Remote access technology allows mobile professionals and telecommuting employees to remain connected to the corporate office. The simple dial-up solutions of the past are giving way to a wide array of advanced services that provide secure, broadband access. The overall market continues to develop, with much of the focus turning toward VPNs supported by ISPs. This report identifies the leaders of the remote access market and discusses the trends driving the industry.

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Executive Summary

Remote access technologies have been embraced by companies looking to implement telecommuting programs. In their earliest incarnations, remote access solutions were simple dial-up terminal services that provided terminal emulation. Now, remote access solutions are advanced and complicated. They can include dedicated remote access services (RAS) and concentrators, VPNs implemented using IPSec of SSL, public Internet or managed networks, and software designed to provide remote control of desktop computers and collaborative applications.

Each of these areas, moreover, continues to evolve in response to the demands of a growing army of mobile and remote workers. Significant overall developments which have affected the market have included:

- Increasing availability of broadband connections, particularly DSL, bringing a wider range of applications possibilities and greater need to remain online, rather than simply dial in intermittently for e-mail messages.
Increasing acceptance and deployment of VPNs as a standard means of extending corporate networks to remote users.

- Gradual rollout of wireless data services, including Wi-Fi and next-generation wireless services.
- Continuing development in call handling capability of RAS devices.
- Evolution of the outsourcing market to meet remote access networking needs at any level, including carrier-agnostic VPN services provided by operators that tunnel a VPN service across multiple networks.

**Description**

Remote access solutions began as simple dial-up terminal servers providing terminal emulation, generally attaching to a centralized mainframe service. As corporate IT has evolved to include minicomputers, PCs, and finally, network connected PCs and the Internet, remote access services have been adapted to meet evolving needs.

Remote access, in its purest form, is simply another means of attaching a system to the corporate computers or networks in order to send and receive messages or share information. Remote access devices were originally designed to act as terminals. Today, however, network access has focused upon the Internet as a single standard, backed by a range of standard PC applications, and a growing range of integration with legacy software, cooperative applications, portal-based data access systems, and the like. This means that it is possible to bring a growing range of office functionality to remote sites, where users might use corporate data and applications just as though they were at the office.

Enabling this type of access, however, requires significant infrastructure and calls into play a variety of concerns regarding security and manageability. The market has evolved to meet needs at all levels, which today range from small businesses with occasional remote access for communications from geographically local users, to the vast requirements of international corporations with thousands of remote users around the globe handling high-bandwidth, mission-critical applications. Hardware has developed to accommodate both ends of the market, and there has been an increasing market for outsourced solutions. Software products have also continued to evolve; although they are more likely to be considered demand drivers for remote access capability than part of the infrastructure, developments in applications are important to understanding how this sector is likely to evolve.

**State of the Marketplace**

The remote access marketplace is really a collection of markets that provide either an end-to-end remote access solution or just parts of one. A list of participants in the remote access market, in fact, could be broadened to include just about every player in the intranet/extranet sector. The major players, however, can be categorized as hardware providers, who are responsible for the remote access servers and associated equipment that provides remote access connections for both carriers and corporate in-house networks; and service providers, particularly those who are offering managed VPN services.

All sectors of this marketplace have been affected by the dot com bust and subsequent downturn in the telecommunications sector.

**The Remote Access Server Market**

Remote access has changed through the years as networking needs and available equipment have
The first generation of remote access technologies combined a terminal service and a modem pool. They were typically used in institutions where a mainframe connection was required, and could be accessed through terminal emulation with data rates of between 300 and 2400 bps. As PCs began to displace dumb terminals in the 1980s, remote access schemes needed to change from one-to-one connections to simultaneous connections from multiple locations. This resulted in a model in which a remote PC could be connected via modem to a LAN.

The result was the evolution of second-generation remote access technologies, which included hardware integrating a modem, terminal server, and LAN access in a single device. These eventually became the multi-card remote access servers of today. In the third generation, brought on by the Internet explosion of the mid 1990s, carrier-class switches began to emerge, designed to handle much higher capacity. These were designed to meet the needs of ISPs and large corporations. A modular card system was required to meet the varying needs of these high performance switches.

The evolutionary path for next-generation devices will be toward even higher density functionality, including the capability of handling 5000 to 10000 calls per rack, improved scalability and performance, and the capability of handling diverse services such as VPN outsourcing and ISP wholesale. The high-end, modular RAS devices in use today are often called remote access concentrators, and they integrate dial-up solutions including analog modems, T1/E1 access, ISDN access, access servers, routers, and LAN hubs in a single chassis.

**Carriers and VPN Providers**

VPNs are becoming the remote access solution of choice for most enterprises. Remote access VPNs can be put into place in three basic architectures:

- Deployment of remote access servers at large sites, with users dialing in either locally or using a toll-free number.
- Remote dial-up to service provider remote access services at local PoPs.
- Outsourcing to a managed service provider.

Managed VPN services have emerged as a potent force in the remote access market. The VPN can be set up using a combination of carrier and network-based equipment, and can extend secure, IP-based network services to remote locations. For remote users and telecommuters, it provides the potential to connect to corporate networks from anywhere that a PoP can be reached—which can be almost anywhere if a solution based on the public Internet is used. The market for remote access managed VPN services is expected to reach $5.3 billion by 2006, according to IDC and Ovum.

The managed network-based IP VPN market has been growing over the past several years, as new options such as Multiprotocol Label Switching (MPLS) have emerged. A managed network IP VPN service provides a secure connection for business intranets, extranets and remote access using public networks, with customers isolated through encryption and tunneling. Networked services are generally provided over backbone data network services optimized for high bandwidth traffic.

**Market Leaders**

The market for these services is highly volatile, with numerous players offering a continuum of services, with varying degrees of management and varying customer premises equipment requirements. The top players combined only control a small portion of the total market. The marketplace spans a wide range of hardware, software and service products. Leaders can be identified in terms of the carrier services sector or the basic remote access hardware sector.
The Remote Access Server Market

The Remote Access hardware market, typified by the remote access server and remote access concentrator, is undergoing a transformation as enterprises move more toward managed network services and VPNs. Dial-up devices are handling ever increasing call density at the high end, serving the needs of ISPs, with capability to handle a wide variety of access types such as ISDN, DSL, cable modems, Wi-Fi, and the like. At the very low end, a market is emerging for units designed to meet the needs of very small offices with local remote access connectivity needs.

Evolution in the market is illustrated by the number of mergers, acquisitions, and realignments that have taken place among the major players in recent years. Some years ago, the dominant players were clearly Ascend, Cisco, 3COM, Shiva, and Livingston. Ascend and Livingston were acquired by Lucent, 3COM realigned its strategy and moved away from the RAS area, Intel acquired Shiva and then moved out of the dial-up market. Lucent and Cisco are now the dominant providers, and they are focusing upon the large carrier solutions required by telecom carriers and ISPs.

There are still a wide variety of smaller players in this market serving niche areas, but the way of the future appears to be that the RAS devices will be part of the telco equipment side of the network. Enterprises will increasingly focus upon remote access as a network service.

Carriers and VPN Providers

Remote access service as a part of an overall VPN strategy is generally considered the wave of the future. This being the case, there are a variety of ways in which a VPN service can be installed, ranging from a complete CPE-based strategy; to a completely managed VPN network service provided by a carrier, and opening remote access to a global system of PoPs.

Outsourcing can include anything from all to none, making it difficult to determine who market leaders are. All ISPs are in some way involved, for example, as are all network providers, including telecom carriers. One area which is of particular importance, however, is the outsourced, managed VPN provider market.

There are only about three percentage points separating market shares for the top four VPN providers in the US. According to IDC, a the current market leader in the US is AT&T, with 7.7 percent of the market. MCI has 6.7 percent; SAVVIS is third with 5.9 percent; and Sprint has 4.9 percent.

According to Infonetics Research, managed network-based VPN services will grow about 283 percent between 2002 and 2006, and managed customer premises equipment-based services will grow 178 percent. Currently, according to Infonetics, IPSec remains the dominant tunneling and encryption technology for VPNs, but MPLS and SSL are beginning to grow and are likely to become increasingly important. MPLS is particularly important, since it is being embraced as a method of integrating multiple classes of service on the IP network, and integrating different protocols.

Market Trends

The remote access marketplace is clearly moving away from remote access servers and toward VPNs that establish connections through a carrier's PoPs. There has also been a continued move toward outsourcing of other aspects of direct access, including network management and security. The managed VPN market is healthy, and it seems to be absorbing not only the corporate WAN and extranet sectors, but remote access as well.

Although outsourcing may be more expensive in some situations than an in-house solution, it provides the advantage of more points of presence, continuous monitoring, and scalability. Service level agreements can also be put into place to ensure remote workers have adequate access to required communications,
applications and data.

**About the Author**

Brian J. Dooley is a regular contributor to Faulkner Information Services and a member of Faulkner's Advisory Board. Brian has been tracking the high-tech industries, including computing, data networking, and telecom industries, particularly International telecom, for the past 15 years.

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