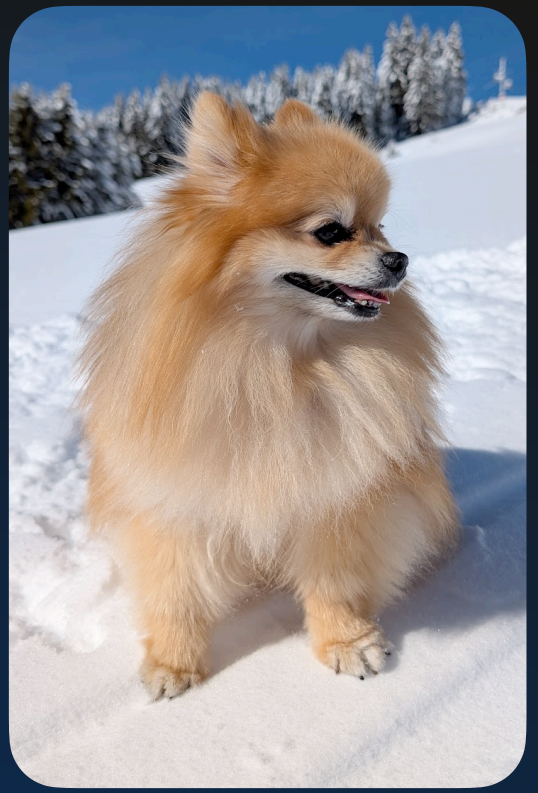
Git, Jenkins and Nexus…

…walk into an IBM i

Who’s this guy?

- Sébastien “Seb” Julliand
- Code for IBM i *core team* member
- IBM i Pipeline Steps Jenkins plugin core maintainer
- IBM Champion since 2024
- R&D Tech Lead at i and me - Training and consulting

- *Dog sold separately*



Jargon checkpoint

- *Build*: the processus that will create the application's objects
- *Artifact*: the result of the build
- *Repository*: where the artifacts are stored
- *Versioning*: track each change iteration with a number
  - *e.g. semantic versioning*: major.minor.patch

Our Goals 🎯

Build once, deploy many times

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- Build the application
  - A repeatable process
  - In a controlled environment
  - To produce an artifact
  - In one click

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- Build the application
  - A repeatable process
  - In a controlled environment
  - To produce an artifact
  - In one click
- Store the artifact(s)
  - In a single, secure repository
  - With traceability - i.e. versioning (snapshot, release)
  - Used by other applications?

Our Goals

- Deploy the artifact(s)
  - Using a single process
  - Repeatable
  - Traceable
  - Using the same artifact everywhere

The Tools 🛠️

Free range and well fed Open-source

The Tools

- Source code repository
  - GitLab

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- Artifacts repository
  - Sonatype Nexus
- A little bit of glue
  - Maven

The Tools - some alternatives

- Source code repository
  - GitLab, GitHub, BitBucket, Azure, GitBucket (runs on IBM i!)
- Build tool
  - gmake, TOBi, shell script, CL, third-party tools…
- Automation server
  - Jenkins, GitHub actions, GitLab CICD, …
- Artifacts repository
  - Sonatype Nexus, JFrog Artifactory, shared folder (IFS, SSH, SFTP…)
- A little bit of glue
  - Maven, shell script

The Tools - separation of duty

- Source code repository
  - Stores the source code
- Build tool
  - Holds the build logic - only the build logic
- Automation server
  - Runs the build and packages it
- Artifacts repository
  - Stores the packages
- A little bit of glue
  - Uploads/downloads packages

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Jenkins

Pipelines and the IBM i pipeline steps plugin

Jenkins - the Pipelines

- Process described as code
  - in the job configuration
    or
  - in the project itself: jenkinsfile

Pipeline script

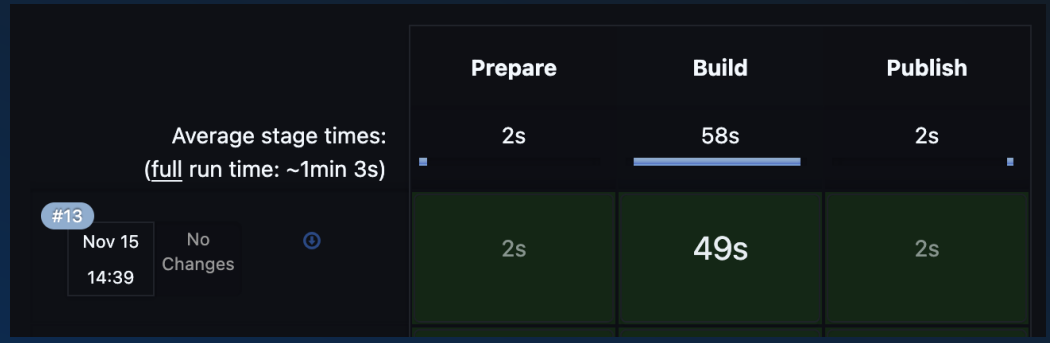
Script

```
node {
    stage('Prepare') {
        dir('company_system') {
            git branch: params.Branch, url: 'git@github.com:sebjulliand/company_system.git', creder
        }
    }

    stage('Build') {
        onIBMi(server:'PUB400') {
            def buildLibrary = "SEBJUB";
            def projectDirectory = "/home/sebju/builds/company_system";
            ibmiCommand command: "RMDIR DIR('$projectDirectory') SUBTREE(*ALL)", failOnError: false
            ibmiPutIFS from: 'company_system', to: projectDirectory
            ibmiCommand command: "CLRLIB LIB($buildLibrary)"

            def build = ibmiShellExec "cd $projectDirectory; chmod +x ./build.sh; ./build.sh $build
            writeFile encoding: "UTF-8", file: "build.txt", text: build.output()

```



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- Process described as code
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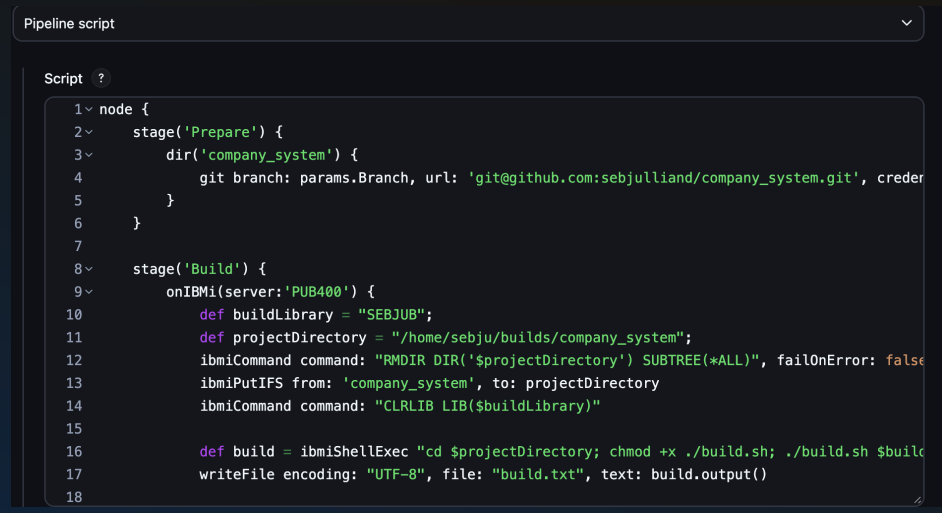
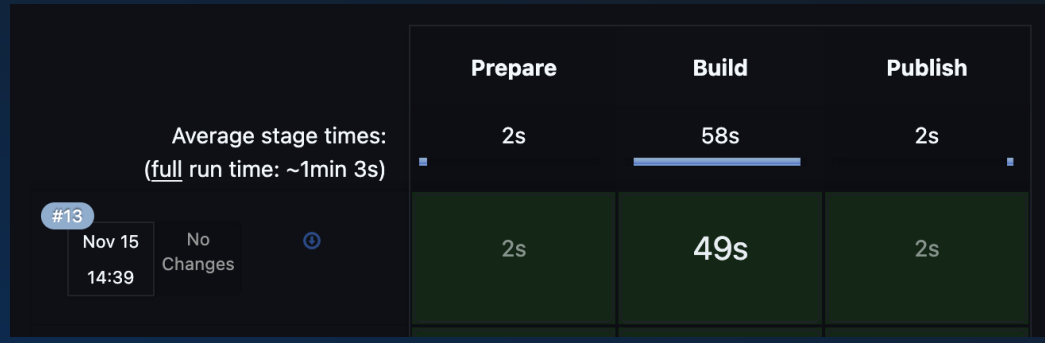
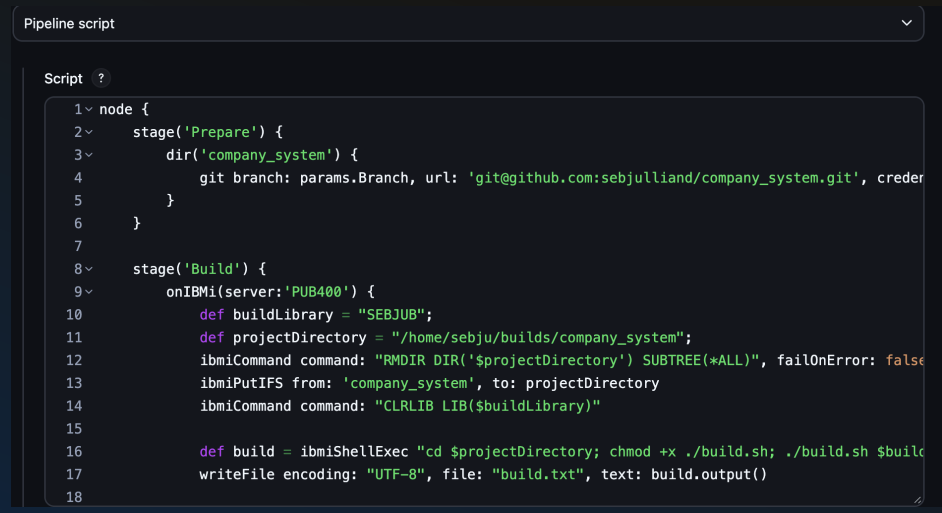
- Describes the build logic: build, test, deploy…

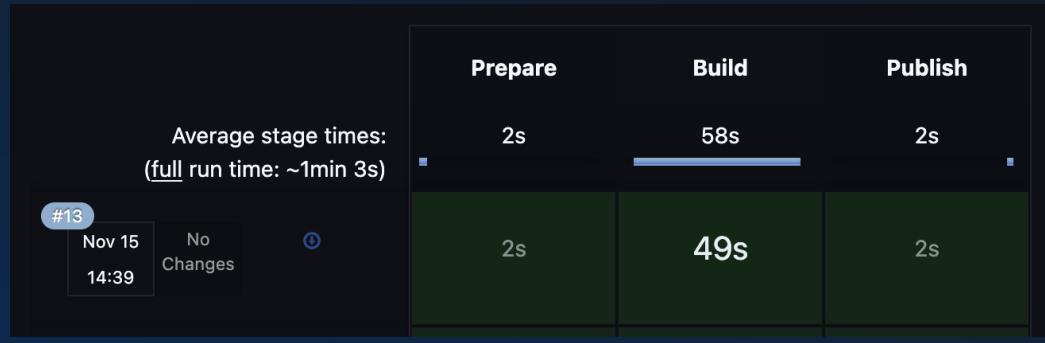




Jenkins - the Pipelines

- Process described as code
  - in the job configuration
    or
  - in the project itself: jenkinsfile
- Describes the build logic: build, test, deploy…
- Divided into simple parts





Jenkins - the Pipeline steps

- Open source plugin
  - Download from Jenkins marketplace
  - https://plugins.jenkins.io/ibmi-steps

- Steps
  - onIBMi
  - ibmiCommand
  - ibmiShellExec
  - ibmiRunSQL
  - ibmiGetSAVF
  - ibmiPutSAVF
  - ibmiGetIFS
  - ibmiPutIFS
  - ibmiGetSPLF
  - ibmiWaitJob

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- Open source plugin
  - Download from Jenkins marketplace
  - https://plugins.jenkins.io/ibmi-steps
- Provides IBM i specific steps
  - run CL command
  - run shell command
  - run SQL queries
  - IFS transfers
  - SAVF transfers
  - download spooled files

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Sonatype Nexus Repository

The Artifact Repository

Sonatype Nexus Repository

- Binary repository
  - artifacts
  - packages
  - metadata
  - …

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- Runs on Java

Sonatype Nexus Repository

- Binary repository
  - artifacts
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  - …
- Runs on Java
- Community edition is free and open-source

Apache Maven™

But why?! 😱

Apache Maven

- Used for building Java project…initially

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- Usable in other scenarios!
  - Thanks to a large collection of plugins

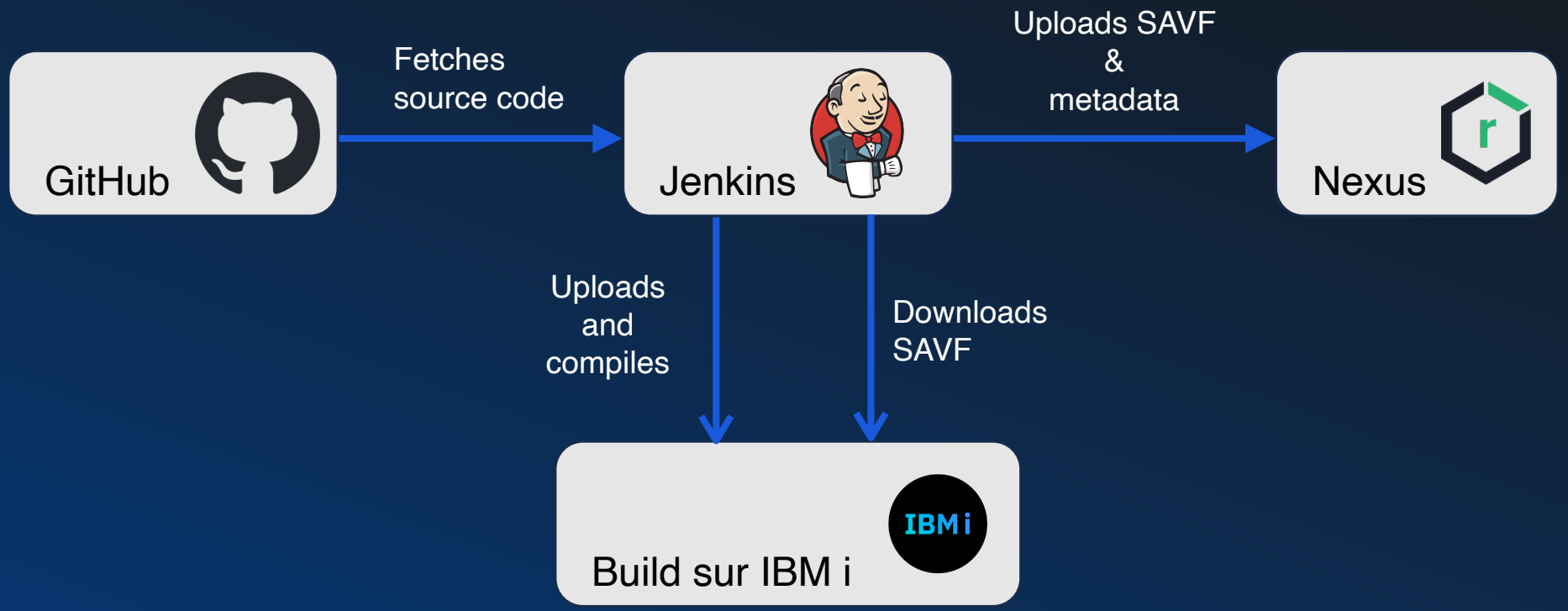
Apache Maven

- Used for building Java project…initially
- Usable in other scenarios!
  - Thanks to a large collection of plugins
- In our specific case
  - Agnostic management of artifacts transfers
  - Versioning enforcement
  - Could also manage inter-applications dependencies

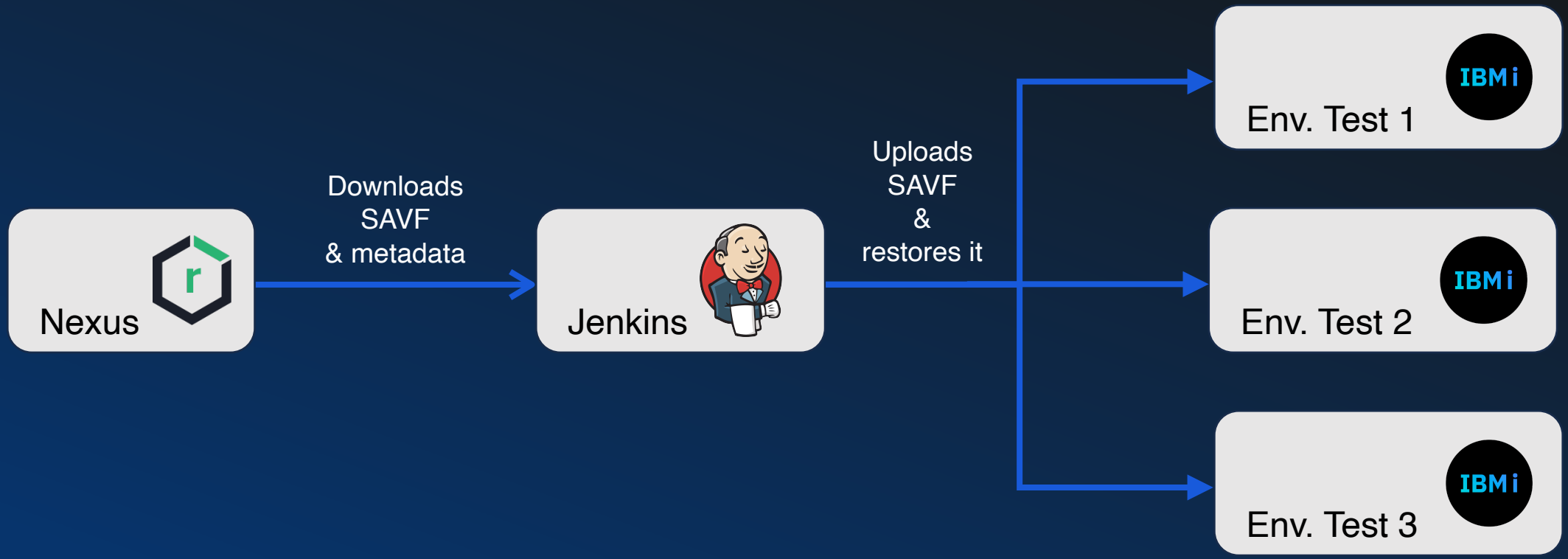
The process

In theory 💭

Build once…


GitHub
Fetches
source code
Jenkins
Uploads SAVF
&
metadata
Nexus
Uploads
and
compiles
Downloads
SAVF
IBM i
Build sur IBM i

…deploy many times



The process

Live! 🚀

Any questions?

Don’t be shy!

Key Takeaway

- 1 click build
- 1 click deployment
- Easy to monitor
- Flexible
  - It’s a big game of Lego
  - Each “brick” can be swapped (except IBM i)
- The whole pipeline can run on IBM I
  - Using Jenkins, Nexus and GitBucket
- Bonus: Jenkins is not only for application build

Mastering the future - together.

THANK YOU

For your attention.

See you tomorrow!

- Design your own VS Code extension and extend Code for IBM I
- VS Code/Code for IBM i hidden gems
- Code for i: What's new, what's next?

Any Question? info@iandme.rocks