Security Strategies in Web Applications and Social Networking

Lesson 9

Mitigating Web Application Vulnerabilities

Learning Objective

- Describe the attributes and qualities of secure coding practices.

Key Concepts

- Common Web application platforms and code bases
- Secure coding technologies and practices
- Weaknesses in coding platforms
- Software configuration management and revision-level tracking
- Best practices for mitigating Web application vulnerabilities

Secure Coding

- Authentication
- Data input validation
- Session management
- Incorporate security in each phase of application development!

Mitigating Vulnerabilities with Policies

- A well-written security policy addresses:
  - Data security in storage and in transit
  - Asset inventory and management
  - End-user security
  - Physical security
  - Access control mechanisms
  - Incident management and reporting
  - Fault-tolerant measures
  - Non-compliance consequences

https://www.sans.org/top25-software-errors

Insecure Interaction Between Components

Risky Resource Management
Porous Defenses

Mitigating Vulnerabilities with Policies (Continued)

- When developing policies, ask:
  - What assets are you trying to protect?
  - What are the common vulnerabilities and threats?
  - What are the mitigation strategies?
  - When should the security policy be reviewed and updated?

Mitigating Vulnerabilities with Policies (Continued)

- Create:
  - Authentication policy
  - Access privilege policy
  - Disclosure of confidential data policy
  - Incident response policy/plan

Implementing Secure Coding Best Practices

https://www.sans.org/security-resources/policies

- Validate input
- Heed compiler warnings
- Plan and design for security policies
- Keep the coding simple
- Deny access by default

Implementing Secure Coding Best Practices (Continued)

Layered security
e.g. SSL, HTTPS

- Use the principle of least privilege
- Sanitize data sent to other systems
- Use layered security
- Use effective QA techniques
- Adopt a secure coding standard

HTML Security

- Encrypt HTML code
- Keep the code clean
- Monitor HTML code
- Use input validation
- Validate URLs

JavaScript Security

Establish trust boundaries
If things coming from untrusted src, refuse them

Untrusted code, run in a sandbox, isolated env don't let it affect our env
Sandbox security

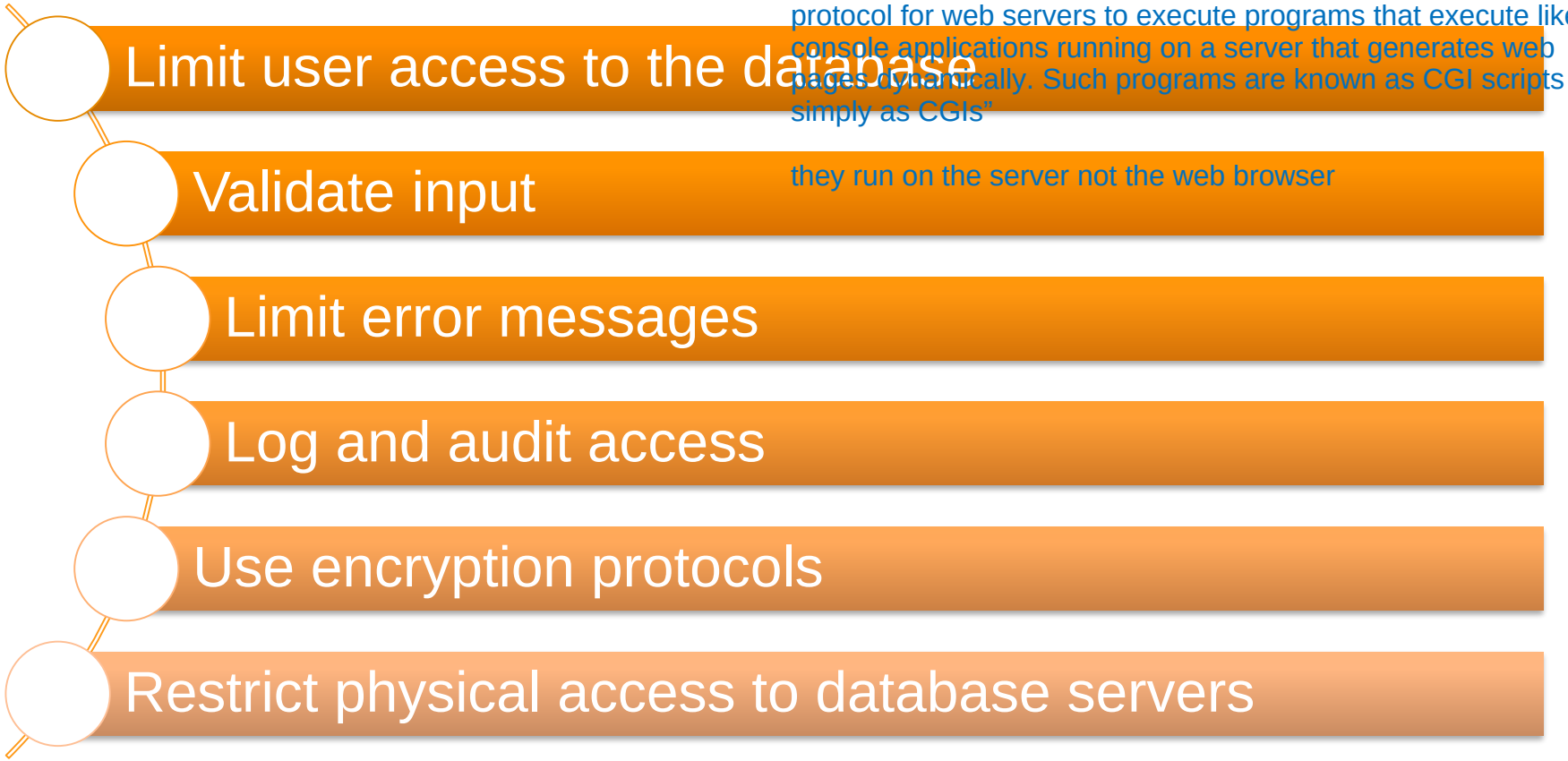
- Prefer to have obviously no flaws than no obvious flaws
- Avoid duplication
- Restrict privileges
- Establish trust boundaries
- Contain sensitive data
- Avoid dynamic SQL
- Take care of interpreting untrusted code

CGI Form and SQL Database Access Security

CGI
Intermediary b/t client and any request to server
Std, written in any language

"In computing, Common Gateway Interface offers a standard protocol for web servers to execute programs that execute like console applications running on a server that generates web pages dynamically. Such programs are known as CGI scripts or simply as CGIs"

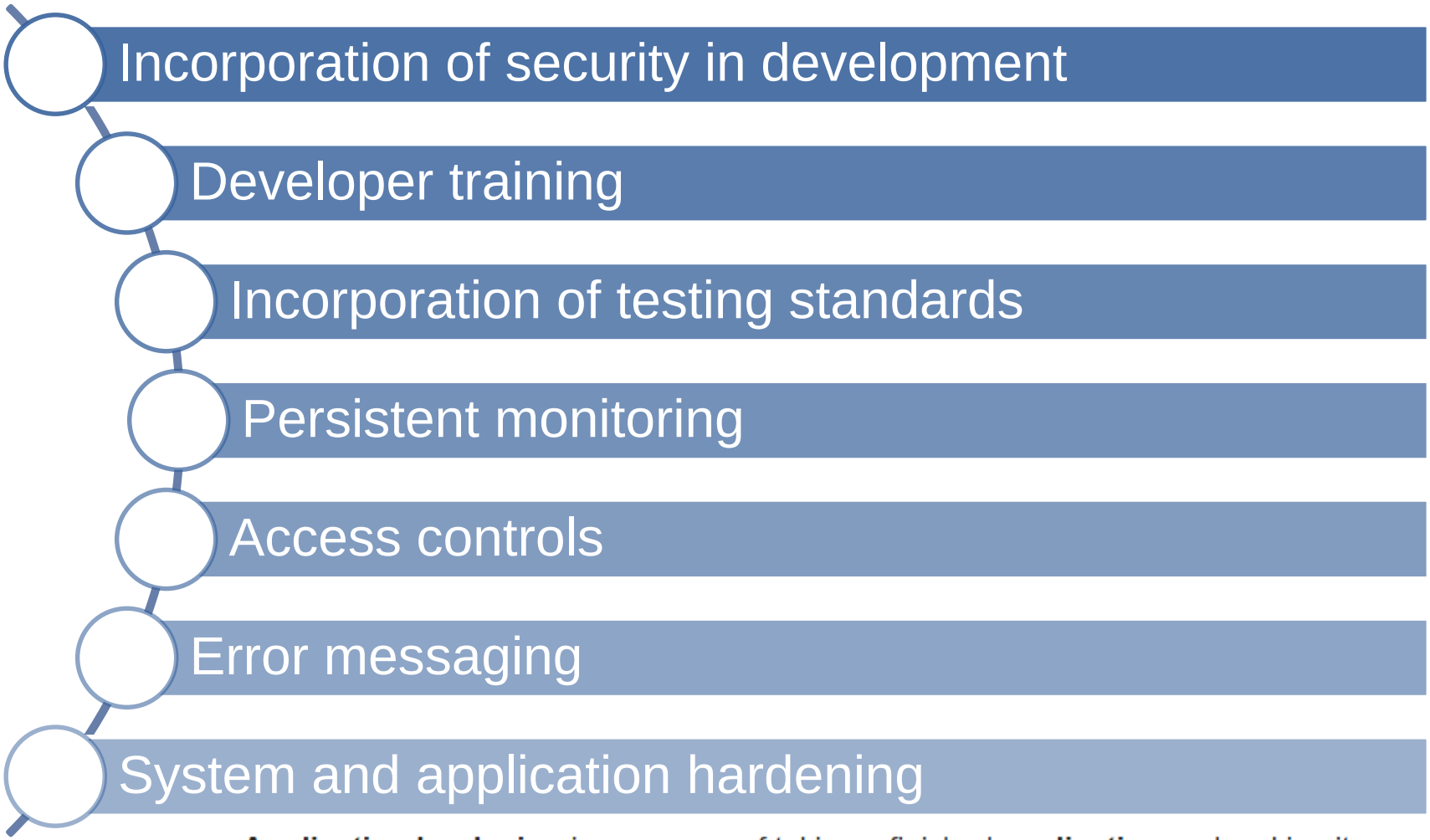
they run on the server not the web browser



Revision-Level Tracking

- Prevent unauthorized changes
- Gives you greater control
- Eases management
- Helps assure quality control

Best Practices



Application hardening is a process of taking a finished **application** and making it more difficult to reverse engineer and tamper. Combined with secure coding practices, **application hardening** is a best practice for companies to protect their app's IP and prevent misuse, cheating, and repackaging by bad users.

Summary

- Common Web application platforms and code bases
- Secure coding technologies and practices
- Weaknesses in coding platforms
- Software configuration management and revision-level tracking
- Best practices for mitigating Web application vulnerabilities