OSI Physical Layer 1 Overview

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**001 Instructor: All right, welcome to OSI Layer 1. Today in this block, we're going to talking about physical layer components.
**002 First we'll go into an overview. So, we'll start with Layer 1.
**OSI Layer 1 – Physical**

- Lowest OSI layer
- Defines data transmission medium
- Defines electrical specifications
- Devices – NICs, repeaters, concentrators
- Interfaces with Data Link Layer
- Transmits/receives raw data
- Performs encoding/decoding
- Responsible for physical network design

**003 We’ll talk about first the OSI model. Has everyone ever seen the OSI model before? I heard a couple people when we did introductions talk about the OSI model, their experiences with it.

But who can tell me what the OSI model is? Does anyone know what it stands for? Let’s start there. No? Okay, Open Standards Interconnection. The physical layer is the very lowest layer of the OSI model. And as you can see, there are seven layers of the OSI model. They go all the way from physical at the very lowest level. This is what we’re talking about today in this block.
That's basically the way ones and zeros get transmitted across a wire, or any physical medium for that matter, whether it's out in the air for a wireless network, whether it's over a microwave shot if you have two microwave connections connecting each other, or in the traditional sense of a fiber optic network or an Ethernet. From there on up, data link which we'll talk about later on, and the other seven layers of the OSI model.

I know everyone probably as you've gone through and learned the OSI model, if this is your first time, there's always an acronym to help remember the OSI model. One of the things that always helped me remember it the first time I was going through and learning all this stuff was around the time of the Paula Abdul Super Bowl incident. I don't know if anyone remembers that. It was back in the early 2000s. But it helped me remember the OSI model going from the bottom up. The acronym that I learned going through was starting at the bottom, people don't need to see Paula Abdul. And it always helped me. I don't know why it always stuck with me. But it's a good acronym to help me remember the layers in order.

Has anyone ever-- does anyone else have a good acronym that helped them remember? I know there's one about pizza. There's one about pancake syrup. There's a few others out there. Feel free to share. Just pipe up.
Student: Please do not throw sausage pizza away.

Instructor: Please do not through sausage pizza away, another fantastic way to remember it. I knew it was something about sausage and pizza. Yeah, go for it.

Student: Ours was from the top. It was all people seem to need data processing.

Instructor: All people seem to need data processing, another good one. David, did you have one too?

Student: That’s mine.

Instructor: Okay, great. The pizza one, there was one about pancake syrup I heard one time. But we won’t go into that today.

So, for the physical layer, obviously according the picture, it's the lowest OSI layer. And like I've kind of talked about, it defines a data transmission medium, again whether that's over wireless, whether it's over microwave, whether it's over a copper cable, whether it's over the air in a wireless access point. We're dealing with hardware mostly when we talk about the physical layer, things you can touch for the most part, things you can put your hands on, for the most part. There's a few exceptions to that.

So, devices, network interface cards, repeaters, hubs, things like this, concentrators, all things like this
operate while they're physical devices. They operate at the physical layer in some form.

They're responsible for transmitting and receiving raw data. They perform encoding and decoding of signals. So, taking those ones and zeros, all that binary code that goes across the wire when we talk about network connections, encoding it, encapsulating it, and presenting it to the other layers of the OSI model.

And lastly, the physical layer of the OSI model is responsible for physical network design. Responsible might not be the right word there. But the physical network design of your network, whether you're at a bank, an Air Force base, Carnegie Mellon, all of that is done at Layer 1, the actual layout, physical layout of your network. Even in this room, if there's an Ethernet port around here somewhere, in fact I'm connected to Wi-Fi right now, so there is a physical network somewhere in this room.

We all probably have cell phones in here, too. I don't think I know anyone anymore that doesn't have a cell phone. So, we're all connected physically at the Layer 1 level in some fashion.
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