Network Monitoring & Management: Nagios

Network Startup Resource Center

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Introduction

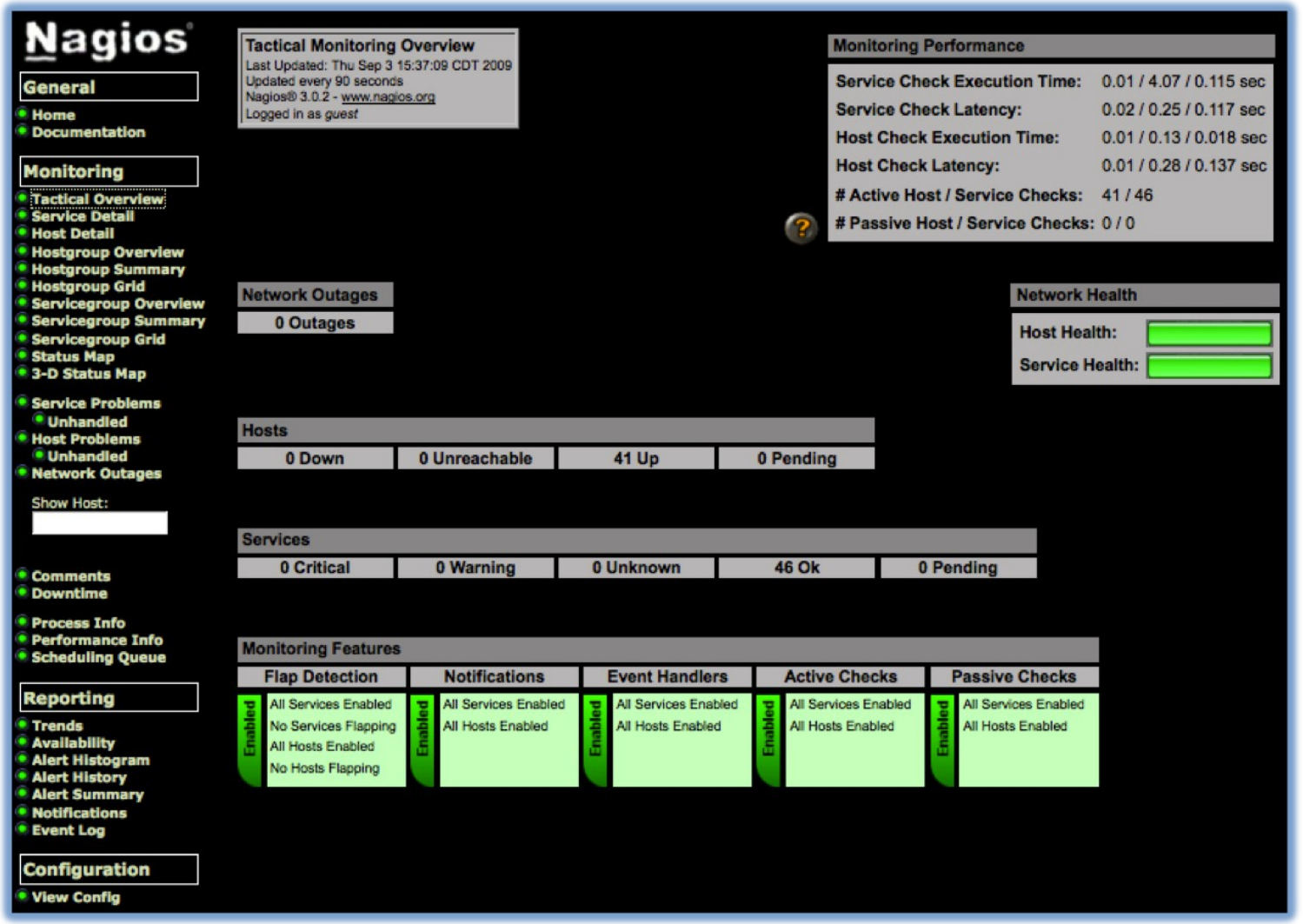
- Possibly the most used open source network monitoring software
- Web interface for viewing status, browsing history, scheduling downtime etc
- Sends out alerts via E-mail. Can be configured to use other mechanisms, e.g. SMS

Introduction

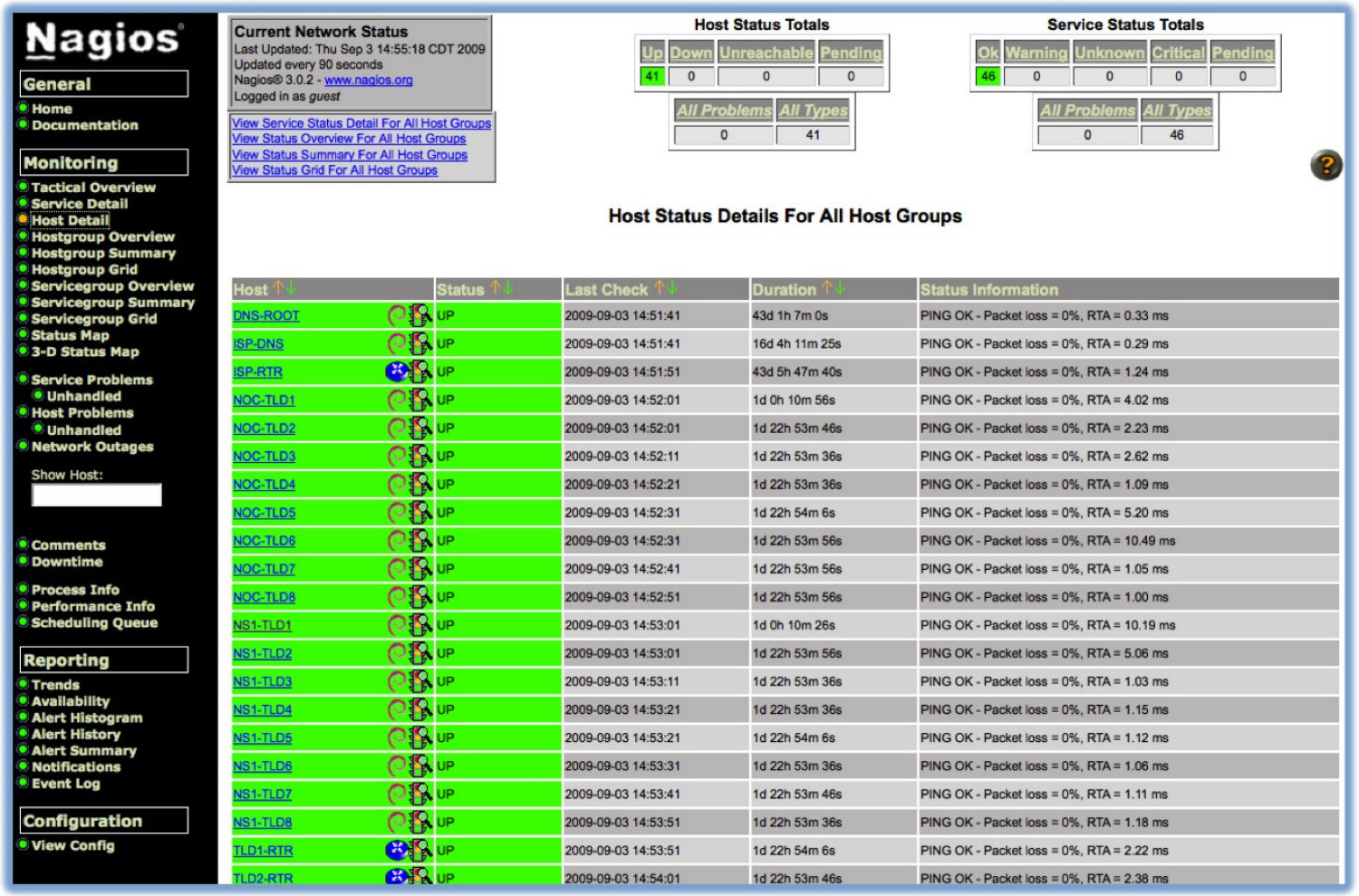
Nagios actively monitors the availability

- of Hosts (devices)
- and Services

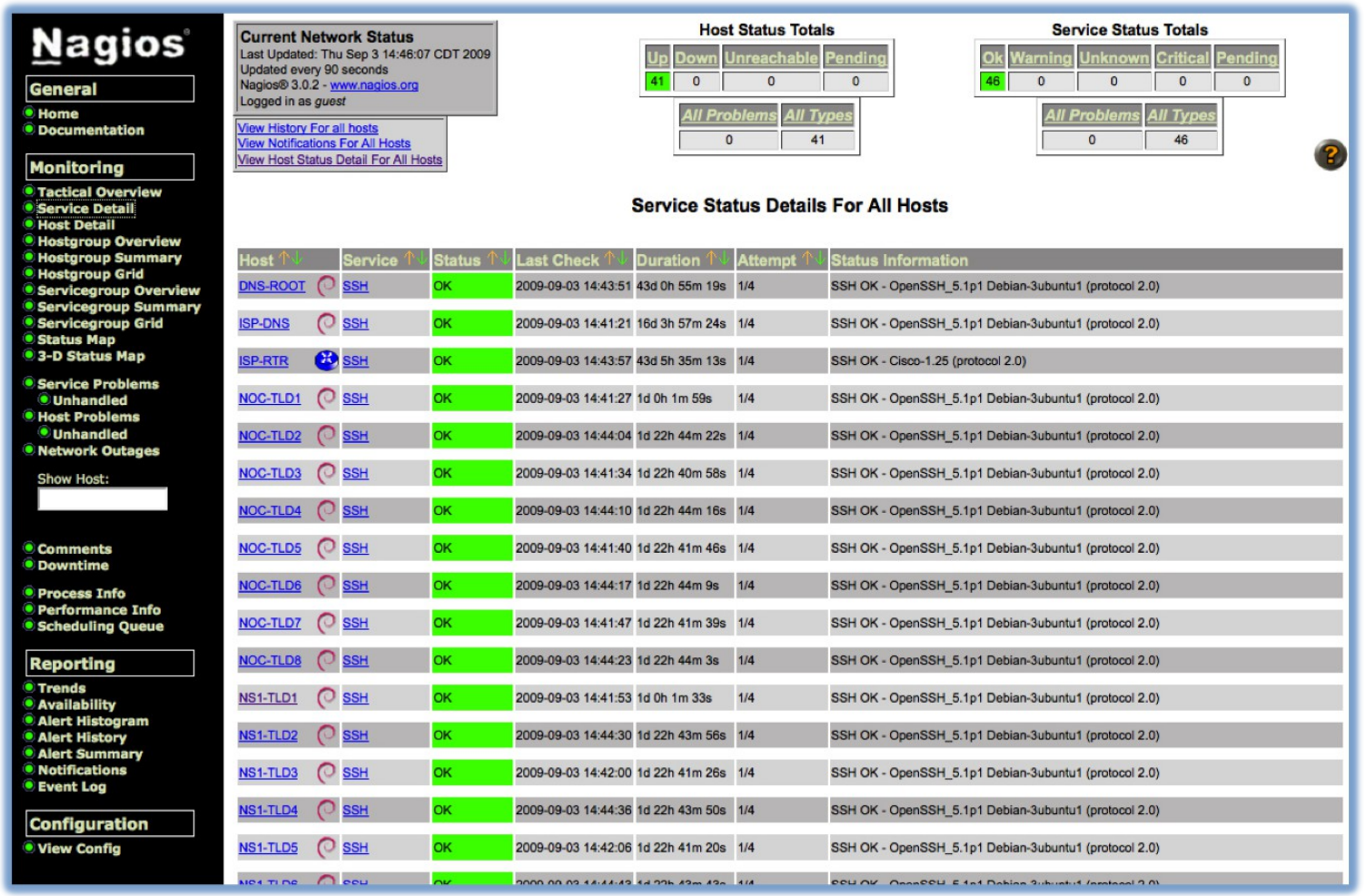
Nagios: General View



Host Detail View



Service Detail View



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

```
2. nsrc@s1: ~ (ssh)
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_nntps       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
nsrc@s1:~$
```

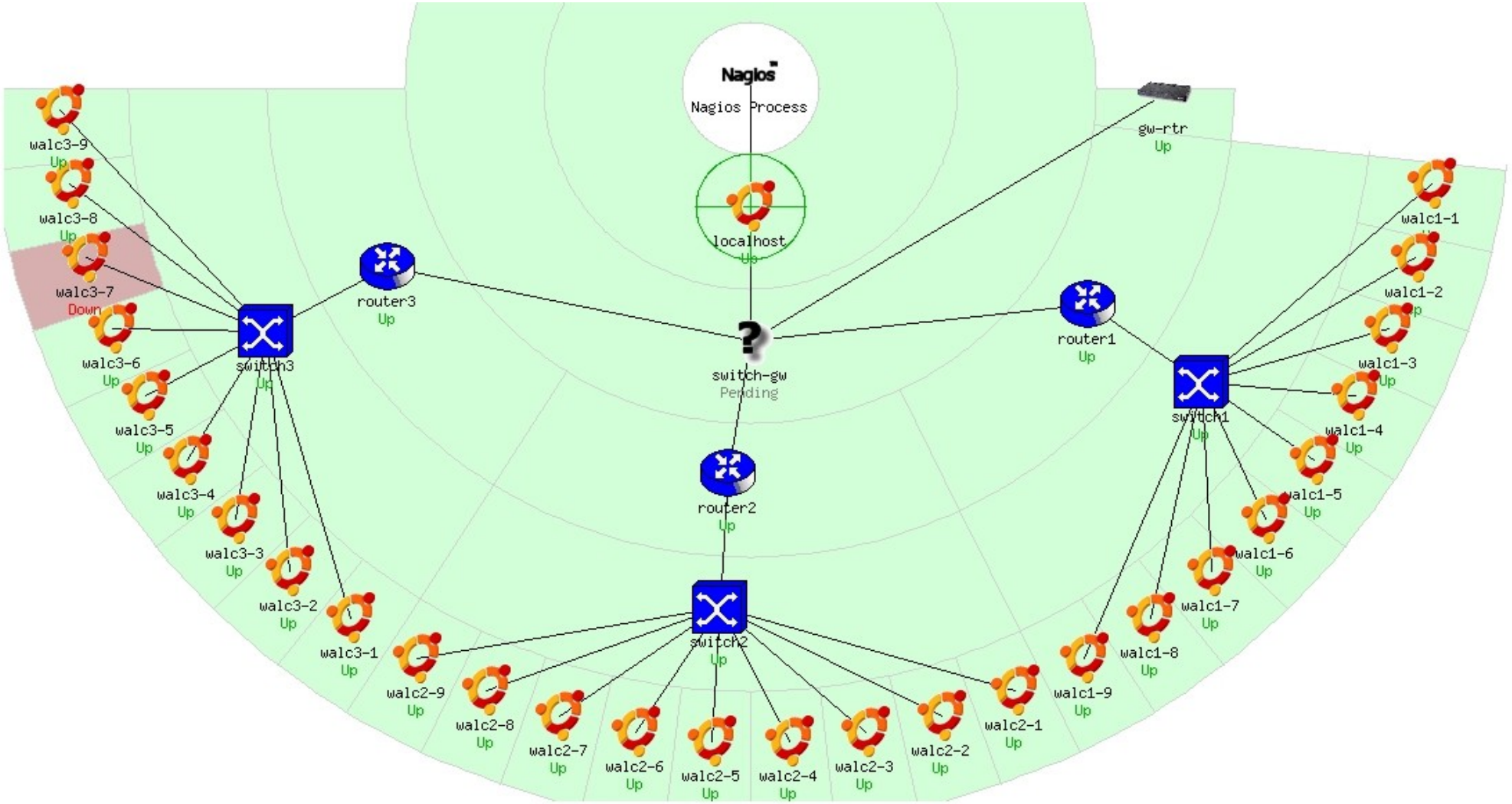
/etc/nagios-plugins/config

```
2. nsrc@s1: ~ (ssh)
nsrc@s1:~$ ls /etc/nagios-plugins/config/
apt.cfg     disk-smb.cfg  fping.cfg  http.cfg      mail.cfg   netware.cfg  pgsql.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
nsrc@s1:~$
```

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/

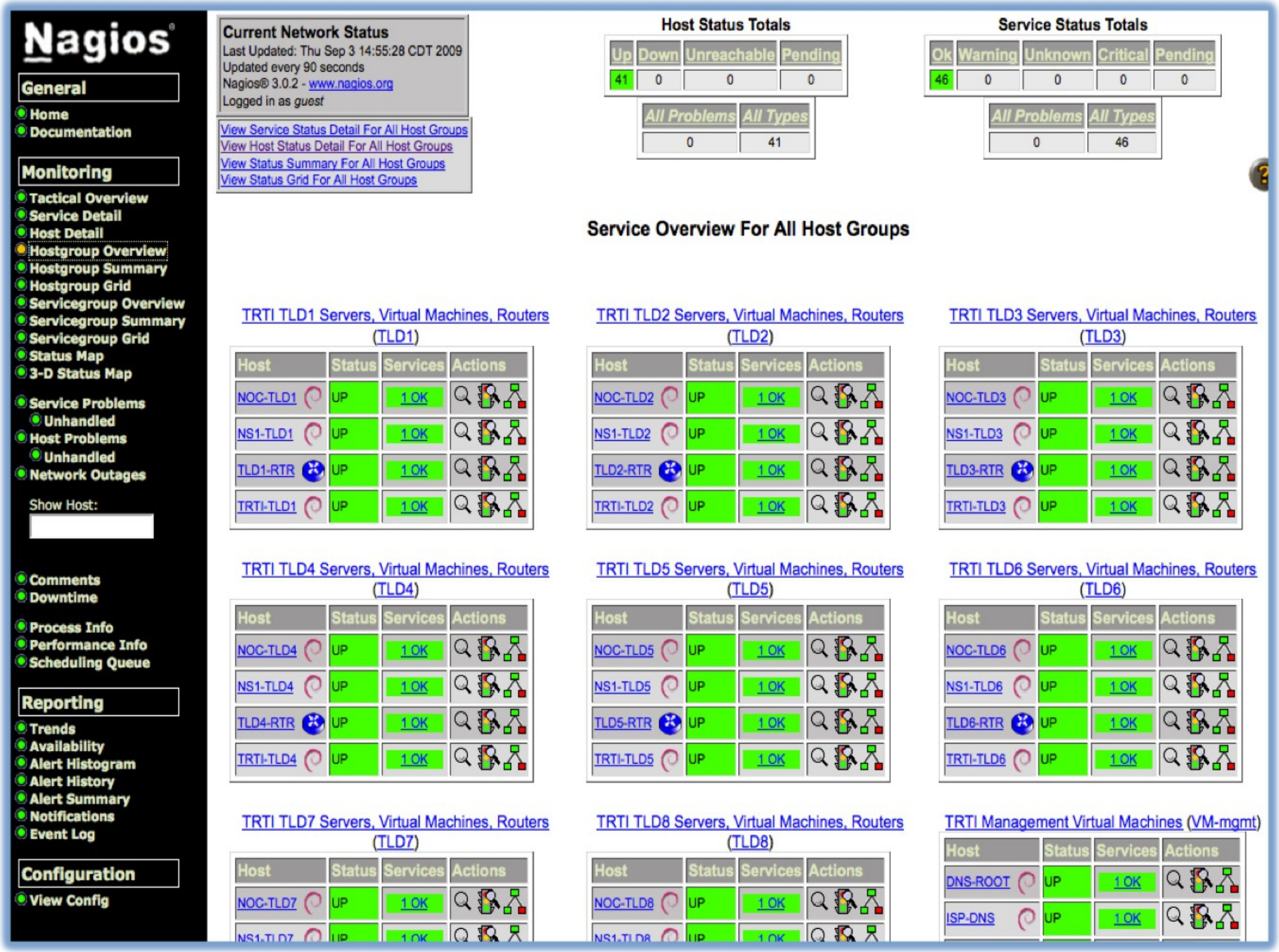
nagiosadmin: lab_password

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.


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:
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
TRTI TLD8 Servers, Virtual Machines, Routers (TLD8)
Host Status Services Actions
NOC-TLD8 UP 1 OK
TRTI Management Virtual Machines (VM-mgmt)
Host Status Services Actions
DNS-ROOT UP 1 OK
ISP-DNS UP 1 OK

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:

- 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: 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

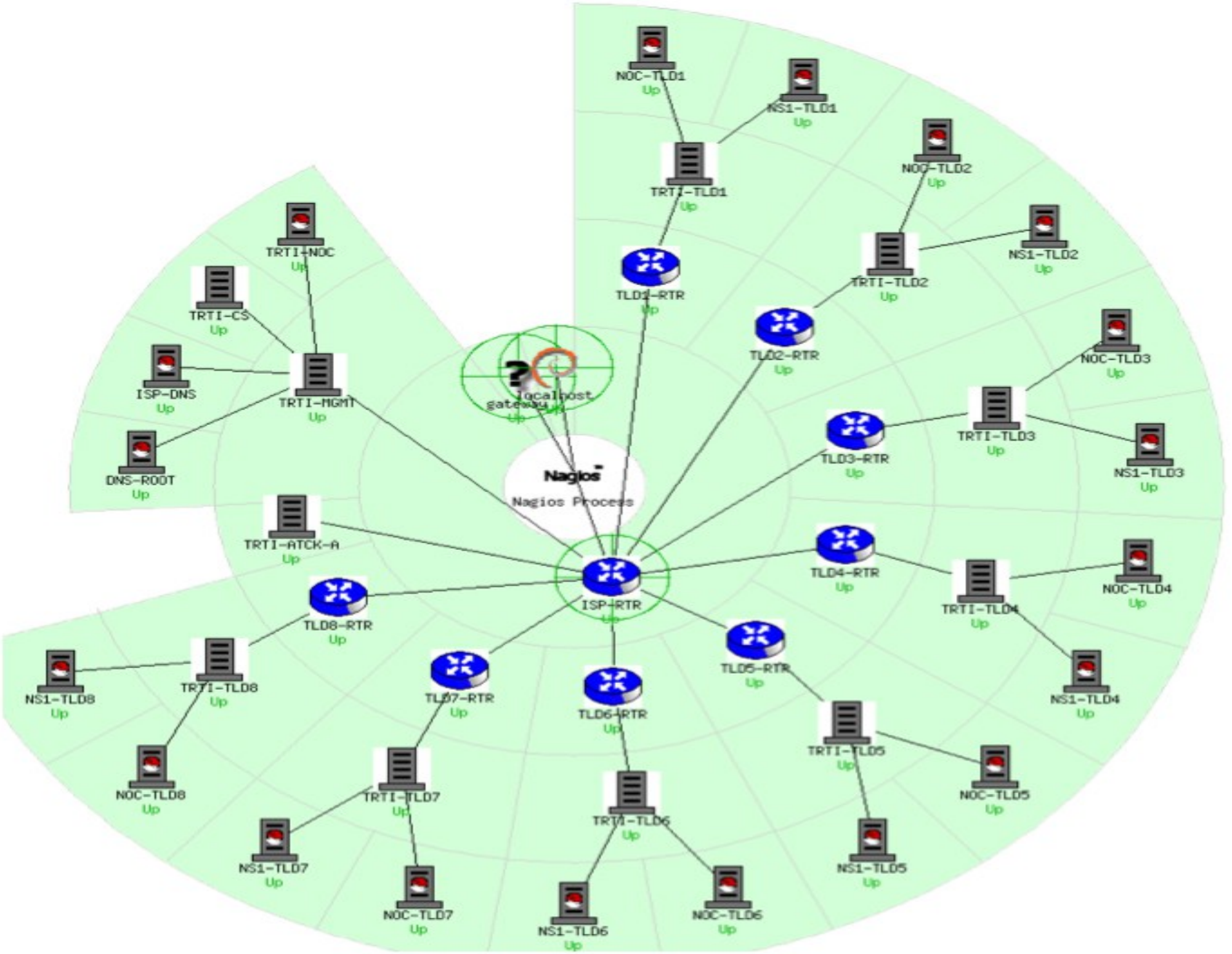
Service Overview For All Service Groups

TLD Servers running Nagios (NAGIOS)

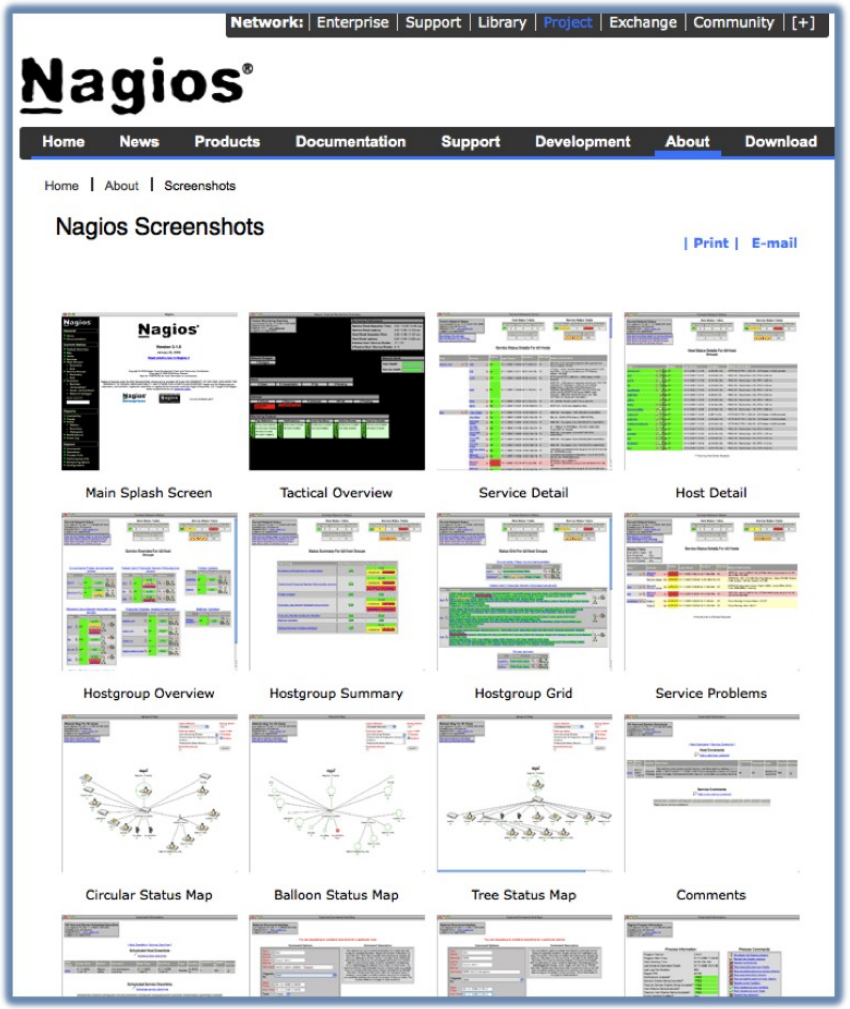
Host	Status	Services	Actions
NS1-TLD1	UP	1 OK	
NS1-TLD2	UP	1 OK	
NS1-TLD3	UP	1 OK	
NS1-TLD4	UP	1 OK	
NS1-TLD5	UP	1 OK	
NS1-TLD6	UP	1 OK	
NS1-TLD7	UP	1 OK	
NS1-TLD8	UP	1 OK	

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	


NOC-TLD1
Up
NS1-TLD1
Up
TRTI-TLD1
Up
NOC-TLD2
Up
TRTI-TLD2
Up
NS1-TLD2
Up
TRTI-NOC
Up
TRTI-CS
Up
TLD1-RTR
Up
TLD2-RTR
Up
NOC-TLD3
Up
ISP-DNS
Up
TRTI-MGMT
Up
localhost
gateway
Up
TRTI-TLD3
Up
TLD3-RTR
Up
NS1-TLD3
Up
DNS-ROOT
Up
Nagios
Nagios Process
TRTI-ATCK-A
Up
TLD4-RTR
Up
NOC-TLD4
Up
ISP-RTR
Up
TRTI-TLD4
Up
TLD8-RTR
Up
TLD5-RTR
Up
NS1-TLD8
Up
TRTI-TLD8
Up
TLD7-RTR
Up
TLD6-RTR
Up
NS1-TLD4
Up
TRTI-TLD5
Up
NOC-TLD8
Up
TRTI-TLD7
Up
NOC-TLD5
Up
TRTI-TLD6
Up
NS1-TLD7
Up
NS1-TLD5
Up
NOC-TLD7
Up
NS1-TLD6
Up
NOC-TLD6
Up

More Sample Screenshots



Many more sample Nagios screenshots available here:

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