



Fact-Sheet OGSA – BES

Context

- Open Grid Forum (OGF) OGSA – Basic Execution Service (OGSA – BES) specification
- Interface to which clients can send requests to initiate, monitor and manage computational activities
- Clients define activities using the Job Submission Description Language (JSDL)

Description

- A OGSA - BES implementation executes each activity that it accepts on a computational resource
- A JSDL document describes a single activity
- The BES CreateActivity operations returns a WS-Addressing Endpoint Reference (EPR) which clients can subsequently use to refer to the new activity.
- OGSA-BES includes an extensible resource model and state model for activities
- State model: During its execution an activity passes through various states
 - (a) Basic state model: every activity is initially Pending, Running and finally either Finished, Terminated or Failed
 - (b) Extensions by which the basic state model can be extended by defining sub-states within a specific BES implementation (e.g. data staging specialization profile)
- Resource model:
 - BES requires that all BES implementations must support a simple operation for retrieving all attributes in a single document (e.g. WSRF-/WS-Notification with the port-Types of BES)
- It defined an extensible information model for a BES and the activities that it creates
- Information model: BES implementations want to expose different properties depending on different computational resources to which they provide access and the types of activity that they support
 - (a) A set of attributes that any implementation of BES must recognize
 - (b) But many of those attributes can be optional
 - (c) Extending the set of information by defining additional attributes
- OGSA-BES consists of three portTypes:
- (1) BES-Management (used by system administrators)
 - Defines operations for managing the BES itself
- (2) BES-Factory (used by ordinary clients)
 - Defines operations for initiating, monitoring, and managing sets of activities
 - Accessing information about the BES (e.g. number of activities it currently has instantiated)
- (3) BES-Activity (used by ordinary clients)
 - Defines operations for the monitoring and managing individual activities

OGSA WSRF Basic Profile 1.0 Rendering

- In addition to BES-Management and BES-Factory port-types, the WS-ResourceProperties, WS-ResourceLifetime and WS-BaseNotification port-types must be supported
- All attributes given in the specification should appear as WS-ResourceProperties with Qnames (e.g. {<http://schemas.ggf.org/bes/2006/08/bes-management>}TotalNumberOfActivities)

BES – Management PortType (Attributes and Operations)

- Operations
 - StopAcceptingNewActivities
 - StartAcceptingNewActivities
- No Attributes



BES – Factory PortType (Attributes and Operations)

- Operations
 - CreateActivity (ActivityDocumentType ActivityDocument) : EPR
 - GetActivityStatuses (EPR[] ActivityIdentifier) : GetActivityStatusResponseType[]
 - TerminateActivities (EPR[] activities): TerminateActivityResponseType[]
 - GetActivityDocuments (EPR[] ActivityIdentifiers) : GetActivityDocumentResponseType[]
 - GetAttributesDocument (none) : BESResourceAttributesDocumentType
- Attributes
 - IsAcceptingnewActivities
 - CommonName (Short human-readable name for BES)
 - LongDescription
 - TotalNumberOfActivities
 - ActivityReference (EPRs to activities currently active in BES)
 - ContainedResourceAttributes (TBD)
 - NamingProfile (URIs of Naming profiles used by BES)
 - BESExtensions (URIs of supported BES extensions)
 - LocalResourceManagerType
 - OperatingSystem
 - CPUArchitecture
 - CPUCount
 - CPUSpeed
 - PhysicalMemory
 - VirtualMemory

BES – Factory PortType (Attributes and Operations)

- No Operations
- Attributes
 - Status
 - ActivityDocument
 - FactoryReference

Many Extensions

- Idempotent Execution Semantics
 - Should a BES implementation receive a second CreateActivity request that includes the same identifier as a previously received request, the BES implementation must not create the requested activity a second time if it already created the activity for the first request
- Subscription to Notification Events
 - A BES implementation that allows its clients to subscribe for messages concerning activity state changes must do so using either the WS-Eventing or WS-Notification protocols.
- Lifetime Management
 - A BES implementation that uses WS-ResourceLifetime should use a dedicated element to indicate the requestor's suggestion for the initial setting of the termination time.

Links

- <https://forge.gridforum.org/projects/ogsa-bes-wg/>