

openKonsequenz – DevOps für Open Source

PaaS für die Entwicklung und Laufzeit der openKonsequenz
Projekte

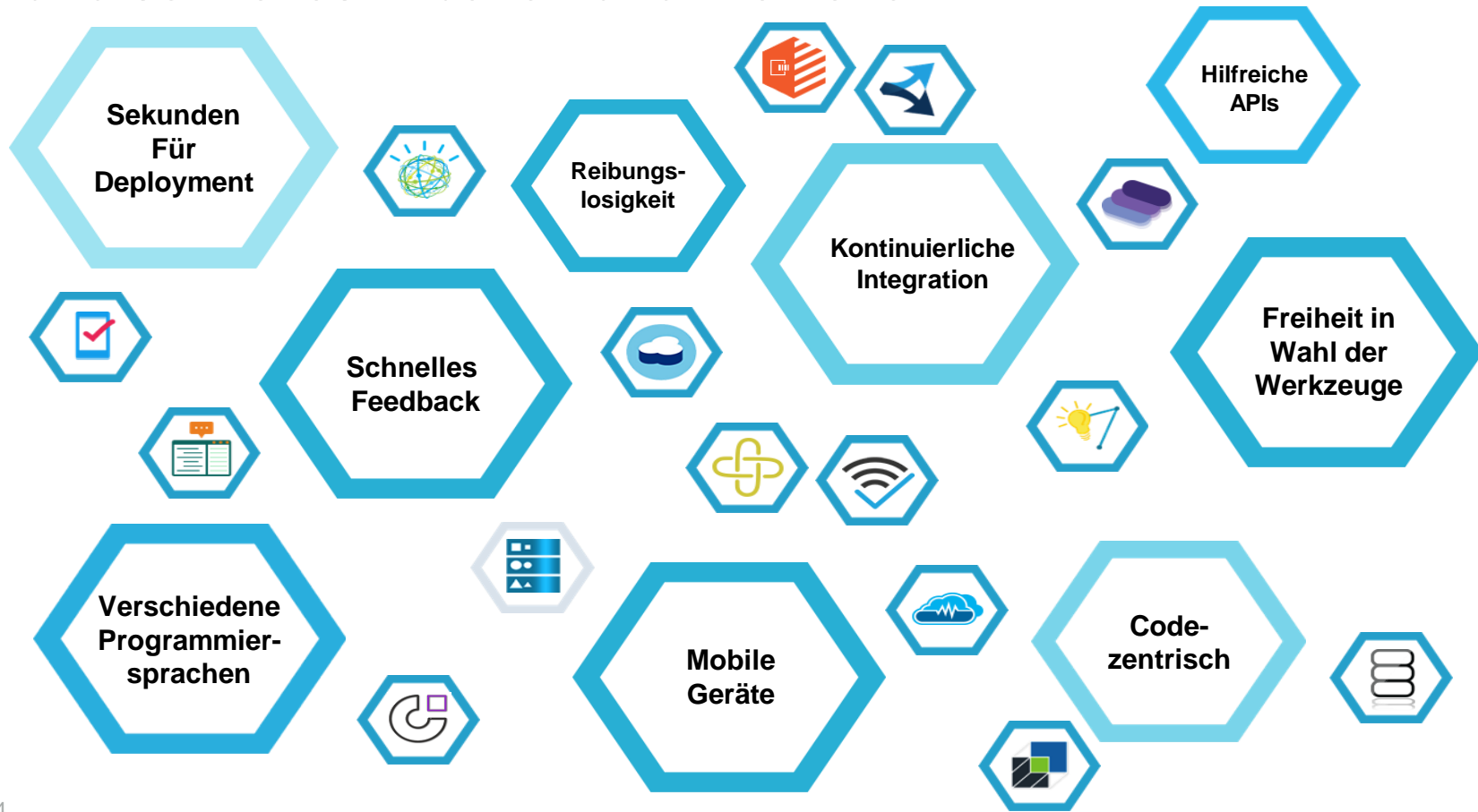
Ziele (Auszug)

- Open Source Plattform und Lösungen
- Agilität, Flexibilität und Effizienz in der Entwicklung der Lösungen
- Offenheit in der Gestaltung des Ecosystems der Entwickler und Partner im Konsortium.
- Offenheit in der Wiederverwertung von Lösungsbausteinen
- Wachstum mit weiteren Netzbetreibern. Bereitstellen von Applikationen und APIs sowie Abrechnen der Nutzung.



Warum DevOps PaaS für
openKonsequenz?

Anwendungsentwicklung heute erfordert Agilität, einfaches und schnelles Arbeiten und Freiheiten



Warum DevOps

- Einheitliche Plattform für die openKonsequenz Entwickler – Netzbetreiber, Netzbetreiber IT, Service Provider und Dritte.
- Open Source Basis und Open Source Support
- Schnelles Bereitstellen und Deployment der Basis.



Warum IBM Bluemix PaaS and DevOps für openKonsequenz

Warum Bluemix?

Neue Produkte und Services schnell und mit niedrigen Kosten in den Markt bringen



Innerhalb weniger Minuten Code zum Laufen zu bekommen

Kontinuierliche Lieferung neuer Funktionen



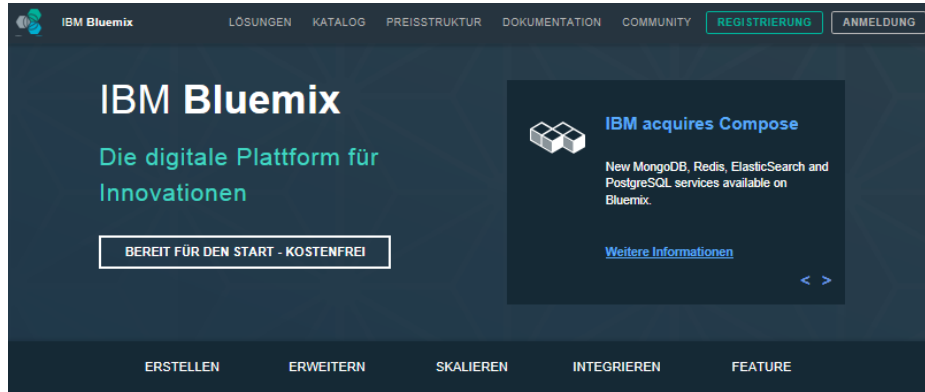
Automatisches Deployment von Applikationen und Services.

Eigene Investitionen erweitern



Bewahrung existierender Investitionen durch sichere Verbindung mit eigenen Systemen

Warum Bluemix? Open, Innovation, Choice, Agile




<https://console.ng.bluemix.net/>

Erstellen Sie Apps nach Ihren Vorstellungen.

Eine Kombination der bekanntesten Open-Source-Computertechniken für Ihre leistungsfähigen Apps. Lassen Sie Bluemix den Rest erledigen.

Instant Runtimes

App-zentrierte Laufzeitumgebungen auf Grundlage von Cloud Foundry.



[Laufzeiten unter Bluemix auschecken](#)

IBM Container


Portierbare und konsistente Bereitstellung Ihrer App ohne Verwaltung eines Betriebssystems.



[Container unter Bluemix auschecken](#)

Virtuelle Maschinen

Höchste Flexibilität und Kontrolle für Ihre Umgebung mit VMs.



[VMs unter Bluemix auschecken](#)

Warum Bluemix? Open, Innovation, Choice, Agile

Auszug Service Catalog – IBM, 3rd party, Offen, Erweiterbar -

The screenshot shows the IBM Bluemix Service Catalog interface. The top navigation bar includes 'LÖSUNGEN', 'KATALOG', 'PREISSTRUKTUR', 'DOKUMENTATION', 'COMMUNITY', 'REGISTRIERUNG', and 'ANMELDUNG'. The search bar contains 'Hier Eingabe für Suche'. The left sidebar has a 'Suche optimieren über:' dropdown and a search icon. The main content area is titled 'Boilerplates' and includes the instruction: 'Wählen Sie ein Paket mit Beispielpcode und Services aus oder beginnen Sie ganz von vorne. Beginnen Sie nun mit der Erstellung einer neuen Anwendung.' Below this, there are two rows of service cards. The first row includes: Apache Spark Starter (IBM), Internet of Things Foundation Starter (IBM), Java Cache Web Starter (IBM), Java Cloudant Web Starter (IBM), Java DB Web Starter (IBM), and Mobile Cloud (IBM). The second row includes: MobileFirst Services Starter (IBM), Node.js Cache Web Starter (IBM), Node.js Cloudant DB Web Starter (IBM), Personality Insights Java Web Starter (IBM), Personality Insights Node.js Web Starter (IBM), and Node-RED Starter Community. Below the boilerplates, there is a section for 'Rechenknospen' with the instruction: 'Mit Cloud Foundry oder Docker-Images beginnen'. This section features a 'Laufzeiten' section with icons for: java (Liberty for Java™, IBM), js (SDK for Node.js™, IBM), go (Go, Community), php (PHP, Community), py (Python, Community), and rb (Ruby, Community). At the bottom, there is an icon for 'Eigenes Buildpack erstellen' (Community).

The screenshot shows the IBM Bluemix Service Catalog interface, specifically the 'Daten & Analyse' section. The top navigation bar and search bar are identical to the previous screenshot. The left sidebar is also identical. The main content area is titled 'Daten & Analyse' and includes the instruction: 'Zentrale Datenrezeits; unbegrenzte Möglichkeiten'. Below this, there are three rows of service cards. The first row includes: Analytics for Apache Hadoop (IBM BETA), Apache Spark (IBM BETA), BigInsights for Apache Hadoop (IBM), Cloudant NoSQL DB (IBM), dashDB (IBM), and DataWorks (IBM). The second row includes: DB2 on Cloud (IBM), Elasticsearch by Compose (IBM), Geospatial Analytics (IBM), Insights for Twitter (IBM), MongoDB by Compose (IBM), and Object Storage (IBM BETA). The third row includes: Object Storage (v2) (IBM BETA), PostgreSQL by Compose (IBM), Redis by Compose (IBM), SQL Database (IBM), Streaming Analytics (IBM BETA), and Time Series Database (IBM). Below the data and analysis services, there is a 'Sicherheit' section with the instruction: 'Sicherheit in Anwendungsdesign integrieren'. This section features icons for: Application Security Manager (IBM BETA), Application Dynamic Analyzer (IBM), Application Mobile Analyzer (IBM), Mobile Analyzer for iOS (IBM BETA), OnPremises Armmen (SSO) (IBM), and Static Analyzer (IBM BETA).

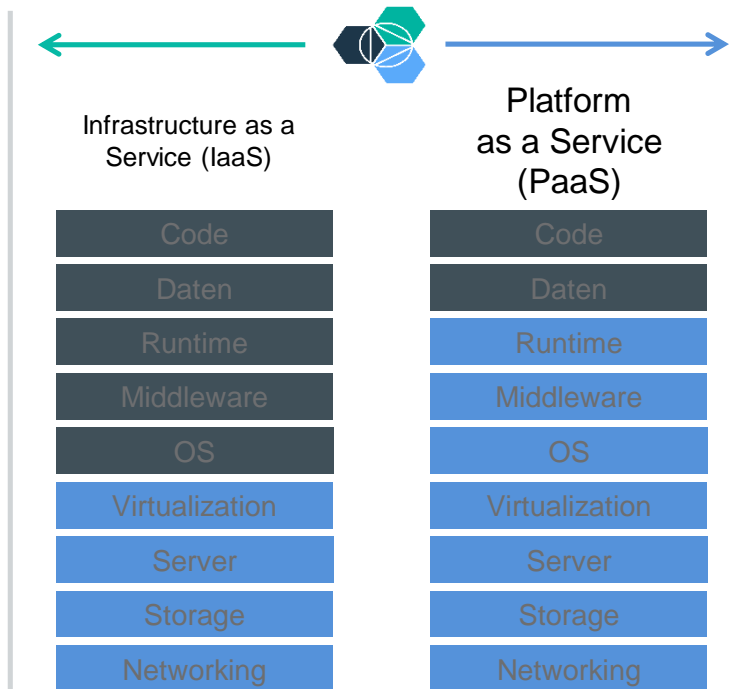
<https://console.ng.bluemix.net/catalog/>

Was ist Bluemix Paas and DevOps

More text on one line in this location if needed

Bluemix ist eine flexible Mischung aus PaaS und IaaS Konzepten, welche als **öffentliche, dedizierte** oder **on-premise** Umgebung genutzt werden kann.

- Verantwortlichkeit Kunde
- Verantwortlichkeit Service Provider



Offene Standards:



Was bietet Bluemix?

Bluemix ist eine auf offenen Standards basierende Cloudplattform für Erstellung, Deployment und Management von Applikationen

Freiheit in der Entwicklung

Nutzung der führenden Cloudtechnologien wie Cloud Foundry, Docker, OpenStack.

Skalierbarkeit

Unterstützung für Monitoring, Deployment, Logging, Debugging Services sowie automatische Skalierung der Anwendungen.

Erweiterbarkeit mit Services

Ein umfangreicher Servicekatalog aus IBM, open source und 3rd party Services um leistungsfähige Anwendungen zu bauen

Hybride Anwendungen

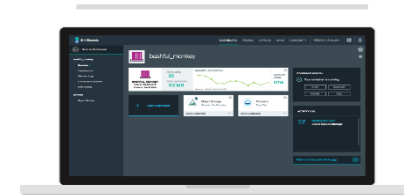
Einheitliche Nutzung und Verwaltung von Applikationen und Services für verschiedene Technologien

Sicherheitsmodelle

IBM sichert die Schichten auf Infrastruktur und Plattform und bietet Sicherheitsservices für die Anwendung

Flexible Preismodelle

Verschiedene Modelle wie z. B. Subscriptions, freie Services oder pay as you go

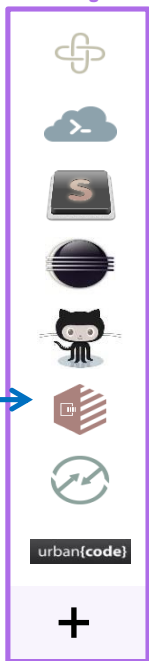


Wie funktioniert IBM Bluemix?

Bluemix basiert auf führenden offenen Standards: **Cloud Foundry**, **Docker** und **OpenStack**.

Erweitert werden diese Laufzeitumgebungen mit einer Vielzahl an **Services**, robusten **DevOps Tools** und **Integrationen**.

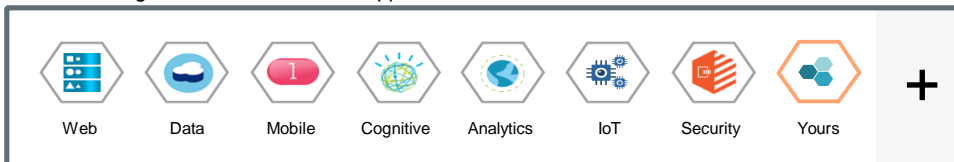
DevOps Werkzeuge



Eigene gehostete Apps / Services



Servicekatalog um Funktionalität der Applikation zu erweitern



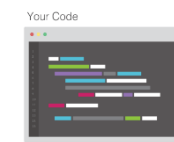
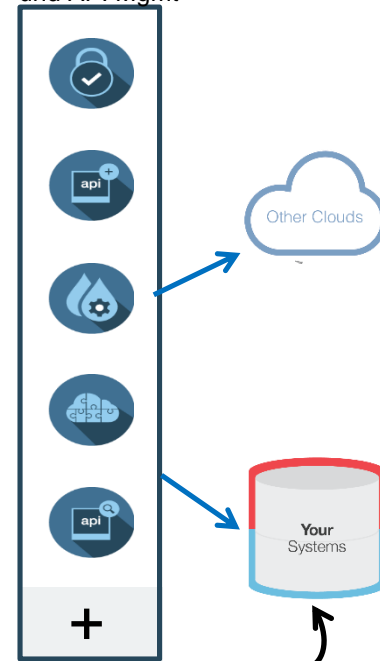
Flexible Laufzeitumgebung



Vielzahl an Deployment Optionen abhängig von Kundenanforderung



Integration und API Mgmt



Der user kann seine bevorzugte IDE nutzen!!!

Sichere Kommunikation zum Backend und anderen Clouds

Bluemix - eine PaaS Umgebung mit Unterstützung für eine Vielzahl von Languages/Frameworks/Services

❖ Multi-Language

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

❖ Multi-Framework

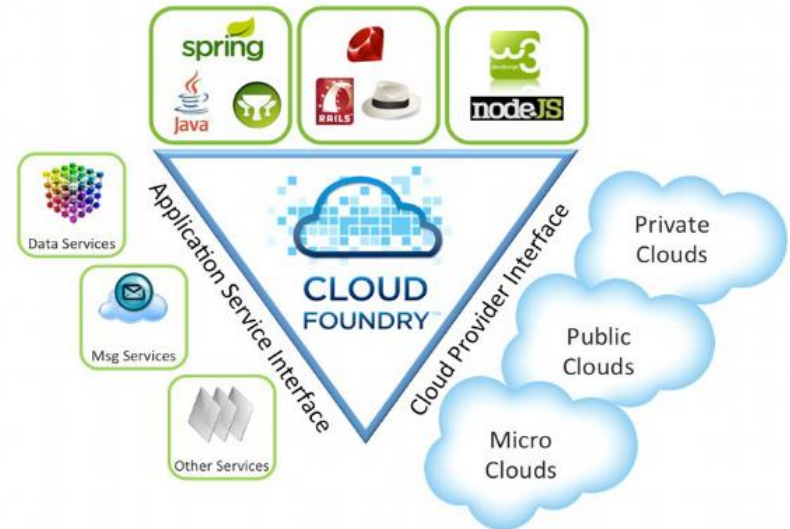
Rails, Sinatra, Spring, Grails, Express, Lift, ...

❖ Multi-Services

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

❖ Multi-Cloud, Multi-aaS

Public Cloud, MicroCloud, Private Cloud



Flexible Compute options

Devs get to **choose** the level of **infrastructure abstraction** and **fine-tuned control** that suits their apps and services.

Instant Runtimes



The highest level of infrastructure abstraction. Focus on the app.

Containers



Powerful, but less resource intensive than VMs. Key to support hybrid portability.

Virtual Machines



Control all the way down to the operating system.

What's different about Bluemix?



- Extends Cloud Foundry with DevOps tooling, integration capabilities, and seamless app management
- Support for 7 key languages and the option to use a community buildpack.



- Docker as-a-service means no VMs to manage
- A repository of enterprise-grade images which are trusted and secure
- Enhanced performance and scalability
- Integrated monitoring, logging, networking, and storage



- Deploy and manage VMs consistently across public, dedicated, and private instances with a single dashboard.
- Connect to your own OpenStack infrastructure



Zusammenfassung

Bluemix bietet Offenheit und Freiheit der Wahl. Anwender können sich auf ihre App konzentrieren. Alles andere liefert Bluemix.

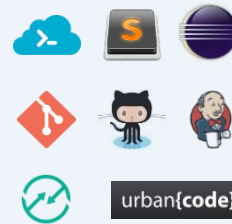
Compute

Frei Wahl der **Infrastruktur-Abstraktion** passend zur Architektur der Apps.



Dev Tooling

Vom Editor über Source Code Management bis Continuous Delivery kann aus den **Bluemix DevOps Tools** gewählt – oder die gewohnte eigene Umgebung genutzt werden.



Location

Apps können auf Bluemix **Public** laufen (in einer wachsenden Zahl von Geos), im eigenen **dedicated Bluemix** oder einer lokalen Cloud **im eigenen Datacenter Bluemix Local**.

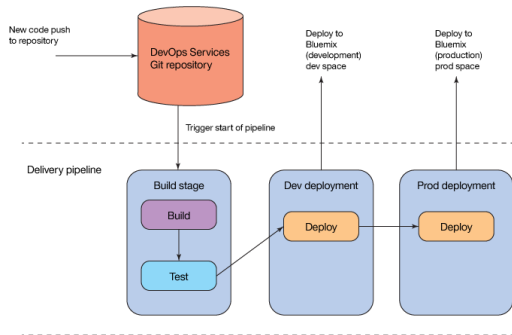


Services

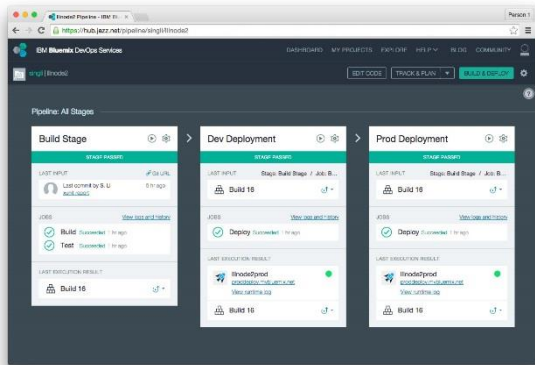
Es besteht die Auswahl aus einem Katalog von **IBM, third party, open source** und auch eigenen **Services** zur Nutzung durch die Apps.



DevOps Services



“IBM Bluemix DevOps Services is a software as a service (SaaS) on the cloud that supports continuous delivery. With DevOps Services, you can develop, track, plan, and deploy software in one place.”



We bring the tools. You bring the code.



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

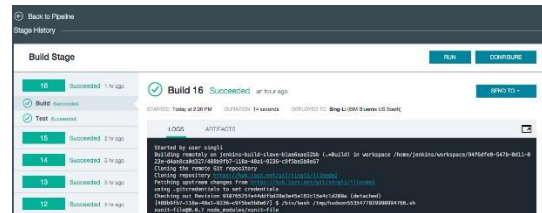
Automatically build and deploy your application to IBM's cloud platform, Bluemix.



Team Collaboration

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

<https://hub.jazz.net/>



Example -

<https://www.ibm.com/developerworks/cloud/librariy/ci-bluemix-fundamentals-using-devops-services-with-your-node-app/index.html#N10329>



Key DevOps principles

Collaborate for speed

Collaborative steering helps maintain direction and make necessary adjustments along the way based on early feedback, and measures activities to improve agility and delivery predictability.

Dashboard everything

Collaborative development enables visibility. Status, performance, build quality team efficiency, and bottlenecks should all be visible through dashboards, so that the operations team knows what is coming and can prepare accordingly.

Automate everything

Continuous automation of release management ensures repeatability and reduces time, errors, and cost by automating the deployment of applications, middleware configuration, and database changes into development, Quality Assurance, and staging environments.

Test everything

Continuous testing ensures quality. Deployment scripts, infrastructure definitions for all environments, test cases, and code are stored in the SCM to enable rapid and error-free repeatability.

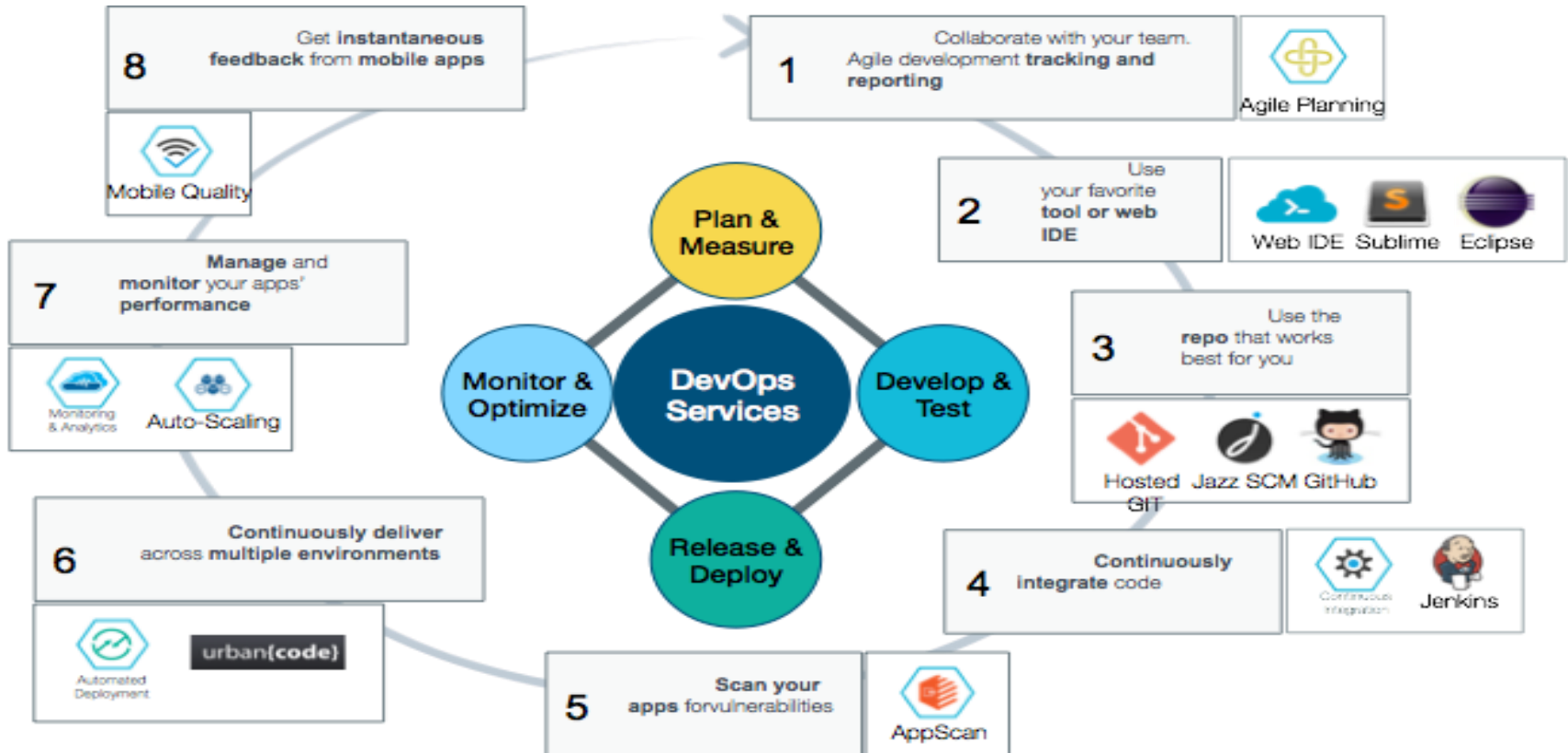
Monitor and audit everything

Continuous monitoring ensures accountability. Monitor the application and audit everything. Audit logs capture the deployment actions and work items instrument teams' activities.

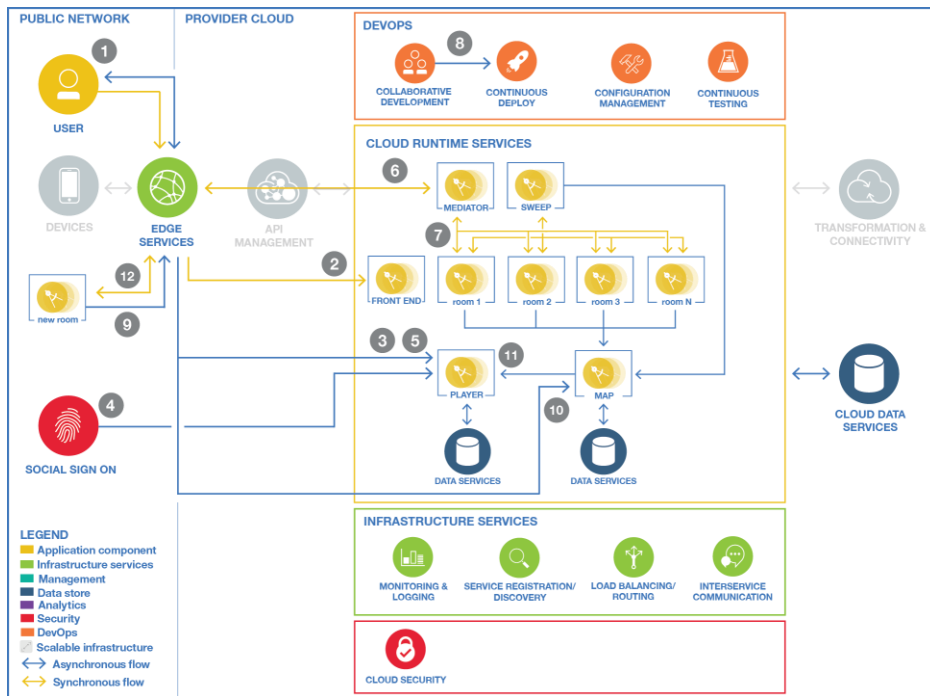


Continuous Innovation & Delivery

Fit for the enterprise: The DevOps experience is unified and open across Bluemix compute technologies, delivery methods, and integrated systems.



<https://developer.ibm.com/architecture/gallery/createMicroservices>

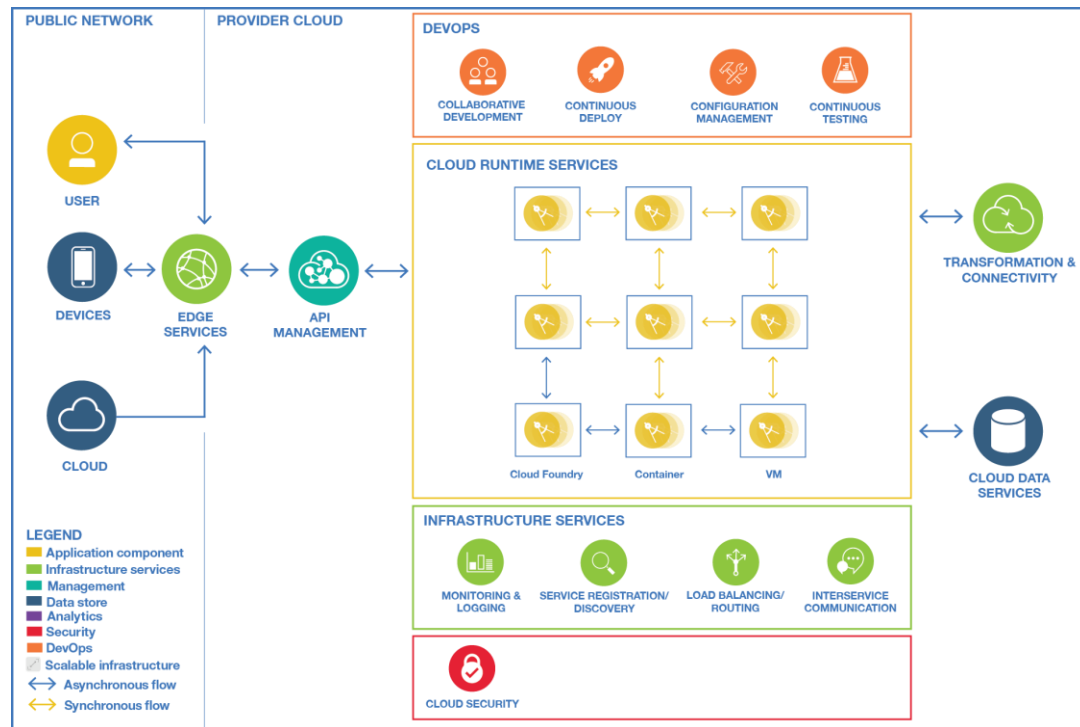


Mit einem Microservice-Architektur-Ansatz sind weitere Vorteile verbunden:

- Festlegung auf bestimmte Programmiersprachen entfällt – Das Team, das implementiert wählt die für den Zweck beste Sprache. Polyglotte Programmierung
- Festlegung auf bestimmte Datenhaltung entfällt – Das Team, das implementiert wählt die Datenhaltung die für den jeweiligen Einsatz am besten gedacht ist.
- Kurze Entwicklungszyklen – Ergebnisse stehen schnell zur Verfügung
- Schaffung einer API Economy – im Rahmen des Konsortiums oder aber auch darüber hinaus.



<https://developer.ibm.com/architecture/microservices>



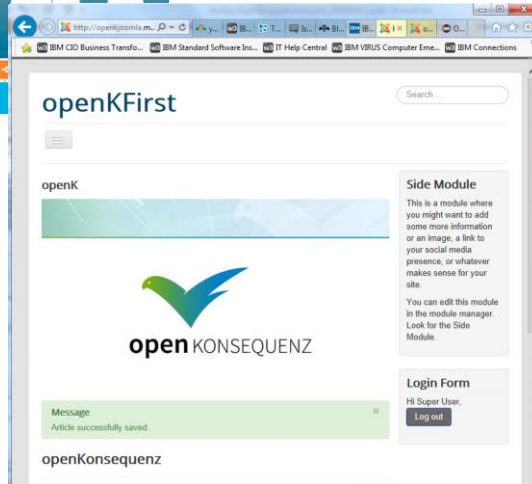
Flow

- 1.DevOps/automation:** Tools used by developers and operations to manage microservice code and automate testing and deployment in the microservices framework.
- 2.Runtime services:** The runtime environments for the execution of the microservice instances, often polyglot in nature across an application.
- 3.Infrastructure services:** The supporting services to manage the execution and communication between individual microservices running in the microservices framework.
- 4.Cloud data services:** Highly available cloud data stores that enable microservices to store persistence data.
- 5.Transformation and connectivity:** Integration services that enable connection to and integration with data and applications on the premises and in other clouds.
- 6.API management:** Managed exposure of business APIs and applications composed of microservices.
- 7.Security services:** Standard authentication and authorization services, supporting request security both internally and at the edge of the application.



Example – Joomla install

https://www.ibm.com/developerworks/community/blogs/318b9632-5582-4635-b5fc-38a1dec81a40/entry/bluemix_deploying_joomla_v3_3_with_cleardb_sendgrid_services?lang=en



Installation Steps

1. Download the latest Joomla v3.3 from the following link:
<http://www.joomla.org/downloads>
2. Unzip the download and change to the base directory.
3. On the same directory, create a manifest.yml file using your favorite text editor (e.g., notepad++).
4. Enter the text below and save the file:

```
---
applications:
- name: joomla
  application: java
  memory: 256M
  instances: 1
  host: openkfirst
  services:
  - clearcloud
  - sendgrid
  buildpacks:
  - heroku-buildpack-jvm-ppa
```
5. Next, we will create the services. For Joomla, typically we will need a database service, and optionally, an email service. Based on the existing services in Bluemix marketplace, we will use ClearDB (MySQL) for the database and Sendgrid for the email.
6. Now, login to Bluemix using the Cloud Foundry CLI. Run the following login command:

```
cf login -a https://api.ng.bluemix.net -u USERNAME -p PASSWORD -o org -s space
```

Please enter your own username and password. If you output ORG is your email/username, and SPACE is dev. However, if you just type of login only, you will be prompt with the required values.
7. To view the list of services available in the marketplace, run the following command:

```
cf marketplace
```

You can also use it for short.
8. As you can see, there are cleardb and sendgrid services that we can use. There is also mysql but we're going to use cleardb instead.
9. To create cleardb service, run the following command:

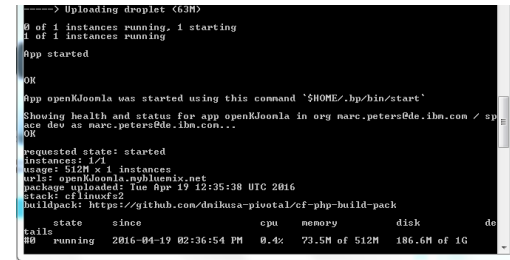
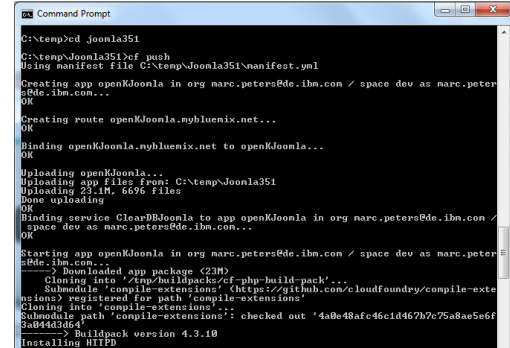
```
cf cs cleardb spark clearcloudjoomla
```

cs is the short form for cf create-service. The above command will create a cleardb service, using spark plan, and named ClearDBJoomla. If you intend, ClearDBJoomla is mentioned in the manifest.yml file earlier. This is based on the following usage:

```
cf create-service SERVICE PLAN SERVICE-INSTANCE
```
10. Next, we will create the sendgrid service:

```
cf cs sendgrid free sendgridjoomla
```

If you have previously created a sendgrid service, you may have problems creating another one. In that case, you can just reuse the existing sendgrid service. To do so, you need to change the manifest.yml file accordingly.
11. Then, we need to deploy or push Joomla to Bluemix. But before that, just want to note that we're using a PHP-3rd party buildpack. If you can't buildpacks, you will notice that PHP is not included, hence we will import the buildpack from outside. In this case, we're using cf-php-build-pack. It is one of the community built buildpacks available that is widely used. This buildpack is using PHP 5.4, so this is compatible with our Joomla version.
12. To deploy Joomla to Bluemix, make sure that you're at the same folder where you created the manifest.yml file. There's one important step that needs to be done. Create a new folder called libfdo and move all the files and folders under manifest.yml to it. This is necessary because it has a folder named libfdo. When you push the



A word on Security

<https://console.ng.bluemix.net/docs/security/index.html#security>

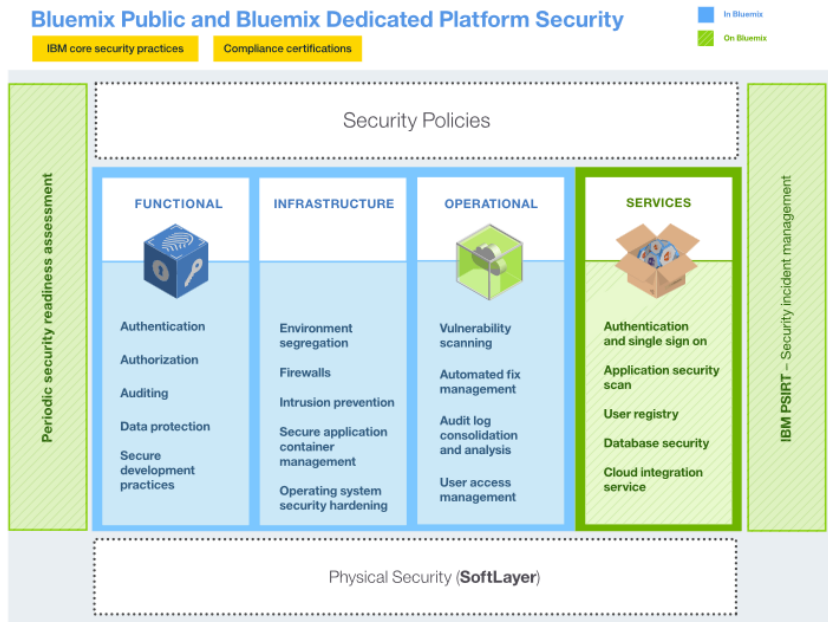
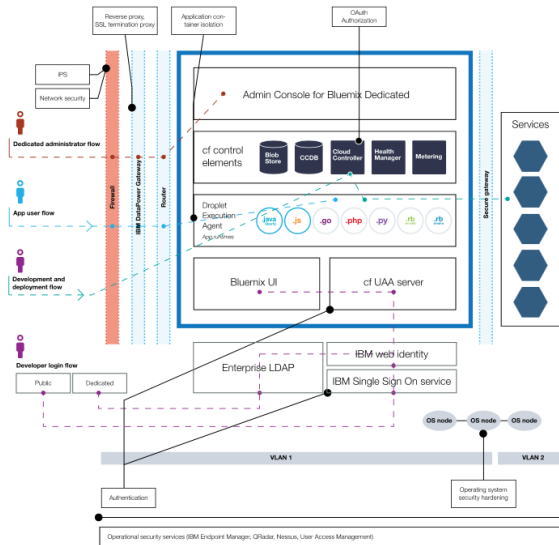


Figure 1. Bluemix platform security overview



IBM® Bluemix® provides a secure cloud platform that you can trust. Bluemix compliance results from a platform and services that are built on best-in-industry security standards, including ISO 27001 and ISO 27002.



Enterprise Integration, Daten- und API Management

Für hybride Szenarien stehen 5 Key Services für die Integration zur Verfügung

Securely access data and applications in other clouds, enterprise data centers and locally on developer laptops



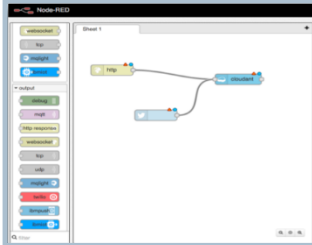
Secure Gateway

Data services like: Shape data, load data, provision masked data, profile data, and classify data let you **prepare your data** for use in production apps

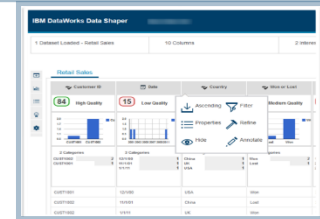


DataWorks

Create REST APIs from on-premises or cloud endpoints (DB2, SFDC, etc). Assemble multiple APIs into a single API using Node-RED for composition



Connect and Compose



API Management

Publish, promote, and oversee your APIs in a secure, scalable environment. Includes the creation of end user support resources that define and document the API

Find the right API for your app. Built from a corpus of the world's public APIs, it understands relationships between already selected APIs and new ones being searched



API Harmony

Wie adressiert IBM Bluemix die
Zielsetzungen von
openKonsequenz?

Mehrwerte

- ✓ ▪ Open Source Plattform und Lösungen
- ✓ ▪ Agilität, Flexibilität und Effizienz in der Entwicklung der Lösungen
- ✓ ▪ Offenheit in der Gestaltung des Ecosystems der Entwickler und Partner im Konsortium.
- ✓ ▪ Offenheit in der Wiederverwertung von Lösungsbausteinen
- ✓ ▪ Wachstum mit weiteren Netzbetreibern. Bereitstellen von Applikationen und APIs sowie Abrechnen der Nutzung.



What's Next

Was ist jetzt zu tun?



Making it easier to work with open tech

With Bluemix we deliver and run many open source projects as-a-service across public, dedicated and on-premises deployment models. Focus on what differentiates your business, not operating infrastructure and databases.

