**Domain: Network Security**

**Question 1: Faulty Firewall**

Suppose you have a firewall that's supposed to block SSH connections, but instead lets them through. How would you debug it?

Make sure each section of your response answers the questions laid out below. ​

1. Restate the Problem Firewall is supposed to block/allow traffic to local network based on the ACL
2. Provide a Concrete Example Scenario
   * In Project 1, did you allow SSH traffic to all of the VMs on your network? SSH was only allowed to a Jump-Box from specific sources
   * Which VMs did accept SSH connections? From outside Jump-Box and VMs will only except connections from Jump-Boxes
   * What happens if you try to connect to a VM that does not accept SSH connections? The access will be denied/blocked Why? Access is controlled by network security group and by default all outside access is blocked
3. Explain the Solution Requirements
   * If one of your Project 1 VMs accepted SSH connections, what would you assume the source of the error is? Network security group is misconfigured
   * Which general configurations would you double-check? Network security group, make sure thee is an explicit rule that blocks all traffic unless allowed
   * What actions would you take to test that your new configurations are effective?
   * Try to access from the source that is not listed in the “allowed/permitted” sources and ports: SSH/HTTP/HTTPS, etc
4. Explain the Solution Details
   * Which specific panes in the Azure UI would you look at to investigate the problem? Network Security Group
   * Which specific configurations and controls would you check? Inbound Security Rules
   * What would you look for, specifically? The source, ports and destination
   * How would you attempt to connect to your VMs to test that your fix is effective?
   * Try to SSH to VMs ( make sure it is blocked ), only HTTP is allowed
5. Identify Advantages/Disadvantages of the Solution
   * Does your solution guarantee that the Project 1 network is now "immune" to all unauthorized access? There is always a probability of hacking/vulnerability, but it is easy to mitigate/restore the services because of the availability set and container replacement
   * What monitoring controls might you add to ensure that you identify any suspicious authentication attempts?​ ELK sever

**Question 2: Unsecured Web Server**

Suppose you find a server running HTTP on port 80, despite compliance guidelines requiring encryption in motion. What do you do? ​​

1. Restate the Problem
2. Provide a Concrete Example Scenario
   * In Project 1, did you have servers running HTTP on port 80? If so, why was it permissible to do so?
   * In a real deployment, which specific machine would you configure differently? How, and why?
3. Explain the Solution Requirements
   * Why is running HTTP on port 80 a potential problem?
   * How would you reconfigure a server to serve HTTP traffic safely?
   * How does this solution fix the problem?
4. Explain the Solution Details
   * Which tools and technologies would you use to implement this solution in Project 1?
   * How, specifically, would you use these tools to harden your deployment?
5. Identify Advantages and Disadvantages of the Solution
   * Will your solution break clients that used to communicate with the server over port 80?
   * Do you have to do any work to keep this solution running longterm? Or can you simply "set it and forget it?”

**Domain: Cloud Security**

**Question 1: Cloud Access Control**

How would you control access to a cloud network?

1. Restate the Problem
2. Provide a Concrete Example Scenario
   * In Project 1, did you deploy an on-premises or cloud network?
   * Did you have to configure access controls to this network?
   * What kinds of access controls did you configure, and why were they necessary?
   * How do these details relate to the interview question?
3. Explain the Solution Requirements
   * In Project 1, what kinds of access controls did you have to implement? Consider:
     + NSGs around the VNet? Around the VMs?
     + Local firewalls (ufw, etc.) on each VM?
     + Protocol allow/deny lists?
   * What did each access control achieve, and why was this restriction necessary for the project?
4. Explain the Solution Details
   * Which rules do you set for each NSG in the network?
   * How does access to the jump box work?
   * How does access from the jump box to the web servers work?
5. Identify Advantages/Disadvantages of the Solution
   * Does your solution scale?
   * Is there a better solution than a jump box?
   * What are the disadvantages of implementing a VPN that kept you from doing it this time?
   * What are the advantages of a VPN?
   * When is it appropriate to use a VPN?

**Question 2: Corporate VPN**

What are the advantages and disadvantages of using a corporate VPN, and under what circumstances is using one appropriate?

1. Restate the Problem
2. Provide a Concrete Example Scenario
   * In Project 1, which VMs did you have on the network?
   * Which tools did you use to control access to and from the network?
   * If you didn't use a VPN, what did you use?
   * What disadvantage(s) did your non-VPN solution have?
   * What advantage(s) did your non-VPN solution have?
3. Explain the Solution Requirements
   * Would a VPN meet the access control requirements you had for Project 1?
   * How would a VPN protect the network just as well, or better, than your current solution?
4. Explain the Solution Details
   * Which Azure tools would you use to implement a VPN to your Project 1 network?
   * How would you onboard users to the new VPN system?
5. Identify Advantages and Disadvantages of the Solution
   * In Project 1, would a VPN have been an appropriate access control solution?
   * Under what circumstances is a VPN a good solution?
   * When, if ever, is a VPN "overkill"?

**Question 3: Containers**

When is it appropriate to use containers in cloud deployments, and what are the security benefits of doing so?

1. Restate the Problem
2. Provide a Concrete Example Scenario
   * In Project 1, when did you use containers?
   * What did you use containers for?
3. Explain the Solution Requirements
   * Why was this an appropriate use for containers?
   * What security benefits did you expect from using containers?
4. Explain the Solution Details
   * In Project 1, how did you configure VMs to be able to run containers?
   * How did you select and install the correct container?
   * How did you verify that it was running correctly?
5. Identify Advantages/Disadvantages of the Solution
   * How would you have achieved the same thing without containers?
   * What are the advantages to doing it without containers?
   * What are the disadvantages?

**Question 4: Cloud Infrastructure as Code**

What are the security benefits of defining cloud infrastructure as code?

1. Restate the Problem
2. Provide a Concrete Example Scenario
   * In Project 1, when did you use infrastructure as code (IaC)?
   * What tool did you use?
   * What did you use it to do?
3. Explain the Solution Requirements
   * Were there any alternatives to IaC?
   * What benefits does IaC have over alternative approaches?
4. Explain the Solution Details
   * In Project 1, which specific configurations did your IaC set up?
   * How did you run and test these configurations?
5. Identify Advantages/Disadvantages of the Solution
   * Are there any disadvantages to using IaC over the "traditional" approach?

**Domain: Logging and Monitoring**

**Question 1: Setting Alerts in a New Monitoring System**

How do you determine which alerts to set in a new monitoring system?

Note: In Project 1, you did not set up any alerts. However, you still have enough experience to answer this question.

1. Restate the Problem
2. Provide a Concrete Example Scenario
   * Describe the network you built for Project 1. Identify the VMs on the network and what they do.
   * Which VMs should be publicly accessible?
   * Which VMs should not be publicly accessible?
3. Explain the Solution Requirements
   * Consider the VMs that should not be publicly accessible from the internet. Which alert(s) should these VMs fire and when?
   * Why should these VMs be associated with these alerts?
4. Explain the Solution Details
   * Which tool in Project 1 would you use to set such an alert?
   * What would the alert rule be? For example, would the alert fire upon a failed SSH attempt or a ping request?
5. Identify Advantages and Disadvantages
   * Are there any malicious circumstances that the alert(s) discussed above do not address?

**Question 2: Challenges of Collecting Large Amounts of Log Data**

What are the challenges of collecting huge amounts of log data? How do security analysts deal with them?

1. Restate the Problem
2. Provide a Concrete Example Scenario
   * In Project 1, when did you deal with log data?
   * What kind(s) of data did you investigate?
   * How much data were you dealing with?
   * What were you looking for?
3. Explain the Solution Requirements
   * What information did you need to find what you were looking for?
   * What does an analyst need to analyze large amounts of log data to find this information?
   * In Project 1, what tools did you use to analyze log data?
4. Explain the Solution Details
   * How did you use these tools to find the log data? E.g., which charts, graphs, etc. were useful for parsing the logs?
5. Identify Advantages and Disadvantages of the Solution
   * What kinds of data did you not inspect during Project 1?
   * Would having access to this additional data have changed your process or conclusions? If so, how?

**Question 3: Escalating Security Events**

How do you determine if a security event or alert is important enough for escalation?

1. Restate the Problem
2. Provide a Concrete Example Scenario
   * What kinds of events and alerts did you encounter in Project 1?
   * Which of these events was most interesting or suspicious?
   * Why was the event suspicious? What led you to investigate it?
3. Explain the Solution Requirements
   * What do you need to figure out in order to determine if this event is worth escalating?
4. Explain the Solution Details
   * How did you use Kibana to find this information?
5. Identify Advantages and Disadvantages of the Solution
   * How confident are you in your conclusion?
   * What additional data would be useful to determine if your conclusions are correct?

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