ENTER CATEGORY
Comparative Review

Wide Area Wireless Data Services Questionnaire

The following questionnaire will allow us to gather information in order to evaluate the data service offerings of nationwide cellular carriers in the US. Our analysis of this information will be presented in print and on line to our audience of enterprise information technology professionals, including technical managers, CIOs and CTOs of organizations who are current and potential new customers for your services.

Some of the questions relate to current services while others relate to forthcoming capabilities. We realize that only a limited amount of information may be available about future services but our readers are making deployment decisions with both current and futures services in mind. Thus, we feel it is essential for service providers to articulate a road map of future services.

Please respond as per the cover letter attached to this questionnaire. You can edit this document directly to provide your information or you can respond in a separate document, explicitly citing the following questions. Please limit your responses to no more than ten pages. You can include references to supplemental materials and we will make an effort to review such materials.

The submission deadline for surveys is **August 13, 2004.** It is our intent to schedule a follow-up call (up to 90 minutes) with each respondent the following week to discuss responses and address any outstanding issues. Please indicate three preferences for a follow up call between 9 am and 5 pm, August 18, 19, or 20. If none of those dates are possible, please contact Dave Molta to arrange an alternative time.

1. Foundation Technologies. Please list and briefly describe the cellular technologies you currently use in your network? (e.g., GSM, GPRS, EDGE, UMTS, 1xRTT, 1xEV-DO, iDEN, etc.)

In order to provide the highest quality network (capacity, throughput, etc.), CDMA 1xRTT is the primary network our customers utilize in order to meet users voice and data needs. CDMA 1xRTT supports data speeds up to 144kbps, with average throughputs of 60-80kbps. We have deployed 1xEV-DO (EV-DO) in three markets (Washington, DC, San Diego, CA, and Las Vegas, NV) and are expanding that footprint to cover 75 M POPs by the end of 2004 and 150 M POPs by the end of 2005. EV-DO is the fastest commercially available WWAN technology, offering users throughputs in excess of 2Mbps, with average throughputs of 300-500kbps. Both 1xRTT and EV-DO are IP packet networks. Since Verizon Wireless has deployed CDMA 2000 technologies across our network, we

are able to provide compatibility (connectivity) to our customers as they travel across the network, and into other network technologies (e.g. EV-DO Customers can utilize 1xRTT when visiting a non-EV-DO Verizon Wireless network). Our packet technology is backward compatible (Broadband to National)

2. Data Coverage Area. As of August 1, 2004 (or most recent date for available data), describe and, where possible, illustrate your POP coverage areas for each major data technology supported on your network? (For a CDMA2000 carrier, this might be X POPS with 1xRTT, Y POPS with 1x-EV-DO. For a GSM-UMTS carrier, this might be X POPS with GPRS, Y POPS with EDGE, Z POPS with UMTS.) You may also summarize coverage outside the US, if available, as well as other wireless data service offerings, including WiFi hotspots.

The Verizon Wireless data network consists of 1xRTT, IS-95a (Circuit Switched), EV-DO, and CDPD networks. The IS-95a and 1xRTT networks reach over 240 M POPs today. The CDPD Network reaches approximately 70 M POPs, and the EV-DO Network reaches approximately 8 M POPs (will cover approximately 75 M POPs by EOY 2004 and 150 by EOY 2005).

3. Roaming for Data Services. Summarize any roaming agreements you have with other carriers as relates to data services.

Data services roam on the following carriers networks:

Verizon Wireless currently has roaming agreements in place to support our 1xRTT customers. Currently, we support roaming in Canada via the Telus Network. Additional carriers and networks will be added in the near future.

For CDPD Services, roaming agreements exist with AT&T, Dobson, U.S. Cellular, Alltel and Cingular.

Verizon Wireless can support data roaming on other CDMA carriers networks by utilizing Circuit Switched Data (IS-95a).

4. Data Service Pricing – Enterprise Plans. As of July 1, summarize the service pricing of your data plans that are targeted at enterprise applications? (This should include unlimited usage and high-volume usage-based plans, if available).

Data plans are standardized across the Verizon Wireless footprint. It is important to note that these services are eligible for corporate discounts, based on volume:

Unlimited 1XRTT or EV-DO Data: $79.99
20 MB 1xRTT: $39.99
60 MB 1xRTT: $59.99

Furthermore, Verizon Wireless offers specialized pricing to PDA devices (Samsung i600, Samsung i700, Treo 600, Kyocera 7135). PDA Rate plans include:
5 MB of Data: $29.99
Unlimited Data: $49.99
Note- PDA Rate plans include VZEmail at no additional cost. If added to a voice plan, a $5 discount is offered.

Blackberry Rate Plans:
5 MB of Data: $34.99
Unlimited: $44.99

5. Pricing Consistency. For nationwide data plans, is your service pricing consistent across the US. (For example, is the pricing obtained for a subscriber in Seattle the same as for a subscriber in New York?)
Yes. Wireless Data pricing is set for a national basis.

6. Mobile Data Device Connectivity. Summarize your approach to supporting data services on notebook and handheld computers. Specifically, address options for connecting such a device through a cell phone (Bluetooth, infrared, or cable) and also through the use of PC-Card, Compact Flash, or SDIO or other modems. Address related pricing issues including subsidized-purchase programs for modems and any additional charges associated with using both a data-enabled phone and a separate modem.
Verizon Wireless currently supports multiple connectivity options for our data customers. Connection methods include PC Cards, tethered handsets (Serial or USB), as well as Bluetooth connectivity on limited devices. Furthermore, Verizon Wireless offers several "Smart-devices" (PDA devices with embedded modules) to meet customer mobile computing needs.

On all connections, Verizon Wireless offers multiple pricing options, each suited to meet individual user needs.
For PC Card solutions: Verizon Wireless suggests uses of Unlimited or MB Rate plans.
For Tethered/Bluetooth Connections: Minute of Use plans typically suffice for rare/limited usage. If devices are expected to generate substantial data traffic, Verizon Wireless suggests the addition of MB or Unlimited data rate plans to customers calling plans.
For PDA solutions (embedded): Verizon Wireless offers specialized Megabyte and Unlimited rate plans for customers. Options for PDA's include 5MB Packages, as well as monthly unlimited pricing- based on the customer's expected usage.
All data pricing options can be added to Voice Rate plans to support multi-function devices (e.g. PDA-Phone).

Verizon Wireless currently sells PC Cards to customers starting at $199.99 ($99.99 with $100 rebate.) Mobile Office Kits (cable, software and drivers to tether a wireless phone to your PC for use as a modem) currently retail for $39.99.

Verizon Wireless will work with customers in order to determine which option is appropriate for their needs. Customers that extensively use laptops and/or PDA's are more likely to opt for separate devices in order to support data solutions (e.g. phone and PC Card). "Light" data users may find that a wireless phone tethered to their PC will more than meet needs-eliminating the need for a second device.

7. Web Optimization. Do you offer optimization of Web traffic as an option? If so, describe the system's architecture (client/server, clientless or both).
Compression is offered at no additional charge. Verizon Wireless offers both client/server solutions as well as clientless solutions for PDA and/or Non-windows OS Devices.
In this architecture, data is compressed, then sent to the compression server, and transmitted over the Internet. Return traffic is sent to the

compression server, where it is compressed, sent to the mobile device, and "de-compressed" by the client.
Compression services add extensive value to our customers by increasing the throughput to the mobile device. Compression services provide improvements of 2-3xs that of raw data transfer. Utilizing our latest compression solution, throughputs over EV-DO mirror 1MB+ connections.

8. Value-Added Business Data Service Offerings. Please list and briefly explain your value-added services for business data connectivity? (This could include items such as optimized e-mail access.)
Verizon Wireless offers multiple solutions to meet enterprise data needs. Solutions offered by Verizon Wireless include:
VZEmail: **VZEmail is a solution targeted to our PDA customers (Samsung i600, i700, Treo 600). This solution, included with our PDA Data Rate Plans at no additional cost, provides push email services to our customers. This solution utilizes a desktop client to re-direct emails to the mobile device to provide the user the ability to immediately act on important requests. Additionally, PIM information such as contacts and calendar are synched to the mobile device.**
RIM Blackberry: **Blackberry provides you with the benefits of "always-on" email on the Verizon Wireless National Enhanced Service Area. It's an end-to-end solution, combining hardware, software, and wireless connectivity, offering a complete email, messaging, organizer, and calling solution. And it's easy to use, with a built-in keyboard, thumb-operated track wheel and integrated speaker and microphone. With Blackberry, messages sent to your personal or corporate email account are automatically delivered to your Blackberry handheld, so there's no need to "check" email - and you can respond instantly, whenever you're in the National Enhanced Service Area. Verizon Wireless offers three different ways to connect your Blackberry to your email. Current offerings include the Blackberry Web Client (to connect to POP3/IMAP email, as well as Hotmail, MSN, and AOL Email), the Desktop Redirector, and Blackberry Enterprise Server. Verizon Wireless supports Blackberry services on the Blackberry 6750 and 7750.**
TXT Messaging: **TXT when you can't talk. TXT Messaging allows users to send and receive short text messages from their wireless handset. Furthermore, users can message customers of other carriers.**
PIX Messaging: **Pix Messaging (on capable devices) allows users to send/receive Multimedia Messages (Pictures, Audio, Text, etc). Use your camera-phone to capture an image, then send it to another Verizon Wireless Pix Messaging phone, upload it to our online storage sight for later use, or send it to an email address.**
Get It Now: **Get It Now provides users the ability to customize their handset. Download applications directly to your mobile device. Applications such as PIM managers, Email Applications, Directories, News and Weather applications, and many more are available.**
Mobile IM: **Utilize this Get It Now Application to Instant Message your friends and co-workers using Yahoo, MSN, or AOL. Take your contacts with you while on the road.**
Mobile Web: **This service, utilizing WAP Protocols, brings the Internet to your wireless phone. Browse the Verizon Wireless content, or visit your companies WAP content. Verizon Wireless provides content including, but not limited to: news, weather, email, IM, and stocks.**

Mobile IP: **Mobile IP provides the ability to assign a static address to your compatible PC Card (PC 5220, Aircard 555). With this service, your device retains the same IP address across the Verizon Wireless Network.**
VZCustom: **Verizon Wireless maintains relationships with multiple solutions providers in order to meet many needs of the enterprise. Verizon Wireless can work the enterprise to determine their remote access application needs, and suggest an appropriate proven solution provider.**

9. Network Connectivity. Do you allow enterprise customers to connect to your network other than via the Internet? (For example, do you offer Frame Relay PVCs? Please list all the options.)
In an effort to meet the requirements of our enterprise customers, Verizon Wireless supports direct connectivity into our network for data transport as an alternative to reach your corporate network (instead of the Internet). Connection options include T-1 and Frame Relay PVC's. Furthermore, Verizon Wireless can support Network-Network VPN connections.

10. Network VPN. Related to the previous questions, for secure connectivity over the Internet, do you allow enterprises to connect to your network using VPN technology over the Internet? (This is a server-to-server VPN connection whose end points are your infrastructure network and the enterprise network. We are not referring to VPNs that terminate on the mobile device.)
Verizon Wireless supports Network-Network VPN as an alternative to dedicated links into our network.

11. IP Addressing. Do you offer customers the option of private or public IP addresses for assignment to mobile stations? Do you offer customers the option of acquiring static IP addresses for their mobile stations? Explain your rationale in both cases.
Verizon Wireless offers public addressing at this time. Options are available for both dynamic and static addressing. Public IP addressing is utilized in order to minimize potential Network-based issues in using applications that may be impacted by NAT (Network Address Translation). Furthermore, integration into enterprise networks and applications is simplified utilizing standard IP addressing schemes.

12. Airlink Security. Does your network encrypt data communications for over-the-air transmission? If so, what encryption algorithm is used? (If this differs for different wireless technologies that you offer, please indicate for each technology.)
Data is encrypted when transmitted over the air. For CDMA Packet Data (1xRTT and EV-DO), data is encrypting utilizing CDMA specifications, including security measures such as spread-spectrum signaling, Walsh Codes, Key Exchanges (Diffie Hillman), LCM (Long code Masks).
Some applications add additional layers of security. For Example, Blackberry utilizes 3DES Encryption, and VZEmail utilizes AES Encryption for data transmitted over the air.
To date, there are no known CDMA interception devices available in the public sector.

CDPD utilizes RSA RC-4 encryption to secure data transmitted over the air.

While Verizon Wireless is confident that data is secure over the airlink, we suggest use of additional security software (such as SSL, VPN, IPSec, etc.)

to provide additional security as your sensitive data traverses the public Internet.

13. Next Generation Deployment Plans. Indicate, if possible, how extensive your coverage area (either POPs or metropolitan areas) will be with emerging 3G cellular technologies (1xEV-DO for CDMA carriers and EDGE and UMTS for GPRS/EDGE/UMTS carriers) by end of 2005 and by end of 2006. If multiple technologies are being deployed, please indicate plans for each technology.

Verizon Wireless has announced a $1B investment into its network prior to End of Year 2005 in order to further deploy 1X EV-DO. This announcement will enable mobile users to connect to the Internet (or their corporate networks) at speeds of 300-500kbps on average, with peak data rates exceeding 2Mbps. While specifics of the deployment are strictly confidential, the full deployment will cover the following number of POPs:
EV-DO End of 2004 Coverage: 75 M POPS
EV-DO End of 2005 Coverage: 150 M POPS
National Access 240 M Pops