White Paper

Empowered by Innovation

NEC

Enterprise Communications and Collaboration in a Fast Changing World

NEC Corporation
http://www.nec.com/

Executive Overview

This white paper is a business briefing for C-Level Executives on how integrating a range of technologies – including unified communications, service oriented architecture, virtualization and cloud computing – can transform the productivity and profitability of large enterprises.

With capital expenditure budgets drastically reduced, the IT team is facing an unprecedented challenge: just how can it meet demands for more flexible working and improved productivity without embarking upon a sustained investment program?

As organizations look desperately for opportunities to reduce office space to cut costs, the pressure is on to enable hot desking and flexible working. And with pandemics such as swine flu or bird flu likely to affect employees' ability to get to work, viable flexible working will become critical. At the same time, IT is also facing concerns about data center power consumption and environmental legislation, as well as the ever present security fear of losing data and managing endpoints.

It is understandable that the over-riding emphasis is now on cutting costs - from server virtualization to achieve dramatic consolidation and a reduction in people, power and hardware costs, to desktop virtualization to exploit the reduced centralized management costs associated with thin client devices.

These technologies are also enabling organizations to significantly reduce the facilities costs associated with the continuous expansion of data center requirements that has occurred over the last two decades: virtualization is enabling organizations to use this data center space far more effectively. Similarly, the 2008/9 recession has actually added impetus to IT and communications convergence, as more organizations look for the cost and management benefits associated with a single infrastructure.

However, for flexible working strategies to be truly effective, organizations need to leverage a lot of additional tools and technologies – from unified communications (UC) that improves communication and collaboration between employees, to cloud computing that will support anytime, anywhere access to both information and core applications.

Yet, to date, the majority of these projects are being undertaken in isolation: organizations are looking at isolated UC components such as unified messaging and video conferencing, for example, without even considering the link with desktop virtualization or cloud computing. By failing to take a consolidated approach, organizations may gain initial cost benefits but they will compromise their ability to take advantage of these technologies to deliver the incremental benefits of integrating instant messaging (IM), presence, voice, video, and other collaboration services with business applications and business processes to achieve true business transformation.

Organizations need to look closely at the overall system design and architecture: putting in place today a consolidated solution based on a Service Oriented Architecture (SOA) framework that will provide the building blocks for highly innovative solutions in the future. A role-based approach delivering new mashups offering a rich user experience and reflecting specific need-based user demands will transform productivity and enable unprecedented flexibility in working practices.

From the CFO able to check availability of a co-worker in another location and initiate a video conference directly from within the ERP solution, to the home worker able to collaborate with office-bound and mobile colleagues, the benefits in effective, productive working will be significant.

Cost cutting is important today, but in the long term organizations need to achieve business transformation for a better, more effective and productive business. Failure to even consider the true possibilities today will result in expensive integration projects in the future or, worse, the need for a complete technology refresh, adding significant cost in the longer term.

Glossary of Cloud terminology

A number of definitions are assumed in this white paper and are explained here to avoid confusion. A 'Cloud' is a collection of services delivered over a network to consumers of services. The 'Public Cloud' is the aggregate of services made available by third party service providers over the public Internet. The Cloud is not the same as the Internet – the latter is simply the delivery mechanism. These services may be delivered from data centers located anywhere in the world – the consumer of services is not normally interested in the source of the service but rather in service-level agreements (SLAs) and pricing models.

Services may be for provision of platforms/infrastructure (eg renting for a period of time a virtual machine with a defined specification of processor, storage, systems software), also known as 'PaaS' or platform-as-a-service; and/or for software applications (eg renting applications on a per user, per month basis), also known as 'SaaS' or software-as-a-service. Other services include 'VaaS' or voice-as-a-service (simple telephony delivered as a service from the Cloud), and 'CaaS' or communications-as-a-service (feature-rich communications rather than simple telephony).

Cloud computing implies centralization of IT resources (for cost, management and efficiency reasons) with delivery of cost-effective services to a large decentralized population.

The concept of 'Utility Computing' is that IT services are provided 'on tap' with defined SLAs and a simple per-use pricing model with the consumer of services unaware and uninterested in the underlying infrastructure and its management. Utility computing is particularly attractive to individual consumers (residential market) and to those SMB organizations that would prefer not to make capital investments in IT infrastructure and dedicate some resource to manage it.

On the other hand, enterprises are by their nature large and complex and will continue to require an 'on premises' model for some or most of their technology needs. Enterprises may outsource some or all of the management and provision of IT resources under this 'on premises' model. This outsourced model is nevertheless still under the control of the enterprise. We make the distinction therefore of a 'Private Cloud' which is a collection of services delivered over a network (eg local-area-network, wide-area-network) to consumers of services (users in an enterprise) that is controlled by an enterprise, not by third party service providers. A Private Cloud uses cloud computing principles (ie highly centralized resources delivered to decentralized users) to minimize costs, increase efficiencies and to act as an enabler for business transformation.

Changing World

Economic pressure and fast evolving business philosophy are driving organizations to look for more flexible yet productive and cost effective ways of working, communicating and managing. With manufacturing production down and businesses still struggling to get viable finance terms from a nervous banking community, organizations are looking ever closer at means of reducing costs and minimizing capital expenditure while boosting productivity.

IT systems have become unwieldy. As technology has advanced there has been a user-led drive towards more decentralized and distributed systems supported by arrays of servers running the different applications delivered to the modern worker. More equipment has needed more space and more power. Small armies of IT personnel have been needed to manage this growing and increasingly complex infrastructure. Costs have spiralled and organizational efficiency has decreased dramatically.

Yet at the same time, businesses across every vertical market sector are having to consider increasing amounts of environmental legislation as well as consumer demands for ever stronger Corporate Social Responsibility (CSR) strategies. With office data centers now recognized as contributing more carbon to the atmosphere than the entire travel industry, including aircraft, organizations are under increasing pressure to reconsider and redesign core systems in a bid to reduce power consumption.

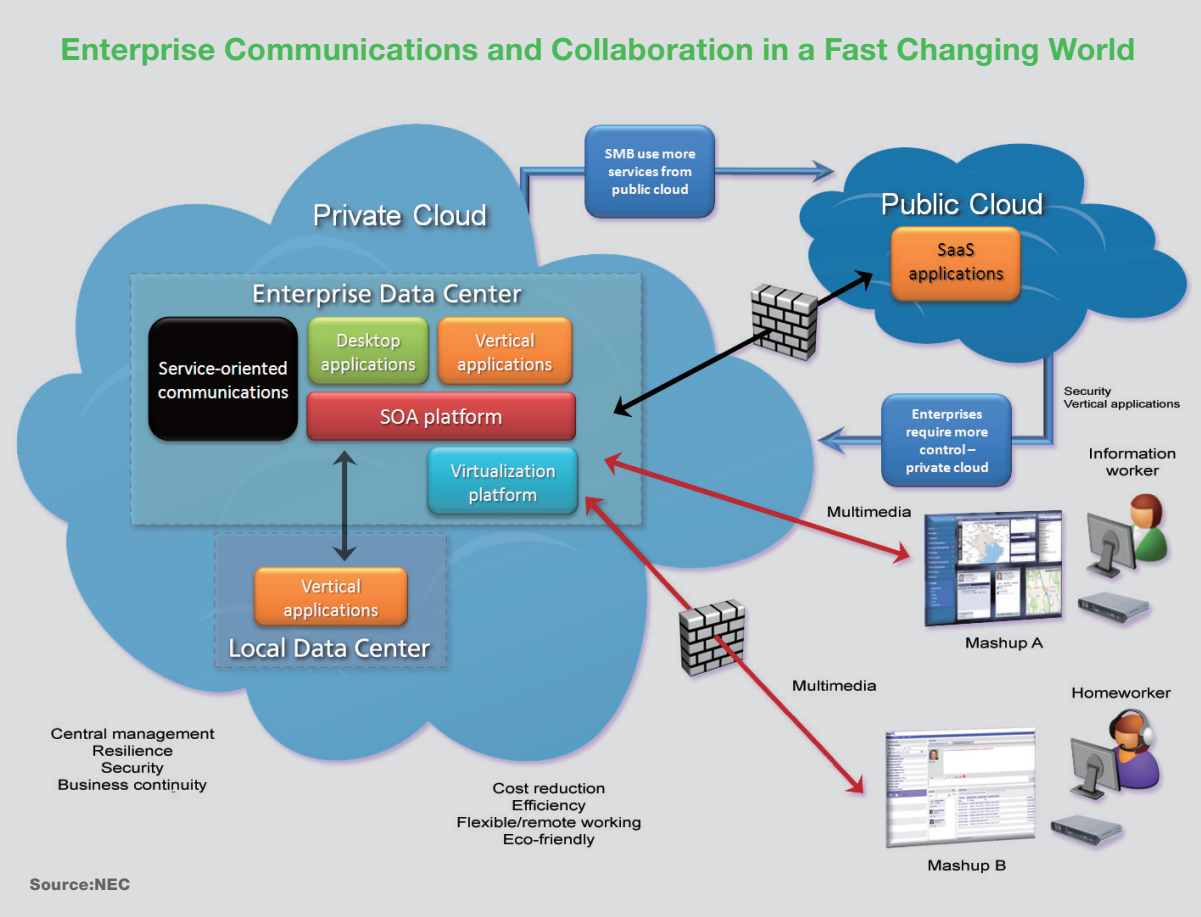
It is little wonder, therefore, that virtualization projects have seen a massive rise recently, with leading research analysts citing virtualization as the highest-impact trend changing infrastructure and operations for the next few years. Organizations are leveraging the increasing maturity of virtualization technologies to consolidate servers across production as well as development environments and drastically reduce power consumption and data center size requirements, while increasing server utilization.

Indeed, according to figures from a top IT consulting firm, data center server utilization can be as low as 6%; while facilities utilization can be as low as 50%. As the organization states, with data center costs now threatening to crowd out other technology investments and huge amounts of capital tied up in the data center, this level of inefficiency has become a board level concern.

Virtualization is enabling organizations to achieve phenomenal improvements in resource and facilities utilization, driving down costs in real estate, power consumption and system management.

At the same time, security remains a critical issue – access needs to be controlled and managed properly, and data protected and safeguarded. Identity management is a key architectural component.

In addition, there is a growing interest in Cloud Computing, with companies looking to exploit massive improvements in bandwidth capability to embrace the new computing model to access infrastructure (PaaS, platform as a service), applications (SaaS, software as a service) and communications as a service (CaaS).



The rise of the Service Oriented Architecture (SOA) approach enables a far more sophisticated and productive technology and communications environment, providing easy access to diverse application services.

Cloud computing is inherently flexible, enabling organizations of different shapes and sizes to tailor the model to meet specific requirements. Small to medium businesses (SMBs) can now leverage public cloud computing to deliver the platform, software and communications via a monthly rental model that delivers unprecedented flexibility and minimizes capital outlay (utility computing). There will be some SMBs that find this model highly attractive while others will continue to buy plug-and-play on-premises products.

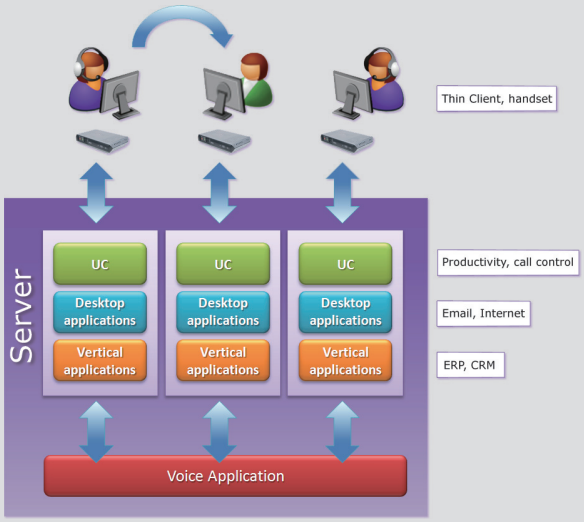
The larger enterprises, meanwhile, may opt to use some publicly available services but will prefer to use cloud technologies within a private environment. In this way, highly distributed enterprises can achieve centralization and consolidation to drive down costs while retaining complete control over the quality and security of service delivery and to perform agility management.

Furthermore, with end user devices getting ever smaller, cheaper and simpler the opportunities for far more innovative, flexible and productive working practices are fast emerging. Combining excellent and affordable network bandwidth with desktop virtualization that uses relatively inexpensive thin client devices, organizations can now deliver centralized services to a highly distributed and continually demanding user population that neither knows nor cares where the applications are being hosted.

The resultant IT infrastructure will be centralized yet also dispersed: data center can be located on premises within a private cloud; with additional application resources accessed from service providers in the public cloud if required. As a result, enterprises now have unprecedented opportunities for delivering more innovative applications via a far more cost effective and flexible infrastructure.

Virtual Desktop

Projects involving virtualization of servers have been the initial emphasis from organizations using virtualization technologies to drive down costs and increase efficiencies. These same technologies can be used in conjunction with 'thin client' devices (small footprint, low power, low specification, no local storage) to deploy virtual desktops to users. Virtual machines are managed within powerful servers in the data center – each server can run many virtual desktop machines. Virtual desktop machines can be moved between servers without the user being aware, providing resilience and allowing physical machine usage to be managed effectively. Unused processing resources can be switched off, minimizing power consumption and costs.



Source:NEC

The user is provided with a virtual PC running desktop productivity applications such as internet browser, email, word processing , etc. as well as specialist applications (eg ERP, CRM). The thin client device can be deployed remotely as well as in an office environment. A user can log off the thin client and later log on, bringing back the desktop exactly as it was left earlier.

This virtual desktop model reduces the administrative burden and cost of managing a large decentralized population of PCs and provides the enterprise with a robust and secure infrastructure – notebooks cannot be lost, data cannot be saved locally.

NEC has architected a sophisticated virtual desktop solution, the VPCC (Virtual PC Center) which provides multi-media capable thin client devices together with best-of-breed virtualization technologies and powerful, efficient servers and storage. VPCC allows voice and unified communications to be delivered within this virtual desktop solution keeping bandwidth requirements to a minimum (see diagram).

IT and Communications Convergence

However, it is important to recognize that the trend towards centralization, virtualization and cloud computing should not only consider data oriented solutions. Driven both by the business imperative to reduce costs and the changing behaviour and attitudes of the Facebook generation, the speed with which data and voice has converged has increased rapidly in recent years – most notably the use of voice over Internet Protocol (VoIP) for both business and personal use.

According to a recent market study, within the next ten years, more than half of mobile voice traffic will be carried on end-to-end VoIP networks instead of traditional mobile networks.

From a business perspective, the economic benefits of convergence have resulted in a significant growth in commercial adoption over the last few years, with organizations looking for cheaper call costs and the reduced overheads associated with a converged IT and communications infrastructure.

The result of this convergence is that voice is no longer an isolated business application and organizations can now consider the value of a converged strategy in delivering a range of requirements, from business continuity to flexible working.

As organizations look desperately to reduce office space and unnecessary travel to cut costs, hot desking, videoconferencing, multimedia collaboration and options for home working are becoming increasingly popular. Combined with the need for excellent business continuity to enable an organization to remain operational during disruptive events such as adverse weather, traffic chaos and crises such as the recent flu pandemics, there is a growing emphasis on delivering improved communication and collaboration tools to end users that leverage this converged model.

Unified Communications (UC)

UC brings together disparate communications methods, business applications and information sources, to facilitate the efficient and timely collaboration between people and to improve accessibility to vital information - regardless of device and location.

UC components include instant messaging (IM), presence, email, voice (traditional as well as VoIP) and unified messaging (UM), routing applications, video and conferencing, real time collaboration, and importantly, integration with business applications. UC is often confused with VoIP… in fact, VoIP is only a very small subset of UC.

One of the major long-term benefits of UC is its potential to enhance business processes and workflow, revolutionizing the way we work.

As a result, there is growing demand for tools such as unified messaging and video conferencing that provide a consistent user experience irrespective of location, from home to mobile to office and enable these flexible working practices.

Yet, to date, the majority of these unified communications and collaboration projects have been conducted in isolation from virtualization initiatives. And, of course, it is understandable that the current focus of virtualization and cloud computing developments is primarily on cost. Organizations want to drive down overheads, reduce capital expenditure and minimize power consumption as far as possible. But cost savings can only deliver a short term business benefit.

At the same time, organizations need to take note of the changing philosophies of those individuals now joining the workforce. The Facebook generation is used to sharing information online, using instant messaging (IM) to achieve communication immediacy and having instant access to both communication and collaboration tools. This shift in behavior will prompt a huge business transformation over time, enabling far more effective working practices, but it will also challenge traditional forms of communication, management and security.

To retain a competitive position in the longer term – both during times of economic downturn and, more critically, during economy recovery, stability and growth – organizations need to leverage the efficient cloud computing infrastructure and flexible converged technology to deliver tangible improvements in user productivity.

Understanding the Challenges

While growing numbers of enterprises are embarking upon both virtualization and UC projects, to date the majority have been undertaken in isolation. As a result, companies are failing to push beyond basic UC solutions (typically VoIP only) and not putting in place the building blocks that will enable UC to be embedded within business applications.

There is a huge difference between an infrastructure-focused approach and a pure software-based, business applications focused approach. Both approaches can be leveraged to achieve a converged infrastructure to realize significant cost savings in a short timeframe. Both approaches can deliver standalone UC functionality for enhanced worker productivity.

But only an approach that treats communications as a business application provides the means to communications-enable a business process, leading to significant business transformation over a relatively short amount of time.

For those reluctant to dispose of viable appliance-based IP communications infrastructure, the alternative will be a great deal of additional work and integration, overlaying new technology in a bid to exploit these advantages, introducing more cost and complexity.

This is a key issue for businesses to address: it is easy to get wrapped up in the individual benefits that can, and are, being achieved by separate virtualization and UC projects. The same argument applies to those enterprises looking to reduce costs by embarking upon desktop virtualization strategies, replacing PCs with less expensive thin client devices.

The resultant centralized infrastructure is not only less expensive; it is more robust and easier to manage. However, few enterprises with such projects are considering the opportunities for tying in UC; some even have separate UC projects underway.

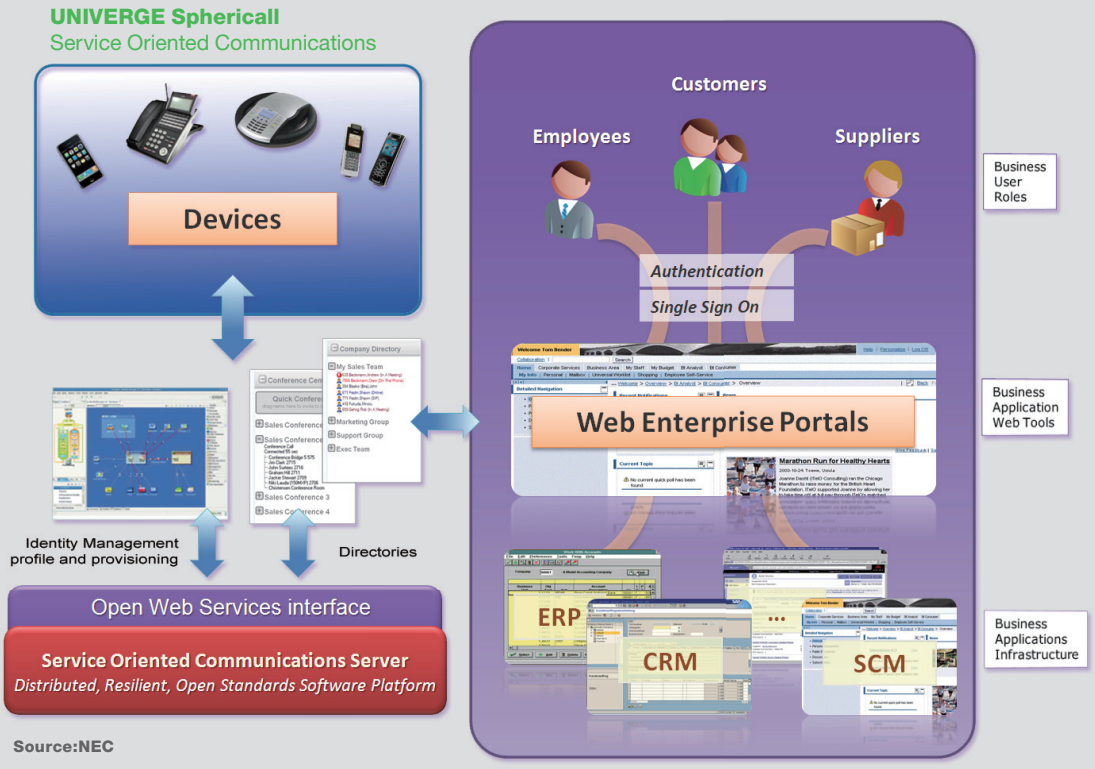
Falling to consider the business opportunities of an integrated approach will not only add cost to the project in the long term but fundamentally limit the speed with which organizations can evolve to deliver far more effective business transformation by enabling flexible and agile working practices and productive employees.

Service Oriented Communications (SOC)

Software made available in a Service Oriented Architecture (SOA) framework follows the concept of breaking down software applications to small re-usable components (or 'services') that can be made available to enhance other applications. 'Mashups' can be created by combining applications and services in one interface (often within a web portal in a browser) to provide need-based information in a format useful to a particular user.

Service Oriented Communications (SOC) uses a SOA framework to deploy software-based communications services that can be called from other applications, making them communications-enabled.

NEC has an enterprise-class software-based SOC platform, UNIVERGE Sphericall, which can be deployed on industry-standard, non-proprietary hardware and devices, and is robust, highly resilient and scalable to 30,000 users per system over any number of locations. It takes an open-standards approach, allowing communications functionality to be called from other applications using web services. This allows applications such as ERP or CRM systems to be communications-enabled, making rich UC functionality available to users of these applications. New mashups can also be communications-enabled. Consequently, UNIVERGE Sphericall users can access UC functionality from a wide range of interfaces and devices.



So what are the excuses for these projects being run in separate silos? With the convergence of IT and communications, organizations are far less prone today to having distinct teams responsible for each area, each having separate budgets. However, few have yet been able to totally overcome the traditional cultural divide and, as a result, are potentially missing out on the real benefits of a consolidated, integrated approach to creating a converged infrastructure.

Nor can organizations claim a lack of maturity in the technology as a reason for non-adoption. Virtualization technologies have been around for years, while interest in cloud computing is relatively new but gaining pace fast, although there is still some confusion as to what cloud computing can really offer. Unified communications technologies are also mature, although many organizations still fail to understand UC as anything other than its most basic component, VoIP.

But what about a combined solution? In fact, the capability of deploying voice and other UC components as part of a virtualized infrastructure has been available for the last couple of years, and there is a growing momentum within the UC industry about the role virtualization can and will play in the future. The key is to consider the options today and ensure any projects put in place the building blocks that will enable full exploitation as and when both technology and business needs demand.

Realizing Value

There are significant steps that organizations can take today to deliver quantifiable value from an integrated IT and communication strategy. Underpinning the creation of a strong foundation is the adoption of a Service Oriented Architecture, with Service Oriented Communications. This 'building block' approach to creating an infrastructure will enable organizations to plug in solutions and integrate UC into business applications as required.

For example, a customer service agent using a UC-enabled CRM system, is able to embark upon a call, video conference or IM from within the application, contacting customers and pulling in available expert resources as required to back them up. This same flexibility and ease of collaboration is available for non-office scenarios, including remote workers, home workers and mobile workers.

The objective is to move away from a traditional handset and many disparate applications to deliver mashed up services over thin client technologies in a number of new ways to meet the needs of each specific user. Applications can then be accessed from any location via a number of thin client devices and at multiple locations and data center, either within the enterprise or private cloud or from outside the enterprise by public cloud service providers. New mashups can incorporate content from both private and public clouds.

Other benefits of this model include improved security and central identity and access management. Also rapid provisioning of new equipment: it is easy to provide new communications and IT resources to company joiners quickly; while the elastic nature of the cloud enables an organization to scale up and down in line with operational requirements.

So what building blocks can enterprises put in place today? Assuming that most are already looking at virtualization projects to drive down costs, it is important to also consider communications and collaboration projects at the same time. For example, a desktop virtualisation project should also embrace all the requirements of a home worker, from email to applications as well as communications and collaboration capabilities, and deploy these as an integrated solution rather than a collection of separate tools.

Indeed, it doesn't matter whether the enterprise is prioritizing virtualization or UC projects. The key is to understand the potential offered by a unified solution and put in place the service oriented technology that will enable easy integration to deliver tailored role-based solutions to end users and act as an enabler for business process improvement.

Those organizations that continue to evolve along two, distinct paths will face either a complex and costly integration project in the future or will need to start again with a new solution. Either way, the costs will be higher and the delay to business innovation significant.

Roadmap to success

To achieve the end goal of a user population empowered by tailored mashup applications that deliver communications and collaboration, organizations need to evolve along a clearly defined path. The majority have already integrated voice and data networks and are reaping the benefits of VoIP with reduced costs associated with technology deployment and support.

Organizations can then leverage this converged platform to improve productivity using unified communications. With a single infrastructure it is then easy to adopt call routing and use presence information to improve communications. However, this is still an appliance-based, infrastructure -focused approach, as distinct from a business applications focused approach.

The next step is to use Service Oriented Communications to embed communications within the application suite, enabling fundamentally key tools such as IM, presence, voice and video conferencing and collaboration to become available as core functions of the application portfolio.

In parallel, desktop virtualization projects should build in a requirement to deploy a software-based SOC capability as part of the virtualized solution

Understanding the Vision

With the right building blocks in place, organizations will be able to provide users with access to information, voice applications and collaborative tools at any time and from any location, home, office or mobile. Critically, this rich user experience will be integrated, providing access to presence, IM and conferencing, for example, from within a core application, and it will be tailored to meet each user's specific requirements.

For businesses this model will not only provide significant productivity improvements but also enable the flexible working practices that are becoming essential for both cost effective and sustainable business.

This model is particularly appealing for organizations looking to increase/empower home workers. The drive towards flexible working, reduced premises costs and the need for business continuity is prompting more companies of every size to consider home and flexible working. But many fear the security risk associated with providing laptops or PCs to home workers. From using memory sticks to download information accessed on the corporate network via a VPN to the risk of laptop theft, home working represents a security concern.

Furthermore, this model can only deliver if workers are able to be productive at home with access to the same communications tools and applications available in the office. With the rise in thin client desktop virtualization and UC, organizations now have access to functional yet secure solutions.

However, too often employees are being provided with just the basics of VoIP via softphone, for example, that can only be used to make calls. As a result organizations are missing out on the rich and sophisticated unified communications applications, including presence, messaging and collaboration. They are failing to deliver tailored applications that include communications and collaboration tools to maximize user productivity.

The technology also offers huge potential benefits to organizations with highly distributed information workers – for example, across the government and retail sectors. The drive for workforce efficiency, combined with a need to consolidate infrastructure to reduce management costs, is leading organizations towards unified communications and collaboration.

By combining highly resilient communications platforms that combine collaborative tools with the core business application, organizations can fundamentally improve productivity and enable far more effective working across remote sites, while also driving down the costs traditionally associated with managing a distributed infrastructure.

Indeed, the improvement in collaboration will also enable organizations to significantly reduce the costs associated with the mobile workforce – most notably travel costs but also communications cost through fixed-mobile convergence. Reducing unnecessary travel and providing collaborative access with remote experts also improves the productivity of key sales and operational personnel.

Conclusion

Spiralling data center costs may be driving organizations towards virtualization and cloud computing but the opportunities extend far beyond cost cutting. By integrating unified communications and collaborative tools with virtualization and the cloud computing model, organizations can achieve rapid cost-savings, improved worker efficiency and productivity, increased security and significant business transformation.

Building on an efficient, effective communications and IT architecture to deliver integrated and intuitive communications and collaboration tools to workers will enable organizations to meet requirements for business continuity while delivering quantifiable improvements in end user productivity and efficiency that will provide long term corporate value.

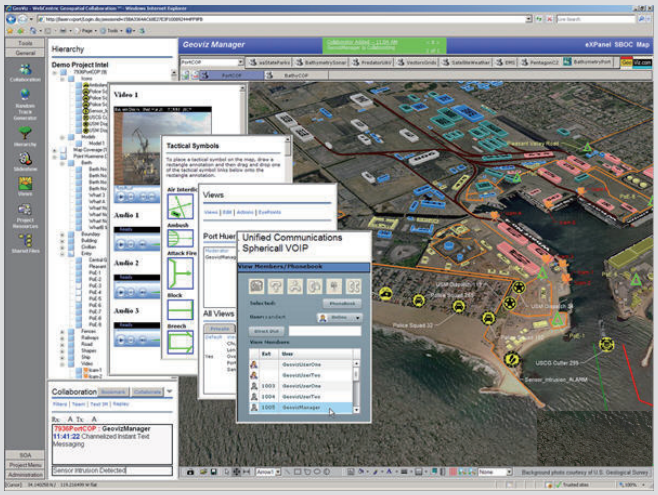
Communications-Enabled Applications: An Example

GeoViz is an example of a consolidated application that uses a service oriented architectural framework to bring together diverse applications components including communications technologies, software applications, and even publicly available information, and allowing users to define and obtain need-based content.

Geospatial collaboration has become one of the hottest areas for government IT organizations to provide a more complete emergency response. Designed to be used by military, security, safety and disaster management officials, GeoViz provides 2-D, 3-D and 4-D mapped views of geographic areas. This also has other applications such as vehicle fleet management.

The collaborative views enable users to create multiple collections of map and multi-media data for interactive review with team members. Users can share files, while the interactive mapping integrates imagery, vectors, map, video, text and collaborative annotations.

By combining the application with service oriented communications provided by UNIVERGE Spherical, users have access to shared VoIP, instant messaging and on demand conferencing. Users can also access public information, such as weather patterns, to further improve risk assessment in the event of a forest fire or chemical explosion, for example. The result is rich collaboration among first responders and emergency personnel that helps to ensure emergency resources are deployed efficiently.



About NEC Corporation

NEC Corporation is one of the world's leading providers of Internet, broadband network and enterprise business solutions dedicated to meeting the specialized needs of its diverse and global base of customers. NEC delivers tailored solutions in the key fields of computers, networking and electronic devices, by integrating its technical strengths in IT and Networks. The NEC Group employs more than 150,000 people worldwide. For additional information, please visit the NEC home page at: http://www.nec.com

Corporate Headquarters (Japan)
NEC Corporation
www.nec.com

Oceania (Australia)
NEC Australia Pty Ltd
www.nec.com.au

North America (USA)
NEC Unified Solutions, Inc
www.necunifiedsolutions.com

Asia
NEC Corporation
www.nec.com

Europe (EMEA)
NEC Philips Unified Solutions
www.nec-philips.com

Cat.No. G01-09090003E