Use Cases for IBM Cloud Services

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IBM Cloud
Definition of Cloud

- Cloud Computing: Paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand.

- NOTE. Examples of resources include servers, operating systems, networks, software, applications, and storage equipment.

ISO/IEC 17788:2014
Cloud is a business model, not another technology

5 characteristics (A), 3 capabilities (B), and 4 deployment models (C)

<table>
<thead>
<tr>
<th>A</th>
<th>IT Services Catalog / Self-service</th>
<th>Global network access from any device</th>
<th>Instant elasticity</th>
<th>Chargeback</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Common IT-resources pool</td>
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<tr>
<td>B</td>
<td>SaaS</td>
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<tr>
<td></td>
<td>• Software as a Service</td>
<td>• Platform as a Service</td>
<td>• Infrastructure as a Service</td>
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<tr>
<td></td>
<td>• «Rent IT»</td>
<td>• «Develop IT»</td>
<td>• «Run IT»</td>
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<tr>
<td>C</td>
<td>Private Cloud</td>
<td>Community Cloud</td>
<td>Hybrid Cloud</td>
<td>Public Cloud</td>
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</table>

Source: NIST, ISO
Cloud computing benefits far beyond cost cutting

Flexibility  Time to Market  Strategic Value
Digital Businesses Innovate 6x Faster Than Their Peers

1/3 of the top 20 companies in every industry will be disrupted in 3 years

80% of enterprise IT organizations will commit to hybrid cloud architectures by 2017

85% of hybrid leaders report that hybrid cloud is accelerating digital transformation in their organization
Disruptor

Survivor
IBM Cloud architecture engineered for disruption

<table>
<thead>
<tr>
<th>Applications, solutions and services</th>
<th>Watson Oncology</th>
<th>Watson Cyber Security</th>
<th>Weather</th>
<th>IBM Services &amp; Ind. Solutions</th>
<th>Watson Virtual Agent</th>
<th>Watson Explore and Discover</th>
<th>IBM Risk and Compliance</th>
<th>Asset Mgmt. (Maximo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>Conversation API</td>
<td>Discovery API</td>
<td>Compare and Comply API</td>
<td>DLaaS API</td>
<td>Tone Analyzer API</td>
<td>Personal Insight API</td>
<td>Visual Recognition API</td>
<td>Speech API</td>
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<tr>
<td>Data</td>
<td>Ingestion</td>
<td>Storage</td>
<td>Analytics</td>
<td>Deployment</td>
<td>Governance</td>
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<tr>
<td>Cloud Infrastructure</td>
<td>Cloud Integration</td>
<td>Cognitive Micro-services</td>
<td>DevOps Tooling</td>
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<tr>
<td>A highly scalable, security enabled infrastructure</td>
<td>Networking</td>
<td>Security</td>
<td>Core Infrastructure</td>
<td>Cognitive Systems</td>
<td>Virtual Servers</td>
<td>Object Storage</td>
<td>File Storage</td>
<td></td>
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</tbody>
</table>
IBM Cloud architecture engineered for disruption

Applications, solutions and services
Targeted solutions for enterprise businesses

Watson & SaaS

Public

IBM Hybrid Cloud

Private

Bluemix IaaS & PaaS

AI
Cognitive building blocks for developers

Data
Tools to prepare data for cognitive

Cloud Infrastructure
A highly scalable, security enabled infrastructure

Networking
Security
Core Enterprise Infrastructure
Cognitive Systems
Virtual Servers
Object Storage
File Storage

DevOps Tooling
Get the performance, control and speed you need with more compute options

- **Bare Metal**: Maximum performance and control
- **Virtual Server or VMware**: Leverage existing languages and tools
- **Containers**: Maximum portability
- **Cloud Foundry**: Open PaaS environment
- **OpenWhisk**: Maximum speed with serviceless apps

**IBM Bare Metal Servers = 2,5x Faster than AWS**

“For Second Year in a Row, Cloud Benchmark Reveals IBM Bluemix Infrastructure (formerly Softlayer) Nearly Three Times Faster than Amazon Web Services” – VoltDB, Jan 2016
IBM Cloud Services: Selected Solutions and Use Cases

**Private Clouds**
- Run your Private workloads on-premise and/or on IBM Cloud

**High availability and disaster recovery**
- Protect your applications and production workloads

**Devops and Devtest**
- Create and test apps with speed and quality

**High Performance Computing**
- Speed-up and optimize your HPC workloads

From Local to Global  Hybrid Enterprise
IBM Cloud for Private Clouds
Delivery Models

IBM Cloud can meet all customer needs from a private cloud deployment perspective.

<table>
<thead>
<tr>
<th>Delivery Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>Public Cloud</td>
<td>Shared public cloud services managed by IBM, hosted in an IBM data center</td>
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<tr>
<td>IBM Managed</td>
<td></td>
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<tr>
<td><strong>Dedicated HW or Private Cloud</strong></td>
<td>Dedicated infrastructure managed by IT, hosted in an IBM data center</td>
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<tr>
<td><strong>Self Managed</strong></td>
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<tr>
<td><strong>Local Private Cloud</strong></td>
<td>Private cloud services managed by IBM, hosted in a client data center</td>
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<tr>
<td>IBM Managed</td>
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</tr>
<tr>
<td><strong>Local Private Cloud</strong></td>
<td>Private cloud services managed by IBM/IT and hosted in a client data center</td>
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<td>IBM Managed</td>
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<td><strong>Local HW or Private Cloud</strong></td>
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<td><strong>Self Managed</strong></td>
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IBM Data Center

Off-Premises Cloud

On-Premises Cloud
IBM Cloud for Private Clouds

**USE CASE #1**

On-premise in client’s DC (Private and Hybrid)
- Bluemix Private Cloud (Bluebox)
- Bluemix Local System with PureApplication
- PureApplication Service
- IBM Cloud Orchestrator (ICO) / Gravitant

**USE CASE #2**

Off-premise on IBM Cloud (Private and Hybrid)
- Bluemix Private Cloud (Bluebox)
- VMware for IBM Cloud
- Aspera
IBM Bluemix Infrastructure (Softlayer): Total Access, Control and Transparency

- Over 46 global cloud centers
- Open, secure, and scalable
- Secure, high-speed network
- Expert services and tools
- Secure integration to on-premises
A Hybrid Cloud Deployment Model

On-Premise Primary DC
- Any Application
- Any x86
- Any Storage
- Any IP network

On-Premise Secondary DC
- Any Application
- Any x86
- Any Storage
- Any IP network

IBM Cloud Softlayer - London
- Any Application
- Any x86
- Any Storage
- Any IP network

IBM Cloud Softlayer - Paris
- Any Application
- Any x86
- Any Storage
- Any IP network

SDDC Platform
VMware Virtualization

Bluemix Infrastructure
Move VMware-based workloads from On-Premises and across IBM Cloud Data Centers

- High Availability w/ VMOTION
- Replication
- Backup/Recover
- Failover/Failback
- Secure Dedicated Link
- SL Private Network
Deployment options for IBM PureApplication

IBM PureApplication is a hybrid cloud application platform for deploying applications and middleware quickly and repeatedly, with enterprise-grade services.
IBM And VMware Deepen Hybrid Cloud Partnership For Customers Like Marriott

IBM and VMware's hybrid story appeals to Marriott in part because of the company's transition to a mostly cloud, but never fully cloud, structure, the company says.

IBM Cloud for high availability and disaster recovery (DR)
Data protection and disaster recovery (DR)

#1 and #2 purposes driving use of cloud infrastructure.

Data loss is costing clients **$1.7 trillion per year**.

Only **6%** had protection plans in place.

- ESG and IDC studies
IBM Cloud for Data Protection and Disaster Recovery (DR)

**USE CASE #1**
IBM Cloud Object Storage as alternative to tapes and VTLs

Bluemix IaaS (Softlayer)
IBM Spectrum Protect
IBM Cloud Object Storage

**USE CASE #2**
Cloud backup for backups

Bluemix IaaS (Softlayer)
IBM Spectrum Protect
IBM Cloud Object Storage

**USE CASE #3**
Real time replication between bare metal and virtualized workloads

Bluemix IaaS (Softlayer)
IBM Spectrum Virtualize

**USE CASE #4**
DR for VMware environments

Bluemix IaaS (Softlayer)
IBM Cloud for VMware
Zerto on IBM Cloud
DevOps on IBM Cloud
Leverage Cloud for Dev Test

Customers building new capabilities for digital disruption, must develop, test and deploy applications at the speed of Cloud and at Enterprise scale.
DevOps means results

- Bluemix cut implementation time by 95%
- Reduced system downtime by 70%
- Improved code quality by 50%
- Time required for software releases down by 99%
- Reduced system integration testing time from 3 weeks to 4 hours
**USE CASE #1**

Automate cloud infrastructure provisioning of production-like environments for DevTest

- UrbanCode Deploy
- ICO/CAM
- Bluemix Local System with PureApplication
- Bluemix IaaS and PaaS

**USE CASE #2**

Automate test execution (functional, integration, performance, security) for improving test outcomes and application quality

- Rational Test Workbench
- Rational Test Virtualization Server
- Rational Performance Tester Server
- Rational Performance Tester on Cloud
- Security Tester
USE CASE #3

Provide fully automated application delivery pipeline, at enterprise scale

UrbanCode Deploy
UrbanCode Build
UrbanCode Release
Bluemix Continuous Delivery
Github hosted on Bluemix
Open toolchains

USE CASE #4

To grow and shrink out Devtest resource base quickly based on demand

IBM Cloud for Skytap Solutions (ICSS)
VMware
Bluemix PaaS
Bluemix IaaS (Softlayer)
IBM Containers / DDC
Cloud hosted test environments

IBM Cloud for Skytap Solutions
- Extensive tools for dev-test workloads
- Clone existing complex environments
- Reset to known state for testing / QA
- Scale up/down quickly for cost saving
- Not intended for production running

IBM Bluemix
- IBM Cloud scale for IaaS and PaaS
- Automation, security, networking
- Integrated DevOps for Cloud native and multispeed applications.

VMware on IBM Cloud
- Extend existing VMware vSphere/NSX to IBM Cloud
- Automation, security, networking and DR capabilities
- BYO testing tools or leverage IBM
High Performance Computing on IBM Cloud
HPC is in Our Everyday Lives

HPC is a critical element of product development, research, discovery and breakthrough science.
<table>
<thead>
<tr>
<th>Industry</th>
<th>Business Function</th>
<th>HPC Applications (Use Cases)</th>
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</thead>
</table>
| Financial Services             | • Risk Analysis                                         | • Risk Analytics  
• Actuarial Asset and Liability Management    | • Monte Carlo and PDE Simulation  
• Real time options pricing                       |
| Electronics, Auto, Industrial  | • Design Verification                                   | • Logical and Physical Verification                                                         |
|                                 | • Electronic Design Automation (EDA)                     |                                                                                             |
| Auto & Aerospace               | • Vehicle Design and Simulation                         | • Computational Fluid Dynamics (CFD)  
• Structural Dynamics  
• Crash & Non-Linear Structural Dynamics          |
| Energy/Oil & Gas               | • Oil and gas field discovery                            | • Seismic Processing  
• Reservoir Simulation and Modeling  
• Reverse Time Migration                         |
| Life Sciences                  | • Genomic Sequencing                                    | • Genomic Sequencing  
• Molecular Dynamics and Drug Research           |
| Public/Higher Ed & Research/Government | • Research & Discovery  
• Prediction                                             | • Climate Modeling & Weather Forecasting                                                   |
# IBM Cloud for HPC

<table>
<thead>
<tr>
<th>HPC Cloud</th>
<th>IBM High Performance Services</th>
<th>IBM Systems HPC CloudOps</th>
<th>IBM Systems HPC Software</th>
<th>IBM Cloud SoftLayer Infrastructure</th>
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<tbody>
<tr>
<td></td>
<td>Managed Services &amp; Support</td>
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<tr>
<td></td>
<td>IBM <strong>Spectrum LSF</strong> &amp; IBM <strong>Spectrum Symphony</strong></td>
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<td></td>
<td>IBM <strong>Spectrum Scale</strong></td>
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<tr>
<td>Softlayer</td>
<td><strong>Network</strong> – 1GB, 10GB, Aspera</td>
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<td></td>
<td><strong>Servers</strong> – Bare Metal &amp; Virtual + GPU</td>
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<td><strong>Storage</strong> – File &amp; Object</td>
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IBM Bluemix Infrastructure (Softlayer)

Enterprise: Test & Dev, NPD, M&As, HPC

Gaming, Entertainment, Social Media, Mobile Developers and ISVs:
1) Growing from CEE to WW
2) Need single Cloud provider WW
3) Starving for performance

Softlayer bare metal shows the best performance


PS: Softlayer VMs were half less of vCPU vs AWS, Azure and Google with just 25% less thruput and bare metal is x2,5 better than AWS
Halliburton HPC Cloud Use Case
Substantially reduces time to understand effects of decisions in oil & gas fields

Needs

• Halliburton requires large capacity compute clusters to run large seismic processing and complex reservoir modelling workloads.
• Different Business Units (BU) and Product Service Lines (PSL) need different cluster profiles to suit their needs, such as low latency networks, fast CPUs, large memory footprints or massive storage.
• Halliburton wants to:
  • Create a unified approach to providing HPC services to 13 PSLs / BUs with unique HPC requirements for each
  • Standardize and move away from ad hoc purchasing from a variety of vendors.
  • Allow PSLs / BUs to focus on science and engineering by removing the burden of implementing and managing specialized HPC resources.

Solution & Benefits

• HPC resources are accessed as needed - Fully functional and ready-to-use high performance compute (HPC) clusters are provisioned as needed and built to the unique specifications of each PSL / BU and workload.
• A dedicated IBM Cloud Operations team builds and configures Clusters using IBM Platform LSF workload management on Softlayer cloud infrastructure.
• Dedicated bare-metal machines are used to deliver the performance expected by the clients.
• As needed the latest technologies are used deliver the expected performance, capacity and response times, such as, InfiniBand, GPUs, SSDs, and Spectrum Scale (GPFS).
• Clusters are scaled up, scaled down and de-commissioned as dictated by the workload and the client.
• The client switches from a CapEx to OpEx expense model

• PR Newswire - Halliburton Turns to IBM Cloud to Help Evaluate Development Decisions for Oil and Gas Fields https://ibm.biz/Bd4KUj
• TheStreet - Halliburton Moves to IBM’s Cloud to Streamline Some Operations https://ibm.biz/Bd4KUq
Halliburton HPC Cloud Solution
Ready-to-use Platform LSF clusters in the SoftLayer cloud

Pay-per-use access to application-ready clusters in the SoftLayer cloud

Maximum Security - Dedicated single-tenant clusters deployed for each Product Service Line

Maximum Performance - IBM Platform LSF, bare-metal servers and InfiniBand

- PR Newswire - Halliburton Turns to IBM Cloud to Help Evaluate Development Decisions for Oil and Gas Fields [https://ibm.biz/Bd4KUj](https://ibm.biz/Bd4KUj)
- TheStreet - Halliburton Moves to IBM's Cloud to Streamline Some Operations [https://ibm.biz/Bd4KUq](https://ibm.biz/Bd4KUq)
Summary
# Other Solution areas addressed by IBM Cloud

<table>
<thead>
<tr>
<th>Entry Points</th>
<th>Solution Patterns</th>
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<tbody>
<tr>
<td><strong>Create</strong></td>
<td>New customer value through innovation in applications, services, and processes</td>
</tr>
<tr>
<td><strong>Connect</strong></td>
<td>People, applications, data, things and services in new ways to enable innovation</td>
</tr>
<tr>
<td><strong>Optimize</strong></td>
<td>Any application, data or service for cloud agility and economics</td>
</tr>
<tr>
<td><strong>Manage</strong></td>
<td>Secure and govern your processes and services wherever they run</td>
</tr>
</tbody>
</table>
Conclusions & Next Steps

- IBM Cloud architecture engineered for disruption
- **Ranked** #1 Hybrid Cloud Provider by Synergy Research
- Dozens cloud & cognitive solutions and patterns for the critical enterprise tasks

Any questions?

Ask Ievgen Pasichniuk (Cloud Leader IBM Ukraine):
i.pasichniuk@ua.ibm.com
Backup slides