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# Federated Trust Policy Enforcement by Delegated SAML Assertion Pruning

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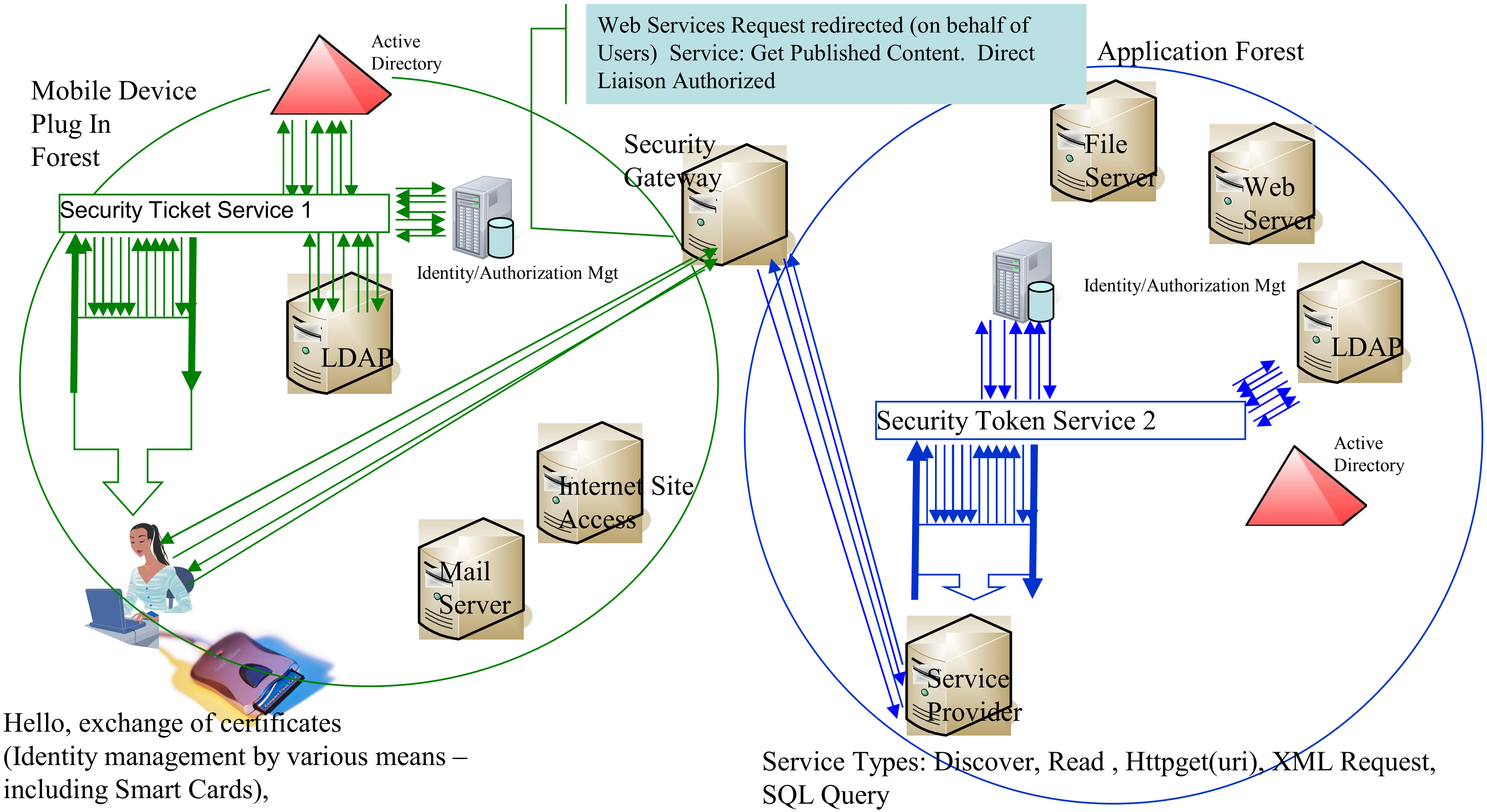
# Agenda

- Need for Federated policy enforcement.
- Communication across forest boundaries.
- Security Token Servers.
- Proposed enforcement framework.

# Need for Federated Policy Enforcement

- General federation agreements between activities are being developed in the push to information sharing.
- These are often negotiated at top level where the individuals negotiating do not have a feel for the IT implications of such agreements if they are not specific enough to restrict as well as permit access.
- Amending such agreements may be a delicate and tedious process when it is discovered that the general agreement to share does not apply to – IP addresses, certain identities, some attribute assertions, compromised systems etc.
- Firewall blocking at enterprise boundaries may have political implications and is generally a gross level approach as opposed to fine tuning.
- To allow for a more precise refinement of policy, the process of trust establishment may be delegated to the Security Token Service (STS) designated as the federation server.

# The Token Server in Federation



Web Services Request redirected (on behalf of Users) Service: Get Published Content. Direct Liaison Authorized

Mobile Device Plug In Forest

Active Directory

Security Ticket Service 1

Identity/Authorization Mgt

LDAP

Security Gateway

Internet Site Access

Mail Server

Application Forest

File Server

Web Server

Identity/Authorization Mgt

LDAP

Security Token Service 2

Active Directory

Service Provider

Hello, exchange of certificates
(Identity management by various means – including Smart Cards),
Bi-lateral authentication and setup for SSL

Service Types: Discover, Read , Httpget(uri), XML Request, SQL Query

Each Forest will have a security Token Server (STS) that is used to provide an environment for bi-lateral authentication, and the production of SAML packages for authorization.

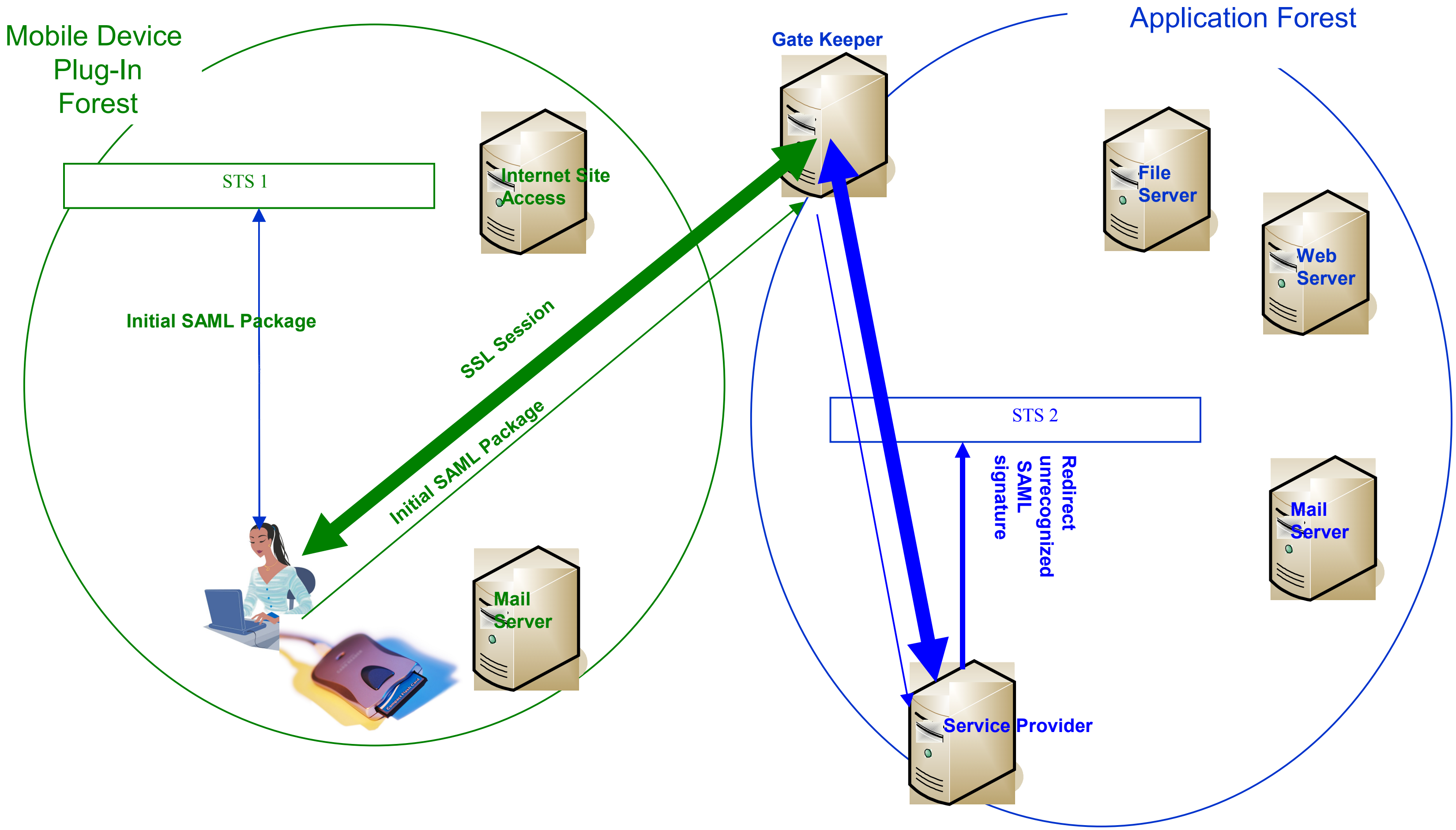
# SAML 2.0 Format

| Item | Field Usage | Recommendation | Notes |
|---|---|---|---|
| ***SAML Response*** | | | |
| Version ID | Version 2.0 | Required | |
| ID | (uniquely assigned) | Required | |
| Issue Instant | Timestamp | Required | |
| Issuer | Yes | Required | STS Name |
| Signature | Yes | Required | STS Signature |
| Subject | Yes For User A | Required | Must contain the X.509 Distinguished name or equivalent |
| ***Attribute Assertion*** | | | |
| Subject | Yes For User A | edipi | For Attribution |
| Attributes, Group and Role Memberships | Yes For User A | Required | |
| ***Conditions*** | | | |
| NotBefore | Yes | Required | TimeStamp - minutes |
| NotAfter | Yes | Required | TimeStamp + minutes |
| OneTimeUse | Yes | Required | Mandatory |

# SAML Resolution Across Forest Boundaries

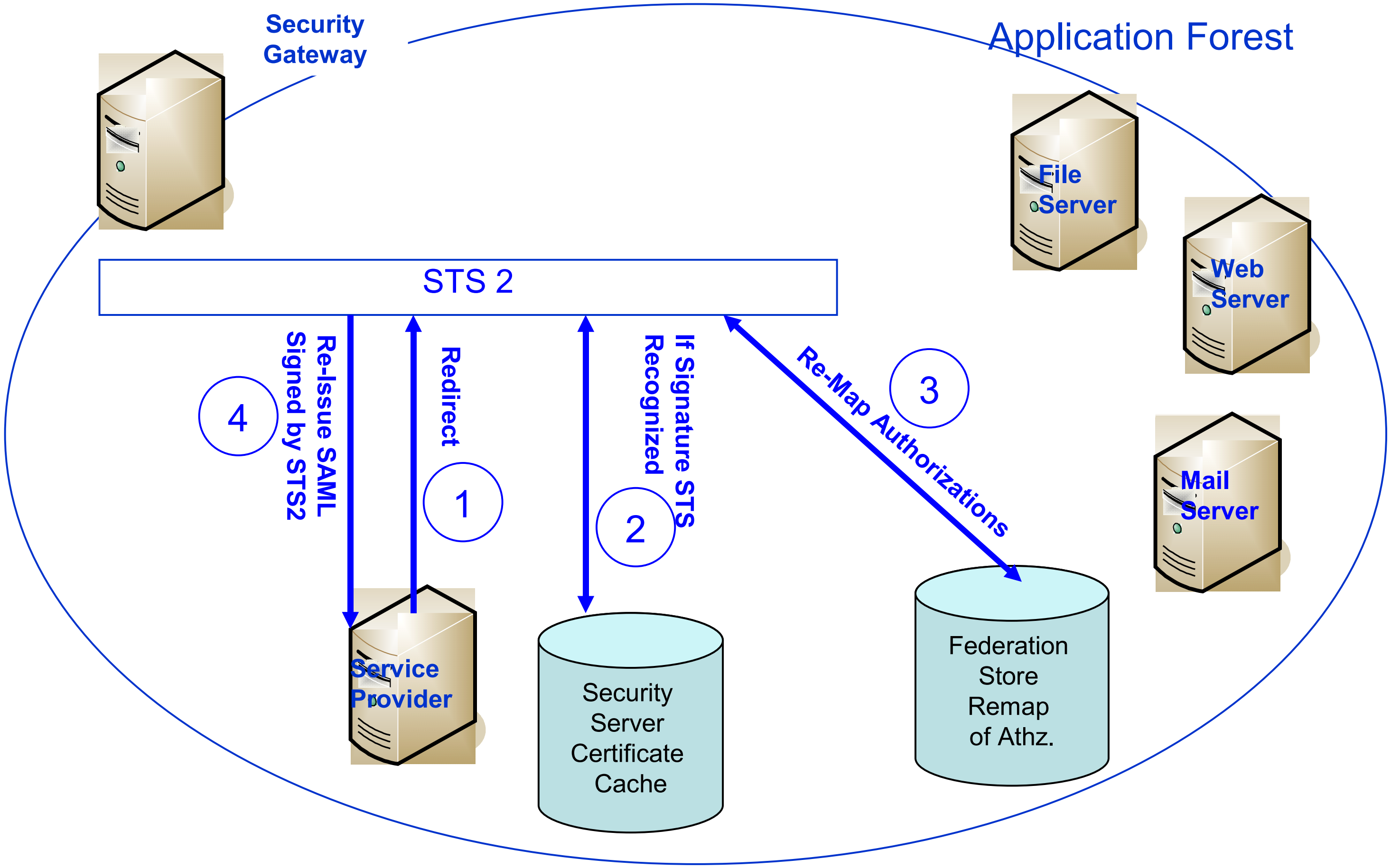
- Once the authentication is completed an SSL is established between the user device and the server, within which a WS Security package will be sent to the service.
- The WS Security package contains a SAML Token generated by the Security Token Server in the requestor’s forest. The signature on this package may not be recognized in the application.
- The signature may be from a federated partner or within the enterprise. Service cannot be granted under these circumstances, and in fact the SAML package will not be examined for assertions.
- As a first step in granting access, the SAML package is forwarded to the local STS for resolution.

# SAML Resolution Across Forest Boundaries – Con't



An Unresolved SAML Package is forwarded to the local STS for resolution

# SAML Resolution Across Forest Boundaries – Con't



The local STS must evaluate both the legitimacy of the request and the mappings required by federation.

# Federation Data Requirements

- In order to resolve the federation issues, the STS must have access to, or maintain a data base that contains the following:
  - Public keys of federated servers for resolving signatures in SAML tokens.
  - The following data is required for each such token server.
    - A set of identity mapping tuples with the form identity1, intentity2.
    - A set of mapping tuples of the form attribute-a, attribute-b.

# Delegation of Security Policy

- In order to apply some fine tuning to the policy of sharing, the tuples for identity mapping can be mapped to null causing a failed authentication in the exchange for the specific identities.
- Further, attribute classes can be mapped to null causing a failure in the authorization.
- IP addresses should still be blocked at the enterprise boundary.
- This delegation of the security policy enforcement can be accomplished without renegotiating the federation agreement.

# Additional Considerations

- Failed authentication and authorization may generate help desk and Enterprise Security analysis issues.
- Several additional features of the STS are needed which the OASIS standards have not addressed.
  - When the communication is across domains, then and STS in each domain is needed and a mutual recognition of signature authority is needed.
  - If they are across enterprises we may need to do a remapping of the SAML assertions.
  - We need a good process for least privilege, delegation and attribution in each of these circumstances.
  - While WS-Federation standards assist; they do not specifically address attribute pruning, remapping, or multiple STS registered recognition.