Podcast Transcript

EPISODE #184

Decoding the Internet: A Deep Dive into the OSI Model

Published January 08, 2026 • Runtime: 18:11

https://myweirdprompts.com/episode/osi-model-networking-layers/

EPISODE SYNOPSIS

Ever wondered how your device actually talks to a server ten thousand miles away without the data becoming a garbled mess? In this episode of My Weird Prompts, Herman and Corn Poppleberry demystify the Open Systems Interconnection (OSI) model, the foundational "grammar" that allows the modern internet to function across disparate hardware and software systems. From the physical pulses of light in undersea fiber optic cables to the complex application protocols like HTTP that power our browsers, the brothers walk through all seven layers to explain how data is packaged, routed, and translated for the end user. Whether you are a seasoned IT professional troubleshooting a network or just a curious user wondering why your video call stutters, this deep dive provides the essential anatomy of a digital conversation in 2026, illustrating why this decades-old framework remains the gold standard for conceptualizing the invisible infrastructure of our lives.

DANIEL'S PROMPT

Daniel

I’d like to learn more about the OSI model. What do the different layers mean, and could you walk me through them from Layer 1 to the top?

TRANSCRIPT

Corn

Hey everyone, welcome back to My Weird Prompts. I am Corn, and as always, I am joined by my brother and resident deep diver into all things technical.

Herman

Herman Poppleberry, at your service. It is good to be back in the studio, Corn. Or, well, our living room here in Jerusalem.

Corn

Exactly. And speaking of our living room, our housemate Daniel sent us a voice note this morning that actually made me realize how much we take for granted every time we open a browser or send a message. He was asking about the Open Systems Interconnection model, better known as the O S I model.

Herman

Oh, I love that Daniel brought this up. It is one of those foundational concepts in networking that everyone hears about if they spend five minutes in a server room, but it can feel incredibly abstract if you do not break it down. It is essentially the grammar of the internet. It was developed by the International Organization for Standardization back in the late nineteen seventies to make sure different computer vendors could actually talk to each other.

Corn

I like that analogy. It is the framework that allows different computer systems to talk to each other, even if they are made by different companies or running different software. So, today we are going to do exactly what Daniel asked. We are going to walk through all seven layers, from the physical hardware at the bottom to the apps you use at the top.

Herman

And we should probably start by acknowledging that even though it is January seventh, two thousand twenty six, and networking technology has advanced light years since this model was first developed, the O S I model is still the primary way we troubleshoot and conceptualize how data moves. It is like the anatomy of a digital conversation.

Corn

Right, and as we discussed back in episode two hundred fifty two, when we were talking about mesh networks versus wired ones, understanding the layers helps you figure out where a problem actually lies. If your Wi-Fi is down, you do not start by checking your email settings. You start at the bottom.

Herman

Exactly. So, let us dive into Layer One. This is the Physical Layer.

Corn

Okay, so Layer One is the actual physical stuff, right? The cables, the radio waves, the electricity?

Herman

Precisely. Layer One is responsible for the actual physical connection between the devices. It is where data is converted into signals that can travel over a medium. We are talking about bits here. Zeroes and ones. But at this level, those zeroes and ones are not even numbers yet. They are electrical pulses, light flashes in a fiber optic cable, or radio waves traveling through the air for your Wi-Fi seven or five G connection.

Corn

So when a technician says there is a Layer One issue, they are basically saying the cable is unplugged, the fiber is cut, or there is too much interference on the radio frequency?

Herman

You got it. It is the most literal layer. It defines things like the pinout on an ethernet cable, the voltage levels, and the timing of the signals. If you think about the massive undersea cables like Google's Nuvem cable connecting South Carolina to Portugal, those are the giants of Layer One. Without this layer, nothing else matters because there is no path for the energy to travel.

Corn

It is interesting because we often think of the internet as this ethereal cloud, but it really is anchored in thousands of miles of glass and copper. But once those pulses of light or electricity reach the other end, they need to be organized. That brings us to Layer Two, the Data Link Layer.

Herman

Yes, and this is where things start to get organized. If Layer One is the raw sound of someone shouting, Layer Two is the realization that those sounds are actually words. At this layer, we stop talking about raw bits and start talking about frames.

Corn

Frames. Okay, explain that.

Herman

Think of a frame as a little envelope. It takes those raw bits from Layer One and packages them with a header and a trailer. The most important thing at Layer Two is physical addressing. This is where M A C addresses live. Media Access Control. Every network interface card in the world has a unique M A C address burned into it at the factory.

Corn

So, Layer Two is how two devices on the same local network find each other? Like my laptop talking to our router here in the house?

Herman

Exactly. Switches operate at Layer Two. When a switch receives a frame, it looks at the destination M A C address and says, oh, this belongs to the device plugged into port four. It does not care about the internet or I P addresses yet. It is just local delivery within the same building or the same segment. It also handles error detection to make sure the bits did not get scrambled during their trip across the wire.

Corn

So if Layer Two is local delivery, like a courier carrying a letter from one office to another in the same building, Layer Three must be the postal service that gets it across the city or the world.

Herman

That is a perfect transition. Layer Three is the Network Layer. This is the home of the Internet Protocol, or I P. In two thousand twenty six, we are mostly talking about I P version six, though I P version four is still hanging on in some corners. This is where we move from frames to packets.

Corn

Packets are the famous ones. Everyone talks about packet loss when their video call stutters.

Herman

Right. And the reason we need packets is that Layer Two is limited. You cannot have a single local network that connects every device on earth. It would be chaos. So Layer Three provides logical addressing. Your I P address is your logical address on the global network. Routers live here at Layer Three. Their job is to look at the destination I P address on a packet and decide the best path for it to take to get to its destination, even if that destination is ten thousand miles away.

Corn

This is where B G P, or Border Gateway Protocol, comes in, right? We have touched on that before when talking about how the internet actually maps itself.

Herman

Spot on. B G P is like the grand navigation system for Layer Three. It is what allows a router in Jerusalem to know that a packet destined for a server in Tokyo should go through a specific path in Europe first. Layer Three handles the routing and the fragmentation. If a packet is too big for a certain part of the network, Layer Three breaks it down and reassembles it later.

Corn

Okay, so we have the physical wire, we have the local M A C address delivery, and we have the global I P routing. We have the data to the right house. But how do we make sure it actually arrives intact and goes to the right person inside that house?

Herman

That brings us to Layer Four, the Transport Layer. This is where things get really sophisticated. The two big players here are T C P and U D P. Transmission Control Protocol and User Datagram Protocol.

Corn

I remember we discussed the difference between these two in episode two hundred six when we were talking about benchmarks. T C P is the reliable one, right?

Herman

Yes, T C P is like a registered letter that requires a signature. It sets up a connection, ensures every packet arrives in the correct order, and asks for an acknowledgment from the receiver. If a packet goes missing, T C P notices and asks the sender to send it again. This is what you want for things like web pages or emails where every single character matters.

Corn

And U D P is more like a live broadcast. You just keep sending and hope the other side catches most of it.

Herman

Exactly. U D P is for speed. It is used for voice calls, video streaming, and gaming. If a single frame of a video call is lost, you do not want the whole stream to stop while the system asks for a resend. You just want to move on to the next frame. But Layer Four does something else crucial. It handles ports.

Corn

Ports. Like port eighty for web traffic or port four hundred forty three for secure traffic?

Herman

Precisely. If the I P address is the street address of the house, the port number is the specific room where the data needs to go. Your computer might be doing ten things at once. It is downloading a file, streaming music, and checking for updates. Layer Four uses port numbers to make sure the music data goes to the music app and the file data goes to the browser.

Corn

So we have reached the point where the data is at the right computer and the right application. We have covered the bottom four layers, which are often called the lower layers or the transport-oriented layers. Now we are getting into the upper layers, which are more about the software and the user experience.

Herman

Right. And this is where the O S I model starts to diverge a bit from the T C P I P model that we actually use in practice, but the distinctions are still really useful for understanding what is happening under the hood. Layer Five is the Session Layer.

Corn

The Session Layer feels like the one people talk about the least. What is actually happening there?

Herman

It is all about the dialogue. Layer Five manages the start, stop, and restart of a conversation between two devices. Think of it like a phone call. Layer Four got the connection established, but Layer Five is the part of the brain that says, okay, I am going to talk now, then you talk, then I will send this file. It handles things like checkpoints. If you are downloading a huge file and the connection drops, Layer Five is what allows the download to resume from where it left off instead of starting from zero. It keeps your remote desktop session or your cloud database sync alive even if the network blips.

Corn

That makes sense. It is the coordinator of the session. It makes sure that even if the underlying connection flutters, the logical conversation stays on track.

Herman

Exactly. And once the session is managed, we move to Layer Six, the Presentation Layer. This is often called the syntax layer.

Corn

Presentation. So, is this how the data looks on the screen?

Herman

Not quite the visual look, but the format. It is the translator. Computers represent data in different ways. Some use different character encoding, some use different compression formats. Layer Six is responsible for making sure that the data sent by Layer Seven on one end is readable by Layer Seven on the other end.

Corn

So, encryption and decryption happen here?

Herman

Yes. When you use T L S one point three to secure your data, that is a Layer Six function. It also handles compression, like the A V one video codec or G Zip for web files. Layer Six is what understands how to pack and unpack that data. It ensures that when you send a string of text, the receiver does not just see a bunch of gibberish because they are using a different encoding standard.

Corn

It is like the universal translator of the network. It takes the raw data and says, okay, this is a movie file, or this is an encrypted message, or this is a piece of J S O N code for an A P I.

Herman

You got it. And that leads us finally to the top of the mountain. Layer Seven, the Application Layer.

Corn

This is where we live. This is the part we actually interact with.

Herman

It is, but there is a common misconception here. People think Layer Seven is the actual app, like Chrome or Spotify. But technically, Layer Seven is the set of protocols that those apps use to communicate with the network. H T T P for web browsing, S M T P for email, or modern A P I protocols like g R P C.

Corn

So when I type a U R L into my browser, the browser is an application that uses the H T T P protocol at Layer Seven to start the whole process we just described?

Herman

Exactly. Layer Seven provides the interface. It identifies communication partners, determines resource availability, and synchronizes communication. It is the layer that understands that you are trying to fetch a specific webpage or send a specific command to a database.

Corn

It is fascinating to see it all stacked up like that. From a pulse of light in a cable at Layer One, all the way up to an H T T P request at Layer Seven. It is like a Russian nesting doll. You wrap the data in a Layer Seven header, then a Layer Six header, and so on, until it is a tiny little package ready to be fired across the world.

Herman

That process is actually called encapsulation. And when it reaches the other side, the reverse happens. It is called de-encapsulation. Each layer peels off its corresponding header, reads the instructions, and passes the remaining data up to the next layer. It is a beautiful, highly coordinated dance that happens billions of times a second.

Corn

So, Herman, I have to ask. Since this model was designed so long ago, how does it hold up in two thousand twenty six? Are there things that do not fit?

Herman

That is a great question. In the real world, we mostly use the T C P I P model, which only has four layers. It lumps the top three O S I layers into one big Application layer, and it combines the bottom two into a Network Access layer. But the reason we still teach the O S I model is that it is much more precise for troubleshooting.

Corn

Right, because if you say there is an application error in the T C P I P model, that could mean anything from an encryption failure to a coding bug to a session timeout. But in O S I, you can say, this is a Layer Six issue, and everyone knows you are talking about data formatting or encryption.

Herman

Exactly. And it helps us understand new technologies too. Think about software-defined networking or network function virtualization. We are moving more and more of the logic that used to live in hardware at Layer Two and Three into software. But even when it is virtualized, the logic remains the same. A virtual router still operates at Layer Three.

Corn

I also think about things like the Internet of Things devices we have all over the house now. Some of them are so simple they barely have a Layer Seven. They are just sending tiny pulses of data. But they still have to follow the rules of the stack to get that data to our phones.

Herman

They do. And it is even more relevant when you look at the massive scale of A I clusters today. When you have ten thousand G P U s all trying to talk to each other to train a model, the latency at Layer One and Layer Two becomes the biggest bottleneck in the world. Engineers are obsessed with shaving nanoseconds off the Physical and Data Link layers because at that scale, those layers determine the speed of innovation.

Corn

It is incredible. We went from talking about undersea cables to A I training clusters, and the same seven-layer map applies to both. It is a testament to how well those original architects understood the fundamental nature of communication.

Herman

It really is. And for our listeners, the next time your internet acts up, try to think through the layers. Is it Layer One? Is the cable plugged in? Is it Layer Three? Can I ping a website? Is it Layer Seven? Is the specific app or service just down? It makes the whole world of technology feel a lot less like magic and a lot more like a well-organized system.

Corn

That is a great way to put it. It turns a frustrating mystery into a logical puzzle.

Herman

One more thing before we wrap up the technical side. There is a joke in the industry about Layer Eight. Have you heard that one?

Corn

Oh, I have. Layer Eight is the human layer, right?

Herman

Exactly. When everything in the seven-layer stack is working perfectly but the system still is not doing what it should, the problem is usually the person sitting in the chair. It is a reminder that even the most perfect technical model has to interact with messy human reality.

Corn

Well, on that note, I think we have given Daniel a pretty solid walkthrough of the O S I model. It is more than just a list for a certification exam. It is the blueprint for how our modern world stays connected.

Herman

It really is. I hope this helped clear things up for everyone listening. It is a lot to take in, but once it clicks, you start seeing the layers everywhere.

Corn

Absolutely. And hey, if you are finding these deep dives helpful, we would really appreciate it if you could leave us a review on your podcast app or on Spotify. It genuinely helps other curious people find the show, and we love hearing what you think.

Herman

Yeah, it really does make a difference. Thanks for the prompt, Daniel. Keep them coming.

Corn

You can find us at myweirdprompts.com for all our past episodes and the R S S feed. This has been My Weird Prompts.

Herman

Until next time, I am Herman Poppleberry.

Corn

And I am Corn. Keep asking those weird questions. We will see you in the next one.