



**INTEL[®]
INNOVATION
DAY**

ПРОГРАММИРУЕМЫЕ УСКОРИТЕЛИ

Добросолец Константин Сегеевич

DATA CENTER CONSIDERATIONS

Performance & Capabilities



Operations
Per second



Low Latency



Scalable

Compute Efficiency



Power
Consumption



Utilization



Management

Total Cost of
Ownership



ACCELERATING DATA CENTER WORKLOADS



Data Analytics
& Databases



Financial



HPC
(e.g. Genomics)



Media
Transcoding



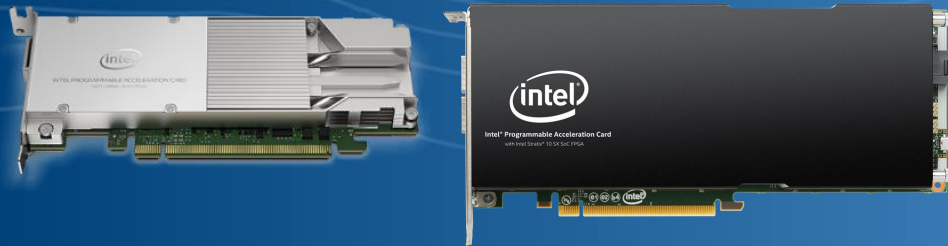
Cyber Security



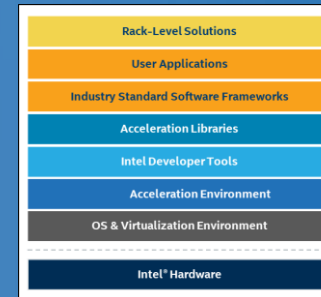
Artificial
Intelligence

Data Center Acceleration Ingredients ...

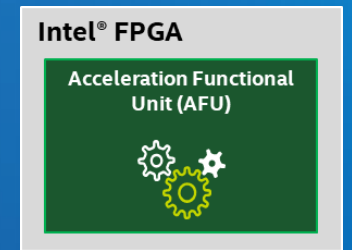
Intel® Programmable Acceleration Cards (PAC)
Qualified on Industry-Leading Enterprise Servers



Acceleration Stack for Intel®
Xeon® CPU with FPGAs



Acceleration IP From
Application Experts



PORTFOLIO OF PROGRAMMABLE ACCELERATION CARDS (PAC) WITH INTEL® FPGAS

Intel® Arria® 10 Accelerator Card



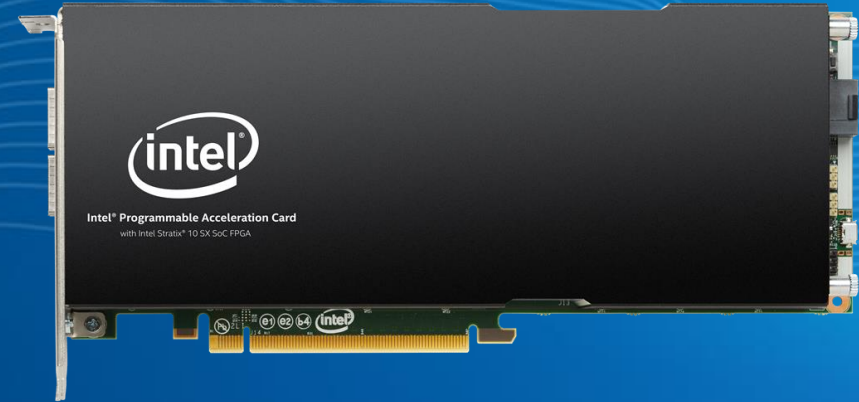
Broadest Deployment at Lowest Power

40G, PCIe Gen3 x8*

½ length, ½ height, single-slot PCIe card

Lowest power 66W TDP

Intel Stratix® 10 Accelerator Card



Highest Performance and Throughput

2x 100G, PCIe Gen3 x16

¾ length, full height, dual-slot PCIe card

Up to 225 W maximum

GROWING LIST OF ACCELERATOR SOLUTION PARTNERS

Easing Development and Data Center Deployment of Intel® FPGAs For Workload Optimization

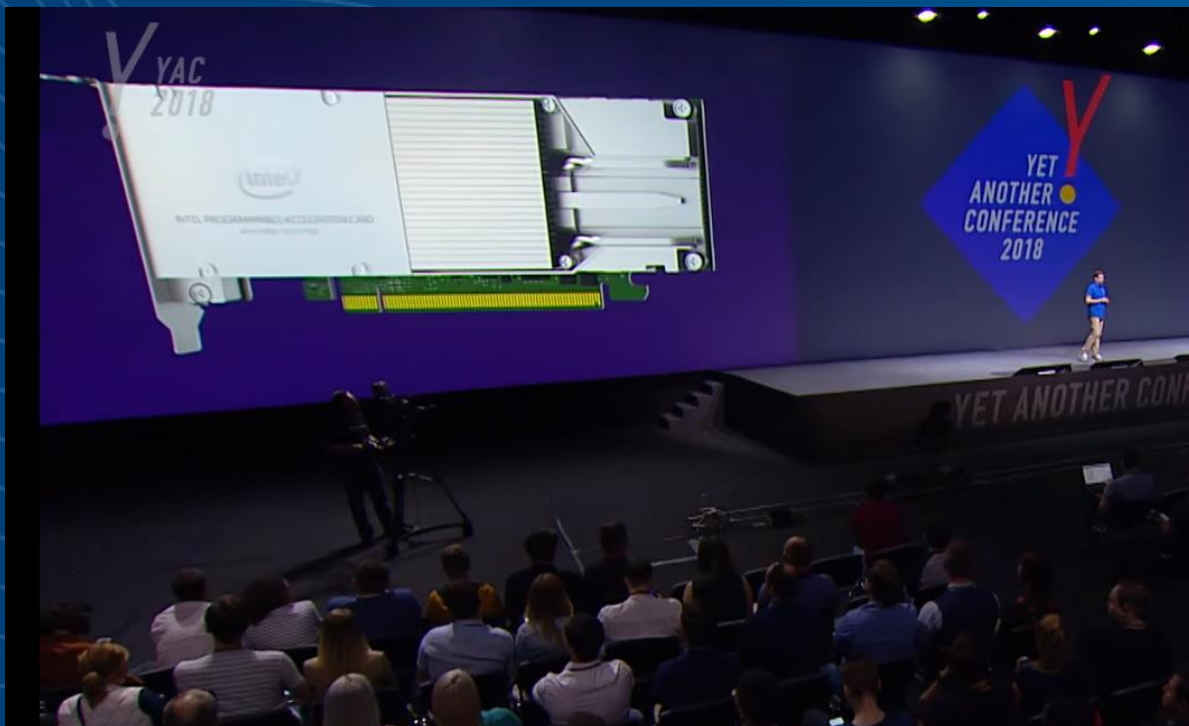


- Data Analytics
- Finance
- Genomics
- Media Transcoding
- Cyber Security
- AI



ПРИМЕРЫ ИСПОЛЬЗОВАНИЯ FPGA

Yet Another Conference 2018



Скорость анализа изображений

x10

Анализ изображений нейросетью ускорился в 10 раз

Время ответа сократилось почти на секунду

Время ответа сократилось

1s

LOSSLESS JPEG COMPRESSION

IMAGE

BOOM

Internet traffic increasing by 24%* annually - image is a large portion of internet data.

Companies are handling huge volumes of images in the data center

- Cloud storage
- Mobile instant messaging
- Social networking
- E-Commerce

COMPUTATIONAL

RESOURCES

Decoding, resizing, cropping, encoding of image files are typical processes which need large numbers of servers. This becomes cost prohibitive.

CPU

PERFORMANCE

CPU performance per core is struggling to keep pace

Lepton image compression: saving 22% losslessly from images at 15MB/s

<https://blogs.dropbox.com/tech/2016/07/lepton-image-compression-saving-22-losslessly-from-images-at-15mbs/>

JPEG2LEPTON TEST RESULTS

➤ QPS:

- FPGA*1 is **2.59** times that of CPU
- FPGA*2 is **3.00** times that of CPU

➤ Latency:

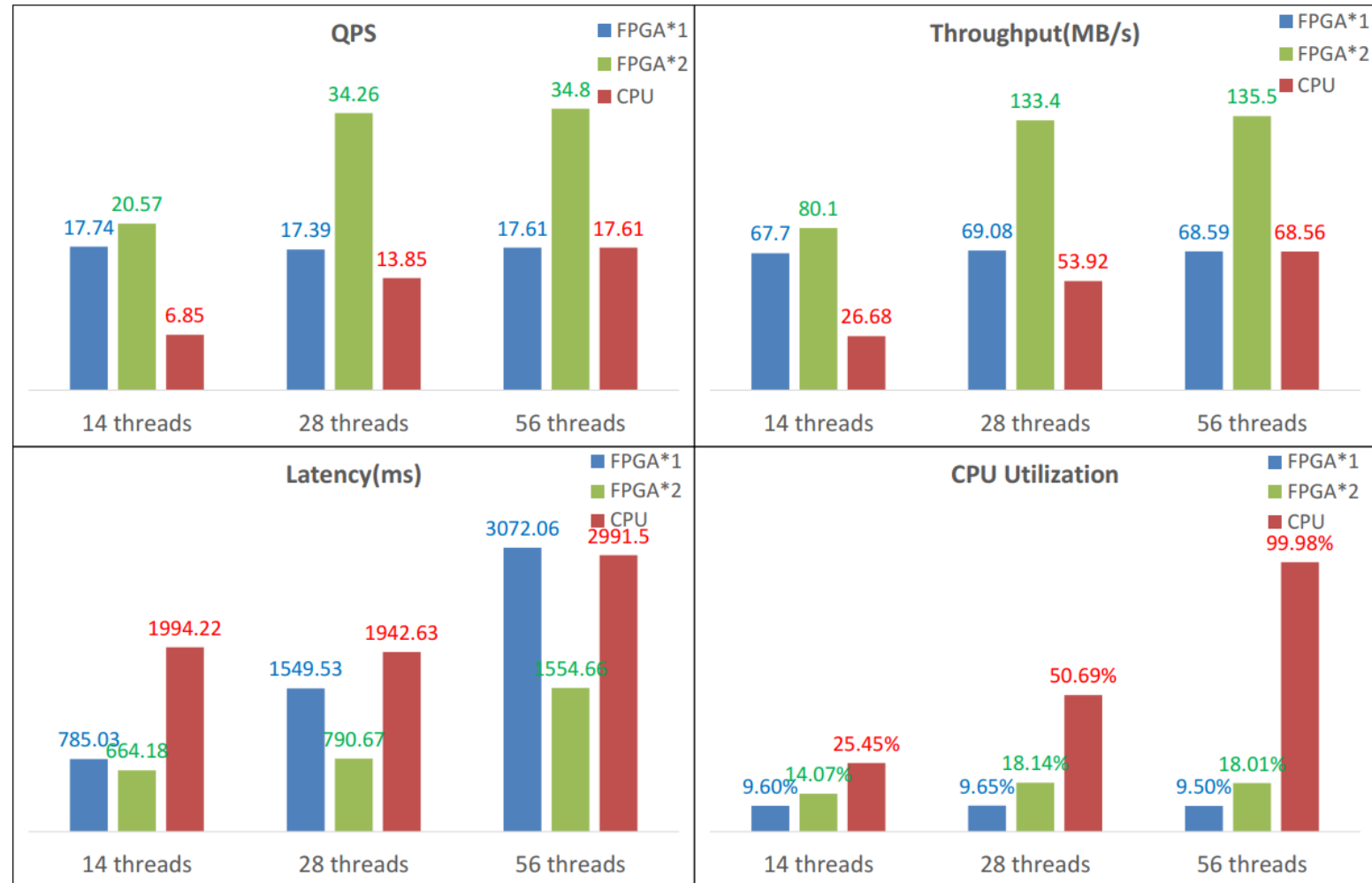
- FPGA*1 is **2.54** times less than CPU
- FPGA*2 is **3.00** times less than CPU

Input:

- Average file size=4MB
- Total file number=999
- Total files size=3890.23MB

Test environment:

- CPU: 2*Intel(R) Xeon(R) CPU E5-2680v4
- RAM: 60GB
- OS: CentOS Linux release 7.3.1611
- Kernel version: 3.10.0-514.2.2.el7.x86_64



SUPERCHARGE DATACENTER PERFORMANCE & LOWER TCO WITH THE VERSATILITY OF INTEL® FPGAS



PERFORMANCE

- Programmable Hardware
- Programmable Software
- Low Latency & High Bandwidth



EFFICIENCY

- Low Power through H/W specific accelerators
- Better Server Utilization



VERSATILITY

- Choice of FPGA Platforms
- Growing Ecosystem of Accelerator Functions



EASE OF USE

- Acceleration Stack
- Common User Interface
- IP Migration

I/O

FASTER WORKLOAD ACCELERATION



LOWER TOTAL COST OF OWNERSHIP



ADAPT QUICKLY TO EVOLVING WORKLOADS & STANDARDS



INCREASED PRODUCTIVITY



THANK YOU

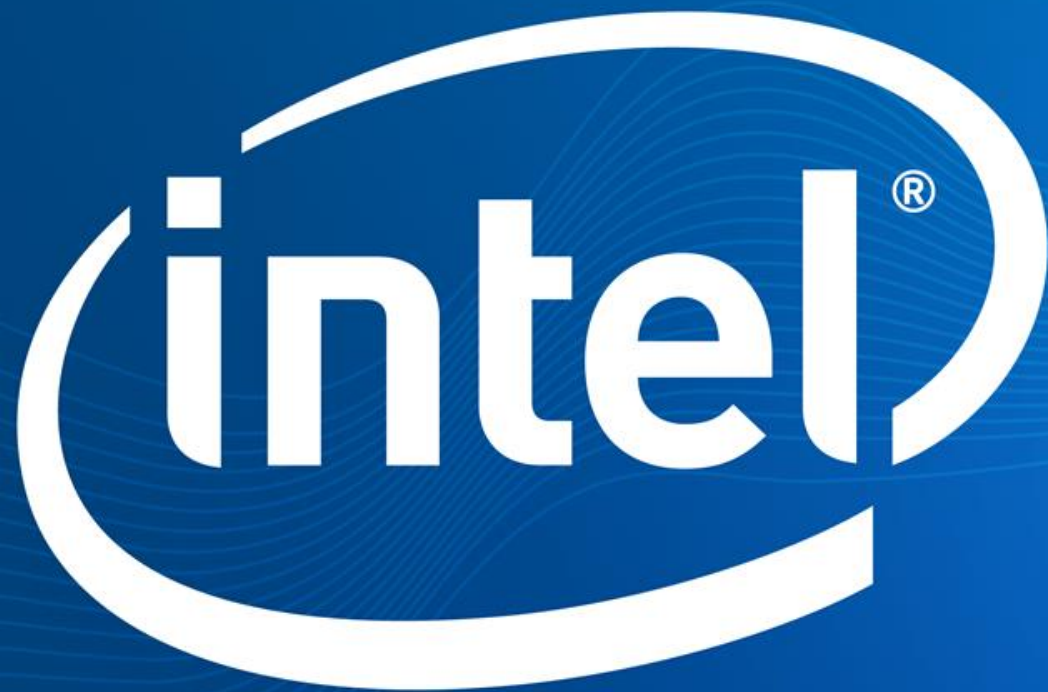
Konstantin.Dobrosolets@intel.com

INTEL® INNOVATION DAY

DISCLOSURES

Intel Technology and Manufacturing Day 2017 occurs during Intel's "Quiet Period," before Intel announces its 2017 first quarter financial and operating results. Therefore, presenters will not be addressing first quarter information during this year's program.

Statements in this presentation that refer to forecasts, future plans and expectations are forward-looking statements that involve a number of risks and uncertainties. Words such as "anticipates," "expects," "intends," "goals," "plans," "believes," "seeks," "estimates," "continues," "may," "will," "would," "should," "could," and variations of such words and similar expressions are intended to identify such forward-looking statements. Statements that refer to or are based on projections, uncertain events or assumptions also identify forward-looking statements. Such statements are based on management's expectations as of March 28, 2017, and involve many risks and uncertainties that could cause actual results to differ materially from those expressed or implied in these forward-looking statements. Important factors that could cause actual results to differ materially from the company's expectations are set forth in Intel's earnings release dated January 26, 2017, which is included as an exhibit to Intel's Form 8-K furnished to the SEC on such date. Additional information regarding these and other factors that could affect Intel's results is included in Intel's SEC filings, including the company's most recent reports on Forms 10-K, 10-Q and 8-K reports may be obtained by visiting our Investor Relations website at www.intc.com or the SEC's website at www.sec.gov.



The image features a dark blue background with abstract, flowing wave patterns in yellow and orange. A bright lens flare is positioned on the right side, partially overlapping the text. The text is centered and reads:

INTEL® INNOVATION DAY
В РИТМЕ ТЕХНОЛОГИИ