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CATEGORY

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.)

Cingular's flagship network technology is GSM, the fastest growing wireless telecommunications technology in the world today. GSM is the de facto global standard for wireless communications with more than 70% of the world's total wireless market, and more than 1 billion people in 200-plus countries using the technology. GSM offers the clearest voice quality of all wireless technologies

and is the only one to offer Smartchip, which allows customers to store service configurations and personal calling information on a removable chip that can be transferred to other GSM phones.

Cingular Wireless is the leading GSM carrier in the U.S., and currently enjoys bilateral roaming agreements with more than 200 carriers in nearly 100 countries. These agreements give Cingular an extended GSM footprint that will enable seamless, global wireless communications for customers who use GSM-based services

Cingular offers advanced wireless data services via our nationwide GPRS network and we are aggressively rolling enhancements to this network based on EDGE technology that can deliver speeds up to 140 kbps. Cingular's GPRS/EDGE network supports exciting new consumers services including multimedia messaging, wireless Web browsing and email access, as well as reliable and secure wireless data services for business, including Internet and corporate email access

Cingular currently offers GSM/GPRS in all of its markets. EDGE is currently available in 84 percent of Cingular's markets and the company expects to have 100 percent of its markets covered by Q304

Cingular also continues to operate its legacy TDMA network in 75 percent of its markets

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.

Total covered POPs at the end of 2Q04 was 226 million (licensed POPs were 243).

GSM/GPRS: In June Cingular completed its GSM/GPRS overlay and now GSM/GPRS roughly covers 226 million POPS (this doesn't include POPs covered by roaming arrangements).

EDGE. Currently roughly 84 percent of covered POPS are EDGE enabled. We intend to have EDGE coverage complete in Sept. '04

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

Cingular customers have nationwide access to data services, whether or not they are in our network area. Cingular has domestic roaming agreements with 40 U.S. carriers. Cingular's primary roaming partner for GPRS and EDGE

services is AT&T Wireless. We also have roaming agreements with T-Mobile, along with a number of rural carriers such as Rural Cellular Corp and Western Wireless.

Note: Once the acquisition of AT&T Wireless is complete, the only "top 100 markets" where Cingular would need to rely on roaming agreements are the Norfolk/Newport News/Richmond markets. Cingular will provide service in these areas through roaming agreements with Triton PCS.

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 Connect Pricing (Data Only Plans for PC Card)

Access	Package	Overage Per KB
$19.99	5 MB	0.5¢
$29.99	10 MB	0.5¢
$39.99	20 MB	0.5¢
$59.99	60 MB	0.5¢
$79.99	Unlimited	N/A

Wireless Internet Express Pricing

Price	Inc. Data	Overage per KB
$0	0 MB	1¢
$2.99	0.5 MB	1¢
$9.99	2 MB	1¢

Short Messaging Pricing

Price	Included Messages	Additional message
$0	0	10¢
$2.99	100	10¢
$9.99	750	3¢

BlackBerry Pricing

Device	Type	Retail Price
6280	Black & White	$249.99
7280	Color	$349.99

	Monthly	Overage
Xpress Mail – 3MB (data only)	$34.99	1¢/KB
Xpress Mail – 3MB (w/ voice package)	$29.99	1¢/KB
Xpress Mail – Unlimited (data only)	$49.99	N/A
Xpress Mail – Unlimited (w/ voice package)	$44.99	N/A

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?)

Data pricing is consistent in all markets

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.

Data Connect is a wireless network service that enables e-rnail, Internet, and corporate r Intranet access to a variety of supported Laptop and PDA devices via secure transports. Once a device is enabled with Data Connect, the end user can access any Internet- based service. An enterprise back-office solution (data servers and applications) enabled with Internet access can be used by the Laptop or PDA user just as if they were directly wired to a secure LAN segment using the enterprise security access control mechanisms deployed by the Enterprise. For the enterprise, Data Connect provides for the wireless extension of their corporate networks.

Cingular customers can use Data Connect GPRS/EDGE PC cards with Cingular Connection Manager software for fast, easy wireless connectivity via laptop. Cingular also offers Data Connect handset kits; including cabling and Cingular Connection Manager software, that allow users to use their GPRS or EDGE enabled handsets as a wireless data modem to connect a laptop or PDA.

For global travelers, this fall, Cingular will offer the SE GC83 World GPRS/EDGE card, which supports 850, 1800 and 1900 MHz bands for global data access. The GC83 gives customers the ability to use one device to access either high-speed EDGE or GPRS wireless data connections in the United States and in many countries across the world. When traveling in areas where EDGE has not yet been enabled, the modem operates at GPRS speeds in more than 50 countries.

NOTE: the GC83 will be offered in late Sept. 04. Pricing for the PC card has not been determined at this time. However Cingular will be offering promotional pricing when customers purchase Data Connect services.

Pricing for the Data Connect handset kit is: $35.99

Data service pricing is referenced above.

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).

MEdia Net is Cingular's optimized Internet service for wireless devices. Media net provides optimized WAP-based content to Cingular GSM customers who have Internet-enabled phones.

In-Network Data Compression/Acceleration:
Cingular Wireless has also added wireless data acceleration/compression servers to its core IP network to provide higher apparent throughput for its Data Connect subscribers. These servers compress and optimize Internet (HTTP) traffic and e-mail (POP3 and IMAP) traffic before sending it over the radio interface to the mobile users. The standard applications present on the user's laptop or PDA then de-compress this data so it can be displayed normally to the user. This network-based compression is provided at no cost to the users. In fact, it actually reduces the user's costs since they are billed for the smaller amount of compressed data that they transfer

Data Connect improves the effective throughput of your wireless network traffic in several ways:

Compression -Data Connect compresses web and email traffic before sending it over the wireless network to the mobile user, thus reducing the amount of data that must be sent and decreasing the time required to send it. Graphical images are further reduced in size by slightly reducing the quality of the images.

Caching -Data Connect stores a copy of recently compressed content from all users of this server, so that subsequent requests for the same content by another user can be returned immediately without needing to fetch it again from the Internet / Intranet and compress it again. This shortens the delay for other users who request this information.

Transport Optimization -The TCP protocol exchanges are optimized
c between Data Connect and the mobile user to make them better optimized for the wireless transmission environment.

Benefits of the Cingular Wireless VPN Acceleration Solution:
Data Connect Acceleration provides a factor of 3x or better (best case estimates are up to 5x) increase in apparent bandwidth, which makes it equivalent to the accelerated speeds of non-VPN traffic on the data Connect network today. This provides GPRS speeds of 60-85Kbps that account for VPN Overhead. GPRS still yields rates better than the fastest dialup modems today.

Data Connect Acceleration is a totally secure solution, which still allows enterprise traffic to be encrypted end-to-end between the mobile and the enterprise firewall, and allows the enterprise to control their own compression I acceleration server (dedicated to an enterprise and not shared with any other enterprises.)

Data Connect Acceleration saves the enterprise cost incurred on wireless network usage charges by reducing the amount of data transferred.

Data Connect Acceleration is a solution tuned to optimize behavior over a wireless environment, as opposed to other generic approaches that still don't address wireless specific challenges like long and variable latency, higher packet loss rate, etc.

Data Connect Acceleration will provide a common acceleration client that in future will be able to work with the Enterprise's acceleration server as well as Cingular's in-network acceleration servers to provide the best performance regardless of what environment the mobile user is in.

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.)

Cingular offers a number of value-added wireless data solutions for business customers from optimized e-mail, to Internet and data access solutions, to fully customized wireless data applications and professional services. Cingular's key value added services include:

Cingular BlackBerry Services
BlackBerry allows our customers attachment viewing, over-the-air synchronization, wireless access to Internet mail, and MDS (BlackBerry Mobile Data Server – which allows customers to access non-e-mail corporate applications from handheld devices using the Blackberry Enterprise Server.) For example, Cingular uses the MDS to enable access to Siebel lead tracking tools or Peoplesoft HR applications

Cingular Xpress Mail
Cingular offers two Cingular branded suite of products (supported by Seven) for enterprise users:

Xpress Mail – Enterprise Edition is a behind the firewall corporate server bundled with installation and technical training, for around $1,500. It provides enterprise customes the ability to control and manage their own server and wireless access if they so choose. XMEE is compatible the Handspring Treo 270 and 600. In the near future we will also allow users to choose from Palm OS, Pocket PC OS, MS Smartphone and J2ME devices.

Xpress Mail Network Edition is a Cingular hosted solution that allows companies wireless access to desktop applications using their existing corporate e-mail servers without the need to install additional hardware or software. It is the perfect solution for large companies that want to scale their access to thousands of users or for small businesses that don't want to purchase their own wireless e-mail servers.

Other Data Services

Multimedia Messaging allows customers to combine photos, video, voice recordings, text, and animated graphics into a single message. Cingular continued to enhance its Multimedia Store catalog by launching Multimedia Alerts in 1Q04. Customers can receive premium Multimedia Alerts ($0.25/ea) including AccuWeather.com Local Weather (Current Conditions and Forecast), AP News Headlines (Top Headlines, Business, World, US, Political, Sci-Tech, and Health), AP This Day In Sports (Baseball, Basketball, Football, Hockey), Astrology.com Horoscopes (Classic and Teen Flirt), Stock Quotes, and Trivia (Sports, Animals, Geography, Science, and Grabbag).
Cingular currently offers 13 multimedia handsets from Nokia, Motorola, Sony-Ericsson, Siemens, LG, and Handspring, 5 of which have built-in cameras.

SMS messaging: Cingular customers can send and receive text messages via their wireless handsets and handhelds

*Instant Messaging***:** Cingular is a leader in text messaging, offering three categories of instant messaging.

- PC2 Mobile messaging allows PC-based IM users to instant message a wireless device and Cingular customers can reply back using text messaging.
- IM Forwarding allows users to have IM messages delivered to their phone while away from their PCs.
- Mobile Instant Messaging gives users "presence" management whereby availability – online, busy, away, etc. can be utilized from the mobile device. This is more of a PC-like IM experience.

We currently have launched PC2Mobile, IM Forwarding and Mobile Instant Messaging with AOL. In addition, we offer PC2Mobile and IM forwarding with Yahoo! Cingular offers a variety of Mobile Instant Messaging capable handsets, and customers can message their buddies for less than $.02 per message.

Enterprise Data & Applications

Working with leading applications partners, Cingular is extending the enterprise to mobile devices, with solutions like Wireless Service Desk, featuring Computer Associates Unicenter ServicePlus Service Center, Siebel Wireless CRM featuring Siebel' Wireless CRM and Unisys' ExecuPoint enterprise data management platform.

Vertical Solutions
Working with a network of Value Added Service Partners, Cingular Wireless enables wireless solutions for key vertical markets, including:

- Telemetry (machine-to-machine) for monitoring and reporting systems
- Point of Sale (POS) – wireless credit card processing
- Automated Vehicle Location (AVL) – vehicle tracking and fleet management
- Field Force Automation (FFA) – mobile dispatch
- Government – specialized encrypted messaging

Professional Services for Custom Wireless Solutions
Cingular has over ten years of experience in delivering wireless business solutions with a team of professionals that offer end-to-end solutions support including, pre-sale engineering, project management, on site installation of BlackBerry servers, wireless solution testing, executive help desk, end user and 'train the trainer' training, configuration and installation of wireless handhelds and wireless data solution support.

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.)

Cingular Commercial Connectivity Services offers direct connection services to its GPRS/EDGE network via Frame Relay and VPN. For Frame Relay connections, CCS supports multiple committed information rate (CIR) speeds up to 4.5 Mbps. To help customers reduce costly down time, CCS provides automatic re-routing of mission critical data from one Cingular data center to another. Customers that operate Remote Authentication Dial-In User Services (RADIUS) for end user username and password authentication can manage their own pool of IP addresses for greater security and control. CCS also supports extended session connections, allowing session timers to run up to 23.5 hours before timeout, making it ideal for public safety use, where continuous connections are critical.

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.)

For CCS customers Cingular can configure VPN access via direct connection to its GPRS/EDGE network. CCS is compatible with a wide range of VPN software packages, enabling full end-to-end VPN connections

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.

Cingular's CCS offers a range of capabilities that are necessary to enable secure reliable network connections, including:

- Dynamic IP addressing, which enables Cingular to assign a random address to a device on an as-needed basis. This is the standard IP addressing scheme.

- Dedicated Access Point Names (APN) each CCS customer gets unique, access to the network via a private access point. The customer's APN is configured into its wireless devices so that only the company's employees can use the access point.

- Persistent Internet Protocol (IP) addressing, which allows IT departments to assign the same IP address to the same mobile device every time it registers on the network. Persistent IP addresses are often required for users to access secure information over the Internet.

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.)

Cingular supports 3GPP standards based security protocols. 3GPP supports ciphering and authentication in the data network.

Higher-evel encryption is done by individual applications.

Enterprise client based VPN is done by the enterprise itself.

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.

Cingular Wireless is focused on EDGE, to meet customers' needs today. We are continuing to expand our EDGE network, which will be deployed across 85 percent of the network by the end of 2Q04 and turned on in nearly all of our markets by end of 3Q04.

In looking what it will take to meet future demand for services such as high-speed multimedia and large file downloads, plus high-speed mobile access to corporate networks and business applications. UMTS is the logical technology choice to meet these needs.

UMTS and HSDPA will work with the existing GSM/GPRS/EDGE network meaning that customers will have a more consistent experience going from high-speed EDGE to even higher-speed UMTS where available. Other carriers must fallback to significantly slower 2.5G data networks.

Cingular has announced plans to deploy UMTS and HSDPA in the majority of its markets beginning in 2005 with the bulk of service availability in 2006.

Universal Mobile Telecommunications System (UMTS) is a high-speed wireless network technology based on GSM/GPRS technology. UMTS is the global standard for 3G
UMTS supports data rates up to 384 Kbps. In addition to higher data throughput, UMTS offers considerable improvements in voice capacity for greater spectral efficiency

High Speed Downlink Packet Access (HSDPA) increases UMTS network capacity and offers speeds with peak data rates up to 14.4Mbps; much in the same way that EDGE enhances GPRS today typically with a 3x speed increase. HSDPA is a software upgrade to UMTS so we will be able to deploy the technology quickly and cost effectively once we have deployed UMTS.

A key advantage in deploying UMTS is the technology's compatibility with Cingular and AT&T Wireless' existing GSM/GPRS/EDGE networks. Once the companies are integrated, Cingular will operate the largest nationwide high-speed data network with its EDGE service. The combined Cingular/AT&T Wireless network footprint and increased spectrum will also make it possible to roll out high-speed data services for the first time in many parts of rural America