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Nexus Cloud Scale Telemetry

Real-time Telemetry and Analytics at Scale

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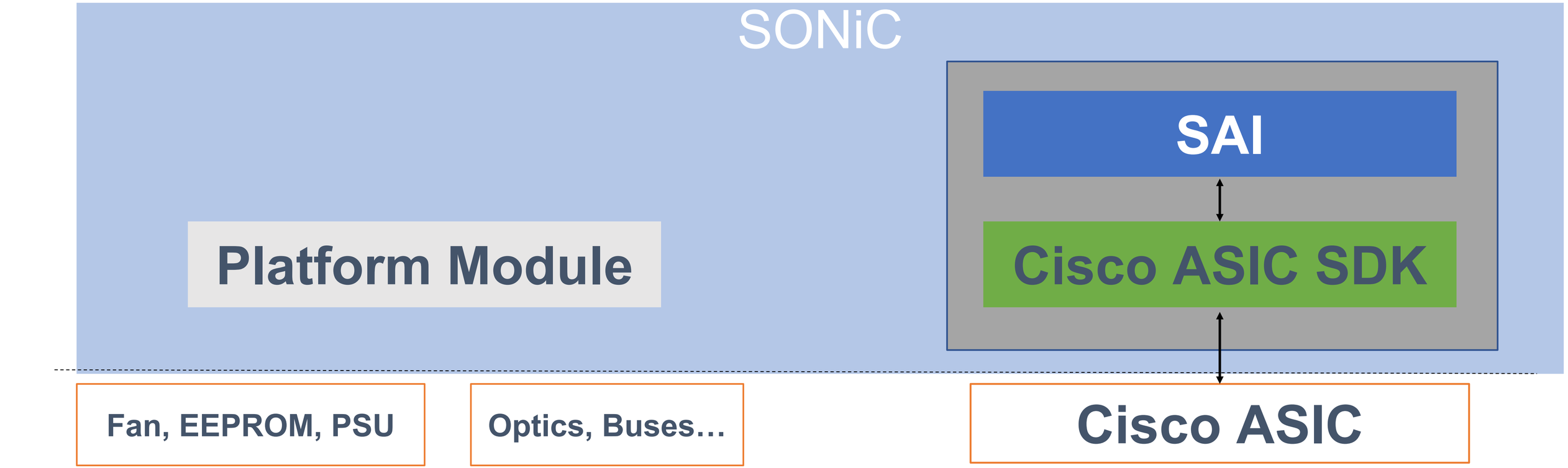
Cisco Nexus SAI Overview



Nexus SONiC Support

Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019
Shipping	Shipping	Shipping	Shipping	In development

Cisco SAI 4.1
- SONiC Ver: 201712
- SAI 1.0.4
- Cisco SDK 7.0(3)I4(5)

Cisco SAI 4.2
- SONiC Ver: 201803
- SAI 1.2
- Cisco SDK 7.0(3)I4(5)

Cisco SAI 4.3
- SONiC Ver:201807
- SAI 1.3
- Cisco SDK 7.0(3)I7(3)

Cisco SAI 4.4
- SONiC Ver: 201811
- SAI 1.3
- Cisco SDK 7.0(3)I7(3)

Cisco SAI 4.5
- SONiC Ver: 201811
- SAI 1.3+
- Cisco SDK 7.0(3)I7(3)

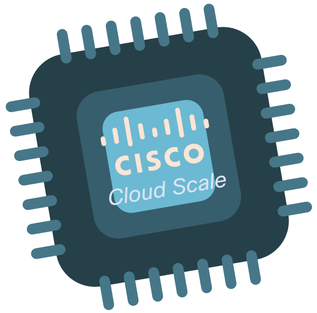
Supported Platforms

- **Nexus 9232C (Q1CY18)**
- **Nexus 92304QC (Q1CY18)**
- **Nexus 9336C-FX2 (Q3CY18)**
- **Nexus 9364C (Q3CY18)**
- **Nexus 3232C (Q1CY18)**
- **Nexus 34180YC (Q3CY18)**
- **Nexus 3464C (Q4CY18)**

On the Roadmap

- **Nexus 9348GC (Q2CY19)**
- **Nexus 9332C (Q3CY19)**
- **Nexus 93240YC-FX2 (Q3CY19)**

Cisco Cloud Scale Silicon



Family of ASICs custom-built by Cisco

Share common characteristics, along with use-case-specific optimizations

Used to build both TOR and modular systems

- Nexus 9300-EX/FX/FX2, Nexus 9332C/9364C (TOR)
- Nexus 9500 EX/FX (modular)

Network Telemetry Use Cases

NETWORKING

Network Health

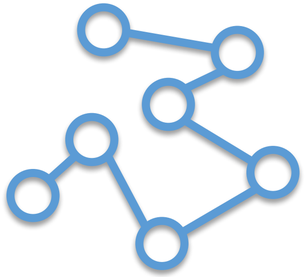
- CPU and memory utilization
- Forwarding table utilization
- Protocol state and events
- Environmental data

Network Performance

- Interface utilization
- Buffer monitoring
- Microburst detection
- Drop event correlation

Path and Latency Measurement

- End-to-end visibility
- Path tracing over time
- Flow latency monitoring



Cisco Cloud Scale Hardware Telemetry

Flow Table (FT)

- Captures full data-plane packet flow information, plus metadata

Flow Table Events (FTE)

- Triggers notifications based on thresholds / criteria met by data-plane packet flows

Streaming Statistics Export (SSX)

- Streams ASIC statistics based on user configuration

Data-Plane Flow Data

Nexus 9300-EX/FX/FX2
Nexus 9500 EX/FX

ASIC State

Nexus 9300-FX2, Nexus 9332C/9364C

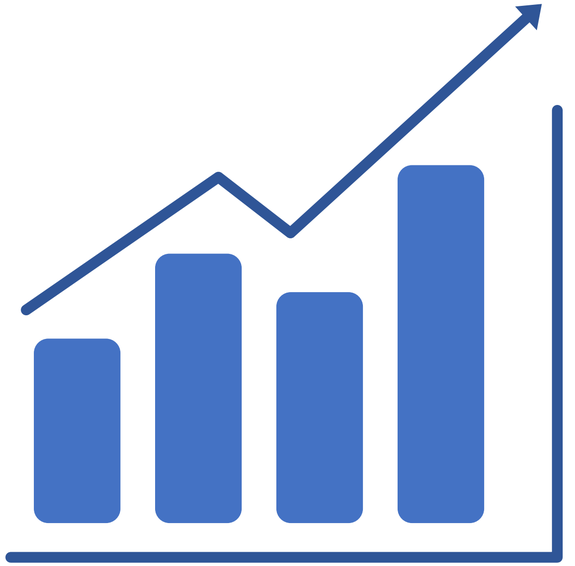
Streaming Statistics Export (SSX)

Streams ASIC statistics at rapid cadence based on user config (can be sub-second)

- Egress-Q-Drops
- Egress-Q-Peak
- Egress-Q-Depth

Direct hardware export

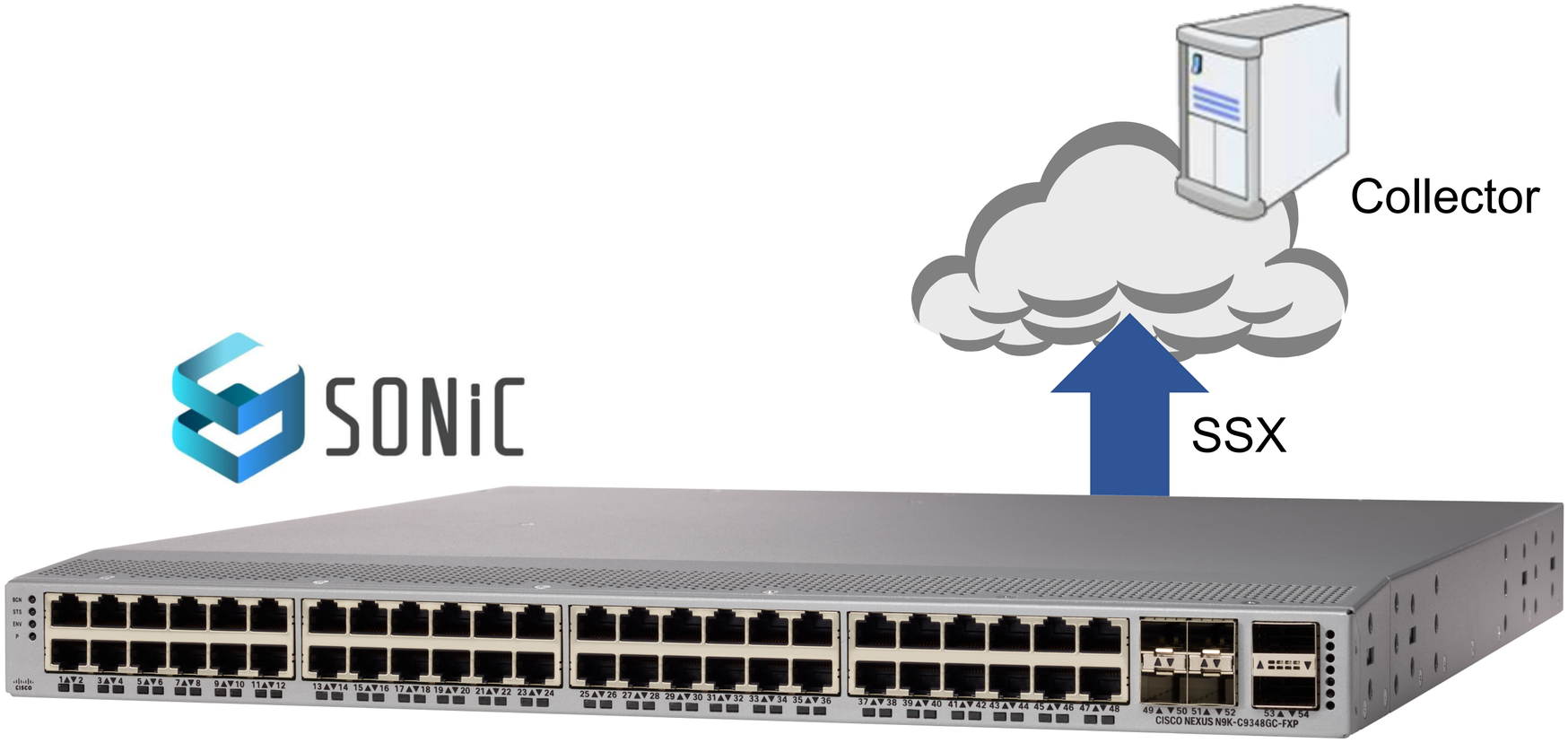
Supported on 9300-FX2 and Nexus 9336C/9364C



SSX Configuration via DTEL

- Leveraging SAIDTEL APIs to program SSX functions on Cloud Scale switch running SONiC
- SSX represents a superset of SAIDTEL functionality
- SAIDTEL is extended to introduce new functionality to support SSX (interval based export)
- Additional SSX functions can be exposed once Telemetry specification finalized

Demo – SSX with SONiC



Nexus 9336-FX2

Open Standards/Open Source Reference

SAI Data Plane Telemetry API

https://github.com/opencomputeproject/SAI/blob/master/doc/DTEL/SAI-Proposal-Data-Plane-Telemetry.md

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