

VMware Monitoring Using Unnoc - Setup Instructions

Summary:

This document explains how to setup an Unnoc server to monitor VMware vCenter Servers, ESX Servers, and Virtual Machines using the Perl VI SDK. This installation assumes SuSE 10 SP1 as the OS installed on the server. Where there are differences in your OS, you may need to perform the necessary substitutions in these instructions, such as the location of files in your OS installation. Be aware that if you use the /srv partition as described below, it should be large enough to hold a large amount of data for RRD graphing purposes (5 GB).

This document also explains how add monitoring for CPU Ready, Memory Swap, Memory Ballooning, and Datastore Usage. These custom statistics are optional and are not required to run Unnoc. Steps below that add these custom statistics are marked with [*Optional Customization*] at the beginning of the step.

If you are running Nagios using Fruity as your configuration database, you may download the script which will automatically add or remove hosts as they are synchronized with the Unnoc database. This script may be downloaded from https://tech.lds.org/wiki/index.php/LDS_Monitoring. Implementing this script requires an advanced understanding of Unnoc, Fruity, and Nagios. You may be able to adapt these steps to another enterprise monitoring solution.

Plugins we use, which perform queries against the Unnoc database, to check the statistics for Virtual Machine CPU, CPU Ready, Memory, Memory-Ballooning, and Swap; ESX CPU, Memory, and VM States (power); vCenter Server Datastore Usage, and VM States (power) may also be downloaded from https://tech.lds.org/wiki/index.php/LDS_Monitoring.

Installing Unnoc:

1. Connect to the server you are going to install Unnoc. It is recommended you run Unnoc on its own server (or VM). Currently supported Linux platforms:
 - Red Hat Enterprise Linux (RHEL) 5.2 (64 bit)
 - Red Hat Enterprise Linux (RHEL) 5.2 (32 bit)
 - SUSE Enterprise Server 10 SP1 (32 bit)
 - Ubuntu 8.04 (32 bit)

We are currently running Unnoc on SUSE Enterprise Server 10 SP1 (64 bit) without any issues. You may try to install Unnoc on another Linux platform but may run into issues with the VI Perl Toolkit install.

If the server is a Virtual Machine, you may need to complete the steps to fix time slip issues. Please see: <http://kb.vmware.com/kb/1006072> for more information.

2. You will need to setup a vCenter Server account for Unnoc. Unnoc's visibility depends on the access granted to this user. This account can have read-only access if desired. Please see the "vSphere Basic System Administration" documentation found on the VMware website for more information.
3. [*Optional Customization*] Unnoc customizations may require a higher "Statistics Level" than is set in vCenter Server by default. To make this change:
 - a. Login to vCenter Server with Administrative rights.
 - b. Click on the "Administration" menu and select "vCenter Server Settings...".
 - c. Click on the "Statistics" category on the left.

- d. Edit the “5 Minutes” Interval Duration.
 - e. Change the Statistics Level to “Level 3”.
 - f. Click the OK button to save changes.
4. Download the latest Mysql rpms (to /usr/local/src) from <http://dev.mysql.com/downloads/> and install (`rpm -Uvh`):
 - a. The RPMs you need are:
 - i. MySQL-client...
 - ii. MySQL-server...
 - iii. MySQL-devel...
 - iv. MySQL-shared...
 - b. Once the updates are installed, start mysql (it may have started as part of the install):
`/etc/init.d/mysql start`
 - c. Change the root password for mysql:
`mysqladmin -u root password '[the-password-you-wish-to-use]'`
 5. Install the following RPMs via Yast:
 - a. gcc (used to compile CPAN modules)
 - b. apache (1.3.x or higher)
 - c. perl-DBD-mysql (this update may be done via CPAN, but there may be problems.)
 - d. php (4.x or higher)
 - e. php-mysql
 - f. apache2-mod_php5
 - g. OpenSSL (used by VMware::VIRuntime)
 - h. OpenSSL-Devel (used by VMware::VIRuntime)
 - i. rrdtool (1.2.11 or higher)
 - j. make (used to install SNMP_Session.pm)
 - k. libxml2
 - l. libxml2-devel
 6. Install the following Perl modules:
 - a. For the BER and SNMP_Session.pm modules, do the following:
 - i. Download the tar file (SNMP_Session-1.12.tar.gz) from <http://www.switch.ch/misc/leinen/snmp/perl/dist/> to the /usr/local/src directory.
 - ii. Extract the file from the gzip'd tar file and enter the extracted home directory for the module.
 - iii. Run the following commands:
`perl Makefile.PL`
`make`
`make install`
 - b. Install/Upgrade the following [CPAN](#) modules to latest version:
 - i. DBI
 - ii. Net::SMTP
 - iii. Encode
 - iv. Net::Ping
 - v. Crypt::SSLeay
 - vi. Time::HiRes
 - vii. Net::Ping::External

- viii. Math::BigInt::FastCalc
 - ix. XML::LibXML
- c. VMware::VIRuntime:
- i. Click on the “VMware vSphere SDK for Perl” link on <http://www.vmware.com/download/sdk/>. If you have any issues with the following steps, review the install instructions on the same page you downloaded the SDK. We are currently running version 1.6 on our production instance of Unnoc but have verified the newer version also works correctly with Unnoc.
 - ii. It will require you to have a VMware.com account. Register for an account if you do not have one.
 - iii. Accept the agreement.
 - iv. Download the “vSphere SDK for Perl – Linux Installer” tar file (select the 32 or 64-bit version to match your version of Linux) to your local machine (as the site will not easily allow you to use wget or other utilities to access the file).
 - v. Use scp to move the file from your local machine over to the Unnoc server (put in /usr/local/src/).
 - vi. Extract the contents of the tar file, and then run the `vmware-install.pl` script found in the extracted directory structure. Accept the defaults.
 - vii. Confirm you can communicate with the vCenter Server:

```
wget https://[vCenter Server]/mob
```
 - viii. Run this test to confirm it is installed correctly (fill in the blanks). The path to `viperformance.pl` may change. Be sure the *virtual center server* name and *esx hostname* are lower case and fully qualified or the test may fail:

```
/usr/lib/vmware-vcli/apps/performance/viperformance.pl --
server=[virtual center server] --username=[user name] --
password=[password] --countertype=cpu --interval=20 --samples=1 -
-instance=* --host=[esx hostname]
```
7. Create a new directory:

```
mkdir /srv/www/unnoc
```
 8. Create a new group for unnoc:

```
groupadd unnoc
```
 9. Create a new user called ‘unnoc’:

```
useradd unnoc -G unnoc -d /srv/www/unnoc
```
 10. Change the directory permissions on the unnoc directory:

```
chown unnoc.unnoc /src/www/unnoc
```
 11. Download the current version of Unnoc from <http://unnoc.org/> (Click on the download link. The current version is listed at the top of the page – click through to that page to find the tar.gz file.) or <http://sourceforge.net/projects/unnoc/> to /usr/local/src.
 12. Extract the contents of the file and cd into the unnoc directory

```
tar xzf unnoc-*.gz
cd unnoc-*
```

13. Run the perl-module-checker.pl script found in the root unnoc install directory. It is okay if DBD::Pg, IO::Socket::SSL, Mail::POP3Client, or any other “Plugin Modules” are not installed.

14. Copy the files and directories in /usr/local/src/unnoc[version]/unnoc/ directory to /srv/www/unnoc:

```
cp -r /usr/local/src/unnoc[version]/unnoc /srv/www/
```

15. [Optional Customization] Apply the patch or replace the files to add monitoring for the additional metrics mentioned above.

a. Patch option:

i. Switch to the /srv/www directory.

ii. Download the patch or complete file replacement file from:

[https://tech.lds.org/wiki/index.php/LDS_Monitoring - Unnoc - Modifications](https://tech.lds.org/wiki/index.php/LDS_Monitoring_-_Unnoc_-_Modifications)

iii. Unzip the file:

```
gunzip Unnoc-modifications.patch.gz
```

iv. Apply the patch:

```
patch -p0 -i Unnoc-modifications.patch
```

v. Confirm no errors were listed in the output.

b. File replacement option:

i. Switch to the /srv/www directory.

ii. Download the patch or complete file replacement file from:

[https://tech.lds.org/wiki/index.php/LDS_Monitoring - Unnoc - Modifications](https://tech.lds.org/wiki/index.php/LDS_Monitoring_-_Unnoc_-_Modifications)

iii. Unzip the file:

```
tar -xzvf Unnoc-modifications.gz
```

iv. The files were put into the correct locations when gunzip'd and untar'd.

16. Change the permissions for the unnoc directory to the unnoc user:

```
chown -R unnoc.unnoc /srv/www/unnoc
```

17. Create and setup new unnoc DB on the Nagios DB server:

a. Run the following command:

```
mysqladmin -p create unnoc
```

b. [Optional Customization] Edit the /usr/local/src/unnoc[version]/mysql_table file:

i. Add the following lines starting at line 683:

```
--
-- Table structure for table `vmware_vm_disk`
--
DROP TABLE IF EXISTS `vmware_datastore`;
CREATE TABLE `vmware_datastore` (
  `id` int(10) unsigned NOT NULL auto_increment,
  `host` varchar(128) default NULL,
  `dtype` int(2) default NULL,
  `ds_name` varchar(128) default NULL,
```

```

`vi_id` varchar(64) default NULL,
`ds_type` varchar(128) default NULL,
`ds_capacity` varchar(128) default NULL,
`ds_free` varchar(128) default NULL,
PRIMARY KEY (`id`),
UNIQUE KEY `id` (`id`)
);

```

- ii. [Optional Customization] Add the following rows to create table section for `vmware_vm_mem` starting at line 591:

```

`vm_maxMemoryBalloon` varchar(128) default NULL,
`vm_memoryBalloonUsage` varchar(128) default NULL,
`vm_maxMemorySwap` varchar(128) default NULL,
`vm_memorySwapUsage` varchar(128) default NULL,

```

- iii. [Optional Customization] Add the following rows to the create table section for `vmware_vm_cpu` starting at line 611:

```

`vm_cpuReady` varchar(128) default NULL,

```

- c. Import the table into the unnoc DB you created in step a:

```
mysql unnoc -p < /usr/local/src/unnoc-[version]/mysql_table
```

- d. Create a new unnoc DB user in mysql (using the mysql root user)

- i. Login to mysql with the root user:

```
mysql -p
```

- ii. Change to the Unnoc db:

```
mysql> use Unnoc
```

- iii. Enter these commands to setup the Unnoc user:

```
grant all on unnoc.* to `unnoc`@`%` identified by '[password]';
```

```
grant all on unnoc.* to `unnoc`@`localhost` identified by
'[password]';
```

```
flush privileges;
```

- e. Add Backups for the unnoc DB [optional but recommended]:

- i. Create backup directory:

```
mkdir /var/dbbackups
```

- ii. Edit the crontab (`crontab -e`) as root.

- iii. Add the following lines (2 lines – note wrapping of second line):

```

# Database backups
45 17 * * * /usr/bin/mysqldump --add-drop-table -u unnoc -
p[password] unnoc > /var/dbbackups/daily_unnoc_backup.sql

```

18. Setup Unnoc Web Server on the same host:

- a. If you are *not* using an existing apache2 installation that has the php5 module working properly, add the following line to the end of the other modules in `/etc/apache2/sysconfig.d/loadmodule.conf` file (the location of your `mod_php5.so` module may differ):

```
LoadModule php5_module /usr/lib64/apache2/mod_php5.so
```

- b. Create a new file `/etc/apache2/vhosts.d/unnoc.conf`.

- c. Put the following text in the file:

```
<VirtualHost [HOST IP ADDRESS]:80>
    ServerAdmin webmaster@localhost
    ServerAlias noc unnoc
    DocumentRoot /srv/www/unnoc
    CustomLog /var/log/apache2/unnoc.log combined-pid

    <Directory /srv/www/unnoc/>
        Options Indexes FollowSymLinks MultiViews ExecCGI
        AllowOverride All
        Order allow,deny
        allow from all

        ## uncomment you can use the following if you want
        ## to require a username/password
        ## make sure to create the /etc/unnoc/htpasswd
        ## file with the htpasswd command
        ## or you can use the provided sample.htaccess
        # AuthUserFile /etc/unnoc/htpasswd
        # AuthName "unnoc"
        # AuthType Basic
        # require valid-user
    </Directory>
</VirtualHost>
```

- d. Setup Apache to start on boot:

```
inserv apache2
```

- e. Confirm the setup is correct (should show 3: on and 5: on):

```
chkconfig -l apache2
```

- f. Start/Reload apache:

```
/etc/init.d/apache2 restart
```

19. Edit the `/srv/www/unnoc/etc/unnoc.conf` file:

- i. Set the following variables:

```
webroot = /srv/www/unnoc
db_pass = "[unnoc password]"
db_host = "localhost"
daemon_user = unnoc
daemon_group = unnoc
alert = 0
```

20. Add the VCM servers to the `/srv/www/unnoc/etc/unnoc.conf` file:

```
host {
    hostname = [VCMS Server]
    service_url = https://[VCMS server]/sdk/vimService
    type = vcms
    user = [user setup in Virtual Center]
    password = [password for the user account]
}
```

21. [Optional Customization] Edit `/srv/www/unnoc/libexec/runtime/table.pl`, and comment out the following line (line 64) with a # at the start of the line:

```
&cleanup_dtype_shared_table (dbh => $dbh, dtype => $dtype_vmware_vcms,
    table => $db_vmware_vi_table, hosts => $all_hosts{$dtype_vmware_vcms});
```

22. [Optional Customization] Edit /srv/www/unnoc/libexec/runtime/config.pl:

- a. Add the following new line after line 404:
`db_vmware_ds_table = vmware_datastore`
- b. Add the following new line after line 52:
`our $db_vmware_ds_table;`

23. Edit and Install the init.d script for unnoc:

- a. Copy the init script (unnocd) from /usr/local/src/unnoc[version]/scripts/init.d/fedora/ to /etc/init.d/
- b. Edit the file and change the following lines:
 - i. Remove lines 3-9 and paste the following in it's place:

```
### BEGIN INIT INFO
# Provides:      unnoc
# Required-Start: network apache2
# Should-Start:
# Required-Stop:
# Should-Stop:
# Default-Start: 3 5
# Default-Stop:
# Description:   Starts and stops the Unnoc monitor
### END INIT INFO
```

- ii. Comment out the following line with # at the beginning of the line:
`. /etc/rc.d/init.d/functions`
- iii. On line 99, change the word “daemon” to “startproc”
- iv. Change webroot from /var/www/unnoc to /srv/www/unnoc.

c. Install the new script:

```
insserv unnocd
```

d. Check the config and confirm it will run at runtime is 3 and 5:

```
chkconfig -l unnocd
```

24. Start Unnoc and verify it is running correctly:

- a. Run the following command to start Unnoc:
`/etc/init.d/unnoc start`
- b. Watch the Unnocd.log file to see if there are any errors with Unnoc:
`tail -F /srv/www/Unnoc/log/unnocd.log`
- c. View the website to see if everything is displaying properly:
`http://[hostname or ip]/display.php?host=[vCenter Server name]`

Auto Sync of Unnoc and Fruity Databases:

25. [Optional Customization] Setup the cron job to sync the unnoc and fruity databases. This will add hosts that meet the requirements and remove hosts that no longer appear in unnoc. It will also add or remove datastores. This step will only work if you are running Nagios 2.x with Fruity as the configuration database.

- a. Download the auto update script from:
[https://tech.lds.org/wiki/index.php/LDS_Monitoring - Unnoc - Unnoc Automatic Scripts](https://tech.lds.org/wiki/index.php/LDS_Monitoring_-_Unnoc_-_Unnoc_Automatic_Scripts)
- b. Log into your Nagios server.
- c. Copy the script you downloaded to the tools (/usr/local/nagios/tools) directory on the Nagios server.
- d. Make sure check_ping is installed.
- e. Install the cpan module Net::DNS if not already installed.
- f. Open the VMWare_fruity_update.pl script. Enter the access information for your Fruity and Unnoc databases.
- g. Run the script to see if there are any errors.
- h. On successful run, add the following to cron:
Run Unnoc automagic updater every hour
0 * * * * /usr/local/nagios/tools/VMWare_fruity_update.pl >/dev/null 2>&1

Useful Links:

- Unnoc - <http://www.unnoc.org>
- Unnoc-support mailing list - <http://lists.sourceforge.net/lists/listinfo/unnoc-support>
- LDS Monitoring Wiki - https://tech.lds.org/wiki/index.php/LDS_Monitoring
- VI Perl Toolkit - <http://www.vmware.com/support/developer/viperltoolkit/>
- vSphere SDK for Perl Community - http://communities.vmware.com/community/developer/forums/vsphere_sdk_perl

Feedback:

If you have any feedback or questions regarding this document please contact us at martinkj_conf@ldschurch.org.