DSV Institutionen för Data- och Systemvetenskap

STOCKHOLMS UNIVERSITET

KUNGLIGA TEKNISKA HÖGSKOLAN

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

Exam 2003-11-26

The following documents are allowed during the exam:

1. Documents in Compendium 1, printed on colored paper.

2. Documents in Compendium 2, printed on colored paper.

3. Documents in Compendium 3, printed on colored paper.

4. Documents in Compendium 7, printed on colored paper.

5. Ordinary language dictionaries between English and Swedish.

Note 1: Compendium 4, 5, 6, 8 and 9 are not allowed during the exam. The exam supervisor will check that you do not have copies of compendiums 4 ,5 ,6 , 8 and 9 printed on color paper. Bringing such compendiums on colored paper is cheating and can result in suspension of your rights to study.

Note 2: Underscoring and short handwritten notes in the yellow documents are allowed.

Note 3: 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.

Jacob Palme can be reached by phone 664 77 48 between 18:00 and 20:00 on the exam day if you need clarification of an exam question.

Continued from the previous page.

No.	Question in English	Question in Swedish	Max points
1	A freight train can carry three kinds of wagons: Container wagons, tank wagons and piece-goods wagons. Limits for these wagons are: For container wagons: Maximum number of tons, for tank wagons: Maximum number of both tons and maximum number of cubic meters, for piece-goods wagons: Maximum number of tons. Write a specification of a protocol to transmit a description of a train containing a variable number of wagons with specified maximal limits of these three kinds. You are free to use ABNF, XML or ASN.1 whichever you prefer.	Ett godståg kan innehålla tre typer av vagnar: Containervagnar, tankvagnar och styckegodsvagnar. Gränser för dessa vagnar är: För containervagnar, ton. För tankvagnar, både ton och kubikmeter. För styckegodsvagnar: ton. Skriv en specifikation av protokoll för att överföra en beskrivning av ett tåg omfattande ett varierande antal vagnar med specificerade gränser enligt ovan. Du kan själv välja att använda ABNF, XML eller ASN.1.	6

Answer:

DTD:

```
<!ELEMENT train (wagon*)>
<!ELEMENT wagon ( container | tank | piecegoods)>
<!ELEMENT container EMPTY>
<!ELEMENT tank EMPTY>
<!ELEMENT piecegoods EMPTY>
<!ATTLIST container
        maxweight CDATA #REQUIRED
>
<!ATTLIST piecegoods
        maxweight CDATA #REQUIRED
>
<!ATTLIST tank
        maxweight CDATA #REQUIRED
        maxvolume CDATA #REQUIRED
>
```

Example of XML based on this DTD:

```
<?xml version="1.0" ?>
<!DOCTYPE train SYSTEM "train.dtd">
<train>
<wagon><container maxweight="10" /></wagon>
<wagon><tank maxweight="10" maxvolume="20" /></wagon>
<wagon><piecegoods maxweight="12" /></wagon>
</train>
```

No.	Question in English	Question in Swedish	Max points

1 *ASN.1:*

Train ::= SEQUENCE OF Wagon
Wagon ::= CHOICE {
       [0] Container,
       [1] Tank,
       [2] Piece-goods }

Container ::= SEQUENCE {
       maxweight REAL }

Tank ::= SEQUENCE {
       maxweight REAL,
       maxvolume REAL }

Piece-Goods ::= SEQUENCE {
       maxweight REAL }

ABNF :

TRAIN = "Train: CRLF *(CONTAINER / TANK / PIECE-GOODS) "TrainEnd" CRLF

CONTAINER = "Container: " *DIGIT "." *DIGIT " Maxweigth" CRLF

TANK = "Tank: " LIMIT " Maxweigth" LIMIT " Maxvolume" CRLF

PIECE-GOODS = "Piece-goods: " LIMIT Maxweigth" CRLF

LIMIT = *DIGIT "." *DIGIT "

Example of data based on this ABNF specification:

```
Train:
Container: 10.0 Maxweight
Tank: LIMIT 10.0 Maxweight LIMIT 20.0 Maxvolume
Piece-goods: LIMIT 10.0 Maxweight
TrainEnd
```

2 Write a specification in HTML of part of an HTML form which contains a HIDDEN control. You can choose yourself a suitable application where such a control might be useful. Also describe why use of the HIDDEN control was suitable in the application you describe.

Skriv en specifikation i HTML av en del av ett HTML-formulär som innehåller en HIDDEN-kontroll. Du kan själv välja ett lämpligt exempel på en tillämpning där det kan vara lämpligt att använda en sådan kontroll. Beskriv också varför användning av HIDDEN-kontrollen var lämplig i ditt exempel.

6

2 *Answer:*

HTML Code

```
<FORM action="http://mysite.com?" method="post"name="comment">
  <P>Add to your cart:</P>

  <P><INPUT name="added" type="checkbox"
     value="Apples"> Apples</P>

  <P>Already ordered: Oranges, Pears</P>

  <P><INPUT type="hidden" name="ordered"
     value="oranges;pears"></P>
```

May look in the web browser like this

Add to your cart:
☐ Apples
Already ordered: Oranges, Pears

Use of a hidden form field was used to remember the contents already stored in the cart for a customer adding more and more products to a card.

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3 A Usenet news client is often restricted to communicate only with a certain news server. In spite of this, communication is possible between users connected to different news servers. What technology is used to make this possible. What are the pros- and cons of this technology?

En Usenet news-klient har ofta bara rätt att kommunicera med en viss newsserver. Trots detta, är det möjligt att kommunicera mellan användare knutna till olika newsservrar. Vilken teknologi används för att göra detta möjligt, och vad är för- och nackdelar med denna teknologi?

6

Answer:

Messages are duplicated between servers, by nearby servers exchanging messages so that a message successively reaches all servers.

Pros:

- Automatic backups by multiple copies on different servers.
- Fast response times for users.

Cons

- Expensive duplicate storage.
- Short retention times.
- All newsgroups not available everywhere.
- Slow distribution.

No.	Question in English	Question in Swedish	Max points
4	Write an extension to RFC 1894 to be able to report that a message was stopped for national security reasons.	Skriv ett tillägg till RFC 1894 för att kunna rapportera att ett meddelande stoppades av hänsyn till nationella säkerhetsintressen.	6

Answer:

This extension adds functionality to RFC1894 to report that a message has been stopped for national security reasons.

The IANA registry of diagnostic types is extended with a new diagnostic type with the name "national-security-reasons".

MTAs performing national-security control of e-mail can send this notification, combined with an action-value "failed".

Security considerations: Even though this extension is meant to increase security, there are obvious security risks with monitoring mail for security reasons, such as the risk of improper rejection of a message and infringement of privacy risks.