Démo – Node.js

Autoscaling App Node.js sur Openshift

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Desjardins

Coopérer pour créer l'avenir

Agenda

1. Présentation de la plateforme « Node.js »
2. Notre site web « Ma filmothèque »
3. Préparation de l'environnement OpenShift
4. Outil de charge « httperf »

1 Présentation de la plateforme « Node.js »

- Historique
  - Écrit par Ryan Dahl en 2009.
  - Il a été inspiré par une barre de progression dans un navigateur qui est déconnecté du serveur.
  - Projet « open source » et multiplateforme.

- Caractéristiques
  - C'est un « JavaScript runtime » s'appuyant sur l'engin « Chrome's V8 JavaScript ».
  - Modèle « I/O non-blocking ».
  - Architecture évènementielle (Event-driven).
  - Un des plus gros écosystèmes de librairie « open source » avec « NPM ».
    - Plusieurs frameworks dont Express, React, Angular, Meteor.

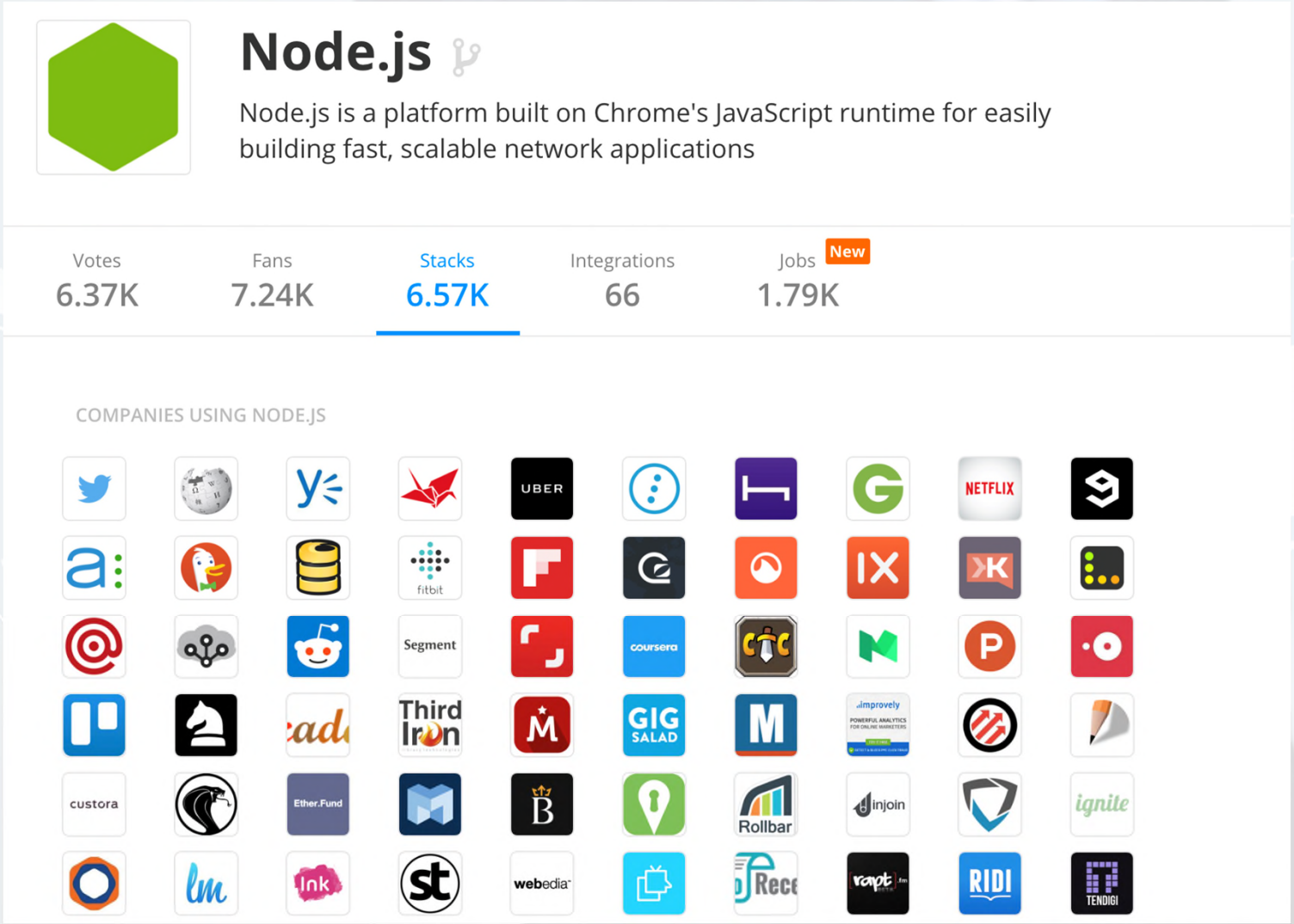
- Applications écrites en JavaScript sous Node.js (https://electron.atom.io/apps/)
  - Microsoft Visual Studio Code.
  - Atom A hackable text editor.
  - GitHub Desktop.

- Plus de 1400 contributeurs au projet, dont plusieurs compagnies.

- Stack MEAN (MongoDB Express Angular Node.js)

1 Les utilisateurs de Node.js

- Voir la stack des autres compagnies (https://stackshare.io/)

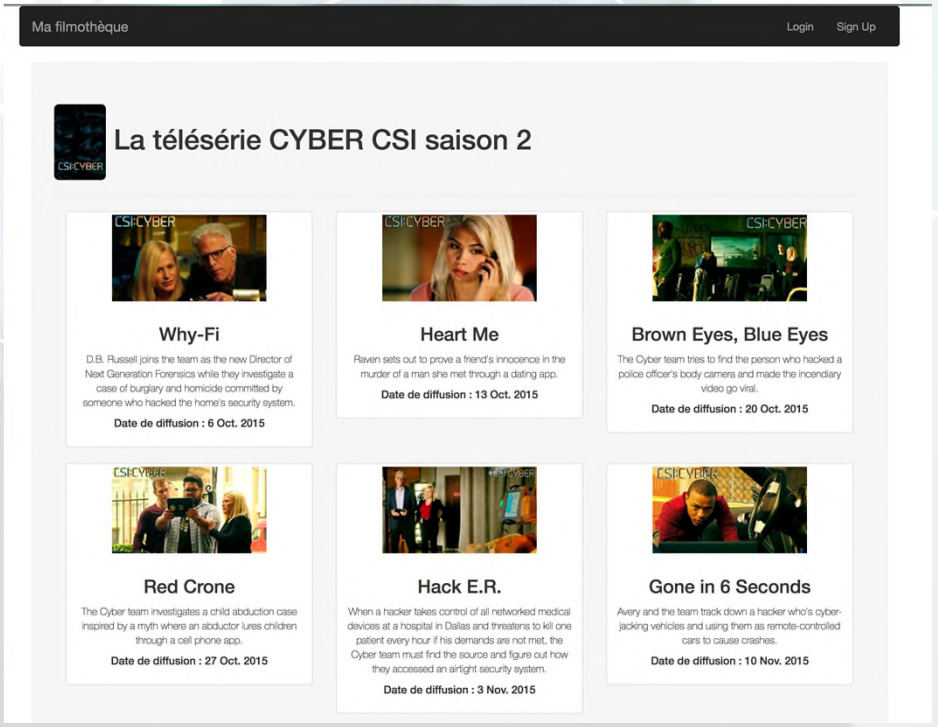


2 Notre site web « Ma filmothèque »

- Site Web sous Node.js.
  - Sources sur Github : https://github.com/sylvoie/testoc.git
- Déploiement et recréation de l'environnement :
  - Selon le fichier configuration « package.json »
  - Exécute commande « npm install »
    - Installation « dependencies »
    - Création répertoire « node_modules »
  - Exécute « start »: « node app.js »
- Framework :
  - Bootstrap
  - Express
  - Embedded JavaScript templates (EJS)
- Résultat de l'application
  - Un page Web
  - 28 requêtes HTTP
    - Dont 19 images
  - Poids 496.8 KB

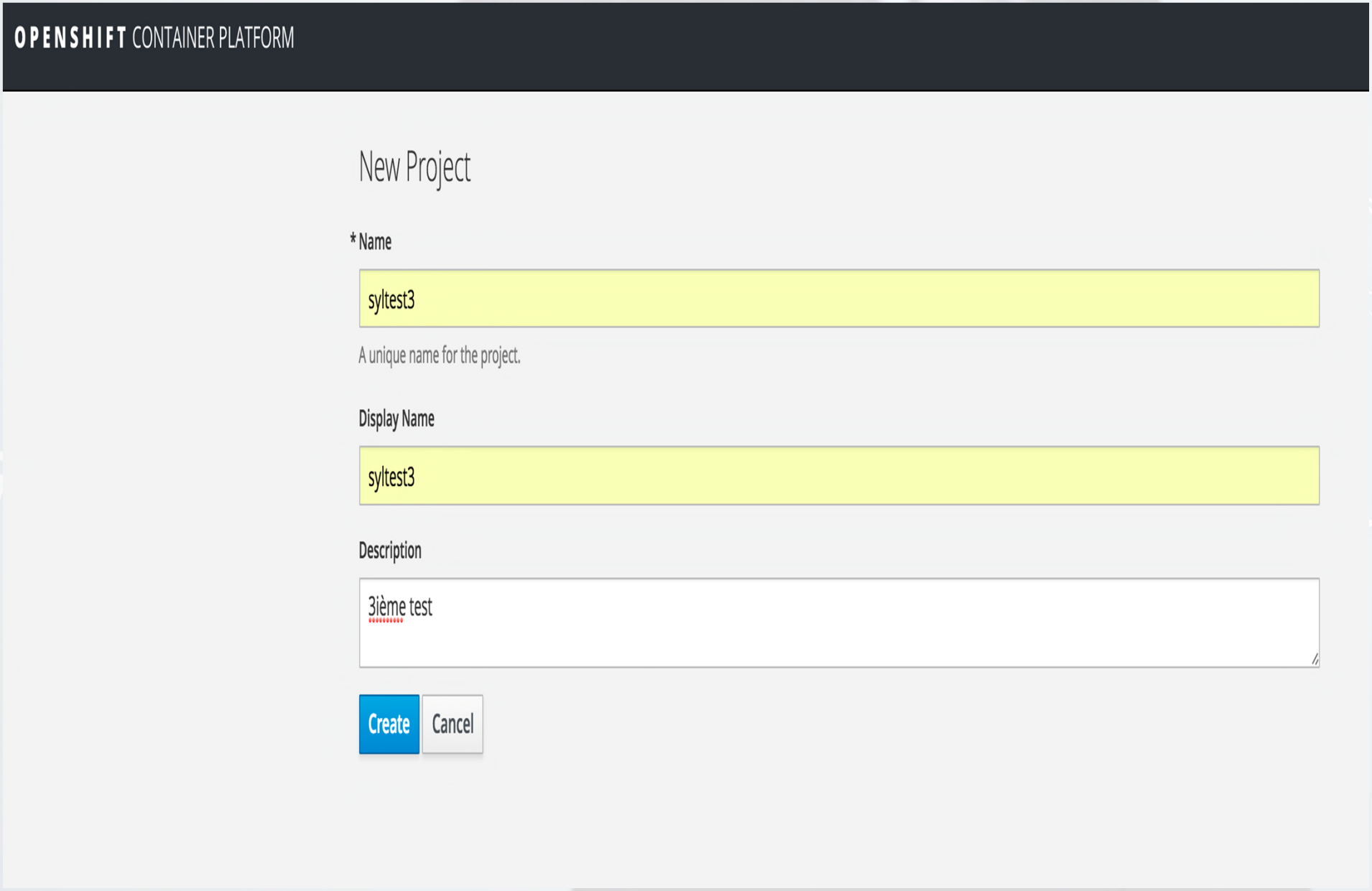
```
{
  "name": "testoc",
  "version": "1.0.0",
  "description": "Site Web pour test de charge dans OpenShift",
  "main": "app.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1",
    "start": "node app.js"
  },
  "author": "Sylvain Lavoie",
  "license": "ISC",
  "dependencies": {
    "ejs": "^2.4.1",
    "express": "^4.13.4",
    "request": "^2.72.0"
  }
}
```

package.json

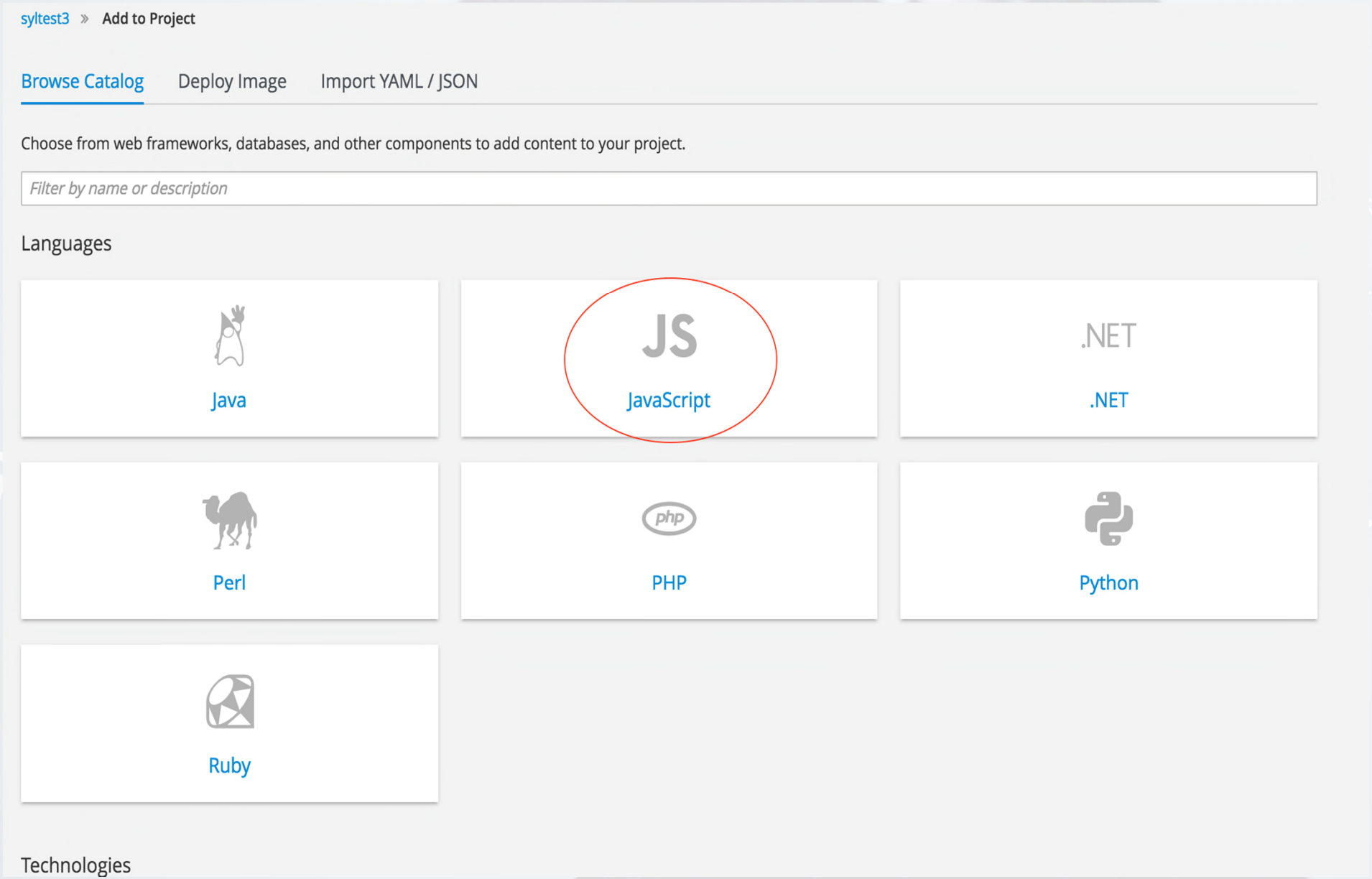


Hands-on OpenShift

3 Création de notre projet



3 Choix d'un langage dans le catalogue



3 Précision du langage

syltest3 » Add to Project » Catalog » JavaScript

JavaScript

Filter by name or description

Node.js

BUILDS SOURCE CODE

Build and run Node.js 4 applications on RHEL 7. For more information about using this builder image, including OpenShift considerations, see https://github.com/sclorg/s2i-nodejs-container/blob/master/...

Version

4 — latest

Select

Node.js + MongoDB (Persistent)

nodejs-mongo-persistent

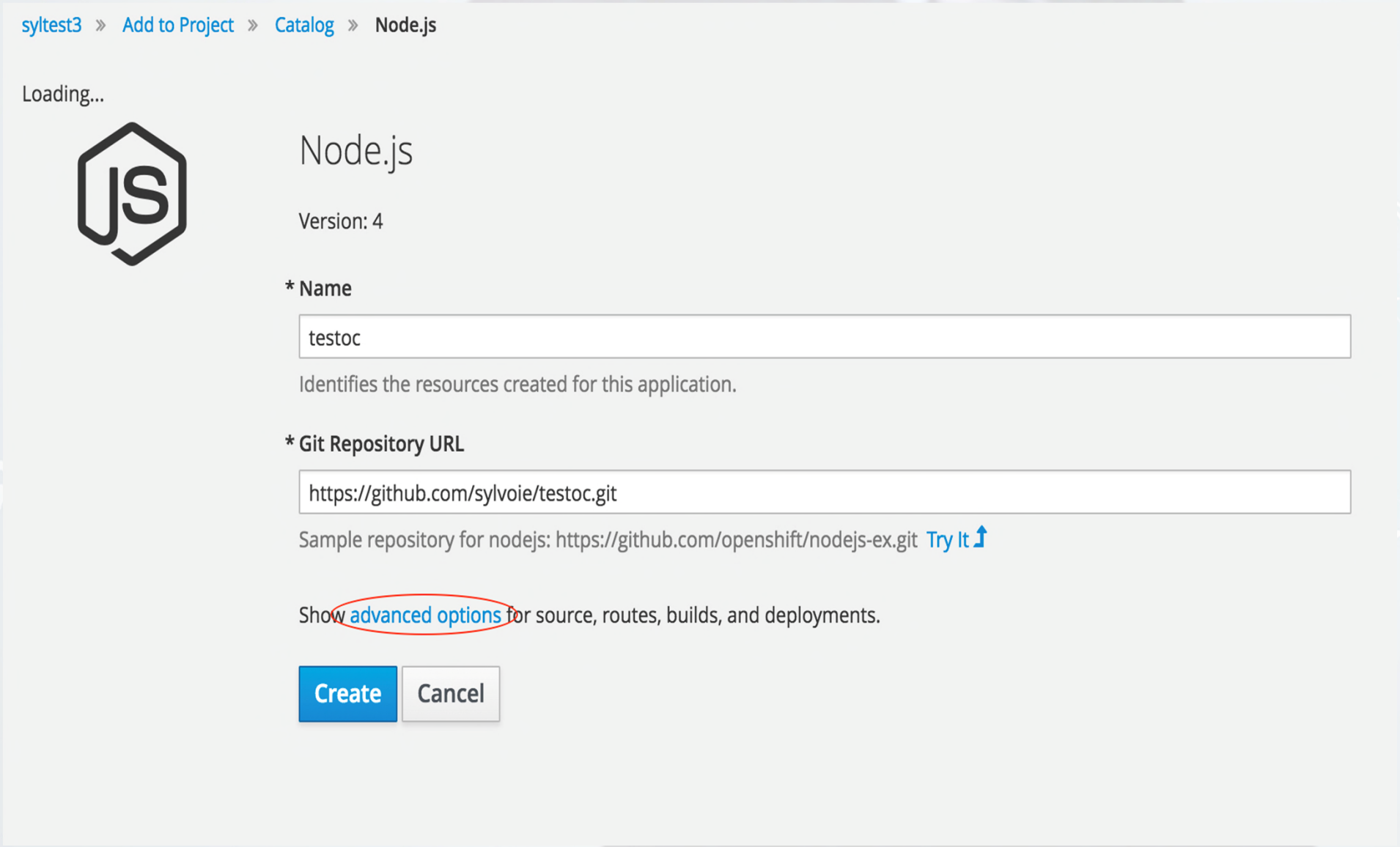
Select

Node.js + MongoDB (Ephemeral)

nodejs-mongodb-example

Select

3 Identifier notre projet et la source de note app



- https://github.com/sylvoie/testoc.git

3 Paramètre de route pour rejoindre notre site web

3 Paramètre de déploiement et construction

Build Configuration

About Build Configuration

- [x] Configure a webhook build trigger
- [x] Automatically build a new image when the builder image changes
- [x] Launch the first build when the build configuration is created

Environment Variables (Build and Runtime)

name | *value*

Add Environment Variable

Deployment Configuration

About Deployment Configuration

Autodeploy when

- [x] New image is available
- [x] Deployment configuration changes

Environment Variables (Runtime only)

Show Image Environment Variables

name | *value*

Add Environment Variable

3 Paramètres d'élasticité

Scaling

About Scaling

Strategy

Automatic

Scale replicas manually or automatically based on CPU usage.

Learn More

Min Pods

1

The lower limit for the number of pods that can be set by the autoscaler. If not specified, defaults to 1.

*** Max Pods**

4

The upper limit for the number of pods that can be set by the autoscaler.

CPU Request Target

80 %

The percentage of the CPU request that each pod should ideally be using. Pods will be added or removed periodically when CPU usage exceeds or drops below this target value. Defaults to 80%.

Learn More

You should configure resource limits below for autoscaling. Autoscaling will not work without a CPU request.

3 Ajout d'une limitation des ressources CPU et RAM

Resource Limits

About Resource Limits

CPU

Request

250 millicores

The minimum amount of CPU the container is guaranteed.

Limit

500 millicores

The maximum amount of CPU the container is allowed to use when running.

What are millicores?

Memory

Request

256 MiB

The minimum amount of memory the container is guaranteed.

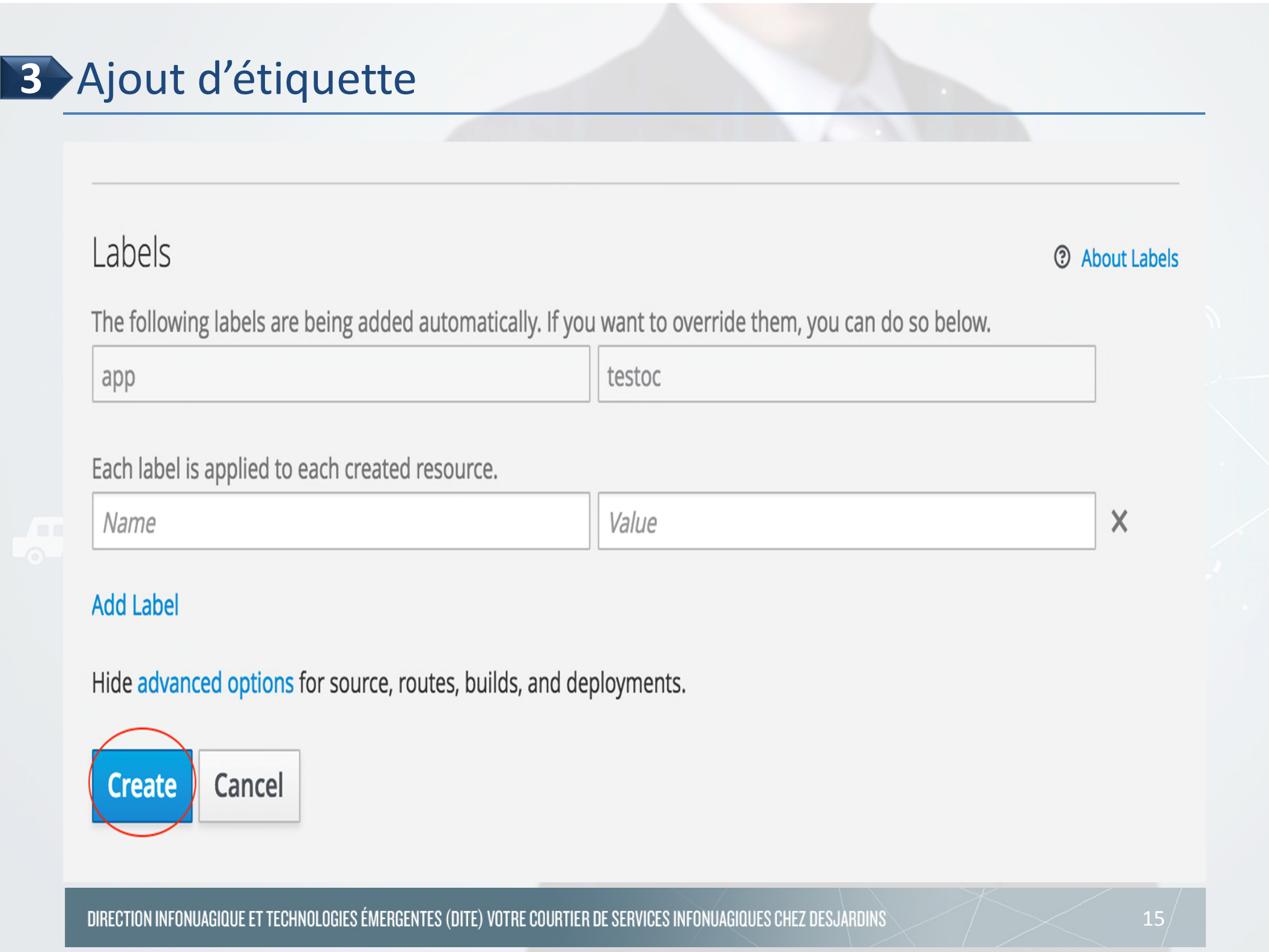
Limit

512 MiB

The maximum amount of memory the container is allowed to use when running.

What are MiB?

3 Ajout d'étiquette



3 Votre projet est complété

syltest3 » Add to Project » Node.js » Next Steps

Application created. Continue to overview.

Manage your app

The web console is convenient, but if you need deeper control you may want to try our command line tools.

Command line tools

Download and install the `oc` command line tool. After that, you can start by logging in, switching to this particular project, and displaying an overview of it, by doing:

```
oc login https://openshift-master.ose3sandbox.com
oc project syltest3
oc status
```

For more information about the command line tools, check the CLI Reference and Basic CLI Operations.

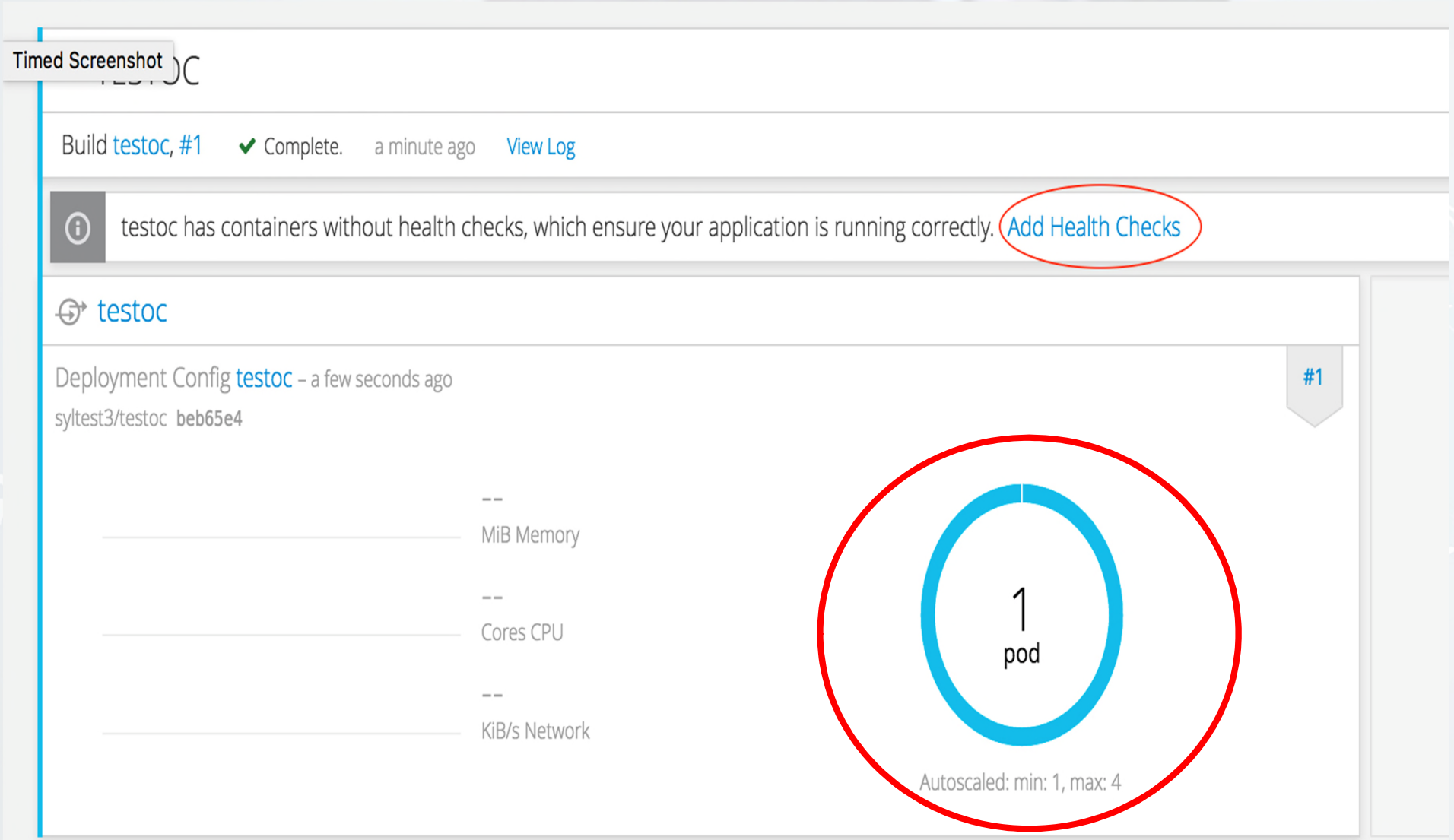
Making code changes

A GitHub webhook trigger has been created for the **testoc** build config.

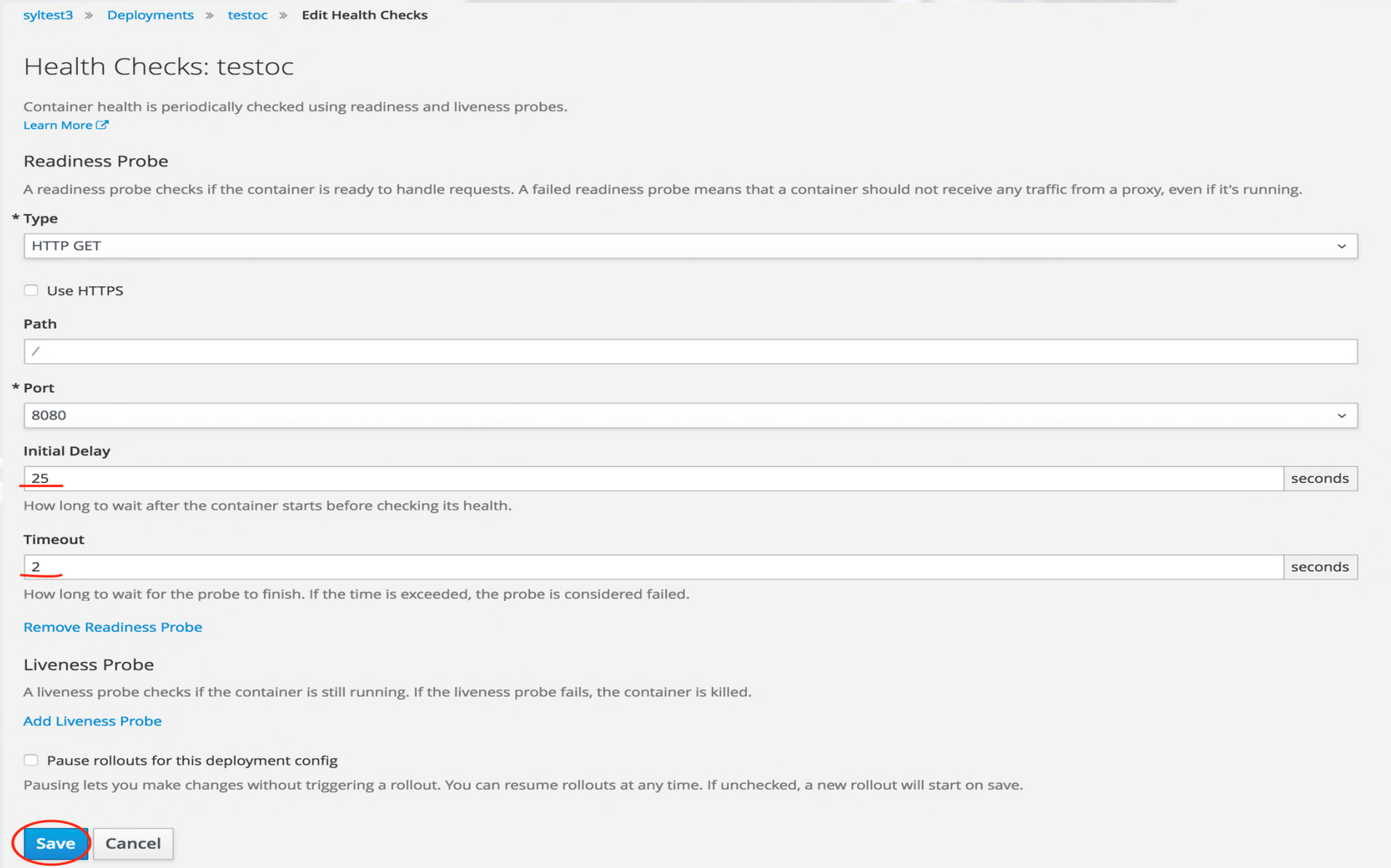
You can now set up the webhook in the GitHub repository settings if you own it, in https://github.com/sylvoie/testoc/settings/hooks, using the following payload URL:

https://openshift-master.ose3sandbox.com

3 Ajout d'un moniteur de santé



3 Ajout d'un moniteur de santé



4 Utilisation de HTTPERF (Invocation)

- Projet « open source » à l'origine développé par HP.
- Outil CLI pour mesurer la performance d'un serveur Web en générant de la charge.
- Sources sur Github : https://github.com/httperf/httperf

- Pour l'invoquer :
  - httperf --server lesite --port 80 --num-conns 1000 --num-cal 100 --timeout 1 --hog --rate 100

Options	Description
--num-conn 3000	instructs httperf to make 3000 connections.
--num-cal 100	instructs httperf to issue 100 requests per connection.
--rate 200	specifies how many new connections are made every second, 200 in our case.
--timeout 1	instructs httperf to report as errors any requests that aren't answered within X seconds.
--client=x/2	Specifies that the machine httperf is running on is client I out of a total of N clients.

- Pour une description des autres options, voir le man httperf.

- Autre outil « open source » : AB (Apache HTTP server benchmarking tool)
  - ab -k -n 1000 -c 10 -s 1 testoc-syltest2.apps.ose3sandbox.com/
  - man ab

4 Utilisation de HTTPERF (Résultat)

```
[sylvoie@centaure ~]$ httperf --server testoc-syltest2.apps.ose3sandbox.com --port 80 --num-conns 1000
--num-cal 100 --timeout 5 --hog --rate 100
httperf --hog --timeout=5 --client=0/1 --server=testoc-syltest2.apps.ose3sandbox.com --port=80 --uri=/
--rate=100 --send-buffer=4096 --recv-buffer=16384 --num-conns=1000 --num-calls=100
httperf: warning: open file limit > FD_SETSIZE; limiting max. # of open files to FD_SETSIZE
Maximum connect burst length: 1

Total: connections 1000 requests 86448 replies 86238 test-duration 50.064 s

Connection rate: 20.0 conn/s (50.1 ms/conn, <=997 concurrent connections)
Connection time [ms]: min 5785.6 avg 34490.5 max 46530.2 median 37936.5 stddev 9537.4
Connection time [ms]: connect 285.4
Connection length [replies/conn]: 86.584

Request rate: 1726.7 req/s (0.6 ms/req)
Request size [B]: 89.0

Reply rate [replies/s]: min 1491.5 avg 1724.8 max 1863.5 stddev 108.0 (10 samples)
Reply time [ms]: response 182.5 transfer 200.3
Reply size [B]: header 307.0 content 14082.0 footer 0.0 (total 14389.0)
Reply status: 1xx=0 2xx=86238 3xx=0 4xx=0 5xx=0

CPU time [s]: user 1.11 system 48.95 (user 2.2% system 97.8% total 100.0%)
Net I/O: 24355.0 KB/s (199.5*10^6 bps)

Errors: total 210 client-timo 210 socket-timo 0 connrefused 0 connreset 0
Errors: fd-unavail 0 addrunavail 0 ftab-full 0 other 0
```

- **Pour l'interprétation du résultat, voir : https://github.com/httperf/httperf**

4 Utilisation de HTTPERF

```
Connection rate: 43.2 conn/s (23.2 ms/conn, <=927 concurrent connections)
Connection time [ms]: min 288.2 avg 21263.0 max 62833.9 median 5106.5 stddev 24294.0
Connection time [ms]: connect 2.0
Connection length [replies/conn]: 27.246

Request rate: 844.1 req/s (1.2 ms/req)
Request size [B]: 89.0

Reply rate [replies/s]: min 639.5 avg 798.4 max 893.1 stddev 76.1 (13 samples)
Reply time [ms]: response 756.0 transfer 0.3
Reply size [B]: header 307.0 content 14082.0 footer 0.0 (total 14389.0)
Reply status: 1xx=0 2xx=55663 3xx=0 4xx=0 5xx=0

CPU time [s]: user 0.62 system 67.46 (user 0.9% system 97.1% total 98.0%)
Net I/O: 11333.6 KB/s (92.8*10^6 bps)

Errors: total 3000 client-timo 2295 socket-timo 0 connrefused 0 connreset 705
Errors: fd-unavail 0 addrunavail 0 ftab-full 0 other 0

================================================================== TEST FINI =====

sh-4.2# ./testoc.sh

================================================================== TEST DEBUTE ===

httperf --hog --timeout=1 --client=0/1 --server=testoc-syltest3.apps.ose3sandbox.com --port=80 --uri=/ --rate=200 --send-buffer=4096 --recv-buffer=16384 --num-conns=3000 --num-calls=100
httperf: warning: open file limit > FD_SETSIZE; limiting max. # of open files to FD_SETSIZE
Maximum connect burst length: 15

Total: connections 1299 requests 104037 replies 103741 test-duration 42.109 s

Connection rate: 30.8 conn/s (32.4 ms/conn, <=1022 concurrent connections)
Connection time [ms]: min 277.5 avg 28245.7 max 38139.0 median 35890.5 stddev 14168.2
Connection time [ms]: connect 2.6
Connection length [replies/conn]: 80.047

Request rate: 2470.7 req/s (0.4 ms/req)
Request size [B]: 89.0

Reply rate [replies/s]: min 2018.4 avg 2461.9 max 2647.2 stddev 199.8 (8 samples)
Reply time [ms]: response 351.7 transfer 0.6
Reply size [B]: header 307.0 content 14082.0 footer 0.0 (total 14389.0)
Reply status: 1xx=0 2xx=103741 3xx=0 4xx=0 5xx=0

CPU time [s]: user 0.70 system 37.64 (user 1.7% system 89.4% total 91.0%)
Net I/O: 34833.2 KB/s (285.4*10^6 bps)

Errors: total 2000 client-timo 50 socket-timo 0 connrefused 0 connreset 249
Errors: fd-unavail 1701 addrunavail 0 ftab-full 0 other 0

================================================================== TEST FINI =====

sh-4.2# ./testoc.sh

================================================================== TEST DEBUTE ===

httperf --hog --timeout=1 --client=0/1 --server=testoc-syltest3.apps.ose3sandbox.com --port=80 --uri=/ --rate=200 --send-buffer=4096 --recv-buffer=16384 --num-conns=3000 --num-calls=100
httperf: warning: open file limit > FD_SETSIZE; limiting max. # of open files to FD_SETSIZE
```

Période de questions

Pour toutes questions veuillez écrire à :

sylvoie@gmail.com