

Cloud Computing

Summer Term 2016

Tutorial Session 1



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Complex and Distributed IT-Systems

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Organization

- Three tutorial sessions (14:00-16:00, Room EMH 225):
 - 29.05.
 - 12.06.
 - 26.06.
- Each session introduces one assignment
- Each assignment is due 2 weeks later (right before the next session)
- Written Exam:
 - 01.08.2017 (10:00-12:00)
- Exam counts 60% of the final grade, assignments count 40%

Organization

- Projects are solved in teams of 4-5 students
- Register on ISIS, get in touch through your “Group Forum”
 - If you don't have a group, write in the “Discussion Board” forum or contact us



Group Selection

- The three project assignments have to be completed in groups of 4-5 students. Please indicate which group you want to be in, by choosing one below.
- You can change your group without further notification up until the deadline of the first project assignment. After that, please notify Anton Gulenko.



Group Forum

- Please use this forum to contact your group members
- Do not write messages in the sub-forums of other groups
- You will also receive some group-specific material required for the assignments over this forum

- **Important: QISPOS Registration**
 - Possible until May 31st
 - Required to submit assignments and write the exam!

Project Assignments

- Topics covered
 - Usage of Infrastructure-as-a-service clouds (dashboard and CLI API)
 - Benchmarking the performance impact of virtualization
 - Benchmarking the cloud API
 - Infrastructure-as-code orchestration
 - Container virtualization (Docker)
 - Container-based orchestration (Docker Swarm)
- Sources of Information:
 - Assignment sheet
 - Online documentation
 - Online forums (<https://stackoverflow.com/>)
 - ISIS forum: ask your fellow students!

Project Assignment 1

- Due: 11.06.2017 23:59
- Summary:
 - Create Amazon AWS account, apply for AWS Educate grant
 - Receive credentials for the OpenStack cloud hosted at the CIT department
 - Create and prepare VMs in both platforms
 - Benchmark the 2 platforms & your PC (CPU, disk, memory benchmarks)
 - Plot benchmarking results, answer questions
- Submission
 - Through ISIS
 - One single PDF file containing text, plots, code snippets
 - Format of the PDF is not relevant, but include your group number and names on top

Amazon AWS Educate

- Amazon AWS accounts require a credit card
 - It will not be charged if you follow our instructions!
- AWS Educate grants 100\$ AWS credits per student per semester
 - More than enough to solve all assignments
 - **Most important thing: always shut down your VMs!**
- You can share an Amazon AWS account using IAM
 - <https://aws.amazon.com/iam/>

Amazon AWS

- >40 services, list growing...

Virtual Machines

Compute

EC2
EC2 Container Service
Lightsail [↗](#)
Elastic Beanstalk
Lambda
Batch

Storage

S3
EFS
Glacier
Storage Gateway

Database

RDS
DynamoDB
ElastiCache
Redshift

Networking & Content Delivery

VPC
CloudFront
Direct Connect
Route 53

Migration

Application Discovery Service
DMS
Server Migration
Snowball

Developer Tools

CodeStar
CodeCommit
CodeBuild
CodeDeploy
CodePipeline
X-Ray

Management Tools

CloudWatch
CloudFormation
CloudTrail
Config
OpsWorks
Service Catalog
Trusted Advisor
Managed Services

Security, Identity & Compliance

IAM
Inspector
Certificate Manager
Directory Service
WAF & Shield
Compliance Reports

Analytics

Athena
EMR
CloudSearch
Elasticsearch Service
Kinesis
Data Pipeline
QuickSight [↗](#)

Artificial Intelligence

Lex
Polly
Rekognition
Machine Learning

Internet Of Things

AWS IoT

Contact Center

Amazon Connect

Game Development

Amazon GameLift

Mobile Services

Mobile Hub
Cognito
Device Farm
Mobile Analytics
Pinpoint

Billing

Application Services

Step Functions
SWF
API Gateway
Elastic Transcoder

Messaging

Simple Queue Service
Simple Notification Service
SES





Business Productivity


WorkDocs
WorkMail
Amazon Chime [↗](#)


Desktop & App Streaming


WorkSpaces
AppStream 2.0


Account Management


 Anton Gulenko  Global  Support 

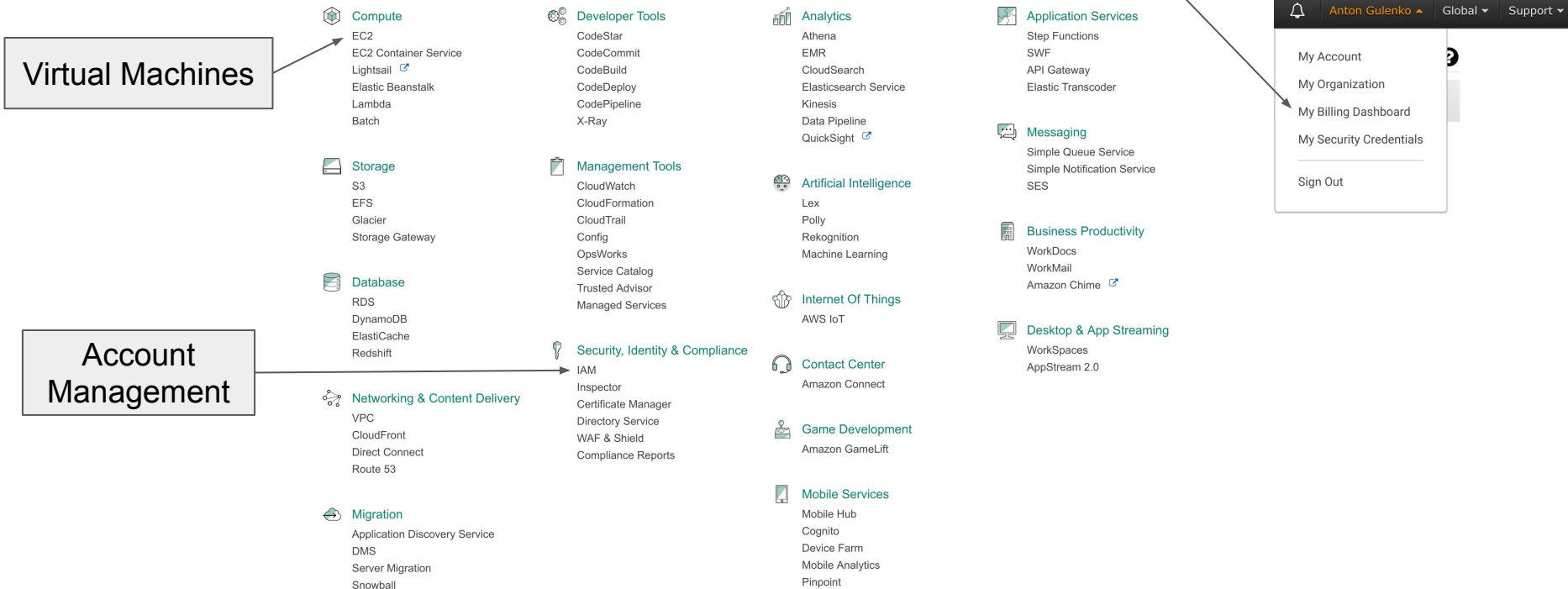
 My Account

 My Organization

 My Billing Dashboard

 My Security Credentials

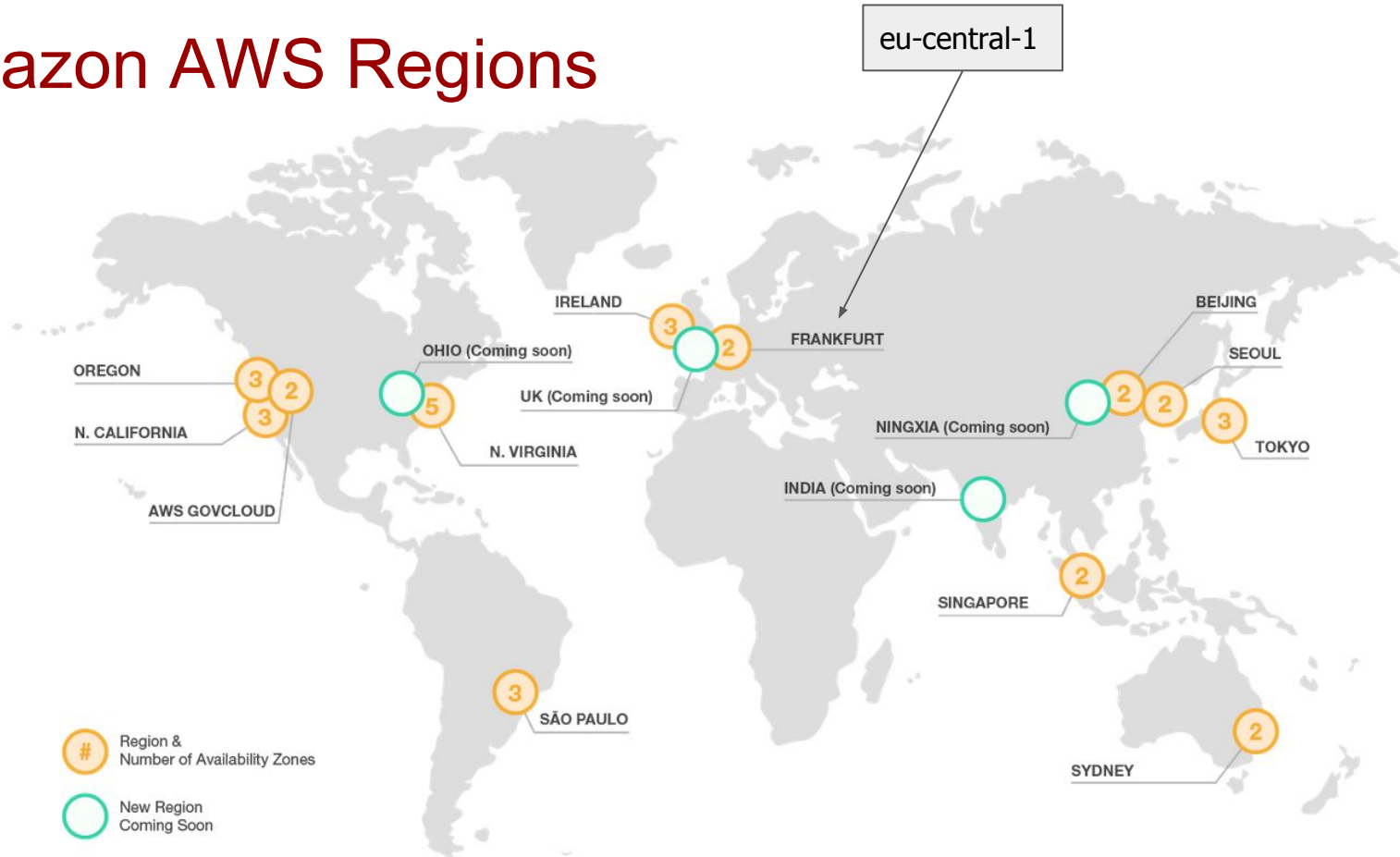
 Sign Out



Amazon AWS

- Pay-as-you-go model:
 - Pay by the hour, megabyte, request, ...
 - Expensive, but many possibilities without much configuration
- Administration possible via:
 - Browser (Management console):
 - <https://console.aws.amazon.com/console/home>
 - Command Line
 - Based on web-service API
 - Required to solve the project assignments
 - REST API

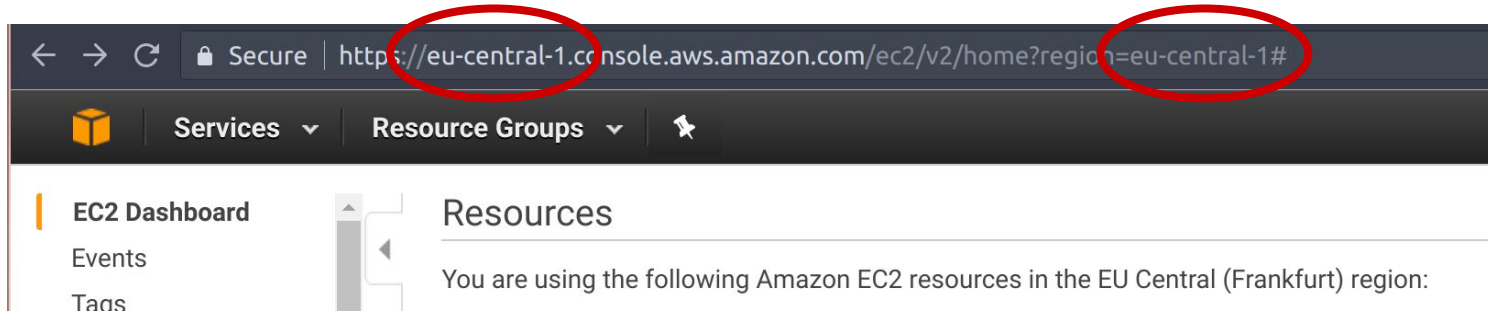
Amazon AWS Regions



Source: <https://awsinsider.net/articles/2016/01/07/aws-launches-region-in-korea.aspx>

Amazon AWS Regions

- Make sure you are in the correct region in the Dashboard



AWS Command Line Tools

- You will have to set up an environment for connecting to the AWS API
 - <http://docs.aws.amazon.com/cli/latest/userguide/installing.html>
- We recommend to use a Linux environment
- Read the docs
- Use the command line tools to create all resources described in the assignment

Last Reminder

Always remember to shut
down your EC2 instances!