

LAN AND WIRELESS UPGRADE

ITEM	QTY	UNIT COST	TOTAL
WIRELESS LAN UPGRADE			
- Access Point 802.11n/ac 2x2:2/3x3:3 MU-MIMO Dual Radio Integrated Antenna AP Including Services	20		
- Flat Surface Wall/Ceiling AP Basic Flat Surface Mount Kit	20		
- LIC-AP Controller per AP Capacity License Including Services	20		
- LIC-PEF Controller Policy Enforcement Firewall Per AP License Including Services	41	₱1,700,000	₱1,700,000
- Modular Core Switch with 6 Module Slot with 2x 700W PoE+ PSU and rackmount Kit	1		
- 8 Port 1G/10GbE SFP+ v3 Mod	1		
- 24 Port 1000BASE-T PoE+ v3 Mod	1		
- 24 Port 1000BASE-T v3 Mod	1		
- 24 Port 1000BASE-T PoE+ v3 z12 Mod	1		
LAN EQUIPMENT UPGRADE			
ADDITIONAL MODULE FOR EXISTING OSG CORE SWITCH			
- 8 Port 1G/10GbE SFP+ v3 z12 Mod	1	₱160,000.00	₱160,000.00
- 8 Port 1/2.5/5/XGT PoE+ v3 z12 Mod	1	₱160,000.00	₱160,000.00
- HPE X132 10G SFP+ LC SR Transceiver	4	₱45,000.00	₱180,000.00
- 24 Port 4SFP+ Layer 3 Switch	1	₱92,000.00	₱92,000.00
- Managed Network Switch POE L2 (24 port)	6	₱20,000.00	₱120,000.00
- LAN and Wireless Implementation and Services including installation and knowledge transfer	1		
GRAND TOTAL			₱2,412,000.00

WIRELESS ACCESS POINT COMPATIBLE WITH EXISTING ACCESS POINT AND CONTROLLER (ARUBA)		20 Units
Specifications	Must be Wave 2 access points that deliver high performance and superb user experience for medium density environments	
	Must have 3x3:3SS MU-MIMO capability	
	Must provide simultaneous data transmission to multiple devices (up to two)	

	Must have advanced ClientMatch radio management technology	
	Must have RF management features	
	Must be Dual Radio 802.11ac Access Point	
	Must have Built-in Bluetooth Low-Energy (BLE) radio	
	Must have Advanced Cellular Coexistence (ACC) that minimize interference from 3G/4G cellular networks, distributed antenna systems and commercial small cell/ femtocell equipment	
	Must support priority handling and policy enforcement for unified communication apps, including Microsoft Skype for Business with encrypted videoconferencing, voice, chat and desktop sharing	
	Must have Adaptive Radio Management (ARM) technology that automatically assigns channel and power settings	
	The APs must be configured to provide part-time or dedicated air monitoring for spectrum analysis and wireless intrusion protection, VPN tunnels to extend remote locations to corporate resources, and wireless mesh connections where Ethernet drops are not available	
	Must have Intelligent app visibility and control	
	Must provide comprehensive protection against advanced online threats	
	Must have Integrated wireless intrusion protection offers threat protection and mitigation, and eliminates the need for separate RF sensors and security appliances	
	Must have Intelligent Power Monitoring (IPM)	
	Must be 5GHz 802.11ac 3x3 MIMO (1,300 Mbps max rate) and 2.4GHz 802.11n 2x2 MIMO (300 Mbps max rate) radios, with a total of three integrated omni-directional downtilt dual- band antennas.	
	Must Support for up to 256 associated client devices per radio, and up to 16 BSSIDs per radio	
	Must have Dynamic frequency selection (DFS) that optimizes the use of available RF spectrum	
	Supported radio technologies:	
	- 802.11b: Direct-sequence spread-spectrum (DSSS) - 802.11a/g/n/ac: Orthogonal frequency-division multiplexing (OFDM)	
	• Supported data rates (Mbps): - 802.11b: 1, 2, 5.5, 11 - 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 - 802.11n (2.4GHz): 6.5 to 300 (MCS0 to MCS15) - 802.11n (5GHz): 6.5 to 450 (MCS0 to MCS23) - 802.11ac: 6.5 to 1,300 (MCS0 to MCS9, NSS = 1 to 3 for VHT20/40/80)	
	The Transmit power must be configurable in increments of 0.5 dBm	

	802.11n high-throughput (HT) support: HT 20/40	
	802.11ac very high throughput (VHT) support: VHT 20/40/80	
	802.11n/ac packet aggregation: A-MPDU, A-MSDU	
Interface	<ul style="list-style-type: none"> • 10/100/1000BASE-T Ethernet network interface (RJ-45) 	
	Auto-sensing link speed and MDI/MDX	
	- 802.3az Energy Efficient Ethernet (EEE)	
	- PoE-PD: 48 Vdc (nominal) 802.3af PoE	
	<ul style="list-style-type: none"> • DC power interface, accepts 1.7/4.0-mm center-positive circular plug with 9.5-mm length 	
	<ul style="list-style-type: none"> • Visual indicators (LEDs): 	
	Power/system status	
	Ethernet link status (ENET)	
	- Radio status (two; RAD0, RAD1)	
	<ul style="list-style-type: none"> • Reset button: factory reset (during device power up) 	
	<ul style="list-style-type: none"> • Serial console interface (RJ-45) 	
	<ul style="list-style-type: none"> • Kensington security slot 	
	Must include the following:	
Licenses	Must have AP Licenses	20 Units
	The LIC-AP Controller must be per AP Capacity License	
Support	The licenses must include 1 year foundation care 24x7 Support	
Mounting Kit	Must be Flat Surface Wall/Ceiling White AP Basic Flat Surface Mount Kit	20 Units
Warranty	Must be lifetime warranty on parts	
	Must include 1 Year Foundation Care Next Business Day Exchange	
Certification	Must belong to the Leaders Magic Quadrant for the Wired and Wireless LAN Access Infrastructure (please attach certificate)	
	LIC-PEF CONTROLLER POLICY ENFORCEMENT FIREWALL PER AP LICENSE E-LTU	41 Units
	* The PEF Controller must be compatible to the existing AP	
	The IDENTITY-BASED POLICY CONTROLS must have the following:	
	* PEF with AppRF technology provides user-level awareness of all traffic across the network. This Mobility Controllers support multiple user categories on a single network, spanning wired, wireless and VPNs.	
	*During the network sign-on process, the identity and role of each user or device is learned. Employees and other authorized internal users can be treated as a single class or further subdivided according to information found in a directory server.	
	The INTELLIGENT APPLICATION IDENTIFICATION must be:	
	*Mobile applications: The AppRF technology distinguishes corporate applications like Box from personal applications like Apple FaceTime, even when they are running on the same mobile device.	

	*Network services like Apple AirPrint and AirPlay: IT optimizes IP multicast video traffic and automatically prioritizes services, and adds policy controls.	
	*Web-based applications: Many web-based applications use the same port to communicate with clients and appear as HTTP traffic. The AppRF technology resolves the destination address to identify unique applications like Facebook, Twitter, Box, WebEx and hundreds of others.	
	*Encrypted applications: For encrypted traffic, The AppRF technology uses heuristics to look for traffic patterns and establishes a unique fingerprint to identify those applications.	
COMPREHENSIVE VOICE MANAGEMENT AND CONTROL		
	*Phone number association – SIP-enabled devices can be tracked and displayed by their phone number	
	*Call quality tracking – Automatically calculate, display and track the R-value for each SIP call being processed through a Mobility Controller.	
	*SIP authentication tracking – Track the registration of SIP devices to an IP PBX to determine if they are authenticated	
	*Call detail records (CDRs) – Display calls made to and from Wi-Fi clients, including originator, terminator, termination reason, rejected and failed calls, duration, and call quality.	
	* Real-time call admission control (CAC) information – Quickly determine call density, CAC state and active calls for load balancing.	
Support	* Must include 1Y Foundation Care 24x7 support	
Certification	* Must belong to the Leaders Magic Quadrant for the Wired and Wireless LAN Access Infrastructure (please attach certificate)	
MODULAR CORE SWITCH		1 Unit
Switch Type	Must be Modular Chassis	
Routing / Switching	Must be Layer 3 Advanced	
Management	Must be Fully Managed	
Included Accessories		
	* Must include z12 Management Module	
	* z12 Switch Fan Tray	
Features		
	* Must be Powerful Layer 3 modular switch series with VSF stacking, Tunnel Node, low latency and resiliency	
	* Must be Smart Rate for high-speed multi-gigabit bandwidth (IEEE 802.3bz) and PoE+ power	
	* Must be Scalable line rate 40GbE for wireless traffic aggregation	

	* Must be Ready for the software defined network with REST APIs and OpenFlow support	
	* Must have Security and network management tools with ClearPass Policy Manager, AirWave and cloud-based Central	
Physical Properties		
Dimensions	17.5(w) x 17.75(d) x 6.9(h) in. (44.45 x 45.09 x 17.53 cm) (4U height)	
Weight	24.5 lb (11.11 kg)	
Port Types		
LAN Ports	up to 144 with optional modules	
Dual Personality Ports	N/A	
SFP Ports	up to 144 with optional modules	
SFP+ Ports	up to 48 with optional modules	
SFP28 Ports	N/A	
XFP Ports	N/A	
X2 Ports	N/A	
CX4 Ports	N/A	
10GBASE-T Ports	up to 48 with optional modules	
QSFP+ Ports	up to 12 with optional modules	
QSFP28 Ports	N/A	
Module Slots	6 open module slots	
Console Port	1 RJ-45 serial console port	
Power Supplies		
Power supply slots	2x power supply slots	
Power supply requirements	Must have 2 x 700W PoE+ z12 PSU	
Memory and Processor		
Memory and Processor	N/A	
Gigabit Module	v3 Gigabit Module: Dual ARM Cortex A9 @ 1 GHz; Packet buffer size: 13.5 MB internal v2 Gigabit Module: ARM 11 @ 450 MHz; Packet buffer size: 18 MB internal	
10Gb Module	v3 10G Module: Dual ARM Cortex A9 @ 1 GHz; Packet buffer size: 13.5 MB internal v2 10G Module: ARM11 @ 550 MHz; packet buffer size: 18 MB internal	
Management Module	Freescale P2020 dual core @ 1.2 GHz, 16 MB flash, 1 GB SD Card, 4 GB DDR3 SODIMM	
Fabric Module	N/A	
I/O Module	v3 40G Module: Dual ARM Cortex A9 @ 1 GHz; Packet buffer size: 13.5 MB internal	
Mounting		
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	
Performance		

100 Mb Latency	[no data]	
1000 Mb Latency	< 2.8 μ s (FIFO 64-byte packets)	
10 Gbps Latency	< 1.8 μ s (FIFO 64-byte packets)	
40 Gbps Latency	< 1.5 μ s (FIFO 64-byte packets)	
Throughput	up to 571.4 Mpps	
Switching Capacity	960 Gbps	
Switch Fabric Speed	1015 Gbps	
Routing Table Size	10000 entries (IPv4), 5000 entries (IPv6)	
MAC Address Table Size	64000 entries	
Electrical Characteristics		
Description	N/A	
Voltage	100-127 / 200-240 VAC	
Current	[no data]	
Frequency	50/60 Hz	
Maximum Power Consumption	[no data]	
Maximum Heat Dissipation	2450 BTU/hr (2584 kJ/hr), (max. non-PoE); 3700 BTU/hr (3903 kJ/hr) (max. using PoE)	
	Heat dissipation does not include heat dissipated by the PoE-powered devices themselves.	
PoE power	* Each 700W power supply provides 630 W chassis power and up to 275 W of PoE/PoE+ power. * Each 1100W power supply provides up to 630 W chassis power and up to 900 W of PoE/PoE+ power. * Each 2750W power supply provides up to 630 W system power and up to 2500 W of PoE/PoE+ power with both line cords.	
Management		
Management	IMC - Intelligent Management Center, command-line interface, Web browser, configuration menu, out-of-band management (RJ-45 Ethernet), out-of-band management (serial RS-232), SNMP Manager	
Other Accessories		
	* Must include 4U/7U Univ 4-post Rackmount Kit	1 Unit
	* Must include 1 x 8p 1G/10GbE SFP+ v3 zl2 Module	1 Unit
	* Must include 1 x 24p 1000BASE-T PoE+ v3 zl2 Module	1 Unit
	* Must include 1 x 24p 1000BASE-T v3 zl2 Module	1 Unit
	* Must include 4 x 10G SFP+ LC SR Transceiver	4 Units
Warranty and Support		
	* Must be limited lifetime warranty on parts	
	* Must include 1 Year Foundation Care Next Business Day on site support	
Certification	* Must belong to the Leaders Magic Quadrant for the Wired and Wireless LAN Access Infrastructure (please attach certificate)	

24 PORT LAYER 3 WITH 4SFP+ SWITCH		1 Unit
Switch Type	Must be Fixed Port	
Routing / Switching	Must be Layer 3 Dynamic	
Management	Must be Fully Managed	
Features		
	* Must be Layer 3 switch series with VSF stacking, static, Rip and Access OSPF Routing, Tunnel Node, ACLs, and robust QoS	
	* Must be Consistent wired/wireless experience with AirWave and ClearPass Policy Manager	
	* Must be Ready for the software defined network with REST APIs and OpenFlow support	
	* Must be Simple deployment with Zero Touch Provisioning and cloud-based Aruba Central support	
	* Must Supports multiple programmatic interfaces, including REST APIs and Openflow 1.0 and 1.3, to enable automation of network operations, monitoring, and troubleshooting	
Management		
	* SNMPv1, v2, and v3 provide complete support of SNMP; provide full support of industry-standard Management Information Base (MIB) plus private extensions; SNMPv3 supports increased security using encryption	
	* Central cloud-based management platform offers a simple, secure and cost-effective way to manage switches	
	* Zero Touch Provisioning (ZTP) simplifies installation of the switch infrastructure using the Aruba Activate-based or a DHCP-based process with AirWave Network Management	
	* Supports multiple programmatic interfaces, including REST APIs and Openflow 1.0 and 1.3, to enable automation of network operations, monitoring, and troubleshooting	
Layer 2 switching		
	<ul style="list-style-type: none"> VLAN support and tagging support IEEE 802.1Q (4,094 VLAN IDs) and 2K VLANs simultaneously 	
	<ul style="list-style-type: none"> Jumbo packet support improves the performance of large data transfers; supports frame size of up to 9,220 bytes 	
	<ul style="list-style-type: none"> IEEE 802.1v protocol VLANs isolate select non-IPv4 protocols automatically into their own VLANs 	
	<ul style="list-style-type: none"> Rapid Per-VLAN Spanning Tree (RPVST+) allows each VLAN to build a separate spanning tree to improve link bandwidth usage; is compatible with PVST+ 	
	<ul style="list-style-type: none"> GVRP and MVRP allows automatic learning and dynamic assignment of VLANs 	
	<ul style="list-style-type: none"> VxLAN encapsulation (tunneling) protocol for overlay network that enables a more scalable virtual network deployment 	
Layer 3 services		

	<ul style="list-style-type: none"> DHCP server centralizes and reduces the cost of IPv4 address management 	
Layer 3 routing		
	<ul style="list-style-type: none"> Static IP routing provides manually configured routing; includes ECMP capability 	
	<ul style="list-style-type: none"> 256 static and 10,000 RIP routes facilitate segregation of user data, without adding external hardware 	
	<ul style="list-style-type: none"> Routing Information Protocol (RIP) provides RIPv1, RIPv2, and RIPng routing 	
	<ul style="list-style-type: none"> Access OSPF <ul style="list-style-type: none"> Provide OSPFv2 and OSPFv3 protocols for routing between access and the next layer on the LAN. Only one OSPF area and up to 8 interfaces are supported 	
	<ul style="list-style-type: none"> Policy-based routing uses a classifier to select traffic that can be forwarded based on policy set by the network administrator (limited to 16 next hop routes) 	
Physical Properties		
Dimensions	17.42(w) x 7.88(d) x 1.73(h) in (44.25 x 20.02 x 4.39 cm) (1U height)	
Weight	5.31 lb (2.41 kg)	
I/O Ports and Slots		
	* 24 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T:full only	
	* 4 SFP+ 1/10GbE ports; PHY-less	
Additional Ports and Slots		
	* 1 dual-personality (RJ-45 or USB micro-B) serial console port	
Port Types		
LAN Ports	24 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T:full only	
SFP+ Ports	4 SFP+ 1/10GbE ports; PHY-less	
Console Port	1 dual-personality (RJ-45 or USB micro-B) serial console port	
Memory and Processor		
Memory and Processor	Dual Core ARM Coretex A9 @ 1016 MHz, 1 GB DDR3 SDRAM; Packet buffer size: 12.38 MB, 4.5MB Ingress/7.785 Egress, 4 GB eMMC	
Mounting		
Mounting	Mounts in an EIA-standard 19-inch telco rack or equipment cabinet (rack-mounting kit available); horizontal surface mounting; wall mounting.	
Performance		

	IPv6 Ready Certified	
1000 Mb Latency	< 3.8 μ s (64-byte packets)	
10 Gbps Latency	< 1.6 μ s (64-byte packets)	
Throughput	up to 95.2 Mpps	
Switching Capacity	128 Gbps	
Routing Table Size	10,000 entries (IPv4), 5,000 entries (IPv6)	
MAC Address Table Size	32,768 entries	
Electrical Characteristics		
Voltage	100 - 127 / 200 - 240 VAC, rated	
Current	0.6/0.4 A	
Frequency	50/60 Hz	
Maximum Power Consumption	29.3 W (idle power: 19.5 W)	
Maximum Heat Dissipation	100 BTU/hr (105.5 kJ/hr)	
Warranty and Support		
	Must be limited lifetime on parts	
	Must include 1 Year Foundation Care Next Business Day on site support	
Certification	Must belong to the Leaders Magic Quadrant for the Wired and Wireless LAN Access Infrastructure (please attach certificate)	
MANAGED NETWORK SWITCH POE+ L2 (24-PORT)		6 Units
Technology	Must be basic smart-managed, fixed-configuration Gigabit Ethernet Layer 2 switches	
	Must provide non-blocking Gigabit per port performance	
	Must include SFP ports for fiber connectivity	
	Must be Power over Ethernet Switch	
	Must be customizable operation using intuitive Web interface	
	Must supports HTTP and HTTP Secure (HTTPS)	
	Flexible deployment options including wall, under table and desktop mounting	
	Must be latest energy-saving capabilities, including Energy Efficient Ethernet (EEE) and idle-port power down.	
	Must have Port Mirroring and Dual Flash Images	
	Must have Default DHCP client mode	
	Must be 1U Height	
Connectivity	Auto-MDI/MDIX	
	IEEE 802.3X flow control	
	Loop protection	
	IEEE 802.3at Power over Ethernet (PoE+)	
	PoE+ port availability	
	Auto PoE power configuration	
	PoE shut down mode	
I/O ports and slots	12 RJ-45 autosensing 10/100/1000 PoE+ ports; Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only	
	12 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type	

	1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only	
	2 SFP 100/1000 Mbps ports (IEEE 802.3z Type 1000BASE-X, IEEE 802.3u Type 100BASE-FX)	
Memory and processor	ARM Cortex-A9 @ 400 MHz, 128 MB SDRAM; Packet buffer size: 1.5 MB, 16 MB flash	
Performance	100 Mb Latency: < 7 μ s (LIFO 64-byte packets)	
	1000 Mb Latency: < 2 μ s (LIFO 64-byte packets)	
	Throughput up to 38.6 Mpps (64-byte packets)	
	Switching capacity: 52 Gbps	
	MAC address table size 8000 entries	
Security	Encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch	
	Monitors nine types of malicious attacks and protects the network by blocking these attacks	
	Provides security so that only authorized access to the Web browser interface is allowed	
Performance	Half-/full-duplex auto-negotiating capability on every port	
	IGMP snooping	
Resiliency and high availability	IEEE 802.1D STP and IEEE 802.1W RSTP that Provides redundant links while preventing network loops	
	Link aggregation (trunking)	
Warranty	Limited Lifetime Warranty	
	The bidder must be and authorized reseller of the brand being offered	
SERVICES		
INSTALL, START-UP and CONFIGURATION OF CORE SWITCHES		
	Scope of Works	
A. Physical Checking Installation	i. Pre-staging	
	ii. Hardware Testing	
	iii. Rack mounting	
	iv. Inserting/connecting power supplies	
	v. Power-up	
B. Management	i. Creation of management VLAN	
	ii. Assigning of management IP address per switch or per stacked of switches	
C. VLAN Configuration	i. Configuration of VLANS	
	ii. Configuration of Tagged port (VLAN up links)	
	iii. Configuration of inter-VLAN routing	
D. Testing	i. Perform Inter VLAN connection	
CONFIGURATION OF CONTROLLER LICENSES		
	A. System name	
	B. Country Code	
	C. Admin Password	
	D. Date and Time	

	E. Connectivity Settings	
	F. Authentication Settings	
	G. Management VLAN configuration	
	H. Configuring Default Gateway	
	I. License installation and activation	
	INSTALLATION AND CONFIGURATION OF ACCESS POINTS	
A. Access Point Controller Discovery	i. Layer 2 Network Discovery	
	ii. DHCP Server Configuration	
	DOCUMENTATION	
	A. Electronic documentation as built	
Knowledge Transfer	Include 1 Day Knowledge Transfers based on Implementation	
CORE SWITCH ADDITIONAL MODULE		
INSTALL, START-UP and CONFIGURATION OF CORE SWITCH ADDITIONAL MODULE AND 24 PORTS LAYER 3 SWITCH		
A. Physical Checking Installation	i. Pre-staging	
	ii. Hardware Testing	
	iii. Rack mounting	
	iv. Inserting/connecting power supplies	
	v. Power-up	
B. Management	i. Creation of management VLAN	
	ii. Assigning of management IP address per switch or per stacked of switches	
C. VLAN Configuration	i. Configuration of VLANS	
	ii. Configuration of Tagged port (VLAN up links)	
	iii. Configuration of inter-VLAN routing	
D. Testing	i. Perform Inter VLAN connection	
	DOCUMENTATION	
	A. Electronic documentation as built	
Knowledge Transfer	Include 1 Day Knowledge Transfers based on Implementation	

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