

# Holmes County District Public Library

## Cellular Bookmobile Connectivity using Sirsi-Dynix Horizon and Microsoft Terminal Services

### **Overview:**

*This document was written by Eric Maynard, Technology Associate for the Holmes County District Public Library System and details our current setup and reasoning for the cellular options we have implemented.*

Geographically speaking, Holmes County is located at the extreme western edge of the Appalachian portion of the Ohio Valley. The glaciers made it as far as the northern edge of the county and then receded leaving a good portion of the county with the steep hillsides and narrow valleys. As a result, reception of airwaves of any kind has always been marginal for all but those located on the higher elevations. Nevertheless, cellular service is available throughout most of the county and provides our bookmobiles mobile access in even some of the most remote areas.



Culturally speaking, Holmes County is currently home to what is considered to be one of the largest Amish populations in the world. The library system as a whole currently serves a total of around 40K residents many of which are Amish and are only reached through our 2 bookmobiles. Their circulation alone accounts for about 30% of the system's total circulation. The sheer number of transactions handled by the bookmobile staff is what drives our need to be online and able to process these in real time. It's just too costly in terms of man hours to process these transaction offline and maintain the level of service and the number of stops we cover in a week's time.

To meet that demand, we currently, we have 4 laptops in service on our bookmobiles using PCMCIA (aka PC Card) based cellular modems. These PC modem cards connect to the Verizon NationalAccess Service which is rated at 144k in our service area. Each unit is connected to an externally mounted antenna to provide addition signal strength. Sirsi-Dynix PC Reliance offline circ software is also loaded on the laptops and is used in those few locations where coverage is not available.

This document details our current setup and offers some reasoning for the options that we have chosen.

## **Detailed Setup Notes:**

**Laptops** – This really is totally up to the organization as everyone has different needs and budgets. The primary thing to consider with bookmobile usage is durability, warranty, expansion slots. Also, since we're using the full graphical Sirsi-Dynix Horizon Windows client at this time in addition to the terminal services client, we needed to make certain that our laptops had plenty of memory as well. As an organization, we have found the Dell Latitude D series to be an extremely light and well constructed laptop for this purpose, but any laptop capable of using a PCMCIA Modem card would work and depending on your cellular provider, a USB based modem card may also be available.



**Wireless modem card** – Initially, our provider (Verizon) only offered a couple of choices in PC cards, but that has since changed and now many different modem cards are available. Regardless how many choices your provider offers, our experience has been that cards with built-in antenna's were not able to pick up the signal strength that we need, so we switched to using cards that also included a jack that allows for connecting an external antenna. In our case this was the AirCard 555 and more recently, a Kyocera KPC-650 which allowed us to connect an external antenna and grab pretty much full signal strength at about 98% of our stops. Organizations located in highly saturated cellular areas may not experience this problem and in many cases the internal antenna-only units may be a more economical alternative.

**Wireless Service** – Because we service such a large number of stops, our bookmobiles are on the road for 5 days each week and each requires something like an average of 30+ hours online each week. As a result, we contracted with Verizon on their Unlimited National Access plan which currently costs us a flat fee of about \$60 per month per unit. This provides no minute restrictions on usage, but does require that we be able to connect to the 1x network. The network provides bursts of up to 144k but normally operates at speeds in the 50-60k range which is faster than most rural dial-up.

Although not currently available locally, we do plan to upgrade to EVDO-based "Broadband" service once available.

**External Antennas** – The geographic area where our bookmobile stops are located are all pretty much covered by wireless service, but there are a few dead spots and maybe even more frustrating to deal with are the marginal areas. What we have run into in these areas in particular, is the situation where the staff member using one laptop at one of the bus will have different signal strength than the staff member at the opposite end of the bus less than 30 feet away. This difference is eliminated by extending the antennas to the outside of the bus and eliminating any interference caused by internal obstructions.

These external antennas are about the size and shape of a hockey puck and can mount either magnetically or by an easy to apply epoxy. Be aware that the epoxy version requires a hole in the mount surface in order to pass the cable through and still create a proper seal. The magnetic mounts are a little more flexible in the sense that they can be removed and replaced if necessary. We have used both applications as you can see the photos. This smaller bookmobile unit has a fiberglass shell and required the permanent epoxy mount while our larger bus is made of steel and the magnetic mounts were placed on the roof and cables ran through existing seals in the air conditioner and windows.

## Equipment Gallery



Sierra Wireless AirCard Series (~\$200)

- Allows for connecting a number of external antenna options
- Can double as a phone using a cellular headset.



External Cellular Antenna

- Reduces interference caused by vehicle walls
- Magnetic & permanent mount options
- Can order custom cable lengths if required.



## **Detailed Usage and Logistics:**

*This is mainly dictated by the method and procedure required to connect to the automation system. Currently, we are members of a consortium that uses Sirsi-Dynix Horizon over MS Terminal Services connections. Holmes County bookmobiles use the WindowsXP built-in Remote Desktop client. This requires relatively little bandwidth and can be easily launched as the busses travel from stop to stop. The main thing to remember is that **this is what works for us** at this point in time and that different automation systems will have different requirements.*

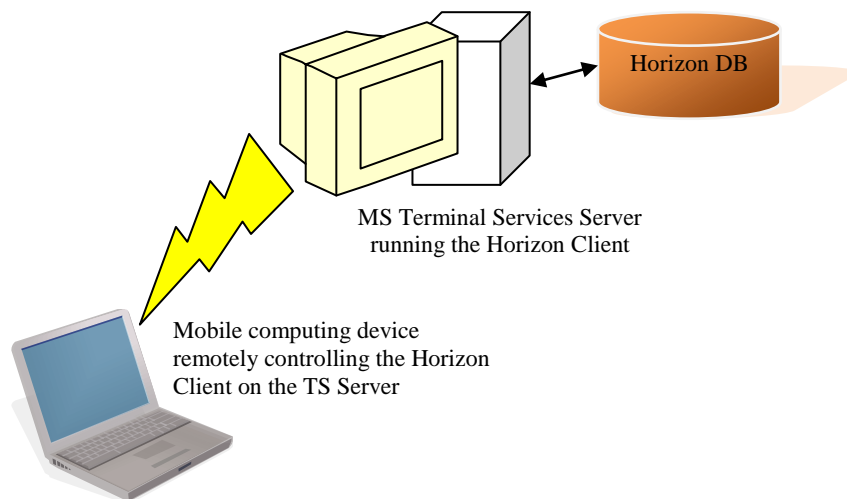
**On Location** – Once on location, staff will power on the laptops and then connect to the automation server over the Verizon network using Windows XP built-in Remote Desktop Connection. Staff will perform their work and then disconnect from the cellular service before moving on to then next stop.

Most PC modem card will have a built-in antenna that can be used in place of the vehicle mounted antenna; these make those trips into a building such as rest homes, schools, or other mobile applications as needed very easy. If for whatever reason, staff is unable to connect to the cellular network, they will run Sirsi-Dynix PC Reliance and circ offline using that software. In this mode we do not attempt to monitor patron blocks or deal with fines.

Once staff are able to return to an area with enough signal strength to connect, they can immediately synchronize the transactions they processed offline with the automation server and then continue with live access or they can defer the upload until they return to the bookmobile garage where we have installed WiFi access points to allow the laptops secure access to the Library's LAN without having to remove the laptop from the bus. NOTE that the WiFi connection is made using the laptop's wireless adaptor and not the modem card.

### **Remote Desktop / Terminal Services**

This technology solution essentially gives the bookmobile staff the ability to remotely control a computer (Terminal Services Server) running Sirsi-Dynix Horizon which is located literally feet from the automation server. It might be simplifying a bit, but if it helps, you can think of Remote Desktop and Terminal Services as super long mouse, keyboard, and video cables.



With remote desktop/terminal services, the only information that travels across the wireless connection to our laptop is what is shown on the screen and then any keyboard or mouse movements. All the processing and communications to the automation server are handled by the remote computer (in our case Terminal Services server) which also takes a load off the connection as well.

Through trial and error, we have found the optimal settings for the cellular connection to follow these guidelines. Keep the display settings as low as possible which in our case with Horizon means as low as 256 colors. Also, it's best to keep the user experience at the maximum setting which we found with Horizon that was either the 56k or 28.8k Connection setting.

Our consortium has chosen to implement MS Terminal Services, however there are other products that can perform similar functions including Citrix, encrypted VNC, and if only one connection is required you can just use Remote Desktop Connection in Windows XP to connect and control another XP machine. The only caveat here is that only one person is permitted to use the machine, either local or remote but not both.

**Security** – Regardless what type of connection you use, I strongly recommend desktop anti-virus and a desktop firewall program for any computer these days. There are many good products out there and some even combine these two functions in one product. Here at Holmes County District Public Library, we use a combination of Symantec (Norton) Antivirus and the Windows XP Firewall. The latter is available free as part of Windows XP SP2. Another powerful, but free desktop firewall is Kerio's Personal Firewall 4.

Also note that by using Remote Desktop to connect to Windows Terminal Services we are adding yet another layer of security to the data flow between our laptops and the automation server as the data flow is wrap in the Remote Desktop Protocol ensuring that only someone with the proper login permissions is able to access the data.

## Associated Costs

<b>The Equipment</b>	• Dell 600 series Latitude Laptop	\$1800.00
	• Sierra Wireless AirCard 555	\$200.00
	• AntennaPlus External Antenna for AC 555	\$100.00
<b>The Service</b>	• Verizon Express Unlimited (144k data service)	\$60.00 / mo
<b>The Software</b>	• Remote Desktop Client for Windows	Free
	• Desktop Antivirus	\$40.00
	• WindowsXP Personal Firewall	Free

## Links

Verizon Wireless	Service Provider	<a href="http://www.verizonwireless.com">http://www.verizonwireless.com</a>
Antenna Plus	Cellular Antennas	<a href="http://www.antennaplus.com">http://www.antennaplus.com</a>
Triangle Communications	Antenna Plus Dealer	<a href="http://www.trianglecommunications.net">http://www.trianglecommunications.net</a>
Kerio	Personal Firewall	<a href="http://www.kerio.com">http://www.kerio.com</a>
Citrix	Terminal Services Solution	<a href="http://www.citrix.com/">http://www.citrix.com/</a>
MS Terminal Services	Terminal Services Solution	<a href="http://www.microsoft.com/windowsserver2003/technologies/terminalservices/">http://www.microsoft.com/windowsserver2003/technologies/terminalservices/</a>
UltraVNC	Free Remote Desktop Software	<a href="http://ultravnc.sourceforge.net/">http://ultravnc.sourceforge.net/</a>
Bookmobile Cell Guide	This Document	<a href="http://www.holmeslib.org/bookmobilecellguide.pdf">http://www.holmeslib.org/bookmobilecellguide.pdf</a>