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GroundWork Monitor Community Edition 5.2.1 Install Guide – VMware Virtual Appliance

The purpose of this document is to detail the components and installation sequence for using this GroundWork Open Source virtual appliance. This appliance is based on GroundWork Monitor Community Edition v5.2.1 and includes configuration of additional Open Source components contributed by the GroundWork Open Source Community of users.

Need assistance? Find answers in the GroundWork Community Support site at:

<http://www.groundworkopensource.com/community/forums/>

For Downloads and Documentation, see:

<http://www.groundworkopensource.com/community/downloads/>

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SECTION 1 – APPLIANCE BUILD AND PREREQUISITES

1. Tested hypervisors

- VMware Server
- VMware ESX v3.x

Note: VMware tools for Linux build 56528 installed.

Note: Time synchronization with host OS is enabled and is required for correct operation.

2. Operating System and Build Notes

- CentOS release 5.1.i386.bin
 - Core installation package with unnecessary components removed like printing, games and a desktop environment. XWin is installed for use with VMware tools and Firefox. See `/usr/local/share/gwrk/docs/installer.log` on the appliance for complete listing.
- Firefox and Xwindows are installed and available from the console.
- Use of this appliance assumes working knowledge of VMware server. For additional information see <http://www.vmware.com/>

The core file system is configured as follows:

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/sda3	3.9G	1.7G	2.1G	44%	/
/dev/sda5	996M	277M	668M	30%	/usr/local
/dev/sda2	3.8G	72M	3.6G	2%	/usr/local/groundwork
/dev/sda1	99M	11M	83M	12%	/boot
tmpfs	790M	0	790M	0%	/dev/shm

The default CentOS 5.1 kernel parameters in `/etc/grub.conf` were updated to the following:

```
kernel /vmlinuz-2.6.18-53.el5 ro root=LABEL=/ nosmp noapic nolapic rhgb quiet
```

Services enabled at startup are listed below:

```
# chkconfig --list |grep 5:on
acpid                0:off 1:off 2:off 3:on 4:on 5:on 6:off
avahi-daemon         0:off 1:off 2:off 3:on 4:on 5:on 6:off
crond                0:off 1:off 2:on 3:on 4:on 5:on 6:off
firstboot            0:off 1:off 2:off 3:on 4:off 5:on 6:off
gwservices           0:off 1:off 2:on 3:on 4:on 5:on 6:off
haldaemon            0:off 1:off 2:off 3:on 4:on 5:on 6:off
httpd                0:off 1:off 2:on 3:on 4:on 5:on 6:off
iptables            0:off 1:off 2:on 3:on 4:on 5:on 6:off
irqbalance           0:off 1:off 2:on 3:on 4:on 5:on 6:off
kudzu                0:off 1:off 2:off 3:on 4:on 5:on 6:off
lvm2-monitor         0:off 1:on 2:on 3:on 4:on 5:on 6:off
mcstrans             0:off 1:off 2:on 3:on 4:on 5:on 6:off
messagebus           0:off 1:off 2:off 3:on 4:on 5:on 6:off
microcode_ctl        0:off 1:off 2:on 3:on 4:on 5:on 6:off
mysql                0:off 1:off 2:on 3:on 4:on 5:on 6:off
nagios               0:off 1:off 2:on 3:on 4:on 5:on 6:off
network              0:off 1:off 2:on 3:on 4:on 5:on 6:off
ntpd                 0:off 1:off 2:off 3:on 4:off 5:on 6:off
readahead_early      0:off 1:off 2:on 3:on 4:on 5:on 6:off
readahead_later      0:off 1:off 2:off 3:off 4:off 5:on 6:off
restorecond          0:off 1:off 2:on 3:on 4:on 5:on 6:off
sshd                 0:off 1:off 2:on 3:on 4:on 5:on 6:off
syslog-ng            0:off 1:off 2:on 3:on 4:on 5:on 6:off
sysstat              0:off 1:off 2:on 3:on 4:off 5:on 6:off
vmware-tools         0:off 1:off 2:on 3:on 4:off 5:on 6:off
xfs                  0:off 1:off 2:on 3:on 4:on 5:on 6:off
```

Services such as sendmail are installed, but off by default. To enable at run time and load, use:

```
#chkconfig sendmail on
#service sendmail start
```

3. Open Source Packages added to Core OS

- MySQL-client-community-5.0.51a-0.rhel5.i386.rpm (<http://www.mysql.com>)
- MySQL-server-community-5.0.51a-0.rhel5.i386.rpm
- MySQL-shared-community-5.0.51a-0.rhel5.i386.rpm

- PLEASE REMEMBER TO SET A PASSWORD FOR THE MySQL root USER !
- To do so, start the server, then issue the following commands:
- /usr/bin/mysqladmin -u root password 'new-password'
- /usr/bin/mysqladmin -u root -h gwrkvm password 'new-password'
-
- Alternatively you can run:
- /usr/bin/mysql_secure_installation
-
- which will also give you the option of removing the test
- databases and anonymous user created by default. This is

- strongly recommended for production servers.

- jdk-1_5_0_15-linux-i586-rpm.bin (<http://www.sun.com>)
- GroundWork Monitor Community Edition v5.2 (<http://www.groundworkopensource.com/>)
- WebInject v1.4.1 (<http://www.webinject.org/>)
- NagVis v1.1 (<http://www.nagvis.org/>)
- Supervisions NagVis Extension for GroundWork Monitor (<http://www.super-visions.com/nagvis/>)
- Graphviz – Graph Visualization Software (<http://www.graphviz.org/>)

4. Hardware Considerations

It is recommended that you have at least 1.5GB of RAM available to the appliance in most cases. Note also that scheduling frequent active service checks of hosts across slow WAN/VPN connections will degrade performance. Consider passive service checks in those situations.

Sizing recommendations for GroundWork Monitor Community Edition virtual appliance monitoring networks up to 150 devices:

- 1.5 GB RAM
- 1 CPU, 2.8 GHz P4 or better
- 80 GB disk

Networks over 150 devices:

- 4 GB RAM or more
- 2 CPU, 3.2 GHz P4 or better
- 160 GB disk

5. GroundWork Community User Counts

GroundWork Open Source, Inc. would like to gather data on the total number active users of our virtual appliance around the world. Configured in this appliance is a service check called “http-page-check”. This service check uses the standard Nagios® check_http plugin to request a specific web page from the GroundWork Open Source Web Site that will be used to estimate the size of the GroundWork Monitor Open Source Community. **This check will not post any data about your deployment.** Only the IP Address making the request and the date and time of the request are recorded. This is not required and if you wish to disable this check, simply delete the service check from the configuration menu.

We hope our Community Edition users will contribute in this way to the success of GroundWork Open Source, Inc. Please consider visiting the GroundWork Google Map and posting some details with other Community Members

<http://maps.google.com/maps/ms?ie=UTF8&hl=en&msa=0&msid=112033879701670338917.00044b658c2588feb8574&ll=37.579413,-63.984375&spn=95.744741,185.625&z=3>

SECTION 2 – DOWNLOAD AND INSTALL

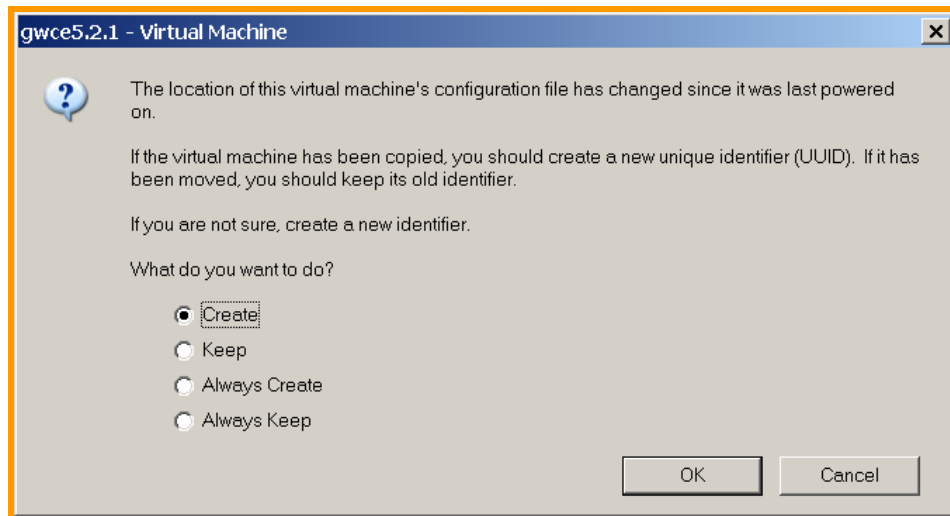
Downloading the GroundWork Monitor v5.2 Virtual Appliance

Go to SourceForge at: <http://sourceforge.net/projects/gwmos>

Select Download GroundWork Monitor Community Edition Virtual Appliance and unzip/unpack the file to your host system.

Power on the appliance.

If you are prompted to create a new unique identifier, choose create.



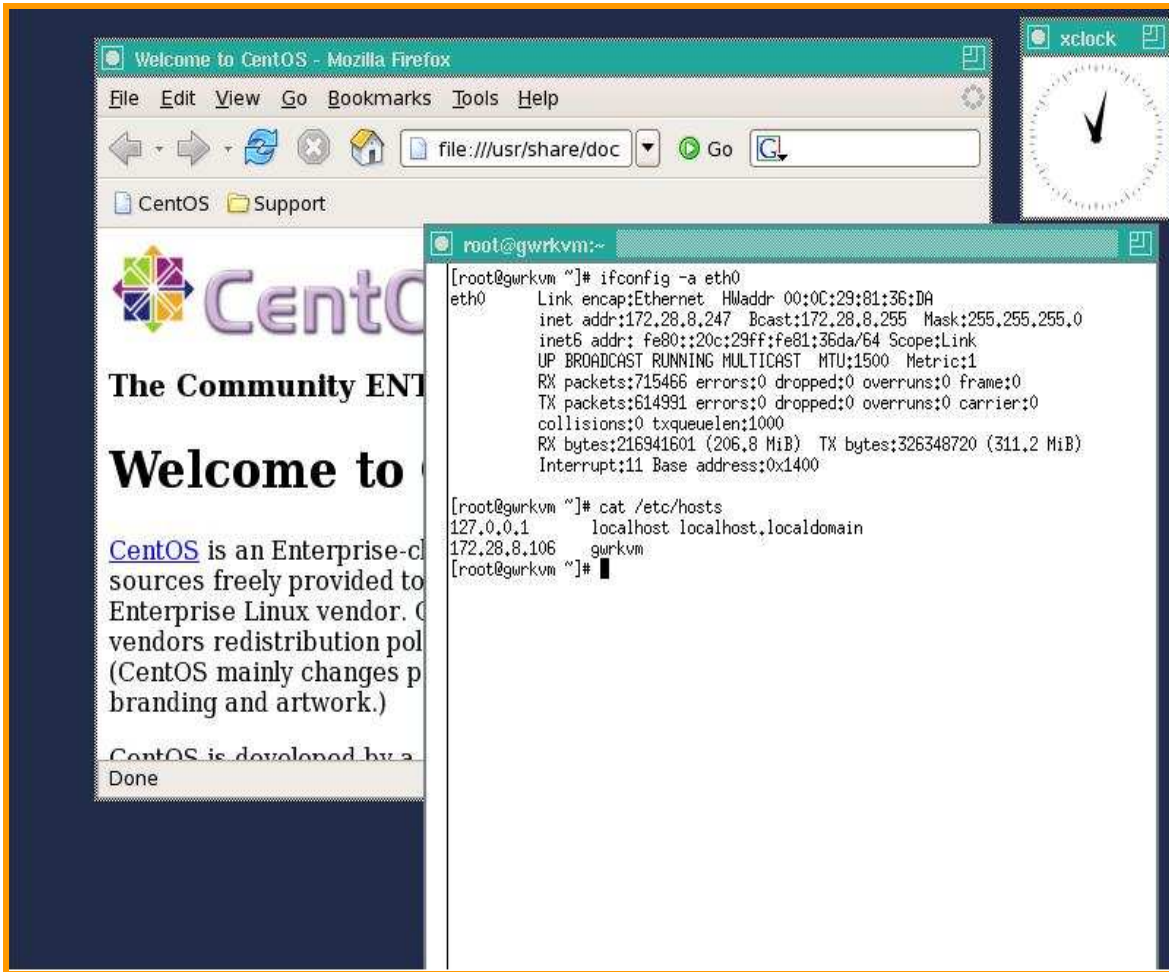
On first boot, a new network card that is unique to your installation of VMware will be detected by the appliance guest OS. You can simply accept the defaults for installation and proceed.

Decide whether you need NAT or Bridged networking. The appliance defaults to bridged networking and the guest OS is configured to use DHCP to acquire an IP address. If you accept this configuration, on first boot you will need to login to the console and determine the IP address assigned to your system.

Login as user root and password opensource

Note: Change this password from default! A user account called eval is also available with password opensource if you want to disable direct root login.

Below is an illustration of how to obtain the IP address assigned by DHCP to your appliance:



Update the `/etc/host` file with the ipaddress you will be using for your environment and update `/etc/resolv.conf` with your local DNS servers, if any. Then restart network services.

`#vi /etc/hosts` | Assumes working knowledge of vi editor

`#vi /etc/resolv.conf` | The discovery application will try and resolve names with the servers listed here

`#service network restart`

Note: If you wish to assign a static IP address to the guest OS, from the console type 'setup' and you can use a GUI to re-configure networking of the appliance.

Update your local DNS configuration. If the hostname/ip address cannot be resolved in your environment by DNS, you must either access GroundWork Monitor with `http://<ip address assigned>` or you will need to update your local PC host file so that you can resolve the host 'gwrkvm', and use <http://gwrkvm/>.

On Windows, edit your `windows/system32/drivers/etc/hosts` file and include the hostname/ip

On *nix, this is `/etc/hosts`

Verify operation

Login to the GUI from a browser

Default administrative account is admin / admin

Default operator account is joe / joe

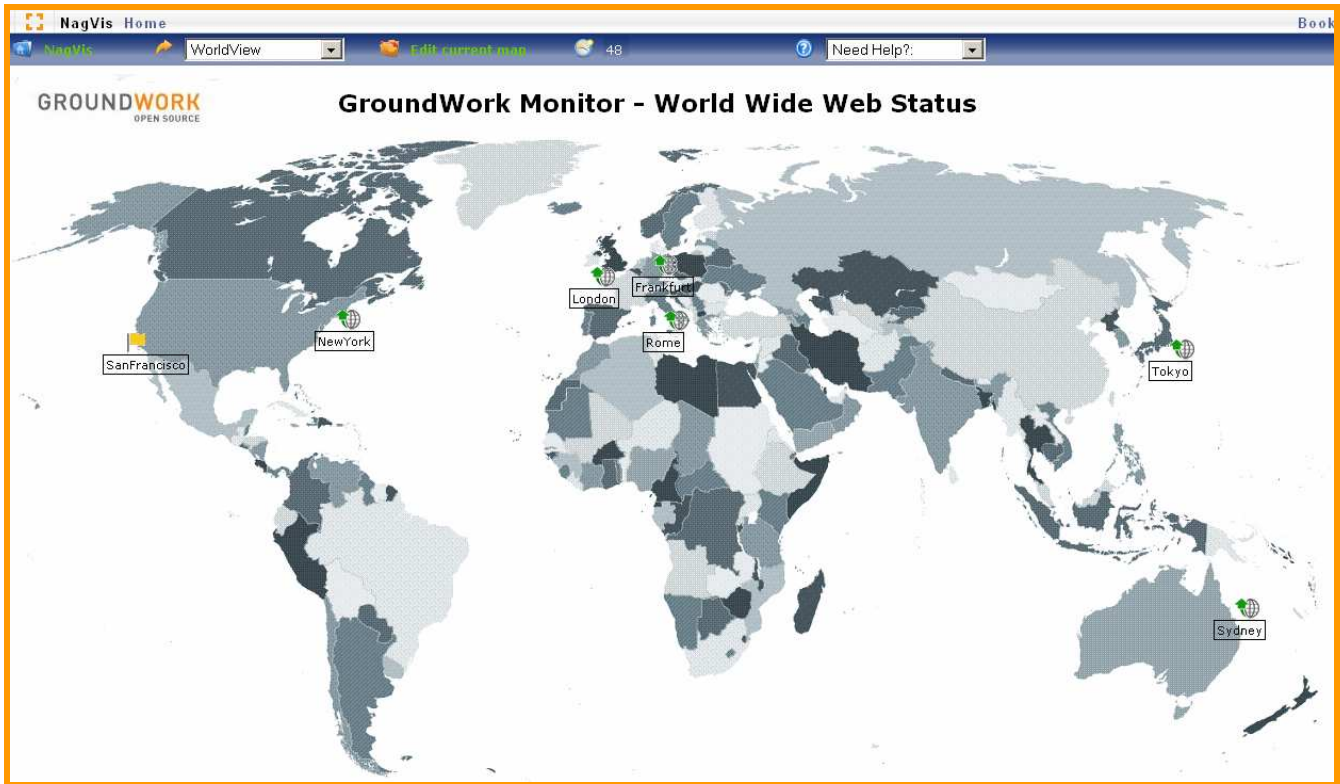
Suggestion: Create new accounts with admin role and disable these before proceeding!

SECTION 3 – WHAT’S NEW IN 5.2 VM

This appliance contains pre-configured monitoring of live Internet hosts to illustrate functionality including the underlying configuration. This appliance is based on GroundWork Monitor Community Edition v5.2 and includes the following extensions:

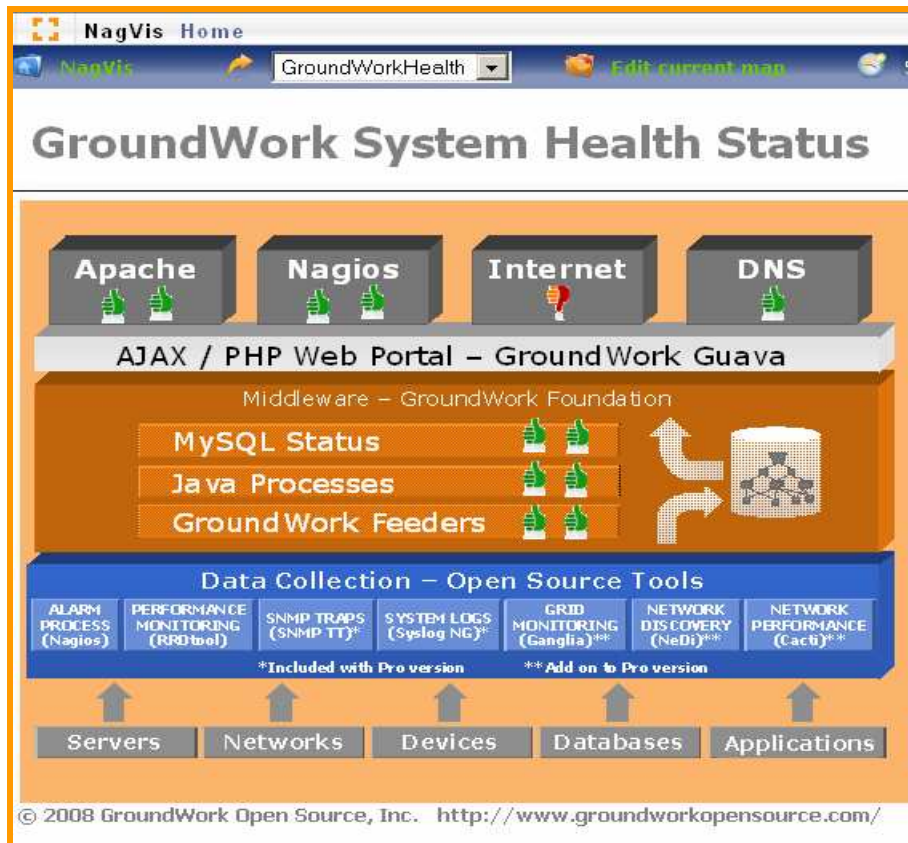
NagVis v1.3rc2 (<http://www.nagvis.org>) – NagVis is a visualization addon for Nagios® that can be used to visualize Nagios data to display IT processes like a mail system or a network infrastructure. It is available for use with GroundWork Monitor Community Edition v5.2 thanks to a code contribution by GroundWork partner Supervisions (<http://www.super-visions.com/>) who provided an extension that integrates Nagvis with the GroundWork Foundation layer. Also included is NagVis WUI, for graphical configuration of this popular Nagios Visualization project.

This appliance is preconfigured with these live examples which provide hover templates and drilldown:

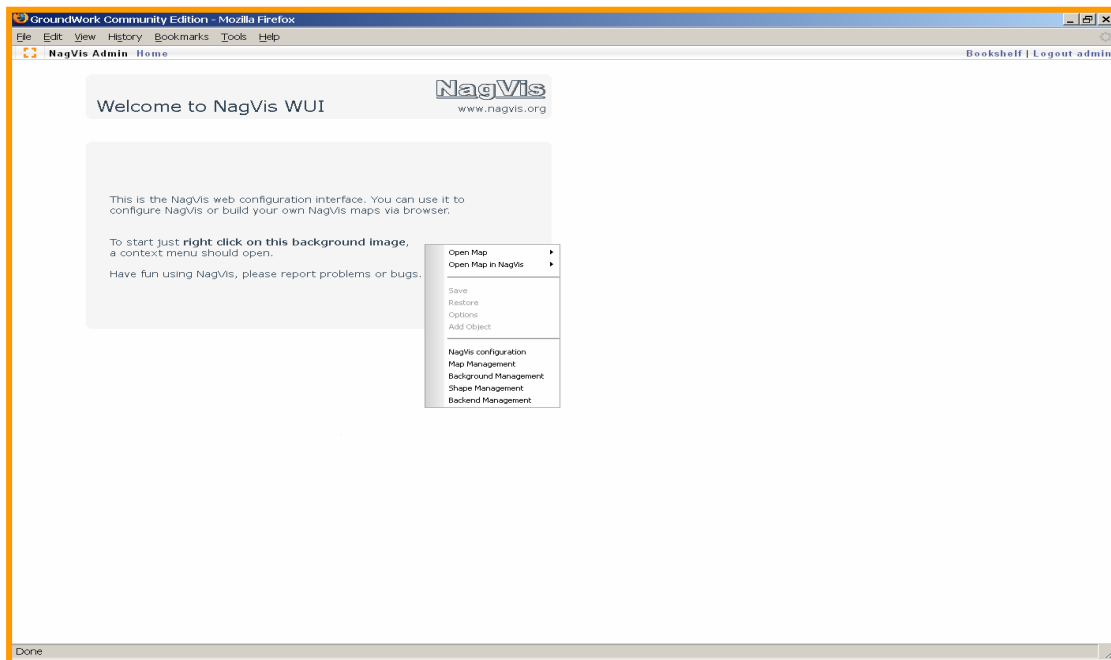


This map shows Nagios® hostgroups defined by location and placed in the geographic area. Notice a problem in San Francisco when this image was captured. Use the NagVis Admin application to create your own World Views.

This view shows the status of different GroundWork Monitor components in a way that is easy to understand.

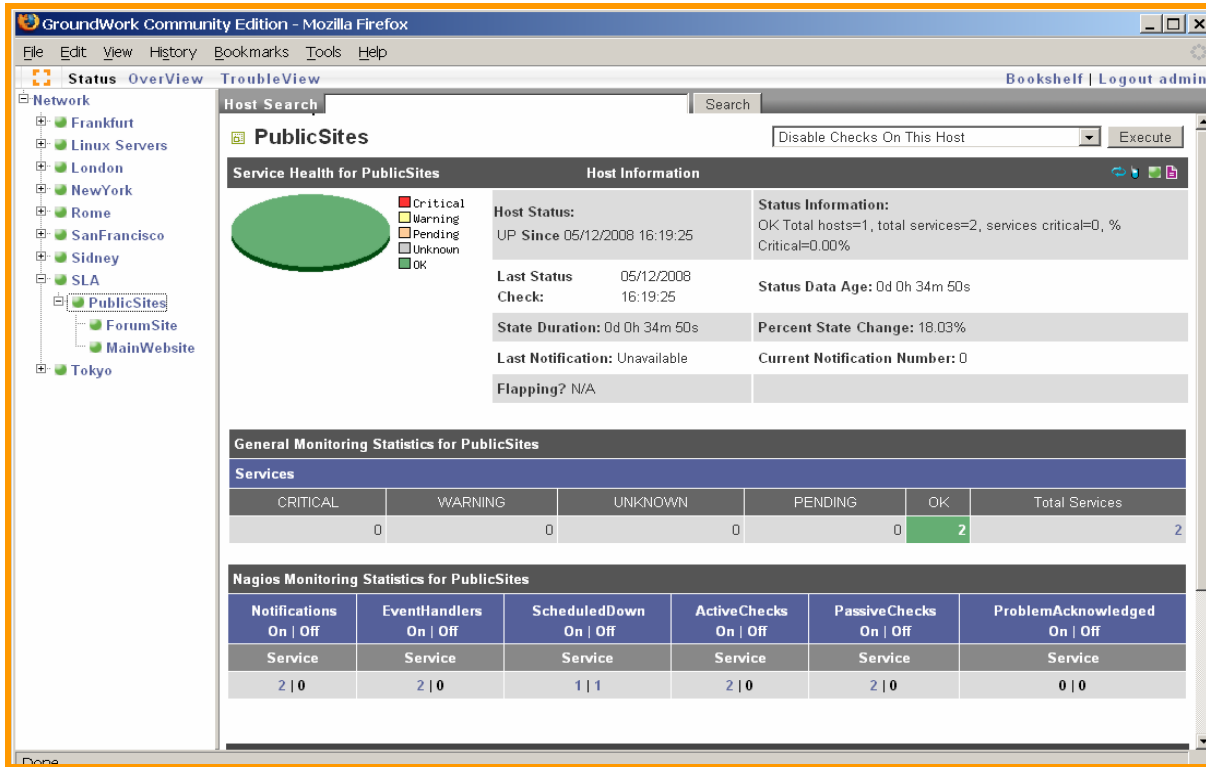


Use the NagVis Admin application to create your own active maps. Select from the Main Application Launcher inside of GroundWork Monitor Community Edition.



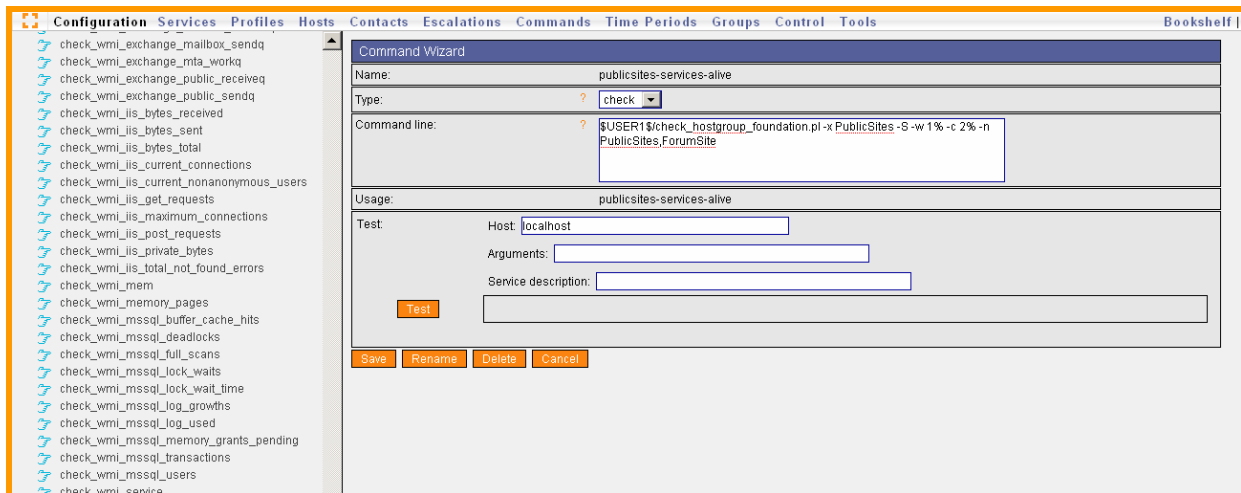
There is a new automap feature in this version. Check the GroundWork forum site for how-to information that has yet to be created ☺

WebInject v1.41 (<http://www.webinject.org/>) – This is a free tool for automated testing of web applications and web services. It is a powerful tool and great way to provide basic SLA reporting of web application availability. It can login to web apps, query databases and exit with detailed status. In this appliance it is preconfigured to monitor both the GroundWork main web site and Community Forum site. Below is a view from Status View

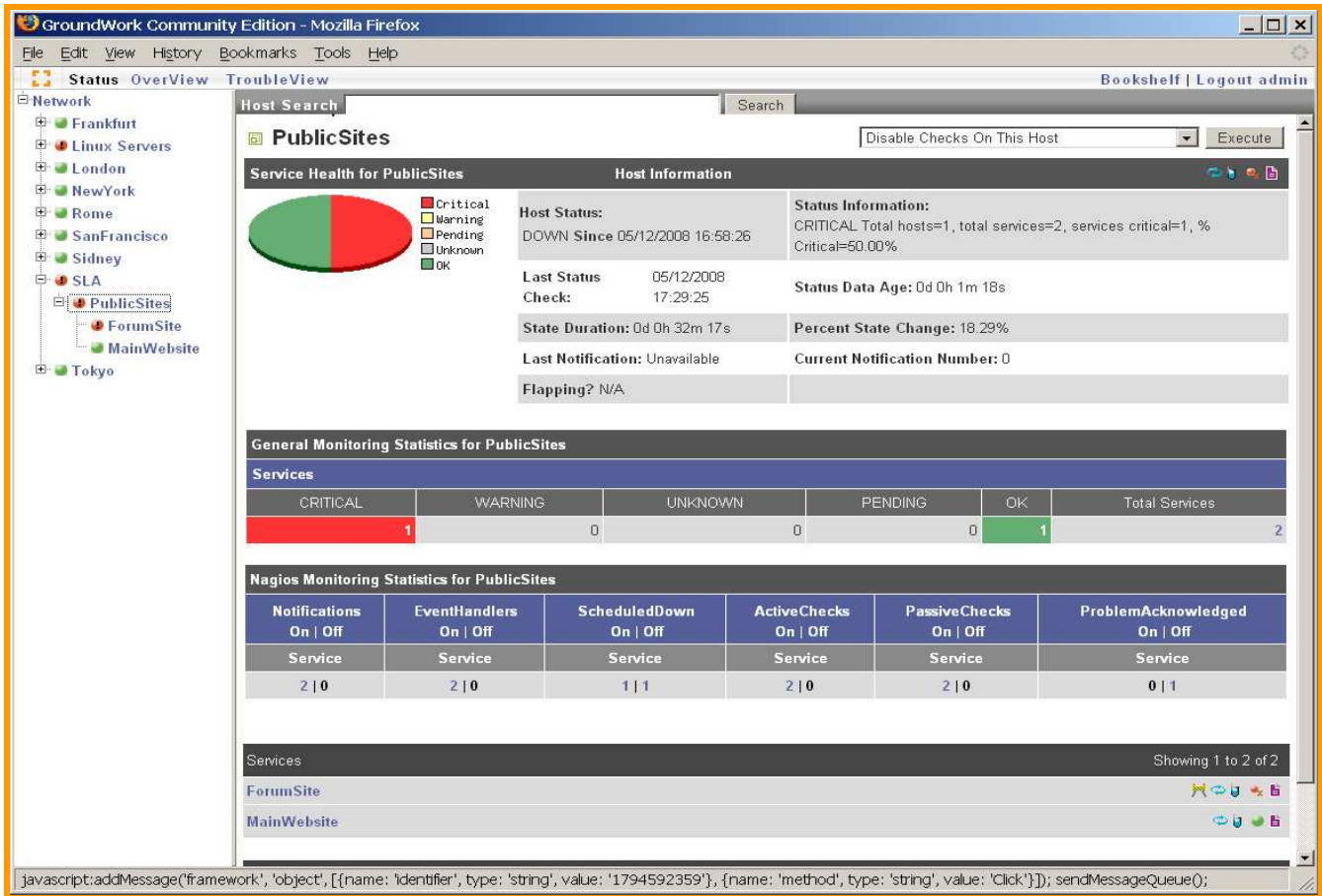



Configured on this appliance are two service checks using WebInject to track the GroundWork Main Web Site and the GroundWork Forum site. These are assigned to synthetic a host called “PublicSites”, which is a member of a hostgroup called “SLA”.

The host alive check for the host PublicSites is based on GroundWork’s check_hostgroup_foundation.pl plugin, instead of a simple ping. This makes this host’s up/down status dependant on the WebInject tests. If either fails, then Nagios runs the command “publicsites-services-alive” to determine whether the host PublicSites is up or down. Below is the command screen from the Groundwork Configuration menu:

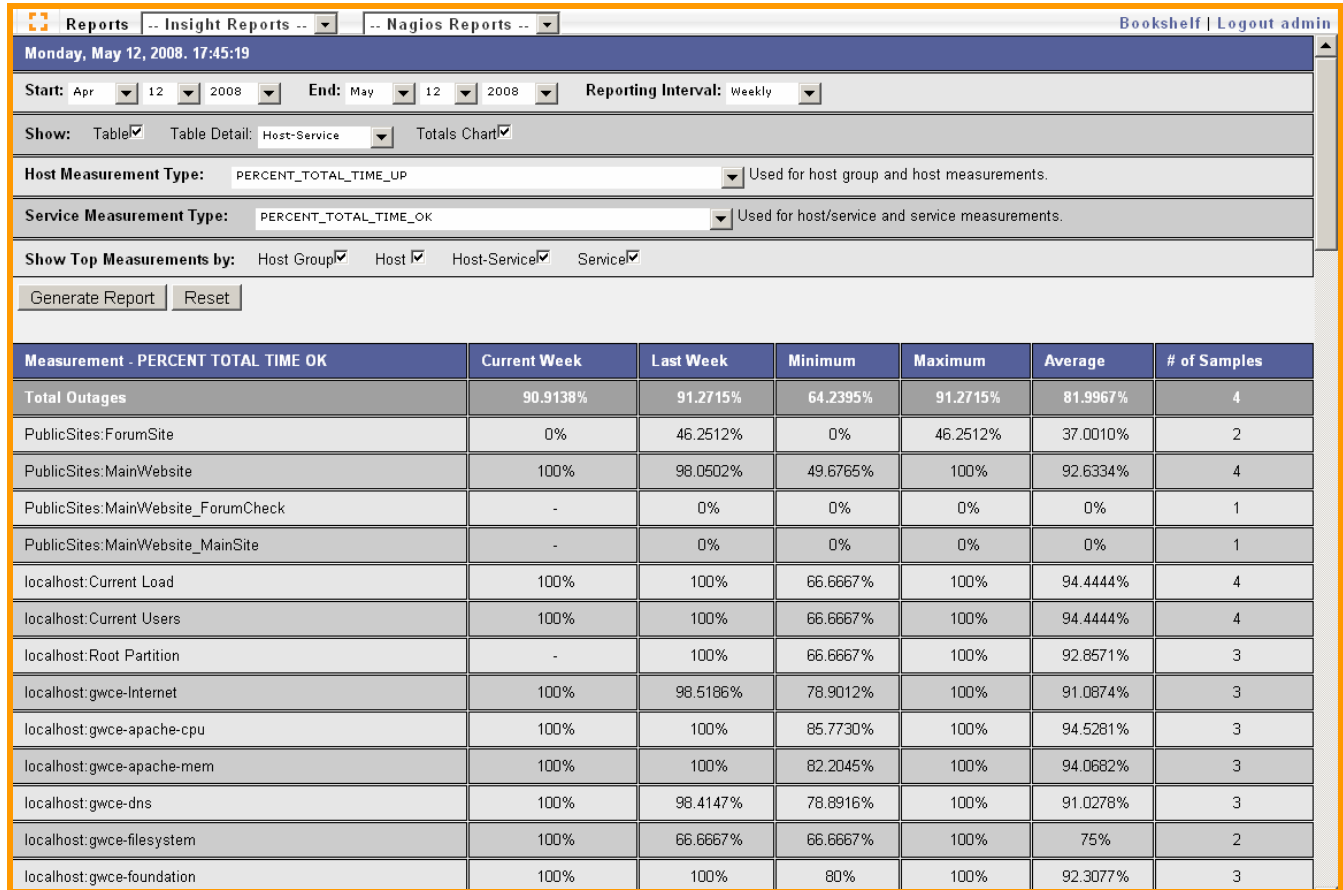


Below you can see that when one of the WebInject tests fail, the host is declared down by Nagios®. The status of the SLA hostgroup is also reflecting the problem. Since the host PublicSites is also a member of the Linux Servers hosts, it too reflects critical status.

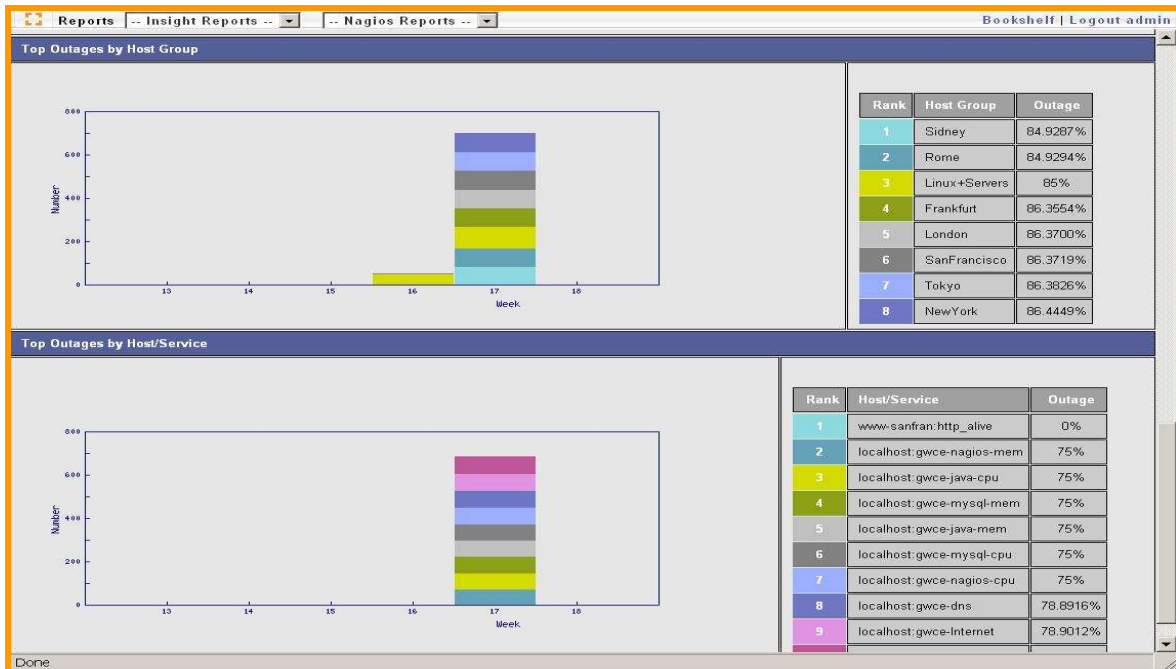


Notice also that the service “ForumSite” is the problem application. The GroundWork status viewer also displays icons with additional information about this troubled service. In this example, notice that the ForumSite check, while critical, is scheduled for downtime. This is indicated by the  icon. This will be automatically reflected as such by the GroundWork Insight Reports. Fortunately for the IT staff, hosts and services that are scheduled for downtime do not generate notifications when they fail. This avoids false alarms and is one of many reasons you’ll love Nagios® too!

Using this methodology, the GroundWork Insight Report produces a clear SLA-style uptime report.



Above we can see a weekly uptime status of the WebInject-based service checks showing 98% uptime of the MainWebsite last week and the average for the date range is 92%. The ForumSite check shows only 46% uptime last week and a 37% average. Examine this config in the appliance to extend for your purposes. Insight Reports can also report on hostgroup availability. Below is one example:



This reflects the Outage measurement “Percent Total Time Up” for the regional hostgroups and services

Performance Graphing Enhancements – Use your advanced rrdtool skills to create more advanced graphs from the RRDs created by GroundWork Monitor. The Performance config has been modified to accept custom graphs.

Performance Configuration Administration

Graph Label: Response Time

Service: http_alive

Use Service as a Regular Expression:

Host: *

Status Text Parsing Regular Expression:

Use Status Text Parsing instead of Performance Data:

RRD Name: /usr/local/groundwork/rrd/HOST/\$SERVICE.rrd

RRD Create Command: `$RRDTOOL create $RRDNAME --step 300 --start n:1yr $LISTSTART$DS:$LABEL#$:GAUGE:1800:U:U:$LISTEND$ RRA:AVERAGE:0.5:1:8640 RRA:AVERAGE:0.5:12:9480`

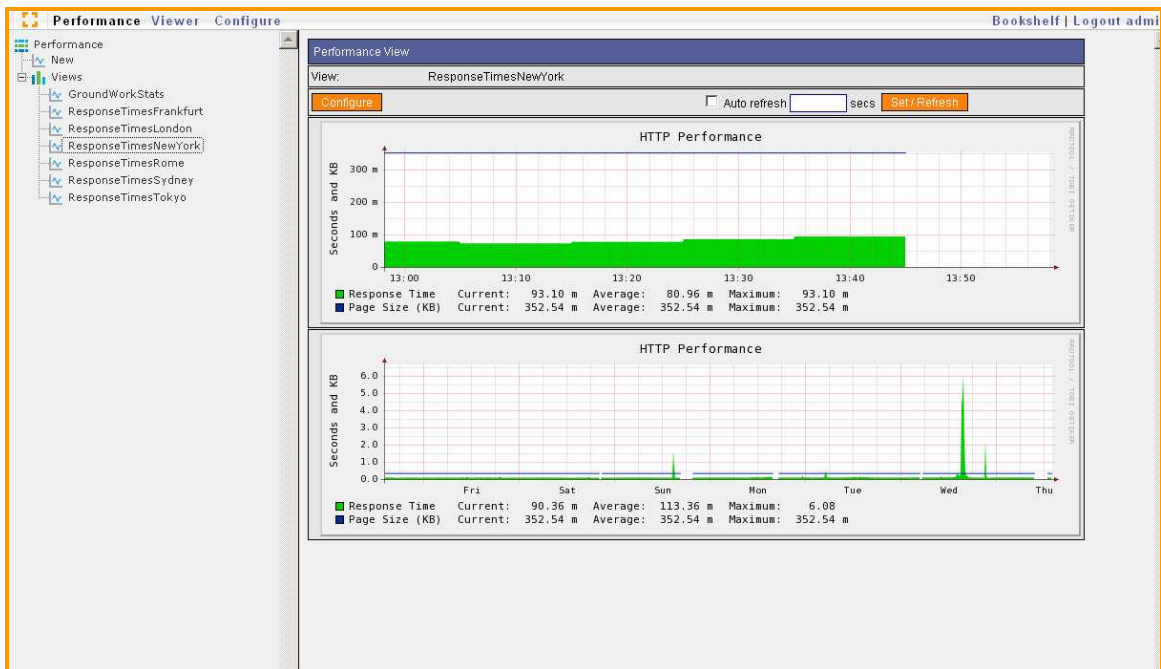
RRD Update Command: `$RRDTOOL update $RRDNAME -t $LABELLIST$ $LASTCHECK$:$VALUELIST$ 2>&1`

Custom RRDtool Graph Command: `/usr/local/groundwork/bin/rrdtool graph -i --imageformat=DNG --title="HTTP Performance" --rigid --base=1000 --height=120 --width=700 --alt-autoscale-max --lower-limit=0 --vertical-label="Seconds and KB" --slope-mode \DEF:a="rd_source":ds_source_0:AVERAGE \DEF:b="rd_source":ds_source_1:AVERAGE \CDEF:cdefa=b \CDEF:cdefe=a,1024,/ \AREA:cdefa#00CF00:"Response Time" \GPRINT:cdefa:LAST:"Current\:%8.2lf %s" \GPRINT:cdefa:AVERAGE:"Average\:%8.2lf %s" \GPRINT:cdefa:MAX:"Maximum\:%8.2lf %s" \LINE1:cdefe#002A97:"Page Size (KB)" \GPRINT:cdefe:LAST:"Current\:%8.2lf %s" \GPRINT:cdefe:AVERAGE:"Average\:%8.2lf %s" \GPRINT:cdefe:MAX:"Maximum\:%8.2lf %s"`

Enable:

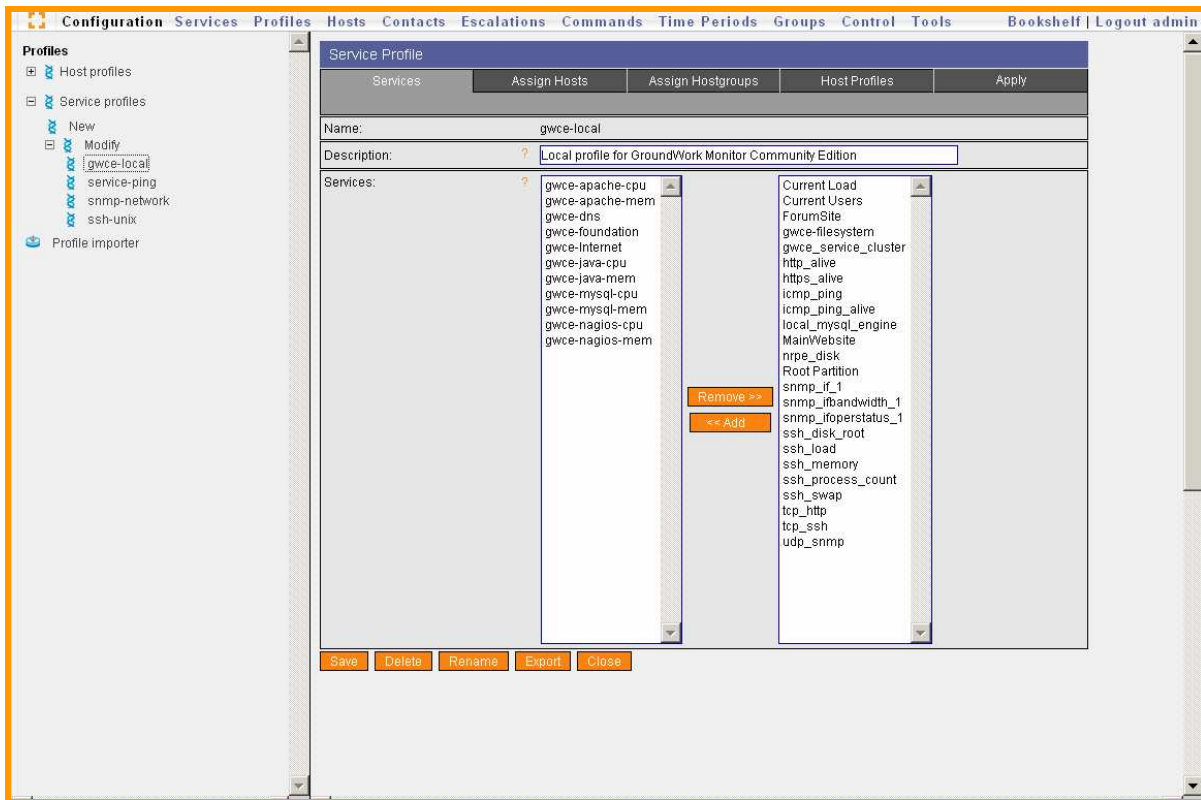
Update Cancel

Notice the config for the http_alive service has a custom RRDTool graph command. This produces additional granularity for performance graphs:

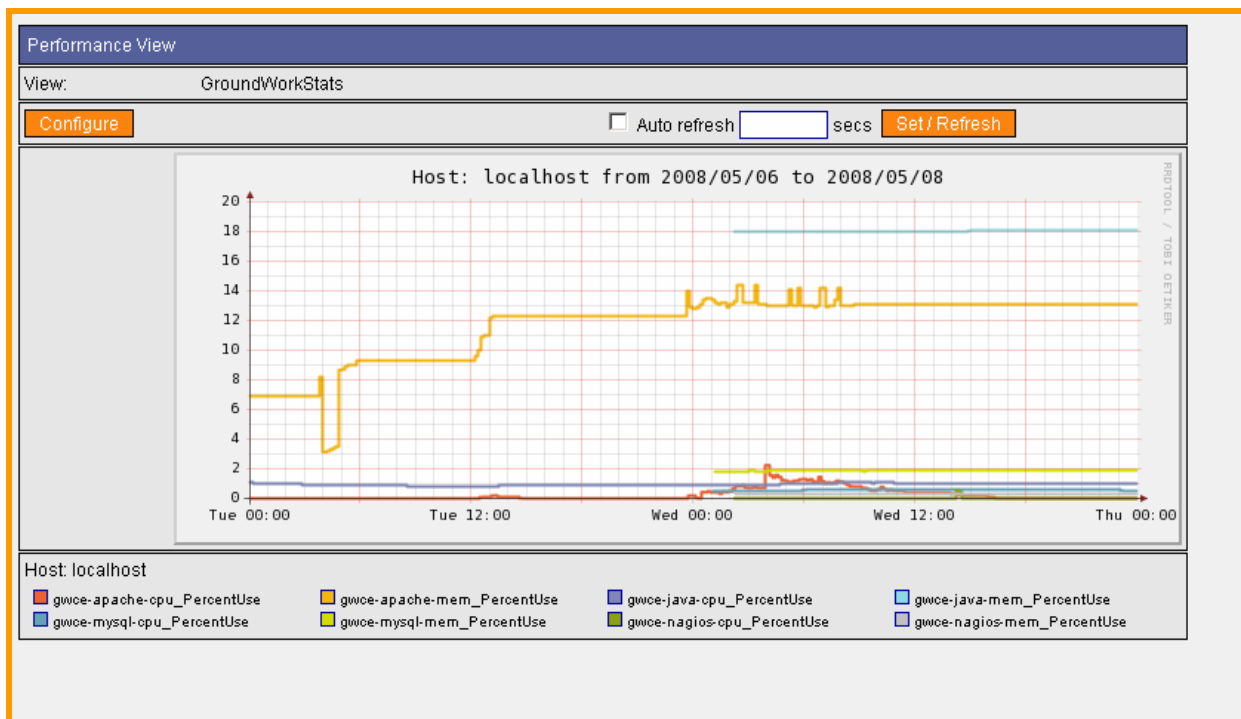


This is the graph created by the custom graphing command above. It plots both the response time in seconds for the web page check together with the KB size of the page returned. This can be very handy the next time a web developer complains that their new site loads slower than previous version. Just show them the page size growth in a graph!

GroundWork Monitor Community Profile – Additional monitors have been included to help measure the performance of various components. Components such as java, apache, nagios and mysql are monitored for cpu and memory. The profile is illustrated below:



The GroundWork Performance view “GroundWorkStats” provides a saved view that combines cpu/mem of the different process to show utilization trends. Below is a screenshot.



SECTION 4 – GETTING STARTED

Here are some suggestions from the GroundWork Support Team if you are new to GroundWork Monitor:

DNS – Make sure your OS can resolve hostnames of the machines it will discover before you begin. Hostnames are used in the database for status and reporting. If DNS is setup first, you'll have names instead of IPs in your screens. If you are running in a lab environment, or you cannot resolve the hostnames you wish to monitor, creating a host file is a simple workaround.

Merging Existing Nagios Instance – If you are running Nagios v2.x or v1.x, you can load the existing config files into Groundwork. Use Configuration -> Control -> Load in the UI. See the bookshelf for more information. Note also that Nagios file paths will need to be modified in those files, or a symlink is needed from /usr/local/nagios to usr/local/groundwork

Discovery – The default templates use nmap and snmp for discovery, but you still want to define what metrics you need vs want. Plan thru what service checks you want to assign to the devices you expect to discover (windows, linux, router, or switch). Consider the reporting needs vs the operational or response needs too when deciding what coverage to configure.

Command Line – Avoid doing things as root. It will avoid permission issues with custom plugins and extensions you might add. This way you avoid creating files and locations that can't be accessed by user nagios. Best would be to create a

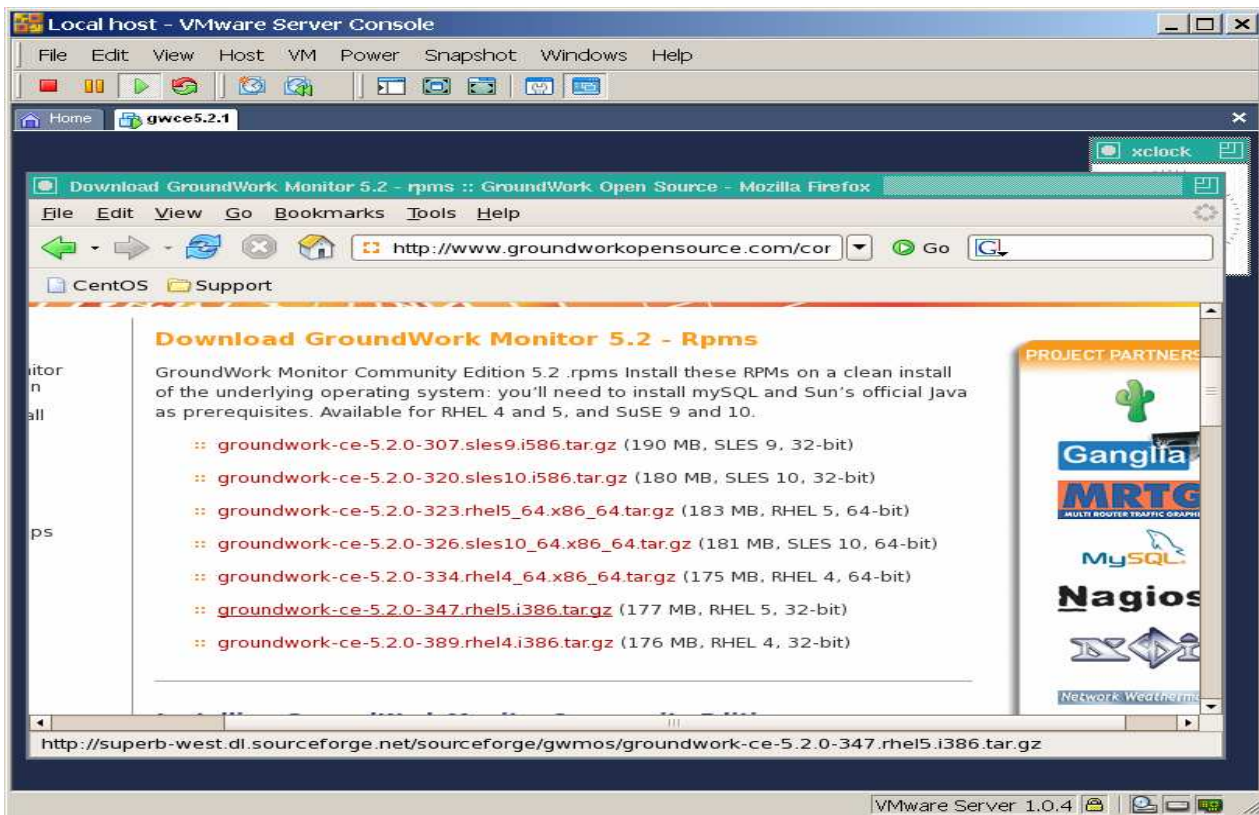
Free Support Incident – If you are currently using GroundWork Monitor Community Edition and you have a problem that hasn't been answered on the forums, our support team would like to assist. Please complete the "Contact Us" form:

<http://www.groundworkopensource.com/about/contact.html>

and in the comments box please describe the problem that you are experiencing, and denote you are also using the Community Edition. We will respond to you promptly.

Upgrading your existing Virtual Appliance:

Login to your appliance console as root. This will launch a Firefox window that you can use to access <http://www.groundworkopensource.com/downloads/> from where you can download the latest version of GroundWork Monitor Community Edition. Installation documentation is available with the download.



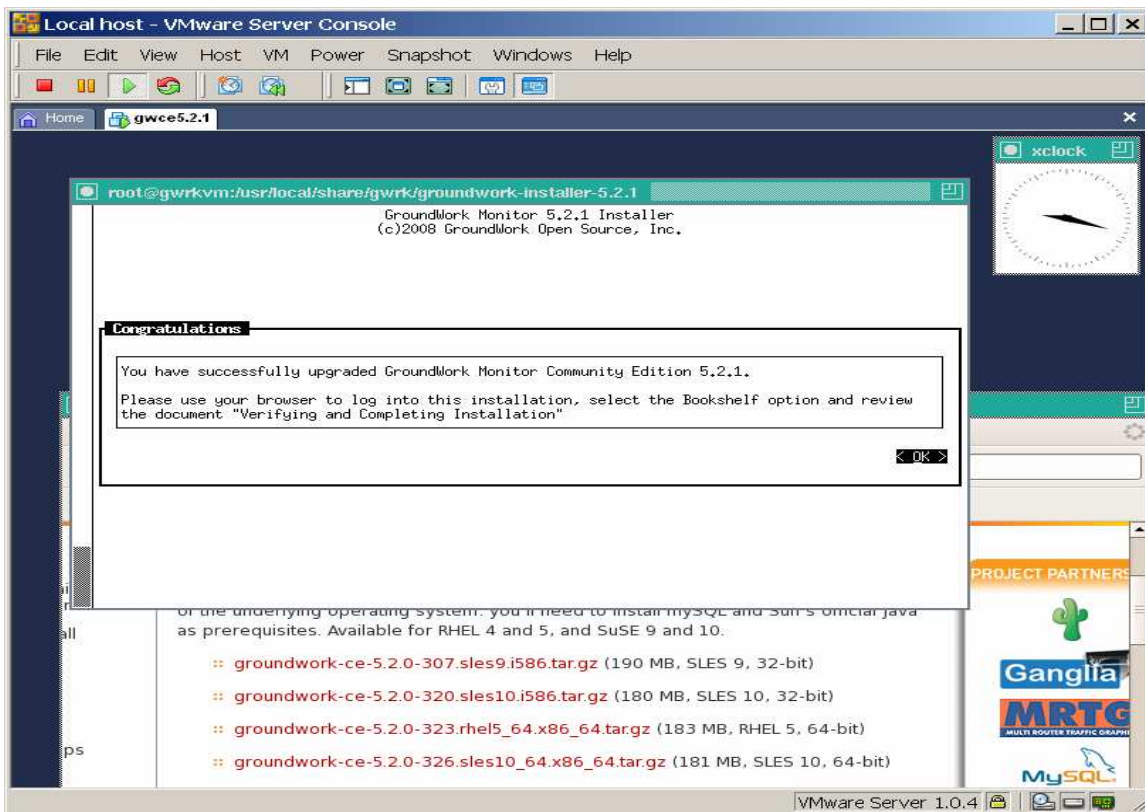
Download the Red Hat 5, 32bit RPM package. This is compatible with CentOS v5.1. It is suggested that you save the file to /usr/local/share/gwrk. Unpack the file as follows:

```
#tar -xzvf groundwork-ce-5-2-###.rhel5.i386.tar.gz
```

This creates the directory /usr/local/share/gwrk/groundwork-installer-5.2.#/

Change to the directory and run the install script

This will step through the upgrade process for you.



Suggested Links –

<http://www.groundworkopensource.com/community/forums/index.php>

http://nagios.sourceforge.net/docs/2_0/networkreachability.html

SECTION 5 –REVISIONS AND TO DO

Completed	Section	Description	Contributor
14APR08	All	Created document and outline	GroundWork Support
03MAY08	All	Updated with screenshots and explanations	GroundWork Support
08MAY08	All	Updated with explanations	GroundWork Support
12MAY08	WebInject	Updated SLA host description	GroundWork Support
20MAY08	All	Upgraded GWCE and Nagvis	GroundWork Support
	To Do	Graph localhost disk space. Needs regex for advanced graph	
	To Do	DNS service dependency for WebInject tests	
	To Do	Email loop test example	
	To Do	WAP interface for Mobile Devices	