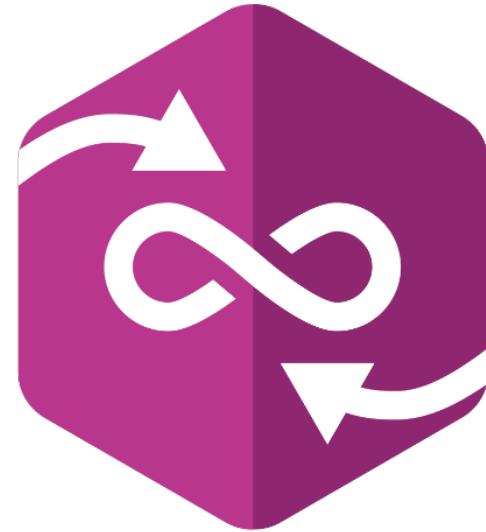


GOVTECH  
SINGAPORE

# 2.0 Migration Wave 1

KICKOFF BRIEFING

GDS Central | 29 Nov 2022



shiphats

# Agenda

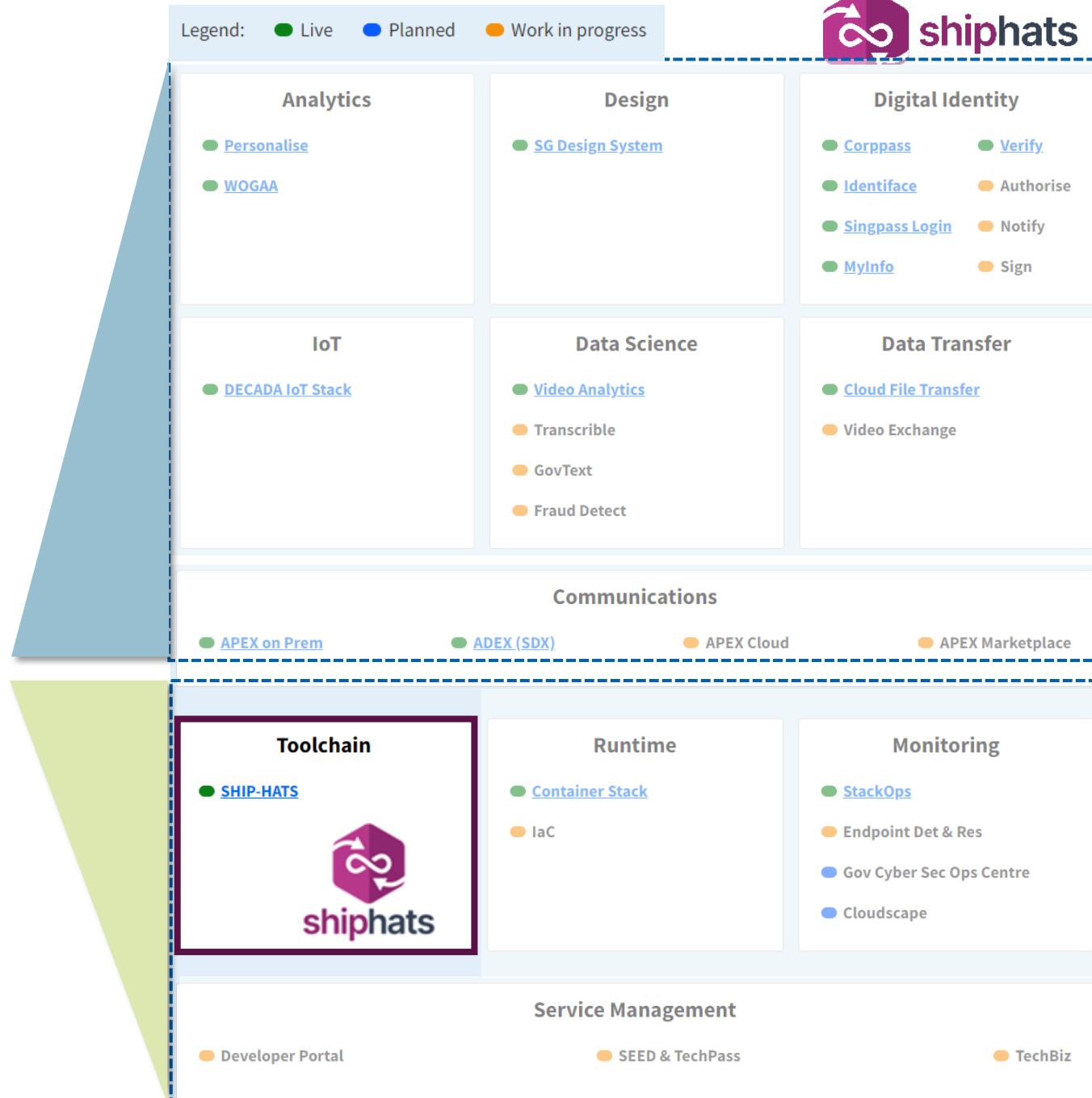
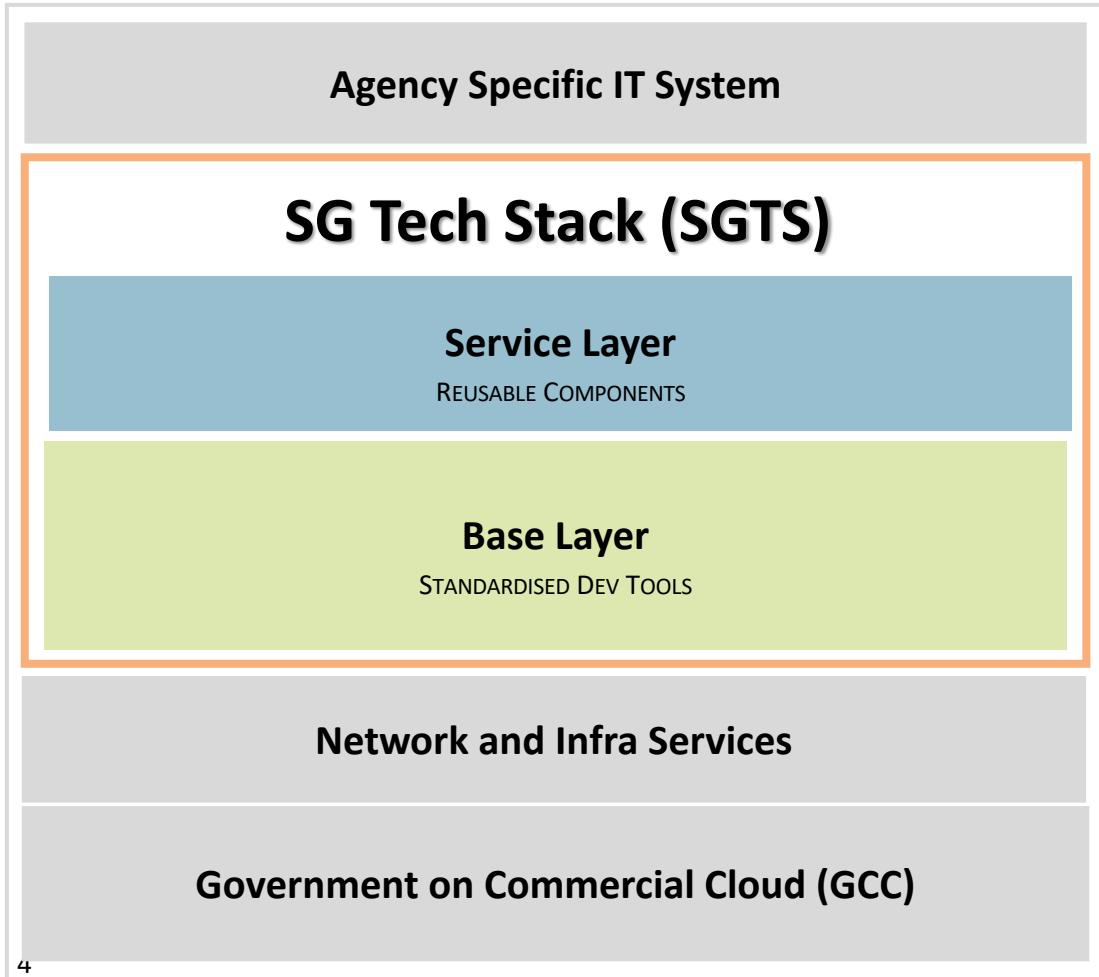
- Product Overview & Updates
- Pilot Lessons
- Timelines
- Onboarding/Migration
  - Scope/Success Criteria
  - Activity Flow
- Support Structure
- Next steps
- Q&A

# PRODUCT OVERVIEW



# Stack – Government-in-a-Box

[www.developer.tech.gov.sg](http://www.developer.tech.gov.sg)



# Recap: SHIP-HATS 2.0 Goals



## 1. Faster time to market

- One DevOps Platform
- End-to-End Source Code Management & CICD



## 2. Greater Transparency

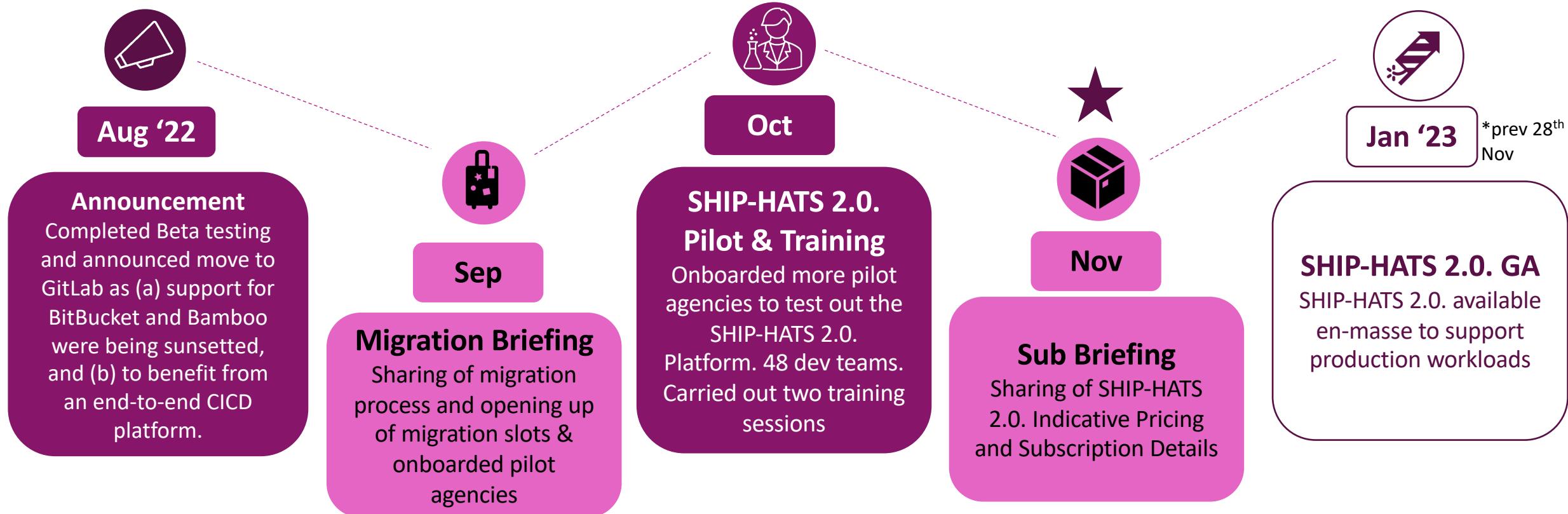
- Pre-Defined Industry DevOps Metrics and Dashboards, incl DORA
- Value Stream Measurement Capabilities



## 3. Built-In Security

- Compliance Pipelines
- Integrated Security Testing

# Recap: SHIP-HATS 2.0. Key Activity Timelines



# Tools Recap



| SHIP-HATS 2.0*   |                                   |                                       |
|------------------|-----------------------------------|---------------------------------------|
| STAGE            | GitLab Native                     | Alternative Tool                      |
| ACCESS           | TechPass & SEED                   |                                       |
| PLANNING         | GitLab Issues/Wiki                | Jira, Confluence                      |
| BUILD            | GitLab CI/CD                      | NA                                    |
|                  | GitLab Package Registry           | Nexus Repo                            |
|                  | GitLab Dependency Scanning        | Nexus Intelligence                    |
| BUILD TESTING    | GitLab SAST                       | Fortify-on-Demand <sup>new!</sup>     |
| OTHER TESTS      | GitLab Code Quality Scanning Tool | SonarQube Developer Edition (On-Prem) |
|                  | GitLab DAST                       | Fortify-on-demand <sup>new!</sup>     |
|                  | GitLab Container Scanning         | NA                                    |
|                  | NA                                | pCloudy Test Farm                     |
| DEPLOY & RELEASE | GitLab CI/CD                      | NA                                    |

# Key Tool Decommission Dates

| Tools   | Decommission Date       | Replacement                                      |
|---|-------------------------|--|
| OpenVPN   | <b>31 December 2022</b> | TechPass/Seed                                    |
| Digital.ai  | <b>31 May 2023</b>      | GitLab   |
| Fortify Webinspect (OnPrem)<br>Fortify SCA (OnPrem) | <b>31 July 2023</b>     | <b>GitLab SAST/DAST or<br/>Fortify On Demand</b> |
| Bitbucket/ Bamboo                                   | <b>Jan 2024</b>         | <b>GitLab</b>                                    |

# Feature Availability

| Items                       | From GA in Jan '23  | Future Releases   |
|-----------------------------|---|---|
| Runners                     | SHIP-hosted runner<br>Agency hosted runner                | Gitlab Shared runners                                       |
| Deployment (common service) | GCC 1.0 (Internet)<br>GCC 1.0 (Intranet)<br>GCC 2.0 (GEN) | Agency On-prem (DC)<br>Commercial Cloud (CC)<br>GCC 2.0 GCP |
| Automated Testing (Runtime) | Internet, non-GEN   | Intranet, GEN   |
| E2E Pipeline Template       | Support common use cases                                  | Mature with inner-sourcing contributions                    |
| Compliance Pipeline         | Limited coverage  | Comprehensive, with SLSA framework, DevSecOps Policy        |
| DevOps Maturity Metrics     | Preliminary   | Continuous development on VSM                               |

# GITLAB NATIVE OR ALTERNATIVE TOOLS

1

## GitLab Native only

- ✓ Lean teams
- ✓ Simple use cases
- ✓ New Projects
- ✓ Value for \$\$

2

## GitLab & Alternative tools

- ✓ Already on alternative tools
- ✓ Complex use cases

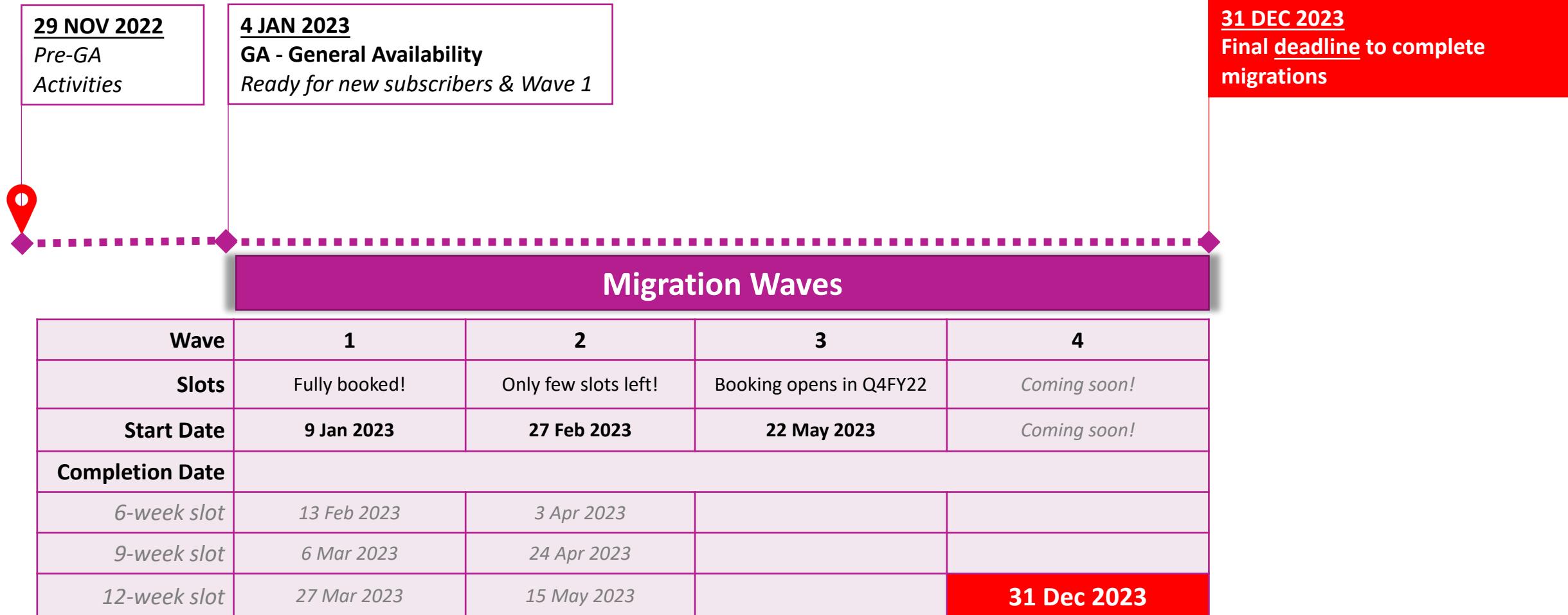
- ❖ Both options meet IM8 Policy requirements
- ❖ Alternative tools are available as add-on anytime

# LESSONS FROM THE PILOTS

40+ projects over 3 months, More than 200 collaborators in Telegram Group

- ✓ Verified **SHIP-HATS templates usage**
  - Users confirmed ease of use and time savings in Pipeline set up
- ✓ Observed **demand for Jira**
  - We are looking at Jira integration to GitLab
- ✓ Developer Portal **2.0 Tech Docs optimized**
  - Working on more troubleshooting support for Runners
- ✓ GitLab Native only option users **maximized on dashboards** available
  - GitLab data ingests seamlessly to dashboards

# Timelines & Migration Waves



# COMPLETE PRE-GA ACTIVITIES

1

## Complete Access Requirement



**techpass**



**SEED**

2

## Review Tooling Assessment & Plan Subscription package

| Assessment       |                                   |                                       |   |
|------------------|-----------------------------------|---------------------------------------|---|
| Stage            | GitLab Native                     | Alternative Tool                      | Assessment  |
| Access           | TechPass & SEED                   | TechPass & SEED                       | NA  |
| Plan             | GitLab Issues                     | Jira                                  | <a href="#">GitLab Wiki vs Atlassian Jira</a>       |
| Plan             | GitLab Wiki                       | Confluence                            | <a href="#">GitLab Wiki vs Atlassian Confluence</a> |
| Plan             | Gitlab Security Dashboard         | NA                                    | NA  |
| Build            | GitLab CI/CD                      | NA                                    | NA  |
| Build            | GitLab Package Registry           | Nexus Repository Pro                  | <a href="#">GitLab vs Nexus</a>                     |
| Build            | GitLab Dependency Scanning        | Nexus Intelligence/Nexus IQ Server    | <a href="#">GitLab vs Nexus</a>                     |
| Building Testing | GitLab SAST                       | Fortify-on-Demand SAST(new!)          | <a href="#">GitLab vs Fortify-on-Demand</a>         |
| Other Tests      | GitLab Code Quality Scanning Tool | SonarQube Community/Developer Edition | <a href="#">GitLab vs SonarQube</a>                 |

# Migration Activity Flow



# Migration Activity Flow – Simplified!



0

## Pre-migration Prep

- Understand Technical Considerations
- Define Success Criteria
- Acknowledge Jira Ticket for Migration
- Complete Subscription Process

1

## Auto-Migrate SCR to 2.0

- Migrate agency SCR 1.0 to 2.0 <2 GB repo

## Migrate Fortify SSC to FOD

- Where applicable

A blue square icon representing the Agency.

A pink square icon representing the SHIP-HATS Team.

2

## Verify SCR & FOD

- Review a verification report
- Perform sample check if required

3

## Set up CI/CD Pipeline

- Apply Compliance framework
- Using E2E or modular template

4

## CD Environment Setup

- Environment setup and runners registration

5

## Create dashboards

- View data and key metrics.

6

## Test & verify pipeline

- Fine tune until the success criteria is met & BAU ready

7

## Archive 1.0 Tools

- Final check and Sign off
- Post Migration Feedback

## Fortnightly Sync up

Candidate session with the SHIP-HATS team

## DEFINE SUCCESS CRITERIA

### Success Criteria

1. Operational Source Code Repository in GitLab
2. Operational FOD Application (if applicable)
3. Operational CI & CD pipeline in GitLab
4. GitLab Dashboards
5. Archival of Project on 1.0 Tools

### Sample Success Criteria

| Objective   | Acceptance Criteria   |
|---|---|
| 1Accept User roles  | Agency team accepts that roles defined for developers and Security Team.  |
| 2Accept SHIP-HATS 2.0 templates used in setting up the CI/CD pipeline | Agency team is aware of SHIP-HATS 2.0 that the pipeline has been set up as per requirement.                                   |
| 3Accept Compliance Framework applied                                  | Agency team understands that applying DevSecOps best practices.   |
| 4Accept Container Scanning capability                                 | Agency team confirms that SAST tests have been run successfully.  |
| 5Accept DAST security test capability                                 | Agency team confirms that SCA tests have been run successfully.   |
| 6Accept Container Scanning capability                                 | Agency team confirms that Container tests are available for review in Security Dashboard.                                     |
| 7Accept DAST security test capability                                 | Agency team confirms that DAST tests are available for review in Security Dashboard.  |
| 8Accept pipeline execution across multiple repositories               | Agency team has tested and verified the pipeline execution across multiple repositories and is able to successfully run them. |
| 9Accept access control for executing pipelines                        | Agency team has tested and verified that access control for executing pipelines is working correctly.                         |
| 10Accept IT Management Dashboard                                      | Agency team has verified that SHIP-HATS 2.0 dashboard is functional and the relevant team members understand how to use it.   |
| 11Sign off the CI/CD Pipeline   | Agency team accepts that the pipeline has been successfully migrated and is ready for production use.                         |

*Sample Success Criteria available on Developer Portal for download!*

## UNDERSTAND TECHNICAL CONSIDERATIONS

### 1 Source code repo size

#### < 2 GB Repo

Repos Auto Migrated by SHIP-HATS

#### > 2 GB Repo

- Agency Project team manages a manual transfer OR
- Reduce repo size before migration

### 2 Shared Runner

**Docker in Docker not supported**  
in SHIP-HATS 2.0 due to security risk

#### Use Docker CLI?

Use to **Kaniko** or **Buildah** as **alternative** to build your containers for your pipeline

## COMPLETE SUBSCRIPTION PROCESS

- ✓ Onboard using **TechBiz** (Covered in Subscription Briefing)
- ✓ GitLab Set up
  - Create new GitLab groups in Portal
  - Setup individual SSH & GPG keys in Gitlab

*Pre Migration Checklist on Developer Portal available for download!*

## Auto-Migrate SCR to 2.0

- Migrate agency SCR 1.0 to 2.0 <2 GB repo

## Migrate Fortify SSC to FOD

- Where applicable



### < 2 GB Source Repo

Migrated by SHIP-HATS within 2 business days

Your bitbucket structure will be migration to GitLab.

| Bitbucket  | GitLab  |
|------------|---------|
| Project    | Group   |
| Repository | Project |

# SAMPLE VERIFICATION REPORT

**Instructions**

This report is a high level view of the migration with diffs listed between source and destination. The report is meant for engineers to get details and stats without having to rely on other teams to verify all the details about the migration. This report DOES NOT replace User Acceptance Testing. The report will show a color coded 'Overall Accuracy' along with individual endpoint 'Accuracy'. Anything with an accuracy of 90% or above is considered a success, and isn't worth looking at unless something comes up in User Acceptance Testing. Items under 90% accuracy should merit further investigation.

**Project Migration Results**

Staged Project's: '13' Successful Project's: '13'

**Project**

[gitlab-instance-0b248ec6/Monitoring](#)

**Overall Accuracy**

99.94%

**Accuracy**

99.26%

**Result**

success

**Result**

success

**All Migrated Projects Results**
**Individual Migrated Project Results**

| endpoint                            | accuracy | diff  |
|-------------------------------------|----------|---|
| <a href="#">projects/:id</a>        | 77.78%   | <div style="background-color: #f0f0f0; padding: 5px;"> <span style="font-size: 1em;">show/hide</span> <pre>{   "visibility": {     "-": "internal",     "+": "private"   } }</pre> </div> |
| Total Number of Merge/Pull Requests | N/A      | <div style="background-color: #f0f0f0; padding: 5px;"> source: 0<br/> destination: 0 </div>   |
| Total Number of Branches            | N/A      | <div style="background-color: #f0f0f0; padding: 5px;"> source: 1<br/> destination: 1 </div>   |
| Total Number of Tags                | N/A      | <div style="background-color: #f0f0f0; padding: 5px;"> source: 1<br/> destination: 1 </div>   |
| Total Number of Commits             | N/A      | <div style="background-color: #f0f0f0; padding: 5px;"> source: 1<br/> destination: 1 </div>   |
| Repo Permission Mapping             | 100.00%  | <div style="background-color: #f0f0f0; padding: 5px;"> <span style="font-size: 1em;">show/hide</span> </div>  |
| Branch Permission Mapping           | 100.00%  | <div style="background-color: #f0f0f0; padding: 5px;"> <span style="font-size: 1em;">show/hide</span> </div>  |

**Data set verification details**
**Difference details**

3

## Set up CI/CD Pipeline

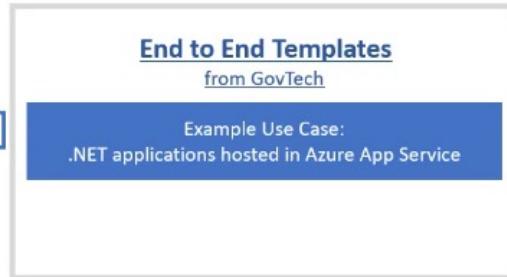
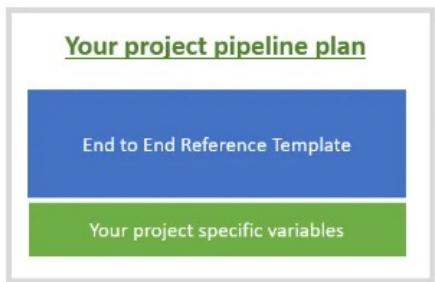
4

## CD Environment Setup

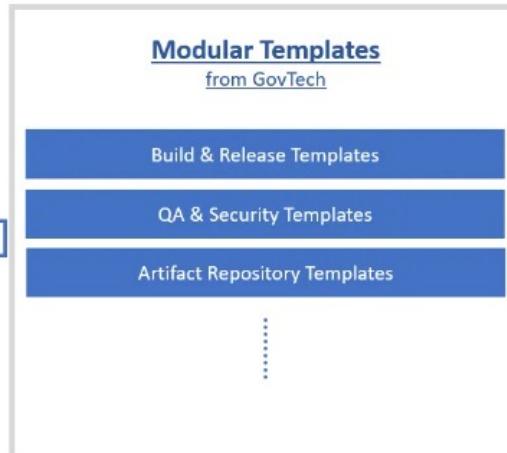
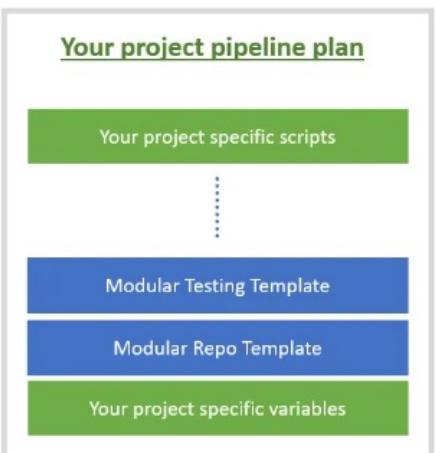
*Pipeline Template list & links available on Developer Portal*



- End-to-End templates:** An end-to-end CI/CD workflow for a specific use case such as .Net application hosted in Azure App Service, Java application hosted in AWS EC2, etc.



- Modular templates:** A stand-alone basic template for invoking build, test, deploy tools, etc.



### E2E templates

| Template  | Description   |
|---|---|
| <a href="#">SHIP-HATS Docker Image CI Pipeline Templates</a>      | This template allows you to deliver a compliant CI pipeline for a standard docker application (regardless of language) considering best practices as well as security aspects.    |
| <a href="#">SHIP-HATS Docker Multi Services App E2E Templates</a> | This template allows you to deliver a compliant CI/CD pipeline for a standard docker application (regardless of language) considering best practices as well as security aspects. |
| <a href="#">SHIP-HATS Docker Single Service App E2E Templates</a> | This template allows you to deliver a compliant CI/CD pipeline for a standard docker application (regardless of language) considering best practices as well as security aspects. |
| <a href="#">SHIP-HATS Webapp E2E Templates</a>                    | This template allows you to deliver a compliant CI/CD pipeline for a standard web application (regardless of language) considering best practices as well as security aspects.    |

### .gitlab-ci.yml

```

1 include:
2   - local: BUILD.gitlab-ci.yml
3   - local: TEST.gitlab-ci.yml
4   - local: DEPLOY.gitlab-ci.yml
5   - project: "WOO/GVT/ship/ship-hats-templates"
6   ref: "main"
7   file:
8     - /templates/vars/.gitlab-ci-sonatype-vars.yml
9     - /templates/.gitlab-ci-publish-to-nexus.yml
10    - /templates/.gitlab-ci-docker-push.yml
11    - /templates/vars/.gitlab-ci-pipeline-coe-vars.yml
12    - /templates/.gitlab-ci-common.yml
13    - /templates/.gitlab-ci-docker-delete.yml
14
15 .converge_parallel_matrix: &converge_parallel_matrix # call this if you need to consolidate
16 before_script:
17   - |
18     for file in ./build-job/*.sh; do
19       source $file # gain PRODUCT_IMAGE_NAME and OUTPUT_BUILD_ARTEFACT as environment
20       OUTPUT_BUILD_ARTEFACTS=$OUTPUT_BUILD_ARTEFACTS$OUTPUT_BUILD_ARTEFACT, # to add to done
21     done
22
23     for file in ./build-image-job/*.sh; do
24       source $file # gain PRODUCT_IMAGE_NAME and OUTPUT_IMAGE_ARTEFACT as environment
25       PRODUCT_IMAGE_NAME=$PRODUCT_IMAGE_NAME$OUTPUT_IMAGE_ARTEFACT, # to add to done
26       OUTPUT_IMAGE_ARTEFACTS=$OUTPUT_IMAGE_ARTEFACTS$OUTPUT_IMAGE_ARTEFACT, # to add to done
27     done
28
29     - PRODUCT_IMAGE_NAMES=${PRODUCT_IMAGE_NAMES:+:}
30     - OUTPUT_BUILD_ARTEFACTS=${OUTPUT_BUILD_ARTEFACTS:+:}
31     - OUTPUT_IMAGE_ARTEFACTS=${OUTPUT_IMAGE_ARTEFACTS:+:}
32     - SCAN_TARGETS=$OUTPUT_BUILD_ARTEFACTS,$OUTPUT_IMAGE_ARTEFACTS
33
34 stages:
35   - build
36   - static-test
37   - runtime-test
38   - publish
39   - sign
40   - deploy-to-prod # to PROD
41
42 image: $NEXUSREPO_DOCKER_PROXY_HOSTNAME/alpine:latest
43
44 .gitlab-ci-azure.yml
45 955 bytes

```

### Common templates

| Template  | Description   |
|---|---|
| <a href="#">Readiness check for web application</a> | This template allows you to check if a web application is ready by querying the URL and searching for a given text in a loop until a given wait duration. |
| <a href="#">Readiness check for docker service</a>  | This template allows you to check if a web application is ready by querying the URL and searching for a given text in a loop until a given wait duration. |
| <a href="#">AZ CLI invocation</a>                   | This template allows you to invoke Azure CLI commands.  |
| <a href="#">Depcheck for NPM projects</a>           | This template allows you to perform depcheck for their npm project to identify unused dependencies.   |
| <a href="#">AWS identity federation</a>             | This template allows you to invoke AWS CLI within the <code>script</code> key.  |
| <a href="#">AWS Secret Retrieval</a>                | This template allows you to invoke AWS CLI within the <code>script</code> key.  |
| <a href="#">AWS EKS kubectl</a>                     | This template allows you to invoke kubectl commands within the <code>script</code> key.   |

### .gitlab-ci-azure.yml

```

1 include:
2   - local: "/templates/.gitlab-ci-common.yml"
3   - local: "/templates/vars/.gitlab-ci-sonatype-vars.yml"
4
5 .invoke-azcli-commands-with-serviceprincipal:
6   image: mcr.microsoft.com/azure-cli
7   tags:
8     - non_privileged
9     - no_root
10    - cstack
11  before_script:
12    - export VARIABLE_NAME=AZ_SERVICEPRINCIPAL_ID
13    - !reference [.check-variable-sh, script]
14    - export VARIABLE_NAME=AZ_SERVICEPRINCIPAL_PASSWORD
15    - !reference [.check-variable-sh, script]
16    - export VARIABLE_NAME=AZ_TENANT_ID
17    - !reference [.check-variable-sh, script]
18    - az login --service-principal --username $AZ_SERVICEPRINCIPAL_ID --password $AZ_SERV
19
20 after_script:
21   - az logout --username $AZ_SERVICEPRINCIPAL_ID

```

3

Set up CI/CD Pipeline

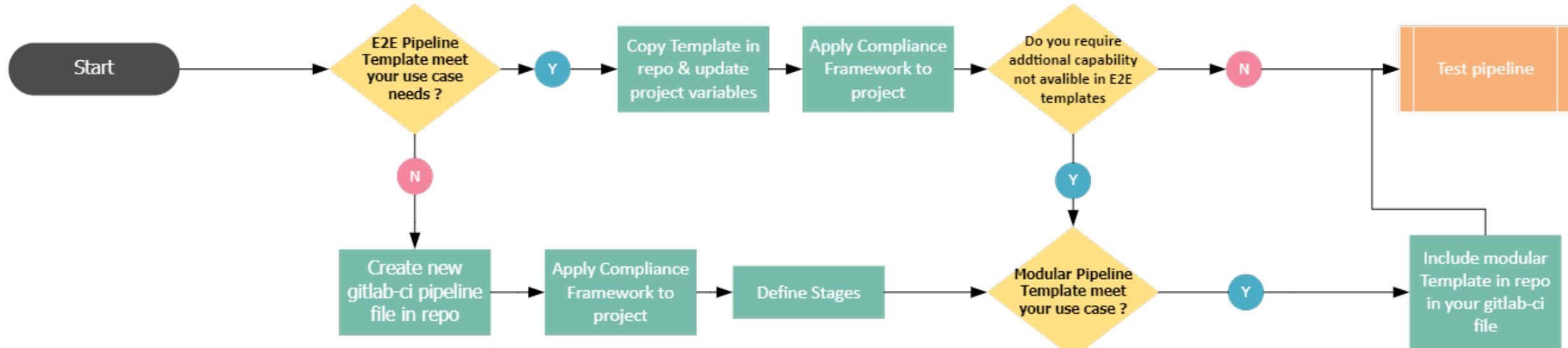
4

CD Environment Setup

# TEMPLATE DRIVEN PIPELINE CONFIGURATION



|               |          |                    |
|---------------|----------|--------------------|
| Pipeline Task | Decision | Milestone Activity |
|---------------|----------|--------------------|



## Create dashboards

## DEVELOPER DASHBOARDS



The image shows a transition from a general dashboard creation guide to a specific developer dashboard setup.

**Left Panel (Create dashboards):**

- Header: Search GitLab
- Navigation: Switch to Projects, Groups, Explore, Milestones, Snippets, Activity.
- Section: Your dashboards
  - Environments
  - Operations
  - Security

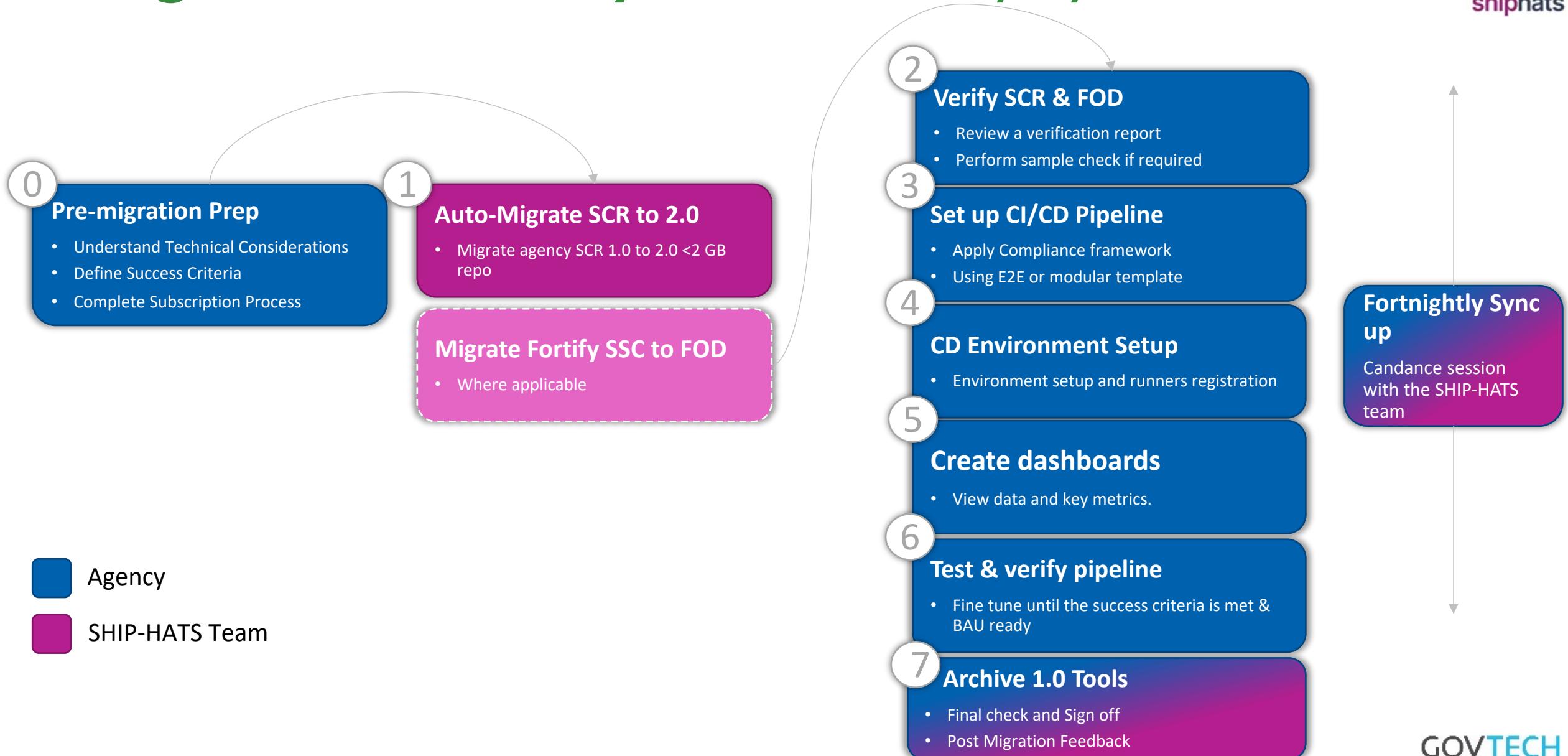
**Right Panel (Developer Dashboards):**

A large blue arrow points from the "Your dashboards" section in the left panel to the developer dashboard interface on the right.

The developer dashboard interface is enclosed in a dashed blue border and contains the following sections:

- Operations Dashboard:** Shows pipeline status for projects like GitLab.org/gitaly, GitLab.com/GitLab Docs, GitLab.org/gitlab-runner, and GitLab.org/GitLab Community Edition.
- Security Dashboard:**
  - Vulnerabilities over time:** A chart showing the number of vulnerabilities over time, with a focus on 2020-09-17.
  - Project security status:** A list of projects graded by severity: Critical (0), High (1), Medium (4), and Low (2).
- Environments Dashboard:** Shows environments gprd and gprd-cny with their respective API deployment logs.
- Lead time charts:** A chart showing the median time between merge and deployment for the period Mar 8 - Apr 7.

# Migration Activity Flow – Simplified!



## Support Structure

1

### **Self Serve**

Free hands-on workshop every month  
Webinars & Documentation on Doc portal  
Pipeline Template GitLab readmes  
GitLab self-paced Learning Platform

2

### **Ask the community**

We've a closed telegram group for all teams on migrations.  
Post a question!

3

### **Reach SHIP-HATS teams**

Log Jira Ticket  
Fortnightly Check

# What can you do NOW?

## Start learning the tools

- POCs to register for hands-on training at <https://go.gov.sg/ship-hatsworkshopreg>
- Rest of the team register for a gitlab.com account (not required to be linked techpass) for free and log in to <https://levelup.gitlab.com/learn/dashboard> to enrol for the Gitlab courses
- Review learning resources in the [Developer Portal](#)

## Communicate with your Migration Consultants

- Acknowledge the Onboarding Jira Ticket created for your Project

## Estimate your Effort for migration

- Download the [Migration Checklist](#)

# COMPLETE Pre-GA ACTIVITIES

1

## Complete Access Requirement



2

## Review Tooling Assessment & Plan Subscription package

| Assessment    |                                   |                                       |   |
|---------------|-----------------------------------|---------------------------------------|---|
| Stage         | GitLab Native                     | Alternative Tool                      | Assessment  |
| Access        | TechPass & SEED                   | TechPass & SEED                       | NA  |
| Plan          | GitLab Issues                     | Jira                                  | <a href="#">GitLab Wiki vs Atlassian Jira</a>       |
| Plan          | GitLab Wiki                       | Confluence                            | <a href="#">GitLab Wiki vs Atlassian Confluence</a> |
| Plan          | GitLab Security Dashboard         | NA                                    | NA  |
| Build         | GitLab CI/CD                      | NA                                    | NA  |
| Build         | GitLab Package Registry           | Nexus Repository Pro                  | <a href="#">GitLab vs Nexus</a>                     |
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| Build Testing | GitLab SAST                       | Fortify-on-Demand SAST(new)           | <a href="#">GitLab vs Fortify-on-Demand</a>         |
| Other Tests   | GitLab Code Quality Scanning Tool | SonarQube Community/Developer Edition | <a href="#">GitLab vs SonarQube</a>                 |

**29 NOV 2022**

Pre-GA Activities

**4 JAN 2023**

**GA - General Availability**

Ready for new subscribers & Wave 1

**31 DEC 2023**

**Final deadline to complete migrations**