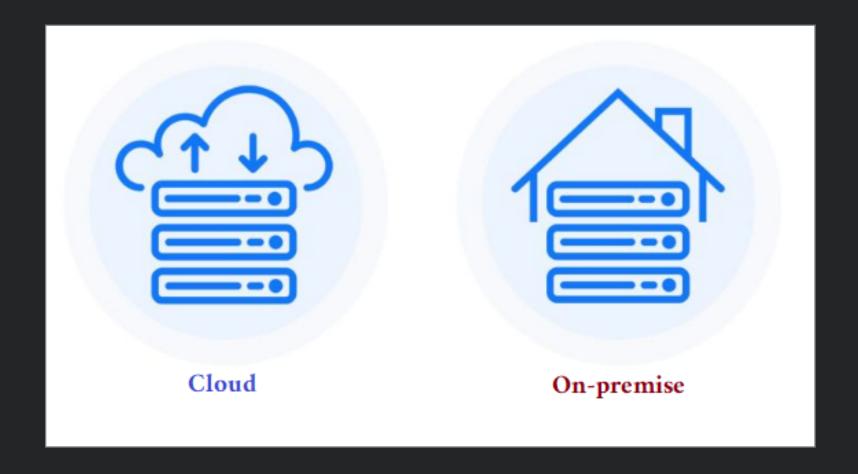
Serverless Design

in Cloud

YEGOR BUGAYENKO

Lecture #12 out of 16 90 minutes

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Amazon Web Services

Docker Containers

PaaS, IaaS, SaaS, EaaS, etc.

P2P: BitTorrent, Blockchain, and Beyond

Books, Venues, Call-to-Action

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Chapter #1:

Amazon Web Services

Simple Storage Service (S3)

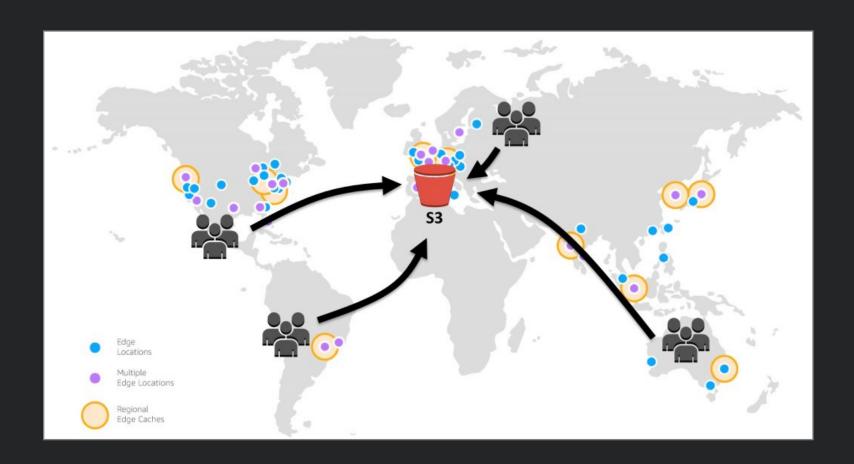
```
def object_uploaded?(s3_client, bucket_name, object_key)
  response = s3_client.put_object(
    bucket: bucket_name,
    key: object_key
)
  if response.etag
    return true
  else
    return false
  end
rescue StandardError => e
  puts "Error uploading object: #{e.message}"
  return false
end
```

Elastic Compute Cloud (EC2)

```
instance = ec2_resource.create_instances(
   image_id: image_id,
   min_count: 1,
   max_count: 1,
   key_name: key_pair_name,
   instance_type: instance_type,
   user_data: encoded_script
)
```

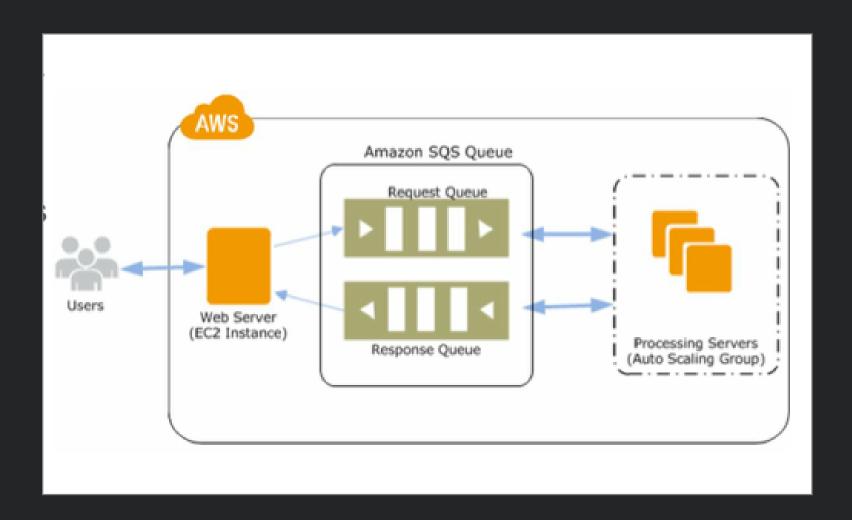
[S3 EC2 CloudFront SQS Lambda OpenStack]

CloudFront



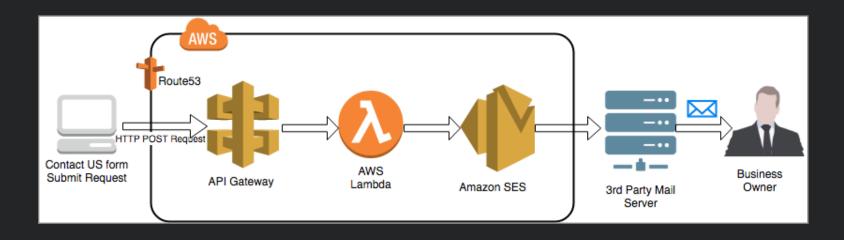
[S3 EC2 CloudFront SQS Lambda OpenStack]

Simple Queue Service (SQS)



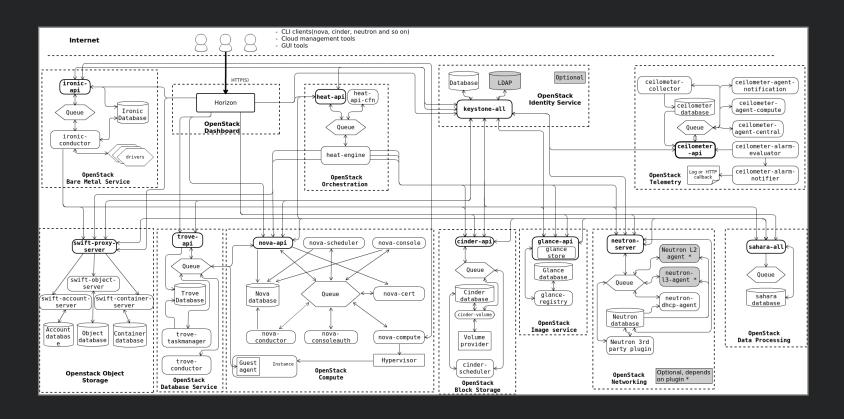
[S3 EC2 CloudFront SQS Lambda OpenStack]

Lambda



[S3 EC2 CloudFront SQS Lambda OpenStack]

OpenStack



https://docs.openstack.org/install-guide/get-started-logical-architecture.html

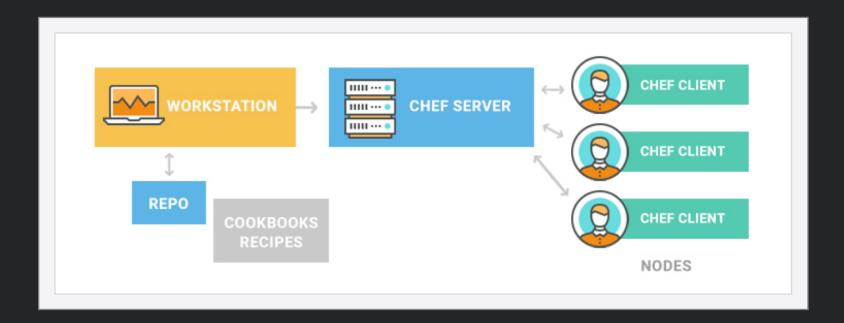
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Chapter #2:

Docker Containers

[Chef Dockerfile LXC K8s]

Chef, Puppet, etc.



[Chef Dockerfile LXC K8s]

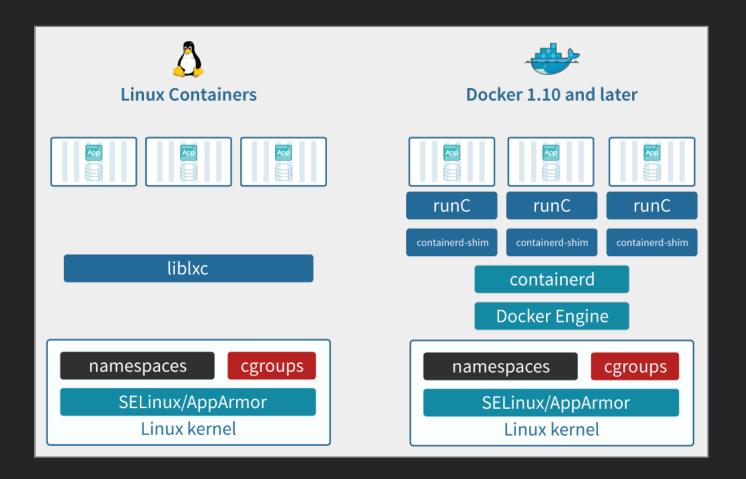
Dockerfile

```
19 FROM yegor256/rultor-image
20 MAINTAINER Yegor Bugayenko <yegor256@gmail.com>
21 LABEL Description="yegor256.com" Vendor="Yegor Bugayenko" Version="1.0"
23 ENV DEBIAN_FRONTEND=noninteractive
25 RUN sudo apt-get -y update --fix-missing
26 RUN sudo apt-get -y install aspell aspell-en
27 RUN sudo apt-get -y install graphviz
28 RUN sudo apt-get -y update --fix-missing
29 RUN sudo apt-get -y install gnuplot
30 RUN sudo apt-get -y install s3cmd
31 RUN sudo apt-get -y install fontforge liblapack-dev
33 RUN sudo apt-get -y install plantuml
34 COPY plantuml.jar /usr/share/plantuml/plantuml.jar
36 RUN wget --no-check-certificate --quiet https://cmake.org/files/v3.5/cmake-3.5.1.tar.gz && \
37 tar xf cmake-3.5.1.tar.gz && \
38 rm -rf _cmake-3.5.1 && \
39 mv cmake-3.5.1 _cmake-3.5.1 && \
40 cd _cmake-3.5.1 && \
41 ./configure && \
42 make && \
43 make install
45 RUN git clone https://github.com/htacg/tidy-html5.git _tidy-html5 && \
46 cd _tidy-html5/build/cmake && \
47 git checkout 5.1.25 && \
48 cmake ../.. && \
49 make && \
50 make install
52 RUN sudo apt-get install -y woff2
53 COPY woff.zip /tmp/woff.zip
54 RUN unzip /tmp/woff.zip -d _sfnt2woff && \
55 cd _sfnt2woff && \
56 make && \
57 cp sfnt2woff /usr/local/bin/
59 RUN sudo apt-get -y update --fix-missing
60 RUN sudo apt-get install -y libxml2-utils
62 RUN npm install -g cssshrink@0.0.5
64 RUN /bin/bash -l -c "gem install jgd -v 1.6.5"
```

```
RUN git clone https://github.com/htacg/tidy-html5.git _tidy-html5 && \
   cd _tidy-html5/build/cmake && \
   git checkout 5.1.25 && \
   cmake ../.. && \
   make && \
   make install
```

[Chef Dockerfile LXC K8s]

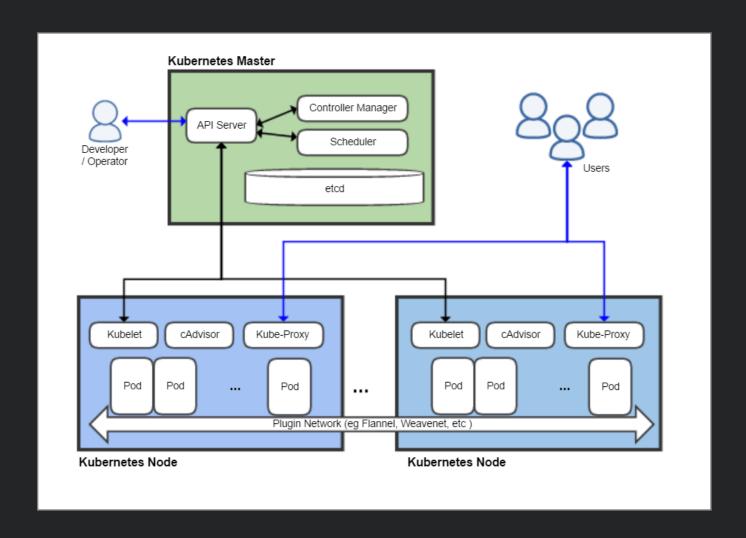




LXC is an operating-system-level virtualization method for running multiple isolated Linux systems on a control host using a single Linux kernel.

[Chef Dockerfile LXC K8s]

Kubernetes



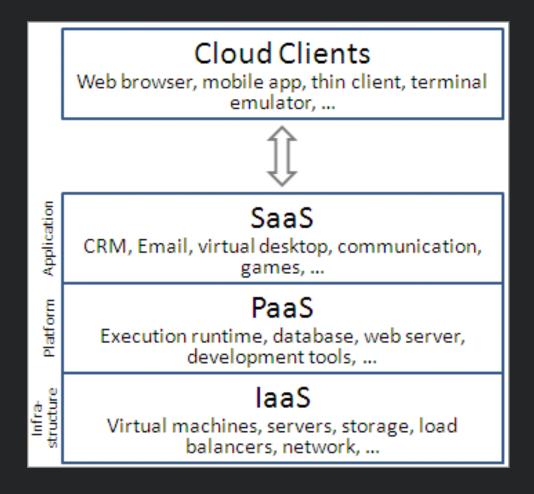
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Chapter #3:

PaaS, IaaS, SaaS, EaaS, etc.

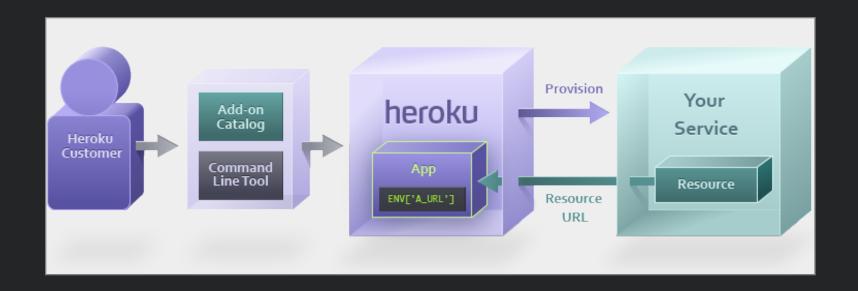
[EaaS Heroku Serverless]

Everything as a Service (EaaS)



[EaaS Heroku Serverless]

Platform as a Service (PaaS)



[EaaS Heroku Serverless]

Serverless Architecture

Serverless architectures are application designs that include third-party "Backend as a Service" (BaaS) services, and the services are designs that include custom code run in managed, ephemeral containers on the containers of th

Fundamentally, FaaS is about running backend code without managing your own server systems or your own long-lived server applications.

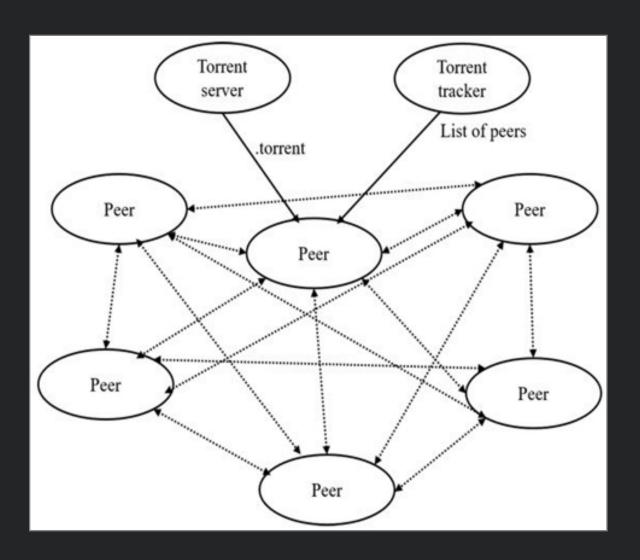
AWS RDS vs. AWS DynamoDB

Chapter #4:

P2P: BitTorrent, Blockchain, and Beyond

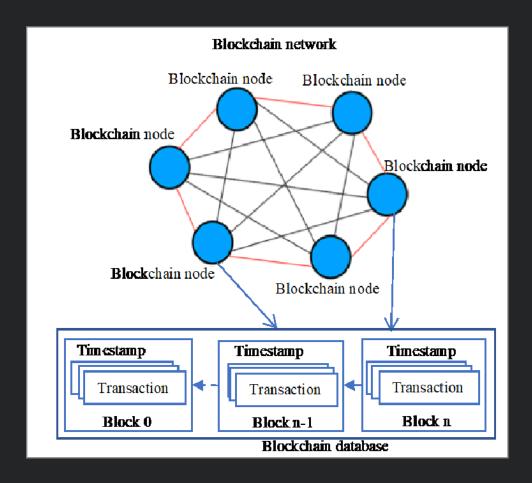
[BitTorrent Blockchain]

BitTorrent



[BitTorrent Blockchain]

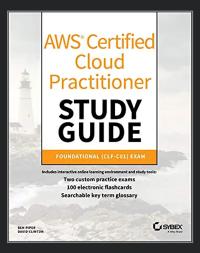
Blockchain



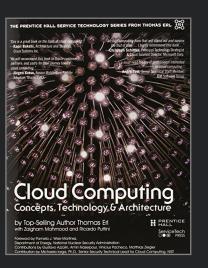
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Chapter #5:

Books, Venues, Call-to-Action



"AWS Certified Cloud Practitioner, Study Guide: CLF-C01 Exam" by BEN PIPER



"Cloud Computing: Concepts, Technology & Architecture" by THOMAS ERL ET AL.

Where to go:

AWS Certified Solution Architect

Call to Action:

Use two AWS services in your app.

Still unresolved issues:

- How to simplify serverless design?
- How to manage data serverless?
- How to decentralize better than Blockchain?
- How to enable decentralized computing on IoT devices?