

## Video – IoT Devices in Packet Tracer

Hello everyone. This is our Cisco Packet Tracer Internet of Things walkthrough video. In this video, we're going to walkthrough many IoT devices that exist within a smart home inside of Cisco Packet Tracer. Let's start off with the basics. This is just a house, and all of these devices I've put on top of it are part of the smart home network. Where do these devices even come from? Here, in the bottom corner of Cisco Packet Tracer, by default we see network devices. We see routers, and switches, and wireless devices.

But there's another section we're going into today, and that's end devices. And when you click end devices, we see some common things. We have our printers and our laptops. We even see things coming into play here such as phones and TVs. They're all here. But besides that, there's another subcategory known as home. And when you click on home, we'll find air conditioning units, we'll find a smart coffee maker, a battery system, ceiling fans, and smoke detectors, and even smart doors and garage doors. It is really easy just to click on a device and click on the screen, but we'll get to that. You have a couple other things to look at. Besides just this home, we also actually have other sections such as smart city. Inside a smart city we see some devices such as even wind detectors and streetlamps. Going further, we have industrial IoT devices, and even power grid IoT devices. Now let's take a look at what we have deployed in our house.

In our smart house right now we have a smart ceiling fan, we have a thermostat, smoke detector, smart lamp, a smart appliance, which is a coffee maker, a smart door, and even a garage door. We have a battery system and a solar panel that can collect energy for us as well. Down below we have something called an MCU, which is a microcontroller, and this microcontroller allows us to program events, and when the door or the fan should be activated. We also have something called a home gateway. And the home gateway is connected to all of our smart devices. If we click on that home gateway, we can take a look at it. There's a physical tab, config, GUI, and attributes. In the physical tab of this home gateway, we can see that this device has wireless antennas. It supports wireless connections. We also have wired network ports as well. In the config tab we have settings that we can configure here regarding those wireless and wired interfaces. We even have a GUI tab, and in this GUI tab, this home gateway is running a web server. It has an index.php file, and this actually has a webpage on it that you can connect to and control your smart devices. In the attributes tab, we're able to see items such as cost and mean time between failure.

To actually interact with these smart devices, and using this home gateway, we have some items to do. For example, we had this appliance smart home coffee maker, and if I were to left click on it while holding my alt key, we can see it turns on with a red light. If I left click on it again holding my alt key, it turns off. That allows us to physically interact with our smart devices. Same thing with the garage door, holding my alt key I can then click the mouse and open and close it, the door as well, and even the lamp. I can turn it on and change intensities of the light, and click it again to turn it off. All of this utilizing the alt key and my left click.

How do we put our own IoT devices into play in this house? What we can do is make sure we're on our end devices. I'm going to click on home, and then I can pick a new device. For example, I can take the IoT Bluetooth speaker. If I don't want the Bluetooth speaker, I can go over and find a normal home speaker. Either will do. I'll take the home speaker. I can click on it, then I'll click on my topology, which is my house, and now I have a new speaker called IoT one home speaker. I want to be able to control this from the home gateway, so let's take a look at the home gateway first. To access that web server on the home gateway, I'll open my tablet, a laptop, a smartphone, a desktop PC, anything would work as long as it's on the network. But I'll open my tablet and go to my desktop tab. In my desktop tab, I'll open my web browser, and now I'll type in the IP address of that home gateway, which is 192.168.25.1. When I click go, I'm now accessing that web server on the home gateway. The username is admin and the password is admin by default. You can change this later on. When I hit submit, I am now on that registration server, and here we see the smoke detector, we see the garage door, the smart coffee maker, and the smart lamp. All of them are connected to the home gateway at this time. What I can do is click on the coffee maker, and I can turn it on using the home gateway connection. We see it goes on. I can click it again and the coffee maker turns off.

What we want to be able to see here is that the home speaker itself can be controlled or at least viewed and managed from the actual web server on the home gateway. To do it, I'll click on the home speaker. When the home speaker opens up, we see the specifications tab. And on this tab we can see it supports a registration server, for example, our home gateway. We can also take a look and see that it supports inputs, and even a sound decibel property. It tells us how it can be used and how we can control it, even utilizing range values when we try to use some type of programming. Besides that, what we can do is go into the physical tab, take a look that it uses a power adapter, go to the config tab, and here we can see that this thing can connect to a network. To connect it to a network we see it has a fast ethernet interface, which means we need to do cabling. And for cabling, we're going to choose the autocable for this to make it quick and easy. So I'll click back on my topology, go to my cabling, which is my orange connections. I'll click on the automatically choose cable. I can click on the home speaker. I can click on the home gateway. And now it is wired to that home gateway.

As the connection comes up going to the home gateway, we can click on the home speaker again, and now that the connection's coming online, I can hit DHCP, and my home speaker should receive an address. The address comes up, and now also here in the settings tab, I can scroll down, and I can choose what type of IoT server to connect to. And here we have the home gateway, as mentioned, so I can click home gateway. Now the speaker's going to register itself with the home gateway. To view it, I'll go back to that tablet, and with the tablet, I'm back on my web server here, which is on the home gateway, and I can click go again, just to check it out, and look at that. There's an IoT one. It's marked as home speaker. When I open that up, I can take a look and actually see the signal strength that that IoT home speaker has regarding its connection. We could've used a smoke detector, we could've used another smart lamp, but either way we connected an IoT device to a web registration server running on our home gateway, and now we can remotely manage a new IoT device.

So take your time, play with Cisco Packet Tracer, and build your own smart home networks.