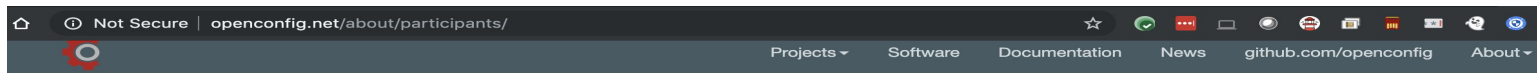# Enterprise Wifi using Open APIs

Openconfig for WiFi

Mike Albano
Shimol Shah

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.

OPENCONFIG

Current participants: www.openconfig.net/about/participants/

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**
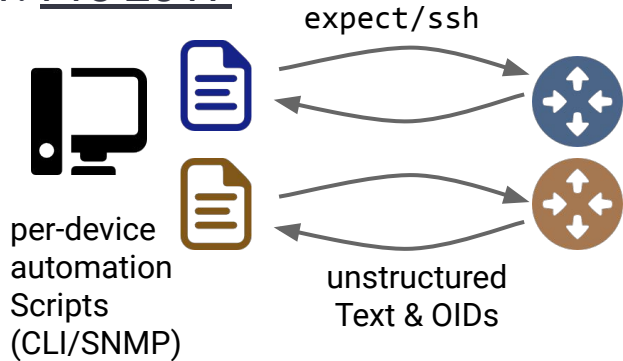
Everyone adheres to 1 Schema. See:
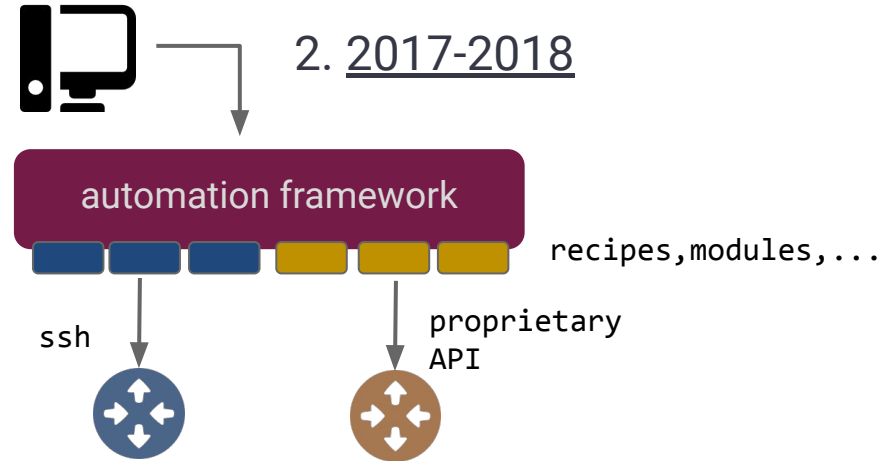https://github.com/openconfig/public/tree/master/release/models/wifi

3. **Programmatic Access**

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

⚙**OPENCONFIG**

Evolution of network element interaction...

1. Pre 2017

expect/ssh

per-device
automation
Scripts
(CLI/SNMP)

unstructured
Text & OIDs

2. 2017-2018

automation framework

recipes,modules,...

ssh

proprietary
API

3. 2019

NMS

model-based
streaming
telemetry

Standard/Open
API
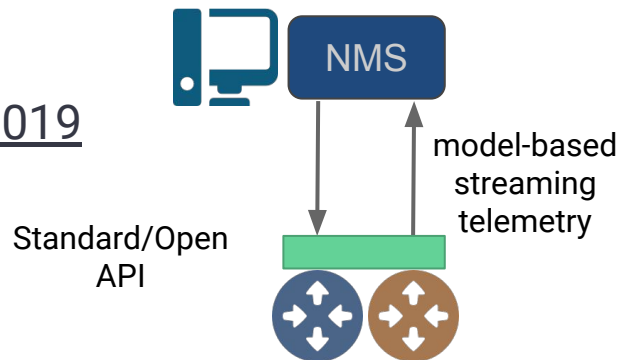
OPENCONFIG

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**

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

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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.

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E2E Automatred Toolchain Example
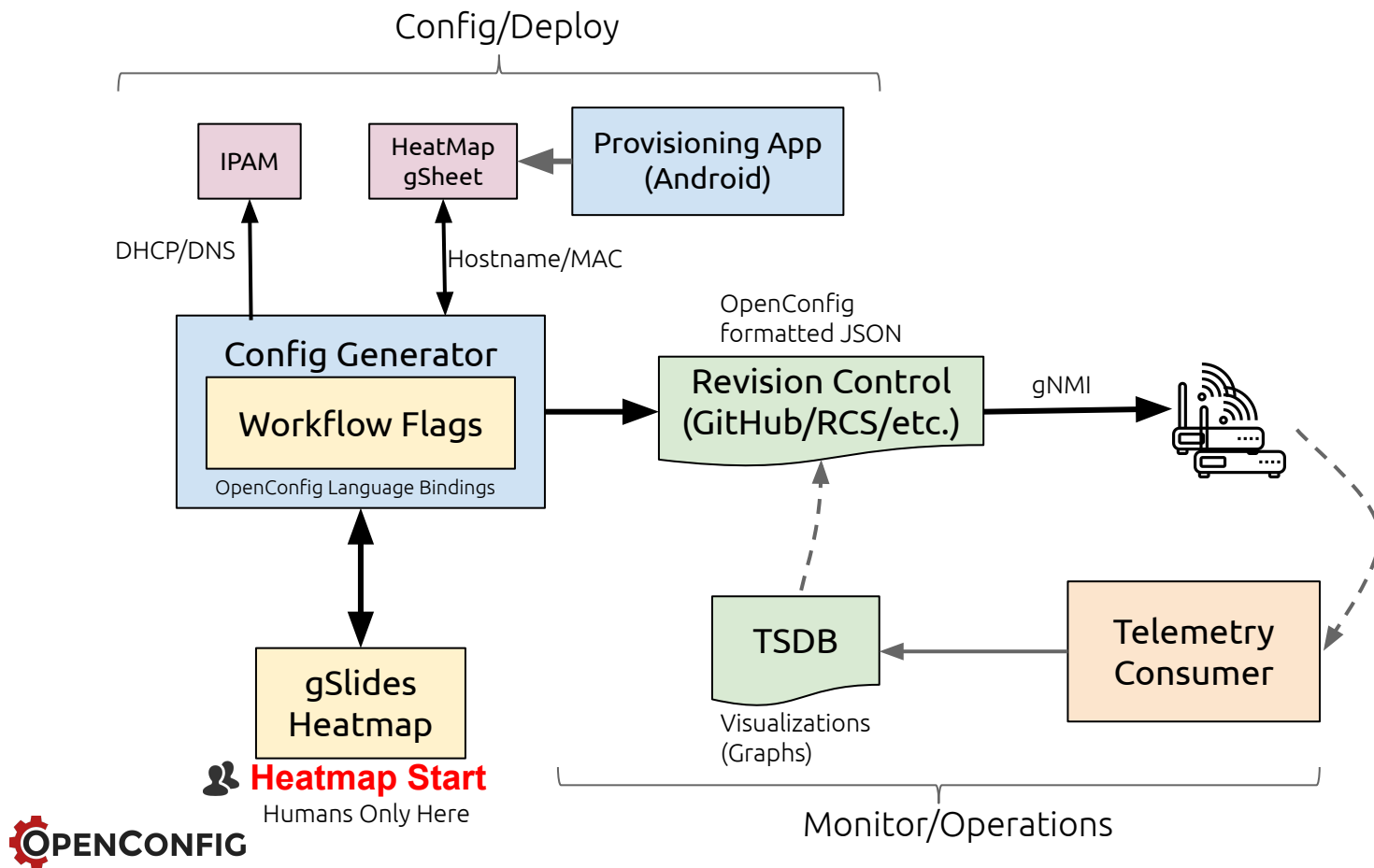
Respond to Conditions

Demo

OPENCONFIG
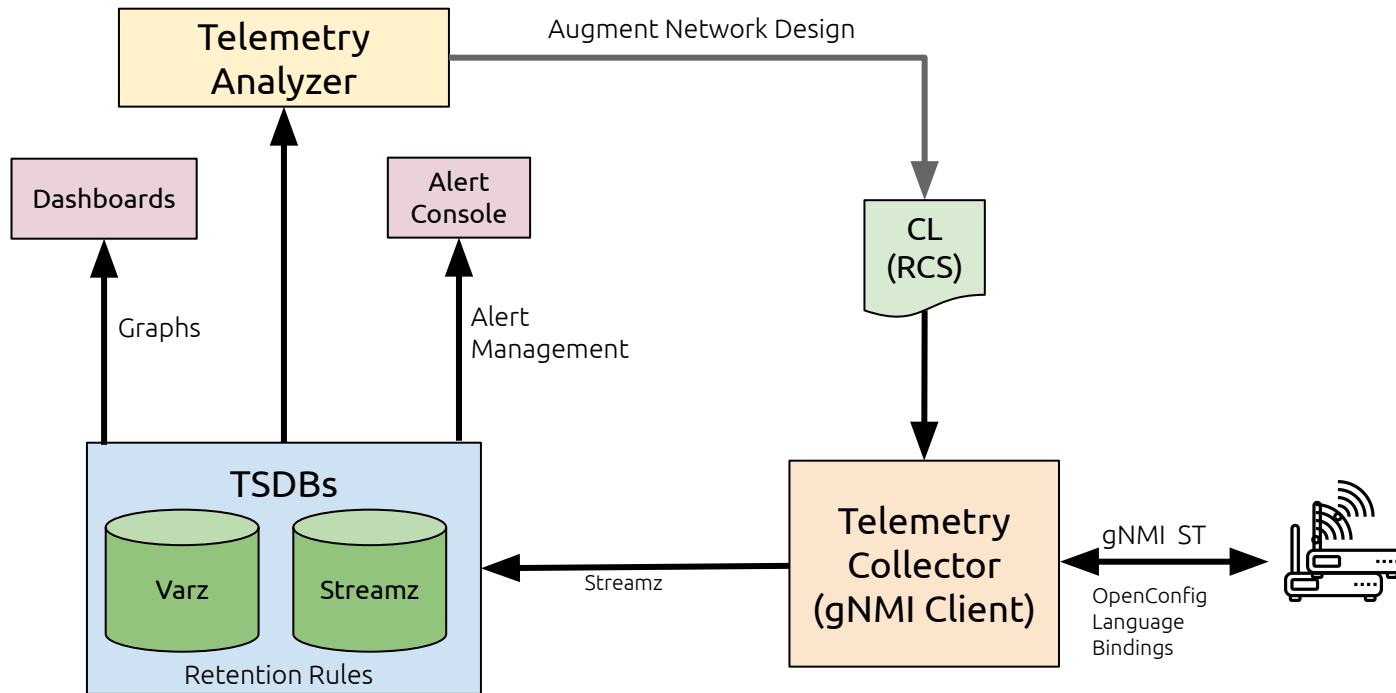
Questions

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