XSEDE Federation and Interoperation Use Cases

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Version 0.1



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# Document History

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| --- | --- | --- | --- | --- |
|  | Version | Date | Changes | Author |
| First use case draft | 0.1 | 12/01/2012 | Document created | Jha, Weidner |
| Draft update on feedback | 0.2 | 12/04/2012 | List of science use cases; glossary; draft development of first 2 use cases | Jha, Weidner, Hossain |
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# Document Scope

This document is one component of a process that generates at least the following documents, some of which are user-facing, some are as of now intended to be internal working documents:

* ***This document*** - A description of use cases [User facing]
* A binary mapping of use cases to Requirements in DOORS (a binary mapping – for each use case a “yes” or “no” flag indicating whether a particular requirement within the full list of requirements is or is not required to enable a particular use case
* A set of level 3 decomposition documents, which include:
  + Quality Attributes descriptions
  + Connections diagram in UML

The use cases are presented here using the following format, derived from the Malan and Bredemeyer white paper1 as follows:

|  |  |
| --- | --- |
| Use Case | Use case identifier and reference number and modification history |
| *Description* | A scientist who is trying to utilize as many resources as possible |
| *References* | References and citations relevant to use case |
| *Actors* | End-Scientists (e.g., Chemists, climate-scientist) |
| *Prerequisites (Dependencies) & Assumptions* | User has allocation on multiple systems. |
| *Steps* | See UML Actor Diagram |
| *Variations (optional)* | The user may want to use not only existing XSEDE resources but also OSG, EGI or PRACE resources, viz. Interoperation of XSEDE Resources and Federation with non-XSEDE Resources |
| *Quality Attributes* | Overall time-to-completion is one critical component; lower the better. Other quality metrics could be the number of tasks completed. O(1000) tasks, each producting O(1GB) |
| *Non-functional (optional)* | Simplicity |
| *Issues* | List of issues that remain to be resolved |

# Glossary

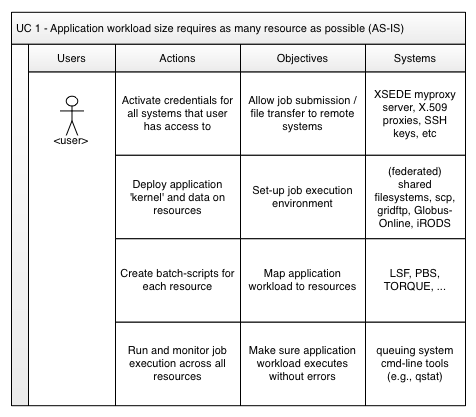
Federation: The aggregation of resources via common policies in allocation, accounting, authentication and identity management. Resources within a given “domain” are generally considered federated. Resources between different domains are federated using different models.

Interoperation: The ability to utilize distinct heterogeneous resources for a common application or user-defined goal.

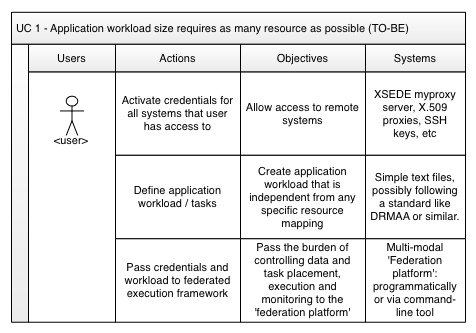
Resources within XSEDE should be deemed to be already federated but are not a priori interoperable.

# Federation and Interoperation Use Cases

Use Case Diagram: A graphical representation of the use case.



AS IS: Currently the user is unable to use multiple resources on XSEDE in an uniform fashion. Where multiple resources are used, different access modes/mechanisms are employed or significant effort/laborious pre-arrangement is required. This is neither scalable nor simple to manage. Furthermore, resources do not have direct support for different usage modes (everything is a single uniform batch queue system to the user, with no distinguishing ability), nor is the user able to execute on XSEDE resources in conjunction with other resources (such as OSG, EGI).



TO BE: The user should be able to execute tasks interoperably across different XSEDE resources which support different resource utilization models, as well as be able to utilize XSEDE resources in conjunction with OSG/EGI etc, without laborious manual pre-arrangement.