

Serverless Design

in Cloud

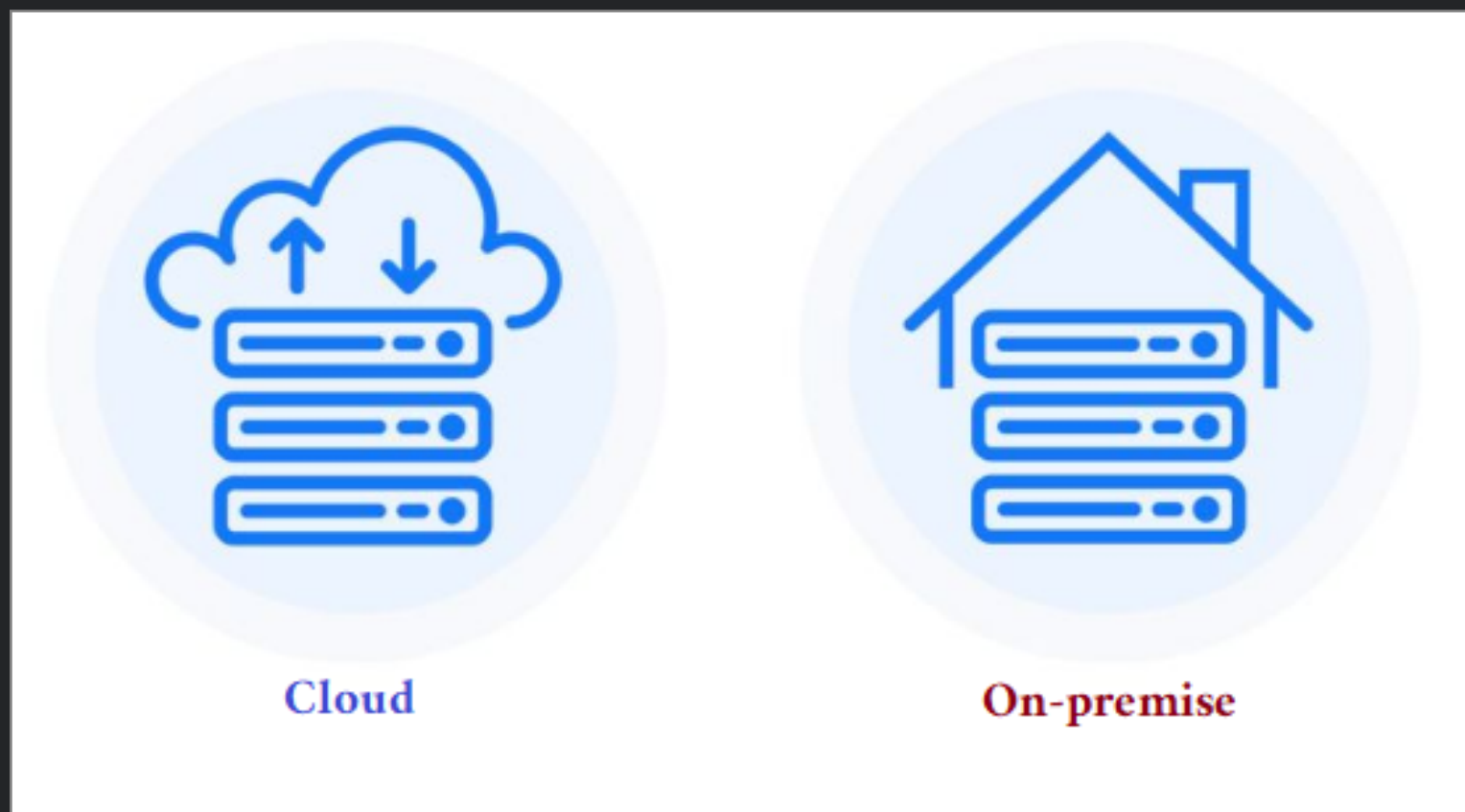
YEGOR BUGAYENKO

Lecture #12 out of 16

90 minutes

All videos are in [this YouTube playlist](#).

All visual and text materials presented in this slidedeck are either originally made by the author or taken from public Internet sources, such as website. Copyright belongs to their respected authors.



Amazon Web Services

Docker Containers

PaaS, IaaS, SaaS, EaaS, etc.

P2P: BitTorrent, Blockchain, and Beyond

Books, Venues, Call-to-Action

Chapter #1:

Amazon Web Services



S3]Simple Storage Service (S3)

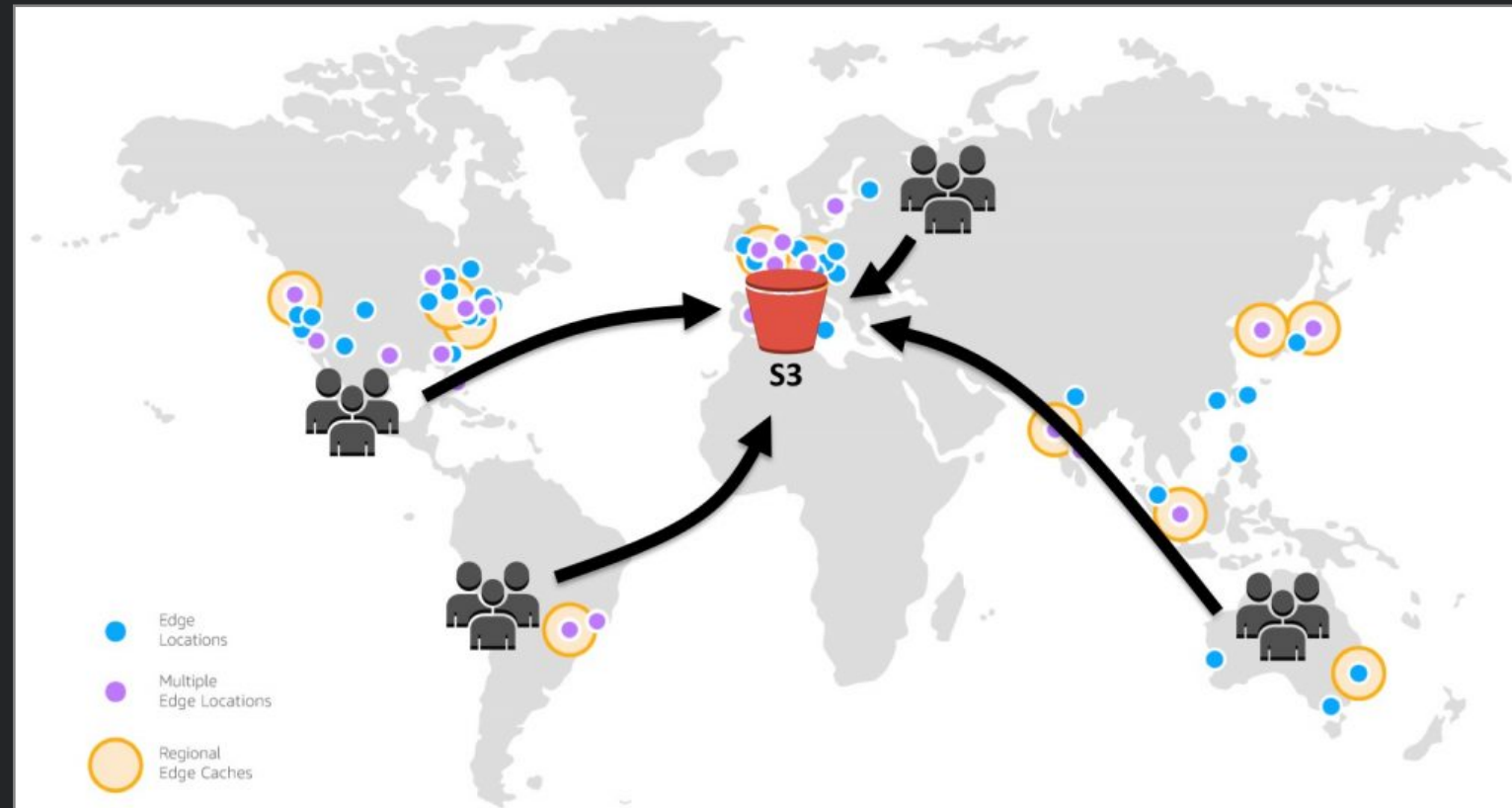
```
def object_uploaded?(s3_client, bucket_name, object_key)
  response = s3_client.put_object(
    bucket: bucket_name,
    key: object_key
  )
  if response.etag
    return true
  else
    return false
  end
rescue StandardError => e
  puts "Error uploading object: #{e.message}"
  return false
end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



EC2]Elastic Compute Cloud (EC2)

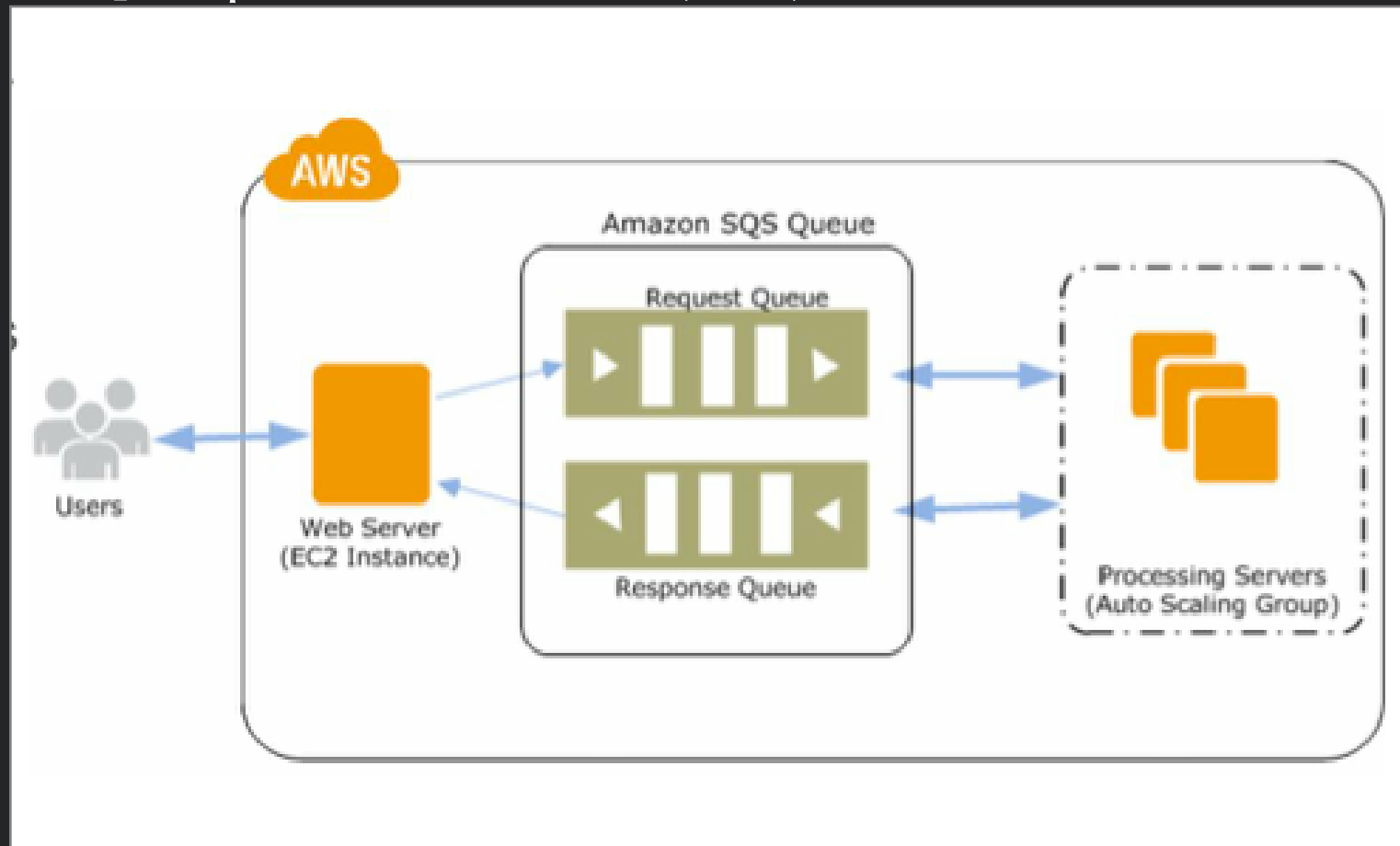
```
instance = ec2_resource.create_instances(  
    image_id: image_id,  
    min_count: 1,  
    max_count: 1,  
    key_name: key_pair_name,  
    instance_type: instance_type,  
    user_data: encoded_script  
)
```

CloudFront

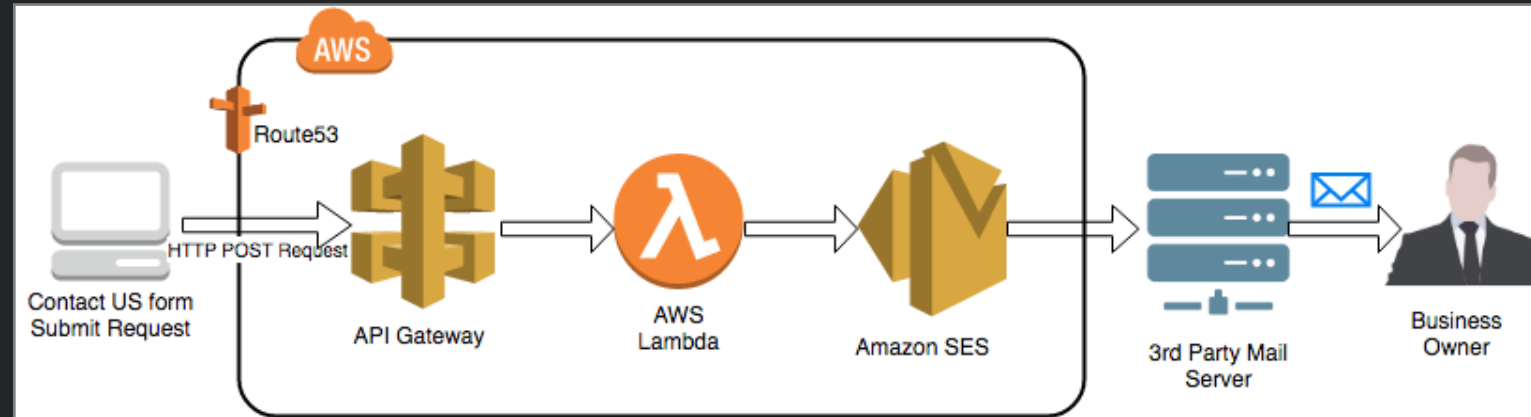




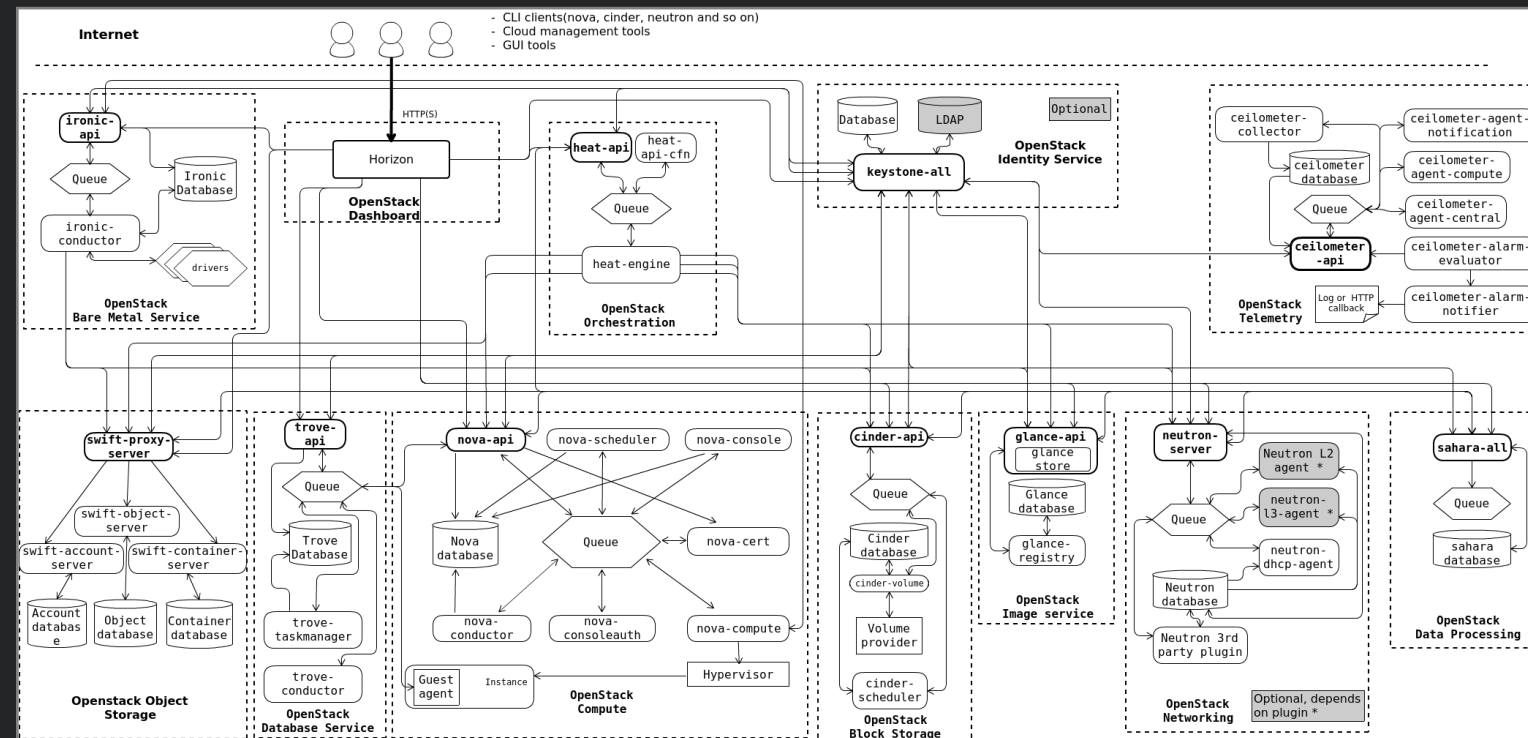
SQS]Simple Queue Service (SQS)



Lambda



OpenStack



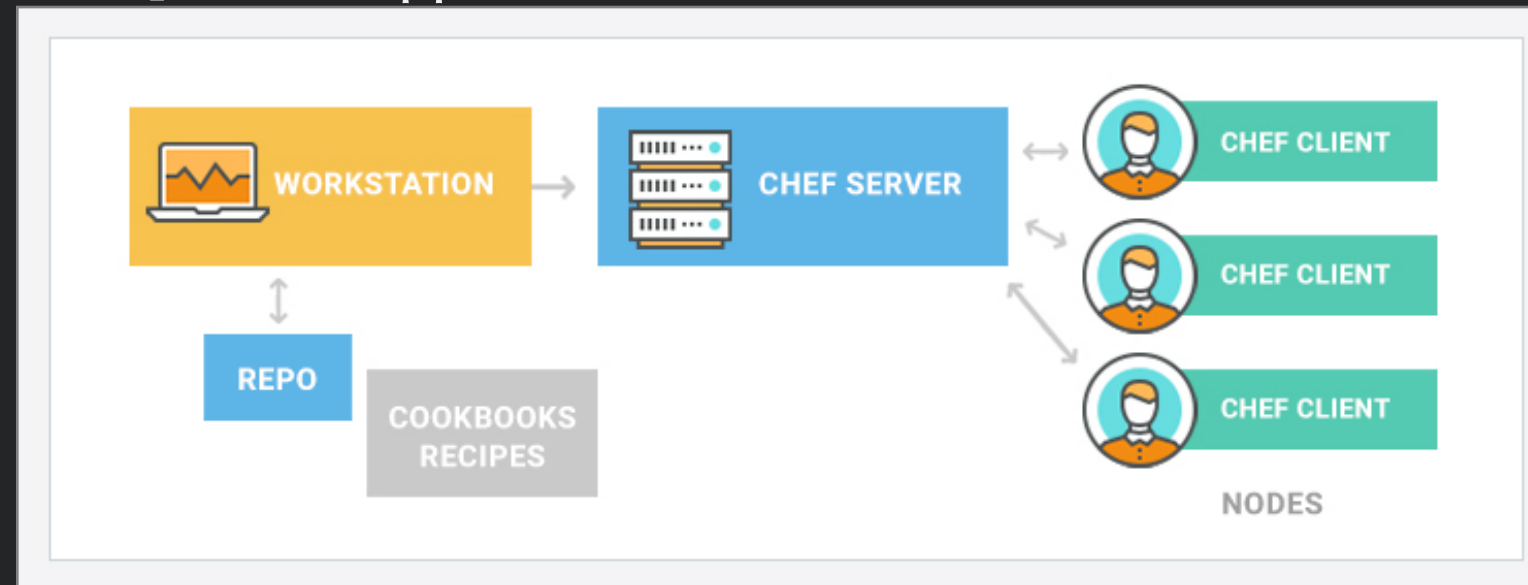
<https://docs.openstack.org/install-guide/get-started-logical-architecture.html>

Chapter #2:

Docker Containers



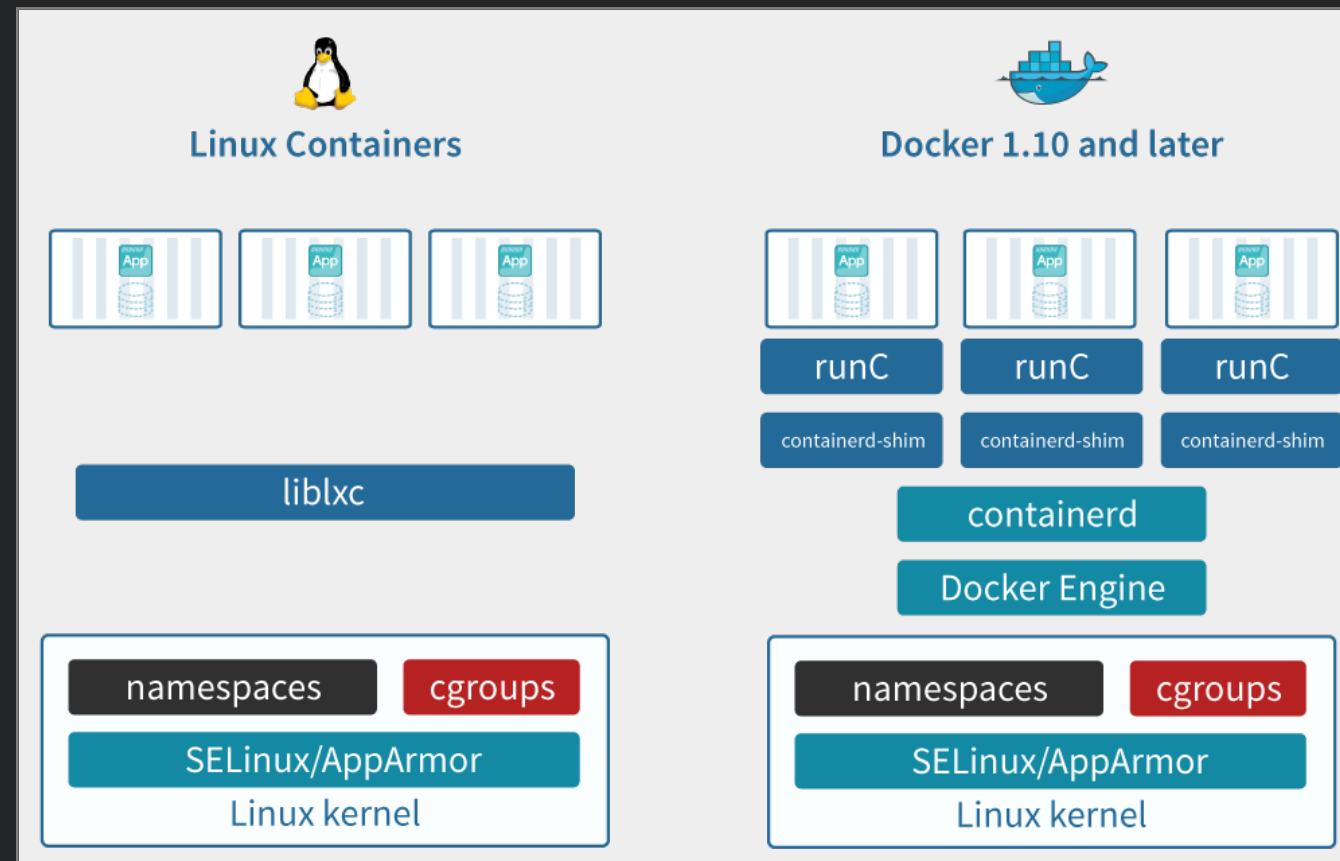
Chef]Chef, Puppet, etc.



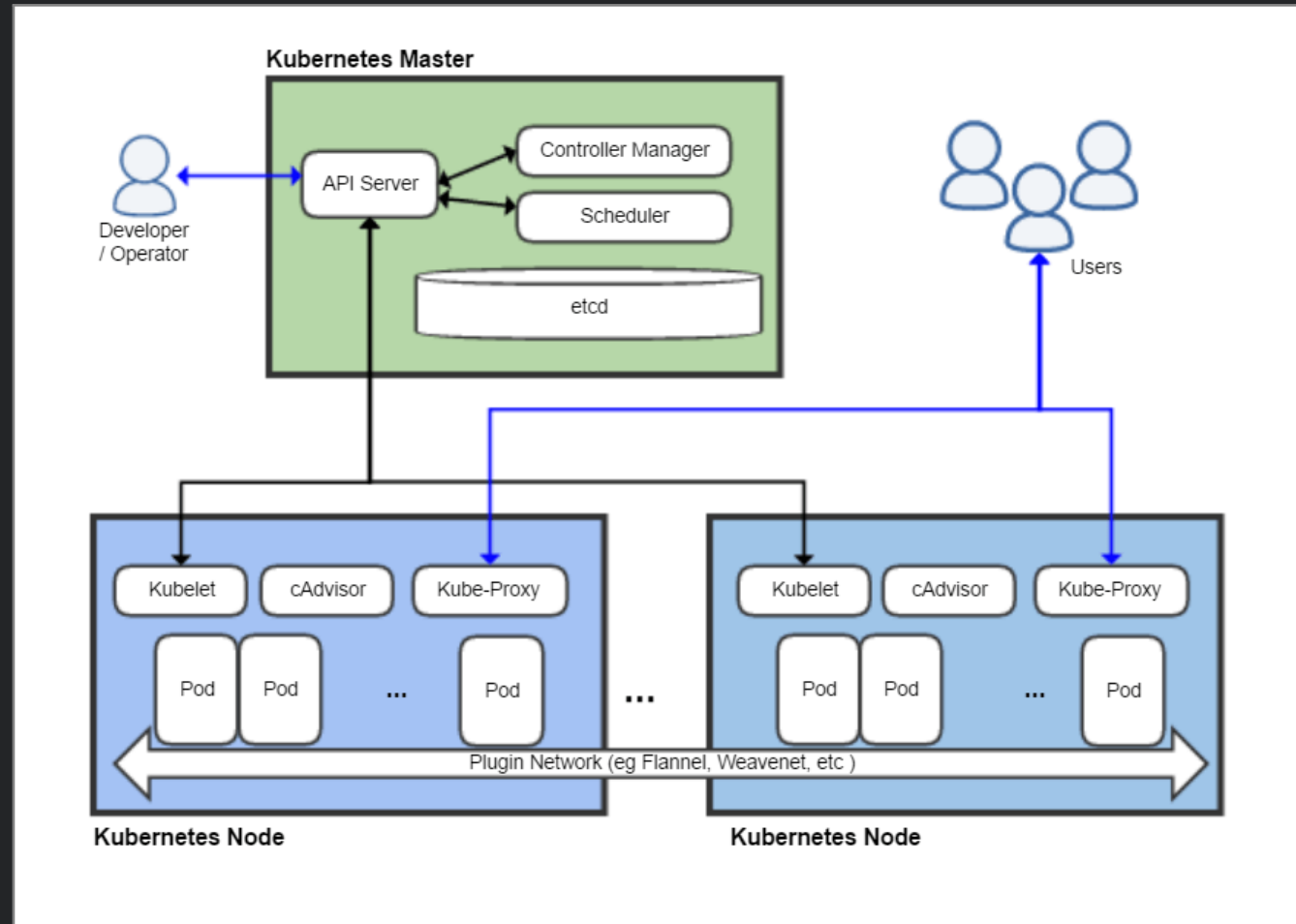
Dockerfile

```
19 FROM yegor256/rultor-image
20 MAINTAINER Yegor Bugayenko <yegor256@gmail.com>
21 LABEL Description="yegor256.com" Vendor="Yegor Bugayenko" Version="1.0"
22
23 ENV DEBIAN_FRONTEND=noninteractive
24
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
32
33 RUN sudo apt-get -y install plantuml
34 COPY plantuml.jar /usr/share/plantuml/plantuml.jar
35
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
44
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
51
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/
58
59 RUN sudo apt-get -y update --fix-missing
60 RUN sudo apt-get install -y libxml2-utils
61
62 RUN npm install -g cssshrink@0.0.5
63
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
```

LXC

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



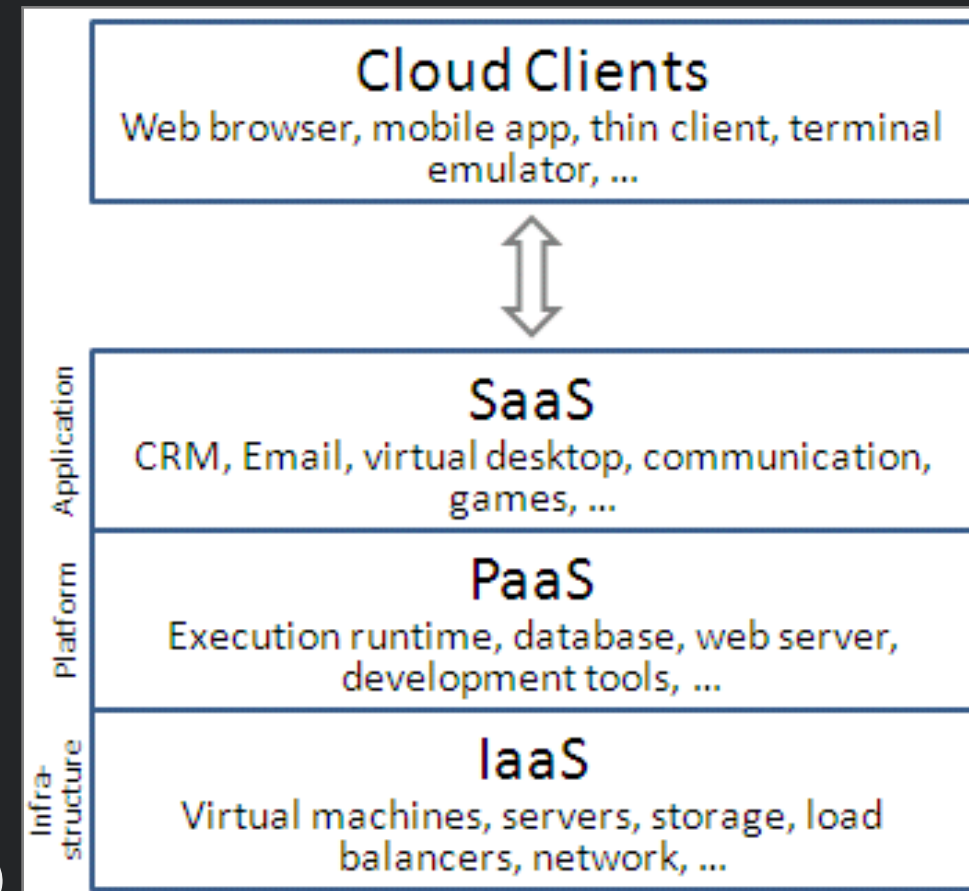
K8s]Kubernetes

Chapter #3:

PaaS, IaaS, SaaS, EaaS, etc.

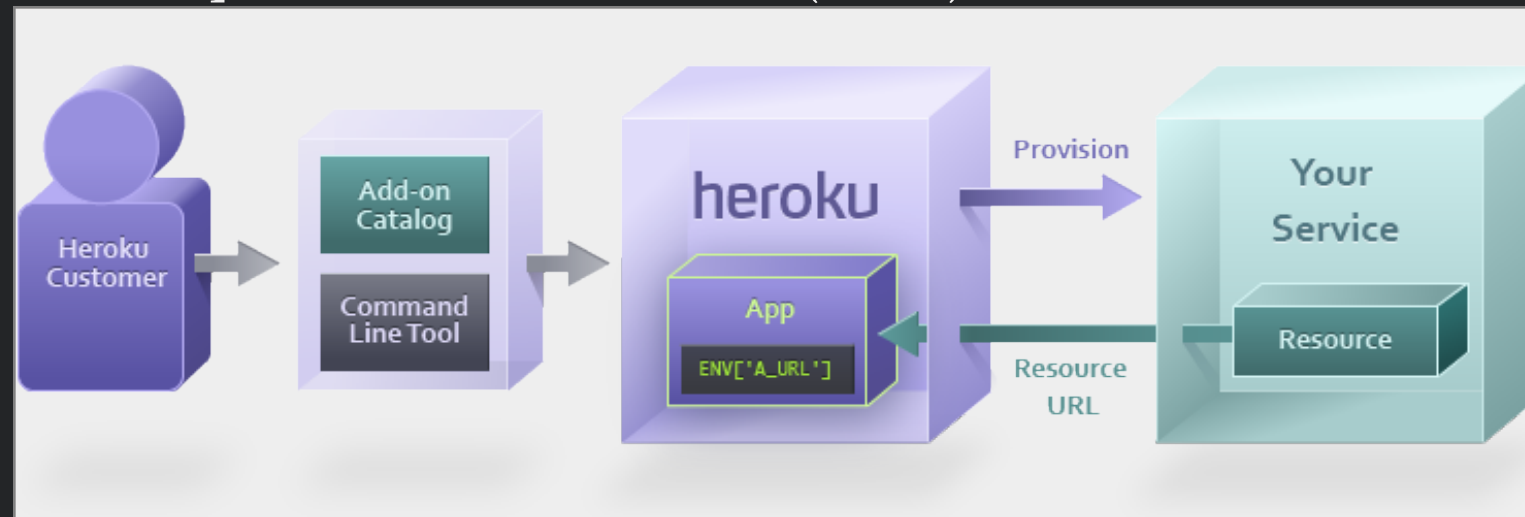


EaaS]Everything as a Service (EaaS)





Heroku]Platform as a Service (PaaS)





Serverless] Serverless Architecture Serverless architectures are application designs that incorporate third-party “Backend as a Service” (BaaS) services, and/or that include custom code run in managed, ephemeral containers on a “Functions as a Service” (FaaS) platform.



<https://martinfowler.com/articles/serverless.html> [tml](#) [→](#)

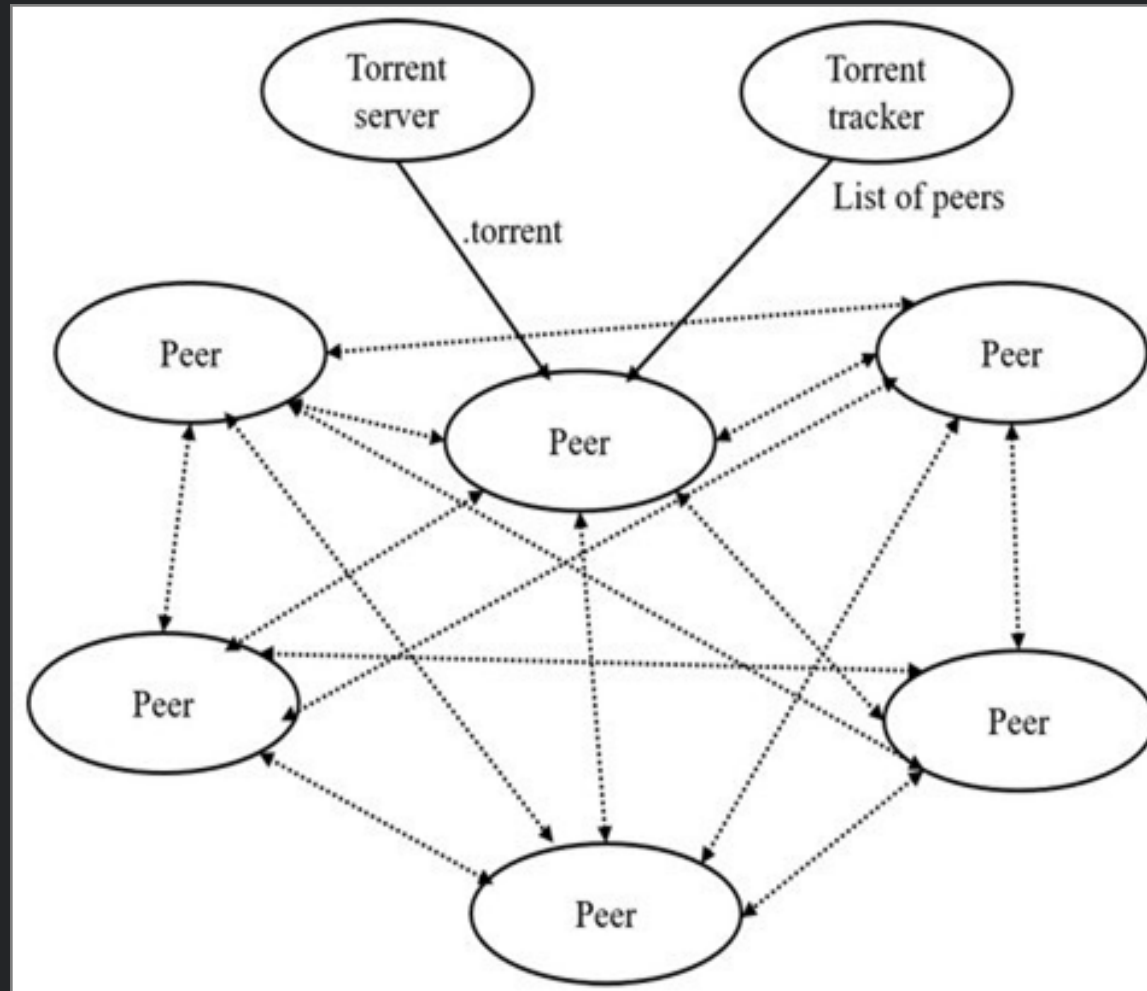
Fundamentally, FaaS is about running backend code without managing your own server systems or your own long-lived server applications.

AWS RDS vs. AWS DynamoDB

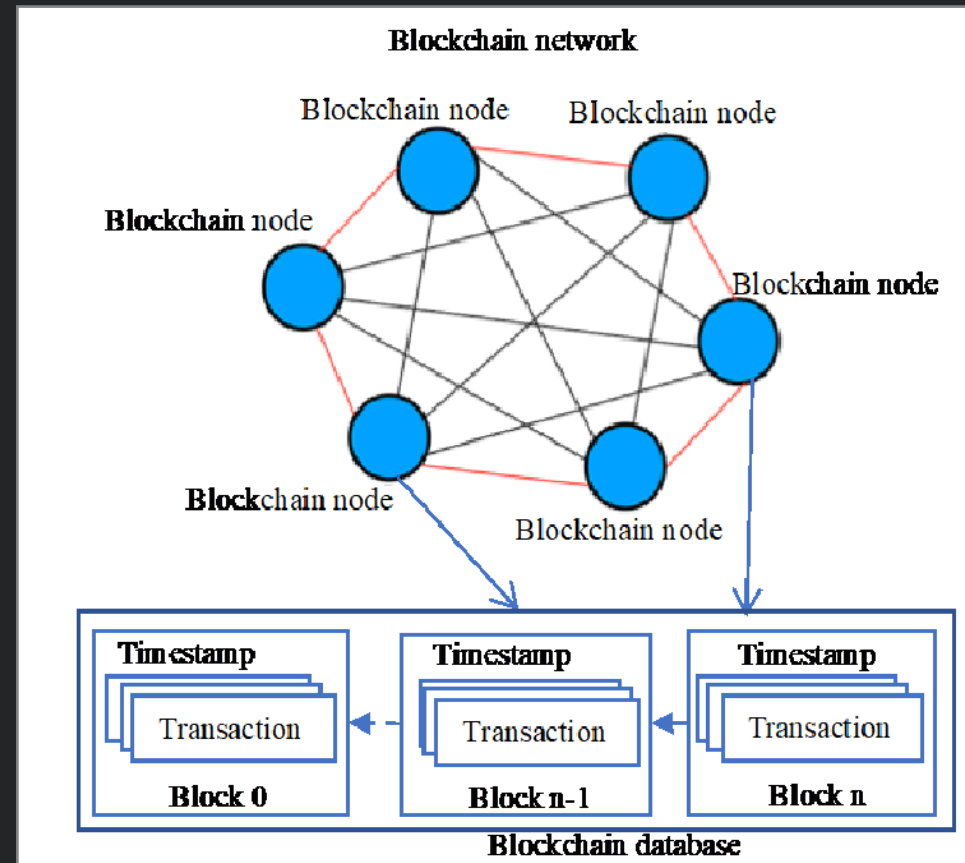
Chapter #4:

P2P: BitTorrent, Blockchain, and Beyond

BitTorrent

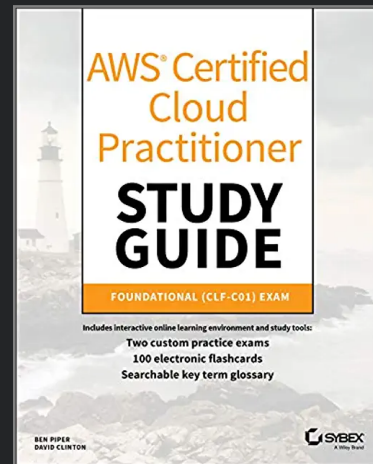


Blockchain

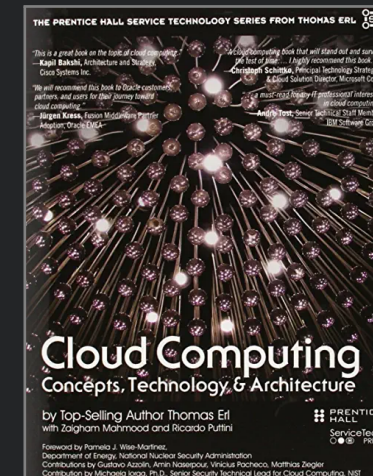


Chapter #5:

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?