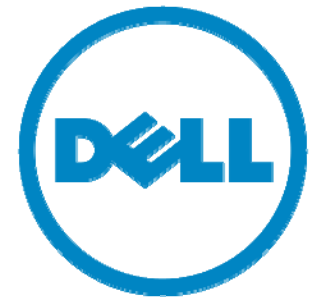

Virtualization Performance Management



Christian Ledwidge

Director Monitoring EMEA: Dell Software Group

Survey: How many Virtual Machines are currently in your environment?

- Fewer than 1000
- 1000 to 2500
- 2500 to 5000
- 5000 or more



Priorities for virtual environments

- Reducing operational expenses and capital cost.
- Analyzing current growth and predicting future requirements within your virtual environment.
- Optimization of your existing virtual infrastructure.
- Troubleshooting and resolution of virtual performance issues.
- Automating reoccurring or mundane virtual housekeeping tasks.



Question #1

- What is our VM Density?
 - # servers / # VMs
- Why is this important?
 - VM Density is a measurement of how effective you use virtualization
- Fact
 - Customers of Dell Foglight for Virtualization have been able to increase VM density by 1-2 VMs per host by simply optimizing their environment
 - In one case this equated to over 200 additional VMs on the same hardware



Question #2

- How much wasted disk space do we have?
 - Over-allocated virtual files?
 - Abandoned templates?
 - Powered off VMs?
- Why is this important?
 - Over-allocation of files is rampant and in some cases VM's are "lost" and not visible in vCenter yet still exist and consume space
 - Even if you thin-provision disks within a storage array, there is waste
- Fact
 - Dell Foglight for Virtualization has found 1000's of terabytes of wasted disk space



Question #3

- How many Zombie VM's do we have?
 - VM is running, but is anyone using it?
 - In 24 hours?
 - In 1 week, month, quarter, year?
- Why is this important?
 - VM Sprawl has created millions of VMs that are powered on but never used
- Fact
 - Dell Foglight for Virtualization has found *1000's* of Zombie VMs and removed them



Question #4


- How do we maintain SLAs, and how to we pinpoint virtual performance problems? How long does it take, hours, minutes, seconds?
 - Do we proactively know if a host or VM is “beginning” to have problems?
 - Proactive alerts?
 - Single pane of glass?
 - Email/text alerts?
 - Automation?
- Why is this important?
 - The optimum VM to Admin ratio is 1:150 – without intelligent analytics and automation, it is impossible to meet SLAs and a high ratio
- Fact
 - Dell Foglight for Virtualization is the de-facto standard for mid-to-large scale virtual infrastructure at almost 8,000 installations.



Question #5

- How do we know when a host is running out of resources before it happens?
 - How many additional VMs can we add to our environment?
 - What is the gating factor to growth? CPU? Memory? Storage?
- Why is this important?
 - Would you rather know weeks or hours before you hit a CPU/Memory/Storage limitation?
 - How do you plan for future server and storage acquisitions?
- Fact
 - Dell Foglight for Virtualization has predictive analytics to tell you when resources are going to run out



A photograph of a server room. In the foreground, there is a glass partition that reflects the server racks. Behind the glass, several rows of black server racks are visible, filled with various server components. The room is well-lit, and the floor is a dark carpet. The overall scene is a clean, organized data center environment.

Visualize,
Analyze,
Optimize,
Automate.....

Dell Foglight for
Virtualization

End to “Everything” Virtual Management

Foglight™ for Virtualization, **Enterprise Edition**
The *one* solution that covers it all

- Multi-hypervisor support available today and coming soon



- Integrated virtual application and OS platform coverage

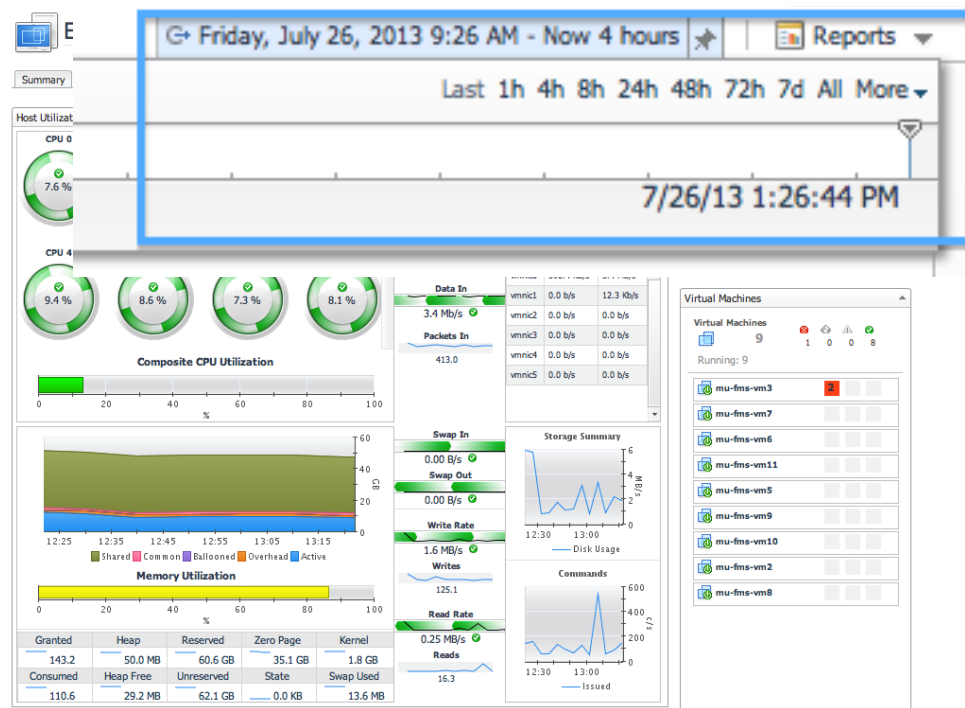


- Deep storage infrastructure performance analysis



Real-time Visualization

- The *one* solution that does it all
 - Real-Time and Historical Analysis
 - Single –pane-of-glass for enterprise wide virtual monitoring
 - Go from real-time to any-point-in-time performance and resource analysis



Enterprise View

Real-Time View

Historical View



Proactive, Actionable Insights

- The *one* solution that does it all
 - Expert Advice – Find Performance Problems in Seconds
 - Pinpoint the problem for immediate resolution
 - Proactively identify potential future problems

The screenshot displays the Foglight Alarms console. On the left, there's a summary section with a line graph showing system alarms over time. Below the graph, an 'Alarm Filter' section indicates 87 current alarms. The main area shows a detailed view of a specific alarm:

Host	Instance
wintest01.torrd.del.tor.ca.qsft	wintest01(babel builder) (VMWVirtualMachineMemory)

Agent: torrdvcw01.prod.quest.corp
Agent Type: VMwarePerformance
Origin (By Rule): VMW Virtual Machine Balloon Memory Deflation
Default Drilldown: n/a

Message and Help:
Balloon Memory : Peak % = 0.65% - Deflation % = 0.65%. The Memory Control Driver for virtual machine wintest01(babel builder), will not deflate. The VM is unable to reclaim memory that is allocated to it. Add more physical resources to the server or use VMotion to move the VM to better balance utilization across servers in the cluster. This rule checks for VMs working really hard to reclaim memory.

Has Service Level Impact on 1 Services:

Service Name	SLC
ResourcePool_Production	⚠

Below the message is a table of alarm instances:

Created Time	Sev	Dur	Ack'd Info	Clearing Info	Notes
7/25/13 5:12 AM	⚠	14 hr	Not Ack'd	No	0

At the bottom, there are buttons for 'Acknowledge', 'Acknowledge Until Normal', 'Clear', and 'Cancel'.

Exception Alarms

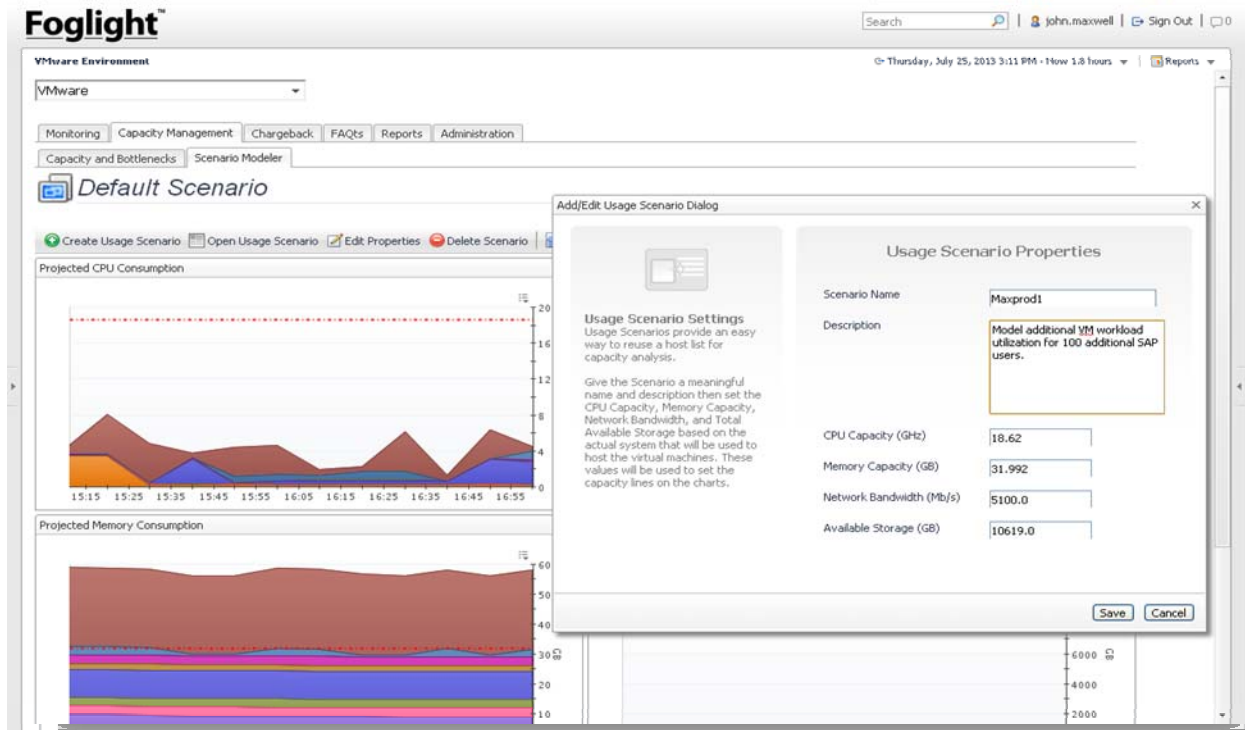
+ Expert Advice

Proactive Insights



Analyze and Forecast Capacity Trends

- The *one* solution that does it all
 - Capacity Management
 - View current growth trends and resource consumption
 - Forecast future resource requirements
 - Scenario modeling and what-if scenarios



Capacity
Trending

Growth
Scenarios

Forecast
Future
Capacity



Optimize and Reduce Data Center TCO

- The *one* solution that does it all
 - **Optimization: Improve VM Density and Control OPEX**
 - **Right-size CPU and Memory; Reclaim wasted resources**

The screenshot shows the Foglight VMware Environment interface. At the top, it displays the environment name 'VirtualCenter_torrdv01.prod.quest.corp' and a search bar. Below this, there are navigation tabs for Monitoring, Capacity Management, Chargeback, Optimizer, FAQs, Reports, and Administration. A summary bar indicates 'Total Potential Savings \$453,631'. A central navigation area includes icons for CPU, Memory, Storage, Abandoned VM Images, Powered Off VMs (highlighted), Unused Template Images, Snapshots, and Potential Zombie VMs. Below this is a 'Reclaim Savings Today' section with a 'Reclaim Now' button. The main content area is a table of powered-off VMs.

Virtual Machine	Datastores	Size	Powered Off For
Win2K3_STD_SP1_vCenter(migrated,donot start)	Storage1	40 GB	1,217 Day(s)
vyatta	VM-POOL1	2.0 GB	1,217 Day(s)
torrdv413 (jBoss%2fWLS Test Node)	VM-POOL1	25 GB	1,185 Day(s)
torrdv425(DB2 Server,TORRD domain member)	VM-POOL3	40 GB	1,179 Day(s)
torrdv414 (DotNET 5.2.3.7 Agent)	VM-POOL1	40 GB	1,147 Day(s)
torrdv415 (DotNET 5.2.3.7 FMS)	VM-POOL1	19 GB	1,137 Day(s)
torrdv416 (DotNET Build x86)	VM-POOL1	33 GB	1,072 Day(s)
torrdv438	VM-POOL1	67 GB	1,071 Day(s)
torrdv255(Oracle 11G%2fPT8.5, vfog agent)	VM-POOL3	63 GB	1,067 Day(s)
torrdv257(DB2%2fPT8.5)	VM-POOL3	25 GB	1,046 Day(s)

Optimize CPU
and Memory

Optimize
Storage
Resources

Reclaim
Wasted
Resources



Automation you can Trust

- The *one* solution that does it all
 - **Flexible Automation**
 - Automate remediation to alarms & common tasks
 - Proactively optimize virtual resources
 - Powerful AND easy to use automation

The screenshot displays the Foglight VMware Environment interface. A 'Reclaim Later - Schedule' dialog box is open, showing a table of virtual machines and their recommendations. The table has two columns: 'Virtual Machine' and 'Recommendation'. The first row lists 'STLVMw08x64QA1_1.vmdk' with the recommendation 'Remove Abandoned Image'. Below the table, there are fields for 'Implement Recommendations' with a date of 'Jul 25, 2013' and a time of '7:11 PM'. A warning message states: 'Please note the implementation of some recommendations requires a VM to be rebooted! Avoid rebooting important VMs by adding additional implementation rules, implementing only recommendations not requiring a VM reboot or excluding that VM from the menu.' There is also an 'E-mail Subject' field with the value 'john.maxwell@software.dell.com' and an 'Address' field with the message 'There Is No Data To Display'. At the bottom of the dialog are 'Reclaim' and 'Cancel' buttons.

Automation

Custom
Workflows

Proactive
Optimization



Question: Which hypervisors are you using today?

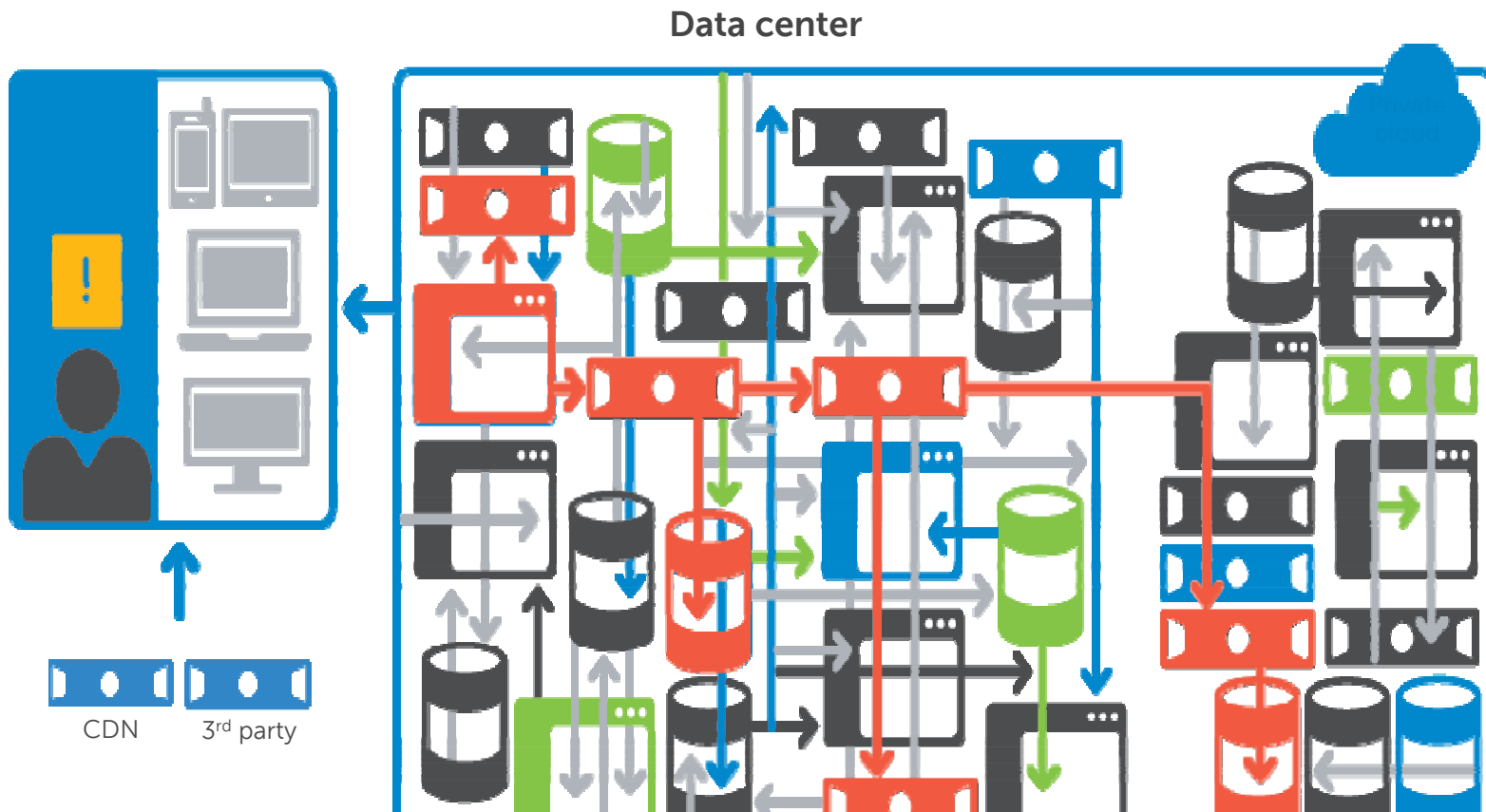
- ESX (VMware)
- Hyper-V
- Xen
- KVM
- Oracle VM
- Power VM
- REV (red hat enterprise virtualization)



Bringing IT All Together



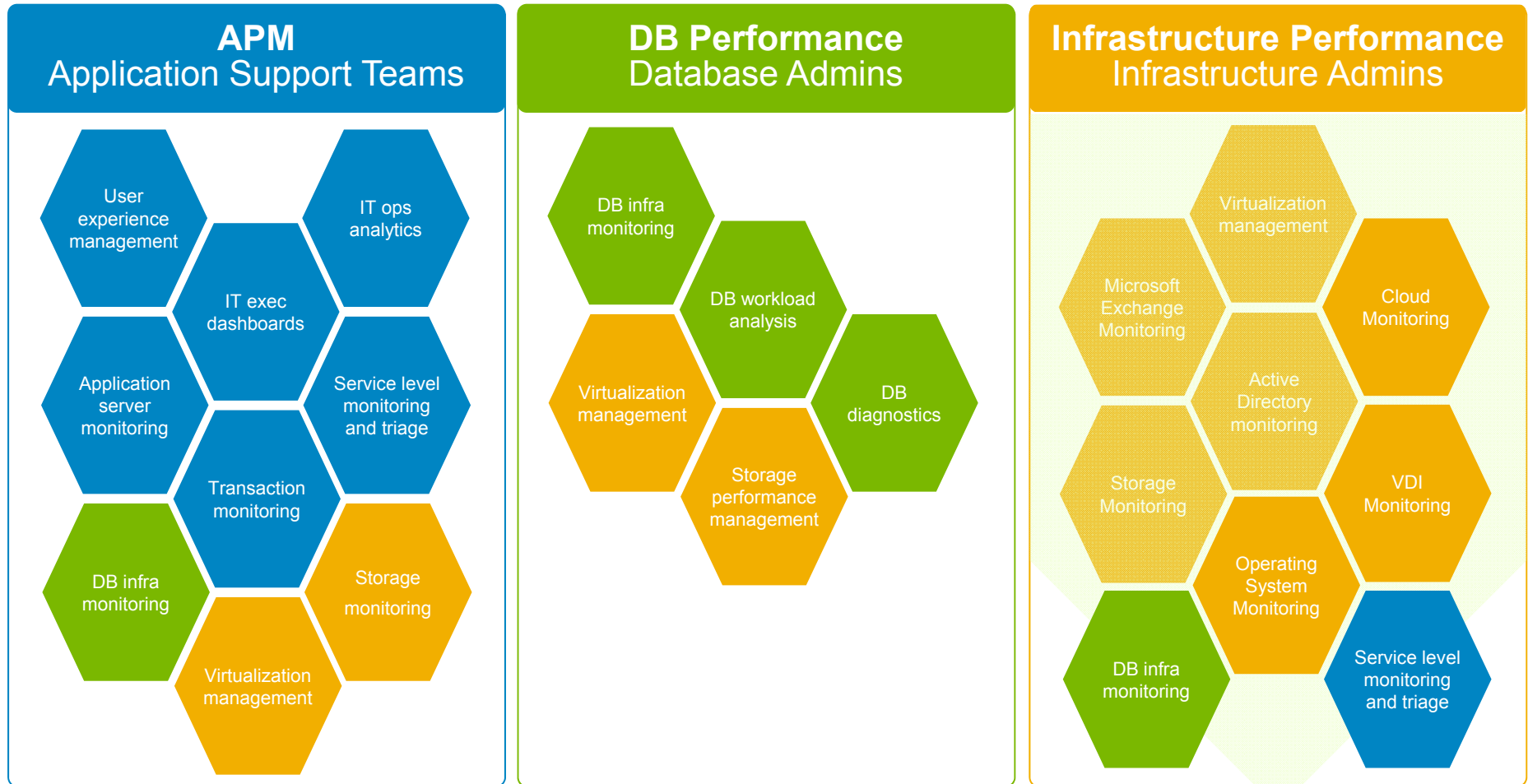
Infrastructure Complexity Affects Visibility



Get Insight into Performance Across the IT Stack

Uniquely Extensible Monitoring Platform

- Modular capabilities enable maximum team collaboration based on a common platform and a "single version of the truth"



Microsoft Active Directory Monitoring

- The *one* solution that does it all
 - Foglight Microsoft Active Directory Cartridge
 - Monitoring of forests, domains, sites and domain controllers

The screenshot shows the Foglight Microsoft Active Directory Cartridge interface. The 'Quick View' for the 'demo.local' domain includes the following data:

- Inventory By Category:**
 - Sub Domains: 0
 - DNS Servers: 2
 - FSMO Holders: 1
 - Global Catalogs: 2
- Statistics:**
 - 185 Users
 - 64 Groups
 - 24 Computers
- FSMO Roles:**

State	Role	Name
✓	Schema Master	alvadcw01.demo.local
✓	Domain Naming Master	alvadcw01.demo.local
✓	Infrastructure Master	alvadcw01.demo.local
✓	PDC Emulator	alvadcw01.demo.local
✓	DFB Master	alvadcw01.demo.local
- Domain Trusts:**

Inbound			Outbound		
Inbound	Type	Transitive	Outbound	Type	Transitive
There Is No Data To Display			There Is No Data To Display		
- Top 3 Consumers:**

Top 3 CPU Consumers		Top 3 Memory Consumers		Top 3 Network Consumers		Top 3 Storage Consumers	
Domain Controller	Used Hz	Domain Controller	Consumed	Domain Controller	Rate	Domain Controller	Rate
alvadcw02.demo...	66 MHz	alvadcw01.demo...	3.0 GB	alvadcw02.demo...	364 Kb/s	alvadcw01.demo...	8.7 KB/s
alvadcw01.demo...	64 MHz	alvadcw02.demo...	3.0 GB	alvadcw01.demo...	134 Kb/s	alvadcw02.demo...	7.1 KB/s
- demo.local Alarms:**

State	Info	Time	Domain Controller	Alarm Message
There are currently no alarms.				

AD
Infrastructure

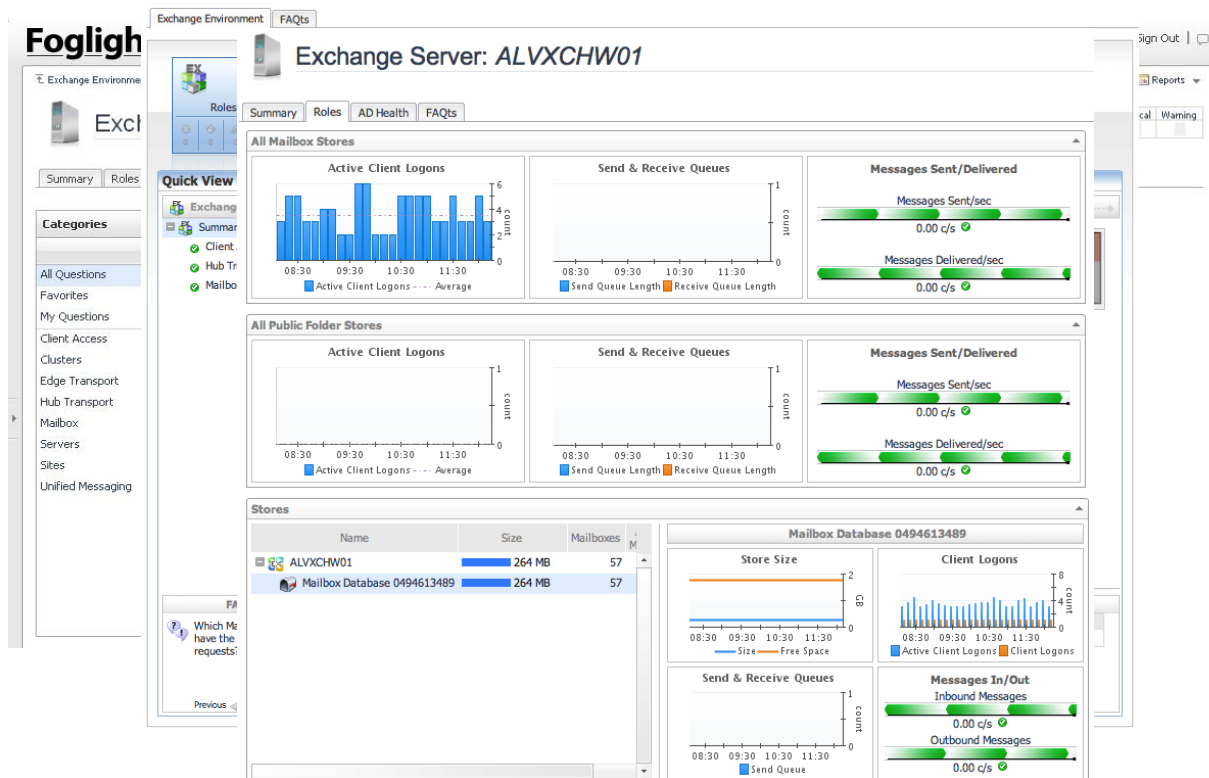
Real-Time AD
Health

Analysis &
Reporting



Microsoft Exchange Monitoring

- The *one* solution that does it all
 - Foglight Microsoft Exchange Cartridge
 - Monitoring of Roles, Servers, Sites and Clusters



Exchange Infrastructure

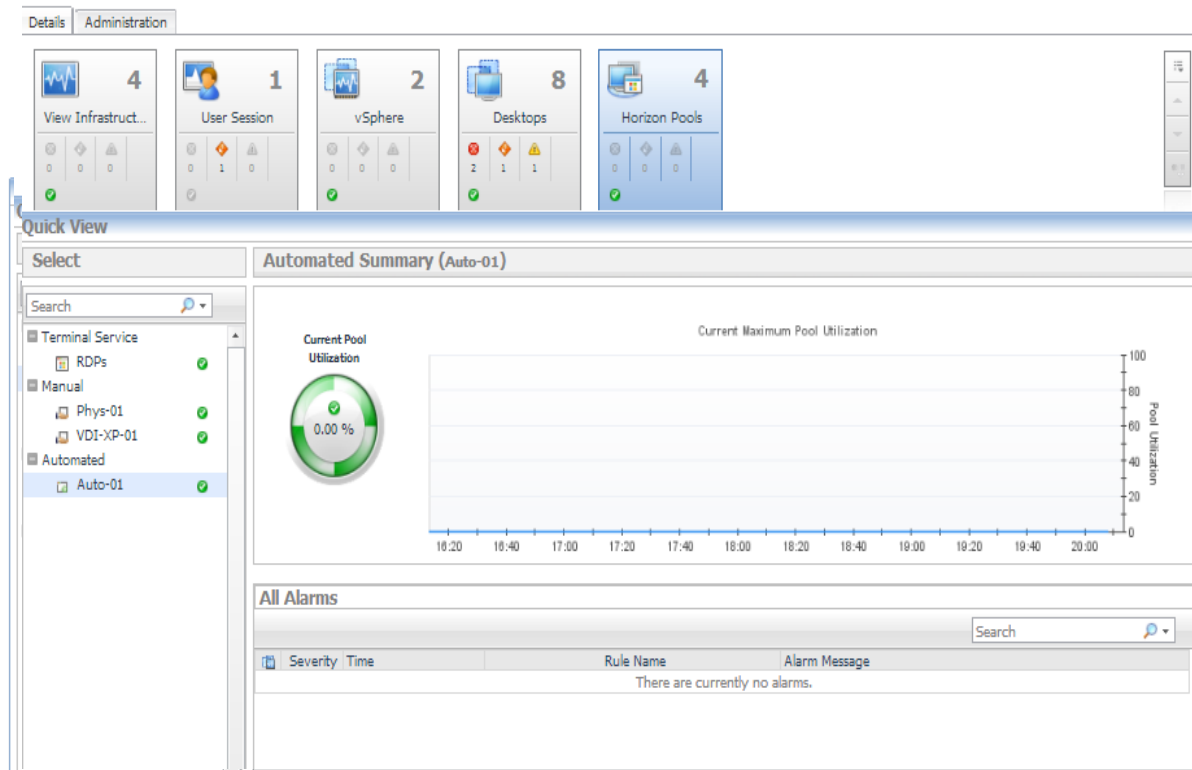
Real-Time Exchange Health

Analysis & Reporting



VDI Monitoring: VMware View

- The *one* solution that does it all
 - VMware View
 - Monitoring of View Infrastructure, User Sessions, vSphere, Desktops and Pools



Infrastructure
at a Glance

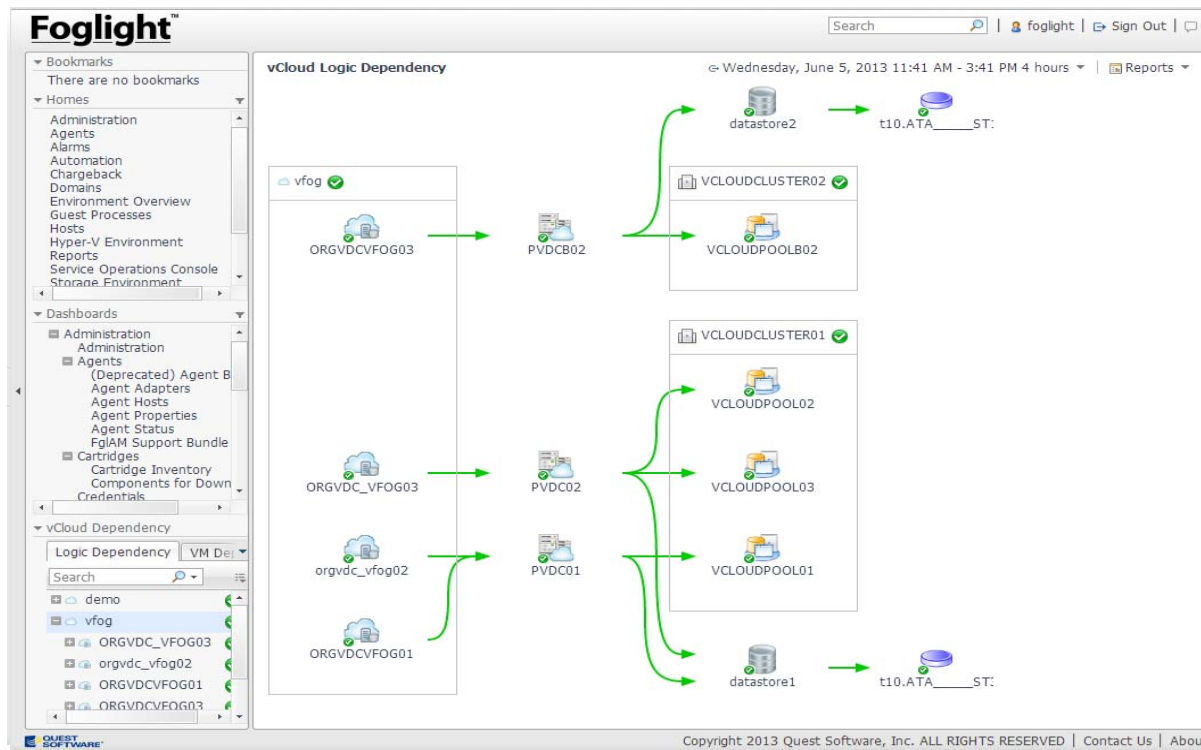
Analyze Users
& Desktops

Pool
Reporting



Cloud Monitoring: vCloud Director

- The *one* solution that does it all
 - vCloud Director
 - Monitoring of Organizations, Provider vDCs, Organization vDC and vSphere Resources



Infrastructure
at a Glance

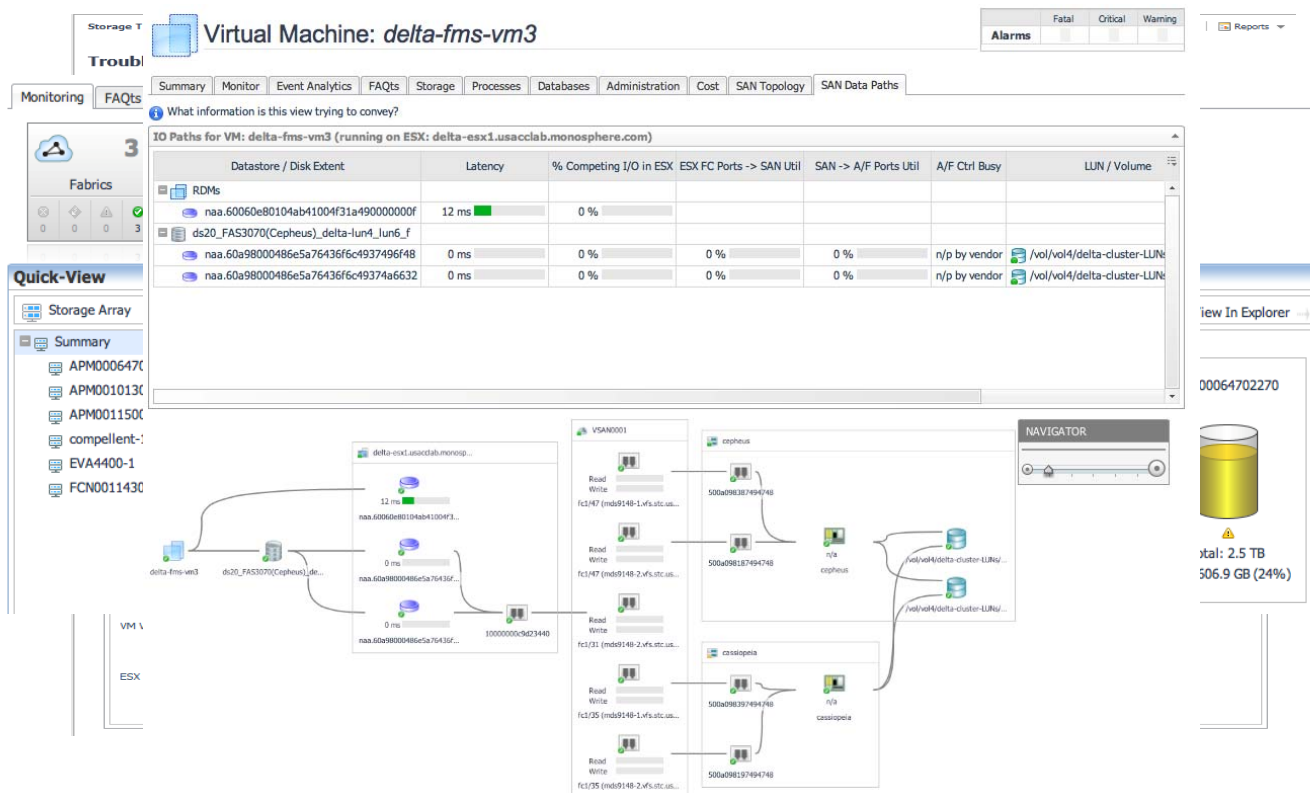
vDC level
alerts & alarms

Cloud
Hierarchy



Storage Monitoring

- The *one* solution that does it all
 - Foglight for Storage Management Cartridge
 - VM to Disk Spindle Performance Monitoring and Advice



Utilization

One Click Analysis

Pool Reporting

Storage Topology





The power to do more