Annex A: Terms of Reference

Internet connectivity

May 2019
Reference: ITB/2019/007

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1 Introduction

1.1 Background

UNHCR communications require a reliable Internet connectivity.

UNHCR has two locations in Geneva: its Headquarters and its Data Centre which is housed at Safehost, a third-party hosting facility. User internet access from Headquarters and access to Data Centre hosted services are currently provided through internet connections.

The UNHCR Data Centre connectivity and Geneva office user Internet connectivity are required to be fault tolerant.

1.2 Statement of Purpose & Objectives

The purpose of these Terms of Reference is to set out a detailed description of UNHCR's requirements for internet connectivity services in connection with UNHCR Invitation to Bid: ITB/2019/007.

UNHCR requires more contractors for the provision of Internet connectivity in UNHCR Geneva locations:

- Headquarters, i.e. primarily redundant Internet service access (*UNHCR HQ Internet connectivity*), defined in section 2.21:
    - *UNHCR HQ Internet connectivity A;*
    - *UNHCR HQ Internet connectivity B;* and
- Data Centre, primarily redundant Internet service access (*Data Centre Internet connectivity*), defined in section 2.2:
    - *Data Centre Internet connectivity A;*
    - *Data Centre Internet connectivity B;*
    - *Data Centre Public UNHCR owned IP Address Management;*

Note: Internet connectivity services (A and B) will need to be provided by different Internet Service Providers (ISP) or Contractors (A and B) in order to offer a higher level of service resilience. The same service providers can propose their services for both locations.

2 Requirements for UNHCR core connectivity services

2.1 HQ Internet Connectivity

2.1.1 The current Network Topology

UNHCR Headquarters is currently connected through:

1) Data Centre Internet Connectivity. Private, dedicated and redundant primary links to its Data Centre in Safehost (10Gbps and 1Gbps). The Data Centre is connected to the internet with two links provided by two ISPs for redundancy purposes: "Data Centre Internet Connectivity A" and "Data Centre Internet Connectivity B" (defined in section 2.2); and
2) HQ Internet Connectivity. A secondary link connecting to an Internet Service Provider at 500Mbps (HQ Internet Connectivity).

The section 2.1 addresses HQ Internet Connectivity, whereas Data Centre Internet Connectivity is addressed in section 2.2.

The current HQ Internet Connectivity consists of three components:

a) The dedicated Gigabit Ethernet connection between UNHCR internet edge router(s) and the Contractor-owned router, or other similar device, at UNHCR Headquarters site (also referred to as CPE – Customer Premise Equipment);
b) a dedicated local tie line (also called "local loop") between the Contractor's selected point-of-presence and the Contractor's CPE router at the UNHCR Headquarters site; and
c) a logical connection to the Contractor's backbone, which has guaranteed capacity and agreed performance rates.

The local tie line is provisioned and operated by the Contractor and its technical support remains the responsibility of the Contractor. The Internet routers at UNHCR site are currently Cisco 4451-X, property of UNHCR and managed by UNHCR.

2.1.2 The requested Network Topology and required services

The new network topology will have two (2) separate ISPs providing the requested service. The Contractor A will provide "UNHCR HQ Internet connectivity A" services and the Contractor B will provide "UNHCR HQ Internet connectivity B" services.

Each Contractor shall meet the following requirements:

- The Contractor shall select, provide and manage the CPE to be installed in UNHCR Headquarters premise (to remain the property and responsibility of the Contractor). The Contractor's CPE will have a 1Gbps Ethernet connection (full duplex) as the demarcation point between UNHCR and the Contractor.
- The Contractor shall provision and manage whatever local tie line (local loop) is required to connect from the Contractor's CPE at the UNHCR site to the Contractor's selected point-of-presence.
- The Contractor's CPE listed above shall be interconnected to UNHCR internet edge router(s), at the demarcation point through the UNHCR Access switch. The Ethernet Frame Size of this interface will be a minimum of 1522 bytes (octets), sufficient to transmit a full 1500 byte (octet) IP frame.
- The Contractor shall supply a /26 public (i.e. non-NATed) IPv4 address range at the demarcation point. The Contractor will use an IP address out of this subnet and will

function as default layer 3 IP gateway for all traffic. All other IP addresses on the demarcation point subnet will be available for use by UNHCR. The Contractor may **not** perform a NAT or NAT-like function on traffic originated from UNHCR.

- The Contractor shall supply a /56 public IPv6 (i.e., non-NATed) IPv6 address range at the demarcation point. (This allocation is in line with BCP 157/RFC 6177). The Contractor will use an IP address out of this subnet and will function as default layer 3 IP gateway for all traffic on the demarcation point subnet. All other IP addresses on the demarcation point subnet will be available for use by UNHCR. The Contractor **may not** perform a NAT or NAT-like function on traffic originated from UNHCR.
- The Contractor shall provide options for Internet connectivity with 100% guaranteed capacity on international legs at UNHCR HQ Office (MBT), located in 94, rue de Montbrillant, 1202 Geneva, for 1Gbps bandwidth.

- The Contractor must engineer its access circuits used to provide their service in UNHCR HQ in order to ensure full physical link diversity from the other contractor in order for UNHCR to have a redundant service overall.
- The Contractor shall have a monitoring system running, continuously monitoring the status of the link, based on the service level requirements defined in section 4.2. The monitoring system will also have the capability of automatically generating a ticket, assigning it to Contractor's support for resolution, and alerting the Customer about the issue, with reference to the ticket number. The system will also provide automatic updates on the status of the issue.
- The Contractor shall provide SNMP read-only access to the Contractor CPE.
- The Contractor will also configure basic stateless packet filters (ACLs), based on UNHCR requests, and anti-spoofing protection on traffic incoming and outgoing to the Contractor. The Contractor may not filter any traffic other than as requested by UNHCR.

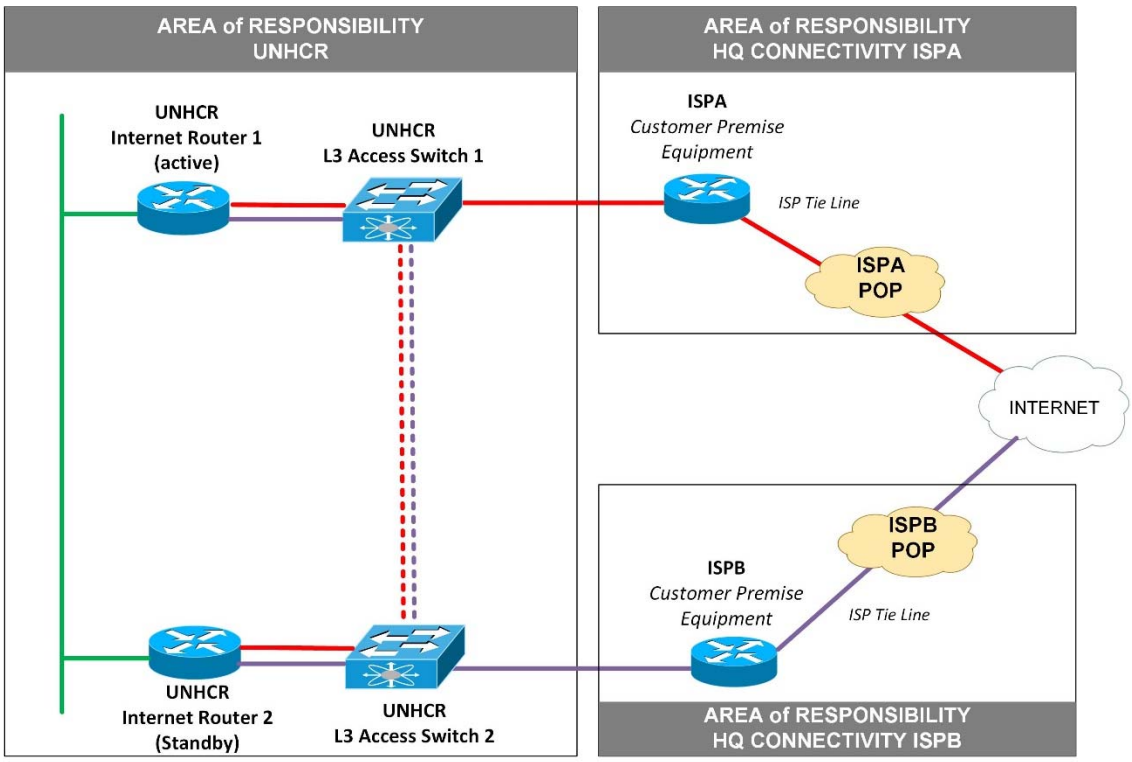

Figure 1: The proposed interconnection architecture

2.1.3 Commissioning and acceptance

Commissioning

- The Contractor shall follow the commissioning of the service end-to-end, providing technical support to the UNHCR staff in this phase. This includes both on premise and remote support and installation assistance required to successfully commission the service.
- The service shall be considered operational when Internet connectivity is established and the UNHCR Internet router (Figure 1) can reach one or more Internet nodes to which the performance measurements are performed (as described in section 4.2). The Contractor shall inform UNHCR when the service is operational.

Acceptance period

- Upon UNHCR's receipt of notice from the Contractor of the operational status of the service, UNHCR shall have a minimum acceptance period of thirty (30) calendar days in which to accept or reject the service. During the acceptance period, all the service level requirements defined in the relevant part of section 4.2 will apply to the provision of the service and shall be monitored by Contractor and UNHCR.
- If the services fail to meet any of the service level requirements for more than two (2) times during the 30-day acceptance period, UNHCR shall have the right to terminate the contract with no penalty.
- If the service level requirements are met during the acceptance period, the contract will continue, unless otherwise terminated in accordance with the terms of the contract.

2.1.4 Ongoing support

The Contractor shall provide ongoing support in order to meet the service level requirements specified in section 4. The Contractor will also provide other required ongoing support and customer services, including access to: (i) a support portal for incident tracking, (ii) a monitoring system and (iii) telephone number and email addresses for communicating with the Contractor's technical assistance centre.

2.2 Data Centre Internet Connectivity

2.2.1 The current Network Topology

UNHCR Data Centre is currently hosted in a third-party facility named Safehost and it is currently connected to the Internet through a redundant, BGP multi-homed connection defined as Data Centre Internet Connectivity A and B. The two connections are provided by two Internet Service Providers (ISPs or Contractors), each offering 1Gbps bandwidth, as per Figure 2 below.

Each link consists of three components:

a) The dedicated Gigabit Ethernet connection between UNHCR internet border routers and the Contractor-owned device, customer premise equipment (CPE), at UNHCR site;

b) a dedicated local tie line (also called "local loop") between the Contractor's selected point-of-presence and the CPE at the UNHCR site; and

c) a logical connection to the Contractor's backbone, which has guaranteed capacity and agreed performance rates.

The local tie line is provisioned and operated by the Contractor and its technical support remains the responsibility of the Contractor. The two Internet routers at UNHCR Data Centre site are currently Cisco ASR1001-X, property of UNHCR and managed by UNHCR, and are running BGPv4 to exchange routing information between UNHCR's Autonomous System (AS) number 43189 and the Contractors.

2.2.2 Technical Specifications of Current Service

- Registered Autonomous System: AS43189;
- Advertised Networks through BGPv4: 193.134.240.0/21;
- Registered Domain Name: unhcr.org;
- Primary DNS: 212.74.78.22;
- Secondary DNS: 212.74.77.22;

2.2.3 The requested Network Topology and required services

The new network topology will closely reflect the former network topology with two (2) separate ISPs (or Contractors) providing the requested service. The Contractor A will provide "Data Centre Internet connectivity A" services and the Contractor B will provide "Data Centre Internet connectivity B" services.

Each Contractor shall meet the following requirements:

- The Contractor shall select, provide and manage a CPE device to be installed in UNHCR Data Centre premise and to remain the property and responsibility of the Contractor. The CPEs will have a 1 Gbps Ethernet connection (full duplex) as the demarcation point between UNHCR and the Contractor.

- The Contractor shall provision and manage whatever local tie line (local loop) is required to connect from the CPE at the UNHCR Data Centre site to the Contractor's selected point-of-presence.
- The Contractor CPE listed above shall be interconnected to UNHCR internet border router(s) at the demarcation point through the UNHCR-provided L3 access switch. The Ethernet Frame Size of this interface will be a minimum of 1522 bytes (octets), sufficient to transmit a full 1500 byte (octet) IP frame.
- The Contractor shall supply a /29 public IPv4 address/mask for the interface of the UNHCR L3 access switch facing the Contractor CPE. The Contractor **may not** perform a NAT or NAT-like function on traffic originated from UNHCR.
- The Contractor shall allow multi-protocol BGP peering sessions from both UNHCR Internet border routers, originating from a UNHCR-owned Public IP address. The BGP peering sessions will be used to advertise both IPv4 and IPv6 address space.
- The Contractor shall provide 1Gbps link for Internet connectivity with 100% guaranteed capacity on international legs at UNHCR Data Centre hosted in Safehost, located in Chemin du Pré-Fleuri 20, CH-1228 Plan-les-Ouates, Switzerland. It shall be the Contractor's responsibility to commission the interconnection trunk line/s they deem sufficient to meet UNCHR's specified capacity requirements.
- The Contractor must engineer its access circuits used to provide their service in Safehost in order to ensure full physical link diversity and redundancy.
- The demarcation point and any Contractor equipment that represents a "single point of failure" shall be served by two power supplies so that power interruption to either supply will not interrupt service to UNHCR.
- The Contractor will manage UNHCR Public IP addresses through a dedicated access to the RIPE systems.
- The Contractor shall have a monitoring system running, continuously monitoring the status of the link, based on the service level requirements defined in section 4.2. The monitoring system will also have the capability of automatically generating a ticket, assigning it to Contractor's support for resolution, and alerting the Customer about the issue, with reference to the ticket number. The system will also provide automatic updates on the status of the issue.
- The Contractor will supply UNHCR with detailed traffic statistics indicating average, peak and minimum usage, and so on. These statistics will be delivered to the UNHCR via a web-based interface.
- The Contractor will supply UNHCR with IPv6 connectivity over the same link for the purposes of testing and evaluation. The provider will be responsible for IP address allocation to the UNHCR.
- The Contractor shall provide SNMP read-only access to the Contractor CPE. The Contractor may not filter any traffic other than as requested by UNHCR.
- The Contractor will also configure basic stateless packet filters (ACLs), based on UNHCR requests, and anti-spoofing protection on traffic incoming and outgoing to the Contractor. The Contractor may not filter any traffic other than as requested by UNHCR.

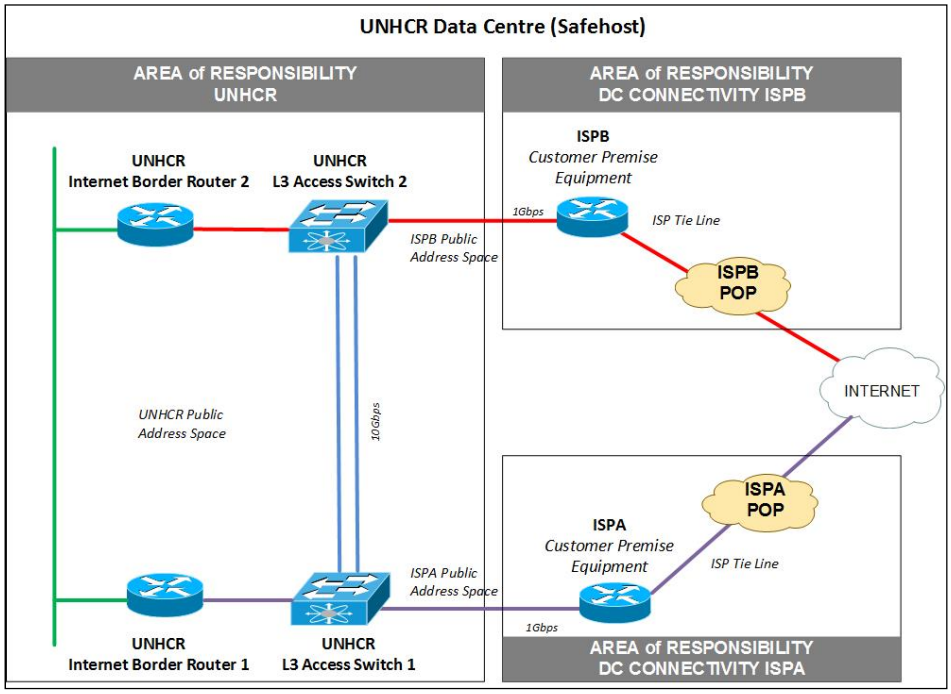

Figure 2: the interconnection architecture

2.2.4 Other services

The following services must be available on the Contractor's portfolio as they may be requested by UNHCR ad hoc:

- DNS Servers: if requested, the provider will host an authoritative primary and/or back-up DNS servers for up to 10 domains as indicated by UNHCR; and
- Address Space: if requested, the provider will take care of requesting the RIPE NCC for address space equal to at least one class C, on behalf of UNHCR.

2.2.5 Commissioning and acceptance

Commissioning

- The Contractor shall follow the commissioning of the service end-to-end, providing technical support to the UNHCR staff in this phase. This includes both on premise and remote support and installation assistance required to successfully commission the service.
- The service shall be considered operational when BGP connectivity is established and the UNHCR Internet border routers (Figure 2) can reach one or more Internet nodes to which the performance measurements are performed (as described in the section 4.2). The Contractor shall inform UNHCR when the service is operational.

Acceptance period

- Upon UNHCR's receipt of notice from the Contractor of the operational status of the service, UNHCR shall have a minimum acceptance period of thirty (30) calendar days in which to accept or reject the service. During the acceptance period, all the service level requirements defined in the relevant part of section 4.2 will apply to the provision of the service and shall be monitored by the Contractor and UNHCR.

- If the service fails to meet any of the service level requirements for more than two (2) times during the 30-day acceptance period, UNHCR shall have the right to terminate the contract with no penalty.
- If the service level requirements are met during the acceptance period, the contract will continue, unless otherwise terminated in accordance with the terms of the contract.

2.2.6 **Ongoing Support**

The Contractor shall provide ongoing support in order to meet the service level requirements specified in section 4. The Contractor will also provide other required ongoing support and customer services, including access to: (i) a support portal for incident tracking, (ii) a monitoring system and (iii) telephone number and email addresses for communicating with the Contractor's technical assistance centre.

3 UNHCR Responsibilities

UNHCR's responsibilities are limited to providing the following:

- A 1 Gbps Ethernet port, depending on the bandwidth requirement, and Ethernet cable in order to connect the interface of the ISP/Contractor's router/CPE to the UNHCR network.
- Adequate secure space for housing the contractor's equipment in a rack in UNHCR premises, as required.
- AC Power supply not to exceed 500 Watts.
- Access to UNHCR premises to the Contractor's support technicians.
- For connections to Safehost, support and necessary permissions for cross-connects required between the UNHCR Suite at Safehost with the ISP/Contractor's facility at Safehost, with the assistance of technicians in Safehost.

Except as set out above, UNHCR shall have no other responsibilities or obligation to provide any assistance to the Contractor in performing the Services.

4 Service Level Requirements

4.1 Service Level Agreement

The Contractor shall perform the connectivity services in accordance with the service level requirements described in section 4.2 below.

If performance falls below the defined service level, the applicable penalties as set forth in section 4.3 shall apply.

4.2 Service Level Requirements

4.2.1 Time to Restore (TTR):

Time to restore shall not exceed 4 hours from:

1) UNHCR creation of trouble ticket with the Contractor's help-desk; or
2) Contractor's monitoring system indicating the issue, alerting the Contractor and UNHCR via email, and automatically creating a trouble ticket with the Contractor's help-desk.

4.2.2 Availability:

The Contractor shall guarantee link availability of at least 99.9%. This availability service level requirement includes all parts of the Contractor's connection, including the Contractor's CPE onsite at UNHCR, the tie line/local loop between the UNHCR site and the Contractor's point-of-presence, and any immediate interconnecting nodes between the UNHCR site and at least one of the locations listed in the Performance measurements below.

4.2.3 Round Trip Time (RTT):

Round trip time shall be performed by executing ICMP "PING" commands (using 100 byte pings) to the Swiss, European and U.S. Data Centres specified in the paragraph below from UNHCR Internet edge/border.

The Data Centres are:

- NYIIX within Telx NYC: (for example, ns3.nyiix.net) – U.S. based Node – New York
- LINX within Telehouse London: (for example, www.linx.net)– European based Node – London
- SWISSIX within Equinix Zurich: (for example, swissix.org) – Switzerland based Node - Zurich

Network service level requirements for the average Round Trip Time are:

1. The RTT shall not exceed 175ms between the UNHCR Internet router and the node NYIIX (67.214.159.206) for a period longer than 15 minutes;
2. The RTT shall not exceed 50ms between the UNHCR Internet router and the node LINX (23.253.17.100) for a period longer than 15 minutes;
3. The RTT shall not exceed 20ms between the UNHCR Internet router and the node SWISSIX (194.242.34.126) for a period longer than 15 minutes.

Note: The RTT will be measured on an uncongested circuit (when the link utilization is under 90% of the specified capacity).

4.2.4 Error Rate/Packet Loss:

The packet loss between the UNHCR Internet edge/border router and the Contractor's internal routing infrastructure shall not exceed 1x10-5 (1 packet lost in 100,000) for a period longer than 15 minutes.

Note: The packet loss will be measured on an uncongested circuit (when the link utilization is under 90% of the specified capacity).

4.3 Service Credits

For every day that the performance of any service fails to meet an applicable service level requirement defined in section 4.2, the Contractor will issue a service credit by deducting from the subsequent invoice an amount equivalent to 24 hours of the fees for the affected service(s) plus 3% of the monthly invoice for such service(s).

In addition, in case of failure to meet the "Time to Restore" service level requirement, resulting in a prolonged unavailability of the service, a service credit consisting of 24 hours of the fees for the affected service will be issued for each continuous subsequent four (4) hours of delay. For instance, if the service is only restored after 8 hours, a service credit will be issued consisting of 48 hours of the fees for the affected service plus 3% of the monthly invoice.

5 ITB Technical Offers

Technical offers should be concisely presented and structured in the following order to include, but not necessarily be limited to, the following information:

5.1 Company Qualifications

- A description of the company with evidence of the company's capacity to perform the services required, including:
    - Company's full name, corporate address, telephone number and fax number;
    - Brief company profile (one page)
    - Primary contact and a back-up contact for this ITB process. Please include title, address, telephone number, fax number and email address; and
    - Financial statements covering the last three years.
- If a multi-location company, please specify the location of the Company's headquarters, and the branches that will be involved in the performance of the services.
- A list of Customer references with special focus on international organizations, such as the United Nations and their (Specialized) Agencies.
- Three or more letters of reference, with contact information.

5.2 Personnel Qualifications

- UNHCR expects to receive the name of the Contractor's designated staff to be involved with the services including but not limited to:
    - Key Account Manager
    - Backup Account Manager
    - Billing Manager

- Other key personnel

- UNHCR reserves the right to ask for more information on some or all of the listed staff.

5.3 Proposed Services

- Contractor must complete the Technical Compliance Form set forth in Annex B.
- Contractor must provide a brief description of the implementation process and anticipated timelines.

6 ITB Contractual Requirements

6.1 Contract Terms and Conditions

Any contract awarded pursuant to UNHCR ITB/2016/744 will be governed by a standard UNHCR contract for the provision of goods and services, including the "UNHCR General Conditions of Contract for the Provision of Goods and Services" that is attached as an Annex to the ITB, which are in turn, based on terms and conditions common to all UN agencies. Acceptance of, and compliance with, these terms and conditions is a prerequisite for establishing any contract with UNHCR. In addition to accepting the UNHCR General Conditions of Contract for the Provision of Goods and Services, the awarded Contractor will be required to sign Annex E.

Please indicate your acknowledgement of the UNHCR General Conditions of Contract for the Provision of Goods and Services by signing this document (Annex E) and including it in your submitted Technical Offer.

6.2 UNHCR Vendor Registration Form

If your company is not already registered with UNHCR, please complete, sign, and submit the Vendor Registration Form in Annex D with your Technical Offer.

6.3 UNHCR Supplier Code of Conduct

UNHCR refers to the UNHCR General Conditions of Contract for the Provision of Goods and Services in Annex E. By signing Annex D, you indicate your acknowledgement of the UNHCR Supplier Code of Conduct.

6.4 Contract Duration

UNHCR anticipates entering into agreements with multiple partner(s) for a term of two (2) years with the option to renew for one (1) additional year. Based on satisfactory performance, the contract may be renewed for the further one (1) year period for a total of

three years (2+1). After three (3) years, the selected Contractor should expect a new market survey to be conducted and a new ITB issued.

7 ITB Commercial Response

As part of this ITB, you have received an Excel spreadsheet (Annex C) that should be used to submit the details of your price quotation. Please state any assumption(s) made when providing the quotation.