Cybersecurity Incident Report

Section 1: Identify the type of attack that may have caused this network interruption
One potential explanation for the website's connection timeout error message is: server takes too long to respond due to high traffic caused by the repeated requests of SYN packets from the attacker's IP address. The logs show that: The logs show that the attacker with IP address 203.0.113.0 started attacking around time 3.39 seconds. In just a few seconds, the attacker has requested many SYN packets, causing errors and communication failure between the web server and legitimate employees. This event is suspected to be a SYN flood DoS-attack as seen by the number of SYN packets requested by the same IP address repeatedly. We are currently trying to resolve the problem and stopping the attacker from causing more damage to the server.

Section 2: Explain how the attack is causing the website to malfunction

When website visitors try to establish a connection with the web server, a three-way handshake occurs using the TCP protocol. Explain the three steps of the handshake:

1. The syn packet, which stands for “Synchronize” is requested when an employee visitor accesses the web page.
2. The web server responses to the visitor’s request with a SYN, ACK packet, which stands for “Synchronize, Acknowledge”. The destination will reserve resources for the source to connect.
3. The visitor’s machine responds with an ACK packet to acknowledge the permission to connect.

Explain what happens when a malicious actor sends a large number of SYN packets all at once:

The server becomes slower in responding as there are too much SYN packets to handle, leading to timeout error message that will appear on a user trying to access the web server

Explain what the logs indicate and how that affects the server:

The logs represent server interactions with users or visitors. The logs shows that the server is overwhelmed, thus unable to process SYN requests by visitors.

Color as text	No.	Time	Source (x = redacted)	Destination (x = redacted)	Protocol	Info
red	52	3.390692	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
red	53	3.441926	192.0.2.1	203.0.113.0	TCP	443->54770 [SYN, ACK] Seq=0 Win-5792 Len=120...
red	54	3.493160	203.0.113.0	192.0.2.1	TCP	54770->443 [ACK Seq=1 Win=5792 Len=0...
green	55	3.544394	198.51.100.14	192.0.2.1	TCP	14785->443 [SYN] Seq=0 Win-5792 Len=120...
green	56	3.599628	192.0.2.1	198.51.100.14	TCP	443->14785 [SYN, ACK] Seq=0 Win-5792 Len=120...
red	57	3.664863	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
green	58	3.730097	198.51.100.14	192.0.2.1	TCP	14785->443 [ACK] Seq=1 Win-5792 Len=120...
red	59	3.795332	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win-5792 Len=120...
green	60	3.860567	198.51.100.14	192.0.2.1	HTTP	GET /sales.html HTTP/1.1
red	61	3.939499	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win-5792 Len=120...
green	62	4.018431	192.0.2.1	198.51.100.14	HTTP	HTTP/1.1 200 OK (text/html)

Color as text	No.	Time	Source	Destination	Protocol	Info
green	63	4.097363	198.51.100.5	192.0.2.1	TCP	33638->443 [SYN] Seq=0 Win=5792 Len=120...
red	64	4.176295	192.0.2.1	203.0.113.0	TCP	443->54770 [SYN, ACK] Seq=0 Win=5792 Len=120...
green	65	4.255227	192.0.2.1	198.51.100.5	TCP	443->33638 [SYN, ACK] Seq=0 Win=5792 Len=120...
red	66	4.256159	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
green	67	5.235091	198.51.100.5	192.0.2.1	TCP	33638->443 [ACK] Seq=1 Win=5792 Len=120...
red	68	5.236023	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
green	69	5.236955	198.51.100.16	192.0.2.1	TCP	32641->443 [SYN] Seq=0 Win=5792 Len=120...
red	70	5.237887	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
green	71	6.228728	198.51.100.5	192.0.2.1	HTTP	GET /sales.html HTTP/1.1
red	72	6.229638	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
yellow	73	6.230548	192.0.2.1	198.51.100.16	TCP	443->32641 [RST, ACK] Seq=0 Win=5792 Len=120...
red	74	6.330539	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
green	75	6.330885	198.51.100.7	192.0.2.1	TCP	42584->443 [SYN] Seq=0 Win=5792 Len=0...
red	76	6.331231	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
yellow	77	7.330577	192.0.2.1	198.51.100.5	TCP	HTTP/1.1 504 Gateway Time-out (text/html)
red	78	7.331323	203.0.113.0	192.0.2.1	TCP	54770->443 [SYN] Seq=0 Win=5792 Len=0...
green	79	7.340768	198.51.100.22	192.0.2.1	TCP	6345->443 [SYN] Seq=0 Win=5792 Len=0...
yellow	80	7.340773	192.0.2.1	198.51.100.7	TCP	443->42584 [RST, ACK] Seq=1 Win=5792 Len=120...

Red = attacker's logs
Green = normal employee logs
Yellow = normal employee logs but with errors