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CITY OF NEWARK
Delaware

May 1, 2014

TO: Mayor and City Council

FROM: Joshua S. Brechbuehl, IT Manager

VIA: Carol S. Houck, City Manager

SUBJECT: Recommendation to Waive Bid for Network Cabling Services

PURPOSE

The City of Newark, via a Capital Improvement Project, is planning to implement a new Voice Over IP (VOIP) phone solution throughout the City to replace the current Toshiba phone system that is outdated and failing. A challenge has been identified in terms of the existing network working within the Municipal Building (specifically the non-Police side).

It has been confirmed that the existing wiring within the building is rated at Category 3 (CAT3) and is not validating at a high enough quality to pass inspection. Current standards for network cabling are at CAT6. Please see the attached for more detailed information on cabling standards.

VOIP requires high quality, properly installed cabling to ensure voice quality and to minimize the number of dropped calls due to network bandwidth issues. It is the recommendation of the City of Newark IT Department that the City invest resources to upgrade the existing wiring within the building to meet technology standards. Our forthcoming VOIP system as well as existing computers would benefit greatly from the increased speed of the new cabling and call quality.

VENDOR & PRICING

On April 15, 2014 Mayor and Council approved the recommendation to waive bid and purchase a Building Access Security System from Advantech, Inc. of Dover, DE, a State of Delaware awarded vendor for Building Access Security Services (Contract # GSS13599) and Audio, Video and Surveillance Equipment and Services (Contract # GSS11584). Considering that Advantech's Scope of Work for the Building Access Security System involves installing wiring and locking hardware for card readers at 38

locations throughout the Municipal Building, they have provided a proposal totaling $42,120 for the installation of CAT6 wiring at 132 locations throughout the Municipal Building that can be completed in conjunction with the access control system.

FUNDING

Funding to cover the cost of the network cabling project are available from phone system depreciation funds totaling $42,120.

RECOMMENDATION

It is, therefore, recommended that Mayor and Council authorize the waiving of bid and approve the purchase of network cabling services from Advantech Inc. of Dover, DE at the total cost of $42,120.

JSB/cw
Attachment

CAT3

The Category 3 or CAT3 standard was used heavily in the early 90's for wiring offices and homes. It's still used in two-line phone configurations, but has largely fallen out of favor for wired networking thanks to the Category 5e cable's superior performance. CAT3 can be relied on to handle data speeds of up to 10 Mbps, but no more. Its maximum frequency clocks in at 16 MHz. Like many other cabling options, it relies on copper for data and power transmission. While theoretically limited to 10BASE-T Ethernet, it can actually support 100BASE-T4 speeds by using 4 wires instead of 2 to achieve 100 Mbps throughput.

CAT5

Around year 2000, CAT5 overtook CAT3 as the Ethernet cable of choice for LAN networking. CAT5 uses either the 10BASE-T or 100BASE-T standard for data transmission. Using two cable pairs to signal over copper wire, CAT5 is now largely archaic and isn't widely used for Ethernet connections. It's rated for a maximum frequency of 100 MHz and top speeds of 100 Mbps. CAT5 uses 8P8C modular connectors to connect devices together, and can be used effectively at lengths of up to 100 meters. Today, CAT5 cable has been replaced for the most part by CAT5e.

CAT5e

While very similar to CAT5 in appearance, CAT5e introduces some new wrinkles in the equation. For one thing, CAT5e uses four pairs of copper wire rather than the two that CAT5 relies on. In addition, the wire pairs are twisted more tightly and are sheathed in heavy-duty shielding to eliminate crosstalk. Crosstalk cuts down on the speed at which a cable can transmit information. Thanks to its internal upgrades, CAT5e is capable of achieving 1000BASE-T speeds. In other words, it can handle up to 1 Gbps of throughput at a distance of up to 100 meters. As of today, it's the most common type of cabling found in modern homes and offices for Ethernet purposes.

CAT6

For back-end, high-capacity networking, CAT6 supports Gigabit Ethernet needs. Supporting frequencies of up to 250 MHz and the 10BASE-T, 100BASE-TX, 1000BASE-T, and 10GBASE-T standards, it can handle up to 10 Gbps in terms of throughput. Thanks to better cable insulation, CAT6 reduces potential crosstalk even more so than CAT5e. When used for Gigabit Ethernet and below, the maximum allowable cable length is 100 meters. For 10GBASE-T speeds, the maximum cable length is 55 meters. The one major caveat of CAT6 cables is that installation can be tricky, as compatibility with 8P8C requires the use of special adapter pieces for optimal performance.