

Home Assignment 4

EITN41

A-2 *What problem in OTR is solved using the Socialist Millionaire Problem?*

Answer: In the first scenario (section 1.4 in the lecture notes) it is assumed that Alice and Bob knows each other's public keys, mitigating the risk for a potential MitM attack. The problem solved by SMP is the agreement on keys, here Alice and Bob does not need to know each other's public keys in advance.

A-4 *How is perfect forward secrecy solved in OTR?*

Answer: A MAC is calculated on each message, after every message the MAC key used for that message is released and a new one is calculated/agreed upon for the next message. This means that the MAC keys are 'fresh' for only one message and that any later use of it directly gives the attacker away.

A-7 *Why does not an IdP send a response to an authentication request with the HTTP GET method? What alternatives are there?*

Answer: Partly because a GET is an insecure method, all parameters are included in the URL and GETs can be cached and also stored in browser history potentially enabling someone to use an earlier authentication without doing a present authentication, partly because the parameters are included in the URL, and the size of the response is usually larger than the Subjects user-agent (e.g. browser) can handle.

An alternative is an artifact binding.

A-9 *Name and describe four problems in SAML. You should be able to provide a more detailed description for one of them.*

Answer:

- SAML requires a trust relationship between IdP and SP.
- ?
- ?
- ?

A-11 *Describe and compare "discovery" in SAML and OpenID.*

Answer: "Discovery" is in the lecture notes defined as a method for an SP/RP "to get information about how to proceed with the authentication request."

OpenID: this can be done either by finding an XRDS document with the necessary information or by finding an HTML page that holds the information.

SAML: does not specify how to do this. There exists a SAML profile called "*SAML identity provider discovery profile*" that can be used for this. The SP can also use another service for this.

A-12 *In a certain sense, there are three different types of communication in SAML and two in OpenID. Describe them and explain the difference.*

Answer:

- OpenID
 - Direct Communication: can only be initiated by RP. RP sends direct requests to OP.
 - Indirect Communication: can be initiated by RP or OP. Messages are passed through the user-agent.
- SAML
 - IdP initiates communication.
 - SP initiates communication.
 - ?

A-18 *In OAuth, explain why the access token must not be cached, and how this is achieved.*

Answer: The Authorisation Server returns an access token with a 200, the data in JSON format. The 200 has header options telling the receiver (Client) to not cache the token (and data).

Cache-Control: `no-store`, this is the *don't cache* command, if you will. <https://tools.ietf.org/html/rfc7234#section-5.2.1.5>

Pragma: `no-cache`, this is mostly used for backwards compatibility, <https://tools.ietf.org/html/rfc7234#section-5.4>. If HTTP 1.0 is used, Cache-Control is not understood, in this case Pragma specifies *don't cache*. If Cache-Control is understood, Pragma is ignored.

A-20 *What is a grant? Name and describe a few different grants.*

Answer: It is a sort of attestation, or authorisation promise. The Resource Owner grants a Client access to certain resources the Owner owns. This can be used by the Client to request an Access Token from the Authorisation Server. The process for this can be different for different types of grants. The four types / classes described in the lecture notes are:

- **Authorisation code** - the Client receives a code, which is used when they request access from Authorisation Server.
- **Implicit grant** - the Client receives a token directly from the Authorisation Server.
- **Resource Owner Password Credentials grant** - Resource Owner gives Client their own login credentials for the Authorisation Server. Using these, the Client receives a token from the server.

- **Client Credentials grant** - Here the Resource Owner is not involved. The Client directly from Authorisation Server after providing their own credentials.