

# Journal

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**1:**

Cognitive Learning (What did you learn this week?)

This week I learned about Network security fundamentals, the OSI Model, and the TCP/IP model. In chapter 1 I learned about the different types of hackers, from the “old school” hackers that operated on the theory that knowledge is power to the hacktivists that use their skills to make political changes in the world. We also covered the use of secure remote access and most importantly in chapter 1 we learned about defense in depth. Defense in Depth is one of the most important topics to understand in network security because it highlights how there is no single layer in security that offers full protection, good protection, there is no such things as bullet-proof protection, can only be accomplished with multiple layers.

Chapter 2 is all about the OSI, and TCP/IP models. The OSI model is the original network model that is broken up into 7 layers, each one building on the previous layer. It is now more common to see the TCP/IP model that is split into 5 layers, the biggest difference between the OSI and TCP/IP models is that the top 3 layers of the OSI model are put into one Application layer at the top of the TCP/IP model.

Affective Learning (How is the course working for you?)

So far, this course is mostly a review for me, as I have an associate degree in network engineering, as well as A+, Network+, and Security+ from CompTIA; with that said I know this course will be very beneficial for me as we progress. I am on the school's cyber defense competition team and learning more about defense will be very helpful for next year's competition.

Conative Learning (How did you approach this week? What effort did you put into the work?)

My normal approach to learning is slow and steady. I always break up my tasks into more manageable sections, so I am not overwhelmed at the last minute. By taking this approach I cannot get over stressed with the homework and my normal day job. I put in a good effort this week, I was able to tackle our Chapter reading, and the PowerPoint lectures, as well as attend class twice this week. Since I know this approach works, I will continue using this approach throughout this class, and my future classes.

**2:**

Cognitive Learning (What did you learn this week?)

This week was a lot of fun, we learned about Network Traffic Signatures, Routing, and Cryptography. When it comes to network's traffic comes in all types, like Active Directory authentication, file shares, web traffic, and others. However, traffic can also be malicious, and we need to be able to spot the malicious traffic and that is where signatures come in. Next, we looked at routing fundamentals, where we learned about the address resolution protocol or ARP which is used to match an IP address to a

computer's physical MAC address kind of like DNS on the Web. We also talked about inter-VLAN routing and VLAN's. VLAN's are virtual networks that we can setup to segregate our network so only the systems that need to talk to each other can, and only with the allowed protocols. Inter-VLAN routing is what allows VLAN's to talk to each other. Lastly, we looked at cryptography.

There are 4 components of any cryptographic systems, confidentiality, integrity, authentication, and nonrepudiation. Confidentiality deals with making sure only authorized users can access the data, Integrity deals with making sure the data has not been changed, authentication deals with making sure the user accessing the data is who they say they are, and nonrepudiation means no party can deny taking part in the data exchange.

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### **3:**

Cognitive Learning (What did you learn this week?)

This week was a lot of fun, we learned about the fundamentals of wireless networks and signals and we also covered wireless security. In the first half of the week, we looked at the fundamentals of wireless networks, this included how radio signals work, electromagnetic radiation, and interference. All of which are very important when planning a wireless network. For example, a microwave oven can output radiation what is in the same frequency as most wireless networks, so can elevators, that is why it is very important to plan where access points and cable runs will be going before deploying the network.

For the second half of the week, we looked at wireless security. In this section we looked at the different types of security available for wireless networks, like WEP, WPA, and WPA2. Once upon a time WEP security was considered secure and it was easy to use, now with modern computers a WEP key can be cracked in less than a minute. One of the reasons is this possible is do to the fact that the initialization vector is sent in cleartext alone with the challenge text also being sent in cleartext. This allows an attacker to easily brute force access to the network.

#### Affective Learning (How is the course working for you?)

I am really liking this course so far. While most of it is overall just a review, I am reviewing some things I have not investigated in a while, and the refresh is very welcomed, and I know it will serve me well in the future. I am a firm believer that as cyber security professionals we should never stop learning, and that includes going back over information you have already learned.

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#### 4:

#### Cognitive Learning (What did you learn this week?)

This week was a lot of fun. It was all about firewalls and internet security. We first started talking about the different types of firewalls, host-based vs network-based firewalls. A host-based firewall is a firewall that only protects the host it is installed on, where a network-based firewall protects the entire network. Both firewalls are very important as attacks can come from anywhere including other hosts in the network and having a firewall on each host can help prevent malicious files from being uploaded to hosts from remote locations.

In the second half of the week, we also looked at security management and security policy design and implementation. In an organization proper security policy design is very important as the security policies that are in place are how a company is protected. In a company nothing gets done unless it is in writing, and nothing can be enforced unless it is in writing. That is why having proper security policy's is very important.

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## 5:

### Cognitive Learning (What did you learn this week?)

This week was all about Web security and VPN's. In our world today VPN's really need to play a large part of our lives. For example, if you are now working from home but still need access to your companies resources a VPN is almost a must. While the network can still be accessed without a VPN it would leave the company at risk for an attack, especially if the attack came from your own network.

Next, we looked at web security. In this section we looked at types of web attacks like SQLi (SQL injection) attacks, and DoS attacks. We also covered ways to secure web sites like securing your DNS from unauthorized zone transfers.

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