



EDGE X FOUNDRY™

# DevOps Working Group

Thursday April 9, 2020



# Agenda

Time	Topic	Owner
20 Min	Linux Foundation Roadmap 2020-Beyond	Andrew Grimberg / Linux Foundation
10 Min	Geneva / DevOps Updates	James
10 Min	Geneva Release Planning	Lisa
15 Min	Hanoi Release Pre-Planning	James / All
5 Min	AOB / Opens	All

# Attendees

Participants (12) — □ ×

Find a participant

JG	James Gregg (Intel) (Me)	+	🔊	🔇
	Andrew Grimberg (LF)		🔊	🔇
T	tonyespy		🔊	🔇
AB	Anthony Bonafide		🔇	🔇
BM	Bill Mahoney (Intel)		🔇	🔇
ER	Emilio Reyes (Intel)		🔇	🔇
EO	Ernesto Ojeda (Intel)		🔇	🔇
JP	Jeremy Phelps			🔇
	Jim White		🔇	🔇
JP	Joe Pearson (Open Horizon, IBM)		🔇	🔇
LG	Lenny Goodell (Intel)		🔇	🔇
MJ	Michael Johanson		🔇	🔇



# Linux Foundation Roadmap 2020-Beyond

- **Self-service committer promotions are coming**  
We've rolled this out to most of our Gerrit based projects already and are working on the needed bits to support this for our GitHub based projects (such as EdgeX). We anticipate this rolling out during Q2 of 2020
- **Self-service releases**  
This has been rolled out to the majority of our Gerrit based projects. We're still working on workflows needed to support this properly on GitHub, but your project is one of the ones targeted for this. Again, if things go well we should see this rolling out during Q2 of 2020
- **Self-service repository setup**  
We are still finalizing the Gerrit based workflows for this. GitHub side should be on track to release along side or shortly after this. Our stretch is to have this available by Q2 of 2020 but Q3 is our current target on this
- **Official Jenkins Pipeline support is coming**  
We're working on the best way to provide a well vetted library that is getting strong unit tests (which should be even better than our current jjb offering) for workflow steps and complete workflows. Early availability will happen during Q2 and we'll be working heavily by Q3 on the porting effort to bring all features of global-jjb into the library

# Linux Foundation Roadmap 2020-Beyond (continued)

- **S3 log storage**  
At present we only offer storing job logs on a Nexus 2 server. We will be rolling out a change to start using S3 as the storage option during Q2 with a hope / plan of phasing out the Nexus 2 log storage by EOY. Nexus 2 and 3 will still be used for our on going workflows but we're deprecating the use of it for log storage.
- **Kubernetes (k8s) support**  
We already offer this in an ad-hoc fashion. What I mean by this is that we have HEAT templates that will allow a project to stand-up a k8s pod on demand, per job, and doing testing against that. What we do not presently offer is the ability to just on demand run tests in an already configured k8s deployment. This does mean that jobs that use this setup will take longer to run as they dynamically provision and build a k8s cluster but this work landed in global-jjb during Q4 of 2019.
- **Alternate CI platforms**  
We are working on getting ourselves familiar with both Azure Pipelines (AZP) as well as GitHub Actions (GHA). We already have a couple of projects on AZP but we're also looking into GHA as a potentially better solution since the two are very closely related.
- **Transitions from Nexus to Artifactory Cloud**  
For our projects that move off of the Jenkins platform to one of the other CI platforms, the need for keeping Nexus systems around for artifact storage decreases significantly. Especially if that is not the final / official release storage location. In those cases we now offer support of using Artifactory Cloud where appropriate including help in getting it properly configured to do Java releases all the way out to Maven Central.
  - only applicable if moving off of LF managed Jenkins

# Linux Foundation Roadmap 2020-Beyond (continued)

## Additional Services / Dependencies used by EdgeX Foundry

- **Iftools / sigul**
- **AWS Hosted services (TIG Stack, Clair)**
- **Codecov.io**
- **SonarCloud**
- **Snyk**

# DevOps WG Update

## Geneva

- Jenkins Transformation to Pipelines
  - Work continues on the transformation to Jenkins Pipelines
    - Multiple stories related to release automation for Geneva - WIP
      - Create global function to handle docker images for the automated release
      - Implementation of new global function - EdgeXReleaseGitTag
      - Still have multiple stories to get the snap release functionality into the release automation - *RISK*
      - Identified an issue with missing GPG key on Jenkins service account
        - Working with LF for a solution
      - LFTools / Sigul latest version that supports Python 3.x - *RISK*
        - Need input from LF on alternative signing tool
  - ADR to outline the release automation flow for EdgeX  
[ADR007](#) - *APPROVED* in TSC 04/08/2020

## Hanoi

- Pre-Planning and some backlog grooming with additional scope related to release automation
  - Backlog grooming discussed in 04/02/20 DevOps WG meeting with decision to drop some of the backlog work items since
  - Started Explore with Linux Foundation on roadmap 2020-beyond
    - Andrew Grimberg invited to the DevOps WG meeting this week



# Open Horizon Project

- Started discussion with Open Horizon team
  - Shared documentation with David Booz/IBM
  - Meeting planned for 04/02/2020
- Linux Foundation Infrastructure
  - Access to the build infrastructure
    - Referred to Linux Foundation documentation  
<https://docs.releng.linuxfoundation.org/en/latest/jenkins.html#>
- Jenkins Pipelines
  - Current Build Process via Jenkins Pipelines documentation  
[https://github.com/edgexfoundry/jenkins\\_pipeline\\_presentation](https://github.com/edgexfoundry/jenkins_pipeline_presentation)  
<https://docs.releng.linuxfoundation.org/en/latest/jenkins-sandbox.html>

- OH source code
  - GitHub.com
- OH Build Infrastructure
  - Travis CI (Open Source)
  - Nexus / Docker Hub
- OH Artifacts
  - Docker images
  - Compiled binaries
  - Debian packages
- OH Resources
  - TBD: May – end of August
- Testing
  - Single VM



# Geneva Freeze and Release dates

## TSC approved

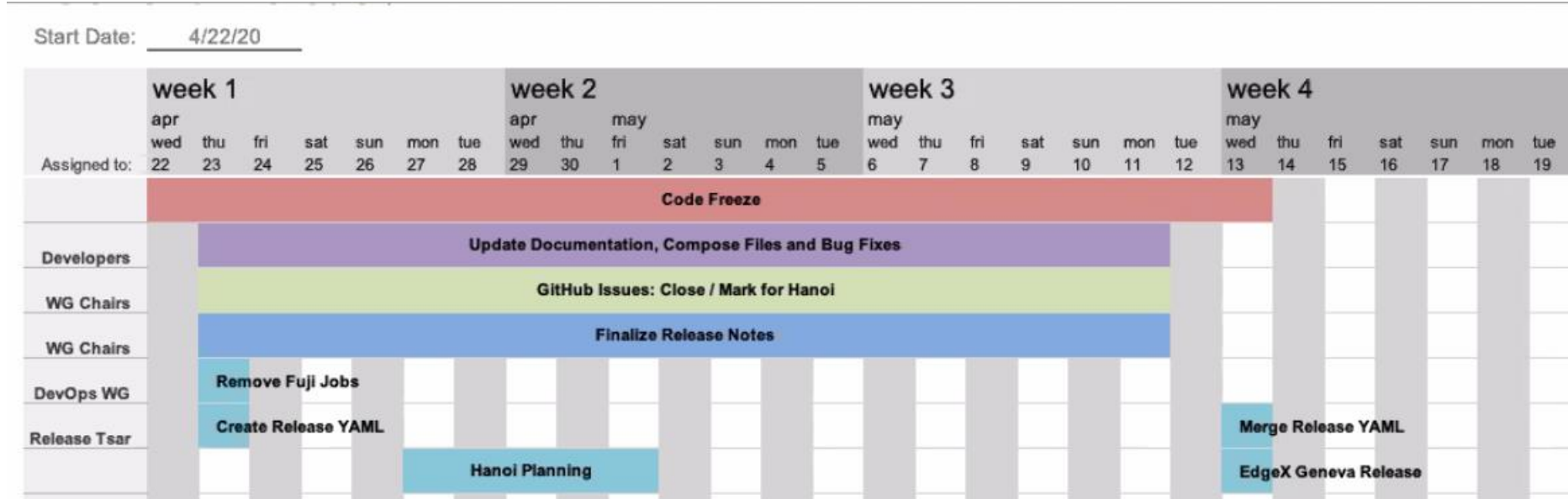
- Freeze: 12pm GMT, April 22 (Wed, week before planning meeting)
- Release: 12pm GMT, May 13 (Wed two weeks after planning meeting)
  - See Geneva release notes for details (on Slack)

# Geneva release

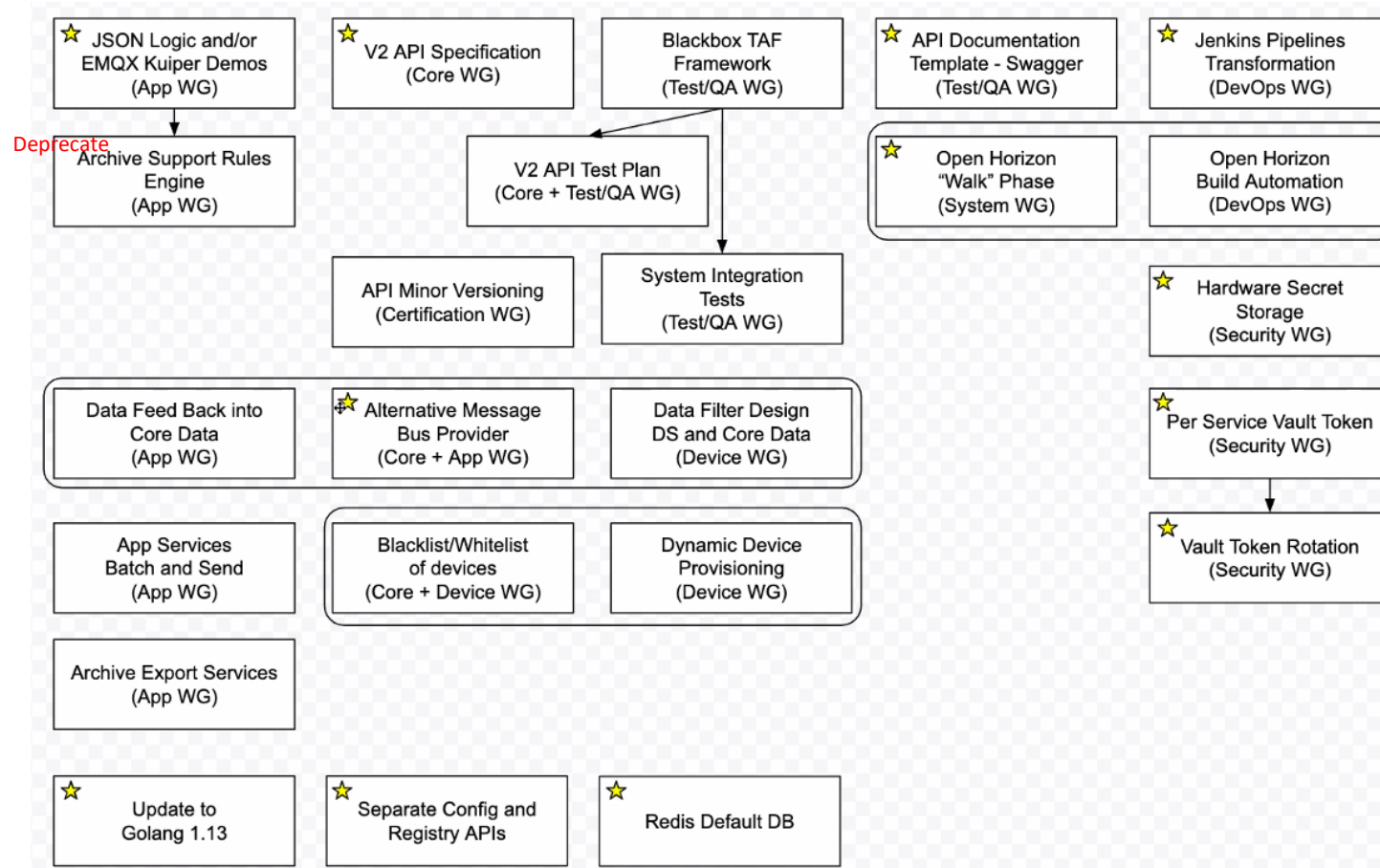
Completed	Work In Progress	Release Backlog
170	1	6

The screenshot displays the EdgeX Foundry Project dashboard with a Kanban board. The board is organized into five columns: New Issues (4 items), Release Backlog (6 items), In Progress (1 item), QA/Code Review (2 items), and Done (170 items). Each card in the board provides details about a task, including its title, priority, status, and assigner. The 'Done' column is the largest, containing 170 completed tasks. The 'In Progress' column has one task: 'Create global function to handle docker images for the automated release'. The 'QA/Code Review' column has two tasks, both of which have been approved. The 'Release Backlog' column contains six tasks, including 'Create documentation for edgex-global-pipelines manual bump of stable and experimental tags' and 'Integrate edgeXSnap function into edgeXBuildGoApp and edgeXBuildCApp'. The 'New Issues' column has four tasks, including 'New build automation for device-opcu-c' and 'Need edgex-global-pipeline version information in the pipeline log'.

# Geneva Release Schedule



# Geneva Dependency



# Backlog Review

EdgeX Foundry Project

Repositories 100 Packages People 69 Teams 100 Projects 12

DevOps WG Updated 21 hours ago

Filter cards + Add ca

5 Icebox

- Snap builds should use unbuffer for better output logging  
ci-management#369 opened by anonymouse64
- Update snapcraft inside docker to use new setup from snapcraft  
ci-management#449 opened by anonymouse64  
enhancement
- Make stage-snap jobs more smart about pushing metadata  
ci-management#475 opened by anonymouse64  
enhancement
- edgeXSemver leaves command to caller but doesn't allow specifying the version/image to use  
edgex-global-pipelines#15 opened by dweomer  
bug
- Create standard pipeline template Jenkinsfile for legacy java repos  
edgex-global-pipelines#55 opened by Iranjbar  
wontfix

4 New Issues

- New build automation for device-opcua-c  
ci-management#481 opened by jamesgregg  
blocked enhancement geneva
- New build automation needed for device-gps service  
ci-management#446 opened by jamesgregg  
blocked enhancement geneva
- Need edgex-global-pipeline version information in the pipeline log  
edgex-global-pipelines#131 opened by jamesgregg  
enhancement hanoi
- Set up codecov for edgex-global-pipelines  
edgex-global-pipelines#56 opened by Iranjbar  
hanoi

7 Release Backlog

- Create documentation for edgex-global-pipelines manual bump of stable and experimental tags  
edgex-global-pipelines#124 opened by Iranjbar  
documentation geneva
- Create global function for releasing git tags  
edgex-global-pipelines#134 opened by Iranjbar  
geneva
- Integrate edgeXSnap function into edgeXBuildGoApp and edgeXBuildCApp  
edgex-global-pipelines#125 opened by Iranjbar  
enhancement geneva
- Add snap stage job for edgex-go in cd-management  
cd-management#2 opened by Iranjbar  
geneva
- Integrate the snap release into the release kraken in cd-management  
cd-management#3 opened by Iranjbar  
geneva
- New build automation for device-bluetooth-c  
ci-management#470 opened by jamesgregg  
blocked enhancement geneva
- Git semver is unable to determine branch for HEAD in Jenkins job  
git-semver#47 opened by soda480  
bug

2 In Progress

- Create global function to handle docker images for the automated release  
edgex-global-pipelines#135 opened by Iranjbar  
geneva
- Build Automation for Open Horizons  
edgex-global-pipelines#63 opened by jamesgregg  
enhancement geneva

2 QA/Code Review

- ADR to outline the release automation flow for EdgeX  
edgex-docs#110 opened by Iranjbar  
geneva  
Changes approved
- update endpoints to test release  
cd-management#6 opened by ernestojseda  
2-medium geneva  
Changes approved

163 Done

- Root cause analysis of the ARM failures for blackbox-testing - Infrastructure failures  
ci-management#520 opened by Iranjbar  
blocked
- Implement release docker image  
edgex-global-pipelines#140 opened by ernestojseda  
2-medium enhancement geneva
- Update developer documentation on how to use Jenkins Sandbox to test a new pipeline.  
ci-management#588 opened by jamesgregg  
documentation geneva
- Migrate from Maven to Gradle  
edgex-global-pipelines#138 opened by ernestojseda  
2-medium enhancement geneva
- EdgeX DevOps: SPIKE - investigate root cause for intermittent OPEN\_SSL errors when pulling go module dependencies  
ci-management#555 opened by jamesgregg  
geneva phase 3
- Create global function for snap releases (Geneva)  
edgex-global-pipelines#45 opened by

# Meeting Minutes

## self-service

- committer (+1 committers / +1 TSC) - at the repo level not Org level  
*Not sure if there's a hybrid model for certain repos or if it's all the same*
- releases (accounts for different release branches, based on Maven java workflow, snapshot of a release with all staged artifacts in Nexus but has dependencies on Jenkins logs)
- repo creation

## pipeline support

- pipeline libraries with unit testing

## s3 log storage

- move off of nexus2 to s3
- Hanoi implications – EOY but should be seamless
- will be an option to move to it if want to

## Kubernetes support (CI Validation only)

Open Daylight HEAT - orchestration of multiple systems stands up multiple VMs and orchestration of spinning up pods with tear immediate tear down. Nothing is long lived and the sole purpose is for CI Validation

ONET project using self managed pods

already in global-jjb (HEAT - OpenStack)

Note: Additional details / documentation found within the global-jb documentation

## CI platforms

Azure Pipelines and GitHub Actions, CircleCI - looking at AWS CodeBuild/CodePipeline with Jenkins

## Artifactory Cloud

LF doesn't recommend using Nexus for apt/yum repos

Recommends to use Package Cloud instead

Note: this is applicable for the Open Horizons project

# DevOps WG Update (Geneva)

Geneva (~Apr 2020) Focus:

- DevOps Jenkins Pipeline Transformation completed
  - Introduced new Jenkins Global Libraries for build automation
    - Includes test framework for Groovy code
    - Explore underway to look into code coverage of Groovy code using Codecov.io
  - Semantic Versioning using Intel contributed utility (git-semver) enhanced to include test framework
  - Continuous Delivery via "release-kraken"
  - Developer Enablement – GitHub Project Tracker, GitHub Issue label creation automated, gitcommit linter implemented \*
  - New ci-build images and global libraries developed to support Jenkins Pipelines
  - New life cycle policies implemented on Linux Foundation Nexus repositories
  - Developer Documentation created for new Jenkins Pipelines
  - Improved performance of all builds to include collaboration with Linux Foundation to drive performance improvements for ARM builds (~15 mins build performance improvements using a new flavor of LF build nodes)
    - X86 build nodes (VM) uses 4cpu – 2gb
    - Arm64 build nodes (VM) now uses 4 cpu – 16gb

DevSecOps scope includes:

- Snyk Advanced Reporting via Community Bridge - \$8K savings on licensing for developer licenses
- Snyk Docker Hub image scans with weekly reports of new vulnerabilities
- Snyk CLI of Go integrated into scan stage of Jenkins Pipelines
- Clair image scans within scan stage of Jenkins Pipelines
- DevOps contributed code fixes to address CVEs found in images based on Snyk reporting
- Lftools updated to use latest version – code signing, git tag signing, Docker image signing





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# Hanoi Planning

Scope Discussions

# Hanoi - DevOps

- Performance Optimizations
  - Jenkins Pipeline optimizations for edgex-go
  - Explore options from LF for supporting Jenkins on K8s
- Performance of the Build Environment
  - Monitoring / Alerting optimizations (Continuous Improvement Opportunity)
- Technical Debt
  - Caching Dependencies – speed it up (upstream dependencies)
- Open Horizons Enablement
  - Shared Infra with Open Horizons
  - Build Automation for OH
- Stretch Goals
  - Code Coverage for Jenkins Global Libraries (codecov.io)
  - Snap improvements
  - Support for **-race** flag



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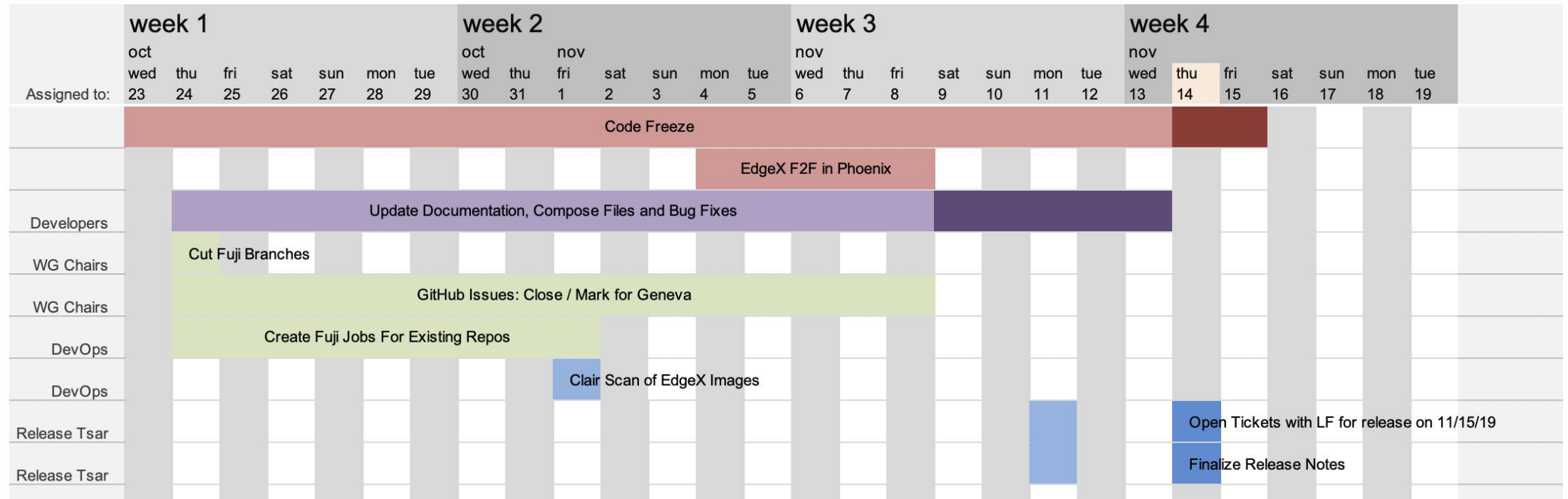
# Geneva Planning

Scope Discussions

# Fuji Release

- Freeze: Oct 23<sup>rd</sup> (Wednesday)
- Release: Nov 15<sup>th</sup> (Friday)

Start Date: 10/23/19 (with extension)



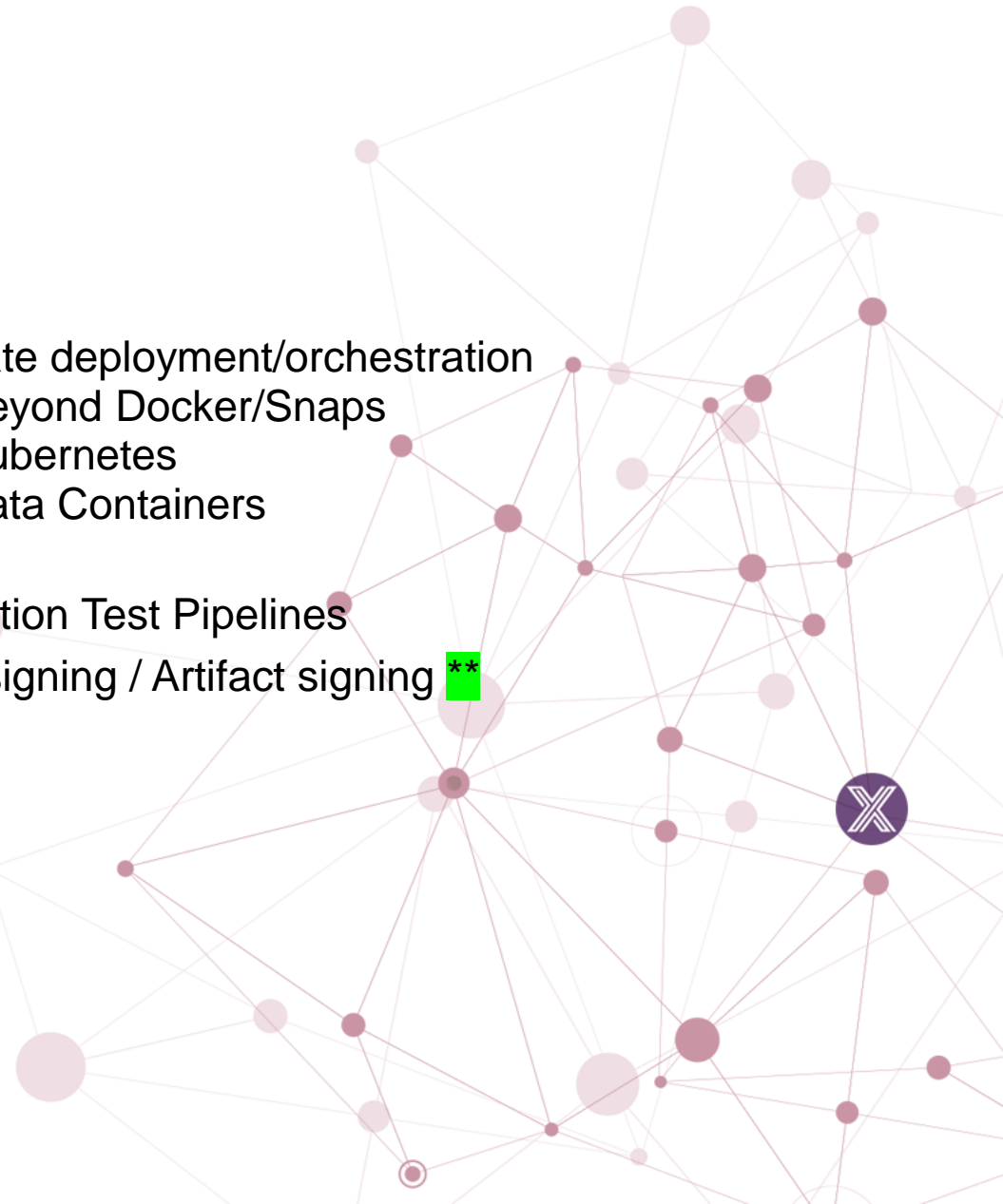
# Geneva – DevOps

## In

- Full Pipeline transformation for EdgeX services
  - Convert Jenkins JJB Freestyle jobs to Jenkins Pipelines
- Introduce GitHub Org Plugin
- Simplified Jenkinsfile
- Global Libraries to support Jenkins Pipeline transformation
- Add Unit testing to global-libraries (uncommitted) \*\*
- Snyk integration for edgex services
  - As part of Jenkins Pipeline conversion
- Slack integration with Jenkins pipelines
- Nexus Cleanup / Lifecycle Policy

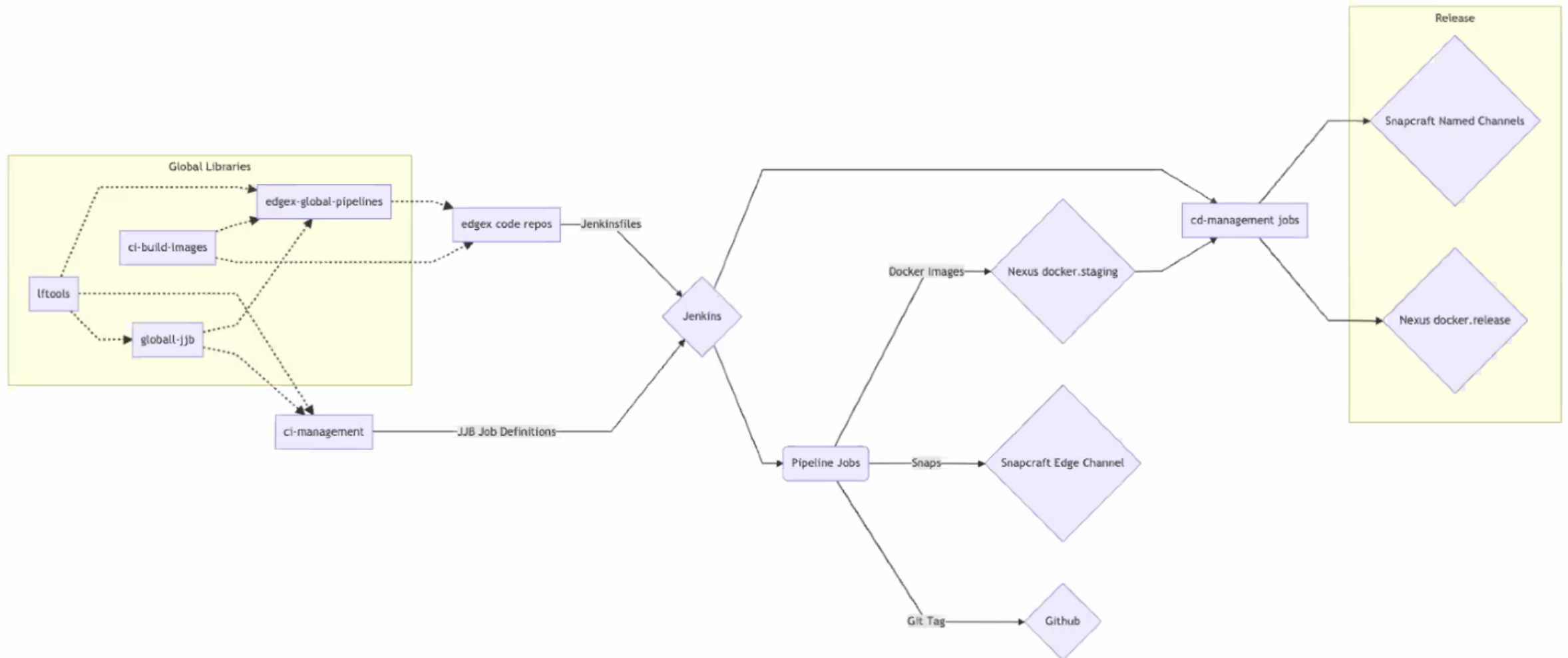
## Out

- Alternate deployment/orchestration
  - Beyond Docker/Snaps
  - Kubernetes
  - Kata Containers
  - ...
- Integration Test Pipelines
- Code signing / Artifact signing \*\*



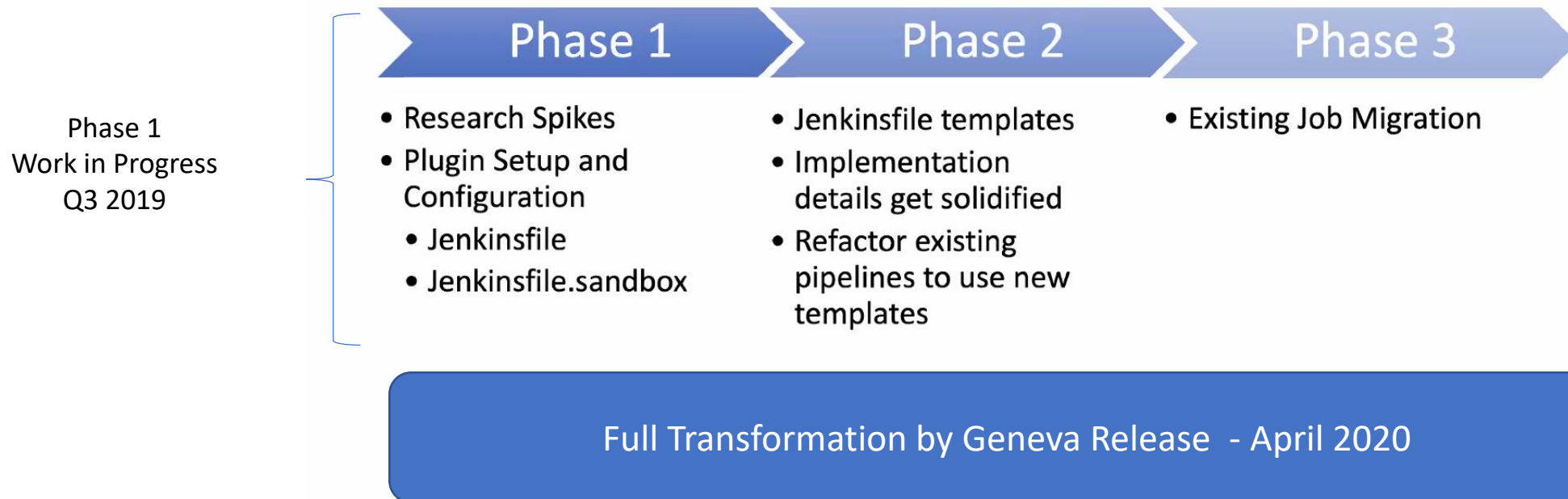


# Geneva Transformation: Architecture



# How long does it take? Is this all Geneva scope?

## Geneva Transformation







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# Fuji Planning

Scope Discussions

# Fuji – DevOps

## In

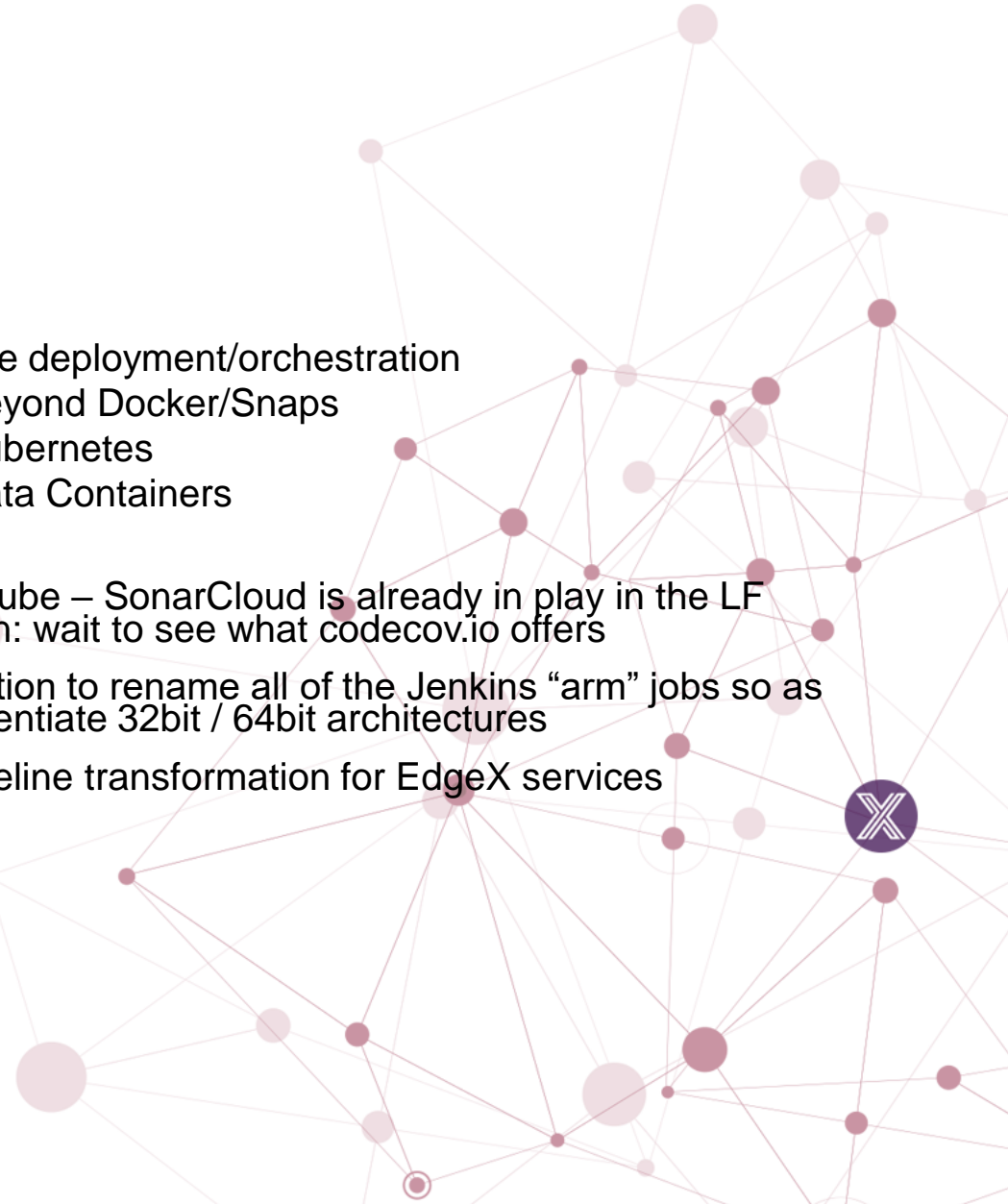
- Static code analysis tool identified and integrated into the EdgeX Jenkins Pipeline for Docker image scanning (Clair Server)

Explore SAST for true static code analysis to include additional tooling such as Fortify / Coverity





- Code and artifact signing with semantic versioning
- Fix Documentation – edgex-go
  - Create a new repo for edgex-docs
- Build Performance Optimizations
  - Pipelines for EdgeX Foundry base build images
  - Basebuild images managed locally within Nexus
  - Leverage PyPi Proxy for local pip dependencies
  - ARM builds – optimization leveraging different high CPU build nodes / OS (ARM Team)

## Out

- Alternate deployment/orchestration
  - Beyond Docker/Snaps
  - Kubernetes
  - Kata Containers
  - ...
- SonarQube – SonarCloud is already in play in the LF Decision: wait to see what codecov.io offers
- Suggestion to rename all of the Jenkins “arm” jobs so as to differentiate 32bit / 64bit architectures
- Full Pipeline transformation for EdgeX services



# EdgeX DevOps Commitments (Fuji)

Scope of Work	
Add static artifact analysis into the EdgeX Jenkins Pipeline (analysis of Docker /runtime artifacts, not the source code)	
Add code and artifact signing with semantic versioning	
Conduct build performance optimizations by: <ul style="list-style-type: none"> <li>• Adding Pipelines for EdgeX Foundry base build images</li> <li>• Allow base build images to be managed locally within Nexus</li> <li>• Leverage PyPi Proxy for local pip dependencies</li> </ul>	
Explore static code analysis like Checkmarx, Coverity, GuardRails, Synk, SonarQube	

- Clair Server landing no longer at risk for Fuji
  - LF committed to implement on AWS and fund with expected completion next week
- gitsemver along with lftools used for artifact signing and semantic versioning
- Jenkins build performance optimizations for base build images completed
- All base build images will now be stored in Nexus (Snapshot):10003
- PyPi enabled as part of Edinburgh scope
- Initial review of GuardRails showed that the product was identifying issues which were not applicable for microservices architecture

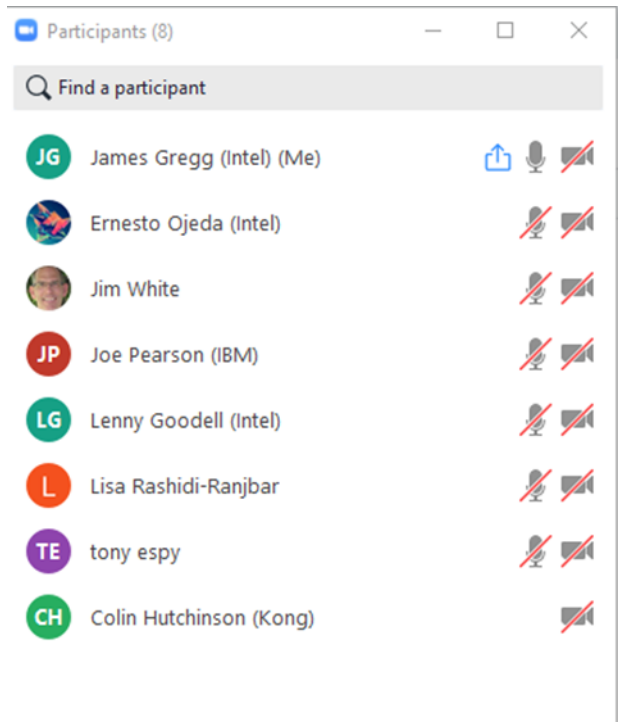


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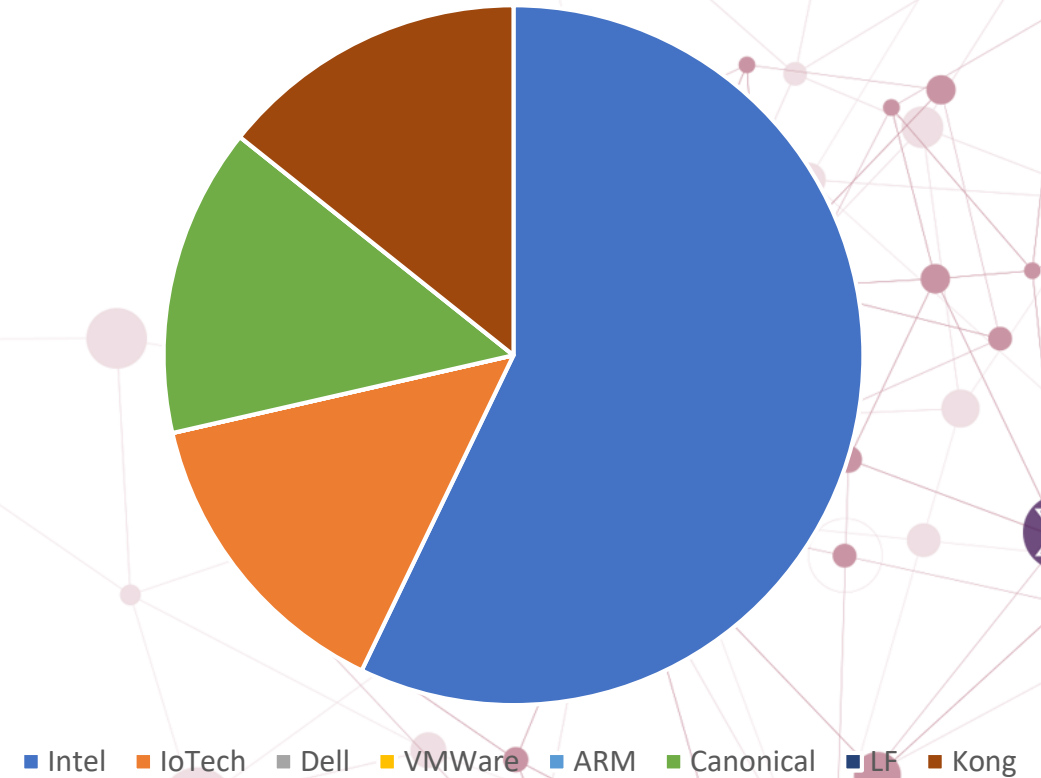




# Attendees & Community Participation – ww14


























Community Participation



# Attendees & Community Participation – ww15

Participants (12)

Find a participant

- JG James Gregg (Intel) (Me)  
- Andrew Grimberg (LF)  
- T tonyespy  
- AB Anthony Bonafide  
- BM Bill Mahoney (Intel)  
- ER Emilio Reyes (Intel)  
- EO Ernesto Ojeda (Intel)  
- JP Jeremy Phelps 
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- JP Joe Pearson (Open Horizon, IBM)  
- LG Lenny Goodell (Intel)  
- MJ Michael Johanson  

Community Participation

