



# CAS-003<sup>Q&As</sup>

CompTIA Advanced Security Practitioner (CASP+)

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### QUESTION 1

An educational institution would like to make computer labs available to remote students. The labs are used for various IT networking, security, and programming courses. The requirements are:

Each lab must be on a separate network segment.

Labs must have access to the Internet, but not other lab networks.

Student devices must have network access, not simple access to hosts on the lab networks.

Students must have a private certificate installed before gaining access.

Servers must have a private certificate installed locally to provide assurance to the students.

All students must use the same VPN connection profile.

Which of the following components should be used to achieve the design in conjunction with directory services?

- A. L2TP VPN over TLS for remote connectivity, SAML for federated authentication, firewalls between each lab segment
- B. SSL VPN for remote connectivity, directory services groups for each lab group, ACLs on routing equipment
- C. IPSec VPN with mutual authentication for remote connectivity, RADIUS for authentication, ACLs on network equipment
- D. Cloud service remote access tool for remote connectivity, OAuth for authentication, ACL on routing equipment

Correct Answer: C

IPSec VPN with mutual authentication meets the certificates requirements.

RADIUS can be used with the directory service for the user authentication.

ACLs (access control lists) are the best solution for restricting access to network hosts.

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### QUESTION 2

A systems administrator has installed a disk wiping utility on all computers across the organization and configured it to perform a seven-pass wipe and an additional pass to overwrite the disk with zeros. The company has also instituted a policy that requires users to erase files containing sensitive information when they are no longer needed.

To ensure the process provides the intended results, an auditor reviews the following content from a randomly selected decommissioned hard disk:





E. Restrict/disable TELNET access to network resources

F. Perform vulnerability scanning on a daily basis

G. Restrict/disable USB access

Correct Answer: DG

A rootkit is a collection of computer software, typically malicious, designed to enable access to a computer or areas of its software that would not otherwise be allowed (for example, to an unauthorized user) while at the same time masking its existence or the existence of other software. A bootkit is similar to a rootkit except the malware infects the master boot record on a hard disk. Malicious software such as bootkits or rootkits typically require administrative privileges to be installed.

Therefore, one method of preventing such attacks is to remove administrative access for local users.

A common source of malware infections is portable USB flash drives. The flash drives are often plugged into less secure computers such as a user's home computer and then taken to work and plugged in to a work computer. We can prevent this from happening by restricting or disabling access to USB devices.

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#### QUESTION 4

##### SIMULATION

A product development team has submitted code snippets for review prior to release INSTRUCTIONS.

Analyze the code snippets and then select one vulnerability and one fix for each code snippet. If at any time you would like to bang back the initial state of the simulation, please click the Reset All button.



Code Snippet 1

```
Web browser:
URL: https://comptia.org/profiles/userdetails?userid=103

Web server code:
--
String accountQuery = "SELECT * from users WHERE userid = ?";
PreparedStatement stmt = connection.prepareStatement (accountQuery);
stmt.setString(1, request.getParameter("userid"));
ResultSet queryResponse = stmt.executeQuery();
--
```

Vulnerability 1

- ☐ Server-side request forgery
- ☐ Cross-site scripting
- ☐ Cross-request request forgery
- ☐ Indirect object reference
- ☐ SQL injection

Fix 1

- ☐ Implement anti-forgery tokens.
- ☐ Perform output encoding of queryResponse.
- ☐ Ensure userid belongs to logged-in user.
- ☐ Inspect URLs and disallow arbitrary requests.
- ☐ Perform input sanitization of the userid field.

Code Snippet 2

```
Caller:
URL: https://comptia.org/api/userprofile?userid=103

API endpoint (/searchDirectory):
...
import subprocess
from http.server import HTTPServer, BaseHTTPRequestHandler
httpd = HTTPServer(('192.168.0.5', 8443), BaseHTTPRequestHandler)
httpd.serve_forever()

def get_request(request):
    userId = request.getParam(userid)

ldapLookup = 'ldapsearch -D "cn' + userId + '" -W -p 389'
               -h loginserver.comptia.org
               -b "dc=comptia,dc=org" -s sub -x "(objectclass=)"'
accountLookup = subprocess.Popen(ldapLookup)

if (userExists(accountLookup))
    accountFound = true
else
    accountFound = false
...
```

Vulnerability 2

- ☐ Command injection
- ☐ SQL injection
- ☐ Authorization bypass
- ☐ Denial of service
- ☐ Credentials passed via GET

Fix 2

- ☐ Implement prepared statements and bind variables.
- ☐ HTTP POST should be used for sensitive parameters.
- ☐ Perform input sanitization of the userid field.
- ☐ Prevent the "authenticated" value from being overridden by a GET parameter.
- ☐ Remove the serve\_forever instruction.



A. Check the answer in explanation below.

Correct Answer: A

### Vulnerability 1

- ☐ Server-side request forgery
- ☐ Cross-site scripting
- ☐ Cross-request request forgery
- ☐ Indirect object reference
- ☒ SQL injection

### Fix 1

- ☐ Implement anti-forgery tokens.
- ☐ Perform output encoding of `queryResponse`.
- ☐ Ensure `userid` belongs to logged-in user.
- ☐ Inspect URLs and disallow arbitrary requests.
- ☒ Perform input sanitization of the `userid` field.



#### Vulnerability 2

- ☐ Command injection
- ☐ SQL injection
- ☐ Authorization bypass
- ☐ Denial of service
- ☒ Credentials passed via GET

#### Fix 2

- ☐ Implement prepared statements and bind variables.
- ☐ HTTP POST should be used for sensitive parameters.
- ☐ Perform input sanitization of the `userid` field.
- ☒ Prevent the "authenticated" value from being overridden by a GET parameter.
- ☐ Remove the `serve_forever` instruction.



**QUESTION 5**

Company A has noticed abnormal behavior targeting their SQL server on the network from a rogue IP address. The company uses the following internal IP address ranges: 192.10.1.0/24 for the corporate site and 192.10.2.0/24 for the remote

site. The Telco router interface uses the 192.10.5.0/30 IP range.

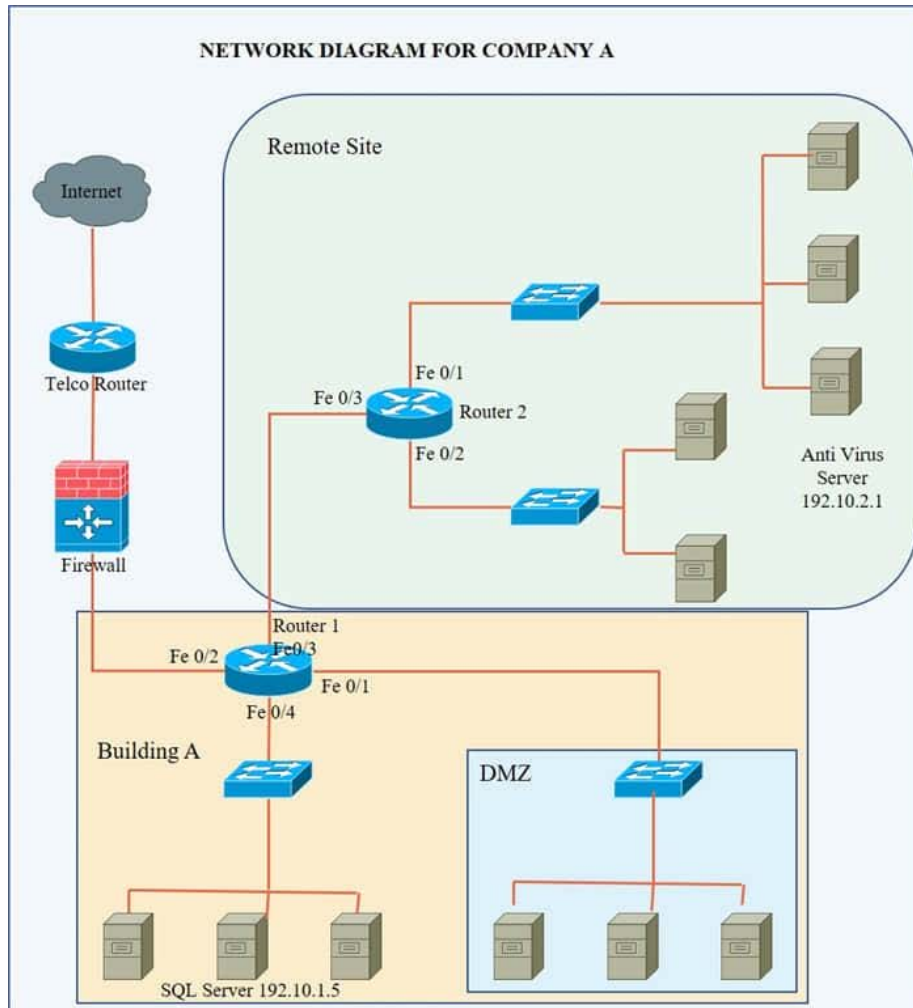
Instructions: Click on the simulation button to refer to the Network Diagram for Company A.

Click on Router 1, Router 2, and the Firewall to evaluate and configure each device.

Task 1: Display and examine the logs and status of Router 1, Router 2, and Firewall interfaces.

Task 2: Reconfigure the appropriate devices to prevent the attacks from continuing to target the SQL server and other servers on the corporate network.





## Log

## Command Prompt

Router1

```
*Jul 15 10:47:27: %FW-6-OMOT: Firewall inspection startup completed;
beginning operation.
*Jul 15 14:47:29:775:%Router1:ICMP Echo Request - from 192.10.3.204 to 192.10.1.5
*Jul 15 14:47:29:776:%Router1:list 101 permitted icmp 192.10.3.204(FastEthernet0/3)->
192.10.1.5, 6 packets.
*Jul 15 09:47:32: %SYS-6-CLOCKUPDATE: System clock has been updated from
14:47:32 UTC Sun Jul 15 2007 to 09:47:32 EST Sun Jul 15 2007, configured
from console by console.
*Jul 15 14:47:29:779:%Router1: list 101 permitted tcp 192.10.3.204(57222)(FastEthernet0/3
)->192.10.1.5(80), 3 packets.
```

## Log

## Command Prompt

Router2

```
*Jul 15 10:47:27: %FW-6-INIT: Firewall inspection startup completed;
beginning operation.
*Jul 15 14:47:29:777:%Router2:ICMP Echo Request - from 192.10.3.254 to 192.10.2.1
*Jul 15 14:47:29:778:%Router2:list 101 permitted icmp 192.10.3.254(FastEthernet0/2)->
192.10.2.1, 5 packets.
*Jul 15 09:47:32: %SYS-6-CLOCKUPDATE: System clock has been updated from
14:47:32 UTC Sun Jul 15 2007 to 09:47:32 EST Sun Jul 15 2007, configured
from console by console.
*Jul 15 14:47:29:779:%Router2: list 101 permitted tcp 192.10.3.254(35650)(FastEthernet0/2
)->192.10.2.1(80), 2 packets.
```



Hot Area:

FIREWALL ACCESS CONTROL LIST(ACL)			
Source Address	Destination Address	Deny	Allow
0.0.0.0	192.10.0.0/30		
0.0.0.0	192.10.0.0/24		
192.10.3.0/24	192.10.1.0/24		
192.10.3.0/24	192.10.2.0/24		
192.10.4.0/24	192.10.0.0/16		
0.0.0.0	192.10.4.0/29		
0.0.0.0	192.100.3.0/24		
192.10.5.0/30	192.10.0.0/16		
192.10.5.0/30	192.10.1.0/24		
192.10.5.0/30	192.10.2.0/24		
IP Any	IP Any		
Reset ACL		Save	Exit

Correct Answer:



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We have traffic coming from two rogue IP addresses: 192.10.3.204 and 192.10.3.254 (both in the 192.10.30.0/24 subnet) going to IPs in the corporate site subnet (192.10.1.0/24) and the remote site subnet (192.10.2.0/24). We need to Deny (block) this traffic at the firewall by ticking the following two checkboxes:



## FIREWALL ACCESS CONTROL LIST(ACL)

Source Address	Destination Address	Deny	Allow
0.0.0.0	192.10.0.0/30	✓	
0.0.0.0	192.10.0.0/24		✓
192.10.3.0/24	192.10.1.0/24		✓
192.10.3.0/24	192.10.2.0/24		✓
192.10.4.0/24	192.10.0.0/16		✓
0.0.0.0	192.10.4.0/29		✓
0.0.0.0	192.100.3.0/24	✓	
192.10.5.0/30	192.10.0.0/16		✓
192.10.5.0/30	192.10.1.0/24		✓
192.10.5.0/30	192.10.2.0/24		✓
IP Any	IP Any	✓	

Reset ACL

Save

Exit

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