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## Highlights

- Improve resource utilization through visibility of performance trends which provide information on where to further consolidate workloads.
  - Ensure high availability of virtual infrastructure with predictive and proactive alerts on virtual machine, ESX host, resource pool, and cluster performance and availability metrics.
  - Reduce virtual server sprawl through historical reporting of virtual machine usage.
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# IBM Tivoli Monitoring for Virtual Servers

*Optimize utilization and ensure high availability of your virtualized environment*

Businesses today are challenged to improve IT service delivery and reduce the costs to deliver services. Virtualization is a key initiative businesses deploy to reduce infrastructure costs through improving server utilization and to improve services by having the ability to rapidly scale for increases in application usage.

While virtualization can produce significant cost savings as a result of reducing infrastructure overhead, it does not address the single-largest cost element for most data centers—the labor to manage this environment—which can be as high as 40 percent of the overall cost. If not controlled, management costs can negate the cost savings realized through virtualization.

Specific challenges around managing a virtual environment include:

- Capacity management and planning to include controlling virtual server sprawl, proactively identifying when critical resources will reach capacity and identifying opportunities for further consolidation of resources.
- Proactive identification and isolation of performance problems across server and storage environments.
- Understanding the relationships between physical and virtual resources to help isolate performance problems to the correct resource.



IBM® Tivoli® Monitoring for Virtual Servers is designed to address the specific challenges described above. Performance monitoring and reporting are vital to understanding how virtual machines are utilizing resources. Utilization reporting can identify resources that are trending to run out of capacity and resources that are underutilized and therefore candidates for consolidation. In addition, availability monitoring can be used to help find problems with critical resources and alert operations teams before users are adversely affected. Specific benefits include:

- Reduced time for capacity analysis and planning through enhanced Cognos® based reporting which includes drag and drop capabilities for ad-hoc report creation
- Reduced time for problem resolution through launch in context problem identification and take-action capabilities enabled by dynamic workspace linking
- Improved application availability by 7 - 10 percent, using proactive problem identification
- Reduction in hardware costs by improving utilization and deferring hardware purchases

IBM Tivoli Monitoring for Virtual Servers, a product bundle, now includes three separate agents to help extend the end-to-end monitoring and management capability of IBM Tivoli Monitoring to include:

**Virtual Infrastructure Agent (VI):** Remote performance and availability monitoring of VMware ESX, ESXi and vCenter Server environments.

**NetApp Storage Agent:** Remote performance and availability monitoring to visualize capacity, latency, and throughput performance metrics of NetApp and IBM N series storage systems.

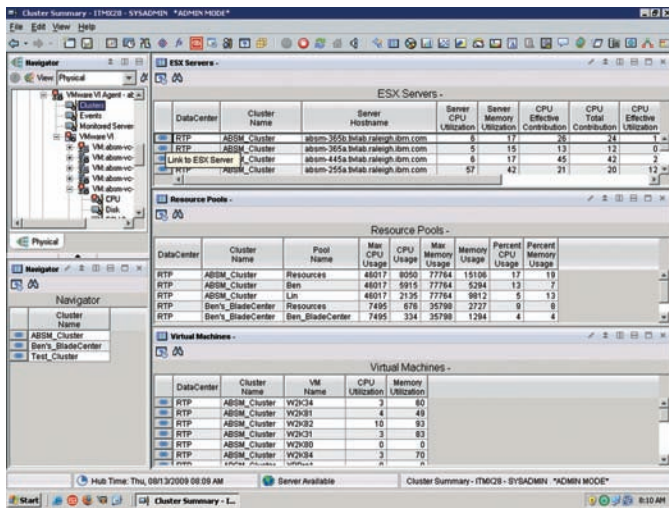
**Citrix Agent:** Monitoring of Citrix XenApp environments.

Each of these agents includes best-practice situations and expert advice, customized workspaces, historical data gathering and reporting. In addition, these agents can send application-specific events to IBM Tivoli Enterprise Console®. With these powerful capabilities, you can more effectively and efficiently manage their complete, end-to-end infrastructure from a single customizable interface. The specifics of each agent are described below.

### **VMware VI Agent**

The VMware VI agent provides monitoring of ESX and ESXi hosts and the VMware vCenter Server. Specific features include:

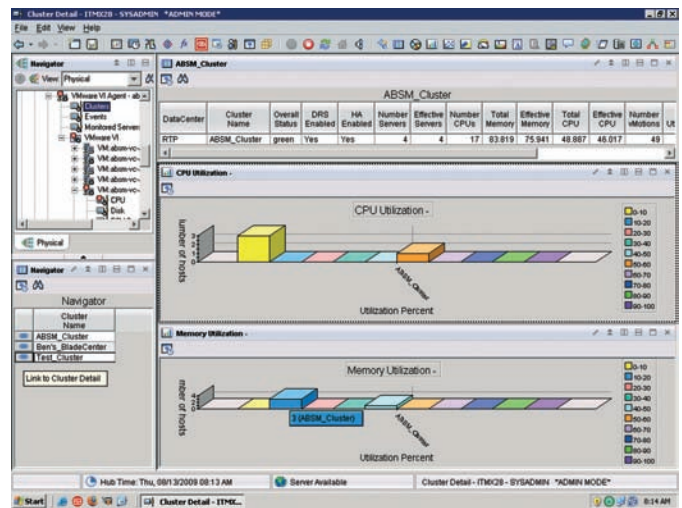
**Cluster, resource pool and VMware vCenter Server events:** Customers who monitor their VMware infrastructure by connecting to the VMware vCenter Server are able to obtain performance and availability alerts and statistics on clusters and resource pools and are able to visualize vCenter events (such as vMotion events). Customers can see overall cluster CPU and memory utilization as well as the distribution of utilization for the ESX servers in the environment—number of servers utilized 0% - 10%, 10% - 20%, and so on. Customers are then able to drill down via dynamic links to the specific ESX server or virtual machine that has a performance problem for further investigation.



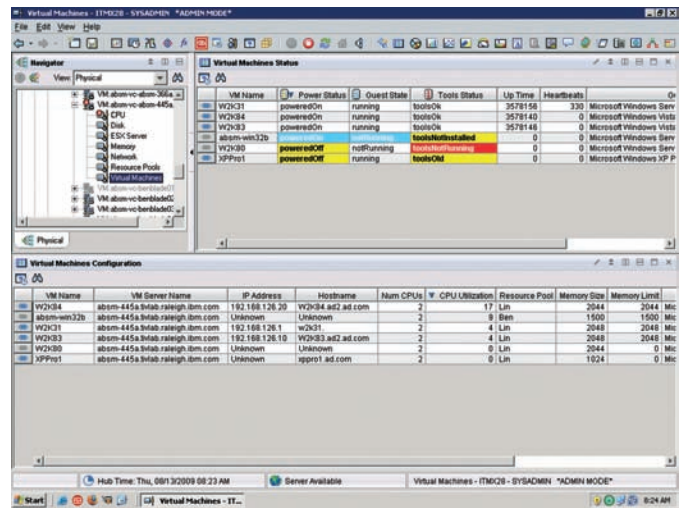
Visualize top and bottom performing clusters in the data center. Link to the cluster detail to view utilization metrics of the cluster by ESX host, Resource Pool or Virtual Machine in that cluster.

**ESX Host performance and availability alerts and statistics:**

Customers who monitor the ESX and ESXi host directly and those who monitor the vCenter server are able to obtain performance and availability alerts for memory and CPU utilization for the ESX host and by virtual machine. Customers are able to view network I/O by virtual machine and ESX host as well as disk utilization by virtual machine and ESX host and disk I/O for the ESX host. Customers who have an operating system agent installed on the guest are able to dynamically link from the VMware VI agent to the guest operating system agent to obtain process data to help in troubleshooting performance problems on the virtual machine.



Drill into each cluster to understand how ESX hosts are utilizing CPU and memory. In this example, 3 ESX hosts in the Cluster are only utilized less than 10%.



View virtual machine status, CPU and memory usage for all virtual machines on the ESX Host.

***Datastore Performance and Availability:*** V6.2.2 now provides detailed information and analysis for performance and availability monitoring and capacity planning of storage systems supporting VMware environments. New performance metrics include datastore performance, capacity and status, datastore disk and I/O usage by virtual machine, and capacity and health of the associated physical NetApp volume.

***Reporting:*** ITM for Virtual Servers v6.2.2 includes the market-leading business intelligence and analytics engine, Cognos 8.4, which is embedded in Tivoli Common Reporting 1.3, which is a free component of ITM for Virtual Servers. Historical reporting helps customers do capacity management activities such as: Virtual Machine right sizing, identify idle VMs, predicting limitations on physical resources (server network, storage), understand environment efficiency (#VMs/cluster/% utilization) and understanding workloads that can be added with existing capacity. Reporting features include:

- Self-service drag and drop reporting (View a demo of [ITM for Virtual Servers Historical Reporting](#))
- Web-based report editing

- Automatic emailing of reports
- Additional report formats like XML, CSV
- Granular data security
- Out-of-the-box Tivoli data models
- Data modeling tool included
- Cross-product integration support
- Smooth upgrade from existing TCR

***Scale:*** Unlike other monitoring vendors, the VI agent scales to monitor large VMware environments. For customers who use the capabilities of vCenter Server, only one agent instance is required per vCenter Server. Agents require one fast CPU with 1 GB - 2 GB RAM for a first vCenter Server, and customers can manage four to five vCenter Servers from a single server with two fast CPUs and 4 GB of RAM. For customers who require management of standalone ESX hosts, the VI agent can monitor 15 ESX servers per agent instance, and multiple agent instances can be run on the same server.

### **NetApp Storage Agent**

The NetApp agent monitors the health and performance of NetApp and IBM N Series network attached storage systems through a remote connection to the NetApp Data Fabric Manager (DFM) server. Virtual infrastructures heavily rely on supporting physical storage systems. Virtual administrators

desire to view the physical storage environment to understand availability and performance of physical components in order to determine if additional capacity on the volume(s) or aggregate can be leveraged for the VMware environment's growth. In turn, storage administrators want to understand how the VMware environment is using the volume (datastore) to effectively plan for growth and effectively manage the storage environment.

While this agent provides value as a stand-alone component to monitor the health and capacity of NetApp storage environments, it provides even more value when used in conjunction with monitoring of VMware environments because the VI agent provides the linkage from the virtual storage environment to how the physical storage environment is performing.

### **Citrix Agent**

The Citrix Agent delivers the following management and maintenance capabilities by:

- Monitoring the availability of Citrix component services and indicating when they are down

- Gathering the IMA session performance metrics for Independent Management Architecture (IMA) network connections, which are between Citrix servers/components (for example XenApp and the License Server)
- Gathering performance metrics for ICA sessions, which are between Citrix servers/components and users (for example, Presentation Server and the Citrix client on a user system, displaying the published applications)
- Showing Citrix-produced error, warning, and informational events from the event log
- Gathering the License Server license usage information
- Gathering performance metrics for the Secure Ticket Authority
- Delivering actions to start and stop Citrix component services

The Citrix Agent monitors the following components: Citrix License Server, Citrix Secure Access Manager, Citrix Secure Ticket Authority, Citrix Conferencing Manager and Citrix Web Interface for XenApp.

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## ITM—ITCAM Family

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*The ITM—ITCAM Solution Family* easily extends ITM for Virtual Servers to monitor and manage an extensive end-to-end application and application infrastructure environment from a single enterprise portal, with a single data warehouse and visualized with a single, common report capability.

- **IBM Tivoli Monitoring**—Monitoring for heterogeneous distributed operating systems and Power Systems™ and Solaris virtualized environments. Extend monitoring for custom applications with the Agent Builder.
  - **IBM Tivoli Monitoring for Energy Management**—Integrated monitoring of energy and thermal metrics for data center assets to help control energy costs and ensure high availability of services.
  - **IBM Tivoli Composite Application Manager for Microsoft® Applications**—Integrated monitoring of Microsoft's applications to include VMware and Hyper-V virtual infrastructure environments.
  - **IBM Tivoli Composite Application Manager for Applications**—Integrated monitoring of J2EE and packaged applications, databases, operating systems and virtual environments.
  - **IBM Tivoli Composite Application Manager for Application Diagnostics**—Deep dive diagnostic capabilities, to include garbage collection analysis and method tracing, for Subject Matter Experts in the area of WebSphere® and J2EE.
  - **IBM Tivoli Composite Application Manager for Transactions**—Proactively monitor the end-user's application transaction experience, response times for Internet technologies and decompose transaction response times to isolate application bottlenecks for composite applications.
  - **OMEGAMON® XE on System z®**—Monitoring of System z operating systems, z/VM®, database and application environments.
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## IBM Tivoli Monitoring for Virtual Servers at a glance

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### VMware VI Agent:

Monitors versions: VMware ESX Server V3.5, and later  
VMware ESXi Server V3.5, and later  
VMware vCenter server V2.5, and later.

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Runs on these operating systems:

- SUSE Linux® Enterprise Server (SLES) – 11.0 x86-32
  - SUSE Linux Enterprise Server (SLES) – 11.0 x86-64
  - Red Hat Enterprise Linux (RHEL) Advanced Platform – 5.0 x86-32
  - Red Hat Enterprise Linux (RHEL) Advanced Platform – 5.0 x86-64
  - SUSE Linux Enterprise Server (SLES) – 10.0 x86-32
  - SUSE Linux Enterprise Server (SLES) – 10.0 x86-64
  - Red Hat Enterprise Linux (RHEL) AS/ES – 4.0 x86-32
  - Red Hat Enterprise Linux (RHEL) AS/ES – 4.0 x86-64
  - Windows® Server 2008 Datacenter Edition – R2 x86-64
  - Windows Server 2008 Enterprise Edition – R2 x86-64
  - Windows Server 2008 Standard Edition – R2 x86-64
  - Windows Server 2008 Datacenter Edition x86-32
  - Windows Server 2008 Datacenter Edition x86-64
  - Windows Server 2008 Enterprise Edition x86-32
  - Windows Server 2008 Enterprise Edition x86-64
  - Windows Server 2008 Standard Edition x86-32
  - Windows Server 2008 Standard Edition x86-64
  - Windows Server 2003 Datacenter Edition x86-32
  - Windows Server 2003 Datacenter Edition x86-64
  - Windows Server 2003 Enterprise Edition x86-32
  - Windows Server 2003 Enterprise Edition x86-64
  - Windows Server 2003 Standard Edition x86-32
  - Windows Server 2003 Standard Edition x86-64
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Prerequisites:

- IBM Tivoli Monitoring V6.2.2 Fix Pack 1 or later
  - IBM Tivoli Enterprise Portal
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### IBM Tivoli Monitoring for Virtual Servers at a glance

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#### NetApp Storage Agent:

Monitors versions of NetApp DataFabric Manager V3.7 or later

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Runs on these operating systems:

- Red Hat Enterprise Linux (RHEL) 4.0 AS/ES x86-32
  - Red Hat Enterprise Linux (RHEL) 4.0 AS/ES x86-64
  - Red Hat Enterprise Linux (RHEL) 5.0 Advanced Platform x86-32
  - Red Hat Enterprise Linux (RHEL) 5.0 Advanced Platform x86-64
  - SUSE Linux Enterprise Server (SLES) 10.0 x86-32
  - SUSE Linux Enterprise Server (SLES) 10.0 x86-64
  - SUSE Linux Enterprise Server (SLES) 11.0 x86-32
  - SUSE Linux Enterprise Server (SLES) 11.0 x86-64
  - Windows Server 2003 Datacenter Edition x86-32
  - Windows Server 2003 Enterprise Edition x86-32
  - Windows Server 2003 Datacenter Edition x86-64
  - Windows Server 2003 Enterprise Edition x86-64
  - Windows Server 2003 Standard Edition x86-64
  - Windows Server 2003 Standard Edition x86-64
  - Windows Server 2008 Datacenter Edition x86-32
  - Windows Server 2008 Datacenter Edition x86-64
  - Windows Server 2008 Enterprise Edition x86-32
  - Windows Server 2008 Enterprise Edition x86-64
  - Windows Server 2008 Standard Edition x86-32
  - Windows Server 2008 Standard Edition x86-64
  - Windows Server 2008 R2 Datacenter Edition x86-64
  - Windows Server 2008 R2 Enterprise Edition x86-64
  - Windows Server 2008 R2 Standard Edition x86-64
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Prerequisites:

IBM Tivoli Monitoring V6.2.2 Fix Pack 1  
IBM Tivoli Enterprise Portal

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### IBM Tivoli Monitoring for Virtual Servers at a glance

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#### Citrix Agent:

Monitors versions: Citrix 3.0 - Enterprise Edition, 4.0 - Enterprise Edition, 4.5 - Enterprise Edition, 5.0 XenApp

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Runs on these operating systems:

- Windows 2000 Server
  - Windows 2000 Advanced Server
  - Windows 2000 Data Center
  - Windows 2003 Server
  - Windows 2003 Enterprise Server
  - Windows 2003 Data Center
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Prerequisites:

- IBM Tivoli Monitoring V6.1 Fix Pack 6 or IBM Tivoli Monitoring V6.2
  - IBM Tivoli Enterprise Portal
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## For more information

To learn more about IBM Tivoli Monitoring for Virtual Servers, please contact your IBM marketing representative or IBM Business Partner, or visit the following website:

[ibm.com/tivoli/products/monitor-virtual-servers](http://ibm.com/tivoli/products/monitor-virtual-servers)

## About Tivoli software from IBM

Tivoli software from IBM helps organizations efficiently and effectively manage IT resources, tasks and processes to meet ever-shifting business requirements and deliver flexible and responsive IT service management, while helping to reduce costs. The Tivoli portfolio spans software for security, compliance, storage, performance, availability, configuration, operations and IT lifecycle management, and is backed by world-class IBM services, support and research.

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