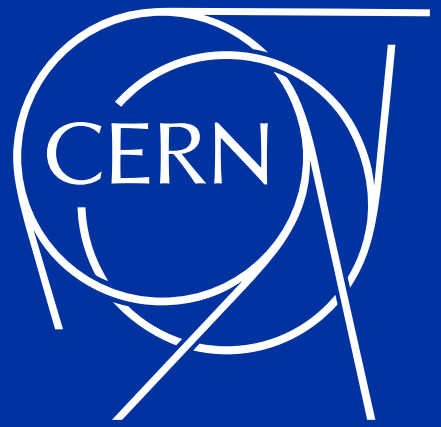

Implementation of projects for acron

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Outline

1. Intro to (a)cron
2. Architecture of acron
3. Acron projects
4. Outlook
5. Q&A

Background
Intro to cron

Goal:
Schedule periodic jobs (i.e. commands or scripts) on Unix-like operating systems

Example:
crontab –e
0 4 * * * /bin/sh backup.sh

Limitations:
Job execution is limited to a single machine

Background
Intro to acron

Motivation:
Run cron jobs on multiple machines
Authenticate users using Kerberos credentials

Features:

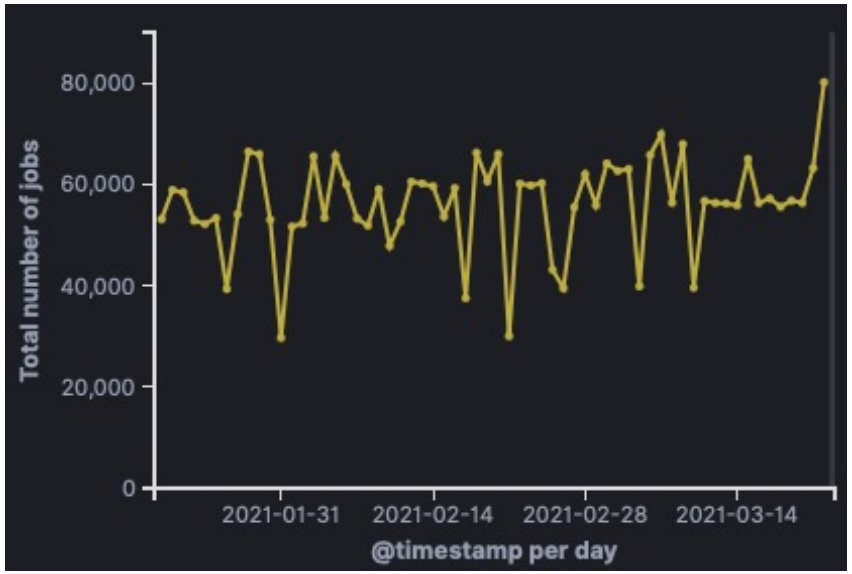
- High availability (via automatic failover)
- Scalability (via load balancer)
- Security (credentials management using Kerberos)
- Ease of use (cron-like syntax)

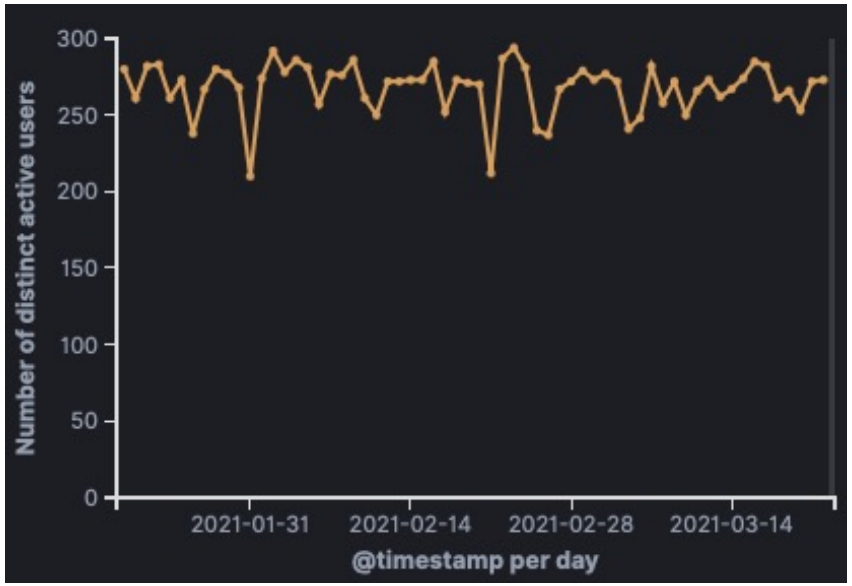
Background
Implementation of acron

Advantages:

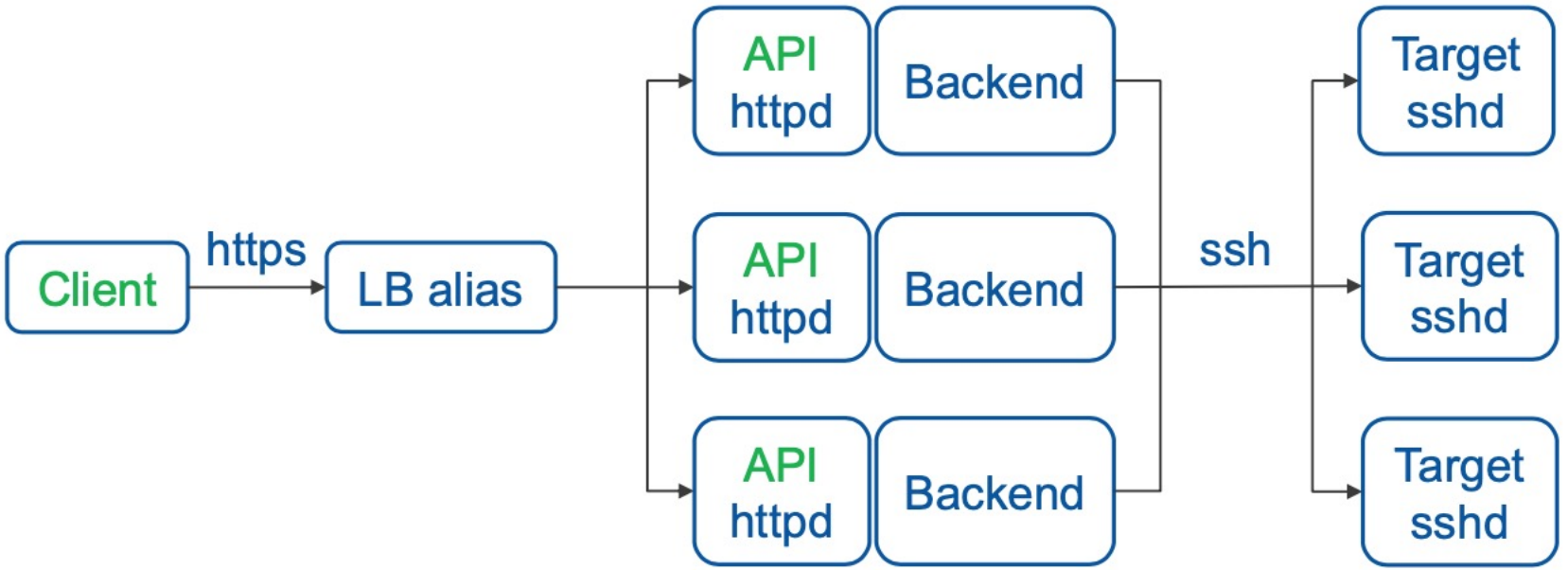
- Modern tools
  - Frontend and backend written in python3
  - REST API
- Portable
  - No CERN-specific tools or protocols
- Ease of use
  - Practically, zero setup for target machines (only sshd required)
- Support for 2FA

Background
Importance of acron service





Architecture



Acron projects

Motivation:
Allow users to manage a common set of jobs.

Design:
One-to-one relationship between user and project, i.e. each user has only one project.
Projects can be shared with users with read-only or read-write access.
Jobs in a project are always run in the name of the owner of the project.
Jobs can access the AFS (Andrew File System) of the project owner.

Concerns:
Delicate security-wise because users can impersonate others.

Solution:
Enable acron project sharing only for CERN service accounts, which are inherently shared to reduce risks.

Acron projects

Personal contributions:

- **Completed implementation 4 weeks faster than expected**
- **Revamped initial draft of acron projects**
- **Improved code maintainability by refactoring codebase**
- **Implemented smoke tests to increase robustness**

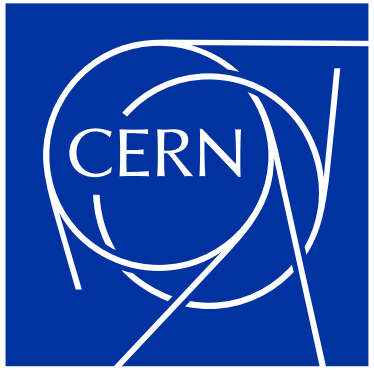
Outlook

- **Restrict service to service accounts**
- **Security enhancements and service hardening**
  - Enable projects in pilot phase and mitigate possible shortcomings
- **Consult CERN Computer Security for advice**
  - Ask for feedback and integrate it

Q&A

References

- User documentation: https://acrondocs.web.cern.ch/mandate/mandate/
- Blog post: https://alexpearce.me/2016/06/running-kerberos-jobs-with-acron/
- Previous acron presentations:
  - Future of the acron service
  - ACRON_NEXT: a replacement service for ACRON. Current status and perspectives¶
  - ACRON_NEXT: status and deployment plans



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