Introduction

Internet and intranet connectivity are essential for all businesses. If you are one of the thousands of small- and medium-businesses today, you are undergoing the same IT evolution as your enterprise counterparts, simply on a smaller scale. However, both business segments have an increasing need for converged voice, data and video networks; always-on and highly reliable connectivity; service-oriented architectures; and the need to support user mobility and remote workers. Reliable, flexible and scalable networks are essential to a SMB network infrastructure and are an operational imperative for businesses of all sizes. Where businesses once gained efficiencies and opportunities by adopting networking and computing technologies, the lack of well-architected IT systems puts businesses—particularly SMBs—at a competitive disadvantage in the marketplace.

For that reason, selecting the right networking hardware products, connectivity options and management software is essential to ensuring efficient and effective IT systems that can serve today’s and tomorrow’s business needs. Building a scalable infrastructure will also help business grow faster. Often, the best path for SMBs is working with certified Value-Added Resellers (VARs) and systems integrators who have the technical training and expertise to craft the right solution for their current and future networking needs. This white paper will outline the issues and questions you should address with your VAR or solution provider.

SMB Technology Needs: Present and Future

Even basic networking infrastructure was once cost prohibitive to SMBs. As standalone products, networking gear such as routers, switches, load balancers and telephony controllers were expensive; but pulling together the components to make effective and scalable networks was economically out of reach. Today, networking gear is not only affordable, but the emergence of consolidated, all-in-one networking, security and telephony devices means you have options for building best-of-breed or out-of-the-box network infrastructures. Choosing the most suitable architecture and components often is dependent upon the future—not the current—networking needs. Taking future growth and capacity needs into consideration will ensure that the IT investments you make today will not be money wasted as new technologies come to market. VARs can deliver scalable and expandable network infrastructures that will yield higher operational reliability and return on your investment.

Before reviewing available networking technologies, we’ll take a look at the internetworking connectivity, network equipment features and decision-making process for determining current and future networking needs.

Conventional wisdom in the enterprise—organizations with 1,000 or more employees—promotes the need to build best-of-breed infrastructures. Best-of-breed doesn’t necessarily mean building networks with the most expensive products, but rather integrating complementary products of multiple manufacturers. Best-of-breed avoids the thorny problem of single points of failure and ensures—in many cases—that organizations have the wealth of feature sets that come with a heterogeneous infrastructure. This approach has the added benefit of adaptability; as needs change, enterprises have the ability to add new technologies and pieces that provide added functionality and features. Nevertheless, best-of-breed also comes with a higher Total Cost of Ownership (TCO), since...
deploying products of multiple manufacturers requires more training, maintenance and support.

There are many alternative networking vendors that can help you lower your TCO and help you build scalable and reliable networks with an emerging class of multifunction router devices. These alternative vendors provide a compelling value for SMB networks—products that are purpose built for the scale of SMB businesses and at almost half the price of the big name network vendors. A trained VAR can help you navigate the labyrinth of vendors to select the right networking products for your business, as well as install, integrate and configure to exact operating parameters.

In some cases, you may be tempted to independently source your own networking equipment and install it yourself. In fact, a 2006 VARBusiness survey of midmarket IT decisions makers found that 22 percent of SMBs will purchase network hardware from online warehouses, catalogues and direct market resellers and another 10 percent will purchase through retail stores. The Do-It-Yourself (DIY) route, with low-cost equipment installed by in-house staff, may seem like a cost-effective approach to building a network but two common problems often arise as a result of DIY networks. First, most low-end, retail networking equipment lacks the capacity, functionality and scalability to meet current and future business needs, and thus is an investment with a limited return. Additionally, many SMBs lack the technical expertise to deploy a network. VARBusiness found that nearly one-half of SMBs end up calling a VAR to help correct mistakes made in DIY installations.

Using a VAR for both sourcing equipment purchases, network design and equipment deployment often saves money, produces a better and more manageable system, and ensures investments made will stand the test of time.

**Network Product Selection**

When building a network, you should challenge your VARs to build systems that take their current and future functionality, manageability and scalability needs into consideration. Networking is more than transmission of data. Contemporary and future networking infrastructure should include capabilities such as routing, switching, Voice over IP (VoIP), wireless connectivity (802.1a/b/g), and security. These functions are obtainable either by building networks with best-of-breed equipment or by consolidating with all-in-one devices. The newest generation of networking routers goes beyond the functionality of traditional routers, offering a host of features and services that support high-bandwidth networking needs for data transfer, duplex voice services and video support.

All-in-one routers offer a host of new capabilities that consolidate the functionality of multiple network devices into a single chassis, providing a balance of performance, functionality and scalability that reduces the TCO for the SMB. Additionally, advanced manageability will ensure a higher ease of use and lower operating costs that frees precious IT resources for other critical tasks and business development projects.

**When working with a network VAR consider the following:**

1. **Speed and connection capacity:** The router should have enough throughput capacity to support data, voice and video feeds. Many SMBs are also adding VoIP-based telephony to lower their communications costs. The next step is unified communications, through which data,
voice and video are seamlessly integrated into a unified management bundle. Networks built today should have enough capacity to support the next generation of unified communications and networking. Additionally, 10/100Base-T is the standard for Ethernet throughput; routers are available that are 10/100Base-T. A gateway router should have at least two Ethernet ports and enough Layer 2 ports to support current and future needs of the network.

2 **Security:** As a SMB, you don’t always have the security infrastructure of an enterprise; but many options are available to help you effectively secure a smaller network. Depending on the environment and the implementation, perimeter security can often be achieved on the gateway device. While some might consider incorporating a firewall into a gateway router creates a single point of failure, the reality is unifying security in an appliance is acceptable for many small to midsized businesses. You should not only consider whether a router has a built-in firewall, but what kind of firewall it includes. The most stringent firewall is that of a stateful packet inspection and the uplift cost associated to such is nominal. Stateful inspection allows for tracking ingress and egress traffic for protocol anomalies and prohibited services.

**Virtual Private Networking (VPN) and encryption:** If you decide to use the gateway router as a security device as well, it should also have VPN capabilities. This can be particularly important for small businesses that want to connect disparate offices without the hassle and expense of building and maintaining a Wide Area Network (WAN). At the very least, you should ensure that the router is IPSec compliant for point-to-point encrypted tunneling.

3 **Network Address Translation (NAT)-compatible:** is standard for converting public and private IP address blocks, expanding the number of available IPv4 addresses. IPv4 is particularly important for translating SIP (Session Initiation Protocol) for VoIP. Many firewalls will block UDP media traffic. Devices should be able to create a TCP tunnel to transfer SIP through the NAT and firewall to the relay.

4 **Power over Ethernet (POE):** With the adoption of VoIP-based telephony comes the challenge of supplying power to endpoints even when primary electricity is not available. POE is similar to electricity delivered over conventional landline telephones, in which low voltage is supplied to the endpoint (a VoIP telephone) over conventional network cables (CAT-5). POE (IEEE 802.3af) is an emerging feature set that should be incorporated today, since the feature will become critical as IP-based telephony becomes a primary means of communication for SMBs.

5 **Wireless:** Mobility is increasingly important for businesses of all sizes. Providing secure wireless access is possible with some gateway routers. If you want wireless incorporated into your router, consider devices that support IEEE 802.1a/b/g—the three most widely used wireless standards—as well as 54 Mbps throughput. The management console should allow for securing wireless access from unauthorized users—commonly referred to as “war drivers”—by locking down Service Set Identifiers (SSIDs) and 801.1x authentication.
6 Management Capabilities: Basic networking and security administration translates across multiple vendor platforms. You may want to give preference to devices that have GUI-based management consoles with remote management capabilities. However, you should consider routers that have command-line interface management consoles, which many IT administrators are familiar with after working with legacy platforms. While vendors will tout the quality of their operating systems, you will further want a device that makes it easy to update software and firmware and apply patches.

7 Scalability: You should consider devices that provide both logical and physical scalability. The number of Ethernet ports will vary on the size of the device, and you may have greater physical connection needs than the number of ports available on the device. Many devices can be stacked or clustered and managed within the same IP address range. This will allow you to standardize on a common hardware platform.

Businesses of all sizes have a propensity to purchase products of big brand, or legacy vendors. However, products offered by smaller, lesser-known vendors often have the same, if not higher, performance, reliability and functionality. Discuss with your VAR the advantages of using comparable, alternative vendor networking products, since they can often provide the same benefit at a lesser cost.

ADTRAN® Proven Solutions for Affordable, Reliable Networking

Many vendors offer networking equipment, but only ADTRAN provides the best mix of functionality, performance and cost-effectiveness to meet the needs of small- to midsized businesses. With ADTRAN’s award-winning and innovative NetVanta® switches, routers, switch-routers, VPN solutions, and wireless and IP-telephony products, it’s easy to find a quality solution that’s perfect for your specific network needs. This portfolio of internetworking solutions includes high-performance IP routers; Fast Ethernet, Gigabit and PoE switches; firewalls; VPN appliances; Wireless Access Points; (WAPs and a unique industry concept that integrates these multiple networking functions into a compact, all-in-one platform.

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ADTRAN provides a breadth of all-in-one solutions that deliver the most for your network investment and are tailored to the specific needs of the SMB. These products are backed by an industry-leading 5- or 10-year warranty and best-in-class telephone technical support from a team of degreed engineers. These innovative products are recognized within the industry as being easy to install, use and maintain – and can greatly reduce the total cost of ownership of your installation.

For more information on the NetVanta Series and other ADTRAN products, go to www.adtran.com/ecatalog.

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