TECH CHOICES

April 4, 2007

The Forrester Wave™: WLAN Infrastructure, Q2 2007

by Chris Silva

FORRESTER® Making Leaders Successful Every Day

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Cisco Leads, ProCurve And Pure-Play Vendors Follow Closely

by Chris Silva
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EXECUTIVE SUMMARY

Forrester evaluated leading wireless local area network (WLAN) infrastructure vendors across 54 criteria and found that Cisco Systems maintained WLAN leadership due to its broad range of hardware and solution features as well as its solid wired network integration. Aruba Networks and Trapeze Networks, both pure-play WLAN vendors, offer a rich feature set, solid security capabilities, and support for advanced features, but lack wired network integration. ProCurve Networking by HP emerges as a Leader due to its expanded enterprise-class product line and unparalleled support offerings. Nortel Networks and Siemens service the enterprise market with WLAN infrastructure solutions based on vertical and feature unique focus areas, with Nortel offering the added benefit of a complex suite of voice hardware and software options and Siemens tackling the complexities of fixed mobile convergence. Meru Networks, 3Com, and Colubris Networks, based on their deployments to date and market focus, are not currently contenders for a large portion of the enterprise WLAN market. Colubris, in its first Wave appearance, still bears the market-specific trappings of its past as a travel and hospitality niche player, but has taken the right steps to begin to seriously approach the enterprise.

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NOTES & RESOURCES

Forrester conducted product evaluations in January 2007 and interviewed nine vendor and user companies: 3Com, Aruba Networks, Cisco Systems, Colubris Networks, Meru Networks, Nortel Networks, ProCurve Networking by HP, Siemens, and Trapeze Networks.

Related Research Documents

"WLANs: What They Mean For SMBs"
January 16, 2007, Trends

"WLAN Adoption In The Enterprise 2006"
November 20, 2006, Trends

"The Forrester Wave: WLAN Solutions, Q4 2005"
October 19, 2005, Tech Choices

TARGET AUDIENCE

IT infrastructure and operations professional

WLANs BECOME A PRIMARY INFORMATION CONDUIT

In 2006, Forrester's Business Technographics® research showed that spending on WLAN technology would increase either slightly or significantly in nearly 60% of North American enterprises.[1]

Emerging Applications And Technologies Drive WLAN Importance

Forrester's Q4 2005 Wave evaluation of WLAN solutions focused on the WLAN becoming a mainstream component of an enterprise network.[2] Since then, the growth and importance of the WLAN continues, as firms look for new ways to enhance office and shop floor worker productivity through mobility.

WLAN strategies are now maturing beyond simple guest access networks and departmental pilot projects into enterprisewide deployments. Looking ahead, Forrester believes that certain technologies will play a major role in making the WLAN a primary network element. They include:

- **Voice over WLAN (VoWLAN).** About 20% of small and medium-size businesses (SMBs) are adopting or piloting VoWLAN.[3] VoWLAN allows enterprise users to make use of a single device for VoWLAN and cellular voice and data connectivity.[4] VoWLAN is not a mainstream technology at present by any measure. However, increasing numbers of available fixed mobile convergence (FMC) solutions will likely speed enterprises' adoption plans for voice on the WLAN.

- **Real-time location services (RTLS).** The utility of the WLAN expands as it can be used in an increasing number of ways. RTLS put the WLAN to use as infrastructure for tracking, locating, and creating audit trails for all manner of objects in an enterprise. Currently popular in healthcare and retail, Forrester expects to see WLAN deployments scale to support ubiquitous RTLS in any industry that has good, assets, or personnel worth tracking over the next five years.

- **802.11n.** The much talked-about standard still needs to be ratified by the Institute of Electrical and Electronics Engineers (IEEE) and vendors don't expect to ship product based on the final standard before late 2007 at the earliest.[5] When it arrives, 802.11n implementations are likely to drive large-scale "forklift" upgrades in many organizations. Forrester estimates the refresh cycle of WLAN hardware to be anywhere from three to five years and we expect to see uptake of 802.11n technology to drive IT spending on WLANs in the middle to latter half of 2008. The improved speed of 802.11n networks and their increased range will continue to drive the number of devices, applications, and business functions the WLAN serves.

Management, Security, And Advanced Services Support Separate Vendors

Overall, WLAN infrastructure solutions offered by the vendors featured in this Wave were equal in terms of basic features. But certain differentiators emerged:

- **Management.** Overall, Leaders exemplified the unified management vision espoused by vendors such as ProCurve Networking by HP. Having recently added integrated wireless product offerings to its roster of products and given its ability to offer a unified solution versus an overlay WLAN, ProCurve moves solidly into the Leaders category.

- **Security.** Robust guest access features and active intrusion detection and/or intrusion prevention system (IDS/IPS) capabilities built into the core offering differentiates Aruba Networks. The FIPS-certified vendor was highlighted in the Forrester's Q4 2005 WLAN Wave evaluation as a security-centric solution and continues to build out this suite of differentiating features with the most recent release of the ArubaOS version 3.1.

- **Advanced services support.** Support for integrated location capability, such as that from Cisco Systems through the use of its 2700 series location appliance, show leading vendors taking advantage of new technologies to differentiate the capabilities of WLAN offerings. A similar example is the Trapeze Networks' partnership with location services technology provider Newbury Networks to bring location services to the Trapeze Smart Mobile offering.

WLAN INFRASTRUCTURE EVALUATION OVERVIEW

To assess the state of the WLAN infrastructure market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of top WLAN vendors.

WLAN Evaluation Criteria

After examining past research, user need assessments, and vendor and expert interviews, we developed a comprehensive set of evaluation criteria (see Figure 1). We evaluated vendors against approximately 54 criteria, which we grouped into:

- **Current offering.** To assess the products and functionality each vendor offers as part of its WLAN product suite, Forrester reviewed vendors' offerings in terms of hardware components, solution feature set, security, reliability, and management characteristics.

- **Strategy.** To assess strategy, we reviewed the vendor's vision for the future of the product, planned enhancements, and relative development agenda in comparison to other vendors. We also considered each vendor's sales approach to its market, looking at the vendor's attention to size, and industry vertical market.

- **Market presence.** To establish a product's market presence, we combined information about each vendor's deployment size, revenues (overall and product), services, employee numbers, and partnerships, average customer size, industry, international presence, and financials.

Figure 1 Evaluation Criteria

CURRENT OFFERING	
Breadth of offering	How extensive are the WLAN product's current capabilities? Are additional wired and wireless products in the portfolio?
Scalability and performance	How scalable is the WLAN product?
Reliability	How reliable is the WLAN product?
Security	How secure is the vendor's WLAN product's approach and features? How does it integrate with wired security features?
Management	How simple is it for a user to install the WLAN product? How extensive are the management capabilities?
STRATEGY	
Vision, strategy, and value proposition	What is the overall value proposition of the WLAN product's offerings? Is the vision unique and bold?
Technology strategy	What is the vendor's overall technology strategy?
Cost	What is the expected cost of the vendor's WLAN product?
MARKET PRESENCE	
Client base	How large is the vendor's installed base of paying customers for the WLAN product?
Financials	Is the vendor financially strong?

Source: Forrester Research, Inc.

Vendors Evaluated Meet Market, Customer Base, And Enterprise Focus Criteria

Forrester included nine vendors in the assessment: 3Com, Aruba Networks, Cisco Systems, Colubris Networks, Meru Networks, Nortel Networks, ProCurve Networking by HP, Siemens, and Trapeze Networks. Each of these vendors has (see Figure 2):

- **A generally available WLAN solution.** All vendors included in the Wave must offer a WLAN solution that is currently shipping to customers.

- **Sufficient customer base.** Vendors must have at least 100 customers with actively deployed WLAN solutions.

- **Enterprise-focused offering.** Vendors must offer a product which features business-class features and must market this offering to midsize and large enterprises.

- **Client interest.** To gauge client interest, we reviewed Forrester client inquiries and included only vendors that were the specific subject of at least three inquiries within the past two years.

Figure 2 Evaluated Vendors: Product Information And Selection Criteria

Vendor	Product evaluated
3Com	3Com Wireless LAN Mobility Systems
Aruba Networks	Aruba Mobile Edge Architecture
Cisco Systems	Cisco Unified Wireless Network
Colubris Networks	Colubris Intelligent Mobility System
Meru Networks	Meru WLAN Product Suite
Nortel Networks	Nortel WLAN 2300 Series
ProCurve Networking by HP	ProCurve Mobility Infrastructure Solutions
Siemens	Siemens HiPath Wireless Portfolio
Trapeze Networks	Trapeze Smart Mobile

Vendor selection criteria
A generally available WLAN solution. All vendors offer a WLAN solution that is currently shipping to customers.
Sufficient customer base. At least 100 customers with actively deployed WLANs.
Enterprise-focused offering. Vendors considered for the Wave are offering a product which features business-class features and are marketing this offering to midsize and large enterprises.
Client interest. Forrester clients have submitted at least three inquiries within the past two years about each vendor's WLAN solution.

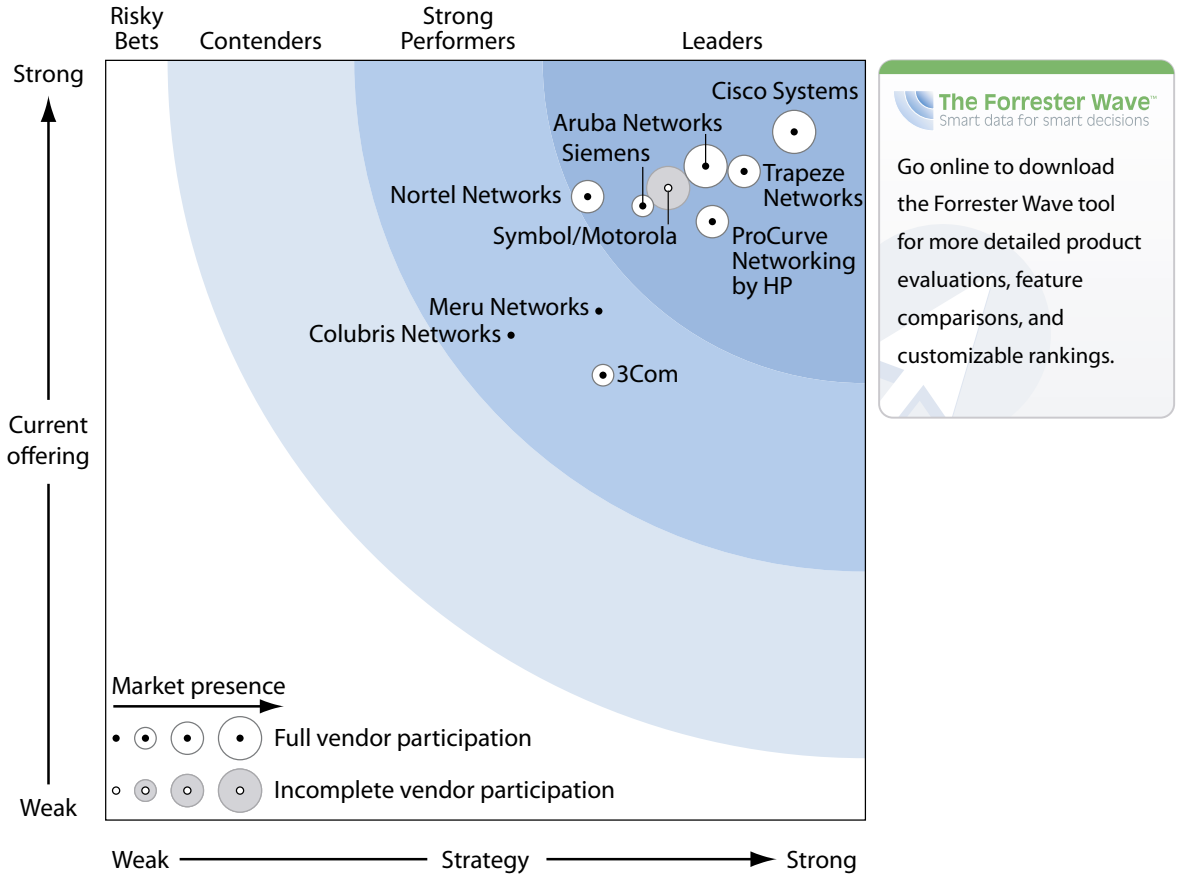
Source: Forrester Research, Inc.

WIRED INTEGRATION, RICH FEATURE SETS LEAD

The evaluation uncovered a market in which (see Figure 3):

- **Cisco, Aruba, and Trapeze lead in innovation.** Cisco, Aruba, and Trapeze offer the most comprehensive suite of features and tools, with Cisco holding the added edge by providing an extensive suite of WLAN hardware and tight integration with its wired and wireless hardware such as its voice offerings, ranging from the Cisco Unified Wireless IP Phone 7920 to the Cisco Unified CallManager's support for dual-mode offerings such as the NTT DoCoMo N902iL FOMA handset. Cisco also emerges as the market presence leader, with a score of 4.98, followed by Aruba, scoring almost a full point lower at 4.01, due, in part, to the large size difference between the two.

Figure 3 Forrester Wave™: WLAN Infrastructure, Q2 2007



Source: Forrester Research, Inc.

Figure 3 Forrester Wave™: WLAN Infrastructure, Q2 2007 (Cont.)

	Forrester's Weighting	3Com	Aruba Networks	Cisco Systems	Colubris Networks	Meru Networks	Nortel Networks	ProCurve Networking by HP	Siemens	Trapeze Networks
CURRENT OFFERING	50%	2.94	4.29	4.54	3.19	3.34	4.11	3.94	4.04	4.27
Breadth of offering	40%	2.96	4.02	4.74	3.32	3.09	3.87	3.83	4.29	4.41
Scalability and performance	5%	2.60	4.60	4.60	3.40	3.10	4.60	4.10	3.80	4.60
Reliability	5%	3.10	4.60	4.40	3.00	2.90	3.80	4.00	4.05	4.50
Security	25%	2.68	4.65	4.48	2.93	3.38	4.10	3.83	3.48	4.08
Management	25%	3.20	4.25	4.30	3.25	3.85	4.45	4.20	4.25	4.15
STRATEGY	50%	3.28	3.95	4.54	2.66	3.24	3.18	4.00	3.53	4.21
Vision, strategy, and value prop.	55%	3.36	4.08	4.98	2.38	3.55	3.36	4.02	3.46	4.39
Technology strategy	25%	2.88	4.11	4.61	2.40	2.86	3.16	3.96	3.20	4.36
Cost	20%	3.58	3.40	3.25	3.75	2.85	2.68	3.98	4.15	3.53
MARKET PRESENCE	0%	2.34	4.01	4.98	1.66	1.82	3.50	3.97	2.29	3.79
Client base	65%	2.53	4.18	4.98	1.48	1.78	4.09	3.79	2.04	3.68
Financials	35%	2.00	3.70	5.00	2.00	1.90	2.40	4.30	2.75	4.00

All scores are based on a scale of 0 (weak) to 5 (strong).

Source: Forrester Research, Inc.

- **ProCurve and Siemens offer solid WLAN functionality.** ProCurve emerges as a Leader due to the enterprise-class feature set, newly available wired integration options, and overall superior support. Siemens, due to recent FMC announcements and a focus on both voice technology and the healthcare space, is a strong vertical play.

- **Nortel, Meru, 3Com, and Colubris show promise.** Each of these vendors offers a strong base offering and each innovates around that offering — Nortel demonstrates a leadership position among these vendors in voice. Meru differentiates itself with innovative architecture, 3Com by addressing the SMB market, and Colubris merits noting due to its redesigned messaging and product line, aimed squarely at the enterprise.

This evaluation of the WLAN infrastructure market is intended to be a starting point only. Readers are encouraged to view detailed product evaluations and adapt the criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool.

A NOTE ON NONPARTICIPATING VENDORS

Due to its recent acquisition by Motorola, Symbol is not listed as a participating vendor in this document. Forrester views Motorola-Symbol as a major supplier in the WLAN infrastructure space. The magnitude of this merger and the combined entity that emerges will play a major role in the emerging landscape among providers in the coming year. While not explicitly scored in this analysis, Forrester has included a graphical representation of the vendor among others in this Wave. Motorola-Symbol services enterprise customers from midsize to large and focuses in the retail, manufacturing, transportation/logistics, and healthcare space. The acquisition of Symbol by Motorola was completed in January 2007. The company is well-positioned to build on the Motorola client list as well as expand on Symbol's base of customers in markets both inside and outside of its core vertical markets.

VENDOR PROFILES

Leaders Embody Advanced Features And Unified Management

- **Cisco Systems.** Cisco emerges as the leader in the WLAN space this year. The vendor, offering a comprehensive solution of standalone, centrally managed, and hybrid access points (APs) complements its strategy with offerings scaling from SMB to data-center-class. In addition, offering a full suite of voice hardware and software and having developed the only location appliance of vendors considered, Cisco spans the full spectrum of WLAN components. The vendor's monolithic size and premium-priced offerings are ideal for large enterprises looking for a one-vendor solution and organizations with a considerable, existing Cisco investment looking for the opportunity to standardize and centrally manage all network elements both wired and wireless.[6]

- **Trapeze Networks.** Trapeze redesigned its WLAN offering around the Smart Mobile architecture. The network, comprised of traditional thin APs, allows for a limited amount of intelligence to be delegated to each AP in order that local traffic handling can be relegated to the AP, eliminating the need to round trips to the controller. The Smart Mobile architecture is well-suited for WLAN deployments that will likely face expansion, increasing complexity, or the piloting of new technologies such as voice or 802.11n. Strategically, multiple OEM partnerships have given Trapeze an edge in gaining market share, but its core, branded offering is seen as a midmarket product suite.[7]

- **Aruba Networks.** Aruba offers multiple and complex schema for managing users, traffic, and bandwidth on the WLAN. It continues to bring on marquee enterprise deployments which will move its customer base solidly away from the midmarket and make the player a contender in the enterprise space. Currently, the vendor follows only Cisco Systems in market presence. Its move from the direct-sales model of its past will illustrate that the vendor is moving away from a pure-play wireless technology-only player to a more balanced, vertical-savvy technology partner.[8]

- **ProCurve Networking by HP.** ProCurve's networking product suite offers comparable features and functions to established, large enterprise vendors, while also offering innovative warranty and support for its products. ProCurve suffers from a lack of recognition among potential buyers as a WLAN solution vendor; however, the full stable of wired and wireless offerings along with robust management and security features, places the vendor securely with the Leaders. Forrester expects to see ProCurve gain share and recognition by increasing its roster of large enterprises and shedding its image as a pure midmarket player.[9]

- **Siemens.** Playing off of its parent company's firm position in the healthcare vertical, Siemens represents a solid technology choice for the midmarket healthcare enterprise. Developing its suite of WLAN offerings through the 2004 acquisition of Chantry Networks, Siemens has continued development of the Chantry offering, bringing to market a solid midmarket WLAN solution with robust radio frequency (RF) planning and IDS/IPS elements. The strong planning and deployment support offered in the Siemens HiPath offering lends itself well to the challenging RF environments often witnessed in healthcare organizations. Paired with its strong track record and significant presence in the healthcare vertical, Siemens is a solid bet for the midmarket healthcare enterprise.[10]

- **Nortel Networks.** Nortel — traditionally a voice and carrier network vendor — has an OEM relationship with pure-play WLAN vendor Trapeze Networks to bring to market its suite of WLAN tools. Given the nature of the relationship between Nortel and Trapeze, Forrester does not find Nortel to be in a strong position to innovate or shape the future of its product offerings. The vendor has innovated significantly on the Trapeze offering in support of voice offerings, standard, IP-based and mixed-mode. As a result of its strong voice technology but relatively weak strategic position, the vendor is best suited to customers with existing Nortel relationships that are looking to leverage the synergy on having only one network vendor. Another area where Forrester expects Nortel to have a strong showing is in voice-centric deployments where multiple types of voice networks are being rolled out.[11]

Strong Performers Offer Vertical-Specific Solutions And Individual Strengths

- **Meru Networks.** Meru's architecture — deploying WLANs based on a shared-channel model — is ideally suited to voice-centric and client-dense deployments. The vendor's architecture is sufficiently different from other vendors' WLAN offerings and may require reeducation of the target customer who is familiar with a more common cell-planning deployment model. Organizations that rely heavily on a standalone wireless voice solution or are seeking to deploy a WLAN in an environment with multiple, simultaneous clients or mitigate resource requirements to deploy an enterprise-class WLAN will be attracted to the Meru offering.[12]

- **3Com.** 3Com remains a clear fit for SMBs among vendors in the WLAN space. An OEM of Trapeze Networks' technology, the vendor has concentrated efforts on the SMB and Asia Pacific (APAC) markets rather than work to innovate on the base offering it licenses from

Trapeze. Considering the wired networking product suite 3Com offers in addition to its wireless infrastructure, the vendor has yet to make significant strides in unifying the two through the development of a truly unified network management solution.[13]

- **Colubris Networks.** Commonly viewed as a niche player in the service and hospitality industries, Colubris is now taking aim at enterprise customers. With expanded product offerings and marketing designed to expand the appeal of Colubris with enterprise customers, the vendor brings its depth of experience in guest access along with a suite of enterprise-class features to the market at an attractive price point. While it does not offer robust integration features, the solution is ideal for firms providing temporary or guest access services and keep costs down as Colubris tries to build market share with aggressive pricing. Colubris is aiming at the enterprise across verticals, shedding its past as a niche travel and hospitality play and adding in the features and capabilities required for it to be considered among other, larger vendors traditionally considered enterprise WLAN Infrastructure heavyweights.[14]

SUPPLEMENTAL MATERIAL

Online Resource

The online version of Figure 3 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings.

Data Sources Used In This Forrester Wave

Forrester used a combination of two data sources to assess the strengths and weaknesses of each solution:

- **Vendor surveys.** Forrester surveyed vendors on their capabilities as they relate to the evaluation criteria. Once we analyzed the completed vendor surveys, we conducted vendor calls where necessary to gather details of vendor qualifications.

- **Customer reference calls.** To validate product and vendor qualifications, Forrester also conducted reference calls with one of each vendor's current customers.

The Forrester Wave Methodology

We conduct primary research to develop a list of vendors that meet our criteria to be evaluated in this market. From that initial pool of vendors, we then narrow our final list. We choose these vendors based on: 1) product fit; 2) customer success; and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don't fit the scope of our evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria,

we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave document — and then score the vendors based on a clearly defined scale. These default weightings are intended only as a starting point, and readers are encouraged to adapt the weightings to fit their individual needs through the Excel-based tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve.

ENDNOTES

[1] Business Technographics May 2006 North American And European Enterprise Infrastructure And Data Center Survey identified 27% of North American enterprises that planned to "significantly increase" their spending on WLANs, with another 31% planning to "slightly increase" spending. See the November 20, 2006, Trends "WLAN Adoption In The Enterprise 2006."

[2] WLANs are being used or considered by more than 60% of the North American and European enterprises that Forrester surveyed in May 2005. These WLANs help herald in the mobile enterprise — where work is done continuously, anywhere. To assess the state of the WLAN solution market and see how the vendors stack up against one another, Forrester evaluated the strengths and weaknesses of top WLAN solution vendors across 44 criteria. See the October 19, 2005, Tech Choices "The Forrester Wave™: WLAN Solutions, Q4 2005."

[3] Twenty percent of respondents to Business Technographics March 2006 North American And European SMB Network And Telecommunications Survey responded that they are either currently in the "initial rollout or partial deployment" stage or "piloting or evaluating" the use of their WLAN/Wi-Fi for voice. See the January 16, 2007, Trends "WLANs: What They Mean For SMBs"

[4] Embarq, the recent local spinoff of Sprint, has introduced its business-focused Smart Connect Plus service, an offering that marries Wi-Fi and cellular calling, allowing seamless handovers between cellular and WLAN. Embarq is the first US provider to make this service available, but it won't be the last — 64% of North American enterprises have an interest in acquiring dual-mode devices. See the November 10, 2006, Trends "Companies Want Wi-Fi Cellular Calling."

[5] 802.11n, the next evolution of the morass of lettered standards in the WLAN family, promises increased speed and range — nearly doubling the reach and vastly increasing on the speed of current standards. Although our clients ask about it as they see consumer devices stamped with "pre-n" certifications, no enterprise should seriously consider adoption until ratification. See the November 21, 2006, Trends "802.11n: Too Early For Enterprise Adoption Today."

[6] View the vendor summary for more detailed analysis on how Cisco fared in this evaluation. See the April 4, 2007, Tech Choices "Cisco Systems Captures The Enterprise Market For WLAN Infrastructure."

[7] View the vendor summary for more detailed analysis on how Trapeze fared in this evaluation. See the April 4, 2007, Tech Choices "Trapeze Networks Emerges As A Leader In WLAN Infrastructure."

[8] View the vendor summary for more detailed analysis on how Aruba fared in this evaluation. See the April 4, 2007, Tech Choices "Aruba Networks Leads In Robust Security In WLAN Infrastructure."

[9] View the vendor summary for more detailed analysis on how ProCurve fared in this evaluation. See the April 4, 2007, Tech Choices "ProCurve Networking By HP Steps Into The Leaders Category In WLAN Infrastructure."

[10] View the vendor summary for more detailed analysis on how Siemens fared in this evaluation. See the April 4, 2007, Tech Choices "Siemens Is Midmarket Healthcare Strong Performer For WLAN Infrastructure."

[11] View the vendor summary for more detailed analysis on how Nortel fared in this evaluation. See the April 4, 2007, Tech Choices "Nortel Networks Provides Voice-Ready WLAN Infrastructure."

[12] View the vendor summary for more detailed analysis on how Meru fared in this evaluation. See the April 4, 2007, Tech Choices "Meru Networks Targets Resource-Strapped Deployments With Unique WLAN Infrastructure."

[13] View the vendor summary for more detailed analysis on how 3Com fared in this evaluation. See the April 4, 2007, Tech Choices "3Com Captures The SMB Market For WLAN Infrastructure."

[14] View the vendor summary for more detailed analysis on how Colubris fared in this evaluation. See the April 4, 2007, Tech Choices "Colubris Networks Takes On The Enterprise With Midmarket WLAN Infrastructure."

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