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Chapter 03

Introduction
Change Management
Technical
Implications
Documentation
Version Control

B.Tech, 6th Sem.,Section: 36 & 38 Computer Networking: Security(CLASS NOTE)

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Summarize fundamental security concepts

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- Introduction
- Change Management
- Technical Implications
- Documentation
- Version Control

Explain the importance of change management processes and the impact to security

Objectives of this chapter

Change management is essential for maintaining security as organizations evolve. Every structural, technological, or procedural change can introduce new risks. A structured change management process ensures these changes are evaluated and implemented securely. The Change Advisory Board (CAB) plays a key role by reviewing and approving changes, ensuring they align with business goals and security policies, and minimizing potential vulnerabilities.

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Change Management

- Nature of Change:
  - Constant in business (e.g., restructuring, tech upgrades, market shifts).
  - In IT: includes software installation, system migration, etc.
- Need for Structure:
  - Prevents negative impacts.
  - Ensures coordination across departments.
- Role of CAB (Change Advisory Board):
  - Evaluates, approves/rejects changes.
  - Assesses financial and security impacts.
  - Oversees approval, ownership, stakeholder engagement, testing, and SOP compliance.

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Key Components of Change Management

- Approval Process:
  - Reviews proposed changes.
  - Involves stakeholders.
  - Ensures alignment with goals.
  - Documents and tracks changes.
- Ownership:
  - Designated individual responsible for implementation.
  - Ensures accountability (e.g., CISO for security tasks).
- Stakeholders:
  - Internal & external parties affected by change (e.g., investors, employees, suppliers, Creditors/Banks, Government and Regulatory Bodies,).
  - Effective communication and trust-building are essential.

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Key Components of Change Management

- Impact Analysis:
    - Assesses risks/benefits before implementation.
    - Identifies potential security implications.
- Test Results:
    - Validates new measures before deployment.
    - Builds confidence in effectiveness.
- Backout Plan:
    - Rollback strategy if a change fails.
    - Minimizes disruption and restores system.
- Maintenance Window:
    - Scheduled low-traffic period for applying updates.
    - Reduces operational impact.

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Key Components of Change Management

- Standard Operating Procedures (SOPs):
  - Defined, repeatable steps for consistent execution.
  - Ensures quality and security.

Technical Implications

To understand the role of change management in maintaining organizational security by evaluating technical implications, managing operational risks, and ensuring that system modifications are implemented securely, efficiently, and with minimal disruption. Different kinds of access control mechanisms:

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Technical Implications

- Allow Lists/Whitelists:
    - Only approved apps/files/users are permitted.
    - Prevents execution of unapproved or malicious software.
    - Used in firewalls, AppLocker, etc.
- Deny Lists / Block Lists:
    - Explicitly blocks known malicious apps/users.
    - Needs regular updates to remain effective.
    - Helps stop unauthorized access and harmful applications.
- Restricted Activities:
    - Prevent unauthorized software installs, system changes, or sensitive data access.
    - Limits risk exposure and maintains system integrity.

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Technical Implications

Change Management & Security Integration: CAB reviews and approves changes and ensures security and operational stability during transitions.

Operational Considerations

- Downtime:
    - System unavailability due to failures or maintenance.
    - Impacts revenue and productivity.
    - Mitigated via Business Continuity Plans (BCP).
- Service Restart:
    - Can disrupt legitimate access and recovery processes.
    - Attackers may exploit vulnerabilities during restart phases.

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Operational Considerations

- Application Restart:
  - Risk of data corruption or inconsistencies.
  - Security gaps may appear if restarts are not properly managed.
- Legacy Applications:
  - Outdated security, lack of vendor support.
  - High risk due to unpatched vulnerabilities.
- Dependencies:
  - Services depend on others to function (e.g., IP Helper needs 5 system components).
  - Missing dependencies can cause system/application failure.

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Documentation

To ensure secure, controlled, and well-documented changes through structured change management processes that enhance transparency, accountability, and minimize risks to business operations and security.

- Update Diagrams:
  - Keep network/system diagrams current.
  - Prevent misconfigurations and security gaps.
  - Ensure clear understanding of infrastructure.
- Update Policies/Procedures:
  - Reflect latest changes and standards.
  - Avoid outdated or incorrect practices.
  - Maintain security and regulatory compliance.

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Version Control

Version control ensures only authorized changes are made, prevents unauthorized modifications, and provides an audit trail for security. It helps identify vulnerabilities, track changes, and is essential in coding and application development to pinpoint the latest version.

References

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Question
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The End