



External Workspace Manager Plugin

Google Summer of Code 2016 @ Jenkins Project

Mentors

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Student

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25 August 2016

About myself

- GSoC Student at Jenkins project
- Major in Software Engineering at Babes-Bolyai University of Cluj-Napoca, Romania



BABEȘ-BOLYAI UNIVERSITY
Faculty of Mathematics and Computer Science



 [alexsomai](#)

 [@alex_somai](#)

Background

- >2 years experience in Software Development
- Coding in Java, Groovy, JavaScript
- Interested in Spring, Hibernate, Web Services
- Build tools and CI: Maven, Jenkins

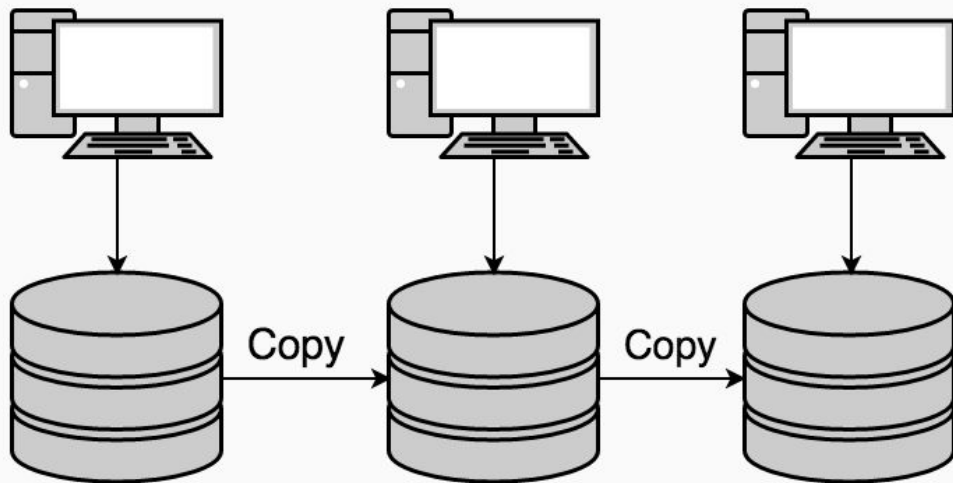


 [alexsomai](#)

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The problem

- Difficult to reuse the same workspace for multiple jobs
- e.g. Running parallel testing across nodes



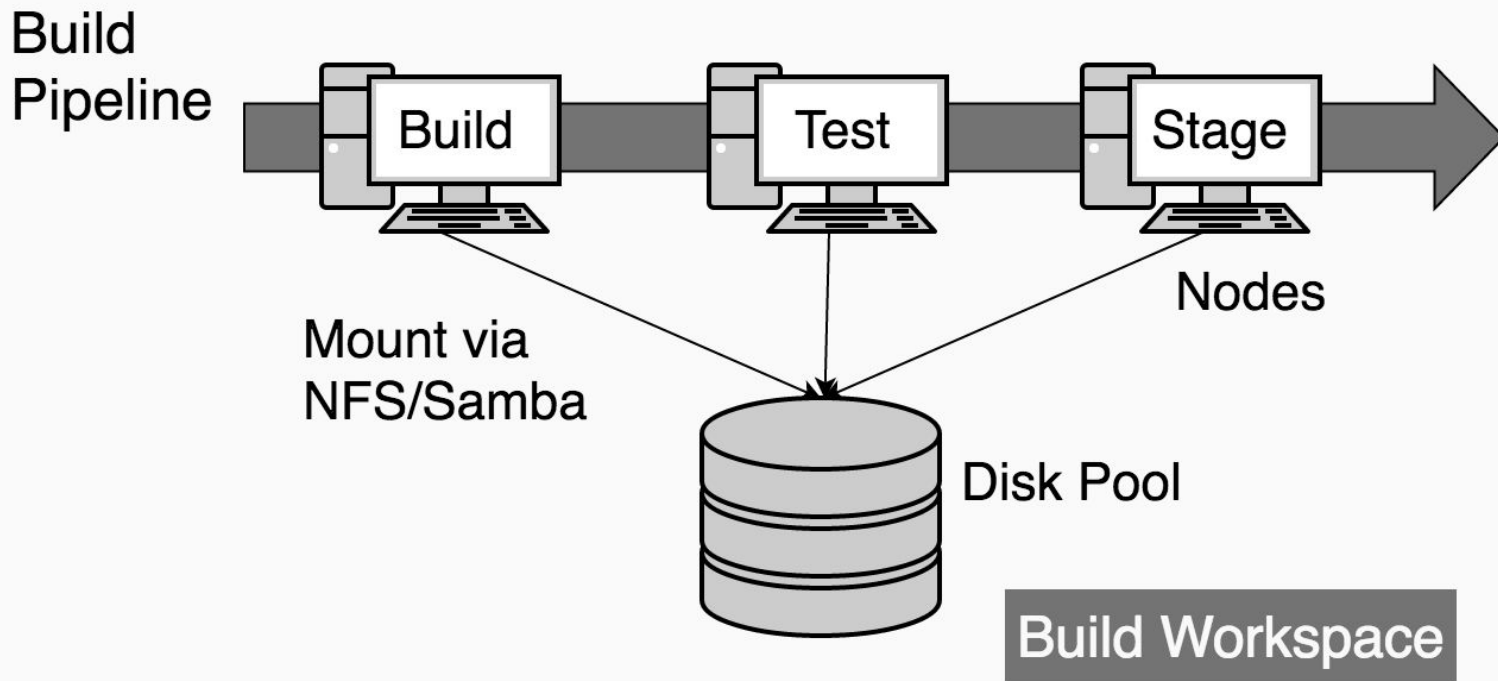
Possible solutions

- Stash/unstash pre-made artifacts (pipeline only)
- Copy Artifacts plugin
- Advanced job setting
 - custom workspace (freestyle)
 - ws (pipeline)

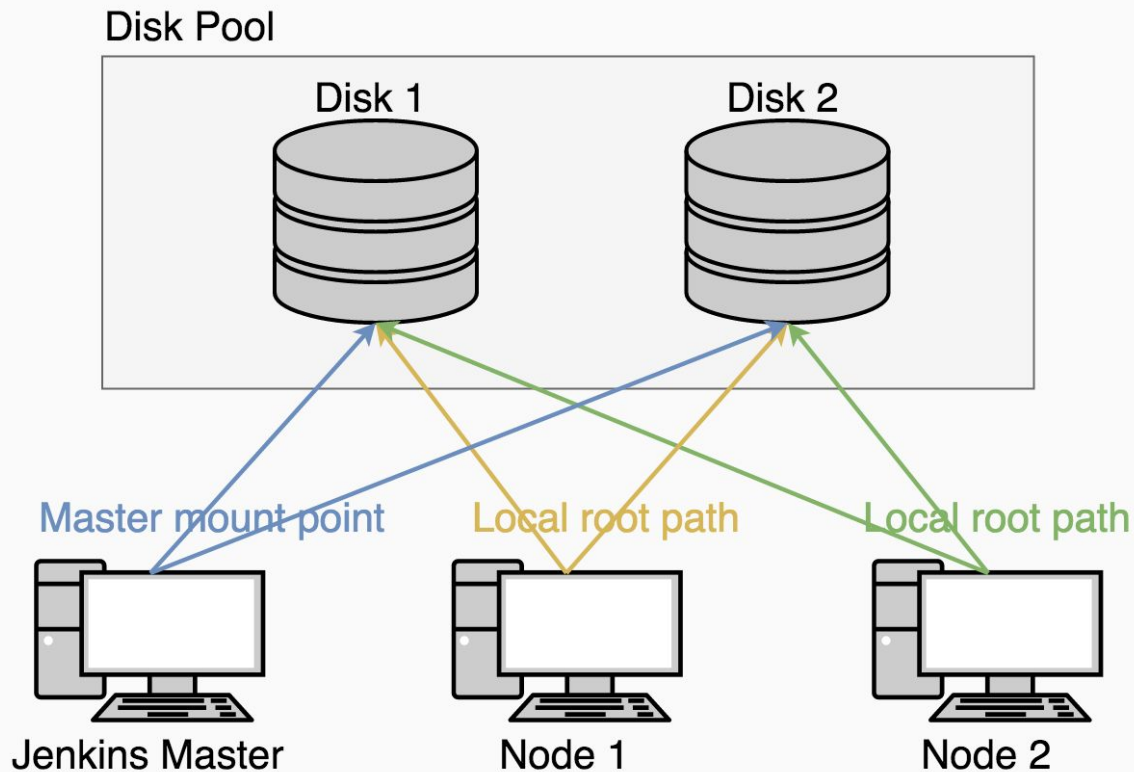
About the project

- Jenkins plugin
- Focus on Pipeline jobs
- Share and reuse workspaces across multiple jobs
 - No need to copy, archive or move files

Concept



Infrastructure



Scope of work

External Workspace
Manager Plugin

NEW!

Pipeline examples

Acceptance Test
Harness

Run Selector Plugin

NEW!

Inherited from Copy Artifact, serious rework
@Symbol support

Workspace Cleanup Plugin

Pipeline support


Job Restrictions Plugin

Minor: default restriction adjustments

Basic features

- Disk configuration
 - Jenkins global config
 - Node config
- Workspace reuse in the same Pipeline job
- Workspace reuse in multiple Pipeline jobs
 - Uses the *Run Selector Plugin*
- Works on both Unix and Windows systems

Jenkins global config

 Disk Pool	
Disk Pool ID	<input type="text" value="diskpool1"/>
Display Name	<input type="text" value="Disk Pool One"/>
Description	<input type="text" value="A summary description of this Disk Pool"/>
Workspace path template	<input type="text"/>
Disk Pool Restriction	<input type="text" value="No restriction (take any)"/>
Disk Allocation Strategy	<input type="text" value="Select the Disk with the most usable space"/>

Disk 1

 Disk	
Disk ID	<input type="text" value="disk1"/>
Display Name	<input type="text" value="Disk One"/>
Master mount point	<input type="text" value="/mount-from-master/to/disk-one"/>
Physical path on disk	<input type="text" value="jenkins-project/disk1"/>
Disk Information	<input type="text" value="No Disk Info"/>

Delete Disk

Disk 2

 Disk	
Disk ID	<input type="text" value="disk2"/>
Display Name	<input type="text" value="Disk Two"/>
Master mount point	<input type="text" value="/mount-from-master/to/disk-two"/>
Physical path on disk	<input type="text" value="jenkins-project/disk2"/>
Disk Information	<input type="text" value="No Disk Info"/>

Delete Disk

Node 1 config

Labels

Usage

Launch method

Availability

Node Properties

☐ Environment variables

☒ External Workspace

Disk Pool Ref ID

Disk

Disk Ref ID

Local root path

Disk

Disk Ref ID

Local root path

Jenkins global config

Disk Pool

Disk Pool ID

Display Name

A summary description of this Disk Pool

Disk

Disk ID

Display Name

Master mount point

Physical path on disk

Disk Information

Disk

Disk ID

Display Name

Master mount point

Physical path on disk

Disk Information

Node 2 config

Labels

Usage

Launch method

Availability

Node Properties

☐ Environment variables

☒ External Workspace

Disk Pool Ref ID

Disk

Disk Ref ID

Local root path

Disk

Disk Ref ID

Local root path

Jenkins global config

Disk Pool

Disk Pool ID

Display Name

A summary description of this Disk Pool

Disk

Disk ID

Display Name

Master mount point

Physical path on disk

Disk Information

Disk

Disk ID

Display Name

Master mount point

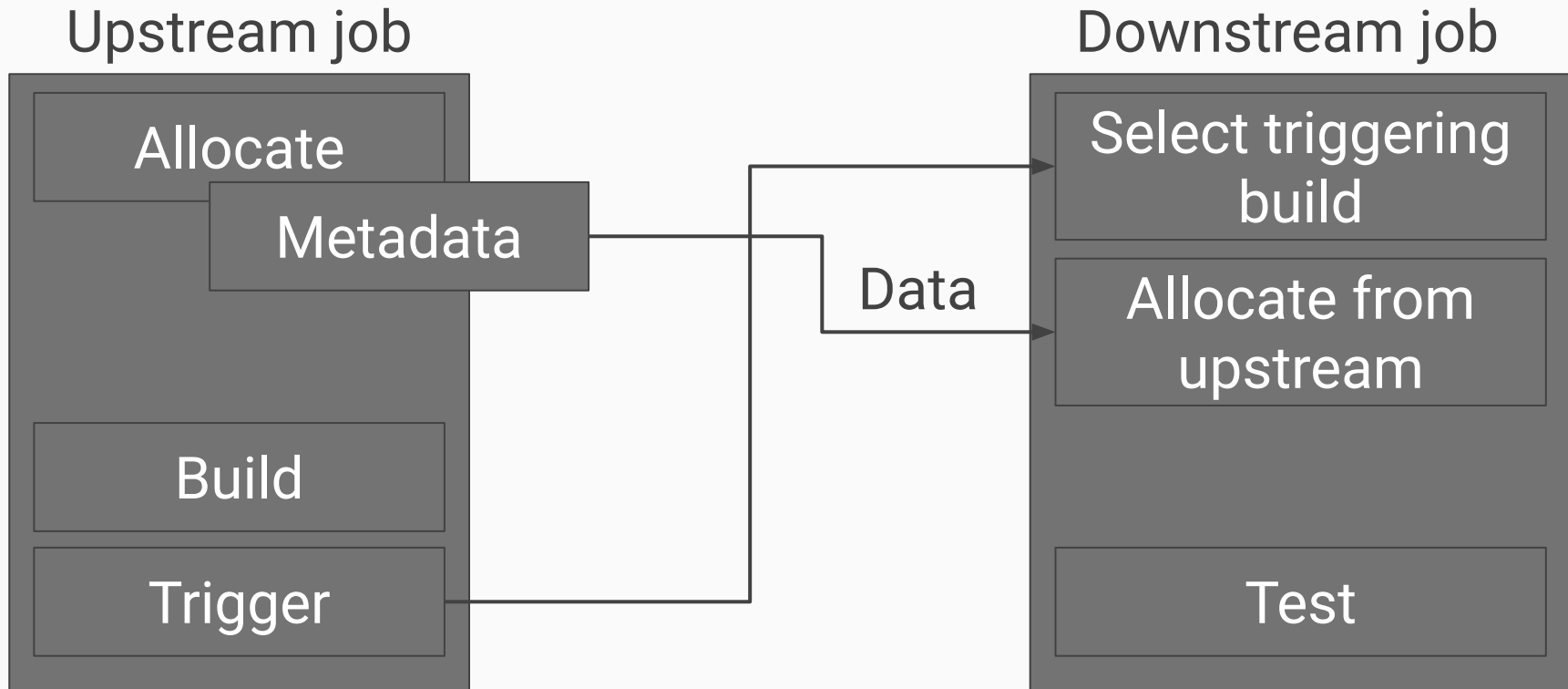
Physical path on disk

Disk Information

Example 1. Usage in a single job

```
def extWorkspace = exwsAllocate 'diskpool1'
node('linux') {
    exws(extWorkspace) {
        checkout scm
        sh 'mvn clean install -DskipTests'
    }
}
node('test') {
    exws(extWorkspace) {
        sh 'mvn test'
    }
}
```

Example 2. Upstream/Downstream



Example 2. Upstream job

- No changes in External Workspace commands!

```
def extWorkspace = exwsAllocate 'diskpool1'  
node('linux') {  
    exws(extWorkspace) {  
        checkout scm  
        sh 'mvn clean install -DskipTests'  
    }  
}  
build 'downstream-job'
```


Example 2. Downstream job

- *Run Selector Plugin* picks the upstream build

```
def run = selectRun job: 'upstream-job',  
    selector: triggering()  
def extWorkspace = exwsAllocate selectedRun: run  
node('test') {  
    exws(extWorkspace) {  
        sh 'mvn test'  
    }  
}
```

Demo part 1

Advanced features

- Workspace cleanup
 - Uses *Workspace Cleanup Plugin*
- Provide custom workspace path
 - By default
/mountPoint/pathOnDisk/\$JOB_NAME/\$BUILD_NUMBER
 - Override
 - Jenkins global config, for each Disk Pool
 - In the Pipeline script

Example 3. Workspace cleanup

```
def extWorkspace = exwsAllocate 'diskpool1'
node('linux') {
    exws(extWorkspace) {
        try {
            checkout scm
            sh 'mvn clean install'
        } catch(e) {
            currentBuild.result = 'FAILURE'
        } finally {
            step ([ $class: 'WsCleanup',
                    cleanWhenFailure: false ])
        }
    }
}
```

- Workspace Cleanup Plugin version 0.30

Example 4. Custom workspace path

```
def customPath =  
    "${env.JOB_NAME}/${PR_NUMBER}/${env.BUILD_NUMBER}"  
  
def extWorkspace = exwsAllocate diskPoolId: 'diskpool1',  
    path: customPath  
  
node('linux') {  
    exws(extWorkspace) {  
        checkout scm  
        sh 'mvn clean install'  
    }  
}
```

Demo part 2

More features

- Disk Pool restrictions
 - Restrict a Disk Pool to be allocated only for specific jobs
 - Integrates *Job Restrictions Plugin*
- Flexible Disk allocation strategies
 - Select the disk with the most usable space
 - Select the disk with the fastest write/read speed

Example 5.

Disk Pool Restrictions

Disk Pool

Disk Pool ID

diskpool1

?

Display Name

Disk Pool One

?

Description

A summary description of this Disk Pool

?

Workspace path template

?

Disk Pool Restriction

Or (multiple entries)

?

Started By User

Users list

User ID

alexsomai

?

Delete

Add user

☐ Accept upstream runs started by users above

☐ Accept runs started by anonymous users

Delete

Regular Expression (Job Name)

Expression

foobar/.*

?

Pattern is valid

☐

Check short name

☐

Delete

Add restriction...

Disk Allocation Strategy

Select the Disk with the most usable space

?

Example 6. Disk allocation strategy

```
def extWorkspace = exwsAllocate diskPoolId: 'diskpool1',  
    strategy: fastestReadSpeed(estimatedWorkspaceSize: 100)
```

```
node('linux') {  
    exws(extWorkspace) {  
        checkout scm  
        sh 'mvn clean install'  
    }  
}
```

Demo part 3

Completed work summary - Phase 2













Phase 2 EPIC [JENKINS-35971](#)

Planned Achieved

- Decouple *BuildSelector* extension point from *Copy Artifact* to *Run Selector Plugin*
 - <https://github.com/jenkinsci/run-selector-plugin>
- Make *Workspace Cleanup Plugin* compatible with Pipeline
 - See PR [#27](#)
- Custom workspace path feature



Completed work summary - Phase 2

	Planned	Achieved
● Disk Pool restrictions		
● Extension points		
○ <i>DiskInfoProvider & DiskAllocationStrategy</i>		
● Unit tests		
● Acceptance tests #172		
● <i>Jenkinsfile</i> - build on ci.jenkins.io		
● Stable release		
● Details on https://alexsomai.github.io/gsoc-2016/		

Stable release

- Stable version has been released!

Filter:

Updates **Available** Installed Advanced

Install ↓	Name	Version
<input checked="" type="checkbox"/>	External Workspace Manager Plugin This plugin provides an external workspace management system. It facilitates workspace share and reuse across multiple Jenkins jobs. It eliminates the need to copy, archive or move files.	1.0.0

Install without restart Download now and install after restart Update information obtained: 1 min 26 sec ago Check now

- Usage guidelines on the [plugin's README page](#)
- Feedback is welcome on Jira and Gitter

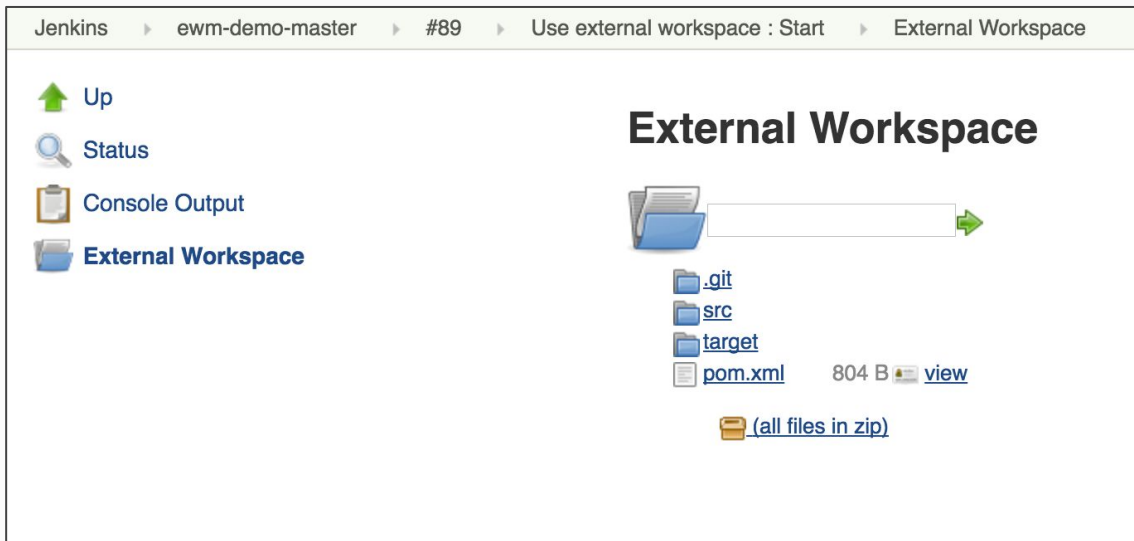
Community interaction

- Set up public meetings (May to August 2016)
 - <https://jenkins.io/hangout>
- Status updates on dev mailing list
- Discussions in IRC and Gitter
 - <https://gitter.im/jenkinsci/external-workspace-manager-plugin>
- Blog posts about plugin releases
 - <https://jenkins.io/blog/2016/06/30/ewm-alpha-version/>
 - <https://jenkins.io/blog/2016/08/09/ewm-beta-version/>
 - <https://jenkins.io/blog/2016/08/22/ewm-stable-release/>

Future work

Phase 3 EPIC [JENKINS-37543](#)


- WIP: Workspace browsing feature
 - See PR [#37](#)





Future work

- Integrate fingerprints

Jenkins External Workspace for Disk ID: disk2 from Disk Pool ID: diskpool-linux [ENABLE AUTO REFRESH](#)



 [Back to Dashboard](#)


**External Workspace for Disk ID: disk2 from Disk Pool ID: diskpool-linux**

Introduced 3 min 2 sec ago  [upstream/trigger-downstream #17](#) MD5: 1e8b8c40618ea1855117b92bfd5bc941

Usage

This file has been used in the following places:

[downstream/triggered-by-upstream](#)  [#16](#)
[upstream/trigger-downstream](#)  [#17](#)

 Workspace

- Integration with external disk providers [JENKINS-36072](#)
 - At least one Extension point in the plugin
 - Candidates: Amazon EBS, Google Cloud Storage

Link summary

- External Workspace Manager repository
 - <https://github.com/jenkinsci/external-workspace-manager-plugin>
- Run Selector repository
 - <https://github.com/jenkinsci/run-selector-plugin>
- Gitter
 - <https://gitter.im/jenkinsci/external-workspace-manager-plugin>
- Work product page
 - <https://alexsomai.github.io/qsoc-2016/>
- Blog posts
 - <https://jenkins.io/blog/2016/06/30/ewm-alpha-version/>
 - <https://jenkins.io/blog/2016/08/09/ewm-beta-version/>
 - <https://jenkins.io/blog/2016/08/22/ewm-stable-release/>
- Phase 2 & 3 EPICs [JENKINS-35971](#) [JENKINS-37543](#)

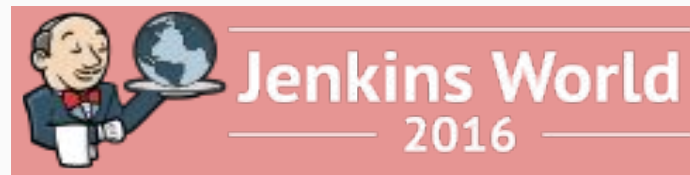
Join me at Jenkins World

- Day 2: Wednesday, September 14

4:15 PM-5:00 PM | Breakout Sessions by Track

Exhibit Hall C	Exhibit Hall A-1	Great America J	Exhibit Hall A-2	Exhibit Hall A-3
Using Jenkins for Diverse Feedback on GitHub	JenkinsOps: An Initiative to Streamline and Automate Jenkins	Lightning Talks	Continuous Performance Testing Feedback	Operating CI/CD at Enterprise Scale with CloudBees Jenkins Platform - Private SaaS Edition
Ben Patterson Engineering Manager edX	Paul Miles Software Development Manager NPR Grant Dickie Software Engineer NPR	Oleg Nenashev Jenkins Developer CloudBees Alexandru Somai GSoC Student at Jenkins Project Babes-Bolyai University of Cluj-Napoca	Eric Proegler Senior Product Manager SOASTA	Kal Vissa Senior Product Manager, Private SaaS Edition CloudBees John Pampuch Engineering Manager, Private SaaS Edition CloudBees

- Community booth
 - Demo Thursday 12:45 - 13:30



Q&A