

Managing a Virtual Computing Environment

How TeamQuest Supports VMware's Virtual Machines

Mainframes were once supposed to go the way of the dinosaurs, replaced by smaller, more nimble servers, but something went wrong along that evolutionary track. As servers proliferated, their inefficiencies became clear. Ten to twenty percent CPU utilization rates were not uncommon, and data centers filled up with barely used disk space. With their ability to create logical partitions (LPARs) to run multiple operating systems and workloads, mainframes suddenly looked a lot smarter.

The emphasis then shifted to server consolidation and storage to reduce unnecessary overhead and eliminate the need to support a large number of boxes. While this represented an improvement, it was not enough. It took virtualization to truly fulfill the promise of a server-based architecture.

But any IT breakthrough is only truly useful if it can be integrated and managed as part of the overall infrastructure. In particular, monitoring, managing and conducting capacity planning for virtual resources presents a unique series of challenges. That's why TeamQuest added VMware to the platforms it supports, making it easy to seamlessly manage a mix of virtual and physical assets.



About the Author

Ron Potter is the Best Practices manager for TeamQuest Corporation. Ron's background includes more than 20 years in the IT industry, spearheading a successful ITIL implementation with a Fortune 500 insurance company, and discussing ITIL topics as a presenter at several conferences and trade shows.

Virtualization Necessity

There is a certain attraction to commodity servers. They are low cost and easy to replace, so initial hardware expense was not as major a consideration when deciding to install a new server. And, if a piece of equipment should fail, it was simple enough to just swap it out. There are certain applications where that is the best approach to take, but not always. As is often the case, the initial costs are dwarfed by ongoing support. Each unit requires its own operating system license; its performance must be monitored; it requires a network connection and power; it needs patching and backup.

Commonly, each server was optimized for and dedicated to running a single application. It is easy to rack up hundreds of devices that way, each of which had to be provisioned for the maximum possible load. As the number of devices proliferates, the support burden grows.

To address this shortcoming, vendors have developed different strategies to separate the hardware and software layers and install between them an abstraction layer that lets the hardware be considered as a pooled resource rather than discrete hardware elements that need to be individually assigned and managed.

TeamQuest's Across-the-Board Support

While virtualization does improve resource utilization, it also adds a layer of complexity to managing the overall system. One still needs to manage the physical infrastructure, the operating systems and applications that make up the virtual services; plus one has to manage the virtualization layer itself. In addition, these need to be brought into a common management framework with the nonvirtualized components of the network.

Taking a look at just the capacity planning approach, for example, the standard method of looking at CPU or disk utilization trends on a server to predict when it will reach capacity is no longer effective when one is looking at dynamically changing resource allocations or a process that is one of eight sharing a common CPU.

To handle these requirements, the TeamQuest product line can be configured to monitor and model VMware.

TeamQuest Manager

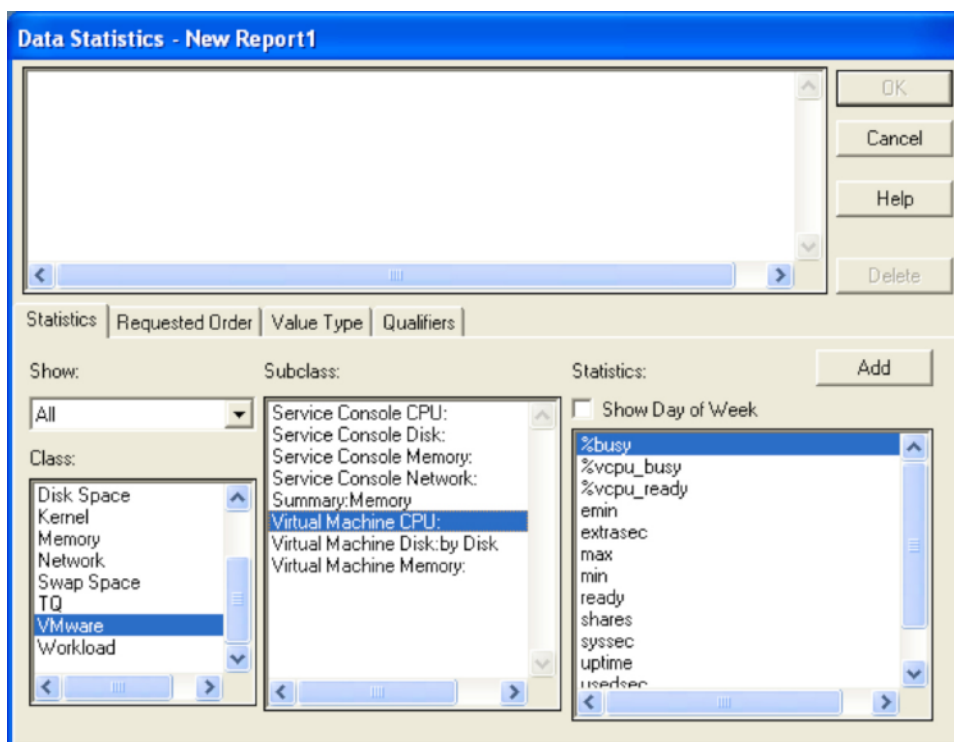
TeamQuest Manager is the core component of the TeamQuest Performance Software Suite. TeamQuest Manager is used to collect, store, manage, and administer performance data. It includes agents for gathering performance statistics, a database for efficiently storing and managing the information gathered, as well as features for creating alarms and analyzing the performance data. It collects data from mainframes and various other server platforms running HP-UX, AIX, Linux, Solaris, Windows, and VMware ESX Server.

Some of the items collected are:

- Operating system statistics (CPU, I/O, memory, disk space, network file system, TCP/IP, log messages, etc)
- Microsoft Exchange
- Web server
- Databases (Oracle, SQL Server, DB2 and Sybase)
- EMC Symmetrix
- Network devices and applications
- Windows Services
- Other applications with TeamQuest user agents

These are the collection agents that gather information from VMware ESX Server:

VMware Agent (tqvmwp)	Collects CPU/disk/memory/NIC resource usage of the virtual machines.
System Activity Agent (tqbsp)	Collects the CPU/disk/memory/NIC resource usage of the ESX Server.
Disk Space Agent (tqdsp)	Collects the disk space usage of the ESX Server.
Process-Workload Agent (tqwarp/tqrtap)	Collects ESX Server process data.
System Log Agent (tqslp)	Collects general and system log messages.



Administrators can view a variety of reports on any of the statistics gathered on both the ESX Server and the virtual machines (See Figure 1 – Performance Statistics).

Figure 1

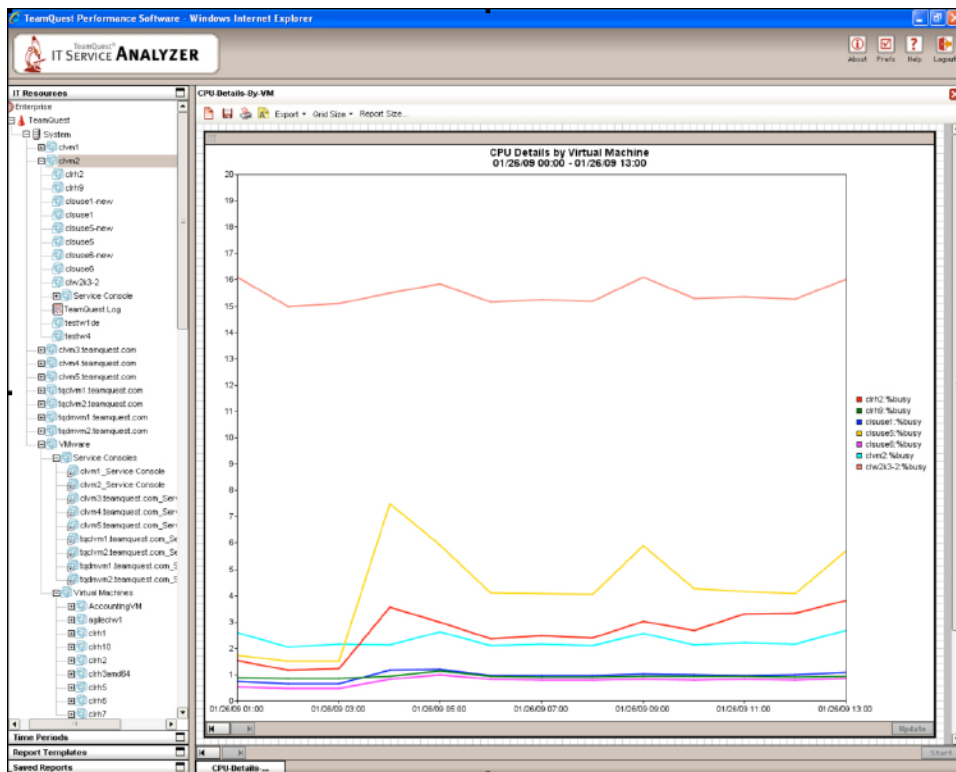


Figure 2

TeamQuest IT Service Analyzer

TeamQuest IT Service Analyzer is a rich web application for proactively detecting, investigating and diagnosing IT service performance issues. TeamQuest IT Service Analyzer comes with a variety of reports, graphs and charts that can be modified to fit the customer's specific needs.

IT Service Analyzer allows you to use "IT Resources" to represent physical or logical components or groups of components within a data center or IT organization. IT Resources are organized in a folder structure to show upstream and downstream relationships between the resources. IT Resource references are useful because they provide a way to include a single IT Resource in multiple places in the folder structure. They also provide a mechanism to link IT Resources together to form sophisticated relationships.

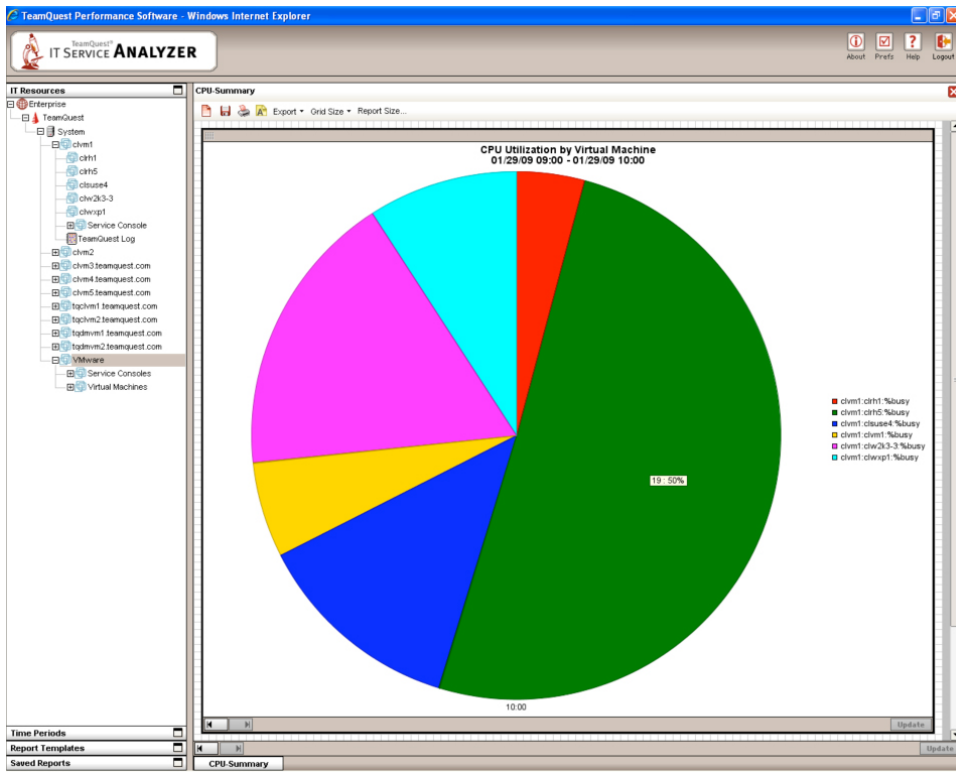


Figure 3

TeamQuest IT Service Analyzer uses IT Resources to show the relationships between virtual and real servers in a VMware environment. Figure 3, for example, shows the CPU utilization on a server that is running the VMware ESX Server, as well as three Linux and two Windows virtual machines. Figure 4 shows the configuration of the virtual machines.

The screenshot shows the 'VMware:Virtual_Machines' window in TeamQuest View. It displays a table with the following data:

Row	System	VM	OS	PID	VMID	CPU Shares	CPU Min	CPU Max	Memory Shares	Memory Min	Memory Max	Disk Shares	VCPU Count
1	cvm1	ciw2k3-3	winNetStandard	22426	194	2000	0	200	10240	512	1024	1000	2.0
2	cvm1	cih5	linux	20752	192	8000	0	200	20240	1012	2024	1000	2.0
3	cvm1	cih1	linux	5800	190	2000	0	200	10240	512	1024	1000	2.0
4	cvm1	ciwsp1	winV-PPro	7219	161	1000	0	100	10240	512	1024	1000	1.0
5	cvm1	cih5e4	linux	1597	143	2000	0	200	10240	512	1024	1000	2.0

Figure 4

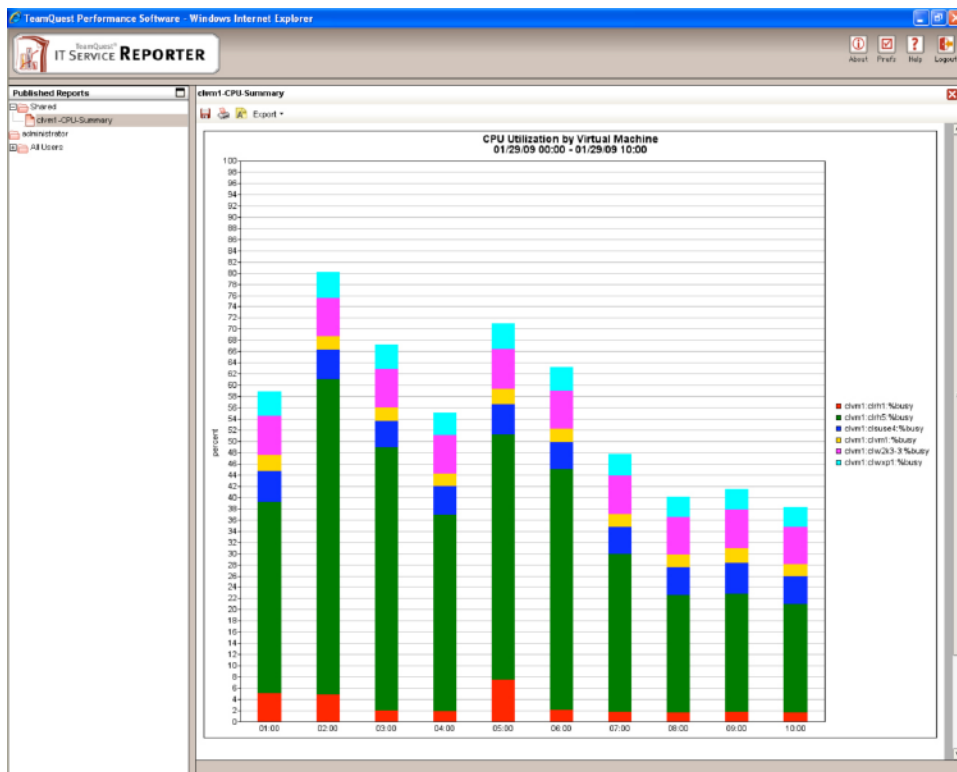


Figure 5

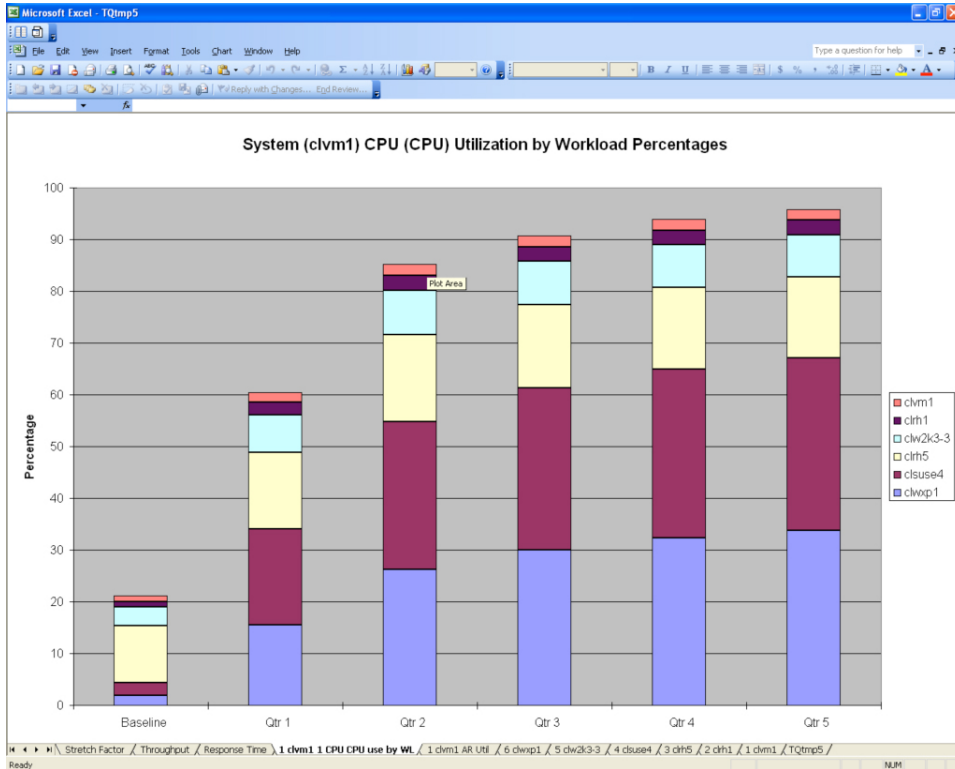
TeamQuest IT Service Reporter

TeamQuest IT Service Reporter is a rich web application that provides an automated performance and capacity reporting facility. TeamQuest IT Service Reporter obtains performance data from the TeamQuest IT Service Application Server and publishes reports for display and analysis.

TeamQuest IT Service Reporter addresses the performance and capacity reporting needs of IT executives, IT managers, and business area customers. TeamQuest IT Service Reporter is used to produce regularly scheduled reports, which might include current usage of resources, trends, and forecasts. TeamQuest IT Service Reporter reports provide “status at a glance” for performance review and identification of risk areas for the enterprise.

Using the same IT Resource mechanism as TeamQuest IT Service Analyzer, IT Service Reporter can produce periodic reports customized with your corporate logo and explanatory text laid out using a drag-and-drop interface.

TeamQuest Model



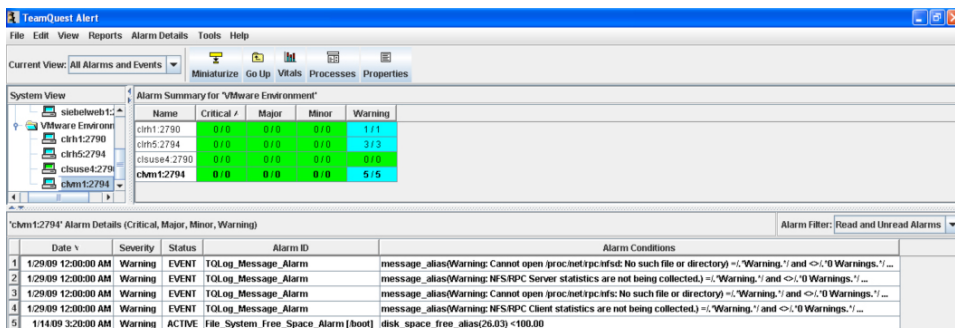
TeamQuest Model is an application that runs on your workstation. It provides capacity planning and “what-if” analysis. TeamQuest Model retrieves data and builds models of systems and applications. Companies use this to predict the performance of new applications, find underutilized resources, consolidate servers and predict future resource requirements. Costly errors are avoided by modeling changes before deploying new software, altering configurations or purchasing equipment (See Figure 6 — Model of How Future Workload Expansion Affects Response Time).

Figure 6

Model currently supports VMware ESX Server by modeling each virtual machine as a workload. This will help capacity planners answer the following questions:

- What happens to response times when activity changes?
- When will my guest’s get “full”?
- When will my application activity exceed my server capacity?

TeamQuest Alert



The final piece of the TeamQuest Performance Software Suite, Alert, treats the VMware ESX Server like any other system. If a virtual machine is running TeamQuest Manager, it will also be treated the same way.

Figure 7

Conclusion

Virtualization offers a superior opportunity for organizations to cut their infrastructure costs, while improving server delivery. With TeamQuest's support, companies can now use VMware's virtual machines as just one more part of their heterogeneous environment.

Enhanced features with VMware include scaling from one to hundreds of systems without losing ease-of-use. Evaluate performance using easy-to-understand rules of thumb from built-in performance guidelines.

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