Identity Authentication & Authorization

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Identity Management

- Provisioning. Adds new users to network operating system directories and application server directories, both inside an enterprise and outside at partner information systems.
- Password management. Enables users to have a single set of credentials to sign on to the company information systems. Additionally, it enables users to self-administer their passwords, user account data, and privileges.
- Access control. Enables the system to recognize security policies for groups of users. For example, a security policy would prevent people from changing their own job title and instead route a request for a job title change to the appropriate authority.

SAML

- Security Assertion Markup Language
- Approved by OASIS, March 2005

- “SAML is a protocol specification to use when two servers need to share authentication information. Nothing in the SAML specification provides the actual authentication service…“ – in IBM Developerworks

- “SAML is different from other security approaches mostly because of its expression of security in the form of assertions about subjects. Other approaches use a central certificate authority to issue certificates that guarantee secure communication from one point to another within a network. With SAML, any point in the network can assert that it knows the identity of a user or piece of data. It is up to the receiving application to accept if it trusts the assertion. Any SAML-compliant software can assert its authentication of a user or data “– in IBM Developerworks

- Example: Univ. Aveiro IDP

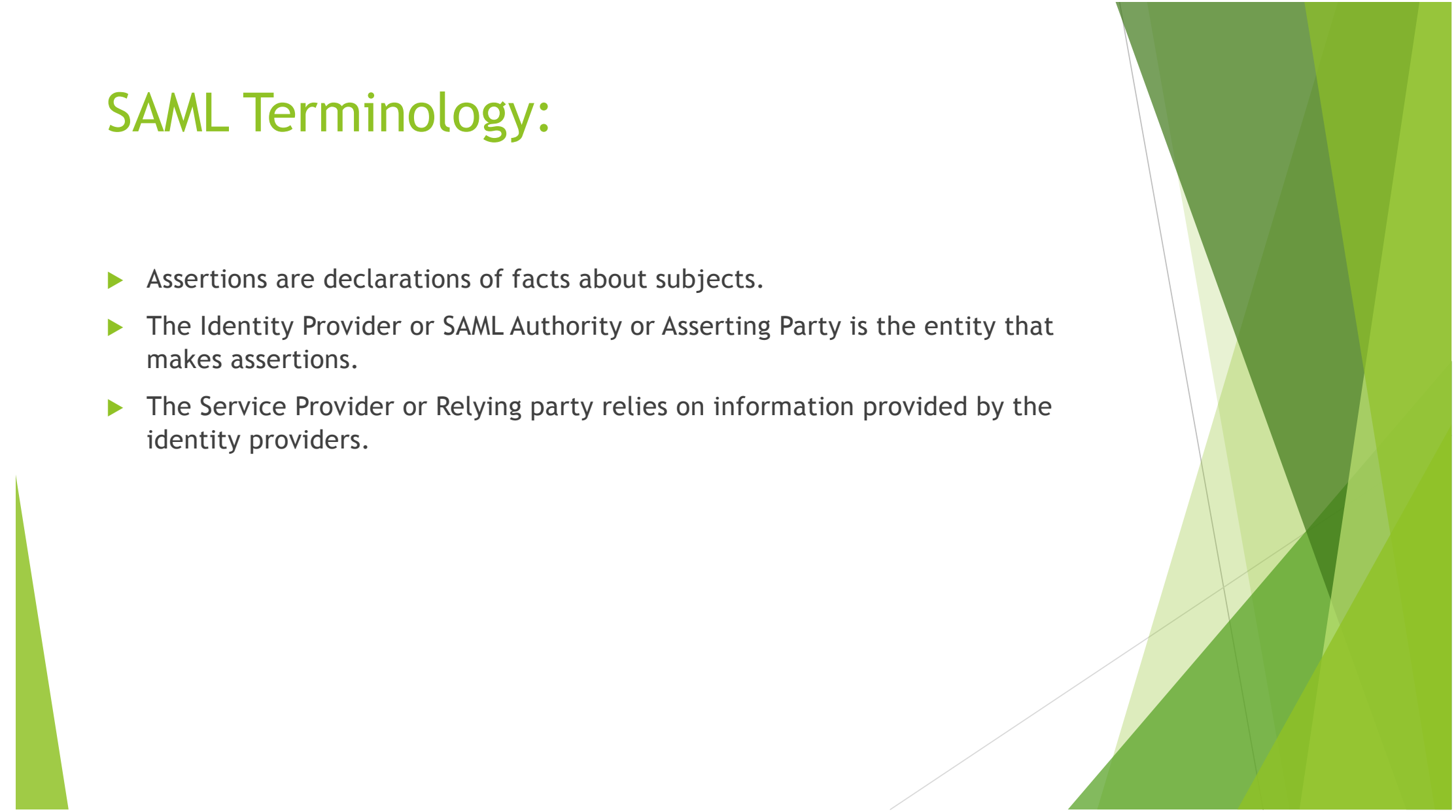
What is SAML?

- Industry standard way of representing and exchanging assertions about identity, attributes and entitlements
- Vendor neutral
- XML based
- Uses SOAP, XMLDSig, XMLEnc
- SSL is required between servers

- SAML falls under the broader topic of Identity Management.
- Identity management applies to both network and federated identity.
- Federated Identity refers to the use of identity or authorization decisions across organizational boundaries.
- Identity management includes the consideration of identity registration, revocation and termination.
- SAML's focus is on single sign on by applications.

SAML Terminology:

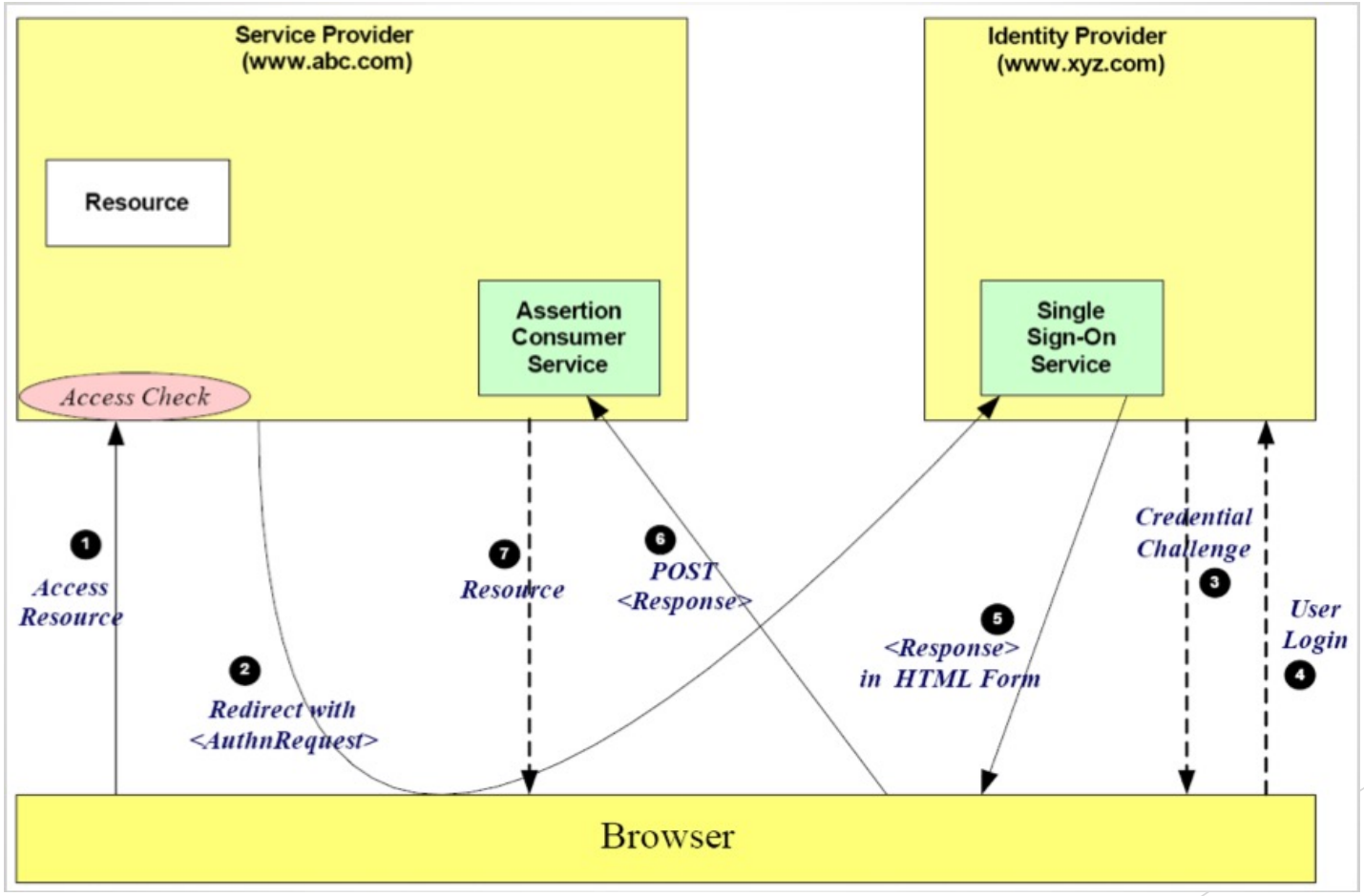
- Assertions are declarations of facts about subjects.
- The Identity Provider or SAML Authority or Asserting Party is the entity that makes assertions.
- The Service Provider or Relying party relies on information provided by the identity providers.



SAML Provides:

- Assertions about:
  - authentication acts (e.g., YES, the entity did authenticate in this way at this time)
  - attributes of subjects (e.g., access rights, credit limits, status) name, value pairs
  - authorization decisions already made
- A Simple Request / Reply protocol
  - Request Types (queries): authentication, authorization, attribute
  - One reply format containing assertions. (authentication, authorization or attribute statements)
  - The requests and replies occur on an SSL channel. The requestor is typically a service provider and the responder an identity provider.

How does it work ?

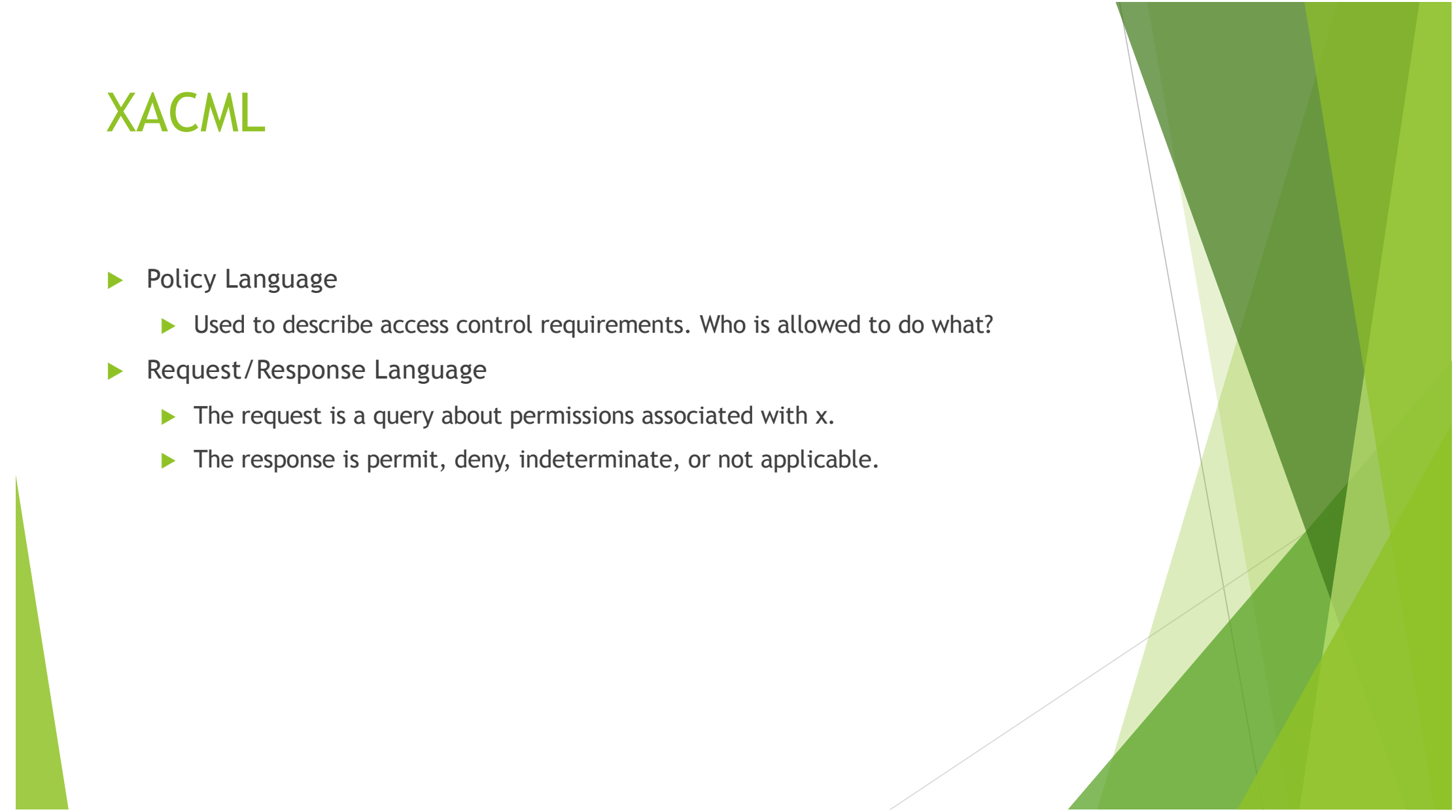


XACML

- Approved by OASIS March 2005
- XML Access Control Markup Language
- Industry standard way of representing and processing access control policies.
- Vendor neutral & XML based
- Provide for “rule combining algorithms”
  - eg: “Deny overrides” or “Permit Overrides”
- An XACML policy may specify what a provider should do when it receives a SAML assertion.
- Separation of concerns: Don’t bake authorization policies into code.

XACML

- Policy Language
  - Used to describe access control requirements. Who is allowed to do what?
- Request/Response Language
  - The request is a query about permissions associated with x.
  - The response is permit, deny, indeterminate, or not applicable.



OpenID

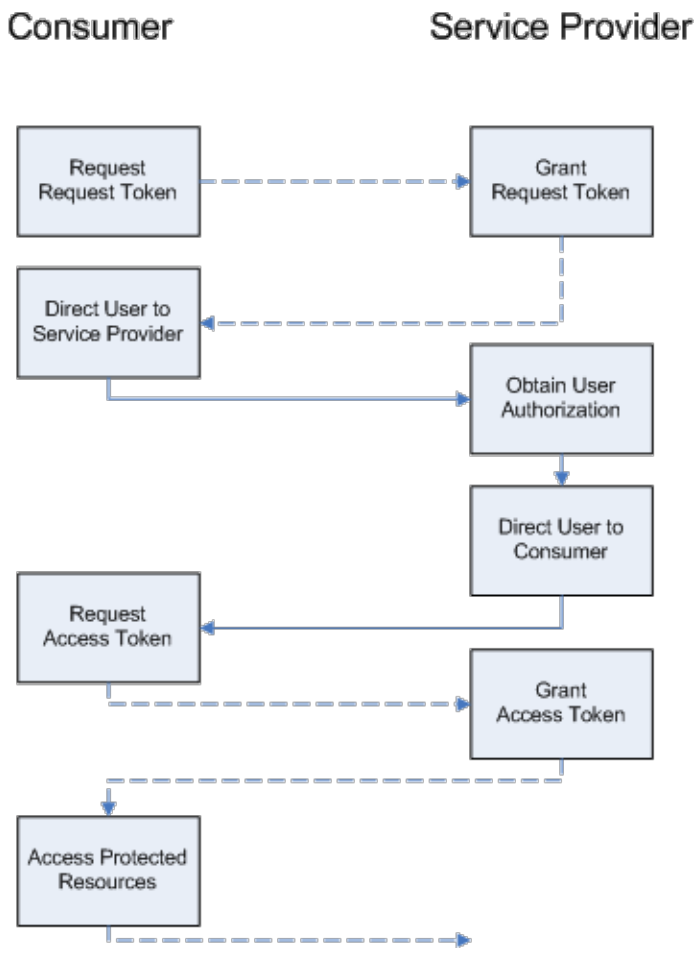
- Grassroots effort since 2005
- Web user identification and authentication
- OpenID used and provided by: AOL, BBC, Google, IBM, PayPal, Verisign, etc.
- Compares a bit with the heavy weight SAML.
- Highly scalable – does not depend on pre-existing agreements.

- Losing industry traction to OAuth…

OAuth

- Open Standard for Secure API authentication
- Started by twitter in 2006
- IETF RFC 5849 in 2010
- Token-based, logged-in user has a unique token used to access data from the site
- Not extendable
- Not “Enterprise-ready”

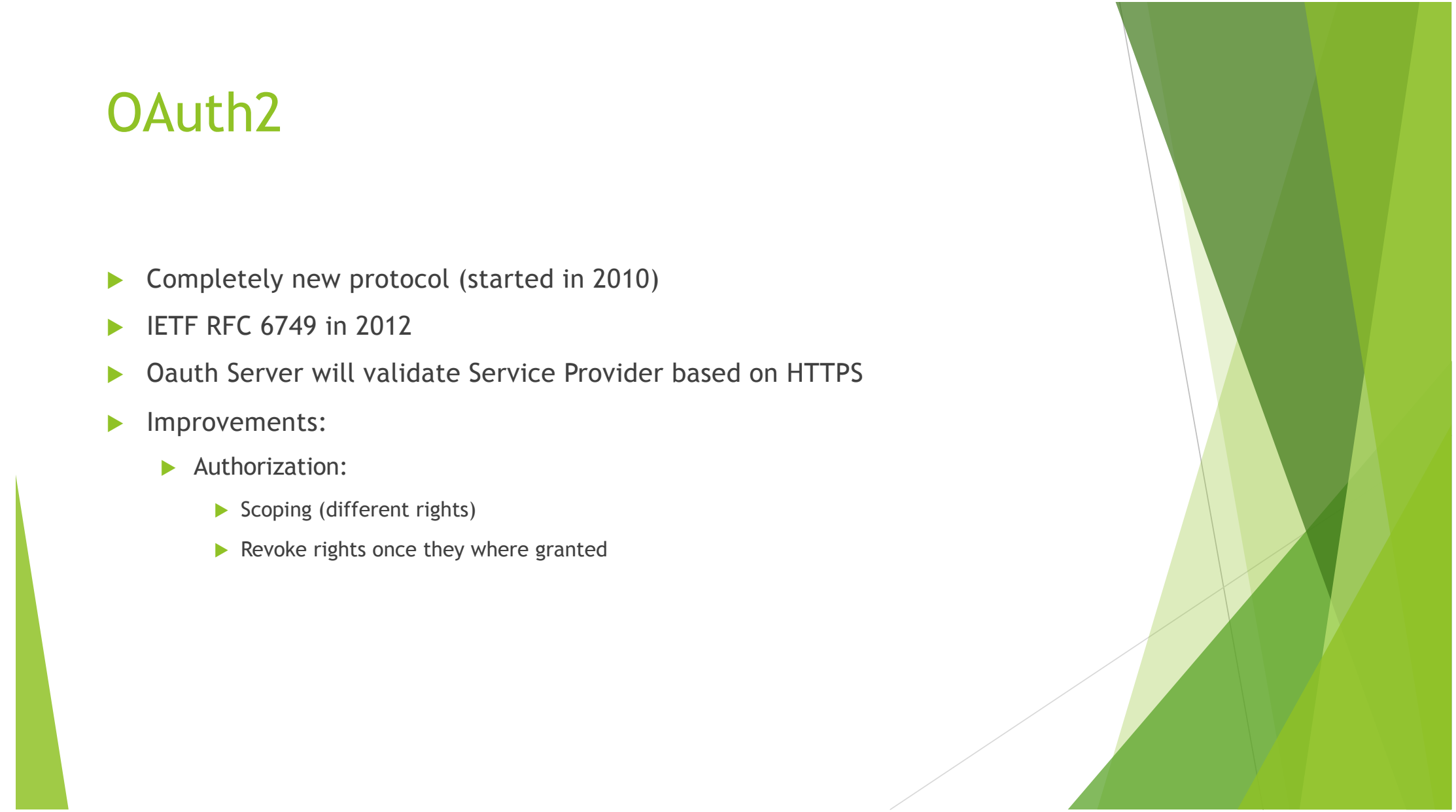
How ?



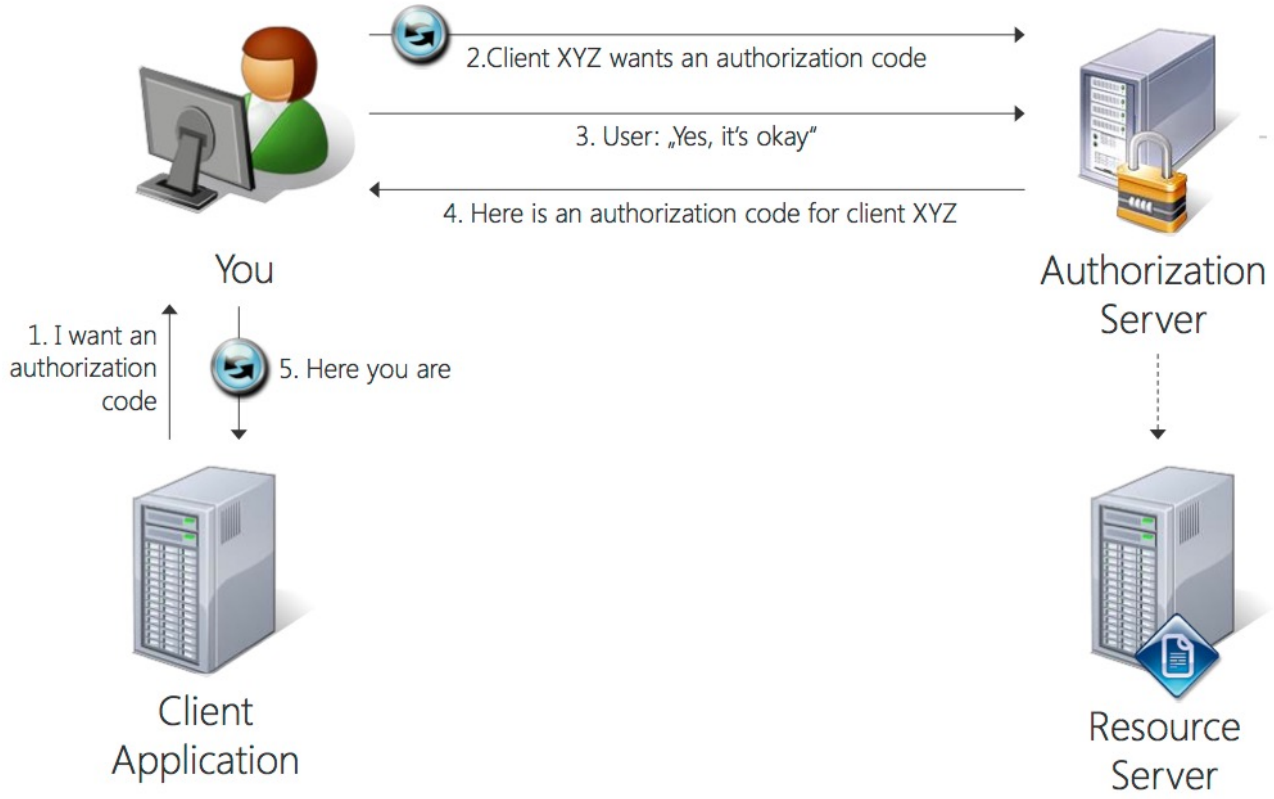
- Obtain request token
- User authorizes request token
- Exchange request token for access token
- Use access token to obtain protected resources
- HTTP Authorization header
- HTTP POST
- URL query string

OAuth2

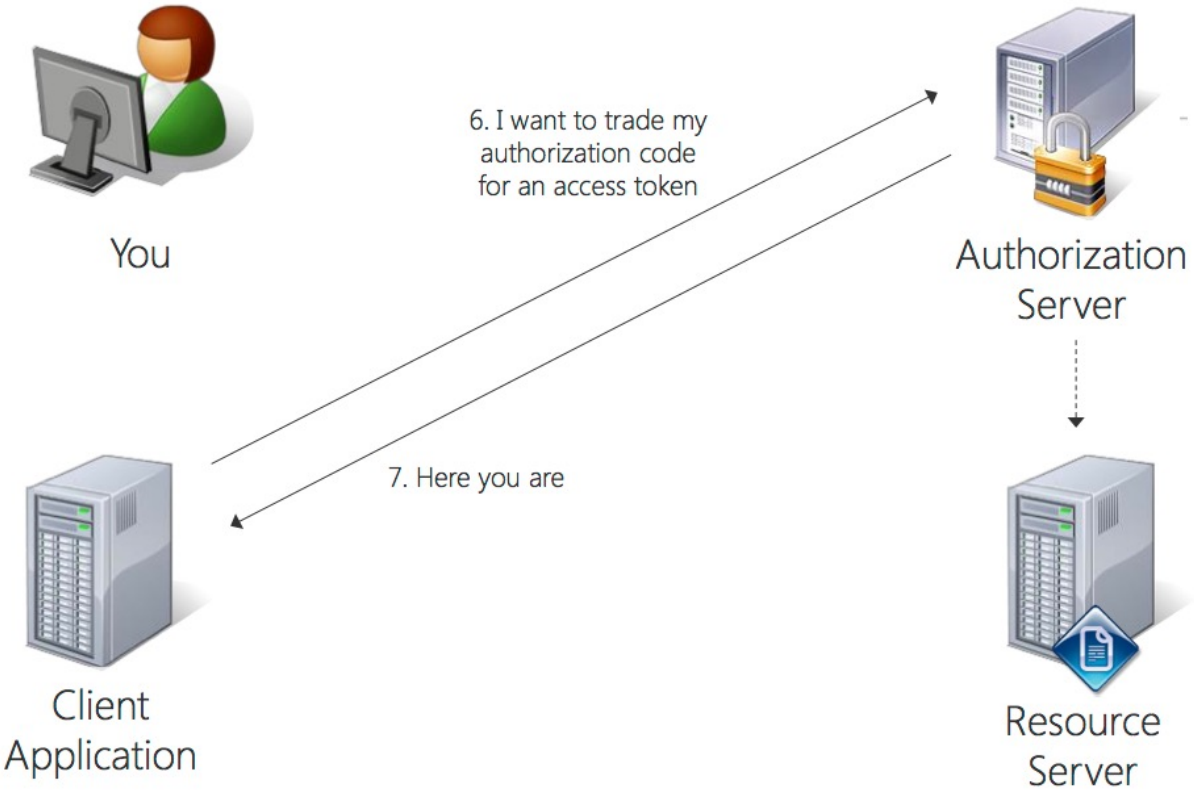
- Completely new protocol (started in 2010)
- IETF RFC 6749 in 2012
- Oauth Server will validate Service Provider based on HTTPS
- Improvements:
  - Authorization:
    - Scoping (different rights)
    - Revoke rights once they where granted



Oauth2 steps



Oauth2 steps



Oauth2 steps