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1 # Server Application (server.py)
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3 # 01/08/2020
4
5 from request import *
6 from response import *
7 from socket import *
8 import sys, select
9
10 class DTServer():
11     def __init__(self, hostname):
12         self.sockets = [["English", "Maori", "German"], [None, None, None]]
13         self.requests = [] # (byte_array, output_lang, sender_ip)
14         self.hostName = hostname
15         print("Server started with host name '{}'.format(hostname))
16
17     def createSocket(self, ports):
18         try:
19             for i in range(3):
20                 sock = socket(AF_INET, SOCK_DGRAM)
21                 sock.bind((self.hostName, ports[i]))
22                 self.sockets[1][i] = sock
23                 print("Port {} is ready to receive {} requests".format(ports[i],
self.sockets[0][i]))
24             return True
25         except Exception as e:
26             raise e
27
28     def shutdown(self):
29         for socket in self.sockets[1]:
30             socket.close()
31
32     def getRequest(self):
33         # get socket has buffer increase (new request)
34         readable, _, _ = select.select(self.sockets[1], [], [])
35         for sock in readable:
36             option = -1
37             if sock is self.sockets[1][0]:
38                 option = 0 # 0x0001 for English
39             elif sock is self.sockets[1][1]:
40                 option = 1 # 0x0002 for Maori
41             elif sock is self.sockets[1][2]:
42                 option = 2 # 0x0003 for German
43             data, ip_sender = sock.recvfrom(1024) # in byte
44             self.requests.append( (data, option+1, ip_sender) )
45
46     def sendResponse(self, response, target, s_ID):
47         packet = response.encodePacket()
48         if isinstance(packet, bytearray):
49             socket = self.sockets[1][s_ID]
50             socket.sendto(packet, target)
51             print("Responded to sender at: {}".format(target))
52         else:
53             print("Respond failed with code {}! Try again ... ".format(packet))
54
55 ##### Main Program #####
56 def mainloop(server):
57     while True:
58         print("\nWaiting DT_request")
59         server.getRequest()
60         while len(server.requests) > 0:

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61     # Receive request
62     packet = server.requests.pop(0)
63     request = DT_Request.decodePacket(packet[0])
64     if isinstance(request, int):
65         err = "A request discarded with error Code {}: \n{}".format(request, request)
66         err_mess = DT_Request.ErrorMessage[request-1]
67         print(err.format(int(request), err_mess))
68         continue
69     print(request)
70
71     # Reply
72     print("Preparing response in {}".format(server.sockets[0][packet[1]-1]))
73     response = DT_Response(packet[1], request.requestType)
74     server.sendResponse(response, packet[2], packet[1]-1)
75
76 def checkInputArgv():
77     if len(sys.argv) != 4:
78         return 1
79
80     ports = []
81     try:
82         ports = [int(sys.argv[1]), int(sys.argv[2]), int(sys.argv[3])]
83     except BaseException:
84         return 2
85
86     for port in ports:
87         if port < 1024 or port > 64000:
88             return 3
89     return 0
90
91 def startServer():
92     print("\nWelcome to DT Finder (Server)")
93     # Error Checking
94     errMess = [
95         "Argument input error.\n    python server.py {host} {port_eng} {port_maori} {port_ger}",
96         "Ports input must be integer (whole number).",
97         "Port must be between 1024 and 64000 inclusively!"
98     ]
99     errCode = checkInputArgv()
100     if errCode != 0:
101         print(errMess[errCode-1])
102         sys.exit()
103
104     # Create Server instance
105     host = getfqdn()
106     ports = [int(sys.argv[1]), int(sys.argv[2]), int(sys.argv[3])]
107     server = DTServer(host)
108     server.createSocket(ports)
109     return server
110
111 if __name__ == "__main__":
112     try:
113         DT_server = startServer()
114         mainloop(DT_server)
115     except KeyboardInterrupt:
116         DT_server.shutdown()
117         print("Program exited!")
118     except Exception as e:
119         print(e)
120         print()

```