

Enterprise WAN: Challenges And Changes Ahead

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Customers want to save money by implementing converged WANs, VOIP and VPNs. Yet they worry about their tight budgets and shortage of technical skills.

In the last 12 months, our work with companies that are upgrading their wide area network (WAN) backbones, coupled with surveys conducted at two recent industry conferences, lead us to one major conclusion: The evolution of the enterprise WAN marketplace is at a critical juncture. There's more potential flux in the marketplace today than at any time since the introduction of frame relay in the early 1990s.

As Figure 1 shows, most enterprises expect to make changes to their WAN within the next year or so. Enterprise network planners are contemplating converged backbones, quality of service (QOS), voice over IP (VOIP) and IP VPNs, and the primary motive in virtually every case is to reduce costs. However, they are constrained by tight budgets and lack of personnel, and the service providers could be doing more to help customers assess their WAN options.

These conclusions and supporting data are reflected in a survey we conducted with Key3Media of registered attendees at the NetWorld + Interop Atlanta 2000 and Las Vegas 2001 conferences. We gathered 269 qualified responses from network professionals who are involved in the daily operations of their WAN (34 percent) or who recommend (46 percent) or approve (20 percent) changes to their WAN.

Drivers And Inhibitors

The two primary factors driving companies to upgrade their WAN infrastructures are the twin desires to lower the cost and to improve the reliability of WAN services (Table 1). The cost factor is certainly no surprise, but we were impressed with just how important it is in driving these survey respondents to evolve their WAN infrastructures. In the past, we have found cost savings to be the third or fourth factor, but now it is the primary driver.

There's also evidence that, while the economic downturn of the last nine months may have slowed the migration to ebusiness, the movement continues. Though ebusiness-related factors clearly represent a second tier of concerns for our respondents, we found continued interest in such factors as:

- The ability to scale the network to support new requirements such as streaming video or voice over IP (VOIP).

- The ability to extend WANs to customers, suppliers and distributors quickly, securely and cost-effectively.

Our surveys also asked about constraints on the evolution of the enterprise WAN at two levels: a "macro" level, focused on constraints independent of the particular technologies involved, and a "micro" level for constraints pertaining to a particular technology.

At the macro level, respondents identified two primary constraints that may limit their ability to evolve their WAN infrastructures: budget and people. As shown in Table 2, the importance of these two constraints dwarfed that of any others.

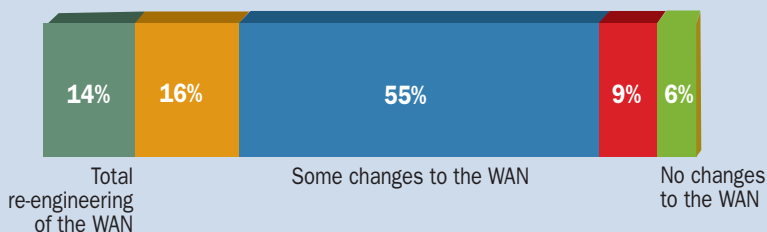
In our experience, there is nothing remarkable about having budget and people constraints limit the evolution of the WAN. Typically, however, we also find that technology issues (i.e., complexity, lack of interoperability) rate as important constraints. While we were surprised to find these issues ranked a distant third at the macro level, we detected more concern about technical constraints when we explored the "micro" issues for convergence, QOS, VOIP and IP-VPN technologies.

Convergence And QOS

As shown in Table 3, nearly one third of respondents (31.3 percent) indicated that their

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FIGURE 1 Anticipated Amount Of Change In The WAN Over Next 12 Months (sliding scale from 1 (no change) to 5 (total change))



Cost concerns top user lists of drivers and constraints

TABLE 1 Issues Driving The Evolution Of The WAN

Issue	Number of Responses: The Number-One Issue	Number of Responses: One of the Top Three issues
Lowering the cost of providing WAN services	73	170
Increasing the uptime of WAN services	70	130
Being able to support new applications such as streaming video or VOIP	54	136
Gaining more control over the network; i.e., faster configuration and modification	46	134
Being able to extend the WAN to customers, suppliers and distributors	40	109
Being able to cost-effectively support road warriors and teleworkers	22	101
Gaining better insight into the performance of the WAN through better reporting	20	92
Note: Some respondents indicated multiple "Number-One" Issues.		N=269

TABLE 2 Barriers Limiting The Evolution Of The Enterprise WAN

Issue	Number of Responses: The Number One Issue	Number of Responses: One of the Top Three issues
Budget constraints for initial investments in new technologies	133	200
Lack of personnel with the time to evaluate new technologies and services	54	143
Lack of personnel with the time to implement and manage the new technologies	44	141
Lack of internal organizational focus	20	124
Complexity of new technologies	24	100
Lack of people with the right skill set in our organization to evaluate new technologies & services	34	98
Ability to provide the appropriate level of security	32	98
Lack of personnel with the right skill set in our organization to implement and manage the new technologies and services	21	83
Lack of network/system/application management functionality	22	80
Note: Some respondents indicated multiple "Number-One" Issues.		N=269

TABLE 3 Characterization Of Converged WAN Backbones

Response	Percentage of Responses
We have already made significant movement towards deploying a converged WAN backbone	21.6%
We intend to deploy it in the next 6 to 12 months, but haven't started yet	9.7%
We have not begun deployment yet, but we are looking seriously at it	14.5%
We intend to evaluate deploying a converged network infrastructure within the next six months	11.9%
We have decided against deploying a converged network infrastructure, after looking at it	10.0%
We have not looked at, nor do we intend to look at, deploying a converged network infrastructure	18.2%
Don't know	14.1%
	N = 269

QOS worries those who are likely to adopt converged WANs

companies had already committed to or made significant movement towards deploying a converged WAN backbone. At the same time, almost as many (28.2 percent) expressed *no* interest in deploying a converged WAN infrastructure.

Cost concerns dominate the respondents' reasons either to embrace or avoid convergence, as shown in Tables 4 and 5. But note that technical issues, such as QOS, garnered a significant showing when respondents were asked about their top *three* barriers to convergence (Table 5, right-hand column).

In fact, when we narrowed the focus to the likeliest adopters, we found that technical concerns were primary. Among those who'd told us (per Table 3) that their companies are deploying, intending to deploy or considering a converged WAN backbone, the top three constraints were:

- Concern about the related technical difficulties, such as implementing QOS.

- Lack of people resources to fully analyze and implement a converged WAN backbone.

- Concern about their ability to properly manage a converged WAN backbone.

When we asked specifically how respondents plan to implement QOS (Figure 2), as expected, queuing was the most common response. The second choice, over-provisioning, seems counterintuitive, given the pressure respondents apparently feel to cut WAN costs—unless they expect to buy considerably more bandwidth for significantly less money.

Voice Over IP

Roughly 20 percent of respondents currently use VOIP for as much as a quarter of their voice traffic, and more than half will be using it to some extent in the next year (Figure 3). However, few plan to use VOIP to carry the majority of their voice traffic; most of those who plan to use VOIP

TABLE 4 Issues Driving The Movement To A Converged WAN Backbone

Issue	Number of Responses: The Number One Issue	Number of Responses: One of the Top Three issues
To save out-of-pocket costs, such as the cost of transmission services	76	137
To experience organizational savings by being more efficient	44	129
To allow us to better support new network-based applications	24	107
To allow us to better support new business-focused applications	11	65
Other	1	10
We have no motivation to deploy a converged WAN backbone	7	17
No answer	5	1

Note: Some respondents indicated multiple "Number-One" Issues. N = 155

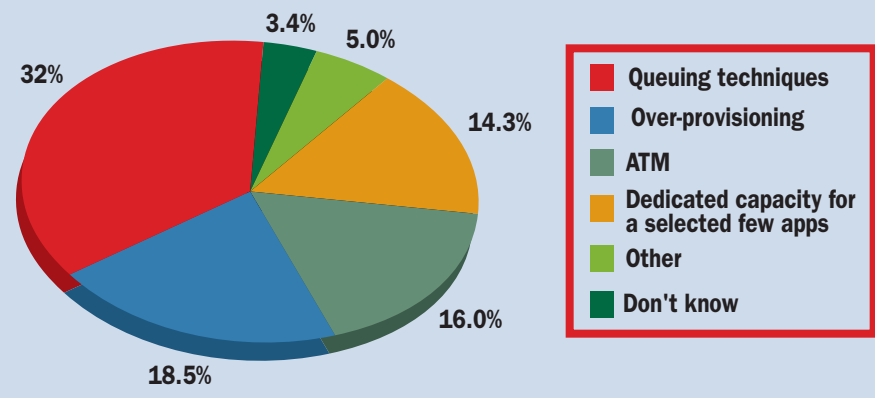
TABLE 5 Barriers To Deploying A Converged WAN Backbone

Issue	Number of Responses: The Number One Issue	Number of Responses: One of the Top Three issues
Do not think that it justifies the capital investment	55	152
We do not see any real benefit to having a converged WAN backbone	53	109
Lack of people resources to fully analyze and implement it	41	138
The political environment within our company would not support it	41	122
Concern about the related technical difficulties, such as implementing QOS	39	143
Concern about our ability to properly manage a converged WAN backbone	35	135
Other	10	18
No answer	25	10

Note: Some respondents indicated multiple "Number-One" Issues. N = 269

Respondents expect to save money with VOIP and VPNs

FIGURE 2 Techniques To Implement QOS (N=119)



expect that a year from now roughly one-quarter of their voice traffic will run as VOIP.

Given the importance of cost as a decision factor, it's no surprise that these respondents expect to save money using VOIP. However, we see a big red flag here. While there certainly are cases in which enterprises can save money by deploying VOIP, the analysis needs to be done carefully. As the domestic cost of carrying voice on the PSTN continues to spiral downward, the challenge is whether companies can buy enough lower-cost IP bandwidth to run VOIP even less expensively.

Given the current cost of VOIP systems (hardware, additional network management, etc.), the payback period may still be too long to justify the capital expenditures. In fact, more than half of all respondents indicated that justifying the capital investment was a significant obstacle to their deployment of VOIP.

But when it came to the subset of likely adopters, we found—as with converged WANs—that the concerns were primarily technical. Among those who intend to deploy VOIP, a full three-quarters rated concerns over the complexity of VOIP-related technologies and/or lack of personnel skills to fully analyze and implement VOIP among their top three barriers to deployment.

IP-Based VPNs

It seemed reasonable to find that half our respondents currently make use of dial-up IP VPNs for at least some of their remote access, and that 70 percent expect to do so in a year. Our experience has been that remote-access VPNs are relatively simple to deploy and provide considerable cost benefits, so we were somewhat surprised that only one-quarter of the survey respondents expect to use dial-up IP VPNs for the *bulk* of their remote access in a year.

The response pattern for site-to-site IP VPNs was similar to that of remote access, as shown in Figure 4 (p. 44). Note that 45 percent of respondents' companies currently use IP VPNs for at least some of their site-to-site connectivity requirements, with an expected increase to about

70 percent in the next year. However, fewer than a quarter expect to use IP VPNs for the *bulk* of their site-to-site connectivity requirements.

Again we found cost savings to be the primary factor; 77 percent listed it in their top three. This was followed by making it easier to extend the WAN quickly to new sites (71 percent had this in their top three) and improving the security of the WAN (50 percent put this in their top three).

Turning to the constraints, nearly half of all respondents rated the lack of people/skills to plan and implement a site-to-site VPN among the top three barriers to deployment. Respondents who intend to deploy site-to-site VPNs in the next year indicated that, after the lack of people skills, their next most important obstacles were:

- Their ability to justify the capital investment.
- Concern about technical difficulties, such as implementing and managing QOS or security.

Breaking The Standoff

We see the enterprise WAN marketplace at a standoff, potentially between an unstoppable force and an immovable object. The unstoppable force is the mandate that enterprise networking organizations have to make significant upgrades to their WAN backbones to save money and increase the availability of WAN services. The immovable

FIGURE 3 Current And Expected Deployment of VOIP

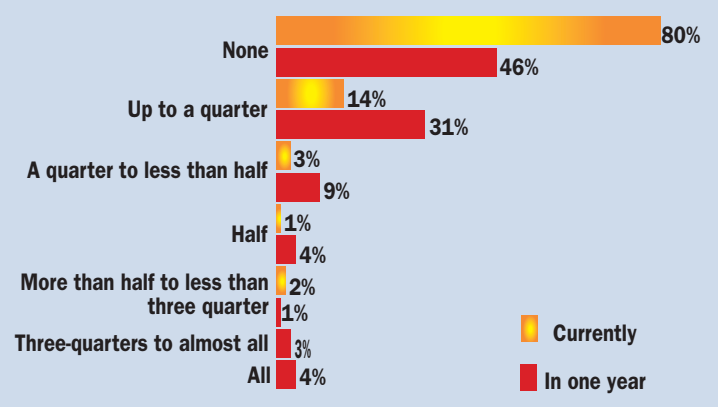
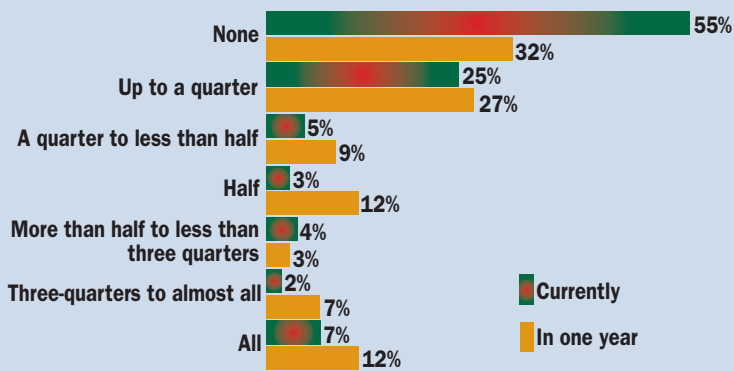


FIGURE 4 Use Of VPNs For Site-To-Site Connectivity



object is a collection of constraints on these same organizations, primarily tight budgets and too few people or skills.

The challenge is thus two-fold: justifying the capital investments required to reap the savings, and incorporating into the life-cycle cost models such costs as the operating investments required to add people or build skills.

Enterprise customers shouldn't have to deal

with these issues without help from their service providers. They should insist on help from existing and/or prospective vendors who have experience with—and should be able to provide references to—customers who have achieved savings. Some vendors have return on investment models for evaluating the financial viability of WAN backbone upgrades, but while these tools can be useful starting points, customers need to carefully check the validity of their assumptions.

Customers also need to insist that vendors provide easily understood and accessible pricing plans and information. Work together on migration plans that detail quarterly cash outlays, as such plans can provide insight into flexible ways to finance WAN upgrades.

Finally, demand that vendors supply templates, tools, guidelines, manuals and assistance on how to reflect your resource management policies in the QOS parameters by which the network operates. If you don't have sufficient leverage with your vendor to get this support, factor these criteria into your evaluation of potential new partners. The enterprise WAN marketplace is defined by the needs of customers and the offerings of vendors—who do you want to be in control? □

The BCR Business Review

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