# Best Practices Guide: Web Application Firewalls

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## OWASP German Chapter

# Big “Thank you!!!” to the Authors

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# Introduction and aim

- Introduction
  - Online Businesses
  - Weak spot HTTP
  - Reference to PCI DSS
- Definition of the term “Web Application Firewall”
  - NOT a Network Firewall
  - Not only Hardware
- Targeted audience
  - Technical decision-makers
  - People responsible for operations and security
  - Application Owners

# Characteristics of web applications with regards to security

- Higher level aspects in the company
  - Prioritizing Web Apps in regard to their importance
    - Access to personal customer data
    - Access to (confidential) company information
      - Image loss
    - Certifications
- Technical Aspects
  - Test and quality assurance
  - Documentation
  - Vendor-Contracts

# Overview of what WAFs can do

- Where do WAFs fit into the Web App Sec field
  - WAFs are part of a solution
  - Main benefits of a WAF
  - Additional functionality
- What can be archived with WAFs
  - Table with (wanted) functionality
    - examples: CSRF, Session fixation, *-Injection
  - Rating / Evaluation:
    - + can be very well implemented using a WAF
    - - can not be implemented
    - ! dependents on the WAF/application/requirements
    - = can partly be implemented with a WAF

# Benefits and risks of WAFs (I)

- Main benefits of WAFs
  - Base line security
  - Compliance
  - Just-in-time patching of problems
- Additional benefits of (depending on functionality)
  - Central reporting and error logging
  - SSL termination
  - URL-Encryption
  - ....

# Benefits and risks of WAFs (II)

- Risks involved using WAFs
  - False positives
  - Increased complexity
  - Yet another proxy
  - Potential side effects if the WAF terminates the application

# Protection against the OWASP TOP 10
# App vs. WAF vs. Policy

- Three types of applications:
  - T1: Web application in design phase
  - T2: Already productive app which can easily be changed (e.g. with MVC architecture)
  - T3: Productive app which cannot be modified or only with difficulty
- Table of OWASP TOP 10 in regards to work required with the 3 types of application to fix the problem
  - in the application itself
  - using a WAF
  - using a policy

# Criteria for deciding whether or not to use Web Application Firewalls (I)

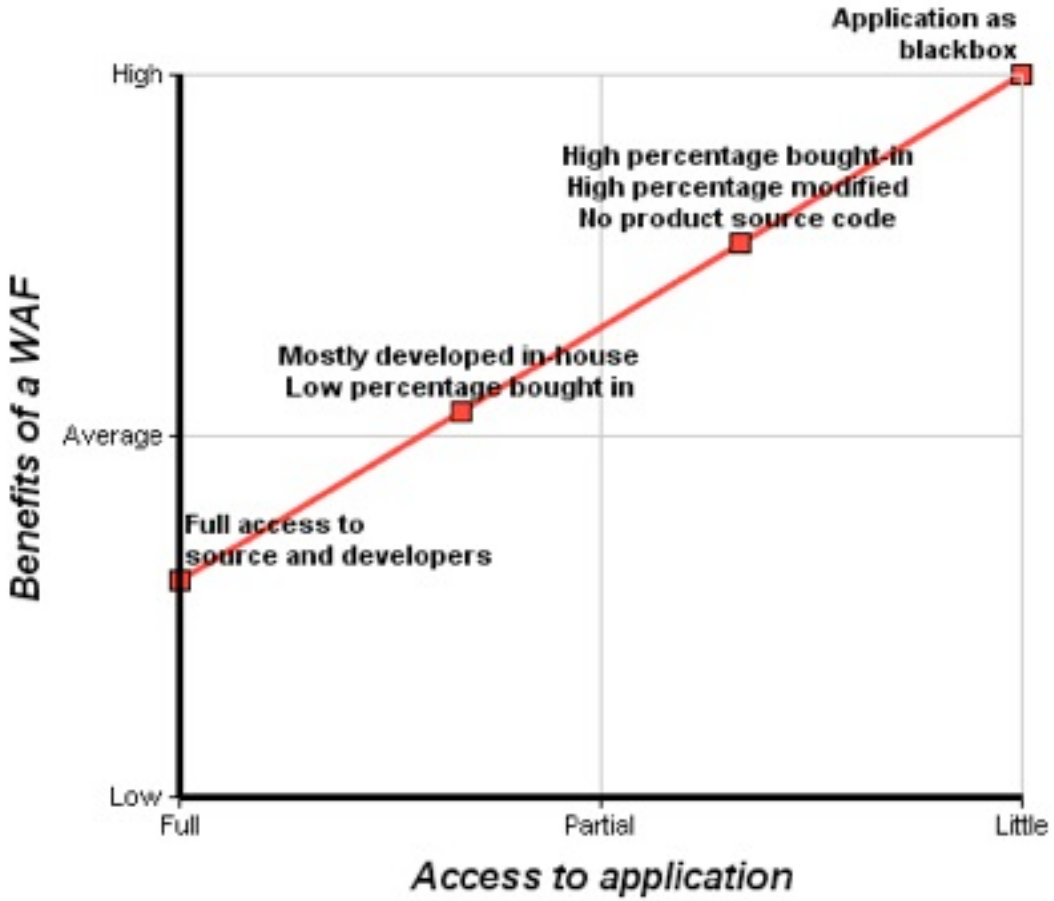
- Company wide criteria:
  - Importance of the app for the success of the company
  - Number of web applications
  - Complexity
  - Operational costs
  - Performance and scalability

# Criteria for deciding whether or not to use Web Application Firewalls (II)

- Criteria with regard to the web application
  - Changeability of the application
  - Documentation
  - Maintenance contracts
  - Time required fixing bugs in third-party products
- Consideration of financial aspects
  - Avoidance of financial damage via successful attacks
  - Costs of using a WAF
    - License costs
    - Update costs
    - Project costs for evaluation and introducing a WAF
    - Volume of work required / Personnel costs

# Criteria for deciding whether or not to use Web Application Firewalls (II)

- Evaluation and Summary



# Best practices for introduction and operation of Web Application Firewalls (I)

- Infrastructure
  - Central or decentralized infrastructure
    - central proxy application
    - host based - plug-in approach
    - virtualization !!???!!!
  - Performance
    - GBits/Second throughput on hardware does NOT matter
    - HTTP requests processed per second is important
    - Simultaneous web application users
    - Think of peak load times (pre Christmas rush)

# Best practices for introduction and operation of Web Application Firewalls (II)

- Organizational aspects
  - Security Policies
    - Try not to change security policies already in place
  - Suggestion of new job position
    - WAF application manager
      - One-off task of commissioning a WAF
      - In-depth knowledge of WAF capabilities
      - Alarm and Error management
      - Changes to the rule-set
      - Talking to the development department(s)

# Best practices for introduction and operation of Web Application Firewalls (III)

- Iterative procedure
  - Step 1
    - Definition of the people responsible for security
      - ideally the "WAF application manager"
  - Step 2
    - Baseline security for all web applications
      - mostly blacklisting using vendor signatures
      - monitor for false positives/negatives and get rid of them
  - Step 3
    - Prioritized list of all web applications which need to be secured
      - Use the checklist (attached to the paper)
  - Further Steps:
    - Work through the list and systematically secure the app

# Appendices

- Checklist to define the 'accessibility' of the web application
  - The more points you score the, the better is the access to web application
- Job descriptions for the 'new guys'
  - WAF platform manager
    - needed in really complex/big environments
  - WAF application manager (per application)
  - Application manager

# Where to find on the net?

- OWASP Wiki of course
  - https://www.owasp.org/index.php/Best_Practices:_Web_Application_Firewalls

# Questions

## Thank you!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