



Video Service Quality Assurance

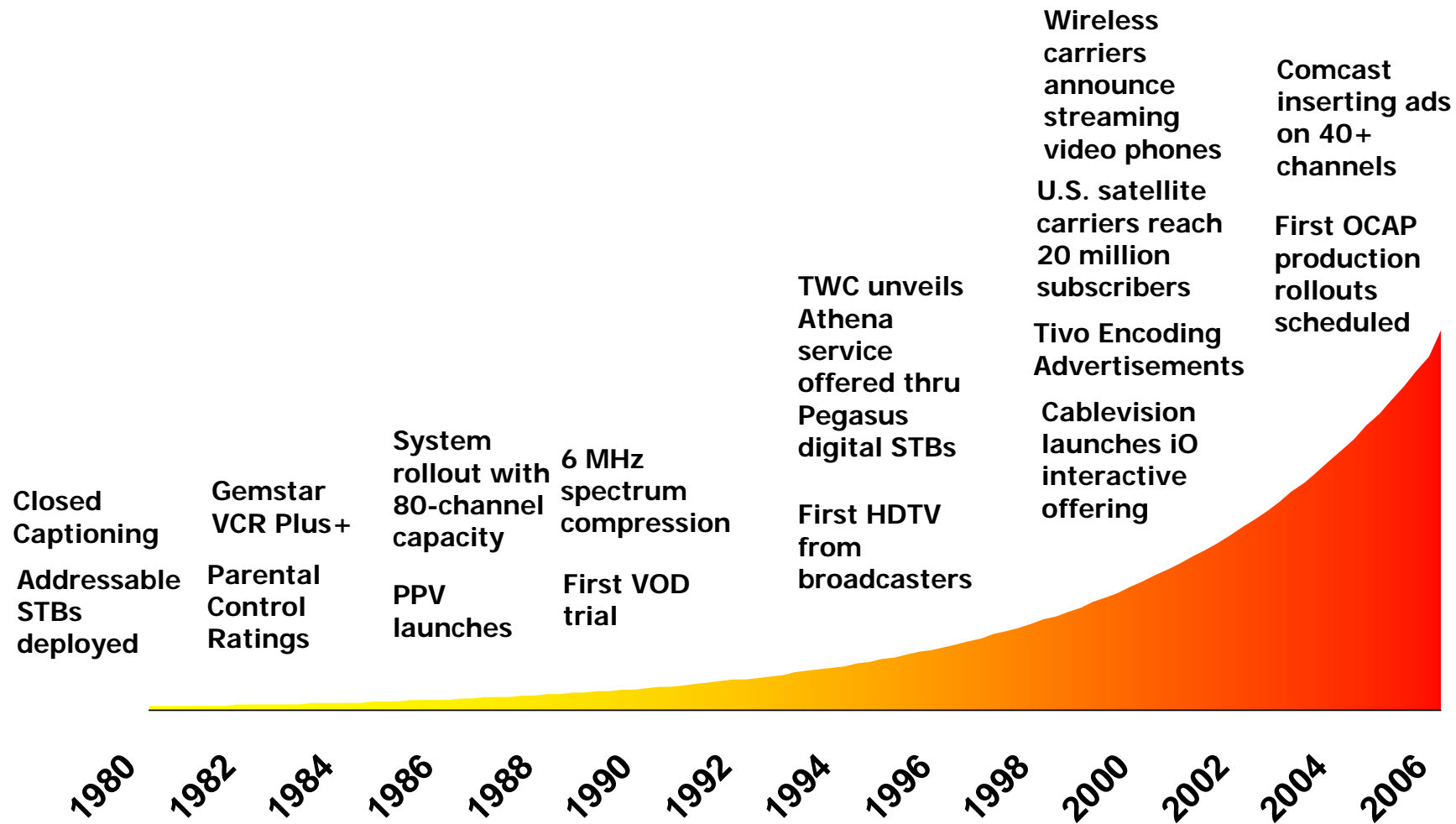
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Equipment and network complexity accelerating





The need for “intelligent monitoring”

- We can't manage if we don't know...
- How do we scale?
- Reactive analyzing and troubleshooting needs to evolve



Intelligent Monitoring Solution

Monitor digital content and network, across all the services, all the time

Proactively report on any subscriber impacting events and catch anomalies early

Easy to use, upgradeable, future proof, and market-proven



Digital Content

- Digital Content is all content sent out to subscribers via (MPEG) transport
 - SD / HD programs
 - Digital advertisements
 - Streamed or carouselled applications & data
 - Closed captioning & other embedded data (SCTE-18, SDT, XDS, CGMS, etc.)
 - Conditional Access data



(IP) Network Health

- IP packets arrival rate
- Delay factor
- Loss packet (RTP)



Performance Matters

- Most (MPEG) analyzers only monitor up to over 100Mbps w/o online analysis capability
- Many monitor at high bit rate but shallow, at low resolution, or in round-robin/channel hopping, which could miss most of the intermittent and transient problems
- Concerns over space, power consumption, and economics
- Must be able to generate real-time alerts and historical report for effective correlating, troubleshooting, and RCA



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Subscribers Impacting Events

- Video freeze
- Video black
- Pixelation
- Error block
- Tiling
- Audio silence
- Audio blips
- Slow channel changing
- STB auto-reboots
- Loss of service
- Missing Close Caption
- Ad drifting or fail to air
- EPG loss data



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Ease of Use

- Web Interface
- Smart Alert Template
- Real-Time Report

Summary | **Templates** | Transport | BFS

Summary | Program Templates

Creating Program Alert Templates

1 An alert should be generated when:

- Programs are Detected Not Detected
- Bitrate drops below Mbps or exceeds Mbps
- The video on a program freezes for minute(s) on the primary video PID
- The audio on a program is silent for second(s) on the primary audio PID
 - On left, right or center speaker (or)
 - Advanced...
- Discontinuities occur or more times in minute(s)

2 Trigger the alert:

- Each time any of the above conditions occur (or)
- Only after any of the above conditions occur time(s) in minute(s)

3 Name the template:

August 20, 2004 System

Program Status Summary

Current View: 1 hour Sort By: Status

Configure Reports Status About

TransportID	PgmID	Pgm Name	Avg. Bitrate	History												
0	5	CNN CNNIntl	4.82 Mbps													
<table border="1"> <thead> <tr> <th>PID</th> <th>Type</th> <th>Bitrate</th> </tr> </thead> <tbody> <tr> <td>128</td> <td>Video</td> <td>2.81 Mbps</td> </tr> <tr> <td>129</td> <td>Audio</td> <td>0.65 Mbps</td> </tr> <tr> <td>130</td> <td>Data</td> <td>0.29 Mbps</td> </tr> </tbody> </table>					PID	Type	Bitrate	128	Video	2.81 Mbps	129	Audio	0.65 Mbps	130	Data	0.29 Mbps
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Reports

General
Current status snapshot
Transport Status
Program status summary
Historical

Port	TSID	Pgm	Name	Avg Bitrate	Discontinuities/5sec			History
				Max	Avg	Total		
AD Cues	1131	1	Discovery Channel	1.152 Mbps	4	0.611	220	

Other Program Information
PMT PID: 35 Cycle time: 794 ms

PID	Type	Avg Bitrate	Discontinuities/5sec			History
		Max	Avg	Total		
32	MPEG-2 Video (CC, Discontinuity)	1.092 Mbps	4	0.519	187	
33	Dolby AC3 Audio (Discontinuity)	59.956 Kbps	3	0.086	31	
34	Ad Cues Info (Discontinuity)	5.556 bps	1	0.006	2	

Graph Selected PIDs

Bandwidth Details

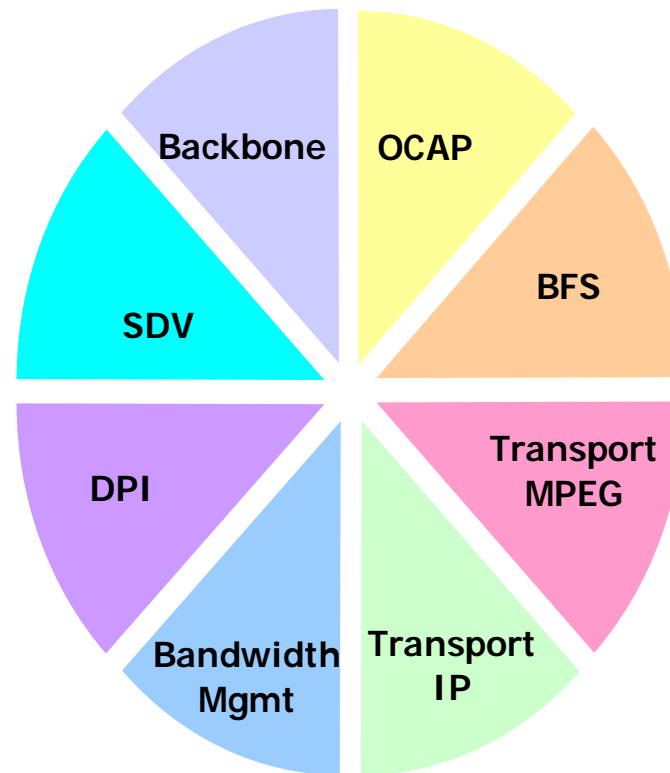
Bitrate for program Discovery Channel

Discontinuity Details

Discontinuities for program Discovery Channel

Future Proof and Flexibility

- Software based
- Modularized design
- Easily upgradeable





Market-Proven: Lessons learned

- Intermittent video & audio quality issues across channels
 - Proactive content monitoring based on threshold rules catches problems before subscribers experience compromised
 - Monitoring at different points in the network and analysis of groups of channels points to root cause



Market-Proven (Cont'd)

- Digital program insertion errors
 - Often the result of missing, misplaced, or drifting SCTE-35 ad insertion cues or CBR encoding levels
 - Remedies eliminate lost revenue opportunities and program pixelization
 - Most service providers report a 1-2% failure rate for digital ads



Example economic benefits

- Eliminate video quality calls (50,000 sub system)
 - 300 subscriber-affecting outages per year
 - X 500 customer complaint calls per outage
 - X \$7 cost per call
 - = **\$1,050,000 reduction in operating costs**

- Eliminate digital ad insertion errors
 - 5 million total local avails per year
 - X 1.5% failure rate
 - = 75,000 local avails lost
 - X \$20 average revenue per ad spot
 - = **\$1,500,000 potential increase in revenue**



Benefits of choosing the right and intelligent monitoring solution

- Video service quality assurance
- Operation efficiency improvements
- In-direct revenue generation and cost-savings



Q&A

- Questions?