CERN Authentication and Authorization

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Recap

- Next generation CERN authentication & authorization
  - Presented at HEPiX Autumn/Fall 2018
- Authentication
  - Uniform scheme for all use-cases (web, desktop…)
  - WLCG alignment
- Authorization
  - Full federation support
  - Identities over accounts
  - Roles over groups
- Resources lifecycle
  - Accounts and other resources
  - Federation support
- LDAP migration

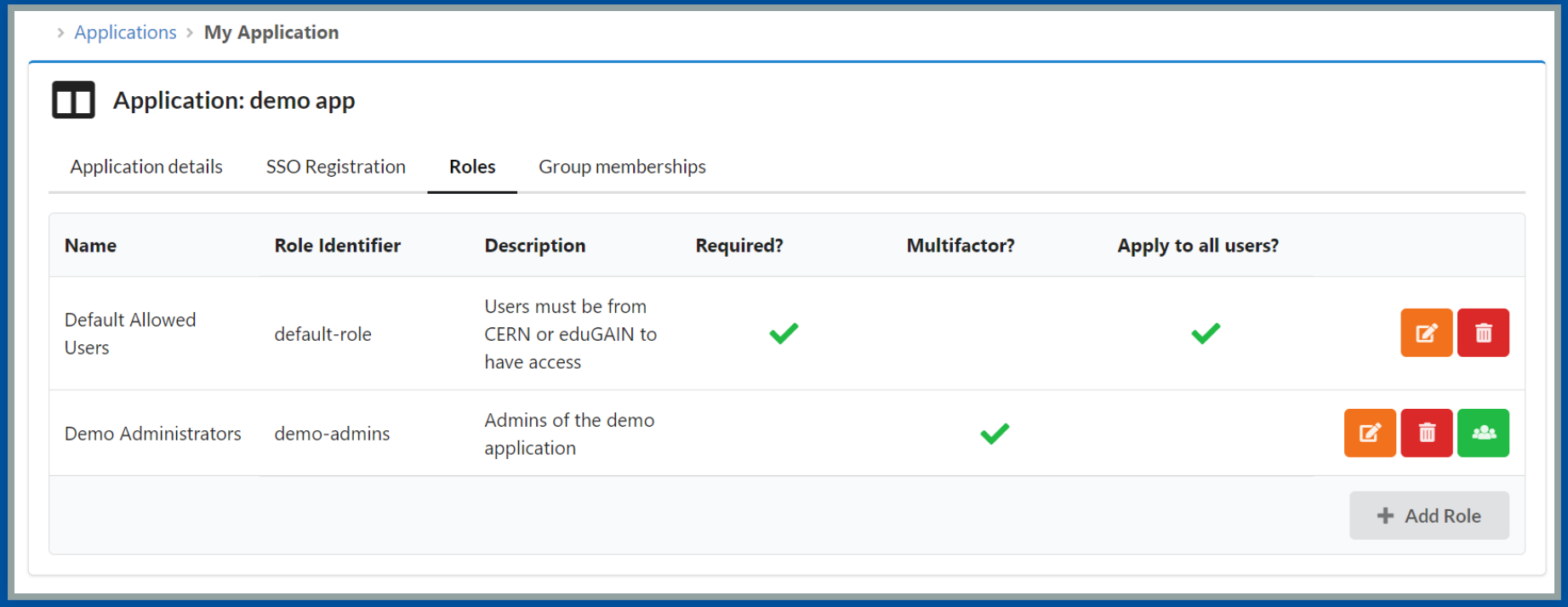
Authentication

- Single Sign-On
  - Fully operational
  - ~3.000 applications / ~15.000 total
- Based on **Keycloak**
  - *More later*
- Support for
  - CERN accounts
  - eduGAIN users
  - Social logins (Linkedin, Github, Google, Facebook)
  - Guest accounts (mail and password)

Authorization

- Groups portal
  - Grouping: fully functional
  - Limited communication
- Groups contain *identities*
- Identities
  - Mapped to one or more accounts (CERN, Edugain…)
  - People, services, applications
- Application owners define *roles*
  - Mapped to groups
  - Restrict by Level of Assurance and Multifactor
  - User token is populated with roles
  - Using groups possible (privacy issues)

Applications portal: defining roles



Resources lifecycle

- Lifecycle for computing resources
- Lifecycle rules based on *roles* transitions, e.g.:
  - “Storage users” role, mapped to several groups
  - Identities in users role can create workspaces
  - When identity leaves role, reassign resources
- Work in progress
  - Implementation completed
  - Migrations needed

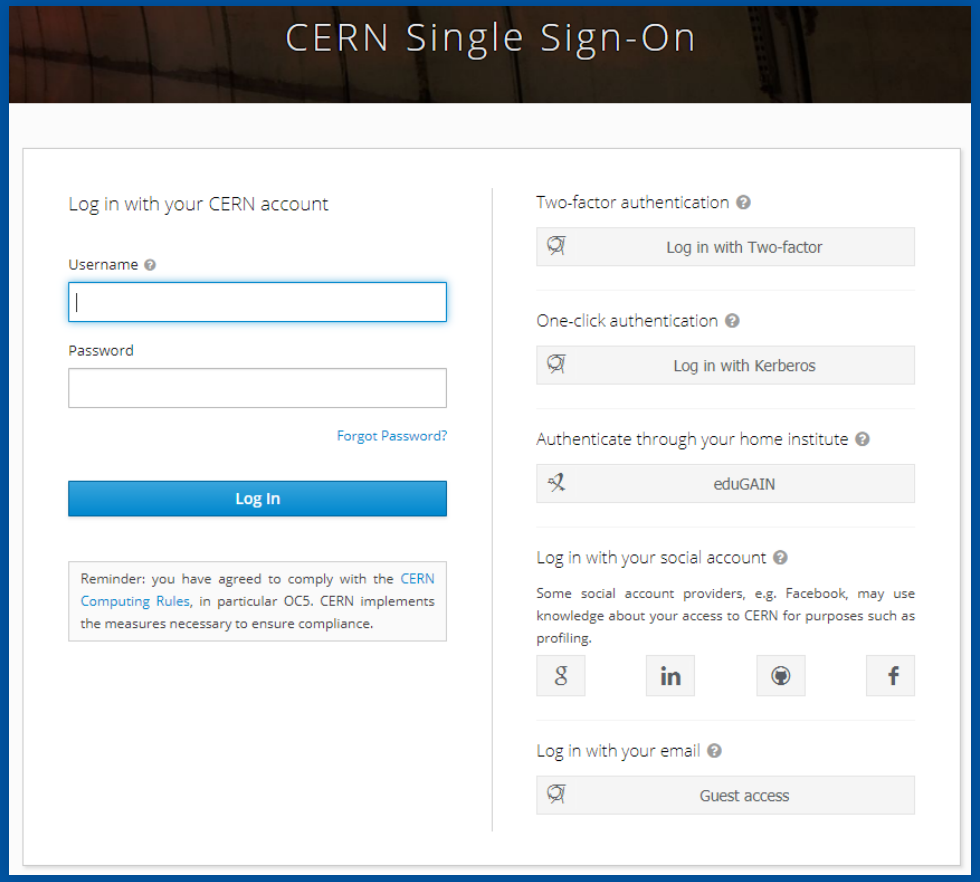
LDAP Migration

- New LDAP/Kerberos service based on FreeIPA
- Pilot phase
- Users and groups synchronized from production
- Services migration strategy defined
- Next steps: proof of concept service on FreeIPA
  - Grid Batch

Keycloak deployment

- Keycloak 11
  - Some preview features enabled, e.g. Token Exchange
- Multiple realms, to allow:
  - “Optional” MFA (to be rediscussed)
  - “Optional” one-click authentication
  - Edugain
  - Social and Guest access

Login screen



eduGAIN integration

- Authentication to CERN using home institute credentials
  - CERN must register a Service Provider (SP) proxy in eduGAIN (done)
- Authentication to eduGAIN SPs using CERN credentials
  - CERN must register an Identity Provider (IdP) in eduGAIN (in progress)
- Must consume a trusted subset of the eduGAIN metadata (> 4000 members)

Additional software used

- Satosa (SAML-to-SAML): token translation proxy
  - Impose restrictions
  - Add authorisation
- PyFF (Python Federation Feeder)
  - Discovery service
  - Metadata Query provider
  - Avoids registering over 4000 entities in Satosa or Keycloak

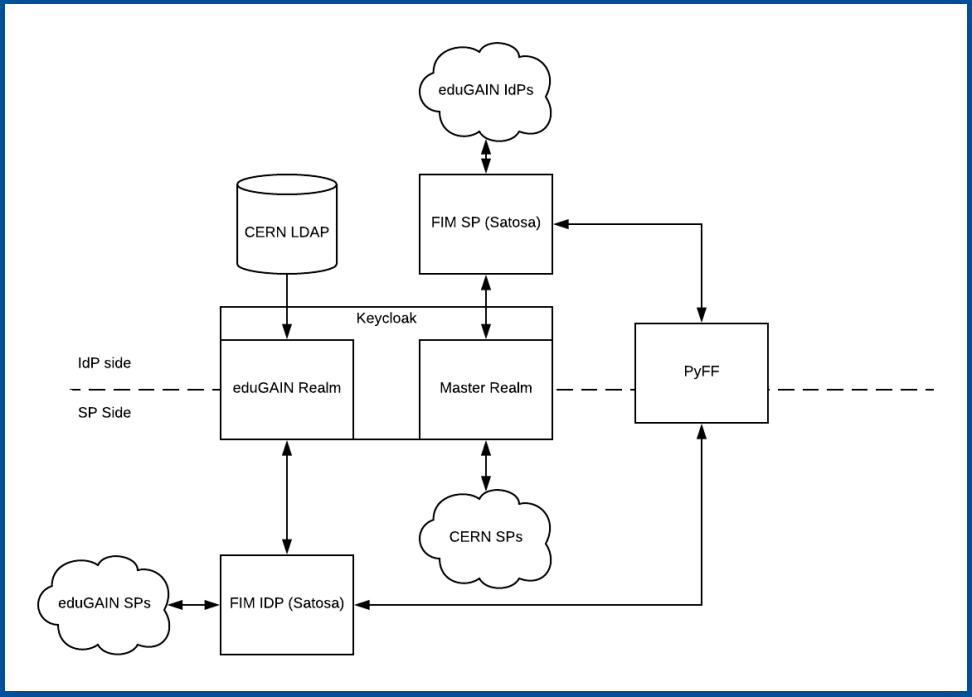
eduGAIN login to CERN

- eduGAIN IdP configured in main CERN realm
- IdP is a Satosa instance handling:
  - Registration of the eduGAIN IdPs
  - Their discovery (through PyFF)
- Satosa rewrites the incoming (from external IdP) token
  - Standardizes attributes in token that goes to Keycloak

CERN login to eduGAIN

- Dedicated eduGAIN realm in Keycloak
- Enable only CERN users
  - LDAP is the only IdP in the realm
- Add a client with eduGAIN attribute mappers configured
- Client is a Satosa instance handling:
  - Registration of eduGAIN SPs

eduGAIN integration overview



Why this design?

- Satosa is the service that interacts with eduGAIN
  - Maintained by the eduGAIN community
- Single point of login where users enter passwords
  - Keycloak if CERN
  - Federated users' home organisation
- We don't have to register clients in Keycloak
- Layer over Keycloak
  - We can change SSO transparently
- Improvements from the previous solution
  - Cleaner design
  - Higher interoperability with the wider community

Additional Keycloak customizations

- Service Provider Interfaces (SPI)
- Custom mappers integrated in the login flow
- Query Authorization Service DB to populate user token
  - Application-specific roles
  - Groups