Campuses and OSG Services

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Introduction

• **Yesterday:** talked about services we provide to researchers, e.g.,
  • Open Science Compute Federation (OSCF), esp. Open Science Pool
  • Open Science Data Federation (OSDF)

• **Today:** *how* we help campus IT organizations (writ large) share their compute and storage capacity

• Why might campuses share?
  • Join a larger ecosystem and contribute beyond their borders
  • Connect with and learn from other campuses
  • Maximize usage of capacity
Sharing Compute
Sharing Compute — Overview

• **Campuses** provide raw compute capacity
  • Any batch system
  • Any “shape” of capacity

• **OSG services** create a consistent, usable runtime environment
  • We call this an Execution Point (EP)
  • Gathered into pools
  • Available via Access Points
Sharing Compute — Options

• OSG Glide-in jobs via a Hosted CE (Compute Entrypoint)
  • Nearly all new campus integrations use this method
  • Will detail next

• OSG Glide-in jobs via a CE that you run
  • But don’t do this!
  • Extra work on your end, only necessary in uncommon situations

• OSG Backfill Container
  • May be useful if you manage computing with, e.g., Kubernetes
  • Few campuses use this approach but contribute a lot
Sharing Compute via Hosted CE

• **Campus IT/cluster requirements**
  - An OSG account that can submit into your cluster
  - SSH access to that account (using public/private keys)
  - Shared user home directories between submit and worker nodes
  - Scratch space, either on each node or shared using, e.g., BeeGFS
  - Unrestricted outbound network connectivity from worker nodes

• **We host and operate** the remaining required services
  - OSG GlideinWMS Factory sends *glide-in* jobs to Hosted CE
  - Hosted CE uses SSH connection to submit those jobs to your cluster
  - When run, the glide-in job sets up the EP environment and joins a pool
Sharing Compute — Optional Extras

• Once integrated, extra software and services may increase usage

• **Apptainer** (née Singularity) – extra software on each worker node
  • Container runtime without root privileges
  • If glide-in jobs detect a working install, will run payload jobs in containers
  • Some payload jobs *require* container support – thus you can run more
  • [https://osg-htc.org/docs/worker-node/install-apptainer/](https://osg-htc.org/docs/worker-node/install-apptainer/)

• **Frontier Squid** caching proxy – extra service next to cluster
  • Caches HTTP and HTTPS fetches from worker nodes
  • May reduce WAN bandwidth and improve throughput
  • [https://osg-htc.org/docs/data/run-frontier-squid-container/](https://osg-htc.org/docs/data/run-frontier-squid-container/)
Sharing Storage
Sharing Storage — Overview

• Open Science Data Federation (OSDF) – our storage services
  • OSDF Origins – where data are placed
  • OSDF Caches – where data are accessed
  • Appears as one global namespace

• Note: Newer set of services than OSCF
  • Integration of campus capacity is particularly new
  • Don’t let that be a deterrent – we will find ways to make things work!
Sharing Storage — Export Your Data

• Export your data, read-only, into the OSDF
  • You provide access to one or more parts of your filesystem
  • You choose whether data are public or protected
  • We manage an OSDF Origin for you – makes data accessible via OSDF
  • Can support writing back to Origin for your users (you provide auth)
Sharing Storage — Other Options

- Donate storage capacity to us, and we manage user access
  - Still exploring and experimenting with this option, but it is likely the future
  - Interested? Contact us (support@osg-htc.org) and let’s figure it out!

- Provide storage capacity as OSDF cache
  - You provide storage capacity
  - We manage the OSDF Cache service that uses it
Collaborating
Collaborating — Overview

• Typical phases of a Campus/OSG collaboration:
  • **Planning** – Before proposal, order, or integration
  • **Integration** – Technical and human aspects
  • **Operations** – Monitoring, accounting, and support

• Recently added a Campus Coordinator role (me!)
  • Single point-of-contact throughout the lifecycle
  • Can connect to all PATh teams
Collaborating — Planning

We provide guidance on how to integrate campus capacity with a national CI ecosystem (e.g., OSPool, OSDF)

• **Consult** on topics like the ones covered here, with more details
  • Options for integration with PATh services
  • CI architecture and system requirements

• We provide **letters of collaboration** for proposals, incl. NSF CC*
Collaborating — Integration

• Meet once to understand goals and form technical plans
• Carry out the integration plan
  • Recent improvement (OSCF): Aim for first jobs in just 1 working meeting
• We provide detailed technical documentation
  • [https://osg-htc.org/docs/](https://osg-htc.org/docs/)
  •Reviewed and updated periodically, plus ad hoc as needed
• Support you throughout process
  • Contact us at any time: support@osg-htc.org
  • Always have Campus Coordinator to turn to
Collaborating — Operations

• We proactively monitor our services and accounting for issues
  • When we find issues in our services, we resolve and let you know
  • When we find issues that may be yours, we let you know and follow up

• Check in with active campuses
  • Listen for new opportunities, including pain points we should address
  • Identify potential connections with other campuses, etc.

• Continue to provide support
  • Respond to questions, concerns, requests
  • Provide software and service updates
  • Improve documentation
Collaborating — Your Responsibilities

• Notify us of changes to your infrastructure, especially:
  • Downtime, scheduled or otherwise (when you can)
  • Major software changes (e.g., to OS, batch system, etc.)
  • Networking changes, esp. firewall updates that could affect us
  • Significant changes to hardware

• Respond to our operational requests in a timely manner
  • In the rare case of campus-specific security concerns, we will provide desired response time

• For big changes, we can start with planning again, etc.
Summary

• We strive to make integration of compute and storage capacity as painless and effective as possible

• Tell us where it hurts, so at least we have the opportunity to fix it

• To get started: support@osg-htc.org
  • Or to me, OSG Campus Coordinator: Tim Cartwright <cat@cs.wisc.edu>
Questions?

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