



IBM Bluemix

Ecosystem Development
Hands on Workshop
Section 1 - Overview

<Presenter name>

The app revolution

Fundamentally changing the way we interact with technology.

Apps are everywhere

The quantity and usefulness of web and mobile apps has led to an “**app revolution**” among consumers and businesses alike.

Experience matters

Customers and employees now expect a **delightful** and **seamless** experience across all interactions with a business.

Cloud makes it possible

Apps today can be stitched together quickly with pre-built assets. Cloud makes the **API economy** possible.



App development is about speed and choice

Developers' expectations have evolved.

Seconds to Deploy



Friction Free



Useful APIs



Continuous Integration



Choice of Tools

Failing Fast



Any Language



Mobile Ready



Focus on Code

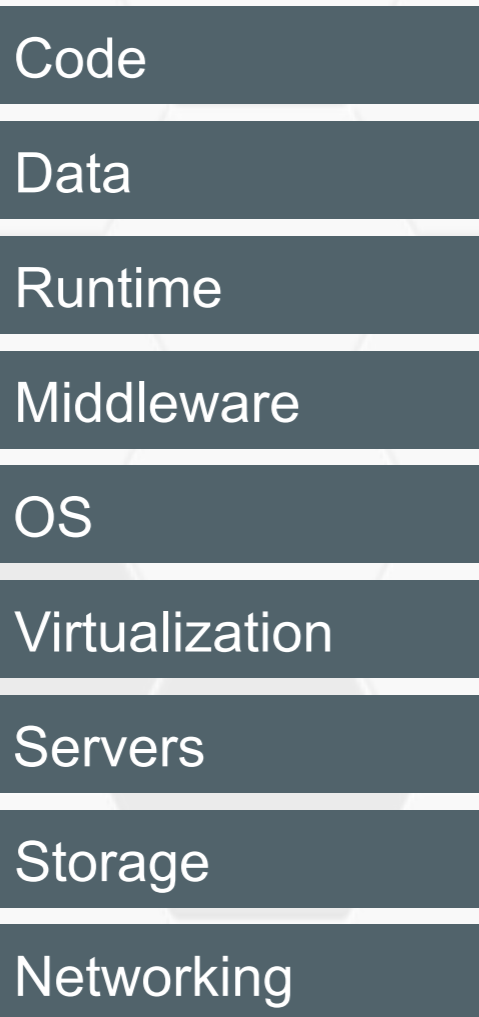


Timing is critical...

Today's apps must keep up with the speed of the app revolution.

● Customer Managed

Core
IT



Benefits

Fully customizable.
Few limitations.
Necessary for some solutions.
Existing Investments.

Time Commitment

Weeks to setup and deploy.
Maintenance/upgrades of
hardware and software.

Time to initial deployment



~ Weeks

~ Days

~ Minutes

Customization; higher costs; slower time to value

Standardization; lower costs; faster time to value

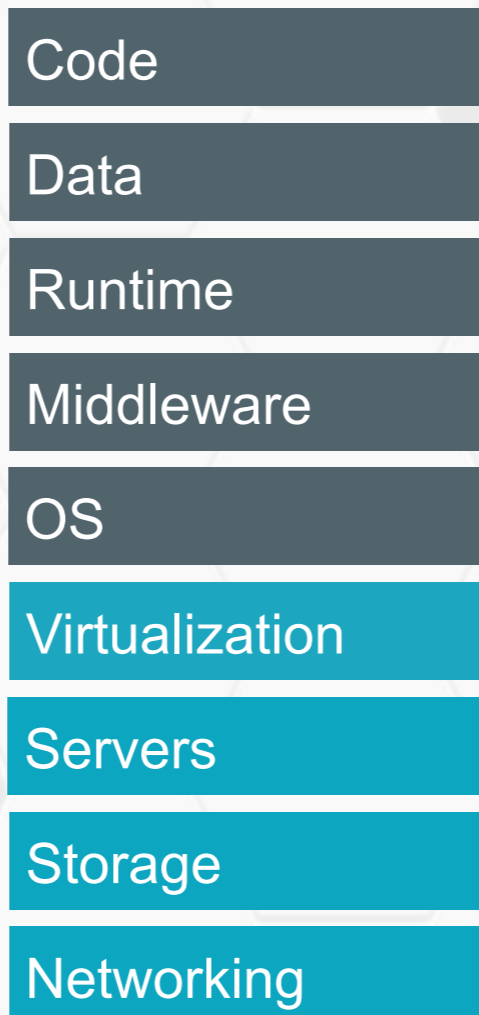


Timing is critical...

Today's apps must keep up with the speed of the app revolution.

- Customer Managed
- Service Provider Managed

Infrastructure as a Service



Benefits

Most control in the cloud.
Necessary for some solutions.
Infrastructure managed by SP.

Time Commitment

Minutes to provision VM.
Time to configure software and apps varies.
Maintenance/upgrades of OS, middleware, runtime.



IBM SoftLayer

Time to initial deployment

Core IT

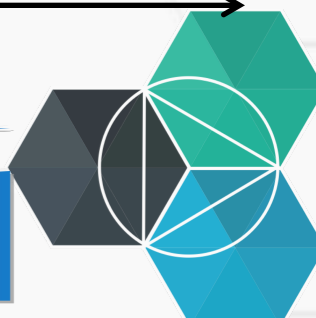
~ Weeks

~ Days

~ Minutes

Customization; higher costs; slower time to value

Standardization; lower costs; faster time to value



Timing is critical...

Today's apps must keep up with the speed of the app revolution.

- Customer Managed
- Service Provider Managed

Platform as a Service



Benefits

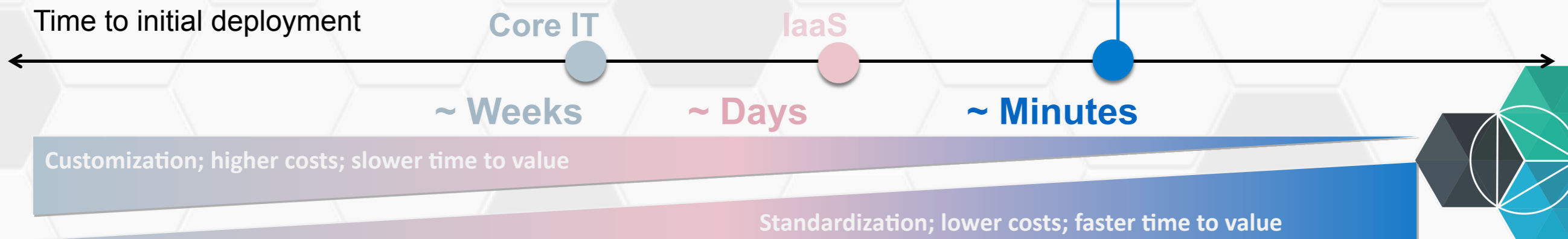
Setup environments and deploy apps *very* quickly. Infrastructure and platform managed by SP.

Time Commitment

Minutes to setup and deploy. Focus on your apps and their data.



IBM Bluemix



...so are all of your other investments

Leverage the power of Bluemix **without abandoning** what you already use.

Core IT



IaaS



PaaS



IBM Bluemix





Bluemix works
with the new IT.

What is Bluemix?

Bluemix is an **open-standard**, cloud-based **platform** for **building, managing, and running applications of all types** (web, mobile, big data, new smart devices, and so on).



Go Live in Seconds

The developer can choose any language runtime or bring their own. Zero to production in one command.

APIs and Services

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

On-Prem Integration

Build hybrid environments. Connect to on-premise assets plus other public and private clouds.

DevOps

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

Layered Security

IBM secures the platform and infrastructure and provides you with the tools to secure your apps.

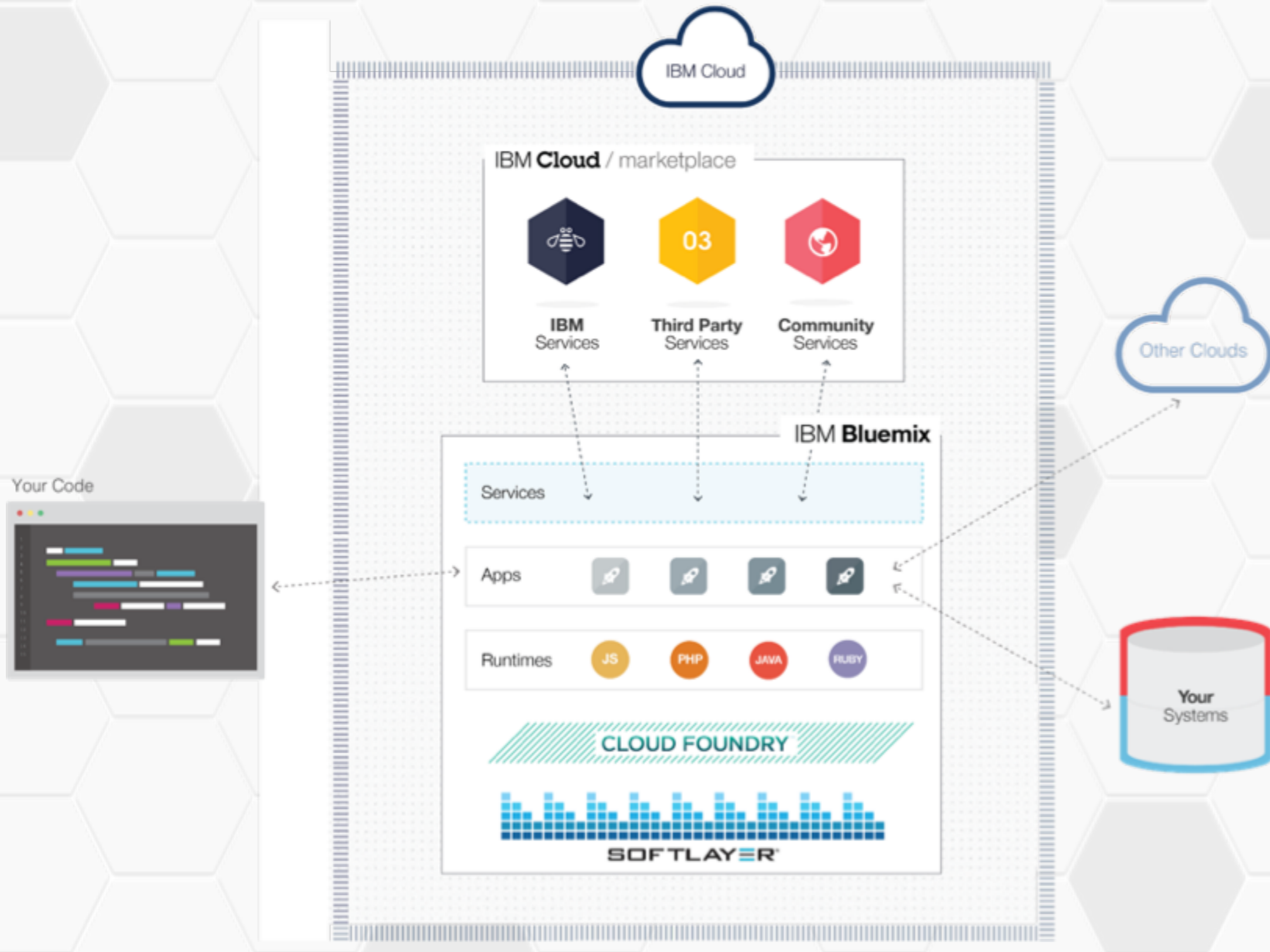
Flexible Pricing

Sign up in minutes. Pay as you go and subscription models offer choice and flexibility.



How does Bluemix work?

Bluemix **embraces** Cloud Foundry as an **open source Platform as a Service** and **extends** it with IBM, third party, and community built services.



Why are developers using Bluemix?

To **rapidly** bring products and services to market at **lower cost**



Go from zero to running code in a matter of minutes.

To **continuously deliver** new functionality to their applications



Automate the development and delivery of many applications.

To extend **existing investments** in IT infrastructure



Extend existing investments by connecting securely to on-premise infrastructure.



Core use cases

What 30,000 beta applications have told us.

Web Applications

- Enabling **online experiences in the physical store** for retail
- Leverages BlueMix for data collection APIs and dashboards
- Reduction of **infrastructure setup from days to minutes** by moving off of a pure IaaS

APIs and On-Prem Integration

- Providing APIs that are **integrated into the BlueMix experience**
- Leveraging **existing on premise databases and technologies**
- Building mobile applications that connect to on-prem data via Bluemix

Mobile Back Ends

- **Back end services replacing custom code** hosted on IaaS (e.g. Push Notification)
- Cloud Code for **offloading business logic** from the mobile client
- Integrated into iOS and Android native applications using **BlueMix SDK**

Analytics and Reporting

- Embed **IBM Cognos business intelligence** content into apps
- Use **IBM Analytics Warehouse** to store and analyze business data
- Gain immediate **visibility and control** over app **performance** and availability





IBM Bluemix

Ecosystem Development
Hands on Workshop
Section 2 – Tour of IBM Bluemix

<http://bluemix.net>

Log in






IBM Bluemix

SOLUTIONS CATALOG PRICING DOCS COMMUNITY SIGN UP LOG IN

IBM® Bluemix™ is now open!

A platform where developers can act like kids in a sandbox—
except this box is enterprise-grade.

[Sign up for a free trial](#)

Connect with Bluemix:     



Dashboard

Dashboard Menu

Spaces

Menu

Organisation

Trial

Quick Stat and Notify

The screenshot shows the IBM Bluemix Dashboard interface. At the top left is the IBM Bluemix logo. The top navigation bar includes links for DASHBOARD, CATALOG, PRICING, DOCS, and COMMUNITY, along with the user's email address (binnes@uk.ibm.com) and a notification bell icon showing 295 alerts. A search bar is located on the right side of the navigation bar. Below the navigation bar, the main content area is divided into several sections. On the left is a sidebar menu with options: DASHBOARD, All (20), APPS (9), SERVICES (11), ADD-ONS, and a button to Connect an Add-On. The main content area features a 'SPACE: dev' header. Below this is a 'Status' section with three circular gauges: '2.69GB out of 8GB of Memory', 'APP HEALTH' (indicated by a green checkmark), and '11/40 SERVICES'. The 'Applications' section displays a grid of application cards. The first card is a '+ CREATE AN APP' button. The second card is 'Blphpmyadmin' (Blphpmyadmin.mybluemix.net) with a 'Running' status. The third card is 'BI-bluemix-days-tia-node' (BI-bluemix-days-tia-node.mybluemix.net) also with a 'Running' status. Below these are three more application cards partially visible.

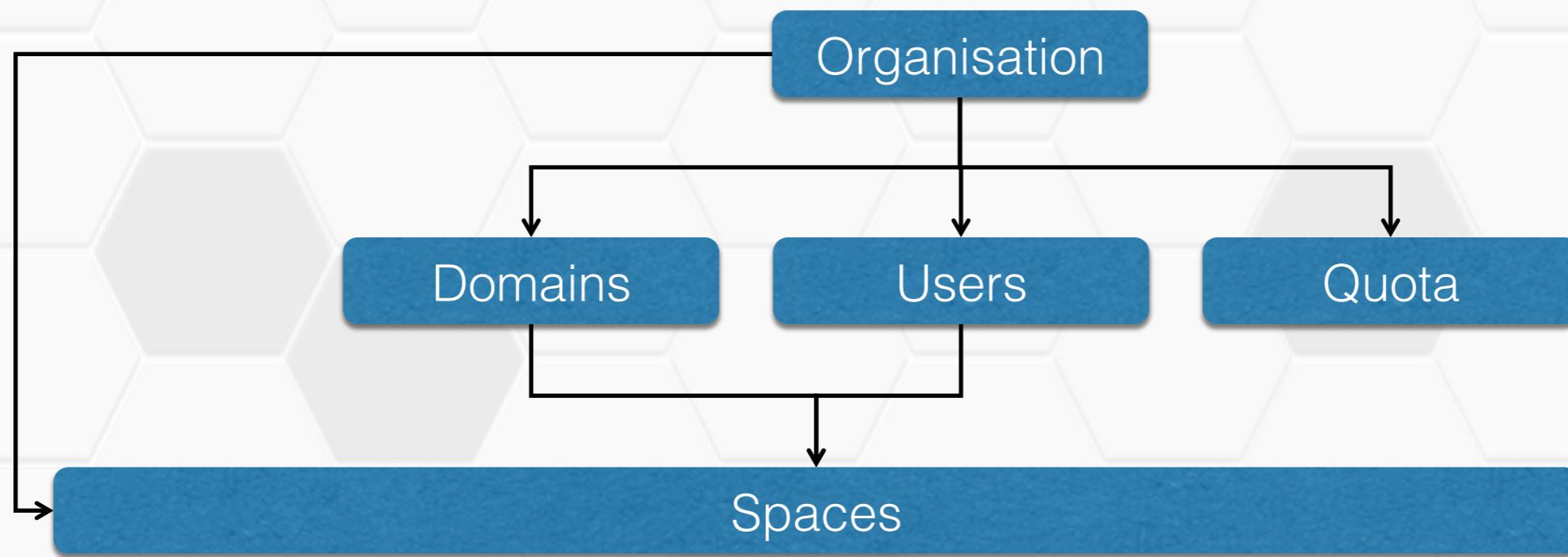
Account

Status

Deployed Apps



Organisations, Spaces, Users and Quotas



Pricing

Pricing menu

Pricing information

Estimator

The screenshot shows the IBM Bluemix Pricing page. The top navigation bar includes 'DASHBOARD', 'CATALOG', 'PRICING', 'DOCS', and 'COMMUNITY'. The left sidebar has sections for 'OVERVIEW' (with 'PRICING SHEET' selected), 'RUNTIMES', 'SERVICES', 'ADD-ONS', and 'SUPPORT'. The main content area is titled 'Runtime Charges' and 'Charged by the GB-hour'. It features a table with columns for 'Plan', 'Price', 'Monthly Usage', and 'Estimate'. The table lists 'Liberty for Java™' and 'SDK for Node.js™'. A callout box on the right shows a calculator icon, '0 items | £0.00 monthly', and a note that prices are for the United Kingdom. A callout box at the top left points to the 'PRICING SHEET' link in the sidebar. A callout box at the top center points to the 'Runtime Charges' section. A callout box at the top right points to the calculator icon in the estimator box.

IBM Bluemix

DASHBOARD CATALOG PRICING DOCS COMMUNITY binnes@uk.ibm.com 295

OVERVIEW **PRICING SHEET**

RUNTIMES

Runtimes

SERVICES

Mobile
Web and Application
Data Management
Big Data
Security
Business Analytics
Internet of Things

ADD-ONS

DevOps
Integration

SUPPORT



Support

Contact us to learn about monthly discounts for subscription plans.

Monthly prices shown are for: [United Kingdom](#)

Runtime Charges

Charged by the GB-hour.

Plan	Price	Monthly Usage	Estimate
 Liberty for Java™ Default <ul style="list-style-type: none">Run one or more apps free for 30 days (375 GB-hours free).	£0.04 GBP / GB-Hour	<input type="text"/>	
 SDK for Node.js™ Default	Instances Memory (GB)	<input type="text"/>	

0 items | £0.00 monthly



Docs

- Opens in new tab

Docs menu

IBM Bluemix Docs

DASHBOARD DOCS COMMUNITY

Type to search

Docs

- Bluemix Overview
- Creating Apps
- Services
- Managing Apps
- Command Line Interface
- Managing Your Account
- Troubleshooting

What is Bluemix?

IBM® Bluemix™ is an open-standards, cloud-based platform for building, managing, and running apps of all types, such as web, mobile, big data, and smart devices. Capabilities include Java, mobile back-end development, and application monitoring, as well as features from ecosystem partners and open source—all provided as-a-service in the cloud.

[Learn More](#)

Getting Started with Runtimes



Community

- Opens in new tab, need to login to ask a question – same log in as Bluemix

The screenshot shows the IBM developerWorks Bluemix Dev community forum. The header includes the IBM developerWorks logo, navigation links for RESOURCES, SUPPORT, FORUM, EVENTS, and BLOG, and a sign-in/register button. The main content area features a search bar, a list of question filters (Questions, Tags, Users, Badges), and a list of questions. The first question is about a service window for Monitoring & Analytics AddOn. The second is about a 500 Error with Push. The third is about a Node app displaying a ruby runtime error. On the right side, there is a summary of 2009 questions and 3725 answers, and a section for top dW users with profile pictures.

IBM developerWorks. Sign in / Register **dW**

IBM Bluemix™ Dev RESOURCES SUPPORT FORUM EVENTS BLOG

VIEW Bluemix ▾

It's all about the answers

Questions Tags Users Badges [Ask a Question](#)

All | Unanswered | Unresolved Search tips

All Bluemix questions

Sort by: Active | Newest | Likes

Answers	Likes	Views	Question Title	Tags	Author	Time
1 answer	0 likes	65 views	Monitoring & Analytics AddOn service window on Sunday Sept 7th 00:00am to 06:00am EDT	BLUEMIX, OUTAGE, MONITORING-AND-ANALYTICS MAINTENANCE.	AdamDarney 1	5 hours ago
0 answers	0 likes	16 views	500 Error with Push	BLUEMIX	AmirAlavi 1	8 hours ago
3 answers	0 likes	33 views	Node app displaying ruby runtime error	NODE.JS, BLUEMIX	Akollek 1	12 hours ago

2009 questions 3725 answers

Top dW users



Catalog

Filter and search

The screenshot shows the IBM Bluemix Catalog interface. At the top, there is a navigation bar with links for DASHBOARD, CATALOG (highlighted), PRICING, DOCS, and COMMUNITY. The user's email is binnes@uk.ibm.com and there are 295 notifications. Below the navigation bar is a search bar with the text "Search" and "All Categories" on the left, and "Type here to begin" in the center. To the right of the search bar are filter checkboxes for IBM, Third Party, Community, and Experimental. Below the search bar is a section titled "Starters" with the subtitle "Choose a package of sample code and services, or start from scratch". Under "Starters", there is a sub-section for "Boilerplates" with the text "Get started with a new app, now". This section displays five boilerplate options: Java Cloudant Web Starter (IBM), Java DB Web Starter (IBM), Java Web Starter (IBM), Mobile Cloud (IBM), and Node JS Web Starter (IBM). Below these are two more options: Internet of Things Starter (Community) and Node-RED Starter (Community). At the bottom of the "Starters" section is a "Runtimes" section with the text "Run an app in the language of your choice". This section displays five runtime options: .java liberty, .js, .rb on rails, .rb Sinatra, and a generic runtime icon.

Starters, Services and Add-Ons










IBM Bluemix

Ecosystem Development
Hands on Workshop
Section 3 – First Deploy

Starters and Runtimes

- **Boilerplates**
 - Deploys a Runtime, service(s) and sample code
 - Quick start with access to sample application code

Boilerplates
Get started with a new app, now

 Java Cache Web Starter IBM	 Java Cloudant Web Sta... IBM	 Mobile Cloud IBM	 Node.js Cache Web St... IBM
 Internet of Things Starter Community	 Node-RED Starter Community		



Starters and Runtimes

- **Runtimes**

- Deploying a runtime will deploy a starter 'hello world' application
 - Quick start with starter application code provided
- Buildpacks provide the runtime for an application running on Bluemix.
- Bring your own buildpack – cannot deploy from web UI (will cover additional deployment options later in this session)



The screenshot shows the 'Runtimes' selection interface in Bluemix. It features a dark blue background with the title 'Runtimes' and the subtitle 'Run an app in the language of your choice'. There are five circular icons representing different runtime options:

- Liberty for Java™**: Represented by a white circle with a blue border, containing the text '.java liberty'. Below it, 'Liberty for Java™' and 'IBM' are displayed.
- SDK for Node.js™**: Represented by a white circle with a blue border, containing the text '.js'. Below it, 'SDK for Node.js™' and 'IBM' are displayed.
- Ruby on Rails**: Represented by a white circle with a blue border, containing the text '.rb on rails'. Below it, 'Ruby on Rails' and 'Community' are displayed.
- Ruby Sinatra**: Represented by a white circle with a blue border, containing the text '.rb Sinatra'. Below it, 'Ruby Sinatra' and 'Community' are displayed.
- Bring Your Buildpack**: Represented by a white circle with a blue border, containing an icon of a medical bag with a cross. Below it, 'Bring Your Buildpack' and 'Community' are displayed.



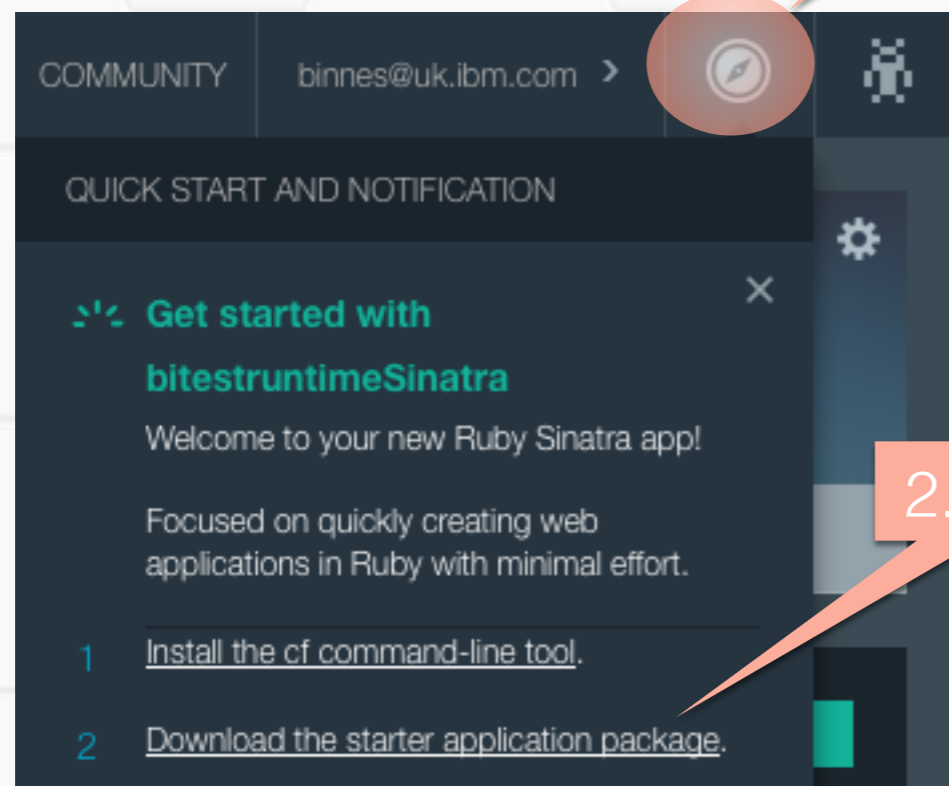


Exercise 3.a

Deploy your first application

Accessing sample code

- Sample code for the application is available to download once a runtime or boilerplate has been deployed



1.Click

2.Click



Command Line Interface

- Bluemix uses the CloudFoundry command line interface (CLI) – `cf`
- `cf help` – provides help page showing all the commands
- `cf help <command>` - provides help for specific command

`cf l` - login

`cf t` – target space or organisation

`cf a` – list apps in current space

`cf app` - display status for specific app in current space

`cf p` – push (deploy or update) app

`cf s` – show service info

`cf cs` – create service

`cf ds` – delete service

`cf bs` – bind service to application

`cf st` – start app

`cf sp` – stop app

`cf d` – delete app

`cf scale` – scale app

`cf logs` – tail or show logs for app



Sample cf commands

- To login to Bluemix:
- `cf l -a https://api.ng.bluemix.net -u <email> -p <password> -o <email> -s dev`
 - This will login to Bluemix, set the organisation to the user's own organisation and the space to dev
- To check what space you are logged onto or to change the space:
- `cf t`
- `cf t -s test`
 - The first option will print the current target organisation and space
 - The second option will switch to the test space
- To check what spaces exist in an organisation:
- `cf spaces`
 - Displays the spaces available in the current organisation
- `cf space dev`
 - Displays information about the dev space in the current organisation





Exercise 3.b

Deploy then update an application using the CLI

Eclipse plugin for Bluemix

- Available in the Eclipse marketplace
 - Note : has more functionality than the CloudFoundry Eclipse plugin
- Enables developers to develop in Eclipse then deploy to Bluemix.

The image shows two screenshots from the Eclipse IDE. The left screenshot displays the 'Servers' view with a context menu open over the 'BINodeTest' server. The right screenshot shows the 'Add and Remove...' dialog box.

Servers view

Right click Bluemix

Select Add and Remove ...

Select available app

Click Add to deploy to Bluemix

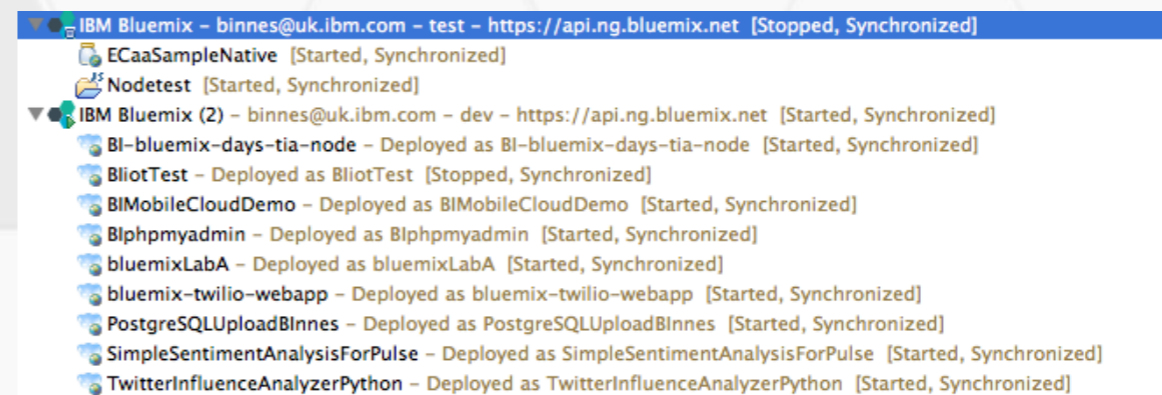
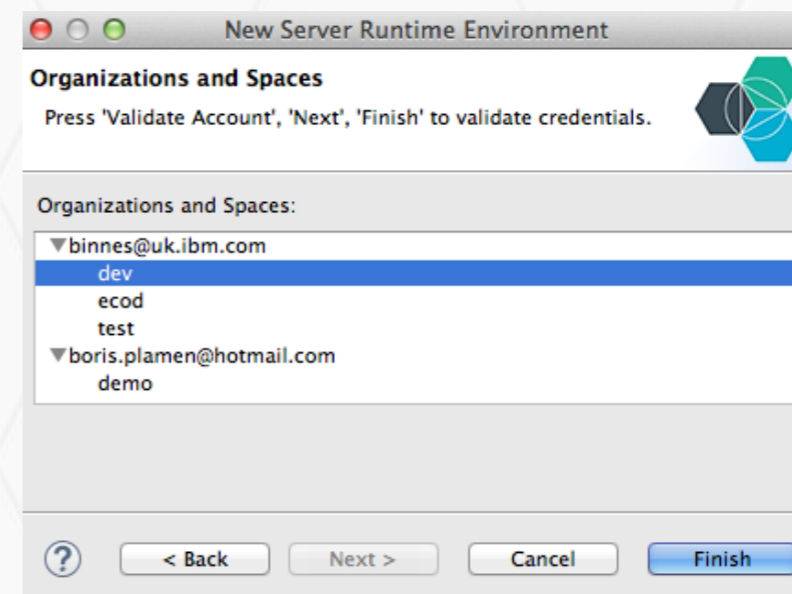
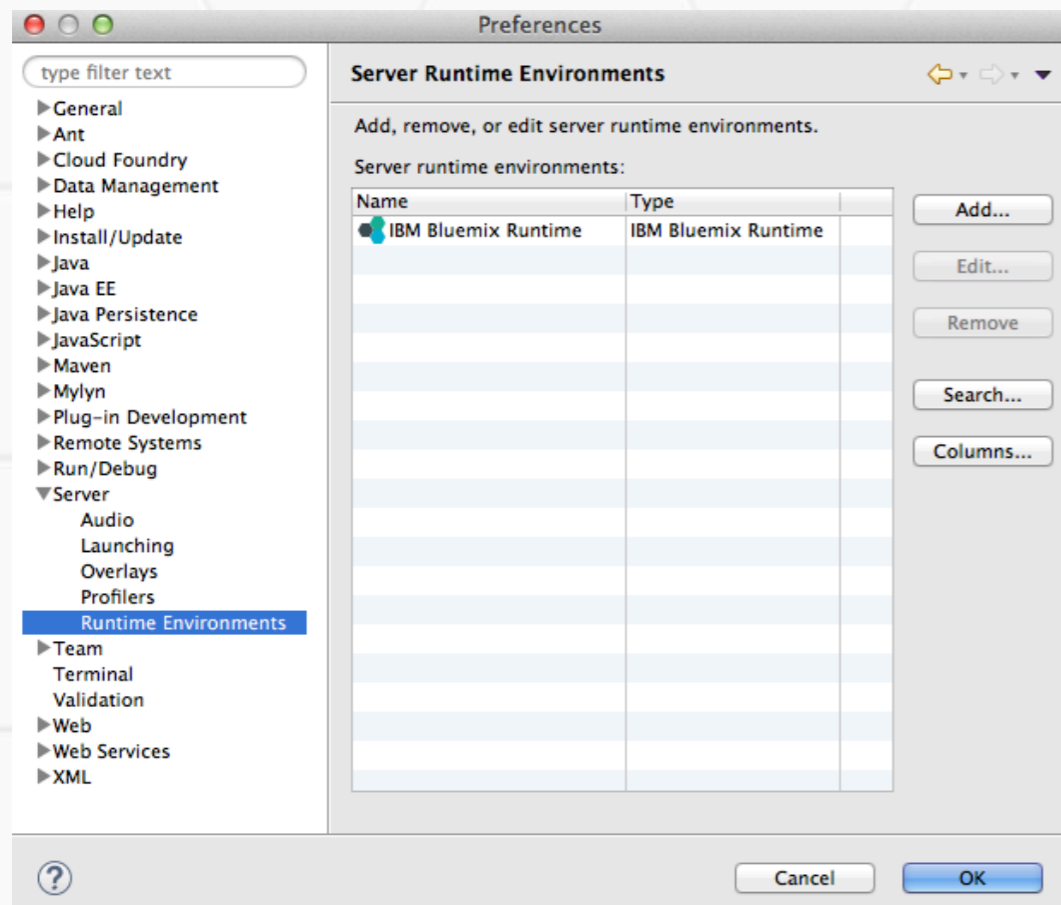
The left screenshot shows the Eclipse IDE interface with the 'Servers' view selected. A context menu is open over the 'BINodeTest' server, listing various actions such as 'New', 'Open', 'Copy', 'Paste', 'Delete', 'Rename', 'Disconnect', 'Connect', 'Restart in Debug', 'Restart', 'Restart in Profile', 'Stop', 'Publish', 'Clean...', 'Add and Remove...', 'Monitoring', 'Clone Server...', 'Update Password', and 'Properties'. The 'Add and Remove...' option is highlighted.

The right screenshot shows the 'Add and Remove...' dialog box. It has two panes: 'Available:' and 'Configured:'. The 'Available:' pane contains 'ECaaSampleNative' and the 'Configured:' pane contains 'Nodetest'. There are buttons for 'Add >', '< Remove', 'Add All >>', and '<< Remove All'. A checkbox at the bottom is checked and labeled 'If server is started, publish changes immediately'. The dialog has '< Back', 'Next >', 'Cancel', and 'Finish' buttons at the bottom.



Need to define your Bluemix server connection in Eclipse

- In Eclipse preferences select 'Server' then 'Runtime Environments'
- Need to add a server definition for each Bluemix space you want to deploy to





Exercise 3.c

Working with Eclipse and
Bluemix

Summary

- Bluemix UI allows you to manage deployed applications and allows you to deploy Boilerplates and runtimes with sample application
- CLI allows you to manage and deploy applications from the command line. Also allows Bluemix to be integrated with other development tools to provide automated integration with your processes
- Eclipse integration allows developers to continue using familiar tools whilst harnessing the power and simplicity of deploying to Bluemix





IBM Bluemix

Ecosystem Development
Hands on Workshop
Section 4 – DevOps Services

IBM Bluemix™ DevOps Services

An Open, Integrated Rapid Development Experience that Scales

- **A Premier DevOps Service for IBM Cloud Platform**

- Promotes incremental frictionless adoption of DevOps Services for Bluemix

- **An Integrated Developer Experience**

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

- **Scalable, secure, enterprise-ready**

- Runs on SoftLayer Infrastructure

IBM DevOps Services

EXPLORE LEARN FEATURES SIGN IN REGISTER HELP

Powered by JazzHub

search projects

f t YouTube

From development to deployment... and everything in between.

IBM DevOps Services is a place where you can collaborate with others to develop, track, plan and deploy software.

Share your genius in free public projects, or keep it confidential with private projects. Get started for free!

Register Now

We bring the tools. You bring the code.

Git Cloud Foundry Jenkins Bluemix



DevOps Services available today



Easy Access

Get started for free. With Git hosting and the built-in Web IDE, it's zero to code in seconds.



Code Now

Use the built-in Web IDE, Eclipse, Visual Studio, or your tool of choice.



Build & Deploy

Automatically build and deploy your application to IBM's cloud platform, Bluemix.



Team Collaboration

Share your work and collaborate through expert tools for Agile Development.



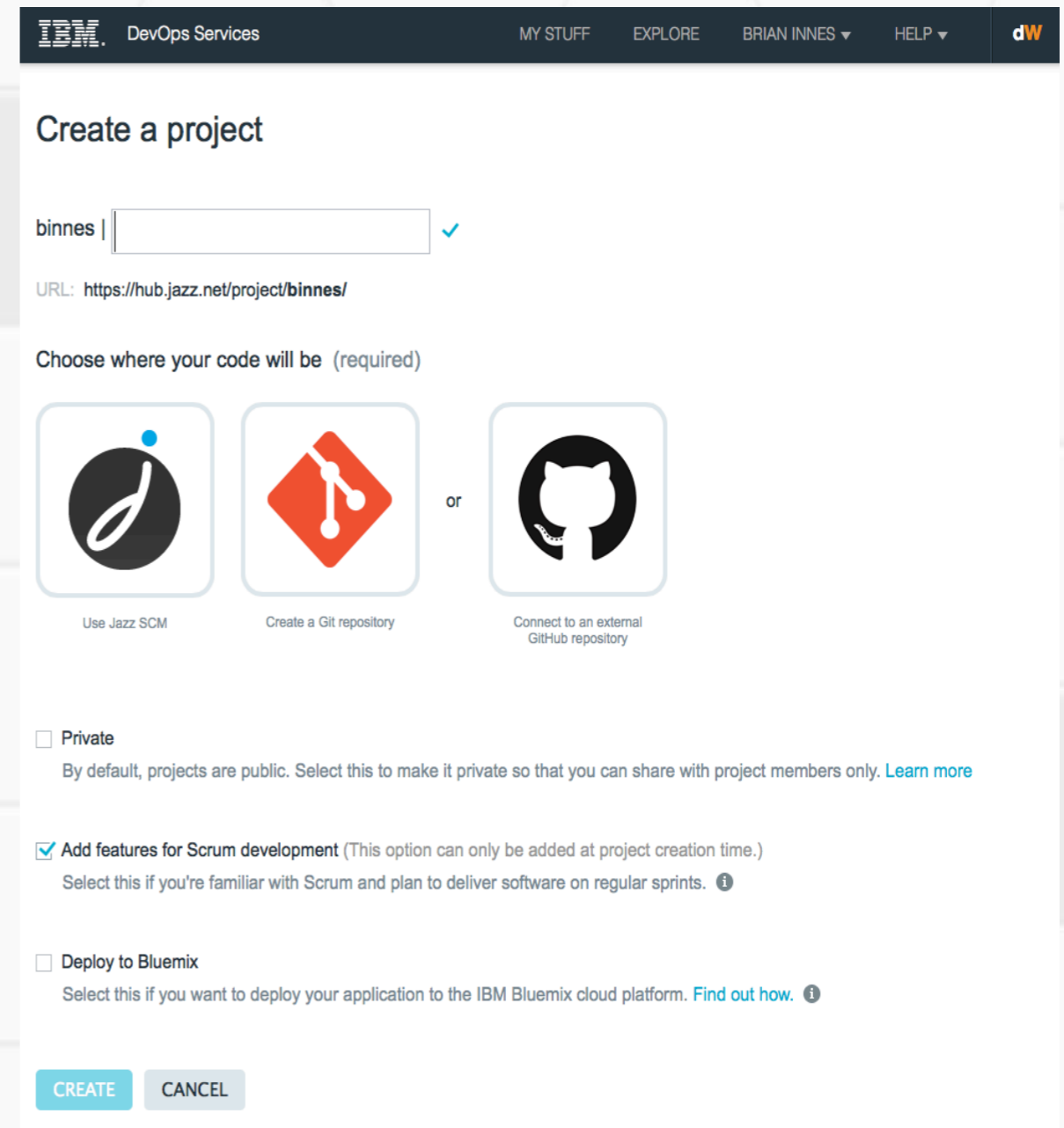


Exercise 4.a

Bluemix integration with DevOps
Services

Get productive with Bluemix™ DevOps Services in minutes

- Register at www.jazzhub.com
- Answer a few questions
 - Which SCM (Git, GitHub, Jazz SCM)?
 - Do you want your project to be public or private?
 - Do you want to practice agile software development?
 - Do you want to deploy on IBM Bluemix?
- Start coding



The screenshot shows the 'Create a project' form in the IBM DevOps Services interface. The form is titled 'Create a project' and includes the following elements:

- Header:** IBM DevOps Services, MY STUFF, EXPLORE, BRIAN INNES, HELP, and a 'dw' logo.
- Project Name:** A text input field containing 'binnes' with a blue checkmark to its right.
- URL:** A text input field containing 'https://hub.jazz.net/project/binnes/'.
- Choose where your code will be (required):** Three options are presented: 'Use Jazz SCM' (with a Jazz SCM logo), 'Create a Git repository' (with a Git logo), and 'Connect to an external GitHub repository' (with a GitHub logo). The 'or' text is placed between the Git and GitHub options.
- Private:** A checkbox labeled 'Private' with a subtext: 'By default, projects are public. Select this to make it private so that you can share with project members only. [Learn more](#)'.
- Add features for Scrum development:** A checked checkbox with a subtext: 'Add features for Scrum development (This option can only be added at project creation time.) Select this if you're familiar with Scrum and plan to deliver software on regular sprints. [i](#)'.
- Deploy to Bluemix:** An unchecked checkbox with a subtext: 'Deploy to Bluemix Select this if you want to deploy your application to the IBM Bluemix cloud platform. [Find out how.](#) [i](#)'.
- Buttons:** 'CREATE' and 'CANCEL' buttons at the bottom.



Collaborate seamlessly on public or private projects

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

IBM DevOps Services MY STUFF EXPLORE BRIAN INNES ▾ HELP ▾ dW

binnes | SentimentAnalysisApp

EDIT CODE TRACK & PLAN BUILD & DEPLOY

About this project (0) Members (1 of 1)

Invite

Branch: master ▾ Git URL

binnes | SentimentAnalysisApp

Last Commit by Brian Innes 9 days ago. checking

Invitations for binnes | SentimentAnalysisApp

Enter email addresses (separated by commas) and click invite.

Emails: Invite

Pending Invitations

There are no pending invitations.

ago	6 KB
ago	1 KB
ago	1 KB
ago	2 KB
ago	1 KB
ago	1 KB
ago	3 KB

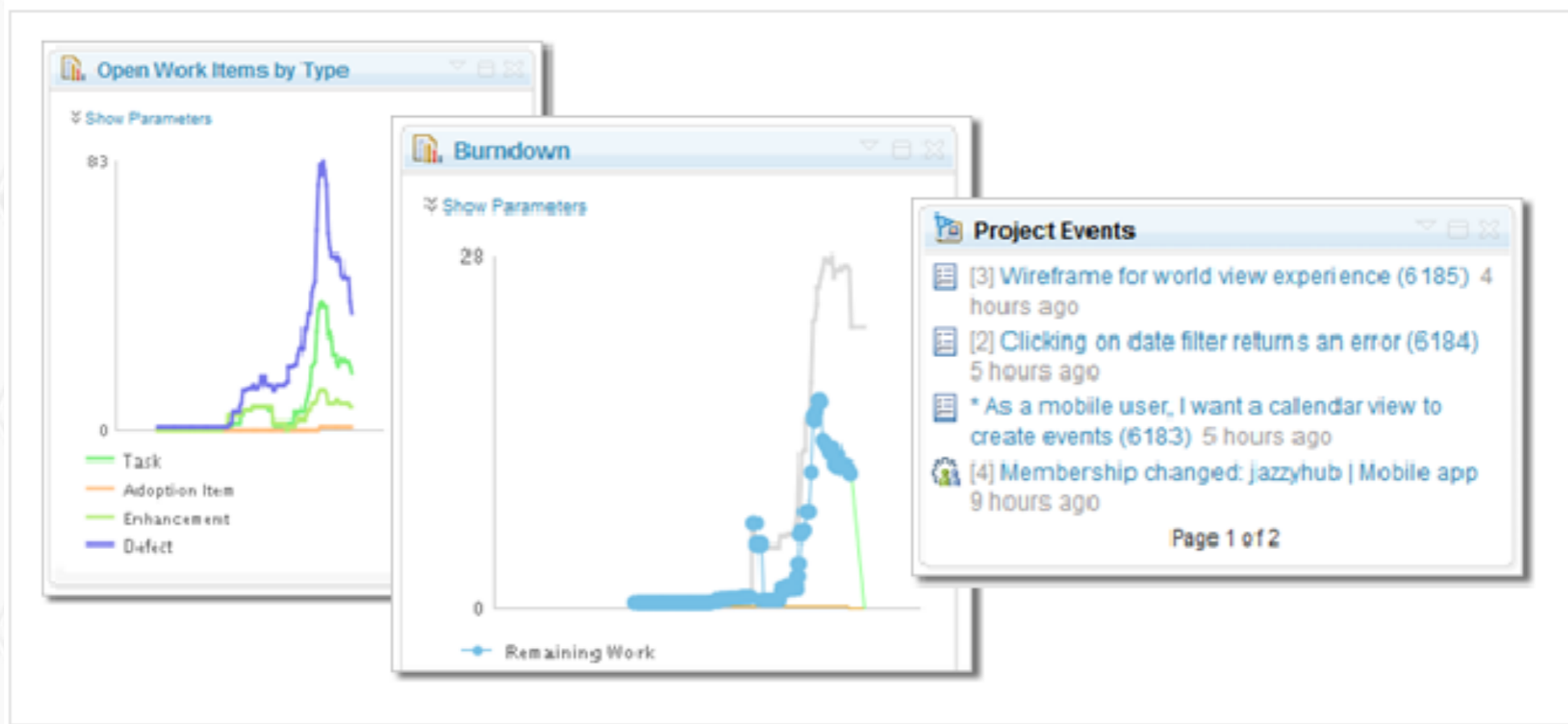
Invite other people to your project

Enter comma separated list of email addresses



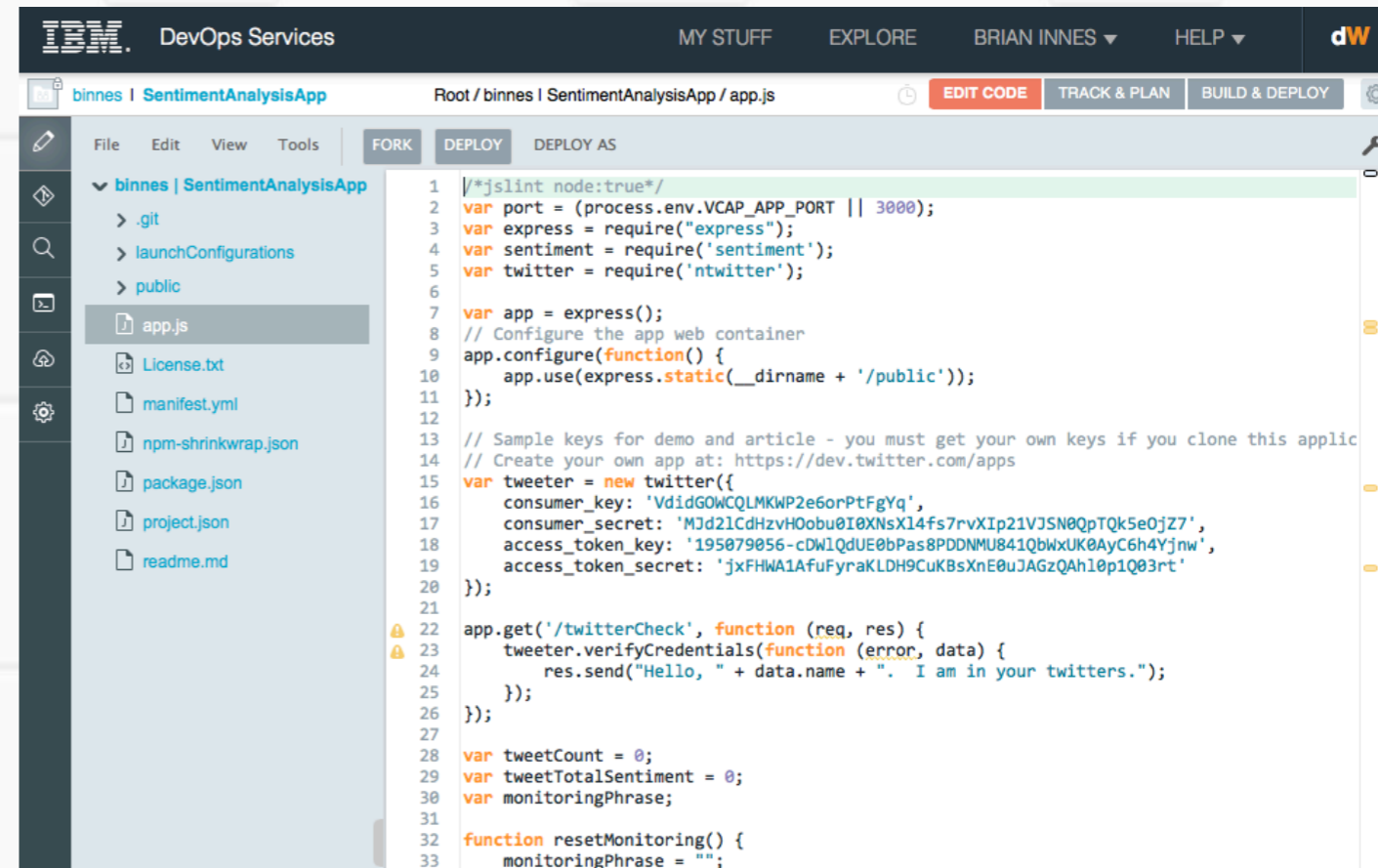
Agile development in the Cloud is easy with Bluemix™ DevOps Services for Bluemix™

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



Choose how you code with Bluemix™ DevOps Services

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



The screenshot shows the IBM Bluemix DevOps Services IDE interface. The top navigation bar includes the IBM logo, 'DevOps Services', and user information 'BRIAN INNES'. The main workspace is divided into a file explorer on the left and a code editor on the right. The file explorer shows a project named 'binnes | SentimentAnalysisApp' with files like 'app.js', 'License.txt', 'manifest.yml', 'npm-shrinkwrap.json', 'package.json', 'project.json', and 'readme.md'. The code editor displays JavaScript code for an Express.js application that uses the 'sentiment' and 'ntwitter' libraries. The code includes configuration for a web container, static file serving, and a route for '/twitterCheck' that verifies credentials and returns a response. The code is as follows:

```
1 /*jshint node:true*/
2 var port = (process.env.VCAP_APP_PORT || 3000);
3 var express = require("express");
4 var sentiment = require('sentiment');
5 var twitter = require('ntwitter');
6
7 var app = express();
8 // Configure the app web container
9 app.configure(function() {
10   app.use(express.static(__dirname + '/public'));
11 });
12
13 // Sample keys for demo and article - you must get your own keys if you clone this applic
14 // Create your own app at: https://dev.twitter.com/apps
15 var tweeter = new twitter({
16   consumer_key: 'VdidGOWCQLMKWP2e6orPtFgYq',
17   consumer_secret: 'MJd2lCdHzvHOobu0I0XNsX14fs7rvXI21VJSN0pTQk5e0jZ7',
18   access_token_key: '195079056-cDWlQdUE0bPas8PDDNMU841QbWxUK0AyC6h4Yjnw',
19   access_token_secret: 'jxFHWA1AfuFyraKLDH9CuKBsXnE0uJAGzQAh10p1Q03rt'
20 });
21
22 app.get('/twitterCheck', function (req, res) {
23   tweeter.verifyCredentials(function (error, data) {
24     res.send("Hello, " + data.name + ". I am in your twitters.");
25   });
26 });
27
28 var tweetCount = 0;
29 var tweetTotalSentiment = 0;
30 var monitoringPhrase;
31
32 function resetMonitoring() {
33   monitoringPhrase = "";
```

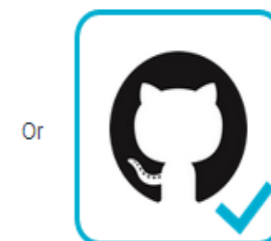
Choose where your code will be



Use Jazz source control hosted at JazzHub



Create a Git repository hosted at JazzHub



Connect to an existing GitHub repository

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





Exercise 4.b

Working in DevOps Services

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

The screenshot shows the 'Explore' page of IBM DevOps Services. The top navigation bar includes the IBM logo, 'DevOps Services', 'MY STUFF', 'EXPLORE' (highlighted), 'BRIAN INNES', 'HELP', and a 'dW' logo. Below the navigation is a search bar with the placeholder text 'Type to search projects'. The main content is divided into three columns: 'Trending', 'Most Active', and 'Activity'. The 'Trending' column lists projects like 'WatsonFilmsDW', 'polls', 'South Island', and 'JazzHub'. The 'Most Active' column lists 'JazzHub', 'OGPC', and 'System_klasyfikacji_skr_zyzowan'. The 'Activity' column shows a list of recent project creations by users like Jerome Clyde Bulanadi, Roberto Pozzi, Harry Eland, Rainald Guentner, Thomas Muschkalski, and Rajendra Barve.





IBM. DevOps Services MY STUFF EXPLORE BRIAN INNES ▾ HELP ▾ dW

Explore




CREATE PROJECT

Type to search projects







Trending

-  [dimascio](#) | [WatsonFilmsDW](#)
Likes (6) Members (2)
0 activities
-  [joelennon](#) | [polls](#)
Likes (56) Members (3)
0 activities
-  [trygst](#) | [South Island](#)
Likes (6) Members (5)
0 activities
-  [srich](#) | [JazzHub](#)
An IBM project focused on improving JazzHub. Our purpose is to gather feedback, bug reports, ideas, and...

Most Active

-  [srich](#) | [JazzHub](#)
An IBM project focused on improving JazzHub. Our purpose is to gather feedback, bug reports, ideas, and...
Likes (67) Members (54)
122 activities
-  [psteinfe](#) | [OGPC](#)
Oregon Game Project Challenge
Likes (4) Members (10)
51 activities
-  [wkulas](#) | [System_klasyfikacji_skr_zyzowan](#)
Likes (4) Members (6)
22 activities

Activity

-  [Jerome Clyde Bulanadi](#) created a new project called [jeromebulanadi](#) | [pt-db-layer-test](#)
2 hours ago
-  [Roberto Pozzi](#) created a new project called [rpozzi](#) | [windfire](#)
2 hours ago
-  [Harry Eland](#) created a new project called [mireina](#) | [TestHBE](#)
3 hours ago
-  [Rainald Guentner](#) created a new project called [rainald](#) | [SAA](#)
4 hours ago
-  [Thomas Muschkalski](#) created a new project called [tmusch](#) | [Project Control Book](#)
4 hours ago
-  [Rajendra Barve](#) created a new project called [rajbarve](#) | [myFirstSampleProject](#)
4 hours ago





Exercise 4.c

DevOps integration with Eclipse

Markdown format – readme.md

```
#Header 1
```

```
Header 1
```

```
=====
```

```
##Header 2
```

```
Header2
```

```
-----
```

```
###Header3
```

```
####Header4
```

```
#####Header5
```

```
#####Header6
```

Header 1

Header 1

Header 2

Header2

Header3

Header4

Header5

Header6



Markdown format – readme.md

using *

- * List item1
- * List item2
- * List item3

using \+

- + List item4
- + List item5
- + List item6

using numbers:

1. List item7
2. List item8
3. List item9

|

using *

- List item1
- List item2
- List item3

using +

- List item4
- List item5
- List item6

using numbers:

1. List item7
2. List item8
3. List item9



Markdown format – readme.md

```
> Indented text  
can also spans multiple lines  
  
>Nested block text also works  
>> Double indented text  
can be used, *in addition* to other markup
```

```
>Like this
```

```
***
```

```
10. This is a list item
```

```
10\. This is not a list item
```

```
***
```

The following create a horizontal line (3 or more astericks, dashes or underscores with optional spaces between them)

```
Option 1 : \* \* \*
```

```
* * *
```

```
Option 2 : \*\*\*
```

```
***
```

```
Option 3 : \-\-\-
```

```
---
```

```
Option 4 : \_\_\_\_\
```

```
_____
```

```
Indented text  
can also spans multiple lines
```

```
Nested block text also works
```

```
Double indented text can be  
used, in addition to other  
markup
```

```
Like this
```

```
1. This is a list item
```

```
10. This is not a list item
```

The following create a horizontal line (3 or more astericks, dashes or underscores with optional spaces between them)

```
Option 1 : * * *
```

```
Option 2 : ***
```

```
Option 3 : ---
```

```
Option 4 : _____
```



Markdown format – readme.md

<pre>Emphasis <i>*strong*</i> or <u>_<i>strong</i>_</u> Strong **strong** or <u>__strong__</u> Code `code` *** ##Inine images and links: ![Alt Text](/path/to/image.jpg) ![Alt Text](/path/to/image.jpg "Optional title") [BBC](http://bbc.co.uk) [](http://bbc.co.uk "Optional Title")</pre>	<p>Emphasis <i>strong</i> or <i>strong</i></p> <p>Strong strong or strong</p> <p>Code <code>code</code></p> <p>////////////////////////////////////</p> <h2>Inine images and links:</h2> <hr/> <p></p> <p></p> <p>BBC</p>
---	---



Markdown format – readme.md

Markdown provides backslash escapes for the following characters:

```
\\    backslash
\`  backtick
\*    asterisk
\_    underscore
\{}    curly braces
\[]   square brackets
\()   parentheses
\#    hash mark
\+    plus sign
\-    minus sign (hyphen)
\.    dot
\!    exclamation mark
```

Note : 2 space characters at the end of a line will cause a line break. Otherwise no line break will appear in the output

```
this line has 2 spaces at the end
this line does not
and should join with this line
```

Markdown provides backslash escapes for the following characters:

```
\ backslash
` backtick
* asterisk
_ underscore
{} curly braces
[] square brackets
() parentheses
# hash mark
+ plus sign
- minus sign (hyphen)
. dot
! exclamation mark
```

Note : 2 space characters at the end of a line will cause a line break. Otherwise no line break will appear in the output

```
this line has 2 spaces at the end
this line does not and should join with this
line
```





Exercise 4.d

Modify the readme.md for your project



IBM Bluemix

Ecosystem Development
Hands on Workshop
Section 5 – Create your app.

Environment Variables

- Bluemix sets environment variables when deploying an application to inform the application about the environment it is running in.
 - Application may need to use this information to set configuration – such as the hostname and port to listen for incoming requests.
 - `VCAP_APP_HOST` – specifies the hostname on which your application should listen
 - `VCAP_APP_PORT` – specifies the port number on which your application should listen
- You can also define custom environment variables to provide configuration to your application





Exercise 5.a

Your first Node.js application

Manifest file

- Allows you to specify the parameters for an application deployment
- manifest.yml file is used at deploy time if found in directory application is being pushed from
- Note: there was a change from v5 to v6 of the cf tool in the way services are handled:
 - V5 could provision applications and services, v6 will only provision the application and bind to an existing service

```
---
applications:
- name: bluemix-todo-node
  host: bluemix-todo-node-#{random-word}
  command: node app.js
  memory: 128M
  services:
  - todo-db
```

```
---
applications:
- name: Myphpmyadmin
  memory: 128M
  instances: 1
  host: Myphpmyadmin
  path: .
  buildpack: https://github.com/dmikusa-pivotal/cf-php-build-pack.git
  services:
  - mysql_BlueMixLab
```

<http://docs.cloudfoundry.org/devguide/deploy-apps/manifest.html>





Exercise 5.b

Working with Node using Eclipse

package.json

- package.json is used to define a node project.
- It specifies project dependencies and can also specify the command to start the project and run project tests.
- Name and Version are the only mandatory fields

```
{  
  "name": "insert-title-here",  
  "version": "0.0.1",  
  "description": "Insert description here",  
  "scripts": {  
    "start": "node app.js"  
  }  
}
```

```
{  
  "name": "Node-CacheApp",  
  "version": "0.0.1",  
  "description": "A sample nodejs app using Elastic Caching Service for Bluemix",  
  "scripts": {  
    "start": "node app.js"  
  },  
  "dependencies": {  
    "express": "3.2.6",  
    "ejs": "*",  
    "querystring": "0.2.0"  
  },  
  "engines": {  
    "node": "0.10.26"  
  },  
  "repository": {}  
}
```

<https://www.npmjs.org/doc/files/package.json.html>





Exercise 5.c

Working with Node using
DevOps Services

.cignore

- When you push an application all content of the root directory and all sub directories are pushed to the server – this is not the behavior you always want
- .cignore allows control of what is sent to the server by listing the files and directories you do not want to send to the server
- Sample .cignore file:

```
.git  
node_modules  
tmp  
lib-src
```





Exercise 5.d

Selecting files to include in your application

Summary

- Use the `manifest.yml` file to specify how to deploy your application
- Use `.cfignore` to determine what should be included with your application



Summary for Node.js runtime

- Listen on host and port specified in environment variables:

```
var port = (process.env.VCAP_APP_PORT || 3000);  
var host = (process.env.VCAP_APP_HOST || 'localhost');
```

- Find out details of bound services using VCAP_SERVICES environment variable:

```
if (process.env.VCAP_SERVICES) {  
  var env = JSON.parse(process.env.VCAP_SERVICES);  
  psql = env['postgresql-9.1'][0].credentials;  
}
```

- Use package.json to fully define you node environment and package requirements:

```
{  
  "name": "myapp",  
  "description": "this is my app",  
  "version": "0.1",  
  "engines": {"node": "0.10.26"},  
  "scripts": {"start": "node app.js"},  
  "dependencies": {"async": "~0.8.0", "express": "4.2.x"}  
}
```

- **npm install** will automatically run when app is staged



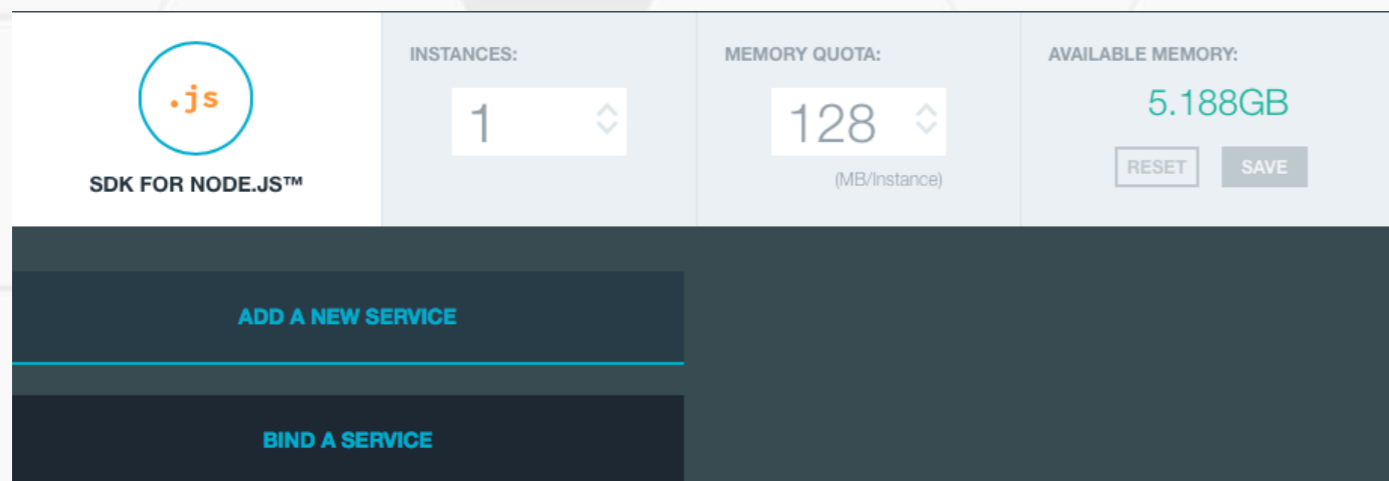


IBM Bluemix

Ecosystem Development
Hands on Workshop
Section 6 - Services

Using services in Bluemix

- Bluemix provides services that can be used by applications without requiring you to manage the setup and operation of those services
- Available services are listed in the catalog in the Web UI and can also be obtained using `cf marketplace`.
- You need to bind a service to your application to get use of the service using Web UI or `cf bs`.



The screenshot displays the Bluemix Web UI configuration page for the 'SDK FOR NODE.JS™' service. The interface includes a header with the service icon and name, and a main configuration area with the following details:

INSTANCES:	MEMORY QUOTA:	AVAILABLE MEMORY:
1	128 (MB/Instance)	5.188GB

Below the configuration area, there are two buttons: 'ADD A NEW SERVICE' and 'BIND A SERVICE'.



Accessing a service

- When you bind a service to your application Bluemix will add details about the service to an environment variable `VCAP_SERVICES`.
- `VCAP_SERVICES` can be inspected in the web UI
- Applications should parse `VCAP_SERVICES`.

Environment Variables

VCAP_SERVICES USER-DEFINED

```
{
  "mysql-5.5": [
    {
      "name": "mysql_BlueMixLabA_BI",
      "label": "mysql-5.5",
      "plan": "100",
      "credentials": {
        "name": "d9e81fde10aa1477894121071bf439645",
        "hostname": "50.23.230.134",
        "host": "50.23.230.134",
        "port": 3307,
        "user": "uA7G9UpIweRYk",
        "username": "uA7G9UpIweRYk",
        "password": "pH2tS0hPtkzdL",
        "uri": "mysql://uA7G9UpIweRYk:pH2tS0hPtkzdL@50.23.230.134:3307/d9e81fde10aa1477894121071bf439645"
      }
    }
  ]
}
```





Exercise 6.a

Adding a service to an application

Parsing VCAP_SERVICES

- **Node**

```
if (process.env.VCAP_SERVICES) {  
  var env = JSON.parse(process.env.VCAP_SERVICES);  
  var credentials = env['mysql-5.5'][0].credentials;  
  ...  
}
```

- **Ruby**

```
mysql_dbs = JSON.parse(ENV['VCAP_SERVICES'])["mysql-5.5"]  
credentials = mysql_dbs.first["credentials"]
```

- **Java**

```
String vcap_services = System.getenv("VCAP_SERVICES");  
if (vcap_services != null && vcap_services.length() > 0) {  
  JsonRootNode root = new JdomParser().parse(vcap_services);  
  JsonNode mysqlNode = root.getNode("mysql-5.5");  
  JsonNode credentials = mysqlNode.getNode(0).getNode("credentials");  
  ...  
}
```

- Note Java buildpack parses VCAP_SERVICES and can auto configure bound services – see [Bluemix Liberty for Java documentation](#)

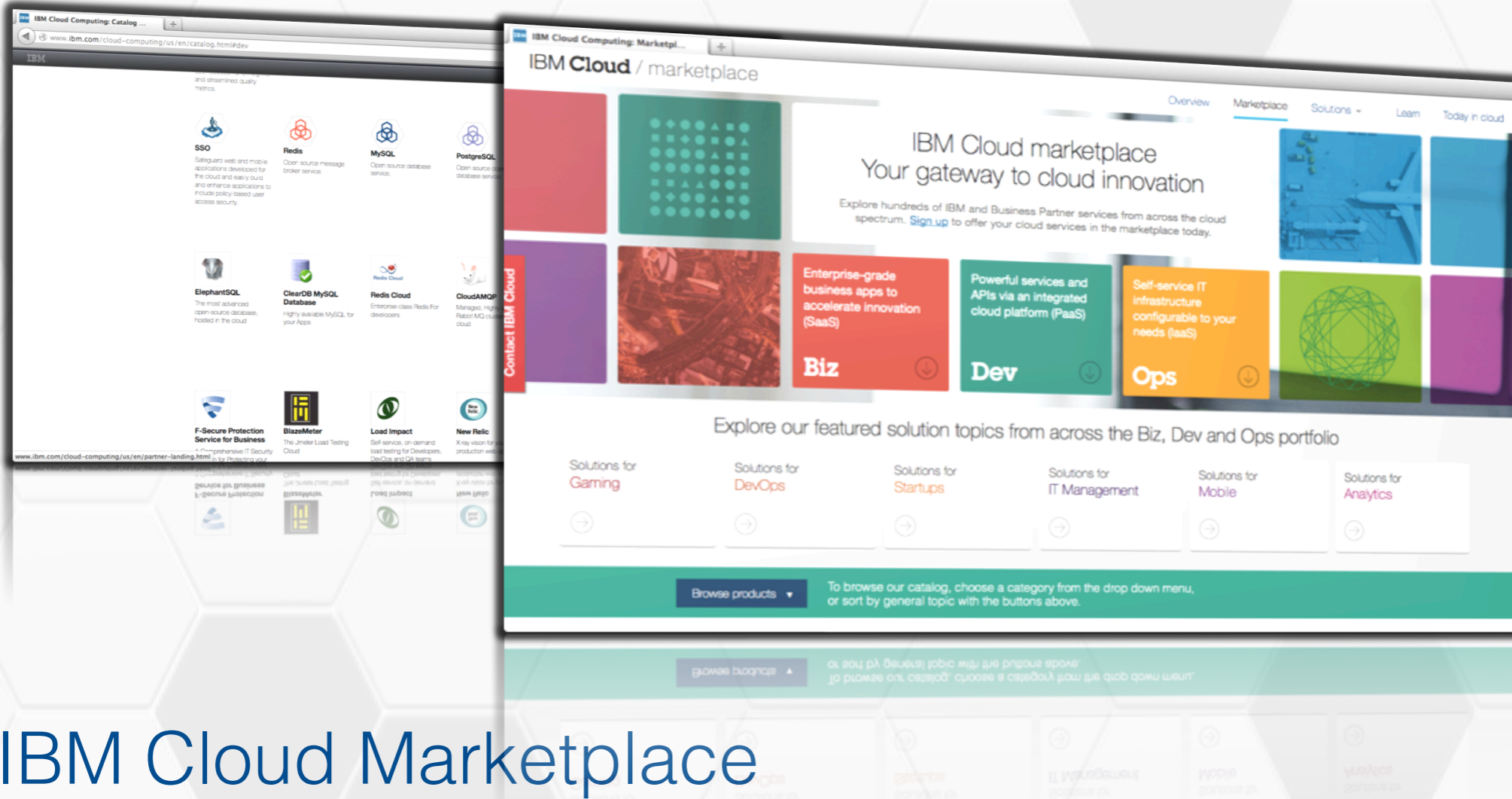


Become a service provider

- In addition to consuming services it is possible to create new services on Bluemix
 - Private services are only available to your organisation
 - `cf cups biTestService -p "host, port, username, password"`
 - Public services, that can become an additional revenue stream, can only be added through the IBM Cloud Marketplace



Partner cloud services in the IBM Cloud Marketplace

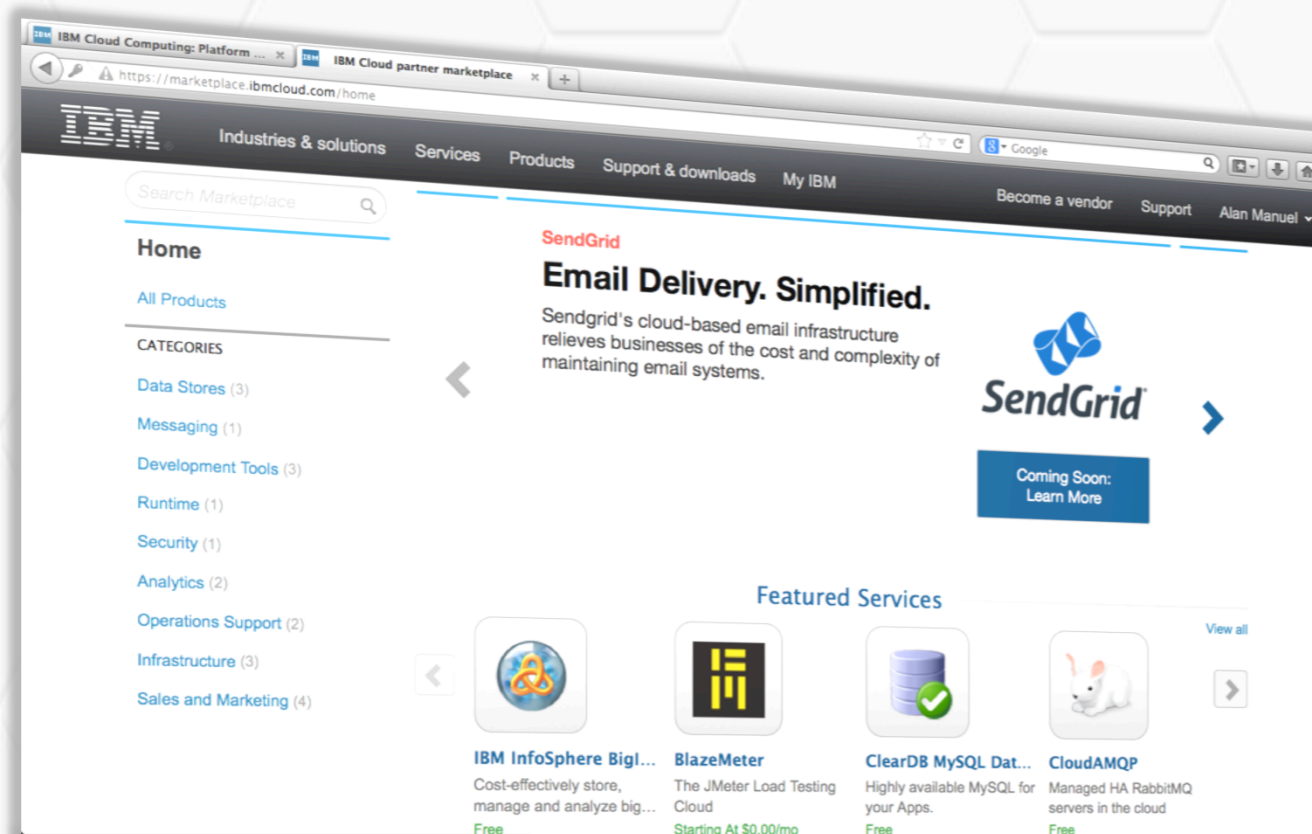


IBM Cloud Marketplace

Is a dedicated area on ibm.com/cloud for IBM customers to discover enterprise cloud services that run on or are deployable to SoftLayer or integrated with Bluemix and are available from IBM partners.



New Way for Partners



Participation in the IBM Cloud marketplace is by nomination. Get started now at ibm.biz/newway4partners

Customers discover our Business Partner cloud services:

- by Biz/Dev/Ops role,
- by Solution,
- in a dedicated area

Business Partner services are:

- appropriate for the enterprise cloud buyer
- run on or deployable to SoftLayer, or integrated with Bluemix
- support key Solutions (mobile, devops, analytics...)
- offered under a standard contract with IBM

Premium features are available for services that take advantage of:

- Bluemix (Cloud Foundry)
- PureApplication Service (Patterns)
- High performance analytics

Business Partners services as trial only today. Commercial later in 2014 (US).



Business Partners are qualified to participate in IBM Cloud marketplace

Services:

- run on or be deployable to SoftLayer, integrate with an IBM premium platform service,* or integrate with or extend our SaaS offerings*
- Are enterprise class, in production and supporting paying customers
- align to IBM strategic imperatives

And are offered by Business Partners who:

- are based in or have affiliates in the following countries: US, UK, Ireland, Germany, Switzerland, France, Hungary, Denmark, Spain, Israel, Australia, New Zealand, Norway, and Finland (non-US business partner services must run in data centers outside of the US)
- must offer at least one priced edition, with a 30 day trial period.**
- integrate into the IBM Cloud marketplace APIs for provisioning within 90 days of signing the agreement
- meet IBM procurement requirements of basic business viability
- agree to the terms in the Marketplace Business Partner Agreement

*Will require additional IBM review, up to 4 – 6 weeks, as services for IBM premium platform services must meet specific criteria which could include additional technical integration and/or certification. See IBM premium platform services in later slide.

**Offerings in IBM Bluemix must additionally have perpetual service defined free tier





Exercise 6.b

Creating a user-provided service

Summary

- `VCAP_SERVICES` allows your application to discover bound services and how to access the service
- Bluemix allows new services to be added via the IBM Cloud Market Place
- Softlayer can be used to host services
- User-provided services (private to an organisation) can be created - accessed the same way as a Bluemix provided service.



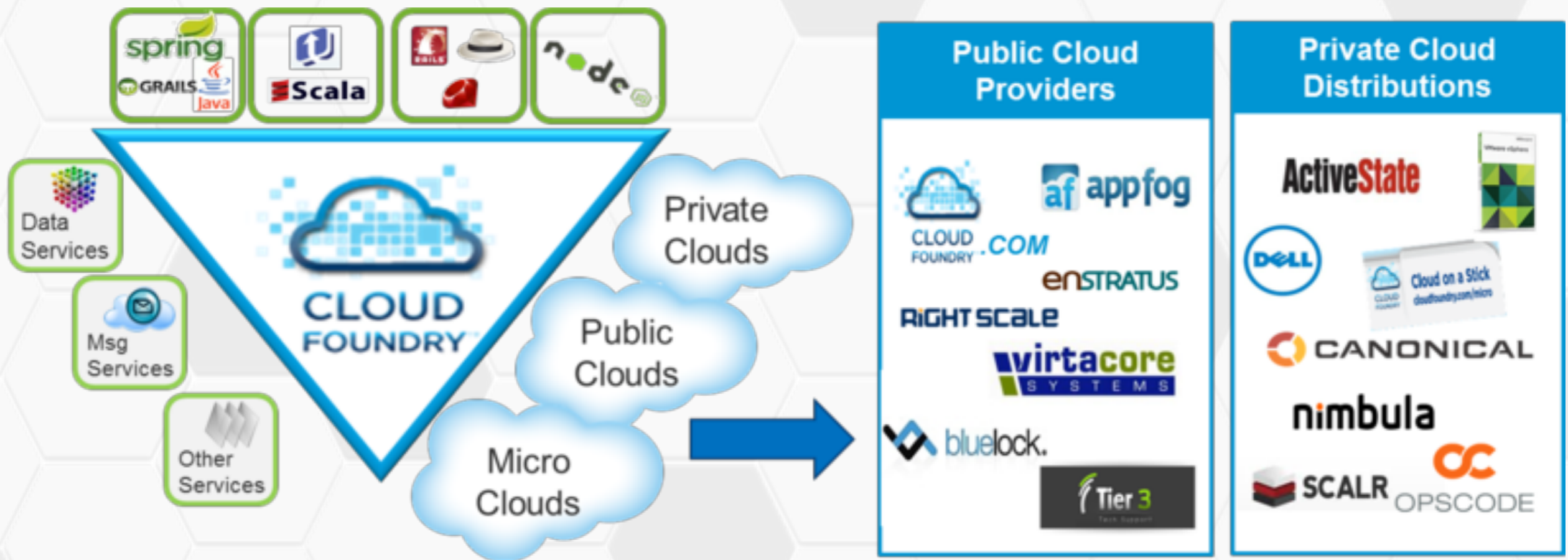


IBM Bluemix

Ecosystem Development
Hands on Workshop
Section 7 – How it works

What is 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

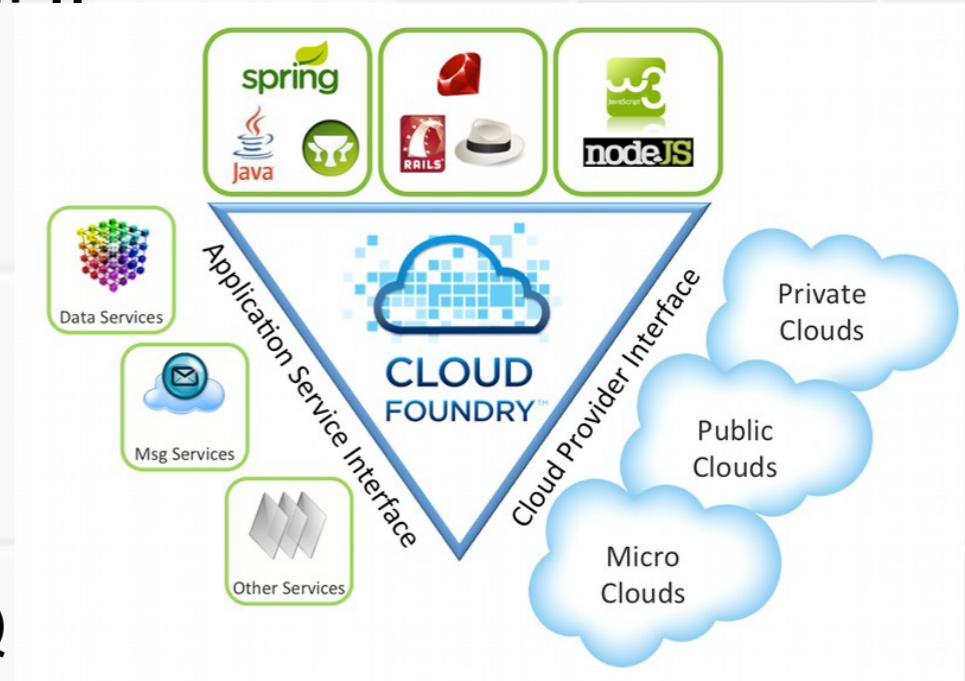
Rails, Sinatra, Spring, Grails, Express, Lift

❖ Multi-Services

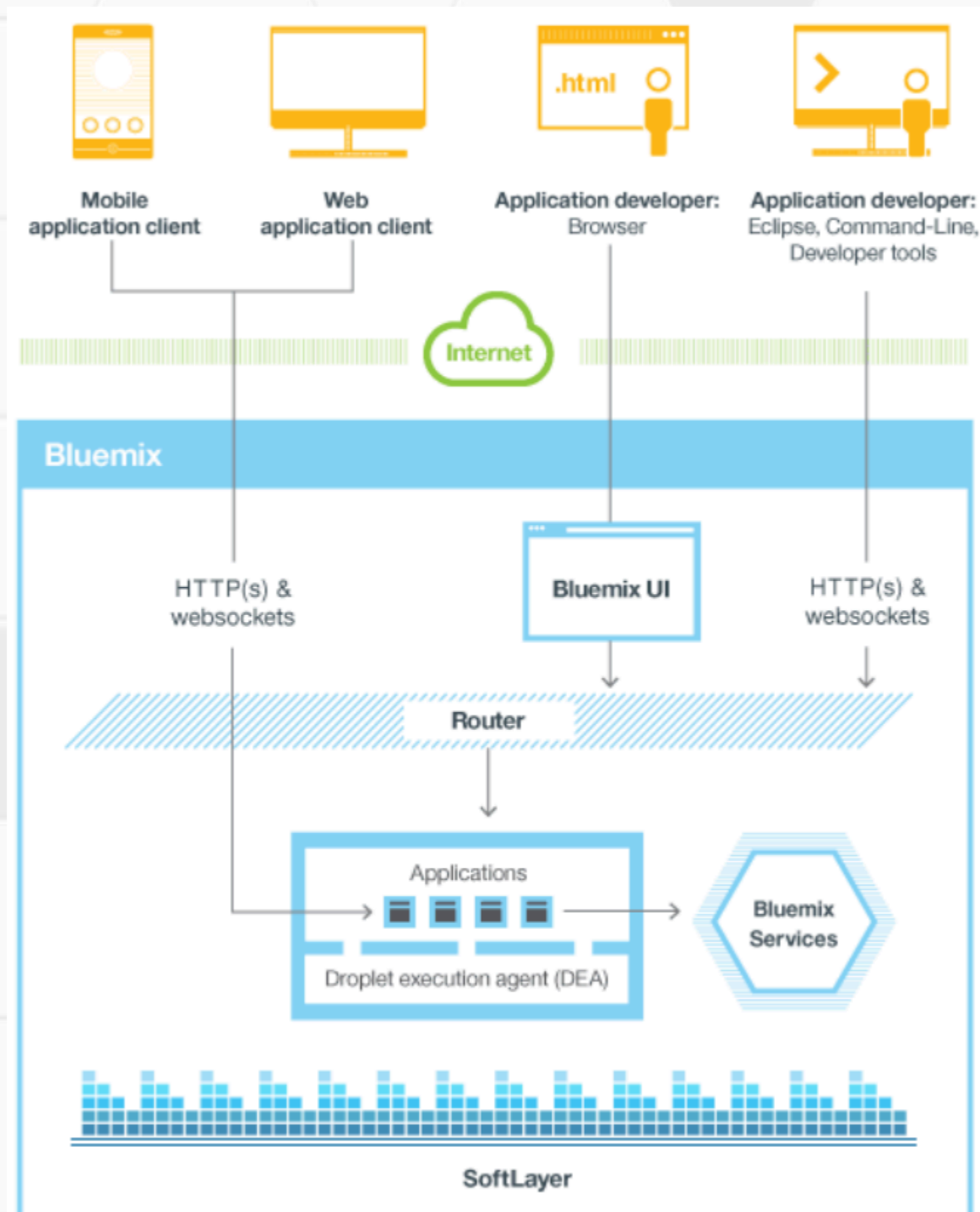
MySQL, Postgres, MongoDB, Redis, RabbitMQ

❖ Multi-Cloud, Multi-iaaS

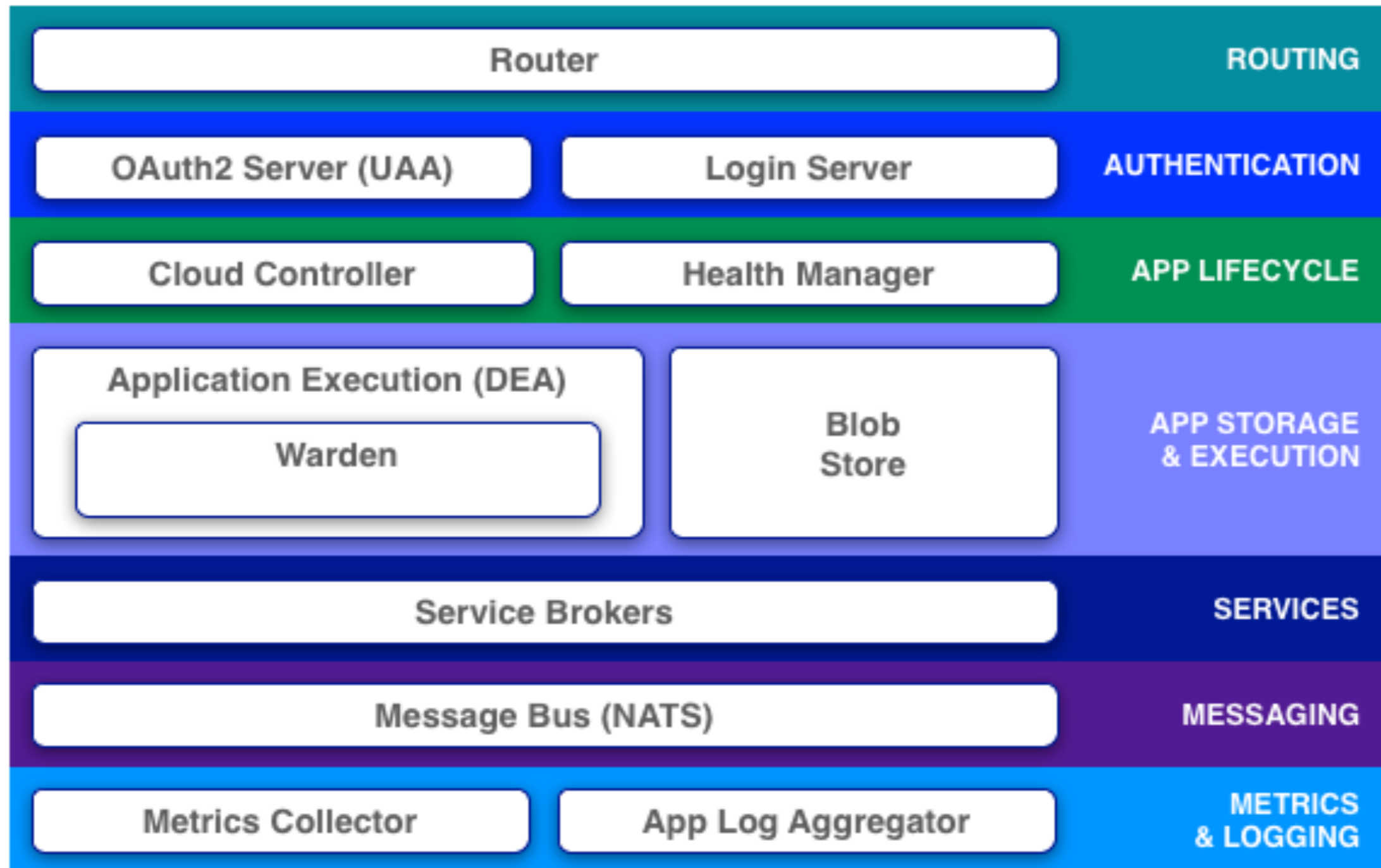
Public Cloud, MicroCloud, Private Cloud



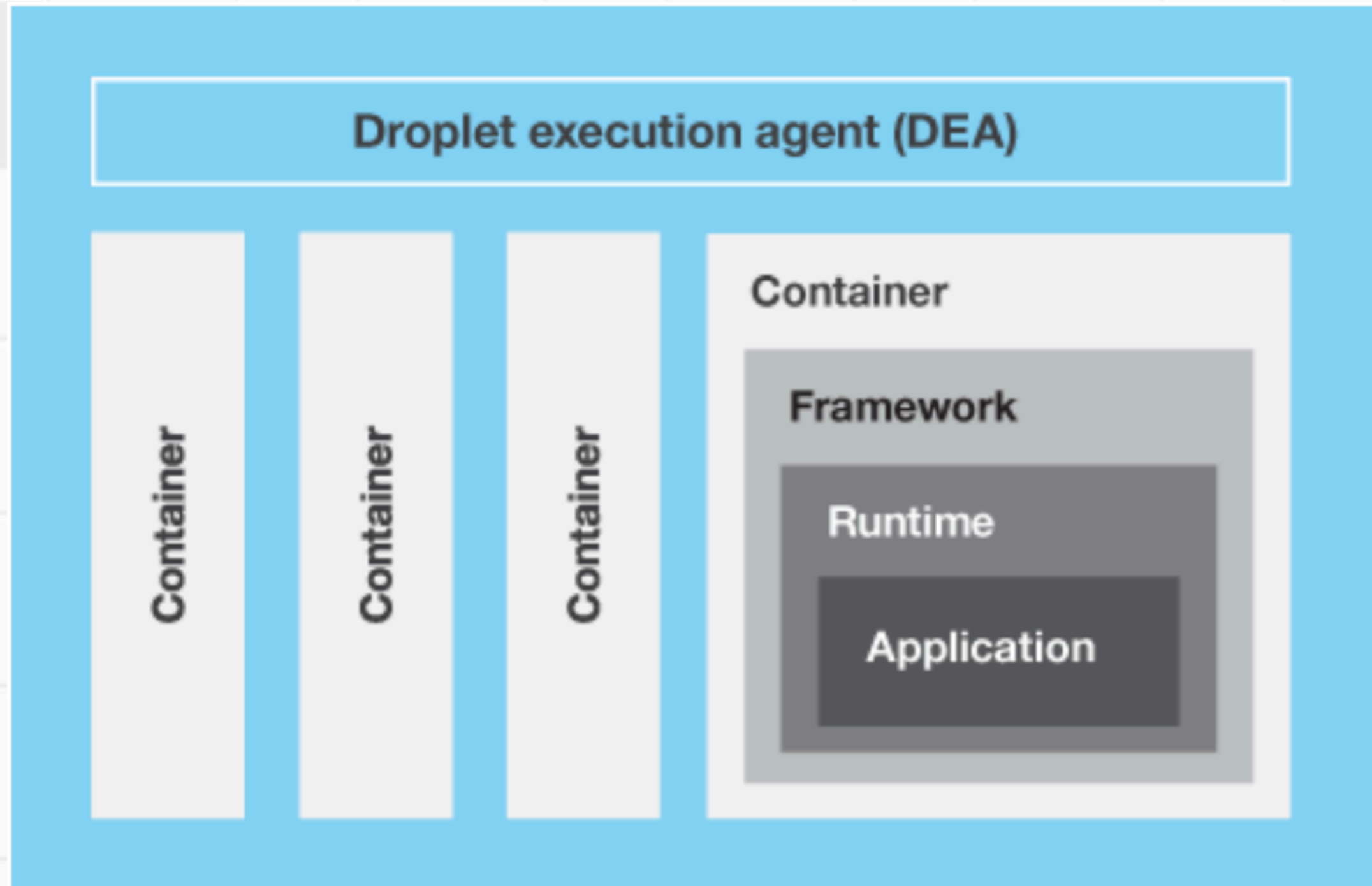
Bluemix Architecture



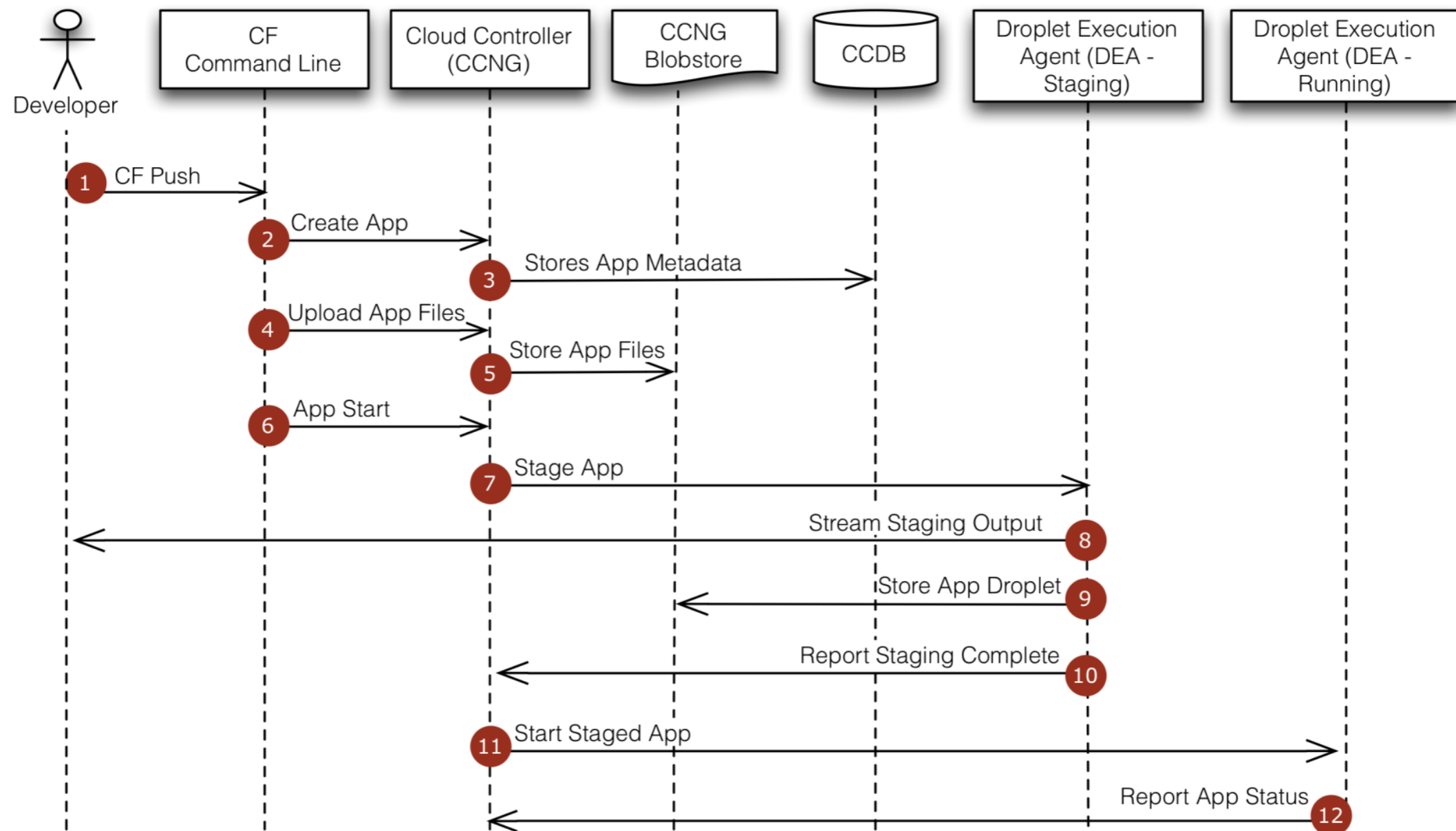
Cloud Foundry Kernel Internal



Design of a VM



Cloud Foundry - Application Staging



Choosing the runtime for an application

- If you don't specify a runtime when deploying an application Bluemix will try to find a suitable runtime
 - Each pre-defined runtime has a position set and runtimes are tried in ascending position order
 - Bluemix asks each runtime, starting with runtime at position 1, if they can run the application
 - First runtime that responds it is able to run the application is used
 - If no runtime can run the application an error is returned
- At deploy time you can specify the runtime to use



Buildpacks

- Buildpacks provide the framework and runtime support for your application
- They will determine if they can run your application as part of the ‘autodetect’ mechanism Bluemix uses when you push an application
- You can control which platform provided buildpack your application should use or specify an external buildpack to be used to run your application = “Bring your own Buildpack”



Specifying a buildpack

- CLI allows you to specify which buildpack to use when deploying your application using the `'-b'` options with `'cf push'`.
- Can specify the name of an internal buildpack or provide the URL for an external buildpack
- `'cf buildpacks'` shows the installed internal buildpacks available:

buildpack	position	enabled	locked	filename
<code>noop-buildpack</code>	3	true	false	<code>noop-buildpack-20140311-1519.zip</code>
<code>java_buildpack</code>	4	true	false	<code>java-buildpack-v2.1.2.zip</code>
<code>ruby_buildpack</code>	5	true	false	<code>buildpack_ruby_v46-245-g2fc4ad8.zip</code>
<code>nodejs_buildpack</code>	6	true	false	<code>buildpack_nodejs_v8-177-g2b0a5cf.zip</code>
<code>liberty-for-java_v1-1-20140725-1341</code>	7	true	false	<code>buildpack_liberty-for-java_v1.1-20140725-1341.zip</code>
<code>sdk-for-nodejs_v1-1-20140717-1447</code>	8	true	false	<code>buildpack_sdk-for-nodejs_v1.1-20140717-1447.zip</code>
<code>sdk-for-nodejs</code>	2	true	false	<code>buildpack_sdk-for-nodejs_v1.3-20140821-1143.zip</code>
<code>liberty-for-java</code>	1	true	false	<code>buildpack_liberty-for-java_v1.3-20140818-1538.zip</code>

- `cf push myApp -b nodejs_buildpack`
- `cf push myApp -b https://github.com/dmikusa-pivotal/cf-php-build-pack.git`

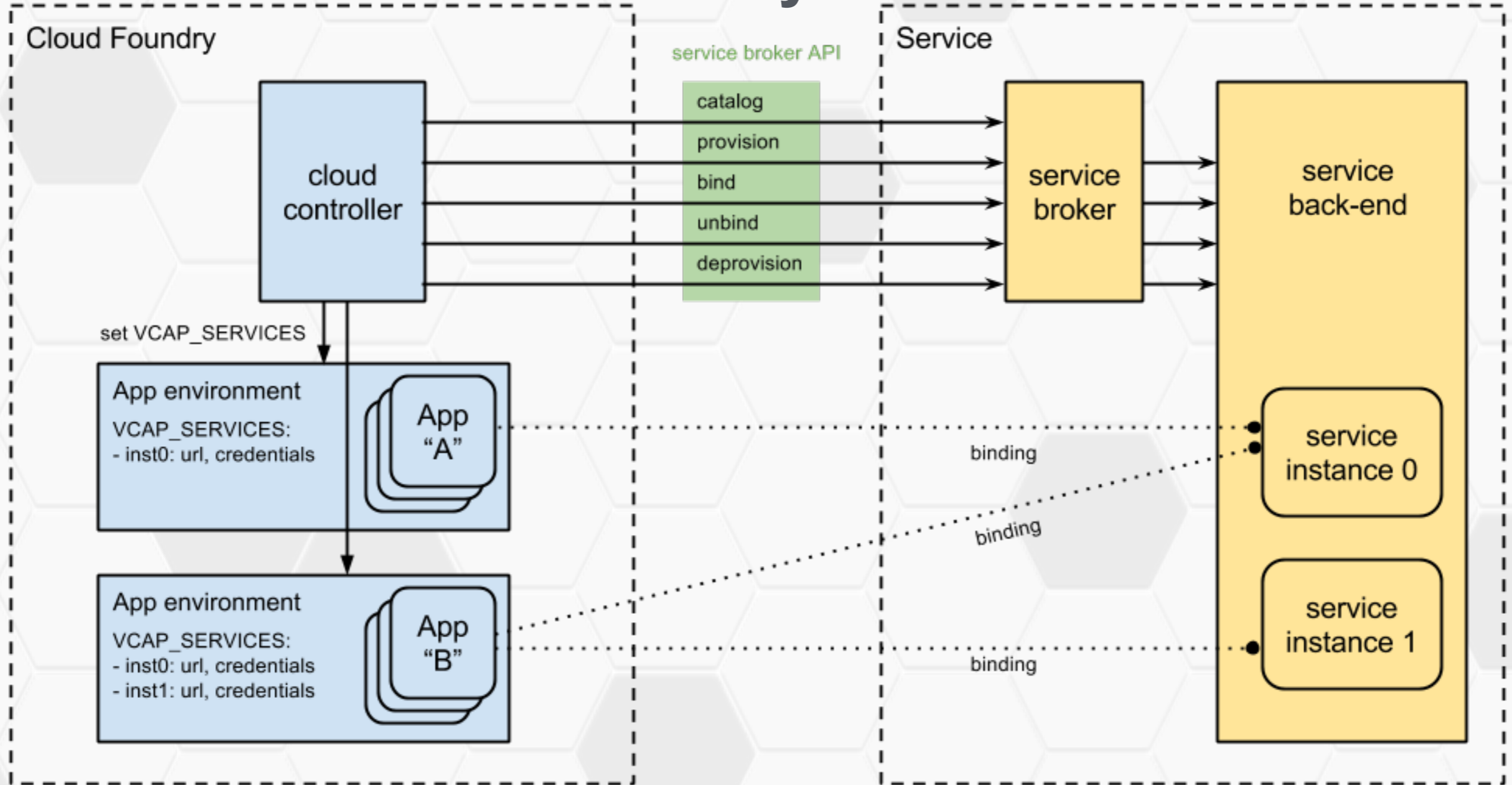




Exercise 7.a

Specifying a buildpack when
deploying an application

Cloud Foundry - Services





IBM Bluemix

Ecosystem Development
Hands on Workshop
Section 8 – Developing for the
cloud

Create apps quickly with prebuilt services

A full range of capabilities to suit any great idea.

Choice

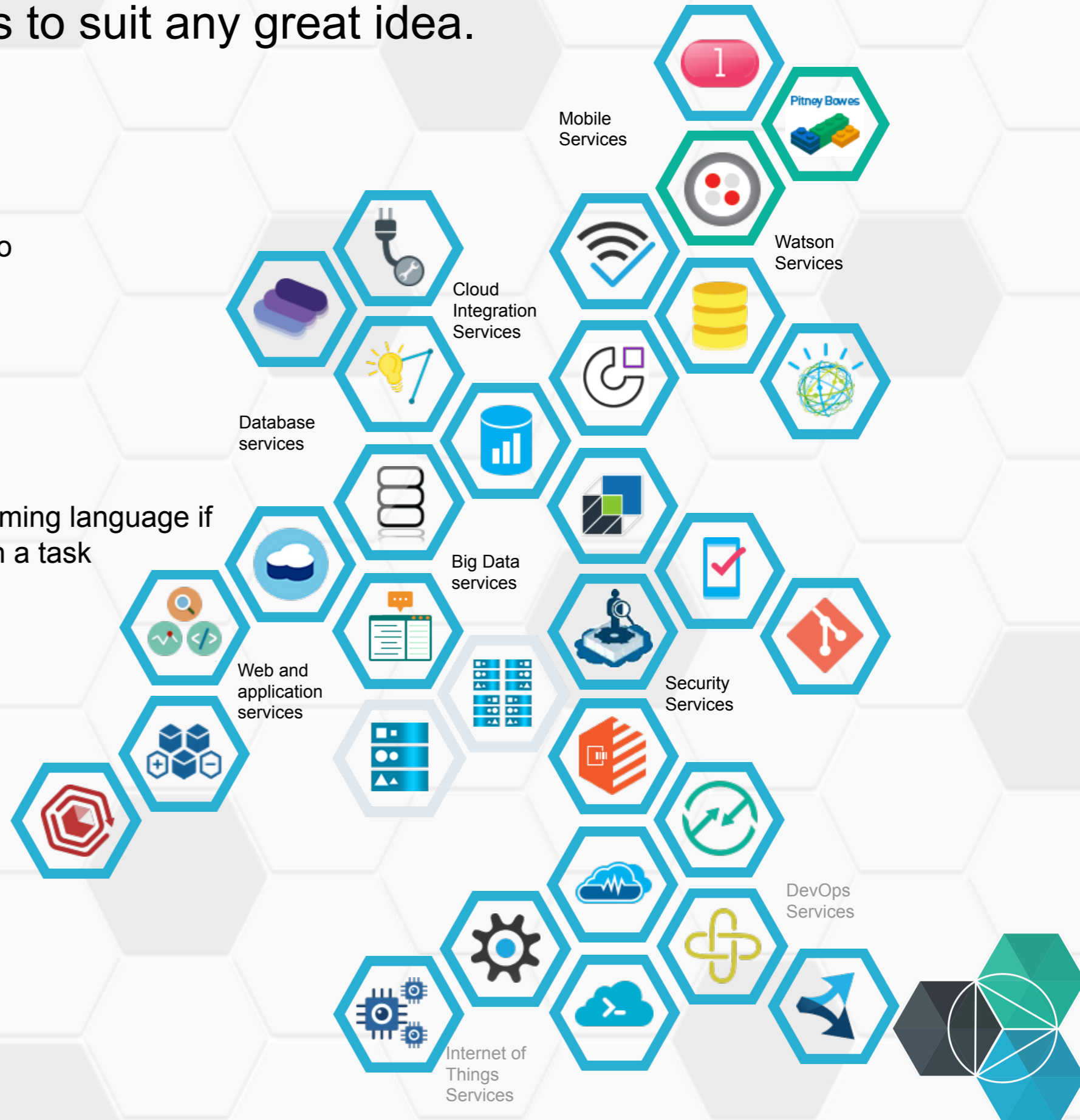
- Runtimes, services, and tooling up to you

Polyglot programming

- Best tool for the job
- No need to stick to a single programming language if it doesn't make it easy to accomplish a task

Service composability

- Adopt micro-service architecture



9 rules for cloud applications

1. Don't code your application directly to a specific topology
2. Don't assume the local file system is permanent
3. Don't keep session state in your application
4. Don't log to the file system
5. Don't assume any specific infrastructure dependency
6. Don't use infrastructure APIs from within your application
7. Don't use obscure protocols
8. Don't rely on OS-specific features
9. Don't manually install your application

Read the article : http://www.ibm.com/developerworks/websphere/techjournal/1404_brown/1404_brown.html



Integrate with your on-premise applications

Securely connect to and leverage data from your existing systems.



Secure Connector



API from On-Premise



Cast Iron Integration



Data Orchestration
(Future)



Embedded Private
API Catalog
(Future)

The screenshot shows the 'Create an API' interface in IBM API Manager. The page title is 'Create an API'. Below the title, there is a description for the API: 'Customer Address' and 'This API provides access to on-premise data, specifically a lookup of the address where a customer purchase was made.' Under the 'Resources' section, there is a dropdown menu set to 'Get' and a resource named 'Get store address Version 1'. A description for this resource states: 'This will retrieve the store address where the customer's purchase was made'. Below this, there is a table of parameters:

Parameter	Type	Required
address_id	String	<input checked="" type="checkbox"/> Yes
customer_id	Integer	<input checked="" type="checkbox"/> Yes
extra_info	String	<input type="checkbox"/> No

Below the table, there is a link 'Add another parameter'. Underneath, there are sections for 'Request Code' and 'Response Code'. The 'Request Code' section contains a JavaScript function:

```
function (requestNumber, value, exception) {  
  if (value) {  
    processResponse(value);  
  } else {  
    processError(exception);  
  }  
}
```

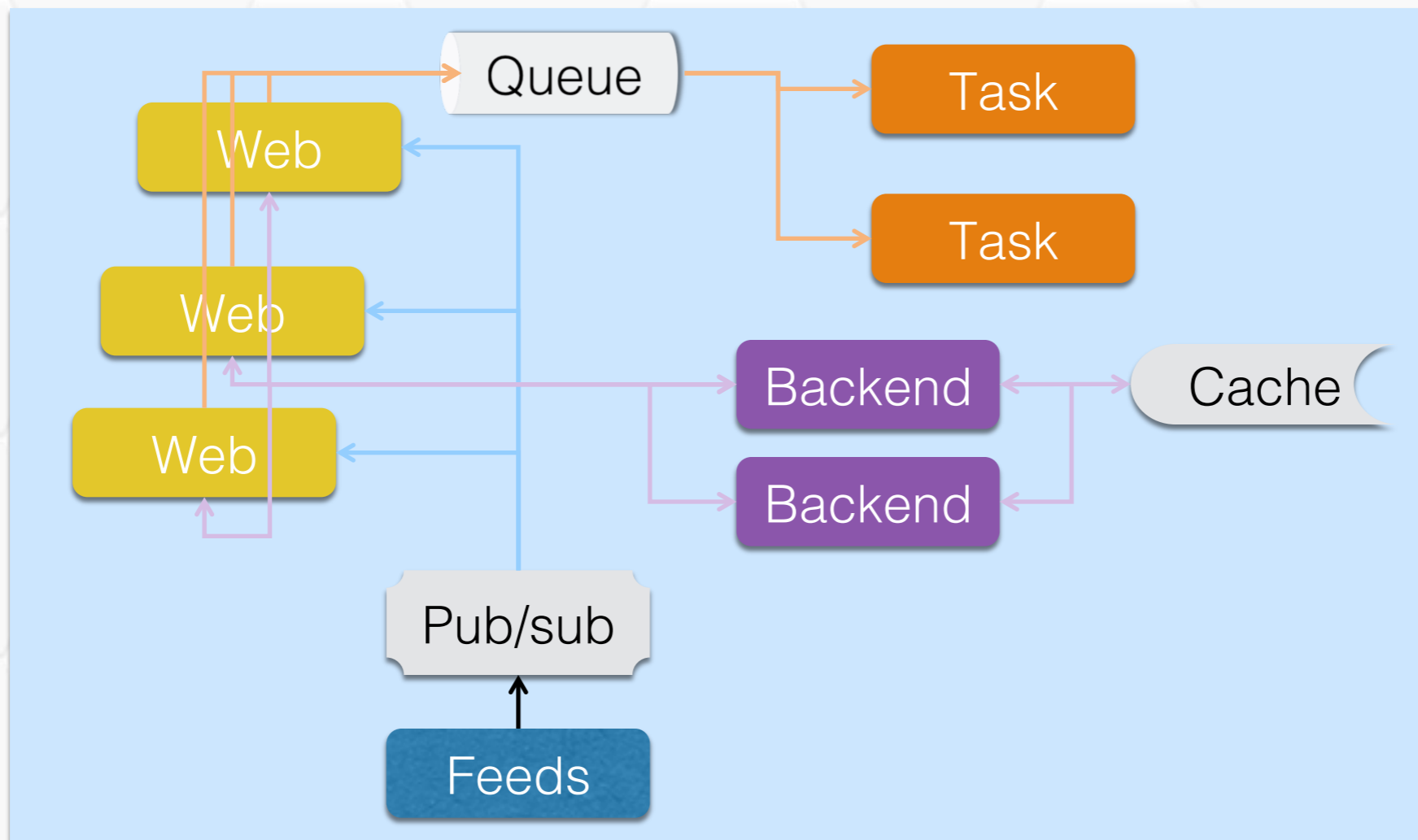
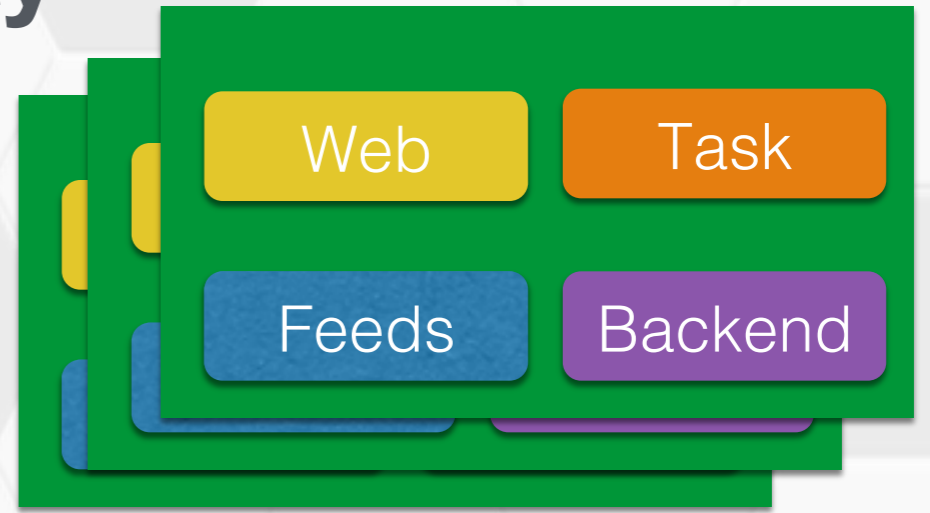
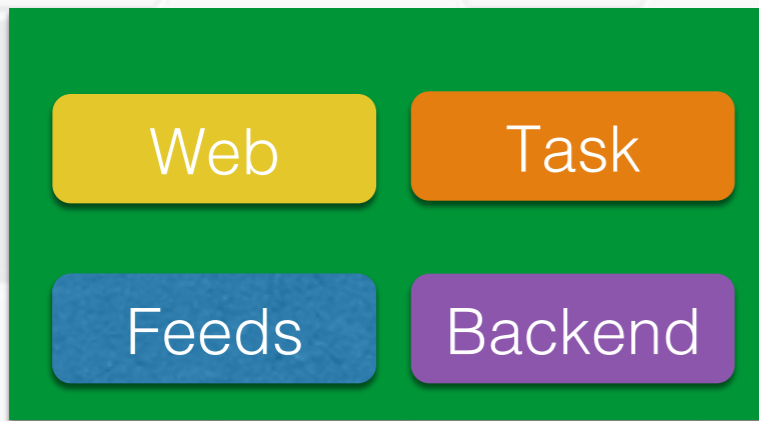
The 'Response Code' section contains a JSON object:

```
{  
  "status_code": 200,  
  "status_txt": "OK",  
  "data" : ...  
}
```

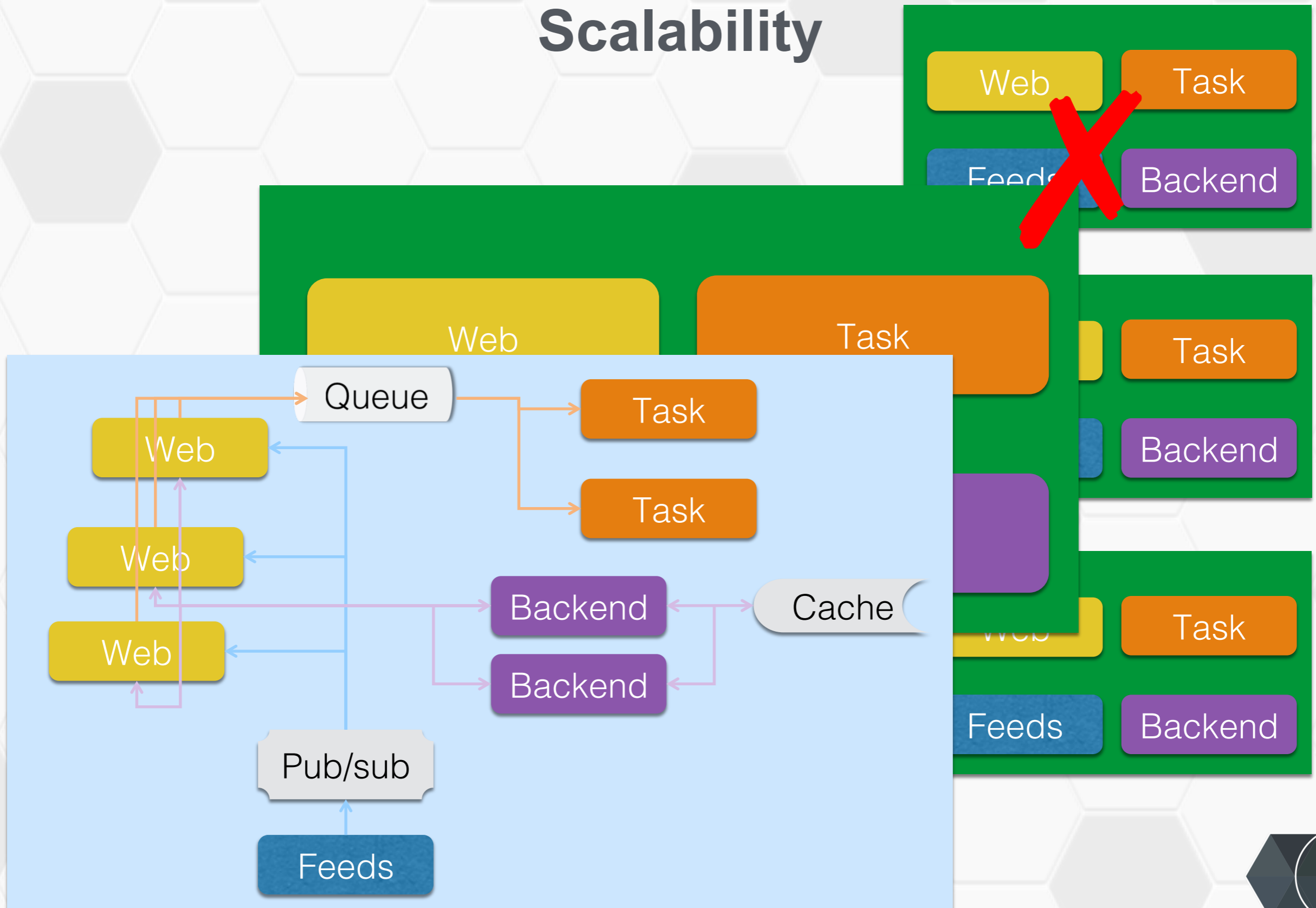
At the bottom of the interface, there are two buttons: 'Cancel' and 'Create API'.



Scalability



Scalability



Links

- [Top 9 rules for Cloud Applications](#)
- [Build highly scalable applications with Node.js and Redis](#)
 - **watch** [Building Highly Scalable Application for Bluemix](#)
- [What are Micro-services](#)



Backup

- **Amazon** (from a conversation with CTO Werner Vogels, 2006 - <http://queue.acm.org/detail.cfm?id=1142065>)
 - The big architectural change that Amazon went through in the past five years was to move from a two-tier monolith to a fully-distributed, decentralized, services platform serving many different applications
 - If you hit the Amazon.com gateway page, the application calls more than 100 services to collect data and construct the page for you.

