SPRING ISD WIRELESS DISTRICT REFRESH AND CABLE UPGRADE

WIRELESS AP TECHNICAL SPECIFICATIONS

SCOPE OF WORK

Spring Independent School District is seeking proposals for replacing portions of its E-Rate Category 2 networking equipment at all eligible school sites. Replacement of the Category 2 network infrastructure equipment components (hardware and software) necessary to maintain data connectivity within each site to include Wireless Access Points (WAPs). The WAP project will be a turnkey refresh as quotes will include the setup, installation, and configuration. All services necessary to implement this project including, but not limited to, planning, installation, configuration, testing, documentation, project management, calling and quality control management.

Spring Independent School District requests Juniper/MIST brand equipment, or equivalent. All equipment or supplies offered shall be new, currently in production, and of the manufacturer's latest design unless otherwise stated. Bidders proposing equipment they consider to be an “equivalent” to the specified equipment will be considered but bidders must include supporting documentation such as manufacturer technical specifications, data sheets, white paper, or other documentation that supports equivalence to the specified equipment. Should said documentation not be included with the RFP submission, the vendor may be considered “non-responsive” and the response may be rejected. All Bidders must submit complete manufacturer’s specifications and current catalog number/identifier if Bidding other than manufacturer specified. Failure to submit complete specifications may be cause for rejection of the bid item.

Primary Objectives: It is the intent of this proposal to upgrade existing broad coverage wireless services at all district facilities to a cloud-based wireless system that supports WIFI 6 and Bluetooth capability.

MINIMUM REQUIREMENTS

Spring ISD requires the following system capabilities:

- Wi-Fi Access Points Management System must be a cloud-based wireless management system that will support 4,000+ APs based on Juniper Mist AI or equivalent that will provide high capacity, dense coverage throughout all district schools and facilities.
- Must support at least 40,000 devices scalable to 75,000 devices
- A centralized cloud-based system for the management of the wireless access points.
- Knowledge Transfer for up to at least for (4) district engineers to support and maintain all aspects of the wireless system.
- The awarded vendor needs to be able to integrate Mist wireless system into ClearPass.
- The awarded vendor needs to be a certified Extreme partner that understands and knows how to integrate Mist wireless system with Extreme campus fabric.
- A centralized cloud-based system for monitoring, reporting, and providing wireless infrastructure analytics.
- An option for on-boarding methodology either through software or hardware processes that will enable the district's students, staff, and guests to access the appropriate resources as defined in the acceptable use policy (AUP).
- Comply with all service provider E-Rate registration, guidelines, and policies as outlined by the Universal Service Administration Company (USAC).
- Solutions proposed need to be non-controller based and "turnkey", including all necessary hardware, wiring (when needed), and configuration.
- Bids provide appropriate device software license and support maintenance for 5 years.
- Removal of existing and installation of new WAPs and cabling, if necessary, as part of a "Rip and Replace" project.
- Outdoor access points must have an Ethernet Protector type, lightning/surge protection device to protect our internal network equipment. All outdoor access points must be connected to the network with outdoor weather-rated patch cables. The Seller shall also be responsible for providing and installing any outdoor access point mast, or any other mounting hardware that is not included with the outdoor access point unit.
- Any wall-mounted access point, gymnasium access point, play area, or outside area (excluding pole/mast-mounted installations), must have a Seller supplied and manufacturer-approved, RF transparent protective cage.
- The Seller is responsible for adding the digital map and AP locations in the cloud-based management system.
- The Seller is responsible for supplying a spreadsheet containing the NIC Machine Address (MAC address), patch panel port numbers, location label information, and Spring ISD asset tag (SISD will provide) that has been placed on the Access Point, Model of the Access Point, and the Serial Number of the Access Point. The electronic spreadsheet must be given to the designated District technical representative **prior to starting** each school. See **Chart A below** for the expected format of the

spreadsheet. As built drawings will be required on completion showing the location of each AP location. These drawings will be provided by Spring Independent School District representative(s) at the beginning of each phase.

- Vendor's proposal should list the closest service office/location the vendor has to Spring ISD.

Chart A, Access Point Labeling and Spreadsheet Example

The Seller will be responsible for placing a "location label and Patch Panel Port label" on each installed AP that is visible and consists of the campus acronym, ap number, and room number, and if there is more than one AP in the room, each access point label will end with a letter, with A representing the first access point, and B representing the second, etc.

The access points will be labeled as such:

Location label: School Acronym – AP number - Room Number
Patch Panel Label: School Acronym – MDF/IDF # - Port #

Internal AP EXAMPLE: AES-AP01-RM225
AES-IDF01-A21

External AP EXAMPLE: AES-EXT-AP01-RM224
AES-IDF01-A21

The Seller is responsible for supplying a spreadsheet containing, the SISD asset tag, NIC Machine Address (MAC address), patch panel port numbers, location label information that has been placed on the Access Point, Model of Access Point, and Serial Number.

SISD Asset Tag	AP NIC Mac	AP Serial No.	Label on AP	Model of AP	Patch Panel #
	xx:xx:xx:1a:2b:3c		AES-AP01-RM205	MyOwn 9039	B1
	xx:xx:xx:4a:6b:3a		AES-AP01-RM105	MyOwn 9039	A25
	xx:xx:xx:7a:2b:6c		AES-AP01-RM105	MyOwn 9039	C7
	xx:xx:xx:aa:b2:3c		AES-AP02-RM219	MyOwn 9039	A3
	xx:xx:xx:ba:eb:7d		AES-AP02-RM116	MyOwn 9039	B15
	xx:xx:xx:8a:b4:ac		AES-AP01-RM226	MyOwn 9039	D48

QUANTITIES

The quantities requested are the district's best estimate and may be adjusted as recommended by the offeror. The district reserves the right to increase or reduce quantities and buy some, all, or none of the listed equipment.

Proposals must include all costs associated with providing the requested products/services to the district including but not limited to taxes, shipping, etc. When applicable, offerors must include all costs associated with the installation of the equipment and components including, but not limited to, mounting brackets, RF transparent protective cage, power cords, configuration, travel, per diem, shipping, installation, etc.

Offerors must provide unit pricing for each item. Partial bids will not be considered and those bids will be disqualified.

Proposed service fees for each piece of equipment should:

- be shown as separate line-item charges,
- include the E-rate eligible percentage, and
- be categorized as Internal Connections (IC) or Basic Maintenance of Internal Connections (BMIC)

Location Types	Indoor AP	Outdoor AP	E-Rate Eligible
District Schools (44)	4,015	301	Yes
NIF (Non-Instructional)	230	34	No
Access Points Total	**4,245**	**335**	

Vendor's proposals should list the ineligible (NIFs) and eligible costs (District Schools) separately.

Additional Information

Quantity (Approx.)	Function	Model Number
4,245	Indoor WAPs with the appropriate bracket	Juniper Mist Wireless AP 45 B-AP45-2S-5Y
335	Outdoor WAPs with the appropriate bracket	Juniper Mist Wireless AP 63 B-AP63-2S-5Y
4,580	Software Licenses	Juniper Mist AI Cloud Services or equivalent
4,580	Support	Support covering a period of 5 years for each WAP

TECHNICAL SPECIFICATIONS

Access Point Hardware Functionality

- Ceiling, ceiling tile, and wall mountable.
- Offer optional Recessed T-bar mounting bracket.
- Each AP must support being powered via PoE, PoE+, and PoH

Indoor Access Points

- Wi-Fi Standard: 802.11ax (Wi-Fi 6e), including support for OFDMA, 1024-QAM, MU-MIMO, Target Wake Time (TWT), Spatial Frequency Reuse (BSS Coloring).
- Backwards compatibility 802.11a/b/g/n/ac
- Combined Highest Supported Data Rates: Tri-Band: 8.3 Gbps Dual 5 GHz (internal antenna model): +6 Ghz 9.6 Gbps
- Quad-Radio 802.11ax (WIFI 6E)
    - 2.4 GHz 4x4:4 802.11 ax
    - 5 GHz 4x4:4 802.11 ax
    - 6 GHz 4x4:4 802.11 ax
    - Dedicated scanning radio 2.4GHz,5GHz,6GHz tri-band WIDS/WIPS, spectrum analysis, synthetic test client, and location analytics radio.
- MIMO Operation: Four spatial stream SU-MIMO for up to 4,800 Mbps wireless data rate to individual 4x4 HE160; Four spatial stream MU-MIMO for up to 4,800 Mbps wireless data rate to up to four MU-MIMO capable client devices simultaneously
- Internal Antennas: Four 2.4GHz Internal Omni-directional antenna, Four 5GHz Internal Omni-directional antenna, Four 6GHz Internal Omni-directional antenna
- 16-element Antenna Array + Omni Bluetooth Antenna able to support user engagement, asset visibility, and contact tracing.
- Beam Forming: Transmit Beamforming and Maximal Ratio Combining
- Power Options: 802.3at PoE, 802.3bt PoE
- Trusted Platform Module (TPM): Includes a TPM for infrastructure security
- IoT Sensors: Temperature, Accelerometer
- Eth0: 100/1000/2500/5000Base-T (802.3bz); RJ45; PoE PD
- Eth1: 10/100/1000Base-T; RJ45; optional PoE 15.4W PSE mode (requires 802.3bt on Eth0)
- Indicators: One multicolor status LED
- Traffic Forwarding Options: Eth0, Eth1, Juniper Mist Edge

Outdoor Access Points

- Wi-Fi Standard: 802.11ax (Wi-Fi 6), including support for OFDMA, 1024-QAM QAM, MU-MIMO, Target Wake Time (TWT), Spatial Frequency Reuse (BSS Coloring)
- Backwards compatibility with 802.11a/b/g/n/ac

- Combined Highest Supported Data Rates: Dual-Band: 3.5 Gbps Dual-5GHz (internal antenna model): 4.8 Gbps
- Quad-Radio 802.11ax (WIFI 6E)
    - 2.4 GHz 4x4:4 802.11 ax
    - 5 GHz 4x4:4 802.11 ax
    - 6 GHz 4x4:4 802.11 ax
    - Dedicated scanning radio 2.4GHz,5GHz,6GHz tri band WIDS/WIPS, spectrum analysis, synthetic test client, and location analytics radio.
- MIMO Operation: Four spatial stream SU-MIMO for up to 4,800 Mbps wireless data rate to individual 4x4 HE160; Four spatial stream MU-MIMO for up to 4,800 Mbps wireless data rate to up to four MU-MIMO capable client devices simultaneously
- Internal Antennas: Four 2.4GHz Internal Omni-directional antenna, Four 5GHz Internal Omni-directional antenna, Four 6GHz Internal Omni-directional antenna
- 16-element Antenna Array + Omni Bluetooth Antenna able to support user engagement, asset visibility, and contact tracing.
- Beam Forming: Transmit Beamforming and Maximal Ratio Combining
- Power Options: 802.3at PoE (no PoE out), 802.3bt PoE
- Trusted Platform Module (TPM): Includes a TPM for infrastructure security
- Eth0: 100/1000Base-T, 2.5GBase-T (802.3bz); RJ45; PoE PD (requires 802.3bt)
- Eth1: 10/100/1000Base-T; RJ45; optional PoE 15.4W PSE mode (requires 802.3bt on Eth0)
- External Antennas: Six N-type male connectors (four dual-band for client radios; two dual-band for the third radio)
- Indicators: One multicolor status LED
- Compliance Standards: CSA/UL 62368-1 FCC Part 15.247, 15.407, 15.107, and 15.109 RSS247 ICES003 (Canada)

Access Point Management System

The proposed solution must provide device and wireless management capabilities that meet the requirements provided below, at a minimum. Your response should describe how your offering would meet those requirements.

- Management platform must be Cloud Management with microservices architecture
- Dynamic packet capture for troubleshooting, stored and accessible from the cloud
- Configured wireless networks must continue to function in the event of a loss of connectivity to the cloud management platform
- Proactive optimization of wireless performance
- Proactive root-cause identification
- Automatic RF channel and power optimization relying on reinforcement learning and neural networks for optimization over time
- Multiple VLAN tagging on a specific SSID
- Zero-touch provisioning of AP hardware

- Automatic Configuration Roll-Back upon detection of misconfiguration
- Mobile app support allows onboarding, device name, placement on map, and photograph during AP installation
- WPA3 Certified.
- Support for RADIUS server and RADIUS Proxy.
- Support for multiple pre-shared keys for unique identification and classification on a single SSID including:
- Ability to create a private Wireless environment for users to isolate wireless users from each other.
    - Ability to limit a PSK to a specific device.
    - Ability to limit a PSK to multiple devices.
    - Ability to define the maximum number of devices per PSK.
    - Ability to map each PSK to a specific VLAN.
    - Ability to map each PSK to a user role with the ability to define access policy.
    - Ability to define expiry date per PSK.
    - Ability to import bulk PSK via CVS file or other by API.
- Apple Bonjour support
- Easy firmware upgrades to an individual access point or to a group of access points without the need to reboot Access Point hardware
- Provide an easy-to-use, integrated graphical tool to display the location of the access points, clients, and rogue devices
- Real-time event correlations with root cause analysis
- Unmanaged anomaly detection to identify issues causing negative performance
- Ability to easily monitor and compare service levels for multiple locations at once
- Automatic RMA based on cloud monitoring of AP hardware failure
- Automatic firmware issue monitoring
- Provide anomaly detection for specific APs including bad cable, ARP failure, Authentication failure, and DNS failure
- Provide Wireless Security alerting for detection of the following:
    - Client Connection to rogue AP
    - Rogue Ap
    - BSSID Spoofing
    - EAP Handshake Flood
    - Honeypot SSID
    - Repeated Client Authentication Failures
    - Disassociation Attack
    - Excessive Clients
    - Out of Sequence
    - Replay Injection – KRACK Attack
    - SSID Injection
- Allow for Zero Touch Provisioning of Access Points with automatic naming including:
    - Site Name
    - Mac Address

    - Increment Counter
    - Any free text within the format
- Single interface with no third-party applications needed to achieve the functionalities listed above.
- System shall allow sub-grouping of devices within a site for the purpose of applying unique configuration to that sub-group devices.
- Prefer a system that correlates events with client devices and visualizes these correlations for the purpose of rapid troubleshooting.
- Prefer a system that can support automatically identified unhealthy devices or clients and present recommended troubleshooting steps.
- Prefer a system that automatically opens an RMA vendor support case for access points that experience hardware failures
- Prefer a system that allows vendor support engineers to remotely view system information, so district staff do not need to collect logs and send screenshots.
- Prefer a system that continuously measures and can report on individual client experience.
- Prefer a system that uses a template-based configuration hierarchy to facilitate applying and managing common settings across multiple sites.

Guest Access

- Secure guest access shall allow each guest to receive a unique pre-shared key without the use of certificates.
- Support for different types of captive Web Portals (CWP). CWPs must be customizable and must support major world languages.
- Guest access solution shall support guest self-registration from a browser, mobile app or/and kiosk.
- Solution shall support multiple ways of distributing guest/BYOD keys.
- Solution shall support the option to revoke the key and force the change of the key.

Technical Support Services

- Support tickets can be submitted and monitored from within the network management GUI
- Support tickets can be escalated by submitter
- Must be able to automatically process RMA (Return Materials Authorization) in the event of hardware failure within management GUI

CABLING UPGRADE TECHNICAL SPECIFICATIONS

SCOPE OF WORK

Spring Independent School District is seeking proposals to upgrade its network wiring to accommodate modern-day wireless access points. The upgrade and/or addition of CAT6A cabling will include removing old wireless AP network cabling runs. This project also includes running new data drops and runs to accommodate additional wireless access points.

New cables shall be terminated, tested, and inspected per building code and manufacturer's specifications. The scope of work would cover all steps from the initial site survey to the complete installation of running cabling from the access point location to MDF/IDF.

This project consists of approximately 3,350 cable runs with 190 being for non-instructional facilities. Vendor's proposals should clearly identify the cost of the eligible (district schools) and non-eligible (NIFs) cabling separately.

Cabling installation will be conducted after school hours to minimize disruption to the school environment. Any onsite work performed during school hours requires prior approval by SISD Technology staff.

MINIMUM REQUIREMENTS

- The awarded vendor must supply all supervision, tools, equipment, hardware, material, transportation, construction, and all other related services unless specific provisioning by the customer has been denoted.
- The awarded vendor is responsible for providing all necessary working/building permits required under this contract, including local, state, or federal permits, as needed.
- The awarded vendor will be responsible for repairing all damage to the building due to the negligence of its workers.
- The awarded vendor will be responsible for the prompt correction of all defects in the system.
- The awarded vendor is responsible for all components and installation, including cabling and horizontal pathways.
- The awarded vendor is responsible for all underground trenching that may be required.
- The awarded vendor is responsible for supplying any new conduit or surface runway that may be required.
- The awarded vendor is responsible for providing patch cables for all new wiring.

TECHNICAL SPECIFICATIONS

- New CAT6A cable runs to IDF/MDF
- Removal of network cabling that is being replaced
- Remove and replace all network wiring patch panels and wiring as needed for this project
- Remove and replace patch cables for wireless with **white patch cables**
- Cable Installation Specifics:
    - All cables must be run inside the wall or conduit.
    - Cables need to be properly dressed and secured.
    - All cables and faceplates must be labeled with a machine-generated label per industry standards at each end. Each cable shall be marked with a unique identifier
    - The cabling system within MDFs and IDFs should include CAT6a: Patch panels, modular jacks, patch cords, cables, and couplers.
    - Installation includes all terminating required.
    - Exposed wiring or patch cables will not be accepted.
- Provide testing and certification, with documentation of cable runs, to meet specifications end–to–end.
- All copper cabling being installed within a building must be CAT6a plenum-rated in all environments.
- All network cabling must be labeled at the point of termination to district standards. Handwritten labels are not acceptable.
- All cables shall be independently supported throughout the entire project as recommended.
- The contractor shall route in-groups or similar types (i.e., each data distribution cable shall be grouped with its kind).
- Cables shall be routed point-to-point (home run). Cables shall not be spliced.
- All data cable runs must have a ten (10) foot service loop on the MDF end of the cable and a three (3) foot service loop at the jack end.
- The outside sheath of any cable shall not be damaged.
- The contractor shall terminate cables properly on both ends.
- The contractor shall provide proper temporary protection for cables after pulling is complete but before final dressing and termination is complete.
- Cable shall not be left lying on the floor or on top of drop celling grids.
- The contractor shall use Velcro-styled straps to tie-wrap all cables. Tie-wrap shall occur on two (2) foot intervals.

- Traditional cable ties shall be used where required to properly support cables and to protect them from harm or other environmental elements (i.e., to be used in ceilings to keep cables off of lighting fixtures or ceiling grids).
- During installation, the contract shall comply with the manufacturer's recommendation for pulling tensions
- The contractor shall comply with the manufacturer's recommendation for the short and long-term minimum bend radius.
- Installation includes J-Hooks as required.
- Patch Cables: The contractor shall provide all patch cables required for completing Ethernet connections between the equipment patch panels and station patch panels. Provide one (1) patch cord of the appropriate size for each data cable installed. These patch cables call be double ended RJ-45 TIA Category 6 cables. Cables shall be of the same manufacturer of the structured cabling solution and shall be part of the channel warranty.
- Ensure all patch panels and cables are rated Category 6A

Evaluation Criteria:

1. Price of Eligible Goods and Services
    a. Price for monthly and one-time costs, including long term costs to the district.

2. Service History
    a. Historical experience with Spring ISD.

3. Expertise of Company
    a. Vendor has technical ability to deliver product / services.
    b. Vendor has resources to deliver product / services.

4. Completeness of Bid / Understanding of Needs
    a. Vendor has responded to all items indicated in bid.
    b. Vendor has demonstrated a full understanding of bid requirements.

5. Location of Company
    a. Location within the State of Texas.
    b. Location within the Houston area.