OCP SUMMIT

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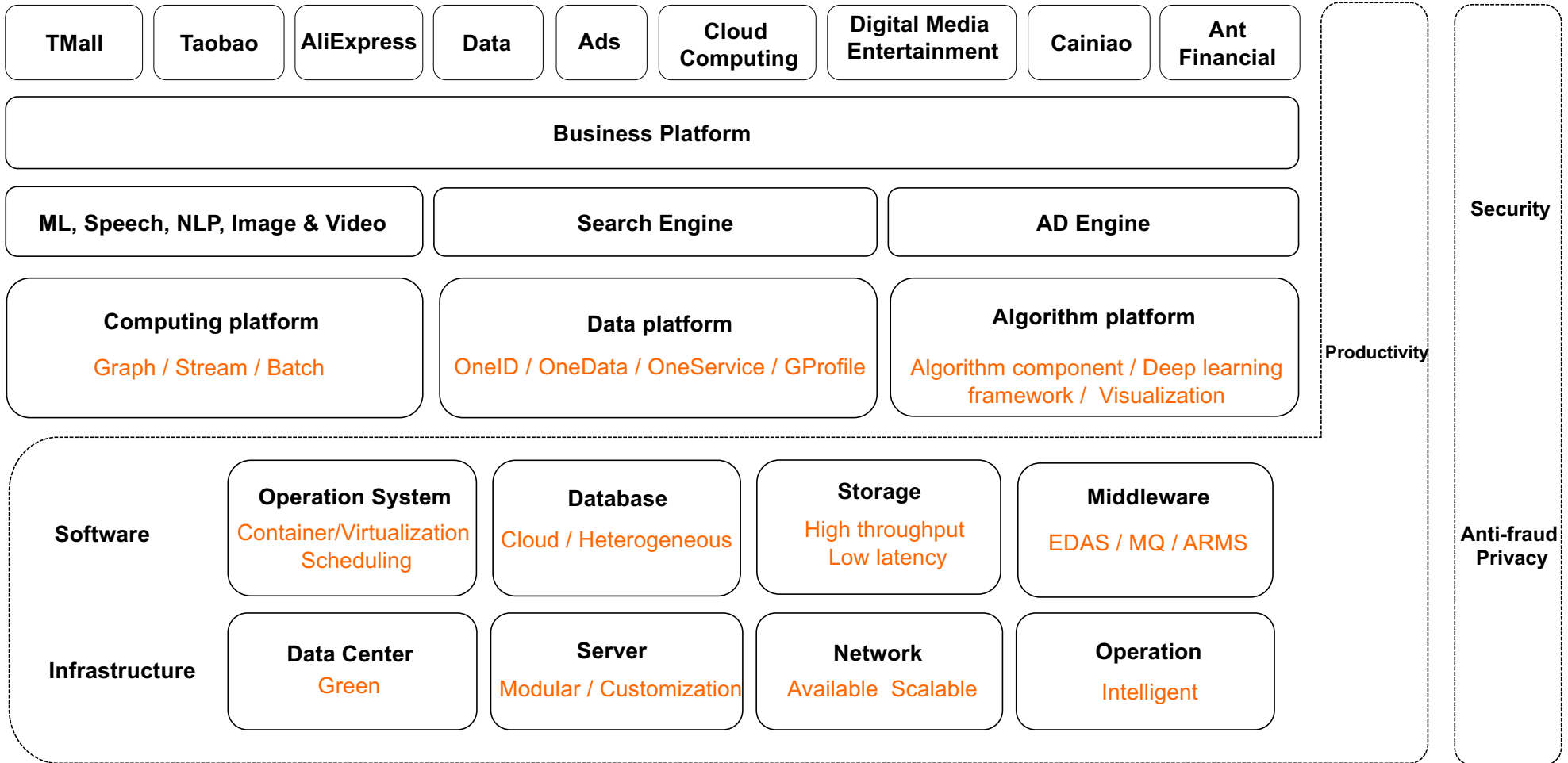
SONiC Development and Deployment at Alibaba

Haiyong Wang

Senior Director

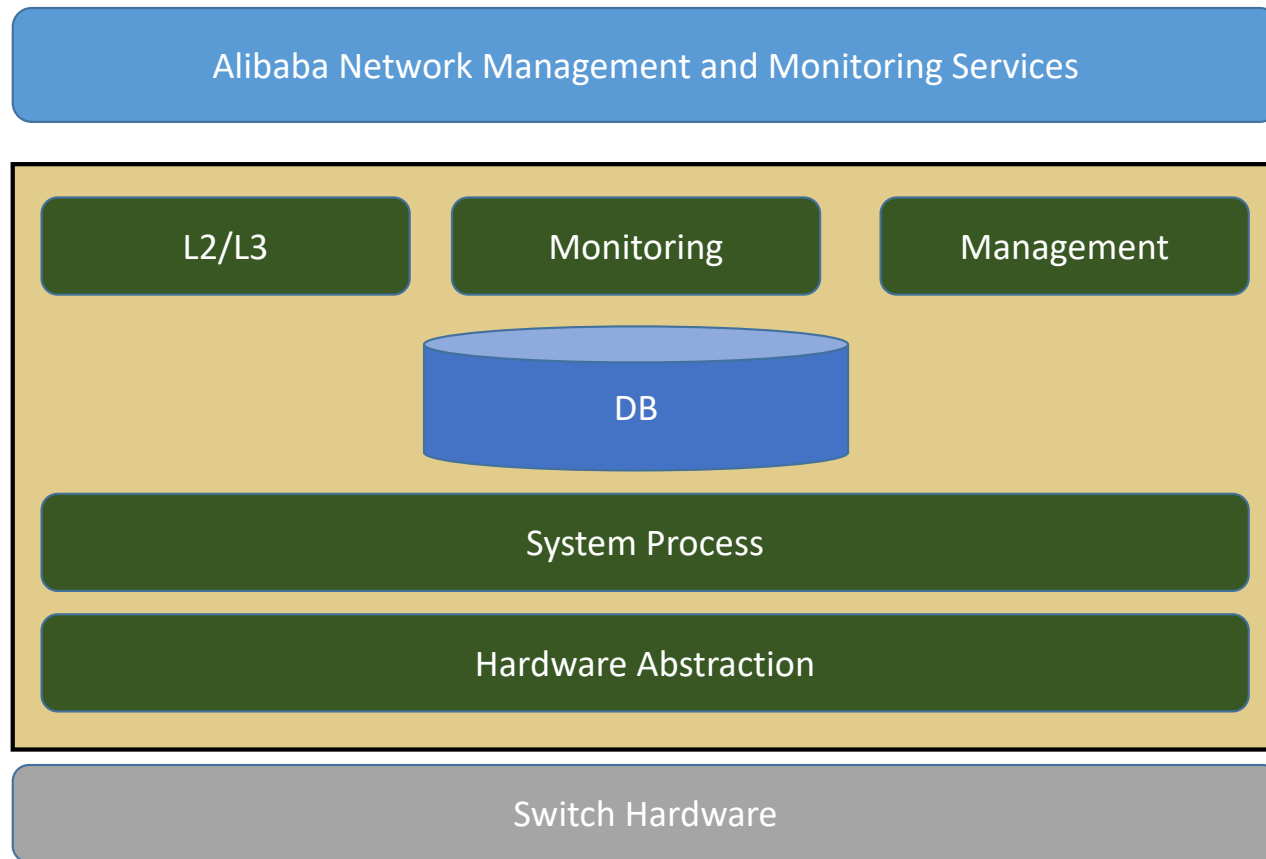Alibaba Group

Alibaba Technology Stack

基础架构事业群
Alibaba Infrastructure Service

TMall	Taobao	AliExpress	Data	Ads	Cloud Computing	Digital Media Entertainment	Cainiao	Ant Financial

Business Platform

ML, Speech, NLP, Image & Video	Search Engine	AD Engine

Computing platform
Graph / Stream / Batch

Data platform
OneID / OneData / OneService / GProfile

Algorithm platform
Algorithm component / Deep learning framework / Visualization

Security

Productivity

Software

Operation System
Container/Virtualization Scheduling

Database
Cloud / Heterogeneous

Storage
High throughput Low latency

Middleware
EDAS / MQ / ARMS

Anti-fraud Privacy

Infrastructure

Data Center
Green

Server
Modular / Customization

Network
Available Scalable

Operation
Intelligent

Alibaba Network OS

Alibaba Network Management and Monitoring Services

L2/L3	Monitoring	Management

DB

System Process

Hardware Abstraction

Switch Hardware

SONiC

- Focus on hyper-scale datacenters

- Open source and vibrant community

- Wide support from ODMs and ASIC vendors

- Linux software and integration

```
root@sonic:/home/admin# docker ps
CONTAINER ID        IMAGE
aa5fa0011f89        docker-dhcp-relay:latest
af3f11ebaa46        docker-syncd-brcm:latest
3e01376893d7        docker-orchagent-brcm:latest
0c96d186c9e8        docker-snmp-sv2:latest
d584c5899762        docker-platform-monitor:latest
109c3850483b        docker-teamd:latest
ef25a4354ee6        docker-lldp-sv2:latest
dc088adf1628        docker-fpm-quagga:latest
b066181f01dd        docker-database:latest
root@sonic:/home/admin#
```

```
root@sonic:/home/admin# ifconfig
Bridge    Link encap:Ethernet  HWaddr 00:05:64:30:73:c0
          inet6 addr: fe80::70b8:ddff:feec:569d/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1173 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1158 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:96600 (94.3 KiB)  TX bytes:112452 (109.8 KiB)

Ethernet45 Link encap:Ethernet  HWaddr 00:05:64:30:73:c0
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

Community Participation

- Announce joining SONiC@OCP community at ONS 2017
- Expand ODM and ASIC vendor SONiC@OCP support
- Lead SONiC adoption in China
- Major contributor to SONiC

Feature Contribution

Release	Release Date	SAI version	Features Included
SONiC.201712	12/15/2017	1.0	SONiC Support SAI 1.0
			Fast Reload
			ConfigDB framework
			TACACS+
			LACP Fallback
			MTU Setting
			Vlan Trunk
			Dynamic ACL Upgrade
			SWSS Unit Test Framework

- Special thanks to
  - o Alibaba team for contribution on: VLan Trunk, TACACS+, MTU Setting, LACP Fallback
  - o Mellanox team for contribution on Dynamic ACL Upgrade
  - o LinkedIn and community on meticulous design reviews
  - o Microsoft team for contribution on: SONiC Support for SAI 1.0, Fast Reload, ConfigDB framework and SWSS Unit Test Framework
  - o ASIC partners to provide SAI 1.0 support
  - o Platform partners to for platform driver support
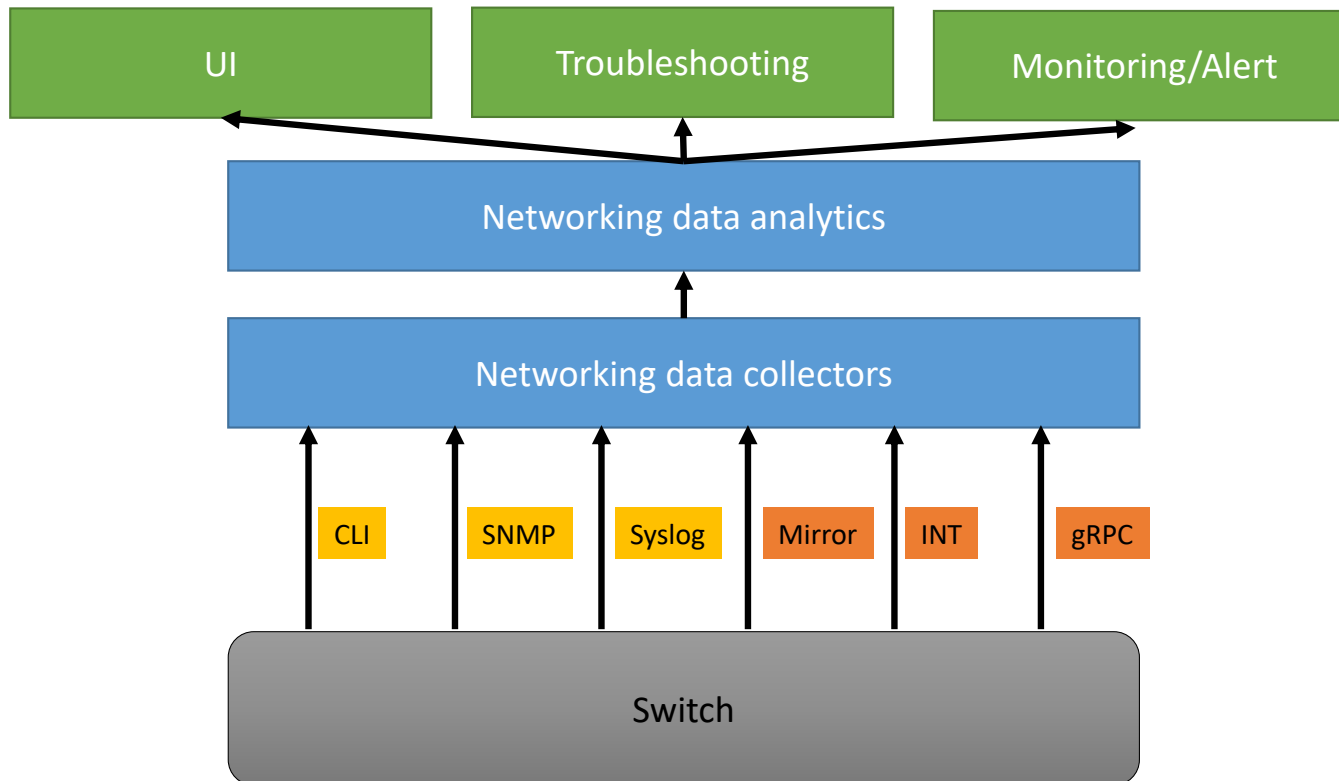
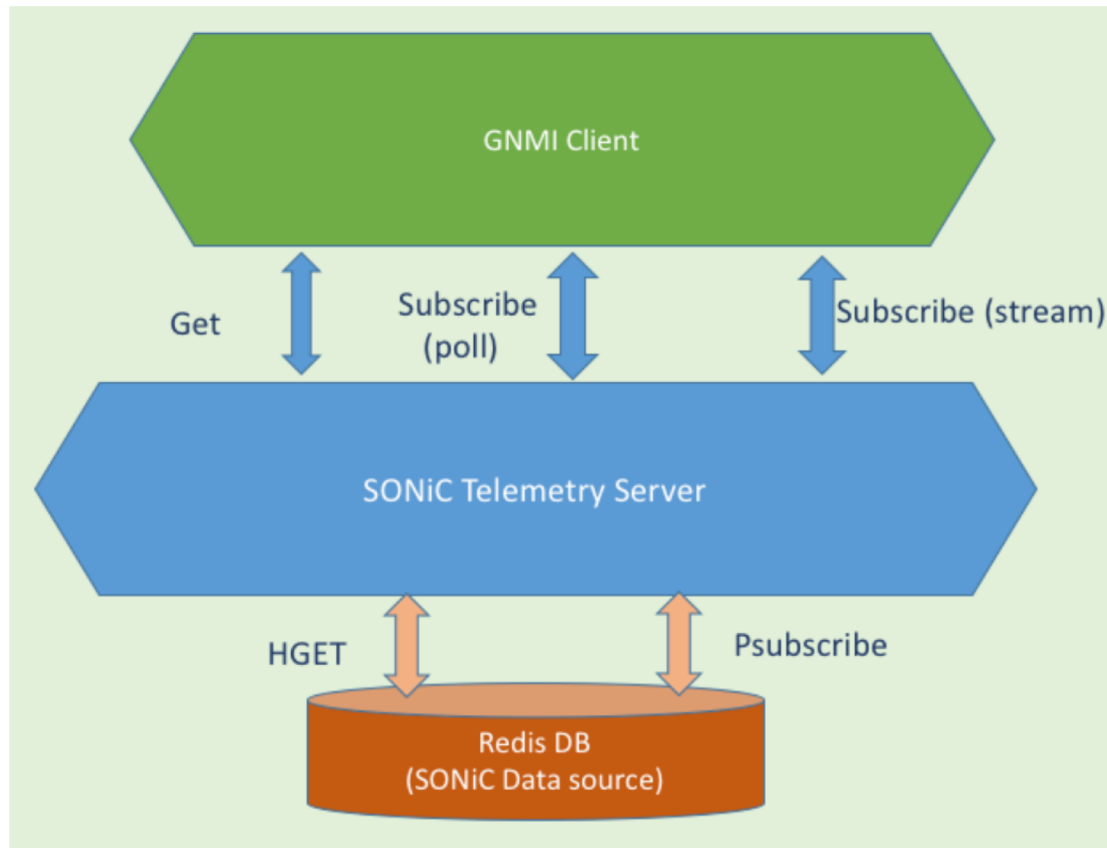# Alibaba Network OS

Support dual uplinks
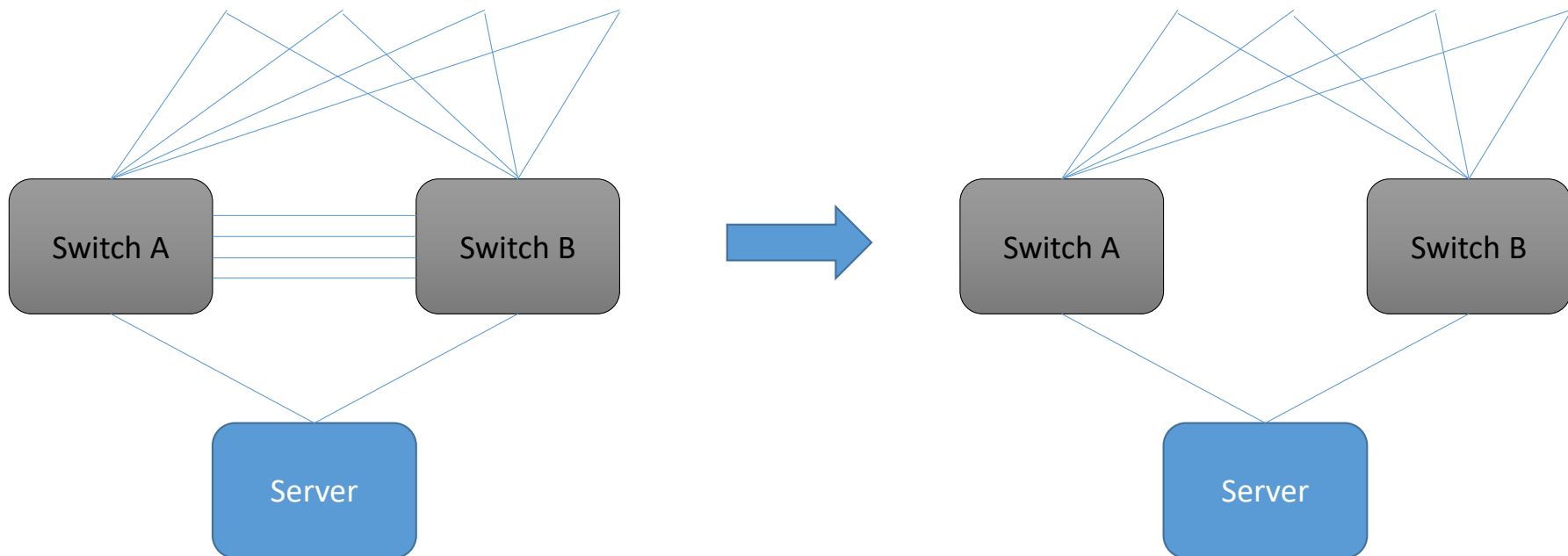
BGP Enhancements

- Announce low priority routes for graceful device restart
- RFC7911 enhancement to support multipath advertisement
- Enable ECMP member de-active on data plane before route removal
- Replace periodic timer with event trigger for faster response and lower CPU

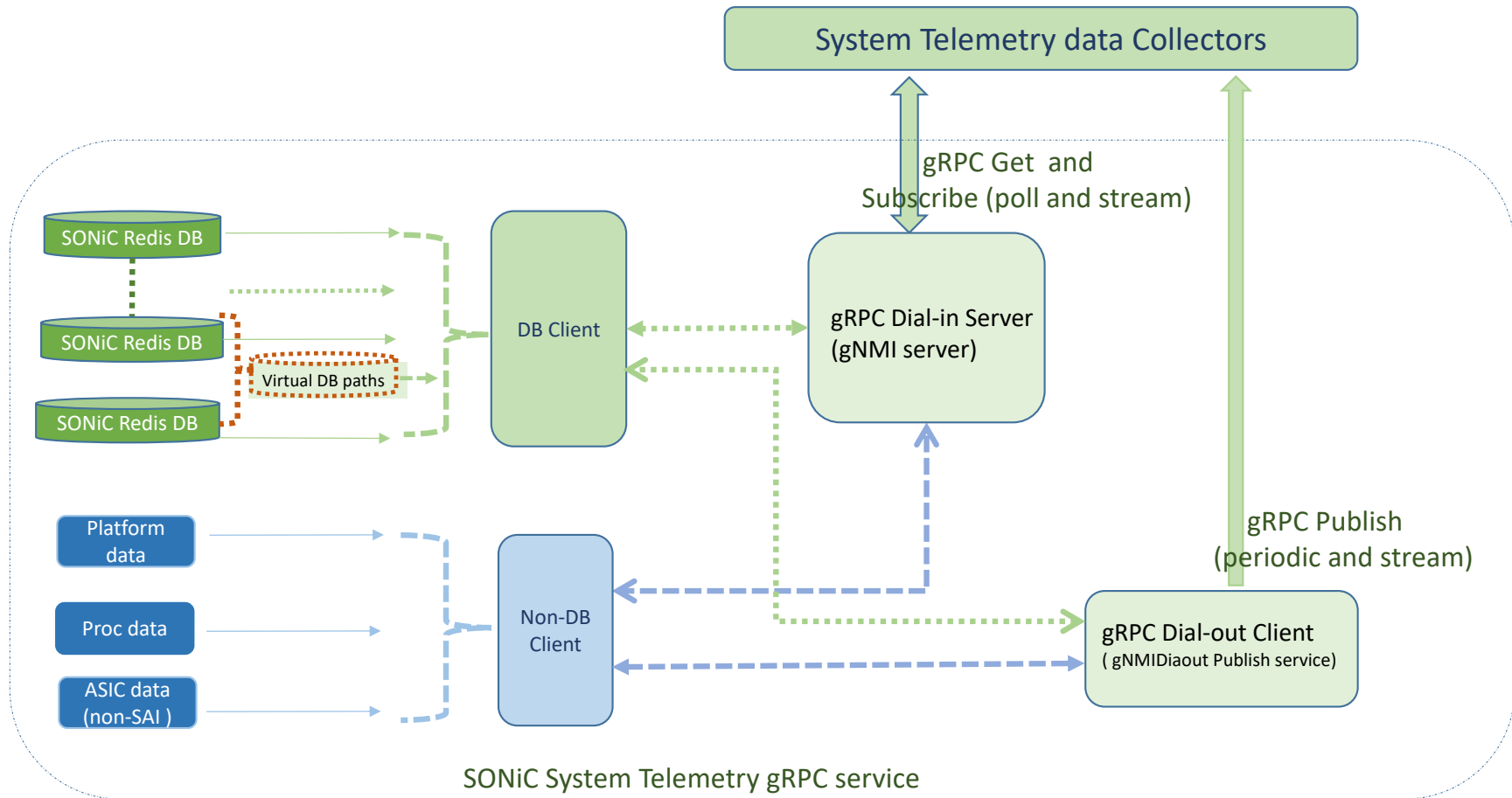# Networking Telemetry

Telemetry via gRPC

Efficient collection stack
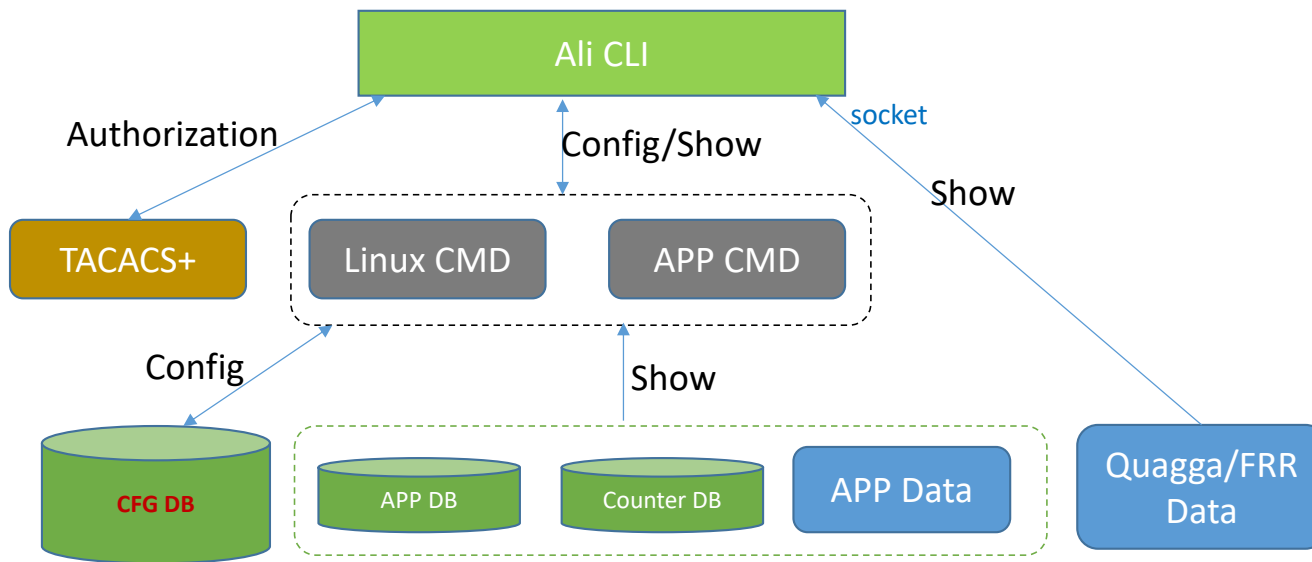
Change only mode

Push instead of poll

gRPC Architecture

gRPC Performance

Unified CLI for Operation

Get Ready for Production

- Feature development and customization
- Testing
  - Automate regression with Robot framework
  - Add test topology to align with Alibaba network architecture
- Operation
  - Integrate with network management and monitoring systems
  - Customized zero touch provision
  - Unified CLI for network operation team

Alibaba Data Center Network Deployment
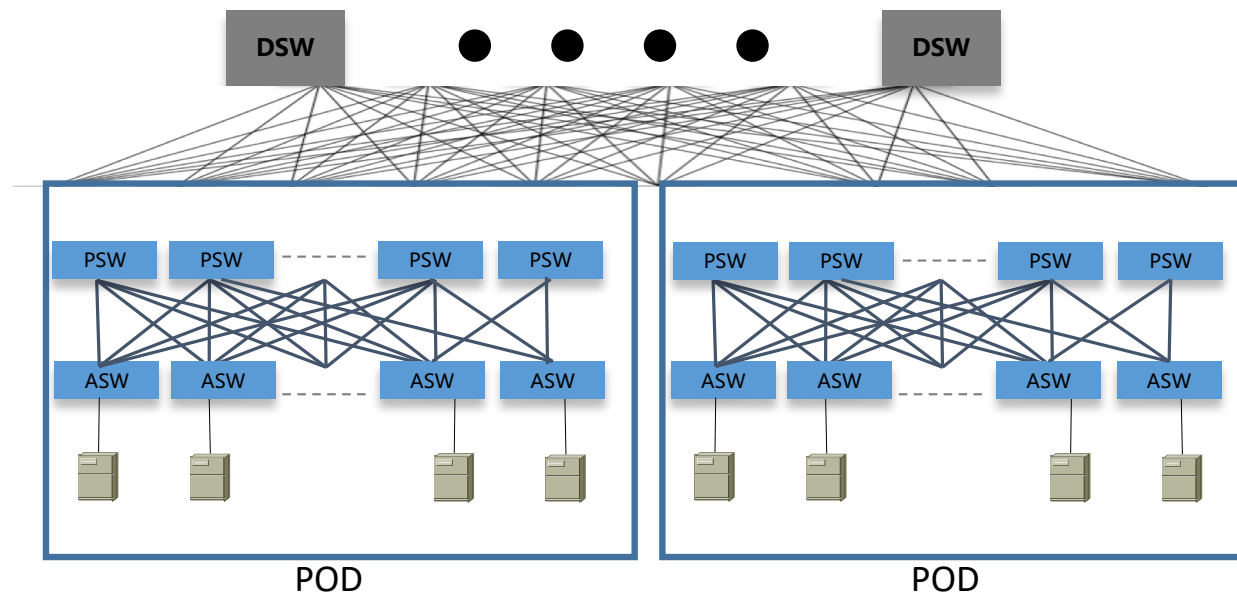
48 * 25G + 16 * 100G

32 * 100G

64 * 100G

Challenges

- Multi-vendor hardware troubleshooting
- Interoperability of INT metadata across multi-vendor devices

Summary

- Alibaba has became a key contributor to SONiC community
- Tremendous progress of developing and deploying NOS at Alibaba
- Future work
  - 10X deployment scale
  - Expand to more device roles
  - Programmable network

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