



# Nagios and the NGS



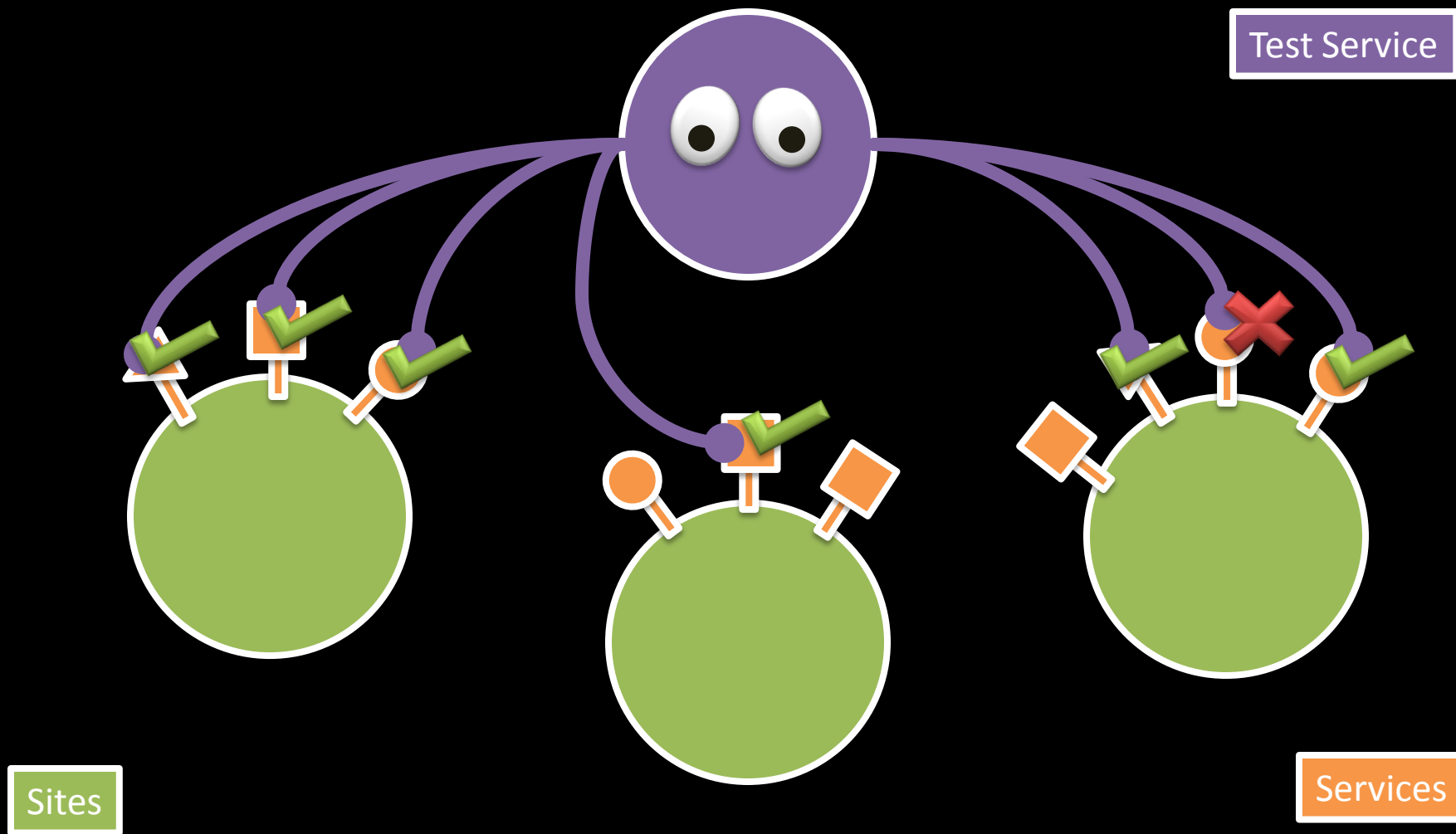
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## The Idea



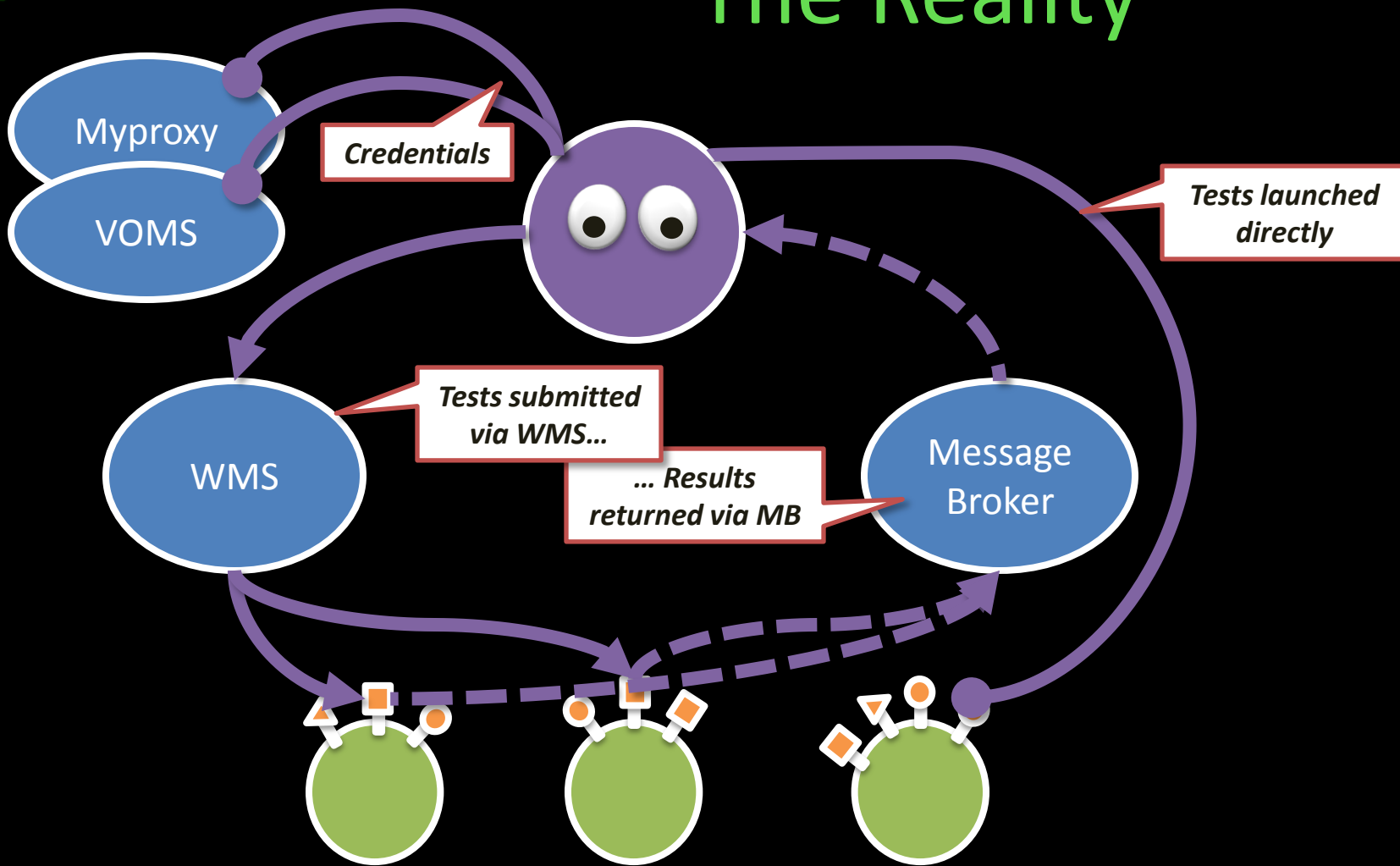
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## The Reality



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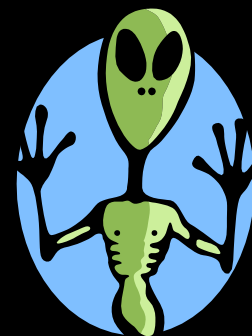
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## The World according to WLCG

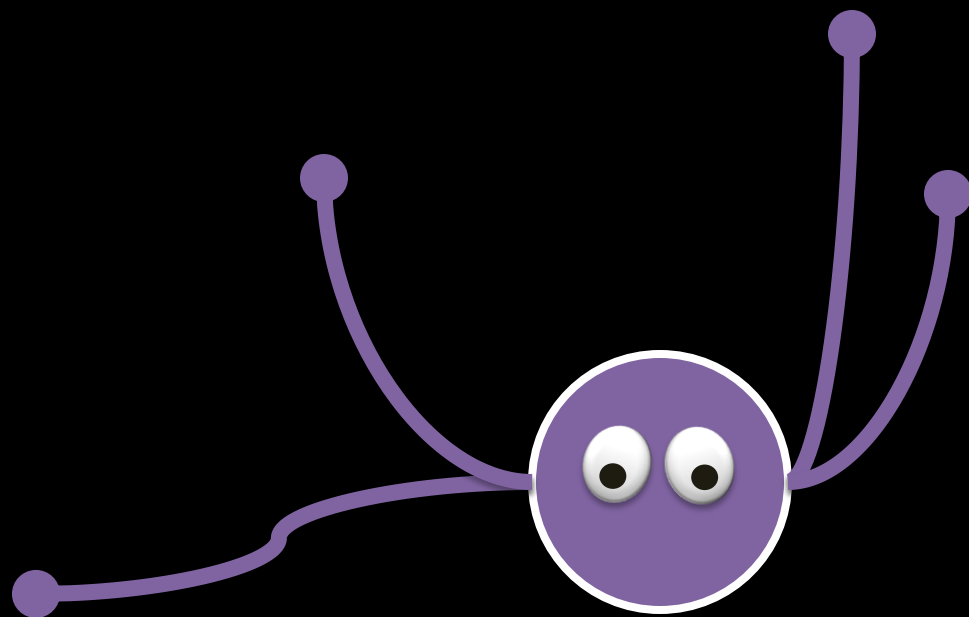
- Every kind of WLCG service is associated with a **Service Endpoint**.
- **Probes** are launched to test Service Endpoints.
- **Metrics** are collected by the probes.
- This approach fits nicely into the Nagios testing framework.





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## USING NAGIOS



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- Nagios is *probably* the most popular Open-Source system monitoring framework. It consists of:
  - A daemon to schedule tests.
  - A web interface to display test results.
  - A set of plugins that run tests and report results.



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## Nagios:

### Hosts and Services

- Nagios defines **hosts** and **services** provided by these hosts.
- A service will only be tested if the associated host is **UP**.
- Services and hosts can be grouped *e.g.*
  - WLCG Site → Group of hosts
  - WLCG Service-Endpoint → Group of related Nagios services.



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## Name that probe

- WLCG use a mixture of externally written and WLCG-specific Nagios tests.
- The **name** of the probe – and the files and data associated with it - reflects:
  - Its origin
  - Its purpose
  - The Virtual Organisation with which it is associated.



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## Name that probe: examples

- [org.nmap.CREAM-CE](#)  
Checks if a CREAM-CE is present using nmap.
- [org.sam.CE-JobState-ngs.ac.uk](#)  
Check on the status of a job submitted to a compute element for the ngs.ac.uk VO.
- [uk.ac.ngs.WN-sarongs-ngs.ac.uk](#)  
Check if a Worker Node supports the SARoNGS certificates.



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## Nagios: Active and Passive Tests

### Active test

- A plugin is executed by the Nagios scheduler.
- The plugin returns one of a set of status codes **and** a text description.

### Passive test

- Tests are **not** associated with a plugin.
- Some external mechanism feeds a status code and text into Nagios.

WLCG service endpoints are represented as a set of Nagios services using a combination of active and passive tests.

# Nagios: Status

## Host status

UP
DOWN
PENDING

## Service status

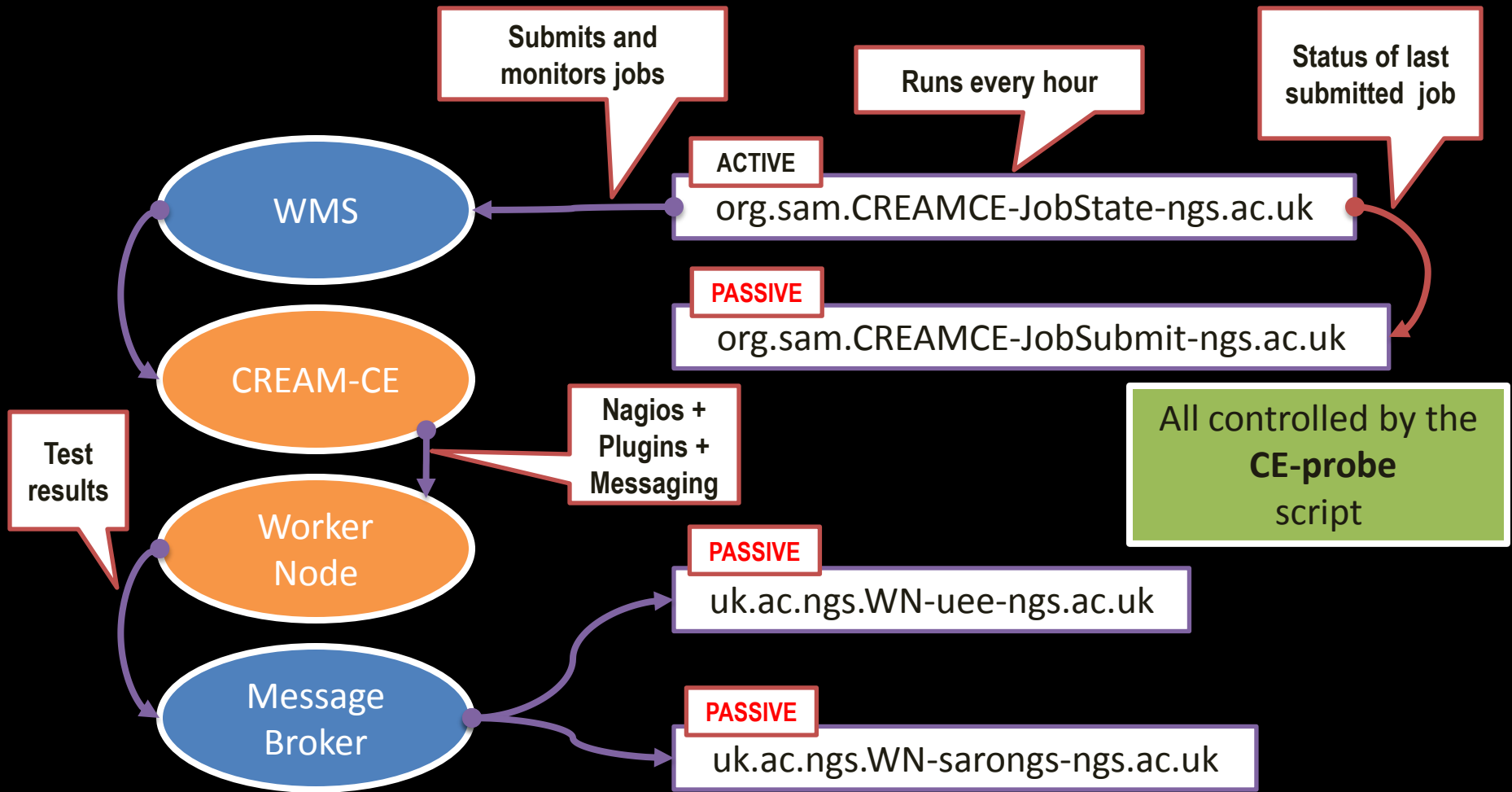
OK
WARNING
CRITICAL
PENDING
UNKNOWN

Nagios can generate statistics on the amount of time spent in each state.



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# Testing Compute Elements



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## Worker Node Tests

- .WN-\* tests originally created as a replacement for the WLCG 'SAM' tests.
- Nagios server creates a tarball containing
  - A message bus client.
  - A copy of Nagios.
  - A set of Nagios plugins and configuration files.
- The tarball and a 'nagrun.sh' that unpacks and runs it are submitted via a WMS.



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## Being like SAM

- SAM-like tests use the **CE-probe script**.
- Tarball built within the script by merging directory trees and tar-ing up the result.
- Directory trees added using `--add-wntar-nag` flag.
- Modified JDL template specified using `--jdl-templ` flag.
- *More on modifying Nagios later...*



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## A SAM-like directory

- `/usr/libexec/grid-monitoring/probes`

- `uk.ac.ngs`

- `wnjob`

- `uk.ac.ngs`

- `etc`

- `wn.d`

- `uk.ac.ngs`

- `commands.cfg`

- `services.cfg`

- `probes`

- `uk.ac.ngs`

Nagios plugins

- `WN-uee`

- `WN-sarongs`

- `uk.ac.ngs.gridJob.jdl.template`

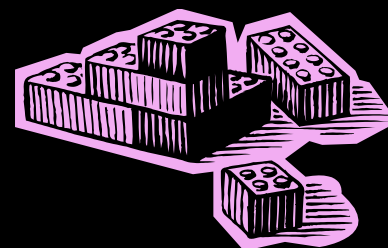
Nagios configuration files

Template for WMS job



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## CONFIGURING NAGIOS



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## Feeding Nagios

- Nagios configuration is built **automatically** using a tool called **ncg.pl**. **ncg.pl**:
  - Collates information about sites, hosts and services.
  - Generates lists of tests to perform.
  - Generates a set of Nagios configuration files to perform the tests.
  - Publishes configuration information for other tools to use.



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## Configuring ncg.pl

- `/etc/ncg/ncg.conf` is an Apache-like configuration file.
- Built from sections enclosed in `<NCG::...> ...</NCG::...>` tags. Each map to a Perl module.
- Variables are defined within (and outside) sections using `VAR=value` syntax.
- Some sections have subsections – usually representing different sources of information.



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## ncg.conf example

```
<NCG::SiteSet>  
  <GOCDB>  
    ROC=UKI  
    PROD_STATUS=  
    CERT_STATUS=  
    SUBGRID_INCLUDE=NGS, NorthGrid,  
    SouthGrid, ScotGrid, LondonT2  
  </GOCDB>  
</NCG::SiteSet>
```

Defines a set of sites to be extracted from the GOCDB



- Turns a set of sites and services into a set of tests.
- Currently using the `NCG::LocalMetrics::Hash`.
  - Perl module – part of the NCG RPMs.
  - Overwritten during an upgrade but...
  - WLCG developers have recently modified `Hash.pm` to incorporate the contents of a local `NCG::LocalMetrics::Hash_local` module if it exists.



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## Hash\_local.pm

```
my $svc_ce_wms = $WLCG_SERVICE->{'org.sam.CE-  
JobState'};  
  
...  
for my $svc ( $svc_ce_wms, ... ) {  
    $svc->{attribute}->{MB_URI} = "--mb-uri";  
    $svc->{parameter}->{'--add-wntar-nag-nosamcfg'} =  
    '';  
    $svc->{parameter}->{'--add-wntar-nag'} =  
    `../uk.ac.ngs/wnjob/uk.ac.ngs`;  
    $svc->{parameter}->{'--jdl-templ'} =  
    `../uk.ac.ngs/wnjob/uk.ac.ngs.gridJob.jdl.template`  
    ;  
};
```

Adds the NGS WN tests



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## Seeing the big picture

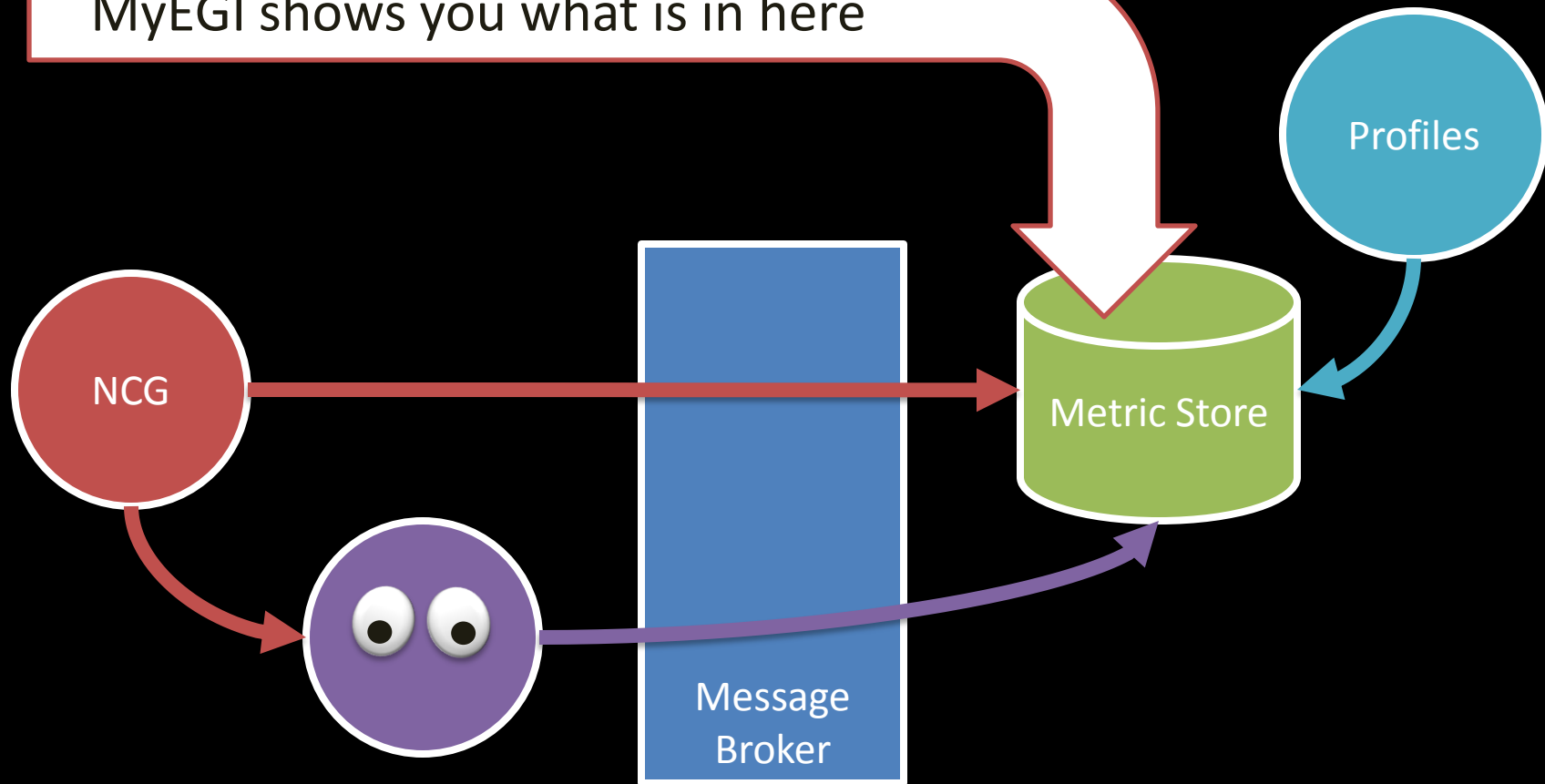
- Nagios web interface is sysadmin friendly rather than user friendly.
- WLCG have developed a separate visualisation tool for the data collected by Nagios: MyEGI.
- MyEGI is replacing an older tool called MyEGEE.



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## Nagios, NCG and MyEGI

MyEGI shows you what is in here



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## The bad news

- We have not yet persuaded MyEGI to work.
- Believe this is because we are **not** using the **Aggregated Topology Provider** as a source of information for Nagios.
- There is a mismatch between the tests expected and the tests delivered.



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## ATP

- Intended as Single Point of Truth for all grid monitoring.
- <https://twiki.cern.ch/twiki/bin/view/LCG/ATP>
- Authoritative sources of information include:
  - GOCDB
  - the CIC Portal
  - Per-VO BDIIs
- Still do not understand how it works...



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## Executive Summary

- Nagios can and will monitor the ngs.ac.uk VO.
- It is very, very nearly working. When it is...
  
- <https://nagios01.ngs.ac.uk/nagios>
- <https://nagios01.ngs.ac.uk/myegi>

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