Integrated Research

White Paper

Managing Multi-Vendor UC and Collaboration in a Virtual World:

From the Metal to the Cloud™

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This white paper from Integrated Research discusses how UC Managers can get the best of both worlds by managing virtualized servers and UC through a single pane of glass.

Contents

White Paper on a Page™

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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. Burdened with the challenge of supporting a medley of servers, operating systems, and applications acquired during numerous purchasing cycles, many organizations are looking to simplify and optimize their IT operations. One of the ways they can achieve this is through server virtualization.

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, virtualized UC is now a reality.

Taking steps to virtualize UC applications and minimize hardware costs, simplify implementation, support easy expansion and disaster recovery makes good sense. However, managing Unified Communications is highly complex with many components, vendors and parameters to incorporate.

That's why metrics across all layers from the host, guest and the network to the UC applications themselves are required. In this way you can be confident that all parts of the virtualized ecosystem are functioning correctly. Enterprises and service providers alike will benefit from a real-time view into Unified Communications services and applications performance.

As UC moves into the cloud where clients pay for services only as needed, service providers will benefit from specialized management to support service delivery and meet service level agreements. Customers will benefit from having access to a set of remote resources and can avoid purchasing, installing, and maintaining hardware that depreciates and is often significantly under-utilized.

If businesses choose to deploy and manage virtualized UC in house as a private cloud or cloud-like service they'll benefit from much the same management approach as service providers. This is because measuring, monitoring and reporting on cloud performance is based upon the end users' experience and their ability to consume resources.

A truly integrated management solution providing high-level and deep drill down metrics into the performance, availability, capacity and quality of the host, guests and applications will enable service delivery insight for private and public clouds alike.

Read on for more information about how Prognosis can help you manage your virtual environment and UC ecosystem through a single unified view from the metal to the cloud.

The Metal

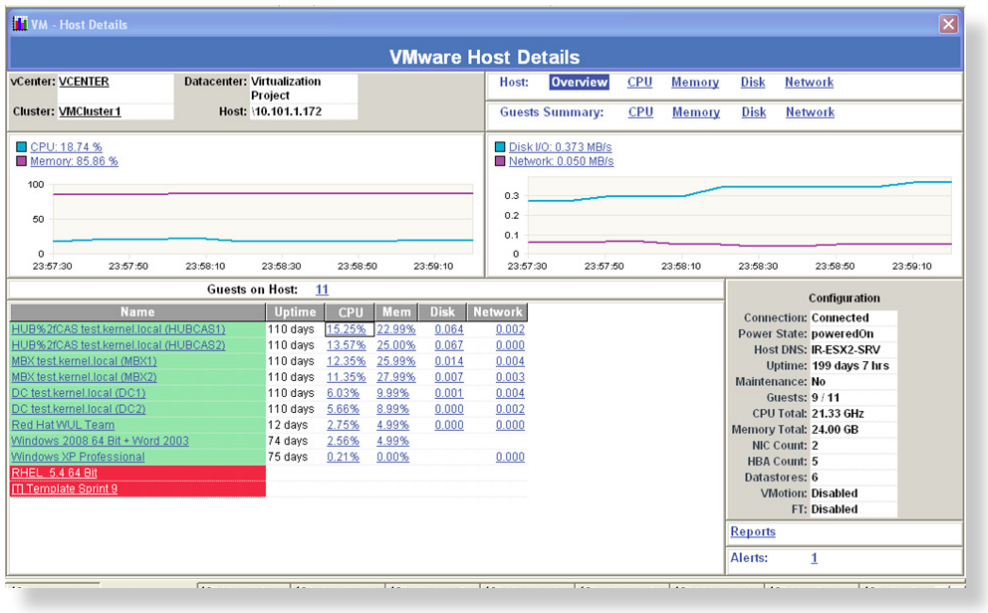
Hardware implies permanence and inflexibility. Metal a little more malleability. Software has the ability to transform both. You can put an entirely new program in the hardware and create an entirely new experience for the user. This is the way it is with virtualization.

But with this transformation, the physical elements increase in criticality because they're carrying a greater load and more will be asked of them. 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 can be breached.

When hardware is virtualized, with multiple guests acting as individual servers it's critical to know that it's up to the job. When a guest running a continuity-critical 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. 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.

The Host

A low-level virtual machine manager, also known as a hypervisor, enables the server hardware – the metal described above, to function as a host. Once the hypervisor is installed, its only task is to run guest operating systems, and accept and arbitrate resource requests for guest VMs.

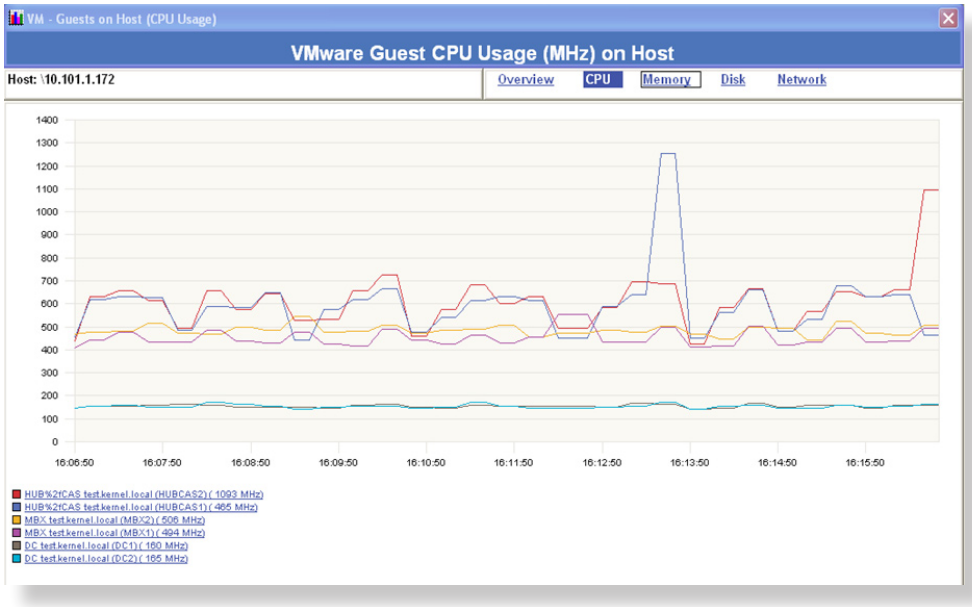


To view the impact of applications and guests on host performance you need to monitor key host performance metrics like CPU utilization, memory consumption, disk and network usage. Problem identification, analysis and resolution can be highly complex so comparing host metrics side by side is invaluable in being able to identify and address any resource contention.

In this way you'll be able to easily recognize if a particular VM is taking too many of the host's resources and affecting other VMs' performance. You'll be able to rapidly isolate the component at fault, and avoid finger pointing between different support teams.

As well as troubleshooting, monitoring usage in real time helps deliver the economic benefits of reduced purchasing, installation, and maintenance of frequently under-used hardware. Capacity planning reporting allows administrators to consolidate and optimize existing servers and increase virtualization density, while ensuring there is room for growth. Private and public cloud providers alike can better predict monthly operating expenses rather than purchasing and deploying additional capital assets.

However these benefits must be carefully managed to ensure that cost rationalization does not impact the real time requirements of VoIP and UC. As such, it's vital to have access to flexible visualizations that reflect the business impact of the applications should they experience latency or fail.

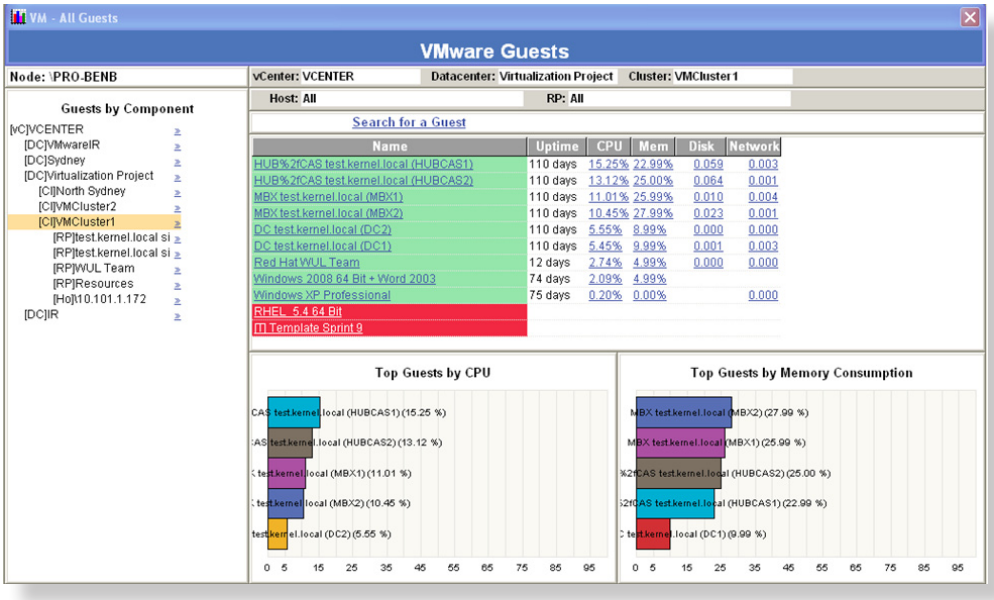


The Guest

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.

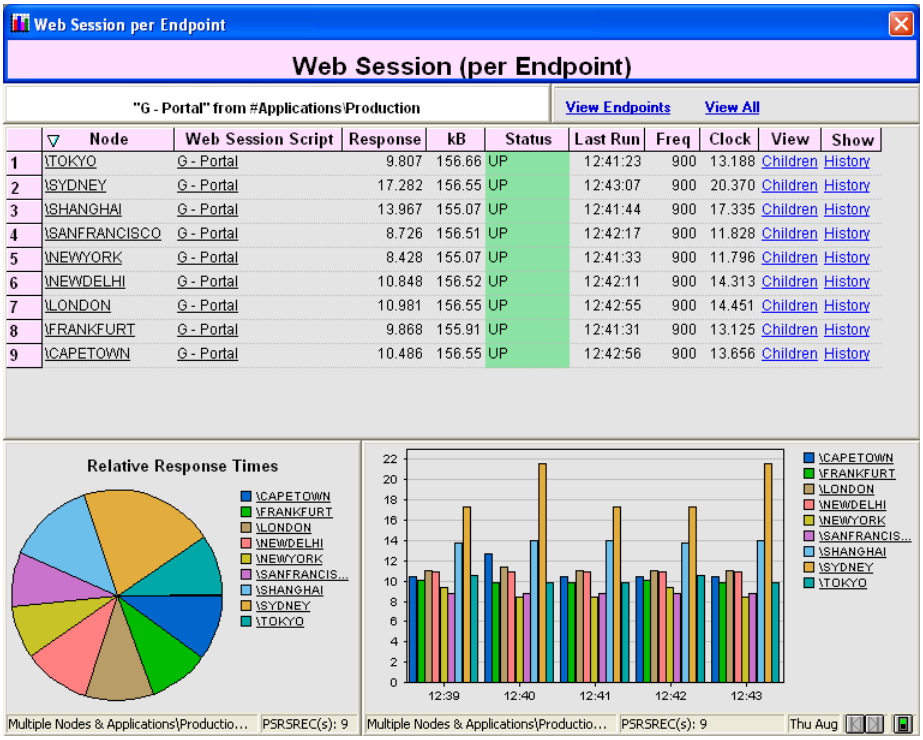
You'll want to see the top guests by CPU, disk use and memory consumption as well as the amount of time each guest waited for physical CPU cycles. Clicking on a flat line or spike to identify a particular guest will mean you can select it rapidly without scrolling through a list of hundreds or thousands of guests. Once you've selected the guest, drill down capabilities will help identify 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.



The Applications

The applications that can be found in a UC solution often need to be highly aware of each other. In direct contrast, the VMs they run in must not. Fortunately the deliberate convergence of communications technologies can co-exist with the equally deliberate separation of virtual machines. That is not to say that the applications themselves need not be aware of the other servers, but there must be no blurring or overlap between the virtual servers themselves.



	Node	Web Session Script	Response	kB	Status	Last Run	Freq	Clock	View	Show
1	\TOKYO	G - Portal	9.807	156.66	UP	12:41:23	900	13.188	Children	History
2	\SYDNEY	G - Portal	17.282	156.55	UP	12:43:07	900	20.370	Children	History
3	\SHANGHAI	G - Portal	13.967	155.07	UP	12:41:44	900	17.335	Children	History
4	\SANFRANCISCO	G - Portal	8.726	156.51	UP	12:42:17	900	11.828	Children	History
5	\NEWYORK	G - Portal	8.428	155.07	UP	12:41:33	900	11.796	Children	History
6	\NEWDELHI	G - Portal	10.848	156.52	UP	12:42:11	900	14.313	Children	History
7	\LONDON	G - Portal	10.981	156.55	UP	12:42:55	900	14.451	Children	History
8	\FRANKFURT	G - Portal	9.868	155.91	UP	12:41:31	900	13.125	Children	History
9	\CAPETOWN	G - Portal	10.486	156.55	UP	12:42:56	900	13.656	Children	History

Therefore UC applications' performance management requires a blend of insight to both physical and virtual environments. It should be able to leverage traditional collection methods as well as state of the art web services and SIP events to provide voice quality, device, performance and availability statistics.

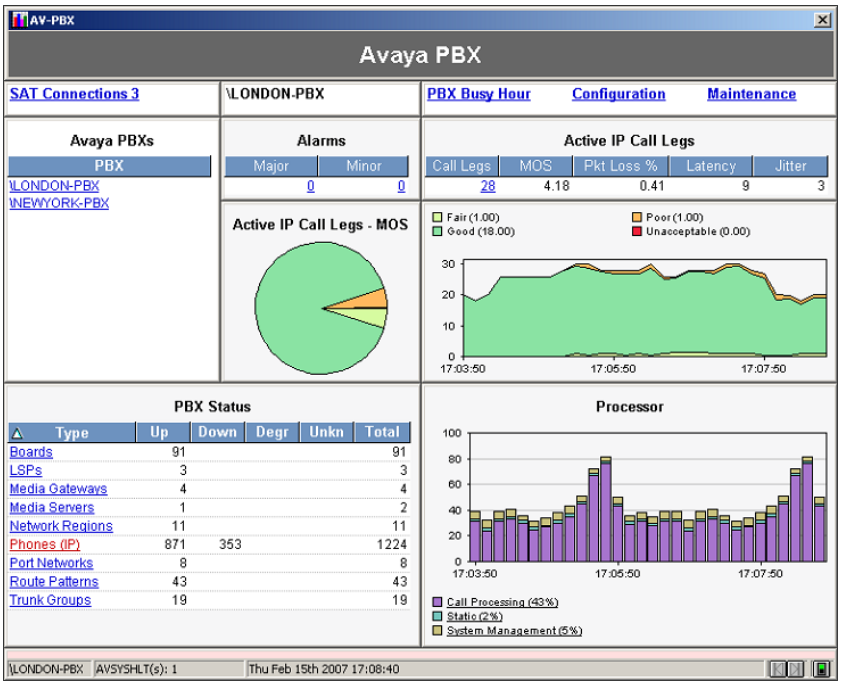
It should also enable you to correlate VoIP quality with network and virtualization performance.

This helps you identify bottlenecks and control communication costs by meeting and optimizing UC requirements as well as reducing server costs through virtualization.

An important aspect to remember when managing applications is the difference between quality of service (QoS) and the user's quality of experience (QoE). From a technical standpoint you need to manage the underlying infrastructure and service delivery.

What matters to the user however, is that they can enhance their productivity, save time and be more efficient through using Unified Communications.

As UC connects people, information, and teams, the underlying application technology performance and its management should not be apparent to the user. For them it should simply enable effective collaboration and quality communication.



The Cloud

As UC moves into the cloud where clients pay for services only as needed, service providers will benefit from specialized management to support service delivery and meet service level agreements.

Service Provider's Perspective

Service level agreements for cloud computing are service rather than customer-based. Measuring, monitoring and reporting on cloud service delivery is based upon the end users' experience and their ability to consume resources.

As a cloud service provider you'll need to ensure that virtual IT for the on-demand enterprise is dynamic and secure, with scalable online storage to support the 'pay as you go' model, irrespective of high traffic rates. Quality of service depends significantly on your infrastructure and any impairments will affect the value of the service delivered to the client. The advantage you have through virtualization is that thousands of virtual machines and applications can be managed more easily. A unified customer-service management dashboard will help you view virtualization performance for hosts and guests as well as delivery of applications, like voice, presence, email and other UC components.

Monitoring network traffic, host and VM performance will help identify any bottlenecks, together with high I/O usage and long wait times, which might be caused by congested server connections, or between servers and storage. As a provider you need to be able to measure, manage and report on your service level KPIs otherwise it won't make good business sense to guarantee them.

Proactive performance monitoring enables hardware or configurations to be modified if performance doesn't meet contracted service levels. A rich collection of host, guest and application metrics enables you to identify performance outliers and capacity issues. Data portability and flexibility – including advanced summarization, export, and integration capabilities enable you to establish trends in usage and performance, which will help match resources to customers' needs. Alerting via thresholds helps you map and implement SLA capabilities, and allows for complete integration into enterprise or service provider alerting and reporting infrastructure.

Be in the know

Positive feedback

If you're able to receive regular positive feedback, you'll have confidence that all parts of your virtualized UC ecosystem are functioning correctly. This type of feedback also lets you see how systems are performing during the busy hour, as well as at other peak times. This knowledge helps you with capacity planning, and proactive risk management. If you can create flexible visualizations that reflect the business impact of application performance you can prioritize upgrades, maintenance, remedial work and disaster recovery planning accordingly.

Heads up

Receiving a 'heads up' on any component experiencing stress, degradation, impending or actual failure puts you ahead of the curve. This may relate to an individual component or a physical or logical component group. For instance a gateway is considered degraded if one or more of its components is down. You'll need to know this ahead of further failures to ensure that backup gateways are functional and have the capacity to take additional traffic. In a UC environment a presence server may be experiencing capacity issues and you'll need to know if this is due to specific circumstances or is likely to persist and affect more people and applications as its capacity decreases further.

Requires immediate attention

When something fails, you may have been aware of its degraded performance and been working hard to put a resolution in place or it may have happened without warning. Ideally you will have received alerts that have been routed intelligently according to subject and importance, and have been sent to the correct group. The alerts may have come to the UC administrators directly via SNMP, and email or through integration with enterprise management software like HP OpenView and IBM Tivoli. Whatever the form and destination of the alerts and the cause of the problems, a centralized alert board will enable multiple users in many locations to take ownership of action items.

Although it's invaluable to be alerted by any metric or combination of metrics when threshold conditions are breached, administrators need to be protected from alert floods. This can be achieved if alert conditions are scripted with powerful intelligent rules and highly customizable event and time parameters. In this way a condition can trigger a rule, that can invoke an action, and if the action fails a further alert can be triggered. Users should only receive relevant alerts that are filtered by the conditions' criticality, and the event's time and location.

Customer's Perspective

Public cloud services

As a customer you'll expect to benefit from cloud computing by having access to a set of remote resources and avoid purchasing, installing, and maintaining hardware that depreciates and is often significantly under-used. It also eliminates the need to hire, train, and manage a skilled 24x7 IT staff. Changes that took days or weeks with physical servers can be done in minutes. In this way you can predict monthly operating expenses rather than depleting and under-utilizing valuable capital resources.

You can store large amounts of data from anywhere without worrying about maintenance. Data can be transferred from one server to another, without needing to worry about server types; for example data can move from Unix-based machines to Windows servers. Cloud computing service level agreements should also ensure there is no change in performance during peak times and allows your business to have on-demand servers available in minutes, with dynamic scaling, ensuring that you only pay for what you use, whether it's measured by the hour or gigabyte.

Private cloud services

If you choose to implement your own virtualized UC ecosystem you'll need to manage a complex environment with multiple vendors, technologies, and quite possibly versions selected over many purchasing cycles. It's likely to include a variety of servers, operating systems, and applications running in virtual machines. Because of this you'll benefit from much the same management approach as a service provider.

When compared to the public cloud this is a more expensive solution but provides more security and privacy and you'll have complete control of your data. You'll need to negotiate with your internal customers in the same way as between service consumer and service provider, which requires a common understanding about services, priorities, and guarantees.

You'll need to be able to measure parameters and enforce rules. A single pane of glass monitoring for VoIP, email infrastructure, UC, cross-platform and virtual servers in real time will help you meet and manage service level agreements. You'll be proactively alerted to status changes in UC infrastructure performance, so you can plan and execute timely remedial action.

Wishlist for Virtualized UC Monitoring

One management solution from the metal to the cloud....

that delivers real-time business insight to the performance of distributed UC components and business applications.

Create flexible visualizations that reflect the business impact of application performance

- Use a truly integrated management solution with an extensive array of out-of-the-box displays, including reusable components to create flexible views of the virtualized infrastructure.
- Have the ability to monitor the impact of UC ecosystem performance on service delivery.

Correlate guest, host and application performance

- Real-time multi-vendor performance monitoring for Cisco, Avaya and Microsoft UC to take the guesswork out of delivering high voice quality to the business and customers.
- A single interface to save time, resources and training so there's no need to become an expert on every component's tool.

Receive performance feedback and alerts

- Know every component is functioning correctly and service levels are being met.
- Route alerts according to subject and importance and business hours of different groups globally.
- A choice of multiple, customizable destinations that allow for problem escalation and integration with enterprise management software like HP OpenView and IBM Tivoli.
- Highly customizable event and time parameters to protect users from alert floods.

View into Unified Communications services and applications performance

- Manage a virtual UC environment with customizable high level views and deep drill down details.
- Manage call, voice and UC quality, PBXs and softswitches, route patterns, endpoint registrations, video and telepresence performance.

Monitor video, audio and web conferencing

- Manage the role of rich media in the UC environment.
- Monitor and manage bandwidth demands for video-streaming applications and conference activity.

Manage TelePresence quality

- Build reliance on TelePresence through superb image quality, distortion free voices and real time lip-synchronization.
- Interact with life-size images of people with real-time body language, who appear to share the meeting space as if at a table.
- Accurately present the ultimate nonverbal cue – eye contact.
- Manage TelePresence peripherals and see which devices are in use, which peripherals are active and how they are performing.
- Measure the load calls are placing on the network.
- Be alerted to any delayed, lost, duplicated packets or those experiencing jitter.

Ensure Presence Servers' availability

- Monitor Presence Servers' service status, resource utilization, capacity, bandwidth and usage in real time.
- Ensure servers can collect and publish presence information, so it can be shared as required.

Monitor Web Applications

- Monitor the health of vital web-based applications and services.
- Ensure good performance when users populate forms, click radio buttons and select hyperlinks.
- Measure response times, errors and delays.
- Test for conditions, availability and performance and the efficiency of HTML code and site navigation.

Manage Unified Messaging performance

- Monitor Cisco Unity and Microsoft Exchange servers' availability, performance, queue status, replication activity and events.
- Proactively manage, rapidly identify and resolve problems to maximize user and business communications.

Monitor Session Border Controllers

- Manage Session Border Controllers to see at a glance the total number of inbound and outbound sessions.
- View the SBC's status and network details such as maximum burst rate and latency.

Conclusion

Unified Communications and virtualization can deliver a strong partnership that will help businesses meet many of their cost savings, efficiency and communications goals. And by adopting UC services from the cloud, businesses can be insulated from many of the headaches they've endured in the past. UC managers can benefit from a computing model that adjusts to the growing business, add resources quickly, reconfigure applications, or deploy new software without up-front capital outlay.

Often, changes that took days or weeks with physical servers can be done in minutes. But for the service providers the headaches are potentially much larger to support the on-demand 'pay-as-you go' model, while trying to achieve the best ROI.

Prognosis real-time UC monitoring and virtualization management delivers deep insight to the entire stack with a single product, correlating host, guest and application performance monitoring, alerting and reporting. Scaling to the largest VMware environments, Prognosis provides information on the performance of individual hosts and guests, within clusters, and across the entire data center.

Detailed workload and process information helps providers evaluate guest load ensuring that guest activity is not too great for any host and helps cloud-based service-providers deliver the benefits of cloud computing to their customers.

Prognosis efficiently collects information about your virtualized environment and uses the information in completely customizable real-time displays with deep drill-down details, historical trend analysis and real-time alerts so you can plan, achieve and maintain your virtualization and UC management goals.

To find out more about how Prognosis can help you manage your Unified Communications ecosystem visit www.prognosis.com/voip-monitoring

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