

## Terms of Reference (ToR): Implementation of 10GB+ Network Backbone

### 1. Purpose

The purpose of this TOR is to upgrade the QCTO's network backbone to a minimum of 10 Gigabits per second (10Gbps) to support high-speed data transmission, improve network performance, and accommodate future scalability needs. This upgrade will enhance connectivity between core infrastructure components, reduce latency, and support bandwidth-intensive applications.

### 2. Objectives

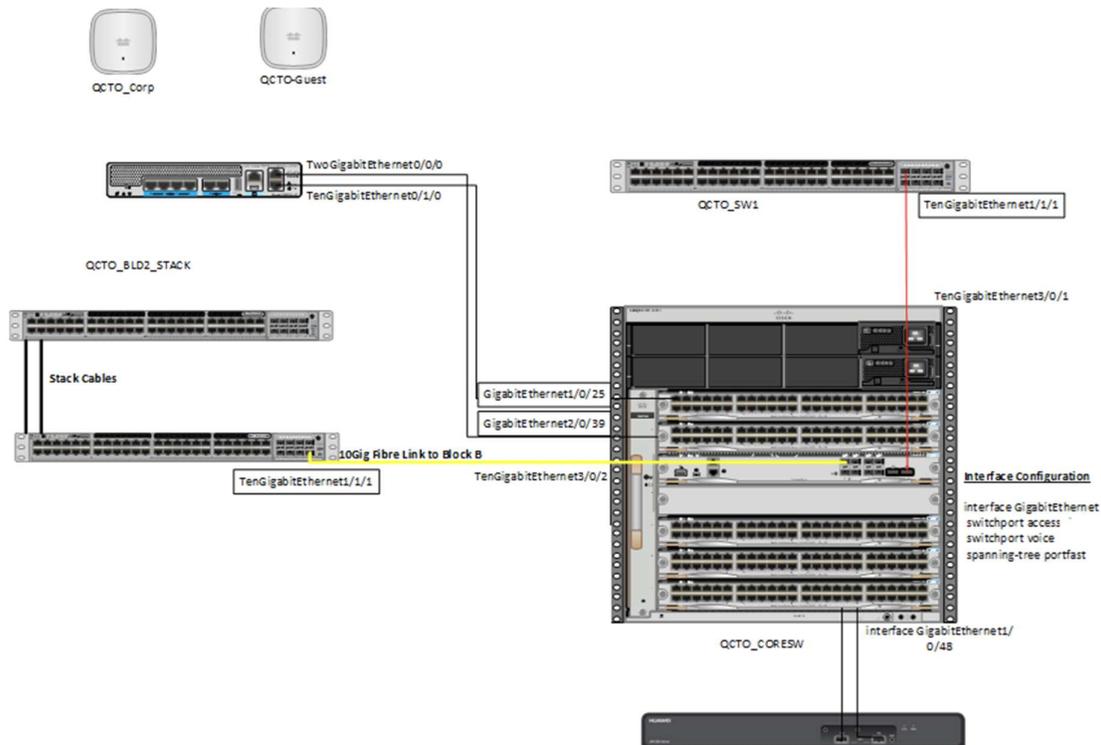
- Establish a high-speed 10Gbps or higher backbone network across QCTO's core infrastructure.
- Improve data throughput and reduce bottlenecks in the current network.
- Ensure compatibility with existing and future network devices.
- Support increased demand for cloud services, video conferencing, and large data transfers.
- Enhance redundancy and reliability of the network.
- Enhance network security.

### 3. Background and Current Infrastructure

#### 3.1 Existing Network Infrastructure

The current network infrastructure at QCTO is supported by the following key devices:

- **Cisco Catalyst 9400 and 3x Cisco Catalyst 9300 Series Switches**  
These serve as the core/distribution and access switches, respectively, providing high-performance connectivity and scalability. They form the backbone for data transmission and support the growing number of connected devices.
- **Cisco Catalyst 9800 Series Wireless Controller**  
Manages the wireless network to ensure seamless connectivity and optimal performance for Wi-Fi-enabled devices. It supports 22 Cisco Access Points and manages 3 SSIDs.
- **22x Cisco Access Points (Model: C9120AXI-E)**  
Deployed across QCTO buildings to provide wireless coverage for internal users and external stakeholders. The wireless controller centrally manages these.
- **1 DHCP Server**  
Dynamically assigns IP addresses to devices connecting to the network. The current IP pool is limited to 333 addresses.
- **4x HPE DL380 Gen10 Servers**  
Provide computing resources for various applications and services.
- **1x 30TB MSA 2060 Storage Array**  
Centralised storage for organisational data and backups.



#### 4. Scope of Work

- Assess current network topology and identify upgrade paths to support 10Gbps+ backbone.
- Procure and install necessary hardware (e.g., 10Gbps-capable transceivers, fibre cabling).
- Configure, segregate and integrate new backbone components with existing infrastructure.
- Conduct performance testing and validation.
- Provide documentation and training for IT support staff.
- Reconfigure all switches to disable Telnet and enable SSHv2 for secure management.
- Cisco ISE (Identity Services Engine) configuration to ensure the best possible security for the QCTO network whilst allowing ICT business services to continue optimally ( balancing security with access).
- Implement switch hardening controls (Network Access Control) to prevent unauthorised endpoint connections, including port security and DHCP snooping to block unauthorised devices from receiving IP addresses.
- VLAN re-numbering to segment the currently flat network to secure logically separate zones that enforce best practices whilst supporting the efficient operations of the QCTO LAN environment.

#### 5. Deliverables

- Upgraded network backbone with a minimum 10Gbps throughput.
- Provide network diagrams and documentation.
- Performance test reports.

## 6. Evaluation Criteria

### 6.1.

Evaluation Criterion	Description / Requirements	Points
1. Detailed project plan highlighting Experience with HPE, Cisco Catalyst series, and enterprise-grade networking	Submission of a comprehensive project plan that reflects proven experience in deploying, configuring, and supporting HPE and Cisco Catalyst enterprise-grade networking solutions.	<p><b>15 Points</b></p> <p>Comprehensive, detailed project plan clearly demonstrating strong HPE and Cisco experience and a realistic execution approach = 15 Points.</p> <p>Project plan is moderate; covers key elements but missing depth or supporting evidence = 10 Points.</p> <p>The project plan is incomplete, lacks detail, has an unclear methodology, or provides limited evidence of HPE/Cisco experience = 0 Points.</p>
2. References from similar projects	Minimum of <b>three (3)</b> references for comparable projects; Evidence of successful delivery of similar high-speed network backbone projects.	<p><b>20 Points</b></p> <p>3 or more references = 20 points</p> <p>2 references = 10 points</p> <p>1 reference = 05 points</p>
3. Lead Cisco Security Engineer	CCIE Security with a valid CCIE number <b>AND</b> a minimum of five years' Cisco network experience	<p><b>25 points</b></p> <p>CCIE number for Security = 25 points</p> <p>NO CCIE number for Security = 0 points</p>

4. Lead Network Engineer (Routing and Switching)	CCIE Routing and Switching Certification with a valid CCIE number <b>AND</b> a minimum of five years of Cisco network experience	<b>25 points</b>  CCIE number for Routing & Switching = 25 points  No relevant certifications = 0 Points
5. Infrastructure Specialist/Systems Engineer	At least one of HPE ASE/ATP, Microsoft Certified: Windows Server Administrator <b>AND</b> at least five years' experience in Microsoft Server environment configuration and maintenance.	<b>15 points</b>  Any 1 or more of the stated certifications = 10 points  None of the stated certifications = 0

To qualify, a bidder must score **80/100** or above across the three criteria

## 6.2. Technical Compliance

- Alignment with QCTO's existing infrastructure (Cisco and HPE environment).
- Proposed solution meets or exceeds 10Gbps backbone requirements.
- Compatibility with current switches, wireless controllers, servers, and storage.
- Scalability and futureproofing of the solution.
- Telnet must be fully disabled on all switches; SSHv2 must be configured for secure access.
- Switch hardening must be applied to prevent unauthorised LAN connections and block IP assignment to unknown devices.

## 6.3. Project Plan and Methodology

- Clear implementation timeline and milestones
- Risk mitigation strategies.
- Minimal disruption to existing services during deployment.

## 6.4. Support and Maintenance

- Post-implementation support plan.
- Availability of technical support.
- SLA commitments for uptime and issue resolution.

## 6.5. Training and Documentation

- Provision of training for QCTO IT staff.
- Comprehensive documentation of the new network backbone.

## **7. COMPULSORY INFORMATION SESSION**

- 7.1 The QCTO has one site situated in Hatfield, Pretoria.
- 7.2 It is important to note that site inspection and evaluation of the existing infrastructure is compulsory before sending through your quotation.

## **8. ENQUIRIES**

- 8.1 For further information, please contact the following QCTO staff members:

**Technical enquiries can be directed to:**

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