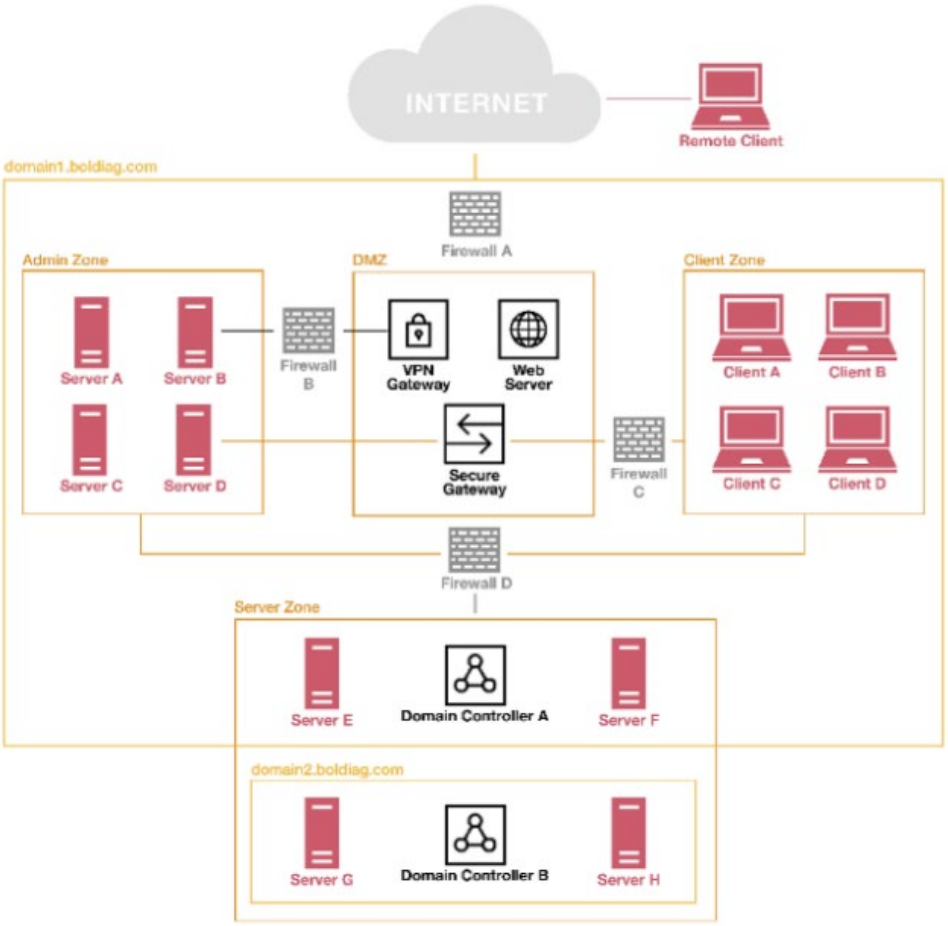
Network Segmentation

● Network segmentation enhances security by dividing a network into isolated subnetworks, limiting the impact of attacks and aiding in IAM implementation through Access Control Lists.

● Firewall configurations can be set to blacklist suspicious IP addresses, whitelist specific IP ranges, and control communication between different network zones.

● Suggested configurations include blacklisting suspicious IPs, whitelisting IPs from DMZ and Server Zone, allowing communication between Admin Zone, Server Zone, and DMZ, and permitting communication between Admin Zone and Client Zone.



The network segmentation not only logically groups cohesive systems into one zone but also creates secure passages between them. Every internal firewall works as check point, where a packet is challenged for its legitimacy which makes lateral movement much harder. The current trend is going more and more into a micro segmentation of networks where the zones are broken down as far as it makes sense. It is also called a Zero Trust Architecture, because at every internal firewall the traffic is verified and not blindly trusted just because it's internal. However, the firewalls allow for the configured protocols to pass through to the next zone. If for example the Domain Controller A was compromised, the attacker could use whitelisted, standard protocols to compromise more servers with very few indicators.

Configurations for Firewalls

Firewall A: Blacklist suspicious IP addresses, those raise flags in the systems or have attempted DDoS the company.

- Open configuration, DMZ needs to allow most of the external access. **Blacklisting**

Firewall B: Whitelist only IP addresses of devices from VPN Gateway.

- VPN Gateway: Inbound: Allow VPN connections from external users. Outbound: Allow: VPN traffic to Admin Zone Deny: Direct Internet access from the VPN Gateway to ensure all traffic is routed through the firewall for monitoring
- Web Server: Outbound (to Admin Zone): Deny: Direct access from the web server to the Admin Zone should be denied as we need to avoid un-monitoring traffic.
- Very tight configuration. Only allows services needed and the rules are regularly challenged. In this case, the VPN service would be allowed. **Whitelisting**

Firewall C: Only allow communications from Admin Zone and Client Zone through the Secure Gateway: Whitelist IP addresses from the Client Zone to DMZ Whitelist IP addresses from the DMZ to Client Zone.

- Very tight configuration allows HTTP traffic going through secure gateway only. **Whitelisting**

Firewall D: Only allow communications between the Admin Zone, Server Zone and Server Zone. **From Admin Zone**: Inbound: Allow communications from Client Zone and Server Zones. IP addresses from these two zones can be whitelisted Outbound: Allow traffics to Server Zone and Client Zones (Depending on the usage, we may specify protocols)

- **From Client Zone**: Inbound: whitelist IP addresses from Admin Zone and Server Zone Outbound: whitelist IP addresses from Admin Zone and Server Zone
- **From Server Zone**: Inbound: whitelist IP addresses from Admin Zone and Client Zone Outbound: whitelist IP addresses from Admin Zone and Client Zone.
- Very tight configuration, due to criticality of domain controller A. **Whitelisting**