

Codename: BlueMix
200 BlueMix Days

200 BlueMix Days – Technical Training

Harald Uebele
IBM Innovation Center, Ehningen
IBM Ecosystem Development
uebele@de.ibm.com



Agenda

1. Lesson 1: BlueMix Overview & Dashboard
2. **Lab A:** BlueMix – Build and Deploy a Simple Application
3. Lesson 2: BlueMix Architecture
4. Lesson 3: BlueMix DevOps Services Overview
5. **Lab B:** Node.js with BlueMix DevOps Services and BlueMix
6. Lesson 4: Registering Services in BlueMix
7. Lesson 5: Cloud Foundry
8. **Lab C:** Build a Twitter Influencer Application in BlueMix
9. **Lab D:** Build an Application with Mobile Backend as a Service (MBaaS) in BlueMix
10. Lesson 6: Maximize BlueMix

Course prerequisites

Before taking this course students should have a familiarity with:

- Cloud computing fundamentals
- Platform as a Service (PaaS) fundamentals
- Knowledge of cloud-based services
- Building web applications (HTML, CSS, JavaScript, Java, etc)
- Source Code Management and Deployment
- IDE (Integrated Development Environment)
- User IDs as requested in invite (BlueMix, BlueMix DevOps)
- and
- An open attitude towards learning

Overall course objectives

Upon completion of this course, you should be able to:

- Describe basic BlueMix information, such as BlueMix Architecture, Application Runtimes, and Services
- Articulate Cloud Foundry Architecture
- Understand BlueMix terminology
- Compare BlueMix to international, national, and regional competitors

Having completed the labs, you will have:

- Navigated around the BlueMix environment
- Navigated around the BlueMix DevOps Services environment
- Developed and deployed a BlueMix Application using BlueMix DevOps Services
- Developed and deployed a mobile application on BlueMix

Introductions



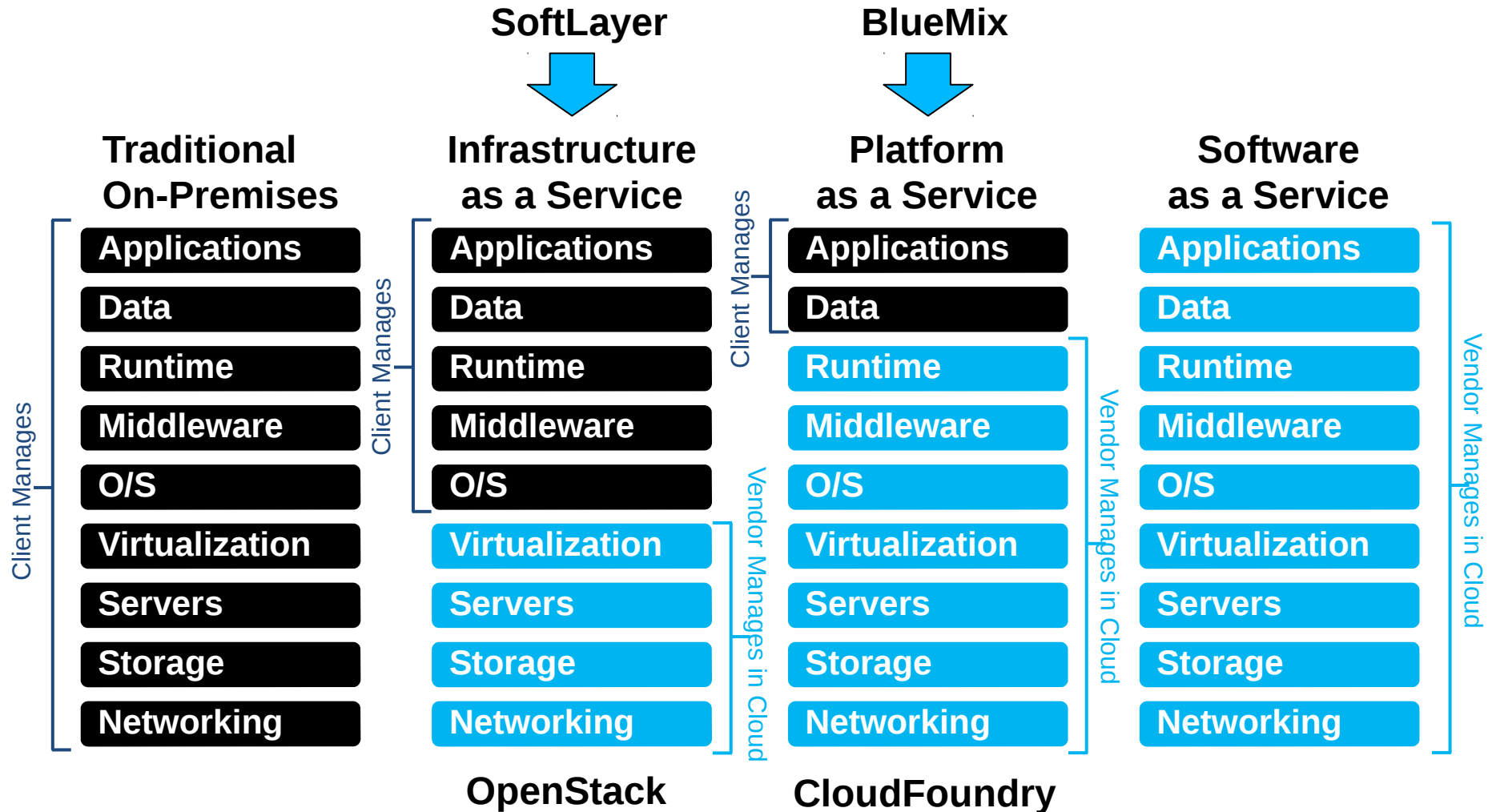
1. Name
2. Company
3. Job role
4. Current experience with cloud
5. Expectations of this course

Lesson 1:

BlueMix Overview & UI Dashboard



Cloud Service Models



Customization; higher costs; slower time to value

Standardization; lower costs; faster time to value

SoftLayer's Infrastructure changes the definition of cloud

Competitive Cloud Mandates

...all resources are virtualized.

...all resources are shared, at every granular level.

Think Differently

With SoftLayer, neither is mandated, opening up cloud computing to new applications and use cases

... virtualization is a choice with a flexible set of options.

... resources can be shared, dedicated, or mixed.



SoftLayer IaaS – More than virtual machines

- Virtual Machines
 - Public (Shared Hardware)
 - Private (Dedicated Hardware)
- Bare Metal (Physical) Machines
 - Built to specification
 - Standard Builds
- Private Cloud
 - Dedicated hardware
 - Customer Managed Hypervisor
- Networking
 - Firewalls
 - VPNs
 - Routers
 - Load Balancers
- Storage
 - Local
 - Network-Attached Storage
 - iSCSI Storage Area Network
 - Dedicated iSCSI
 - Build-Your-Own
 - ObjectStorage (OpenStack)



Evolution of BlueMix

Business Problems

- “I am losing talented developers because they don’t have access to the tools they want to use”
- “It’s not that my developers lack the skills to manage infrastructure, it’s that I don’t want them to. I need them writing code for the business”
- “I am nervous we are spending time and money integrating things that should naturally fit together”
- “My average developer has 250 open change requests from the business. That is a lot of business value we need to deliver”
- “I am not confident that the platform is secure as I integrate into existing systems”



Evolution of BlueMix (continued)

Developer Problems

- Spending time installing middleware keeps me from coding
- Sifting through pages of docs diminishes desire to use a new technology.
- Accessing data between different apps often requires writing custom data layers and routines to share, sync, and manage data.
- Creating API integrations is difficult when working with on-premise data.
- Setting up a productive development for a developer



Evolution of BlueMix (continued)

- **Inefficiency and delay** in managing the application development process in disparate, heterogeneous environments
- **Limited adaptability** in managing disparate infrastructures to handle multiple application developments across the lifecycle
- **Lack of predictability and scaling** for the future, when transitioning from individual development environments to QA and production



BlueMix Value to Developers

- <2 Mins: from idea to search to coding via Integrated developer tools.
[E.g. Polling app in 2 mins](#)
- Everything you need to write modern mobile apps are pre-integrated and preconfigured
- Self service to start, scale and make money!

**Simplicity &
Speed**

- BlueMix Framework and Services are built based on Open standard
- Use what you already use: MongoDB, NodeJS
- Need something more, find it in Marketplace!

**Open &
Flexible**

- Best in class security, support and reliability, loved by Fortune 500 companies.
- Reuse your existing business services to create new composable apps integrating with what you already have.

**Brand trust
&
integration**



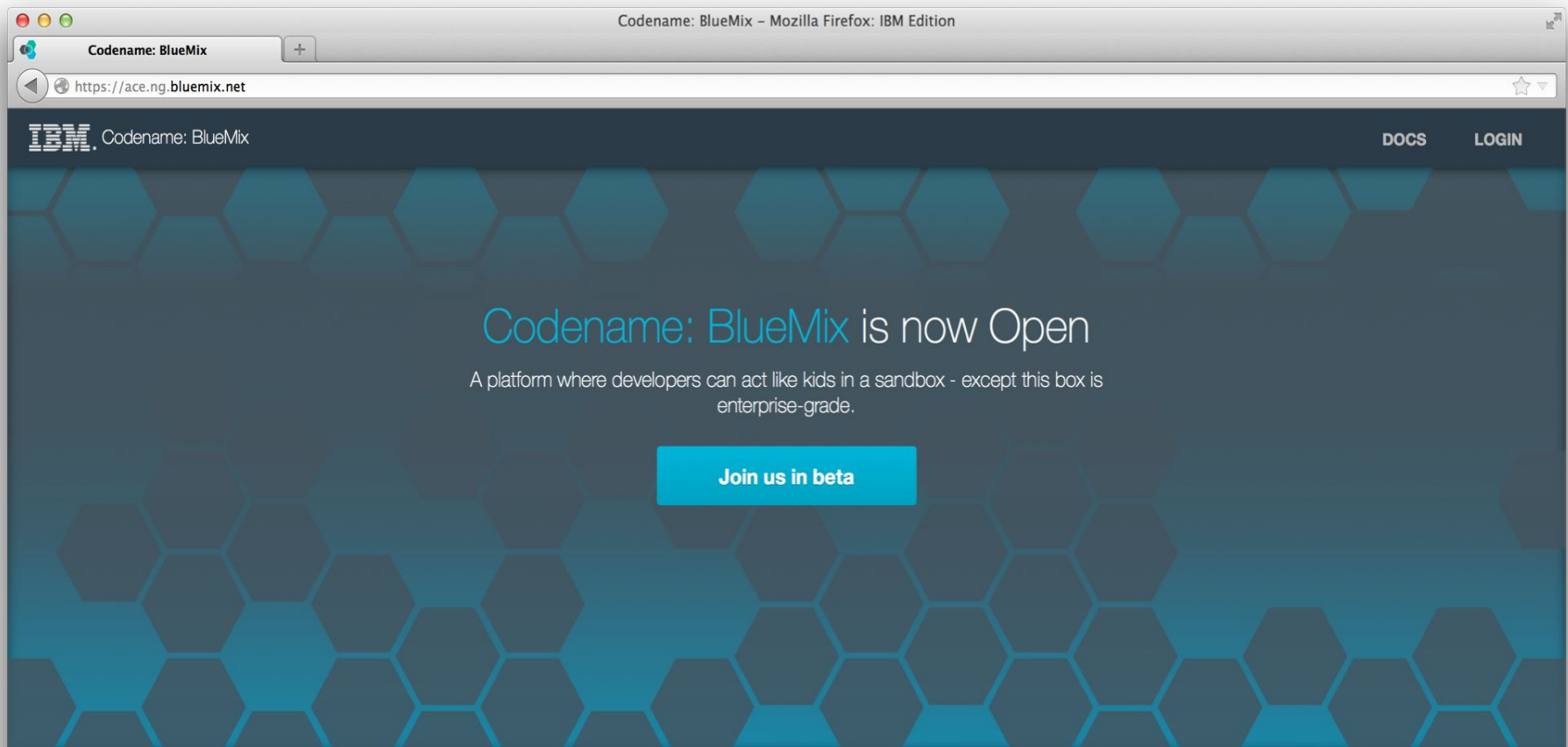
Why BlueMix?

- **Speed** – Time-to-Value
 - A. Fast—increase velocity of IT service contribution to business from application development to infrastructure deployment and monitoring
 - B. Improved—deploy high value-generating applications quickly instead of spending excessive time in scripting and debugging
- **Agility** – Operational Efficiency
 - A. Adaptable—scale environments elastically based on business demand
 - B. Extensible—embrace and transform legacy environments to a platform approach
- **Predictability** – Reduced Risk and Cost
 - A. Improve application performance and availability
 - B. De-risk and separate concerns of application development and operations

Why BlueMix? (Cont'd)

- BlueMix is a composable environment built on open standards
- BlueMix is an open, integrated and flexible cloud-centric platform
- BlueMix changes the way developers work - Move quickly, see results fast.
- BlueMix leverages API's and SDK's that can quickly and easily be incorporated with the latest technology
- BlueMix Supports fit-for-purpose programming models (polyglot) and services.
- BlueMix Embeds manageability of services and applications.
- BlueMix Provides optimized and elastic workloads.
- BlueMix Enable continuous availability.






The future is yours.

If you're a developer, you will now have a hand in creating the future. Codename: BlueMix offers you all the instant services, runtimes, and infrastructure you need to push your ideas into the present.

BlueMix Login



Industries & solutions

Services

Products

Support & downloads

My IBM

United States

Welcome [IBM Sign in]

Search

SIGN IN

Please enter your IBM login credentials

IBM ID:


PASSWORD:

SIGN IN

Don't have an IBM ID? [Register](#)

[Manage your IBM ID accounts](#)

[Forgot your password?](#)



Codename: Bluemix

Print

Facebook

Twitter

LinkedIn

YouTube

Google Plus

Contact

Privacy

Terms of use

Accessibility

Cookie Preferences

BlueMix UI Dashboard

Main menu

IBM Codename Bluemix **Dashboard**

DASHBOARD

CATALOG

DOCS

Citibank Personal ▾



Jane Smith
Logout

Space A ▾

○ ALL (0) ▶

📦 APPS (0) ▾

⚙️ SERVICES (0) ▾



Applications

Looks like you don't have any apps yet.
Click below to start creating!



Create an application

Services

Looks like you don't have any services yet.
Click below to start creating!



Create a service

Getting Started Guide ✕

Welcome to IBM Codename Bluemix!

To get started, you can compose an application or add a service [from our catalog](#). To learn more, visit our [documentation](#).

[Browse Catalog ▶](#)

1:52 pm



Catalog - Delivering Composable Services for building an environment



Run Your Apps

The developer can choose any language runtime or bring their own. Just upload your code and go.

DevOps

Development, monitoring, deployment and logging tools allow the developer to run the entire application

APIs and Services

A catalog of open source, IBM and third party APIs services allow a developer to stitch together an application in minutes.

Cloud Integration

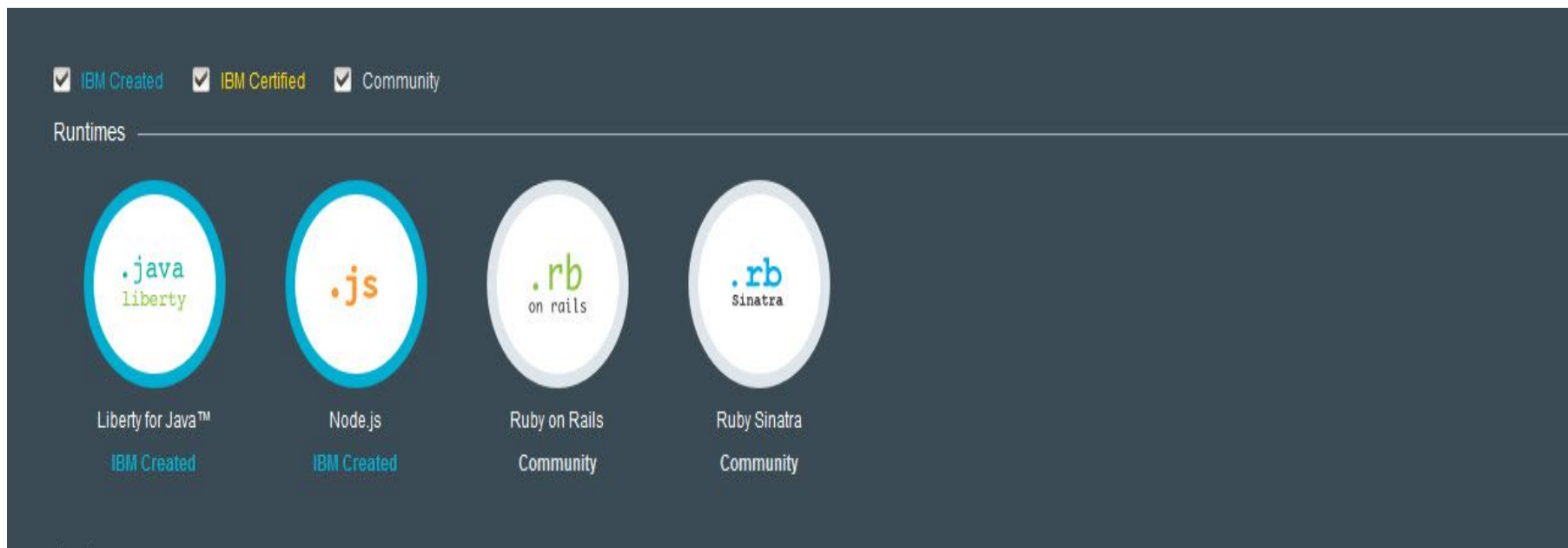
Build hybrid environments. Connect to on-premises systems of record plus other public and private clouds. Expose your own APIs to your developers.

Extend SaaS Apps

Drop in SaaS App SDKs and extend to new use cases (e.g., Mobile, Analytics, Web)

App Runtimes

Runtimes in the BlueMix represent different buildpacks that are provided. Each runtime is an application with a starter application code deployed, and a starter



Services

A service is a piece of code that BlueMix hosts. And the service offers a piece of functionality for applications to use. BlueMix provides a set of pre-defined services that you can use

Services



BLUAcceleration
IBM Created



Cloud Integration
IBM Created



Cloudant
IBM Created



CloudCode
IBM Created



DataCache
IBM Created



Decision
IBM Created



ElasticMQ
IBM Created



JazzHub DevOps
IBM Created



JSONDB
IBM Created



LogAnalysis
IBM Created



MAM
IBM Created



MapReduce
IBM Created



MobileData
IBM Created



MobileQualityAssurance
IBM Created



Push
IBM Created



SessionCache
IBM Created



SQLDB
IBM Created



SSO
IBM Created



Geocoding
IBM Certified



Reverse Geocoding
IBM Certified



Travel Boundary Service
IBM Certified



Twilio



Validate Address



mongodb



mysql



postgresql



rabbitmq



redis

Applications on your dashboard

The dashboard displays a list of applications on the left sidebar and a grid of application cards on the main area. The sidebar includes a dropdown menu for 'dev' and a list of applications: 'ALL (10)', 'APPS (4)', and 'SERVICES (6)'. The main area shows four application cards, each with a status indicator and a message: 'Your app is running great!'.

Left Sidebar:

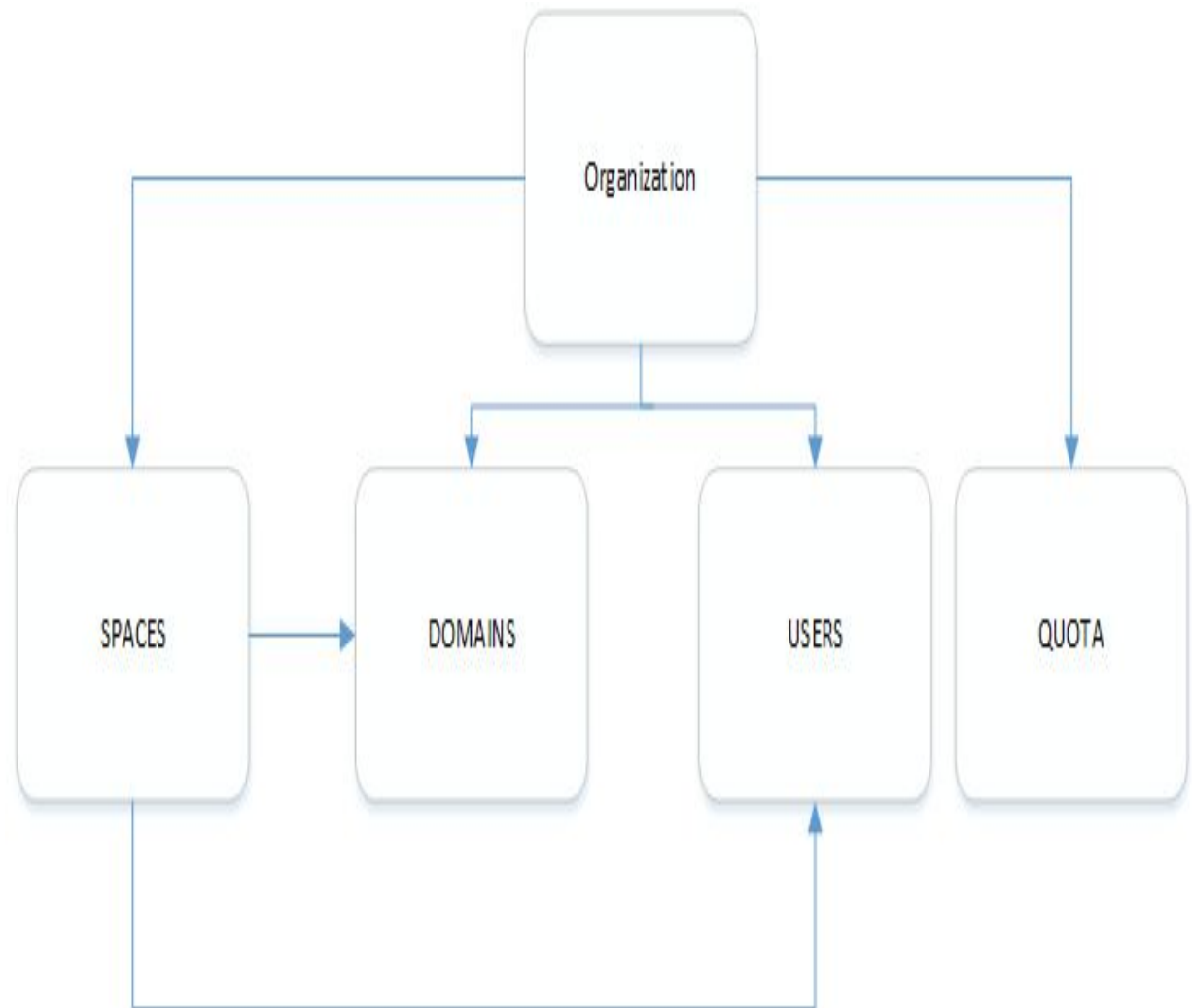
- dev
- ALL (10)
- APPS (4)
 - myupload-vellanki
 - SimpleSentimentAnalysis...
 - vellanki-mobileservices
 - vellanki1-twitter_influence...
- SERVICES (6)

Main Area:

- Top Row:**
 - MEMORY: 2.188GB / 8GB
 - STATUS: Green checkmark
 - SERVICES: 7 / 20
- Application Cards:**
 - vellanki1-twitter influenc...**
vellanki1-twitter_influence_analy...
Your app is running great!
 - SimpleSentimentAnalysis...**
SimpleSentimentAnalysis-349bd...
Your app is running great!
 - myupload-vellanki**
myupload-vellanki.nq.bluemix.net
Your app is running great!
 - vellanki-mobileservices**
cc-30e8f45d-8a0a-4f1f-9af8-57...
Your app is running great!

Organizations, Spaces , Users and Domains

- Organizations
- Users
- Domains
- Spaces
- Quota



Organizations

An organization is defined by the following items:

Spaces -

Spaces provide a mechanism to collect related applications, services, and the users that can collaborate on the resources. An organization can contain multiple spaces. All application and service creation within BlueMix must be associated with a space.

Users -

A user must be assigned to an organization to be granted permission to the spaces within the organization.

Domains -

Domains provide the route on the Internet that is allocated to the organization. A route has a sub-domain and a domain. A sub-domain is typically the application name. A domain might be a system domain, or a custom domain that is the personally registered for your application.

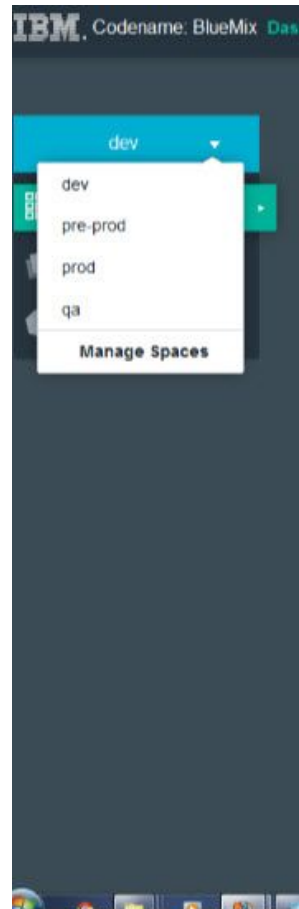


Quota -

Quota represents the resource limits for the organization. Quota defines the number of services and the amount of memory that can be allocated for use by the organization. Any application or service in a space of the organization contributes to the usage of the quota. The quota is assigned when organizations are created.



Spaces



Users

The screenshot shows the IBM BlueMix Users management interface. The top navigation bar includes the IBM logo, "Codename: BlueMix", "Organizations", and links to "DASHBOARD", "CATALOG", "DOCS", and the user profile "bala.vellanki@us...". The main header displays the user's email "bala.vellanki@us.ibm.com" and a "Last refresh: 10s" status. On the left, a sidebar lists the user's email and environment types: "dev", "pre-prod", "prod", and "qa". The main content area is titled "Organization: bala.vellanki@us.ibm.com" with a "Create a new space" button. Below this, there are tabs for "USERS", "DOMAINS", and "QUOTA". The "USERS" tab is active, showing an "ADD USER" button and a table of users. The table has columns for "USERNAME", "MANAGER", "BILLING MANAGER", and "AUDITOR". Two users are listed: "bala.vellanki@us.ibm..." and "bkvellanki@gmail.c...". The first user is the manager, and the second user is the billing manager and auditor. A "SAVE" button is at the bottom right.

IBM Codename: BlueMix Organizations DASHBOARD CATALOG DOCS bala.vellanki@us...

bala.vellanki@us.ibm.com

Last refresh: 10s

▼ bala.vellanki@us.ibm.com
dev
pre-prod
prod
qa

Organization: bala.vellanki@us.ibm.com Create a new space

USERS DOMAINS QUOTA

ADD USER

USERNAME	MANAGER	BILLING MANAGER	AUDITOR
bala.vellanki@us.ibm...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bkvellanki@gmail.c...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

SAVE RESET

Domains

bala.vellanki@us.ibm.com



Last refresh: 3m

▼ bala.vellanki@us.ibm.com

dev
pre-prod
prod
qa

Organization: bala.vellanki@us.ibm.com

Create a new space

USERS

DOMAINS

QUOTA

System Domain: ng.bluemix.net

ADD DOMAIN

CUSTOM DOMAINS

ACTIONS

parnterapps.blumix.net



partners.vellanki.net



Quota

bala.vellanki@us.ibm.com



Last refresh: 3m

▼ bala.vellanki@us.ibm.com

dev

pre-prod

prod

qa

Organization: bala.vellanki@us.ibm.com

Create a new space

USERS

DOMAINS

QUOTA

MEMORY:

SERVICES:

PLAN

PRICE

2.188GB / 8GB

7 / 20

free

Free



Buildpacks

A buildpack is a collection of scripts responsible for preparing your code for execution on the target PaaS. A buildpack can gather the framework and runtime dependencies of an application, and package them with the application into a droplet that can be deployed to the cloud.

-
- IBM created buildpacks in BlueMix
 - Liberty Built-in
 - Node.js Built-in
 -





Boilerplates

A boilerplate has an associated runtime and services, and is the container of one application with multiple services.



Boilerplates (cont'd)

The screenshot displays the IBM Cloud Boilerplates interface. A modal window for the 'NODE JS WEB STARTER' is open, showing its details. The background interface includes sections for 'Boilerplates', 'App Runtimes', and 'Services'.

Boilerplates

- NODE JS WEB STARTER
- JAVA Web Starter
- GROCERY LIST Sample App

App Runtimes

- Node JS +
- Java

Services

- ElasticClouding IBM Cloud
- Mobile Sync IBM Cloud

Bring Your Own

Modal Window: NODE JS WEB STARTER

This boilerplate is so great, you'll be the new Mark Zuckerberg in under 30 seconds or your money back. Yeah, that's what's up. Maybe you'd like to say some more about this boilerplate?

ADD BOILERPLATE

NodeJS [View full documentation](#)

- Map/Reduce**
Flexible aggregation and data processing. Scale horizontally without compromising functionality.
- Document-Oriented**
JSON-style documents with dynamic schemas offer simplicity and power also more description and stuff.
- Agile and Scalable**
Flexible aggregation and data processing. Store more files of any size without complicating your stack.
- Full Index Support**
Index on any attribute, just like you're used to. Mirror across LANs and WANs for scale and peace of mind.

Monitoring and Logs

OVERVIEW

RUNTIME

Files and Logs

MONGODB



Runtime

Resources

Instances:

1

Memory Quota (Instance):

512MB

SAVE

RESET

Memory Quota	Current	After
Total:	8.000GB	--
Other Apps:	1.687GB	--
This App:	512.0MB	512.0MB
Per Instance:	512.0MB	512.0MB
Instances:	1	1
Available:	5.812GB	5.812GB

Instance Details

1 of 1 instances running

Instance	State	CPU	Memory Usage	Disk Usage	Start Time
0	Running	1.0%	161.0MB / 512MB	264.1MB / ...	Mar 10, 2014, 2:49:06 PM



Monitoring and Logs

vellanki1-twitter_influence...

OVERVIEW

RUNTIME

Files and Logs

MONGODB



Runtime

Files and Logs

File: /logs/env.log Size: 1.3K

.bash_logout

.bashrc

.profile

▶ app

droplet.yaml

▼ logs

env.log

messages.log

staging_task.log

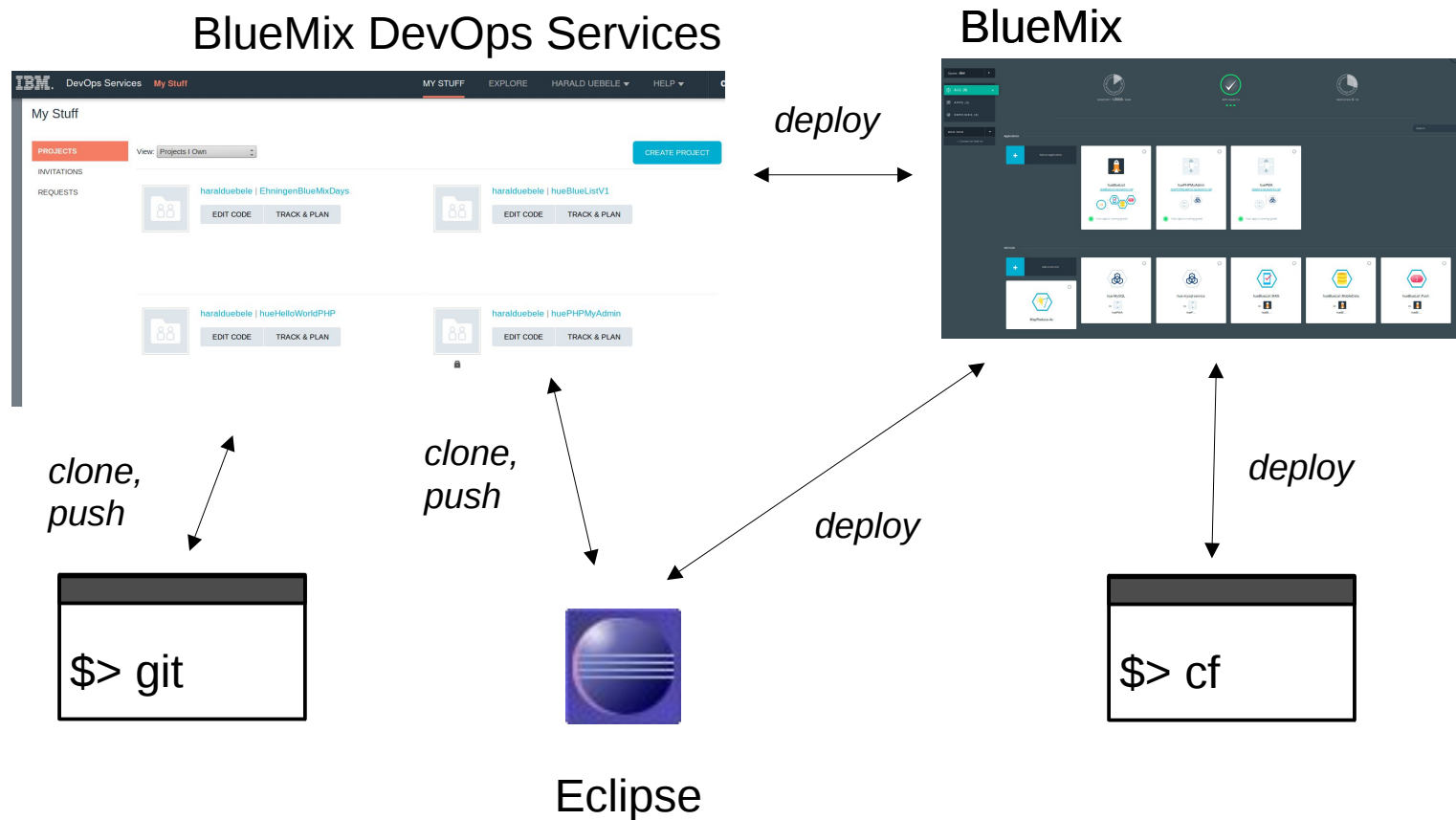
stderr.log

stdout.log

```
TMPDIR=/home/vcap/tmp
VCAP_APP_PORT=63679
USER=vcap
VCAP_APPLICATION={"instance_id":"3b8c586149fa425188c0d714a4dd1ee4","instance_
PATH=/bin:/usr/bin
PWD=/home/vcap
VCAP_SERVICES={"mongodb-2.2":[{"name":"mongodb-ksd4g","label":"mongodb-2.2",'
SHLV=1
HOME=/home/vcap/app
PORT=63679
VCAP_APP_HOST=0.0.0.0
DATABASE_URL=
MEMORY_LIMIT=512m
_=/usr/bin/env
```



Lab Introduction – Tools used



Setup of Lab Image (based on Win 7 64bit)

1. Oracle SUN JDK 7
2. Eclipse Kepler for J2EE
3. <http://www.eclipse.org/downloads/packages/eclipse-ide-java-ee-developers/keplersr2>
4. Add CloudFoundry Plug-In to Eclipse
5. <http://docs.gopivotal.com/pivotalcf/devguide/deploy-apps/sts.html>
6. Android Developer Tools (Download for other platforms, SDK Tools only)
7. <http://developer.android.com/sdk/index.html>
8. ADT Eclipse Plugin
9. <http://developer.android.com/sdk/installing/installing-adt.html>
10. CloudFoundry CL
11. <https://github.com/cloudfoundry/cli/releases>
12. git
13. <http://git-scm.com/downloads>



NEW: BlueMix for Eclipse Kepler Plugin (Beta)

- Extend your existing Eclipse or Rational WDT development environment
- Expose some of the unique features of the Liberty buildpack
 - Deploy a Liberty packaged server
- Support for deploying node.js applications
 - Target your JavaScript project
 - Deploy and run your server side JavaScript application in the Cloud
- Plug-In for Eclipse (Kepler)
- Instructions: <https://ibm.biz/BdRJ3X>



LAB A – Build an App using BlueMix



Lesson 2: BlueMix Architecture

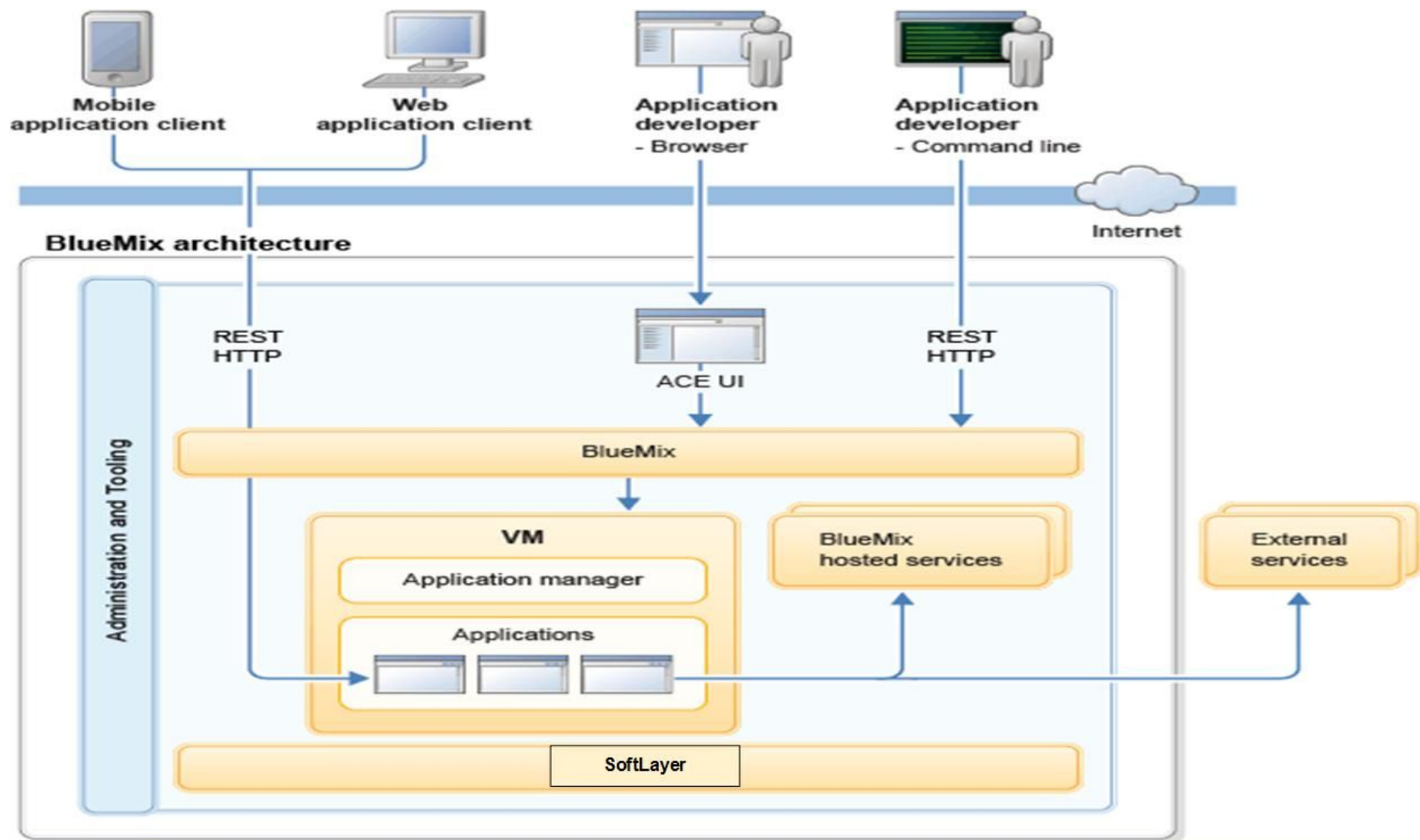


BlueMix Architecture

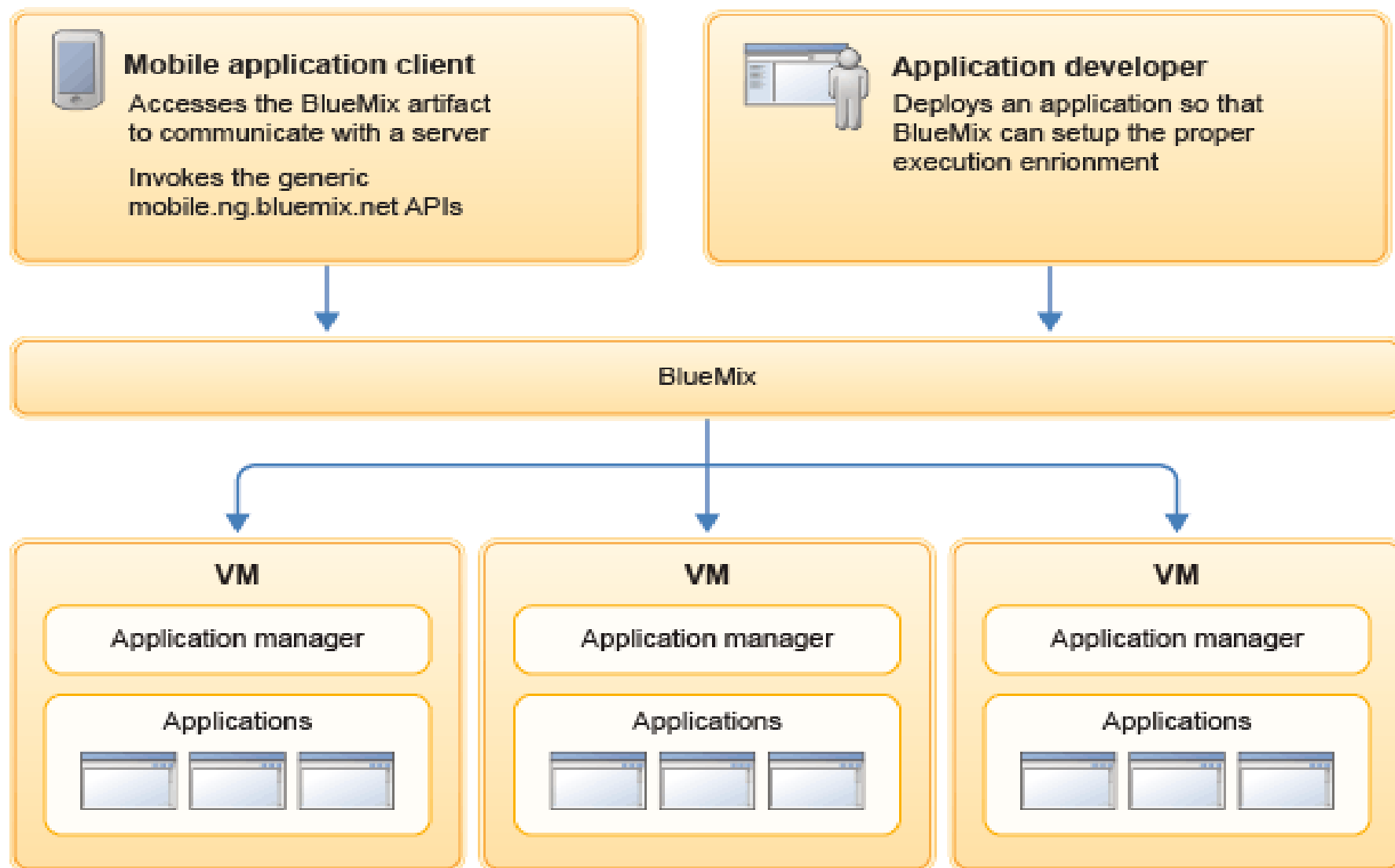
What is Blue Mix?

1. BlueMix is an implementation of IBM's Open Cloud Architecture, leveraging Cloud Foundry to enable developers to rapidly build, deploy, and manage their cloud applications, while tapping a growing ecosystem of available services and runtime frameworks.
2. IBM will provide services and runtimes into the ecosystem based on our extensive software portfolio.
3. For developers, this meant that we wanted a system that would significantly reduce the time needed to create the application, to provision it, allow for flexible capacity in terms of storage, but also bandwidth and processing power, and which would handle the back-end infrastructure needs without requiring the developer to spend their valuable time doing so.

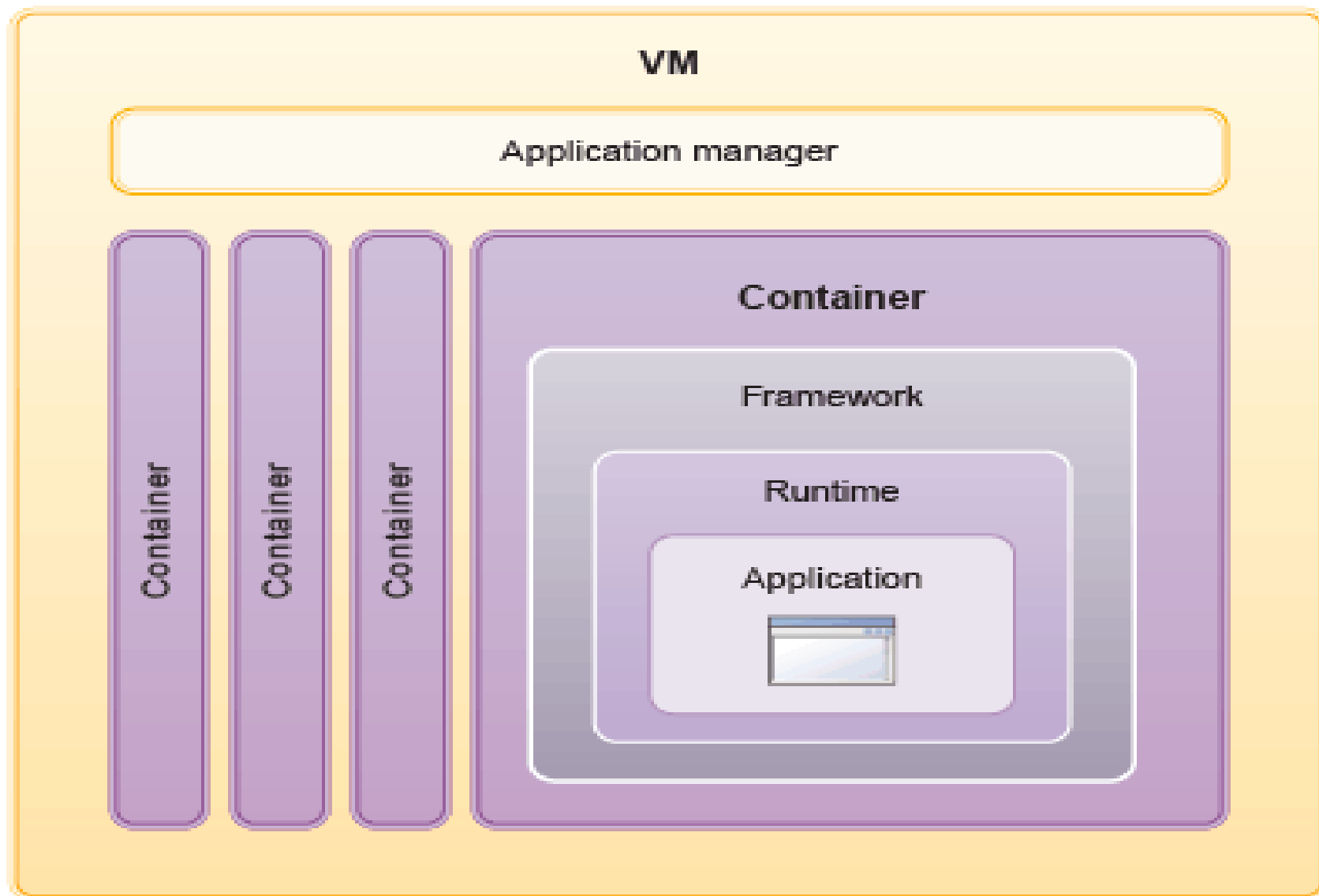
BlueMix Architecture – High Level



BlueMix Architecture – How it works



BlueMix Architecture – How it works (Cont'd)



Lesson 3:

DevOps Services

for BlueMix



What is DevOps Services for BlueMix?

DevOps Services for BlueMix is an end-to-end solution in the cloud providing an open, integrated rapid development experience that scales.



IBM BlueMix DevOps Services

An Open, Integrated Rapid Development Experience that Scales

1. A Premier DevOps Service for IBM Cloud Platform

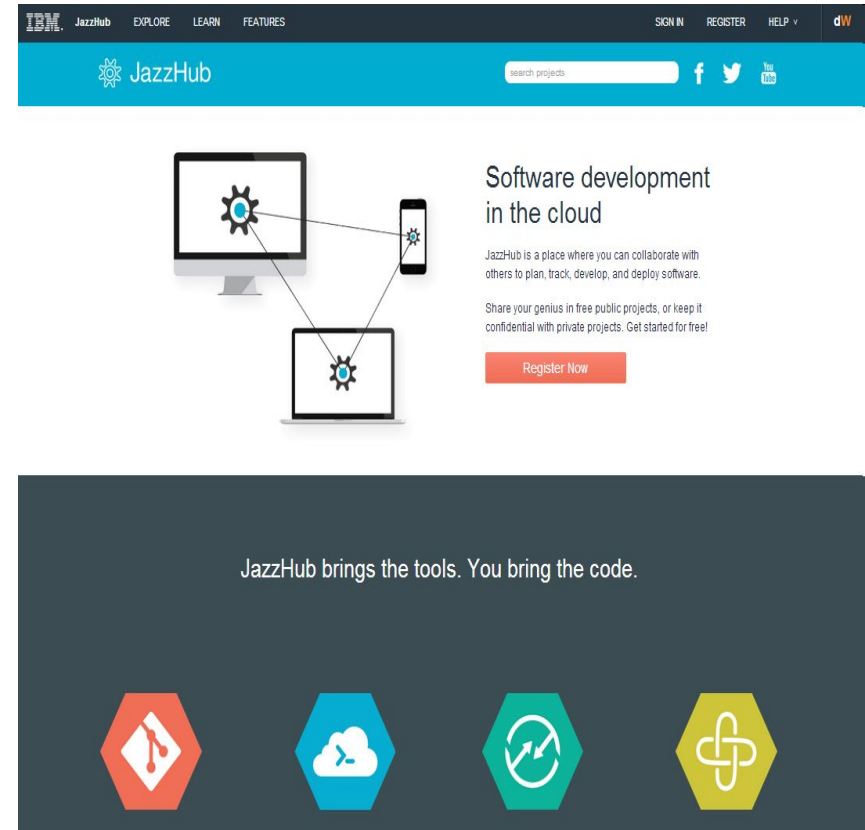
- A. Promotes incremental frictionless adoption of DevOps Services for BlueMix

2. An Integrated Developer Experience

- A. End-to-end DevOps Solution in the cloud for developing applications.
- B. Integrated task tracking, agile planning, source control with auto deploy
- C. Complementary mobile quality and application performance monitoring
- D. Use your favorite tools or work from the Web IDE
- E. Free public and fee-based private projects (free for now during Beta)

3. Scalable, secure, enterprise-ready

- A. Runs on SoftLayer Infrastructure



DevOps Services available today



Mobile Quality Assurance

Instrument apps to capture tester and live-user experiences, including context-aware crash log and in-app bug reports, in-app user feedback and insightful and streamlined quality metrics.



Git Hosting

Integrated Git hosting, with deployment via Git push and auto deployment from Git repositories.



Deployment Automation

Single stage Continuous Deployment



Monitoring and Analytics

Application Performance Monitoring and Management



Web IDE

Web IDE — scripted languages. Eclipse - Simplified client setup



Agile Development

Adds IBM tooling and service for agile planning and tracking with the cloud platform.



Get productive with BlueMix DevOps Services **in minutes**

1. Register at www.jazzhub.com

2. Answer a few questions

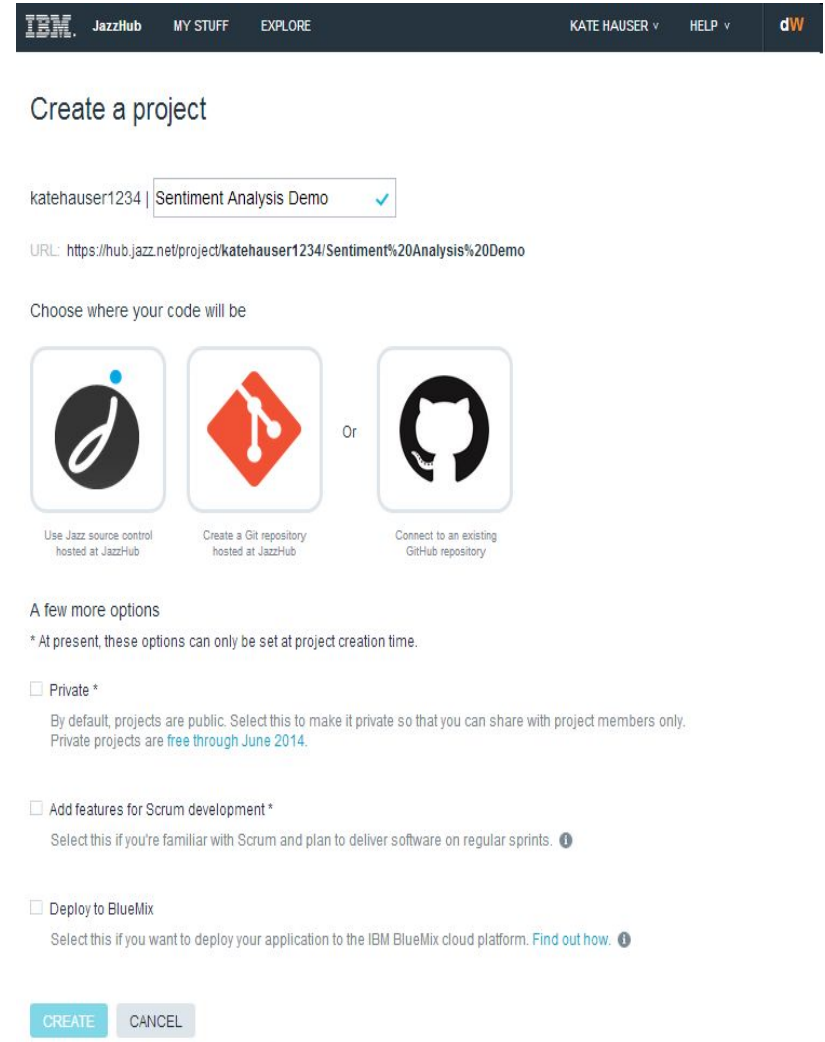
A. Which SCM (Git, GitHub, Jazz SCM)?

B. Do you want your project to be public or private?

C. Do you want to practice agile software development?

D. Do you want to deploy on IBM BlueMix?

3. Start coding



The screenshot shows the IBM JazzHub project creation page. At the top is a navigation bar with the IBM logo, 'JazzHub', 'MY STUFF', 'EXPLORE', and user information 'KATE HAUSER' and 'HELP'. The main heading is 'Create a project'. Below this, the username 'katehauser1234' is shown next to a dropdown menu currently displaying 'Sentiment Analysis Demo' with a checkmark. The URL is 'https://hub.jazz.net/project/katehauser1234/Sentiment%20Analysis%20Demo'. The next section is 'Choose where your code will be', featuring three options: 'Use Jazz source control hosted at JazzHub' (with a Jazz logo), 'Create a Git repository hosted at JazzHub' (with a Git logo), and 'Connect to an existing GitHub repository' (with a GitHub logo). Below these are 'A few more options' with checkboxes: 'Private *' (with a note that private projects are free through June 2014), 'Add features for Scrum development *' (with a note to select if familiar with Scrum), and 'Deploy to BlueMix' (with a note to select if wanting to deploy to the IBM BlueMix cloud platform). At the bottom are 'CREATE' and 'CANCEL' buttons.


IBM. JazzHub MY STUFF EXPLORE KATE HAUSER ▾ HELP ▾ dW


Create a project

katehauser1234 | Sentiment Analysis Demo ✓


URL: <https://hub.jazz.net/project/katehauser1234/Sentiment%20Analysis%20Demo>

Choose where your code will be


Use Jazz source control hosted at JazzHub


Create a Git repository hosted at JazzHub

Or


Connect to an existing GitHub repository

A few more options

* At present, these options can only be set at project creation time.

☐ Private *

By default, projects are public. Select this to make it private so that you can share with project members only. Private projects are [free through June 2014](#).

☐ Add features for Scrum development *

Select this if you're familiar with Scrum and plan to deliver software on regular sprints. ⓘ

☐ Deploy to BlueMix

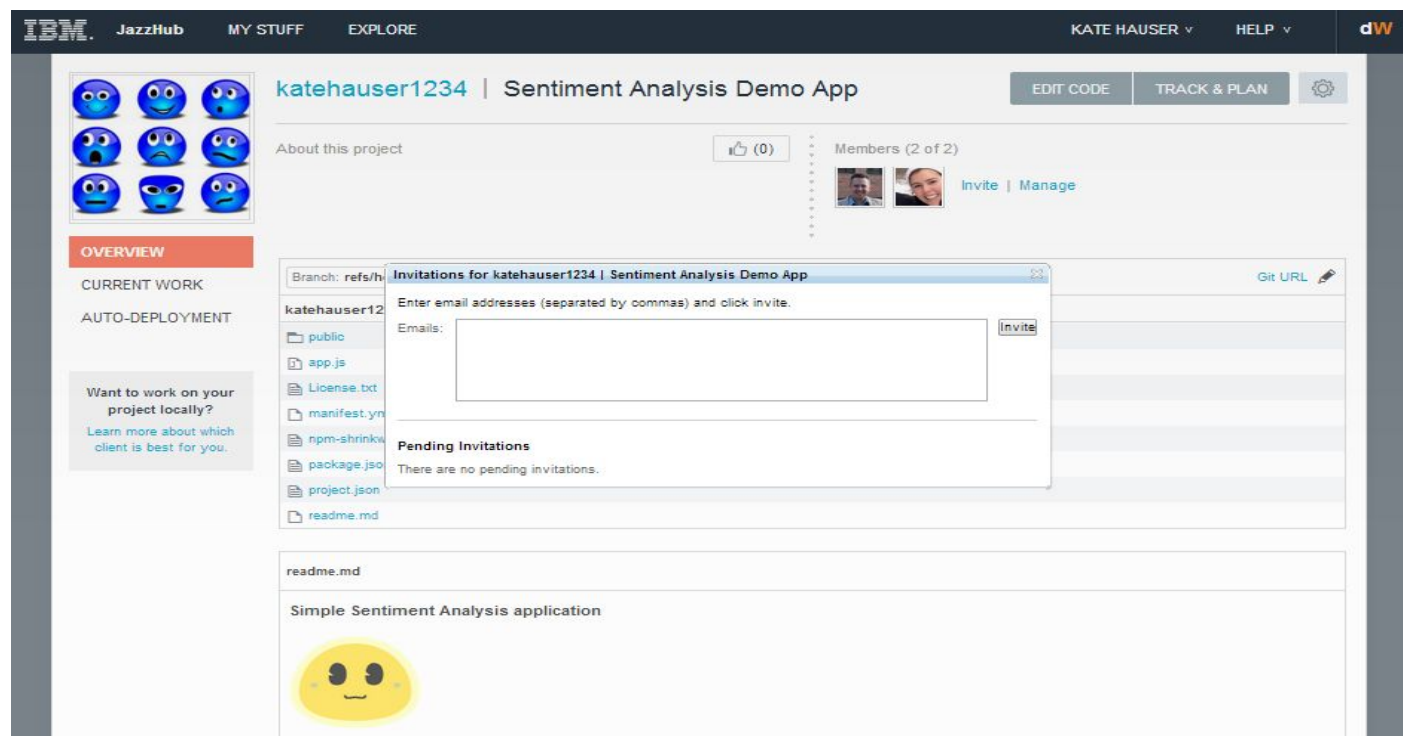
Select this if you want to deploy your application to the IBM BlueMix cloud platform. [Find out how](#). ⓘ

CREATE CANCEL



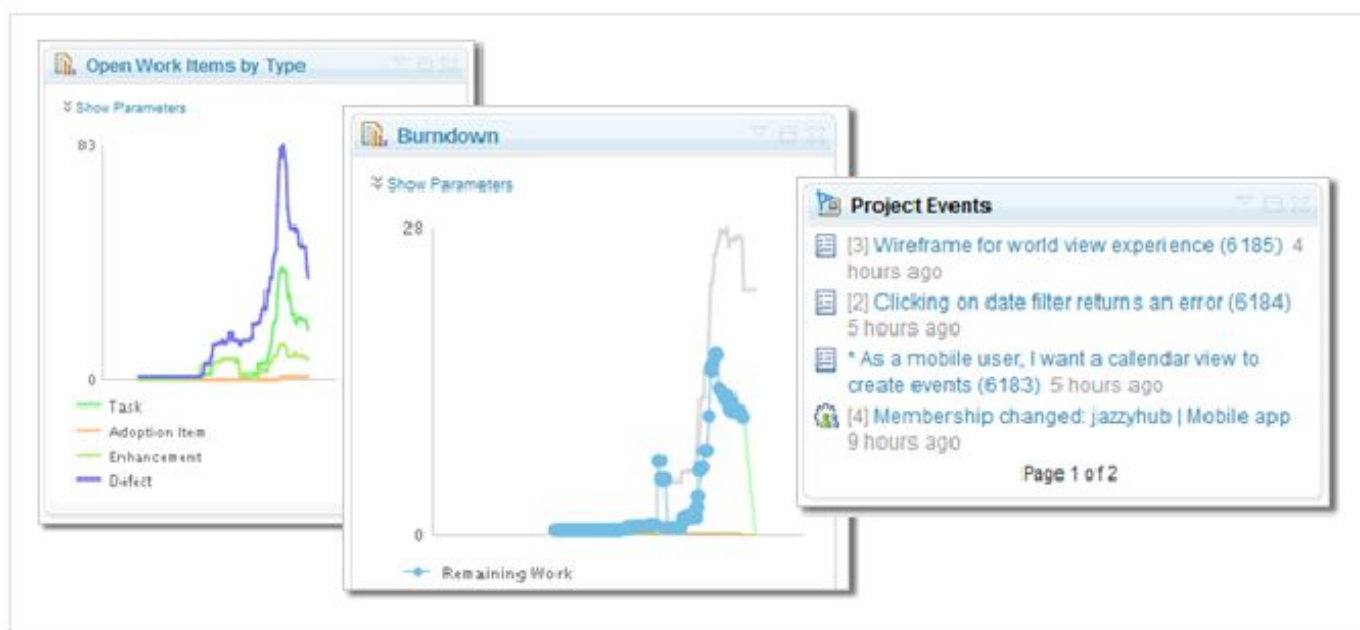
Collaborate seamlessly on public or private projects

1. Easily invite team members
2. Access from anywhere
3. Built for collaboration from the ground up
4. Choose who sees your project, and how you engage with broader communities



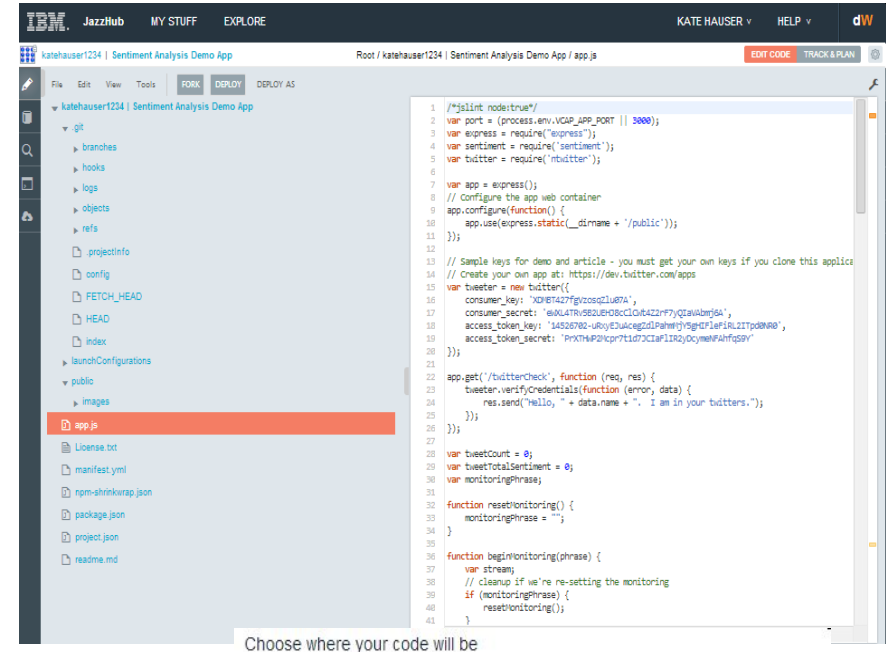
Agile development in the Cloud is easy with BlueMix DevOps Services for BlueMix

1. Built-in agile process support
2. Work items to track and plan project activities
3. Agile tools for the product backlog, releases, and sprints.
4. Dashboard charts for project status



Choose how you code with BlueMix DevOps Services

1. Browser-based Integrated Development Environment
2. Full support for local development with Eclipse or Visual Studio
3. Built-in support for Jazz Source Control
4. Hosted Git repository
5. Got GitHub? No problem



Choose where your code will be



Use Jazz source control
hosted at JazzHub



Create a Git repository
hosted at JazzHub

Or



Connect to an existing
GitHub repository

Copy and paste URL (<https://github.com/username/project-name.git>)



Leverage the power of social coding. With public projects, it's easy to learn and share work with a broader audience.

The screenshot displays the IBM JazzHub 'Explore' page. The top navigation bar includes the IBM logo, 'JazzHub', and tabs for 'EXPLORE', 'LEARN', and 'FEATURES'. On the right, there are links for 'SIGN IN', 'REGISTER', 'HELP', and a 'dw' logo. A 'CREATE PROJECT' button is located in the top right corner of the main content area.

The main content area is divided into three columns:

- Trending:** Lists projects with their icons, names, descriptions, and activity counts. Projects include 'snrich | JazzHub' (561 activities), 'rschoon | Jazz In Flight' (73 activities), 'joelennon | polls' (9 activities), and 'simnewton | gODEV' (604 activities).
- Most Active:** Lists projects with their icons, names, descriptions, and activity counts. Projects include 'markw | SBTSDK' (730 activities), 'lerch | ClubUMLSpring2014' (620 activities), 'simnewton | gODEV' (604 activities), and 'snrich | JazzHub' (561 activities).
- JazzHub Activity:** A feed of recent project creations, including 'John Kellerman created a new project called kellman | JKsLatestNodeApp' (5 minutes ago), 'John Kellerman created a new project called kellman | JKsSentimentalApp' (10 minutes ago), 'Kamil Jezek created a new project called kjezek | sf-bugreports-analysis' (1 hour ago), 'Jerome Clyde Bulanadi created a new project called jeromebulanadi | jeromejavawebstarter' (2 hours ago), 'Mattias Mohlin created a new project called mattias | BlueMxWebApp' (2 hours ago), 'Wim Tobback created a new project called tobbaw | nodejstest' (3 hours ago), 'Pankaj Dhoolia created a new project called pdhoolia | helloWorld' (3 hours ago), 'Rui Sousa created a new project called drummer | inicial' (5 hours ago), and 'Rui Sousa created a new project called drummer | LifeGest' (5 hours ago).

LAB B – Node.js with DevOps Services and BlueMix



Lesson 4:

Register a Service

in BlueMix



Lesson 4 - Registering Services in BlueMix

WORK IN PROGRESS...

Why Register a Services?

1. BlueMix offers pay-as-you-go *cloud services* for cloud platform *services*.
2. BlueMix helps service providers go to market more quickly, efficiently, and effectively.
3. BlueMix assists service providers by providing cloud monetization strategies and actionable business and technology planning

Registering Services in BlueMix

1. To register a service with BlueMix, you must define service metadata, create service image assets, and issue the command line utility [cloud-cli](#).
2. Two types of service can be registered with BlueMix, a regular Bluemix service that exists within Bluemix, and a 'User Provided' service that is provisioned outside of Bluemix.

Service Metadata

There are two parts to the metadata defined for a service: metadata that is used to define the BlueMix service, and metadata specific to the UI.

- **BlueMix service metadata**
 - BlueMix Service metadata is defined in a JSON file.
- **BlueMix user interface service metadata**
 - The UI specific metadata is specified under the 'metadata' attribute. This metadata affects the display of the service in the BlueMix user interface



BlueMix User Provided Service Instance - Service metadata

The following example shows the BlueMix metadata for the Sample service. In this example, the Sample service is classified as being of service type "sample", and it is categorized under a hierarchy of "Sample" → "Foundation Services" → "Services"

For 'User Provided' services, there can be only one plan. The 'url' value must be a valid URL, but it is never referenced, so it can be anything. The 'token' and 'timeout' values are not used.

```
{
  "label" : "Sample Service",
  "provider" : "ace",
  "url" : "http://1.2.3.4",
  "description" : "A sample hello world service. Instructional use only, not for use in
production.",
  "version" : "0.1",
  "info_url" : "http://www.ibm.com",
  "token" : "MySampleService",
  "timeout" : 57,
  "plans" : [ {
    "name" : "free",
    "free" : true,
    "public" : false,
    "description" : "This is a free service plan for the Sample service",
    "visibilities" : [ {"organization_name" : "MyOrganizationName"} ]
  } ]
}
```



BlueMix User Provided Service Instance - User Interface service metadata

```
{
  ---
  "metadata": {
    "featuredDescription": "A user provided service. Instructional use only, not for use in
production.",
    "isFeatured": false,
    "docURL": "http://www.yourserver.com:7080/doc/Sample/RESTapi.html",
    "userDefinedService" :
    {
      "parameters" : [

        {
          "name": "host",
          "type" : "text",
          "value" : "example.com",
          "readonly": true,
          "hidden": true
        },
        {
          "name": "userid",
          "displayname" : "User id",
          "type" : "text",
          "description": "The user id that will be used to access the service.",
          "invalidmessage" : "Not a valid email address" ,
          "pattern" : "^[_A-Za-z0-9-\\+]+(\\.[_A-Za-z0-9-]+)*@[A-Za-z0-9-]+(\\.[_A-Za-z0-9-]+)*
(\\.[_A-Za-z]{2,})$",
          "placeholder" : "email@example.com"
        },
        {"name": "password", "type" : "password"},
        {"name": "description"}
      ]
    }
  }
}
```

Lesson 5:

Cloud Foundry



Lesson 5 – Cloud Foundry

This lesson provides an overview of PaaS, Open PaaS, & Cloud Foundry

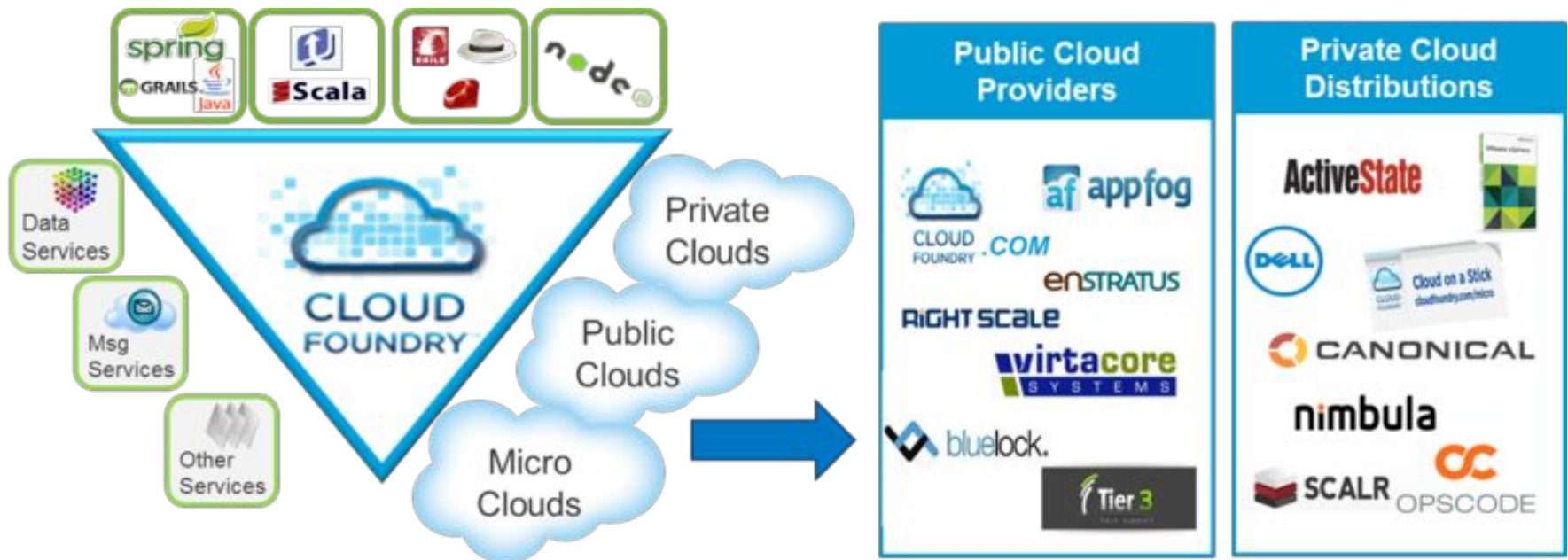
Topics in this lesson include:

- What is Cloud Foundry?
- Cloud Foundry Architecture and
- Application Staging
- Cloud Foundry CLI



What's Cloud Foundry?

*An open platform-as-a-service (**PaaS**). The system supports **multiple** frameworks, **multiple** application infrastructure services and deployment to **multiple** clouds.*



Making Multi-Cloud a Reality

Languages/Frameworks/Service

❖ Multi-Language

Ruby, Java, Scala, Node.js, Erlang, Python, PHP, ...

❖ Multi-Framework

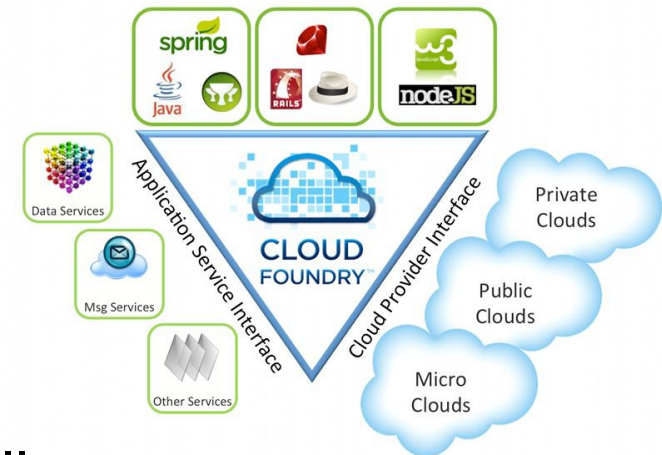
Rails, Sinatra, Spring, Grails, Express, Lift, ...

❖ Multi-Services

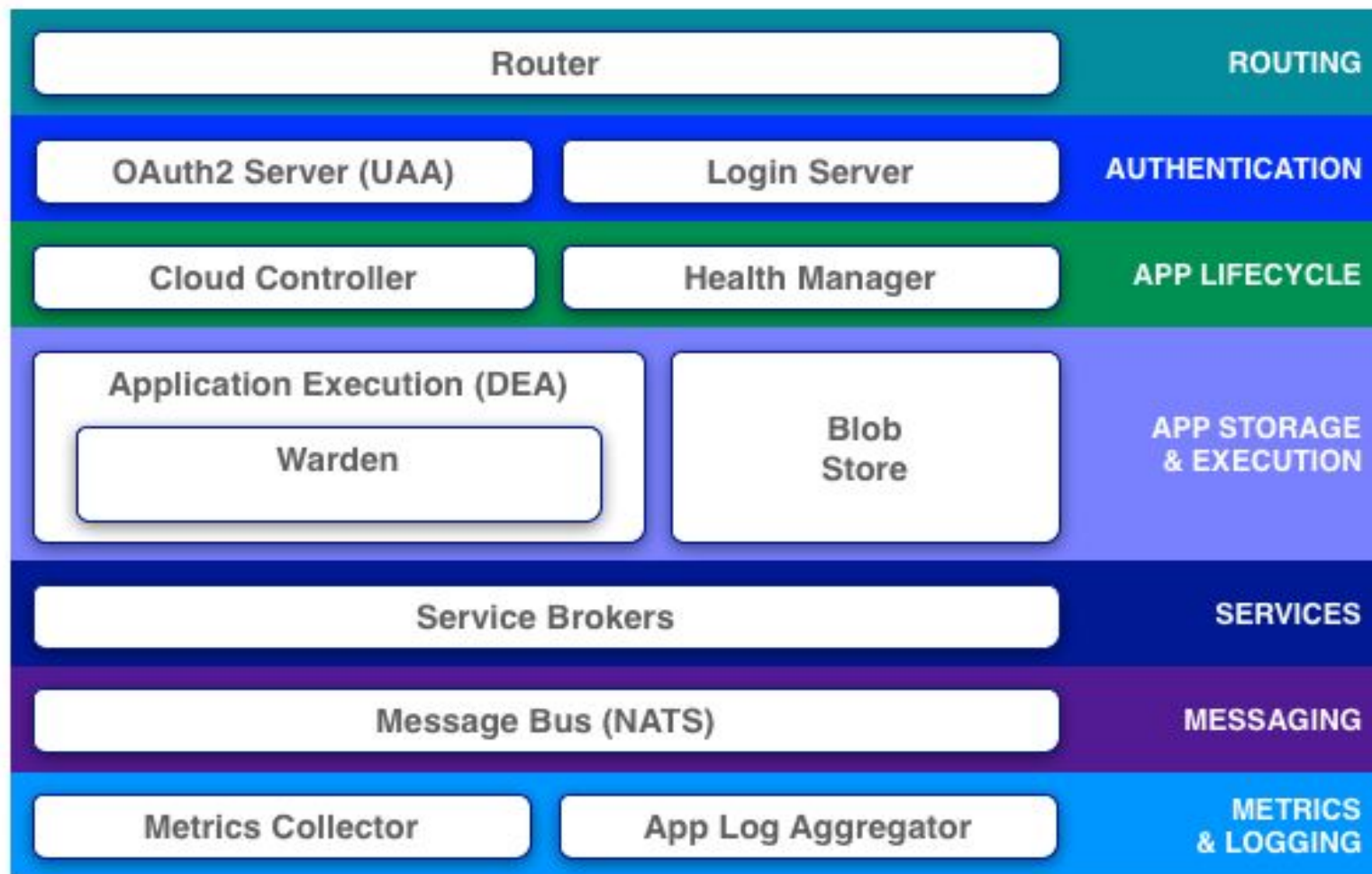
MySQL, Postgres, MongoDB, Redis, RabbitMQ, ...

❖ Multi-Cloud, Multi-IaaS

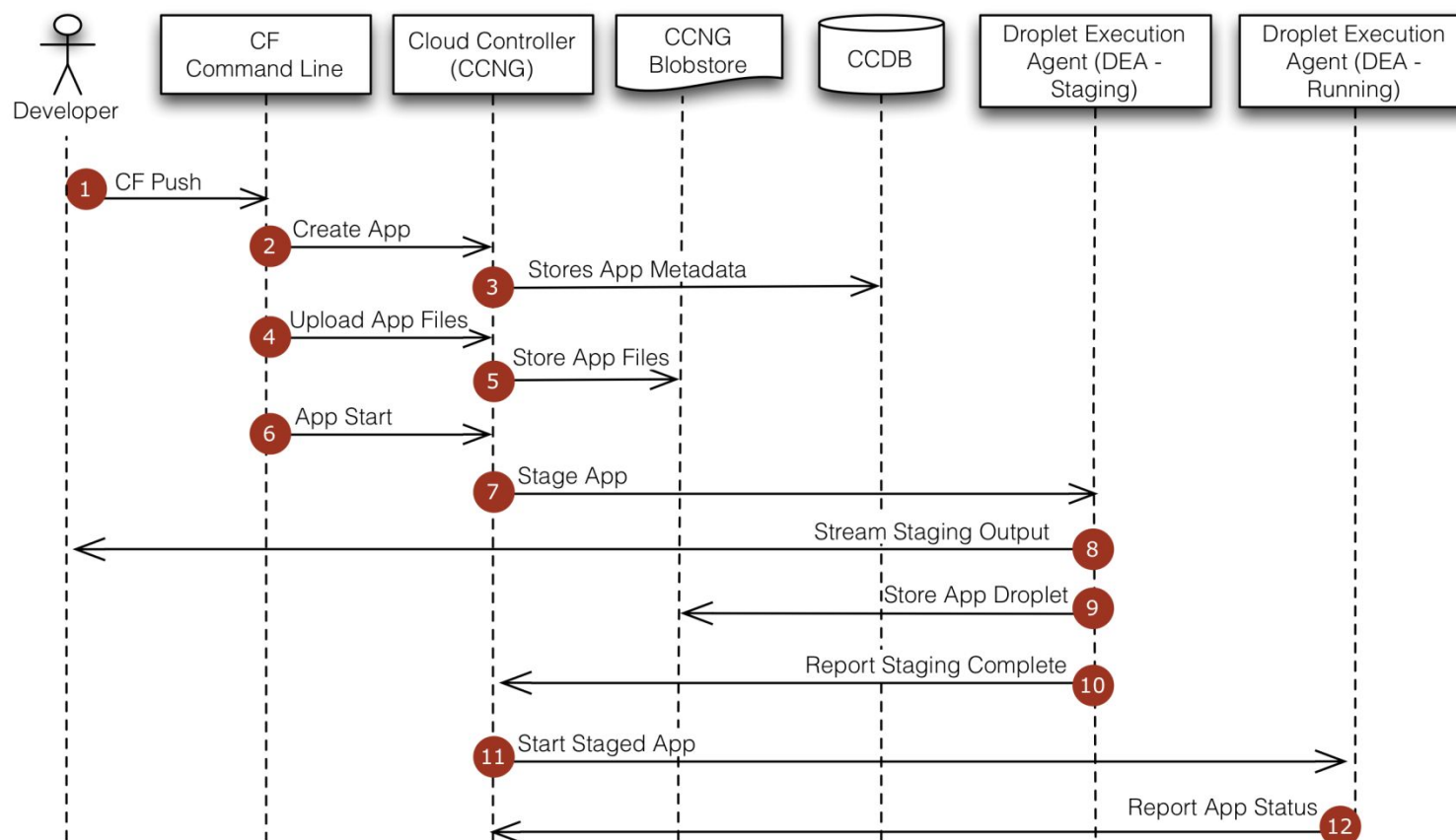
Public Cloud, MicroCloud, Private Cloud



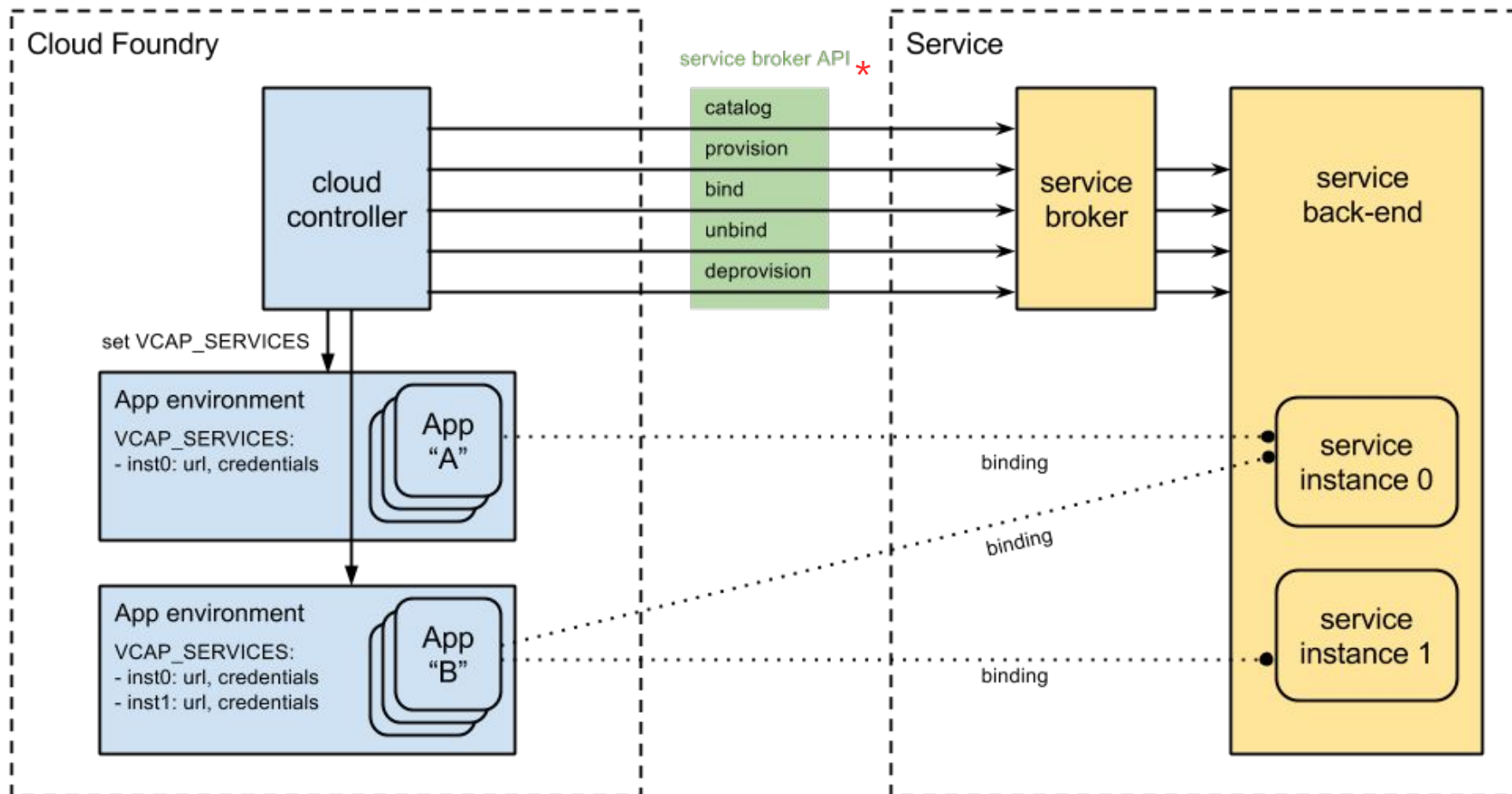
Cloud Foundry Architecture – CF Kernel Internal



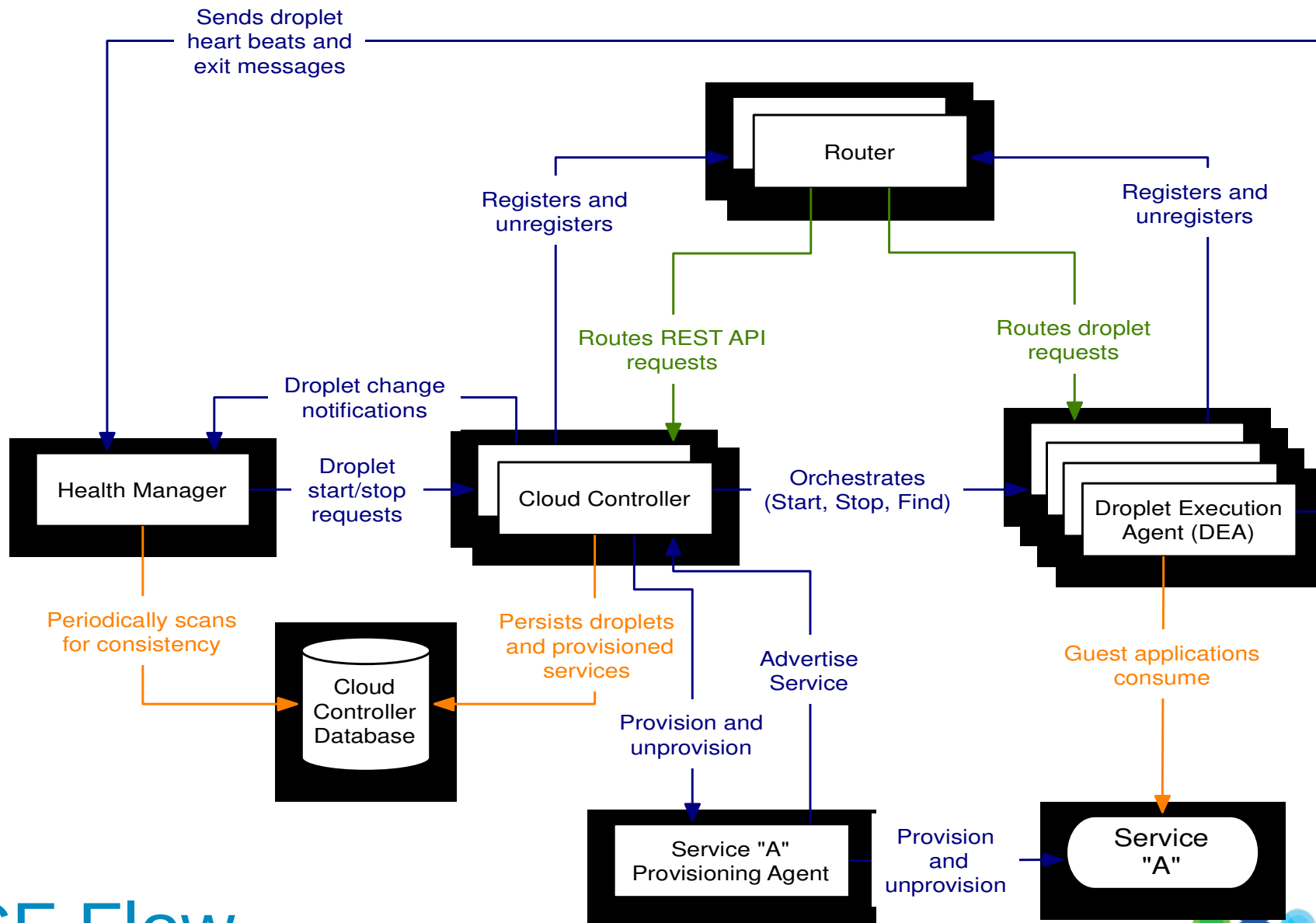
Cloud Foundry - Application Staging



Cloud Foundry - Services



*) *catalog = cf marketplace*
provision = cf create-service
bind = cf bind-service etc.



CF Flow

BlueMix - Cloud Foundry CLI (Command Line Interface)

- cf is Cloud Foundry's command line interface.
- Used to deploy and manage applications running on most Cloud Foundry based environments
- cf go binary for your OS in github

Important CF CLI Calls

- cf -a api-end-point
- cf login user-id
- cf push my-new-app
- cf create-service my-service
- cf bind-service my-service my-new-app



Is BlueMix = Cloud Foundry?

BlueMix is based on the Cloud Foundry open source PaaS, it is more than just a hosted Cloud Foundry offering.

IBM is embracing the open source and extending it with additional capabilities such as GUI and services that represent the breadth of the IBM portfolio.



LAB C – Build a Twitter influencer application
using BlueMix

OR

LAB D – Mobile Backend as a Service
(MBaaS) using BlueMix



Lesson 6:

Maximize BlueMix



BlueMix Services Scope

Dec Beta 1

Feb Beta 2

June GA+

* = 3rd party

- Web
 - Java (IBM Liberty)
 - Ruby (CF*)
 - PHP (CF*, Zend PHP*)
 - JavaScript (JS*, Node.js)
 - Tomcat (CF*)
 - Redis (CF*)
 - Caching (IBM eXtreme Scale)
- Mobile
 - Data API (IBM NoSQL with SDK)
 - Push Notification (IBM)
 - Cloud Scripts (IBM)
 - Mobile Application Management (IBM)
 - Mobile Data Sync (IBM)
 - Mobile Quality Management (IBM)
- Data management
 - MongoDB (CF*)
 - MySQL (CF*)
 - SQL (IBM DB2)
 - Data API (IBM NoSQL with SDK)
 - PostgreSQL (CF*)
 - NoSQL (IBM NoSQL)
 - Object Store (IBM/SL)
 - Data Snapshot, Backup, Recovery (IBM)
 - Cloudant*
- Application Services
 - Rabbit MQ (CF*)
 - Log Analytics (IBM 20/20)
 - Application Performance (IBM Application Performance Management)
 - Messaging (IBM Elastic Messaging)
 - Source Control Repo (Git & JazzHub)
 - Integration Service (IBM Cast Iron)
 - Workflow Service (IBM BPM)
 - Rules Service (IBM Decision Mgmt)
 - SendGrid*
 - Flow*



BlueMix Future Content

- Marketing
 - Commerce (EZCommerce)
 - Digital Marketing & Analytics (Tealeaf, Coremetrics, Xtify, Unica)
- Security
 - Secure Transactions (Trusteer)
 - Access (IBM Access Management)
 - AppScan (IBM AppScan)
- Watson
 - Watson Q&A
- Social
 - Workforce Management (Kenexa)
 - Social Analytics, Integration, & Content
- Dev & Test
 - Agile Project Management (JazzHub)
 - Team Collaboration (JazzHub)
 - Continuous Delivery (UrbanCode)
 - Quality/Testing
- Big Data & Analytics
 - Hadoop*
 - BigInsights
 - Streams
 - Reporting & Charting (Cognos)
 - Predictive Analytics (SPSS)
- M2M
 - MessageSight
 - Internet of Things
- Media
 - Object Store (SoftLayer)
 - Media Transcoding
 - Content Delivery Network (SoftLayer)
- Smart Infrastructure
 - Asset Management (IBM Maximo)

* = 3rd party



Differentiators

Differentiate BlueMix from Amazon Web Services, Microsoft Azure, Heroku, Openshift?

1. BlueMix has the whole package: scalability, performance, and wide range of services, including 37 services
2. Open platform with IBM services and third party services built on top of open source
3. Proven IBM on premise solutions available as service
4. IBM unique services: such as Decision Services (business rules), and Watson (future)
5. IBM leading services: such as DevOps, Monitoring and Analytics
6. High performance and scalability with SoftLayer
7. Full support and consultation



BlueMix Support

BlueMix developerWorks Community -

<https://www.ibmmdw.net/bluemix/>

Need Help? Use the BlueMix developerWorks Forum -

<https://www.ibmmdw.net/answers/?community=bluemix>

BlueMix Events - <https://www.ibmmdw.net/bluemix/events/>

BlueMix DevOps Services – <https://www.jazzhub.com>



Lesson 7:

Security



Complying with industry and regulatory standards

In this topic, you will learn about SoftLayer's industry and regulatory compliance.



Industry and regulatory compliance



- Service Organization Control (SOC) 2
 - SoftLayer have an unqualified SOC 2 Type II report for all data centers.
 - Audits security, availability, process integrity, privacy and confidentiality.
 - Report available to customers and their auditors via NDA.
- Safe Harbor
 - Certification demonstrates that SoftLayer provides adequate privacy protection as defined by the Directive.



Industry and regulatory compliance (cont.)



- Payment Card Industry Data Security Standard (PCI-DSS)
 - SoftLayer is a PCI Level 3 compliant merchant for its handling of PCI regulated data.
 - This certification is not transferable to customer workloads.



- Federal Information Security Management Act (FISMA)
 - SoftLayer is working towards FISMA compliance in select data centers.



- Health Insurance Portability and Accountability Act (HIPAA)



Industry and regulatory compliance (cont.)

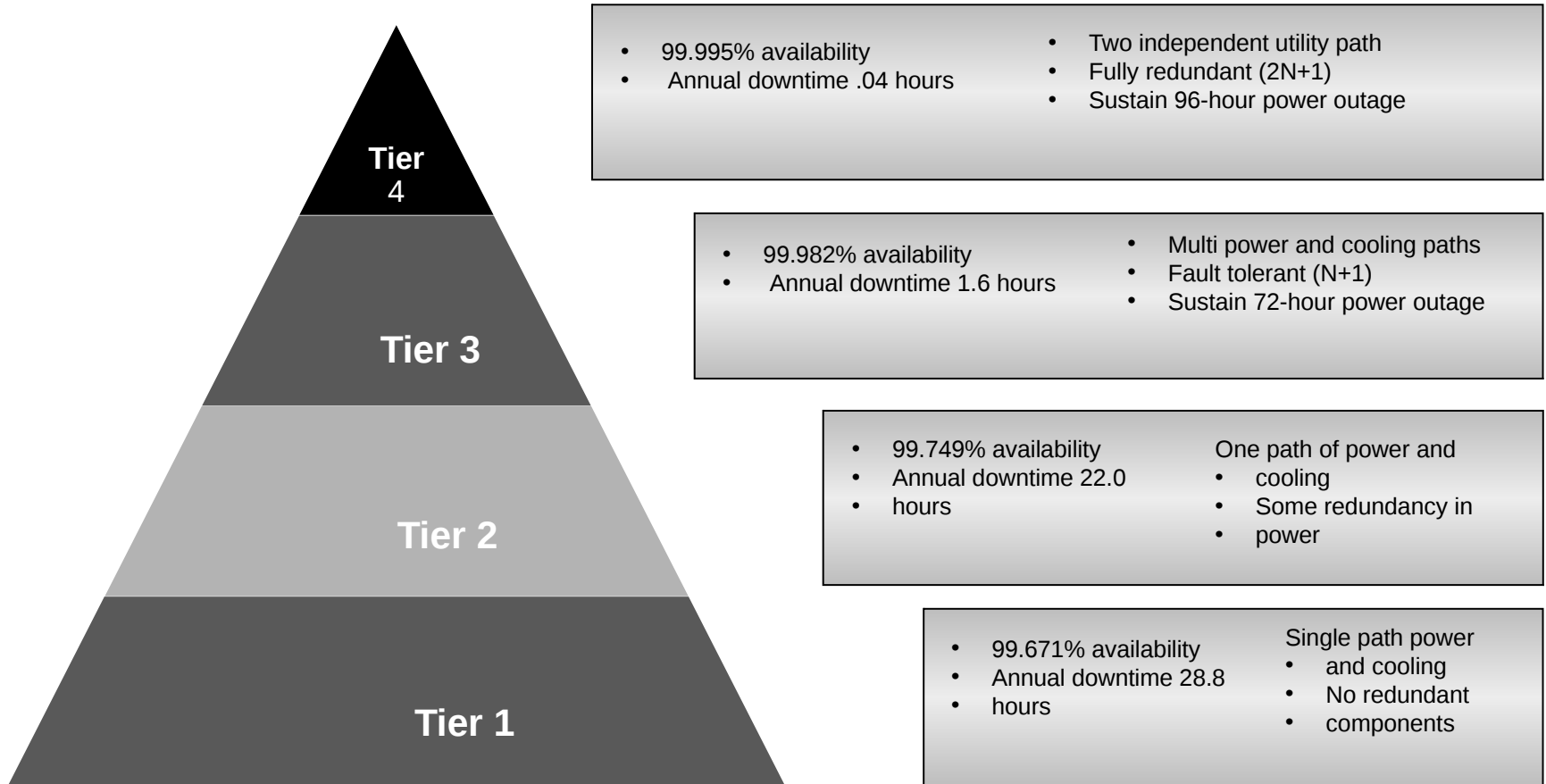


- Cloud Security Alliance (CSA)
 - SoftLayer have published a self-assessment in the CSA Security, Trust and Assurance Registry (STAR).
- SoftLayer expects to be eligible for CSA-STAR Certification and Attestation since they have an existing SOC 2 Type II assessment from a third party.
- CSA-STAR Continuous certificate is still under development by CSA.



Securing the data centers

SoftLayer data centers are Tier 3 data centers.



Securing the data centers (cont.)

Data center and server room security

- Data centers located only in facilities with controlled access and 24- hour security.
- No server room doors are public-facing.
- Server rooms are staffed 24 x 7.
- Unmarked entry and exit doors into server rooms.
- Digital security video surveillance is used in the data center and server rooms
- Biometric security systems are used throughout the data center.
- Server room access strictly limited to SoftLayer employees and escorted contractors or visitors.
- Barcode-only identification on hardware;
- no customer markings of any type on the
- servers themselves.



Securing the data centers (cont.)

Operational security

- I Engineers and technicians trained on internal industry standard policies and procedures, and audited yearly.
- ▢ Geographic redundancy for all core systems for disaster recovery and business continuity.
- ▢ Two-factor authentication for Customer Portal access adds greater server security.
- ▢ All data removed from re-provisioned machines with drive wipe software approved by the US Department of Defense.
- ▢ Ongoing PCI DSS compliance for SoftLayer's own handling of credit card information.
- ▢ Current SSAE 16 SOC1 report, with no exceptions
- ▢ noted.



Questions?



Trademarks

IBM®, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at "Copyright and trademark information" at www.ibm.com/legal/copytrade.shtml.

Intel and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Other company, product, or service names may be trademarks or service marks of others.