

Ka-Band for News

ACM Controlled Adaptive Video

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 Broadband Systems

 Professional Equipment

 IP Software



Ka-band facts

- ✓ Almost 40 satellites with Ka-band capacity
- ✓ Estimated over 200 Ka-band transponders
- ✓ Global footprint
- ✓ Excess capacity – frequency re-use across spotbeams
- ✓ Lease cost for Ka-band is lower than C/Ku

So ?

- ✓ Satellite operators understand that video is the best mean to fill the pipe
- ✓ Broadcasters and SNG operators have access to cost effective bandwidth

But ...

- ✓ Quality of Service remains a big concern for **live video** contribution such as Satellite News Gathering (SNG)

What is impacting QoS on Ka-band ?

Rain fades are the biggest source of QoS reduction on Ka-band

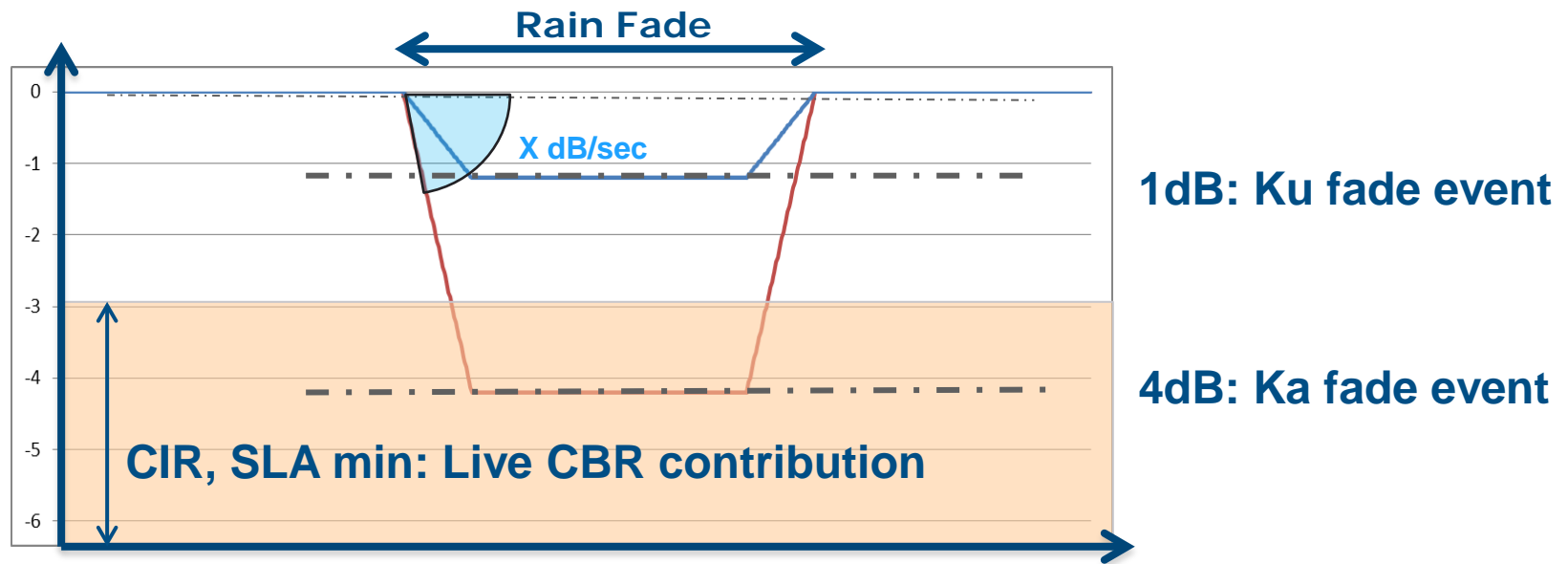
- (dB) High Fade Depth, mostly related to rain fades
 - Much higher impact compared to Ku-band (and C-band)
- (dB/Sec) High Fade Rate of signal fluctuation
 - Typically 0,1 to 1 dB/Sec (up to 2.5 dB/sec)
- (GHz) Frequency dependency
 - Impact on 20GHz is 3 times bigger compared to 11GHz

Different technologies can help reduce the impact of rain fades

- Uplink Power Control (UPC)
- ACM Controlled Adaptive Video



Ka-band: Rain affecting the Minimum SLA



Fade depth of typical rain fade event

Ku = 1dB

Ka = 4dB (below CIR?)

Min bandwidth in thunderstorm

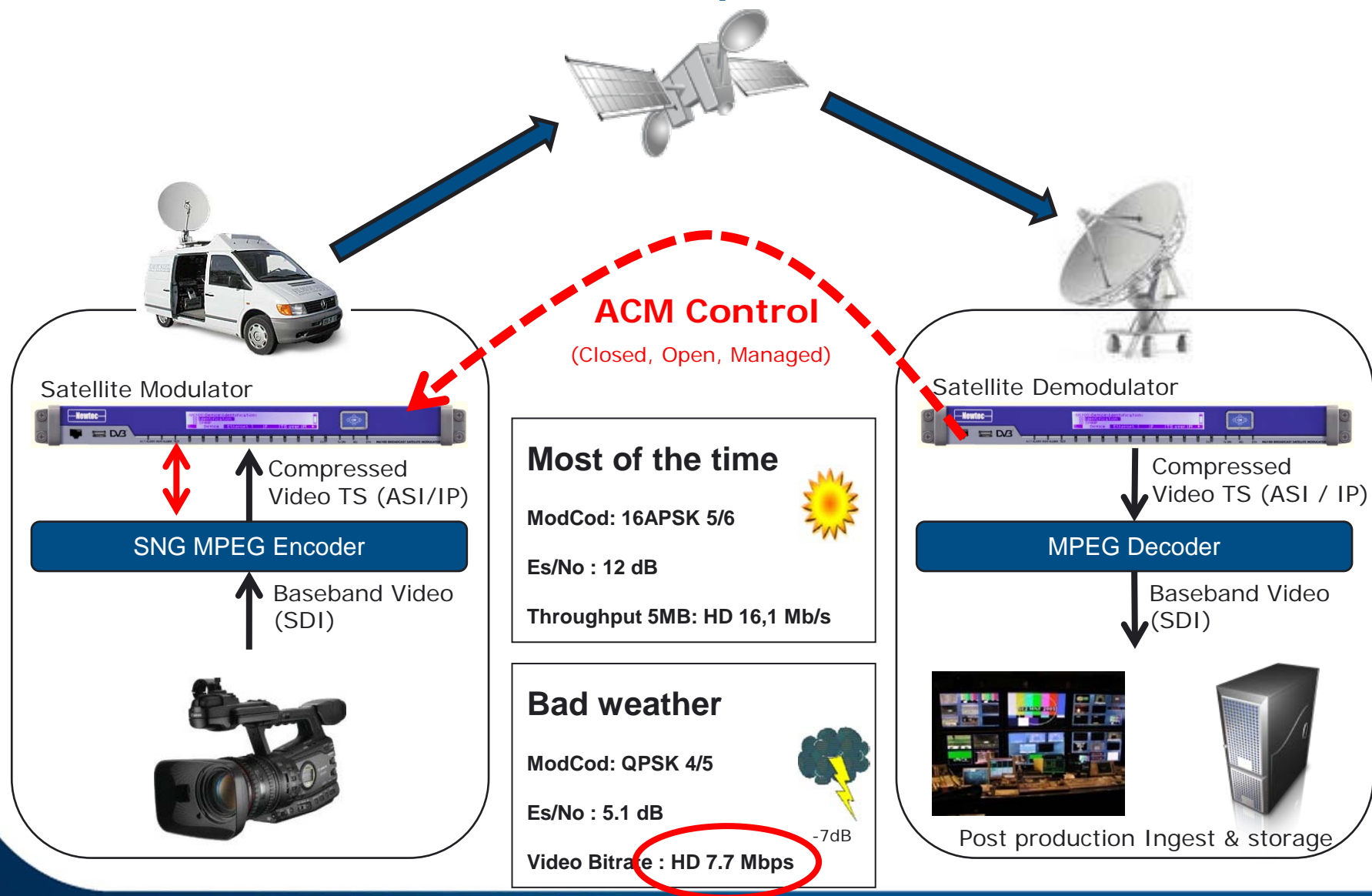
C : little impact

Ku: stayed working

Ka: 2 or 3 outages experienced during overnight tests

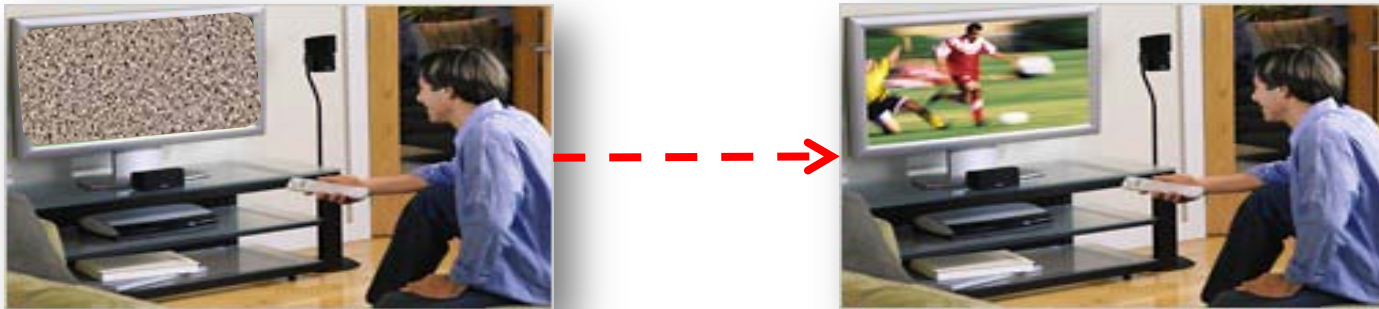
Ka: Faster fading (high dB/sec)

ACM Controlled Adaptive Video



ACM Controlled Adaptive Video

When something is better than nothing



Store and Forward

- Preserve high quality video (time-shift)
- Local recording of HQ video
- Workflow for file transmission of high quality video clip for $n+1$ news break

ACM Controlled Adaptive Video Technology

Building blocks are available

- ACM control loop and ACM satellite demodulator requirements
 - Accurate link margin measurement
 - Active margin prediction (fade speed) & management
 - Adaptive to rain fade depth (different frequencies)
 - Works with DVB-S2 and VSAT
- Video encoder and decoder need to support variable rate MPEG TS
 - E.g. using SMPTE 2022-4 variable bitrate MPEG TS on IP
- Store and Forward
 - High quality file store on modulator and/or MPEG encoder

Conclusion

- Video is the best content to fill Ka-band capacity at a lower operational cost
- ACM Controlled Adaptive Video technology for live news gathering is mature enough to start building a solution set

The big question is : Are satellite operators, SNG operators and broadcasters willing to accept new type of SLA?





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