**Technical Specifications**

**Backbone Upgrade for the National Computer Network**

Version 1.0 - November 2015

National Centre for Information Technology

Republic of Maldives

**Terms of Reference**

# INTRODUCTION

The National Centre for Information Technology (NCIT) wishes to hire a competent firm to supply the necessary hardware and licenses required to upgrade the Backbone equipments of the National Computer Network (NCN).

# BACKGROUND

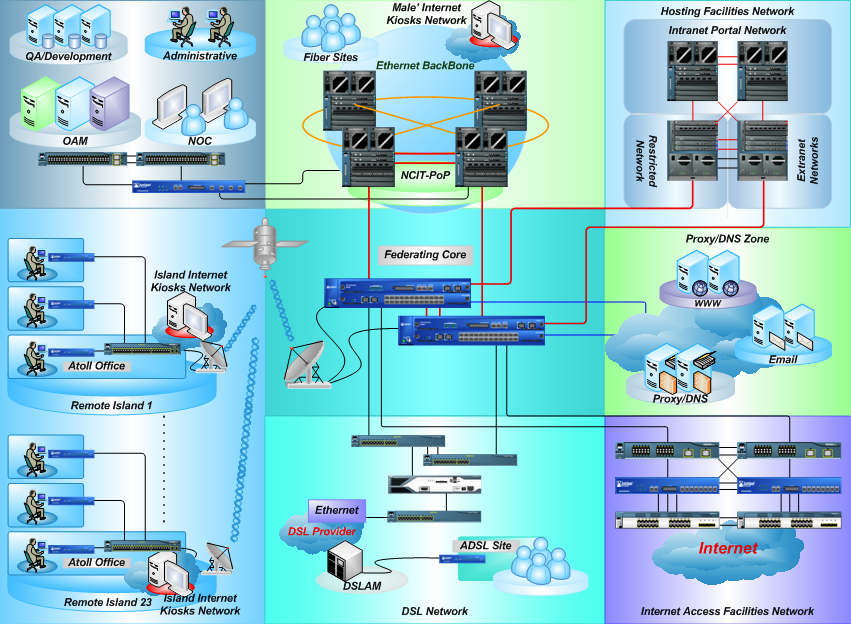
The National Computer Network (NCN) connects government and parastatal agencies (including Vilingili, Hulhule’ and Hulhumale’ islands) in Male’ and all the other inhabited island of Maldives. This Wide Area Network enables government and parastatal agencies to share information electronically. The network also host the eGovernment portals which will enable the public to get access to government information and services through the internet.

The rationale of the NCN is for the Government of Maldives to take advantage of information communication technology (ICT) in its pursuit of making government work more efficient, transparent, and accountable, and of delivering public services to the public.

The NCN is composed of:

1. a Metropolitan Area Network in Male’ built over Ethernet fibre and DSL technologies,
2. two National Leased line distribution networks for the connection of all islands (Support from two LLC Service Providers),
3. the distribution networks for the connection of sites inside the islands,
4. the common network infrastructure for the hosting of Government applications and the secured access to Internet.
5. OAM Network and Operation Centre inside the NCIT

As the existing backbone equipment has reached its EOL, it is crucial to upgrade the existing hardware in order to maintain the availability, uptime and service levels of the network.



Eleements comprising the NCN and Service Platforms

See Appendix 1 for a detailed list of Equipment.

# OBJECTIVES

The objective of this tender is to identify a local firm who will be able to supply the necessary hardware and provide engineering guidance, in accordance to the manufacture best practices to enhance the existing infrastructure.

# SCOPE

The scope of this project is:

1. Procurement of Male’ Metropolitan Area Network (MAN) Switches, router and firewall, which includes:
   1. Male’ MAN equipment, which includes Federating Core, , Hosting Facilities, NCIT NOC and the Distribution switches for MALE’ sites.
2. Consultancy: Provide service of a Systems Engineers to add, move and change to the infrastructure as needed. The System engineer shall provide on job training and assistance to the network engineers of NCIT while redesigning and implementing the acquired hardware, including bringing out the enhancements of the new hardware in accordance to the manufactures best practices.

The detailed list of Hardware requirements are given in Appendix 5, including existing infrastructure (Appendix 1), list of equipment (Appendix 2), and total no of sites (Appendix 3).

# DELIVERABLES

The bidders are expected to submit the following:

1. Cost, with detailed breakdown, of all hardware.

# TERMS

### Waranty

All equipment supplied under this tender must comprise of a Minimum Warranty period of 1 (one) year for parts and labor on site. Additional details shall be specified on the warranty form under appendix

# MINIMUM CRITERIA USED TO DETERMINE RESPONSIBILITY AND RESPONSIVENESS OF PROPOSALS

The following points will be considered in the evaluation of the bids:

* 1. Does the bidder demonstrate an understanding of the Employer’s needs?
  2. Can the bidder supply the request hardware in a timely manner?
  3. Does the bidder possess the ability, capacity, skill, and financial resources to provide the requested services?
  4. Can the bidder take upon itself the responsibilities set forth in the RFP and produce the required outcomes in this RFP?
  5. Has the provider performed satisfactorily in previous contracts of similar size and scope, has it otherwise demonstrated its capacity to perform the contract the Employer seeks to establish through this RFP?

All work performed shall be of the highest quality in accordance with good practices, procedures and industry standards. The contractor must conform to all laws and government regulations.

Knowledge of system architectures, characteristics, commands and components, applicable to the network environments used in the NCN, network security including experience with secured and sensitive information, network architectures and theory and principles of design, integration and administration, including topologies and protocols; principles, practices and methods of systems/network administration and maintenance, including configuration, performance tuning and security; principles, methods and techniques for layout, installation, configuration, integration and operation of network, systems, equipments and devices; Internet/intranet technologies and design concepts and techniques, including firewall configuration and applicable programming languages; principles and practices of systems analysis and design; methods and techniques for performing connectivity testing and network analysis and troubleshooting, including use of diagnostic tools and equipment; techniques and procedures for business and technical system applications.

# Appendix 1: Description of the Government Network of Maldives (GNM)

## Description of GNM

The GNM has been divided in several coherent network elements following a geographical and/or functional repartition. These elements are:

* Federating Core
* Male’ Metropolitan Area Network
* Access and Distribution Networks in Islands
* Hosting facilities and Internet Access Facilities
* OAM Network and Operation Centre inside the NCIT

This is a scheme of the solution:

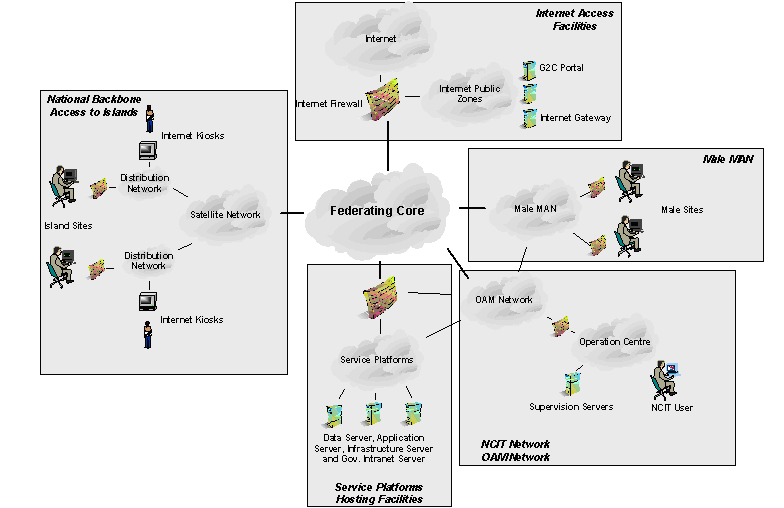


Figure 1. Elements composing the GNM

These elements are described in the following paragraphs:

### Federating Core

The federating core is the heart of the network and its main mission is interconnecting every network element. The federating core will be composed of redundant equipments located in the middle of the network. These equipments must be able to recognise virtual networks for every network element to assure the connection to corresponding virtual networks in the others networks elements. The following scheme shows the construction of two virtual networks from a single physical infrastructure by using the federation core:

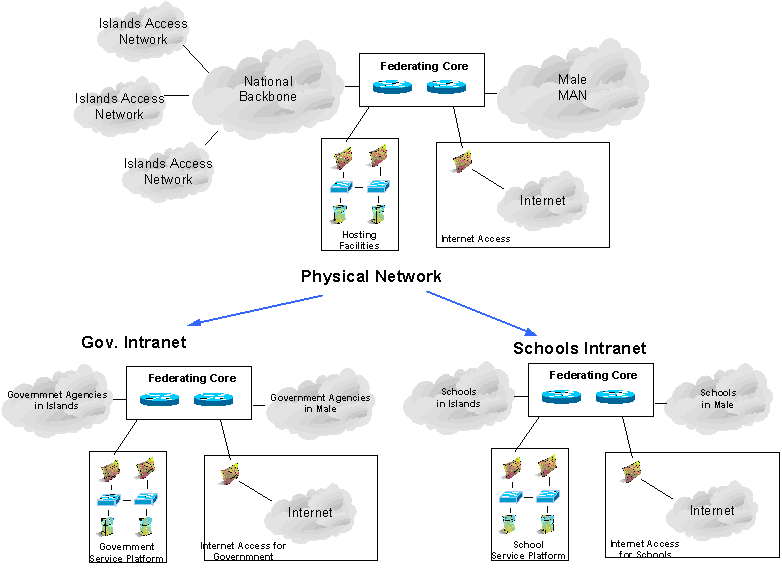


Figure 2. Physical and logical schemes of the network

The characteristics of the federating core are:

* 1. Virtual Routing: capability to create independent virtual routing environments inside single equipments. Possibility of using different routing schemes inside each private network.
  2. Support for main tunnelling protocols:
     + IPSec,
     + L2TP, PPPoA, PPPoE, ATM, MPLS
     + 802.1q VLANs
  3. Virtual Firewalling capabilities: capability to create independent firewalling contexts inside each private network
  4. Internet bandwidth monitoring and management for individual government sites
  5. High capacity: Support for hundreds of tunnels and tens of different routing and firewalling contexts. The federating core equipment will be hosted inside the NCIT.

### Male’ Metropolitan Area Network

The MAN in Male’ will connect Government organisations in the capital and, therefore, it will support the most important part of the traffic. It must be designed to scale to thousands of users. It will be mainly based on Gigabit Ethernet complemented with an ADSL solution. The main characteristics of this network is:

1. 1 Gbps Ethernet backbone capacity
2. Access via standard Ethernet interfaces
3. Ring backbone to assure redundancy data paths
4. Access to sites via Fast or Giga Ethernet over fibre
5. Easy management
6. Flexibility and secure isolation of traffic via VLANs
7. This Ethernet network requires a dedicated fibre infrastructure in order to support the ring backbone and the access to every fibre site. The construction of this infrastructure will be included in the project.

### Service platforms and hosting facilities

This element is an important component of the network given that main common applications and contents should be hosted in it. This element will be composed of a series of firewalls and switches supporting the installation of servers and databases. Main feature of this element will be the capacity of logically creating different architectures to match hosting requirements for different applications and organisations.

This service platform could host main common Government applications and databases. For this, a three security level network will be created.

The design assumes that main facilities concerning the Government common services platform will be hosted and maintained by the NCIT. Other service platforms (e.g. inside the Schools or Faculties Intranet) will be designed, installed and managed by the concerned organisation (e.g. Ministry of Education or Maldives College of Higher Education). Nevertheless, the NCIT could provide hosting facilities for the construction of these service platforms if it is required.

Hosting facilities will be hosted inside the NCIT building.

### Internet access facilities

Internet access facilities will include the following components:

* Routing equipment
* Firewalls
* DMZ for hosting Government–to–Citizens and Government–to– Business portals

This element must provide Internet access services for the users of Government, Schools and Faculties Intranets. The service must be able to support different access policies for each of these Intranets.

The NCIT will be in charge of the management of the Internet Access for the Government Intranet. The control of the access to Internet for other network users such as students should be done by the appropriate organisation. The use of different firewalls for the Internet access of each Intranet will allow a clear definition of responsibilities for this service. The GNM will provide common bandwidth via a single connection to the Internet for every concerned group of user in order to reduce the global cost.

The Internet Firewall will also fulfil the role of VPN gateway for remote connections through the Internet for Government Users. This functionality could be used for connecting agencies in islands not covered by the satellite network.

### OAM Network and Operations Centre inside the NCIT

The Operation and Maintenance (OAM) network will connect the OC (Operations Centre) in the NCIT building to any network equipment installed in the GNM. This connection will allow NCIT staff to supervise and manage remote equipment. In the OAM network, we will find the following parts:

1. Operation Centre LAN: This is the Local Area Network where the stations from the NCIT staff are located
2. Operation Centre servers LAN: In this LAN, OAM servers and tools will be installed.
3. NCIT supervision network: It will be used for the supervision of network equipment and servers hosted inside the NCIT building.
4. Male’ Supervision Network: It will provide a supervision connection to every network equipment in the Male’ MAN.
5. Island supervision Network: It will provide a supervision connection to every network equipment in the backbone and in the access network.

# Appendix 2: Government Network of Maldives (GNM)

# Equipment List and Price sheet.

**List of Equipments**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Item Name** | | **Description** | **Quantity** | **Unit** |
| **1.0** | **N7K-C7004** | | 4 Slot Chassis No Power Supply Includes Fans | 4 | Nos |
| 1.0.1 | CON-SNT-C7004 | | SNTC-8X5XNBD Nexus 7000 4-Slot Ch | 4 | Nos |
| 1.1 | N7KS2K9-72 | | Cisco NX-OS Release 7.2 for Nexus 7000 Series | 4 | Nos |
| 1.2 | CAB-AC-2500W-EU | | Power Cord 250Vac 16A Europe | 8 | Nos |
| 1.3 | N7K-C7004-FD-MB | | Nexus 7004 Front Door Kit | 4 | Nos |
| 1.4 | N7K-DP-CORE | | N7K or N77 DC Core Deployment; For Tracking Only | 4 | Nos |
| 1.5 | N7K-AC-3KW | | Nexus 7000 - 3.0KW AC Power Supply Module (Cable Included) | 8 | Nos |
| 1.6 | N7K-SUP2E | | Nexus 7000 - Supervisor 2 EnhancedIncludes 8GB USB Flash | 4 | Nos |
| 1.7 | N7K-USB-8GB | | Nexus 7K USB Flash Memory - 8GB (Log Flash) | 4 | Nos |
| 1.8 | N7K-SUP2E | | Nexus 7000 - Supervisor 2 EnhancedIncludes 8GB USB Flash | 4 | Nos |
| 1.9 | N7K-USB-8GB | | Nexus 7K USB Flash Memory - 8GB (Log Flash) | 4 | Nos |
| 1.10 | N7K-F248XP-25E | | Nexus 7000 F2-Series 48 Port 1/10G (SFP+) Enhanced | 4 | Nos |
| 1.11 | GLC-LH-SMD | | 1000BASE-LX/LH SFP transceiver module MMF/SMF 1310nm DOM | 192 | Nos |
| 1.12 | N7K-F248XP-25E | | Nexus 7000 F2-Series 48 Port 1/10G (SFP+) Enhanced | 4 | Nos |
| 1.13 | GLC-LH-SMD | | 1000BASE-LX/LH SFP transceiver module MMF/SMF 1310nm DOM | 24 | Nos |
|  |  | |  |  |  |
| **2.0** | **ASA5585-S10F10-BUN** | | ASA 5585-X SSP-10 with FirePOWER Svcs. Chassis and Subs. | 1 | Nos |
| **2.1** | **ASA5585-S10F10-K9** | | ASA 5585-X SSP-10 FirePOWER SSP-1016GE4GEMgt1AC3DES/AES | 2 | Nos |
| 2.1.0.1 | CON-SNT-A85S1F19 | | SNTC-8X5XNBD ASA 5585-X SSP-10, FirePOWER SSP-10,16GE | 2 | Nos |
| 2.1.1 | ASA5585-BLANK-HD | | ASA 5585-X Hard Drive Blank Slot Cover | 4 | Nos |
| 2.1.2 | ASA5585-10CTRL-LIC | | Cisco ASA5585-10 Control License | 2 | Nos |
| 2.1.3 | CAB-AC-2500W-EU | | Power Cord, 250Vac 16A, Europe | 4 | Nos |
| 2.1.4 | ASA5585-PWR-AC | | ASA 5585-X AC Power Supply | 2 | Nos |
| 2.1.5 | SF-ASA-X-9.2.2-K8 | | ASA 9.2.2 Software image for ASA 5500-X Series,5585-X,ASA-SM | 2 | Nos |
| 2.1.6 | ASA5500-SC-10 | | ASA 5500 10 Security Contexts License | 2 | Nos |
| 2.1.7 | ASA-VPN-CLNT-K9 | | Cisco VPN Client Software (Windows, Solaris, Linux, Mac) | 2 | Nos |
| 2.1.8 | ASA5585-PWR-AC | | ASA 5585-X AC Power Supply | 2 | Nos |
| 2.1.9 | ASA-SSP-10-INC | | ASA 5585-X SSP-10 with 8GE,2SFP, incl with bundle | 2 | Nos |
| 2.1.10 | ASA-ANYCONN-CSD-K9 | | ASA 5500 AnyConnect Client + Cisco Security Desktop Software | 2 | Nos |
| 2.1.11 | ASA5500-ENCR-K9 | | ASA 5500 Strong Encryption License (3DES/AES) | 2 | Nos |
| 2.1.12 | ASA-SFR-10-INC-K9 | | ASA 5585-X FirePOWER SSP-10, 8GE | 2 | Nos |
| 2.1.13 | SF-FP5.3.1-K9 | | Cisco FirePOWER Software v5.3.1 | 2 | Nos |
| **2.2** | **L-ASA5585-10-TAMC=** | | Cisco ASA5585-10 FirePOWER IPS AMP and URL Licenses | 2 | Nos |
| 2.2.0.1 | L-ASA5585-10TAMC1Y | | Cisco ASA5585-10 FirePOWER IPS, AMP and URL 1YR Subs | 2 | Nos |
| **2.3** | **FS-VMW-2-SW-K9** | | Cisco FireSIGHT Management Center(VMWare) for 2 devices | 1 | Nos |
| 2.3.0.1 | CON-SAU-VMWSW2 | | SW APP SUPP + UPGR Cisco FireSIGHT Mana | 1 | Nos |
| **3.0** | **L-AC-PLS-P-G** | | Cisco AnyConnect / RA VPN Plus Perpetual License Group | 1 | Nos |
| 3.0.1 | CON-SAU-LACPLSPG | | SW APP SUPP + UPGR Cisco AnyConnect Plus Perpetual License | 1 | Nos |
| 3.1 | AC-PLS-P-1K-S | | Cisco AnyConnect 1K User Plus Perpetual License | 1 | Nos |
| 3.1.0.1 | CON-SAU-ACPL1K | | SW APP SUPP + UPGR Cisco AnyConnect 1K User Plus Perpetual | 1 | Nos |
| 3.2 | L-AC-PLS-P-1K | | Cisco AnyConnect 1K User Plus Perpetual (ASA License Key) | 99999 | Nos |
|  |  | |  |  |  |
| **4.0** | **ASA5545-FPWR-K9** | | ASA 5545-X with FirePOWER Services 8GE AC 3DES/AES 2SSD | 2 | Nos |
| 4.0.1 | CON-SNT-A45FPK9 | | SNTC-8X5XNBD ASA 5545-X with FirePOWER Services 8GE | 2 | Nos |
| 4.1 | SF-FP5.3.1-K9 | | Cisco FirePOWER Software v5.3.1 | 2 | Nos |
| 4.2 | ASA5545-CTRL-LIC | | Cisco ASA5545 Control License | 2 | Nos |
| 4.3 | ASA-RAILS | | ASA 5512-X -- ASA 5555-X Rail Kit | 2 | Nos |
| 4.4 | ASA-PWR-AC | | ASA 5545-X/5555-X AC Power Supply | 2 | Nos |
| 4.5 | SF-ASA-X-9.2.2-K8 | | ASA 9.2.2 Software image for ASA 5500-X Series5585-XASA-SM | 2 | Nos |
| 4.6 | CAB-ACE | | AC Power Cord (Europe) C13 CEE 7 1.5M | 2 | Nos |
| 4.7 | ASA-VPN-CLNT-K9 | | Cisco VPN Client Software (Windows Solaris Linux Mac) | 2 | Nos |
| 4.8 | ASA5545-MB | | ASA 5545 IPS Part Number with which PCB Serial is associated | 2 | Nos |
| 4.9 | CAB-ACE | | AC Power Cord (Europe) C13 CEE 7 1.5M | 2 | Nos |
| 4.10 | ASA-PWR-AC | | ASA 5545-X/5555-X AC Power Supply | 2 | Nos |
| 4.11 | ASA-ANYCONN-CSD-K9 | | ASA 5500 AnyConnect Client + Cisco Security Desktop Software | 2 | Nos |
| 4.12 | ASA5500X-SSD120INC | | ASA 5512-X through 5555-X 120GB MLC SED SSD (Incl.) | 4 | Nos |
| 4.13 | ASA5500-ENCR-K9 | | ASA 5500 Strong Encryption License (3DES/AES) | 2 | Nos |
|  |  | |  |  |  |
| **5.0** | **ASA5545-FP-UPG** | | Upgrade Kit: ASA5545-X FW IPS CX to ASA5545-X FirePower | 1 | Nos |
| **5.1** | **ASA5545-CTRL-LIC=** | | Cisco ASA5545 Control License | 2 | Nos |
| **5.2** | **L-ASA5545-TAMC=** | | Cisco ASA5545 FirePOWER IPS AMP and URL Licenses | 2 | Nos |
| 5.2.0.1 | L-ASA5545-TAMC-1Y | | Cisco ASA5545 FirePOWER IPS, AMP and URL 1YR Subs | 2 | Nos |
| **5.3** | **ASA5500X-SSD120=** | | ASA 5512-X through 5555-X 120 GB MLC SED SSD (Spare) | 4 | Nos |
| 5.3.0.1 | CON-SNT-ASD120 | | SNTC-8X5XNBD ASA 5512-X through 5 | 4 | Nos |
| **5.4** | **FS-VMW-2-SW-K9** | | Cisco FireSIGHT Management Center(VMWare) for 2 devices | 1 | Nos |
| 5.4.0.1 | CON-SAU-VMWSW2 | | SW APP SUPP + UPGR Cisco FireSIGHT Mana | 1 | Nos |
|  |  | |  |  |  |
| **6.0** | **WS-C2960X-24TD-L** | | Catalyst 2960-X 24 GigE 2 x 10G SFP+ LAN Base | 10 | Nos |
| 6.0.1 | CON-SNT-WSC24TDL | | SNTC-8X5XNBD Catalyst 2960-X 24 G | 10 | Nos |
| 6.1 | CAB-ACE | | AC Power Cord (Europe) C13 CEE 7 1.5M | 10 | Nos |
|  |  | |  |  |  |
| **7.0** | **ASR1001-X** | | Cisco ASR1001-X Chassis 6 built-in GE Dual P/S 8GB DRAM | 2 | Nos |
| 7.0.1 | CON-SNT-ASR1001X | | SNTC-8X5XNBD Cisco ASR1001-X Chassis Crypto 6 built | 2 | Nos |
| 7.1 | SLASR1-AIS | | Cisco ASR 1000 Advanced IP Services License | 2 | Nos |
| 7.1.0.1 | CON-SNT-SLASR1AK | | SNTC-8X5XNBD Cisco ASR 1000 Advanced IP Services | 2 | Nos |
| 7.2 | ASR1K-OTHER | | ASR1K-other applications for Enterprise or SP- Tracking only | 2 | Nos |
| 7.3 | M-ASR1001X-8GB | | Cisco ASR1001-X 8GB DRAM | 2 | Nos |
| 7.4 | NIM-BLANK | | Blank faceplate for NIM slot on Cisco ISR 4400 | 2 | Nos |
| 7.5 | SASR1K1XUK9-313S | | Cisco ASR1001-X IOS XE UNIVERSAL | 2 | Nos |
| 7.6 | ASR1001-X-PWR-AC | | Cisco ASR1001-X AC Power Supply | 4 | Nos |
| 7.7 | CAB-ACE | | AC Power Cord (Europe) C13 CEE 7 1.5M | 4 | Nos |
|  |  | |  |  |  |
| **Spare parts and accessories** | | | | |  |
|  |  |  | |  |  |
| **8.0** | **N7K-F248XP-25E=** | Nexus 7000 F2-Series 48 Port 1/10G (SFP+) Enhanced | | 1 | Nos |
| **9.0** | **WS-C2960X-24TD-L** | Catalyst 2960-X 24 GigE 2 x 10G SFP+ LAN Base | | 1 | Nos |
| 9.0.1 | CON-SNT-WSC24TDL | SNTC-8X5XNBD Catalyst 2960-X 24 G | | 1 | Nos |
| 9.1 | CAB-ACE | AC Power Cord (Europe) C13 CEE 7 1.5M | | 1 | Nos |
| **10.0** | **GLC-LH-SMD=** | 1000BASE-LX/LH SFP transceiver module MMF/SMF 1310nm DOM | | 10 | Nos |
| **11.0** | **SFP-10G-LR=** | 10GBASE-LR SFP Module | | 10 | Nos |
| **12.0** | **SFP-H10GB-CU5M=** | 10GBASE-CU SFP+ Cable 5 Meter | | 2 | Nos |
|  |  |  | |  |  |
| **13.0** | Fiber Media Converter | Fiber Media Converter (100/1000Base-T to 1000Base-X, SC Fiber Single Mode Fiber Media Converters) | | 216 | Nos |
| **14.0** | **Fiber Patch Cords** |  | |  |  |
| 14.1 | Duplex Fiber Patch Cable | Duplex Fiber Patch Cord, - Single Mode LC to SC (5 Meter) | | 110 | Nos |
| 14.2 | Duplex Fiber Patch Cable | Duplex Fiber Patch Cord - Single Mode LC to SC (10 Meter) | | 110 | Nos |
|  |  |  | |  |  |
| **15.0** | **Installation and Training** | Installation and Training (On Site/ On the job) for the H/W and Software | | 1 | Lot |

# Price Sheet:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Item Name** | **Description** | | **QTY** | **Unit Price** | **GST** | **Total** |
| **1.0** | **N7K-C7004** | Nexus C7004 | | 4 |  |  |  |
| **2.0** | **ASA5585-S10F10-BUN** | ASA 5585-X SSP-10 with FirePOWER Svcs. | | 1 |  |  |  |
| **3.0** | **L-AC-PLS-P-G** | Cisco AnyConnect / RA VPN Plus Perpetual License Group | | 1 |  |  |  |
| **4.0** | **ASA5545-FPWR-K9** | ASA 5545-X with FirePOWER Services 8GE AC 3DES/AES 2SSD | | 2 |  |  |  |
| **5.0** | **ASA5545-FP-UPG** | Upgrade Kit: ASA5545-X FW IPS CX to ASA5545-X FirePower | | 1 |  |  |  |
| **6.0** | **WS-C2960X-24TD-L** | Catalyst 2960-X 24 GigE 2 x 10G SFP+ LAN Base | | 10 |  |  |  |
| **7.0** | **ASR1001-X** | Cisco ASR1001-X Chassis 6 built-in GE Dual P/S 8GB DRAM | | 2 |  |  |  |
|  |  | |  |  |  |  |  |
| **8.0** | **N7K-F248XP-25E=** | | Nexus 7000 F2-Series 48 Port 1/10G (SFP+) Enhanced | 1 |  |  |  |
| **9.0** | **WS-C2960X-24TD-L** | | Catalyst 2960-X 24 GigE 2 x 10G SFP+ LAN Base | 1 |  |  |  |
| **10.0** | **GLC-LH-SMD=** | | 1000BASE-LX/LH SFP transceiver module MMF/SMF 1310nm DOM | 10 |  |  |  |
| **11.0** | **SFP-10G-LR=** | | 10GBASE-LR SFP Module | 10 |  |  |  |
| **12.0** | **SFP-H10GB-CU5M=** | | 10GBASE-CU SFP+ Cable 5 Meter | 2 |  |  |  |
| **13.0** | Fiber Media Converter | | Fiber Media Converter | 216 |  |  |  |
| **14.0** | Fiber Patch Cord | | Fiber Patch Cord | 220 |  |  |  |
|  |  | |  |  |  |  |  |
| **15.0** | **Installation and Training** | | Installation and Training (On Site/ On the job) for the H/W and Software | 1 |  |  |  |
| **Grand Total (MRF)** | | | | | | |  |

# Warranty Terms

|  |  |  |
| --- | --- | --- |
| **#** | **Item** | **Warranty Terms** |
|  |  |  |

# Delivery

|  |  |  |
| --- | --- | --- |
| **#** | **Item** | **Delivery period (Days)** |
|  |  |  |

# Appendix 3: Government Network of Maldives (GNM) Number of Sites

|  |  |  |
| --- | --- | --- |
| **S/N** | **Location** | **Sites** |
| 1 | Male’ (Single fiber, Dedundant fiber..etc) | 135 |
| 2 | Additional/New sites | 50 |
| **TOTAL NUMBER OF SITES** | | **235** |