

System Monitoring: OMD and check_mk

Why Monitor?

- Your server and network infrastructure have limited resources
- The quality of the network and compute services that you offer depends on managing these resources intelligently

Monitoring Virtualized Systems

- Determining resource utilization in a virtualized environment requires visibility into the utilization of the “host” and “guest” systems

Where to Monitor?

- Host
 - Global perspective on resource utilization
 - “How is my cluster doing?”
- Guest
 - Local perspective on resource utilization
 - Monitoring follows guest even after migration
 - “Which host is using all the resources?”

What to Monitor?

- CPU Utilization, Context Switches
 - Does my hosts/guests need more/less CPU allocated to it?
- Disk Utilization, IO
 - Will my hosts/guests run out of storage soon?
 - Are my hosts/guests able to efficiently read and write to disk?
- Memory Utilization
 - Does my host/guest need more/less RAM allocated to it?

How to Monitor?

- Plenty of options!
 - Nagios
 - OpenNMS
 - OMD + check_mk
 - ...

Recommended Monitoring Solution

- `omdistro` with `check_mk`
 - Turn-key system/network monitoring solution
 - One package for the agent, one package for the server
 - Powered by Nagios
 - Massively scalable, small footprint

omdistro

- Bundles Nagios core and useful Nagios plugins
 - check_logfiles
 - check_mk
 - ...
- Packages for many common Linux distributions
 - RPM
 - Deb

check_mk

- **Configuration & Check Engine**
 - Automatic service detection
- **Livestatus**
 - Provides direct connection to status data via Unix socket
- **Multisite**
 - Web GUI, replaces Nagios Classic GUI
- **WATO**
 - Web Administration Tool
 - Provides administration of a Check_MK-based system possible over a Browser
- **Notify**
 - Notifications System makes the configuration of notifications simple and flexible.

Installing OMD

Installing omnistudio on Ubuntu 14.04

- Package repositories available for Ubuntu, CentOS, Debian, Suse
 - <https://labs.consol.de/repo/omd-thruk/>
- Steps
 1. Install GPG Key
 2. Add Repository to “sources.list”
 3. Update apt-cache
 4. Install omnistudio

Add Repository GPG Key

```
gpg --keyserver keys.gnupg.net --recv-keys  
F8C1CA08A57B9ED7
```

```
gpg --armor --export F8C1CA08A57B9ED7 |  
apt-key add -
```

Add repo to sources.list

```
echo 'deb  
http://labs.consol.de/repo/stable/ubuntu trusty  
main' >> /etc/apt/sources.list
```

Install omdistro

1. apt-get update
2. apt-get install omdistro
3. omd create <name>

Enable SSL

1. cd /etc/apache2/sites-enabled && ln -s ../sites-available/default-ssl.conf default-ssl.conf
2. a2enmod ssl
3. service apache2 restart

Allow HTTPS in UFW

1. ufw allow from any to any port 443

Installing check_mk Agent

Installing check_mk agent

1. apt-get install xinetd
2. wget
http://mathias-kettner.de/download/check-mk-agent_1.2.4p5-2_all.deb
3. dpkg -i check-mk-agent_1.2.4p5-2_all.deb

Allowing check_mk in UFW

1. ufw allow from <omd server IP> to any port
6556

Verifying check_mk Agent

- lsof -P -i | grep xinetd
- nc localhost 6556

Add Host to Monitoring Server

Screenshot of the Check_MK Main Overview page (https://nsrc-mon.uoregon.edu/nsrc/check_mk/index.py?start_url=%2Fnsrc%2Fcheck_mk%2Fdashboard.py) showing host monitoring statistics and configuration.

The WATO Configuration sidebar shows the "Hosts" item selected.

Main Overview Statistics:

- Host Statistics:**

State	Count
Up	1
Down	0
Unreachable	0
In Downtime	0
Total	1
- Service Statistics:**

State	Count
OK	17
In Downtime	0
On Down host	0
Warning	0
Unknown	0
Critical	0
Total	17
- Host Problems (unhandled):** 0

Service Problems (unhandled): 0

Events of recent 4 hours: 0

Master control: Add, Edit, Delete

Add Host to Monitoring Server

The screenshot shows the Check_MK web interface version 1.2.6p1. The main title bar reads "Check_MK nsrc - Main dire" and "https://nsrc-mon.uoregon.edu/nsrc/check_mk/index.py?start_url=%2Fnsrc%2Fcheck_mk%2Fwato.py%3Fmode%3Dfol...". The top right corner shows the user "Robert" and the timestamp "14:51". The left sidebar has a "WATO · Configuration" panel with various monitoring settings like "Hosts", "Host Tags", and "Global Settings". The main content area is titled "Main directory" and contains several buttons: "No Changes", "Main Menu", "Rulesets", "Folder Properties", "New folder", "New host", "Bulk Import", "Bulk Discovery", "Parent scan", "Status", and "Search". A large callout arrow points to the "Create new host" button, which is described as "Add a new host to the monitoring (agent must be installed)". Below it is another button for "Create new folder". The bottom status bar shows the URL "https://nsrc-mon.uoregon.edu/nsrc/check_mk/wato.py?mode=newhost&fold" and some navigation icons.

Add Host to Monitoring Server

The screenshot shows the 'Create new host' page in the Check_MK web interface. The left sidebar lists navigation options like 'Hosts', 'Host Groups', 'Services', etc. The main area has tabs for 'Folder' and 'Main directory'. Under 'General Properties', the 'Hostname' field contains 'nsrc-logs.uoregon.edu', which is highlighted with a red box and has a black arrow pointing to it. Below this, the 'Basic settings' section includes fields for 'Permissions', 'Alias', 'IP address', and 'Parents', each with a checkbox and a note 'empty (Default value)'. At the bottom, there are three buttons: 'Save & go to Services', 'Save & Finish' (which is highlighted with a red box and has a black arrow pointing to it), and 'Save & Test'. The status bar at the bottom indicates '1 changes'.

Perform Service Discovery

The screenshot shows the Check_MK web interface version 1.2.6p1. The browser title bar reads "Check_MK nsrc - Main direc". The URL in the address bar is https://nsrc-mon.uoregon.edu/nsrc/check_mk/index.py?start_url=%2Fnsrc%2Fcheck_mk%2Fwato.py. The top right corner shows the user "Robert".

The main content area is titled "Main directory" and displays a "Tactical Overview" table:

Hosts	Problems	Unhandled
0	0	0

Below the overview are several buttons:

- 1 Changes (orange)
- Main Menu
- Rulesets
- Manual Checks
- Folder Properties
- New folder
- New host
- New cluster
- Bulk Import
- Bulk Discovery
- Parent scan
- Status
- Search

A message box states: "Successfully created the host. Now you should do a [service discovery](#) in order to auto-configure all services to be checked on this host." An arrow points from this message to the "Discovery" button in the "Selected hosts" toolbar.

The left sidebar contains a "Views" section with "Overview", "Hosts", "Host Groups", and "Services" sections. The "Services" section includes links for "All services", "Favorite services", "Recently changed services", "Serv. by host groups", and "Service search".

The "Hosts" section shows a table with one host entry:

Actions	Hostname	Alias	IP address	Parents	Auth	Permissions	Contact Groups	Tags	Move To
	nsrc-logs.uoregon.edu								cmk-agent prod lan tcp

The bottom of the interface includes standard navigation icons (New Host, Delete, Edit, Cleanup, Discovery, Parentscan) and a footer with "EDIT" and "© Mathias Kettner".

Activate Service Monitoring

The screenshot shows the Check_MK 1.2.6p1 web interface for host `nsrc-logs.uoregon.edu`. The left sidebar includes links for hosts, host groups, services, and WATO configuration. The main content area displays a table of available services, many of which are marked as missing. A red arrow points to the **Activate missing** button at the top of the table.

Status	Checkplugin	Item	Service Description	Plugin output	Action
OK	cpu.loads	None	CPU load	15min load 0.05	<input checked="" type="checkbox"/>
OK	cpu.threads	None	Number of threads	167 threads	<input checked="" type="checkbox"/>
OK	df	/	Filesystem /	11.8% used (11.12 of 94.11 GB), (levels at 80.00/90.00%), trend: 0.00 B / 24 hours	<input checked="" type="checkbox"/>
OK	df	/boot	Filesystem /boot	59.0% used (138.73 of 235.32 MB), (levels at 80.00/90.00%), trend: 0.00 B / 24 hours	<input checked="" type="checkbox"/>
PEND	diskstat	SUMMARY	Disk IO SUMMARY	WAITING - Counter based check, cannot be done offline	<input checked="" type="checkbox"/>
PEND	kernel	Context Switches	Kernel Context Switches	WAITING - Counter based check, cannot be done offline	<input checked="" type="checkbox"/>
PEND	kernel	Major Page Faults	Kernel Major Page Faults	WAITING - Counter based check, cannot be done offline	<input checked="" type="checkbox"/>
PEND	kernel	Process Creations	Kernel Process Creations	WAITING - Counter based check, cannot be done offline	<input checked="" type="checkbox"/>
OK	kernel.util	None	CPU utilization	user: 0.8%, system: 0.4%, wait: 0.1%, total: 1.3%	<input checked="" type="checkbox"/>
OK	inx_if	2	Interface 2	[eth0] (up) MAC: 00:50:56:ab:50:fe, 10.00 Gbit/s	<input checked="" type="checkbox"/>
OK	mem.used	None	Memory used	1.78 GB used (1.72 RAM + 0.05 SWAP + 0.01 Pagetables, this is 46.1% of 3.86 RAM (4.00 total SWAP)), 0.0 mapped, 1.7 committed, 0.0 shared	<input checked="" type="checkbox"/>
OK	mounts	/	Mount options of /	mount options exactly as expected	<input checked="" type="checkbox"/>
OK	mounts	/boot	Mount options of /boot	mount options exactly as expected	<input checked="" type="checkbox"/>
OK	tcp_conn_stats	None	TCP Connections	ESTABLISHED: 43	<input checked="" type="checkbox"/>
OK	uptime	None	Uptime	up since Thu Apr 16 16:53:13 2015 (21d 05:30:06)	<input checked="" type="checkbox"/>

Apply Configuration

The screenshot shows the Check_MK web interface. The top navigation bar includes a user icon for "Robert", a back/forward button, and a URL bar showing https://nsrc-mon.uoregon.edu/nsrc/check_mk/index.py?start_url=%2Fnsrc%2Fcheck_mk%2Fwato.py. The main header says "Check MK" and "1.2.6p1". On the left, a sidebar menu lists categories like "All hosts (mini)", "Host Groups", "Services", "Service Groups", "Business Intelligence", "Problems", "Addons", "Inventory", and "Other". A sub-menu under "WATO · Configuration" lists items such as "Main Menu", "Hosts", "Host Tags", "Global Settings", "Host & Service Parameters", "Manual Checks", "Host & Service Groups", "Users", "Roles & Permissions", "Contact Groups", "Notifications", and "Time Periods". The main content area is titled "Main directory" and displays a grid of buttons: "2 Changes" (yellow background, highlighted by a black arrow), "Main Menu", "Rulesets", "Manual Checks", "Folder Properties", "New folder", "New host", "New cluster", "Bulk Import", "Bulk Discovery", "Parent scan", and "Status". Below these buttons, a message says "Saved check configuration of host [nsrc-logs.uoregon.edu] with 15 services". A "Main directory" button is also present. The "Hosts" section shows a table with one row for "nsrc-logs.uoregon.edu". The bottom of the screen has a toolbar with icons for "New", "Edit", "Delete", "Cleanup", "Discovery", and "Parentscan". The status bar at the bottom shows the URL https://nsrc-mon.uoregon.edu/nsrc/check_mk/wato.py?mode=changelog&fold.

Apply Configuration

The screenshot shows the Check_MK interface for managing pending configuration changes. The main title is "Pending changes to activate". The top navigation bar includes "Main Menu", "Activate Changes!" (which is highlighted with a yellow background and a black arrow pointing to it), "Discard Changes!", and "Audit Log". The user is logged in as "omdadmin (admin)" at 15:26.

Pending changes to activate

Main Menu Activate Changes! Discard Changes! Audit Log

Changes that are not yet activated:

Host	Date	Time	User	Description
nsrc-logs.uoregon.edu	2015-05-07	22:25:04	omdadmin	Saved check configuration of host [nsrc-logs.uoregon.edu] with 15 services
nsrc-logs.uoregon.edu	2015-05-07	22:23:16	omdadmin	Created new host nsric-logs.uoregon.edu.

WATO · Configuration

- Main Menu
- Hosts
- Host Tags
- Global Settings
- Host & Service Parameters
- Manual Checks
- Host & Service Groups
- Users
- Roles & Permissions
- Contact Groups
- Notifications
- Time Periods

https://nsrc-mon.uoregon.edu/nsrc/check_mk/wato.py?folder=&mode=changelog&_action=activate&_transid=1431037573/39682