



WLCG operations aspects for T1 & T2 sites

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v1.1

CMS documentation for new sites

- CMS grid operations experts provide tips, requirements and recipes for new sites on [this page](#)
- Mind: though most of the information looks very useful indeed, there are some inaccuracies and optimistic estimates...
- In particular, please do not underestimate the person power needed to operate a T1 or even a big T2 site!
 - Expertise will need to be acquired in many systems and services, often with special configurations to satisfy CMS / WLCG requirements
- WLCG requirements for T1 and T2 sites are documented [here](#)
 - As part of the MoU [annexes](#)

Grid services at T1 & T2 sites

- T1 & T2
 - [Computing Element nodes \(CE\)](#)
 - [Batch system head node](#)
 - [Worker nodes \(WN\)](#)
 - Still (mostly) x86_64 for the time being
 - [HTTP proxy: Frontier](#)
 - [APEL – accounting](#)
 - [Disk Storage Element \(SE\)](#)
 - Head node
 - Disk servers
 - [perfSONAR servers – network monitoring](#)
- T1
 - [Archival Storage Element](#)
 - Normally based on a tape robot service
 - Head node
 - Staging cache disk servers

Example [documentation](#) for setting up an [HTCondor CE](#) and [HTCondor batch system](#)

Services for [EGI](#):

- Site BDII – information system
- A/R tests via the “ops” VO

Details of the relationship with EGI to be looked into separately.



Joining the [OSG](#) infrastructure may be more practical for now...

Repositories

- OS
 - [Use RHEL, AlmaLinux or Rocky Linux](#)
 - Preferably release series 9
 - [Set up your own Kickstart server or equivalent](#)
- Middleware
 - [EGI UMD-5](#), when it has become available
 - [WLCG repository](#)
 - Products specific to WLCG
 - Temporary location for products that should be in UMD-5
 - [EPEL](#)
 - [Product team repositories](#)
 - For some products, also to get early access to new versions

Host provisioning

- A private cloud management system is suitable for ~all cases
 - OpenStack – the most popular
 - Other systems
 - CloudStack, OpenNebula, VMWare, ...
- A container orchestration system **may** become a better choice for certain services
 - Docker
 - Kubernetes
- More services will become runnable as containers
 - VMs of various services could be replaced with containers in the future

Configuration (1)

- Use a configuration management system for Linux systems
 - **Puppet, Foreman**
 - Heavy – will continuously check and correct the configuration as needed
 - Templates for some services **may** be provided or copied from other sites
 - **Ansible**
 - Lightweight – configuration only at boot time and when explicitly invoked
 - Becoming more popular
 - **Terraform**
 - For cloud provisioning
 - **Other systems**
 - SaltStack, Chef, ...
 - In use at some sites

Configuration (2)

- All secure services need host certificates from a certificate authority (CA) that is accredited by the [IGTF](#) (Interoperable Global Trust Federation)
 - In this case that looks covered by [AMRES](#)
- The services that need to be reachable from the internet need openings for specific ports in the relevant firewalls
 - Usually open to the whole internet
 - The services could be hosted in a *science DMZ* in the data center
 - Authorized client access is configured per service
- Only the site admins have root access to the services

Monitoring

- Many popular commercial and free systems & tools
- Some middleware comes with some support for certain choices
- Templates for some services **may** be provided or copied from other sites
- In the end, significant local effort may still be needed
- Products currently being used in CERN IT:
 - [Fluentd](#)
 - [Grafana](#)
 - [Kafka](#)
 - [OpenSearch](#)
 - [OpenTelemetry](#)
 - [Prometheus](#)
 - [Spark](#)
 - ...

Operations tools for EGI / WLCG

- [CRIC](#) – catalog of experiment resources, federation pledges, etc.
- [GOCDDB](#) – catalog of sites and services in EGI / WLCG
 - Also for posting service downtimes, imported by experiment frameworks
- [GGUS](#) – ticketing and support system
 - Foreseen to be replaced this autumn by the new WLCG Helpdesk
- EGI [Operations Portal](#)
 - WLCG only has limited direct use cases
- [Accounting Portal](#)
- Service Availability and Reliability Monitoring
 - EGI – [ARGO](#)
 - WLCG – [SiteMon](#)

WLCG-related forums and meetings

- Weekly [operations](#) meetings
 - CMS also have such meetings
- Monthly [Ops Coordination](#) meetings
- Monthly [GDB](#) meetings will be succeeded as of this autumn by Open Technical Forum meetings every 2-3 months
- Monthly [Management Board](#) meetings
- Yearly [WLCG workshops](#)
- Biannual [HEPiX](#) and yearly European HTCondor [workshops](#)
 - Very useful for **site admins** – example: (CPU) [Benchmarking WG](#)
- Biannual [LHCOPN-LHCONE](#) meetings
- CHEP conferences – every ~1.5 years
 - [2024](#) (Oct 21-25), [2023](#) (May 8-12)

WLCG ops [docs](#) & [more](#)