
WRITTEN EXAMINATION
FOR THE LECTURE
“E-COMMERCE”
WINTER SEMESTER 2004/2005
FEBRUARY 25, 2005
PROF. DR. RALF MÖLLER

Name: _____

Student Id: _____

Name of curriculum: _____

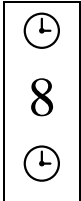
Signature: _____

Please note:

1. **Check if your student Id is on the list of Ids handed out by the supervisors.**
 - (a) If your **Id is not on this list**, please **fill out a proviso**, which will be given to you by the supervisor. **You may not start the exam until you have returned the proviso to the supervisor.**
 - (b) Also **fill out the additional form** given to you by the supervisor. Please **go to the students office** which is responsible for your curriculum and **let them sign the form. Return the signed form to the STS secretary (Harburger Schloßstr. 20, 2nd floor, Frau Hantschmann).**
2. Put your student identification card as well as your passport on the table.
3. You have **90 minutes** for answering the questions. **Additional resources are not allowed.**
4. The symbol “⊖” gives an advice on how much minutes to spend for answering a question.
5. There is sufficient space for your solutions on the examination sheets.
6. If you receive **additional pieces of paper** from the supervisor, please write your name and student Id also on these pages, and add a page number.
7. If you **need to leave the examination room**, silently **inform the supervisors. Do not leave your table.** Wait until the **supervisor approaches your desk and gives you the permission to leave the room.** There may be only one person away.

1. General questions about internet technology – true or false?

| Question | True | False |
|--|-----------------------|-----------------------|
| The www part of www . amazon . com is the top-level domain (TLD). | <input type="radio"/> | <input type="radio"/> |
| If you don't specify a port number in a HTTP requests, standard port 8081 is used. | <input type="radio"/> | <input type="radio"/> |
| A firewall is a security component that is primarily used to determine the origin of malicious code executed on a server system. | <input type="radio"/> | <input type="radio"/> |
| If you don't specify a port number in an HTTP request, the port number is negotiated between client and server. | <input type="radio"/> | <input type="radio"/> |
| When an ECommerce company moves a service (e.g. on-line shop) to a different computer, the IP address must change. | <input type="radio"/> | <input type="radio"/> |
| When an ECommerce company moves a service (e.g. on-line shop) to a different computer, the IP address may change, but this can be made transparent (invisible) to the clients. | <input type="radio"/> | <input type="radio"/> |
| A resource on the Internet (e.g., web page) can be addressed by exactly one URL. | <input type="radio"/> | <input type="radio"/> |
| HTTP is a request / response protocol. | <input type="radio"/> | <input type="radio"/> |



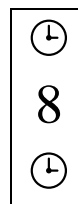
2. Define and explain (in 3-4 sentences) the following network components:

(a) Proxy

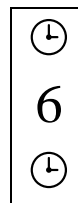
(b) Gateway

(c) Mirror

(d) Firewall



3. What is the difference between Identification, Authentication, and Authorization?



4. Explain the difference between an ISP and an ASP.

⌚
2
⌚

5. What are the two basic approaches to realize sessions over HTTP? For each approach, briefly describe the fundamental technical realization.

⌚
6
⌚

6. Online Shops:

(a) What is referred to as an “Online Shop”? Give a definition.

⌚
6
⌚

(b) Briefly list the core functionality of an Online Shop.

7. Security and Trust:

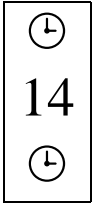
- (a) Explain the notions of security and trust. How and why are security and trust related? Explain.



- (b) Name and describe briefly (one or two sentences) four important security problems in ECommerce.

8. Digital Encryption Techniques, Signatures and Certificates:

- (a) Encryption techniques can be broadly classified into two main classes. Name these classes and describe the underlying main ideas of each class.



- (b) What does a digital signature state? How is it used in ECommerce?

- (c) Why are encryption techniques used for digital signatures?

- (d) How does a digital signature work? Consider the two main tasks (“use cases”) related to digital signatures.

- (e) What is the role of a Certification Authority (CA)?

9. Web Services:

- (a) Suppose you are book seller and want to offer a “book price lookup service” on the web.

What do you need to do in order to enable others to make use of your service? Name and briefly describe the involved steps.



- (b) Draw a diagram illustrating the roles of the WebServer Provider and of the WebService Requester. What other parties must be present?

10. Semantics of Web Services and the Semantic Web:

(a) Describe, with a few sentences, the basic data model used in the *Resource Description Framework (RDF)*.

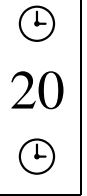
(b) With RDF Schemas (RDF/S) it is possible to express specialization hierarchies of classes (subsumption hierarchies), to specify domain- and range restrictions for so-called properties (similar to description logic “roles”), and moreover, these properties can also be put into a specialization hierarchy.

Give two examples for common-sense classes (concepts) which cannot be appropriately represented with RDF/S, but with basic description logics. Justify why the expressivity of RDF/S is insufficient for your given example classes (e.g., “the class of green frogs cannot be adequately represented in RDF/S, because RDF/S cannot represent the fact that ...”).

(c) Model the following information as a description logic TBox. Give appropriate definitions for the following concepts:

- i. A *book* has a title (which is of type *book title*), an author (which is of type *author*), and a topic (which is of type *topic*). Moreover, a book has a price (which is of type *price*) and an ISBN (which is of type *string*).

11. (c) ii. An *ECommerce book* is a special book whose topic is ECommerce.



iii. An *author* is a person who has written at least one book.

iv. An *ECommerce author* is an author who *only* writes ECommerce books.

v. An "*ECommerce bestseller*" *author* is an author who has written at least 3 ECommerce books. More than 100.000 copies have been sold of each ECommerce book this author has written.