

**Yifan Zhu:** Last week, we separate our work. I'm think about the software and Yuhao Li and Yi Ding are thinking about hardware. In the end, we also want to discuss the remote-control access. So, Hari, are you there? Can you stay for a little longer? So, we want to discuss the time for remote control labs with you. Would you mind?

**Hari:** Sure.

**Yifan Zhu:** Thanks. Shall we wait for doctor Johnson or we just start ahead?

**Joe:** I think that's up to you guys. If you wanna wait a few minutes, wait for doctor Johnson. That's fine with me. But if you want to start now, that's fine as well. So, it's completely up to you.

**Yifan Zhu:** About software. The mininet requires the virtual machines. Like VMware, for now I found two software of the virtual machine, one is when, which is provided in the official mininet website. Another one is the workstation pro 16 I presented it in the snapshot day. So, during the final presentation, should we tell them the license or the activated code.

**Joe:** Sorry, I was a mute there. Where are you asking whether we should? Whether you should give over that. The activation code for it. I guess, maybe I don't understand your question.

**Yifan Zhu:** Oh yeah. So, why do you need a license?

**Joe:** Why do you need a license?

**Yifan Zhu:** The license. The software installed on my computer i have bought a license to activate it. Is that about the patents?

**Joe:** Not sure. I'm not sure I fully understand what you're asking. Are you asking whether the university can reimburse you for that? License?

**Yifan Zhu:** No. I the software, the workstation, I which I use requires a license, but I have bought it. So, during the presentation, why you ask me to, find the alternative somewhere like without the license. Yeah I'm kind of curious about that.

**Joe:** Yeah, that would be interesting. So, I think I there's kind of two major players in the virtual machine world and. That's VM ware and virtual box. I think they both offer Free tears. I think virtual box has a little bit more extensibility there. I'm not sure to what extent. Let me give you a link. I'll put it in our chat here for virtual box. You can look at that. Virtual box is an oracle product. They've done a few things recently with how they've structured their pricing. I'm aware of, but I'm not sure. You know, how deep that goes?

**Yifan Zhu:** My computer only supports one kind of virtual machine. The workstation has its own advantage. It is the menu, very simple and very clear for users to use, very user-friendly.

**Joe:** Yeah, that's definitely true. That's a good point. What? Why are you only able to use vm where is that? Hardware limitation operating system.

**Yifan Zhu:** Still, the software simulation has its own limitations. I checked the labs on ECE 444 for several times. They are also connected to raspberry pi and other hardware. The software, mininet. It has a Wireshark for this method, I draw the network topology scheme and run the emulation. And start the Wireshark. So, the only thing I can do with the wire shark is to record the IP address begin for where it come from and where it goes. I can't find other functions in the Wireshark.

**Joe:** Yes, where it's kind of a. A very intense tool. I mean there's a lot of functionality in Wireshark. But it can be very challenging to get used to all of the functionality that's there. One of the things wire shark is known for packing. It's ability to perform packet inspection. That's basically taking an analysis packet by packet, and looking at what data is there. So that can be really useful when you're trying to troubleshoot network communication issues. Things like. What am I trying to say? Like, say, for example. You have communications, network SCADA and network DNP to communicate between a relay and some

other device to processors. And you're having trouble with that communications, you can use Wireshark to. It's a monitor that traffic and see exactly what's happening. So, you can see if, say packets are being dropped. Or if there's like a bit flip issue in one of the packets, if a zero is one, or a one is a zero, something like that. You could also see if there's just a simple misconfiguration where the DNP server is configured for one address. And that's not the IP address, but that's like the DNP address. And the DNP client is configured for a different. Right? That would be something that you can see in the Wireshark communication. So, there's some useful stuff you can do there. Oh yeah.

**Yifan Zhu:** Another thing is, when I finish the network evolution, I realized that I'm not a student in the in the ECE444. So I'm sure that's quite a concept, which I'm not sure if I apply them into the network emulation. So, I think my fundamental job is to provide a software, a platform. I show the students, the tools and students should figure out how to drop the scheme relevant on the labs. The original labs,

**Joe:** Yeah, I think that's probably a pretty fair statement.

**Yifan Zhu:** I think there should be a standard. Also, I'm not sure I if I draw the scheme correctly. I have finished a lab report. Would you like to see now?

**Joe:** Yeah, I think that would be good.

**Hari:** Yifan, we actually connected the remote computer to the lab computer, the local computer yesterday. And we can't figure it to be able to log in. You can probably try remodeling into the computer and you can then think the computer downstream that computer you can remotely desktop into that has all the tools the wild shark is in store. You can see the communication between the devices.

**Yifan Zhu:** You mean the link last time the IT guys provided?

**Smadi:** Is it the same computer set up by Mike?

**Hari:** Yes.

**Smadi:** All right good.

**Hari:** That computer of the law has another port we installed. The internet board actually allows to anxious the desk the card. We have a moving card, right? That card has all of the devices. There is a switch in the card that is connected to the second internet board. So, these guys jump into the server. To VPN and then they can remote desk toping into the card computer, which has the Wireshark and all this offer the others.

**Smadi:** I'm trying to.

**Hari:** It's all connected. It's got an IP artist of 192.163.3 tapping in that. And then remote desktop into it. I'll give you the credential sub. Can you please make them? Make an account that they can use? I'm gonna give you the ADMIN credentials and you can create like a user account for them to create configurations and change.

**Smadi:** Is this the same computer as I send in the chart? I sent direct to you to everyone.

**Hari:** It is a card computer.

**Smadi:** This is set up by Mike.

**Hari:** No, this is another computer that who send and I set up for the students. This is the one that the senior design team has been using in the past as well.

**Smadi:** I don't know.

**Hari:** Right now it's on the card. I will show you when we meet up tomorrow or something. Okay. There is a card that I dragged to the g ten. Do you know? We connected the switch on the card to the second after? That computer that might set up has a second after now that is connected to this card. Since people

can come into the computer that might set up already, they can remove us up into the card computer easily.

You see? How are, we what? Try? Remote desktop into it. I think you have access on the link.

**Smadi:** You mean for this computer?

**Hari:** The remote computer, one that makes it up.

**Smadi:** Yeah, I think I have very much access to this one.

**Hari:** Can you please log in and verify? If the ping actually worked, it was updating, it was connected to windows.

**Smadi:** Just give me some time.

**Hari:** It was connected to the internet, call it internet and it started downloading the windows updates yesterday. It was running the windows update, so I couldn't finish of the setup.

**Smadi:** I'll share my screen. I think I'll be able to access it. What have you done there? Hari? I share every share again when it's completed. If you have any other things to talk about.

**Yifan Zhu:** About the lab report, I will send to all of you the emails. So, you can give me some advice about the Mininet. One last thing is the equipment. Yeah, you require us to make a list of the hardware, which is can I use in the lab. So, our idea is, first, we need to know what kind of equipment you have and maybe we should do the lab first. Then we can make decision about which equipment is most suitable for us.

**Hari:** I think I'm gonna meet Harry tomorrow. You can send me EMAIL about, do you want me to take a picture for you or type of things you do?

**Yifan Zhu:** Or maybe we can through the zoom.

**Smadi:** That's okay with you.

**Yifan Zhu:** What's time? How about the same time as today?

**Smadi:** Actually, I'll text Hari to see his time. Then when we meet and send you the time and zoom link. I'll take the laptop with me, then you can visualize whatever you like to use?

**Yifan Zhu:** Thank you. I think that's it. Is doctor Johnson here?

**Smadi:** Those are like we have professor Johnson and I we have another meeting. But the, other group we have. He might join that team. I don't know.

**Yifan Zhu:** It's okay. Anyway, we have finished all the questions we want to ask for this week. Thank you for your time. Have a good day.

**Smadi:** Thank you so. And I'll contact you when I get a confirmation from Hari.

**Yifan Zhu:** Sure. No problem,  
okay Thank you.

**Smadi:** Thank you.

**Joe:** Take care of. Thank you.

**Yifan Zhu:** Bye.

**Smadi:** Hari, he is, just wait for a minute.

**Hari:** Did you get the credentials? Try logging in.

**Smadi:** Those credentials used for this. Bc actually, I am in now. The same, right?

**Hari:** Can you share your computer screen?

**Smadi:** Just a minute.

**Hari:** I send you the credentials for the car computer and you can use those.

**Smadi:** This. Now I am in.

**Hari:** Perfect. Can you open window of the cmd, command? Ipconfig. Run Ipconfig. Can you ping?

**Smadi:** Yeah, it's a thing. 192.168. Base. There's a space after being 192. Don't want to say.

**Hari:** 168.

**Hari:** . . 3.

**Hari:** The 3 dot three again.

**Hari:** That's the computer that is connected to. And.

**Smadi:** It's out.

**Hari:** We should go down, check it tomorrow.

**Smadi:** So the students they ask us to like, when we meet, you and I, they need to like to be with us in the meeting, through zoom. So, I bring, my laptop with me. And then what time you like to meet?

**Hari:** That's 130. Work?

**Smadi:** Uh, Actually, I have an appointment at two. So is it possible like evening, I'm okay until like 11:00 pm 12:00 pm, i don't mind.

**Hari:** How about 3:30?

**Yifan Zhu:** 3:30 pm?

**Hari:** Yes. You know.

**Smadi:** Uh uh. I can't like say because the appointment is in the course. So, I don't know, how much time they're gonna?

**Hari:** I like, maybe 4:30. That's all.

**Smadi:** 4:30. Yeah, first, that is gonna.

**Yifan Zhu:** That works, thank you.

4:30 pm, right?

**Smadi:** Ok, Tomorrow.

**Hari:** You have everything pretty much set up. Yifan, you can log into the computer and start using the things and, playing with it. Since you have it at, 2047 access, you can keep walking on it until you understand elements. And if you have any questions, let me know uh. Do you have anything else that you wanted to? Converse? I remember you wanted me to stay on the call for a little bit longer.

**Smadi:** What's that?

**Hari:** That was for the Chinese students.

**Yifan Zhu:** We're going to discuss it like this remote control. So we don't have any questions. Okay, thank you for coming and thank you for you. Or your effort.



**Hari:** I think you guys can pretty much work on it. As soon as we figure this one out, it should be able to walk. See you. I'm not sure it just windows updated yesterday, and I didn't have the time to check today.

**Smadi:** Yifan, please update doctor Johnson with the like what we have discussed.

Because you need like, because I believe he's in the other meeting. I'll go and check in the other meeting after I signed out from here. So just update him with what we have talked about in our meeting tomorrow. Also CC doctor Li, because he's not here today.

**Yifan Zhu:** I see. Yeah, sure of course.

**Smadi:** Bye. All right.