

ARCHITECTING HYBRID CLOUD SOLUTIONS WITH THE WATSON DEVELOPER CLOUD

A Lesson in Innovation

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IBM

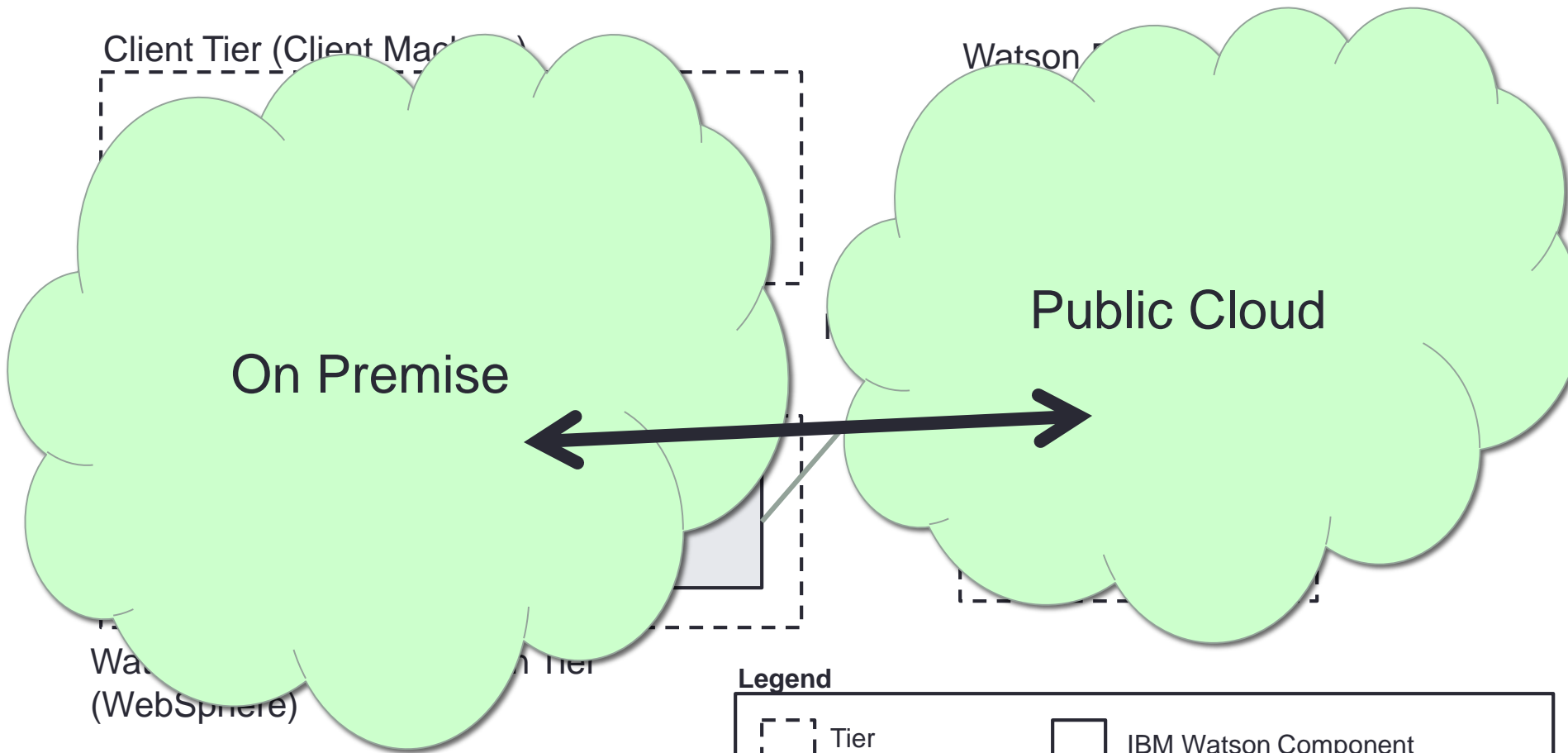
@wmchaparro





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?



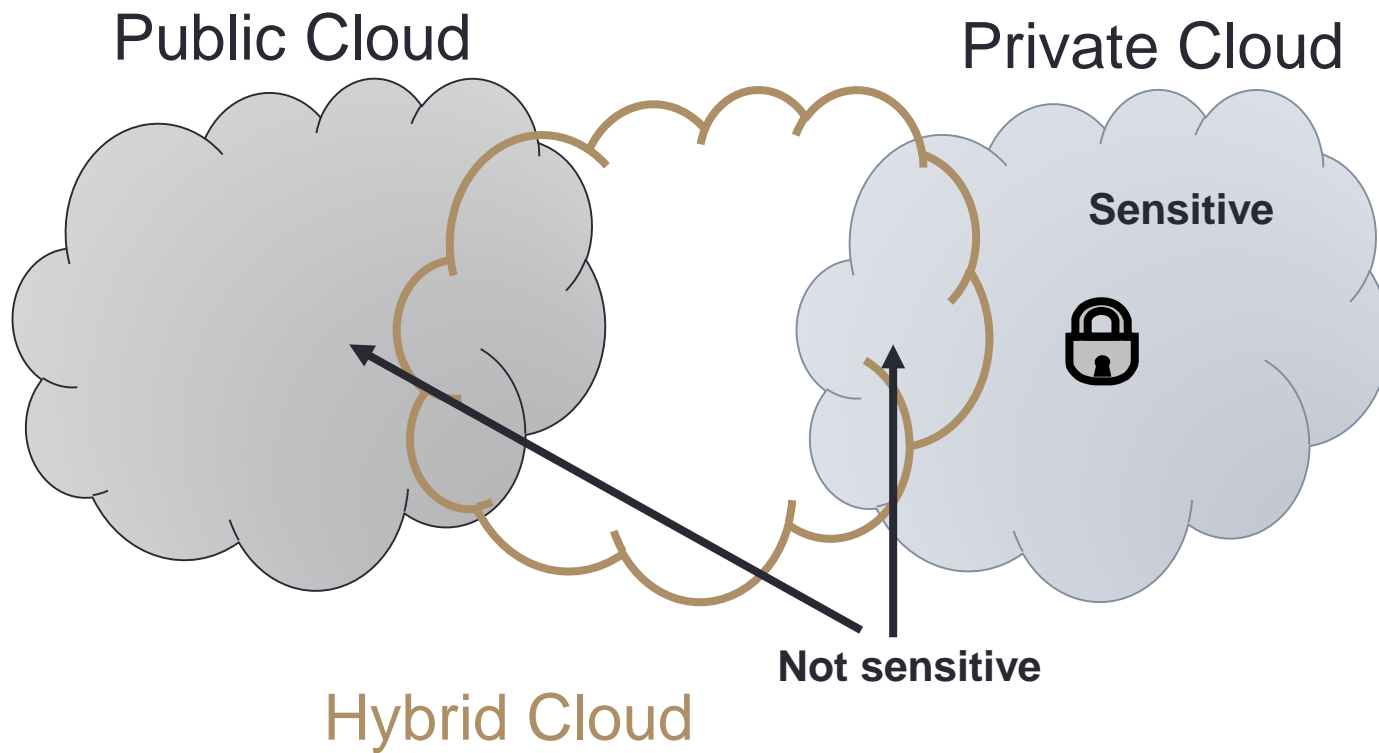
Definition: Hybrid Cloud

- 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

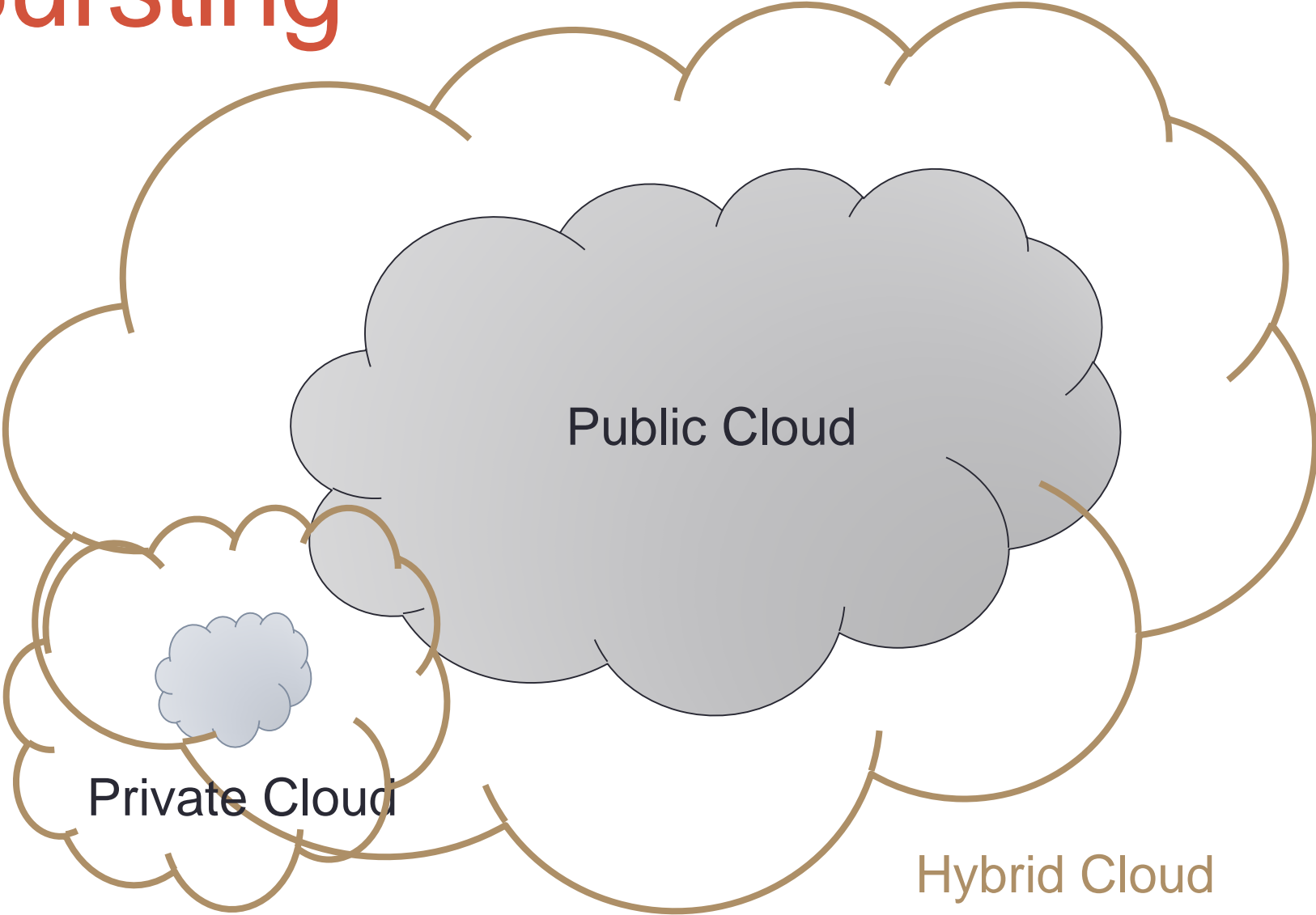
A white llama is positioned in the lower-left foreground, looking towards a white speech bubble. The background features the stone ruins of Machu Picchu, a lush green valley, and a large, dark mountain peak under a cloudy sky.

**WHY
Hybrid
Cloud?**

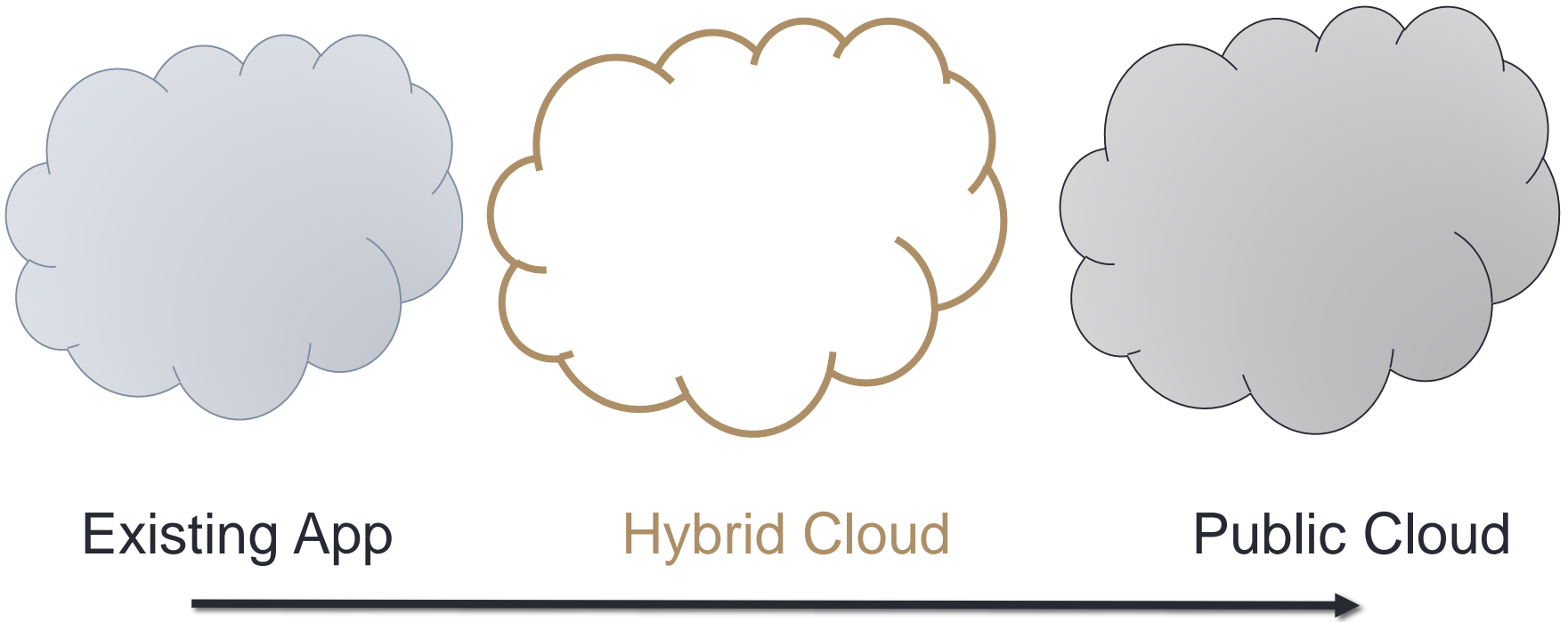
Compliance



Bursting



Transition to 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...

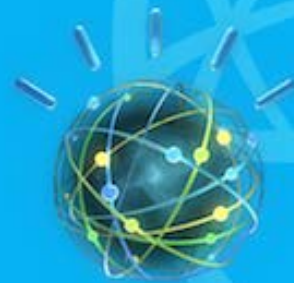
- Quickly
- With minimal investment
- Without a PhD in machine learning
- With a reliable technology...

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

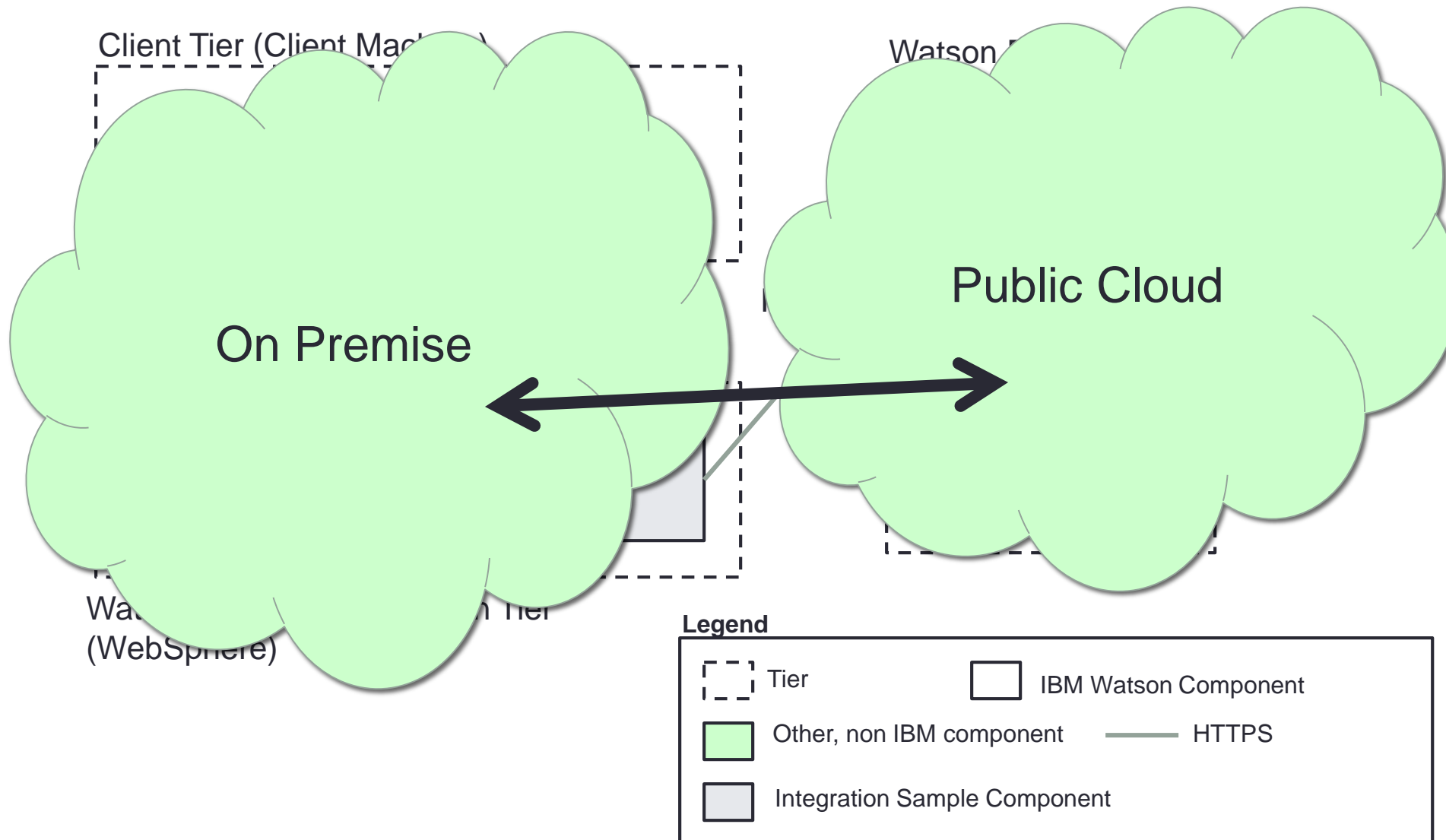


Description: REST API uses linguistic analytics to infer cognitive and social characteristics based on text information created by individuals or groups.

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





User Modeling Profile



User Modeling Legend

Big 5
Extraversion 100.0%

Needs
Excitement 13.0%

Values
Self-transcendence 20.0%

Social behavior
Wed. Noon tweeter

Self-discipline

- personality
- needs
- values
- behavior

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

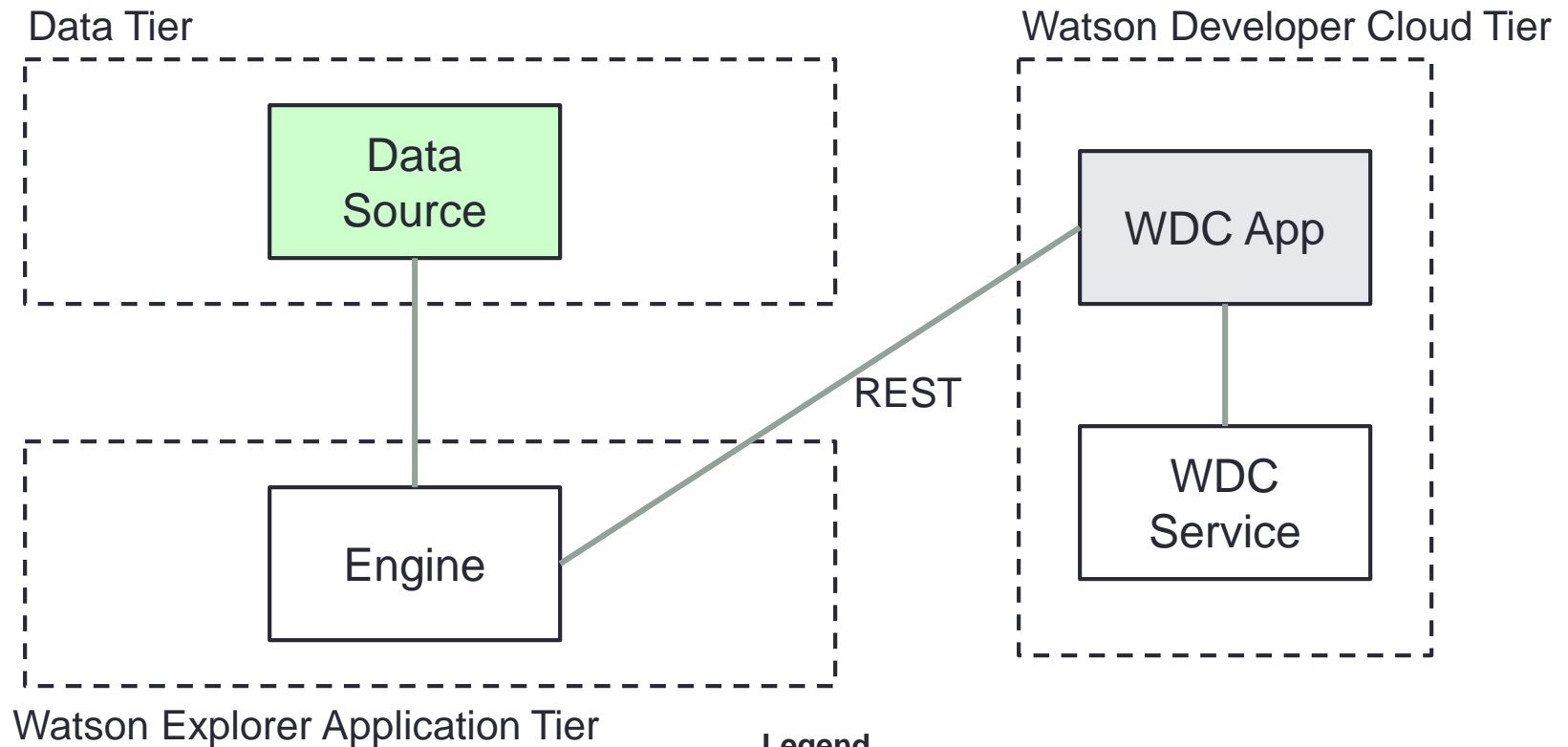
[David Garlan and Mary Shaw, January 1994, CMU-CS-94-166, see "An Introduction to Software Architecture" at

http://www.cs.cmu.edu/afs/cs/project/able/ftp/intro_softarch/intro_softarch.pdf]

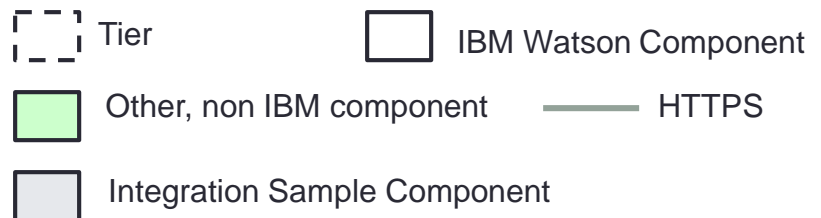
Integration Patterns We Discovered

- Browser (AJAX)
- Server-side
- Query Time
- Crawl Time
- Pre- or post- processing

Example Pattern: Crawl Time

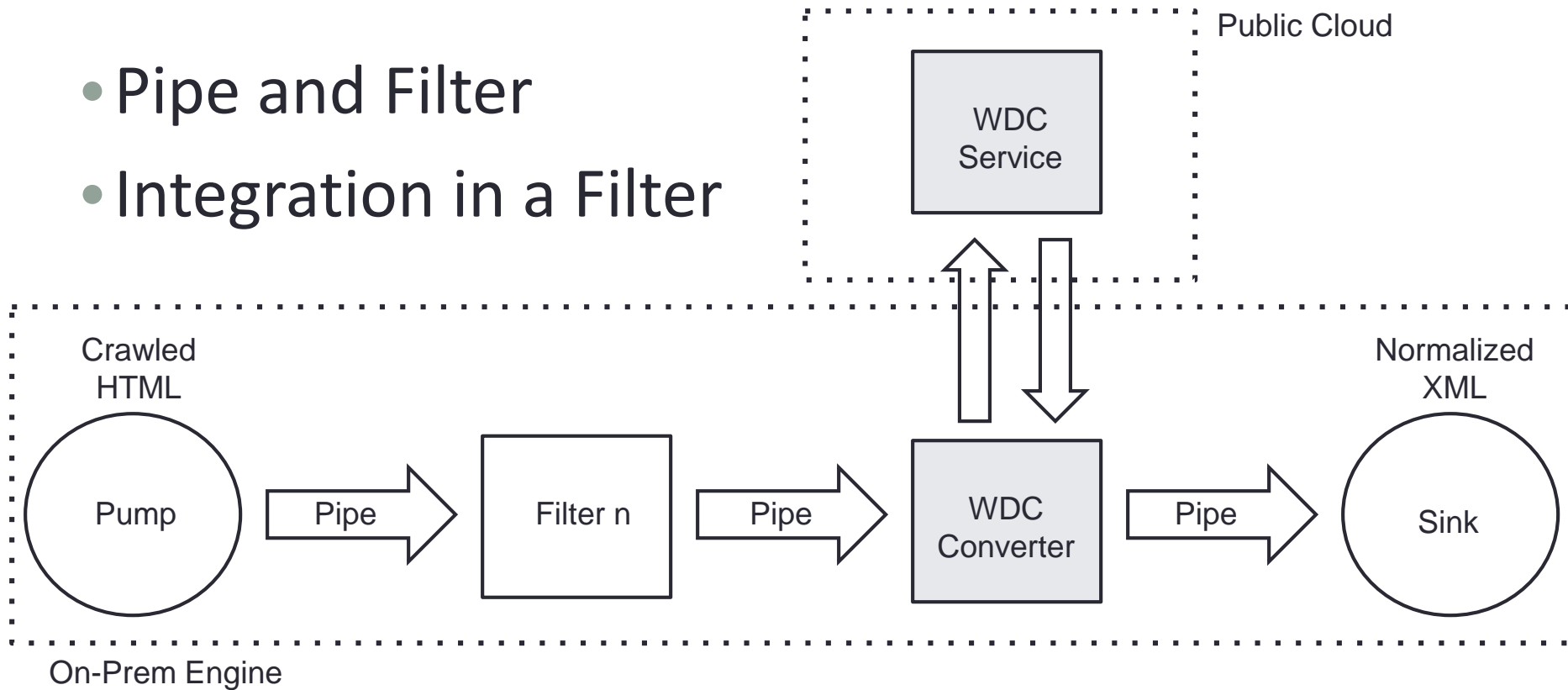


Legend

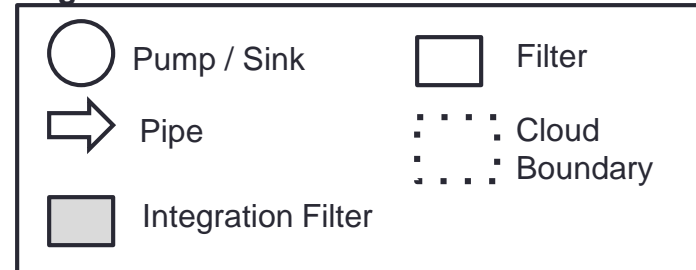


Pattern: Crawl Time

- Pipe and Filter
- Integration in a Filter



Legend



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.

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

<http://www.softwarearchitectures.com/go/Discipline/DesigningArchitecture/QualityAttributes/tabid/64/Default.aspx>

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)



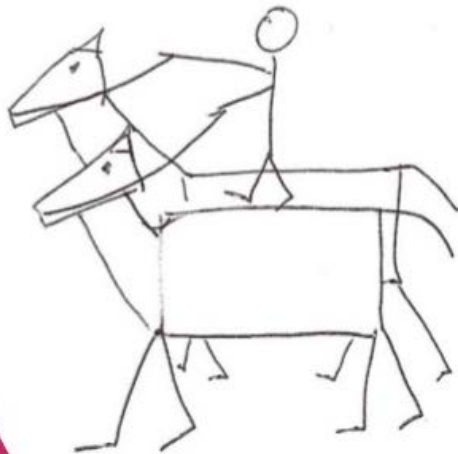
Benefits

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



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

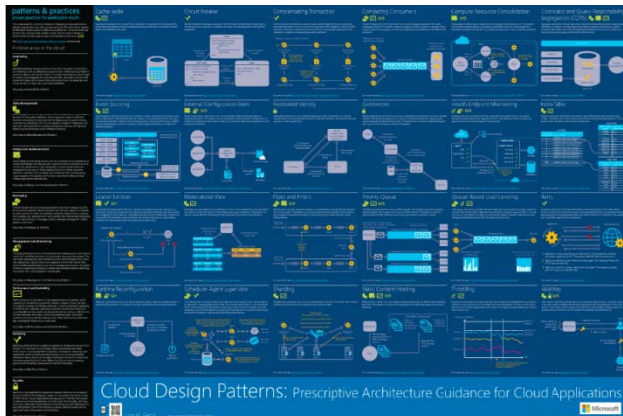
What? Sample code? Yes!

<https://github.com/Watson-Explorer>

<https://github.com/watson-developer-cloud>

More Cloud Patterns...

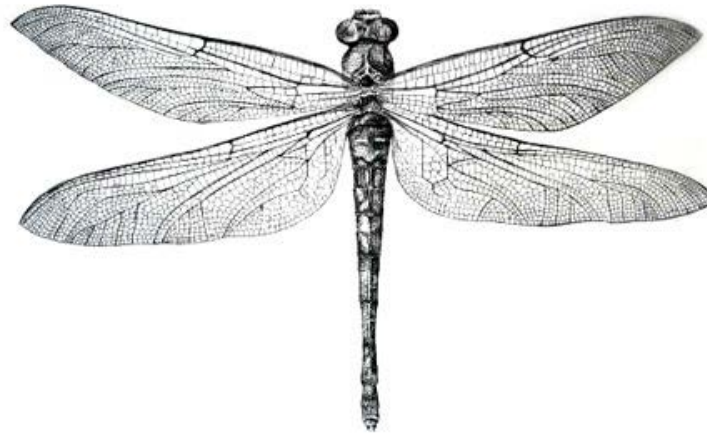
- <http://www.cloudcomputingpatterns.org/>
- <http://azure.microsoft.com/en-us/documentation/infographics/cloud-design-patterns/>



References

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- Netflix: <http://netflix.github.io/>
- Openstack: <http://docs.openstack.org>
- IBM Bluemix: <http://bluemix.ibm.com>
- <http://www.cloudcomputingpatterns.org>
- Microsoft Azure - Cloud Design Patterns <https://msdn.microsoft.com/en-us/library/dn568099.aspx>

Thank you!



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