Shells Exam

Goal

You are required to implement a client server architecture. The client has several requests that can be sent to the server. The server needs to process the requests and return appropriate data.

Note – the exam can be written in any programming language.

Systems description

1. Client - sends and receives an XML formatted messages - see the attached file "commands.xml" for examples

2. Server - receives the requests from the Client, and generate a response based on a set of rules.

Requests

The following are the type of possible requests, each needs to be handled separately

LOGIN
LOGOUT
DISCOVRY
BIDIR
UNIDIR
SET_ATTRIBUTE
GET_ATTRIBUTE

Rules for responses and behavior, per possible request

- Every command other the LOGIN/LOGOUT will immediately return 0 if the Server is not logged in.
- The Server is considered logged in, if the last login command was within less than 10 minutes ago
- A global list, called "discovery List" is required for multiple commands, by default it is empty.

LOGIN

If the Server is already logged in, return 1.
If the Server is not logged in:
1. Perform a ping to the <Address> (i.e. 192.168.42.240)
2. If the ping was successful return 1 else wait 1 minute and attempt again, if it still fails, return 0

LOGOUT

If the Server is already logged in, return 1, else return 0
Also change the Server state from "logged in" to "logged out"

BIDIR

As can be seen in 1.1 BIDIR XML format consist of two fields: Port_A and Port_B
If a previous BIDIR command already included the two ports (regardless of the order in which they appear) return "CONNECTION EXISTS"
If at least one port appeared before but not in the same command with the other port (regardless in which field it appeared in before) return "CONNECTION USED"
If none of the ports appeared before, return "CONNECTION CREATED"

"Discovery List" – each level from the port address is added into the "discovery list"
I.e. if Port_A was <IP>/<BladeID>/<PortID> the following should be added to the "discovery list"
<IP>
<IP>/<BladeID>
<IP>/<BladeID>/<PortID>

UNIDIR
As can be seen in the examples this command format consist of two fields: SrcPort and DstPort
If a previous UNIDIR command already included the two ports (in the same order) return "CONNECTION EXISTS"
If a previous UNIDIR command already included the two ports (in the opposite order) return "CONNECTION CREATED"
If the SrcPort appeared in a previous UNIDIR command with a different DstPort then the current one, return "SrcPORT is USED - Creating additional connection"
If the DstPort appeared in a previous UNIDIR command with a different SrcPort then the current one, return "DstPORT is USED - Not creating an additional connection"
"Discovery List" - same as mentioned above under BIDIR

DISCOVRY
Note: The discovery procedure is affected by other commands: BIDIR and UNIDIR
This command returns the "discovery List" for each resource (and including) that spawn from the given address

SET_ATTRIBUTE
Return 1 (unless the Server is not logged in).

GET_ATTRIBUTE
Return the previously value that was set by SET_ATTRIBUTE for the given port.