Strengths and Limitations of Nagios as a Network Monitoring Solution

By
Sophon Mongkolluksamee

http://inms.in.th

NECTEC
a member of NSTDA

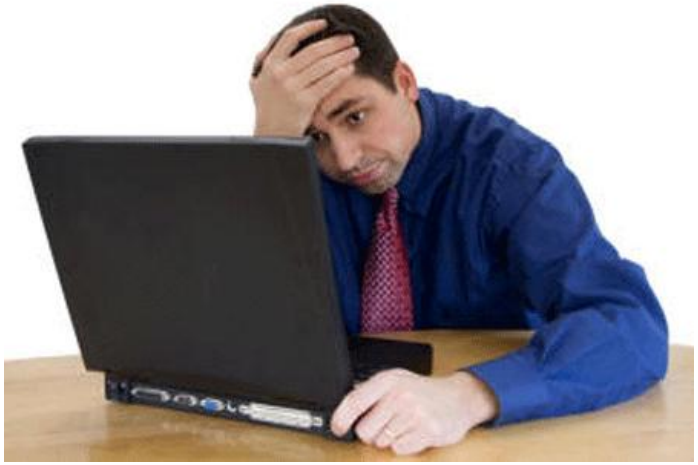
NTL
Network Technology Lab

Agenda

- Network monitoring software
- About Nagios
- Limitations of Nagios
  - Improve with third-party add-ons
  - Without current solution
- Use Nagios as a framework for creating Network Monitoring Tool

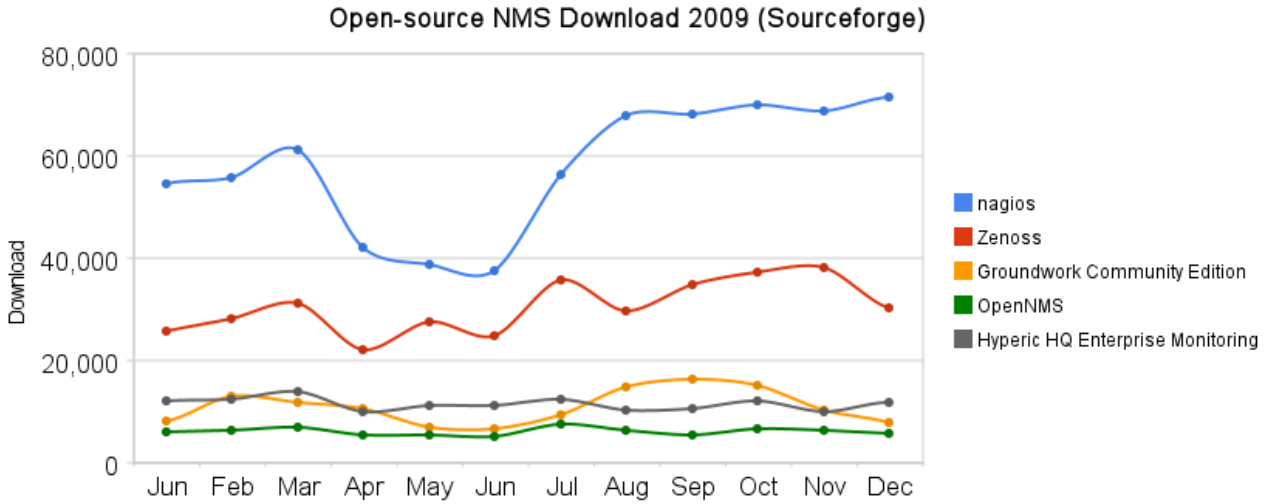
Network monitoring software

- Reduces a burden of network administrator with automatic checking of device and service status and error report
- Type of software
  - Commercial
    - Comprehensive features
    - Nice user interface
    - Cost a lot
  - Open-source
    - No technical support
    - Difficult to use
    - Free!



Nagios

- Nagios is the widely used open-source powered by a big developer community.



- Many users such as ISPs, governments and big enterprises (Yahoo, Amazon, Google)

Nagios

- The main tasks of Nagios are to monitor status of network devices and their services and to notify system administrators of network problems.
- Nagios perform status check and notify a problem through the use of external “plugins”, which are compiled executables or scripts (Perl, shell, etc.)
- The core of Nagios engine is a scheduler daemon that regularly executes plugins to probe specified network devices and their services.
- Nagios requires text-based configuration files to control all its activity.

Limitations of Nagios

- Some limitations are probably due to the minimalism philosophy of Nagios design concept.
- Some of the weaknesses can be fulfilled with add-ons or plugins from the Nagios community.
- Some limitations remain a challenge to fulfill.

Limitations that can be solved with third-party add-ons

Problem	Fixed with
Un-user friendly GUI	NagVIS, NetHAM
Lack of Database and Performance Records	NDOUtils, Opdb, NagiosGrapher
Difficult Configuration	Lilac, Fruity, NagiosQL, NConf
Lack of Automatic Device Discovery	NACE, check_find_new_hosts, Nmap2Nagios-ng

* Many add-ons are not straightforward and user-friendly. Administrator still need to tweak and adapt them to suit each network.

Limitations without current solutions

- Most of the problems are due to limitations of the native Nagios structure.
- Nagios makes no distinction among different types of devices like servers, routers, or switches.
- Nagios treats every device generically as a host.

Limitations without current sulotions

- How to treat an "interface" of a router or a switch?

Treated interface as	result
Service	The interface will not show up on a network map and difficult to quickly trouble-shoot connectivity problem.
Host	• Non-IP interface cannot be checked as a "host" by Nagios plugin • The interface shows up on a topology display as independent host device. • Need more levels of relationship between hosts.

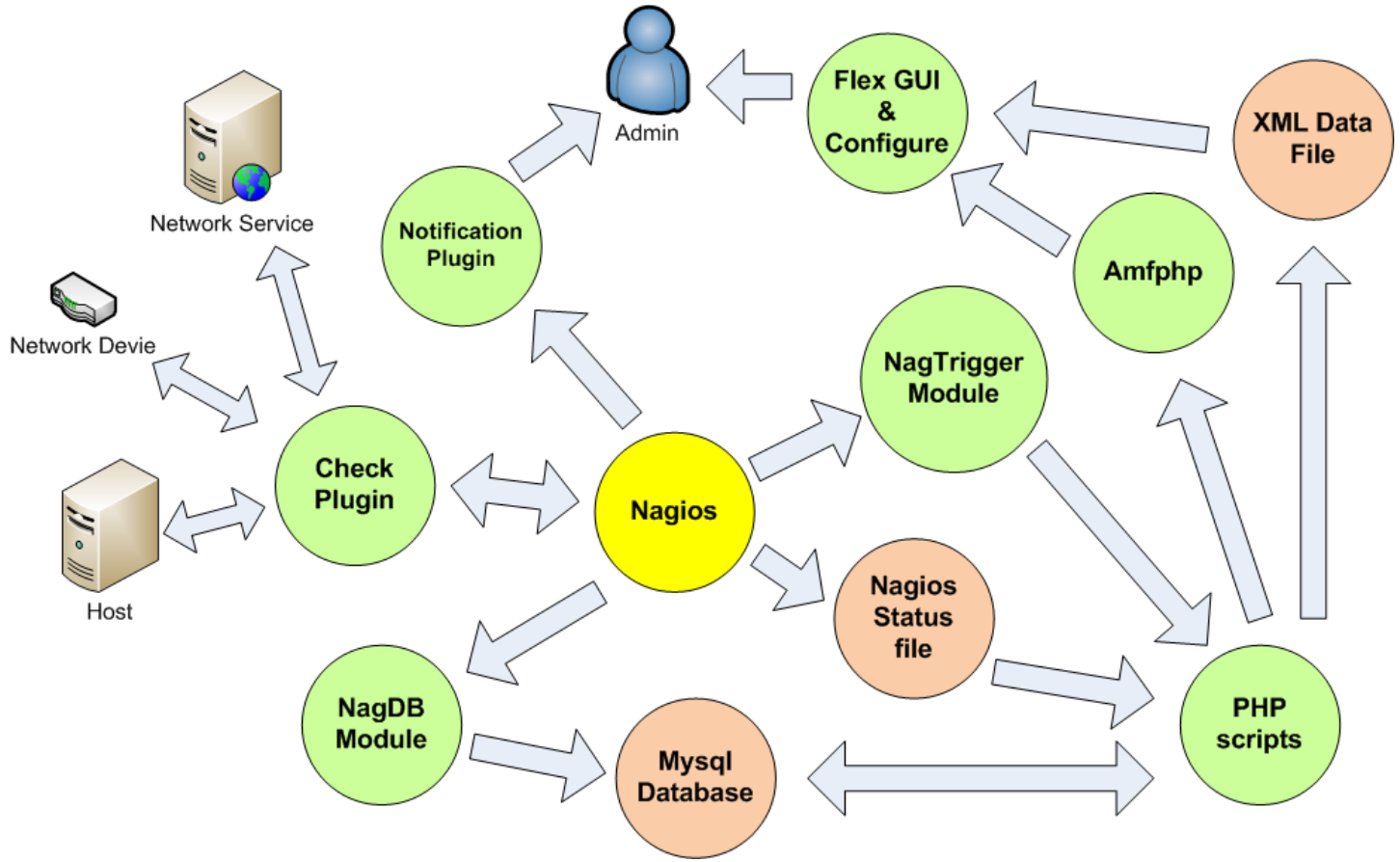
Limitations without current sulotions

- How to monitor and report status of a “link”?
  - Nagios has a link that represent parent-child relationship only.
  - No property such as propagation delay, channel quality, link utilization and bandwidth.
  - A link cannot treated as host or service.
- How to detect network anomaly dynamically?
  - Almost all Nagios check plugins use thresholds to classify levels of network status (critical, warning, ok).
  - User have to know all performance levels in advance before configuring plugin.

Nagios as Framework for creating a User-Friendly Network Monitoring Tool

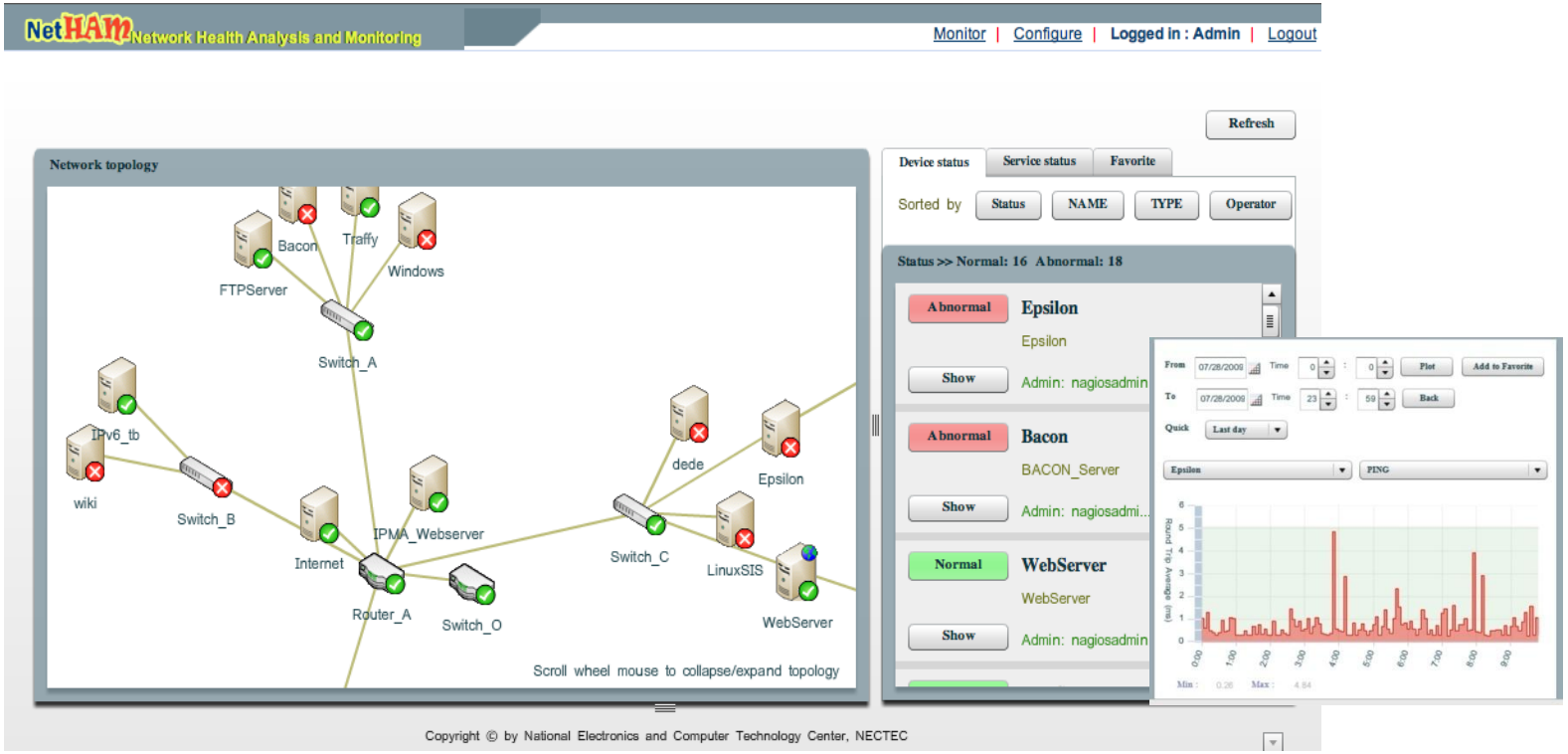
- New prototype named NetHAM (Network Health Analysis and Monitoring)
- New user interface
  - Monitoring panel (with Adobe Flex)
  - Configuring panel (modified NagiosQL)
- New modules by using Nagios Event Broker API
  - NagDB: use to capture output returned by Nagios plugin.
  - NagTrigger: use to link internal Nagios event to external command executions.

NetHAM internal process



NetHAM user interface

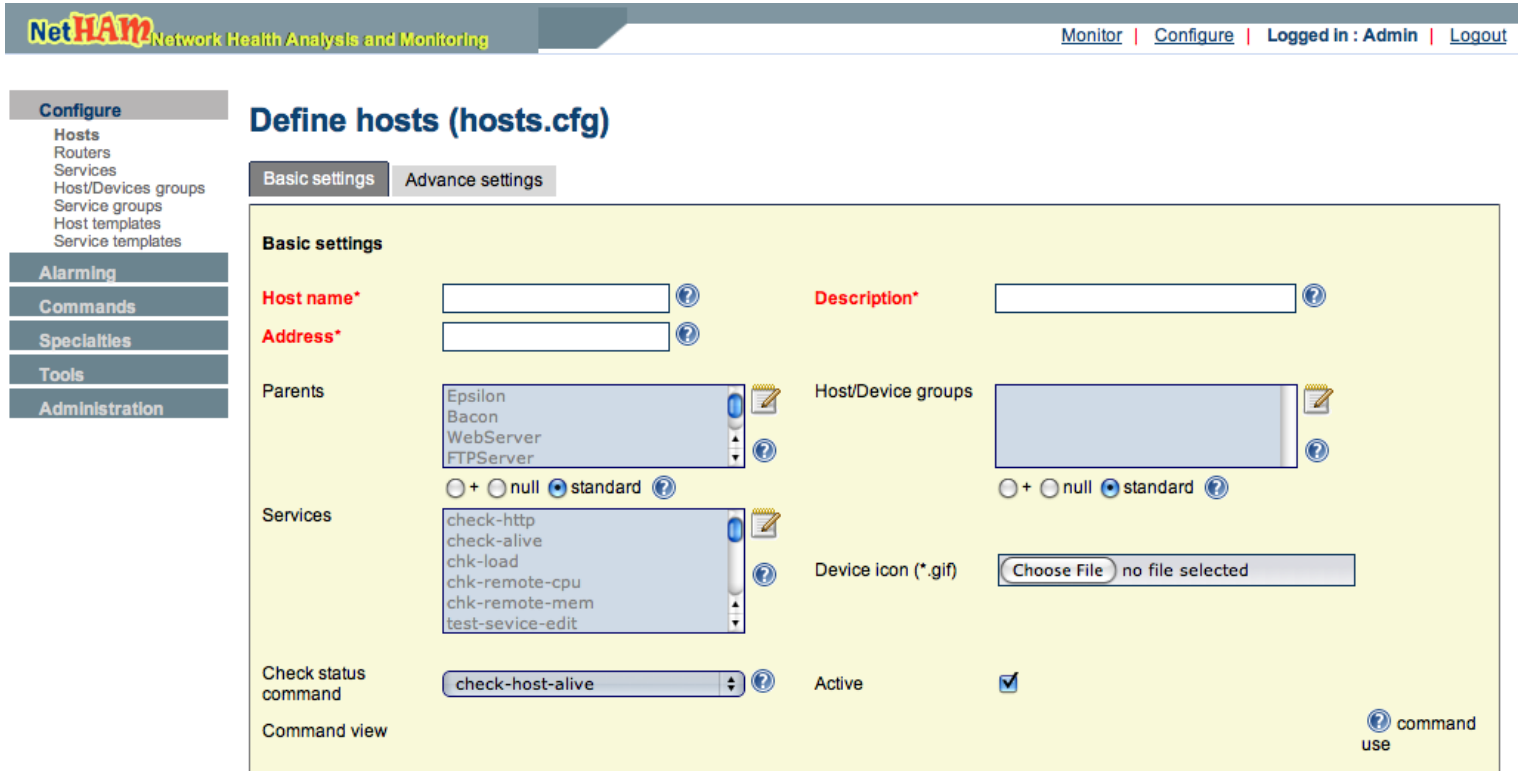
- Monitor – Interactive GUI with flex



OK **Warning** **Unknown** **Critical**

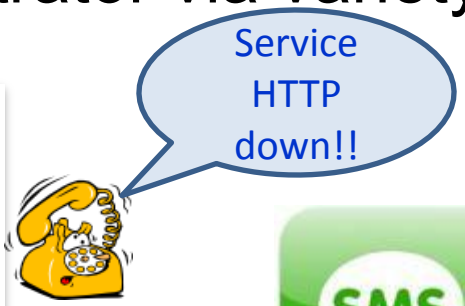
NetHAM user interface

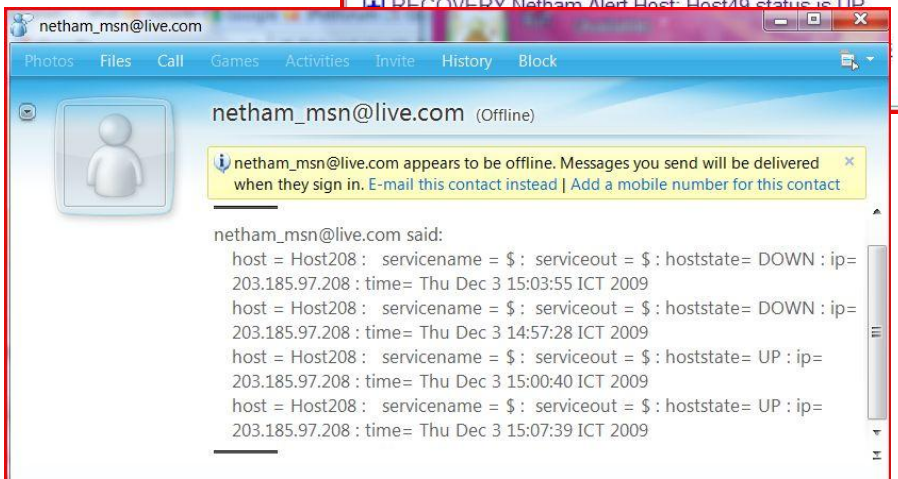
- Configure



Example of NetHAM alert

When the network problem is found, NetHAM sends an alert to administrator via variety channels.





Conclusion

- Nagios is one of the most popular open-source network monitoring tools.
- Some limitations can be improved with third-party add-ons or plugins
- Some limitations still need to fulfill
- Nagios can be used as a framework for building more powerful and easy-to-use network monitoring software.

Thank you.

inms-nectec@googlegroups.com