SDP Implementation

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Using Mininet, two virtual hosts are started with a switch connecting them. One host acts as a server and the other acts as a client. After the server is started, the client can be started. The client will connect to the server using TCP. Once a TCP connection is setup between the server and client, the client will show the operation list. In the operation list, there are three operations to select from – PULL, PUSH, and EXIT – and a brief description of each. More on each operation later.

# Device List

The device list displays pertinent information about the devices on the server and allows the user to select any number of them. The device list will be populated after the connection is set up but before the operation list is shown. After the TCP connection is set up, the client asks the server for the device information by sending a special PULL message. When the server receives the special PULL message, it sends information about all the devices it currently has. The client then creates a device list that lists the devices’ names, descriptions, and type. In the device list, a user can select any number of available devices by inputting each name with a space between them. If the user provides a name that matches no device’s name, it will be noted that the name was not found and continue execution. If the user provides no names or no names where found, then the client goes back to the operation list.

# PULL Operation

The PULL operation acts similarly to HTPP’s GET operation. When the user selects the PULL operation, the device list will appear (see more in [Device List](#_Device_List)). The client will send a PULL message to the server with the selected devices. The server will send a REPLY message containing the device status message for each device selected. In the client, each device will have its own line that displays the device’s name, type, description, and status.

# PUSH Operation

The PUSH operation acts similarly to HTTP’s PUT operation. When the user selects the PUSH operation, the device list will appear (see more in [Device List](#_Device_List)). The PUSH operation then prompts the user for the value he/she wishes to set each selected device to. Then, the client will send a PUSH message to the server where each device selected will have its status updated to the value input. After successfully setting the status of a device, the server sends a REPLY message to the client that contains the device status message. If the server fails in setting the status of a device, then an ERROR message will be sent to the client. The ERROR message will contain the device’s name, type, description and the value that it could not be set to. When the client receives a REPLY or an ERROR message, the value of the message will be displayed in blue or red, respectively.

# EXIT Operation

The EXIT operation will stop the program. When the user selects the EXIT operation, the client will send an EXIT message to the server. Then, the client will close its socket and terminate. When the server receives an EXIT message, it will close the client connection and its socket then terminate.