

```
<!DOCTYPE html>  
<html><head><title>
```

Web- UI development for SAFER

```
</title></head>  
<body>
```

Akash Gupta
Openlab Summer Student
(Computer Security Team)

```
</body>  
</html>
```



Presentation Outline

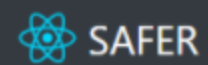
- ▶ What is SAFER?
- ▶ How does SAFER works?
- ▶ Web - UI
- ▶ Problems Faced
- ▶ Future Work
- ▶ The Team



SAFER

Welcome to SAFER - The CERN IoT Security Framework

This portal is designed to inform to you about the computer-security risk level of a large variety of IoT devices. For every device in our database, we provide information concerning vulnerabilities and assess the overall device risk.



Log Out

Scan a device / subnet

You can directly scan a device or a subnet on the CERN network. Once the scan is completed, you get notified by email. At that point, you can review the risk assessment of the discovered device.

Scan for:

- IP Address / Hostname
- Subnet

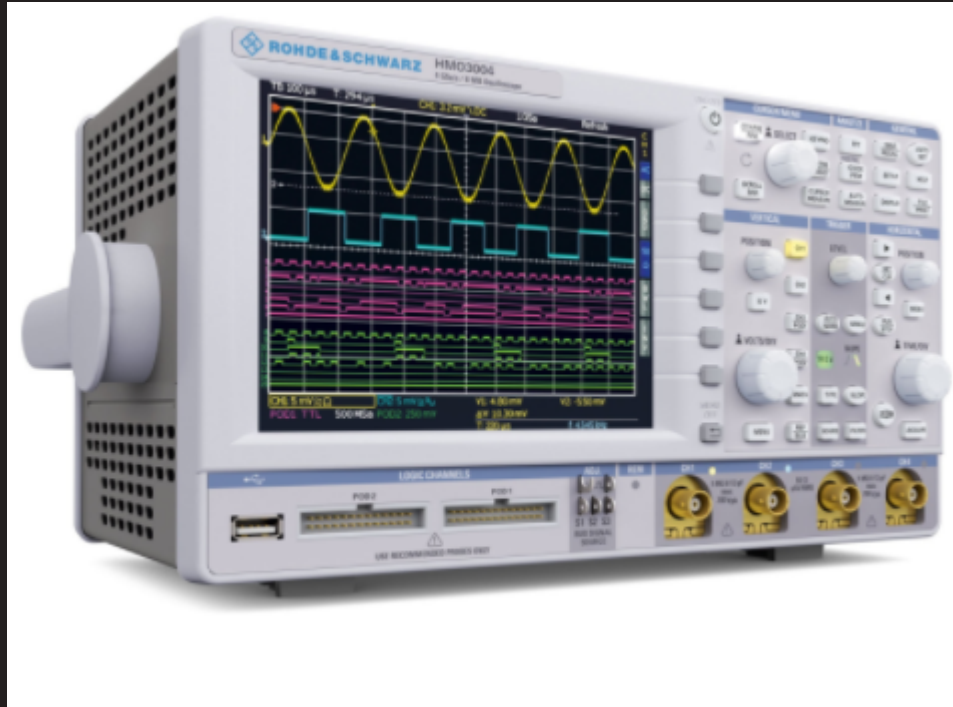


What is SAFER?

- **SAFER:-** Security **A**ssessment **F**ramework for **E**mbedded-device **R**isks.
- A Computer Security framework designed to assess the risks of heterogeneous IoT devices.
- Works on all the IoT devices at CERN, non - intrusively.



Did You Know?



~1000

IoT devices in
General - Purpose
Network at CERN.



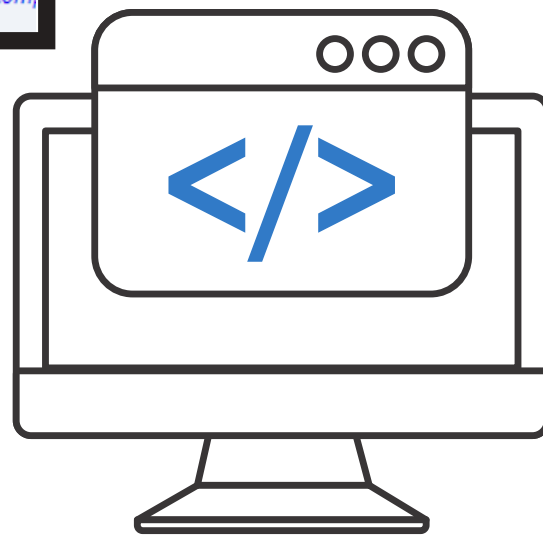
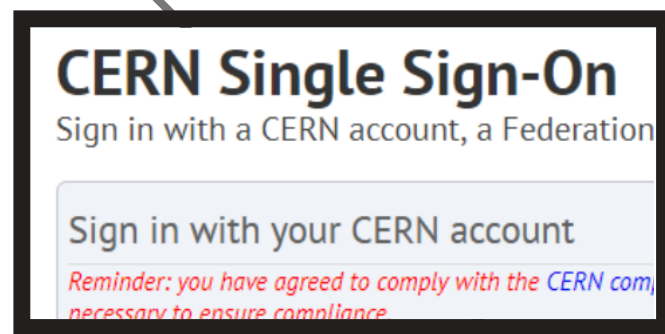
So, how does *SAFER* work?



1. User logs in to SAFER

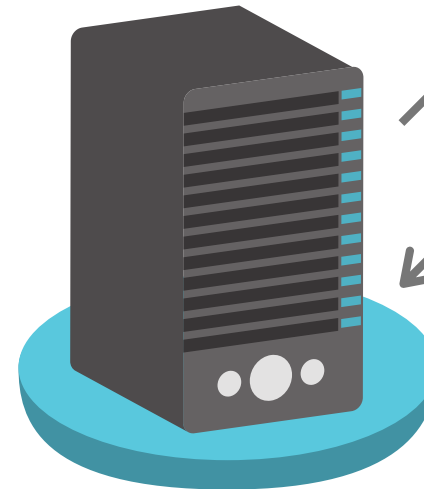


Client



SAFER Web - UI

+



Web Server



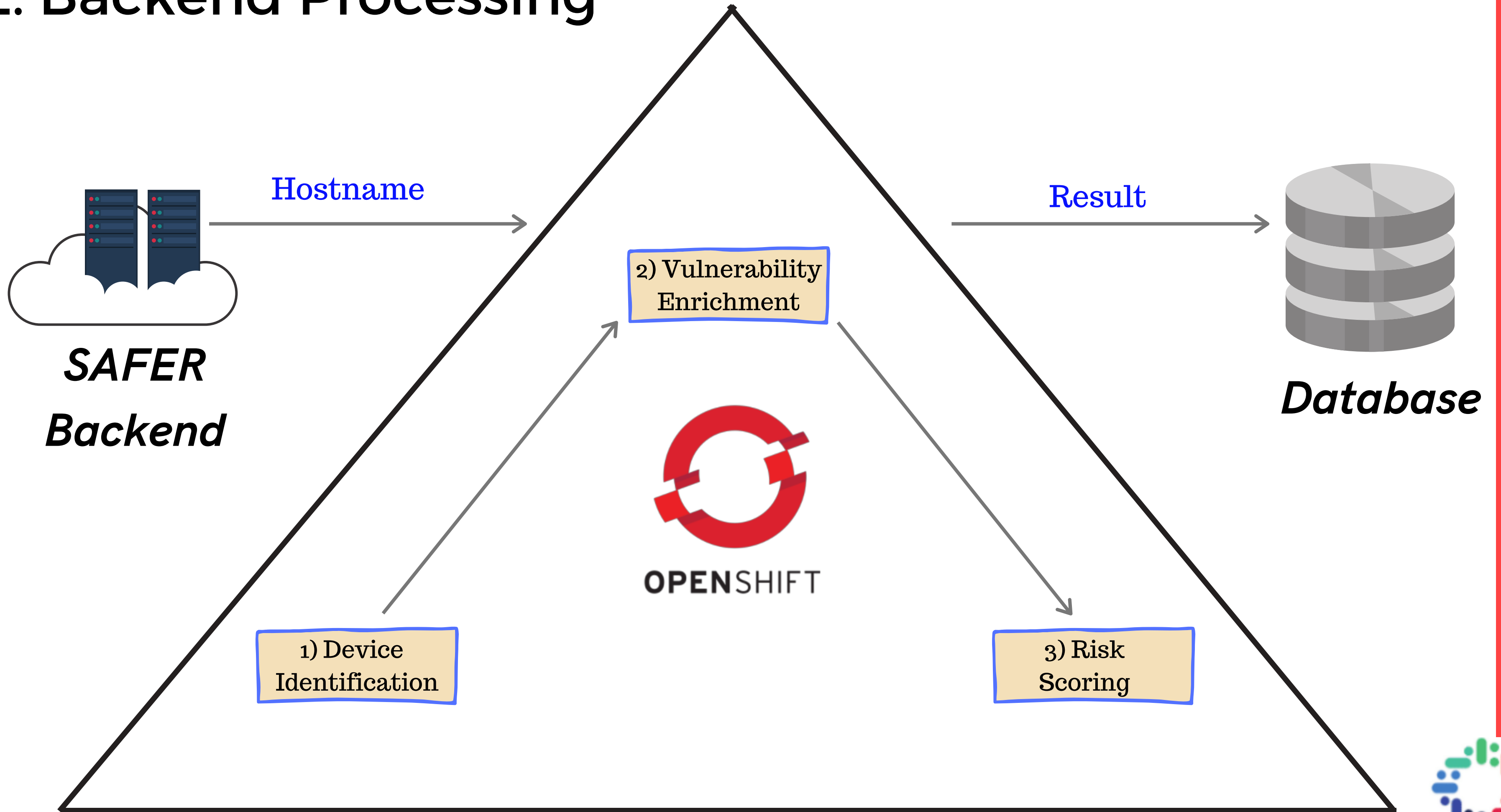
SAFER Backend

Hostname

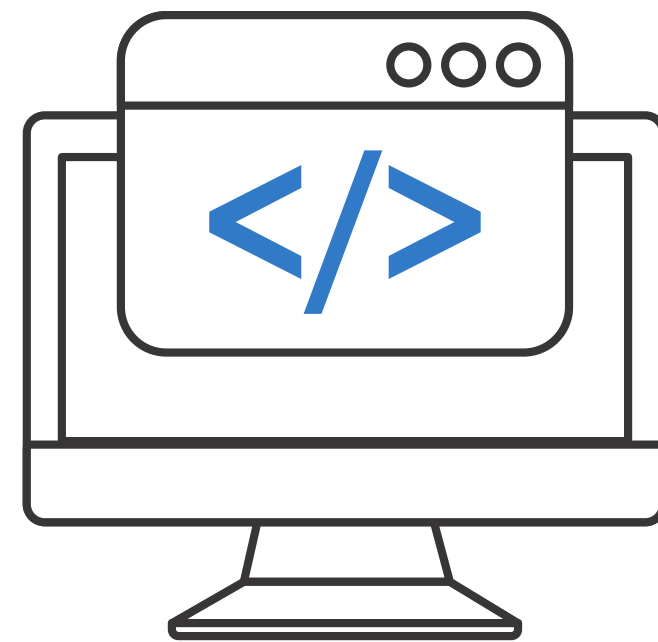
Scan Key



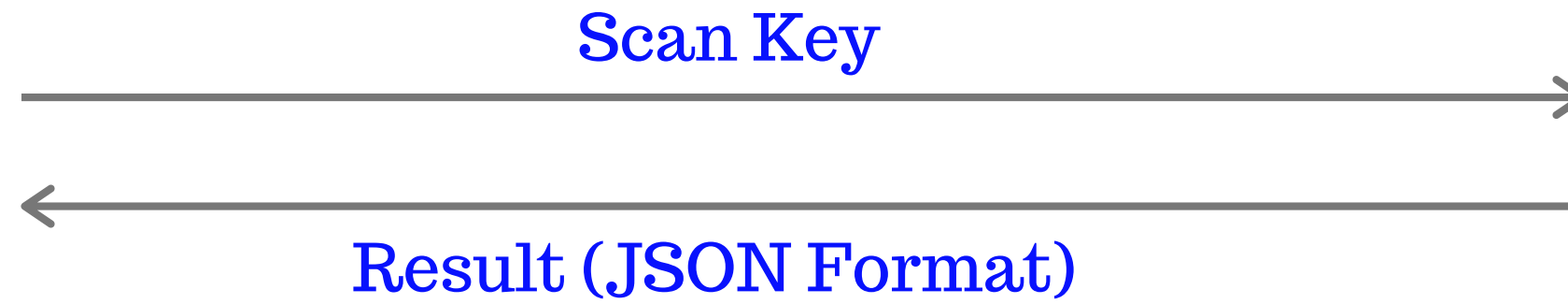
2. Backend Processing



3. Getting Results



SAFER Web - UI



Database



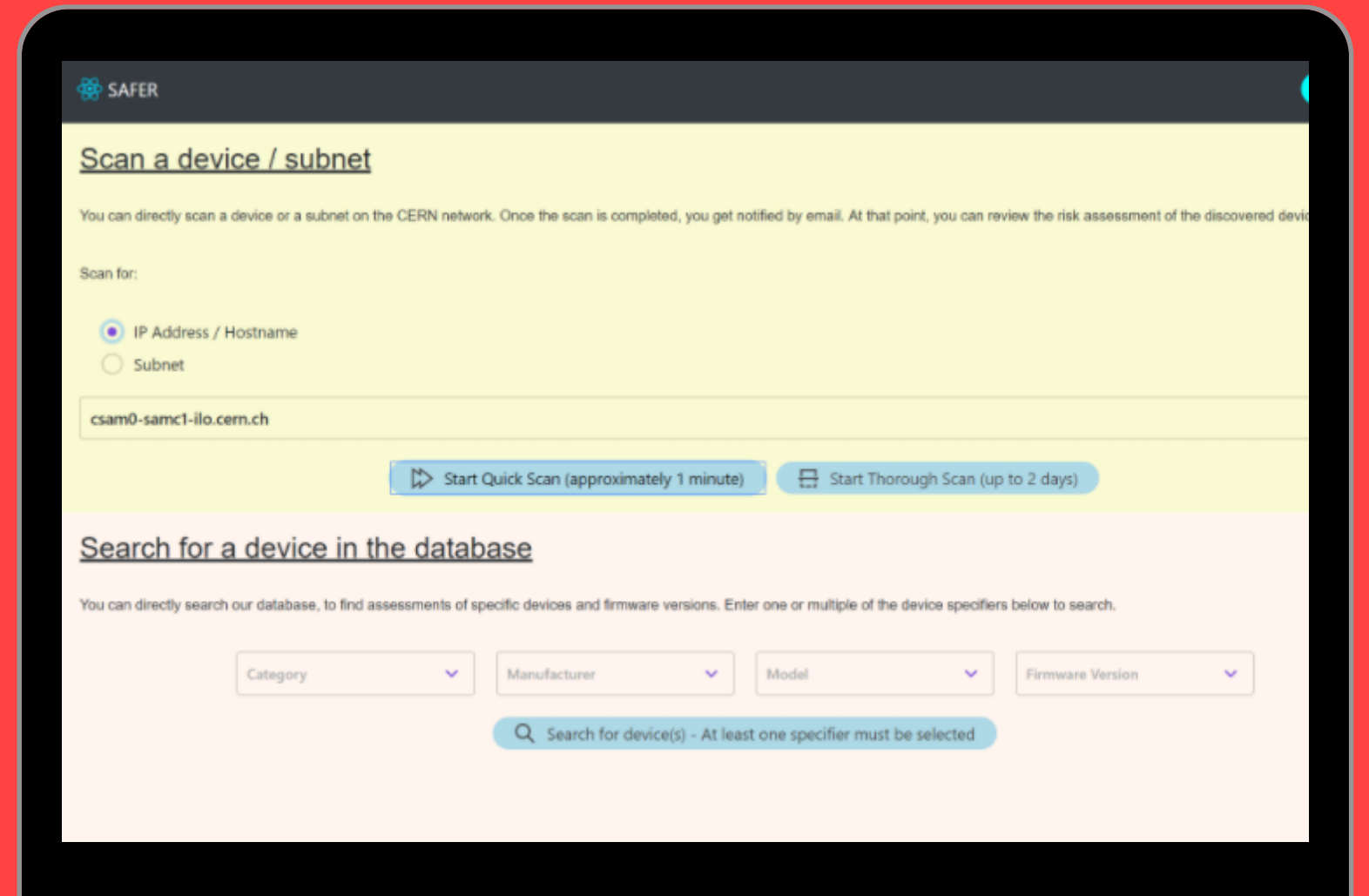
Web - UI



Making a Request

```
curl https://*****.web.cern.ch/initial_request_akash -X POST -H  
"Content-Type:application/json"--  
data '{"request_type":"o","ip":"IOT.CERN.CH","username":"","password":""  
'
```

How it used
to be



The screenshot shows the SAFER web interface. At the top, it says "SAFER". Below that is the heading "Scan a device / subnet". A sub-heading reads: "You can directly scan a device or a subnet on the CERN network. Once the scan is completed, you get notified by email. At that point, you can review the risk assessment of the discovered device." Under "Scan for:", there are two radio buttons: "IP Address / Hostname" (selected) and "Subnet". Below this is a text input field containing "csam0-samc1-ilo.cern.ch". There are two buttons: "Start Quick Scan (approximately 1 minute)" and "Start Thorough Scan (up to 2 days)". Below this is another heading: "Search for a device in the database". A sub-heading reads: "You can directly search our database, to find assessments of specific devices and firmware versions. Enter one or multiple of the device specifiers below to search." There are four dropdown menus: "Category", "Manufacturer", "Model", and "Firmware Version". Below these is a search button with a magnifying glass icon and the text "Search for device(s) - At least one specifier must be selected".

How it is
now

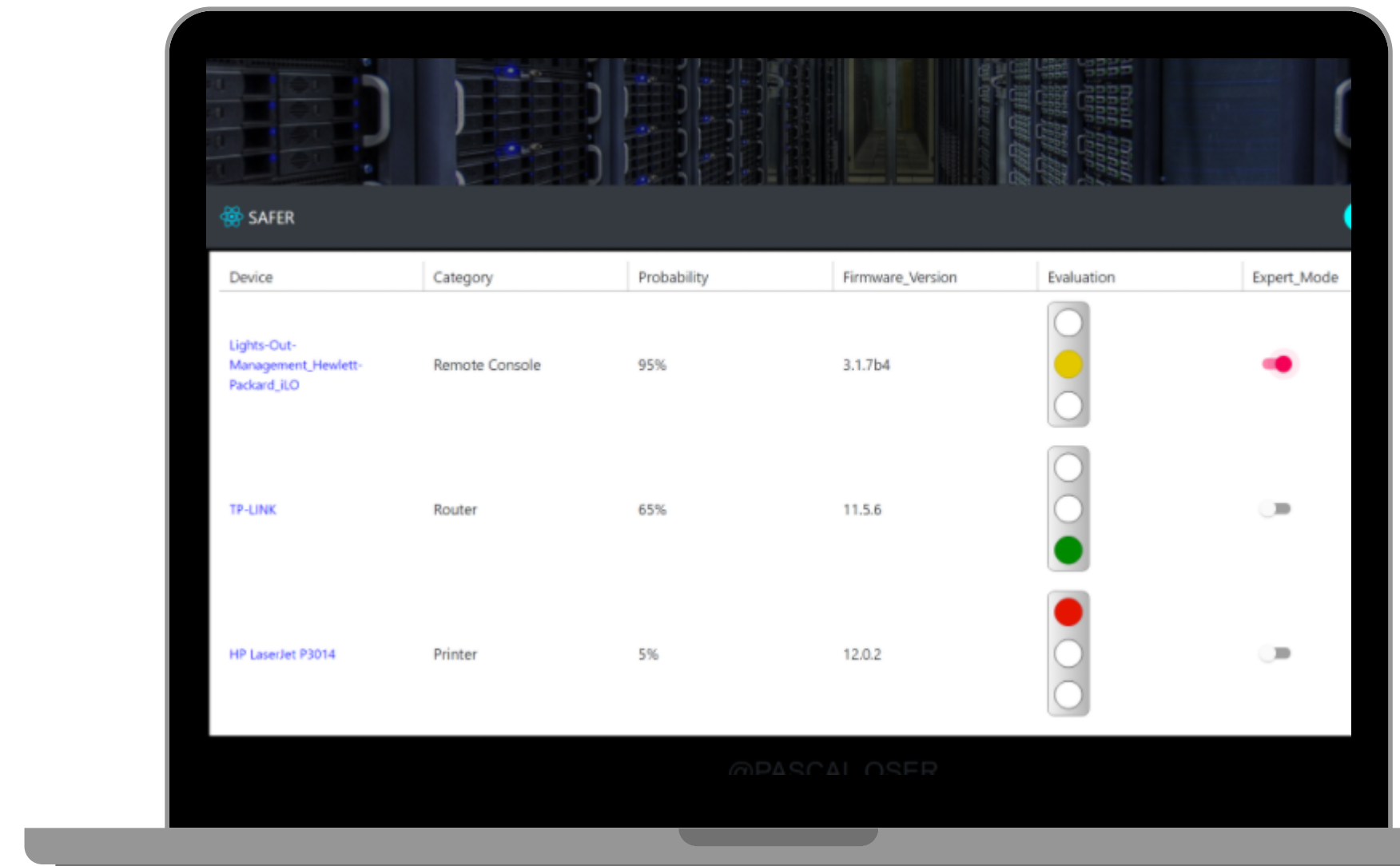


Getting Results

```
curl https://*****.web.cern.ch/initial_request_akash -X POST -H  
"Content-Type:application/json"--  
data{"request_type":"o","ip":"IOT.CERN.CH","username":"","password":"","  
}
```

```
{"ip":"IOT.cern.ch","password":"","request_id":"b0795ac3-ad65-4d4f-8335-  
9dfc02110855","request_state":7,"request_type":"o","sl_result":{"Lights -  
Out - Management_Hewlett  
Packard_iLO4":0.26049022522828474,"Printer_Hewlett -  
Packard_DesignJet - T120":0.005788671671738991,"Printer_Hewlett -  
Packard_Laserjet -  
CP3525":0.005788671671738991},"subnet":"None","timestamp":"2019-07-25  
16:36:09","trend_result_id":"Lights-Out-Management_Hewlett-  
Packard_iLO-4//2.55","username":""}
```

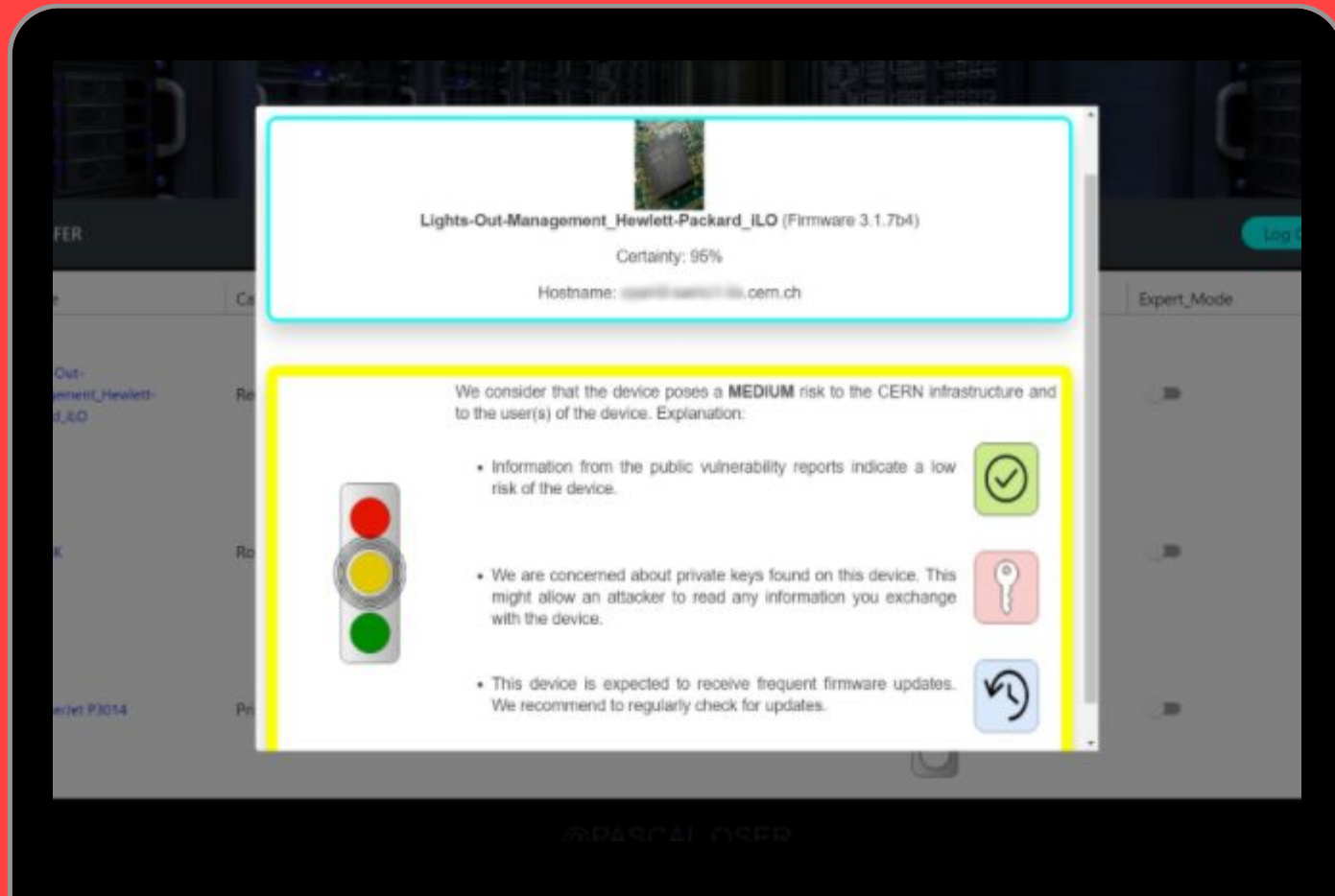
How it used
to be



How it is
now

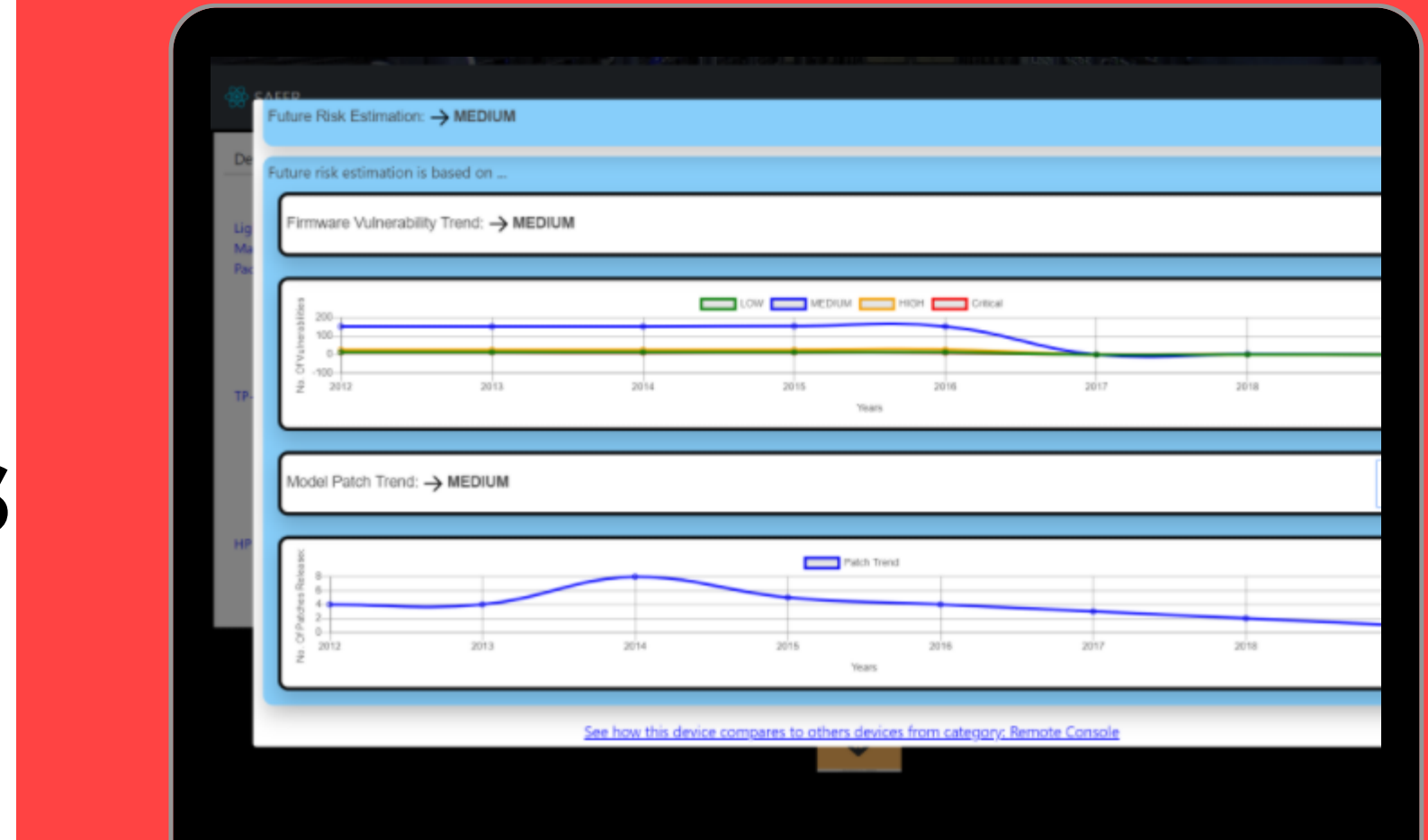


Layman View

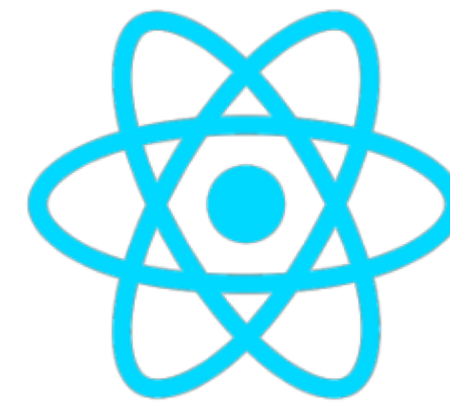
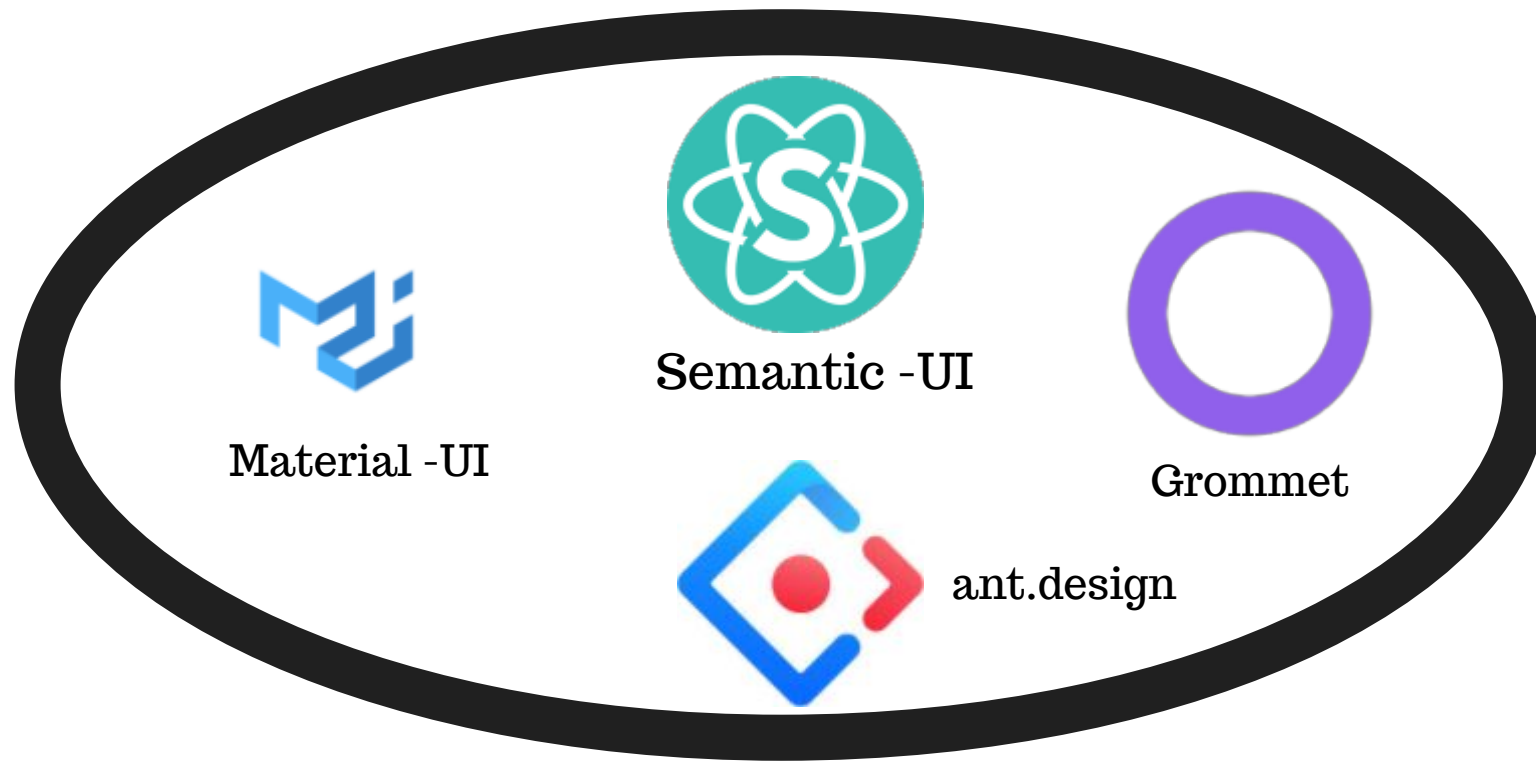


Views

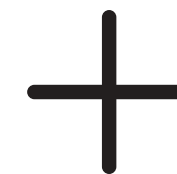
Expert View



Front - End Stack

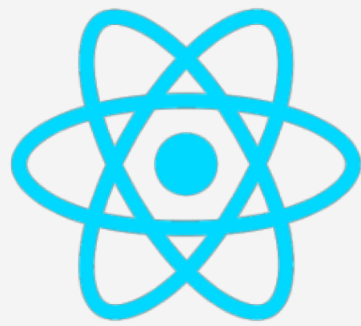


Reactjs





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Deployment Stack



Problems Faced

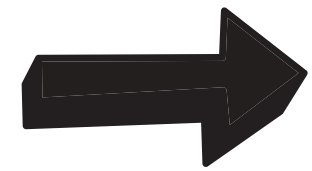
? Too many **State** variables for each Component.

➔ **React Hooks** - A new addition to React v16.8

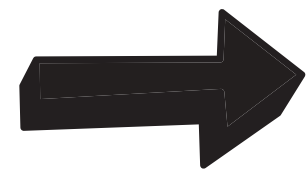
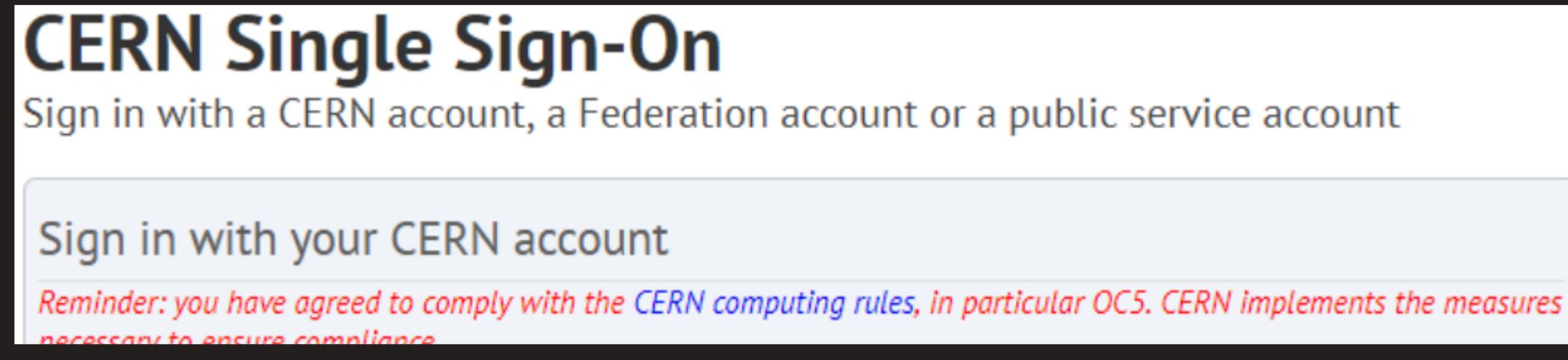
? **Cross-Origin Request Blocked:** The Same Origin Policy disallows reading the remote resource at somesite.



Future Work



Integrating my React Application with CERN Single-Sign On.



Using Flask to write the Backend Server.



THE TEAM

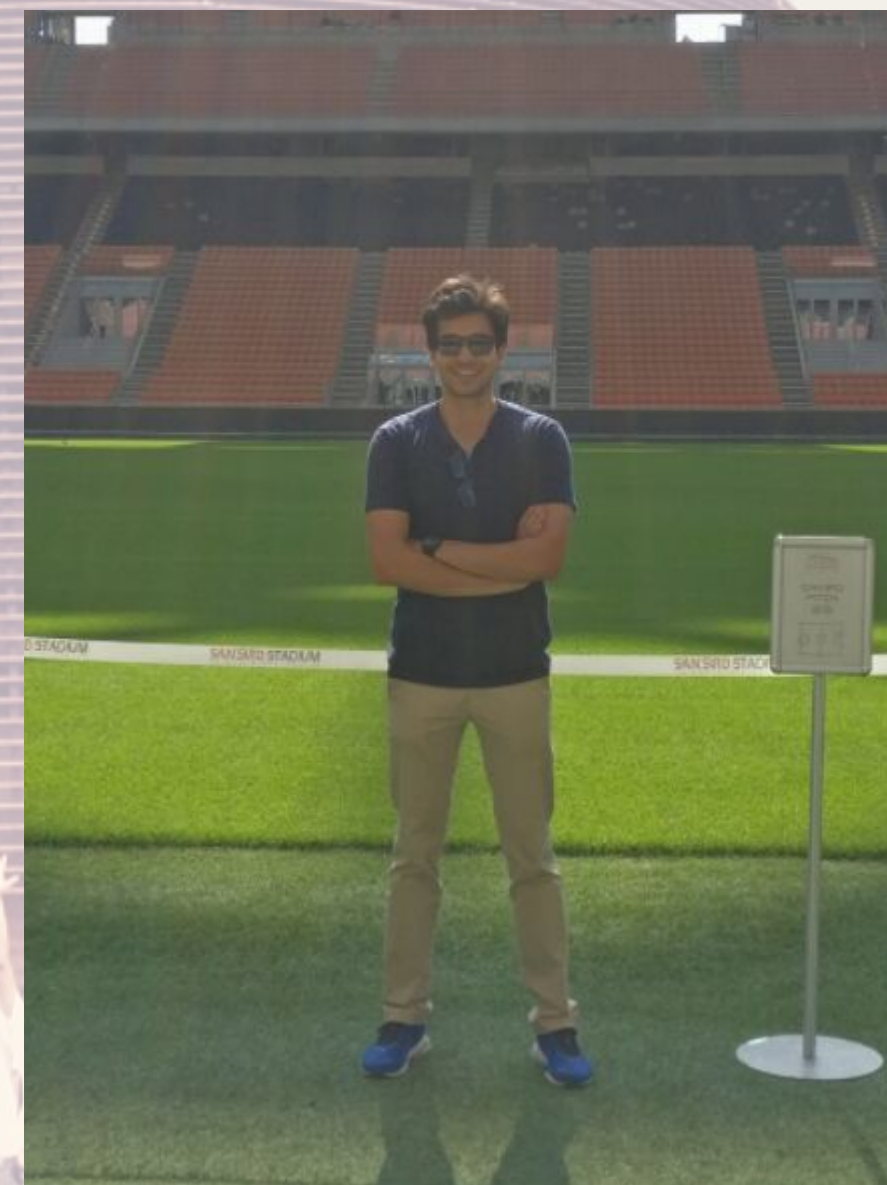
Back - End Guru



**Pascal Oser
(Supervisor)**

Email : - p.oser@cern.ch

Front - End Rookie



Akash Gupta

Email : - aksgupta3697@gmail.com



CERN Openlab Lightning Talks.....



Thank You