



IP Telephony and the Contact Center

Does it make good business sense to operate your mission-critical Contact Center on IP based technologies?

This paper explores the business benefits and operational models where unique Avaya contact center solutions are deployed on IP based networks for immediate and compelling financial return.

White Paper

Global Strategic Solutions Team

Avaya Inc.

September 2004

Issue 2



Table of Contents

Section 1: Overview	1
Section 2: Basic Components in an Avaya IP Contact Center	2
Section 3: Voice Server Consolidation	3
Section 4: “Virtual” Site Consolidation	8
Section 4.1: Virtual Operations and the Branch Office.	10
Section 5: Enterprise Resource Optimization	11
Section 6: Contact Center Globalization	13
Section 6.1: Option #1 — IP Endpoints	14
Section 6.2: Option #2 — Remote Gateways	15
Section 6.3: Option #3 — Peer-to-Peer	16
Section 7: The Total Business Case for IP Contact Centers	20
Section 8: Conclusion	20



Section 1: Overview

Over the past three years, there has been an explosion in the amount of information available on Voice over IP (VoIP) and IP (Internet Protocol) Telephony. This information has largely been focused on answering the questions “What is VoIP and IP telephony?” and “How does VoIP and IP Telephony work?” As potential users of the technology have become more comfortable with the answers to those two infrastructure related questions, the key question now becomes “Why should I use VoIP and IP Telephony?” The purpose of this paper is to answer the more specific question, “Why should I use VoIP and IP telephony in the contact center?”

This paper assumes that the reader has some fundamental understanding of VoIP and IP Telephony technology basics. For the purpose of this discussion, VoIP is the transmission of voice conversations over an IP based data network and represents an alternative transport method to the more traditional Time Division Multiplexing (TDM) or circuit switching. IP Telephony is the collective set of software based voice applications that transport voice via VoIP.

Avaya offers unique and compelling applications of IP Telephony in the contact center. The compelling value of IP Telephony is not just about creating converged networks, toll (long-distance) call avoidance, and simpler Moves, Adds, and Changes (MACs). The significant business value is in a continuum of contact center solutions that include:

- **Voice Server Consolidation** reduces capital expenditures by 30-35% and ongoing maintenance and support by 12-15% by radically reducing application and application infrastructure complexity¹. This reduction in complexity makes the contact center more agile when responding to changes in the competitive landscape.
- **Virtual Site Consolidation** increases staffing efficiencies in the range of 3-8% by pooling agent resources across the enterprise¹.
- **Enterprise Resource Optimization** cuts staffing costs by 3-9%, helps grow revenue, or increases customer loyalty by connecting the right agent to the right caller at the right time¹.
- **Contact Center Globalization** delivers operating cost reductions of approximately 30% by staffing the contact centers with high quality, low turnover, college-educated agents from developing economies¹.

All of these solutions cost justify themselves in standalone implementations. However, the true power to alter business fundamentals is unleashed when these solutions are deployed in combination across the solution continuum. Avaya IP contact centers exhibit the following technological differentiators:

¹ Results are highly dependent on individual operating environments. Obviously, different implementation methodologies, processes, and objectives may contribute to lower or higher results.



- Massive scalability
- Granular reporting detail
- Higher throughput from increased agent occupancy
- Dynamic resizing of agent pools to meet service levels
- Matching the right caller to the right agent at the right cost
- Equitable distribution of work across the enterprise
- Global deployments
- The ability to deploy in 100% IP, 100% circuit switched, or any mix of IP and circuit switched environments

Before examining each of these solutions and technology areas in detail, let's look at some fundamental components in an Avaya IP contact center.

Section 2: Basic Components in an Avaya IP Contact Center

The fundamental components in an Avaya based IP Contact Center include Avaya Communication Manager Software, Avaya Media Servers, Avaya Media Gateways, and Endpoints. These components are also requirements in other IP-based communications applications such as call coverage, call forwarding and messaging for administrative knowledge workers.

- **Avaya Communication Manager Software** provides the core intelligence of the contact center system. It also provides the administrative PBX capabilities — including roughly 700 distinct features — as standard in the same globally available software. The application includes conditional routing (Vectoring), skills based routing (Expert Agent Selection), agent work states (Login, Logout, After Call Work, and Auxiliary Work), advanced agent and work selection (Business Advocate/Dynamic Advocate), and Computer Telephony Integration Application Programming Interfaces such as ASAI (Applications Switch Adjunct Interface), as well as management of announcements, integrated prompting, and queue treatments. This communications software also provides the VoIP gatekeeper functions of registration, admission, and status.
- **Media Servers** execute the IP Telephony application software. Avaya offers a variety of server operating system options, including Windows 2000, Linux, and Unix. Hardware options include traditional telephony cards (DEFINITY®), internal blade servers (Avaya S8100 and Avaya S8300), and rack mounted Intel based servers (Avaya S8500 and Avaya S8700) to meet your unique business needs.



- **Media Gateways** convert circuit switched voice calls to IP media streams in a gateway. Avaya Gateways can be traditional Avaya DEFINITY® cabinets, or rack mounted data type devices such as the Avaya G350, Avaya G650 and Avaya G700 gateways. Gateways communicate with the media servers using the ITU H.248 standard.
- **Endpoints** are either IP based telephones or IP based softphones (PC based software telephony application). In remote agent applications, IP endpoints either work as standalone devices or in conjunction with a media gateway. Wireless IP phones as well as an IP based softphone for Windows CE based Pocket PCs are also options. All IP endpoints currently conform to the ITU H.323 standard; Session Initiation Protocol (SIP) is also supported. For more traditional deployments, circuit switched analog, digital, and ISDN -BRI telephones are also fully supported.

The four components listed above are used in all contact center implementations. Additional supporting applications typically include an Avaya Call Management System (CMS) for advanced contact center reporting, Avaya Interaction Center for Computer Telephony Integration (CTI) functionality (i.e. desktop telephony, screen pops, data directed routing) and multimedia routing (email, fax, text chat, and web collaboration), Avaya Predictive Dialing System (outbound contact), Avaya Interactive Response (IVR self service), as well as Avaya Quality Management (interaction recording and evaluation packages) and Avaya Workforce Management (forecasting and agent work scheduling) systems. Avaya Communication Manager software, media servers, gateways, and endpoints serve as the core building blocks in all Avaya IP contact center solutions. The following sections examine the typical drivers for Avaya IP contact center deployment: Voice Server Consolidation, Virtual Site Consolidation, Enterprise Resource Optimization, and Contact Center Globalization.

Section 3: Voice Server Consolidation

For a new multi-site contact center deployment, the ability for Avaya to consolidate voice servers may reduce capital expenditures in the range of 30-35% and lower ongoing support costs in the range of 12-15%. The biggest cost reductions provided by IP telephony come from simplifying the applications and application infrastructure. By comparison, the cost savings from operating a converged network are relatively minor. Through the 1990's and into the year 2000, Information Technology (IT) organizations struggled to keep up with the breakneck growth of their organizations. Many applications were deployed haphazardly and sub optimally in order to meet the immediate business needs of fast growing enterprises. In some cases, they were cobbled together during mergers or acquisitions, in other cases, the applications were rushed to become Y2K compliant. Since the global economic slowdown began in the spring of 2001, technical organizations



have undertaken the optimization of existing applications and application infrastructure to help reduce the total cost of ownership (TCO). One of the significant trends in this rework and optimization is server consolidation. In fact, over the past two years, server consolidation has ranked as one of the top five IT initiatives of the typical Fortune 500 firm. Consolidation of voice servers is part of that trend. In the contact center, voice servers include, but are not limited to, the combination of software and hardware in applications such as ACD/PBXs, Desktop and Network Routing based Computer Telephony Integration, Interactive Voice Response Units, Predictive Dialing Systems, Voice Mail Systems, Reporting Systems, Quality Management Systems, and Workforce Management Systems. VoIP enables the consolidation of voice servers in a multi-site contact center environment. By taking advantage of the ubiquity of low cost, high performance, IP based Wide Area Networks (WANs), applications are deployed with simplicity throughout the enterprise. The mantra of IP telephony might well be “Deploy Once, Extend Everywhere”.

The simpler application infrastructure enables the contact center IT support staff to react to changing business needs with increased speed and flexibility; cycle times for mass system administration changes now take hours instead of weeks. As a result, the contact center is now more agile and opportunistic, and an asset instead of a hindrance when executing on strategic intent. The following sections illustrate the benefits of voice server consolidation with an example.

Problem

An enterprise with five contact centers is operating each location independently. Each location has its own contact center management and technology management team. At each site, there is a physical installation of an Automatic Call Distributor/Private Branch Exchange (ACD/PBX) Server, Reporting Server, Quality Management (call recording and evaluation application), Workforce Management System (WFMS), Desktop Computer Telephony Integration (CTI), Interactive Voice Response (IVR) system with a standalone Speech server, and a Voice Mail system. These applications are coming off of their existing leases, and management wants to evaluate new technology alternatives. This deployment is depicted in Diagram 1.

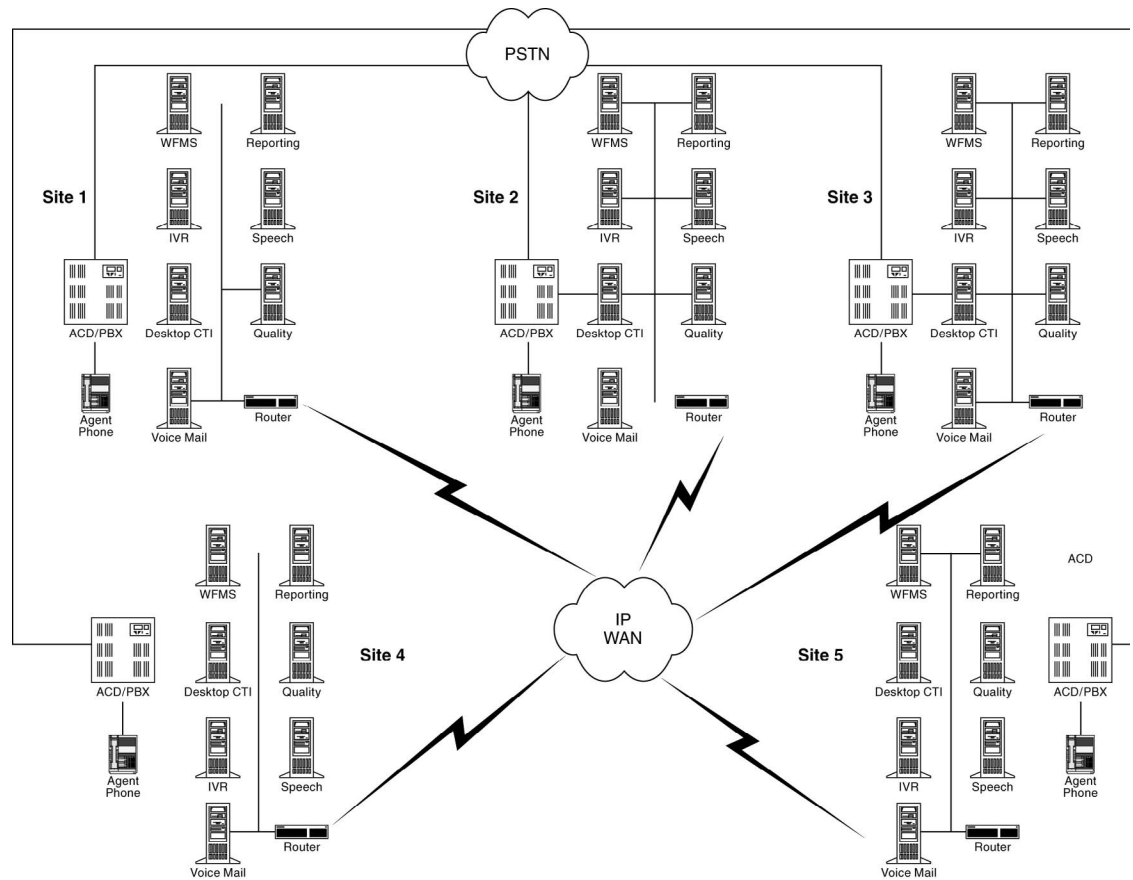


Diagram 1: Traditional TDM based multi-site contact center deployment

Management realizes that the existing operating and technology model has some serious server redundancy and operating inefficiencies. The redundant investments include:

- Software applications
- Hardware servers
- Supporting software (operating systems, database management systems, Web servers, etc)
- System interfaces between applications
- Data centers (physical security, cooling, power and fire suppression systems) Redundant service activities at each server location include:
 - Installation
 - System integration
 - Configuration
 - Administration
 - Maintenance



Because of the numerous sites, it was very easy for each location to be on different software loads, patches, and security fixes. These system inconsistencies led to functional, process, and operational defects, which in turn led to devaluing of the corporate brand and customer defections. The complexity of the infrastructure required three weeks of lead-time to make relatively simple changes such as adding a toll free number, or adding a skill group. Each location needed its own highly qualified support staff to keep the infrastructure running at peak performance. Finally, the ability to plan and execute on a business continuity plan was limited by the lack of per site consistency.

Solution

Avaya Communication Manager helped to alleviate the infrastructure redundancies and operating inefficiencies by enabling a contact center utility. This utility is very similar in concept to the Application Service Provider (ASP) model. Once a single instance of Avaya applications are deployed, the ubiquity of IP based Wide Area Networks (WANs) extend the contact center functionality to any location, whether across town or across the globe. This simplified infrastructure lets the support staff make enterprise wide system changes in minutes as opposed to weeks. More importantly, this consolidation effort makes it easier to ensure that consistent service is delivered. The contact center now gets extended through remote IP telephones (physical telephone sets or PC based softphones), remote gateways, or a combination of both. Remote IP phones fit nicely with branch offices, small offices, home office workers, and telecommuters, while the remote gateway options work in scenarios where remote public switched telephone system (PSTN) access is desired (for local presence as well as diversified access). In an Avaya IP contact center, these remote gateways can become standalone voice servers in the event of WAN failure. This model concentrates the application infrastructure and a vast majority of the support staff in a single corporate data center location. For our five-site example, these concepts are illustrated in Diagram 2.

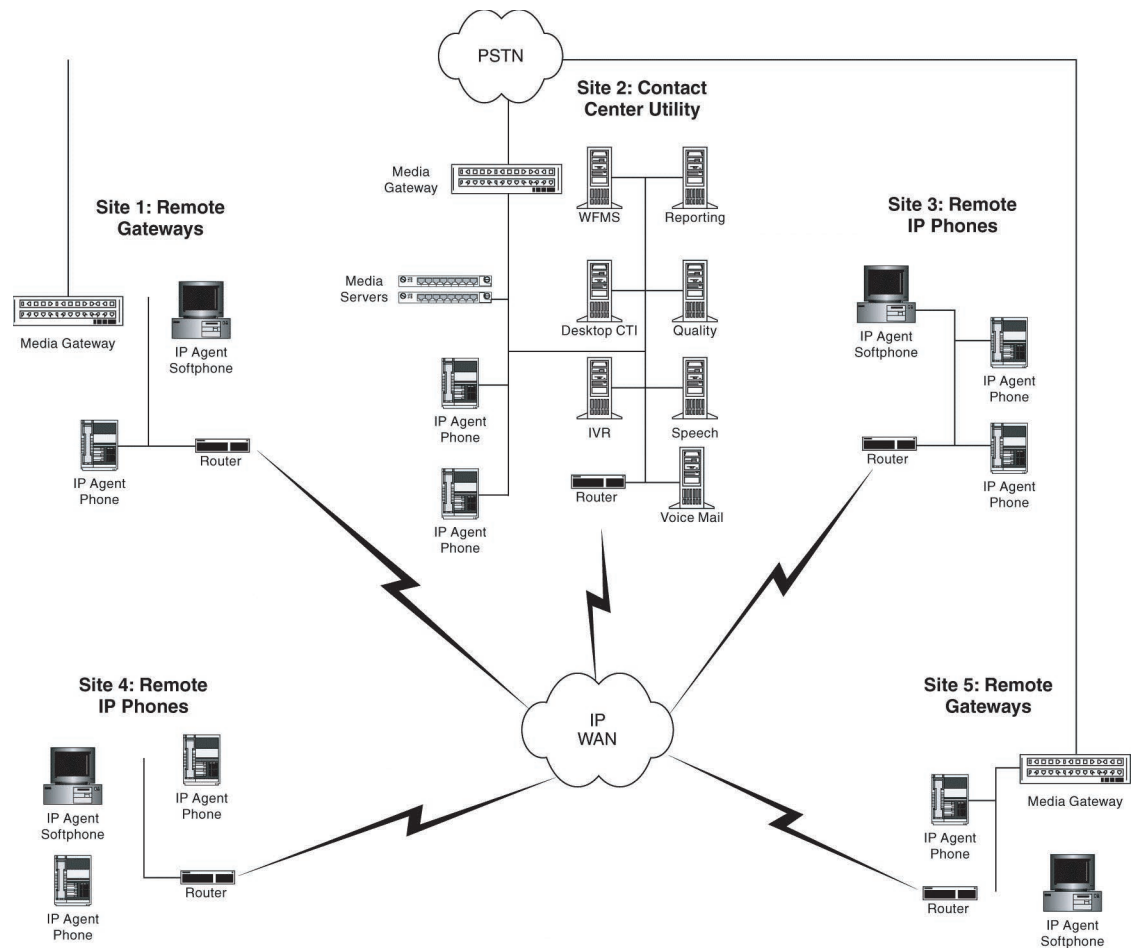


Diagram 2: IP based multi-site contact center: "Deploy Once — Extend Everywhere"

From a *technology management perspective*, the primary value of IP telephony comes from consolidating the application infrastructure, centralizing contact center application support staff, and simplifying the geographic reach of application logic in multi-site environments. Comparatively, the benefits from managing a converged network could be relatively small.

A unique Avaya differentiator is the ability to operate an IP based contact center at massive scale with consolidated voice servers. As proof points, Avaya is currently supporting global contact center deployments where more than 2,000 agents are operating on a single instance of Avaya Communication Manager software. A single Avaya S8700 Media Server has the ability to support 5,200 active agents.

Voice server consolidation is not about just replacing a lot of small PBXs or ACDs with larger PBXs or ACDs. Server consolidation is about:



- Serving customers better
- Capturing market share
- Increasing revenue
- Reducing costs

Most importantly, consolidation is about redesigning your network to establish a foundation for the rapid deployment of new strategic initiatives. Virtual site consolidation should be considered one of those strategic initiatives.

Section 4: “Virtual” Site Consolidation

The ability for Avaya to implement virtual site consolidation through IP contact center technologies may reduce agent staffing levels 4% to 8% for a given service level¹. In the past, the main enabler for contact center virtualization was a horrifically complex, very expensive, nearly unsupportable, Signaling System 7 (SS7) and Computer Telephony Integration (CTI) based carrier routing application. Because of the complexity, it is fairly common for firms to out-task this CTI alternative. Avaya Communication Manager significantly reduces this multi-site complexity through the extension of superior contact center logic over simple, low cost, and ubiquitous IP networks. With “virtual” site consolidation, contact center agents may work in any number of sites globally — including regional centers, branch offices, small offices, or home offices — and the entire agent population can be managed as a single talent pool by a single instance of Avaya Communication Manager software. A well-known fact of call center management is that a single large call center runs much more efficiently from a staffing perspective than several smaller centers — a very straightforward application of Erlanger C principles. For a given service level, a single pool of agents is more efficient than several smaller groups, and the larger the agent pool, the higher the agent occupancy level.

Continuing with our five-site example from the previous section, let’s assume that the same type of work is performed in each center. Approximately 500 calls per half hour are distributed to each center, the average talk time is four minutes, and after call work time is 45 seconds per call (thus making the average handle time equate to 285 seconds). In order to meet a service level of answering 90% of calls in 30 seconds, each standalone center needs 88 agents staffed during the thirty-minute period, and agents are occupied with work 90% of the time during that interval (from Erlanger C tables). A total of 440 total agents (88 agents x 5 sites) are needed to meet the service level set by senior management and expected by callers. If all five physical locations are managed as a single agent pool, the staffing situation improves significantly. With the same traffic levels and call handling assumptions, this enterprise now requires only 409 agents to meet



the same service level of 90% of calls answered in 30 seconds. The additional staffing efficiency comes from a higher level of agent occupancy: the pooled agents are occupied with work 97% of the time during the interval as compared with 90% occupancy with the 5 separately served contact. Assuming no reduction in call volume, the agent salary savings of 31 people is saved into perpetuity. The supporting technology resources also gain efficiencies with the single virtual center. Trunking, IVR system ports, and Quality Management system ports all show efficiency gains in the pooled center. Under the standalone scenario, 84 trunks are required for each individual center (derived from Erlanger B tables); a total of 420 trunks (84 x 5) are required to support the needs of the five-standalone centers. However, when pooled into a single virtual center, only 370 trunks are needed. The efficiencies from the pooling principal save the cost of 50 trunks into perpetuity. IVR and Quality Management system ports also show similar efficiency gains.

Management's ability to plan and adjust to changes in their operating environment also improves. By using the Avaya Call Management System (CMS), all contact center activities across all sites are collapsed into a single database application, giving consolidated views of call center performance with a wide variety of standard real-time, historical and integrated (combined real-time and historical) reports that can be easily customized. A contact center analyst no longer has to aggregate reports from multiple sites. A single infrastructure for routing and self-service applications also increases process consistency across sites. Avaya can implement site virtualization through a single instance of Avaya Communication Manager software. For extra large implementations, or for those organizations wanting to add an extra layer of operational resiliency, multiple instances can be implemented. Contact centers can be logically grouped, and then multi-site Best Service Routing (BSR) logic predictively balances the traffic load across the IP WAN. For our example, the five locations are broken into two logical groupings. Sites one through three operate in one logical grouping of voice servers, while sites four and five operate in a second logical grouping of voice servers. Best Service Routing balances the traffic between the two logical entities over the IP based WAN. In the event of a catastrophic building or system loss, agents can re-register to the surviving logical grouping. This arrangement is depicted in Diagram 3.

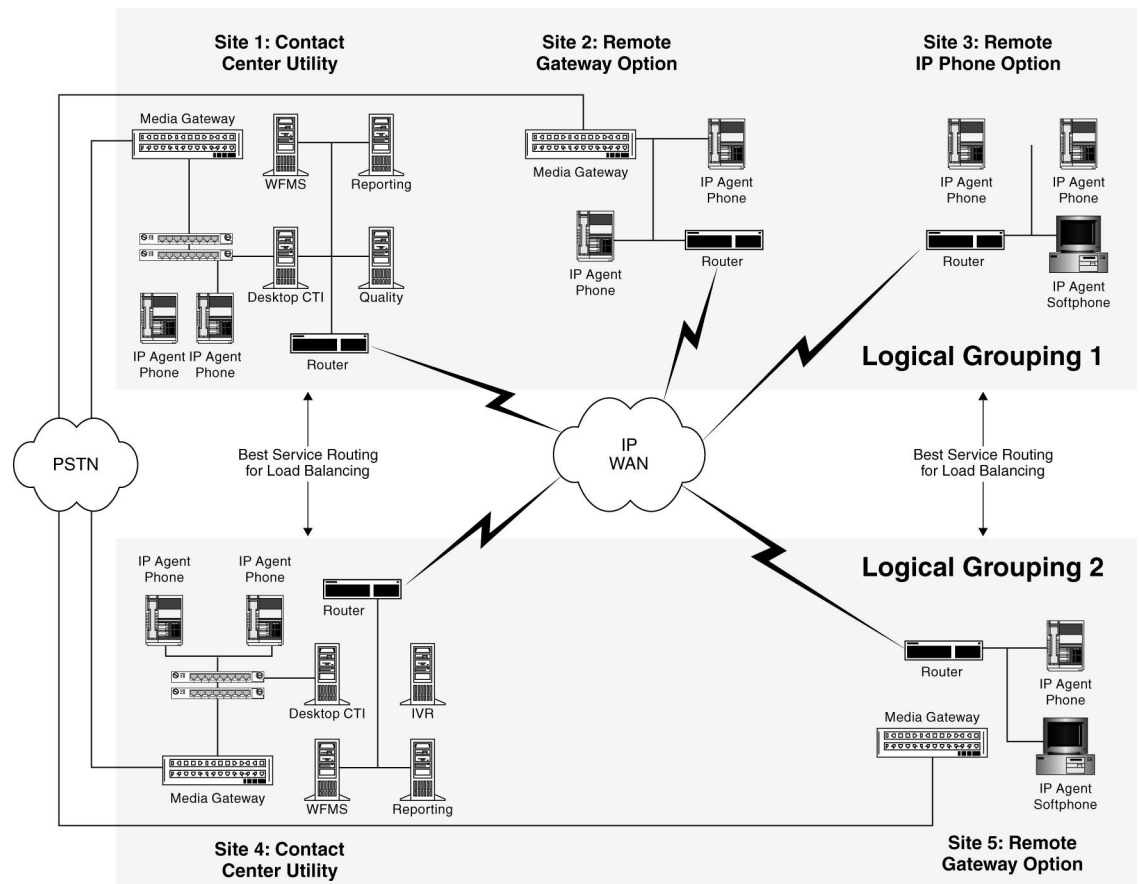


Diagram 3: Virtualization through IP Telephony

Section 4.1: Virtual Operations and the Branch Office

According to Cahner's In Stat, 53% of employees work from a branch or virtual office. In the U.S. alone, 32 million workers will work from branch locations by 2004, representing a 20% compound annual growth rate since 2001. The Avaya IP contact center enables the main corporate contact centers to tap into the branch workforce for temporary contact center work. Alternatively, the branch offices can tap into the main call centers for assistance during peak periods. Most enterprises operate in a model where the main corporate call centers tend to be busiest in the mid-morning and mid afternoon, while branch operations tend to be busiest with walk in traffic during early morning, noon, and late afternoon. The Avaya IP contact center can be implemented in a way so that the less busy operation backs up the other operation with temporary help during their busiest periods.

It is a well-known call center operational tenet that when a call center is under-performing, the addition of just a few additional resources can make a huge difference in service level attainment. For example, if a



call center has an average handle time of 200 seconds (3:20), receives 500 calls in a 30 minute interval, and has 57 people staffed, the addition of just four additional agent resources will raise call center performance from 32% of calls answered within 20 seconds to 80% of calls being answered within 20 seconds. Strategies can be made operational for using agent resources more collaboratively between branch operations and the main corporate or regional call centers. These back-up strategies can be implemented by day of week, time of day, and state of business of the call center. This collaboration between home offices and branch offices produce staffing savings that contributes immediately to improved profitability and service levels. Besides day-to-day operational efficiency, these collaborative staffing strategies can be used for business continuity due to building loss, epidemics, inclement weather, labor unrest, floods, earthquakes, or catastrophic systems loss. In the branch offices, local survivable media gateways support business continuity. In the event of a WAN failure, the local survivable processor provides full telephony support for the branch or remote office. Regardless of the collaboration on staffing, the Avaya IP contact center extends first class tools to branch operations. These tools include routing and work distribution, self-service applications, outbound contact, CTI, multimedia channel management, reporting, workforce management and quality tools. Customers expect a consistent experience regardless of the call answering point, and these extended tools foster consistency of call processes. The consistency of customer experience helps build brand equity, improve customer retention and raise customer satisfaction.

Section 5: Enterprise Resource Optimization

If an organization is looking to reduce costs, Avaya's unique approach to optimizing agent resources may result in an agent staff reduction of 3% to 9% while maintaining the same service levels. Alternatively, agent caller interactions may be optimized to increase sales or improve customer loyalty¹. Server consolidation and virtual site consolidation offer the compelling benefit of cost reduction. Those solutions help take cost out of a contact center by simplifying the technology infrastructure and improving staffing efficiencies through agent pooling. Those capabilities are largely enabled by layer two and three data networking capabilities: it is simply the extension of contact center logic and applications via a TCP/IP based Wide Area Network (WAN). Enterprise resource optimization adds a layer of uniquely Avaya business logic to the distributed IP contact center. This logic can further lower customer service costs, increase top line revenue growth, and increase the percentage of loyal customers. This unique Avaya logic serves the right caller (as determined by business value), to the right agent (as determined by skill and cost), over the right communication channel, and at the right time. Although there are a number of solutions currently in the marketplace making the promise to optimize contact center resources, few are focused in the critical area of work distribution. Others may claim similar functionality, but Avaya's unique business logic uses real



time events to make decisions proactively. Adjustments are made to dynamically resize the resource pool before a problem manifests itself and becomes critical. The other vendors are simply taking snapshots of historical data. This difference is critical to performance because in large scale contact center deployments, with hundreds of agents and hundreds of callers, the state of affairs can change drastically in a matter of seconds: bursts of callers arrive randomly, and agents become available randomly within seconds. A burst of call arrivals, or an agent shift change will cause problems in service delivery thirty seconds into the future — unless the problem is addressed immediately. Avaya Business Advocate software, based on patented work distribution concepts developed initially by Bell Labs and refined over the years by Avaya Labs, proactively manages this randomness to optimize outcomes. The business benefits of this distributed optimization logic may include:

- **Lowering customer-servicing costs:** “Just in time” work allocation increases agent occupancy and recaptures idle time resulting in lower staffing requirements. Supervisors spend more time mentoring and coaching agents, instead of reacting to work-resource imbalances and there is a reduction in both over servicing and under servicing. In one application for a large wireless service provider, the efficiency gains translated into a 9% agent reduction¹.
- **Increase top line revenue growth:** An expert execution of match rate connects top tier customers with the highest skilled sales associates. Agents most adept at customer retention connect with the most “at risk” customers — and reducing the churn rate drives profitability by reducing new customer acquisition costs. For a specialty retailer, the increase in match rate between best customer and best skilled agent resources resulted in an average order size increase of 35%.
- **Enhance customer loyalty:** Consistently delivers positive experiences through lower wait times. The connection to the right resource the first time enables execution of a common “branded” experience — regardless of where the call gets answered. For a large vehicle maintenance organization, this resulted in a 61% improvement in average speed of answer and a decrease in caller abandons of 53%.

The advanced operating characteristics of an Avaya IP contact center are:

- Service level objectives are consistently met by proactively and dynamically resizing the agent pools.
- Higher utilization of agent resources by recapturing agent idle time.
- Match rates improve by more consistently connecting the right customer to the right agent.
- Contacts are equitably distributed across the enterprise, eliminating the “hot seat” found in multiskilled contact centers.
- Quality improves by dramatically reducing the number of interactions handled by back-up (less skilled) agents.



Avaya is uniquely positioned to provide significant financial benefit by reducing overall staffing requirements, executing against service level, and reducing the variance in agent utilization. This benefit builds upon the benefits garnered from server consolidation and virtual site consolidation.

Section 6: Contact Center Globalization

By globalizing contact center operations into developing markets, enterprises may maintain or increase contact center quality, while reducing operating expenses by 30%¹. Contact center managers are under extreme pressure to add agent headcount. Some of the reasons include:

- Increasingly complex and longer interactions
- Diminishing returns to self service applications, such as IVR and the web
- New customer communications media channels such as e-mail, chat, and web collaboration
- 7 x 24 operating models are fast becoming the norm
- Customer base is increasingly global
- Additional sites for business continuity

These requirements are driving the need for high quality, educated, skilled and retainable talent. At the same time, senior managers are pressuring call center managers to increase service with no increase in cost. Developing markets can help supply the workforce while offering a 30% operating cost reduction. The shift to globalization of contact center work is following migrations similar to textiles in the 70s, electronics in the 80s, and IT services in the 90s.

Contact center work is shifting from the United States, Western Europe and Japan to developing call center markets in India, Philippines, Africa, China, the Caribbean, Latin America, and South America. For companies wanting to minimize some of the operational and geopolitical risks of developing markets, there are near shore hedge strategies. For example, Canada and Ireland are near shore options for companies operating in the U.S., while Australia, New Zealand, and Eastern Europe offer near shore opportunities for companies operating in Western Europe. These near-shore options do not typically offer all of the wage advantages of developing markets, but they do help lower risk in a diversified global portfolio of call center locations. Typically, the near shore options offer a 10% operating cost advantage as compared to the developing markets advantage of 30%. With the portfolio approach to globalization, a company might move 40% of positions to a developing market, 30 % to a near shore country, and the remaining 30% are kept in country. To address the financial risks, there are a variety of business models that support contact center globalization, including



wholly owned subsidiaries, outsourcing arrangements, or joint venture operations. Avaya IP contact center technologies enable global contact center operations while removing substantial amounts of technology risk. Avaya uniquely reduces the technology risk because of vast global expertise:

- Avaya is a worldwide leader in customer call center systems.
- In the U.S., Avaya dominates the market with 71% of contact centers with 400 or more active agents².
- Avaya is No. 1 in contact center market share in Europe, India, China, Latin America and the Philippines².

Today Avaya has three Avaya IP contact center technology models support offshore operating models: IP endpoints, Remote Gateways, and Peer-to-Peer Networking.

Section 6.1: Option #1 — IP Endpoints

This solution option provides centralized contact center functionality. The applications stay in the home country, while IP phones or softphones are deployed in the remote countries. This option follows the Contact Center Utility or Application Service Provider (ASP) model very closely. Agents login remotely to the contact center applications, and they can provide service from anywhere in the world. All applications, call control and signaling is provided from the home country media and application servers. The call is only routed from the home country to the remote destination after the caller and call purpose is identified (through unique DNIS (Dialed Number Identification Service) digits, CTI, prompted digits, etc.) and an agent becomes available. The home country contact center infrastructure provides call aggregation, self-service applications, caller identification, and call purpose. In addition, the home country furnishes all queuing, queue treatment, call selection, and agent selection functions. At the remote country location, the only installation setup is for IP telephones and/or IP soft-phones. This option offers the advantages of:

- Lowest cost per seat
- Minimal infrastructure investment offshore
- Simplified contact center reporting — no need for consolidating reports
- Fast deployment of remote locations — very helpful in piloting services
- Very easy set-up for offshore agents providing extended hours of operation
- Centralized adjunct applications, such as reporting, self-service, quality management, CTI, and workforce management
- Minimal support resources at remote sites

² Based on Frost & Sullivan and Gartner estimates.



Potential disadvantages of this approach include:

- 100% dependent on WAN performance and uptime

This solution is depicted in Diagram 4.

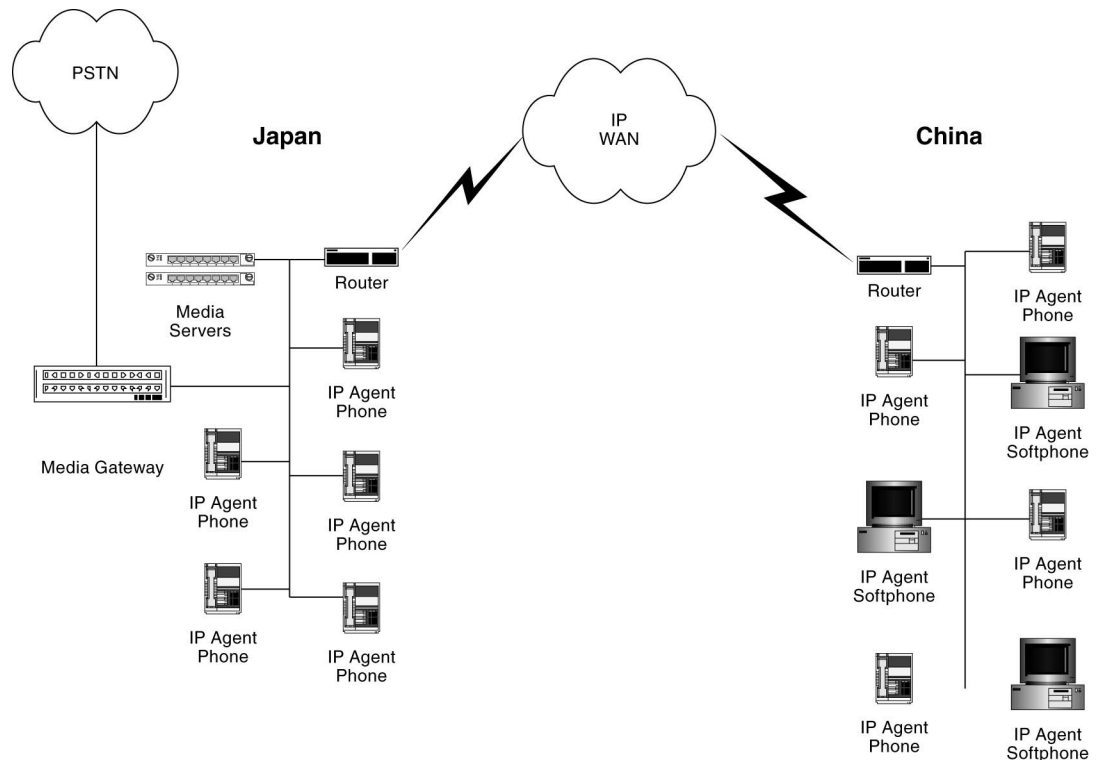


Diagram 4: IP End Points

Section 6.2: Option #2 — Remote Gateways

With this option, call processing logic and adjunct applications are centralized in the home country. In country and out of country PSTN trunks directly connect to the media gateways in the remote locations. This adds an additional layer of operating resiliency, as there are now multiple transmission paths on multiple networks connecting to remote agent resources. This configuration also offers optional Local Spare Processor capabilities, allowing operations to continue if there is a loss of gateway to media server communication. When using IP facilities, the call is routed from the home country to the remote destination after the caller and call purpose is identified (through unique DNIS digits, CTI, prompted digits, etc.) and an agent becomes available. The home country contact center performs call aggregation, self-service applications, caller identification, call purpose, as well as all queuing, queue treatment, call selection, and agent selection functions. When using circuit switched facilities, the caller queues on the remote gateway. As an option, a compression multiplexer may be used to gain additional throughput.



Advantages of this implementation model include:

- Relatively low cost option
- Simplified contact center reporting—no need for consolidating reports
- Calls can be sent directly from the home country Public Switched Telephony Network (PSTN) and local country PSTN to the remote gateways—adding to operational flexibility and resiliency
- Local Survivability Potential disadvantages to this model include:
- Adds a layer of network and application infrastructure complexity

This solution is depicted in Diagram 5.

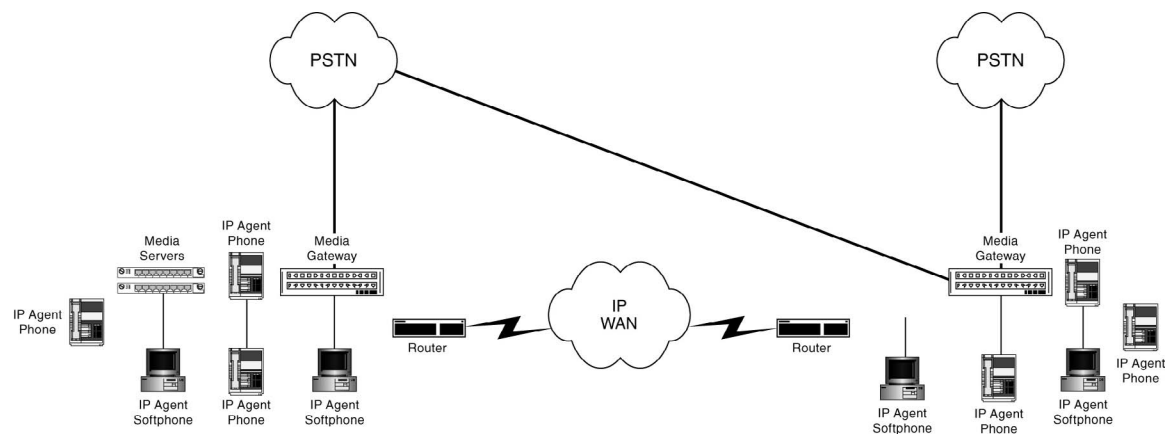


Diagram 5: Remote Media Gateways

Section 6.3: Option #3 — Peer-to-Peer

With this option, call processing is distributed globally to each contact center location. A set of media servers and media gateways are located at each remote location. With this technology model, the home country application infrastructure provides identification of the caller and the call purpose (through unique DNIS digits, CTI, prompted digits, etc.). After the identification, intelligent polling is applied to make the best decision in real time. If there is an agent surplus, the most qualified agent among all distributed centers is selected. Conversely, if there is a global call surplus (calls are queued), the call is routed to the center with the shortest expected wait time. The home country contact center performs call aggregation, self service, caller identification, and call purpose, while the remote location performs all queuing, queue treatment, call selection, and agent selection. Agents login to the remote contact center infrastructure.

Advantages of this implementation model include:



- Redundant, survivable call processing supports crucial business continuity.
- Massive scalability: supports tens of thousands of agents
- Calls can be processed directly from the home country PSTN and local country PSTN — adding to resiliency and operational flexibility
- Increased reliability because agent registration for services is reliant on LAN infrastructure — tends to be more reliable than WAN infrastructure

Potential disadvantages to this model include:

- Highest cost option
- Reporting needs to be consolidated across sites
- Regional support staff will most likely be required
- Most system administration intensive option
- System administration is required at each location

This topology is depicted in Diagram 6.

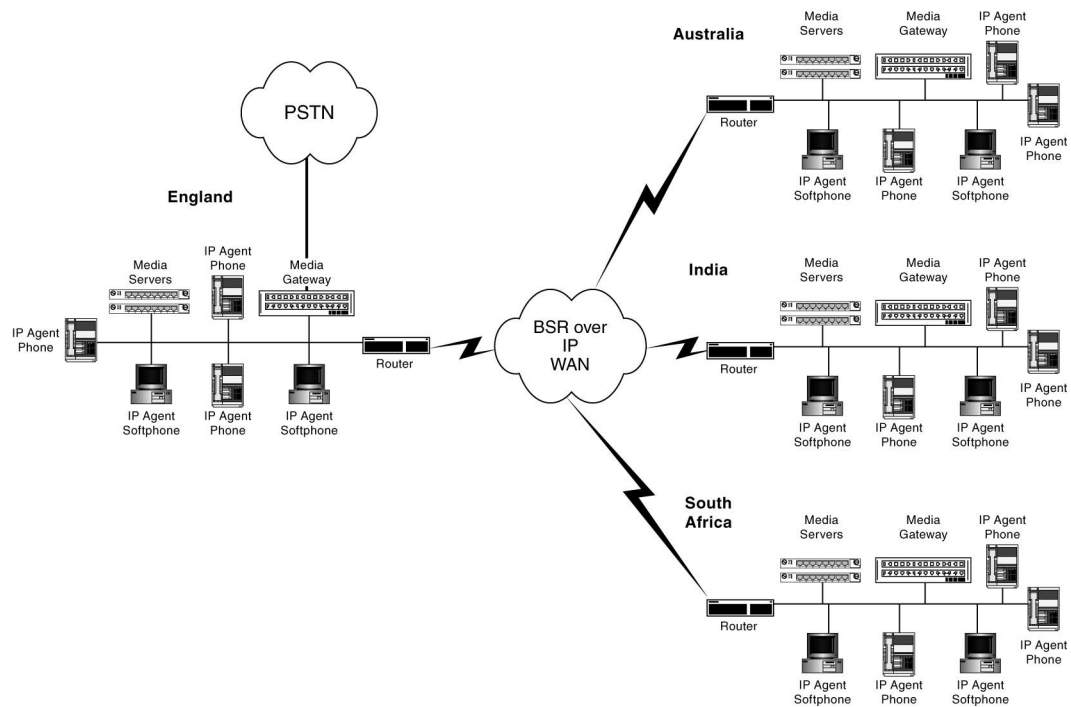


Diagram 6: Peer-to-Peer Option



Continuing with our example of the five-site enterprise, let's assume that three additional contact center sites are added to support a major business expansion. Because the business is under heavy scrutiny from the financial markets, senior management decides to globalize the contact center operations in three separate markets to hedge operational risks while also gaining the benefits of a quality workforce at reduced costs. The expansion takes place in Canada, the Philippines, and India. Because most of Canada operates in the same time zones as the United States, the Canadian agents are blended with the U.S. agents to enhance regular day business coverage between 8 AM and 5 PM. The Canadian site is enabled via remote IP phones as the company's long distance carrier has redundant fiber in Canada and a history of delivering quality, high availability network services. For second and third shift coverage of general customer service, the business decides to operate in the Philippines because of the large population of English speaking agents. For the Philippines contact center, remote gateways are chosen to add a layer of resiliency to insure against short-term WAN outages. For outbound services such as credit, collections, and telemarketing, as well as the inbound IT helpdesk, the business decides to expand in India because India offers the advantage of large pools of university graduates educated in business administration and computer science. To enable the India operation, a second instance of Avaya Communication Manager is implemented for massive scalability as well as the business continuity technology site for the Philippines center.

Across all eight sites, contact center management has 100% visibility into all contact center operations. A consistent Quality Management program is implemented across all sites, and workforce requirements are forecasted globally, while the scheduling for the staffing requirement is handled locally. Load balancing is performed in real time between the two U.S. based centers and India in real time. The right customer gets connected to the right agent at the right time — 100% independent of agent location. The eight-site deployment is represented in Diagram 7.

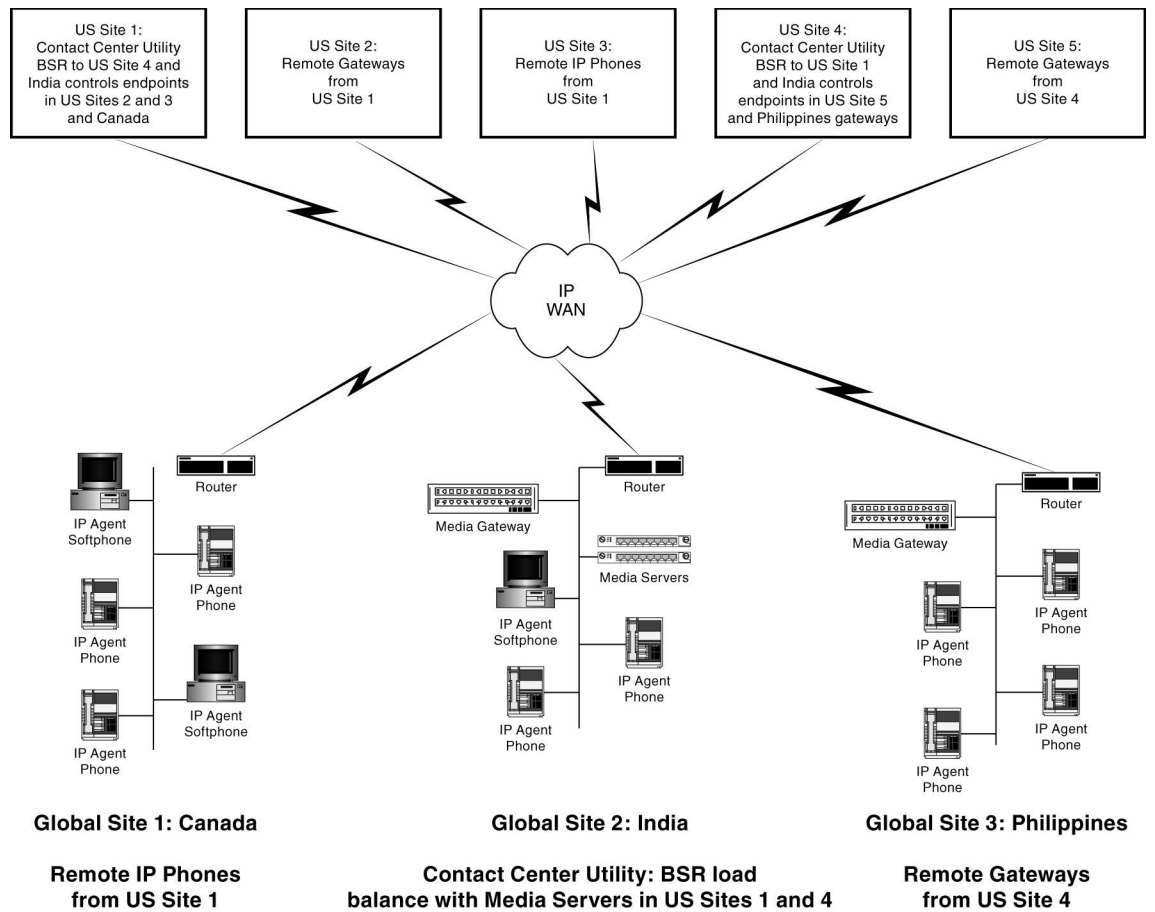


Diagram 7: Global Contact Center Deployment Example

Regardless of the deployment and business model selected, Avaya has the products, services and the global relationships to help make your global contact center strategic intent an operational reality. Whether through our network of Avaya Global Service and Professional Service associates operating in over 50 countries, or our relationships with leading outsourcers, consulting houses, system integrators, BusinessPartners, and the financing community, we have the right combination of risk-reducing services and technology to make your global operations a success.



Section 7: The Total Business Case for IP Contact Centers

This paper has highlighted a continuum of business solutions based on Avaya IP contact center technologies. Collectively, these solutions will typically show a payback of less than 12 months¹. In summary, the estimated financial contributors of each solution include:

- **Server Consolidation**
 - Reduce capital expenditures by 30-35%
 - Lower ongoing maintenance and support by 12-15%
 - Increase contact center flexibility and agility
- **Virtual Site Consolidation**
 - Reduce call center staffing by 3-8%
 - Enable contact center staffing backup strategies between home office and branch office operations
 - Provide additional business continuity options
- **Enterprise Resource Optimization**
 - Improve contact center staffing efficiency by 3-9%
 - Increase sales by improving match rate between caller and agent
 - Improve customer loyalty by reducing caller abandons and lowering average speed of answer
- **Contact Center Globalization**
 - Reduce the cost of contact center services by 30% by operating in developing markets
 - Lower the cost of contact center services by 10% by operating in near shore markets

These financial benefits avail themselves in single point solutions, and they are additive in combinations of solutions.

Section 8: Conclusion

In 2004, IP telephony is ready for widespread production deployment in the contact center. The technology has been through several development cycles, and reliability and quality has been engineered into the current generation of products. It is critical to remember that IP is only a transport technology and as such it offers no inherent value on its own. It is only through its ability to enable solutions that organizations have new opportunities to cut costs, grow revenue, and increase customer loyalty. Avaya IP contact centers uniquely offer a continuum of solutions, including server consolidation, virtual site consolidation, enterprise wide resource optimization, and global contact center operations — all with massive scalability — for your business advantage.

About Avaya

Avaya enables businesses to achieve superior results by designing, building and managing their communications networks. Over one million businesses worldwide, including more than 90 percent of the FORTUNE 500®, rely on Avaya solutions and services to enhance value, improve productivity and gain competitive advantage.

Focused on enterprises large to small, Avaya is a world leader in secure and reliable IP telephony systems, communications software applications and full life-cycle services. Driving the convergence of voice and data communications with business applications — and distinguished by comprehensive worldwide services — Avaya helps customers leverage existing and new networks to unlock value and enhance business performance.



IP Telephony

Contact Centers

Unified Communication

Services

© 2004 Avaya Inc.

All Rights Reserved. Avaya and the Avaya Logo are trademarks of Avaya Inc. and may be registered in certain jurisdictions. All trademarks identified by the ®, SM or TM are registered trademarks, service marks or trademarks, respectively, of Avaya Inc. All other trademarks are the property of their respective owners.

Printed in the U.S.A.

11/04 • EF-MIS2140-02

