

Five days Hands-on Network Security Training and Workshop by Riphah International University, Islamabad



In Collaboration with
Pakistan Education and Research Network (PERN)



European Union



5th July – 09th July, 2021

At Lahore College for Women University Lahore, Pakistan



1 Overview/Background

The security of personal information is a kind of preservation of human rights. Being secure and remain private is a fundamental human right. The workshop targets the network security skills and capacity enhancement of young females. Network security consists of the provision and policies adopted by anyone to prevent and monitor unauthorized access, misuse of network-accessible resources while allowing access to those who are authorized. It also provides user authentication and access control. However, the massive volume of data sharing over an insecure network has made it an ideal target for malicious attackers. In this regard, there is an urgent need to secure the networks. State of the art security protocols and security best practices needs to be implemented. In recent years, there has been an increase in cybercrimes in Pakistan. As can be seen from figure 1,

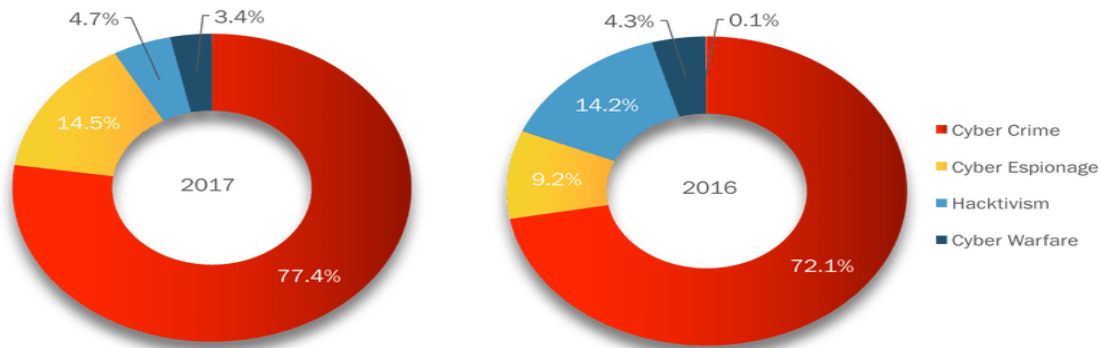


Figure 1: state of cybercrimes in Pakistan

Cybercrimes have increased enormously. The reason behind this is the lack of hands-on skills and awareness in the community. In 2013, there's only 11% of equal participation of women representation in cybersecurity roles globally. At the same pace, it covers only 20% of equal involvement of women representation in 2019. In 2017, only 13% of the equal participation of women. F500 CISO positions were failed in cybersecurity and only 20% filled with required positions in 2019. There are 1 million unfilled jobs in 2014, and it will jump up to 3.5million in 2021, as shown in figure 2.

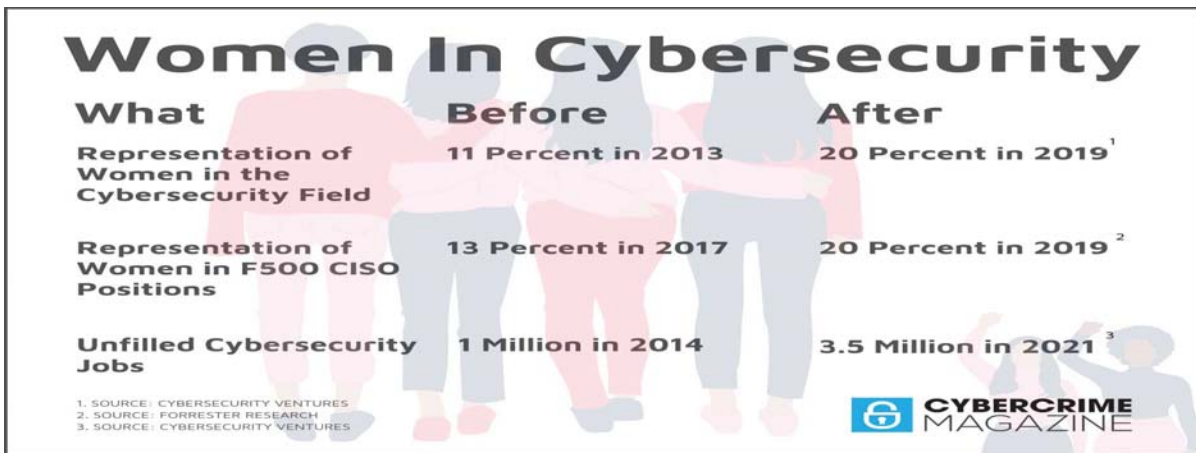


Figure 2: Women in Cyber Security

We at the Department of Cybersecurity and Data Science, Riphah Institute of Systems Engineering, Riphah International University, Islamabad, offer MS and PhD information security Programs. The enrolment ratio of women and girls in our programs is below 5%. The employees

and students in women universities across Pakistan are girls.

As the government of Pakistan is planning to have more women universities in the country, there is a need for trained women to serve in newly established universities to ensure the security of networks of those universities. Moreover, there isn't any cybersecurity or network security program or department in women universities in Pakistan. Most of these women universities have PERN connectivity. Women in Pakistan are facing isolation. Due to cultural and religious implications, they cannot go to big cities to train on network and cybersecurity.

There is a dire need to conduct hands-on training and workshops at their doorsteps and campuses to fill the above gap. Hence, this workshop is designed to enhance and amplify women's network security skills, understanding, and knowledge.

2 Objectives

- The participants will gain an advanced level of knowledge on key concepts, protocols and the policies involved in establishing and maintaining security for a network.
- By imparting network security training, the participants will learn how to protect their assets on the network to ensure the well-functioning of their network and maintain the resiliency of their network
- Reduce the gender gap in network security skills.
- Participants of the hands-on training and workshop will examine the network infrastructure security to establish a robust, stable, and secure network and protect the data and processes that occur in the network.
- Implement the best security practices.
- Increase knowledge of women about security for protection against cybercrimes.
- Motivate women to participate in network security by enhancing their skills.

3 Session Scheduling

Session 1	08:00 - 09:45
Break	09:45 - 10:00
Session 2	10:00 - 11:45
Session 3	11:45 – 13:15
Lunch	13:15 – 13:45
Session 4	13:45-15:30

4 Tentative Course Content Outline

Day 1	Topic
Session 1	Understanding Internet Ecosystem
Session 3	Understanding Protocols in TCP/IP Stack and their Vulnerabilities and Exploits
Session 3	Packet Sniffing and Spoofing Lab, ARP Cache Poisoning Attack Lab, IP and ICMP Attacks Lab
Session 4	Public Key Infrastructure (Public-key encryption, Public-Key Infrastructure (PKI), Certificate Authority (CA) and root CA, X.509 certificate and self-signed certificate)

Day 2	Topic
Session 5	Public Key Infrastructure Lab
Session 6	Network Access Control (Network Access Control, Extensible Authentication Protocol, IEEE 802.1X Port-Based Network Access Control)
Session 7	Network Access Control Lab
Session 8	Firewall Concepts and Deployments, Application Proxies

Day 3	Topic
Session 9	Firewall Lab (Firewall Exploration Lab and Firewall Exploration Lab)
Session 10	IDPS Concept and Deployment Modes
Session 11	IPSec (IP Security Overview, IP Security Policy, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange, Cryptographic Suites)
Session 12	Lab VPN

Day 4	Topic
Session 13	TCP Attacks Lab (Launching attacks to exploit the vulnerabilities of the TCP protocol, including session hijacking, SYN flooding, TCP reset attacks, etc.)
Session 14	Tls 1.2, Tls 1.3 (RFC) What's New in TLS 1.3 Web Security Considerations, Transport Layer Security, HTTPS, Secure Shell (SSH)
Session 15	Security Operation Centre (SOC)
Session 16	SOC LAB Apache Metron Deployment

Day 5	Topic
Session 17	Cyber Threat Intelligence
Session 18	Cyber Threat Intelligence Lab (TAXII STIX deployment, MISP Deployment),
Session 19	Incident Response, Security Orchestration, Automation, and Response
Session 20	SOAR Lab (Deployment of 'The hive')

5 Impact /Outcome

The participants gained a good grounding in network security through this workshop, open-source Intrusion Detection Systems (IDS), tools SOC setup, CTI, and Security orchestration. Automation and response, Network admission controls and Firewall.

6 Participants

The number of maximum participants is 30, mainly the final year students knowing **programming and computer networking concepts**. In addition, female faculty and IT/Network staff can also attend the workshop.