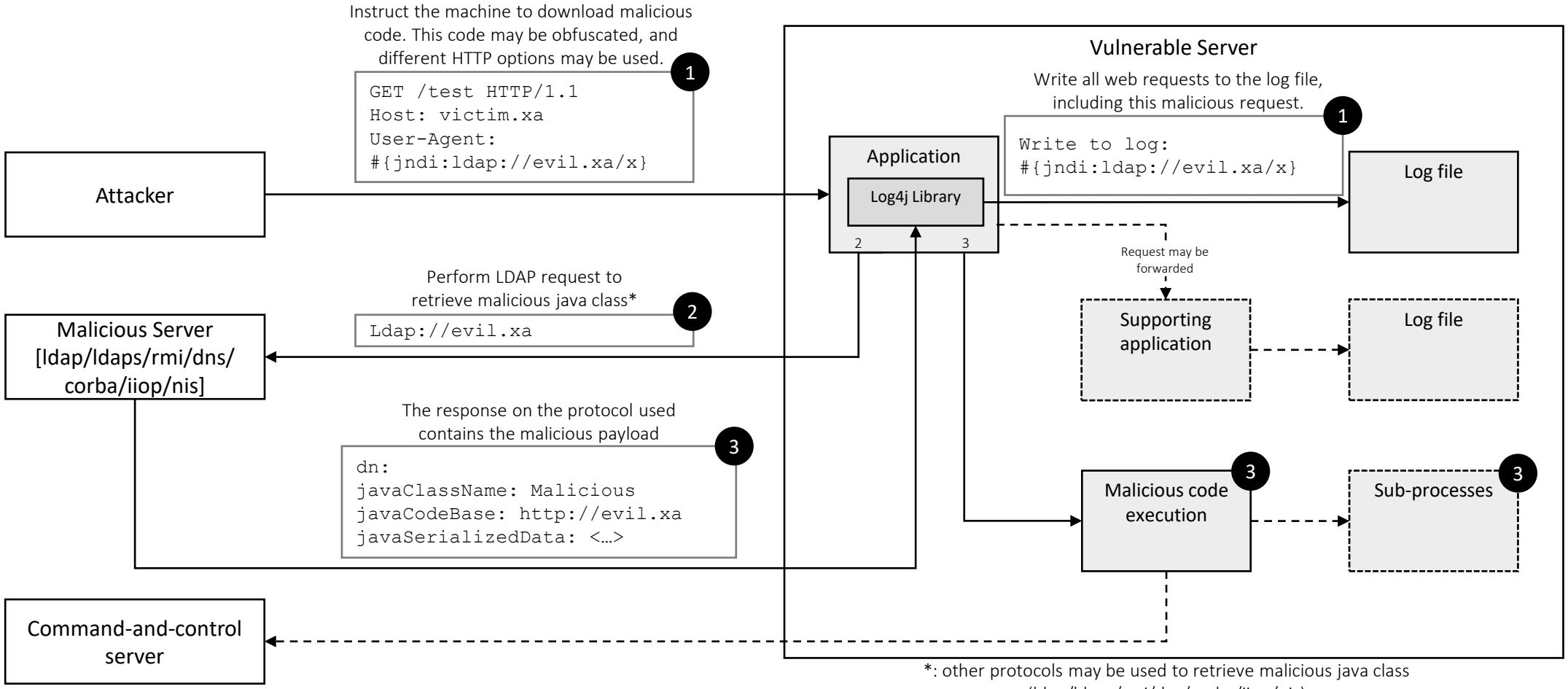
Detection Guidance: log4j CVE-2021-44228



1. Identify who is scanning the environment for vulnerable machines.
2. Identify if a vulnerable application has attempted to retrieve the malicious code for potential execution
3. Download of the malicious code and execution of the malicious code on the vulnerable machine.

Credits to GovCERT.ch for the description of the log4j JNDI attack

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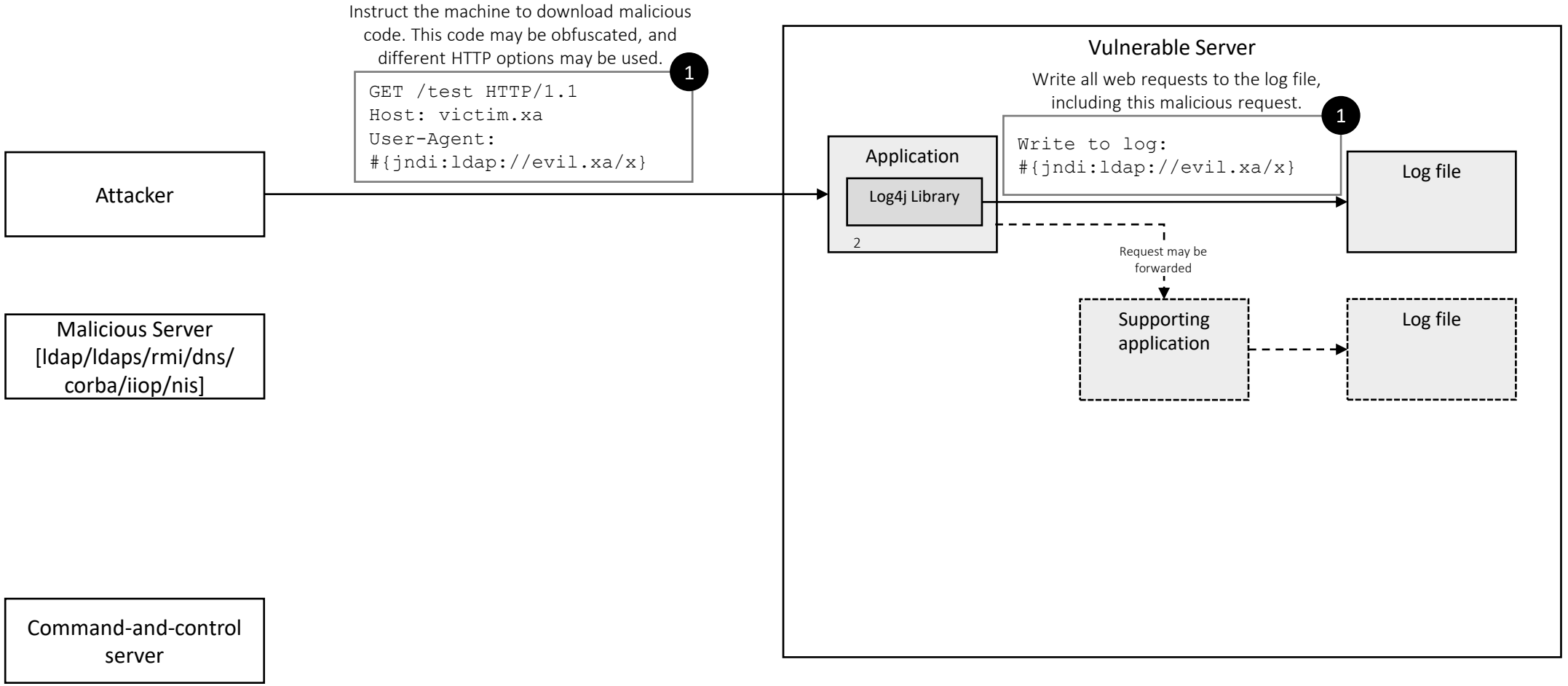

1	Identify who is scanning the environment for vulnerable machines.	
Detection	Logs	Conclusion on a hit
• Scan inbound requests in the proxy/firewall/load balancer logs. • Investigate the application logs to determine web requests which contain indicators of scanning attempts. • Identify the source and protocol used by the attack.	• Web proxy (inbound) • Firewall (inbound) • Web application firewall (inbound) • Load balancer (inbound) • IDS/IPS (across the network) • Application logs (java) (inbound) • IP addresses of attackers which are known to actively exploit the vulnerability (enrichment)	Somebody has scanned your asset to identify if it is vulnerable.

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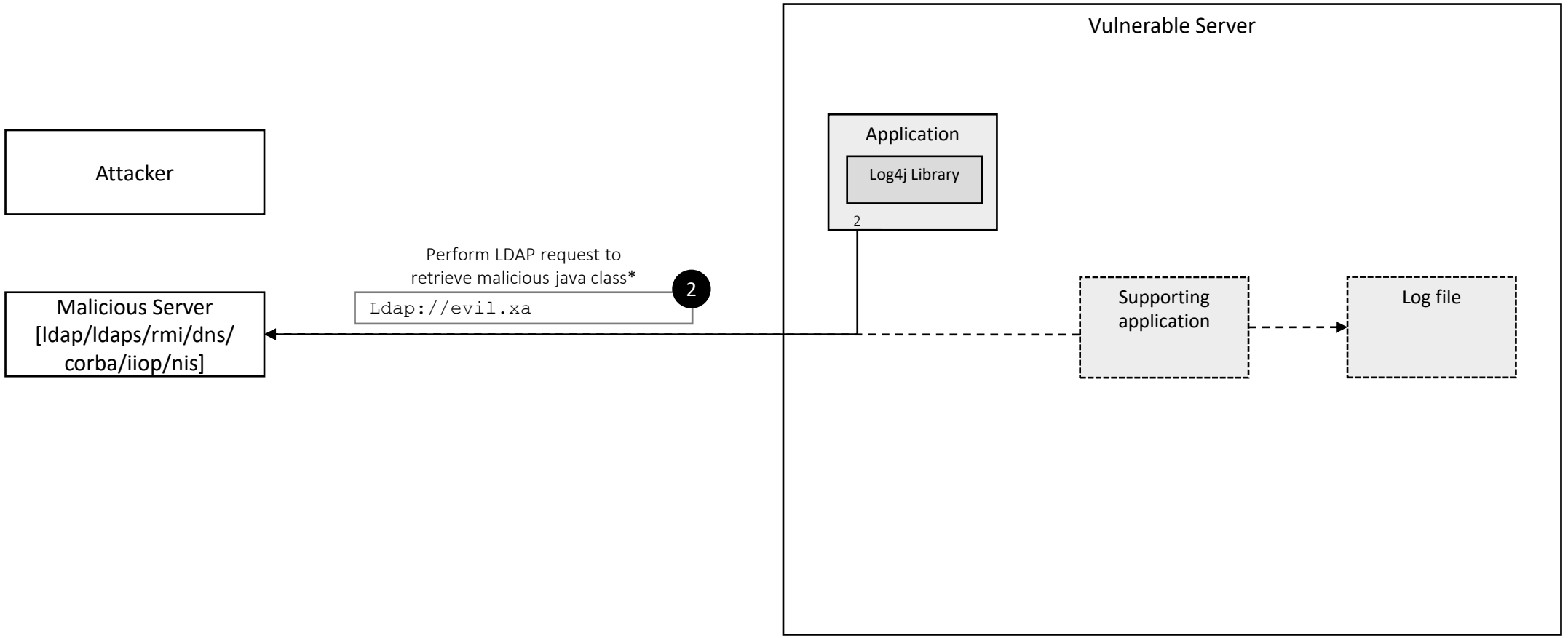

*: other protocols may be used to retrieve malicious java class
(ldap/ldaps/rmi/dns/corba/iiop/nis)

2 Identify if a vulnerable application has attempted to retrieve the malicious code for potential execution		
Detection	Logs	Conclusion on a hit
• Identify whether the outbound request has been blocked or allowed. • Identify the source IP of the attack and determine if the IP is known to present a malicious payload to execute code or if the IP has been used to scan for vulnerabilities to obtain risk context.	• Web proxy (outbound) • Firewall (outbound) • Load balancer (outbound) • IDS/IPS (across the network) • IP addresses of attackers which are known to actively exploit the vulnerability (enrichment)	The targeted application is vulnerable and has contacted the remote server to download a payload. You still need to verify whether this was a scan from a benign actor or an actual attack, by verifying whether a malicious payload was retrieved to the application's host

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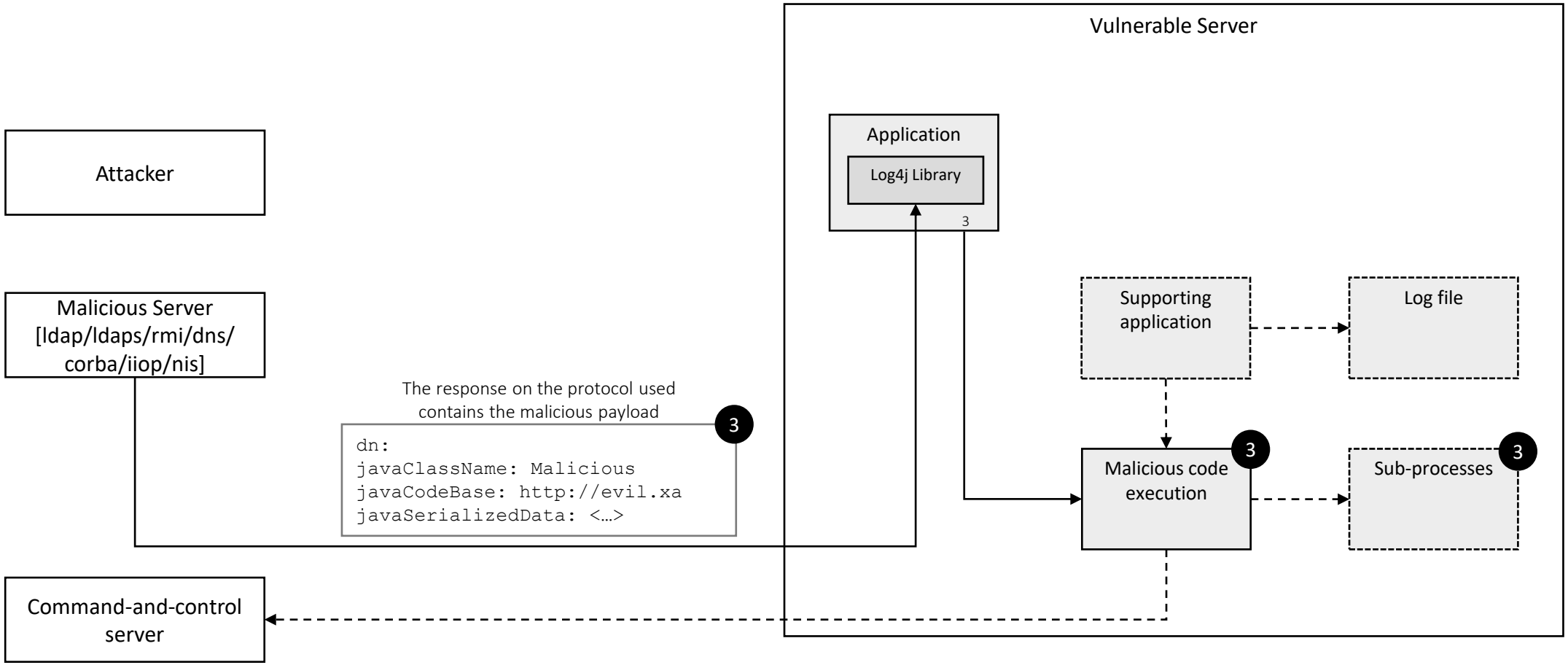

3	Download of the malicious code and execution of the malicious code on the vulnerable machine.	
Detection	Logs	Conclusion on a hit
• Identify if the malicious payload has passed any network device (proxy, firewall, load balancer, IDS/IPS). • Investigate the local machine if the server process has initiated any new child processes which show signs of malicious intent. • Generic signs of command-and-control or beaconing traffic	• Web proxy (inbound) • Firewall (inbound) • Load balancer (inbound) • IDS/IPS (across the network) • Application logs (java) (inbound) • Machine logs (Sysmon/security logs) • Process monitoring	The targeted application has downloaded the malicious payload. Execution of the payload can be identified through host-based process monitoring and forensic analysis.

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