2024 RIC Forum: Application

Submit the completed application via email to: ricforum@ntia.gov by 7:00 p.m. ET on Monday, October 23, 2023. There is no fee to apply. The selected presenters will be announced publicly by Monday, November 13, 2023.

1. Applicant Information

We welcome university, corporate, or individual applicants to apply singly or in groups. Multiple affiliates may partner on one application. There are no restrictions on an applicant's country or place of origin, with the exception that individuals or entities on the Entity List in Supplement No. 4 to Part 744 of the U.S. Export Administration Regulations (EAR) are barred from participating in the RIC Forum. An individual or team leader (if multiple individuals enter as a team) must be at least age 18 at the time of notification.

SAMPLE APPLICATION

Applicant Name	Pearl McGuckin, Left Hand O-RAN		
Address	Street		Country
	1234 Arapahoe Avenue		USA
	City	State/Province	ZIP/Postal Code
	Boulder	CO	80302
Team Leader	Name and Title		Phone Number
	Avery Dushanbe, Project Manager		+1 720-555-1212
	Email Address		
	avery.dushanbe@lefthandoran.com		
Include affiliations and sponsors, if applicable	Open RAN Policy Coalition, O-RAN Alliance, Telecom Infra Project, CBRS Alliance, ONF – Open Networking Foundation, Small Cell Forum		

2. Use Case

X Identify your App use case(s). Mark all that are applicable with an X.

☐ Energy Saving

☒ Traffic Steering

☐ Wild Card

Describe how you accomplish the use case. What is unique about your implementation?

With the use case of best utilizing spectrum in a shared channel environment (in the presence of interference), our xApp and related rApp will monitor and compare interference levels in real-time in a series of shared TDD channels. If our xApp detects interference (above a set threshold over a set time increment), it will choose an alternative channel interfacing with our rApp (among a set of shared channels) where the maximum interference detected meets the rApp's set criteria. If the xApp can find no channel meeting the interference requirements, it will power down the RU (to not create interference), notify the operator, update the rApp's historic tables and continue to monitor the list of channels (along with the rApp) until a channel's interference falls below the required limit. Then the xApp will notify the operator a channel is available and—when approved—will power up the RU (via an E2 instruction set to the O-DU/CU) to continue service. The xApp can also attempt to maintain operations on a channel per a prioritized list, managed by the rApp, and move the active channel back to a higher priority channel when it becomes available (i.e., interference meets the minimum required to move the active channel to that channel).

Why would the Department of Defense, a mobile network operator (MNO), or other parties be interested in your implementation of this use case?

Operators will find this xApp/rApp combination interesting and beneficial as it maintains channel quality and availability in a shared channel environment by real-time switching (and switching back) between channel alternatives.

Government and military will find this xApp/rApp interesting and beneficial as enforces priority, maintains government control (of the channel asset), maximizes channel quality and availability (as required by law) in a shared channel environment by real-time switching (and switching back) between channel alternatives.

3. Technical Specifications

Which vendor's RIC software development kit (SDK) did you use to develop your App?

At Left-Hand ORAN, we will use Flatirons RIC and RIC SDK including RIC services xApp/rApps Lifecycle Management, Policy Management, Orchestration, API Proxy and xApp API.

Do you propose to demo a standalone xApp, a standalone rApp, or an xApp that works in concert with an rApp or rApps?

Left-Hand ORAN's solution is an xApp working on concert with an rApp to manage and monitor longer term (>1 sec) interference channel trends, channel priorities and other related information.

Describe your 5G Core and Open RAN network. Will you use a software-based network emulator, a hardware-based network emulator, or an actual network?

Left-Hand's ORAN xApp/rApp connects to our software-based network emulator, FISKE (Flatirons Integral Software for Keeping ORAN-xApps/rApps Enabled), located in our data center at CU Boulder.

Describe the current status of your App. Is it operational now? If you've demonstrated your App and use case previously, describe how you did so, including whether you used a commercial network or a laboratory test bed.

Our xApp and rApp are currently operational. We demonstrated and won second prize for our Traffic Steering xApp/rApp at the 2023 Chautauqua RIC-Fest. We used the software-based network emulation, as noted above.

Describe how you would modify your App for the RIC Forum. Does your App already implement a use case that would be of interest to DoD and could be modified?

We continually improve the performance of our Apps. Our xApp and rApp are already of interest to DoD.

4. On-site Presentation with Live-streamed Demonstration

The goal of the presentation is to provide an authentic RIC App demonstration that measures and displays the effects of an xApp or rApp on a 5G Open RAN network. Each presenter will have approximately 30 minutes to describe their App and showcase its impact on a 5G network.

Presentations will occur in a plenary room with theater or classroom seating, microphones, and a projection screen. The presentation will include a live video stream from the site where the RIC App is deployed.

Presentations must be live (real time) and include the following elements:

- A main presenter appearing in-person (on the stage)
- Live video stream of the App deployment(s)
- Actual, non-simulated RIC and App(s)
- Dynamic network changes triggered by the RIC App

The following elements are not allowed in presentations:

- On-site equipment (other than a laptop)
- Simulated RIC and App(s)
- Video recordings

Do you have any concerns about live streaming your presentation according to the time constraints and manner noted above?

No. We expect our demonstration to proceed as planned as we have conducted the demonstration many times.

Will you require any special accommodation for the presentation? What are the connectivity requirements for your demonstration (*e.g.*, bandwidth, latency)?

No special accommodations are needed.

How much of your presentation will be in-person? Which segments of your presentation will be remote, and why?

We will have at least one presenter in person, who will be responsible for most of the presentation. We will locate additional resources at our (remote) data center for configuration and troubleshooting, if necessary. Personnel at the data center will move their camera, to focus on various aspects of our installation.

Describe the 5G Open RAN network where your App is installed. Describe the remote location(s) and how showing it would support your presentation.

We will use our software-based network emulator, FISKE (Flatirons Integral Software for Keeping ORAN-xApps/rApps Enabled), located in our data center at CU Boulder.

Describe your live system demonstration. How will you activate changes to the network? How will the audience notice the changes? How will you measure improved performance?

During our demonstration, we will create interference on one channel and show (via a spectrum analyzer) how our xApp will change the O-RU to a different frequency (via the O-CU/DU). We will then remove the interference, show the priority channel list and demonstrate how the O-RU will return to the original frequency. Second, we will inject interference on all four available frequencies and demonstrate how the xApp, without a frequency choice meeting the interference requirements, will power down the O-RU and issue a message to the operator.

5. RIC Showcase

The goal of the RIC Showcase is to facilitate interaction between presenters and attendees one-on-one. Presenters are not expected to have enough time with each attendee to demonstrate dynamic network changes on a live system. Therefore, in the Showcase area, presenters may use pre-recorded videos to quickly show the impact of the App on a network (*e.g.,* depict several different operating modes without waiting for network configuration changes). The RIC Showcase may optionally include a live video stream from the site where the RIC App is deployed.

Presenters are encouraged to bring equipment to the RIC Showcase. Each RIC Forum presenter will be given space in a room separate from the plenary room in which to showcase their RIC xApp or RIC rApp. Each presenter's Showcase area will include two tables, two chairs, up to 7500 W power, 100 Mbps internet bandwidth, and a large monitor (two can be made available upon request). Once the final list of presenters is announced, NTIA/ITS will work with each presenter to tailor their RIC Showcase area to their needs.

Briefly explain the demonstration you propose for your RIC Showcase.

We will focus on delving deeper into questions raised by the audience, using an identical setup as the presentation.

What 5G equipment, if any, will you bring to your RIC Showcase?

We require only an Internet connection (Ethernet or Wi-Fi) meeting the connectivity requirements we list above.

What are the requirements for your RIC Showcase area (*e.g.*, power, bandwidth, latency)? What equipment would you bring? What equipment will you require from us?

We request two large (75" or larger 4K) screens to perform our demonstration.

Left-Hand ORAN's demonstration will require a 100 MB/s Ethernet (or Wi-Fi) Internet connection (without firewalls) as we will use a laptop connected to our data center with the following requirements: (1) jitter should be below 30 milliseconds, (2) packet loss should be no more than 1% and (3) network latency should not exceed 140 milliseconds one-way (300 milliseconds return).

Will your proposed demonstration include live video streams from remote locations? Describe the remote location(s) and how showing it will support your showcase.

We will show live video streams of our spectrum analyzer camped on our list of frequencies in our data center. Live personnel at our data center will indicate different frequencies going up and down in response to the interference injected to that frequency. We have obtained permission to use all four frequencies (at a reduced power) at our data center for our demonstration.

Will your showcase include video recordings? How will you use video recordings to showcase your App?

We will have a backup of video recordings of our demo (i.e., spectrum analyzer video with RU shifting frequencies in response to injected interference). In the case that our demonstration does not go as planned, we would be to show video recordings of our demonstration (but we do not anticipate this taking place; our demonstration will be live).

6. Additional Comments or Questions for the RIC Forum Organizers

We look forward to being chosen to demonstrate our xApp at the ITS/NTIA RIC/xApp Forum.