

# **XSEDE Software Development & Integration ECSS Presentation October 23, 2015**

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# **XSEDE**

**Extreme Science and Engineering  
Discovery Environment**



# Agenda

- **Delivered Services/Software**
- **Active Integration Projects**
- **XSEDE 2 (July 2016 and beyond)**



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# Delivered Services/Software

## Remote Job Execution (UCCAN 1.0)

- UNICORE 6 / EMS
- Genesis II
- Karnak job prediction service ([karnak.xsede.org](http://karnak.xsede.org))
- xdusage (displays gateway user information)
- Science gateway user count (`gateway_submit_attributes`)
- UNICORE 6 Airavata provider pilot

## Data Movement (UCCAN 2.0, UCDM 4.0, UCSGW 2.0)

- Globus Transfer Service
- Globus Connect Server (streamlined GridFTP endpoint deployment)
- GridFTP server packages

## Remote File Access (UCCAN 3.0)

- Genesis II GFFS (including Campuses)
- XWFS (on L1-2 SPs); will be discontinued in XSEDE2

## Interactive Login (UCCAN 4.0)

- SSO Hub ([login.xsede.org](http://login.xsede.org))
- GSI OpenSSH server packages
- Phase 1 two factor authentication for SPs

# Delivered Services/Software

## Federated Identity and Group Management (UCCAN 6.0, 9.0, UCCB 1.0)

- MyProxy ([myproxy.xsede.org](http://myproxy.xsede.org))
- CI Login (<http://www.cilogon.org/xsede>)
- MyProxy OAuth (<https://oa4mp.xsede.org/oauth/>)

## Resource Information Management (UCCAN 7.0, 8.0, 11.0, 12.0)

- Legacy information services ([info.xsede.org](http://info.xsede.org))

## Miscellaneous

- Globus client packages
- JGlobus 1.x phase out guidance

## Engineering Support

- Software distribution repositories for SPs, campuses, gateways ([software.xsede.org](http://software.xsede.org))
- Engineering activity management ([jira.xsede.org](http://jira.xsede.org))
- XSEDE source repository (<https://software.xsede.org/svn/>)



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# PY5 Activities by Use Case

- **Run a Remote Job** — UCCAN 1.0
- **Data Movement** - UCCAN 2.0, UCDM 4.0, UCSGW 2.0
- **Interactive Login** — UCCAN 4.0
- **User and Allocations Management** - UCCAN 5.0, UCCAN 9.0
- **Federated Identity and Group Management** - UCCAN 6.0, 9.0, UCCB 1.0
- **Resource Information Management** - UCCAN 7.0, 8.0, 11.0, 12.0
- **Workflows** - UCCB 5.0, UCHPC 3.0, UCSW 1.1, 2.0
- **Share data repository with community** - UCDM 1.0

Use Case Registry has information on individual Use Cases:

- <https://software.xsede.org/registry-dev/index.php>

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# Run a Remote Job – UCCAN 1.0

- **Continuing activities from PY4**
  - *Improved GRAM5 packaging and customization (SDIACT-32) - In Testing*
  - *Deliver Shared Virtual Compute Facility using Global Queues for Campus Bridging (SDIACT-177) - In Testing*
- **Relevant PY5 Activities**
  - UNICORE maintenance (SDIACT-205, SDIACT-236, SDIACT-221)
  - Enhance Resource Prediction Service showing where jobs would run first (SDIACT-234)
  - Enhance gateway\_submit\_attributes



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# Data Movement - UCCAN 2.0, UCDM 4.0, UCSGW 2.0

- **Continuing activities from PY4**
  - Deliver Globus Transfer REST API (SDIACT-106)
- **Relevant PY5 activities**
  - Improve many small file transfer performance with GridFTP (SDIACT-201)
  - Improve data transfer performance with a central logging and transfer analysis service (SDIACT-200)
  - Provide XSEDE service client coding examples (SDIACT-230)
    - Authentication via Globus IdM, MyProxy, OAuth, and CILogon
    - Submit/monitor jobs with UNICORE, Genesis II, and GRAM5
    - Move data with Globus Transfer, GridFTP, and Genesis II
    - Discover resources via pub/sub and RESTfull queries
  - Assist Science Gateways adopting XSEDE's Globus Transfer and Sharing services (SDIACT-053)



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# Federated Identity and Group Management - UCCAN 6.0, 9.0, UCCB 1.0

- **Continuing activities from PY4**
  - Deliver new XSEDE Identity management (SDIACT-196, SDIACT-190, SDIACT-191, SDIACT-192)
  - Document single sign-on using federated identity across XSEDE services (SDIACT-67, SDIACT-68)
- **Relevant PY5 Activities**
  - Phase II deployment of user two factor authentication (SDIACT-181)
  - Update oa4mp.xsede.org to support OAuth 2.0 (SDIACT-203)
  - Unified and extensible group management service for XSEDE users and staff (SDIACT-109); likely delayed to XSEDE2

# Resource Information Management

## UCCAN 7/8/11/12.0

- **Continuing activities from PY4**
  - Improve Resource, Software, and Service Description and Availability Information Management (SDIACT-117, *SDIACT-118*, SDIACT-178)
- **Relevant PY5 Activities**
  - Improved (phase 2) Resource Description Information Management (SDIACT-212); possibly describe Gateways?
  - Enhance views and interfaces to Information Services Warehouse (SDIACT-213, SDIACT-214, SDIACT-218)
  - Enable subscribing to XSEDE monitoring information from Inca and Nagios (SDIACT-159)
  - Document how to subscribe to job state changes (SDIACT-232)



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# Workflows - UCCB 5.0, UCHPC 3.0, UCSW 1.1, 2.0

- **Relevant PY5 Activities**

- Evaluate alternatives and produce an XSEDE supported workflow roadmap (SDIACT-145)
- Pilot Pegasus DAGMAN workflow engine that works with UNICORE and Genesis II for LIGO (SDIACT-146)
- Deliver Kepler workflow support on XSEDE (SDIACT-226, SDIACT-227, SDIACT-228)



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# Share data repository with community - UCDM 1.0

- **Continuing activities from PY4**
  - Enable data sharing using Globus Sharing (SDIACT-27)
- **Relevant PY5 Activities**
  - Survey and recommend Data Integrity mechanisms that could be supported by XSEDE (SDIACT-008)



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# XSEDE 2

- **L2 XSEDE *Community Infrastructure* “XCI”**
  - Merges TIS, A&D, SD&I, parts of Operations, and Campus Bridging
  - Much smaller budget
  - Use Cases moved to L2 *Community Engagements and Education* “CEE”
- **Shift from XSEDE developed/integrated capabilities, to XSEDE facilitated partner/community integration**
  - XSEDE 1 examples: Kepler
- **Shift from XSEDE funded software/service provider staff to software subscriptions (Globus)**
- **Simpler streamlined engineering process**
  - Use Cases are still key
  - ROI driven by real use



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Our reach will forever  
exceed our grasp, but,  
in stretching our horizon,  
we forever improve our world.

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Discovery Environment