

WHITE PAPER

The Changing Role of Communications in IT Architecture: Implications for CIOs, Architects, and Developers

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IDC OPINION

Imagine your job is to review complex orders identified as abnormal within your company's automated order processing system. Right now the screen on your order fulfillment system shows an order for 4,000 black widgets from Big Yellow Inc., one of your best customers; however, you happen to know that Big Yellow Inc. historically orders only yellow widgets. You decide to do a quick check with someone on the sales team for Big Yellow Inc. to confirm whether the order was filled out properly.

What follows is a series of phone calls, voice mails, instant messages, and emails to find someone who knows the answer or can approve the transaction. Finding someone to get even a small, but critical question answered quickly is often more difficult than it could be. The order processing system knows which sales team members were involved with the order, and the communications system should be able to identify which of them are available and even the preferred communication method to reach them. Taking the scenario another step forward, say that you have access to searchable transcripts of all voice, video, and text interactions with Big Yellow Inc. You could easily listen to the order request to hear whether there was an order for the black widgets; alternatively, you may see that a member of the sales team is available and could be speaking to him within seconds. In either case, the ability to add communication intelligence and capabilities to the order processing system could allow you to quickly resolve the issue. More broadly, integrated communication capabilities holds the potential to dramatically speed up a wide set of business processes.

The notion of real-time communications as an application distinct from traditional information technology practices is ending. IDC believes the convergence of communications and mainstream IT architectures will drive significant innovation in business processes over the next decade.

IN THIS WHITE PAPER

This white paper discusses:

- The evolution of communications, from proprietary technologies housed in separate organizations to software-based communications designed to be part of mainstream IT architectures.

- ☒ Examples of emerging business cases for treating communications in the same manner as other business applications.
- ☒ Options and migration paths available to companies looking to justify future communications investments.
- ☒ The experience of a professional business application development and integration company working with the NEC UNIVERGE Spherically communications platform.

SITUATION OVERVIEW

IT & Communications: What's Really Changing?

Technology trends in mainstream IT architectures are focused on ways to optimize the business, using everything from virtualization technologies to services oriented architectures (SOAs) to create a more cost effective and agile IT infrastructure that ultimately creates a more competitive enterprise.

Modes of business communications are similarly in the midst of technological, political, and use case changes. In many cases, new communications capabilities are changing the way work is done: for example, communications tools based on mobile and remote access technologies have already begun to optimize *where* users are able to work.

Traditionally, business communications consisted entirely of voice calls that traversed proprietary networks with specialized systems managed by staff outside of the IT group. Over the last decade, with the advent of voice packetized to traverse data networks, this staff has largely moved into IT; however, despite this migration voice is still largely treated as a separate and unique entity from other IT resources.

In the next phase of communications, voice will become much more aligned with mainstream IT architectures and these technologies will combine to change how we work and interact with existing and emerging information sources, transactions, and decision needs.

Bringing People into the Process

Where optimization of business workflows requires addressing interaction between people inside and outside the company, IT is beginning to ask how to better incorporate people into processes. Bringing people into business workflows requires communications services to be easily consumed, like other data-centric IT services. The advent of communications as a business software application—the next *real* change—will mean that the separation of communications from business applications and modern software architectures is coming to an end.

The Test—Which of the Following Are You More Familiar with: SIP or SOA?

Two major technology shifts are under way:

1. In information technology, the big shift is the move to service oriented architectures with enterprise service buses, web services, and federated applications that enable IT system resources to be easily shared and application technology to be reused.
2. In real-time communications, the migration of voice and video from dedicated networks to packet networks has driven session initiation protocol (SIP) standards as a common approach to arranging media sessions.

Chances are good you only are familiar with one of these two technological shifts. In today's IT architectures, developers and architects are very comfortable with applications, portals, and software technologies such as SOAP, HTTP, XML, WSDL, UDDI, ESBs, JEE, .NET, and JSR-168/268. Meanwhile, the telecommunications world spends a fair amount of time discussing terms such as SIP, QoS, unified communications (UC) and PBX.

In short, there are two very different sets of technology ecosystems and fundamentally different approaches to delivering business solutions. So how will they come together?

IDC estimates that today roughly half of all enterprises in the United States have either deployed or are piloting a services oriented architecture. This finding is based on a 2008 survey (IDC doc #213758) in which 56% stated they were pursuing a SOA initiative. Respondents said keeping up with changing business dynamics is the number one driver for SOA, and companies that have deployed enterprise service bus architectures and SOA projects largely report success from their efforts. Finally, enterprise application and IT managers overwhelmingly stated that for new projects they prefer products that fit into existing SOA standards.

Since service oriented architectures are the preferred standard sets for new projects, the communications investments now under the purview of IT should also adhere to the same set of standards. And as communications functions adhere to SOA standards, is there a business case for treating real-time communications the same way we treat all the other data sources and applications in today's enterprise?

The Business Case for Treating Communications as an IT Application Resource

Marketing messaging for business communications has relied heavily on the term unified communications, which is used to describe the integration of multiple communication media including textual, presence, messaging, and other productivity enhancements. The notion of communications as a part of a larger service oriented architecture assumes all the functions of UC, but seeks to find a more natural fit into IT architectures and SOA environments. Moreover, communications systems developed with IT architectures and SOA in mind provide access in a manner that is natural for applications developers to enable very easy consumption of UC services. As a result the term "unified communications" falls flat in describing the efforts and business value created by communications platforms that enable organizations to embed, mash-up, and integrate communications into existing or emerging IT applications and architectures.

Despite the current vendor push for horizontal UC solutions, customers that have realized some of the most significant ROI are getting there with industry-specific, role-based, and situation-specific communications solutions. Since the future business value likely to be derived by UC infrastructure is critical to a project's success, IDC recommends customers seeking to evolve their communications should focus investment on infrastructure that will enable IT to use unified communications technologies to drive new business solutions. Business case examples of current or emerging deployments that could fit into this category include:

- ☒ **Healthcare.** Patient discharge communications and patient scheduling communications can optimize expensive room and equipment utilization. ROI is based on improved utilization of resources.
- ☒ **Finance.** Examples include facilitating analyst-to-client interaction after a major event as well as debt collection communications.. ROI is respectively based on optimizing the accuracy and productivity of highly compensated workers and eliminating inaccurate transaction rework and reducing overhead of transaction record capturing.
- ☒ **Food service.** Store safety and employee absenteeism communications to keep workers focused, informed, safe, and to ensure optimum staffing levels for customer service. ROI: better alignment of staffing assignments and staff change notifications, including dispatching resources based on location knowledge.
- ☒ **Manufacturing.** Line interruption and supply chain disruption communications minimize costly work stoppage and optimize labor and inventories. ROI is based on resource utilization on manufacturing lines and increased accuracy and optimization of supply chain flows.
- ☒ **Education.** Campus safety communications keep on-campus safety staff coordinated with off campus services while improving campus safety. ROI is based on automating security tools with communications to reduce overhead, capture security breaches, and inform security personnel.

Improving "Time to X"

When discussing potential applications with people from different functions, consider the effect of a meeting invitation titled "Unified Communications Upgrade." It is likely to draw glazed eyes and poor attendance. On the other hand, an invitation titled "New Applications to Reduce Our Time to X" is likely to generate much more interest among business line owners.

Every organization IDC has ever interviewed regarding communications solutions has a business challenge we describe as their "time to X" challenge. X varies by industry and company, but every enterprise has an aspect of its business in which decisions, approvals, or information gathering are made by humans and in which streamlining them would be valuable to the business. Hospitals want patients discharged faster with fewer errors; insurance companies want quotes approved faster with less risk, and airlines want to turn planes around faster and avoid weather delays. Every company has a "time to X" challenge.

For many enterprises, optimizing "time to X" requires infrastructure changes. Fortunately, many companies already have plans to migrate from proprietary communications to IP-based, real-time communications infrastructures. The vision for how new business applications solve the "time to X" problem needs to be part of the evaluation process. Even if communications infrastructure upgrades are not on the horizon, companies can elect to deploy new, software-based communications infrastructure that connects with existing voice systems to address targeted group or situational needs.

Finding "Time to X" Applications

For organizations looking for places to start, IDC suggests looking for potential applications through two primary lenses:

- Role-based communications**, used to determine what communications tasks need to be accomplished by a particular group or individual.
- Situational communications**, consisting of asking what communications are needed to deal with a particular event or process.

For particular groups, enterprises can contrast communications tasks with the IT tools used in the group to get a handle on achievable efficiency gains by incorporating communications into the tools. For situational communications, companies should look at workflows that require human interaction, and then ask how to use communications resources to notify targeted individuals and reduce or eliminate latency.

IDC considers the following list to be good places to start treating communications as an IT resource:

- Voice-intensive business processes
 - Urgent-call lists
 - Heavy volume transfers to transaction processors or subject experts
 - Event-triggered conference calls
- Scheduling intensive processes
 - Deliveries, onsite support, or installation scheduling
 - Patient scheduling
 - Airline crew scheduling
 - Service and support optimization
- Approval processes
 - Sales force automation

- Procurement
- Safety and security
 - Patching 911 calls to local security resources
 - Alerting
 - Location- and event-specific people management
- Regulatory solutions
 - Call recording for transaction archiving
 - Policy auditing/enforcement
 - Do-not-call lists
 - Mobile user privacy, presence, and dial plan optimization

Communications Infrastructure: Deciding to Build It Properly

Even organizations not prepared to invest in application development to enhance group or situational communications should still consider UC in their communications infrastructure planning. Enterprises must ultimately think about the foundation that will enable their future application development needs.

Adapting existing telecom infrastructure is one option, and many vendors offer middleware appliances, telecom-oriented APIs, and supporting professional services to achieve some level of application integration. There are many cases where specialized resources and interfaces have enabled incremental business process integration, although these methods often fail to provide benefits of SOA such as reusability.

Most new business communications application projects are incremental in nature and their scope is tiny relative to major business application and IT architecture projects; however, they can have significant impacts on the business value provided by existing applications and can greatly impact specific communications-intensive business processes. IDC recommends starting small, both to gain experience with new communications tools in a measured manner, and to enable iterative changes and functional reuse as the applications are rolled out. In many cases smaller projects can serve as test beds to evaluate potential long-term communications infrastructure.

When considering a new communications infrastructure, IDC recommends evaluating the degree that new systems are open and can provide easy application development and reuse. Many newer systems are pure software systems built to operate, integrate, and interface with other business applications.

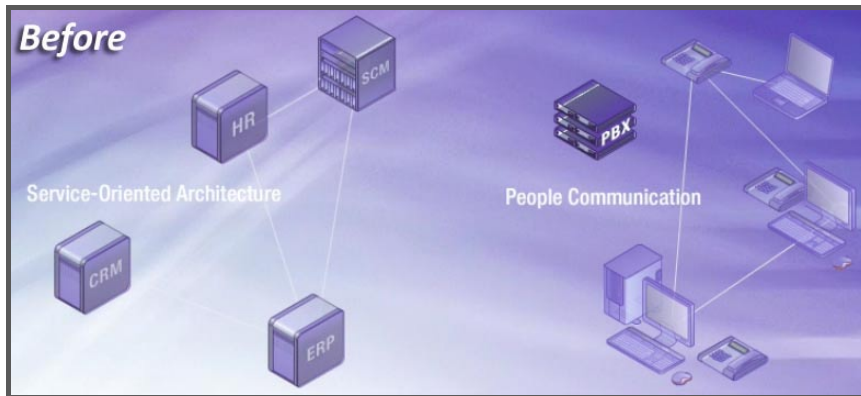
Communications is Becoming Part of IT Architecture

In today's mainstream company, business information, intelligence, and transaction applications are integrated or share data in various ways. People interact with these

information systems primarily through PCs and other compute devices. When people communicate with other people, however, that interaction occurs through a separate set of phones and collaborative applications. This distinction is illustrated in Figure 1.

FIGURE 1

Today's IT and Communications Architecture

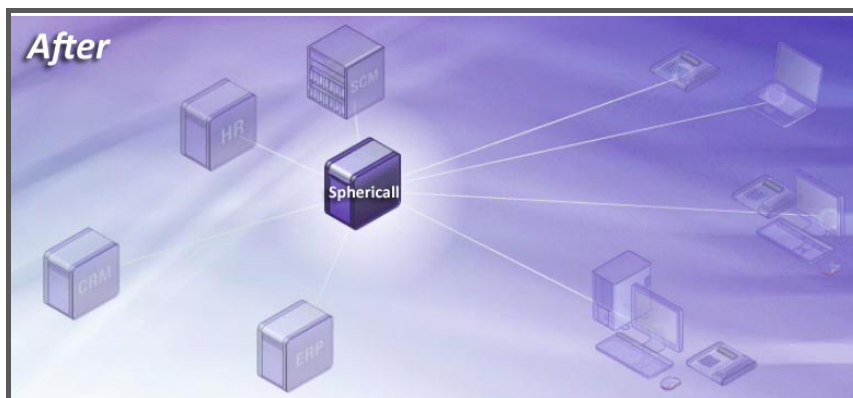


Source: IDC, 2009

In order to solve for "Time to X," communications and business application architectures will have to be able to handle an ever-increasing amount of information and real-time communications functions. A communications system that can support future demands must be able to interoperate with both traditional communications devices as well as the existing IT infrastructure. Such a solution is illustrated in Figure 2.

FIGURE 2

Connections Enabled with Service Oriented Communications



Source: IDC, 2009

Future Proofing and Development Options

When evaluating vendors and their communications technologies, there are several key attributes to keep in mind:

- ☒ **Northbound flows.** Does the communications platform provider understand and embrace business software and web services standards that can be utilized easily within the integrated development environments (IDEs) in the enterprise? Are they flexible enough to span multiple IDEs or limited to certain environments?
- ☒ **Southbound flows.** Does the platform provider support multivendor, multimodal (i.e., voice, video, conferencing, instant messaging, etc.) communications services? Does the platform provide standards-based flexibility to utilize communications devices required by the business? Does the system connect with existing PBX systems?
- ☒ **Cultural DNA.** What is the cultural DNA of the platform provider? Does it actively encourage a developer and ISV community? Are multivendor and standards-based commitments real? Has it studied and does it understand business applications, portal, and web-based software technologies? Does it have sample code and development tools to help customers get started?
- ☒ **Customer examples.** Does the company have an ever-expanding list of customer examples? Can it describe the value that can be achieved for certain business scenarios? Can it point to customer examples where it has previously integrated with the required IDE environment?

The Power of Reuse and Building Off of Early Successes: A Customer Example

One good example of solving a small problem that later resulted in unexpected benefits is found in an NEC Sphere customer in the financial transactions industry that needed to record customer calls. It recorded these calls on physical tapes, which required a significant number of human-intensive steps to track, ship, and warehouse.

This company deployed an open, flexible IP communications solution that recorded calls onto digital media on a storage area network (SAN), achieving significant operational savings. The avoided shipping and storage costs alone provided a significant ROI for the project. Further, recorded calls can now be integrated with the company's customer relationship management (CRM) system. Calls can be associated with customer transactions in the CRM software and easily recalled, saving critical time previously spent searching for recordings. Searches can even be conducted while a customer is waiting on the line.

FUTURE OUTLOOK

Outside the United States, the acronym "IT" is falling out of favor, with "ICT" (Information & Communications Technology) rising to replace it. The use of real-time communications in conjunction with new and existing data sources and transaction

types holds significant promise for transforming business processes and has already resulted in a growing number of customer successes. IDC expects the current recession to accelerate innovation within IT consultancies as they look to exploit the improved user experiences available as human-to-human or machine-to-human communications become an integrated component of the business process.

The real-time communications industry has been slowly adopting aspects of mainstream IT architectures. Some vendors are using communications capabilities to solidify customer lock in, while others are embracing SOA standards to provide greater client and application integration capabilities and enable customers to migrate off legacy platforms at appropriate speeds. As the vision and reality of SOA evolves, infrastructure vendors who build products from the ground up with native SIP and SOA architectures will ultimately enable customers to take better advantage of their internal human capital.

IDC expects the view of communications as a "dark art" within the IT world will subside as developers get their hands on next-generation platforms. Any organization that forgoes the capabilities enabled by these new platforms is likely to lose out on a powerful toolset for building a competitive advantage.

OVERVIEW OF NEC

A global Fortune 500 company with more than 150,000 employees worldwide and more than \$40 billion in revenues, NEC Corporation has a history of more than 100 years of leadership and innovation in high technology.

NEC brings to market technology solutions designed to meet the future needs and demands of e-commerce and other Internet-based solutions. It is a provider of core technologies and services required in today's networked world. NEC offerings include advanced semiconductors and device solutions, high-speed optical and microwave radio communications, systems integration, integrated IT/network solutions and e-commerce software applications.

As part of its ongoing innovation efforts, NEC is delivering the next generation of software-based, service-oriented enterprise communications. It puts communications directly into enterprise IT applications infrastructure, providing the ability to make human collaboration a fundamental element of every business workflow.

A key transformation this technology enables is service-oriented communications (SOC). SOC is based on the premise that applications in an SOA can easily consume the services provided by a common "communications services engine." Developers and architects can now consider how collaboration using voice, messaging, video, screen or application sharing, location, and user state (or "presence") integrates into a natural part of business applications.

NEC Sphere Communications and UNIVERGE Spherical

NEC Sphere Communications is an NEC software subsidiary that has developed solutions to integrate human capital with business processes, business applications, and SOA using open, standards-based methods as an integral part of a UC software

platform. Part of NEC's UNIVERGE family of communications solutions, Spherical software has been deployed across a range of industry deployments throughout the world. Designed to operate as a single instance for smaller environments or as part of large distributed software infrastructures, Spherical can scale to enterprise architectures and can enable enterprise cloud communications.

Spherical's approach takes communications out of the closet and puts them into the data center, and is intended to make communications a natural part of the IT architecture. Spherical is accredited by the U.S. Department of Defense under its Joint Interoperability Test Command (JITC) PBX1 certification. This distinction is useful for local, state and Federal government agencies seeking communications security, reliability and emergency response features. It also applies to enterprises that demand performance and resiliency from their communication infrastructure.

CHALLENGES/OPPORTUNITIES

IDC believes the opportunities lying at the intersection of IT and communications technology will define the next decade of IT and business transformation. This convergence lies at the intersection of two multi-billion dollar industries; however, these industries currently have little in common. The traditional channels for telephony and video are ill-equipped to sell to application developers and architects in large enterprises. On the other hand, many IT departments do not perform the operational diligence that is the traditional hallmark of telecommunications.

The increasingly federated application environment found in both the web world and the enterprise application world should ease some of this pain. This should occur as long as ICT organizations can use some of the same organizational structures found in current application structures while adopting the operational diligence business-critical applications increasingly demand.

Advice for CIOs

- ☒ Don't treat communications refresh investments merely as ways to improve costs on your own budget or to simply refresh voice communications. Consider the strategic benefits these investments can provide to the business as a whole.
- ☒ Be on the lookout for and raise the challenge of the technology's ability to improve "time to X" applications.
- ☒ Do not let historical areas of expertise slow internal innovation. Encourage communications experimentation by architects and developers.

Advice for Architects

- ☒ Consider using communications capabilities in places where input, approval, or alerts would be beneficial.
- ☒ Engage with real-time communications professionals in your company and with vendors that are leading new initiatives to determine what options exist to improve business processes.

- ☒ Download software development kits (SDKs), simulation tools, and other materials that allow you to experiment with communications functions.

Advice for Developers

- ☒ Download SDKs, simulation tools, and other materials that allow you to experiment with communications functions.
- ☒ Consider how prototyping real-time communications in existing projects can increase the business value of the project.
- ☒ Insist on the adoption of real-time communications platforms that support and augment your existing tools and skills without requiring extra training.

CASE STUDY: INTEGRATING COMMUNICATIONS INTO PORTAL ARCHITECTURES WITH NEC'S UNIVERGE SPHERICALL SOFTWARE

Many IT services firms have an acute understanding of their customers' business challenges and a solid knowledge of today's business applications; however, due to the historical silos between voice communications and IT software, few have a great deal of communications expertise. One well known IT consultancy taking steps to break down these silos is Perficient Inc.

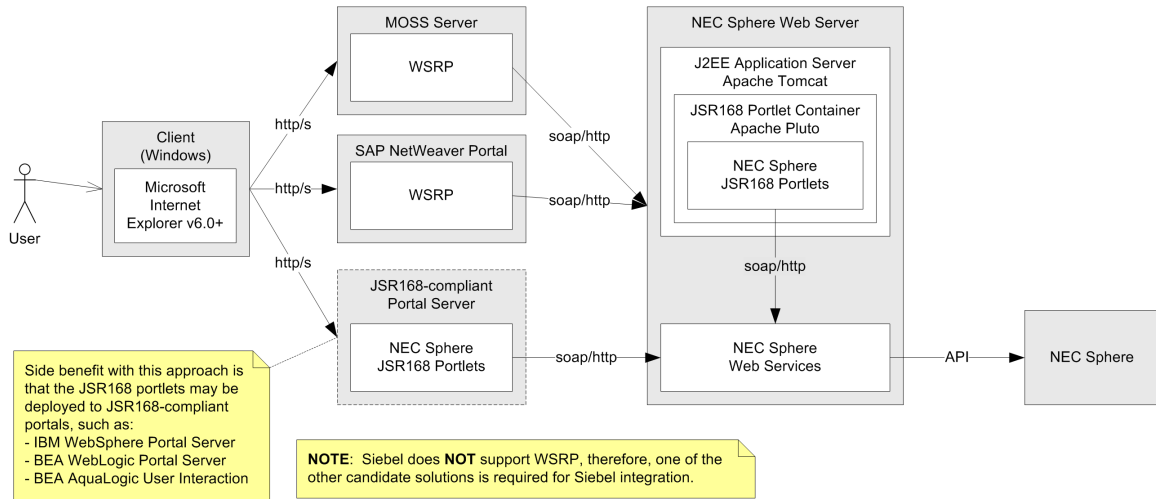
Perficient (Nasdaq: PRFT) is a publicly-traded IT consulting firm that employs approximately 1,300 full-time consultants and serves clients from locations in 19 markets across North America. Perficient specializes in architecting and integrating middleware to deliver and accelerate enterprise applications, data, and services via web service aggregation. It specializes in IBM, TIBCO, Microsoft, EMC/Documentum, SAP, and Oracle application server and web service delivery platforms.

In May of 2009, NEC asked Perficient to identify approaches to embed Spherically communications functionality into three pervasive enterprise application platforms: Microsoft Office SharePoint Server (MOSS), SAP NetWeaver, and Siebel. The NEC Sphere partnership with Perficient is notable because Perficient consultants have traditionally focused on integration of business applications such as CRM, ERP, and HRMS, and have limited experience with telephony and real-time communications.

Considering Perficient's core-competencies—or lack thereof—in telecommunications it would be reasonable to conclude that significant training would be required; however, Perficient's project leader, Director Don Miller, handed his platform developers the Spherically SDK and essentially said "figure it out." NEC's UNIVERGE Spherically is designed to require little training beyond the fundamentals of the platform it is being integrated into. Miller's team quickly came up with several "on the glass integrated" architectures: a widget approach using JSR standards as shown in Figure 3, a widget approach using WSRP standards, and a Rich Internet Application (primarily FLEX/FLASH) approach that uses NEC Sphere as a web server, shown in Figure 4.

FIGURE 3

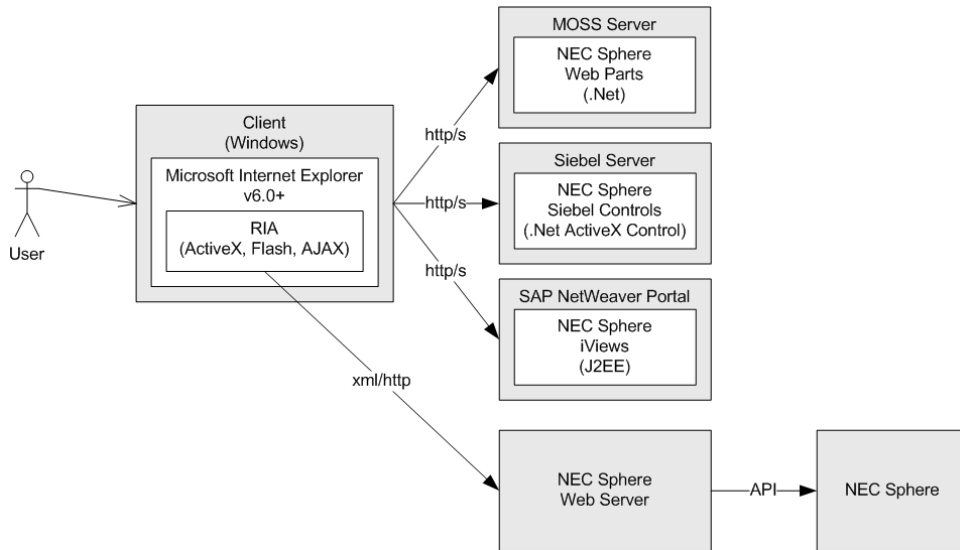
Widget Approach Using JSR Standards



Source: NEC, 2009

FIGURE 4

RIA Widget Approach



Source: NEC, 2009

Once it was finished designing and testing these architectures, Perficient found Spherically "worked like any other app," making the widgets and RIAs reusable for future web services and service bus architecture integration projects. Moving forward, Perficient is looking to differentiate itself by using Spherically as the IP PBX component to introduce embedded communications functionality in new projects for its portfolio of healthcare providers and other customers.

DEFINITIONS

Service-Oriented Architecture

Service-oriented architecture (SOA) is a technology and application architecture that promotes the utilization of autonomous application and system "services" abstracted from one another, independent of implementation and state, and designed to be dynamically invoked. Each service provides a function that is self-contained and defined via a published interface made accessible to other services or systems elements, most commonly over a network. Ideally, an SOA should be modular, with separate layers of functional code, process, data, and presentation interfaces.

Web Services Software

Web services software consists of application development and deployment tools, infrastructure software, and packaged applications that conform to Web Service Architecture (WSA) standards.

The Web services software market sizing is derived from a robust market model that combines both demand- and supply-side factors in the adoption and consumption of Web services technology and services. The software may include those products where the primary purpose is to enable some function of the WSA, specific extensions have been implemented for the purpose of working within WSA, or the software is built according to the principles of WSA.

Session Initiation Protocol

Session Initiation Protocol (SIP) is a signaling protocol used for controlling multimedia communication sessions over Internet Protocol (IP) networks. Today SIP is found primarily in real-time voice and video communications, although the protocol is increasingly found in the underlying infrastructure of presence and other modes of communications. In a true SIP environment, a SIP server brokers connections between clients, while the media (voice or video) does not pass through the SIP server, but rather travels directly between clients in a peer to peer fashion. SIP is a request-response protocol modeled from HTTP and SMTP (web and email respectively).

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