Computer and Informatics Engineering Projects

SOFTWARE DEFINED NETWORKS MONITORING SYSTEM

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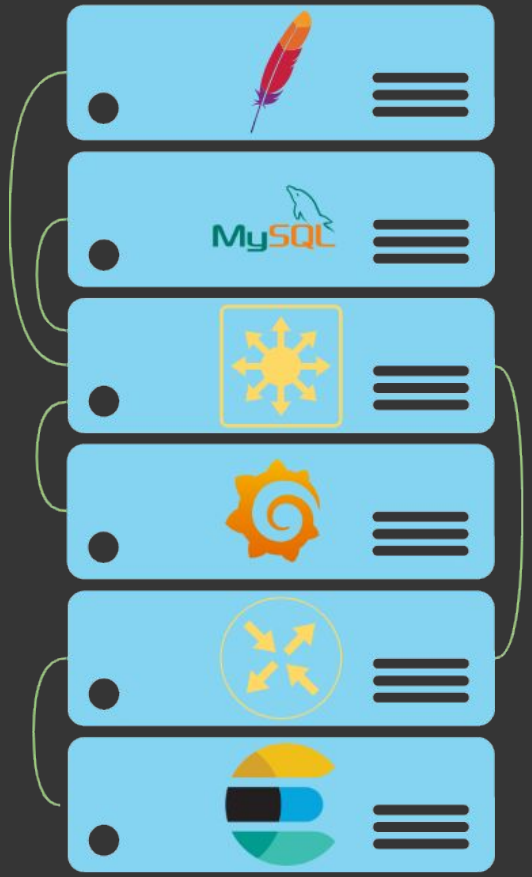
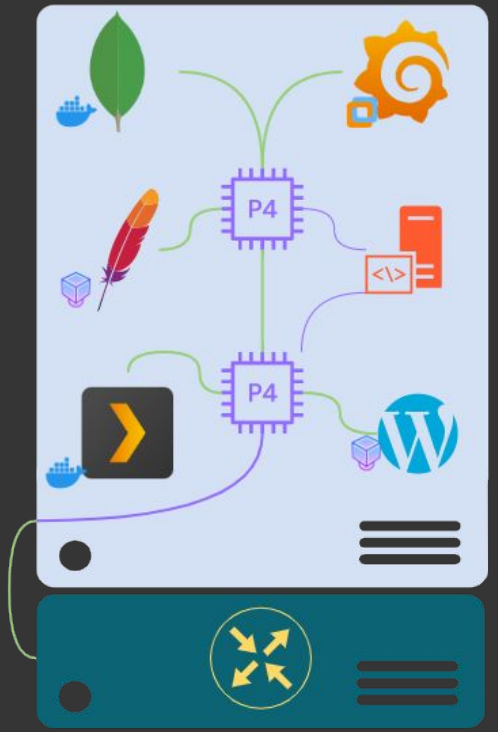
March 2023

Traditional Network vs. SDNs

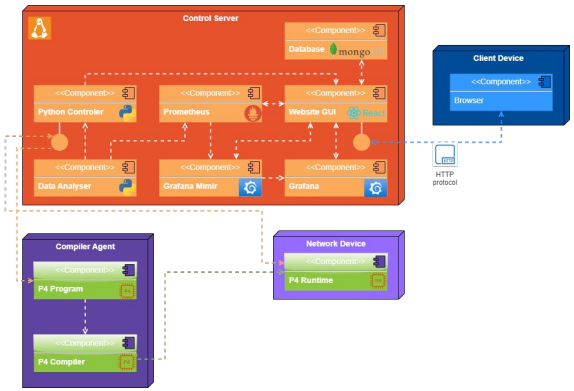


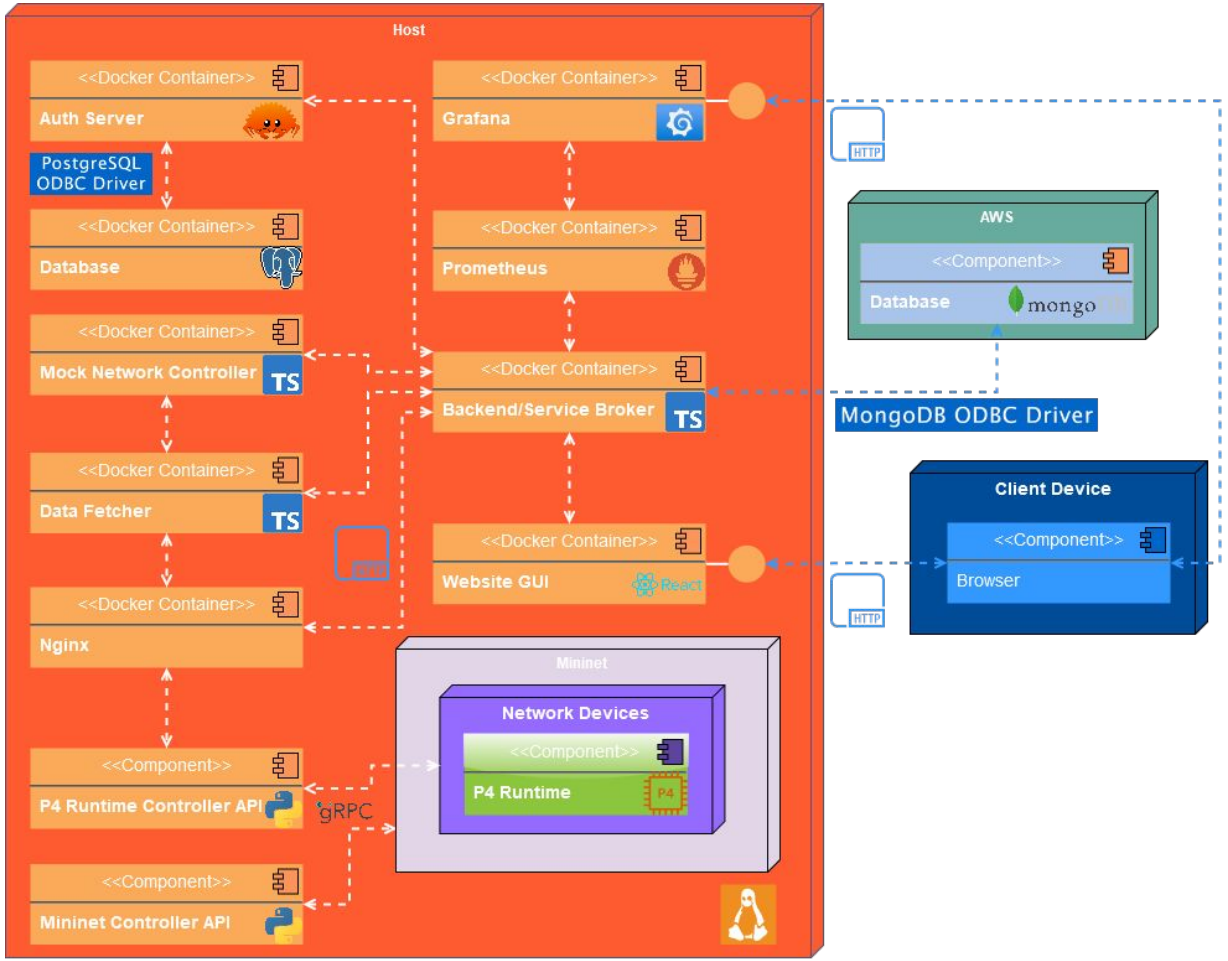


Goals for this milestone

1. **Deploy networks** via controller request or **connect to existing** networks.
2. **Programming** running **devices**
3. **View** existing **topologies**
4. Backend **fetches** the device **counters** for **grafana**

System Architecture





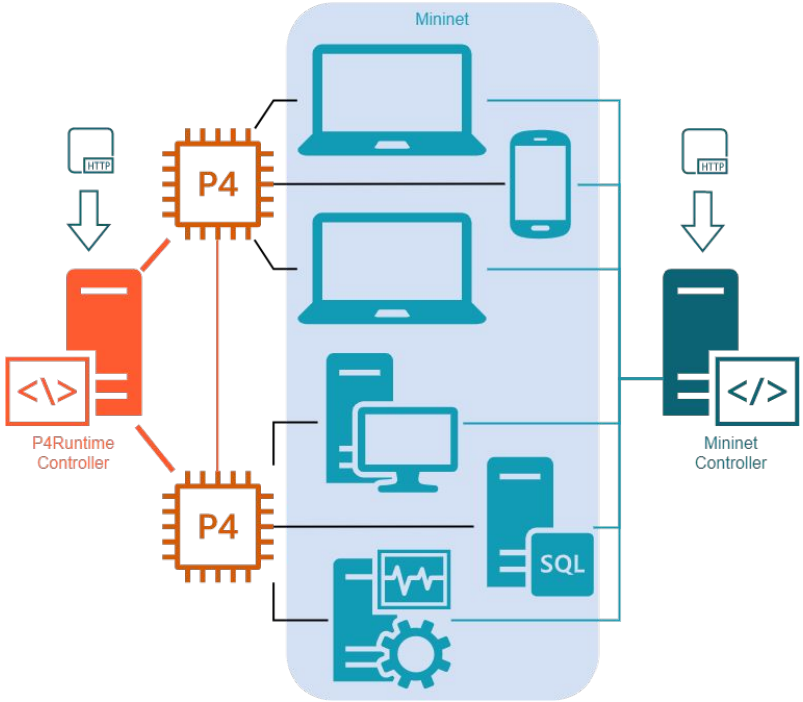
Main Components

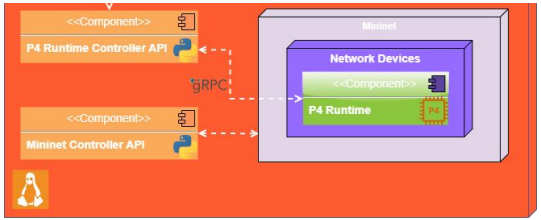
P4Runtime Controller API, Backend and metric processing, Dashboard

Controlling APIs

Two main APIs control the environment:

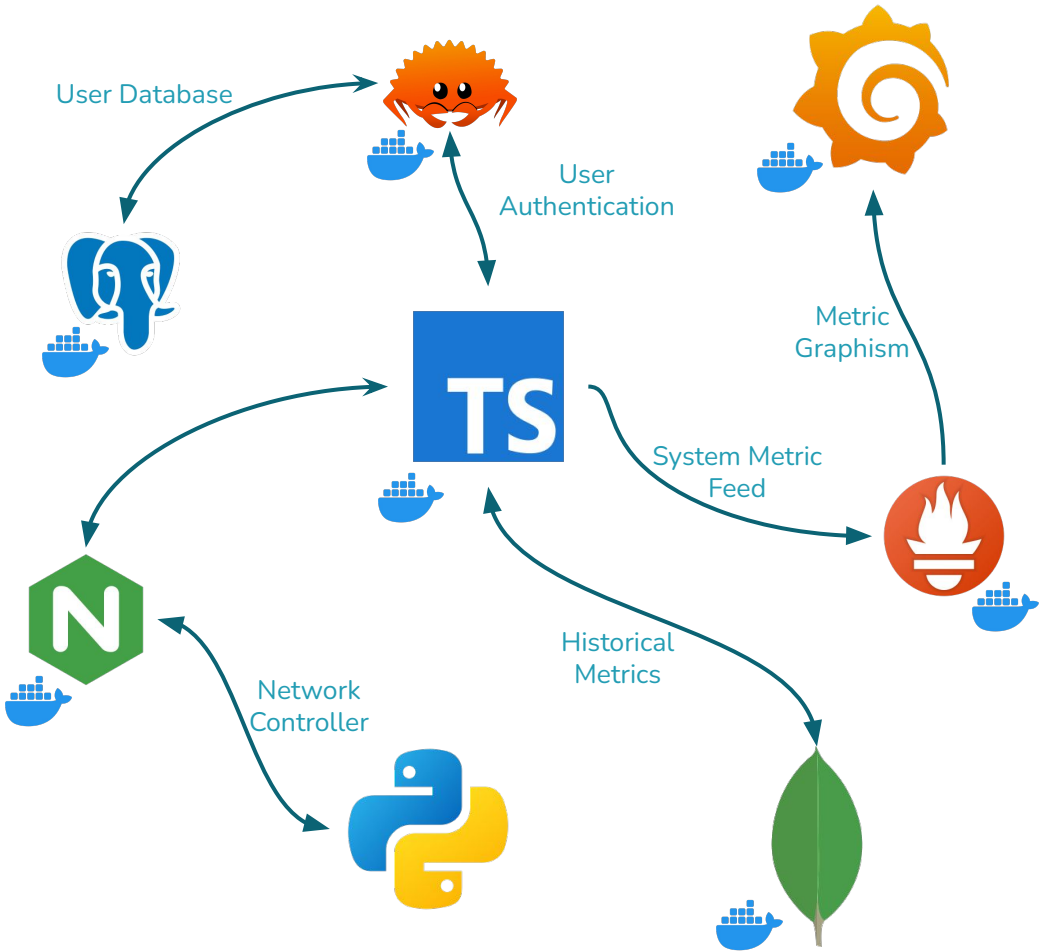
- **Translates HTTP** requests to effective communication with P4 Devices via the **P4Runtime** which uses **gRPC**.
- Programmatic control **over Mininet network** using HTTP request.





Backend

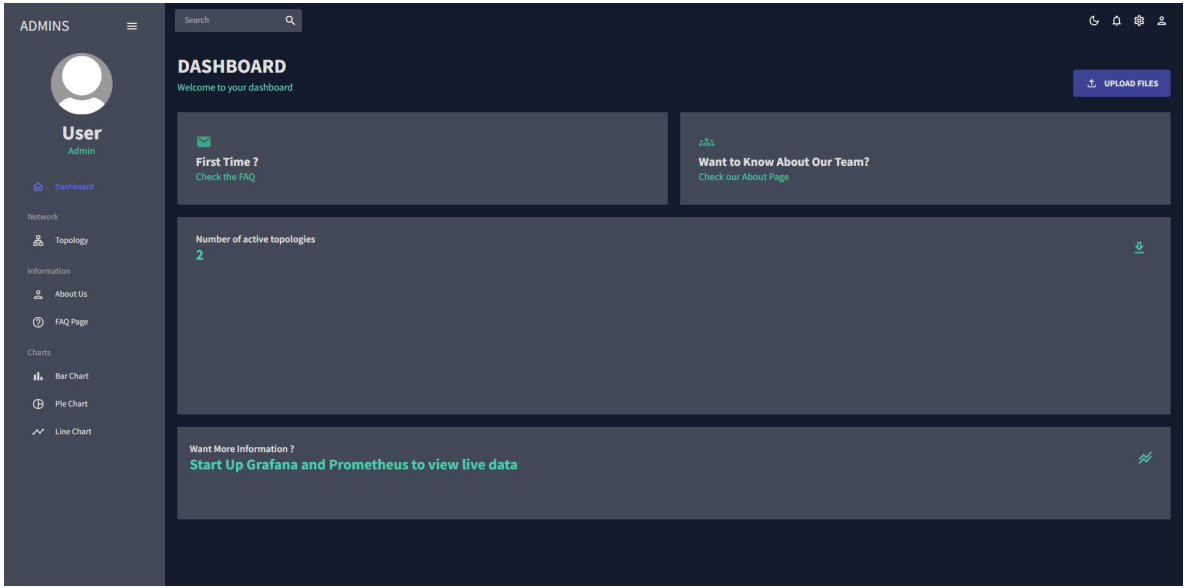
- **Flexible** data model (MongoDB)
- Authentication / Authorization / User metadata
- Integration with Prometheus and **Grafana** for metric visualization
- Service Broker
- **Microservice** Architecture



Dashboard

Interface to display the information about the network topology:

- **Generates** table displaying the available **network topologies**
- **Displays** the **hosts**, **switches** and the **links** of the network, and their details
- Includes **information** about our team and to help non-experienced users



Demo

Upcoming features

- User authentication.
- Prometheus and Grafana data implemented within React.
- Visual representation of the network.
- Transition from emulated to real networks.