Enterprise desktop at home with FreeIPA and GNOME

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Enterprise?

* almost

local office network is not managed by a company's IT department

* almost

company services' hosting is cloudy

there is no one cloud to rule them all

* almost

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- A corporate identity for services sign-on

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- Private data to protect and share

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I work on FreeIPA, `https://www.freeipa.org`

Management of identities and policies:

- stored centrally
- applied locally

And it is available in:

- Fedora
- Red Hat Enterprise Linux / CentOS
- GNU/Linux Debian and Ubuntu
- `https://account.gnome.org/` runs FreeIPA since october 2014

How *enterprisey* are we?

Let's score by a password

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3. Obtain initial Kerberos credentials (enter a password)
4. Use corporate applications (enter a password?)

Can we do better than this?

how far are we from

- Sign into a corporate environment
- Use corporate applications

?

Let's try to login!

Demo of interactive logon

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- **Credentials were entered only once**

Kerberos proxy

Available on the client side with Microsoft Active Directory and MIT Kerberos 1.13

- protocol is called MS-KKDCP
- transparent for Kerberos library users

Kerberos proxy is implemented by FreeIPA 4.2, OpenConnect Server 7.05, and as a standalone server

- Requires HTTPS connection, set up by default in FreeIPA 4.2, very easy to use (one line change on the client)
- Allows to obtain tickets from anywhere
- SSSD 1.12+
- GNOME project has enabled KDC proxy support in `https://account.gnome.org` to allow use of Kerberos credentials for SSH accounts for GNOME developers

VPN and Kerberos

OpenConnect client supports GSSAPI negotiation

- Fedora 22+ works out of the box

OpenVPN does not support GSSAPI negotiation

- to do since 2005

Could we enforce stronger authentication at a VPN edge?

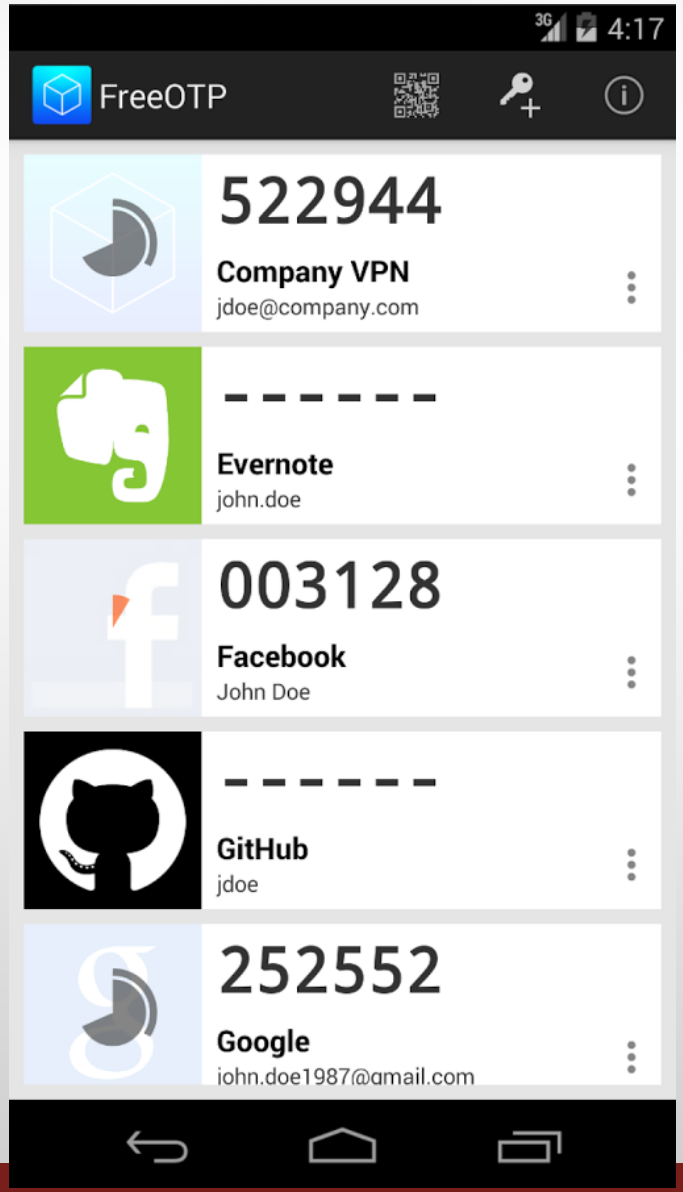
- yes, we are be able to do so with Kerberos 1.14
  - no practical implementation in FreeIPA yet

Two-factor authentication

FreeIPA 4.x supports 2FA natively

- Yubikey, FreeOTP client for Android and iOS, any HOTP/TOTP compatible software and hardware
- Two-factor authentication is enforced on Kerberos level
- Performs pre-authentication before issuing a ticket
- Authentication Indicators are in Kerberos 1.14
- Pre-authentication modules can say *how* tickets were issued

FreeOTP client for Android and iOS



Demo of interactive logon with 2FA

Let's create a token for a user and logon with 2FA via Yubikey

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- Renew the ticket granting ticket (TGT)
- Choose which Kerberos principal is in use

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- No single sign-on with GSSAPI from GNOME applications using WebkitGtk to authenticate

Can we do better than this?

What was that?

- Tomáš Popela (Red Hat) and David Woodhouse (Intel) worked to fix `libsoup` and `WebkitGtk`
- This laptop is running an experimental build of them
- We logged into my FreeIPA server's Web UI
- Hopefully, the code will be in the next GNOME release

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- Single sign-on is the primary feature
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- No need to store passwords locally (secure kiosks?)

Visualize

GNOME Online Accounts could show Kerberos ticket properties

- Ticket time validity, flags (forward, renewal)
- Authentication indicators
- Existing service tickets in the credentials cache and allow to remove them selectively
- Allow automatic ticket renewal if KDC permits it

Visualize

And choose between different Kerberos principals

- MIT Kerberos supports kernel keyring (1.12+) and directory-based (1.11+) storage of credentials
- Multiple Kerberos principals can be stored and used at the same time
- Only a single principal can be defined as “primary” for each Kerberos realm in the collection of credentials

Kerberos ticket renewal

- SSSD supports automatic Kerberos ticket renewal for single factor cases
  - Renewing 2FA tickets requires UI interaction triggered by expiry time
  - Automatic ticket renewal requires permission from KDC, visible as a ticket flag
- GNOME Online Accounts could integrate with SSSD in prompting for credentials (multiple factors) in 2FA case needed information could be provided via SSSD InfoPipe/AuthPipe

Better Kerberos in browsers

- Firefox Kerberos setup isn't nice
  - needs about:config manipulation
  - DNS domains associated with Kerberos realm could be discovered via DNS SRV records, prompted for confirmation once
- FreeIPA used to provide an extension to automate Firefox setup
  - Extension was generated locally for for each FreeIPA deployment to provide configuration details
  - not anymore: Firefox removed ability to provide non-publicly available extensions since version 43

Better Kerberos in browsers

- Chromium/Chrome
  - Have bugs for processing of `WWW-Authenticate: Negotiate` when Kerberos credentials are not available
  - On Linux only allows to configure Kerberos use through command line, poor user experience
- A fixed libsoup/WebkitGtk allows to always use GSSAPI if server advertises `WWW-Authenticate: Negotiate` over HTTPS
  - no need to configure anything in Epiphany
  - could be further confined with a user confirmation similar to how passwords are managed on first use

Better Kerberos in browsers

- GSSAPI flow is synchronous, needs better UI interaction to avoid hogging down other tabs
  - still major issue for many browsers

Any *practical* use of it?

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Oops, I “invented” Owncloud Enteprise Edition?

Better support for SAML in GNOME Online Accounts

GNOME Online Accounts doesn't support SAML for arbitrary provider

- One cannot setup own Owncloud account in GNOME without entering passwords
- Have to use separate Owncloud end-point for non-SAML logon

Certificates

FreeIPA 4.2 supports issuing x.509 certificates to users

FreeIPA 4.2 adds per-user vault to store keys and credentials wrapped into an encrypted blob

- authentication to password vaults is GSSAPI-based
- multiple clients can use unique public/private key pairs to derive their access to user's vault
- SSSD 1.13 allows to authenticate with certificates
- Certificates can come from any OpenSC and coolkey compatible devices

How *enterprisey* our home could become?

What benefits do we get by becoming *enterprisey* with FreeIPA and GNOME?

1. Control your own infrastructure

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1. Control your own infrastructure
2. Improve user experience by reducing number of password/logon interactions
3. Profit?

Questions?