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<th>Speakers</th>
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Expert Thinking              |
The Cloud Standards Customer Council
THE Customer’s Voice for Cloud Standards!

- Provide customer-led guidance to multiple cloud standards-defining bodies
- Establishing criteria for open standards-based cloud computing

700+ Organizations participating

2017 Deliverables
- Cloud Customer Architecture for Hybrid Integration
- Impact of Cloud Computing on Healthcare v2.0
- Cloud Customer Architecture for API Management
- Data Residency Challenges
- Cloud Customer Architecture for Blockchain
- Cloud Customer Architecture for Big Data and Analytics v2.0
- Hybrid Cloud Considerations for Big Data and Analytics
- Practical Guide to Cloud Management Platforms
- Practical Guide to Cloud Computing v3.0
- Interoperability and Portability for Cloud Computing: A Guide v2.0
- Security for Cloud Computing: 10 Steps to Ensure Success v3.0

2018 Projects
- Migrating Apps to Public Cloud Services: Roadmap for Success v2.0
- Cloud Customer Architecture for Artificial Intelligence
- And more!

http://cloud-council.org
Revision Highlights

- Cloud computing widely adopted
- Variety of cloud services has led to proprietary architectures & technologies
- Use of multiple cloud services from different providers now common
- New ISO 19941 cloud interoperability & portability standard: facet models
- Risk of vendor lock-in for customers has increased
- Increased use of automation
- New technologies such as Containers & Serverless
Basic Definitions

**Interoperability**

- “Ability for two or more systems or applications to exchange and mutually use the exchanged information”
- Ability of public cloud services, private cloud services, and other customer systems to use each other’s APIs
- Standard interfaces ideal so customers can switch to another cloud service provider with minimal impact

**Application Portability**

- “Ability to migrate an application from one cloud service to another cloud service or between a CSC’s system and a cloud service”
- Significant changes to the application code should not be required

**Data Portability**

- “Ability to easily transfer data from one cloud service to another cloud service or between a cloud service customer’s system and a cloud service, in a commonly used electronic format”
- APIs to retrieve/import data are an important aspect of portability
- Syntax and semantics of transferred data is an important aspect of portability
Interoperability Challenges

- Multiple interfaces & APIs across several dimensions
- Non-standardized interfaces & APIs
- IaaS has highest level of interoperability
- PaaS has lower level of interoperability
- SaaS has lowest level of interoperability

Potential solutions:
- ESBs can help address interoperability challenges
- Inter-cloud providers (i.e. brokers) are an option

Portability Challenges

- IaaS: Highest level of app portability
- PaaS: Varying software stacks make app portability more challenging
- SaaS: Data portability is of most concern

Potential solutions:
- IaaS: Operating systems like Linux and standards like OVF, Docker ease app portability
- PaaS: Adoption of common open source platforms helpful (e.g. Cloud Foundry)
- Common container technology allows independent deployment of app parts (e.g. Docker, Kubernetes)
Customer systems

- User function
- Admin function
- Business function

Cloud Service

- Derived data

Application

- Artifacts
- Dependencies

Customer data

Functional interfaces

Admin interfaces

Business interfaces

Application portability

Data portability

Service capabilities

- Application
  - Artifacts
  - Dependencies

Customer data
PaaS services: Main considerations

Customer systems
- User function
- Admin function
- Business function

Application
- Artifacts
- Dependencies

Customer data

Cloud Service
- Derived data
- Service capabilities
  - Application
    - Artifacts
    - Dependencies
  - Customer data

Interoperability
Admin interfaces
Business interfaces
Application portability
SaaS service: Main considerations

Customer systems
- User function
- Admin function
- Business function

Cloud Service
- Derived data
- Service capabilities
  - Application
    - Artifacts
    - Dependencies
  - Customer data

Interoperability
- Functional interfaces
- Admin interfaces
- Business interfaces

Data portability
- Customer data
  - Application
    - Artifacts
    - Dependencies
  - Customer data
Scenarios

1. Customer switches providers for a cloud service
2. Customer uses cloud services from multiple providers
3. Customer links on cloud service to another cloud service
4. Customer links in-house capabilities with cloud services
5. Migration of customer capabilities into cloud services
Scenario 1: Customer switches providers for a cloud service

before…

Cloud Service A
Provider A

Cloud Service Customer

after…

Cloud Service B
Provider B

Cloud Service Customer

Considerations

- For SaaS, APIs and user interfaces are key – not often standard
- For IaaS & PaaS, application portability is the biggest issue
- For SaaS, data portability is a major concern

Recommendations

- For IaaS, ensure cloud service accepts standard app packaging formats like OVF, Docker
- For PaaS, require app environment based on open technologies & APIs
- For SaaS, demand well defined APIs, protocols & data formats, standardized where possible

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Scenario 2: Customer uses cloud services from multiple providers

**Considerations**
- Customer systems must interact with 2 or more cloud services
- Need consistency of admin, management and business interfaces

**Recommendations**
- Consider use of ESB as a mapping layer
- Choose business and admin tools that provide adapters
- Look for support of common or standard technologies e.g. IDaM
Scenario 3: Customer links one cloud service to another cloud service

### Considerations
- Service 1 has to consume API of service 2
- Interoperability the main problem
- Security between 2 services often required

### Recommendations
- Ensure service 2 has well defined & consumable API
- Consider use of adapter layer (e.g. PaaS app fronting SaaS service)
- Ensure security technologies of service 2 can be used by service 1
Scenario 4: Customer links in-house capabilities with cloud services

**Considerations**
- Well-defined APIs for on-prem data and functionality must exist
- Integration of in-house admin functionality with cloud admin functionality
- New Security requirements
- New business interfaces defined by cloud provider

**Recommendations**
- Ensure that on-prem apps leverage SOA
- Leverage ESB to perform interface, protocol and data transformations
- Address security issues with cloud services accessing on-prem capabilities
- Examine if in-house systems can deal with business aspects of cloud services
Scenario 5: Migration of customer capabilities into cloud services

before...

after...

Considerations
- For SaaS, API differences for apps migrated to cloud and format/content of customer data
- For IaaS/PaaS, ease of migrating app to cloud
- New security requirements
- Compatibility of admin and business interfaces for the migrated app

Recommendations
- For SaaS, consider compatibility with on-prem apps and the migrated cloud service
- For PaaS, ensure cloud app environment is compatible with on-prem environment
- Ensure cloud admin and business capabilities can be integrated with in-house systems
Summary of recommendations

**Portability**
- IaaS: Use standard package formats like OVF
- IaaS: Consider containers – Docker, Kubernetes
- PaaS: Use compatible app environment(s)
- PaaS: Support common open technologies
- SaaS: Insist on standard protocols & data formats

**Interoperability**
- Use SOA principles for on-premises systems
- Consider ESBs for interface mappings
- Leverage 3rd party IDaM using standards
- Use API Management to access on-premises systems
- Insist on open technologies for admin & business APIs
- Check for standard security technologies
- Demand well defined APIs
- Consider use of PaaS mapping layer
- Consider using Cloud Management Platform
Open Technologies

- **OVF**
  - [http://www.dmtf.org/standards/ovf](http://www.dmtf.org/standards/ovf)

- **CDMI**
  - [http://www.snia.org/cdmi](http://www.snia.org/cdmi)

- **ISO 17789 CCRA**

- **OASIS TOSCA**

- **ISO 19941 Cloud Computing Interoperability and Portability**
  - [https://www.iso.org/standard/66639.html](https://www.iso.org/standard/66639.html)

- **SAML 2.0**

- **OAuth 2.0**
  - [http://oauth.net/2/](http://oauth.net/2/)

- **OpenStack**
  - [http://www.openstack.org/](http://www.openstack.org/)

- **Open Containers Initiative / Docker**
  - [https://www.opencontainers.org/](https://www.opencontainers.org/)

- **Cloud Foundry**
Call to Action

- **Join the CSCC Now!**
  - To have an impact on customer use case based standards requirements
  - To learn about all Cloud Standards within one organization
  - To help define the CSCC’s future roadmap
  - Membership is free & easy: [http://www.cloud-council.org/become-a-member](http://www.cloud-council.org/become-a-member)

- **Get Involved!**
  - Join one or more of the CSCC Working Groups
    [http://www.cloud-council.org/workinggroups](http://www.cloud-council.org/workinggroups)

- **Leverage CSCC Collateral**
  - Visit [http://www.cloud-council.org/resource-hub](http://www.cloud-council.org/resource-hub)
Additional Resources

- **Practical Guide to Hybrid Cloud Computing**

- **Practical Guide to PaaS**

- **Practical Guide to Cloud Computing Version 3.0**

- **Migrating Applications to Public Cloud Services: Roadmap for Success**

- **Security for Cloud Computing: 10 Steps to Ensure Success Version 3.0**

- **Practical Guide to Cloud Service Agreements Version 2.0**

- **Practical Guide to Cloud Management Platforms**
Thank You