

6. Bill of Quantity

TECHNICAL SPECIFICATIONS OF WLAN CONTROLLER AND ACCESS
POINTS

Wireless Lan Controller(Qty. 1)					
Sr. No.	Items	Description/ Specifications	Brand and Model	Unit Price	Total
	General Requirement	The controller should have: 1. 2 x 10G & 4 x GE ports. 2. Separate Control plane and data plane 3. Survivable AP Architecture i.e., In the event of backhaul outage, new APs and clients can be added and full WLAN functionality persists	DELL EMC RUCKUS	1,497,474	1,497,474
1.	Compliant Standards	IEEE 802.11a , IEEE 802.11b , IEEE 802.c, IEEE 802.11d , IEEE 802.11e, IEEE 802.11g , IEEE 802.11h , IEEE 802.11i , IEEE 802.11n , IEEE 802.1D , IEEE 802.1Q , IEEE 802.1x , IEEE 802.3 , IEEE 802.3u, 802.11ac	DELL EMC RUCKUS		
2.	Features	ARP support, DHCP support, MAC address filtering, Manageable, Syslog support, VLAN support, centralized security policies, wireless intrusion prevention system, RF management, quality of service (QoS) for voice and video, The APs and controller should be capable of 802.11q VLAN tagging of Management traffic independent of VLANs utilized by the WLANs (SSID). Further: a. The APs and controller may utilize different VLAN tags	DELL EMC RUCKUS		
3.	Network Transport Protocol	ARP , , DHCP , ICMP/IP , TCP/IP , UDP/IP	DELL EMC RUCKUS		
4.	Switching Protocol	Ethernet	DELL EMC RUCKUS		
5.	Type	Network management device	RUCKUS		

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6.	Other Features	Wired speed, no blocking performance for 802.11n and optimized for 802.11ac networks Separate SSID tunnels allow both corporate and personal Internet access Support for up to 1000 access points and 25,000 clients with 55 activate licenses of AP Designed to support both 802.11n and 802.11ac networks Ability to manage 1000 access points simultaneously Option to add additional access points and feature licenses over time Allows access points to dynamically establish wireless connections without the need for a physical connection to the wired network	DEU EMC Ruckus		
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**Wireless Access Point
In Door
(Qty. 50)**

Sr.No.	Items	Description/Specifications	Brand / Model	Unit Price	Total
1.	Compliant Standards:	IEEE 802.11a , IEEE 802.11ac , IEEE 802.11c, IEEE 802.11b , IEEE 802.11d , IEEE 802.11g , IEEE 802.11h , IEEE 802.11i , IEEE 802.11n , IEEE 802.1x , IEEE 802.3af , IEEE 802.3at, WMM/802.11e	DELL EMC RUCKUS	109,185.82	5,459,291
2.	Connectivity Technology:	Wireless	DELL EMC RUCKUS		
3.	Data Link Protocol:	IEEE 802.11a , IEEE 802.11ac , IEEE 802.11b , IEEE 802.11g , IEEE 802.11n	DELL EMC RUCKUS		
4.	Other Features	Supporting channels up to 160MHz Wide Dynamic Bandwidth Selection allows the access point to dynamically switch between 20-, 40-, 80-, and 160-MHz channels Supporting Four spatial streams, MU-MIMO enables access points to split spatial streams between client devices, to maximize throughput. Enables both radios to operate in 5-GHz client serving mode, Allowing an industry-leading 2.5 Gbps over-the-air speeds while increasing client capacity. Allows the access points to intelligently determine the operating mode of serving radios based on the RF environment. The access points must operate in the following modes: 2.4-GHz and 5-GHz mode: One radio will serve clients in 2.4-GHz mode, while the other serves clients in 5-GHz mode. • WMM, Power Save, LDPC, STBC, 802.11r/k/v • Hotspot • Hotspot 2.0 • Captive Portal • WISPr	DELL EMC RUCKUS		

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5.	Supported Channels	• 2.4GHz: 1-13 • 5GHz: 36-64, 100-144, 149-165	RUCKUS		
6.	MIMO Technology	• 4x4 SU-MIMO • 4x4 MU-MIMO	DELL EMC RUCKUS		
7.	Security	• WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, Dynamic PSK • WIPS/WIDS			
8.	Supported Rates	• 802.11ac: 6.5 to 1,733Mbps (MCS0 to MCS9, NSS = 1 to 4 for VHT20/40/80) • 802.11n: 6.5 Mbps to 600Mbps (MCS0 to MCS31) • 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6Mbps • 802.11b: 11, 5.5, 2 and 1 Mbps	DELL EMC RUCKUS		
9.	Antenna Gain	• Min Up to 3dBi	RUCKUS		
10.	Ethernet	• Min Two Ethernet ports; Min one 2.5GbE & one 1GbE port • Power over Ethernet(802.3af/at/bt)with Category 5/5e/6 cable • Link Aggregation (LACP)	DELL EMC RUCKUS		
11.	Client Capacity	• Up to 500 clients per AP	RUCKUS		
12.	SSID	• Min Up to 16 per AP	RUCKUS		
13.	PERFORMANCE AND CAPACITY	• 2.4GHz: 500Mbps or Higher • 5GHz: 1700Mbps or Higher	RUCKUS		
14.	NETWORKING	• Controller based Platform Support. • Supported wireless meshing technology • IPv4, IPv6, dual-stack • Vlan, 802.1Q, 802.1x, Tunneling Technology, Policy Management Tools will be required. • USB 1 USB 2.0 port, Type A	DELL EMC RUCKUS		

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15.	CERTIFICATIONS AND COMPLIANCE	• Wi-Fi Alliance4 • Wi-Fi CERTIFIED™ a, b, g, n, ac • Passpoint®, Vantage • Standards Compliance5 • EN 60950-1 Safety • EN 60601-1-2 Medical • EN 61000-4-2/3/5 Immunity • • EN 50121-1 Railway EMC • EN 50121-4 Railway Immunity • IEC 61373 Railway Shock & Vibration • UL 2043 Plenum • EN 62311 Human Safety/RF Exposure • WEEE & RoHS • ISTA 2A Transportation	DELL EMC RUCKUS		
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Accessories (Original Manufacturer Brand)		
	Item Specifications	Quantity
	Secure Mounting Bracket	50
	Power over Ethernet (PoE) Adapter (10/100/1000 Mbps) with EU power adapter.	50

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**Wireless Access Point
Out Door
(Qty. 05)**

Brands: Cisco , Ruckus or equivalent

Sr.No.	Items	Description/Specifications	Brand/ Model	Unit Price	Total
1.	Compliant Standards:	IEEE 802.11a , IEEE 802.11ac (draft 5.0) , IEEE 802.11c, IEEE 802.11b , IEEE 802.11d , IEEE 802.11g , IEEE 802.11h , IEEE 802.11i , IEEE 802.11n , IEEE 802.1x , IEEE 802.3af , IEEE 802.3at, WMM/802.11e	DELL Emc Ruckus	248,701	1,243,505
2.	Connectivity Technology:	Wireless	Ruckus		
3.	Data Link Protocol:	IEEE 802.11a , IEEE 802.11ac , IEEE 802.11b , IEEE 802.11g , IEEE 802.11n	Ruckus		
4.	Other Features	Supporting channels up to 80 MHz wide Dynamic Bandwidth Selection allows the access point to dynamically switch between 20-, 40-, and 80-, MHz channels Supporting Four spatial streams, MU-MIMO enables access points to split spatial streams between client devices, to maximize throughput. Enables both radios to operate in 5-GHz client serving mode, Allowing an industry-leading 2.5 Gbps over-the-air speeds while increasing client capacity. Allows the access points to intelligently determine the operating mode of serving radios based on the RF environment. The access points must operate in the following modes: 2.4-GHz and 5-GHz mode: One radio will serve clients in 2.4-GHz mode, while the other serves clients in 5-GHz mode. • WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v • Hotspot • Hotspot 2.0	DELL Emc Ruckus		

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		• Captive Portal • WISPr			
5.	Supported Channels	• 2.4GHz: 1-13 • 5GHz: 36-64, 100-144, 149-165	DELL EMC RUCKUS		
6.	MIMO Technology	• 4x4 SU-MIMO • 4x4 MU-MIMO	RUCKUS		
7.	Security	• WPA-PSK, WPA-TKIP, WPA2 • AES, 802.11i, Dynamic PSK • WIPS/WIDS	RUCKUS		
8.	Supported Rates	• 802.11ac: 29.3Mbps – 1733 Mbps (80MHz) • 802.11n: 6.5Mbps – 216.7 Mbps (20MHz) • 13.5 Mbps – 800Mbps (40MHz) • 802.11a: 54, 48, 36, 24, 18, 12, 9 and 6Mbps • 802.11b: 11, 5.5, 2 and 1Mbps • 802.11g: 54, 48, 36, 24, 18, 12, 9 and 6Mbps	DELL EMC RUCKUS		
9.	Antenna Gain	• Omni - Min Up to 3dBi • Sector – Up to 8dBi	DELL EMC RUCKUS		
10.	Ethernet	• 2 x 1GbE ports • Support for LACP (Link Aggregation Control Protocol) to maximize the backhaul bandwidth using both Ethernet ports • SFP Fiber Interface providing flexibility to backhaul to fiber	DELL EMC RUCKUS		
11.	Client Capacity	• Up to 500 or Higher clients per AP	RUCKUS		
12.	SSID	• Min Up to 16 per AP or Higher	RUCKUS		
13.	PERFORMANCE AND CAPACITY	• 2.4GHz: 500Mbps or Higher • 5GHz: 1700Mbps or Higher	RUCKUS		
14.	NETWORKING	• Controller based Platform Support. • Supported wireless meshing technology • IPv4, IPv6, dual-stack • Vlan, 802.1Q, 802.1x, Tunneling Technology, Policy Management Tools will be required.	DELL EMC RUCKUS		



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15.	CERTIFICATIONS AND COMPLIANCE	• Wi-Fi Alliance4 • Wi-Fi CERTIFIED™ a, b, g, n, ac • Passpoint®, Vantage • Standards Compliance5 • EN 60950-1 Safety • EN 60601-1-2 Medical • EN 61000-4-2/3/5 Immunity • - EN 50121-1 Railway EMC • EN 50121-4 Railway Immunity • IEC 61373 Railway Shock & Vibration • UL 2043 Plenum • EN 62311 Human Safety/RF Exposure • WEEE & RoHS • ISTA 2A Transportation	DEU EMC RUCKUS		
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Accessories (Original Manufacturer Brand)		
	Item Specifications	Quantity
	Secure Mounting Bracket	05
	Power over Ethernet (PoE) Adapter (10/100/1000 Mbps) with EU power adapter.	05


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Wireless Network Reporting & Data Analytics

(Qty. 01)

Sr.No.	Items	Description/Specifications	Brand / Model	Unit Price	Total
1.	Deployment & Licensing options	- Virtualized on-premises (Hyper-V®, VMware® or KVM™) - Must include 55 AP licenses for the software tool along with support upto 1000 AP's	DELL EMC RUCKUS	193,118	193,118
2.	Features Required in Software	- Proposed Big Data Wi-Fi analytics and reporting engine must be purpose built to help service providers make informed business decisions regarding the operation of their Wi-Fi networks and to be located in the Network Operations Centers (NOCs) - The software must provide comprehensive network intelligence by collecting and aggregating data from applications, devices, access points and controllers - Pre-packaged and customizable reports, dashboards and correlations - Granular drill-down capability—to the level of individual sessions, clients and access points - Predictive analytics powered by machine learning - Three-year data storage capacity for up to 100,000 access points and millions of clients - Open APIs for integration with network management and business intelligence systems - The proposed Big Data Analytics and Reporting Engine must be able to provide real-time and historic data is analysis and graphically displayed it in an easy to understand format with a wide variety of views and customized reports. - The data gathered by proposed Big Data Analytics and Reporting Engine must cover details essential network statistics such as traffic usage, client and session measurement, network changes, network latency, and inventory.	DELL EMC RUCKUS		

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	Reporting Engine must support traffic statistics are reporting by SSID in addition to per radio and client, providing a service (SSID) view of network usage, client connections and performance statistics.	DELL EMC RUCKUS		
	Proposed Big Data Analytics and Reporting Engine must be able to provide the following metrics: AP Stats: • AP Name, MAC, Description, Serial #, GPS • Controller Name & MAC • Client Hostname & Username • # of sessions • # of sub sessions • # of unique clients • Session Length • Tx & Rx bytes Client Session: • AP Name, MAC, Description, Serial #, GPS • Controller Name & MAC • Client Device OS, Hostname & Username • # of sessions • # of sub sessions • # of unique clients • Session Length • Tx & Rx bytes • Connected time duration Events: • AP Name, MAC, Description, Serial #, GPS • Controller Name & MAC • Number of Events Controller: • Controller Name & MAC • Client Count • License Count • License Utilization	DELL EMC RUCKUS		

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Total	8,393,388
GST	1,426,875
Total Amount with GST	9,820,263

Grand Total Rupees (in words) Nine Million Eight Hundred Twenty
Thousand Two Hundred Sixty-Three

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