IBM Open Cloud Architecture
Agenda

• Introduction
• IBM Open Cloud Architecture
• Softlayer – an IBM Company
• Summary
We are at an inflection point in the industry
Technology is increasingly the most critical driver for business growth

The emergence of big data, social, mobile, cloud and analytics are fundamentally changing how we live, work and interact

Digital transformation forces

- **67% of global consumers** want to use mobile devices to complete retail transactions
- **30%+ of Asia’s GDP** is expected to be handled through mobile money transfers by 2015
- **1 out of every 7** minutes spent online is spent on social network
- **40% of people** socialize more online than they do face-to-face
- **80% of new apps** will be distributed or deployed via the cloud
- **1/3 of consumer data** will be stored in the cloud by 2016
Some Use Cases

**INSURANCE**
- LOB need for new solutions to “get closer to their customers…”
- Address millennial generation of customers and interaction models (**social, mobile**)
- Enhance current Sales System with a multi-channel integration system that provides for sales (quoting) and service of all products to Agents, Call Centers and direct to Policyholders

**RETAIL**
- LOB need for new solutions to engage customers in-store and over web channels
- Address customer acquisition, customer retention, customers interaction in-store (coupons, promotions) and metrics such as average revenue per user (**social, mobile, analytics**)
- Enhance current retail systems with a multi-channel interaction

**GOVERNMENT & PUBLIC SECTOR**
- New solutions to engage citizens driven by Smarter Cities & Government
- Address citizen interaction with local government resources (**social, mobile, analytics**)
- Integrate current systems (e.g. work order management systems) with a multi-channel interaction leveraging GPS, GIS and mobile devices

**IBM Social Business**
- Making the work environment for sellers & sales managers simpler, social, more integrated, and insightful…”
- Applications that utilize CRM tools and integrates IBM Sales tools to deliver an integrated solution
- Enhanced with social network mapping and expertise location (e.g. LinkedIn)
- Integrating CRM applications with **social, mobile and analytical capabilities**

**MARKETING & SALES**
- LOB capabilities for short-term marketing campaigns aligned to events (e.g. sporting events)
- Dynamic engagement of customers and end-users (e.g. ASICS “Support Your Marathoner” multimedia campaign at the ING NY City marathon)
- Rapid creation of applications and integration with variable demands leveraging **social, mobile, multi-media and analytical capabilities**
Expectations on how Business and IT want to interact with systems and applications are driving **disruptive technologies**

- **Developers**
  - Low Touch, easy to consume
  - Minimal coding, lots of mashing
  - Continuously updating to delight, compete

- **Lines of Business**
  - Immediate gratification
  - Instant access from anywhere
  - Connect and Collaborate

- **CXO**
  - Predict vs React
  - Visual and precise
  - Highly consumable, intuitive

- **IT Operations**
  - Infrastructure as Code
  - Manage on and off prem service

**BIG DATA**

**Mobile**

**Cloud**

**Social**

**Embedded Intelligence**
Organizations must embrace new business models and disruptive technologies to be competitive, meet business need, and innovate.

**Systems of Record**
- Consolidation and modernization
- Operations Automation
- Risk and compliance Management
- Manual policy to analytics driven optimization

**Systems of Engagement**
- Assemble solutions from verified components and services
- Fast deployment and redeployment
- Agile to DevOps model
- User first delivery model

**Optimize**
**Focus on Operational Costs**
- Drives Need
- Drives Investment

**Business Models**
- "xaaS"
- MSPs
- Brokers

**Innovate**
**Focus on Speed and Agility**
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The IBM Common Cloud Reference Architecture (CCRA)

Represents the aggregate experience from hundreds of cloud client engagements and IBM-hosted cloud implementations

- Based on knowledge of IBM’s services, software & system experiences, including IBM Research
- Provides prescriptive guidance on how to build IaaS, PaaS, SaaS and service provider clouds using IBM technologies

Reflected in the design of
- Clouds IBM implements for clients
- IBM-hosted cloud services
- IBM cloud appliances
- IBM cloud products

Focuses on cloud specifics
- Radical cost reduction
- Achievement of high degrees of security, reliability, scalability and control

Consists of multiple detailed documents representing best-of-industry knowledge and insight
- How to architect, design and implement clouds

IBM CCRA public material:
https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Wf3cce8ff09b3_49d2_8ee7_4e49c1ef5d22/page/IBM%20Cloud%20Computing%20Reference%20Architecture%203.0
IBM Open Cloud Architecture

API Economy

External Ecosystem

Marketplace

API

analytics API
commerce API
collaboration API
location API
data API
services API

API

Software as a Service

Cloud Operating Environment

Workload definition, Optimization, & Orchestration

Resource Abstraction & Optimization

Software Defined Compute
Software Defined Storage
Software Defined Networking

Traditional Workloads

Software Defined Environment

OASIS

API & Composition Patterns

API & Integration Services

API

datastore
mobile
middleware
Services
security
ops
dev

Platform as a Service

Infrastructure as a Service

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API Economy

Value
- Adapt: application development & delivery
- API-accessible applications
- Multi-channel integration

Capability
- Composition of services
- Marketplace of internal & external services

Software as a Service
- Platform as a Service
- Infrastructure as a Service

Cloud Operating Environment
- Services & Composition Patterns
- API & Integration Services
- Traditional Workloads

Workload definition, Optimization, & Orchestration
- Resource Abstraction & Optimization

Software Defined Environment
- Software Defined Compute
- Software Defined Storage
- Software Defined Networking
IBM Cloud marketplace features IBM and Business Partner cloud services

- Comprehensive catalog supported by multi-billion dollar investments:
  - **Biz** (line of business) features IBM’s world class SaaS portfolio
  - **Dev** (developer) supports traditional application styles (patterns) and new application styles (composable services/Bluemix)
  - **Ops** (IT operations) features Management Services

- Purpose built Solutions (e.g., Mobile, DevOps) help you navigate the catalog

- Enables IBM customers to discover and experiment with a broad portfolio of offerings in a consistent way

[http://ibm.com/cloud](http://ibm.com/cloud) and click on Marketplace
IBM Service Management

Engaging the new world of service management
Developer Centric Platform, Marketplace & Services in a Cloud Operating Environment

Value

Fast, automated composition of services
Repeatable patterns-of-expertise

Capability

OPEN ecosystem of composable services
Optimized workload deployment
Integration patterns with systems of record

Cloud Operating Environment

Software Defined Environment

Services & Composition Patterns
- datastore
- mobile
- middleware
- security
- ops
- dev

API & Integration Services

Traditional Workloads

Software as a Service
Platform as a Service
Infrastructure as a Service

Workload definition, Optimization, & Orchestration

Resource Abstraction & Optimization
- Software Defined Compute
- Software Defined Storage
- Software Defined Networking
Agile Service Composition and Continuous Delivery

1. Create app
2. Add database service
3. Extract social media data into database
4. Add social analytics service
5. Secure the service
6. Add Monitoring service instance

TASK: Create a secure application that analyses sentiment about certain topics in social media
Evolving IaaS to a More Dynamic, Analytics Based Software Defined Environment

**Value**
- Simplified & standardized management
- Agile infrastructure
- Understanding & programming workloads

**Capability**
- Embedded analytics
- Workload-aware optimization
- Integrated security & governance

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**SmartCloud**

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What is a pattern?

- A pattern describes infrastructure and application components required to deliver a Cloud Service
- A pattern is a single point of control to deploy, manage and scale a Cloud Service
- Examples for pattern components are definitions of network/storage elements, image, software binaries, install scripts, chef recipes etc.
- Also known across the industry as:
  - Templates
    - Heat/HOT, Amazon CloudFormation
  - ServerTemplate
    - Rightscale
  - Stack
    - Rackspace, Amazon CFN (for a template instance)
- Think about Patterns as "**WhiteBox PaaS**", where you get insights into all components being deployed, e.g. definition of application topology, including scaling. Applications built on PaaS offerings like BlueMix are "**BlackBox PaaS**", where you do not get any insights in the underlying infrastructure/middleware topology.
Enable **portability** and **automatic management** of cloud applications across clouds, thus expanding customer **choice**, improving **reliability**, and **reducing cost** and **time-to-value**.

The **TOSCA** standard...

- **provides the Interoperable Description** and **Solution Portability for:**
  - **Applications**, their component **Services** and **Artifacts**, including **Relationships** of these services
  - **Platform** and **Infrastructure** services
  - **Management** and **Operational** behavior of these services

- **is an approved OASIS Standard** since Nov. 25th 2013:
  - [http://docs.oasis-open.org/tosca/TOSCA/v1.0/os/TOSCA-v1.0-os.pdf](http://docs.oasis-open.org/tosca/TOSCA/v1.0/os/TOSCA-v1.0-os.pdf)

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**Contributing Members**

![Contributing Members Logos](image-url)
IBM-Lead, OASIS Sponsored Multi-Company Interop. Demo

- **Private demos of** SAP CRM, ERP and Mobile application portability

  Slides, videos: [https://www.oasis-open.org/events/cloud/2013/toscademo](https://www.oasis-open.org/events/cloud/2013/toscademo)

Different partner cloud orchestration engines & tools interpreting and seamlessly deploying, running and monitoring the same TOSCA service templates on different clouds.
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• Backup
  • Managing SaaS Environments with SmartCloud Orchestrator and Service Engage – the Novatec Example
Softlayer – an IBM company

15 data centers
17 network PoPs
Global private network

- 100,000 servers
- 21,000 customers
- 22,000,000 domains
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Summary

Mobility, big data, analytics, social collaboration and cloud are creating a new wave of business opportunities and IT challenges.

New Hybrid Cloud Environments combining System of Records and System of Engagements are addressing these opportunities and challenges.

IBM Open Cloud Architecture supporting rapid composable application development and continuous delivery in these environments is build on these three layers:

- API Economy exposing SaaS Services through web-based APIs
- Cloud Operating Environment (Bluemix) allowing rapid application development and services composition ("Blackbox PaaS")
- Software Defined Environment enabling rapid and continuous delivery of diverse set of workloads on a programmable heterogeneous infrastructure

IBM Softlayer is an IaaS Cloud with Global Presence.

IBM Bluemix is an enterprise grade PaaS platform based on CloudFoundry.
Thank You!

Yes madam, software as a service does mean you won’t need to install software on your computer - but no, it won’t make your laptop any lighter.
About the presenter ...

Gerd Breiter IBM Software Group Division, IBM Germany Research and Development, P.O. Box 1380, 71003 Boeblingen, Germany (GBREITER@de.ibm.com).

Mr. Breiter is an IBM Distinguished Engineer working in the IBM Research and Development Laboratory in Boeblingen, Germany. As the Cloud and Smarter Infrastructure Chief Architect for Cloud Computing he is one of the key technicians defining IBM's Cloud Computing Architecture and Strategy. With more than ten years of experience in Utility-, On Demand- and Cloud Computing Mr. Breiter is one of the key experts within the industry in this new compute paradigm.

He is co-leading the definition of the Cloud Computing Reference Architecture (CC RA) which serves as the architectural underpinning for all the IBM private and public Cloud engagements. Another of his recent focus areas is the architecture for the buildout of Hybrid Clouds and the Software Defined Environment.

His research has led to more than 30 patents, recognition as an IBM Master Inventor and election into the IBM Academy of Technology.
Backup
Cloud Orchestration in a Software Defined Environment
High level architecture
IBM Cloud Orchestrator

IBM Cloud Orchestrator

Self Service
Offering Catalog

Modeling and Admin

ICCT Image Creation

Image Library

Composite Patterns Management

Hypervisor Management
OpenStack Gateway

OpenStack

Hybrid Extension

Content packages

Automation Engine
BPM Process Server

Automation Modeling UI
IBM Business Process Manager (BPM)

API

Content packages

Licence Mgmt
Service Desk
SW Install & Patch
Accounting
Cost Mgmt
Network FW/LB
Storage File-based

Amazon EC2
VMware vCenter
SoftLayer
KVM
HyperV
ESX
XEN

Openstack Cinder driver for Block Storage

*) supported in following releases

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A typical scenario: create a new cloud service to deploy and manage SAP

Step 1: Cloud Admin: Import or define the structural model of the Cloud Service
Step 1 cont.: Cloud Admin: Import or define the process model of the Cloud Service

- Access to rich libraries (toolkits) of reusable automation assets that enable to speed automation creation.
- Palette of library assets enable easy workflow composition through drag and drop.
- Tooling to edit, version, debug, optimize workflows.
- Graphical editor for composing and connecting workflows.
- Actions types, flow control, data handling primitives that simplify creation of complex automations.
- Easy workflow action editing for managing: data mapping, error recovery options, implementation details, etc.
Step 2: Cloud Admin: Publish service in the catalogue

- **My Favorites**: The service offerings which you marked with the label favorites.
- **Network Services**: These service offerings allow you to manage network services.
- **Storage and Backup Services**: These service offerings allow you to manage storage and backup services.
- **Customer Onboarding Services**: These service offerings allow you to manage customer onboarding services.
- **Development and Test Services**: These service offerings allow you to define new development and test services.
- **SAP Applications**: These service offerings allow you to use applications on SAP.
- **Database Servers**: These service offerings allow you to add additional database in an existing environment.
- **Software Installation**: These service offerings allow you to install software on a server.
Step 3 – End User: Request the service –
Fully automated, standardized, with a simple and intuitive interface
A practical example:
Managing SaaS Environments on IBM Softlayer with IBM Cloud Orchestrator, Novatec AutomalIT and Service Engage
B2B SaaS use case and the solution to it

Solution for as-a-Service delivery

Government Agency

Additional Information from Enterprise Applications

Operations

Mobile and smart devices

Performance Insight

Scalability

TOSCA
Bringing IT together

**automait does**

- Advanced configuration for a **large set** of application and middleware components on **many OSes**
- Instance visualization and management
- Update handling for deployed components

**automait does not**

- Deploy and manage **cloud infrastructure**
- Overall orchestration and integration with existing enterprise environments
Bringing IT together

- Does not focus on deployment details for software components, **but**
- Provides a **framework** for plugging in orchestration content using different technologies
- **Overall orchestration** across software and infrastructure

**IBM Smart Cloud Orchestrator**

- **Deploy** and manage cloud infrastructure
- Support for **various** infrastructure **components** and **platforms**
- Support for **on prem** and **hybrid cloud** deployments
Bringing IT together

IBM SmartCloud Orchestrator + automalt = end-to-end orchestration

Network

Firewall

GlassFish

Java

mongoDB

PostgreSQL

Server

Server

Storage

Pulse 2014 - The Premier Cloud Conference
Basic deployment of „sprIT“ aaS

Reproducible deployment of complete SaaS stacks within minutes

Deploy pattern

Use application
Gaining application performance insight

Performance Dashboard

Application Performance Management

Your Software-as-a-Service
Gaining application performance insight ... in 3 steps

1. Request Application Performance Management as-a-Service (APMaaS) instance and download agents
2. Add monitoring definitions to workload pattern
3. Inspect deployment in application dashboard