

Radio Edge Cloud (REC) Use Case Details

Use Case Details:

Attributes	Description	Inf or ma tio nal
Type	New	
Industry Sector	Telco networks	
Business driver	<p>Optimizing a radio network is a complex task considering that we want to</p> <ul style="list-style-type: none"> • Use the available radio spectrum, front haul and back haul network capacity, and signaling capacity optimally • Provide optimal quality of experience considering the application type, user subscription, and user mobility • Be able to collect diagnostic data for fault analysis and performance optimization <p>To address these needs, the O-RAN Alliance is defining the Radio Intelligent Controller (RIC) and new interfaces towards the LTE/5G Radio Access Network (RAN). Especially, the RIC has the E2 interface towards the RAN Centralized Unit (CU), and the A1 interface towards an orchestration system such as ONAP. This allows for more intelligence in managing the radio resources.</p> <p>Especially, the RIC has a Radio Information Store database with generic information about radio resources, it supports third-party applications with access towards the RAN, and it has a high-speed, high-capacity message bus.</p>	
Business use cases	<p>As an operator, I want to</p> <ul style="list-style-type: none"> • Deploy an LTE/5G network as the components RRH, DU, CU, and RIC to leverage the benefits of standard hardware and software infrastructures at the edge of the network • Promote an ecosystem of interchangeable components in the RAN • Enable new machine-learning based algorithms for optimizing radio access <p>Some use cases that the RIC enables</p> <ul style="list-style-type: none"> • Sampling Channel Quality Indicators to get a better understanding of the radio network quality in different locations • It supports collecting and storing detailed event logs for troubleshooting and performance optimization • Especially, the 5G network new radios allow fast-speed beamforming. Therefore, it is possible to use intelligent algorithms to guide beamforming with different parameters • There are also other tunable parameters in the radio network related to radio capacity allocation and power saving <p>All of these allow for more optimal resource allocation which will benefit the end users with better quality of service.</p> <p>The O-RAN: Towards an Open and Smart RAN. O-RAN Alliance White Paper. Available from https://www.o-ran.org lists as use cases:</p> <p>per-UE controlled</p> <ul style="list-style-type: none"> • Load balancing • RB Management (radio band?) • Interference detection • Interference mitigation <p>In addition, it enables</p> <ul style="list-style-type: none"> • QoS management • Connectivity management • Seamless handover control 	
Business Cost - Initial Build Cost Target Objective	<p>The RIC has different deployment models which have slightly different cost implications:</p> <ul style="list-style-type: none"> • It can be co-located with the RAN CU • It can be co-located with the Orchestration&Automation system • It can be a standalone system <p>In the first case, as the RIC will run on the same infrastructure as the RAN CU itself, it will meet all the performance requirements. In the second case, the RIC is some distance from the RAN. It is running on cheaper hardware in a datacenter, but since its performance requirements are stricter than that of the Orchestration system, it may require a different infrastructure layer.</p>	

Business Cost – Target Operational Objective	<p>For Example:</p> <ol style="list-style-type: none"> 1. Edge Cloud deployable at Central offices with 7 servers in a single rack should incur low operational costs per year 2. In-place upgrade of the Edge cloud should be supported without impacting the availability of the edge applications 3. Edge Solution should have role based access controls, Single Pane of Glass control, administrative and User Based GUIs to manage all deployments. 4. The automation should also support zero touch provisioning and management tools to keep operational cost lower 	
Security need	The Radio Edge Cloud should be resistant to physical tampering, but it can be dedicated as a single user system	
Regulations	The Edge cloud solution should meet all the industry regulations of data privacy, telco standards (NEBS), etc.,	
Other restrictions	Consider the power restrictions of specific location in the design (example - Customer premise)	
Additional details		

Case Attributes	Description	Informational
Type	New	
Blueprint Family - Proposed Name	Telco Appliance	
Use Case	RIC vRAN	
Blueprint proposed Name	Radio Edge Cloud	
Initial POD Cost (capex)		
Scale & Type	x86 OCP Open Edge servers x 6	
Applications	RIC	
Power Restrictions		
Infrastructure orchestration	Airship Redfish ONAP	
SDN	OVS-DPDK	
Workload Type	Containers	
Additional Details	Submitter to provide additional use case details	