

# Report: Hardware Acceleration

## Table Of Contents

1. Executive Summary
  - 1.1 Summary of Findings
  - 1.2 Recommendations
2. Introduction
  - 2.1 Overview of Hardware Acceleration
    - 2.1.1 History
    - 2.1.2 Methodology
      - 2.1.2.1 Identify the task that requires acceleration
      - 2.1.2.2 Design the hardware architecture
      - 2.1.2.3 Optimize the software for hardware acceleration
      - 2.1.2.4 Test and validate the hardware and software
      - 2.1.2.5 Integrate the hardware acceleration solution
3. Company Profile
  - 3.1 Intel
    - 3.1.1 4th Gen Intel Xeon
    - 3.1.2 Intel Accelerator Engines
  - 3.2 NVIDIA
    - 3.2.1 Apache Spark 3.0
    - 3.2.2 Nvidia's Mellanox portfolio
  - 3.3 AMD
    - 3.3.1 AMD Instinct MI Series Accelerators
    - 3.3.2 SmartNIC Network Accelerators
    - 3.3.3 AMD Alveo Data Center accelerator cards
  - 3.4 IBM
    - 3.4.1 IBM FlashSystem
    - 3.4.2 IBM Cloud Pak for Data
  - 3.5 Qualcomm
    - 3.5.1 Qualcomm Hexagon DSP
    - 3.5.2 Qualcomm Adreno GPU

### 3.6 Altera

#### 3.6.1 Altera Demonstrates Security and System Acceleration Solutions at MILCOM 2015

### 3.7 Imagination Technologies

#### 3.7.1 PowerVR Series3NX

### 3.8 Habana Labs

#### 3.8.1 Habana Gaudi

#### 3.8.2 Greco

### 3.9 Graphcore

#### 3.9.1 Graphcore Intelligence Processing Unit (IPU)

#### 3.9.2 Poplar software stack

### 3.10 Synopsys

#### 3.10.1 Synopsys HAPS (High-Performance ASIC Prototyping System)

#### 3.10.2 Synopsys ZeBu

### 3.11 CEVA

#### 3.11.1 NeuPro

#### 3.11.2 SensPro

### 3.12 Cadence

#### 3.12.1 Protium X1

#### 3.12.2 Palladium Z1

### 3.13 NXP Semiconductors

#### 3.13.1 Layerscape Access

### 3.14 Texas Instruments

#### 3.14.1 C6000 DSPs

#### 3.14.2 Sitara processors

### 3.15 Marvell Technology

#### 3.15.1 ThunderX2

#### 3.15.2 OCTEON TX2

### 3.16 Fujitsu

#### 3.16.1 A64FX Processor

#### 3.16.2 Fujitsu's Digital Annealer

## 4. Market Dynamics

### 4.1 Drivers and Constraints

#### 4.1.1 Compatibility

- 4.1.2 Integration
- 4.1.3 Performance optimization
- 4.1.4 Reliability
- 4.1.5 Security
- 4.1.6 Hardware acceleration enhancing open RAN implementation
- 4.1.7 Self-driving vehicles
- 4.1.8 AI robotics
- 4.1.9 Industrial IoT
- 4.1.10 Smart appliances
- 4.2 Regional Analysis
  - 4.2.1 North America
    - 4.2.1.1 NVIDIA announces RAPIDS Open-Source Platform for Data Analytics and Machine Learning
    - 4.2.1.2 Intel fourth-generation Xeon Scalable processors and Ponte Vecchio Max GPU series
  - 4.2.2 Europe
    - 4.2.2.1 European Processor Initiative (EPI)
  - 4.2.3 Asia-Pacific
    - 4.2.3.1 ZTE vSBC adopts Nvidia's general GPU series cards
    - 4.2.3.2 Huawei launched three solutions: Huawei FTTR OptiXstar F30, OptiX Alps-WDM, 50G PON
  - 4.2.4 Latin America
    - 4.2.4.1 Sinergia Tech raises \$500k for Latin America's first hardware accelerator
  - 4.2.5 Middle East & Africa
    - 4.2.5.1 Batelco and Brinc MENA launch Middle East's first IoT hardware accelerator
- 5. Global Market Overview
  - 5.1 Breakdown by Revenue Stream
  - 5.2 Breakdown by Network Function
  - 5.3 Breakdown by Application
  - 5.4 Breakdown by Region