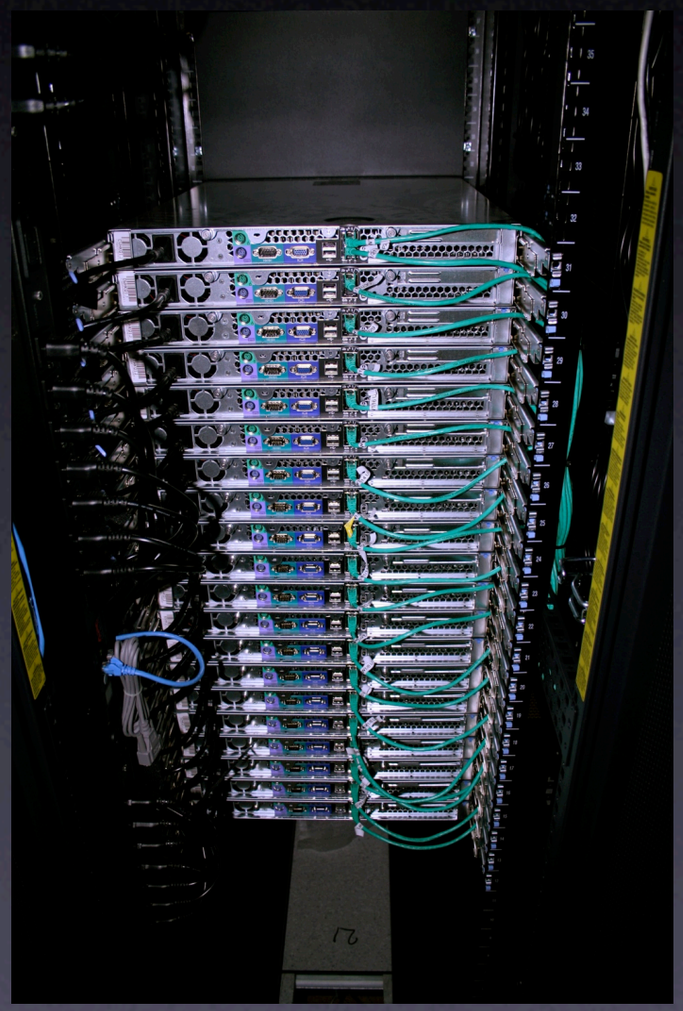
Tier2 Management At Manchester

Colin Morey
(colin.morey@manchester.ac.uk)

Maximum Efficiency with Minimum Effort

The Nodes

- 2x2.8Ghz Xeons
- 2x250GB hdd
- 4GB ram
- 2x1GigE

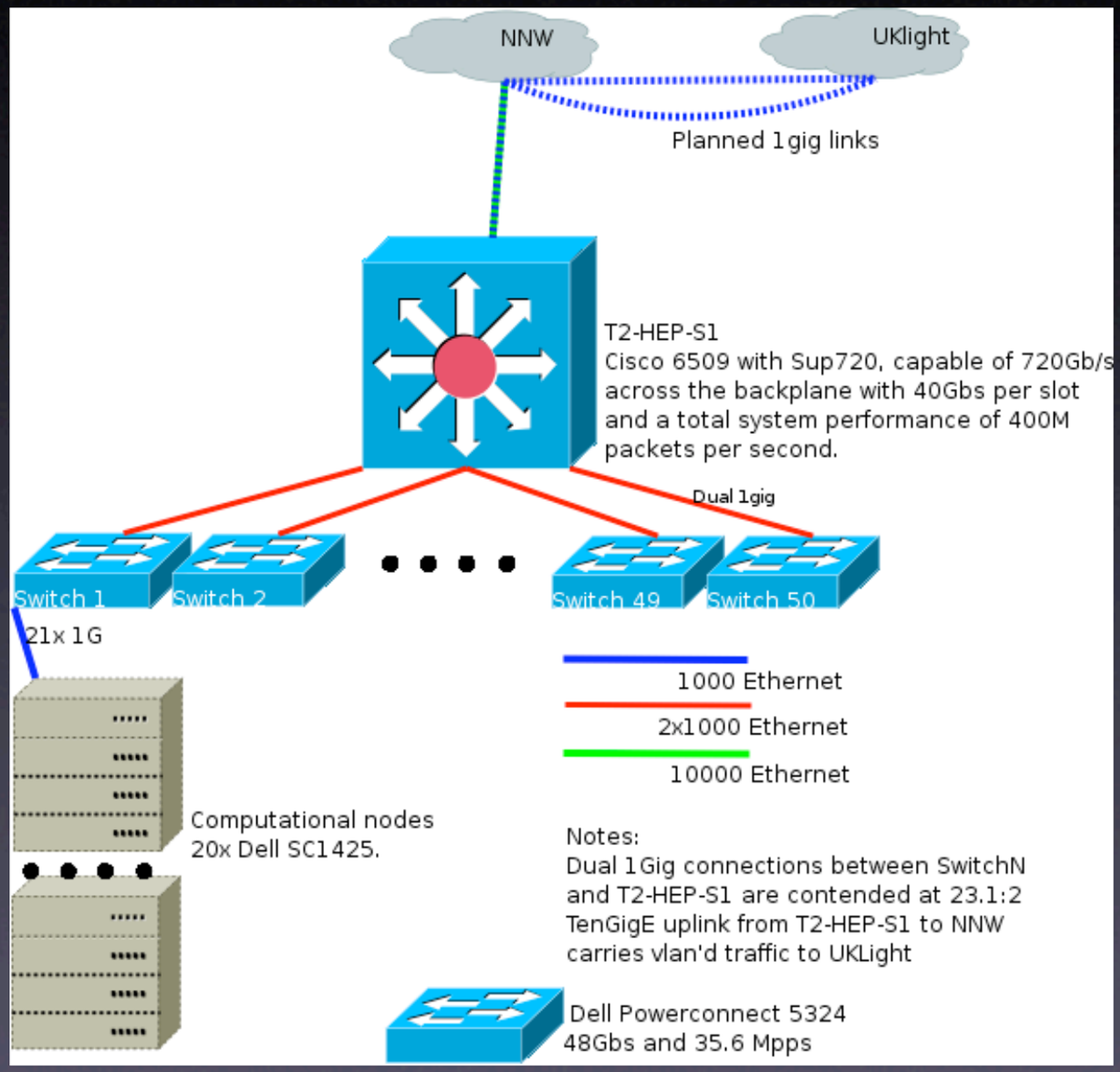


The Farm

- 1000 Nodes
- 2000 x2.8Ghz Xeons
- 1/2 Petabyte storage
- 4TB ram

The Network

- 51 Switches
- 50 Dell 5324
- 1 Cisco 6509
- 1250 Gbit links



Automation

- Build/install - Kickstart
- Configuration - Cfengine
- Administration - ssh
- Updates - yum

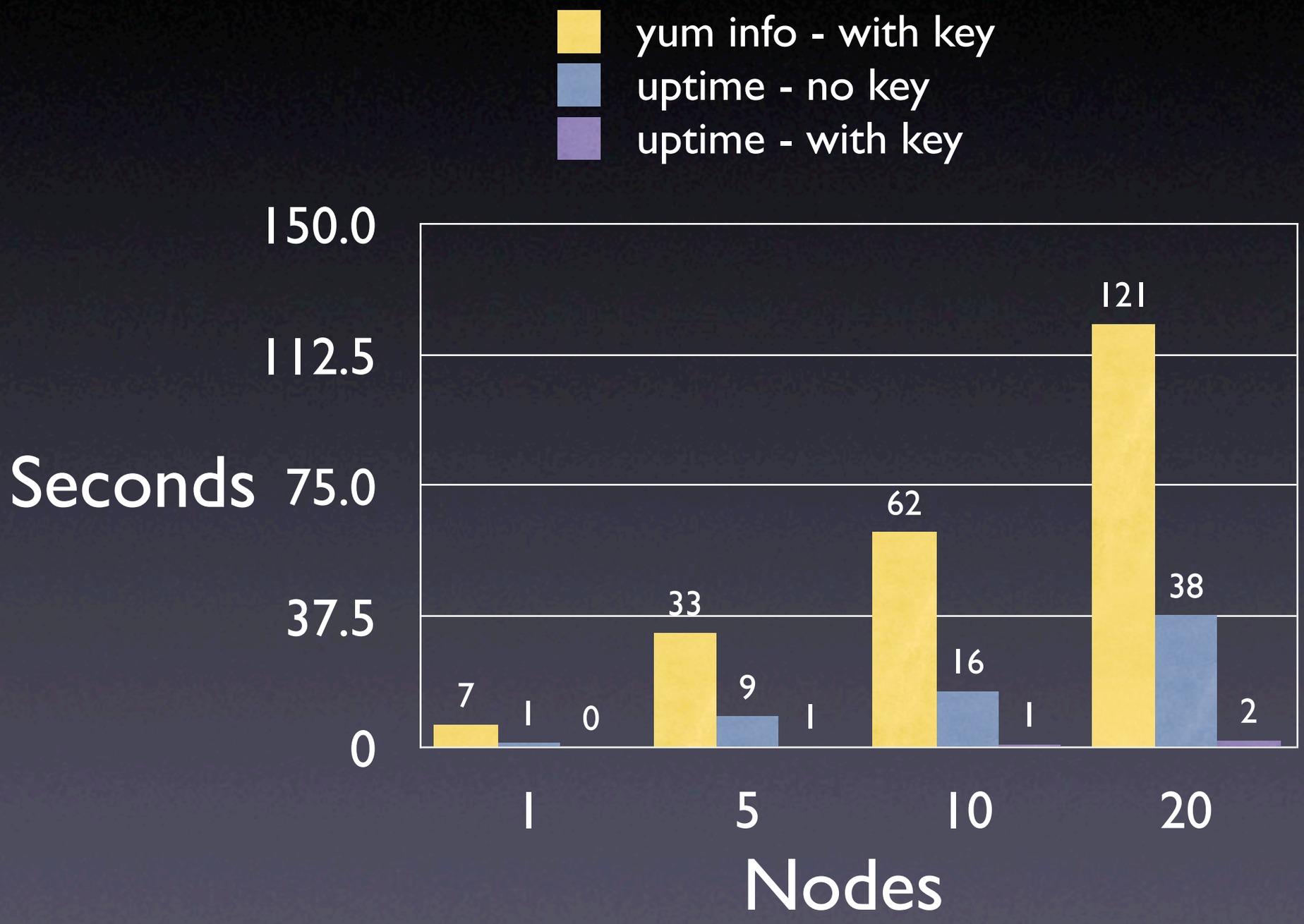
Kickstart

- 2 DHCP servers provide leases for the whole network, including the powerbars, and the LOM interfaces on the nodes.
- 4 Servers in total, connected via 2xGigE, All server are identical and currently kept in sync via rsync from a designated ‘master’,
- With 3 servers, we were able to supply data at an aggregate rate of 600MB/s

Cfengine

- Early Stages of deployment.
- Very, Very powerful.
- Integration with Kickstart.

OpenSSH


yum info - with key
uptime - no key
uptime - with key
150.0
112.5
75.0
37.5
0
Seconds
7
1
0
33
9
1
62
16
1
121
38
2
1
5
10
20
Nodes

Yum

- Easy to use package management
- Cryptographic checking of packages
- Supports multiple repositories
- Supports autonomous execution

Monitoring

- Network Usage - ntop, mrtg, rrdtool
- Environment - mrtg, rrdtool
- Service status - nagios

NTop

- Uses a concept of traffic flows
- Act as a netflow target
- Clear and concise display of detailed information

MRTG

Pros

- Reliable
- Well known
- Mature
- Capable
- Not restricted to SNMP targets

MRTG

Cons

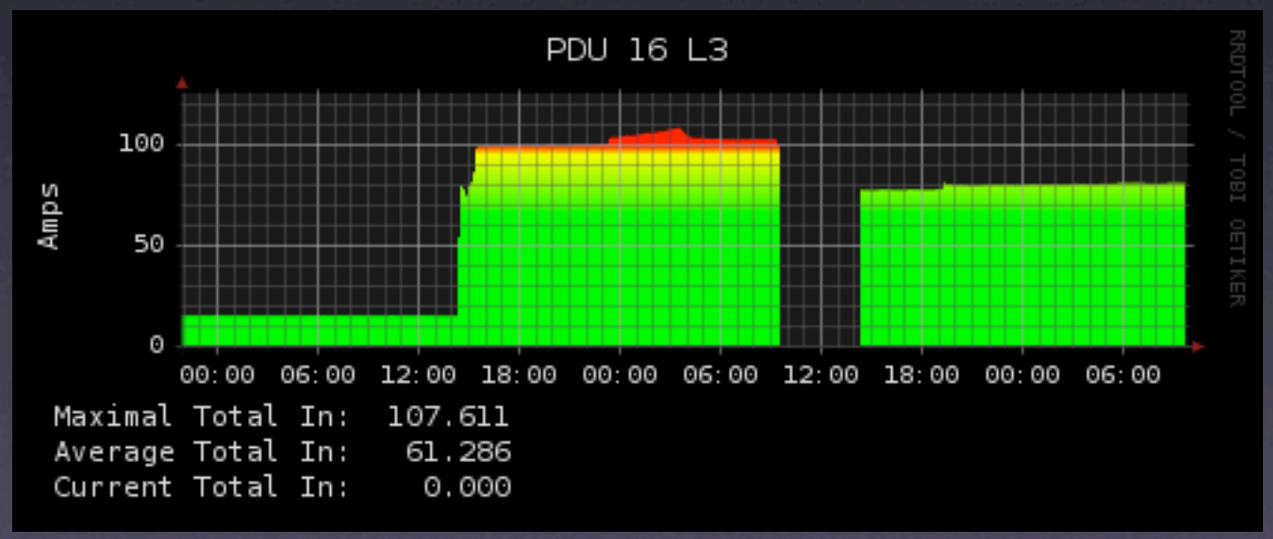
- Scalablility issues
- Integer only
- Unable to record samples at a resolution < 1min
- Only 2 items per target

RRDTool

- Concerned only with the Storage and displaying of data.
- Backend storage and front end visualisation of data for MRTG.
- Multiple interfaces for inserting data into datasets.
- RPN can be confusing for the beginner, but it's capable of producing good results.

RRDTool

- With a bit of Perl and bash (and coffee), we can create graphs like these.



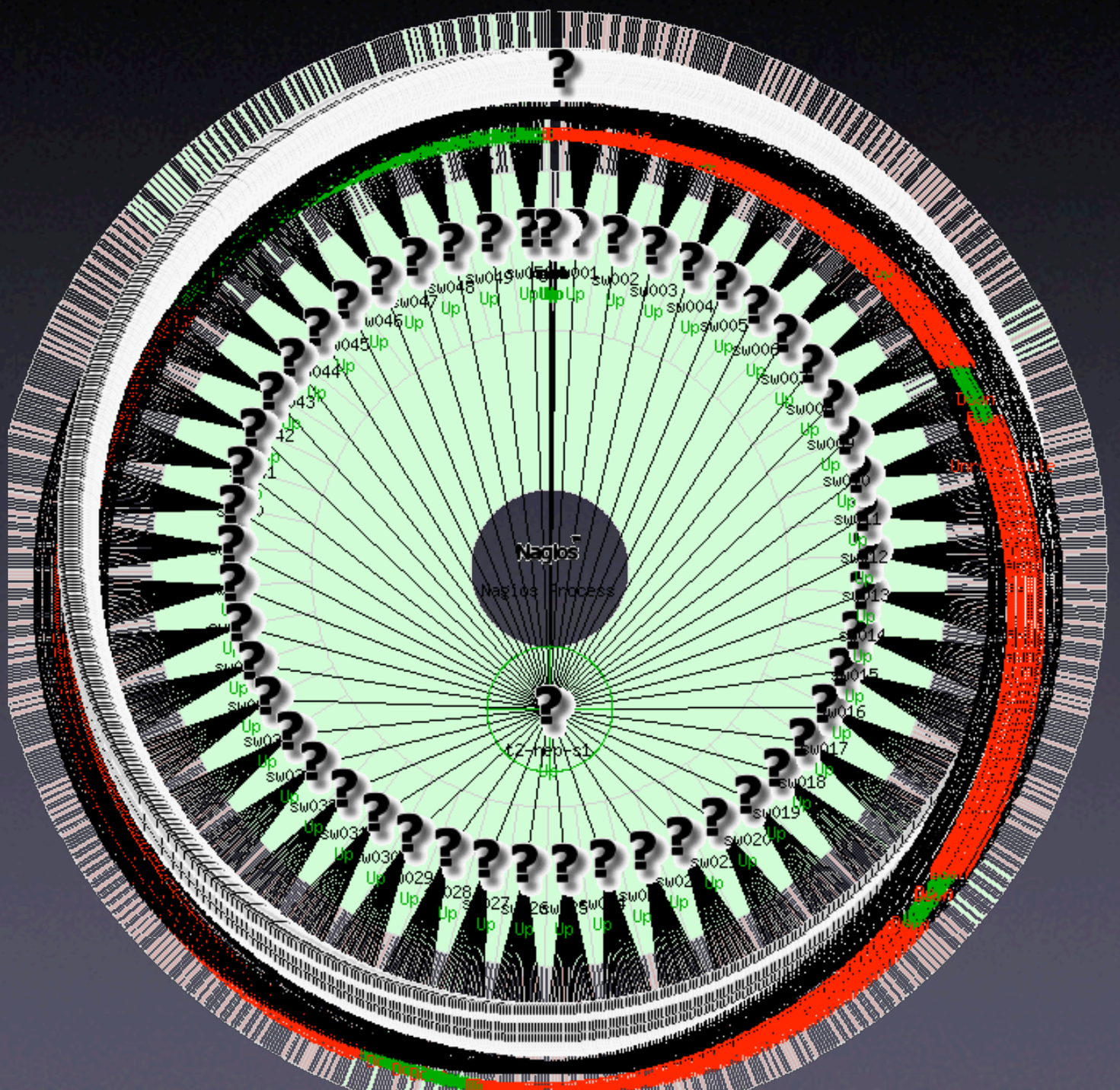
Nagios

- Service based monitoring,
- New revision (version 2 upwards) introduces classes and dependancies
- easily extensible

Nagios

- <= 1 minute: 331 (15.3%)
- <= 5 minutes: 1984 (91.4%)
- <= 15 minutes: 2170 (100.0%)
- <= 1 hour: 2170 (100.0%)
- Since program start: 2170 (100.0%)

Nagios


Nagios
Nagios Process
t2-repl-s1
sw001
sw002
sw003
sw004
sw005
sw006
sw007
sw008
sw009
sw010
sw011
sw012
sw013
sw014
sw015
sw016
sw017
sw018
sw019
sw020
sw021
sw022
sw023
sw024
sw025
sw026
sw027
sw028
sw029
sw030
sw031
sw032
sw033
sw034
sw035
sw036
sw037
sw038
sw039
sw040
sw041
sw042
sw043
sw044
sw045
sw046
sw047
sw048
sw049
Up
Down

Node Management

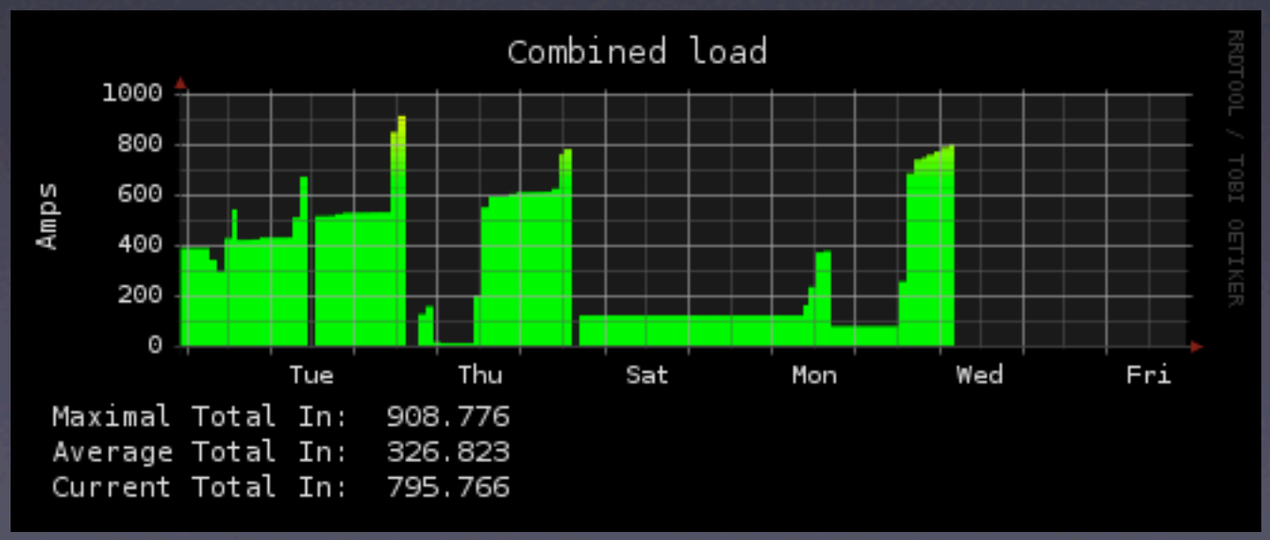
- All Nodes have a seperate ‘ipmi’ address that provides LOM
- Remote Chassis Control, power on/off/cycle
- Reports Chassis status, temps, fan speed, onboard event log.

Facilities Management

- Power bars in each Node rack
- Exports current draw per bank of sockets via SNMP
- Provides remote control of Power to each node.

Facilities Management

- Power bars in each Node rack
- Exports current draw per bank of sockets via SNMP
- Provides remote control of Power to each node.



fin.

resources

- mrtg http://www.mrtg.org/
- rrdtool http://www.rrdtool.org
- cfengine http://www.cfengine.org
- ntop http://www.ntop.org
- nagios http://www.nagios.org
- OpenSSH http://www.openssh.com
- kickstart http://www.redhat.com/docs/manuals/linux/RHL-9-Manual/custom-guide/part-install-info.html
- yum http://linux.duke.edu/projects/yum/
- http://linux.duke.edu/projects/yum/