Demystifying networking
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Lecture - 96
Trouble Shooting Challenge 3

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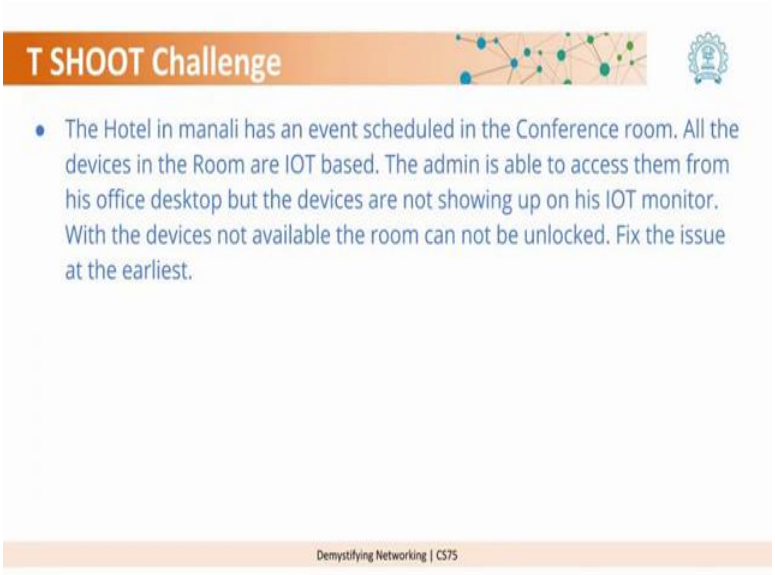

So, the third challenge is the hotel in Manali has an event scheduled in the conference room. All the devices in the room are IOT based, the admin has access of his office desktop, but the devices are not showing up on his IOT monitor. With the devices not available, the room cannot be unlocked. Fix the issue at the earliest. So, this is our last and final challenge. So, if you remember that on our topology, we have one network of a smart hotel as we call it and it has some IOT based devices. So, let us go back and look at that.

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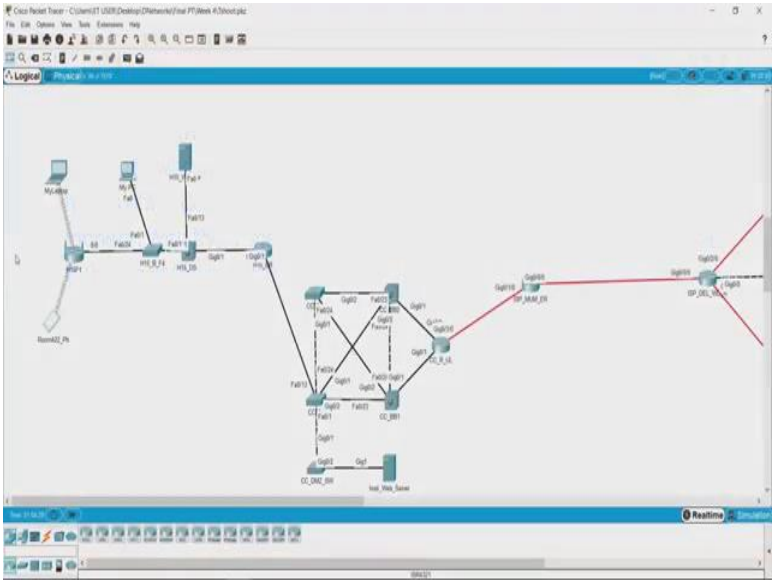

So, this is the central hub of our network and this is where the hotel is. If you want to check it on the physical topology, you can come out from here, go up to Manali and this is the network.

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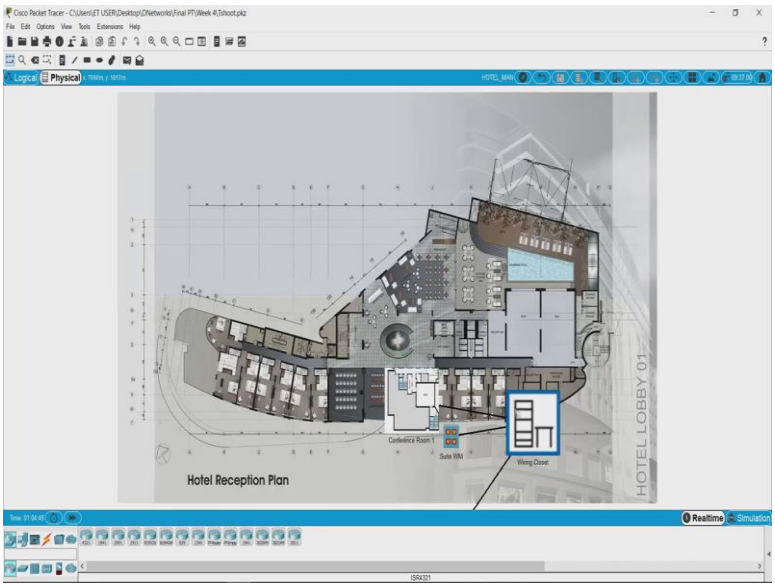

So, here is the primary wiring closet and I guess this is the….

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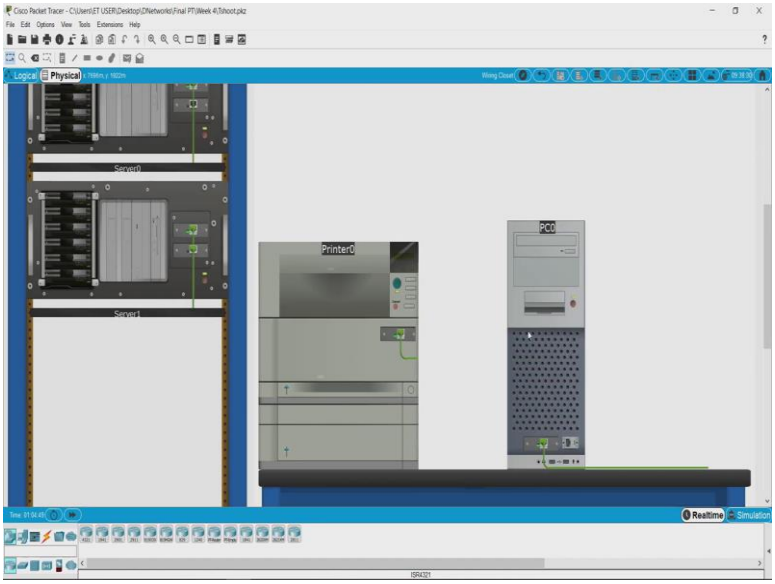

So, this is the system that is there and what else do we have? We have a conference room here which has some smart devices.

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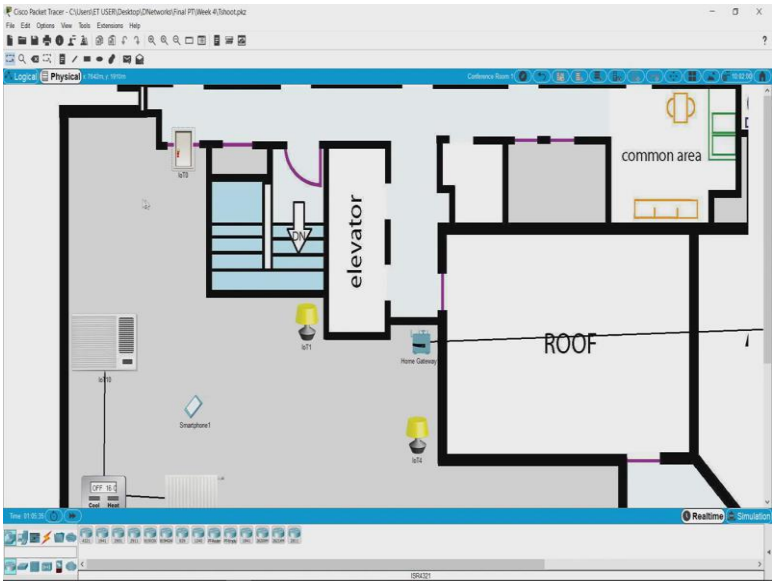

What you can see is there is a door here which is locked, this red light shows locked. So, we can physically unlock this door and open it. So, it is the way you do it in packet tracer is you press alt and click on the red link, see it turned green and you can unlock it, but this is not the way you want to solve the problem. So, what we want to do is, we want to see why is the communication not happening.

So, what we say here is there is a home gateway, there is thermostat here which controls the heater and the air conditioning, there are some lights which work on the Wi-Fi. So, now let us go back to the topology and see what is there on the network.

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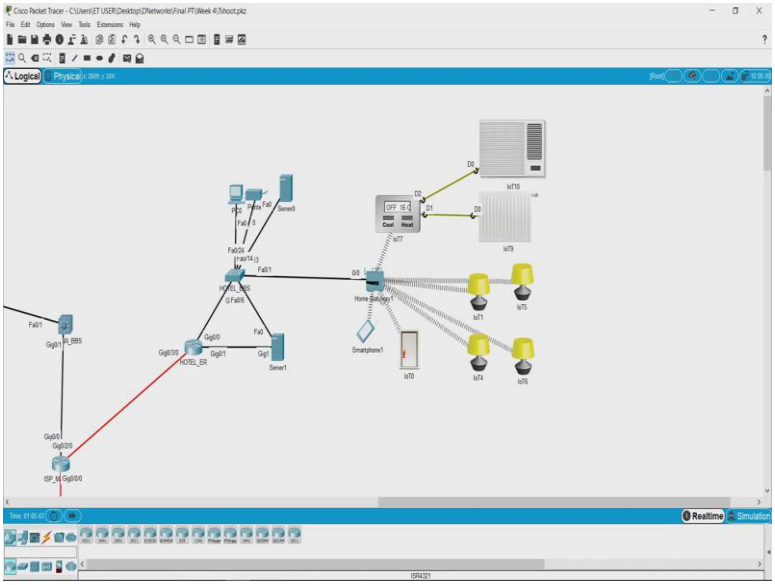

So, now what we see is every, So, in this you can see that every device is connected to the home gateway and this home gateway is actually responsible for controlling or actually lending the control of all these IoT devices. So, what is happening here is, there is one server this is an end looks like an internal server and this looks like an external server because this is directly connected to the edge router and this is an internal server.

So, all your smart devices will be registered to this server. So, this is the desktop that they were talking about which the manager has. So, how the manager can control all these is, if you go to the desktop and go to IoT monitor. So, now, you cannot see any devices here. So, the idea is you have to login to your server that has registered all the IoT devices and then control them. So, let us first go and check what is the IP address of that server.

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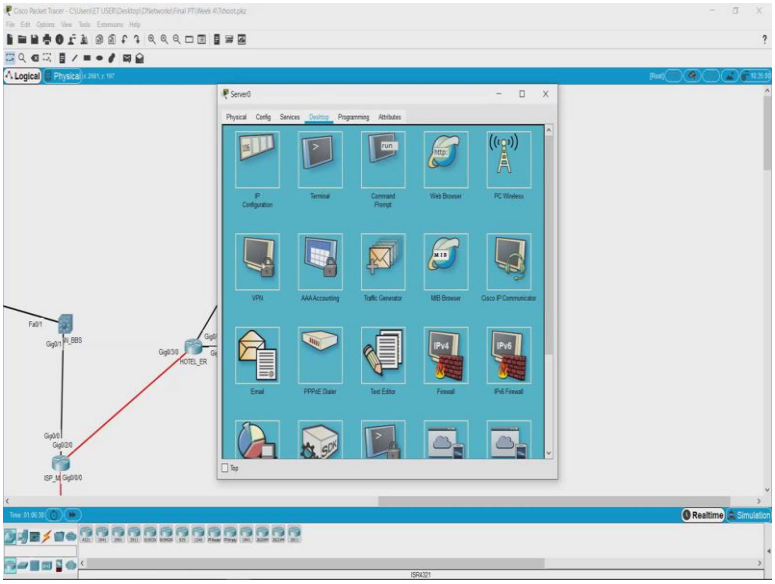

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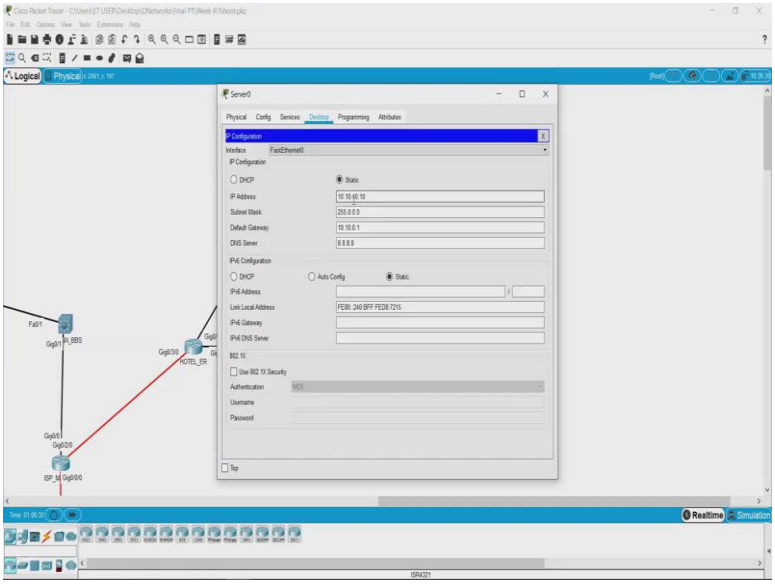

So, this is our server and the IP address of this service 10.10.10.10. Now do not get confused about this IP address and the IP address we saw in the college network these both are what? These are yes these are private IP addresses and two different networks can actually use the same series of IP addresses if they are not connected on the same router because one router cannot have the same series of network running on two of its interfaces.

So, this is a completely separate network from it. So, they can definitely run this IP address, though this IP address will not be routable on the internet. So, internet is only after when you leave the edge router of the hotel. So, this is the edge router anything that goes out is the internet. So, locally the IP address is 10.10.10.10 as we see.

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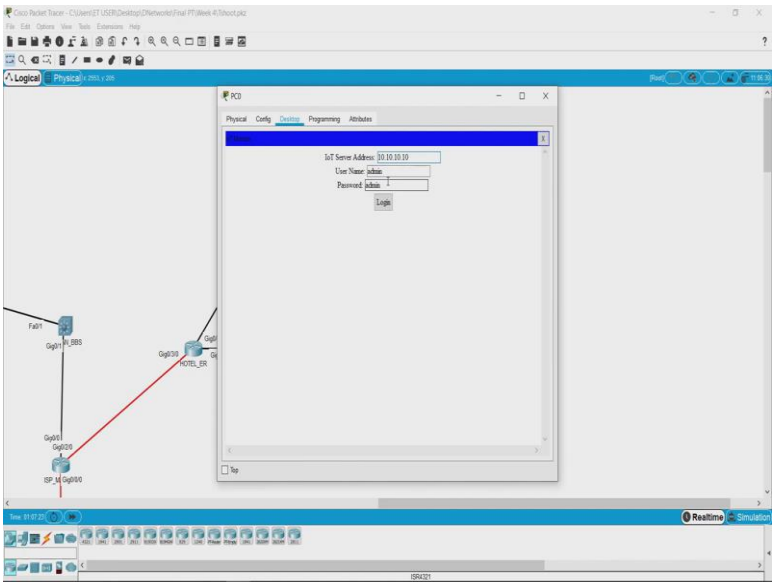

So, let us go to the PC and what we will try to do is, go to the IoT monitor and type the IP address 10.10.10.10. So, admin is default login that you have and login, but still you cannot see any IoT devices over here ok.

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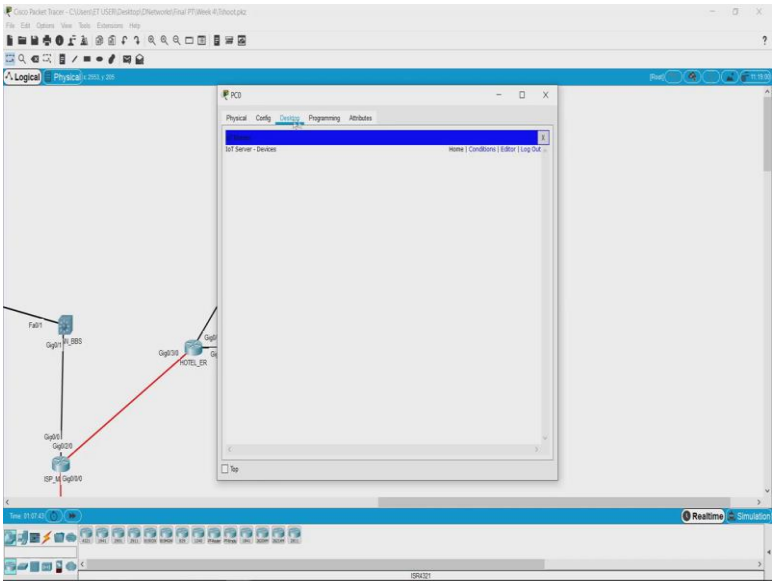

So, now let us try to see what is happening. So, the first thing that we can do is try to see if we are able to reach the IoT server.

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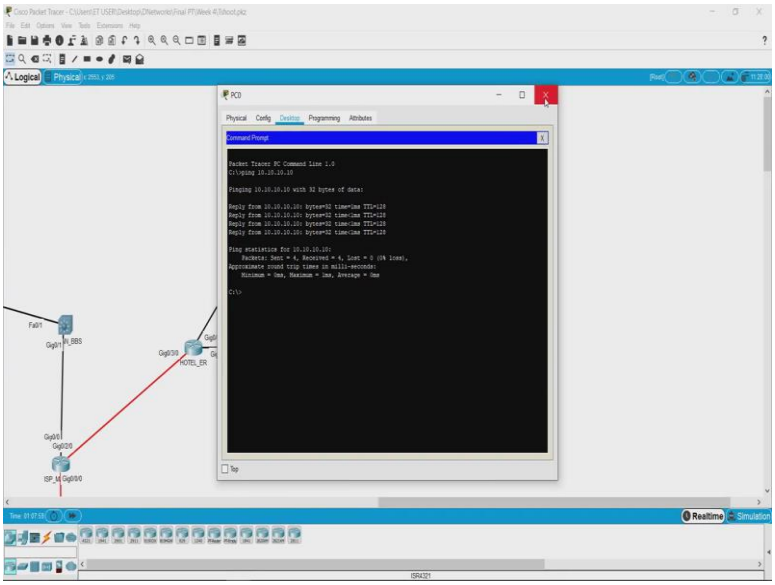

So, how we can do that? Go to the desktop and go here and again type ping 10.10.10.10 yes. So, we are successfully connected to the IoT server ok. So, now, that is not the issue then. So, let us go on to the server and check if we are able to access the smart devices from there. Now as we saw the connectivity is fine. So, one of the issues could also be thus service level issue on the application that is the IoT service is it running on the server or not.

So, first let us try to see if we can connect to the IoT monitor. So, it is already logged in and you can see it you we are not able to look at any of the devices 10 login no devices can be seen here. So, now, let us see if the IoT service is running yeah. So, registration server is on; that means, your IoT service is running. So, it is not this is not an application level issue ok. So, now, let us try to see what other connectivities are responsible for this service to run ok. So, the other thing is that we should be connected to the home gateway.

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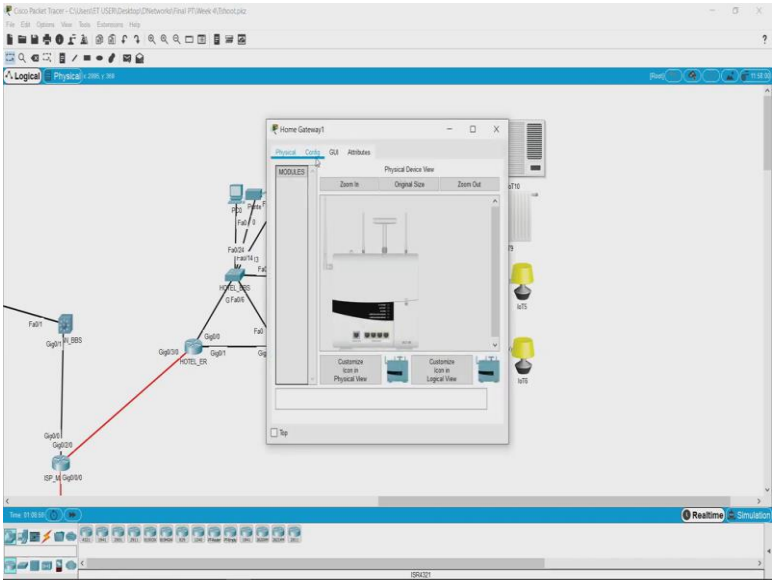

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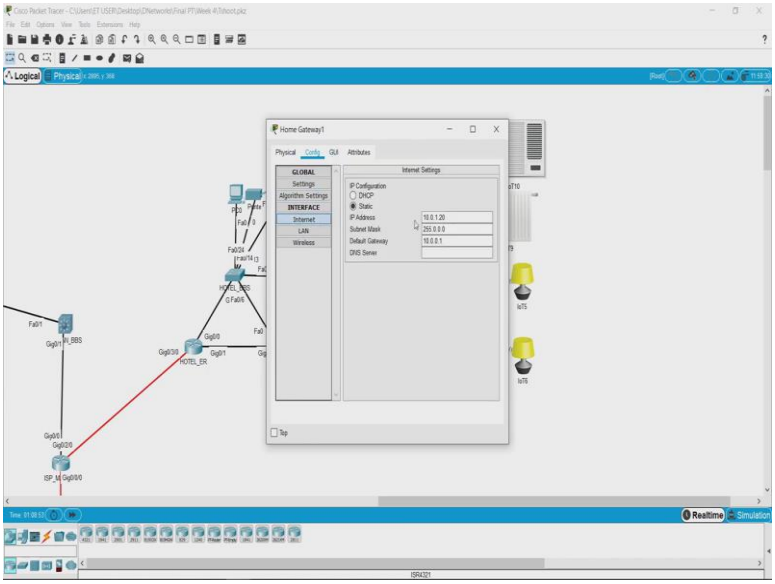

So, what is the scenario here? So, let us open the home gateway here look at the configuration tab and check the IP addresses. So, it is network IP is 10.0.1.20 and local area is 192.168.25.1. So, we have a Smartphone here. So, we can connect we can see if the connectivity of the gateway and the Smartphone is working or not.

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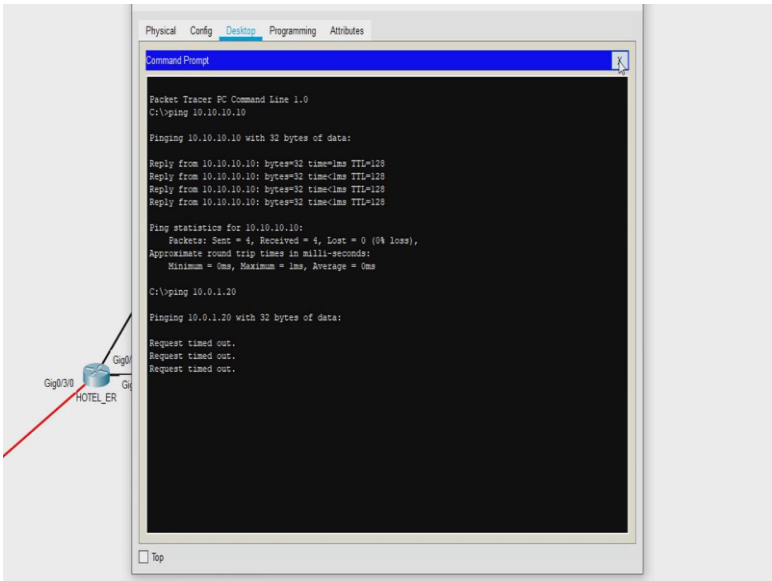

So, for that we will again go back to command prompt and type a command ping 192.168.25.1 So, we have good connectivity between the phone and the home gateway; that means, the home gateway is connectivity is fine. So, we will assume for now that it is the connectivity with all the other device is fine though we cannot ping from any of these devices and check the home gateway. So, this looks perfectly fine. So, let us check the other network that we have which is the internet or the other side of the network which is 10.0.1.20

So, what we will do is, let us go on the PC and see if we can ping that. Command prompt ping 10.0.1.20 ok. So, what we see here is we are not able to connect to the home gateway; that means, so, the fault lies below where network layer is. So, let us go and see what could be the cause. So, we will go back we will go down to the physical layer and then start troubleshooting upwards.

So, for the physical layer what we have is, we have this switch here, but we know that the PC is able to connect to the server, this means that the PC and the server are connected properly ok. And we are we know that the Smartphone and the home gateway are able to connect are able to connect to each other; that means, this is fine. So, the fault either lies on the switch, the home gateway router or this particular link. So, what we can do is let us go back and look at if the connectivity between the switch and the gateway is fine.

So, we have fast Fa 0/1 port connected to the 0 0 of the home gateway. So, now, let us go to the physical topology and we will come out and get into the wiring closet and we look at the switch ok.

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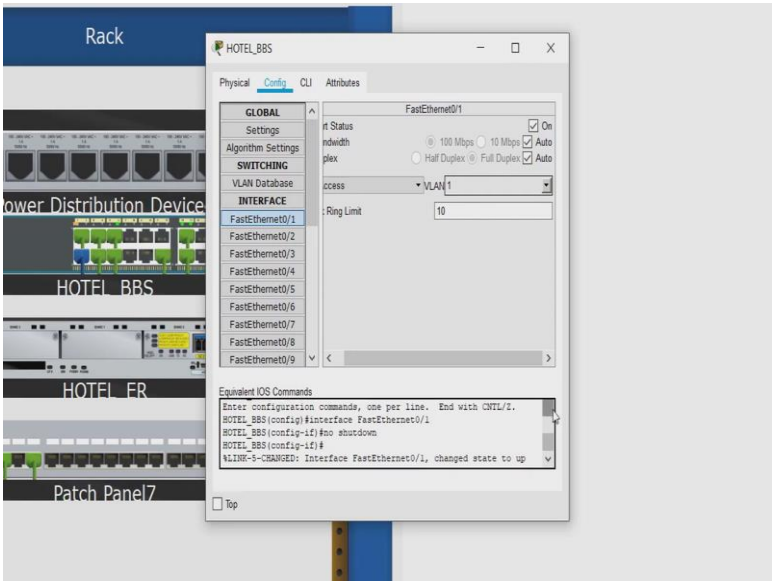

So, this is the switch now you can see the small green lights these once here I will see if I can zoom in, I can zoom in. So, you can see a small green light over here. So, now, the port that we know was Fa 0/1. So, I can definitely see this light is not glowing. So, based on my experience I can tell you. So, the port number how the port numbers are numbered.

So, this was Fa 0/1 fastEthernet 0/1. So, if you come here this is 0/2 this is 3, 4, 5, 6 and this is how they are numbered till 24. So, 24 is connected it is showing green and you have 1, 2, 3, 4, 5 which is also connected which is showing green, but 1 which was the port that the home gateway is connected to is showing no light over here. So, that would be you know a physical way of verifying if your device is working properly or not.

Now, let us see what is the issue, I mean is it the wire or what is it. So, let us open the switch first and look at this. So, yes the port status here we can see is off it is not on you can do it via command line or what I will do here is, I will just switch it on like this. So, just to look at what the command is. The command is you go into the interface, fastEthernet 0/1 and type no shut that no shutdown or no shut.

So, that will actually activate the port. Now you can see a yellow color light has come up over here. So, it takes time for a switch to actually connect to the home gateway and then stabilize this connection. As soon as this connection is stabilized in turns green now we can see the light has turned green ok. So, now, let us go back to the logical topology and see if there is a; if there is any change between the network connectivity.

So, we will go here go to command prompt and try to connect it again ok. We are still not able to ping that device. let us go back and check if we have used correct IP address 10.0.1.20. So, the IP address we used is 10.0.1.20 ok. Now the other thing that we must know is sometimes you are ping commands might not work. Now a home gateway might have a setting which does not allow responses to ping commands ok.

Now the only other way of checking it would be let us go to the server and see if we are able to login to our IoT monitor and are we able to control the devices, sorry not the app manager IoT monitor.

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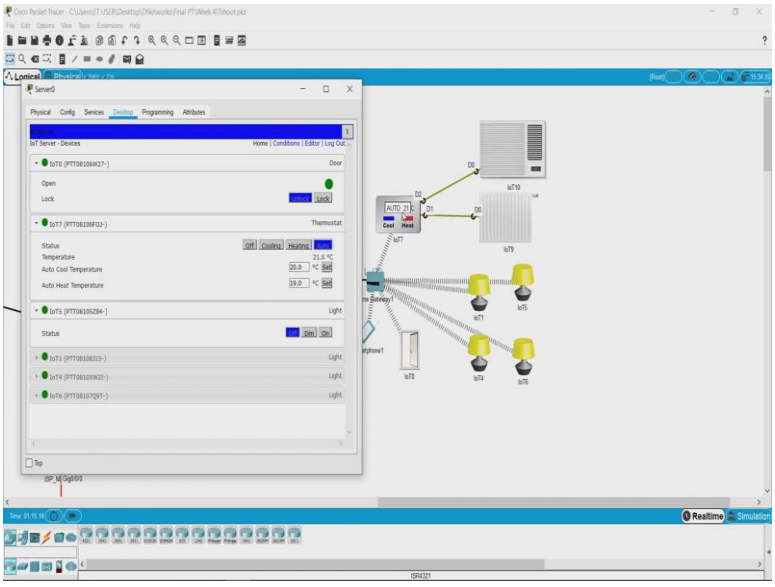

Yes, now we are able to see these devices; that means, the connectivity fine. So, yes this could be one of the scenarios where some devices what they do is, they will turn off or block ICMP packets which is ping packets why do they do so? Actually it is also a security risk; that means, that if somebody is trying to do a passive attack on your network or a recon sense to understand how your network is, using ping it can identify which devices are available and how far they are and all of those.

So, in certain cases some devices by default they do not send responses to ping packets. So, now, let us see if we are able to control or IoT devices. So, it is the door. So, what will do is we will unlock the door and let us see if we can open it.

So, I guess you cannot open the door from you have to physically go and open the door, it will just show you the state I will click on alt click the door has opened now it shows door open fine. So, now, let us see if we can control the other things let us set the thermostat to auto, your maximum temperature 20, it will keep it temperature between 20 and 19. So, yes the auto thermostat has started working we can see there and let us try to switch on some lights.

So, we will switch on yes this one has lit up, will switch this one also on this one also has lit up. So, what we can see is, we are able to control the lights over here; now let us see now this is from the server. Now let us see if we can connect it control it form the PC. So, what will do is, we will just close the door and we will go to the PC and go to IoT monitor. Yes even here we can see it now. I will just log out and login once again just to confirm 10.10.10.10 which is the IoT server that we have, we login yes we are able to see all the devices over here.

So, let us go back and lock the door. So, we have been able to successfully lock and till the conference is to start let us we can keep the AC on. So, that the temperature is fine, we will just switch off all the lights or we can have one light on dim on so, that when someone walks in there is some light ok.

So, it looks like we have solved the last challenge also. So, here what we saw is, we again took the approach of trying to narrow down the sub system where the problem is and we found that the sub system where the problem lies was the home gateway. And the connectivity between the PC and the server was perfect because we were able to ping each other, now here the ping definitely failed with the home gateway initially and with the server.

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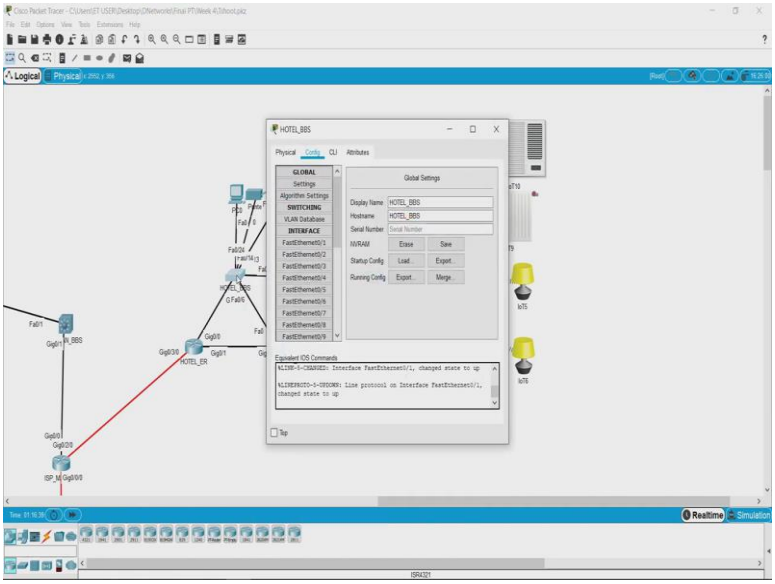

And then what we went then what we did was, we went and checked the physical connectivity of the switch and we were trying to look at if the lights are on or off. So, there what we found is, the connectivity there are there was a problem and the port was shut down. This was just one another example of what are the different challenges that you face.