



Review Open Call 5 Stress-Test asvin.io

Rohit Bohara

asvin.io

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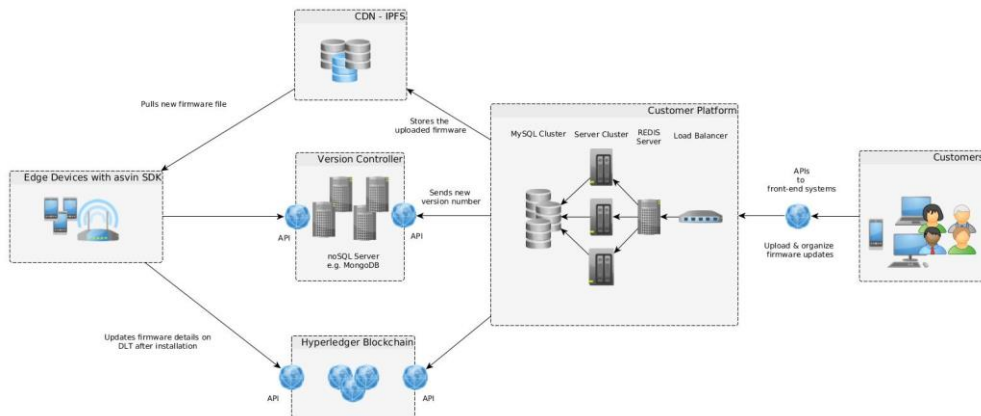


asvin.io

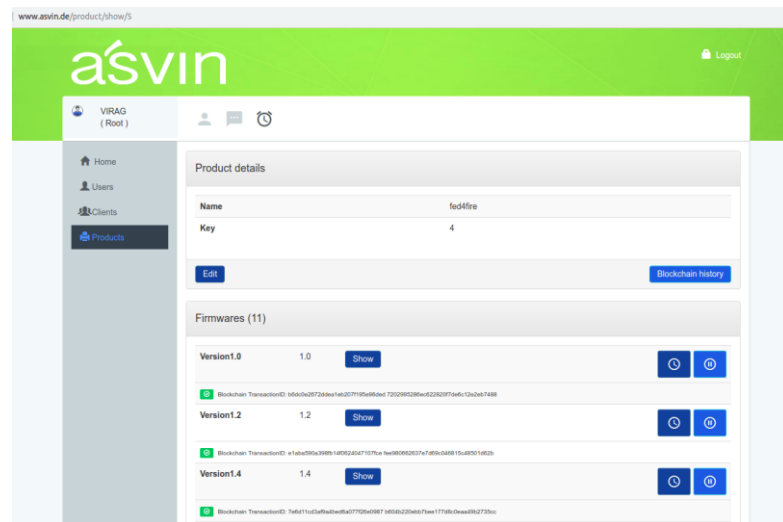
HEALING THE INTERNET OF THINGS

Concept

Architecture



Front end



www.asvin.de/product/show/5

asvin

Logout

VIRAG (Root)

- Home
- Users
- Clients
- Products

Product details

Name	fed4fire
Key	4

[Edit](#) [Blockchain history](#)

Firmwares (11)

Version 1.0	1.0	Show	⏪	⏩
Blockchain TransactionID: 3f6a3a2872a5a7e4207115e969e4720299528e422323754613a2e7488				
Version 1.2	1.2	Show	⏪	⏩
Blockchain TransactionID: e14e4255a295b14282d2c47107ba7e480928271749348815a48214623				
Version 1.4	1.4	Show	⏪	⏩
Blockchain TransactionID: 7e6f115d3f8a8a8a077026d987165482204687e4e1771860eaa892723e				

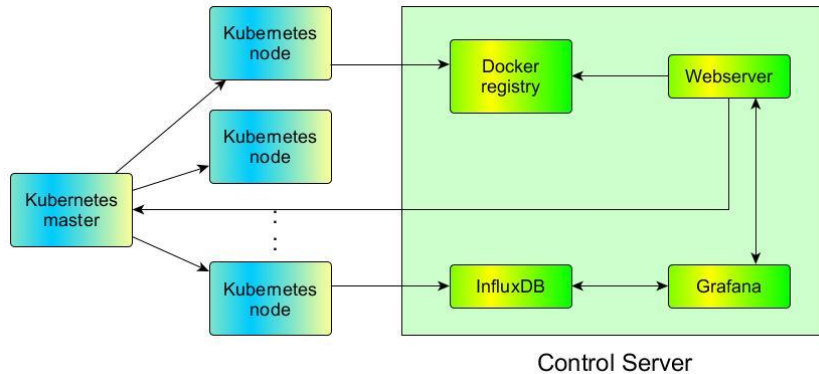
- Controlled validation of asvin.io architecture
- Assessment of scalability and resilience
- Monitor effects of network latency and bandwidth
- Gather network logs and induce insights
- Authenticate reliability of the architecture
- Configure server parameters by iterative experiments

Objectives

Background & Motivation

- Gain practical knowledge of the architecture
- Stress-test asvin.io for a market fit solution
- Proof of scalability
- Verification and validation of the architecture
- Physical experimentation not plausible
- Fed4Fire+ experiments are cost effective
- Large computing experiment are possible on Fed4FIRE+ testbeds

Experiment Setup



FEATURES

- Kubernetes cluster of 100 nodes
- Control server to build and deploy docker images
- Grafana to visualize analytics
- InfluxDB to store time series

Results



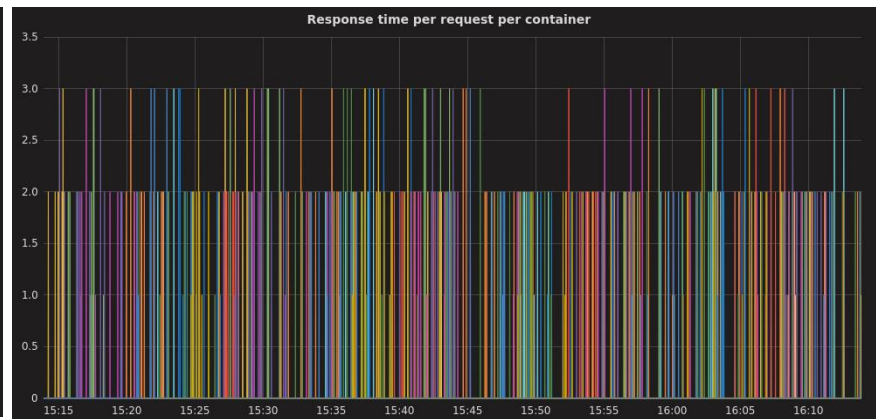
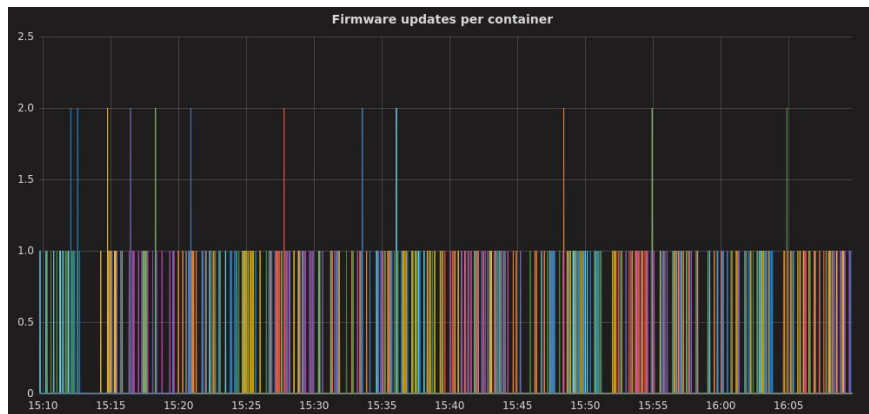
- Response time reduced by optimizing server parameters
- Authentic proof of scalability
 - Effortlessly upscale devices to 10,100, 1000x
- Architecture is robust and reliable
 - Requests from 10,000 devices handled smoothly
- Verification of life cycle of an IoT device on asvin.io
 - Registration -> Firmware updates -> Cancellation
- asvin.io is adaptable to network latency and bandwidth limitation

Analytics



FIRMWARE UPDATE

RESPONSE TIME



- asvin.io platform is robust and scalable
- Performance can be improved
- Fed4FIRE+ platform is convenient to use
- Fed4FIRE+ experiments can be tailored for specific needs
- Ample technical support and documentation available
- Fed4FIRE+ is best suitable for stress testing
- Diversified resources are available on Fed4FIRE+ testbeds

Lessons Learned

Business Impact

- Practical proof gives edge over competitors
- Improved performance
- Cost effective
- Positive response from customers
- Expanded customer base
- Seal of verifiability from EU sponsored project

- Enormous data is generated from experiments
- asvin.io has authentic proof of its claims
- Fed4FIRE+ experiments gave practical knowledge
- Cement confidence in architecture to fulfil growing market needs
- Fed4FIRE+ experiments reinforced trust in our solution
- Acquired new skills, e.g. Kubernetes

How did it help?

Value Perceived

- Increased knowledge about the architecture
- Practical experience
- Proof of scalability and resilience
- Acquired new competence
- Confidence to run experiments on Fed4FIRE+ in future
- Edge over competitors

- Open, reliable and highly accessible
- Credibility of European Union
- Diversity of available resources
- Simple, efficient and cost effective experimental process
- Excellent technical support and documentation
- Combining infrastructures
- Cost effective

Why Fed4FIRE+?

Resources and Tools

JFED

A screenshot of the jFed Login web application. The window title is "jFed login". The page features the jFed logo (a stylized human figure) and the text "jFed Login". Below this, there is a "User certificate:" field containing "<CACHED LOGIN>" and a "Browse ..." button. Underneath, the following information is displayed: "Username: asvin", "Authority: imec Virtual Wall 2", and "Cert expires: 2021-11-01" with a green checkmark. A "Password:" field is shown with a masked password of 15 dots. A "Login" button with a right-pointing arrow is located below the password field. A note below the login button reads "Enter the password associated with the certificate". At the bottom of the page, there are three buttons: "Connectivity Tester" (with a globe icon), "Advanced login" (with a gear icon), and "Reset jFed" (with a warning triangle icon).

USAGE

- Provision and manage experiment on testbeds
- RSpec
 - Network and resource configuration
- ESpec
 - Bootstrap an experiment
- Testbed
 - Virtual Wall 1

Resources and Tools

GENERATE ESPEC

```
rohit$ python generate-espec/main.py --help
usage: main.py [-h] [--nodes [NODES]] [--no-control-server] [--gateway]
              [--wall {wall1,wall2}]

Generate espec for kubernetes

optional arguments:
  -h, --help            show this help message and exit
  --nodes [NODES]       amount of nodes in the generated espec, not including
                        the master node
  --no-control-server   Do not include the code to provision and setup a
                        control server with influx, grafana, private docker
                        registry and control website
  --gateway             add a gateway + apache server for delay testing
  --wall {wall1,wall2} Target Virtual Wall, defaults to wall2
rohit$ python generate-espec/main.py --wall wall1 --nodes 100
```

USAGE

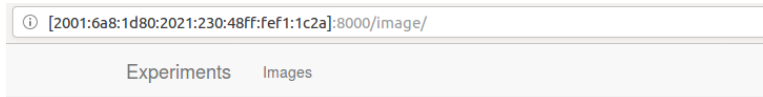
- Tool written in python
- Generate ESPEC for Virtual Wall1 and Wall2
- Easy to create and deploy Kubernetes cluster on testbeds

<https://github.ugent.be/jlemaes/generate-espec>

Experiment Setup

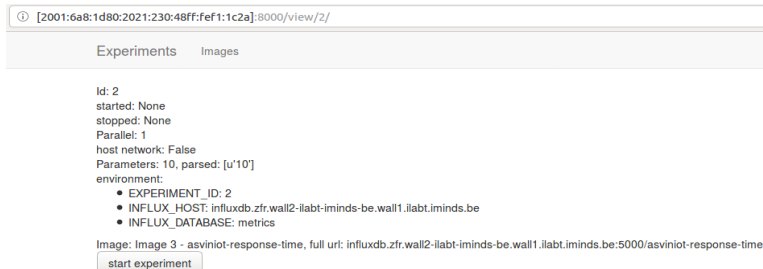


CONTROL SERVER



Images

- id: 1, tag: asviniot7, tarfile: [Download tarfile](#), build_started: True, build: True
- id: 2, tag: asvincurl, tarfile: [Download tarfile](#), build_started: True, build: True
- id: 3, tag: asviniot-response-time, tarfile: [Download tarfile](#), build_started: True, build: True
- id: 4, tag: asvin-firmware-update, tarfile: [Download tarfile](#), build_started: True, build: True
- id: 5, tag: asvin-performance, tarfile: [Download tarfile](#), build_started: True, build: True
- id: 6, tag: asvin-latency, tarfile: [Download tarfile](#), build_started: True, build: True
- id: 7, tag: asvin-latency-increase, tarfile: [Download tarfile](#), build_started: True, build: True
- id: 8, tag: asvin-bandwidth, tarfile: [Download tarfile](#), build_started: True, build: True
- id: 9, tag: asvin-blockchain-block, tarfile: [Download tarfile](#), build_started: True, build: True



USAGE

- Build and deploy docker images.
- Start and control an experiment on cluster
- Scale containers on the cluster
- Utilize InfluxDB and Grafana for visualization



- User friendly interface of jFed experimenter
- Around the clock technical support
- Abundant nodes on testbeds, Wall1 206 and Wall2 159
- High speed internet connectivity on testbeds
- Network impairment e.g. delay, packet loss and bandwidth limitation possible
- Multiple OS are supported

Added Values



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**THANK YOU FOR
YOUR ATTENTION**

WWW.FED4FIRE.EU