































































## Uncompressed

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
Uncompressed 8bit 4:2:2 SD	525i 23.98	23	45	64	84	101	118	81
Uncompressed 8bit 4:2:2 SD	625i 25	23	46	65	86	108	130	81
Uncompressed 8bit 4:2:2 SD	525i 29.97	25	52	78	102	122	N/T	88
Uncompressed 8bit 4:2:2 HD	1280x720p 23.98	49	95	N/T	N/T	N/T	N/T	172
Uncompressed 8bit 4:2:2 HD	1280x720p 25	50	96	N/T	N/T	N/T	N/T	176
Uncompressed 8bit 4:2:2 HD	1280x720p 29.97	57	112	N/T	N/T	N/T	N/T	200
Uncompressed 8bit 4:2:2 HD	1280x720p 50	92	N/T	N/T	N/T	N/T	N/T	323
Uncompressed 8bit 4:2:2 HD	1280x720p 59.94	112	N/T	N/T	N/T	N/T	N/T	394
Uncompressed 8bit 4:2:2 HD	1920x1080p 23.98	103	N/T	N/T	N/T	N/T	N/T	362
Uncompressed 8bit 4:2:2 HD	1920x1080p 25	104	N/T	N/T	N/T	N/T	N/T	366
Uncompressed 8bit 4:2:2 HD	1920x1080p 29.97	124	N/T	N/T	N/T	N/T	N/T	436
Uncompressed 8bit 4:2:2 HD	1920x1080i 50	104	N/T	N/T	N/T	N/T	N/T	366
Uncompressed 8bit 4:2:2 HD	1920x1080i 60	124	N/T	N/T	N/T	N/T	N/T	436
Uncompressed 10bit 4:2:2 SD	525i 23.98	25	48	71	94	117	N/T	88
Uncompressed 10bit 4:2:2 SD	625i 25	31	59	87	116	N/T	N/T	109
Uncompressed 10bit 4:2:2 SD	525i 29.97	30	58	88	115	N/T	N/T	105
Uncompressed 10bit 4:2:2 SD	1280x720p 23.98	64	N/T	N/T	N/T	N/T	N/T	225
Uncompressed 10bit 4:2:2 SD	1280x720p 25	65	N/T	N/T	N/T	N/T	N/T	229
Uncompressed 10bit 4:2:2 SD	1280x720p 29.97	76	N/T	N/T	N/T	N/T	N/T	267

### Legend

- N/T indicates not tested
- White cells indicate 1 Gb connectivity required
- Gray cells indicate Dual 1 Gb (2 Gb) connectivity required
- Orange cells indicate 10 Gb connectivity required

## 19.2 Final Cut Pro Editor Hardware and Software Used During Testing

The following chart describes the Final Cut Pro X and Avid hardware and software used during testing in a complete Final Cut Pro X environment and in a mixed environment.

Platform	OS	CPU	Memory	Editor Version	ISIS Client
Mac Pro	10.9.x	2 x 2.66GHz Quad-Core Intel Xeon (Nehalem)	16GB	Media Composer v7.0.x Media Composer v8.x	v4.7.4
Mac Pro	10.9.x	2 x 2.4 GHz Quad-Core Intel Xeon Mid 2010	16GB	Final Cut Pro X	v4.7.4
Mac Pro	10.9.x	2 x 2.66GHz Quad-Core Intel Xeon (Nehalem)	16GB	Media Composer v7.0.x Media Composer v8.x	v4.7.4
Mac Pro	10.9.x	2 x 2.26 GHz Quad-Core Intel Xeon Early 2009	16GB	Final Cut Pro X	v4.7.4
HP Z400	Windows 8	6 Core 3.07 GHz Intel Xeon	12GB	Media Composer v7.0.x	v4.7.4

## 20.0 Engine Bandwidth Performance (MB/s) with Adobe Premiere Clients

See Section 12.1 of this document for support of 2K/4K/5K formats/codecs while using Adobe Premiere Pro CC v8. Avid has tested Adobe Premiere Pro CC v8 as a client in the Avid ISIS 5000 shared storage environment, using Adobe Premiere Pro CC v8, Media Composer v7.0 and v8.0, with an Avid ISIS v4.7 client in an ISIS v4.7 infrastructure.

The following are guidelines used with Adobe Premiere clients on Avid ISIS 5000.

- Adobe Premiere 10 Gb clients are now supported on ISIS 5000.
- Media from both Adobe Premiere and Avid Media Composer are able to co-exist in the same storage group. For optimal performance you should not mix Avid editors and Premiere editors in the same Storage Group.
- Adobe Premiere CC was qualified on Windows 7 and 8 64-bit and Mac OS v10.9.x and 10.10.x 64-bit operating systems.
- Adobe Premiere clients follow the same guidelines as for Avid editors in regards to the Avid ISIS Client Manager Preference settings. The default setting is set to Medium Resolution (limited to resolutions that draw 16 MB/s or less). Use the High Resolution setting when working with High Definition media (resolutions that draw higher than 16 MB/s). There are some HD resolutions that draw less than 16 MB/s for a single stream, but you should still use the High Resolution setting (for example, XDCAMHD 50). For data rate specifications, see the data in the following tables.

The tables below illustrate the engine ratings in an all Adobe Premiere storage group as well as an environment with Adobe Premiere and Avid editors used together in the same storage group. Scaling an Avid ISIS 5000 beyond a single engine effectively scales in a linear fashion based on a single engine's performance.

### Adobe Premiere Only

# of Engines	All Reads	All Writes	Aggregate
Available B/W per Engine	300 MB/s AVC intra is 130 MB/s	200 MB/s	300 MB/s

### Adobe Premiere and Avid Editors in a Mixed Environment

# of Engines	All Reads	All Writes	Aggregate
Available B/W per engine	300 MB/s <ul style="list-style-type: none"> <li>• When you have Adobe and Avid clients, better performance is expected if you have more Avid clients than Adobe clients.</li> <li>• Engine ratings are better with some DVC PRO resolutions. Some AVC resolutions can cause the Engine rating to fall below the expected rate.</li> </ul>	200 MB/s	300 MB/s

The following provides information on how many streams were qualified per client at various resolutions. These tables define the bandwidth used per resolution and the recommended stream count for each. Attempting to increase the number of streams beyond what is shown may result in unexpected results for the client, but should not affect the ISIS system.

Take the following into consideration when reading the tables included in this section:

- All bandwidth ratings have been adjusted to include up to 8 tracks audio.
- Data in this document was obtained using the Adobe Premiere Creative Cloud v8 editing application.
- All bandwidth ratings have been adjusted to include up to 8 tracks of 16 bit audio @ 48 KHz. The sequence used for testing has two second audio and video cuts offset by one second.

**DVC Pro SD (Windows x64 and Mac OS 10.8.5/10.9.x)**

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
SD DVC Pro50 20*480	NTSC 29.97	10	20	30	39	49	58	35.2
SD DVC Pro50 20*576	PAL 25	10	20	30	40	50	60	35.2

**720p (Windows 7/8 x64 and Mac OS 10.8.5/10.9.x)**

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
DVCPROHD 960*720 23.976	720p/24	9	18	27	37	45	54	31.6
DVCPROHD 960*720 50	720p/50	18	35	51	69	86	N/T	59.8
DVCPROHD 960*720 59.94	720p/60	18	35	52	69	86	N/T	59.8

*Legend*

- N/T indicates not tested
- Gray cells indicate 2 X 1 Gb

**720p (Mac OS 10.8.5/10.9.x)**

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
AVC-Intra 50 960*720 23.976	720p/24	6	11	19	25	30	35	21.1
AVC-Intra 50 960*720 25	720p/25	6	13	20	26	32	42	21.1
AVC-Intra 50 960*720 29.97	720p/30	7	14	19	25	33	42	21.1
AVC-Intra 50 960*720 50	720p/50	11	20	28	N/T	N/T	N/T	35.2
AVC-Intra 50 960*720 59.94	720p/60	9	19	N/T	N/T	N/T	N/T	35.2
AVC-Intra 100 1280*720 23.976	720p/24	9	18	29	35	47	58	28.1
AVC-Intra 100 1280*720 25	720p/25	10	21	30	45	57	N/T	35.2
AVC-Intra 100 1280*720 29.97	720p/30	10	20	28	45	53	N/T	35.2
AVC-Intra 100 1280*720 50	720p/50	20	41	N/T	N/T	N/T	N/T	59.8
AVC-Intra 100 1280*720 59.94	720p/60	18	38	N/T	N/T	N/T	N/T	59.8

*Legend*

- N/T indicates not tested

**720p (Windows 7/8 x64)**

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
AVC-Intra 50 960*720 23.976	720p/24	5	10	18	22	28	N/T	21.1
AVC-Intra 50 960*720 25	720p/25	7	14	21	28	N/T	N/T	21.1
AVC-Intra 50 960*720 29.97	720p/30	8	15	24	32	N/T	N/T	21.1
AVC-Intra 50 960*720 50	720p/50	12	20	N/T	N/T	N/T	N/T	35.2
AVC-Intra 50 960*720 59.94	720p/60	11	N/T	N/T	N/T	N/T	N/T	35.2
AVC-Intra 100 1280*720 23.976	720p/24	10	19	28	37	N/T	N/T	28.1
AVC-Intra 100 1280*720 25	720p/25	12	21	31	N/T	N/T	N/T	35.2
AVC-Intra 100 1280*720 29.97	720p/30	11	20	31	N/T	N/T	N/T	35.2
AVC-Intra 100 1280*720 50	720p/50	18	N/T	N/T	N/T	N/T	N/T	59.8
AVC-Intra 100 1280*720 59.94	720p/60	19	N/T	N/T	N/T	N/T	N/T	59.8

*Legend*

- N/T indicates not tested

### 1080i (Mac OS 10.8.5/10.9.x)

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
DVC Pro HD 1440*1080 25	1080i/50	29	54	83	110	126	N/T	59.8
DVC Pro HD 1280*1080 29.97	1080i/60	20	40	60	N/T	N/T	N/T	59.8

#### Legend

- N/T indicates not tested
- Gray cells indicate 2 X 1 Gb

### 1080i (Windows 7/8 x64)

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
1:1 10 bit	1080i/59.94	160	320	N/T	N/T	N/T	N/T	527
1:1 8 bit	1080i/59.94	130	260	N/T	N/T	N/T	N/T	439
DVC Pro HD 1440*1080 25	1080i/50	27	53	79	105	N/T	N/T	59.8
DVC Pro HD 1280*1080 29.97	1080i/60	18	35	53	69	86	100	59.8

#### Legend

- N/T indicates not tested
- Gray cells indicate 2 X 1 Gb
- Orange cells indicate 10 Gb connectivity required

### 1080p (Mac OS 10.8.5/10.9.x)

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
AVC-Intra 50 1440*1080 23.976	1080p/24	10	17	25	N/T	N/T	N/T	28.1
AVC-Intra 50 1440*1080 25	1080p/25	11	20	35	N/T	N/T	N/T	35.2
AVC-Intra 50 1440*1080 29.97	1080p/30	10	20	31	N/T	N/T	N/T	35.2
AVC-Intra 100 1920*1080 23.976	1080p/24	15	30	N/T	N/T	N/T	N/T	49.2
AVC-Intra 100 1920*1080 25	1080p/25	27	51	N/T	N/T	N/T	N/T	59.8
AVC-Intra 100 1920*1080 29.97	1080p/30	18	N/T	N/T	N/T	N/T	N/T	59.8

#### Legend

- N/T indicates not tested
- Gray cells indicate 2 X 1 Gb

### 1080p (Windows 7/8 x64)

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
AVC-Intra 50 1440*1080 23.976	1080p/24	10	20	N/T	N/T	N/T	N/T	28.1
AVC-Intra 50 1440*1080 25	1080p/25	11	21	N/T	N/T	N/T	N/T	35.2
AVC-Intra 50 1440*1080 29.97	1080p/30	11	21	N/T	N/T	N/T	N/T	35.2
AVC-Intra 100 1920*1080 23.976	1080p/24	16	27	N/T	N/T	N/T	N/T	49.2
AVC-Intra 100 1920*1080 25	1080p/25	28	N/T	N/T	N/T	N/T	N/T	59.8
AVC-Intra 100 1920*1080 29.97	1080p/30	18	N/T	N/T	N/T	N/T	N/T	59.8

#### Legend

- N/T indicates not tested



### XDCAM HD422 (Windows 7/8 x64 and Mac OS 10.8.5)

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
XDCAM HD422 CBR_25	1080i/50	14	25	34	45	53	63	35.2
XDCAM HD422 CBR_29.97	1080i/60	17	27	37	46	55	65	35.2
XDCAM HD422 CBR_23.98	1080p/24	13	23	33	42	52	61	35.2
XDCAM HD422 CBR_25	1080p/25	15	24	35	44	53	62	35.2
XDCAM HD422 CBR_29.97	1080p/30	18	27	38	47	56	66	35.2
XDCAM HD422 CBR_50	720p/50	17	30	40	50	60	N/T	35.2
XDCAM HD422 CBR_59.94	720p/60	17	28	38	49	60	N/T	35.2

#### Legend

- N/T indicates not tested
- Gray cells indicate 2 X 1 Gb

### Apple ProRes (Mac OS 10.8.5/10.9.x)

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
ProRes 422 HQ	1080p/24	28	56	85	111	N/T	N/T	98.4
ProRes 422 HQ	1080p/25	46	80	101	N/T	N/T	N/T	161.7
ProRes 422 HQ	1080p/30	34	68	101	N/T	N/T	N/T	119.5
ProRes 422 HQ	1080p/50	56	N/T	N/T	N/T	N/T	N/T	196.9
ProRes 422 HQ	1080p/59.94	65	N/T	N/T	N/T	N/T	N/T	228.5
ProRes 422 HQ	720x486p29.97	13	26	39	52	65	N/T	45.7
ProRes 422 HQ	720p24	17	32	48	64	80	N/T	59.8
ProRes 422 HQ	720p50	30	60	89	N/T	N/T	N/T	105.5
ProRes 4444	1080p30	50	N/T	N/T	N/T	N/T	N/T	175.8
ProRes 422 720p59.94	720p59.94	25	49	72	N/T	N/T	N/T	87.9
ProRes 422	1080p25	30	59	89	N/T	N/T	N/T	105.5
ProRes 422 LT	1080p50	26	52	79	N/T	N/T	N/T	91.4
ProRes 422 Proxy	1080p50	13	27	41	N/T	N/T	N/T	45.7

#### Legend

- N/T indicates not tested
- Gray cells indicate 2 X 1 Gb

### Apple ProRes (Windows 7/8 x64)

Resolution	Project Format	Number of Streams per client (MB/s)						GB/Hr
		1	2	3	4	5	6	
ProRes 422 HQ	1080p/24	33	N/T	N/T	N/T	N/T	N/T	116
ProRes 422 HQ	1080p/25	50	N/T	N/T	N/T	N/T	N/T	175.8
ProRes 422 HQ	1080p/30	41	N/T	N/T	N/T	N/T	N/T	144.1
ProRes 422 HQ	720x486p29.97	11	22	33	44	54	64	38.7
ProRes 422 HQ	720p24	14	28	42	54	67	N/T	49.2
ProRes 422 HQ	720p50	26	52	N/T	N/T	N/T	N/T	91.4
ProRes 422 720p59.94	720p59.94	20	41	N/T	N/T	N/T	N/T	70.3
ProRes 422	1080p25	27	N/T	N/T	N/T	N/T	N/T	94.9
ProRes 422 LT	1080p50	22	44	68	N/T	N/T	N/T	77.3
ProRes 422 Proxy	1080p50	12	25	N/T	N/T	N/T	N/T	42.2

#### Legend

- N/T indicates not tested
- Gray cells indicate 2 X 1 Gb

## 20.1 Adobe Premiere Hardware and Software Used During Testing

The following chart describes the Adobe Premiere and Avid hardware and software used during testing in a complete Adobe Premiere environment and in a mixed environment.

Platform	OS	CPU	Memory	Editor Version	ISIS Client
HP z400	Windows 7 64-bit SP1 Windows 8	W3550 3.06 8MB/1066 Quad-Core Intel Xeon	6 GB	Adobe Premiere CC v8	v4.7.4
Mac Pro	10.8.5 10.9.x	2 x 2.8GHz Quad-Core Intel Xeon (Harpertown)	6 GB	Adobe Premiere CC v8	v4.7.4