XSEDE Canonical Use Case 12:
Update Resource Information

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Version 1.2
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A. Document History

Overall Document Authors:

Ian Foster
The University of Chicago and Argonne National Laboratory
Argonne, IL 60439
foster@anl.gov

Morris Riedel Jülich Supercomputing Centre
Forschungszentrum Jülich GmbH
D-52425 Jülich
Germany

Felix Bachmann
Carnegie Mellon University
4500 5th Avenue
Pittsburgh, PA 15213
fb@sei.cmu.edu

Andrew Grimshaw
University of Virginia
PO Box 400740
Charlottesville VA 22904
grimshaw@virginia.edu

David Lifka
Cornell University
512 Frank H. T. Rhodes Hall
Ithaca, NY 14853
lifka@cac.cornell.edu

Warren Smith
Texas Advanced Computer Center
10100 Burnet Road
Austin, TX 78758-4497
wsmith@tacc.utexas.edu

John-Paul Navarro
<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Changes</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>First use case draft</td>
<td>0.1</td>
<td>3/21/2013 Document created</td>
<td>Foster, Grimshaw, Hossain, Lifka, Riedel, Tuecke</td>
</tr>
<tr>
<td>Revised draft</td>
<td>1.0</td>
<td>9/28/13 Clean up formatting; Separate from UCCAN 8; prepare for archiving</td>
<td>Brown</td>
</tr>
<tr>
<td>Near final draft</td>
<td>1.1</td>
<td>11/13/13 Split 7,8 into 7,8,11,12; incorporate ADR reviewer feedback</td>
<td>Navarro, Smith</td>
</tr>
<tr>
<td>Final Draft</td>
<td>1.2</td>
<td>3/27/2014 Cleaned up some terms.</td>
<td>Navarro</td>
</tr>
</tbody>
</table>
B. Document Scope

This document is both a user-facing document (publically accessible) and an internal working document intended to define user needs and use cases that fall within the overall activities of XSEDE. The definition of use cases is based on a template from Malan and Bredemeyer\(^1\). In general it is in keeping with the approaches and philosophy outlined in “Software architecture in practice.”\(^2\)

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 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 paper\(^1\) as follows:

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Use case identifier and reference number and modification history</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Goal to be achieved by use case and sources for requirement</td>
</tr>
<tr>
<td><strong>References</strong></td>
<td>References and citations relevant to use case</td>
</tr>
<tr>
<td><strong>Actors</strong></td>
<td>List of actors involved in use case</td>
</tr>
</tbody>
</table>
| **Prerequisites (Dependencies) & Assumptions** | Conditions that must be true for use case to be possible
|                   | Conditions that must be true for use case to terminate successfully |
| **Steps**         | Interactions between actors and system that are necessary to achieve goal |
| **Variations (optional)** | Any variations in the steps of a use case                        |
| **Quality Attributes** |                                                                      |

\(^2\) Bass, L., P Paul Clements, and Rick Kazman
Non-functional (optional) | List of non-functional requirements that the use case must meet
---|---
Issues | List of issues that remain to be resolved

## C. Related Use Cases

Canonical Use Cases (UCCAN) 7.0, 8.0, 11.0, and 12.0 reflect two different forms of information system: first an asynchronous publish subscribe mechanism in which consumers can subscribe to topics and publishers can publish on topics, and second a form akin to a centralized registry or database in which publishers synchronously update information that can be subsequently queried by consumers. As a consequence asynchronous pub/sub systems are typically used when high volume message transport is required and data validation is less important. In these systems accepted messages are not immediately available to subscribers. By contrast, synchronous add/update/query systems are typically used when information validation is more important and publishers need confirmation that information was successfully updated and is available immediately to users.

Examples of information that may be available thru update query:

- Resource description and characteristics information
- Software description, characteristics, and availability information
- Project/allocation information
- User information
# D. Canonical Use Case 12

<table>
<thead>
<tr>
<th>Use Case UCCAN 12.0</th>
<th>Update Resource Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Synchronously add or update resource information in the information system.</td>
</tr>
<tr>
<td><strong>References</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Actors</strong></td>
<td>Publisher: publishes resource information to the Information System</td>
</tr>
</tbody>
</table>
| **Prerequisites (Dependencies) & Assumptions** | ● The Publisher knows how to contact and communicate with the Information System.  
● The term “information system” does not imply a single central service.  
● The Publisher is responsible for the quality of the published information (e.g., it is accurate, it is up to date, it conforms to any specified schemas).  
● Publishers include appropriate timestamps and validity time (time to live) in the resource information they update.  
● The Publisher has authenticated to the Information System and has been authorized.  
● Publishers must be able to communicate securely with the information system when they wish to.  
● Publishers will comply with XSEDE wide information policies. |
| **Steps**           | 1. The Publisher obtains resource information that it needs to update.  
2. The Publisher sends resource information to the Information System.  
3. Optionally, the Information System validates the resource information against the validation rules, and rejects the resource information if it does not conform.  
4. The Information System acknowledges acceptance of the information (i.e., Publisher can be assured the resource information has been updated in the Information System).  
5. If the Publisher has additional resource information, return to step 2. |
| **Variations (optional)** | Related use case UCCAN 11.0 describes an alternate approach for publishing resource information. |
| **Quality Attributes** | When the information system is providing acknowledgements to the Publisher, the amount of time it takes to publish information and receive |
acknowledgement is less than 5 second. [source: A&D]
The aggregate rate at which all Publishers can update information: 2 updates/sec and 100 KB/sec. [source: job state updates rates]
The amount of resource information that can be stored by the Information System: 100 million entries, 100 GB of data total. [source: job volume, accounting volume]
Information that does not conform with specified schemas and integrity rules will be rejected by the Information System 99.999% of the time. [source: A&D]
Update requests that conform with specified schemas and integrity rules will succeed 99.9% of the time. [source: A&D]
Once information has successfully been accepted by the system, it will be available for retrieval in the system for one year 99% of the time unless it is explicitly deleted. [source: A&D]

<table>
<thead>
<tr>
<th>Non-functional (optional)</th>
<th>Update-query software is easy to install and support. [source SPs] Update-query interfaces are simple and well documented. [source SPs]</th>
</tr>
</thead>
</table>

Issues