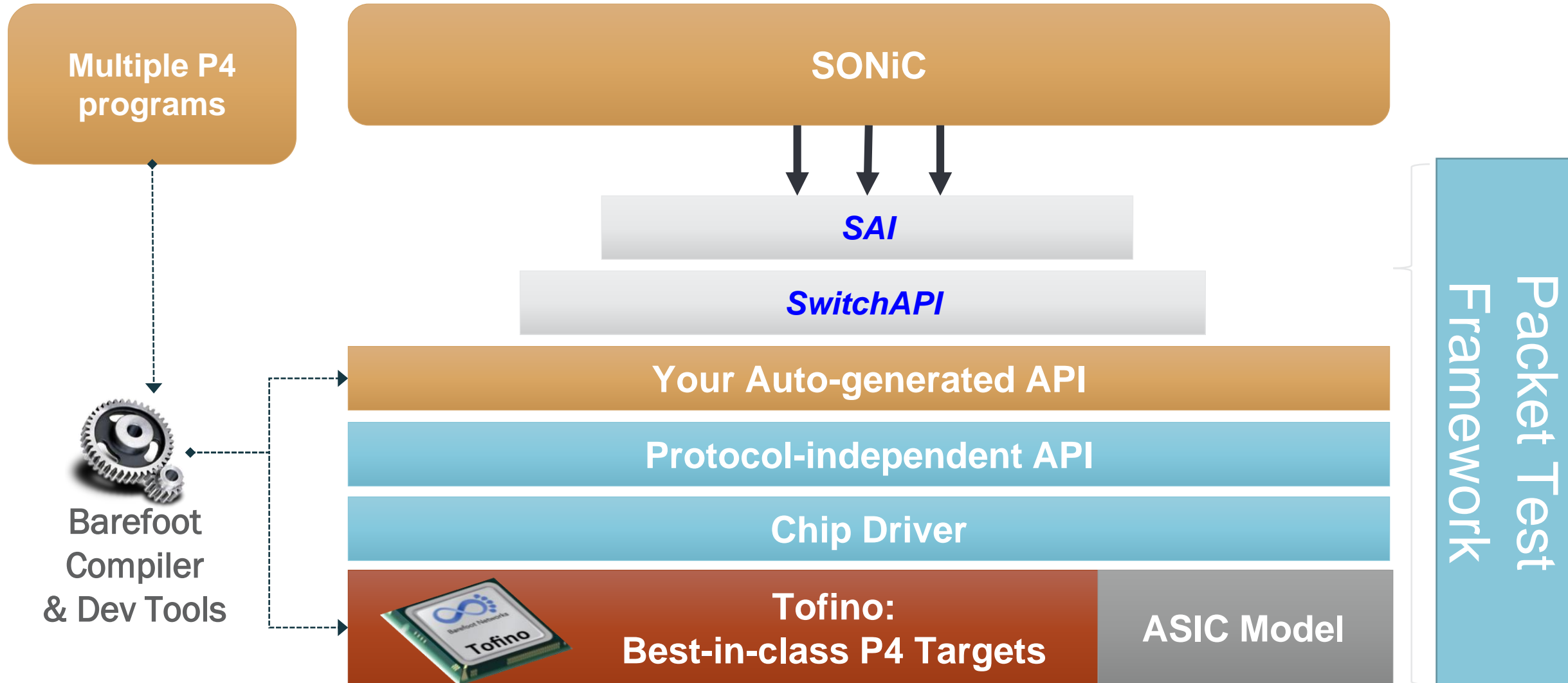# SONiC Powered by Programmable Dataplane

## Glow Yang

MANAGER APAC, CUSTOMER ENGINEER, BAREFOOT NETWORKS

# Barefoot Software Support for SONiC

# SONiC Tofino-based Platform Support

| Vendor | Platform Name |
|---|---|
| Edge-core | Wedge100BF-32x<br>Wedge100BF-65x |
| WNC | OSW1800 |
| Ufi Space (Ingrasys) | S9180-32X<br>S9280-64X |

*Note: upstreamed platforms only, reach out to ODM vendors for other platforms*

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# SONiC with Programmable Silicon

- P4 program defines a **use-case** (ToR, Spine, Gateway):
  - **Features** enabled / disabled (L2, L3, MPLS, VxLAN, Telemetry etc.)
  - **Scale** for each table (MACs, routes, ACLs etc)

- Delivering different dataplanes with operating system:
  - Option 1: Compile different images
  - **Option 2: Single image includes multiple P4 programs**

# Switching Between Different Dataplanes in SONiC

## AVAILABLE WITH 201807 SONIC RELEASE AND SINGLE BAREFOOT DEBIAN PACKAGE

1. In SONiC, edit /etc/sonic/config_db.json to include the p4_profile attribute:

```
…
"DEVICE_METADATA": { "localhost": {
…
"p4_profile": "<P4 program name"}}
```
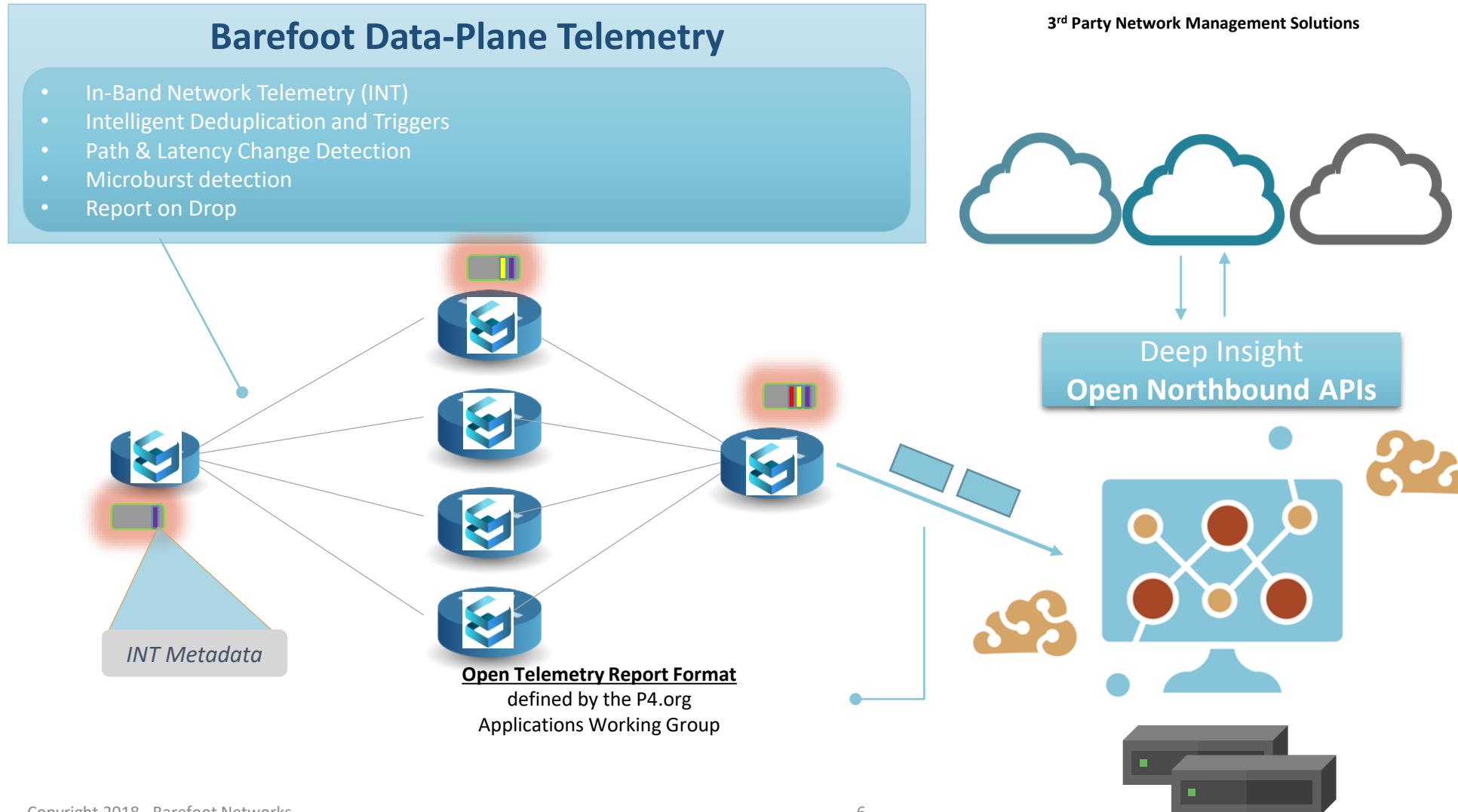
2. Load the updated `config_db.json`:

```
sudo config load -y
```

3. Reboot the switch for the new dataplane to take effect

Embedded P4 programs:

- **MSDC_PROFILE**
  - Default for baseline SONiC features

- **MSDC_IPV4_PROFILE**
  - Advanced tunneling use-case

- **MSDC_LEAF_DTEL_INT_PROFILE**
  - Dataplane telemetry leaf

- **MSDC_SPINE_DTEL_INT_PROFILE**
  - Dataplane telemetry spine

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# SONiC Dataplane Telemetry Support

## Barefoot Data-Plane Telemetry

- In-Band Network Telemetry (INT)
- Intelligent Deduplication and Triggers
- Path & Latency Change Detection
- Microburst detection
- Report on Drop

**3rd Party Network Management Solutions**

Deep Insight
**Open Northbound APIs**

*INT Metadata*

**Open Telemetry Report Format**
defined by the P4.org
Applications Working Group

BAREF∞T

# SONiC Dataplane Telemetry Support

- New tables in several SONiC databases

- Upstreamed Debian package includes P4 programs supporting dtel
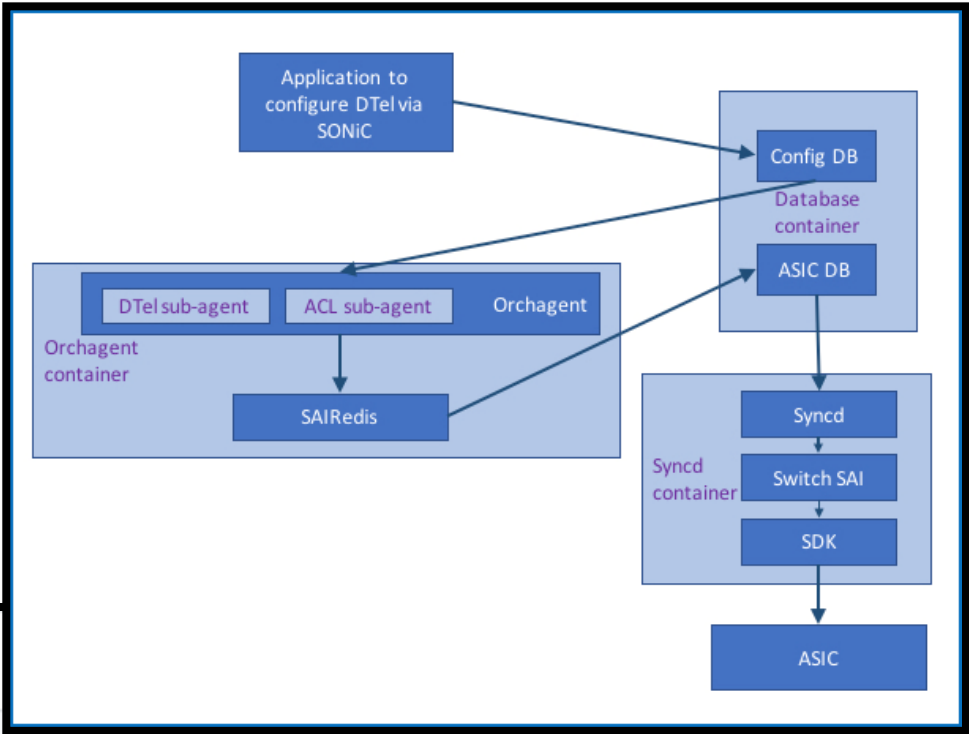


| SONiC.201807 | 07/30/18 | 1.3 | |
|---|---|---|---|
| | | | gRPC |
| | | | Dtel support |

# SONiC Dataplane Telemetry Configuration

## CONFIG_DB.JSON DTEL CONFIGURATION

```json
"DTEL_INT_SESSION": {
    "INT_SESSION1": {
        "COLLECT_EGRESS_TIMESTAMP": "TRUE",
        "COLLECT_SWITCH_PORTS": "TRUE",
        "COLLECT_INGRESS_TIMESTAMP": "TRUE",
        "COLLECT_SWITCH_ID": "TRUE",
        "MAX_HOP_COUNT": "8",
        "COLLECT_QUEUE_INFO": "TRUE"
    }
},
    "DTEL": {
    "DROP_REPORT": {
        "DROP_REPORT": "TRUE"
    },
    "INT_ENDPOINT": {
        "INT_ENDPOINT": "TRUE"
    },
```

```json
    "SINK_PORT_LIST": {
        "Ethernet76": "Ethernet76",
        },
    "SWITCH_ID": {
        "SWITCH_ID": "123"
    }
},
"ACL_RULE": {
    "DTEL_FLOW_WATCHLIST|RULE1": {
        "FLOW_SAMPLE_PERCENT": "100",
        "PRIORITY": "10",
        "REPORT_ALL_PACKETS": "FALSE",
        "SRC_IP": "10.131.0.0/11",
        "INT_SESSION": "INT_SESSION1",
        "FLOW_OP": "INT",
        "DST_IP": "10.131.0.0/11"
    }
},
```
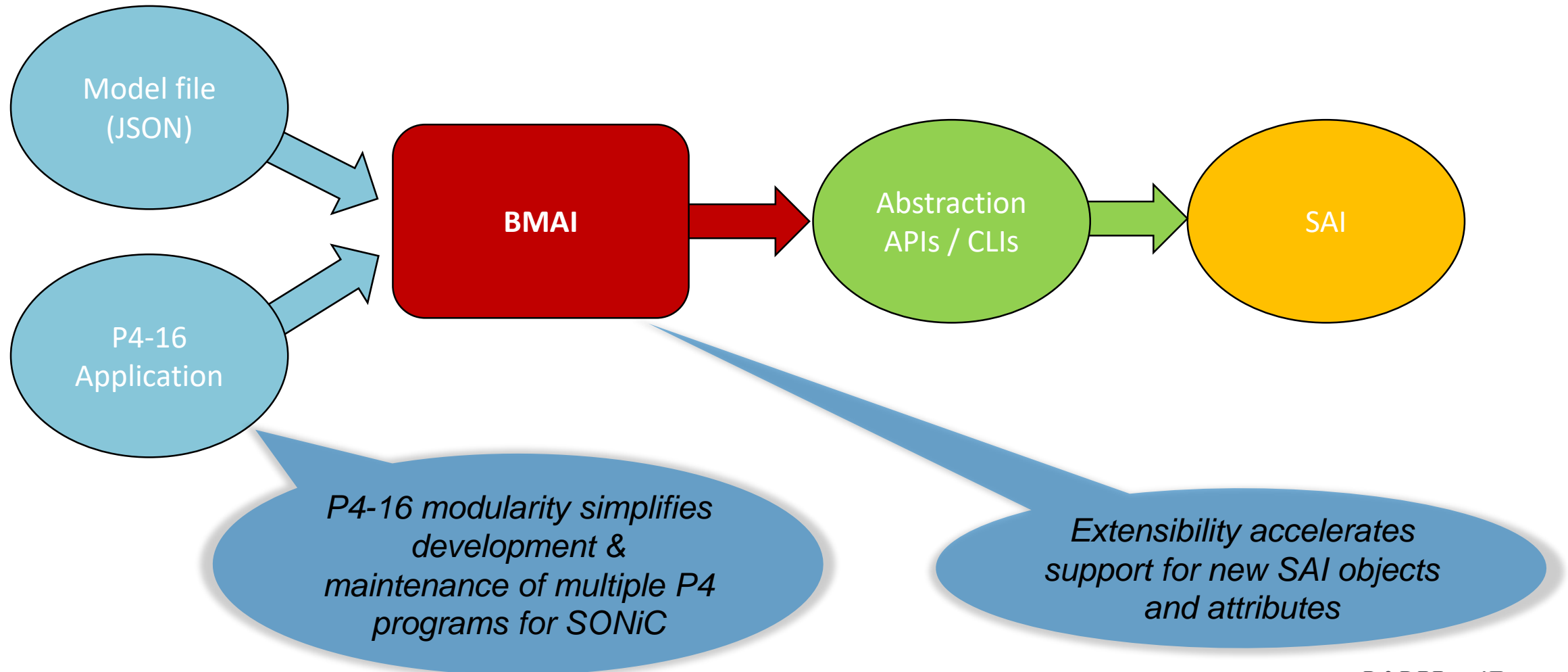
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Barefoot SONiC Support with P4 Studio
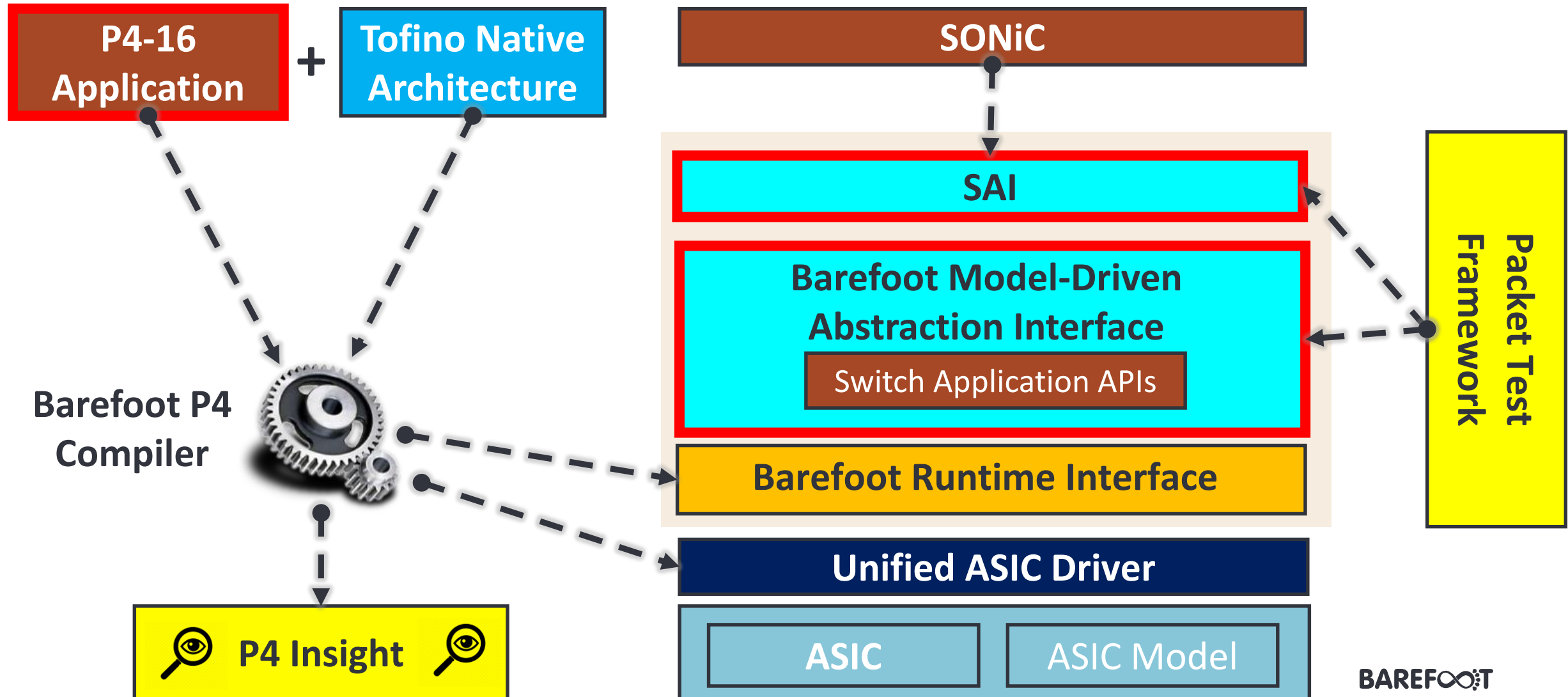
# Barefoot Next Generatipon P4 Applications and Abstraction APIs

## ACCELERATING SONIC SUPPORT

Model file (JSON)

P4-16 Application

BMAI

Abstraction APIs / CLIs

SAI

*P4-16 modularity simplifies development & maintenance of multiple P4 programs for SONiC*

*Extensibility accelerates support for new SAI objects and attributes*

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# Thank you

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