XSEDE Capability Delivery Plan
GRP-02, GRP-03, GRP-05, GRP-06, GRP-09, GRP-10, GRP-12, GRP-13, GRP-14, GRP-15, GRP-16
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Background

Use cases describe community needs, requirements, and recommendations for improvements to cyberinfrastructure (CI) resources and services. A Capability Delivery Plan (CDP) is an executive summary of the current gaps in our support for a use case, current plans to fill those gaps with new or enhanced capabilities, and the operational components that currently support the use case.

Use case summary

These eleven GRP use cases (02, 03, 05, 06, 09, 10, 12, 13, 14, 15, 16) describe how XSEDE users, staff, and partners create and manage groups of registered users for various purposes. This set of use cases captures the results of a project-wide needs assessment activity conducted by the XSEDE Requirements Analysis and Capability Delivery (RACD) team. [1] Use case document: http://hdl.handle.net/2142/98542.

Use cases 02 and 03 describe expectations for the user interfaces for group creation and basic group management, respectively. Use case 03 includes basic membership management (add/remove members, change members' roles in the group) and the user interface for finding and displaying group definitions. Use cases 05 and 06 add two "advanced" features for group management: inviting someone to join a group and requesting membership in a group.

Use case 09 describes the need to create a special kind of group: one that is actually a synchronized copy of a group maintained in another system.

Use case 10 describes the needs for programmatic interfaces to XSEDE groups: API, CLI, and SDK interfaces that enable software applications and external systems to use and manage XSEDE groups. The driving scenarios for this include XSEDE service providers (SPs), science gateways, campus bridging, federations with other cyberinfrastructure systems, and tools for use by the XSEDE staff.

Use cases 12, 13, and 14 describe how groups are used to make authorization (access control) decisions in XSEDE SP resources, XSEDE "central" services, and external services, respectively. The latter category notably includes science gateways and campus bridging

efforts.

Use cases 15 and 16 describe two additional needs for groups: project management (especially team and task assignments and tracking) and email distribution lists.

CDP summary

This CDP explains the current implementation status of these use cases and our plans to support them more fully in the XSEDE system.

Gap(s) that we currently plan to address:
- We do not expect to <u>fully address</u> any of these gaps in the near term.
- When the XSEDE management selects an XSEDE-wide multi-factor authentication mechanism, we can address the "application of multi-factor authentication" gap.
- We also plan to conduct a technology readiness assessment to identify and evaluate externally provided solutions that we can use to satisfy the remaining gaps.

Gap(s) that will <u>not</u> be addressed <u>at this time</u>:
- User-created groups
- Application of multi-factor authentication
- Basic group access controls
- Advanced group membership management features
- External group synchronization
- Programmable group access and management interface
- Support for groups in XSEDE staff tools
- Referencing XSEDE groups in external resources

Time and effort summary:
- Selecting a multi-factor authentication mechanism: ***unknown***
- Technology readiness assessment: **4.5 - 5.5 person-months** of effort
  - Identify implementation, conduct lightweight assessment, and select which ones to do a detailed assessment of: 4 person weeks
  - Detailed assessment/testing of the 2-3 top implementations: 4 weeks each
  - Analyze detailed assessments, select implementation(s), and prepare full implementation CDPs: 6 weeks

Functionality gaps

1. User-created groups (suggested priority: high)

The ability for users to create their own groups, described in GRP-02, does not exist in the current XSEDE system.

Plans: This need could be satisfied in a simple way using the existing XUP framework, but that solution would not satisfy the further needs expressed in use cases 9, 10, 12, 13, or 14. Unless some or all of those needs are also satisfied, the solution would be of little value to the community. We will conduct a technology readiness assessment to identify and evaluate solutions that have a chance of satisfying a broader set of these needs. *There are no plans to address this gap other than to conduct a technology readiness assessment activity.*

2. Application of multi-factor authentication (suggested priority: high)

The support for multi-factor authentication requirements described in use cases 2, 3, 5, 6, 9, and 12 does not exist in the current XSEDE system.

Plans: The XSEDE management is currently evaluating options for an XSEDE-wide multi-factor authentication mechanism. When a specific mechanism is selected, accessing that mechanism in the XUP and applying it to existing group management functions should not be difficult. *There are no plans to address this gap until a specific multi-factor authentication mechanism has been selected.*

3. Basic group access controls (suggested priority: low)

The basic group access controls described in use cases 2, 3, 5, and 6 do not exist in the current system.

Plans: These features could be added to the current XUP/XCDB implementation. However, given the other limitations of the current implementation (the other gaps identified in this document), it's not clear that the effort to add these features would result in a combined solution offering enough benefit to be worthwhile. We will include the need for basic group access controls in the technology readiness assessment mentioned above, as we look for a solution that satisfies a broader set of these needs. *There are no plans to address this gap other than to conduct a technology readiness assessment activity.*

4. Advanced group membership management features (suggested priority: medium)

The current XSEDE system does not include the ability to invite a member to a group (giving the individual the option to decline membership) described in use case GRP-05. It also does not include the ability for individuals to request membership in a group (giving the group manager(s)

a prompt to add the individual) described in use case GRP-06.

Plans: These features could be added to the current XUP implementation. However, it's not clear that it would be useful to the community as long as groups are only used to control membership in allocation projects. (See the other gaps identified in this document.) We will include these needs for advanced group membership management features in the technology readiness assessment mentioned above, as we look for a solution that satisfies a broader set of these needs. *There are no plans to address this gap other than to conduct a technology readiness assessment activity.*

5. External group synchronization (suggested priority: high)

The current XSEDE system does not provide a way to link an XSEDE group's membership and roles to a group defined in an external system, as described in use case GRP-09.

Plans: A solution based on XSEDE's current group implementation would require significant development effort by XSEDE staff members and would lack support for the uses of these groups described in use cases GRP-13 and GRP-14. We will include this need in the technology readiness assessment mentioned above, as we look for a solution that satisfies a broader set of these needs. *There are no plans to address this gap other than to conduct a technology readiness assessment activity.*

6. Programmable group access and management interface (suggested priority: high)

The current XSEDE system offers a limited API for accessing an individual user's group membership information, but this API does not satisfy the needs expressed in use case GRP-10. The current interface is limited to allocation project groups, is read-only, and is limited to looking up individuals, rather than groups. The API was defined by XSEDE and has no adoption or support beyond the XSEDE community. The XSEDE system provides no other programmable interface for accessing or managing (configuring) XSEDE groups.

Plans: A solution based on XSEDE's current group implementation would require a very large development effort by XSEDE staff members. We will include this need in the technology readiness assessment mentioned above, as we look for a solution that satisfies a broader set of these needs. *There are no plans to address this gap other than to conduct a technology readiness assessment activity.*

7. Support for groups in XSEDE staff tools (suggested priority: low)

The current XSEDE system does not offer group definition and management features that can be used in XSEDE staff tools as described in GRP-13, GRP-15, and GRP-16.

Plans: The XUP/XCDB group implementation currently in use could easily be extended to allow creation and management of staff groups and subgroups. In fact, the system already maintains

a single group for all XSEDE staff that is used to control basic access to some of XSEDE's staff tools (those hosted by XUP itself). However, the lack of a programmable group access and management interface (gap 6) and missing management features (gaps 1, 3, and 4) severely limits our ability to use these groups broadly in staff applications. *There are no plans to address this gap other than to conduct a technology readiness assessment activity.*

8. Referencing XSEDE groups in external resources (suggested priority: high)

The current XSEDE system does not offer group definition and management features that can be used in external resources and services (science gateways, campus bridging efforts, and other cyberinfrastructure systems) as described in GRP-14.

Plans: A solution based on XSEDE's current group implementation would require a very large development effort by XSEDE staff members. We will include this need in the technology readiness assessment mentioned above, as we look for a solution that satisfies a broader set of these needs. *There are no plans to address this gap other than to conduct a technology readiness assessment activity.*

System components that support these use cases

The following XSEDE operational components currently support these use cases.

Component	Supported Functionality
XSEDE User Portal (XUP)	The front-end (web browser-based) user interface to the XSEDE system where individuals register with XSEDE, manage their user profile information, request allocations to use XSEDE SP resources, and manage membership in projects that have active allocations.
XSEDE Central Database (XCDB)	The repository that stores XSEDE user profile data for individuals and XSEDE group definitions. Group definitions are currently used only for two purposes: XSEDE staff membership (for access to staff tools) and allocation project memberships (for permission to use resources associated with a project allocation).
AMIE	A secure messaging service that is used to share individual user identity information and XSEDE group definitions between XCDB and individual SP resources and accounting systems.

References

[1]   User Needs Assessment: XSEDE-wide Group Features. Technical Report, April 6, 2017. (https://software.xsede.org/svn-public/xci/inputs/user-needs/XSEDE-wide-groups.pdf)