HPC Profile WG

Marty Humphrey, co-chair

Department of Computer Science
University of Virginia
Charlottesville, VA

Monday Oct 15 2007
11:00am – 12:30pm

Agenda

- **Document status**
- **SC07 demo planning**
- **Discussion of extensions**
  - Activity Credential
  - File Staging
  - Activity Filters (incl. in HPC Basic Profile)
- **SC07 Marketing plans: OGF interop press release, product press releases, signs on booths**
- **Participation in BES++ (sourceforge)**

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GFD-I.100
OGSA HPC Profile WG

Marvin Theimer, Microsoft
Chris Smith, Platform Computing
Marty Humphrey, University of Virginia

July 1, 2006

HPC Job Scheduling: Base Case and Common Cases

Status of This Document

This document provides information to the Grid community on batch job scheduling of scientific/technical applications, also broadly referred to as the "core" high performance computing (HPC) use case. It does not define any standards or technical recommendations. Distribution is unlimited.

Copyright Notice

Abstract

This document describes the set of use cases for batch job scheduling of scientific/technical applications, also broadly referred to as the core high performance computing (HPC) use case. A simple base case is defined that we expect to have universally implemented by all batch job scheduling clients and schedulers. Additional "Common Cases" are enumerated, which are anticipated to be applicable to at least two but not all batch job scheduling clients and schedulers.

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GFD-R-P.108
Open Grid Services Architecture Basic Execution Service

Authors:

I. Foster, Argonne National Laboratory
A. Grimshaw, U. Virginia
P. Lane, Argonne National Laboratory
W. Lee, Imperial College London
M. Morgan, U. Virginia
S. Newhouse, U. Southampton
S. Pickles, U. Manchester
D. Pulsipher, EMC
C. Smith, Platform
M. Theimer, Microsoft

http://forge.gridforum.org/projects/ogsa-bes-wg

8/8/2007

OGSA Basic Execution Service

Version 1.0

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GFD-R-P.111
JSDL-WG

Marty Humphrey, UVA
Chris Smith, Platform Computing
Marvin Theimer, Microsoft
Glenn Wasson, UVA
August 28, 2007

JSDL HPC Profile Application Extension, Version 1.0

Status of This Document

This document provides information to the Grid community regarding the specification of the HPC Profile Application. Distribution is unlimited.

Copyright Notice

Abstract

This document specifies the semantics and structure of the HPC Profile Application. The HPC Profile Application is an extension to JSDL 1.0 [JSDL10] that is used to describe an executable running as an operating system process. The document includes the normative XML Schema for the HPC Profile Application, along with examples of documents based on this schema.

Contents

GFD.114.pdf - Adobe Reader

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GFD-R-P.114
HPC Basic Profile

http://forge.gridforum.org/projects/ogsa-hpcp-wg

Authors:
Blair Dillaway, Microsoft
Marty Humphrey, University of Virginia
Chris Smith, Platform (Editor)
Marvin Theimer, Microsoft
Glenn Wasson, University of Virginia

August 28, 2007

HPC Basic Profile, Version 1.0

Status of this Document

This document provides information to the Grid community regarding the specification of the HPC Basic Profile. Distribution is unlimited.

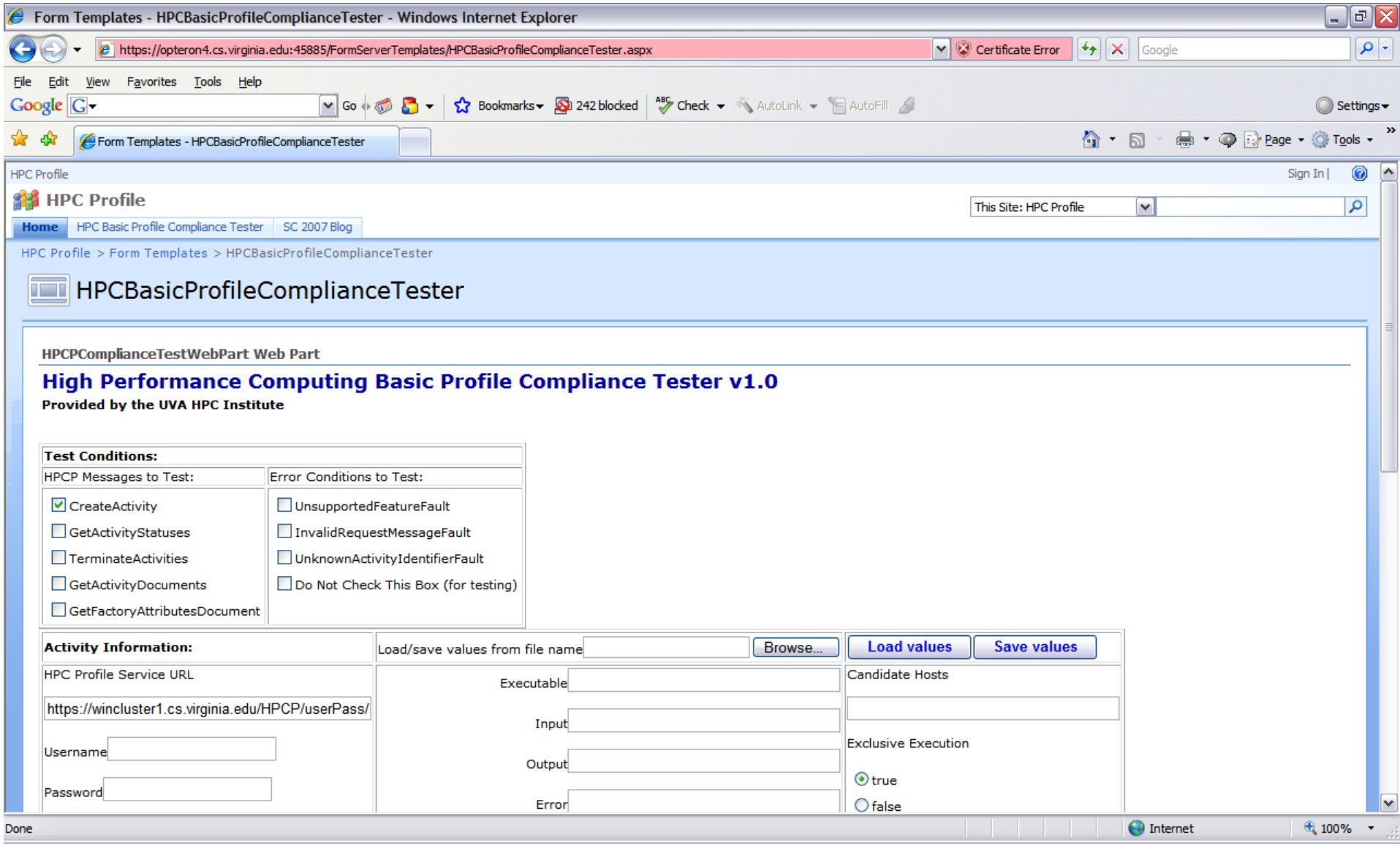
Copyright Notice

Abstract

This document defines the HPC Basic Profile, consisting of a set of non-proprietary specifications, along with clarifications, refinements, interpretations and amplifications of those specifications

To become "Grid Recommendation"

- **Remain as a proposed recommendation for at least 6 months (Feb 28 2008) – ASAP**
- **Demonstrate at least two interoperable implementations documented in the form of an "Experience" document**
- **Go through a 4 month review by at least 3 experts in the subject matter and context of the work**
- **Be approved by the GFSG verifying the feasibility and utility of the recommendation**


Form Templates - HPCBasicProfileComplianceTester - Windows Internet Explorer
https://opteron4.cs.virginia.edu:45885/FormServerTemplates/HPCBasicProfileComplianceTester.aspx
Certificate Error
Google
File Edit View Favorites Tools Help
Bookmarks
242 blocked
Check
AutoLink
AutoFill
Settings
Form Templates - HPCBasicProfileComplianceTester
Page
Tools
HPC Profile
Sign In
HPC Profile
This Site: HPC Profile
Home
HPC Basic Profile Compliance Tester
SC 2007 Blog
HPC Profile > Form Templates > HPCBasicProfileComplianceTester
HPCBasicProfileComplianceTester
HPCPComplianceTestWebPart Web Part
High Performance Computing Basic Profile Compliance Tester v1.0
Provided by the UVA HPC Institute
Test Conditions:
HPCP Messages to Test:
CreateActivity
GetActivityStatuses
TerminateActivities
GetActivityDocuments
GetFactoryAttributesDocument
Error Conditions to Test:
UnsupportedFeatureFault
InvalidRequestMessageFault
UnknownActivityIdentifierFault
Do Not Check This Box (for testing)
Activity Information:
Load/save values from file name
Browse...
Load values
Save values
HPC Profile Service URL
https://wincluster1.cs.virginia.edu/HPCP/userPass/
Username
Password
Executable
Input
Output
Error
Candidate Hosts
Exclusive Execution
true
false
Done
Internet
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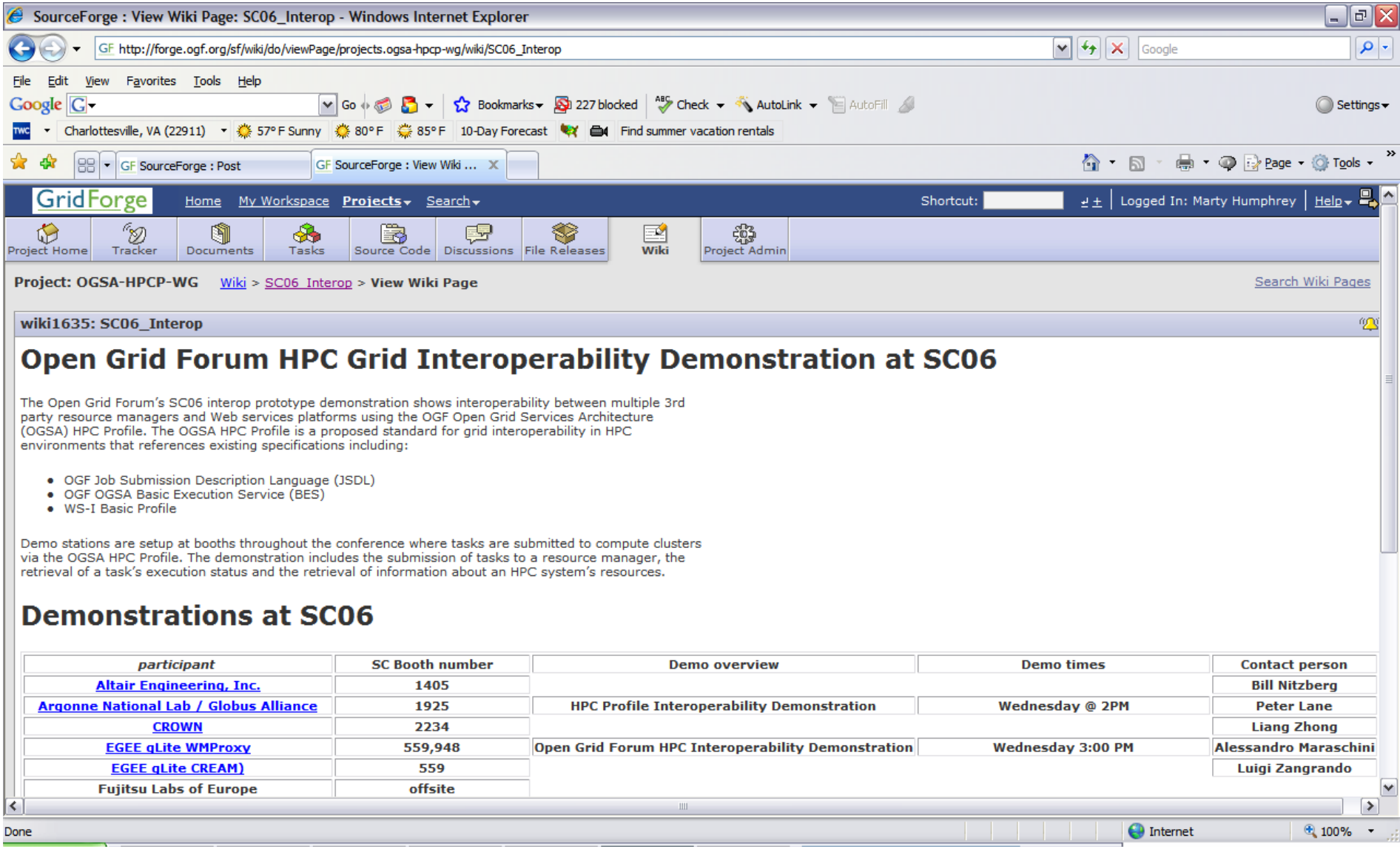
SourceForge : View Wiki Page: SC06_Interop - Windows Internet Explorer
http://forge.ogf.org/sf/wiki/do/viewPage/projects.ogsa-hpcp-wg/wiki/SC06_Interop
GridForge
Home
My Workspace
Projects
Search
Logged In: Marty Humphrey
Help
Project Home
Tracker
Documents
Tasks
Source Code
Discussions
File Releases
Wiki
Project Admin
Project: OGSA-HPCP-WG
Wiki > SC06_Interop > View Wiki Page
Search Wiki Pages
wiki1635: SC06_Interop
Open Grid Forum HPC Grid Interoperability Demonstration at SC06
The Open Grid Forum's SC06 interop prototype demonstration shows interoperability between multiple 3rd party resource managers and Web services platforms using the OGF Open Grid Services Architecture (OGSA) HPC Profile. The OGSA HPC Profile is a proposed standard for grid interoperability in HPC environments that references existing specifications including:
OGF Job Submission Description Language (JSDL)
OGF OGSA Basic Execution Service (BES)
WS-I Basic Profile
Demo stations are setup at booths throughout the conference where tasks are submitted to compute clusters via the OGSA HPC Profile. The demonstration includes the submission of tasks to a resource manager, the retrieval of a task's execution status and the retrieval of information about an HPC system's resources.
Demonstrations at SC06
participant
SC Booth number
Demo overview
Demo times
Contact person
Altair Engineering, Inc.
1405
Bill Nitzberg
Argonne National Lab / Globus Alliance
1925
HPC Profile Interoperability Demonstration
Wednesday @ 2PM
Peter Lane
CROWN
2234
Liang Zhong
EGEE gLite WMProxy
559,948
Open Grid Forum HPC Interoperability Demonstration
Wednesday 3:00 PM
Alessandro Maraschini
EGEE gLite CREAM)
559
Luigi Zangrando
Fujitsu Labs of Europe
offsite
Done
Internet
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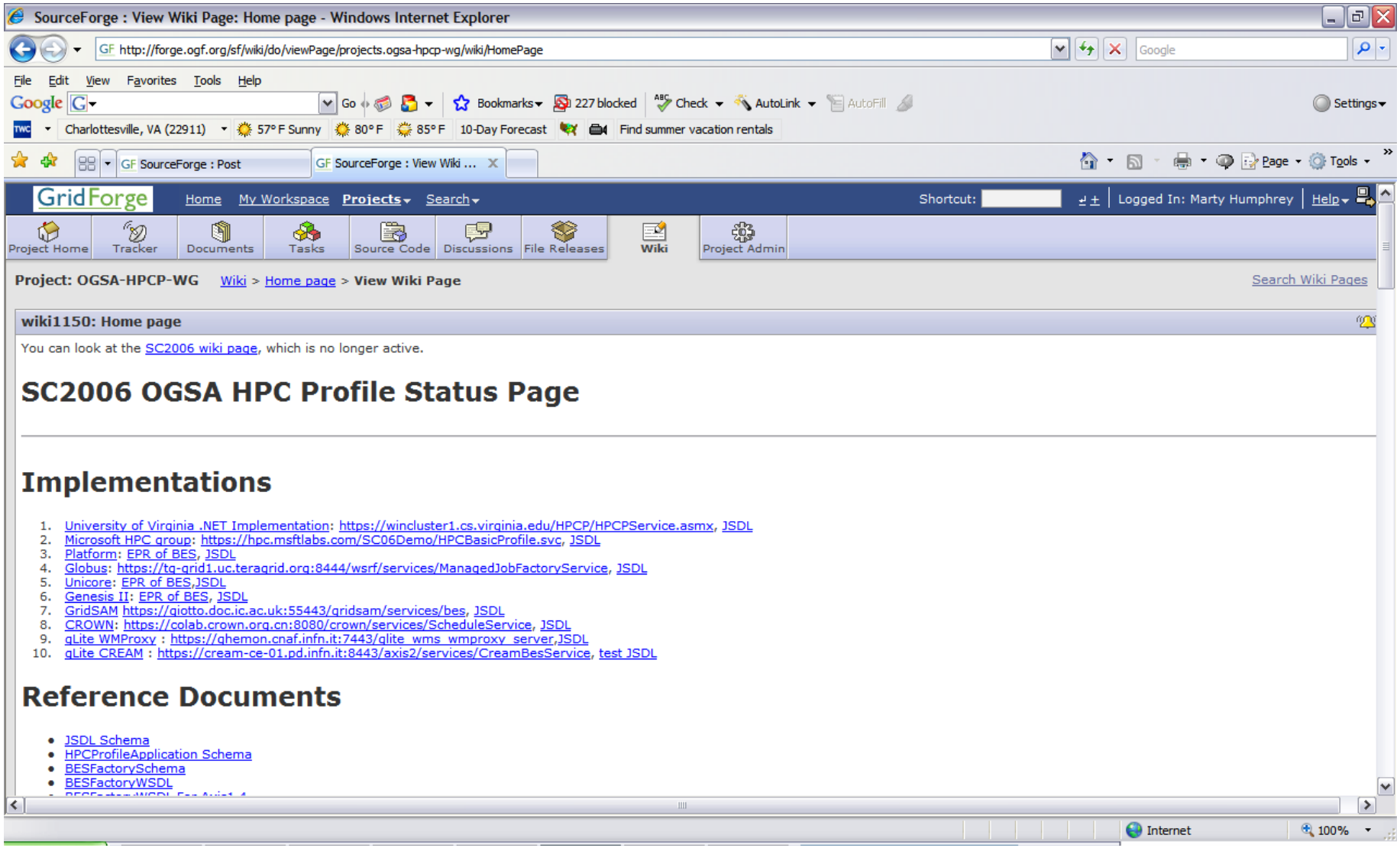
SourceForge : View Wiki Page: Home page - Windows Internet Explorer
http://forge.ogf.org/sf/wiki/do/viewPage/projects.ogsa-hpcp-wg/wiki/HomePage
GridForge
Home
My Workspace
Projects
Search
Shortcut:
Logged In: Marty Humphrey
Help
Project Home
Tracker
Documents
Tasks
Source Code
Discussions
File Releases
Wiki
Project Admin
Project: OGSA-HPCP-WG
Wiki > Home page > View Wiki Page
Search Wiki Pages
wiki1150: Home page
You can look at the SC2006 wiki page, which is no longer active.
SC2006 OGSA HPC Profile Status Page
Implementations
1. University of Virginia .NET Implementation: https://wincluster1.cs.virginia.edu/HPCP/HPCPService.asmx, JSDL
2. Microsoft HPC group: https://hpc.msftlabs.com/SC06Demo/HPCBasicProfile.svc, JSDL
3. Platform: EPR of BES, JSDL
4. Globus: https://tg-grid1.uc.teragrid.org:8444/wsrf/services/ManagedJobFactoryService, JSDL
5. Unicore: EPR of BES,JSDL
6. Genesis II: EPR of BES, JSDL
7. GridSAM https://giotto.doc.ic.ac.uk:55443/gridsam/services/bes, JSDL
8. CROWN: https://colab.crown.org.cn:8080/crown/services/ScheduleService, JSDL
9. gLite WMProxy : https://ghemon.cnaf.infn.it:7443/glite_wms_wmproxy_server,JSDL
10. gLite CREAM : https://cream-ce-01.pd.infn.it:8443/axis2/services/CreamBesService, test JSDL
Reference Documents
JSDL Schema
HPCProfileApplication Schema
BESFactorySchema
BESFactoryWSDL
Internet
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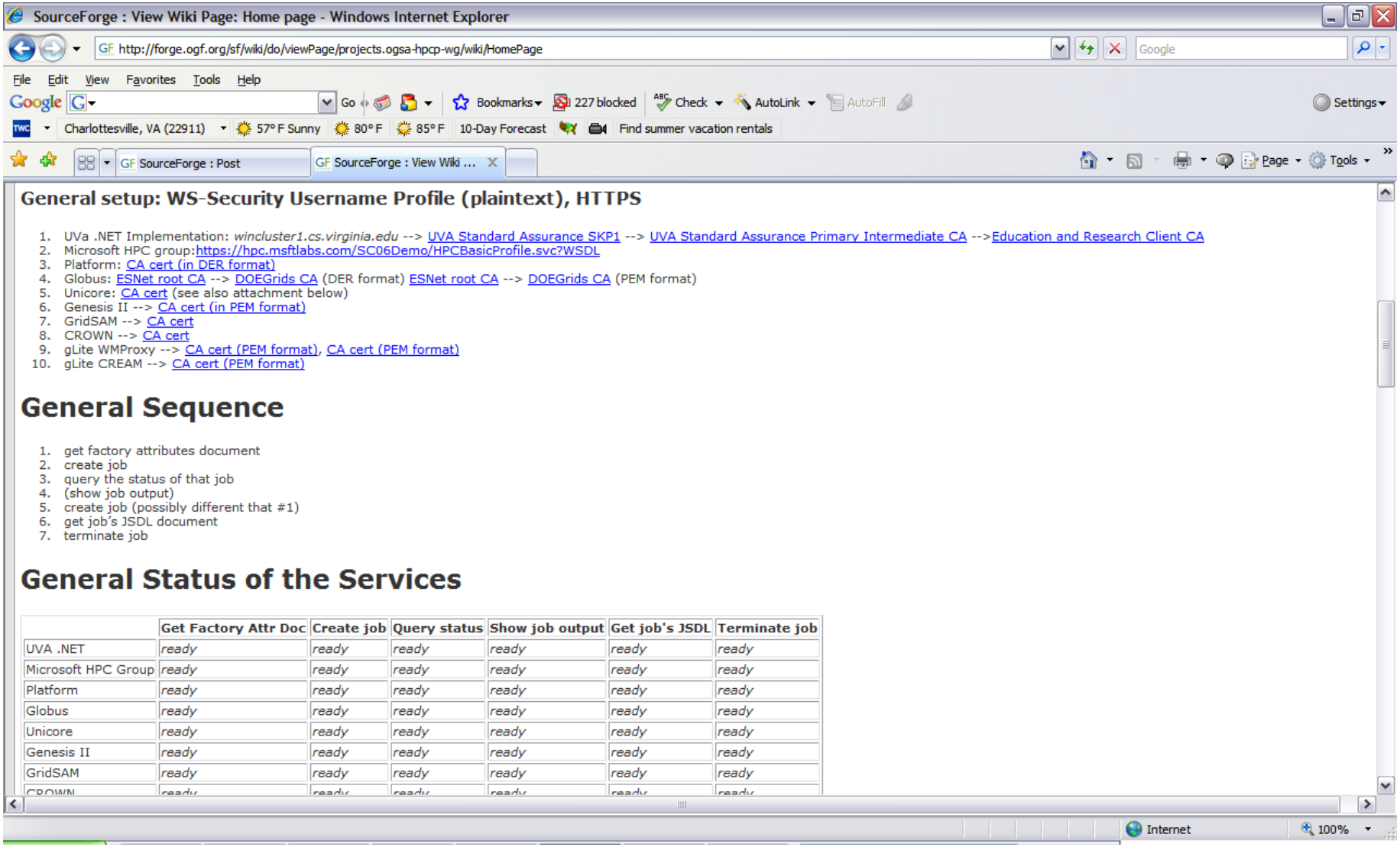
SourceForge : View Wiki Page: Home page - Windows Internet Explorer
http://forge.ogf.org/sf/wiki/do/viewPage/projects.ogsa-hpcp-wg/wiki/HomePage
File Edit View Favorites Tools Help
SourceForge : Post
SourceForge : View Wiki ...
General setup: WS-Security Username Profile (plaintext), HTTPS
1. UVa .NET Implementation: wincluster1.cs.virginia.edu --> UVA Standard Assurance SKP1 --> UVA Standard Assurance Primary Intermediate CA -->Education and Research Client CA
2. Microsoft HPC group:https://hpc.msftlabs.com/SC06Demo/HPCBasicProfile.svc?WSDL
3. Platform: CA cert (in DER format)
4. Globus: ESNet root CA --> DOEGrids CA (DER format) ESNet root CA --> DOEGrids CA (PEM format)
5. Unicore: CA cert (see also attachment below)
6. Genesis II --> CA cert (in PEM format)
7. GridSAM --> CA cert
8. CROWN --> CA cert
9. gLite WMProxy --> CA cert (PEM format), CA cert (PEM format)
10. gLite CREAM --> CA cert (PEM format)
General Sequence
1. get factory attributes document
2. create job
3. query the status of that job
4. (show job output)
5. create job (possibly different that #1)
6. get job's JSDL document
7. terminate job
General Status of the Services
Get Factory Attr Doc | Create job | Query status | Show job output | Get job's JSDL | Terminate job
UVA .NET | ready | ready | ready | ready | ready | ready
Microsoft HPC Group | ready | ready | ready | ready | ready | ready
Platform | ready | ready | ready | ready | ready | ready
Globus | ready | ready | ready | ready | ready | ready
Unicore | ready | ready | ready | ready | ready | ready
Genesis II | ready | ready | ready | ready | ready | ready
GridSAM | ready | ready | ready | ready | ready | ready
Internet
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SC06_Interop.pdf - Adobe Reader

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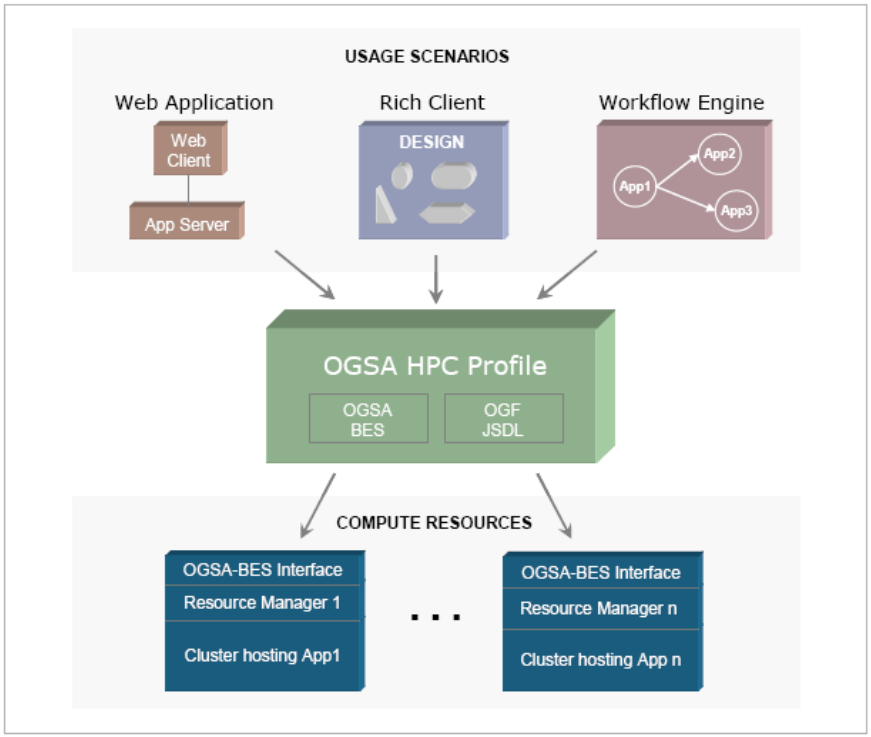
Applications and Usage

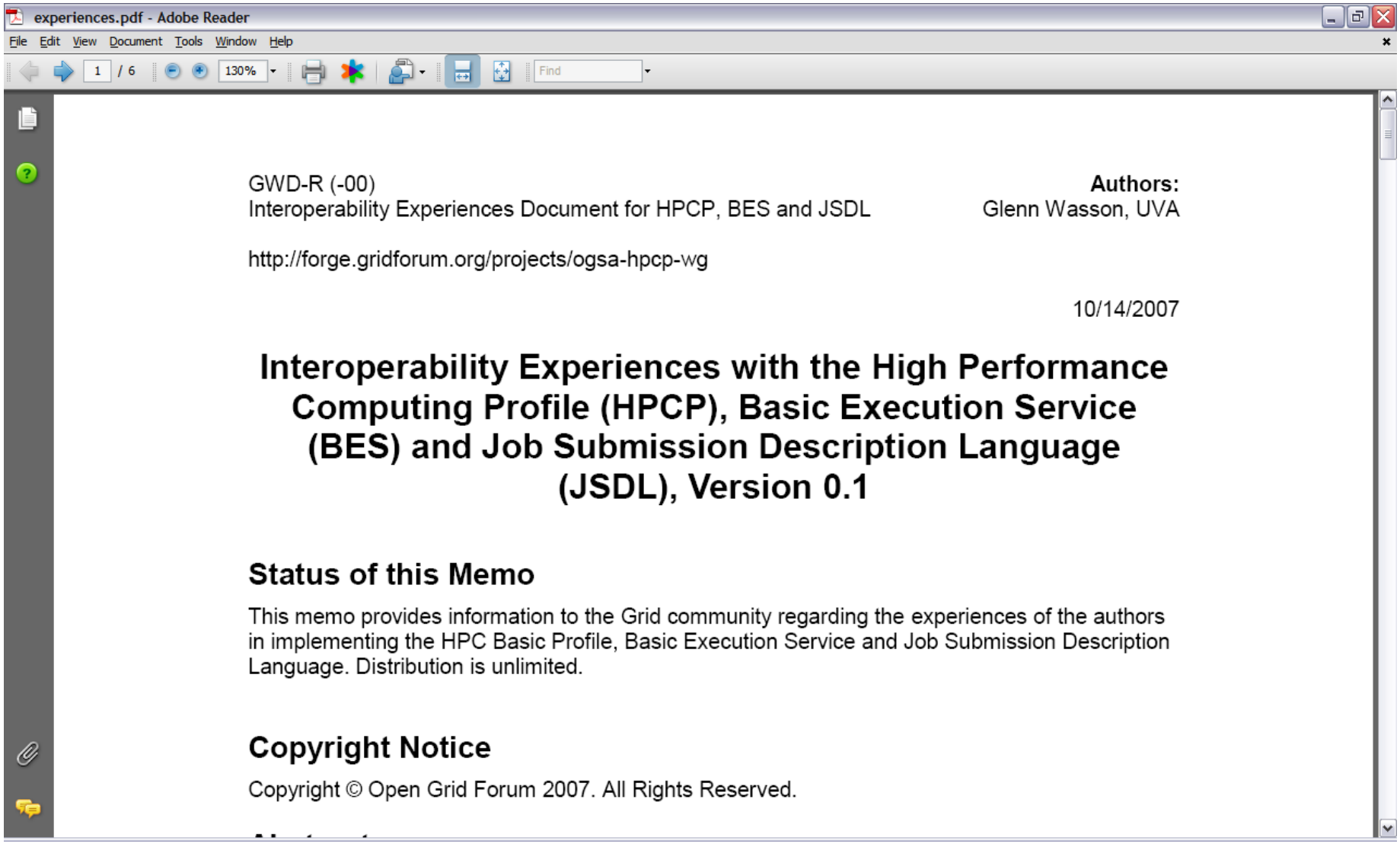


HPC Grid Interoperability Demonstration

The diagram illustrates how the OGSA HPC Profile is leveraged to support various usage scenarios. The

SC2007 Demo

- **Goal: implementation experience doc for HPC Basic Profile v1.0**
  - Changes since SC 2006
    - Security section added to HPC Basic Profile (incl. X509)
    - Modifications to enhance interoperability
- **Development and implementation experiences of three extensions**
  - Activity Credential
  - File Staging
  - Activity Filters



GWD-R (-00)
Interoperability Experiences Document for HPCP, BES and JSDL

Authors:
Glenn Wasson, UVA

http://forge.gridforum.org/projects/ogsa-hpcp-wg

10/14/2007

Interoperability Experiences with the High Performance Computing Profile (HPCP), Basic Execution Service (BES) and Job Submission Description Language (JSDL), Version 0.1

Status of this Memo

This memo provides information to the Grid community regarding the experiences of the authors in implementing the HPC Basic Profile, Basic Execution Service and Job Submission Description Language. Distribution is unlimited.

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SC 2007 Participants (from phone calls)

- University of Virginia (Humphrey/Wasson)
  - .NET
  - BES++ (PBS)
- Microsoft (.NET)
- Platform (BES++)
- OMII-UK (GridSAM)
- Altair (Java Client)
- University of Virginia (Grimshaw)
- EGEE (gLite?)
- Condor? CROWN? Fujitsu? HP? Tokyo Inst Tech?

Process

- **Add endpoints to Forge.ogf.org wiki**
  - WSDL indicates support for authentication tokens

Extensions

- **Activity Credential**
- **File Staging**
- **Activity Filters**

HPC_Activity_Cred_Extension_v0.1.pdf - Adobe Reader

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GWD-R (-00)

Authors:
Jim Basney, NCSA/UIUC
Blair Dillaway, Microsoft
Marty Humphrey, UVA (Editor)
Glenn Wasson, UVA

http://forge.gridforum.org/projects/ogsa-hpcp-wg

7/20/2007

HPC Common Case Profile: Activity Credential, V. 0.1

Status of this Memo

This memo provides information to the Grid community regarding the specification of the HPC Common Case Profile: Activity Credential. Distribution is unlimited.

Copyright Notice

Abstract

This document defines the HPC Common Case Profile: Activity Credential, which defines a mechanism by which to transmit one or more “activity credentials” to an HPC Basic Profile-compliant Web service. An “Activity Credential” is not used for authentication to the HPC Basic Profile-

HPC Data Staging Profile.pdf - Adobe Reader

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GWD-R (-00)
HPCP Data Staging Profile

http://forge.gridforum.org/projects/ogsa-hpcp-wg

Authors:
Glenn Wasson, UVA
Marty Humphrey, UVA

10/14/2007

HPC Data Staging Profile, Version 0.1

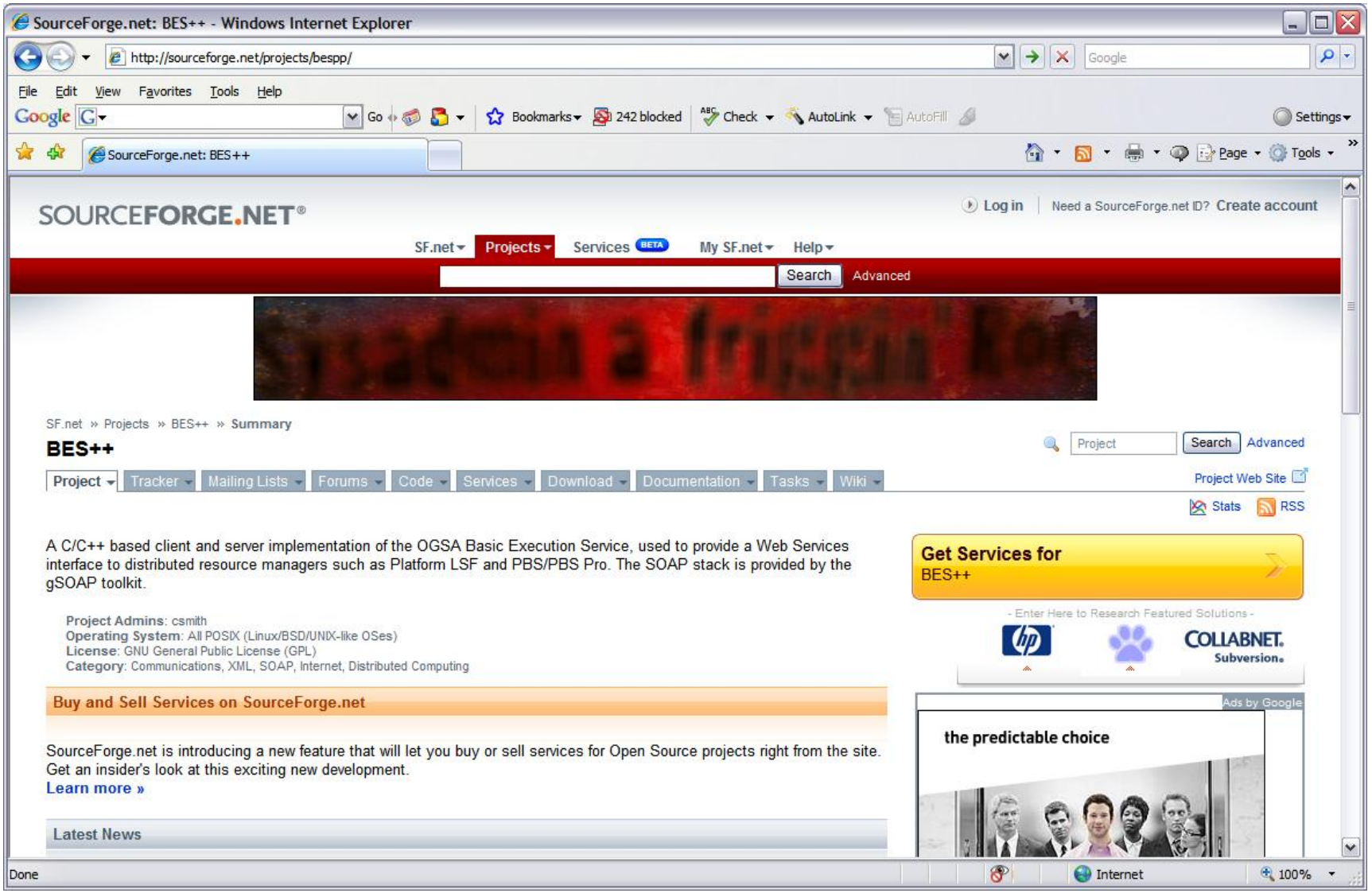
Status of this Memo

This memo provides information to the Grid community regarding the specification of the HPC Data Staging Profile. Distribution is unlimited.

Copyright Notice

Abstract

This document profiles the DataStaging capabilities of the Job Submission Description Language (JSDL) for use in HPC Basic Profile compliance services. It includes clarifications, refinements, interpretations and amplifications of JSDL which promote interoperability.


SourceForge.net: BES++ - Windows Internet Explorer
http://sourceforge.net/projects/bespp/
SourceForge.net: BES++
SOURCEFORGE.NET®
Log in | Need a SourceForge.net ID? Create account
SF.net Projects Services BETA My SF.net Help
Search Advanced
SF.net » Projects » BES++ » Summary
BES++
Project Tracker Mailing Lists Forums Code Services Download Documentation Tasks Wiki
Project Search Advanced
Project Web Site
Stats RSS
A C/C++ based client and server implementation of the OGSA Basic Execution Service, used to provide a Web Services interface to distributed resource managers such as Platform LSF and PBS/PBS Pro. The SOAP stack is provided by the gSOAP toolkit.
Project Admins: csmith
Operating System: All POSIX (Linux/BSD/UNIX-like OSes)
License: GNU General Public License (GPL)
Category: Communications, XML, SOAP, Internet, Distributed Computing
Get Services for BES++
- Enter Here to Research Featured Solutions -
COLLABNET. Subversion.
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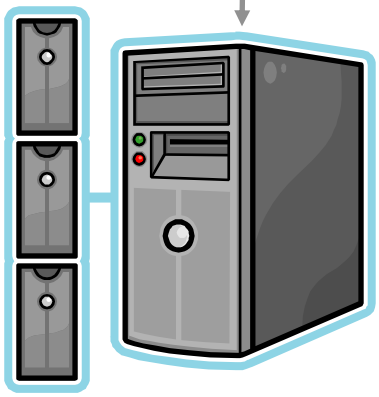
BES++ project

- **Implements:**
  - OGSA BES v0.X , bes-factory port type
  - HPC Basic Profile, v0.1
  - LSF cluster interface
  - Client password-based authentication
- **Desirable features:**
  - Support last versions of BES and HPC Basic Profile
  - Add SSL mutual authentication
  - Add extensions: activity credential and data staging
  - Better use of gSOAP structures

BES++ UVA modifications

- **SSL mutual authentication**
- **Support of updated versions of:**
  - HPC Basic Profile v0.3
  - OGSA BES 1.0, bes-factory port type
- **Extensions:**
  - HPC Profile Activity Credential v0.2
  - Data Staging: HTTP, FTP, SCP, GridFTP protocols
- **Extensible: added cluster independent interface**
- **PBS cluster interface**

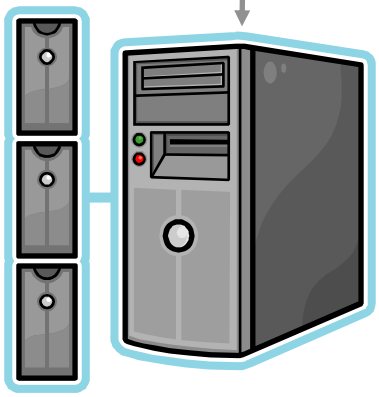


BES++ server connected to PBS cluster

```
<ActivityDocument>
  <JobDefinition>
    <JobDescription>
     <JobIdentification>
        <JobName>Cat</JobName>
     </JobIdentification>
     <Application >
       <HPCProfileApplication>
        <Executable>cat</Executable>
        <Input>test.txt</Input>
        <Output>
          /home/ar5je/output.txt
        </Output>
        <UserName>ar5je</UserName>
       </HPCProfileApplication>
     </Application>
    <JobDescription>
  <JobDefinition>
</ActivityDocument>
```

BES++ client

TLS/SSL SOAP envelope

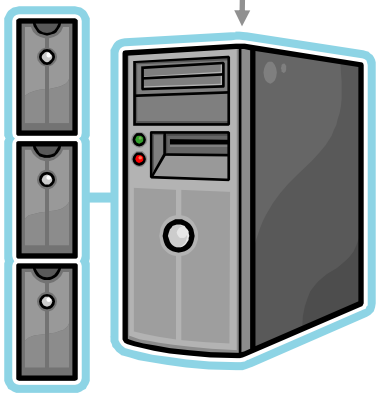


BES++ server connected to PBS cluster

```
<ActivityDocument>
 <JobDefinition>
  <JobDescription>…

   <HPCProfileApplication>…

   <DataStaging>
    <FileName>test.txt</FileName>
    <Source>
     <URI>
      ftp://ftpserver.es/home/ar5je/file.txt
     </URI>
    </Source>
   </DataStaging>

  </JobDescription>
 </JobDefinition>
</ActivityDocument>
```

BES++ client

TLS/SSL SOAP envelope



BES++ server connected to PBS cluster

```
<ActivityDocument>
 <JobDefinition>…
    <HPCProfileApplication>…
    <DataStaging>
     <FileName>test.txt</FileName>
     <Target>
      <URI>
          gsiftp://gridftpserver.es/tmp/myfile.txt
      </URI>
     </Target>
    </DataStaging>…
 </JobDefinition>
<ActivityCredentials>
 <Credential>
    <UsernameToken>
      <Username>ar5je</Username>
      <Password>pass</Password>
    </UsernameToken>
    <AppliesTo>
       myproxy://myproxy.ncsa.uiuc.edu
    </AppliesTo>
 </Credential>
</ActivityCredentials>
</ActivityDocument>
```

BES++ client

TLS/SSL SOAP envelope

BES++ mods (soon)

- **PAM support**
- **Kerberos**
  - Initial authentication
  - Activity credential
- **Client enhancements**
- **GLUE schema support**
- **SGE support**

- **Automated building support**

Next Steps / Deadlines / Milestones: SC 2007 Demo

- **Create Wiki (UVa)**
- **Add endpoints**

Next Steps / Deadlines / Milestones: Experiences Doc

- **1st draft of experiences doc: authors?**
- **Draft: Nov1, Public Comment: Nov 23 (1 week after SC)**

Next Steps / Deadlines / Milestones: Activity Credential and File Staging

- **Implementations**
- **Interop testing**