NTNU
Norges teknisk-naturvitenskapelige universitet
Institutt for telematikk

EXAM TTM4128 – SERVICE AND RESOURCE MANAGEMENT
EKSAM I TTM4128 – TJENESTE- OG RESSURSADMINISTRASJON

Contact person / **Faglig kontakt**:	Mazen Shiaa
Tlf.:	452 76 156
Date / **dato**:	05.06.2007
Time / **tid**:	15:00-18:00
Remedies / **Tillatte hjelpemidler**:	**D**: No printed or handwritten remedies allowed. **D**: Ingen trykte eller håndskrevne hjelpemidler tillatt.
Language / **Språkform**:	English / Norsk (Bokmål) (Den engelske oppgaveteksten er den originale og gyldige teksten.)
Results / Sensurdato:	13.06.2007

English

Question 1. (10%)
A host with an IPv4 address of (TLV):
01000000 00000100 00010100 00010100 00010100 00010100
Assume the subnet of this host uses a subnet mask of 21 bits:

a) What is the subnet address?
b) What is the maximum number of hosts in this subnet?

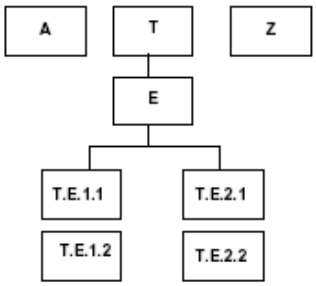
Question 2. (10%)
Assume an snmptable command generates the following result:

snmptable -v 2c -c public snmp-server.org 1.3.6.1.2.1.65.3.8

rsIndex	*rsAddress*	*rsType*	*rsAccess*
1	*129.241.20.1*	*Types.1*	*readWrite*
2	*129.241.20.2*	*Types.2*	*readOnly*
3	*129.241.20.3*	*Types.3*	*readWrite*
4	*129.241.20.4*	*Types.4*	*readOnly*
5	*129.241.20.5*	*Types.5*	*readWrite*

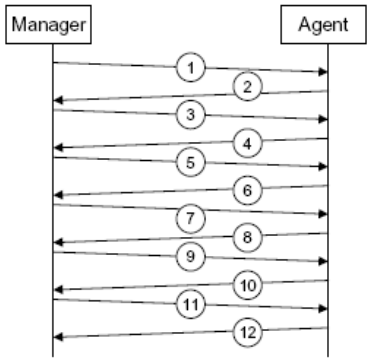
a) What is the OID of the third column?
b) What is the OID of the entry in the 2nd row and 3rd column? Explain why?

Question 3. (15%)
Assume the following MIB tree:

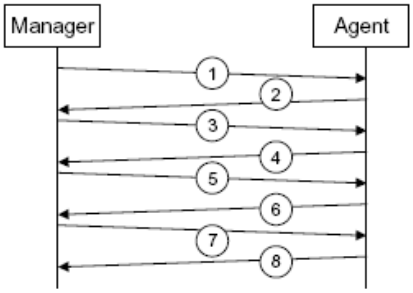


In the following 3 cases the manager will retrieve all the entries of this tree by polling the agent using different SNMP requests and possibly different parameters.

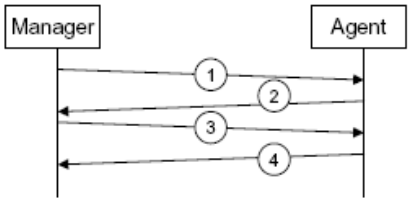
a) Assume you only know that the MIB tree starts at node ‘A’, what are the SNMP requests 1-12 and their parameters in the following diagram?



b) Assume you know the MIB tree starts at node ‘A’ and you know the table structure, what are the SNMP requests 1-8 and their parameters in the following diagram?



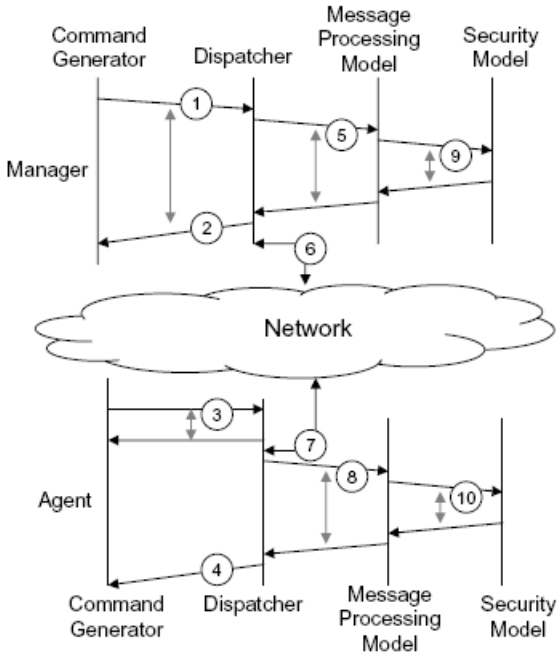
c) Assume you know the MIB tree starts at node ‘A’ and you know the table structure, what are the SNMP requests 1-4 and their parameters in the following diagram?



Question 4. (20%)

The following figure shows a generalized time-sequenced operation for get request message going from manager to an agent. Identify where the get request is sent and received as well as the primitives exchanged between the different modules (marked 1-10).

(In this question choose among the following primitives: encryptData, decryptData, generateResponseMsg, generateRequestMsg, processIncomingMsg, prepareDataElements, returnResponsePdu, sendPdu, processPdu, prepareOutgoingMsg, authenticateOutgoingMsg, authenticateIncomingMsg, registerContextID, sendPduHandle, processIncomingMsg, isAccessAllowed)



Question 5. (20%)

a) Explain two ways to describe XML tags, elements and their relations?
b) List three ontology languages and explain the differences between them?
c) What are the parts of a UDDI entry and what are they used for?

Question 6. (25%)

Answer the following statements by indicating TRUE or FALSE (no explanation is required):

1) In ASN.1, an object name is a unique name for the leaf node of an OBJECT IDENTIFIER.
2) SNMPv1 protocol uses only UDP as transport protocol
3) SNMP access policy is the pairing of the SNMP MIB view with the SNMP access mode
4) SMIv2 introduced MODULE-IDENTITY, OBJECT-TYPE, and NOTIFICATION-TYPE
5) RowStatus is an enumerated Integer used by the manager when creating and deleting rows
6) Trap and get-request messages have the same message format in SNMPv1
7) In SNMPv3 notification originator sends notifications to the manager
8) Abstract service interface is used to provide access control
9) The OSF function block of the TMN executes in the same telecommunication network that it manages
10) SOA is a management module used to create web services

(Don't answer randomly as there will be discount points for wrong answers. The following algorithm will be applied in correcting this question:

- every good answer is given 1 point,
- unanswered statements are not counted,
- single wrong answer is given 0 point,
- any further wrong answer is given -1 point,
- and the overall point count will provide the weight for this question)

NORSK

Oppgave 1. (10%)
En host som har følgende IPv4 adress (TLV):
01000000 00000100 00010100 00010100 00010100 00010100
Anta at subnettet hvor denne hosten befinner seg bruker 21 bits subnetmaske:

a) Hva er adressen til dette subnettet?
b) Hva er maksimalt antall noder i dette subnettet?

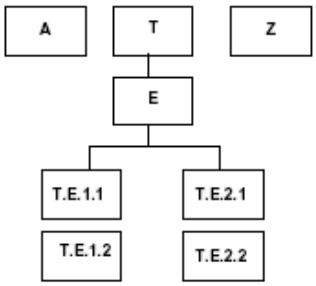
Oppgave 2. (10%)
Anta en snmptable kommando som generer følgende resultat:

snmptable -v 2c -c public snmp-server.org 1.3.6.1.2.1.65.3.8

rsIndex	*rsAddress*	*rsType*	*rsAccess*
1	*129.241.20.1*	*Types.1*	*readWrite*
2	*129.241.20.2*	*Types.2*	*readOnly*
3	*129.241.20.3*	*Types.3*	*readWrite*
4	*129.241.20.4*	*Types.4*	*readOnly*
5	*129.241.20.5*	*Types.5*	*readWrite*

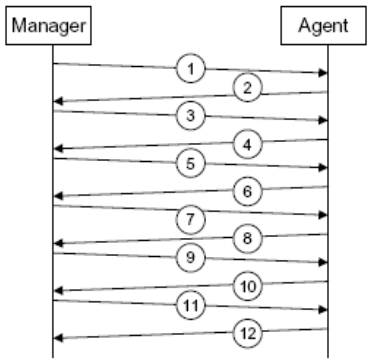
a) Hva er OID av tredje kolonnen?
b) Hva er OID av objektet i andre rad og tredje kolonne? Forklar hvorfor?

Oppgave 3. (15%)
Anta følgende "MIB tree":

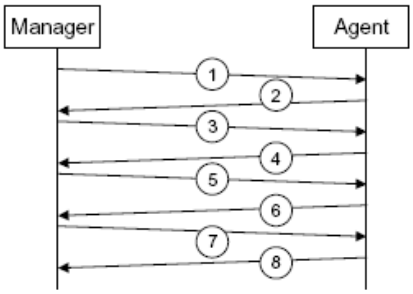


I de følgende 3 tilfellene vil manageren få verdiene til nodene av dette "MIB tree" ved å bruke forskjellige SNMP meldinger og muligens forskjellige parametere.

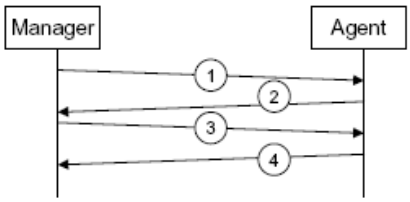
a) Anta du vet at "MIB tree" starter ved node 'A', tegn SNMP meldingene 1-12 og deres parametere i figuren under?



b) Anta du vet at "MIB tree" starter ved node 'A' og du kjenner strukturen til tabellen, tegn SNMP meldingene 1-8 og deres parametere i figuren under?



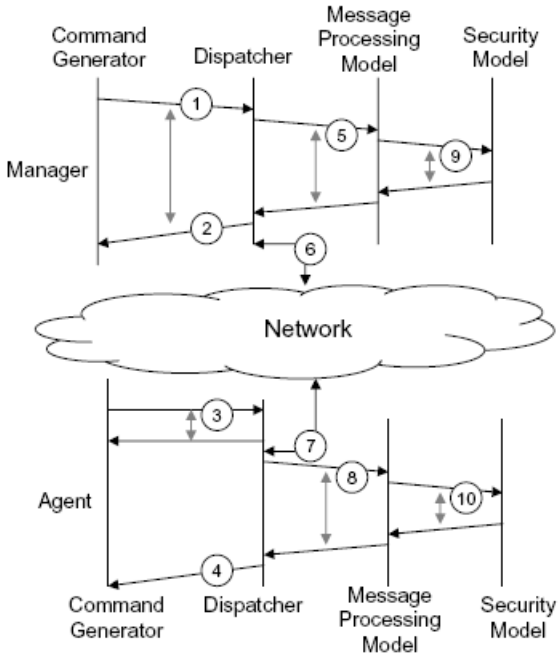
c) Anta du vet at "MIB tree" starter ved node 'A' og du kjenner strukturen til tabellen, tegn SNMP meldingene 1-4 og deres parametere i figuren under?



Oppgave 4. (20%)

Følgende figuren viser en generell "time-sequenced" operasjon for "get request" melding som går fra en manager til en agent. Identifiser hvor "get request" bli sent og mottat, og samtidig de primitivene som utvekles mellom de forskjellige modulene (tegnet 1-10).

(I dette spørsmålet velg blant følgende primitiver: encryptData, decryptData, generateResponseMsg, generateRequestMsg, processIncomingMsg, prepareDataElements, returnResponsePdu, sendPdu, processPdu, prepareOutgoingMsg, authenticateOutgoingMsg, authenticateIncomingMsg, registerContextID, sendPduHandle, processIncomingMsg, isAccessAllowed)



Oppgave 5. (20%)

a) Forklar to måter for å beskrive XML tags, elementer og sammenhengen mellom dem?
b) List tre ontologi språk og forklar forskjellen mellom dem?
c) Hva er innholdet i en ”UDDI entry” og hva blir de brukt til?

Oppgave 6. (25%)

Svar følgende ved å skrive TRUE eller FALSE (ingen forklaring er kreves):

1) I ASN.1, et “object name” er et unikt navn for den ”leaf node” av en OBJECT IDENTIFIER.
2) SNMPv1 protokollen bruker kun UDP som transport protokoll
3) ”SNMP access policy” er kombinasjon av “SNMP MIB view” med “SNMP access mode”
4) SMIv2 introduserer MODULE-IDENTITY, OBJECT-TYPE, and NOTIFICATION-TYPE
5) RowStatus er en “enumerated Integer” som brukes av manageren ved oppretting og fjerning av rader
6) Trap og get-request meldinger har same melding format i SNMPv1
7) I SNMPv3 “notification originator” sender notifikasjoner til manageren
8) “Abstract service interface” er brukt for å oppnå access control
9) Den “OSF function block” av TMN eksekverer i det samme telekommunikasjon nettverk som den styrer
10) SOA er en “management module” som brukes for å lage “web services”

(følgende algoritm ville bli brukt I dene oppgaven:

- hver riktig svar gir 1 poeng,
- ubesvarte spørsmål teller ikke,
- et feil svar gir 0 poeng,
- ethvert feil svar I tilleg gir -1 poeng,
- og total poengsumm vil være basis for vekting av oppgaven)