

The road to next generation public networking begins with addressing the current public switched telephone network (PSTN). Although designed to carry voice traffic, the PSTN is now carrying an increasing percentage of traffic generated by dialup users. While the average voice call lasts five minutes, the average dial data call lasts forty minutes.

As data transmission continues to increase, the strain on the PSTN will only intensify. Simply put, more capacity is needed. The ideal solution is to offload this data to a Remote Access Server (RAS) as soon as possible to avoid unnecessary overloading of voice switches. This requires an SS7 gateway that can terminate signaling messages so data can be sent to the appropriate RAS. Voice switches can perform this



Offloading
Data from
the PSTN

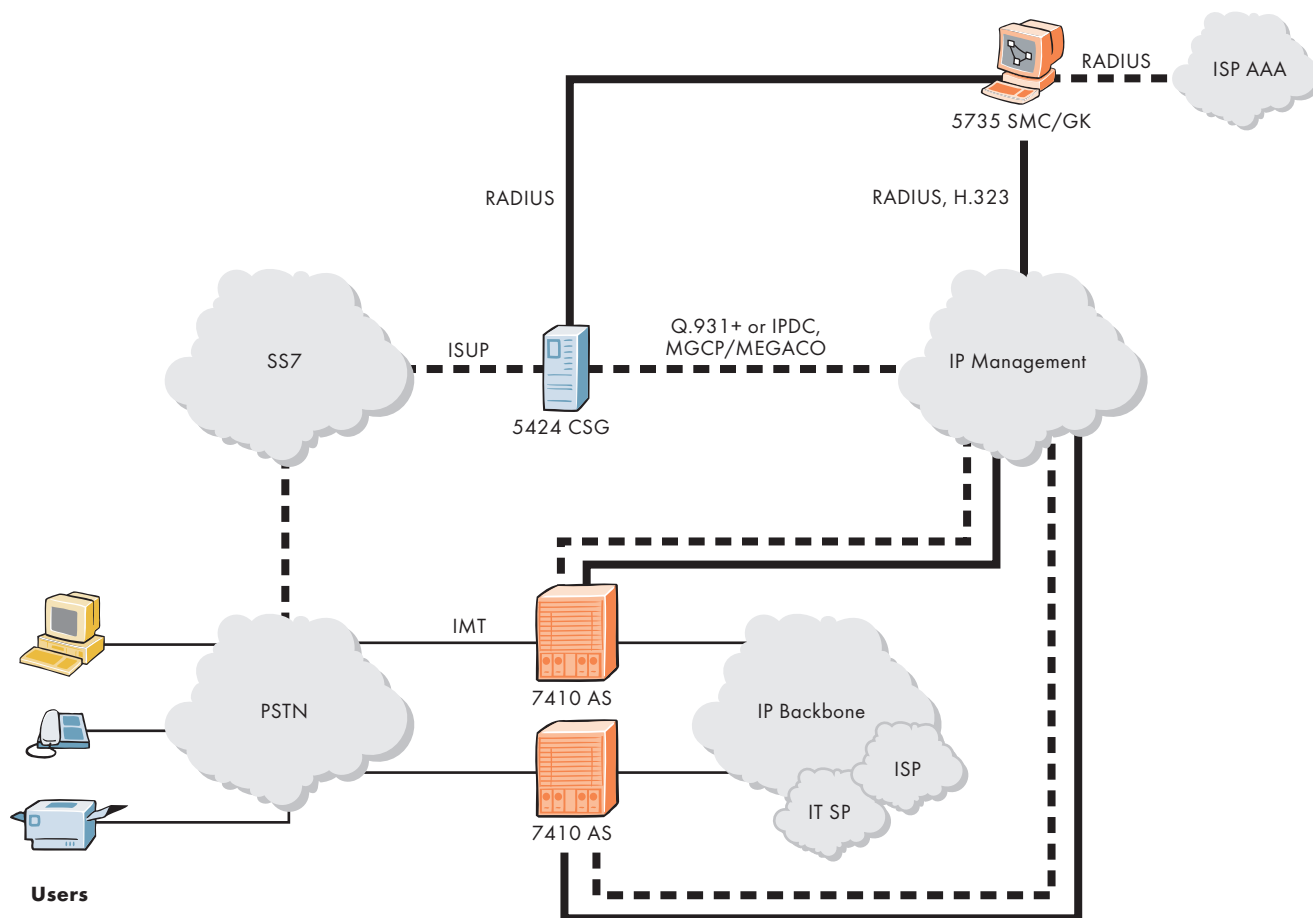


gateway function, but they are optimized (and priced) for voice traffic – not for the offloading of data. Alcatel has developed an efficient SS7 gateway solution that enables service providers to route data calls directly to a data network, freeing up the voice network for voice traffic. It's all part of the voice-data convergence solutions from Alcatel: Architects of an Internet World.

The Alcatel 5424 Call Signaling Gateway (CSG) is a carrier-class signaling server that builds a bridge between PSTN and IP networks. When combined with the Alcatel 7410 Access Server (AS), the solution offers service providers true integration between IP networks and traditional circuit-switched TDM networks. By using the SS7 and IP network capabilities, the 5424 CSG offloads data traffic from voice switches and routes calls directly to a data network, optimizing the use of the voice infrastructure and thereby dramatically increasing the PSTN's efficiency.

Features

- ▼ Allows service providers to offload data traffic from the PSTN
- ▼ Allows CLECs to separate incoming voice and IP traffic before it reaches the core of the PSTN
- ▼ Ensures nonstop operation through a distributed architecture, allowing the addition of processors, links and applications "on-the-fly"
- ▼ Delivers fully scalable capabilities; can support thousands of signaling links on a single platform
- ▼ Enables advanced signaling services such as call grooming and pre-authentication
- ▼ Supports multiple applications and signaling protocols, enabling interoperability with industry-wide remote access servers



Reduce congestion to achieve optimal service

The growth in Internet traffic over the PSTN has created a significant challenge for service providers: data and voice calls competing for the same resources are creating congestion. Alcatel's 5424 Call Signaling Gateway eases this congestion through the use of the SS7 infrastructure. The CSG terminates SS7 signaling links, assigns a port on the 7410 AS to set up the physical connection, then performs the necessary processing and signaling to establish a circuit between the local exchange switch and the RAS. The Internet call is offloaded from the PSTN to the data network, thus easing congestion and enabling carriers to optimize delivery of their network services.

Cost-saving solution for ILECs, CLECs and their ISP customers

The biggest expense for an ISP is T1/E1 PRI access, which must be purchased from a carrier. For their part, carriers such as ILECs and CLECs must invest in costly switch upgrades, which require the installation of PRI cards. The Alcatel 5424 CSG eliminates the need to transport data over PRI lines by using less costly inter machine trunks (IMTs) to terminate data calls.

CLECs that have both voice and dialup networks face an additional problem – the inefficient use of voice switches to split voice and Internet traffic. The Alcatel 5424 CSG solves this problem by working in conjunction with the Alcatel 7410 AS. By placing the 7410 AS at the earliest point in the PSTN (in front of the first switch) CLECs can free up to two ports for all Internet calls. The existing PSTN switch now has plenty of room for growing voice revenue.

Fully redundant and scalable system

The 5424 CSG ensures nonstop operation through a fully resilient and high availability architecture. The CSG is built on a Compaq platform, which supports both hot standby and load-sharing modes. Design upgrades and maintenance activities can occur with no service interruptions. Other design highlights include clustering, memory channel and RAID technologies.

Advanced signaling services

The 5424 CSG's use of the SS7 network allows carriers to flexibly integrate signaling services with PSTN-based network routing functions. The CSG's signaling support includes call grooming, pre-authentication, and quality of access (QoA). With call grooming, the CSG interfaces with the PSTN on behalf of the media gateways (MGs) by controlling the incoming call and identifying the required resources for the call's logical termination points. The pre-authentication function provides greater efficiency during call setup by rejecting calls before a connection is established with the MGs. QoA rounds out the 5424 CSG's advanced signaling services by allowing ISPs and CLECs in the wholesale business to assign different priorities to their customer base.

Simplified management

The 5424 CSG can provide real time statistics such as call duration, total number of rejected or accepted calls, and total number of inbound or outbound calls. The CSG also stores call detail records (CDRs). Support for SNMP allows trap and alarm information to be sent to the CSG's management agent. The 5424 CSG can be configured through a Windows-based central agent to enable easy provisioning, monitoring and troubleshooting. More complex activities can be configured through a command line interface.

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Technical Summary

Platform Redundancy

- ▼ Distributed SS7 configuration supports:
 - Link termination over multiple FEPs
 - Application load over multiple BEPs
- ▼ IP interface used to communicate to any RAN within the network to ensure availability of resources
- ▼ Hardware:
 - N+1 Redundancy on FEPs
 - 1+1 Redundancy on BEPs
- ▼ Software: Application synchronization and failover between BEPs

Billing Records

- ▼ Generates files in intermediate record format based on number of records and/or period
- ▼ Billing records stored on a RAID system for availability
- ▼ Conversion module provides CDR format conversion, merging and sequencing
- ▼ CDR management function provides spooling for delivery and backup services

Monitoring Capabilities

- ▼ Supports SNMP alarm and event traps
- ▼ Provides read-only MIBs that provide entity states and statistical counters
- ▼ Uses logging and SYSLOG to track alarms and events, and to provide debugging

SS7 Interface Capabilities

- ▼ Support for four SS7 interface cards per server
- ▼ V.35 PCI module (four ports per card)
- ▼ T1 PCI module: (one port per card)
 - Supports up to 24 channelized links
- ▼ E1 PCI module:
 - Supports up to 32 channelized links

SS7 Connectivity

- ▼ System capabilities:
 - 128 point codes
 - 2,048 links
 - 256 to 999 (combined) link sets
 - 256 to 999 adjacent PCs
 - 4,096 routes
- ▼ FEP capabilities:
 - 3 or 4 x V.35
 - 3 or 4 x 1 x T1
 - 3 or 4 x 1 x E1
- ▼ Managed circuits
- ▼ System capabilities:
 - 255 to 2,048 trunk groups
 - 200,000 circuits
 - 400 RANs
- ▼ Per trunk group:
 - 128 E1 (ITU)
 - 682 T1 (ANSI)

Platform

- ▼ Compaq Alpha Server

Operating Environment

- ▼ 10° to 35° C (50° to 95° F)
- ▼ 20% to 80% relative humidity

Product Safety

- ▼ UL: Listed to UL1950 (3rd edition)
- ▼ CSA: Certified to CAN/CSA-C22.2 No. 950-M95
- ▼ TUV: EN 60950/A4: 1997
- ▼ VDE 0805 GS marked
- ▼ FCC: Part 15.B Class A
- ▼ CE: EN55022, EN50082 VCCI Class II ITE
- ▼ BCIQ: CISPR 22, CNS13438
- ▼ C-Tick: CISPR 22, AS/NZS 3548

Reviewed to:

- ▼ AS/NZ 3260: 1993
- ▼ Australia/New Zealand Standard
- ▼ EN 60950/A4: 1997
- ▼ European Norm IEC 950 (2nd edition, 3rd amend)

Power Consumption

- ▼ Power supplies are universal, PFC, auto ranging, 100/240 V AC
- ▼ Two 375-watt hot plug power supplies, standard; optional third N+1 for redundancy



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