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7	1	wireless access point controller/software with installation, setup & configuration
8	1	Firewall with installation, setup & configuration
9	1	Fiber Connection to Switches including installation of 4 core Fiber Optic cables (supplier to provide cables & required accessories) - 150meter 4 core fiber cable - 200meter 4 core fiber outdoor cable
10	10	SFP trans receiver BiDi

1- 16 Port SFP+ SWITCH

Should be rack-mountable manageable switch with Layer3 features, and it should have fully loaded 16 SFP+ ports for high performance

Features

- Boot option for SwOS or RouterOS
- Non-blocking Layer 2 switching capacity
- 16K host table
- IEEE 802.1Q VLAN
- Supports up to 4K simultaneous VLANs
- Port isolation and Port security
- MSTP
- SFP 1.25 and SFP+ 10Gbit module support
- 800 MHz dual core CPU
- Dual power supplies

Technical Specification

- Operating System: RouterOS
- Size of RAM: 1 GB
- Storage size: 16 MB
- Storage type: FLASH

2- 48 PORT GIGABIT LAYER 2 MANAGEABLE SWITCH Should provide compatible 10km 10G BiDi LC, SM SFP (2 Units with Each Switch)

Should have independent 48 Gigabit Ethernet ports (Minimum 48 Ports) and minimum 2 SFP+ ports provide up to 10 Gbps & 2 SFP+ ports provide up to 40 Gbps connectivity via either optical fiber Flash 16MB minimum storage & RAM minimum 64 MB

Features

- Non-blocking Layer 2 switching capacity
- 16K host table
- IEEE 802.1Q VLAN
- Supports up to 4K simultaneous VLANs
- Port isolation
- Port security
- Broadcast storm control
- Port mirroring of ingress/egress traffic
- STP / RSTP / MSTP
- Access Control List
- SNMP
- 10218-byte jumbo frames support
- IGMP snooping
- IEEE 802.3ad and static link aggregation

Technical Specification

- 48 Gigabit Ethernet ports
- 2 SFP+ ports 10G
- 2 SFP+ ports 40G
- RJ45 serial console port

- Non-Blocking throughput: 168 Gbps
- Switching capacity: 336 Gbps
- Forwarding rate: 235 Mpps
- Temperature based fan control
- 1U rackmount
- Selectable power output per port (26 / 53 V)

3- 24 PORT GIGABIT LAYER 2 MANAGEABLE SWITCH Should provide competible 10km 10G BiDi LC, SM SFP (2 Units with Each Switch)

Should have independent 48 Gigabit Ethernet ports (Minimum 48 Ports) and minimum 2 SFP+ ports provide up to 10 Gbps & 2 SFP+ ports provide up to 40 Gbps connectivity via either optical fiber Flash 16MB minimum storage & RAM minimum 64 MB

Features

- Non-blocking Layer 2 switching capacity
 - 16K host table
- IEEE 802.1Q VLAN
- Supports up to 4K simultaneous VLANs
 - Port isolation
 - Port security
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4- Firewall Requirements

- Central web & cloud management console
- Supports High Availability (HA) Configurations.
- Client Based, Client Less VPN access

- Should be able to support with high throughput to cater minimum of 200 live users.
- Dual WAN Supported
- Client based VPN access (minimum 200 Concurrent Users)
- Identity awareness-based Firewall
 - Bandwidth Management based on:
 - Active Directory Users and Groups
 - External Users
 - Apply rules to specific devices.
- Apply rules to specific websites or applications.
- Includes integrated intrusion detection and prevention (IPS) function
- Web Content and Application Filtering /URL Filtering
- Able to create and set security policy definitions per AD user, role, computer, IP or MAC address, specific aspects of an application and security groups.
- Networking: All internet-based applications should be supported for filtering like Telnet, FTP, SMTP, http, DNS, ICMP, DHCP, ARP, RPC, SNMP, NAT Functions etc.
 - User Authentication through AD, Local and LDAP
- Support dual stacking of IPv4 and IPv6 protocols for all firewall features.
- Secure access to applications used in RDC. Includes: SQL Server, VOIP, Video Conference, RDP, O365 and other web-based applications.
- Enable secure remote access to authorized resources from inside and outside of the networks.
- Zone-based network segmentation and zone protection
- VOIP traffic filtering
- Policy-based traffic shaping (priority, guaranteed, maximum)
- For applications, user, groups, etc....
- Able to support agent-less & agent base integration with Microsoft Active Directory and facilitate Microsoft AD user and group integration within the firewall.
- Web and Application filtering
- Provide application function control to identify, allow, block or limit usage of applications and features within them.
- identity-based enforcement of the organization's policies over new evasive, web-based communication technologies (i.e., social media, web mail and popular remote access applications, P2P application sharing, etc.)
 - Automatically prevent web-based attacks, including phishing links in emails, phishing sites, HTTP-based command-and-control, and pages that carry exploit kits.
 - Supports zero trust network framework.

Threat Prevention

- Able to determine if an unknown traffic is a threat or not.
- Able to detect and prevent protocol misuse, malware communications, tunnelling attempts, and generic attack types without signatures.
- Detects and blocks unsanctioned peer to peer traffic.
 - The Proposed Solution (Firewall, IPS, Application Control, URL Filtering, Anti-Virus & Anti-Bot, Sandboxing) should support for Active – Active connections without a dependency on a 3rd party product or appliance.
- Ability to see all unknown traffic on all ports in one management location.

VPN

- Client VPN Based Solution, authentication to work network via users' Active Directory Credentials with 2 factor Authentication.

- VPN users' activity monitoring, logging, and reporting. Must be able to view the activity logs of users via the management console.
- Staff can use a web portal on the firewall to view VPN setups and self-guided access to the corporate intranet.

Monitoring and Reporting Systems

- Able to report events via standard mechanisms, for example, to a syslog or SNMP server or a SIEM solution.

Generate reports of (user based wherever appropriate)

- Bandwidth usage.
- Application Usage.
- Accessed websites.
- VPN Usage
- Intrusion attacks with source IP, destination IP or port must be available.

Training

- The service provider must provide on-site training in implementation
- Provide manufacturer certified training for two of our employees. To be trained to configure, operate and maintain the proposed solution.

Licenses / Subscription

- Concurrent user software license for URL filtering and blocking, antispam, Anti phishing, and content filtering functionality, pattern file, and scan engine updates.
- If there is separate cost for licensing, this cost should be per device and should NOT be based on per user or IP endpoint (should support unlimited users) c) Subscription Year minimum 1 year

Access Point

Management interfaces	Ethernet Bluetooth
Networking interface	(1) GbE RJ45 port
Button	Factory reset
Power method	802.3af PoE, passive PoE (48V)
Power supply	802.3af PoE 48V, 0.32A PoE adapter
Supported voltage range	44 to 57VDC
Max. power consumption	12W
Max. TX power	
2.4 GHz	23 dBm
5 GHz	17 dBm

MIMO	
2.4 GHz	2 x 2
5 GHz	2 x 2
Throughput rate	
2.4 GHz	300 Mbps
5 GHz	1201 Mbps
Antenna gain	
2.4 GHz	2.8 dBi
5 GHz	3 dBi
Operating temperature	-30 to 60° C (-22 to 140° F)
Operating humidity	5 - 95% noncondensing
Certifications	CE, FCC, IC
WiFi standards	802.11a/b/g WiFi 4/WiFi 5/WiFi 6
Wireless security	WPA-PSK, WPA-Enterprise (WPA/WPA2/WPA3)
BSSID	8 per radio
VLAN	802.1Q
Advanced QoS	Per-user rate limiting
Guest traffic isolation	Supported
Concurrent clients	300+