Deep Dive On F5 „on and off prem“ Application Protection

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Important Trends: Patching Vulnerabilities Remain An Issue

Vulnerabilities help make Web application attacks amongst the leading causes of data breaches

86% of websites has at least 1 vulnerability and an average of 56 per website WhiteHat Security Statistics Report 2013

99% of vulnerabilities were compromised a year after the vulnerability was made public (CVE)

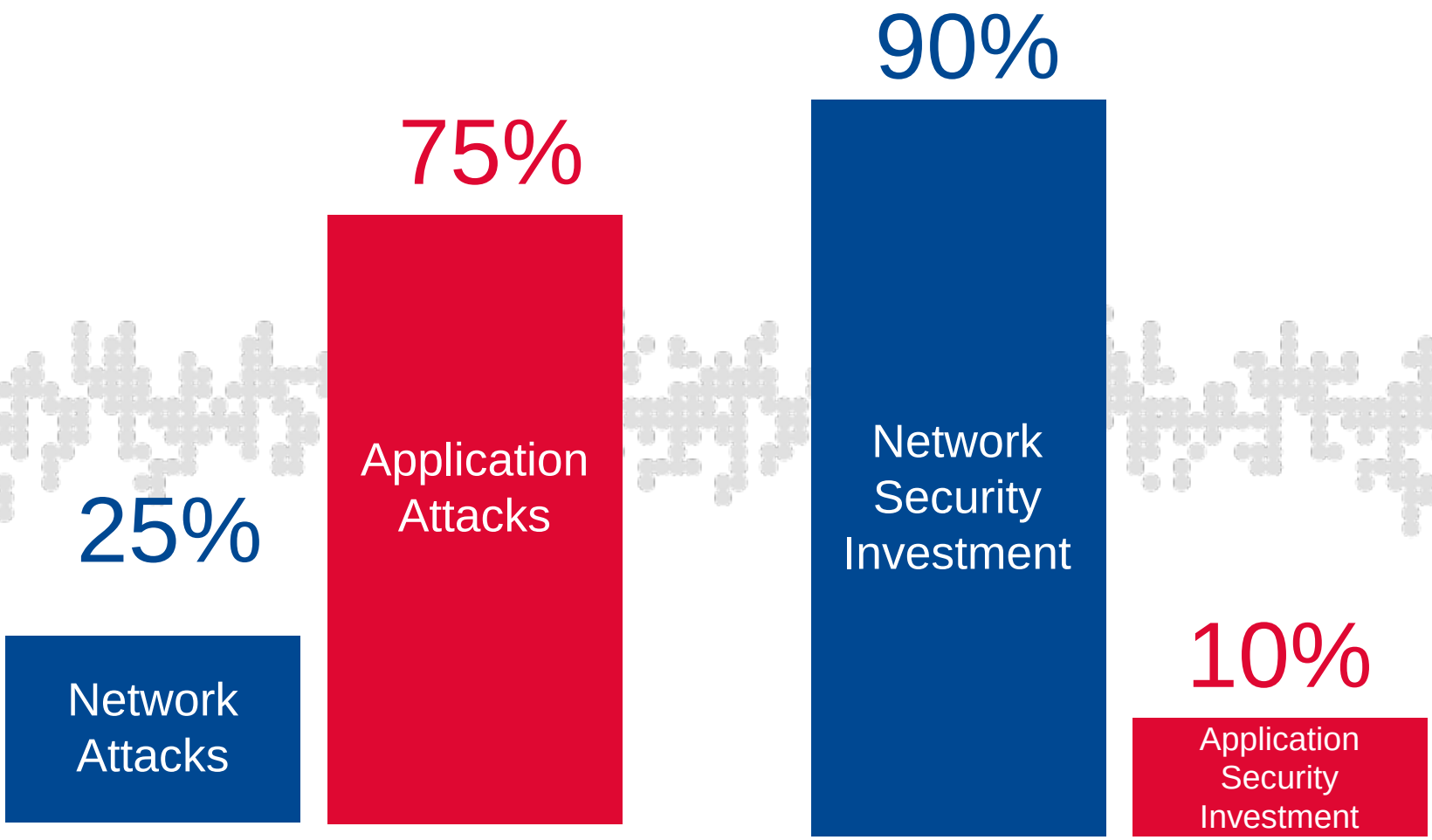
10 CVE's account for 97% of the exploits observed in 2014

Less than 49% of companies have an organized effort for patching

2015 Cisco Annual Security Report

What's Going on in the Market?

Today's Security Investment Doesn't Address the Big Problem



Source: Gartner

Application Security Manager (ASM)

BIG-IP ASM: Leadership in WAF

Traditional WAF

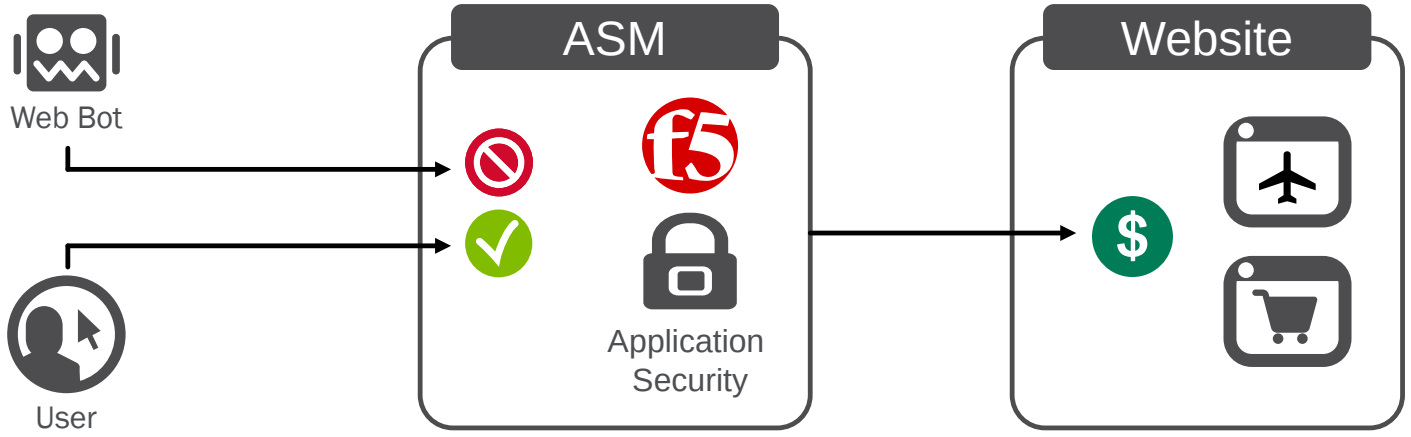
- Signatures (OWASP Top 10)
- DAST Integration
- Site Learning
- File/URL/Parameter/Header/Cookie Enforcement
- Protocol Enforcement
- Login Enforcement / Session Tracking
- Data Leak Prevention
- Flow Enforcement
- IP Blacklisting

Advanced WAF

- Bot Detection
- Client Fingerprinting
- Web Scraping Prevention
- Brute Force Mitigation
- L7 DDoS Protection
- Heavy URL Mitigation
- CAPTCHA Challenges
- HTTP Header Sanitization/Insertion
- Anti-CSRF Token Insertion
- PFS Ciphers

Highly accurate anti-bot and scanner protection

- Differentiate between script and browser
- Inspection of user interaction with browser
- Distinguish real-user from bot
- Mitigate automated attacks, scanners, botnets and intellectual property scrappers
- Detect a persistent scrapper that uses multiple ip addresses or a single request session



Fingerprinting, DeviceID

- Collects browser attributes
  - Screen resolution
  - Time zone
  - Default fonts
  - User agent
  - Installed plug-ins
  - …
- Associates collected information and browser behavior to identify suspicious clients

http://browserspy.dk/

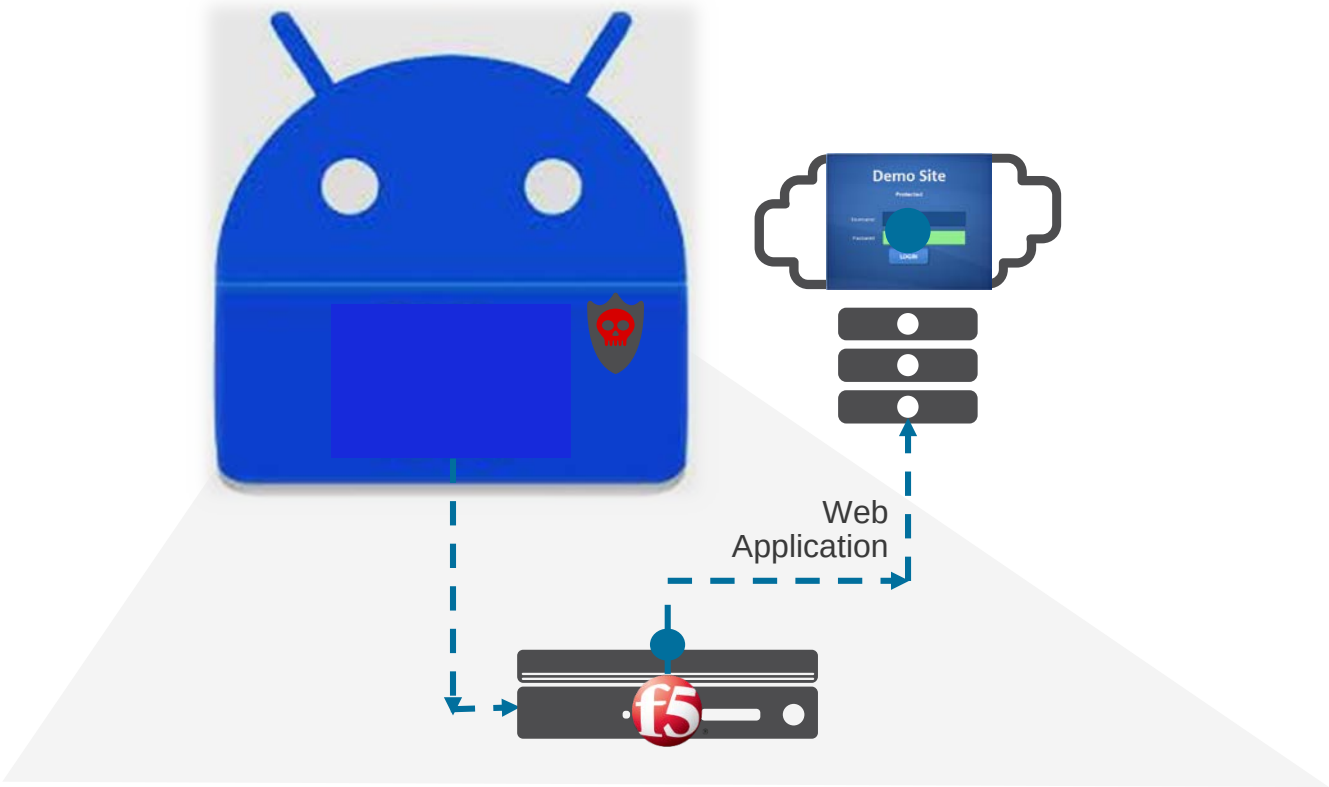
https://panopticlick.eff.org/

http://jcarlosnorte.com/security/2016/03/06/advanced-tor-browser-fingerprinting.html

ASM’s unique Proactive Bot defense

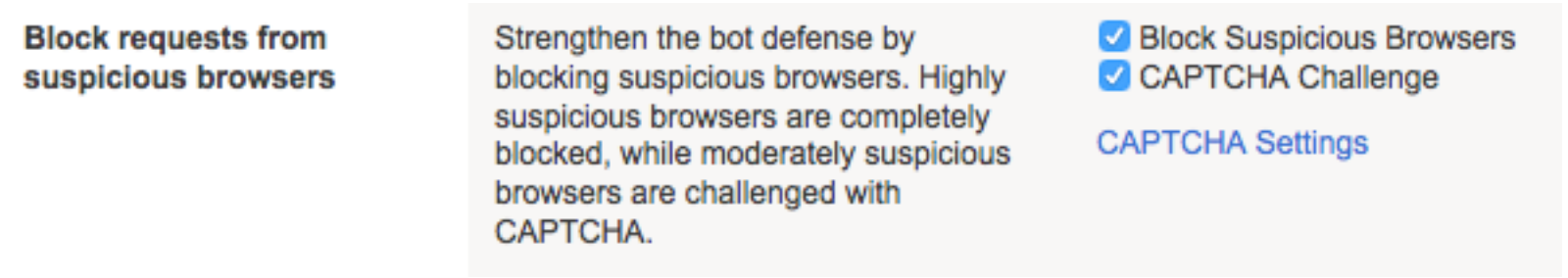
Stop automated attacks from ever materializing

- Enables always-on protection that preempts attacks
- Compliments existing reactive protections
- Utilizes advances detection methods and techniques CAPTCHA challenges & geolocation enforcement
- Categorize BOTs detected by signature classification to distinguishes good Bots from malicious offenders
- Detect headless browsers that run JS

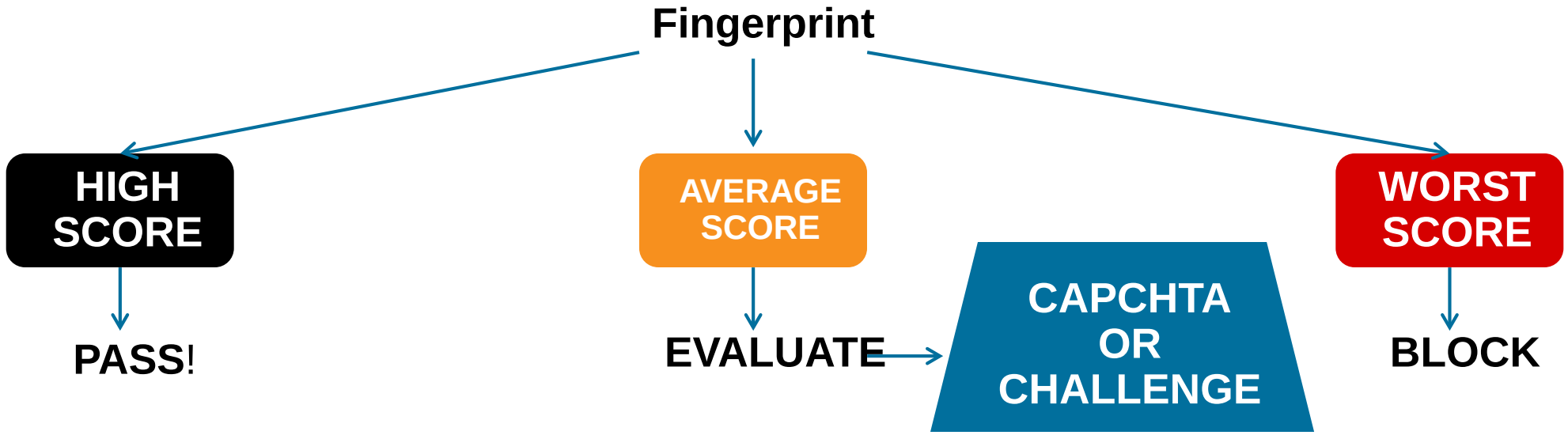


Defend against automated non-human webscraping, DDoS and Brute force attacks

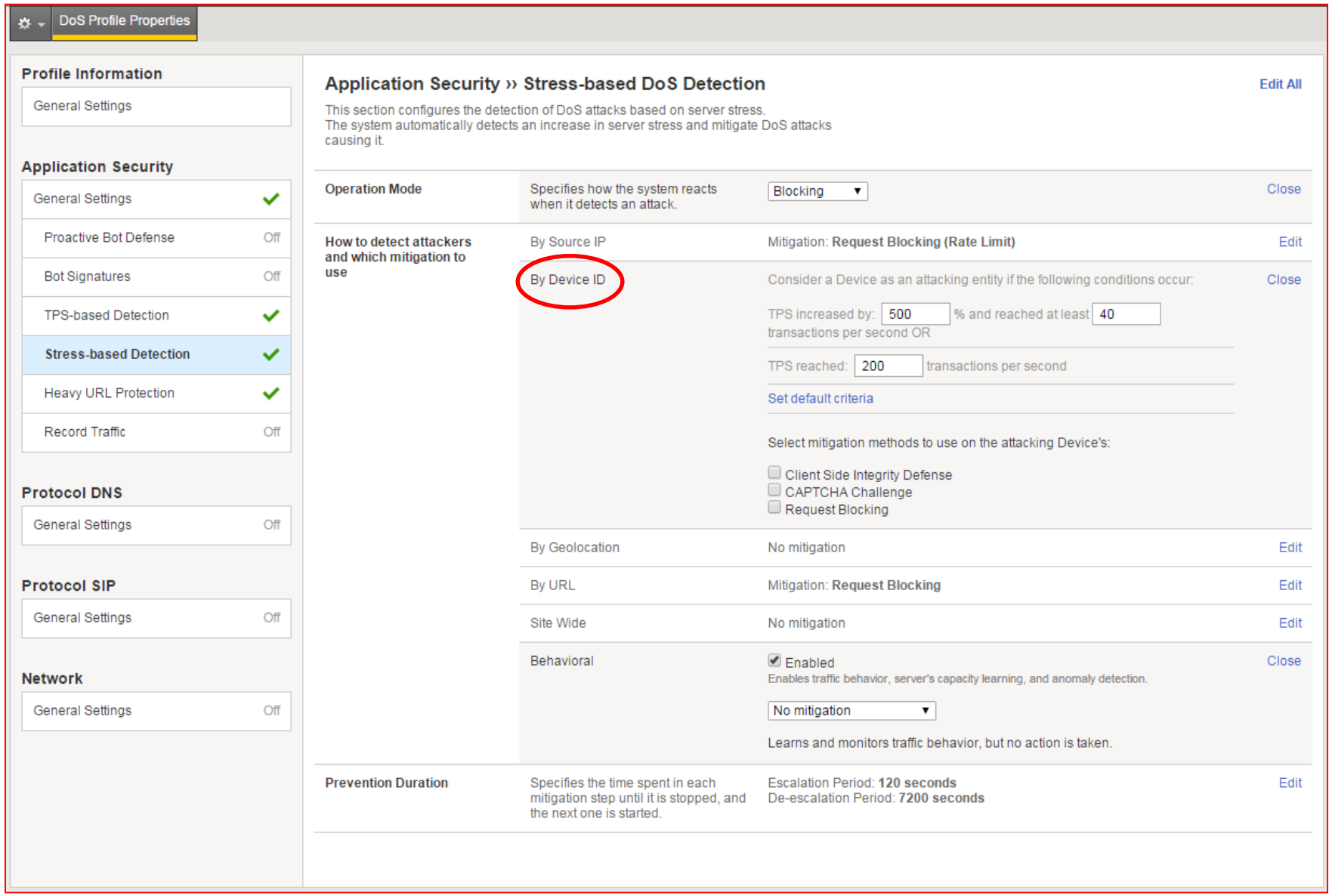
Detecting bots and blocking



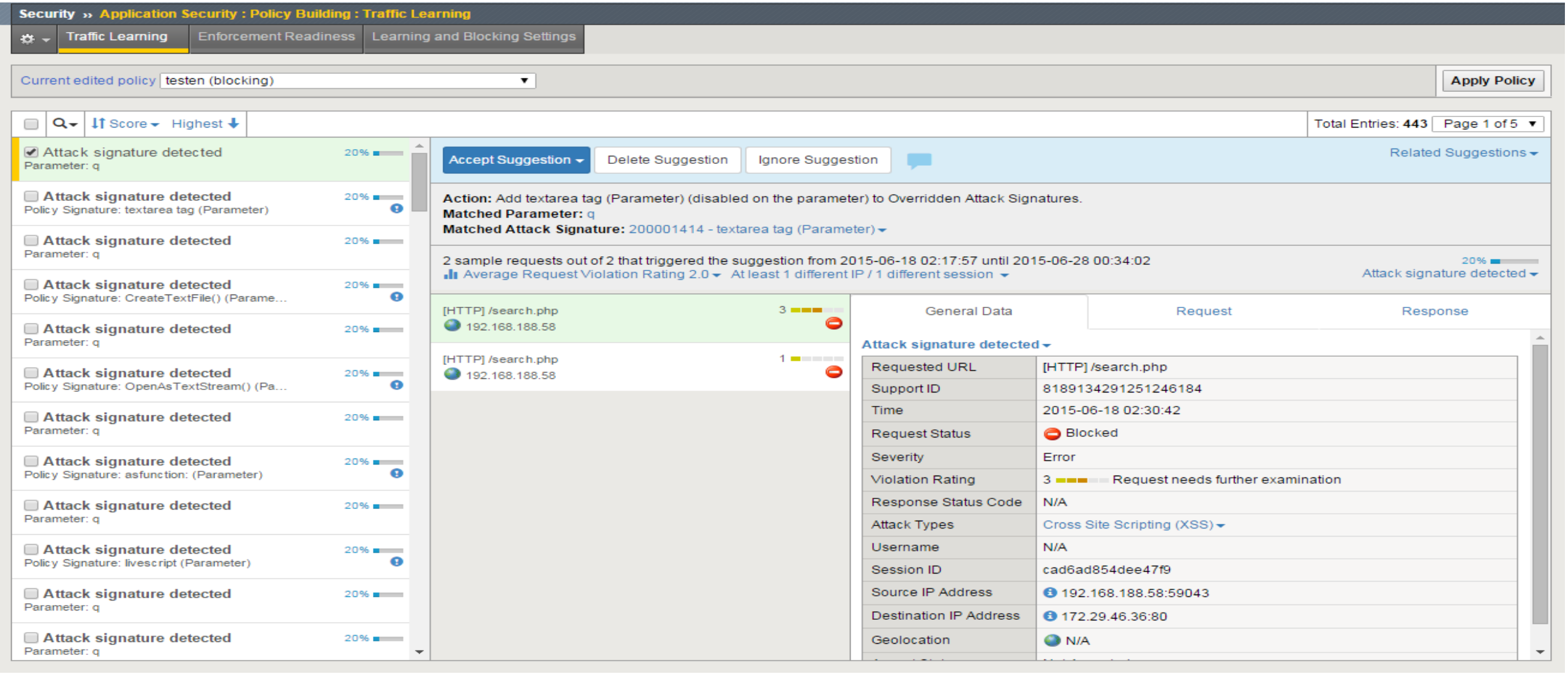
- When checked, ASM will fingerprint and score the browser and check multiple variables to determine if it is a bot



DDOS Profile



Traffic Learning



Demo: Evasion Techniques

Websocket Security

HTTP and Real Time Updates

Why does HTTP run into difficulties?

- HTTP is half duplex
- It is primarily designed for document sharing and not for interactive applications
- The protocol overhead is big, especially if the message (payload) is a short

Introducing WebSocket

- TCP based, bi-directional, full-duplex messaging
- Part of HTML5
- IETF-defined Protocol: RFC 6455
- W3C defined JavaScript API
- Uses HTTP upgrade handshake
- Supports HTTP proxies, filtering, authentication and intermediaries

How does it work?

- Starting from an HTTP connection the clients needs to “update” the connection to another protocol, which is WebSocket

Request:

```
GET ws://echo.websocket.org/?encoding=text HTTP/1.1
Host: echo.websocket.org
Upgrade: websocket
Connection: Upgrade
Origin: http://websocket.org
Cookie: __utma=99as
Sec-WebSocket-Key: uRovscZjNol/umbTt5uKmw==
Sec-WebSocket-Version: 13
```

Request upgrade to WebSocket connection

WebSocket Handshake headers

How does it work?

- **Response**:

  HTTP/1.1 101 WebSocket Protocol Handshake
  Date: Fri, 10 Feb 2012 17:38:18 GMT
  Connection: Upgrade
  Server: Kaazing Gateway
  Upgrade: WebSocket
  Access-Control-Allow-Origin: http://websocket.org
  Access-Control-Allow-Credentials: true
  Sec-WebSocket-Accept:
  rLHCkw/SKsO9GAH/ZSFhBATDKrU=
  Access-Control-Allow-Headers: content-type

At this point the HTTP connection breaks down and is replaced by the WebSocket connection over the same underlying TCP/IP connection. The WebSocket connection uses the same ports as HTTP (80) and HTTPS (443), by default.

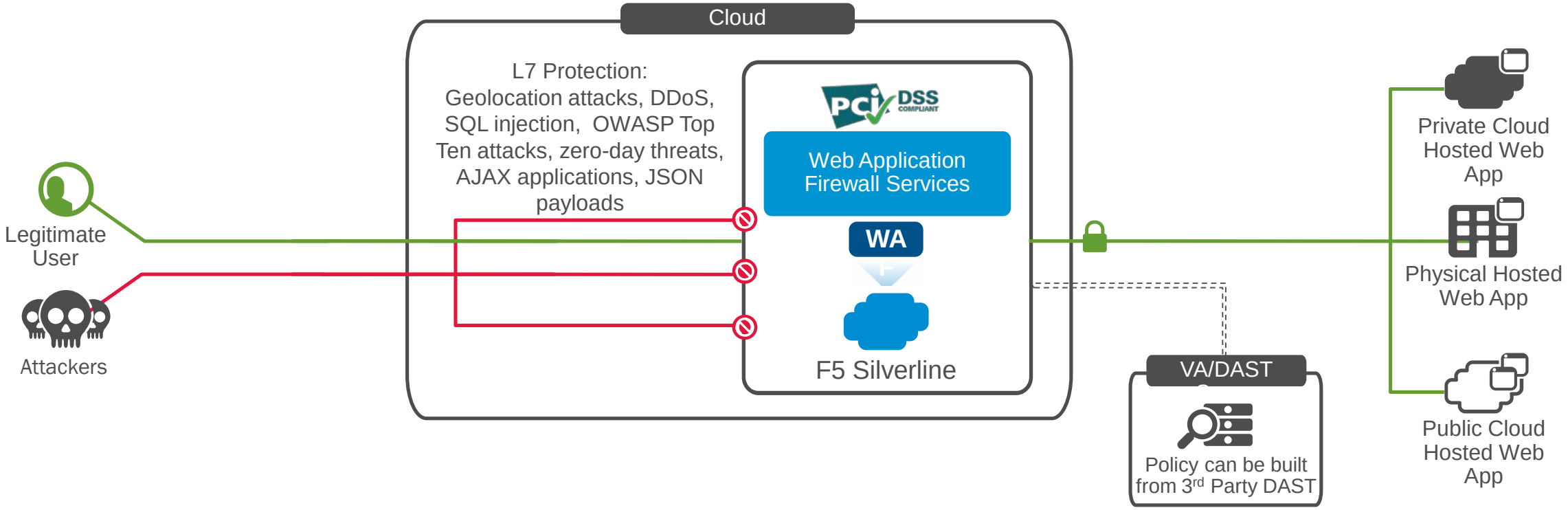
Demo: Websocket Security

Silverline: WAFaaS

Silverline Web Application Firewall

Proven security effectiveness as a convenient cloud-based service

Protect web applications and data from layer 7 attacks, and enable compliance, such as PCI DSS, with the Silverline Web Application Firewall service which is built on BIG-IP Application Security Manager and backed by 24x7x365 support from F5 experts.



Global Coverage

SSAE 16 SOC I TYPE II CERTIFIED

PCI DSS COMPLIANT

24/7 Support

F5 Security Operations Center (SOC) is available 24/7 with security experts ready to respond to DDoS attacks within minutes

- Seattle, WA US
- Warsaw, Poland

Global Coverage

Fully redundant and globally distributed data centers world wide in each geographic region

- San Jose, CA US
- Ashburn, VA US
- Frankfurt, DE
- Singapore, SG

Industry-Leading Bandwidth

- Attack mitigation bandwidth capacity over 2.0 Tbps
- Scrubbing capacity of over 1.0 Tbps
- Guaranteed bandwidth with Tier 1 carriers

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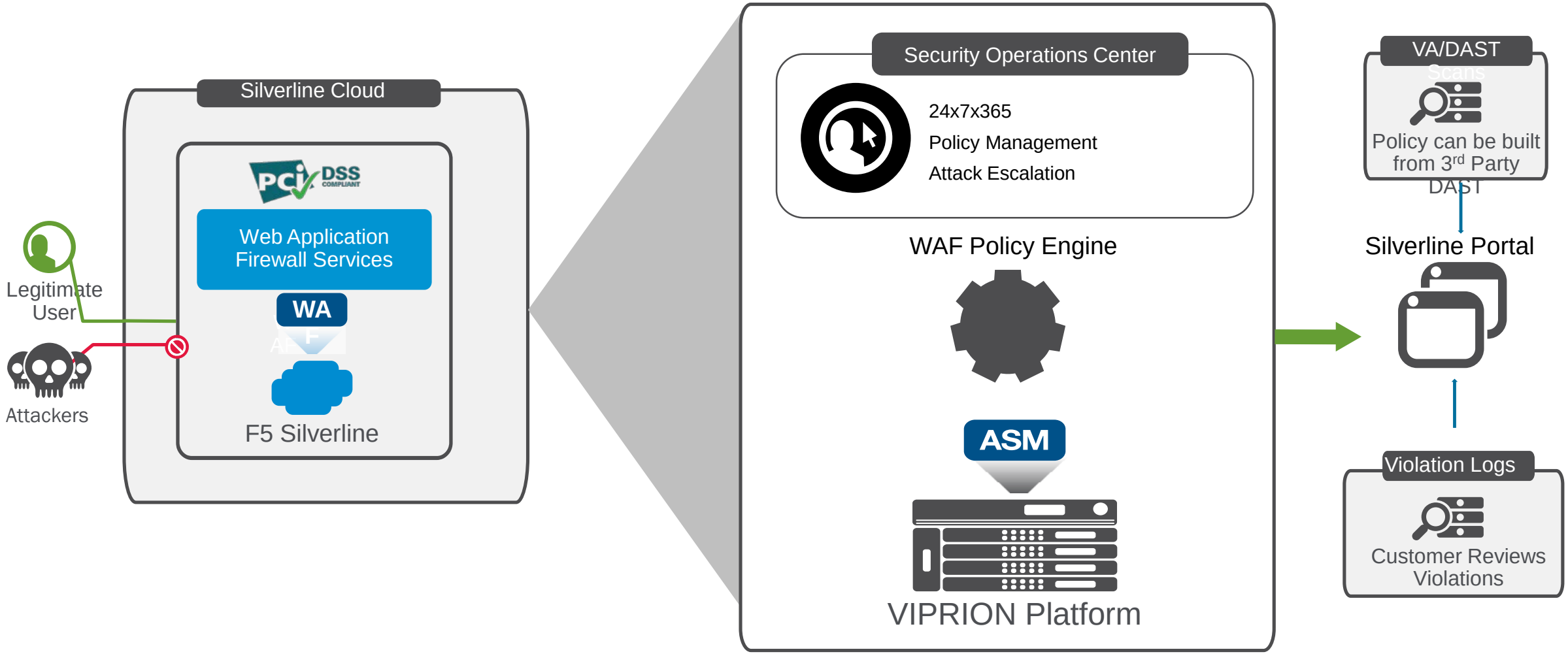

SOLUTIONS FOR AN APPLICATION WORLD