long beach unified school district

SECTION 27 20 00

DATA COMMUNICATIONS ACTIVE INFRASTRUCTURE

PART 1 GENERAL

In general, each school campus will be built out in a single phase. Multiple schools may be implemented simultaneously. LBUSD will specify an implementation schedule shortly after contract award.

1.01 SUMMARY

A. General: This section describes the data communications network infrastructure including electronics and software needed to support Local Area Networks and network management.

B. Related Work

1 Related Documents: Drawings and Specifications, including General and Supplementary Conditions and Cabling specifications apply to the Work in this Section.

2 Products Installed but not Furnished Under this Section:

a. Manholes, Hand-holes, Conduits, Electrical Work, Pull-strings, Sleeves, Cores, Raceways, Cable Tray, Plywood and associated supporting hardware.

b. The provisioning of telephone equipment, its' mainframe cross-connects and placement of telephone instruments.

c. Cabling systems including station copper cabling and backbone fiber optic multimode cabling.

C. Products Installed Under this Section: Only new equipment and material, produced by manufacturers that are recognized nationally by the telecommunications industry and approved by Underwriters Laboratory shall be used as specified in this Section or on the Drawings.

1. All mounting hardware.

2. All mounting brackets.

3. All power cords.

D. Quality Assurance:

1. Use adequate numbers of skilled workers thoroughly trained and experienced on the necessary crafts and completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

2. Contractor is required to provide references of three similar installations completed in the last 12 months in the Southern California Area.

3. Contractor must provide a project manager who has demonstrated the ability to supervise a project of this magnitude. The project manager must be available to be interviewed by the District and/or their representative, and must be deemed acceptable by the School District and/or their representative. The Project Manager must be available to attend meetings as required. Acceptance will not be unreasonably withheld.

4. Contractor shall be manufacturer certified to provide and install Data Communications equipment.

E. References: Comply with the provisions and recommendations of the following documents, except where more stringent documents are indicated.

1. IEEE and ANSI standards for Fast Ethernet (100BaseTX/FX) and Gigabit Ethernet (1000BaseSX/LX) and 10Gigabit Ethernet (10GbaseSR/SL).

2. Installation and configuration manuals for specified products.

F. Submittals.

1. Submit the following in accordance with the approved submittal Schedule.

a. Materials list of items proposed to be provided under the Section;

b. Manufacturer’s specifications and other data needed to prove compliance with the drawings and specifications as needed to depict the space required for these items, and their interface with the work of other trades;

c. Manufacturer’s recommended installation procedures which, when approved by LBUSD, will become the basis for accepting or rejecting actual installation procedures used on the work.

d. Provide current part numbers and confirm with District Representative.

G. Delivery, Storage and Handling.

1. Delivery of Materials: Deliver materials (except bulk materials) in manufacturer's unopened containers fully identified with manufacturer's name, trade name, type, class, grade, size and color.

2. Storage of Materials: Store materials in unopened containers. Store off ground and under cover, protected from damage.

H. Warranty: LAN electronics and associated software shall be warranted for three years (24-hour/7-day-per-week) with on-site service for MDF core switch electronics and one year (8am-5pm) on-site service for IDF switch locations.

2.0 PRODUCTS

2.01 LAN ELECTRONICS

A. Material - Must be rack mountable in the equipment racks specified in the structured telecommunications cabling and pathway system standard.

B. Shall be able to be remotely managed by existing LBUSD CiscoWorks LAN Management Solution (LMS).

C. Manufacturer: Please provide current part number and confirm with District during submittal phase.

1. Cisco 4500-E and 6500-E Series chassis

2. Cisco Supervisor 720 and Supervisor 7 modules with advanced routing capabilities

3. Cisco WS-C3560E-S access layer switch

4. Cisco RPS 2300 power system

5. Tripplite SU5000RT4UHV rack-mount UPS.

6. Centralized Wireless LAN management and control with single sign on security

2.02 FILE STORAGE SERVER

A. Material - Must be rack mountable in the equipment racks specified in the structured telecommunications cabling and pathway system standard.

B. Operating System:

1. Microsoft Windows Storage Server 2003 Release 2, Standard x64 Edition with HP All-in-One Storage Manager.

C. Processor:

1. Quad-Core Intel® Xeon® E5430 2.66 GHz
2. Single processor

D. Memory:

1. 4GB (2 x 2GB) standard

E. Storage Controller:

1. Smart Array P800/512MB Controller (RAID 0/1/5/6) with BBWC and external expansion.

F. Drive Support:

1. Eight small form factor (SFF) hot-plug internal bays that support SAS or SATA HDDs

a. 2 x 72GB SAS SFF HDDs for mirrored OS

2. External SAS or SATA HDD support via bundled HP StorageWorks 60 Modular Smart Array enclosures

a. 6 x 750GB SATA LFF (4.5TB SATA model)

b. 6 x 1TB SATA LFF (6TB SATA model)

c. 6 x 300GB SAS LFF (1.8TB SAS model)

d. 6 x 450GB SAS LFF (2.7TB SAS model)

3. Slimline DVD-ROM Drive (8x/24x)to support System Restore

G. Network Controller:

1. Dual embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine

H. Expansion Slots:

1. Two embedded half-height low profile x4 PCIe slots.

2. PCIe Riser: one x4 PCIe slot and two x8 PCIe slots (one slot occupied by Smart Array P800/512MB controller on all models).

I. Redundancy:

1. Hot-plug SAS/SATA hard disk drives.

2. Hot plug redundant power supplies.

3. Fully redundant hot plug fans (N+1).

J. Management:

1. HP All-in-One Storage Manager Software

a. File share creation and scheduled snapshots included

b. iSCSI features require optional installation of Microsoft iSCSI Software Target

c. Data protection features require optional installation of HP Data Protector Express Software.

d. Streamlined data replication features require optional installation of HP Storage Mirroring Software.

2. Microsoft Management Console (MMC)-based user interface.

3. Remote system management via Remote Desktop or Telnet.

4. Remote hardware management via Integrated Lights Out 2 (iLO 2) - Advanced License included.

K. Form Factor:

1. Rack (2U), (3.5-inch); Depth 26 inches (66 cm)

L. Warranty:

1. Protected by HP Services and resellers and service providers. Three-year Next Business Day, on-site limited warranty (three years parts, three years labor, and three years on-site support).

M. Manufacturer:

1. HP ProLiant DL380 G5 Storage Server, or equal

3.0 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected. Request for Information (RFIs) shall be submitted to LBUSD for direction as required.

3.02 INSTALLATION

A. Property damage caused by the contractor during the installation and testing process shall be replaced at no cost to LBUSD.

B. Contractor will be responsible for all mounting kits and brackets for the LAN electronics.

C. Contractor will be responsible for providing and patching ALL fiber and copper data cables into LAN electronics per LBUSD specifications.

3.03 LOCATIONS

A. Coordinate with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by LBUSD representative, anchoring all components firmly into position for long life under hard use.

3.04 LAN ELECTRONICS

A. General.

1. The Target System Configuration in all schools will be a collapsed backbone topology. A high capacity Gigabit Ethernet (10GBaseSR/LR) switch located in the MDF of each school site will be the focal point of the backbone. WAN connectivity is via MetroEthernet Transparent LAN Service.

2. The switch will connect client workstations with servers and applications throughout the school campus as well as to applications available through the WAN, and should have IP/IPXbase routing capabilities with secure shell console management.

3. For all Elementary and Middle schools, this switch will be a Cisco model 4506-E equipped with a Supervisor 7e module, as well as a 4606-X2-E 6 port 10GE fiber module and a 4648-RJ45V+E 48 port 10/100/1000 copper module with POE+, quantities as required.

4. For all High Schools (or where specified) the core switch shall be a Cisco 6509-E equipped with a Supervisor VS-S720-10G-3C module, as well as a 6716-10G-3C 16 port 10G module and 6548-GE-45AF 48 port 10/100/1000 copper module, quantities as required.

5. All core switches shall be configured with all necessary control and management modules for complete and operational system.

6. Each MDF 4506-E and 6509-E switch will be configured with redundant load sharing power supplies with POE support and capable of sufficient power to handle POE and full stack of blades. In the 4506 a power supply no smaller than a 2800W and in the 6500 no smaller than 4000W

7. Each MDF 4506-E and 6509-E switch will be supported by an in-line Tripplite UPS and appropriate extended run battery(s) such as Tripplite BP192V12-3U capable of supplying 60 minutes of power to the MDF switch at full load.

8. The UPS will also be equipped with an SNMP agent such as a Tripplite snmpwebcard so that the management station is notified if the UPS is operating in battery mode.

9. MDF UPS power supply shall be capable of interfacing with the 4506-E and 6509-E So MDF is aware of when it is using battery backup

10. Each building (or portable cluster) will have one Intermediate Distribution Frame (IDF) that will serve as wiring closets/technology rooms.

11. Access layer Fast Ethernet (100BaseTX/1000BaseTX) PoE Switches will be located in each closet supporting interfaces to switched 100BaseT Ethernet and switched 1000BasetT Fast Ethernet to station devices, delivering 802.3af power over Ethernet.

12. Unshielded Category 6 Twisted Pair (UTP) wiring will connect access layer switches to the station devices (PC's, printers, etc.) All 100BaseTX/1000BaseTX interfaces will be 8-pin modular (RJ-45) type.

13. All Gigabit interfaces to the core switch will be fiber optic.

14. Access layer switch will be a Cisco 3560E-S 10/100/1000 BaseT with POE+ support and, / 10GBaseSR/LR X2 uplinks as required) modules. Quantities as required.

15. Each set of IDF 3560E-S switches will be supported by a Cisco RPS 2300 redundant power system with in-line Tripplite SU1000RTXL2Ua or SU1500RTXL2UA UPS and appropriate extended run battery(s) such as Tripplite BP2428-2U or BP48V242U capable of supplying 60 minutes of power to the RPS 2300 at full load.

16. The UPS will also be equipped with an SNMP agent so that the management station is notified if the UPS is operating in battery mode. The SNMP agent will support Ethernet.

17. Multimode fiber optic cable (laser optimized 50/125µm) will connect the IDF LAN Electronics to the high capacity Ethernet switch.

18. Each school will be equipped with a Wireless LAN controller supporting management of LWAPPs, 802.1x and single sign on such as Cisco 5508 Wireless Controller.

19. Wireless LAN controller will support redundant power supply and network connections.

20. Wireless Access Points supporting latest technologies (POE, N-Draft) and are centrally manageable and support 802.1x such as Cisco Air-LAP1142N.

21. The goal of the network is to allow any workstation (PC) access to any application that the user is authorized for on the LAN or WAN.

22. All MDF and IDF switch components must be manageable by the existing LBUSD Cisco Works centralized system management console.

23. TCP/IP addresses will be provided by LBUSD. The vendor will be responsible for configuring each switch with the appropriate TCP/IP address and District configuration. The console and management software is currently installed at LBUSD offices.

3.05 FILE STORAGE SERVERS

A. LBUSD Elementary Schools, Middle Schools and High Schools each have separate and specific file server storage requirements. Prior to ordering and installing files storage server, contractor shall coordinate with LBUSD, the specific configuration requirements of file storage server.

B. Due to the many versions and releases of file storage servers, contractor shall not purchase server more than 60 days prior to installation.

C. Contractor shall not purchase or install file storage server without written approval from LBUSD.

3.06 ACCEPTANCE TESTING

D. All LAN electronics specified in this document must meet manufacturer's standard tests. Testing must include the ability to successfully "ping" from one device to another and to and from PC end stations and servers. PC's must be able to connect to their appropriate servers.

E. Device configurations must be reviewed and approved by LBUSD IT management before deployment in production environment to allow for changes and acceptance.

F. The LBUSD project manager will issue an acceptance certificate upon successful completion of all network tests. Issuance of the certificate will not be unreasonably withheld.

3.07 PROJECT RECORD DOCUMENTATION

A. Prepare and submit copies of configurations, as-builds and logical network diagrams updated to reflect the new work completed for each campus project (i.e. site plans, cable, pathways, MDF/IDF cabinet elevations, equipment configuration spreadsheets, etc.).

B. These documents must be delivered to LBUSD, 10 working days after a school site is completed.

3.08 INSTALLATION REQUIREMENTS

A. LBUSD requires the successful contractor to provide a full suite of installation services. A turnkey solution is expected. Specifically, this includes:

1. The project shall be executed under the direction of the LBUSD project team.

2. Each contractor will be responsible to coordinate activities with other contractors on site under the overall direction of the project team.

3. The successful contractor will appoint their own project manager who will be responsible for the implementation of the system hardware and software components.

4. The contractor shall provide the name and resume of their project manager in their response to this RFP.

5. The successful contractor is expected to have their personnel perform in a professional manner. At the end of each workday, the contractor personnel will clean the work area. This includes removal of all garbage, trash, food and installation debris.

6. The contractor will submit a short written report on a weekly basis to the LBUSD Project Team. This report should contain the following information:

   a. Summary of work completed for the week concluded.

   b. Summary of work anticipated for the following week.

   c. Any questions the contractor has that may materially affect the project.

   d. Any action items requested of LBUSD personnel.

   e. Any deviations from the implementation schedule.

7. The contractor will be responsible for attending coordination meetings (weekly or biweekly as needed) until the system has reached final acceptance.

8. The contractor will be responsible for all phases of the equipment delivery process.

9. The contractor will be responsible for all insurance, security, delivery and staging of equipment.

10. The contractor will be responsible for installation of all equipment and software identified in this RFP to insure a functional, attractive and quality installation.

11. The contractor will coordinate installation schedules with the LBUSD Project Team so as to minimize the impact on day-to-day operation for each campus project.

12. Turnkey installation is defined as having all networking components including cabling, LAN electronics and LAN servers working as individual components as well as a homogenous system.

3.09 DOCUMENTATION REQUIREMENTS

A. Initial set-up and configuration

B. Configuration management for adds and changes. (Including emergency board replacement.)

C. Problem solving and resolution procedures

D. A custom operations manual in support of the day-to-day operations that is unique to LBUSD's Network.

E. The contractor shall provide all products standard documentation in printed and electronic format. Two copies of the printed documentation are required for all equipment and software products proposed in this section.

3.10 MAINTENANCE REQUIREMENTS

A. Warranty - The contractor shall provide one-year Smartnet maintenance on all equipment and software provided during the course of this contract. In addition, the contractor shall provide a limited lifetime hardware and software warranty on all products supplied. The contractor will warrant the system to perform in the intended use as indicated in this section.

B. The system is expected to operate 24 hours/day, 7 days/week. At a minimum, LBUSD expects an uptime of 99 percent for any single switch component during the hours of 7:00 a.m. to 7:00 p.m. (and 98 percent uptime when calculated over a 24-hour day). The contractor should state Mean Time between Failure (MTBF) statistics in their response for the equipment bid.

C. The contractor shall commit that major component failures will be replaced within a four-hour period. A major component shall be considered any hub or switch component that affects fifty or more user devices. The contractor should state Mean Time to Repair (MTTR) statistics in their response for the equipment bid.

D. The contractor must provide a four-hour response time to problem calls during the Prime Period of Maintenance (PPM). For problems reported outside of PPM, response time can occur no later than the beginning of PPM for the next day. Response time is defined as on-site presence of authorized maintenance personnel equipped with appropriate spare parts and diagnostic tools.

E. Once work has begun on repair of a critical problem, a technician shall remain on-site until the problem has been repaired. The contractor shall be allowed to change technicians at shift changes, however, the first technician shall not leave the site until the second has arrived and has been briefed on the problem.

F. The contractor shall provide its published escalation and priority handling procedures. This shall include the names and phone numbers, in organizational chart format, of the technicians and management (up to the CEO of the company) responsible for supporting LBUSD.

G. The contractor shall describe its policies and plans to assist LBUSD in the event of a catastrophic disaster to the facilities mentioned in this section.

H. The contractor shall provide a toll-free hotline and support center to assist LBUSD personnel in the installation, tuning, maintenance and updating of the systems hardware and software for the term of this contract.

I. Maintenance Charges for all equipment and software purchased from the contractor shall raise at a rate no greater than two-thirds the annual increase in the Consumer Price Index (CPI).

J. The contractor shall maintain an inventory of critical spare parts that shall be available locally, in a location approved by LBUSD, so as to ensure the repair response times required in this section.

K. If parts are required to fix a critical problem that is not available locally, they shall be shipped by the fastest possible means at no cost to LBUSD.

L. The contractor shall keep on-site detailed maintenance records of all maintenance calls made to the facility.

END