White Paper

Business Video - A Key Enabler for Business Transformation

Executive Summary

According to the Cisco Visual Index study, video will account for nearly 90 percent of all consumer Internet traffic by 2013, and 60 percent of all online video will be consumer video—up from 32 percent in 2009.

All forms of communications, collaboration, and entertainment are becoming digitized, and connected. New, rich media applications, such as video collaboration, IPTV, music and video streaming, are flourishing. So too is a new generation of devices—from multi-function mobile phones to access control points; card readers to Radio-frequency identification (RFID) tags. A multitude of video formats; devices and information sources are being integrated into innovative applications that are changing the way people interact.

Both consumers and businesses are driving this evolution. Video is becoming a key requirement for effective collaboration as increasing globalization drives a desire for more personal contact across geographic and cultural boundaries. Video users now demand the ability to view any content, on any device, anywhere.

In the past, while stand-alone video-based solutions promised to reduce complexity, they often came at the cost of reduced functionality and little to no integration with other applications. The net result was frequently an absence of an adequate Return On Investment (ROI).

Today, businesses are using video to transform key business processes to create competitive advantage, lower costs, and to reduce environmental impact, particularly by avoiding the need for travel.

To enable this greater volume of video, companies must need to recognize the role of the network as an integral foundation able to support these new, robust solutions and applications. The ubiquity of the IP protocol, combined with advances in networking, is transforming the use and value of video.

For most organizations the foundation of this revolution is a media aware network optimized for video, a medianet. A medianet will lower the cost of infrastructure, and make integration, expansion, operations, support, and the introduction of new services easier.

A medianet is a media intelligent infrastructure capable of handling all communications and services; cross platform, and in a distributed model. It creates a supremely flexible environment that enables the introduction of new applications without having to replace or purchase completely new or separate base infrastructures. Importantly, it provides specific capabilities to address the unique challenges of video and rich media in six key areas: quality of experience, content virtualization, mobility, session control, security, and management.

A medianet's ability to integrate multiple IP video applications together on the same network platform is key to unlocking the potential of Business Video to enable business transformation.

Contents

Section	Page
1 Introduction	4
2 Business Requirements Driving the Growth of Video	4
2.1 A Global Workforce and Need for Real-Time Collaboration	4
2.2 Reducing Energy Usage	4
2.3 New Opportunities for IP Convergence	4
2.4 Media Explosion	5
2.5 Social Networking	5
2.6 Multimedia Integration with Communications Applications	5
2.7 Demands for Universal Media Access	5
2.8 Each Organization is Unique	5
3. Individual Use Cases and Business Benefits	6
3.1 Cisco Unified Communications Video	6
3.2 Cisco TelePresence	7
3.3 Physical Security	8
3.4 Digital Media System	9
4. Integrated Use Cases: Bringing it Together	10
4.1 Expert on Demand / Premier Concierge Banking	10
4.2 Cisco TelePresence Studio	11
4.3 Interactive Queue Management	12
4.4 Emergency Messaging	12
4.5 Cisco TelePresence Business-to-Business Communications	13
4.6 Cisco TelePresence Interoperability	13
5. Integrated Use Cases: Innovation—New Ways of Doing Things	14
5.1 Enhanced Dynamic Signage	15
5.2 Video Contact Center	15
5.3 Content Control and Command: IP Phone Services	16
5.4 IP Smart Access Control	16
5.5 Visitor Guidance	17
6. The Challenges of Deploying Video	17
7. Medianet: Providing the Foundation for Integrated Business Video	19
7.1 A Medianet: Evolving the Network	19
8. Looking into the Future	20
For Further Information	20
APPENDIX A — Glossary	21

1. Introduction

Video is a powerful tool. It can bridge distances and cultures; persuade and inform; monitor and protect.

Today, however, the video systems that are commonly seen in the workplace tend to be difficult to use and limited in their ability to integrate with other systems. In comparison, video applications in the consumer market have been far more widely adopted. User acceptance has been driven by ease of use, and low cost.

To achieve a similar usage pattern, Business Video needs to be easy to use with a quantifiable ROI.

Corporate solutions must also enable video applications to integrate easily with business processes and other applications in order to drive additional benefits.

This document focuses on how a holistic approach to integrating video within organizations can positively impact business and operations.

The first part of the document reviews the business drivers for video within an organization and explores how video solutions can transform business processes. Integration is fundamental to the successful deployment of Business Video and it is, therefore, important that even when considering discrete systems, decisions are made within the context of possible future deployments. Such understanding comes from an awareness of both the range of individual solutions that might benefit the organization, and those that integrate with other systems.

The second part of the document considers the networking challenges of introducing Business Video, and the ability of a robust medianet to provide an intelligent, flexible, secure, and scalable platform for all business applications, including voice, data, and video.

2. Business Requirements Driving the Growth of Video

There are a number of business challenges driving the growth of media-based applications. The following highlight the convergence of a range of factors that are driving the adoption and development of Business Video applications.

2.1 A Global Workforce and Need for Real-Time Collaboration

One of the first challenges posed by globalization for most companies is acquiring and retaining skilled and talented individuals located in multiple geographic locations. A new wave of productivity tools are emerging that help harness collective and collaborative knowledge. Future productivity gains will be achieved by creating collaborative teams that span corporate and national boundaries, and geographies. Employees will collaborate with partners, research and educational institutions, and customers to create a new level of collective knowledge.

2.2 Reducing Energy Usage

Until recently the focus of most CIOs was how to improve the productivity of people on the move. Today, there is as much focus on harnessing IT to actually avoid travel. Companies are under increasing pressure to demonstrate environmental responsibility. With the right strategy it is entirely possible for the IT department to pursue green initiatives, while simultaneously increasing productivity and lowering expenses.

2.3 New Opportunities for IP Convergence

The convergence of voice delivered cost savings and new ways of communicating were made possible by the integration of VoIP on the IP network. A new wave of IP convergence for media applications is now emerging. One source of convergence is from applications that have historically required dedicated video transmission and broadcast networks, such as high-definition video collaboration, video surveillance systems, and video advertising signage. Increasingly, companies are further leveraging the investment in their corporate network by converging these video applications onto a single IP network.

2.4 Media Explosion

The sheer explosion of media content is driving the demand for video on IP networks. In recent years the barriers to media production, distribution, and viewing, have been dramatically lowered. The plummeting cost of video cameras and a new generation of high-quality, low-cost devices, such as the Flip camera, have turned users into would-be movie producers. Even mobile phones and PDAs deliver relatively high-quality video capture capabilities. Social networking sites like YouTube and MySpace enable easy distribution. Add cheap and easy-to-use video editing software to the mix and essentially everyone can produce and distribute their own video material. This explosion of media content is now the overwhelming majority of consumer network traffic, and is quickly "crossing over" to corporate networks. As a consequence, there are few barriers remaining to inhibit video communication, and so this incredibly effective medium is appearing in new and exciting applications every day.

2.5 Social Networking

The social networking phenomenon can no longer been seen as relevant only to the YouTube generation. These sites — and the imaginations of their users - are enabling new forms of communication and information sharing. In the workplace, parallels are emerging because the same types of communication and information sharing are just as effective in business as they are in a social setting. For example, traditional corporate directories only provided employee names, titles, and phone numbers, but companies are now embracing social networking by adding skill sets and experience, URL links to shared work spaces, blogs, and other useful information. The result is a more productive and effective workforce that can adapt and find the skill sets and people needed to accomplish dynamic projects.

Similarly, in the past, information was primarily shared via text documents, email, and slides, but now employees are increasingly filming short videos to share best practices with colleagues, and to brief peers about projects and initiatives.

2.6 Multimedia Integration with Communications Applications

The explosion of media and the new uses to which it is being put is driving the desire to integrate audio and video into many forms of communication. Sharing of information through emailed slide sets will start to be replaced with video clips. The audio conference bridge will co-exist with the video-enabled conference bridge. Collaboration tools designed to link together distributed employees will increasingly integrate desktop video to bring teams closer together.

2.7 Demands for Universal Media Access

Just like voice and data, as multimedia applications become increasingly utilized and integrated, users will demand to be able to access these applications wherever they are, and on any device. These needs will drive new ways of thinking about how employees work and how to deliver IT services to them. Today, employees extend the workplace using mobile phones and wireless networking to home offices, airports, hotels, and recreation venues. Participation in video conferencing, viewing the latest executive communications, and collaborating with co-workers, will need to be accessible to employees, regardless of their work location.

2.8 Each Organization is Unique

The exact mix, and nature of these drivers for the adoption of video, will vary from organization to organization, and by business function. Marketing, for example, is particularly challenged by globalization, fast-changing consumer tastes and increased competition. The CIO's focus may be on cost rationalization, IT's alignment with the business, regulatory compliance, green IT, infrastructure resilience and security both of data and of the individual.

While these needs may seem to have little in common, they can all be addressed through Business Video. For example, video enables collaboration by reducing the time-to-trust between diverse teams. This increases productivity, produces results, and reduces costs. Video streamlines operations by protecting people and assets. Video creates new revenues streams by focusing on increased customer intimacy. It scales knowledge transfer within any company, and does so with only limited complexity. Video is therefore relevant to the challenges that both Marketing and the CIO are facing. Consequently, the business case for video really holds up when a holistic view of the needs it can address are considered.

3. Individual Use Cases and Business Benefits

Most organizations will start to deploy Business Video in order to meet a specific and well-understood need. Such initiatives have the benefit of not only being supported by a sound business case, they also serve as a low risk entry to video, and the means to develop a better understanding of its benefits as user acceptance grows.

The following use cases focus on discrete Business Video applications that can be regarded almost as stand alone solutions, as opposed to the 'integrated solutions' that feature in Section 4 of this document.

3.1. Cisco Unified Communications Video

Video conferencing is the ideal medium for effective communications between geographically dispersed teams. When a team uses video conferencing as an alternative to traditional voice conferencing, the added value of non-verbal communication such as body language and eye-to-eye contact can make the difference between a meeting that is successful and one that is not. For example, when a presenter is able to see the reactions of their audience, the result is a superior experience for both the presenter and the audience.

Figure 1. Cisco Uniifed Communicaitons comprises a suite of solutions

Cisco Unified Communication solutions contains a suite of products aimed at media rich and video based communication (see Figure 1). With a number of video endpoint options and support for many protocol solutions, IP Video Conferencing (IPVC) provides options that enable point-to-point, multipoint and other collaboration experiences.

Video within Cisco Unified Communications uses the following main components:

- **Endpoints**: Endpoints are any devices that capture or display video. Cisco offers a wide choice of endpoints to provide businesses with the flexibility they need to meet the broad range of needs they face. They range from traditional dedicated video conferencing stations, to integrated software clients that run on a user's desktop through to Cisco TelePresence, a High Definition (HD) solution that delivers the ultimate immersive experience.
- **Call Control and Scheduling**: IP video conferencing is often considered an extension of traditional voice services. The call control infrastructure already in place for voice services can readily be reused for video call control as well. Users can book conferencing resources easily through their usual office groupware such as Microsoft Exchange or Lotus Notes that are integrated into the video conferencing system.
- **Conferencing Services**: A multiparty IP Video Conferencing session is initiated much like a multiparty voice conference call. A unique conference number is scheduled and given to all participants. All endpoint sessions are connected through the MCU (Multi Conferencing Unit), which also converts the different protocols and video formats. Importantly, these technical functions are invisible to users who simply have to be at their chosen endpoint.
- **Professional Services**: Cisco and its ecosystem of certified partners provide a comprehensive portfolio of end-to-end services and support that can help increase the business value and ROI from a company's network. This approach defines a minimum set of activities needed to help the customer successfully deploy and optimize a solution that meets their unique needs. Building a solid plan to align business priorities with technology strategy is paramount to success. Utilizing a proven methodology and leading practices, these professional services help customers to simplify and accelerate planning and deployment processes, maintain business continuity and productivity, and make full use of existing technology investments.

The deployment of voice and video services over a single infrastructure brings a number of benefits for the organization and the user.

Cost of ownership and operation reduces where traditional data, IP voice and IP video co-exist as it avoids the need for separate networks, duplicated equipment and support resources. A single infrastructure and common video conferencing platform also enable businesses to do things differently and achieve competitive advantage, such as streamlining business processes to deliver a more enriched customer service experience in order to retain and win customers. For users, Cisco Unified Communications brings together a range of features; from voice, to video, and even presence (where the real-time communications status of other users is known), to create a media-rich, interactive, collaborative environment.

3.2. Cisco TelePresence

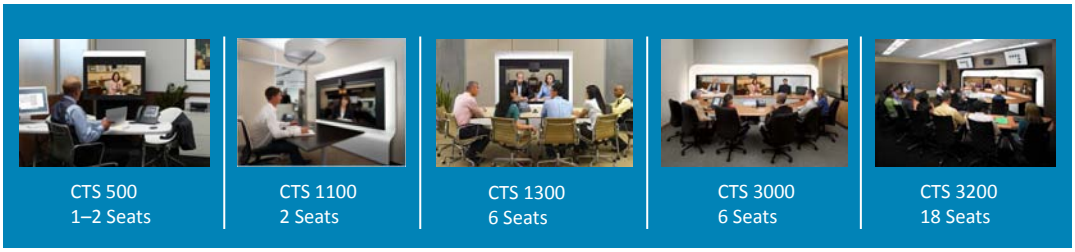
Cisco TelePresence is an evolutionary breakthrough technology that is designed to allow interaction and collaboration with a near "in person" meeting experience. The systems are designed around HD video and high fidelity to deliver a real-time, lifesize, face-to-face experience.

It is widely accepted that face-to-face meetings yield significantly better results than voice-only communication technologies. If the same face-to-face experience can be achieved without the need for actual travel, the result is cost savings, higher productivity, scalability and time claimed back to all participants. And as an integrated part of the Unified Communication family, Cisco TelePresence provides a number of additional benefits beyond those of traditional video conferencing. These range from easy-to-use, "one button start" session set up and integration with groupware calendars, to the development of specific solutions for healthcare and retail banking environments.

The Cisco TelePresence suite of products comprises four main components:

- **Endpoints**: HD screens and cameras, and codec systems, support collaboration and external image sources. Cisco TelePresence systems are available in a variety of configurations, from single screen/single camera for individual use, through to multi-screen/multi-cameras built into a dedicated room (see Figure 2).

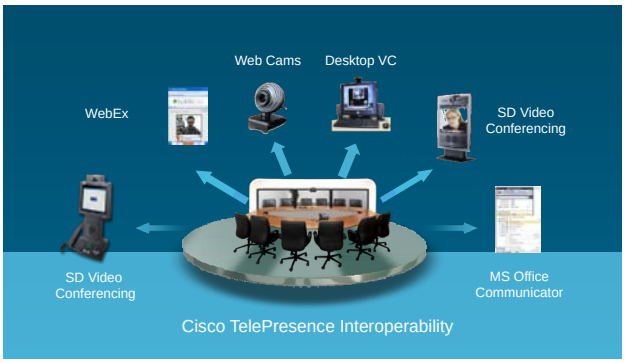
Figure 2. A variety of Cisco TelePresence endpoints are available.



- **Unified Communications and Scheduling Integration**: Cisco TelePresence is a natural extension of an existing Unified Communication infrastructure. Call control is provided by the Unified Communication Manager systems supporting existing IP telephony at the desk. Cisco TelePresence Manager (CTM) controls scheduling, management and reporting capabilities, with full call detail recording. CTM integrates with most enterprise groupware applications, including Microsoft Exchange and Lotus Notes, and also offers a scheduling Application Programming Interface (API) for other systems. This provides seamless session scheduling and 'one button to press' connection.

- **Interoperability and Multi-use Functions**: Not all conference requirements are point-to-point. Cisco TelePresence is designed for multi-point operation with as many as 48 separate TelePresence segments (incoming feeds), and interoperates with existing IP video conferencing systems through a Multipoint Conferencing Unit (MCU) bridge. By using the auto-collaboration channel, all presentation, desktop, and even Cisco WebEx sessions, can easily be shared with other TelePresence participants. (see Figure 3)

Figure 3. Cisco TelePresence has been designed to ensure interoperability with other Business Video systems.



- **Professional Services**: With Cisco Services and appropriate planning, the TelePresence system can be integrated into the network and optimized for future expansion while also delivering a lower Total Cost of Ownership (TCO). A system design and implementation plan aligned to business need can enable greater user acceptance and utilization, leading to increased ROI, and Total Economic Impact (TEI).

3.3. Physical Security

- With the migration of many proprietary (closed) technologies to a more open and flexible IP network, Cisco now offers a network centric surveillance and access control solution for physical security. Cisco's physical security products can be deployed and integrated to protect existing investments in older analogue technology, while leading the way towards full digital integration and multi-vendor device interoperability. Professional Services play a critical role in the successful planning, design, deployment and ongoing operation of video surveillance technology. Services help customers achieve the full benefits of the solution, and to protect existing and future video surveillance investment.

Networked physical security comprises two main functions: access control, and cameras and video surveillance.

- **Access Control** provides a scalable solution using modular hardware to provide an electronic interface to card readers and door locks. Each gateway module is capable of interfacing to two doors and the IP network and, subsequently, the Physical Access Gateway Manager server. Access control integration though the Gateway Manager provides flexible access policies and integration to Microsoft Active Directory, to allow control, monitoring and reporting of building or room access.

- **Cameras and Video Surveillance**, often referred to as Closed Circuit TV (CCTV), is another area where migration to an IP network has extended the use and functionality of a traditional safety and security application to other business functions. Cisco's video surveillance solution provides IP cameras and also supports analogue cameras, Standard Definition (SD) and HD IP-based digital surveillance cameras. It also supports operations and media managers, and a comprehensive API that allows integration with many third party analytics software vendors. A network module for the Cisco's industry leading Integrated Services Router (ISR) family, supporting up to 16 analogue or 32 digital surveillance cameras, further enhances deployment options.

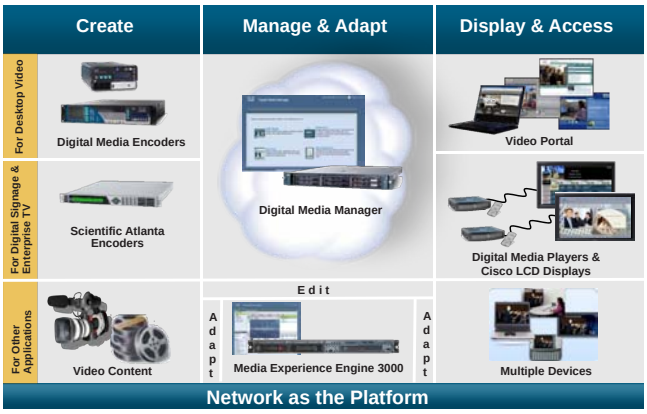
Figure 4. An integrated system approach to deploying surveillance can reduce installation and operating costs.

With an integrated system approach (as featured in Figure 4) to deploying surveillance on a single IP network, reusing the existing communications infrastructure can reduce installation and operation costs. With features like Power over Ethernet (PoE), network based monitoring for quick failure detection, and "any location" access to live or archived feeds, new uses can be found for systems that have traditionally been used only for safety and security purposes.

3.4. Digital Media System

Digital Media System (DMS) is a comprehensive suite of digital signage, Enterprise TV, and desktop video applications that allow companies to use digital media to increase sales, enhance customer experiences, and facilitate learning. DMS enables organizations to gain maximum ROI by facilitating the re-purposing of content and multiple Business Video applications running over the same infrastructure (see Figure 5).

Figure 5. Cisco DMS provides a comprehensive digital media solution, from content creation to display and access.



For example, a university campus could use its DMS to not only deliver e-learning, but also paid-for IPTV to on-campus student dormitories. The power of the network to reach all users, combined with the DMS's ability to manage different formats intelligently, means that video can be integrated to create seamless workflows, from capture (be it by a camera or video conferencing system) through to distribution to various endpoints.

Cisco's broad partner ecosystem provide access to a wide range of complementary expertise and resources—from solution development to content creation—that helps to ensure a successful digital media implementation.

The DMS family includes:

- **Cisco Digital Signage**, which provides a scalable, centrally managed, publishing system for delivering high-quality content to networked, on-premise digital signage displays. These solutions provide instant and timely impact, with new content pushed to the digital media displays at one or multiple locations practically instantaneously.
- **Cisco Enterprise TV**, an interactive application enabling the delivery of on-demand video and live TV channels and broadcasts over an IP network to digital displays, taking advantage of the same hardware used for Cisco Digital Signage. Enterprise TV allows an existing signage system to become an on-demand training, or a live event, system for common areas such as building foyers.
- **Cisco Desktop Video**, which gives users access to on-demand videos and live webcasts at the desktop. People can browse, search, and view digital media over the web anywhere, anytime through a unique, easy-to-use Cisco Video Portal experience.
- **Media Experience Engine (MXE) 3000**, which extends the scope of a DMS deployment without increasing the content creators' workloads. Users only need to create content: the MXE will then automatically produce versions in different formats as required. The MXE is a network-embedded appliance that transcodes content to alternate media formats and performs basic editing and can add trailers or headers based on corporate policy—all through a drag and drop functionality.

To ensure that the video and rich media is transported efficiently across an existing IP network, Cisco has validated the integration of Business Video DMS into Wide Area Application Services (WAAS) and content delivery solutions like ACNS (Application and Content Network Services). These options ensure that content can be pre-positioned to localized storage out of hours while normal traffic is at its lowest.

A range of Professional Services helps customers accelerate business transformation and achieve the full benefits of their DMS. These services not only encompass planning, design, deployment and ongoing operation, but also content development services help customers create and transform digital signage content to support their communication goals and deliver the right visual experiences.

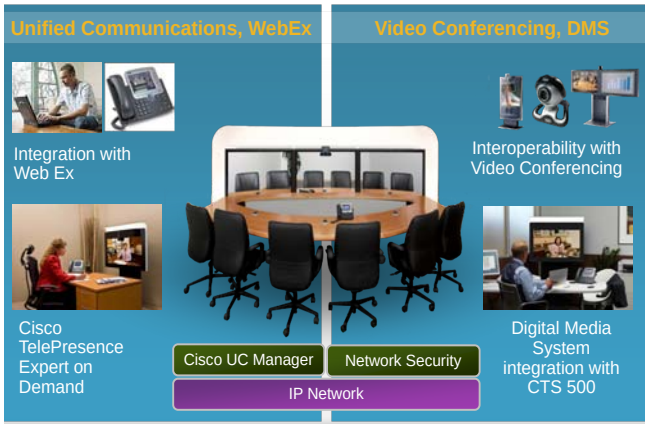
The value of digital media is widely accepted. The challenge is to simplify these assets in terms of cost control and business value. Through a centralized approach to management, creation, distribution and reporting, DMS enables media rich advertising, and personalized content to be developed and shared in an easy and repeatable manner.

4. Integrated Use Cases: Bringing it Together

Most companies will start to utilize Business Video through the deployment of one or two applications. In the past this was typically using propriety systems that were difficult and expensive to scale, and virtually impossible to integrate with other applications.

Today that siloed approach is a thing of the past for those companies that recognize the ubiquity of IP and the power of a media-ready network architecture to provide an enterprise class infrastructure able to scale Business Video across the entire organization. Companies may still enter the world of rich media through one or two applications that meet specific needs, but if those deployments are treated as part of an holistic approach to Business Video they will be part of a journey to fully utilize its power, rather than destinations in their own right (see Figure 6).

Figure 6. Creating an immersive collaborative experience.



The following Business Video applications are available today. Systems such as DMS can already be leveraged to deliver a wide range of applications to add to the value already delivered by those video investments. Users themselves will unlock even greater value as they start to experiment, to collaborate even more effectively, as they realize that they are "better together".

4.1. Expert on Demand / Premier Concierge Banking

Expert on Demand is a next-generation collaboration solution that transforms the way organizations deliver high-touch customer and point-of-sale services (see Figure 7). Integrating Cisco Unified Communications, and Cisco Unified Contact Center, the solution leverages the unique, immersive "in person" experience of Cisco TelePresence so that organizations can create customer experiences with unprecedented intimacy and differentiation far beyond traditional methods. Expert on Demand enables organizations to transform existing service business models and deliver tailored "on-demand" customer experience. At the touch of a button, a service specialist or product expert is ready to provide an in-person service experience like never before[1].

Figure 7. Expert on demand can transform business service models

1. Allowing customers to access expert advisers over an ultra-high-definition video link could improve cash flow by more than US$100 million across a typical 1,000-branch retail banking network. (Source: A leading British bank.)

By using Expert on Demand to connect customers with specialists, companies can transform themselves, for example, by:

- Improving customer service
- Improving productivity
- Creating consistency of message and experience
- Differentiating the video experience from online alternatives
- Strengthening customer relations / Reduce customer waiting times.

Figure 8. The same screen can be used for different applications, from signage, Enterprise TV to TelePresence.

Each TelePresence screen, when not being used for meetings, can also be used as a Digital Media System display to deliver Digital Signage or Enterprise TV services (see Figure 8). This not only lowers the TCO of both solutions within a branch by maximizing the investments between different assets, it also extends the range of services and information available to both customers and employees.

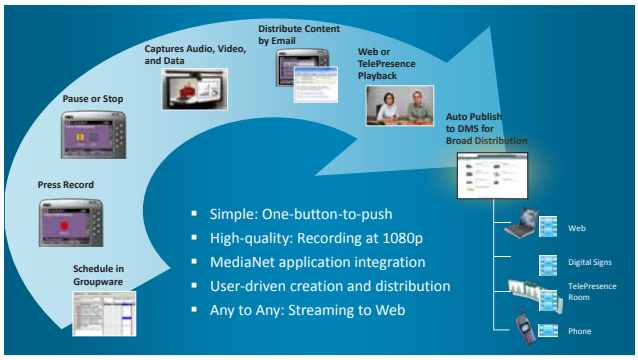
By providing customers with timely access to the expertise and information required to make decisions (regarding complex financial products, for example) video communications, such as Cisco TelePresence and DMS, will play a major role in improving customer relationships and services. This helps to build consumer loyalty by enabling rich and regular communication between customer and their relationship managers.

4.2. Cisco TelePresence Studio

Cisco TelePresence Recording transforms Cisco TelePresence units into HD recording studios. Using an intuitive user interface on the existing Cisco TelePresence IP phone, users can record high-quality video to deliver rich, immersive messages for internal and external communications, such as training or crisis management. Distributing and viewing video content is easy and recordings can be replayed on Cisco TelePresence endpoints, or on standard browser-based desktop players.

The recording facility creates a whole new category of opportunities. The Cisco TelePresence room becomes a production studio, transforming the content over the network by leveraging the Media Experience Engine and then pushing it over the Digital Media System suite. In this way video captured by Cisco TelePresence becomes the content for digital signage, desktop video, or enterprise TV services, and adds value far beyond that of a conferencing system. Studio mode operation provides onscreen prompting, and visual aids, that make the recording experience comfortable and easy-to-use. Recorded content is ready for immediate playback, allowing the user to review the recorded session immediately upon completion, and then to distribute that content to the appropriate parties.

Figure 9. Cisco TelePresence and Digital Media System: an end-to-end Business Video solution.



This holistic approach to Cisco TelePresence leverages both the investment in Business Video and the underlying network (see Figure 9). Network services, such as built-in security, integration with call control, mobility, and Web 2.0 applications deliver greater TEI, with high-quality video applications delivered over the network as flexibly as data or voice. In addition, the recording capability can be harnessed to create strong competitive differentiation. Organizations will be able to leverage different assets (Cisco TelePresence and DMS) and services (Collaborative Video and Broadcast Video) and integrate them together in innovative ways in a media-rich environment in which video will become as familiar as email communications.

4.3. Interactive Queue Management

One of the key operational challenges is how managers can track the performance of employees in real-time and receives prompt information on in-branch sales status. Queue management systems are first and foremost not just for simple ticket dispensing (to tell a customer that it is their turn for service) or queue management, but much more. These systems should be designed to both track performance and to also help monitor and improve underlying sales efficiency and cross-sales achievement.

Figure 10. Interactive Queue Management combines "front office" video with "back office" systems.

By integrating "front office" Business Video assets and "back office" systems over the network, it is possible to add real intelligence to queue management (see Figure 10). For example, the type of content shown on digital signs might vary with queue length. People moving in a fast queue may only have time to see a short advertisement; those in a longer queue have time for more informative content. RFID-enabled loyalty or other cards could be used to differentiate content and service to individuals, drawing on the analytics and data held in back-office systems.

Interactive Queue Management is a good example of the benefits of Cisco's partner ecosystem approach. The integration of DMS with ecosystem partner companies, like Onlinet, delivers a fully dynamic and flexible customer queue management system enabling:

- Calling of customers, transaction closing, priority management, forwarding function, waiting list management, change of service
- Web-based statistical and monitoring functions, closing code system, management of transaction notes, selection of administrator, user-rights management
- VIP customer management with credit card reader and RFID tags
- Preliminary registration modules — personally, by phone, via the Internet or Short Message Service (SMS)
- Participant meeting reminders via SMS
- Ticket dispenser screen editor module (advertisements, marquees), ticket editor module
- "Dashboard" Management Information System for customized monitoring and statistics.

The ability to receive accurate information promptly on sales in-branch status, while leveraging DMS as a platform for communications, yields an immediate ROI as well as a lower TCO. For example, one bank has integrated its Digital Media System with a queue and customer management system from Onlinet, to show dynamically Foreign Exchange currency rates, queue called numbers, and Touch-screen displays[2]

4.4. Emergency Messaging

Every business wrestles with the challenge of cutting costs while improving the customer service experience. At the same time, the need to ensure people and assets are safe and secure has to be met.

A holistic approach to Business Video can help address these different needs by leveraging the assets that may already be in place. For example, many companies will install digital signs in order to deliver advertising. However, if these assets are on the network and the systems are all connected, then this advertising asset could be transformed into something used for emergency notifications and directing people inside a building during an emergency.

2. http://www.onlinet.hu/hu/news/show/48

Figure 11. An holistic approach to Business Video means that displays can serve a range of needs, from signage to emergency management.

This integration could be delivered for controlling emergency messages directly to IP Phone services located in the branch (leveraging Cisco ecosystem partners, such as Nevotek), or even more directly, fed by the video surveillance systems with video analytics intelligence. (see Figure 11)

The flexibility of such as system is of particular interest to airports and rail stations to both keep the traveling customer better informed on a day-to-day basis, and also during a public safety situation. In fact, Emergency Messaging is of value wherever people congregate, be it in a shop, a bank, or a sports stadium.

Emergency Messaging enables:

- Cost reduction and process optimization: the same assets used for commercial communication are extended to drive safety and security communications, leading to savings during implementation.
- Improved customer experience: people will receive prompt emergency communication using the same assets where they receive advertisements — that is, in high-profile locations situated where they can be easily viewed by the majority of people.

4.5. Cisco TelePresence Business-to-Business Communications

The 21st Century is seeing the emergence of the borderless organization. It is a phenomenon that is affecting, to a greater or lesser extent, virtually all companies. Globalization has progressed hand-in-hand with extended supply chains, outsourced processes, and virtualized operations, all brought together and supported by advances in networking technologies.

Cisco TelePresence is proving a powerful means of enabling companies, and their customers and partners, to collaborate more effectively together, without the cost and difficulty of scaling those interactions through traditional face-to-face meetings that demand attendees are physically in the same room.

With an inter-company Cisco TelePresence solution, businesses can now use existing networks to have a virtual meeting with anyone, at any time. For example, two Wall Street financial companies can arrange a merger for their distant clients by holding joint, confidential, and frequent “face-to-face” meetings. Global manufacturing companies can conduct cross-functional meetings that include suppliers and partners without waiting for people to travel. Pharmaceutical companies can meet with physicians and patients together during drug trials. Inter-company Cisco TelePresence makes it possible for a company to bring together its customers, suppliers, or partners face-to-face around “one table” in a highly secure environment: within minutes, with no travel time or cost, and with access to the information they need to make better decisions, faster.

4.6. Cisco TelePresence Interoperability

While Cisco TelePresence provides tremendous value by both accelerating the pace of business and bolstering productivity, customers are just beginning their rollouts and may already have other conferencing solutions in parts of the organization.

Cisco supports a bridging strategy during rollouts, by providing the ability to bring the vast majority of video conferencing systems, even desktop, into a Cisco TelePresence meeting at standard or high definition quality.

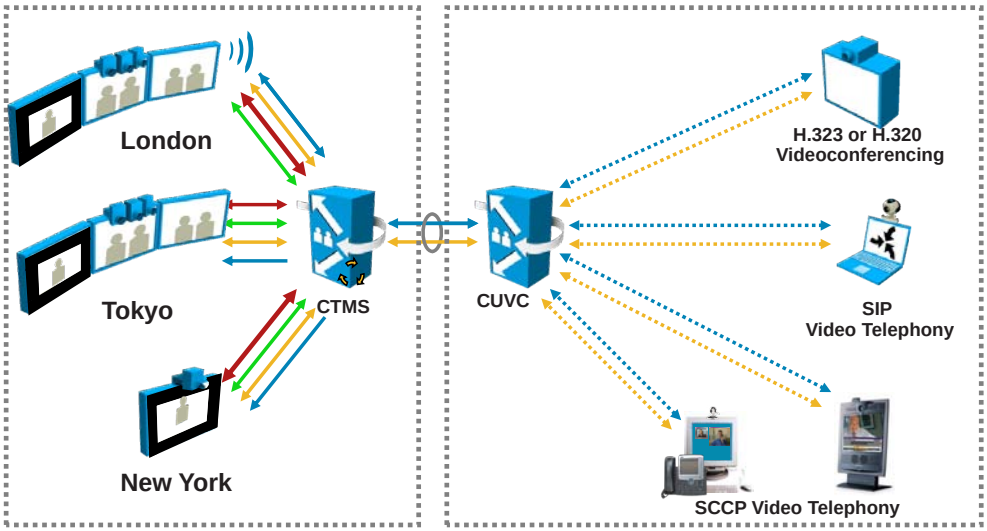
Figure 12. Interoperability ensure that existing resources are maximized.

Cisco TelePresence interoperability (see Figure 12) allows the Cisco TelePresence endpoints to deliver a video stream that can be displayed by a existing H.323, SIP, or SCCP video conferencing endpoint, and vice versa. Cisco TelePresence interoperability uses Cisco Unified Video Conferencing (CUVC), Communications Manager, and the Cisco TelePresence products, to deliver a fully network-based solution to connect to Cisco TelePresence and video conferencing endpoints.

Any standards-based video conferencing endpoint will interoperate with Cisco TelePresence. This includes endpoints from Polycom, Tandberg, Sony, Aethra, VCON, PictureTel, VTel, Huawei, and Microsoft. It also includes video endpoints from Cisco like Cisco Unified Video Advantage (CUVA), Cisco Unified Personal Communicator (CUPC), and the Cisco7985 IP Phone (see Figure 13).

The business benefit is clear. Interoperability provides customers with a bridging strategy to both grow their Cisco TelePresence rollouts while maximizing existing resources. While traditional video conferencing cannot provide a true "in person" experience for end users, interoperability allows customers to expand collaboration to the widest possible audience.

Figure 13. Cisco TelePresence interoperability allow the integration of different endpoints into conferences.



5. Integrated Use Cases: Innovation—New Ways of Doing Things

Business video is already having a dramatic impact on collaboration and business processes. The pace of change and the value derived is being driven in no small measure by the ability of the network to support the integration of video with other systems and assets. The following use cases represent the power of that integration to not only streamline or improve existing processes and communications, but to actually innovate new ways of doing things.

Importantly, they do not represent "blue sky" thinking that is dependant on the development of key enabling devices or technologies. The following are achievable today, using commercially available and proven components.

5.1. Enhanced Dynamic Signage

Most organizations are looking to proactively reduce threats rather then having to react to them or changing information for customers based on specific behaviors. Some enterprises have experimented with the ability to integrate video surveillance video flows directly into displays commonly used as digital signs. Having a digital signage display in a public window showing what is happening outside the branch, for example, reduces both the threat to the organization as well as increasing the protection of its assets.

This facility delivers increased TEI by linking the DMS digital signage and Cisco Visual Surveillance Manager (VSM), to third-party analytics software (such as ObjectVideo or TruMedia) (see Figure 14). For example:

Figure 14. Third-party analytics software can help create exciting new Business Video applications

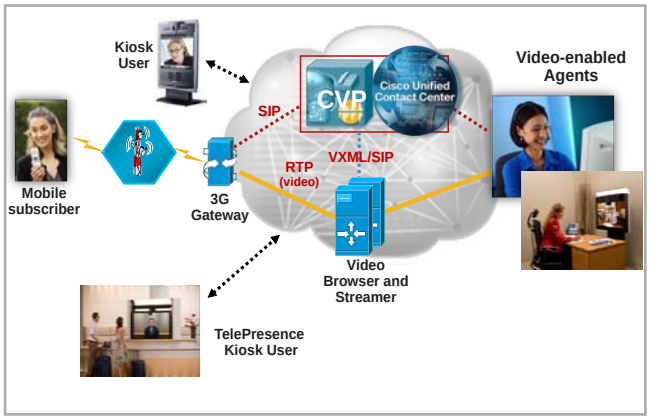
- if a security breach or situation arises that might be a threat to customers or staff, the Cisco Digital Media Player (DMP) would stop showing advertisements and start to present video flows from IP video surveillance cameras. Screens could display what was happening at key locations and then show instructions to help direct people to safety. The same system could also help the Police to see what happening inside the building, thereby helping them to make better decisions, faster
- the same concept could apply to project content specifically focused on a well-defined audience or a group of people behaving in a certain way. Analytic software could monitor factors such as people's walking patterns, gender and other parameters to determine what should be shown, where.

In addition to better managing what is displayed, enhanced dynamic digital signage improves customer satisfaction and staff morale through the perception of improved security due to great visibility.

5.2. Video Contact Center

Reducing time-to-trust and the ability to convey how-to information quickly are among the key performance indicators for contact centers (see Figure 15).

Figure 15. A Cisco Unified Video Contact Center will deliver new levels of customer service xperience.



Research has demonstrated that 53 percent of a person's perception of trustworthiness is based on behavior and body language, meaning that people trust what they see, rather than what they hear (audio contributes just seven percent towards the overall impression)[3]. This explains why video can literally say more then a1000 words in just 15 seconds.

This fact has dramatic implications for the call center, especially when one recognizes that most mobile phones have video capture facilities and the ability to easily transmit video over the public network.

The Cisco Unified Video Contact Center architecture leverages existing investments in Business Video and unified communications to create a contact center with video-enabled agents, and the ability to stream content either from agents, or even to make a caller's wait in a queue more interesting.

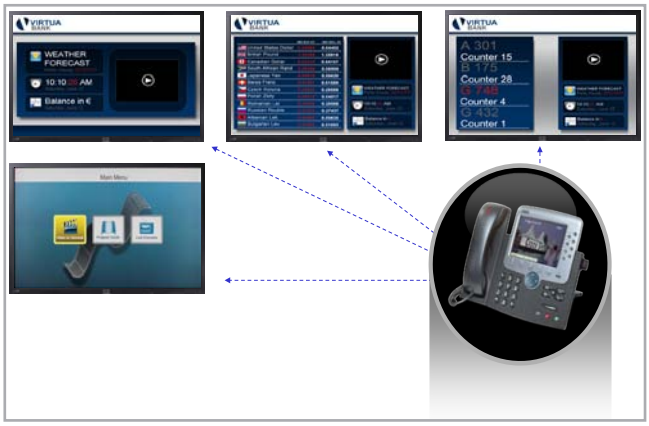
3. Landmark study by Dr Albert Mehrabian

The ability to operate a video enabled contact center will realize a tremendous impact for contact center operations and performance now[4] and in the near future.

5.3. Content Control and Command: IP Phone Services

Another good example of how different Business Video solutions work together in a very simple way is the integration between DMS, and the ability to drive training or communication Video on Demand (VoD) over an Enterprise IPTV system, through an XML IP Phone interface.

Figure 16. An IP Phone can become the remote control for a Digital Media Player.



Embedding a Digital Media Player's remote control into the phone service — as opposed to controlling it through a classic remote control device — both eliminates the need (and cost) of the device, but also enables the phone's display to better guide the user and offer additional functions (see Figure 16).

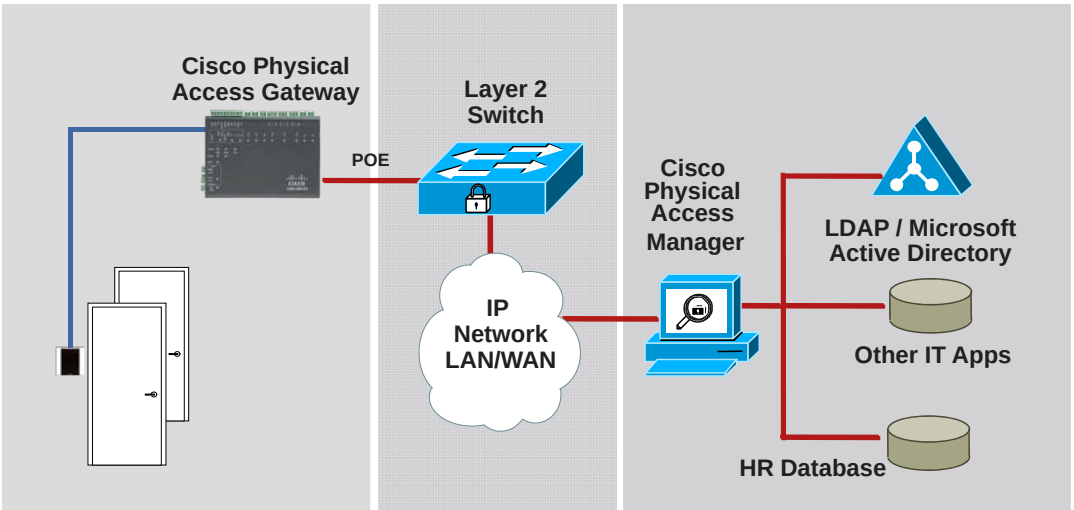
This type of integration transforms the IP phone into a centralized control device, not just for video, but also for other systems, such as environmental and security control, which also seeing increasing integration with Business Video capabilities.

5.4. IP Smart Access Control

Cisco's Physical Security solution has the ability to convert badge readers to IP and link back to a single database. (For example, using a Lightweight Directory Access Protocol (LDAP) directory, an Internet protocol that email and other programs use to look up information from a server.)

This represents a tremendous opportunity to consolidate user profiles into a single database, used for logical and physical access. It also enables integration with XML IP Phone services to lock or unlock doors, to record specific video clips from a surveillance camera based on door-activity events, and even to control the environment (see Figure 17). By "badging out" of a room, a chain of events can be triggered, such as turning off lights, beamers, phone, office air-conditioning and even LAN switch ports.

Figure 17. Smart Access Control systems utilize a single database and can integrate both IP Phones and video surveillance.



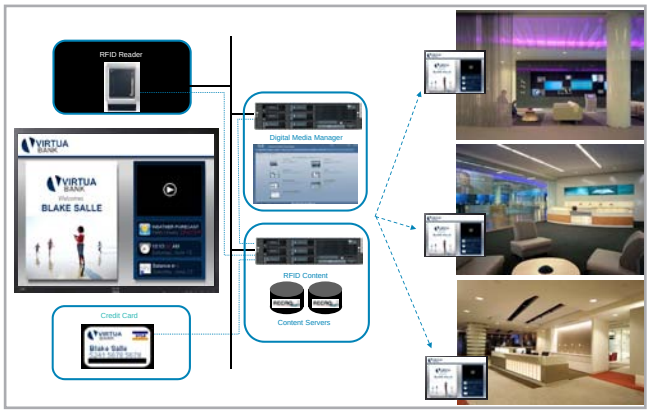
4. SignVideo (www.signvideo.co.uk) is currently running a video enabled contact center in the UK and amongst others, provides translation service to the deaf and disabled

Such a system is a win-win for all. Consumers have greater control of their environment (and help in how to exercise that control); infrastructure TCO is greatly reduced as key components such as the network are reused; physical security is improved, which brings occupants greater peace of mind (and often a reduction in security personnel), while lower operational costs and better environmental sustainability is achieved through better energy management.

5.5. Visitor Guidance

Specific Cisco ecosystem partners, like Recronet, take advantage of Cisco DMS that is integrated with RFID. This enables a direct screen update based on external events, like RFID activity or location. One straightforward application is to link an RFID tag to a customer's badge and make a screen adaptive and smart, based on who, or what, is present in the surroundings of this screen. This application is commonly used at large audience events to quickly guide many people to their destination room, to check attendance ratios, or to send customized messages to certain people.

Figure 18. Integrating RFID and Cisco DMS can create an intelligent visitor guidance system.



Faced with increasing competition and the need to protect margins, companies are increasingly seeking to transform themselves in order to deliver superior customer experience. Content personalization is the most compelling route to delivering better service through demonstrating greater relevance to customers (see Figure 18). This is why a smart signage solution, with DMS integrated with RFID, can deliver a compelling proposition for a company and its customers.

6. The challenges of deploying video

Today, deploying and integrating voice onto the IP network is comparatively simple.

However, doing the same for the many video applications that are emerging highlights the limitations of existing network infrastructures in terms of the architecture designs and video friendly functions.

In the past, different types of traditional delivery methods—from satellite, to DVDs, to dedicated coaxial cable networks—were needed for different types of video. Today, it is possible to deliver different business solutions on a single IP network, which offers both lower operation costs and the opportunity to do business in new and innovative ways.

Even so, different video media applications have different networking characteristics. For example, Cisco TelePresence (as it is a HD real-time interactive application) requires high-bandwidth and low latency/low loss paths. Solutions like Digital Signage, or Video-to-the-Desktop, require only limited amounts of bandwidth; but factor in the implications of requesting joint streaming to many endpoints and large quantities of bandwidth are consumed. However, the use of streaming technologies means that traffic flows (often unidirectional) are less sensitive to latency and jitter.

Each different type of media application: video conferencing, HD content distribution, surveillance and so on, needs to be identified and classified within the existing communication infrastructure to ensure the quality of experience. Even with classification mechanisms in place, the infrastructure itself must be able to act, by prioritizing and routing in the most efficient and optimal method. Quality of Service (QoS), classification based routing, and traffic prioritization, are all infrastructure features that need to be considered when designing a media enabled communication network.

Once video media applications have migrated to a single network, a new set of opportunities emerges. Video used in one technology can be used in other media systems, or by other applications, providing exciting opportunities to reuse content in new ways.

The movement of video across a network, however, presents several challenges for the network and therefore impacts the ease of deployment and the end user experience. These challenges include flow predictability, maintaining performance, quality of experience, endpoints, content, and infrastructure security. These different factors can only be successfully anticipated, and managed, through a cohesive strategy to deliver integrated media solutions, where media intelligence has been embedded in the network infrastructure, distribution mechanisms, applications, endpoints, and overall solution fabric.

"Bottom-up" versus "top-down" media application deployments are also a challenge. Closely related to the social-networking growth of media applications, corporate users have increasingly driven certain types of media application deployments within the enterprise from the "bottom-up." This is where the user base either demands, or just begins, to use a given media application with or without formal management or IT support. Similar bottom-up deployment patterns have been noted for other Web 2.0 and multimedia collaboration applications. In contrast, company-sponsored video applications are pushed from the top-down (that is, the management team decides and formally directs IT to support a given media application for their user-base).

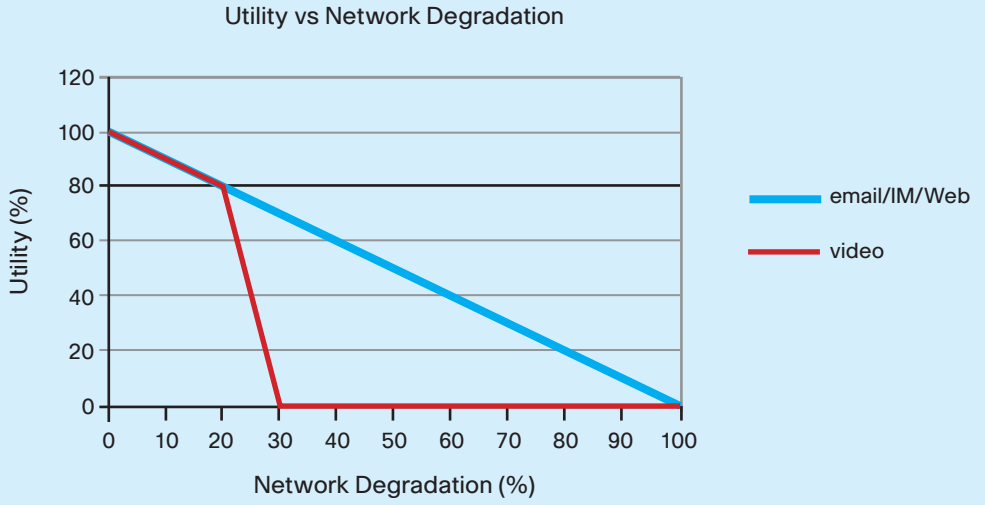
The proliferation of top-down and bottom-up media application places a heavy burden on the IT department as it struggles to cope with both officially-supported and unofficial (but very popular) media applications.

As video becomes the dominant data type, traditional IP networks are not well equipped to deal with its interactive and real-time demands. Initially, existing networks need to be optimized by tuning existing features to support video. In the longer term, new or enhanced technology development is required to make a network "media intelligent". In all cases, the business reason for adopting video and collaboration technologies is the experience, that is, collaboration is an "experience technology".

In terms of their network characteristics, experience technologies do not degrade gracefully. There is not a linear relationship between the amount of network degradation or delay and the perceived quality of experience. Once delay, packet loss, and jitter exceed visible thresholds, the usefulness of streamed video quickly drops to zero because it becomes unintelligible and unwatchable. The "experience" it creates becomes non-existent.

In the graph below (see Figure 19), a comparison of the usability between traditional data-based applications and video is shown. As the network degrades, while it is possible to maintain traditional communication at some levels, this is impossible for video and interactive media.

Figure 19. Network degradation has a significant impact on video and interactive media.



Put simply, video is a very demanding application that immediately exposes any weaknesses in the network.

7. Medianet: Providing the Foundation for Integrated Business Video

The growing use of video on networks requires a more intelligent approach. Delivering new video experiences will place additional demands on IP networks in terms of performance, adaptability, and manageability.

Networks will need to scale and deliver an optimized quality of experience: but this objective introduces additional complexity. Networks that were designed for an era of best-effort (data and voice) delivery, low-bandwidth, and high latency, will not work for video. A network that is designed for video has an additional benefit that it will support many other rich media types as well as traditional voice and data services.

Networks have always evolved to respond to new requirements, from intranet to extranet, to Internet, and now to medianet: an intelligent network optimized for rich media.

A medianet is a media-optimized network, comprising advanced, intelligent technologies and devices. A medianet will emerge within the home, businesses, and service providers, all interlinked to deliver a more visual, more social, more personal experience for users. Medianet is an evolution of converged IP networks: by adding to, or evolving, current infrastructure technologies, a platform is created which is optimized for the delivery of rich media experiences.

A medianet has the following characteristics:

- **Media-aware**: capable of detecting and optimizing different media types (video, audio, and so on) to deliver an optimal quality of experience
- **Endpoint-aware**: A network that is capable of detecting and configuring media endpoint focused services automatically
- **Network-aware**: Intelligent video endpoints, able to detect and respond to changes in network path, connection, and service availability.

By being media and endpoint aware, a medianet provides a better experience to the end user, use network resources more efficiently and minimize complexity for the IT organization.

A medianet extends traditional IP technologies by adding protocols and devices to:

- Deliver predictable performance
- Automatically adapt to varying network conditions
- Optimize video playback by adapting signaling and media.

In addition to infrastructure and device development, there are more generic areas to address in the unique challenges of video and rich media:

- Content Virtualization
- Mobility
- Session control
- Security
- Management.

7.1. A Medianet: Evolving the Network

Once media intelligent technologies are available for both endpoint devices and the infrastructure itself, there will be a natural evolution of existing infrastructures.

This evolution to a medianet-enabled architecture will ensure predictability, performance, quality and security in all video areas. There will not be a requirement to build new or overlay specific networks as all medianet devices will continue to coexist with legacy IP infrastructure for some time.

This future development may take a number of years, and for many companies it will be appropriate that they adopt video technologies slowly. A medianet may also evolve accidentally, as part of an enterprise life-cycle change out of existing systems. However, for some companies, the challenges of video networking are already becoming apparent as they adopt video as part of their ongoing business transition strategy. For these customers other solutions are needed while full medianet technologies are developed.

Initially, the first steps are to investigate how the new media applications behave and compare that with the capabilities of the existing networks. Once this information is available, customers will need to determine which part of their legacy IP networks would need to be reconfigured, possibly taking advantage of existing, but disabled capabilities (QoS, multicast, connectivity and availability) and which parts must be upgraded.

Cisco offers a Medianet Readiness Assessment (MRA) service that will help customers better prepare for this evolution into supporting a rich media environment. The MRA analyzes the existing infrastructure against business solutions the customer wants to implement. It provides a documented recommendation on the delta between "now" and "required". These professional services can be extended beyond prepare, plan and design, to full implementation, operation, and optimization enabling a successful and step-wise migration to a medianet.

The value of professional services in supporting planning and optimization cannot be underestimated, however, as video quality is only as good as the weakest link.

In addition to the MRA and other deployment services, Cisco has published a collection of design guides, white papers and documented use cases for each video solution area. The intention is to help customers build a media ready network and establish a firm foundation for medianet service deployment in the future.

8. Looking into the Future

With a medianet, different applications work together and integration and interoperability will continue to evolve to support more robust services. By building a platform and medianet architecture today, companies will have investment protection and insurance that future applications will be supported.

This medianet platform will become the launch-pad for innovation.

Some of the uses already being developed include:

- On Stage Presence services where Cisco TelePresence will move from a two-dimensional immersive solution into a 3D immersive solution mimicking Star Trek-like situations with holodecks or holograms. If this sounds like science fiction, watch it actually happening here on YouTube: http://www.youtube.com/watch?v=rcfNC_x0VvE
- Automatic and Dynamic Translation services where in a multipoint conference with different parties globally dispersed, everyone will be able to speak and listen in their own native language. In 2009 at the "Networkers" exhibition, Cisco's Chairman and CEO, John Chambers, demonstrated machine-based, (near) real-time translation services for communications across geographic barriers.
- Cisco TelePresence Public Dial tone and Residential Cisco TelePresence are on the route map. In the future, the ability to set up a Cisco TelePresence session as easily as it is to pick up a phone and make a call today will revolutionize the way businesses and consumers communicate and interact.

For further information

As data, voice and IP video converge; video is emerging as a major force for business transformation. While each company and organization will judge for itself the speed and exact path it will take towards harnessing Business Video, success will come from an holistic approach. Only by being aware of the potential synergy between assets, applications, and the needs of different groups of users, will the full potential of Business Video be realized. The medianet is a vital enabler of such a holistic approach, touching as it does all users, assets and applications.

Cisco is committed to the development of standards-based Business Video enabled over a medianet. It has the people, products and partners to help ensure that its customers are best able to take full advantage of this coming communications revolution, as cost-effectively and with as a low risk, as possible.

For more information about how Cisco can help you benefit form Business Video go to: www.cisco.com/go/businessvideo

Alternatively, call your Cisco Account Manager.

APPENDIX A – Glossary

ACNS - Application Content Networking System

CCTV - Closed Circuit TV

CUVA - Cisco Unified Video Advantage

CUVC - Cisco Unified Video Conferencing

CTM - Cisco TelePresence Manager

CUPC - Cisco Unified Personal Communicator

CUVC - Cisco Unified Video Conferencing

DMS - Digital Media System

DMP - Digital Media Player

DMM - Cisco Digital Media Manager

VP - Video Portal

ETV - Enterprise TV

DME - Digital Media Encoder

MXE - Media Experience Engine

H.323 - An umbrella Recommendation from the ITU Telecommunication Standardization Sector defining protocols to provide audio-visual communication sessions on any packet network.

HD - High Definition

IPVC - Internet Protocol Video Conferencing

LDAP - Lightweight Directory Access Protocol

MCU - Multipoint Conferencing Unit

MRA - Medianet Readiness Assessment

QoS - Quality of Service

RFID - Radio-frequency identification

ROI - Return On Investment

SCCP - Skinny Client Control Protocol

SD - Standard Definition

SIP - Session Initiation Protocol

SMS - Short Message Service

TCO - Total Cost of Ownership

TEI - Total Economic Impact

TP - TelePresence

VoIP - Voice over Internet Protocol

VOD - Video On Demand

WAAS - Wide Area Application Services

Web 2.0 - Web technologies, development and design that facilitate interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web.

XML - Extensible Markup Language

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at **www.cisco.com/go/offices.**