

SOHware White Paper Series

WP100132

**SOHware OACIS™
Networking Infrastructure for SMB**

July 20, 2005 revised

Abstract:

SOHware OACIS™ Network Infrastructure is the industry's first SMB-centric architecture framework that will facilitate the evolution of high-performance, affordable, scalable, and easy to manage networking solutions, enabling SMBs to implement Converged SMB Networks to better connect with customers and partners on a global basis. OACIS™ networking solutions, in conjunction with SOHware's exclusively Direct-to-VAR business model, foster long-term win-win partnerships with SMB networking VARs and pave the way for delivering highly valued networking solutions and services.

1. Technology Trends for SMB Networking

Small and Medium Business (SMB) as defined by the US Department of Labor is any business which has between 10 to 1,000 employees. There are approximately 8.6 million SMBs in the United States today.

As we migrate towards a networked economy, with outsourcing and ecosystem partnerships growingly popular, more and more SMBs will flourish or be created over the next 5 years. SMBs in the US have been the primary source for jobs creation in recent years and the trend is growing stronger as we transition into an increasingly networked economy.

As direct beneficiaries from the emerging networked economy, it goes without saying that SMBs need to invest in networking solutions that will enable them to be better connected with customers and partners. However, among the three distinctive networking market segments, i.e., Enterprise, SMB and Consumer, SMB ranks the lowest as far as the adoption rate is concerned for emerging technologies such as Broadband Access, Wi-Fi, VoIP, etc. A majority of SMBs today still rely on simple Ethernet Hubs/Switches with Modem connections to the Internet. Although the need to migrate to a converged SMB network supporting various IP services such as data, voice and video is well envisioned by most SMB executives to fully unleash their business potential, the actual implementation barrier is still high today due to a lack of networking solutions optimized for SMBs.

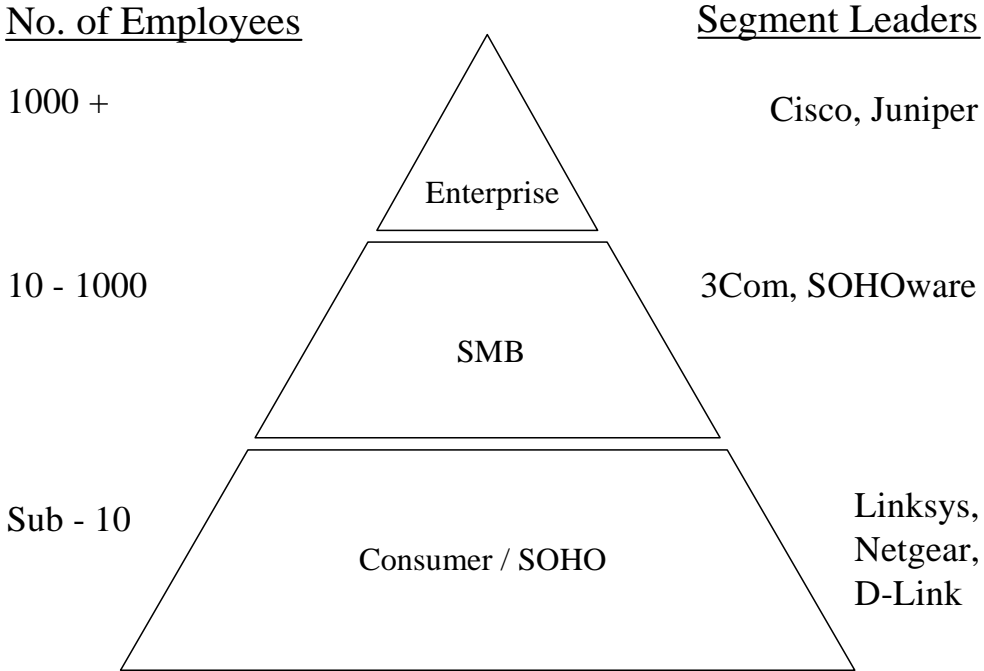


Figure 1: U.S. Networking Market Players

2. Why is SMB Networking Unique?

Figure 1 illustrates the state of the US networking industry in late 2004. In the enterprise market segment, Cisco has been the undisputed leader since the mid 1990's, while Juniper is becoming a proactive challenger with its Netscreen acquisition in early 2004. In the consumer segment, Linksys, Netgear and D-Link are the leading vendors, which rely on major retail chains to sell their broadband router and Wi-Fi products to the residential market. In general, both the enterprise and consumer segment are becoming fairly stable from a competitive landscape point of view, as the foreseeable evolution path in their respective technology and channel structure is quite predictable, thus favoring the incumbent segment leaders.

However, the competitive landscape in the SMB segment poses a vastly different picture. Historically, when a typical SMB network consisted of just a few Ethernet Hubs and Switches interconnected by CAT-5 wiring, 3COM was the major leader with its SuperStack Hub/Switch product families. However, at a time when the SMB network was migrating to converged IP Services where Broadband Access, L3 Gigabit Switch, Wireless LAN, Internet Security and VoIP were becoming critical system building blocks, 3COM made a major corporate decision in 2003 to shift its business focus to the enterprise segment as part of its corporate initiatives to return to profitability after having 17 consecutive quarterly losses. It remains to be seen whether 3COM will survive and thrive with its new enterprise play, as both Cisco and Juniper are very well entrenched in that space.

The SMB segment poses the largest growth potential over the next five years in the networking industry. Now that the historical SMB leader 3COM has shifted its focus to the enterprise segment, leading enterprise companies such as Cisco, and consumer leaders such as Netgear, are attempting to penetrate the SMB segment with different approaches leveraging their respective strengths.

Cisco's CEO, John Chambers, announced in July 2004 that Cisco will invest up to \$2B over the next two years to overhaul their product lines and channel programs to be better tailored for SMB. However, the VAR community gave Cisco a lukewarm response on its much-touted SMB mission announcement. According to CRN's 8/3/04 Online Poll, only 19% of the respondents believed that Cisco's product and channel strategies are on target to connect with the SMB market, while 44% said Cisco should stick to what it does best, the Enterprise, and the remainder responded that they are not sure now and will wait for a year or so to see what really goes on with Cisco.

Meanwhile, the key retail player, Netgear, has been beefing up its product portfolio to introduce more and more business-grade products as part of its push into the SMB space, fully leveraging its strong supply chain partnerships with ODM vendors based in Taiwan and China. In contrast to Cisco's system-oriented solution approach as coined by its AVVID network architecture framework, Netgear

functions like a “super catalog shop” with various “point products” sourced from different offshore low-cost suppliers, with these products being widely distributed by retailers, e-tailers, resellers, distributors, direct marketers, and Netgear's own on-line store. It has been well recognized that overly distributed products tend to erode VAR's margins significantly.

Networking Market Segmentation

	Enterprise	SMB	Consumer/VSB
Product	Highly complex mission critical solutions	Modular, scalable and easy to manage solutions	One highly integrated box that is easy to use
Place	Direct sales	VAR	Retail
Promotion	Moderate	Moderate	Heavy
Price	Moderate concern for customers	Important concern for customers	Critical concern for customers

Figure 2: Network Market Segmentation

Figure 2 illustrates networking market segmentation in terms of the familiar "Marketing 4 Ps" notion. As each segment demands distinctly different composite product/place/promotion/price strategy, it is always difficult for either an Enterprise-centric or a Consumer-centric player to excel in the SMB space, due to the sheer nature of the 80/20 rule; i.e., whenever business resource allocation or priority-setting conflicts arise, the secondary side-segments will always be sacrificed in favor of the core. Therefore, VAR's poor perception of Cisco's SMB push shouldn't be taken as a total surprise.

SOHware fully recognizes that in a growingly networked economy world, over the longer term market forces will favor those firms that are highly focused with compelling value-propositions for its target market segment. SOHware is the only SMB-centric networking vendor in the industry with a comprehensive SMB networking solutions portfolio encompassing Broadband access, L3 Gigabit Switches, Wireless LAN, Internet security and VoIP. Integrating SOHware's product families is OACIS™, a unifying framework of solutions that offers modularity, scalability, QoS support, security, manageability and compliance to open standards.

3. What is OACIS™?

SOHware's Open Architecture for Converged IP Services (OACIS™) is a technical framework to evolve high-performance cost-effective networking solutions

for converged SMB Networks. OACIS™ is the networking industry's only network infrastructure framework that is optimized for SMB.

Figure 3 illustrates the OACIS™ network infrastructure reference model. Central to the OACIS™ architectural framework is that in contrast to Cisco's AVVID enterprise network infrastructure, known for its complexity due to the "invasive integration" design philosophy (Reference 1) of its IOS-based management interfaces that discourages 3rd party vendor account penetration, OACIS™ stresses Modularity, Scalability and Ease-of-Management aspects that are key drivers for achieving a high-performance, cost-effective and easy to manage SMB Network. Additionally, OACIS™ support for QoS, Security and Open Industry Standards renders a highly secure converged SMB network that enables the SMB to better connect with its customers and partners in a most efficient manner.

SOHware OACIS™

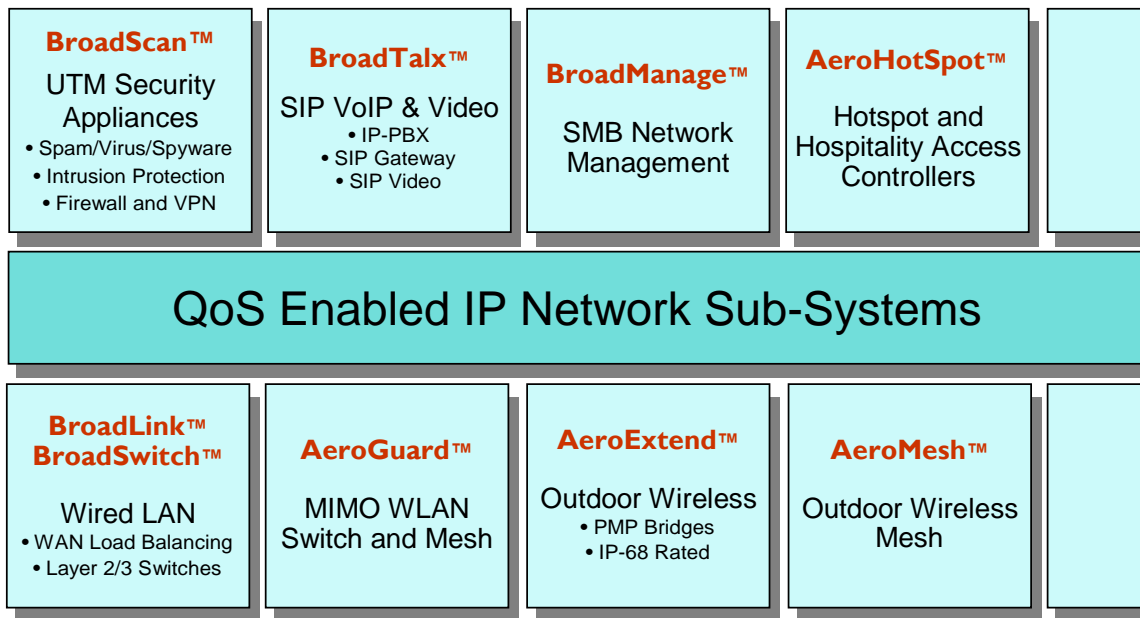


Figure 3: SOHware OACIS™ Reference Model

4. SOHware OACIS™ Highlight

4.1 OACIS Modularity-

As illustrated in Figure 3, OACIS™ is based on a highly modular framework for Converged SMB Networks. It is vertically layered as follows:

- QoS-enabled IP network foundation, which can be any combination of Broadband Access, L2/L3 Ethernet and WLAN sub networks.

- VoIP, Video Communications and Content-based Security are simply "IP-based Applications" on top of the QoS-enabled IP network foundation.

For example, as long as the OACIS™ QoS-enabled IP network foundation meets the overall QoS requirement of the specific VoIP solution there is no need to perform "invasive integration" to deploy a new VoIP system, which is typical for Cisco's AVVID solutions such that a new installation of Cisco's VoIP would require a complete overhaul of many IP network foundation components in a quite convoluted manner (Reference 1).

Modularity also renders better system economics due to the ease of mix-n-match of various system components and simpler network management.

4.2 OACIS™ Scalability-

Scalability is a major system design factor for SMB-grade networking products when compared with Consumer-grade products. Typically, Consumer networking products are in the form of one highly integrated device (e.g. DSL Wi-Fi Gateway) at a sub-\$200 price range linking a few PCs in a relatively small site. But SMB networking needs to address a fairly wide range of staffing (10-1000) and site dimensions (tens of thousands sq. ft. office building and/or distributed branch sites), thus, scalability is a critical system design factor.

SOHware OACIS™ SMB networking solutions have embraced scalability as a key requirement on all OACIS™ family products through either a "stackable expansion" or "multi-tiered performance platforms per product family" approach such that they can meet the wide range of SMB networking solutions requirements today and in the future.

4.3 OACIS™ QoS-

OACIS™ supports industry standards based Quality of Service functionality such as:

- 802.1 p and q for Layer 2 prioritization.
- Type of Service (TOS) support for Layer 3 priority.
- Prioritized queues for differentiated services.
- IEEE 802.11e QoS support (draft standard compliance and future field SW upgrade for full compliance).

Additionally, whenever technically feasible, OACIS™ networking solutions will leverage HW-based processing for highly complex tasks that may be incurred with

excessive latencies through SW-based processing, e.g., 3-DES IPsec and AES encoding for 802.11i.

4.4 OACIS™ Security-

- Support common requirements of wired and wireless security, including:
 - Physical device security
 - Logical device security
 - User policy
 - Authentication
 - Auditing
 - Intrusion detection

- Support for IEEE 802.11i wireless security mechanisms, including:
 - WPA
 - AES
 - 802.1x

- Support for gateway-based security functions at the Broadband interface:
 - Connection-based security: Firewall/VPN/IDS
 - Content-based security: Anti-virus, anti-spam, content filtering

4.5 OACIS™ Manageability-

- Support for intuitive Web-based management interfaces.

- Support SNMPv2.

- Optional support for HTTPS and SNMP V.3 for secure management interfaces.

- Support for NMS as with SOHware NMS for AeroGuard MIMO WLAN solutions which supports multi-site remote management of wireless networks to reduce end user complexity by enabling outsourcing of management for WLAN deployments.

4.6 OACIS™ compliance to open standards-

- Compliance to TCP/IP standards as defined by IETF.

- OACIS™ VoIP and IP Video solutions will comply with the SIP protocol.

- Compliance to IEEE 802.11 and Wi-Fi standards for AeroGuard™ series WLAN products.

- BroadGuard® Firewall/VPN products are based on ICSA and VPNC certified software engines.

5. SOHware OACIS™ vs. Cisco AVVID

Figure 4 highlights the relative merits of SOHware OACIS™ versus Cisco AVVID. While AVVID is a respectable industry-leading network infrastructure for the Enterprise networking arena, modularity, manageability and affordability are its key weaknesses for the SMB networking landscape. The prestigious Tolly Group made the following insightful remarks in 2002 regarding AVVID as described below:

- Modularity-

"AVVID's fundamental downside is that it requires an "invasive integration" approach to incorporating VoIP into an existing Cisco network. In effect, existing Cisco IP data switches and routers must be retrofitted to support VoIP. That means that Cisco has succeeded in "shoehorning" VoIP functionality into 10 platform varieties including the 17XXX, 26XX, 3XXX, 42XX and 60XX, each with their own hardware and software option."

- Affordability-

"Long-term support for AVVID promised to require a hefty investment..."

- Manageability-

"Most third-party products are managed by a single Web-based user interface, as opposed to Cisco's AVVID that requires a Web-like GUI on its highly centralized CallManager and legacy CLIs for configuring various switches and other VoIP-related components."

Cisco AVVID vs. SOHware OACIS™

	AVVID *	OACIS™
Modularity	Poor	Excellent
Scalability	Excellent	Very good
Security	Very good	Very good
Manageability	Fair	Excellent
Compliance to open standards	Moderate	Excellent

Figure 4: Relative Merits of Cisco AVVID to SOHware OACIS™

6. SOHware OACIS™ vs. "Point Product" SMB Solutions

Leading consumer-grade networking product leaders such as Netgear, Linksys and D-Link are also beefing up their product portfolios to introduce more SMB-grade products as part of their push into the SMB space, fully leveraging strong supply chain partnerships with ODM vendors based in Taiwan and China. Unlike SOHware's OACIS™ system-oriented approach to the emerging Converged SMB Network marketplace, these retail-savvy vendors are essentially functioning like "point products catalog companies" and treating SMB as an extension from their consumer-grade "points products" core business.

However, as illustrated by Figure 2, SMB networks need to deal with any business which spans from 10 to 1000 employees, thus modularity, scalability, manageability and affordability are highly critical system requirements which cannot be adequately provided through a piece-meal "point products" mentality prevalent in the consumer networking space. Converged SMB Networking solutions need to be provisioned with a system-oriented technical framework upon which high-performance cost-effective solutions can be designed and evolved over time. SOHware OACIS™ is the ideal framework to achieve this.

7. OACIS is Purpose Built for SMB

While Cisco's AVVID and consumer networking leaders' "point products" portfolio have their respective merits for their core market segments, i.e., enterprise and consumer segment, they all have practical limitations in meeting the demand of mainstream SMB customers. An analogy of the scenario is the birth of the minivan, which was in direct response to the desire of mainstream American families to have a vehicle that "affordably carries like a van and drives like a car." Creating the minivan required more than simply reducing the size of the conventional van (Cisco AVVID) or inflating the size of a compact car (consumer networking gear); instead, a new car platform (SOHware OACIS™) was architected. The huge success of the minivan created a major market, which essentially pulled Chrysler out of its slump in the 1980s. In the late 1990s, we saw a similar trend happening for the SUV, which was built upon a totally different "vehicle platform architecture" addressing new market segment needs creating another big hit for the car industry.

History has proven again and again that the number one criteria to succeed in a market is to listen to customers' needs and swiftly provide an optimized solution at affordable prices, working together with channel partners to deliver the value-proposition to end-customers.

8. Summary

SOHware OACIS™ Network Infrastructure is the industry's first SMB-centric architecture framework that will facilitate the evolution of high-performance, affordable, scalable, and easy to manage networking solutions, enabling SMBs to implement Converged SMB Networks that better connect customers with partners on a global basis.

The SMB-centric OACIS™ networking solutions, in conjunction with SOHware's exclusively Direct-to-VAR business model fosters long-term win-win partnerships with SMB networking VARs, paving the way for delivering the best networking solutions and services as demanded by mainstream SMBs in the United States.

References

1. "Cisco vs. Shoreline: The Impact of VoIP Architecture on Management, Functionality and TCO", 2002, The Tolly Group.