

REQUEST FOR PROPOSAL

E-RATE Funding Year 2020-2021
NETWORK UPGRADE PROJECT

Monroe County School District
Technology Department
1619 Hwy 25 North
Amory, MS 38821

Contact: Alan Pearson
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RFP/E-Rate URL: <http://erate.mcsd.us>

December 5, 2020

**STATEMENT OF QUALIFICATIONS
And
REQUEST FOR PROPOSAL
RFP # 2020-1**

Subject

RFP - The Monroe County School District will accept sealed statements of qualifications (SOQ) and proposals from qualified firms/vendors to provide services necessary for installation and configuration of network equipment for the FY2020-21 (E-RATE) cycle. Bidders must have a Service Provider Identification Number (SPIN) and this SPIN must be included on the bid proposal. Those interested shall submit a signed, sealed SOQ and cost proposal to the district on or before 10:00 AM local time, January 17, 2020 at the Monroe County School District Central Office, located in the Monroe County Government Complex 1619 Hwy 25 North Amory, MS. 38821.

Purpose

Proposals are being sought by the Monroe County School District for the purpose of securing the most cost efficient way of upgrading the school district's instructional areas (*classrooms/labs/etc.*) with wireless capacity and network backbone bandwidth.

General Requirements

The District will be looking for Ruckus or equivalent network switches and Ruckus or equivalent wireless equipment for this project. Vendors who are responding to this RFP with Ruckus or equivalent network equipment must state their certifications and must have a minimum of one Ruckus Certified RNE or equivalent and one Ruckus Certified CWNP or equivalent engineer(s) on staff and employed full time by the proposing vendor. Proposed solutions must integrate with the existing network environment to ensure a seamless management and design. Wireless management software must be able to successfully manage all access points from one centralized "on-premise" management package/solution. The District does not want a "cloud-based" controlled system. It will be the responsibility of the bidder to check the RFP website daily (<http://erate.mcsd.us>) for any changes to the RFP or listing of bidder questions and answers that may arise.

Terms used throughout this RFP

MCSD – The Monroe County School District
USAC – Universal Service Administrative Company
SPIN – Service Provider Identification Number
FCDL – Funding Commitment Decision Letter
FCC – Federal Communication Commission
SLD – School and Library District
USF -- Universal Service Fund

All proposals and supporting documentation must be sent to:*(Submittal should be clearly labeled on the outside of the submittal)*

Monroe County School District
 FY2020-21 Network Upgrade Project
 RFP # 2020-1

Submittal should be addressed to:

Monroe County School District
 Alan Pearson, Technology Director
 Monroe County Government Complex
 1619 Hwy 25 North
 Amory, MS. 38821

One original and two copies of proposals and statements of qualifications and “hot maps” of wireless locations in each school building (to include access point model and location of all proposed wireless equipment) are to be prepared and delivered either by mail or Federal Express to Monroe County School District 1619 Hwy 25 North, Amory, MS. 38821 on or before 10:00 AM local time, January 17, 2020, where they will be time and date stamped. In addition, the bid must be broken down per school building and totals per school campus must be shown, as well as a grand total for the entire district project. All of the above bid documents must also be provided in electronic format on one CD, jump drive or uploaded to the district’s electronic bid server. Please view the district’s e-rate website for instructions as how to access the electronic bid server (erate.mcsd.us). **Please do not fax proposals.**

Selection Schedule

Event	Date(s)	Time
Release of RFP to vendors	12-5-2019	
<u>Mandatory</u> Vendor Site Visit	01-6-2020	10:00 AM
Deadline for Submission of Proposals	01-17-2020	10:00 AM
Opening of Proposals (MCSd District Office)	01-17-2020	11:00 AM

Proposers are prohibited from contacting or lobbying members of the school board, school district administrators, school district employees, school district contractors, or school district consultants. Failure to conform to this condition will be grounds for disqualification of the proposer. Questions regarding the RFP may be emailed to alanpearson@mcsd.us before Monday, January 13, 2020. A response within 3 business days will be posted on the District’s RFP web site, it will be the responsibility of the vendor/bidder to check the RFP website daily (<http://erate.mcsd.us>) for any changes to the RFP or listing of bidder questions and answers that may arise.

Basis of Award

1. E-rate approval by USAC
2. Bidder must have SLD SPIN
3. References of at least two installations of similar application size and complexity.
4. Please see “Vendor Requirements” on following pages for additional information.
5. Please also see “Criteria for Selection” on more detail on page seven.

VENDOR REQUIREMENTS

Vendors who respond to this Request for Proposal (RFP) must be willing to provide the Network Upgrade Project (RFP # 2020-1) to Monroe County School District (The District). The District will be looking for Ruckus or equivalent network switches and Ruckus or equivalent wireless equipment for this project. Vendors who are responding to this RFP with Ruckus or equivalent network equipment must state their certifications and must have a minimum of one Ruckus Certified RNE or equivalent and one Ruckus Certified CWNP or equivalent engineer(s) on staff and employed full time by the proposing vendor. *It will be the responsibility of the bidder to check the district's RFP website daily (<http://erate.mcsd.us>) for any changes to the RFP or listing of bidder questions and answers that may arise.*

NONAPPROPRIATION OF FUNDS

In the event funds are not appropriated by the Monroe County School District governing body in any fiscal period for payments due under RFP # 2020-1, then the Technology Director, or Superintendent's designee(s), will immediately notify the successful vendor(s), or designee(s), of such occurrence and this contract will terminate on the last day of the fiscal period for which appropriations were received without penalty or expense to the School District of any kind whatsoever, except other payments herein agreed upon for which funds will have been appropriated and budgeted or are otherwise available.

AWARD OF SOME OR THE ENTIRE PROJECT MAY BE SUBJECT TO AVAILABILITY OF DISTRICT FUNDING AND PROJECT NEEDS.

Proposer's response to the Request must include a statement that the proposed terms will remain in effect and available for the project term identified as July 1, 2020 through June 30, 2021.

The work itself will consist of all aspects of technology implementation for which District desires to contract with the selected Proposer(s). The school district's vision for this technology projects calls for the installation and configuration of new technology equipment, software and services to improve the district's network wireless and switch (backbone) infrastructure. Proposed solutions must integrate with the existing network environment to ensure a seamless management and design. Final completion for the project is scheduled for June 30, 2021. Monroe County School District reserves the right to waive any informality and to reject any or all proposals.

Proposers are prohibited from contacting or lobbying members of the School Board, school district administrators, school district employees, school district contractors, or school district consultants. Failure to conform to this condition will be grounds for disqualification of the proposer. Questions regarding the RFP may be emailed to alanpearson@mcsd.us, and will be responded to within 3 business days on the District's RFP web site. But, it is the responsibility of the bidder to check the RFP web site daily (<http://erate.mcsd.us>) for those answers. The final day for question submittal will be January 13, 2020 at 12:00 pm.

Proposals and statements of qualifications are to include the information requested in the following questionnaire precisely in the sequence and format prescribed. In addition to and separate from the requested information, organizations submitting may provide supplementary materials further describing their capabilities and experience.

One original and two copies of proposals and statements of qualifications along with “hot maps” of wireless locations in each school building to include access point/array model and location of all proposed wireless equipment are to be prepared and delivered either by mail or Federal Express to Monroe County School District 1619 Hwy 25 North, Amory, MS. 38821 on or before 10:00 AM local time, January 17, 2020, where they will be time and date stamped. In addition, all of these documents must also be provided in electronic format (see page 3).

A **MANDATORY** vendor walk-through will be held on January 6, 2020 from 10:00 AM – 3:00 PM, beginning at the Monroe County School District Central Office and proceeding to the respective school campuses. Any questions received will be discussed at that time and responses will be posted on the RFP web site for everyone to review after the walk-throughs have been completed. Written questions will be allowed for any vendor interested in responding to District’s RFP and responses again will be posted on the RFP web site. **The district will accept only ONE bid per vendor.**

This Network Upgrade Project will be awarded to a SINGLE vendor that can quote, install and configure all network equipment and network cabling requested/required. The School District requires a “turn-key” solution for this project. Requested paper copies and electronic copies of the proposal and other required documentation (*see page 3*) must be sent in a sealed envelope clearly marked with the words **“FY2020-21 Network Upgrade Project RFP # 2020-1”** or submitted online to the district’s electronic bid server.

The Network Upgrade Project will include preferred equipment preference information and will be provided to each vendor who attends the mandatory walk-through this information will include a listing of equipment specifications and school campus maps with explanations. The equipment specification list provided is a minimum guideline list. If the bidder wishes to add to the District’s equipment list to improve the functionality of their proposed equipment, the bidder is encouraged to do so. The bidder/vendor must also provide “hot maps” of wireless locations in each school building to include access point/array model and location of all proposed wireless equipment. E-rate funding is available for some (but not all) of our individual school campuses. Therefore attendance to this mandatory walk-through is of utmost importance to allow the prospective bidder to receive a detailed equipment list and be able to visit each school campus.

STATEMENT OF QUALIFICATIONS FORMAT

Please provide the following information in the same format prescribed by this questionnaire. Supplemental materials providing additional information may be attached, but the information requested below is to be provided in this format and sequence. Please provide succinct responses to the following questions and limit those responses to the page allowances set out in each item.

1. FIRM INFORMATION: (LIMIT 1/2 PAGE)

Name of Firm:

Address of Home Office and Address of Branch Office if Applicable:

Telephone Number(s):

Fax Number(s):

Form of Business Organization (Corporation, Partnership, Individual, Joint Venture, Other):

Year Founded:

Primary individual to contact:

2. ORGANIZATION: (LIMIT 1/2 PAGE)

2.1 How many years has your organization been in business in its current capacity?

2.2 How many years has your organization been in business under its present name? Under what other or former names has your organization operated?

2.3 If your organization is a corporation, answer the following: Date of incorporation, State of incorporation, President's name, Vice-President's name(s), Secretary's name, and Treasurer's name.

2.4 If your organization is a partnership, answer the following: Date of organization, type of partnership, if applicable, names of general partner(s).

2.5 If your organization is individually owned, answer the following: Date of organization, name of owner.

2.6 If the form of your organization is other than those listed above, describe it and name the principals.

3. LICENSING: (LIMIT 1/2 PAGE)

3.1 List jurisdictions in which your organization is legally qualified to do business and indicate registration or license numbers, if applicable.

3.2 List jurisdictions in which your organization's partnership or trade name is filed.

4. EXPERIENCE: (LIMIT 2 PAGES)

4.1 Describe your firm's experience with completing this scope of work for public entities, if any.

4.2 Provide a list of the public entities previously assisted with contact names and phone numbers.

5. FEES:

5.1 Based on the scope of work outlined herein please describe your firm's full price associated with the completion of this work for the Network Upgrade Project (RFP # 2020-1).

6. COORDINATION OF INSTALLATION

6.1 The Contractor shall be responsible for securing all permits and approvals necessary to complete the work (if required).

Additional Warranty Instructions

The successful proposer must warrant its material and workmanship for a period of one year (for items requiring purchase and installation). Their respective manufacturer warrants all other products and material under separate warranty. Warranty for “outright purchase” of equipment and software should include at least one year (**with optional five-year warranty to be listed separately from bid total, for purchase of equipment and software should be included for second through fifth years**). **No re-furbished or “gray market” equipment will be accepted. All equipment must be new and “out-of-box” with full warranty and support.**

CRITERIA FOR SELECTION

The District will utilize the following criteria (*as the basis for the proposal evaluations & selection*).

<u>Factor</u>	<u>Weight</u>
Price of the ELIGIBLE Equipment, Services & Warranties	25%
Prior Experience with the District	15%
Personnel Qualifications, Professionalism & Scope of Work	10%
Management Integration w/ Current Network	15%
Company Provides all Services (No sub-contractors)	20%
Preference to Mississippi Based Companies	15%
Total	100%

The District reserves the right to select outright a single Proposer, and to waive the finalists’ state of the evaluation process in the event a Proposer has total points scored significantly higher than all the other Proposers responding to this RFP.

The District in its sole discretion may accept or reject any or all responses to this RFP and may waive all formalities, technicalities and irregularities. All bidders are placed on notice that award of the RFP will be based upon the products and services best suited to the District. The sole judgment of the District on such matters shall be final.

The District has identified the factors itemized above under scoring criteria as critical to a company’s ability to effectively assist the District’s integration of technology. To be considered for evaluation, bidders must provide relevant responses to all sections of this RFP. (***100 evaluation points are possible***). A separate response is requested for each criteria section. Appropriate labeling required. (*See details of each factor below and on the following pages*).

A. Pricing (All Eligible Equipment, Cabling, Installation and Warranty)

- Proposer must abide by the district’s bid policy.
- Proposer must abide by the state of Mississippi bid laws.

- Proposer must provide specific price quotes for eligible services. The District reserves the right to select a combination of pricing, services and/or Proposer(s) that appears best suited to meet the needs of the District. Proposer must allocate to the extent that a clear delineation can be made between eligible and ineligible components. Proposer(s) must provide school campus bid totals, as well as total cost for the entire project.

B. Prior Experience with the School District

The District has also determined that a company's background, experience, and financial stability are essential for the success of a long-term relationship with its selected Proposer(s). Proposers responding to this RFP should include information about their company's experience, financial stability, and quality of services and products and satisfaction of their clients. A minimum of three (3) references (school districts preferred) should be included in bid document.

C. Personnel Qualifications, Professionalism & Scope of Work

The District is seeking (an) E-rate Proposer(s) that has the depth, breadth, and quality of resources necessary to complete all phases of a broad technology and service project. In addition, the timely availability of these resources and related support elements will be critical to project success. Describe the various resources from your company that will be made available to assist the District in the execution of its mission in performance of each scope of work (SOW). Provide resumes and related experience summaries to demonstrate the competencies and experience of typical personnel who would be assigned to the District program. Provide a list of industry standard certified employees and their certifications. Proposers must provide SOW and contract information for each school campus project being proposed

D. Management Integration

The District requires a network that will continue to provide the District with a modern, efficient and reliable network to support bandwidth and data and provide all needed capabilities within the district school buildings. Reliability and high performance are key requirements of this networking plan, as the District network continues to support the technology needs of the future. Vendor's proposal provides interoperability with current District environment. Seamless integration with the current network. Wireless management software must be able to successfully manage all access points from one "on-premise" management controller/solution.

E. Company provides all services (no sub-contractors)

The District is interested in providers that provide all components, installations and configurations for this RFP without sub-contractors.

F. Mississippi Based Companies (K-12 Experience)

The District is interested in providers that understand the technology, administrative, and instructional challenges facing today's educators, children and administrators. The education environment is vastly changing with challenges that make technology decisions more important as they reach the District constituencies. The respondent must show that their solutions are sustainable within the framework of the District's resources to implement and maintain ongoing operations and that future support is local and Mississippi based.

ADDITIONAL TERMS AND CONDITIONS

A. CONTRACT TERM

The term of the contract term will begin when school board approves and a written contract is signed by both the District and the vendor/bidder selected. The term of the contract award will begin July 1, 2020. Initiation of the contract is dependent on E-Rate funding, in the event E-Rate does not fund the project then the contract will be null and void. In addition, a Funding Commitment Decision Letter (FCDL) does not guarantee the District will proceed with this project and may only be able to proceed with portions of the project on a per school campus basis.

B. CONTRACT/PURCHASE ORDER TERMINATION

The District shall reserve the right to terminate any contract/purchase order entered into as a result of the REQUEST FOR PROPOSAL at any time by giving thirty (30) days written notice of its intent to cancel. In the event the Proposer fails to carry out and comply with any of the conditions and agreements to be performed under the specifications, the District will notify the Proposer, in writing, of such failure or default. In the event the necessary corrective action has not been completed within a 10-day period, the Proposer must submit, in writing, why such corrective action has not been performed. The District reserves the right to determine whether or not such non-compliance may be construed as a failure of performance of the contract/purchase order.

C. LICENSING REQUIREMENTS

The successful Proposer must keep himself informed of, and adhere to, all laws and ordinances governing any matter related to work performed under the resulting contract/purchase order. The successful Proposer will obtain all necessary licenses and permits, and will be aware of all labor conditions and agreements relating to the work specified in this document and shall make all provisions necessary to avoid any disputes which might arise from those conditions and agreements and shall be responsible for any delays, damages or extra costs caused by disputes.

D. SAFETY REQUIREMENTS

It shall be the Proposer's responsibility to provide for the safety of workers and public in compliance with the requirements of insurance and public health and safety. The District requires all workers on-site to have a company badge. A list of workers with current photograph must be provided to the school district's Technology Department throughout the life cycle of the project(s) that require installation or services

E. INDEMNIFICATION

The Proposer shall be responsible for all damage persons or property that occurs as a result of his fault or negligence, or that of any of his employees, agents, or subcontractors. Proposer shall save and hold harmless the District and its School Board against any and all loss, cost, damage, claims, expense or liability in connection with the performance of the contract/purchase order. Any equipment or facilities damaged by the Proposer's operation shall be repaired and /or restored to their original condition, including cleaning and painting, at the Proposer's expense. The successful Proposer will assume the liability for all losses, damages (including loss of use), expenses, demands and claims in connection with or arising out of any injury or alleged injury to

persons (including death), or damages or alleged damage to property, sustained or alleged to have been sustained in connection with or to have arisen out of the performance of the work by the Proposer, and his agents, and employees, including losses, expenses, or damages sustained by the District. The successful Proposer will undertake and agree to indemnify and hold harmless the District and its board, individually or collectively, and the officers, agents, and employees of the District and its Board, from any and all such losses, expenses, damages (including loss of use), and to pay all damages, judgments, costs and expenses, including attorney's fees in connection with said demands and claims resulting thereof. Any claims against the District must be filed within the State of Mississippi within the county of the District (Monroe).

The Proposer shall abide by the Federal Occupational Safety and Health Administration (OSHA) regulations that apply to work performed under this Request. The Proposer shall defend, indemnify, and hold the District free and harmless against any and all claims, loss, liability and expense resulting from any alleged violation(s) of said regulation (s) including but not limited to, fines or penalties, judgments, court costs, and attorney's fees.

F. ATTORNEYS STATEMENT

In the event that the District employs attorneys or incurs other expenses that it may deem necessary to protect or endorse its rights under this contract/purchase order, the Proposer agrees to pay the attorney's fees and expenses incurred by the District. If either party defaults in the performance of this agreement, the defaulting party shall pay the non-defaulting party responsible attorney's fees and court costs.

G. NEGOTIATIONS

The District reserves the right to have any additional terms and conditions incorporated into the agreement provided an authorized modification to the contract/purchase order is mutually agreed upon and duly executed by both parties.

H. ORDER OF PRECEDENCE

In the event of an inconsistency between the terms and conditions of the resulting contract/purchase order, the inconsistency shall be resolved by giving precedence in the following order: (1) The REQUEST FOR PROPOSAL, including the Scope of Work and Statement of Qualifications, and (2) Proposer Response.

I. PROJECT START DATE

The District reserves the right to start the project on or after July 1, 2020, even if the project has not yet received funding. All pricing proposed will be considered valid.

EXHIBIT E-1 (PROPOSER'S CONTRACT DOCUMENTS)

Proposer shall provide a contract for services to be offered. Proposer shall also provide a Service Level Agreement (SLA) to include resolution procedures, escalation process, and Proposer's response structure (tiered or other).

EXHIBIT E-2 (REFERENCES)

Reference List		
1	Company	Contact Name
	Phone Number	Fax Number
	E-Mail Address	Physical Address
	Scope of Work	
2	Company	Contact Name
	Phone Number	Fax Number
	E-Mail Address	Physical Address
	Scope of Work	
3	Company	Contact Name
	Phone Number	Fax Number
	E-Mail Address	Physical Address
	Scope of Work	

SPECIFIC EQUIPMENT REQUIREMENTS & DETAILS

Please Note: School building drawings/maps showing network MDF and IDFs and additional details will be provided at the mandatory walkthrough along with additional equipment specification details.

The following section provides more specific technical requirements/specifications for **RFP # 2020-1**. The Monroe County School District has standardized our network equipment for ease of management and future growth on our district network. This is the reason specific network equipment (or equivalent) is being requested on this RFP. The District will standardize on Ruckus or equivalent network switches and Ruckus or equivalent wireless equipment. The District does not want a “**cloud-based**” controlled system, the District however has an “on premise” controlled system. The on premise wireless management software must be able to successfully manage all access points from one management package/solution. For installation of equipment for this project, all school sites will be open from 8:00AM to 4:00PM.

The awarded vendor will:

- (1) Install new wireless system equipment, network switches and all other requested network equipment to support the wireless infrastructure and network backbone upgrade.
- (2) Install all needed cabling (fiber and/or copper) connections, patch cables and patch panels, to access points from indicated wiring closets on school building maps.
- (3) Test all wireless equipment across the district sites after installation.
- (4) Provide “hot maps” of wireless locations in each school building to include access point/array model and location.
- (5) Submit a bid that includes total price of entire project AND must include breakdown list of all equipment and cost of each in line item (*with total cost*) PER school site.
- (6) Provide a solution that accommodates the 802.11ac wireless standard.
- (7) Provide a solution for the network switches to include fiber modules and other components necessary. (*See details below*)
- (8) Provide a solution for all switches to be linked by fiber.

District Initiatives: BYOD and/or 1:1

The District is developing a 1:1/BYOD policy for a “one-to-one” device initiative. The wireless vendor must provide a wireless solution that provides coverage to all classrooms, labs and other instructional areas in all school building in the district. The initiative calls for a minimum of twenty-five (25) student wireless connections per classroom. The district initiative will not accept wireless bids stating that their solution can support up to 100 of devices per radio/AP. Furthermore, the district initiative requires that the selected wireless solution will accommodate the 2.4GHz, 5GHz and 802.11ac wireless standard.

Additional Network Switch Specifications

1. The switch must support long-distance stacking. All ICX switches stack on regular Ethernet ports (10G/40G/100G) and using standard Ethernet optics with distances up to 10kms. This enables single stack to span multiple wiring closets, across stairs/floors/buildings/campus.
2. The switch must stack on a regular Ethernet ports. All ICX switches stack on regular Ethernet ports (SFP+10G/QSFP+40G/QSFP28 100G)
3. The switch must stack up to 12 units. All ICX switches stack up to 12 units.
4. Switches should be able to aggregate together into a single logical device/switch, up to 40 switches, eliminating the need for spanning tree. All ICX switches can be aggregated, into a single logical device/switch up to 40 switches using campus fabric. This technology is supported across the ICX family, meaning entry level and high-end level switches can be combined within the fabric.
5. Switches must have a single point of management across switches.

The backbone of our network is our MDF and IDF core switching for both wired and wireless connections. The main MDF closet shall have at a minimum of one core switch as designated by switching equipment list and a mandatory onsite walk through must be attended for additional questions. The main MDF routing core switch must have full layer three protocols including IPv4 and IPv6 dynamic routes OSPF v2, OSPF v3 (IPv6) PIM-SM, PIM-SSM, PIM-DM, PIM passive (IPv4/IPv6 multicast routing functionality) PBR Virtual Route Redundancy Protocol VRRP v3 (IPv6) VRRP-E (IPv4, IPv6) BGP4, BGP4+ (IPv6) GRE IPv6 over IPv4 tunnels VRF (IPv4 and IPv6) MSDP. All remaining switching being replaced in the main MDF closet must be connected together using manufactured provided stacking cables. The stacking cable shall be at a minimum ten gigabit connection between each switch and an additional stacking cable to complete the ring stack. The main layer three core switch shall be connected to any additional stacks by 10 gig SX fiber modules using fiber patch cables.

MDF switches shall be Ruckus (or equivalent) ICX7450 series switches or equivalent minimum. 24 or 48 one gigabit ports, POE+ 4x10 GbE SFP+ uplinks/stacking, 2x40 GbE QSFP+ uplinks/stacking, 1x1,000 W AC power supply and one fan, front-to-back airflow. Aggregated stacking bandwidth of 960 Gbps and must meet or exceed twelve switches (maximum switches in a stack). Additional license and modules will be provided by equipment list during required district walk through. Equipment list is only a guideline for required walk through. MDF must use 40 GbE QSFP+ stacking cables when two or more 7450 are stacked together.

IDF Switches shall be Ruckus (or equivalent) ICX 7250 series or equivalent minimum 24-port 1 GbE switch PoE+ 370W bundle with 2x1GbE/10GbE + 6x1GbE SFP+ (upgradeable to 10GbE) uplink/stacking ports upgrade or 48- port 1 GbE switch PoE+ 740W bundle with 2x1GbE/10GbE + 6x1GbE SFP+ (upgradeable to 10GbE) uplink/stacking ports upgrade. Ruckus ICX7150-C12P-2X1G Ruckus ICX 7150 Compact Switch, 12x10/100/1000 Mbps PoE+ ports, 2x1 GbE RJ45 uplink-ports, 2x1 GbE SFP uplink-ports upgradeable to 2x10 GbE SFP+ with license. 124 W PoE budget, basic Layer 3 (static routing and RIP). Additional license and modules will be provided at walk through by

equipment list. Aggregated stacking bandwidth 480 Gbps and must meet or exceed twelve switches (maximum switches in a stack). 10Gbps stacking cables to be used on IDF switch stacks.

The addition of new equipment requires maintenance upgrades of existing uninterruptible power supplies. The district's MDF UPS's will need to be replaced with APC Smart-UPS 3000VA LCD RM 2U 120V with Network Card SMT3000RM2UNC or equivalent. A three-year warranty on unit and two year on batteries on the unit is minimum. IDF closets shall require a minimum APC Smart-UPS 1500VA LCD RM 2U 120V with Network Card SMT1500RM2UNC or equivalent. A three-year warranty on unit and a two-year warranty on batteries.

Additional Wireless Solution Specifications

The district wishes to replace all existing wireless AP's with Ruckus 600 and 700 series or equivalent. The vendors must provide maps and coverage area for all buildings. Each AP must be able to provide coverage per classroom for up to twenty-five devices. Each vendor will provide data to support access point coverage. Gyms and cafeteria, shall provide cover for 100 devices. Each location may be called on for state testing in the future. All access points shall be connected and managed by an onsite controller. The controller has to be a virtual or a hardware appliance. The vendor will provide a five-year software update warranty on controller and access points. Each access point will be labels with room number, building, school and a brief description. POE or POE + will be provided by switches or power injector. Additional information will be given at walk through. District will provide the number of access points to be replaced. During mandatory walkthrough, vendors will be allowed to look at all current APs in all rooms. **Network APs must be same brand as network switches quoted.**

Access Point (AP) Technical Requirements

1. APs must concurrently support:
 - a. The legacy 802.11a, 802.11b and 802.11g standards
 - b. The 802.11n standard in both the 2.4 and in the 5 GHz bands
 - c. The 802.11ac standard in the 5Ghz band
2. APs must support up to 4 MIMO streams in both bands (4x4:4 specification)
Note: this assumes the customer requirement is for a premium 802.11ac AP rather than 2x2:2 mid-range 802.11ac AP
3. APs must support 802.11ac MU-MIMO
4. APs must support WPA2 Personal/Enterprise authentication and AES/CCMP encryption.
5. APs must be capable of being powered by standard 802.11af PoE with no loss of functionality in the 5GHz radio
6. APs must support 220+ concurrent client devices of a mixed nature. Please provide real-world collateral on this type of high client density deployment.
7. APs must be Wi-Fi Alliance certified and support the standards: WMM, WMM-PS, 802.11d, 802.11h and 802.11e.
8. APs must support 802.11ac [chip based] Transmit Beamforming.
9. APs should provide adaptive directional/sectorised antenna patterns for high density deployment, where the network capacity is the key. This technology must be available to focus the energy on the destination device and minimise radio interference surrounding of the AP Further:

- a. The vendor should specify if the activation of such feature is still compatible with 802.11ac spatial multiplexing. If respondent supports chip based beamforming, spatial multiplexing (MIMO B) must also be supported
 - b. Specify the number of adaptive directional antenna elements supported by the APs
 - c. Specify if the adaptive antenna is capable from selecting between or using a combination of horizontally and vertically polarised antenna elements to best match the client device antenna orientation
 - d. The antenna system should provide at least 3dBi of physical antenna gain and at least 10dB of interference mitigation
10. APs should support the following advanced radio technologies:
 - a. Polarization Diversity with Maximal Ratio Combining (PD-MRC) to improve performance robustness regardless of client device orientation
 - b. Maximum Likelihood Decoding (MLD) to improve client uplink performance
 - c. Low Density Parity Check (LDPC) to improve client uplink performance
 - d. Space Time Block Coding (STBC) to improve client downlink performance
 - e. Packet Aggregation to improve client downlink performance
11. APS must support DFS (Dynamic Frequency Selection) in the respective 5Ghz bands and should be at least EN 301 893 v1.6.1 compliant.
12. Security mechanisms must be in place to protect the communication between the Access Point controller and the Access Points.
13. APs must be automatically upgraded to the appropriate software revision on initial connection and subsequent controller upgrades by a central controller. Further:
 - a. There must be no pre-requisite software revision already residing on the APs in order for the controller to perform the upgrade
14. WLAN Controller must be field upgradeable without impacting AP operations and/or causing the AP to reboot.
 - a. Furthermore, the WLAN controller must support legacy APs and different versions of AP firmware simultaneously.
15. APs must be deployable on the same LAN/VLAN/IP subnet as the controller, or on different LANs/VLANs/IP networks separated by routers/WAN links where appropriate.
16. APs should support channel selection by the following methods:
 - a. Automatic by measuring throughput capacity in real time and switching to another channel should the capacity fall below the statistical average of all channels without using background scanning as a method. This method must include the ability to take into account both 802.11 and non-802.11 interference
 - b. Automatic using background scanning
 - c. Manual channels selection per AP/radio
 - d. Channel blacklisting (this must interoperate with automatic channel methods)
17. The AP must be able to adapt individual AP radio channels to provide the maximum capacity in each AP location based on the available airtime and sources of interference. Describe how the solution deals with interference experienced over varying channels of the 2.4 and 5Ghz RF spectrum for adjacent AP locations and how it adapts to changes in the RF environment.

18. APs must support band steering of 802.11a/n/ac capable clients to the 5Ghz band when appropriate. Further:
 - a. The band steering client RSSI threshold should be configurable to dictate at which minimum signal strength a client is band steered
 - b. They should support Band-Balancing threshold to prevent the 2.4Ghz band becoming starved of clients at the expense of overloading the 5Ghz band
19. Apple has adopted the 802.11k and 802.11r standards to provide seamless roaming for mobile Wi-Fi clients when using applications such as VoIP and it is expected the mobile client device industry will follow. The APs should therefore support these standards.
20. APs must support an “air-time fairness” mechanism to prevent slower transmitting Wi-Fi client devices from unfairly penalising clients that are capable of faster transmission/throughput i.e. 802.11b/g/a client devices penalising the performance of 802.11n/ac devices.
21. APs must support client load balancing to fairly distribute clients between APs in high density deployments. Further:
 - a. The feature should support configurable client RSSI thresholds dictating the signal strengths when clients should or should not be load balanced
22. If the APs implement any proprietary or non-802.11 standards based MAC protocol manipulation please explain and indicate any potential interoperability caveats or limitations.
23. APs should be operational even in situations where they are not connected to an Ethernet port. They should be able to reach the backhaul/core network using a radio links (aka Wireless Mesh) via other APs. Further:
 - a. The establishment of those radio links should be automatic and self-organising
 - b. Given sufficient neighbouring AP density the radio links should self-heal in the event of a current upstream neighbour failing
24. AP antennas must be enclosed along with the radio hardware to minimise damage and create a low profile unit that does not stand out visually. Further:
 - a. Optional external antennas should be supported by certain AP models, if required
25. APs must have the following mounting characteristics:
 - a. Solid ceiling/wall mounting mechanism built into their standard enclosure
 - b. Drop (false) ceiling mounting mechanism built into their standard enclosure
 - c. Anti-theft mechanisms built into their standard enclosure
 - d. Optional: a universal high security mounting bracket
26. APs must have at least two Ethernet ports allowing the cascading of multiple access points, or the connection of Ethernet based devices. Further:
 - a. The Ethernet ports must be capable of being administratively enabled/disabled
 - b. The Ethernet ports must support 802.11q VLAN tagging and Trunk, General and Access modes
 - c. The Ethernet ports must support 802.1x Authenticator or Supplicant modes
 - d. The AP must support LACP (link aggregation) across Ethernet ports
27. APs must support 802.1q VLAN tagging and tagging of each WLAN individually. Further:
 - a. There should be a mechanism to over-ride a WLANs configured VLAN tag per AP

28. APs must support up to 500 concurrent device associations subject to conditions and configuration. Please state any limitations.
29. APs must support at least 16 BSSIDs per radio for multiple differentiated user services.
30. Air-time efficiency must be maximised at all time for maximum capacity. Indicate and explain any potential airtime inefficiencies such as unicast beacons.
31. APs should support proper identification of ToS tagged packets and provide support for multiple queuing of 802.1p frames per user and traffic marking for QoS purposes.
32. APs must support multicast to unicast traffic conversion for reliable delivery of multicast packets to clients.
33. APs should support insertion of DHCP option 82 information to aid location specific services.
34. The APs must support the 3 following methods of controller IP discovery:
 - a. Manual entry of controller IP address
 - b. DHCP option 43
 - c. DNS
35. The administrator must be able to turn off the AP LEDs.
36. For troubleshooting purposes the administrator must have the ability to remotely capture 802.11 and/or 802.3 frames from an access point without disrupting client access.

Controller/Solution Technical Requirements

1. The proposed WLAN solution must support a distributed forwarding/local breakout architecture in which only client authentication is tunnelled to the centralised controller; all client data traffic is forwarded directly on towards its destination via the clients default gateway. Further:
 - a. Specify any loss of functionality, caveats or loss of capacity/performance is exhibited by the solution in this distributed forwarding mode
 - b. On a per WLAN (SSID) basis there must be an option to tunnel traffic to the controller either unencrypted or encrypted format
2. The controller must be able to support in excess of 1000 APs and 10,000 concurrent devices with capacity to spare. Please state specified controller capacities.
3. The solution needs to support virtual controllers
4. The solution must allow control plane and data plane separation between different controllers
5. The controller must support a High Availability (HA) mode. Please summarise HA deployment and operation. Further:
 - a. The High Availability solution must allow for the controllers to be distributed in 2 different data centres
 - b. The High Availability solution must be Active/Active in which all controllers must actively manage APs and client devices
 - c. The High Availability solution must be expandable beyond just two controllers
 - d. The High Availability must be supported on virtual controllers
6. The APs and controller should be capable of 802.11q VLAN tagging of Management traffic independent of VLANs utilised by the WLANs (SSID). Further:
 - a. The APs and controller may utilise different VLAN tags for management traffic

7. The solution should support all models of indoor and outdoor AP management from the same controller.
8. The solution must have the flexibility to transfer AP licenses between controllers
9. Specify if all features are available with the basic access controller pricing or if the support of some features require the acquisition of additional licenses. Specify which feature requires which type of licensing.
10. An overlay Management solution may be specified as part of the solution to provide management and reporting of all wireless components and wireless services. Detail any such proposed components here and their indicative cost if not provided as part of the overall solution cost.
11. To aid to physically locating rogue devices in conjunction with scanning at the APs the controller should be able to list/classify detected Rogue Devices. Further:
 - a. The information presented must include information about the detecting AP(s) and the rogues signal strength relative to them
 - b. The controller should be able to send a filtered notification to the administrator when a rogue device has been detected
 - c. Neighboring APs should be capable of de-authenticating clients from a malicious rogue device i.e. one which is spoofing the BSSID or SSID of a genuine managed AP
12. The controller must provide 802.1X based wireless client authentication for Eduroam and Enterprises Radius authentication server infrastructures
13. The controller should support an interoperability mechanism with external 3rd party Enterprise Firewalls such as Palo Alto, Barracuda, etc in order to be able to create per user security policies dynamically on the Firewall when a user associates and authenticates to a WLAN.
14. The controller should support Shibboleth based authentication services.
15. The controller should provide Application recognition to allow the administrator to gain insight on the applications in use and the bandwidth they consume per system and per user.
16. The controller should provide a captive portal in order to authenticate Guest users that are not part of the organization via a Guest pass key. Further the solution must:
 - a. Provide a web-based application that allows non-technical staff to create Guest passes that are valid for a time limited duration
 - b. Allow the IT Administrator to view and delete individual Guest passes
 - c. Allow for batch generation of Guest passes
 - d. Provide customizable Guest portal and guest pass instructions
17. The controller must be capable of identifying device host OS type and the host name. Further:
 - a. It should be able to utilize the host OS information to provide per WLAN policy based access such as allow/deny access, rate limit and assign to VLAN
18. The controller should support Role-based Access Controls that can provide policy controls on a single SSID such as:
 - a. Time of day access
 - b. VLAN assignment

- c. Per device rate limiting
 - d. Deny/Allow specified device OS types
19. The system should support HotSpot 2.0 (Wi-Fi Alliance Passpoint).
 20. The solution should include a mobile friendly application or tool for real-time monitoring and configuration of the Wi-Fi infrastructure. Please provide indicative cost if the application/tool is not provided as part of the overall solution cost
 21. The solution should include a mobile friendly application for validating the performance (throughput and coverage) of an existing installation, generating emails with throughput and/or heat map results.
 22. The solution must support policy driven secure device on-boarding.
 23. The solution must continue to serve client devices even if it loses connectivity to wireless controllers

General Management Requirements

1. The WLAN controller must be accessible only via secure means i.e. HTTPS for WebUI and SSH for CLI.
2. APs must support some direct, secure user interface (CLI via SSH/WebUI via HTTPS) even when under controller management for basic information and debugging purposes.
3. The administrator must be able to limit access to the controller Management interfaces through IP address, range or mask restrictions.
4. The controller must support SNMPv3 for remote monitoring and management. Further:
 - a. The vendor should provide their own controller/AP MIBs facilitating the polling by an SNMP management platform
5. The controller must support forwarding of detailed log information to an external Syslog server.
6. The controller must be capable of generating pro-active alarms to the IT Administrator via SNMP traps and E-Mail notifications. Further:
 - a. The E-Mail client must support SMTP outbound authentication and TLS encryption
7. In order to have good visibility on the utilization of an AP, the controller should be able to provide the following statistics for each AP:
 - a. List of all the SSIDs deployed on each of the radio of the AP
 - b. Number of client devices associated on each radio
 - c. Average client RSSI
 - d. Data sent/received
 - e. Air Time utilization (%RX, %TX, %Busy)
 - f. Statistics on retransmitted packets
 - g. Graphical collation of various trend and troubleshooting data such as estimated channel capacity, current channel utilization, number of associated clients, RF pollution, other APs detected
8. In order to troubleshoot issues with a specific device, the controller should be able to show the following statistics:
 - a. AP to which the client device is associated
 - b. Signal strength of the client device measure by the AP

- c. All alarm/event messages related to that client device including association de-association
 - d. Amount of data received/transmitted by the client device
- 9. The controller should be able to present a customizable dashboard view with information on the status of the Wireless network components.
- 10. When Wireless Mesh is enabled the controller should be able to show the mesh topology on floor plans in a graphical format.
- 11. The Wireless Mesh should support self-healing whereby if Root AP goes down then the Mesh AP should be able to automatically find and connect to another Root AP
- 12. The controller must support APIs for easier management and integration with existing network management devices. Provide the list of APIs supported.

Throughout the project if required by the District

- Vendors will be required to conduct a site visit to each area listed.
- Remove and replace all enclosures designated by the technology department.
- Mount and ensure operational roof mounted fans in each enclosure. Power outlets will be provided Technology department.
- Remove and replace all patch panels and wiring as needed to fit new enclosures.
- Remove all old network switches and re-install new switches in new enclosures as directed by Technology department
- Remove and replace patch cables with designing color codes provided by the technology department (see below)
- New switch configuration will be provided by the technology department prior to installation to enclosures.
- New fiber cables will be required as needed to support new SFP Switch Modules. Please note during site visit in documentation.
- Any additional patch panels or patch cables that were not noted by vendor during site visit will be provided by vendor unless requested by the District in writing stating additional cables or panel were added after site visit and contract awarded.
- Remove and replace all existing wireless AP's using existing connections. Remove and replace faulty network cables that may be damaged during replacement of new AP's. Please note on site visit documentation before bidding on the project.
- New wireless controller and AP's will be configured by the technology department prior to installation.
- Installation of enclosures may require re-positioning the cabinets in the closet. Please note in site visit documentation.
- Ensure all patch panels and cables are rated Category 6E. Also ensure all Fiber patch cables are replaced as needed to support new SFP Switch Modules. Please note in site visit documentation.

Patch Cable Colors

Color codes (approximate counts on equipment list)

- Data Drops/Other - Gray
- Access Points - Yellow
- UPS - Pink
- Firewall - Red
- Content Filter - Blue
- Server/SAN - Purple

REMINDER: Warranty of the wireless solution

For the wireless solution that is bid, the District requires the bidder to provide one-year and five-year warranty options on the bid/quote, to include all hardware and software upgrades and technical assistance to the District support staff as a part of the bid price. Vendor will provide explanation of manufacturer's warranty on the one-year quote.