

Network Monitoring & Management: Nagios

Network Startup Resource Center
www.nsrc.org



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Introduction

- Possibly the most used open source network monitoring software
- Web interface for viewing status, browsing history, scheduling downtime etc
- Sends out alerts via E-mail. Can be configured to use other mechanisms, e.g. SMS

Introduction

Nagios actively monitors the **availability**

- of Hosts (devices)
- and Services

Nagios: General View

Nagios

General

- Home
- Documentation

Monitoring

- Tactical Overview
- Service Detail
- Host Detail
- Hostgroup Overview
- Hostgroup Summary
- Hostgroup Grid
- Servicegroup Overview
- Servicegroup Summary
- Servicegroup Grid
- Status Map
- 3-D Status Map
- Service Problems
 - Unhandled
- Host Problems
 - Unhandled
- Network Outages

Show Host:

Reporting

- Trends
- Availability
- Alert Histogram
- Alert History
- Alert Summary
- Notifications
- Event Log

Configuration

- View Config

Tactical Monitoring Overview
Last Updated: Thu Sep 3 15:37:09 CDT 2009
Updated every 90 seconds
Nagios® 3.0.2 - www.nagios.org
Logged in as guest

Monitoring Performance

Service Check Execution Time:	0.01 / 4.07 / 0.115 sec
Service Check Latency:	0.02 / 0.25 / 0.117 sec
Host Check Execution Time:	0.01 / 0.13 / 0.018 sec
Host Check Latency:	0.01 / 0.28 / 0.137 sec
# Active Host / Service Checks:	41 / 46
# Passive Host / Service Checks:	0 / 0

Network Outages
0 Outages

Network Health

Host Health: ██████████

Service Health: ██████████

Hosts

0 Down	0 Unreachable	41 Up	0 Pending
--------	---------------	-------	-----------

Services

0 Critical	0 Warning	0 Unknown	46 Ok	0 Pending
------------	-----------	-----------	-------	-----------

Monitoring Features

	Flap Detection	Notifications	Event Handlers	Active Checks	Passive Checks
Enabled	All Services Enabled No Services Flapping All Hosts Enabled No Hosts Flapping	Enabled All Services Enabled All Hosts Enabled	Enabled All Services Enabled All Hosts Enabled	Enabled All Services Enabled All Hosts Enabled	Enabled All Services Enabled All Hosts Enabled

Host Detail View

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- Servicegroup Summary
- Servicegroup Grid
- Status Map
- 3-D Status Map

Service Problems

- Unhandled

Host Problems

- Unhandled

Network Outages

Show Host:

Comments

- Downtime

Process Info

- Performance Info
- Scheduling Queue

Reporting

- Trends
- Availability
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Configuration

- View Config

Current Network Status
 Last Updated: Thu Sep 3 14:55:18 CDT 2009
 Updated every 90 seconds
[Nagios® 3.0.2 - www.nagios.org](#)
 Logged in as guest

[View Service Status Detail For All Host Groups](#)
[View Status Overview For All Host Groups](#)
[View Status Summary For All Host Groups](#)
[View Status Grid For All Host Groups](#)

Host Status Totals

Up	Down	Unreachable	Pending
41	0	0	0

All Problems	All Types
0	41

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
46	0	0	0	0

All Problems	All Types
0	46

Host Status Details For All Host Groups

Host ↑↓	Status ↑↓	Last Check ↑↓	Duration ↑↓	Status Information
DNS-ROOT	UP	2009-09-03 14:51:41	43d 1h 7m 0s	PING OK - Packet loss = 0%, RTA = 0.33 ms
ISP-DNS	UP	2009-09-03 14:51:41	16d 4h 11m 25s	PING OK - Packet loss = 0%, RTA = 0.29 ms
ISP-RTR	UP	2009-09-03 14:51:51	43d 5h 47m 40s	PING OK - Packet loss = 0%, RTA = 1.24 ms
NOC-TLD1	UP	2009-09-03 14:52:01	1d 0h 10m 56s	PING OK - Packet loss = 0%, RTA = 4.02 ms
NOC-TLD2	UP	2009-09-03 14:52:01	1d 22h 53m 46s	PING OK - Packet loss = 0%, RTA = 2.23 ms
NOC-TLD3	UP	2009-09-03 14:52:11	1d 22h 53m 36s	PING OK - Packet loss = 0%, RTA = 2.62 ms
NOC-TLD4	UP	2009-09-03 14:52:21	1d 22h 53m 36s	PING OK - Packet loss = 0%, RTA = 1.09 ms
NOC-TLD5	UP	2009-09-03 14:52:31	1d 22h 54m 6s	PING OK - Packet loss = 0%, RTA = 5.20 ms
NOC-TLD6	UP	2009-09-03 14:52:31	1d 22h 53m 56s	PING OK - Packet loss = 0%, RTA = 10.49 ms
NOC-TLD7	UP	2009-09-03 14:52:41	1d 22h 53m 56s	PING OK - Packet loss = 0%, RTA = 1.05 ms
NOC-TLD8	UP	2009-09-03 14:52:51	1d 22h 53m 56s	PING OK - Packet loss = 0%, RTA = 1.00 ms
NS1-TLD1	UP	2009-09-03 14:53:01	1d 0h 10m 26s	PING OK - Packet loss = 0%, RTA = 10.19 ms
NS1-TLD2	UP	2009-09-03 14:53:01	1d 22h 53m 56s	PING OK - Packet loss = 0%, RTA = 5.06 ms
NS1-TLD3	UP	2009-09-03 14:53:11	1d 22h 53m 36s	PING OK - Packet loss = 0%, RTA = 1.03 ms
NS1-TLD4	UP	2009-09-03 14:53:21	1d 22h 53m 36s	PING OK - Packet loss = 0%, RTA = 1.15 ms
NS1-TLD5	UP	2009-09-03 14:53:21	1d 22h 54m 6s	PING OK - Packet loss = 0%, RTA = 1.12 ms
NS1-TLD6	UP	2009-09-03 14:53:31	1d 22h 53m 36s	PING OK - Packet loss = 0%, RTA = 1.06 ms
NS1-TLD7	UP	2009-09-03 14:53:41	1d 22h 53m 46s	PING OK - Packet loss = 0%, RTA = 1.11 ms
NS1-TLD8	UP	2009-09-03 14:53:51	1d 22h 53m 36s	PING OK - Packet loss = 0%, RTA = 1.18 ms
TLD1-RTR	UP	2009-09-03 14:53:51	1d 22h 54m 6s	PING OK - Packet loss = 0%, RTA = 2.22 ms
TLD2-RTR	UP	2009-09-03 14:54:01	1d 22h 53m 46s	PING OK - Packet loss = 0%, RTA = 2.38 ms

Service Detail View

Nagios®
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Current Network Status

Last Updated: Thu Sep 3 14:46:07 CDT 2009
Updated every 90 seconds
Nagios® 3.0.2 - www.nagios.org
Logged in as *guest*

[View History For all hosts](#)
[View Notifications For All Hosts](#)
[View Host Status Detail For All Hosts](#)

Host Status Totals

Up	Down	Unreachable	Pending
41	0	0	0
All Problems		All Types	
0		41	

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
46	0	0	0	0
All Problems		All Types		
0		46		

Service Status Details For All Hosts

Host	Service	Status	Last Check	Duration	Attempt	Status Information
DNS-ROOT	SSH	OK	2009-09-03 14:43:51	43d 0h 55m 19s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
ISP-DNS	SSH	OK	2009-09-03 14:41:21	16d 3h 57m 24s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
ISP-RTR	SSH	OK	2009-09-03 14:43:51	43d 5h 35m 13s	1/4	SSH OK - Cisco-1.25 (protocol 2.0)
NOC-TLD1	SSH	OK	2009-09-03 14:41:27	1d 0h 1m 59s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NOC-TLD2	SSH	OK	2009-09-03 14:44:04	1d 22h 44m 22s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NOC-TLD3	SSH	OK	2009-09-03 14:41:34	1d 22h 40m 58s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NOC-TLD4	SSH	OK	2009-09-03 14:44:10	1d 22h 44m 16s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NOC-TLD5	SSH	OK	2009-09-03 14:41:40	1d 22h 41m 46s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NOC-TLD6	SSH	OK	2009-09-03 14:44:17	1d 22h 44m 9s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NOC-TLD7	SSH	OK	2009-09-03 14:41:47	1d 22h 41m 39s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NOC-TLD8	SSH	OK	2009-09-03 14:44:23	1d 22h 44m 3s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NS1-TLD1	SSH	OK	2009-09-03 14:41:53	1d 0h 1m 33s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NS1-TLD2	SSH	OK	2009-09-03 14:44:30	1d 22h 43m 56s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NS1-TLD3	SSH	OK	2009-09-03 14:42:00	1d 22h 41m 26s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NS1-TLD4	SSH	OK	2009-09-03 14:44:36	1d 22h 43m 50s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NS1-TLD5	SSH	OK	2009-09-03 14:42:06	1d 22h 41m 20s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)
NS1-TLD6	SSH	OK	2009-09-03 14:44:43	1d 22h 43m 43s	1/4	SSH OK - OpenSSH_5.1p1 Debian-3ubuntu1 (protocol 2.0)

Features

Utilizes topology to determine dependencies.

- Differentiates between what is *down* vs. what is *unreachable*. Avoids running unnecessary checks and sending redundant alarms

Allows you to define how to send notifications based on combinations of:

- Contacts and lists of contacts
- Devices and groups of devices
- Services and groups of services
- Defined hours by persons or groups.
- The state of a service.

Plugins

Plugins are used to verify services and devices:

- Nagios architecture is simple enough that writing new plugins is fairly easy in the language of your choice.
- There are **many, many** plugins available (thousands).
 - ✓ <http://exchange.nagios.org/>
 - ✓ <http://nagiosplugins.org/>



Pre-installed Plugins for Ubuntu

/usr/lib/nagios/plugins

```
nsrc@s1:~$ ls /usr/lib/nagios/plugins
check_apt      check_disk      check_hpjd      check_jabber      check_mysql      check_ntp_time  check_real      check_ssh      check_wave
check_breeze   check_disk_smb  check_http      check_ldap        check_mysql_query check_nwstat    check_rpc       check_ssmtp    negate
check_by_ssh   check_dns       check_icmp      check_ldaps       check_nagios     check_oracle    check_rta_multi check_swap     urlize
check_clamd    check_dummy     check_ide_smart check_load        check_nntp       check_overcr    check_sensors   check_tcp      utils.pm
check_cluster  check_file_age  check_ifoperstatus check_log         check_nntp      check_pgsql     check_simap     check_time     utils.sh
check_dbi      check_flexlm    check_ifstatus  check_mailq       check_nt        check_ping      check_smtp      check_udp
check_dhcp     check_ftp       check_imap      check_mrtg        check_ntp       check_pop       check_snmp      check_ups
check_dig      check_host      check_ircd      check_mrtgtraf    check_ntp_peer  check_procs     check_spop      check_users
```

/etc/nagios-plugins/config

```
nsrc@s1:~$ ls /etc/nagios-plugins/config/
apt.cfg      disk-smb.cfg  fping.cfg  http.cfg  mail.cfg  netware.cfg  postgresql.cfg  real.cfg  tcp_udp.cfg
breeze.cfg  dns.cfg      ftp.cfg    ifstatus.cfg  mailq.cfg  news.cfg     ping.cfg        rpc-nfs.cfg  telnet.cfg
dhcp.cfg    dummy.cfg    games.cfg  ldap.cfg   mrtg.cfg  nt.cfg       procs.cfg       snmp.cfg    users.cfg
disk.cfg    flexlm.cfg   hppjd.cfg  load.cfg   mysql.cfg  ntp.cfg      radius.cfg      ssh.cfg
```

How Checks Work

- Periodically Nagios calls a plugin to test the state of each service. Possible responses are:
 - OK
 - WARNING
 - CRITICAL
 - UNKNOWN
- If a service is not OK it goes into a “soft” error state. After a number of retries (default 3) it goes into a “hard” error state. At that point an alert is sent.
- You can also trigger external event handlers based on these state transitions

How Checks Work (Continued)

Parameters

- Normal checking interval
- Retry interval (i.e. when not OK)
- Maximum number of retries
- Time period for performing checks
- Time period for sending notifications

Scheduling

- Nagios spreads its checks throughout the time period to even out the workload
- Web UI shows when next check is scheduled

Hierarchy: The Concept of Parents

Hosts can have parents:

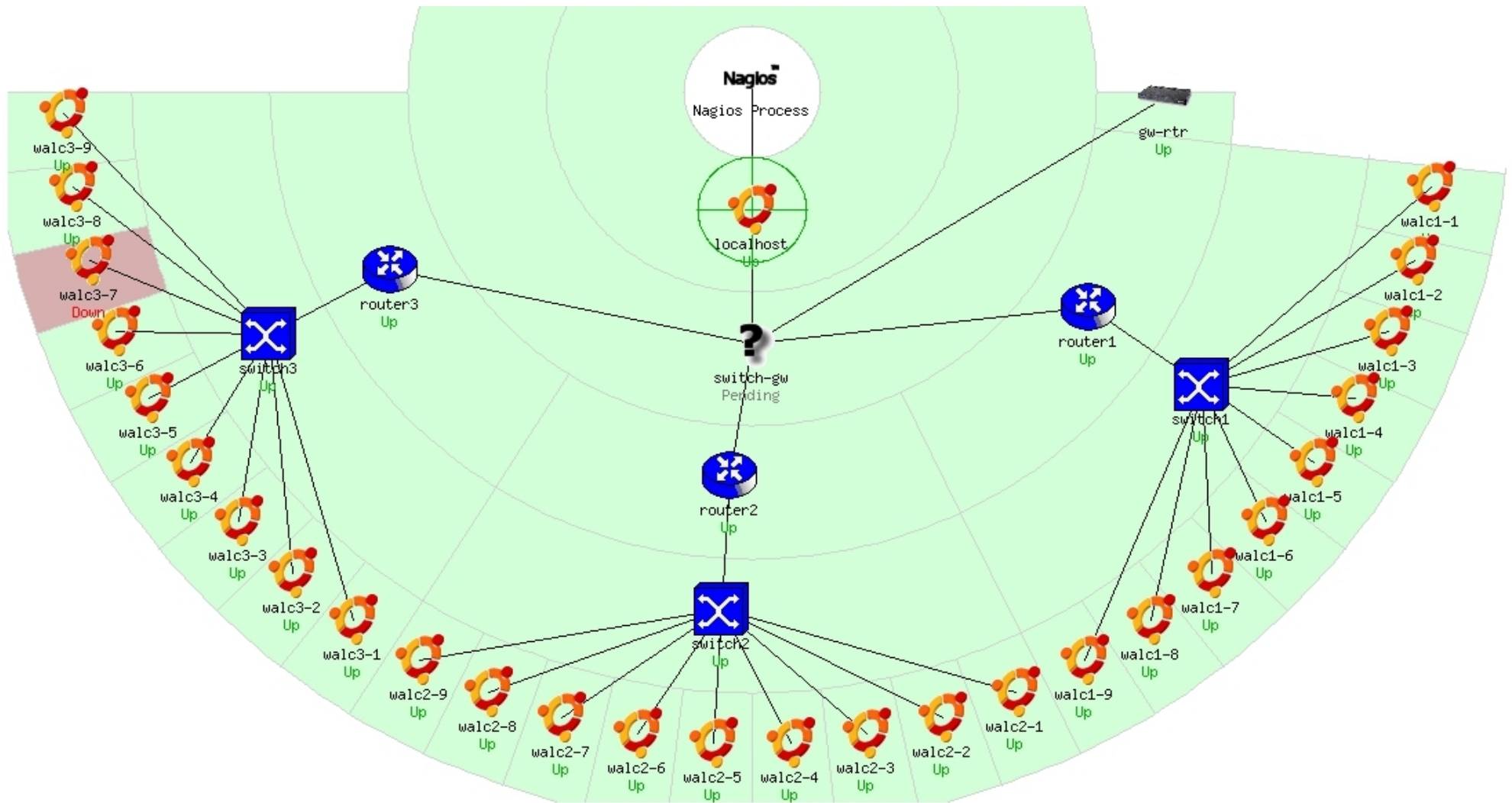
- The parent of a **PC** connected to a **switch** would be the **switch**.
- Allows us to specify the dependencies between devices.
- Avoids sending alarms when parent does not respond.
- A node can have multiple parents (dual homed).



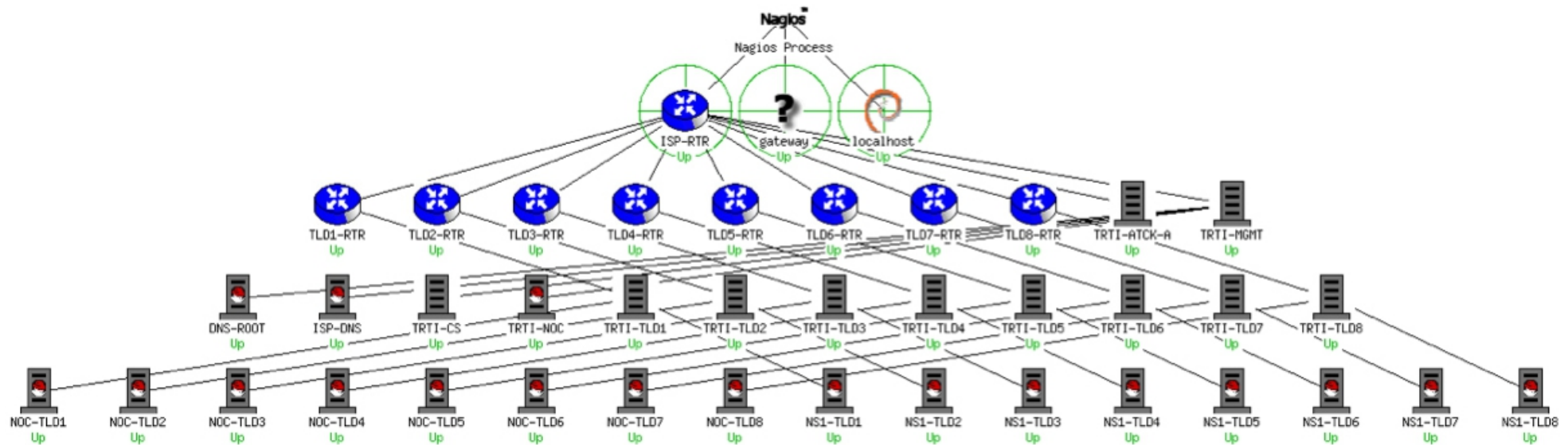
Network Viewpoint

- Where you locate your Nagios server will determine your point of view of the network.
- The Nagios server becomes the “root” of your dependency tree

Network Viewpoint



Collapsed Tree Network View



Demo of Nagios

<http://noc.ws.nsrc.org/nagios3/>

nagiosadmin: lab_password

Installation

In Debian/Ubuntu

```
# apt-get install nagios3
```

Key directories

```
/etc/nagios3
```

```
/etc/nagios3/conf.d
```

```
/etc/nagios-plugins/config
```

```
/usr/lib/nagios/plugins
```

```
/usr/share/nagios3/htdocs/images/logos
```

Nagios web interface is here:

<http://pcN.ws.nsrc.org/nagios3/>

Host and Services Configuration

Based on templates

- This saves lots of time avoiding repetition

There are default templates with default parameters for a:

- *generic host* (generic-host_nagios2.cfg)
- *generic service* (generic-service_nagios2.cfg)
- Individual settings can be overridden
- Defaults are all sensible

Configuration

- Configuration defined in text files
 - `/etc/nagios3/conf.d/*.cfg`
 - Details at http://nagios.sourceforge.net/docs/3_0/objectdefinitions.html
- The default config is broken into several files with different objects in different files, but actually you can organise it how you like
- Always verify before restarting Nagios – otherwise your monitoring system may die!
 - `nagios3 -v /etc/nagios3/nagios.cfg`

Monitoring a Single Host

pcs.cfg

```
define host {  
    host_name pc1  
    alias      pc1 in group 1  
    address    pc1.ws.nsrc.org  
    use        generic-host  
}
```

copy settings from this template

- This is a minimal working config
 - You are just pinging the host; Nagios will warn that you are not monitoring any services
- The filename can be anything ending **.cfg**
- Organise your devices however you like – e.g. related hosts in the same file

Generic Host Template

generic-host_nagios2.cfg

```
define host {
    name                generic-host      ; The name of this host template
    notifications_enabled 1 ; Host notifications are enabled
    event_handler_enabled 1 ; Host event handler is enabled
    flap_detection_enabled 1 ; Flap detection is enabled
    failure_prediction_enabled 1 ; Failure prediction is enabled
    process_perf_data      1 ; Process performance data
    retain_status_information 1 ; Retain status information across program restarts
    retain_nonstatus_information 1 ; Retain non-status information across restarts
    check_command           check-host-alive
    max_check_attempts      10
    notification_interval   0
    notification_period     24x7
    notification_options    d,u,r
    contact_groups          admins
    register                0 ; DON'T REGISTER THIS DEFINITION —
                           ; IT'S NOT A REAL HOST, JUST A TEMPLATE!
}
```

Overriding Defaults

All settings can be overridden per host

pcs.cfg

```
define host {  
    host_name          pc1  
    alias              pc1 in group 1  
    address            pc1.ws.nsrc.org  
    use                generic-host  
    notification_interval    120  
    contact_groups        admins,managers  
}
```

Defining Services: Direct Way

```
define host {  
    host_name      pc1  
    alias          pc1 in group 1  
    address        pc1.ws.nsrc.org  
    use            generic-host  
}
```

pcs.cfg

```
define service {  
    host_name          pc1  
    service_description HTTP  
    check_command      check_http  
    use                generic-service  
}
```

service "pc1,HTTP"

plug
in

```
define service {  
    host_name          pc1  
    service_description SSH  
    check_command      check_ssh  
    use                generic-service  
}
```

service
template

Service Checks

- The combination of host + service is a unique identifier for the service check, e.g.
 - “pc1,HTTP”
 - “pc1,SSH”
 - “pc2,HTTP”
 - “pc2,SSH”
- *check_command* points to the plugin
- *service template* pulls in settings for how often the check is done, and who and when to alert

Generic Service Templates

```
define service{
    name                                generic-service
    active_checks_enabled                1
    passive_checks_enabled              1
    parallelize_check                    1
    obsess_over_service                  1
    check_freshness                      0
    notifications_enabled                1
    event_handler_enabled                1
    flap_detection_enabled               1
    failure_prediction_enabled           1
    process_perf_data                    1
    retain_status_information             1
    retain_nonstatus_information         1
    notification_interval                0
    is_volatile                          0
    check_period                         24x7
    normal_check_interval                5
    retry_check_interval                 1
    max_check_attempts                   4
    notification_period                  24x7
    notification_options                 w,u,c,r
    contact_groups                       admins
    register                             0    ; DONT REGISTER THIS DEFINITION
}
```

generic-service_nagios2.cfg

(comments have been removed)

Overriding Defaults

Again, settings can be overridden per service

services_nagios2.cfg

```
define service {  
    host_name          pc1  
    service_description HTTP  
    check_command      check_http  
    use                generic-service  
    contact_groups     admins,managers  
    max_check_attempts 3  
}
```

Repeating Service Checks

- Often we are monitoring an identical service on many hosts
- To avoid duplication, a better way is to define a service check for all hosts in a *hostgroup*

Creating Hostgroups

hostgroups_nagios2.cfg

```
define hostgroup {  
    hostgroup_name    http-servers  
    alias             HTTP servers  
    members          pc1,pc2  
}  
  
define hostgroup {  
    hostgroup_name    ssh-servers  
    alias             SSH servers  
    members          pc1,pc2  
}
```

Monitoring Services in Hostgroups

```
define service {  
    hostgroup_name      http-servers  
    service_description  HTTP  
    check_command        check_http  
    use                  generic-service  
}  
  
define service {  
    hostgroup_name      ssh-servers  
    service_description  SSH  
    check_command        check_ssh  
    use                  generic-service  
}
```

services_nagios2.cfg

if hostgroup "http-servers" contains pc1 & pc2 then Nagios creates HTTP service checks for both hosts. The service checks are called "pc1,HTTP" and "pc2,HTTP"

Alternative View

- “this hostgroup contains these PCs”
or:
- “this PC belongs to these hostgroups”
- No need for “members” line in hostgroups file

Alternative Group Membership

```
define host {  
    host_name      pc1  
    alias          pc1 in group 1  
    address        pc1.ws.nsrc.org  
    use            generic-host  
    hostgroups    ssh-servers,http-servers  
}  
  
define host {  
    host_name      pc2  
    alias          pc2 in group 1  
    address        pc2.ws.nsrc.org  
    use            generic-host  
    hostgroups    ssh-servers,http-servers  
}
```

pcs.cfg

Hosts and services conveniently defined in the same place

Other Uses for Hostgroups

Choosing icons for the status map

```
define host {  
    host_name      pc1  
    alias          pc1 in group 1  
    address        pc1.ws.nsrc.org  
    use            generic-host  
    hostgroups     ssh-servers,http-servers,debian-servers  
}
```

pcs.cfg

```
define hostextinfo {  
    hostgroup_name    debian-servers  
    notes            Debian GNU/Linux servers  
    icon_image       base/debian.png  
    statusmap_image  base/debian.gd2  
}
```

extinfo_nagios2.cfg

Optional: Servicegroups

- Services can be grouped into a “servicegroup”
- This is so related or dependent services can be viewed together in the web interface
- The services themselves must already exist

```
define servicegroup {  
    servicegroup_name    mail-services  
    alias                Services comprising the mail platform  
    members              web1,HTTP,web2,HTTP,mail1,IMAP,db1,MYSQL  
}
```

servicegroups.cfg

Configuring Topology

```
define host {  
    host_name      pc1  
    alias          pc1 in group 1  
    address        pc1.ws.nsrc.org  
    use            generic-host  
    parents       rtr1  
}
```

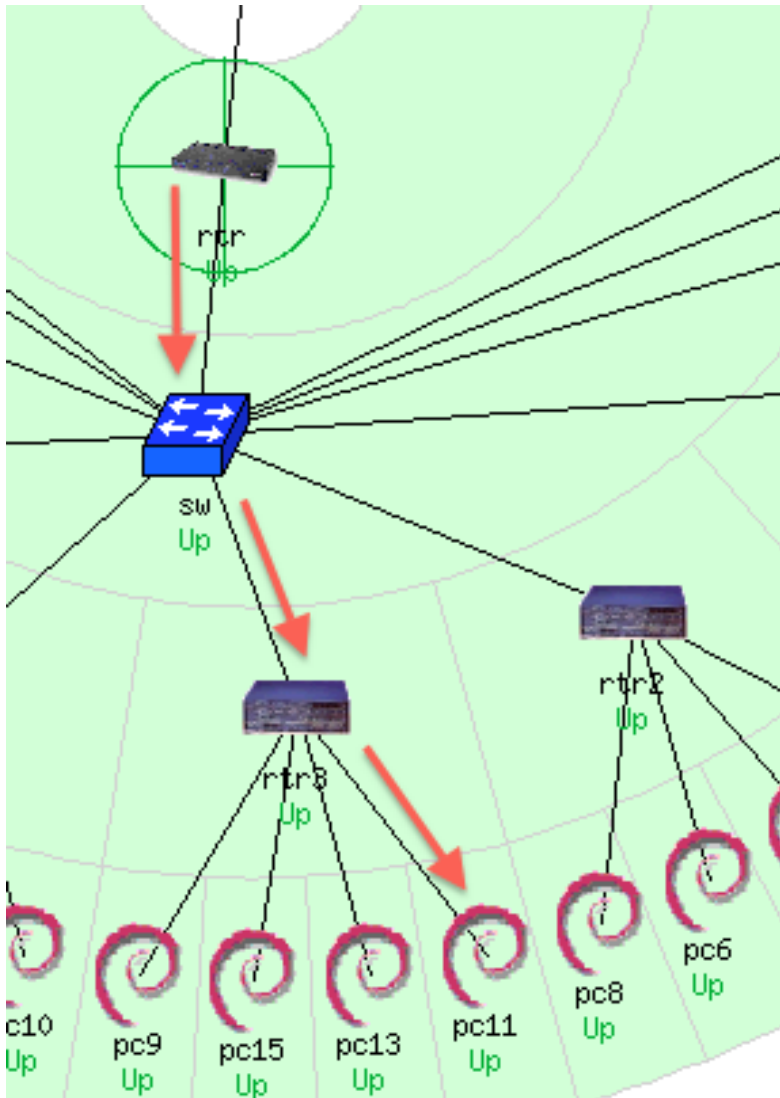
pcs.cfg



parent
host

- This means “pc1 is on the far side of rtr1”
- If rtr1 goes down, pc1 is “unreachable”, not “down”
- Prevents a cascade of alerts if rtr1 goes down
- Also allows Nagios to draw cool status map

Another View of Configuration



RTR

```
define host {  
  use  
  host_name  
  alias  
  address
```

```
generic-host  
rtr  
Gateway Router  
10.10.0.254 }
```

SW

```
define host {  
  use  
  host_name  
  alias  
  address  
  parents
```

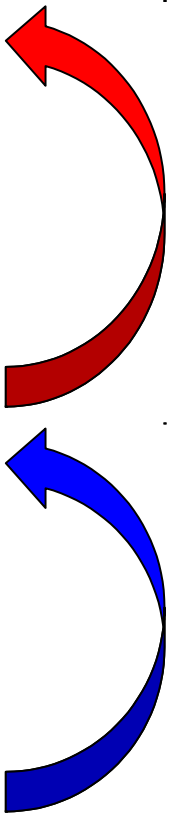
```
generic-host  
sw  
Backbone Switch  
10.10.0.253  
rtr }
```

RTR3

```
define host {  
  use  
  host_name  
  alias  
  address  
  parents
```

```
generic-host  
rtr3  
router 3  
10.10.3.254  
sw }
```

PC11...



Out of Band (OOB) Notifications

A critical item to remember: an SMS or message system that is independent from your network.

- You can utilize a cell phone connected to the Nagios server, or a USB dongle with SIM card
- You can use packages like:

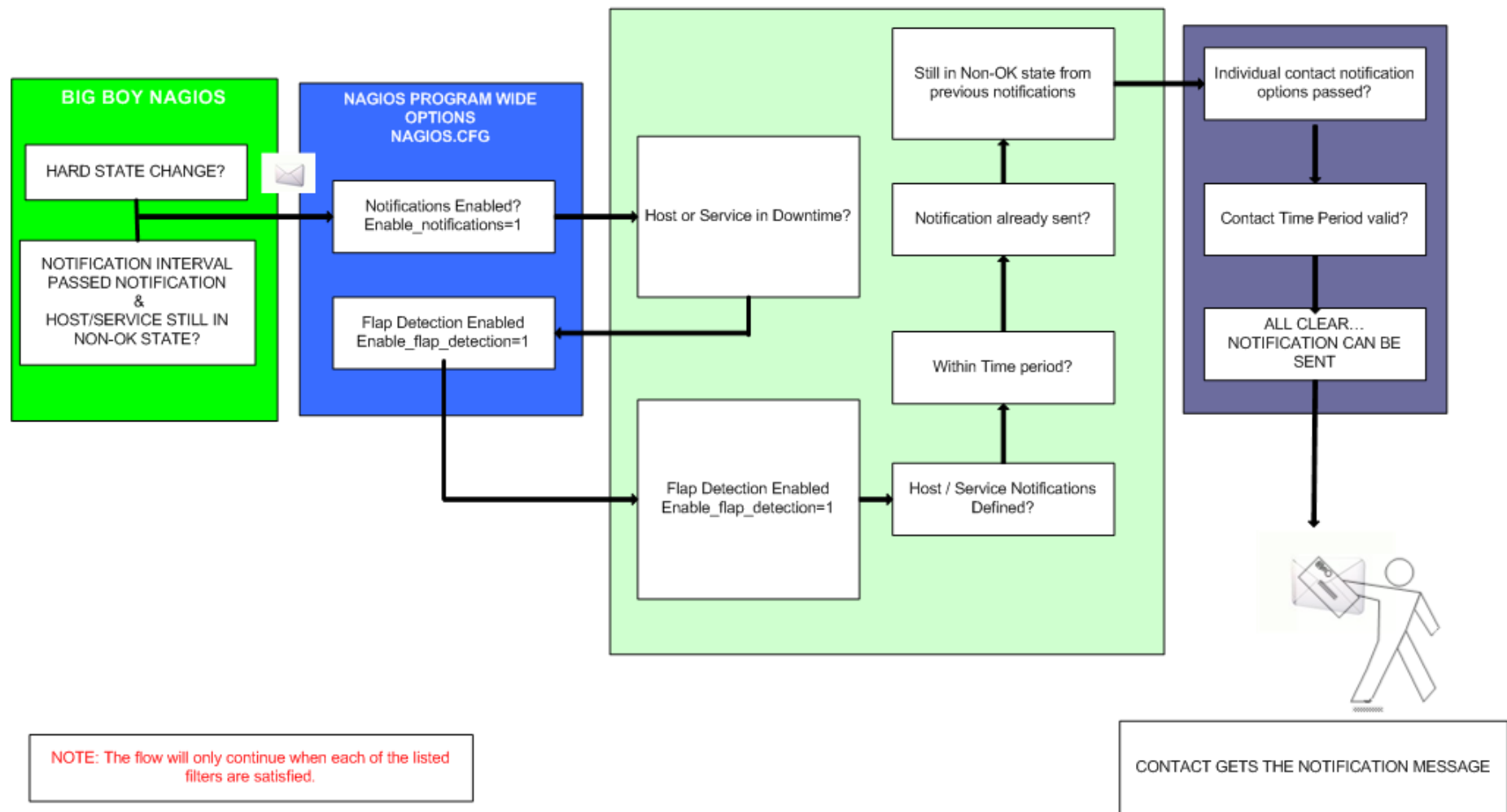
gammu: <http://wammu.eu/>

gnokii: <http://www.gnokii.org/>

sms-tools: <http://smstools3.kekekasvi.com/>

I use a Raspberry Pi with Kannel: <http://www.kannel.org/>

NAGIOS - NOTIFICATION FLOW DIAGRAM



References

- **Nagios web site**
<http://www.nagios.org/>
- **Nagios plugins site**
<http://www.nagiosplugins.org/>
- *Nagios System and Network Monitoring*, by Wolfgang Barth. Good book about Nagios.
- **Unofficial Nagios plugin site**
<http://nagios.exchange.org/>
- **A Debian tutorial on Nagios**
<http://www.debianhelp.co.uk/nagios.htm>
- **Commercial Nagios support**
<http://www.nagios.com/>

Additional Details

A few additional slides you may find useful or informative...

More Features

- Allows you to acknowledge an event.
 - A user can add comments via the GUI
- You can define maintenance periods
 - By device or a group of devices
- Maintains availability statistics and generates reports
- Can detect flapping and suppress additional notifications.
- Allows for multiple notification methods:
 - e-mail, pager, SMS, winpopup, audio, etc...
- Allows you to define notification levels for escalation

Host Notification Options

Host state:

When configuring a host you can be notified on the following conditions:

- **d:** DOWN
- **u:** UNREACHABLE
- **r:** RECOVERY
- **f:** FLAPPING (start/end)
- **s:** SCHEDULED DOWNTIME (start/end)
- **n:** NONE

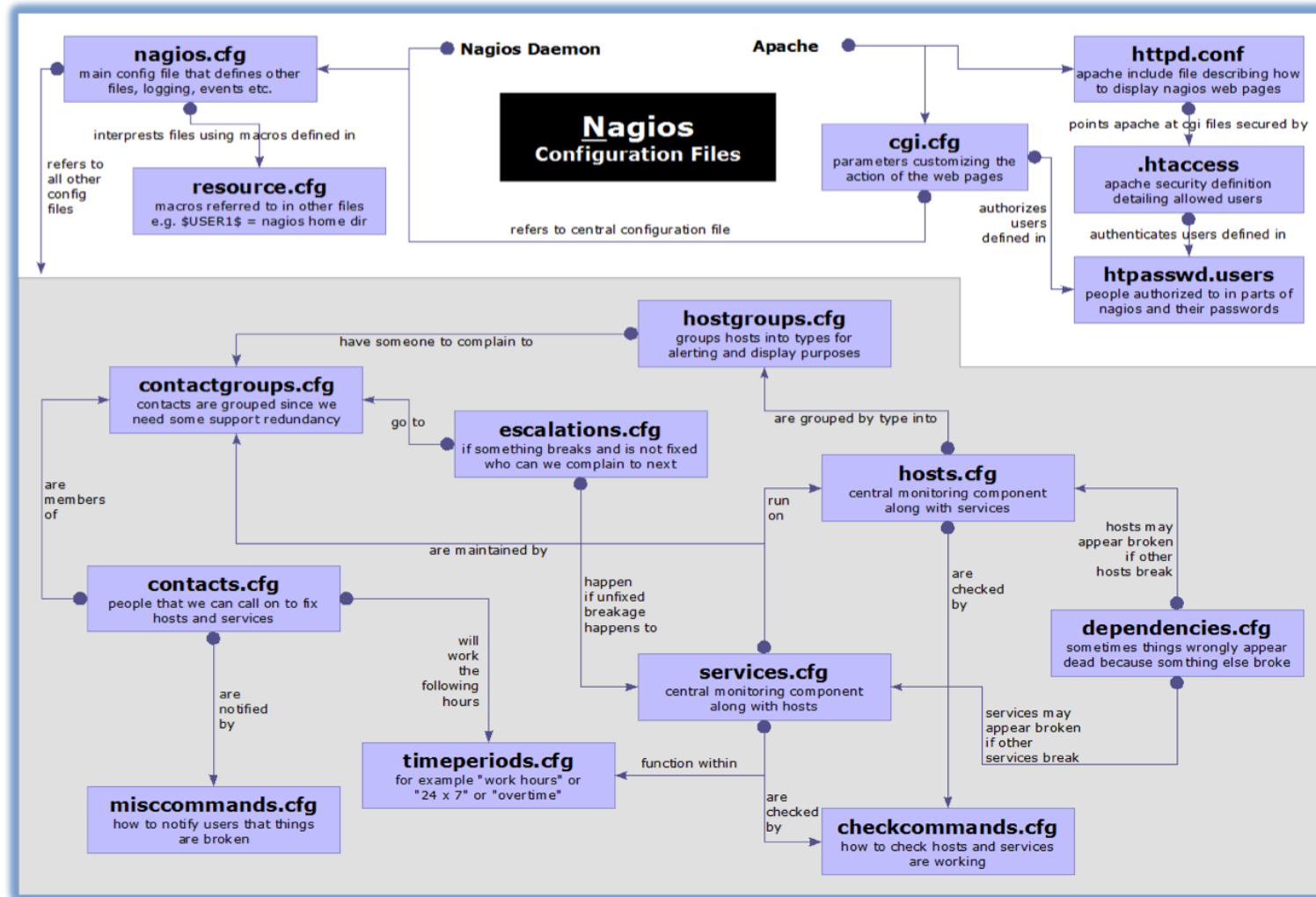
Service Notification Options

Service state:

When configuring a service you can be notified on the following conditions:

- **w:** WARNING
- **c:** CRITICAL
- **u:** UNKNOWN
- **r:** RECOVERY
- **f:** FLAPPING (start/end)
- **s:** SCHEDULED DOWNTIME (start/end)
- **n:** NONE

Configuration Files



Debian/Ubuntu Configuration Files

Located in `/etc/nagios3/`

Important files include:

- `nagios.cfg` Main configuration file.
- `cgi.cfg` Controls the web interface and security options.
- `commands.cfg` The commands that Nagios uses for notifications.
- `conf.d/*` All other configuration goes here!

More Configuration Files

Under conf.d/*

- `contacts_nagios2.cfg` users and groups
- `extinfo_nagios2.cfg` make your UI pretty
- `generic-host_nagios2.cfg` default host template
- `generic-service_nagios2.cfg` default service template
- `host-gateway_nagios3.cfg` upstream router definition
- `hostgroups_nagios2.cfg` groups of nodes
- `localhost_nagios2.cfg` definition of nagios host
- `services_nagios2.cfg` what services to check
- `timeperiods_nagios2.cfg` when to check who to notify

More Configuration Files

Under conf.d some other possible config files:

- [servicegroups.cfg](#) Groups of nodes and services
- [pcs.cfg](#) Sample definition of PCs (hosts)
- [switches.cfg](#) Definitions of switches (hosts)
- [routers.cfg](#) Definitions of routers (hosts)

Main Configuration Details

Global settings

File: `/etc/nagios3/nagios.cfg`

- Says where other configuration files are.
- General Nagios behavior:
 - For large installations you should tune the installation via this file.
 - See: *Tunning Nagios for Maximum Performance*
http://nagios.sourceforge.net/docs/3_0/tuning.html

CGI Configuration

`/etc/nagios3/cgi.cfg`

- You can change the CGI directory if you wish
- Authentication and authorization for Nagios use:
 - Activate authentication via Apache's .htpasswd mechanism, or using RADIUS or LDAP.
 - Users can be assigned rights via the following variables:
 - `authorized_for_system_information`
 - `authorized_for_configuration_information`
 - `authorized_for_system_commands`
 - `authorized_for_all_services`
 - `authorized_for_all_hosts`
 - `authorized_for_all_service_commands`
 - `authorized_for_all_host_commands`

Time Periods

This defines the base periods that control checks, notifications, etc.

- Defaults: 24 x 7
- Adjust as needed, such as work-week only.
- Set up new time period for “outside regular hours”, etc.

```
# '24x7'
define timeperiod{
    timeperiod_name 24x7
    alias            24 Hours A Day, 7 Days A Week
    sunday           00:00-24:00
    monday           00:00-24:00
    tuesday          00:00-24:00
    wednesday        00:00-24:00
    thursday         00:00-24:00
    friday           00:00-24:00
    saturday         00:00-24:00
}
```

Configuring Service/Host Checks

```
define command {  
    command_name    check_ssh  
    command_line    /usr/lib/nagios/plugins/check_ssh '$HOSTADDRESS$'  
}
```

```
define command {  
    command_name    check_ssh_port  
    command_line    /usr/lib/nagios/plugins/check_ssh -p '$ARG1$' '$HOSTADDRESS$'  
}
```

/etc/nagios-plugins/config/ssh.cfg

- Notice the same plugin can be invoked in different ways (“commands”)
- Command and arguments are separated by exclamation marks (!)
- e.g. to check SSH on a non-standard port, you can do it like this:

```
define service {  
    hostgroup_name    ssh-servers-2222  
    service_description    SSH-2222  
    check_command      check_ssh_port!2222  
    use                generic-service  
}
```

this is
\$ARG1\$

Notification Commands

Use any command you want!

We could use this to generate tickets in RT.

```
# 'notify-by-email' command definition
define command{
    command_name    notify-by-email
    command_line    /usr/bin/printf "%b" "Service: $SERVICEDESC$\nHost:
$HOSTNAME$\nIn: $HOSTALIAS$\nAddress: $HOSTADDRESS$\nState: $SERVICESTATE$\nInfo:
$SERVICEOUTPUT$\nDate: $SHORTDATETIME$" | /bin/mail -s '$NOTIFICATIONTYPE$:
$HOSTNAME$/$SERVICEDESC$ is $SERVICESTATE$' $CONTACTEMAIL$
}
```

From: nagios@nms.localdomain
To: router_group@localdomain
Subject: Host DOWN alert for TLD1-RTR!
Date: Thu, 29 Jun 2006 15:13:30 -0700

Host: gw
In: Core_Routers
State: DOWN
Address: 192.0.2.100
Date/Time: 06-29-2006 15:13:30
Info: CRITICAL - Plugin timed out after 6 seconds

Group Service Configuration

```
# check that ssh services are running
define service {
    hostgroup_name      ssh-servers
    service_description  SSH
    check_command        check_ssh
    use                  generic-service
    notification_interval 0
}
```

The “service_description” is important if you plan to create Service Groups. Here is a sample Service Group definition:

```
define servicegroup{
    servicegroup_name  Webmail
    alias              web-mta-storage-auth
    members            srvr1,HTTP,srvr1,SMTP,srvr1,POP, \
                     srvr1,IMAP,srvr1,RAID,srvr1,LDAP, \
                     srvr2,HTTP,srvr2,SMTP,srvr2,POP, \
                     srvr2,IMAP,srvr2,RAID,srvr2,LDAP
}
```

Screen Shots

A few sample screen shots from a Nagios install.

General

- Home
- Documentation

Monitoring

- Tactical Overview
- Service Detail
- Host Detail
- Hostgroup Overview**
- Hostgroup Summary
- Hostgroup Grid
- Servicegroup Overview
- Servicegroup Summary
- Servicegroup Grid
- Status Map
- 3-D Status Map
- Service Problems
 - Unhandled
- Host Problems
 - Unhandled
- Network Outages

Show Host:

- Comments
- Downtime
- Process Info
- Performance Info
- Scheduling Queue

Reporting

- Trends
- Availability
- Alert Histogram
- Alert History
- Alert Summary
- Notifications
- Event Log

Configuration

- View Config

Current Network Status

Last Updated: Thu Sep 3 14:55:28 CDT 2009
Updated every 90 seconds
Nagios® 3.0.2 - www.nagios.org
Logged in as guest

[View Service Status Detail For All Host Groups](#)

[View Host Status Detail For All Host Groups](#)

[View Status Summary For All Host Groups](#)

[View Status Grid For All Host Groups](#)

Host Status Totals

Up	Down	Unreachable	Pending
41	0	0	0
All Problems		All Types	
0		41	

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
46	0	0	0	0
All Problems		All Types		
0		46		

Service Overview For All Host Groups

TRTI TLD1 Servers, Virtual Machines, Routers (TLD1)

Host	Status	Services	Actions
NOC-TLD1	UP	1 OK	  
NS1-TLD1	UP	1 OK	  
TLD1-RTR	UP	1 OK	  
TRTI-TLD1	UP	1 OK	  

TRTI TLD2 Servers, Virtual Machines, Routers (TLD2)

Host	Status	Services	Actions
NOC-TLD2	UP	1 OK	  
NS1-TLD2	UP	1 OK	  
TLD2-RTR	UP	1 OK	  
TRTI-TLD2	UP	1 OK	  

TRTI TLD3 Servers, Virtual Machines, Routers (TLD3)

Host	Status	Services	Actions
NOC-TLD3	UP	1 OK	  
NS1-TLD3	UP	1 OK	  
TLD3-RTR	UP	1 OK	  
TRTI-TLD3	UP	1 OK	  

TRTI TLD4 Servers, Virtual Machines, Routers (TLD4)

Host	Status	Services	Actions
NOC-TLD4	UP	1 OK	  
NS1-TLD4	UP	1 OK	  
TLD4-RTR	UP	1 OK	  
TRTI-TLD4	UP	1 OK	  

TRTI TLD5 Servers, Virtual Machines, Routers (TLD5)

Host	Status	Services	Actions
NOC-TLD5	UP	1 OK	  
NS1-TLD5	UP	1 OK	  
TLD5-RTR	UP	1 OK	  
TRTI-TLD5	UP	1 OK	  

TRTI TLD6 Servers, Virtual Machines, Routers (TLD6)

Host	Status	Services	Actions
NOC-TLD6	UP	1 OK	  
NS1-TLD6	UP	1 OK	  
TLD6-RTR	UP	1 OK	  
TRTI-TLD6	UP	1 OK	  

TRTI TLD7 Servers, Virtual Machines, Routers (TLD7)

Host	Status	Services	Actions
NOC-TLD7	UP	1 OK	  
NS1-TLD7	UP	1 OK	  

TRTI TLD8 Servers, Virtual Machines, Routers (TLD8)

Host	Status	Services	Actions
NOC-TLD8	UP	1 OK	  
NS1-TLD8	UP	1 OK	  

TRTI Management Virtual Machines (VM-mgmt)

Host	Status	Services	Actions
DNS-ROOT	UP	1 OK	  
ISP-DNS	UP	1 OK	  

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- Scheduling Queue

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- Trends
- Availability
- Alert Histogram
- Alert History
- Alert Summary
- Notifications
- Event Log

Configuration

- View Config

Current Network Status

Last Updated: Fri Sep 4 13:29:20 CDT 2009
 Updated every 90 seconds
 Nagios® 3.0.2 - www.nagios.org
 Logged in as *guest*

[View Service Status Detail For All Service Groups](#)
[View Status Summary For All Service Groups](#)
[View Service Status Grid For All Service Groups](#)

Host Status Totals

Up	Down	Unreachable	Pending
41	0	0	0
All Problems		All Types	
0		41	

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
53	0	0	1	0
All Problems			All Types	
1			54	

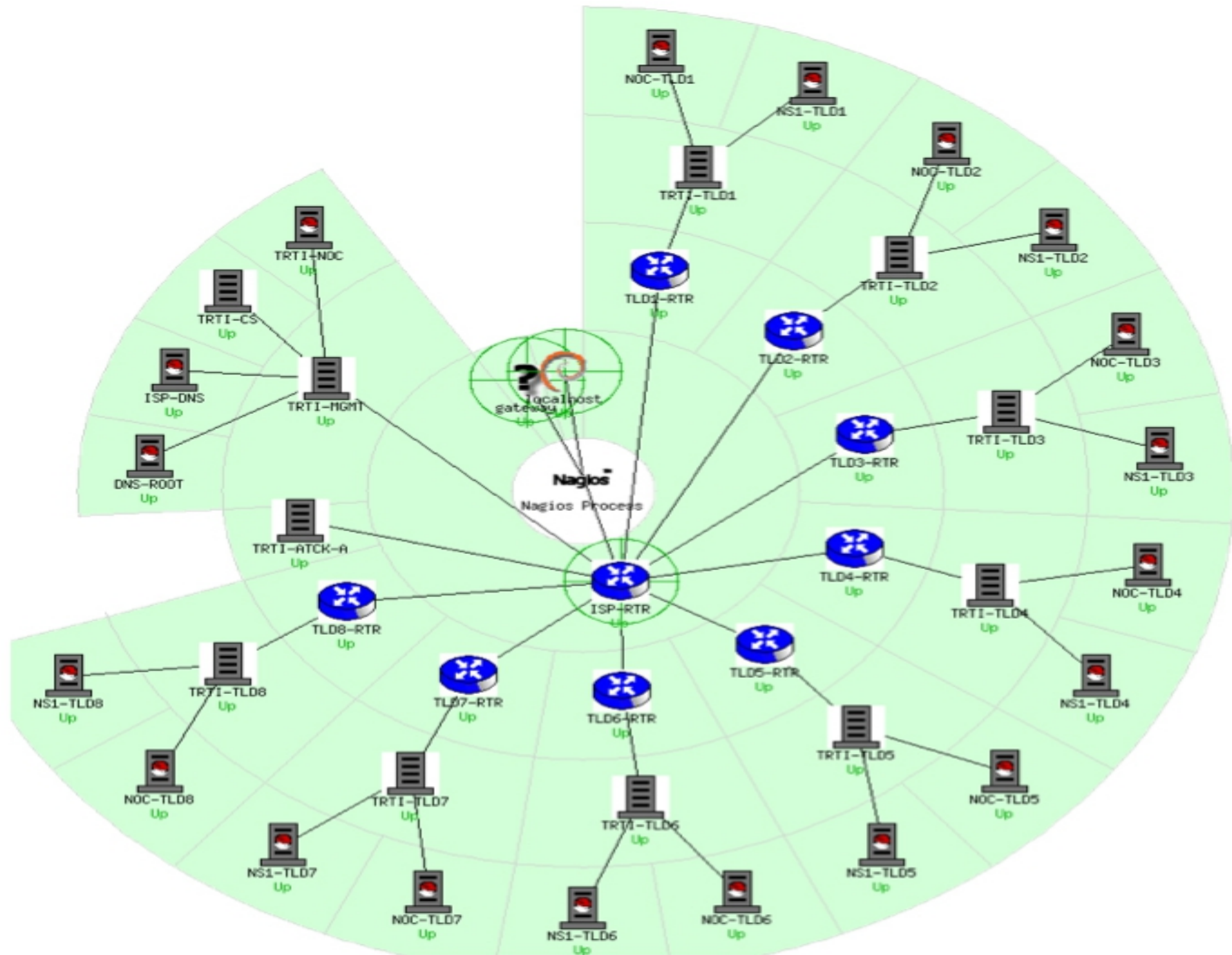
Service Overview For All Service Groups

[TLD Servers running Nagios \(NAGIOS\)](#)

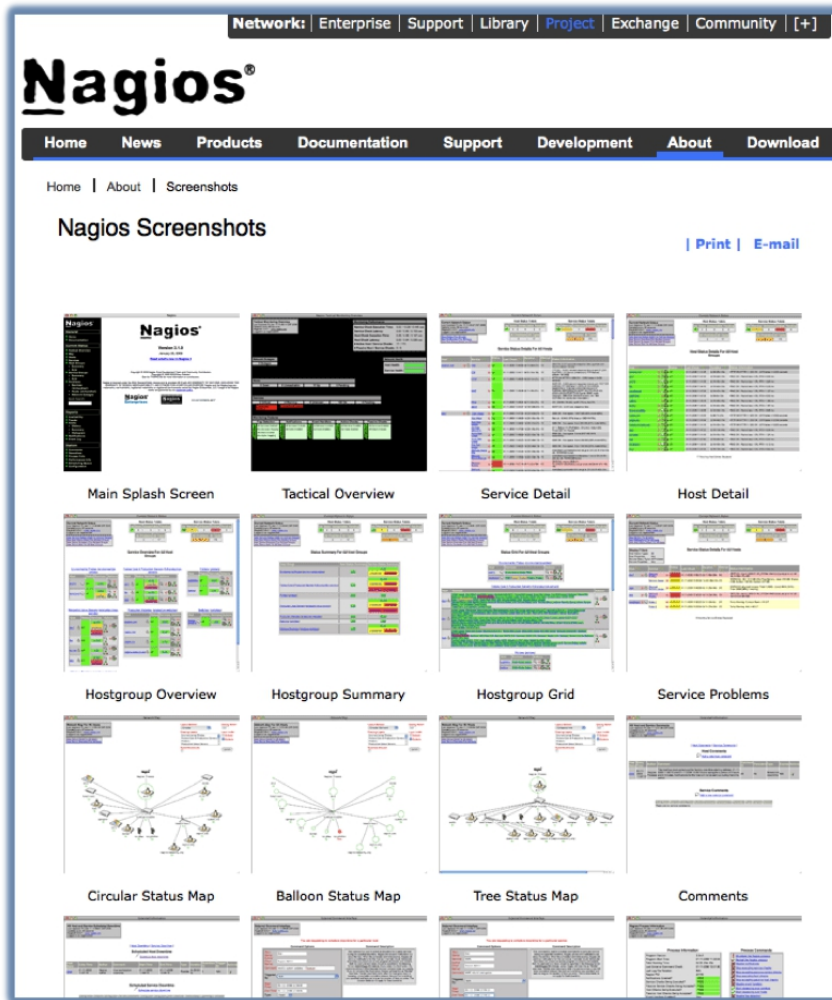
Host	Status	Services	Actions
NS1-TLD1	UP	1 OK	  
NS1-TLD2	UP	1 OK	  
NS1-TLD3	UP	1 OK	  
NS1-TLD4	UP	1 OK	  
NS1-TLD5	UP	1 OK	  
NS1-TLD6	UP	1 OK	  
NS1-TLD7	UP	1 OK	  
NS1-TLD8	UP	1 OK	  

[TLD Servers running SSH \(SSH\)](#)

Host	Status	Services	Actions
NS1-TLD1	UP	1 OK	  
NS1-TLD2	UP	1 CRITICAL	  
NS1-TLD3	UP	1 OK	  
NS1-TLD4	UP	1 OK	  
NS1-TLD5	UP	1 OK	  
NS1-TLD6	UP	1 OK	  
NS1-TLD7	UP	1 OK	  
NS1-TLD8	UP	1 OK	  



More Sample Screenshots



Many more sample Nagios screenshots available here:

<http://www.nagios.org/about/screenshots>

Nagios Lab Classroom Topology

