

**REQUEST FOR PROPOSAL
FAIRFIELD CITY SCHOOL DISTRICT
Wireless Upgrade**

Prepared By: Michael Gilmore

July 28, 2008

RESPONSE DUE: AUGUST 19, 10:00AM

SECTION 1: INTRODUCTION

1.1 Purpose and Scope

The purpose of this Request for Proposal (RFP) is to solicit proposals from vendors for the selection of up grade wireless infrastructure for the Fairfield City School District (The District). General Information about the District can be found on the District's website at <http://www.fairfieldcityschoolsystem>. The District is seeking to implement extended coverage to the existing Trapeze Wireless architecture. The proposed architecture will add additional wireless ap's and PoE switch at all schools within the District. The acquisition will include CAT5E cabling, AP's, and Layer 2 PoE switches:

- a. Supported by a highly qualified and reliable vendor with experience in complex Cabling implementations
- b. Mainstream products with strong manufacturer commitment and vendor support
- c. Easy to use and readily accepted
- d. Open system industry standards based - SIP, 802.1p and 802.1q, TAPI, LDAP
- e. Easy to upgrade to newer standards as they become readily accepted - SIP
- f. Easily maintained by network administrators through standards based interface (Web-based management is strongly recommended)

A copy of this Request for Proposal (RFP) may be obtained from the District's web site at <http://www.fairfieldcityschoolsystem>. It is the sole responsibility of the 'proposer' to monitor the District's web site for any amendments to the RFP. For the purpose of this document the terms proposer, vendor and contractor are those entities representing the submission of a response to this RFP.

1.2 Evaluation Process

The evaluators will consider how well the vendor's proposed solution meets the needs of the District as described in the vendor's response to each requirement and form. It is important that the responses be clear, concise and complete so that the evaluators can adequately understand all aspects of the proposal in a succinct fashion. The evaluation process is not designed to simply award the contract to the lowest cost vendor. Rather, it is intended to help the District select the right vendor with the best combination of professional attributes, experience and relevant skill-sets, including that of price, based on the evaluation factors. The District reserves the right to require that a subset of finalists make a presentation to the evaluation team for consideration.

This RFP provides general and technical information as well as the required format for responses. Your submitted response will be the primary source of information used for system evaluation and selection. Please include all required and appropriate information with your proposal. No other source of information submitted, written or verbal will be considered part of your proposal.

At the completion of the RFP process, the Fairfield District School District will complete contract negotiations with the chosen vendor to provide equipment and services, representing, but not limited to, solutions that best meet the District's criteria in design, cost, vendor requirements and references.

1.3 Appeals

Vendors who wish to appeal a disqualification of proposal or the award of contract may submit the appeal in writing to the Purchasing Office within ten (5) business days of the postmark on the Notice of Award or disqualification.

Appeals should be sent to the following address:

| |
|--|
| Fairfield City School District |
| RFP Wireless Infrastructure Attn: Dr. Anthony C. Greene 6405 Ave. D Fairfield, Al 35064 |

The appeal must describe the specific citation of law, rule, regulation, or practice upon which the protest is based. Neither the judgment used in the scoring by individual evaluators nor disagreement with the procurement process shall constitute grounds for appeal. The District will not consider any protest based on items that could have been or should have been raised prior to the deadline for submitting questions or requesting addenda. The filing of a protest shall not prevent the District from executing a contract with any other vendor.

1.4 Schedule

Hard copy responses and related materials must be delivered by _____ August 19, 2008 10:15AM, as specified in the RFP. Late responses will be rejected at the sole discretion of the Fairfield District School District.

An approximate schedule for selection is as follows:

| | |
|--|---------|
| Issue RFP/ Publish to Fairfield City School District Website | 7-28-08 |
| Vendor Notice of Intent to Propose: | 8-15-08 |
| Scheduled Vendor Tour of Infrastructure: 9:00AM | 8-15-08 |
| Deadline for Questions: | 8-18-08 |
| Vendor Questions & District Responses Released to Vendor | 8-18-08 |
| Responses Due: 10:15AM | 8-19-08 |
| Pre-Bid Conference: 8:45AM | 8-15-08 |
| Tentative Vendor Selection: | 8-21-08 |
| Contract Completion: | ASAP |
| Implementation Commences: | ASAP |

1.5 Notice of Intent to Propose

Those submitting proposals are required to submit a Letter of Intent no later than 4:00 PM CST on Tuesday, __08-7-08_____ to Michael Gilmore mgilmore@fairfield.k12.al.us. The letter must be submitted on the vendor's letterhead. Please identify the name, address, phone number, fax number, and e-mail address of the person who will serve as the key contact for all correspondence regarding this RFP.

Submission of the Letter of Intent constitutes the vendor's acceptance of the procedures, evaluation criteria, and all administrative instructions of this RFP. Letters may be withdrawn at any time before the deadline for submission. A list of all vendors submitting a letter of intent will be available upon request.

1.6 Withdrawal of Proposals

Proposals may be withdrawn at any time prior to the submission time specified in this RFP, provided notification is received in writing. Proposals cannot be changed or withdrawn after the time designated for receipt.

1.7 Non-Disclosure Agreement (NDA)

Because the nature of IP Telephony systems requires a detailed understanding of the network architecture for proposal purposes, vendors are required to complete an NDA in addition to the Letter of Intent, prior to release of this sensitive information. Upon execution of the NDA, the Appendices section of this RFP will be provided.

All information and data furnished to the vendor by the District, and all other documents to which the vendor's employees have access during the term of the contract, shall be treated as confidential to the District. Any oral or written disclosure to unauthorized individuals is prohibited.

1.8 Pre-Proposal Vendor Conference/Meetings

There will be a formal pre-proposal conference conducted prior to the RFP due date. The pre-proposal conference will be held at the District's Board of Education at 9:00AM on __08-4-08_____. The District will conduct tours exclusively at the proposers request. All tours will take place following the conference.

1.9 Deadline for Questions

Questions with regard to the RFP maybe asked during facility tours; however, official answers will be faxed. **ALL** questions must be submitted in writing. Questions and answers will be forwarded to all proposing vendors.

In order to make information available to all proposing vendors, no questions will be entertained past __08-7-08_____ as stated in the scheduled in Section 1.4.

1.10 RFP Submission

Please submit one (1 hard copies of the proposal, in its entirety, to the contact and address below no later than 10 AM CST __August 11, 2008.

| |
|--|
| <p>Fairfield District School District 6405 Ave. D Fairfield, Al 35064</p> |
|--|

1.11 Proposal Validity Period

Submission of the proposal will signify the vendor's agreement that its proposal and the content thereof are valid for 180 days following the submission deadline and will become part of the contract that is negotiated between the District and the successful vendor.

1.12 Vendor Communication

Upon release of this RFP, all vendor communications concerning the overall RFP should be directed to the RFP Coordinator listed below. Unauthorized contact regarding this RFP with District employees will not help. Any oral communications will be considered unofficial and non-binding on the District.

Vendors should rely only on written statements issued by the RFP Coordinator.

Name: RFP Coordinator

Michael Gilmore

Address:

Telephone:

Fax:

E-mail: mgilmore@fairfield.k12.al.us

1.13 Right of Selection/Rejection - Waiver of Informalities or Irregularities

The District reserves the right to reject any or all proposals, to waive any minor informalities or irregularities contained in any proposal, and to accept any proposal deemed to be in the best interest of the District. Selection of a vendor solution shall not be construed as an award of contract, but as commencement of contract negotiation, including but not limited to the contract price proposed.

1.14 RFP Revisions

The District reserves the right to change the schedule or issue amendments to the RFP at any time. The District also reserves the right to cancel or reissue the RFP at any time. Amendments or a notice of cancellation will be posted to the District's web site. It is the sole responsibility of the proposer to monitor the District's web site for the posting of such information.

1.15 Statement of Confidentiality

"Under Alabama State Law," the documents (including but not limited to written, printed, graphic, electronic, photographic or voicemail materials and/or transcriptions, recordings or reproductions thereof) submitted in response to this Request for Proposal (the "documents") becomes a public record upon submission to the District, subject to mandatory disclosure upon request by any person, unless the documents are exempted from public disclosure by a specific provision of law.

1.16 Compensation

No payment of any kind will be provided to the submitting vendor, or parties they represent, for obtaining any of the information solicited. Procurement of all equipment and services will be in accordance with subsequent contractual action.

1.17 Commitments

All quotes should be submitted initially on the most complete basis and with the most favorable financial terms available. The selected vendor's proposal may, at the Fairfield City School District's option, be made part of the final purchase contract and all representations in the vendor's proposal may be considered commitments to supply the system as described.

Vendors may submit more than one proposal in response to this RFP. However, each proposal must be a separate, complete package, which can be considered independently of any other proposals from the same vendor.

1.18 Contract Award and Execution

The District reserves the right to make an award without further discussion of the proposal submitted. Therefore, the proposal should be initially submitted on the most favorable terms the vendors can offer. It is understood that the proposal will become a part of the official file on this matter without obligation to the District.

The general conditions and specifications of the RFP and the successful vendor's response, as amended by agreements between the District and the vendor, will become part of the contract documents. Additionally, the District will verify vendor representations that appear in the proposal. Failure of the vendor's products to meet the mandatory specifications may result in elimination of the vendor from competition or in contract cancellation or termination.

The vendor selected as the apparently successful vendor will be expected to enter into a contract with the District on terms similar to those presented in the copy of the District's standard Professional Services Agreement. If the selected vendor fails to sign and return the contract within ten (5) business days of delivery of the final contract, the District may

Elect to cancel the award and award the contract to the next-highest-ranked vendor.

No cost chargeable to the proposed contract may be incurred before the vendor has received a fully executed contract.

1.19 Payment Terms and Conditions

The proposal must contain a fee schedule that includes line items for equipment, software, professional services, warranties, project management, and installation and training fees.

1.20 Fairfield Business License

The contractor awarded the contract will be required to have a current Fairfield City Business License.

1.21 Insurance Requirements

The District will require the selected vendor to comply with the insurance requirements as outlined below:

The contractor shall procure and maintain for the duration of this Agreement insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the contractor, his agents, representatives, employees or subcontractors. The cost of such insurance shall be paid by the contractor. Insurance shall meet or exceed the following unless otherwise approved by the District.

1.21.1 Minimum Scope of Insurance

1.21.2 Minimum Levels of Insurance

1.21.3 Verification of Coverage

Contractor shall furnish the District with certificates of insurance affecting coverage required by this clause. The certificates for each insurance policy is to be signed by a person authorized by that insurer to bind coverage on its behalf and shall name the District as an "additional insured". The certificates are to be received and approved by the District before work commences. The District reserves the right to require complete, certified copies of all required insurance policies at any time.

1.21.4 Subcontractors

Contractors shall include all subcontractors as insured under its policies or shall require subcontractors to provide their own coverage. All coverage for subcontractors shall be subject to all of the requirements stated herein.

1.21.5 Asbestos or Hazardous Materials Abatement Work

If Asbestos abatement or hazardous materials work is performed, contractor shall review coverage with the District's Risk Manager and provide scope and limits of coverage that are appropriate for the scope of work. No asbestos abatement work will be performed until coverage is approved by the Risk Manager.

1.22 Equal Opportunity Compliance

The District is an equal opportunity employer and requires all proposers to comply with policies and regulations concerning equal opportunity.

1.23 Other Compliance Requirements

In addition to nondiscrimination and affirmative action compliance requirements, the proposer awarded a contract shall comply with federal, state and local laws, statutes, and ordinances relative to the execution of the work. This requirement includes, but is not limited to, protection of public and employee safety and health; environmental protection; waste reduction and recycling; the protection of natural resources; permits; fees; taxes; and similar subjects.

1.24 Acknowledgement

Where requested in sections 3, 4 and 7 indicate by marking an “X” in one of the pre-defined options such as Understood/Comply/Not Comply/Not Supported. Mark NA where applicable.

1.25 Exceptions

Respondents may take exception to any of the stated requirements so long as all such exceptions are expressly noted and clarified in the response. Alternatives may be shown and quoted as options.

1.26 Visits, Conferences and Provision of Facilities

Fairfield City School District team members may elect to visit vendor facilities or installed customer locations as part of their evaluation. Vendors should be prepared to provide information on appropriate locations and to arrange for such visits.

1.27 Primary Provider of all Services

If a vendor's proposal includes equipment, hardware, software, or services to be supplied by entities other than the proposing vendor, it is mandatory for the proposing vendor to act as the prime contractor for the entire procurement of all products and services proposed with the possible exceptions noted below. The vendor acting as the prime contractor must be the sole point of contact with regard to contract stipulations including payment of any and all charges resulting from the purchasing of the proposed equipment, hardware, software, and/or services. The vendor acting as the primary contractor must take full responsibility for the demonstration, delivery, installation, and acceptance testing of the items proposed to be supplied by its subcontractor.

1.27.1 Servers

Whenever possible the District prefers to purchase their own servers to take advantage of government pricing unless the vendor's proposed servers meet or are below the government pricing available to the District. The District's server preference is for DELL manufacturer.

Wireless LAN RFP: Technical Requirements

1. Architecture Overview and System Technology

- 1.1. Provide a brief overview of the wireless system architecture and elements (i.e., is it an integrated system with a centralized intelligent device or is it a collection of fat APs?).
- 1.2. Does the system allow me to designate the way data is forwarded (either centralized at the controller, or distributed at the AP) for different applications and types of traffic?
- 1.3. Can traffic be restricted, permitted or prioritized by user, group of users, SSID, application, source/destination IP, protocol and CoS?
- 1.4. Does the system future-proof my investment by allowing me to implement 802.11n technology when it's available without having to upgrade my switching infrastructure?
- 1.5. Does the system use the thick or thin AP model?
- 1.6. Please describe any aspects of the architecture that help scale the following:
 - 1.6.1. Throughput
 - 1.6.2. User and system control
 - 1.6.3. Management
- 1.7. Describe the supported AP types and radios.

- 1.7.1. What kind of antennas do the APs support?
 - 1.7.2. Is there an outdoor access point (AP)?
 - 1.7.2.1. Does the outdoor AP support the same functionality and features as the indoor AP?
 - 1.7.2.2. What kind of antenna options are available with the outdoor AP?
 - 1.7.2.3. What are the environmental specifications for the outdoor AP?
 - 1.7.3. Can the APs operate in an untethered mode?
- 1.8. Provide an overview of the management capabilities.

2. Planning and Design

A significant concern is how the wireless LAN will be planned and designed, incorporating both current coverage and capacity needs but also future expectations. The questions below are focused on understanding the planning process for the proposed system.

- 2.1. To what extent are site surveys required both now and when a floor plan or office layout is changed?
- 2.2. Does the system allow the integration of CAD drawings for floor plans (e.g. DXF, DWG file formats) to spatially determine the number and placement of APs?
- 2.3. How does the planning process and tools determine the number and placement of APs to deploy? Describe how bandwidth requirements are incorporated into this design. Please highlight where processes are automated.
- 2.4. Describe how "what-if" scenario planning is handled for designs incorporating more or less bandwidth capacity, various radio technologies, and differences in office layout or other potential RF obstructions?
- 2.5. How do the planning process and tools determine the various APs' RF channel assignments, power levels and association rates? Please highlight where processes are automated.
- 2.6. How does the system help plan for redundancy?
- 2.7. We have a large and complex facility and need to ensure that we have seamless RF coverage to support the use of wireless VoIP. How can we validate the results of a virtual site survey actual RF measurements from a physical site survey?
- 2.8. We plan to deploy our wireless LAN beyond a single campus. How can we massively scale security and services to our branch offices without creating a management nightmare?

2.9. Does the system assist craft personnel by generating work orders for the location and install process of access points? Please highlight where processes are automated.

2.10. How do the planning process and system tools support third-party APs?

3. Deployment and Configuration

It is critical to understand the deployment and configuration processes of the proposed system. In particular, the following questions seek to capture the costs to configure, deploy and maintain the wireless system, especially as needs evolve and the environment the WLAN serves changes.

3.1. Please describe how the system plan generated above becomes incorporated (configured and deployed) into the actual equipment. Please highlight where processes are automated.

3.1.1. Does system provide automated configuration verification?

3.2. Are there configuration changes needed on aggregation or edge switches and routers? Please detail.

3.3. Do your APs automatically configure themselves for optimal channel and transmit power when they become operational?

3.4. How does the system simplify the deployment of wireless services such as voice and security to branch offices?

4. VLAN Support

A significant concern is the preservation of existing network engineering in the form of VLANs already deployed on the wired network. The questions below are focused on understanding the VLAN implementation of the proposed system.

4.1. How does the system support multiple VLANs in the air?

4.2. Does the WLAN system support 802.1X dynamic VLAN policies?

4.3. Does every VLAN have to be accessible on every subnet supporting an AP for the WLAN?

4.4. Does the system allow IT managers to limit multicast traffic in the WLAN?

4.5. What is the maximum number of VLANs, APs and users that can be supported in a single intelligent device? In a system of intelligent devices?

5. Security – AAA, Encryption, Traffic Isolation

A significant concern is the breadth of security measures supported by the proposed WLAN system. The following questions are designed to determine standards adherence, range of security protocols supported and future-proofing of the system.

5.1. What methods of authentication are supported?

- 5.2. Does the system support web-based AAA?
- 5.3. What EAP protocols are supported?
- 5.4. Can users associated with third-party APs be authenticated?
- 5.5. Does the system support third-party RADIUS servers?
- 5.6. Can your controller act as an AAA server for its wireless clients?
- 5.7. Can EAP processing be offloaded from the AAA server to the controller?
- 5.8. What encryption methods does the system support?
- 5.9. Where does the system store user and network data? Is there any local store on the APs? Is direct access to the APs supported?
- 5.10. Does the system support per-user in-bound and out-bound extended access control lists (ACLs)? Per-port ACLs? Per-VLAN ACLs?
- 5.11. Does the system include a utility for a non-technical designee (e.g. receptionist) to supply temporary credentials to guests?
- 5.12. Does the system support endpoint assurance to protect the corporate network from a compromised laptop or other mobile device?
- 5.13. Does the system support Microsoft Network Access Protection for endpoint assurance?
- 5.14. Does the system enable scalability through distributed cryptography, or does it require centralized encryption of all data at the controller?
- 5.15. Does the system enable voice-aware personal firewall policy?
- 5.16. Is any sensitive data stored persistently on the APs?

6. Intrusion Detection and Countermeasures

A primary goal of the WLAN deployment is to use the system as a mechanism for detecting and locating rogue access points and users. The following questions are aimed at understanding how the proposed system aids in this critical function.

- 6.1. Is your WLAN tightly integrated with a best-in-class wireless intrusion detection/prevention solution (WIDS/WIPS) or does it require a separate overlay for best-in-class WIDS/WIPS?
- 6.2. Can the APs be temporarily re-provisioned as AirDefense sensors?
- 6.3. Is your WIDS/WIPS solution NIAP Common Criteria certified?
- 6.4. Does your WIDS/WIPS have integrated configuration and management?

- 6.5. Does the system auto-populate adds, moves, and changes of APs directly into your WIDS/WIPS?
- 6.6. Do intrusion alarms automatically roll up in your WLAN management console?
- 6.7. Does your management console provide a single consolidated view of intrusion alarms and WLAN status?
- 6.8. Do your WLAN and WIDS/WIPS leverage common hardware for APs and intrusion sensors to reduce capital costs and simplify parts management?
- 6.9. Can APs be converted on the fly to intrusion sensors to assist with location and mitigation, and then converted back to APs, thereby reducing capital and operating costs?
- 6.10. How many attack signatures Does the system recognize?
- 6.11. Does the system store forensic data for up to one year?
- 6.12. Does the system perform rogue detection automatically?
- 6.13. Does the system listen for all RF activity or only beacons?
- 6.14. What countermeasures can be used against these rogues?
- 6.15. Does the system send alerts when rogues are detected?
- 6.16. What types of management logs and traps for rogue activity can be shown?
 - 6.16.1. What additional information is provided about rogues?

7. Roaming

A primary goal for a WLAN is to support roaming. It is critical that roaming does not complicate deployment or troubleshooting, compromise security or necessitate multiple client logins and authentications. The following questions are designed to explain how the system supports roaming.

- 7.1. How does the system support roaming between APs or between intelligent devices when the APs or intelligent devices reside on different subnets?
- 7.2. Can users maintain the same IP address as they roam?
- 7.3. As a user roams, does s/he need to re-authenticate or re-login?
- 7.4. Does the user's subnet attributes (VLAN, ACLs, route policies) follow the user as s/he roams?
- 7.5. Does the system support any mechanisms to control where users can physically roam throughout the WLAN infrastructure?
- 7.6. For large installations, can the system perform fast-roaming (WPA2) between controllers?

8. Voice over Wireless LAN

There's a desire to support both voice and data services over the same WLAN infrastructure. The following questions are designed to discover how the WLAN system supports voice.

- 8.1. How do your network management capabilities help plan for voice over wireless LAN (VoWLAN)?
- 8.2. Describe the suitability of this architecture for supporting voice over wireless LAN.
- 8.3. Does the system automatically calculate voice coverage and capacity requirements?
- 8.4. Does the system support 802.11e to preserve voice prioritization (WMM, WMM Powersave [U-APSD] and TSPEC)?
- 8.5. Does the system implement 802.11v?
- 8.6. Does the system implement 802.11k (neighbor report)?
- 8.7. Does the system enable seamless roaming between networks (e.g., Wi-Fi and cellular)?
- 8.8. Does the system support dual-mode handsets?

9. Location-Based Services

There's a desire to support emerging services like location-based applications to support the business. The following questions are designed to understand how the system supports location-based services.

- 9.1. As facility-wide deployments of WLANs become more common, new service possibilities are created, such as using Wi-Fi access points to track the physical location of Wi-Fi client devices and Wi-Fi tags. Describe how the WLAN system supports location-based services.
- 9.2. Can the wireless access points be used to track assets?
- 9.3. How many tags does the system support?
- 9.4. Does the system support chokepoint alerts?

10. System Capacity and Performance

A major concern is that the WLAN provide sufficient capacity for business-level application performance. The following questions will help in determining how the system helps IT design for performance vs. simple RF signal reach.

- 10.1. Does the system help IT design for capacity as well as coverage? Can it let IT set average bandwidth requirements per user?
- 10.2. Does the system support setup and enforcement of minimum association rates to improve system performance? Please detail.

- 10.3. Does the system support per-user QoS capabilities and prioritization via per-user queuing in the APs?
- 10.4. Does the system enable IT to control an AP's transmit power level via software?

11.Management

A major concern is the ability to manage the air as a network resource. The following questions are critical to understanding the controls and performance and the available user statistics of the proposed wireless system.

- 11.1. Does the system use data from the planning process to continually manage and verify WLAN operations?
- 11.2. Can the management tool schedule reports for automatic generation and delivery via email?
- 11.3. What types of configuration and monitoring reports can be generated?
- 11.4. Does the system allow IT to force a user off the network?
- 11.5. Does the system allow IT to set up a user session timeout?
- 11.6. Does the system allow IT to track a user's AP associations, both current and historical?
- 11.7. Can the system monitor a user's bandwidth consumption, system performance, roaming path and time on the system?
- 11.8. What information about bandwidth usage does the system track? Can it provide a breakdown by user? Can it provide a breakdown of any other groupings?
- 11.9. What type of reporting is available when rogues are detected?
- 11.10. Does the system tie to AAA accounting? Can the system enable departmental charge back for WLAN services? Please detail.
- 11.11. Does the system support exportation of management graphs and statistics files?
- 11.12. How many controllers/switches does your WLAN management solution support per server?
- 11.13. Does the system enable network-wide change management?
- 11.14. Does the system provide 30-day trend monitoring?
- 11.15. Does the system provide end-user customizable reports?
- 11.16. Does the system support drill down to real-time and historical data?

12.High Availability and Failover

Given the expectation that wireless is migrating from a luxury service to a primary means of network access and that the number of wireless users will grow quickly, it's critical to understand the redundancy features of the proposed system.

- 12.1. What redundancy mechanisms are available in the AP? Does it have two 10/100 Mbps ports for redundant data path and power?
- 12.2. What redundancy mechanisms are available in the intelligent devices?
 - 12.2.1. Does the intelligent device provide redundant connections to the wired network? If so, do these links support load-sharing? What technology is used for load-sharing?
 - 12.2.2. Does the intelligent device provide redundant power supplies?
- 12.3. Can AP be configured on multiple controllers for redundancy? Explain.
- 12.4. Can the controllers be configured for N+1 redundancy?
- 12.5. Does the management application support automatic backup of management and configuration data?

13. Scalability and Technology Migration

A primary concern is the ability to grow the wireless system easily over time, both in user count and in overall capacity. The following questions will help detail what tools are available to scale the proposed system.

- 13.1. What is the maximum number of SSIDs supported by each AP?
- 13.2. Can traffic be encrypted in a distributed fashion by the APs or is all traffic required to pass through the controller?
- 13.3. Does the management application support centralized management of APs and controllers or does it require accessing each controller separately?
- 13.4. What is the maximum number of controllers that the management application can accommodate? What is the maximum number of APs?
- 13.5. Does the planning application support multiple buildings?
- 13.6. Does the planning facility compute optimal AP channel and power settings for buildings with multiple floors?
- 13.7. Does the management application monitor the wireless system enterprise-wide?

14. Standards and Interoperability

Adherence to industry standards is critical in the wireless arena, especially since the environment will support a wide range of client types. The following questions will help detail the specifications the proposed system supports.

- 14.1. Is the system Wi-Fi certified? Does it meet the Wi-Fi Alliance's WPA (Wi-Fi Protected Access) specification?
- 14.2. Do the APs support 802.11a/b/g?
- 14.3. Do the APs support WPA/WPA2 (802.11i) with AES encryption?
- 14.4. Do APs support standard 802.3af POE?
- 14.5. Do the APs support 802.11i fast-roaming?
- 14.6. Does the wireless system support 802.1X?
- 14.7. Does the wireless system support 802.11d?
- 14.8. Does the wireless system support 802.11h?
- 14.9. Is DSCP (Diffserve) supported?
- 14.10. Is multicast supported? If so, how does the wireless system determine the data rate when serving many clients?

Network Switch Requirement

The Intent of the Specifications below is to have a Network Infrastructure that will:

- last minimally 7 years - Goal Statement
- support any converged technology that the school system may choose to deploy
- provide the most flexible and economic use of the districts money
- mitigate any fork lift upgrades in the future
- use the existing MMF fiber where currently installed for either 1GE or 10GE

The School District is committed to 10/100/1000 in the closets and would like to plan to:

- support Voice or Video over IP any where
- support 802.11a/b/g/n any where
- support N x 10GE uplinks any where due to the 10/100/1000 uplink ratio

The School District will either centrally manage or outsource the management of the network. Therefore the network design will have to support an inclusive Network Element Management System – capable of managing both the Wired and Wireless networks within the same framework.

- All Switches

Must Support either sFlow or NetFlow in Hardware without impact on the individual switch

Must Support CDP, FDP , and LLPD/LLDP- MED for Network Node and End-Point Discovery

Must Support GE SFP Optic capable of roughly 2km over 62.5 MMF

Must Support 10GE XFP Optics capable of roughly 220m over 62.5 MMF

Must Support Console/Telnet CLI , or HTTP/HTTPS Web Management

Must Support a Centralized Network Management System and SNMP Management

Must Support Field Replaceable Primary Power Supplies

Must Support Internal Primary and Redundant Power Supplies (No Externally Cabled PSU's)

Must Support Dual IOS Image storage in Primary and Secondary Flash

Must 802.1p, DSCP QoS and packet remarking for QoS management

Must support 802.1x Security Authentication

Must support IGMP Snooping (v1, v2, and v3)

- Core or Large Edge/Distribution Switches (12-Ports to 336-Ports)

Minimum Stackable or Chassis Based Options

Must be configured for Wire-Speed, Non-Blocking Architectures (No Oversubscription)

Must support minimum of 12-ports of 1000bX SFP ports per Stackable or Chassis

Must support minimum of 2-ports wirespeed, non-blocking 10GE

Must support a maximum of 36-ports wirespeed, non-blocking 10GE

Chassis Options must provide either Redundant or Non-Redundant Management options

Chassis Options must provide either Redundant or Non-Redundant Wire Speed Switch Fabric options

Maximum of 336-ports of 10/100/1000bTX POE or non-POE in a single stack or chassis

Must support Internal POE Power Supplies to support up to 336 Class 3 (15.4W) ports Fully Loaded

Must Support Full Layer 3 Routing, including OSPF and BGP

- Small Distribution Switches (12-Ports to 24-Ports)

Minimum 12-port or 24-port 1000bX SFP combo ports

Must be configured for Wire-Speed, Non-Blocking Architectures (No Oversubscription)

24-Port SFP must have an optional internal up grade for 2-ports 10GE XFP

Must Support Full Layer 3 Routing, including OSPF and BGP

- Edge Switches (24-port or 48-Port)

Minimum 24-port or 48-port 10/100/1000bTX with minimally 4 100/1000bX SFP combo ports

Must be configured for Wire-Speed, Non-Blocking Architectures (No Oversubscription)

Must have an optional internal field upgrade for 24-ports or 48-ports of POE

Must have an optional internal up grade for 2-ports 10GE XFP per stackable switch

Must support full class 3 power (15.4W) with Internal Power Supplies (without external PSU's)

| Location | AP's | Switch |
|-----------------------|-------------|---------------|
| Central Office | 5 | 1 |
| CJ Donald | 10 | 1 |
| RES | 10 | 1 |
| Glen Oak | 10 | 1 |
| FHMS | 12 | 1 |
| FHPS | 10 | 1 |

| | | |
|--------------|-----------|----------|
| Total | 57 | 6 |
|--------------|-----------|----------|