What’s new in FreeIPA 4.9

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about:me

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FreeIPA

- Identity management solution:
  - provides centralized infrastructure to manage POSIX identities across a fleet of Linux machines
  - combines together 389-ds LDAP server, MIT Kerberos, BIND DNS server, SSSD, Samba, and Python-based management tools
  - often seen as 'Active Directory for Linux' but this is not exactly correct comparison
  - Depends on a lot of OS components working together, can be used as a canary to detect breakage in many packages

FreeIPA and RHEL IdM

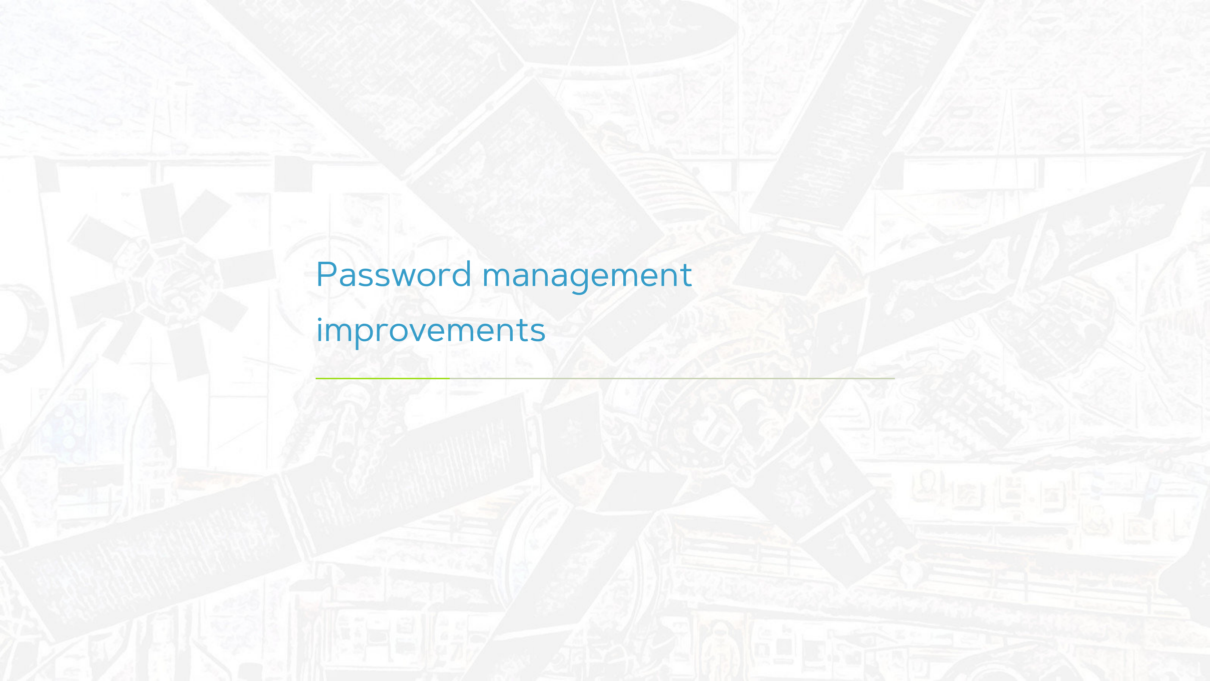
- RHEL IdM
  - a version of FreeIPA in Red Hat Enterprise Linux (RHEL)
  - supported by Red Hat support as a part of RHEL subscription
  - RHEL 7: FreeIPA 4.6.x, Python 2-based
  - RHEL 8: FreeIPA 4.8/4.9, Python 3-based
  - mostly rebranded but has few functional differences to FreeIPA
    - or had before FreeIPA 4.9 release …
  - CentOS:
    - debranded but otherwise should be equal to RHEL IdM functionally

FreeIPA 4.9 series

- FreeIPA 4.9.0 released on December 23rd, 2020
- about 370 bug fixes over FreeIPA 4.8.10
- Release cadence of 6-8 weeks
- 4.9.3 released on March 31st, 2021
  - ~80 bug-fixes over 4.9.0
- available in CentOS Stream:
  - CentOS 8 Stream since January 2021
  - CentOS 9 Stream since April 2021

Major themes for FreeIPA 4.9

- password management improvements
- group membership management
- ACME CA support
- FIPS mode operations
- Active Directory integration enhancements
- Kerberos-related improvements
- DNS infrastructure improvements



Password management improvements

Password policies

- `libpwquality` support
  - reuse of a user name
  - dictionary words using a cracklib package
  - numbers and symbols replacement
  - repeating characters in the passwords

Expiring Password Notification

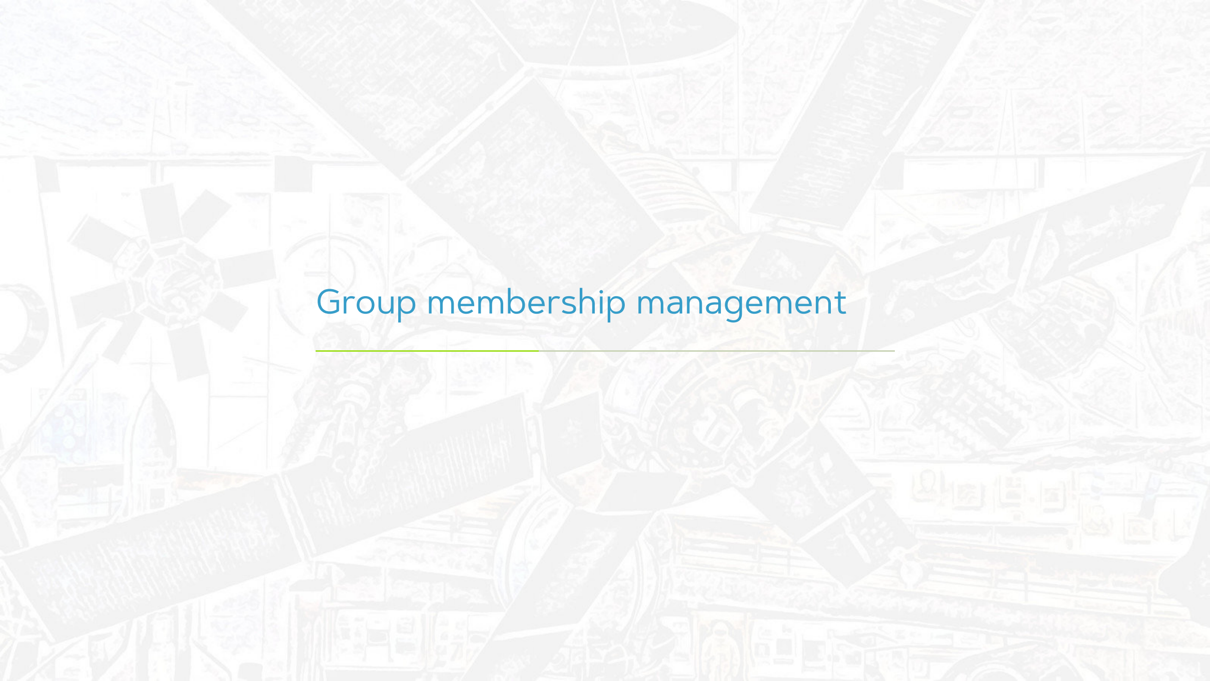
- a standalone tool, `ipa-epn`
- available since FreeIPA 4.8.7
- allows determining list of users whose passwords are about to expire
- can send e-mail notifications to users

Password policies for system accounts

- system account
  - typically is not a Kerberos principal
  - located in `cn=sysaccounts,cn=etc,$SUFFIX`
  - used to interate 3rd-party software with FreeIPA LDAP server
- system accounts can now have non-expiring Kerberos keys

Uniform password length

- Password authentication and validation
    - LDAP: set and synchronized with Kerberos keys
    - Kerberos: set and synchronized with LDAP password
- LDAP password wasn't limited
- MIT Kerberos hard-codes password length to 1024 characters and there is no way to distinguish a cutoff and 1024-character passwords
- passwords now limited to 1000 characters everywhere



Group membership management

Fedora Accounts integration

- Group sponsors
  - ability to add users to a specific group only
  - `ipa group-[add|remove]-member-manager`

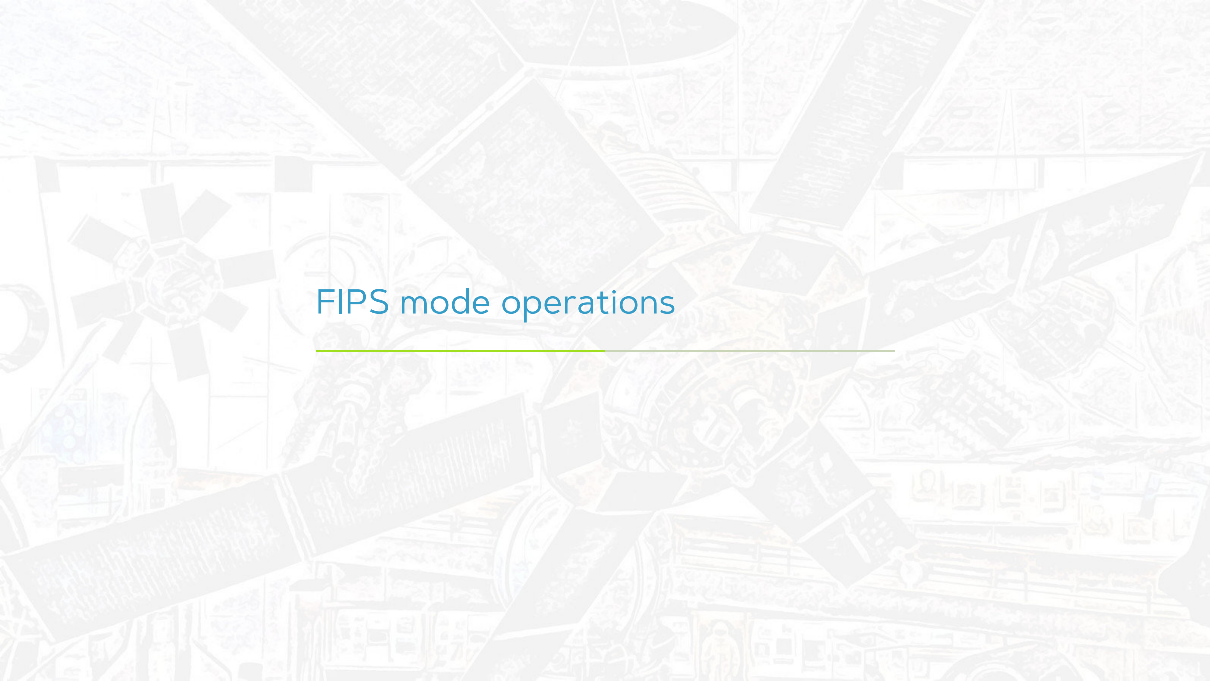
Group membership extensions

- Groups as access control aggregators
  - permission, privilege, role
    - permissions define access controls
    - privilege collects permissions
    - roles grant access to privileges
- Kerberos services
  - role members since 4.2
  - group members since 4.7.0
- ID user overrides since 4.8.7
  - role members
  - group members

ACME CA support

ACME CA

- Dogtag PKI supports ACME protocol (RFC 8555) since v10.10
- ACME support deployed automatically on all CA servers
  - not enabled by default
- accessible through `ipa-ca.$DOMAIN` end-point
- implements `dns-01` and `http-01` challenges
- works and tested against
  - `certbot`
  - `mod_md`
- known to not work with `cert-manager`
  - incorrect implementation of RFC 8555
  - cert-manager issue 3777



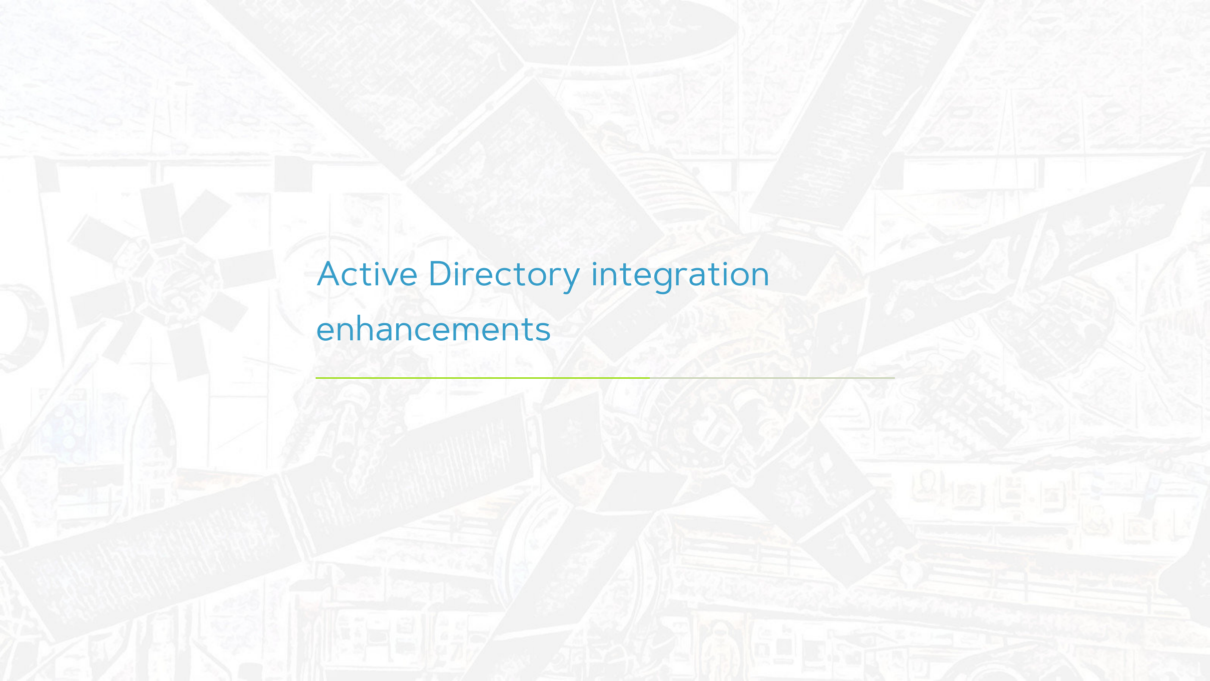
FIPS mode operations

Crypto policies

- FreeIPA obeys system-wide crypto policies
- Fedora 32+ and RHEL 8.3+ disable unsafe ciphers
  - TLS but also Kerberos
  - RC4-HMAC is required for interoperability with Active Directory
- AD-SUPPORT crypto sub-policy enables RC4-HMAC in Kerberos
  - `update-crypto-policy --set DEFAULT:AD-SUPPORT`

FIPS mode

- FreeIPA 4.9.1+ can be operated in FIPS mode
  - only AES ciphers will be enabled
  - Trust to Active Directory will only use AES keys
    - shared secret trust is not supported
- Samba in RHEL 8.4+ can be operated in FIPS mode
  - only Kerberos authentication, no NTLMSSP support
  - only part of RHEL IdM or a member of AD domain
  - no SMB1 support



Active Directory integration enhancements

Manage IPA resources as Active Directory user

- AD users can manage IPA resources
  - create ID user override
  - add ID user override to IPA group
  - apply permission/privilege/role to a group
- Available in RHEL 8 through an external plugin
  - Merged to FreeIPA upstream and released in 4.9.0

SUDO improvements

- SUDO rules now can reference AD users and groups
  - allows avoiding non-POSIX/POSIX group dance
  - requires SSSD 2.4+ version (RHEL 8.4)
- AD user references supported in
  - `ipa sudorule-[add|remove]-user`
  - `ipa sudorule-[add|remove]-[runasuser|runasgroup]`

Samba integration improvements

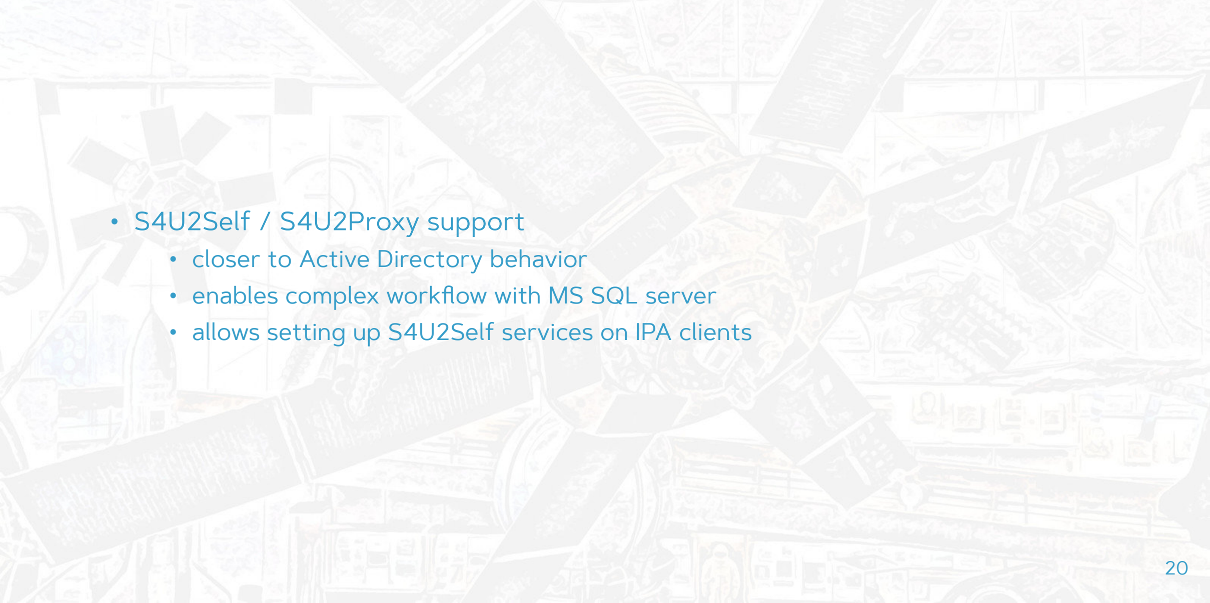
- Samba file server
  - `ipa-client-samba` to set up Samba file server on IPA client
  - works for IPA users and users from trusted Active Directory domains
  - uses SSSD/Samba integration
- SMB user properties can be updated in IPA Web UI
- Available since RHEL 8.2, few fixes in FreeIPA 4.9

Kerberos improvements

Compatibility with Active Directory

- MS-PAC record in Kerberos tickets
  - IPA KDC issued tickets look closer to what Active Directory does
  - Adds asserted identity SIDs:
    - S-1-18-1 is a SID for an Authentication Authority Asserted Identity
    - S-1-18-2 is a SID for a Service Asserted Identity

Compatibility with Active Directory



- S4U2Self / S4U2Proxy support
  - closer to Active Directory behavior
  - enables complex workflow with MS SQL server
  - allows setting up S4U2Self services on IPA clients

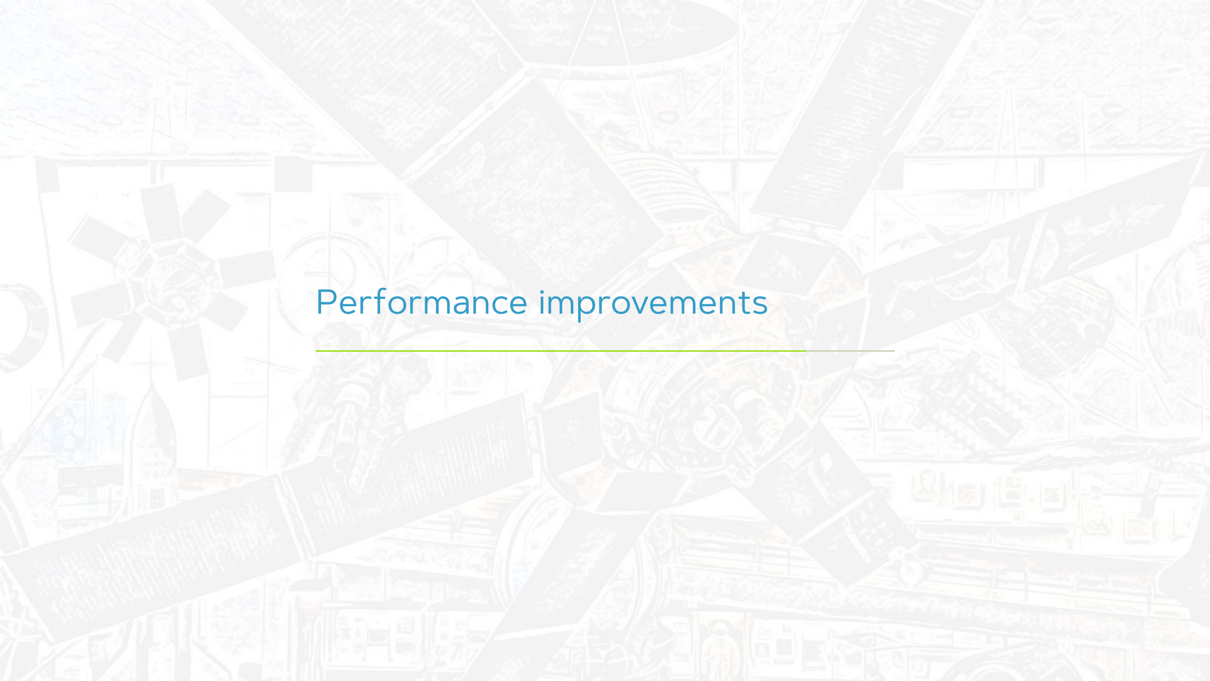
Kerberos authentication to PAM services

- SSSD 2.4: new PAM module, `pam_sss_gss.so`
  - allows authenticating with Kerberos ticket to PAM
- authentication indicators support
  - e.g. SUDO access only to Kerberos tickets obtained with smart-cards, not passwords

DNS improvements

DNS improvements

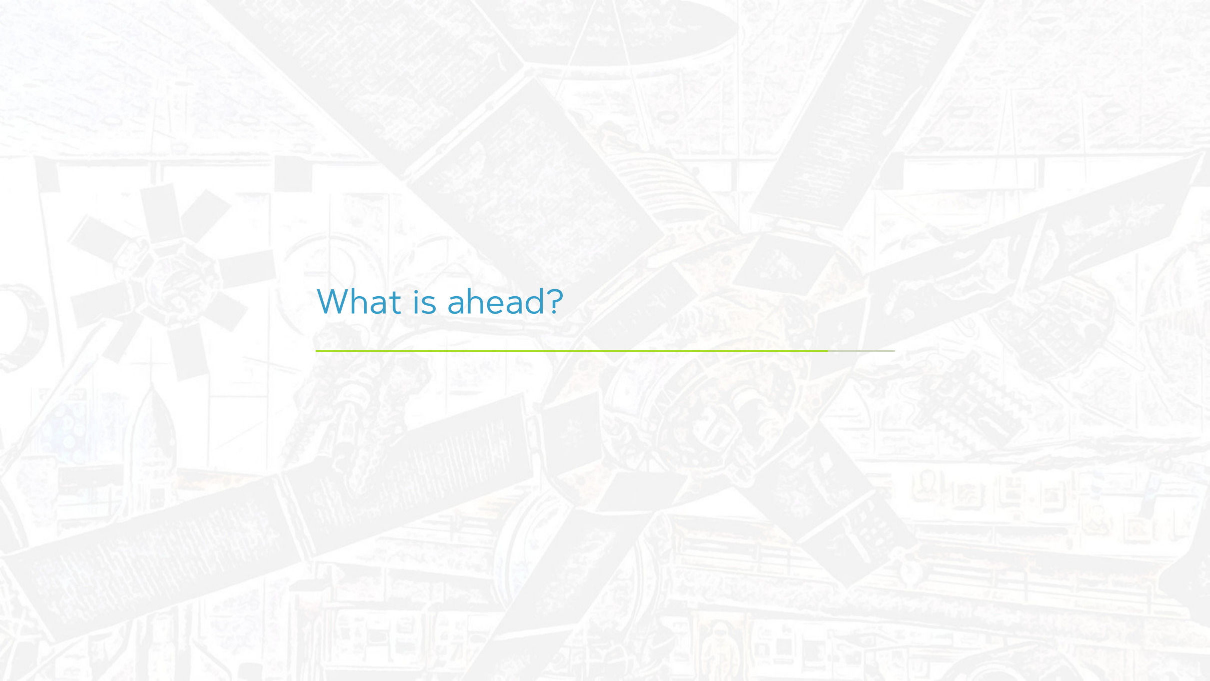
- `systemd-resolved` support
  - Fedora 34+
  - automatic enablement of IPA DNS server lookup on IPA server
- `bind-dyndb-ldap` LDAP module now supports BIND 9.16+
- enables native PKCS#11 support
  - could work with OpenSSL engines
- migrated to OpenDNSSEC v2



Performance improvements

Performance improvements

- LDAP caching layer in IPA API
  - ~30% performance boost for complex API calls
  - part of FreeIPA 4.9.4 (to be released)
- Better LDAP indexing
  - faster Kerberos KDC responses



What is ahead?

SUBID support

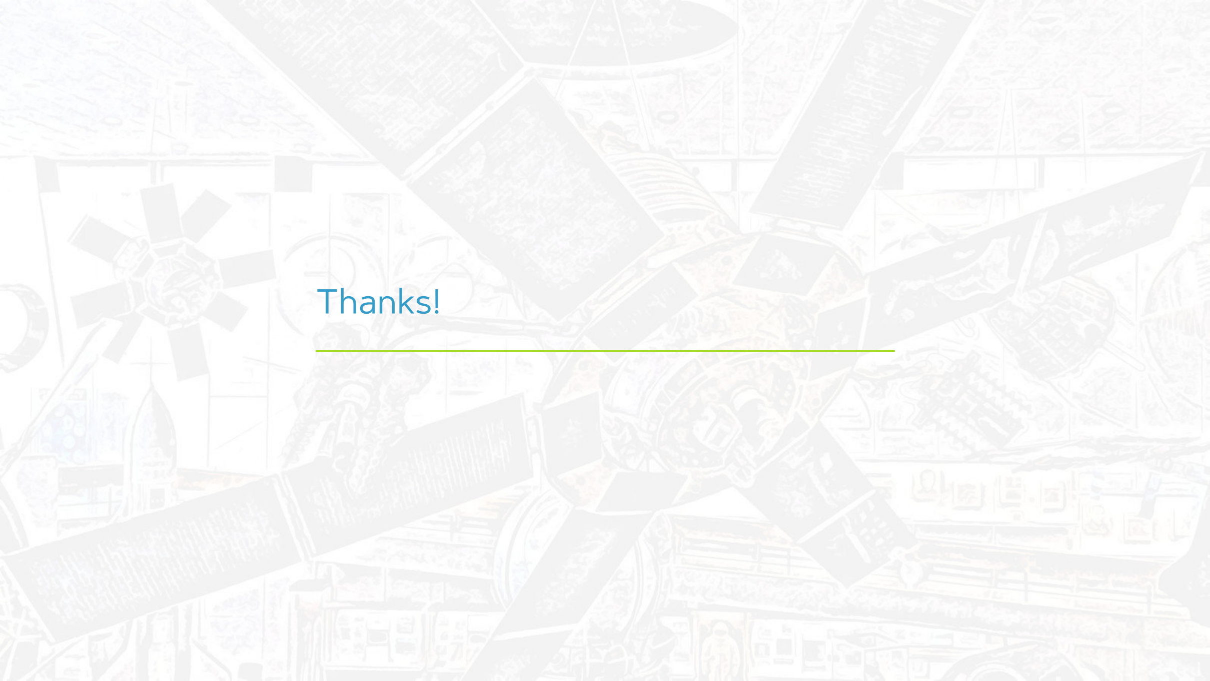
- Centralized management of user namespaces on Linux
  - new `shadow-utils` support for plugins in ‘libsubid’
  - needs new SSSD code to support IPA subid records

Two-way trust

- Global catalog support
  - allows login to Windows systems from Active Directory
  - enables two-way trust between two separate IPA deployments

External identity providers

- Authenticate against OAuth2 identity provider for IPA users
  - login with your IdP and get a Kerberos ticket on IPA clients
- Transparent integration with Keycloak / RH SSO



Thanks!