

# External Fingerprint Storage for Jenkins

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# About Me

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- 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

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- 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?

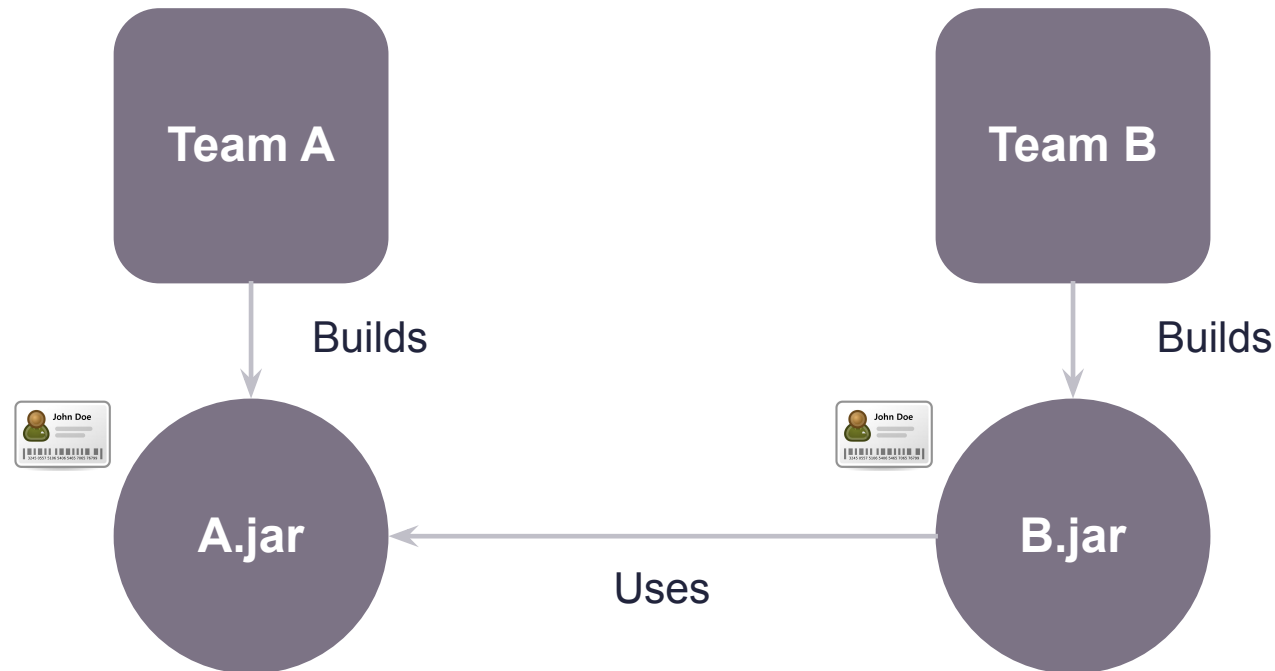




# Introduction to Fingerprints

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- 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

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# External Fingerprint Storage API for Jenkins Plugin Developers

Exploring the features offered





# Before External Fingerprint Storage API

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- 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

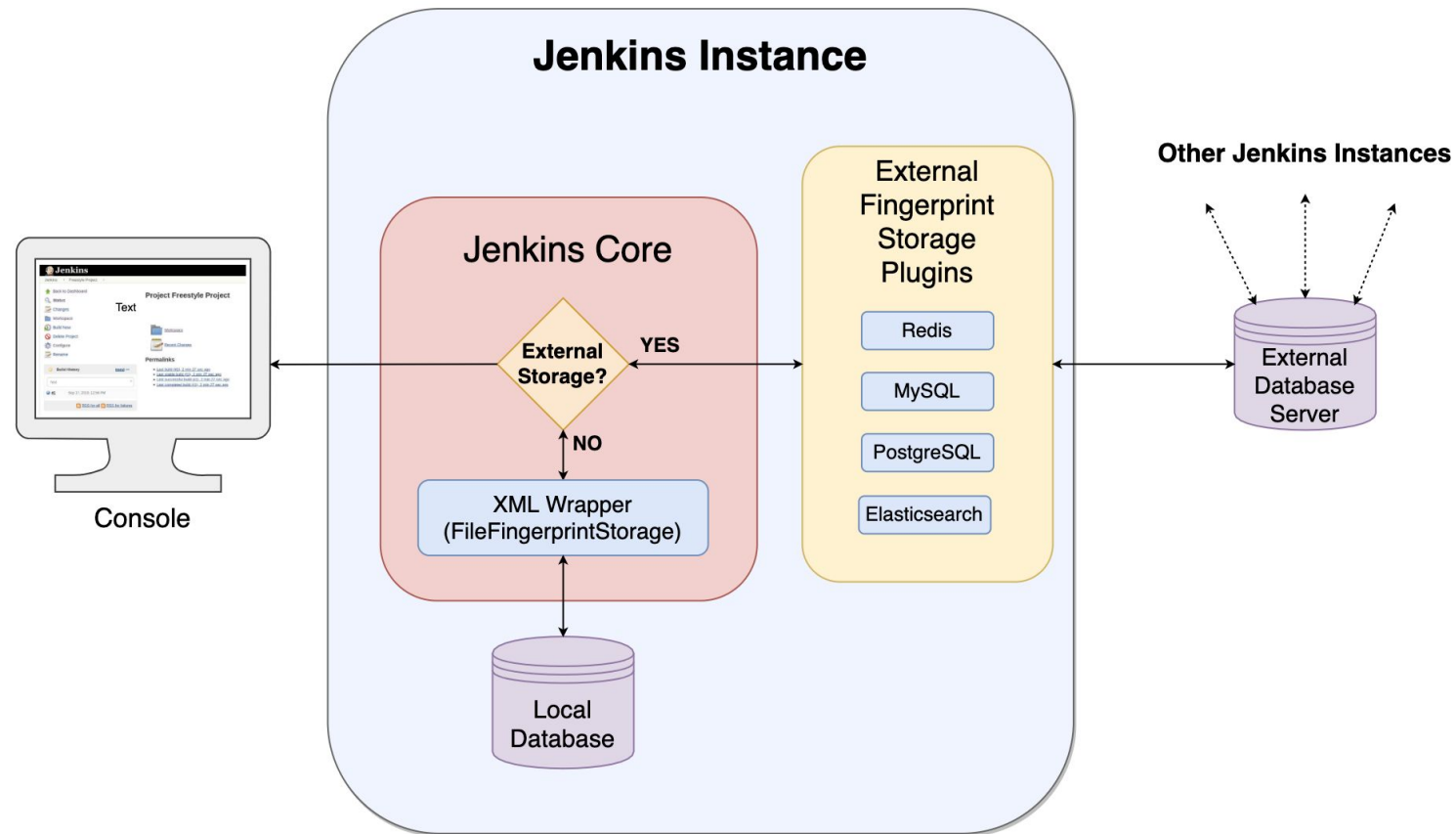
# Defining a Pluggable Storage

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- 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

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- 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

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- 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

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Disable Fingerprint Cleanup

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Fingerprint Storage Engine

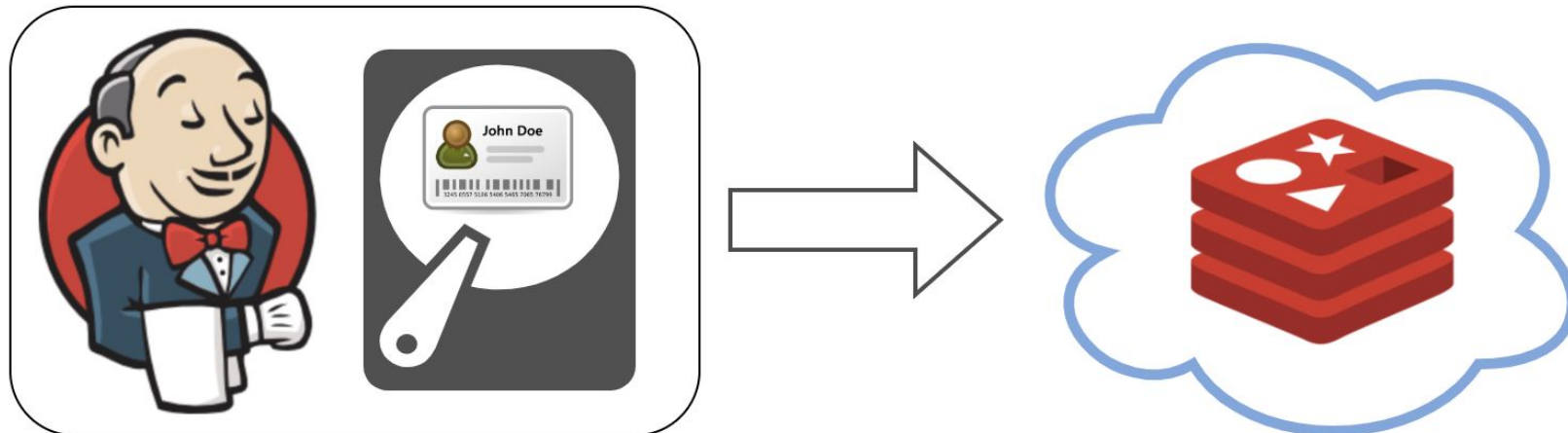
Local Fingerprint Storage



# Fingerprint Migration

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- 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

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- 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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