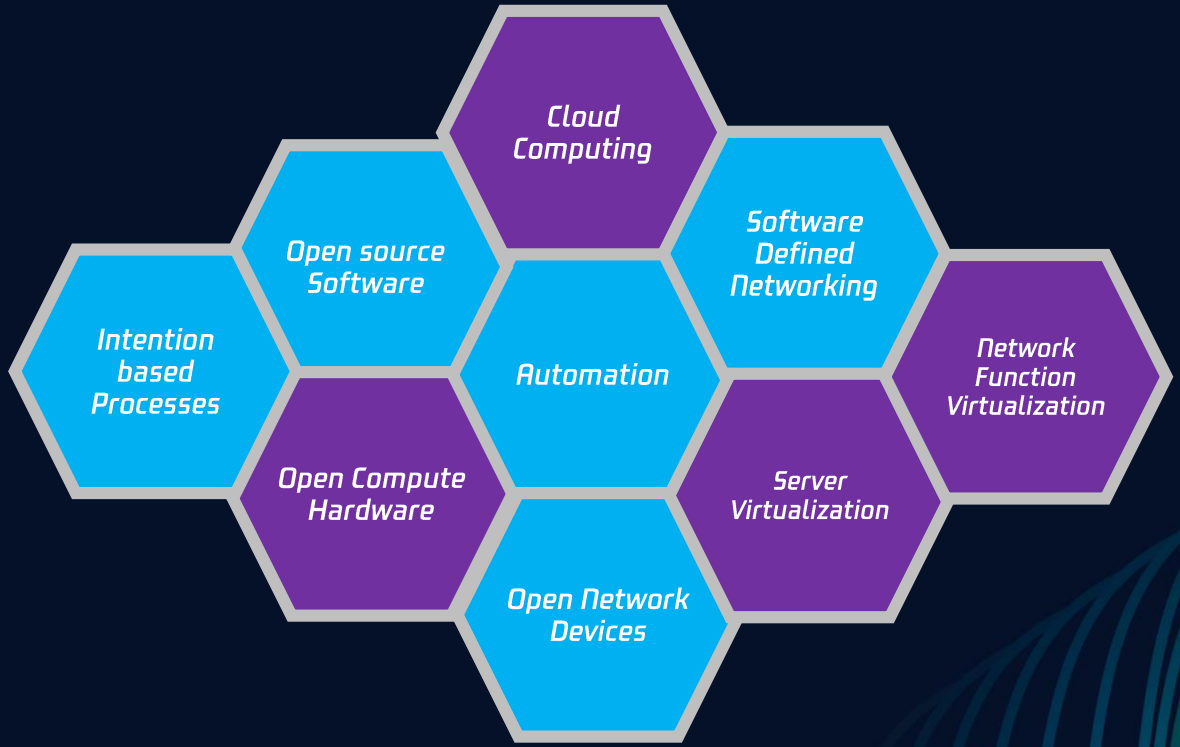
Tencent | Tencent Cloud

Open DCN networking

Andrew Qu

2019.01.15

Open Networking @ Tencent



Open Networking Ecosystems @ Tencent

Open source Software

Open/R

GoBGP

FRROUTING

BIRD

Software Defined Networking

STRATUM

OPENDAYLIGHT

openstack.

P4

Co-development

Automation

Intention based Processes Automation

RED HAT ANSIBLE

rConfig™ NETWORK MANAGEMENT

Batfish

MiniNet

StarlingX

influxdb

Grafana

APACHE kafka

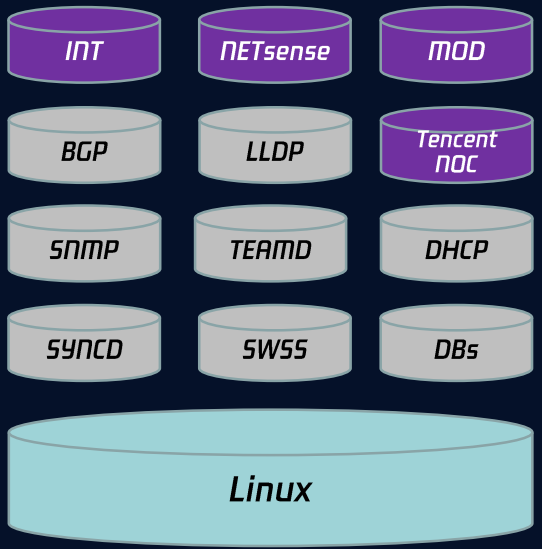
Open Network Devices

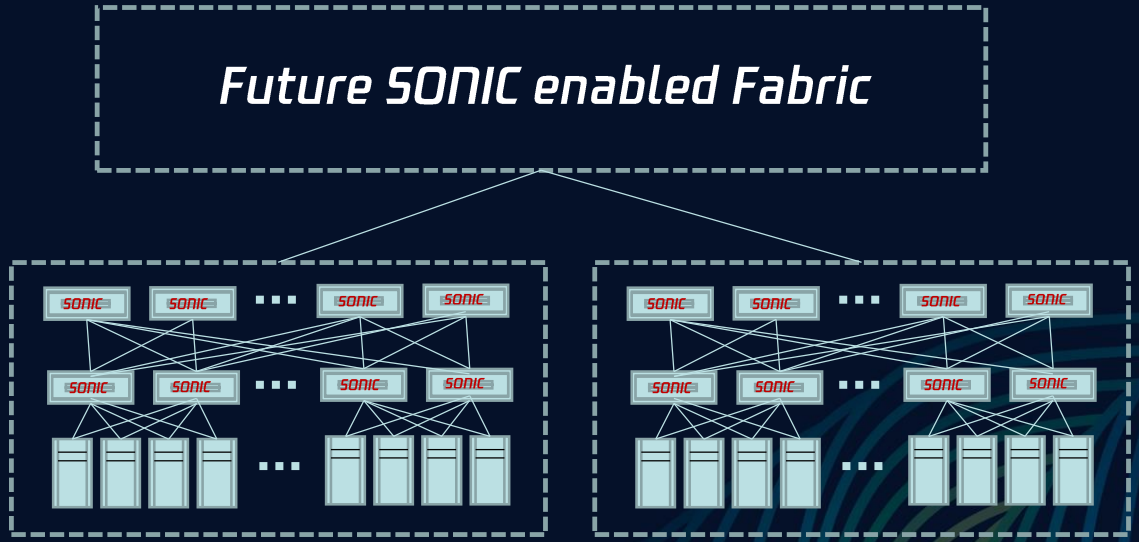
opendatacenter.cn

OPEN Compute Project

Tencent DCN Open NOS: SONiC

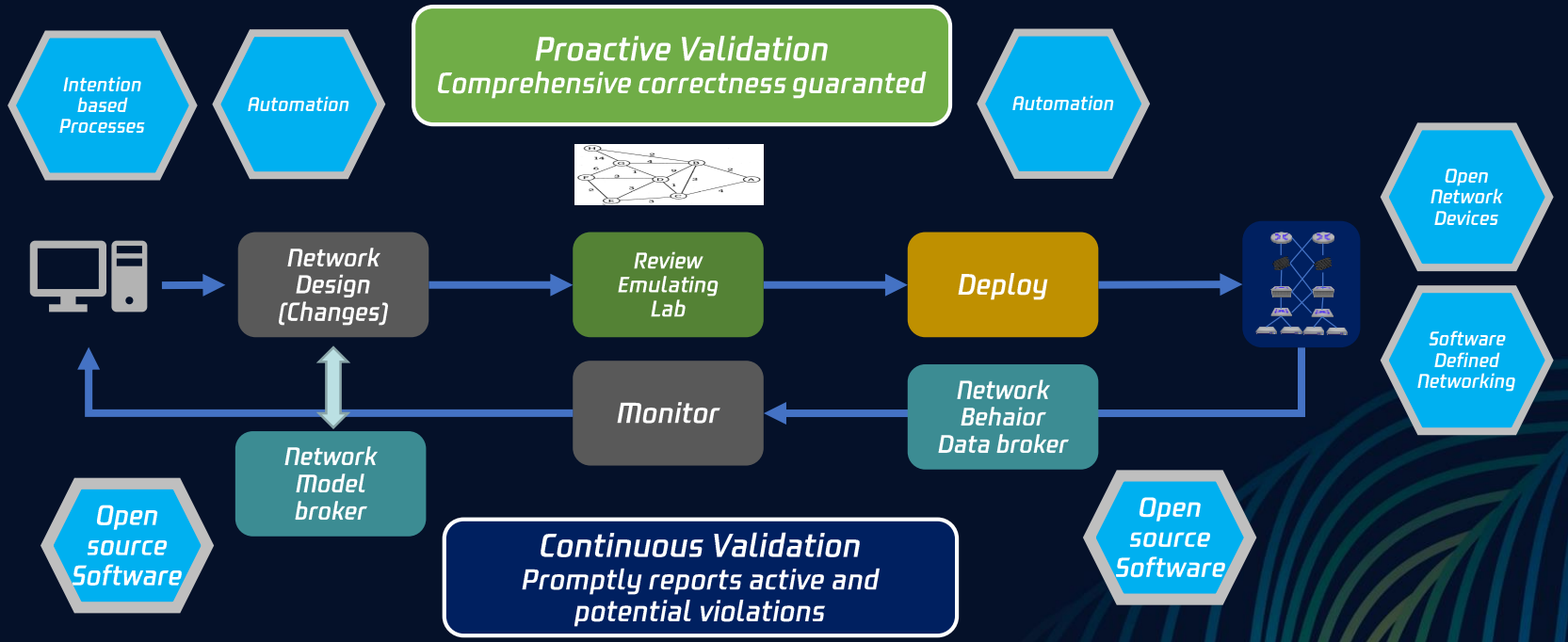
Open source Software





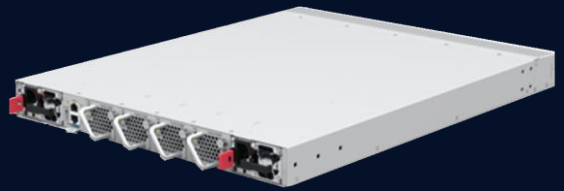
2019

Tencent open DCN networking in making

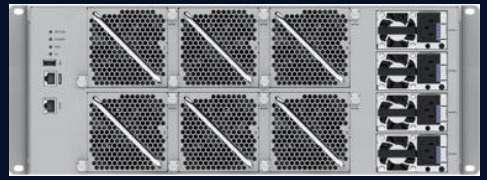


Tencent DCN Open Switches

Open Network Devices



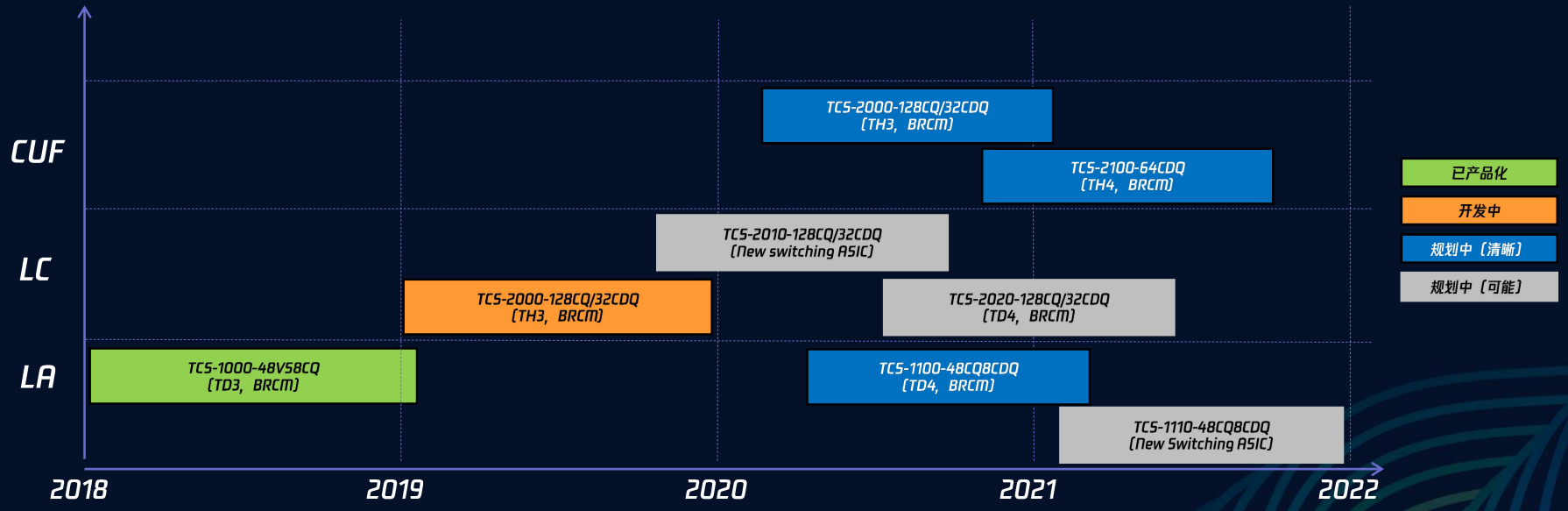
- Front panel 48*25G+8*100G;
- 3+1 Fans, 1+1 PSUs;
- ASIC: BCM56873 (TD3)
- Selected Cage、PSU、FAN;
- Selected CPU: Intel D-1527;
- Dual: BIOS、Dual BMC image;
- Optical Module Init Process;
- I2C architecture、
- UART customization;



- 4U, Horizontal, Pluggable;
- 100G or 400G Line cards,
- 100G and 400G LCs ;
- 5+1 PSUs, 2+2 Fans;
- ASIC: BCM56980 (TH3)
- Trident4 considered;
- Selected Cage、PSU、FAN;
- CPU: Intel D-1527,
- Dual BIOS、Dual BMC image
- I2C architecture、
- UART customization

Tencent DCN Switch roadmap

Open Network Devices



- LA/LC: Initial deployment in 2019, more afterwards

Tencent DCN: Open Optical module

Open Network Devices

► Certification Process/Lab setup

Background checking
- Stability in resource
- Historical shipment record
- Capacity in production
- Shipments
- System issue record

Module device analysis
- DPA Analysis
- Module performance test
- Reliability
- Long fiber test

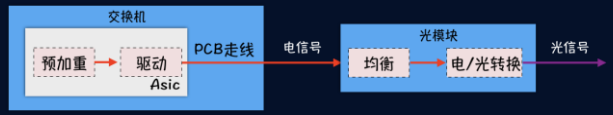
Interoperability
- Between Vendors
- Long fiber test

Systems Test → EFT → MP

Under Designed situation;
System tests;
Stress tests with various factors;

► Major problems

► Interoperability

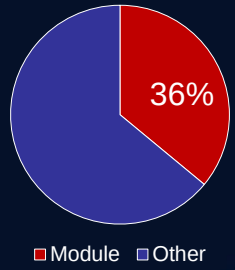


Risk in compatibility of high speed electrical signal: Between ASIC PHY and the Optical module, SERDES signal degradation via PCB could be severe , which causes jitter, hence the error in decoding

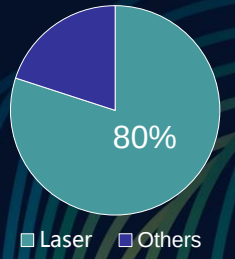
Other problems are like: System flaw in shipments, Switch hardware failure in shipments、Software patch caused issue, more specifically, these issues are hard to find in early testing cycle。

► Reliability

Tencent现网故障统计



Tencent光模块问题分类



Tencent DCN: Open Optical module

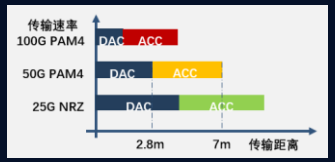
-- Next Generation consideration

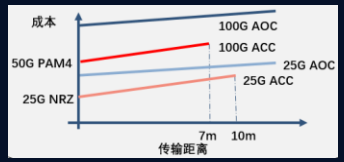
Open Network Devices

► Architecture evolution

► 100G/400G ODM Tencent spec Modules

✓ Low cost 100G ACC technology:

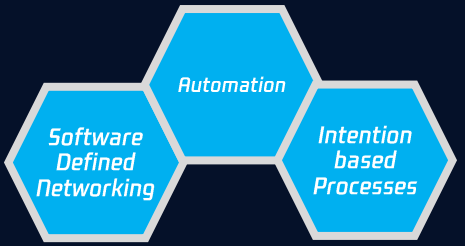


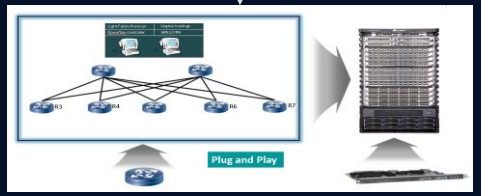


✓ Silicon Photonic 400G eDR4:

THANKS

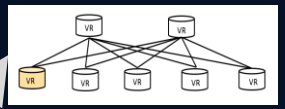
Tencent open DCN networking in making





Domain Network Controller

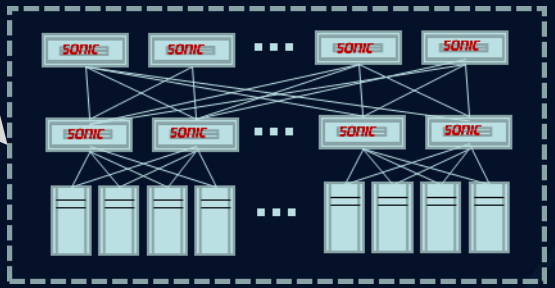
Network Emulator



Network Policy Checker

Network models

Analysis engine

Certifications:
- All devices are password protected

Violations:
- Subnets of Leaf-1 and Leaf-3 cannot communicate
- rtr-y failure reduces availability