FRED update

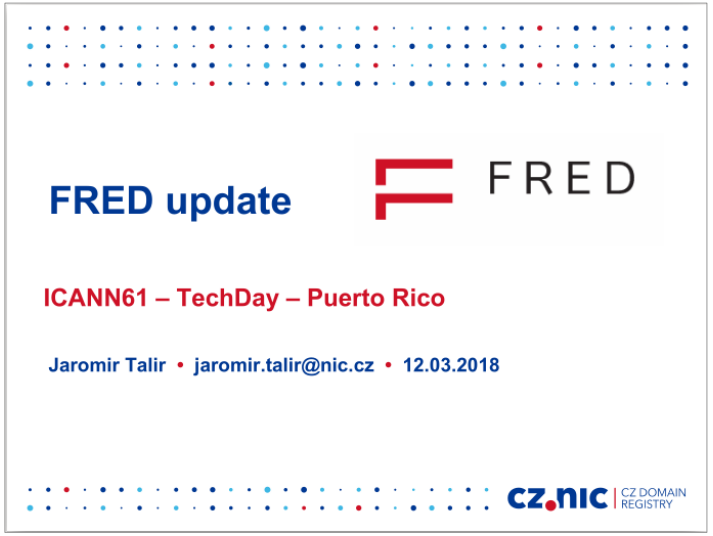
ICANN78 – TechDay – Hamburg

Jaromir Talir • 23.10.2023

cz.nic | CZ DOMAIN REGISTRY

ICANN TechDay updates

- Link to last FRED update



FRED

- Open source registry solution
- EPP, WHOIS, RDAP, DNSSEC with automation via CDNSKEY scanning, ...
- Developed (and used) by CZ.NIC since 2006
- Website: https://fred/nic.cz
- Comprehensive documentation: https://fred.nic.cz/documentation/html/
- Source code: https://gitlab.nic.cz/fred
- It is possible to order support (consultations, help with migration, NBD responses...)

Who uses FRED

Main development drivers

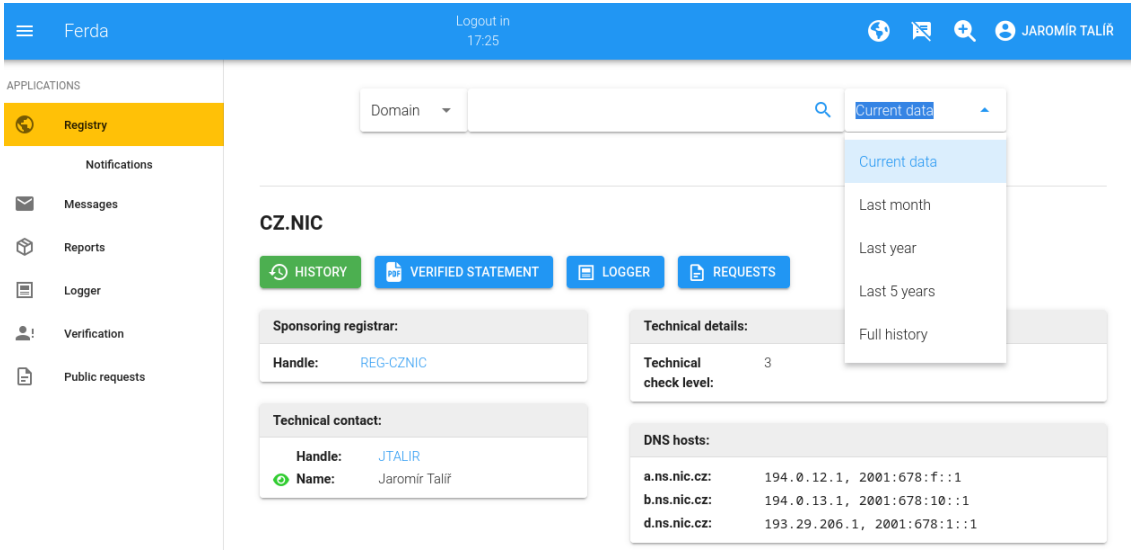
- Catching up with industry progress
- Main languages are Python and C/C++
  - 2020 was end of live of Python 2 → everything had to be rewritten in Python 3
  - Sometimes it was easier to rewrite from scratch
- CORBA RPC technology is aging
  - Some required libraries (i.e ORBit) not maintained anymore
  - Decision was made to move to gRCP
- Modern Python systems requires a lot of dependencies that are not distributed via system packaging
  - Moving to deployment via Docker

Payment processing

- Ongoing effort to separate billing and invoicing into independent module (or ideally integrate with external billing/accounting software)
  - There is a lot of country specific features in this area
- New API for processing incoming payments
- New web application for administration of incoming payments based on Czech specific rules

Web administration interface

- Completely rewritten from scratch
- Python3, gRPC, Docker deployment
- Modular architecture with plugins
- New features
  - MFA with FIDO keys
  - Full-text searches
  - Reports generation
- Missing “in-progress” features
  - Administrative blocking



WebWHOIS & RDAP

- Migration to Python3, gRPC and Docker
- Drop support for old Python/Django versions
- RDAP
  - Object states based on RFC8056
- WebWHOIS
  - Remove .CZ specific template
  - Show CDNSKEY scan results

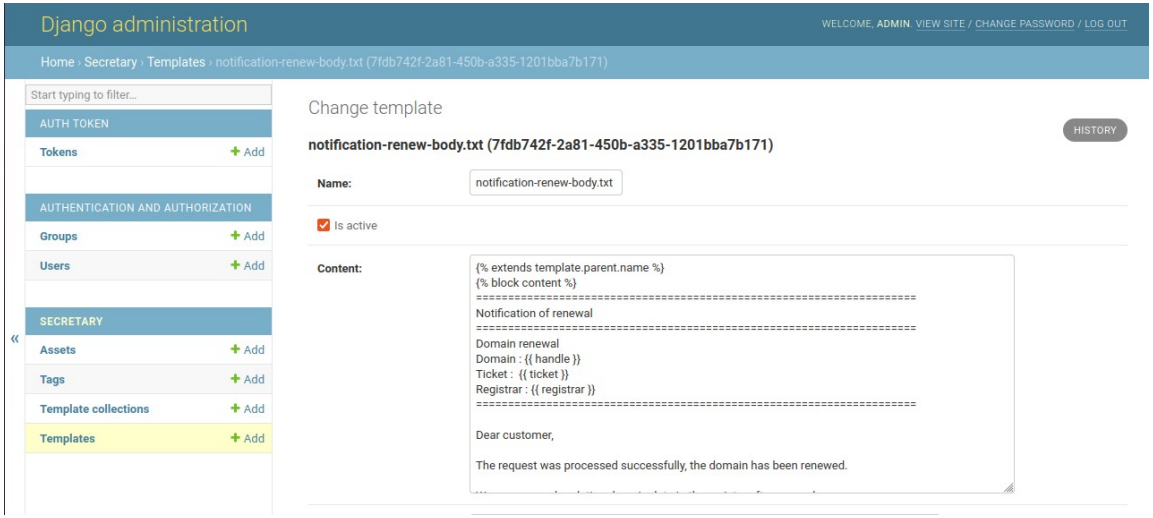
EPP client

- Starting from scratch with Python3
  - EPP library moved to separate project
    - https://gitlab.nic.cz/fred/utils/epplib
  - FRED EPP interactive client (fred-eppic)
    - https://gitlab.nic.cz/fred/eppic/

- Due to slow progress we had to do Python2→Python3 migration of original fred-client tool
  - As a result now we have two epp clients
  - Old one will be supported only for limited time

Messenger

- New component responsible for sending messages (emails, sms, letters)
  - Database with archive is separated from FRED
  - Unified approach to all types
  - Administration interface for templates (secretary)
  - Better performance
  - Plugins for senders
- Migration can be complicated
  - Templates
  - Archive



Current state of refactoring

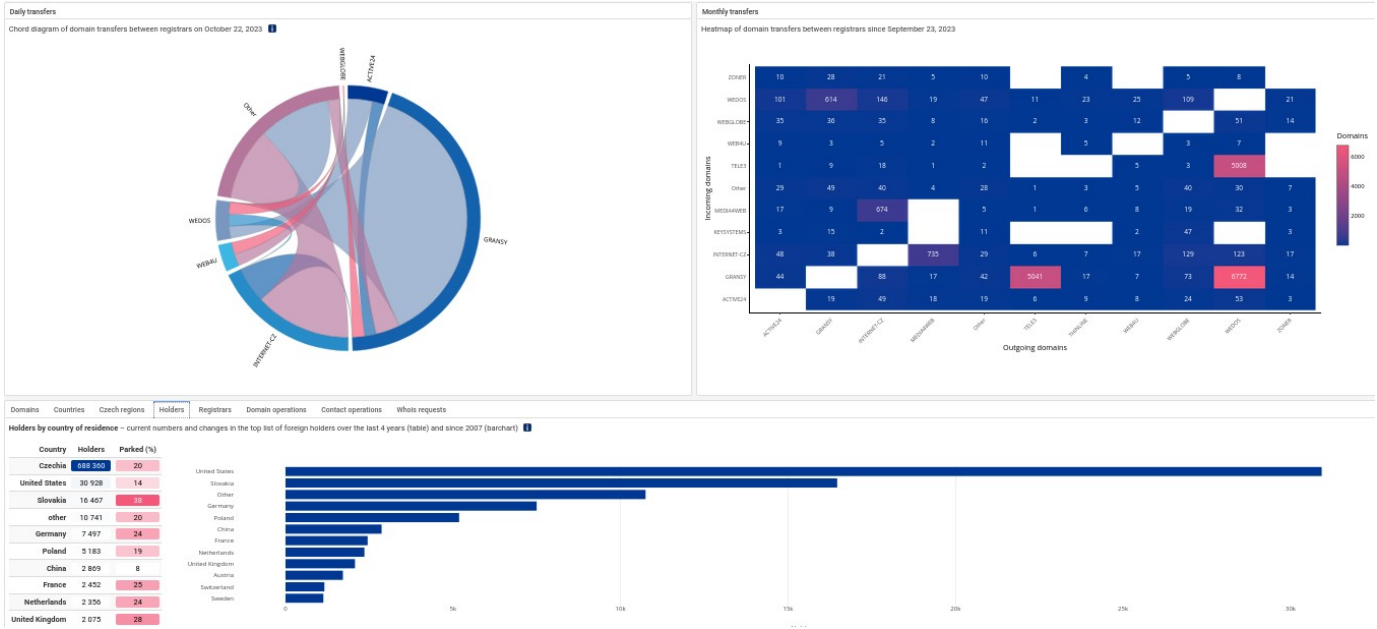
- Still a few missing tasks
  - EPP, processing part and Port 43 Whois
  - Zonefile generation is rewritten as well, but still not deployed
  - Technical checks are abandoned in favor of Zonemaster integration
- For new architecture we prepared a new installation script
  - Since several components are using Docker, it is not possible to deploy into LXC environment
  - Installation via script should be considered as “demo” and not used in production
- New development not related to refactoring follows...

New authinfo usage and handling

- Securing access to contact data
  - Registars could always access all contacts data in the registry
  - Now the access (contact_info) is secured with authinfo for not owned contact
- Authinfo is stored as hash and expires
  - Implementation of RFC9154 (Extensible Provisioning Protocol (EPP) Secure Authorization Information for Transfer)
  - For each authinfo “usage” (transfer, contact_info) there must be a new authinfo generated either via registrar or via registry
  - It is not possible to query authinfo from the registry
  - Expiration is configurable (14 days for .CZ)

Statistical dashboard

- Independent application that collects all the data from our systems
- Visual graphs and REST API to the data



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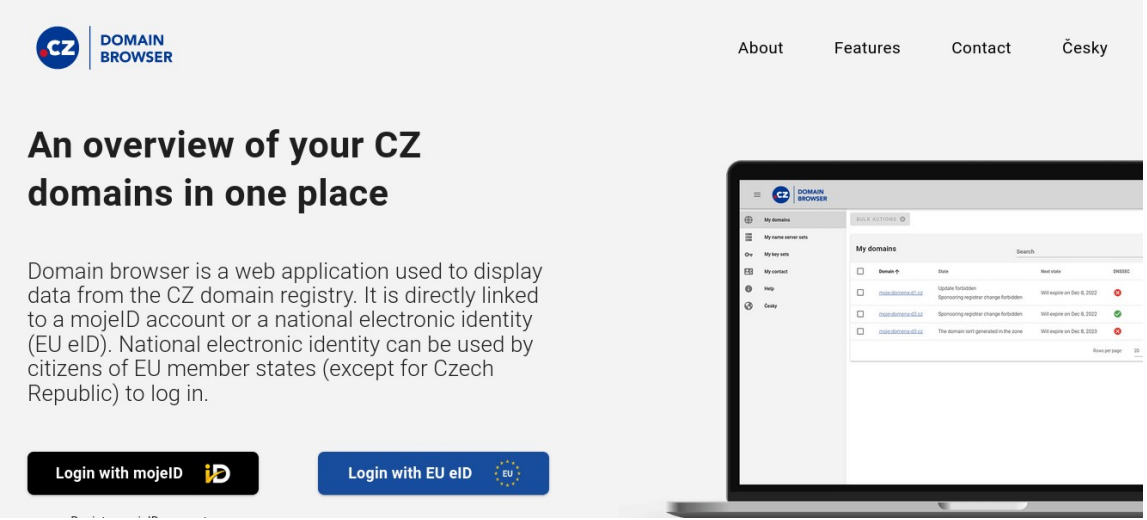
DomainBrowser and eID

- Registrant portal
  - Not part of distribution due strong dependency on our identity service
  - Refactored with eIDAS authentication included
  - Full generalization of access possibilities still in progress



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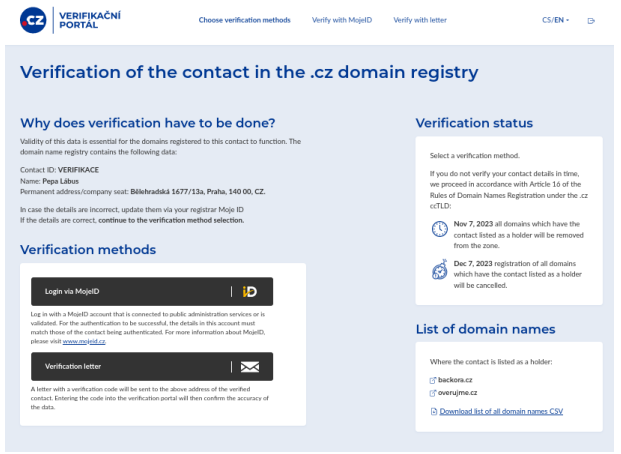
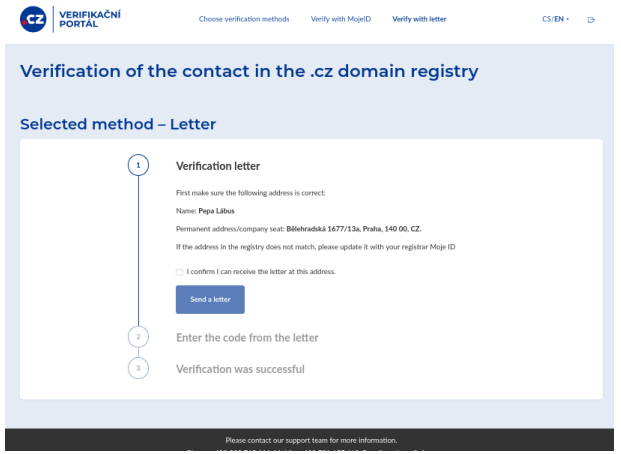
Verification portal

- As reaction to NIS2 we need more flexible approach for registrant data verification
- New web portal where registrant can select method for verification
- First version is out to collect feedback
  - with methods send letter or use MojeID
- More work is needed to make it general for other registries





Auctions

- Reaction to complains about unfair access to expired domain
- Inspired by successful implementation of auctions in Estonia
  - However with some differences (open auctions)
- Auction portal implemented in DomainBrowser
  - It will again require verified digital identity to participate
- Expected launch in 2024

Future

- Finishing refactoring
  - Thanks to modular architecture we can rebuild “as we go”
- Be fully “cloud ready” using Docker
- Embracing digital credentials and wallets
  - Potentially universal technology that we can use in DomainBrowser and Verification portal
  - Crazy idea: “Registries as the issuers of domain ownership credentials that are accepted by issuers of TLS certificate as the alternative to domain validation”
  - To explore these possibility we participate in Large Scale Pilots for European Digital Identity Wallet as part of EWC consortium

Thank you for watching!

Jaromir Talir • 23.10.2023

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