Presenters

Heather Kreger
CTO International Standards, IBM US
kreger@us.ibm.com

Mike Edwards
Senior Technical Staff Member, Cloud Computing & SOA Standards, IBM UK
mike_edwards@uk.ibm.com
This talk will introduce the first of a series of vendor neutral Cloud Solution Architecture - the Web Application Cloud Hosting Architecture recently published. We will show how Open Source - including OpenStack - can be used to implement this architecture.

- What are Cloud Solution Architectures?
- Candidate Architectures
- Web Application Hosting Cloud Architecture
- Comparing to Amazon
- Open source projects that can be used to support this
Cloud Solution Architectures for Customers

Cloud Solution Architectures are…
- straightforward description of elements needed to implement particular application solutions using cloud infrastructure, cloud platforms, cloud software, and cloud services
- deployment neutral (public, private, hybrid) & implementable via IaaS, PaaS, SaaS
- general purpose reusable architectures as well as industry specific architectures
- vendor neutral & open

Important because they…
- enable cloud customers to understand unique features & advantages of using cloud computing
- bridge gap between cloud customer needs and cloud provider offerings
- provide practical customer guidance on how common business applications can be realized
- are stable anchors in a rapidly innovating cloud landscape
- save time, effort & money: be more productive

Useful when…
- planning to build cloud based applications
- talking with cloud providers about their offerings
- understanding of the common elements and relationships in relevant solutions

Target audience: customers planning on building/purchasing cloud solutions – developers, architects, managers

Consistent with ISO/IEC 17789 International Standard Cloud Computing Reference Architecture
Cloud Customer Solution Architecture Candidates

General
- Web Application Hosting
- e-commerce
- Big Data / Analytics
- Mobile
- Social Business

Industry
- Financial
- Healthcare
- Travel
- Gaming
Web Application Hosting Cloud Solution Architecture

Web Browser

Cloud Provider's Public Network

Domain Name Services
Content Delivery Network
Firewall

Cloud Provider's Private Network

Web Tier

Scalable Cloud Infrastructure
Load Balancers
Application Servers

Service Tier

Scalable Cloud Infrastructure
Databases

Scalable Cloud Infrastructure

Caches
File Repositories
User Directories
Web Application Hosting Cloud Solution Architecture

2-tier architecture: web tier; service tier
DNS – resolve URL to address – can be dynamic
Web Application Hosting Cloud Solution Architecture

Content Delivery Network: cache and serve static content near end user
Scalable Firewall: Fence off cloud services from internet
Load Balancer: spread requests across cluster of web application instances
Web Application Hosting Cloud Solution Architecture

Web App Servers: cluster of ‘stateless’ web application instances
Local cache to reduce load on service tier
File or object repository: Static data like configuration information, Images, Videos, PDFs…
User directory: where authentication & access control is required
1. DNS – resolve names to resources
2. Content Delivery Network – If contains the content, fast return without going through firewall.
3. Distribute content from geographically diverse nodes to customer.
4. Firewall – Guards intranet from the internet. Available hardware, software, shared, or dedicated.

5. Load Balancer – Picks server to handle request, simple or sophisticated. Local, global, or highly available options.
6. Web App Servers – A scalable cluster comprised of Virtual Servers running on dedicated Bare Metal Servers.
7. User Directory – make sure he has permission First!

8. Cache – check local cache for content
9. File Repository – check network storage for content
10. Database – Access DB for content..
Web Application Hosting Cloud Solution Architecture

Database: dynamic data, replicated, backed-up, scalable…
Web Application Hosting Cloud Solution Architecture: PaaS implementation

PaaS includes all

Web Browser

Cloud Provider’s Public Network

Domain Name Services

Content Delivery Network

Firewall

Web Tier

Load Balancers

Scalable Cloud Infrastructure

Application Servers

Scalable Cloud Infrastructure

Service Tier

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Cloud Provider’s Private Network

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User Directories

Scalable Cloud Infrastructure
Amazon & the CSCC Web Application Hosting Cloud Solution Architecture

CSCC uses modern 2 tier
CSCC adds:
Firewall
Inter/Intranet
Cache
File Repository
Security User Directory

http://media.amazonwebservices.com/architecturecenter/AWS_ac_ra_web_01.pdf
Web App Hosting Cloud Solution Architecture: Open Source Mapping

DNS – BIND, PowerDNS

CDN – Can Implement on: Apache Web Server, OpenStack Object Storage

PaaS – Cloud Foundry

App Servers – run on Open Source VMs: OpenStack Compute (Nova), Cloud Foundry PaaS, Docker Containers OR Open Source App Servers - Tomcat, Apache, Ruby on Rails, node.js, python...

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Databases

Cloud Foundry

OpenStack Networking: Neutron

Router, HAPbxy, OpenStack Network LBaaS

Cache – Redis, memcached

File Repository – Static Contents – OpenStack Object Storage (Swift), OpenStack Block Storage (Cinder), NFS

Auto Scale – OpenStack Orchestration (Heat), Cloud Foundry PaaS,

User Directory – OpenLDAP, OpenStack Keystone

Database – MongoDB, CouchDB, MySQL, Postgres

Firewall – Iptables, Vyatta

Load Balancer – Cloud Foundry PaaS
Take Aways

- This is the first in a series of cloud customer solution architectures

- Use these architectures to learn about best practices and common ways to deploy applications relevant to cloud customers using cloud infrastructure, platforms and services

- Use these architectures to talk to cloud providers

- Consider getting involved in the architectures under development
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/application

▪ Get Involved!
  – Join one or more of the CSCC Working Groups
    • http://www.cloud-council.org/workinggroups.htm
Additional Resources

- **Web Application Hosting Cloud Solution Architecture**
- **Practical Guide to Cloud Computing V2**
  - [http://www.cloud-council.org/webinar/pgv2-pdf.htm](http://www.cloud-council.org/webinar/pgv2-pdf.htm)
- **Migrating Applications to Public Cloud Services: Roadmap for Success**
- **Cloud Security Standards: What to Expect & What to Negotiate**
- **Security for Cloud Computing: 10 Steps to Ensure Success**
  - [http://www.cloud-council.org/security-d.htm](http://www.cloud-council.org/security-d.htm)
- **Convergence of Social, Mobile & Cloud: 7 Steps to Ensure Success**
- **Practical Guide to Cloud SLAs**
  - [http://www.cloud-council.org/webSLA-download.htm](http://www.cloud-council.org/webSLA-download.htm)
- **Public Cloud Service Agreements: What to Expect & What to Negotiate**
  - [http://www.cloud-council.org/sla/index.htm](http://www.cloud-council.org/sla/index.htm)
- **Impact of Cloud Computing on Healthcare**
  - [http://www.cloud-council.org/webHC-download.htm](http://www.cloud-council.org/webHC-download.htm)
Web App Hosting Cloud Solution Architecture: Key Contributors

John Bell
Heather Kreger
Mike Edwards
Manuel Silveyra
Thank You