

5G (ENCQOR) Technology Development Challenge Template

Enhanced IP VPN Networking Adapted to 5G

Challenge Launch Date	August 27, 2019
Challenge Deadline	September 24, 2019
Challenge Statement	<p>The ENCQOR 5G iPaaS network is a shared infrastructure that will enable many SMEs and academic researchers to develop and test innovative applications, products, and services.</p> <p>In the industry today, Layer 3 IP VPN is getting increasing traction and is rapidly becoming a critical component of future intelligent networking. It is also becoming clear that L3 IP VPN based-solutions will be serving a much larger set of use-cases driven by Wireless (5G) requirements.</p> <p>However, today's networking solutions do not provide the necessary features to enable a 5G network to support the breadth of applications that developers will want to test and run on the iPaaS network. The intent of this project is to enhance existing routing protocols with improved scalability, network management, and most importantly strengthened path isolation and traffic separation for all the SMEs and researchers using the test bed.</p> <p>Layer 3 IP VPN will be the foundation required by the new technologies for a shared end to end network solution. New areas to be explored include virtual routing and forwarding, introduction of network virtualization via segment routing, soft-slicing and improved support for shared services and enhanced troubleshooting. All of which will provide a fundamental advantage to the successful deployment of 5G technology and applications.</p>
Project Partner	<ul style="list-style-type: none"> • Ciena
Timeline	<ul style="list-style-type: none"> • 2 years
Available funding	Up to \$375,000 CDN
Applicant Type	<ul style="list-style-type: none"> • Ontario based SME Scale company
Location	<ul style="list-style-type: none"> • Ontario
Project Details	To successfully accomplish this project, Ciena is seeking to work with an SME that has deep expertise in the design and implementation of L3 IP VPN network solutions, fundamental requirements of a 5G network, and new networking principles such as segment routing and network slicing.

	<p>Concurrently Ciena is working on designing and implementing an OpenStack compute environment for the iPaaS 5G network.</p> <p>The iPaaS 5G network is operational and the plan is to support SMEs across 5 hubs in the provinces of Quebec and Ontario. The 5 city hubs are Quebec City, Montreal, Ottawa, Toronto and Waterloo.</p> <p>Key deliverables will include:</p> <ul style="list-style-type: none"> ➤ Develop cross portfolio network engineering capabilities by working with Architect and Design primes to define a Solution or Interop scenario with an initial focus on IP VPN, and extending to new segment routing and network slicing technologies. ➤ Develop and execute a comprehensive validation strategy (including detailed test scenarios). This work includes management of 3rd party products and integration of all aspects of our solutions to ensure that new designs meet ENCQOR requirements. ➤ Drive hands-on proof of concept testing, performance, interworking and solution acceptance for a variety of applications on our Converged Packet Optical, Packet Access, and Management platforms. ➤ Provide support function to ENCQOR iPass 5G network
<p>Project Goals/ Outcomes</p>	<ul style="list-style-type: none"> ➤ Deliver a workable and deployable solution into the ENCQOR network ➤ Generate technical presentations, engineering guidelines, training sessions and other key items to facilitate understanding and introduction of new technology, and solution into ENCQOR networks.
<p>Applicant Capabilities</p>	<ul style="list-style-type: none"> ➤ Hands-on experience engineering, testing or deploying networks on Carrier Ethernet or IP/MPLS based platforms with (Ciena, Ericsson, Nokia, Cisco, Juniper) ➤ Excellent understanding of Carrier Ethernet Services (E-Line, E-LAN, E-Tree and E-Access) ➤ Hands-on experience deploying and troubleshooting MPLS L3VPN ➤ Good understanding of L2/L3 (IP, Ethernet, Eth OAM, OSPF, IS-IS, BGP, VRRP, STP, IPv6, MPLS-TP, VPLS, IP/MPLS, etc...) ➤ Experience on Unix/Linux environment including RedHat, CentOS, Ubuntu or other distributions is a plus ➤ Experience with cloud computing infrastructure and implementation such as OpenStack, hypervisor technology (KVM, VMware ESXi), Linux Containers and Virtualization (Docker, Kubernetes) etc. is a plus ➤ Working knowledge or good understanding of Network Management concepts such as SDN and Virtualization concepts such as VNF's and orchestration solutions. ➤ Experience with Network Management and various tools, Open APIs (REST, NetConf, Yang, gRPC etc.) is a plus. ➤ Experience with security (RADIUS, 802.1X, authentication, encryption, etc.) is a plus

	<ul style="list-style-type: none"> ➤ Working experience with a variety of test sets including Ixia, Spirent, JDSU, and Anritsu etc... ➤ Successful practical troubleshooting skills, problem solving, excellent written and interpersonal communication, and documentation skills ➤ Experience with data center architectures is a plus ➤ Familiarity in delivery of industry orchestration and management solutions for Packet Optical networks.
Additional Information	

Launched in 2018, the [ENCQOR 5G SME Technology Development Program](#) Partners Ontario based SMEs with ENCQOR 5G Anchor Firms on 5G technology development projects. Areas of research interest are defined by Challenge Statements submitted to OCE by the [ENCQOR 5G Anchor Firms](#) and posted to the [OCE website on a rolling basis](#).

If you are interested in developing an expression of interest, please visit the [program guidelines](#) for information on next steps.

For any questions about new Challenge Statements or the ENCQOR 5G SME Technology Development Program please contact Sarah Fairlie at sarah.fairlie@oce-ontario.org