A scenic landscape featuring a paved road that curves through rolling green hills under a bright blue sky with large, fluffy white clouds. The clouds are arranged to form a stylized world map. In the background, there are power lines, a small town, and a stone wall. The overall scene is bright and clear, suggesting a sunny day.

**Timothy K. Harder**  
**EMC Cloud Infrastructure Group**

# EMC Cloud Division



## Cloud Infrastructure Group

## Services

Cloud Division



*Cloud Optimized Storage*

Storage as a Service

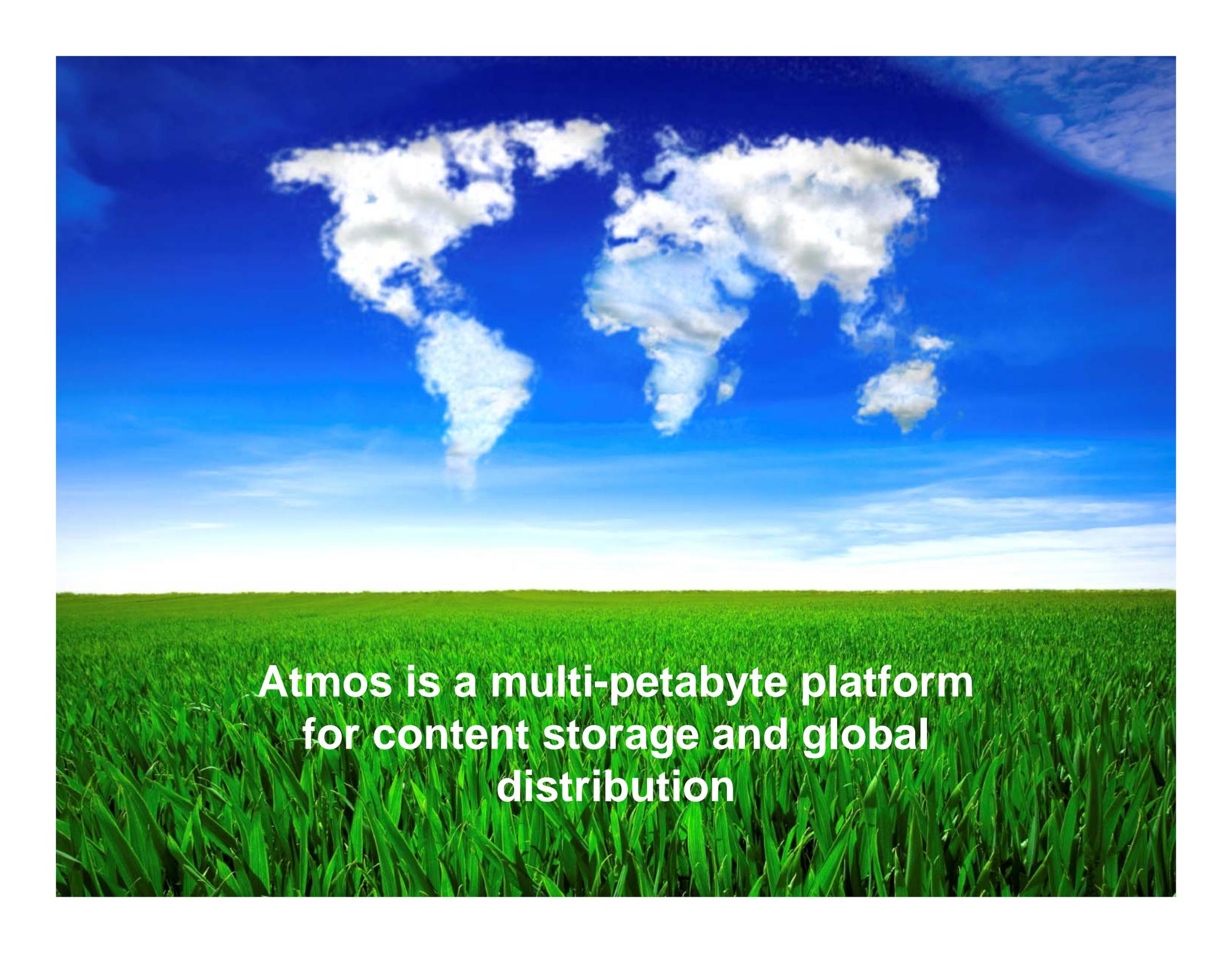
Compute as a Service



*Mozy*  
On-line backup

*piWorx*  
Information Bank



A vibrant green field of crops, likely corn, stretches across the bottom half of the image. The sky above is a deep blue, featuring a large, stylized world map composed of white, fluffy clouds. The map shows the continents of North America, South America, Europe, and Africa. The text is centered in the lower half of the image, overlaid on the green field.

**Atmos is a multi-petabyte platform  
for content storage and global  
distribution**

# A New Approach for Content Stores

Disperse Copies Address Geographic Performance and Reliability

**EMC<sup>2</sup>**  
where information lives<sup>®</sup>



- Susceptible to failures of the system, site, and network connectivity
- May not meet required performance because limits of device and or location of access
- Improves resilience to failures of the system, site, and network connectivity
- Potentially improves performance of remote access
- Greatly improves resilience to failures of the system, site, and network connectivity
- Greatly improves performance of remote access

# Supporting Hardware Configurations



## 5 kW Config

- 1:15 servers-to-disks
- 120 TB total capacity
- GbE or 10Gbe



## Capacity Config

- 1:60 servers-to-disks
- 360 TB total capacity
- GbE or 10Gbe



## Compute Config

- 1:15 Server-to-drive ratio
- 240 TB total capacity
- GbE or 10Gbe

# A Peek Inside The Cloud



software on dedicated servers...

... that intelligently stores content based on customizable meta data and policy rules...

# A New Approach for Content Stores

## Policy Driven Intelligence



- Each tenant has policies
  - Content distribution
  - Optimized performance
  - Information protection
  - Archiving
- Policies drive object placement constraints
- Constraints dictate locations and copies
- Policy automatically triggered by events
  - create
  - open
  - extend
  - close
  - delete

### Pseudo Example

CustType = Free : Bronze  
CustType = Premium : Gold  
ContentType = NewRelease : Global

---

Bronze: Compressed, Green  
<1>:New Jersey

Gold: SyncReplica = 2,  
<1>:Philadelphia  
<2>:New Jersey,  
AsyncReplica = 2,  
<1>:San Francisco  
<2>:London

Global: AsyncReplica =100,  
<>:Fast

# Cloud Optimized Storage - Features



- **Massively scalable infrastructure**

- Petabyte scale
- Global footprint

- **Intelligent data management**

- Personalized by metadata and policy
- Auto-configuring when capacity is added
- Auto-healing when failures occur
- Auto-managing content placement

- **All-in-one data services**

- Replication, versioning
- Compression, spin-down
- De-duplication
- Advanced metadata support
- Powerful access mechanisms

- **Cost effective hardware**

- Industry standard building blocks
- Modular packaging
- User-serviceable components

The screenshot displays the Maui Web Scale Information Storage dashboard. The top navigation bar includes the Maui logo, 'Web Scale Information Storage', and the EMC logo with the tagline 'where information lives'. The breadcrumb trail shows 'Home > System Management > Maui Dashboard'. A welcome message for 'user1@emc.com as MauiAdmin' is visible, along with a 'logout' link.

The main content area is titled 'Maui Dashboard' and features a 'System Summary' section. This section includes a 'Software Version' of 1.0, a 'Cluster Throughput' graph showing Inbound and Outbound data over time, and a 'Storage View' pie chart. The storage view shows a total of 100.29 TB, with 10.29 TB free (10.3%) and 90.0 TB used (89.7%).

Below the storage view is an 'Alerts' section with a table of active alerts:

ID	Condition	Disposition	Cluster	Node
01	Disk failure	None	Cluster_Shanghai_1	Node 5
02	MDS halted	None	Cluster_Cambridge_2	Node 2
03	SS full	None	Cluster_Boston_3	Node 3

The 'Cluster Information' section is currently expanded for 'Cluster\_Shanghai\_1', showing its status as 'Running' and an alert for 'Node5'. It also displays the cluster's location as 'Shanghai, 10<sup>th</sup> floor'. Below this is a 'Node Information' table:

ID	IP	Status	Group	Capacity	Free Space	Node Services
01	192.168.8.10	Running	grp1	5.5 TB	2.1 TB(38%)	MDLS, MDS, SS
02	192.168.8.11	Running	grp1	5.5 TB	2.5 TB(45%)	SS
03	192.168.8.12	Running	grp1	5.5 TB	2.3 TB(41%)	MDS, SS
04	192.168.8.13	Running	grp2	5.5 TB	2.1 TB(38%)	SS
05	192.168.8.14	Running	grp2	5.5 TB	2.3 TB(41%)	SS
06	192.168.8.15	Running	grp2	5.5 TB	2.1 TB(38%)	SS

The dashboard also lists other clusters: 'Cluster\_Cambridge\_2' and 'Cluster\_Boston\_3', and includes an 'Add New Cluster' button at the bottom.

A scenic landscape featuring a paved road with white lane markings that curves through a green, hilly area. In the background, there are rolling hills, a small town, and a large white cloud formation in the sky that is shaped like a world map. The sky is a deep blue with scattered white clouds. The overall scene is bright and clear, suggesting a sunny day.

**EMC's**  
**Internet-delivered storage and**  
**compute services**

# Storage Service Overview – Atmos Online



- What is it?
  - Scalable EMC-hosted storage service delivered via the internet
  - Runs in EMC data centers
- Value proposition
  - Infinitely scalable
  - Pay as you go
  - No cap-ex
  - Additional capacity when you need it
- Top Features
  - Provides different SLAs and cost models
  - Provisioned on-demand with usage based billing to provide infinite scalability
  - Customers access storage via web services programmable API

# Portal



EMC Cloud Infrastructure Services - Early Access Program - Windows Internet Explorer

http://maasportal.maas.emc.com/

File Edit View Favorites Tools Help

EMC Cloud Infrastructure Services - Early Access Pro...

EMC Storage Utility

## Cloud Infrastructure Services

Harnessing the Power of the Cloud

Cloud computing is a technology paradigm whereby software and IT infrastructure are delivered as a set of services via the Internet. This network of infrastructure services operate like a utility; whereby you obtain IT resources on an as-needed basis, and only pay for what you actually use. Enterprises and independent software vendors leverage this utility model to improve agility, lower costs and reduce time to market.

### Early Access Program

Our on-line storage service is now operational and we're currently seeking participants for our early access program!

Just click [here](#) and complete the application form to be considered. You will be notified via email when your stage of testing begins. Thank you for your interest in this highly-anticipated storage utility.

### Service Offerings

#### Put Your Data in the Clouds

EMC Storage Utility is a scalable and secure, on-line storage service. It's ideal for web applications that need reliable access to unstructured content.

[Learn More](#)

### ISV Program

Looking to deliver cloud-based solutions to your customers? Our partner program is designed to enable you to deliver and deploy cloud-based solutions with faster time-to-market. Join now to get access to EMC's industry-leading cloud platform and services.

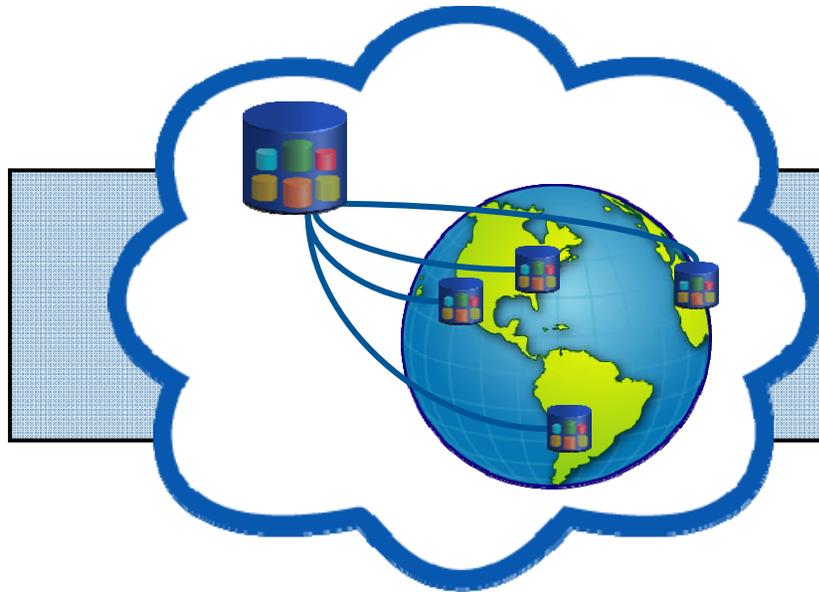
[Become a Partner](#)

# Compute Service Overview



- What is it?
  - EMC-hosted compute infrastructure
  - Offered in conjunction with EMC's Storage Service offering
- Value proposition
  - Efficient compute resource utilization with usage-based billing
  - Seamless federation between internal and external infrastructure
- Top Features
  - Flex in/out on the fly using business rules
  - Multi-tenancy
  - Application container and virtual resources management
  - Compute and data affinity

# Building a Private Cloud with EMC Atmos



## Features

- Designed for petabytes
- 100's of sites
- Policy-based information management
- Replication, versioning, compression, de-duplication, spin-down
- Web services interfaces
- File system access
- Multi-tenancy
- **Federation to service providers**

## • Benefits

- Quickly deliver cloud-based information services to market
- Improves operational efficiency
- Increase administrative productivity
- Effortlessly grow capacity

# Atmos Partners



Partner	Demo Summary	Vertical
<b>Atempo</b>	Atempo Digital Archive - large video and other digital images archived to cloud. Also show HSM (Hierarchical Storage Management), archiving data from disk to cloud after a defined period of time.	TME - Digital Image Archiving/HSM
<b>Fabrix</b>	The ingestion and playout of video streams related to cloud based personal/digital video recording (PVR/DVR). demo the ability to pause, fast forward, rewind and ad splicing.	TME - Video Streaming
<b>Signiant</b>	Fast content transfer; being used for transfer of entertainment media between production facilities. Demo will show nearline archive of media transcoded files on the cloud.	TME - Media Production
<b>TwinStrata</b>	A "bridge" product to allow access to cloud based storage for legacy business applications which commonly use fiber channel connected storage.	Storage Consolidation/Backup/ Disaster Recovery
<b>Networker</b>	<b>Enterprise</b> - Enterprise backup to cloud based storage <b>Consume</b> - Backup and restore of mobile device data including settings, applications and content using real and simulated mobile devices.	Data Backup and Restore
<b>Lifelimage</b>	Personal storage "in the cloud" of medical images such as MRIs, CT scans and X-rays to name a few.	HealthCare - Medical Image Mgmt
<b>OSA/Acuo</b>	DICOM formatted medical images stored in the cloud for global distribution.	HealthCare - Medical Image Mgmt
<b>DCTM - MaaS</b>	Backup of DCTM server to the cloud.	Content Management - Backup
<b>DCTM - SharePoint</b>	Store MSFT SharePoint content on Atmos.	Content Management
<b>Rainfinity</b>	HSM - using Rainfinity's File Management Appliance for data migration from Celleria to Atmos (could be on or off premise, demo will show to cloud).	HSM

**EMC<sup>2</sup>**<sup>®</sup>

**where information lives<sup>®</sup>**