GRID SECURITY for Grid Computing

as Implemented in the Globus Toolkit

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Layers of Grid Security
Grid Security – Outline

- Security components of the Globus Toolkit
- GSI certificates
- What is a Web service?
- Grid security with Web services
- Web service software requirements
- Demo
- Conclusions
- References
Grid Security Components of the Globus Toolkit

- Grid Security Infrastructure (GSI)
- Authentication via Certificate Authority (CA)
- Community Authorization Service (CAS)
- Web Service (WS) security
GSI Certificates (for Globus) include the following:

- A subject name, which identifies the person or object that the certificate represents.
- The public key that belongs to the subject.
- The identity of a Certificate Authority (CA) that has signed the certificate.
- The digital signature of the named CA.
Grid Security - What is a Web Service?

A Web service is a unit of application logic.
- Contains objects and methods.
- Accessible via HTTP and SOAP (Simple Object Access Protocol).
- SOAP allows you to treat the object as local.
- This means you can create an object that has methods and publish it on the web.
Grid Security - More on Web Services

The foundation for Web services lies in XML (eXtensible Markup Language).

- All the operations (methods in Java analogy) of a Web service are stated through a **WSDL** (*Web Service Description Language*) file.

- The **WSDL** file is used to access and call operations on web services.
Grid Security with Web Services

Soap Server

Java Component

Authenticator

Deployment descriptor

Local Policies

CA Certificate & Mapping

Soap Request

Proxy Certificate

Soap Header

Request Params

Soap Body

Authentication Client

Client Machine

Proxy Certificate

Soap Response

Soap Header

Response

Soap Body

New Mexico Tech
Grid Security - Web Service Software Requirements

- Apache AXIS
  - Toolkit to create and consume Web services for the Java platform; implements Web services
- Apache Tomcat
  - Java 2 Enterprise Edition (J2EE) application server
- Apache XML security
  - XML digital signatures and encryption
- Java SDK
  - Software Development Kit for Java
Grid Security – Conclusions

• Web service security which provides authentication, authorization, confidentiality, integrity, and non-repudiation is currently implemented in the Globus Toolkit (starting with version 3).

• SOAP is used by Web services as the mechanism for requests and responses between the client and server. It is based on XML.

• WSDL is used for describing Web services and how to access them. It is also based on XML.
Grid Security - References


http://www.ammai.com/webservices/index.html


Memon, et al. GEON: Standards-based secure invocation of Arcweb services.