HIKVISION™ TECHNICAL BULLETIN

Title:	NVR Camera Capacity based on Bit Rate				
Date:	8/31/12	Version:	1.1	Pages	2
Product:	9632NI-**ST** *(Includes future NVR releases with the "ST" extension)*				
Action Required:	Information Only				

The 9632NI-ST is capable of supporting **UP TO** 32 IP cameras @ 30 fps at once. Actual capacity depends on the total bit-rate from all the cameras. The 9632NI-ST can support a maximum of 80 mbps across all cameras, but "Best Practice" calls for leaving some headroom for machine operations such as remote streaming, so it is recommended to not exceed 74 mbps total.

To fully understand NVR capacity, it is necessary to understand the concepts of Video Streaming, Resolution and Quality, and above all, Bit Rate.

Streaming video is content sent in compressed form over a network and processed in "real time", meaning as it is received.

Hikvision Streaming Video Types:
- **Main Stream**: the high quality video that is being recorded and may be streamed
- **Sub Stream**: never recorded; intended for streaming only. Default is CIF 512kbps @ 30fps
- Can be video alone, or video & audio compressed together. Audio requires very little bandwidth.

The combination of the main and sub streams make up the total **Bit Rate** of each camera. It is expressed in **kbps** (kilobits per second) or **mbps** (megabits per second)

Bit-rate is determined by:
  The selected resolution *(1280x720, 1920x1080, 2560x1920, etc.)*
  Frame rate *(frames per second)*
  Video Quality *(The amount of compression being applied to each camera.)*

EXAMPLE:
32 channels of 720P cameras at 15fps with good image quality will have 32x (1536 + 512) = 65536 kbps (about 66Mbps), so the DS-9632NI-ST can support them.

NOTE:
- Video quality is NOT the same as resolution. Resolution is measured in height and width.
- An Image or video clip can be at very high resolution while being at a very low quality.
- The higher your data stream / bit rate is the better the video quality.
- The lower your data stream / bit rate is the lower your video quality.
- These instructions are for general reference only. There are many other factors affecting file size, such as the amount of motion, the complexity of the scene, lighting, etc.

Title:	NVR Camera Capacity based on Bit Rate				
Date:	8/31/12	Version:	1.1	Pages	2
Product:	9632NI-**ST** *(Includes future NVR releases with the "ST" extension)*				
Action Required:	Information Only				

It is important to note that each channel can support a different camera, as long as the total bit rate limit is not exceeded. It is entirely possible to mix 5 MP cameras with 4CIF IP cameras, etc.

Refer to this chart to calculate the needed total bit rate for a given NVR. Remember to include both Main stream and Sub stream.

Recommended Bitrate in Kbps					
Resolution	Pixels	Frame rate	Best	Better	Good
5MP	2560*1920	30fps	16384Kbps[1]	16062	12047
		15fps	10039	8031	6023
		8fps	5701	4560	3420
3MP	2048*1536	30fps	15360	10240	8192
		15fps	7680	5120	4096
		8fps	4361	2907	2326
2MP	HD 1080P(1920*1080)	30fps	10240	7168	5120
		15fps	5120	3584	2560
		8fps	2907	2035	1453
	UXGA(1600*1200)	30fps	9481	6637	4740
		15fps	4740	3318	2370
		8fps	2692	1884	1345
1.3MP	HD 900P(1600*912)	30fps	9728	6485	4864
		15fps	4864	3242	2432
		8fps	2725	1817	1362
	HD 960P(1280*960)	30fps	8192	5461	4096
		15fps	4096	2730	2048
		8fps	2326	1550	1163
1.0MP	HD 720P(1280*720)	30fps	6144	4096	3072
		15fps	3072	2048	1536
		8fps	1744	1163	872
Standard Resolution	XVGA(1024*768)	30fps	5242	3495	2621
		15fps	2621	1747	1310
		8fps	1488	992	744
	SVGA(800*600)	30fps	4363	2909	2181
		15fps	2181	1454	1090
		8fps	1238	826	619
	4CIF(704*480) @ 30fps	30fps	3072	2048	1536
		15fps	1536	1024	768
		8fps	872	581	436
	VGA(640*480)@ 30fps	30fps	2048	1536	1280
		15fps	1024	768	640
		8fps	581	436	363

[1]: In theory, 5MP@30fps requires around 20078 Kbps for best quality. But NVR/HDVR is currently limited to 16 Mbps maximum.

[2]: Hikvision used to have 6 levels in our Image Quality settings: Highest, High, Medium, Low, Lower, Lowest. We are keeping the first three levels here and renaming them as Good, Better, Best.