

External Fingerprint Storage for Jenkins

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About Me

- Sumit S.
- GSoC 2020 Student with Jenkins
- Started contributing to Jenkins in December 2019
- Maintain Redis and PostgreSQL Fingerprint Storage Plugins
- <https://github.com/stellargo>

What I'll Be Talking About

- Jenkins Fingerprinting Engine
- External Fingerprint Storage API for Jenkins
- External Fingerprint Storage Plugins
- Demo

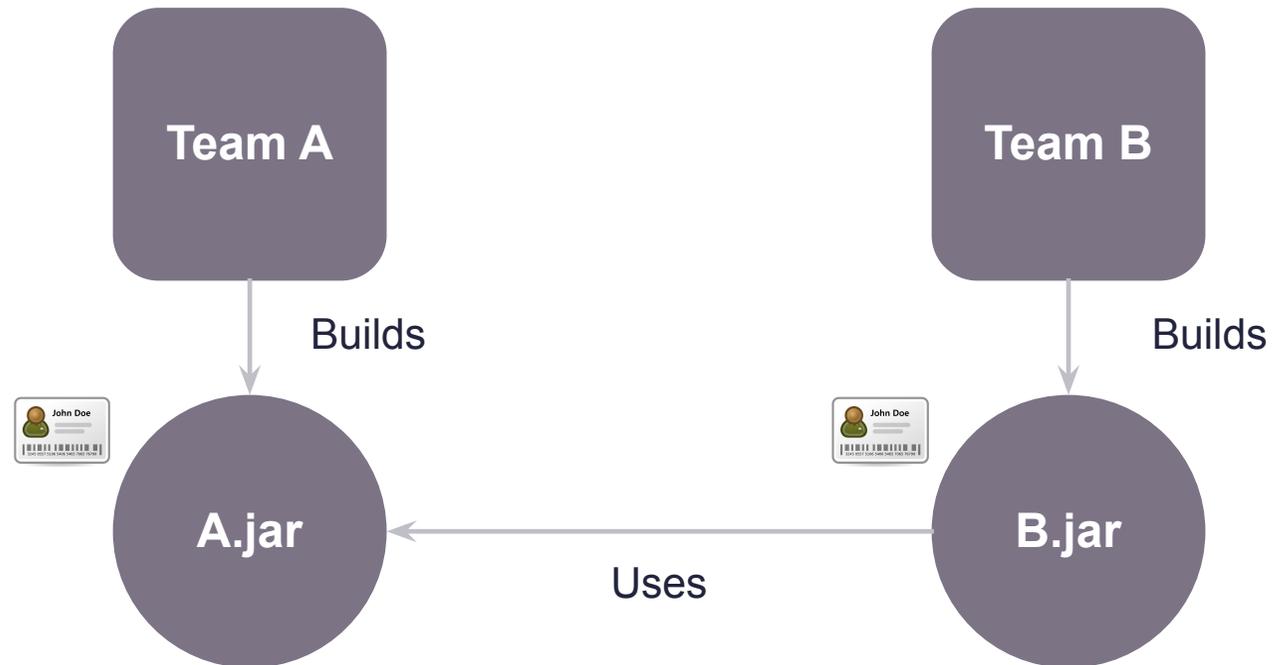
Jenkins Fingerprinting Engine

What are fingerprints, and how to use them?



Introduction to Fingerprints

- File fingerprinting is a way to track which version of a file is being used by a job/build, making dependency tracking easy.



Enabling Fingerprints

Post-build Actions



Record fingerprints of files to track usage



Files to fingerprint



Advanced...

Add post-build action ▾

Fingerprints UI in Jenkins

Jenkins > B > #1 > See Fingerprints

- Back to Project
- Status
- Changes
- Console Output
- Edit Build Information
- Delete build '#1'
- See Fingerprints

Recorded Fingerprints

File ↓	Original owner	Age
A.jar	A #1	53 sec old

Jenkins > A.jar

- Back to Dashboard

A.jar

Introduced 1 min 40 sec ago A #1

Usage

This file has been used in the following places:

- A #1
- B #1

External Fingerprint Storage API for Jenkins Plugin Developers

Exploring the features offered

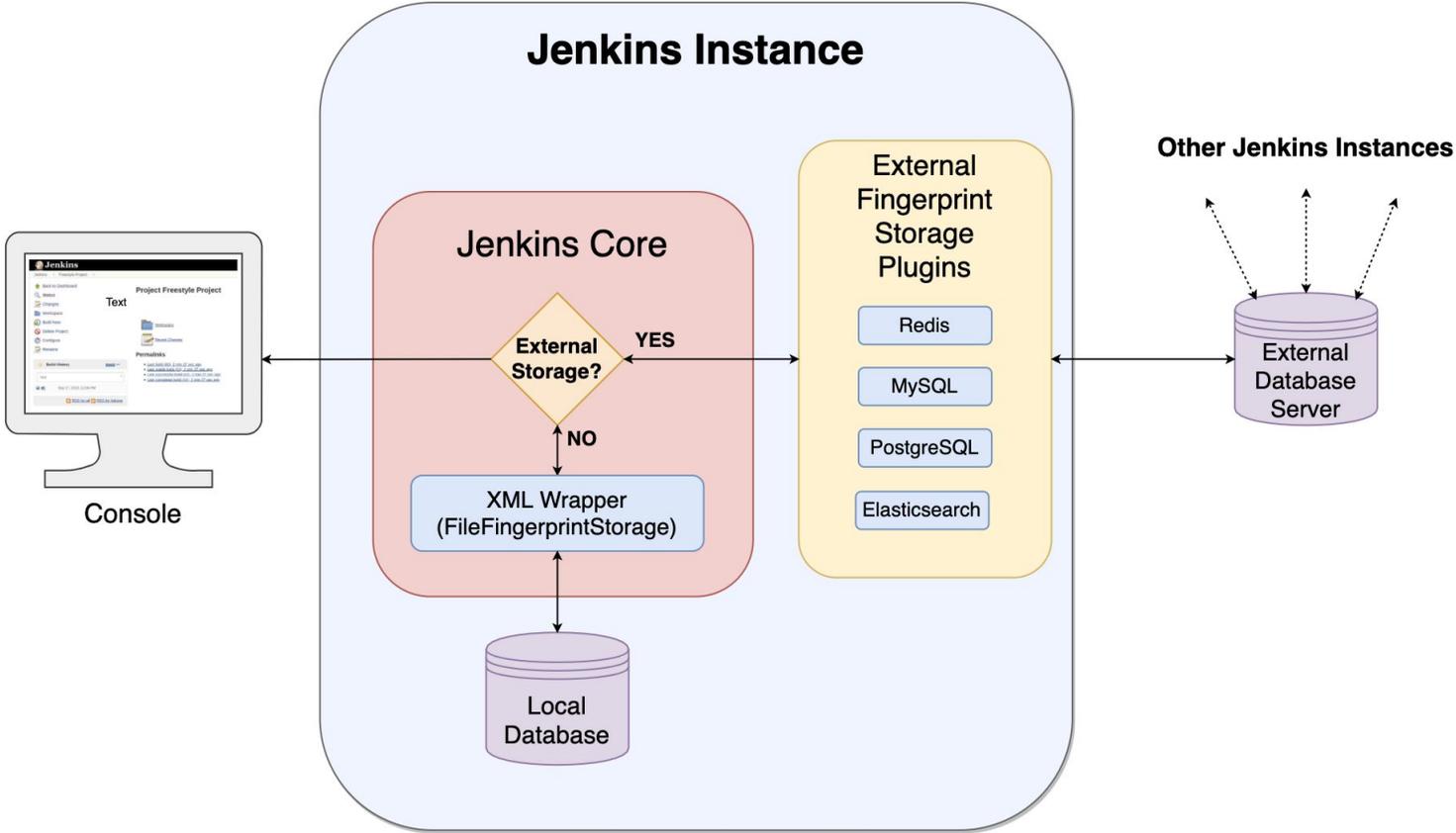
Before External Fingerprint Storage API

- Fingerprints stored in local XML-based database in Jenkins Home.
- Disadvantages:
 - Dependent on Disk Storage of Jenkins master
 - Cannot configure pay-as-you-use cloud storages
 - Difficult Backup Management
 - Poor Reliability and Availability
 - Fingerprints cannot be tracked across Jenkins instances

Defining a Pluggable Storage

- Externalizing the Fingerprint Storage
- Plugin configurable external storage
- Multiple Jenkins instances, single fingerprint store
- Externalizing storages for various features of Jenkins is a wide initiative to make Jenkins “Cloud Native”
- Pluggable storage stories in the Cloud Native SIG
<https://www.jenkins.io/sigs/cloud-native/pluggable-storage/>

Defining a Pluggable Storage (contd.)



The API

- Introduced in <https://www.jenkins.io/changelog/#v2.242>
- Offers:
 - load(String id)
 - save(Fingerprint fingerprint)
 - delete(String id)
 - ... etc.
- For more details:
 - <https://javadoc.jenkins.io/jenkins/fingerprints/FingerprintStorage.html>
 - <https://javadoc.jenkins.io/jenkins/fingerprints/FingerprintStorageDescriptor.html>

Fingerprint Cleanup

- Allow external storage plugins to perform and configure their own fingerprint cleanup strategies.
 - Redis Fingerprint Storage Plugin uses cursors to optimize cleanup.
- Methods in API for Plugin Developers
 - `iterateAndCleanupFingerprints(TaskListener taskListener)`
 - `cleanFingerprint(Fingerprint fingerprint, TaskListener taskListener)`
- Fingerprint cleanup is togglable via the new Fingerprint configuration page

Fingerprints

Disable Fingerprint Cleanup

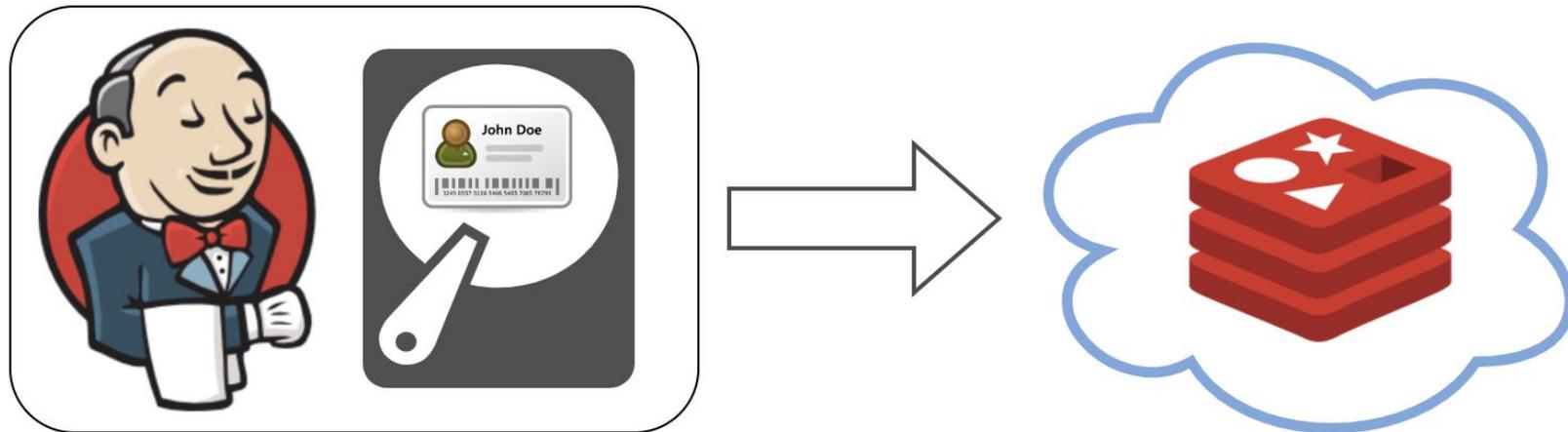
Fingerprint Storage Engine

Local Fingerprint Storage



Fingerprint Migration

- The old fingerprints are migrated to the new configured external storage as and when they are used (lazy migration).
- This allows gradual migration of fingerprints from local disk storage to the new external storage.



External Fingerprint Storage Plugins

Available plugins ready for use

Available Plugins

- Redis Fingerprint Storage Plugin
 - <https://plugins.jenkins.io/redis-fingerprint-storage>
 - Latest Release: 1.0-rc-3
 - Supports migration and cleanup
 - Stores fingerprints as blobs
 - <https://github.com/jenkinsci/redis-fingerprint-storage-plugin>
- PostgreSQL Fingerprint Storage Plugin
 - Alpha release will take place soon!
 - Supports migration but not cleanup at the moment
 - Defines a relational structure to store fingerprints
 - <https://github.com/jenkinsci/postgresql-fingerprint-storage-plugin>

Demo

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