Accelerating Intelligence

Bishwa Roop Ganguly
Chief Solution Architect

bigstream

Performance Needs of Financial Applications

Risk Management

Algorithmic Trading

Fraud Analytics

Investor Intelligence

Back Testing

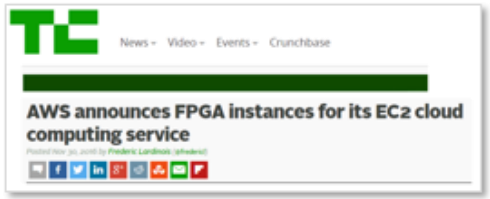
Security Analytics

Hardware Accelerators Break Through the Processing Wall

Microsoft Azure

On track to millions of servers w/FPGAs

amazon web services



Introduces FPGA powered server instances

Google Cloud Platform

TPUs help avoid cost of 12-15 data centers

intel FPGA

$16.7B acquisition of Altera

XILINX

$1B in datacenter revenues

NVIDIA

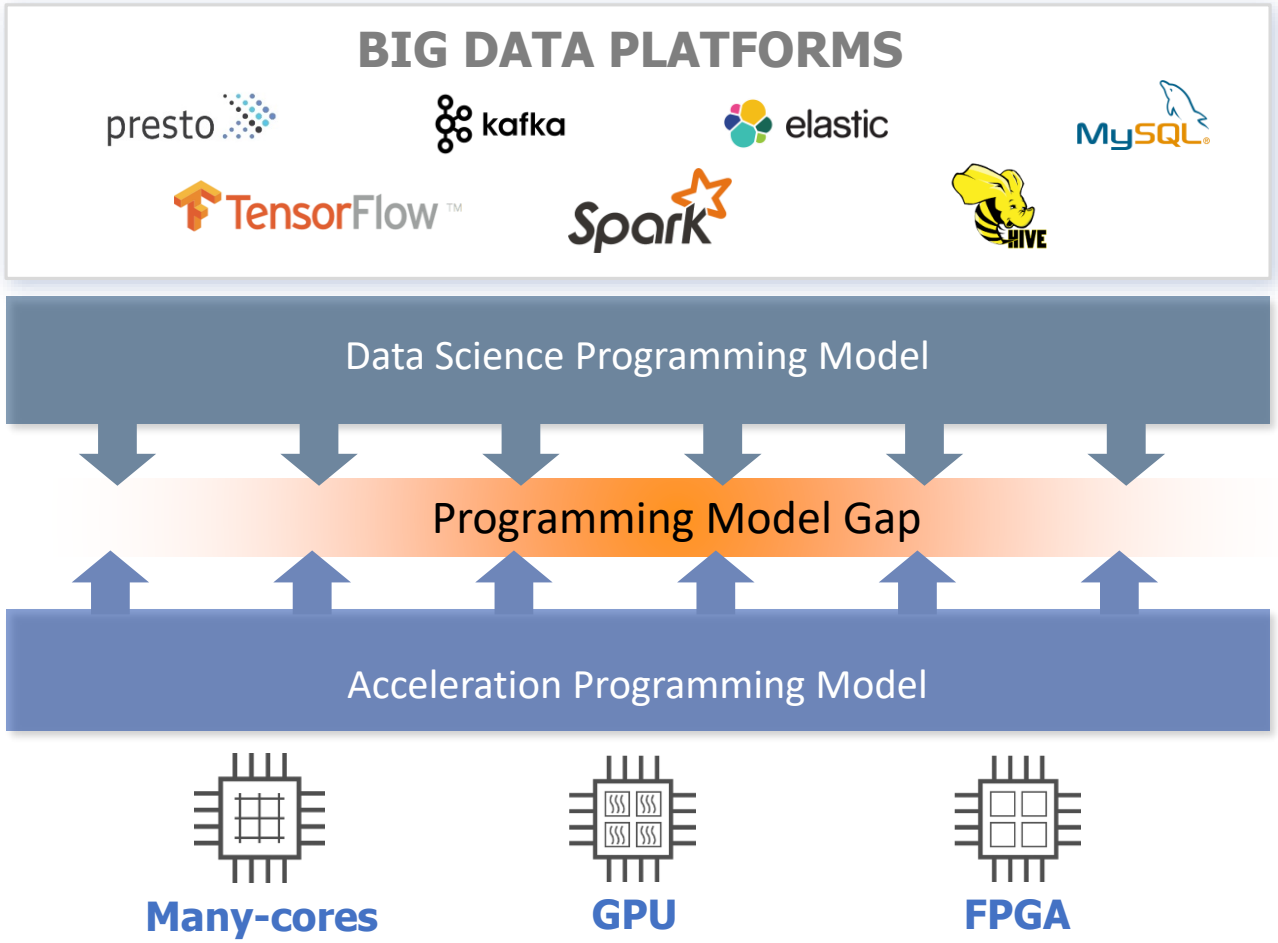
193% growth in datacenter segment

FPGA

ASIC

GPU

Inhibitor: Programming Model Gap for Hardware Accelerators



Data Scientists &
Quants & Developers

Focus on
Macroarchitecture

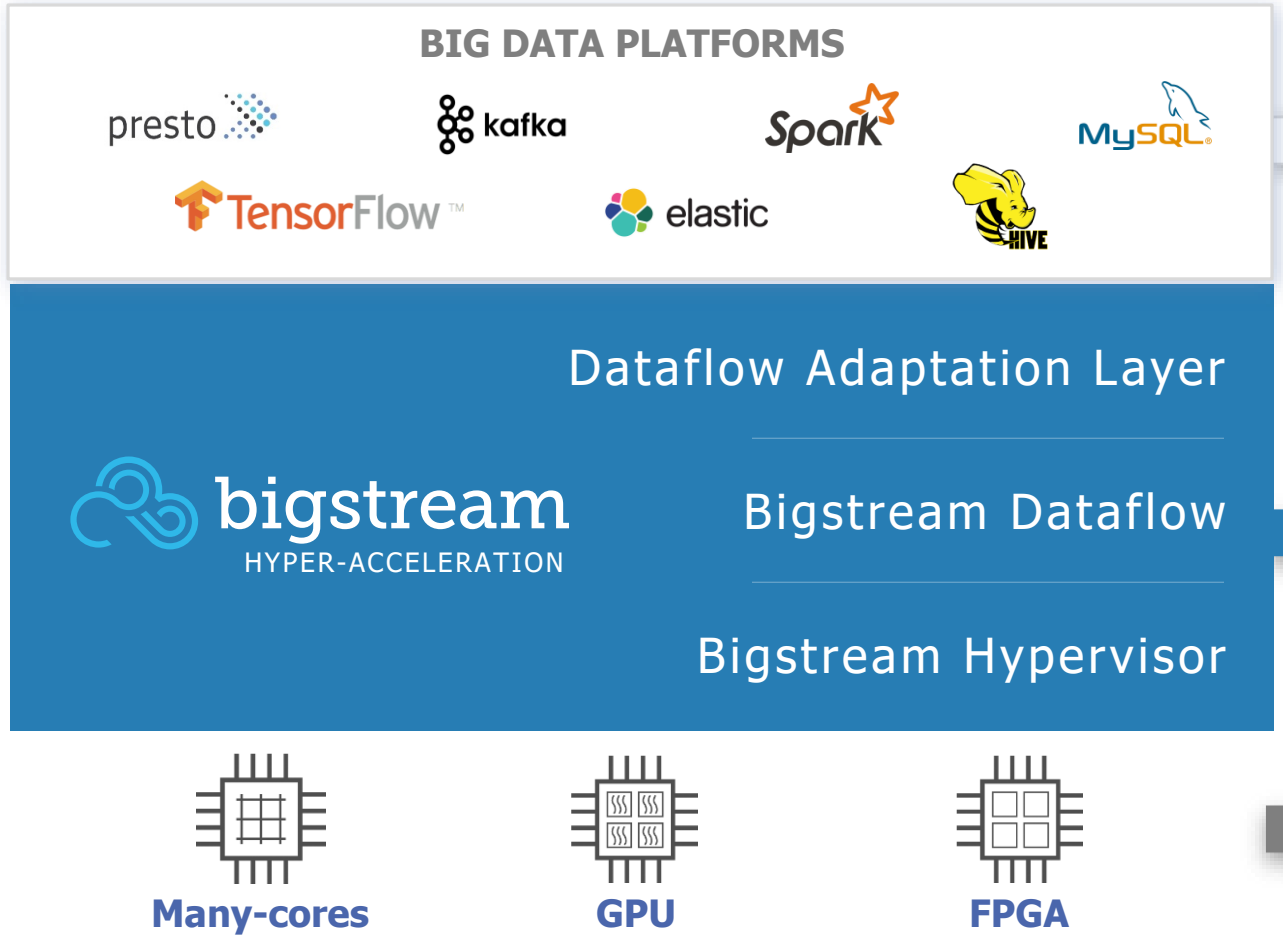
Skills Gap

Focus on
Microarchitecture

Performance
Engineers

bigstream

Introducing: Bigstream Hyper-acceleration Layer



Zero code change

Cross platform

Intelligent, automatic computation slicing

Cross acceleration hardware

2X to 30X acceleration

bigstream

Announcing: Acceleration of Spark on AWS F1 Instances

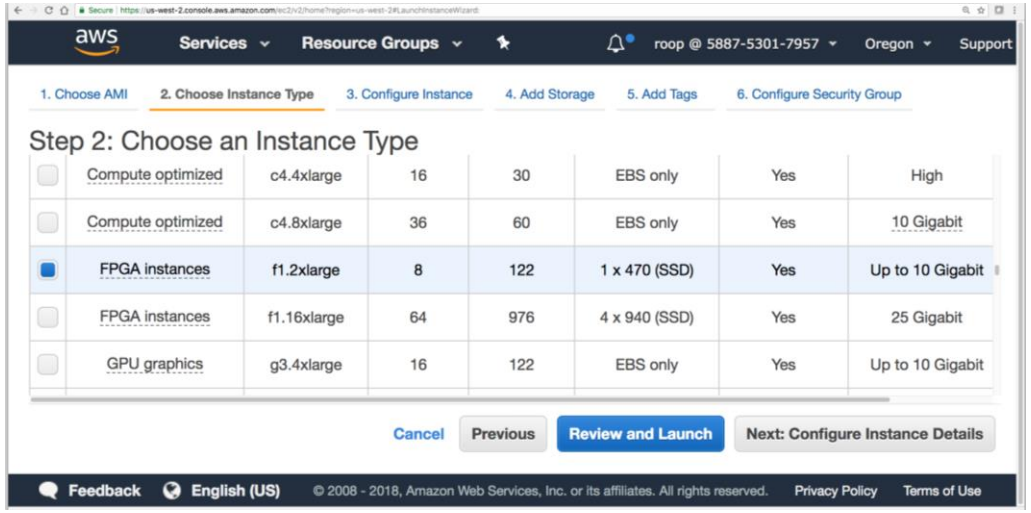
What: Hyper-accelerated Spark on F1 instance

How: Standard AWS EC2 GUI with Bigstream software

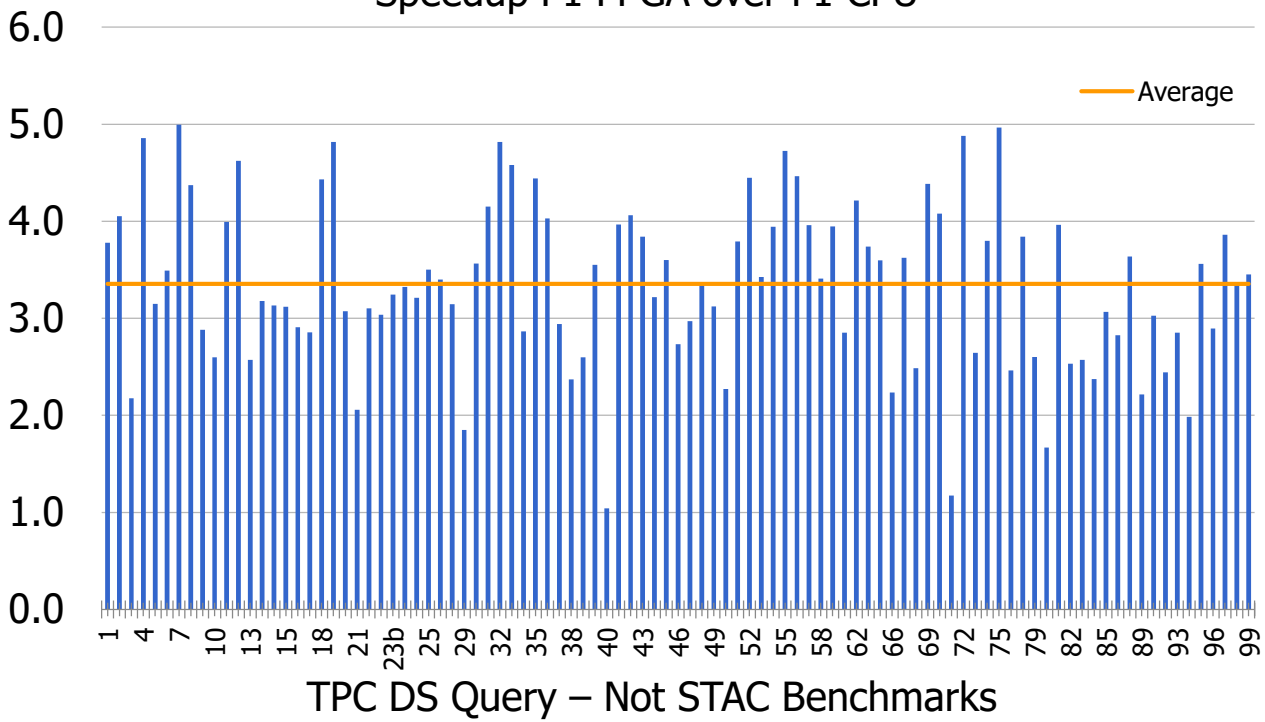
Result: Up to 5x end-to-end speedup

- CPU-only time vs. CPU/FPGA+Bigstream time
- **3.3x** average end-to-end speedup
- 45% FPGA utilization

Results applicable to on-premise customer deployments

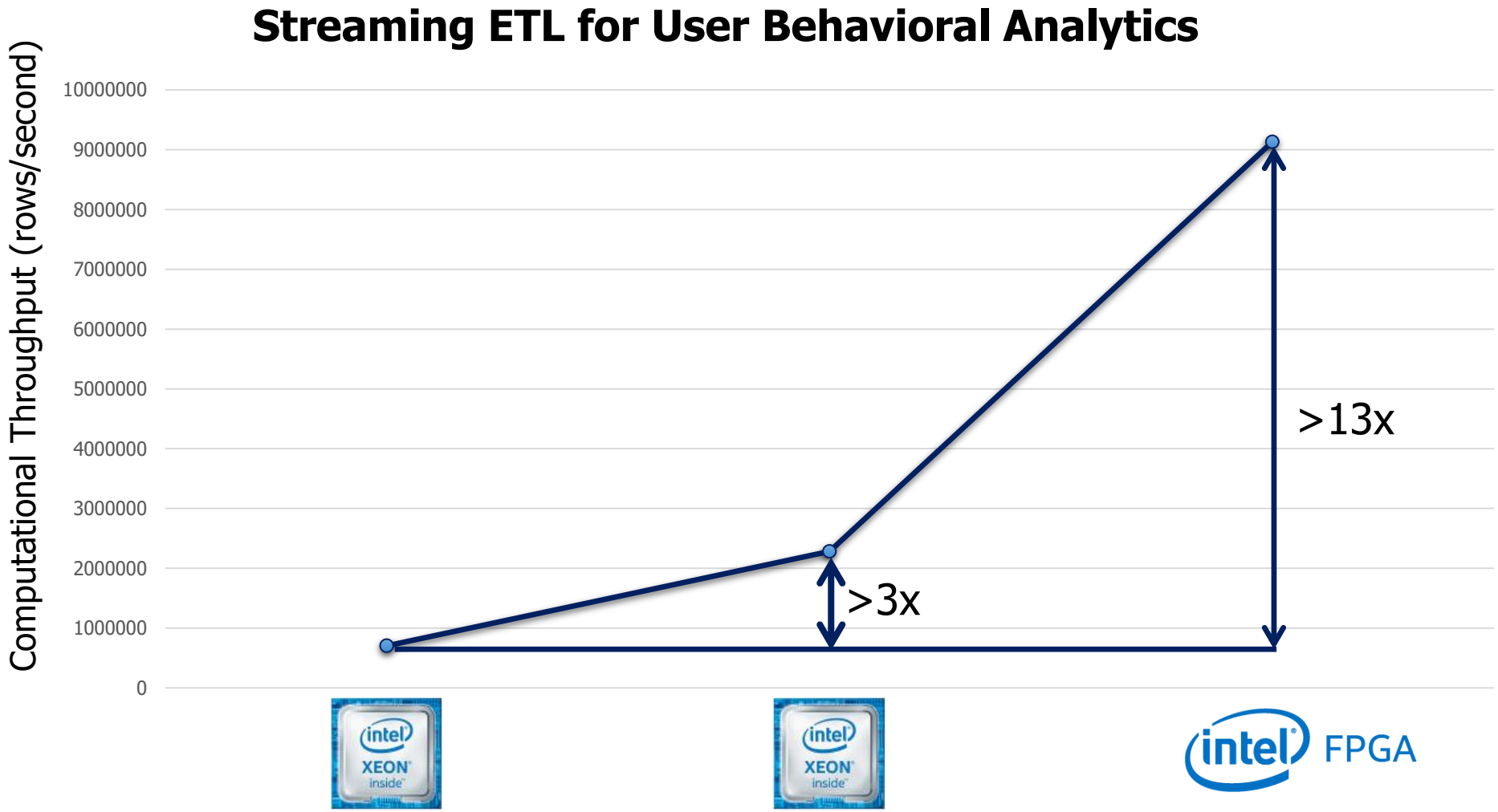


Speedup F1 FPGA over F1 CPU



TPC DS Query – Not STAC Benchmarks

On-Premise User Sentiment Analysis Pipeline



Not STAC Benchmarks

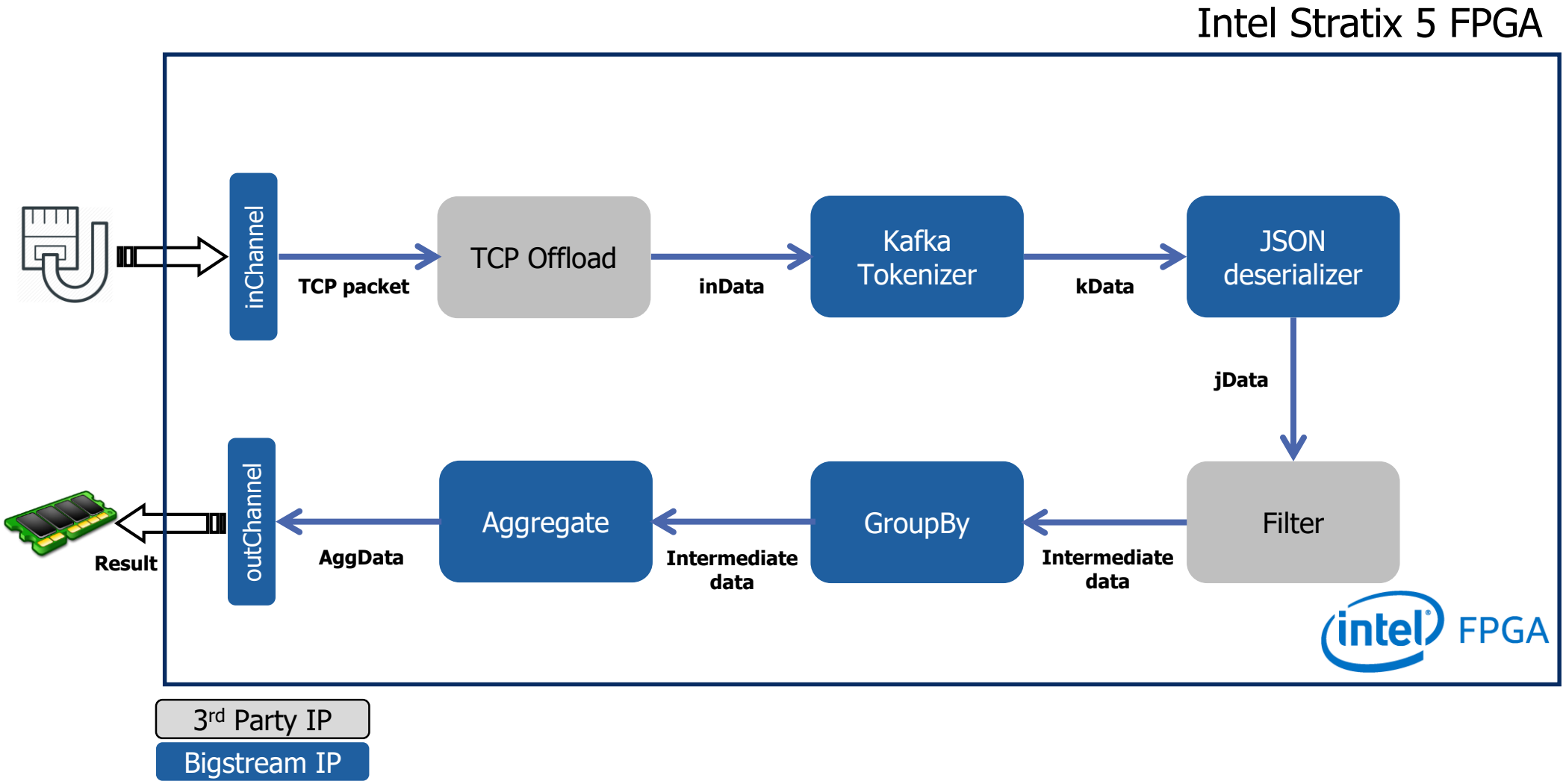
Spark
700,000
rows/second

Bigstream NS
(SW Only Acceleration)
2,282,462 rows/second

Bigstream XS
(FPGA Acceleration)
9,130,000 rows/second

bigstream

HW Architecture: User Behavior Pipeline In-line Accelerator



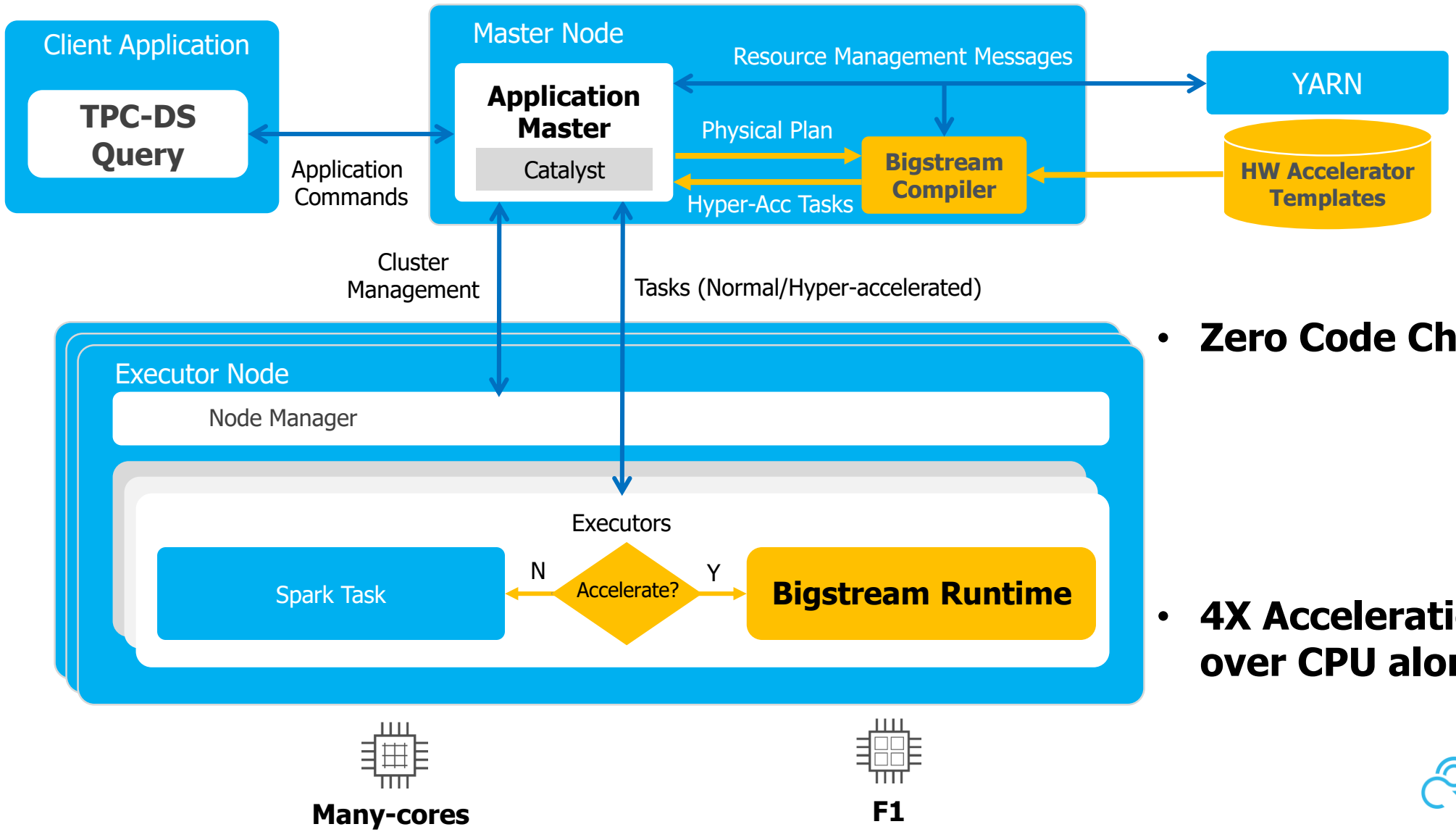
bigstream

Thank You

Check off Bigstream for More Info

roop@bigstream.co

Bigstream Acceleration of TPC-DS Spark On AWS F1



- **Zero Code Change**
- **4X Acceleration over CPU alone**

bigstream