Software-Defined Data Center and the Pursuit of Extreme Flexibility

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Software-Defined Data Center and the Pursuit of Extreme Flexibility

Join us for a live webcast and hear Michael Hay, vice president and chief engineer, discuss why businesses are betting on software-defined everything to achieve extreme flexibility. Learn why Hitachi is uniquely qualified to deliver on this promise with its 3 Cs (control, content, and containers) approach

Specifically, you’ll learn about

- The business drivers for the software-defined data center
- The 5 key characteristics of a software-defined data center
- Using programmable infrastructures to deliver variable application QoS
EMPOWER I.T. AS A SERVICE

AUTOMATE AND SIMPLIFY INFRASTRUCTURE
Unique Hitachi Perspective

Hitachi companies solve problems using IT

Hitachi Data Systems develops IT through the lens of an end user

CONSTRUCTION

MACHINERY

ENERGY

TRANSIT

WATER TREATMENT
**GOAL:** Help brokers recommend buy and sell decisions to clients based on corporate social sentiment

**IMPLEMENTATION:** Multiple technologies orchestrated in VMware vSphere
Help brokers recommend buy and sell decisions to clients based on corporate social sentiment.
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Why Software-Defined?

- Adopt Modern Architectures
- Manage Legacy Easier, Better
- Lower Opex Now
- Time/Maturity
- Abstraction
- PaaS
- ITaaS
Software-Defined Data Center Characteristics

Abstracted
- Virtualized
- Resources aligned to services
- Complexities masked

Pooled
- Logical “pools” of virtualized compute resources
- Performance, capacity, connectivity, and bandwidth

Automated
- Software layer automates execution
- According to service policies and profiles

Programmable

Extensible
Foundation for Software-Defined

Hitachi Storage Virtualization OS

Hitachi Virtual Storage Platform (VSP G1000)

Future Storage Platforms

Unified Management

Service Templates

Open Standards

Data Protection

UCP Director Infrastructure Service Management
Hitachi Software-Defined 3 Cs: Control, Content, and Containers

INTELLIGENT CONTROL

CONTENT

HITACHI STORAGE VIRTUALIZATION OS

CONTAINERS

Infrastructure Service Management

CONVERGED PLATFORMS

STORAGE  |  COMPUTE  |  NETWORK
### Two Approaches to Software-Defined

<table>
<thead>
<tr>
<th>1</th>
<th>Software and Hardware Differentiation</th>
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<tbody>
<tr>
<td>Customize and define infrastructure behavior through software</td>
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<tr>
<td>▪ Performance acceleration and cache management</td>
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<tr>
<td>▪ Data services (snapshots, replication, dedupe, encryption) hardware assist as warranted by workload criticality</td>
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<td>▪ For example, transactional workloads with strict timing</td>
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<th>2</th>
<th>Intelligence Completely in Software</th>
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<tbody>
<tr>
<td>Customize and define infrastructure behavior through software</td>
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<tr>
<td>▪ No hardware assist</td>
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<tr>
<td>▪ General-purpose hardware</td>
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<td>▪ For example, Web applications, Hadoop</td>
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**Infrastructure is Programmable**
Architectural Approaches to Software-Defined

**Scale Up**
Abstracted, pooled, automated, and controlled via software, transactional

**Scale Out**
If hardware fails, software knows how to recover; embarrassingly parallel

**Programmable Software Layer**
- Virtualization
- Programmable: Adjusts to new apps/conditions
- Data access through APIs

**Shared Everything**
Virtualized Server, Storage, Network

**Virtualized x86 Commodity Compute, Storage, Network**

**Shared Nothing**

**In Common**
- Virtualization
- Programmable: Adjusts to new apps/conditions
- Data access through APIs
Software-Defined and Future-Proof

2014

Today’s Hitachi Storage Platforms

Future Hitachi Storage
General Purpose Platforms

Off-the-Shelf X86

HITACHI STORAGE VIRTUALIZATION OS

#Innovation

Third-Party Storage
Software-Defined and Data Center Workloads

Hitachi Storage Virtualization Operating System (SVOS)

Critical
Essential
Least Essential

Workload Criticality

Hardware Assist
Processing power and cache management

Number of microprocessors required

Time/Maturity

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OpenStack and Software-Defined

Open Source  Interoperable  Massively Scalable

Gold Member

Cost-Optimized

Software-Defined  Adaptable  Automated  Continuous

Manage Multi-vendor Virtualization Environments
Questions and Discussion
Upcoming WebTechs

- **WebTechs**
  - *Achieve Operational Recovery for Critical Applications*, July 23, 9 a.m. PT, 12 p.m. ET

- **Check** [www.hds.com/webtech](http://www.hds.com/webtech) for
  - Links to the recording, the presentation, and Q&A (available next week)
  - Schedule and registration for upcoming WebTech sessions
  - Questions will be posted in the HDS Community: [http://community.hds.com/groups/webtech](http://community.hds.com/groups/webtech)
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Thank You