ARCHITECTING HYBRID CLOUD SOLUTIONS WITH THE WATSON DEVELOPER CLOUD

A Lesson in Innovation

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You are here
Legend:

- Tier
- IBM Watson Component
- Other, non IBM component
- HTTPS
- Integration Sample Component
REVIEW

Some definitions…
Definition: Cloud Computing

Essentials:

• On demand self service
• Broad network Access
• Resource Pooling
• Rapid Elasticity
• Measured Service
Cloud Deployment Models

• Private Cloud
• Community Cloud
• Public Cloud
• Hybrid Cloud
Cloud Service Models

- Software as a Service (SaaS)
  - Google Apps for Business
  - Microsoft Office 365

- Infrastructure as a Service (IaaS)
  - Amazon AWS

- Platform as a Service (PaaS)
  - Google App Engine
  - Heroku
  - Windows Azure Cloud Services
  - Amazon AWS
  - IBM Bluemix
Anyone remember timeshares?
Definition: Hybrid Cloud

• Hybrid Cloud means that the design spans more than one cloud.
  • Openstack.org

• The connection of one or more clouds to on-premise systems and/or the connection of one or more clouds to other clouds
  • IBM
WHY Hybrid Cloud?
Compliance

Public Cloud

Not sensitive

Hybrid Cloud

Private Cloud

Sensitive

Not sensitive
Bursting

Public Cloud

Private Cloud

Hybrid Cloud
Transition to Public Cloud

Existing App → Hybrid Cloud → Public Cloud
Why Hybrid Cloud?

- Disaster Recovery
- Scaling
- Cost Optimization
- Geographic Optimization
- Cover Legacy System Gaps

and…
INNOVATION

Paves the way to a cloud solution
INNOVATION

Watson Developer Cloud
Watson
We needed to innovate…

• Quickly
• With minimal investment
• Without a PhD in machine learning
• With a reliable technology…
We used a Hybrid Cloud solution
IBM® Watson™ Services for Bluemix™

Rapidly prototype and build cognitive apps in the cloud
What is the Watson Developer Cloud?

• A collection of REST APIs and SDKs hosted on IBM Bluemix that use cognitive computing to solve complex problems.

• Let the developers build the next generation of cognitive enhanced applications.
What is IBM Bluemix?

- IBM Bluemix is the IBM open cloud platform that provides mobile and web developers access to IBM software for integration, security, transaction, and other key functions, as well as software from business partners.

- PaaS

- Similar offerings
  - Microsoft Azure Cloud Services
  - Amazon AWS
  - Heroku
Watson Developer Cloud Services

- Concept Expansion
  - IBM BETA
- Language Identification
  - IBM BETA
- Machine Translation
  - IBM BETA
- Message Resonance
  - IBM BETA
- Question and Answer
  - IBM BETA
- Relationship Extraction
  - IBM BETA
- Personality Insights
  - IBM
Our approach

• Play to your Strengths
• Focus on the User
• Experiment and Learn
• Collaborate
• Keep grounded in sound practices
EXAMPLE
On Prem + Public Cloud
Personality Insights

**Description:** REST API uses linguistic analytics to infer cognitive and social characteristics based on text information created by individuals or groups.

**Search Application Uses:** Psychographic segmentation, Customer portraits combined with a 360 degree view of a customer

**Quality Attributes:** Security, Scalability, Performance, Privacy, Cost
Integration Architecture

**Legend**
- Tier
- IBM Watson Component
- Other, non IBM component
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What did we learn?

• Patterns
• Quality Attributes
• Benefits
• Challenges
Definition: Architectural Pattern

• An architectural pattern is a general, reusable solution to a commonly occurring problem in software architecture within a given context.

• An architectural style (that) determines the vocabulary of components and connectors that can be used in instances of that style, together with a set of constraints on how they can be combined.

http://en.wikipedia.org/wiki/Architectural_pattern

Integration Patterns We Discovered

• Browser (AJAX)
• Server-side
• Query Time
• Crawl Time
• Pre- or post- processing
Example Pattern: Crawl Time
Pattern: Crawl Time

- Pipe and Filter
- Integration in a Filter

Legend:
- Pump / Sink
- Pipe
- Cloud Boundary
- Integration Filter

Crawled HTML

Pipe
Filter n
Pipe
WDC Converter
Pipe
Sink

On-Prem Engine

Public Cloud

Normalized XML

WDC Service
Definition: Quality Attribute

- Benchmarks that describe a system’s intended behavior within the environment in which it was built.
- Requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors.


Key Quality Attributes

• Data Protection and Security
• Scalability and Elasticity
• Maintainability
• Interoperability
• Performance
• Availability and Reliability
Personality Insights: Quality Attributes

• Concerns:
  • Computationally expensive (Cost, Scalability, Performance)
  • Twitter API calls are limited (Cost, Scalability, Reliability)
  • Security, Privacy
Crawl Time Quality Attributes

• Concerns:
  • Significant increase in crawl time (Performance)
  • API Calls are limited (Cost, Scalability)
  • API Call failure (Reliability)
Benefits

Compliance  Bursting  Transition

- Disaster Recovery
- Scaling
- Cost Optimization
- Geographic Optimization
- Cover Legacy System Gaps
- Innovation
CHALLENGES
Hybrid Cloud is Roman Riding.

If either horse trips, you crash.

Adrian Cockcroft
@adrianco
It's Difficult
Challenges

• New technologies, new set of problems
• Paradigm Shift
• Reliance on something you have no control over
• It’s the Wild West
WRAP - UP
You will introduce architecture complexity when moving to hybrid cloud.
Hybrid cloud allows you to handle increased workloads but keep the safety net of being behind the firewall.
Hybrid cloud offers organizations a phased approach for transition to the cloud.
What? Sample code? Yes!

https://github.com/Watson-Explorer

https://github.com/watson-developer-cloud
More Cloud Patterns…

- http://www.cloudcomputingpatterns.org/

References

- "An Introduction to Software Architecture" by David Garlan and Mary Shaw, January 1994, CMU-CS-94-166

  [http://www.sei.cmu.edu/reports/05tn014.pdf](http://www.sei.cmu.edu/reports/05tn014.pdf)

- “State of the Art in Microservices” by Adrian Cockcroft, December 2014,


- Openstack: [http://docs.openstack.org](http://docs.openstack.org)


- [http://www.cloudcomputingpatterns.org](http://www.cloudcomputingpatterns.org)

- Microsoft Azure - Cloud Design Patterns
Thank you!

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