Moving Security up the Stack
Web Application and API Security

Dave Ferguson
Director of Product Management, Qualys, Inc.

Agenda

Recent trends in Application Security

Web Application Scanning (WAS)

Qualys Periscope

Building Securing APIs

Trends in Application Security

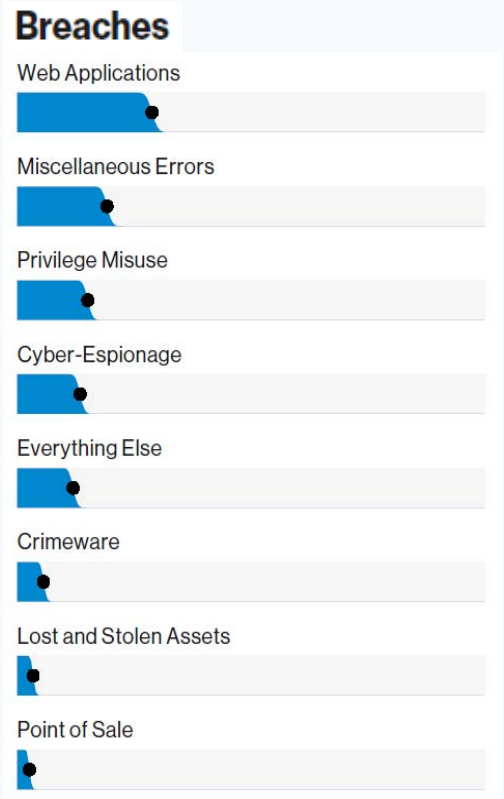
Web app breaches continue

E-commerce sites targeted

API attacks

Trends in AppSec testing

- Shifting left
- Coverage
- Automation



Source: 2019 Verizon DBIR

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Web Application Scanning

WAS Overview

Detects application-layer vulnerabilities in web apps & APIs

Browser engine

Automated crawling

Play back of Selenium scripts

API to integrate with other systems

Unique integration with Qualys WAF

Mature product

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2019 Highlights

WAS Jenkins plugin v2

Updated Qualys Browser Recorder

TLS 1.3

Full HTTP requests

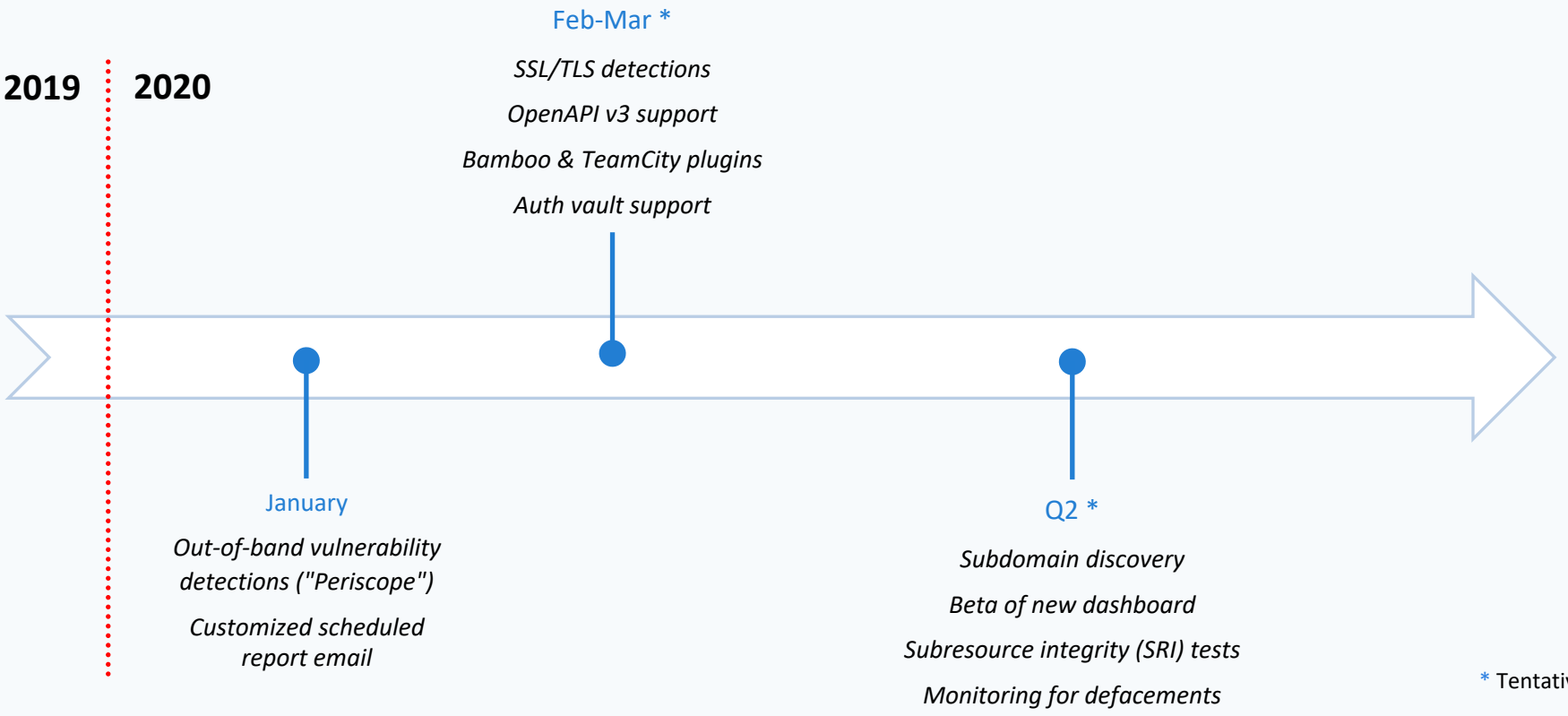
Enhanced crawling

Postman Collections

WAS Burp extension v2

Editable QID severity

WAS Roadmap



* Tentative

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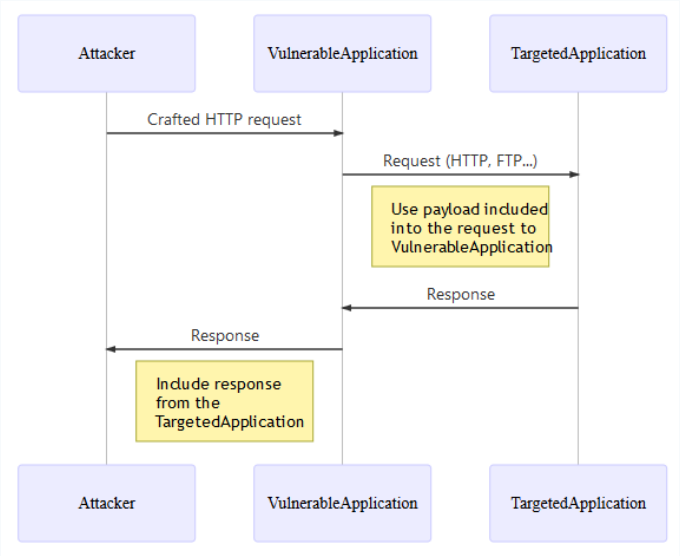
Out-of-Band Vulnerabilities

Some issues can't be detected by traditional request-response

- SSRF
- SMTP header injection
- Blind XXE injection

Detecting these vulnerabilities requires a different approach



Source: OWASP

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Introducing Periscope

Detection mechanism for out-of-band web app vulnerabilities

Scanner sends a test; POST request body is:

p1=joe&p2=smith&p3=http%3A%2F%2Fe528efddaa51766cb86afb19f22de54b6da1093c.1454156_35626.2086421852.ssrf01.ssrf.qualysperiscope.com

The web app tries to resolve this FQDN:

e528efddaa51766cb86afb19f22de54b6da1093c.1454156_35626.2086421852.ssrf01.ssrf.qualysperiscope.com

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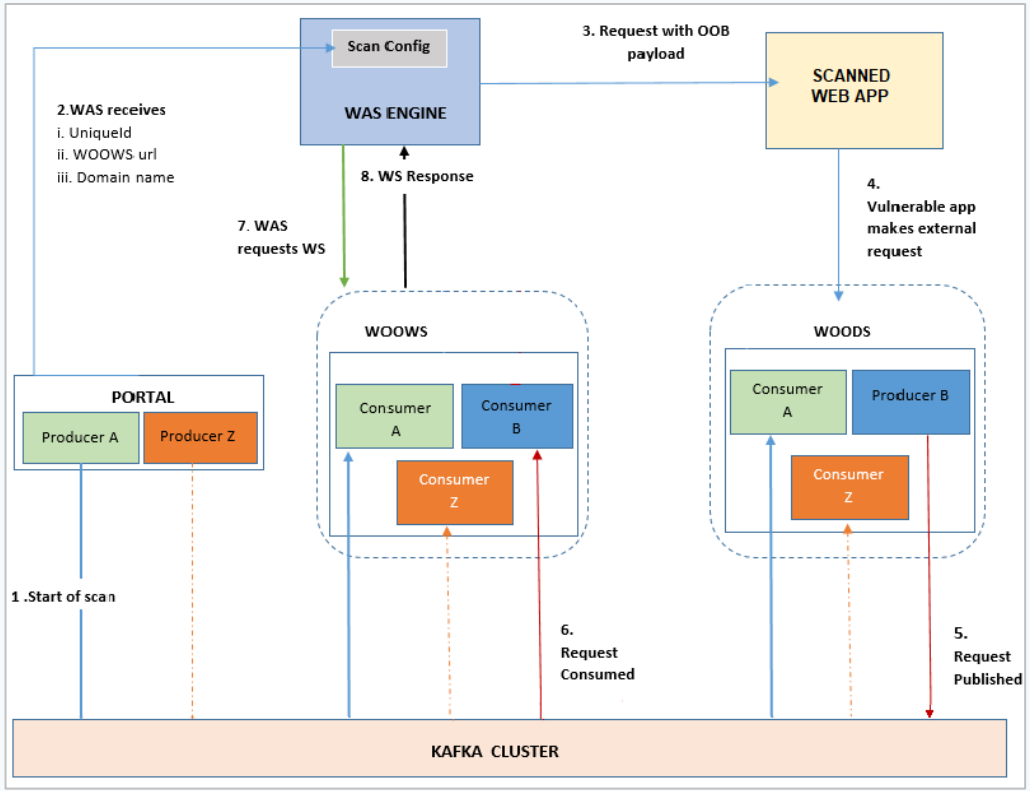

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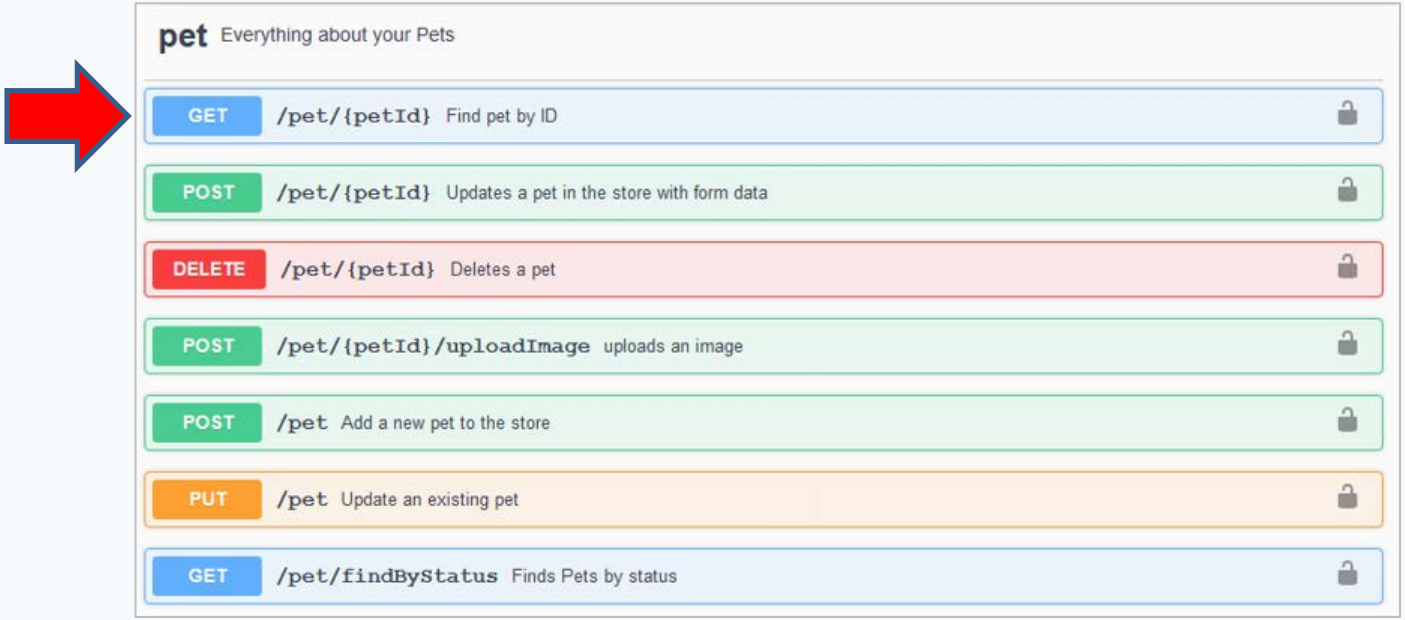
Building Secure APIs

OWASP API Security Top 10

1	Broken Object Level Authorization (BOLA)
2	Broken User Authentication
3	Excessive Data Exposure
4	Lack of Resources & Rate Limiting
5	Broken Function Level Authorization
6	Mass Assignment
7	Security Misconfiguration
8	Injection
9	Improper Assets Management
10	Insufficient Logging & Monitoring

Example API – Pet Store



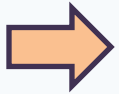
Relevant portion of the Swagger File

```
{
  "swagger": "2.0",
  "info": {
    "version": "1.0",
    "title": "Petstore",
   },
  "host": "api.petstore.com",
  "basePath": "/v1",
  "schemes": [
    "http", "https"
  ],
  "paths": {
    "/pet/{petId}": {
      "get": {
        "summary": "Get info for a specific pet",
        "operationId": "showPetById",
        "parameters": [
          {
            "name": "petId",
            "in": "path",
            "required": true,
            "description": "The ID of the pet to retrieve",
            "type": "integer"
          }
        ],
        "responses": {
          "200": {
            "description": "Expected successful response",
            "schema": {
              "$ref": "#/definitions/Pet"
            }
   ...snip...
```

How Does this Help with Security?

We can leverage the Swagger spec to harden the API endpoints in a declarative way

```
"paths": {
    "/pet/{petId}": {
      "get": {
        "summary": "Get info for a specific pet",
        "operationId": "showPetById",
        "parameters": [
          {
            "name": "petId",
            "in": "path",
            "required": true,
            "description": "The ID of the pet",
            "type": "integer"
          }
        ],
```



```
"paths": {
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        "summary": "Get info for a specific pet",
        "operationId": "showPetById",
        "parameters": [
          {
            "name": "petId",
            "in": "path",
            "required": true,
            "description": "The ID of the pet",
            "type": "integer",
            "minimum": 1,
            "maximum": 999999
          }
        ],
```

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Capabilities Coming to Qualys API Security

Static Assessment of Swagger/OpenAPI file

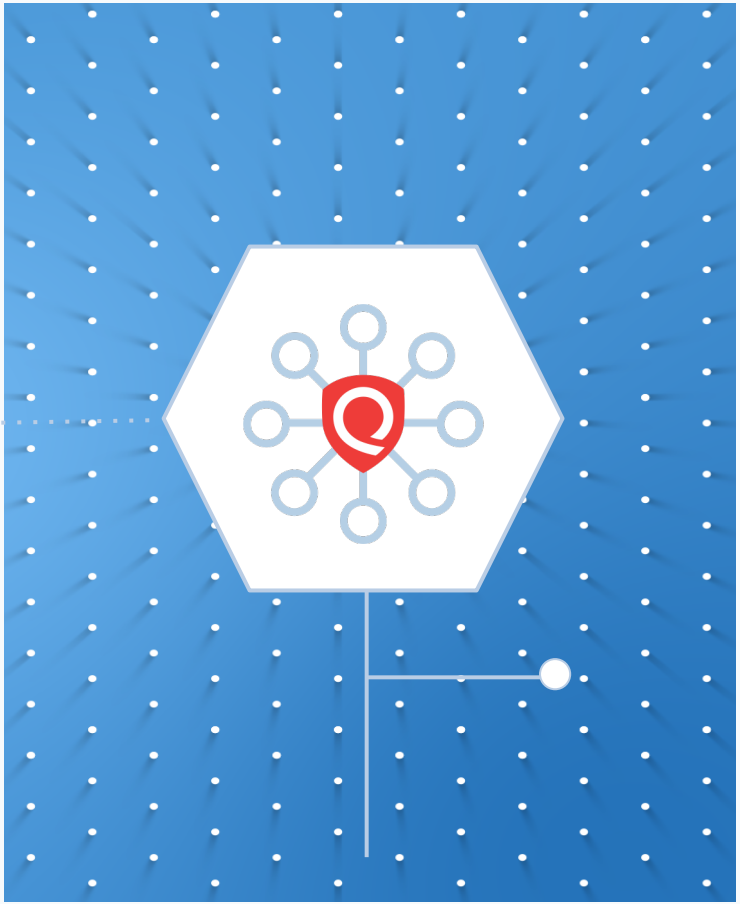
Get recommended changes to harden your API

Conformance Scan to check the API's actual behavior

Test the API endpoints for behavior that violates the Swagger file

Vulnerability Scan to check the API for security flaws

Current feature in Qualys Web Application Scanning (WAS)



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Thank You

Dave Ferguson
dferguson@qualys.com