Computer and Informatics Engineering Projects

SOFTWARE DEFINED NETWORKS MONITORING SYSTEM

Afonso Cardoso	88964
David Araújo	93444
Diogo Dias	85085
Guilherme Craveiro	103574
João Machado	89119
Vasco Santos	98391

universidade de aveiro  deti departamento de eletrónica, telecomunicações e informática

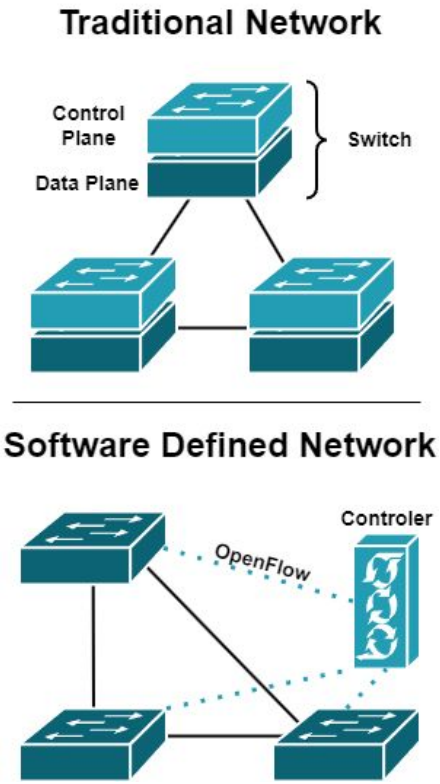
October 2022

There's a problem !

Big traditional networks **aren't flexible** enough to coupe with their own success.

In addition, it is **difficult to trace issues** throughout a network topology.

Rapid **alterations** to a network are next to impossible and usually **preventive instead of reactive**.



SDNs are the next level

With SDN we only need a **centralized controller** that can control **multiples devices**.

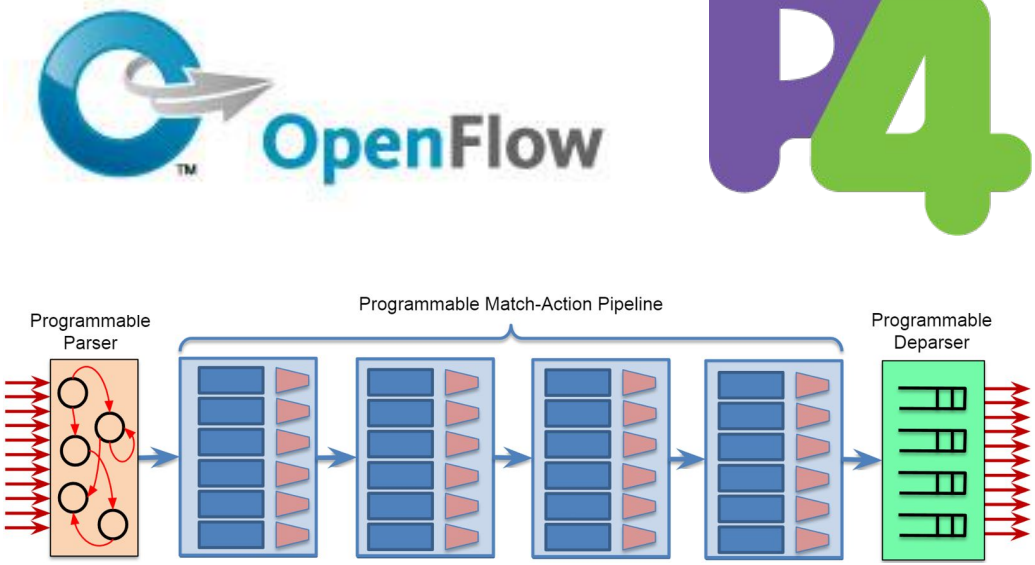
This makes the network, **directly programmable**, **agile**, **centrally managed** and **programmatically configured**, all while being **open** **standard-based** and **vendor-neutral**.

OpenFlow & P4

OpenFlow is a communication protocol which enables a controller to access the data plane.

While Programming Protocol-independent Packet Processors (P4) allow to specify how data plane devices (switches, NICs, routers, filters, etc.) process packets.

P4 key objectives: reconfigurability, protocol independence, target independence.



Existing Work

Most follow the same idea of **monitoring** a network.

In-Band Network Telemetry (INT) seams to be a favourite for telemetry reporting using **P4**.

GUI implementations of dashboard is **not referred**.

Focus on **passive observation** of a network.

What We Hope To Do With It

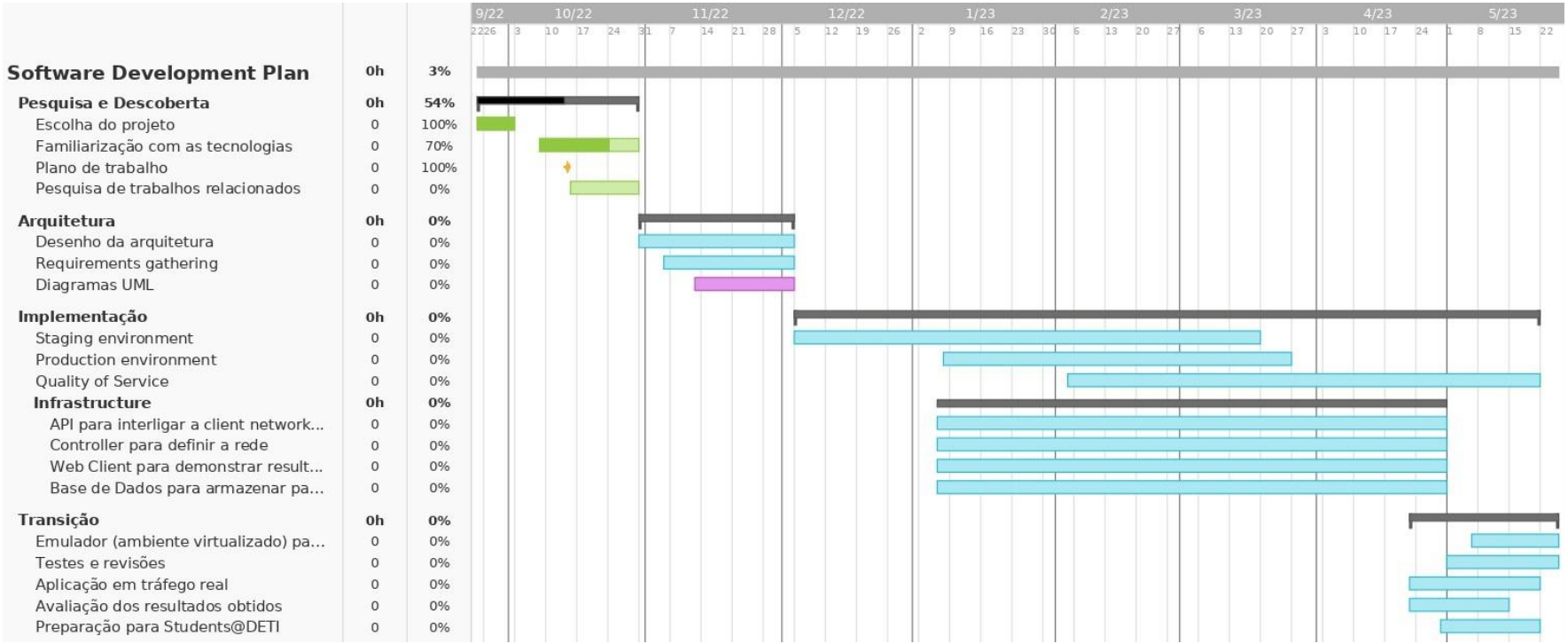
Main features

Real time **monitorization** of a network.

Create **dashboard** for multiple users, with **control over the network**.

Reactive reconfiguration, like

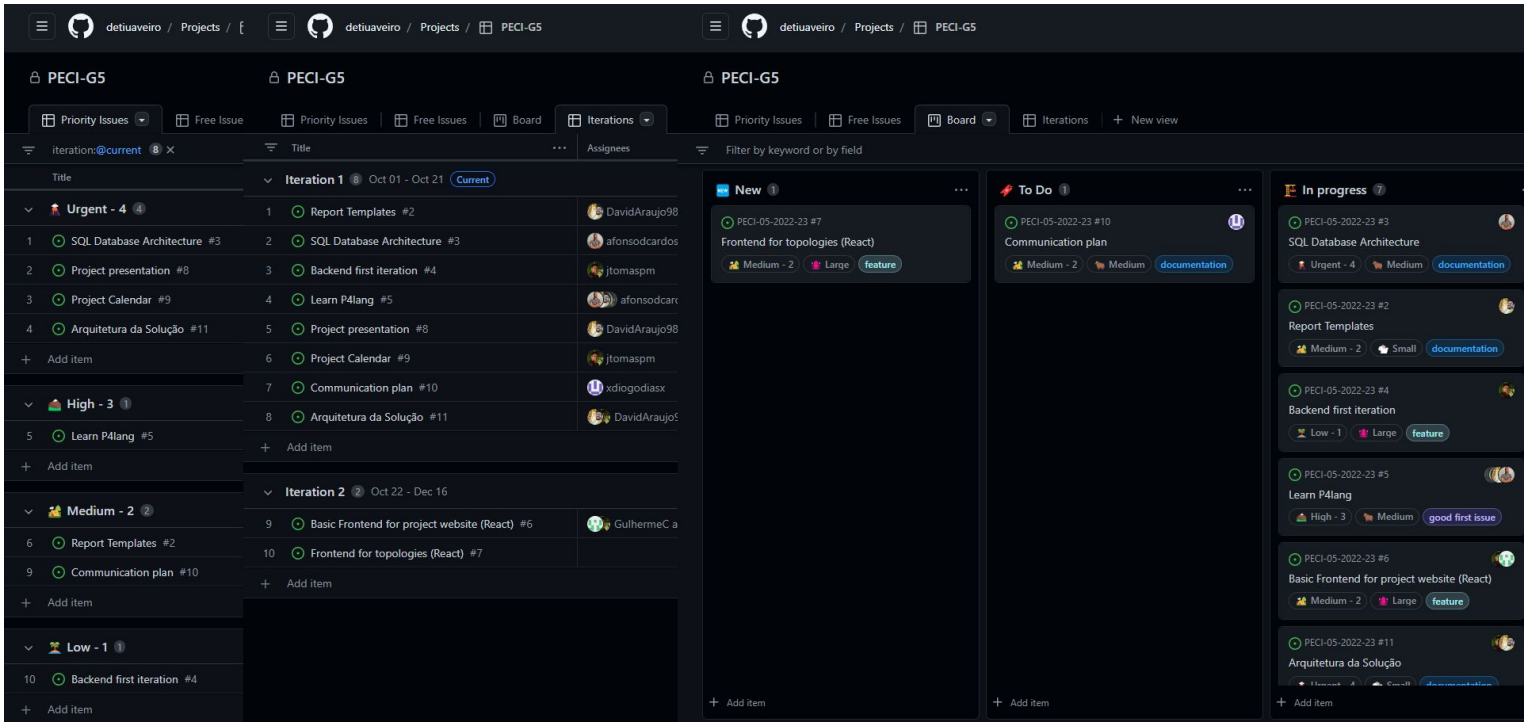
- **Re-route** packages;
- Impose **traffic limitations**;
- Permit **topology dynamism**.



Calendar Draft

Tasks

- **Requirement** analysis and **architecture** design.
- Define a **set of telemetry data** we expect the system to monitor (e.g: traffic flow, heavy flows, traffic spikes, ...)
- Create a **custom dashboard** that displays information about the network and allows control over it.
- **Creation of an agent** capable of dynamically re-programming the switches.
- Set of rules to **dynamically re-reprogram the devices** according to data traffic analysis.



Communication Plan

Expected Results

1. Network devices traffic **log reporting**.
2. Centralized log processing.
3. Online **dashboard with visual representation** of topology
4. Network architecture that adapts to drop in throughput in order to maintain QoS.