

BUILDING THE BUSINESS CASE FOR AN ENTERPRISE CONTENT NETWORKING SOLUTION

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PREFACE

The following document outlines the high-level requirements for any large, dispersed organization considering deployment of a content networking solution for rich media applications like streaming video and e-learning. Business managers in training, corporate communications and information technology in particular should find useful guidance in the following areas:

- Does my organization need rich media applications like streaming video?
- What are the requirements for successfully deploying rich media applications?
- What is the total cost of installing and managing a content networking solution to support company-wide rich media applications?
- What are the benefits of deploying an enterprise content networking solution?

This document is intended to provide a roadmap for organizations to build a solid business case around rich media application deployment. For more information on Fantastic's content networking solutions, please refer to our website at www.fantastic.com.

IMPORTANT TERMS

While reading this document, readers should be initially familiar with the following terms:

- *Rich Media* – Also known as *rich content*, refers to a variety of Web-based multimedia formats including streaming audio and video, motion graphics and animation, which typically incorporate an element of user interactivity.

- *Content Networking* – The dynamic delivery of rich content by linking applications with a distributed network of intelligent servers and distributing requests across the network to maximize performance.

- *Content Delivery Network (CDN)* – A vastly distributed network of servers interconnected to transmit large amounts of multimedia files (audio, video, animation, image and text files) over public Internet Protocol (IP) networks. This network enables content providers to more efficiently distribute bandwidth-intensive files to individual users, but faces challenges in delivery to multiple simultaneous users within a corporate environment.

- *Intranet Content Delivery Network (iCDN)* – A network similar to that of a CDN, but specially equipped to combat corporate delivery challenges by transmitting audio, video, animation, image, and text files over private Internet Protocol (IP) networks, or "intranets." Delivering bandwidth-intensive content in this manner eliminates Wide Area Network (WAN) bottlenecks. Corporate end users are served glitch-free content locally from dedicated content servers residing on the Local Area Network (LAN).

- *Extranet Content Delivery Network (xCDN)* – A private content delivery network dedicated to serving trusted business partners with rich content over a secure network connection like a virtual private network (VPN). Dedicated content servers are co-located behind the firewall of partners' networks where content is encrypted and published securely.

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OVERVIEW

The demand for rich media is growing fast…

Many large companies today face increasing demand for rich media applications running over their private corporate networks. Business units are finding streaming video extremely valuable for delivering product launches, executive broadcasts and training seminars—live or on demand—to employees, partners, suppliers, and customers anywhere in the world. These applications are drastically improving employee productivity and increasing time-to-market, while at the same time reducing corporate communications and training costs. According to Training Magazine, corporations are saving 50 to 70 percent of their overall training costs by replacing traditional training with online delivery.

Gartner Group predicts that by 2006, 80 percent of Global 2000 enterprises will have become dependent on streaming media applications for supporting internal corporate communications and training.

…but most companies are not prepared

Few companies, however, are capable of handling these rich media applications. In fact, a recent study by Information Week reveals that over 42 percent of IT managers feel that their current network infrastructure is currently incapable of handling streaming media. Streaming media is inherently bandwidth-intensive and causes network congestion. As such, most IT departments often restrict or prohibit the use of streaming media over the corporate network to preserve precious bandwidth and to maintain the integrity of mission-critical applications.

To effectively deploy scalable rich media applications, it requires either a high availability of bandwidth or a means of intelligently distributing content to the edge of the network to bypass WAN links. Information week finds that 56 percent of IT managers feel that additional bandwidth is NOT the solution for enabling streaming media, while 82 percent feel that content networking technologies offer a clear advantage.

Aside from the technical limitations, lack of skilled IT resources and limited funding are also factors hindering deployment of company-wide rich media applications.

Streaming media applications are leading the way…

Despite adoption barriers, many large organizations are forging ahead with rich media applications. According to Jupiter Media Metrix, over 40 percent of companies currently have a streaming media initiative in place.

Leading companies recognize they must forge ahead with rich media. Live broadcasts, video on demand, and other rich media applications have the potential to dramatically reduce costs, improve productivity, speed time-to-market of new products and ultimately be a source of competitive advantage.

While streaming media emerged as a potentially viable application for many internal and external applications, its true value has been uncovered in the enterprise. Internal business uses of streaming media offer the most tangible benefits. The problem is that traditional delivery models are ineffective in satisfying corporate users residing behind the firewall.

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…but many companies are still unclear on a long-term strategy

The champions of streaming media so far within the enterprise have come primarily from the business units, who want specific applications for their own purposes and benefits. IT, on the other hand, has traditionally viewed enterprise-wide streaming as a risky proposition, jeopardizing the stability of the network and posing a great threat to mission-critical applications.

To support rich media applications, companies need to understand that they need adequate infrastructure to satisfy current needs with scalability to handle future needs. Enterprise content networking initiatives should be considered an alternative to bandwidth investment and a platform to support everything from live broadcasts and video on demand (VOD) to software distribution and file replication.

New content networking technologies are available for enterprises to build intranet-based content delivery networks (iCDNs) so that rich media applications can be widely deployed internally without jeopardizing stability of the network. Gartner Group predicts that by 2006, 80 percent of Global 2000 enterprises will have implemented iCDNs for enabling VOD and distributing rich content to branch and regional offices.

Rich media deployment should be based on a solid business case…

In order to move forward with a complete deployment, companies need a clear understanding of the technical issues surrounding content distribution, delivery and management within a private IP network environment. Companies should control activities in-house when it makes economic sense and outsource the rest. Most importantly, companies should align content networking deployments with corporate cost-cutting initiatives.

In doing so, a solid business case should be built around the applications to justify the infrastructure investment. Building a comprehensive business case is more than just a return on investment (ROI) calculation; it is a full accounting of the hard and soft benefits and costs both initially and ongoing. The following strategy guidelines should help any company build a solid business case for such an initiative.

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STRATEGY GUIDELINES

Fantastic is pioneering the enterprise content networking industry and has been developing content networking solutions since 1996, when streaming media first emerged as a viable business application. Our experience working with a variety of world-class organizations enables us to understand both the technical and business challenges of deploying rich media applications over private enterprise networks. Few technology providers can claim as much "hands-on" experience deploying rich media behind the firewall as Fantastic.

We have compiled a useful set of guidelines appropriate for any organization considering deployment of rich media like streaming video over their private network. Consider it a roadmap for building a business case around rich media deployment and ensuring that your project is a success.

1. Consider content networking as a platform for supporting both current and future rich media applications, company-wide

Streaming media was the first widely proliferated rich media application within the business environment. Most companies' initial efforts around streaming media have been directed at an external audience (e.g., customers, investors) in hopes of driving higher revenues or valuations. The results, unfortunately, were largely disappointing due to its reliance on end user connection speeds and the inefficiencies of a shared content delivery network (CDN) or Internet. Revenues did not increase as hoped, in large part due to the unpredictability and poor quality of the content even under ideal conditions.

Over time, corporations learned that streaming video bridged the gap in distance learning, combining the power of video with the ubiquity of the Internet. As corporations began using streaming technology more for training and corporate communications internally, they quickly realized that traditional CDN models were insufficient for delivering a quality experience to the corporate user residing behind the firewall.

Intranet-based content delivery networks (iCDNs) emerged to satisfy these issues, offering a unique and scalable solution for enterprises to deliver high performance rich media applications within their own private networks. By leveraging intelligent content networking technologies, iCDNs proved effective in overcoming content delivery issues while preserving the stability of the network.

While streaming media has been the driving application, many new rich media applications are on the horizon. As the World Wide Web transforms from an environment of static graphics and text to one characterized by audio, video and animation, traditional Web-based applications will likewise evolve to incorporate rich media. Soon enterprise resource planning (ERP) systems, customer relationship management (CRM) systems and learning management systems (LMS) will all harness rich media. All of these business systems will require content networking infrastructure to operate efficiently.

iCDNs offer a scalable platform to support these applications, integrating streaming and caching technologies with content networking technology. Content networking is defined as the dynamic delivery of rich content by linking applications with a distributed network of intelligent servers and distributing requests across the network to maximize performance. Leading companies are quickly realizing that in order to control costs and stay competitive, they need to incorporate content networking technologies into their corporate networks.

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LAYER	DETAIL
User Applications	• Training on Demand • Distance Learning / E-learning • Executive Broadcasts • Product Demos • Financial Announcements
Content Networking Applications	• Encoding • Publishing • Streaming (live and on demand) • Edge Caching • Digital Asset Management (DAM) • Digital Rights Management (DRM)
Content Networking Overlay Architecture	• Content Distribution / Rate Shaping • Content Management • Content Delivery / Edge Redirection • Device Management
Existing Network Infrastructure	• Hardware / Appliances • Software • Routers / Switches • Bandwidth

FIGURE-1. ENTERPRISE CONTENT NETWORKING FRAMEWORK

2. Consider every possible requirement of a content networking solution

There are many user applications supported by an enterprise content networking solution. Most companies are driven by one initial application within a particular business unit and then realize the potential for more. During the assessment process, it is important to consider every possible rich media application and how different business units might benefit from rich media applications enabled by content networking infrastructure. This will ensure that the business case captures all of the long-term benefits across the entire organization. According to Jupiter Media Metrix, most companies find that streaming media alone covers a host of activities from internal announcements through customer support.

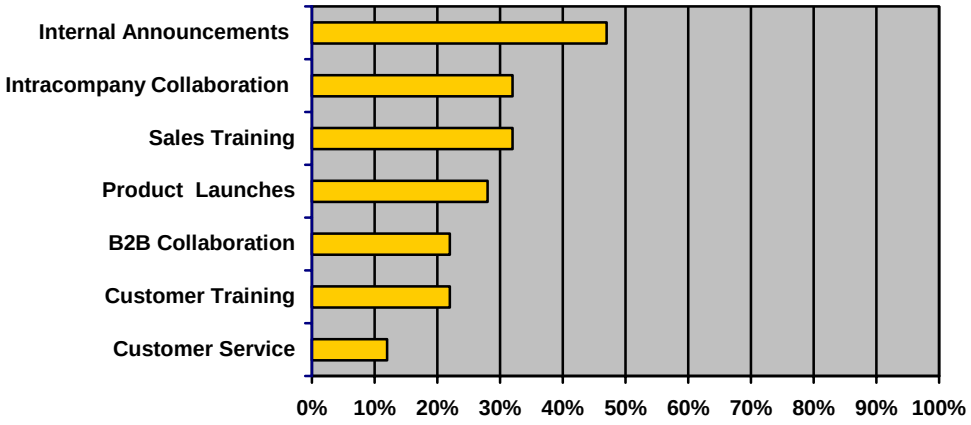


FIGURE-2. CURRENT APPLICATIONS FOR ENTERPRISE STREAMING
SOURCE: Jupiter Media Metrix

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3. Make sure the applications enabled by a content networking solution make sense for your organization

Content networking is not suitable for all organizations. It makes the most sense in medium and large organizations that must use rich media applications to train and communicate with dispersed audiences regularly. Ask yourself these important questions. If you answer yes to most of them, then content networking is worth considering.

- Is your company global?
- Are your employees dispersed across multiple geographic locations?
- Does your CEO need to communicate with employees on a regular basis?
- Is your industry changing rapidly?
- Does your company develop new products regularly?
- Is your company growing rapidly?
- Have you acquired or merged with one or more companies recently?
- Does your company have an existing library of media assets (e.g., VHS tapes, CD-ROM)?
- Are your employees away from their work regularly for training or company meetings?
- Does your company hold quarterly or bi-quarterly sales conferences?

Also, consider whether your competition is currently leveraging rich media applications supported by a content networking solution. Rich media applications increase productivity, speed time-to market of new products, reduce education and training costs, and prove to be a source of competitive advantage.

4. Include IT early in your assessment of a content networking solution

Because content networking is an infrastructure-based solution, it is important to include IT at the beginning of the assessment to address all of the technical issues. Even though most content networking initiatives are predominantly application-driven and most of the benefits are often realized at the business unit level in the form of productivity enhancements and cost savings, the responsibility for deployment always involves the IT group.

The benefits for IT come in the form of a more efficient, higher performance network. Content networking technologies minimize the impact of rich media on the corporate network and reduce bandwidth requirements. Additional IT benefits are determined on the basis of how easy the solution is to implement, scale, and manage.

Business units and IT need to work together to build the business case for an enterprise content networking solution. Only a cross-functional assessment with IT can adequately measure costs and benefits across the enterprise. The content networking initiative should be aligned with corporate cost-cutting objectives.

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5. Understand all of the complexities and issues involved with the implementation and management of an enterprise content networking solution

Implementing a content networking solution in any organization can be a challenge. Resources for implementation and management may be tight. Network connectivity between offices may need upgrading. Last year, Perey Research conducted its study on enterprise rich media deployment and found that a number of issues hindered its adoption. While bandwidth constraints and quality of service issues remain at the top of concerns for IT managers, recent developments in content networking technologies have been effective in overcoming these issues. The primary challenge that most companies still continue to face is installation and compatibility issues, along with ongoing management issues.

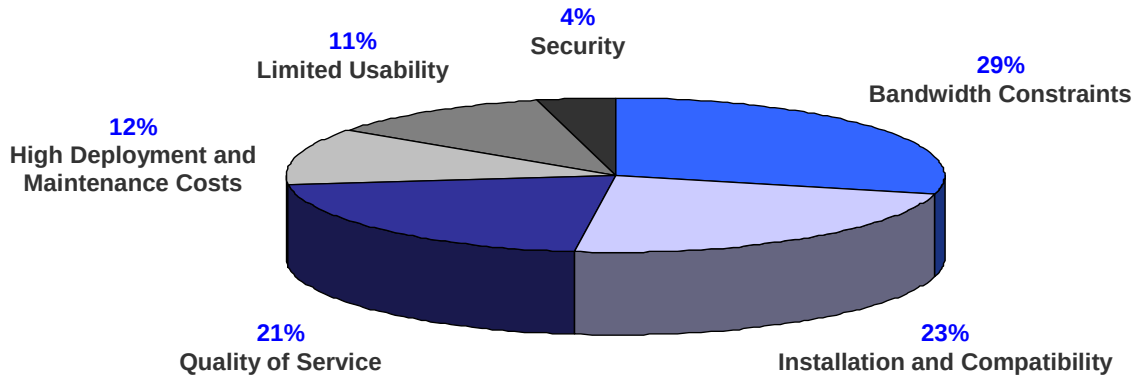


FIGURE-3. MAJOR CONCERNS WITH DEPLOYMENT OF RICH MEDIA APPLICATIONS OVER PRIVATE ENTERPRISE NETWORKS
SOURCE: Perey Research

In considering rich media applications, enterprises must consider the technical implications of the existing network and the resource limitations of their in-house IT departments early on. This will determine the feasibility of implementing a content networking solution using in-house resources, or it will illuminate the need for outsourced services.

6. Devise a long-term content networking strategy for the whole organization

Companies must take a holistic approach to content networking from the beginning. This means considering all of the audiences and respective content needs across the organization. Customers, investors, suppliers and employees are all part of the extended enterprise and may require a different set of rich media applications. It is also important to remember that a different set of business rules must be applied to each audience type regarding distribution, security and billing.

Serving employees requires upgrading the existing infrastructure with an iCDN. Customers and investors are most likely to interact with your organization via the open Internet, and this usually requires an externally-based content delivery network services. Suppliers may require a combined solution depending on their level of interdependence with your organization. Only a complete assessment of each audience will yield a long-term content networking framework that delivers optimal benefits across the extended enterprise.

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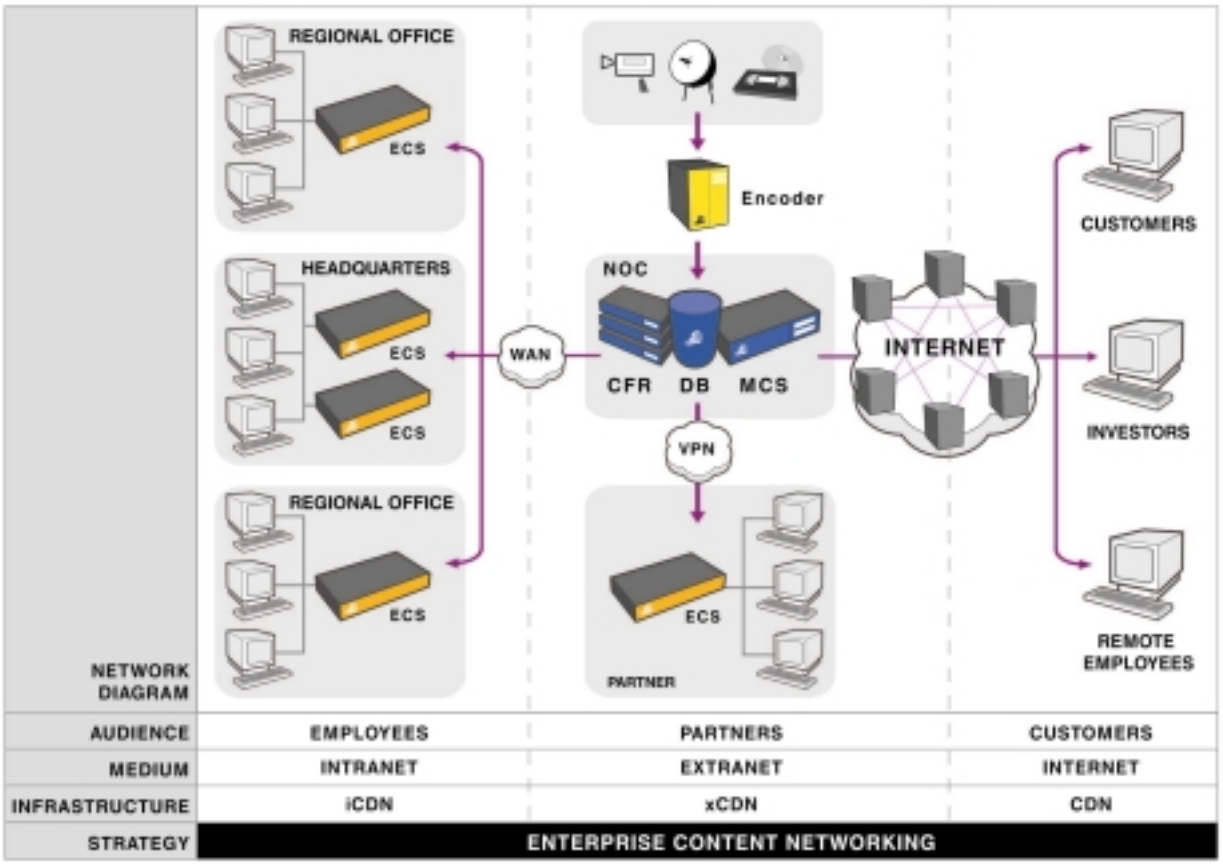


FIGURE-4. LONG-TERM ENTERPRISE CONTENT NETWORKING SOLUTION OVERVIEW

Fantastic breaks downs an end-to-end content networking solution for the enterprise into three distinct categories. All three must be based on a cohesive strategy and built upon a common platform for smooth scalability and ease-of-management.

- *Intranet Content Delivery Network (iCDN)* – Content networking infrastructure seamlessly integrated with the company intranet to support rich media applications, behind the firewall.

- *Extranet Content Delivery Network (xCDN)* – Content networking infrastructure deployed behind the firewall of a partner network (suppliers, resellers, etc.) for secure content distribution in a VPN environment.

- *Content Delivery Network (CDN)* – Traditional, Internet-based infrastructure to support streaming media and Web site acceleration among external users (remote employees, resellers, customers, investors, etc.).

In addition, most companies must consider an element of content acquisition, whether from an in-house video production department, or a third-party vendor. Fresh content, both live and on demand, is a critical success factor for an enterprise content networking solution.

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7. Start at the core of your organization with an iCDN and build out

Every large corporate initiative requires a phased implementation, and content networking is no exception. The best deployment strategy is one that considers return on investment when determining phasing. Start where you can realize immediate benefits. While customers may be your top priority, our experience has shown that delivering rich media content to them does not translate into immediate returns. It may be better to start at the core of your business and deliver streaming media to employees first. That's where you will realize the greatest return on investment in the near-term. A study by Training Magazine shows that corporations can save 50 to 70 percent of their overall training costs by replacing traditional training with online delivery. Once a content networking solution is in place for employees, it is easy to extend functionality both internally and externally.

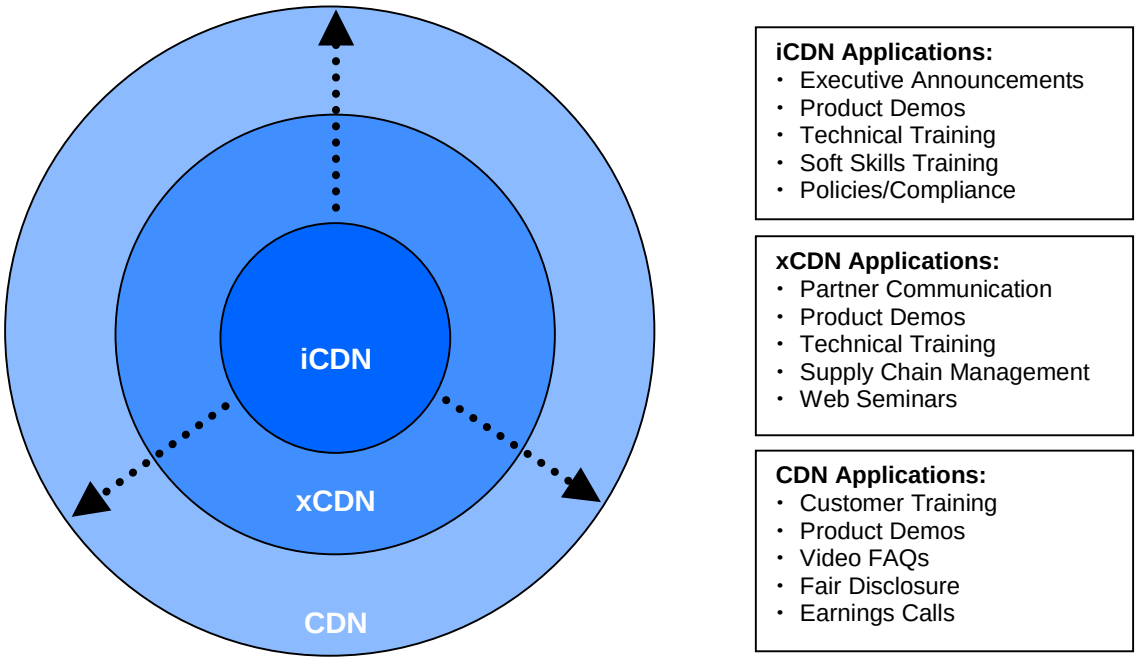


FIGURE-5. PHASED CONTENT NETWORKING IMPLEMENTATION

8. Leverage both existing and planned IT investments

A major benefit of implementing a total content networking solution is that it can leverage your existing network infrastructure investment. Content networking infrastructure layers on top of incumbent hardware/software platforms, adding an additional layer of intelligence and functionality. Most iCDN solutions have the ability to leverage and increase the functionality of existing storage and database systems. In some cases the technology can be installed on existing network servers.

In addition, existing or planned initiatives like learning management systems (LMS) and video conferencing implementations can benefit greatly from the enhanced rich media distribution capabilities enabled by an iCDN. Companies should take stock of all current and planned IT initiatives so that synergies are realized, and overlapping and lost opportunities are minimized.

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RETURN ON INVESTMENT CONSIDERATIONS

1. Look at Total Cost of Ownership

Major corporate IT initiatives are always a challenge. There can be significant cost and complexity associated with both implementation and ongoing management of any solution that spans an entire organization. Companies should be careful when comparing solution alternatives to consider the Total Cost of Ownership (TCO). This goes well beyond the cost of software and hardware. In fact, most research firms estimate that companies will spend twice as much on implementation and support resources as they will on the technology itself. Consider all of the following cost drivers when assessing a content networking solution for the enterprise:

A. Software – The essential ingredient to a content networking solution is the software. The ongoing management costs are driven primarily by functionality included with the software and the amount of automation and intelligence built into the application. A good content networking solution should include the following functionality:

i. Content Distribution and Management

- *Content Distribution* – Performs publication of rich content from the master server to the edge servers, along with peer-to-peer distribution, and rate shaping.
- *Content Delivery* – Performs edge delivery of live and on demand rich content with edge redirection and automated failover capabilities.
- *Device Management* – Performs overarching monitoring and management of all edge devices from a central location.
- *Network Reporting* – Performs real-time gathering of network data for online analysis of network performance and usage.
- *Digital Asset Management* – Performs content indexing, organization and retrieval for companies with large content libraries.
- *Digital Rights Management (optional)* – Performs content protection and billing mechanisms to ensure media is appropriately accessed and monetized.

ii. Content Delivery

- *Caching* – Performs local storage and delivery of Web objects for higher performance while preserving network bandwidth.
- *Streaming* – Performs streaming delivery of audio and video content in a variety of formats (e.g., Windows Media, Real, QuickTime, MPEG).

iii. Content Creation

- *Authoring* – Performs production of audio, video and other rich content (e.g., Flash, PowerPoint, etc.) for delivery over computer networks.
- *Self-publishing* – Performs uploading and circulation of rich content to specified destinations throughout the distribution and delivery network.
- *Encoding* – Performs conversion of rich media into the appropriate digital and/or streaming formats for live or on demand access.

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B. Hardware – Content networking solutions require dedicated servers, or appliances, to perform specialized tasks. In some cases, a solution may be able to leverage existing hardware depending on platform and performance requirements. Server requirements are as follows:

- *Master Control Server* – Core network server where all content distribution and management functions are centralized that monitors and controls all downstream edge devices.
- *Central File Repository* – Supports the requirement for central storage of digital media assets (can reside on the Master Control Server or leverage NAS, SAN, or NFS solutions).
- *Edge Content Servers* – Performs intelligence at the edge of the network (based on real-time network analysis) and local storage and delivery of rich content to end users.
- *Rich Media Encoding Server* – Performs scheduled or on-the-fly conversion of analog content to rich media into the appropriate streaming format.

C. Deployment Services – Companies should expect a reasonable amount of work in the planning and implementation of a content networking solution. These services can either be performed by in-house IT staff, or outsourced to third parties. Core installation requirements include the following:

- *Network Design* – Assessment of current network topology and relative geographic breakdown of users to determine target server locations and network rollout plan.
- *Installation* – Installation and configuration of core and edge devices, as well as system integration with legacy platforms.
- *Application Interface Development* – Interfacing the content networking application with other applications that will leverage its functionality (e.g., LMS, ERP, CRM).
- *User Interface Development* – Designing a customized graphical user interface (GUI) for accessing rich media on the front-end, seamlessly integrating with the corporate intranet.
- *Content Conversion* – Preparations of existing content for rich media delivery, including encoding, augmenting, indexing and publishing.

D. Management Personnel – Ongoing management of enterprise content networking solutions can be completely outsourced or maintained in-house. In any case, companies should budget a reasonable amount of management time for oversight and guidance, including the following:

- *Project Management* – Overseeing the implementation from start to finish, while maintaining timelines and budgets.
- *Solutions Assessment* – Evaluating competitive offerings and investigating technologies for their long-term viability and synergy with business objectives.
- *Installation* – Supervising the actual deployment of the content delivery network, along with scheduled phased implementations and/or upgrades.

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- *Integration* – Interfacing content networking technology with legacy databases, storage solutions, and learning management systems.
- *Troubleshooting* – Testing multiple user locations and addressing any problems that arise during phase one of the installation.
- *Training* – Educating IT staff, business units, content owners and end users on rich media applications supported by content networking technology across the organization.

E. Additional Considerations – There are additional factors to consider when estimating TCO. While some factors are unavoidable, their impact can be minimized based on the functionality and scalability the solution offers. Companies must be careful because many solutions have hidden costs or technical limitations down the road. Here is a partial list of things to look for:

- *Open/Closed Architecture* – Many streaming/caching appliances use a proprietary operating system, which limits interoperability and scalability.
- *Storage Capacity* – Rich media requires significant storage requirements, which will dramatically increase over time.
- *Software Licensing* – Some streaming formats are based on licensing agreements, which require block upgrades to accommodate new users, making them more expensive.
- *Technology Obsolescence* – Streaming and caching technologies are rapidly advancing with new developments which will require a roadmap for product upgrades.
- *Network Upgrades* – Adding rich media applications to existing network infrastructure will expose bottlenecks in connectivity, and may require upgrading.
- *Multicast Enabling* – Supporting multicast streaming (live scenarios only) requires compatibility at the router level, which often requires a software upgrade.

2. Measure hard and soft benefits

Many rich media applications enabled by content networking technology generate significant benefits for the enterprise that are typically difficult to quantify. Examples of this include increased productivity, higher employee retention and greater customer satisfaction. While it may be difficult to measure these potential benefits, they should still be estimated alongside the more quantifiable benefits like training and bandwidth cost savings.

Both hard and soft benefits of an enterprise solution fall into three main categories: training, corporate communications and network usage. These benefits are summarized in the table on the following page.

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CATEGORY	HARD BENEFITS	SOFT BENEFITS
Training	**Cost savings up to 70 percent over instructor-led training:** • Eliminates need for travel (e.g., hotels, facilities, airfare, rental car, meals, etc.) • Reduces instructor and facility fees • Less need for print materials (e.g., books, pamphlets, etc.) • Higher employee productivity and operational efficiency for greater output • Massively scalable to accommodate growing organizations, partnerships, customers and additional content needs **Cost savings compared to VHS and CD-ROM distribution:** • The cost of producing and delivering a VHS tape is about $6 each, which could be saved by delivering content online • The cost of producing and delivering a CD-ROM is about $3 each, which could be saved by delivering content online	**24/7 availability:** • Less disruptions to work schedule, employees train at own pace and convenience • Employees constantly learning and growing because training is at fingertips • Content can be easily reviewed **Higher consistency of training:** • Content and delivery is the same for everybody regardless of location • Everybody has access to best instruction • Easier to track employee performance and attendance **Higher employee retention:** • Online training a perk • Greater personal fulfillment from job **Lower opportunity costs:** • Less time spent traveling • Fewer disruptions to work schedule
Corporate Communi-cations	**Cost savings more than 60 percent over company-wide meetings, conferences and events:** • Reduces need for travel (e.g., hotels, facilities, airfare, rental car, meals, etc.) • Reduces facility, rental equipment, talent fees • Massively scalable to accommodate growing organizations, partnerships, customers and additional content needs **Cost savings over satellite broadcasts:** • Satellite broadcasts typically cost $25,000 per event, which can be reduced to less than $2,000 by delivering broadcasts over IP • Lower production crew costs	**Better impact and translation of the message (e.g., video vs. text):** • Almost as effective as a real meeting • Easy to incorporate additional visuals (e.g., PowerPoint slides) **Higher consistency of messaging:** • Message is delivered right from the source, not second-hand • Everybody can participate **Easily recorded and stored for later access by anyone, anytime and anywhere:** • Everybody has access to the meeting archive at a later date and time • Nobody gets left out
Network Usage	**Cost savings up to 30 percent from lower WAN utilization:** • Web objects and learning objects cached locally • Preserves bandwidth usage across the WAN • Minimizes impact of streaming media on the network **Maximizes IT infrastructure investment:** • Can leverage existing hardware • Integrates with existing database and storage systems • Integrates with video conferencing systems • Supports learning management systems	**Better site performance:** • Faster delivery of Web and learning objects to users • Higher quality streaming video **Scalability:** • Accommodates virtually unlimited access • Handles flash crowds **Lower risk of network congestion, preserving mission-critical applications:** • Streaming video and mission-critical applications can peacefully co-exist • Less risk of network downtime **Easy installation and manageability:** • Appliances are self-actualizing and self-organizing • Content distribution and delivery processes are automated, requiring less IT personnel management resources

FIGURE-6. HARD AND SOFT BENEFITS SUMMARY

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CASE STUDY

Company X is a leading e-business software provider enabling companies to conduct business electronically across corporate networks and over the Internet. Forbes recently ranked them one of the country's 100 fastest growing companies.

Dealing with constant organizational change at high growth companies like Company X is an ongoing challenge. Training and corporate communications become key success factors. A steady stream of new employees require basic training while existing employees require continual updates on new products and services. Delivering all of this information in meetings or classrooms would be both economically impossible and extremely disruptive steady to growth.

In addition, a globally distributed field sales force makes it difficult for product marketing teams to provide and update business-critical information in a timely and consistent fashion. Quarterly sales conferences are expensive and disruptive. VHS cassette tapes and CD-ROMs are expensive, have lengthy development cycles and are not easily updated.

Company X recognized these challenges early on and set out to find an efficient way of getting new employees up-to-speed quickly while keeping existing employees abreast of new developments in their product and service offerings. They looked for a solution that was secure, wide reaching, and compelling on the front-end. Most importantly, they needed a solution up-and-running quickly to keep up with their high growth rate as an organization.

Streaming video seemed like a natural fit for Company X. It offered an easy way for product marketing managers to train and educate field sales reps on new developments either collectively in a live environment, or by providing on demand access to video content. Video would bring the message to life, something email-based communications lacked. Moreover, the technology would enable Company X to produce and update content quickly, while overcoming distance and time barriers in its distribution.

Fantastic was the only provider that could address all of the requirements for Company X. They brought a total solution, which included the software, hardware, professional services and ecosystem of content partners required to get Company X up-and-running in a few short months at their headquarters and 10 main regional offices.

Today, Company X is realizing the benefits of a content networking solution across the enterprise. While it is still early in the project, they estimate that their return on investment will exceed 200 percent annually over a five year period. This does not include any soft benefits from higher productivity, higher retention and faster time to market with new products. Regardless of the financial benefits, Company X is well positioned to maintain their position as a leader in e-business software.

The following is a summary of the business case developed by Company X that highlights the kind of realistic results most companies can achieve with a content networking solution.

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Total Cost of Ownership

Company X formed a task force early in their investigation of content networking solutions. While the initial objective was simply to enable webcasting of periodic product update information, they recognized the opportunity could offer many additional long-term benefits company-wide. Training on demand would enable them to reduce training costs across the organization. It would also enable the workforce to sharpen business and technical skills. On the technical side, caching would speed Web site performance while reducing WAN traffic costs.

Company X looked for a solution that could further leverage its existing network infrastructure investment and could be seamlessly and securely integrated with the corporate intranet. While the initial applications were internally-based, the vision was to expand the use of rich media applications to train and communicate with partners, customers and investors.

A Request For Information (RFI) was distributed to a host of vendors to initiate the information gathering process. Although many streaming media service providers and CDNs offered robust networks to deliver content over the Internet, few offered reliable “behind the firewall” solutions for content delivery. The process was narrowed to a short list of vendors, each of which came from a different industry background. Some were storage and caching vendors, while others had roots in routers and switches. Of these, none offered the level of services needed to deploy and manage the system effectively.

Fantastic was the only company that could satisfy all of the requirements. One of the most important considerations was Total Cost of Ownership (TCO), or the actual cost to the organization both in terms of implementation as well as ongoing management. Fantastic’s CORECast technology not only proved to be the least expensive on the market, but also proved to be the least expensive to manage and maintain. This was due to the system’s intelligence, which could automate most back-end processes based on real-time network analysis, which meant less IT management resources needed for the project.

Throughout the due diligence process, Fantastic was instrumental in helping Company X understand all of the initial and ongoing requirements of an enterprise content networking solution and the respective costs. Fantastic offered a solution that could be customized to meet the current needs of Company X, with enough scalability to meet future anticipated needs.

The following is a summary of both implementation and ongoing cost estimates for Company X using Fantastic. Estimates are based on one master server architecture at the company headquarters in the main data center, which included a built-in central file repository consisting of local RAID storage. There were ten main regional offices, each of which required an edge server that could perform both streaming and caching. An encoding server was also installed at the company headquarters in the video production studio to handle live conversion of satellite and terrestrial video feeds for delivery across the network.

Estimates also included development of a media library accessible via the corporate intranet through a custom graphical user interface (GUI). Fantastic initially produced two custom product training videos and converted an additional ten hours of existing content on VHS tape, all of which was published to the system at launch.

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CATEGORY	COST DRIVER	DETAIL	FANTASTIC
Implementation	Software	Content Networking – Core (1 license) Content Networking – Edge (10 licenses) Self-publishing (basic) iCDN Management HTTP Caching Streaming Media (Real 500-user license)	$50,000 ($3,000/license) $30,000 Included with COREcast Included with COREcast Included with COREcast $10,000
	Hardware	Master Server Central File Repository (76GB RAID storage) Edge Appliances (10 remote offices) Encoding Server	$25,000 $7,500 ($3,000 each) $30,000 $15,000
	Services	Configuration and Installation of Network User Interface Development Application Interface Development Content Production / Conversion	$30,000 $20,000 $15,000 $27,500
	Personnel	Project Management Network / Content Management Business Unit Management Application Integration Training	$50,000 $50,000 $37,500 $50,000 $50,000
			Total Implementation Costs $497,500
Ongoing Management (annual)	Software Support	Content Networking (15%) Streaming Media (Real license – 15%)	$12,000 $1,500
	Hardware Depreciation	Master Server (1 total – 50%) Edge Appliances (10 total – 50%) Encoding Server (1 total – 50%)	$12,500 $15,000 $7,500
	Services	Content Conversion	$9,000
	Personnel	IT Manager Content Manager	$100,000 $100,000
			Total Ongoing Management Costs (annual) $257,500

FIGURE-7. TOTAL COST OF OWNERSHIP CALCULATION

Figure-7 Assumptions:

- Software costs assume $50,000 per master and $3,000 per edge server and 15% annually for support
- Hardware costs assume $25,000 per master, $3,000 per edge server, and $15,000 per encoder as well as a two year depreciation schedule for ongoing costs
- Central File Repository has variable costs associated with increased RAID storage
- Ongoing service fees assume approximately 14 hours of content conversion at $650 per hour
- Client personnel costs assume each position works full-time at fully loaded cost of $100,000 per year

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Total Benefits of Ownership

Company X not only assessed the Total Cost of Ownership (TCO) but also considered the Total Benefits of Ownership (TBO) for a content networking solution. They broke benefits into three main areas: Training, Corporate Communications and Network Usage.

A. **Training** – Web-based training (WBT) today makes up only 20 percent of all corporate training for employees, whereas traditional, instructor-based training (IBT) is still the dominant method. Although this is due to several factors, the biggest challenge is the cost and complexity of WBT. With a content networking solution, WBT could easily handle 80 percent of all employee training needs. In fact, most companies today are striving to attain the 80/20 Rule, which leverages a "blended approach" for corporate training (80 percent online and 20 percent in the classroom). For example, if an employee typically gets five training sessions per year today, only one of them will require travel and expenses to a classroom. According to WR Hambrecht & Co., companies spend on average $1,500 per employee per year on training and two-thirds of that is relative to travel and expenses. With Web-based training, employees do not need to travel. This cuts travel and expenses by 75 percent and reduces overall training costs per employee by 50 percent. For a company of 1000 employees, that is a savings of $750,000 per year.

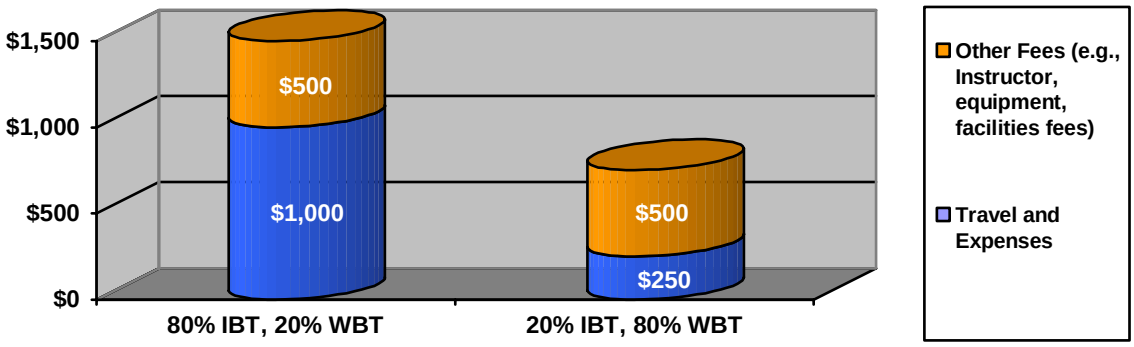


FIGURE-8. ANNUAL COST SAVINGS FROM WEB-BASED TRAINING (PER EMPLOYEE)

DETAIL	TODAY	FUTURE	ANNUAL
Total training sessions per employee per year	5	5	
Total classroom training sessions per employee per year	4	1	
Total Web-based training sessions per employee per year	1	4	
Total number of employees	1000	1000	
Training travel and expense costs per employee per year	$1,000	$250	$750
Training other costs per employee per year	$500	$500	
Total training costs per employee per year	$1,500	$750	$750
Total annual training costs	**$1,500,000**	**$750,000**	**$750,000**

FIGURE-9. TRAINING SAVINGS ESTIMATE

Figure-9 Assumptions:

- Annual training costs of $1500/year per employee according to Corporate University Exchange
- 20 percent of training today done online according to Corporate University Exchange
- 66% of overall training costs from travel and expenses according to W.R. Hambrecht study

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B. Corporate Communications – Most companies today spend almost as much on corporate communications as they do on employee training. The largest expense here is also travel and expenses related to meetings and events. It would not be unreasonable to estimate that employees attend as many meetings/events as training sessions. For example, assume that employees participate in five major meetings per year. Assume that today, one out of five of these meetings is broadcast across the network and the rest require attendance and related travel expenses. Most companies today are only experimenting with Web-based meetings, and the whole effort is usually outsourced to traditional CDN providers. If a company is serious about broader use of Web-based communications, then it makes sense to consider a content networking solution to enable their own network to handle broadcasts internally. Most companies today spend about $1,500 per employee for meetings and events. Two-thirds of this expense is in travel and expenses. Over time, it is reasonable to assume that broadcasting of meetings will increase to at least three out of the five. This would cut travel and expenses by 50 percent and realize an overall cost savings of about 30 percent. For a company of 1000 employees, that is a savings of $500,000 per year.

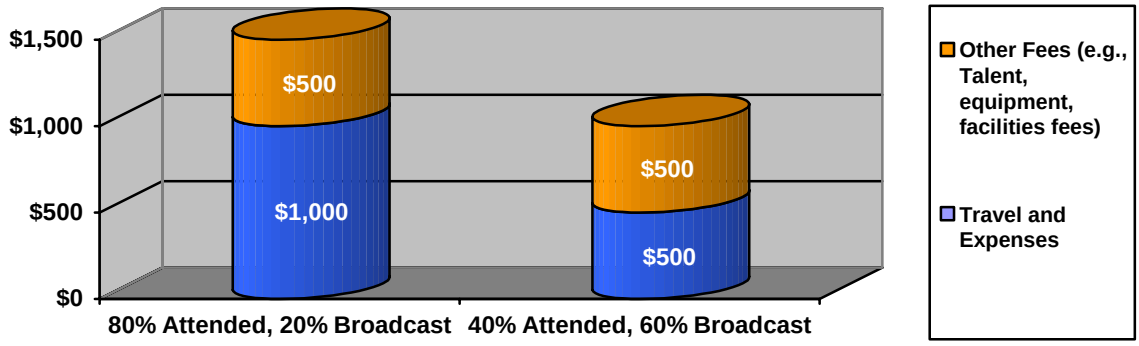


FIGURE-10. ANNUAL COST SAVINGS FROM WEB-BASED MEETINGS/EVENTS (PER EMPLOYEE)

DETAIL	TODAY	FUTURE	ANNUAL
Total meetings/events per employee per year	5	5	
Total facilities-based events per employee per year	4	2	
Total Web-based events per employee per year	1	3	
Total number of employees	1000	1000	
Meeting travel and expense costs per employee per year	$1,000	$500	$500
Meeting other costs per employee per year	$500	$500	
Total meeting costs per employee per year	$1,500	$1,000	$500
Total annual meetings/events costs	**$1,500,000**	**$1,000,000**	**$500,000**

FIGURE-11. CORPORATE COMMUNICATIONS SAVINGS ESTIMATE

Figure-11 Assumptions:
- Annual meeting costs of $1500 per employee per year according to Fantastic estimates
- Annual average travel costs of $1000 per employee per year according to Fantastic estimates

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C. Network Usage – Company X also estimated that by leveraging a content networking solution, it could reduce the amount of HTTP traffic over the Wide Area Network (WAN) significantly. They were currently spending $25,000 per month on total WAN usage, of which roughly 80 percent of the traffic was HTTP. By leveraging caching functionality of a content networking solution, frequently requested Web objects could be stored and delivered locally, thereby eliminating inefficiencies in the network. Company X estimated that 25 percent of current traffic could be eliminated, or 20 percent of the overall WAN usage. This would be an immediate savings of roughly $5000 per month or $60,000 per year.

TRANSPORT	MONTHLY BANDWIDTH (KB)	MONTHLY COST	% HTTP TRAFFIC	% SAVINGS WITH CACHING	BANDWIDTH RECOVERED (KB)	MONTHLY SAVINGS
Link-1	256	$5,000	75%	25%	48	$938
Link-2	4000	$10,000	80%	25%	800	$2,000
Link-3	4000	$10,000	90%	25%	900	$2,250
Total	**8256**	**$25,000**			**1748**	**$5,293**

FIGURE-12. WAN BANDWIDTH SAVINGS ESTIMATE

Figure-12 Assumptions:
- Bandwidth usage based on actual client
- Transport links represent only major WAN links, not connectivity to all ten remote offices

Although caching is effective in reducing HTTP traffic across the WAN, most important for IT is the cost avoidance of a content networking solution for deploying streaming media. However, because there is no basis for measurement of past performance, it is difficult to quantify the hard benefits.

According to Gartner Group, companies can expect to spend $1,000 per month per remote office for additional bandwidth required to distribute live and on demand streamed content (periodically) over existing networks by using traditional CDN delivery methods. For Company X, this would represent $10,000 per month or $120,000 per year in additional WAN bandwidth costs.

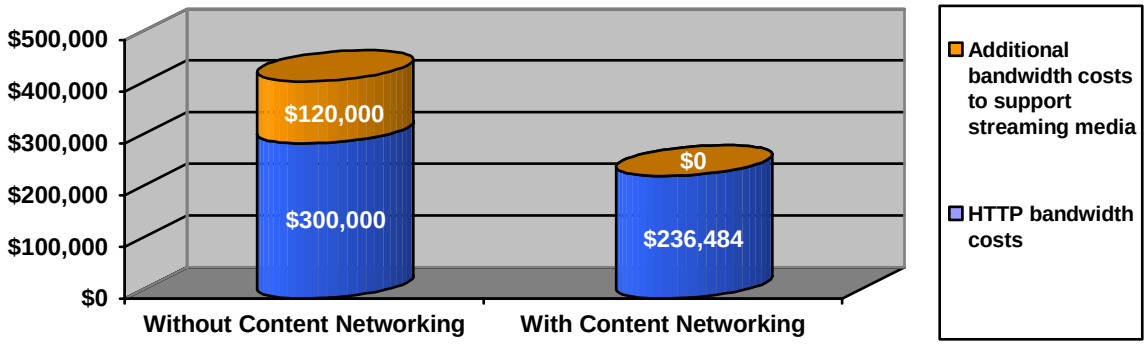


FIGURE-13. ANNUAL NETWORK BANDWIDTH COSTS (TOTAL)

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Summary of Costs and Benefits

Potential cost savings for Company X with a content networking solution are significant. A summary of savings from web-based training, web-based meetings and reduced WAN bandwidth will yield over $1.3 Million in savings per year when fully implemented. A complete cost/benefit analysis (below) shows that the average return on investment over a five year period is 235 percent. This does not even include an estimate of the intangible benefits like higher employee retention, higher productivity and faster time to market with products.

COST / BENEFIT ANALYSIS		INSTALL	YEAR-1	YEAR-2	YEAR-3	YEAR-4	YEAR-5
Cost Calculations	Initial Setup	$497,500	-	-	-	-	-
	Ongoing Management	0	$257,500	$265,225	$273,182	$281,377	$289,819
	Total Costs	**$497,500**	**$257,500**	**$265,225**	**$273,182**	**$281,377**	**$289,819**
Benefit Calculations	Number of Employees	1000	1100	1210	1331	1464	1611
	Training	-	$275,000	$605,000	$998,250	$1,098,075	$1,207,883
	Corp. Communications	-	$275,000	$605,000	$665,500	$732,050	$805,255
	Network Usage	-	$60,000	$66,000	$72,600	$79,860	$87,846
	Total Benefits	**$0**	**$550,000**	**$1,210,000**	**$1,663,750**	**$1,830,125**	**$2,013,138**
Net Benefit	Net Benefit	(-$497,500)	$292,500	$944,775	$1,390,568	$1,548,748	$1,723,319
	NPV	**$4,219,330**	-	-	-	-	-
	Average ROI	**237%**	**59%**	**190%**	**280%**	**311%**	**346%**

FIGURE-14. COST / BENEFIT ANALYSIS

Figure-14 Assumptions:

- Costs grow at 3% annually
- Organization grows by 10% annually
- Training and corporate communications benefits are phased in over three years
- Benefits increase with size of organization
- Discount rate for Net Present Value (NPV) calculation of 10%

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CONCLUSION

In building the business case for an enterprise content networking solution, companies must look at all of the benefits across the organization and use ROI-based assessments to justify the investment. Simply stated, enterprise content networking initiatives must be aligned with corporate cost-cutting initiatives. Business units need to collaborate with IT departments to implement the necessary infrastructure to support the rich media applications that will ultimately yield the greater benefits. IT departments need to embrace content networking technologies as a tool to make their networks more efficient and deliver the performance users demand.

Although many intangible benefits are generated from an enterprise content networking solution, including higher employee retention, higher productivity and faster time to market with products, many hard benefits can be easily measured. These are primarily in the realm of reduced expenses associated with traditional forms of training and corporate communications. By leveraging content online, companies reduce opportunity costs of employees being out of the office while saving significant money on airfare, hotels, meals, etc.

Technical hard benefits are centered on bandwidth savings by caching static content locally at the edge of the corporate network. They are also measured by the cost avoidance of putting streaming media on the network, compared to the bandwidth alternative.

Industry analysts predict that by 2006, 80 percent of Global 2000 enterprises will have become dependent on streaming media applications for supporting internal corporate communications and training. Eighty-five percent of those companies will realize a positive ROI in less than one year.

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About Fantastic

The Fantastic Corporation, headquartered in Zug, Switzerland, is a supplier of proven broadband multimedia delivery software solutions allowing businesses to get the right information to the right people at the right time. Fantastic addresses corporations, network owners and content providers that are challenged by the need to aggregate, package, manage, distribute and view ever-growing multimedia content. The Fantastic Corporate Solution starts with the OmniCast product for simple file delivery with the option for customers to migrate to more advanced functionality like Video on Demand, live streaming and interactive training. Fantastic's COREcast technology is a plug-and-play server architecture enabling companies to effectively perform content distribution and delivery, behind the firewall, in a scalable and easy-to-manage environment. Fantastic is a public company, quoted on the Frankfurt Stock exchange using the symbol: FAN.

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