Practical Network Defense

Introduction

Module 1

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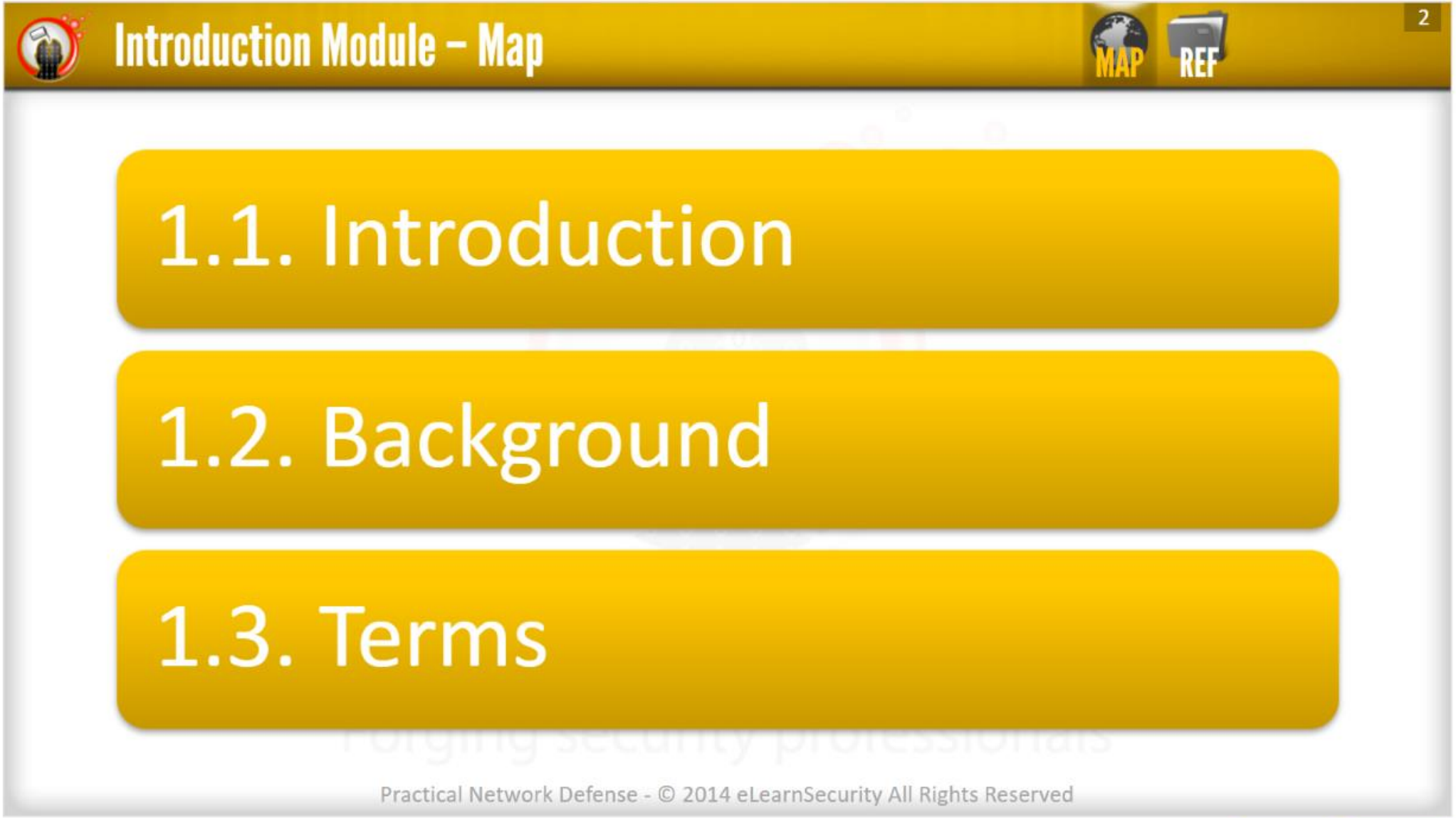
v1.1

1 / 30 00:00 / 00:00

PREV NEXT

OUTLINE



1.1. Introduction

MAP REF

Welcome to eLearnSecurity's course – Practical Network Defense. This course takes a look at the defensive side of security from the beginner to intermediate level. If you are working in I.T., managing a network or a pentester looking to learn how to mitigate your attack path, this course is for you.

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This course is divided into three main sections: Introduction, Network Security and System Security. The Introduction modules will lay the ground work and foundation in information security needed for the rest of the course.

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This course will introduce some of the basics of information security, including terminology. In the Network Security and System Security sections, it will explore some theory but then show you practical steps you can take to defend and harden your network.

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OUTLINE

1.2. Background

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As more data is moved into the digital world, the need to secure that data will grow. Data is becoming more accessible which leaves it open to direct compromise and misuse.

As topologies and applications become more complex, they become more difficult to secure and it gives attackers the opportunity to exploit them.

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A common saying is - “Attacks always get better; they never get worse.”

Attackers are getting smarter and exploits are growing in number AND complexity.

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1.2. Background

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Secunia is an information security company with popular security products such as Secunia Personal Software Inspector (they also have a commercial version). They use data from their products and public sources to compile reports; one of them is an annual vulnerability review.

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1.2. Background

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The next slide shows a graph by Secunia from their report which shows the number of vulnerabilities, CVEs and advisories released over the past several years.

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1.2. Background

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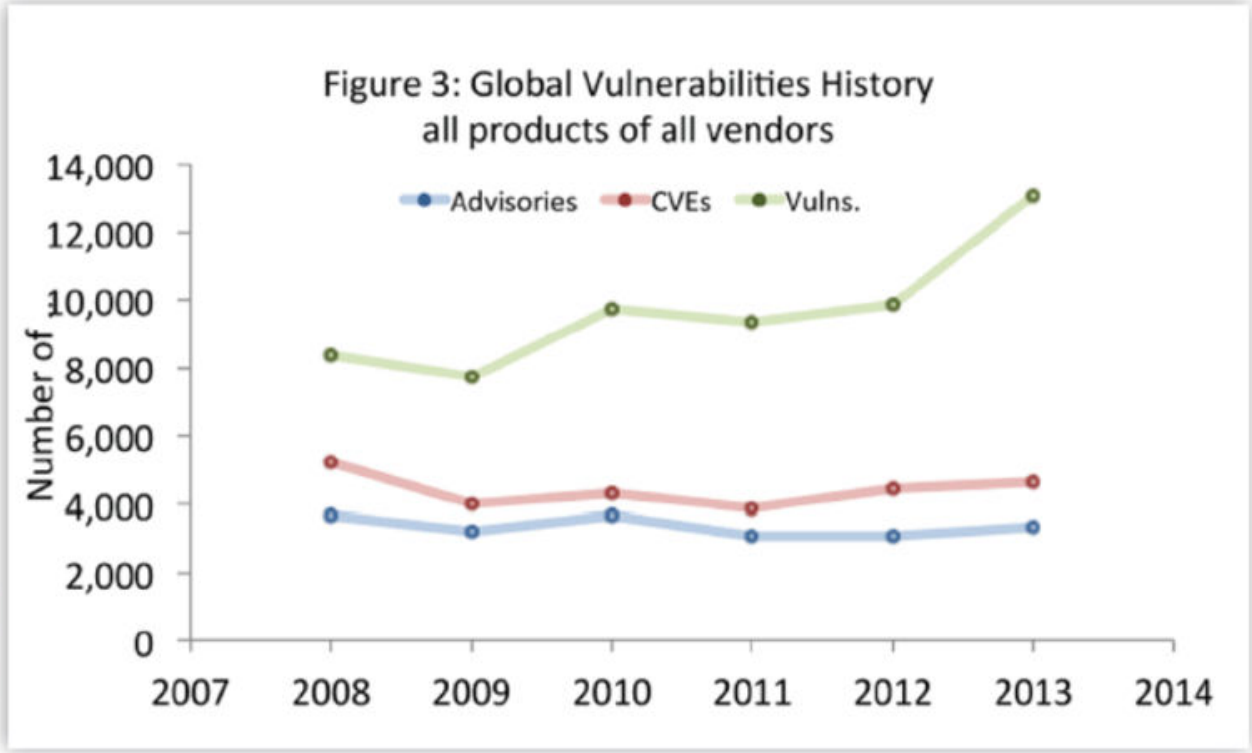
As you can see, the number of vulnerabilities has sky-rocketed.



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1.2. Background

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This rise in vulnerabilities will unfortunately most likely continue to be the trend.

Attackers are not just script-kiddies anymore. They may be on a company's payroll or even state-sponsored. A group of attackers with sponsorship may have an endless supply of resources at their disposal.

It is your role to defend against the ever-growing threat.

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1.3. Terms

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The **CIA Triad** represents three high-level information security categories. All InfoSec topics can be grouped into these three main categories.

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1.3. Terms

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Confidentiality – ensuring data is only access by those authorized to access it.

Integrity – ensuring data has not been improperly altered.

Availability – ensuring data and services are always available.

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1.3. Terms

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Least privilege is the mentality that users and systems only have access to what they need to complete their job and nothing more. E.g. if a user accesses a file server, they only have access to the file shares they need to complete their job; they do NOT have access to other shares.

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1.3. Terms

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Many InfoSec professionals use this model to plan their end-user permissions on systems and data. This model can extend beyond just users to devices and to networks too. For example, consider egress filtering. If you want to allow users to browse the internet, you would open ports 80 and 443 but they would NOT need access to port 81 outbound so this port should not be allowed on egress.

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Access control is the selective restriction to data and resources. E.g. in a file server, you would control what shares a user or group has access to. There are three main types/strategies to access control.

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Mandatory access control- security is controlled by centralized policies set by the security administrator.

Discretionary access control- security to an object is controlled by the object owner.

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Role-based access control- security to an object is based on the role of that user or system. This is one of the most common used ones and is often used with Active Directory (A.D.) groups. One may say A.D. Group A has access to Resource B. A.D. users are placed in Group A based on their role within the company.

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Non-repudiation

With regard to InfoSec, this is the concept that authentication without a doubt proves the validity of the user. A common non-repudiation violation is to have a shared account. Imagine a bank where all tellers login with the user account "Teller". If one of those tellers were to commit a malicious act, one could not prove who it was based on the user account because multiple users access the same account.

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A **vulnerability** is a weakness in a software or hardware which could allow an attacker to exploit it and damage the system in some way.

An **exploit** is the code or technique used by the attacker to take advantage of the vulnerability.

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A **vulnerability assessment** is a service where a team (usually a third party company) tests a company's systems and network to find where vulnerabilities may exist. They will often deliver a report of the found vulnerabilities, their severity and recommended remediation steps.

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A **penetration test** goes beyond that of a vulnerability assessment. As opposed to just testing for the existence of vulnerabilities, a penetration tester will validate the vulnerability and exploit it to gain access to internal systems. A vulnerability assessment merely reports on the existence of vulnerabilities whereas a penetration test demonstrates the practical exploitation of found vulnerabilities and shows how they can be leveraged against a network.

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Virtualization allow simulation of hardware so multiple operating systems can run on a single piece of hardware while being completely separate from each other.

The hypervisor is the virtualization software which allows this to happen.

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1.3. Terms

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Logs are records of system activity. They often include the time, date, action and user who performed the activity.

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1.3. Terms

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Debuggers are software programs used to assist users in detecting errors in computer programs. They can be used by programmers to troubleshoot flow in their programs or by attackers looking to exploit a program via a buffer overflow.

Two popular debuggers are Immunity Debugger and WinDbg.

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This concludes the introduction module. We have reviewed the need for more secure networks as well as many of the associated terms.

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References

- Secunia
- Vulnerability review
- Immunity Debugger
- WinDBG

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