ENCQOR 5G SME Technology Development Program

Anchor Firm	ciena
Challenge Statement	**End-to-end 5G Zero Touch Network Automation and Service Management**

Challenge Launch Date	January 22, 2020
Deadline for Open Call Applications	February 19, 2020
Challenge Statement	5G is a disruptive technology aimed to provide numerous advances in multiple vertical domains or industries. A key enabler for a network service provider to be able not only to monetize their investment but also advance innovation is through network slicing. An end to end network slice is a logical network comprised of stitching together components (VNFs and PNFs) from the Transport Domain, the CORE Domain, the RAN domain and all the way down to the edge of the network. Network Slices enable a service provider to provide service diversity, guaranteed performance, fast deployment and short Time-To-Market (TTM). In a 5G network, the provisioning and LCM (life-cycle management) is critical to achieve the necessary scalability and flexibility required to support complex services. The main research challenge is to provide E2E automation of a 5G network slice management and orchestration thus creating a Network Slice as a Service (NSaaS) through Zero touch network and service management (ZSM) framework. The ZSM framework provides the required flexible management framework required in the increasingly complex 5G networks.
Project Partner	Ciena Canada
Timeline	18 months [NOTE: Projects must be completed by March 31, 2022, no extensions will be available beyond this timeline].
Available funding	Up to $500,000 CDN
Applicant Type	Ontario based SME scale company
Location	Ontario
Project Details	Zero touch network and service management (ZSM) framework will consist of the following elements: • Management services that can be composed and supports service exposure and integration; • Model-driven, open, intent based interfaces; • Separation of management concerns: Domains and End-to-End; encapsulation of complexity; • Shared data (stored, streamed) key for automation; • Closed loops at various levels as the driver of automation; and, • Deployment flexibility. The ZSM framework architecture consists of: • **ZSM service:** A set of offered management capabilities • **Management function:** Logical entity playing the roles of service consumer and/or service producer; • **Integration fabric:** A management function that enables interoperation and communication between management functions within and across management domains;

	• **Cross-domain data services:** Services that allow to share data with authorized consumers across domains; • **Management domain:** A scope of management delineated by a technological, business, administrative or other boundary; and, • **E2E service management domain:** A management domain specialized to manage E2E services. The ZSM framework shall support the zero-touch full automation of 5G network and service management which includes the following: • Instantiation of a complete 5G network that includes the RAN, mobile core, transport network, Data Network (DN); • Full Automation of VNF provisioning; • 5G network services may be incrementally deployed in the operator's network in logically separated and/or isolated manner from the other already deployed services; • 5G network services may be deployed and provided to other operators and/or service providers when requested, via open interfaces; • Fast LCM of the 5G network including corresponding DNs. This may be automatically triggered based on vendor independent FCAPS management; • Plug & Play of new components into a live 5G production network; • Automated Network Bandwidth Management; • Automatically heal from unexpected issues; • E2E network service and topology management; • Termination of one or more 5G network service; • Automatic Software Deployment and Upgrades; and, • Domain Exposure requirement in support of network slicing. Some goals to be achieved with the SME may include, but not limited to: 1. Investigation and possible development of an ZSM framework; 2. Development of components required in a ZSM framework and architecture; 3. Automation requirements [key mentioned] of the ZSM framework; 4. Characterization of system requirements for ZSM NSaaS; and, 5. Testing and validation of ZSM framework establishing NSaaS in an E2E lab environment.
Project Goals/ Outcomes	Phase 1: Initial set of algorythms and some code modules that can be validated in the lab; Phase 2: Partial ZSM software Framework ready for initial integration testing; Phase 3: Complete Implementation and lab validatation. The final outcome is the autonomous or Zero touch automation of a system through the creation of a 5G Network Slice through management and orchestration of service delivery including Network Slice Lifecycle mangement, Network Slice isolation mangement, end-2-end Network slice provisioning, and performance monitoring which in turns provides Network Slice as a service (NSaaS).
Applicant Capabilities	SME applicant should be a dynamic and agile software development organization looking to expand its engineering expertise into the 5G automation and orchestration space. Applicant should be looking into strategically leverage the outcome of this project to become a relevant player in this emerging domain.

	The SME applicant should have expertise in the following areas: • Comprehensive understanding and hands-on experience with 5G Network Slicing; • Expertise in software development, software architecture principles and complex systems test; • Experience with Java, Python, GoLan, Linux; • Understanding of cloud development environments, OpenStack, vmware/Xen; • Understanding of networking concepts (IP/MPLS, Ethernet, virtual and physical networks); and, • Ability to work in an Agile environment, define sprints, run scrum meetings and drive a rapid demo-based environment.

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 Jennifer Moles at Jennifer.Moles@oce-ontario.org.