

Intel I7 Core Processor – A Advanced Version

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ABSTRACT:-

The paper presented over here is a complete exposure to the precisely used technologies in Intel i7 core processor.Intel i7 processor is a newly available and latest core processor present in the market. It uses all the new technologies present with in the corporative world. It is redesigned by a high repetitive quality of software technocrats so that it is sophisticated form of all of the core processors present.Intel Core i7 usually applies to all families of desktop and laptop 64-bit x86-64processors which uses the Westmere. Nehalaem, Ivy, Sandy Bridge and the Haswell microarchitectures. The Core i7 brand mostly targets all the business and high-end consumer markets for both desktop and laptop distinguished computers, and is from the (entry-level consumer)Core i3, (mainstream Core consumer) i5. and (server and workstation) Xeon brands.

Intel firstly introduced the Core i7 in late 2001 with Nehalemthe name based BloomfieldOuad-core processor. In 2009, the new Core i7 models based on the Lynnfield the Nehalem-based, desktop quad-core processor and the Clarks field the Nehalem-based quad-core mobile were added, andIn January 2010 the models based on the Irondale dual-core mobile processor were also Nehalem-based added too. The first six-core processor in the Core lineup is the Nehalem-based Gulf town, which was launched on March 16, 2010. Both the regular Core i7 and the Extreme Edition are advertised as five stars in the Intel Processor Rating.

In the first three microarchitecture generations of Intelbrand, Core i7 has family members using two distinct system-level architectures, and therefore two distinct. In each of the generation, the highest-performing Core i7 processors uses same socket and QPI-based architecture as the low-end Xeon processors of the previous generation, while the lowerperforming Core i7 processors uses the same socket and the PCIE/DMI/FDI architecture as was in the Core i5.

Introduction:-

"Intel" all are well aware of it is the multinational company that comes with new technological developed software, processors that are in great demand in the market because of their higher and efficient compatibility, advanced response towards the users demand. Now, the question arise why only Intel core? .Intel Core basically is a brand name which Intel uses for the various range of mid to high-end consumers and business based microprocessors. Generally, processors sold in the name of Core are more powerful variants in the market of the same processors as marketed entry-level Celeron and Pentium. On the other hand, identical or more advanced versions of Core processors are moreover sold as Xeon processors for server and workstation market. As of 2013, the current Core processors includes the latest launched Intel Core i7, Intel Core i5, and Intel Core i3, and older Intel Core 2 Solo, Intel Core 2 Duo, Intel Core 2 Quad, and Intel Core 2 Extreme

Intel I7 Core Processor - A Advanced Version Priyanka Khatri & Anuj kumar Bishnoi



lines.Intel i7 core processor is one of the leading processor in the world it uses all of its advanced technology present. It is bit costlier than other processors present over but implies with the best and efficient work done. Intel Penrynmicroarchitecture includes Core 2 family of the processors which was the first mainstream. Intel microarchitecture isbased on the 45nm fabrication process. This allows Intel to make a higher performance range of processors that rapidly consumes similar or less power than the previously generation

TECHNICAL ASPECTS:-

(a) Developed MicroArchitecture:-



PREVIOUS MICRO ARCHITECTURE

In the previous Intel microarchitectures as is shown above there are basically three main parts of the microarchitecture (a) CPU (Central processing unit) (b) North bridge also called as processors.

Nehalem the Intel microarchitecture that inhibits the Core i7 class of processors which uses a 45nm fabrication process for the different processors in Core i7 family. In addition to, using the power consumption benefits of 45nm, Intel has made some of the dramatic changes in the Nehalem microarchitecture (Intel) to offer all the new features and capabilities presided in the Core i7 family.

The new features indulged in i7 core processors are as above:-



NEHLAEM/ I7 MICRO ARCHITECTURE

micro controller and graphics hub. (c) South bridge also called as input and output controller hub. Both the memory and pci are connected to the north bridge where as the cpu

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was freed increasing the complicity and however the i/o controller was connected to the south bridge. But in the nehaleam or i7 core processor the both memory and pci are connected to the CPU and the chipset is made in order to handle over the all i/ostreams. Thus, the complexity is reduced in a much effective way and the same way a lot of memory space is also increased a lot.

(b)Quick path interconnect is done with higher processor micro controller:-





The Nehalem microarchitecture (core i7) integrated the memory controller and also introduced the high-speedQPI databus. In Nehalem-based multiprocessor system, each of the CPU has to access the local memory but they can also access the memory that is local one to other CPUs by the help of QPI transactions. For example, one of theCore i7 processor can access memory region from the local to another processor through one direct hop or through multiple hops.

(c)Intel turbo boost technology boosts CPU performance:-A performance boost is to provide for the lightly threaded applications and also optimizes processor power consumption. Intel knows introduced a new feature called Intel Turbo Boost. Intel Turbo Boost is a recently launched an innovative feature that automatically allows active processor cores to run faster than the base operating frequency when certain conditions are met.

(d) High quality of catch latency: - Cache is a block which has high-speed memory for the temporary data storage that is located on the same silicon chip as the CPU. If for an instance the single processing core in a multicore CPU requires the specific data while

Intel I7 Core Processor – A Advanced Version Priyanka Khatri & Anuj kumar Bishnoi



it executes an instruction set, it firstly searches for the data in the local caches (L1 and L2). If the data is not available in the cache, it's

Comparison of Intel i5 and i7.-

known as a cache-miss, after it accesses the larger L3 cache.

Intel® Core™ i7 and Intel® Core™ i5 Processor Comparison		
INTEL* CORE" 17-980X EXTREME EDITION	INTEL® CORE® i7-875K PROCESSOR	INTEL® CORE® 15-655K PROCESSOR
12	8	4
12 MB	8 MB	4 MB
3.33 GHz	2.93 GHz	3.20 GHz
3.60 GHz	3.60 GHz	3.46 GHz
Yes	Yes	Yes
3	2	2
Yes	Yes	Yes
X58	P55	P55
	IS Processor Comparing INTEL® CORE® 17-980X EXTREME EDITION 12 12 MB 3.33 GHz 3.60 GHz Yes 3 Yes X58	IS Processor ComparisonINTEL® CORE® 17-980X EXTREME EDITIONINTEL® CORE® 17-875K PROCESSOR12812812 MB8 MB3.33 GHz293 GHz3.60 GHz360 GHzYesYes32YesYesX58P55

Conclusion:-

When I reviewed the six-core Core i7 4960X a little surprised thing came in to notice that clock-for-clock Ivy Bridge -E is slower than the Sandy-Bridge-E generation. Advantages of Intel core i7 processor:-

1. You get Quad Channel memory compatibility

2. Driving multiple graphics cards could favor Core i7 4820K as the X79 chipset has 40 PCI Express Gen 3.0 lanes.

The advantages surely will make a very little difference in overall performance. It is correctly said that the Intel core i7 contains all the main and scientific features one can contain and on other hand it is bit costlier than other processors because of the embedded technologies which has a great impact on the consumers. But it has a disadvantage to that it has a less clocking speed which makes it difficult to understand and utilize too.

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Intel I7 Core Processor - A Advanced Version Priyanka Khatri & Anuj kumar Bishnoi

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