

## Enterprise Computing: Exercise 1 – Tools, Accounts & Tasks

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# Agenda

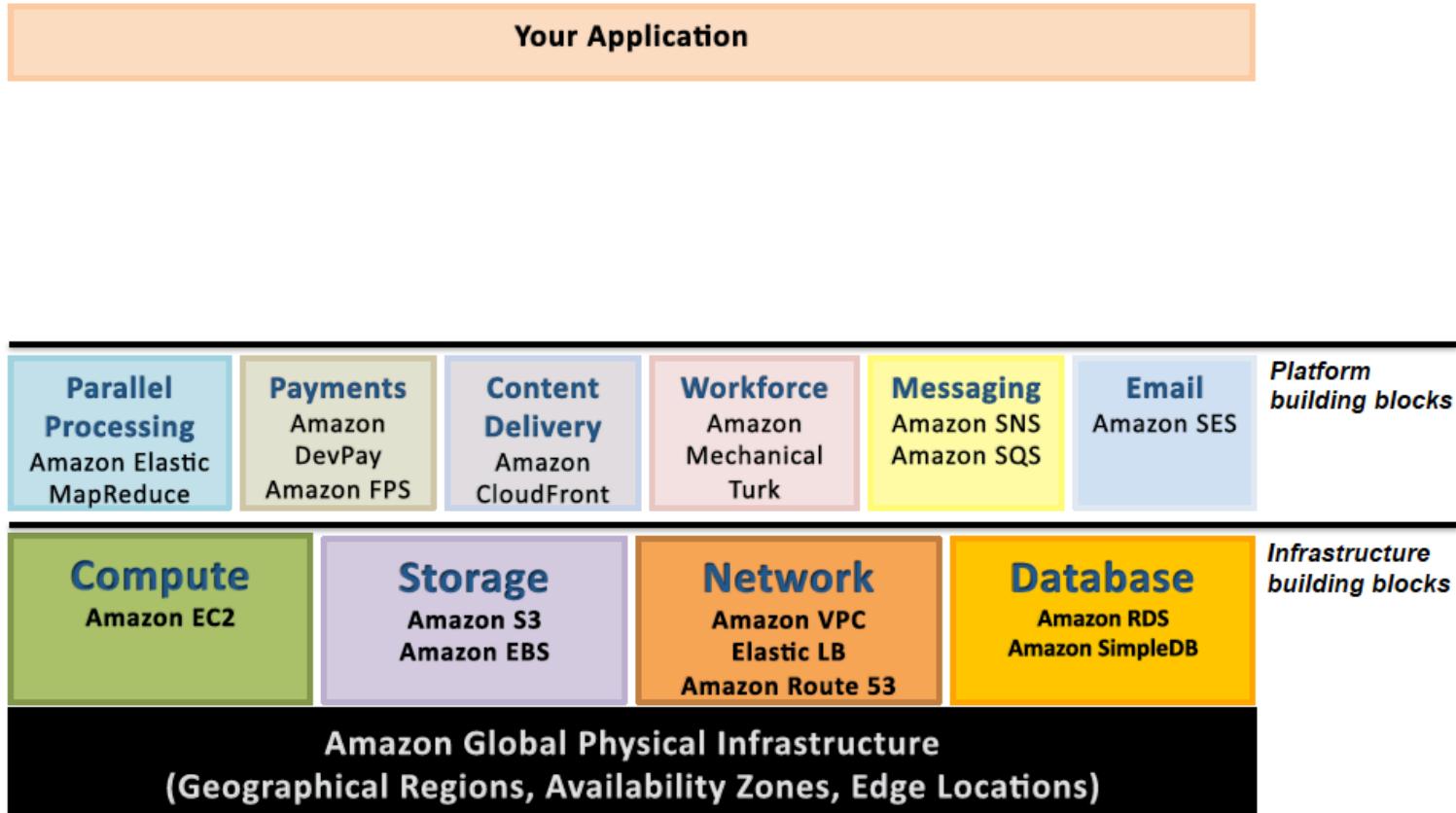
AWS

Bluemix

Git

Postman

Exercise



<https://aws.amazon.com/education/awseducate>



**Institutions**  
Provide educators and students with resources for cloud-related learning. Those at member institutions receive twice as many AWS credits,



**Educators**  
Professors, teaching assistants, and educators receive access to AWS technology, open source content for their courses, training resources, and



**Students**  
Students receive credits for hands-on experience with AWS technology, training, content, career pathways, and job board.

# Associate with your ...@tu-berlin.de Email Address.

## Step 2. Fill out Application

Institution Name  Please write the full name of your school / institution.

Country  City

Field of Study  Please select the most appropriate

First Name

Last Name

Email  Provide a valid, current email issued by your institution

Please choose only one of the following two options:

Enter an AWS Account ID  Your AWS Account ID is a 12-digit number.  
[Don't have one? Sign up now](#)

Click here to select an AWS Educate Starter Account  
AWS Educate Starter Account (ESA) is a free, capped-account that doesn't require a credit card. There are some usage limitations, including ~25% reduction in access to AWS services. Applicants selecting ESA will NOT receive an AWS credit code. See FAQs below for details.

Grade Level  Click your grade level under Available and then click the arrow to move your grade level to Chosen

Graduation Year (current degree program)  The graduation year of your current degree program.

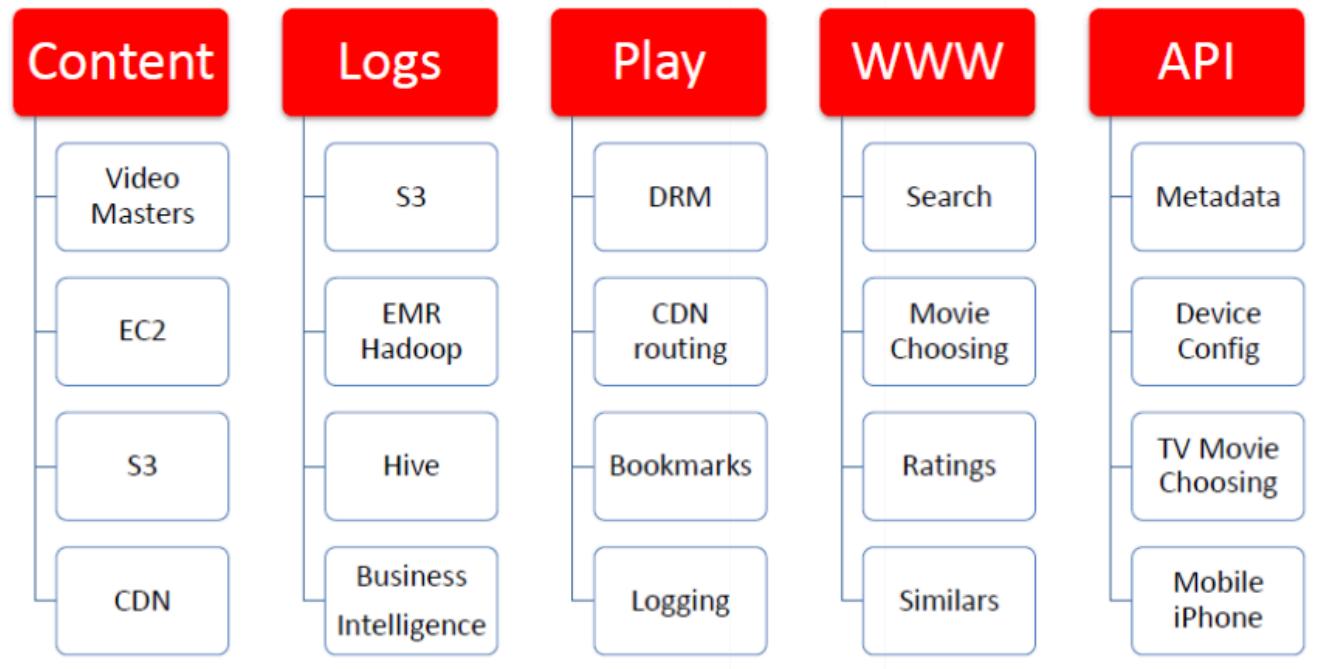
Graduation Month (current degree program)  The graduation month of your current degree program.

Promo Code  Enter a promo code here; codes are case sensitive.

[Frequently Asked Questions](#)

[Next](#)

# Netflix Deployed on AWS



AWS



# Management Console

AWS Compute



EC2

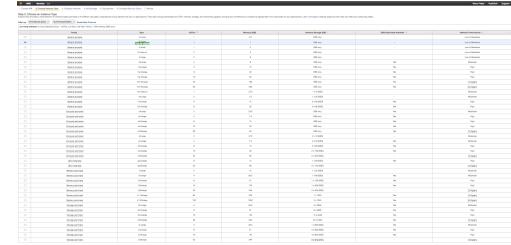
EC2 Container Service

Elastic Beanstalk

Lambda

# AWS EC2

- EC2 = Amazon Elastic Compute Cloud (Virtual Machine)
- Obtain and boot new server instances
- Scale capacity up or down
- variable sizes:
  - CPU power, Memory, Storage, Network Capacity (t2.nano ... x1.32.large) 42 Frankfurt
- Features:
  - Preconfigured templates of OS and additional Software (AMIs)
  - Deployment across Availability Zones
  - Monitoring of status and usage



# AWS EC2 - Command Line Interface (CLI)

## - Installation

Prerequisites: Python 2 version 2.6.5+ or Python 3 version 3.3+

<https://www.python.org/downloads/>

```
$ python --version
```

```
$ pip install awscli
```

(Windows)

```
$ sudo pip install aswcli
```

(Linux, OS X, Unix)

## - Configuration

```
$ aws configure –profile <NAME>
```

AWS Access Key ID | AWS Secret Access Key | Default region name | Default output format

## - Test -> excursion *IAM User Guide*

```
$ aws ec2 describe-instances --profile <NAME>
```

~/.aws/credentials

|

~/.aws/config

# AWS EC2 - Command Line Interface (CLI)

## - Key Pairs & Security Groups

*generate private key:* \$ openssl genrsa -out my-key.pem 2048

*generate public key:* \$ openssl rsa -in my-key.pem -pubout > my-key.pub

*import key:* \$ aws ec2 import-key-pair --key-name ec-courseAWSKeyPair --public-key-material "XYZ" --profile EC-course

*display key:* \$ aws ec2 describe-key-pairs --key-name ec-courseAWSKeyPair --profile EC-course

*create security group:* \$ aws ec2 create-security-group --group-name ec-course --description "security group for EC-Course WS2016/17" --profile EC-course

*describe security group:* \$ aws ec2 describe-security-groups --group-names ec-course --profile EC-course

*adding rules (RDP):* \$ aws ec2 authorize-security-group-ingress --group-name ec-course --protocol tcp --port 3389 --cidr your.I.P.Adress/24 --profile EC-course

*adding rules (SSH):* \$ aws ec2 authorize-security-group-ingress --group-name ec-course --protocol tcp --port 22 --cidr your.I.P.Adress/24 --profile EC-course

*Using default AWS credentials:*

```
$ export AWS_ACCESS_KEY_ID="PUTINYOURAWSACCESSKEY"
```

```
$ export AWS_SECRET_ACCESS_KEY=" PUTINYOURAWSSECRETACCEESSKEY"
```

# AWS EC2 - Command Line Interface (CLI)

## - Command Line Options

--profile – name of a profile to use, or "default" to use the default profile.

--region – AWS region to call.

--output – output format.

--endpoint-url - The endpoint to make the call against.

```
$ aws ec2 describe-instances --profile <NAME> --output table --region eu-central-1
```

## - Command Structure

```
$ aws <command> <subcommand> [options and parameters]
```

# AWS EC2 - Command Line Interface (CLI)

- AMI
- <https://console.aws.amazon.com/ec2/>

The screenshot shows the AWS EC2 console interface for selecting an AMI. The top navigation bar includes AWS Services, Edit, Marco Peise, Frankfurt, and Support. Below the navigation is a breadcrumb trail: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Tag Instance, 6. Configure Security Group, 7. Review. To the right is a 'Cancel and Exit' button.

**Step 1: Choose an Amazon Machine Image (AMI)**

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

The main area displays a list of available AMIs:

Quick Start	AMIs	Actions
My AMIs	Amazon Linux AMI 2016.09.0 (HVM), SSD Volume Type - ami-0044b96f	Select
AWS Marketplace	Amazon Linux Free tier eligible	64-bit
Community AMIs	Red Hat Enterprise Linux 7.2 (HVM), SSD Volume Type - ami-875042eb	Select
<input checked="" type="checkbox"/> Free tier only	SUSE Linux Enterprise Server 12 SP1 (HVM), SSD Volume Type - ami-59699036	Select
	Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-26c43149	Select
	Microsoft Windows Server 2016 Base - ami-133bc27c	Select
	Microsoft Windows Server 2016 Base with Containers - ami-f2d0299d	Select
	Microsoft Windows Server 2016 Base Nano - ami-e4e61f8b	Select

A red arrow points to the Ubuntu Server 14.04 LTS entry, which is highlighted with a black box. The entry details are as follows:

**Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-26c43149**

Ubuntu Server 14.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Available from Canonical (<http://www.ubuntu.com/cloud/services>).  
Root device type: ebs Virtualization type: hvm  
Free tier eligible

# AWS EC2 - Command Line Interface (CLI)

## - AMI

The screenshot shows the AWS EC2 console interface for creating a new instance. The top navigation bar includes 'AWS Services Edit'. Below it, a progress bar shows steps 1 through 7. Step 2, 'Choose an Instance Type', is currently selected. A red arrow points to the 't2.micro' row in the table, which is highlighted with a red border. The 'Free tier eligible' badge is visible on this row. The table columns include Family, Type, vCPUs, Memory (GiB), Instance Storage (GB), EBS-Optimized Available, and Network Performance.

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate
<input checked="" type="checkbox"/>	General purpose	t2.micro <small>Free tier eligible</small>	1	1	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate

# AWS EC2 - Command Line Interface (CLI)

- *Choose the right EC2 Instance Type*

<https://aws.amazon.com/blogs/aws/choosing-the-right-ec2-instance-type-for-your-application/>

# AWS EC2 - Command Line Interface (CLI)

## – *Create*

```
$ aws ec2 run-instances --image-id ami-26c43149 --count 1 --instance-type t1.micro --key-name ec-courseAWSKeyPair --security-groups ec-course
```

## – *Adding a Name Tag*

```
$ aws ec2 create-tags --resources i-00551e0fc585caaab --tags Key=Name,Value=EC-Instance_001
```

## – *Adding a Block Device Mapping* (<http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/block-device-mapping-concepts.html>)

```
$ aws ec2 run-instances ... --block-device-mappings "[{\\"DeviceName\\":\\"/dev/sdf\\",\\"Ebs\\":{\\"VolumeSize\\":20,\\"DeleteOnTermination\\":false}}]"
```

## – *Find*

```
$ aws ec2 describe-instances --filters "Name=instance-type,Values=t2.micro"
```

## – *Shut-down*

```
$ aws ec2 stop-instances --instance-ids i-00551e0fc585caaab
```

# AWS EC2 - Command Line Interface (CLI)

## – *Connect (SSH/PuTTY/MindTerm)*

pre: ssh client | AWS CLI | instance ID | public DNS name | private key | enable inbound SSH

*pre lock your private key:* \$ chmod 400 ecAWSPprivateKey.pem

*connect:* \$ ssh -i /<pathToPrivateKey>/<PrivateKeyFile> user\_name@PublicDnsName

**Linux:** ec2-user **RHEL5:** root/ec2-user **Ubuntu:** ubuntu **Fedora:** fedora/ec2-user **SUSE Linux:** root/ec2-user

```
$ ssh -i .aws/ecAWSPprivateKey.pem ubuntu@ec2-54-93-182-31.eu-central-1.compute.amazonaws.com
```

## – Transfer

```
$ scp -i /path/my-key-pair.pem /path/SampleFile.txt ec2-user@ec2-198-51-100-1.compute-1.amazonaws.com:~
```

# AWS EC2 - Command Line Interface (CLI)

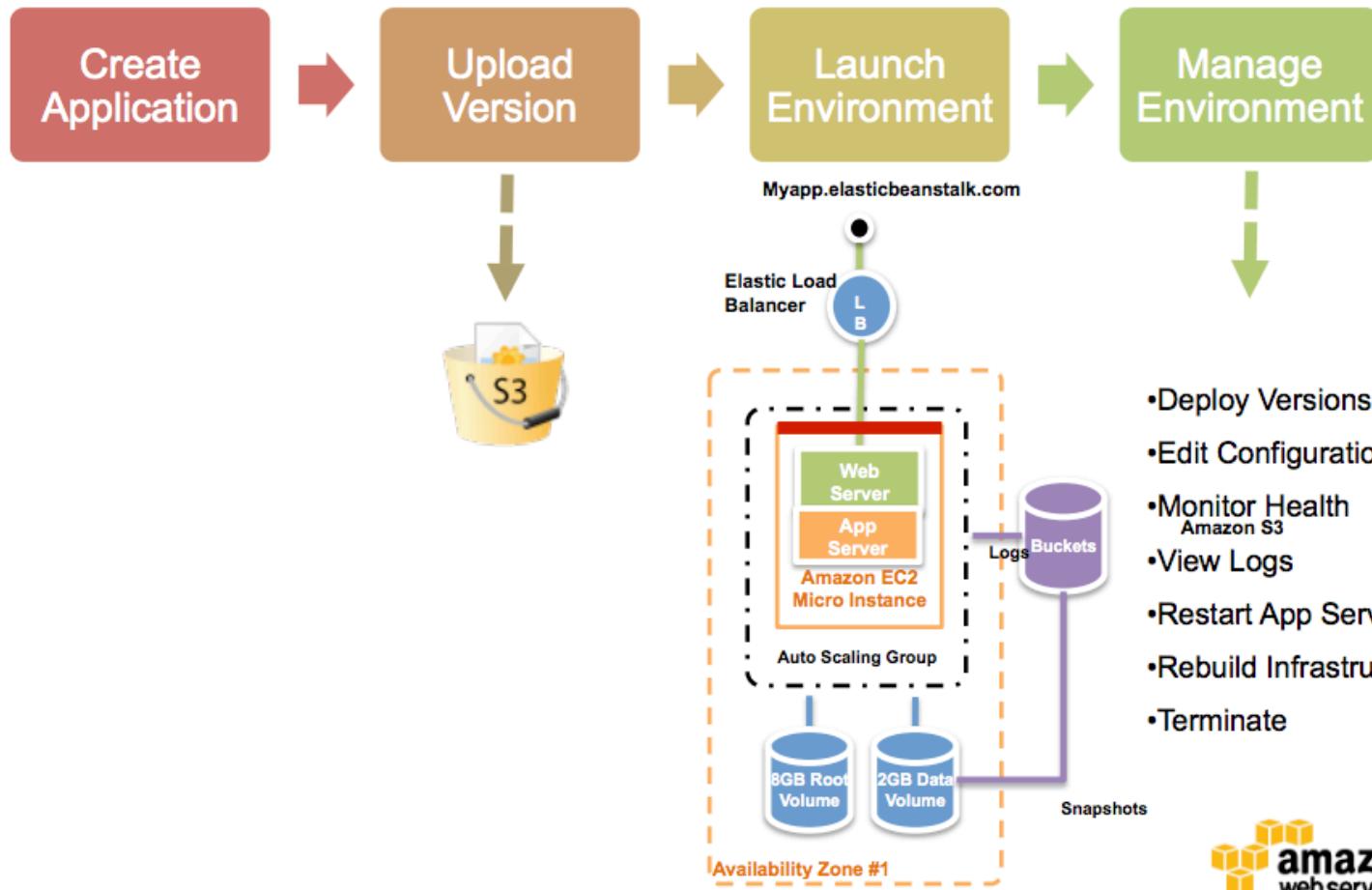
## – *Terminate*

```
$ aws ec2 terminate-instances --instance-ids i-00551e0fc585caaab
```

# AWS EC2 – AWS Toolkits

- *Toolkit for Eclipse* (<https://aws.amazon.com/eclipse/>)
- *AWS Manager by JetBrains*  
(<https://plugins.jetbrains.com/plugin/4558>)
- NetBeans & AWS (<https://blog.idrsolutions.com/2015/10/how-to-set-up-amazon-cloudaws-elastic-beanstalk-on-the-netbeans-ide/>)
- Plugins for variable Editors: ATOM  
(<https://atom.io/packages/remote-edit>) etc.

# AWS Elastic Beanstalk



# Bluemix



# Bluemix - Register

<https://ibm.onthehub.com>



Anmelden | Registrieren

Produktsuche

Faculty/Staff Students

### Kontoregistrierung

Vorname\*  Nachname\*

Benutzername\*  E-Mail-Adresse\*   
Ihre E-Mail-Adresse ist gleichzeitig Ihr User-Name. Sie benötigen es, um sich in die Webstore einzuloggen.

Kennwort wählen\*  Kennwort bestätigen\*   
Das Passwort muss mindestens sechs Zeichen lang sein.

Ich möchte E-Mail-Benachrichtigungen von Kivuto Solutions Inc. erhalten, einschließlich Informationen über Werbeaktionen und Neuerscheinungen.  
Sie können diesen Dienst jederzeit abbestellen. Für weitere Einzelheiten und Kontaktdata siehe bitte [Datenschutzerklärung](#).

Please keep me informed of products, services, and information specifically related to this offer. (Required for program consideration)

### Berechtigungsnachweis

Ihre Organisation\*  Von der Organisation vergebene E-Mail-Adresse\*

Gruppe, bei der Sie Mitglied sind\*

Sie haften für den vollen Preis aller Produkte die Sie bestellen haben, sollten Sie nicht in der Lage sein, auf Anfrage einen Nachweis bzgl. Ihrer Berechtigung zu erbringen.

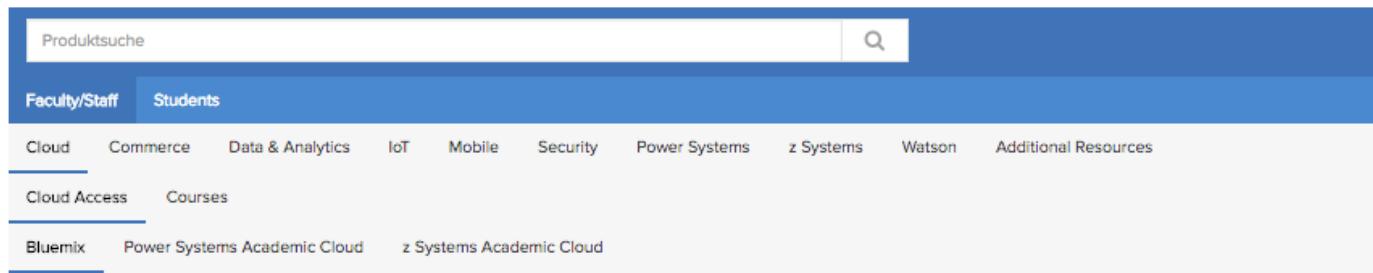
  
Geben Sie den angezeigten Text ein

# Bluemix – Register 6 Month Trial

<https://ibm.onthehub.com>



Anmelden | Registrieren



The screenshot shows the IBM Academic Cloud interface. At the top, there's a search bar labeled "Produktsuche" and a navigation menu with tabs for "Faculty/Staff" and "Students". Below the menu, there are links for various IBM services: Cloud, Commerce, Data & Analytics, IoT, Mobile, Security, Power Systems, z Systems, Watson, and Additional Resources. Under "Cloud", "Cloud Access" and "Courses" are listed. Under "Cloud Access", "Bluemix" is selected, while "Power Systems Academic Cloud" and "z Systems Academic Cloud" are also shown. A prominent blue banner at the top of the main content area reads "IBM Bluemix Promo Code - 12 Month Trial".



Hersteller: IBM Academic Initiative

Kostenlos

Liefertyp: Benutzerdefinierte Lieferung

 In den Warenkorb legen

Verfügbar für: Dozent/Mitarbeiter

 Express Checkout

Sind Sie berechtigt?

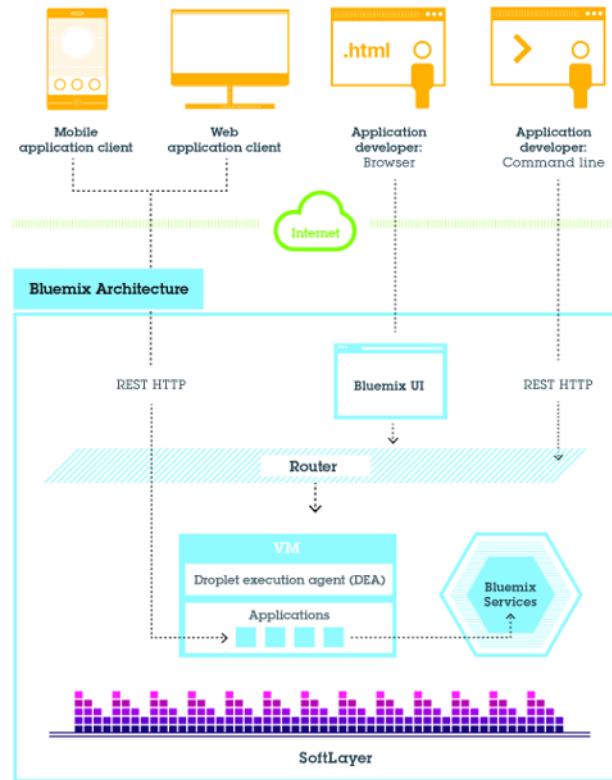
[Beschreibung](#)

[Sind Sie berechtigt?](#)

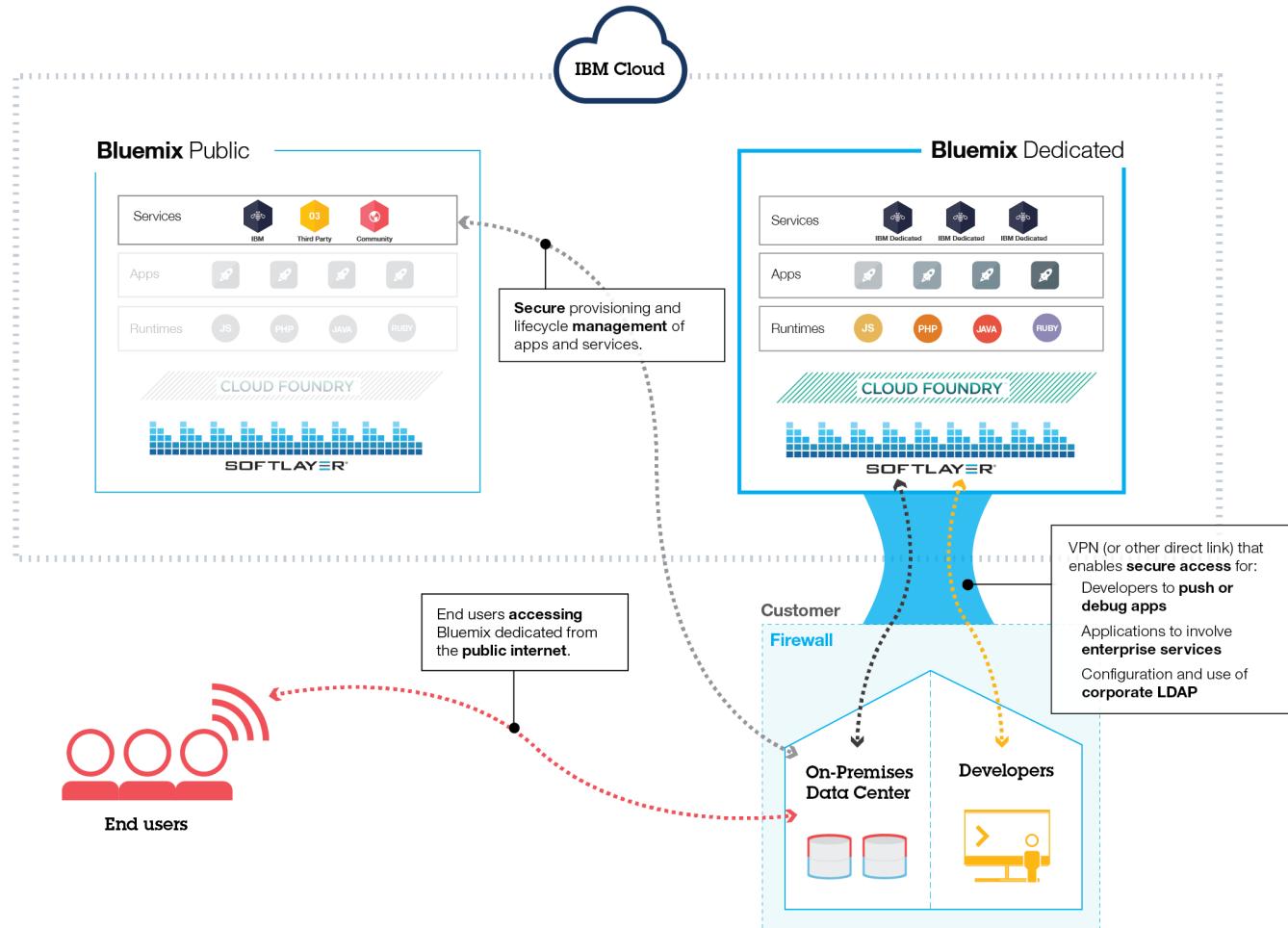
# Bluemix - Regions

Regionsname	Standort	Regionspräfix	cf-API-Endpunkt	Benutzerschnittstellenkonsole
Region 'Vereinigte Staaten (Süden)'	Dallas, US	ng	api.ng.bluemix.net	console.ng.bluemix.net
Region 'United Kingdom'	London, England	eu-gb	api.eu-gb.bluemix.net	console.eu-gb.bluemix.net
Region 'Sydney'	Sydney, Australia	au-syd	api.au-syd.bluemix.net	console.au-syd.bluemix.net

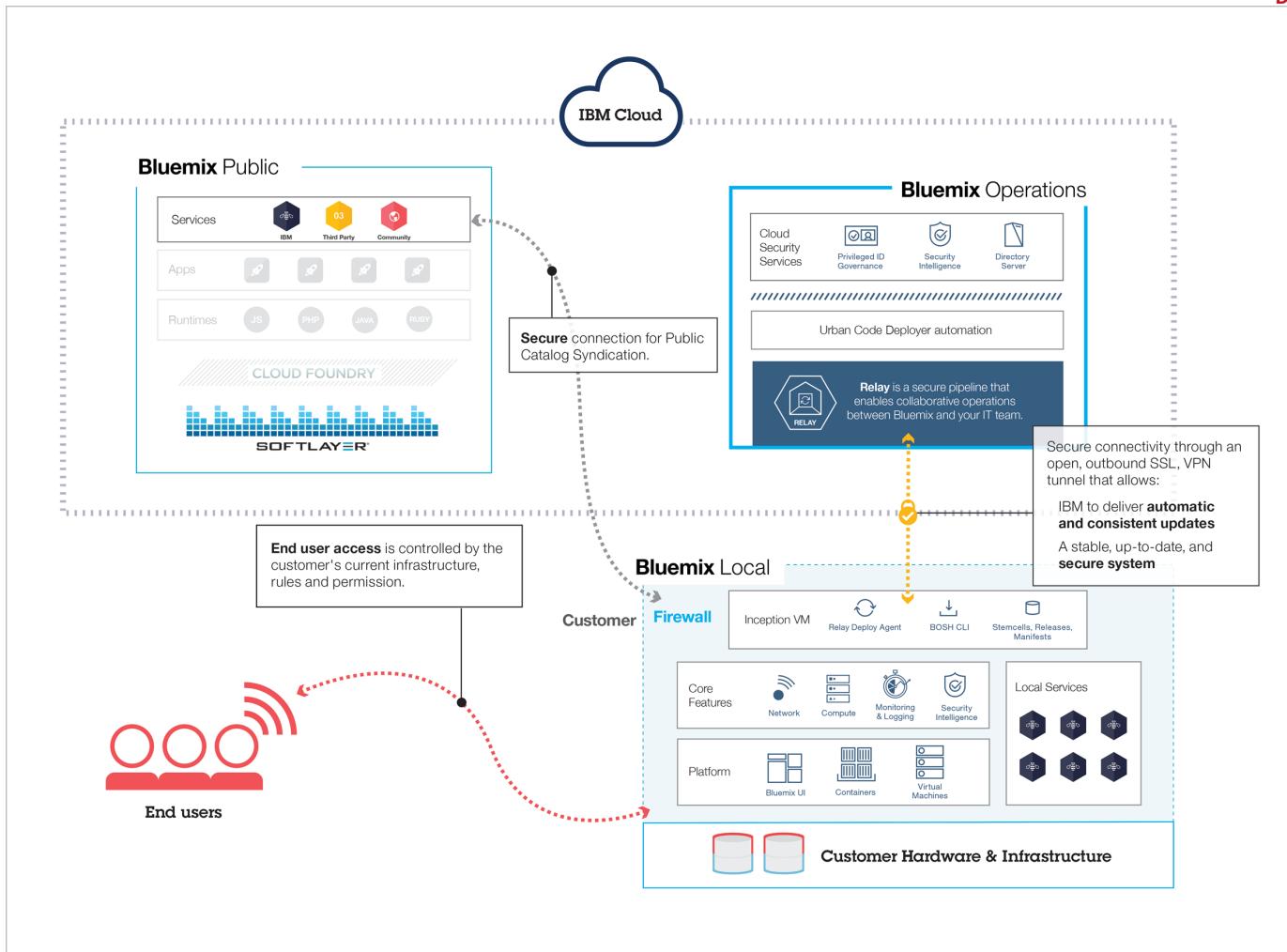
# Bluemix - Architecture



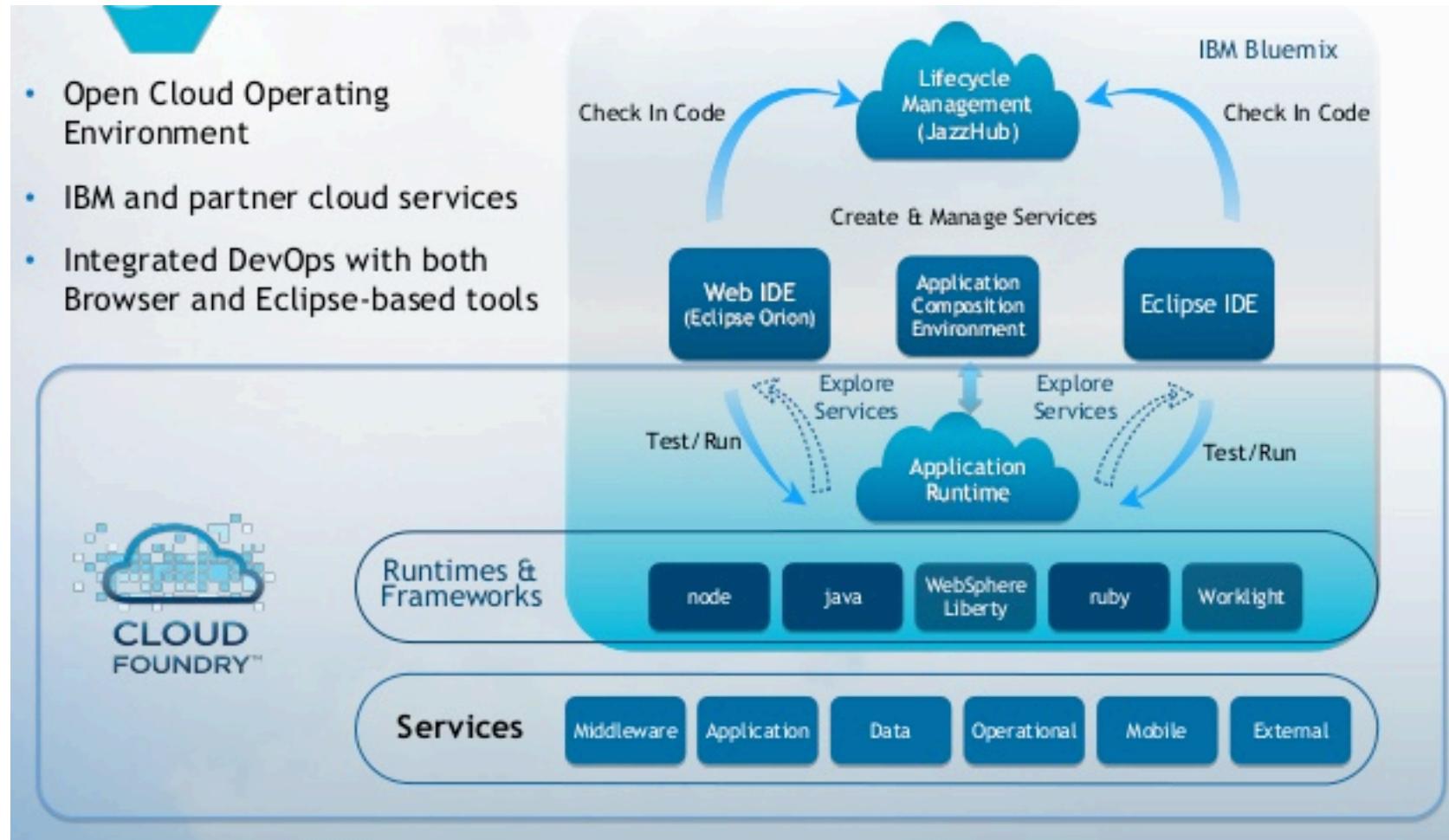
# Bluemix - Architecture



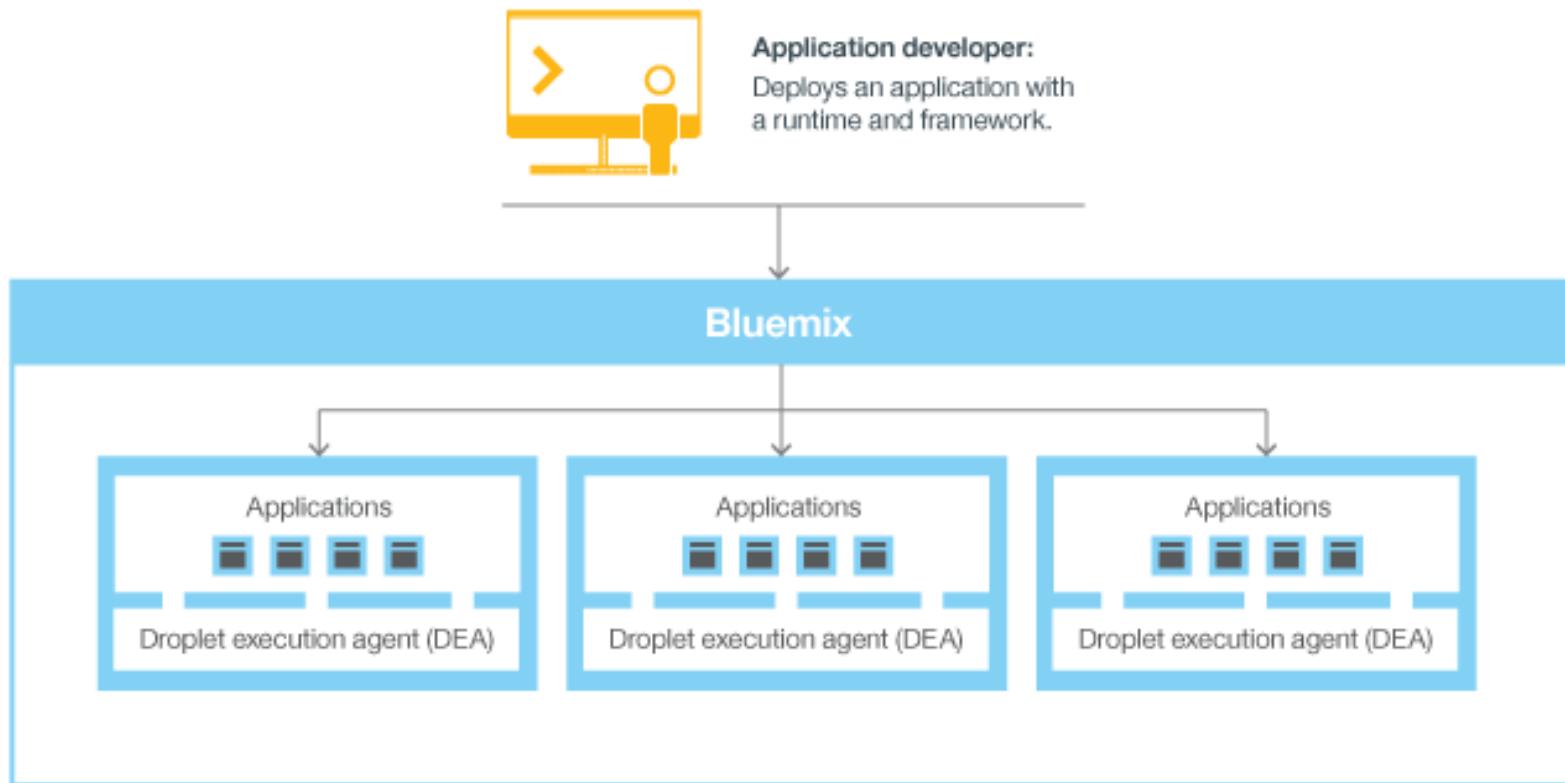
# Bluemix - Architecture



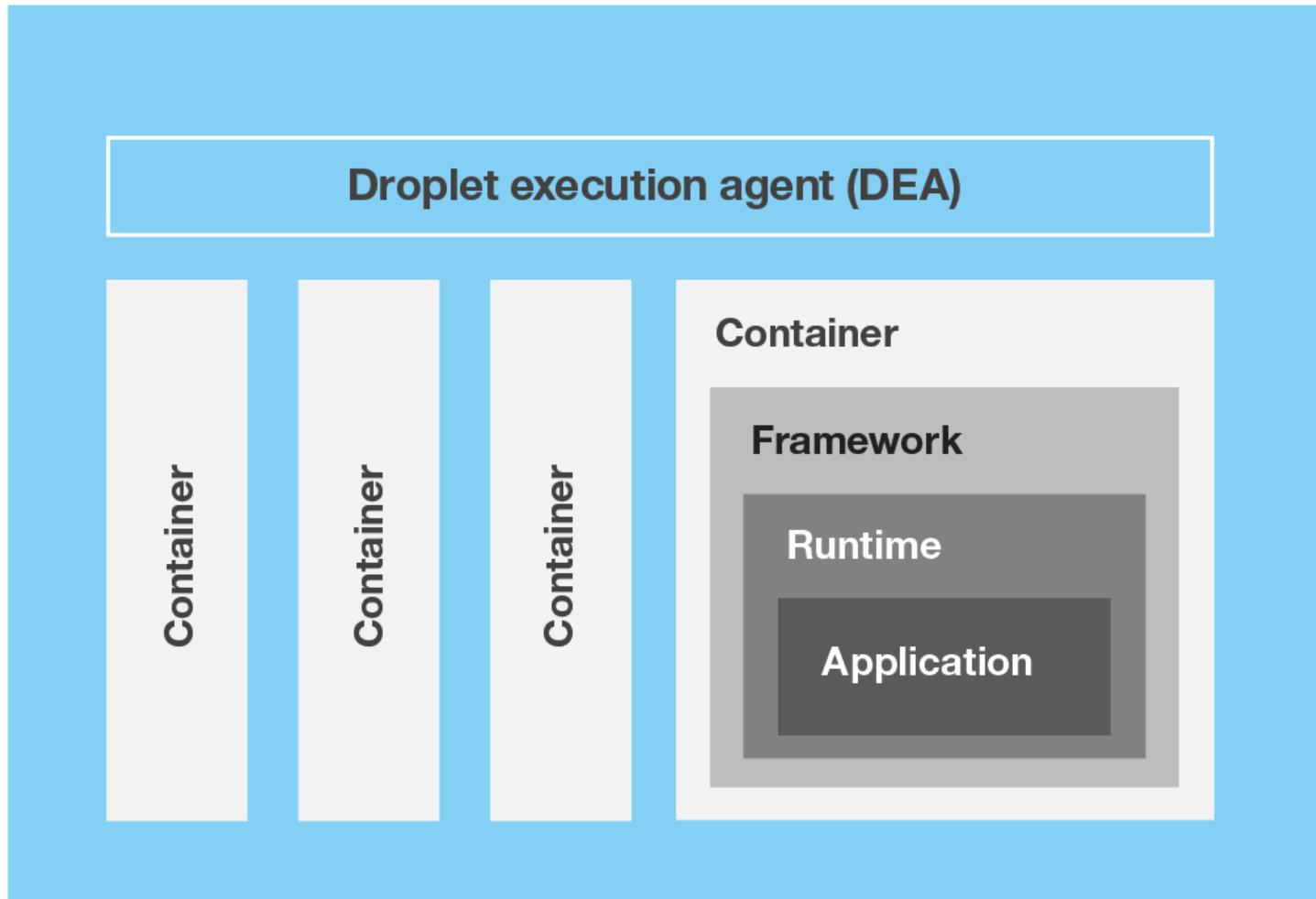
# Bluemix - Architecture



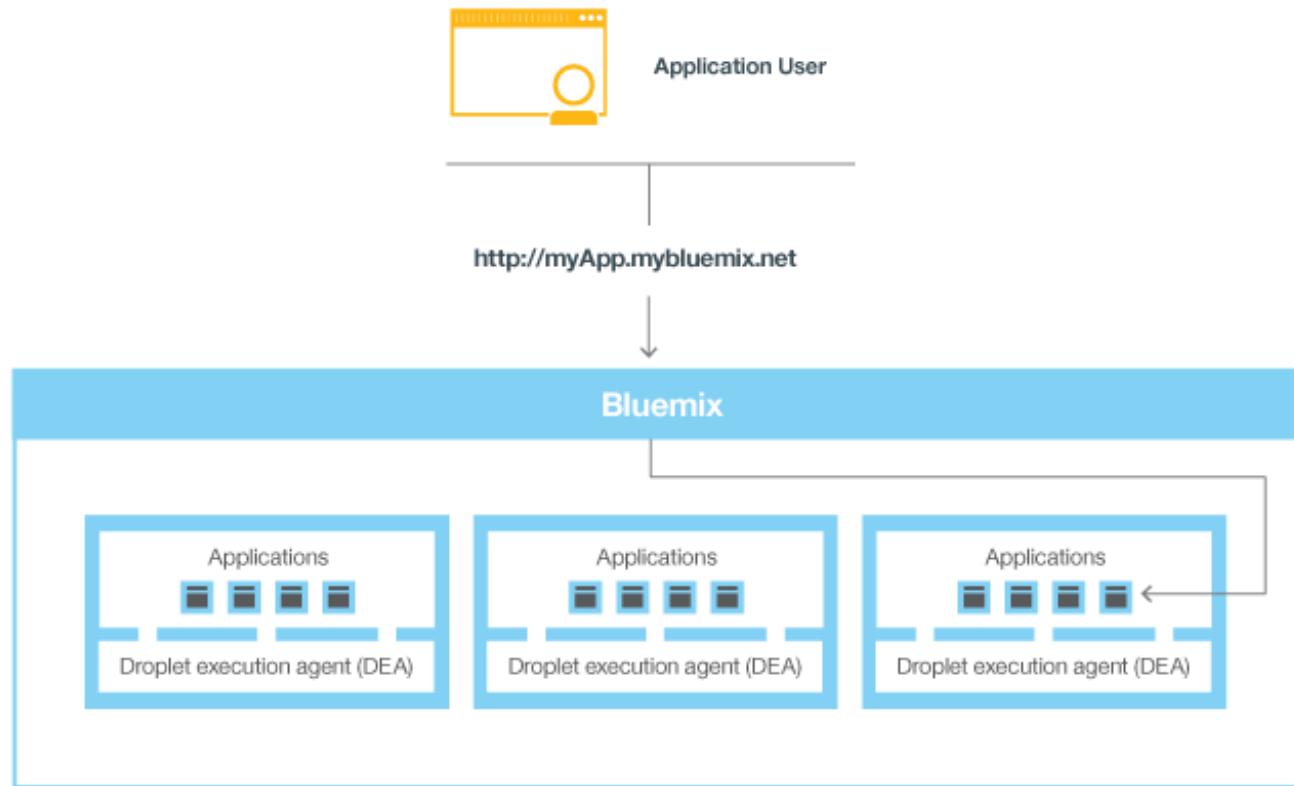
# Bluemix - Deployment



# Bluemix - Deployment



# Bluemix - Deployment



# Bluemix - Services

Service name	Description		
BigInsights for Hadoop	Powered by InfoSphere BigInsights, which is based on open source Hadoop, this service provides the open source capabilities of HBase, Hive, MapReduce, Pig and others, including your own open source packages.	MongoDB	A popular NoSQL database
Business Rules	Enables developers to spend less time recoding and testing when the business policy changes. This service minimizes your code changes by keeping business logic separate from application logic.	MQ Light	Develop responsive, scalable applications with a fully-managed messaging provider in the cloud. Quickly integrate with application frameworks through easy-to-use APIs.
Cloudant NoSQL DB	Provides access to a fully managed NoSQL JSON data layer that's always on. This service is compatible with CouchDB, and accessible through a simple to use HTTP interface for mobile and web application models.	Redis	A popular distributed dictionary server used by many distributed applications
Data Cache	Improve the performance and user experience of web applications by retrieving information from fast, managed, in-memory caches, instead of relying entirely on slower disk-based databases.	Secure Gateway	Brings Hybrid Integration capability to your Bluemix environment. It provides secure connectivity from Bluemix to other applications and data sources running on-premise or in other clouds. A remote client is provided to enable secure connectivity.
DevOps Auto-Scaling	Enables you to automatically increase or decrease the compute capacity of your application. The number of application instances are adjusted dynamically based on the Auto-Scaling policy you define.	Sendgrid	Sendgrid's cloud-based email infrastructure relieves businesses of the cost and complexity of maintaining email systems.
DevOps Delivery Pipeline	Automate builds and deployments, test execution, configure build scripts, and automate execution of unit tests. Automatically build and deploy your application to IBM's cloud platform, Bluemix.	Session Cache	Improve application resiliency by storing session state information across many HTTP requests. Enable persistent HTTP sessions for your application and seamless session recovery in event of an application failure.
Embeddable Reporting	Use a simple cloud editor then embed reports and dashboards in your web or mobile app using a wide variety of languages such as Node.js or Java using a RESTful API.	Single Sign-On	Implement user authentication for your web and mobile apps quickly, using simple policy-based configurations.
Geospatial Analytics	Leverage real-time geospatial analytics to track when devices enter or leave defined regions.	SQL Database	Add an on-demand relational database to your application. Powered by DB2, it provides a managed database service to handle web and transactional workloads.
Internet of Things	Lets your apps communicate with and consume data collected by your connected devices, sensors, and gateways.	Watson Alchemy API	Leverage natural language processing and computer vision in your apps to deeply understand the world's conversations, documents and photos.
Mobile Push Notifications	Push information to all application users or to a specific set of users and devices. You can even let users subscribe to specific tags or topics for notification.	Watson Language Translation	Converts text input in one language into a destination language for the end user. Translation is available among English, Brazilian Portuguese, Spanish, French, and Arabic.
		Watson Personality Insights	Derives insights from transactional and social media data to identify psychological traits which determine purchase decisions, intent and behavioral traits; utilized to improve conversion rates.

# Bluemix - Watson Services

All Kategorien	AlchemyAPI	Conversation	Document Conversion
Infrastruktur	Mit diesem AlchemyAPI-Service können Sie unstrukturierten Text und Bildinhalte analysieren.  IBM	Sie können zu Ihrer Anwendung eine Schnittstelle für natürliche Sprache hinzufügen, um Interaktionen  IBM	Konvertiert ein HTML-, PDF- oder Microsoft Word™-Dokument in normalisiertes HTML-Format, einschließlich der Struktur, Farben und Bilder.  IBM
Compute			
Storage			
Security			
Apps	<b>Language Translation</b> Text von einer Sprache in eine andere für bestimmte Domänen übersetzen.  IBM    Veraltet	<b>Language Translator</b> Text von einer Sprache in eine andere für bestimmte Domänen übersetzen.  IBM	<b>Natural Language Classifier</b> Natural Language Classifier führt eine Klassifikation natürlicher Sprache bei Fragentexten durch. Ein  IBM
Boilerplates			
Cloud Foundry-Laufzeiten			
Container			
Virtuelle Server			
Mobile			
Services	<b>Personality Insights</b> Watson Personality Insights leitet Einblicke aus transaktionsorientierten Daten und Social-Media-Plattformen.  IBM	<b>Retrieve and Rank</b> Durch intelligente Lernfunktionen erweiterte Suchfunktionalität zur Anwendung hinzufügen  IBM	<b>Speech to Text</b> Streamingtranskription mit geringer Latenz  IBM
Data & Analytics			
Watson	<b>Text to Speech</b> Natürlich klingende und gut verständliche Sprache wird synthetisch aus Text erstellt.  IBM	<b>Tone Analyzer</b> Tone Analyzer verwendet linguistische Analysefunktionen, um drei Arten des Tonfalls in  IBM	<b>Tradeoff Analytics</b> Unterstützt Entscheidungsfindungsprozesse bei einer Vielzahl in Konflikt stehender Ziele. Kombiniert  IBM
Internet of Things			
APIs			
DevOps			
Application Services			
Integrate	<b>Visual Recognition</b> Erkennen Sie die Aussage visueller Inhalte! Analysieren Sie Bilder auf Szenen, Objekte, Gesichter, Emotionen und mehr.  IBM	<b>Cognitive Commerce™</b> Cognitive Commerce is a service provided by Cognitive Scale.  Drittanbieter	<b>Cognitive Graph</b> Cognitive Graph is a service provided by Cognitive Scale.  Drittanbieter
Network			
Storage			
Security			
	<b>Cognitive Insights™</b> Cognitive Insights™ is a service provided by Cognitive Scale.  Drittanbieter		

# Bluemix - Boilerplate

Dokumentation | Marco Peise's Account | Vereiniges Königreich : ISE@TUBerlin : EC | 36 | Katalog | Support | Konto

Alle Kategorien | Suche | Filter ▾

Infrastruktur

Compute  
Storage  
Security

Apps

Boilerplates >

Cloud Foundry-Laufzeiten  
Container  
Virtuelle Server  
Mobile

Services

Data & Analytics  
Watson  
Internet of Things  
APIs  
DevOps  
Application Services  
Integrate  
Network  
Storage  
Security

ASP.NET Core Cloudant Starter

Cloudant NoSQL DB-Service in einer ASP.NET Core-Anwendung verwenden.

IBM

Internet of Things Platform Starter

Beginnen Sie mit der Entwicklung einer Internet of Things Platform-Anwendung, die Node-RED in

IBM

Java Cloudant Web Starter

Cloudant NoSQL DB-Service mit Laufzeit 'Liberty for Java™' verwenden.

IBM

LoopBack Starter

Hierbei handelt es sich um eine beispielhafte StrongLoop LoopBack Node.js-Anwendung, die

IBM

MobileFirst Services Starter

Erstellen Sie Ihre nächste mobile App mit den mobilen Services für Bluemix.

IBM

Node.js Cloudant DB Web Starter

Cloudant NoSQL DB-Service mit Laufzeit 'SDK for Node.js™' verwenden.

IBM

Personality Insights Java Web Starter

A simple Java app that uses the Personality Insights service to analyze text to derive personality traits.

IBM

Personality Insights Node.js Web Starter

A simple Node.js app that uses Personality Insights to analyze text to derive personality traits.

IBM

StrongLoop Arc

Bei dieser Anwendung handelt es sich um die grafische Benutzerschnittstelle 'StrongLoop Arc'.

IBM

Boilerplates

Beginnen Sie nun mit der Erstellung einer neuen App.

Community

Node-RED Starter

This application demonstrates how to run the Node-RED open-source project within IBM Bluemix.

Community

Boilerplates

Beginnen Sie nun mit der Erstellung einer neuen App.

Community

Ruby Sinatra

Eine Ruby-Webanwendung mithilfe des Sinatra-Frameworks entwickeln.

Community

Vaadin Rich Web Starter

This application demonstrates how to use the Vaadin UI Framework to build rich HTML5 applications.

Community

# Bluemix – Toolkits

- *Toolkit for Eclipse* (<https://www.ibm.com/cloud-computing/bluemix/eclipse>)
- *Cloud Foundry Deployment by JetBrains* (<https://www.jetbrains.com/help/idea/2016.2/run-debug-configuration-cloud-foundry-deployment.html>)
- *Java & Bluemix* (<https://hub.jazz.net/tutorials/jazzeditorjava/>)
- Plugins for variable Editors: ATOM (<https://atom.io/packages/gp-atom>) etc.

# Git / Repository

- *GitLab TUBIT* ([http://www.tubit.tu-berlin.de/menue/dienste/daten\\_server/gitlab\\_dienst/parameter/en/](http://www.tubit.tu-berlin.de/menue/dienste/daten_server/gitlab_dienst/parameter/en/))
- *Tutorial* (<https://de.udacity.com/course/how-to-use-git-and-github--ud775/>)

# Register for AWS & Bluemix



## Register at either GitLab or Github

# Task 1 – REST Client



# Task 1 – REST Client

Your Task is to write a HTTP client program in the programming language of your choice.

1. **Insert** an event name (corresponding to your name) and a date value via a HTTP **PUT** operation.

Endpoint: <http://api-server.eu-gb.mybluemix.net/api/Calendars>

Request Parameter:

```
{  
  "name": <String>,          // i.e.: "chrismas_marco_peise"  
  "date": <Date>            // i.e.: "2016-12-24"  
}
```

# Task 1 – REST Client

Possible Response:

```
{  
  "id": "56437462ed1d293800aa4c7e",  
  "name": "chrismas_marco_peise",  
  "date": "2016-12-24T00:00:00.000Z"  
}
```

# Task 1 – REST Client

2. Use the Service “timeToDate” for a given Event via a HTTP GET.

Endpoint: <http://api-server.eu-gb.mybluemix.net/api/Calendars/timeToDate>

Request Parameter:

```
{  
  "eventName": <String>,           // i.e.: "chrismas_marco_peise"  
}
```

Possible Response:

```
{  
  "TimeToEvent": "1 month 27 days 7 hours 9 minutes 47 seconds"  
}
```

# Task 1 – REST Client

Hand in your programmed lines of code for your client in ISIS.

# Task 1 – REST Client

DEMO Postman



## Task 2 – HTTP Methods

Review the API of Liquidfeedback  
(<http://dev.liquidfeedback.org/trac/lf/wiki/API>)

Discuss the following four HTTP Requests:

GET /issue, POST /voter, POST /interest, GET /suggestion

State for each Request an example call (endpoint, request attributes).

Please check in the following table whether the HTTP methods are idempotent and / or safe.

HTTP Methode	Idempotent	Safe	None
GET /issue			
POST /voter			
POST /interest			
GET /suggestion			

# Task 3 – WebServices

## Given is a WebService with the following WSDL

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <wsdl:definitions xmlns:s1="http://microsoft.com/wsdl/types"
3    xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
4    xmlns:s="http://www.w3.org/2001/XMLSchema" xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
5    xmlns:tns="http://tu-berlin.de/ise/ec/" xmlns:tm="http://microsoft.com/wsdl/tnme/textMatching/"
6    xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/" targetNamespace="http://tu-berlin.de/ise/ec"
7    xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
8    <wsdl:types>
9      <s:schema elementFromDefault="qualified" targetNamespace="http://tu-berlin.de/ise/ec">
10        <s:import namespace="http://microsoft.com/wsdl/type/"/>
11        <s:element name="GetPositionsOfSymbolInText">
12          <s:complexType>
13            <s:sequence>
14              <s:element minOccurs="0" maxOccurs="1" name="text" type="s:string"/>
15              <s:element minOccurs="1" maxOccurs="1" name="symbol" type="s1:char"/>
16            </sequence>
17          </s:complexType>
18        </s:element>
19        <s:element name="GetPositionsOfSymbolInTextResponse">
20          <s:complexType>
21            <s:sequence>
22              <s:element minOccurs="0" maxOccurs="1" name="GetPositionsOfSymbolInTextResult" type="tns:ArrayOfInt"/>
23            </sequence>
24          </s:complexType>
25        </s:element>
26        <s:complexType name="ArrayOfInt">
27          <s:sequence>
28            <s:element minOccurs="0" maxOccurs="unbounded" name="int" type="s:int"/>
29          </sequence>
30        </s:complexType>
31      </s:schema>
32    <s:schema elementFromDefault="qualified"
33      targetNamespace="http://microsoft.com/wsdl/types">
34      <s:simpleType name="char">
35        <s:restriction base="s:unsignedShort"/>
36      </s:simpleType>
37    </s:schema>
38  </wsdl:types>
39  <wsdl:message name="GetPositionsOfSymbolInTextSoapIn">
40    <wsdl:part name="parameters" element="tns:GetPositionsOfSymbolInText"/>
41  </wsdl:message>
42 </wsdl:message>
```

# Task 3 – WebServices

```
43  <wsdl:message name="GetPositionsOfSymbolInTextSoapOut">
44    <wsdl:part name="parameters" element="tns:GetPositionsOfSymbolInTextResponse"/>
45  </wsdl:message>
46  <wsdl:portType name="ECServiceSoap">
47    <wsdl:operation name="GetPositionsOfSymbolInText">
48      <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">Liefert Position eines Zeichens in einem Text</documentation>
49      <wsdl:input message="tns:GetPositionsOfSymbolInTextSoapIn"/>
50      <wsdl:output message="tns:GetPositionsOfSymbolInTextSoapOut"/>
51    </wsdl:operation>
52  </wsdl:portType>
53  <wsdl:binding name="ECServiceSoap" type="tns:ECServiceSoap">
54    <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="document"/>
55    <wsdl:operation name="GetPositionsOfSymbolInText">
56      <soap:operation soapAction="http://tu-berlin.de/ise/ec/GetPositionsOfSymbolInText" style="document"/>
57      <wsdl:input>
58        <soap:body use="literal"/>
59      </wsdl:input>
60      <wsdl:output>
61        <soap:body use="literal"/>
62      </wsdl:output>
63    </wsdl:operation>
64  </wsdl:binding>
65  <wsdl:service name="ECService">
66    <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">This service is intended to teach the WSDL and SOAP protocols to the students of the Enterprise Computing lecture.</documentation>
67    <wsdl:port name="ECServiceSoap" binding="tns:ECServiceSoap">
68      <soap:address location="http://ws-server.de/ECService/ExerciseService.asmx"/>
69    </wsdl:port>
70  </wsdl:service>
71 </wsdl:definitions>
```

# Task 3 – WebServices

**Enter the signature of the method(s) in the typical Java / C # / C ++ Notation like:**

ReturnType MethodName ([ParamType ParamName [, ParamType ParamName] \*])

Specifically **which data is transferred from (1) a client to the server and (2) back again** when SOAP / HTTP is used as a transfer protocol? (the XML part is sufficient)

Requirements:

You are using the parameters "Enterprise Computing is fun!" And "u". Assume that the service has the functionality indicated by the method signature.

Hint:

<?xml...>

Caution: This task is based on WSDL 1.1, while you have learned WSDL 2.0 in the lecture.