and S8100/G600/IP600
  - Easy two board swap upgrade
  - Investment protection with existing CMC and G600 carriers
  - Incrementally add IP endpoints
- **Compact solution for new customers**
  - Lower-cost traditional/hybrid choice
- **Expandable up to 5 G650s in a stack**
- **Small network distribution**
  - Control up to 5 remote gateways (G250, G350, G700) with local gateway survivability
- **Scalable up to 900 ports + 400 trunks**
  - 1300 total ports – same as CSI/ProLogix

**Distributed IP phones and gateways**
The S87XX-Series Server controls media gateways via separate bearer and control paths. Call control signaling is established from the 87XX-Series Server over an Ethernet connection to an IP Server Interface TN2312 (IPSI) in the media gateway.
The IPSI has the following characteristics:

- Always resides in the tone/clock slot
- 10/100BaseT interface for connection to server
- 10/100BaseT faceplate RJ 45 jack for connection to services laptop
- Media gateway clock generation and synchronization (Stratum 4 type II only)
- Media gateway tone generation
- Provides Global Call Classification
- Media gateway packet interface
- Support for IPSI firmware download
- Interface to media gateway TN775D maintenance board
- The TN2312BP IP Server Interface (IPSI) provides environmental maintenance and is the IP server interface supported in the G650.
G650 Media Gateway

- Enhanced Maintenance Bus for better reporting
- AC/DC Power Supply
- Supports Redundant Load Sharing Power Supplies
- Can Support 14 TN Circuit Packs
- Up to five G650s per PN
- Used in lieu of traditional cabinets in new systems
- Used in Conjunction with traditional cabinets in existing systems
- Supports Direct Connect, CSS, ATM, and IP PNC depending on design
Avaya Communication Manager Branch Solutions

- Extending Intelligent Communication Applications throughout the Enterprise

- **Communication Manager Branch Gateways**
  - G450 Gateway
  - G700 Gateway
  - G350 Gateway
  - G250 Gateway
  - IG550 Integrated Gateway
The G450 chassis features field replaceable RAM, DSPs, PSUs, fan tray, and main board module for enhanced reliability.

- 8 T1/ E1, 192 Analog/ DCP phones, 240 Voice Channels, 10000 BHCC, 64 announcements, uses existing voice/ WAN MM
The Avaya G700 Media Gateway

- The G700 gateway can function either as a stand alone system or as a gateway extending a centralized system out to a remote location.
- Supports 450 stations/450 trunks.
- Up to 10 G700 can be stacked to support higher number of ports.
The Avaya G350 Media Gateway

- The G350 gateway can function either as a stand alone system or as a gateway extending a centralized system out to a remote location

- capacities:
  - Standard supports up to 40 telephones and 40 trunks
  - Enhanced supports up to 72 telephones and 60 trunks (CM3.1.2); More than G350 can be installed at one location.

- The G350 has module slots to allow support for multiple configurations

- WAN connections are supported through a WAN Ethernet port or through a media module, both supported by robust WAN routing capability
The Avaya G250 Media Gateway

- The G250 gateway can function either as a stand alone system or as a gateway extending a centralized system out to a remote location.
- The G250 gateway is very similar to the G350, but with fixed interfaces.
- Analog, BRI, DCP, DS1 models.
- WAN connections are supported through a WAN Ethernet port or through an optional media module (T1/ E1 or USP), both supported by WAN routing capability.
Avaya IG550 Integrated Media Gateway

- **Telephony Gateway Module (TGM)**
  - Targets 2 to 100 users
  - Local survivability, PSTN connectivity
- **Rich feature set**
  - Access to central Communication Manager and other communications applications
  - Complementary with other Avaya gateways
  - Security: full media encryption
  - Call Center agents supported
  - 6-party meet-me conferencing
  - Local music-on-hold & voice announcements
- **Telephony Interface Modules (TIM)**
  - Analog, T1/E1, PRI and BRI options
- **Simplified Management**
  - Joint Installation Tool, HP OpenView support
  - Centralized Avaya Integrated Management
• **High Density Interfaces - DS3s**
• **Small Footprint (5U) and Lower Costs**
  - Reduction of carrier access charges
    • (Break-even point for DS3 is around 7 T1s)
  - Lower costs associated with acquiring and maintaining data center floor space (up to 85-90% reduction in space required)
  - Operational and maintenance cost savings by eliminating a large number of G650 gateways (less power, UPS, cooling needs)
• **SIP Connectivity to Avaya Communication Manager**
• **Carrier Grade Reliability**
• **Works in Conjunction with G650s**
• **Targeted to Large IP-based Contact Centers and Campuses**
• **Installed and supported by Avaya Global Services**
Gateway Survivability

- Enterprise Survivable Server
- Local Survivable Processor
- Standard Local Survivability
- Modem Dial-up Backup
What is ESS?

• **Enterprise Survivable Servers** allow backup servers to be placed at various places in your network so that your communications can continue in the event that the main server(s) fails, or when connectivity to the main server(s) is lost.

• **Enterprise Survivable Servers** can be deployed where needed throughout your network to provide increased communications continuity:
  - The IPSI card in the port networks automatically obtains service from an ESS server(s) if the control signal to the main server is lost.

• **Enterprise Survivable Servers** can be connected to ATM, IP and Center Stage Switch (CSS) connected port networks.
Catastrophic Main Server Failure

S8700 Media Server
(Main Server)

S8500 ESS
(2nd Alternative)

S8700 ESS
(1st Alternative)
ESS Recovery of Failure

New IPSI Control

S8700 Media Server
(Main Server)

S8500 ESS
(2nd Alternative)

S8700 ESS
(1st Alternative)
Network Fragmentation Failure

S8700 Media Server (Main Server)

S8500 ESS (2nd Alternative)

S8700 ESS (1st Alternative)
Network Fragmentation Failure

New IPSI Control

S8700 Media Server
(Main Server)

S8500 ESS
(2nd Alternative)

S8700 ESS
(1st Alternative)
Network Fragmentation Recovery

S8700 Media Server
(Main Server)

S8700 ESS
(1st Alternative)

S8500 ESS
(2nd Alternative)
Main Server Recovery

S8700 Media Server (Main Server)

S8500 ESS (2nd Alternative)

S8700 ESS (1st Alternative)
Agglomeration Back To Main Server

S8700 Media Server (Main Server)

S8700 ESS (1st Alternative)

S8500 ESS (2nd Alternative)
Considerations

• The ESS priorities are administered and maintained in the main server(s) translations
  – The main server/server pair is always the highest priority server on the list
  – Each entry can consist of an S8700/S8710 server pair or a simplex S8500 server
  – An S8500/B Main can only have S8500/B as ESS servers
• The IPSI will detect a failure of the main server connection when the “keep alive” from the main server fails
• When an ESS takes over for a Main Server, communications capability is lost temporarily for affected port networks non-connection preserving failover
  – Shuffled IP-to-IP calls would stay up
More Considerations

• Recovery to the main server can be scheduled or manual
  – Most customers will prefer manual due to the fact that fall-back is not connection preserving
• The ESS server(s) have full translations
• The ESS server(s) synch translations with the primary server (pair)
• When an ESS is in control, it will be in a “license error” mode until the main server takes over
  – Translations can be changed on an ESS, but they cannot be saved
Local Survivable Processor (LSP) Provides 100% of the Avaya Communication Manager Features

Slot for an optional Local Survivable Processor

- For critical branch operations, an S8300 Media Server can be optionally installed in the local branch gateway to provide 100% of the Avaya Communication Manager feature set.
- System translations are regularly downloaded to all branch local processors so telephone, trunking, and system programming is up to date if the local processor needs to take over.
Transitioning to/from Back-up Modes

- **Connection Preserving Failover/ Fall back**
  - Existing stable calls where the talk path exists between two or more parties are not dropped when the media gateway fails over to another server or falls back to the primary server
  - Connection cannot be preserved for:
    - calls that are not in stable state (on-hold, ringing, etc.)
    - calls using IP or ISDN-BRI trunks, or ISDN stations

- **Auto Fall-back to Primary Connection**
  - The G250 or G350 Media Gateway will automatically reconnect to the primary server when available after having failed over to the Local Survivable Processor (LSP)
  - Automatic reconnect can be administered to allow for orderly return to service without manual intervention
Standard Local Survivability

- Available only at the G250, G350 and IG550
- Basic telephony is provided at the branch if connection to a server running the Avaya Communication Manager cannot be achieved
- **Cost effective survivability for price sensitive customers:**
  - No need in S8300
- The gateway continuously attempts to reconnect and when possible will automatically reconnect to a server
- The Provisioning and Installation Manager (PIM) is recommended for
  - configuration
  - configuration sync between CM and SLS
Modem Dial Backup

- Modem dial backup feature provides an alternative backup path to the central location to maintain call control at the branch in the event of WAN Link or Router failure
  - Supports dialup backup to the enterprise-owned routers
  - Supports dial-up to an ISP using IPSec-VPN tunnel

- Supports routing protocols

- The same modem can be used for dial-in by Services when not in use for backup

- only available in the G250/ G350/ IG550
Modem Dial-up Backup - Branch Office Survivability for WAN or Router Failures

Central Location

Branch Location
Avaya Reliability/Survivability Solutions
First Level-Stateful Failover

- Avaya offers *stateful* server duplication, using the Avaya patented Memory Shadowing, where only one S87XX-Series Media Server is running the entire system of up to 36,000 stations and 8,000 trunks.
- The non-active redundant server is synchronized real-time (either via a dedicated fiber or across an IP network) to the active server, providing imperceptible fail-over in the event of major component failure in the active server.
- Not only are the in-progress calls maintained during failover but call control features, for example, the ability to transfer a call, are preserved as well. Calls that may be queued in a call center, or even calls that are being set up including the continuation of processing digits being entered are also maintained.
• Second Level – Multiple Interfaces

Avaya offers multiple/dual-homed interfaces from the servers to the media gateways (or Port Networks), where each server and each media gateway can be connected to duplicated Ethernet switches at the same time. This provides redundancy for cases of component failure (server, Ethernet port, IPSI or IP Server Interface) and network segment failure.
Third Level - Multiple signal and bearer channels

Avaya provides separate signaling and bearer (voice) interfaces in the form of C-LAN (Control LAN/H.323 Gatekeeper functions) modules for signaling and DSP resources (generically called MedPros for Media Processors or Media Resources) for bearer traffic. This separation provides resiliency in the form of protection from a single interface failing or being attacked maliciously.
• **Fourth Level – Backup servers (ESS)**

Avaya offers the Enterprise Survivable Server(s) (ESS) solution which is used for catastrophic failures in ‘s enterprise. The ESS solution allows up to 63 ESS (backup) servers at key locations throughout the enterprise which can be activated hierarchically. An ESS server is capable of taking over for the entire enterprise or, if needed, just a portion of the enterprise in the event that some type of outage has occurred.
• **Fifth Level - Redundant Announcement and queue music**

Avaya provides redundancy for Announcements and Queue Music, which not only increases the availability of these imperative functions, but is also designed so that in most instances these audio sources are played locally closest to where the call came into the network, making sure that valuable WAN resources are not consumed by streaming this audio over the WAN.
• **Sixth Level - Proactive Active WAN Traffic Monitor/Redirect**

Customer can take advantage of the proactive monitoring and redirection capabilities of Avaya Converged Network Analyzer (CNA) with Adaptive Path Control (APC) to get sub-second failover when WAN failures or brownouts occur. CNA monitors application performance, WAN connectivity (packet loss, jitter, and delay), bandwidth utilization, etc., and can "rescue" specific applications (not only limited to VoIP), certain hosts, or entire sites as needed.
• **Seventh Level - Local Survivable Processors (ESS, LSP, SLS)**

Avaya provides local processing capabilities to protect against WAN outages. Local processing can be offered in two variations – full feature for all models of gateways (Enterprise Survivable Server and Local Survivable Processor) and basic survivability (Standard Local Survivability) for the small location gateways.
Avaya's commitment to user experience

- **Intelligent access to intelligent communications**
- One experience, simple and practical for the task at hand
- Driving personal productivity and competitive advantage
- Meeting the different needs of different people across many devices and interfaces

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**Avaya one-X™ family members**

- **one-X Mobile Edition**  |  Soft client on mobile phones (e.g. Nokia)
- **one-X Desktop Edition**  |  Integrated Softphone on PCs
- **one-X Quick Edition**    |  Peer-to-peer solution for small <20 person offices
- **one-X Deskphone Edition** |  Next gen IP Phone - context sensitive UI, high fidelity audio
Changeable faceplates that can be matched to your Corporate personality
9610 – Walkup Profile Use

• Designed for use in a lobby or common area (no speakerphone, no headset interface) supports one line appearance
• Pixel based graphical backlit display
• Supports a WML application interface for Avaya and third party applications
• Wall mountable
• Class 2 PoE
9620 IP Phone - Casual Profile Use

- Backlit Display—3.45” diagonal ¼ VGA quality gray-scale pixel based with adjustable display angle
- Supports 12 Call Appearances or Administered features
- Three line appearance LEDs
- Full duplex speaker phone
- Wideband audio handset and headset interface
- Ethernet (10/100) line interface with secondary ethernet interface
- POE 802.af compliant class 2 device
- 1 USB, 1 Adapter, and 1 Module interface
- Contacts application (250 entry) with hard button
- Call log (100 entry) with hard button/LED for missed call indication
- H.323 protocol with future support for SIP
- Avaya’s Push API application interface—for phone applications
9630G – Essential Profile Use

Native Gigabit IP Telephone

• Same Features as the 9630 plus native gigabit for the Essential user’s co-located PC
• Supports the use of the SBM24 Button Module
• Class 2 PoE
9630 IP Telephone – Essential Profile Use

- Features
  - Wideband Hearing Aid Compatible Handset Supporting TTD Acoustic Coupler
  - Standards-Based Wideband Codec
  - Full Duplex Wideband Speaker Phone
  - Message Waiting Indicator
  - Four Contextual Softkeys
  - Four Way Navigation Cluster Button
  - Telephony Application (hard button)
  - 250 Entry Contacts Application (hard button)
  - 100 Entry Call Log Application (hard button with LED for Missed call indication)
  - Forward/Mobility Button
  - Avaya Menu Button (Browser, Options and Settings access)
  - Mute Button
  - Speaker Button
  - Volume Button
  - Message Button (LED)

- 3.8” Diagonal ¼ VGA Quality Gray-Scale Pixel Based Display
- Six Line Appearance Buttons with LEDs
- Adjustable Display Angle
- WML Application Interface
- Innovative Dual Position Flip Stand
- Wall Mountable
- 10/100/1000 Ethernet Line Interface with Secondary Ethernet Interface
- Two Adapter Interface
- One Module Interface
- Supports use of up to three 24 Button Module*
- One USB Interface
- PoE 802.af Compliant Class 2 Device
- Customizable Faceplate

*Requires Communication Manager Release 4.0
9640 - Essential Profile Use

Color Display
• Designed to meet the needs of an Administrative Assistant or Receptionist for improved call handling and call management

• Provides 11 one touch buttons for quick access to Communication Manager features or call appearances

• Supports 24 call appearance/CM features, standards-based full duplex wideband speakerphone, two adapter interfaces, headset interface and a WML Application interface

• Supports the use of the SBM24 Button Module

• PoE Class 2
9650 IP Telephone – Navigator Profile

Features

- Wideband Hearing Aid Compatible Handset Supporting TTD Acoustic Coupler
- Standards-Based Wideband Codec
- Full Duplex Wideband Speaker Phone
- Message Waiting Indicator
- Four Contextual Softkeys
- Four Way Navigation Cluster Button
- Eight Aux Buttons (CM Features/Call Appearances)
- One Aux Shift button
- Telephony Application (hard button)
- 250 Entry Contacts Application (hard button)
- 100 Entry Call Log Application (hard button with LED for Missed call indication)
- Avaya Menu Button (Browser, Options and Settings access)
- Mute Button

- Volume Button
- Message Button (LED)
- 3.8” Diagonal ¼ VGA Quality Gray-Scale Pixel Based Display
- One Appearance Buttons with LEDs
- Adjustable Display Angle
- WML Application Interface
- Innovative Dual Position Flip Stand
- Wall Mountable
- 10/100/1000 Ethernet Line Interface with Secondary Ethernet Interface
- Two Adapter Interface
- One Module Interface
- Supports use of up to three 24 Button Module*
- One USB Interface
- PoE 802.af Compliant Class 2 Device (Aux power available)
- Customizable Faceplate

*Requires Communication Manager Release 4.0
Unique High-Fidelity Audio Quality

- IP telephony should sound better than traditional telephony!
- Acoustically engineered: handset, phone body, speakerphone
- Standard G722 wideband codec available on all phones
- Latest VoIP chip technology
- Avaya Labs audio design expertise

More productive communication and collaboration

- Natural realistic sound
- Greater clarity, less background noise
- Easier to hear people
- Understand speech nuances, accents, languages
- Less user fatigue and stress
VPNremote for 4600 Series IP phones

• **What is it?**
  - VPN Software enhancement within Avaya IP telephones
  - Allows IP phones to be deployed remotely (such as in the home) via any available broadband internet connection.
  - Works with Avaya VPN Gateways, Cisco (500 and 3000) and Juniper (Netscreen, 500 and ISG) gateways

• **Who will use it?**
  - Virtual office / Teleworkers
  - Home contact center agents
  - Temporary deployments / disaster recovery scenarios

• **Why?**
  - Superior telephone experience – versus any Windows laptop and IP Softphone
  - Ease of use
  - Easier for IT depts. to configure, deploy and support ongoing
Delivering Applications to IP Endpoints
Avaya Phone Application Suite

- Packaged Applications
  - Network Directory
  - Click-to-Call using Smart Agent
  - Broadcast Alerts
  - Text Messaging

- And Transformed Web Applications
  - Leverage existing applications
  - Convert with easy to use, “point-and-click” Design Studio
Network Directory

Corporate Directory (10’s of thousands of entries) Access – from the IP phone

- Single keystroke per letter
- LDAP integration
- Predictive selection of possibilities
- Self-pruning of non-possibilities
- Extremely fast – saves users time
- Soft-dials the selected number
- Supported on the 4610, 4620, 4621, 4622 IP Telephones
- 4625 support – requires firmware patch
Broadcast Server

- Broadcast messages containing audio, text or any combination to screens and speakerphones of IP endpoints
  - Security, IT alerts, weather
  - Advertisements
Phone Applications Scenarios

Webcam Integration
Phone Applications Scenarios

Events, weather forecast
Phone Applications Scenarios

Ordering Products
Customer or Employee Surveys
Extension to Cellular

• Software Only Feature
• User administration of cell phone number
• Bridges Cell Phone to Avaya Desk Phone
  – Cellular standard independent
  – Simultaneous ringing of desk set and cell phone
  – 2 Call Appearances delivered
  – Programmable status button (on/off/delayed)
  – Cellular Access to PBX features (Conf, Xfer, Call forward, international calling)
• One number on the Business Card and one voicemail box

Any Cell (GSM, CDMA, etc)
Easily Switch from Mobile Phone to Desk Phone and Back

**Issue:** Switching from Mobile Phone to Desk Phone and Vice Versa

**Current Situation**

To / from work

At the office

Hang up one, redial the other

1 foot away

So close yet normally so far away

**Solution**

Transition with a single button press

- Select bridged light appearance when coming into office
- Extend Call button when leaving office
Mobile Phone Cost Savings for the Office

**Issue:** Expensive Mobile Phone Usage in the Office

**Current Situation**

40-70% of cell phone usage occurs in the office…

…translating into larger expenses

**Solution**

Switch from cell to WiFi for cheapest network available

Dual mode GSM / 802.11 phones from Nokia
Avaya one-X™ Mobile Edition Solution Topology

- **Nokia phone functions as off-PBX bridged extension**
- **Nokia phone makes and receives calls through Avaya Communication Manager**

1. Kathy uses Avaya app to call Steve at Ext 22001
2. App connects to PBX
3. ACM simultaneously rings Steve’s desk phone & mobile
4. Steve answers on mobile phone
5. Steve walks into office and continues call on desk phone

- Nokia phone functions as off-PBX bridged extension
- Nokia phone makes and receives calls through Avaya Communication Manager
PBX features accessible from any cell phone

- Active appearance select
- Automatic call back
- Automatic call back cancel
- Call forwarding all
- Call forwarding busy/no answer
- Call forwarding deactivation
- Call park
- Call unpark
- Call pick-up group
- Call pick-up directed
- Call pick-up extended group
- Calling party number block
- Calling party number unblock
- Conference on answer
- Drop Last Added Party
- Exclusion
- Extend call off-PBX enable
- Extend call off-PBX disable
- Held appearance select
- Idle appearance select
- Last number dialed
- Malicious call trace activation
- Malicious call trace deactivation
- Priority call
- Send all calls enable
- Send all calls disable
- Transfer on hang up
- Transfer to voice mail
- Whisper page
IP Soft Phone Mobility

PSTN

IP with QoS

Control + VoIP Audio

IP DATA

IP without QoS

Voice

Control

Road Warrior Mode

Telecommuter Mode
Desktop Video Telephony

• Video as Simple as Phone Call
• Solution Integration
  – Avaya Comm. Manager
  – IP Softphone
  – Polycom ViaVideo
• TV-quality video
• Integrated Software Client
Securing Enterprise Communications

- No Direct ROOT access
- Partition/NOEXEC Hard Drives
- DoS Protection
- Network Region & Segmentation Support
- Authenticated Downloads
- Adjunct Security and Hardening
- Separate Physical Interfaces for VoIP, Admin, and Control
- IP Tables FW
- No mail server or web browser
- Minimal network services
- No file sharing
- Integrated Branch Office VPN Support
- Encrypted Control Channels (IPSI, H.248)
- Encrypted Media and Signaling (H.323, SIP)
- SSH and HTTPS
- VLAN Support
- minimal network services
- no file sharing
- integrated branch office VPN support
- encrypted control channels (IPSI, H.248)
- encrypted media and signaling (H.323, SIP)