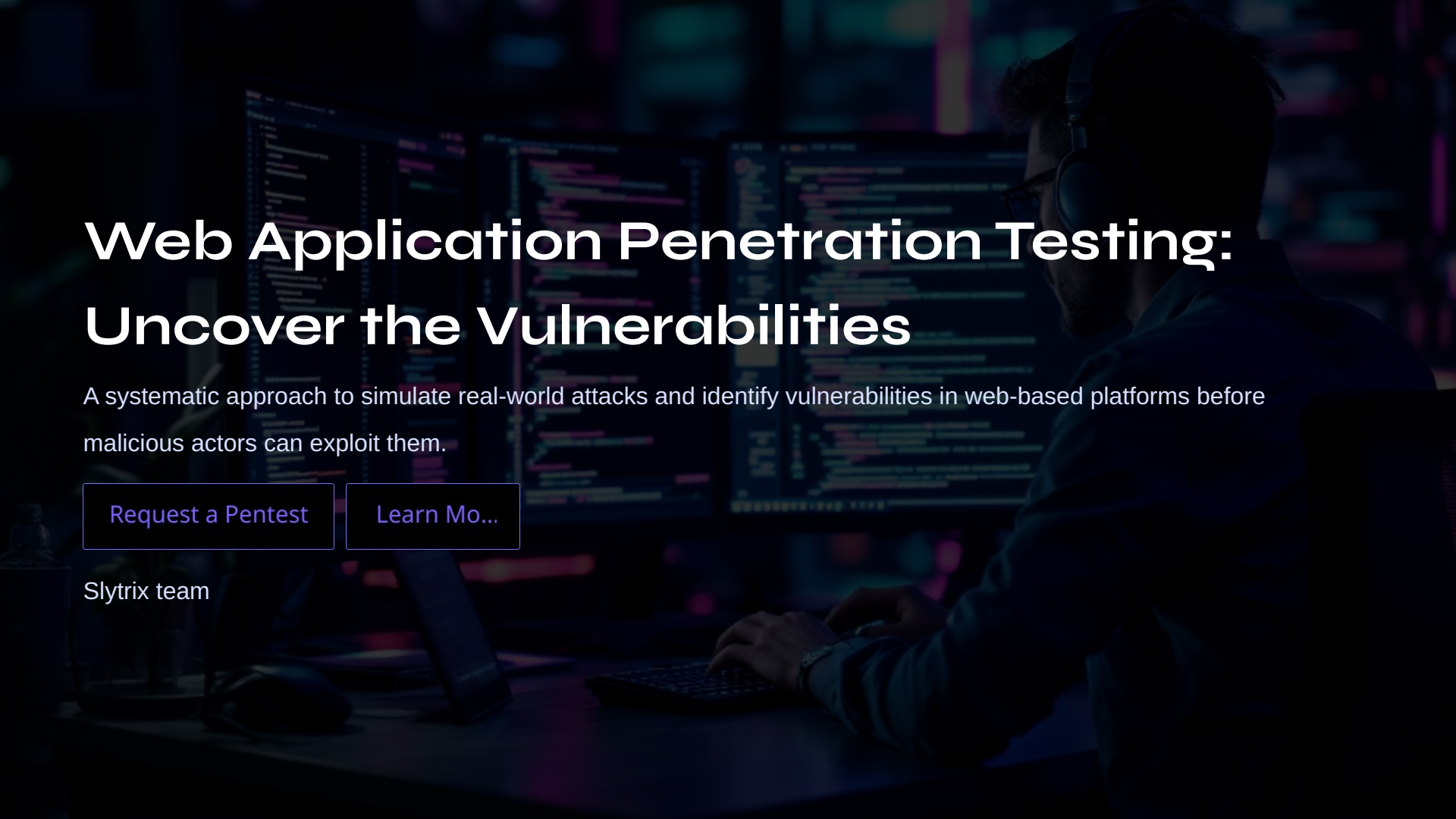

Web Application Penetration Testing: Uncover the Vulnerabilities

A systematic approach to simulate real-world attacks and identify vulnerabilities in web-based platforms before malicious actors can exploit them.

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Slytrix team

Purpose and Scope of Web App Penetration Testing

With tens of thousands of new vulnerabilities discovered annually, web app pentesting has become a cornerstone of cybersecurity, compliance, and secure development practices.

Client/Server Components

Evaluates APIs, databases, and third-party services for potential vulnerabilities

Authentication Mechanisms

Tests login systems, session management, and authorization controls

Input Validation

Examines how the application handles and sanitizes user inputs

Secure Configurations

Assesses system settings and security headers for proper implementation

Planning & Reconnaissance: The First Steps

Define Testing Scope

Identify target systems including IP ranges, APIs, and establish clear testing constraints to ensure focused assessment.

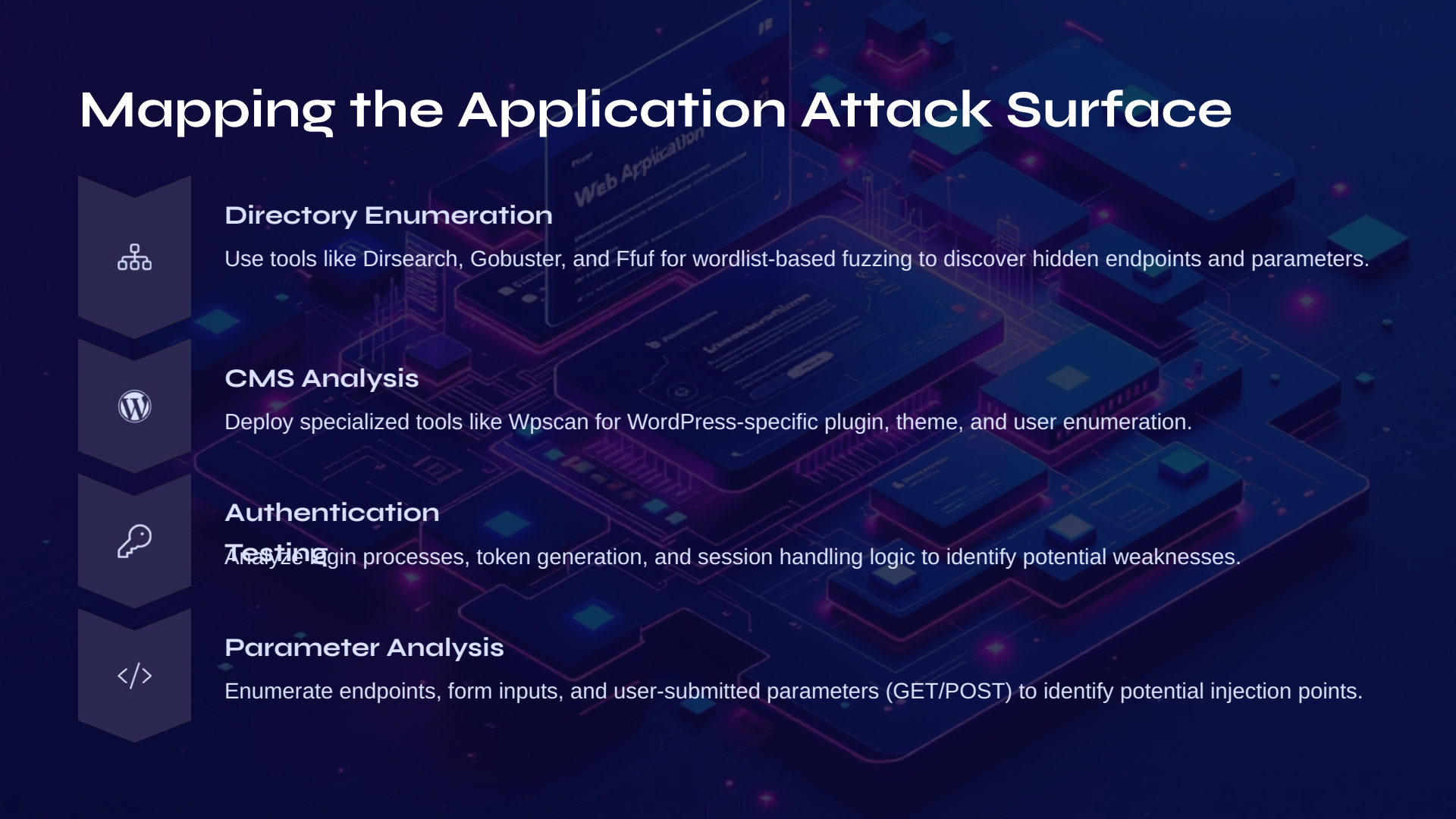
Gather Intelligence

Conduct Open-Source Intelligence (OSINT) to collect domain details, subdomains, and exposed services.

Deploy Discovery Tools

Utilize specialized tools like Nmap, Nikto, and Shodan to map the application landscape and identify potential entry points.

Mapping the Application Attack Surface



Directory Enumeration

Use tools like Dirsearch, Gobuster, and Ffuf for wordlist-based fuzzing to discover hidden endpoints and parameters.

CMS Analysis

Deploy specialized tools like Wpscan for WordPress-specific plugin, theme, and user enumeration.

Authentication Testing

Analyze login processes, token generation, and session handling logic to identify potential weaknesses.

Parameter Analysis

Enumerate endpoints, form inputs, and user-submitted parameters (GET/POST) to identify potential injection points.

Vulnerability Identification and Exploitation

Automated Scanning

Tools like OWASP ZAP detect common flaws such as misconfigurations and outdated components, providing a baseline for further investigation. These scanners excel at finding "low-hanging fruit" but often miss complex logical vulnerabilities that require human expertise.

Manual Testing

Expert penetration testers validate logical flaws including business logic bypasses and insecure direct object references that automated tools typically miss. This phase includes proof-of-concept attacks that demonstrate real-world impact by exploiting vulnerabilities like SQLi, XSS, and broken access controls.

Post-Exploitation

Assess lateral movement risks such as database server compromise and credential theft to understand the full scope of potential damage. This critical step helps organizations understand how initial vulnerabilities could lead to broader system compromise.

Part of OWASP Top 10 Web Application Vulnerabilities

Vulnerability	Definition	Attack Scenario
SQL Injection (SQLi)	Untrusted input manipulates database queries	Injecting ' OR 1=1-- into a login form to bypass authentication
Cross-Site Scripting (XSS)	Malicious scripts execute in victims' browsers	Storing in a comment field
Broken Authentication	Weak passwords, session fixation, or flawed MFA	Brute-forcing default credentials (admin:admin) to access sensitive dashboards
Security Misconfiguration	Unpatched servers, verbose errors, default settings	Exposing .git directories revealing API keys
Insecure Direct Object References	Unvalidated access to resources via user-input parameters	Changing user_id=123 to user_id=124 to view another user's data

Testing Approaches: Black, Gray, and White Box

Black-Box Testing

Simulates external attackers with no prior knowledge

- Focuses on exposed interfaces
- Tests business logic flaws
- Most realistic attack simulation

Gray-Box Testing

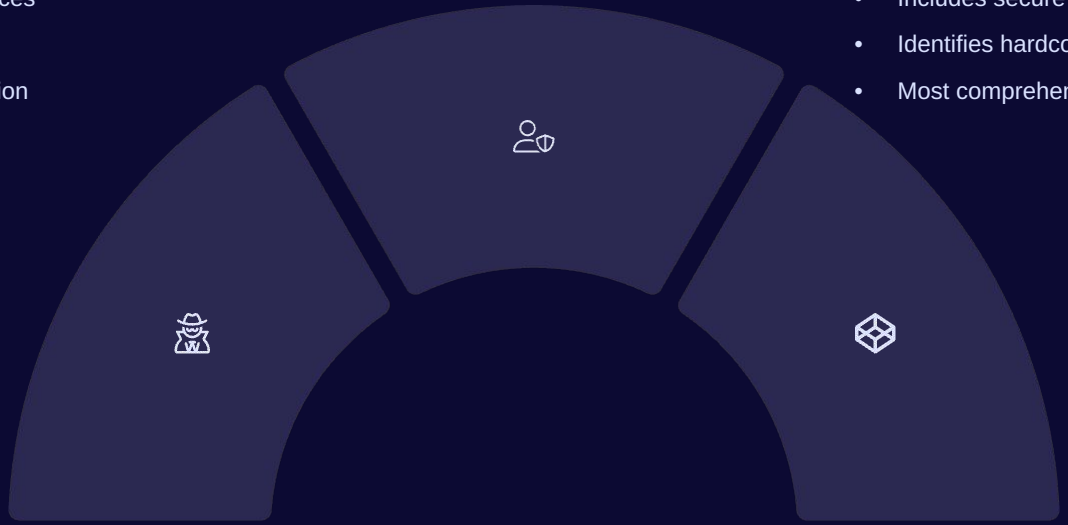
Partial knowledge (user credentials) balances realism and efficiency

- Effective for testing role-based access controls
- More efficient than black-box
- Simulates insider threats

White-Box Testing

Full code/architecture access enables deep analysis

- Includes secure code reviews
- Identifies hardcoded secrets
- Most comprehensive approach



Best Practices and Expected Outcomes

Input Validation

Use allowlists for user inputs (only alphanumeric characters in usernames). Implement parameterized queries to prevent SQL injection, XSS attacks.

Authentication & Sessions

Enforce MFA and rate-limiting for login attempts. Generate cryptographically secure session tokens with short timeouts to minimize risk.

Access Control

Apply least privilege principles by restricting users to minimal necessary permissions. Always validate ownership checks for resources.

Secure Configurations

Disable unnecessary services and implement automated patch management for frameworks and libraries to maintain security.

A comprehensive penetration test delivers: risk visibility, remediation guidance, compliance validation, and improved developer awareness—all critical components of a robust security program.