

Enterprise Wifi using Open APIs

Openconfig for WiFi

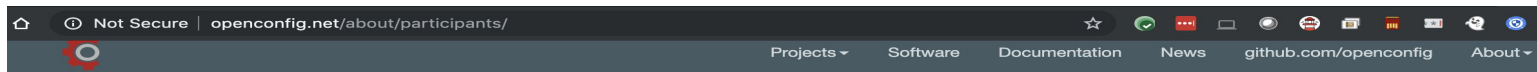
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What is OpenConfig

- A set of Vendor-neutral data models for interacting with the network; authored by Network engineers.
- Informal, structured like open source: <https://github.com/openconfig/public/>
- OpenConfig is the Schema. gNMI is the Transport. gNOI is what's left.

Current participants:

www.openconfig.net/about/participants/



OpenConfig participants

The OpenConfig working group consists of technical contributors from a variety of network operators representing a broad set of use cases.

We welcome participation from additional network operators who share OpenConfig's goals and want to contribute. If you are interested in working more directly with OpenConfig, please see the FAQ for operators.

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Apple



Jive Communications



Deutsche Telekom / Terastream



Bloomberg

Why? What problems did it solve?

1. We needed **Telemetry** (radio-data) and we needed it fast. *[Ops Impact]*
2. We wanted to move away from translation layers. (We tried them. Difficult & error-prone). *[Tools Impact]*
3. We need **programmatic access** and structured APIs for **everything**. *[Deploy & Ops Impact]*

How does it solve them?

1. Telemetry

Streaming Telemetry is a big part of Openconfig

2. Translation Layers

Everyone adheres to 1 Schema. See:

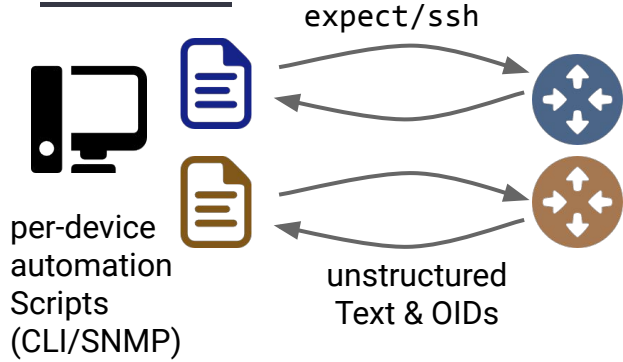
<https://github.com/openconfig/public/tree/master/release/models/wifi>

3. Programmatic Access

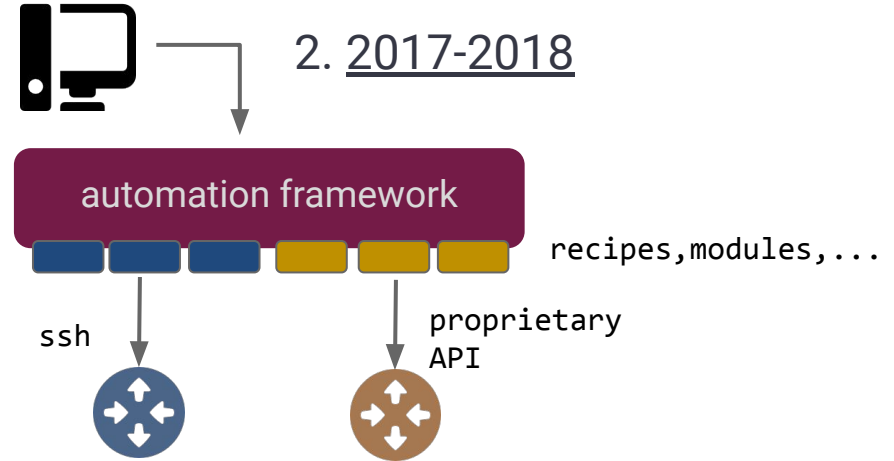
Entirely API driven, through gNMI/gRPC. 0 native access.

Evolution of network element interaction...

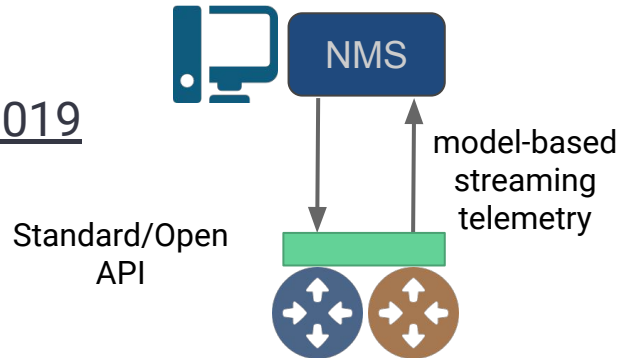
1. Pre 2017



2. 2017-2018



3. 2019



Pre Openconfig Network

- Physical Controllers -- like everywhere.
 - Multiple physical management points. Configure them, Operate them, LCM them
 - No programmatic access
- Centralized Data plane (lots of tunnels in network to solve mgmt-plane)
 - Large failure domains (WLC goes down -- so did a lot of APs)
- Configuration Management
 - CLI access needed to make changes
- Too much human input (CLI based)
 - To push config
 - To operate
- Non granular Telemetry
 - SNMP based
 - Not fast enough

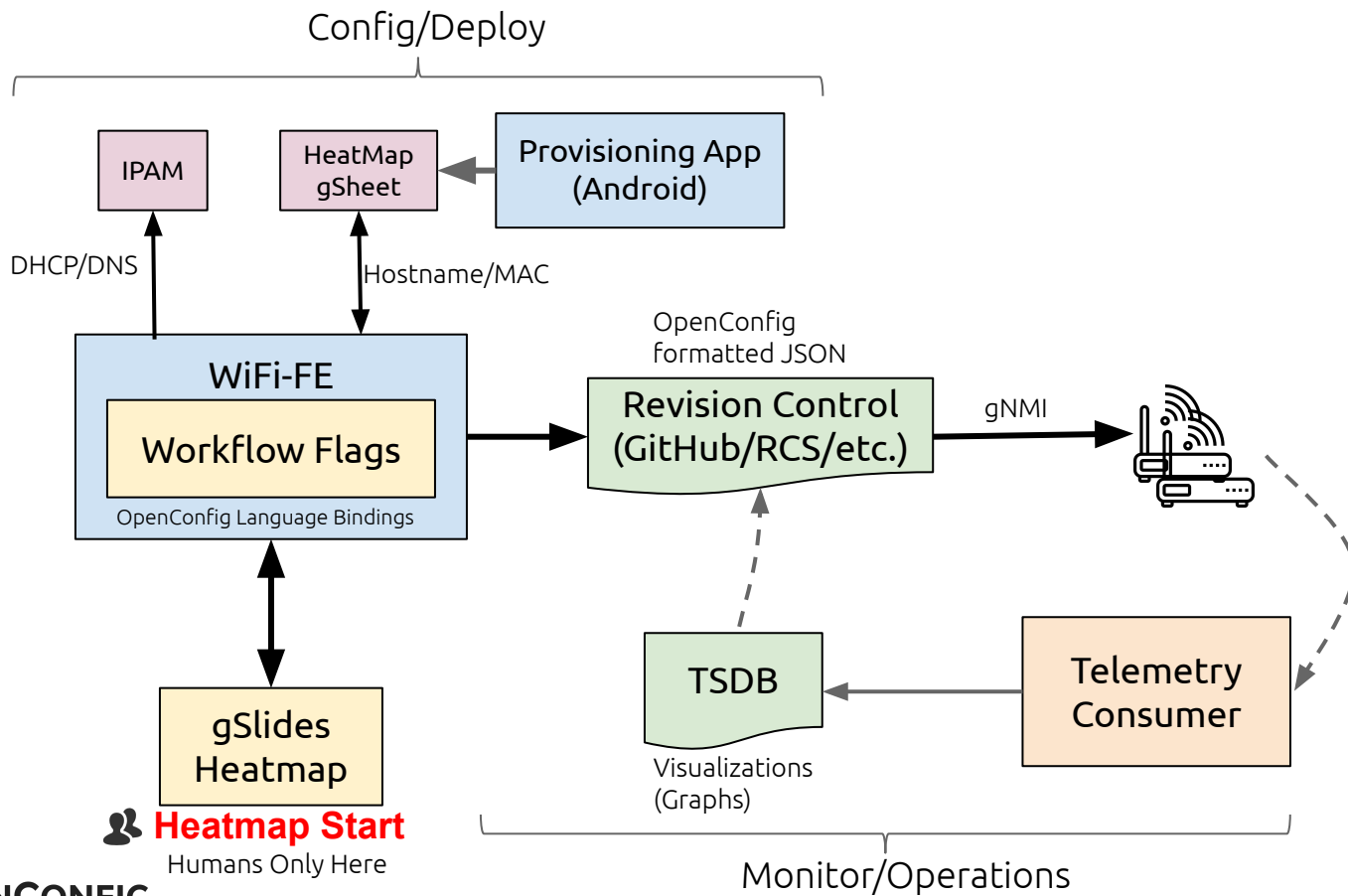
Openconfig Network

- **Controllers; only where required**
 - Data-plane out-of-scope.
 - Programmatic access.
- **Configuration Management**
 - Standard APIs used to configure & monitor
- **No Human Input for config/operate**
 - To push config
 - To operate
- **Granular Telemetry**
 - Publisher/Subscriber (pub/sub); not polling
 - Fast, encrypted by default

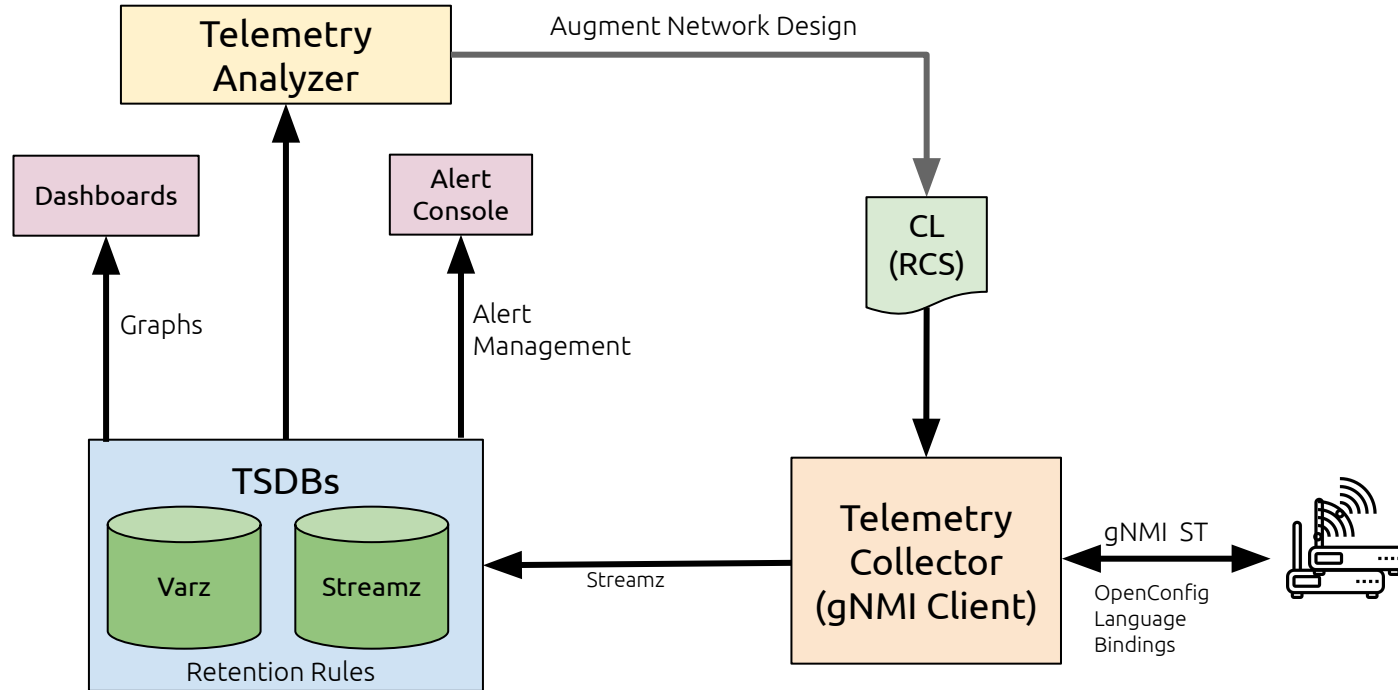
How Do We Use It

- Intent is populated by automation (inferred from design rules in heatmap)
- No humans interact directly (no CLI or direct access) with network elements
- Network Admin modifies design rules (heatmap) to trigger configuration changes
- Network Operator only uses vendor-independent UI (eg TSDB Visualizations). No CLI or direct access to operate the network
- Network Operator does not know what vendor's network element in use.

E2E Automated Toolchain Example



Respond to Conditions



Questions

Reach out to albanom@google.com & shimol@google.com