



Impact Study

Cost-Effectively Provision, Deploy, and Manage Your Hot Spots...*Pronto!*

July 2003

Pronto Networks™ has designed a carrier-class solution that provides provisioning and deployment, service creation, and management of large-scale public wireless LANs.

Pronto Networks™ has developed a carrier-class Operations Support System (OSS) for cost-effective provisioning, deployment, and management of large-scale public WLAN networks.

Recent history has demonstrated that very few technologies have the ability to impact people in every facet of their day-to-day lives. One such technology, 802.11, also known as Wi-Fi, is changing the lives of people at home, work and, before long, everywhere in between. The market for mobile internet access via wireless LANs (WLAN) is expected to grow dramatically over the next several years, especially in “hot spots” such as airports, hotels, and cafés. Driving this growth will be end-users, such as business travelers, who often have significant, unproductive downtime while on the road. This end-user demand translates into potentially lucrative revenue opportunities for service providers if they have the Operations Support System (OSS) in place to handle the provisioning, deployment, and management of their public WLAN network.

In terms of Wi-Fi technology, the bulk of the growth in the WLAN market to date has occurred primarily in the home and SOHO space. In fact, while the wireless market overall has increased, enterprise vendor revenue actually decreased eight percent from 2001 to 2002 according to Synergy Research Group™ (SRG). However, despite the market’s recent sluggishness, SRG™ believes that there is still a great deal to look forward to in terms of future growth potential and technological innovation in both the wireless enterprise and public access spaces. For instance, SRG believes that the recent announcement of Intel’s entrance into the WLAN market with its Centrino™ Mobile Platform will have an extremely positive effect on the WLAN industry as a whole. As mobile

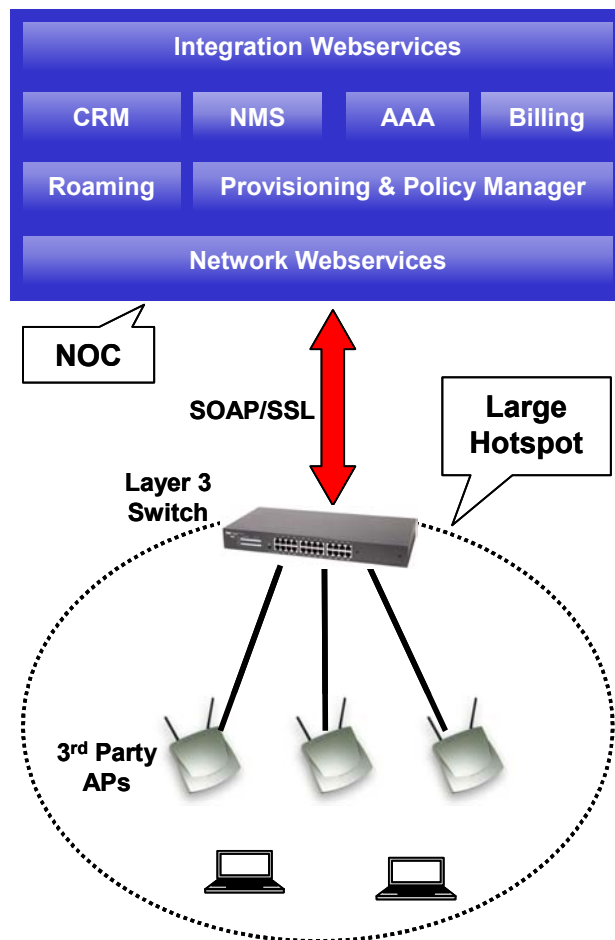
devices (laptops, PDAs, pocket PCs, phones, etc.) become embedded with Wi-Fi technology, there is no doubt that end users will benefit and take advantage of the technology in a variety of different environments.

To date, carriers have been relatively cautious in their deployments of public hot spots for a variety of reasons, including issues relating to security, emerging and maturing standards, cost, management, roaming, billing, service provisioning, and most importantly, demand. However, recent advances in standards, such as 802.11g, 802.1x and Wi-Fi Protected Access (WPA), coupled with new architectures that perform a variety of Layer 1-3 security schemes, have helped to alleviate some of these concerns.

While carriers and service providers often consider building their own back-end solutions to enter the public WLAN market, they often underestimate the complexities and costs involved in building a scalable, flexible OSS platform that will address both their current and future needs. One challenge, for example, is to develop an OSS that will enable remote provisioning and management of thousands of multi-vendor network edge devices, including access points, gateways, and switches. An OSS needs to be able to monitor and manage these network elements, often distributed over a WAN and sometimes behind NAT and firewalls.

Without these remote provisioning and management capabilities, network operators will discover that their initial deployment costs and ongoing operational costs will be unmanageable. A typical single site deployment today, which requires on-site hardware configuration, costs approximately \$5,000. Each time an on-site technician is required to troubleshoot a problem, costs range from \$200 to \$2,000 per maintenance call. Thus, having the ability to remotely provision, monitor, and troubleshoot a large hot spot network becomes critical.

System Architecture:



A Wi-Fi OSS platform also needs to support specific requirements for the hot spot market, including pre-paid and post-paid billing, roaming support, and integration with widely used Property Management Systems (PMSs).

Furthermore, an OSS needs to be flexible to handle future requirements, such as next generation AAA to support Mobile Virtual Network Operators (MVNOs) and value-added applications, such as VoIP, downloading of videos and music, gaming, and merchandise purchasing. Finally, a Wi-Fi OSS needs to integrate with legacy billing and customer care systems for operational efficiencies and to enable the bundling of services.

Today, carriers are still in need of a solution that can address all of these elements and the only company with an OSS solution on the market that meets all of the above requirements is Pronto Networks.

Pronto's Hotspot OSS™ streamlines the deployment of wireless public access networks and minimizes ongoing costs for network operators by providing the capability to remotely provision and manage all network elements in the field. Pronto offers a complete, standards-based solution, integrating basic customer care and billing management capabilities, end user self-provisioning, remote network management, usage based pricing, pre-paid and post-paid services, and multiple authentication and roaming options, all in an extensible, scalable platform.

Pronto's Hotspot OSS is installed on the back end at the NOC, which allows all edge devices to be managed remotely and act as the proxy for various AAA, billing, security, encryption, and roaming features. The software itself provides for the management of the complete network infrastructure.

The Pronto Hotspot OSS also provides a portal functionality to present personalized and location-based user interface to customers. Hot spot owners and service providers will have the capability to enable location-based content and control the initial screen of this portal.

Pronto's Hotspot OSS is a modular, multi-tier platform that includes feature rich components for:

- Service creation, activation, and maintenance of hot spot locations
- Network policy implementation (QoS) and monitoring capabilities
- AAA and custom authentication schemes
- Roaming clearinghouse for network partners
- Customer care, billing management, payment processing, and collection

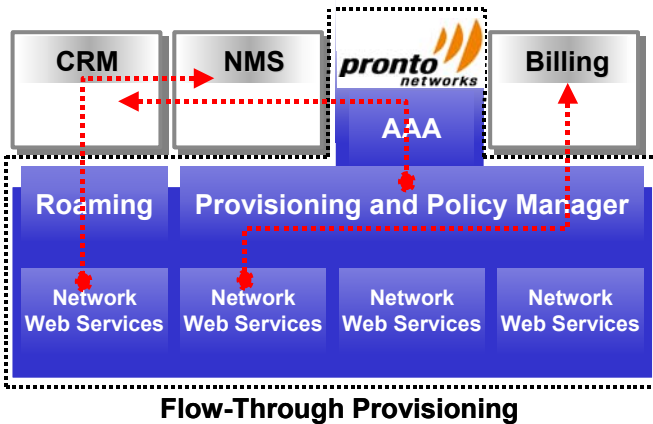
Additionally, the OSS manages all operational aspects for the deployment of multi-vendor edge devices including leading WLAN access points, gateways, and Wi-Fi switches. Pronto's open architecture enables service providers to build their hot spot networks with equipment from preferred suppliers.

The Pronto OSS was designed using Java 2 Enterprise Edition (J2EE) technology and supports web services to enable development of secure, robust, and interoperable business applications. The platform provides native integration with third party billing and CRM systems and includes TIBCO middleware integration for legacy systems support. Moreover, the Pronto OSS supports SIM-based authentication against a carrier's HLR via SS7, thus enabling carriers to provide a consolidated bill to their subscribers for 3G and Wi-Fi services.

Key features of Pronto's OSS solution include:

- Provisioning of Edge Elements:
 - Plug-n-play provisioning, monitoring, management, and remote upgrades
 - Support for multiple service providers on one server
 - Flow through provisioning from existing OSS infrastructure
- User Provisioning:
 - Bulk provisioning of existing users
 - Self service based provisioning
 - NOC managed user provisioning
 - Customer portal and reports

Hotspot OSS: Easily Integrated within Existing Service Provider Infrastructure



- Flow through provisioning
- Service Creation:
 - Location based services
 - Bandwidth management/classes of service
 - Flexible service plans
 - Value added services (such as gaming, VoIP, etc.)
- Service Fulfillment:
 - Service policies (time and QoS enforcement)
 - SSL encrypted HTTP traffic for service deployment
 - Corporate VPN compatibility
- AAA:
 - RADIUS AAA
 - 802.1x support
 - External authentication (such as SIM, SMS, Microsoft PASSPORT, etc.)
- Billing:
 - Flexible pricing, rating, and discounting (such as usage-based and flat rates)
 - Multiple payment options (such as credit cards, invoices, pre-paid cards, etc.)
 - Foreign currency billing, payment, and taxation

- Native integration to third party billing and CRM systems
- Integrated clearing, settlement, and reconciliation
- Customer Care:
 - Customer self care portal
 - Account limit management
 - Incident tracking
 - Account adjustments and refund
- Roaming Services:
 - Inter-WISP roaming
 - iPass, GRIC, and Boingo smart client support
 - 3G to Wi-Fi roaming
 - Subnet roaming

Solving Carrier-Class Problems, Pronto

In today's market, service providers are faced with the challenge of rapidly building out and efficiently operating their hot spots at the pace demanded by end-users. However, today's approach of integrating various software components is not cost effective in terms of capital investment, deployment costs, and ongoing operational costs. What's more, most infrastructure systems lack the advanced features that enable both property owners and service providers to capitalize on location-based and personalized services.

To address these problems, Pronto Networks has developed a solution that will enable service providers to realize a rapid return on their investment by dramatically lowering their deployment and ongoing management costs and providing advanced features that enable the generation of new revenue streams.

In an effort to reduce setup costs, Pronto has developed a Wi-Fi infrastructure solution that requires no on-site configuration. All that is required to set up a hot spot are the edge devices, the OSS, and a high-speed Internet connection. All configuration is handled remotely at the back

office. As a result, SRG estimates that service providers can expect their overall capital costs to decrease anywhere from 30 to 60 percent.

SRG estimates that service providers can expect to reduce their network management costs anywhere from 25 to 40 percent. From a management cost perspective, the Pronto OSS was designed with remote management capabilities that enable service providers to save on time, labor, and travel costs by controlling all aspects of the edge device from a central location.

Finally, the Pronto OSS is built on a highly extensible, open architecture that can easily adapt to and/or integrate new standards. Pronto's solution easily interoperates with existing network infrastructure, thereby enabling hot spot proprietors to run their existing infrastructure without requiring equipment upgrades or changes in network design. In sum, Pronto's OSS is highly scalable and can manage thousands of locations as well as millions of users.

Conclusion

SRG believes that public WLAN hot spots represent a significant revenue opportunity for service providers. However, in order to take advantage of this opportunity, service providers need a solution that can cost-effectively deploy and manage their hot spots. In SRG's opinion, Pronto's OSS is the only solution available today that integrates network provisioning, authentication, security, billing, roaming, and location based services, all in one highly integrated platform. Moreover, Pronto's solution allows service providers to rapidly realize a return on their investment while simultaneously providing advanced features that enable the generation of additional revenue.

Aaron Vance aaron@synergyresearchgroup.com
Industry Analyst

Jeremy Duke jeremy@synergyresearchgroup.com
President & CEO

Ray Mota rmota@synergyresearchgroup.com
Chief Research Officer

© Copyright Synergy Research Group Incorporated™ 2003. All rights reserved.

Any reproduction in whole or in part is prohibited without the direct permission from Synergy Research Group Incorporated™.

The contents of this report represent Synergy Research Group Incorporated's interpretation and analysis of statistics and information collected from authorized company representatives. These statistics and information are generally available to the public. In cases where statistics and information are not available, Synergy Research Group Incorporated™ has made estimates. SRG Synergy Research Group Incorporated™ does not guarantee the accuracy or completeness of the statistics and information contained in this report.