

Network Monitoring & Management: Nagios

Network Startup Resource Center



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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

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- 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
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- Alert Histogram
- Alert History
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- Notifications
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- 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
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Services

0 Critical	0 Warning	0 Unknown	46 Ok	0 Pending
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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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Current Network Status
 Last Updated: Thu Sep 3 14:55:18 CDT 2009
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[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

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Current Network Status

Last Updated: Thu Sep 3 14:46:07 CDT 2009
Updated every 90 seconds
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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
```

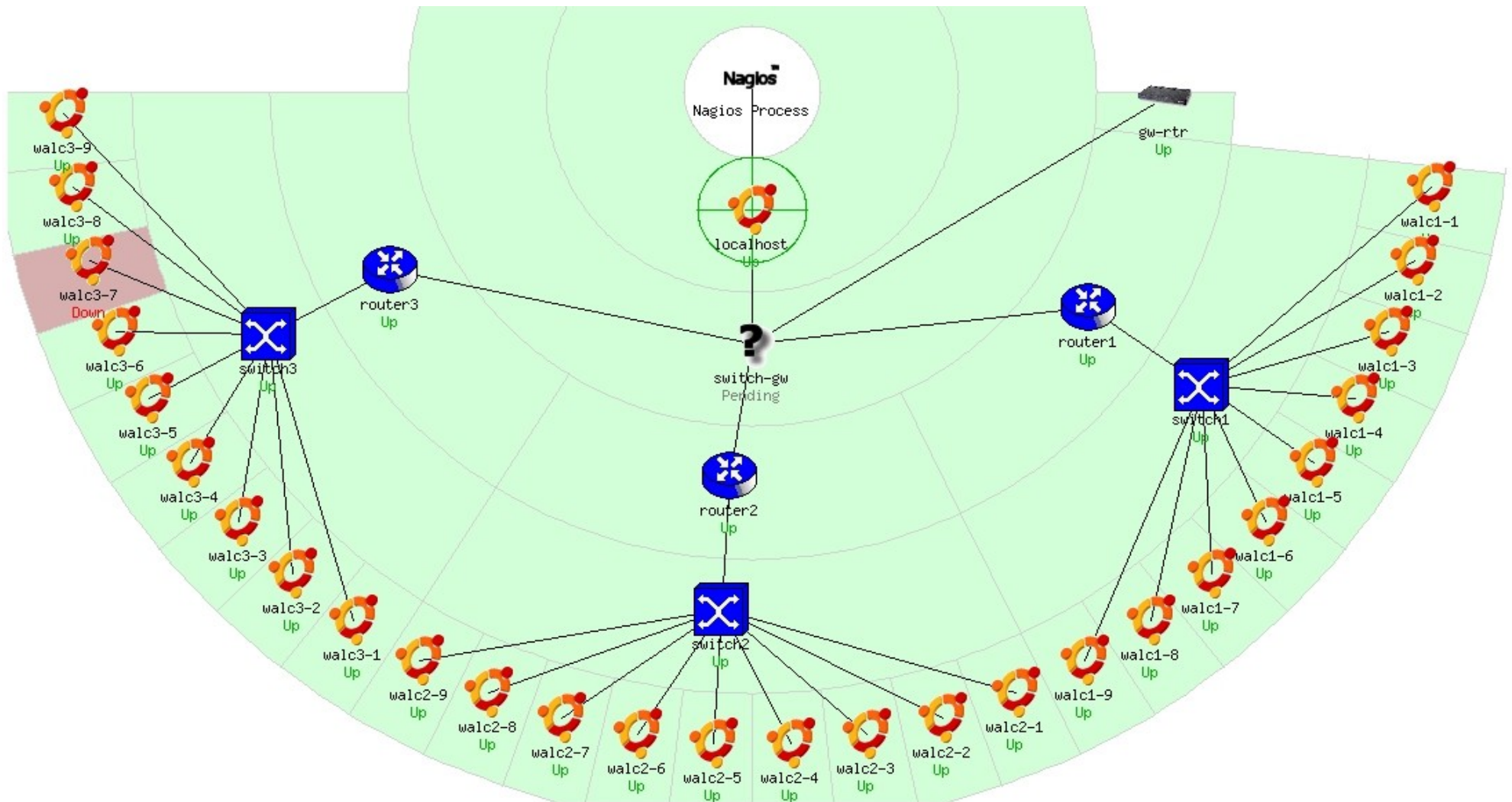
/etc/nagios-plugins/config

```
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

Network Viewpoint



Demo of Nagios

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

nagiosadmin: lab_password

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/>

Screen Shots

A few sample screen shots from a Nagios install.

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Last Updated: Thu Sep 3 14:55:28 CDT 2009
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[View Service Status Detail For All Host Groups](#)

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

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[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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Last Updated: Fri Sep 4 13:29:20 CDT 2009
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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	

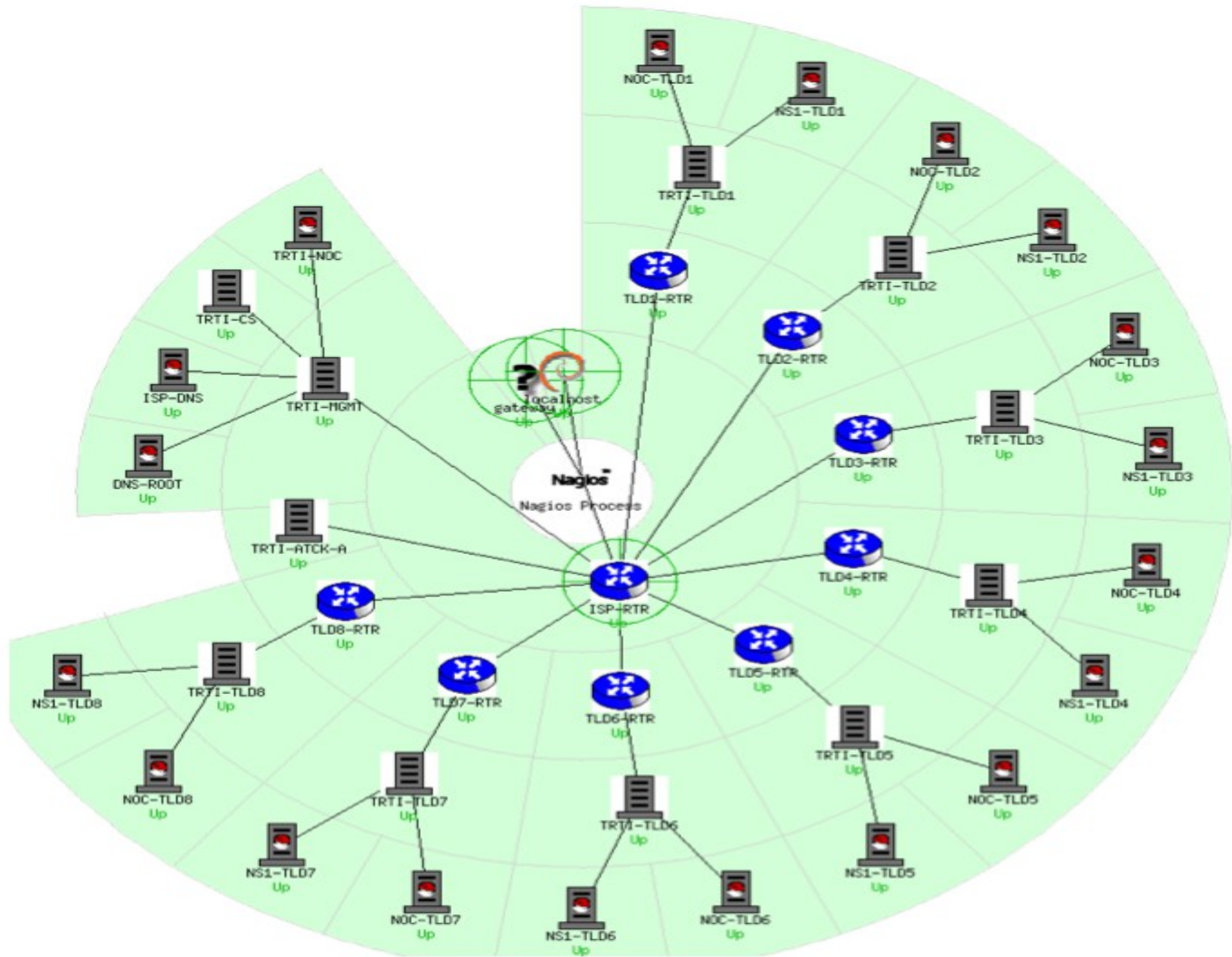
Service Overview For All Service Groups

TLD Servers running Nagios (NAGIOS)

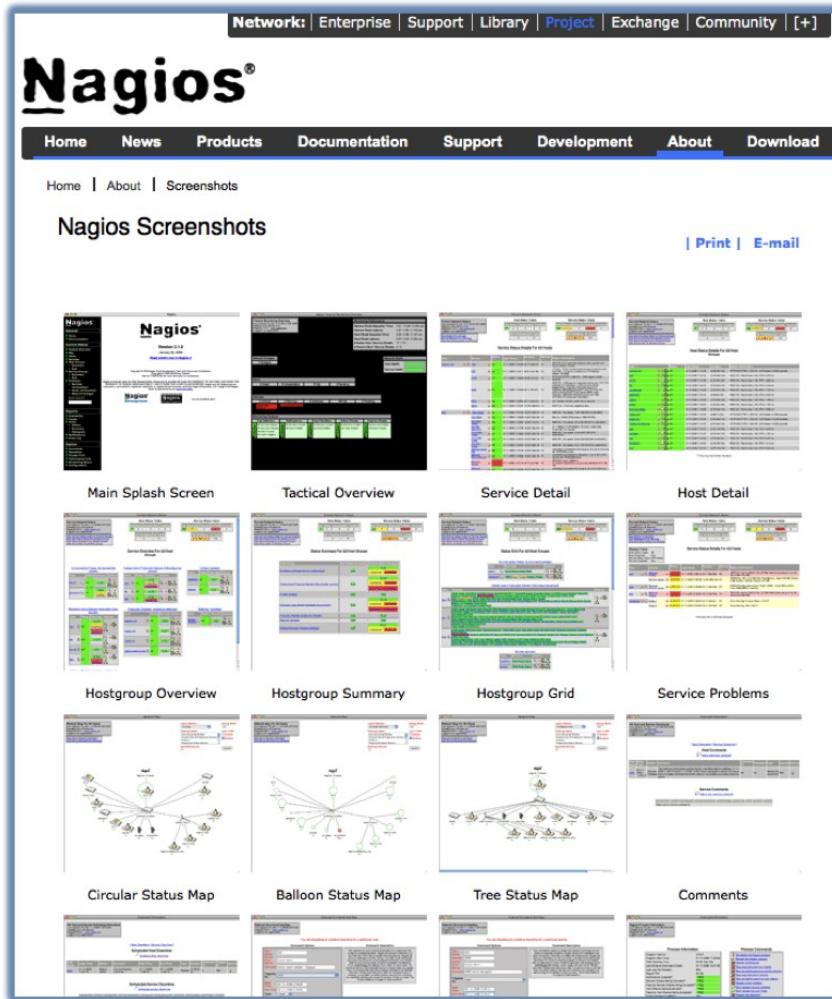
Host	Status	Services	Actions
NS1-TLD1	UP	1 OK	  
NS1-TLD2	UP	1 OK	  
NS1-TLD3	UP	1 OK	  
NS1-TLD4	UP	1 OK	  
NS1-TLD5	UP	1 OK	  
NS1-TLD6	UP	1 OK	  
NS1-TLD7	UP	1 OK	  
NS1-TLD8	UP	1 OK	  

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>