



## Data and Intelligence in Storage Carol Wilder

### carol.a.wilder@intel.com Intel Corporation<sup>®</sup>





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## **SD**<sup>®</sup>

# CLOUD

#### **CLOUD ECONOMICS**

# **AI & ANALYTICS**

#### INTELLIGENT DATA PRACTICES

MEGATINEDS

# • Rectanged 56

#### NETWORK TRANSFORMATION

## **"Digital Fusion" Across All Industries**



TRADITIONAL

ECONOMY

#### Agriculture Artificial Intelligence

Wearables (Industrial/Lifestyle)

Robotic Warehouse



DIGITAL

**ECONOMY** 

#### Smart Retail

## **SD**<sup>®</sup>

## **DATA IS THE NEW OIL**

## **INTELLIGENCE IS THE NEW ENGINE**

## **STORAGE WILL BE THE FUEL TANK**





## **REQUIREMENTS ARE EVOLVING**



Power Consumption Latency Re-Provisioning Time Total Cost of Ownership





## WE NEED TO GET SMARTER



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## Digital Transformation Is Driving "Systems Approach" to Data Center Design



1. Source: Intel® 2017 Investor Meeting

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### New Approach: Rack Scale Design

#### Standard Server Design Fixed configuration



### Intel® Rack Scale Design

Disaggregated & Composable Resources Pooled as Needed











## New Approach: Rack Scale Software Management

- Resource Discovery
- System Composability
- Resource Telemetry
- Resource & System Management



### FLEXIBLE MANAGEMENT ARCHITECTURE ALLOWS A RANGE OF IMPLEMENTATION OPTIONS

\*\* Intel® provides reference code only for PODM, RMM & PSME. OEM expected to productize RSD software for their platforms





## **ADVANCES @ HARDWARE LEVEL**



3D XPoint<sup>™</sup> technology & NAND SSD's & DIMMs EDSFF\* NVMe **RSD Storage Pooling Volume Mgmt Device** (VMD)

Networking Fabrics Silicon Photonics Ethernet Network Function Virtualization

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\*EDSFF =Enterprise & Datacenter Storage Form Factor



## ADVANCES @ SOFTWARE LEVEL

AVX512 FPGA SDK for Open CL Math Kernel Library Storage **Data Analytics** Compute Acceleration Library (DAAL) BigDL Neon & DL Optimized Frameworks Comms CoFluent<sup>™</sup> Studio Hyperscan

Intelligent Storage Acceleration Library (ISA-L) Persistent Memory over Fabrics (PMoF) NVM Library Storage Performance Dev Kit (SPDK) Cache Acceleration SW (CAS) Advanced Encryption Std New Instructions (AES-NI)

Data Plane Dev Kit (DPDK) Network Function Virtualization Single Root I/O Virtualization



## HOW CAN STORAGE BECOME SMARTER?



Storage Modernization, Automation and Orchestration will provide the foundation for Intelligent Data Management and enable seamless data services in the datacenter



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## SUPPORT STANDARDS INITIATIVES...







Address all data center components w/ a consistent API Unified management of servers & storage NVMe Over Fabrics...











## **CALL TO ACTION**

### Refuel your tank:



- Try out the new HW & SW technologies
- Join Intel Storage Builders
- Provide your feedback to Jim Pappas (jim@intel.com)

## JOIN US IN DRIVING DATA INTELLIGENCE E2E AND FUELING THE FUTURE!



