

# Status report 2019-09-10

## E2 (making lots of assumptions (using ORAN-WG3.E2GAP) and to be adapted as WG3 defines details)

The near-RT RIC platform is implemented as per WG3's E2 General Aspects and Principles (ORAN-WG3.E2GAP), e.g.,

- It is assuming that xApps use services exposed by E2 nodes via E2SM models,
- Independent transport function within RIC platform (RIC message routing (RMR) over TCP using nanomsg next generation) versus E2 transport function (STCP, IPv4/IPv6)
- Each E2 node having 0..1 RIC connections and each RIC having 0 to many connections to E2 nodes
- RICP implements routing of messages from E2 termination to xApps or to E2 manager (managed based on subscription IDs in messages received via E2), ...
- Can be used in scope of RRM, e.g., to "monitor, suspend/stop, override or policy the behavior of E2 nodes"
- Re-uses interface management procedures from 3GPP RAN interfaces.
- Implements
  - "E2 insert messages" interrupting processing on E2 node (E2 node -> RIC),
  - control messages (RIC->E2 node),
  - information report messages not interrupting processing (E2 node-> RIC),
  - E2SM policy management (RIC -> E2 node)
- Supporting setup (currently initiated by RIC), reset of E2 connections, configuration update via E2.
- Supporting simple key-value database APIs based on Redis key-value store.
- Supporting a high-level API for accessing E2-learned configuration data of the E2 node (such as a list of cells by E2 node).

## O1 (making lots of assumptions and to be adapted as WG defines details)

- Trying to re-use open-src projects:
  - Logging via stdout/stderr caught by container platform and processed via fluentd
  - Tracing as processing involves multiple micro-services: based on opentracing+Jaeger
  - Statistics from xApps collected via Prometheus and, for now, adaptation with ONAP's VES protocol.
  - very simple config management (via REST API) for xApps based on name-value pairs exposed to xApps via updatable Kubernetes ConfigMaps
- LCM via xApp manager providing REST APIs (deploy, undeploy, list, (re-)configure)

## A1 (making lots of assumptions and to be adapted as WG defines details)

- No alignment on A1 and current placeholders are two options: (A) A1 mediator (translating REST API control messages into RIC-internal messages to xApps) and (B) API gateway proxying/adapting REST APIs declared by xApps
- Discussions with WG2 members, but also others on getting more specific on A1 implementation. WG2 seems to point to REST, which is more aligned with current near-RT RIC assumptions.

## Other

- ASN1 compiler switched to Lev Walkin's open-src "asn1c" with some enhancements to support PER encoding, but current experimental specification "E2 ASN.1 definitions" (and related spec) not publicly available as there is still a discussion ongoing related to 3GPP legal issues and copyright issues (see "Referencing 3GPP Specifications in O-RAN Alliance Deliverables 9-5-2019.pptx" from o-an-sc mailing list) and related to how to provide the information.

## Platform

- Integrated with Akraino Edge Stack project's REC (Radio Edge Cloud) blueprint under TA (Telco Appliance) blueprint family

## Known accepted limitations

- So far, no separate implementation for E2-cp, E2-up, E2-du.
- No alignment with WG on A1 (see A1 section above)
- Limited O1 implementation: Current focus is on giving a framework for xApps how to handle statistics, logging, tracing and very-simple configuration. Basic idea is to implement O1 adapters on top of the open-source services re-used. No alarm management yet.
- Development is continuing, but there is still a discussion on legal aspects ongoing which prevents us to fully switch to LF's open-source repositories for all components.
- CI/CD on top of LF's infrastructure still being worked on, e.g. Package and docker image building in LF already possible. Integration of each repo (as they are cleared) still to be done.
- Poor documentation for xApp developers. Also LF's readthedocs.org integration still being worked on. Eventually preferably near-RT RIC developers need to write RST markup documentation.
- Amber-release-work on HA functionality (connection loss, pod, server/node failures) still ongoing.
- Subscription manager work still ongoing (e.g., no subscription delete yet)

## Next steps

- Finalize Amber release work
- Define B release content based on Amber leftovers, WG output (focus A1, O1?), and general development goals, better documentation