



Institutionen för Data-
och Systemvetenskap



STOCKHOLMS
UNIVERSITET



KUNGLIGA
TEKNISKA
HÖGSKOLAN

***:96 (SU) and 2I1263 (KTH)
Internet Application Protocols
and Standards**

Exam 2001-10-20

The following documents are allowed during the exam:

1. Documents in Compendium 1, printed on coloured paper.
2. Documents in Compendium 2, printed on coloured paper.
3. Documents in Compendium 3, printed on coloured paper.
4. Documents in Compendium 7, printed on coloured paper.
5. Ordinary language dictionaries between English and Swedish.

Note 1: Compendium 4, 5, 6, 8 and 9 are not allowed during the exam.

Note 2: Some students may have the compendiums from the previous time this course was given. Some of these compendiums have yellow paper only on the front page of the allowed documents, and there was a separate document Appendix A: ASN.1 syntax (basic items) which is allowed during the exam.

Note 3: Compendium 4 was wrongly printed on yellow paper in August 1998, but is not allowed during the exam.

Note 4: A few copies of these compendiums (part 1-3 and 7) will be available for loan during the exam for students who have not bought the compendiums.

Important warning

It is not acceptable to answer an exam question by just a verbatim quote from the allowed documents above. You must show that you understand the question and your answer by using your own words.

Questions during the exam

Jacob Palme will come to the exam rooms around 11:00 to answer questions for clarification regarding the exam.

Notification of result by e-mail

Print your e-mail address on the front cover page of the exam, so that I can notify you by e-mail if you did not pass the exam. Print legibly!



Continued from the previous page.

No.	Question in English	Question in Swedish	Max points
1.	<p>Write an ASN.1 specification to send a request for one or more theater tickets. The request should contain the name of the theatre (text string), the name of the play (text string), the date and time of the performance, a request for one or more tickets, where each ticket request should indicate whether the customer is a minor (lower price), a senior (lower price) or an ordinary adult (not minor or senior) and whether this seat are wanted in the stalls or on the balcony. Note that it should be possible to order several tickets in one request, some of which are in the stalls and some on the balcony, and some of which are minors, some seniors and some adults, in all possible combinations.</p>	<p>Skriv en ASN.1-specifikation för att sända en beställning av en eller flera teaterbiljetter. Beställningen skall innehålla namnet på teatern (textsträng), namnet på pjäsen (textsträng), datum och tidpunkt för föreställningen, samt en beställning av en eller flera biljetter, där var och en av de beställda biljetterna kan avse ett barn (lägre pris), en pensionär (lägre pris) eller en vuxen (normalt pris). Varje enskild biljett skall också kunna beställas på antingen parkett eller balkong. Det skall vara möjligt att i en beställning beställa flera biljetter, där vissa avser barn, vissa vuxna, vissa seniorer, vissa parkett, vissa balkong i alla tänkbara kombinationer.</p>	6
<p>Solution</p> <pre>TicketRequest ::= SEQUENCE { theatre VisibleString, play VisibleString, datetime GeneralizedTime, SEQUENCE OF TicketItem }</pre> <p>TicketItem ::= SEQUENCE { number INTEGER, agegroup Enumerated { minor(0), adult(1), senior(3) }, seating Enumerated { stalls(0), balcony(1) }</p>			



*:96 (SU) and 211263 (KTH) Internet Application Protocols and Standards

Exam 2001-10-20

Page 3

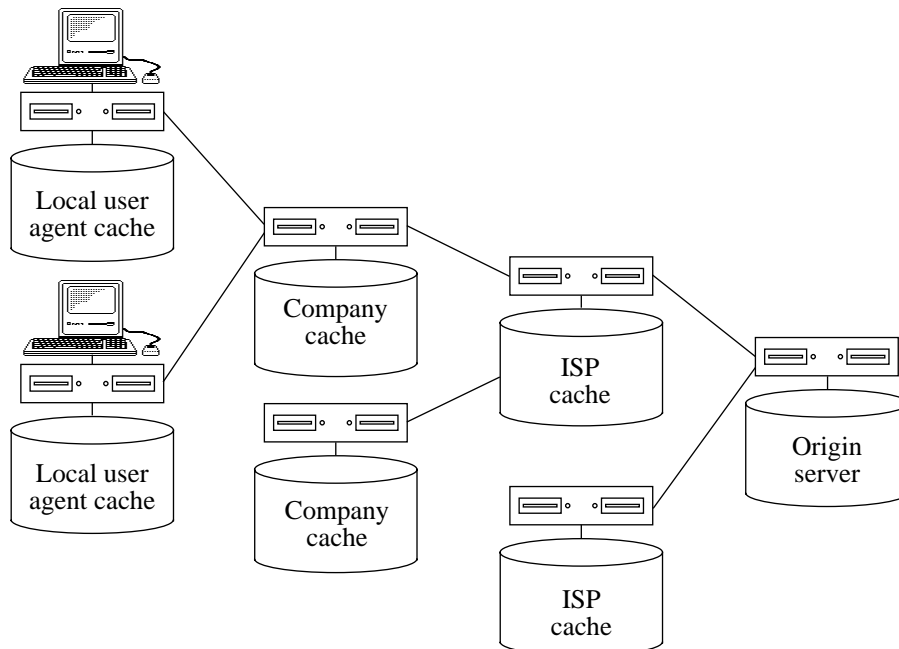
No.	Question in English	Question in Swedish	Max points
2	A common technique to reduce load on a network is to replicate some information in several places, so that the information needed can be downloaded from a nearby copy. Describe different strategies for managing such replication. Which problems can occur, and how can they be handled?	En vanlig teknik för att minska belastningen på ett nätverk är att replikera en del information på flera olika platser, så att den information som behövs kan hämtas från en kopia placerad nära mottagaren. Beskriv olika strategier för att hantera sådan replikering. Vilka problem kan uppstå, och hur kan man hantera dem?	6

Solution

Uncontrolled caching	Copies are kept for a certain time, without knowledge if the original has changed. Can be combined with methods of guessing lifetime.
Expiration-time-controlled caching	Original is delivered with a lifetime, and cached for this time.
Always check strategy	For every request, a check is made with the server of the original to see if it has been changed.
Master-controlled strategy	The master server, which holds the original, knows where replicates are kept and updates them when the original is changed. It may also know secondary replicates, who furthers changes to the original.
No master strategy	With this policy, which is used in Usenet News, there is no particular master server for any document. Changes will trickle through from server to server. The advantage is that information is not lost if the master server stops operating.
No-change allowed	Information is organized into items, which can never be modified.
Pre-loading	A cache may request new version of popular documents before any user actually asks for them. Advantage: Fast response time. Disadvantage: May load documents no one wants to see.

<p>Manual reload</p>	<p>The user can (this is common in web browsers) ask for a reload if the user believes that a page is not up-to-date. The advantage is that a human may know better than a machine, the disadvantage that many users do not understand when and how to use this facility.</p>
----------------------	---

All can be combined with chaining of successive levels of caches:



3	<p>A relative URL is evaluated relative to a base. The method which evaluates a relative URL into an absolute URL takes two parameter values as input, one of them is the relative URL, the other is the base. From which different sources can the value of the base be taken?</p>	<p>En relativ URL görs fullständig relativt till en bas. Metoden som omvandlar en relativ URL till en absolut URL tar som indata två parametrar, dels ett värde på den relativa URL-en, dels ett värde på basen. Från vilka olika källor kan ett värde till basen hämtas?</p>	6
---	---	---	---

Solution

1. Information inside the document itself, for example a <BASE> element in the <HEAD> of the file containing the URI.
2. Information in the environment of the document, such as a Content-Base statement in the HTTP response delivering the file.
3. Use the URI of the referencing file itself, if neither of 1. or 2. provides a base.



*:96 (SU) and 2I1263 (KTH) Internet Application Protocols and Standards

Exam 2001-10-20

Page 5

No.	Question in English	Question in Swedish	Max points
4	Write a specification, in a format which might be submitted to a standards organisation, of an extension to HTTP which would allow the requestors to specify their religion, and then get the version of a web page which is appropriate to their religion. It is an advantage if you allow users to specify more than one religion, in order to get a web page adapted to any of these religions.	Skriv en specifikation, i ett format som skulle kunna sändas in till en standardiseringsorganisation, av ett tillägg till HTTP som skulle göra det möjligt för de, som laddar ner en webbsida, att ange sin religion, och sedan få den version nedladdad av webbsidan som passar för deras religiösa övertygelse. Tillåt gärna att man kan ange flera religioner, om man kan godta en sida anpassad till vilken som helst av dessa religioner.	6

Solution

The Accept-Religion request-header in HTTP can be used to indicate to which religions web pages, which are available adjusted to multiple religions, should adhere.

```
Accept-Religion = "Accept-Religion" [LWSP] ":" [FLWSP]
                  religion *("," FLWSP religion)

religion =        majorreligion ["-" subreligion]

majorreligion =  "Christian" / "Islamic" / "Buddhist" /
                  otherreligion

otherreligion =  1*ALPHA

subreligion =    1*ALPHA
```

Religions are listed in order of preference.