The Future of Data Infrastructure

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Forward-Looking Statements

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The Evolving Role of Data

Creating the data-driven economy

Data as a record

Data as communication

Data as efficiency

Data as currency

Richness

Value

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Diverse and Connected Data Types

Tight coupling between Big Data and Fast Data

Big Data

Fast Data

INSIGHT

MOBILITY

PREDICTION

REAL-TIME

PRECISION

SMART MACHINES

Batch Analytics

Machine Learning

Data Aggregation

Streaming Analytics

Modeling

Artificial Intelligence

Scale

Performance
The Changing Nature of Data Interaction

**Past**
Data Held Captive by Single Application

create  
transform

access  
store

**Current and Future**
Data Pooled and Shared by Multiple Applications

create  
transform

deliver  
store

access  
transform

deliver  
create
Increasingly Dynamic Workloads

A survey of mid-sized and large-enterprise IT users found...

45% of compute hours and storage capacity are utilized

70% report inefficiencies in the time required to provision compute and storage resources

Driving New Demands on Data Infrastructure

- Scalability
- Efficiency
- Agility
- Performance
The Data Infrastructure (R)evolution

**Converged**
- Preconfigured HW/SW for a specific application and workload

**Hyper-Converged**
- Software-defined with deeper levels of abstraction and automation

**Composable**
- Disaggregated compute and storage resources
- Shared pool of resources that can be composed and made available on demand

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Hyperconverged vs. Composable

Flash Intensive Workload

HCl

SCI

Underutilized resources

Scalability
Efficiency
Agility
Performance
Hyperconverged vs. Composable

Capacity Intensive Workload

HCl vs. SCI

Underutilized resources

Scalability

Efficiency

Agility

Performance
The Benefits of Composability

lower TCO than traditional HCI architectures\(^1\)

~40% savings in initial CapEx investment\(^1\)

~50%

Greater economics, agility, efficiency and simplicity at scale

Applicable to all environments – virtual, containers, bare metal – and applications

\(^1\)TCO and CapEx estimates based on internal analysis, utilization estimates and component pricing as of July 2018.
Our Composable Infrastructure Vision

1. Open
2. Scalable
3. Disaggregated
4. Extensible
Enabling Composable Infrastructure

- No physical systems – only composed systems
- No established hierarchy – CPU doesn’t ‘own’ the GPU or the Memory
- All elements are peers on the network and they communicate with each other
NVMf Fabric Devices

The New World of NVMf Fabric Devices

- Simpler building blocks
- Maintains multiple paths to the device

- Network matched to media performance
- Faster Time-to-Market of innovation
Purpose-Built Disaggregated Infrastructure

Rack Option A: More Flash

Rack Option B: More Disk

Flash Enclosure

Compute Enclosure

Disk Enclosure

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Introducing OpenFlex™
Open standards enable vendor-neutral solutions

**OpenFlex™ F3000 Fabric Device and E3000 Fabric Enclosure**
High-performance, low-latency fabric device for Fast Data: AI, real-time analytics, IoT

**OpenFlex™ D3000 Series Fabric Device**
High-capacity fabric device for Big Data: batch analytics, machine learning, predictive modeling
OpenFlex Management API

- Kingfish Open API builds on existing open standards
- Unified across entire data infrastructure for delivering simplicity at scale
- Providing APIs to the public to accelerate innovation and market adoption
Software Orchestration

Rapid composability

New instances in seconds

Optimize to the unique needs of an application or workload
Broad Ecosystem Support

Focused on software composability tools and interoperable hardware
**Western Digital OpenFlex**

*Positioned to Accelerate Market Adoption*

1. **Open**
   - Firm commitment to an open standards-based approach

2. **Ecosystem**
   - Strategic position in the ecosystem to help accelerate market adoption

3. **Trust**
   - Trusted leader in data center products, technologies and infrastructure
Innovating for a Data-Centric World

Visit Western Digital at booth #207 for an OpenFlex demo

wdc.com/opencomposable to learn more