Live Content Everywhere

Our Mission

Opening the Internet to deliver high quality live content to any glass

Company Overview

Comprehensive knowledge in designing and selling solutions to operators, broadcasters, Teleports, and OTTs

Extensive video and networking expertise ensures the delivery of error-free high quality live content over any network including the Internet

Intellectual Property

- Four patents pending
- Sixteen additional patents in the areas of high quality live video delivery and optimization are in the pipeline

VideoFlow's portfolio

- ✓ Generates new revenue
- ✓ Secures existing revenue
- ✓ Significantly cuts costs

Relieving the Live Content Delivery Pain

VideoFlow's Digital Video Protection (DVP) product line overcomes the challenges of delivering live high quality video over the public Internet

The Public Internet Pain

The Internet is challenging for live video	Delay fluctuations (Jitter) is challenging. Jitter can cause decoders to loose synchronization Packet loss may be a result of the physical link limitations and/or network congestion. Packet loss will cause degradation to the video quality (artifacts)
Secured VPN tunnel is a must	The only way to deliver multicast over the Internet Often requires additional appliances and/or services
Reasonable video quality demands expensive solutions	Commercial grade service level agreement (SLA) Leased lines

But Not Any More…

VideoFlow

VideoFlow's DVP is turning the Internet into a true Live Content Delivery Network (LCDN)

VideoFlow Digital Video Protection (DVP)
New Dimensions, New Possibilities, New Opportunities

Excellent Track Record

Tested and deployed globally by teleports, broadcasters and operators

- Recovered **100%** of lost packets at **35%** network packet loss (Russian Network)
- Recovered **100%** of lost packets and eliminated jitter in a low bit rate contribution (0.5-2Mbps) over **standard A/VDSL Internet connections**
- Eliminated a staggering **1.6sec** jitter in a live broadcast over **Ka band Satellite** (Europe)
- Eliminated 500msec jitter in a **long haul** connection contribution from Europe and the Far East
- Eliminated 475msec jitter in a **seven-hops** network (Eastern Europe)

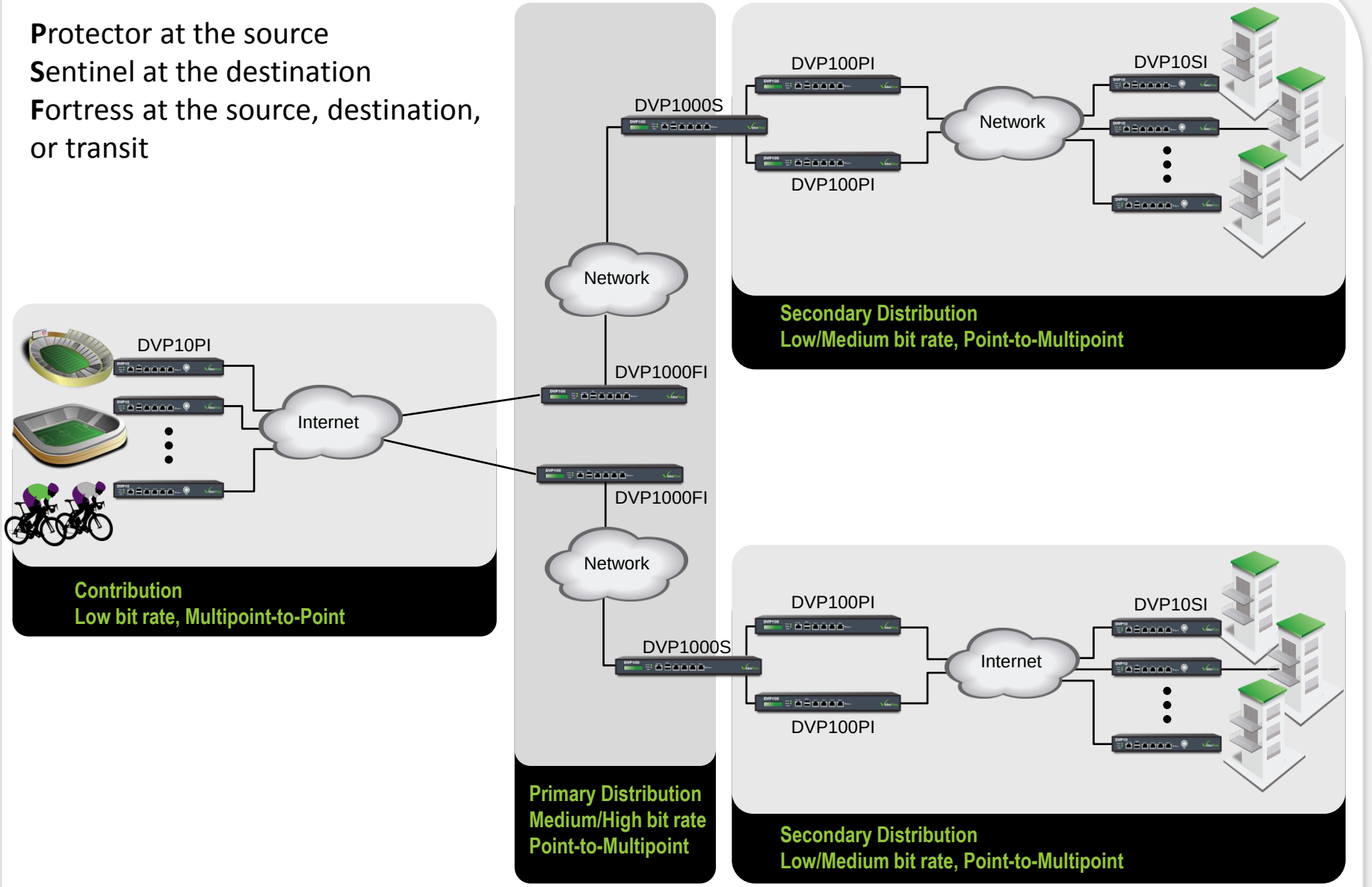
VideoFlow's 3V Technology

VideoFlow 's Patent Pending 3V Technology and Intellectual Property is turning the Internet into error-free live high quality content delivery network

- **VFEC** – VideoFlow Error Correction is making sure high quality video is maintained at all times
- **VFAB** – VideoFlow Advanced Buffering **eliminates** excessive jitter enabling the delivery of live high quality video over long distances across the Internet
- **VPN** – Secured VPN tunneling is the only solution to **deliver** secured live video across the Internet
  - No need for external router to open VPN tunnel
  - No need for premium services from ISP

Digital Video Protection (DVP) Solution's Overview

Protector at the source
Sentinel at the destination
Fortress at the source, destination, or transit



VideoFlow DVP Benefits

1

Generating New Revenue

Enables the flexibility to choose your partners and to open new markets otherwise out of reach as well as enhances existing CDNs with Live Video capabilities

2

Securing Existing Revenue

Lowers the costs of live content delivery, improves margins, and allows offering services at a lower cost easily competing with satellite and legacy transport networks by opening the Internet to carry high quality live content over **long distances**

3

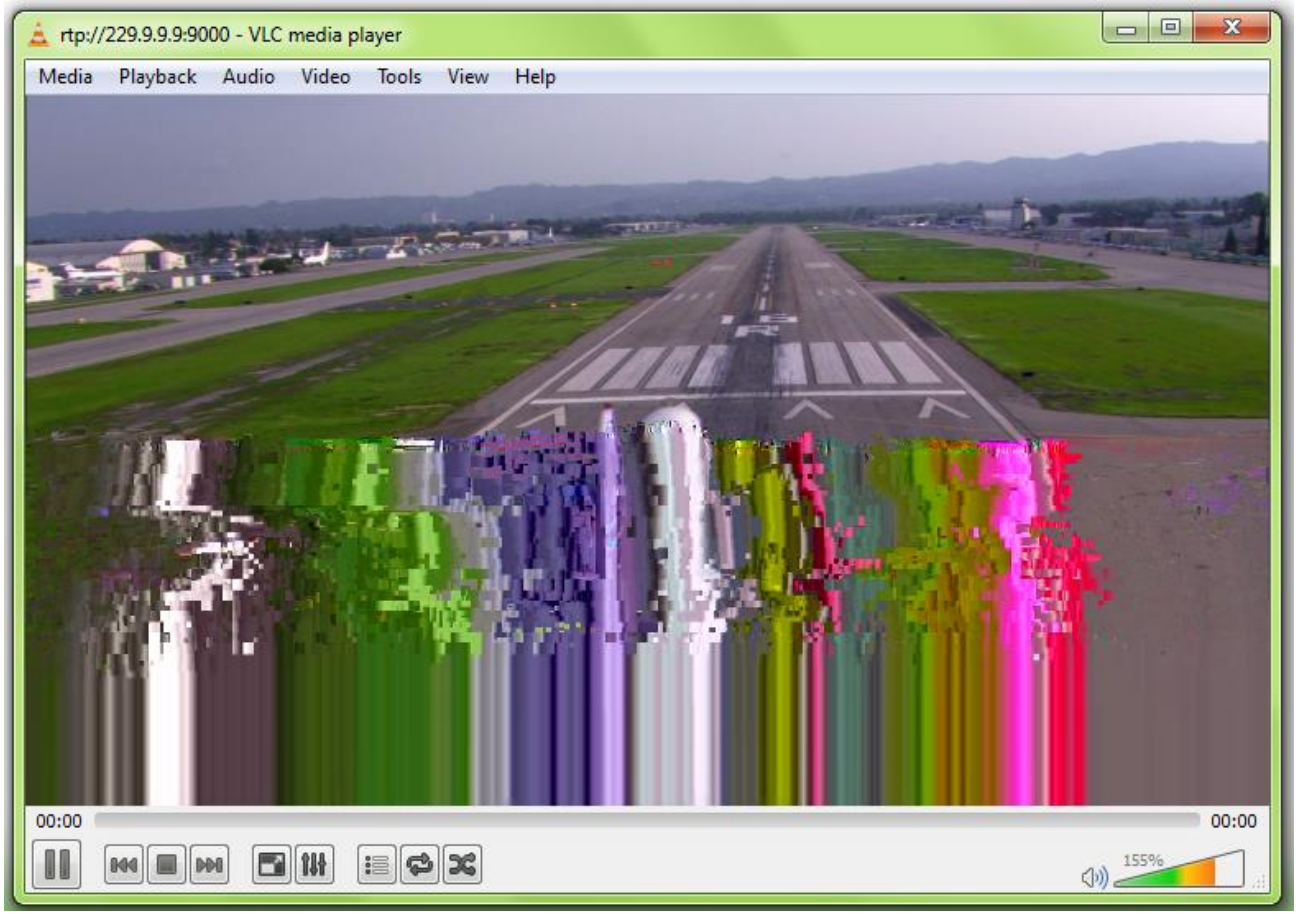
Significantly Cutting Cost

Uses **standard Internet connections** to lower the cost of high quality live content delivery without quality compromise as well as replacing expensive backup or primary leased lines

Live Stream Over the Internet

Packet loss = 1%, Delay = 100msec, Jitter = 50msec
Protection = OFF

Quality of experience is *ANNOYING*!



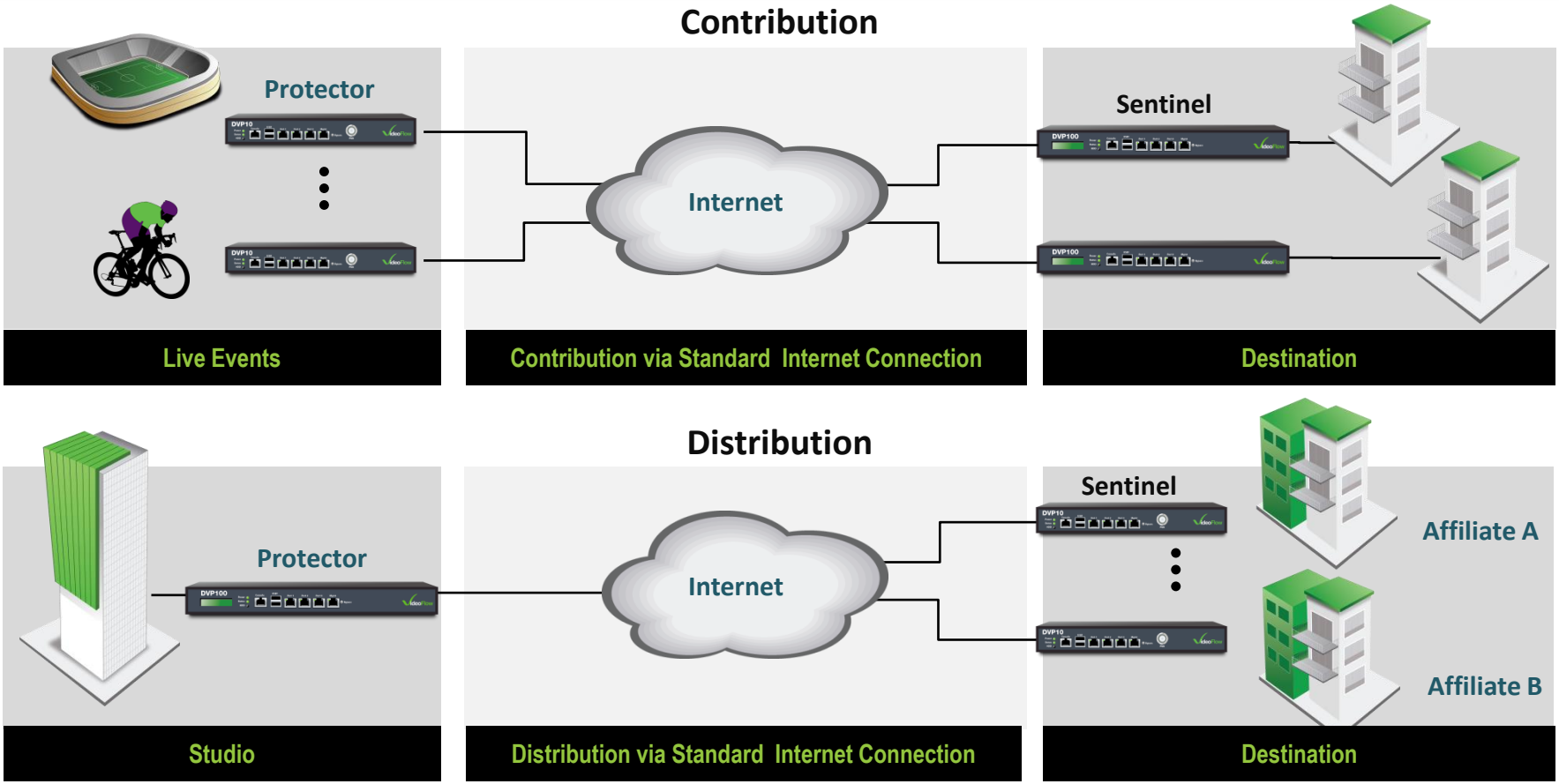
Live Stream Over the Internet – With VideoFlow

Packet loss = 1%, Delay = 100msec, Jitter = 50msec
Protection = ON

Network issues remain but QoE is OUTSTANDING!!!

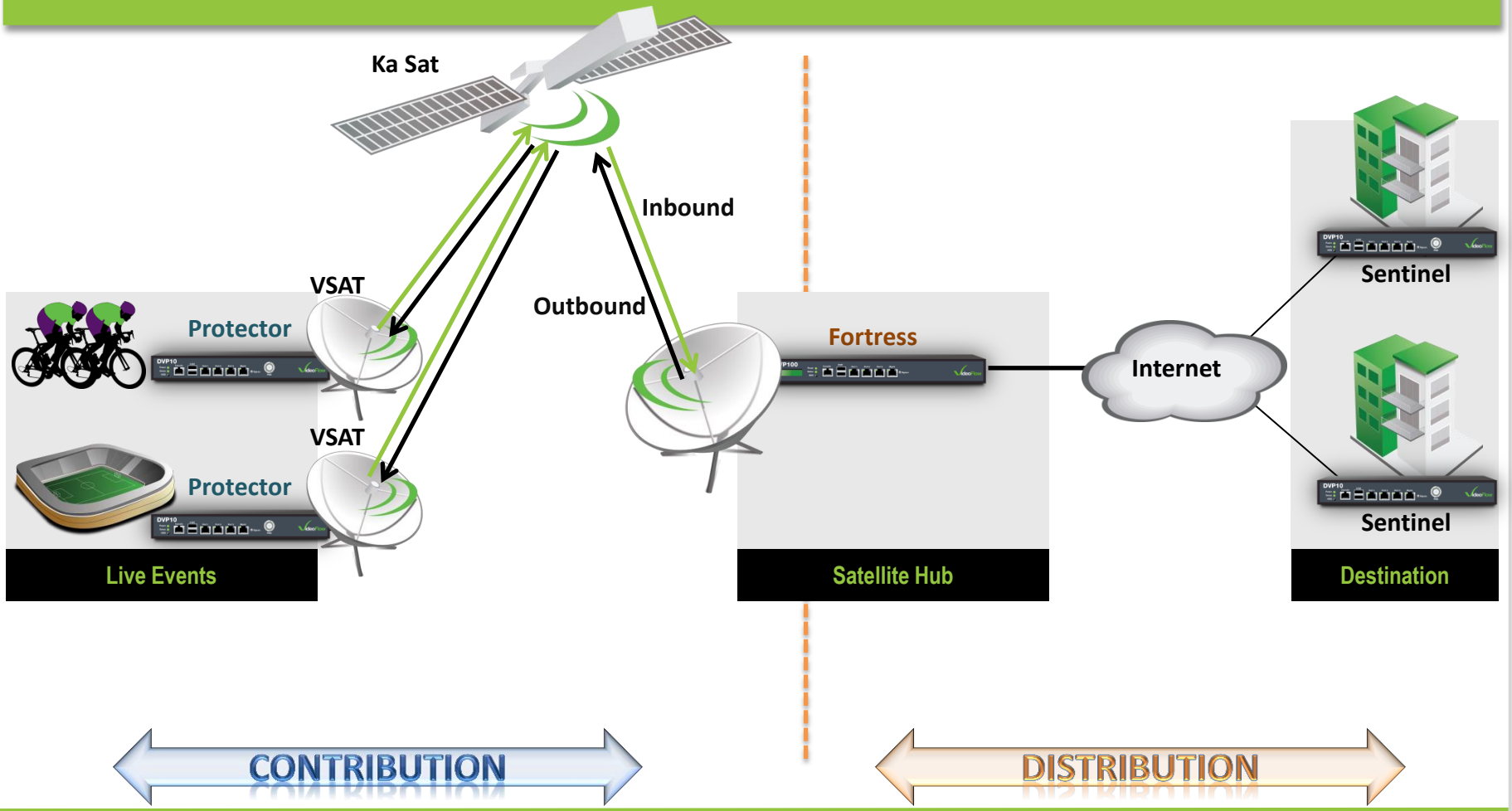
Cutting Costs – Leveraging the Internet

The cost of Live Content Delivery over the Internet is considerably lower than current solution



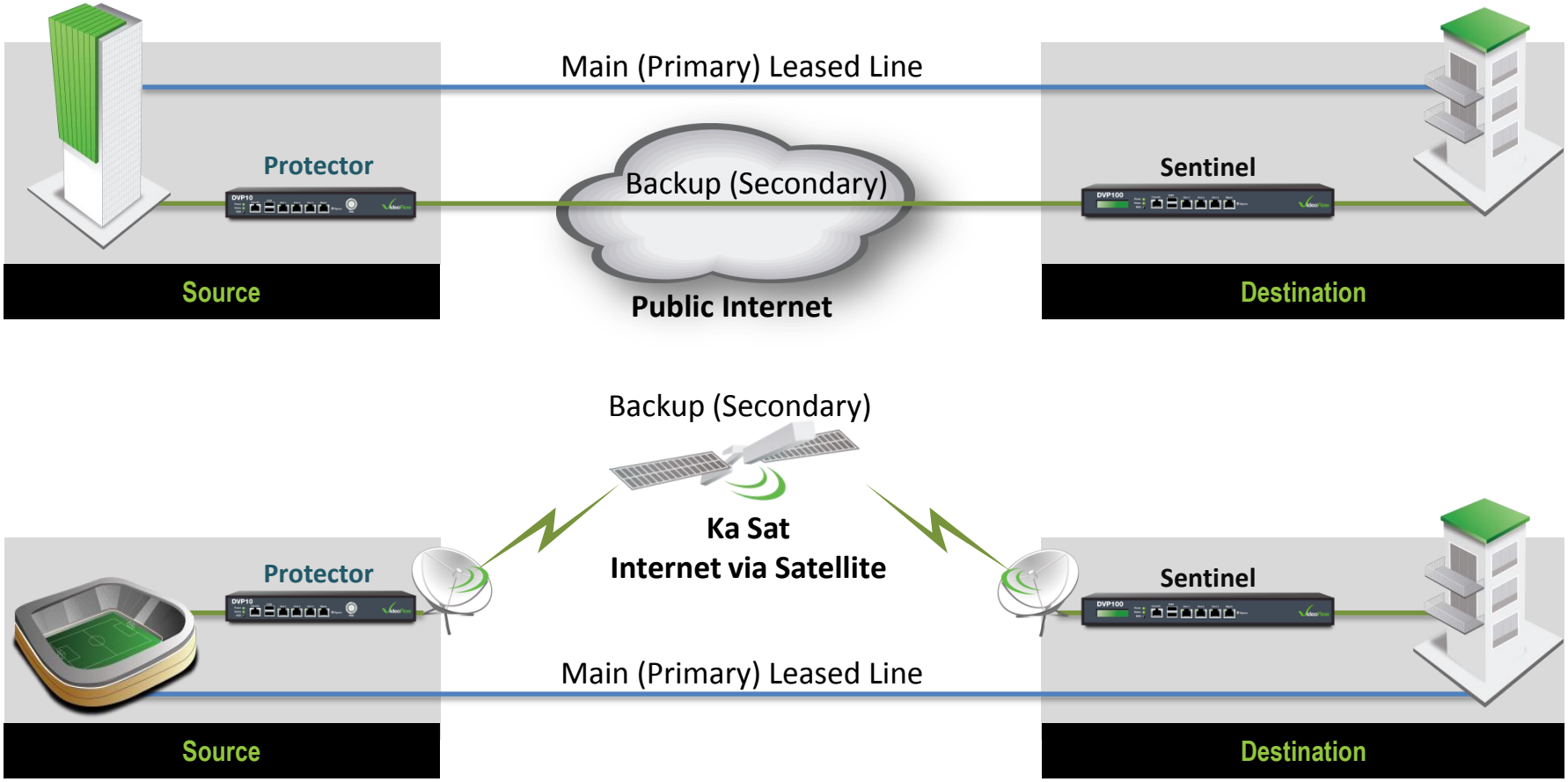
Cutting Costs – Internet via Satellite

Until VideoFlow, using Low-cost Ka Band satellite connectivity for live video delivery was impractical



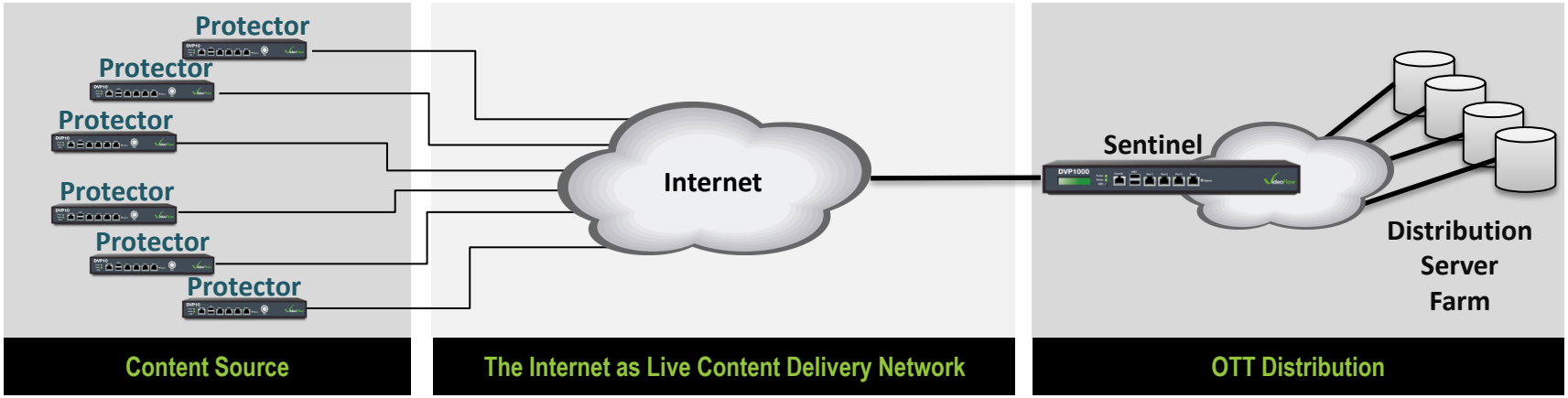
Ensuring 24x7 Lowering Backup Costs

Both primary and backup leased lines are always active
Primary is in use 99.999% of the time, backup only 0.001%, Same OPEX
Leveraging the Internet for backup will dramatically cut your backup cost



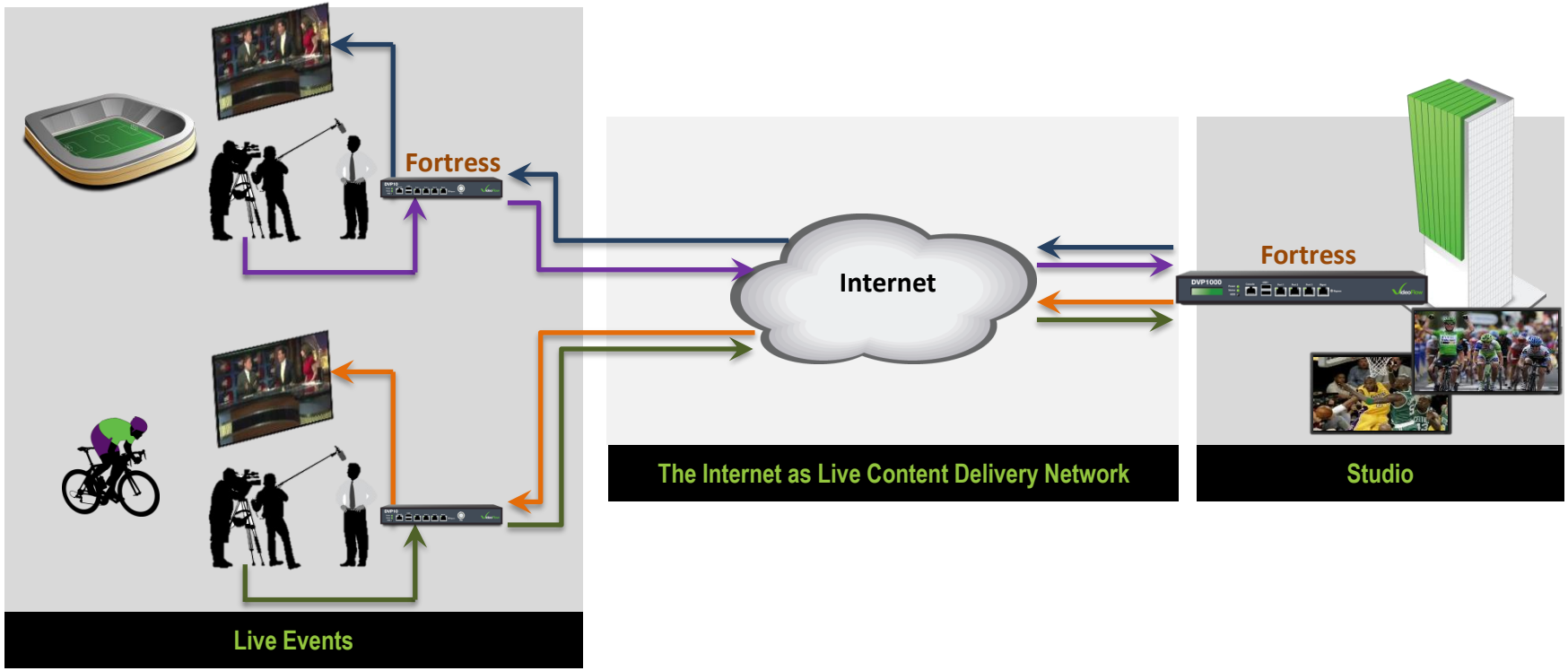
Cutting Costs – Live Content Delivery to OTT

The cost of Live Content Delivery over the Internet is considerably lower than current solution



Live Events – Close Teamwork

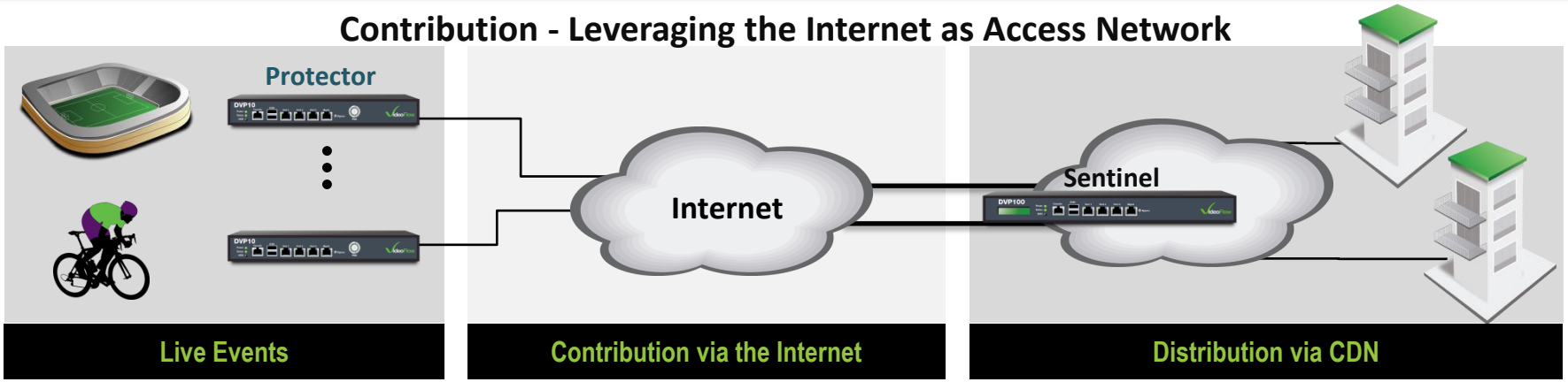
Low delay, error free, high quality video feed from live event to studio and from studio to the live event
Feels as if you were in the studio – Natural broadcast from the field



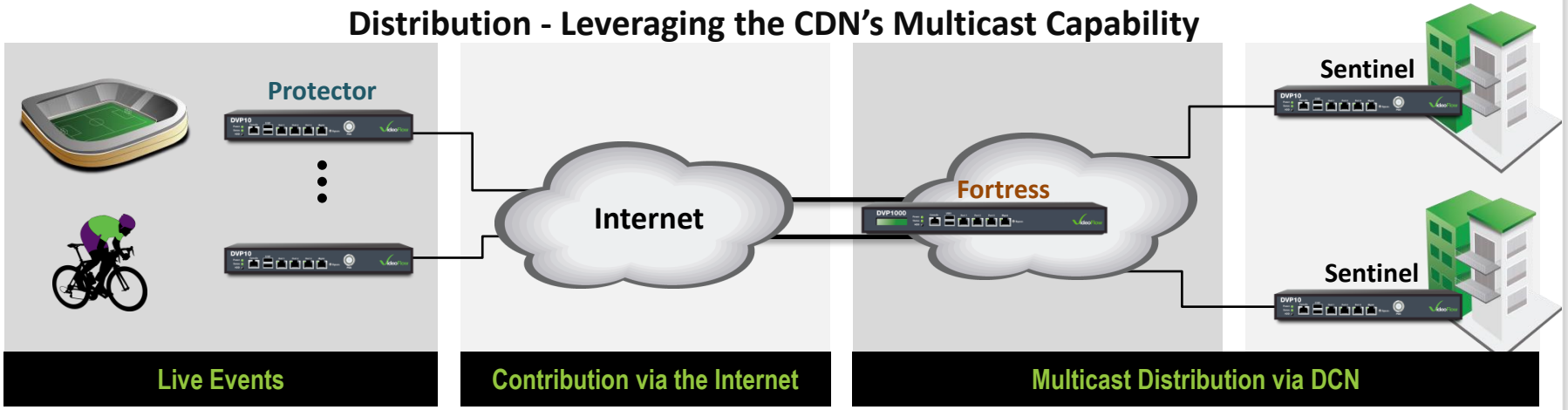
Unified CDN/Internet Network

Improving the local extension
Extending CDN reach to potential customers by lowering connectivity cost

Contribution - Leveraging the Internet as Access Network



Distribution - Leveraging the CDN's Multicast Capability



VideoFlow

Must Have Features

Stream Monitoring – ETR290

Cuts the cost of network maintenance and support
Reduces the time it takes to isolate a problem in the network
Clearly indicates where the issue is

Configuration | Streams | Interfaces | ETR 290 | Alarms | Tools | Logout

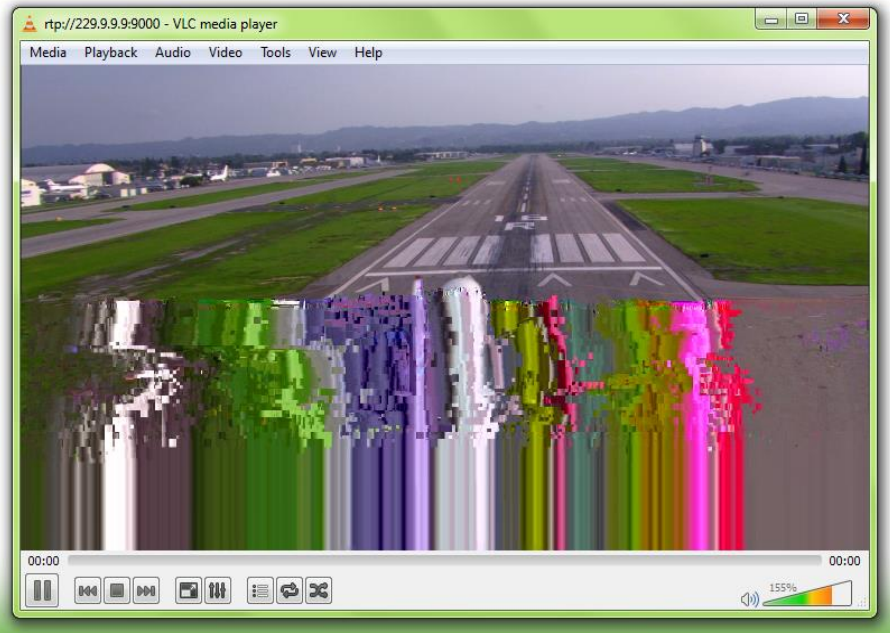
DVP 100 Sentinel

Streams

Name	state	IP address	Port	TS rate (pcr)	TS rate (measured)	Packet rate	Requested packets	Unrecovered packets	Action
tunnel		229.9.9.9	9000	10000007	9948960	945.77	10463	1499	Reset stream

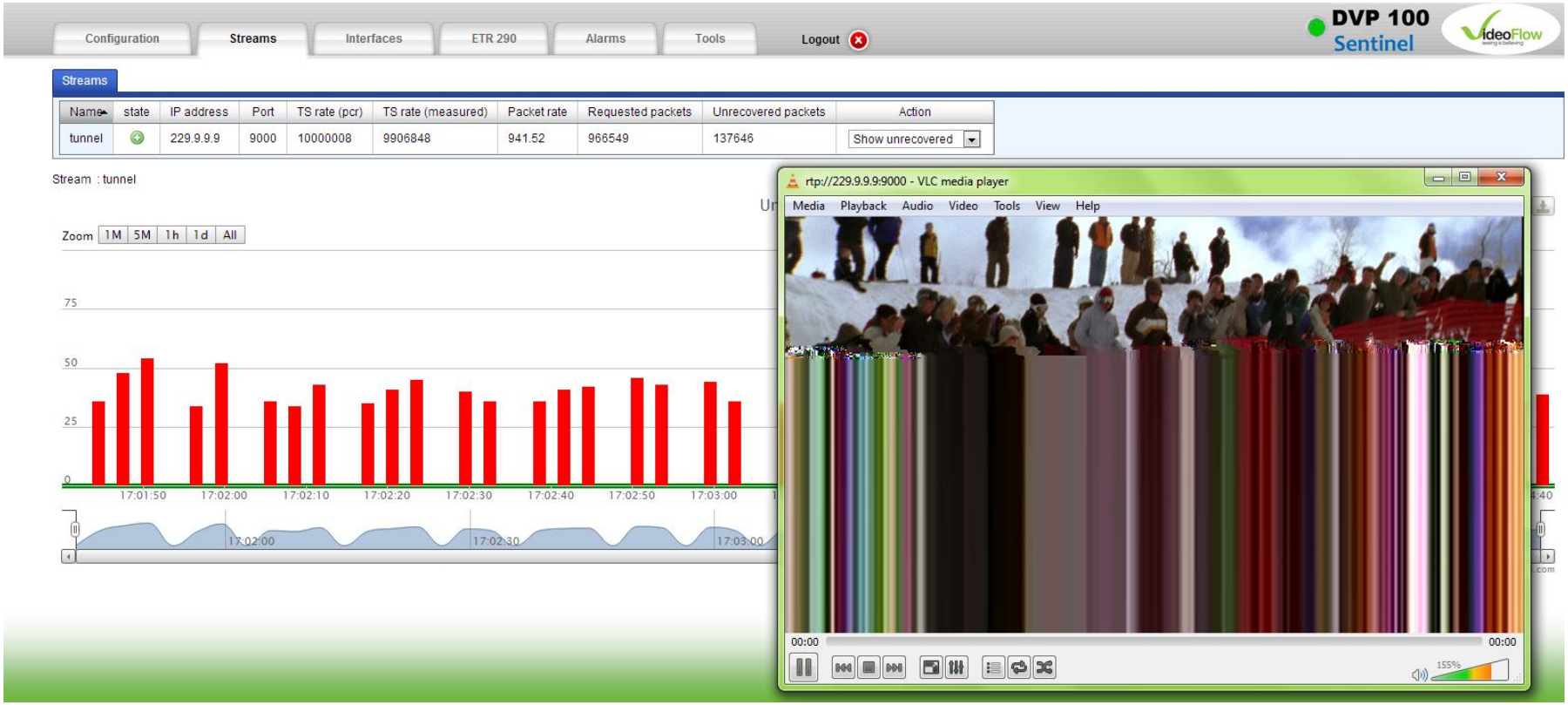
Stream : tunnel

Name	PID	count	Priority and description	state	Last update
CAT-1	0	0	2.6 scrambled packets exist, but no CAT found		23-05 11:42:27 AM
CAT-2	0	0	2.6a Section with table_id other than 0x01 found on PID 0x1		23-05 11:42:27 AM
CC-ERROR	33	125	1.4 Continuity Counter error		23-05 11:47:48 AM
CRC-ERROR	0	0	2.2 CRC error in some table		23-05 11:42:27 AM
PAT-2	0	0	1.3a Section with table_id other than 0x00 found on PID 0x0		23-05 11:42:27 AM
PAT-1	0	0	1.3 PAT was not seen for at least 1/2 seconds		23-05 11:42:27 AM
PAT-3	0	0	1.3b Scrambling_control_field is not 00 for PID 0x0		23-05 11:42:27 AM
PCR-1	0	0	2.3 PCR discontinuity of more than 100mSec		23-05 11:42:27 AM
PCR-2	33	2	2.3a PCR interval of more than 40 mSec		23-05 11:47:48 AM
PCR-3	0	0	2.4 PCR accuracy worse than +/- 500 nSec		23-05 11:42:27 AM
PID-ERROR	0	0	1.6 data PID does not appear for N seconds		23-05 11:42:27 AM
PMT-3	0	0	1.5a PMT table is scrambled		23-05 11:42:27 AM
PMT-1	0	0	1.5 PMT was not seen for at least 1/2 seconds		23-05 11:42:27 AM
PTS-RPTIN	0	0	2.5 PTS repetition of more than 700 mSec		23-05 11:42:27 AM
SYNC-ERR	0	0	1.2 Sync_byte not equal 0x4		23-05 11:42:27 AM
SYNC-LOSS	0	0	1.1 Loss of synchronization		23-05 11:42:27 AM
TR-ER-IND	0	0	2.1 TEI is set for some packet		23-05 11:42:27 AM
UNKWN-TID	0	0	3 Table with unknown table ID		23-05 11:42:27 AM



Stream Monitoring – Unrecovered

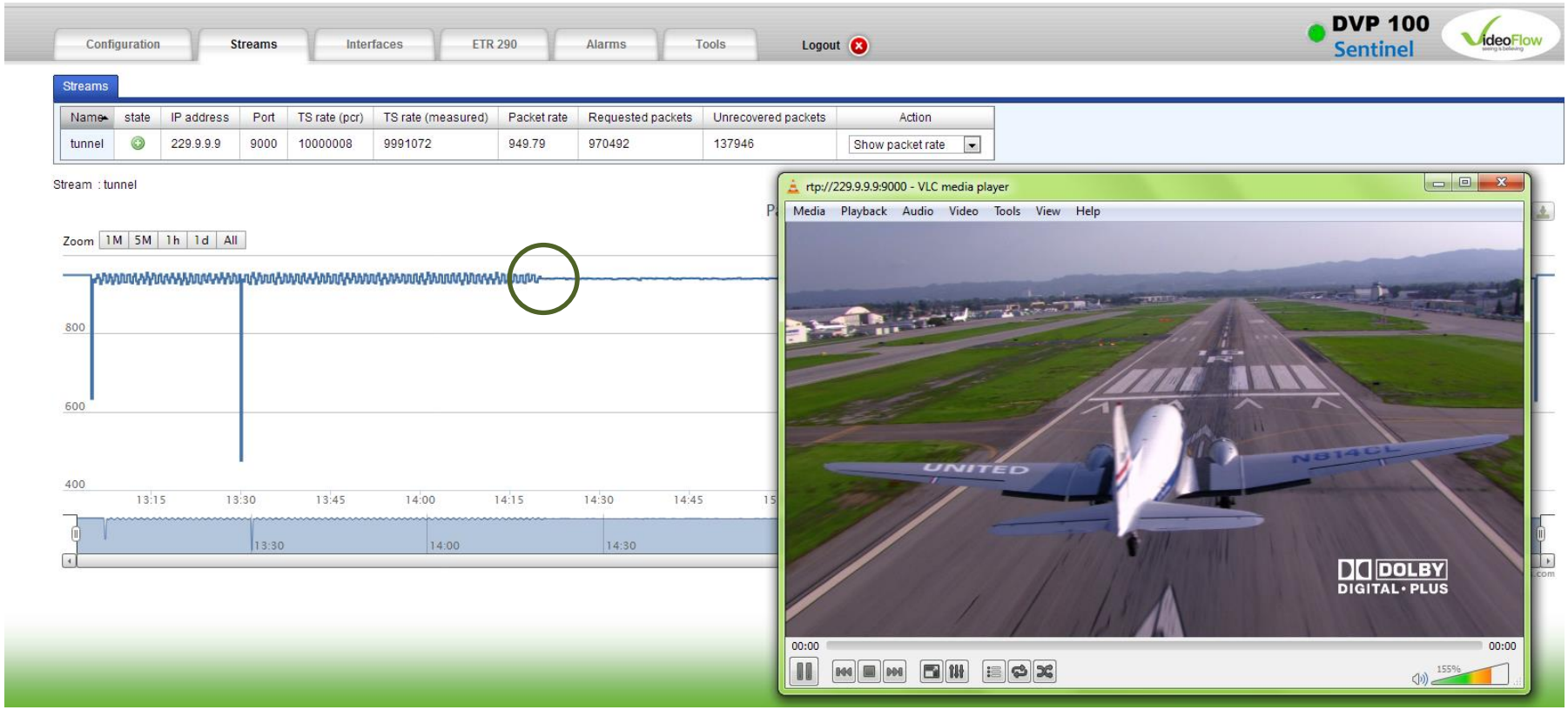
Cuts the cost of network maintenance and support
Straightforward indication on the network's quality



Stream Monitoring – Packet Rate

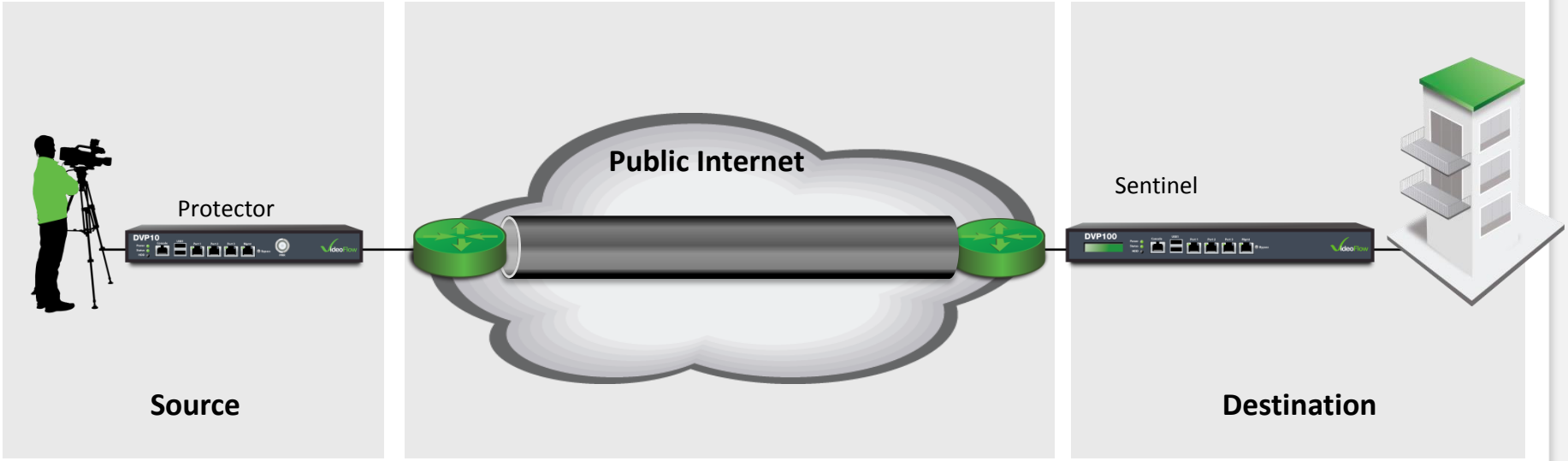
Cuts the cost of network maintenance and support

Easy to see network bandwidth issues



VPN Tunnel

Secured and protected
Generic Routing Encapsulation (GRE)
Optional IPSec encryption
Remote site In-band management



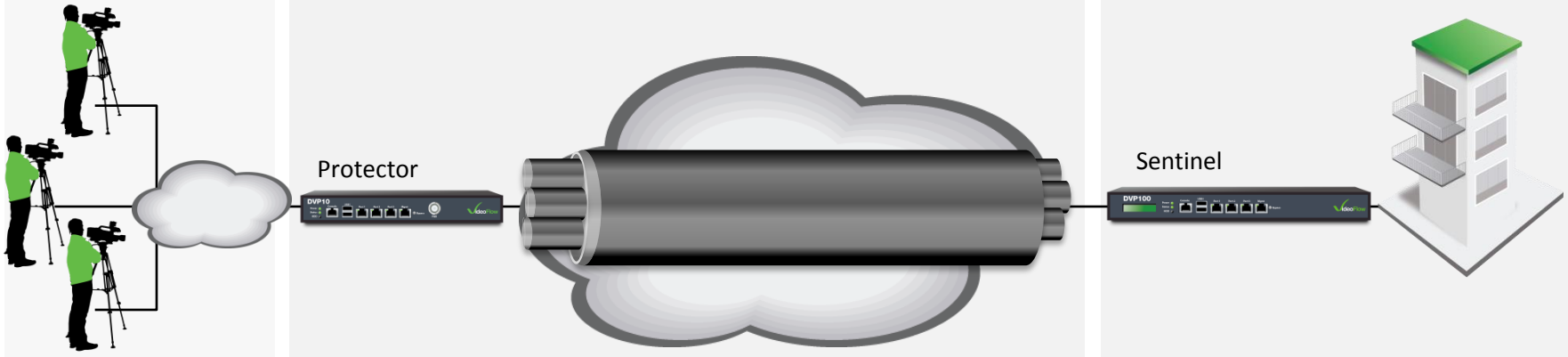
No Premium Services

Point-to-Point – Deploying LCDN Over the Internet

Single VPN tunnel can include single or multiple live video streams

The sentinel eliminates the jitter of all streams inside a tunnel

Stream tunnel is leveraged to manage remote site in band

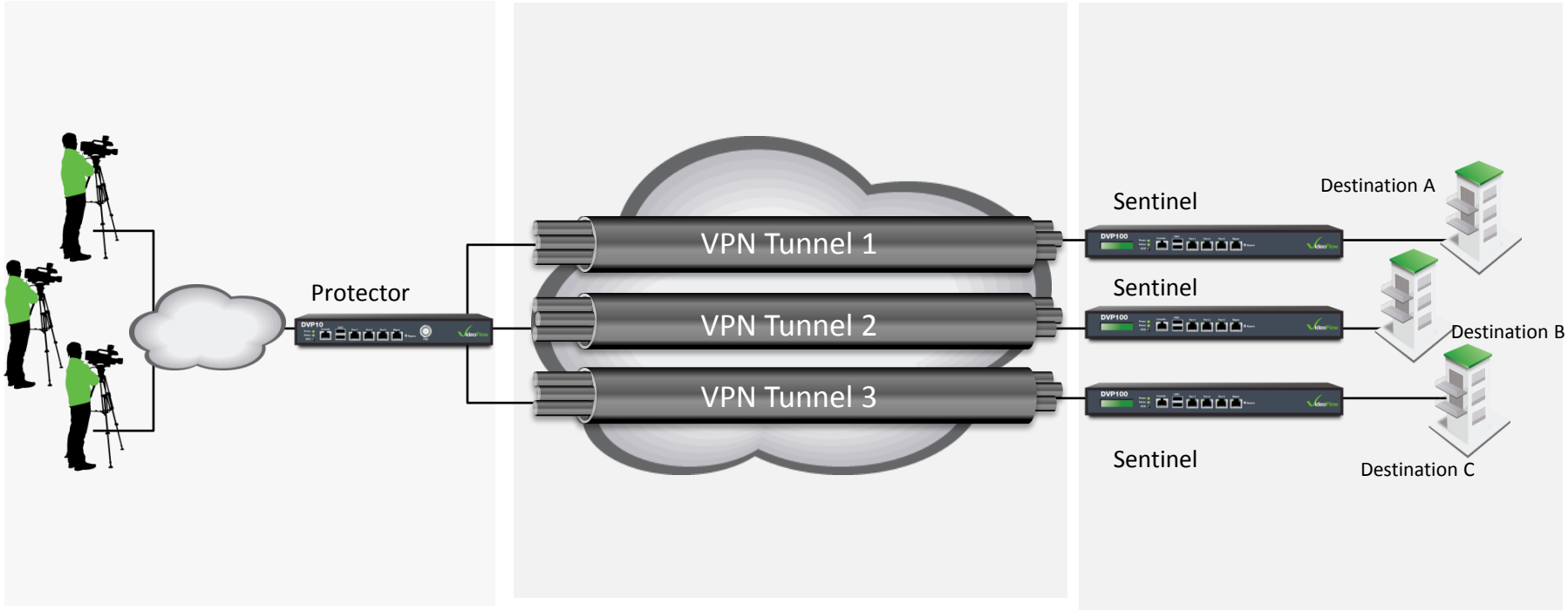


Point-to-Multipoint – Deploying LCDN Over the Internet

Protector creates and maintain multiple VPN tunnels to remote sites

Each VPN tunnel can include single or multiple live video streams

Independent jitter removal capabilities

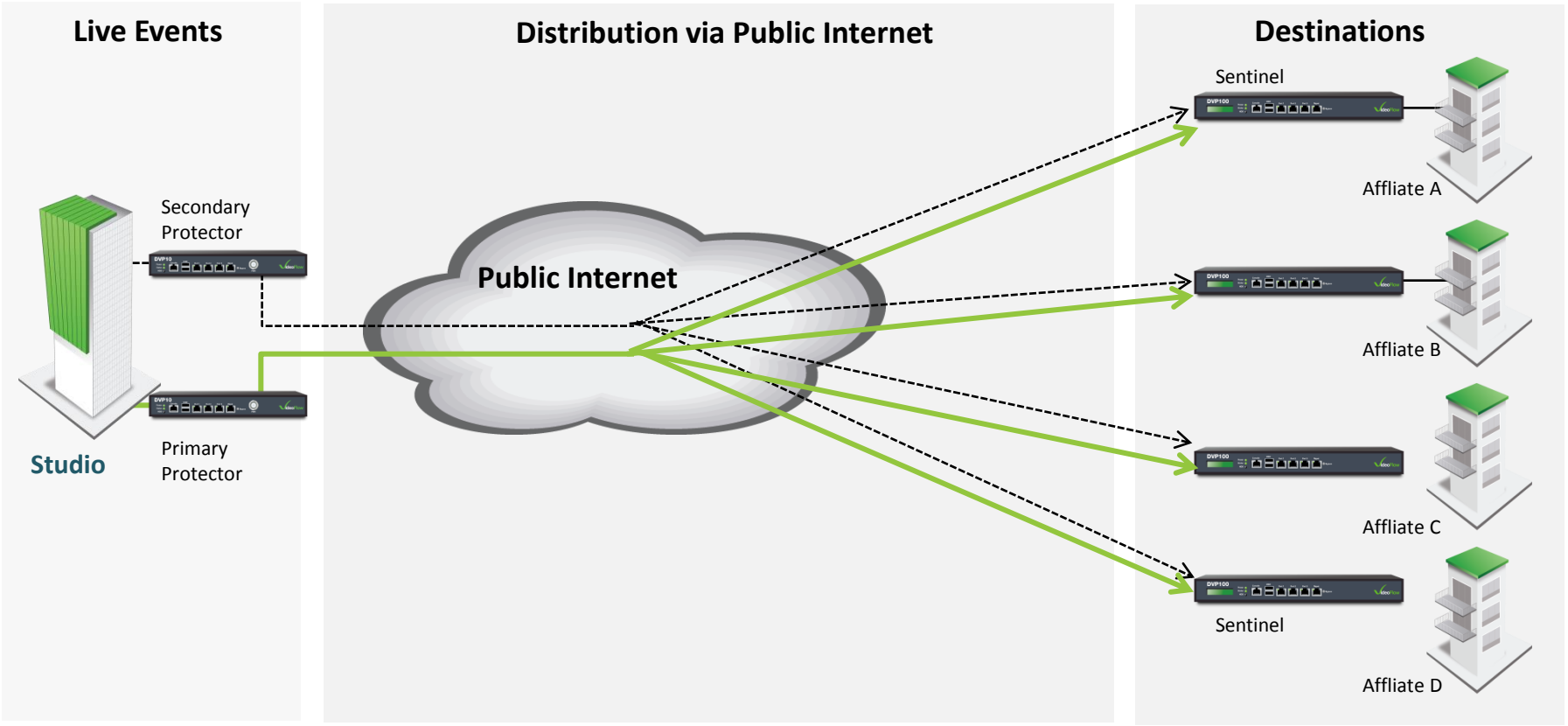


Redundancy – High Quality Content 24x7

Auto redundancy assures active protector-sentinel at all times

1:1 redundancy by exchanging information allowing smooth switchover

Built in network bypass ensuring no connection is lost in case power is off



Questions?