Progetti Open Source Per La Sicurezza Delle Web Applications

Marco Morana

Mercoledi 5 Novembre 2008

Giornata Della Sicurezza Informatica In Sardegna

OWASP

akhela

SARDEGNA RICERCHE

REGIONE AUTONOMA DELLA SARDEGNA

P.O.R. Sardegna 2000 - 2006 MISURA 3.13

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LAB Intelligenza d'Ambiente

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The OWASP Foundation

http://www.owasp.org

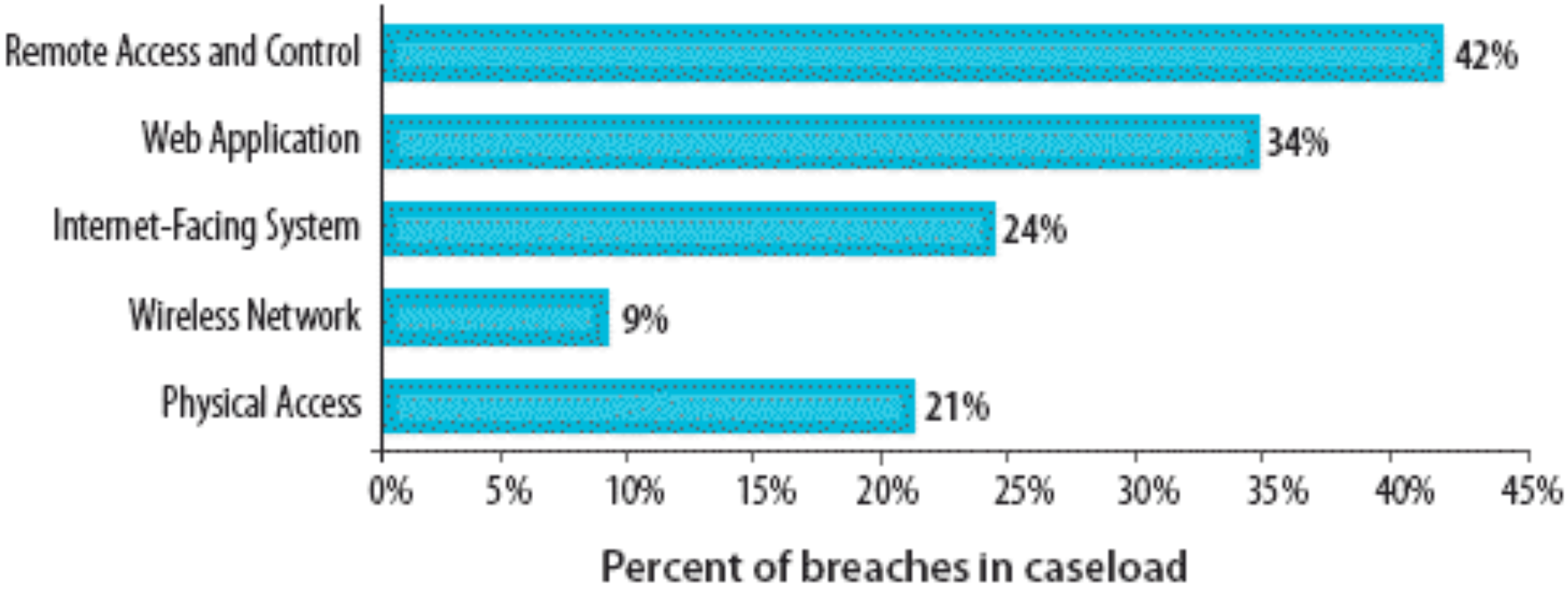
Agenda

- I problemi della sicurezza delle web applications
- Cosa e' OWASP e cosa puo offrire
- Sicurezza Dell Web Applications, Dove E Come Iniziare?
- Utilizzo Di Progetti E Strumenti OWASP Per lo Sviluppo Di Applicazioni Sicure
- Come Participare?
- Domande?

I problemi della sicurezza delle web applications

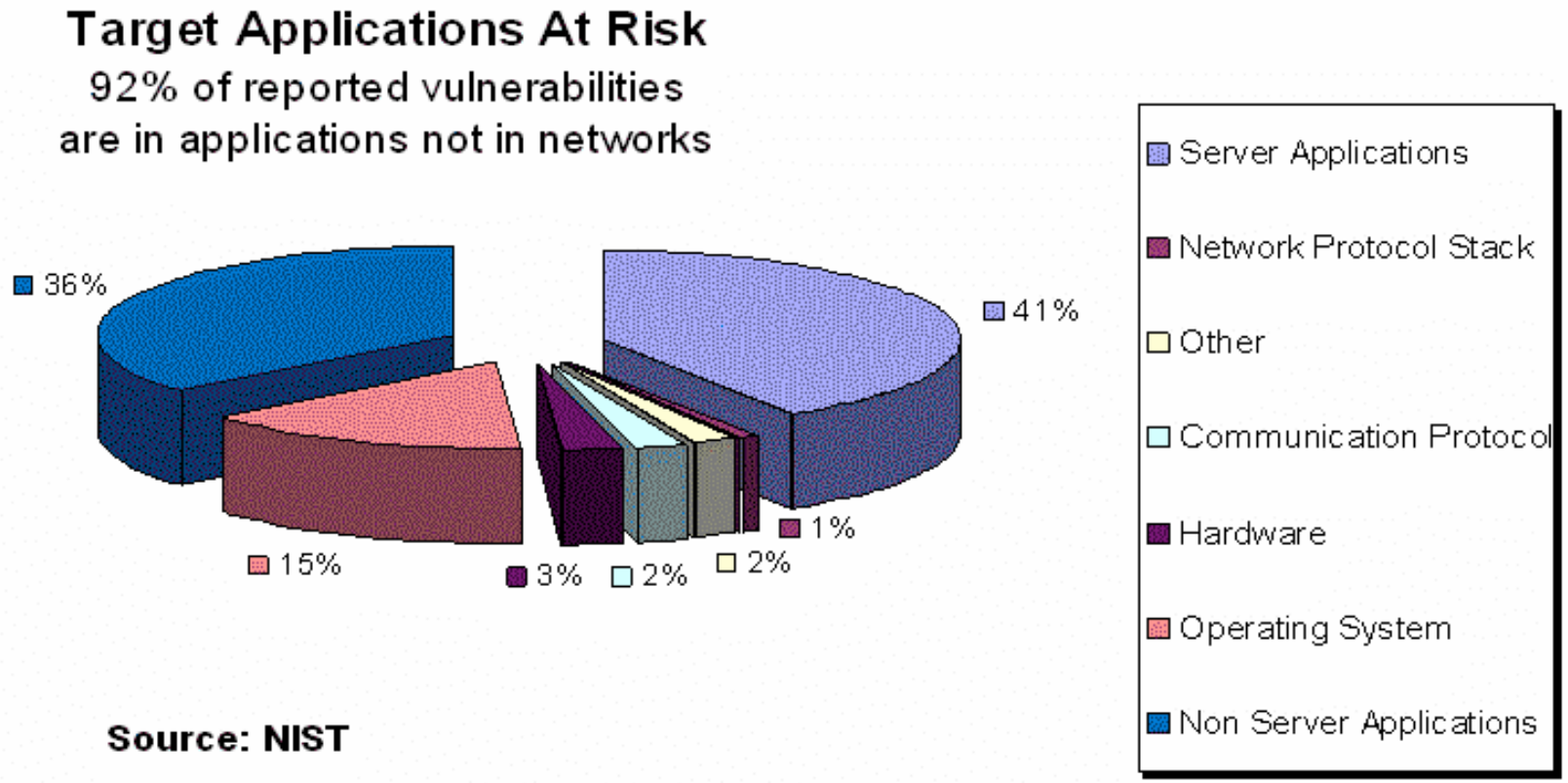
Problema #1: Le applicazioni web sono a rischio

- **Secondo un recente report (Verizon/2008), le intrusioni via web applications sono fra le piu frequenti**



Problema #2: Le applicazioni sono la principale causa delle vulnerabilta'

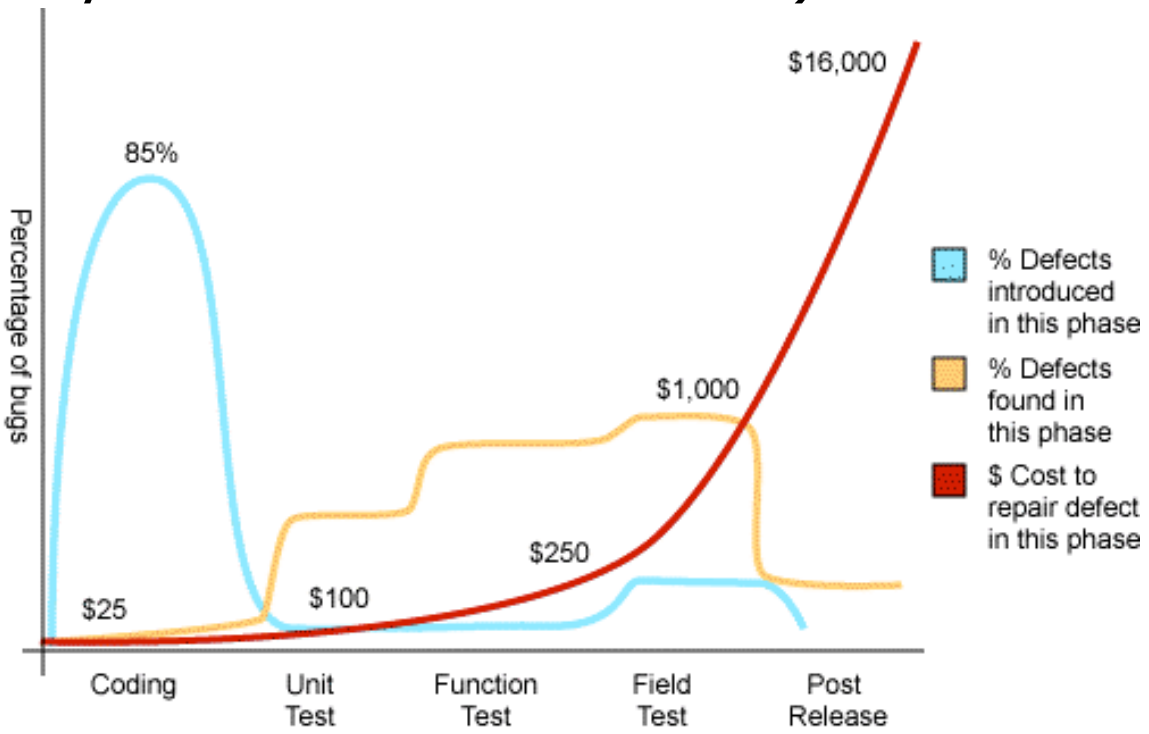
92 % delle vulnerabilita' si trova al livello delle applicazioni non della rete (NIST)



Source: NIST

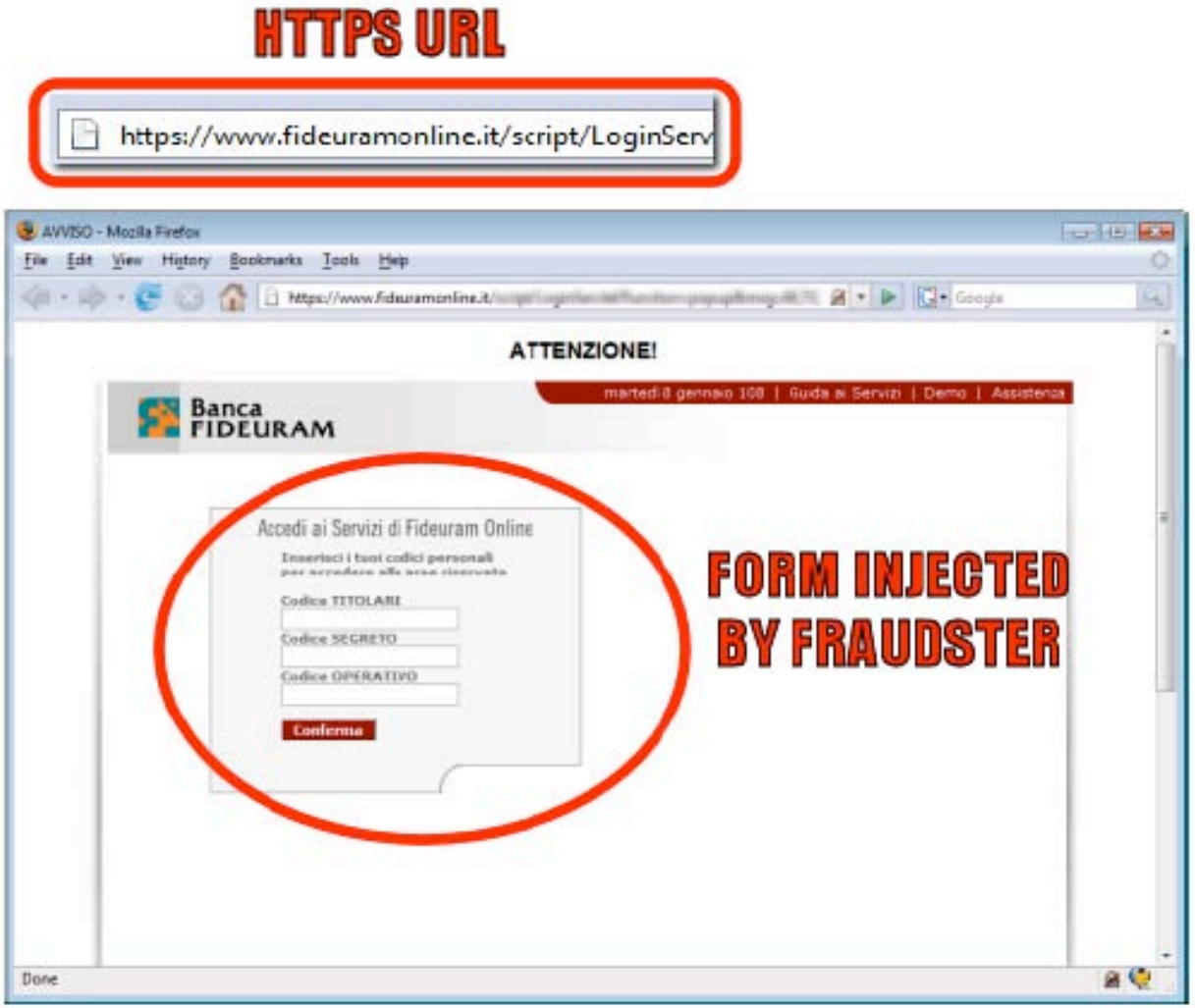
Problema #3: La gestione delle vulnerabilita' delle web applications e' costosa

- "***Costa 100 volte di meno rimediare una vulnerabilita' quando il software e' in fase di progetto piuttosto che quando e' in produzione***
  (IBM Systems Sciences Institute)



Source: Applied Software Measurement, Capers Jones, 1996

Problema #4: Non rimediare le vulnerabilita' dei siti per servizi on-line web espone l'aziende a rischi tangibili e a danni quantificabili



Cosa sono I progetti OWASP e quale soluzione possono offrire?

http://www.owasp.org

OWASP Spring of Code 2007

OWASP Summer of Code 2008

OWASP
The Open Web Application Security Project
http://www.owasp.org

Welcome to OWASP
the free and open application security community

- Guide
- Top Ten
- WebGoat
- CLASP
- WebScarab
- Contracting
- Testing
- Code Review
- More...

About · Searching · Editing · New Article · OWASP Categories

OWASP Overview

The Open Web Application Security Project (OWASP) is a worldwide free and open community focused on improving the security of application software. Our mission is to make application security "visible," so that people and organizations can make informed decisions about application security risks. Everyone is free to participate in OWASP and all of our materials are available under a free and open software license. The OWASP Foundation is a 501c3 not-for-profit charitable organization that ensures the ongoing availability and support for our work.

You'll find everything **about OWASP** here on our wiki. Please feel free to make changes and improve our site. There are hundreds of people around the globe who review the changes to the site to help ensure quality. If you're new, you may want to check out our **getting started** page. Questions or comments should be sent to one of our many **mailing lists**. Or you can contact us directly at **owasp@owasp.org**. If you like what you see here and want to support our efforts, please consider **becoming a member**.

OWASP Community

Global OWASP Events

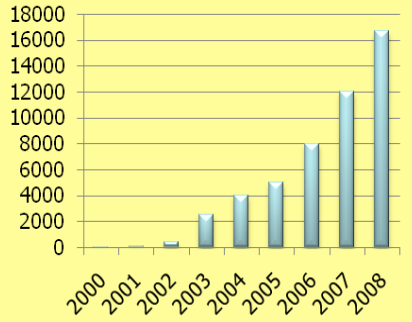
article | discussion | view source | history

Italy

Contents [hide]

1 Welcome to the OWASP Italy Local Chapter
2 NEWS: Presentations of the OWASP Day II are online!
3 Local Activities
4 OWASP-Italy Board
5 What is OWASP?
6 OWASP-Italy is a CLUSIT Member
7 Activities
8 Events
8.1 31st March, 2008 - OWASP Day II
8.2 February 2008 - OWASP Italy at InfoSecurity 2008
8.3 November 30th, 2007 - OWASP-Italy @ Elsag Datamat Security Forum
8.4 October 20th, 2007 - OWASP Italy at SMAU E-Academy 2007
8.5 September 10th, 2007 - OWASP Day WorldWide: "Privacy in the 21st Century"
8.6 May 29th, 2007 - Seminar: "Software Security"
8.7 May 15th-17th, 2007 - 6th OWASP AppSec Conference in Italy
8.8 April 14th, 2007 - Master on Information Security, University of Rome "La Sapienza"
8.9 March 30th, 2007 - University of Rome "La Sapienza"
8.10 March 1st, 2007 - EuSecWest 07

Participants



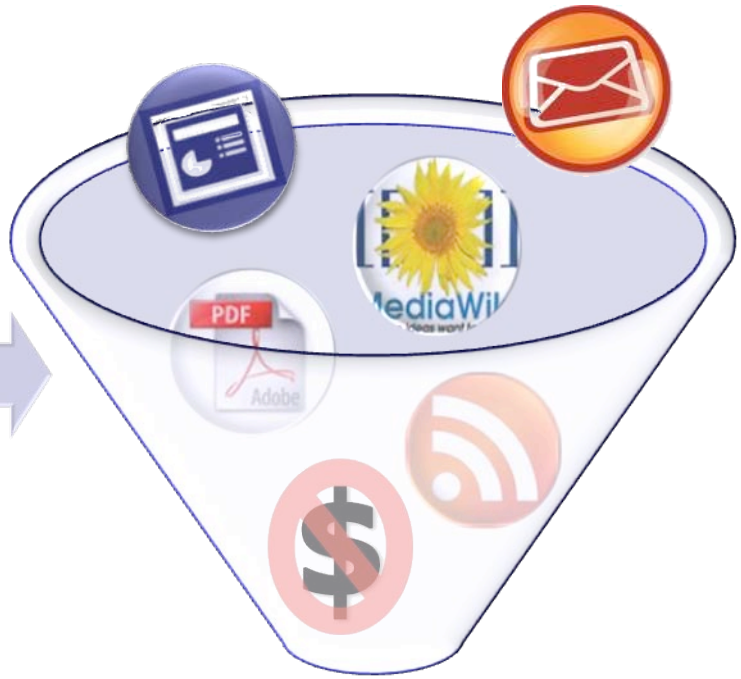
OWASP

Che Cosa e' OWASP

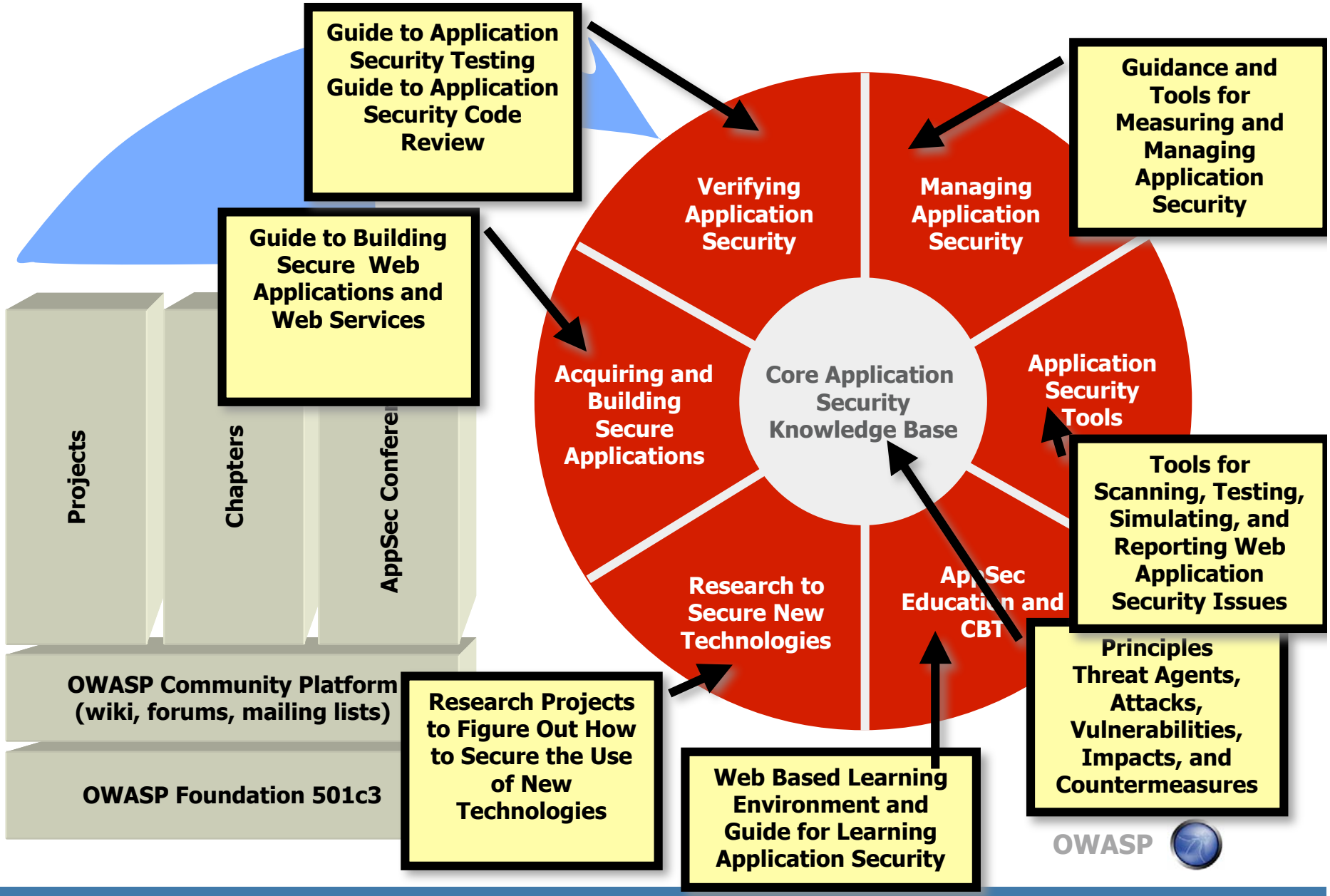
- Open Web Application Security Project
  - Organizzazione internazionale a non scopo di lucro dedicata a promuovere lo sviluppo di software sicuro
- La missione e' rendere la sicurezza visible attraverso…
  - Documentazione
    - Top Ten, Dev. Guide, Design Guide, Testing Guide, …
  - Software
    - WebGoat, WebScarab, Site Generator, Report Generator, ESAPI, CSRF Guard, CSRF Tester, Stinger, Pantera, …
  - Gruppi Di Lavoro
    - Browser Security, Industry Sectors, Access Control, Education, Mobile Phone Security, Preventive Security, OWASP SDL..
  - Coinvolgimento con comunita'/educazione
    - Local Chapters, Conferences, Tutorials, Mailing Lists

Come OWASP Crea Knowledge?

- 3,913 articoli
- 427 presentazioni
- 200 documenti in aggironamento
- 179 liste emails
- 180 blogs monitorati
- 31 progetti di documentazione
- 12 borse/grants per sviluppo

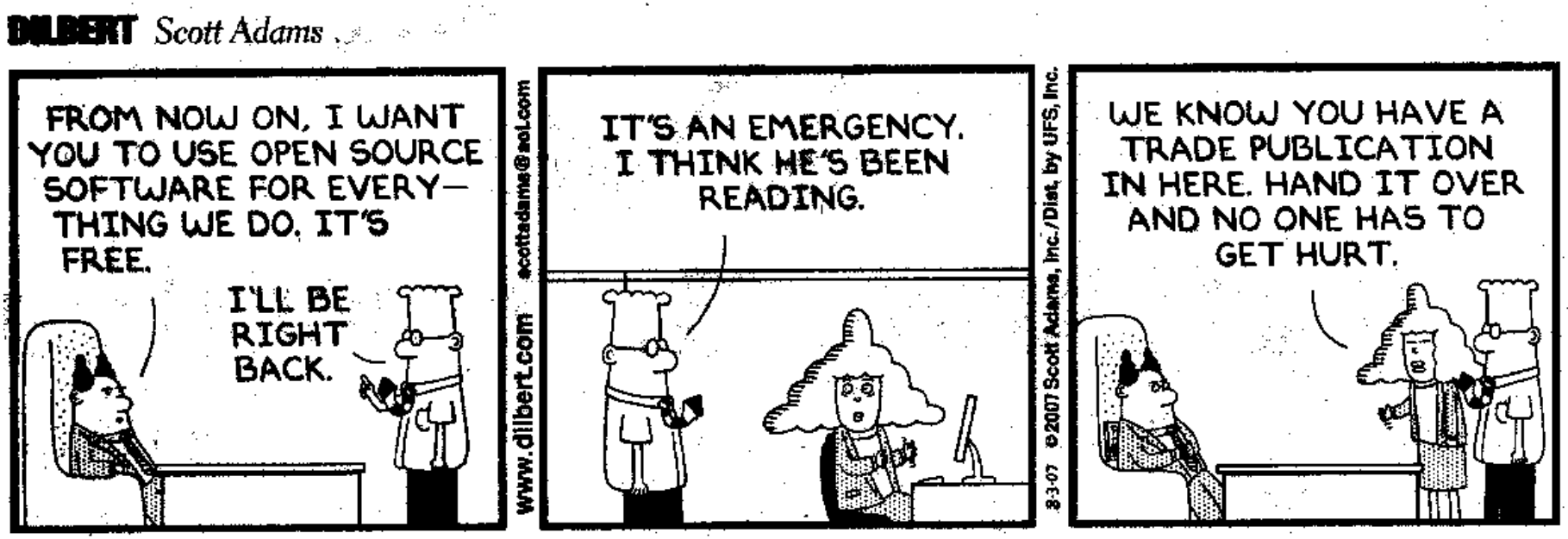


OWASP Centro Di Conoscenze (Knowledge Base)



Sicurezza Dell Web Applications, Dove E Come Iniziare?

Il Rischio Dei Progetti Open Source.....



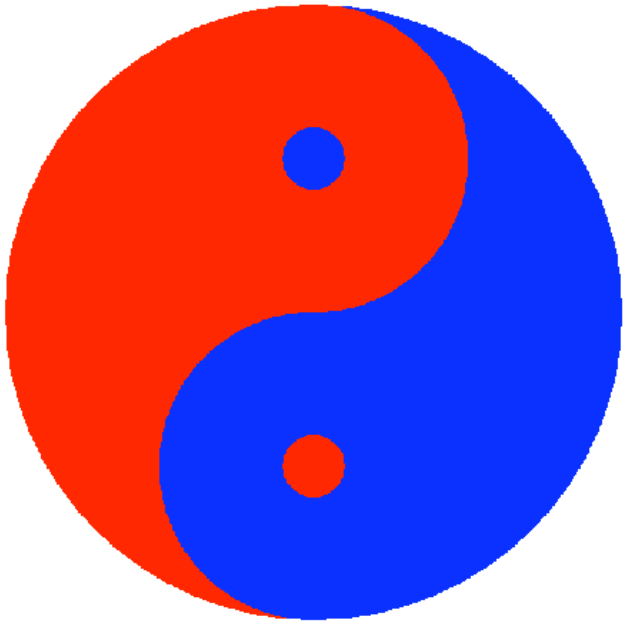
Come Approcciare la sicurezza del software?

Software o Applicazioni

Identificazione delle cause delle vulnerabilita'

Sicurezza del software e dei processi

Approccio pro-attivo
Analisi e
Gestione dei rischi



Rimediazione dei sintomi

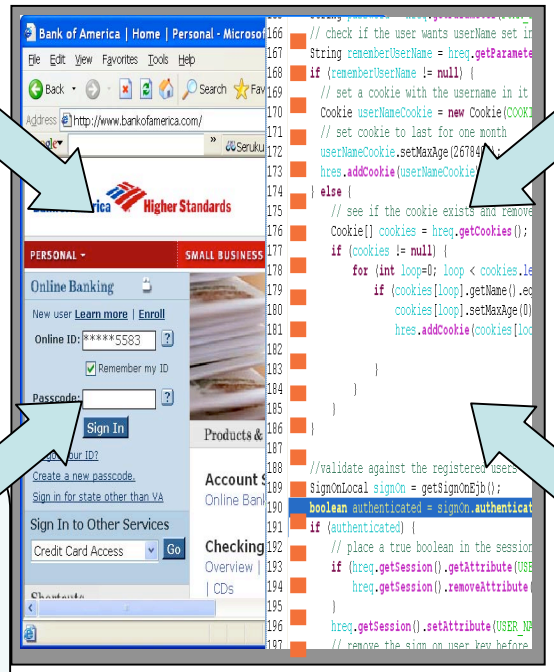
Sicurezza via applicazione di patches

Approccio reattivo risposta agli incidenti

Approccio Tattico: Trovare le Vulnerabilita'

Test Di Penetrazione Manuale

Revisione Del Codice Manuale



Scanning Della Applicazione Via Penetration Testing Tools

Scanning Del Codice Via Static Code Analysis Tools

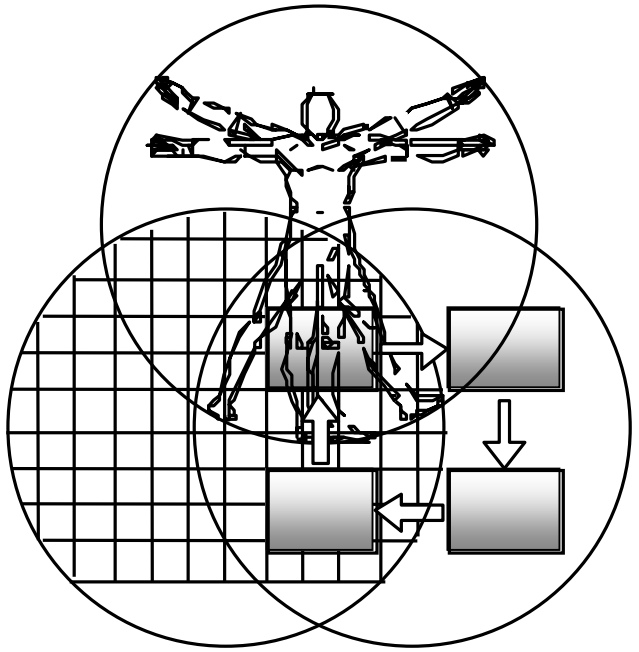
OWASP

Approccio Strategico: Iniettare Security nella SDLC

SDLC Phases	Requirements		Design	Development	Testing	Deployment and Operations	
Secure Software Best Practices	Preliminary Software Risk Analysis	Security Requirements Engineering	Security Risk-Driven Design	Secure Code Implementation	Security Tests	Security Configuration & Deployment	Secure Operations
Ongoing S-SDLC Activities Metrics and Measurements, Training, and Awareness							
S-SDLC Activities	Define Use & Misuse Cases	Define Security Requirements	Secure Architecture & Design Patterns Threat Modeling Security Test Planning Security Architecture Review	Peer Code Review Automated Static and Dynamic Code Review Security Unit Tests	Functional Test Risk Driven Tests Systems Tests White Box Testing Black Box Testing	Secure Configuration Secure Deployment	
Other Disciplines	High-Level Risk Assessments		Technical Risk Assessment				Incident Management Patch Management

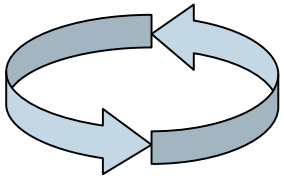
Pre-requsiti per la software security

- **Processi:**
  - SDLC sicura (e..g. CLASP)
  - Attivita' di modello delle minaccie e verifica vulnerabilita (codice e applicazioni)
- **Standards/Tecnologie**
  - Standards per il codice sicuro
  - Patterns per architecture sicura
  - Strumenti per l'analisi vulnerabilita'
- **Formazione/Training**
  - Come scrivere e produrre secure software
  - Analisi e gestione delle vulnerabilita'-minaccie-rischi



Uso di progetti e strumenti OWASP nella SDLC

OWASP Nel Ciclo Di Sviluppo Del Software



Approccio Evolutivo

Guide Per Progettare Applicazioni Sicure

Documentazione Dei Requisiti Security Testing Guide OWASP T10

Modelli Delle Minaccie E Dei Rischi

Guida Per I Test

Strumenti per l'analisi statica del codice

Guida Per Security Test e Strumenti Pen Test

Requisiti e use cases

Design

Test plans

Codice

Verifica E Risultati Dei Test

Feedback Operativo

Guida Per La Revisione Del Codice

OWASP

Il Progetto OWASP Top 10

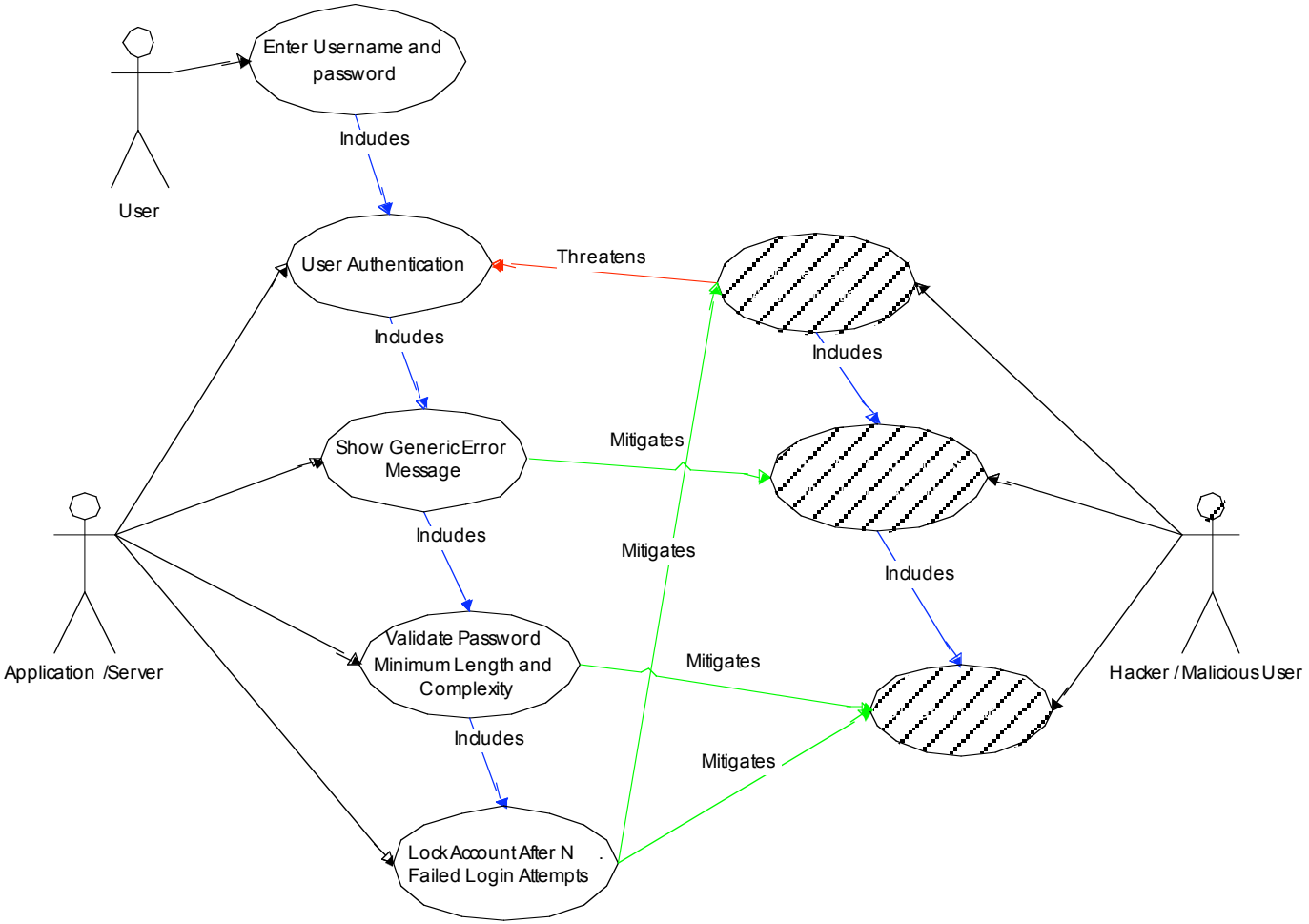
- Top 10 Vulnerabilita' delle Web Applications
  - Lista delle prime 10 vulnerabilita' piu ad alto rischio
  - Aggiornata ogni anno
  - Lo scopo sono le vulnerabilita' delle applicazioni exploitable dall'esterno
  - Presa come riferimento dal organizzazioni USA e business:
    - Federal Trade Commission (US Gov)
    - US Defense Information Systems Agency (DISA)
    - VISA (Cardholder Information Security Program)
  - Un buon punto di partenza per le iniziative di application security
  - La lista di organizzazioni che adottano OWASP si trova qui:
    - https://www.owasp.org/index.php/Category:OWASP_Top_Ten_Project

Esempio di lista per le vulnerabilita': OWASP Top 10

- Le 10 vulnerabilita' piu diffuse (2007)
  - A1. Cross Site Scripting
  - A2. Injection Flaws
  - A3. Malicious File Execution
  - A4. Insecure Direct Object Reference
  - A5. Cross Site Request Forgery
  - A6. Information Leakage and Improper Error Handling
  - A7. Broken Authentication and Session Management
  - A8. Insecure Cryptographic Storage
  - A9. Insecure Communications
  - A10. Failure to Restrict URL Access

https://www.owasp.org/index.php/Top_10_2007

OWASP vs3: Derivazione della specifica: security requirements via use and misuse cases

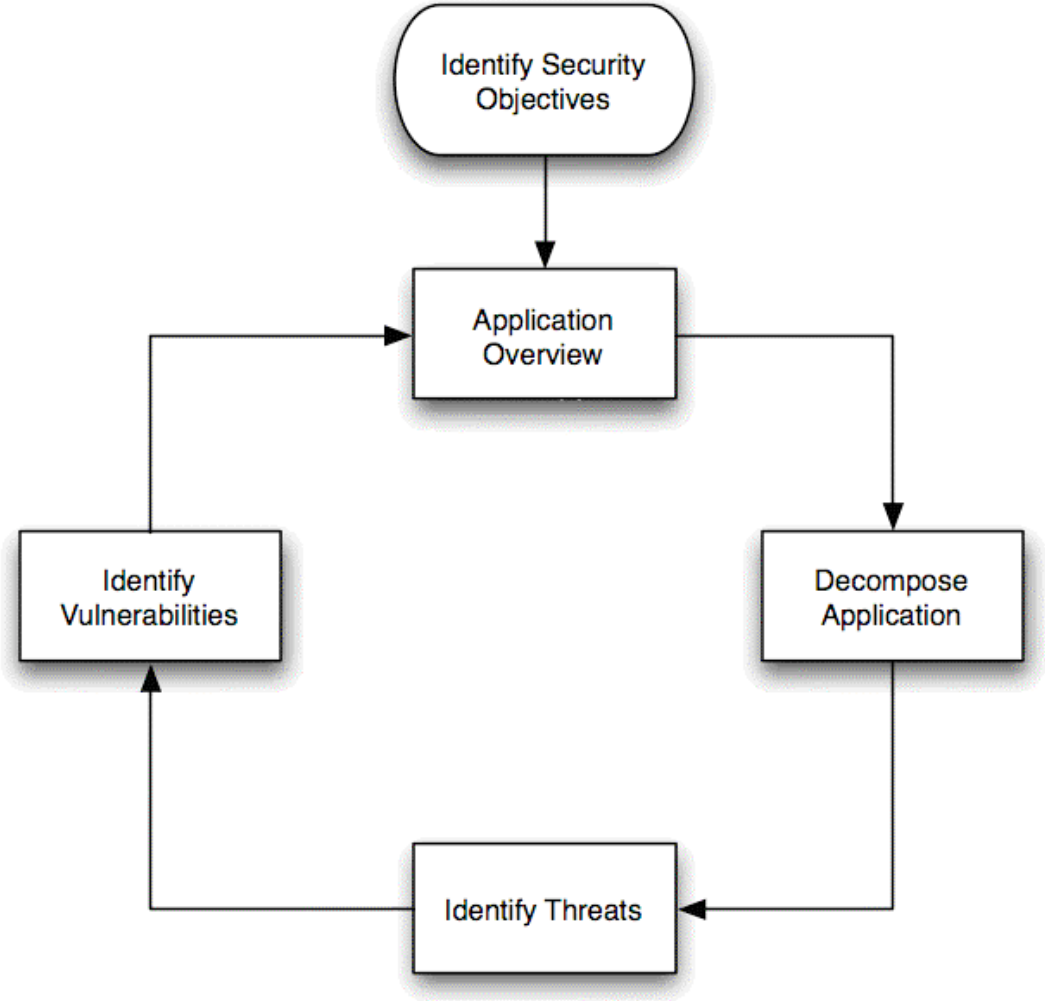


Source: OWASP Testing Guide Vs 3 Introduction

Guida per la progettazione: OWASP Guide 2.0

- Guida Per Sviluppare Sicure Web Applications e Web Services
  - Concetti e linee guida fondamentali per sviluppare software sicuro
    - Principi per security architecture e design
    - Sicurezza nella SDLC (Secure Coding, Threat Modeling, Pen Test)
    - Information security (policy, standards)
    - Si focalizza su aspetti fondamentali di design e implementazione:
      - Architettura
      - Autenticazione
      - Autorizzazione
      - Gestione delle web sessions
      - Logging e auditing degli Eventi
      - Validazione dei dati in input
      - Configurazione sicura

Analisi dei rischi dovuti alla architettura S/W: OWASP Threat Modeling



Progetto OWASP Application Threat Modeling

1. **Cattura dello scopo della applicazione**

   Requisti, Use Cases

2. **Modello di architettura del Sistema**

   Modello fisico e logico, Data Flows, Trust Boundaries, Entry/Exit Points

3. **Identificazione delle minaccie (Threats)**

   STRIDE, ASF

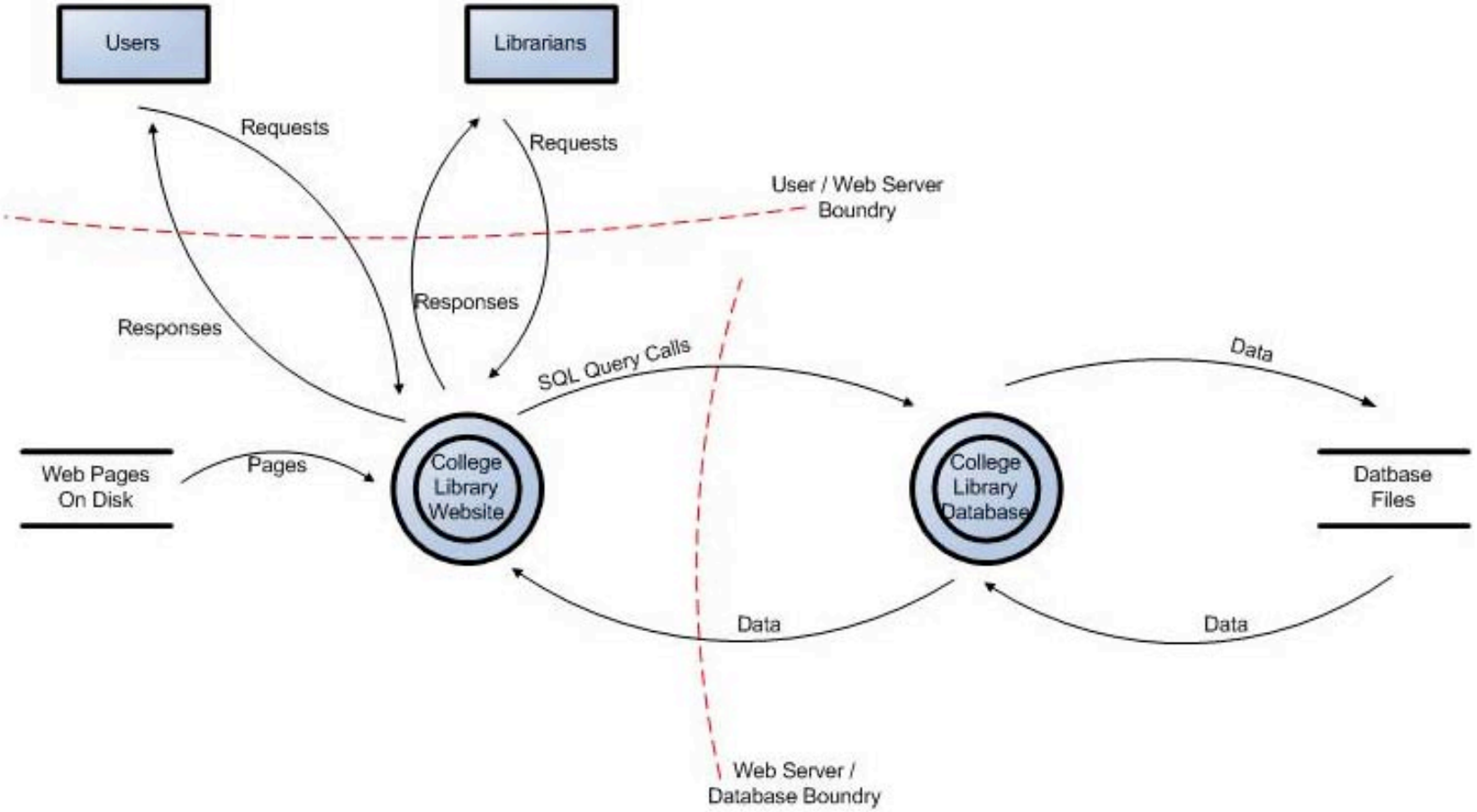
4. **Mapping delle minaccie- vulnerabilita- contromisure**

   Threat tree e checklists

5. **Determiniazione dei rischi associati alle minaccie**

   Modelli di Rischio

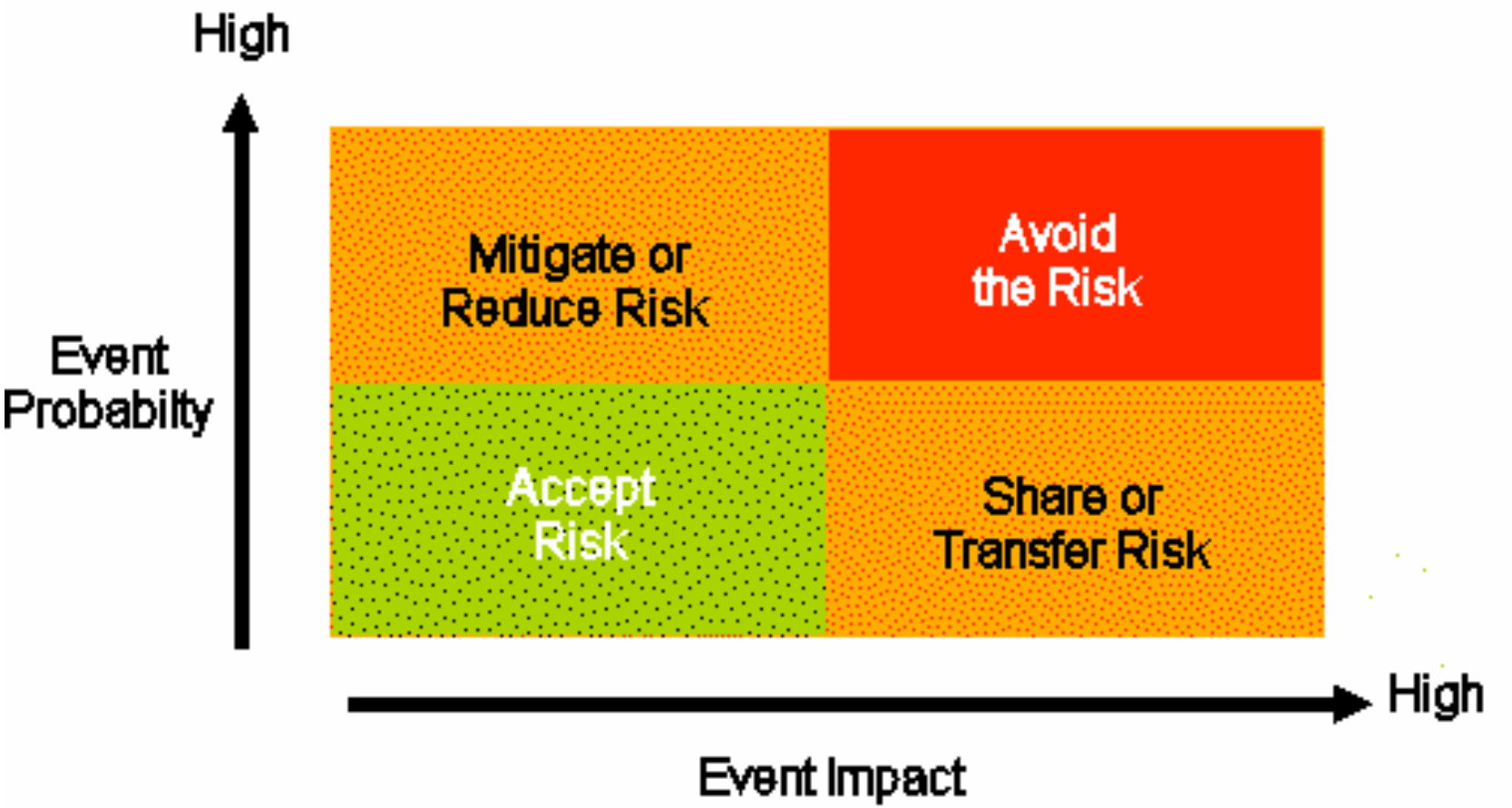
OWASP Application Threat Modeling (parte del progetto Secure Coding Guide vs.3)



OWASP Application Threat Modeling https://www.owasp.org/index.php/Application_Threat_Modeling

Modelli per la valutazione del rischio

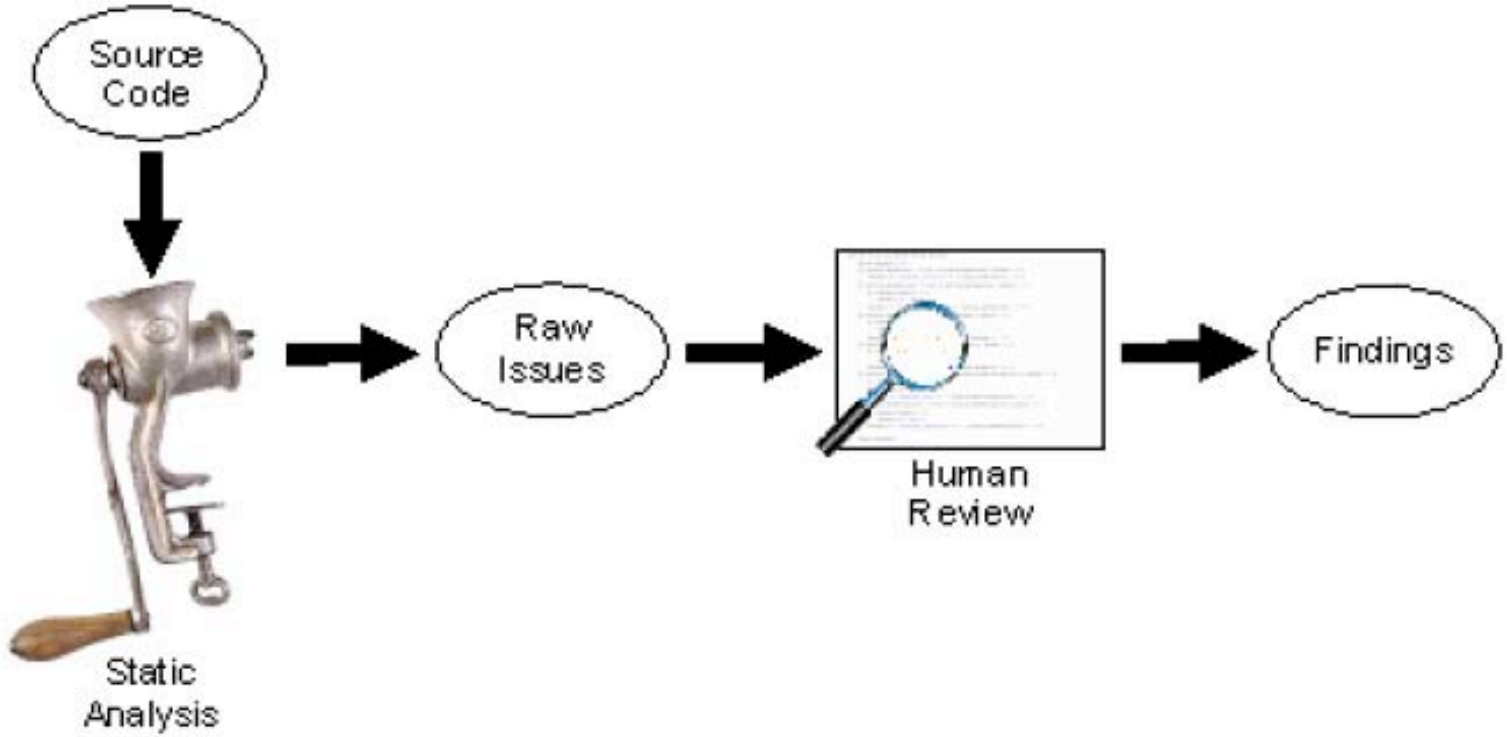
- Rischio = Minaccia x Vulnerabilita' X Impatto



Progetto OWASP Secure Coding Guideline

- Formalizza le “best practices” per scrivere software in modo sicuro
- Puo’ servire come documento base per creare secure coding standards specifici per la tua organizzazione/azienda
- E’ scritta per essere utilizzata da software engineers
- Puo’ essere usata per produrre una metrica e valutare la qualita’ del codice sorgente

Progetto per l'analisi del codice sorgente di progetti OWASP



http://owasp.fortify.com

Progetto OWASP Testing Guide (vs 3 , 2007)

- Il maggiore contributo italiano a OWASP…

- Principi Dei Test
- Processi Per Il Testing
- Testing Per Web Applications
  - Black Box Testing
  - Grey Box Testing
- Analisi Rischi e Reporting
- Appendix: Testing Tools
- Appendix: Fuzz Vectors

- Perdita Informazioni
- Test Logica Di Sistema
- Test Authentication
- Test Session Management
- Test Validazione Data
- Testing Denial of Service
- Web Services Testing
- Ajax Testing

http://www.lulu.com/items/volume_63/4037000/4037522/1/print/OWASP_Testing_Guide_v2_for_print.doc.pdf

Mitigazione dei rischi delle SQL injection: documentazione minaccie e contromisure

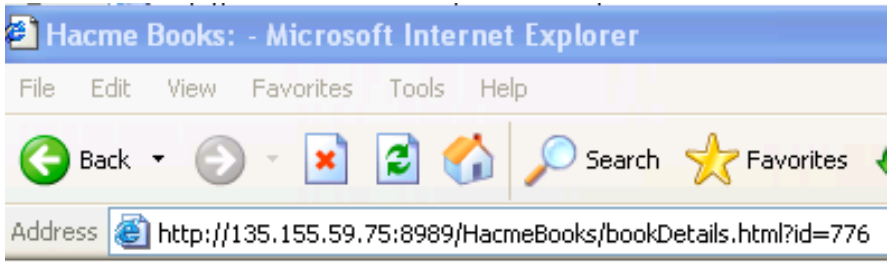
- **Minaccie: Accesso non autorizzato a dati, bypass della authentication, denial of service**
- **Contromisure:**
  - **Evita la concatenazione delle stringhe nei SQL statement** (e.g. *SELECT * FROM users WHERE username)*
  - **Usa SQL parameterized queries**
    - *JAVA EE usa strongly typed "PreparedStatement"*
    - *in .NET usa "SqlCommand" e "SqlParameters"*
  - **Rimuovi caratteri "in-sicuri" dall'input**:

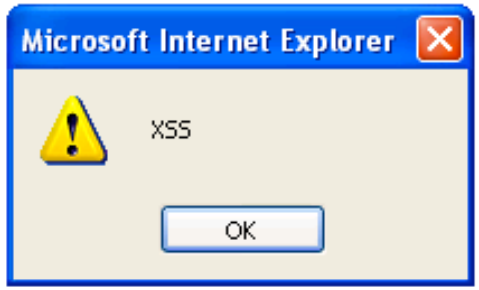
' " ` ; * % _ =&\|*?~<>^()[]{}$\n\r

  - **Usa messaggi di errore generici:**
    - No ai messaggi SQL exception all utente

Esempio di procedure per il test delle vulnerabilita' XSS

- Documenta il Test Case
  - Test Web Page Per Login
- Procedura Manuale
  - Vettori Di Attacco:
    - **<script>alert()</script>;**
    - **javascript:alert()**
    - **+ADw-SCRIPT+AD4-alert();+**
  - Passa il test se: Un messaggio di errore e' presentato all' utente
  - Non passa: se javascript e' eseguito dal browser: alert dialog





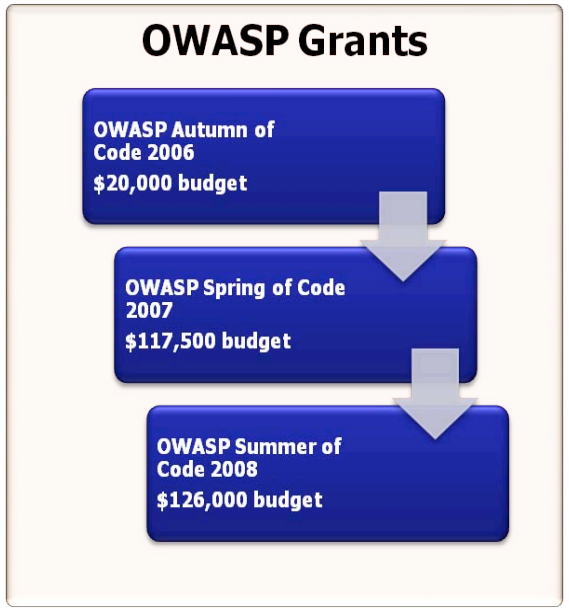
Strumenti OWASP Per l' Analisi Della Security

- http://www.owasp.org/index.php/Phoenix/Tools
- OWASP Tools + Conosciuti
  - WebGoat: applicazione web con vulnerabilita' per training e tests
  - WebScarab: web proxy e fuzzer
- Ricorda che:
  - Secondo MITRE le vulnerabilita' identificate dai tool trovano al massimo il 45% del totale vulnerabilita' presenti
  - Non c'e' tool che possa sostituire un consulente esperto
  - Tools non hanno idea della architettura e del contesti
  - Il fatto che un tool non trovi vulnerabilita' non vuol dire che il codice/applicazione e' sicuro

Come Partecipare A OWASP ?

Fondi OWASP e sponsorizzazioni per progetti

- 100% delle quote dei soci OWASP sono usate per sponsorizzare i progetti.
- Attualmented 3 “season of code” sono stati sponsorizzati da OWASP.
  - OWASP Autumn Of Code 2006
    $20,000 budget
  - OWASP Spring Of Code 2007
    $117,500 budget
  - OWASP Summer of Code 2008
    $126,000 budget



OWASP Summer of Code 2008

- Finanziamento per 31 progetti di application security

Application	Applicant's Name	Assessment	Selection	Sponsorship
OWASP Code review guide, V1.1	Eoin Keary	By vote	YES	5.000 US$
The Ruby on Rails Security Guide v2	Heiko Webers	By vote	YES	2.500 US$
OWASP UI Component Verification Project (a.k.a. OWASP JSP Testing Tool)	Jason Li	By vote	YES	2.500 US$
Internationalization Guidelines and OWASP-Spanish Project	Juan Carlos Calderon	By Vote	YES	5.000 US$
OWASP Application Security Desk Reference (ASDR)	Leonardo Cavallari Militelli	By vote	YES	5.000 US$
OWASP .NET Project Leader	Mark Roxberry	By vote	YES	2.500 US$
OWASP Education Project	Martin Knobloch	By vote	YES	2.500 US$
The OWASP Testing Guide v3	Matteo Meucci	By vote	YES	5.000 US$
OWASP Application Security Verification Standard	Mike Boberski	By vote	YES	2.500 US$
OWASP Online code signing and integrity verification service for open source community	Phil Potisk and Richard Conway	By vote	YES	2.500 US$
Securing WebGoat using ModSecurity	Stephen Evans	By vote	YES	2.500 US$
OWASP Book Cover & Sleeve Design	LXstudios	By vote	YES	6.000 US$
OWASP Individual & Corporate Member Packs, Conference Attendee Packs Brief	LXstudios	By vote	YES	2.000 US$

Progetti Finanziati Nel 2008 (cont)

Application	Applicant's Name	Assessment	Selection	Sponsorship
OWASP Access Control Rules Tester	Andrew Petukhov	By vote	YES	2.500 US$
OpenPGP Extensions for HTTP - Enigform and mod_openpgp	Arturo 'Buanzo' Busleiman	By vote	YES	2.500 US$
OWASP-WeBekci Project	Bunyamin Demir	By vote	YES	2.500 US$
OWASP Backend Security Project	Carlo Pelliccioni	By vote	YES	2.500 US$
OWASP Application Security Tool Benchmarking Environment and Site Generator refresh	Dmitry Kozlov	By vote	YES	5000 US$
Teachable Static Analysis Workbench	Dmitry Kozlov, Igor Konnov	By vote	YES	5000 US$
OWASP Positive Security Project	Eduardo Vianna de Camargo Neves	By vote	YES	2.500 US$
GTK+ GUI for w3af project	Facundo Batista	By vote	YES	2.500 US$
OWASP Source Code Review OWASP Projects	James Walden	By vote	YES	2.500 US$
OWASP Interceptor Project - 2008 Update	Justin Derry	By vote	YES	2.500 US$
Skavenger	Matthias Rohr	By vote	YES	2.500 US$
SQL Injector Benchmarking Project (SQLiBENCH)	Mesut Timur & Bedirhan Urgun	By vote	YES	2.500 US$
OWASP AppSensor - Detect and Respond to Attacks from Within the Application	Michael Coates	By vote	YES	2.500 US$
Owasp Orizon Project	Paolo Perego	By vote	YES	2.500 US$
OWASP Corporate Application Security Rating Guide	Parvathy Iyer	By vote	YES	2.500 US$
OWASP AntiSamy .NET	Arshan Dabirsiaghi	By vote	YES	2.500 US$
Python Static Analysis	Georgy Klimov	By vote	YES	2.500 US$
OWASP Classic ASP Security Project	Juan Carlos Calderon	By vote	YES	2.500 US$
OWASP Live CD 2008 Project	Matt Tesauro	By vote	YES	2.500 US$

Application	Applicant's Name	Assessment	Selection	Sponsorship
OWASP Code Crawler	Alessio Marziali	By selection criteria	YES	2.500 US$

Sciegli Un Progetto OWASP

O

- [+] OWASP .NET Project
- [+] OWASP AIR Security Project
- [+] OWASP ASDR Project
- [+] OWASP Access Control Rules Tester Project
- [+] OWASP AntiSamy Project
- [+] OWASP AntiSamy Project .NET
- [+] OWASP AppSec FAQ Project
- [+] OWASP AppSensor Project
- [+] OWASP Application Security Assessment Standards Project
- [+] OWASP Application Security Metrics Project
- [+] OWASP Application Security Requirements Project
- [+] OWASP Application Security Tool Benchmarking Environment and Site Generator Refresh Project
- [+] OWASP Application Security Verification Standard Project
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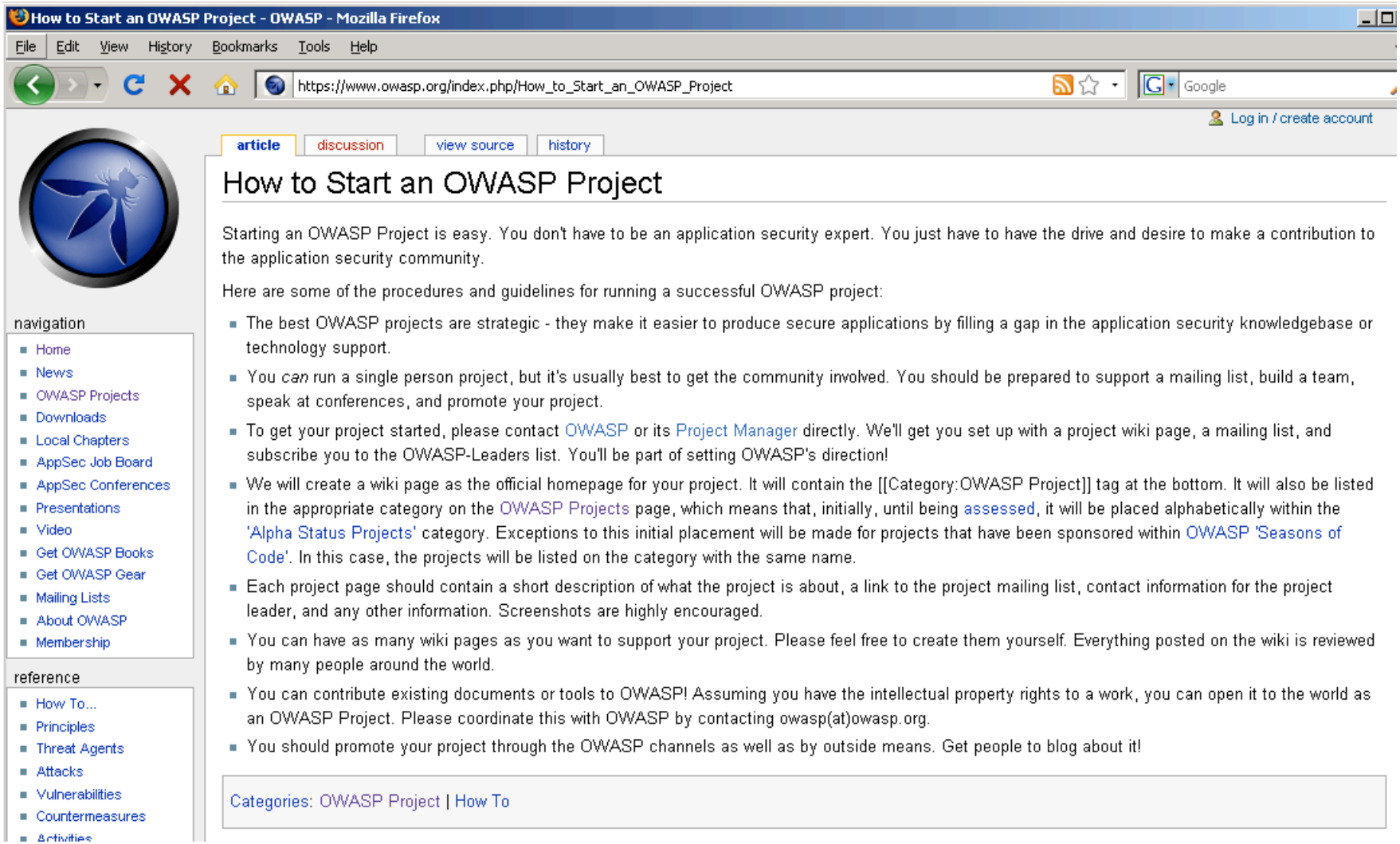
List administrators, you can visit the list admin overview page to find the management interface for your list.

If you are having trouble using the lists, please contact mailman@lists.owasp.org.

List	Description
Europe-summit-2008	*[no description available]*
Java-project	OWASP Java Project Mailing List
Netherlands-board	*[no description available]*
Open-review-project	OWASP Open Review Project
Owasp-access-control-rules-tester-project	OWASP Access Control Rules Tester Project
Owasp-ahmedabad	*[no description available]*
Owasp-ajax	Owasp-ajax
Owasp-alabama	*[no description available]*
Owasp-antisamy	*[no description available]*
Owasp-appcec-tool-benchmarking-project	OWASP Application Security Tool Benchmarking Environment and Site Generator Refresh Project
Owasp-application-security-verification-standard	OWASP Application Security Verification Standard Project
OWASP-AppSec-Requirements	OWASP Application Security Requirements Project
Owasp-appsec-standards	*[no description available]*
Owasp-appsensor-project	OWASP AppSensor Project
Owasp-argentina	*[no description available]*
Owasp-atlanta	*[no description available]*
Owasp-austin	The OWASP Austin Chapter email list

Oppure.. inizia un tuo progetto



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