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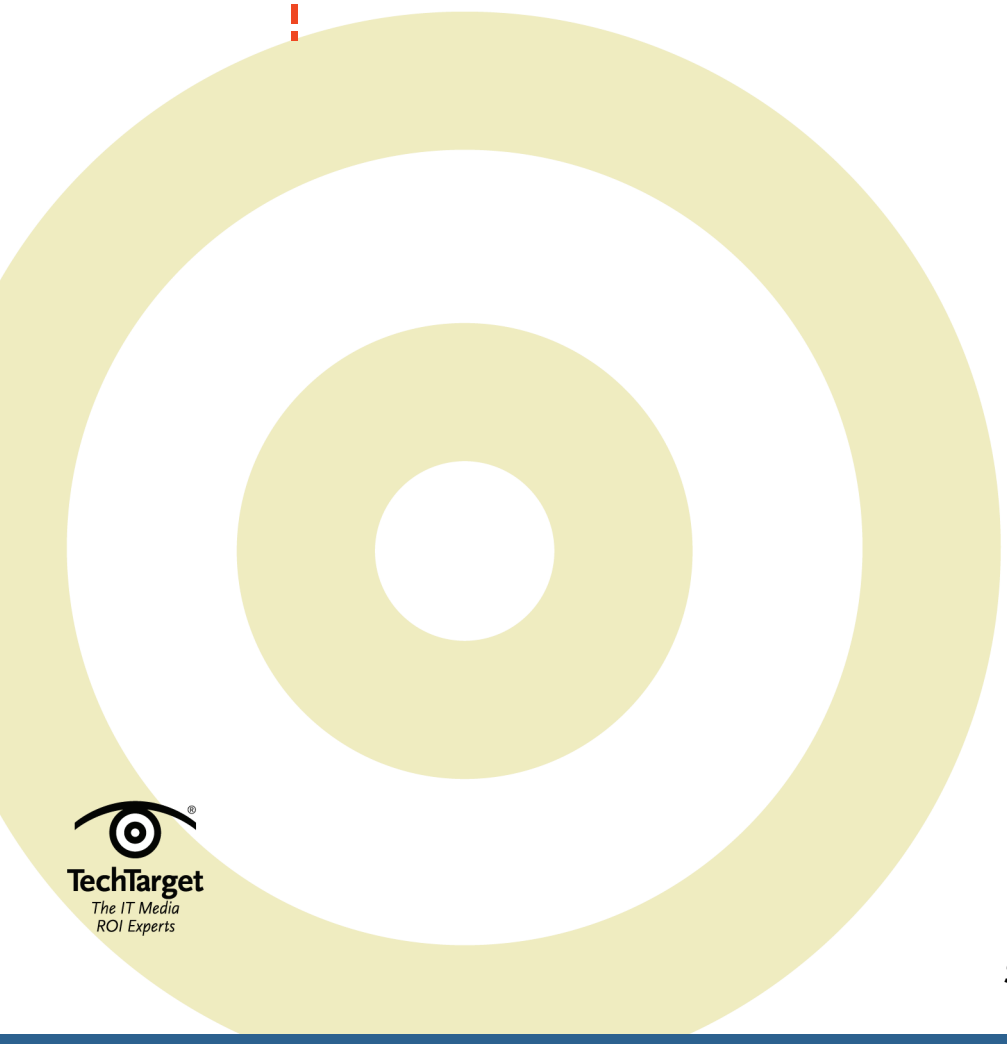
Unleashing the Power of System Center for the Entire IT Environment



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Unleashing the Power of System Center for the Entire IT Environment

By Rob Mallicoat and John Baker

BIOS

Rob Mallicoat is a Senior Solutions Architect with Quest Software. He is focused on Quest's Windows Management products supporting Identity Management, Compliance, SharePoint, System Center, and heterogeneous enterprise monitoring. For the last four years, Rob has worked with hundreds of customers and partners as a technical advisor for back-end infrastructure and management needs.

John Baker is an IT Pro Evangelist at Microsoft, covering Georgia and the Carolinas. He has been with Microsoft for more than 10 years. During his tenure in the TechEvents team, he presented more than 200 TechNet Events and many product launches including Office, Windows Vista, and Windows Server 2008. He has also delivered a variety of Webcasts with a focus on System Center Operation Manager and Configuration Manager.

This *IT Briefing* is based on a Quest Software/TechTarget Webcast, "Unleashing the Power of System Center for the Entire IT Environment."

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Unleashing the Power of System Center for the Entire IT Environment

Introduction

This briefing includes a review by John Baker of Microsoft's Infrastructure Optimization (Core IO), a System Center overview, and a review of System Center Operations Manager 2007. Rob Mallicoat then reviews Quest's capabilities for unleashing the power of System Center Operations Manager in heterogeneous environments.

Microsoft Infrastructure Optimization Model

The basic vision of Infrastructure Optimization (IO) is to help customers realize the value of their investments in their IT infrastructure and to turn the IT infrastructure into a strategic asset that enables agility within the organization. An optimized IT infrastructure is developed to IT standards. It operates efficiently and productively and helps ensure conformation to those IT standards. It supports cost reduction, security, and risk mitigation for the environment and for users. The IO model is most often used as a strategic tool, to help evaluate the maturity level of an organization's core technology infrastructure, whether it is management, security, or networking. It also helps determine areas, such as application optimization, where a company can realize significant reduction in costs and improvement in capabilities.

The IO model is not designed to focus on any technology type or manufacturer. Instead it focuses on the capabilities outlined for each stage shown in Figure 1. An assessment of a company's technology adoption relative to the IO model enables strategic discussions that focus on the business value of deploying new technologies and using an existing platform as a whole. Customers can optimize their

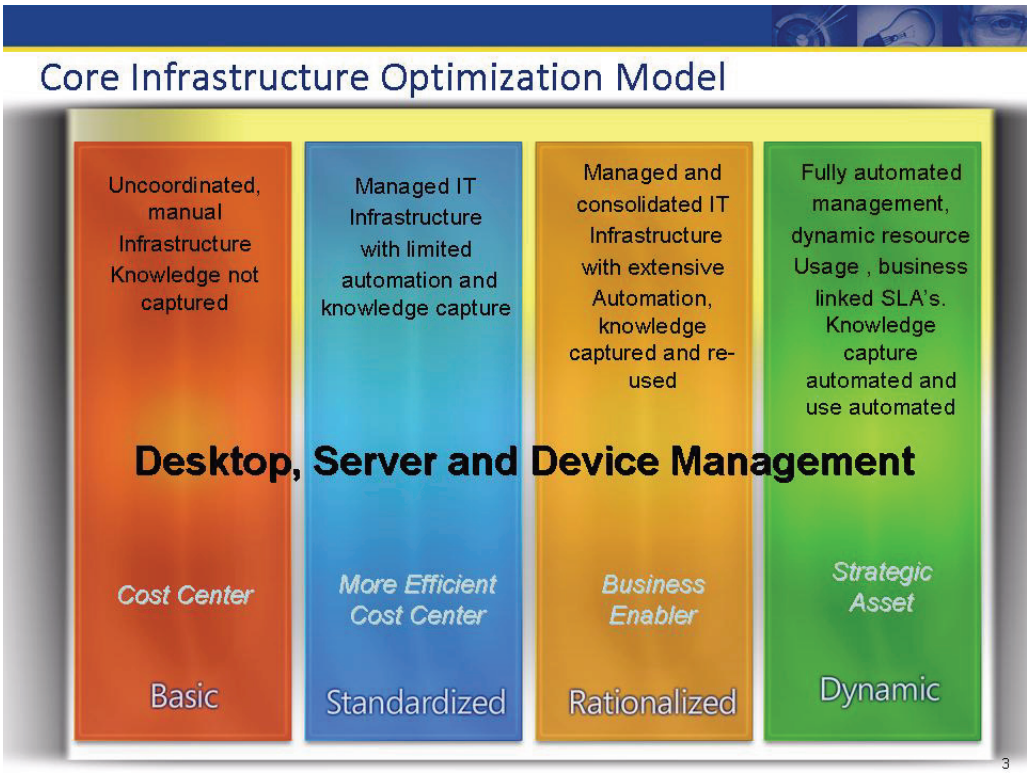

Figure 1

infrastructure across a heterogeneous IT environment. The IO model itself is a continuum of four levels or phases in which progressively higher technology maturity occurs.

The left, red, column, the basic level, is a typical company with a lot of manual, localized processes, minimized central control, and limited or unenforced IT policies. A basic IT infrastructure comes at a high cost, because it is characterized by chaotic, ad hoc, reactive, or more manual operation. Things are not done proactively. In the basic stage, service levels are low and business drivers are not used to set IT priorities.

The next level is standardized. A company in the standardized phase can be characterized as having a managed infrastructure, which means that they introduced operational controls through standards, policies, service, and resources. The standardized infrastructure is centrally managed and is somewhat automated. IT operations are still primarily reactive but some proactive processes are brought in at this stage to reduce short-term costs. Service levels are better than in the basic stage but are still not optimal. IT makes decisions on behalf of the business based on its perception of the business needs.

The third stage is rationalized. Compared to standardized, a rationalized infrastructure includes more proactive processes, proactive provisioning, and policies that have matured or begun to play a major role in supporting and expanding the business. The costs of managing desktop computers and servers are at their lowest. A rationalized infrastructure is a business enabler, because security enhancements are well-managed. It has low complexity and high automation levels including, for example, zero-touch deployment, where deploying operating systems or applications requires minimal or no interaction from the user. It helps minimize the cost and reduce the time to deploy and removes many of the technical challenges, because it removes many of the potential errors that users could create. IT costs in a rationalized stage are substantially lower than in basic and standardized stages, because the efficiency is increased through centralized management and the monitored desktop environment. Security administration is improved, which reduces the burden on IT resources.

The last column in Figure 1 shows the dynamic stage of IO management. Customers with dynamic infrastructures are fully aware of the strategic value of their infrastructures in helping them both run their business efficiently and stay ahead of their competitors. At the dynamic stage, processes are fully automated, often incorporated into the technology itself. They enable IT to be aligned and managed according to the business's needs. In a dynamic stage, costs are fully controlled. Users and data, desktop computers and servers are fully integrated. Users and the IT department collaborate. The levels of service and capabilities are the same for both mobile and onsite users.

System Center Products and the Optimization Model

Figure 2 overlays the System Center family of products on the basic, standardized, rationalized, and dynamic stages. System Center Operations Manager flows over the standardized and rationalized stages. In a virtual environment, the Virtual Machine Manager provides a tool for rationalized and dynamic stages, because it offers centralized management of the virtual environment, whether it uses Hyper-V, Server 2008, VMWare, or others. The System Center Data Protection Manager goes all the way across standardized to dynamic. It offers data protection with a backup solution and a disaster recovery solution. System Center Essentials, for the small- to medium-sized business, combines System Center Configuration Manager and System Center Operations Manager, but with some limitations. System Center Essentials is targeted at corporations that have fewer than 30 servers and 500 desktops. Corporations with more should move to Configuration Manager and Operations Manager, because they are more scalable.

The System Center family is, as Figure 3 shows, knowledge-driven IT management. Beginning at the top right with hardware provisioning, System Center Configuration Manager offers over-the-network provisioning of operating system deployment to desktops and servers. Virtual Machine Manager offers the ability to automate provisioning of virtual machines in a virtual environment. Again, Virtual Machine Manager can manage a variety of different virtual software like Hyper-V and VMware. Virtual Machine Manager also maintains a library of the different types of servers deployed in the virtual environment.

Configuration Manager offers workload provisioning, patching, and software distribution. Configuration Manager's primary functions are software distribution

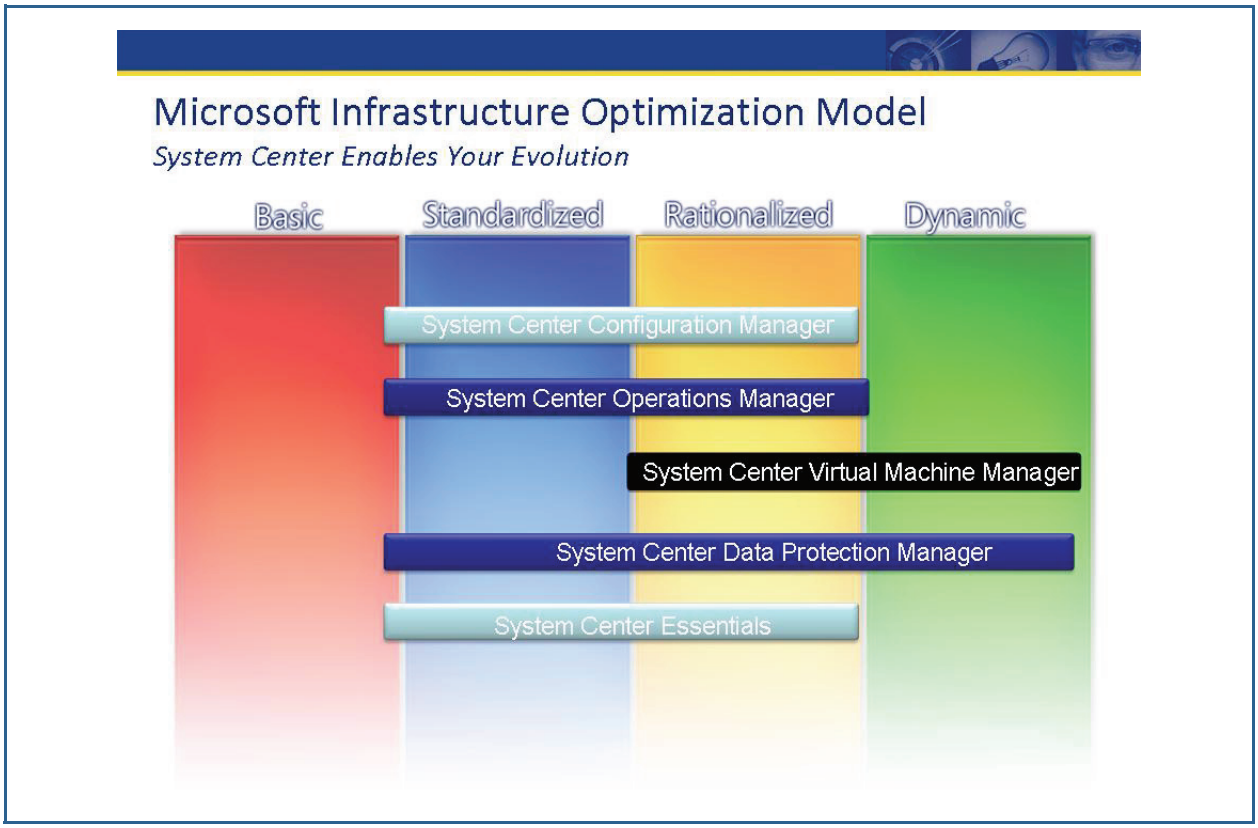

Figure 2

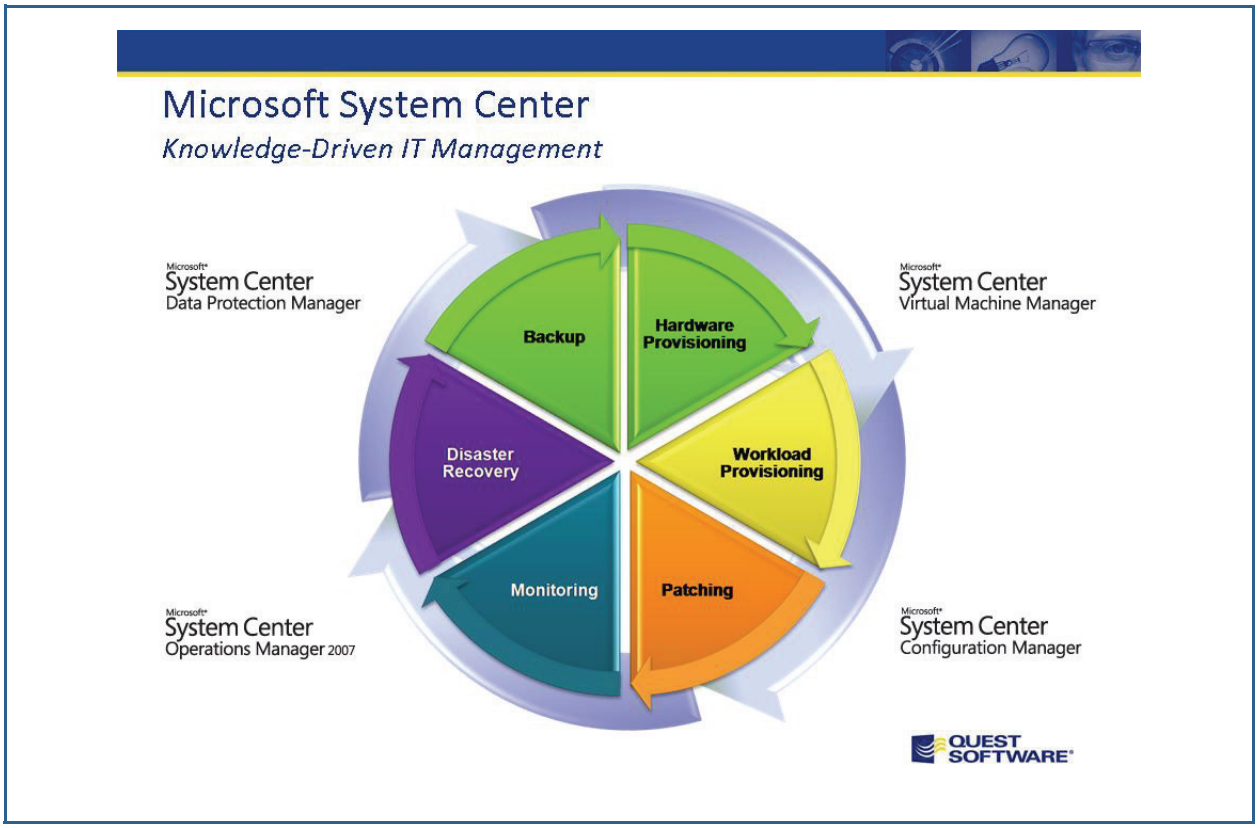

Figure 3

and asset management. It includes a hardware and software inventory from all the clients it manages. In a virtual environment managed with Virtual Machine Manager, if you want to deploy or provision a new SQL server and you manage ten virtual servers, Virtual Machine Manager assesses the workload on each server and suggest the best location to deploy the new server.

For monitoring, on the bottom left, System Center Operations Manager 2007 provides proactive monitoring not only of servers, as in previous releases, but also of desktops. The last two segments in the circle, disaster recovery and backup, are covered by Data Protection Manager. System Center Data Protection Manager provides automated server backup anywhere in the environment and also provides disaster recovery from those backups.

System Center Operations Manager

As shown in Figure 4, System Center Operations Manager 2007 now offers end-to-end service monitoring. For example, an external ordering Web application lets customers order products from a company's Website. It is a multitiered application—the Web application is a front end to a back-end database where the orders are stored. End-to-end service monitoring verifies not just that the Web service is running on that server, as in previous versions, but also that the back-end servers or applications are responsive to the Web application. It does what are called synthetic transactions. Through a synthetic transaction it can see whether a customer transaction on the Website is actually working. It can also set expectations for response time. The application might be working but if it takes 30 minutes to enter an order that is obviously not good enough. The threshold can define the time frame for the action. Operations Manager is a much better tool for proactively managing the full multitiered levels of any application.

It is also the best-of-breed tool for Windows, because the intelligence of Operations Manager is not in the application itself but in what are called management packs. Management packs exist for each product, for example SQL 2008 and Exchange 2007. Even System Center has its own management pack. These management packs have intelligence built into them for alerts and rules. Before Operations Manager 2005, the management packs were created by the

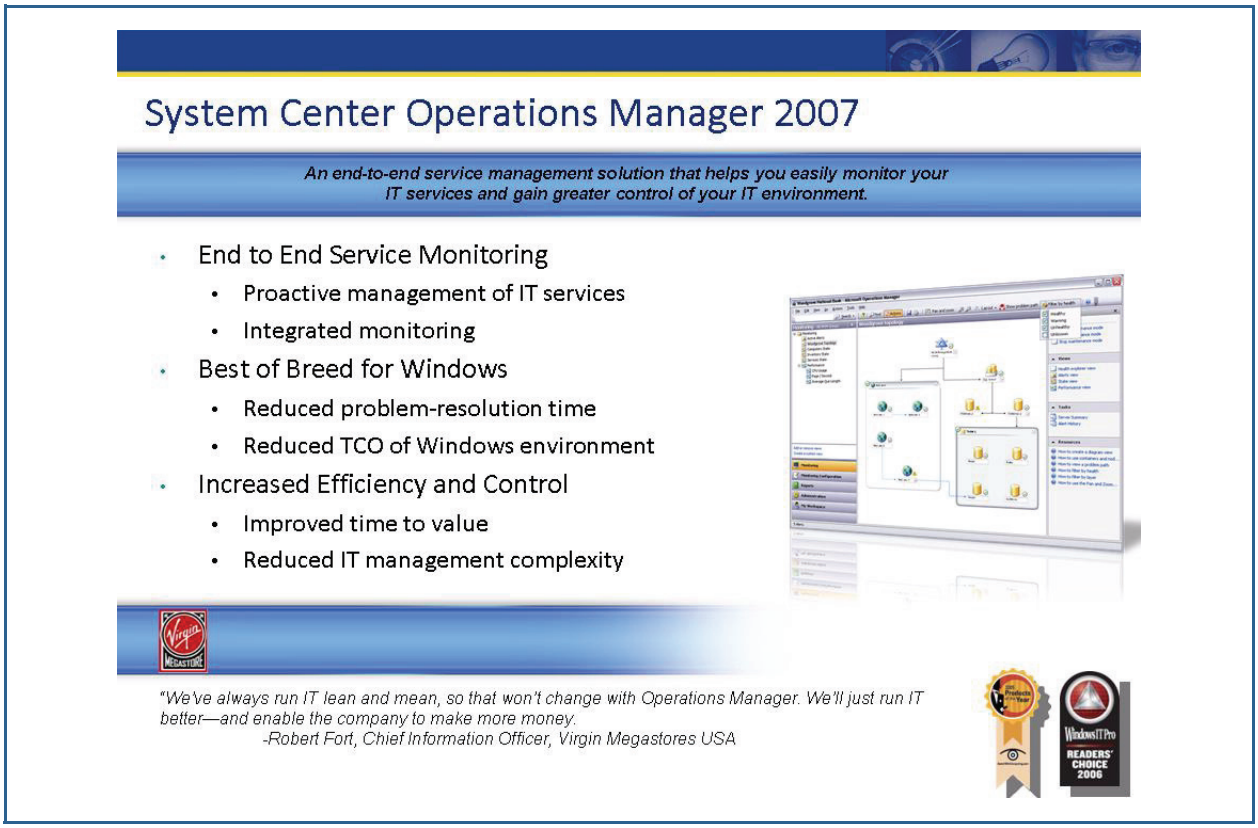

Figure 4

Operations Manager product group. Beginning in 2005 they were created by the product group that creates the application. For example, the Exchange product group creates the management pack that goes with Exchange 2007, because they are the ones that know their own product best. Those management packs have rules and alerts in them that can greatly reduce problem resolution time, because they have built-in intelligence for what the product group considers problems for those systems. Management packs exist not only for Microsoft products; third-party product vendors can, and in fact do, build their own management packs. Many third-party database solutions have management packs that can be imported into Operations Manager 2007. In summary, Operations Manager 2007 provides a proactive notification of any kind of potential services, application problems, or server problems for the systems it manages in your environment.

Figure 5 touches on some of the differences discussed above. Operations Manager 2005, which was the previous release of the System Center Operations Manager, was easy to use, but it was focused specifically on particular servers. If you had a Web server, for example, it would manage and monitor the Web server, but if that server relied on other back-end applications, more customization was needed to get the whole application covered. It had built-in platform knowledge similar to that in Operations Manager 2007, but the bottom line is that Operations Manager 2005 was designed for managing servers. Operations Manager 2007 goes to a higher level in that it is service oriented; it is not just monitoring the server now. Knowing that a Web service is running does not necessarily mean that the service is responding to a request. The service orientation is a big improvement in Operations Manager 2007.

It is still easy to use. The console now combines the operator and administrator consoles of previous releases into a single console. The user's role, set up in the security configuration, determines what the user sees on the console. It is still knowledge driven, because the management packs provide the knowledge-driven information needed to help fix any potential problems. Finally, it is enterprise class. It is highly scalable, while still offering simple deployment and configuration within the enterprise level.

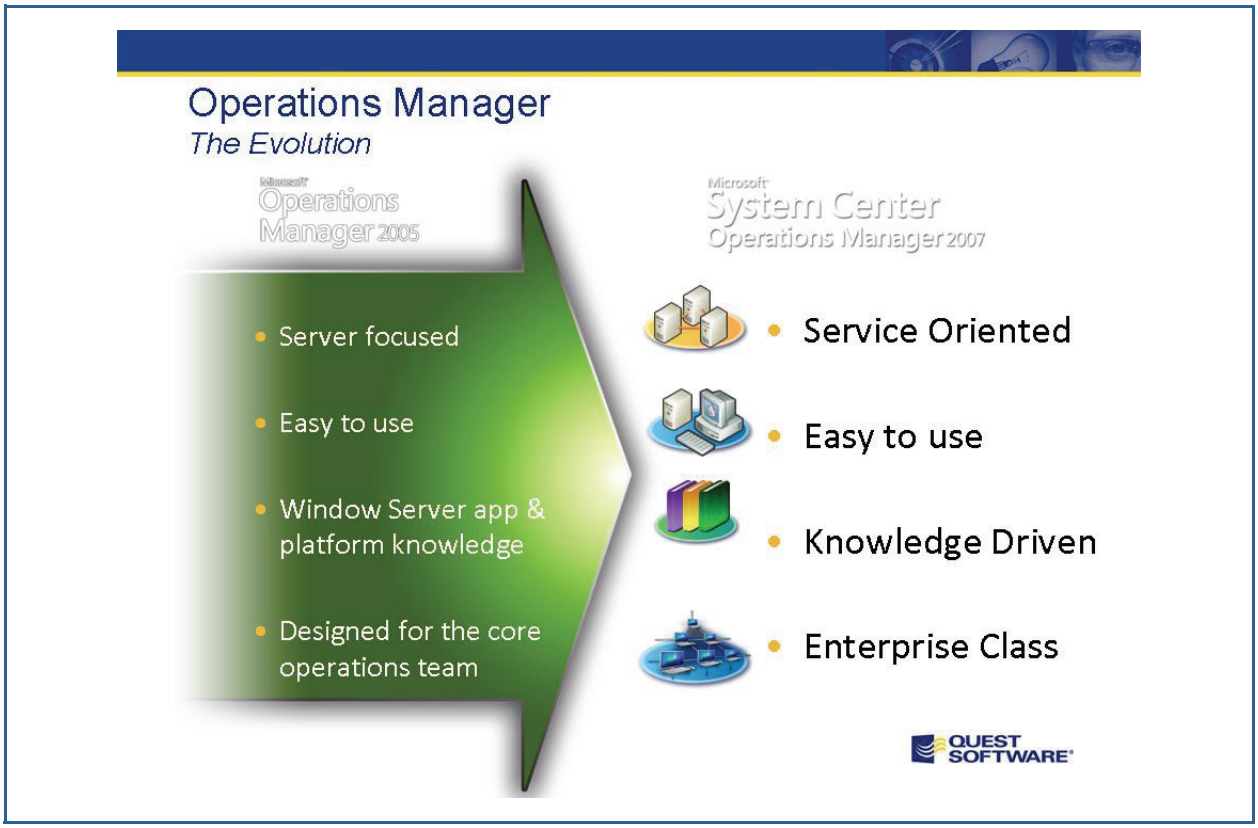

Figure 5

Expanding into the Non-Windows Environment

Not every environment is purely a Microsoft environment. Operations Manager is geared towards the Windows environment. How then can you monitor systems across a heterogeneous environment? Figure 6 shows a typical management scenario including different tools for managing the different platforms, which include Oracle, Groupwise, Apache, Netscape—a little bit of everything. Even with the different management tools being used, gaps exist. The full environment is not being managed or monitored. Quest offers a solution using System Center Operations Manager 2007.

Quest offers a wide array of products, as shown in Figure 7. The focus in this document is on the System Center column on the far right, but Quest also support other platforms across the Microsoft Environment, including Active Directory, Exchange, SharePoint, and SQL Server. It covers a number of solutions and other technologies that are newer in the Microsoft space, including PowerShell and Desktop Management.

Quest Management Xtensions provide a way for System Center—and also configuration managers that have Microsoft System Center products—to reach out into the non-Windows environment. The idea is to use System Center as a single pane of glass or a single console to provide information about availability, SLAs, and system monitoring.

As shown in Figure 8, the idea is to provide a native way for the information gathered in these non-Windows systems to feed into Operations Manager. Over time, people trying to manage large environments end up with a hodgepodge of monitoring consoles, one for Oracle, one for SQL Server, one for their network devices, one for their non-Windows operating systems such as Unix and Linux. The idea is to merge these. Operations Manager 2005 and now 2007 provide a way for the information from other enterprise monitoring systems (from the areas that the MOM or the Operation Manager Management Packs do not cover) to appear in the single console of Operations Manager 2007.

Quest has also recently added new "PRO-enabled" management packs that work with SCVMM 2008, which is the next version of System Center Virtual Machine Manager. Quest is working on providing metrics to Operations Manager, then from Operations Manager over to SCVMM, to connect alerts, for

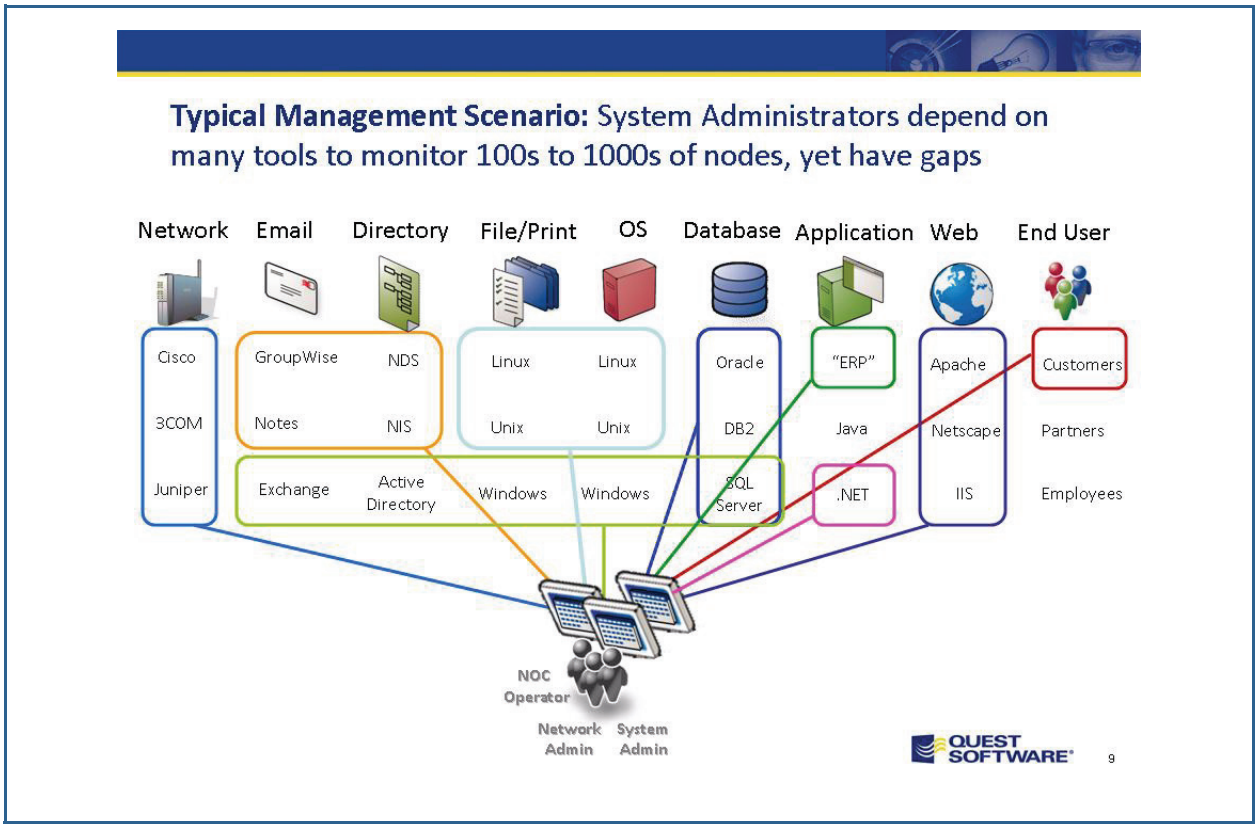

Figure 6

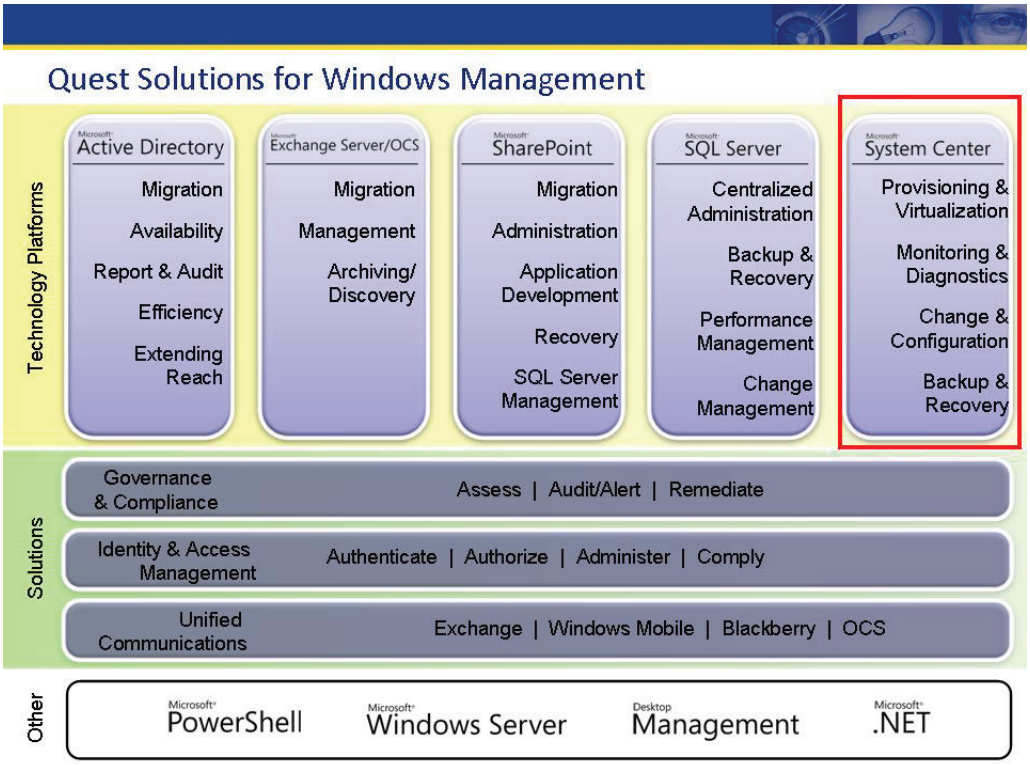

Figure 7

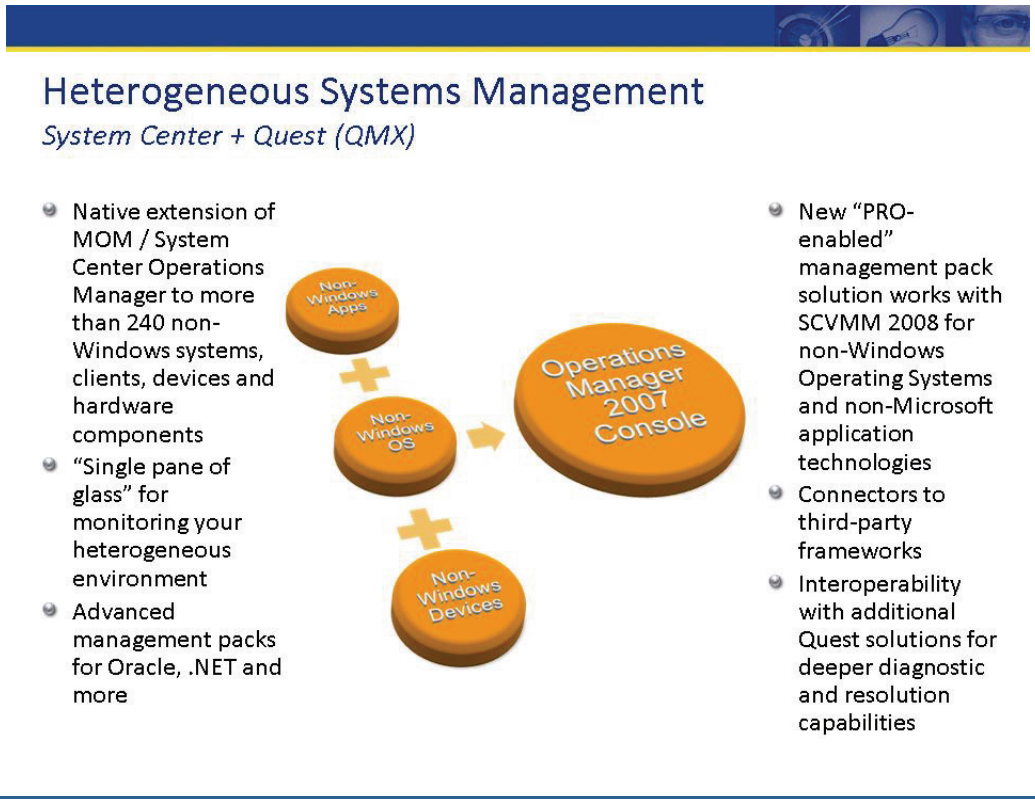

Figure 8

example, that a system is running hot or that CPU, disc use, memory use, or network traffic is running high. Then, in the dynamic data center scenario, the machine can be moved.

The PRO-enabled component for SCVMM works very well with Windows, but future enhancements include support for non-Windows operating systems, such as Solaris, HPUX, AIX, and Linux.

Environments today are mostly heterogeneous, as shown in Figure 9. Even all-Windows environments have switches, routers, firewalls, load balancers, and other items to manage, most of the time from multiple vendors. Operations Manager brings all that information into a single place so that you can view availability and performance metrics and build SLAs around business applications. In the ordering example discussed above, a Web application, an application server, and a database are three of the pieces in the application that need to be running. All the different network pieces, the switches, routers, and firewalls that allow the traffic to connect the pieces also need to be running. You need to be able to monitor those, to see events across the entire enterprise, not just the operating systems and applications; that is where Operations Manager plus Quest Management Xtensions (QMX) can help.

Figure 10 illustrates the broad list of management packs—or instrumentation packs as Quest calls them—that Quest offers. The list contains a growing number of instrumentation packs for non-Windows network devices that are not operating-system based. Quest supports 130 or 140 operating systems, and 240 or 250 network devices, including routers, firewalls, databases, faxes, printers, and so on. All integrate directly with Operations Manager 2005 and 2007.

How Does Quest Do It?

Information is gathered in an agentless fashion. This offers scalability to hundreds if not thousands of devices per server from which Quest can gather information. Quest uses command-line based instrumentation packs, formerly called virtual agents, to collect as much information as possible remotely. SNMP-based instrumentation packs can get information from a Cisco router, switch, or load balancer. Quest also uses SNMP-based traps. If the network devices support traps, Quest can pull them, filter them, and push them up to the Operations Manager console for

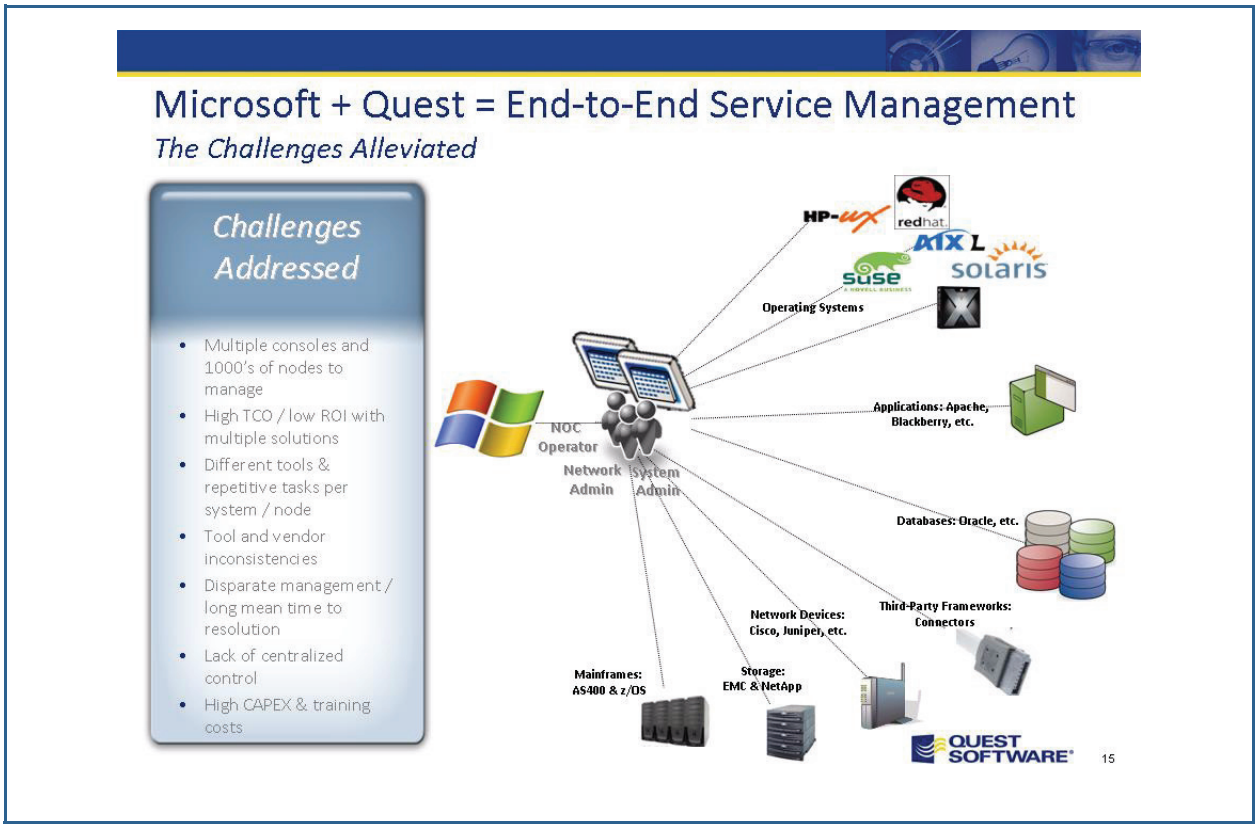

Figure 9

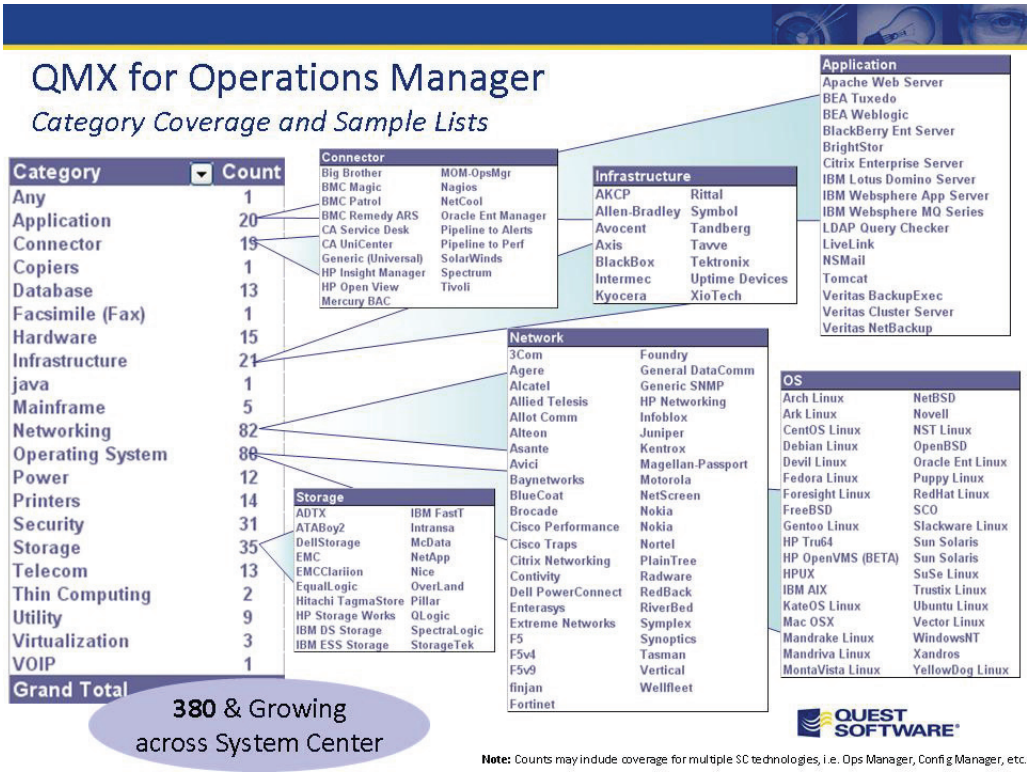

Figure 10

resolution and alerting. Quest can get information through Web Services. If you have a Web Services-based application, you can check its connectivity, response time, and the responses returned. Native APIs are provided for extensibility. It is straightforward to build a new instrumentation pack for an application, if one does not already exist. Quest provides an SDK along with the latest release of the base framework, which lets customers get any SNMP value they want. It is easy to sort quickly through the values, select the ones to evaluate, and add them to be pushed up to Operations Manager.

As shown in the architectural overview in Figure 11, no agent is installed. Information is gathered via command line, SNMP, or any command-line interface. Rules, thresholds, and alerts are set through the Quest base framework, and that information is pushed up to Operations Manager. A single management pack is installed in the Operations Manager environment. That single management pack takes the information as it comes in. Then child management packs filter the information and say, "Put all my Cisco alerts in one container, all my uninterruptible power supply information in another," in a way that is completely configurable.

Many customers are not using Operations Manager alone. They also have some incumbent applications that they have been using to monitor their networks or their operating systems in a non-Windows environment and they want to merge all of these. A long-term objective is to integrate everything into Operations Manager When you look at the expense of monitoring and managing from six different consoles as well as the knowledge that you have to share across different departments, it makes sense to move into a single enterprise console. However, some want to make the transition in phases. For them, Quest offers Management Connectors, as shown in Figure 12. Management Connectors feed alerts and performance data from these other enterprise consoles to Operations Manager. Operations Manager can be the enterprise console even with other consoles still in use. Operations Manager offers a single pane of glass, a single console from which users can access enterprise information. Connectors can be bidirectional and support a wide range of platforms, such as BMC, Nagios, Tivoli, plus many more.

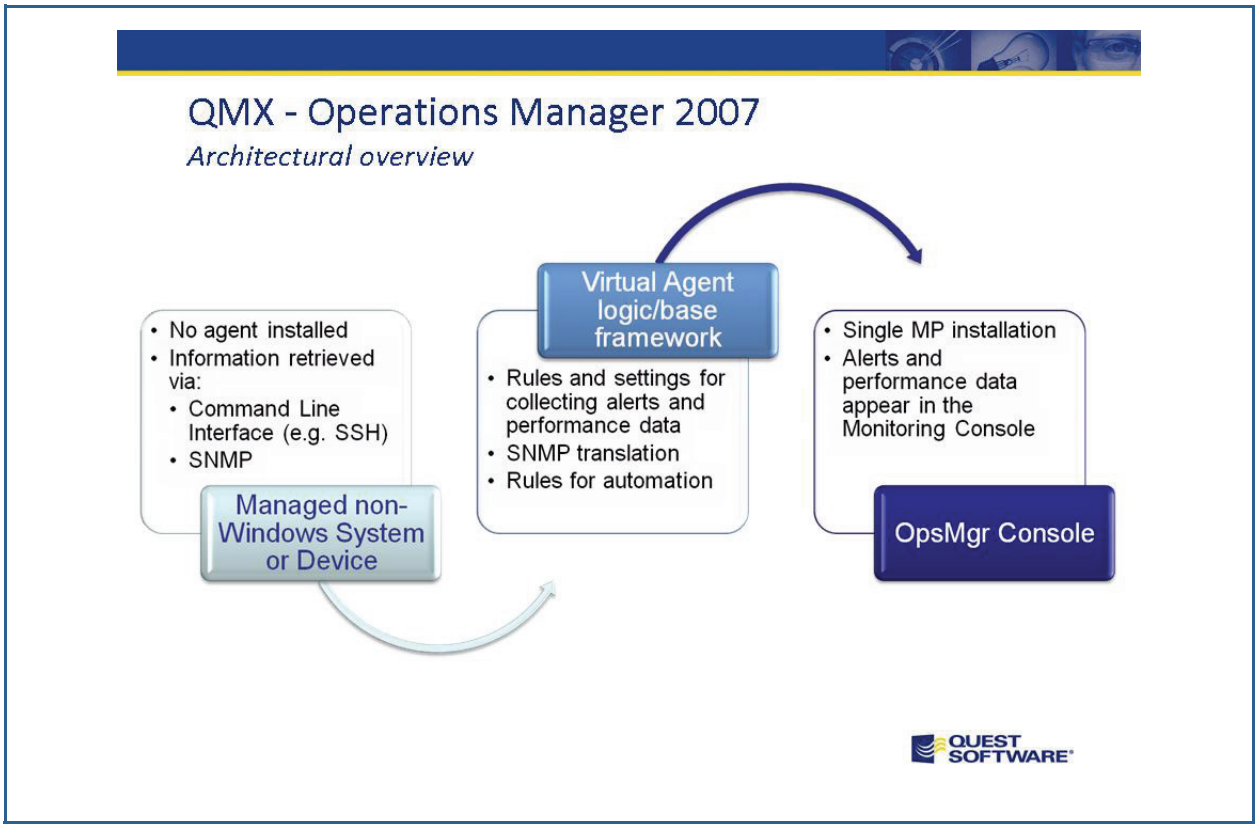

Figure 11

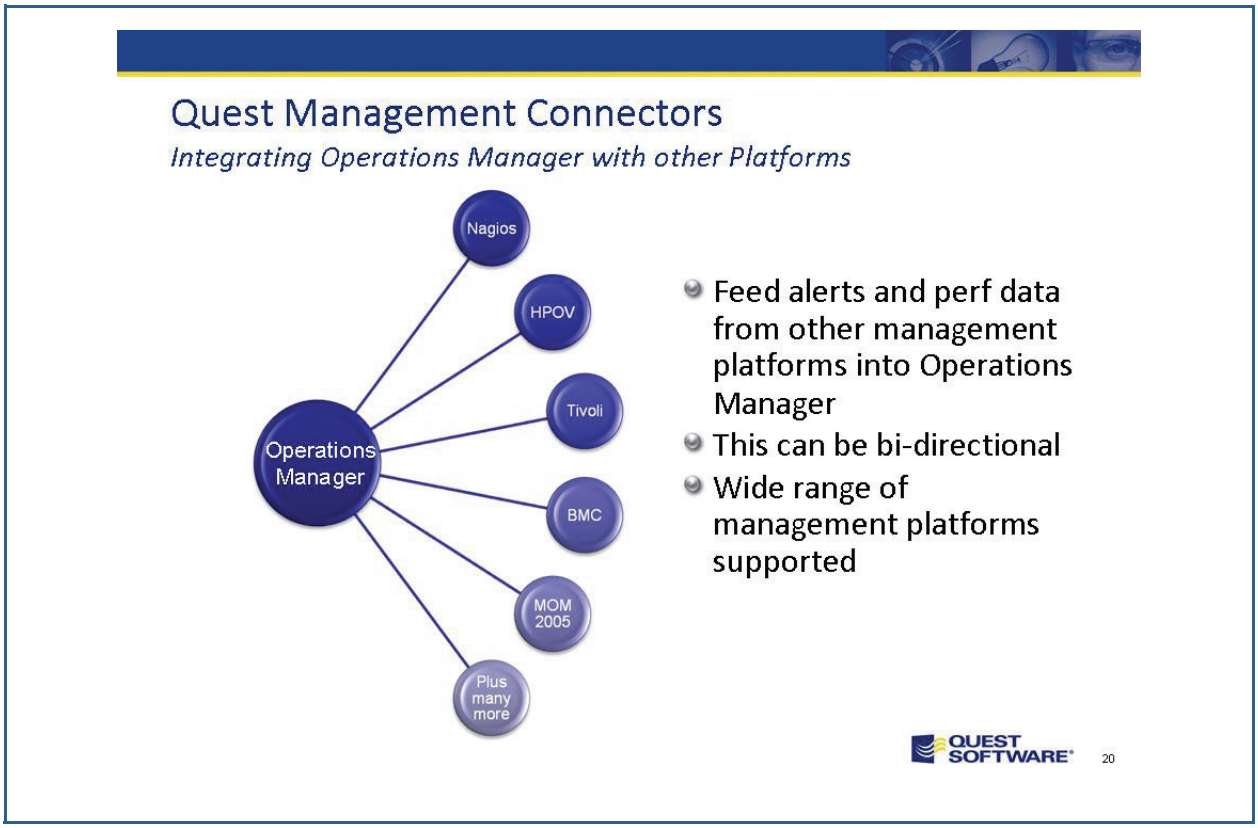

Figure 12

Conclusion

In summary, QMX for Operations Manager provides a single pane of glass for systems monitoring through Operations Manager. It offers the ability to gather information on many operating systems, databases, and network services into a single console, so that you can build a diagram of the network and see the effect of an outage in one area across the entire environment. It is an agentless architecture, which offers increased strength and flexibility. It extends Operations Manager to more than 240 non-Windows systems, applications, clients, devices, and hardware components. If a device is not shown on Quest's Website, most likely someone has requested it and it is being developed.

QMX allows other management systems to be integrated with Operations Manager. If a customer decides that Operations Manager is going to be the technology moving forward, but has other consoles currently in use, they can be merged with QMX. PRO Pack integration is designed to help people move to a dynamic data center environment. When Operations Manager detects a server running with high disk, CPU, memory, or network, the Virtual Machine Manager either alerts the system manager to move the machine from one server to another or moves it automatically. This is working well with the Window OS. In the future, Quest will provide metrics for non-Windows devices to the PRO Pack component.

Figure 13 summarizes the Microsoft and Quest end-to-end systems management. We have discussed how QMX extends Operations Manager into non-Windows devices, but Quest also supports Configuration Manager. QMX for Configuration Manager can get hardware inventories, software deployment, software inventories, and licensing on non-Windows operating systems and devices, and pull that information up to the System Center Configuration Manager. You can use the native reporting within Operations Manager and Configuration Manager to look at performance data and hardware inventory and get all the information in one place.

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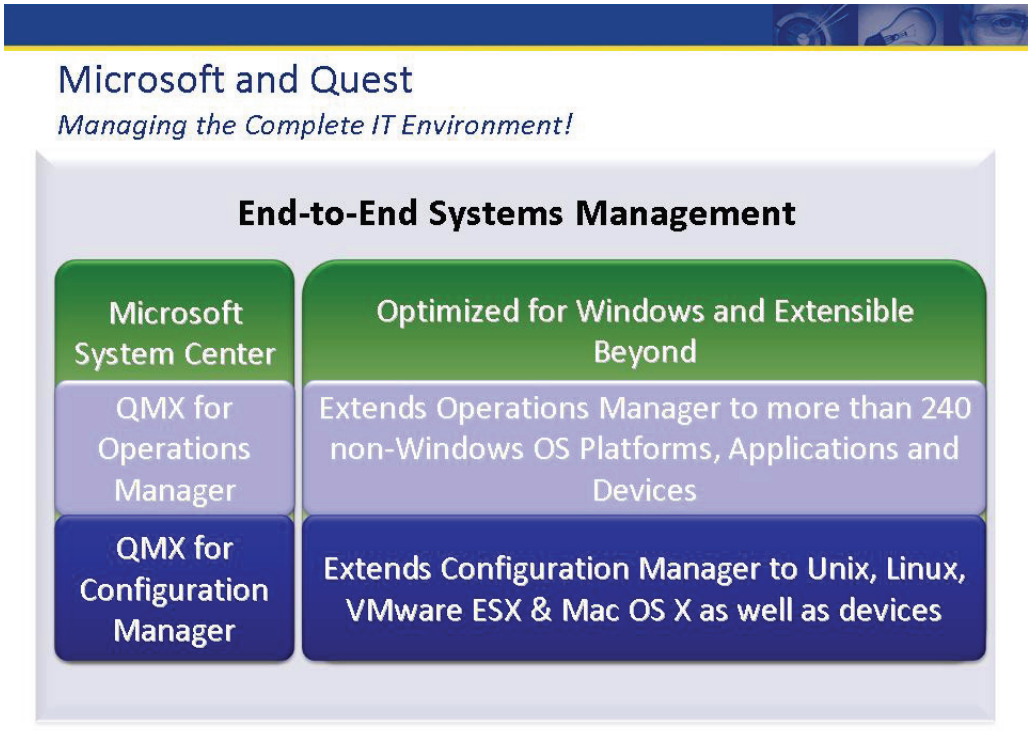

Figure 13

Common Questions

Question: Is a Microsoft CAL license required for the QMX Operations Manager products?

Rob Mallicoat: No, it is not. We base our licensing on the number of devices that you want to monitor. If you have a multifunction server, you pay only for the server. All the virtual agents that you run are included in that license.

Question: Is your QMX Operations Manager agentless architecture scalable?

Rob Mallicoat: Absolutely. One of the benefits we have with the agentless architecture is that we run our base framework on your root manager server. For anything more than maybe 20 or 30 servers, or if you are going to monitor 1000 switches or 2000 devices, we recommend installing our base framework on a dedicated server or workstation that has the Operations Manager agent and console on it. We collect the information and send it as a proxy agent, and we push that information using WMI Backup. We have customers running thousands of agents and collecting information from thousands of devices from a single dedicated server.

Question: What does it really mean to say that QMX natively integrates to the System Center Operations Manager?

John Baker: We are taking the information from these non-Windows devices and pushing it up to Operations Manager and Configuration Manager, putting it in the same place as the performance thresholds and performance metrics for the Windows-based management packs. CPU, disk, memory, network information, process information—that data all shows up in the SQL database as well as the data warehouse for long-term reporting within Operations Manager. Therefore, Operations Manager console alerts all work the same way; right-click and close work the same way. The other big benefit is to use the reporting console to see all servers within the group. They could be Windows or Linux, but you can see the CPU, disk, memory, and network across all of those, without having to go to another reporting console.

Question: Do I have to engage both Microsoft and Quest to get the solution implemented?

John Baker: That's actually a good question, to which I don't have the answer. I'm more on the technical side. I want to say the answer is no. Microsoft can sell the solution, and I believe first-level technical support is also handled by Microsoft; then second- and third-level are passed over to Quest for deeper troubleshooting.

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