

10 Technical Advantages of Silex Serial Device Servers

There are a number of serial device servers on the market today, but many of these only provide the basic serial connectivity. There are many potential issues that need to be considered when connecting serial devices to wired or wireless networks. Silex has been in the device connectivity business for over 20 years, so we have already encountered and solved most of these issues.

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TEN TECHNICAL ADVANTAGES OF SILEX SERIAL DEVICE SERVERS

Every serial device server on the market can connect a serial device to a network. But not all serial device servers are created equal. As a result of over 20 years experience in connecting devices to networks, Silex has encountered and solved numerous device connectivity technical issues. This white paper discusses the ten major technical advantages Silex has against our competition. Although some of our competitors offer a few of these capabilities, none can match all of them.

The ten major Silex technical advantages include:

1. *Enterprise wireless network security.* Very few serial device servers support more than the basic WEP and WPA-PSK security. Yet there are many well-documented flaws with WEP, and WPA-PSK was never designed to be used in an enterprise environment. So why is this important?

First of all, security is much more critical in wireless environments than in wired ones. This is because wireless signals “leak” outside of a building, and can therefore be easily intercepted by any hacker with a wireless laptop computer. It is therefore very important to stop such hackers at two levels:

- *Encryption.* Encryption scrambles the data so that it cannot be read without the proper encryption keys. The device server should support the latest WPA2 wireless security standard, which includes Advanced Encryption Standard (AES) support, to provide the highest level of security for enterprise applications.
- *Authentication.* Authentication prevents access to the network unless the user has the proper credentials (the serial device server is treated as a user when it connects to the wireless network). For enterprise class applications, the device server should support 802.1X authentication with one of the secure EAP types (TLS, TTLS, PEAP, EAP-FAST, or LEAP; note that TLS, TTLS, and PEAP also work in a wired environment). According to the market research company Infonetics, 69 per cent of all Enterprise networks (1000+ users) will use 802.1X authentication by the end of 2007.

An almost equally important reason is that many large networks now require that all connected wireless devices conform to the security standards of the network. For example, if the network requires WPA2 encryption with 802.1X TTLS authentication, then the serial device server must also support this standard. This type of requirement isn't just for the sake of standardization. It's also because the security of the network is only as strong as the weakest link – for example, if the serial device server only supports the WEP standard, a hacker can easily crack both the encryption and the authentication to gain unhindered access to the network.

In addition to the security issues, there may also be network management issues. Maintaining multiple security methods can be a management headache, and in some cases, new hardware or software may be needed to support devices that do not conform to the network security standards.

2. *ECable mode.* Every serial device server allows a host computer to initiate a connection to the device server. In many cases, however, it is desirable for the device server to initiate the connection. For example, some devices need to exchange status information when they are powered up, which could be a problem if the host computer has not yet made a connection to the device server. With ECable mode, the serial device server connects on power-up to the host computer, thereby simulating a direct cable connection.

3. *Programmable E-mail alerts and SNMP traps.* It is often desirable to alert the user when a particular type of event occurs on the device server. Silex device servers allow users to monitor events on the serial port and/or general purpose I/Os (the SX-500 only supports serial port events).

When an event trigger occurs (for example, if a switch connected to a GPIO is closed, or if data is received on the serial port that matches a pre-defined character string), a user-defined message is sent via E-mail or SNMP traps. The user can select up to 8 E-mail addresses and/or up to 8 SNMP destination IP addresses, each of which can receive messages associated with any combination of up to 8 event triggers.

4. *High-speed serial port.* The serial ports on most serial device servers are limited to 230.4Kbps or less. Silex serial device servers, on the other hand, support 921.6Kbps capabilities with full modem controls to handle the latest high-speed serial devices.
5. *Powerful control capabilities.* Commands to control the device server and the connected to device can be sent over the network or in-band through the serial port.
 - a. AT commands. Standard AT command support allows the device connected to the serial port of a Silex device server to initiate a network connection to a remote computer, disconnect, control echo, send console commands, and more. The console command capability is especially powerful, because it allows the device to access the full capabilities of the Silex device server.
 - b. RFC 2217. RFC 2217 allows the modem controls on a device connected to a serial device server to be managed by a computer across the network. It is especially useful for migrating applications that use modem controls from a direct serial connection to a network connection. RFC 2217 support is available in Silex's Serial Port Emulator software or by connecting to TCP port 9200 on the device server from an application program.
 - c. TELNET. Console commands can be sent to the Silex device server via a TELNET network console.
 - d. IP timeout. The device server can be programmed to automatically break the TCP/IP connection after a user-specified period of inactivity.
6. *Print server mode.* One major application for serial device servers is connecting various types of specialty printers, such as barcode printers. However, printing generally requires capabilities over and above a simple serial connection. For example, the lpr/lpd protocol is a standard way of printing from a UNIX host, and HP JetAdmin/JetDirect compatibility is desirable for Windows printing. Silex has been a leader in print server technology for over 15 years, so our serial device servers have all of the necessary print server functionality built in, plus many capabilities not available on other products.

An especially powerful feature not found in most print servers and device servers is the capability of virtual printers. That is, the device server appears as multiple devices on the network, even though there is just a single physical printer. Each of these virtual printers can have a configurable setup and reset string (for example, the PJI command *ESC%-12345X* to reset the printer), and can have a configurable character substitution filter (for example, substitute *<CR><LF>* every time a *<LF>* character is encountered in the job stream). This is useful for printing to the same printer from different kinds of host computers (for example, a Windows computer handles printer resets in the drivers, but an lpr print job from a UNIX computer may need an external reset).

7. **Utilities and Support features.** Most serial device servers only support one or two configuration methods. Silex, on the other hand, provides multiple methods with extensive capabilities, including:
 - a. *ExtendView.* ExtendView is an easy-to-use graphical management utility for Windows systems. Capabilities include:
 - *Initial configuration of the device server address.* ExtendView automatically locates all Silex serial device servers on the network, and allows you to configure an IP address in both configured and unconfigured units.
 - *Bulk configuration of multiple devices.* Most device servers require you to configure each unit on the network one at a time. With ExtendView, however, you can save a substantial amount of time by configuring multiple print servers simultaneously.
 - *Save/restore configuration capability.* This capability lets you save the device server's configuration to a file and then reload it at a later time. This is particularly useful when replacing a defective device server.
 - b. *Internal Web pages.* Silex device servers can be configured via a graphical user interface using any standard web browser.
 - c. *Internal Command Console (Command line interface).* For advanced users, the command line interface is the fastest and most comprehensive way to configure the device server. It also provides a method for remote control of the serial device server. This interface is accessible through the console port, or it can be enabled on any of the serial ports, or it can be accessed over the network via TELNET, the internal web pages, or ExtendView.
 - d. *IP address load methods.* The initial setting of the IP address can often be quite difficult. Therefore Silex provides a wide variety of ways to perform this task, including DHCP, ExtendView, manual configuration via the console port, BOOTP, rarp, and arp/ping. Once the initial IP address is configured, the IP address can reset using any of these methods plus the web browser interface and TELNET.
 - e. *Bulk Firmware update.* Most device servers require you to download each unit individually whenever a firmware upgrade is required. Often this is done using the tftp slave protocol, which requires that you configure tftp master software on one of your host computers. Silex's Update IP utility, on the other hand, is an easy to use Windows utility that allows you to select any or all of the Silex device servers on the network and download them concurrently.
 - f. *FTP.* FTP is a convenient way to test the capabilities of the device server. The device server acts as an FTP server, so any PC can send a file to the device server using the FTP command.
8. *Proven Roaming Capabilities.* Almost every wireless serial device server can provide a good connection to a single 802.11 access point. But what if you need to move your device between multiple access points? This requirement, known as roaming, is necessary for mobile wireless devices that are used in large areas (for example, warehouses or hospitals) where multiple access points are required to provide complete wireless coverage.

When a device roams from one access point to another, it must first disassociate itself from the original access point. It must then search for a strong signal from another

access point, and associate and authenticate itself with that access point. All of this must happen quickly enough so that the network connections are maintained without disruptions. There are a number of technical challenges with roaming, and testing is also a difficult process.

Silex has substantial field experience with roaming applications in some of the largest wireless installations in the world. As a result, you can be confident that Silex serial device servers will meet any roaming requirements that you may encounter.

9. *Bridge mode.* The SX-550 embedded intelligent module can be configured as an Ethernet-to-802.11 bridge, and Silex also offers the SX-600 external Ethernet-to-802.11 bridge. Bridge capabilities allow any hardwired Ethernet device to connect to an 802.11 wireless network. As a result, the Ethernet device can be used in mobile applications, or it can be located in places where there is no Ethernet connection available.

Operation of the Silex bridge capabilities is totally transparent to the Ethernet device. There are no modifications required to the device's hardware or firmware, and all application programs run without modification. One big advantage of Silex bridge products compared to competing products is that they support full enterprise wireless network security (see advantage #1, above).

10. *OEM Support and Customization.* Silex has been a major supplier to some of the largest OEM manufacturers in the world for over 20 years, so we have vast experience in dealing with OEM applications. So if you're an OEM, Silex can provide everything you need to make your project successful.

- *Built-in OEM features.* Silex serial device servers include some built-in capabilities for OEMs. For example, in order to make the Silex device server appear as an integrated part of your product, we allow you to set a custom identification string (for example, "Company XYZ") that is displayed in the console and web browser interfaces, and to define a custom 3-character header string for the default server/service names (for example, XYZ532105). These values are not changed when the server is reset to its default configuration. In addition, our ExtendView software is available in a generic version that does not include any Silex-specific text or graphics.
- *Standard Support.* Unlike some companies, Silex provides free basic technical support. So if you need help configuring our products and making them work on your network, just give us a call or send us an E-mail. One of our expert technical support representatives will guide you through the process and answer any questions you might have. Please note that this support does not include programming or hardware design assistance.

In addition, our standard firmware and software updates are generally free. You simply download them from the Support section of our website, with no need for an annual maintenance contract. Occasionally we will come out with a major software or firmware product enhancement that is chargeable, but you are not under any obligation to purchase these enhancements. Custom firmware and software updates may be chargeable, depending on the terms of your OEM contract.

- *Custom software.* If you need support in developing your own drivers, or if you want us to develop a driver for you, we can provide these services on a fixed price or time and materials basis.

- *Custom hardware.* We can modify our existing hardware to meet your requirements through such capabilities as private labeling, special enclosures, and custom form factors. Or for high volume customers, we can even design a totally new product from scratch. Any of these options can be done on a fixed price or time and materials basis.
- *Custom firmware.* We can also modify our existing firmware to meet your specific requirements on a fixed price or time and materials basis.
- *Manufacturing support.* Manufacturing issues are often overlooked during the product development process. Silex is an expert in manufacturing, with a state-of-the-art high-volume ISO 9001:2000 facility in Japan. So we can help you with your manufacturing process with solutions ranging from custom barcode labels to full turnkey ready-to-ship products.

Want to Know More?

If you have any questions or need additional information, please contact Silex Technology at 866-765-8761 (U.S. toll-free) or +1 801 748-1199, or send an E-mail to sales@silexamerica.com.