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Welcome to AIP

Main objective

Implement a medium-sized web application incorporating multiple data sources, transaction integrity, data and application security.

The main objective is for you to demonstrate this objective directly: you will implement a web application for the subject's assessment.

It is not enough to simply 'hack' functionality together. You will need to use principles of good design to create an application that is ready for deployment in production environments.

Outcomes

You will be able to:

- Describe, conceptually, a full e-commerce application
- Compare and contrast web application architectures
- Recommend solutions for arbitrary web applications

You will be able to explain concepts relating to:

- Security
- Transactions
- Robustness
- High-availability

Assumed knowledge

- Good Java programming skills
- Able to write HTML with forms
- Confident user of Linux / Unix
(or the console of your preferred operating system)

This is **Advanced** Internet Programming. It isn't going to be the basics. You should already know how to develop simple interactive websites.

Java:

You should have a solid grasp of the Java programming language.

You should understand the following features in Java: class, interface, Java's primitive types (boolean, byte, char, short, int, long, float, double), visibility (private, protected, default, public), String, abstract, static, final, synchronized, arrays, loops, exceptions, try/catch and some of the standard libraries (e.g., the collections classes in java.util.*). You should be comfortable with object oriented programming.

HTML:

You should be able to create a simple website using HTML. You should understand the basic operation of HTTP. You should be able to explain how forms work and the difference between GET and POST.

Linux/Unix:

You should be able to edit files, launch programs and use basic commands in the shell (ls, cd, rm).

Challenges

Challenges

Think about a website you've built:

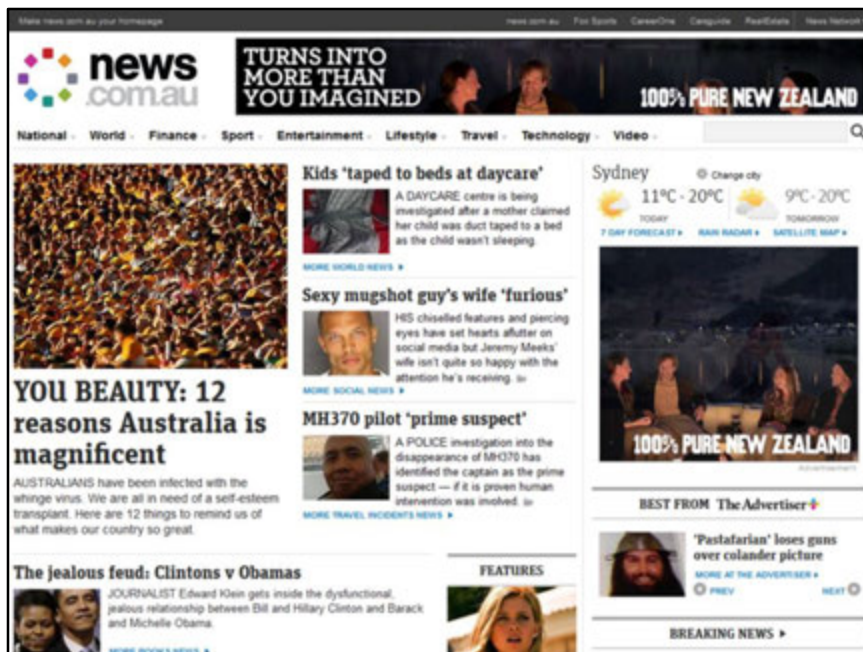
- Is it interactive, personalized and dynamic?
- Can it handle thousands of developers?
- Can it handle millions of users?
- Is it secure?

Why do we need to learn AIP?

- What about everything taught in Internet Programming?
- Isn't PHP good enough? ("It was good enough for Facebook")

Because we need to deal with:

- Scalability (many users, lots of data, fast response, many servers)
- Reliability
- Security
- Maintainability



Some challenges facing News.com.au:

- Ensuring quality
- Flexible presentation
- Location-based personalization
- Maintaining old content and links
- Surges in popularity
- Multiple platforms

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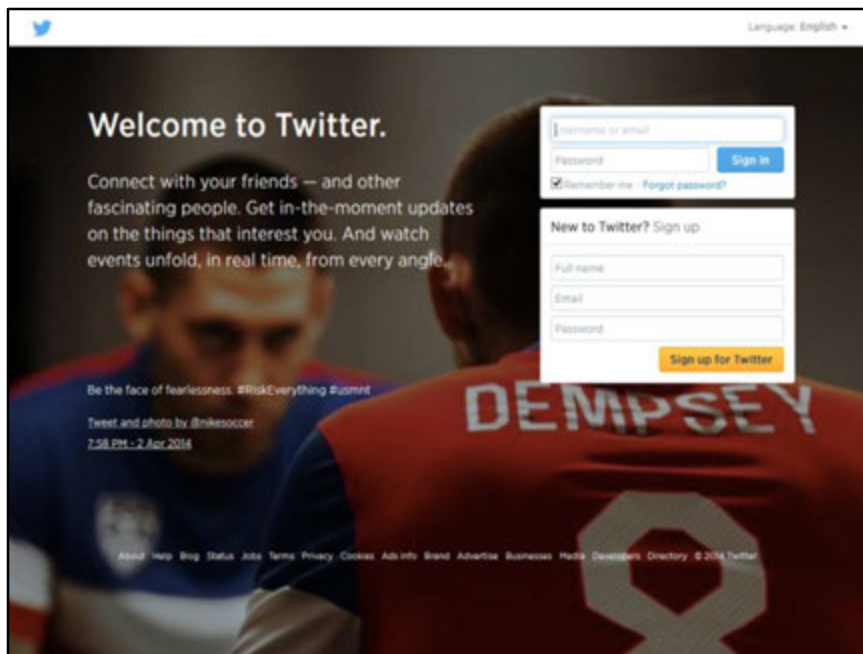
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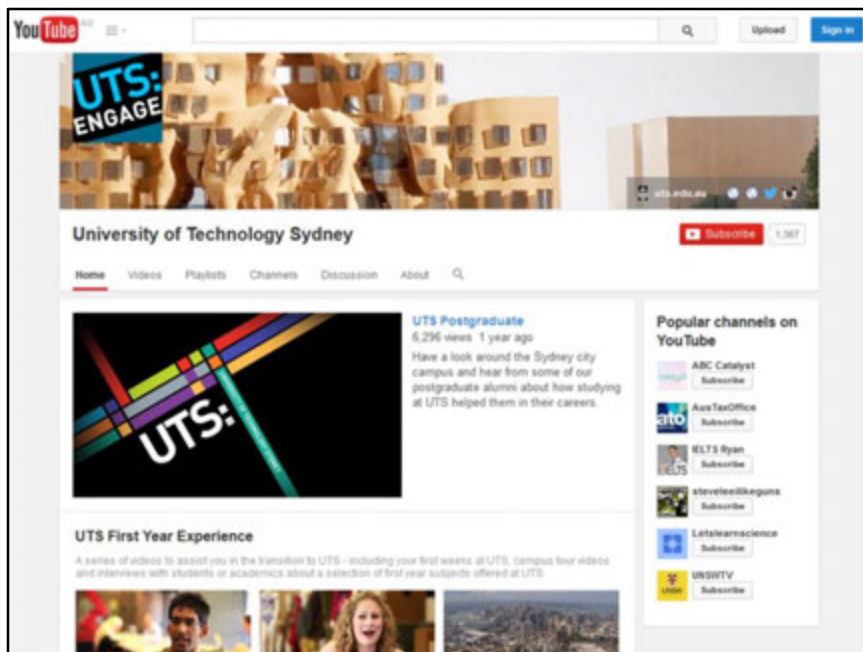
Challenges facing LinkedIn:

- Confidential information
- Real-time interaction
- Highly-personalized content for every individual user
- Multiple languages
- Sophisticated searching



Challenges facing Twitter:

- Many, many platforms including third-party apps
- Expectation of real-time, instantaneous interaction
- Half-a-billion tweets per day (2013)
- Global surges in popularity
- Rapid growth in early years



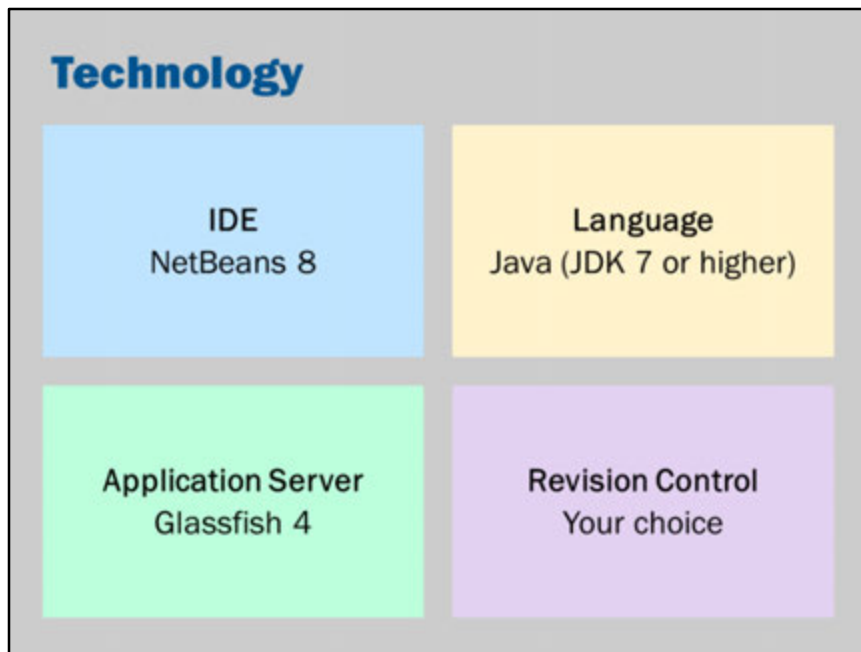
Challenges facing YouTube:

- Many videos
- Huge files used in upload and download
- 1 billion unique visitors per month
- Transcoding is slow and time-consuming
- Lots of copyright management challenges

Some challenges

- Internationalization
- Reliability
- Performance
- Integrity
- Security
- Maintainability
- and so on...

Bonus slides



While the software for this subject is available on the lab computers, it is very easy to install the software on your own computer or laptop.

In fact, I strongly recommend that you set up a development environment on your own computer.

IDE:

We will be using NetBeans 8.0.2 in lectures and in tutorials. NetBeans makes it very simple to deploy your application. You are free to install and use any IDE you wish, on any operating system you wish.

Language:

We will be using Java 7 or higher.

Application Server:

You can use other application servers. However, your assignments will be tested against Glassfish 4.

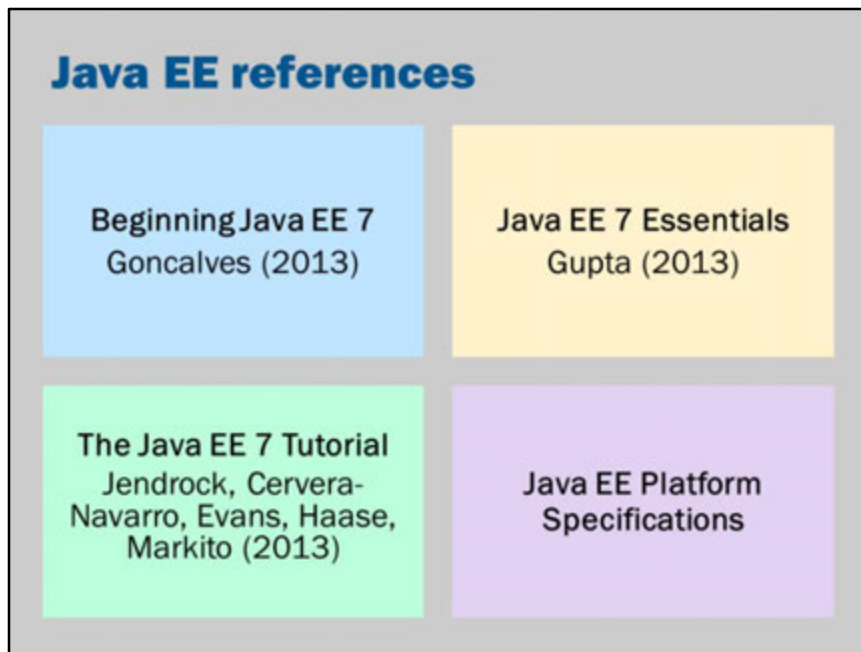
Revision Control:

You must use a revision control system and check in code on a regular basis.

Note that NetBeans has built-in support for revision control and is very easy to use.

You might consider using:

- A free account on develop.eng.uts.edu.au (Subversion)
- A free BitBucket account (Git or Mercurial)
- A paid account on github (Git)
- Your own installation of Git, Mercurial, or Subversion



There is no fixed textbook.

Beginning Java EE 7:

Free download of complete PDF via the library website. A step-by-step guide based on NetBeans and Glassfish 4.

http://find.lib.uts.edu.au/?R=OPAC_b2874770

Java EE 7 Essentials:

A shorter book that summarizes key points but is not a tutorial.

http://find.lib.uts.edu.au/?R=OPAC_b2838102

Java EE 7 Tutorial:

Free download, and very comprehensive. However, this is quite an advanced-level tutorial.

<http://docs.oracle.com/javaee/7/tutorial/doc/home.htm>

Java EE Platform Specifications:

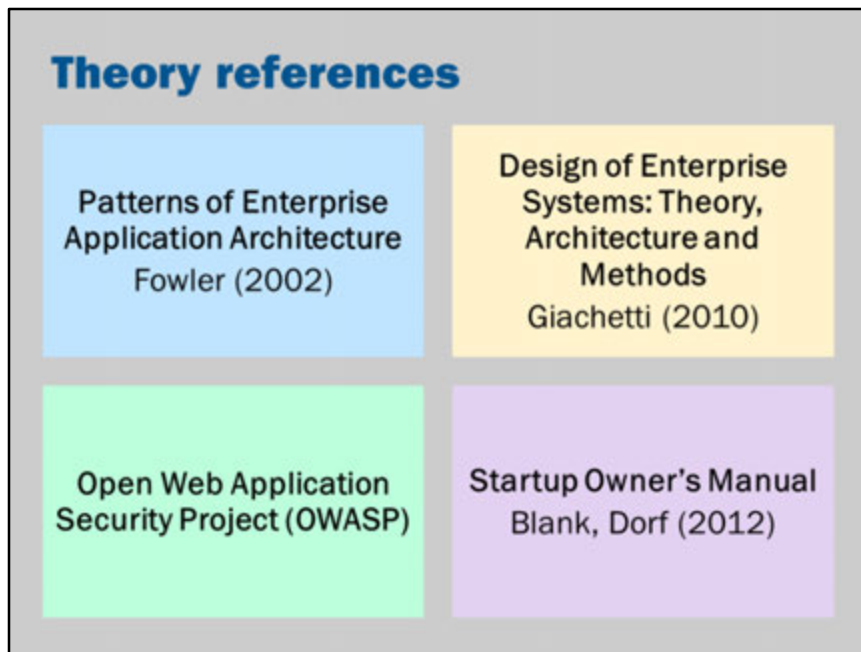
When in doubt about something, check the full specifications!

<https://java.net/projects/javaee-spec/pages/Home>

Other resources:

NetBeans E-Commerce Tutorial: Slightly out-of-date but an excellent introduction to features of the Java EE platform.

<https://netbeans.org/kb/docs/javaee/ecommerce/intro.html>



While this subject is hands-on and technical, you may like to take a look at some of the bigger picture questions of internet programming and enterprise development.

Patterns of Enterprise Application Architecture:

A classic book on software architectures for enterprise systems:

http://find.lib.uts.edu.au/?R=OPAC_b1603101

<http://martinfowler.com/books/ea.html>

Design of Enterprise Systems: Theory, Architecture and Methods:

Provides high-level overviews of many aspects of building enterprise systems, including data modeling, estimating performance, project management

http://find.lib.uts.edu.au/?R=OPAC_b2549670

Open Web Application Security Project:

Free guides with information about securing and testing websites:

https://www.owasp.org/index.php/Main_Page

Startup Owners Manual:

Information about the “Customer Development methodology”, in which startups are

treated as an experimental process.

http://find.lib.uts.edu.au/?R=OPAC_b2748519

<http://www.amazon.com/The-Startup-Owners-Manual-Step-By-Step/dp/0984999302>

<http://steveblank.com/>

See also Udacity course: <https://www.udacity.com/course/ep245>

Other resources:

Mozilla Developer Network:

An excellent reference for HTML, CSS, JavaScript:

<https://developer.mozilla.org/en-US/>

W3C Specifications:

When in doubt, check the full specifications!

<http://www.w3.org/>

<http://www.w3.org/TR/html5/>

TCP/IP Illustrated:

The classic book on the low-level protocols underlying the internet.

Stevens (1993) *TCP/IP Illustrated, Volume 1*, Addison-Wesley Professional.

Even more reading ideas:

<http://blog.codinghorror.com/recommended-reading-for-developers/>