ETSI ENI PoC#4

Predictive Fault management of E2E Multi-domain Network Slices

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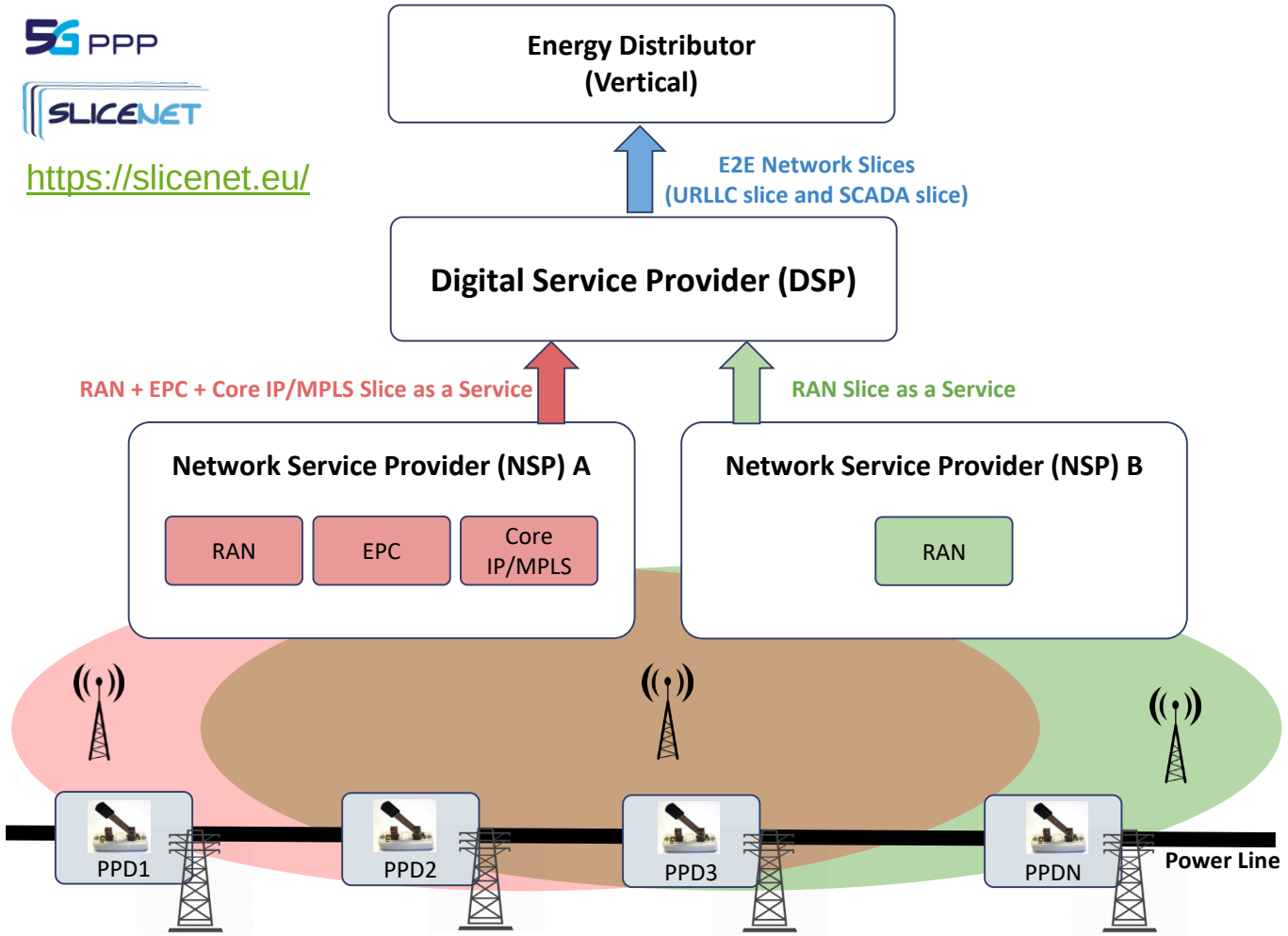
PoC Status @ ENI#13

ENI PoC project #4: Predictive Fault management of E2E Multi-domain Network Slices

https://slicenet.eu/



- PoC scenario is a power grid vertical, that uses 5G to provide time sensitive communications for grid protection mechanisms. A Network Slice is provided by a DSP for that effect.

- PoC is focused on the **DSP** functions
  - NSPs provide Sub-slices
  - DSP monitors all Sub-slices behaviour
  - DSP predicts Sub-slice failure
  - DSP decides best failover sub-slice alternative
  - DSP triggers Subslice/NSP switching

PoC Project Goal #1: Network Slice Fault Prediction. Demonstrate the use of AI on performance data to be able to accurately predict failure situations on Network Slices and estimate their impact on an E2E multi-domain slice performance.

PoC Project Goal #2: Policy-based Network Slice Management. Evaluate the use of a policy-based structure for slice composition decisions, as well as the mechanisms for policy definition on that same context.

https://eniwiki.etsi.org/index.php?title=PoC#PoC.234:_Predictive_Fault_management_of_E2E_Multi-domain_Network_Slices

ENI PoC#4 Status Report

- The vertical (Smart Grid) scenario setup is now completed
- NSP optimization loop (on-slice fault prediction) is now working and initiating E2E tests
- DSP optimization loop, proposed for this PoC, is delayed and will be complete by the end of the project (June 2020)

ENI PoC#4 delay risks and mitigation

- If Slicenet works progress as expected, POC#4 wil be available in June
- Slicenet ends by the end of June
- NSP Slice Fault Prediction Use Case is now working and initiating E2E tests
- With COVID-19 contingencies ahead, further delays are to be expected
- We propose to demo the NSP optimization loop in ENI#14, if the originally proposed scenario is not available by that time

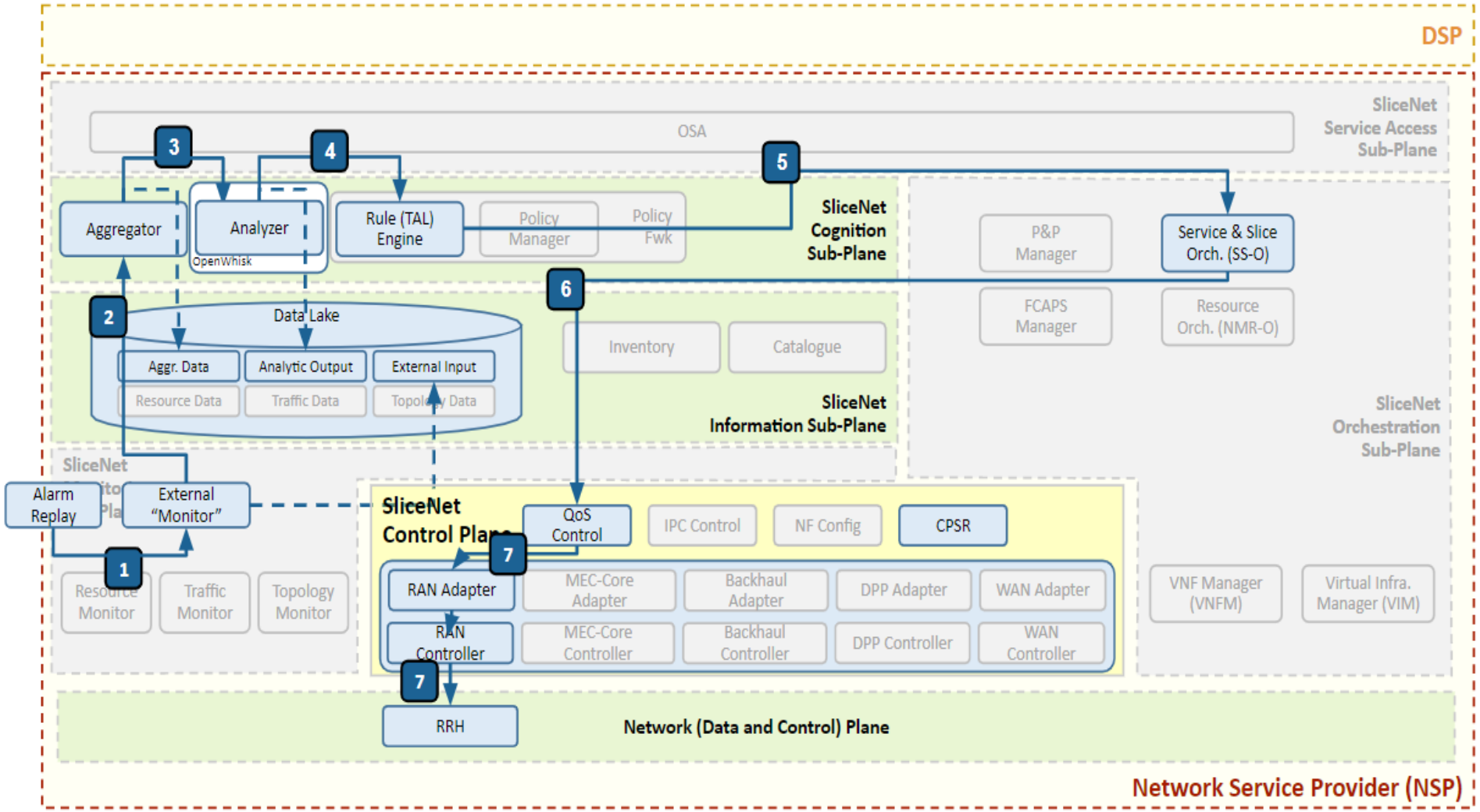
NSP Slice Fault Prediction Use Case

Alarms data provided by an Operator is used for model training

1. Alarms data is replayed and ingested by the Slicenet System
2. Data is aggregated and persisted
3. The **Analyser,** which is running the Alarms Prediction ML model, runs the model, producing alarmas insights/predictions
4. A **Rule Engine** consumes a prediction event, checks the NSP policies conditions and verifies that the slice available bandwidth is too low. It decides to increase the NS bandwidth to avoid/mitigate the fault
5. The action plan decided by the **Rule Engine** is delivered to the **Service and Slice Orchestrator** for enforcement.
6. the **Service and Slice Orchestrator** interacts with the **QoS Control** subsystem
7. **QoS Control** identifies the appropriate network segment (RAN) adapter to address and interacts with the **RAN Controller**, which translates the generic bandwidth increase information request to RAN specific parameters.
8. Finally, the **RAN Controller** modifies the NS bandwidth by interacting with the OAI **Remote Radio Head (RRH)**

This is a diferent Use Case, of a more restricted scope but the AI based loop is similar…

NSP Slice Fault Prediction Use Case



Thank you!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