

## **SECTION VI. TECHNICAL SPECIFICATIONS**

### **A. Components**

The components of the project are the following:

1. 359 nodes of Cat6 color-coded structured network cabling for data (blue) and voice (white);
2. Gigabit and Cloud Managed Network Switches;
3. Wireless Access Points;
4. Point-to-Point Wireless Mesh between Main and Annex buildings;
5. Appliance Firewall;
6. Network Attached Storage (NAS); and
7. Uninterrupted Power Supply (UPS).

### **B. General Requirements**

The winning bidder shall provide the following:

1. Supply, delivery, installation and configuration of wired and wireless network equipment in the Embassy, including VLAN setup. All network switches, firewall and access points (AP) should have enterprise/advanced security license. All equipment must be brand new and must be intended for the US market.
2. Supply of labor, materials and engineering services required for the project.
3. The wired and wireless network design and implementation must be compliant with the ANSI/TIA/EIA 569-B Commercial Building Standards for Telecommunications Pathways and Spaces and the ANSI/TIA/EIA 568-C Commercial Building Telecommunications Cabling Standards.
4. The bidder should provide a Project Manager for the duration of the project.
5. The bidder should provide onsite engineer for the duration of the project. The bidder must guarantee to make available competent technical personnel for the duration of the project.
6. Provisioning of documentation containing the items below, at the minimum:
  - Warranty Certifications
  - Technical documentation – As built documentation (blueprint) of the structured cabling and implemented network setup/configuration, on all floors for both buildings; User's Guide; data sheet and unit's standard and extended functions
  - Escalation procedure in case of hardware failure

## C. Scope of Work

For the supply, delivery, installation and configuration of Cat6 color-coded data and voice structured cabling, cloud managed network switches, wireless access points, point-to-point wireless mesh, cloud managed security appliance, network attached storage, and UPS, the Bidder shall undertake the following:

1. Provide and install 359 category 6 cables in 1600 Massachusetts Avenue NW Washington DC (Main Chancery), and 1617 Massachusetts Avenue NW (Annex/Old Chancery). All works must be coordinated with the General Contractor at the Annex building. All materials and services are described below:
  - Main Chancery - 93 cable drops for data, 80 cable drops for voice, and 20 cable drops for CCTV; Annex (Consular Office) – 41 cable drops for data, 37 cable drops for voice, and 20 cable drops for CCTV ; to include Cat6 Keystone jacks (blue & white), faceplates, rubber boot and molding materials.
  - The following are already provided for/installed at the Annex/Old Chancery: (a) 62 drops of metal flex conduit for data and voice from 3rd to 1st floor; (b) metal conduit for the 8 cable drops for the 2nd floor to 1st floor; and (c) riser pipes and junction boxes from 1st to 4th floor.
  - Supply, delivery and installation of rack cabinets for Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF) including provision of power and power outlets (Power Distribution Units):
    - 12u Plexiglas door, sides, hinged; wallmount rack enclosure with cooling roof fan kit (7 units);
    - 42u Plexiglas door, sides, hinged; rack enclosure cabinet with cooling roof fan kit (1 unit); and
    - 8-Port 1u rackmount console KVM switch with 19" LCD, touchpad and keyboard (1 unit).
  - Provision of six (6) tie cables (2 fiber, 4 copper) to be run from each floors' IDF to the MDF on both buildings.
  - Provision of twenty six (26) ceiling connections for the Access Points for both buildings.
  - Provide and install approximately ten feet of 12" ladder tray above the rack continuing from wall to wall for overhead cable support.
  - All cables must be supported above the drop ceiling by J hooks with tie wire.
  - All voice and data cables will be terminated on Cat6 patch panels in the designated wiring rack

- Cat6 48-port patch panel 19" rack mountable (7 units)
  - Cat6 24-port patch panel 19" rack mountable (3 units)
- Provide 2u wire management between voice/data panels.
  - Provide patch cables between the patch panel and the network switches and between the wall outlet and the network device.
  - Supply the Embassy with appropriate labeling scheme for all newly installed cables.
  - Conduct a final test of all newly installed cables using an industry standard cat6 tester; results to be saved and submitted in soft and hard copy.
  - All penetrations through fire-rated building structures (walls and floors) shall be sealed with an appropriate Firestop system.
  - All work shall be performed expeditiously with minimum disruption to be done during normal working hours, Monday through Friday 8:00 AM to 4:00 PM. Prior to commencement of work, the design and installation must be approved.
2. Supply, delivery, installation and configuration of cloud managed Gigabit network switches:
- Mounting of switches to the IDF and MDF racks.
  - Installation and configuration of VLAN infrastructure setup for the e-Passport network, per section/units and attached agencies' connections.
  - Testing and labeling.
3. Supply, delivery, installation and configuration of wireless access points:
- Mounting of Access Points for both buildings.
  - Programming, testing and commissioning of Access Points.
4. Supply, delivery, installation and configuration of point-to-point wireless mesh between the two buildings:
- Mounting of wireless bridge, one on each rooftop of the two buildings.
  - Programming, testing and commissioning of the wireless bridge.
  - Auto-pairing using aiming software to optimize wireless link between the two buildings.
5. Supply, delivery, installation and configuration of cloud managed security appliance (Firewall):

- Programming and testing compatibility with the Home Office UTM device.
  - Setup of security policies and advanced security license activation.
  - Setup of site-to-site VPN connection for automatic failover to secondary WAN link.
6. Supply, delivery, installation and configuration of network attached storage system:
    - Setup of Users and Folders.
    - Installation and configuration of System Applications (IRMS, internal VPN, eMail).
  7. Supply, delivery, installation and configuration of Uninterrupted Power Supply units:
    - Installation and configuration of a UPS in all IDFs and MDF.
  8. Submit a Project Management Plan, within ten (10) days after issuance of the notice of award.
  9. Create a network staging lab at the Embassy to test network configuration before actual installation of network components.
  10. Submit a bill of materials for the project including software and hardware and its related network architecture.
  11. Conduct an annual preventive maintenance of all components of the project during the validity of their warranty period.
  12. Conduct housekeeping (including removal of old cables), grooming and labeling of cables including rack cabinets before the turn-over of the project.
  13. Repair and restore to its original state any type of alterations or any kind of damages on the building that were caused by the installation of cables and other project-related equipment.

#### **D. Minimum Technical Requirements**

1. Gigabit Cloud-Managed Power Over Ethernet (PoE) Network Switches

##### Specifications:

Structured Cabling Project (Ver. 11-16-2015)

- a. 48 Port PoE Layer 3 Switch (2 units);  
48 Port PoE Layer 2 Switch (4 units)
  - 48 x 10/100/1000BASE-T Ethernet RJ45
  - 4 x SFP for 1GbE uplink
  - 104 Gbps Switching Capacity
  
- b. 24 Port PoE Switch (2 units)
  - 24x 10/100/1000BASE-T Ethernet RJ45
  - 4 x SFP for 1GbE uplink
  - 48 Gbps Switching Capacity
  
- c. 8 Port PoE Switch (2 units)
  - 8 x 10/100/1000BASE-T Ethernet RJ45
  - 2 x SFP for 1GbE uplink
  - 20 Gbps Switching Capacity

### General Specifications

- Management
  - Managed via a cloud management platform
  - Single pane of glass management of distributed switch deployments
  - Zero-touch remote deployment
  - Layer 7 OS, client, and hostname fingerprinting
  - Detailed historical per-port and per-client usage statistics
  - DHCP, client and hostname fingerprinting
  - Automatic firmware upgrades
  
- Remote Diagnostics
  - Email and SMS (text) alerts upon power loss, downtime or configuration changes
  - Live tools such as cable test to isolate physical layer issues
  - Aggregated event and configuration change logs with instant search
  
- Scalable Stacking
  - Unified configuration and monitoring of all switches
  - Virtually stacking supports thousands of switch ports in a single logical stack for unified management, monitoring, and configuration
  
- Ethernet Switching Capabilities

- 802.1p Quality of Service prioritization
- 802.1Q VLAN tagging for up to 4,095 VLANs
- 802.1D Spanning Tree Protocol (STP) and 802.1w Rapid Spanning Tree
- Broadcast storm control
- Port mirroring
- IGMP snooping for multicast filtering
- DHCP snooping to prevent users from adding unauthorized DHCP servers on the network
- Security
  - Integrated two-factor authentication
  - Role-based administration
  - IEEE 802.1x port-based security
  - Corporate wide password policy enforcement
  - MAC-based RADIUS authentication
  - Sticky MAC
  - MAC whitelisting
  - BPDU guard
  - Root guard
  - IPv4 ACLs
- Performance
  - 2.5 microsecond latency
  - Non-blocking fabric
- Mounting
  - Rack-mountable (rack mount hardware included)
- Environment
  - Operating temperature: 32 - 104 °F (0 - 40 °C)
  - Humidity: 5 to 95% non-condensing
- Warranty
  - Lifetime hardware warranty with next-day advanced replacement included

## 2. Wireless Access Points

### d. Cloud Managed Wireless Access Point (20 units)

#### Specifications:

- Management
  - Managed via a cloud management platform
  - Zero-touch remote deployment

- Automatic firmware upgrades
- Radios
  - 1 x 2.4 GHz 802.11b/g/n
  - 1 x 5 GHz 802.11a/n/ac
  - 1 dedicated for dual-band WIPS & spectrum analysis
  - 1 dedicated to Bluetooth Low Energy Beacon & Scanning
  - Concurrent operations of all four radios
- Performance
  - Max data rate of 1.2 Gbps
  - 2x2 multiple input, multiple output (MIMO) with two spatial streams
  - 802.11ac and 802.11n capabilities
  - Self-healing, zero-config mesh
- Interface
  - 1 x 100/1000Base-T Ethernet (RJ45)
  - Integrated omni-directional antennas
  - PoE (802.3af compatible)
- Security
  - Integrated policy firewall (identity policy manager)
  - Mobile device policies
  - 24x7 Real-time WIPS/WIDS (wireless intrusion prevention/detection system) and spectrum analytics via dedicated third radio
  - Rouge AP containment
  - Guest isolation
  - Teleworker VPN with IPSec
  - WEP, WPA, WPA2-PSK, WPA2-Enterprise w/ 802.1x
  - TKIP and AES encryption
  - VLAN tagging (802.1q)
- Quality of Service
  - Advanced Power Save
  - DSCP
  - 802.1p Quality of Service prioritization
  - Layer 7 Application Traffic Shaping and Firewall
- Mounting
  - Ceiling, Desktop or Wall mountable (mounting hardware included)
- Environment
  - Operating temperature: 32 - 104 °F (0 - 40 °C)
  - Humidity: 5 to 95% non-condensing

- Warranty
  - Lifetime hardware warranty with next-day advanced replacement included

### 3. Point -to-Point Wireless Bridge

#### Specification:

#### e. Cloud Managed Outdoor Wireless Bridge (2 units)

- Management
  - Managed via a cloud management platform
  - Zero-touch remote deployment
  - Automatic firmware upgrades
- Radios
  - 1 x 2.4 GHz 802.11b/g/n
  - 1 x 5 GHz 802.11a/n/ac
  - 1 dedicated for dual-band WIPS & spectrum analysis
  - 1 dedicated to Bluetooth Low Energy
  - Concurrent operations of all four radios
- Performance
  - Max data rate of 1.2 Gbps
  - 2x2 multiple input, multiple output (MIMO) with two spatial streams
  - 802.11ac and 802.11n capabilities
  - Self-healing, zero-config mesh
- Interface
  - 1 x 100/1000Base-T Ethernet (RJ45)
  - External bidirectional antennas
  - PoE (802.3af compatible)
- Security
  - Integrated policy firewall
  - Mobile device policies
  - 24x7 Real-time WIPS/WIDS (wireless intrusion prevention/detection system) and spectrum analytics via dedicated third radio
  - Rouge AP containment
  - Guest isolation
  - Teleworker VPN with IPSec
  - WEP, WPA, WPA2-PSK, WPA2-Enterprise w/ 802.1x
  - TKIP and AES encryption
  - VLAN tagging (802.1q)



- Quality of Service
  - Advanced Power Save
  - DSCP
  - 802.1p Quality of Service prioritization
  - Layer 7 Application Traffic Shaping and Firewall
- Mounting
  - Vertical Poles or Wall mountable (mounting hardware included)
- Environment
  - Operating temperature: -40 to 140 °F (-40 to to 60 °C)
  - IP67 environmental rating
- Warranty
  - Lifetime hardware warranty with next-day advanced replacement included

#### 4. Cloud Managed Security Appliance (Firewall)

##### Specification

##### f. Cloud Managed Security Appliance (2 units)

- Overview
  - Stateful Firewall Throughput: 750 Mbps
  - GbE interface: 9
  - GbE (SFP) interface: 2
  - Advanced Security throughput: 600 Mbps
  - Max VPN Sessions: 250
- Management
  - Managed via a cloud management platform
  - Zero-touch remote deployment
  - Automatic firmware upgrades
  - Role based administration with change logging and alerts
- Monitoring and Reporting
  - Throughput, connectivity monitoring an email alerts
  - Detailed historical per-port & per-client usage statistics
  - Application usage statistics
  - VPN tunnel and latency monitoring
  - Network asset discovery and user identification

- WAN Performance Management
  - Web Caching
  - WAN link aggregation
  - Application level (Layer 7) traffic analysis and shaping
  - Automatic layer 3 failover (including VPN connections)
  - Automatic failover to secondary WAN link or 4G connection
- Network and Security Services
  - Stateful firewall, 1:1 NAT, DMZ
  - Identity-based policies
  - Auto VPN: Automated site-to-site (IPSec) VPN using AES 128-bit encryption
  - Client (IPSec L2TP) VPN
  - Multiple WAN IP, PPPoE, NAT
  - VLAN support and DHCP services
  - Static routing
  - User and device quarantine
  - QoS: Bandwidth priority, VLAN management services
- Hardware
  - Form factor: 1u rack mountable
  - Hard Drive for Web Caching: 1TB
  - Environment: 32 - 105 °F (0 - 40 °C)
  - Humidity: 05% - 95%
  - Warranty: Full lifetime hardware warranty with next-day advanced replacement included
- Software
  - Gateway anti-virus, anti-spyware, anti-phishing, intrusion detection & prevention , application control
  - Content filtering
  - Web Search filtering
  - 5-year Advanced Security License

## 5. Network Attached Storage (NAS)

### Specification:

#### g. Rack Station High Availability Network Attached Storage (3 units)

- CPU: Quad Core 2.4 GHz, floating point, hardware encryption engine
- Memory: 6Gb DDR3
- Storage: 2 x 96TB (8TB x 12 bays), hot swappable drives

- File sharing capacity
  - Users: 2048
  - Groups: 256
  - Folders: 512
- Management
  - Central management
  - High availability manager
  - Log center
- Environment: 5°C to 35°C (40°F to 95°F), 5-95% humidity
- Power Supply Unit: 2 x 500W (Redundant PS)
- Warranty: Standard 3 years

#### 6. Uninterrupted Power Supply (UPS)

##### Specification:

h. 1350W 1500VA UPS 2U (2 units)

i. 800W 1000VA UPS 1U (5 units)

- Surge protection and filtering
- 4 Output connections (minimum)
- Control panel and audible alarm
- Maintenance-free battery with 1 hour runtime
- Operating Environment of 32 - 104 °F (0 - 40 °C)
- Operating Relative Humidity of 0 - 95%
- Standard Warranty: 3 years

#### **E. Other Requirements**

##### 1. Warranty and Maintenance

Bidder should provide warranty for the following:

##### HARDWARE

- a. Three (3) years product warranty, unless a specific warranty/license period is provided in the minimum technical requirements, all warranties/licenses should be valid for at least 3 years, on its entire hardware products, including free parts and labor. The product warranty covers the components against defects in material or

workmanship under normal and proper use, includes parts and labor coverage on cable and connecting hardware.

- b. Warranty shall also cover the immediate replacement of equipment (service unit) or defective parts free of charge.

## SOFTWARE

- a. Bidder should provide five (5) years software license subscription for the wireless access points, appliance firewall and network switches.
- b. For standardization purposes, the wireless access points, appliance firewall and network switches should be of a single brand/manufacturer.

## CABLING

- a. Bidder should provide a one (1) year warranty against defects in local materials or workmanship under normal and proper use of the structured cabling.
- b. At least twenty (20) years system performance warranty on the manufacturer's cable, from the time of acceptance.
- c. Bidder shall be responsible for all costs related to the twenty (20) years for structured cabling onsite service support.

## 2. Support Services

- a. Technical support must be available 24x7 for the following:
  - Network Switches
  - Access Points
  - Wireless Bridge
  - Firewall
  - NAS
  - UPS
- b. Technical support response time must be one (1) hour for phone support and maximum four (4) hours for onsite support.
- c. Technical support must also be available via the internet and/or email.
- d. Bidder must provide procedures on support and problem escalation.

- e. When the hardware cannot be repaired onsite within 24 hours due to extraordinary difficulties, bidder must provide service unit during the maintenance period.

### 3. Project Implementation Support

- a. Within Ten (10) days after receiving the notice of award, the winning bidder must deliver a Project Management Plan detailing the activities and estimated man-hours to implement the project. The Embassy shall review and approve the plan. It must include a Test and Acceptance Checklist that will be reviewed and approved by the Embassy.
- b. The installation shall be performed together with Embassy personnel.
- c. The winning bidder shall define together with Embassy personnel the configuration parameter requirements of the project.
- d. The winning bidder and Embassy personnel shall ensure that all applications are simulated and successfully tested.
- e. The winning bidder shall submit as-built documentation of implemented network setup and configuration.
- f. The winning bidder shall prepare final acceptance document that will be reviewed and approved within two (2) weeks after implementation.

### 4. Training

- a. The bidder shall provide System Administration training for at least two (2) Embassy personnel for the following:
  - o Cloud Managed Network Switches
  - o Wireless Access Points
  - o Wireless Bridge
  - o Firewall
  - o NAS
  - o UPS

### 5. Delivery, Installation and Configuration

- a. All equipment shall be delivered to the Embassy for configuration and testing within thirty (30) calendar days after receipt of Notice to Proceed.

- b. Deployment, configuration and testing of the project must be completed within sixty (60) calendar days after acceptance of Notice to Proceed.
- c. Designated locations for the deployment of wireless network equipment may change without prior notice.

**F. Payment**

- a. Payment shall be made by milestones as will be defined in the Contract.