Service Strategies

# Guide to New Service Offerings

*Priority Frame™*



# Expanding Frame Relay

## Overview

Since the introduction of commercial Frame Relay services less than six years ago, the number of users embracing this technology has grown beyond industry expectations. Frame Relay's ability to transport data traffic in a simple, economical, and efficient manner has led to this widespread acceptance. Industry analysts predict continued high growth of Frame Relay services. New delay-sensitive applications, including SNA and voice, will drive Frame Relay growth as today's users migrate from leased lines to Frame Relay services.

The catalyst for wide spread migration of these applications will be the delivery of Frame Relay services with Service Level Agreements (SLAs) that offer quality guarantees.

## Service Opportunity

Frame Relay service revenue will grow to $8B by 1999, a compound annual growth rate of 77% over the next three years, as depicted in Figure 1.

## The Need for Value-Added Services

Today's Frame Relay is primarily used for Internet access, Intranet access, and LAN interconnect. SNA and voice, however, are predicted to be major drivers of Frame Relay usage over the next 5 years.

An estimated 60% of the worldwide data traffic is SNA. To date, approximately 20% of SNA users have migrated to Frame Relay, leaving a large market opportunity for converting SNA users to public frame relay. With industry support and the introduction of new voice Frame Relay Access Devices (FRADs), end user demand for Frame Relay voice services has become a hot topic. Over the next four years, major Frame Relay demand will be for SNA and advanced IP, with new voice services beginning to grow. (See Figure 2.)

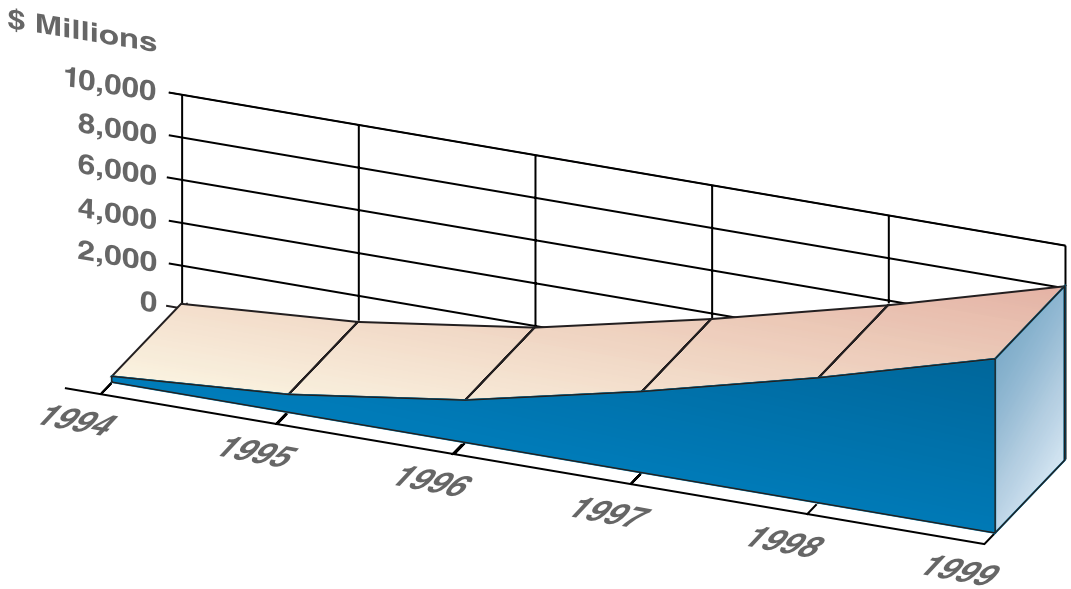



*Figure 1: Worldwide frame relay market — service revenue growth.*

Source: Vertical Systems 1996

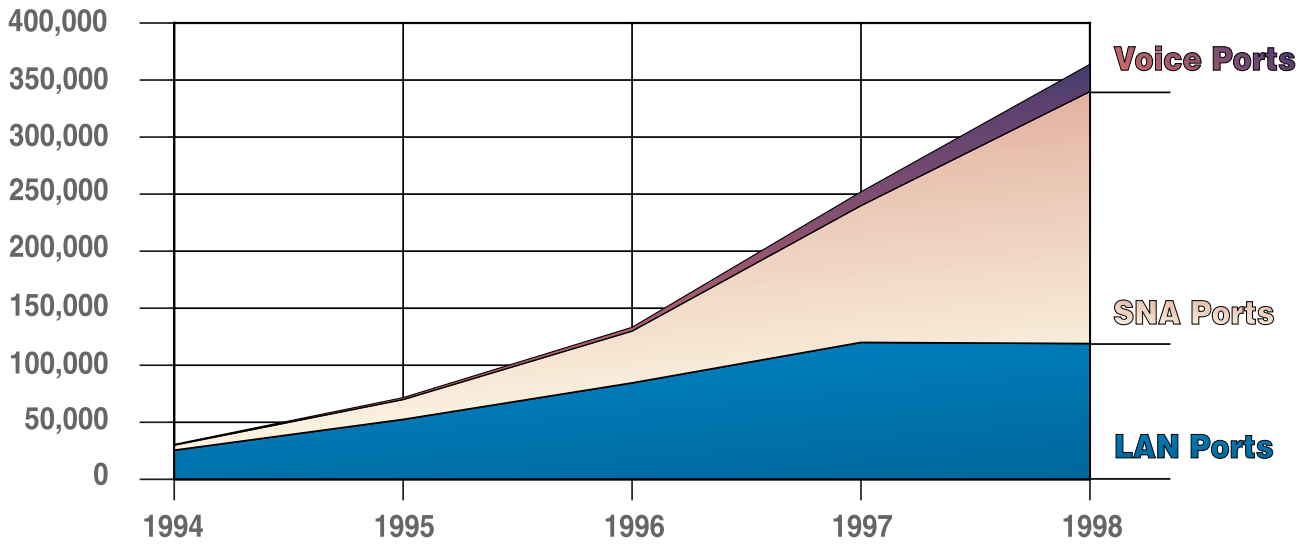



*Figure 2: Growth of frame relay ports by traffic type.*

## Technology Limitations

Today's packet technologies are limited in their ability to cost-effectively and efficiently support delay-sensitive applications. Current Frame Relay services cannot offer the type of network guarantees that users are demanding to support SNA and voice. ATM offers guarantees through its quality of service (QoS) capabilities, however it does not offer ubiquitous low speed access and is more sophisticated than many users require.

A solution is required that will offer network guarantees for throughput and network delay, in addition to being simple and cost-effective.

SNA users are primarily banking and financial institutions, which by their nature are mission-critical environments. Combine their mission-critical service requirements with SNA's delay-sensitive nature, and you have users who require network services with absolute quality guarantees.

Frame Relay offers a simple, cost-effective service delivery option. However, its inherent statistical nature does not allow it to deliver the adequate service level guarantees that are required to satisfy typical voice or SNA applications. SNA and voice, both delay-sensitive applications, are substantially affected by Frame Relay's inherent delay variation. In public frame relay environments with mixed data types, large LAN frames traversing the network cause SNA frames to "wait," introducing delay.

With existing Frame Relay technology, corporate IP users have no way to prioritize their traffic. Today, corporate users accessing business information and teenagers downloading video clips receive the same level of access. As companies rely more heavily on the Internet as a business tool, new priority-based access services are required

Frame Relay technology must be expanded to support priority-based services whose characteristics include throughput, delay, delay variation, and frame loss. Different levels of service must be available to meet the needs of different applications. Only these multidimensional network guarantees will provide the kind of service guarantees required for new Frame Relay SNA, voice, and advanced commercial IP services.

## Priority Frame Overview

The Priority Frame™ offering from Cascade Communications Corp. allows providers to specify multiple elements of quality in a Frame Relay service, including throughput, delay, and frame loss. This new technology extends ATM-like QoS to Frame Relay, supporting end-to-end WAN service guarantees. (See Figure 3.)

The Priority Frame service class system enables a new portfolio of service offerings. The following four new service classes (detailed in Figure 4) comprise the service class system:

- Unspecified/Available Frame Rate (UFR/AFR)
- Non-real time Variable Frame Rate (nrt VFR)
- Real Time Variable Frame Rate (rt VFR)
- Constant Frame Rate (CFR)

By providing consistent levels of delay and delay variation, Priority Frame supports an expanded list of Frame Relay services (also detailed in Figure 4) including:

- Mission-critical SNA
- Prioritized LAN Interconnect
- Commercial business class Internet and Intranet access
- High-quality Packetized Voice
- Video Conferencing
- Video Broadcast/Distance Learning

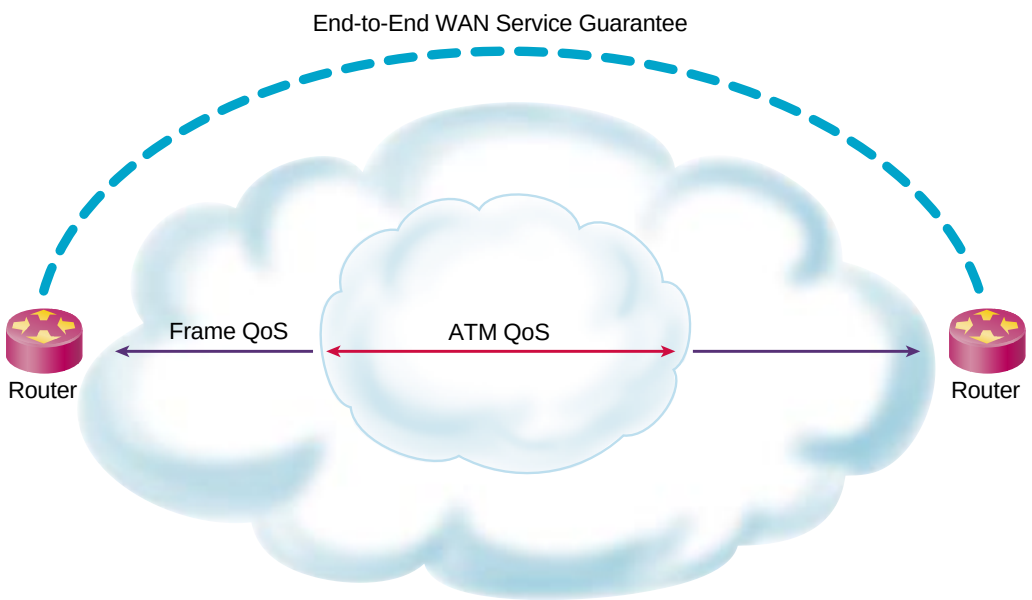



*Figure 3. Priority frame: extending ATM-like QoS to Frame Relay.*

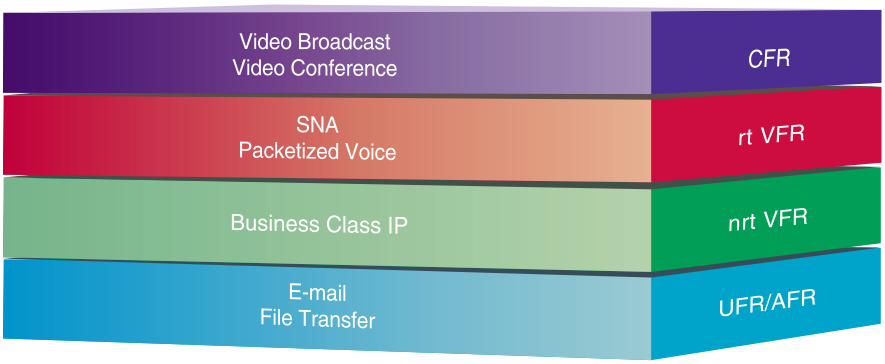



*Figure 4. New service classes enabling new service offerings.*

## Expanded Service Offerings

End users now have new options for service classes and pricing. Further, subscribers running delay-sensitive applications have reliable options for migrating to Frame Relay services. SNA users can move to Frame Relay with confidence, using an SNA Frame Relay service based on rt VFR. Solutions for improving packetized voice quality will be available through rt VFR class Frame Relay. IP traffic will be prioritized at different levels, using nrt VFR for high priority corporate Internet or Intranet access and UFR Frame for lower priority residential Internet access. New options based on CFR or rt VFR Frame classes will be available for corporate video conferencing or video broadcast for distance learning applications.

## Service Provider Solutions

The predicted Frame Relay growth cannot be accomplished on the bandwidth - only Frame Relay service offerings that are supported by today's Frame Relay technology. Today Frame Relay guarantees how much information will be delivered by the network — with no guarantee as to when the information will be delivered. These offerings compete on one dimension — price — providing little differentiation and leaving providers vulnerable to price wars. Eroding prices will make new Frame Relay rollouts less profitable, reducing the ability to leverage the existing Frame Relay infrastructure and operational knowledge.

Frame Relay technology must be expanded from a single service definition to a value-added transport for multiple services. From a single dimensional service to a multidimensional service. This is the function of Priority Frame.

Through Priority Frame, service providers have new, differentiable service offerings. (See Figure 5.)

Priority Frame allows service providers to reliably carry new services over the existing infrastructure. Priority Frame guarantees bandwidth with a new dimension. It agrees to deliver a specified amount of information, within a specified period of time. Services can now be differentiated based on the maximum amount of delay that the network will deliver. New applications with different network delivery requirements can now be supported on Frame Relay. With these new capabilities, Frame Relay moves from a commodity to a value-added transport. Priority Frame allows service providers to differentiate their services, providing new ways to compete other than price. And because Priority Frame is a simple software upgrade, service providers can offer new services quickly and cost-effectively, utilizing the existing infrastructure, generating increased revenue with little added cost, and responding quickly to subscriber demand.

Virtual Network Navigator (VNN) and CascadeView offer service providers powerful tools for provisioning new Priority Frame services. VNN provides quality-aware routing, automatically selecting paths through the network that will support the guaranteed service level. In addition, CascadeView allows service providers to monitor service levels to ensure that the network is delivering the level of quality guaranteed for each service.

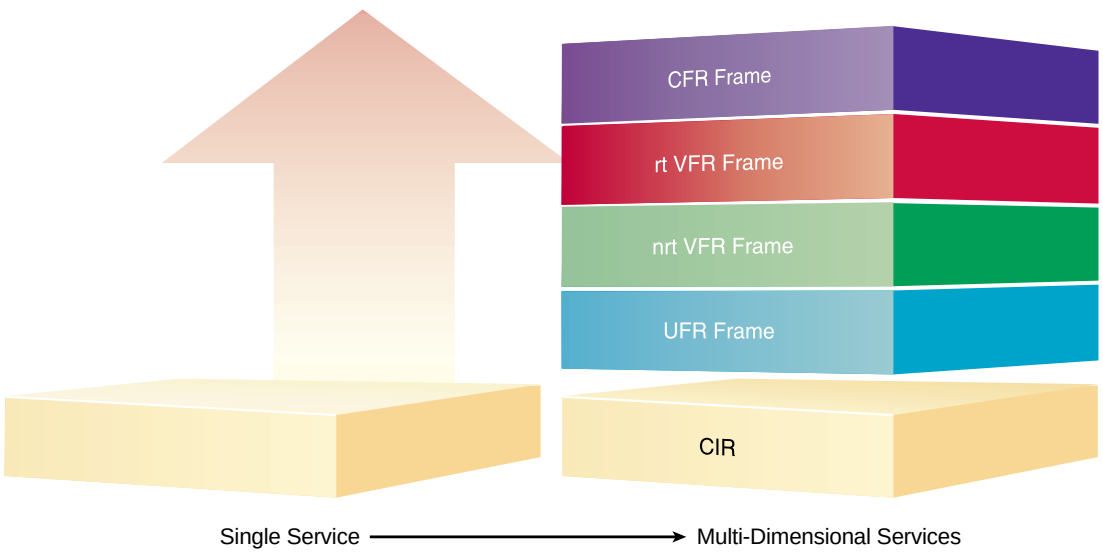



*Figure 5: Differentiable service offerings available through priority frame.*

# Applications and Priority Frame Services

## Priority Frame Services

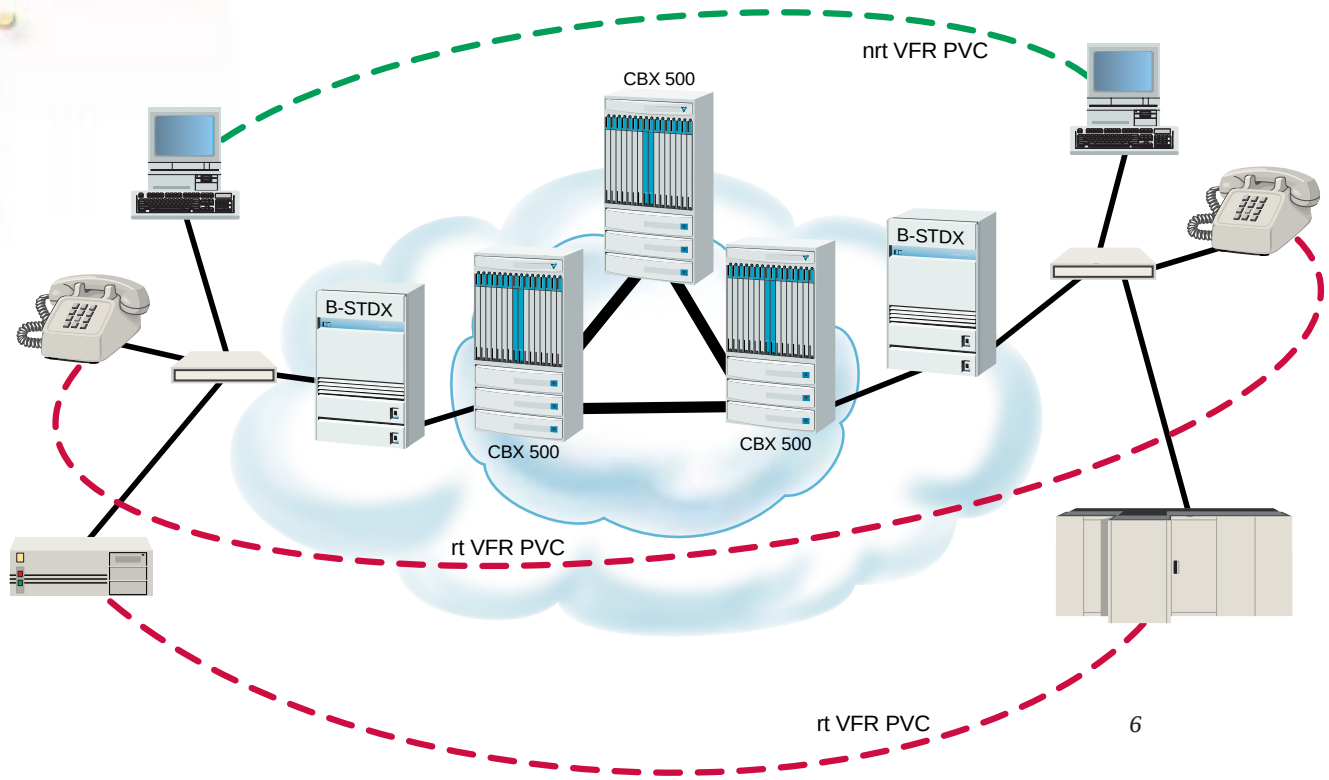
Only Cascade lets you provide these Frame Relay Services:

- Mission Critical SNA Services
- Priority LAN Interconnect
- High quality packetized voice

**Target Subscribers:**
Mission Critical SNA users including Banks and Financial Institutions

As the trend moves to outsourcing network capabilities, the demand for SNA over Frame Relay becomes enormous. However, given the delay-sensitive nature of most SNA applications, many users are reluctant to utilize public services until network delay and delay variance guarantees are ensured. Priority Frame allows service providers to offer network guarantees. The rt VFR services offer minimal delay and delay variance, making them well-suited to SNA applications. Priority Frame service classes also support the other branch office applications, such as voice with rt VFR Frame service, LAN interconnect with nrt VFR Frame service, and file transfer with UFR Frame service. With Priority Frame, providers have a full portfolio of offerings to support branch offices. (See Figure 6.)

*Figure 6: Branch office services:*
*Mission Critical SNA, packetized voice, LAN interconnect services.*



## Differentiated Internet Services

❖ Priority-based Internet Access

**Target Subscribers:**

Internet Subscribers, Internet users

The application in Figure 7 applies Priority Frame to provide unique Internet services. Priority Frame allows service providers to offer guaranteed levels of service based on the user's requirements. Corporate sites can get a higher priority access service with an nrt VFR PVC. Residential users can select inexpensive UFR services.

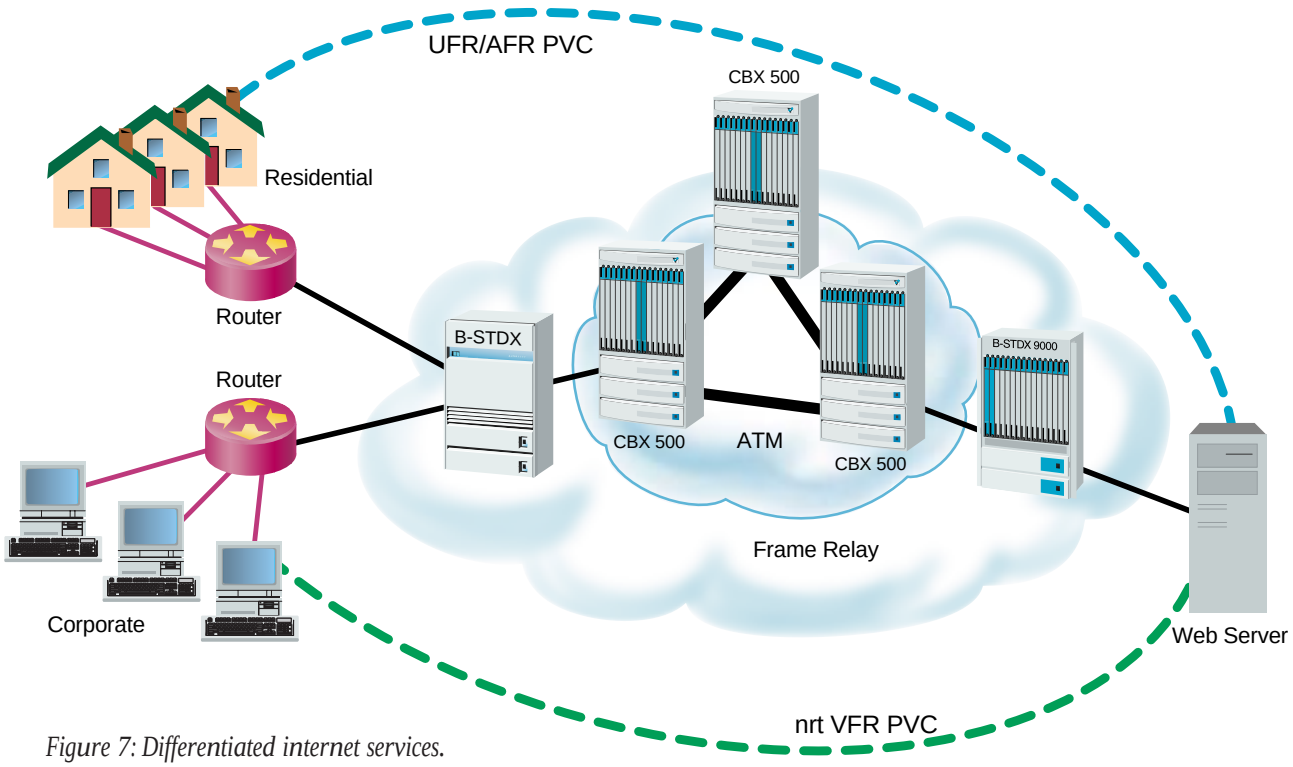



*Figure 7: Differentiated internet services.*

## Video Services

- Video-on-Demand
- Video Conferencing
- Video Broadcast/Distance Learning

**Target Subscriber:**

Corporate Customers with Branch Offices, Educational Facilities

End user demand for video services is growing, requiring service providers to find network delivery tools to handle this delay-sensitive traffic. Three types of applications are in demand. (See Figure 8.)

The first is Video-on-Demand, where users access server-based video clips. The second is video broadcast, where live or taped video is broadcast to multiple locations. This is often used for lectures or distance learning applications. The third application is video conferencing with real time, two-way interaction. This is often a corporate means of cutting travel costs, by allowing remotely located employees to conduct virtual meetings. Priority Frame CFR class of service allows service providers to deliver all three types of video applications.

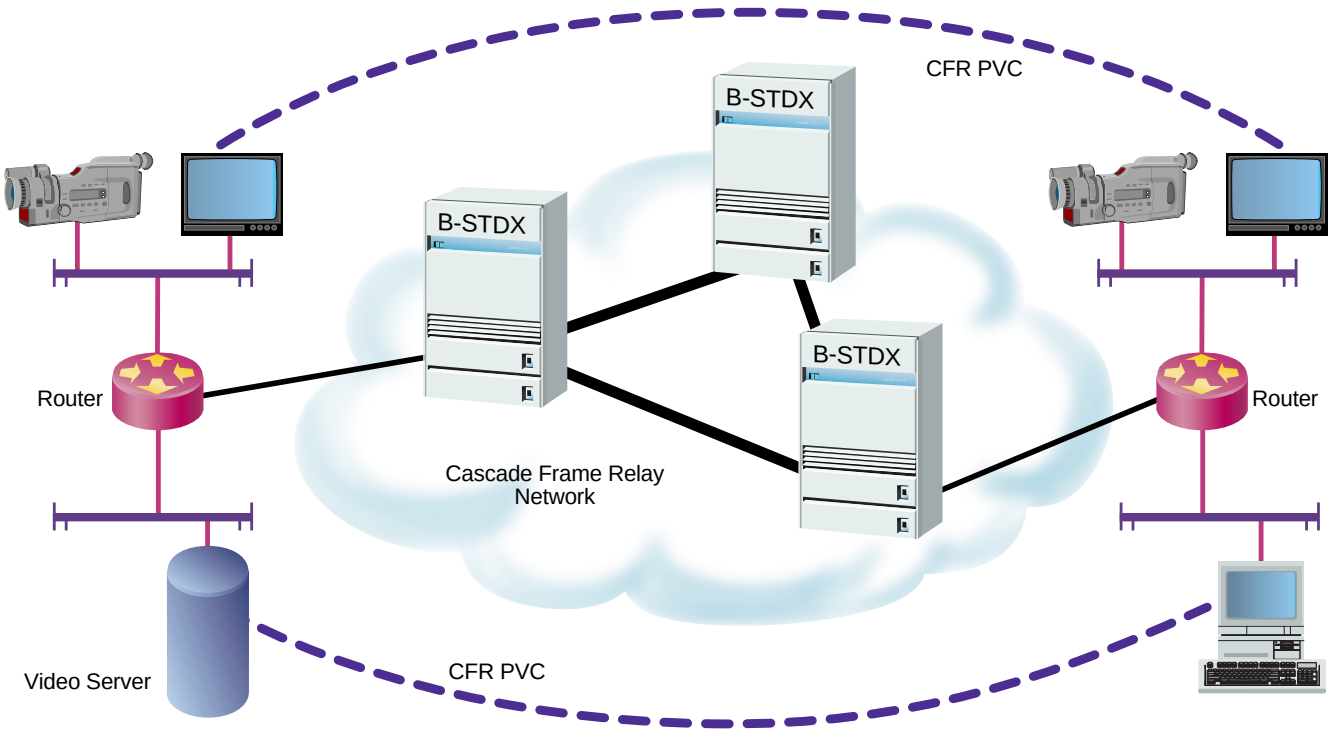



*Figure 8: Video services.*

## Conclusion

To support the demand for SNA, packetized voice, and advanced commercial IP Frame Relay services, Cascade offers Priority Frame, the simple and cost-effective solution delivering network services with absolute quality guarantees. Priority Frame allows providers to specify the multiple elements of quality needed for different Frame Relay services. With Priority Frame, service providers can reliably carry new services over the existing infrastructure. Priority Frame guarantees bandwidth with a new dimension and it delivers a specified amount of information, within a specified period of time. It allows new applications with different network delivery requirements to be supported on Frame Relay, moving Frame Relay from a commodity to a value-added service. And, because Priority Frame is a simple software upgrade, service providers can offer these new services quickly and cost-effectively, generating increased revenue with little added cost, and responding quickly to their subscribers' demands.

**Cascade Communications Corp.**
5 Carlisle Road
Westford, MA 01886 U.S.A.
(800) 647-6926 (within U.S.A.)
Main number: (508) 692-2600
Fax: (508) 692-5052
Internet: mktg@casc.com
Internet Home Page:
http://www.casc.com

***Latin America***
Cascade Communications Corp.
Pembroke Pines Professional Center
9050 Pines Boulevard, Ste. 360
Pembroke Pines, FL 33024 U.S.A.
Phone: 954-450-9922
Fax: 954-450-9733

***Brazil***
Cascade Ltda., Brazil
Av. Roque Petroni Junior,
999 13 andar
Sao Paulo-SP Brazil 04707-910
Phone: +5511-532-2823

***China***
Cascade Communications Corp.
1065 Poly Plaza
14 Dong Zhi Men Nan Street
Dong Cheng District
Beijing 100027 China
Phone: +86-10-6500-7003/7004
Fax: +86-10-6500-7005

***Japan***
Cascade Communications Asia Corp.
MS Bldg. 5F
5-11 Shiba 4-chome
Minato-ku, Tokyo 108 Japan
Phone: +81-3-3798-5181
Fax: +81-3-3798-5180

***Asia***
Cascade Communications Corp.
555 Twin Dolphin Drive, Suite 340
Redwood City, CA 94065 U.S.A.
Phone: 415-595-2520
Fax: 415-595-2404

***Europe***
Cascade Communications Ltd.
5B Foundation Park
Roxborough Way
Maidenhead
Berkshire SL63UD U.K.
Phone: +441-628-828500
Fax: +441-628-825002

***France***
Cascade Communications Corp.
20/22 Rue Louis Armand
75015 Paris France
Phone: +1-44-25-26-07
Fax: +1-44-25-26-00

***Germany***
Cascade Communications Corp.
Hessenring 121
D-61348 Bad Homburg Germany
Phone: +49-6172-925858
Fax: +49-6172-925825

***Spain***
Cascade Communications Corp.
Serrano 240 Planta 5,
28016 Madrid Spain
Phone: +34-1-345-7276
Fax: +34-1-457-2079



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