





OSG as an agile computing environment

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BYOR = Bring Your Own Resource

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| OSG as an agile computing environment | <i>Frank Wuerthwein</i>  |
| <i>Online</i> | 11:00 - 11:25 |
| CLAS12 simulations on the OSG | <i>Dr Maurizio Ungaro</i> |
| <i>Online</i> | 11:25 - 11:50 |
| Accessing XSEDE allocations from the OSG access points | <i>Mats Rynge</i>  |
| <i>Online</i> | 11:50 - 12:05 |
| Searching for dark matter with XENON, OSG, and XD/XSEDE | <i>Evan Shockley</i> |
| <i>Online</i> | 12:05 - 12:30 |

**We wanted to highlight some examples for BYOR,
and encourage people to grow their resource pool via BYOR.**

This talk is part **aspirational and part report of what (sort of) exists as options to built an agile computing environment that includes OSG**

Let's start with an idea from my Monday talk

OSG Supports you to build your own dHTC environment

OSG supports a **modular software stack** and a “**Fabric of Services**” that allows organizations to create their own dHTC environment.

A Feature-Complete dHTC Environment

- **Compute Resource Pool**

- Submission infrastructure that functions as compute “Access Point”
- Workload management system
 - Complex workflows across heterogeneous resources possible.
 - Easy to run workflows comprised of 100,000 jobs or more with complex dependencies between sets of jobs (full support of arbitrary DAGs).
- Homogeneous runtime environment across heterogeneous resources

- **Data Resources**

- Storage that functions as “Data Entry Point”
 - Origin to Caching infrastructure
 - Storage for data input to and output from workflows.
- Transparent “Data Access” via Caching Infrastructure

How can we make this agile ?

- We want to **support dynamic integration of resources** that you bring to your dHTC environment that we/you have assembled for you with OSG services.
 - You buy resources in the **commercial cloud** that dynamically appear in your dHTC environment
 - You receive **HPC allocations** that you use from your dHTC environment
 - Your **collaborator gives you resources** that you use from your dHTC environment.

**We certainly support BYOR (see following talks)
... how dynamic can it be ?**

BYOR = Bring Your Own Resource



Agile growth of Compute Resources

- Adding your **allocation** to an existing Hosted-CE at an NSF HPC system
- Have your **collaborator run our container/VM on their cloud** infrastructure to connect to your pool.
- Use “**glidein in a vacuum**” from the login of your collaborators cluster
- Use **HTCondor Annex** to access AWS
- Use our **VM on Google or Azure** to connect to your pool.
- Use K8S integration to add **Google TPUs** to your pool.

It is possible to think outside the box to be agile!

- OSG operates **K8S infrastructures** at U.Chicago and UW-Madison for service deployments.
 - K8S native service deployments
 - OSG GitHub driven deployments
 - SLATE federation
 - K8S native federations (Admiralty & KubeFed)
- OSG integrates with **K8S compute infrastructures** at SDSC and U.Chicago
 - We have federated with K8S in the cloud to run applications on TPUs as a proof of principle.
- NSF offers an **HPC system that supports K8S** (Expanse)

**Not clear all that's possible makes sense to do.
We are open to discuss unusual use cases.**

- **OSG is committed to support you to build your own dHTC environment.**
- **We encourage you to BYOR**
- **We are curious to engage with you on novel integrations of resources into agile dHTC environments.**
 - **Are there other dimensions of agile that we missed in this talk, and should be considering?**
- **Disclaimer:** not everything that can be done makes sense to do.

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