

White Paper

UC: Mitigating the risk and reaping the rewards

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This white paper helps you identify some of the risks associated with deploying Unified Communications so you can mitigate and manage them to achieve the best possible outcomes.



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Contents

Opening the Door to Unified Communications	04
What is UC?.....	04
UC Rewards	04
UC Risks	06
Mitigating Risk	06
UC Planning and Design	07
Correlating Network Performance and Voice Quality	08
Managing Virtualized Servers	08
Conclusion	09
Prognosis VoIP Monitoring Checklist	10



Opening the Door to Unified Communications

If you've already taken the plunge and deployed VoIP or IP telephony you'll be aware of the benefits of further optimizing business processes and enhancing person to person, person to device and person to process communications.

However, once you look at further convergence and the possibility of placing more reliance on your network, you'll need to address the risks associated with the changes in these areas.

Failure or security breaches could damage your reputation, as well as possibly exposing confidential and proprietary information.

This white paper identifies some of the risks involved in deploying Unified Communications and makes recommendations to address them.

To begin with do you know what your UC goals are? And if you do, will your network infrastructure be capable of supporting increasingly converged communications?

It is critical to understand the requirements of the technologies, their impact on your environment, and how to deliver performance, consistency, scalability, and integration with your business's needs

What is UC?

Unified Communications is an evolving set of technologies that include voice, video, Presence, mobility, TelePresence, and unified email, voice and instant messaging.

It can also encompass UC-enabled applications and services based on what the business's needs are. And like anything new it brings with it an inherent set of rewards, experiences, management requirements and risks.

UC Rewards

Although the UC requirements of almost every business will be unique, common anticipated benefits include reducing costs and latency. Streamlining end-user and customer communications and determining others' availability quickly, helps manage information flow and escalation more efficiently.

Improve communications and information flow

Speeding up communication response times, and locating subject matter experts is essential in decision making and acting upon instructions. Presence and instant messaging capabilities help workers find and communicate with one another efficiently and effectively. With this information, users can make more effective communication choices. Enabling users to approach colleagues at the right time with the right mode of communication contributes to a more productive work environment. Contact management options let users control what information others can see, such as whether they are working from home, at a client's site, or unavailable.

Users can also choose to manually set their status and add a personal note to provide colleagues with more information about their status, such as 'reviewing annual report' or 'urgent proof reading for 3pm deadline'. With more control over availability and contact information, users can ensure that others know the best way and the best time to reach them.

Unify different message types

UC enables unification of message types like e-mail, voice-mail, faxes, and calendar events in one inbox. Depending on the client you select you may have the option of prioritizing and color coding voice-mails and faxes in the same way as e-mail messages.

For example Microsoft Exchange Unified Messaging enables users to play a voice message from the reading pane using Microsoft Windows Media Player, which is integrated into an Office Outlook 2007 mail form, or from the message list. Users can listen to voice messages in Outlook, and view all voice mail in one location.

Voice and fax messages can be distinguished from e-mail messages by using new icons, including unique notifications for new e-mail, voice, and fax messages. Users can determine whether a voice message has already been played, add annotations to a voice mail message in a text box and reply to a voice message with an e-mail message when the sender's contact information is known.

As Microsoft Exchange retains e-mail, voice-mail, and faxes in a central archive it can resolve many of the compliance issues businesses currently face.

Address your travel budget crunch

To reach important decisions quickly many people would prefer to stay up during the night for an inter-continental TelePresence meeting rather than travel on a long-haul flight. As well as helping people feel more connected to the distant environment, there are also the benefits of reduced travel budgets, reduced lost time, jetlag and impact on family life. TelePresence may also help cross language barriers by making it easier to communicate using physical cues like hand gestures.

Lower hard costs - locations

Using collaborative technologies, such as presence, soft phone clients, and video conferencing, some organizations can expand operations and geographic reach without incurring the costs of additional office infrastructure, reducing office space per employee and improving space utilization.



Lower costs - hardware

Virtualization has already transformed the way business applications are deployed in data centers and UC managers are no different in wanting to transform the way they deploy and deliver UC. But will this model work for Unified Communications? Introducing virtualization raises the bar on performance and accentuates the challenges of delivering quality VoIP and UC services because of the need for real-time host and guest performance. Until quite recently, real-time applications in virtualized production environments weren't an ideal combination, but with maturing technologies and major vendor support, including Avaya, Cisco and Microsoft, it is now more of a reality.

Increase productivity and business process integration

Users get access to new, high-quality IP communications applications sooner, increasing their productivity and improving business process efficiency. The real benefit of UC comes from better interaction between company employees and from closer integration of communication and collaboration.

Enhanced communications between customer service and subject-matter experts through presence, call forwarding, escalation and other tools means customer issues can be resolved more quickly, reducing the cost required to field calls and handle customer interactions.

End-users also benefit from simpler and more intuitive interfaces, particularly when it comes to managing telephony. Many of today's handsets are non-intuitive and it can be difficult to add another party to a call or initiate a conference. The ability to easily set up a conference or add another party, transfer a call and so on increases productivity and reduces the risk of losing callers or inadvertently terminating calls.

UC Risks

The dramatic, rapid convergence of communications, collaboration and social media, accompanied by new cloud delivery models, poses a critical challenge for CIOs and planners. Any changes to technologies or strategies raise issues about security and resilience.

To adopt UC successfully, an enterprise must address the risks associated with convergence to limit the chance of failures or security breaches that could damage a company's reputation, not to mention risking the vulnerability of sensitive information. Unfortunately the list of risks is long and includes disrupted communications systems, failure to plan properly for capacity, inadequate security, and the possibility of losing customers and its potential revenue impact.

It is critical to understand the requirements and interdependencies of UC technologies, their impact on the organization's environment, and how to deliver performance, consistency, scalability, and integration with the business's needs. There are risks around planning, designing, implementing, operating, expanding, consolidation, redundancy/failover, as well as disaster recovery.

People affected by failure are both users of the technology as well as the people whose job it is to keep it running.

Mitigating Risk

Assessing Network Readiness

It's a good idea to benchmark your network now to see if it is UC-ready. Certainly most centralized corporate IP networks may have sufficient bandwidth to handle the load but it's often remote offices that will need attention. They may have old cables, switches, endpoints and even power that isn't quite ready for a complete UC loading during peak times of the day. Assessing the readiness of your existing network infrastructure to support Unified Communications is essential in mitigating risk. A network assessment will identify where improvements to your network configuration and design need to occur and will help with capacity planning.

To establish what needs to change you need to establish a baseline. This can be done by collecting data on a regular basis and then summarizing it over a week, a month, year and so on. Customizable reports are useful in this regard and let you establish existing trends as well as plan for future capacity.

As far as VoIP is concerned this includes utilization and capacity of voice stream paths, PBXs, gateways, trunks, transcoders and DSPs. In addition, if you're considering SIP trunking as part of the evolution from VoIP to UC you'll also need to revisit the basic question of your network's capacity to support the extra traffic that will flow across the WAN to the SIP trunk or trunks.

You may well find that you are wasting time and money with legacy PRI systems and over-trunking. By collecting information over regular periods you can easily see how much spare capacity you have – that you are probably paying for but not using. Having this type of information means you can make informed decisions about SIP trunk sizing and network capacity.

It's also important to establish the busy hour. This is the sliding 60-minute period during which the maximum total traffic load in a given 24-hour period occurs. In this way you can plan for busy-hour activity across all PBXs, irrespective of vendor platform.

The greater your aversion to risk, the longer you should allow for implementation. The more complex the environment, the harder it is to troubleshoot problems and the more people are affected. Deploying UC in phases can mitigate this risk.

A plan to implement the recommendations should address hardware, software, traffic, capacity, network design, IP addressing, quality of service, availability, scalability, security, cabling, power, and existing network services.

UC Planning and Design

The basic structure of your LAN will go a long way to eliminating or even *causing* problems! Poorly thought out or legacy designs can affect both voice quality and signaling. It's no secret that the top issues affecting VoIP call quality are often not caused by the application itself, but are related to its configuration, conflict with other applications for network resources and misalignment between VoIP and network design.

Areas to check during UC planning include:

- Ensure sufficient prioritized bandwidth for voice traffic
- Check configuration of QoS on switches and routers
- Provide sufficient bandwidth on alternate routes
- Ensure sufficient gateway resources are available to accommodate call volumes
- Manage jitter
- Monitor location bandwidth to ensure quality VoIP to all locations
- Configure sufficient DSP resources for transcoding and conferencing

Planning for Quality

If you're investigating ways to move to VoIP and Unified Communications, what quality do you expect to achieve? In the early stages of VoIP deployment, network architects often aren't aware of previous calling patterns, which means that network links can become congested, or that voice traffic does not receive the priority it needs.

Delayed voice traffic or non-prioritized traffic can result in significant quality loss. So it's common practice to take a best guess at capacity. The attempted remedy is often to purchase more bandwidth in small incremental chunks. However, this approach may still not accommodate the delay-sensitive, real-time demands of voice. A better approach is to accurately measure existing call patterns to determine what capacity may be required before adding more bandwidth. Your carrier may be able to provide this information to assist you with establishing capacity to support busy hour requirements and the use of the WAN to route calls to PSTN gateways and other locations.

UC Packet Prioritization

Making use of traffic prioritization techniques such as QoS marking for audio, video, chat and other services is the best way to make sure UC traffic is routed above other network traffic. Once voice streams are identified, you can analyse corresponding network performance on the voice stream path, in real time or historically. This will then provide the insights you need to review QoS settings for any link that is experiencing latency and resolve voice quality issues.



Managing Multiple Vendors' UC Technologies

As any UC ecosystem is likely to incorporate technologies from multiple vendors it will almost certainly require that IT personnel and end-users must learn new services and applications. Unfortunately this means that you may have to use the management tools that come with each of them, and this will prevent you from having a complete view of the entire UC ecosystem.

A far better management solution is using a single interface to save time, resources and training which means there's no need to become an expert on every component's tool.

Unified management reduces resource overhead and training requirements and gives you a consistent and consolidated view of performance, usage and capacity across the entire UC ecosystem. You can mitigate as well as manage risk by having a single management solution for distributed systems, VoIP, UC and virtualized servers.

This also means you can reduce the cost of training, as well as build skills-redundancy into support teams, systems and processes, leaving staff free to deal with UC issues rather than spending time learning different management tools.

Correlating Network Performance and Voice Quality

Slow network links delay voice traffic. A link can be slow for many reasons, and congestion can be one of them although not necessarily the only reason. Whatever the cause, a slow link can delay voice packet delivery resulting in poor voice quality. So what will help you identify slow network links?

Viewing a network map that is built from call activity and regularly updates link status and latency will prove invaluable. As devices involved in the call are discovered, classified and monitored, slow links are identified, allowing you to focus on the devices involved in affected voice streams.

You can then automatically correlate slow links on the network map with all devices involved in the calls. You can drill down to view details of the actual voice streams, and compare the latency, packet loss and jitter experienced on any call. What changes in QoS policies and infrastructure will this dictate? And how will the need for scalability (more users, more devices, more applications and service levels) be met in the future?

To answer these questions you can use performance history to review achieved levels to date. Then you can put measurement, management and reporting in place to manage projected growth and the introduction of additional UC features. This will enable you to plan for increases in capacity as well as support future bandwidth-hungry applications like video, shared video, multi-screen video and the latest immersion video technology.

Managing Virtualized Servers

Many organizations are now deploying virtual servers to minimize their hardware footprint, energy costs and create administration efficiencies. However server virtualization brings its own unique challenges.

When hardware is virtualized, with multiple guests acting as individual servers it's critical to know that it's up to the job. The physical elements increase in criticality because they're carrying a greater load and more will be asked of them. When a guest running a UC application makes a request in real time it is without regard for other host activity. Hence both guests and hosts can come under performance pressure. With this type of environment, problems can exist in any one of the layers. It can be within the physical hardware or the virtual machines as well as the applications themselves. Because of this, problem detection needs to be multi-layer, multi-vendor and multi-technology.

As introducing virtualization raises the bar on performance it accentuates the challenges of delivering quality VoIP and UC services because of the need for real-time host and guest performance. A rich collection of UC and virtualization management metrics for the host, guests and UC applications will give you a high-level view as well as the granular detail you need to monitor and troubleshoot individual components. This information helps you mitigate the risk of deploying virtualized UC.

The Metal

At the bare metal level you should consider monitoring voltage, electrical current intensity, fan status, temperature, LEDs and power supply units. This is particularly important when one physical server is supporting several virtual machines. If things go wrong, what will the business impact be if you lose your voice or presence service or experience degraded voice quality?

The right decisions need to be made quickly because more people or processes are affected. If mean times to identify, convince and repair are not rapid, the overall quality of the user experience will suffer and service levels may be breached.

If you're wondering what mean time to convince (MTTC) actually means, it's an easily understood concept. MTTC is the time it takes the network team to convince the server, applications, or security team that the network is not at fault for some problem the other team sees. It's been observed that MTTC is a major component of mean time to repair (MTTR). In some cases up to 60 percent of the MTTR is due to MTTC.

The Host

The host's only task is to run guest operating systems, and accept and arbitrate resource requests for guest virtual machines (VMs). Host performance, problem identification and resolution can be highly complex. To view the impact of applications and guests on host performance you need to monitor key host performance metrics like CPU utilization, memory consumption, disk and network usage. Being able to compare host and guest metrics side by side is invaluable in being able to identify and address any resource contention.

The Guest

The consolidation of multiple applications onto fewer servers may lower hardware provisioning, configuration and maintenance costs, but it can also increase the risk of hardware failure. Sharing hardware resources between applications running in guest machines creates a need to monitor resource contention between guests and across CPUs, memory and disk interfaces.

It will be very useful in managing availability and performance of UC applications if you can see the top guests by resource consumption as well as the amount of time each guest waited for physical CPU cycles. As host machines can support many guests, being able to identify performance outliers via flat lines or spikes will allow you to select a guest from hundreds or thousands of other guests based on its performance. This will help you mitigate the risk of resource contention that can cause performance bottlenecks and affect the value of UC to your users.

Finally it's a distinct benefit if you have a choice of combining vCenter Server metrics with more granular information collected directly from each guest. You'll then be able to accurately monitor the host's performance and view deep drill down process and application level information on a guest by guest and host by host basis.

Obtaining Feedback

How will you know there is a problem with your unified communications services? In some cases, it is obvious: there is a complete failure! However, in most cases, the problems are less obvious and can include conditions that steadily degrade over time, impacting the business along the way. Feedback into unified communications services and applications performance allows you to know every component is functioning correctly and that service levels are being met.

When things do go wrong you need to know that alerts will be routed according to subject and importance and business hours of different groups globally. Having a choice of multiple, customizable destinations will enable problem escalation and integration with enterprise management software like HP OpenView and IBM Tivoli. To avoid alert floods it's useful to be able to choose from highly customizable event and time parameters that will allow you to manage call, voice and UC quality, PBXs and soft switches, route patterns, endpoint registrations, video and telepresence performance.

Security

It's imperative that security measures be implemented as part of the deployment, not as an afterthought. For example, SIP calls can be hijacked and redirected to the wrong number, another site, used for toll fraud or worse. Calljacking also includes the 'injection of hate, explicit, or other undesirable content'. The impact of just calljacking alone can likely lead to litigation if allowed to continue without adequate corporate security or due diligence.

Conclusion

Unified Communications for your business is tied to the evolution of the supporting technology. Once you've defined your UC goals and the associated risks, it is time to choose the technologies that enable them and design appropriate safeguards for their delivery.

Prognosis has been managing mission-critical business systems for over 20 years. With a single interface to manage VoIP, UC, physical and virtual servers it helps you manage the real time requirements of UC technologies.

In this way you can manage their impact on your organization's environment, and deliver performance, consistency, scalability, and integration with the business's needs.

Prognosis VoIP Monitoring Checklist

Real time monitoring

This is critical for VoIP so you can monitor voice quality and the factors that can impair it. This helps you to ensure availability and quality of VoIP as an integral part of UC services and applications delivery.

Forensic Replay

Prognosis delivers the forensic capability to go back to a point in time and diagnose issues that occurred prior, during or after that point. It also offers the flexibility to collect information at a defined interval, such as every five minutes, and then automatically summarize it to view the trends over an hour, a day a month or a year.



Proactive Insight

Prognosis empowers a team by providing proactive visibility so problems can be prevented. For example, a gateway may not have failed completely but not all components required for a route pattern are available. Prognosis will alert you to the failure of one or more components that are essential for the gateway to function as a complete entity.

Intelligent Automation

Prognosis can automate actions to maximize availability and reduce operating costs. It does this by monitoring your entire UC ecosystem for changes in performance, availability and quality over a defined period.

If any changes breach defined operating conditions, Prognosis will alert according to location, group, date, time and severity. This is important to avoid alert floods. Prognosis will then automatically execute rules to rectify a problem and alert administrators that it has attempted to do this, together with the outcome of the automated action.

Multi-platform support

Prognosis allows you to compare QoS and Service Level Agreement performance across all monitored platforms. It also ensures long term ROI regardless of your UC platform evolution. These are key differentiators when compared to vendor-supplied management tools that only monitor a single platform.

Proven Scalability

Prognosis' unique architecture enables it to scale to manage hundreds of thousands of endpoints. As well as its scalability it provides highly flexible management options. This means that you can manage your UC ecosystem from any location as well as roll up monitored information to one or more central locations.

Broad Extensibility

Prognosis leverages many APIs, including WMI, as well as its unique PACE toolkit to provide visibility to the entire UC ecosystem. It also comes with a rich set of tools that allows users to create and customize their own displays, dashboards and reports. In fact, users are provided with the same toolset that Prognosis' own design teams use.

In this way system administrators can design custom dashboards to suit the needs of individual stakeholders and ensure the information they need is rapidly delivered in real time. To support historical trend analysis, this same information, in equivalent granular detail, or in custom summaries provides operational and business-level reports.

Proven Experience

Prognosis has been a global leader in VoIP performance management for 10 years. Customers in more than 50 countries, including many of the world's largest organizations such as stock exchanges, banks, credit card companies, airlines and universities rely on Prognosis.

Complete UC Ecosystem Visibility

As complexity increases so does the time it takes to identify problems, convince the correct team to own the problem, take action and achieve resolution. Prognosis provides complete visibility into your UC ecosystem allowing you to minimize the overall mean time to repair (MTTR).

It does this in several ways –

- Provides a single pane of glass to monitor all vendors' UC platforms' performance
- Alerts you wherever you are to problems across your entire physical and virtual infrastructure
- Allows you to correlate underlying network performance with voice quality, trunk and server utilization and capacity, gateway performance and availability
- Enables custom designed dashboards and reports to provide vital and relevant information to stakeholders and groups



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