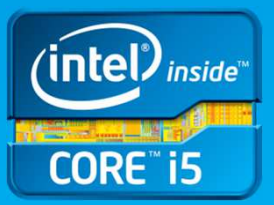
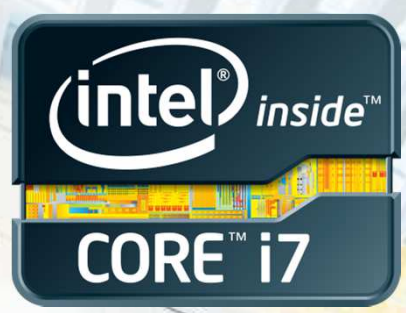
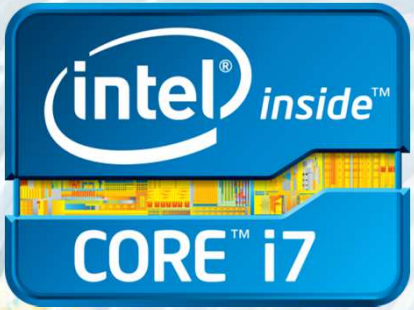
3rd Generation Intel® Core™ Processor Family
Quad Core Launch Product Information

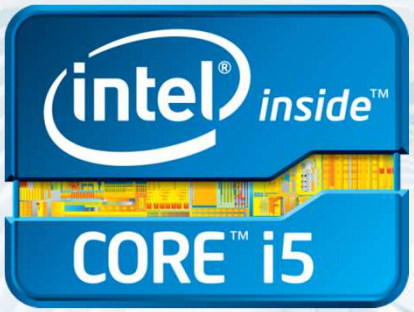
April 23, 2012



3rd Generation Intel® Core™ Processor Family







Amazing performance. Stunning visuals.
Get a difference in your PC experience that you can see *and* feel
- featuring a visibly smart 3rd generation Intel® Core™ processor -

On April 23, 2012, Intel Announces the 3rd Generation Intel® Core™ Processor Family

Newest Manufacturing Technology Delivers

45nm Process Technology		32nm Process Technology		22nm Process Technology
Penryn Intel® Core™ Microarchitecture	Nehalem Intel® Core™ Microarchitecture	Westmere Intel® Core™ Microarchitecture (Nehalem)	Sandy Bridge Intel® Core™ Microarchitecture	**Ivy Bridge** Intel® Core™ Microarchitecture (Sandy Bridge)
TICK	*TOCK*	*TICK*	*TOCK*	*TICK*
	2009	2010	2011	2012

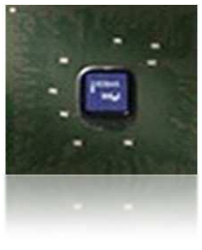
Ivy Bridge:

First microprocessor on Intel's latest 22nm process technology

Cadence of Innovation delivers New Microprocessor Efficiency on the 22nm Process

3rd Generation Intel® Core™ Notebook Platform

3rd gen Intel® Core™ Processor



Intel ® 7 Series Chipset

Intel ® Centrino® Advanced Wireless

Higher CPU performance with lower power

- Made possible by revolutionary 3-D transistor technology, 22nm process technology, improvements in the Sandy Bridge architecture, and responsiveness technologies

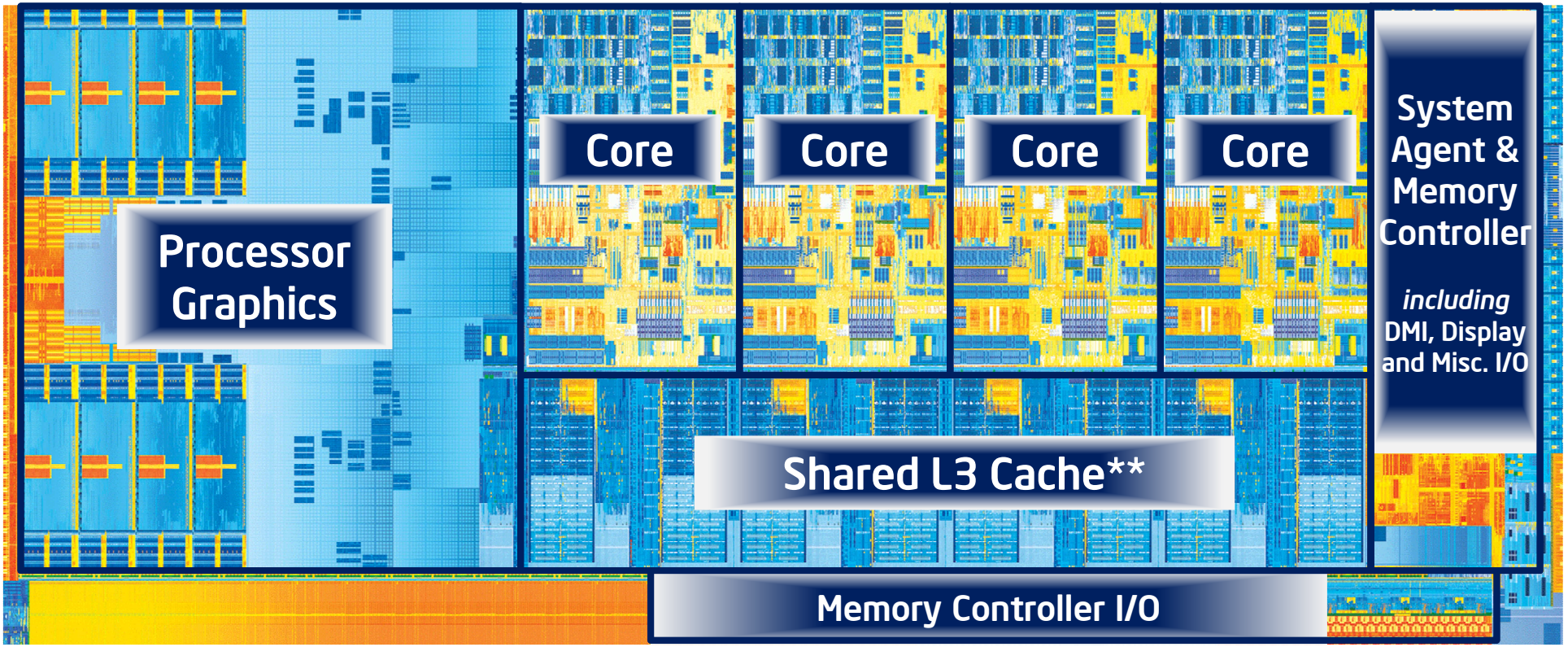
Up to 2X performance improvement plus enhanced features

- *Delivered by improvements in processor graphic performance, media acceleration, Intel® Wireless Display and Intel® Insider™*

Faster Device Connections

- *Connections by high bandwidth Intel® wireless and integrated USB 3.0 enable sharing of device capabilities, fast files transfers and device synchronization*

3rd Generation Intel® Core™ Processor: 22nm Process



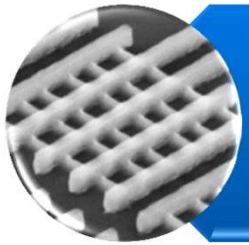
New architecture with shared cache delivering more performance and energy efficiency

Quad Core die with Intel® HD Graphics 4000 shown above

Transistor count: 1.4Billion Die size: 160mm^2

** Cache is shared across all 4 cores and processor graphics

3rd generation Intel® Core™ Processor



World's First 3-D Transistor Manufactured at 22nm

Smaller transistor with power aware interrupt routing for better performing and more power efficient computing

Industry Leading Performance

Faster CPU performance with Intel® Turbo Boost Technology 2.0 & Intel® Hyper-Threading Technology. Shared Cache with processor graphics for load balancing optimization. Plus reduced power for mobile platform.

Enhanced Security

New hardware based random number generator for higher performance encryption, and improved hardware based security protection against malware intrusion

Improved Overclocking Features

Real time overclocking adjustments, higher CPU multiplier limits, finer DDR frequency control & XMP 1.3 support

3rd Gen Intel® Core™ Processor Graphics and Media Benefits

Intel® Built-in Visuals[1] and….

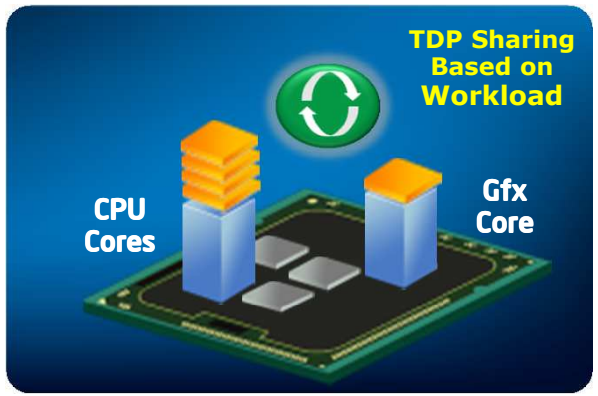
- **Intel® Quick Sync Video** — Fast transcoding
- **InTru™ 3D** — View 3D content
- **Intel® HD Graphics** — Immersive gaming & browsing
- **Intel® Clear Video HD** — Stunning visuals
- **Intel® Insider*** — Full 1080p movies
- **Intel® Wireless** — PC content on your TV

New Initiatives

- **Intel® Identity Protection** with Protected Transaction Display

Processor Graphics

- Single Device integrating IA Core, Graphics and Media
- Performance on demand with
  Intel® HD Graphics Dynamic Frequency Technology
- Leadership Media and Great Mainstream 3D Gaming
- Built-in Visuals (Visibly Smart Campaign)



Intel® HD Graphics Dynamic Frequency Technology

Built-in Visuals available only with Intel Processor Graphics!

[1]Available with Core Only. Only Intel HD Graphics available on Pentium and Celeron

3rd Generation Intel® Core™ processors – Graphics and Media Features

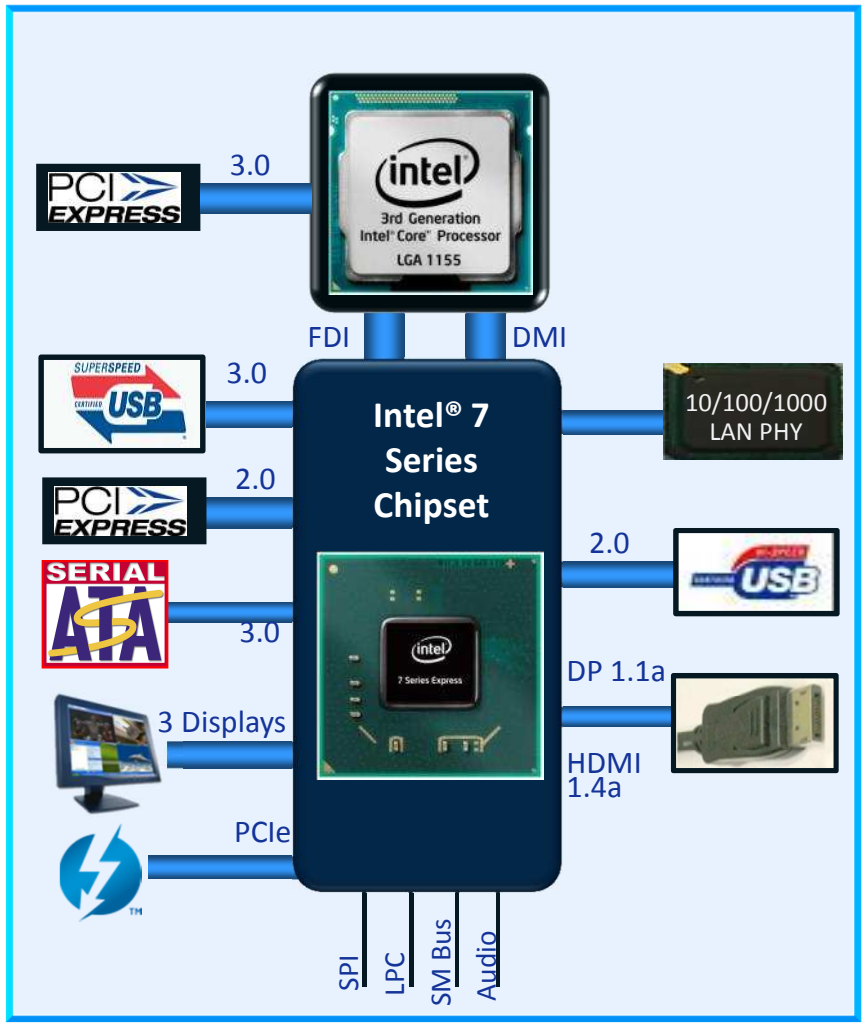
Feature	2nd Gen Core	3rd Gen Core
Game Playability	Good	Best
New games playable out of the box	50	100
Intel® Quick Sync Video (HD to HD)	Good	Better
Intel® Clear Video HD Technology	Yes	Yes
InTru™ 3D Technology	Yes	Yes
Intel® WiDi	Good	Better
Intel® Insider™	Yes	Yes
Switchable graphics (muxless solution)[2]	Yes	Yes
DX11 (Tessellation, Compute Shader)	No	Yes
HTML5	Yes	Yes
OpenCL 1.1	CPU	CPU/GPU
Media SDK	2011	2012
Independent Digital Display Support	2	3
eDP	1.1	1.1
Premium video conferencing	Yes	Enhanced
Windows 8 support	Yes	Yes

3rd gen core Improvement

Intel® 7 Series (Panther Point) Chipset Overview[1]

New

- 3rd Gen and 2nd Gen Intel® Processor Family Support
- Integrated USB 3.0 (with Streams support)
- 3 Display Support
- Intel® Rapid Storage Technology 11
- Intel® Small Business Advantage
- Intel® Thunderbolt support (optional)



- Manageability and Security Features
- High Speed SATA 6 Gb/s support for SSD/HDDs
- Storage Power Savings
- Legacy PCI support[1]
- Intel® 65nm process

Intel® 7 Series based platforms enable new platform capabilities

[1]Certain features may not be present in all SKU

2012 Platform Summary

The 3rd generation Intel® Core™ processor is the first 22nm CPU in the market

Intel's 3rd generation Intel® Core™ processor delivers increased performance with lower power

3rd generation Intel® Core™ processor graphics has up to 2X media and graphics performance over the prior generation

2012 platforms enable multiple capabilities enhancing connectivity, responsiveness, and security

PRODUCT FEATURES-
Matrices

3rd Gen Intel® Core™ Processor Feature Matrix

	Consumer	
Feature		
Greater Cache (>8MB)		√
Intel® Turbo Boost Technology 2.0	√	√
DX11	√	√
≥4 way multitask processing	√	√
Intel® Response Technologies •Intel® Smart Response Technology •Intel® Rapid Start Technology •Intel® Smart Connect Technology	√	√
Built-in Visuals – includes: •Intel® HD Graphics 2500/4000 •Intel® Quick Sync Video 2.0 •Intel® Advanced Vector Extensions •Intel® Clear Video HD Technology •Intel® InTru™ 3D •Intel® Insider™ •Intel® WiDi	√	√
Intel® Secure Key	√	√
Intel® OS Guard	√	√
Intel® Anti-theft Technology	√	√

Note: Not all features available on all SKUs. Optimized software may be required, check with your system manufacturer. Launch timing for other 3rd gen Intel® Core processors may differ, for further details consult with your Intel representative.

All New 3rd Gen Intel® Core™ Mobile QC SV Processors

Brand		CORE i7	CORE i7	CORE i7
Processor Number		i7-3720QM	i7-3820QM	i7-3920XM
Price		$378	$568	$1096
TDP		45W	45W	55W
Cores/ Threads		4/8	4/8	4/8
CPU Base Freq (GHz)		2.60	2.70	2.90
Intel® Turbo Boost Technology 2.0 Max Frequency (GHz)	**SC**	3.60	3.70	3.80
	DC	3.50	3.60	3.70
	QC	3.40	3.50	3.60
DDR3/DDR3L (MHz)		1600MHz	1600MHz	1600MHz
L3 Cache		6MB	8MB	8MB
Intel® HD Graphics 4000		Yes	Yes	Yes
Gfx Base Render Frequency		650MHz	650MHz	650MHz
Graphics Max Dynamic Frequency		1250MHz	1250MHz	1300MHz
PCIe Generation 3 Support		Yes	Yes	Yes
Intel® Secure Key		Yes	Yes	Yes
Intel® OS Guard		Yes	Yes	Yes
Intel® AES/TXT Technology		Yes	Yes	Yes
Intel® Virtualization Technology		Yes	Yes	Yes
Package		rPGA/ BGA-1224*	rPGA/ BGA-1224*	rPGA

** QC BGA is a different package than DC BGA*

Under Embargo Until Further Notice

Standard Power 3rd Gen Intel® Core™ Desktop QC Processors

Brand					
Processor Number	Core i7-3770K	Core i7-3770	Core i5-3570K	Core i5-3550	Core i5-3450
Price	$332	$294	$225	$205	$184
TDP	77	77	77	77	77
Cores/ Threads	4 / 8	4 / 8	4 / 4	4 / 4	4 / 4
CPU Base Freq (GHz)	3.50	3.40	3.40	3.30	3.10
Max Turbo Freq (GHz)	3.90	3.90	3.80	3.70	3.50
DDR3 (MHz)	1600	1600	1600	1600	1600
L3 Cache	8M	8M	6M	6M	6M
Intel® HD Graphics 2500/4000	4000	4000	4000	2500	2500
Graphics Base Render Frequency	650MHz	650MHz	650MHz	650MHz	650MHz
Graphics Max Dynamic Frequency	1150MHz	1150MHz	1150MHz	1150MHz	1100MHz
PCIe Gen3.0	yes	yes	yes	yes	yes
Intel® Secure Key	yes	yes	yes	yes	yes
Intel® OS Guard	yes	yes	yes	yes	yes
Intel® SIPP		yes		yes	
Intel® VT-d		yes		yes	
Intel® TXT		yes		yes	

Under Embargo Until Further Notice

Low Power 3rd Gen Intel® Core™ Desktop QC Processors

Brand	intel inside CORE i7	intel inside CORE i7	intel inside CORE i5	intel inside CORE i5	intel inside CORE i5
Processor Number	Core i7-3770T	Core i7-3770S	Core i5-3570T	Core i5-3550S	Core i5-3450S
Price	$294	$294	$205	$205	$184
TDP	45	65	45	65	65
Cores/ Threads	4 / 8	4 / 8	4 / 4	4 / 4	4 / 4
CPU Base Freq (GHz)	2.50	3.10	2.30	3.0	2.80
Max Turbo Freq (GHz)	3.70	3.90	3.30	3.70	3.50
DDR3 (MHz)	1600	1600	1600	1600	1600
L3 Cache	8M	8M	6M	6M	6M
Intel® HD Graphics 2500/4000	4000	4000	2500	2500	2500
Graphics Base Render Frequency	650MHz	650MHz	650MHz	650MHz	650MHz
Graphics Max Dynamic Frequency	1150MHz	1150MHz	1150MHz	1150MHz	1100MHz
PCIe Gen3.0	yes	yes	yes	yes	yes
Intel® Secure Key	yes	yes	yes	Yes	yes
Intel® OS Guard	yes	yes	yes	Yes	yes
Intel® SIPP	yes	yes	yes	Yes	
Intel® VT-d	yes	yes	yes	yes	
Intel® TXT	yes	yes	yes	yes	

BENCHMARK INFORMATION

Legal Notices and Important Information
Regarding the performance measurements in this presentation

differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_numbers for details.

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Intel® Turbo Boost Technology

Disclaimer:
Intel® Turbo Boost Technology (Intel® TBT) requires a PC with a processor with Intel TBT capability. Intel TBT performance varies depending on hardware, software, and overall system configuration. Check with your PC manufacturer on whether your system delivers Intel TBT.
See http://www.Intel.com/technology/turboboost for more information.

System Configurations

Operating System: Windows* 7 SP1

IVB Intel® Core™ i7-3770K 3.5 GHz (Turbo up to 3.9 GHz) 4C8T/4x256KB/8MB, Intel HD Graphics 4000 @ 1150 MHz, Motherboard: DZ77GA-70K (BIOS:BLH6710H.86A.0079), Intel INF 9.3.0.1019, Graphics driver version 8.15.10.2616, Memory: Samsung 8 GB (2x4 GB) DDR3 1600, Hard drive: Seagate* 1 TB HDD

SNB Intel® Core™ i7-2700K 3.5 GHz (Turbo up to 3.9 GHz) 4C8T/4x256KB/8MB, Intel HD Graphics 3000@1350 MHz, Motherboard: DZ68DB (BIOS:DBZ6810H.86A.0032.2011.0928.1502), Intel INF 9.3.0.1019, Graphics driver version 8.15.10.2616, Memory: Micron 8 GB (2x4 GB) DDR3 1333, Hard drive: Seagate 1 TB HDD

All measurements use eDP panel at 1366x768

IVB Intel® Core™ i7-3820QM SV 2.7 GHz (Turbo up to 3.7 GHz), 4C8T/4x256KB/8MB, Intel HD Graphics 4000 1.25 GHz, Motherboard: Emerald Lake 2 BIOS:78, INF Version 9.3.0.1019, Graphics driver version 15.26.64.2616, Memory: Micron* 4GB (2x2GB) DDR3 1600, Hard drive: Intel 160 GB SSD, RST 11.0.0.1032

SNB Intel® Core™ i7-2860QM SV 2.5 GHz (Turbo up to 3.6 GHz), 4C8T/4x256KB/8MB, Intel HD Graphics 3000 1.30 GHz, Laptop System: Emerald Lake BIOS: 80, INF Version 9.3.0.1019, Graphics driver version 15.26.64.2616, Memory: Micron* 4 GB (2x2GB) DDR3 1600, Hard drive: Intel 160 GB SSD, RST 11.0.0.1032

Performance tests and ratings are measured using specific computer systems and / or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit http://www.intel.com/performance/

Performance Benchmark and Application Test Information

Application names listed in alphabetical order

3DMark* Vantage is a 3D graphics benchmark, designed for Microsoft Windows Vista* and DirectX*10. It includes two graphics tests, two CPU tests, and several feature tests. The CPU tests measures the contribution of the processor on 3D graphical while the graphics test measures game simulation performance.

PCMark* Vantage is a PC benchmark suite designed for Windows Vista offering one-click simplicity for casual users and detailed, professional grade testing for industry, press and enthusiasts. A PCMark score is a measure of your computer's performance across a variety of common tasks such as viewing and editing photos, video, music and other media, gaming, communications, productivity and security.

CINEBENCH* is a real-world cross platform test suite that evaluates your computer's performance capabilities. CINEBENCH is based on MAXON's award-winning animation software CINEMA 4D, which is used extensively by studios and production houses worldwide for 3D content creation.

QSV Enabled Applications

ArcSoft* MediaConverter 7 is an all-in-one multimedia file converter. This utility converts multimedia files into formats optimized for use on your mobile phone, PMP, TV, and many other popular devices. The workload file is a 5 minute, 381 MB, 1280x720, H.264, 10660 kbps, .MOV video file which is transcoded to a smaller 1280x720, H.264, ~3Mbps, .MP4 file for uploading and publishing to YouTube.

CyberLink* MediaEspresso 6.5 The workload file is a 6 minute, ~1GB, 1920x1080p, 23738 kbps, MOV video file that one would have obtained from an iPhone 4S. The file is transcoded to a smaller 640x360, H.264, .MP4 file for reduced file size during internet transfers or for viewing on a portable device with lower resolution such as an iPod.