

Software Engineering

Today on The Battlefield

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2016

Yang Menjadi Perhatian

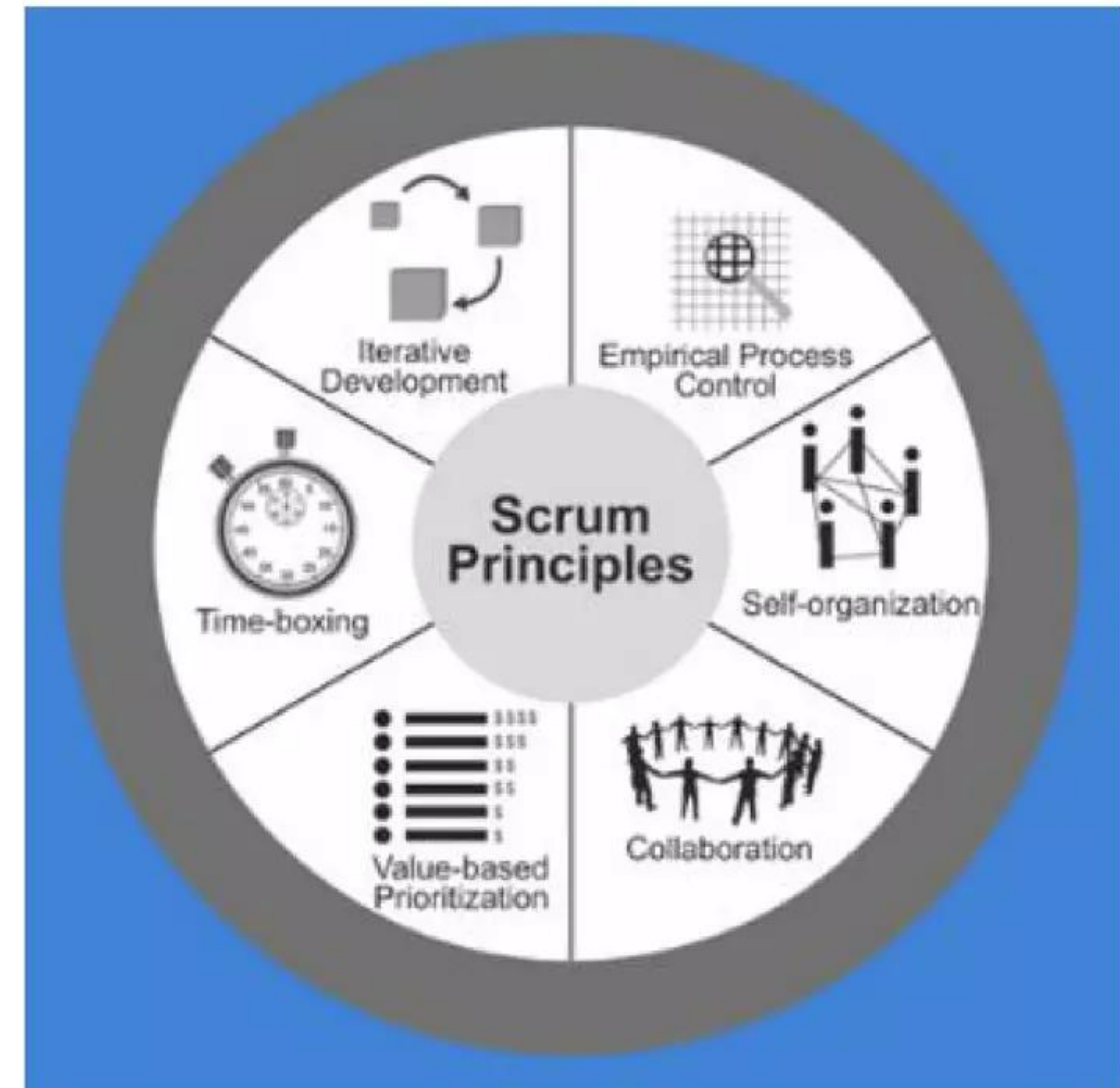
- Software methodology
- Culture, management, and governance
- Architecture
 - multi-tier
 - micro- services
 - messaging
- **Technology Stack**
 - Software Development
 - Infrastructure
 - Deployment
- Cloud Services
- Mobile
- Output :
 - Reliability
 - Availability
 - Efficiency
 - Security
 - impact to business

Software Methodology (Agile)

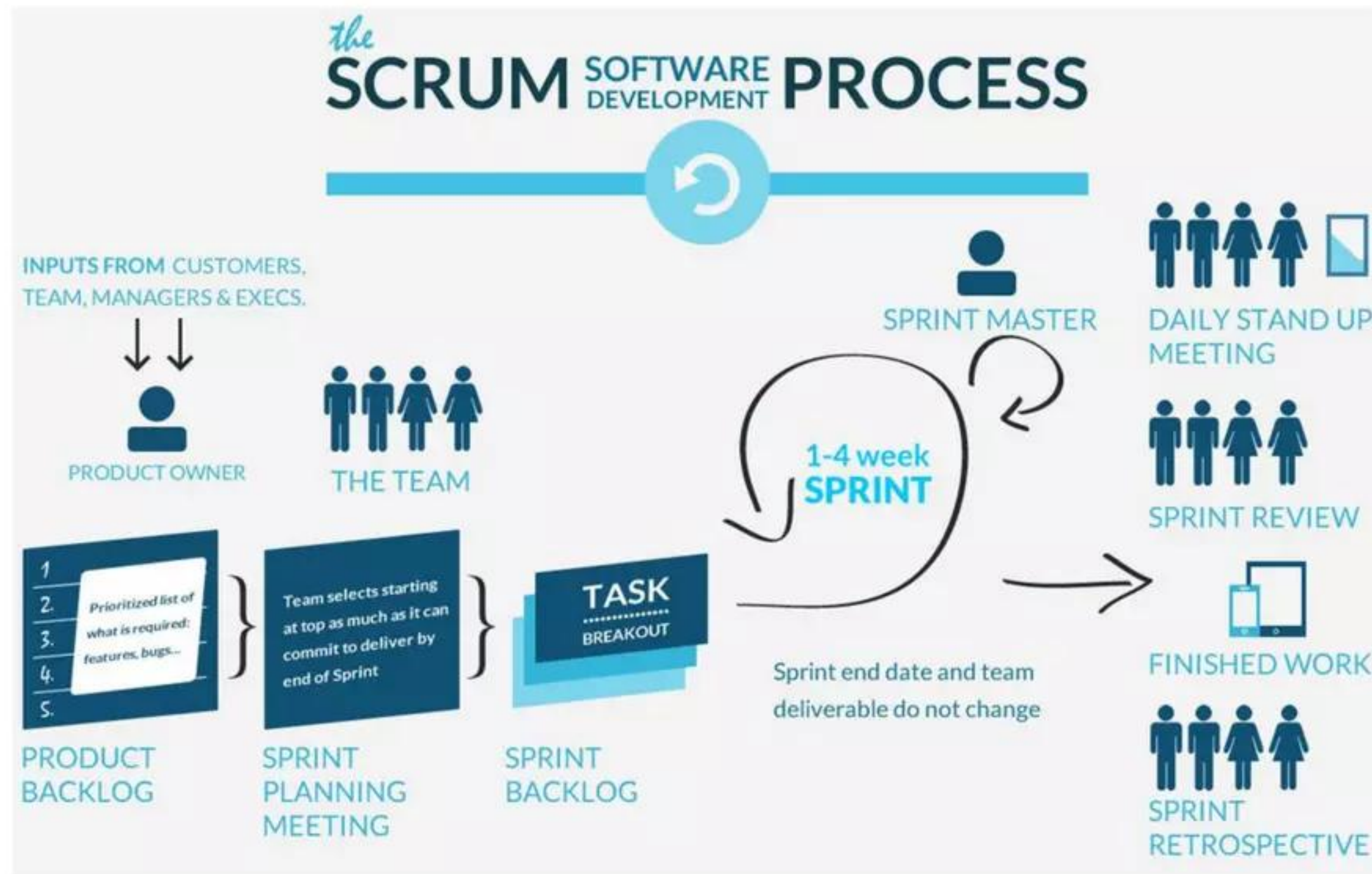
- SCRUM
 - KANBAN
 - Extreme Programming
- Tools :
 - Trello
 - Basecamp
 - Jira (bilibli pake jira)
 - git (versioning control system)
 - etc.

SCRUM

- Scrum (n): A framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value.
- Lightweight
- Simple to understand
- Difficult to master



SCRUM



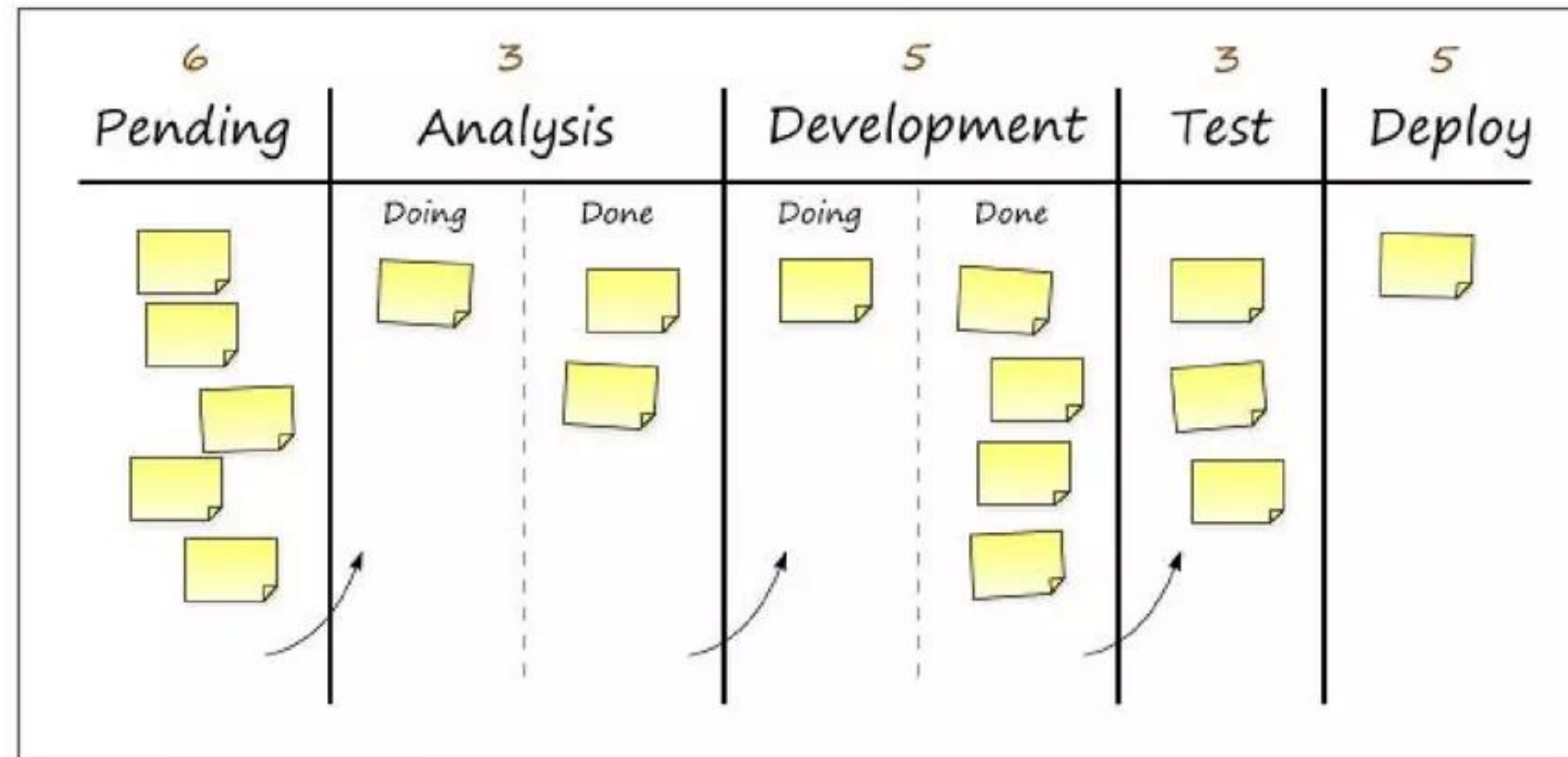
- **Sprint:** a 30-day focused effort moving the team toward fixed goals.
- **Product Backlog:** a prioritized feature list containing short descriptions of all functionalities desired in the product.
- **Sprint Backlog:** a list of the highest prioritized items or tasks from the product backlog.
- **Scrum Master:** the facilitator of the product management team who works to ensure the realization of the goals of the sprint.
- **Product Owner:** member of the team responsible for defining and prioritizing the backlog.
- **Scrum Team:** this includes three roles: the product owner, the Scrum Master and the members of the development team. This is a group of 5-9 people who self-organize and have joint responsibilities for completing the tasks.
- **Sprint Planning**
- **Daily Scrum**
- **Sprint Review**
- **Sprint Retrospective**

<http://www.augustinfotech.com/scrum-effective-way-implement-agile/>

KANBAN

- Kanban is a new technique for managing a software development process in a highly efficient way.
- Kanban underpins Toyota's "just-in-time" (JIT) production system.
- Although producing software is a creative activity and therefore different to mass-producing cars, the underlying mechanism for managing the production line can still be applied.
- A method for managing knowledge work which balances the demand for work to be done with the available capacity to start new work.
- Intangible work items are visualized to present all participants with a view of the progress of individual items, and the process from task definition to customer delivery.
- Team members "pull" work as they have capacity, rather than work being "pushed" into the process when requested.

KANBAN



1. Visualize
2. Limit work in progress
3. Manage flow
4. Make policies explicit
5. Implement feedback loops
6. Improve collaboratively, evolve experimentally.

EXTREME PROGRAMMING

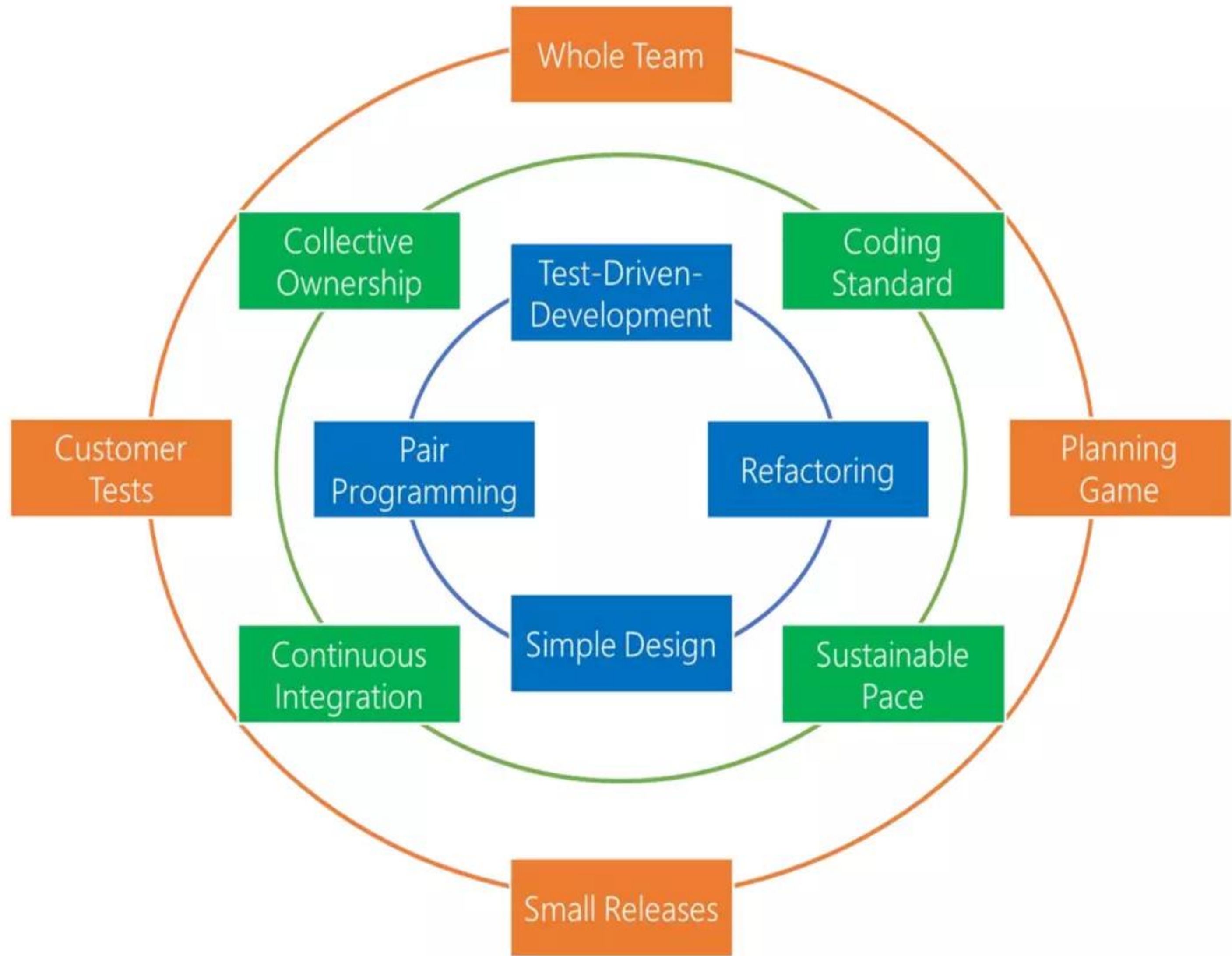
- a software development methodology which is intended to improve software quality and responsiveness to changing customer requirements.
- As a type of agile software development,[1][2][3] it advocates frequent "releases" in short development cycles, which is intended to improve productivity and introduce checkpoints at which new customer requirements can be adopted.

EXTREME PROGRAMMING

Extreme Programming
Planning/Feedback Loops



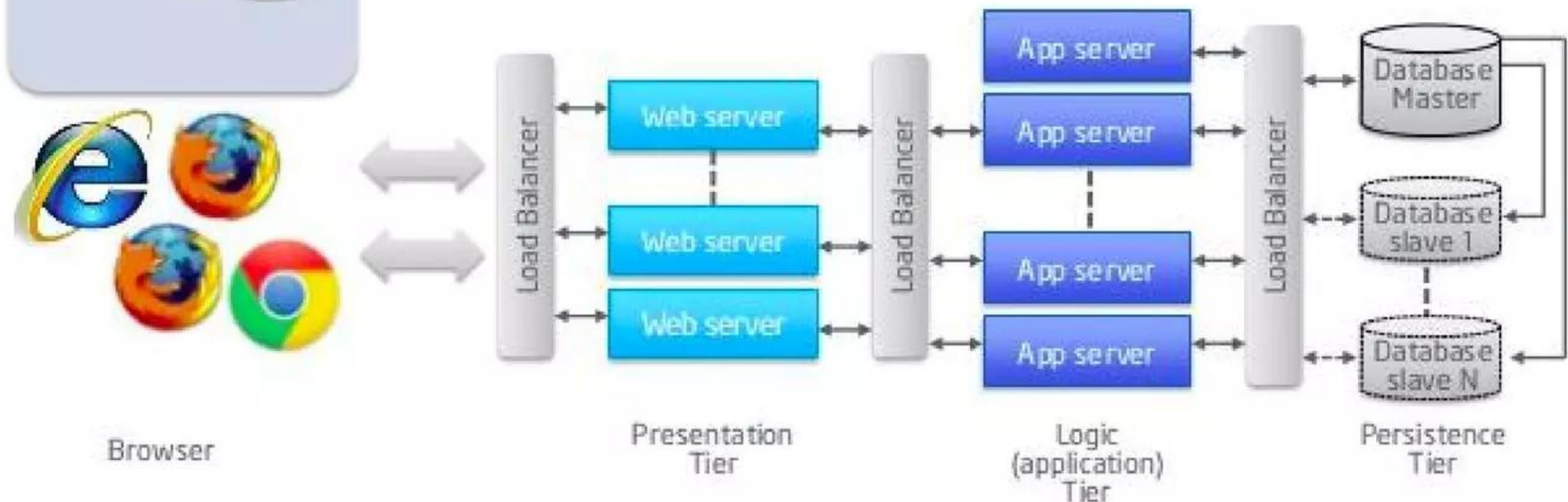
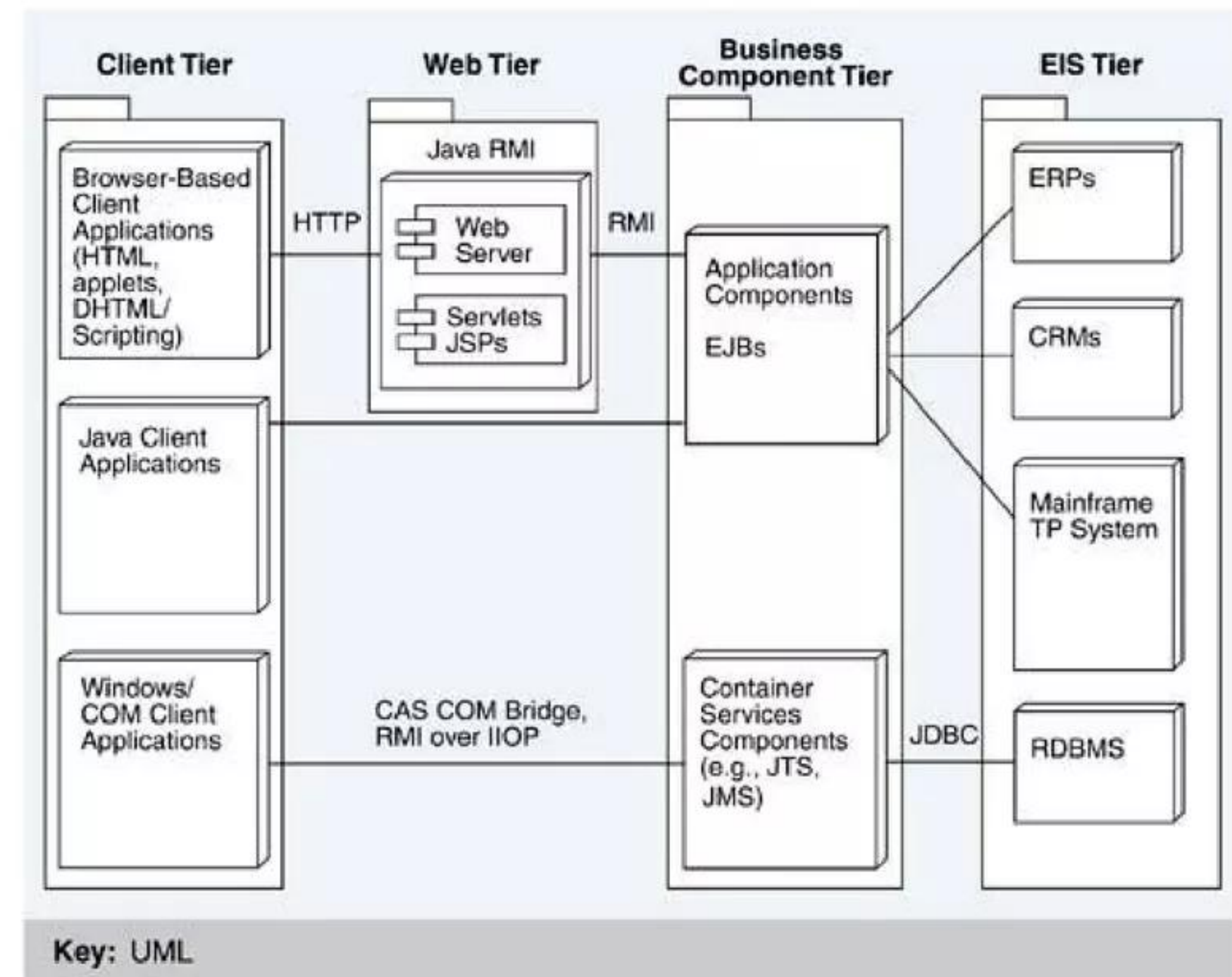
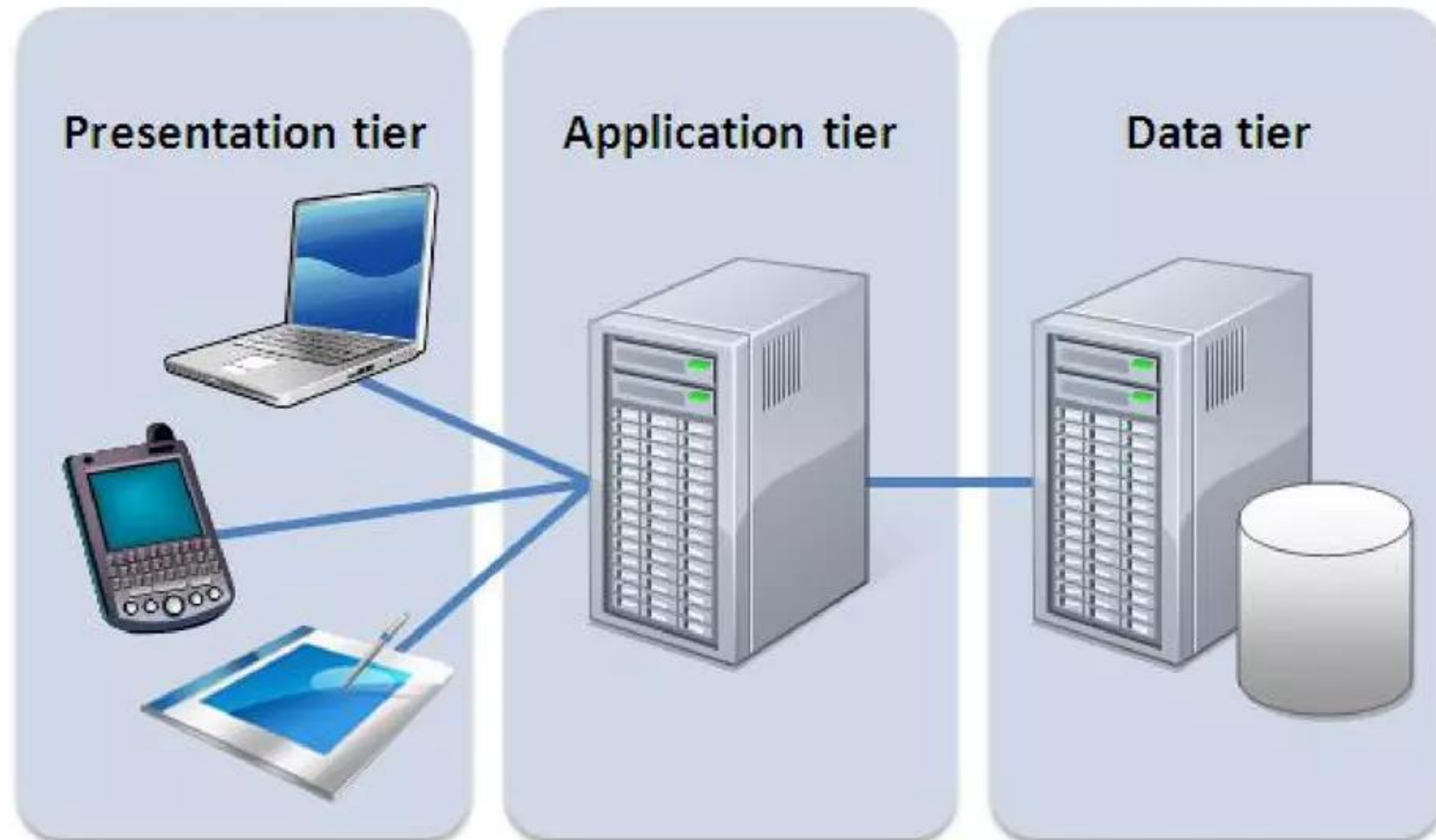
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Culture

Hirarchycal vs Flat bereaucracy

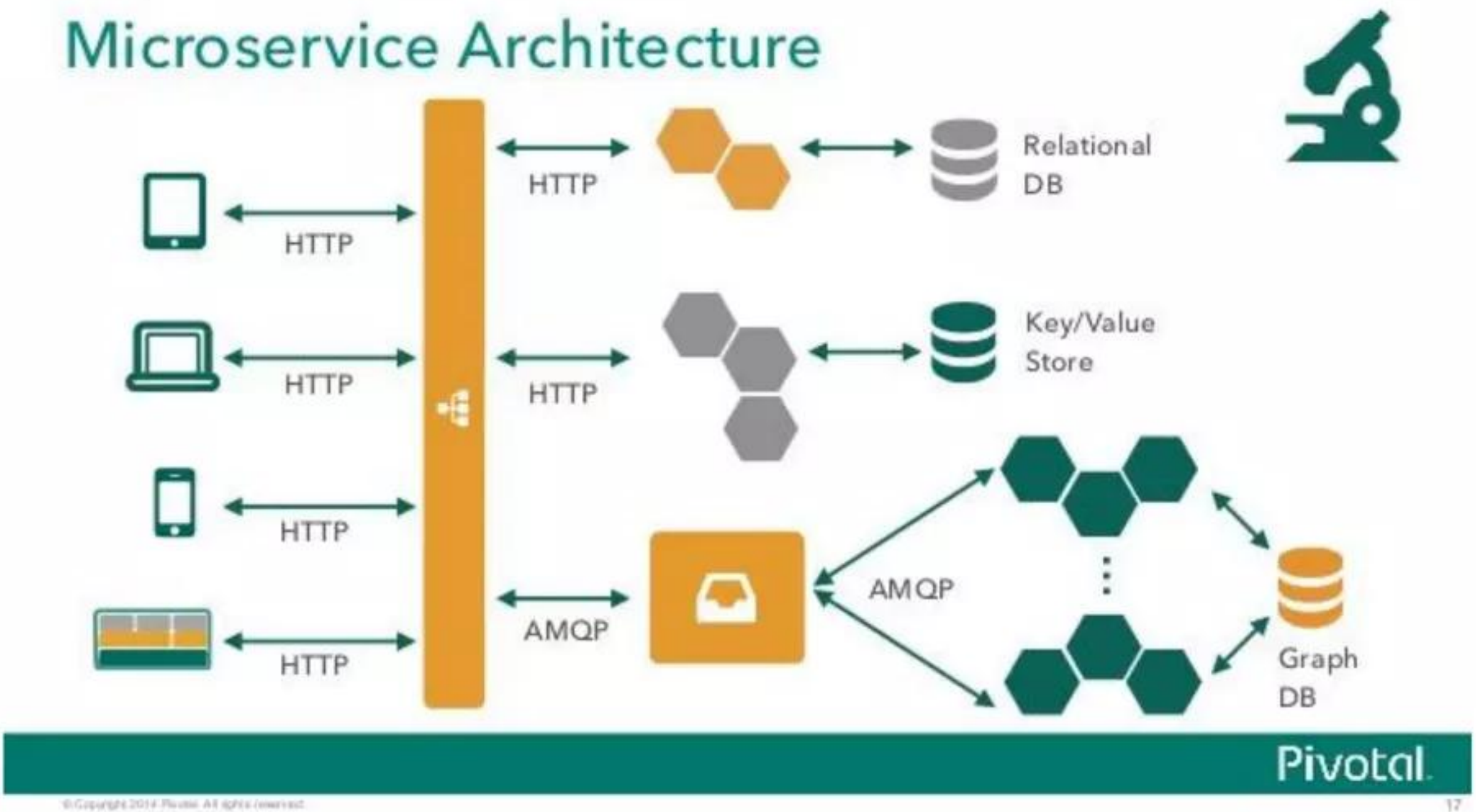
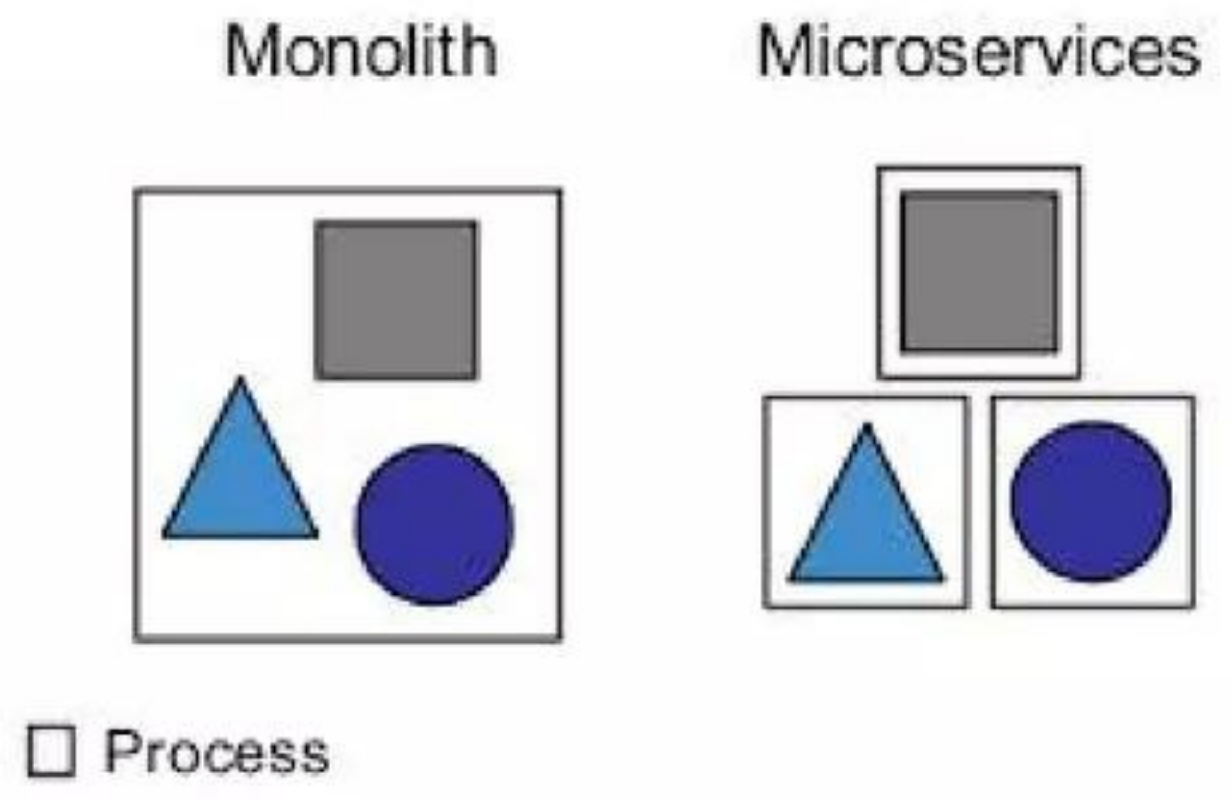
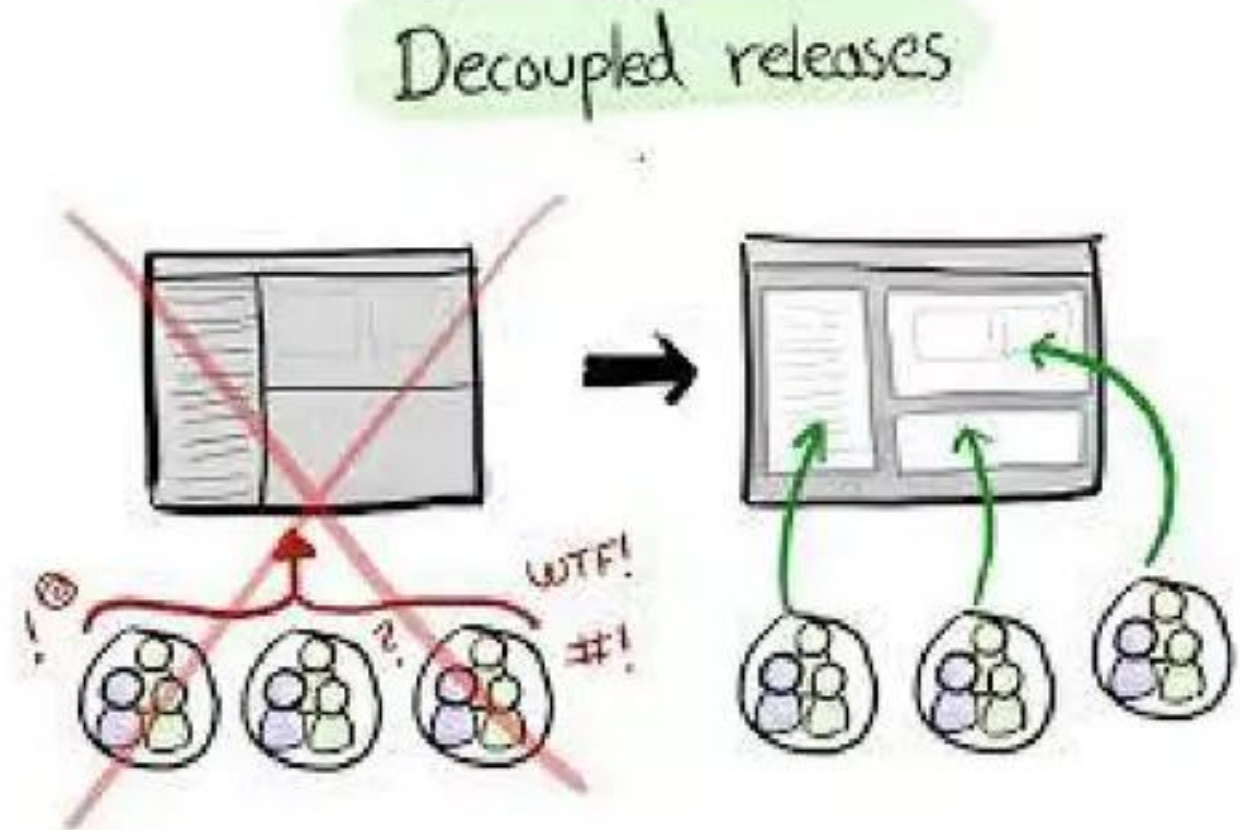
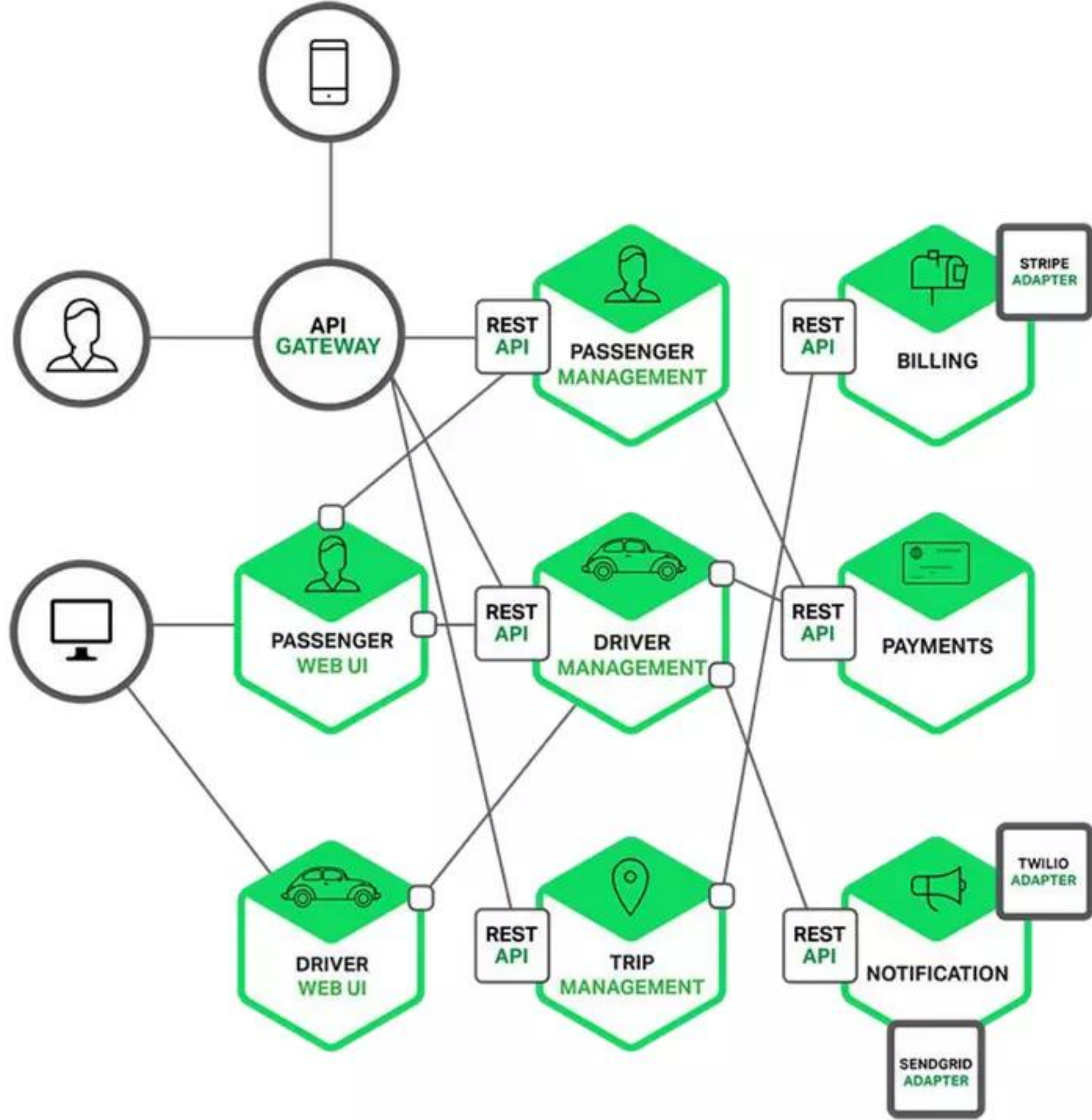
Multi Tier -Three Tier



Micro services Architecture

"A specialisation of and implementation approach for service-oriented architectures (SOA) used to build flexible, independently deployable software systems. Services in a microservice architecture (MSA)[1] are processes that communicate with each other over a network in order to fulfill a goal. These services use technology-agnostic protocols.[2][3][4] The microservices approach is a first realisation of SOA that followed the introduction of DevOps and is becoming more popular for building continuously deployed systems.[5][6]" -- wikipedia

MICROSERVICES

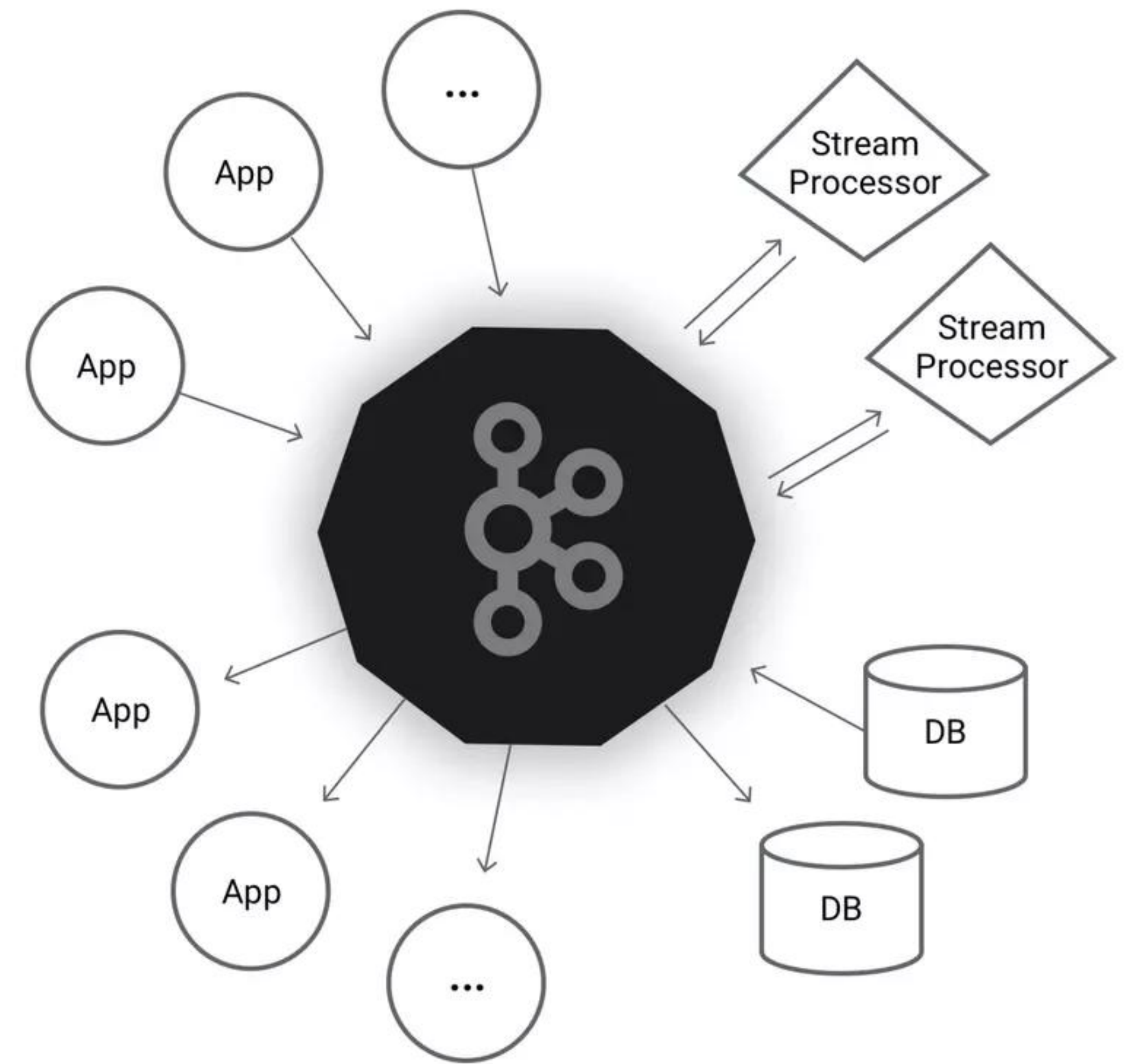


Application Programming Interface (API)

- SOAP (XML)
- WSDL
- RESTful (Json)

Messaging

- AMPQ
- RabbitMQ
- MSMQ (microsoft)
- ESB (Enterprise Service Bus, IBM)
- Apache Service Mix
- Apache Camel
- Apache Synapse ()
- Apache ActiveMQ
- Apache Kafka



Technology Stack

- Tumpukan teknologi yang digunakan dalam software development.
- Dibagi menjadi 2 yaitu Software Development, Infrastructure (termasuk teknologi network dan server), ditambah dengan stack dalam melakukan **deployment** (otomatisasi deployment).
- Software Development meliputi front-end, back-end, hingga database.

Technology Stack

- Engineer/programmer yang memiliki kemampuan development end-to-end disebut **full-stack** engineer/programmer.
- Infrastructure meliputi server, jaringan dan topologinya, hingga security dari network (ada yang hingga masuk ke security governance atau compliance)

Stack Front-End

- HTML -> HTML5 -> template engine (jade, mustache, dust, etc)
- UI/View framework : angular.js, react.js, ember.js, meteor.js, D3.js, etc.
- Server-side : javascript (nodejs), java, python, ruby, perl, go, scala, kotlin, clojure, etc.
- Package manager: npm, maven repo, rubygems, pip, etc
- content : markdown

Stack Back-end

- Programming language : javascript (nodejs), java, python, ruby, perl, go, scala, kotlin, clojure, etc.
- Framework : Spring, Spring boot, Play, express, rails, flask, django, etc.
- Package manager: npm, maven repo, rubygems, pip, etc
- Other engine/lib/middleware : RxJava, Akka, socket.io, etc.

Database and search engine

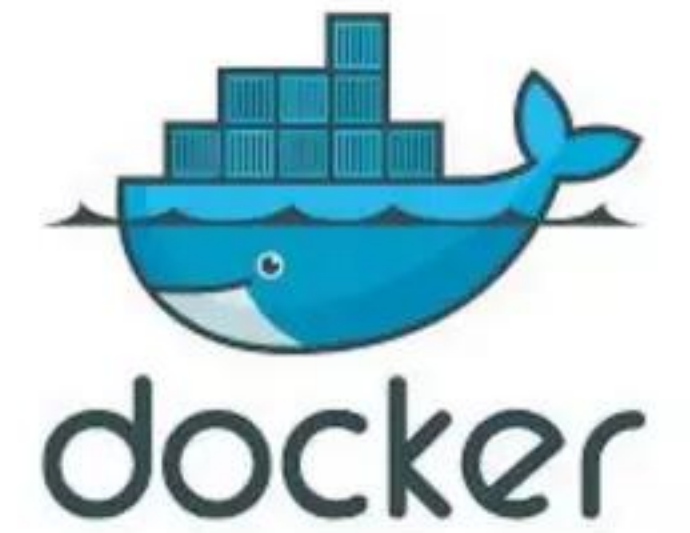
- SQL : Mysql, Postgre, Oracle, SQL Server
- NoSQL :
 - Document oriented : Mongoddb
 - Column oriented : hbase, cassandra
 - Graph : Neo4J
 - memory db : redis
- Search Engine (Base on lucense) : SOLR, elasticsearch

Infrastructure dan Deployment

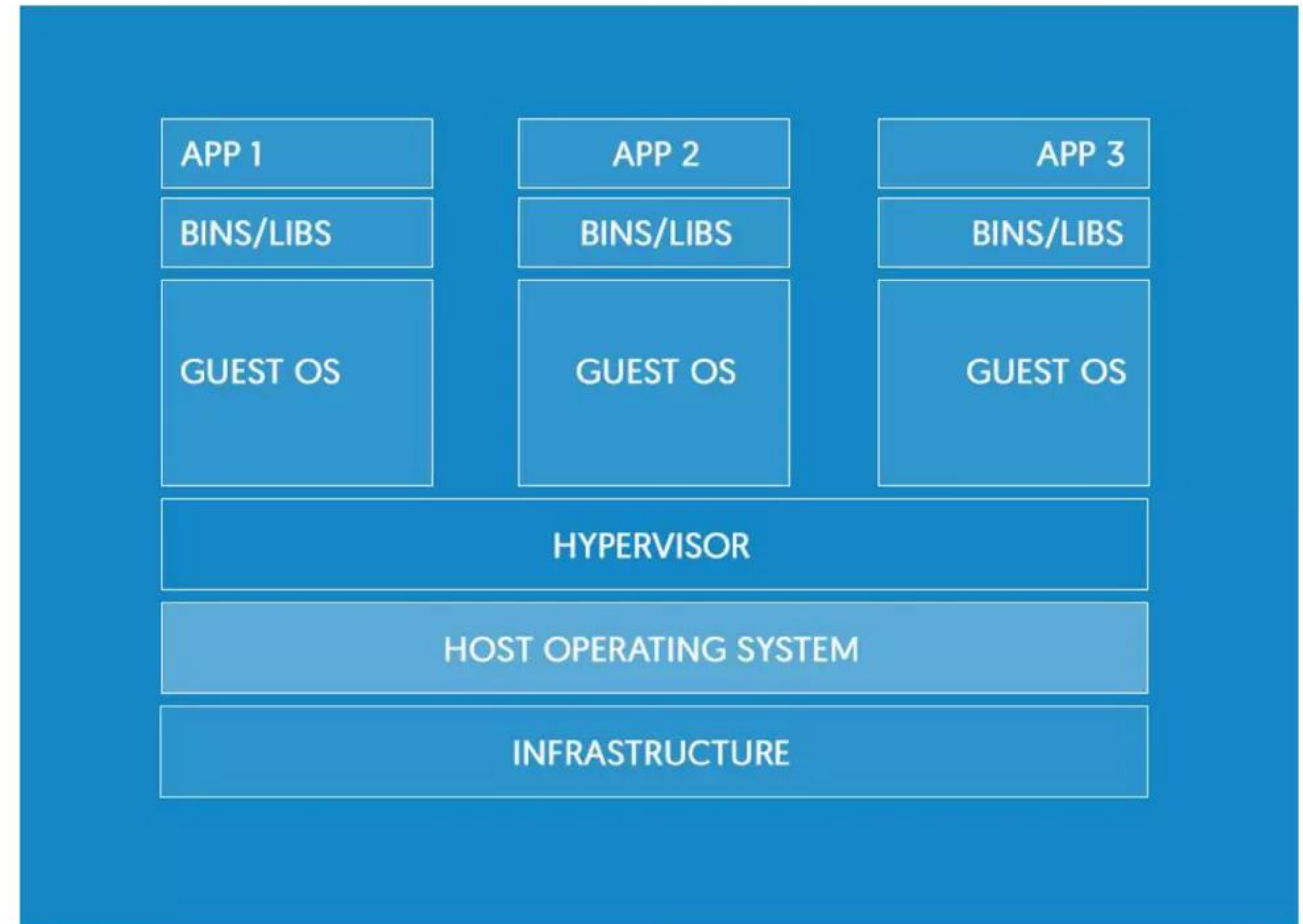


- **CHEF** : is both the name of a company and the name of a configuration management tool written in Ruby and Erlang. It uses a pure-Ruby, domain-specific language (DSL) for writing system configuration "recipes". Chef is used to streamline the task of configuring and maintaining a company's servers, and can integrate with cloud-based platforms such as *Internap*, *Amazon EC2*, *Google Cloud Platform*, *OpenStack*, *SoftLayer*, *Microsoft Azure* and *Rackspace* to automatically provision and configure new machines. <https://www.chef.io/chef/>

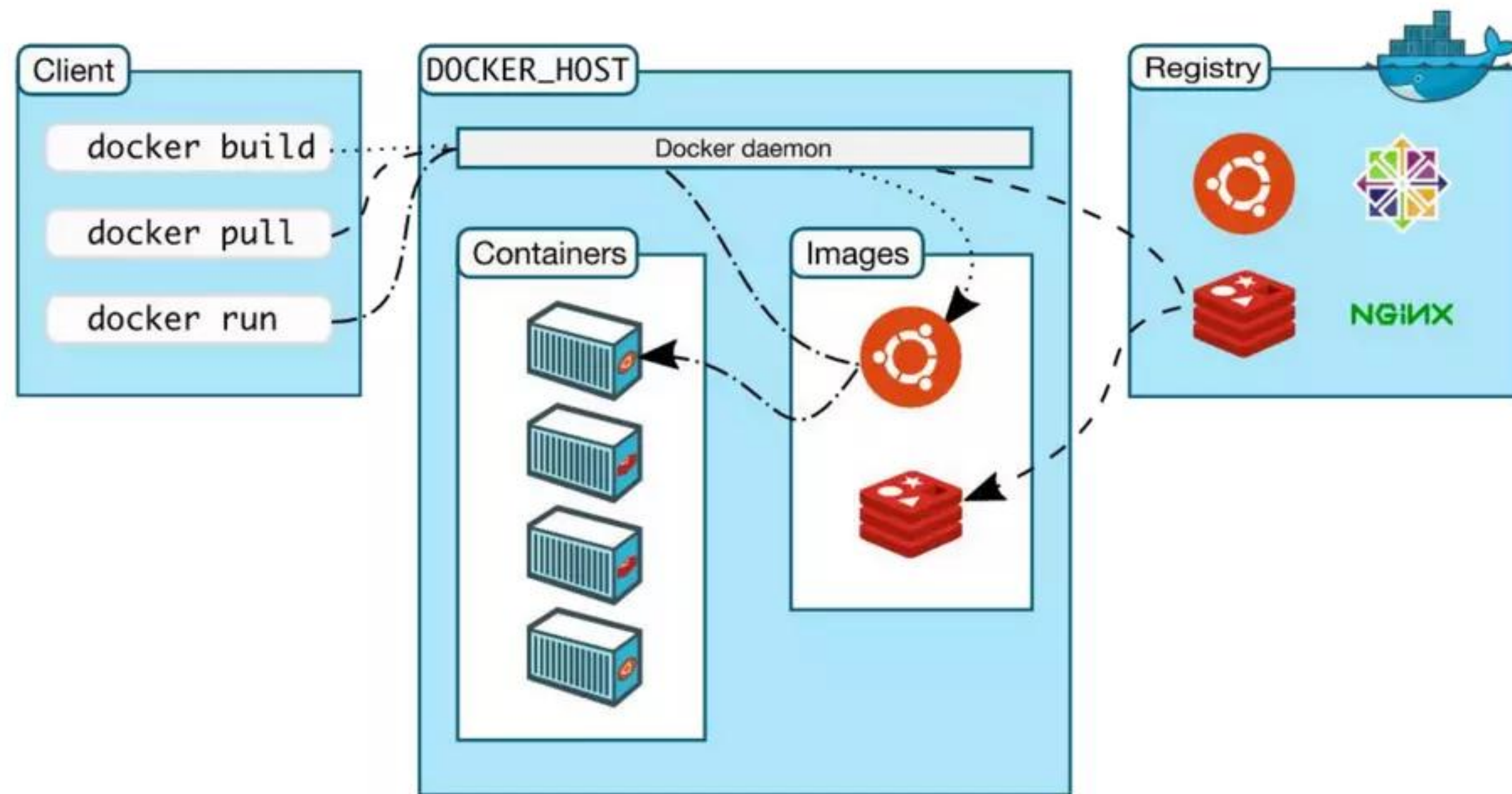
Infrastructure dan Deployment



- **Docker** : containers wrap a piece of software in a complete filesystem that contains everything needed to run: code, runtime, system tools, system libraries – anything that can be installed on a server. This guarantees that the software will always run the same, regardless of its environment.



Infrastructure dan Deployment



Chef enables Infrastructure as Code



```
1 package "sudo" do
2   action :upgrade
3 end
4
5 template "/etc/sudoers" do
6   source "sudoers.erb"
7   mode 0440
8   owner "root"
9   group "root"
10  variables(
11    :sudoers_groups => node[:authorization][:sudo][:groups],
12    :sudoers_users => node[:authorization][:sudo][:users]
13  )
14 end
```

Manage configuration as idempotent **Resources**.

Put them together in **Recipes**.

Track it like **source code**.

Configure your servers.

Cloud Service

- Amazon
- Azure
- CloudFoundry
- Pivotal
- Cloudfiklat
- etc.

Goals

- Reliability
 - Availability
 - Efficiency
- Security :
 - PCI DSS Compliance
 - OWASP
 - Pentest
 - Performance Test
 - Fraud and Intrusion Detection

Terima kasih