O-RAN E2AP implementation in OAI
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O-RAN Architecture
SD-RAN Solution

Interoperability, QA, tooling, releases, certification

ONF xApps
SDK

3rd party xApps
SDK

μONOS nearRT RIC

RU

Vendor A
CU-C
CU-U
DU

Vendor B
CU-C
CU-U
DU

100k+ UEs
ONF RAN Simulator

Non RT RIC
Orchestrator
Mobile Core

ONF RAN
CU/DU + E2
SD-RAN Component: CU/DU/RU & UE
E2AP & E2SM

- E2AP defines the general protocol by which the nRT-RIC and disaggregated E2 Nodes communicate.
  - Action Types: Report, Insert, Policy, Control
- E2SMs are “contracts” between an xApp and the E2 Node. They define function specific protocols that are implemented on top of the E2AP specification.
- The implementation of a given E2SM on the gNB side requires explicit feature and interface development / stack enhancements
- E2AP & E2SM-KPM support added to OAI
App requests for CU-CP stats

1. E2 node makes SCTP association with RIC

2. E2 node sends E2AP Setup Request with KPM SM Ran Function

3. RIC sends E2AP Setup Response with Accepted Ran Functions

4. RIC sends E2AP Subscription Request for Target Ran Function with Event Trigger and Action Type Report

5. E2 Agent accepts with E2AP Subscription Response

6. E2 Agent generates periodic Indications of Type Report with CU-CP KPM IEs

7. RIC delivers reported data to app
SD-RAN v1.0

SD-RAN on hardware

- **RIC**
- **KPM xApp**
- **SDK**
- **onos-topo** (R-NIB)
- **UE-NIB**
- atomix
- **onos-cli**
- **onos-e2-sm**
- **onos-e2t**
- **O1t** (onos-config)

**RAN in a Box**

- **RIC**
- **KPM xApp**
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**E2AP over ASN.1/SCTP**

**OMEC**

**UE (OAI)**

**USRP+NUCs**

**OMEC**

**RanSim**

**NI/KPM/++ SMs**

**SDK**

**RanSim**

**OMEC**

**KPM SM**

**KPM SM**

**E2/ CU-C**

**E2/ CU-C**

**E2**
Hardware Setup
SD-RAN Dev/Test: sdRan-in-a-Box (RiaB)

OAI version
Thank You

https://opennetworking.org/sd-ran/