Configuration Management?

AnsibleWorks

Chef

puppet labs

http://scotgrid.blogspot.co.uk/

A Voyage to Arcturus

Mark Mitchell et al.
University Of Glasgow

A new approach - MESOS?

MESOS

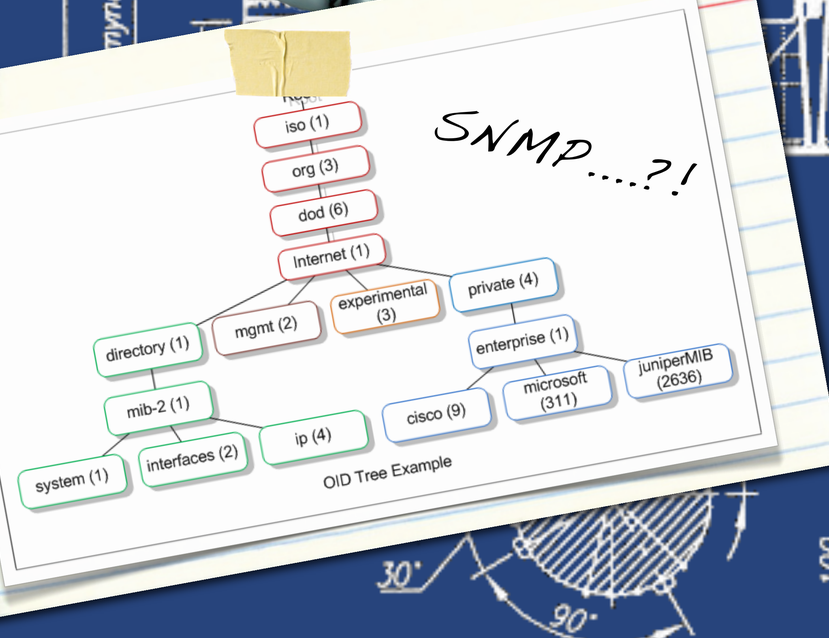
Hadoop scheduler
MPI scheduler
ZooKeeper quorum
Mesos master
Standby master
Standby master
Mesos slave
Hadoop executor
task
Mesos slave
MPI executor
task
Mesos slave
Hadoop executor
task
MPI executor
task

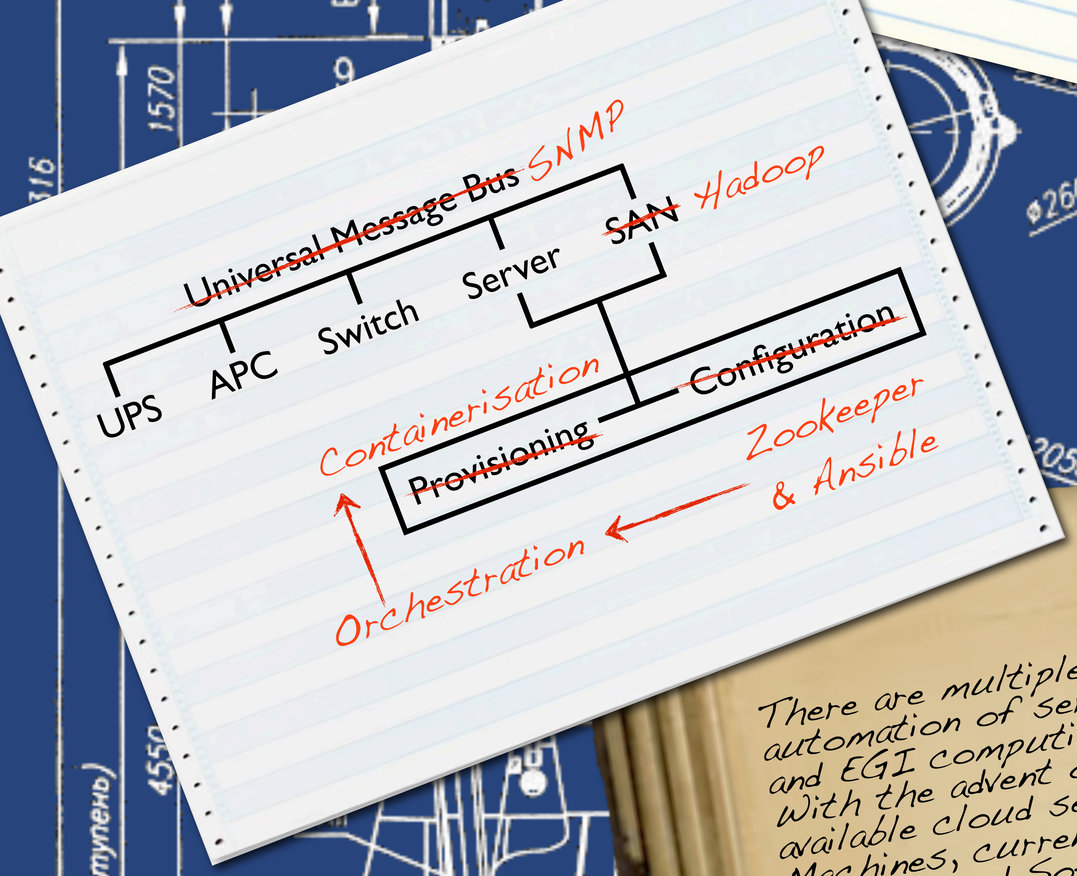
Containerisation?

docker

OpenVZ
Linux Containers

SNMP....?!





The Challenge

There are multiple approaches to the automation of services within WLCG and EGI computing environments. With the advent of commercially available cloud services, Virtual Machines, current service provisioning methods and Software Defined Networking solutions, the operational complexity behind delivering Grid services to research environments has become so large that traditional management and maintenance software platforms cannot meet all of these criteria.

ScotGrid Glasgow is undertaking a series of investigations examining combination of multiple software technologies to deliver a unified cluster management system. Various components including SNMP, distributed data storage and containerisation are being integrated to deliver a modular cluster management and configuration environment.

The Plan

A miniature test cluster has been constructed at Glasgow to allow for deployment and testing of new services and protocols in support of the WLCG. The cluster comprises of 68 cores and 10 TB of storage, supports both IPv4 and IPv6 addressing and has a dedicated 1 Gigabit link to JANET. The network supports MPLS, Layer 3 routing and SFlow.

Provisioning, configuration and management of the cluster is handled by a series of software components including Cobbler, Ansible and OpenVZ. The use of containerisation allows flexible management of software services and easies the configuration overhead for multiple user environments (VO). Orchestration of these container software solutions takes advantage of distributed configuration stores such as Zookeeper or etcd

By utilising SNMP, SFlow feeds and bespoke Python scripts the health of the cluster can be monitored with the output visualised via Graphite to deliver a unified overview of the cluster's performance and operational status.