



# SIGNIFICANT DEVELOPMENTS IN THE COMPUTER INDUSTRY 2006 TO 2020

IGOR KLJUIKO TITGV20

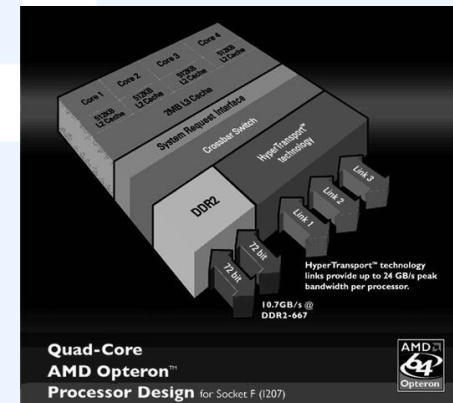
## 2006

1. APPLE INTRODUCED THE FIRST MAC PRO ON AUGUST 7, 2006.
2. ON JANUARY 5, 2006, INTEL INTRODUCED THE INTEL CORE, CORE DUO, AND VIIV.
3. TOSHIBA RELEASED THE FIRST HD DVD PLAYER IN A COMPUTER ON MAY 16, 2006.



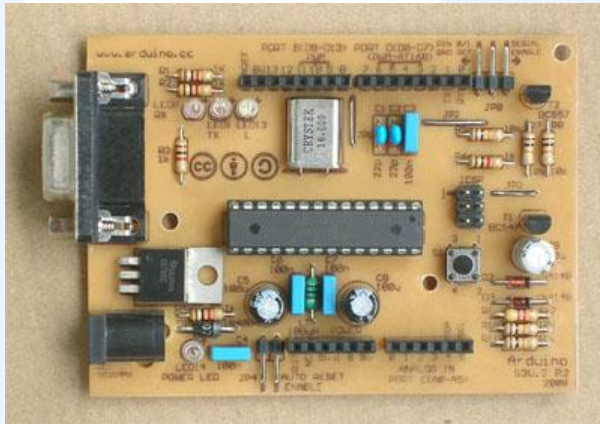
## 2007

1. APPLE RELEASED THE IPHONE TO THE PUBLIC ON JUNE 29, 2007.
2. GOOGLE RELEASED ANDROID ON NOVEMBER 5, 2007.
3. AMD INTRODUCED QUAD-CORE TECHNOLOGY FOR THEIR OPTERON LINE OF PROCESSORS.



# 2008

1. ARDUINO RELEASED THE DUEMILANOVE ON OCTOBER 18, 2008.
2. APPLE RELEASED THE IPHONE 3G AND MOBILEME ON JUNE 9, 2008.



2009

1. INTEL RELEASED THE FIRST CORE I5 DESKTOP PROCESSOR WITH TWO CORES.
2. USB 3.0 BEGAN BEING RELEASED IN NOVEMBER 2009.



## 2010

1. SAMSUNG INTRODUCED THE SAMSUNG GALAXY S IN JUNE 2010.
2. APPLE INTRODUCED THE IPAD ON JANUARY 27, 2010.



2011

1. INTEL RELEASED A SMALL FORM FACTOR COMPUTER.
2. APPLE RELEASED THE THUNDERBOLT HARDWARE.



## 2012

1. APPLE INTRODUCED THE IPAD MINI ON OCTOBER 23, 2012.
2. THE RASPBERRY PI SINGLE-BOARD COMPUTER WAS RELEASED IN 2012





## 2013

1. APPLE INTRODUCED THE IPHONE 5C, 5S WITH TOUCH ID AND SECURE ENCLAVE.
2. SONY RELEASED THE PS4 ON NOVEMBER 15, 2013.
3. MICROSOFT RELEASED THE XBOX ONE ON NOVEMBER 22, 2013.



## 2014

1. THE FIRST 8 TERABYTE HARD DRIVE IS RELEASED BY SEAGATE.
2. AMAZON OFFICIALLY RELEASED THE AMAZON ECHO ON NOVEMBER 4, 2014.



## 2015

1. ASUS RELEASED THE FIRST CHROMEKIT ON MARCH 31, 2015.
2. APPLE OFFICIALLY RELEASED THE APPLE WATCH ON APRIL 24, 2015.



## 2016

1. FIXSTARS SOLUTIONS RELEASES THE WORLD'S FIRST 13 TB SSD.
2. APPLE RELEASED THE APPLE AIRPODS WIRELESS HEADPHONES.

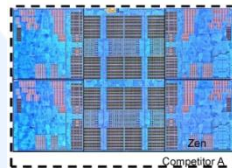


## 2017

1. AMD INTRODUCED THE VEGA ON JANUARY 5, 2017.
2. AMD INTRODUCED THE ZEN CPU MICROARCHITECTURE AND THE RYZEN.
3. INTEL INTRODUCED THE INTEL CORE I9 IN MAY 2017.



State Of The Art Comparison



	Zen	Competitor A [1]
Tech	14nm	14nm
Cores	4 Cores, 8 Threads	4 Cores, 8 Threads
Area	44mm <sup>2</sup>	49mm <sup>2</sup>
L2	512KB, 1.5mm <sup>2</sup> /core	256KB, 0.9mm <sup>2</sup> /core
L3	8MB, 16mm <sup>2</sup>	8MB, 19.1mm <sup>2</sup>
CPP (nm)	78	70
Fin Pitch (nm)	48	42
1x Metal Pitch (nm)	64	52
Standard 6T SRAM (mm <sup>2</sup> )	0.0806	0.0588
Metal Layers	12 w/ MIM	13 w/ MIM

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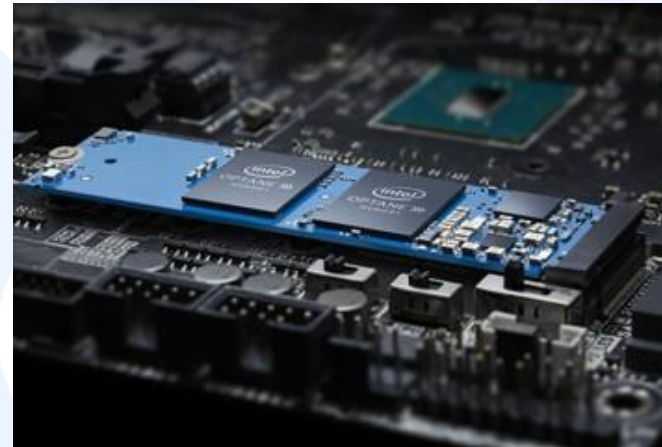
3.3 Zen: A Next-Generation High-Performance x86 Core

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## 2018

1. APPLE INTRODUCED THE APPLE HOMEPOD IN 2018.
2. INTEL ANNOUNCED NEW OPTANE DC PERSISTENT MEMORY IN 2018.



## 2019

1. LEXAR ANNOUNCES THE FIRST SD CARD WHICH CAN STORE 1 TERABYTE.
2. MICROSOFT INTRODUCED THE SURFACE DUO ON OCTOBER 2, 2019.



2020

1. AMD ANNOUNCED THE RYZEN THREADRIPPER 3990X CPU, FEATURING 64 CORES.
2. LENOVO ANNOUNCED THE YOGA 5G, A 5G-CAPABLE LAPTOP.

