

Headend – Broadcast (Encode, multiplexing and RT)

Use-case	A10	A20
SRT/RIST/ZIXI/TS throughput	1.2Gbps or 80 streams	1.5Gbps or 80 streams
scrambled/Unscrambled multiplexer throughput	1.2Gbps 200Mbps per TS	2.0Gbps 200Mbps per TS
MPEG-2 SD 4:2:0 Extreme encode	6	7
MPEG-2 1080i 4:2:0 Extreme encode	3 (1 if src = 422 HD)	4 (2 if src = 422 HD)
MPEG-2 1080i 4:2:0 Up! encode	2 (1 if src = 422 HD)	4 (2 if src = 422 HD)
AVC SD 4:2:0 Standard encode	-	8
AVC SD 4:2:0 Extreme encode	6	7
AVC 1080i 4:2:0 High Standard encode	2	4
AVC 1080i 4:2:0 High Extreme encode	2 (1 if src = 422 HD)	3 (2 if src = 422 HD)
AVC 1080i 4:2:0 High Up! encode	1	2
AVC 1080i 4:2:0 High Up!+ encode	1	2
HEVC 1080i 4:2:0 Extreme encode	0	2 (1 if src = 422 HD)
HEVC 1080i 4:2:0 Up! encode	0	1

E50	E60
10.5Gbps or 750 streams	16.8Gbps or 1200 streams
TBA 200Mbps per TS	12Gbps 200Mbps per TS
48	69
37 (14 if src = 422 HD)	50 (14 if src = 422 HD)
24*	24*
57	74
44	54
32	47
25 (13 if src = 422 HD)	27 (13 if src = 422 HD)
12	17
7 (7 if src = 422 HD)	11 (10 if src = 422 HD)
20 (17 if src = 422 HD)	28 (22 if src = 422 HD)
7	10

H70
TBA
TBA
92
76 (43 if src = 422 HD)
24*
114
83
69
55 (26 if src = 422 HD)
27
18
41 (32 if src = 422 HD)
TBA

*limited by i/o

** choose 2x A20 for controllers in distributed deployment

Headend – Streaming (Encoding & Packaging)

Use-case*	C30/60	E50	E60	H70
Ladder 1 = SD AVC 480	14	44	58	82
Ladder 2 = HD AVC 720	8	28	37	50
Ladder 3 = HD AVC 1080	5	16	21	29
Ladder 4 = HD AVC 1080 Extreme	-	7	9	13
Ladder 5 = HD HEVC 1080	-	-	5	7
Ladder 6 = UHD HEVC 2160	-	-	1	2

* Ladder details in appendix

- Choose 2x A20 nodes for controllers in distributed deployment
- Assume 5% more capacity if transcode-only (i.e., no packager)
- Assume 15% less capacity if 4:2:2 10-bit sources for AVC ladders
- Assume 15% more capacity if 25fps (vs. 29.97fps default) for AVC ladders

Contribution Encoding – low delay (SDI input)

Use-case	A10	A20	C30	E50	E60	H70	X40
MPEG-2 (720P) 4:2:2 10bit encode	1	4	8	24	24	24	24
MPEG-2 (1080i) 4:2:2 10bit encode	1	4	5	13	17	24	17
AVC (720P) 4:2:2 10bit encode	1	2	5	15	22	24	12
AVC (1080P) 4:2:2 10bit encode	0	1	2	6	9	13	4
AVC (1080P) 4:2:2 8bit encode	1	3	3	8	10	16	5
AVC (1080i) 4:2:2 10bit encode	1	4	4	12	16	24	10
HEVC (720P) 4:2:2 10bit encode	0	2	4	11	16	24	9
HEVC (1080P) 4:2:2 10bit encode	0	1	2	5	8	12	4
HEVC (UHD/4k) 4:2:2 10bit encode	0	0	1	1	2	3	1
JPEG-XS (1080p) 10bit encode	1	4	7	24	24	24	24

Reception / Receivers / IRDs

Use-case	A10	A20	C30	E50	E60
MPEG-2/AVC 1080i 4:2:0 decode	4	4	24/23	24	24
MPEG-2/AVC 1080p 4:2:2 decode	3	4	13/9	24	24
HEVC 1080i 4:2:0 decode	4	4	18	24	24
HEVC 1080p 4:2:2 decode	2	3	8	24	24
HEVC UHD 4:2:2 decode	0	1	3	6	6
JPEG-XS 1080p 4:2:2 decode	3	4	8	24	24
SRT/RIST/ZIXI/TS throughput	1.2Gbps or 80 streams	1.5Gbps or 80 streams	TBA	10.5Gbps or 750 streams	16.8Gbps or 1200 streams

Streaming profile detail

Ladder 1	Codec	Resolution	Bit rate
SOURCE	MPEG-4	1080i29.97 420 8-bit	20
1	MPEG-4 Standard	854x480 29.97	2.5
2	MPEG-4 Standard	768x432 29.97	1.2
3	MPEG-4 Standard	640x380 29.97	0.8

Ladder 3	Codec	Resolution	Bit rate
SOURCE	MPEG-4	1080i29.97 420 8-bit	20
1	MPEG-4 Standard	1920x1080 29.97	6
2	MPEG-4 Standard	1280x720 29.97	3.7
3	MPEG-4 Standard	854x480 29.97	3
4	MPEG-4 Standard	768x432 29.97	1.8
5	MPEG-4 Standard	640x360 29.97	1.3

Ladder 2	Codec	Resolution	Bit rate
SOURCE	MPEG-4	1080i29.97 420 8-bit	20
1	MPEG-4 Standard	1280x720 29.97	3.7
2	MPEG-4 Standard	768x432 29.97	2.4
3	MPEG-4 Standard	640x360 29.97	1.3
4	MPEG-4 Standard	512x288 29.97	0.8
5	MPEG-4 Standard	320x180 29.97	0.4
6	MPEG-4 Standard	256x144 29.97	0.25

Ladder 4	Codec	Resolution	Bit rate
SOURCE	MPEG-4	1080i29.97 420 8-bit	20
1	MPEG-4 Extreme	1920x1080 59.94	8
2	MPEG-4 Extreme	1280x720 59.94	6
3	MPEG-4 Extreme	1280x720 59.94	4.5
4	MPEG-4 Standard	854x480 29.97	2.5
5	MPEG-4 Standard	854x480 29.97	1.8
6	MPEG-4 Standard	768x432 29.97	1.2
7	MPEG-4 Standard	640x360 29.97	0.8

Streaming profile detail

Ladder 5	Codec	Resolution	Bit rate
SOURCE	HEVC	1080p5994 422 10-bit	40
1	HEVC Extreme	1920x1080 59.94	6
2	HEVC Extreme	1280x720 59.94	4.5
3	HEVC Extreme	1280x720 59.94	3
4	HEVC Standard	854x480 29.97	2
5	HEVC Standard	854x480 29.97	1.5
6	HEVC Standard	768x432 29.97	1
7	HEVC Standard	640x360 29.97	0.7

Ladder 6	Codec	Resolution	Bit rate
SOURCE	HEVC	2160p5994 422 10-bit	80
1	HEVC Extreme	3840x2160 59.94	18
2	HEVC Extreme	2560x1440 59.94	12
3	HEVC Extreme	1920x1080 59.94	8
4	HEVC Extreme	1280x720 59.94	5
5	HEVC Standard	960x540 59.94	2
6	HEVC Standard	960x540 59.94	1.5