Top 10 Ways that Foglight for Virtualization, Free Edition Can Help You

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Introduction

Maximizing the resources of your physical servers requires the right tools.

So much of server virtualization is about maximizing the resources of your physical servers. This involves pushing your server utilization higher than ever before while still trying not to over-saturate your resources and cause application performance degradation.

To do this, you need information and statistics that aren't found in centralized management tools like vCenter and System Center. There are numerous commercial tools available to help with capacity analysis and management. However, in the list of free capacity analysis tools, you won't find any tool more useful than Dell´s Foglight for Virtualization, Free Edition. If you aren't familiar with Free Edition, you'll learn all that you need to know in the rest of the Introduction. If you already have experience with Free Edition, skip ahead to learn about the top 10 ways that Free Edition can help you.

Foglight for Virtualization, Free Edition delivers the tools you need.
Foglight for Virtualization, Free Edition is a suite of six free utilities, delivered in a single virtual appliance. Free Edition includes:

- Environment Explorer
- vScope Explorer
- SearchMyVM Explorer
- Storage Explorer
- Change Explorer
- Snapshot Explorer

There is no traditional Windows installation for any of these utilities, nor do you have to install or configure anything. In fact, all of the utilities are contained in a single virtual appliance download that is deployed into your vSphere, Hyper-V or RHEV infrastructure—you can have it up and running in less than 15 minutes.

Using Foglight for Virtualization, Free Edition
Once running, you'll connect Free Edition to your management system (vCenter, vCloud Director, SCOM or RHEVM) so it can learn about your virtual infrastructure. Free Edition will gather information and present you with unique statistics and helpful capacity and performance information that you just can't find in the native tools.

Once you log in to Free Edition, you'll see the easy-to-use web interface with tabs for each of these free utilities, as shown in Figure 1.

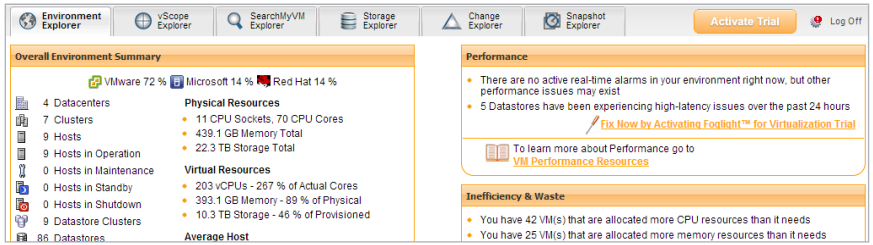

Figure 1. Free Edition includes six free utilities.

Now let's look at the top 10 things that these free utilities in Free Edition can do for you.

1. Managing snapshots

Snapshots consume a lot of disk space, which can lead to an outage. Hypervisor snapshot functionality is extremely useful when used to temporarily preserve the state of a VM before an upgrade or configuration change. Unfortunately, however, snapshots are too often misunderstood and used for long-term backup. Moreover, in many cases, snapshots are forgotten about.

In any case, snapshot data can consume huge amounts of disk space that many administrators don't even know about because vCenter doesn't calculate space used by all snapshot files. Those large files take up space on expensive SANs and make virtual infrastructure backups run longer than needed. Worst of all, they can cause a datastore to run out of capacity.

Snapshot Explorer makes it easy to manage snapshot files. Snapshot Explorer shows you how many snapshots there are in your environment , how old they are, and how much space they consume. Plus, it identifies orphaned snapshots—snapshots that vCenter has lost control of. Snapshots can be orphaned when a snapshot or snapshot tree is deleted or committed and for some reason the system is unable to merge snapshot delta files with the base disk. The result will be one or more snapshots actively growing on disk without your knowledge. This can cause the datastore to run out of disk space, which in turn can cause a serious outage.

Snapshot Explorer detects the following orphaned snapshot files:

- **VMSN:** Memory state of VM when snapshot was taken (optional)
- **.VMDK:** Delta disk containing all changes since snapshot was taken

The easiest way to remove an orphaned snapshot inside vCenter (requires vSphere 5) is by right clicking on *VM – Snapshot – Consolidate*. If you are running an older version you can try taking a new snapshot and then deleting it. Make sure no orphaned files are left over in the VM folder.

Figure 2. Snapshot Explorer shows you how many snapshots you have, how old they are, and how much space they consume. And it identifies orphaned snapshots, too.

Avoid performance and capacity problems by proactively monitoring snapshots with Snapshot Explorer.

2. Identifying memory limits

Memory limits can cause performance issues.
Memory limits are often configured by VMware admins who fear that a single VM could monopolize all the memory of a host. Unfortunately, these memory limits cause performance issues because the guest OS believes it has full access to the virtual memory that it is assigned. Instead, if you want to limit the memory of a VM, simply reconfigure the virtual memory that is assigned. Memory limits are inherited from the template it was deployed from so make sure you follow the best practice, which is setting the memory limit to unlimited. However, rather than limiting memory, in most cases you should simply trust the vSphere memory management techniques.

Environment Explorer detects VMs with memory limits so you can remove them, if appropriate.
In many cases, memory limits are configured without the VM admin's knowledge. Environment Explorer detects any VMs that have memory limits so that you can investigate and, likely, remove the limits (by setting memory resource allocation to unlimited), thereby preventing performance issues.

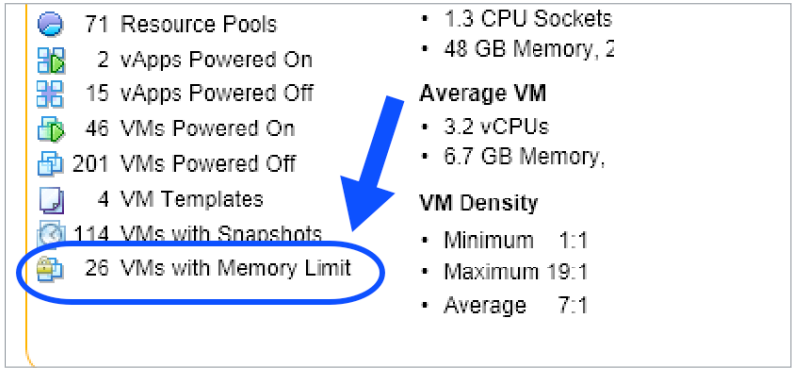

Figure 3. Environment Explorer detects any VMs that have memory limits.

3. Tracking changes

Performance issues and outages are often related to a change in the virtual infrastructure. In many cases, those changes aren't tracked, so resolving the issue requires a great deal of troubleshooting.

Change Explorer detects changes to the virtual infrastructure over the last seven days and assigns each one a risk level of low, medium or high. The frequency of the change can increase the risk level, ensuring that you are made aware of abnormal activity going on. Change Explorer also tracks before and after values, along with who made the change. This type of functionality just isn't possible with the native tools.

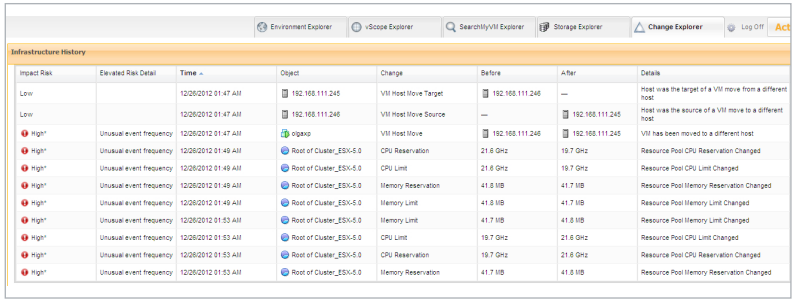

Figure 4. Change Explorer tracks infrastructure changes and assesses the risk they pose.

4. Sizing virtual machines

VM sizing needs to be performed regularly—but not using manual methods.
The sizing of VM CPU, memory and disk isn't something that you can do once and never repeat. When new VMs are deployed. it's very hard to know exactly what amount of resources are required, so VM admins typically add extra resources to avoid performance problems. This leads to a great amount of resources being wasted with no performance benefits.

Moreover, VM utilization, which is driven by the application demands inside the VM, will change over time. Therefore, capacity analysis and VM sizing needs to be done frequently. However, it's not something that you want to do manually, especially in a large virtual infrastructure.

vScope Explorer pinpoints where resources are constrained or wasted, making sizing easy.
Saving you vast amounts of time and effort, vScope Explorer provides a color-coded heat map of hosts, VMs and datastores that shows performance, capacity and efficiency so you can see at a glance where resources are constrained or wasted. With this information instantly available, you can proactively analyze the host or VM to balance the load or resize the VM before your users experience performance problems.

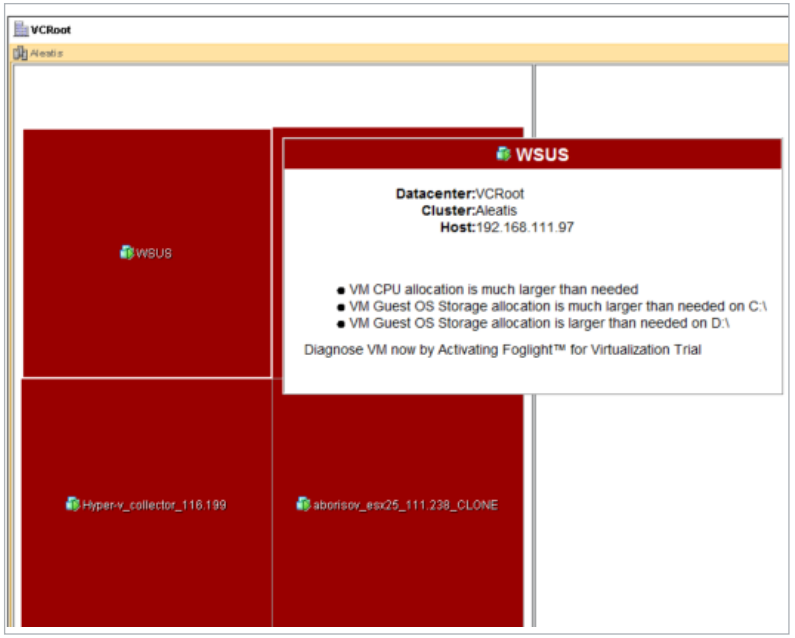

Figure 5. vScope Explorer assesses VM efficiency so you can balance the load or resize the VM before your users experience performance problems.

vScope Explorer provides a color-coded heat map of hosts, VMs and datastores that shows performance, capacity and efficiency so you can see at a glance where resources are constrained or wasted.

5. Measuring virtual machine density

As a VM admin, one of your goals is to maximize your sever hardware by running as many VMs as possible on each host. In doing so, it's easy to overload your hosts or end up with a one host having many more VMs
than others.

Environment Explorer shows your VM density per host. In Figure 6, you can see that one host just has a single VM, another host has 19 VMs running, and the average is 7 VMs per host. Right-sizing your VMs will increase density, which ultimately improves the ROI for your virtual datacenter.

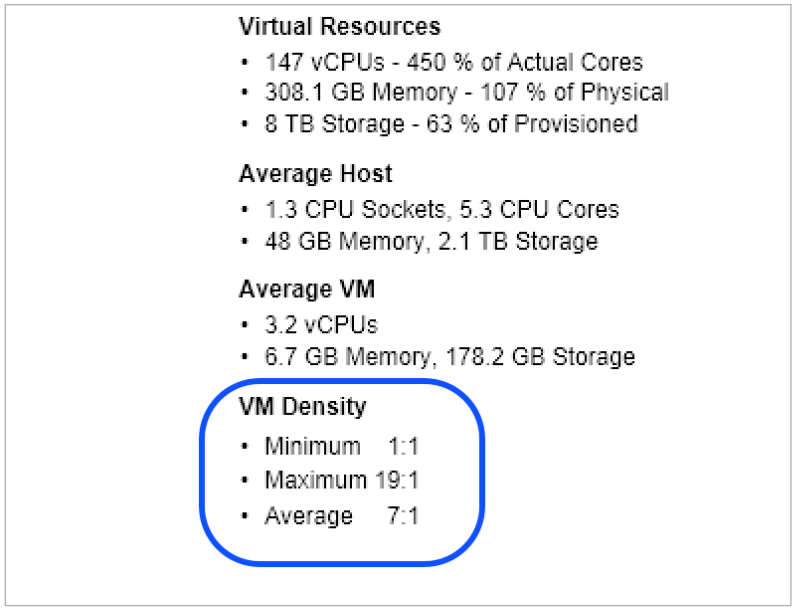

Figure 6. By measuring VM density, Environment Explorer helps you maximize virtual datacenter ROI.

6. Finding virtual infrastructure waste

As the resource demand on some VMs increases over time, the demand of other VMs will decrease, resulting in oversized VMs and virtual infrastructure waste.

Environment Explorer identifies oversized VMs and reports on how much capacity could be regained by right-sizing them. It also detects additional waste, such as abandoned VMs, zombie VMs, unused templates, powered-off VMs and snapshots, and estimates how much money you could save by fixing the issues.

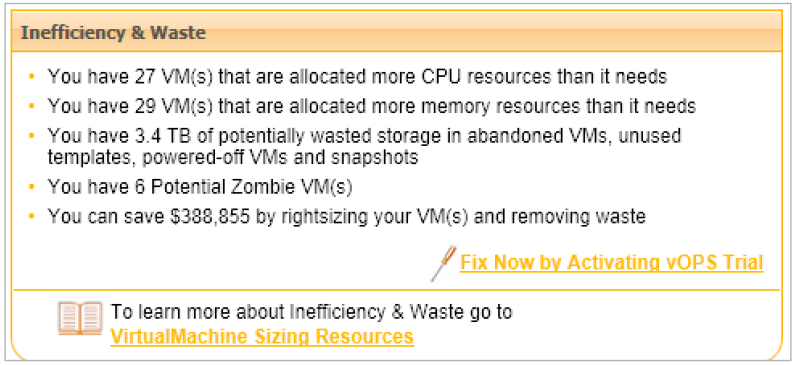

Figure 7. Environment Explorer identifies virtual infrastructure waste and estimates how much you could save by addressing the problems.

Environment Explorer identifies oversized VMs and additional waste, such as abandoned VMs, zombie VMs, unused templates, powered-off VMs, and snapshots.

7. Reporting virtual machine inventory

With the number of VMs rapidly increasing, one of the major challenge affecting virtualization admins is simply knowing how many VMs, hosts, resource pools, datacenters, vApps, templates and snapshots you have and the status of each.

Environment Explorer provides the overall status of your virtual infrastructure inventory, the status of your hosts and VMs, and the resources in use at a glance. While you could obtain the same information in vCenter, finding it would take considerable time.

If you need more detailed inventory reporting, such as hypervisor versions, virtual hardware versions, snapshots, guest OS information and VM sizing, simply turn to SearchMyVM Explorer. You can quickly view this information and export it to XML, PDF or CSV format.

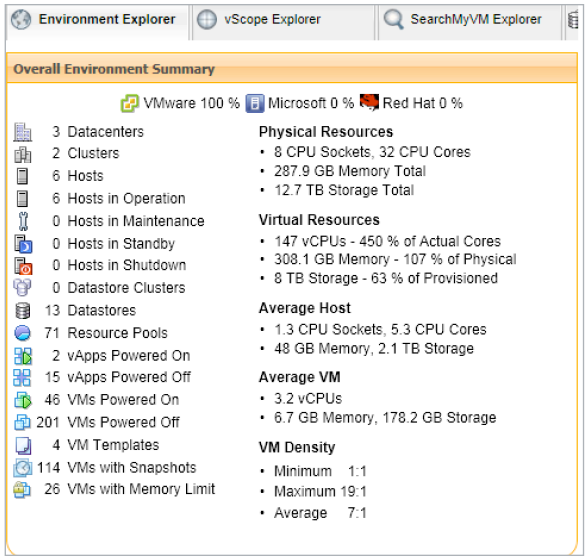

Figure 8. Environment Explorer provides the overall status of your virtual infrastructure inventory, the status of your hosts and VMs, and the resources in use at a glance.

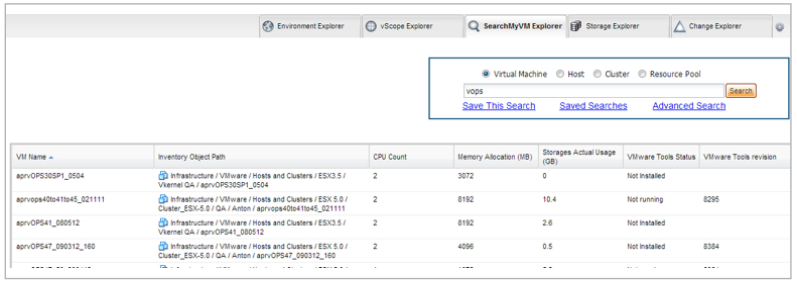

Figure 9. SearchMyVM Explorer provides detailed inventory information.

8. Measuring storage latency

One of the most common causes of performance issues in a virtual infrastructure is storage latency. Storage latency is the delay that a VM experiences reading or writing to the storage that it is running from. Storage latency can slow down everything that a VM does, even though it may have plenty of CPU and memory assigned. Even though storage latency is so common, it's painful to obtain information about it from vCenter.

Storage Explorer shows you what datastores and VMs are experiencing high average latency, peak latency and other critical storage metrics.

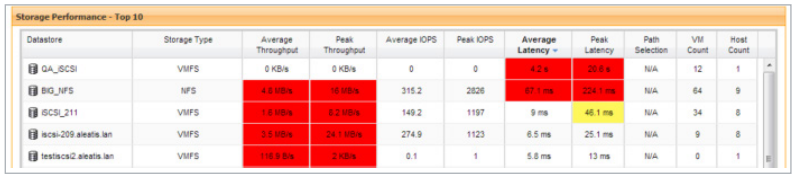

Figure 10. Storage Explorer shows you what datastores and VMs are experiencing high average latency, peak latency and other critical storage metrics.

Storage latency is the delay that a VM experiences reading or writing to the storage that it is running from. Storage latency can slow down everything that a VM does, even though it may have plenty of CPU and memory assigned.

9. Determining how many more virtual machines can be added

VM admins who are trying to maximize physical server resources and increase VM density often ask, "How many more VMs can I add?" In vCenter, you'll find that you can try to guestimate the answer to this question, but there is no easy way to calculate it.

Environment Explorer shows how many more VMs can be added to your environment, so you'll know whether you have capacity for more VMs and how soon you will need to increase your physical server count.

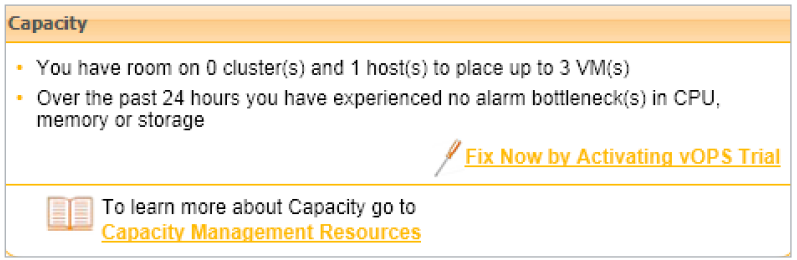

Figure 11. Environment Explorer shows how many more VMs can be added to your environment.

10. Preventing over-allocation of physical resources

One of the challenges that every VM admin faces is how to manage virtual resources. Virtualization is great because it allows you to over-provision your physical servers, but that flexibility can quickly become a bad thing if all the resources you over-provisioned are suddenly utilized by the guest OS and apps in your VMs. Pay special attention to storage over-provisioning as it can result in a catastrophe if you run out of capacity.

Environment Explorer allows you to quickly see the percentage of over allocated CPU, memory and storage, as shown in Figure 12.

Environment Explorer ensures that you don't over allocate your physical resources to the point of resource saturation and application slowdown.

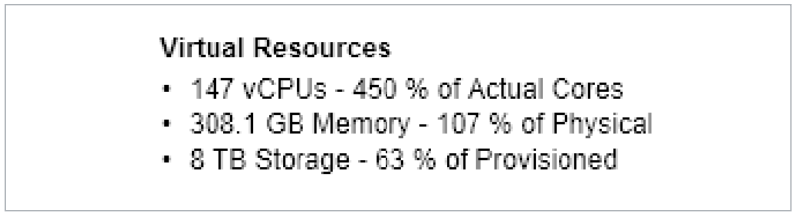

Figure 12. Environment Explorer makes it easy to assess physical resource utilization.

Environment Explorer ensures that you don't over allocate your physical resources to the point of resource saturation and application slowdown.

Conclusion

Virtualization gives you the power to maximize your datacenter resources into efficient processing machines—but it can also enable you to bring your company's critical applications to a screeching halt. Unfortunately, the built-in performance graphs in the native tools aren't going to give you what you need. They can't answer the critical questions you'll have on a daily basis related to virtual infrastructure capacity.

I'm thankful that Dell has released their latest edition of Foglight for Virtualization and made it completely free. With this tool, you can find runaway snapshots, properly size your VMs, measure VM density, find virtual infrastructure waste, report on your virtual infrastructure, measure storage latency, and much more.

Download Foglight for Virualization, Free Edition today.

About the authors

David Davis is the author of the best-selling VMware vSphere video training library from TrainSignal. He has written hundreds of virtualization articles on the web and is a vExpert, VCP, VCAP-DCA, and CCIE #9369 with more than 18 years of enterprise IT experience. His personal website is VMwareVideos.com.

Mattias Sundling is known for his deep technical expertise in server virtualization, which he regularly shares in blog posts and white papers and by speaking at industry events like VMworld, Virtual Forum and VMUGs across the U.S. and Europe. VMware has awarded Mattias the vExpert designation multiple times in recognition of his contributions to the VMware community and his expertise.

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