Authorisation Policy coordination and gLite Java Authorisation Framework (gJAF)

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Outline

- **Observations**
  - AuthZ in EGEE/LCG and gJAF
  - Activities and Initiatives on AuthZ coordination
  - Difficulties and problems in implementing common AuthZ FW
- **gJAF Overview**
- **GT4-AuthZ overview**
- **GAAA-AuthZ framework by UvA**
- **Next steps – Discussion**

Observations – AuthZ in EGEE/LCG

- **Wide diversity between sites**
  - Typically based on LCAS/LCMAPS (C-based)
- **Foundation for gLite Java AuthZ Framework**
  - DJRA3.1 (updated in DJRA3.3) – EGEE Security Architecture
  - Developer's guide - https://edms.cern.ch/document/501718
- **gJAF was developed to be compatible with Globus AuthZ framework**
  - Version 1.0 released end 2004, some extensions later
    - Supports VOMS attributes (VOMS PDP), GridMapFile, BlackList
  - Now GT4-AuthZ significantly developed
    - More flexible configuration and better user creds handling

Activities and Initiatives

- **EGEE AuthZ Policy Coordination**
  - Meeting in Bologna June 6-7, 2005
- **GGF-AuthZ Working Group**
  - EGEE interest – bring EGEE reality to GGF standardisation
- **Other GGF/EGEE/LCG activities**
  - LCG AuthZ workshops – interoperability between current solutions
  - GIN – Grid Interoperation Now
    - Use of VOMS attributes for AuthZ in Grid
  - TONIC – Taskforce Organizing Near-term Interoperation for Credentials

Difficulties and problems in implementing common AuthZ FW

- **Human and Legacy type (Developers and implementers)**
  - Successful only when smoothly migrated and easier achieved obvious benefits
    - "When implementing/debugging security solution is too hard, developers will do it in their own way" – GGF16 AuthZ Workshop
  - Working with the distributed computing paradigm (computer clusters and pool account)
- **Technical**
  - Coordination and application specific (incl. legacy solutions)
  - Fine-grained and consistent access control with ACL
    - Local security and resource context is often implicit
    - Problem with replica data access policy

    => Common PEP and context/environment aware Policy

gJAF Overview

- **Provided as org.glite.security.authz Java package**
- **Called from applications via interceptor**
  - SOAP/Axis or application specific
  - Presumably orthogonal to application and easy integrated
- **Contains a configured chain of PIP and PDP modules**
  - PIP collects/extracts information to be sent to PDP
  - Each PDP evaluates its relevant attributes against its own Policy
  - Chain is configured to apply PDP decisions combination
- **Problems**
  - Requires application specific manual chain configuration/programming
  - Unchanged but GT4-AuthZ has evolved

GT4 Authorisation Framework

- **Can potentially be configured for Container, Message, Service/Resource**
  - But all based on SOAP/Axis msg processing by Axis interceptor
- **AuthZ processing sequence includes**
  - Bootstrapping X.509 PIP – retrieves request parameters from msg
    - Subject, Resource, Action
  - Sequence of pre-configured PIP's, including SAML
  - Sequence of (specialised) PDP's
  - Different PDP decisions combination algorithms by AuthZ engine
    - However, multiple policy decision's consistency is not resolved
- **Available PDP's**
  - ACL and GridMap
  - HostAuthorization and UserNameAuthorization
  - SAML AuthZ callout and SAML AuthZ Assertion
  - SelfAuthorization – based on shared/trusted Resource credentials
  - Simple XACML PDP (provided as a placeholder for extension)

GAAA-AuthZ framework by UvA

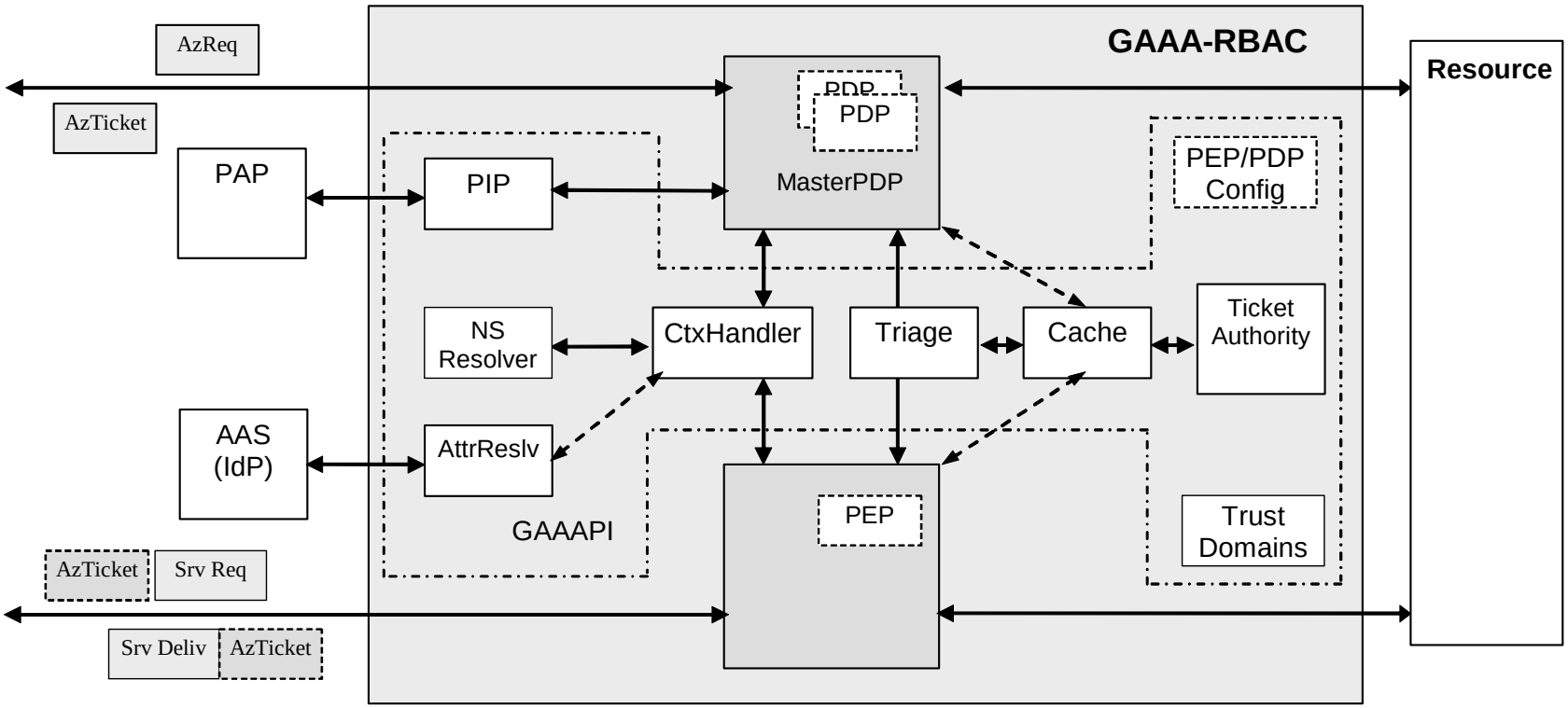
Generic AuthZ FW development for SOA applications

- **Major focus – AuthZ for dynamic services**
- **Major application areas**
  - Grid-based Collaborative systems
  - Complex Resource Provisioning (CRP), e.g. Optical LightPath Provisioning (OLPP) as service on demand
- **Cooperation and projects**
  - EGEE, NextGRID, LUCIFER=> PHOSPHOR
  - GT4-AuthZ Team, TF-EMC2
- **Recent developments**
  - XACML and SAML
  - Dynamic security context management
  - Authorisation Session support
    - AuthZ tickets (both proprietary and SAML-based)
    - Delegation and roles management/restrictions

Extending GAAA Toolkit - Adding new functionality to GT4-AuthZ

- **Specific functionality provided by GAAA-AuthZ Toolkit**
  - Authorisation tickets and tokens handling for performance optimisation and advanced Authorisation Session management
    - SAML and Proprietary AuthZ tickets format
      - *Support extended AuthZ session context and Delegation*
  - Complex XACML policies evaluation to provide fine-grained access control
    - Supports hierarchical resource management and administration policy management (including delegation)
      - *With XACML RBAC and Hierarchical Resources special profiles and XACML 3.0 Administrative Policy*
  - Flexible trust domains and request/attributes semantics configurations and management

GAAA-RBAC and GAAAPI



GAAA-RBAC AuthZ Ticket format

```
<AAA:AuthzTicket xmlns:AAA="http://www.aaauthreach.org/ns/#AAA" Issuer="urn:cnl:trust:tickauth:pep"
    TicketID="cba06d1a9df148cf4200ef8f3e4fd2b3">
  <AAA:Decision ResourceID="http://resources.collaboratory.nl/Philips_XPS1">Permit</AAA:Decision>
      => <AuthorizationDecisionStatement Decision="*" Resource="*"
  <AAA:Conditions NotBefore="2006-06-08T12:59:29.912Z" NotOnOrAfter="2006-06-09T12:59:29.912Z" renewal="no">
      => <Conditions NotBefore="*" NotOnOrAfter="*">
    <AAA:ConditionAuthzSession PolicyRef="PolicyRef-GAAA-RBAC-test001" SessionID="JobXPS1-2006-001">
       => EXTENDED <SAMLConditionAuthzSession PolicyRef="*" SessionID="*">
      <AAA:SessionData>put-session-data-Ctx-here</AAA:SessionData>  =>  EXTENDED <SessionData/>
      </AAA:ConditionAuthzSession>
  </AAA:Conditions>
  <AAA:Delegation MaxDelegationDepth="3" restriction="subjects">
     =>  LIMITED <AudienceRestrictionCondition> (SAML1.1), or <ProxyRestriction>/<Audience> (SAML2.0)
    <AAA:DelegationSubjects>
      <AAA:SubjectID>team-member-2</AAA:SubjectID>
      <AAA:SubjectID>team-member-1</AAA:SubjectID>
    </AAA:DelegationSubjects>
  </AAA:Delegation>
  <AAA:Subject Id="subject">
    <AAA:SubjectID>WHO740@users.collaboratory.nl</AAA:SubjectID>  => <Subject>/<NameIdentifier>
    <AAA:SubjectConfirmationData>IGhA11...</AAA:SubjectConfirmationData>
       =>  EXTENDED <SubjectConfirmationData/>
    <AAA:Role>analyst</AAA:Role>
      => <Evidence>/<Assertion>/<AttributeStatement>/<Assertion>/<Attribute>/<AttributeValue><AttributeValue/>
    <AAA:SubjectContext>CNL2-XPS1-2005-02-02</AAA:SubjectContext>
      =>
   <Evidence>/<Assertion>/<AttributeStatement>/<Assertion>/<Attribute>/<AttributeValue><AttributeValue/>
  </AAA:Subject>
  <AAA:Actions>
    <AAA:Action>cnl:actions:CtrlInstr</AAA:Action>  => <Action>
    <AAA:Action>cnl:actions:CtrlExper</AAA:Action>
  </AAA:Actions>
  <AAA:Obligations>
  <AAA:Obligation>put-policy-obligation(2)-here</AAA:Obligation>  =>  EXTENDED <Advice>/<PolicyObligation>
    <AAA:Obligation>put-policy-obligation(1)-here</AAA:Obligation>
  </AAA:Obligations>
</AAA:AuthzTicket>
```

Next steps – Discussion

- **Compatibility and/or move to GT4-AuthZ**
  - Benefits
  - Problems
- **AuthZ Policy compatibility and coordination**
  - Common or mapped attributes semantics
  - Policy formats mapping
- **Using XACML for policy expression**
  - Standard, Context aware
  - Can be added as XACML PDP plugin to gJAF or GT4-AuthZ
  - Need policy management tool (simple or complex)
- **SAML/Shib Credentials support**
  - Coming also with GridShib
  - Will rely on good cooperative contact with SWITCH

- **Any other issues?**