SecGuru National Security Defense Plan

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Cybersecurity Practical Applications

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Executive Summary

Purpose

Address urgent cyber threats due to rising risks to national infrastructure

Deploy full defense strategy:

1.) Cyber simulations

2.) Incident response plans

3.) Recommendations / Roadmap

The SECGURUS team executed a comprehensive, cross-functional assessment to fortify CyberDome's infrastructure.

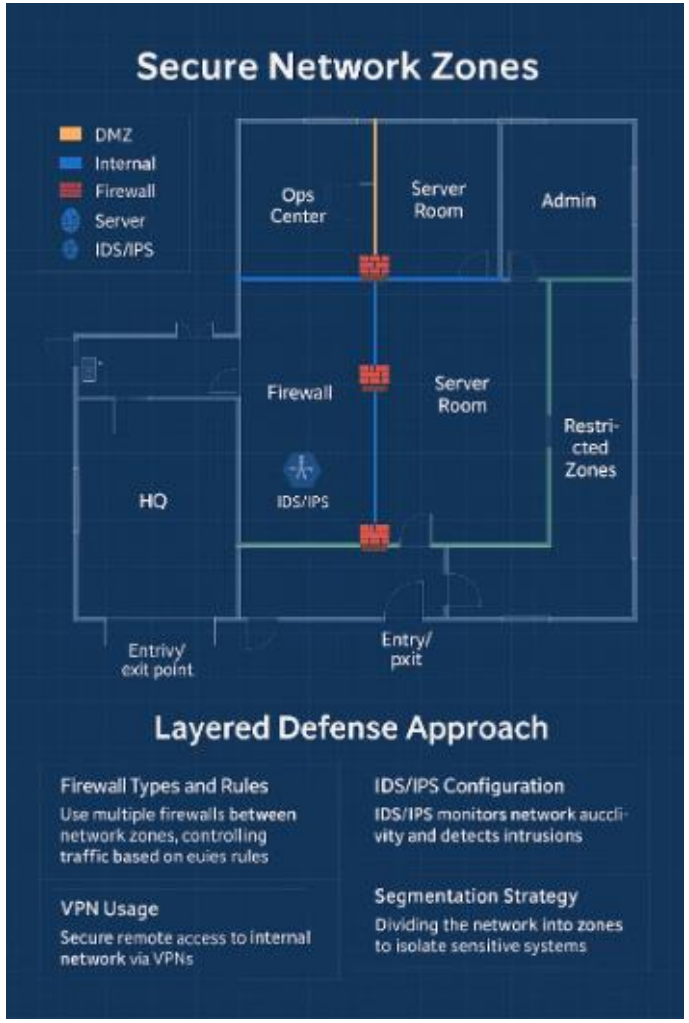
Their efforts included designing a hybrid network topology alongside a layered defense strategy, implementing role-based access control and multi-factor authentication (MFA), and developing Security Information and Event Management (SIEM) monitoring tools and incident response playbooks.

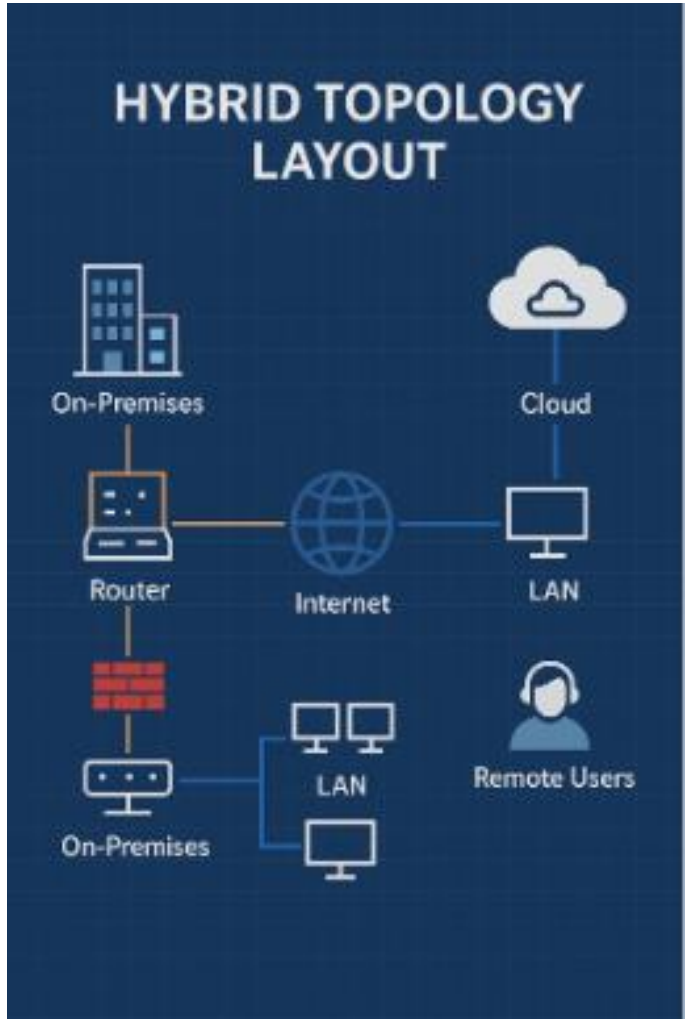
They also established business continuity and disaster recovery plans, deployed physical access controls with insider threat detection capabilities, and conducted Red vs. Blue Team simulations using MITRE techniques.

To enhance situational awareness, they integrated real-time threat intelligence and behavioral analytics into CyberDome's cybersecurity framework.

Topology & Layered Defense Strategy

- SecGuru is a hybrid network architecture combining on-premises systems, cloud infrastructure, and secure remote access. Routers, firewalls, and LAN components support connectivity and enforce perimeter security. Cloud platforms provide scalability, while VPNs ensure secure remote user access.
- The layered defense model segments the network into:
  - **DMZ** for public-facing services
  - **Internal Zone** for business operations
  - **Admin Zone** with restricted access
- Next-gen firewalls, SIEM, and IDS/IPS tools are strategically placed to monitor, detect, and respond to threats. Physical HQ security includes surveillance, entry controls, and biometric authentication. Together, these layers provide strong cyber-physical protection and limit breach impact.






SecGuru's Cybersecurity Plan

Asset Inventory

List of critical systems

- **Email server (Microsoft Exchange)**
- **Web servers, databases**
- **IoT devices**
- **VPN gateway (GlobalProtect, Fortinet)**
- **SIEM system (Splunk/Security Onion/elk slack)**
- **Database server (SQL)**
- **Secure network zones (DMZ)**
- **Entry/exit points for physical layout (HQ blueprint style)**
- **Labeled departments (Ops Center, Server Room, Restricted Zones, LAN, WAN)**
- **Switches and routers**
- **Mobile devices**
- **Generator, UPS**

Network Defense Strategy

SecGurus' defense model applies a layered, proactive approach to protect critical infrastructure. Key components include:

- **Firewalls** – Deployed at all network boundaries (DMZ, internal, admin), enforcing strict rules that block unauthorized traffic and log denied attempts.
- **IDS/IPS** – Intrusion systems detect and block suspicious behavior and threats in real time, helping stop attacks before they spread.
- **VPN Access** – Secure, encrypted tunnels for remote users with 2FA, centralized monitoring, and no split tunneling.
- **Segmentation** – The network is divided into zones (DMZ, Internal, Admin) with firewalls and RBAC to contain breaches and minimize lateral movement.

Together, these measures provide visibility, control, and rapid response to evolving threats.

Monitoring & Logging (SIEM)

splunk>

Logs that are collected:

- **System logs (OS information)**
- **Network logs (Routers, Switches, and other network devices)**
- **Application logs (Apache/Ngnix)**
- **Security logs (Firewall, IDS, IPS, EDR/Anti-virus alerts)**
- **Firewall logs**
- **Email gateway logs**

Anomalies that are monitored:

- **Multiple failed login attempts:** Possible brute-force attack
- **Unusual outbound connections:** Data-exfiltration or command and control (c2) activity
- **Unauthorized file changes:** Potential malware or Insider threat
- **Phishing or malware attachment detected:** Email gateway alert
- **Access to sensitive files outside business hours:** Insider threat or compromised credentials

Analyzed the failed login attempts with Splunk

```
1 source="*failedlogins64.csv"
2 | stats count as "Failed Login Attempts" values(IP) as "IP Addresses" by Username
3 | sort - Attempts
4 | head 5
```

Username	Failed Login Attempts	IP Addresses
ABurke	2	192.168.1.10
ACase	2	192.168.1.2
AMays	2	192.168.1.5
EChan	1	192.168.1.8
EFisher	1	192.168.1.12

Finding the malicious upload with the IP address

```
1 source="*uploadedhashes.csv" IP="192.168.1.10"
2 | table Timestamp IP Filename "File Hash" "User Agent"
```

Timestamp	IP	Filename	File Hash	User Agent
6/4/2023 17:59	192.168.1.10	EvilScript.exe	3AADBF7E527FC1A050E1C97FEA1CBA4D	Opera/75.0.3969.218

Authentication & Access Control

Multi Factor Authentication & Password Policy

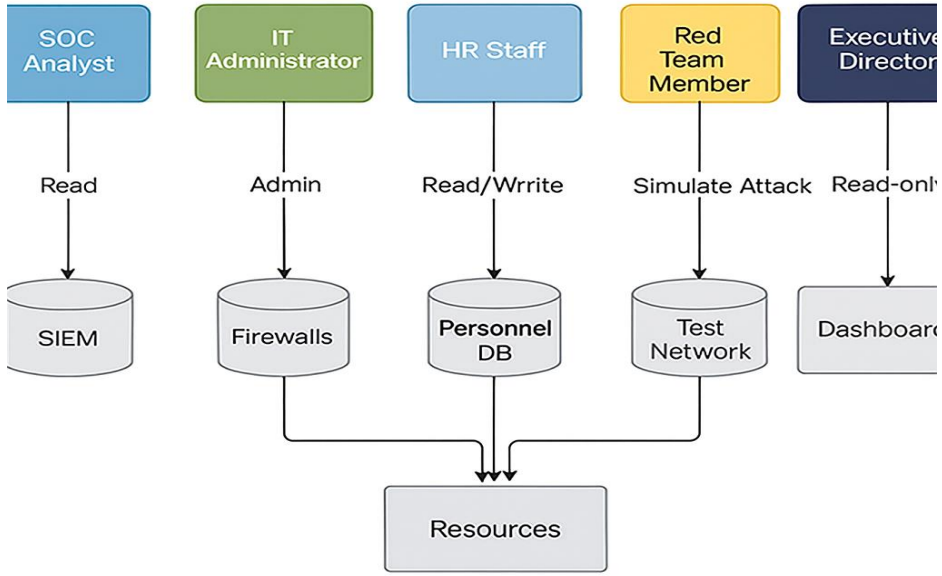
To protect SecGuru's mission-critical assets, a Zero Trust Architecture is enforced, centered around strong identity verification, least privilege, and continuous monitoring.

Password Policy

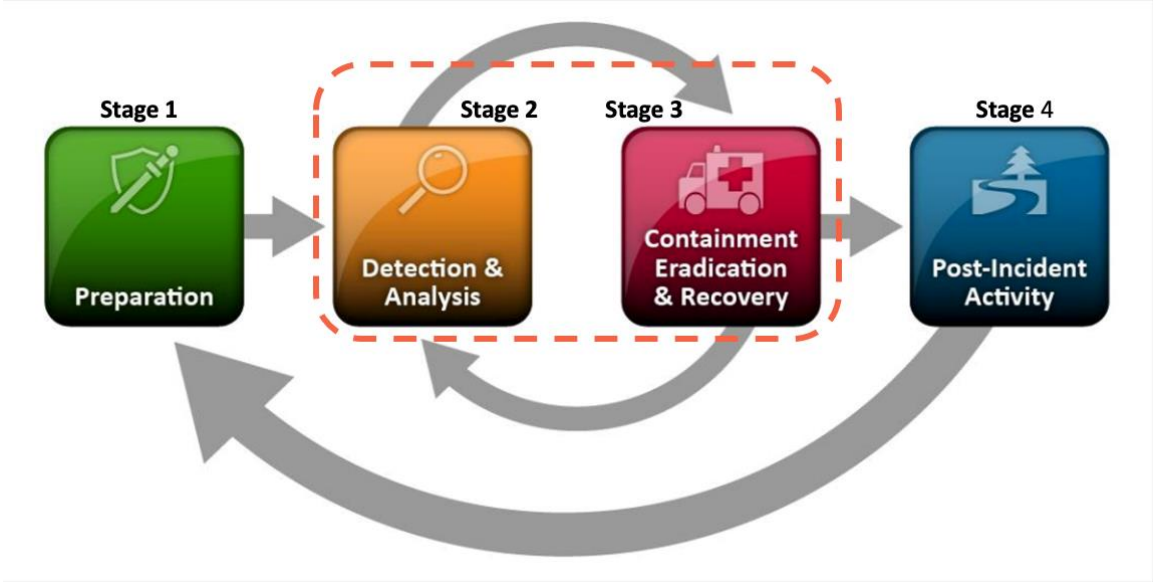
To reduce brute force and credential stuffing attacks, a **strict password policy** is enforced across all domains:

Policy Element	Value
Length	Minimum 16 characters
Complexity	Must include uppercase, lowercase, number, and special character
Expiration	Every 90 days
Reuse Restrictions	Cannot reuse any of the last 10 passwords
Storage	Passwords stored using salted SHA-512 hashes
Account Lockout	Lock account after 5 failed attempts (auto-unlock after 30 min or admin reset)
Passwordless Support	Biometrics + token-based authentication for top-clearance

Role Based Access Control (RBAC)

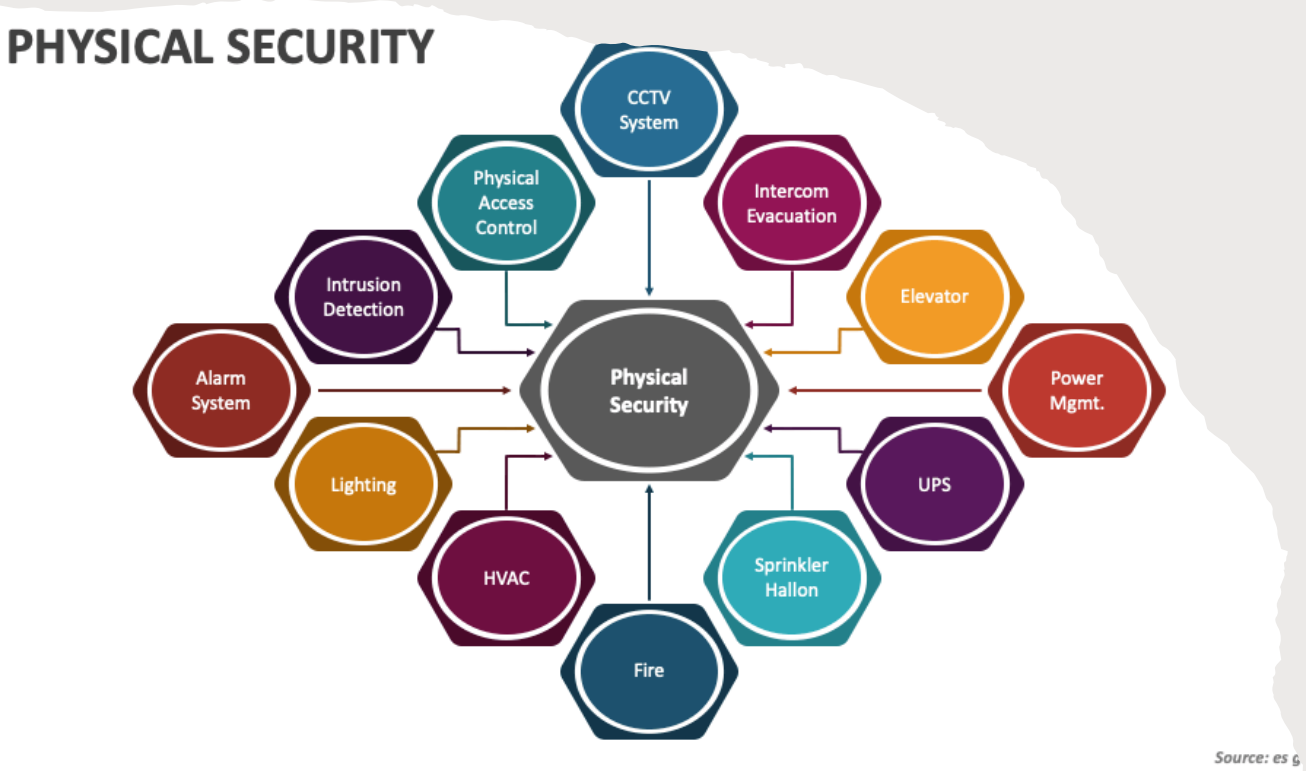


Incident Response Playbook (NIST SP 800-61)



Phrase	Objective	Key Actions (Examples)
Preparation	Build readiness	Policy team, training, tools, communication
Detection & Analysis	Identify & confirm incidents	Monitoring, alerting, analysis, reporting
Containment	Limit impact	Isolation, segmentation, stakeholder communication
Eradication	Remove cause	Malware removal, patching, vulnerability mitigation
Recovery	Restore operation	Backups, validation, monitoring, gradual restoration
Lessons Learned	Continuous improvement	Review, documentation, plan updates, awareness

Physical Security Blueprint



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SecGuru's physical security strategy protects people, assets, and infrastructure from threats like intrusion, theft, natural disasters, and sabotage. Security controls are integrated with cybersecurity to ensure operational continuity.

Core measures to access to SecGuru's HQ include:

- **Access Control** – Biometric scans, keycards, and restricted zones
- **Perimeter Defense** – Fencing, barriers, and surveillance coverage
- **Intrusion Detection** – Alarms and systems that trigger alerts in real time
- **Emergency Preparedness** – Fire, disaster, and security breach response planning
- **CPS Protection** – Securing systems that link digital controls to physical processes
- **Insider Threat Monitoring** – Behavioral analysis, role-based access, and activity logging

This convergence of cyber and physical controls ensures defense-in-depth across all facilities.

Insider Threat Mitigation Plan

SecGuru's Insider Threat Analyst plays a crucial role in safeguarding organization, including those involved in National Cyber Defense and Facility Security.

- Threat Detection and Analysis: analyze data, identify threats, and suspicious behavior.
- Investigation and Response: determine root cause and implement appropriate response actions.
- Program Development and Enhancement: develop and recommend improvements based on metrics and reporting.
- Collaboration: here, teams played crucial role among themself to ensure the insider threat program aligns with organizational goals and compliance requirements.
- Reporting: prepare and present analysis and findings to stakeholders, including government leads and managers.

- SecGuru's Insider Threat in these fields combines technical expertise with investigative skills to protect sensitive information, systems, and facilities from threats originating from within the organization. SecGuru's used the following tools: Coralogix, Wazuh, OSSEC, Anodot for real time detection which analyze data in real-time and flag anomalies, which could indicate errors, fraud, or other critical situations. SecGuru's performed regular training to all users.

Threat Intelligence Integration

Sources of Threat Intelligence

- SecGuru leverages open-source threat intelligence sources, tailored for critical infrastructure protection:

Open-Source Threat Intelligence (OSINT) & Community Platforms:

- AlienVault Open Threat Exchange (OTX): A community-powered threat intelligence platform where security professionals share threat data, enabling collaborative research and rapid dissemination of IoCs (IPs, domains, file hashes, URLs). We integrate OTX pulses directly into our SIEM and other security tools.
- MISP (Malware Information Sharing Platform): Used for sharing, storing, and correlating threat information, including IoCs, malware samples, and attack patterns. MISP facilitates structured information exchange within our organization and with trusted partners.
- VirusTotal: For analyzing suspicious files and URLs, providing insights into known malware signatures and detection rates across various antivirus engines.
- SANS Internet Storm Center (ISC): Provides daily insights into internet threats and vulnerabilities.
- Threat Intelligence Blogs & Research Papers: Monitoring reputable cybersecurity blogs (e.g., from major security vendors, independent researchers) and academic research for emerging threats and vulnerabilities.

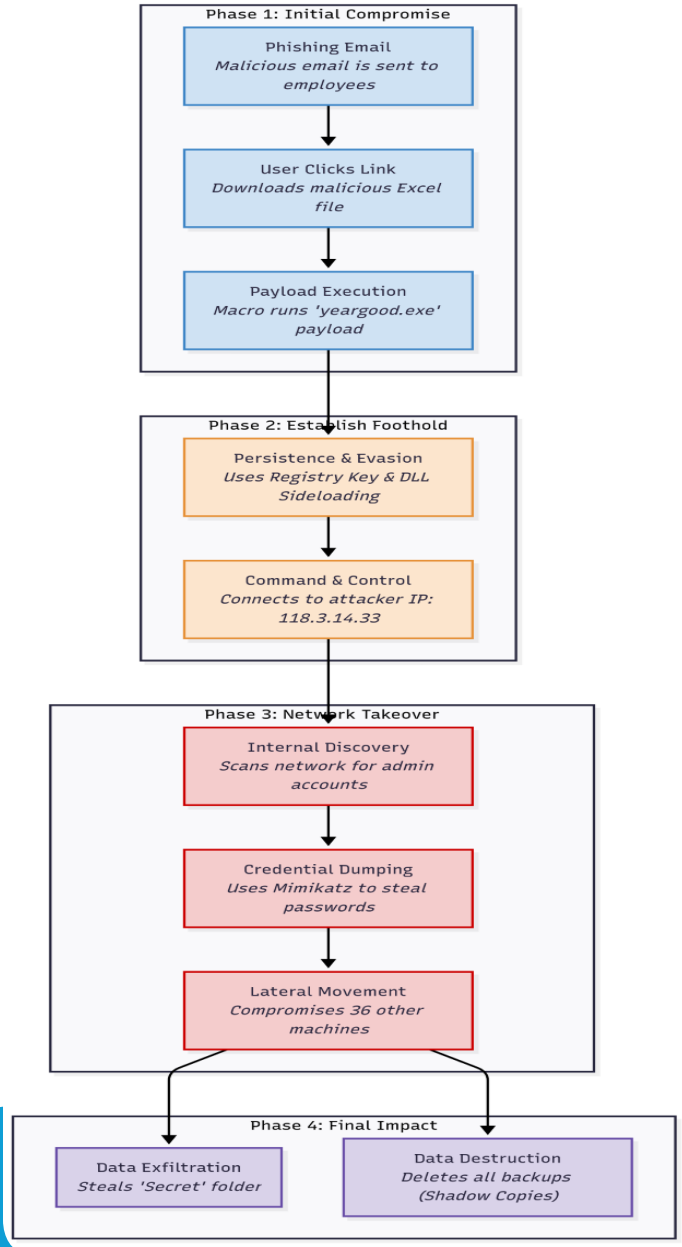
Examples of Threat Alerts

ICS/SCADA Vulnerability (e.g., Log4Shell)

Source: CISA + Commercial Feeds (Recorded Future)

Action Taken:

- Asset Identification → Segmentation → Patching
- IoC Hunting via SIEM/EDR
- Firewall/IPS Updates
- Internal & Partner Dissemination (AIS, TLP protocols)



Red Team / Blue Team Exercise Report

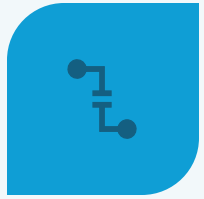
- Red Team / Blue Team Exercise
- A simulated multi-stage attack tested SecGuru's defenses against realistic threats like credential theft, data exfiltration, and persistence. The scenario used phishing, macro payloads, DLL sideloading, and command-and-control (C2) communications to emulate an advanced intrusion.
- **Red Team Tactics (MITRE-aligned):**
  - **Phishing via malicious Excel attachments**
  - **Macro execution and persistence via registry keys**
  - **DLL sideloading for evasion**
  - **Credential dumping with Mimikatz**
  - **Lateral movement through RDP**
  - **Data destruction and outbound C2 traffic**
- **Blue Team Response:**
  - **Detected key indicators via SIEM, endpoint monitoring, and network analysis**
  - **Flagged macro activity, DLL hashes, and unauthorized memory access**
  - **Isolated affected hosts and triggered containment playbooks**
- **Key Gaps Identified:**
  - **Phishing bypassed email filters**
  - **No MFA on privileged accounts**
  - **Excessive user privileges enabled compromise**
  - **C2 traffic remained active for hours**
- **Lessons Learned:**
  - **Enforce MFA and least privilege**
  - **Improve email filtering and segmentation**
  - **Enhance behavioral detection and outbound traffic controls**
  - **Conduct regular simulation training**

Business Continuity Plan

To ensure SecGuru's mission-critical operations remain functional during cyberattacks, outages, or disasters, we developed a robust Business Continuity Plan. This plan minimizes downtime, protects data integrity, and ensures rapid recovery by combining technical safeguards, structured response protocols, and continuous testing.

CRITICAL SYSTEMS IDENTIFIED: BIA OUTLINES RTO/RPO FOR ASSETS LIKE SIEM, VPN, AND SQL DATABASES.

REDUNDANT INFRASTRUCTURE: ENCRYPTED BACKUPS (CLOUD + ON-SITE), GENERATOR POWER, AND INTERNET FAILOVER.



CONTINUITY OF OPERATIONS (COOP): VPN/VDI ACCESS AND A FULLY EQUIPPED ALTERNATE HQ ENSURE RESILIENCE.

SECURE COMMUNICATION PROTOCOLS: CONTACT TREE, ENCRYPTED MESSAGING, AND PRE-APPROVED RESPONSE TEMPLATES.

ONGOING TESTING & UPDATES: QUARTERLY DRILLS AND POST-INCIDENT REVIEWS IMPROVE READINESS.

VENDOR COMPLIANCE: PARTNERS MUST MEET ISO 27001 AND SOC 2 STANDARDS WITH PROVEN BCPS.

Disaster Recovery Plan (DRP)

- **Objective:** To ensure the rapid and orderly restoration of critical IT systems and data in the event of a significant disruption or disaster. This plan is built on a foundation of risk analysis and is designed to meet predefined Recovery Time Objectives (RTO) and Recovery Point Objectives (RPO) for all essential business functions.

Component	Strategy	Key Actions
1. **Roles & Responsibilities**	Establish a clear chain of command.	A dedicated **Disaster Recovery Team** is formed with defined roles (Coordinator, Technical Leads, Communications Manager) to manage the crisis response.
2. **Backup & Recovery**	Guarantee data resilience using the **3-2-1 backup rule**.	**Three Copies** of data are maintained on **Two Media Types** (e.g., on-prem disk, cloud storage), with **One Off-Site Copy** in a secure Azure cloud region.
3. **Disaster Recovery Site**	Utilize a **"warm site" hybrid cloud model** for rapid infrastructure failover.	Pre-configured and updated VM templates are maintained in Azure. In a disaster, these VMs are rapidly deployed, and data is restored from cloud backups.
4. **Communication Plan**	Implement a **multi-channel communication plan** to keep all stakeholders informed.	Use a mass notification system for alerts, maintain an out-of-band channel (e.g., Signal) for the DR Team, and use pre-approved templates for status updates.
5. **Testing & Maintenance**	Treat the DRP as a **living document** through continuous testing and updates.	Conduct **quarterly tabletop exercises** to validate procedures and perform **annual failover tests** to ensure technical recovery processes function as expected.

Recommendations

Enforce Multi-Factor Authentication (MFA): Apply MFA across all privileged and sensitive user accounts to reduce the impact of credential theft.

Implement Least Privilege: Remove unnecessary administrative rights and ensure role-based access control is enforced.

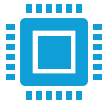
Strengthen Email Filtering & User Awareness: Enhance filtering rules and run regular phishing simulation training to reduce human risk.

Improve Network Segmentation: Isolate sensitive systems to reduce lateral movement opportunities.

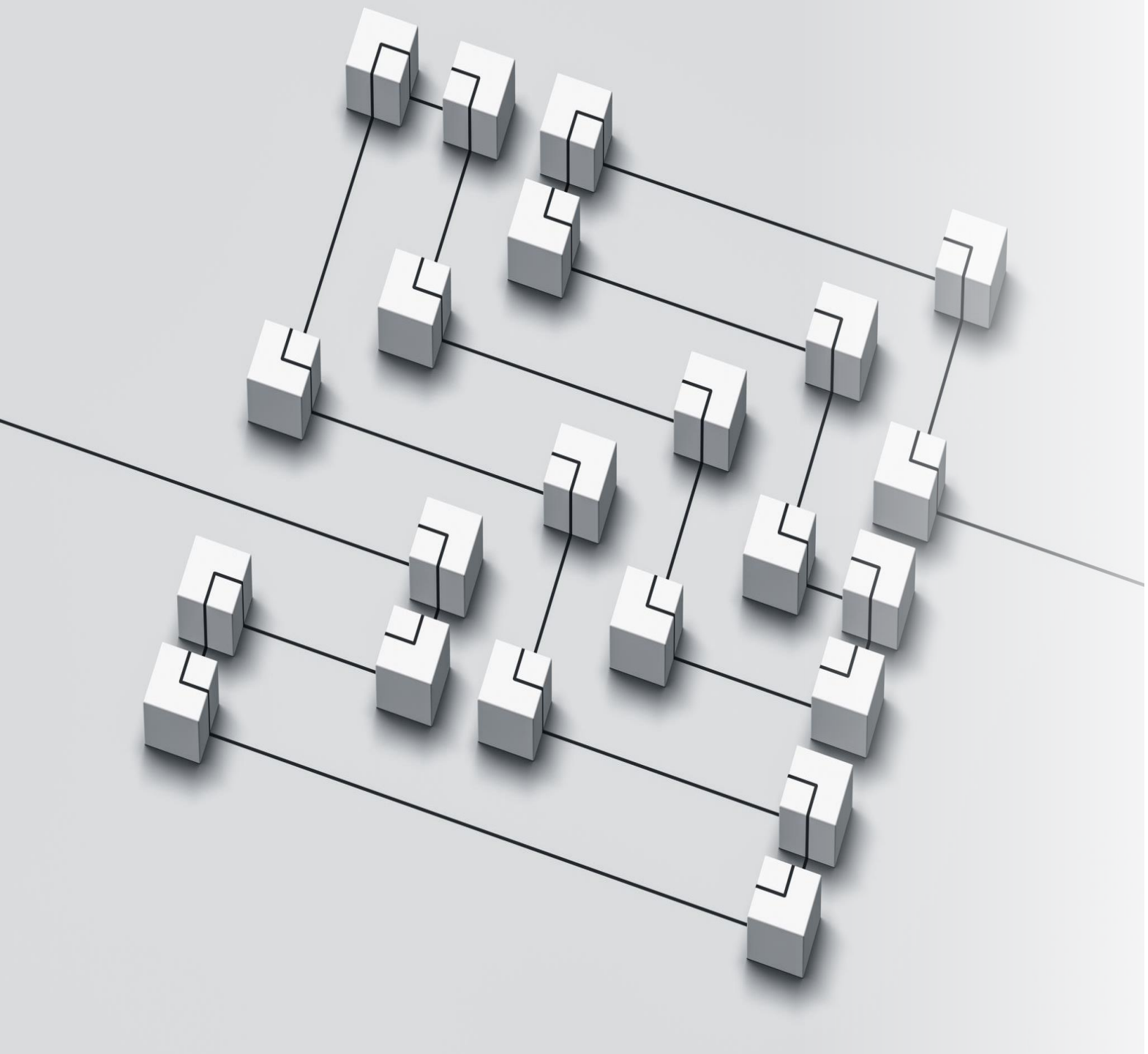
Integrate Physical and Cybersecurity: Strengthen building access control, surveillance, and emergency readiness in parallel with cyber defenses.

Enhance Endpoint & Memory Monitoring: Deploy advanced detection tools (e.g., Sysmon, EDR) to catch in-memory attacks.

Expand Threat Intelligence Integration: Leverage platforms like CISA alerts and AlienVault OTX to stay ahead of emerging threats.



Audit and Test Incident Response Plans: Simulate attacks routinely to refine detection and response playbooks.



Conclusion and Final Thoughts

This SecGuru presentation has successfully demonstrated a comprehensive, layered security architecture that integrates both technical and physical safeguards to defend critical infrastructure and data assets. Through the collaborative efforts of the SecGuru team, we have identified strengths in detection, containment, and response across network, endpoint, and physical domains.

The Red Team/Blue Team exercise revealed valuable insights. While the Blue Team showed strong detection capabilities against lateral movement, credential theft, and data destruction, the Red Team's initial phishing campaign exposed vulnerabilities in email filtering, privilege access, and outbound traffic monitoring. These lessons reinforce the need for continuous hardening of your security posture.

This SecGuru presentation reflects a real-world approach to securing hybrid infrastructures. Continued testing, simulation, and policy enforcement will ensure that SecGuru remains resilient in the face of evolving threats.

Appendices

Roles

Aldo – Executive Team Lead
Marion – Security Architect
Afrika – SIEM Lead
Max – Physical Security Analyst
Alex – Red/Blue Simulation Lead
Derelys – Threat Intelligence Lead

Citations:

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Montgomery College. TechMAP Cybersecurity. Instructed by Prof. Reza Mirabrishami, Cyber Department, Spring 2025. Montgomery College, Germantown Campus. Lecture.

THANK YOU!

ANY QUESTIONS?