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Optimizing WAN for Application Acceleration

October 2007

~ Underwritten, in Part, by ~

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Executive Summary

Aberdeen Group surveyed 235 organizations in October 2007 to identify challenges and best practices around optimizing Wide Area Networks (WAN) for acceleration of enterprise applications. This report is a roadmap for organizations that desire to achieve those goals through Best-in-Class use of technology solutions for WAN optimization and application acceleration.

Best-in-Class Performance

Aberdeen used three key performance criteria to distinguish Best-in-Class companies: improvement in bandwidth utilization, improvement in response times for business critical applications, and decrease in WAN latency. Best-in-Class organizations reported:

- 1158% average improvement in response times for business critical applications
- 87% average improvement in bandwidth utilization
- 100% decreased WAN latency

Competitive Maturity Assessment

Survey results show that the firms enjoying Best-in-Class performance shared several common characteristics:

- The Best-in-Class are two-times more likely to have policies for prioritization of WAN traffic in place in comparison to Laggards
- The Best-in-Class are two-times more likely to have capabilities to centrally manage WAN optimization appliances in comparison to Laggards
- The Best-in-Class are 2.5-times more likely to use application specific compression tools in comparison to Laggards

Required Actions

In addition to the specific recommendations in Chapter Three of this report, to achieve Best-in-Class performance, companies must:

- Develop capabilities for monitoring and analyzing performance of applications that are running on their WANs
- Use historical data to plan changes in bandwidth capacity
- Deploy technology solutions for shaping WAN traffic
- Develop controls to limit the use of bandwidth for applications

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Research Benchmark

Aberdeen's Research Benchmarks provide an in-depth and comprehensive look into process, procedure, methodologies, and technologies with best practice identification and actionable recommendations

"Ongoing network management requires process, knowledge, and experience. Just like in gastronomy, you need excellent raw material, tools, and skill sets to not only create excellent meals but to obtain optimal repetitive results on an ongoing basis."

~ CEO, Consulting Company

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Chapter One: Benchmarking the Best-in-Class

Business Context

In August of 2007 Aberdeen surveyed more than 430 organizations, and 93% indicated that they need more visibility and control over the performance of their networks. As organizations are leveraging bandwidth-intense applications, finding the balance between maximizing network and application performance and optimizing costs to operate and manage the network is becoming increasingly important.

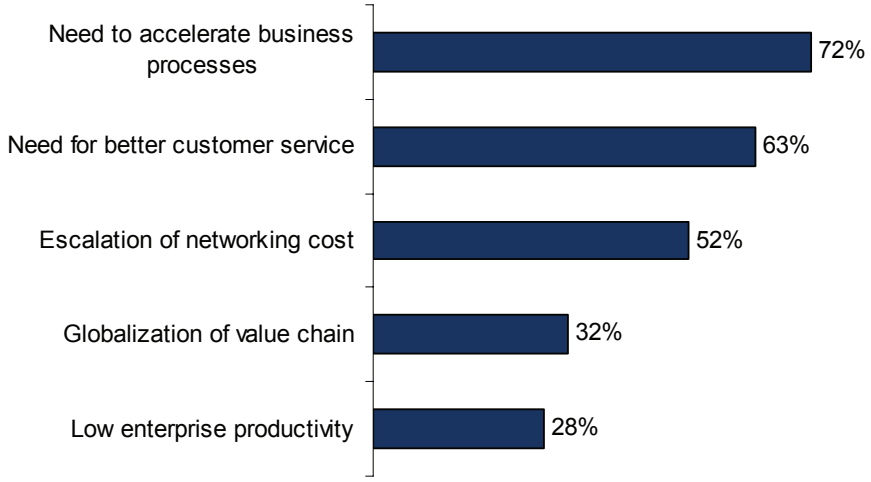
Fast Facts

- √ 93% of organizations reported increases in bandwidth capacity
- √ 18% of all organizations that increased their bandwidth capacity reported an improvement in application response times by 50% or more

Pressures Driving Resources on Optimizing WAN for Application Acceleration

Figure 1 shows that organizations are driven to invest resources in optimizing their WANs predominantly due to the need to accelerate key business processes. In addition, Aberdeen's research shows that the need to provide timely and continuous customer service and optimization of networking costs are the key pressures for more than half the organizations surveyed. It is noticeable that the majority of organizations are trying to find the right balance between improving application performance to streamline business processes and keeping networking costs under control.

Figure 1: Top Pressures Driving Organizations to Focus Resources on WAN Optimization for Application Acceleration



Source: Aberdeen Group, October 2007

In general, organizations are increasing the number of remote locations and individual remote users while centralizing data repositories and enterprise applications. Forty-five percent (45%)of respondents in Aberdeen's survey have 20 or more remote network locations and 49% have 100 or more

individual remote employees. That highlights that enabling seamless, timely access to applications and data repositories for any of the organization's employees accessing corporate data over their WAN is rapidly becoming a major item on their IT departments' agenda.

The Maturity Class Framework

Aberdeen used three key performance criteria to distinguish the Best-in-Class from Industry Average and Laggard organizations. These Key Performance Indicators (KPIs) are: improvement in bandwidth utilization, improvement in response times for business critical applications, and decrease in WAN latency.

Table 1: Companies with Top Performance Earn Best-in-Class Status

Definition of Maturity Class	Mean Class Performance
Best-in-Class: Top 20% of aggregate performance scorers	▪ 87% average improvement in bandwidth utilization ▪ 1158% average improvement in response times for business critical applications ▪ 100% decreased WAN latency
Industry Average: Middle 50% of aggregate performance scorers	▪ 40% average improvement in bandwidth utilization ▪ 99% average improvement in response times for business critical applications ▪ 41% decreased WAN latency
Laggard: Bottom 30% of aggregate performance scorers	▪ 16% average improvement in bandwidth utilization ▪ 10% average improvement in response times for business critical applications ▪ 0% decreased WAN latency

Source: Aberdeen Group, October 2007

The Best-in-Class PACE Model

Best-in-Class organizations are adopting strategies, developing internal capabilities and leveraging technology to optimize their WANs for application acceleration, which has an impact on their performance measured through three metrics listed in Table 1. Aberdeen's research shows that leveraging the enabling technologies listed in Table 2 directly affect organization's ability to improve application response times, bandwidth utilization, and decrease WAN latency.

Table 2: The Best-in-Class PACE Framework

Pressures	Actions	Capabilities	Enablers
▪ Accelerate business processes	▪ Reduce network complexity ▪ Enable global access to enterprise applications	▪ Policies for prioritization of network traffic ▪ Dedicated headcount for application performance management ▪ Capacity planning based on historic data ▪ Centralized management of WAN optimization appliances ▪ Defined traffic thresholds for optimal application performance	▪ Application-specific compression tools ▪ Auto troubleshooting of application response times ▪ Byte caching ▪ Object / file caching ▪ Auto prioritization of business-critical applications ▪ TCP acceleration tools ▪ Intelligent traffic agents for assigning class-of-service ▪ Auto alerts for issues with application performance

Source: Aberdeen Group, October 2007

Best-in-Class Strategies

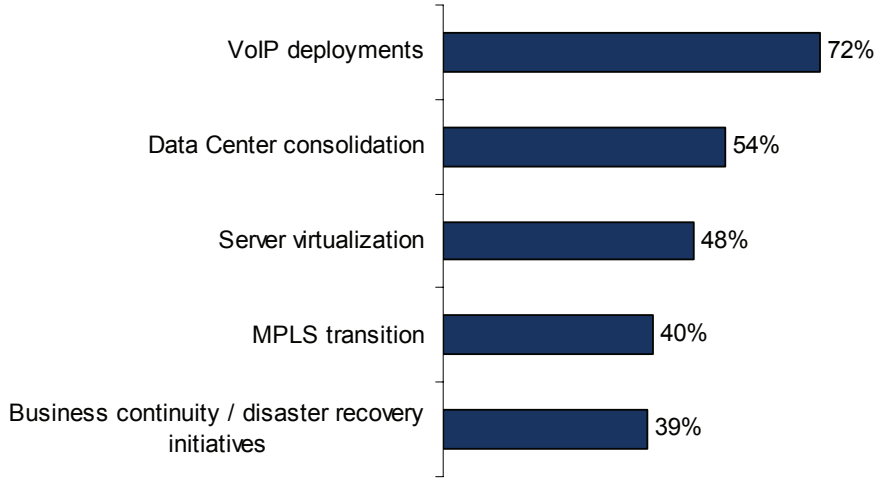
Aberdeen's research shows that the top strategic actions that Best-in-Class organizations are taking to address the challenges of optimizing their WAN's for optimal application performance are:

- Reduce network complexity (48%)
- Enable global access to enterprise applications (47%)
- Converge corporate applications (41%)

The fact that the majority of Best-in-Class organizations chose reducing network complexity and converging corporate applications as the top strategic actions in response to the need to streamline business processes shows that these organizations realize how important effective network management is in achieving operational efficiencies.

In addition to business pressures that organizations are addressing though deployment of WAN optimization solutions, network managers need to optimize their WANs for different infrastructure initiatives and new technology rollouts (Figure 2). Enterprise-wide infrastructure projects such as VoIP and MPLS deployments, and consolidation of data centers and branch offices are driving enterprises to develop capabilities for optimizing, monitoring, and controlling their networks so that new technology rollouts will not cause deterioration of network performance.

Figure 2: Top Infrastructure Projects Impacting WAN

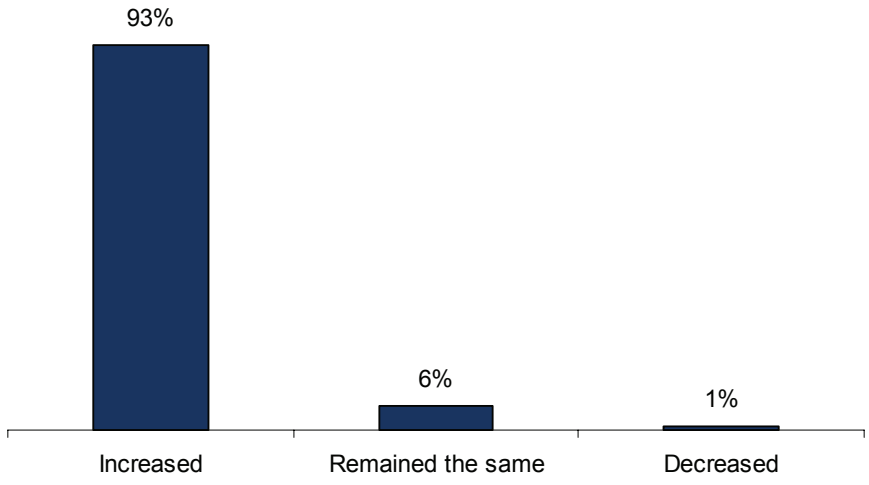


Source: Aberdeen Group, October 2007

Is Adding More Bandwidth a Viable Solution for Dealing With Network Complexity?

As new technologies and applications are being rolled out on their networks, organizations are trying to ensure optimal performance of their WANs predominantly by adding more bandwidth capacity. Figure 3 shows that 93% of organizations increased their bandwidth capacity over the last two years. However, only 52% of these organizations experienced an improvement in application response times and only 18% improved response times of business critical applications by 50% or more. Additionally, only 36% of all organizations that increased their bandwidth capacity reported decreases in WAN latency.

Figure 3: Changes in Bandwidth Capacity over the Last Two Years



Source: Aberdeen Group, October 2007

Eighty-seven percent (87%) of organizations that participated in Aberdeen's survey reported that managing their networks has become more complex over the last two years. New technology rollouts, convergence of voice and data networks, and multiple bandwidth-intensive applications that are running on the same network are driving organizations to add more bandwidth capacity to support the role of their networks in achieving strategic organizational goals. In some cases, such as a significant increase in the number of employees per location, or the creation of new data centers, investments in additional bandwidth services are justified and required. But, adding more bandwidth for the sole purpose of improving application and overall WAN performance is not viable solution, as 48% of organizations that increased their bandwidth capacity did not experience improvements in application performance.

In addition, Aberdeen's research shows that rolling out new technologies and applications doesn't necessarily lead to deterioration in network performance. Seventy-three percent (73%) of Best-in-Class organizations reported an increase in their ability to estimate the impact of new technology rollouts on network performance as compared to 28% of all others. This led to Best-in-Class organizations reporting an average of only 2% deterioration in network performance due to new technology rollouts as compared to a 24% average deterioration rate for Laggard organizations.

Aberdeen Insights - Strategy

In Aberdeen's survey respondents were asked about level of importance of 20 different enterprise applications for their organization. Interestingly, 14 out of 20 applications listed were selected by at least 30% of respondents as business critical. As organizations are converging voice and data networks and are rolling out new applications on their existing networks, thus, adding more bandwidth capacity might seam to be a logical solution. However, only 18% of all organizations that increased their bandwidth capacity experienced an improvement in application performance of 50% or more. Part of the challenge for the majority of organizations is that they see increasing bandwidth as one of the first steps in dealing with increasing network capacity. Instead of starting by adding more bandwidth these organizations first need to develop capabilities to achieve full visibility into network performance and bandwidth consumption to identify potential bottlenecks. This would allow them to make an educated decision about technologies and services they need to invest in to optimize their network for better application performance.

"I make sure that on a monthly basis I am looking at the trending of individual links; utilization and availability. I ensure that I am aware of new applications that are being planned for the network and that testing has been done to verify any impact that may have."

~ IT Manager, Professional Services

In the next chapter, we will see what the top performers are doing to achieve these gains.

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Chapter Two: Benchmarking Requirements for Success

The selection of WAN Optimization and application acceleration technologies and their integration with business intelligence and business process management systems plays a crucial role in the ability to turn these strategies into profit.

Case Study - Utilities Company Prioritizing WAN Traffic

Take the example of a utilities company in the U.S. that has 26 sites around the country. The company bandwidth was exceeding its existing capacity, causing low network speed. In response to this, the company decided to use a software solution for filtering and prioritizing network traffic, giving Internet use and large file transfers a lower priority than the rest of the network traffic.

The company's first step in the process was to create an in-house solution that would capture User IDs and Terminal IDs for every bandwidth-intensive application used on the network. Initial results showed that the majority of bandwidth-intensive applications being used were for non-productive work like streaming videos and music, and sending large files during peak hours of network operation.

The next step was to deploy the software solution on their routers to prioritize network traffic. As the software was deployed, the company instituted a set of internal policies to define appropriate usage of network bandwidth. These actions helped network managers to improve the capacity of the existing network bandwidth, while improving the speed and performance of their network without increasing the cost of bandwidth.

"The key issue with network performance is how to get a good handle on what types of traffic you are experiencing when you are seeing higher throughput rates, and educating users on flow of traffic through the network," said the IT Director of the utilities company.

Competitive Assessment

The aggregated performance of surveyed companies determined whether they ranked as Best-in-Class, Industry Average, or Laggard. In addition to having common performance levels, each class also shared characteristics in five key categories: (1) **process** (policies for prioritization of network traffic; pre-defined traffic thresholds for optimal application performance); (2) **organization** (dedicated headcount for application performance management); (3) **knowledge management** (WAN capacity planning based on historic data); (4) **technology** (the selection of appropriate tools and the intelligent deployment of those tools); and (5) **performance management** (the ability of the organization to measure the benefits of technology deployment and use the results to improve key processes further). These characteristics (identified in Table 3) serve as a guideline for best practices, and correlate directly with Best-in-Class performance across the key metrics.

Fast Facts

- √ Twice the number of Best-in-Class organizations decreased bandwidth cost (as a percentage of total IT spend) compared to Laggards
- √ Three-times more Best-in-Class organizations decreased the percentage of network traffic occupied by non-critical usage compared to Laggards
- √ Five-times more Best-in-Class organizations reported an improvement in their ability to prevent issues with application response times compared to Laggards

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Table 3: The Competitive Framework

	Best-in-Class	Average	Laggards
Process	Policies for prioritization of network traffic		
	73%	59%	35%
	Defined traffic thresholds for optimal application performance		
	41%	31%	19%
Organization	Dedicated headcount for application performance management		
	35%	23%	5%
Knowledge	Centralized management of WAN optimization appliances		
	49%	39%	20%
	Capacity planning based on historic data		
	52%	44%	38%
Technology	WAN optimization and application acceleration technology currently in use		
	▪ 42% byte caching ▪ 40% auto prioritization of business-critical applications ▪ 40% application-specific compression tools ▪ 34% object / file caching ▪ 32% auto troubleshooting of application response times ▪ 32% TCP acceleration tools ▪ 28% intelligent traffic agents for assigning class-of-service	▪ 25% byte caching ▪ 30% auto prioritization of business-critical applications ▪ 32% application-specific compression tools ▪ 24% object / file caching ▪ 13% auto troubleshooting of application response times ▪ 28% TCP acceleration tools ▪ 19% intelligent traffic agents for assigning class-of-service	▪ 2% byte caching ▪ 14% auto prioritization of business-critical applications ▪ 15% application-specific compression tools ▪ 11% object / file caching ▪ 8% auto troubleshooting of application response times ▪ 7% TCP acceleration tools ▪ 5% intelligent traffic agents for assigning class-of-service
Performance	Application and response times measured in real-time, or near real-time:		
	65%	35%	22%

Source: Aberdeen Group, October 2007

Fast Facts

Aberdeen's research found no correlation between company size and type of the network design with categorization into Best-in-Class, Industry Average, and Laggards. With that said, an average distance between network locations for Best-in-Class organizations was 3,995 miles compared to 3,900 miles for the average Laggard organization. In addition to that, the average Best-in-Class organization in Aberdeen's survey reported $1.9 billion in annual revenues compared to the average of $1.4 billion for all others. Also, it is important to highlight that 38% of Best-in-Class organizations have annual revenues of $100 million or less and 28% of Laggard organizations reported annual revenues of $1 billion or more.

Capabilities and Enablers

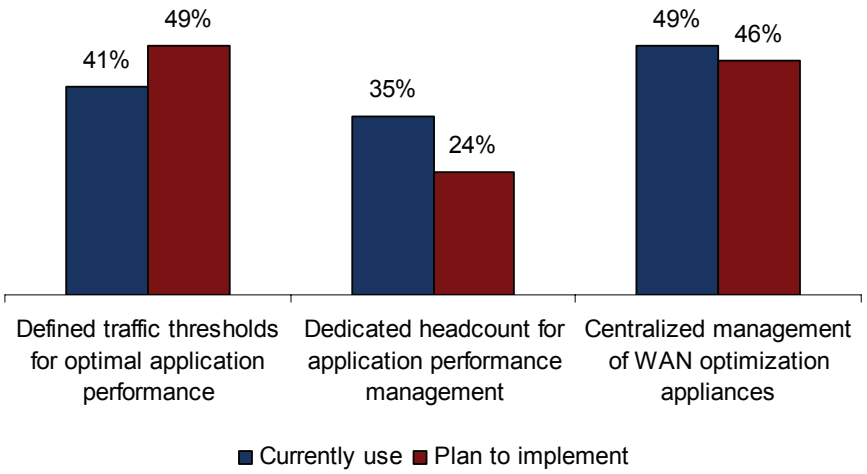
Based on the findings of the Competitive Framework and interviews with end users, Aberdeen's analysis of the Best-in-Class reveals that these organizations have developed more robust internal capabilities and are more likely to deploy technology solutions for WAN optimization and application acceleration

Process

Table 3 shows that, compared to Laggards, Best-in-Class organizations are two times more likely to have policies for prioritization of WAN traffic in place. These policies include assigning a higher importance to applications that are business critical and time sensitive. Having these policies in place contributed to nearly three-times more Best-in-Class organizations decreased the percentage of network traffic occupied by non-critical usage compared to Laggards.

Table 3 also shows that Best-in-Class organizations are two-times more likely to have defined traffic thresholds for optimal application performance compared to Laggards. This enables the network managers of Best-in-Class organizations to more quickly identify potential problems with application performance. The result is that five-times more Best-in-Class organizations reported an improvement in their ability to prevent issues with application response times. It is important to highlight that even though 59% of Best-in-Class organizations do not have defined traffic thresholds, 49% of these organizations plan to develop it in near future (Figure 4). Organizations with a documented plan to expedite defining these thresholds are moving in the right direction by further expanding their capabilities around WAN optimization.

Figure 4: Best-in-Class Plans for Developing New Capabilities



Source: Aberdeen Group, October 2007

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Organization

Best-in-Class organizations are seven-times more likely to have a dedicated headcount for managing application performance compared to Laggards. Having a dedicated staff for application performance management enables these organizations to get a better understanding of challenges related to application performance and, therefore, allows them to react faster and resolve performance issues before they cause disruption to business processes. Figure 4 shows that while 35% of Best-in-Class organizations have already developed this capability, an additional 24% are implementing it in the near future. Ensuring a dedicated headcount to manage application performance resulted in Best-in-Class organizations reporting a 38% decrease in Mean Time to Repair (MTTR) for application response times compared to 7% decrease for all the others.

Knowledge Management

Best-in-Class organizations are two-times more likely to have capabilities for centralized management of WAN optimization appliances compared to Laggards. Having this capability in place not only allows network managers to have better control of their networks, but also to be more productive because it provides them visibility into WAN appliances across the network through Web browser. Figure 4 also shows that the overwhelming majority of Best-in-Class organizations that currently do not have this capability are planning to implement it in near future. This contributed to Best-in-Class organizations reporting an 11% decrease in labor costs associated with managing the network (as a percentage of total IT spend) compared to a 4% increase for Laggard organizations. Also, it is important to highlight that Best-in-Class organizations are 69% more likely to outsource optimization of their WANs to a third party. That enables them to achieve operational efficiencies while maintaining a high level of network performance.

Also, Best-in-Class are 37% more likely to plan their network capacity by basing it on historic performance data. Monitoring, recoding, and analyzing data around network performance enables network managers to make better decisions about the solutions and services needed for optimal network performance. Utilizing historical performance data when planning their network capacity led to two-times more of the Best-in-Class organizations reporting decreases in bandwidth cost (as a percentage of total IT spend) compared to Laggards.

Technology

Table 3 shows that Best-in-Class organizations are choosing different technologies to optimize their WANs for better application performance. It is important to highlight that none of the techniques for WAN optimization and application acceleration are being deployed by more than 49% of Best-in-Class organizations. However, Aberdeen's research shows that when it comes to deployment of WAN optimization and application acceleration solutions all Best-in-Class organizations have two common characteristics: they are two to 21-times more likely to have specific technology enablers in

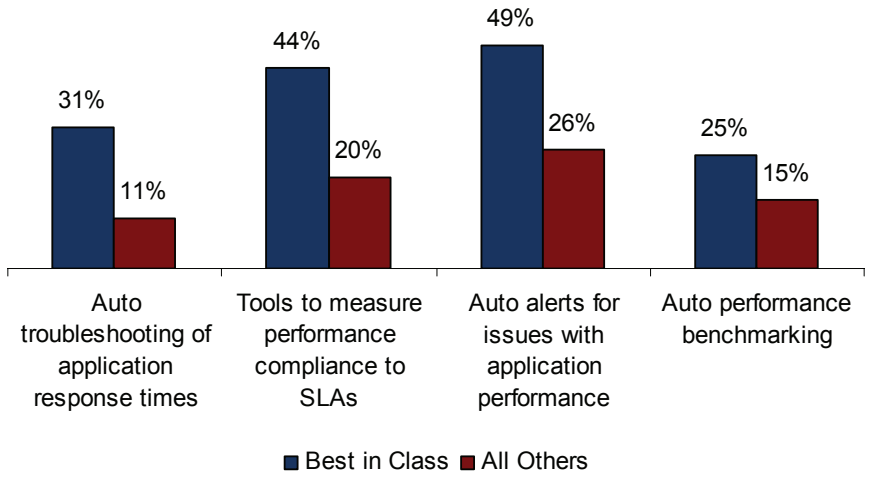
place compared to Laggards, and they were able to improve their performance at significantly higher rates compared to the rest of the market. Additionally, Aberdeen's research shows that 68% of Best-in-Class organizations are internally managing their WAN optimization capabilities while 32% are either outsourcing WAN optimization to a third party or using on-demand solutions for WAN Optimization. These organizations are realizing that the effectiveness of different products and strategies varies based on the applications involved and internal capabilities they have in place. Having this knowledge in advance allows these organizations to make better and faster decisions around strategies and technology solutions needed for WAN optimization and application acceleration.

Best-in-Class organizations are realizing that improvement in WAN performance can not be achieved through deployment of a single technology enabler, but instead through integration of several different capabilities that allows organizations to monitor, optimize, and control their WAN traffic for optimal application performance.

Monitor, Analyze, and Prevent

Figure 5 shows that Best-in-Class organizations are nearly two times more likely to have tools for auto troubleshooting of application response times compared to all others. In addition, Best-in-Class organizations are nearly two times more likely to have auto alerts for application performance issues compared to all others. Also, Best-in-Class organizations have automated processes in place to identify, analyze, and resolve issues with application performance in timely manner. This contributed to the fact that, on average, Best-in-Class organizations experienced 47% decrease in end-user complaints due to application response times compared to 12% decrease for all others.

Figure 5: The Best-in-Class Monitor, Analyze, and Resolve Faster



Source: Aberdeen Group, October 2007

Also, it is important to highlight that two times more Best-in-Class organizations reported increases in customer satisfaction compared to all others. The ability to identify and solve issues with application response times before they impact end-users allowed these organizations to be more responsive to customers' needs and improve efficiency of customer-facing employees.

Optimize, Accelerate, and Control

Table 3 shows that Best-in-Class organizations have developed more robust capabilities to optimize WAN traffic compared to all others. These tools include different techniques for accelerating WAN traffic such as byte caching, file caching, application-specific compression tools, and TCP acceleration tools. In addition, these organizations are leveraging tools to control WAN traffic such as techniques for auto prioritizing of WAN traffic and assigning class-of-service. It is important to highlight that, on average, Best-in-Class organizations were able to accelerate business critical applications at 115.8-times higher rate compared to the average Laggard organization (1158% improvement compared to 10% improvement). Even though Best-in-Class organizations selected different WAN optimization and application acceleration techniques to improve performance of their WANs, they all share common gains from these deployments measured through labor costs, bandwidth costs, business processes efficiencies, and customer satisfaction.

Best-in-Class organizations are taking a lifecycle approach to deploying technology solutions to improve performance of applications running on their networks. This type of approach includes optimization, acceleration, and control integrated with ongoing monitoring and analyzing enables Best-in-Class organizations to achieve a superior performance when compared against their peers.

Aberdeen Insights - Technology

Aberdeen's May, 2007 benchmark study *Network Transformations: Managing Transitions for Growth* found that the top strategic action that Best-in-Class organizations are taking around deployments of network optimization solutions is justifying cost to Finance. However, the top strategic action for Laggard organizations was development of detailed project plan. Consequently, Best-in-Class organizations were able to develop more robust capabilities to manage their networks and improve their performance at significantly higher rate compared to Laggards. Network and IT managers have a good understanding of the importance of improving visibility into performance of their networks and the development of capabilities to control and optimize their networks, but they need to be able to prove to their finance departments and senior management the impact that optimizing their WANs could have to achieving the key strategic and financial goals of the organization.

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Aberdeen Insights - Technology
The fact that Best-in-Class organizations are able to reduce labor costs, costs of bandwidth services, improve customer satisfaction, and streamline their key business processes should become a tool that network managers and application performance managers could leverage to get buy-in from their finance departments to invest more resources in optimizing their WANs for application acceleration.

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Chapter Three: Required Actions

Best-in-Class practices can be used as a set of guidelines to help Laggards and Industry Average users improve their performance in optimizing their WANs. There is also room for improvement for Best-in-Class organizations and some specific actions that these organizations could take to further improve their performance.

Fast Facts

- √ Laggard organizations should develop policies and deploy auto tools for prioritizing WAN traffic
- √ Industry Average companies should use historic data to define traffic thresholds for optimal application performance
- √ Best-in-Class organizations should continue to take a holistic approach to network management

Laggard Steps to Success

- **Develop policies and deploy auto tools for prioritizing WAN traffic**

  Sixty-five percent (65%) of Laggard organizations do not have developed policies for prioritization of WAN traffic, and 86% of these organizations do not have tools for automatic prioritization of business-critical applications in place. It is becoming increasingly important for these organizations to be able to reduce the percentage of WAN bandwidth taken up by non-critical traffic. As organizations are rolling out new applications on their networks and more applications are becoming business-critical, organizations need to make decisions about how they want their WAN bandwidth to be used and deploy technology solutions to enable network managers to reinforce these decisions. This would allow these organizations to avoid unnecessary costly investments in additional capacity and enable them to improve performance of business critical applications.

- **Implement technologies and techniques for accelerating and optimizing WAN traffic**

  Eighty-five percent (85%) of Laggard organizations do not have tools for WAN traffic compression in place. In addition, 93% do not possess tools for TCP acceleration while 89% lack tools for file or byte caching. The deployment of these technology solutions for accelerating and optimizing WAN traffic would enable Laggard organizations to improve bandwidth utilization, decrease application response times, and save on bandwidth costs. Additionally, acceleration and optimization tools will allow Laggards to decrease the amount of data on their networks and reduce the impact of WAN latency on application performance.

Industry Average Steps to Success

- **Define traffic thresholds and plan WAN capacity based on historic data**

  Sixty-nine percent (69%) of Industry Average organizations do not have defined traffic thresholds for optimal application performance. Furthermore, 56% of these organizations do not plan WAN capacity based on historic data on bandwidth utilization. These organizations

need to develop capabilities to capture and store data related to bandwidth consumption per network location as well as bandwidth consumption per application. That data should be used to plan potential changes in network capacity as well as to define traffic thresholds for optimal application performance. Establishing these baselines for optimal consumption of WAN traffic per application would allow network managers of Industry Average organizations to identify and resolve issues with traffic congestion in timely manner and preserve optimal application performance. Additionally, deploying technology solutions for automating the processes of establishing, analyzing, and managing traffic thresholds would enable these organizations to achieve additional savings in labor costs to manage the network.

- **Implement auto alerts for issues with application performance**

  Sixty-eight percent (68%) of Industry Average organizations do not have auto alerts for issues with application performance in place. After these organizations are able to capture historic data around network performance and use it to define traffic thresholds for optimal application response times, the next step would be to develop capabilities to alert network managers when traffic reaches defined thresholds. That would enable them to reduce mean time to repair application performance issues and protect end-users from potential deterioration in application performance.

- **Centralize management of WAN optimization appliances**

  Sixty-one percent (61%) of Industry Average organizations do not have capabilities for centralized management of WAN appliances in place. To ensure ease of management and operational efficiency, these appliances should be managed through a Web interface with centralized access. Also, Aberdeen's research shows that the average distance between network locations for Industry Average organization is 3,700 miles. Therefore, developing the ability to manage remote WAN appliances from a central location is critical for Industry Average organizations seeking Best-in-Class performance.

Best-in-Class Steps to Success

- **Create a new job role: application performance manager**

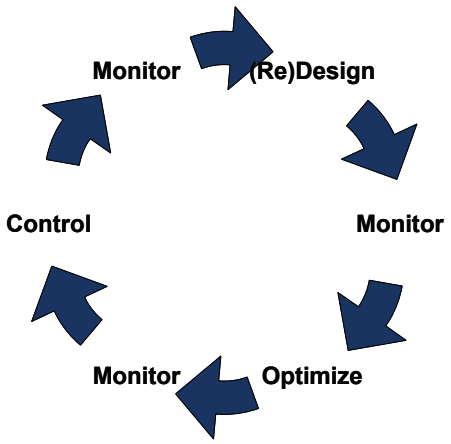
  Even though Best-in-Class organizations are seven-times more likely to have this capability in place compared to Laggards, 65% of Best-in-Class organizations still do not have this capability. As organizations try to accelerate their business processes through deployment of WAN optimization solutions, having dedicated staff to ensure that all application response time issues are resolved before end-users are affected is a critically important factor in attaining operational efficiencies. Aberdeen's research shows that organizations that have staff dedicated to application performance

management have been able to reduce their labor costs for network management at a higher rate than all others. Taking some of the current responsibilities away from network managers and creating a new job role solely in charge of network application performance management will enable that individual to far more productively and effectively deal with application performance issues.

- **Manage a full lifecycle of network management**

  Aberdeen's research shows that Best-in-Class organizations are taking a holistic approach to managing their WANs for application acceleration. The majority of these organizations established the ability to cover all four major segments of network management: monitoring, optimization, control, and design - or re-design (Figure 6). These organizations realize that managing the network is a continuous and dynamic process, and they are investing in tools and capabilities to establish control of the full lifecycle in relation to network management. Best-in-Class organizations should continue to treat their enterprise networks as one of their key strategic assets to meet new challenges of increased network complexity and maintain a high level of performance.

Figure 6: Network Lifecycle Management



Source: Aberdeen Group, October 2007

Aberdeen Insights - Summary

With increases in the complexity of enterprise networks it seems that the job of network manager has never been more difficult. However, Best-in-Class organizations are able to continuously improve the performance of their networks while reducing operating costs. They are able to do this by taking a holistic approach to optimizing their WANs for application acceleration and by developing organizational capabilities that allow them to use their existing resources more effectively. As organizations roll out new applications and continue to increase the amount of WAN traffic, the role of effective network management in

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streamlining business processes and improving customer responsiveness will become even more important. The best way for these organizations to find the optimal balance between application performance and the cost to manage and operate the network is through addressing the full lifecycle of network performance management by developing capabilities for monitoring, optimizing, controlling, and transforming WANs.

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Appendix A: Research Methodology

In October 2007, Aberdeen examined the use, the experiences, and the intentions of more than 230 enterprises using WAN optimization and application acceleration technologies in a diverse set of enterprises.

Aberdeen supplemented this online survey effort with telephone interviews with select survey respondents, gathering additional information on WAN optimization and application acceleration strategies, experiences, and results.

Responding enterprises included the following:

- *Job title / function:* The research sample included respondents with the following job titles: network or IT manager (34%); senior management (15%); IT or MIS Director (13%); and network management staff (10%).
- *Industry:* The research sample included respondents from 29 industries. Some of the largest industry segments were: computer equipment and peripherals (19%); high technology / software (17%); manufacturing (16%); education (9%); finance / banking (9%); and retail (9%).
- *Geography:* The majority of respondents (56%) were from North America. The majority of remaining respondents were from the Asia-Pacific region (20%) and Europe (14%).
- *Company size:* Thirty-two percent (32%) of respondents were from large enterprises (annual revenues above US $1 billion); 38% were from midsize enterprises (annual revenues between $50 million and $1 billion); and 30% of respondents were from small businesses (annual revenues of $50 million or less).
- *Headcount:* Eighteen (18%) of respondents were from small businesses (headcount between 1 and 99 employees); 30% were from midsize enterprises (headcount between 100 and 999 employees); and 52% of respondents were from large enterprises (headcount greater than 1,000 employees).

Solution providers recognized as sponsors of this report were solicited after the fact and had no substantive influence on the direction of the *Optimizing WAN for Application Acceleration* Benchmark Report. Their sponsorship has made it possible for Aberdeen Group to make these findings available to readers at no charge.

Study Focus

Responding executives completed an online survey that included questions designed to determine the following:

- √ The degree to which WAN optimization and application acceleration solutions are deployed on their networks and the implications of the technology
- √ The structure and effectiveness of existing WAN optimization and application acceleration implementations
- √ Current and planned use of WAN optimization and application acceleration solutions to aid operational and promotional activities
- √ The benefits, if any, that have been derived from WAN optimization and application acceleration initiatives

The study aimed to identify emerging best practices for WAN use, and to provide a framework by which readers could assess their own management capabilities

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Table 4: The PACE Framework Key

Overview
Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows: **Pressures —** external forces that impact an organization's market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive) **Actions —** the strategic approaches that an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product / service strategy, target markets, financial strategy, go-to-market, and sales strategy) **Capabilities —** the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products / services, ecosystem partners, financing) **Enablers —** the key functionality of technology solutions required to support the organization's enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cleansing, and management)

Source: Aberdeen Group, October 2007

Table 5: The Competitive Framework Key

Overview	
The Aberdeen Competitive Framework defines enterprises as falling into one of the following three levels of practices and performance: **Best-in-Class (20%) —** Practices that are the best currently being employed and are significantly superior to the Industry Average, and result in the top industry performance. **Industry Average (50%) —** Practices that represent the average or norm, and result in average industry performance. **Laggards (30%) —** Practices that are significantly behind the average of the industry, and result in below average performance.	In the following categories: **Process —** What is the scope of process standardization? What is the efficiency and effectiveness of this process? **Organization —** How is your company currently organized to manage and optimize this particular process? **Knowledge —** What visibility do you have into key data and intelligence required to manage this process? **Technology —** What level of automation have you used to support this process? How is this automation integrated and aligned? **Performance —** What do you measure? How frequently? What's your actual performance?

Source: Aberdeen Group, October 2007

Table 6: The Relationship Between PACE and the Competitive Framework

PACE and the Competitive Framework – How They Interact
Aberdeen research indicates that companies that identify the most impactful pressures and take the most transformational and effective actions are most likely to achieve superior performance. The level of competitive performance that a company achieves is strongly determined by the PACE choices that they make and how well they execute those decisions.

Source: Aberdeen Group, October 2007

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Appendix B:
Related Aberdeen Research

Related Aberdeen research that forms a companion or reference to this report include:

- Network Transformations: Managing Transitions for Growth; May 2007
- Look before You VoIP: Inventory Management Paves the Way to Convergence, January 2007
- CFO's View of Telecom Cost Management, March 2007
- Latency Matters: The Wide Area Network (WAN) Benchmark Report; February 2007
- Beyond Dial-Tone: Unified Communications Benchmark Report; December 2006
- Twice As Many Mid-Market Organizations to Purchase IP Telephony in 2007 Then Large Organizations; December 2006

Information on these and any other Aberdeen publications can be found at www.Aberdeen.com.

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Virtela™

Virtela Communications delivers award-winning network and security solutions to many of the world's largest and fastest-growing multinational companies. Currently serving customers across six continents, Virtela's network reach spans more than 190 countries. Virtela's unique Global Service FabricSM offers the foundation for delivering critical applications via the company's acclaimed service methodology, with a services suite that includes MPLS- and IP-based virtual private networks (VPNs), security services, remote monitoring and management of WAN/LAN infrastructure, and converged services (data, video, voice).

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SHUNRA

Shunra Virtual Enterprise provides highly robust, comprehensive network and application performance solutions as well as Professional Services that enable development, quality assurance, pre-deployment and operations teams to create a virtual test environment. Shunra offers a suite of tools which allow users to test application performance and network equipment under a wide variety of network conditions and topologies – exactly as if they were running in a production environment. With Shunra's industry leading technology, customers are able to predict and understand the performance impact the network has on the applications – before rollout. Ultimately a more proactive approach to solving application errors earlier in the application development lifecycle positively impacts the remote end-users' experience and decreases production related failures.

For additional information on Shunra Virtual Enterprise:

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Exinda Networks provides WAN optimization, application acceleration and application visibility for enterprise, government and service provider clients. Founded in 2002, Exinda's mission is to ensure optimal and consistent application performance over the WAN and reduce network operating costs. Exinda has more than 1,000 customers in more than 35 countries around the world. Exinda's award winning technology is available by contacting leading resellers or Exinda directly.

Research and development offices are located in Melbourne, Australia. Exinda's U.S. headquarters is located in Boston, Massachusetts. Additional corporate offices are located in Dubai, Frankfurt, London and Kuala Lumpur. For more information, visit www.exinda.com

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Mazu Networks' solutions enable IT organizations to manage, secure, and optimize the availability and performance of business services. Mazu Profiler uses Network Behavior Analysis (NBA) to provide a new way of looking at the IT infrastructure by analyzing network traffic to provide valuable information about the interactions of and dependencies between users, applications, and systems. This enables IT organizations to ensure optimal performance and availability, enhanced protection and support for regulatory compliance, and informed decision making for IT initiatives.

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