XDF XILINX DEVELOPER FORUM

Computational Storage: Acceleration Through Intelligence & Agility

Presented By

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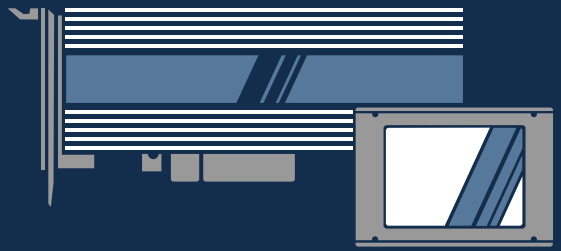
XILINX

Alibaba Cloud

ScaleFlux™

Computational Storage Provides the Solution



Real-time analytical processing from transactional data

- Intelligent data management
- Parallelize Compute at Data
- Programmable hardware

ScaleFlux™

10X Transactional-Analytical Processing, **Half** the Flash Capacity

GM at Alibaba Cloud Database

"By bringing compute to the data, ScaleFlux is **transforming** the way we are architecting our **Flash storage infrastructure**.

We're looking to fully utilize the values of Computational Storage in order to cost-effectively scale **real-time analytics** across exploding transactional data sets, all the while delivering the most responsive, cloud-native user experience."

How?

ScaleFlux™

Cohesive Application to Storage Acceleration

Open Channel Flash Management

Computation Acceleration

Solution Agility

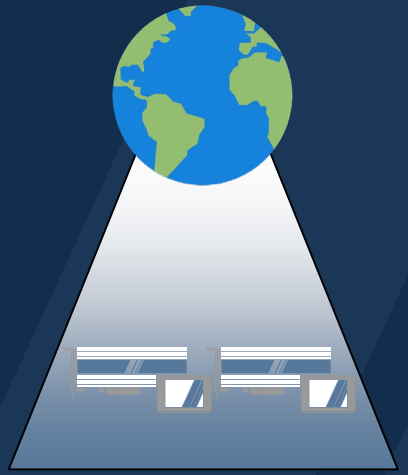
ScaleFlux™

Open Channel (Host) Flash Management

Data Placement

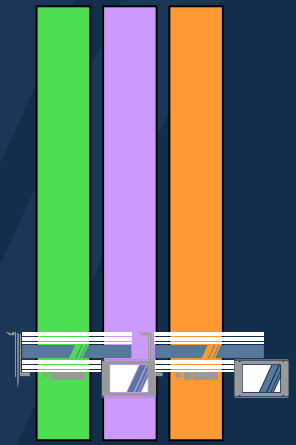
✓Controllable
✓ Application Awareness

Global View



✓ Reduce Overprovision
✓ Minimize Write Amplification

Multi-Tenant



✓ Isolation
✓ Consistent

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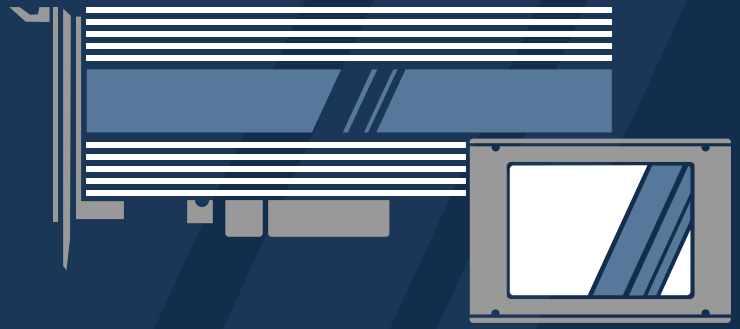
More Values from Open Channel Model

Easily Tunable

3D NAND TLC to QLC+

Simple Storage Class Memory Integration



Next: Industry standardization

Cohesive Application to Storage Acceleration

Open Channel
Flash Management

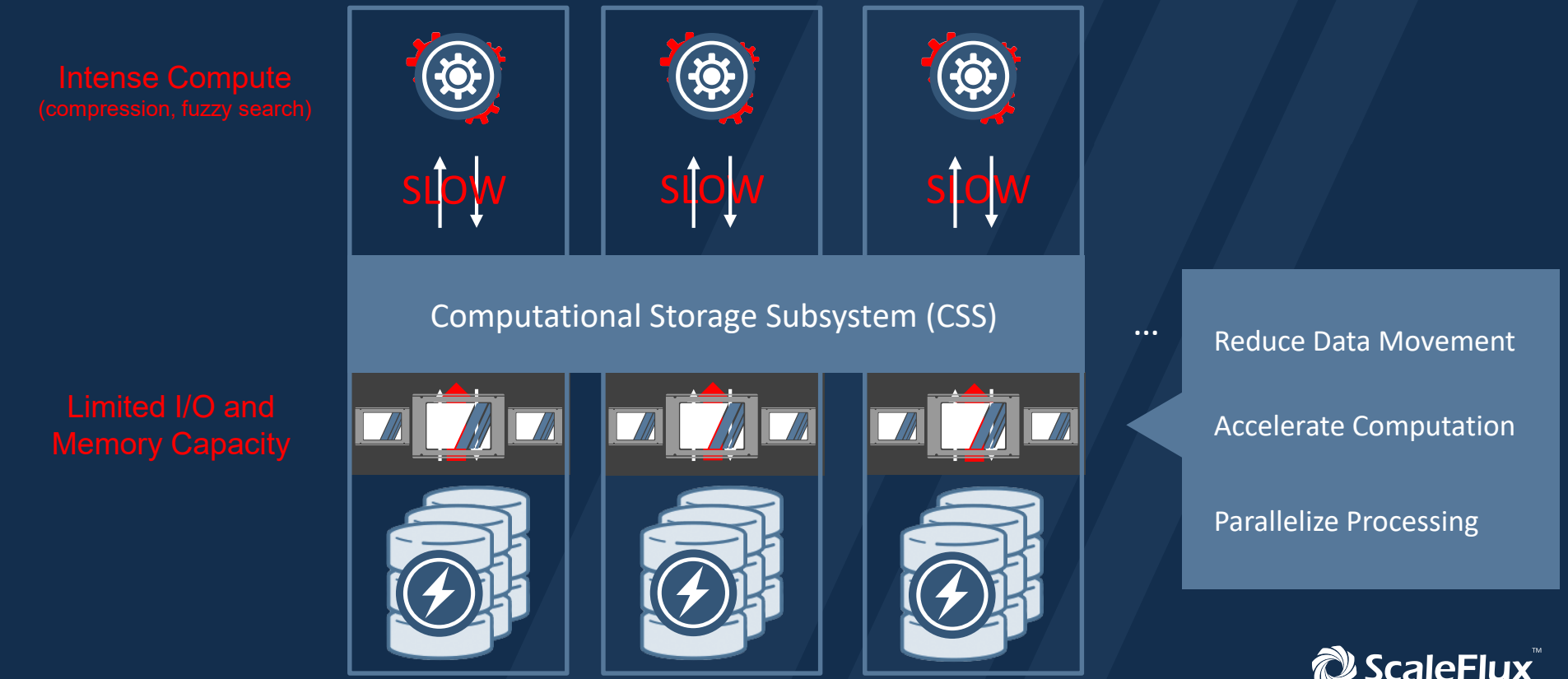
Computation
Acceleration

Solution
Agility

ScaleFlux™

Acceleration

Performance & Scalability



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Tradeoffs and Design Consideration

Compute Functions

- Data intensive, fixed function
- 5-100x speed up vs. CPU

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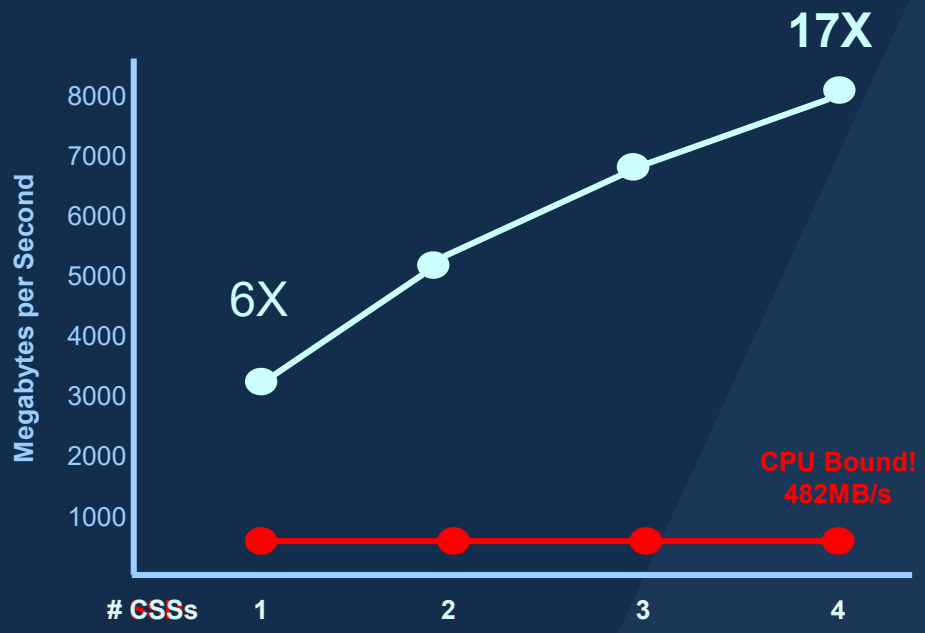
Parallelizing Computational Storage

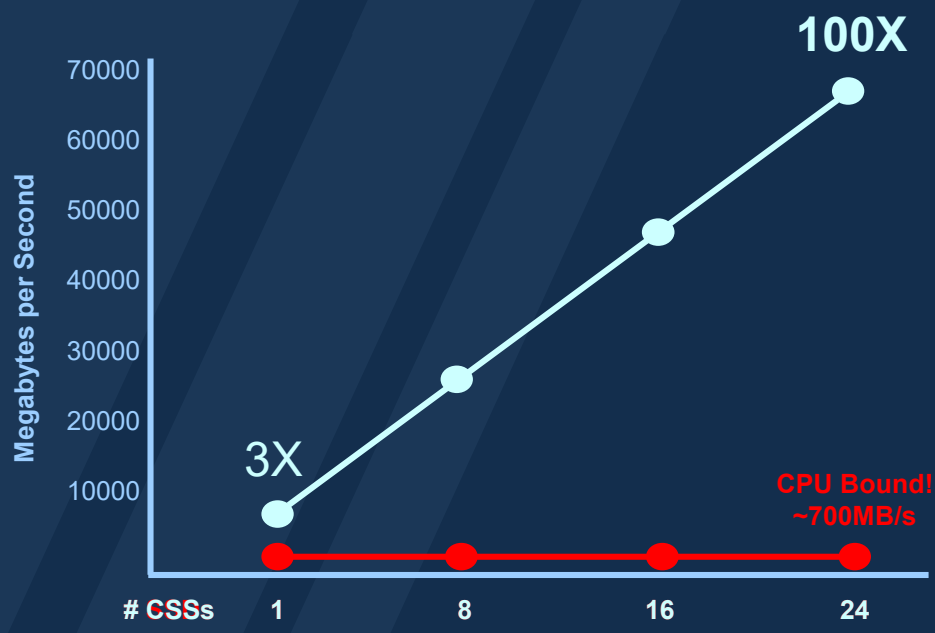
GZIP Compression

(CPU zlib vs. ScaleFlux css_zlib, corpus.cantebury E5-2667v4)



Fuzzy Search

(POC Unindexed Text Data, Edit Distance = 8, E5-2637v3)



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Identify Right Workloads

INFRASTRUCTURE

STORAGE

Compression (GZIP)
Erasure Coding (RS)
Security (AES)
Authentication (SHA)
Error Checking (CRC)

PLATFORM

DATABASE, ANALYTICS

KV-Store
Transactional-Analytical
SQL Processing
Big Data Analytics

APPLICATION

AI, Genomics, CDN, Search

Media Scaling & Transcoding
Neural Networks
Fuzzy Search
Filtering, Matching

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Cohesive Application to Storage Acceleration

Open Channel
Flash Management

Computation
Acceleration

Solution
Agility

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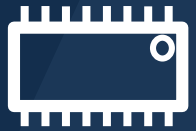
Agility is Important

ENGAGEMENT

Demand to POC < 6 months

+



FLASH LIFECYCLES

Reducing to 12 months

+

HW AGILITY

Update after deployment

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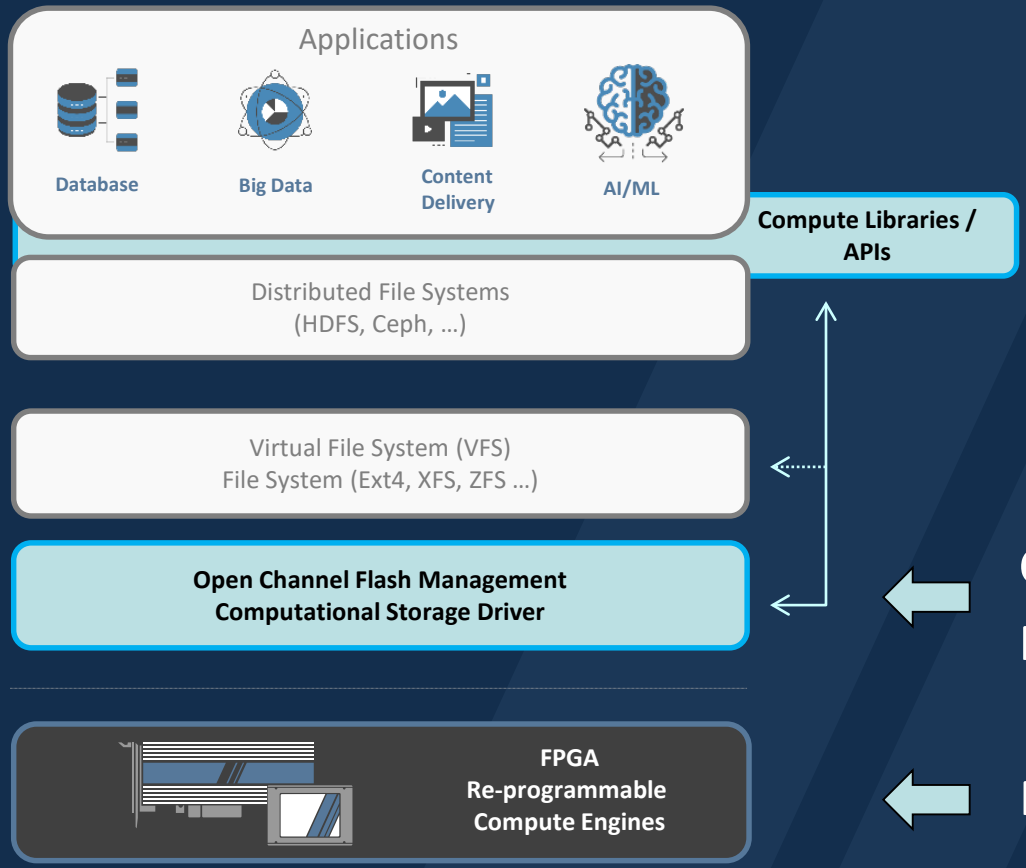
Solution Agility Across Whole Stack



Simple Interface
Easy Integration

Controllable Data Placement
Performance/QoS (latency)

Programmable HW engines

Fast TTM for Turnkey Apps

2.7x
Transactions per Second

ACT

AEROSPIKE

2.6x
Operations per Second

YCSB Load

APACHE HBASE

1.6x
Jobs Completed

Teragen & Terasort (vs HDD)

hadoop MapReduce

Available Through:

DELL EMC

inspur

packet

ScaleFlux™

Delighted Customers

ScaleFlux™

"…delivering fantastic **OPERATIONS PER SECOND** for our latest NoSQL database…"

"…**INSTANTLY** saw how this can help us **COST-EFFECTIVELY** scale our infrastructure …"

"…accelerating **MULTIPLE, BUSINESS-CRITICAL APPLICATIONS** for us…"

ScaleFlux™

ScaleFlux™

The pioneer in deploying Computational Storage at scale

- HQ in San Jose, Offices in China
- Shipping Computational Storage worldwide

Thank You!

Come visit us at Booth #14

www.scaleflux.com

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