XSEDE Capability Delivery Plan
CRI-1 Updated XCBC
Last Revised 2017-05-30

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 use case support gaps, of plans to fill those gaps with new or enhanced capabilities, and of existing operational components that already support aspects of a use case.

Use Case Summary

Use cases CB-02 and CB-07 describe how XCI will provide resources to enable both campus administrators and commercial service providers the resources necessary to implement 'XSEDE-like' computing environments to smooth the path to XSEDE for researchers they support. This includes reuse and local implementation of tools commonly used on XSEDE resources. The resources implemented may be available only to local users, or shared more broadly with XSEDE users, possibly for a fee, as in CB-07. This CDP deals with the capability to build an XSEDE-like HPC resource, using the XCI-provided XSEDE-Compatible Basic Cluster software stack.

Use case document (contains all CB use cases):
http://hdl.handle.net/2142/94821

CDP Summary

The functionality described in this use case is 50% supported by the operational components listed below.

Gap(s) that we currently plan to address:
- Original XCBC stack is out of date
- Improved documentation is needed for the XCBC stack

Gap(s) that will not be addressed at this time:
- This does not address integration of the XSEDE environment with an existing HPC resource, or the co-requisite documentation.

Time and effort summary:
- 12 person-weeks of effort in 2 activities

Functionality Gaps

1. Original XCBC stack is out of date (suggested priority: high)

The original XCBC stack implemented within XSEDE 1 was based on the Rocks Cluster Management software, which still requires CentOS 6 as an operating system. While the Rocks project was successful, XCI cannot suggest that institutions use an unsupported operating system for critical research computing services. The XCRI team must provide a cluster management solution that allows for the use of a modern, supported OS on new or upgraded HPC resources.

Plans: XCRI will base the new XCBC toolkit off of the OpenHPC cluster solution, which allows for a variety of RHEL-based operating systems, and is fully supported by several academic and industrial partners. The XCRI toolkit will include scripts for OpenHPC installation that are modified to provide easy integration of XSEDE-suggested software.
Best available effort and time estimate: 8 person-weeks

2. Improved documentation is needed for the XCBC stack (Priority: medium)

Building or upgrading an HPC resource is a complex process. XCRI provides the XCBC toolkit as a solution for institutions with limited time, personnel, or funding, and must also provide clear documentation in order for such a toolkit to really be useful. While the XCRI team in involved with most XCBC implementations, the toolkit is ideally useable by anyone with an interest in HPC. Support for commercial providers can also only be provided via documentation, since travel support for XCRI staff is not available for collaboration with non-academic partners.

Plans: XCRI will provide documentation alongside the XCBC toolkit that is sufficient to allow an experienced, but new to HPC, systems administrator to easily stand up a new cluster on local hardware. The documentation will take the user from bare-metal installation to an HPC cluster with working scheduler. The documentation will be tested be XCRI staff not involved in creation of the documentation or XCBC.
Best available effort and time estimate: 4 person-weeks

System Components That Support This Use Case

The following XSEDE operational components currently support this use case:
(Hyperlink the component <Name> to the XCSR Component Description Repository)

Component	Supported Functionality
XSEDE Community Software Repository	The XSEDE Community Software Repository provides XSEDE-recommended open-source software to interested institutions, and will be the prime source for XCRI toolkits. Documentation will be provided as part of the toolkit.
XSEDE User Portal	The XSEDE User Portal (XUP) provides the XSEDE knowledge base, which will hold updated articles to reflect the updated version of the XCBC.