DevOps World

Jenkins World

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Featured Speaker

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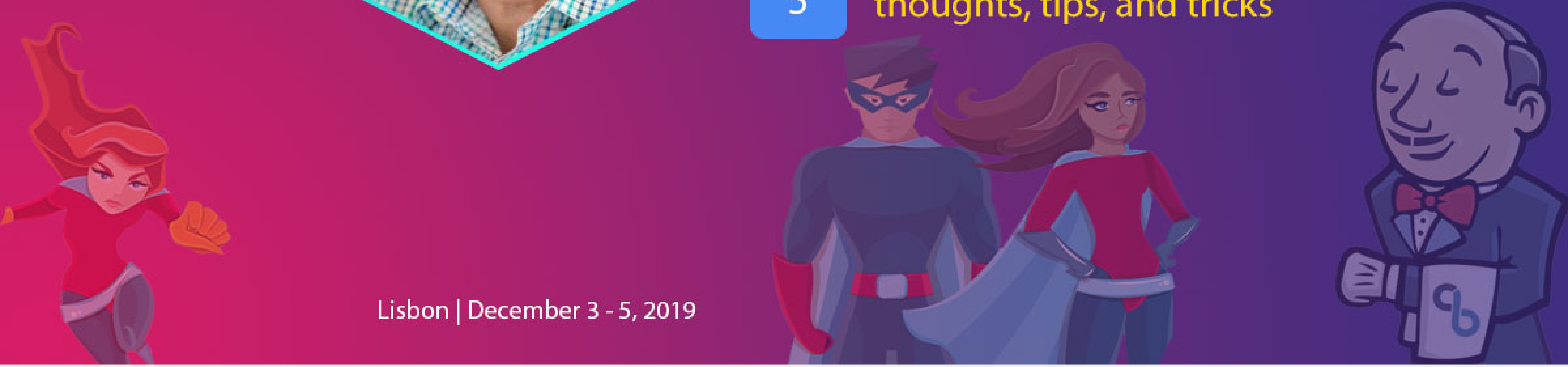
## Automating Jenkins (re)installation: some thoughts, tips, and tricks



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Once upon a time….

# Automating Jenkins (re)installation:

some thoughts, tips, and tricks

Presentation available at: https://jmMeessen.github.io/slides/jw-eu-2019

## Hello !!

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  - Belgian (beer and chocolates)

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iglo
CAPTAIN IGLO
10 Fish Sticks
NATUURLIJKE BRON VAN
SOURCE NATURELLE DE
SELENIUM
15 min
8 min
iglo Forever Food
300g ℮
10 Fish Sticks

iglo

## Who are you?

## What is configuration Management?

## Pet versus Cattle

## Automation, automation, automation!

## In Source Control!

## Why are CI/CD systems handled as Pet ?

## Use cases

- **Provision** (bootstrap) new CI/CD cluster 🐣
- **Update** the system
  - ex: add a new master, change a setting, add a plugin

## Other automation objectives

- Properly document the system
  - Peer-review mechanism for configuration changes
- Scaling
- support CI/CD power users
  - behind the scene warranty for creativity

## Jenkins configuration vectors

## Direct file System manipulation

## Command Line Interfaces

- two types
  - REST API
  - Jenkins CLI

## REST API

- using HTTP requests to GET, PUT, POST and DELETE data.

```
curl -X POST "<jekinsURL>/testProject/build" --user jmm:<password|token>
```

## REST API $\Rightarrow$ use a token

## Jenkins CLI

## Jenkins CLI - Classic

Much better 😊 :

```
java -jar jenkins-cli.jar -http -s $JENKINS_URL -auth @FILE command ...
```

Can use file permission, easy to configure with Ansible

## Jenkins CLI - SSH

```
ssh -l jmm -i ~/.ssh/id_rsa -p 10200 my-jenkins-server help
```

🤔 Can solve some of the bootstrapping problem

## Summary

- Rich set of API
- Easy to use in Ansible for example
- CLI does a better job at controlling parameter
- CLI makes synchonous calls
- CLI commands are better documented 😇
- Parsing results is tricky 😒

## Recommendation

- Use CLI
- Use CLI with SSH if you can (networking)
- Consider executing commands from target host (localhost).

## Groovy Scripts

- Make them idempotent ! 👀

## How to use Groovy Script

- via the script console
- at startup, as init-script
  - placed in `$JENKINS_HOME/init.groovy.d/`
- via the CLI

## Groovy Scripts from the CLI

```
cat my_script.groovy | {{ CLI_command }} groovy =
```

# Docker Container

## Jenkins Configuration as Code

- Declarative method, yaml based
- Loaded on reboot or with a CLI command

## JCasC Example (LDAP cfg)

```yaml
jenkins:
  securityRealm:
    ldap:
      configurations:
      - inhibitInferRootDN: false
        managerDN: "uid=idm,ou=Administrators,dc=example,dc=com"
        managerPasswordSecret: "{{ ldap_admin_passw }}"
        rootDN: "dc=example,dc=com"
        server: "ldap://{{ full_agent_docker_dns_name }}:389"
      disableMailAddressResolver: false
      disableRolePrefixing: true
      groupIdStrategy: "caseInsensitive"
      userIdStrategy: "caseInsensitive"
```

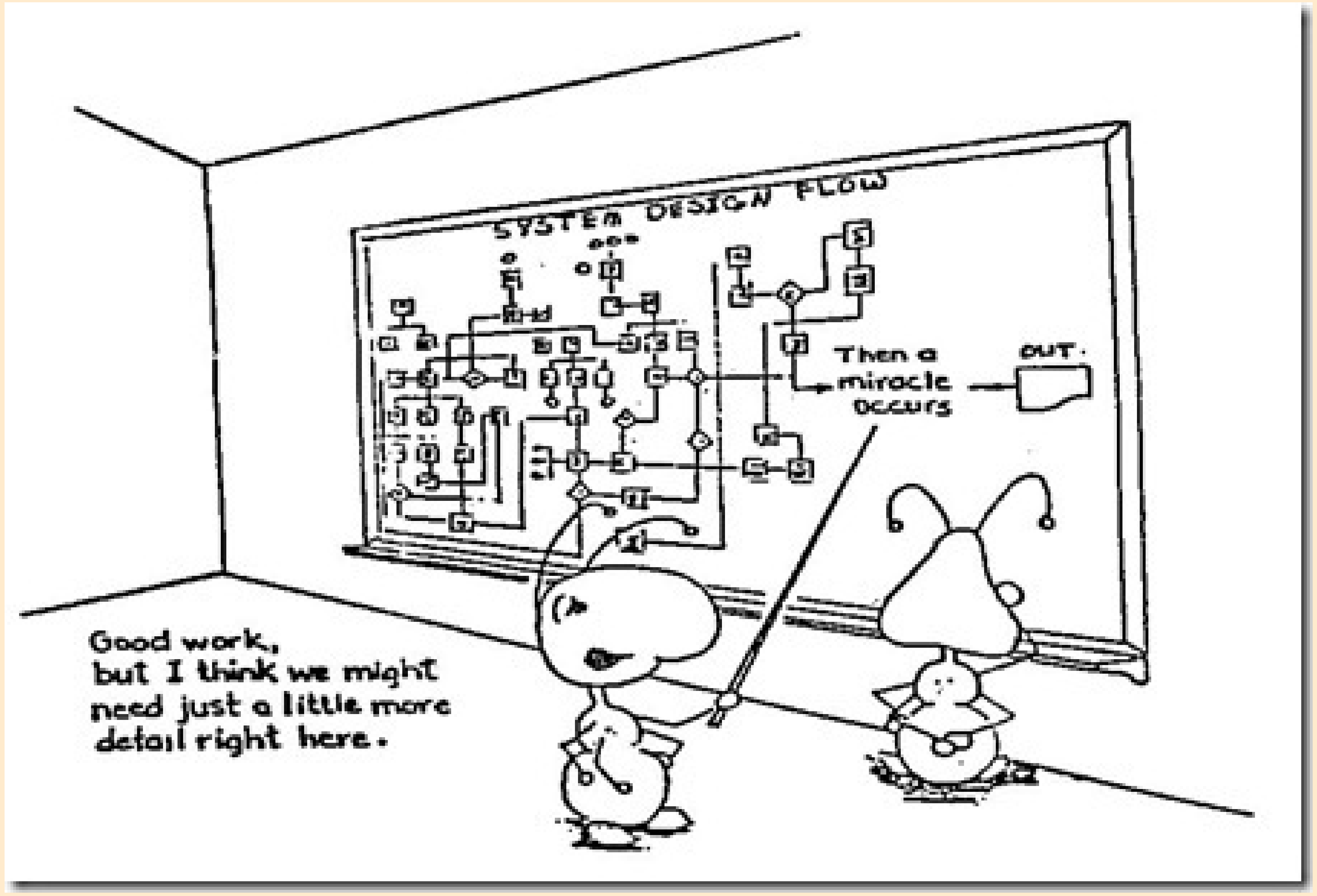
## JCasC Example (JNLP agent)

```yaml
jenkins:
  nodes:
  - permanent:
      labelString: "jnlp"
      mode: NORMAL
      name: "jnlp-agent"
      remoteFS: "/home/jenkins"
      launcher:
        jnlp:
          workDirSettings:
            disabled: true
      nodeDescription: "Agent that initiates its own connection to Jenkins"
      retentionStrategy: "always"
  numExecutors: 0
```

## Current Status

- In technical preview for CloudBees products
  - Waiting for RBAC support 😛
- Centralized CasC management from CJOC

# And in Real Life?


SYSTEM DESIGN FLOW
Then a miracle occurs
OUT
Good work, but I think we might need just a little more detail right here.

## My opinion

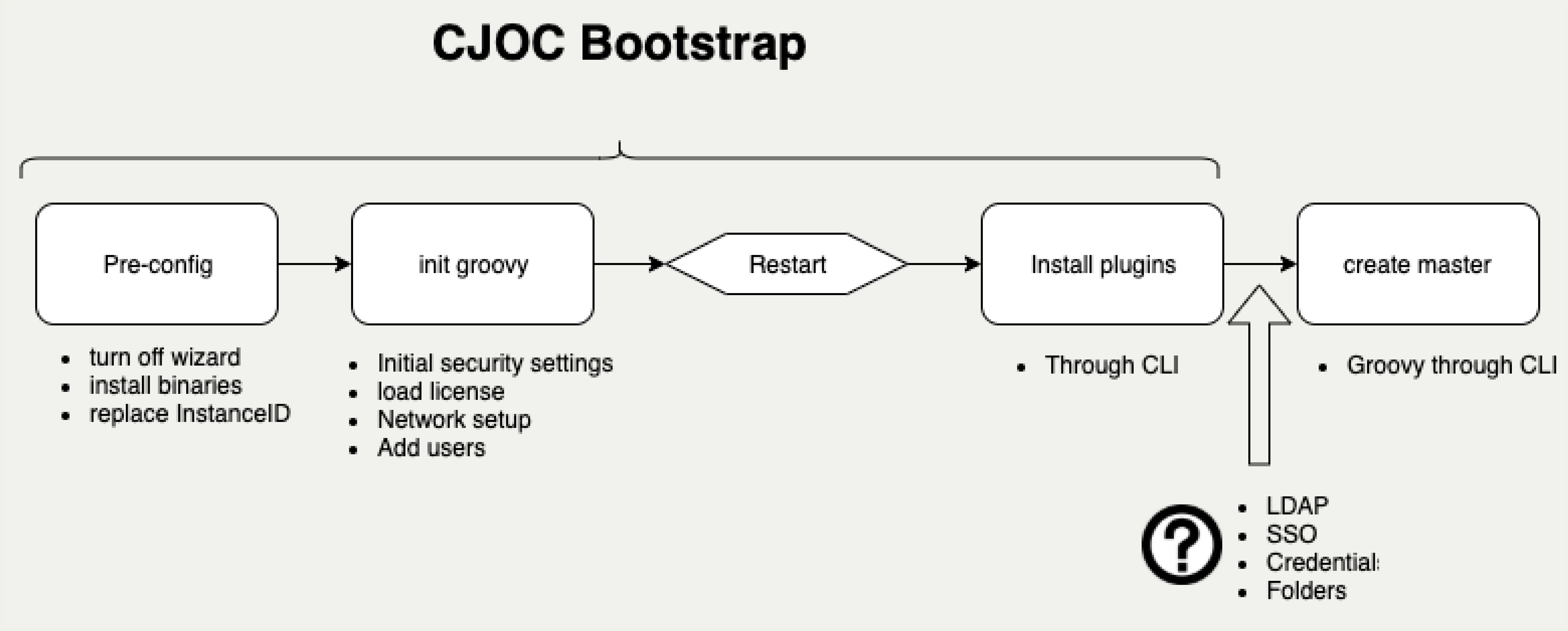
- Practice is still "sedimentary config layer"

- No easy way to solve bootstrapping problem
- Poorly documented / tooled
- Not fit for the volatile K8S world

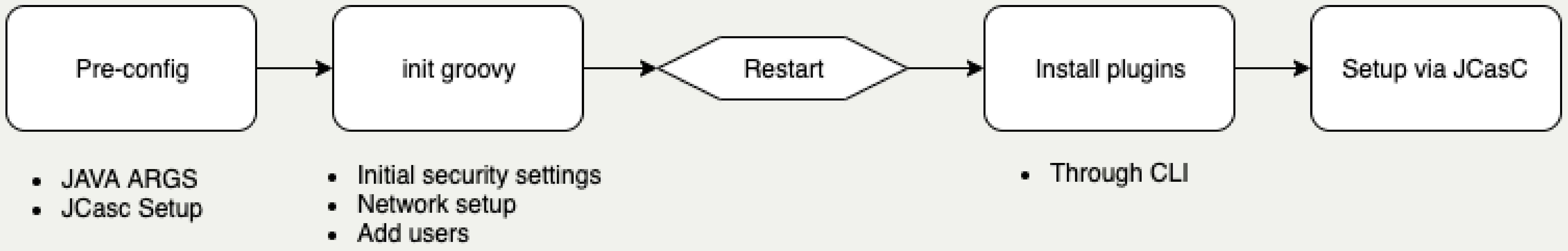
## But Cloudbees is actively working on it

# Bootstrap strategy

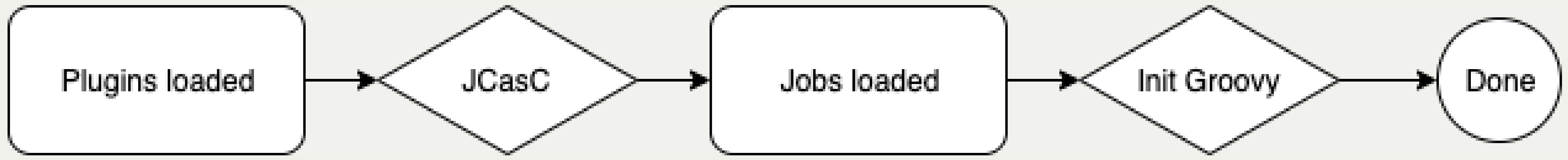
- see example on **https://github.com/jmMeessen/captains_aws_cjp**



## Add Master


Pre-config
init groovy
Restart
Install plugins
Setup via JCasC
JAVA ARGS
JCasc Setup
Initial security settings
Network setup
Add users
Through CLI

## Good to know



## Some thoughts

## Thoughts (1)

- AUTOMATE! (especially in a Cloud World)
- "CasC" is the way to go …
- Plugins installation !
- Bootstrapping is not solved yet
  - But not a reason not to start now

## Thoughts (2)

- Exercise your system (drift…)
- all config changes must be done via source & automation
- Cut the access to that administration UI 👈

## And a last one 😉

- Self-Service portals…
  - very 2010
  - why not ask for a configuration PR?

# Thank You !

@jm_meessen

jmMeessen

Slides: https://jmMeessen.github.io/slides/jw-eu-2019

Source on : https://github.com/jmMeessen/slides/tree/jw-eu-2019

## Bonus

## REST API documentation

- To learn more: 📖
  - https://wiki.jenkins.io/display/JENKINS/Remote+access+API
  - https://wiki.jenkins.io/display/JENKINS/Authenticating+scripted+clients

## BONUS - how to retrieve a token

```
# First thing we do is obtain a crumb from cjoc, this allows us to call the rest API wi
JENKINS_CRUMB=$( \
  curl --user $USERNAME:$PASSWORD \
       --silent "$URL/cjoc/crumbIssuer/api/xml?xpath=concat(//crumbRequestField,\":\",/
)

# Get the JSON payload from the generateNewToken API
JENKINS_TOKENS_JSON=$( \
  curl --header "$JENKINS_CRUMB" \
       --user $USERNAME:$PASSWORD \
       --silent "$URL/cjoc/user/$USERNAME/descriptorByName/jenkins.security.ApiTokenPro
       --data "newTokenName=$USERNAME" \
)

# Pulls the token out of the JSON payload.
JENKINS_TOKEN=$( \
```

## Jenkins CLI - More details

- https://jenkins.io/doc/book/managing/cli/

## Groovy Scripts

- See this *Knowledge Base article* on how to access the javadocs

## JCasC

- https://github.com/jenkinsci/configuration-as-code-plugin

# Bootstrap strategy

- see example on **https://github.com/jmMeessen/captains_aws_cjp**

1. Install jenkins configuration file (startup option)
    1. JAVA_ARGS → `-Djenkins.install.runSetupWizard=false`
2. Proceed with installation via package manager (`apt-get`)
3. Create `init.groovy.d` directory
4. Replace the instanceID with know one (`secret.key`)

# Bootstrap strategy (cont.)

1. Add "init groovy scripts" in directory
    1. Initial security settings
    2. License loading script
    3. Set-URL, JNLP, and SSHD Port configuration scripts
    4. Create Cfg-Management user, generate key and load public key
2. Restart CJOC to activate scripts
3. Use CLI to install plugins
4. Use CLI to execute groovy to create Client Master

## Bootstrap strategy (cont.)

1. Configure Client Master in same principle
    1. Add to JAVA_ARGS the connection info
    2. Configure security and initial users via init scripts
    3. Install default plugins
2. Configure JCasC environment
3. Copy definition in adequate directory
4. Use CLI to force the load of configuration