

## Performance Benchmarks

These Performance Benchmark charts provide reference points for the transcoding speed of the Harmonic ProMedia™ Carbon MP cloud-based media transcoder from specific sources to some of its standard presets. All charts indicate results specific to Amazon Elastic Compute Cloud (EC2) instance types.

The headers across the top of each column — SD NTSC MPEG-2 transport stream at 3 and 15 mbps, DV25 and 1080i MPEG-2 transport stream at 50 mbps — identify the source content used to establish the benchmarks. The ProMedia Carbon MP output presets are listed down the left-hand side of the chart. These same presets are found in the application, so you can use them to benchmark your own hardware.

Each source file — containing the exact same video content with a duration of 300 seconds — was transcoded individually to each target file listed. The results for each transcode are recorded as a factor of real time (RT). To calculate the encoding rate, the source duration is divided by how long it took for the file to completely transcode. For example, if the transcode took 300 seconds to complete, then the calculation would be 300/300 for a result of 1.00 x RT. If the transcode took 60 seconds to complete, then the calculation would be 300/60 for 5.0 x RT, or five times faster than real time.

Put another way:

$$\frac{\text{Source Duration (in seconds)}}{\text{Transcode Duration}} = \text{Rate of RT}$$

You can use this rate to calculate how long it will take to transcode your files by using the following formula:

$$\frac{\text{Source Duration (in seconds)}}{\text{Rate of RT}} = \text{Transcode Duration}$$

### MEDIUM INSTANCE

Codec Type	Codec	SD MPEG-2 TS 3 mbps	SD MPEG-2 TS 15 mbps	DV 25 mbps	HD MPEG-2 TS 50 mbps
<b>Broadcast Servers</b>	GXF Long-GOP 1080i	N/A	0.10	0.08	0.15
	GXF MPEG-2 SD	N/A	1.74	2.26	0.42
	LXF I-Frame 1080i	N/A	0.13	0.16	0.22
	Spectrum Long-GOP 1080i	N/A	0.07	0.10	0.09
	Spectrum Long-GOP SD	N/A	0.69	0.67	0.09
	Quantel OP1A SD	N/A	1.04	1.15	0.42
<b>Broadcast</b>	ATSC HD	N/A	0.32	0.39	0.34
	ATSC SD	N/A	2.10	0.94	0.80
	CableLabs 1080i MPEG-2	N/A	0.12	0.11	0.10
	CableLabs 720p MPEG-2	N/A	0.49	0.23	0.27
	CableLabs 3/4 Screen	N/A	2.78	0.98	1.02
	H.264 TS 1080i30	N/A	0.04	0.05	0.07
	H.264 TS 720p60	N/A	0.06	0.09	0.09
	H.264 TS 480i30	N/A	0.82	0.73	0.79
	H.264 TS 720p30	N/A	0.25	0.20	0.17
	H.264 TS 640x360p30	N/A	0.13	0.12	0.09
	H.264 TS 320x180p30	1.12	1.03	1.19	0.19
	H.264 TS 640x360p15	N/A	1.86	0.13	0.74
	<b>DVD</b>	DVD — Mastering Quality	N/A	N/A	N/A
<b>Editing</b>	XDCAM DV25	N/A	1.03	2.14	0.42
	D10 OP1A	N/A	0.93	0.30	0.36
	P2 DVCPRO HD 1080i	N/A	0.43	0.45	0.36
	XDCAM HD 4:2:2 MPEG-2 1080i	N/A	0.10	0.12	0.14
<b>Mobile</b>	iPhone 640x480	0.64	0.64	0.64	0.42
	iPhone 320x240	1.11	0.99	1.56	0.55
	iPhone HD	0.54	0.52	0.53	0.31
	iPad	0.34	0.34	0.34	0.35
	iPad Retina	0.09	0.09	0.10	0.14
<b>Web</b>	H.264 852x480 1.2 mbps	0.62	0.59	0.62	0.33
	H.264 720p 4.0 mbps	N/A	0.34	0.36	0.38
	H.264 432x240 400 kbps	1.28	1.52	1.06	0.49
	VC-1 852x480 1.3 mbps	0.13	0.13	0.13	0.11
	VC-1 720p 4.1 mbps	N/A	0.15	0.15	0.15
	VC-1 432x240 500 kbps	0.47	0.45	0.41	0.28
	Microsoft SS — H.264 (8 Layers)	0.08	0.08	0.08	0.08
	Apple HLS — H.264 (8 Layers)	0.19	0.19	0.18	0.16
<b>Average Real-Time Transcode Rate</b>		<b>0.55</b>	<b>0.64</b>	<b>0.54</b>	<b>0.32</b>

The Amazon EC2 Medium instance type possesses the following specifications:

- Memory: 3.75 GB
- EC2 Compute Units: 2 (1 virtual core with 2 EC2 Compute Units)
- Instance Storage: 410 GB
- Platform: 32-bit or 64-bit
- I/O Performance: Moderate
- EBS-Optimized Available: No
- API Name: m1.medium



## HIGH-CPU MEDIUM INSTANCE

Codec Type	Codec	SD MPEG-2 TS 3 mbps	SD MPEG-2 TS 15 mbps	DV 25 mbps	HD MPEG-2 TS 50 mbps
<b>Broadcast Servers</b>	GXF Long-GOP 1080i	N/A	0.18	0.19	0.26
	GXF MPEG-2 SD	N/A	1.63	1.88	0.65
	LXF I-Frame 1080i	N/A	0.04	0.04	0.24
	Spectrum Long-GOP 1080i	N/A	0.02	0.02	0.02
	Spectrum Long-GOP SD	N/A	0.82	0.76	0.43
	Quantel OP1A SD	N/A	3.24	1.73	0.77
<b>Broadcast</b>	ATSC HD	N/A	0.71	0.46	0.47
	ATSC SD	N/A	3.09	1.28	0.98
	CableLabs 1080i MPEG-2	N/A	0.09	0.19	0.19
	CableLabs 720p MPEG-2	N/A	0.40	0.49	0.48
	CableLabs 3/4 Screen	N/A	3.93	1.49	1.15
	H.264 TS 1080i30	N/A	0.12	0.10	0.10
	H.264 TS 720p60	N/A	0.19	0.20	0.19
	H.264 TS 480i30	N/A	1.11	0.91	0.89
	H.264 TS 720p30	N/A	0.50	0.43	0.33
	H.264 TS 640x360p30	N/A	0.21	0.21	0.19
	H.264 TS 320x180p30	1.95	1.89	2.08	0.97
H.264 TS 640x360p15	N/A	1.81	0.28	0.25	
<b>DVD</b>	DVD — Mastering Quality	N/A	N/A	N/A	0.70
<b>Editing</b>	XDCAM DV25	N/A	1.59	1.73	0.60
	D10 OP1A	N/A	1.59	1.75	0.59
	P2 DVCPRO HD 1080i	N/A	0.82	0.80	0.70
	XDCAM HD 4:2:2 MPEG-2 1080i	N/A	0.04	0.04	0.03
<b>Mobile</b>	iPhone 640x480	1.60	1.18	1.23	0.72
	iPhone 320x240	2.02	1.81	3.50	0.99
	iPhone HD	1.02	0.96	1.04	0.59
	iPad	0.67	0.65	0.69	0.61
	iPad Retina	0.16	0.17	0.20	0.26
<b>Web</b>	H.264 852x480 1.2 mbps	1.15	1.08	1.18	0.63
	H.264 720p 4.0 mbps	N/A	0.70	0.76	0.61
	H.264 432x240 400 kbps	2.86	2.42	1.87	0.94
	VC-1 852x480 1.3 mbps	0.28	0.27	0.27	0.22
	VC-1 720p 4.1 mbps	N/A	0.31	0.31	0.32
	VC-1 432x240 500 kbps	0.94	0.91	0.81	0.55
	Microsoft SS — H.264 (8 Layers)	0.14	0.14	0.13	0.13
	Apple HLS — H.264 (8 Layers)	0.35	0.35	0.32	0.27
<b>Average Real-Time Transcode Rate</b>		<b>1.10</b>	<b>1.00</b>	<b>0.84</b>	<b>0.50</b>

The Amazon EC2 High-CPU Medium instance type possesses the following specifications:

- Memory: 1.7 GB
- EC2 Compute Units: 5 (2 virtual cores with 2.5 EC2 compute units each)
- Instance Storage: 350 GB
- Platform: 32-bit or 64-bit
- I/O Performance: Moderate
- EBS-Optimized Available: No
- API Name: c1.medium



## LARGE INSTANCE

Codec Type	Codec	SD MPEG-2 TS 3 mbps	SD MPEG-2 TS 15 mbps	DV 25 mbps	HD MPEG-2 TS 50 mbps
<b>Broadcast Servers</b>	GXF Long-GOP 1080i	N/A	0.14	0.19	0.24
	GXF MPEG-2 SD	N/A	1.40	2.58	0.54
	LXF I-Frame 1080i	N/A	0.14	0.18	0.21
	Spectrum Long-GOP 1080i	N/A	0.12	0.14	0.16
	Spectrum Long-GOP SD	N/A	1.10	0.98	0.47
	Quantel OP1A SD	N/A	1.51	1.54	0.67
<b>Broadcast</b>	ATSC HD	N/A	0.35	0.41	0.39
	ATSC SD	N/A	3.11	1.31	0.92
	CableLabs 1080i MPEG-2	N/A	0.13	0.14	0.09
	CableLabs 720p MPEG-2	N/A	0.52	0.37	0.39
	CableLabs 3/4 Screen	N/A	3.27	1.54	1.05
	H.264 TS 1080i30	N/A	0.07	0.08	0.15
	H.264 TS 720p60	N/A	0.17	0.17	0.12
	H.264 TS 480i30	N/A	1.08	0.88	0.81
	H.264 TS 720p30	N/A	0.39	0.37	0.27
	H.264 TS 640x360p30	N/A	0.17	0.20	0.16
	H.264 TS 320x180p30	1.58	1.46	1.80	0.83
H.264 TS 640x360p15	N/A	1.98	0.24	0.81	
<b>DVD</b>	DVD — Mastering Quality	N/A	N/A	N/A	0.59
<b>Editing</b>	XDCAM DV25	N/A	1.49	2.87	0.54
	D10 OP1A	N/A	2.64	1.60	0.56
	P2 DVCPRO HD 1080i	N/A	0.66	0.69	0.56
	XDCAM HD 4:2:2 MPEG-2 1080i	N/A	0.14	0.18	0.23
<b>Mobile</b>	iPhone 640x480	1.02	0.96	1.07	0.65
	iPhone 320x240	1.60	1.42	2.82	0.80
	iPhone HD	0.80	0.77	0.86	0.46
	iPad	0.56	0.55	0.59	0.53
	iPad Retina	0.14	0.19	0.16	0.22
<b>Web</b>	H.264 852x480 1.2 mbps	0.83	0.83	1.01	0.52
	H.264 720p 4.0 mbps	N/A	0.57	0.64	0.59
	H.264 432x240 400 kbps	2.25	1.89	1.59	0.73
	VC-1 852x480 1.3 mbps	0.23	0.22	0.23	0.18
	VC-1 720p 4.1 mbps	N/A	0.26	0.27	0.25
	VC-1 432x240 500 kbps	0.82	0.75	0.71	0.46
	Microsoft SS — H.264 (8 Layers)	0.13	0.13	0.13	0.13
	Apple HLS — H.264 (8 Layers)	0.31	0.31	0.28	0.25
<b>Average Real-Time Transcode Rate</b>		<b>0.86</b>	<b>0.88</b>	<b>0.82</b>	<b>0.46</b>

The Amazon EC2 Large instance type possesses the following specifications:

- Memory: 7.5 GB
- EC2 Compute Units: 4 (2 virtual cores with 2 EC2 compute units each)
- Instance Storage: 850 GB
- Platform: 64-bit
- I/O Performance: High
- EBS-Optimized Available: 500 Mbps
- API Name: m1.large



## EXTRA-LARGE INSTANCE

Codec Type	Codec	SD MPEG-2 TS 3 mbps	SD MPEG-2 TS 15 mbps	DV 25 mbps	HD MPEG-2 TS 50 mbps
<b>Broadcast Servers</b>	GXF Long-GOP 1080i	N/A	0.18	0.24	0.46
	GXF MPEG-2 SD	N/A	3.23	3.38	1.02
	LXF I-Frame 1080i	N/A	0.18	0.24	0.44
	Spectrum Long-GOP 1080i	N/A	0.18	0.23	0.39
	Spectrum Long-GOP SD	N/A	2.85	2.30	1.01
	Quantel OP1A SD	N/A	3.04	2.06	0.75
<b>Broadcast</b>	ATSC HD	N/A	0.80	0.51	0.53
	ATSC SD	N/A	3.43	1.43	1.07
	CableLabs 1080i MPEG-2	N/A	0.18	0.22	0.23
	CableLabs 720p MPEG-2	N/A	0.80	0.51	0.53
	CableLabs 3/4 Screen	N/A	4.13	1.81	1.61
	H.264 TS 1080i30	N/A	0.15	0.18	0.25
	H.264 TS 720p60	N/A	0.33	0.33	0.35
	H.264 TS 480i30	N/A	1.26	0.97	0.85
	H.264 TS 720p30	N/A	1.18	0.48	0.40
	H.264 TS 640x360p30	N/A	0.49	0.49	0.78
	H.264 TS 320x180p30	3.07	3.89	3.38	1.56
H.264 TS 640x360p15	N/A	2.72	0.67	0.84	
<b>DVD</b>	DVD — Mastering Quality	N/A	N/A	N/A	1.03
<b>Editing</b>	XDCAM DV25	N/A	4.24	2.26	0.89
	D10 OP1A	N/A	2.88	1.90	0.80
	P2 DVCPRO HD 1080i	N/A	0.84	0.53	0.55
	XDCAM HD 4:2:2 MPEG-2 1080i	N/A	0.18	0.22	0.40
<b>Mobile</b>	iPhone 640x480	0.83	2.60	1.71	0.77
	iPhone 320x240	1.72	3.93	1.60	1.38
	iPhone HD	1.22	2.07	1.21	0.89
	iPad	0.85	1.43	0.87	0.89
	iPad Retina	0.17	0.18	0.22	0.38
<b>Web</b>	H.264 852x480 1.2 mbps	1.42	2.62	1.44	0.98
	H.264 720p 4.0 mbps	N/A	1.47	1.39	0.88
	H.264 432x240 400 kbps	1.29	5.53	1.26	1.04
	VC-1 852x480 1.3 mbps	0.53	0.54	0.52	0.47
	VC-1 720p 4.1 mbps	N/A	0.57	0.59	0.24
	VC-1 432x240 500 kbps	1.14	1.16	0.87	1.10
	Microsoft SS — H.264 (8 Layers)	0.39	0.39	0.38	0.39
	Apple HLS — H.264 (8 Layers)	0.85	0.85	0.77	0.68
<b>Average Real-Time Transcode Rate</b>		<b>1.12</b>	<b>1.73</b>	<b>1.06</b>	<b>0.75</b>

The Amazon EC2 Extra-Large instance type possesses the following specifications:

- Memory: 15 GB
- EC2 Compute Units: 8 (4 virtual cores with 2 EC2 compute units each)
- Instance Storage: 1,690 GB
- Platform: 64-bit
- I/O Performance: High
- EBS-Optimized Available: 1,000 Mbps
- API Name: m1.xlarge



HIGH-CPU EXTRA-LARGE INSTANCE

Codec Type	Codec	SD MPEG-2 TS 3 mbps	SD MPEG-2 TS 15 mbps	DV 25 mbps	HD MPEG-2 TS 50 mbps
<b>Broadcast Servers</b>	GXF Long-GOP 1080i	N/A	0.20	0.28	0.48
	GXF MPEG-2 SD	N/A	3.49	4.44	1.08
	LXF I-Frame 1080i	N/A	0.20	0.26	0.48
	Spectrum Long-GOP 1080i	N/A	0.20	0.26	0.47
	Spectrum Long-GOP SD	N/A	3.08	2.89	1.08
	Quantel OP1A SD	N/A	3.59	3.65	1.07
<b>Broadcast</b>	ATSC HD	N/A	0.92	0.57	0.53
	ATSC SD	N/A	3.72	1.51	1.14
	CableLabs 1080i MPEG-2	N/A	0.20	0.21	0.22
	CableLabs 720p MPEG-2	N/A	0.91	0.56	0.55
	CableLabs 3/4 Screen	N/A	4.21	1.97	1.62
	H.264 TS 1080i30	N/A	0.20	0.26	0.39
	H.264 TS 720p60	N/A	0.49	0.49	0.48
	H.264 TS 480i30	N/A	1.32	1.03	0.96
	H.264 TS 720p30	N/A	1.46	1.28	0.71
	H.264 TS 640x360p30	N/A	0.99	0.96	0.89
	H.264 TS 320x180p30	4.25	4.16	4.12	1.76
H.264 TS 640x360p15	N/A	2.77	0.67	0.85	
<b>DVD</b>	DVD — Mastering Quality	N/A	N/A	N/A	1.14
<b>Editing</b>	XDCAM DV25	N/A	2.53	3.99	0.92
	D10 OP1A	N/A	2.96	1.98	0.80
	P2 DVCPRO HD 1080i	N/A	0.92	0.89	0.88
	XDCAM HD 4:2:2 MPEG-2 1080i	N/A	0.20	0.26	0.47
<b>Mobile</b>	iPhone 640x480	2.84	2.79	3.60	1.07
	iPhone 320x240	4.17	4.24	7.88	1.16
	iPhone HD	2.23	2.26	2.42	1.09
	iPad	1.63	1.61	1.81	1.10
	iPad Retina	0.19	0.19	0.25	0.50
<b>Web</b>	H.264 852x480 1.2 mbps	3.01	1.97	3.40	1.01
	H.264 720p 4.0 mbps	N/A	1.64	1.80	1.10
	H.264 432x240 400 kbps	7.15	4.37	4.50	1.17
	VC-1 852x480 1.3 mbps	0.53	0.52	0.51	0.50
	VC-1 720p 4.1 mbps	N/A	0.57	0.59	0.53
	VC-1 432x240 500 kbps	1.07	1.21	1.06	1.10
	Microsoft SS — H.264 (8 Layers)	0.41	0.40	0.38	0.37
	Apple HLS — H.264 (8 Layers)	0.97	0.93	0.97	0.55
<b>Average Real-Time Transcode Rate</b>		<b>2.37</b>	<b>1.76</b>	<b>1.76</b>	<b>0.84</b>

The Amazon EC2 High-CPU Extra-Large instance type possesses the following specifications:

- Memory: 7 GB
- EC2 Compute Units: 20 (8 virtual cores with 2.5 EC2 compute units each)
- Instance Storage: 1,690 GB
- Platform: 64-bit
- I/O Performance: High
- EBS-Optimized Available: No
- API Name: c1.xlarge



**HIGH-MEMORY EXTRA-LARGE INSTANCE**

Codec Type	Codec	SD MPEG-2 TS 15 mbps	HD MPEG-2 TS 50 mbps
<b>Broadcast Servers</b>	GXF Long-GOP 1080i	0.26	0.44
	GXF MPEG-2 SD	3.23	0.99
	LXF I-Frame 1080i	0.25	0.38
	Spectrum Long-GOP 1080i	0.22	0.31
	Spectrum Long-GOP SD	2.84	0.87
	Quantel OP1A SD	3.47	0.78
<b>Broadcast</b>	ATSC HD	0.90	1.03
	ATSC SD	3.62	1.18
	CableLabs 1080i MPEG-2	0.27	0.41
	CableLabs 720p MPEG-2	0.91	0.91
	CableLabs 3/4 Screen	4.12	1.38
	H.264 TS 1080i30	0.15	0.19
	H.264 TS 720p60	0.37	0.33
	H.264 TS 480i30	1.10	0.71
	H.264 TS 720p30	1.33	0.81
	H.264 TS 640x360p30	1.04	0.88
	H.264 TS 320x180p30	3.03	1.52
H.264 TS 640x360p15	2.19	0.84	
<b>DVD</b>	DVD — Mastering Quality	N/A	1.11
<b>Editing</b>	XDCAM DV25	2.47	0.92
	D10 OP1A	2.87	0.82
	P2 DVCPRO HD 1080i	0.86	0.56
	XDCAM HD 4:2:2 MPEG-2 1080i	0.24	0.39
<b>Mobile</b>	iPhone 640x480	2.86	1.24
	iPhone 320x240	4.22	1.52
	iPhone HD	1.53	1.07
	iPad	1.61	0.99
	iPad Retina	0.23	0.46
<b>Web</b>	H.264 852x480 1.2 mbps	2.01	0.98
	H.264 720p 4.0 mbps	1.71	1.02
	H.264 432x240 400 kbps	3.87	1.41
	VC-1 852x480 1.3 mbps	0.40	0.36
	VC-1 720p 4.1 mbps	0.57	0.54
	VC-1 432x240 500 kbps	1.36	0.96
	Microsoft SS — H.264 (8 Layers)	0.39	0.36
	Apple HLS — H.264 (8 Layers)	0.87	0.48
<b>Average Real-Time Transcode Rate</b>		<b>1.64</b>	<b>0.81</b>

The Amazon EC2 High-Memory Extra-Large instance type possesses the following specifications:

- Memory: 17.1 GB
- EC2 Compute Units: 6.5 (2 virtual cores with 3.25 EC2 compute units each)
- Instance Storage: 420 GB
- Platform: 64-bit
- I/O Performance: Moderate
- EBS-Optimized Available: No
- API Name: m2.xlarge



**HIGH-MEMORY DOUBLE EXTRA-LARGE INSTANCE**

Codec Type	Codec	SD MPEG-2 TS 15 mbps	HD MPEG-2 TS 50 mbps
<b>Broadcast Servers</b>	GXF Long-GOP 1080i	0.28	0.61
	GXF MPEG-2 SD	3.53	1.14
	LXF I-Frame 1080i	0.28	0.57
	Spectrum Long-GOP 1080i	0.26	0.51
	Spectrum Long-GOP SD	2.91	1.35
	Quantel OP1A SD	3.31	1.01
<b>Broadcast</b>	ATSC HD	1.09	1.16
	ATSC SD	4.21	1.48
	CableLabs 1080i MPEG-2	0.29	0.60
	CableLabs 720p MPEG-2	1.07	1.15
	CableLabs 3/4 Screen	5.22	2.07
	H.264 TS 1080i30	0.24	0.34
	H.264 TS 720p60	0.45	0.46
	H.264 TS 480i30	1.56	1.12
	H.264 TS 720p30	1.61	1.62
	H.264 TS 640x360p30	1.67	0.63
	H.264 TS 320x180p30	5.21	2.01
H.264 TS 640x360p15	2.82	1.62	
<b>DVD</b>	DVD — Mastering Quality	N/A	1.42
<b>Editing</b>	XDCAM DV25	2.45	0.91
	D10 OP1A	2.91	0.96
	P2 DVCPRO HD 1080i	0.91	0.58
	XDCAM HD 4:2:2 MPEG-2 1080i	0.26	0.50
<b>Mobile</b>	iPhone 640x480	3.29	1.98
	iPhone 320x240	5.10	2.10
	iPhone HD	2.64	1.33
	iPad	1.90	1.77
	iPad Retina	0.27	0.60
<b>Web</b>	H.264 852x480 1.2 mbps	3.33	1.45
	H.264 720p 4.0 mbps	1.78	1.08
	H.264 432x240 400 kbps	6.86	2.07
	VC-1 852x480 1.3 mbps	0.72	0.65
	VC-1 720p 4.1 mbps	0.57	0.63
	VC-1 432x240 500 kbps	1.55	1.47
	Microsoft SS — H.264 (8 Layers)	0.51	0.50
	Apple HLS — H.264 (8 Layers)	1.15	0.90
<b>Average Real-Time Transcode Rate</b>		<b>2.06</b>	<b>1.12</b>

The Amazon EC2 High-Memory Double Extra-Large instance type possesses the following specifications:

- Memory: 34.2 GB
- EC2 Compute Units: 13 (4 virtual cores with 3.25 EC2 compute units each)
- Instance Storage: 850 GB
- Platform: 64-bit
- I/O Performance: High
- EBS-Optimized Available: No
- API Name: m2.2xlarge



## HIGH-MEMORY QUADRUPLE EXTRA-LARGE INSTANCE

Codec Type	Codec	SD MPEG-2 TS 15 mbps	HD MPEG-2 TS 50 mbps
<b>Broadcast Servers</b>	GXF Long-GOP 1080i	0.25	0.62
	GXF MPEG-2 SD	3.43	1.34
	LXF I-Frame 1080i	0.25	0.60
	Spectrum Long-GOP 1080i	0.24	0.57
	Spectrum Long-GOP SD	3.20	1.34
	Quantel OP1A SD	3.26	0.96
<b>Broadcast</b>	ATSC HD	1.13	1.17
	ATSC SD	4.21	1.40
	CableLabs 1080i MPEG-2	0.25	0.60
	CableLabs 720p MPEG-2	1.13	1.15
	CableLabs 3/4 Screen	5.22	2.01
	H.264 TS 1080i30	0.25	0.61
	H.264 TS 720p60	0.80	0.81
	H.264 TS 480i30	2.38	1.37
	H.264 TS 720p30	2.22	1.81
	H.264 TS 640x360p30	1.60	1.04
	H.264 TS 320x180p30	6.66	2.07
H.264 TS 640x360p15	2.78	1.97	
<b>DVD</b>	DVD — Mastering Quality	N/A	1.43
<b>Editing</b>	XDCAM DV25	2.55	0.78
	D10 OP1A	2.87	0.96
	P2 DVCPRO HD 1080i	0.89	0.62
	XDCAM HD 4:2:2 MPEG-2 1080i	0.23	0.52
<b>Mobile</b>	iPhone 640x480	4.00	2.03
	iPhone 320x240	6.66	2.12
	iPhone HD	3.11	1.38
	iPad	2.26	1.98
	iPad Retina	0.25	0.64
<b>Web</b>	H.264 852x480 1.2 mbps	4.53	1.50
	H.264 720p 4.0 mbps	1.97	1.15
	H.264 432x240 400 kbps	7.27	2.09
	VC-1 852x480 1.3 mbps	0.75	0.74
	VC-1 720p 4.1 mbps	0.59	0.64
	VC-1 432x240 500 kbps	1.55	1.52
	Microsoft SS — H.264 (8 Layers)	0.96	0.93
	Apple HLS — H.264 (8 Layers)	1.89	1.29
<b>Average Real-Time Transcode Rate</b>		<b>2.33</b>	<b>1.22</b>

The Amazon EC2 High-Memory Quadruple Extra-Large instance type possesses the following specifications:

- Memory: 68.4 GB
- EC2 Compute Units: 26 (8 virtual cores with 3.25 EC2 compute units each)
- Instance Storage: 1,690 GB
- Platform: 64-bit
- I/O Performance: High
- EBS-Optimized Available: 1,000 Mbps
- API Name: m2.4xlarge

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