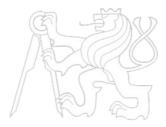
Middleware Architectures 2

Motivation and Course Overview

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Modified: Mon Feb 14 2022, 20:08:26 Humla v0.3

Overview

- Motivation
- Scope, Requirements, Learnings
- Assessment, Resources, Communication

Web 2.0

- A new version of the Web?
- Principles
 - Read-Write Web
 - Programmable Web
 - Realtime Web
 - Social Web

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Motivation in Brief

- Need for highly performant and scalable apps
 - Sudden increase in traffic
 - Slashdot effect
- The Web is programmable
 - Applications provide data and functionality
 - Users end-users (GUI) and programmers (API)
 - Any company with a Web presence has an API
 - → Google, Amazon, LinkedIn, Facebook, ...

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AM2 and AM1 Courses

- AM2 builds on AM1
- Application Architecture
 - Multi-tier client-server architecture
 - Cloud native and microservices
 - Interface of the app, REST
 - Client side of the architecture, JavaScript, AJAX
 - Infrastructure empowered by cloud technologies
- Technology, Platform
 - JavaScript
 - → client-side + related technologies
 - → server-side asynchronous I/O, node.js
 - It does not mean you cannot combine technologies
 - → Node.js as a Web server, ESB for proxy services with back-end systems, all running in a cloud environment (auto scaling, load balancers, message queues, etc.)

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Scope

• Cloud Architectures

- Details of some IaaS and PaaS services
- Cloud Native, Microservice Architecture
- Containers
- Docker, Kubernetes

Advanced HTTP

- Same origin policy, cross-origin
- OAuth, Open ID, JWT
- Realtime Web protocols
- HTTP Performance, HTTP/2
- Selected middleware technologies

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Organization of Lectures

- 13 Lectures
 - Czech: Mon 9:15-10:45, online
- Plan
 - 1. 14.02.2022 Motivation and Course Overview
 - 2. 21.02.2022 Asynchronous I/O
 - 3. 28.02.2022 Introduction to Cloud Computing
 - 4. 07.03.2022 Cloud Native Architecture
 - 5. 14.03.2022 Microservices Patterns
 - 6. 21.03.2022 Accessing and Utilizing Services
 - 7. 28.03.2022 Security
 - 8. 04.04.2022 Protocols for the Realtime Web
 - 9. 11.04.2022 HTTP Performance Optimization
 - 10. 18.04.2022 Easters
 - 11. 25.04.2022 Kafka
 - 12. 02.05.2022 Reserve
 - 13. 09.05.2022 Reserve

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Organization of Practicals

- Work alone, you can collaborate
- Practicals every second week
- Number of sessions: 6-7, 5 major tasks
 - 1. Introduction, JavaScript
 - 2. CORS/JSONP
 - 3. OAuth (JWT)
 - 4. Realtime Web
 - 5. HTTP/2
- Plus a number of tasks to complete at home

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Assessment

Labs

- Presence is mandatory
 - → You can miss up to 1 lab without sending regrets
- Total maximum points: P=40
 - → exercises for labs + your activity + your homeworks
- to pass: P >= 20

• Final exam

- Mandatory written test: 3 parts, ∼1 hour
 - \rightarrow each gives you a max. of 20 points, the total E = 60 points
 - \rightarrow you must have at least 50% of points from each theme covered by a test part and 50% of points in total
- Final score:
 - \rightarrow P + E = 100 maximum points
 - → The more points you have from labs, the better for the exam!

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Assessment – Final Marks

Mark	Points	In words
А	100–90	výborně
В	89–80	velmi dobře
С	79–70	dobře
D	69–60	uspokojivě
E	59–50	dostatečně
F	49–0	nedostatečně

Source: http://www.cvut.cz/pracoviste/pravniodbor/dokumenty/studijni-predpisy/studijnirad.pdf

Everything good and bad will count

- practicals, coding, (pro-)activity, passiveness, hacking, lectures, exam, cheating, ...

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Resources

• Online sources

- https://courses.fit.cvut.cz/NI-AM2/ Courses
- https://project.fit.cvut.cz/ your project home
- http://w20.vitvar.com both html and pdf (1 and 2 slides per page)

Books

- I. Grikorik: High Performance Browser Networking, O'Reily 2013
- B. Burns: Designing Distributed Systems, O'Reily 2018
- L. Richardson, M. Amundsen: RESTful Web APIs, O'Reilly Media, May 2015, ISBN 978-1-449-35806-8.

Other

- Many sources on the Web, to be listed throughout the course
- A lot of W3C sources, Web architecture, HTTP

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About Slides

• Humla – Open Source HTML5 Presentation Environment

- every slide has a unique URL
- all figures linked with Google drawings
- possible to format and print in PDF
- running local, with back-end NodeJS support, and offline
- Fork it at Humla github repo

Keys

- default browsing mode
- slideshow mode (automatically scales to full screen)
- grid (overview) mode
- 4 print mode, 2 slides per page
- ← slide left
- → slide right
- d debug mode
- e toggle last error messages on/off

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