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Specifications Requirement Data Center Core Switch Replacement

Introduction

The United Nations University (UNU) is an international community of scholars engaged in research, postgraduate training and dissemination of knowledge in furtherance of the purposes and principles of the United Nations, its member states and peoples. For more information please visit www.unu.edu.

The UNU intends to carry out a formal procurement exercise to solicit bids from suppliers for the provision of hardware requirements for Core Switch system replacement including installation and configuration services. The awarded contractor is expected to supply, deliver and install hardware specifications and features, carry out service requirements and configuration to support functionality acceptance test as indicated in this document.

Background

Like many other organizations, UNU face a requirement to enhance the overall network services performance, scalability and reliability. Factors contributing to this requirement include (1) the growing dependence of the university on the network for teaching, learning, research, service delivery and business processes, (2) higher-speed workstations, (3) increase in the number of workstations, (4) server and desktop virtualization, (5) bandwidth/data intensive applications (e.g., real-time data backup, desktop and room-based videoconferencing, video streaming, PC imaging) and (6) the multimedia nature of the Web.

The main components of the campus network include a core switch, Cisco 6509 and twelve 10/100 Mb/s access switches, Cisco 3560, which are connected to the core switch using SFP gigabit fiber uplinks. The purpose of this ITB is to replace the aging Cisco 6509 with a resilient and highly available core switch system, which will consist of two member switches that are active at the same time in a loop-free layer-2 topology.

To ensure full compatibility with our existing Cisco-based network backbone and take full advantage of the in-house expertise with configuring and managing Cisco devices, the replacement of the core switch is required to be the successor model from the same vendor having higher capacity with the added fault-tolerance functionality.

Existing Core Switch Specifications

No.	Item Type	Description	Part/Number	Qty	Remark
1	Chassis	CISCO Catalyst 6509 Chassis	WS-C6500 Series	1	
2	Supervisor module	Catalyst 6000 supervisor 2	WS-X6K-SUP2-2GE	2	Active/Standby configuration
3	Line Card	16 SFM-capable 16 ports 1000mb GBIC	WS-X6516-GBIC	1	
4	Line Card	48 SFM-capable 48 ports 10/100/1000mb RJ45	WS-X6548-GE-TX	1	
5	Fan Tray	Fan Tray	WS-C6K-9SLOT-FAN2	1	
6	Sub-Module	Policy Feature Card 2	WS-F6K-PFC2	2	
7	Sub-Module	Cat6K MSFC 2 daughterboard	WS-F6K-MSFC2	2	
8	Power Supply	CISCO Catalyst AC Power Supply	CNP1HERCAA	2	Redundant power supply

Required Hardware Specifications and Features

Item	Sub-item	Product	Description and details	Quantity
CISCO Catalyst 6500 Virtual Switching System 1440				
1	0	CISCO Catalyst 6500 Virtual Switching System 1440		1
1	1	WS-C6509-E	Enhanced C6509 Chassis, 9slot, 15RU, No power supply, no Fan Tray	2
1	2	SV33ISK9C-12233SXI	IP Services IOS (Latest stable IOS version)	2
1	3	VS-S720-10G-3C	Catalyst 6500 Supervisor 720 with 2 ports 10GbE and MSFC3 PFC3C	2
1	4	CF-ADAPTER-SP	SP adapter for SUP720 (512MB CF included)	2
1	5	WS-X6724-SFP	Catalyst 6500 24-ports GigE module: Fabric-enabled	2
1	6	WS-X6748-GE-TX	Catalyst 6500 48-ports 10/100/1000 GE module: fabric enabled, RJ-45	4
1	7	WS-C6509-E-FAN	Catalyst 6509-E chassis Fan Tray	2
1	8	WS-CAC-3000W	Catalyst 6500 3000W AC power supply	4
1	9	CAB-AC-C6K-TWLK	Power cord, 250 VAC 16A, twist lock NEMA L6-20 plug	4
1	10	MEM-C6K-CPTFL1GB	Catalyst 6500 Compact Flash Memory 1GB	2
1	11	GLC-SX-MM	GE SFP, LC connector SX transceiver	30
1	12	LC-SC Fiber cable	LC-SC Fiber Optic patch cable (3 meters)	36
1	13	X2-10GB-SR	10Gb Fiber transceiver for connection between 6509-E supervisor modules	4
1	14	SC-SC Fiber cable	SC-SC Fiber Optic patch cable (5 meters) for connection between 6509-E Supervisor modules (X2-10GB-SR)	2
1	15	L-CWLMS-4.0-SBE	CISCO Works LMS Small Biz Edition, 50 Devices limited, WIN LIC Only	1
1	16	SmartNet 8x5xNBD	SmartNet support (8x5xNBD) hardware only (or equivalent)	2
CISCO Catalyst Access switches				
2	0	WS-C3560X-24P-S	Catalyst 3560-X 24 ports PoE switch	1

2	1	SmartNet 8x5xNBD	SmartNet support (8x5xNBD) hardware only	1
3	0	WS-C3560X-48P-S	Catalyst 3560-X 48 ports PoE switch	1
3	1	SmartNet 8x5xNBD	SmartNet support (8x5xNBD) hardware only	1
Networking Device Rack and accessories				
4	0	APC-AR3130 (or) equivalent	APC NetShelter SX 42U, 700mm wide, 1070mm Deep rack enclosure with Sides Black	2
4	1	APC-AP7830J	Metered Rack PDU, Zero U, 20A, 100V, (24) 5-15	2
4	2	APC-AP7581	Rack PDU Extender, Basic, 2U, 30A, 200/208V, (4)L6-20	1
4	3	APC-AP7580	Rack PDU Extender, Basic, 2U, 30A, 100/120/200/208V, (4)L5-20	1
4	4	Accessories	Other accessories for earthquake proof mounting, brackets, cable management, etc...	2

Service requirements

Item	Service Description and details
1	<p>Installation</p> <ul style="list-style-type: none"> - Earthquake-proof rack installation for 2 new APC racks (anchor bolting to concrete floor) - Install APC PDUs into rack. - Install other rack accessories into rack, such as cable management brackets, shelf, etc... - Install new CISCO Catalyst 6509-E chassis into racks.
2	<p>Fiber Patch panel relocation</p> <ul style="list-style-type: none"> - Relocate existing 24-port fiber patch panel into 2 new racks, 12 ports in each rack. Distance between old and new racks is approximately 5 meters. - Work must be performed during a weekend - The contractor will be liable for damage or loss against the existing materials (e.g., fiber cables, brackets, etc) incurred arising out of the commissioned works
3	<p>Ethernet Patch panel relocation</p> <ul style="list-style-type: none"> - Relocate existing 2 x 24-port Ethernet patch panel (only 29 cables are currently installed) into one of the new racks. Distance between old and new racks is approximately 5 meters. - Work must be performed during a weekend - The contractor will be liable for damage or loss against the existing materials (e.g., fiber cables, brackets, etc) incurred arising out of the commissioned works
4	<p>New Ethernet Cable and Patch panel installation</p> <ul style="list-style-type: none"> - Set up two 24-port patch panels on the existing APC server rack - Set up one 24-port patch panel on each of the new network racks - Ethernet cables CAT6a or better required - Run and distribute 48 Ethernet cables evenly from the existing APC server rack to the two new network racks - Distance between the server rack and any of the new network racks is approximately 5 meters
5	<p>CISCO VSS basic configuration</p> <ul style="list-style-type: none"> - Basic installation of CISCO VSS 1440 including any necessary IOS and firmware upgrade - Configure the CISCO VSS 1440 to work in a simplified version of the production environment as described in “Functionality Test” section below.

Functionality Acceptance Test

The configuration of all servers and applications, including the IP telephone handsets will be prepared by UNU. In order to ensure interoperability of the core switch system with the existing network infrastructure and meet the overall functional requirements, a simplified version of the production environment will be set up by the awarded contractor as shown in Figure 1. The awarded contractor is required to configure the VSS 1440 core switch system in order to support the following test cases:

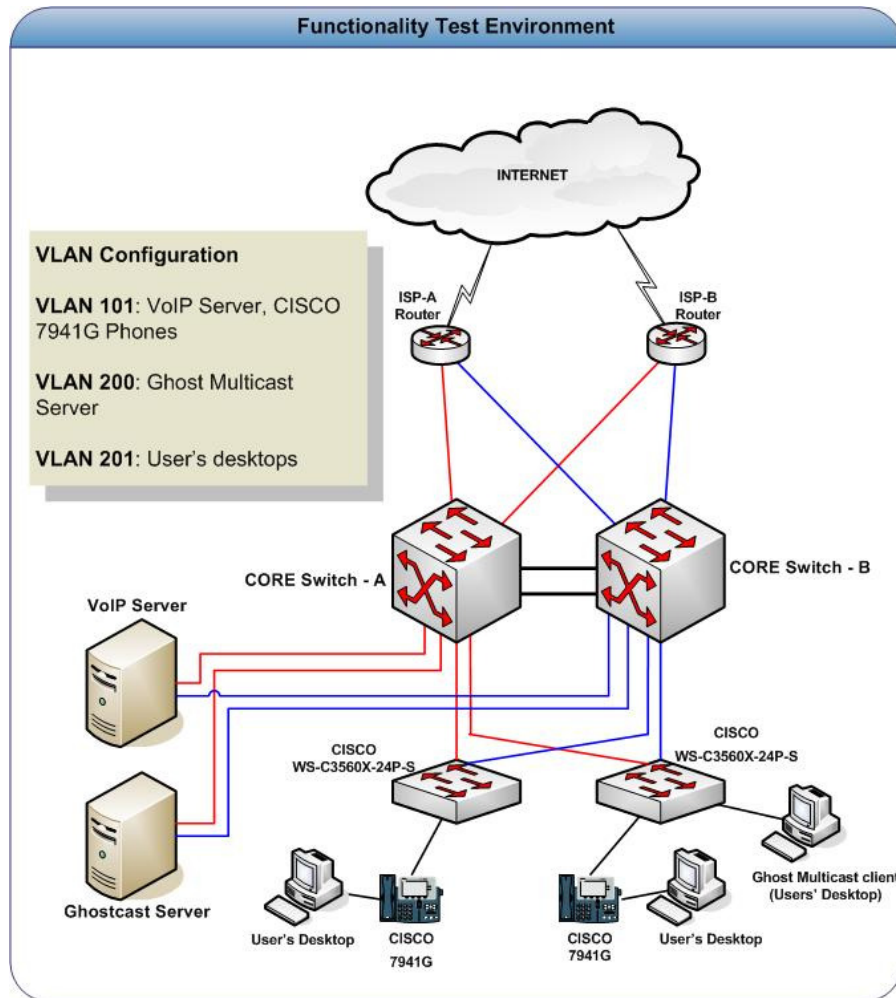


Figure.1: Functionality test environment

Item	Test Features	Acceptance Requirements
1	Active/Active VSS 1440 Configuration	The data planes of both member switches should be active at the same time to permit aggregation of available layer 2 bandwidth across the redundant switches.
2	VSS 1440 Fault Tolerance Test	In case of failure of any redundant element in the dual core switch system, such as a cable, a network interface, or a whole member switch, the access layer and the core layer should continue to forward traffic with no disruption to applications that rely on network state information
3	Member switch failover	<ul style="list-style-type: none"> - Ping between any two hosts should recover after a short period of time
4	Link failure between the core switch system and access layer	
5	Link failure between the member switches of the core switch system	
6	Inter-VLAN routing across 3 VLANs	All hosts should be able to ping each other
7	Link aggregation using two Ethernet links	<ul style="list-style-type: none"> - Ping should recover after a short time upon the disconnection of one Ethernet link - The speed of the NIC team configured on the Ghost server should be the combined speed of the member NICs
8	Multicasting	Deploy a Symantec Ghost image using multicast from Ghost server in VLAN 200 to the target machine on VLAN 201.
9	Routing	Traffic from VLAN 210 should be routed through ISP A and traffic from VLAN 200 should be routed through ISP B
10	VoIP	<ul style="list-style-type: none"> - Telephones should automatically be placed into the Voice VLAN; receive an IP from the PBX server running Asterisk and DHCP service - Telephones should successfully register to the Asterisk server and call each other
11	QoS	<ul style="list-style-type: none"> - Voice traffic should be prioritized over data traffic
12	Fiber cable test results required	End-to-end measurement test results, cables must be properly labeled
13	Ethernet cable test results required	End-to-end measurement test results, cables must be properly labeled

Warranty and maintenance

- Bidder shall also provide complete maintenance support for all the proposed components required as outlined in the ITB for a term of 1 year from the date of the contract award.
- During the warranty period, the bidder warrants that the goods installed under the contract are new, unused, of the most recent version/ models and incorporate all recent improvements in design and materials. The bidder further warrants that the goods installed under this ITB shall have no defects arising from design, materials or workmanship.