THE UNIVERSITY OF CHICAGO

Accelerating Science

with connective services for cyber infrastructure

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Science is Collaborative

- On campus
- Inter-campus
- National
- International

National Cyber Infrastructures

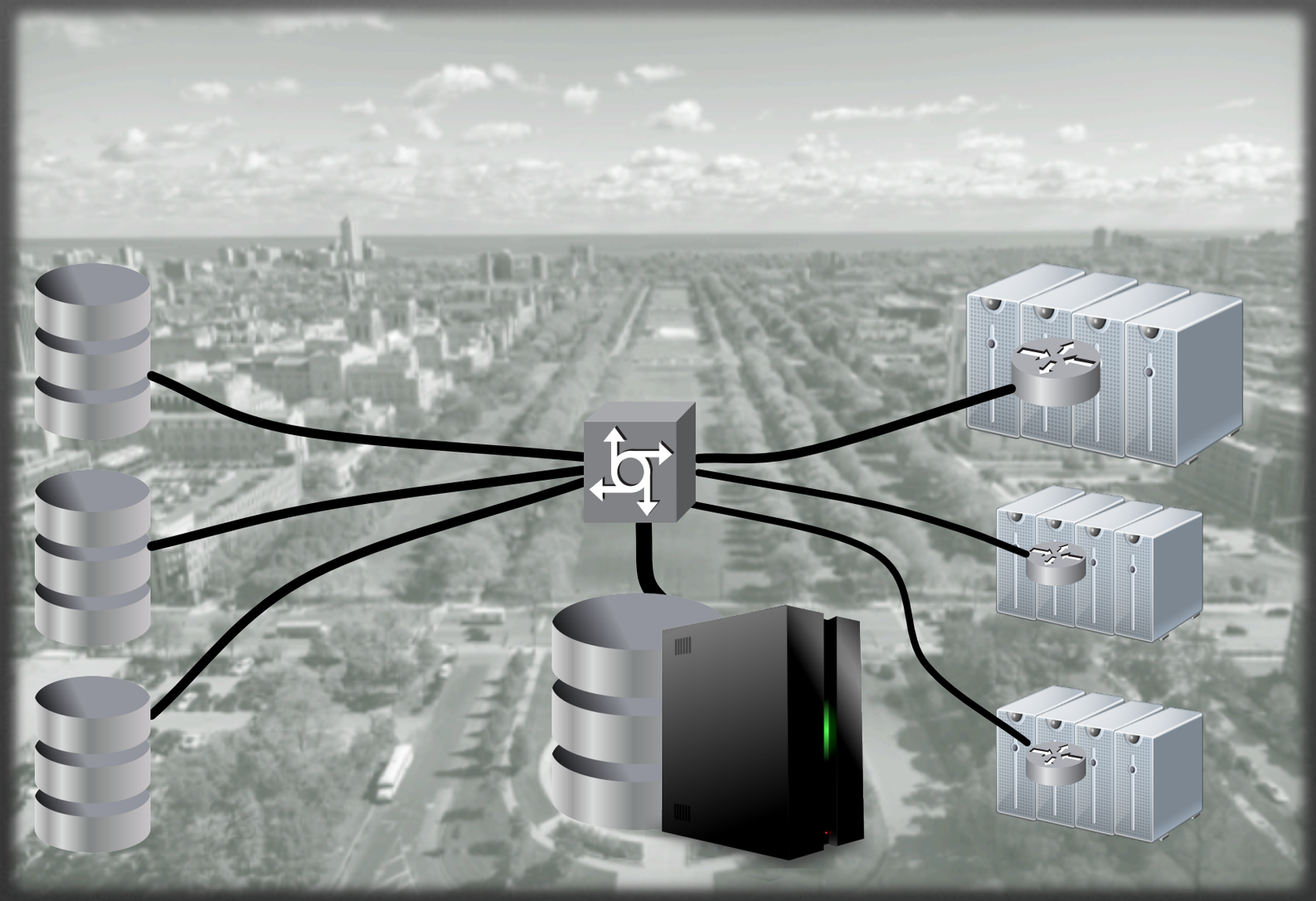
- XSEDE
- Open Science Grid
- Worldwide LHC grid
- Services … e.g. Globus
- How do campuses connect to these, and to each other?

Campus Ecosystem

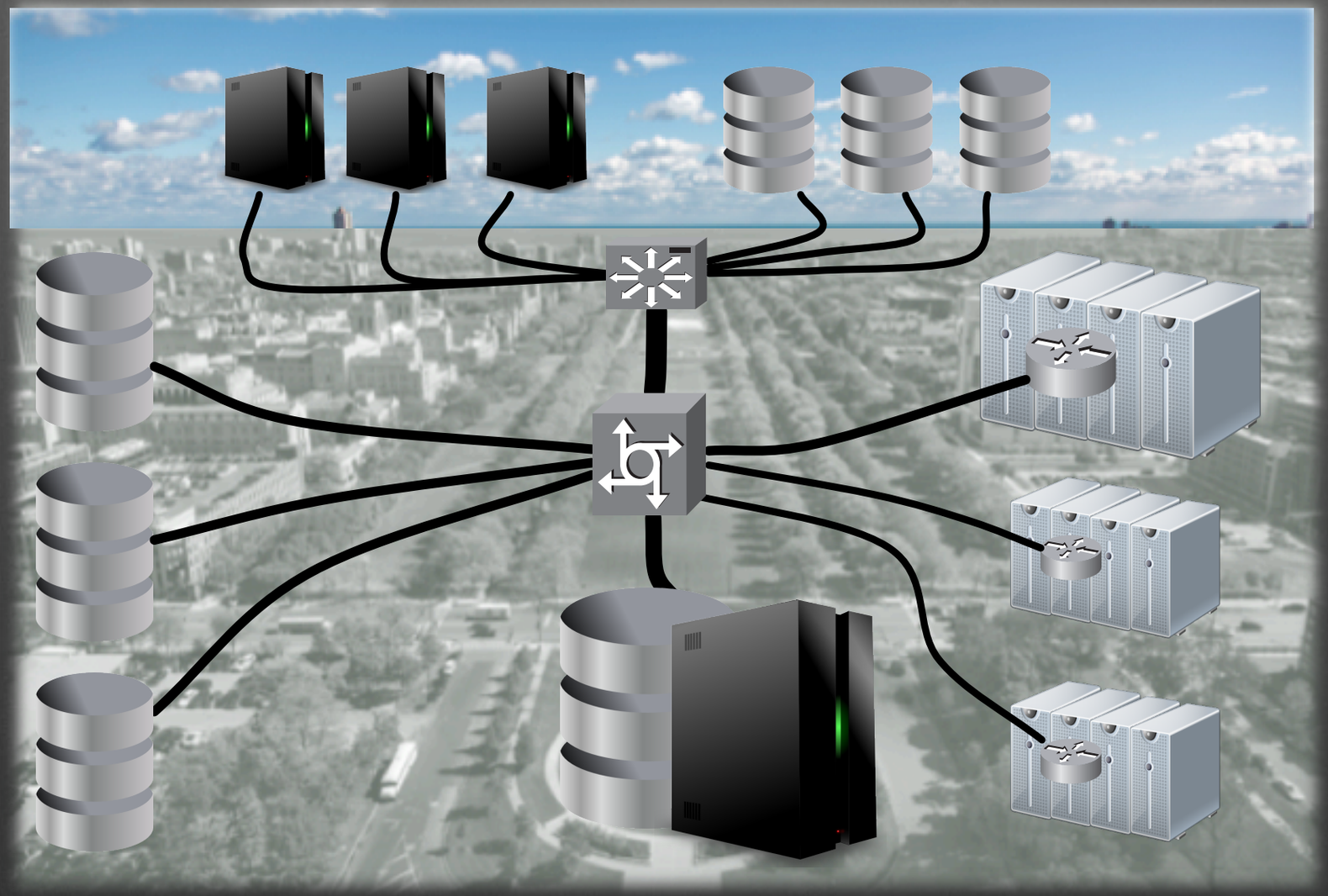
Challenges: limited budgets, operational costs, scale of science

Commodification, Centralization

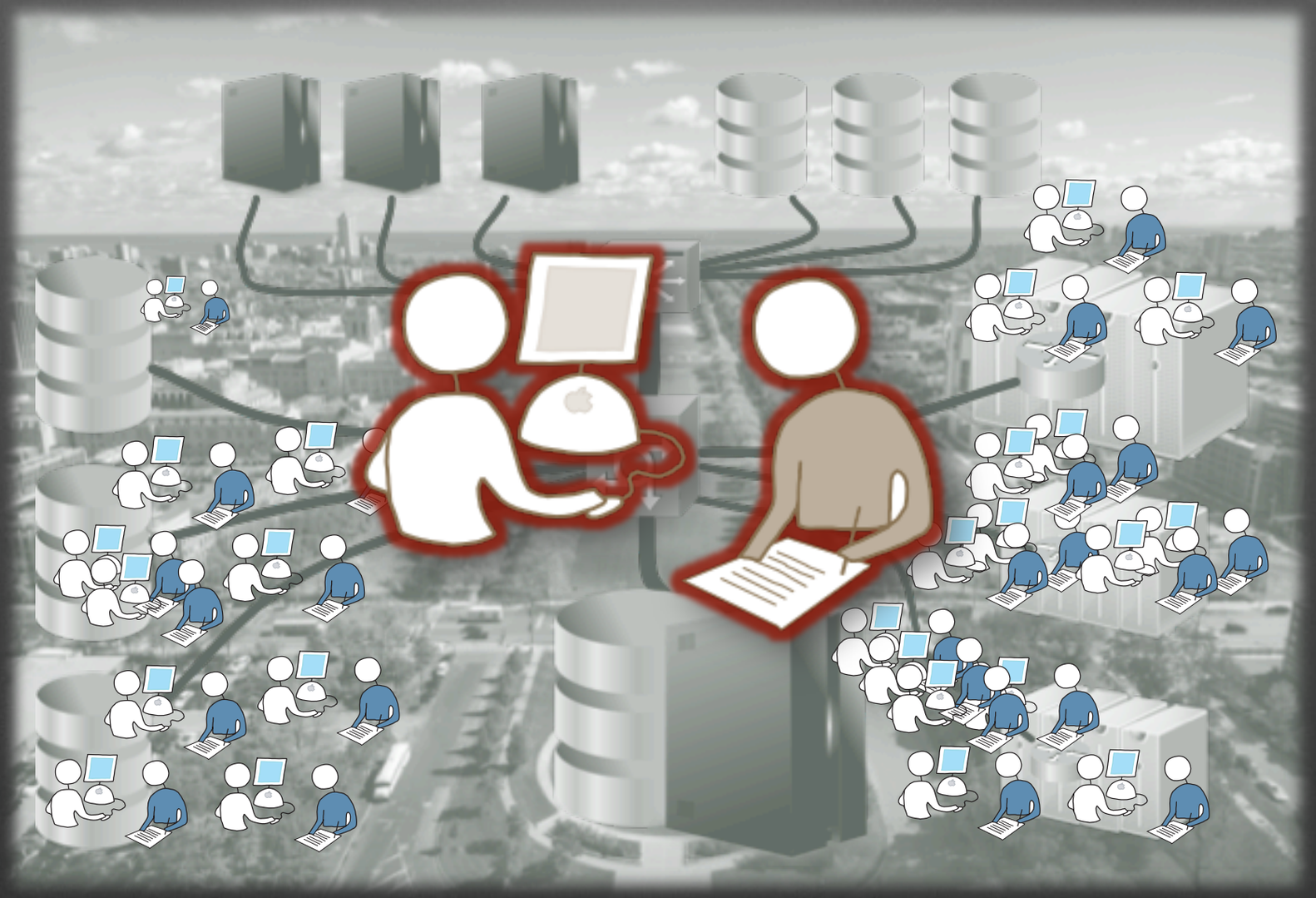
Even so, distributed resources remain



Off-campus too
(the national ecosystem)



Need: transparency for users, cost effective for providers

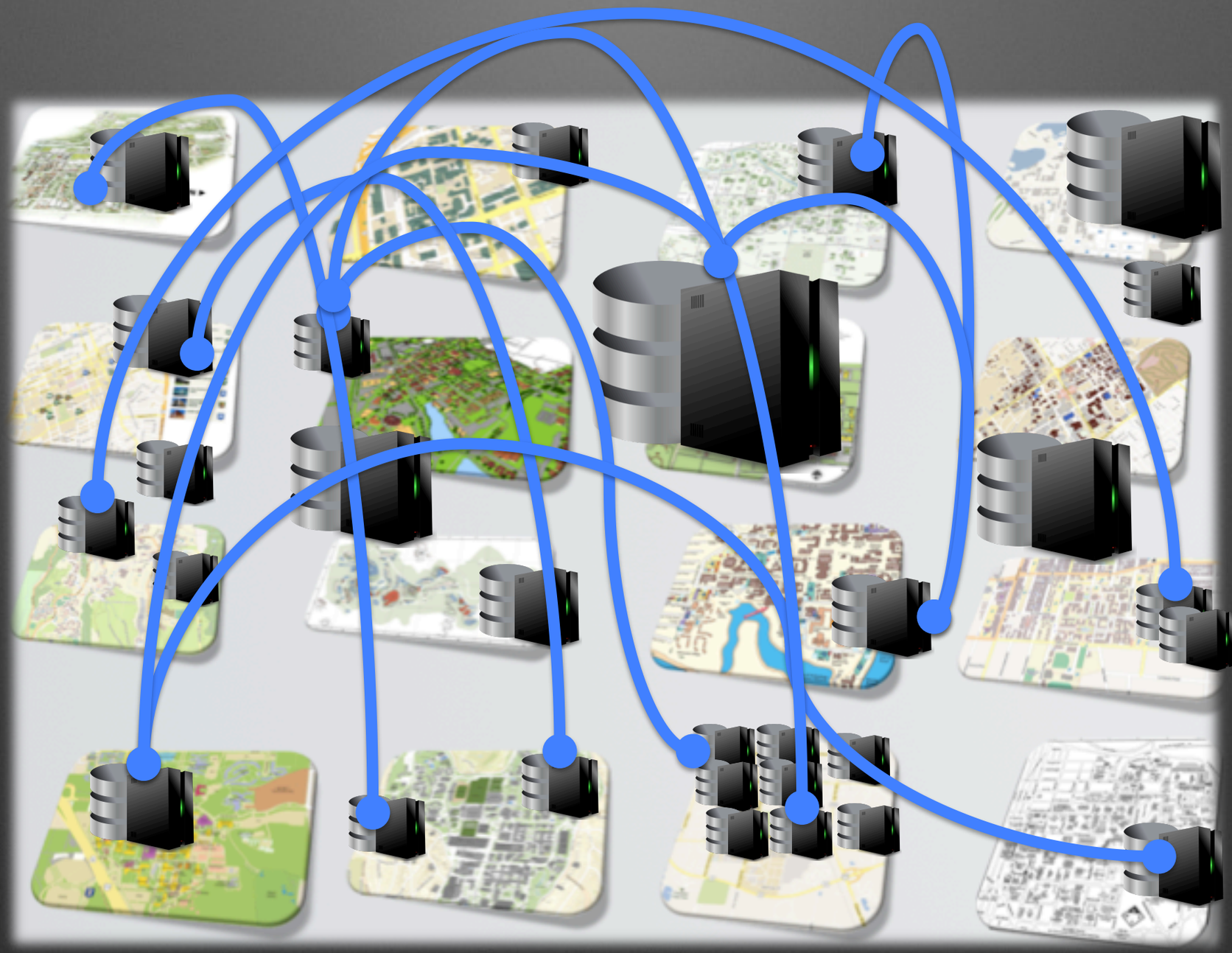


Campus Data Centers

and the national cyber infrastructure

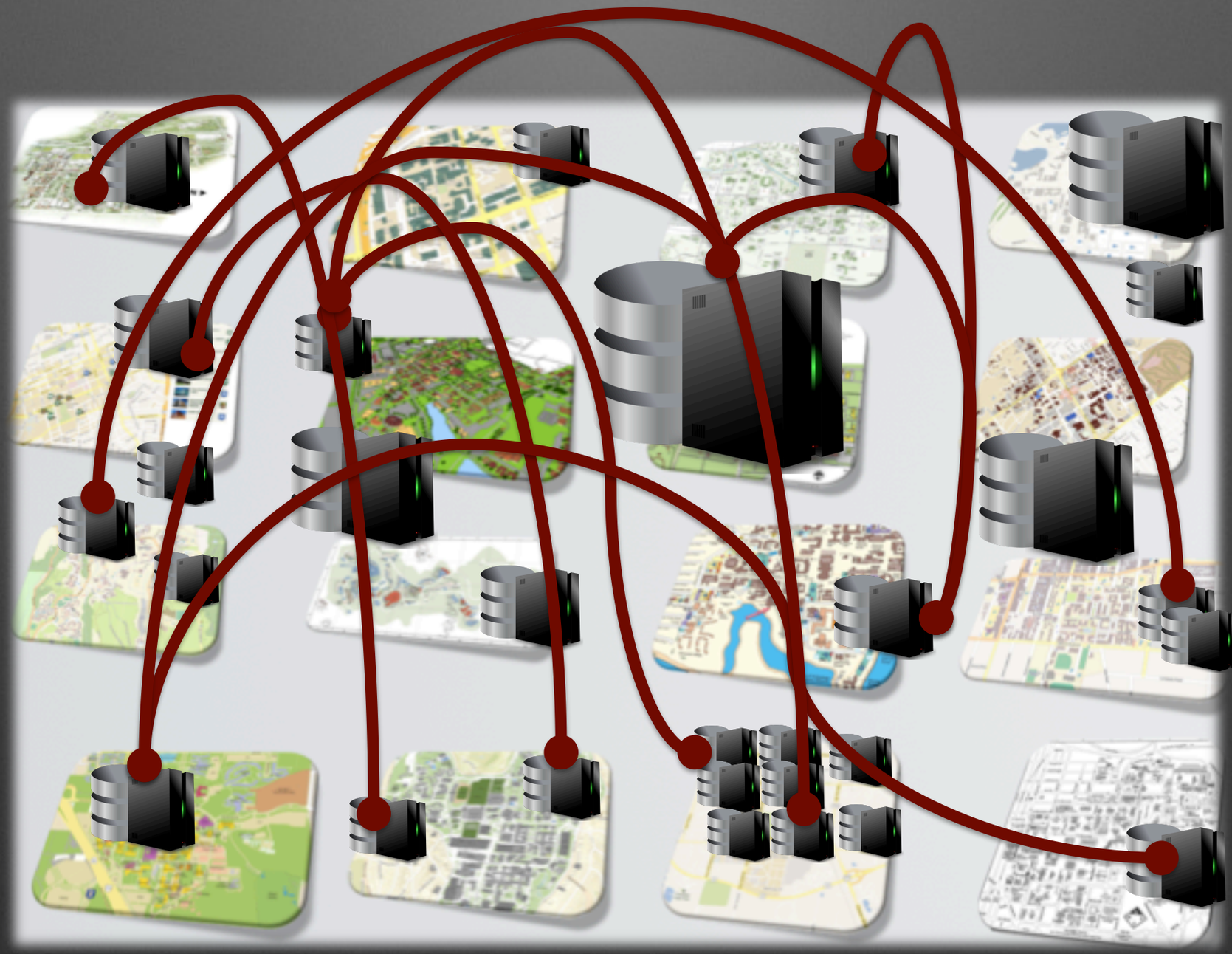
Globus data transfer, sharing

(and now publication)



globus

Cycle sharing ecosystem?



Distributed HT Computing

The OSG fabric of services

- The leading **distributed** high throughput computing service in the US
  - 104k cores, 75.6 PB, 123 compute endpoints
- Well connected
  - Most sites on OSG have 10 Gbps or greater to I2 or ESnet, many upgrading, plus SciDMZs
  - (at least) 2M transfers/day, 1 PB/day
- Friction free
  - The OSG VO with **GlideinWMS** offers transparent access to these resources for small groups

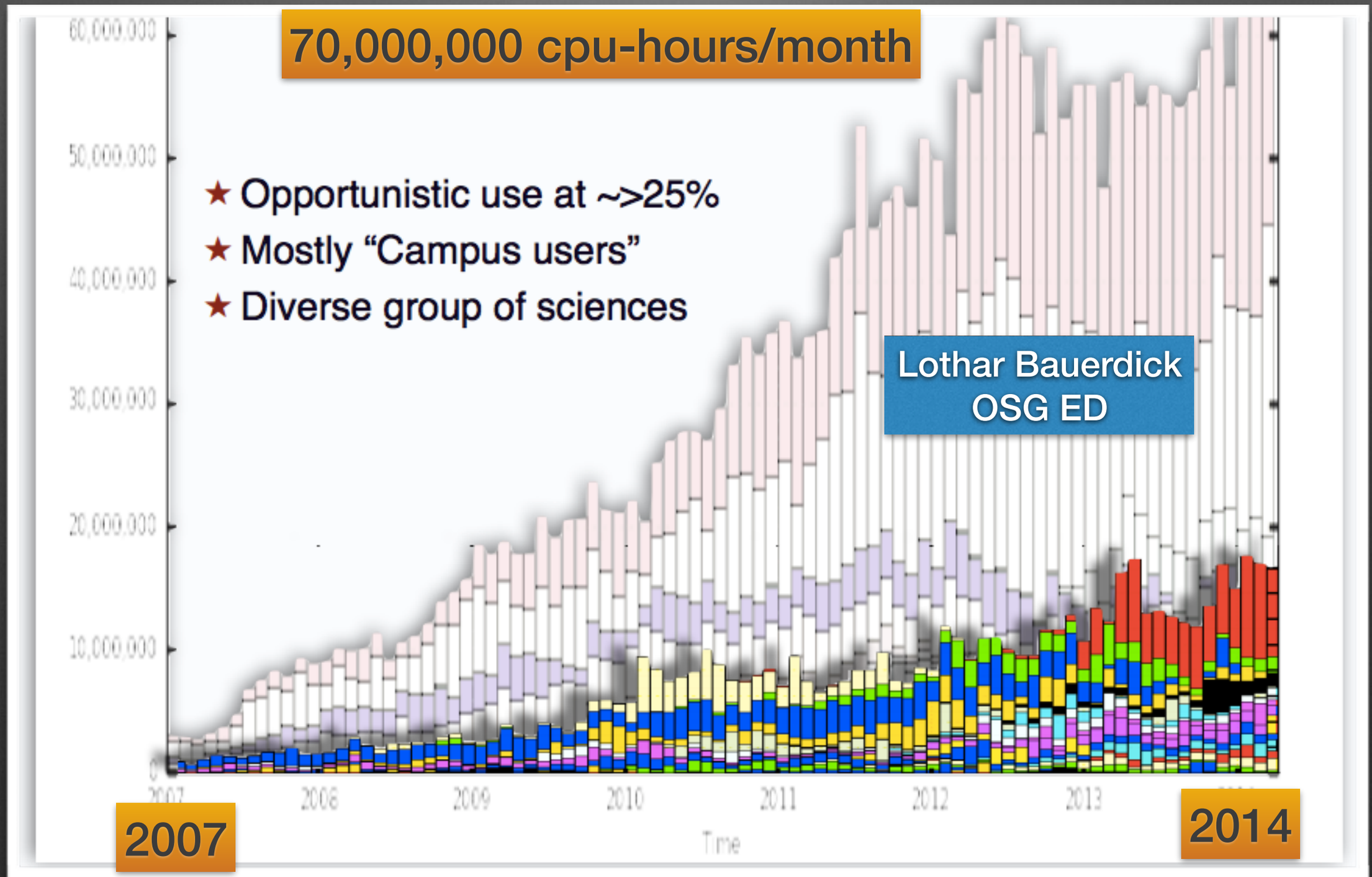
Open Science Grid

HTC

DHTC

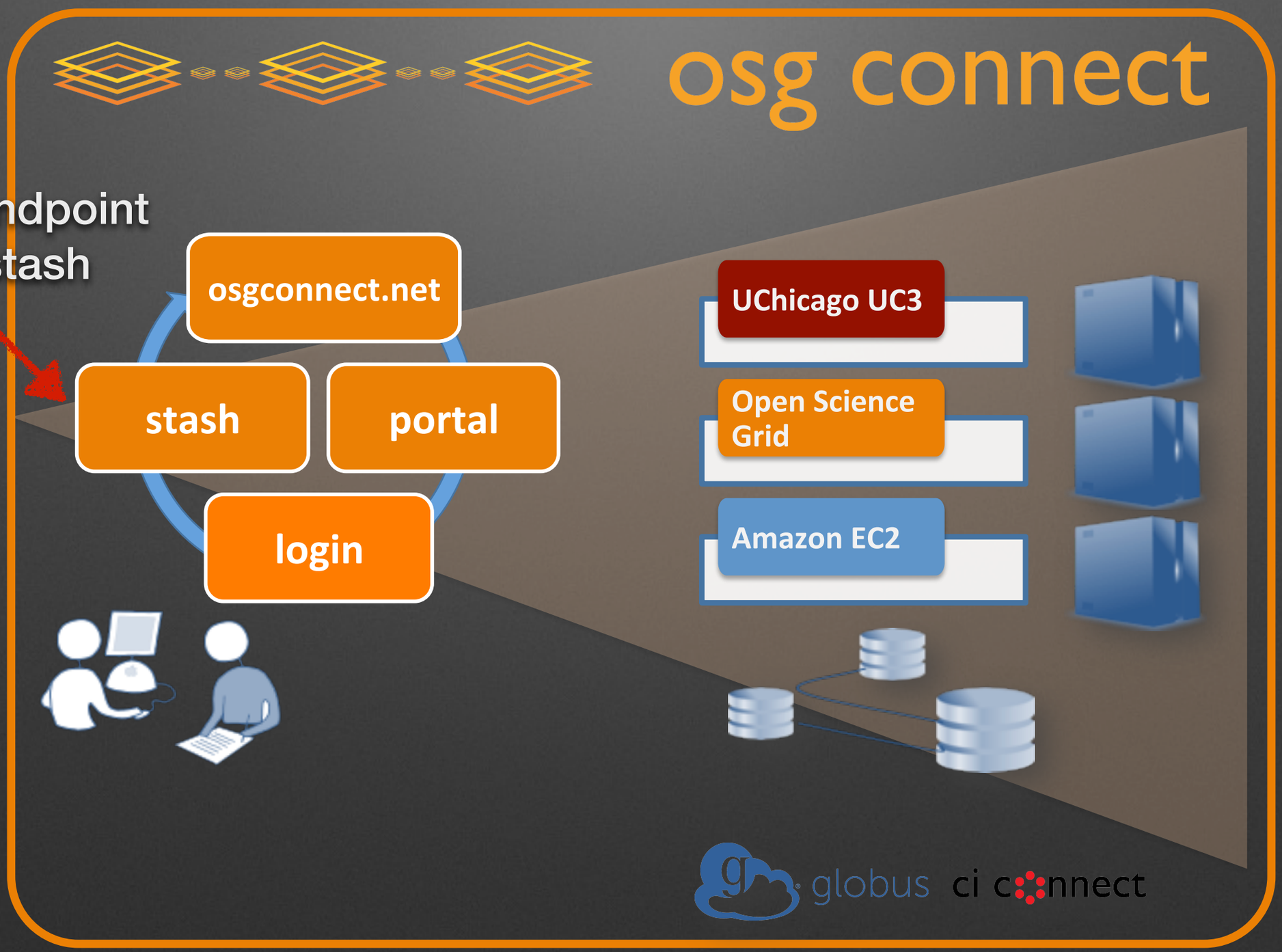
A great way to share empty job slots

Growing number of campus users

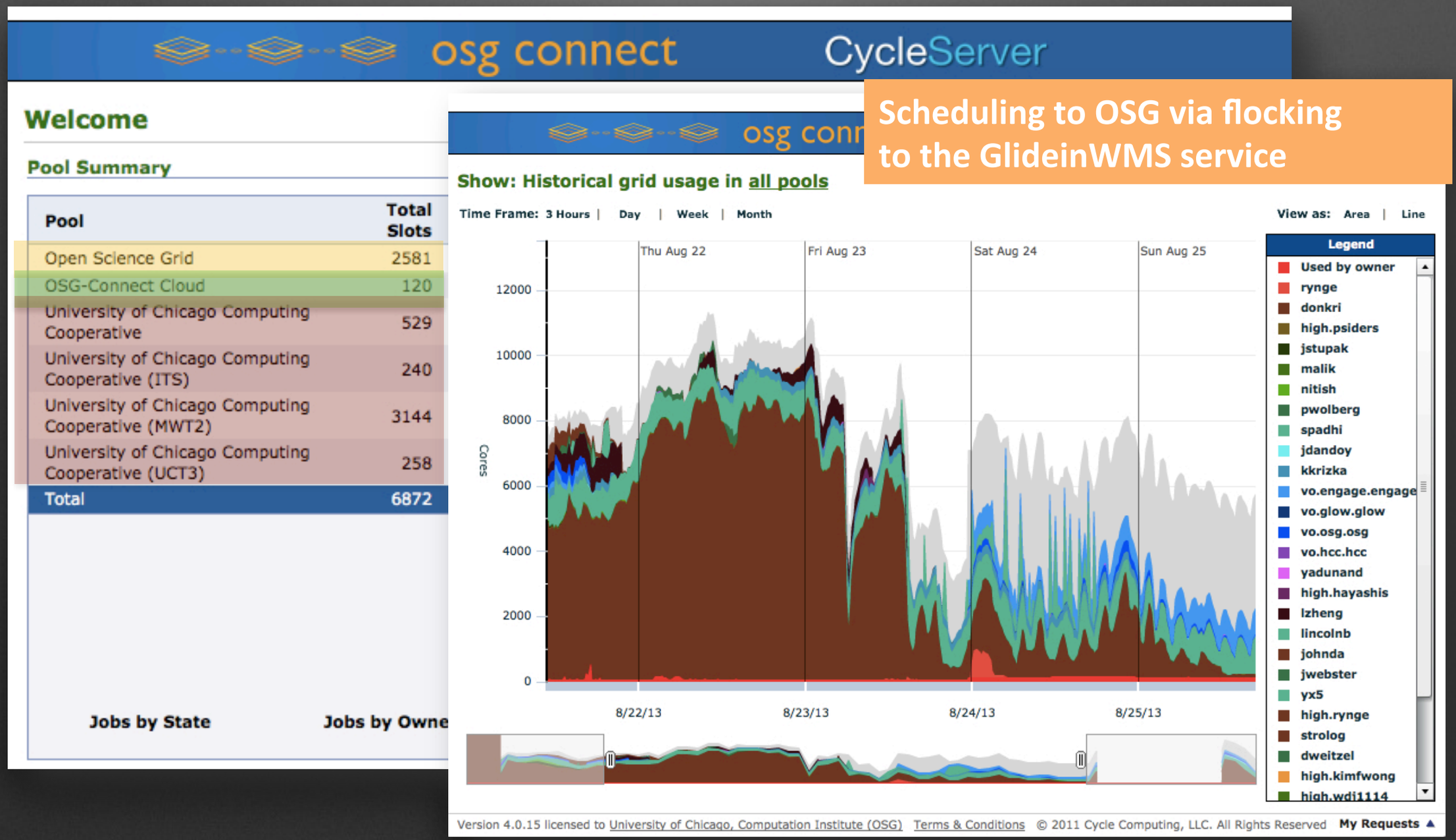


Login to the OSG

(direct access to those cycles)



Bringing resources together: Campus, OSG, Cloud



OSG Connect Suggested Campus Grids as Service

ci connect

ci-connect.net built on Globus Platform and HTCondor

Services for Connecting

ci connect

ci-connect.net

stash

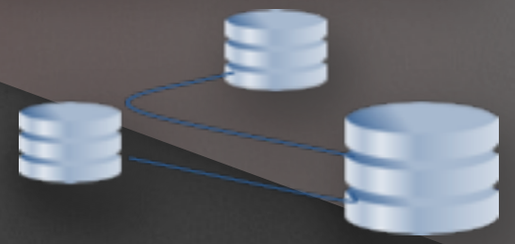
portal

login

Campus grids

Open Science Grid, XD, HPC

Commercial & Science clouds

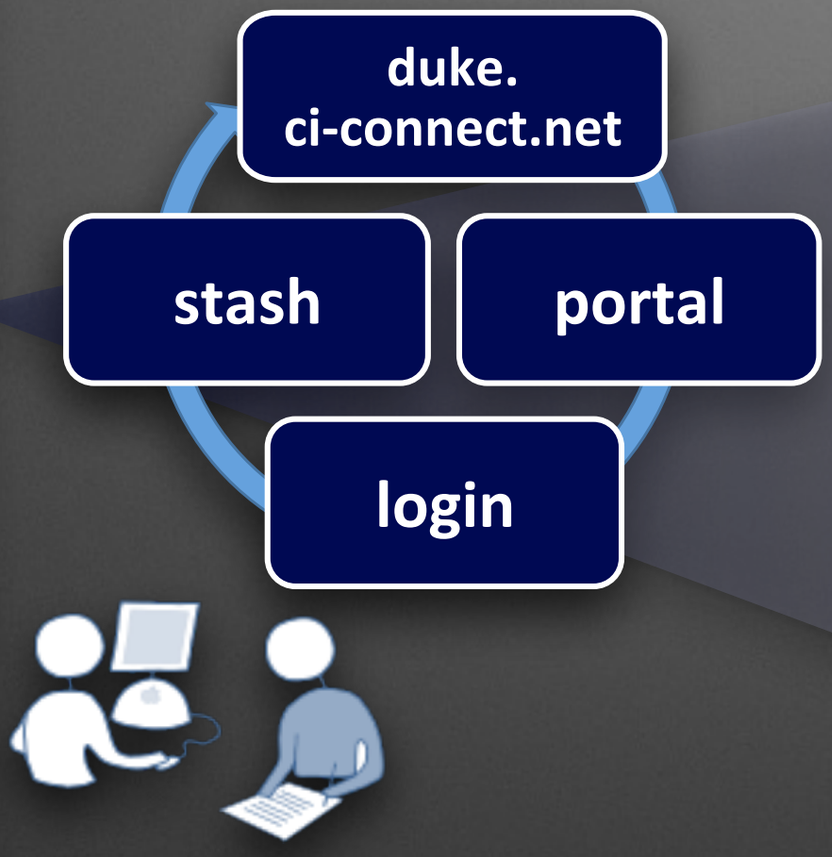


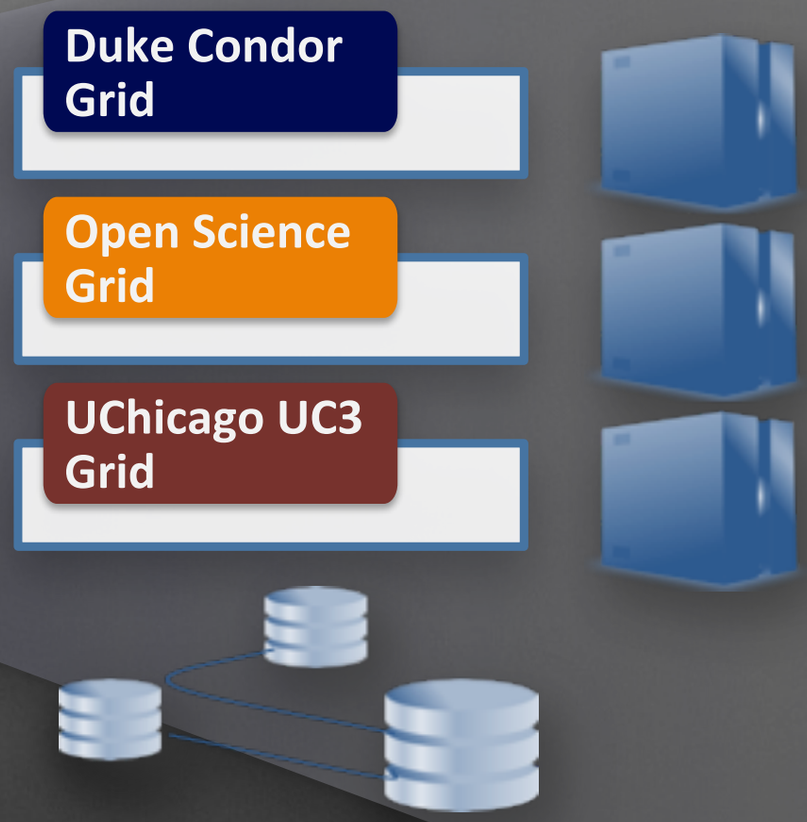
osg connect

globus

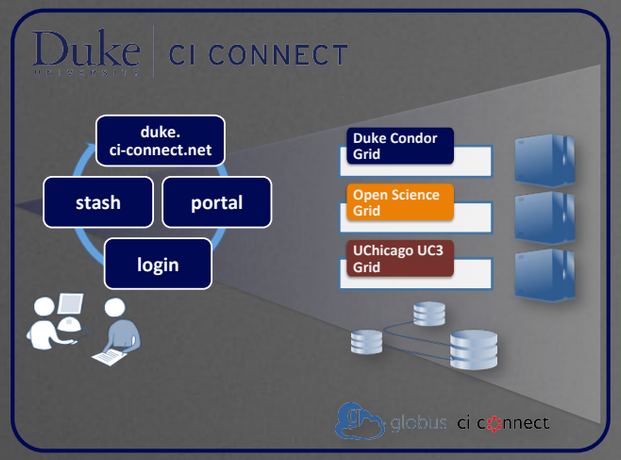
HTCondor
High Throughput Computing

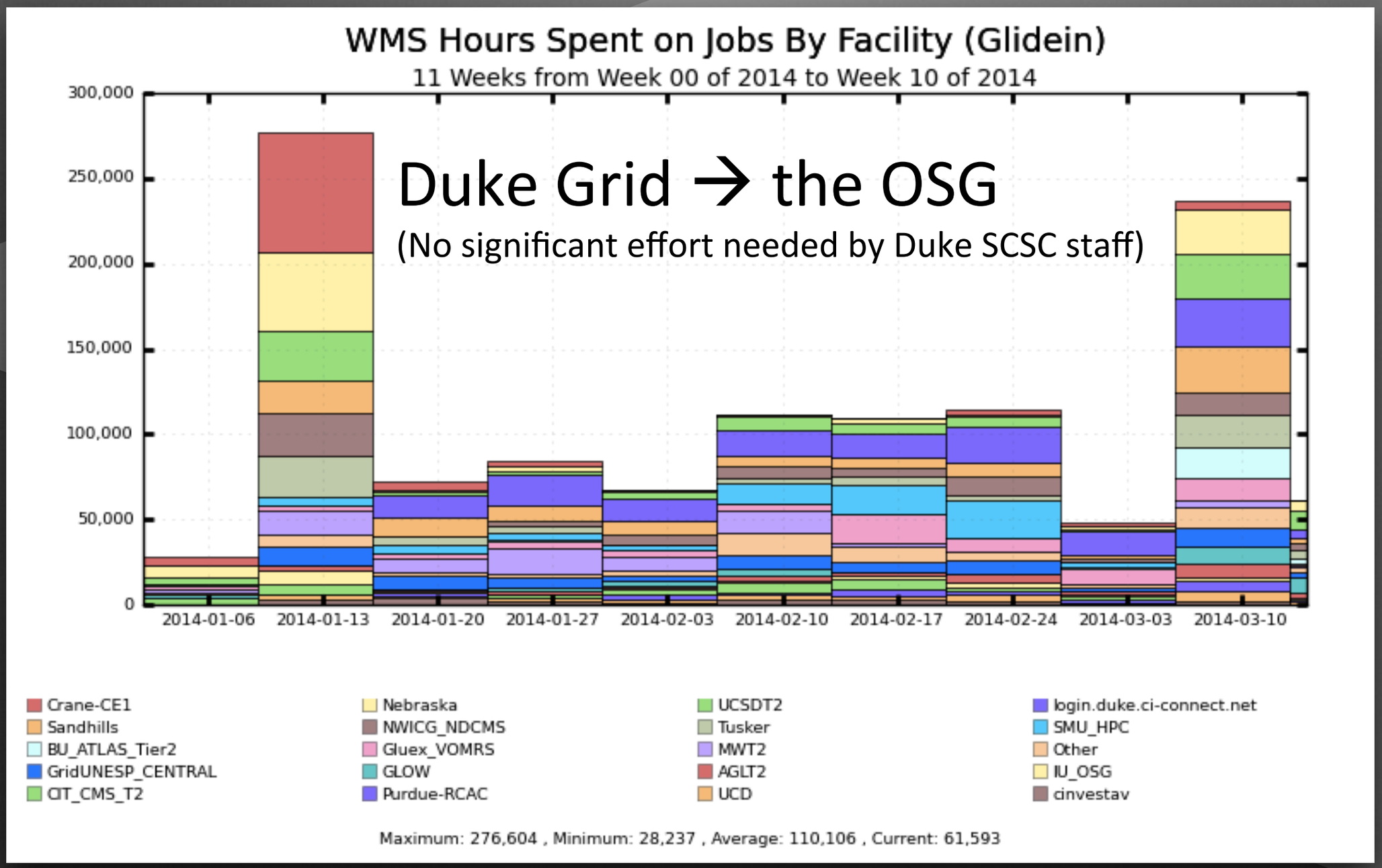
Duke UNIVERSITY | CI CONNECT





globus ci connect

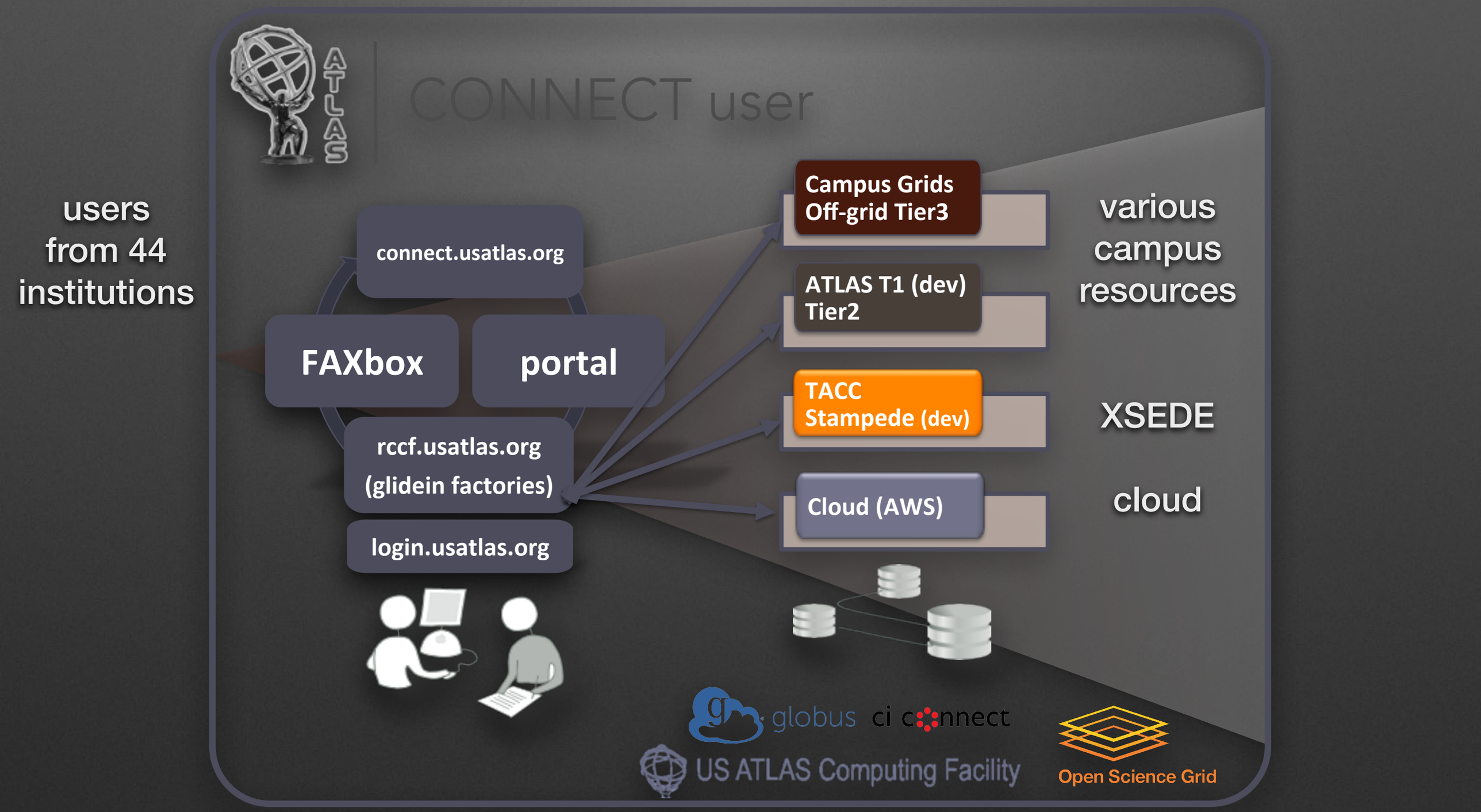




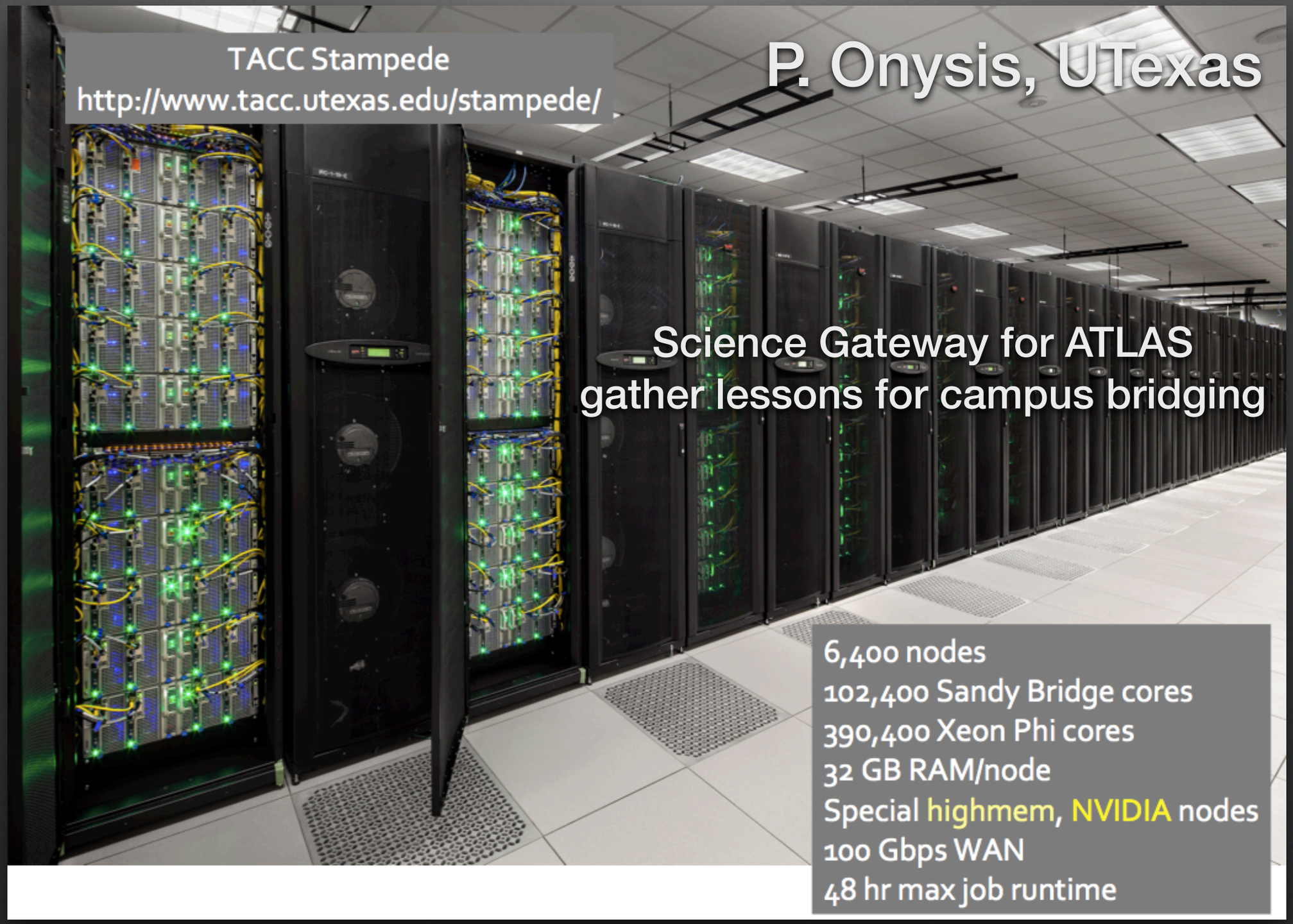
Duke Grid → the OSG

(No significant effort needed by Duke SCSC staff)

Connecting communities to the national ecosystem



Strategy for XSEDE



Minimize footprint @ TACC

- Key is minimizing Stampede admin involvement while hiding complexity for users
  - Simple SSH to Stampede SLURM submit node
  - ATLAS software mounted using CVMFS and Parrot
  - ATLAS squid cache configured nearby
  - Wide area federated storage access
- Leverage Globus, HTCondor, Glidein Factory, CCTools, OSG accounting
  - (CI Connect Services)

Campus Connect Services In Preparation

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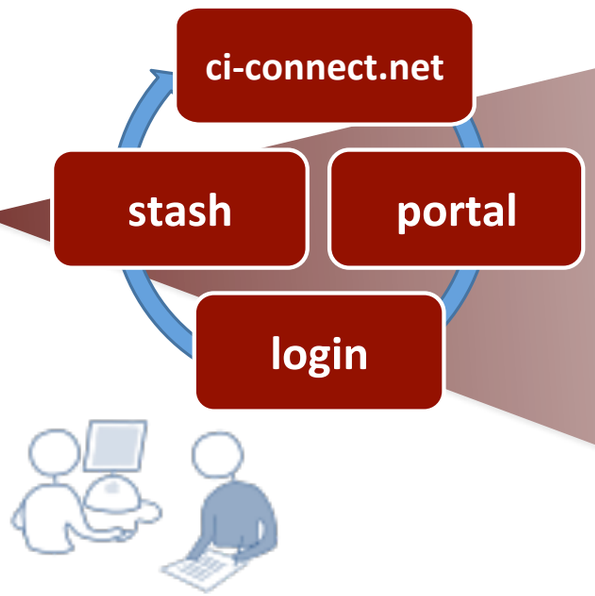
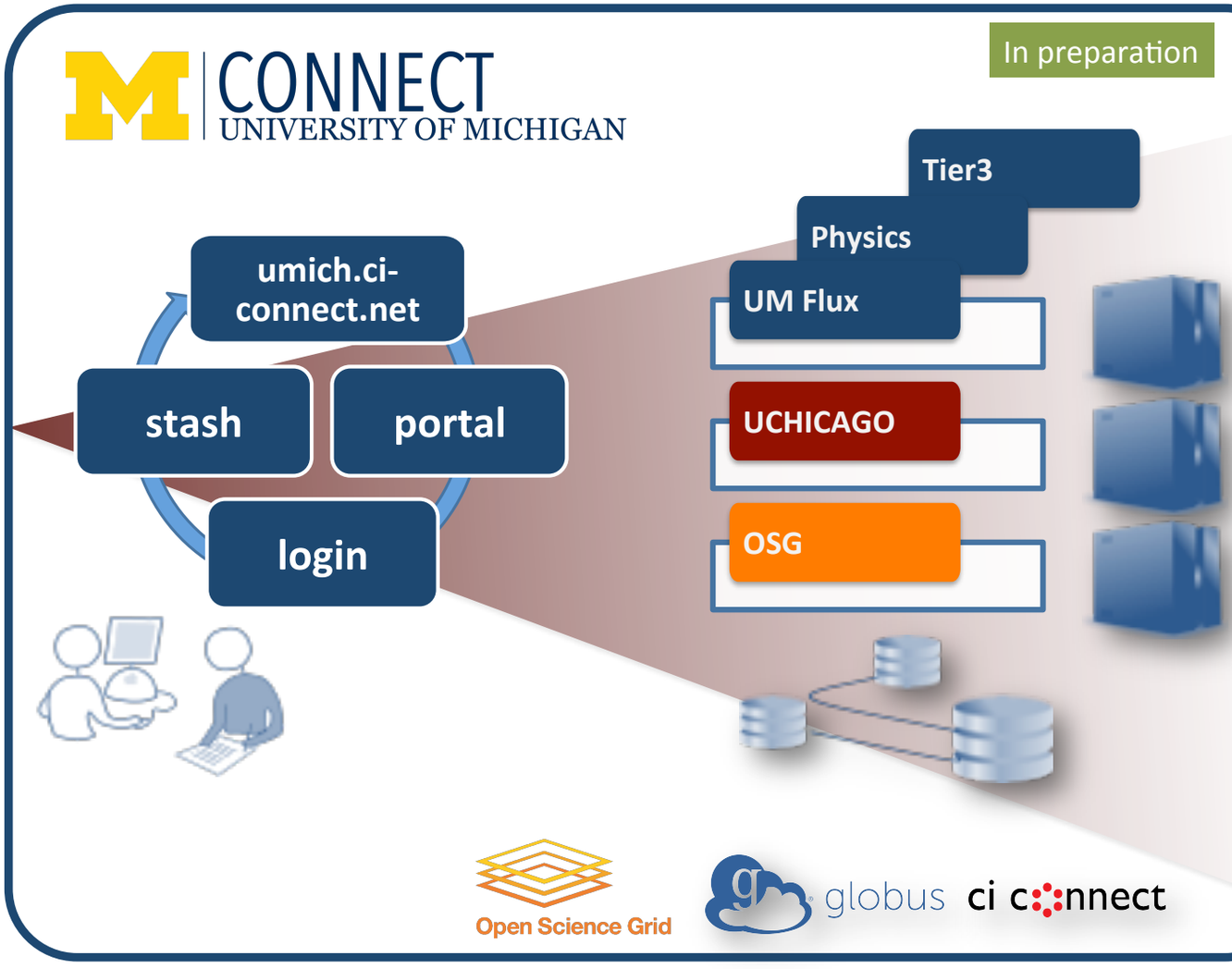
In preparation



Open Science Grid

CONNECT
UNIVERSITY OF MICHIGAN

In preparation



Open Science Grid

globus ci connect

Summary

- Discovered we could leverage the Globus Platform to connect users to the Open Science Grid

- Suggested a model to couple users, data and distributed compute cycles as a service

- Easy path for campuses to “connect” or “bridge” to the national ecosystem

Acknowledgements

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