draft-perez-abfab-kerberos-preauth-options

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Kitten & Kerberos WGs

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Objective

- Improve inter-organisational use of Kerberos
  - RFC5868 describes some issues of contemporary Kerberos cross-realm operation in large-scale systems

- Some interest in using a AAA-based cross-realm architecture
  - AAA is highly effective at federated authentication for network access (i.e., mobile telephony & data, IEEE 802.1X, LTE, etc)

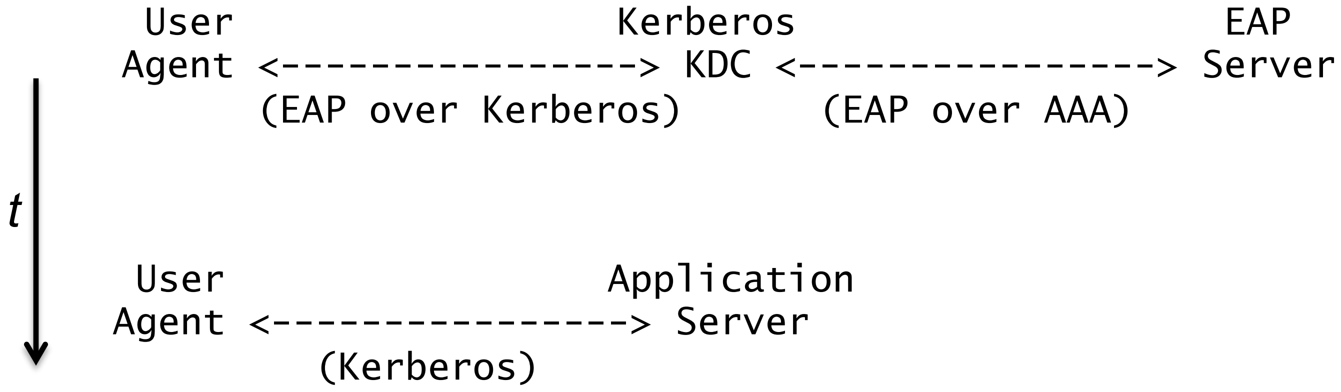
- ABFAB provides AAA-based federation architecture for application-level protocols
  - EAP for authentication & SAML for authorisation
  - RADIUS / Diameter provides federation (and authorisation)
  - GSS-API enables integration with applications

Options

- Two different models to integrate ABFAB and Kerberos have been discussed:
  1. The Kerberos client is the ABFAB initiator
  2. The Kerberos client is the ABFAB acceptor
- The models are similar but address different use cases
- Two different approaches for binding EAP to Kerberos have also been discussed:
  1. Bind EAP directly to Kerberos
  2. Bind via a GSS pre-authentication mechanism, using ABFAB’s GSS-EAP mechanism

Model 1: Kerberos client is the ABFAB initiator

- *ABFAB Initiator/Kerberos Client* obtains a TGT from the KDC using an EAP-based pre-authentication mechanism
  - Straightforward integration of Kerberos and AAA infrastructures
  - User is authenticated by the home domain, but obtains a ticket from the KDC (acting as an EAP pass-through authenticator)
  - After Kerberos pre-authentication, the client uses standard Kerberos to obtain STs for the services within the visited domain



```
 User                   Kerberos                   EAP
Agent <-----------------> KDC <-----------------> Server
      (EAP over Kerberos)      (EAP over AAA)


 User                   Application
Agent <-----------------> Server
         (Kerberos)
```

Model 2: Kerberos client is the ABFAB acceptor

- *ABFAB Acceptor/Kerberos Client* obtains a ST from the KDC using an EAP-based pre-authentication mechanism
  - Kerberos client uses EAP tokens from ABFAB initiator to authenticate against KDC
  - User is still authenticated by home domain
  - Abfab RP and KDC act as ‘split EAP authenticator’

```
 User         ABFAB          Kerberos         EAP
Agent <-------> RP <----------> KDC <------> Server

      (GSS-EAP)      (EAP over   (EAP over AAA)
                      Kerberos)
```

Approaches for implementing EAP-based Kerberos pre-authentication

- Initial description of EAP over Kerberos and GSS-EAP over Kerberos in:
  - http://www.ietf.org/mail-archive/web/abfab/current/msg00033.html

- More detailed description:
  - Rafael Marin-López, Fernando Pereñíguez, Gabriel López, and Alejandro Pérez-Méndez. *Providing EAP-based Kerberos pre-authentication and advanced authorization for network federations. Computer Standards & Interfaces, 33(5):494 – 504, 2011*

Approaches for implementing EAP-based Kerberos pre-authentication

1. EAP pre-authentication

   - Use Kerberos as EAP lower layer

   - Architecture more straightforward

   - Need to define the whole interface with EAP stack and framing

Approaches for implementing EAP-based Kerberos pre-authentication

2. GSS pre-authentication
   - Introduces an additional layer
   - GSS becomes the lower layer
   - GSS-EAP is already defined and implemented by ABFAB WG
     - Makes GSS-preauth simpler to define than EAP-preauth
   - Flexibility: allows the use of other non-EAP GSS mechanisms
     - Extensible to other forms of federation

Summary

	Element	GSS-preauth	EAP preauth
MODEL 1	UA	EAP peer GSS initiator Kerberos client	EAP peer Kerberos client
	RP	Application server	Application server
	KDC	EAP authenticator GSS acceptor	EAP authenticator
MODEL 2	UA	EAP peer Abfab GSS initiator	EAP peer Abfab GSS initiator
	RP	EAP authenticator (split) Abfab GSS acceptor GSS pre-auth initiator Kerberos client	EAP authenticator (split) Abfab GSS acceptor Kerberos client
	KDC	EAP authentication (split) GSS pre-auth acceptor	EAP authentication (split)

Summary

- The models address similar but different use cases
- Model 1
  - Preference for GSS pre-auth
- Model 2
  - Preference for EAP pre-auth
- Can we do both? If not, which?