Developer Operations

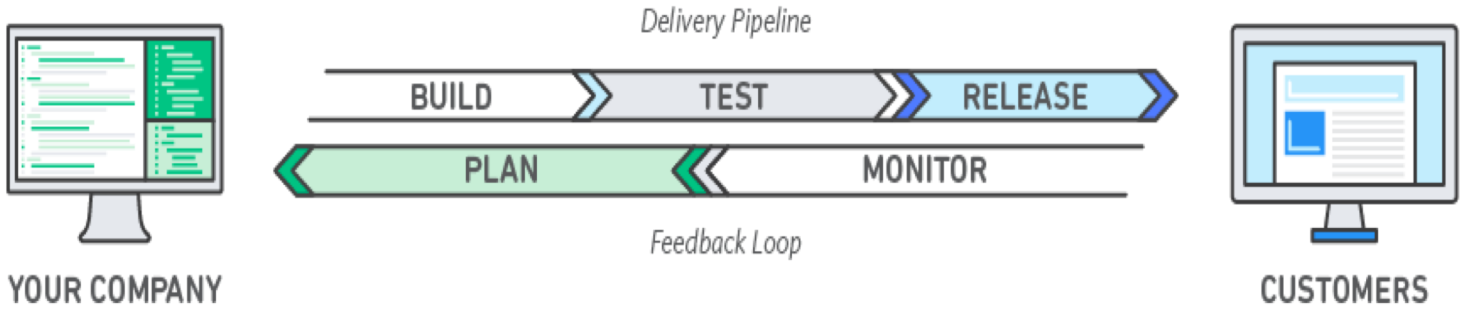
What is DevOps ?

Wikipedia definition…

.. a software development method that stresses communication, collaboration and integration between software developers and information technology (IT) professionals. DevOps is a response to the interdependence of software development and IT operations. It aims to help an organization rapidly produce software products and services

AWS definition…

DevOps is the combination of cultural philosophies, practices, and tools that increases an organization's ability to deliver applications and services at high velocity: evolving and improving products at a faster pace than organizations using traditional software development and infrastructure management processes.



https://aws.amazon.com/devops/what-is-devops/

What is DevOps ?

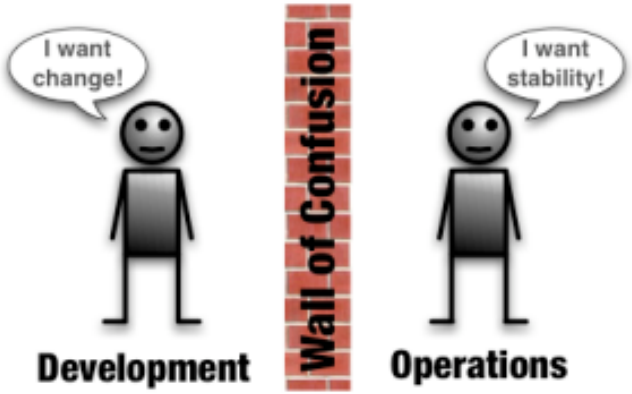
Where does it fit?

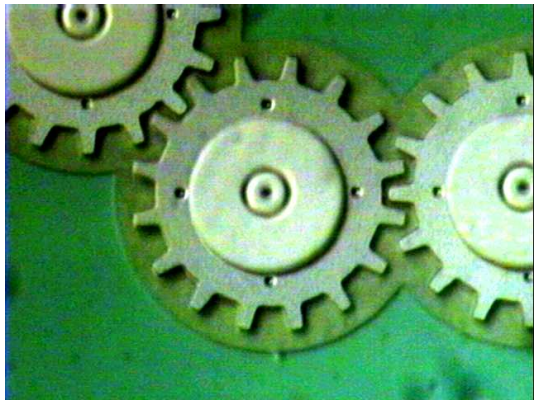
The DevOps movement

- Shares common goals
- Development vs Operations

Deployment automation

- Age-old practice by smart developers
- Loads of scripts, tools, commercial and open source products
- Part of Continuous Delivery



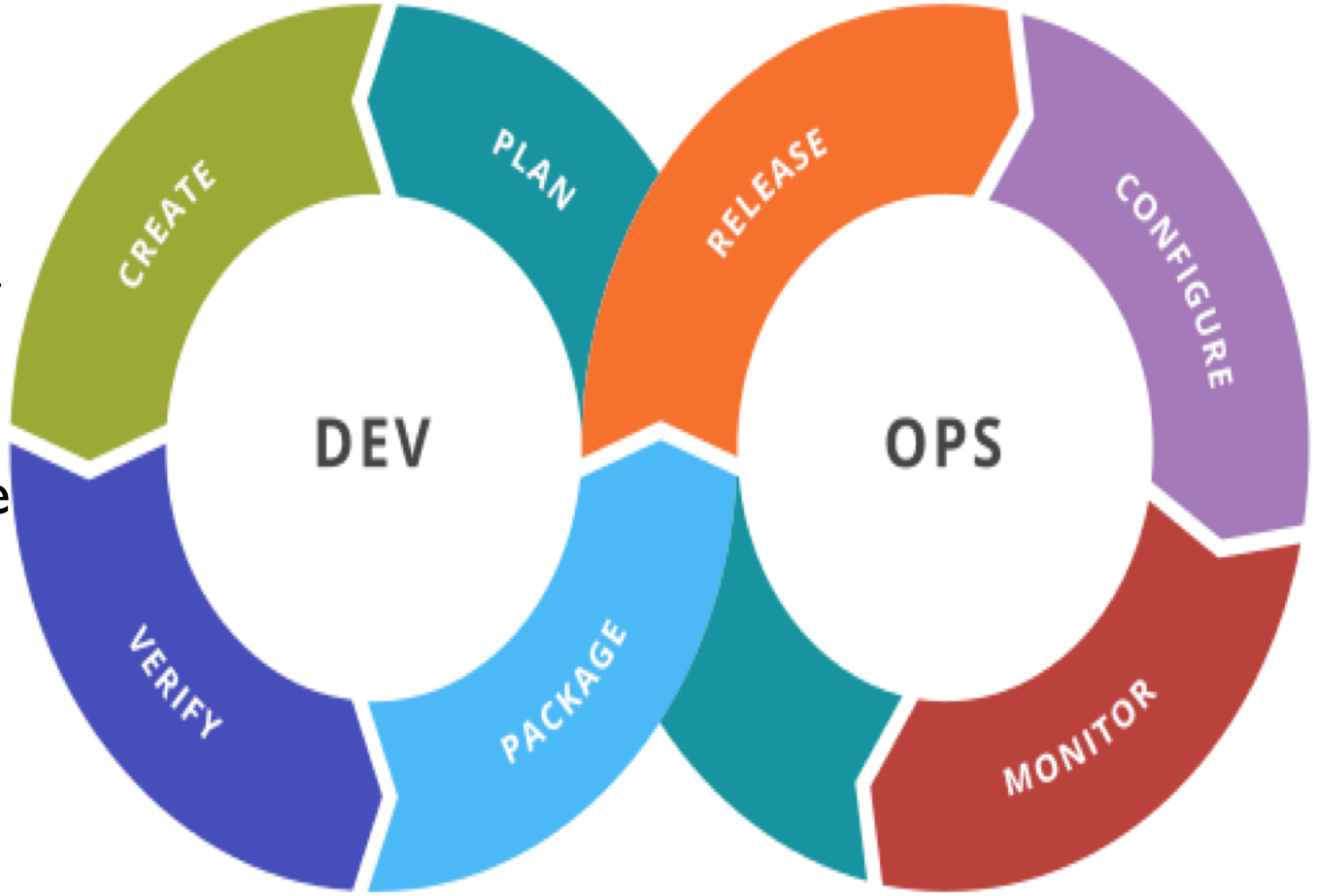


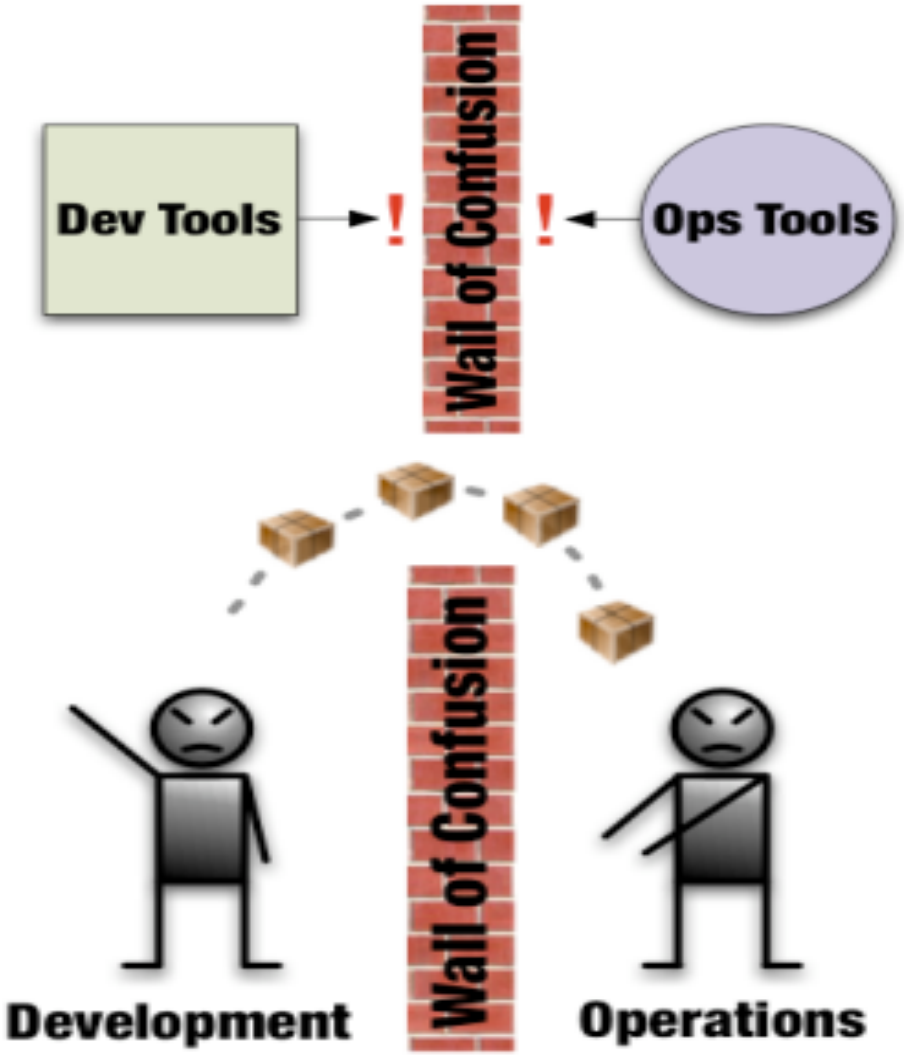
DevOps Toolchain

DevOps toolchain is a set or combination of tools that aid in the delivery, development, and management of applications throughout the software development lifecycle. Because DevOps is a cultural shift and collaboration between development and operations, there is no one product that can be considered a single DevOps tool.

Generally, DevOps tools fit into one or more of these activities, which supports specific DevOps initiatives: Plan, Create, Verify, Preprod, Release, Configure, and Monitor.

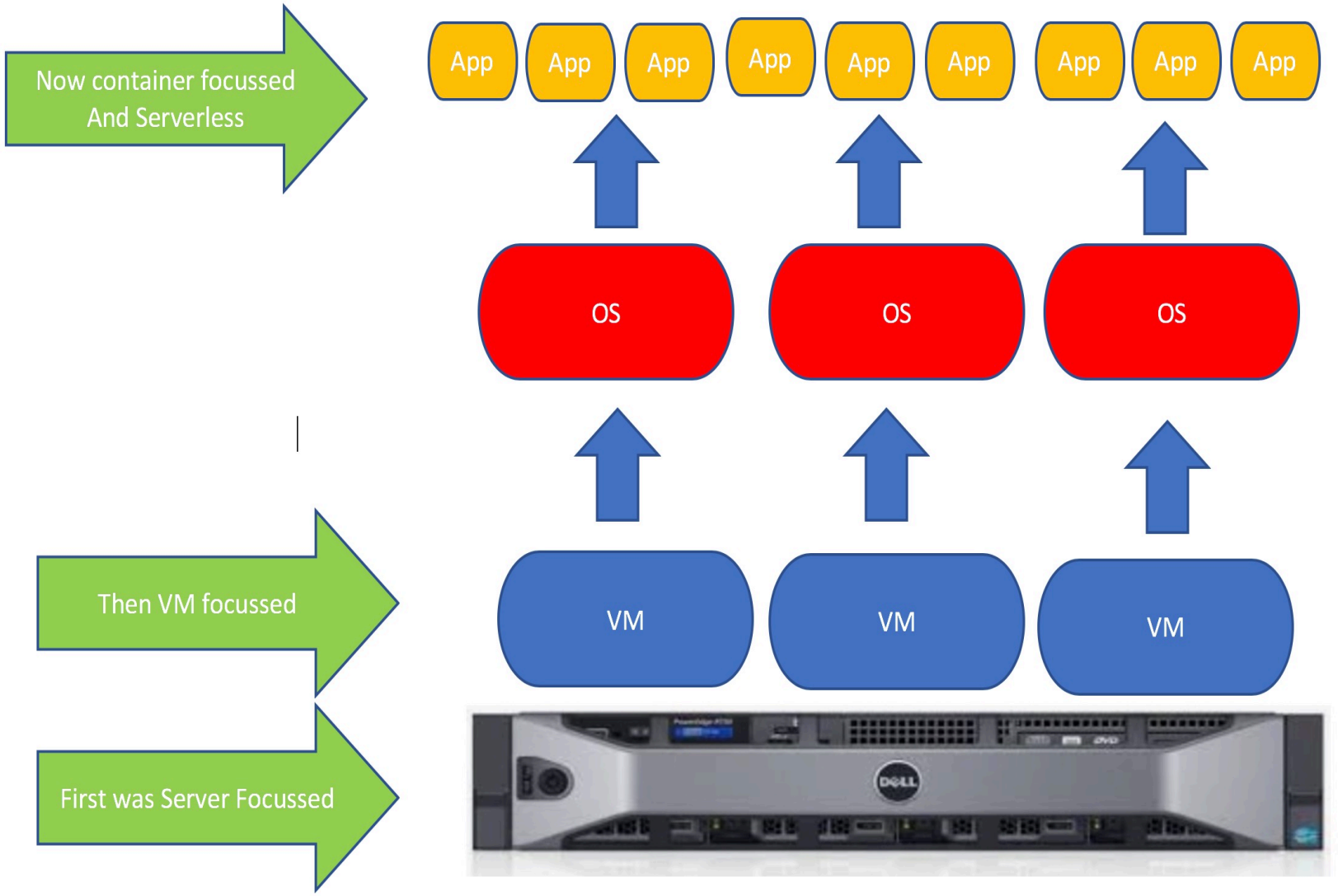
https://en.wikipedia.org/wiki/DevOps_toolchain





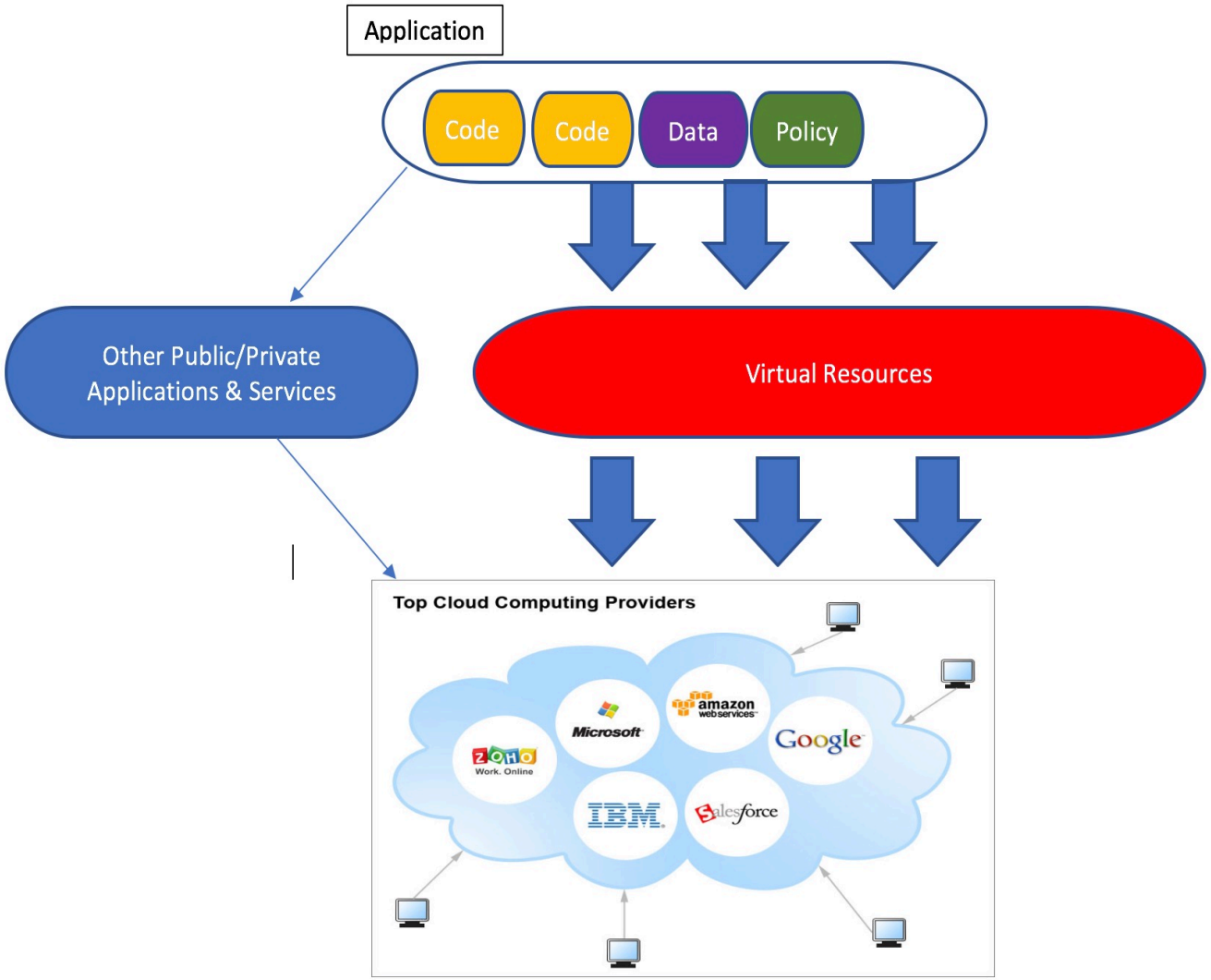
Adding to the Wall of Confusion is the all too common mismatch in development and operations tooling. Nowhere is the Wall of Confusion more obvious than when it comes time for application changes to be pushed from development to operations.

Pre-Cloud Application Deployment



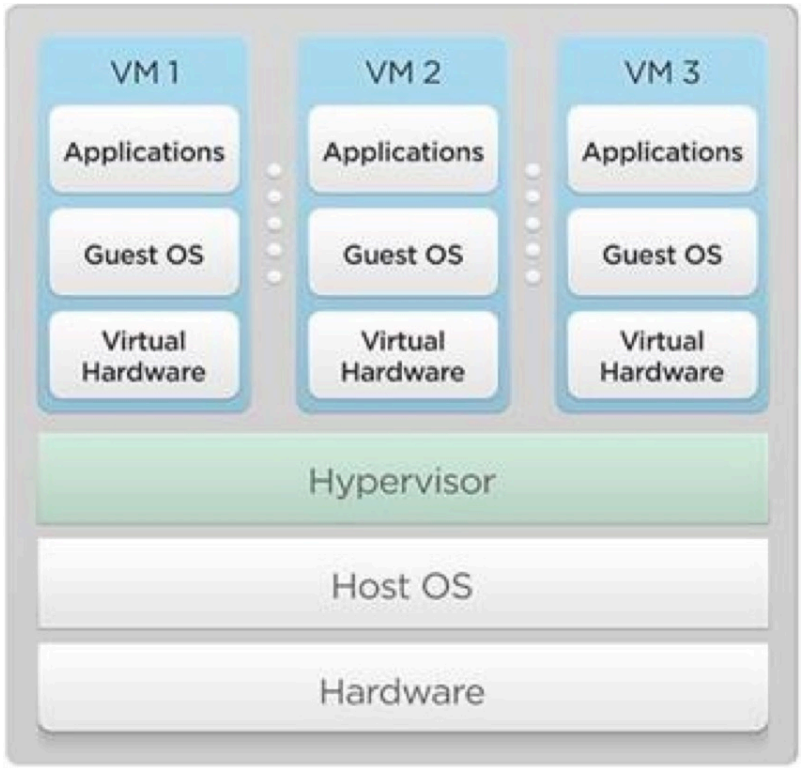
In the past, the unit of deployment into the data center was the server. The server was procured, provisioned with an OS, connected to the network, assigned an address and an identity, etc. The application was secondary; it just went along for the ride.

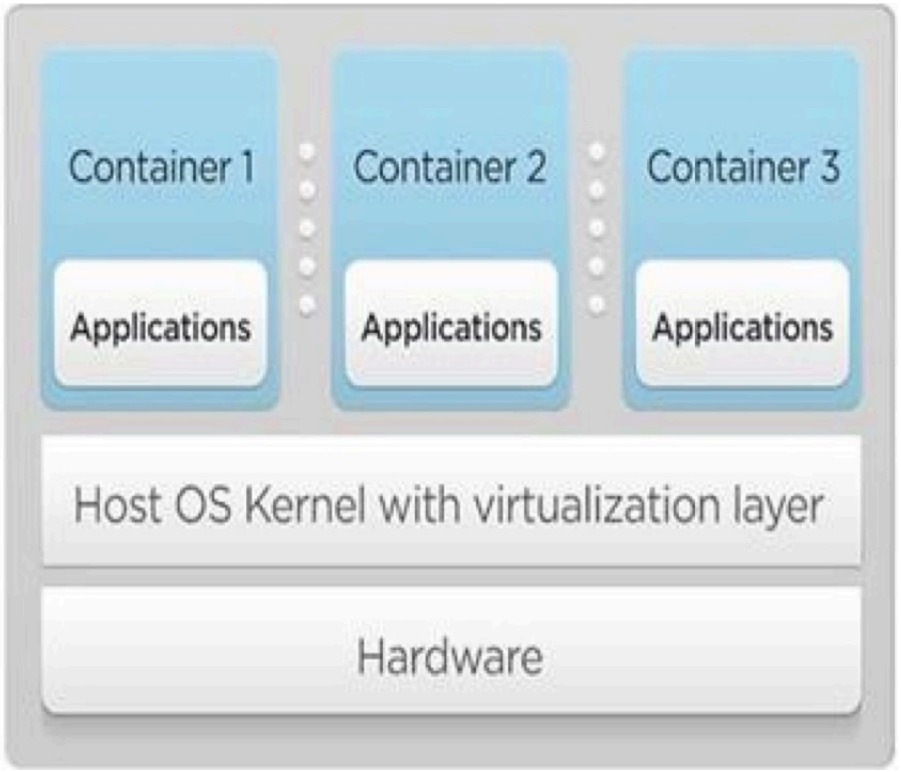
Cloud Application Deployment



Cloud computing, however, is an application centric operations model. The unit of deployment is quickly shifting from the server (even the VM image) to the application itself. What evidence is there of this? Most production server images are now being built to support a single application or application component. E.g. Look at the list of applications available as commercial AMIs on EC2.

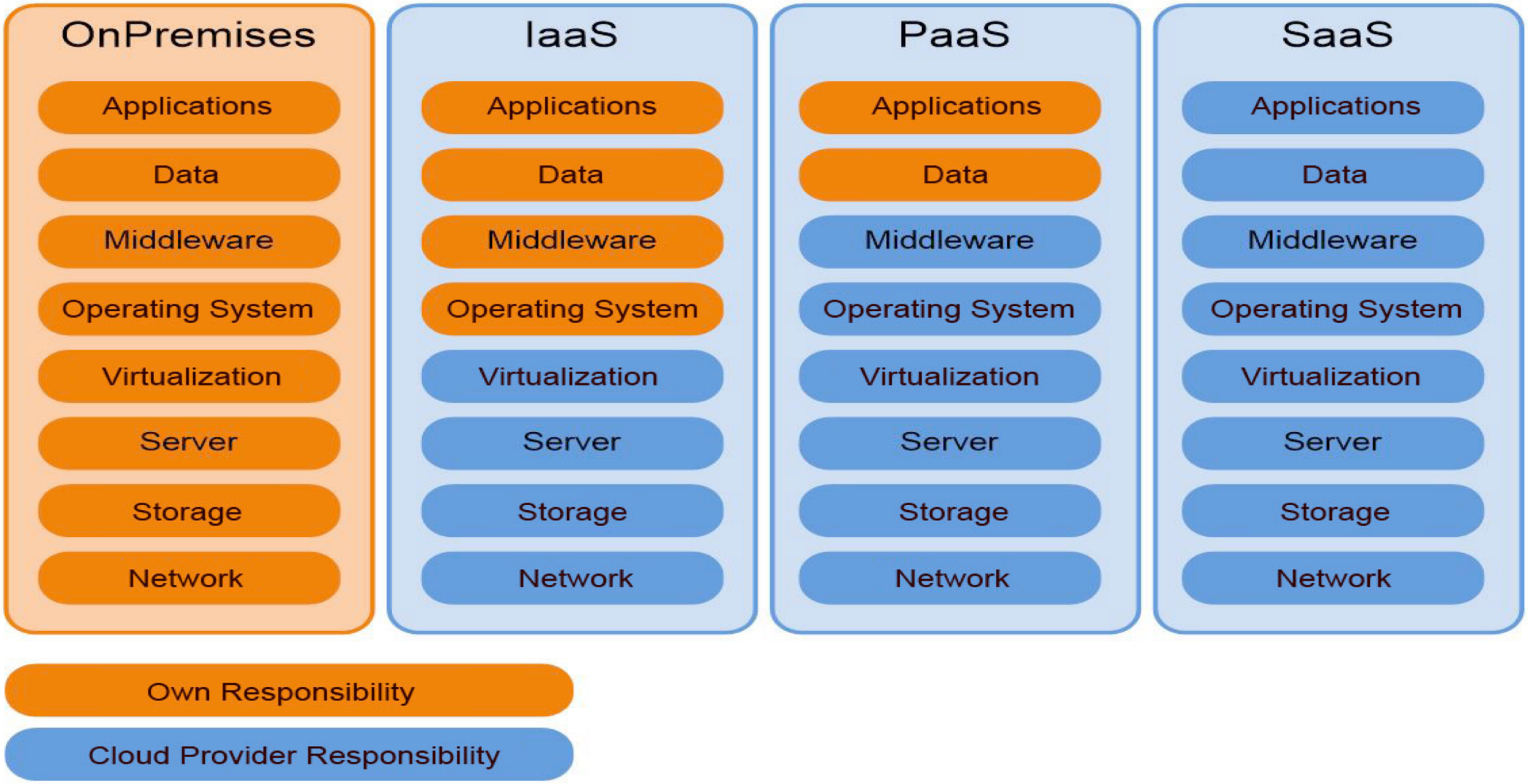
Virtualisation v Containerisation





Docker is an open-source project that automates the deployment of applications inside software containers, by providing an additional layer of abstraction and automation of operating-system-level virtualization on Linux, Mac OS and Windows

Shared Responsibility



DevOps another description…

James Urquhart nails it ..modern applications, running in the cloud, still need to be resilient and fault tolerant, still need monitoring, still need to adapt to huge swings in load, etc. Those features, formerly provided by the IT/operations infrastructures, now need to be part of the application, particularly in "platform as a service" environments. Operations doesn't go away, it becomes part of the development. And rather than envision some sort of uber developer, who understands big data, web performance optimization, application middleware, and fault tolerance in a massively distributed environment, we need operations specialists on the development teams. The infrastructure doesn't go away — it moves into the code; and the people responsible for the infrastructure, the system administrators and corporate IT groups, evolve so that they can write the code that maintains the infrastructure. Rather than being isolated, they need to cooperate and collaborate with the developers who create the applications. This is the movement informally known as "DevOps.

Adoption of DevOps

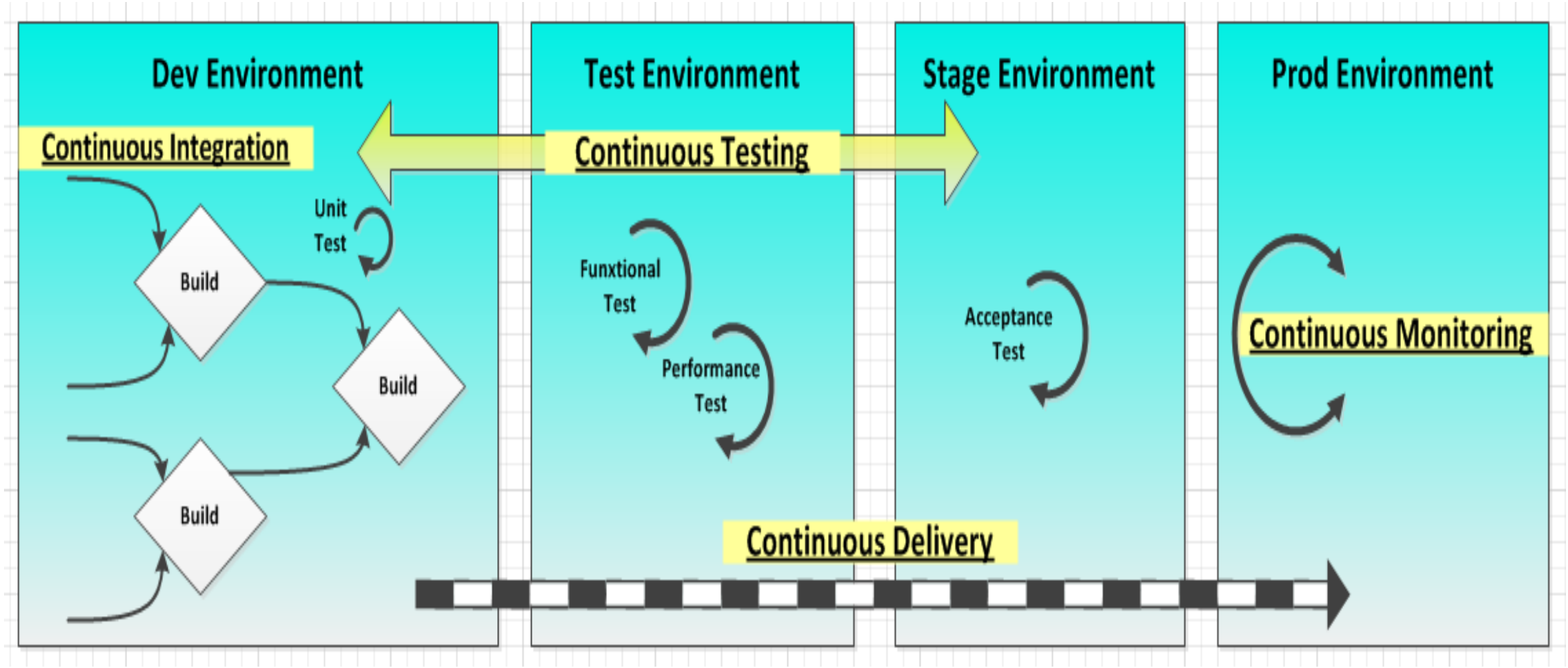
The adoption of DevOps is being driven by factors such as:

- Use of agile and other development processes and methodologies
- Demand for an increased rate of production releases from application and business unit stakeholders
- Wide availability of virtualized and cloud infrastructure from internal and external providers
- Increased usage of data center automation and configuration management tools
- Increased focus on test automation and continuous integration methods

3 areas of focus for DevOps related solutions

- *Measurement and incentives to change culture*
- *Unified processes*
- *Unified tooling*

How does DevOps help?



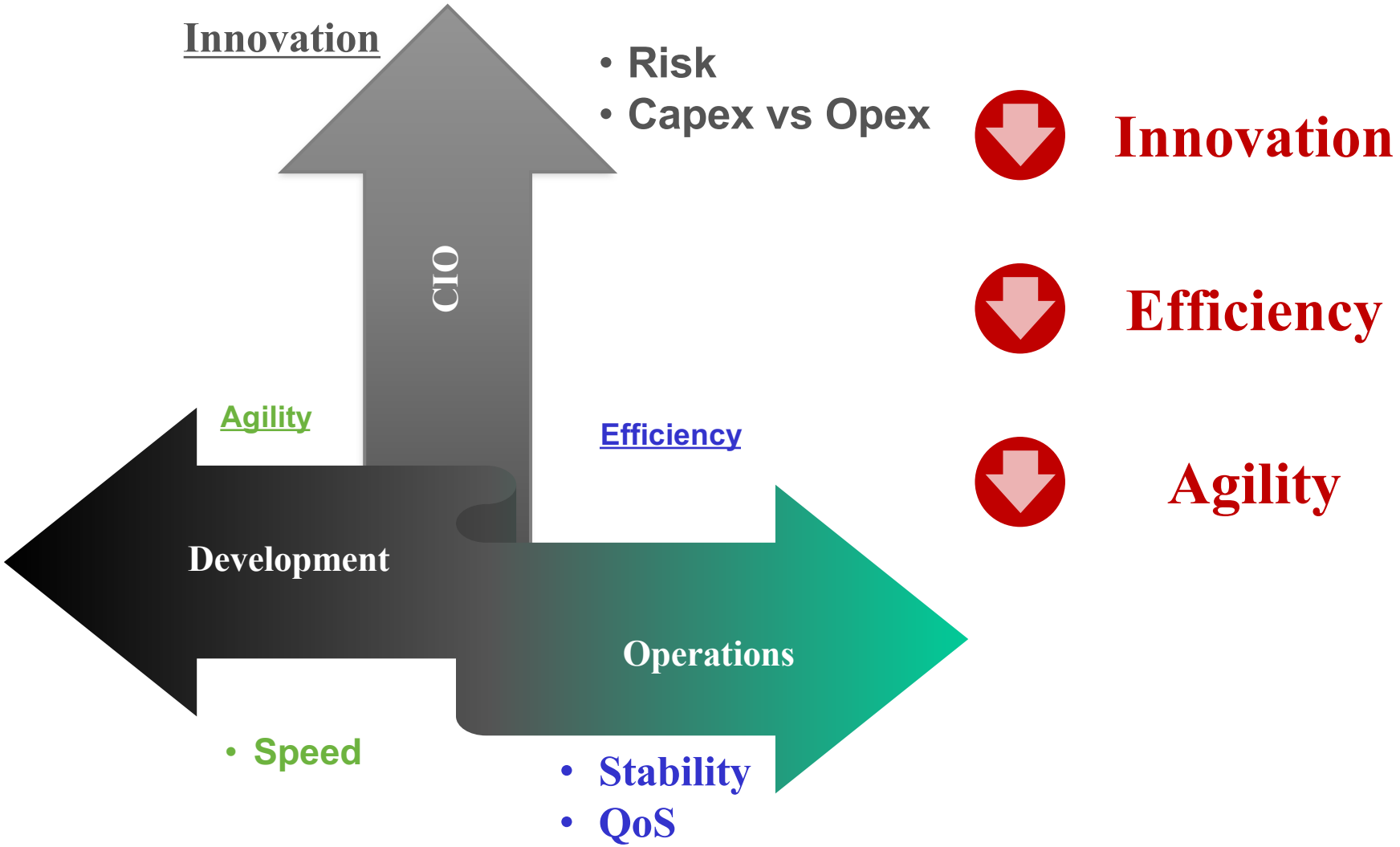
DevOps Best Practices

- Continuous Integration (CI)
- Continuous Delivery (CD)
- Continuous Testing

DevOps Best Practices

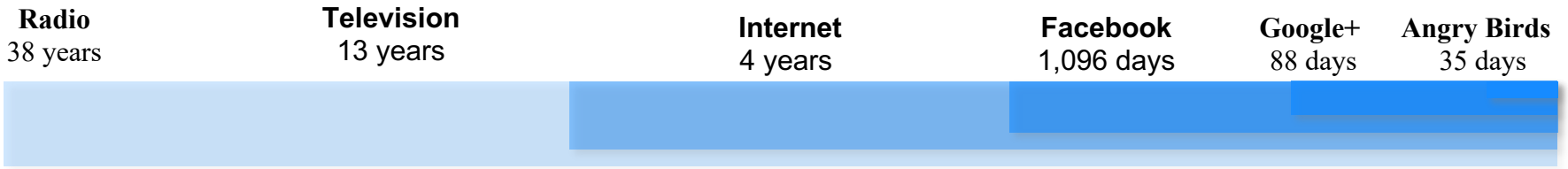
- Microservices
- Infrastructure as Code
- Monitoring and Logging
- Communication and Collaboration

Business Places Strict Demands of IT – Is IT Ready?



Business in the Fast Lane

Time to 50,000,000 users:

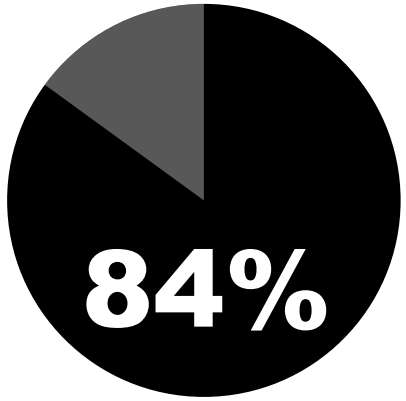


Did not exist 15 years ago, and today have millions of subscribers and offer high-quality services at no-charge

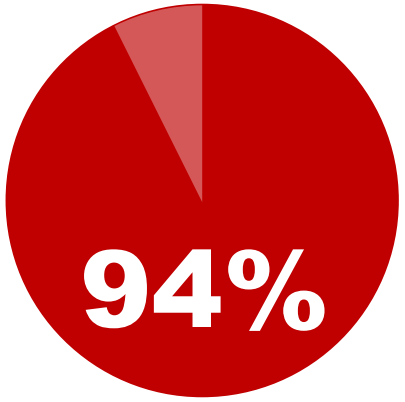
Innovation, **efficiency** and **agility** are *requirements* for survival

The Reality Check

IT does not enable the business, it ***is*** the business



Global executives believe **innovation** is extremely important to their growth strategies



Are **unsatisfied** with their innovation performance

Forbes®

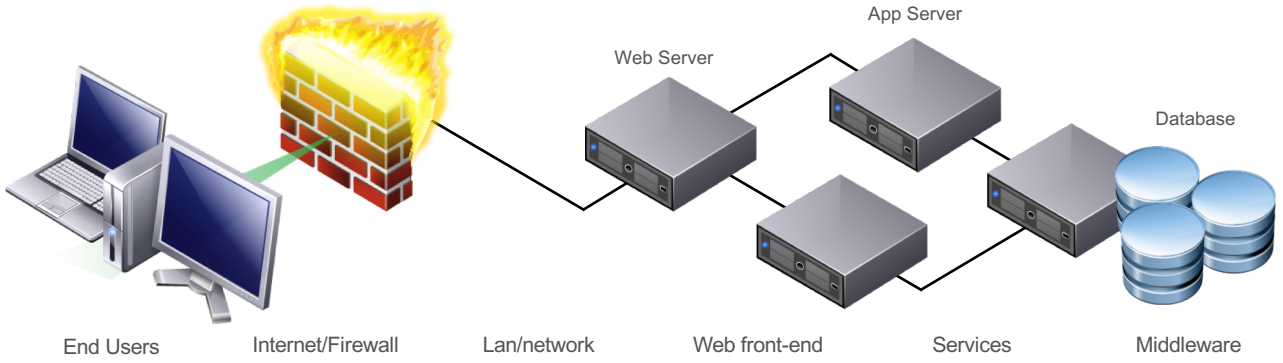
"...CMOs will spend more on IT than CIOs"

http://http://www.forbes.com/sites/lisaarthur/2012/02/08/five-years-from-now-cmos-will-spend-more-on-it-than-cios-do//

Application evolution

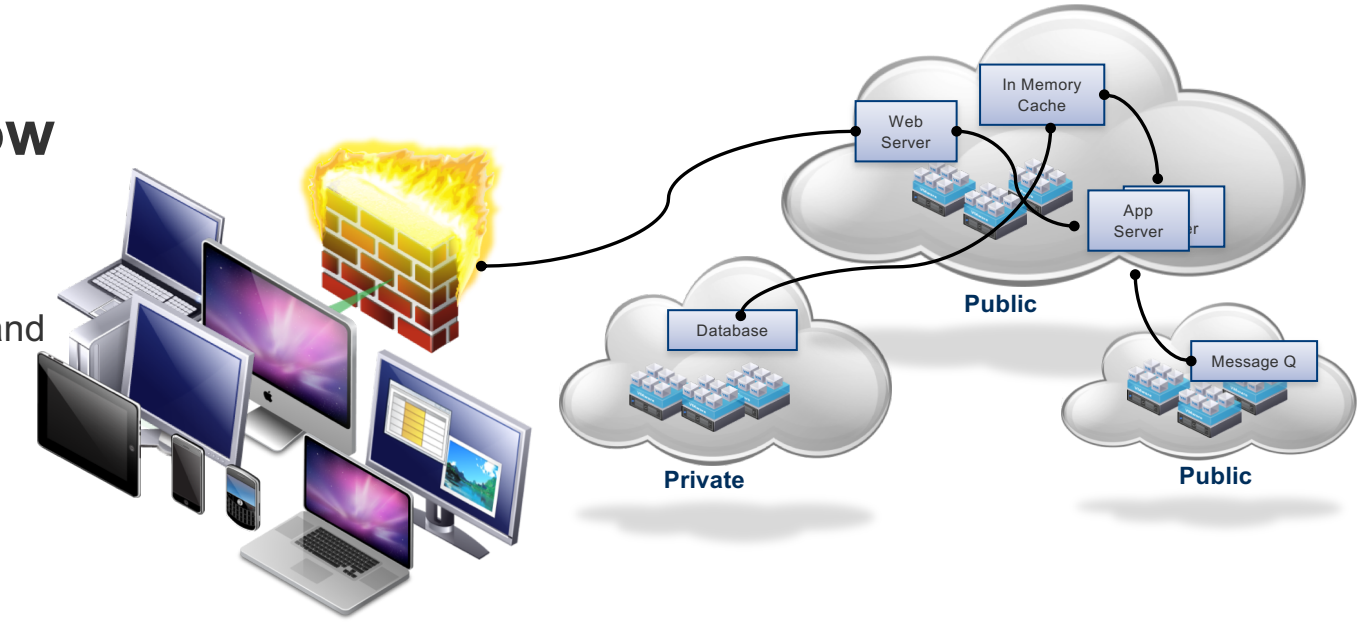
Yesterday

- Waterfall development
- Weeks to provision
- Static resources
- Limited change windows
- $100k+ of compute
- Limited number of users, in business hours

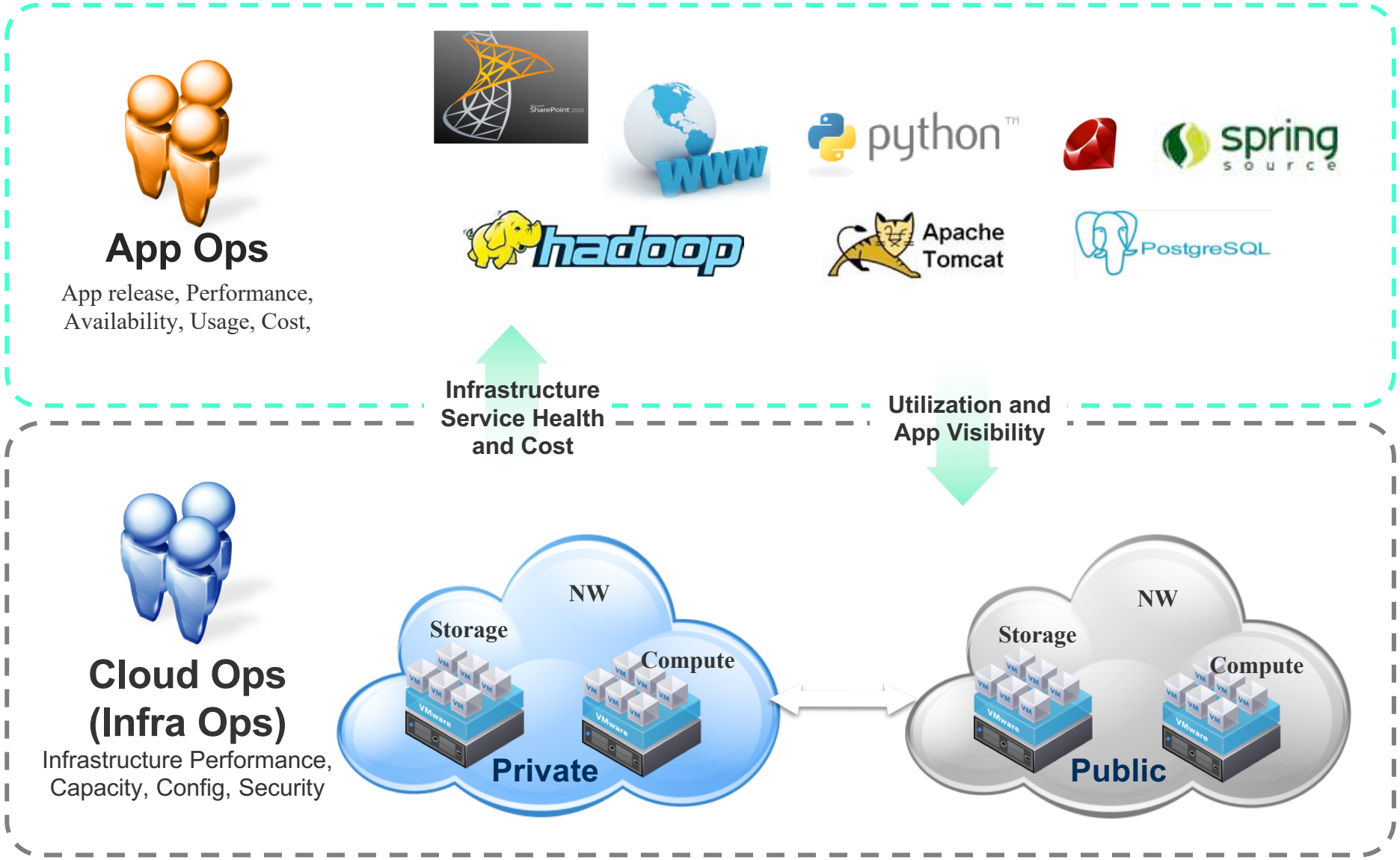


Today/Tomorrow

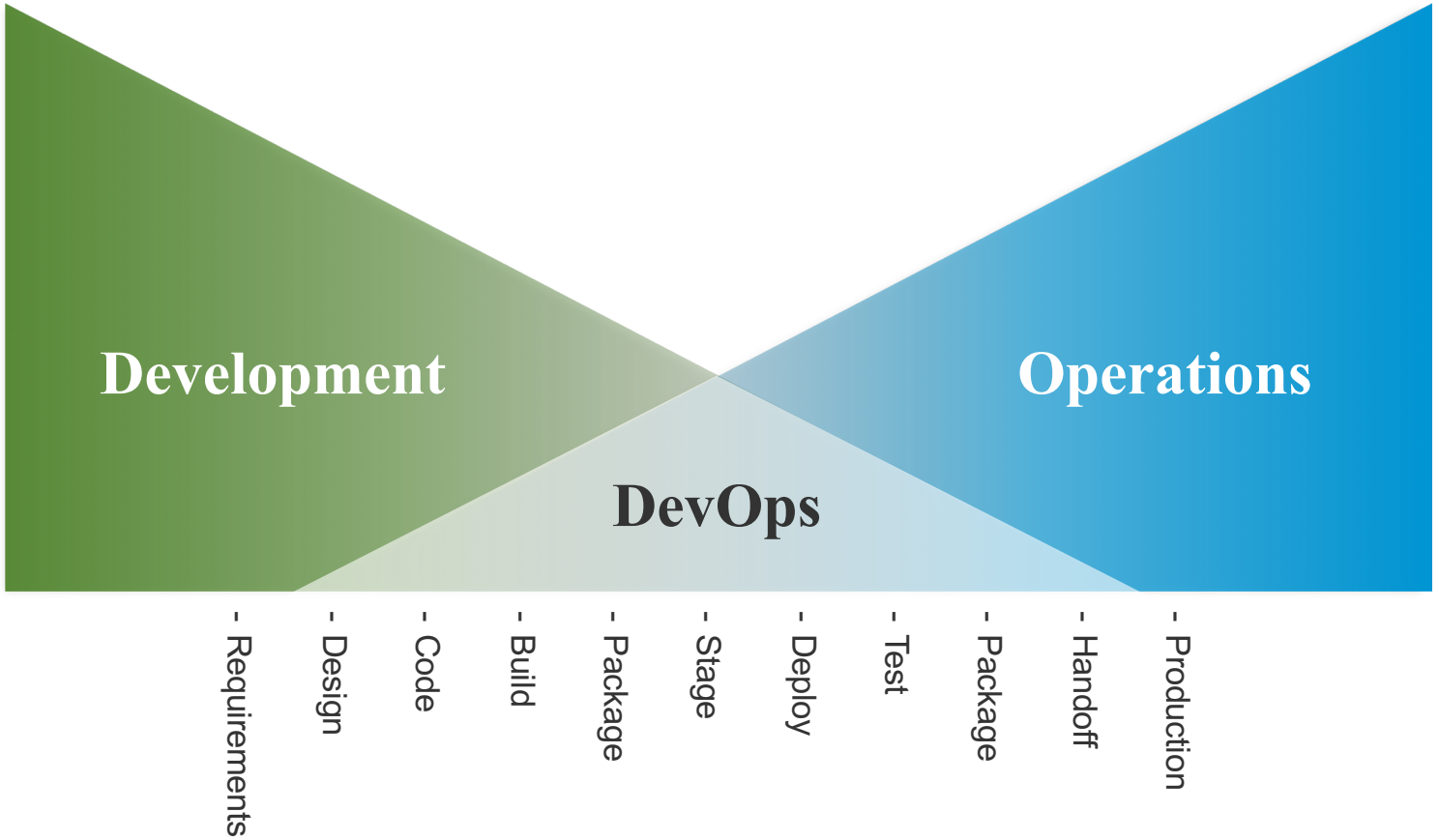
- Agile development
- Continuous deployment
- Dynamic resourcing
- Spans across data centers and clouds
- Fraction of compute costs
- Millions of users with 24x7 access



The “Cloud operating model” enabling efficiency and agility



DevOps is a response to the interdependence of software development and IT operations.



Complex and time consuming

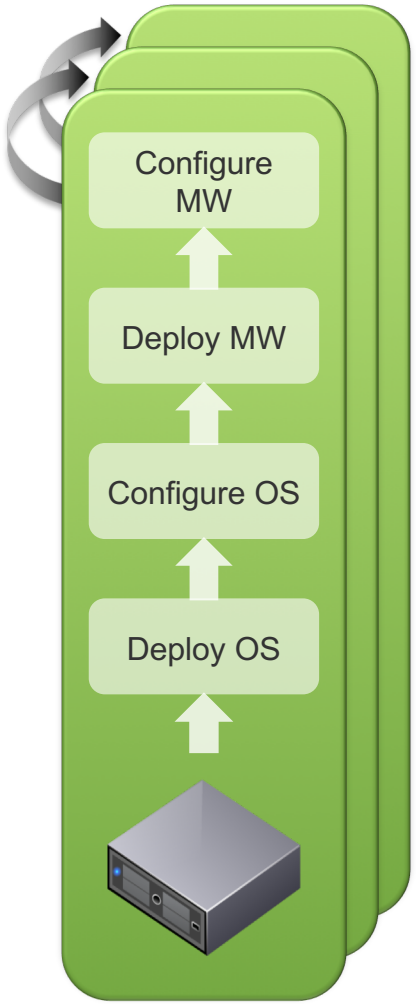
- –Bottom up thinking
- –Vertical and static approach
- –On going management is procedural and reactive

Proliferation of IT assets

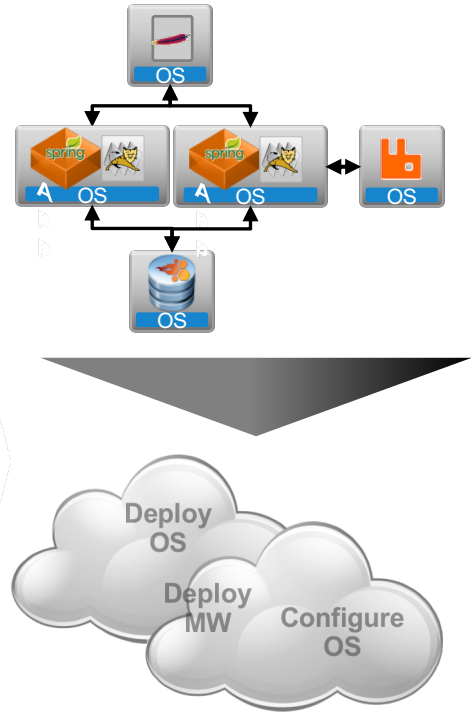
- –Lack of standardization increases permutations of software components

Not cloud aware

- –Each deployment plan is tied to a specific infrastructure service



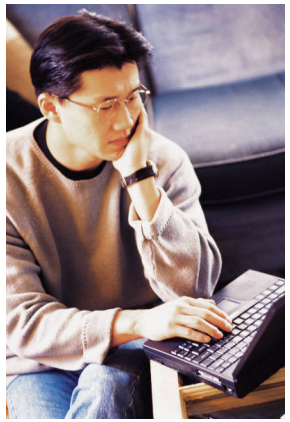
Traditional Deployment & Configuration Tools Break in the Cloud



New approach required….

IT Developers

"Write code, not tickets"



- Friction-free deployment
- Latest high productivity frameworks
- Choice of application services
- Cloud portability

IT Operations

"IT as a service provider"

- More responsive to developers
- Elastic and dynamically scalable
- Change aware
- Digest future cloud advances
- Cloud portability

Serverless Architectures

Applications where some amount of server-side logic is still written by the application developer but unlike traditional architectures is run in stateless compute containers that are event-triggered, ephemeral (may only last for one invocation), and fully managed by a 3rd party. One way to think of this is 'Functions as a service / FaaS' . AWS Lambda is one of the most popular implementations of FaaS at present, but there are others.

https://martinfowler.com/articles/serverless.html

What does this module cover….

- DevOps from an 'Infrastructure' and Services viewpoint – "NetDevOps" or devOps
- Does not look at Application development/deployment toolchain
- How can practices from these areas be adopted/integrated with the creation, management and maintenance of the supporting infrastructure and services ?

References

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