

# LOCKSS Software Re-Architecture

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# Overview

1. Shifting Sands
2. Legacy
3. Changing LOCKSS
4. Code and APIs



# Shifting Sands

# On the Web

- Dynamic Web
- Web replay

# In IT

- Appliance model
  - Storage
  - Computation
- Management
  - Machine environment
  - Virtualization
  - Outsourcing



# Legacy

"Love Padlocks on the Corktown Footbridge in Ottawa, August 14th, 2017" by William Chen ([CC BY-SA 4.0](https://commons.wikimedia.org/wiki/File:Love_Padlocks_on_the_Corktown_Footbridge_in_Ottawa,_August_14th,_2017.jpg)  
[https://commons.wikimedia.org/wiki/File:Love\\_Padlocks\\_on\\_the\\_Corktown\\_Footbridge\\_in\\_Ottawa,\\_August\\_14th,\\_2017.jpg](https://commons.wikimedia.org/wiki/File:Love_Padlocks_on_the_Corktown_Footbridge_in_Ottawa,_August_14th,_2017.jpg))



# What's In the (LOCKSS) Box?

- 1,100+ Java classes
- 750+ test classes
- Single codebase
- Single stack

# Custom Implementations

- LOCKSS Web Crawler
- Web replay
- Repository (storage)



# Things Change

- Project hosting
- Source control management
- Build system
- Unit testing
- Continuous integration
- Binary distribution
- Development environment

# Changing LOCKSS

# LAAWS Initiative

- "LOCKSS Architected As Web Services"
- Mellon Foundation grant
- Modernization effort

# Goals

- Re-architect LOCKSS daemon as collection of Web Services
  - WARC storage
  - Memento access
- Use off-the-shelf open source components
- Minimize LOCKSS-only components

# Desiderata

- LOCKSS protocol compatibility
- LOCKSS plugin compatibility

# Splitting Up Functionality

- Components -> services
- REST API
- Considerable refactoring

# Technologies

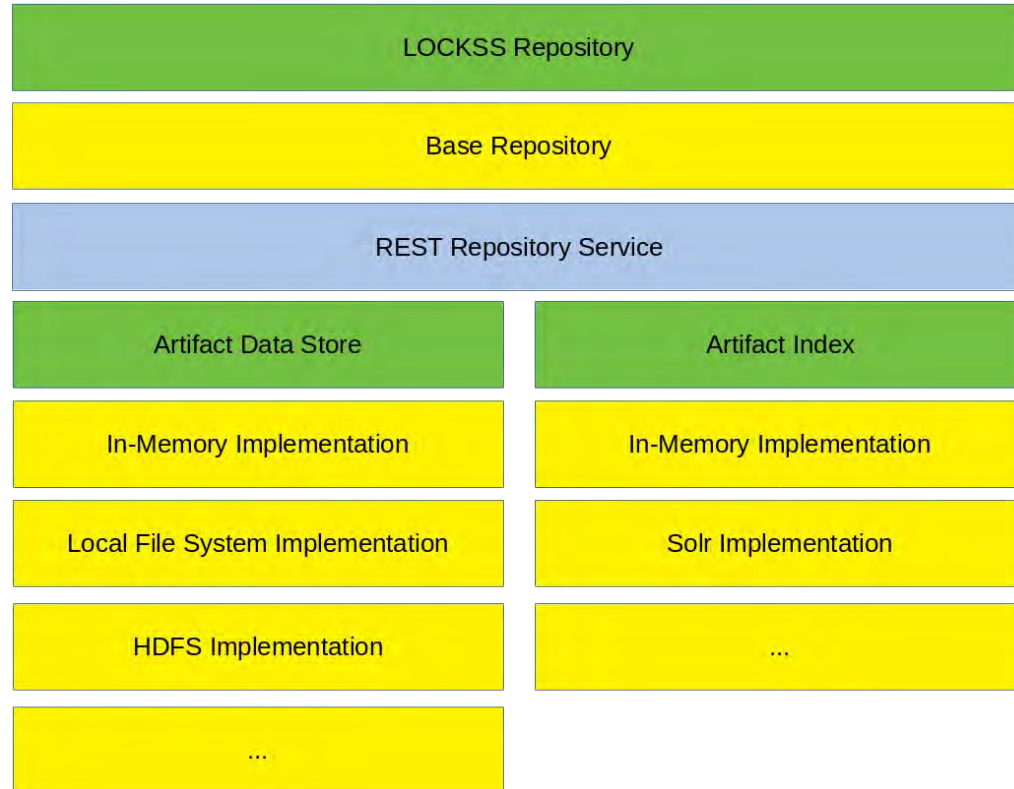
## In progress

- Maven, Maven Central
- JUnit 4, JUnit 5, Mockito
- Spring Framework 4, Spring Boot 1
  - Spring Framework 5, Spring Boot 2
- Swagger 2
  - OpenAPI 3
- OpenWayback, Pywb
- Solr
- Docker, Docker Hub

## Under consideration

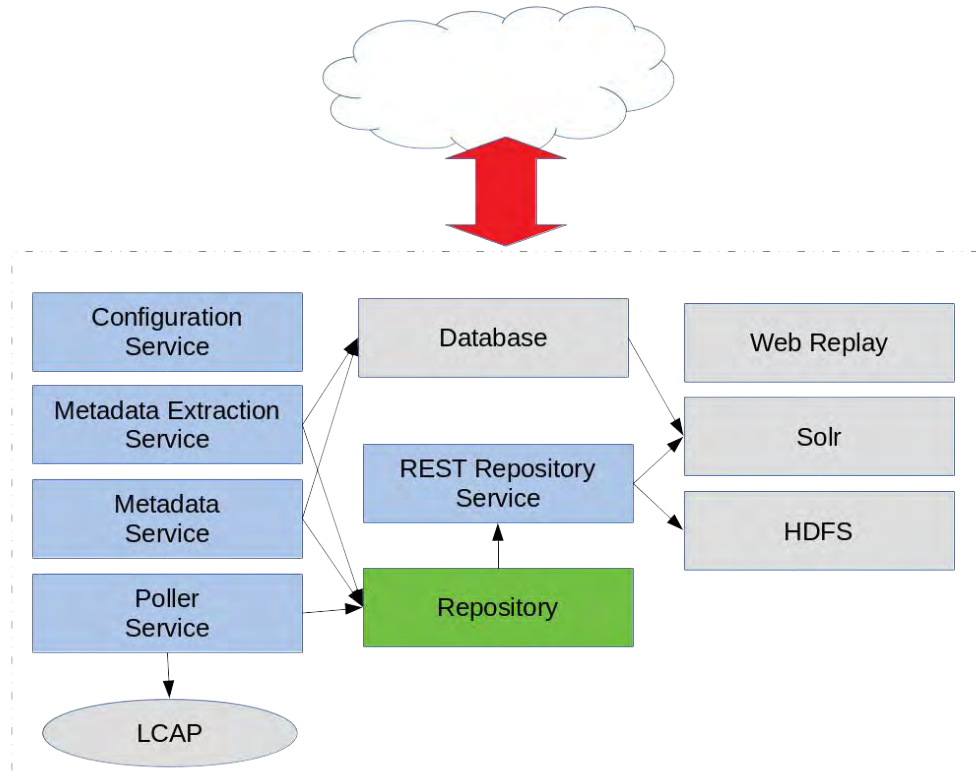
- Orchestration

# Repository Architecture

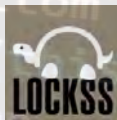




# Disaggregated Architecture



# Code and APIs



# LOCKSS Developer Pages

- <https://lockss.github.io/>
- <https://lockss.github.io/laaws/code-artifacts/>

# Core

- LOCKSS Core (org.lockss.laaws:lockss-core)
  - Stable version: 1.1.1
  - Development version: 1.2.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/lockss-core>

# Repository

- LOCKSS Repository Core (org.lockss.laaws:laaws-repository-core)
  - Stable version: 1.11.4
  - Development version: 1.12.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/laaws-repository-core>
- LOCKSS Repository Service (org.lockss.laaws:laaws-repository-service)
  - Stable version: 1.7.0
  - Development version: 1.8.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/laaws-repository-service>
- LOCKSS WARCImport Client (org.lockss.laaws:laaws-repository-client)
  - Stable version: 1.5.0
  - Development version: 1.6.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/laaws-repository-service>

# Metadata

- LOCKSS Metadata Extraction Service  
(org.lockss.laaws:laaws-metadata-extraction-service)
  - Stable version: 1.0.0
  - Development version: 1.1.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/laaws-metadataextractor>
- LOCKSS Metadata Service (org.lockss.laaws:laaws-metadata-service)
  - Development version: 1.0.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/laaws-metadataservice>
- LOCKSS Metadata Extractor Common Code  
(org.lockss.laaws:laaws-metadataextractor-common)
  - Stable version: 1.2.0
  - Development version: 1.3.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/laaws-metadataextractor-common>

# Polling and Repair

- LOCKSS Poller Service (org.lockss.laaws:laaws-poller)
  - Development version: 1.0.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/laaws-poller>

# Infrastructural

- LOCKSS Configuration Service  
(org.lockss.laaws:laaws-configuration-service)
  - Stable version: 1.0.0
  - Development version: 1.1.0-SNAPSHOT
  - GitHub: <https://github.com/lockss/laaws-configservice>