EVALUATIONS W1_EV (20 points possibles)

Remarque : les réponses à certaines questions se trouvent dans des RFCs, dont l'URL est fourni aux débuts des questions. La valeur NA indiquée à la fin de chaque question correspond au nombre de réponses attendues.

Question W1.EV.1: What is the best definition of Network Management? (NA=1)

- (●) Standards and automated techniques to ensure the good network operation through monitoring and control ✔
- ( ) Rules to design and build an efficient network architecture
- ( ) Rules to evaluate the operational cost of a network

EXPLANATION

Network management is about defining means to ensure the proper operation of networks.

Question W1.EV.2: What does SNMP mean? (NA=1)

- ( ) Standard Network Management Protocol
- ( ) Standard Naming Management Protocol
- (●) Simple Network Management Protocol ✔
- ( ) Simple Network Monitoring Protocol

EXPLANATION

SNMP means Simple Network Management Protocol: it is a standard protocol to transmport management information.

Question W1.EV.3: What is the relationship between SNMP, SMI, ASN.1 and MIB? (NA=1)

- ( ) SNMP transports information from MIB, organized following ASN.1 and defined in SMI language.
- ( ) MIB transports information from SNMP, organized following ASN.1 and defined in SMI language.
- (●) SNMP transports information from MIB, organized following SMI and defined in ASN.1 language. ✔

EXPLANATION

Simple Network Management Protocol transports the management information contained in Management Information Bases, which are organized following the Structure of Management Information and written in Abstract Syntax Notation 1 language.

Question W1.EV.4: Which standardization institute, well known in the field of computer networks, defined SNMP? (NA=1)

- [x] IETF ✔
- [ ] TDF
- [ ] INRIA
- [ ] W3C

EXPLANATION

SNMP was designed, and is still being improved, by the Internet Engineering Task Force (IETF).

Question W1.EV.5: Which monitoring strategies may reduce the resource consumption? (NA=2)

- [ ] Polling
- [x] Event reporting ✔
- [x] Sampling ✔
- [ ] Exhaustive measurements

EXPLANATION

Event reporting generates less trafic than polling, and so does sampling compared to exhaustive meausurements, at the cost of a reduced accuracy.

Question W1.EV.6: How can we define SMI? (NA=1)

- ( ) Rules to define how to properly monitor a given device.
- ( ) Rules to define how to structure a monitoring architecture.
- (●) Rules to define how to write management information in ASN.1 and to organize it. ✔

EXPLANATION

Structure of Management Information defines a subset of ASN.1 used to write mangement information as MIB, and how each MIB is identified in the naming tree.

Question W1.EV.7: Which SNMP primitives are push-based (i.e. are sent by the agent when possible)? (NA=2)

- [x] TRAP ✔
- [x] INFORM ✔
- [ ] GET
- [ ] GETNEXT

EXPLANATION

TRAP, and INFORM in SNMPv2, messages ask the agent to report an event to the manager.

Question W1.EV.8: let consider the following definition.

```
uptime OBJECT-TYPE
SYNTAX ...
MAX-ACCESS read-write
STATUS current
DESCRIPTION "Time elapsed since startup"
::={1.2.2}
```

What is the most appropriate type for this management object? (NA=1)

- ( ) Counter32
- ( ) Gauge32
- ( ) Integer32
- (●) TimeTicks ✔

EXPLANATION

Uptime, and other time-related values, are better expressed based on the TimeTick type.

Question W1.EV.9: let consider the following definition.

```
tcpConnTable OBJECT-TYPE
SYNTAX ... TcpConnEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION "A table containing TCP connection-specific information"
::={tcp 13}
```

What is the missing keyword to define a table of TCPConnEntry? (NA=1)

- ( ) OBJECT
- ( ) ROW
- (●) SEQUENCE OF ✔
- ( ) TYPE

EXPLANATION

To define a list of 1..N values of a same type, ASN.1 keyword is SEQUENCE OF.

Question W1.EV.10: If we suppose that an SNMP agent has the following table called "net-to-media" defined in the RFC 1213 (p39):

```
Interface-Number  Network-Address  Physical-Address  Type
       1             10.0.0.51     00:00:10:01:23:45  static
       1              9.2.3.4      00:00:10:54:32:10  dynamic
       2             10.0.0.15     00:00:10:98:76:54  dynamic
```

What is the result of the following request: GetNextRequest(ipNetToMediaPhysAddress, ipNetToMediaType)? (NA=1)

- ( ) ipNetToMediaPhysAddress = "000010012345", ipNetToMediaType = "static"
- ( ) ipNetToMediaPhysAddress = "000010543210", ipNetToMediaType = "dynamic"
- (●) ipNetToMediaPhysAddress.1.9.2.3.4 = "000010543210", ipNetToMediaType.1.9.2.3.4 = "dynamic" ✔

EXPLANATION

The GetNextRequest being used, we have to consider the second line of the table. Moreover, the real name of the variable includes index elements (INDEX { ipNetToMediaIfIndex, ipNetToMediaNetAddress}).

- 1-A^2
- A^2
- (selected) 1-(1-A)^2 ✔

EXPLANATION

The two components work in parallel so that both have to be broken to affect the system. The probability of a component being down is 1-A, of the two components at the same time is (1-A)^2, so that the overall availability is 1-(1-A)^2.

Question W1.EV.12: What component in a network management architecture does provide users with a graphical interface? (NA=1)

- Management Information Base
- (selected) Network Management Application ✔
- Network Management Entity

EXPLANATION

The MIB is a simple database. A Network Management Entity (or agent) is a daemon processing management information on a device. The Network Management Application is used by the system administrator to efficiently monitor and configure the network through a GUI.

For the next three questions, please take a look at the RFC that defines SNMPv2: https://tools.ietf.org/html/rfc3416.

Question W1.EV.13: What are the goals of the "request-id" field in a Response-PDU? (NA=2)

- ☐ Sort messages
- ☑ (selected) Correlate a SNMP response with its request ✔
- ☐ Prioritize messages
- ☑ (selected) Identify retransmissions ✔

EXPLANATION

In section 4.1 of the RFC is written: "By use of the request-id value, an application can distinguish the potentially multiple) outstanding requests, and thereby correlate incoming responses with outstanding requests. In cases where an unreliable datagram service is used, the request-id also provides a simple means of identifying messages duplicated by the network."

Question W1.EV.14: What is the "non-repeaters" value of a BulkPDU used for? (NA=1)

- (selected) Group in a single response the first N requested variables ✔
- Request N responses to get N variables
- Repeat N times the same request
- Repeat N times the same response

EXPLANATION

"The values of the non-repeaters and max-repetitions fields in the request specify the processing requested. One variable binding in the Response-PDU is requested for the first N variable bindings in the request..."

Question W1.EV.15: What are the differences between the "error-status" and the "error-index" fields? (NA=2)

- ☑ (selected) error-status is the error code and error-index points to the faulty variable ✔
- ☐ error-status points to the faulty variable and error-index is the error code
- ☑ (selected) error-index brings additionnal information to error-status ✔
- ☐ error-status brings additionnal information to error-index

EXPLANATION

"A non-zero value of the error-status field in a Response-PDU is used to indicate that an error occurred to prevent the processing of the request. In these cases, a non-zero value of the Response-PDU's error-index field provides additional information by identifying which variable binding in the list caused the error."

For the next two questions, please take a look at the RFC that defines the MIB for TCP/IP devices: https://www.ietf.org/rfc/rfc1213.txt.

Question W1.EV.16: In MIB-2: In what unit is expressed the speed of an interface? (NA=1)

- (selected) In bits per second, up to a limit ✔
- In bits per second, with no limit
- In bytes per second, up to a limit
- In bytes per second, with no limit

EXPLANATION

ifSpeed is of type Gauge: it has a limit value that cannot be passed. Also, the description of the variable says: "An estimate of the interface's current bandwidth in bits per second. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth."

Question W1.EV.17: We consider the MIB-2 with OID 1.3.6.1.2.1.: what is the complete OID of the variable ipDefaultTTL? (NA=1)

- 1.3.6.1.2.1.4.1
- 1.3.6.1.2.1.1.2
- 1.3.6.1.2.1.2.1
- (selected) 1.3.6.1.2.1.4.2 ✔

EXPLANATION

The parent node is: 1.3.6.1.2.1.4 (ip) then, it is the second variable from the ip object.

Question W1.EV.18: If a manager requests an unknown variable, what is the error code value? (NA=1)

- noError, just an empty response
- badValue
- (selected) noSuchName ✔
- noAccess

EXPLANATION

The noSuchName error code is sent when the name of a requested object was not found by the agent. badValue is sent if the request didn't match the structure of the object (incorrect length or type). noAccess is raised for security reasons.

Question W1.EV.19: How are authenticated SNMP requests in SNMPv1 or v2? (NA=1)

- SNMP requests cannot be authenticated in SNMPv1 or v2
- thanks to an encrypted token
- (selected) thanks to a clear-text community string ✔

EXPLANATION

As seen in the practical lab, the authentication in SNMP version prior to v3 is done in an unsecure way thanks to a clear-text community string. SNMPv3 brings security with the native support of encryption.

Question W1.EV.20: Which command of NetSNMP does translate an OID into the human-readable MIB name? (NA=1)

- (selected) snmptranslate ✔
- snmpprint
- snmp2string
- snmpshow

EXPLANATION

From net-snmp documentation: "The SNMP protocol tends to work with numeric OIDs and raw values. One of the main roles of the MIB files is to convert these into more meaningful textual names and sensibly formatted values. While most of the Net-SNMP command-line applications can control how the results of an SNMP query are displayed, there is one tool (snmptranslate) which can be used standalone, simply displays information drawn from the MIB files themselves. "

Vous avez utilisé 0 essais sur 3