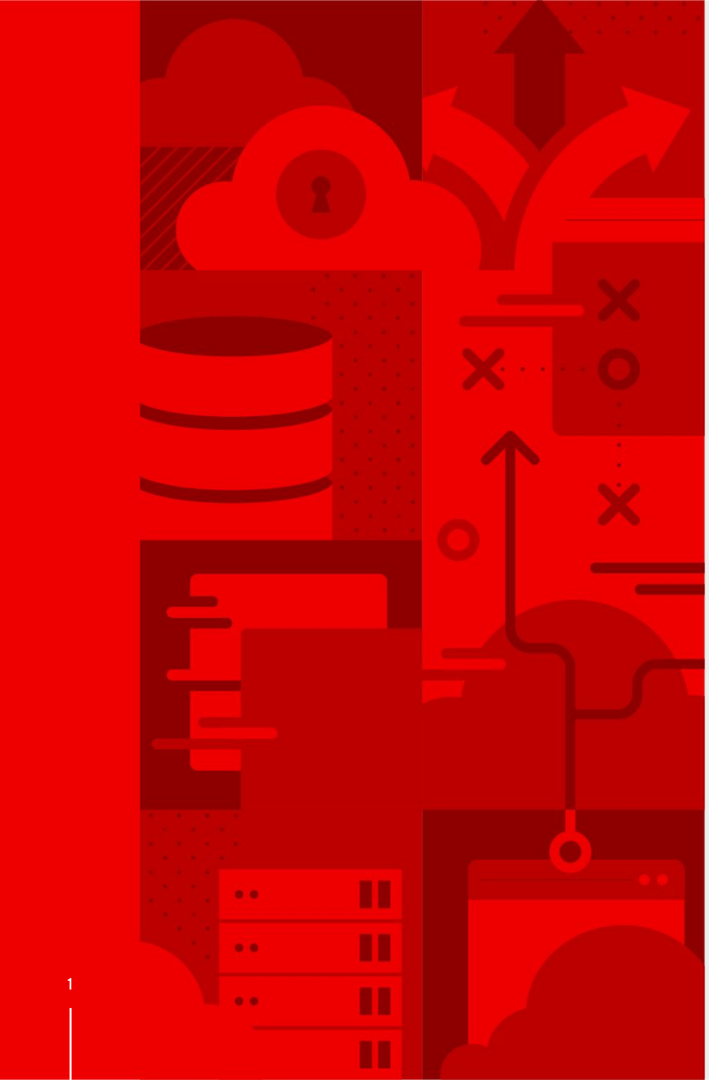


Eclipse Che 7: New & Noteworthy

Florent Benoit

Eclipse Che

Config and Setup

24%

of a dev team's week is spent on building and maintaining developer environments

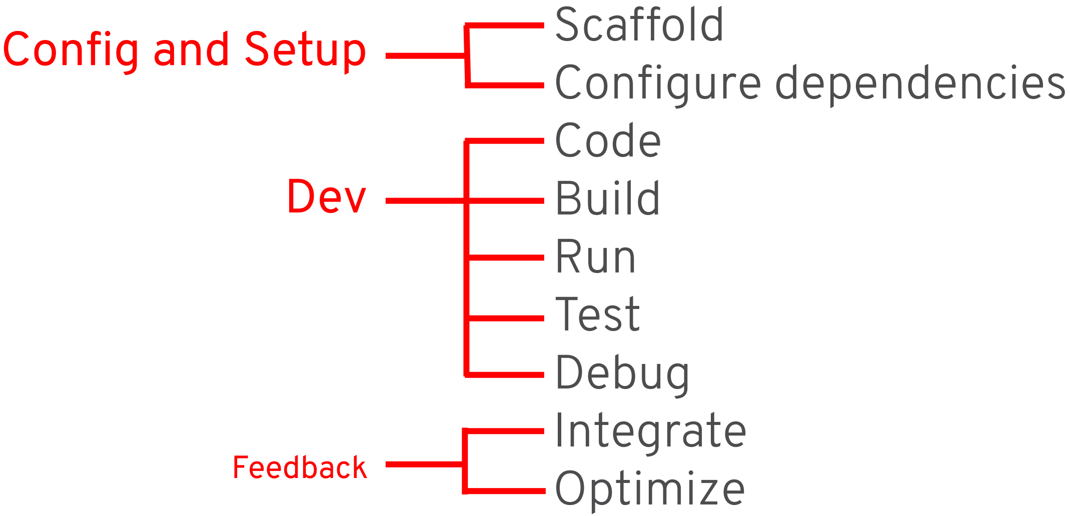
Activities that require configuration and setup:

- Onboarding on a new project
- Switching between different projects, technologies
- Fixing a maintenance branch
- Reviewing a pull request
- Upgrading tools, plugins, dependencies
- Trying out a new technology

Eclipse Che

Anyone, anytime can contribute to a project without installing software.

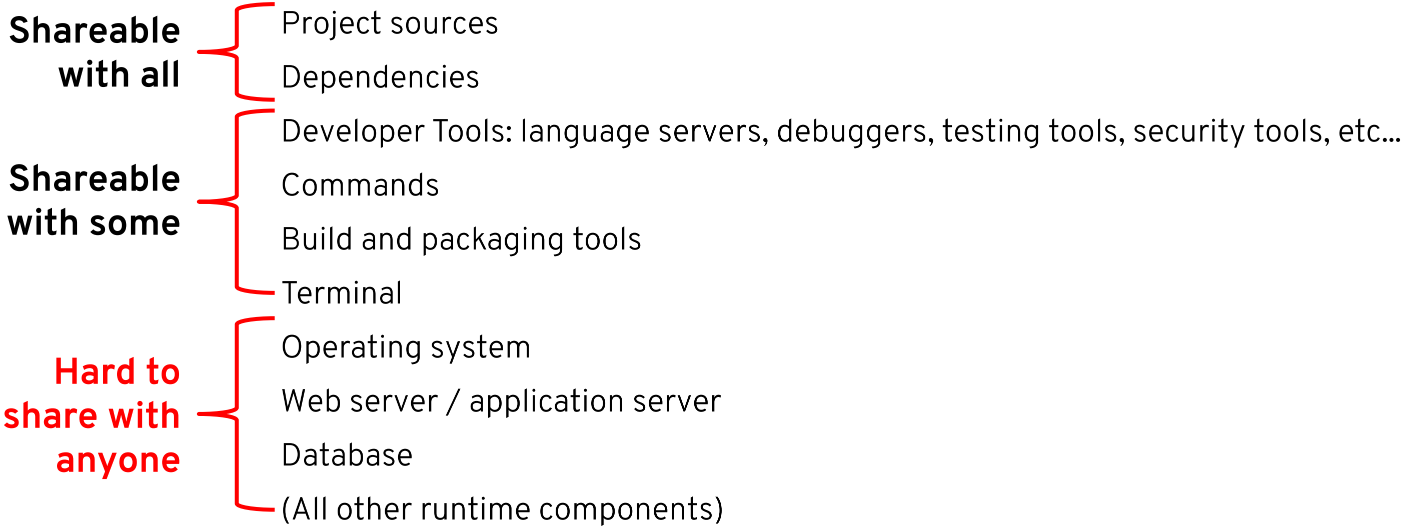
The developer contribution journey



- Config and Setup
  - Scaffold
  - Configure dependencies
- Dev
  - Code
  - Build
  - Run
  - Test
  - Debug
- Feedback
  - Integrate
  - Optimize

Consistency, reproducibility, and ease of access is a velocity factor

TRADITIONAL LAPTOP APPROACH



Shareable with all

- Project sources
- Dependencies

Shareable with some

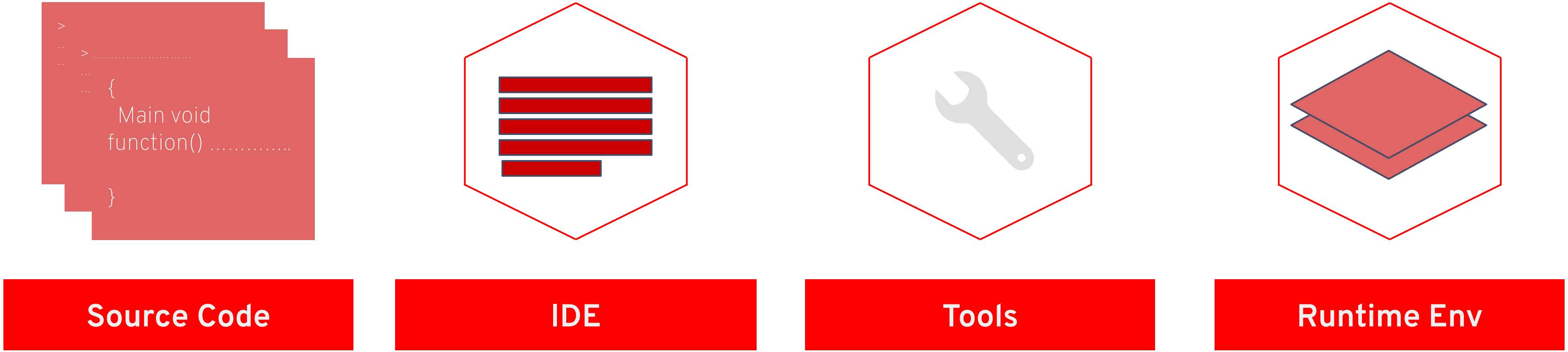
- Developer Tools: language servers, debuggers, testing tools, security tools, etc...
- Commands
- Build and packaging tools
- Terminal

Hard to share with anyone

- Operating system
- Web server / application server
- Database
- (All other runtime components)

A laptop makes it hard to share and secure everything a developer needs.

Defining a new kind of workspace



Source Code

IDE

Tools

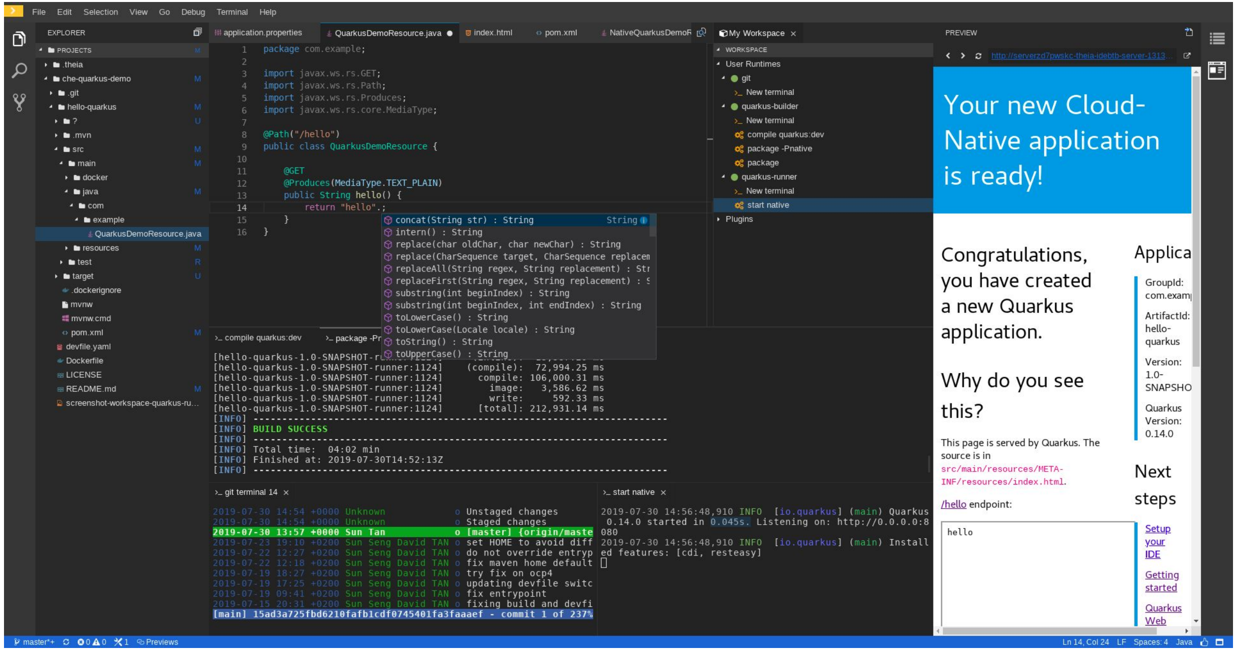
Runtime Env

Eclipse Che Workspace

New Editor

New editor: Eclipse Theia

Containerizing the IDE: zero install and automate configuration



```
package com.example;

import javax.ws.rs.GET;
import javax.ws.rs.Path;
import javax.ws.rs.Produces;
import javax.ws.rs.core.MediaType;

@Path("/hello")
public class QuarkusDemoResource {

    @GET
    @Produces(MediaType.TEXT_PLAIN)
    public String hello() {
        return "hello".;
    }
}
```

```
concat(String str) : String                String
intern() : String
replace(char oldChar, char newChar) : String
replace(CharSequence target, CharSequence replacen
replaceAll(String regex, String replacement) : Str
replaceFirst(String regex, String replacement) : S
substring(int beginIndex) : String
substring(int beginIndex, int endIndex) : String
toLowerCase() : String
toLowerCase(Locale locale) : String
toString() : String
toUpperCase() : String
```

```
[hello-quarkus-1.0-SNAPSHOT-ru
[hello-quarkus-1.0-SNAPSHOT-runner:1124]    (compile):  72,994.25 ms
[hello-quarkus-1.0-SNAPSHOT-runner:1124]      compile: 106,000.31 ms
[hello-quarkus-1.0-SNAPSHOT-runner:1124]        image:   3,586.62 ms
[hello-quarkus-1.0-SNAPSHOT-runner:1124]        write:     592.33 ms
[hello-quarkus-1.0-SNAPSHOT-runner:1124]      [total]: 212,931.14 ms
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  04:02 min
[INFO] Finished at: 2019-07-30T14:52:13Z
[INFO] ------------------------------------------------------------------------
```

```
2019-07-30 14:54 +0000 Unknown              o Unstaged changes
2019-07-30 14:54 +0000 Unknown              o Staged changes
2019-07-30 13:57 +0000 Sun Tan              o [master] {origin/maste
2019-07-23 19:10 +0200 Sun Seng David TAN o set HOME to avoid diff
2019-07-22 12:27 +0200 Sun Seng David TAN o do not override entryp
2019-07-22 12:18 +0200 Sun Seng David TAN o fix maven home default
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2019-07-15 20:31 +0200 Sun Seng David TAN o fixing build and devfi
[main] 15ad3a725fbd6210fafb1cdf0745401fa3faaaef - commit 1 of 237%
```

```
2019-07-30 14:56:48,910 INFO  [io.quarkus] (main) Quarkus
 0.14.0 started in 0.045s. Listening on: http://0.0.0.0:8
080
2019-07-30 14:56:48,910 INFO  [io.quarkus] (main) Install
ed features: [cdi, resteasy]
```

Your new Cloud-Native application is ready!

Congratulations, you have created a new Quarkus application.

Why do you see this?

This page is served by Quarkus. The source is in `src/main/resources/META-INF/resources/index.html`.

/hello endpoint:

```
hello
```

Applica

GroupId: com.examp

ArtifactId: hello-quarkus

Version: 1.0-SNAPSHO

Quarkus Version: 0.14.0

Next steps

Setup your IDE

Getting started

Quarkus Web

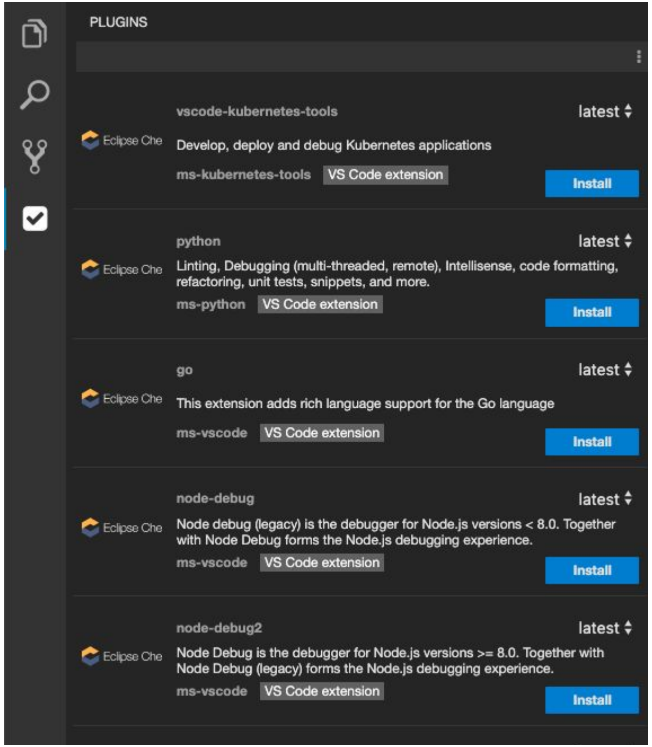
Extended Eclipse Theia, to provide a VSCode-like experience

Built-in:

- Languages Server Protocol
- Debug Adapter Protocol

Compatible with VSCode extensions

Customize with VSCode extensions



vscode-kubernetes-tools

Develop, deploy and debug Kubernetes applications

ms-kubernetes-tools VS Code extension

python

Linting, Debugging (multi-threaded, remote), Intellisense, code formatting, refactoring, unit tests, snippets, and more.

ms-python VS Code extension

go

This extension adds rich language support for the Go language

ms-vscode VS Code extension

node-debug

Node debug (legacy) is the debugger for Node.js versions < 8.0. Together with Node Debug forms the Node.js debugging experience.

ms-vscode VS Code extension

node-debug2

Node Debug is the debugger for Node.js versions >= 8.0. Together with Node Debug (legacy) forms the Node.js debugging experience.

ms-vscode VS Code extension

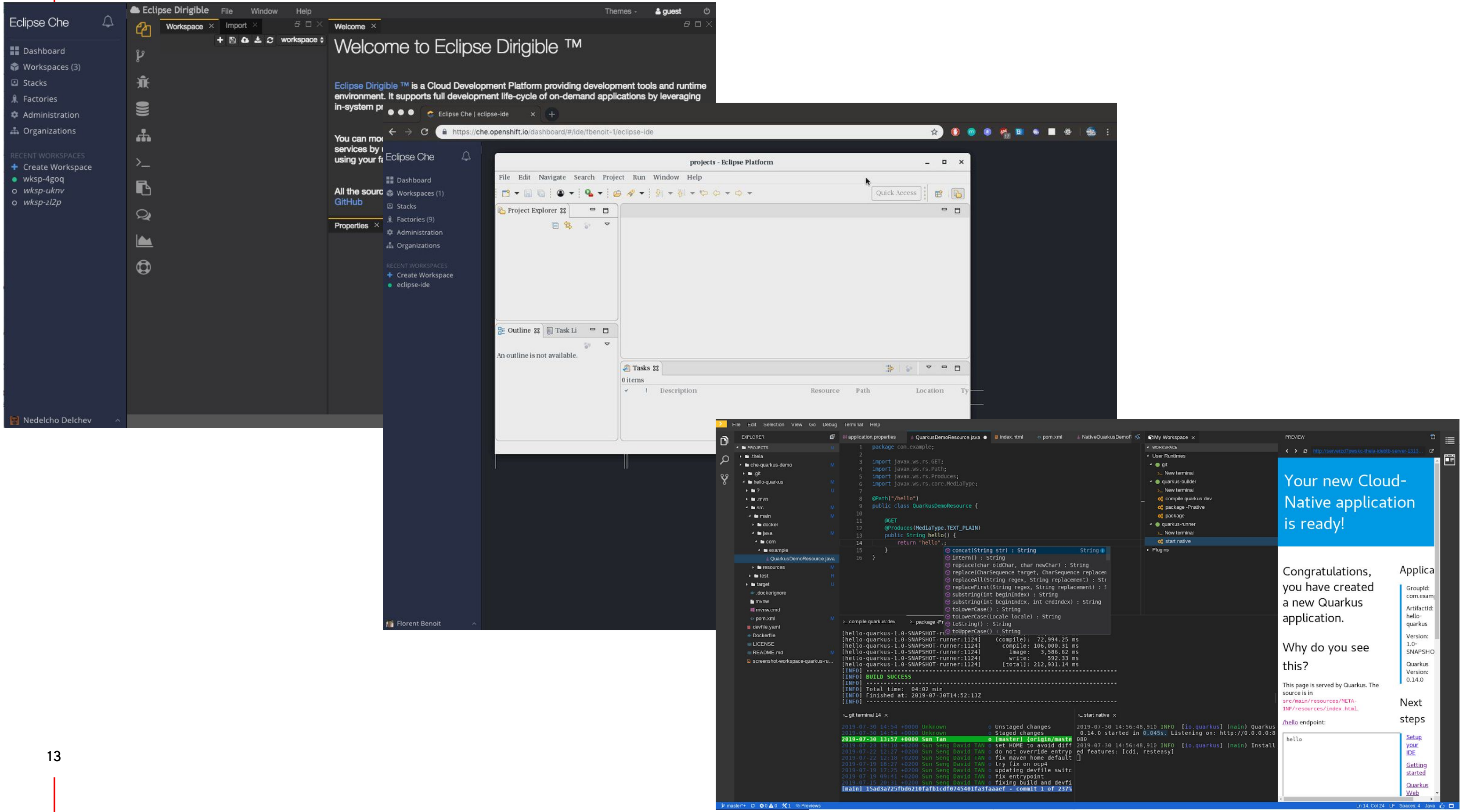
- Visual Studio Code extensions compatibility
- Extensions packaged with their dependencies
- Plug-in registry with predefined set of plug-ins

Enriched Developer Experience

- Keyboard Navigation: Command Palette
- Rich Editor
  - Find/Replace instances
  - Peek Definition
  - Outline
- Improved Debug
- Simple Git Plugin
- Layout customization
- Theming
- Port detection Plugin

Swappable Editor

Che 7: swappable editor



Welcome to Eclipse Dirigible ™

Eclipse Dirigible ™ is a Cloud Development Platform providing development tools and runtime environment. It supports full development life-cycle of on-demand applications by leveraging in-system pr

You can mo
services by
using your f

All the sourc
GitHub

An outline is not available.

0 items

✓	!	Description	Resource	Path	Location	Ty

```
package com.example;

import javax.ws.rs.GET;
import javax.ws.rs.Path;
import javax.ws.rs.Produces;
import javax.ws.rs.core.MediaType;

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ArtifactId: hello-quarkus

Version: 1.0-SNAPSHO

Quarkus Version: 0.14.0

Next steps

Setup your IDE

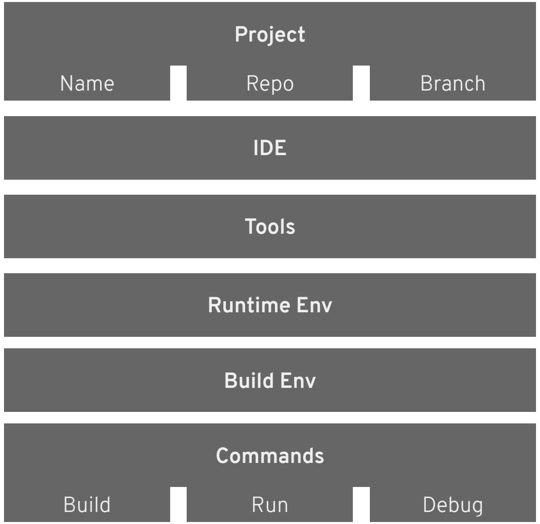
Getting started

Quarkus Web

Red Hat

Devfile

Devfile: Developer environment as code



Project

Name

Repo

Branch

IDE

Tools

Runtime Env

Build Env

Commands

Build

Run

Debug

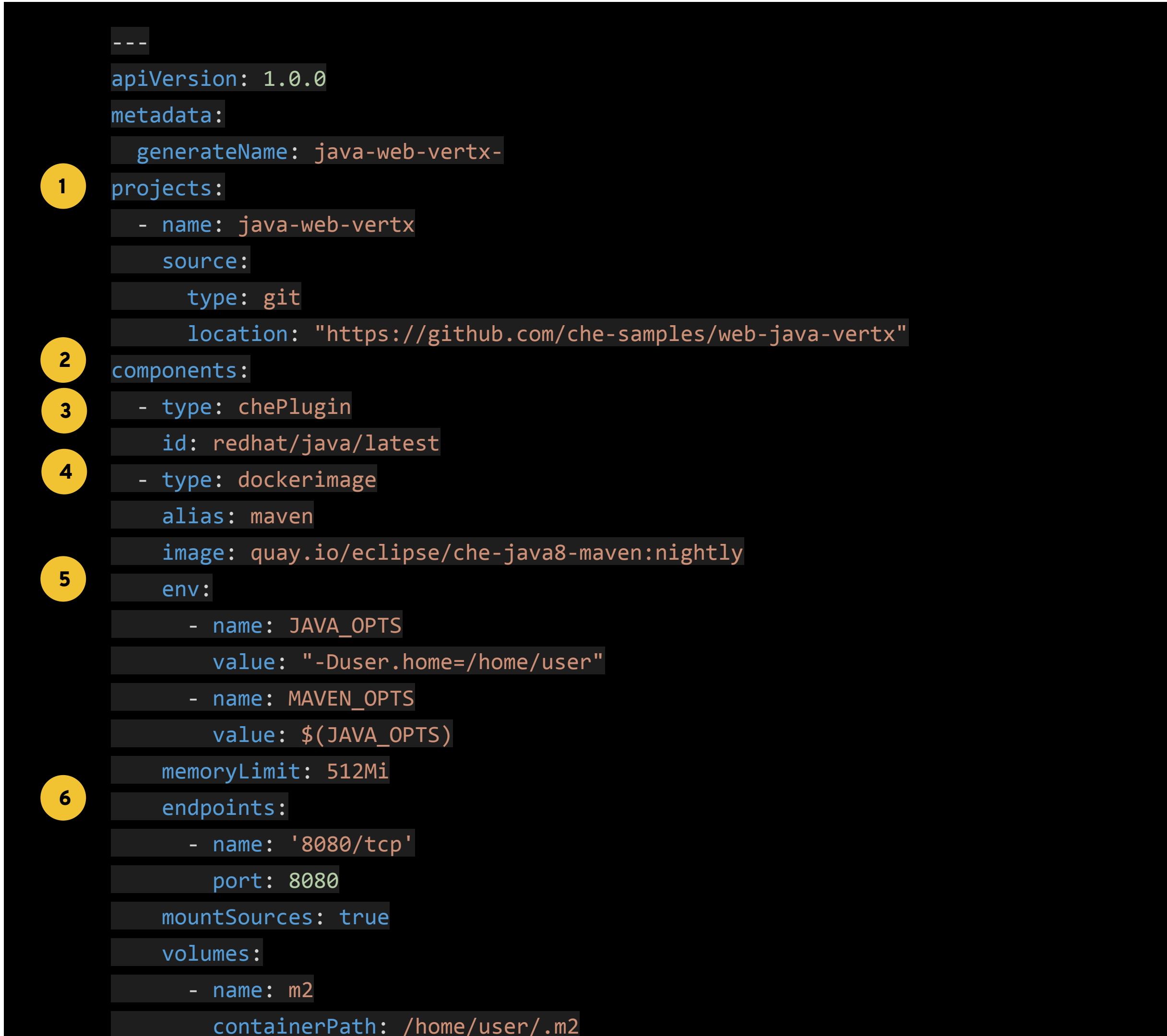
Devfile Definition

The devfile provides easy-to-configure, highly reproducible definitions of portable developer environments.

It is a declarative abstraction of a replicable developer workspaces, which includes the runtime environments, the source code of the projects mapped to repositories and the tools, plugins and commands needed to code, build, test, run and debug a project.

Devfile Example

1. Project information
2. List of components of the workspace
3. Plugin component
4. Runtime image
5. Env variables to configure the container
6. End-points definition



```yaml
---
apiVersion: 1.0.0
metadata:
  generateName: java-web-vertx-
projects:
  - name: java-web-vertx
    source:
      type: git
      location: "https://github.com/che-samples/web-java-vertx"
components:
  - type: chePlugin
    id: redhat/java/latest
  - type: dockerimage
    alias: maven
    image: quay.io/eclipse/che-java8-maven:nightly
    env:
      - name: JAVA_OPTS
        value: "-Duser.home=/home/user"
      - name: MAVEN_OPTS
        value: $(JAVA_OPTS)
    memoryLimit: 512Mi
    endpoints:
      - name: '8080/tcp'
        port: 8080
    mountSources: true
    volumes:
      - name: m2
        containerPath: /home/user/.m2
```

Devfile: Made for Team

Manage Consistency

First class support of K8S, manage the complexity of developer environments take out the pain.

Easy to Integrate

Devfiles are easy to integrate with any tools. Developer environments can be created from anywhere at anytime.

Simple to Share

Devfile live with source code, are easy to modify, fork and share.

Extensible

Customize per task, with plug-in and developer preferences

DEMO #1

Photo by Unsplash

Stack and Plug-ins Registries

Stack and Plug-ins Registries

Tools Registry

In-house deployment

Define plug-ins

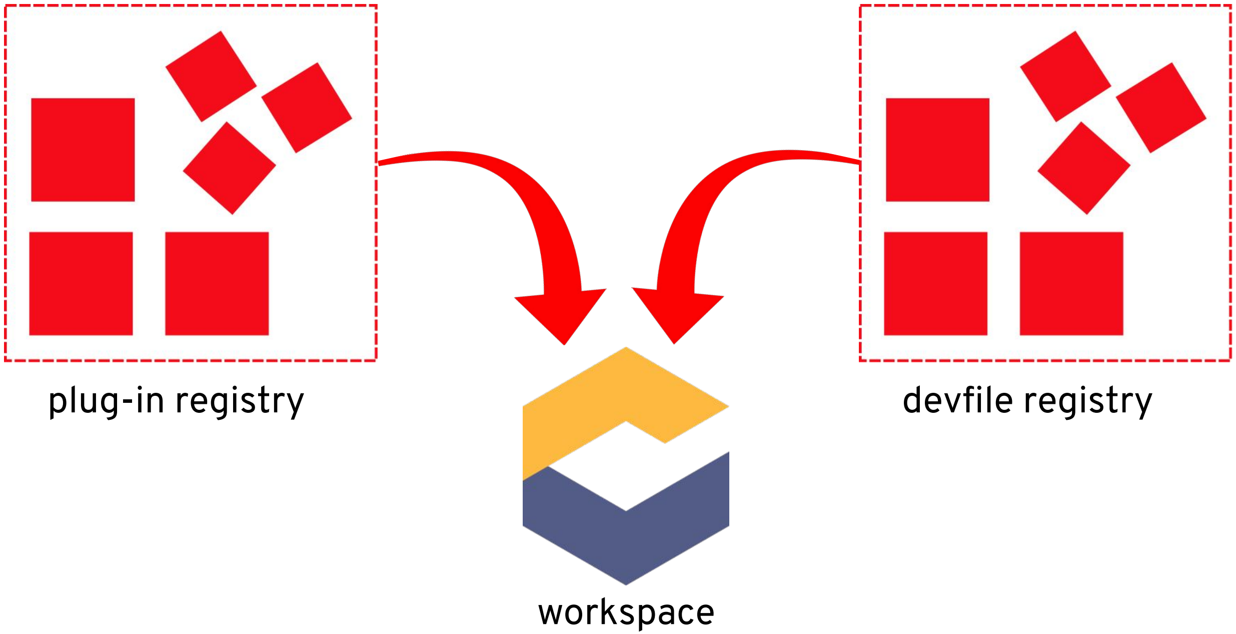
Define IDEs

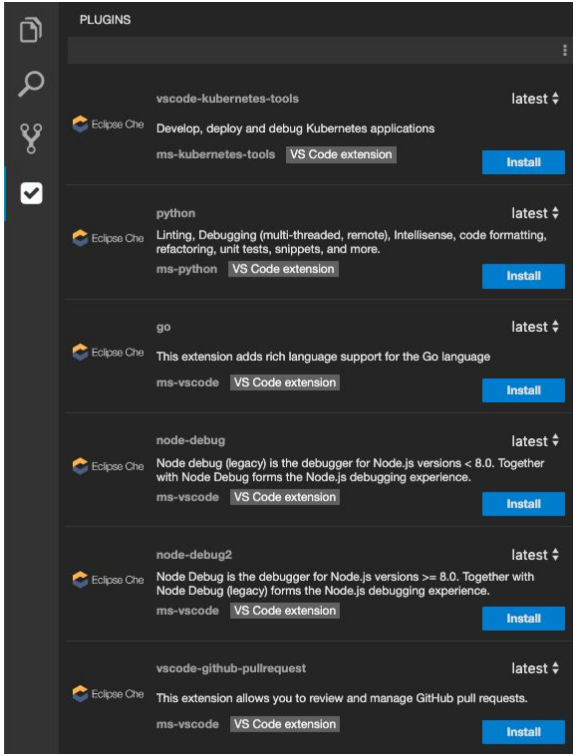
Devfile Registry

Provide ready-to-use developer stacks

Manage stacks

Registries in Eclipse Che





PLUGINS

Eclipse Che
vscode-kubernetes-tools latest
Develop, deploy and debug Kubernetes applications
ms-kubernetes-tools VS Code extension
Install

Eclipse Che
python latest
Linting, Debugging (multi-threaded, remote), Intellisense, code formatting, refactoring, unit tests, snippets, and more.
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node-debug2 latest
Node Debug is the debugger for Node.js versions >= 8.0. Together with Node Debug (legacy) forms the Node.js debugging experience.
ms-vscode VS Code extension
Install

Eclipse Che
vscode-github-pullrequest latest
This extension allows you to review and manage GitHub pull requests.
ms-vscode VS Code extension
Install

Manage all plugins including VS Code extensions

Develop VS Code extensions

How to start ?

Scaffolding: Yeoman generator

yo code

Develop

Intellisense from Eclipse Che IDE

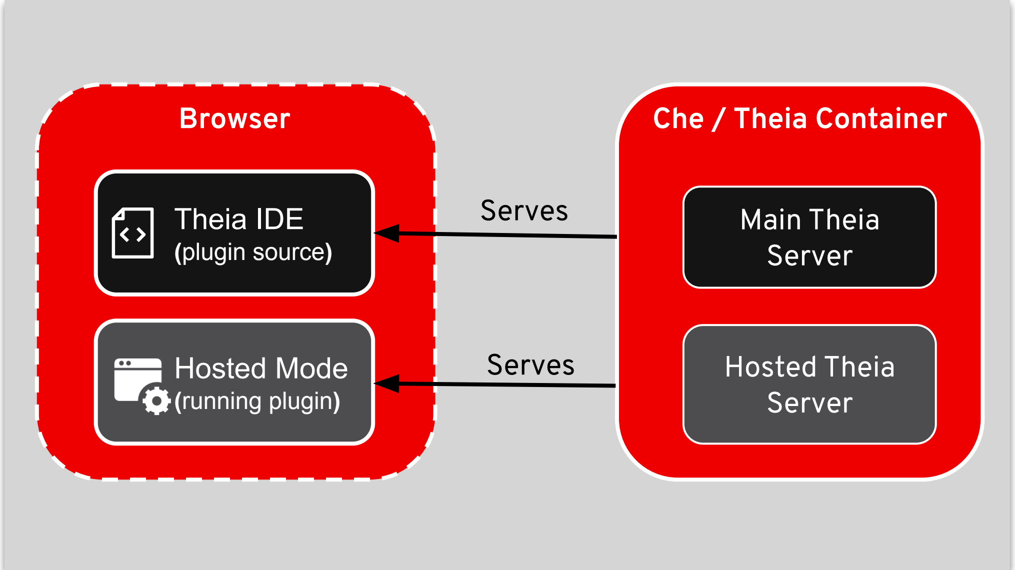
Run

Run inside Eclipse Che IDE

Debug

Run inside Eclipse Che IDE

Hosted / development mode



Two instances of Theia

- Main instance to write plug-ins
- A new instance to run plug-ins

DEMO #2

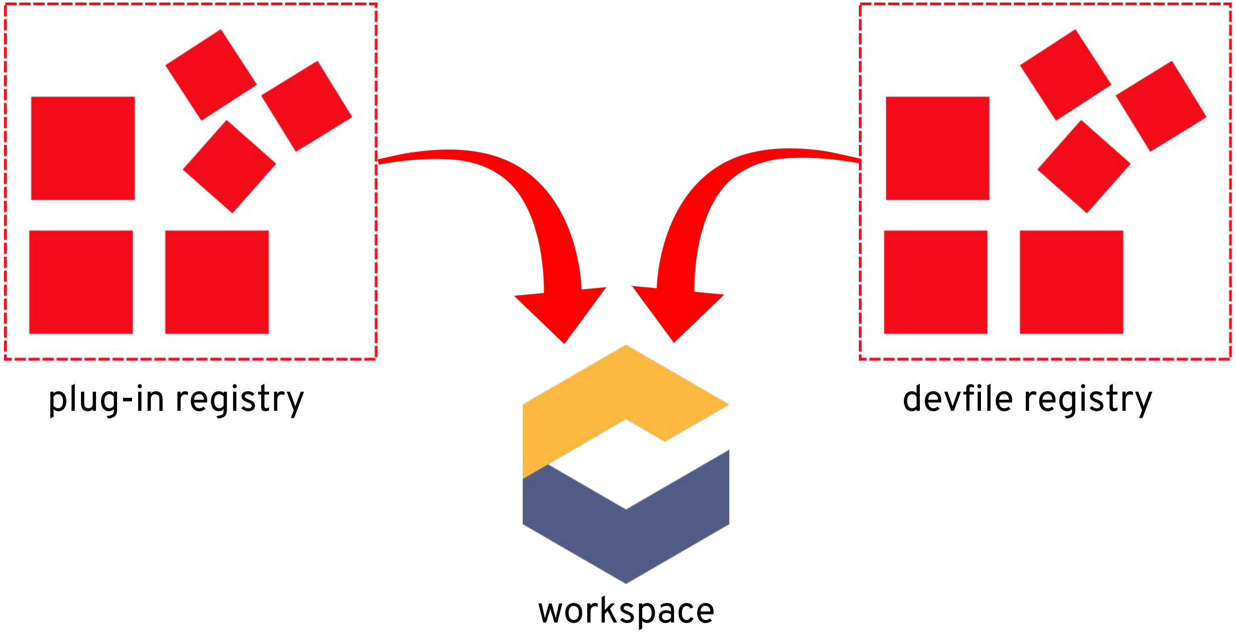
Develop and debug VSCode extension

youtube

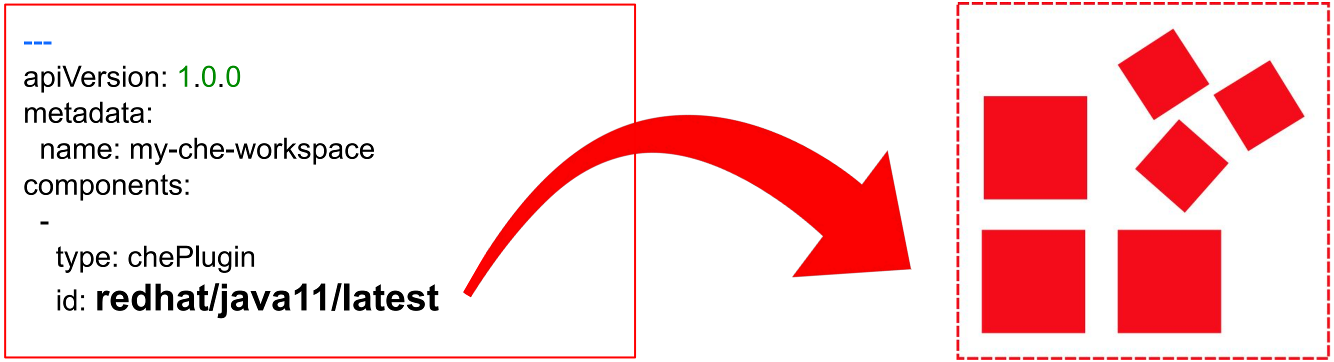
Photo by Unsplash

Publish VS Code extensions on Eclipse Che registries

Registries in Eclipse Che



Devfile



```
---
apiVersion: 1.0.0
metadata:
  name: my-che-workspace
components:
  -
    type: chePlugin
    id: redhat/java11/latest
```

devfile

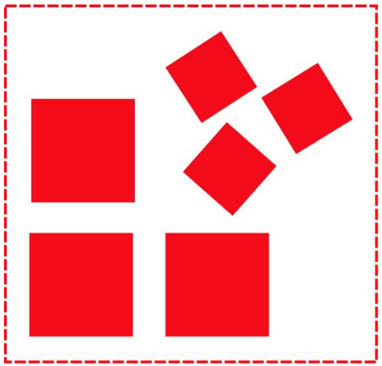
plug-in registry

https://che-plugin-registry.openshift.io/v3/plugins/

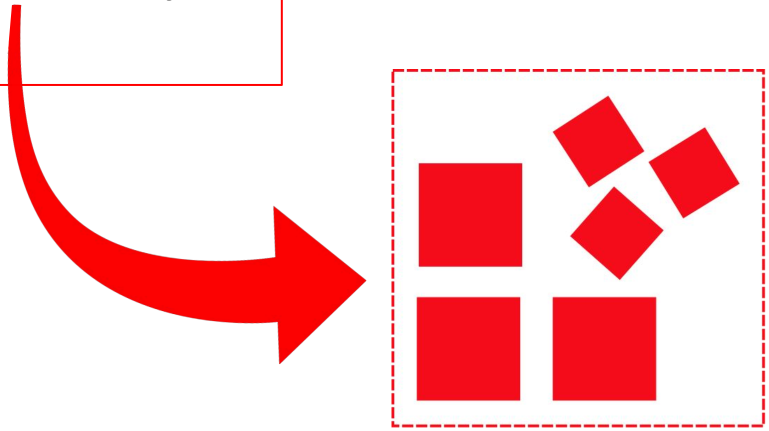
Devfile and registries

```
---
apiVersion: 1.0.0
metadata:
  name: my-che-workspace
components:
  - type: chePlugin
  - reference: https://my-registry/plugins/florent/hello/0.1/meta.yaml
```

devfile

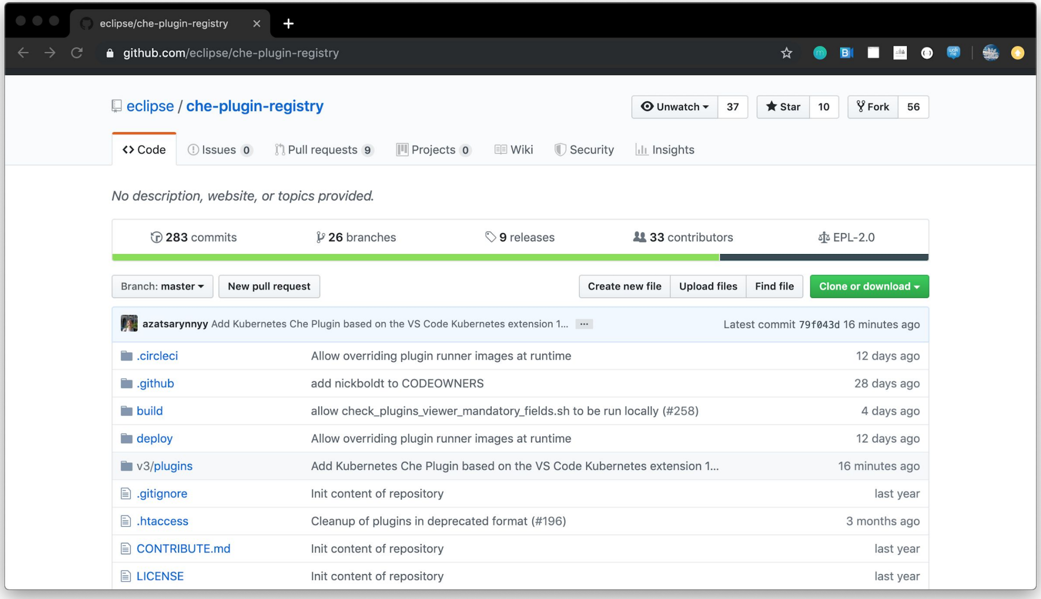


che plug-in registry



my registry

Build a custom registry based on existing one



eclipse / che-plugin-registry

No description, website, or topics provided.

283 commits · 26 branches · 9 releases · 33 contributors · EPL-2.0

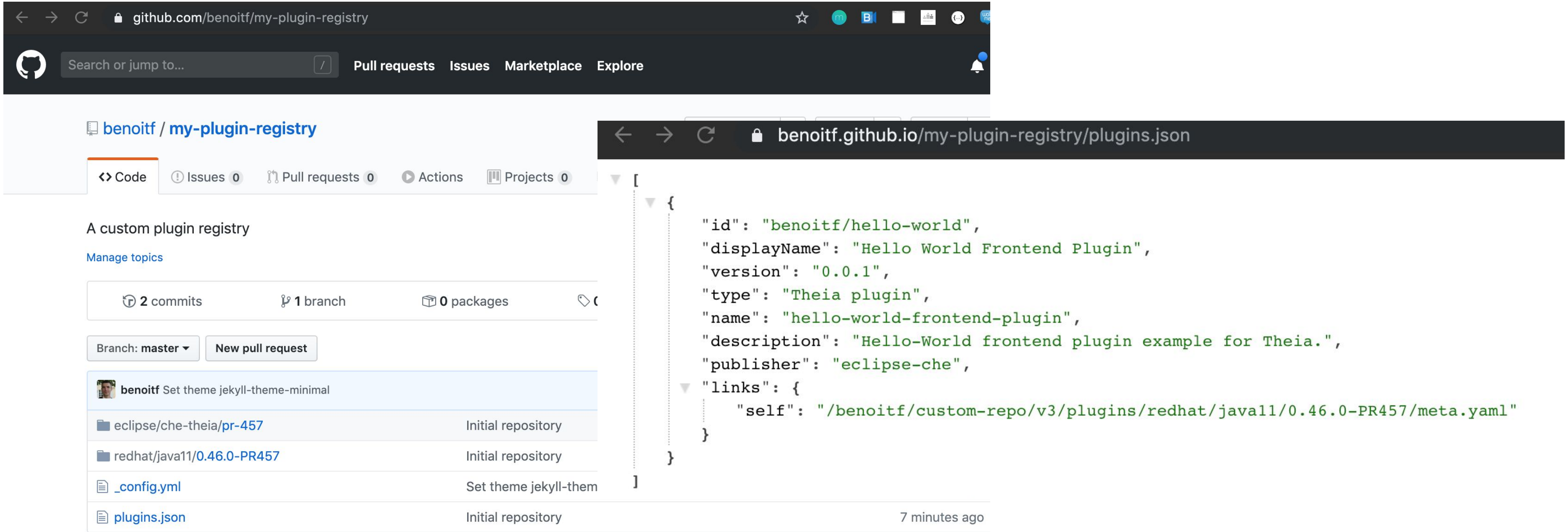
azatsarynnyy Add Kubernetes Che Plugin based on the VS Code Kubernetes extension 1... Latest commit 79f043d 16 minutes ago

.circleci	Allow overriding plugin runner images at runtime	12 days ago
.github	add nickboldt to CODEOWNERS	28 days ago
build	allow check_plugins_viewer_mandatory_fields.sh to be run locally (#258)	4 days ago
deploy	Allow overriding plugin runner images at runtime	12 days ago
v3/plugins	Add Kubernetes Che Plugin based on the VS Code Kubernetes extension 1...	16 minutes ago
.gitignore	Init content of repository	last year
.htaccess	Cleanup of plugins in deprecated format (#196)	3 months ago
CONTRIBUTE.md	Init content of repository	last year
LICENSE	Init content of repository	last year

- Add / update / remove plug-ins
- Rebuild docker image

Create its own registry on github

Or use a simple github project



github.com/benoitf/my-plugin-registry

benoitf / my-plugin-registry

A custom plugin registry

Manage topics

2 commits · 1 branch · 0 packages

benoitf Set theme jekyll-theme-minimal

eclipse/che-theia/pr-457	Initial repository	
redhat/java11/0.46.0-PR457	Initial repository	
_config.yml	Set theme jekyll-them	
plugins.json	Initial repository	7 minutes ago

benoitf.github.io/my-plugin-registry/plugins.json

```
[
  {
    "id": "benoitf/hello-world",
    "displayName": "Hello World Frontend Plugin",
    "version": "0.0.1",
    "type": "Theia plugin",
    "name": "hello-world-frontend-plugin",
    "description": "Hello-World frontend plugin example for Theia.",
    "publisher": "eclipse-che",
    "links": {
      "self": "/benoitf/custom-repo/v3/plugins/redhat/java11/0.46.0-PR457/meta.yaml"
    }
  }
]
```

Red Hat

DEMO #3

VSCode extension with custom plugin registry

youtube

Photo by Unsplash

VS Code extensions and Eclipse Che

ECLIPSE CHE

Eclipse Che Workspaces
plug-ins per workspace

Multi-user / auth
OpenID Connect / LDAP / Keycloak

Plug-in Registry
Global / per instance

Cloud Ready
Kubernetes / OpenShift

Custom namespace

@eclipse-che/plugin namespace

- Interact easily with Eclipse Che API

  https://github.com/eclipse/che-theia/blob/master/extensions/eclipse-che-theia-plugin/src/che-proposed.d.ts

```
 export namespace workspace {
    export function getCurrentWorkspace(): Promise<cheApi.workspace.Workspace>;
    export function getAll(): Promise<cheApi.workspace.Workspace[]>;
    export function getAllByNamespace(namespace: string): Promise<cheApi.workspace.Workspace[]>;
    export function getById(workspaceId: string): Promise<cheApi.workspace.Workspace>;
    export function create(config: cheApi.workspace.WorkspaceConfig, params: KeyValue): Promise<any>;
    export function update(workspaceId: string, workspace: cheApi.workspace.Workspace): Promise<any>;
    export function deleteWorkspace(workspaceId: string): Promise<any>;
    export function start(workspaceId: string, environmentName: string): Promise<any>;
    export function startTemporary(config: cheApi.workspace.WorkspaceConfig): Promise<any>;
    export function stop(workspaceId: string): Promise<any>;
    export function getSettings(): Promise<KeyValue>;
}
```

- Simple code to use

```
import * as che from '@eclipse-che/plugin';

...
await che.workspace.getCurrentWorkspace();
```

System Runtime dependencies / Language server protocol

Java LSP needs Java, PHP requires PHP, etc

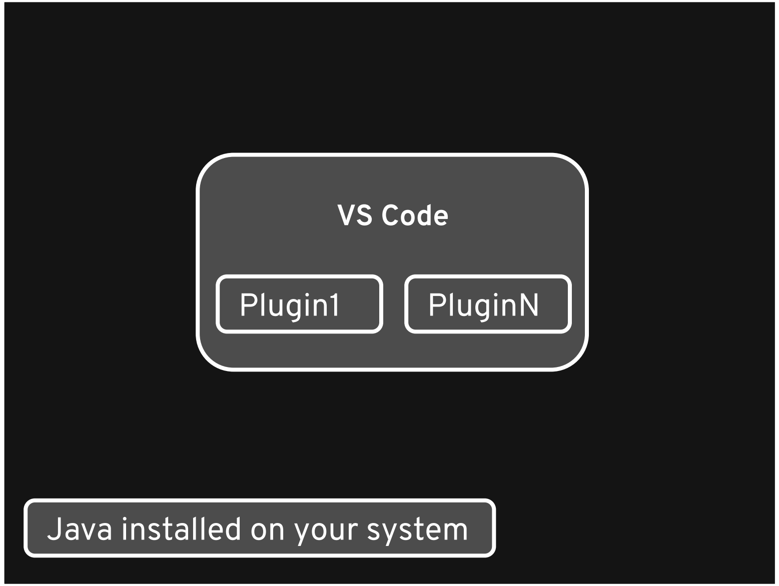
Tools dependencies

$ apt-get install / yum install

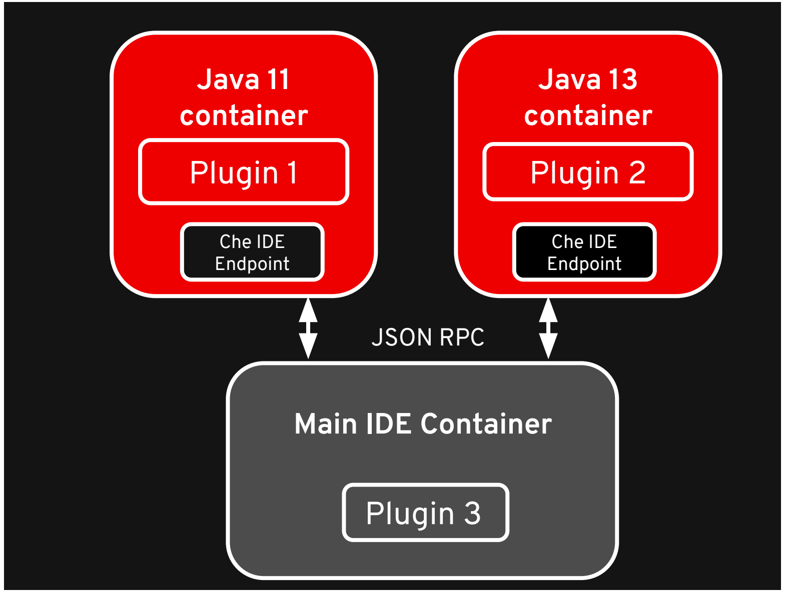
Native libraries

ECLIPSE CHE

Standalone VS Code



Eclipse Che with containers



Che Remote Theia endpoint

```
FROM eclipse/che-theia-endpoint-runtime:next
RUN apk --no-cache add openjdk11 -repository=http://dl-cdn.alpinelinux.org/alpine/edge/community
ENV JAVA_HOME /usr/lib/jvm/default-jvm/
```

```
FROM eclipse/che-theia-endpoint-runtime:next
RUN apk --no-cache add fortune
```

Che Remote Theia endpoint : some limitations

- Needs to inherit from a dedicated Docker image
- Workaround with multi-staged builds
- Strong link between Theia image and sidecar images
  - (better to use same version of theia on main theia and sidecars)

Che Remote Theia endpoint : some limitations

- Needs to inherit from a dedicated Docker image
- Workaround with multi-staged builds
- Strong link between Theia image and sidecar images
    - (better to use same version of theia on main theia and sidecars)

Upcoming Eclipse Che 7.4 : endpoint improvements

- Create a single all-in-one binary for this endpoint
    - Using nexe tool on Eclipse Che Theia remote package
- Copy this binary and run it
- Allow to use existing dockers image from docker registries

```
FROM docker.io/openjdk:14-alpine
```

- ⇒ no need to build images, use image name in plugin’s meta.yaml

Use a custom runtime for a VS Code extension : meta.yaml

```yaml
apiVersion: v2
publisher: redhat
name: vscode-xml
version: latest
type: VS Code extension
displayName: XML
title: XML Language Support by Red Hat
description: This VS Code extension provides support for creating and editing XML
  documents, based on the LSP4XML language server, running with Java.
icon: https://www.eclipse.org/che/images/logo-eclipseche.svg
repository: https://github.com/redhat-developer/vscode-xml
category: Language
firstPublicationDate: '2019-04-19'
spec:
  containers:
   - image: "docker.io/eclipse/che-remote-plugin-runner-java11:next"
     name: vscode-xml
     memoryLimit: "768Mi"
  extensions:
  - https://github.com/redhat-developer/vscode-xml/releases/download/0.7.0/vscode-xml-0.7.0-3205.vsix
```

DEMO #4

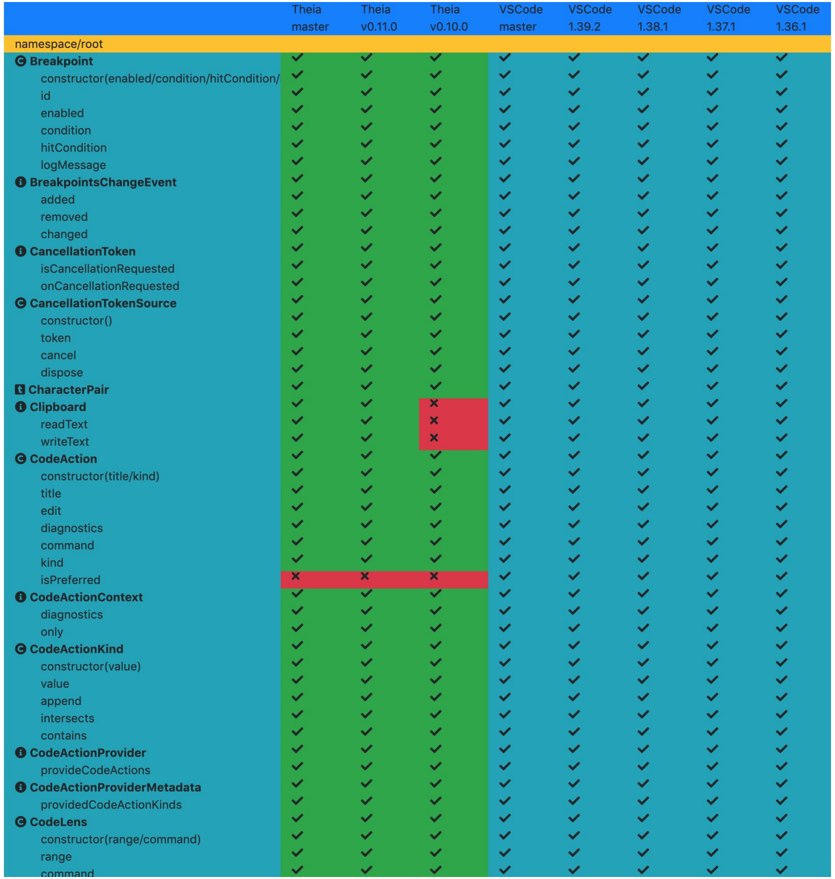
VSCode extension with custom runtime

youtube

Photo by Unsplash

Status

https://che-incubator.github.io/vscode-theia-comparator/status.html



	Theia master	Theia v0.11.0	Theia v0.10.0	VSCode master	VSCode 1.39.2	VSCode 1.38.1	VSCode 1.37.1	VSCode 1.36.1
namespace/root								
C **Breakpoint**	✓	✓	✓	✓	✓	✓	✓	✓
constructor(enabled/condition/hitCondition/	✓	✓	✓	✓	✓	✓	✓	✓
id	✓	✓	✓	✓	✓	✓	✓	✓
enabled	✓	✓	✓	✓	✓	✓	✓	✓
condition	✓	✓	✓	✓	✓	✓	✓	✓
hitCondition	✓	✓	✓	✓	✓	✓	✓	✓
logMessage	✓	✓	✓	✓	✓	✓	✓	✓
i **BreakpointsChangeEvent**	✓	✓	✓	✓	✓	✓	✓	✓
added	✓	✓	✓	✓	✓	✓	✓	✓
removed	✓	✓	✓	✓	✓	✓	✓	✓
changed	✓	✓	✓	✓	✓	✓	✓	✓
i **CancellationToken**	✓	✓	✓	✓	✓	✓	✓	✓
isCancellationRequested	✓	✓	✓	✓	✓	✓	✓	✓
onCancellationRequested	✓	✓	✓	✓	✓	✓	✓	✓
C **CancellationTokenSource**	✓	✓	✓	✓	✓	✓	✓	✓
constructor()	✓	✓	✓	✓	✓	✓	✓	✓
token	✓	✓	✓	✓	✓	✓	✓	✓
cancel	✓	✓	✓	✓	✓	✓	✓	✓
dispose	✓	✓	✓	✓	✓	✓	✓	✓
t **CharacterPair**	✓	✓	✓	✓	✓	✓	✓	✓
i **Clipboard**	✓	✓	✗	✓	✓	✓	✓	✓
readText	✓	✓	✗	✓	✓	✓	✓	✓
writeText	✓	✓	✗	✓	✓	✓	✓	✓
C **CodeAction**	✓	✓	✓	✓	✓	✓	✓	✓
constructor(title/kind)	✓	✓	✓	✓	✓	✓	✓	✓
title	✓	✓	✓	✓	✓	✓	✓	✓
edit	✓	✓	✓	✓	✓	✓	✓	✓
diagnostics	✓	✓	✓	✓	✓	✓	✓	✓
command	✓	✓	✓	✓	✓	✓	✓	✓
kind	✓	✓	✓	✓	✓	✓	✓	✓
isPreferred	✗	✗	✗	✓	✓	✓	✓	✓
i **CodeActionContext**	✓	✓	✓	✓	✓	✓	✓	✓
diagnostics	✓	✓	✓	✓	✓	✓	✓	✓
only	✓	✓	✓	✓	✓	✓	✓	✓
C **CodeActionKind**	✓	✓	✓	✓	✓	✓	✓	✓
constructor(value)	✓	✓	✓	✓	✓	✓	✓	✓
value	✓	✓	✓	✓	✓	✓	✓	✓
append	✓	✓	✓	✓	✓	✓	✓	✓
intersects	✓	✓	✓	✓	✓	✓	✓	✓
contains	✓	✓	✓	✓	✓	✓	✓	✓
i **CodeActionProvider**	✓	✓	✓	✓	✓	✓	✓	✓
provideCodeActions	✓	✓	✓	✓	✓	✓	✓	✓
i **CodeActionProviderMetadata**	✓	✓	✓	✓	✓	✓	✓	✓
providedCodeActionKinds	✓	✓	✓	✓	✓	✓	✓	✓
C **CodeLens**	✓	✓	✓	✓	✓	✓	✓	✓
constructor(range/command)	✓	✓	✓	✓	✓	✓	✓	✓
range	✓	✓	✓	✓	✓	✓	✓	✓
command	✓	✓	✓	✓	✓	✓	✓	✓

Theia-vscodecov checker

https://github.com/theia-ide/theia-vscodecov

```
$ cd my-vscode-extension
$ npx theia-vscodecov
```

Conclusion

Get started with Eclipse Che

Sources

github.com/eclipse/che

Dev List

che-dev@eclipse.org

Docs

http://eclipse.org/che/docs

Mattermost

https://mattermost.eclipse.org

Try it out : https://che.openshift.io

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