LF NETWORKING

LFN Developer & Testing Forum

Supporting O-RAN A1 Policies

Test & Demo using Non-RealTime RIC functions

Automated test & demo environment

Björn Magnusson (Ericsson)
John Keeney (Ericsson)

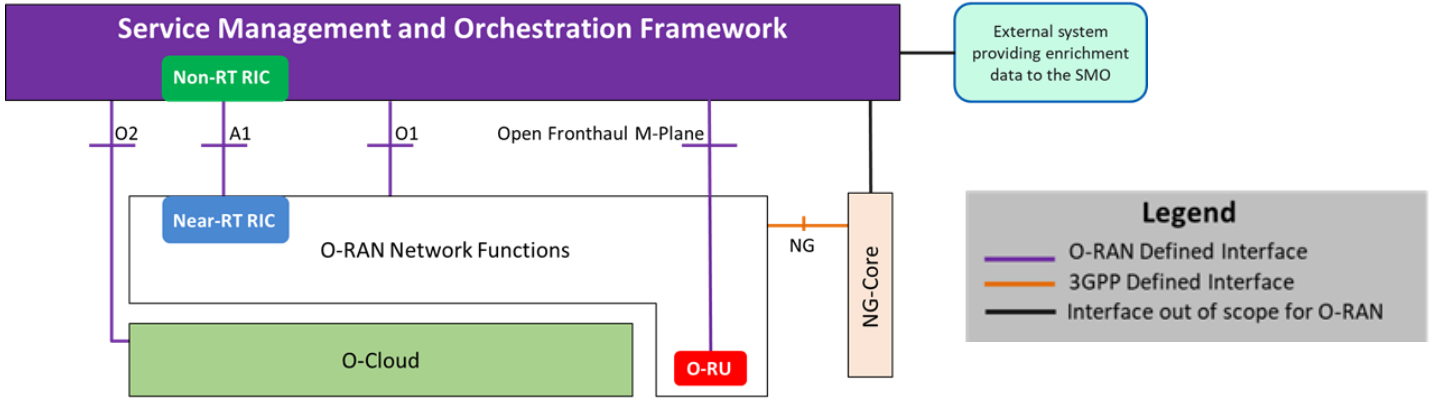
O-RAN ALLIANCE

ONAP OPEN NETWORK AUTOMATION PLATFORM

ERICSSON

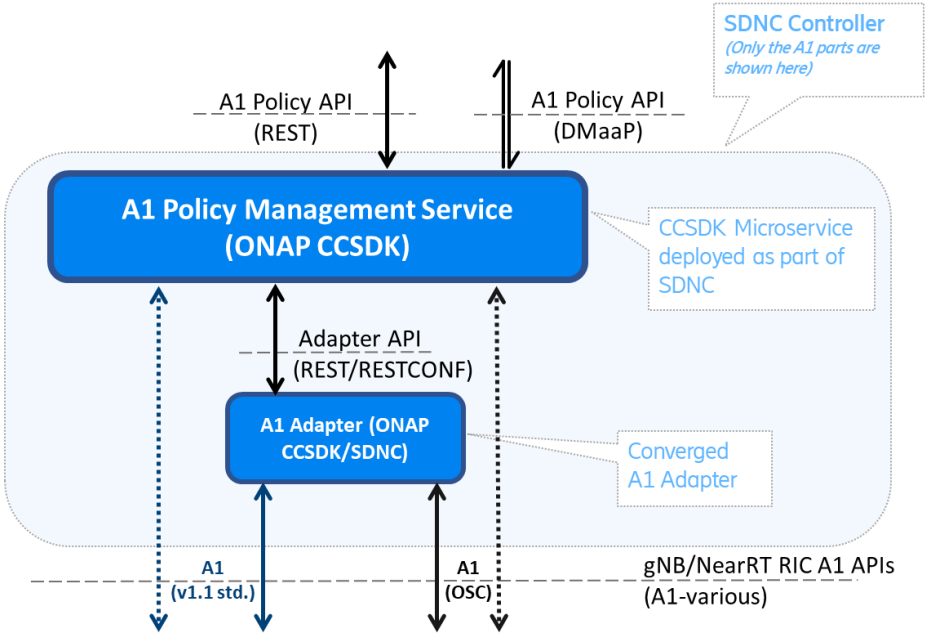
The O-RAN A1 Interface

- The A1 interface connects Non-RealTime-RIC logical function in OAM/SMO layer with the Near-RealTime-RIC logical function in the RAN.
  - A1 interface enables policy-based guidance (“A1 Policies”) to be sent to underlying RAN elements from the management system (“A1-P”).
  - “A1-EI” to pass enrichment information from the management platform to the RAN elements
  - “A1-ML/AI” to assist with ML Model management in the RAN (Still being defined)



A1 Policy Functions in ONAP

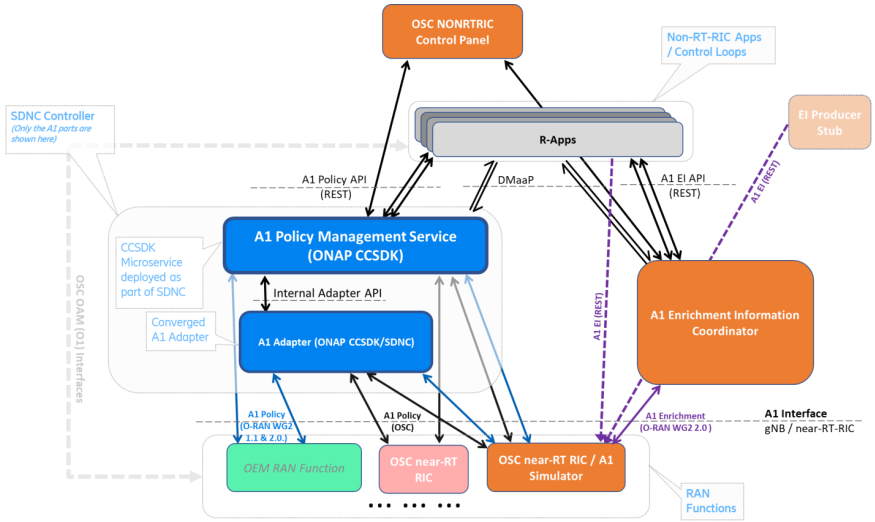
- A1 Adapter
  - A1 REST southbound
  - RESTCONF Northbound
  - Can be included in an any controller based on ONAP CCSDK
- A1 Policy Management Service
  - RAN-wide multi-version management of A1 Policy information
  - Query A1 Policy Types in near-RT-RICs
  - Status/Create/Query/Update/Delete A1 Policy Instances in near-RT-RICs
  - Optional re-synchronization after inconsistencies or near-RT-RIC restarts
  - Unified REST & DMaaP NBI
  - Optionally deploy without A1 Adaptor to connect direct to near-RT-RICs



Non RealTime RIC Functions in OSC

LFN Developer & Testing Forum

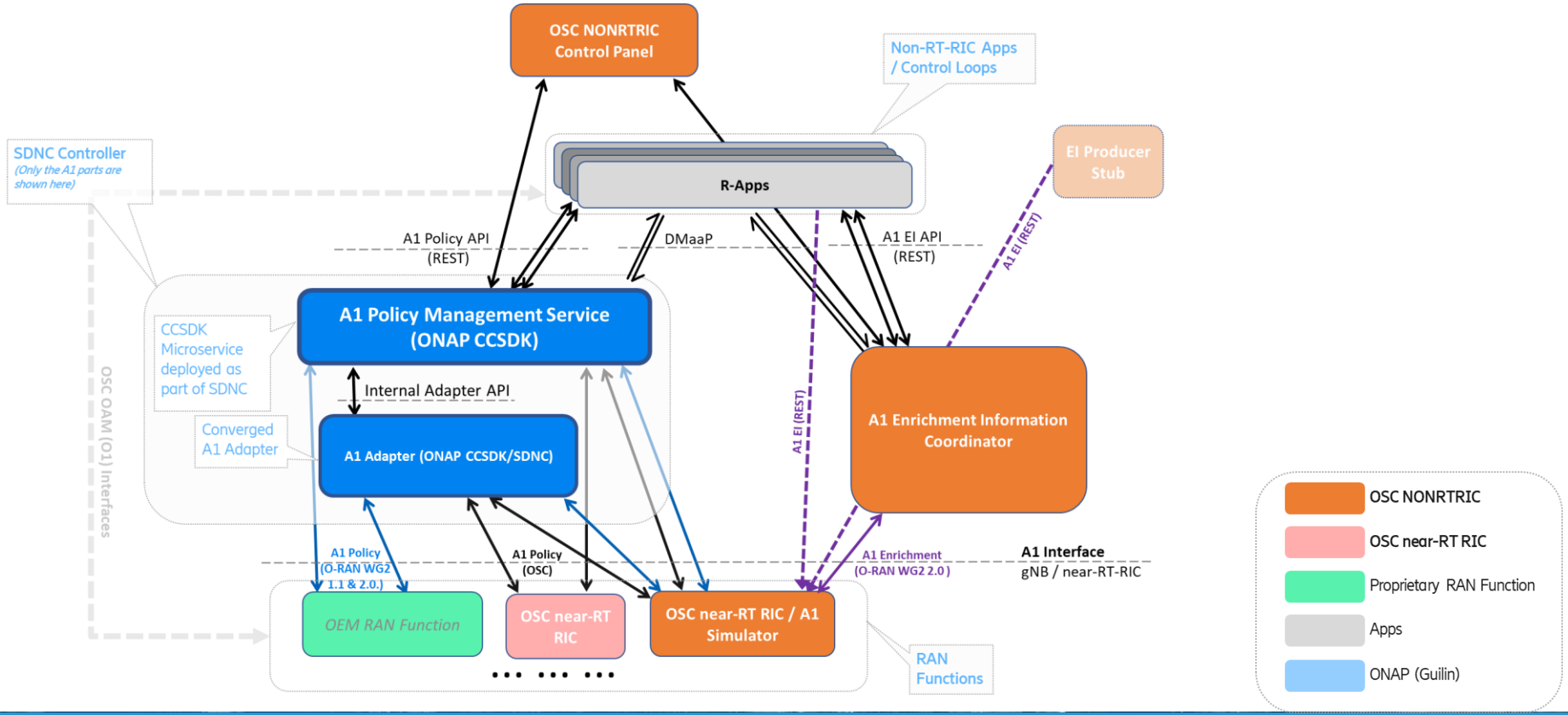
- A1 Enrichment Information Coordinator
  - Registry for A1-EI types, sources, consumers and EI-jobs
  - Includes specifics of requested data (e.g. schema), delivery characteristics, identifier, etc.
  - Provides ongoing EI-Job management, LCM & status information
  - A1-EI Query API
  - Monitors all near-RT-RICs and recovers from inconsistencies
  - A1-EI data/flows pass from management layer to RAN directly
- Non-RT RIC Control Panel / GUI
  - Query A1 Policy Types supported in RAN
  - Model-driven Create/View/Delete/Status of A1 Policy instances
  - View registered A1-EI jobs
- (Initial) R-App Register
  - Registry for rApps / Services in Non-RT-RIC
  - First step towards R-App management
- A1 / near-RT-RIC Simulator
  - Used to create multiple stateful A1 providers (simulated near-RT-RICs)
  - Supports A1-Policy and A1-Enrichment Information
  - Deployment / Configuration API - enables multiple A1 profiles, dynamic metric & status checks, simulator LCM, A1-P & A1-EI consumer/producer management



- A1 Adapter
  - Standalone A1 Controller based on SDNC
  - Also use in combined OSC A1/O1 controller
- A1 Policy Management Service

Non RealTime RIC Functions in OSC

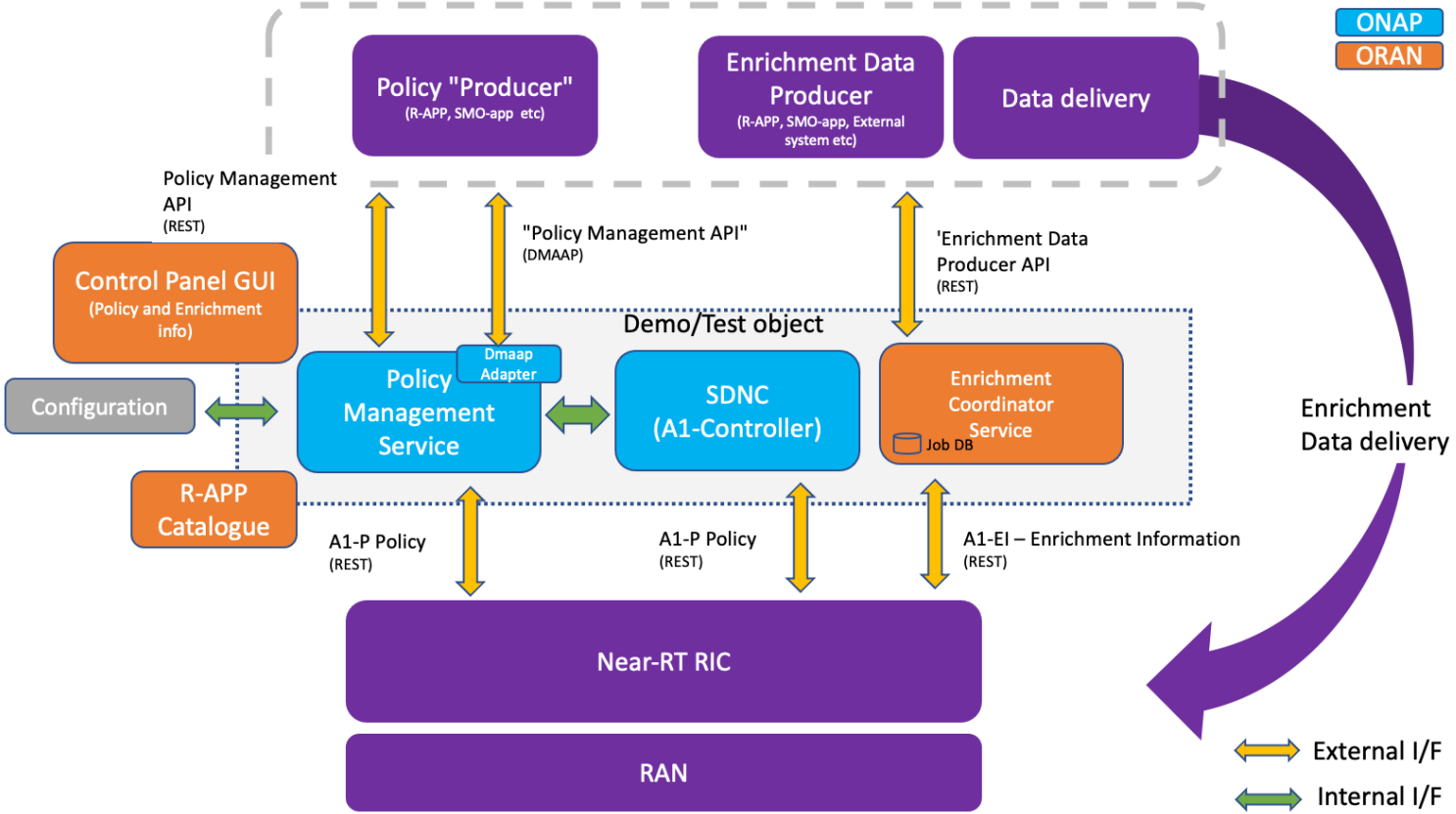
LF NETWORKING
LFN Developer & Testing Forum



Demo contents

- ONAP – Guilin release
  - A1 Policy Management Service (*A1 Policies*)
  - SDNC with A1 Adapter (*A1-P termination/Mediation*)
- O-RAN SC – Cherry Release
  - A1 Enrichment Coordinator Service (*A1 Enrichment data*)
  - Non-RT-RIC Control Panel (*View/Edit A1 Policies & A1 Enrichment Information Jobs*)
  - A1 / near-RT-RIC Simulator (*Terminates A1 Interface*)
  - R-App Registry (*Service Catalog*)
  - (… and other interface stubs)
- Demo – execute an existing test case
  - Spin up a new simulated environment - currently docker based
  - Add some A1 Policy types, Enable/Define some A1 Policy Types, Create/Deploy some A1 Policies
  - Register an A1 Enrichment Information producer and create jobs to send data to the consumer (simulator)
  - Register a new R-APP

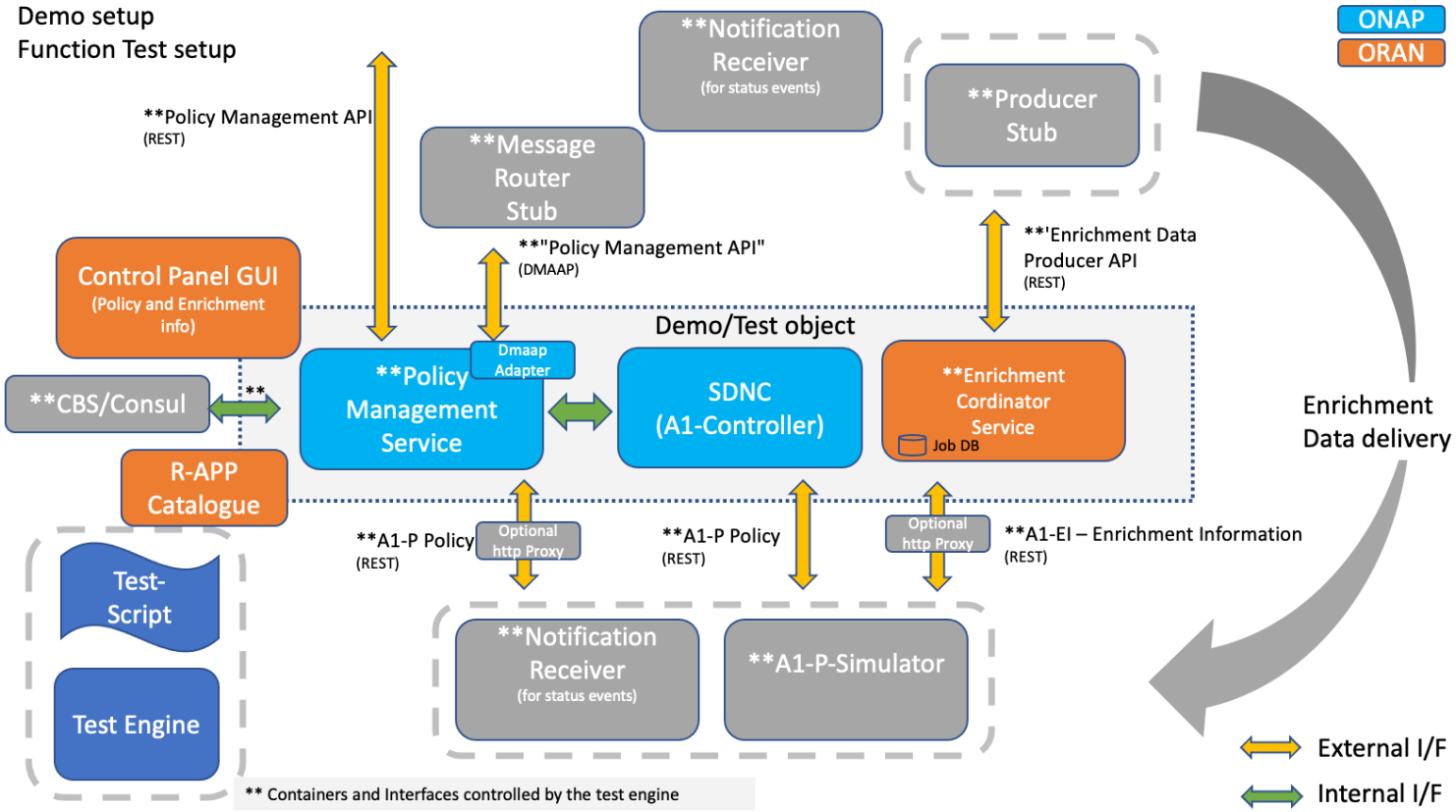
Test/demo architecture



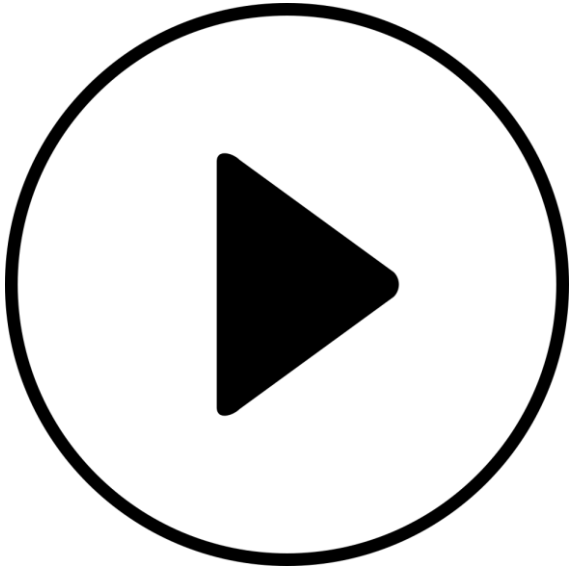
A1 NonRT RIC Function test env

- A function test environment built around a test engine and support functions for each component and simulator/interface stub
- Easy and fast to defined new test/demo scenarios
- Based on bash and python scripts
- Multi-platform – MacOS, Ubuntu and Windows (*gitbash*)
- Requires only docker, docker-compose, python3 and kubernetes
- Tests execute in dockers or kubernetes (but just docker in this demo)
- The test envrionment handles:
  - image management
  - environment/configuration setup of components
  - docker/kubernetes deployment
  - all tests - rest calls to/from the components, including checking json data
  - test case reporting and detailed logging
  - zero touch – start and wait for test completion

Function test/demo setup



Demo time



Summary

- A1 Policies enables intent-driven and fine-grained updates to RAN using the O-RAN Non-RealTime RIC function
- Non-RealTime RIC using A1 Policies and A1 Enrichment Information enables a more intelligent context-aware RAN
- Non-RealTime-RIC, A1 Policies and A1 Enrichment Information opens new opportunities for RAN optimization and automation.
- Opensource development supporting quality functions for A1, Non-RealTime RIC and SMO continues in OSC and ONAP
- Ericsson will continue to innovate in Non-RealTime RIC and drive for an open rApp eco-system.


LF
NETWORKING
LFN Developer & Testing Forum
O-RAN
ALLIANCE
ONAP
OPEN NETWORK AUTOMATION PLATFORM
ERICSSON