


Scalable Cybersecurity Training: Integrating Virtual and Physical Security Teaching Environments

4th GI/ITG KuVS Fachgespräch "Network Softwarization" 2025

Lukas Bechtel, Markus Schramm, Lukas Popperl, Tobias Heer


IT Security Lab Welcome Page



For people and technology.

- Welcome
- SSH Keys
- Courses
- VirtualMachines
- Achievements
- Admin View
- User Admin
- System Admin
- FAQ

Sign out



Welcome to the IT-Security Lab

Participate in Lecture

Participate

Review Achievements

Review

Create Course

Create

Manage Courses

Manage

Manage VM Templates

Manage

Debug VMs on Proxmox

Proxmox

Contact Support

Support







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



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Students Managing their Courses


Your Courses

Course	Lecturer	Group	Team			
Project Honeypot	Primary lecturer: Lukas Bechtel Lecturers: Markus Schramm, Tobias Heer, Nils Lohmiller	Honeypot	Honeypot ► Members	 Enter	Rename team	Leave Team
Network Testbed	Primary lecturer: Markus Schramm Lecturers: Lukas Bechtel, Nils Lohmiller	admin	admin ► Members	 Enter	Rename team	Leave Team
IPID Testbed	Primary lecturer: Sabrina Kaniewski Lecturers: Lukas Bechtel	admin	Festive Tharp ► Members	 Enter	Rename team	Leave Team
Netsec Data Analysis	Primary lecturer: Tobias Heer Lecturers: Lukas Bechtel, Markus Schramm, Lukas Popperl, Nils Lohmiller, Sabrina Kaniewski, Samuel Müller	Main	Epic Keldysh ► Members	 Enter	Rename team	Leave Team
Network Simulations	Primary lecturer: Samuel Müller Lecturers: Lukas Bechtel	Main	Compassionate Wiles ► Members	 Enter	Rename team	Leave Team
Netboot	Primary lecturer: Lukas Popperl Lecturers: Lukas Bechtel	Netboot	Practical Germain ► Members	 Enter	Rename team	Leave Team

Available Courses to Join

Course	Lecturer	Groups
Project IT Security Summer 2025 ⓘ	Primary lecturer: Markus Schramm Additional Lecturer: Tobias Heer	 Topology
AD Security Testbed (Study Project) ⓘ	Primary lecturer: enbeit02 Additional Lecturer: Markus Schramm	 StudyProject
Network Security ⓘ	Primary lecturer: Lukas Bechtel Additional Lecturer: Tobias Heer	 Summer Term 2025  4. GI/ITG KuVS Fachgespräch

Students Joining a Course



For people and technology.

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SSH Keys

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① Update SSH Keys

② Review Courses

③ Participate

Team Name

Gracious Hertz

Team Info

0 / 2

Members

Join Team

Team Name


Cranky Elbakyan

Team Info

0 / 2

Members

Join Team

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Students Accessing the Course Details

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IT-Security Lab Course: Network Security

Group: 4. GI/ITG KuVS Fachgespräch

Topology

Your Team Topology

Access to your VMs

You can only access your VMs from the network of the HS Esslingen VPN. The lab topology is always secured behind a jump host. This jump host can only be accessed via SSH. We have prepared a tutorial on SSH in the [Wiki](#). The SSH access is limited to public key authentication only. Therefore, you must upload your public key on the following page before you can start: [Your SSH Keys](#)

For **Linux, WSL, macOS, and Windows** with the OpenSSH client implementation, you can use the following command(s) to connect to the VM listed in the beginning of the line:

jump-host-2 ssh lwuesten@134.108.218.43

If you use **PuTTY** for SSH, you can enter one of the following strings in the Host Name field for each of the VMs listed in the beginning of the line:

jump-host-2 lwuesten@134.108.218.43

Additionally in PuTTY, you must navigate on the left hand side to Connection/SSH/Auth and add your private SSH key in the ppk format.

Course Details

Course Description

Description

AIM Network Security

You are enrolled to Group '4. GI/ITG KuVS Fachgespräch' and Team 'Gracious Hertz'.

IP Addresses:


netsec-challenges-1 192.168.200.8

netsec-challenges-2 192.168.200.9

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Students Solving Exercises in the Infrastructure



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netsec-challenges-2 192.168.200.9

netsec-challenges-3 192.168.200.10

jump-host-2 134.108.218.43

kali-2024 192.168.200.38

Credentials:

kali-2024

User: kali

Password: kali

Exercise #1: Challenges

Deadline July 28, 2025

+

+

Exercise Description

This exercise accompanies the Network Security AIM lecture. Each challenge reveals a password needed for the exercises in Moodle.

Task #1 Wireshark

In the topology, you have a kali VM. Use this VM to intercept the communication between the two other machines. In all the traffic, you ca

Task #2 RSA

In the lecture, you learned the basics of asymmetric cryptography, specifically RSA. Given is the public key with $n=527, e=13$. Please calcu

Task #3 iptables

You are stuck in Home Office and forgot how to login to your company's VPN, but you remember that Bob has an SSH tunnel server runn

remember the IP and port. This tunnel server is in theory reachable from the internet (as it has a public IP Address), but should be protec


Task Wireshark

Hint: use the tool **arp spoof** and have a look at both directions

Flag

FLAG

Submit

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Solving the Traffic Interception Challenge

```

22:27:45 ~ $ ssh kali@192.168.200.38 -J lwuesten@134.108.218.43
The authenticity of host '192.168.200.38 (no nstip for proxy command)' can't be established.
ED25519 key fingerprint is SHA256:g0iDLJWNKc0wCyfTogNkScUcar2yy5XwotvabZfxpI.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.200.38' (ED25519) to the list of known hosts.
[kali@192.168.200.38]~$ password:
Linux kali-2024 6.10.11-amd64 #1 SMP PREEMPT_DYNAMIC Kali 6.10.11-1kali1 (2024-09-26) x86_64

The programs included with the Kali GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Thu Apr  3 22:24:29 2025 from 192.168.200.1
~(kali@kali-2024)-[~]
$

```

```
[kali@kali-2024-1]~  
└─$ sudo tcpdump -XXX | grep PW  
[sudo] password for kali:  
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode  
listening on eth0, link-type EN10MB (Ethernet), snapshot length 262144 bytes  
0x0280: 4a67 5057 494b 714e 3162 4136 3131 4a4e JgPWIKqN1bA61iJN  
0x0220: 2020 5057 3d4d 7956 6572 7953 6563 7572 ..PW=MyVerySecur  
0x01a0: b066 544c 4e67 416f 5057 0a4c 642b 4b2b kfTLNgAoPW.Ld+K+  
0x02c0: 6f55 594e 4b66 6a34 3550 5768 7742 6a6f oUYNNkfj45PWwhBjo  
0x0030: 3664 4479 4457 5057 4972 6864 5776 6132 6uMlDwPWlrdhWva2  
0x0280: 4755 444c 376f 4d32 7a35 3061 6975 5057 GDdL7oM2z50aiuPW  
0x0040: 365a 6439 2f43 4f55 4471 5057 434b 694f 6Zd9/COUDgPWCKiO  
0x01e0: 5057 504b 302f 6a44 6970 6476 314a 3936 PWPk0/jDipdv1J96  
0x01e0: 5057 504b 302f 6a44 6970 6476 314a 3936 PWPk0/jDipdv1J96  
0x02c0: 6f32 526b 634b 596f 5057 6b54 6964 7437 o2RkcKYoPWkTidt7  
0x02c0: 6f32 526b 634b 596f 5057 6b54 6964 7437 o2RkcKYoPWkTidt7  
0x0040: 536e 5838 6438 4e38 6d50 5754 5073 6e72 SnX8d8N8mPWTpsnr  
0x03a0: 666d 7551 5850 524a 5057 6535 614d 6433 fmuQXPJRJPWe5aMj3  
0x0300: 2f4e 7655 6933 626c 6861 5647 5057 6b64 /NvuI31lhaVGpWkd  
0x0220: 2020 5057 3d4d 7956 6572 7953 6563 7572 ..PW=MyVerySecur
```

[illegible]

The screenshot displays the Wireshark network protocol analyzer interface. The top toolbar includes icons for file operations, network analysis, and search. The main window is divided into three panes:

- Packet List:** Shows a list of captured packets. Packet 667 is selected, which is an Ethernet II packet of length 1328 bytes.
- Packet Details:** Shows the hierarchical structure of the selected packet. It includes Ethernet II (Source: 52:64:e9:4b:41:01), Internet Protocol Version 4 (Source: 192.168.200.8, Destination: 192.168.200.9), and User Datagram Protocol (Source Port: 58025, Destination Port: 22222).
- Packet Bytes:** Shows the raw data of the packet in hexadecimal and ASCII. The ASCII column highlights the text "PW=MyV erySecur e123Pass word!" in red, indicating a password transmission.

Gamification of the Exercises with a Leaderboard

Profile / Leaderboard

#	Team	Score	Exercise 1 Task 1	Exercise 1 Task 2	Exercise 1 Task 3	Exercise 1 Task 4	Exercise 1 Task 5	Exercise 1 Task 6	Exercise 1 Task 7	Exercise 2 Task 1	Exercise 2 Task 2	Exercise 3 Task 1	Exercise 3 Task 2	Exercise 3 Task 3	Exercise 3 Task 4	Exercise 4 Task 1	Exercise 4 Task 2	Exercise 4 Task 3	Exercise 4 Task 4	Exercise 4 Task 5	Exercise 4 Task 6	Exercise 4 Task 7	Exercise 5 Task 1	Exercise 5 Task 2	Exercise 5 Task 3	Exercise 5 Task 4	Exercise 5 Task 5	Exercise 5 Task 6	Exercise 5 Task 7	Exercise 5 Task 8	Exercise 5 Task 9	
1	Hungry Hopper	450	<div>20/10</div> <div>19. March 2025, 19:29</div>	<div>20/10</div> <div>19. March 2025, 19:35</div>	<div>20/10</div> <div>19. March 2025, 19:34</div>	<div>20/10</div> <div>19. March 2025, 19:35</div>	<div>20/10</div> <div>19. March 2025, 19:40</div>	<div>10/10</div> <div>19. March 2025, 19:53</div>	<div>20/10</div> <div>19. March 2025, 19:24</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>26. March 2025, 19:40</div>	<div>20/10</div> <div>26. March 2025, 20:52</div>	<div>20/10</div> <div>26. March 2025, 20:22</div>	<div>20/10</div> <div>26. March 2025, 20:05</div>	<div>10/10</div> <div>26. March 2025, 20:20</div>	<div>20/10</div> <div>26. March 2025, 19:10</div>	<div>20/10</div> <div>26. March 2025, 19:58</div>	<div>10/10</div> <div>02. April 2025, 19:16</div>	<div>20/10</div> <div>02. April 2025, 19:19</div>	<div>20/10</div> <div>02. April 2025, 19:27</div>	<div>20/10</div> <div>02. April 2025, 19:34</div>	<div>20/10</div> <div>02. April 2025, 19:35</div>	<div>20/10</div> <div>02. April 2025, 19:36</div>	<div>10/10</div> <div>02. April 2025, 20:00</div>	<div>20/10</div> <div>02. April 2025, 20:04</div>	<div>20/10</div> <div>02. April 2025, 20:06</div>	
2	Magical Carver	310	<div>10/10</div> <div>19. March 2025, 20:51</div>	<div>10/10</div> <div>19. March 2025, 20:51</div>	<div>10/10</div> <div>19. March 2025, 20:52</div>	<div>10/10</div> <div>19. March 2025, 20:52</div>	<div>10/10</div> <div>19. March 2025, 20:53</div>	<div>10/10</div> <div>19. March 2025, 20:54</div>	<div>10/10</div> <div>19. March 2025, 20:46</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>02. April 2025, 20:30</div>	<div>10/10</div> <div>02. April 2025, 20:30</div>	<div>10/10</div> <div>02. April 2025, 21:15</div>	<div>10/10</div> <div>02. April 2025, 21:26</div>	<div>10/10</div> <div>26. March 2025, 19:49</div>	<div>10/10</div> <div>26. March 2025, 21:11</div>	<div>10/10</div> <div>26. March 2025, 20:32</div>	<div>10/10</div> <div>26. March 2025, 20:20</div>	<div>20/10</div> <div>26. March 2025, 20:05</div>	<div>10/10</div> <div>26. March 2025, 19:49</div>	<div>10/10</div> <div>26. March 2025, 20:47</div>	<div>10/10</div> <div>02. April 2025, 19:19</div>	<div>10/10</div> <div>02. April 2025, 19:23</div>	<div>10/10</div> <div>02. April 2025, 19:31</div>	<div>10/10</div> <div>02. April 2025, 19:41</div>	<div>10/10</div> <div>02. April 2025, 19:45</div>	<div>10/10</div> <div>02. April 2025, 19:45</div>	<div>20/10</div> <div>02. April 2025, 19:59</div>	<div>10/10</div> <div>02. April 2025, 20:14</div>	<div>10/10</div> <div>02. April 2025, 20:14</div>	
3	Friendly Cannon	310	<div>10/10</div> <div>19. March 2025, 20:38</div>	<div>10/10</div> <div>19. March 2025, 20:40</div>	<div>10/10</div> <div>19. March 2025, 20:48</div>	<div>10/10</div> <div>19. March 2025, 20:45</div>	<div>10/10</div> <div>19. March 2025, 20:49</div>	<div>10/10</div> <div>19. March 2025, 20:53</div>	<div>10/10</div> <div>19. March 2025, 20:30</div>	<div>0/10</div>	<div>0/10</div>	<div>20/10</div> <div>26. March 2025, 20:19</div>	<div>20/10</div> <div>26. March 2025, 20:20</div>	<div>20/10</div> <div>26. March 2025, 20:19</div>	<div>20/10</div> <div>26. March 2025, 20:28</div>	<div>10/10</div> <div>26. March 2025, 20:00</div>	<div>10/10</div> <div>26. March 2025, 21:10</div>	<div>10/10</div> <div>26. March 2025, 20:50</div>	<div>10/10</div> <div>26. March 2025, 20:35</div>	<div>10/10</div> <div>26. March 2025, 20:29</div>	<div>10/10</div> <div>26. March 2025, 20:00</div>	<div>10/10</div> <div>26. March 2025, 20:00</div>	<div>10/10</div> <div>02. April 2025, 19:24</div>	<div>10/10</div> <div>02. April 2025, 19:33</div>	<div>10/10</div> <div>02. April 2025, 19:34</div>	<div>10/10</div> <div>02. April 2025, 19:56</div>	<div>10/10</div> <div>02. April 2025, 19:57</div>	<div>10/10</div> <div>02. April 2025, 19:58</div>	<div>10/10</div> <div>02. April 2025, 20:25</div>	<div>10/10</div> <div>02. April 2025, 20:26</div>	<div>10/10</div> <div>02. April 2025, 20:34</div>	
4	Romantic Kilby	230	<div>10/10</div> <div>19. March 2025, 20:58</div>	<div>10/10</div> <div>19. March 2025, 20:57</div>	<div>10/10</div> <div>20. March 2025, 19:57</div>	<div>10/10</div> <div>20. March 2025, 19:46</div>	<div>10/10</div> <div>20. March 2025, 20:24</div>	<div>10/10</div> <div>26. March 2025, 20:17</div>	<div>10/10</div> <div>19. March 2025, 20:53</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>27. March 2025, 20:21</div>	<div>10/10</div> <div>27. March 2025, 20:24</div>	<div>10/10</div> <div>02. April 2025, 20:04</div>	<div>0/10</div>	<div>10/10</div> <div>27. March 2025, 21:47</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>27. March 2025, 21:48</div>	<div>10/10</div> <div>28. March 2025, 16:51</div>	<div>20/10</div> <div>02. April 2025, 19:06</div>	<div>10/10</div> <div>02. April 2025, 20:16</div>	<div>10/10</div> <div>02. April 2025, 20:16</div>	<div>10/10</div> <div>02. April 2025, 20:25</div>	<div>10/10</div> <div>02. April 2025, 20:31</div>	<div>10/10</div> <div>02. April 2025, 20:31</div>	<div>10/10</div> <div>02. April 2025, 20:54</div>	<div>10/10</div> <div>02. April 2025, 20:57</div>	<div>10/10</div> <div>02. April 2025, 21:04</div>	
5	Cranky Benz	230	<div>10/10</div> <div>19. March 2025, 19:40</div>	<div>10/10</div> <div>19. March 2025, 19:42</div>	<div>10/10</div> <div>19. March 2025, 19:44</div>	<div>10/10</div> <div>19. March 2025, 19:44</div>	<div>10/10</div> <div>19. March 2025, 19:45</div>	<div>20/10</div> <div>19. March 2025, 19:47</div>	<div>10/10</div> <div>19. March 2025, 19:35</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>02. April 2025, 19:22</div>	<div>10/10</div> <div>02. April 2025, 19:23</div>	<div>10/10</div> <div>02. April 2025, 19:33</div>	<div>10/10</div> <div>02. April 2025, 19:55</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>02. April 2025, 19:57</div>	<div>10/10</div> <div>02. April 2025, 19:59</div>	<div>10/10</div> <div>02. April 2025, 20:01</div>	<div>10/10</div> <div>02. April 2025, 20:04</div>	<div>10/10</div> <div>02. April 2025, 20:06</div>	<div>10/10</div> <div>02. April 2025, 20:09</div>	<div>10/10</div> <div>02. April 2025, 20:12</div>	<div>10/10</div> <div>02. April 2025, 20:14</div>	<div>10/10</div> <div>02. April 2025, 20:15</div>		
6	Zen Mendel	200	<div>10/10</div> <div>19. March 2025, 20:49</div>	<div>10/10</div> <div>19. March 2025, 21:07</div>	<div>10/10</div> <div>19. March 2025, 21:08</div>	<div>10/10</div> <div>19. March 2025, 21:10</div>	<div>10/10</div> <div>19. March 2025, 21:12</div>	<div>0/10</div>	<div>10/10</div> <div>19. March 2025, 20:38</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>30. March 2025, 23:55</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>26. March 2025, 19:42</div>	<div>10/10</div> <div>30. March 2025, 23:25</div>	<div>10/10</div> <div>30. March 2025, 21:38</div>	<div>10/10</div> <div>26. March 2025, 21:08</div>	<div>10/10</div> <div>26. March 2025, 20:34</div>	<div>10/10</div> <div>26. March 2025, 19:42</div>	<div>10/10</div> <div>26. March 2025, 20:00</div>	<div>10/10</div> <div>02. April 2025, 19:39</div>	<div>10/10</div> <div>02. April 2025, 20:06</div>	<div>10/10</div> <div>02. April 2025, 20:15</div>	<div>10/10</div> <div>02. April 2025, 20:53</div>	<div>10/10</div> <div>02. April 2025, 20:54</div>	<div>10/10</div> <div>02. April 2025, 20:55</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	
7	Vibrant Chatelet	160	<div>10/10</div> <div>26. March 2025, 20:11</div>	<div>10/10</div> <div>26. March 2025, 20:17</div>	<div>10/10</div> <div>26. March 2025, 20:19</div>	<div>10/10</div> <div>26. March 2025, 20:20</div>	<div>10/10</div> <div>26. March 2025, 20:21</div>	<div>10/10</div> <div>26. March 2025, 21:06</div>	<div>10/10</div> <div>26. March 2025, 19:55</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>03. April 2025, 22:35</div>	<div>10/10</div> <div>03. April 2025, 22:37</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>02. April 2025, 19:36</div>	<div>10/10</div> <div>03. April 2025, 22:08</div>	<div>10/10</div> <div>02. April 2025, 21:00</div>	<div>10/10</div> <div>02. April 2025, 20:53</div>	<div>10/10</div> <div>02. April 2025, 20:37</div>	<div>10/10</div> <div>02. April 2025, 19:37</div>	<div>10/10</div> <div>02. April 2025, 20:16</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	
8	Interesting Leavitt	130	<div>10/10</div> <div>19. March 2025, 20:58</div>	<div>10/10</div> <div>19. March 2025, 21:06</div>	<div>10/10</div> <div>19. March 2025, 21:11</div>	<div>10/10</div> <div>02. April 2025, 19:05</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>19. March 2025, 20:49</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>26. March 2025, 20:31</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>26. March 2025, 20:38</div>	<div>10/10</div> <div>26. March 2025, 20:23</div>	<div>10/10</div> <div>02. April 2025, 19:37</div>	<div>10/10</div> <div>02. April 2025, 19:40</div>	<div>10/10</div> <div>02. April 2025, 20:12</div>	<div>10/10</div> <div>02. April 2025, 20:52</div>	<div>10/10</div> <div>02. April 2025, 20:54</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	
9	Busy Chaum	100	<div>10/10</div> <div>26. March 2025, 20:52</div>	<div>10/10</div> <div>26. March 2025, 20:47</div>	<div>10/10</div> <div>26. March 2025, 20:03</div>	<div>10/10</div> <div>26. March 2025, 19:51</div>	<div>10/10</div> <div>26. March 2025, 20:49</div>	<div>10/10</div> <div>26. March 2025, 20:10</div>	<div>10/10</div> <div>26. March 2025, 21:16</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>26. March 2025, 20:51</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>10/10</div> <div>26. March 2025, 21:18</div>	<div>10/10</div> <div>26. March 2025, 20:52</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>	<div>0/10</div>

Teachers Managing the Network of a Team

Topology

Your Team Topology

```
graph TD
    vmbr91705((vmbr91705)) --- net0_1((net0))
    vmbr91705 --- net0_2((net0))
    vmbr91705 --- net0_3((net0))
    vmbr91705 --- net0_4((net0))
    vmbr91705 --- net0_5((net0))
    vmbr91705 --- net0_6((net0))
    net0_1 --- netsec-challenges-1((netsec-challenges-1))
    net0_2 --- netsec-challenges-2((netsec-challenges-2))
    net0_3 --- netsec-challenges-3((netsec-challenges-3))
    net0_4 --- kali-2024((kali-2024))
    net0_5 --- jump-host-2((jump-host-2))
    net0_6 --- VPN((VPN))
```

VM Credentials:

kali-2024:

User: **kali**

Password: **kali**

Migrate Team:

Currently running on Name: **itlx2001** (IP: **134.108.191.50**).

Select new Proxmoxnode:

Name: **itlx2002** (IP: **134.108.191.51**) **Migrate**

- ✓ F1.301-04
- F1.301-06
- F1.301-10
- F1.301-12
- F1.301-14
- F1.301-20
- F1.301-22
- F1.301-24
- F1.301-26
- F1.301-28
- F1.301-32
- F1.301-34**
- F1.301-36
- F1.301-38
- F1.301-40
- F1.301-42
- F1.301-44
- F1.301-46
- F1.301-48
- F1.301-50
- F1.301-52
- F1.301-54
- F1.301-56

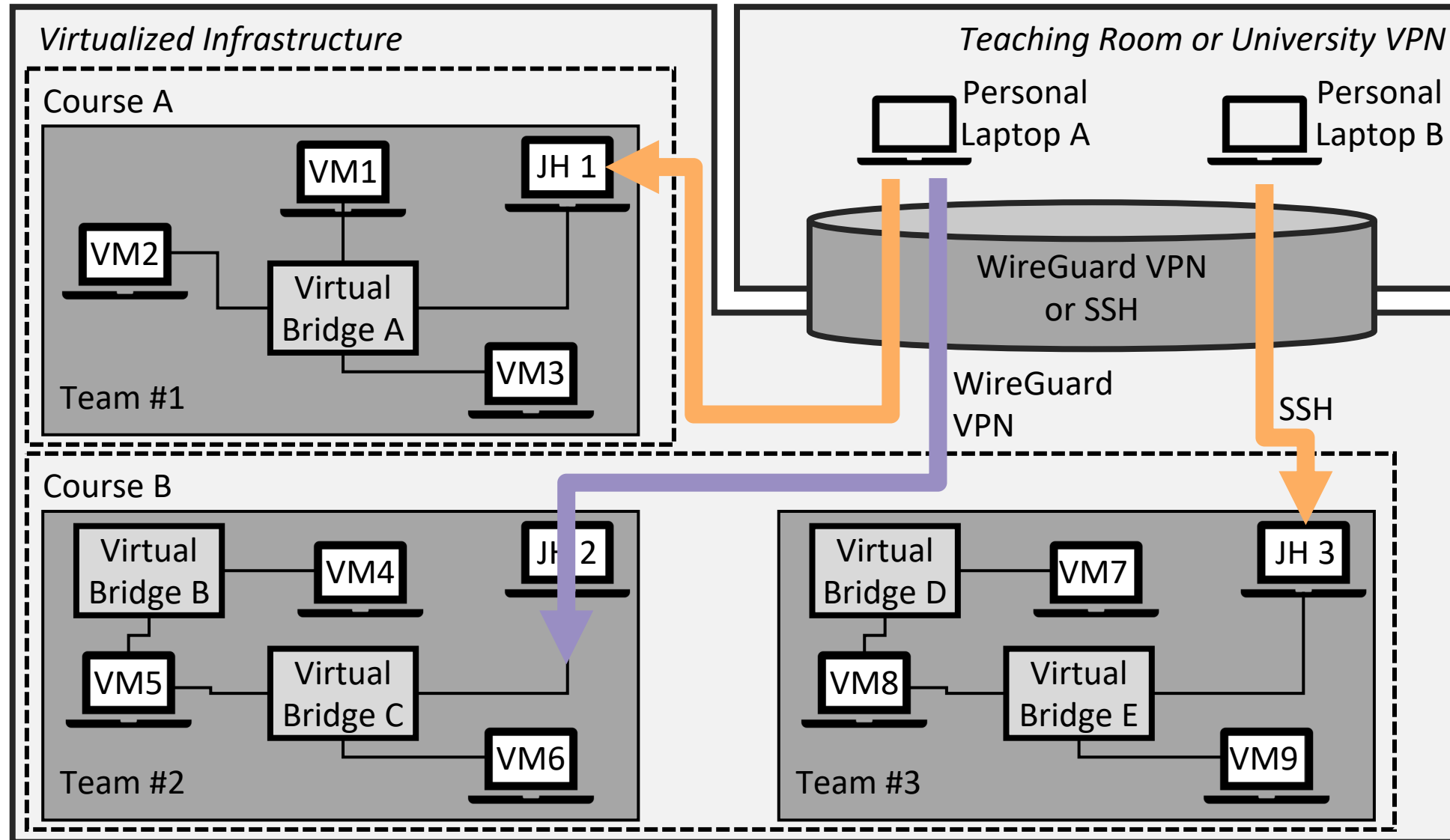
anges-1	192.168.200.8	<input type="checkbox"/>
anges-2	192.168.200.9	<input type="checkbox"/>
anges-3	192.168.200.10	<input type="checkbox"/>
	134.108.218.42	<input type="checkbox"/>
	192.168.200.38	<input type="checkbox"/>

ection:

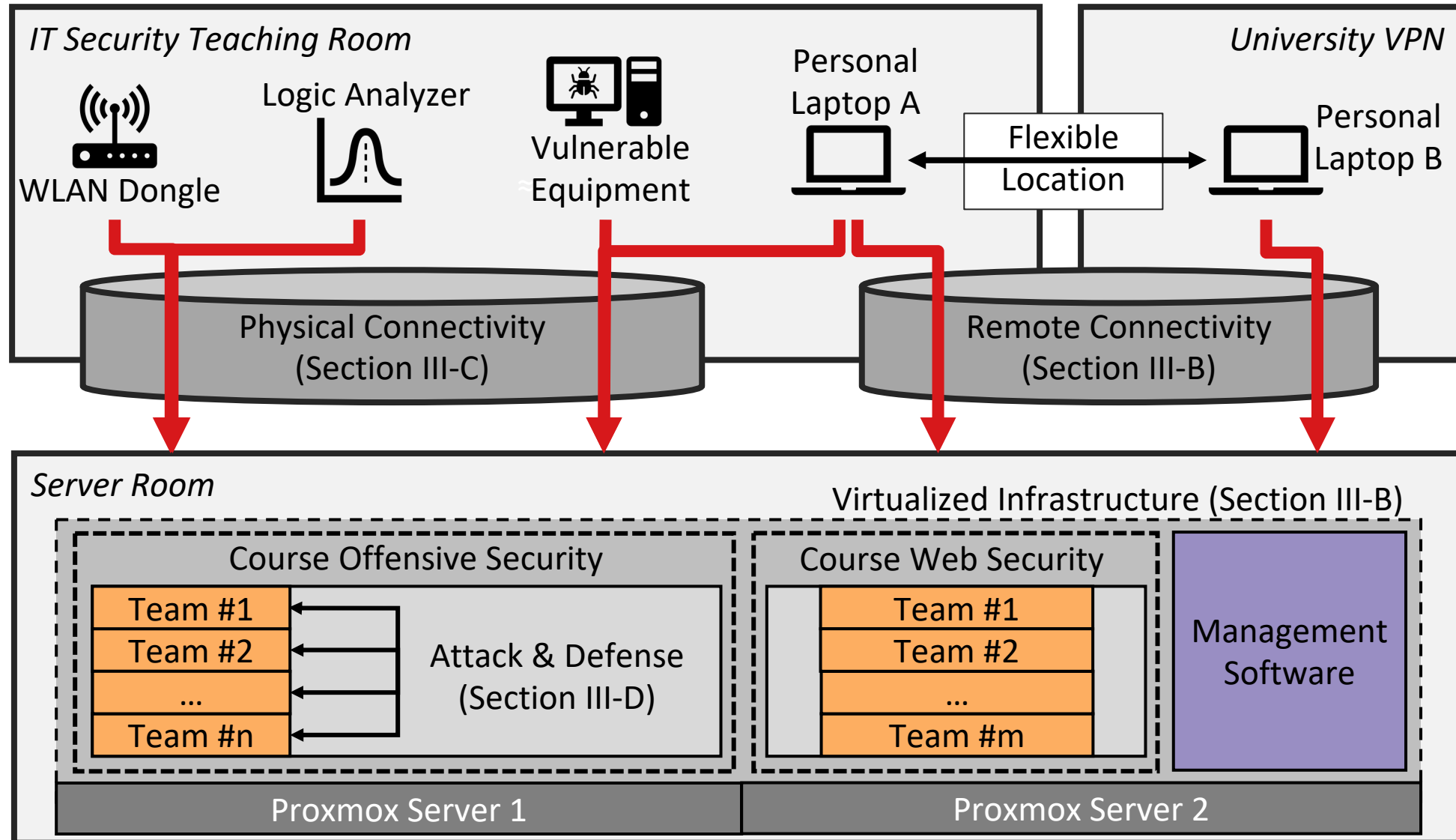
ort and your network name below before connecting the Port.

F1.301-04 **vmbr91705** **Connect Port**

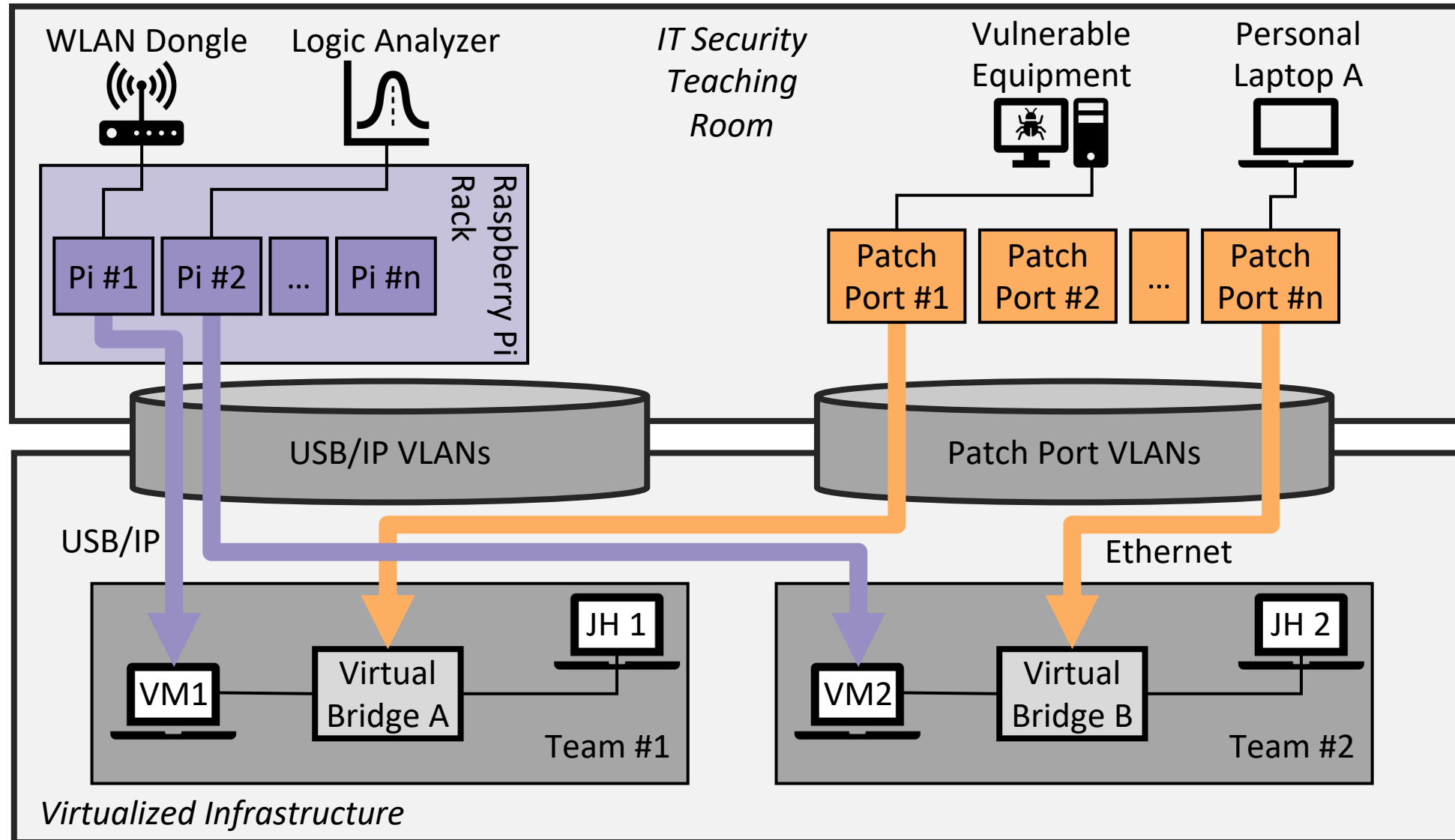
Teaching Room Virtualization



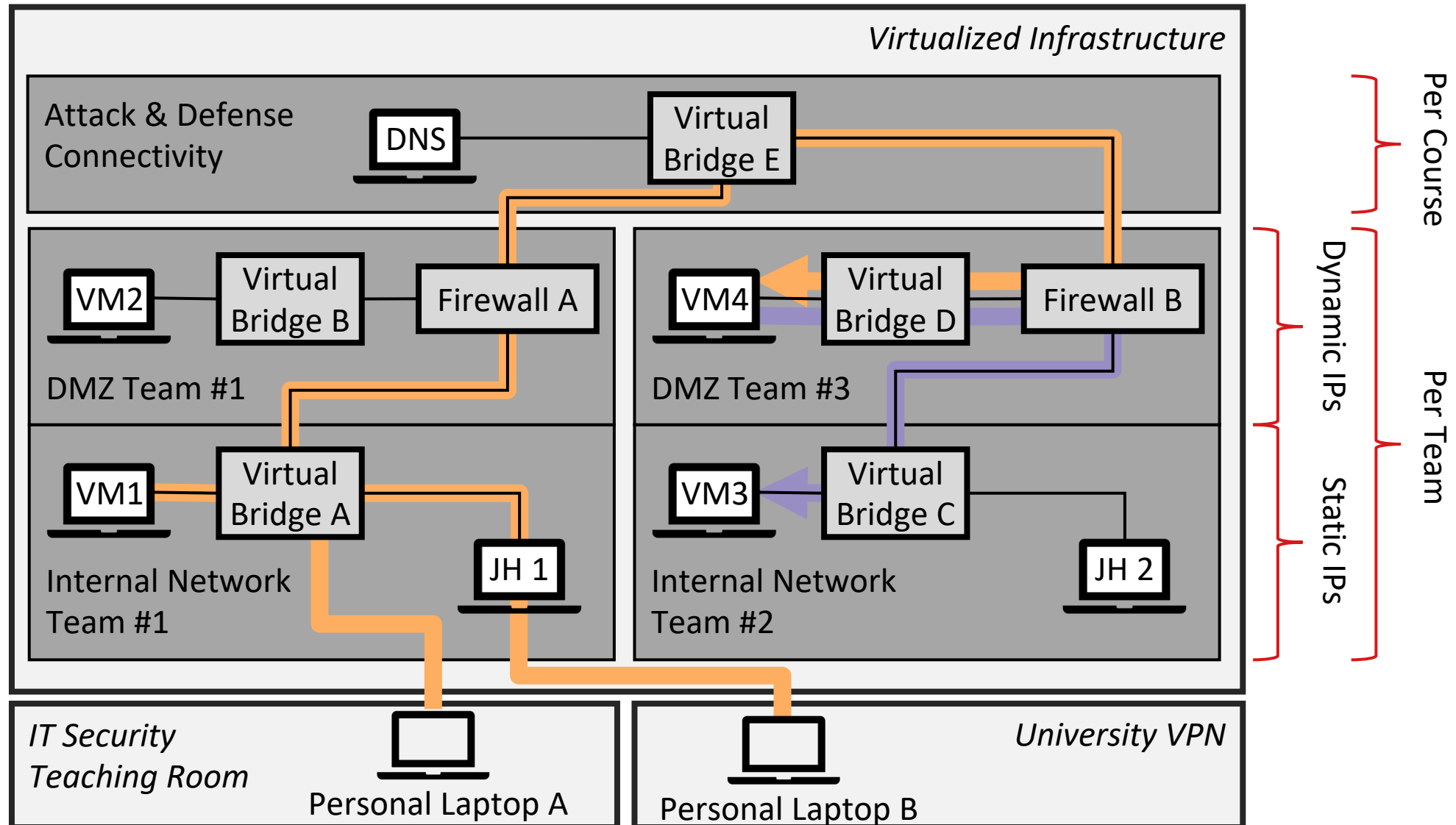
Teaching Infrastructure Architecture



Hardware Integration



Attack & Defense



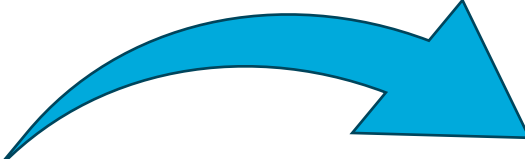
Conclusion and Future Work

Conclusion and Summary

- Wrapper for Proxmox virtualization
- Reduces overhead during setup
- Per Semester:
 - 450 VMs
 - 80 Students
 - Six Lectures
- More resources available per student
- Flexible use for various cyber security challenges with and w/o hardware

Next Steps

- Open source the project
 - Development team:
 - 1 Full-time employer
 - 4 HiWi students
 - Angular-based frontend
 - Goal: towards the end of the year
- Collaborate between universities
 - Develop a course repository
 - Share courses (specifically CTFs)



Interest in more details,
demo, or collaboration?



Questions?

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