**ANEXO N° 09.**

**ANEXO TÉCNICO**

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Señores:

UNIVERSIDAD DE CUNDINAMARCA

ATTN: DIRECCIÓN DE BIENES Y SERVICIOS

Diagonal 18 No. 20 - 29 Fusagasugá

**REF: ADQUISICIÓN Y FORTALECIMIENTO DE LA RED WIFI PARA LA BIBLIOTECA CENTRAL DE LA UNIVERSIDAD DE CUNDINAMARCA - SEDE FUSAGASUGÁ**

Estimados señores:

[Nombre del representante legal o de la persona natural Proponente], identificado como aparece al pie de mi firma, [obrando en mi propio nombre o en mi calidad de representante legal de] [nombre del Proponente], manifiesto que:

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| **Ítem** | **AP INDOOR** | **Cumple(SI/NO)** | **# FOLIO** |
| **1** | **Wi-Fi Standards:** • IEEE 802.11a/b/g/n/ac/ax |   |  |
| **2** | **Supported Rates:** • 802.11ax: 4 to 4800 Mbps• 802.11ac: 6.5 to 3467 Mbps• 802.11n: 6.5 to 600 Mbps • 802.11a/g: 6 to 54 Mbps • 802.11b: 1 to 11 Mbps |   |  |
| **3** | **Supported Channels**: • 2.4GHz: 1-13• 5GHz: 36-64, 100-144, 149-165 |   |  |
| **4** | **MIMO:**• 8x8 MU-MIMO• 8x8 SU-MIMO |   |  |
| **5** | **Spatial Streams:**• 8 MU-MIMO • 8 SU-MIMO |   |  |
| **6** | **Radio Chalns and Streams:** • 8x8:8 |   |  |
| **7** | **Channelization:** • 20, 40, 80MHz |   |  |
| **8** | **Modulation:** • OFDMA (up to 1024-QAM) |   |  |
| **9** | **Security:** • WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, Dynamic PSK • WIPS/WIDS |   |  |
| **10** | **Other Wi-Fi Features**: • WMM, Power Save, TxBF, LDPC, STBC, 802.11r/k/vHotspot • Hotspot 2.0 • Captive Portal • WISPr |   |  |
| **11** | **Antenna Type:** **2.4GHz Antennas** • Omni: 2 Antennas• BeamFlex+ Adaptive: 2 Antennas • Polarization: 3 Vertical & 1 Horizontal **5GHz Antennas** • Omni: 4 Antennas • BeamFlex+ adaptive: 4 Antennas • Polarization: 6 Vertical & 2 Horizontal |   |  |
| **12** | **Antenna Gain (max):** • Up to 2 dBi |   |  |
| **13** | **Frequency Bands**: • 2.4 - 2.484 GHz • 5.17 - 5.33 GHZ • 5.49 - 5.71 GHz • 5.735 - 5.835 GHz |   |  |
| **14** | **Controller Platform Support:** • SmartZone • ZD • Standalone |   |  |
| **15** | **Mesh** • SmartMesh™ wireless meshing technology |   |  |
| **16** | **IP:** • IPv4, IPv6 |   |  |
| **17** | **VLAN:** • 802.1Q • BSSID-based (16 BSSIDs / radio) • Port-based • Dynamic, per user based on RADIUS |   |  |
| **18** | **802.1x**: • Wired & wireless • Authenticator & Supplicant |   |  |
| **19** | **Tunnel**: • RuckusGRE, SoftGRE |   |  |
| **20** | **Policy Management Tools:** • Application Recognition and Control • Access Control Lists • Device Fingerprinting |   |  |
| **21** | **IoT Capable:** • Yes |   |  |
| **22** | **Ethernet:** • 1x 1/2.5/5 Gbps port, RJ-45 • 1x 10/100/1000 Mbps port, RJ-45 |   |  |
| **23** | **Wi-Fi Alliance:** • Wi-Fi CERTIFIED™ a, b, g, n, ac • Passpoint® • Vantage |   |  |
| **24** | **Standards Compliance:** • 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 • EN 62311 Human Safety/RF Exposure • UL 2043 Plenum • WEEE & RoHS • ISTA 2A Transportation  |   |  |

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| **Ítem** | **AP OUTDOOR OMINIDIRECCIONAL y SECTORIAL** | **Cumple(SI/NO)** | **#FOLIO** |
| **1** | **Wi-Fi Standards**IEEE 802.11a/b/g/n/ac  |   |  |
| **2** | **Supported Rates*** 802.11ac: 6.5 to 1,733Mbps (MCS0 to MCS9, NSS = 1 to 4 for VHT20/40/80)
* 802.11n: 6.5Mbps to 600Mbps (MCS0 to MCS 31)
* 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6Mbps
* 802.11b: 11, 5.5, 2 and 1 Mbps
 |   |  |
| **3** | **Supported Channels*** 2.4GHz: 1-13
* 5GHz: 36-64, 100-144, 149-165
 |   |  |
| **4** | **MIMO**• 4x4 SU-MIMO• 4x4 MU-MIMO |   |  |
| **5** | **Radio Chains and Streams**• 4x4:4 |   |  |
| **6** | **Channelization**• 20, 40, 80MHz |   |  |
| **7** | **Security**• WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, DynamicPSK• WIPS/WIDS |   |  |
| **8** | **Other Wi-Fi Features**• WMM, Power Save, Tx Beamforming, LDPC, STBC,802.11r/k/v• Hotspot• Hotspot 2.0• Captive Portal• WISPr |   |  |
| **9** |  **Antenna Type**• BeamFlex+ adaptive antennas with polarizationdiversity• Adaptive antenna that provides over 4,000 uniqueantenna patterns per band |   |  |
| **10** |  **Antenna Gain (max)**• Omni - Up to 3dBi• Sector - Up to 8dBi |   |  |
| **11** | **Controller Platform Support**• SmartZone• ZoneDirector• Unleashed2• Cloud Wi-Fi• Standalone |   |  |
| **12** | **IP**• IPv4, IPv6 |   |  |
| **13** | **VLAN**• 802.1Q (1 per BSSID or dynamic per use based on RADIUS• VLAN Pooling• Port-based |   |  |
| **14** |  **802.1x**• Authenticator & Supplicant |   |  |
| **15** | **Client Capacity**• Up to 512 clients per AP |   |  |
| **16** | **Ethernet** • 2 x 10/100/1000 Mbps ports, RJ-45• LACP |   |  |
| **17** | **Peak PHY Rates**• 2.4GHz: 600Mbps• 5GHz: 1733Mbps |   |  |
| **18** | **Wi-Fi Alliance**• Wi-Fi CERTIFIED™ a, b, g, n, ac• Passpoint®, Vantage |   |  |
| **19** | **Standards Compliance**• 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 |   |  |

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| **Ítem** | **EQUIPO ACTIVO - SWITCH DE ADMINISTRACIÓN** | **Cumple (SI/NO)** | **#FOLIO** |
| **1** | **I/O port and slots**44 Autosensing 10/100/1000Ports (IEEE 802.3 Type 10 BASE-T,IEEE 802.3u Type 100BASETX,IEEE 802.3ab Type 1000Base-T,IEEE 802.3at PoE+); Duplex:10ABSE-T/100BASE-TX:half or full; 1000BASE-T:full only1 modulo SFP+ 10GbE de 4 puertos |  |  |
| **2** | **Additional ports and slots**1 RJ-45 Serial Console Port1 Uplink Slot2 Power Supply Slots1 transceivers SFP+ LC  |  |  |
| **3** | **Memory and processor**Dual Core ARM Cortex A9 @ 1016 MHz1 GB DDR3, Packet buffer size: 12.38MB 4.5MB ingress/7.875MB Egress, 4GB eMMC |  |  |
| **4** | **Performance**1000 Mb Latency: < 3.1 µs10 Gbps Latency: < 3.4 µsThroughput: 112 Mpps Switching Capacity: 176 GbpsRouting table size: 2000 entries IPv4, 1000 entries IPv6 in hardware, 200 OSPF, 256 Static, 10000 RIPMAC address table size: 32768 entries  |  |  |
| **5** | **Electrical characteristics**Frequency; 50/60 HzImput voltage: 110V – 240V ACPower capacity: 2 Fuentes de 1050WIdle power: 73 WPoE+ |  |  |

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| **Ítem** | **EQUIPO ACTIVO - SWITCH DE ACCESO** | **Cumple (SI/NO)** | **#FOLIO** |
| **1** | **I/O ports and slots**24 RJ-45 autosensing 10/100/1000 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T, IEEE 802.3at PoE+); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only4 SFP+ 1/10GbE ports; PHY-less |  |  |
| **2** | **Additional ports and slots**1 RJ-45 Serial Console Port1 transceivers SFP+ LC |  |  |
| **3** | **Memory and processor**Dual Core ARM Cortex A9 @ 1016 MHz, 1GB DDR3 SDRAM; Packet buffer size: 12.38MB 4.5MB Ingress/7.785 Egress, 4GB eMMC |  |  |
| **4** | **Performance**1000 Mb Latency < 3.8 µs10 Gbps Latency < 2.9 µsThroughput 95.2 Mpps Switching capacity 128 GbpsRouting table size 2000 entries IPv4, 1000 entries IPv6 in hardware, 200 OSPF, 256 Static, 10000 RIPMAC address table size 32768 entries  |  |  |
| **5** | **Electrical characteristics**Frequency; 50/60 HzAC voltaje: 100 - 127/200 – 240VACCurrent: 4.9/2.4 AMaximum power rating: 445 WIdle power: 36.8 WPoE power: 370 W PoE+ |  |  |
| **6** | **Safety**UL 60950-1: 2nd Edition;EN 60950-1:2006 + A11:2009 + A1:2010 +A12:2011 +A2:2013;IEC 60950-1:2005 +A1:2009 +A2:2013;CSA 22.2 No. 60950-1-07 2nd; EN 60825-1:2014 / IEC 60825-1:2014 Class 1 |  |  |
| **7** | **Management**IMC—Intelligent Management Center; command-line interface; Web browser; SNMP Manager |  |  |

En constancia de lo anterior firmo este documento a los [Insertar información] días del mes de [Insertar información] de [Insertar información].

Atentamente,

**Nombre o razón social:**

**Nombre del representante legal:**

**Documento de identificación:**

**Firma del representante legal/ persona natural:**