Multi-Cloud Portability & Interoperability

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Interoperability

Why portability?

- High availability
- Cost
- Performance
- Avoid lock-in
Why interoperability?

- High availability
- Cost
- Performance
- Privacy
- Hybrid
- One size does not fit all

Cloud based systems

- Data
- Applications
- Platforms
- infrastructures

<table>
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<th>On Premise</th>
<th>On Premise (hosted)</th>
<th>IaaS</th>
<th>PaaS</th>
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Organization has control

Organization shares control with vendor

Vendor has control
Do not forget data!

Pizza as a Service

- Traditional On-Premises (On-Site)
  - Dining Table
  - Soda
  - Electric / Gas
  - Oven
  - Fire
  - Pizza Dough
  - Tomato Sauce
  - Toppings
  - Cheese
  - Made at home

- Infrastructure as a Service (IaaS)
  - Dining Table
  - Soda
  - Electric / Gas
  - Oven
  - Fire
  - Pizza Dough
  - Tomato Sauce
  - Toppings
  - Cheese
  - Take & Bake

- Platform as a Service (PaaS)
  - Dining Table
  - Soda
  - Electric / Gas
  - Oven
  - Fire
  - Pizza Dough
  - Tomato Sauce
  - Toppings
  - Cheese
  - Pizza Delivered

- Software as a Service (SaaS)
  - Dining Table
  - Soda
  - Electric / Gas
  - Oven
  - Fire
  - Pizza Dough
  - Tomato Sauce
  - Toppings
  - Cheese
  - Dined Out

- You Manage
- Vendor Manages
Data Portability

- Data portability enables re-use of data across different applications.
- The structure of the data is often designed to fit a particular form of application processing.
- A significant transformation is needed to produce data that can be handled by a different product.
- Data portability problem exists in traditional environments. But …
- Cloud introduces no new technical problems, but cloud can make the old technical problems much more serious.

Application Portability

- Application portability enables the re-use of application across cloud and traditional computing platforms.
- Suppose that an enterprise has an application built on a particular cloud and wishes to move it to another cloud. How easy will this be?
- Example: portability between development and operational environments.
- Application portability brings development and operations closer together, and indeed increasingly leads to the two being integrated as **devops**
Platform Portability

- Platform source portability
- Machine Image portability

Application interoperability

- Application interoperability is interoperability between application components deployed as SaaS
- Data synchronization is a particular issue when components in different clouds or internal resources work together.
- Application interoperability allows hybrid cloud
Platform interoperability

- Platform interoperability is interoperability between platform components
- Platform interoperability requires standard protocols for service discovery and information exchange
- Application interoperability cannot be achieved without platform interoperability.

http://www.opengroup.org/cloud/cloud/cloud_iop/cloud_port.htm

To summarize

- Data
- Applications
- Platforms
- Infrastructure

Via applications
Hardware/Virtualization

Exists in traditional environments, but the problem could be more serious within the cloud
- UCI : Unified Cloud Interface

- OCCI : Open Cloud Computing Interface

- CIMI (Cloud Infrastructure Management Interface)