A-CORD (Analytics for CORD)
WHAT IS CORD?

Central Office Rearchitected As Data Center
Domains of Use: Residential, Mobile, Enterprise
A-CORD is a part of the Platform Core
A-CORD is about ANALYTICS, TELEMETRY, and CONTROL in a cycle:

1. **ANALYTICS**
   - **Publish**
2. **TELEMETRY**
   - **Collect**
3. **CONTROL**
   - **Execute**
4. **ANALYTICS**
   - **Decide**

This cycle represents the process of using data analysis (ANALYTICS) to inform the collection of telemetry data, which is then executed to make decisions and further analyze data.
A-CORD High Level View

- **Analytics Engines**
  - Real-time Analytic Apps
  - Diagnostic Analytic Apps
  - Security Analytic Apps

- **Telemetry-as-a-Service**
  - Service Controller (XOS)
    - Programmable Observability
      - Configuration
      - Collection
    - Data Storage
      - TSDB

- **Programmable Probes**
  - Enterprise Metro Ethernet
  - BBU (Multi-RATs)
  - PON OLT MACs
  - VNF
  - VNF

- **CORD Orchestration Platform**

- **Change Observability**
  - Control Decision

- **Control**
Programmable Probes: Fabric Switches

**Work in progress for P4 INT**

*sFlow* - Packet Samples

**BroadView**
- ingress-port-priority-group
- ingress-port-service-pool
- ingress-service-pool
- egress-cpu-queue
- egress-mc-queue
- egress-port-service-pool
- egress-rqe-queue
- egress-service-pool
- egress-uc-queue
- ...

**OpenFlow Probes/Metrics**
- switch.port.receive.packets
- switch.port.transmit.packets
- switch.port.receive.bytes
- switch.port.transmit.bytes
- switch.port.receive.drops
- switch.port.transmit.drops
- switch.port.receive.frame_error
- switch.port.receive.crc_error
- switch.port.receive.overrun_error
- switch.port.receive.underrun_error
- switch.port.transmit.underrun_error
- switch.port.transmit.underrun_error
- switch.table.active.entries
- switch.table.lookup.packets
- switch.table.matched.packets

**Fabric Control App Events**
- TBD

**OF-DPA**
- Promotion

**BRCM ASIC**
- OCP Bare Metal Hardware
Programmable Probes: Service VNFs and NFVI

Service Level Events
vSG
- vsg_dns_cache_size
- TBD

vMME
- TBD

vBBU
- vbbu_power_level
- TBD

Infrastructure Metrics
- instance_cpu
- instance_vcpu
- instance_memory_usage
- instance_network_incoming_bytes_rate
- instance_network_outgoing_bytes_rate
- instance_disk_usage
- instance_create
- instance_delete
- hardware_ipmi_node_cpu_util
- hardware_ipmi_node_mem_util
- hardware_ipmi_node_io_util

Virtual Tenant Networking
- App Events
  - TBD

OpenFlow Probes/Metrics
- From Virtual Network Switches
  - TBD
A-CORD Roadmap

Upgrade all current A-CORD services to the CORD 4.1 release

Integrate P4 INT enabled Trellis to A-CORD

Integrate A-CORD and ONAP DCAE including VNF onboarding alignments.

Move from unstructured to structured telemetry data combining data models from OpenConfig, VES and ETSI.

Create an hierarchical multi-collector architecture with dynamic collector and probe instantiations

Create a programmable SD Collector architecture along with SD Collector development guidelines and SD Collector SDKs.

Create vProbe development guidelines and vProbe SDKs.
What is coming up? – Multi Layer Loops

ACORD MAIN COLLECTOR

ACORD COLLECTOR Loop 1

ACORD COLLECTOR Loop 2

ACORD COLLECTOR Loop 3

ACORD COLLECTOR Loop 0

vProbe

Signalling

Data

White Box

NIC

Chip

Multi Loop App

Multiloop App Agent
What is coming up? – SD Collectors

SD Collectors

Analytics APP

Policies

Program

L4-Collector Application Probes
L3-Collector Control / Orchestration level
L2-Collector Server/ Switch Level
L1-Collector Board Level
L0-Collector SOC Level

AI

Self Driving Networks
Monitor packet loss and throughput parameters for specific switch / port

Analytics App

Grafana

OPTSDB

Receiver

Subscribe

P4 INT Probe

gNMI

gRPC/PB

L0 Collector

gNMI

gRPC/PB

L1 Collector

gNMI

gRPC/PB

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Subscribe

Monitor packet loss and throughput parameters for specific switch / port.
Demo - 2 VES and ONAP DCAE
Demo - 2 VES and ONAP DCAE
Demo - 2 VES and ONAP DCAE

Apps

DMaaS

REST/JSON

VES collector

MODEL VALIDATION
TOPICS ROUTING

REST/JSON

VES Event simulator

GENERATE EVENTS:
SYSLOG
STATE CHANGE
MOBILE FLOW
FAULT
HEARTBEAT
OTHER
Get Involved!

1. join Weekly Meetings, every Monday 09:30 PST
2. Join our mailing list analytics@opercord.org
3. Join us on Slack
Thank you!

CONTACT

Bora Eliacik bora.eliacik@netsia.com

Tom Tofigh mt3682@att.com