INTEL NEWS FACT SHEET

Introducing the Intel® Xeon® Processor E3-1500 v5 Family

Powering the Workloads for Media Processing and Data Center Graphics

May 31, 2016 — As video approaches 80 percent of all Internet traffic[1], delivering video quickly and efficiently is a top priority for cloud and communications service providers. This is driving the need for more media processing in the network and the cloud, such as video transcoding to reduce network bandwidth usage while improving the end-user experience. Cloud service providers have traditionally used general purpose processors to deliver video, but are increasingly looking at optimized solutions that include integrated graphics processors. Comms service providers have used fixed-function DSPs, ASICs and FPGA for video delivery, but are increasing looking at general purpose solutions complemented by graphics processors.

The new Intel® Xeon® processor E3-1500 v5 family cost-effectively accelerates video and enables secure, remote delivery of graphic-intensive applications by combining the performance of Intel Xeon processors with the power of Intel® Iris™ Pro Graphics P580, Intel's most advanced graphics processor. By integrating the graphics processor onto the Intel Xeon processor, compared to the use of add-in PCIe* graphics cards, the product family enables service providers to cost-effectively deliver high-quality content on demand, including live broadcasting and videoconferencing, by packing more video streams per watt into a single server or appliance for a smaller data center footprint and lower power consumption[2].

Changing Graphics Application Delivery

Globalization and mobility have increased the need for professional engineers, content creators and researchers to get their work done anytime, anywhere. Engineering and content creation applications that once ran only on deskside workstations are now extended to run in the data center. The increased graphics capabilities[3] offered by the Intel Xeon E3-1500 v5 family enable complex, 3D applications to be delivered remotely to multiple end devices from secure public and private cloud data centers - unleashing the professional "creator" and enabling greater collaboration among the global workforce.

Network and Cloud Media Processing

Hardware-Assisted HEVC Video Transcode Performance
While HD (1080p) video is predominant today, UHD (or 4K video) is quickly emerging along with immersive experiences such as 3D and virtual reality. Intel is investing ahead of broad 4K video delivery by enabling hardware-enhanced High Efficiency Video Codec (HEVC) transcoding of 4K video on the new Intel Xeon processor E3-1500 v5 family.

The product family takes video and puts it into various formats so users can view it on their TV, laptop, phone or other user device no matter what the resolution. The product family can deliver two real-time HEVC streams for 4K 30 frame-per-second (FPS) video and up to 18 AVC streams for taking 1080p 30 frame-per-second video and transcoding it into HEVC at the same resolution[4]. It also delivers increased performance for remote application delivery with up to 26 percent more performance available to complex CAD and content creation applications in virtualized environments[5]. The Intel Xeon E3-1500 v5 family is delivering the breakthrough, immersive experiences enabled by the visual cloud. A cloud

service provider can now take video recorded at a music concert, upload the video into multiple formats (4K, 1080p and 720p, for example) and stream it to user devices all over the world.

For developers of video transcoding software, Intel® Media Server Studio simplifies development of media applications by giving state-of-the-art transcoding features for tailoring image quality versus performance. This comprehensive suite of development tools supports both Linux* and Windows*[6]. It also provides access to the Intel Iris Pro graphics and Intel® Quick Sync Video media accelerators for high-speed media transcode.

Remote Workstations

Dynamic Application Support for Demanding Users
The Intel Xeon processor E3-1500 v5 product family cost-effectively provides workstation-class visual experiences and greater reach to even the most demanding users. Intel® Graphics Virtualization Technologies (Intel® GVT) allows users to dedicate the resources of each processor to a single designer or engineer, or share them among groups of users.

Developers can pick one or more techniques from the Intel GVT portfolio to best suit their respective solutions and business models.

- **Intel® Graphics Virtualization Technology –d (Intel® GVT-d)** - provides the highest possible performance for engineers and content creators, assigning a dedicated physical graphics processing unit (GPU) to their virtual machine (VM).
- **Intel® Graphics Virtualization Technology –g (Intel® GVT-g)** - enables collaboration among engineers and content creators, allowing up to seven users to share a single graphics processor simultaneously.
- **Intel® Graphics Virtualization Technology –s (Intel® GVT-s)** - supports a large number of knowledge workers using common office applications (e.g., Microsoft Office * and Chrome Browser*).

Product Overview

The Intel Xeon processor E3-1500 v5 family, based on the Skylake microarchitecture, integrates graphics acceleration with Intel Iris Pro Graphics P580 and enhances energy-efficiency and performance with Intel's industry-leading 14nm transistor technology. The product family offers up to 26 percent more overall graphics performance than the previous generation Intel® Xeon® processor E3-1200 v4 product family[5]. For dense and high-capacity media processing in the network and cloud, the new processor family delivers up to 18 advanced video coding (AVC) streams or 8 HEVC streams at 1080p 30 FPS, or 2 HEVC streams at 4K 30 FPS[4].

When paired with the Intel® C236 series chipset, the product family supports new, faster memory performance, with up to 64 GB of DDR4 at 2133 MHz[7]. The chipset also provides faster connectivity and flexibility with integrated I/O technologies, such as PCI Express* Gen 2.0, 6.0 Gbps SATA 6.0, and USB 3.0 with Intel® Flex I/O. The tight integration of graphics, compute and I/O on the same platform increases performance and density while reducing power consumption[2], data movement and software complexity. The result is another leap forward in media and graphics capability for better user experiences at a lower cost for media and graphics-intensive workloads.

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The Intel Xeon processor E3-1500 v5 product family includes five SKUs designed to satisfy different customer requirements. Two of the SKUs are designed for cloud service providers looking to optimize data center footprint. For comms service providers who require network infrastructure solutions be deployed for up to 7-10 years, the product family offers three long-life solutions at a variety of power envelopes.

PROCESSOR NUMBER	Processor Base Frequency	Max Turbo Frequency	Graphics Base Frequency	Graphics Max Dynamic Frequency	Intel® Iris™ Pro Graphics	POWER
Data Center Graphics SKUs (optimized for performance)						
Intel® Xeon® Processor E3-1585 v5	3.5 GHz	3.9 GHz	350 MHz	1.15 GHz	P580	65W
Intel® Xeon® Processor E3-1585L v5	3.0 GHz	3.7 GHz	350 MHz	1.15 GHz	P580	45W
Intel® Xeon® Processor E3-1565L v5	2.5 GHz	3.5 GHz	350 MHz	1.05 GHz	P580	35W
Media Processing in the Network SKUs (optimized for reliability)						
Intel® Xeon® Processor E3-1578L v5	2.0 GHz	3.4 GHz	700 MHz	1.0 GHz	P580	45W
Intel® Xeon® Processor E3-1558L v5	1.9 GHz	3.3 GHz	650 MHz	1.0 GHz	P555	45W

INTEL® C236 Series Chipset

			PCI EXPRESS PORTS			SATA PORTS				
Intel® Iris™ Pro Graphics	**Intel® ATM 9.0**	**Intel® Node Manager**	**Gen 3 PCH**	**Gen 2 PCH**	**USB 3.0 Ports**	**USB 2.0 Ports**	**6 GB/s**	**3 GB/s**	**Intel® Rapid Storage Technology**	**LAN**
•	•	•	16	8†	6†	8	6†	•	•	Integrated MAC

For more information on the Intel Xeon processors E3-1500 v5 family, visit http://www.intel.com/content/www/us/en/processors/xeon/xeon-processor-e3-family.html.

[1] Cisco Visual Networking Index: Forecast and Methodology, 2014-2019 White Paper," 2015, pg 2, www.cisco.com/c/en/us/solutions/collateral/service-provider/ip-ngn-ip-next-generation-network/white_paper_c11-481360.html.

[2] Density compares stream density/rack unit for Intel Xeon processor E5-2697 v3 (90W per HEVC stream) vs Intel Xeon processor E3-1585L v5 (5W per stream). Configuration: Intel Media 2016 R1 SW HEVC 8-bit on 2 Intel Xeon processor E5-2697 v3 == 24 fps 4k HEVC. MSS 2017 R1 HEVC 8-bit on E3-1585Lv5 == 60 fps 4k HEVC. Convert to 1080 p30 (for baseline). 4k = 4 HD 4*24fps = 96 fps of HD content @ 290W TDP for 2 E5-2697 v3 @ 145W) = (96/30) = 3.2 1080p30 HEVC streams. 290W/3.2 ~ 90W/stream HEVC on E5. 60 fps 4k 4 UHD/4 = HD streams @ 60fps / 30= 8 1080p30 HD streams @ 45W TDP (1 E3 @ 45W) = 8 1080p30 HEVC streams. 45W / 8 1080p 30 streams = 5.6W/stream HEVC on E3
[3] 72 graphics execution units on Intel® Xeon® processor E3-1500 v5 family vs. 48 execution units on Intel® Xeon® processor E3-1200 v4 family.
[4] Benchmark platform configuration: Processor: Intel® Xeon® processor E3-1585L v5 @ 3.0GHz, Ring @ 3.0GHz and GT @1.15GHz; primary BIOS Version: SKLSE2R1.R00.B104.B01.1511110114; driver: 20.19.15.4444. platform: rvp11 halo fab 2; OS: Windows* 8.1x64 Enterprise, 16 GB memory, 2 DIMMS 2133 MHz; one socket, four cores, Intel® Hyper-threading Technology enabled, Intel® Virtualization technology enabled.
[5] Benchmark platform configuration (new generation): Processor: Intel® Xeon® processor E3-1585L v5 @ 3.0GHz, Number of Populated Processor Sockets: 1, Number of Physical Cores per Processor Socket: 4, Number of Logical Cores per Processor Socket: 8, Number of Processor Threads per core: 2, L1 Cache per Socket (KB): 256, L2 Cache per Socket (KB): 1024, L3 Cache per Socket (KB): 8192, System Memory: 16 GB, Memory Type: DDR3, Memory Speed: 2133 MHz, Memory Configuration: 8 GB, 8 GB, Disk Model: INTEL SSDSC2BA800G3, Disk Size: 745.21GB, Operating System: Microsoft Windows* 8.1 Enterprise64-bit. Graphics hardware configuration: Graphics Accelerator: Intel® Iris™ Pro Graphics P580, Graphics Driver Version: 20.19.15.4323, Display Resolution: 2560x1440 @ 32 bpp, Display Refresh Rate: 59 Hz. Benchmark platform configuration (prior generation): Processor: Intel® Xeon® processor E3-1285 v4 in workstation platform (Intel S1200RP board), Number of Populated Processor Sockets: 1, Number of Physical Cores per Processor Socket: 4, Number of Logical Cores per Processor Socket: 8, Number of Processor Threads per core: 2, L3 Cache per Socket (KB): 6 MB, System Memory: 32 GB, Memory Type: DDR3 ECC UDIMM, Memory Speed: 1866 MHz, Memory Configuration: 4 x 8 GB, BIOS: S1200RP.86B.03.01.0002.041520151123, Intel HT Technology best configuration, Operating System: Microsoft Windows* 8.1 Graphics hardware configuration: Graphics Accelerator: Intel Iris™ Pro graphics P6300 with driver 10.18.10.3980, Microsoft Windows 8.1*
[6] For more information, visit https://software.intel.com/en-us/intel-media-server-studio/try-buy.
[7] Faster memory performance compares up to 64 GB of DDR4 at 2133 MHz on Intel Xeon E3-1500 v5 family vs. 32 GB of DDR3 at 1600 MHz for the Intel® Xeon® processor E3-1200 v4 family.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance.

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See http://www.intel.com/performance for details.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can provide absolute security.

All dates and products specified are for planning purposes only and are subject to change without notice.

Relative performance for each benchmark is calculated by taking the actual benchmark result for the first platform tested and assigning it a value of 1.0 as a baseline. Relative performance for the remaining platforms tested was calculated by dividing the actual benchmark result for the baseline platform into each of the specific benchmark results of each of the other platforms and assigning them a relative performance number that correlates with the performance improvements reported.
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