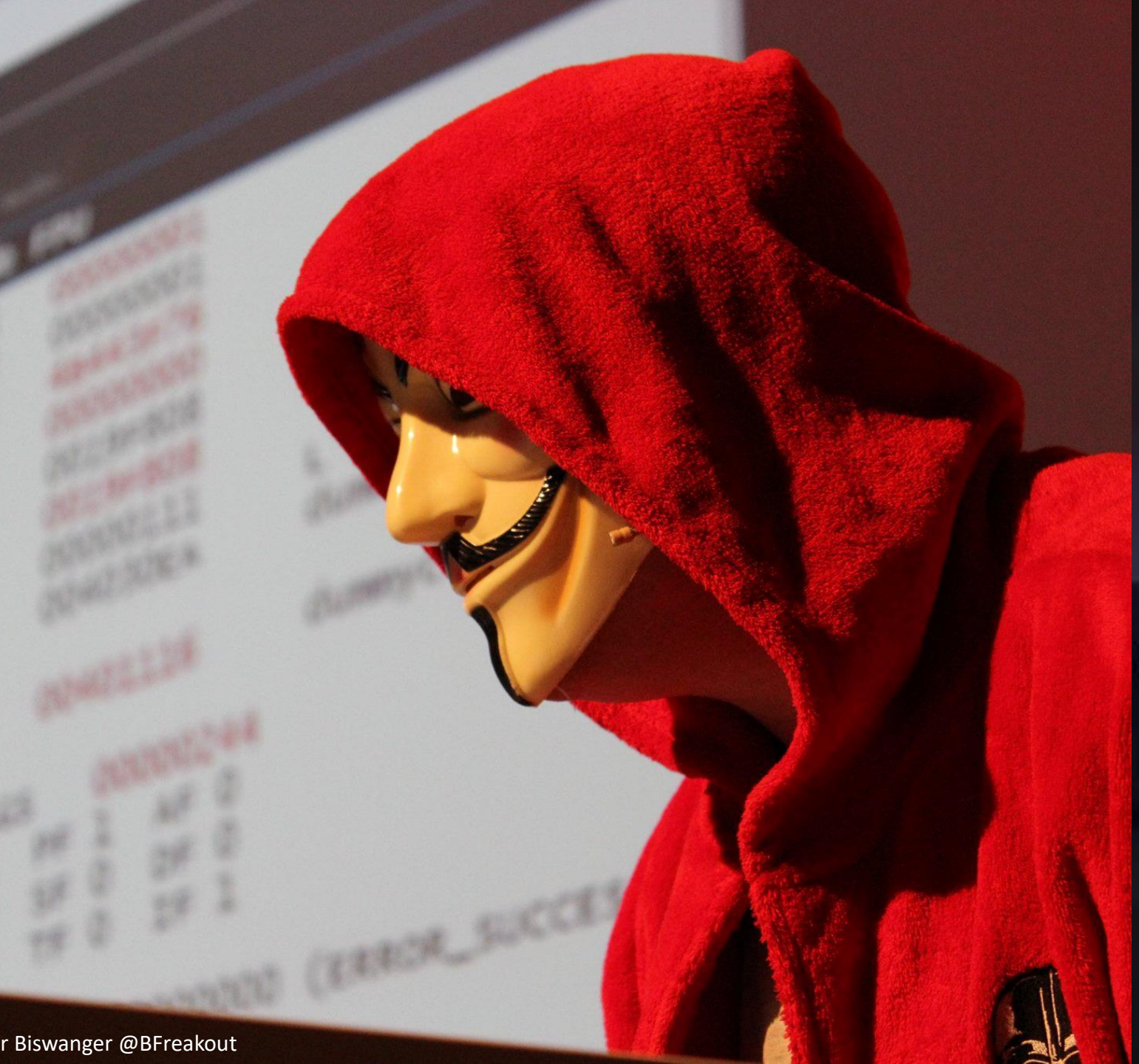
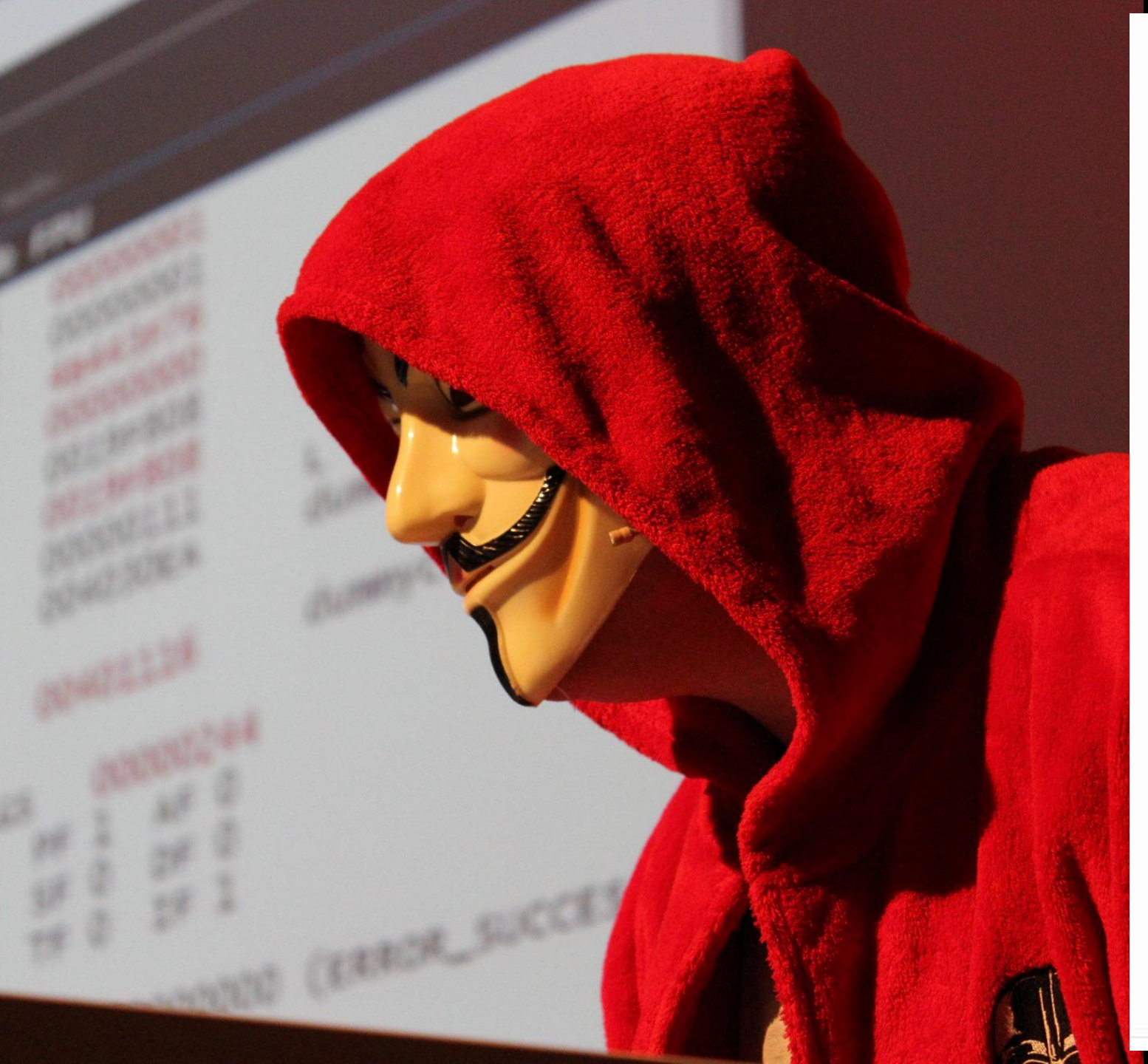
Secure DevOps

#DevSecOps

Sicherheit in Zeiten von täglichen Deployments





How people think they get hacked

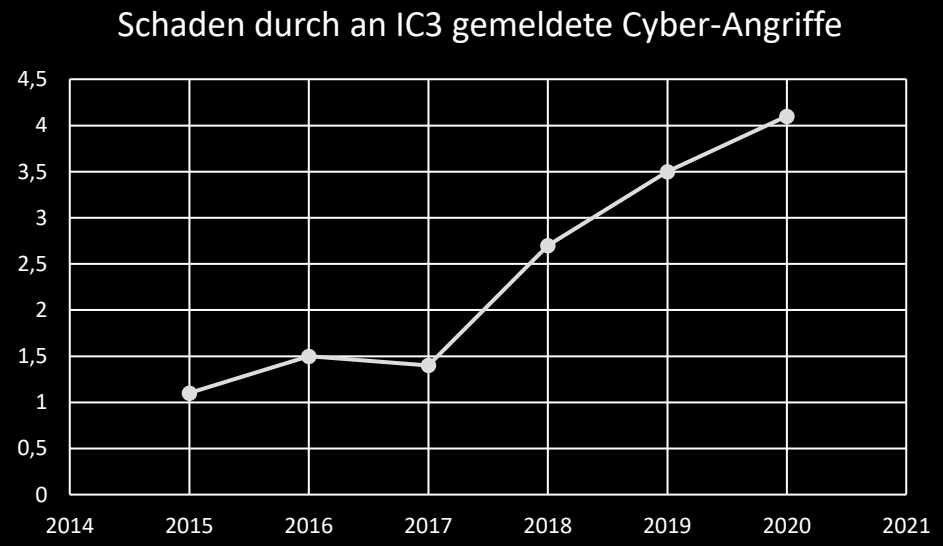
How they really get hacked

Wenn wir über Sicherheit sprechen…

- „Wir hatten bisher noch nie einen Sicherheitsvorfall“
- „Unsere Entwickler sind Experten“
- „Unsere Firma ist zu unwichtig, um angegriffen zu werden“
- „Wir haben uns schon gut abgesichert“
- „Unsere Firewalls sind sicher“

Schaden durch an den IC3 gemeldete Cyber-Angriffe:

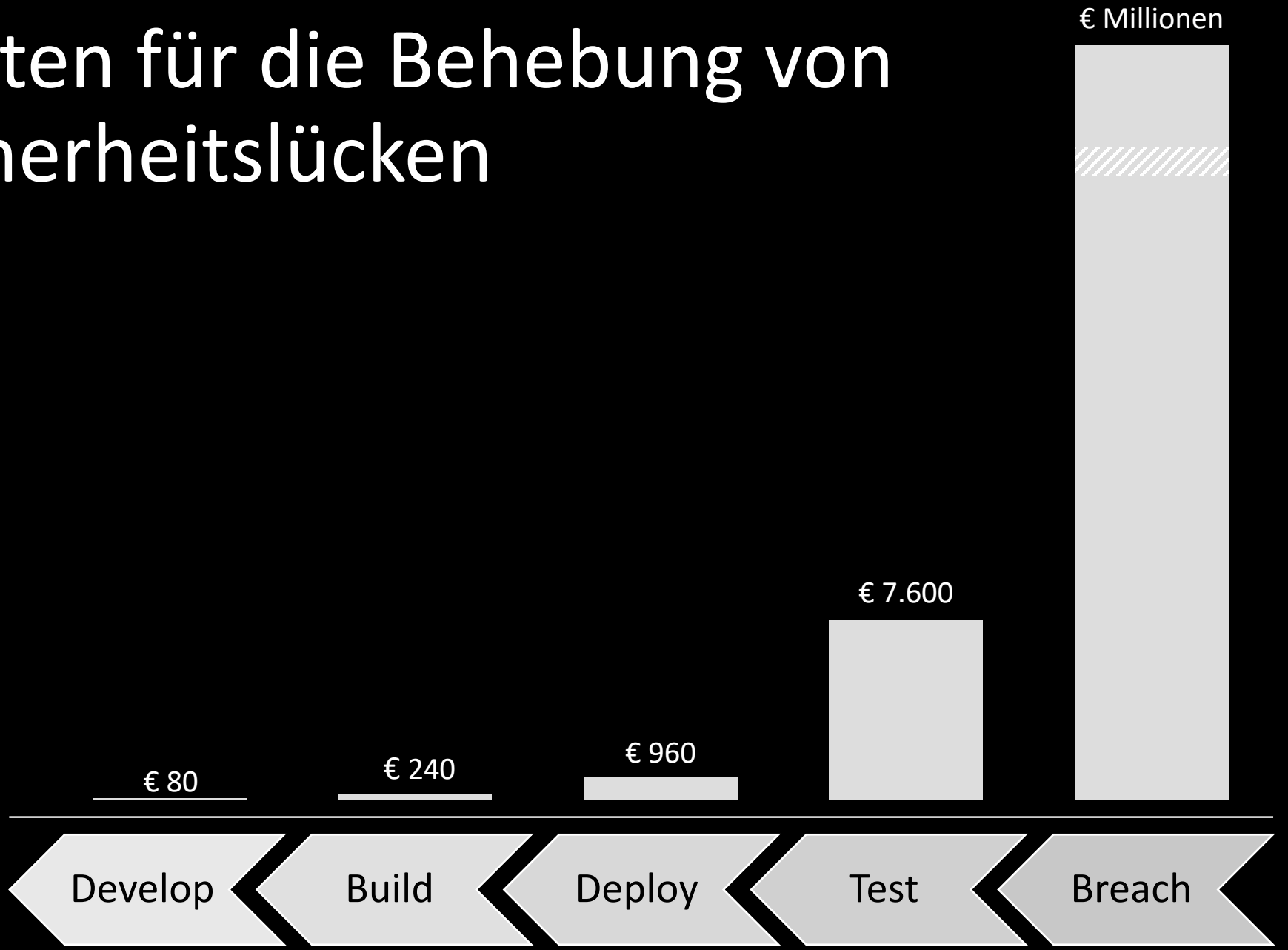
2019	2020
$ 3.500.000.000	$ 4.100.000.000



SolarWinds

March to June 2020: access to government and other systems through a compromised update to SolarWinds' **Orion** software

Kosten für die Behebung von Sicherheitslücken



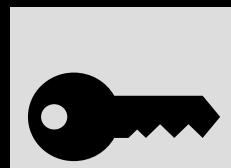
Assume-Breach-Paradigma

„Im Grunde ist es so, wenn jemand hereinkommen will, dann kommt er auch rein. In Ordnung. Akzeptieren Sie das.“

- Michael V. Hayden

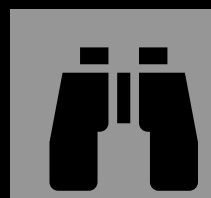
ehemaligen Generals der US Air Force und ehemaliger Direktor der NSA und CIA)

Von Prevent-Breach zu Assume-Breach



Prevent-Breach

- Sicherheits-Layers (Firewall, VPN, DMZ)
- Risikoanalysen
- Threat-Modeling
- Architektur-Reviews
- Code-Reviews
- Security-Testing



Assume-Breach

- Red-Team | Blue-Team Übungen (War-Games)
- Zentrales Monitoring (SIEM)
- Penetrationstests im Produktionsbetrieb
- Erkennung von Unregelmäßigkeiten

Zero-Trust-Policy

- Alle Systeme – auch die internen - sind so gesichert, als wären Sie über das Internet erreichbar: MFA aktiviert, HTTPS verschlüsselt, System immer gepatcht etc.
- Jeder Mitarbeiter hat nur die Zugriffe, die er absolut benötigt solange er sie benötigt. Lokale Administratorrechte werden möglichst vermieden.
- Keiner hat mit seinen normalen Zugangsdaten Zugriff auf Produktionssysteme. Auch Test-Accounts, die auf Entwicklungs- und Testumgebungen verwendet werden, haben keinen Zugriff auf die Produktion.

Red-Team | Blue-Team

- Ziel des Spiels
- Teamaufstellung
- Spieldauer

Red-Team | Blue-Team

Verhaltenskodex:

- Keinen echten Schaden anrichten
- Nicht mehr als nötig tun, um Ziel zu erreichen
- Physikalische Angriffe in normalem Rahmen (Niemanden bedrohen, keine Zugangskarten stehlen oder drucken etc. –„gesunder Menschenverstand“)
- Die Namen der Personen, die kompromittiert wurden, nicht preisgegeben

Red-Team | Blue-Team

Spielregeln:

- Die Verfügbarkeit des Produktionssystems darf nicht beeinträchtigt werden ➔ rote Team hat gewonnen
- Echte Kundendaten dürfen nicht kompromittiert werde (Daten von internen Kunden schon)
- Kompromittierte Daten (Zugangsdaten, personenbezogene Daten etc.) müssen sicher abgelegt werden
- Die Sicherheit des Produktivsystems darf nicht übermäßig geschwächt werden
- Es darf kein unnötiger Schaden entstehen
- Proof!

Wie funktionieren angriffe?

- Angriffe auf Entwickler
- Angriffe auf das Engineering-System
- Angriffe auf Produktionssysteme

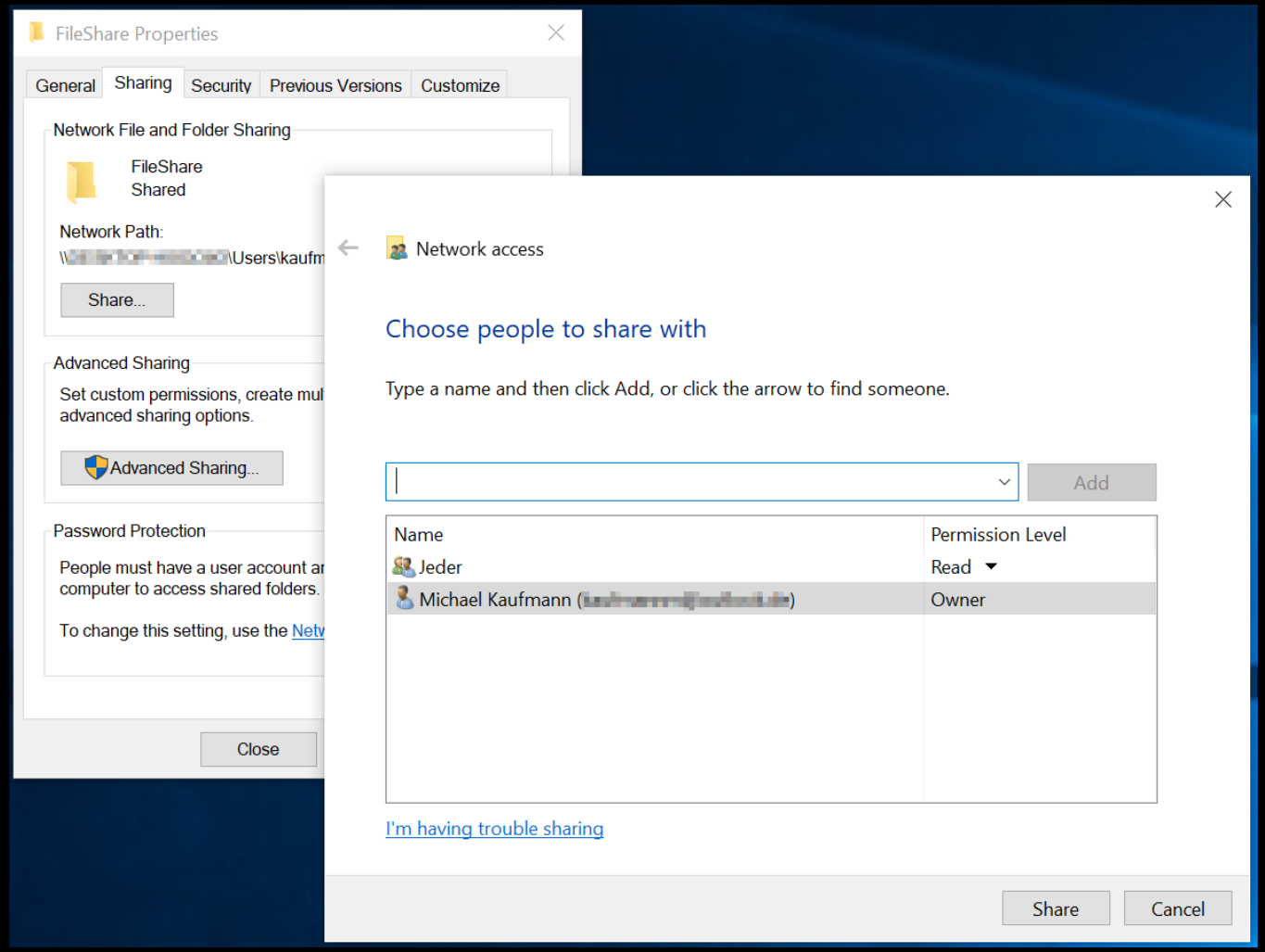
Angriffe auf Entwickler

- Nicht geschützte Dateifreigaben
- Zugangsdaten in Textdateien oder im Code
- Mimikatz
- Phishing

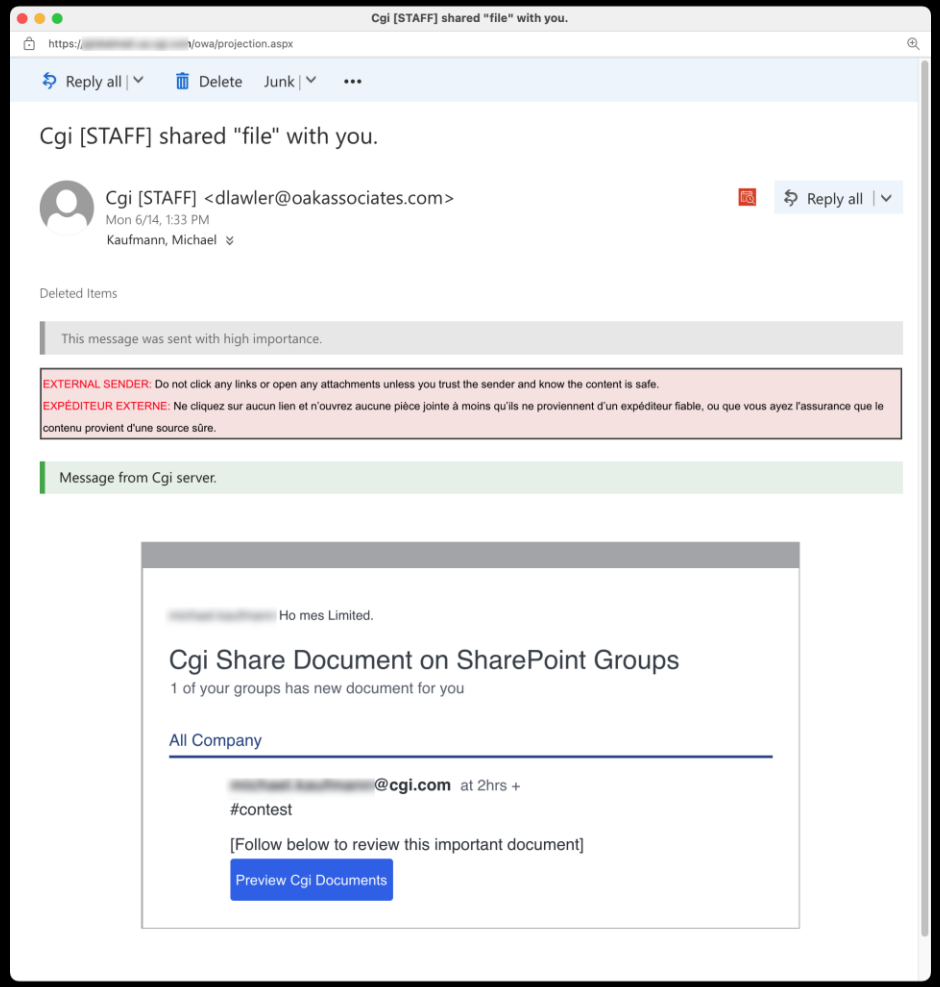
Angriffe auf das Engineering-System

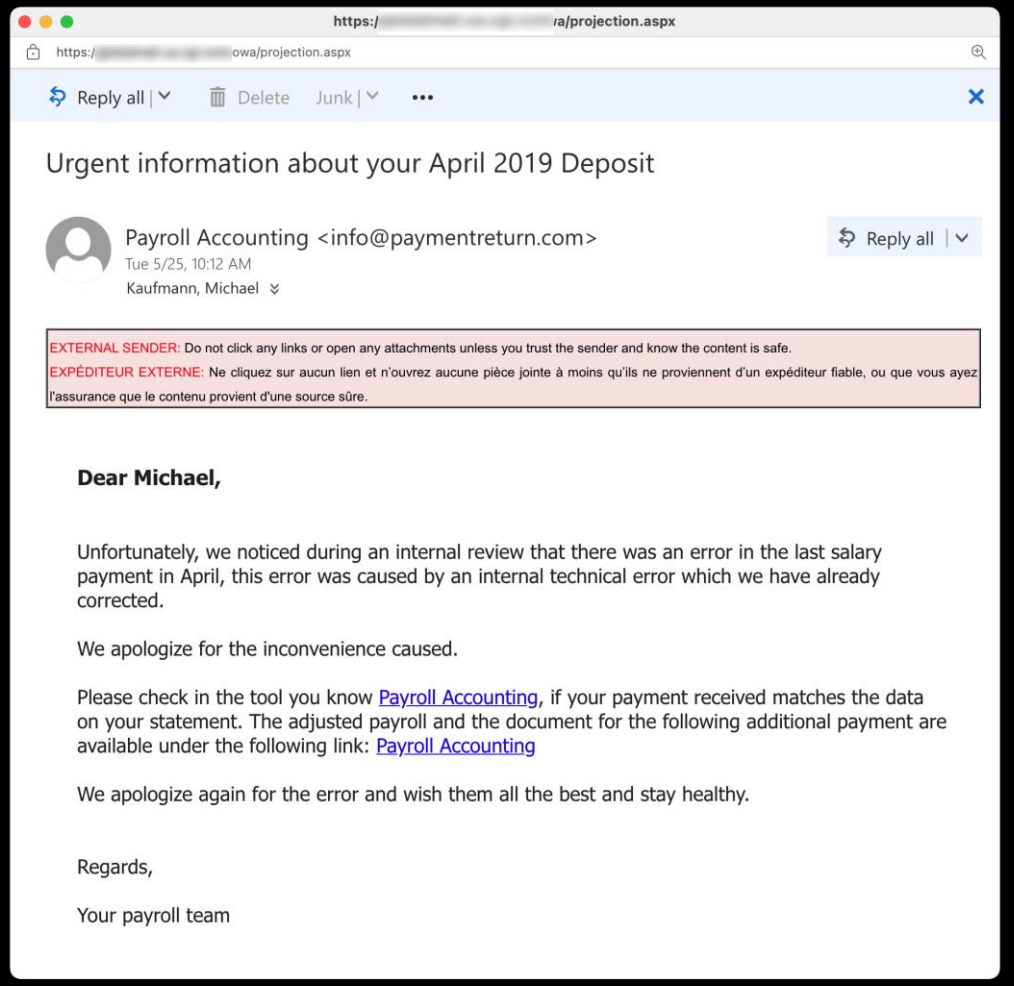
- Entwicklungsumgebungen
- Testumgebungen / Test-Accounts
- Angriffe auf die Software-Lieferketten
- Code-Ändern (eine Zeile reicht)
- Pipeline-Zugriff (Code/Scripte ausführen)

Nicht geschützte Dateifreigaben



Phishing

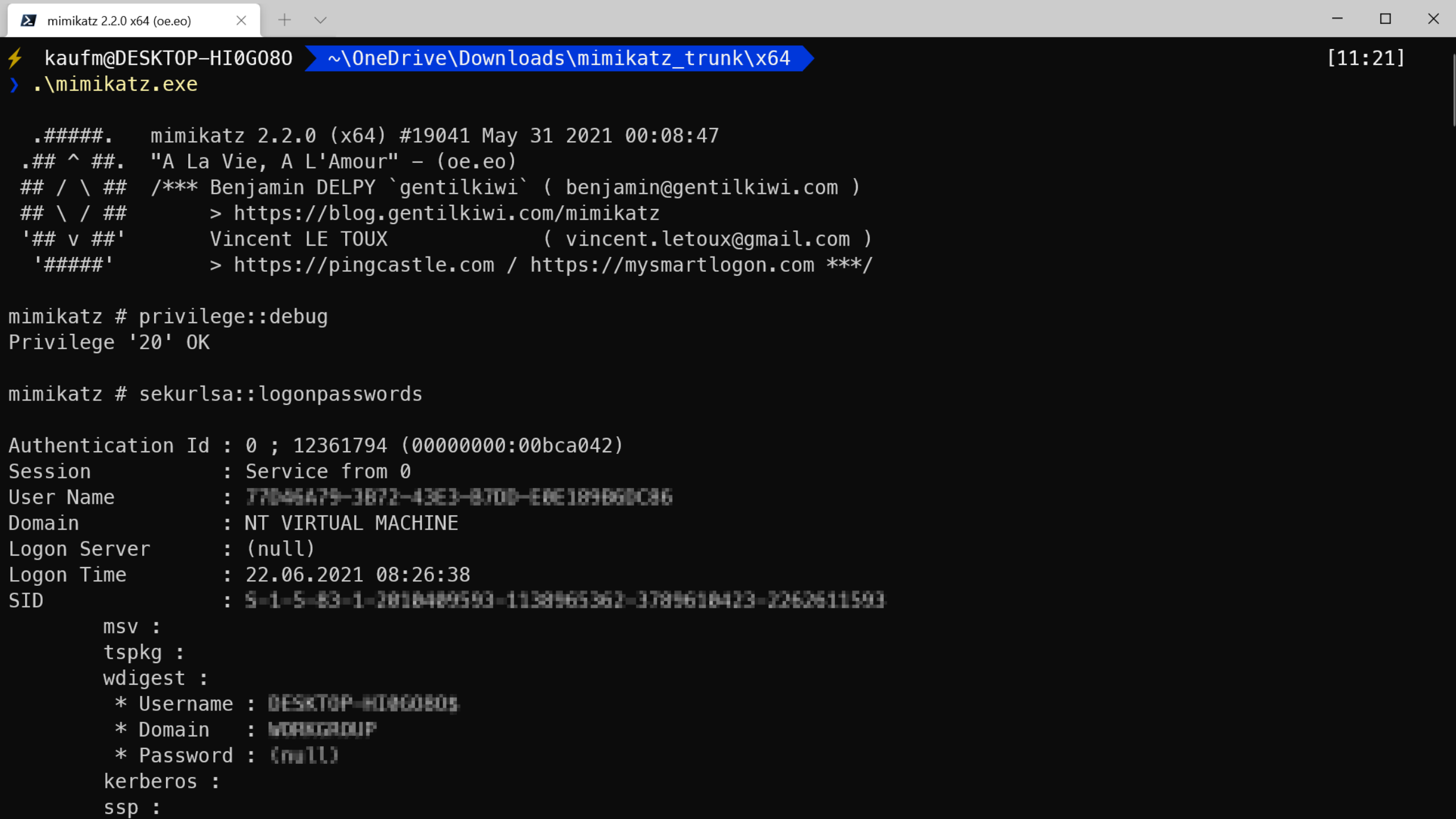




Zugangsdaten in Textdateien

TestCredentials.xml — Bearbeitet

```
<TestAccounts>
    <TestAccount name="domain\testUser1" password="testP@ssw0rd1!" />
    <TestAccount name="domain\testUser2" password="testP@ssw0rd2!" />
    <TestAccount name="domain\testUser3" password="testP@ssw0rd3!" />
</TestAccounts>
```


mimikatz 2.2.0 x64 (oe.eo)
kaufm@DESKTOP-HI0GO8O ~\OneDrive\Downloads\mimikatz_trunk\x64 [11:21]
.\mimikatz.exe
.#####. mimikatz 2.2.0 (x64) #19041 May 31 2021 00:08:47
.## ^ ##. "A La Vie, A L'Amour" - (oe.eo)
/ \ ## /*** Benjamin DELPY `gentilkiwi` (benjamin@gentilkiwi.com)
\ / ## > https://blog.gentilkiwi.com/mimikatz
'## v ##' Vincent LE TOUX (vincent.letoux@gmail.com)
'#####' > https://pingcastle.com / https://mysmartlogon.com ***/
mimikatz # privilege::debug
Privilege '20' OK
mimikatz # sekurlsa::logonpasswords
Authentication Id : 0 ; 12361794 (00000000:00bca042)
Session : Service from 0
User Name : 77046A79-3B72-43E3-87DD-E0E189B6DC86
Domain : NT VIRTUAL MACHINE
Logon Server : (null)
Logon Time : 22.06.2021 08:26:38
SID : S-1-5-83-1-2010409593-1138965362-3789618423-2262611593
msv :
tspkg :
wdigest :
* Username : DESKTOP-HI0GO8O$
* Domain : WORKGROUP
* Password : (null)
kerberos :
ssp :

mimikatz 2.2.0 x64 (oe.eo)

```
         * Username : kaufmann@outlook.de
         * Domain   : MicrosoftAccount
         * Password : (null)
        ssp :
        credman :
         [00000000]
         * Username : mk@writeabout.net
         * Domain   : outlook.office365.com
         * Password : [redacted]
         [00000001]
         * Username : (null)
         * Domain   : MicrosoftOffice16_Data:SSPI:mk@writeabout.net
         * Password : [redacted]
         [00000002]
         * Username : github.auth
         * Domain   : vscodevscode.github-authentication/github.auth
         * Password : [redacted]
64 4b 63 6c 43 46 37 4c 4f 72 4e 37 67 66 6a 44 55 36 4b 6a 51 36 65 6b 64 45 30 33 2f 0d 0a 35 61 78 57 42 4e 58 44 71
42 43 4a 52 44 74 42 39 47 63 34 45 4a 59 5a 69 43 36 4b 4a 2f 53 49 68 39 6e 55 67 6f 4e 6e 53 57 67 71 4a 47 6d 33 58
4e 30 34 34 75 4c 6e 4c 52 42 2f 50 32 43 51 0d 0a 45 41 45 41 2f 34 5a 4e 66 2b 47 54 6b 53 56 4d 65 75 52 79 49 74 4e
56 76 5a 5a 6f 35 42 68 4e 75 75 58 61 30 2f 4f 6a 50 5a 38 62 7a 7a 53 71 50 74 61 62 43 78 74 31 6b 6f 36 35 59 74 6d
[redacted]
64 4b 63 6c 43 46 37 4c 4f 72 4e 37 67 66 6a 44 55 36 4b 6a 51 36 65 6b 64 45 30 33 2f 0d 0a 35 61 78 57 42 4e 58 44 71
42 43 4a 52 44 74 42 39 47 63 34 45 4a 59 5a 69 43 36 4b 4a 2f 53 49 68 39 6e 55 67 6f 4e 6e 53 57 67 71 4a 47 6d 33 58
4e 30 34 34 75 4c 6e 4c 52 42 2f 50 32 43 51 0d 0a 45 41 45 41 2f 34 5a 4e 66 2b 47 54 6b 53 56 4d 65 75 52 79 49 74 4e
56 76 5a 5a 6f 35 42 68 4e 75 75 58 61 30 2f 4f 6a 50 5a 38 62 7a 7a 53 71 50 74 61 62 43 78 74 31 6b 6f 36 35 59 74 6d
72 0d 0a 53 30 2b 72 39 6c 69 47 46 34 42 55 32 48 6a 70 4f 5a 73 43 47 6a 6c 46 63 37 6d 72 46 6f 4c 70 64 30 6a 37 59
64 43 2b 47 48 5a 4a 37 68 79 2b 70 48 6f 4d 48 7a 32 51 76 6d 2f 78 5a 6d 30 75 0d 0a 38 55 49 6c 47 30 52 2b 71 37 47
4d 55 74 44 6f 72 43 7a 69 4a 78 4a 47 31 59 67 49 51 34 51 45 79 61 7a 55 4e 49 67 4f 70 63 68 74 47 4f 57 44 41 6e 35
5a 53 0d 0a 41 4c 51 37 38 6b 37 53 6a 0d 0a 64 5a 43 34 74 6c 65 6e 73 31 77 68 65 35 59 59 60 2f 66 33 56 32 70 39 5a
```

mimikatz 2.2.0 x64 (oe.eo)

```
[redacted]
         [00000003]
         * Username : wulfland
         * Domain   : GitHub - https://api.github.com/wulfland
         * Password : [redacted]
         [00000004]
         * Username : [redacted]
         * Domain   : https://gitlab.com
         * Password : [redacted]
        cloudap :
             Cachedir : [redacted]
             Key GUID : [redacted]
             PRT      : 
             DPAPI Key: [redacted]

Authentication Id : 0 ; 195058 (00000000:0002f9f2)
Session           : Interactive from 1
User Name         : DWM-1
Domain            : Window Manager
Logon Server      : (null)
Logon Time        : 21.06.2021 22:24:46
SID               : [redacted]
        msv :
        tspkg :
        wdigest :
         * Username : [redacted]
         * Domain   : [redacted]
         * Password : [redacted]
```

Beispiel


Offener Fileshare
Zugangsdaten Test-Account im Klartext
Dev-Maschine mit Test-Account als lokaler Admin
Mimikatz
Passwort Entwickler

Zugangsdaten Entwickler

- E-Mail → Phishing von Kollegen
- Zugriff auf Maschinen → Logon, Mimikatz
- Quellcode → Code einfügen/modifizieren
- Zugriff Pipeline → Skripte ausführen
- Zugriff Testumgebung → Testet Prod?
- Zugriff Prod → Game Over

```
{
  "/api/*": {
    "changeOrigin": true,
    "target": "https://api.project-demo.de",
    "auth": "[redacted]"
  }
}
```

```
const id_token_string = '[redacted]';

app.use(
  '/api/test',
  createProxyMiddleware({
    target: 'https://api.test.[redacted]com/',
    changeOrigin: true,
    pathRewrite: {
      '^/api/test': '/test',
    },
    headers: {
      'Content-Type': 'application/json',
      'Credentials': true,
      'Cookie': `id_token=${id_token_string}`
    },
  })
);
```

Schema: https://json.schemastore.org/appsettings.json

```
{
  "AppSettings": {
    "ScheduleExecutionIntervalInMinutes": 60
  },
  "MailSettings": {
    "Url": "Outlook.office365.com",
    "User": "[redacted]",
    "Password": "[redacted]",
    "ProcessedFolderName": "[redacted]",
    "ErrorFolderName" : "[redacted]",
    "OutOfToleranceFolderName": "[redacted]"
  }
}
```

27 lines (27 sloc) | 1.45 KB

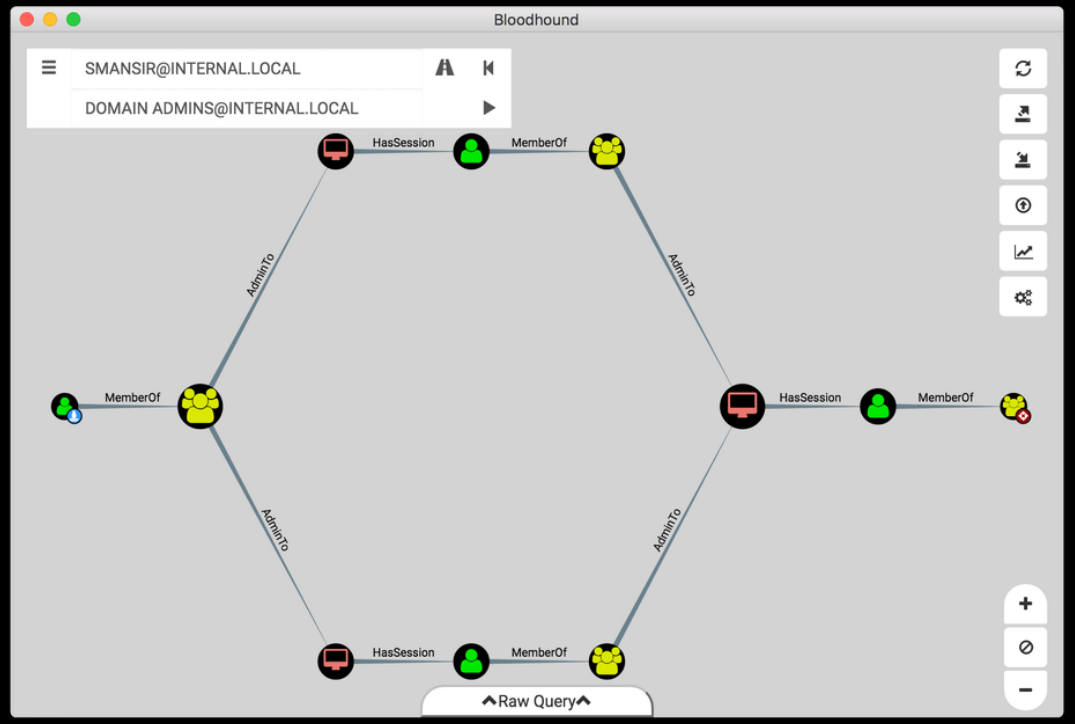
```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>
    <configSections>
        <sectionGroup name="applicationSettings" type="System.Configuration.ApplicationSettingsG
            <section name="SPOEmulators.Tests.Properties.Settings" type="System.Configuration.Cl
        </sectionGroup>
    </configSections>
    <applicationSettings>
        <SPOEmulators.Tests.Properties.Settings>
            <setting name="OnPremUrl" serializeAs="String">
                <!-- Enter thr url to a on prem site for integration testing. -->
                <value>https://localhost/sites/dev</value>
            </setting>
            <!-- Enter thr url to a O365 site for integration testing. -->
            <setting name="O365Url" serializeAs="String">
                <value>http://xxxx.sharepoint.com</value>
            </setting>
            <!-- Enter credentials to connect to the site (O365 or on prem if neccessary) -->
            <setting name="O365User" serializeAs="String">
                <value>user@tenant.onmicrosoft.com</value>
            </setting>
            <setting name="O365Password" serializeAs="String">
                <value>****</value>
            </setting>
        </SPOEmulators.Tests.Properties.Settings>
    </applicationSettings>
</configuration>
```

Von Dev zu Prod

Bloodhound: https://github.com/adaptivethreat/Bloodhound

grpmgr test01 Administrators /enum

Andere Möglichkeiten an Zugangsdaten zu kommen:
- Phishing
- Responder (https://github.com/lgandx/Responder)
- Pineapple
- …
- Schwache Passwörter



TestAccounts.txt
dom\test01

→ mkadev01
dom\mka
dom\test01

→ testsrv01
dom\mka
dom\admlisa

→ prod01
dom\admlisa

Angriffe auf das Produktionssystem

- SQL-Injection
- XSS (Cross-Site-Scripting)

SQL Injection

```
txtUserId = getRequestString("UserId");
txtSQL = "SELECT * FROM Users WHERE UserId = " + txtUserId;
```

105; DROP TABLE Suppliers

```
11  module.exports = function searchProducts () {
12    return (req, res, next) => {
13      let criteria = req.query.q === 'undefined' ? '' : req.query.q || ''
14      criteria = (criteria.length <= 200) ? criteria : criteria.substring(0, 200)
15      models.sequelize.query(`SELECT * FROM Products WHERE ((name LIKE '%${criteria}%' OR description LIKE '%${criteria}%') AND deletedAt IS NULL) ORDER BY name`)
16        .then(([products]) => {
17          const dataString = JSON.stringify(products)
18          if (utils.notSolved(challenges.unionSqlInjectionChallenge)) { // vuln-code-snippet hide-start
19            let solved = true
20            models.User.findAll().then(data => {
21              const users = utils.queryResultToJson(data)
22              if (users.data?.length) {
23                for (let i = 0; i < users.data.length; i++) {
24                  solved = solved && utils.containsOrEscaped(dataString, users.data[i].email) && utils.contains(dataString, users.data[i].password)
25                  if (!solved) {
26                    break
27                  }
28                }
29                if (solved) {
30                  utils.solve(challenges.unionSqlInjectionChallenge)
31                }
```

XSS (Cross-Site-Scripting)

```
143   // vuln-code-snippet start localXssChallenge xssBonusChallenge
144   filterTable () {
145     let queryParam: string = this.route.snapshot.queryParams.q
146     if (queryParam) {
147       queryParam = queryParam.trim()
148       this.ngZone.runOutsideAngular(() => { // vuln-code-snippet hide-start
149         this.io.socket().emit('verifyLocalXssChallenge', queryParam)
150       }) // vuln-code-snippet hide-end
151       this.dataSource.filter = queryParam.toLowerCase()
152       this.searchValue = this.sanitizer.bypassSecurityTrustHtml(queryParam)
153       this.gridDataSource.subscribe((result: any) => {
154         if (result.length === 0) {
155           this.emptyState = true
156         } else {
157           this.emptyState = false
158         }
159       })
160     } else {
161       this.dataSource.filter = ''
162       this.searchValue = undefined
163       this.emptyState = false
164     }
165   }
```

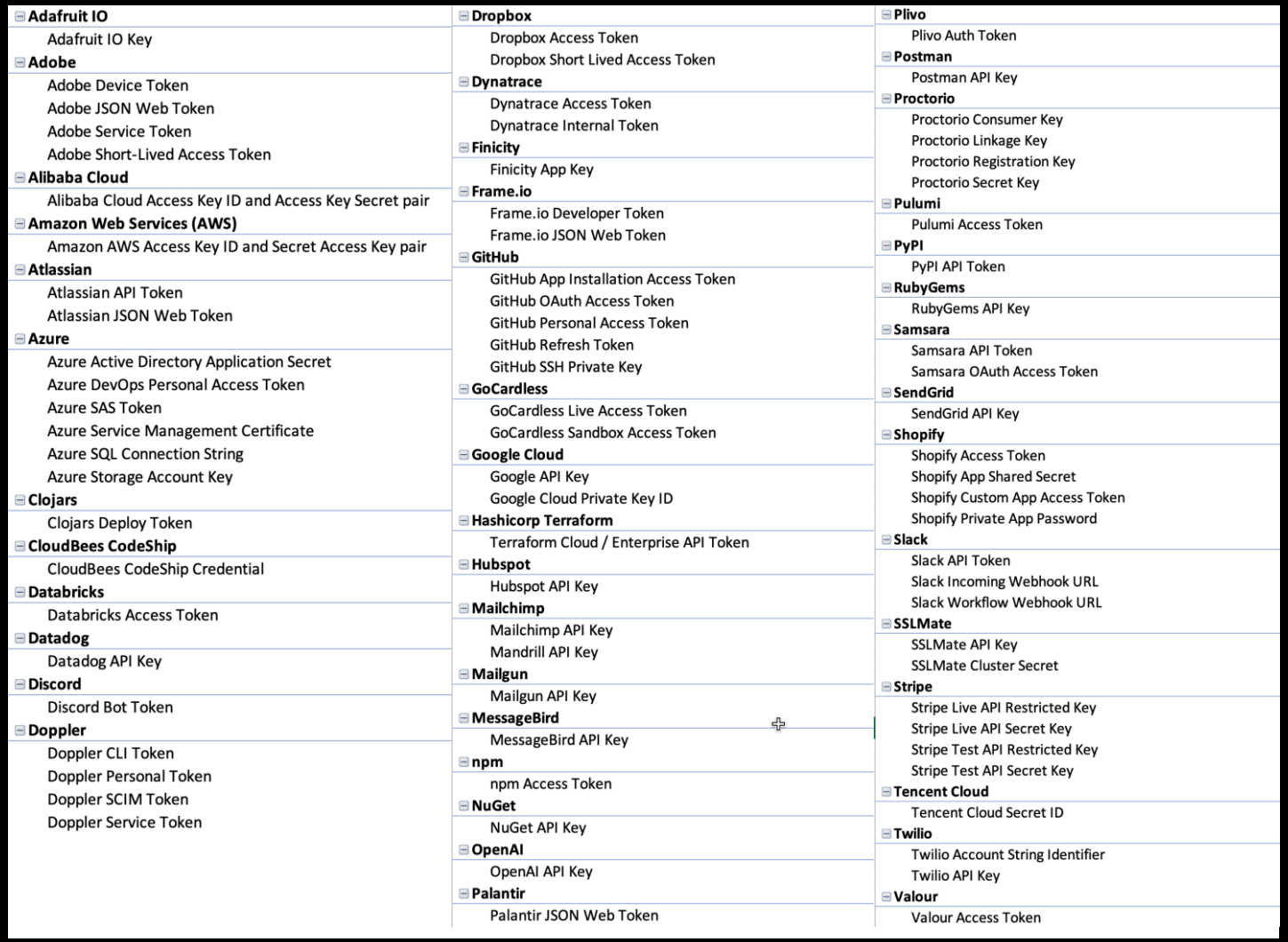
```
var Affix = function (element, options) {
  this.options = $.extend({}, Affix.DEFAULTS, options)

  this.$target = $(this.options.target)
    .on('scroll.bs.affix.data-api', $.proxy(this.checkPosition, this))
    .on('click.bs.affix.data-api',  $.proxy(this.checkPositionWithEventLoop, this))

  this.$element     = $(element)
  this.affixed      = null
  this.unpin        = null
  this.pinnedOffset = null

  this.checkPosition()
}
```

Was kann man tun (Blue-Team)?

- MFA für alle Systeme
- Lokale Adminrolle entziehen
- Strikte Trennung Test/Prod
- Key-Vault für alle Secrets
  - Trennung Laufzeit/deployment
  - Test/Prod
  - Automatische Rotation
- Separate Subscriptions
- Codespaces / VDI für Development
- SIEM (Azure Security Center, Splunk)
- Credential Scanning (Code/Fileshares)

How to shift left security?

Secret Scanning



- **Adafruit IO**
  - Adafruit IO Key
- **Adobe**
  - Adobe Device Token
  - Adobe JSON Web Token
  - Adobe Service Token
  - Adobe Short-Lived Access Token
- **Alibaba Cloud**
  - Alibaba Cloud Access Key ID and Access Key Secret pair
- **Amazon Web Services (AWS)**
  - Amazon AWS Access Key ID and Secret Access Key pair
- **Atlassian**
  - Atlassian API Token
  - Atlassian JSON Web Token
- **Azure**
  - Azure Active Directory Application Secret
  - Azure DevOps Personal Access Token
  - Azure SAS Token
  - Azure Service Management Certificate
  - Azure SQL Connection String
  - Azure Storage Account Key
- **Clojars**
  - Clojars Deploy Token
- **CloudBees CodeShip**
  - CloudBees CodeShip Credential
- **Databricks**
  - Databricks Access Token
- **Datadog**
  - Datadog API Key
- **Discord**
  - Discord Bot Token
- **Doppler**
  - Doppler CLI Token
  - Doppler Personal Token
  - Doppler SCIM Token
  - Doppler Service Token
- **Dropbox**
  - Dropbox Access Token
  - Dropbox Short Lived Access Token
- **Dynatrace**
  - Dynatrace Access Token
  - Dynatrace Internal Token
- **Finicity**
  - Finicity App Key
- **Frame.io**
  - Frame.io Developer Token
  - Frame.io JSON Web Token
- **GitHub**
  - GitHub App Installation Access Token
  - GitHub OAuth Access Token
  - GitHub Personal Access Token
  - GitHub Refresh Token
  - GitHub SSH Private Key
- **GoCardless**
  - GoCardless Live Access Token
  - GoCardless Sandbox Access Token
- **Google Cloud**
  - Google API Key
  - Google Cloud Private Key ID
- **Hashicorp Terraform**
  - Terraform Cloud / Enterprise API Token
- **Hubspot**
  - Hubspot API Key
- **Mailchimp**
  - Mailchimp API Key
  - Mandrill API Key
- **Mailgun**
  - Mailgun API Key
- **MessageBird**
  - MessageBird API Key
- **npm**
  - npm Access Token
- **NuGet**
  - NuGet API Key
- **OpenAI**
  - OpenAI API Key
- **Palantir**
  - Palantir JSON Web Token
- **Plivo**
  - Plivo Auth Token
- **Postman**
  - Postman API Key
- **Proctorio**
  - Proctorio Consumer Key
  - Proctorio Linkage Key
  - Proctorio Registration Key
  - Proctorio Secret Key
- **Pulumi**
  - Pulumi Access Token
- **PyPI**
  - PyPI API Token
- **RubyGems**
  - RubyGems API Key
- **Samsara**
  - Samsara API Token
  - Samsara OAuth Access Token
- **SendGrid**
  - SendGrid API Key
- **Shopify**
  - Shopify Access Token
  - Shopify App Shared Secret
  - Shopify Custom App Access Token
  - Shopify Private App Password
- **Slack**
  - Slack API Token
  - Slack Incoming Webhook URL
  - Slack Workflow Webhook URL
- **SSLMate**
  - SSLMate API Key
  - SSLMate Cluster Secret
- **Stripe**
  - Stripe Live API Restricted Key
  - Stripe Live API Secret Key
  - Stripe Test API Restricted Key
  - Stripe Test API Secret Key
- **Tencent Cloud**
  - Tencent Cloud Secret ID
- **Twilio**
  - Twilio Account String Identifier
  - Twilio API Key
- **Valour**
  - Valour Access Token

← **Code**

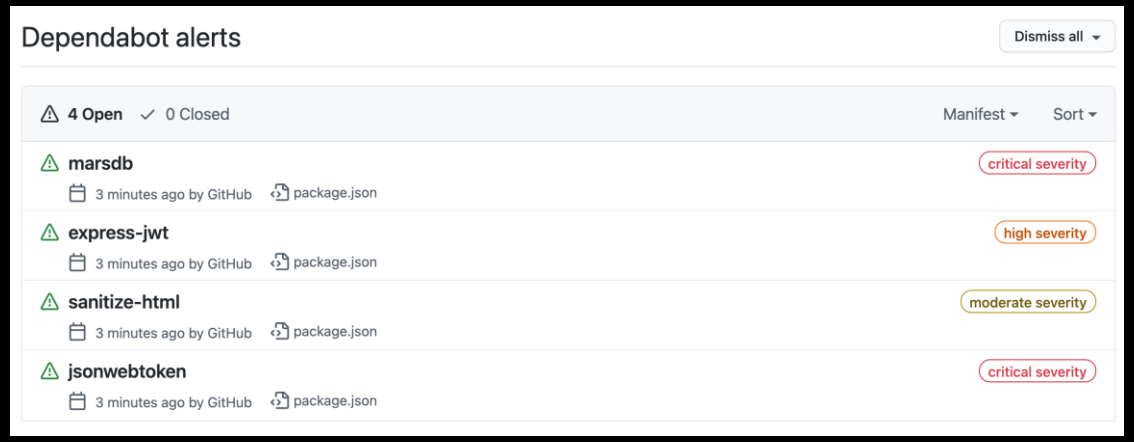
- **GitHub (private!)**
- gitLeaks.
- SpectralOps
- Git-Secrets
- Whispers
- Gittyleaks
- Git-all-secrets
- **…**

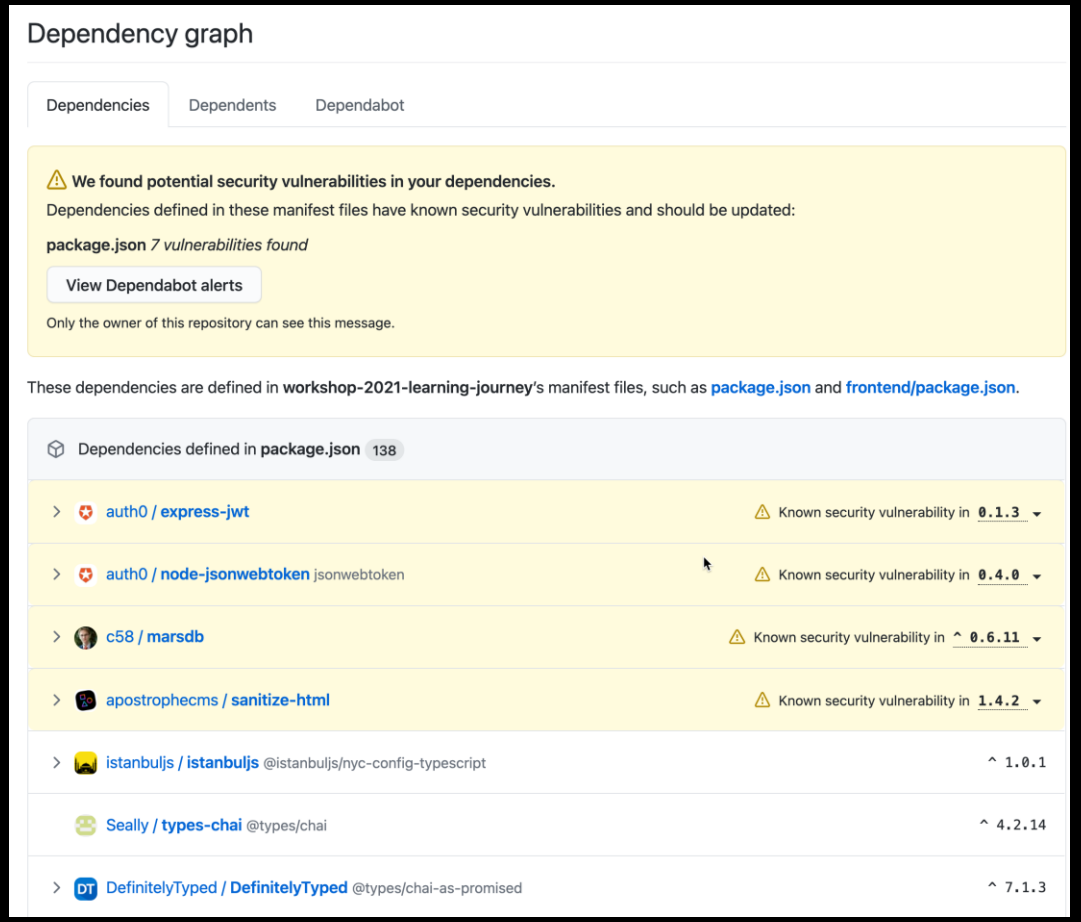
Fileshare

- Bash/PowerShell
- Dumpster

Software Composition Analysis (SCA)

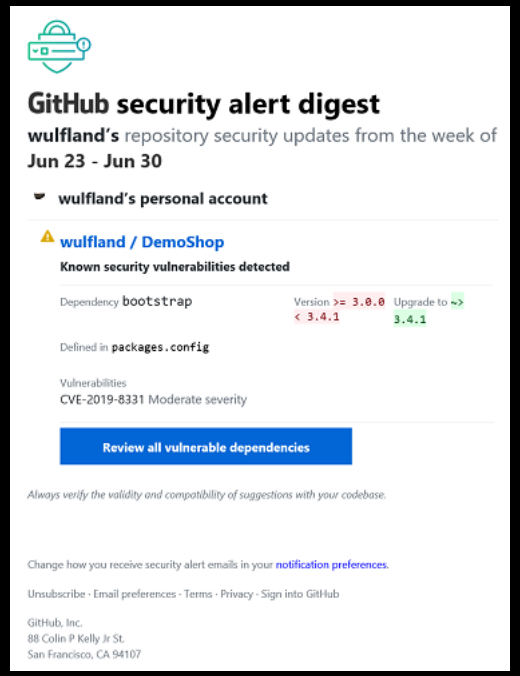
GitHub (Dependency-Graph/Dependabot)
anchore (https://anchore.com/) oder
Dependency-Track (https://dependencytrack.org/)

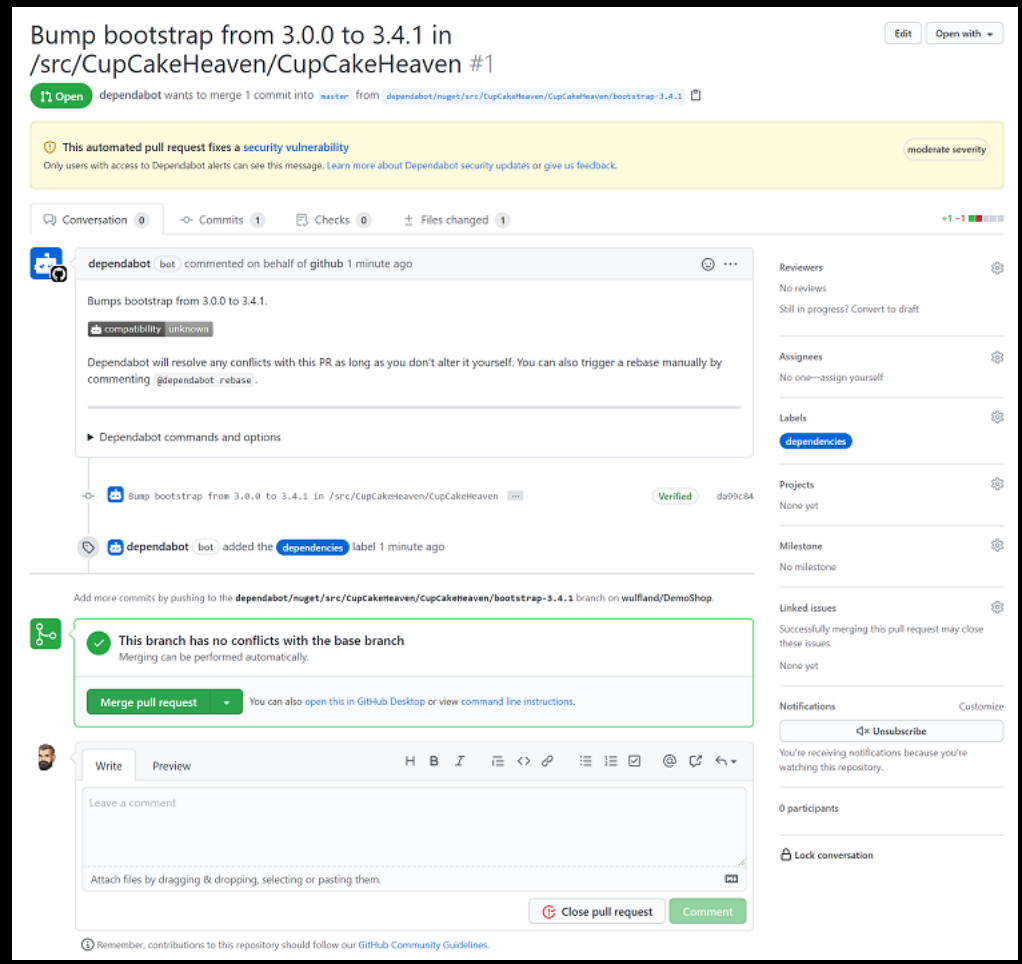




Software Composition Analysis (SCA)

GitHub (Dependency-Graph/**Dependabot**)
anchore (https://anchore.com/) oder
Dependency-Track (https://dependencytrack.org/)

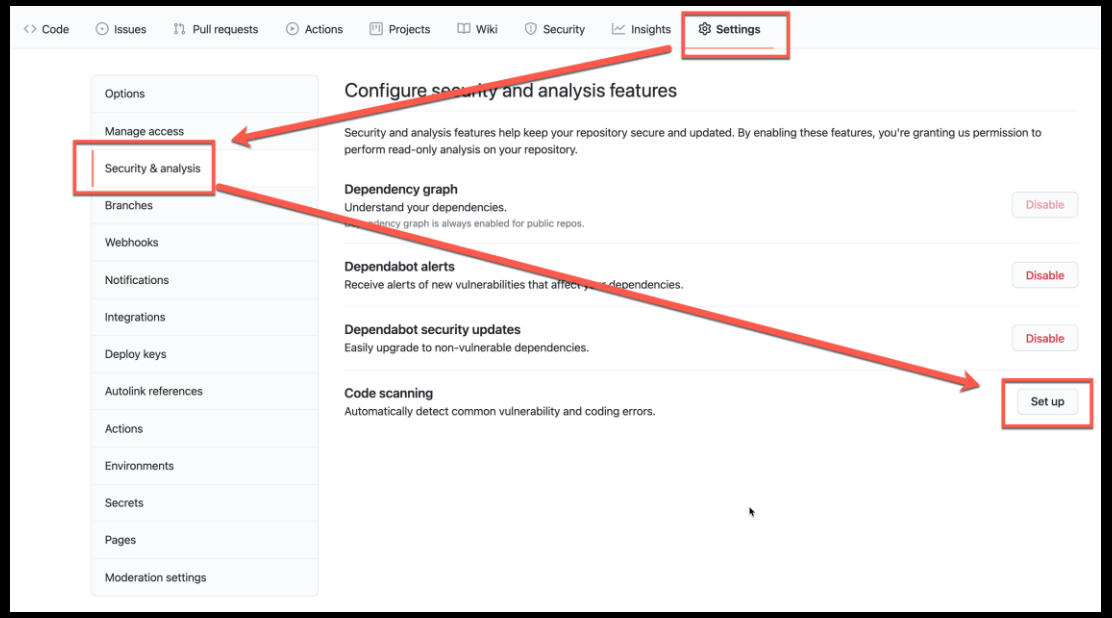


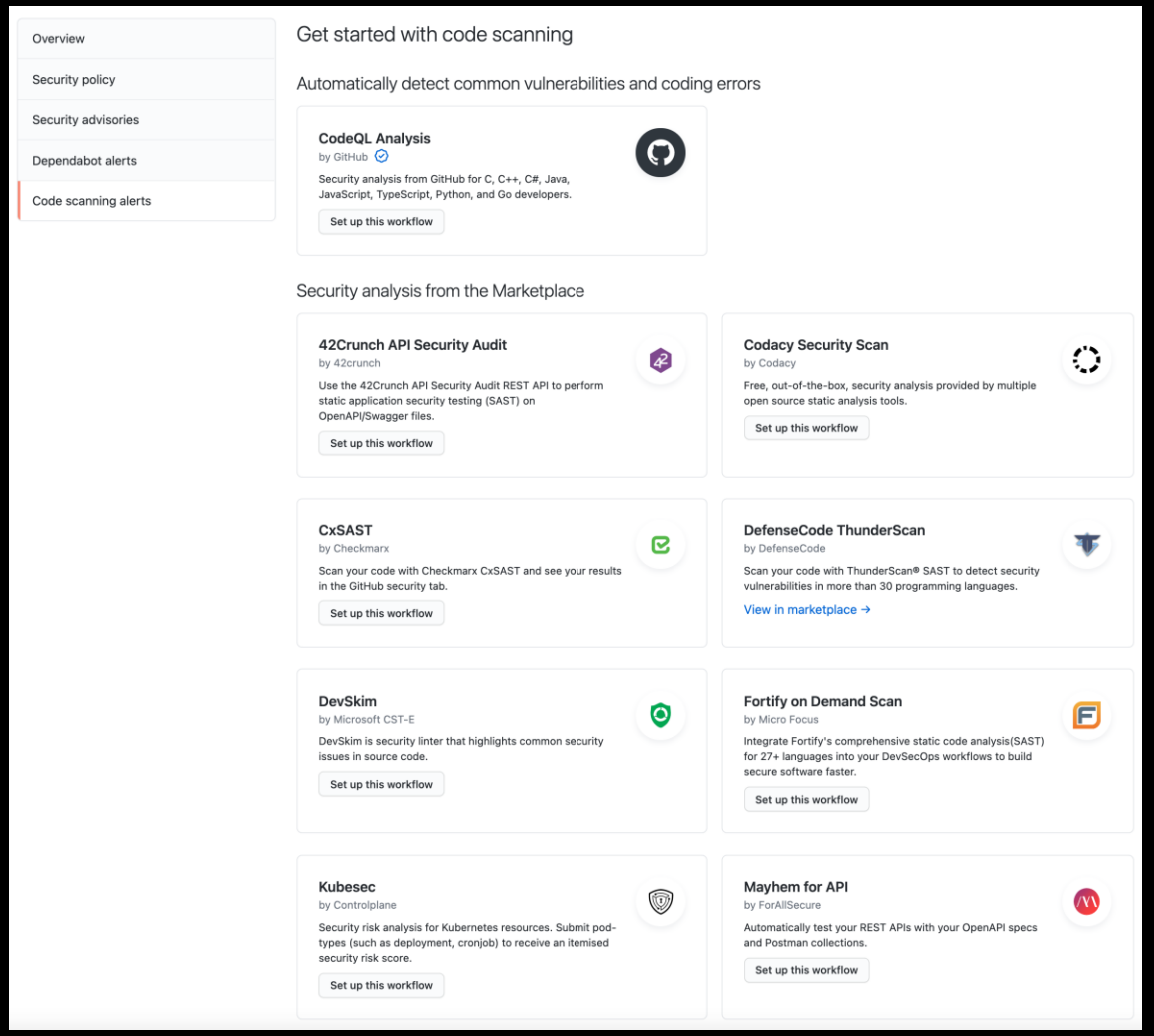


Static Application Security Testing (SAST)

Whitebox-Testing

- GitHub CodeQL
- SonarQube
- Semgrep (https://semgrep.dev/)
- Mobile-Security-Framework (MobSF)
  (https://github.com/MobSF/Mobile-Security-Framework-MobSF)

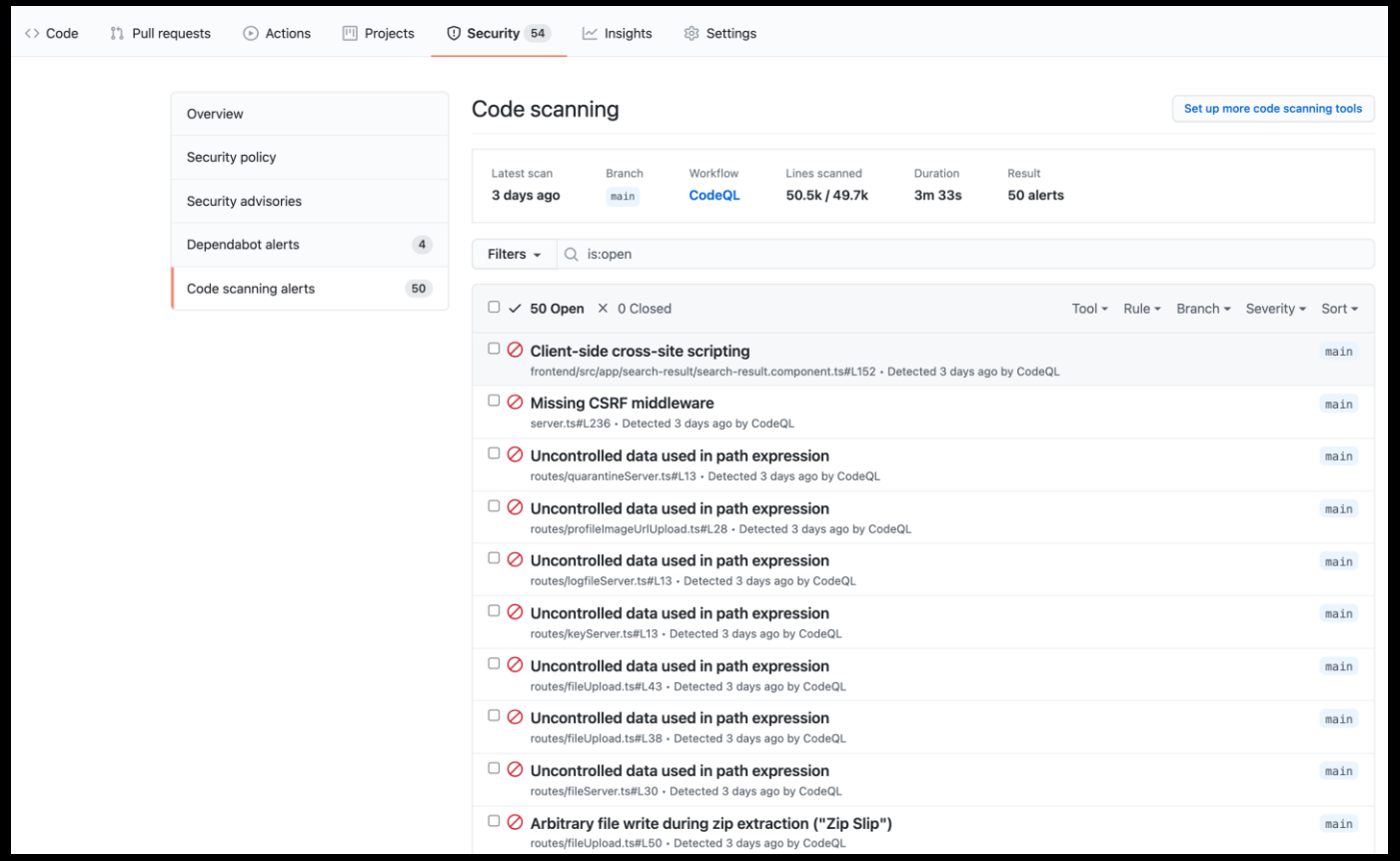




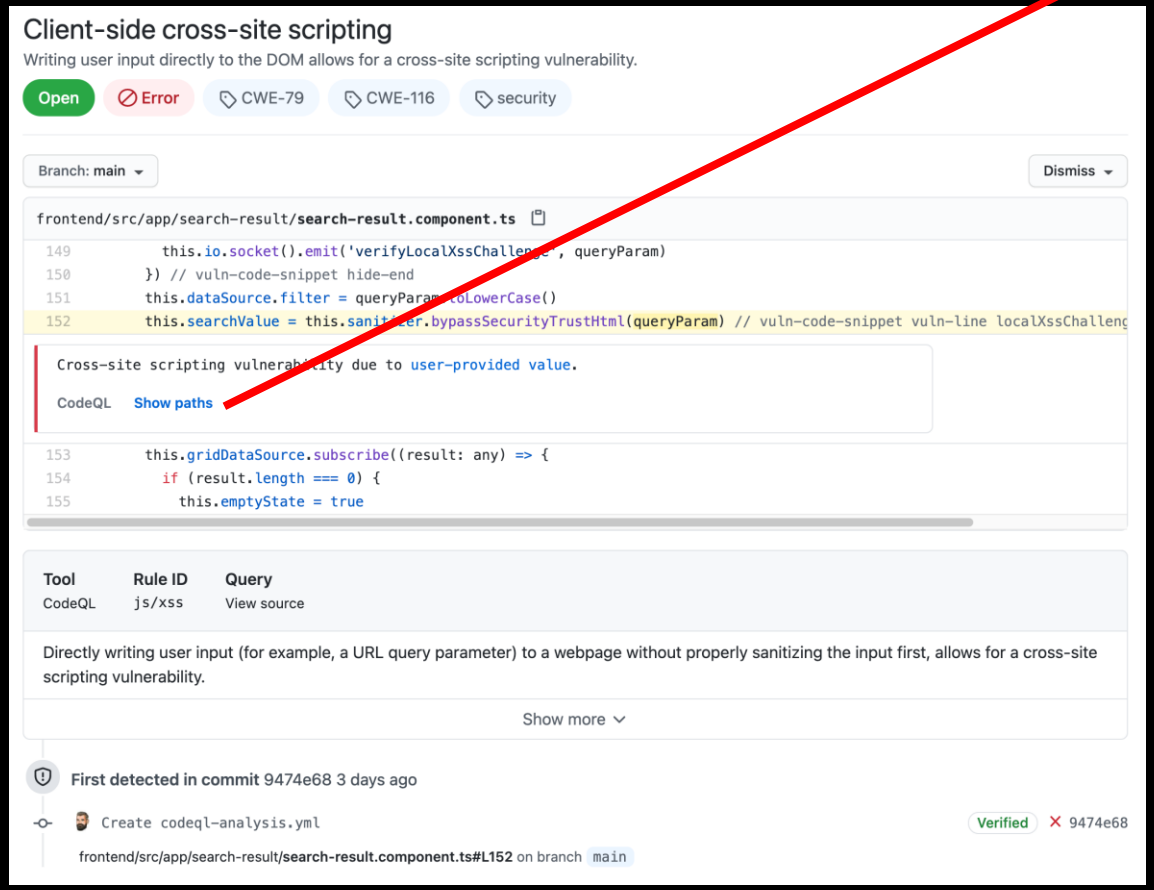
Code Scanning (CodeQL)

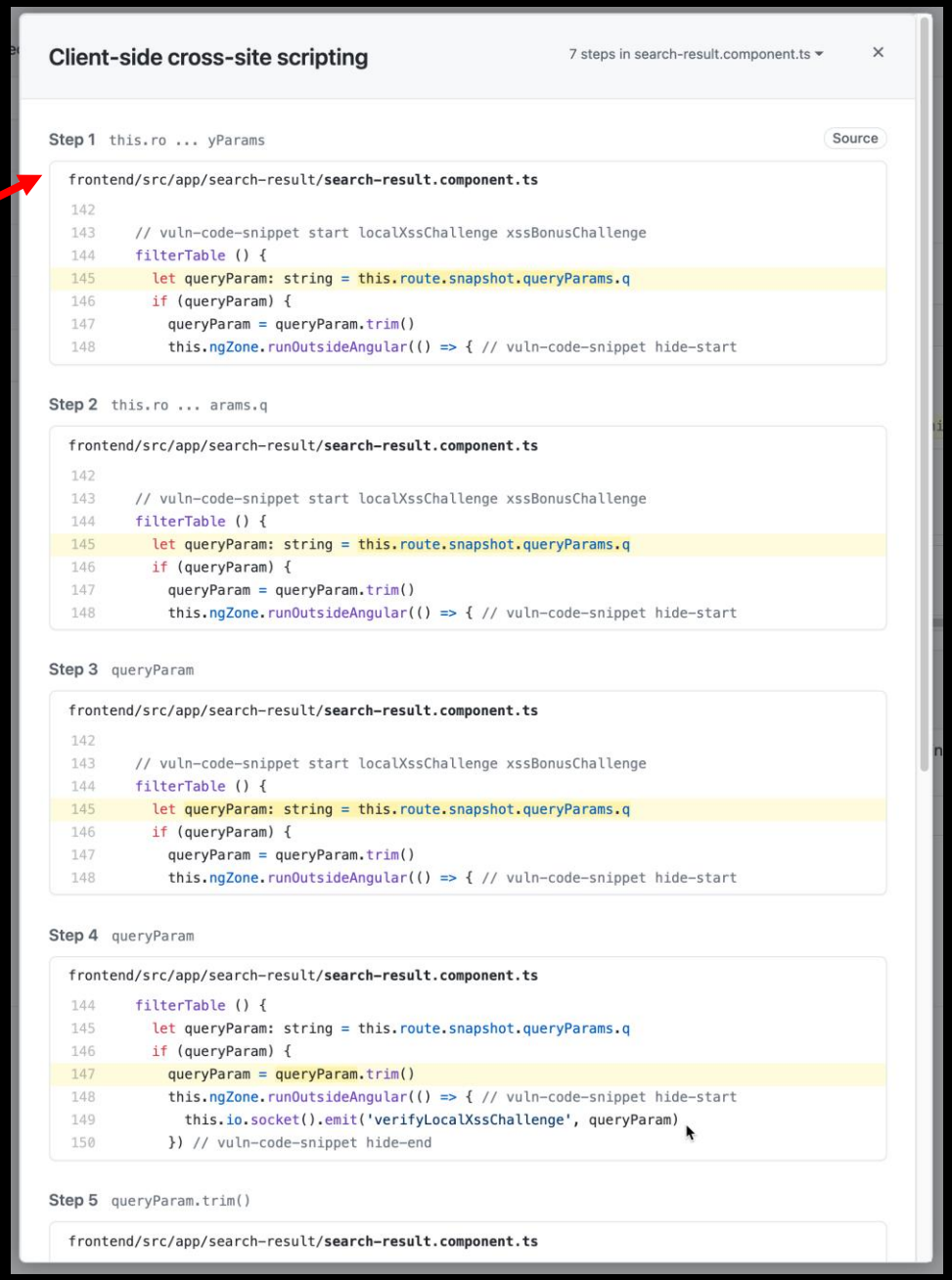
Fork: https://github.com/advanced-security/workshop-2021-learning-journey

```yaml
name: "CodeQL"

on:
  push:
    branches: [ master ]
  pull_request:
    # The branches below must be a subset of the branches above
    branches: [ master ]

jobs:
  analyze:
    name: Analyze
    runs-on: ubuntu-latest
    permissions:
      actions: read
      contents: read
      security-events: write

    strategy:
      fail-fast: false
      matrix:
        language: [ 'javascript', 'java' ]
        # CodeQL supports [ 'cpp', 'csharp', 'go', 'java', 'javascript', 'python' ]

    steps:
    - name: Checkout repository
      uses: actions/checkout@v2

    # Initializes the CodeQL tools for scanning.
    - name: Initialize CodeQL
      uses: github/codeql-action/init@v1
      with:
        languages: ${{ matrix.language }}
        # If you wish to specify custom queries, you can do so here or in a config file.
        # By default, queries listed here will override any specified in a config file.
        # Prefix the list here with "+" to use these queries and those in the config file.
        # queries: ./path/to/local/query, your-org/your-repo/queries@main

    # Autobuild attempts to build any compiled languages  (C/C++, C#, or Java).
    # If this step fails, then you should remove it and run the build manually (see below)
    - name: Autobuild
      uses: github/codeql-action/autobuild@v1
```

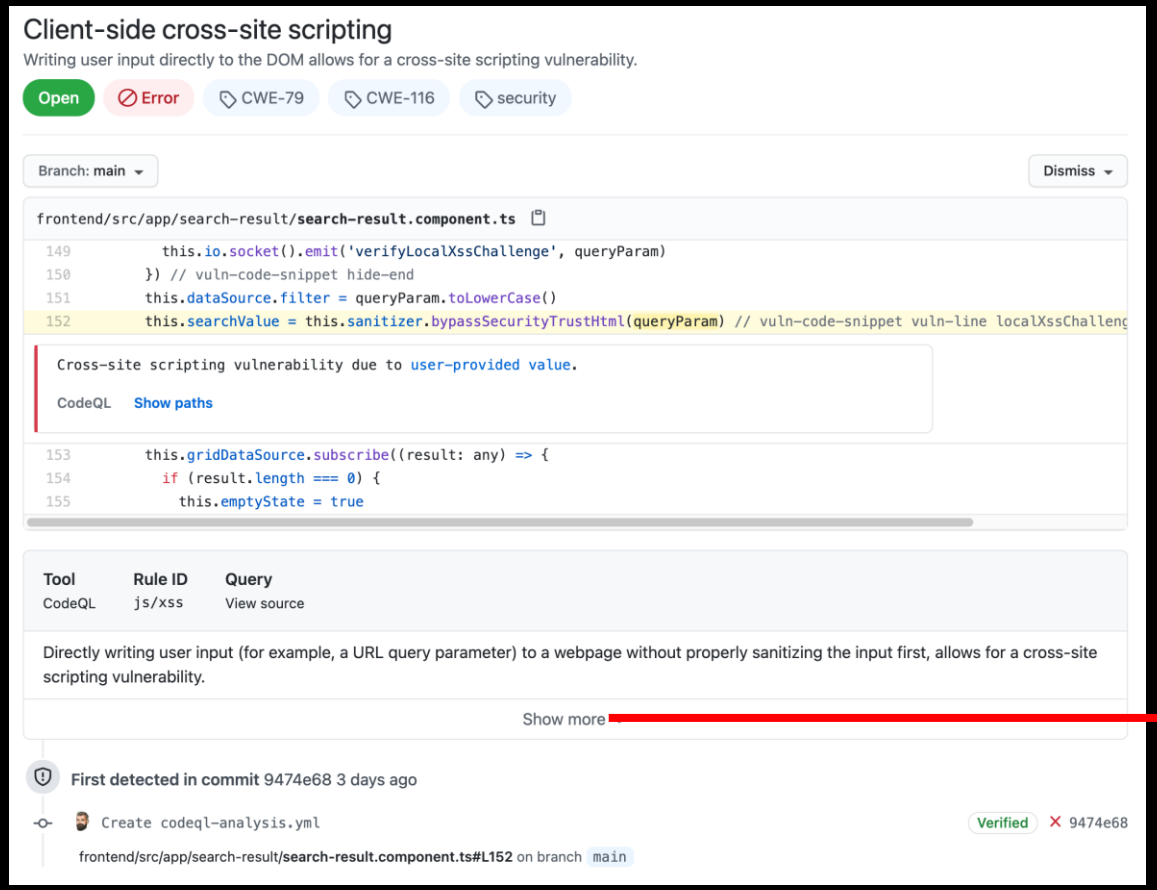


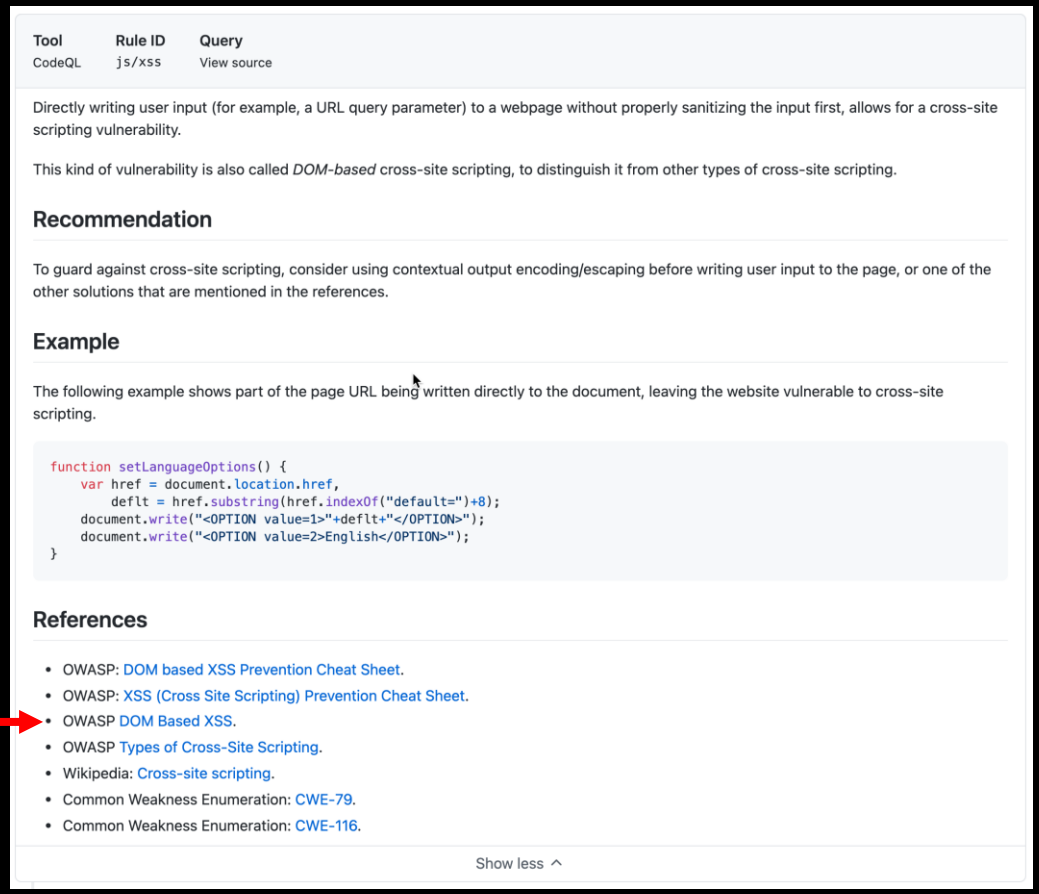
Code Scanning (CodeQL)



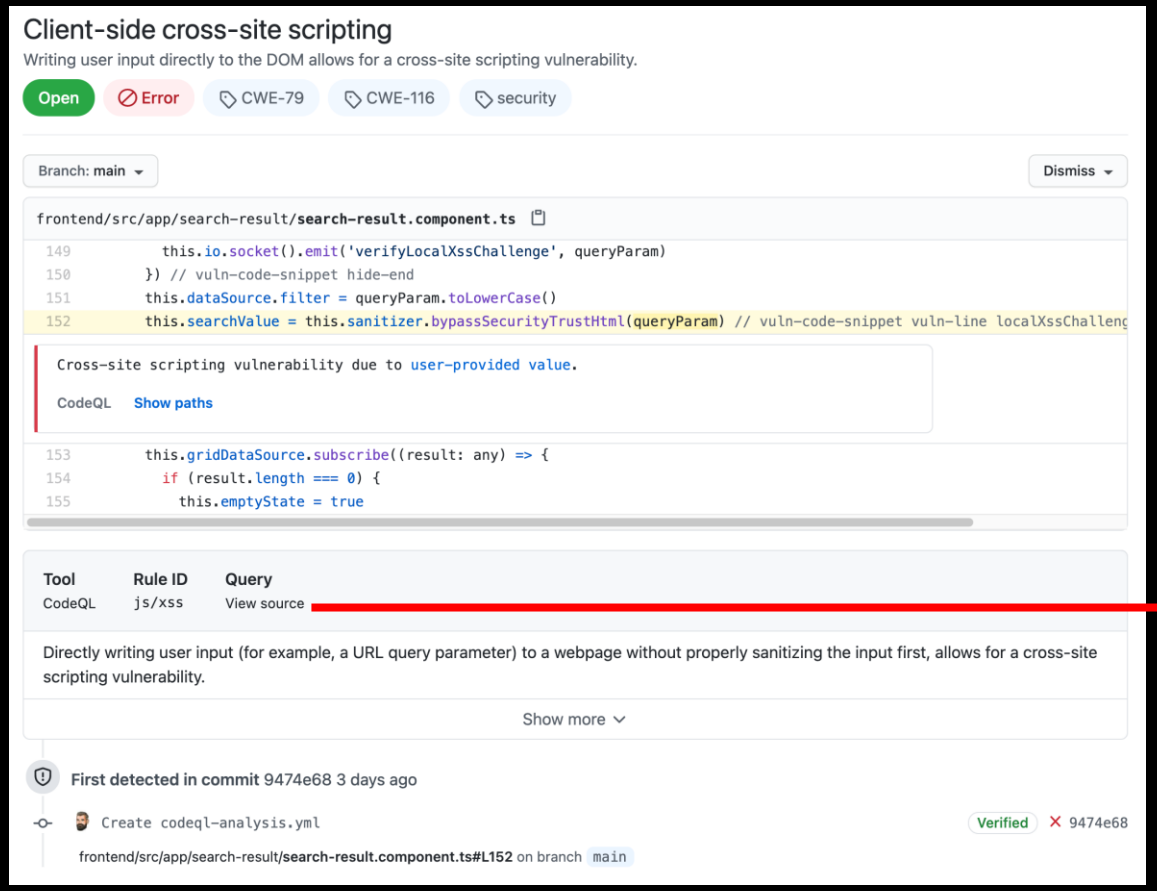


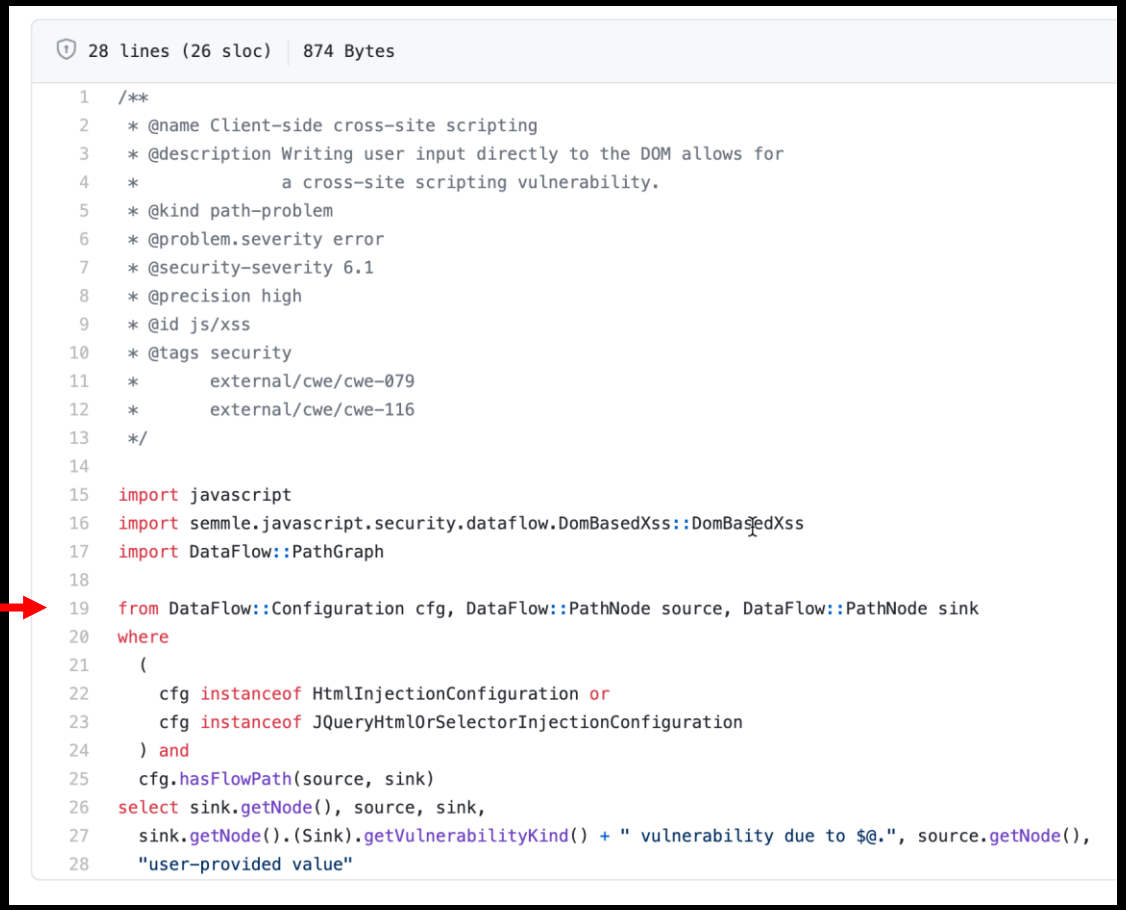
Code Scanning (CodeQL)



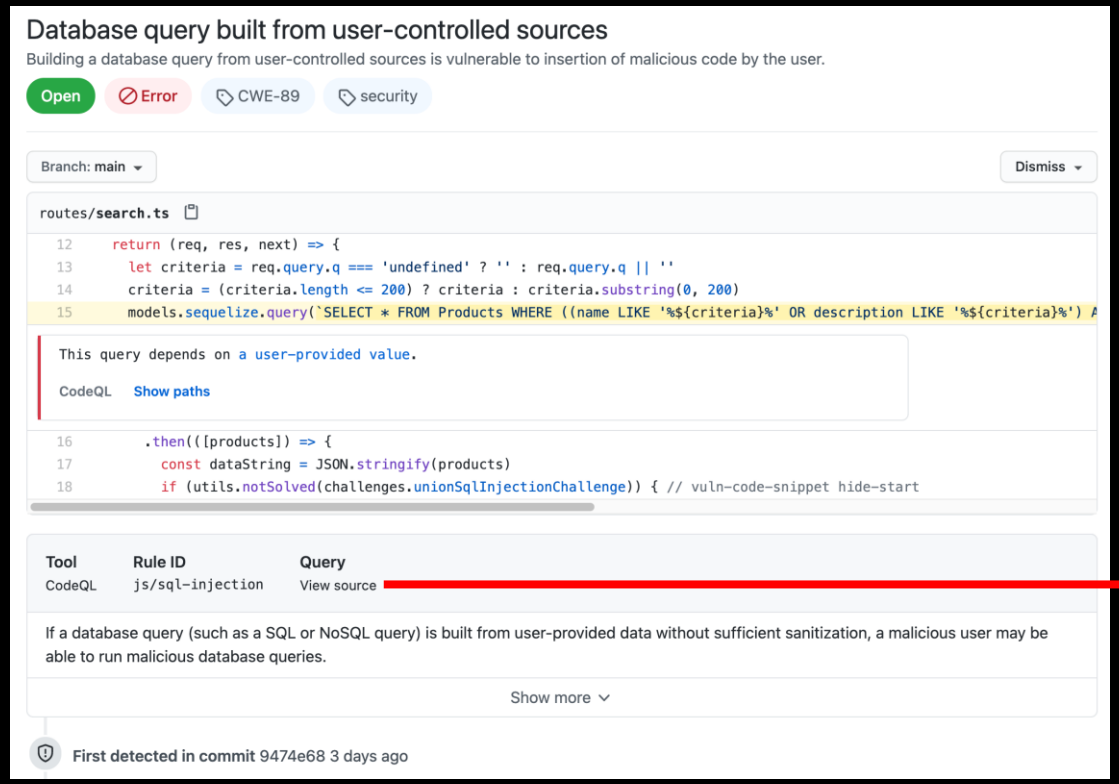


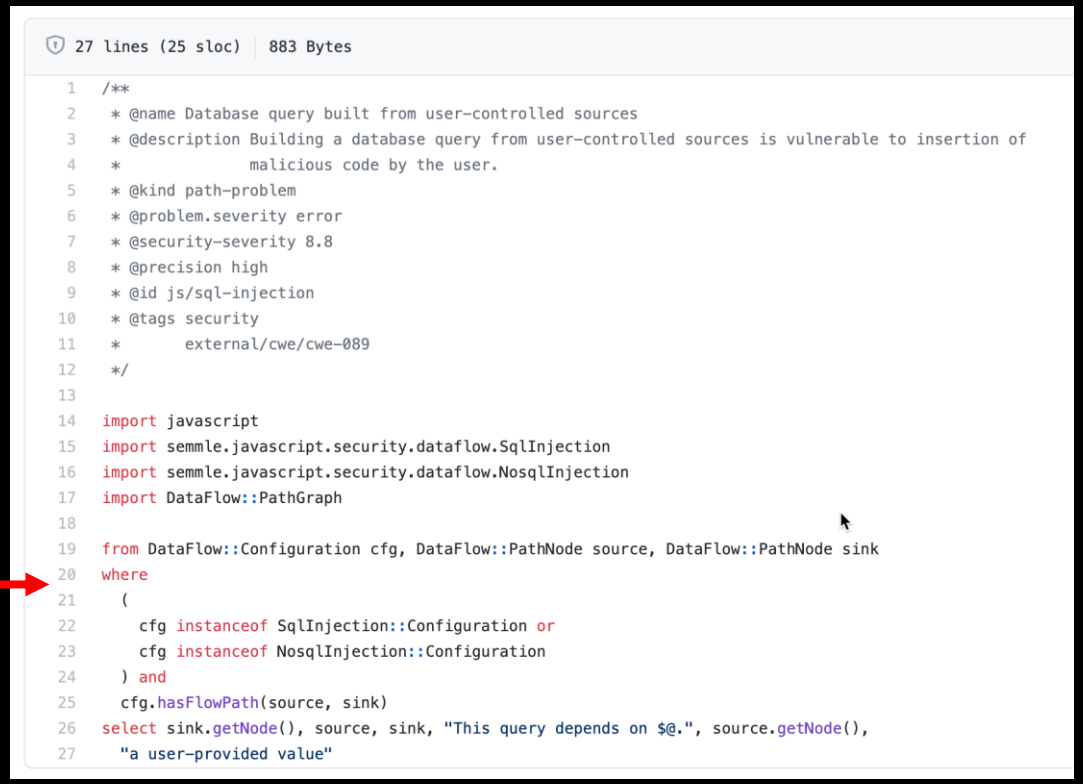
Code Scanning (CodeQL)



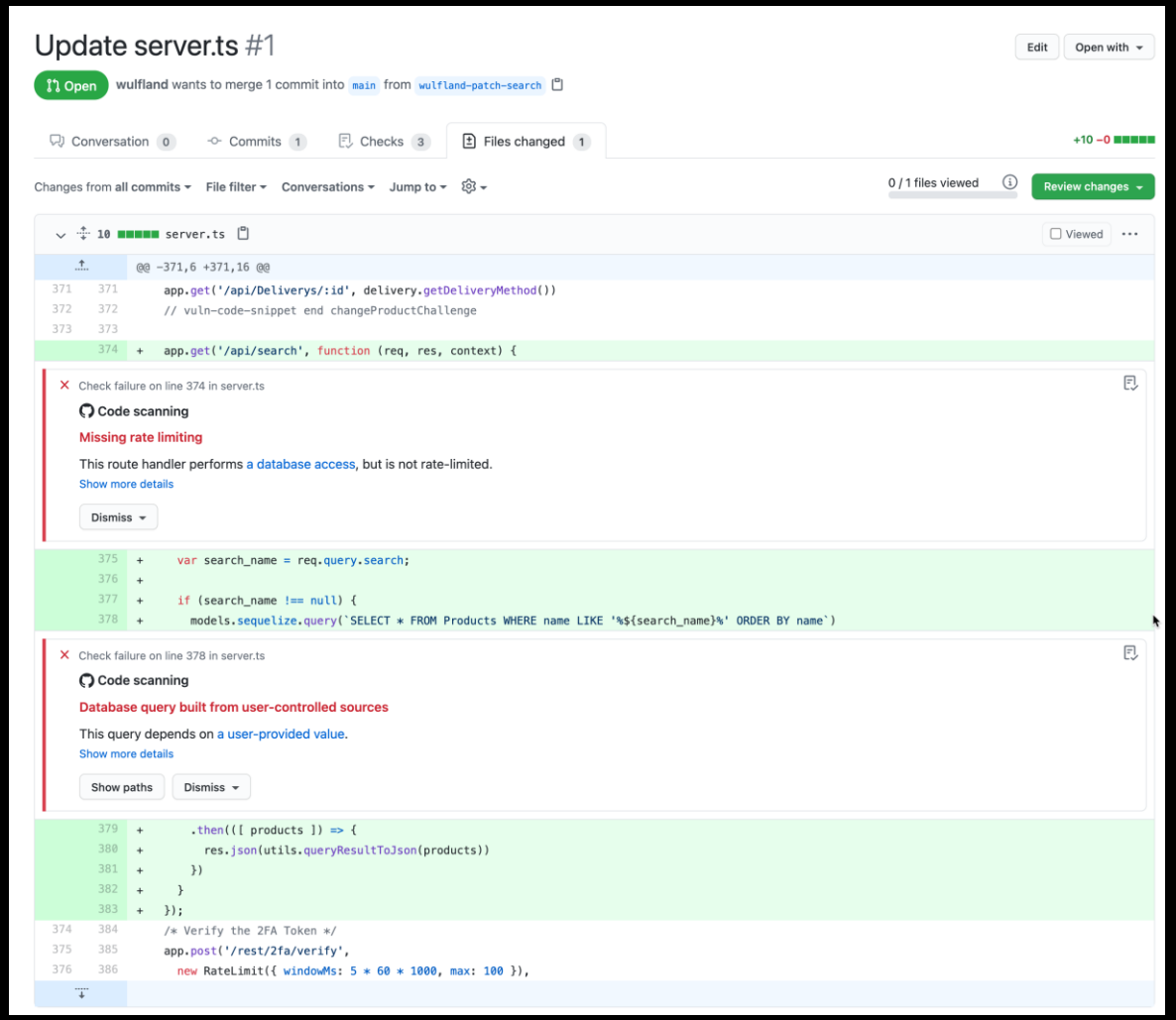


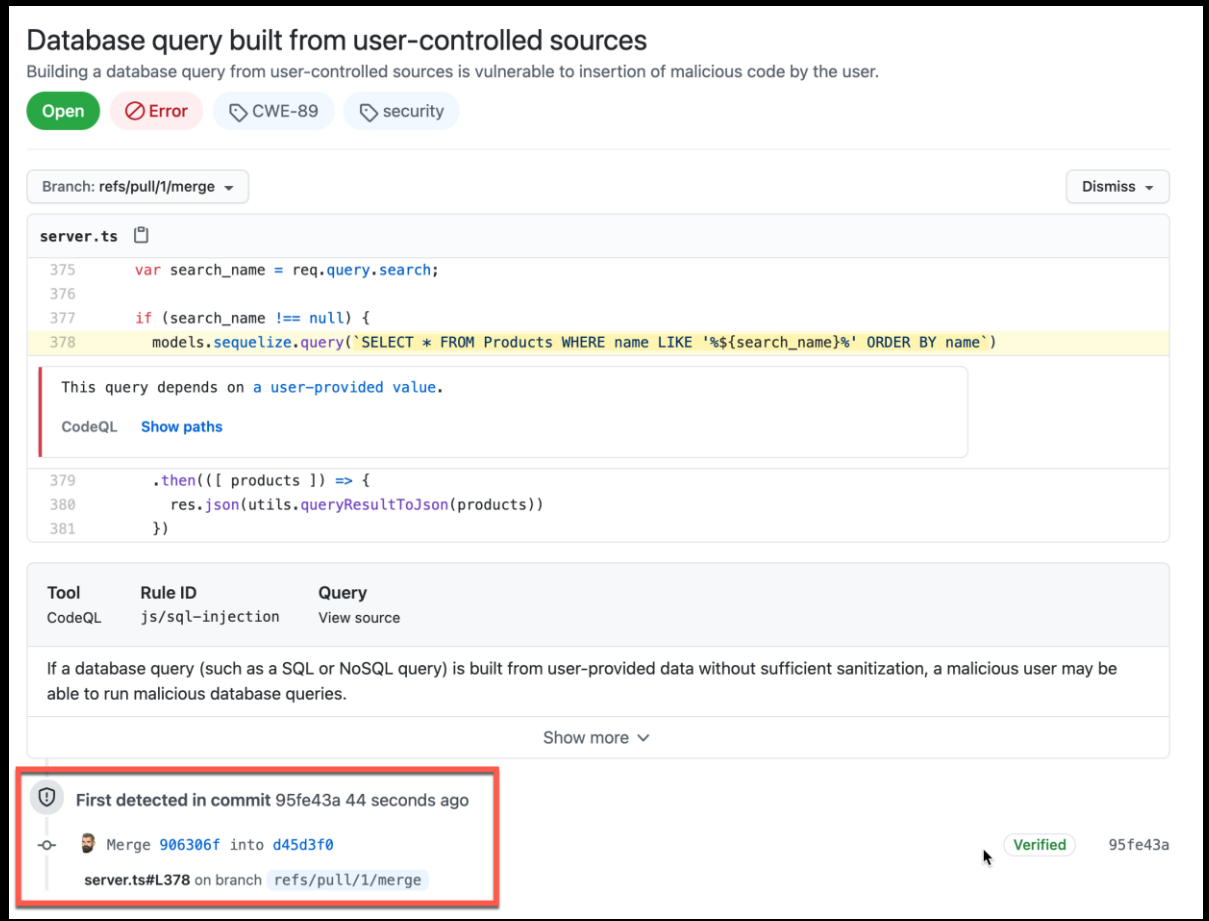
Code Scanning (CodeQL)





CodeQL: Pull-Request Integration





CodeQL: Config

```yaml
# Initializes the CodeQL tools for scanning.
- name: Initialize CodeQL
  uses: github/codeql-action/init@v1
  with:
    languages: ${{ matrix.language }}
    # If you wish to specify custom queries, you can do so here or in a config file.
    # By default, queries listed here will override any specified in a config file.
    # Prefix the list here with "+" to use these queries and those in the config file.
    # queries: ./path/to/local/query, your-org/your-repo/queries@main
    queries: security-extended
```

CodeQL: Config

```yaml
# Initializes the CodeQL tools for scanning.
- name: Initialize CodeQL
  uses: github/codeql-action/init@v1
  with:
    languages: ${{ matrix.language }}
    # If you wish to specify custom queries, you can do so here or in a config file.
    # By default, queries listed here will override any specified in a config file.
    # Prefix the list here with "+" to use these queries and those in the config file.
    # queries: ./path/to/local/query, your-org/your-repo/queries@main
    # queries: security-extended
    config-file: ./.github/codeql-config.yml
```

codeql-config.yml

Raw

```yaml
name: "Custom CodeQL Configuration"

# Disabling the default queries is critical part of this.
# Nothing will be disabled if the default queries still run.
# - https://docs.github.com/en/code-security/secure-coding/configuring-code-scanning#disabling-the-default-queries
disable-default-queries: true

queries:
  # Point to the custom query suite that needs to be used
  - uses: ./.github/codeql/custom-javascript.qls

# Ignore some of the paths as these are some open source componants.
# This only works for Interpreted Languages (JavaScript / TypeScript / Python)
# - https://docs.github.com/en/code-security/secure-coding/automatically-scanning-your-code-for-vulnerabilities-and-errors/conf
paths-ignore:
  - '**/node_modules'
  # Ignoring our test folders
  - '**/test'
```

CodeQL: Config

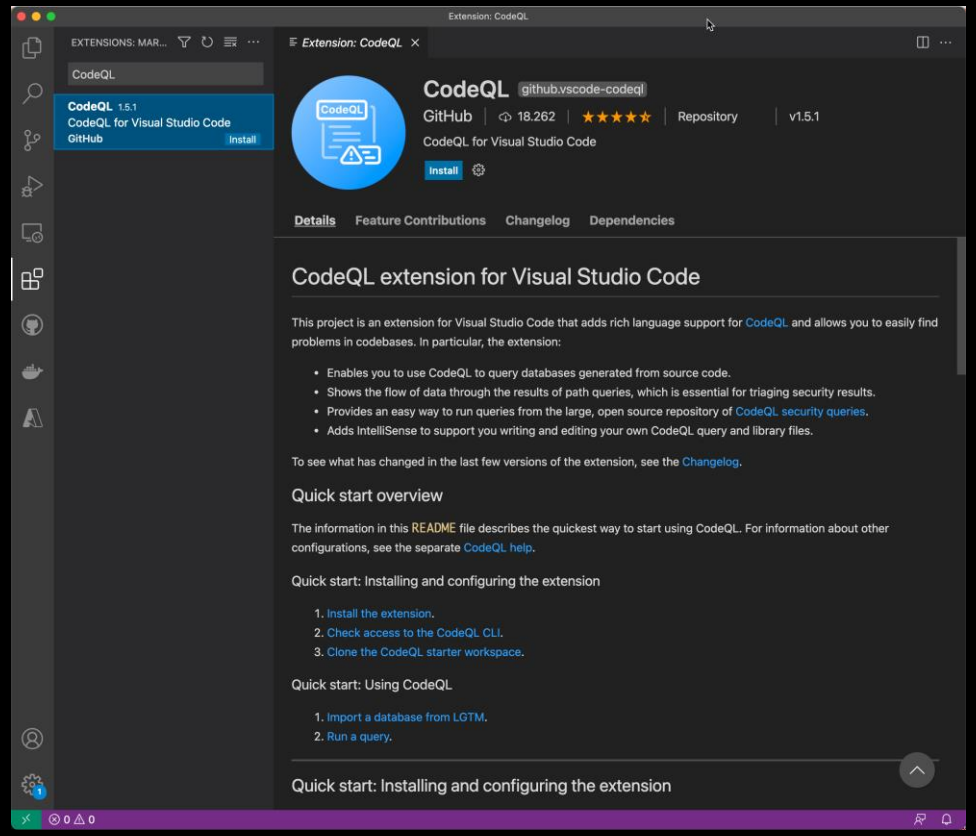
custom-javascript.qls

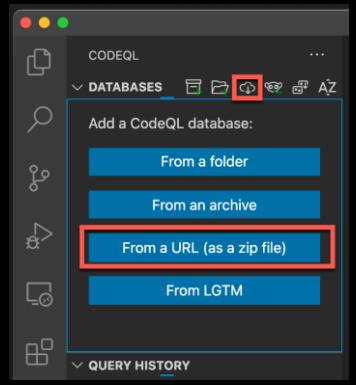
Raw

```
# Documentation
# - https://codeql.github.com/docs/codeql-cli/creating-codeql-query-suites/
# - https://github.com/github/codeql/actions/workflows/query-list.yml
# - https://github.com/github/codeql/blob/main/misc/suite-helpers/security-extended-selectors.yml
# - https://codeql.github.com/docs/codeql-cli/creating-codeql-query-suites/#examples

- description: "Custom JavaScript Suite"

# Import/Extend from an existing CodeQL suite
- import: codeql-suites/javascript-security-extended.qls
  from: codeql-javascript


# Exclude queries that are not relevant for my organisation or have a
# higher False Positive rate than we are confident with.
- exclude:
    id:
      # https://github.com/github/codeql/blob/main/javascript/ql/src/Security/CWE-770/MissingRateLimiting.ql
      - js/missing-rate-limiting
```

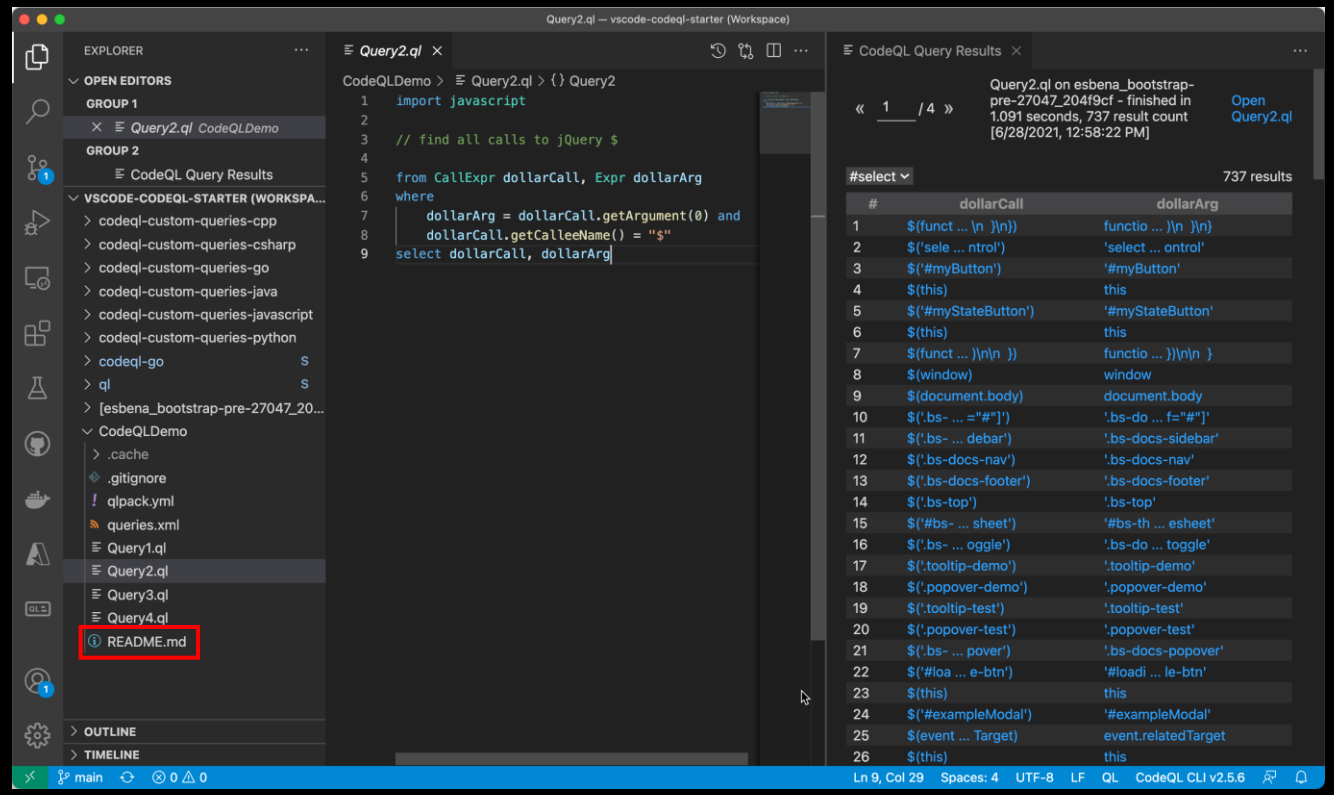
Eigene CodeQL Queries

https://github.com/wulfland/CodeQLDemo





https://github.com/githubsatelliteworkshops/codeql/releases/download/v1.0/esbena_bootstrap-pre-27047_javascript.zip

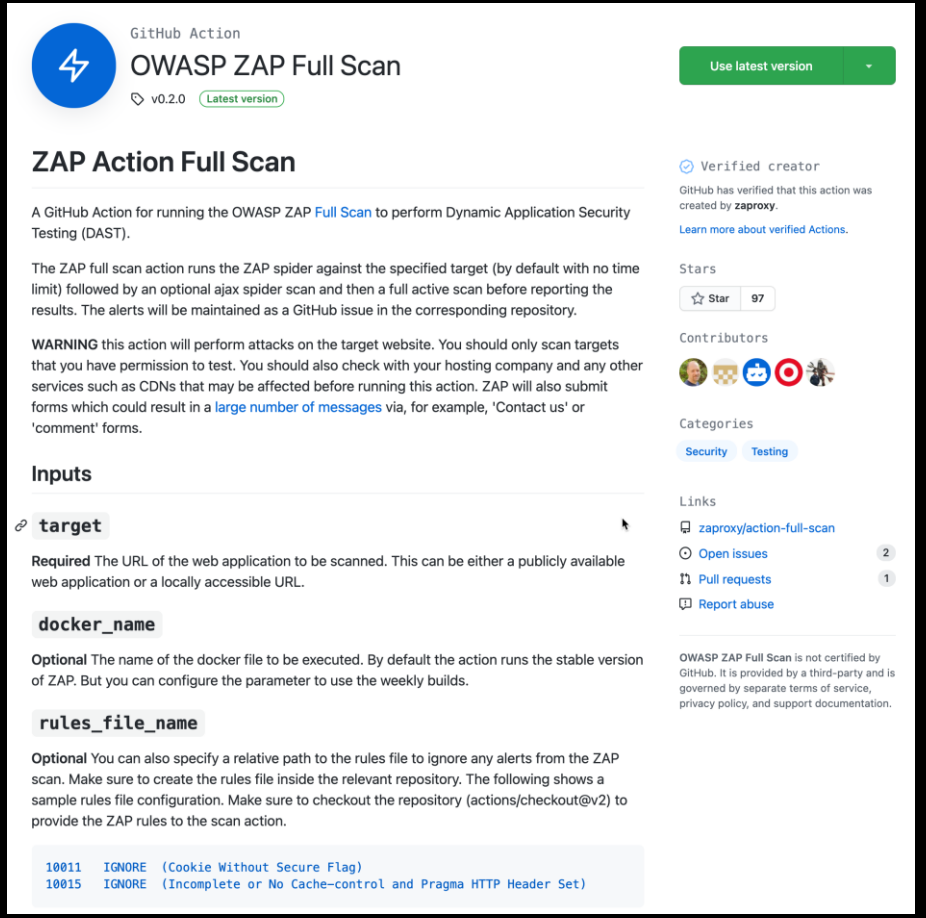


Dynamic Application Security Testing (DAST)

Blackbox-Testing

- OWASP ZAP (Zed Attack Proxy, https://owasp.org/www-project-zap)
- Burp Suite von PortSwigger (https://portswigger.net/burp)

```yaml
jobs:
  owasp:
    name: OWASP Full Scan
    runs-on: ubuntu-latest
    steps:
      - name: OWASP ZAP Full Scan
        uses: zaproxy/action-full-scan@v0.2.0
        with:
          # GitHub Token to create issues in the repository
          token: ${{ github.token }}
          target: https://target
```



Infrastructure Scanning

Container Vulnerability Analysis (CVA)
Container Security Analysis (CSA)

- WhiteSource
  https://www.whitesourcesoftware.com/solution-for-containers/
- Aqua
  https://www.aquasec.com/products/container-security/

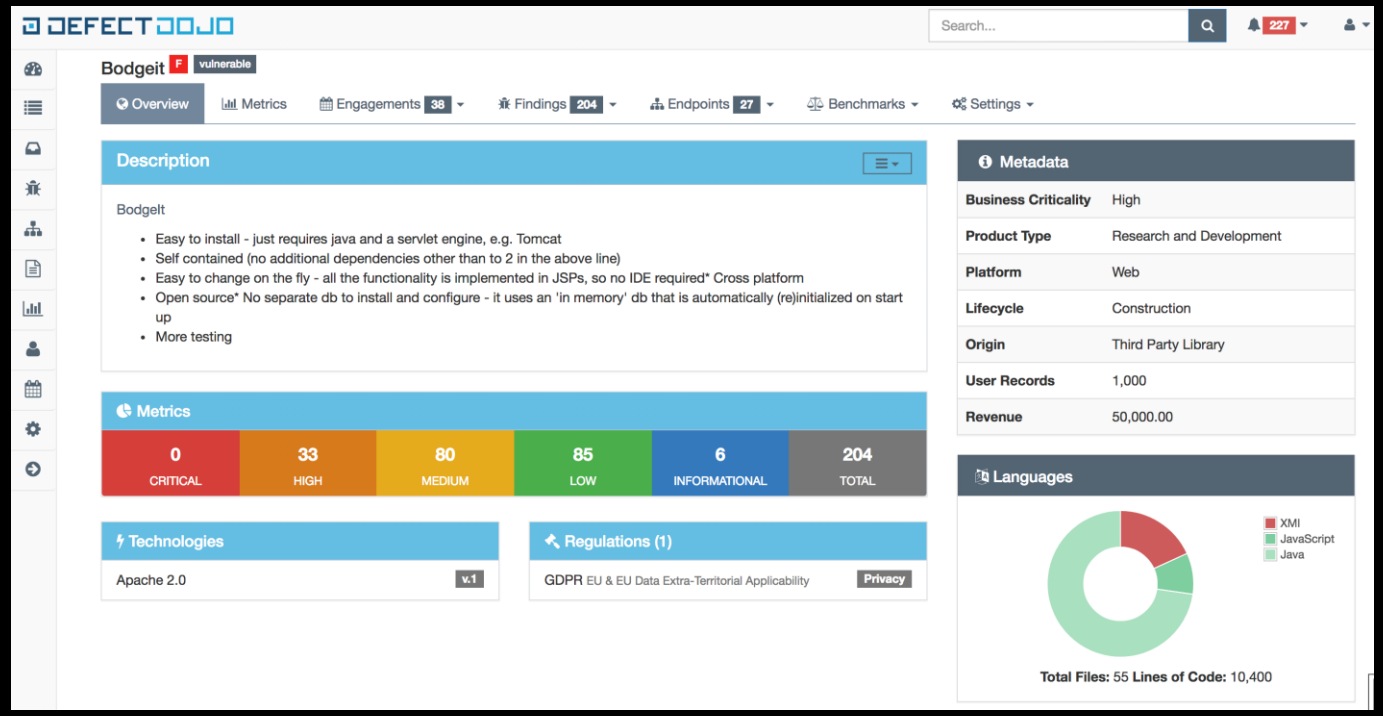
Andere Infrastruktur:

- Azure Policy
  https://docs.microsoft.com/de-de/azure/governance/policy/
- Checkov
  https://www.aquasec.com/products/container-security/
- OpenVAS
  https://www.openvas.org/

```yaml
name: build
on:
  push:
    branches:
      - master
  pull_request:
jobs:
  build:
    name: Build
    runs-on: ubuntu-18.04
    steps:
      - name: Checkout code
        uses: actions/checkout@v2

      - name: Run Trivy vulnerability scanner in repo mode
        uses: aquasecurity/trivy-action@master
        with:
          scan-type: 'fs'
          ignore-unfixed: true
          format: 'template'
          template: '@/contrib/sarif.tpl'
          output: 'trivy-results.sarif'
          severity: 'CRITICAL'

      - name: Upload Trivy scan results to GitHub Security tab
        uses: github/codeql-action/upload-sarif@v1
        with:
          sarif_file: 'trivy-results.sarif'
```

DefectDojo

https://github.com/DefectDojo/django-DefectDojo
Demo: demo.defectdojo.org
Log in: admin / defectdojo@demo#appsec

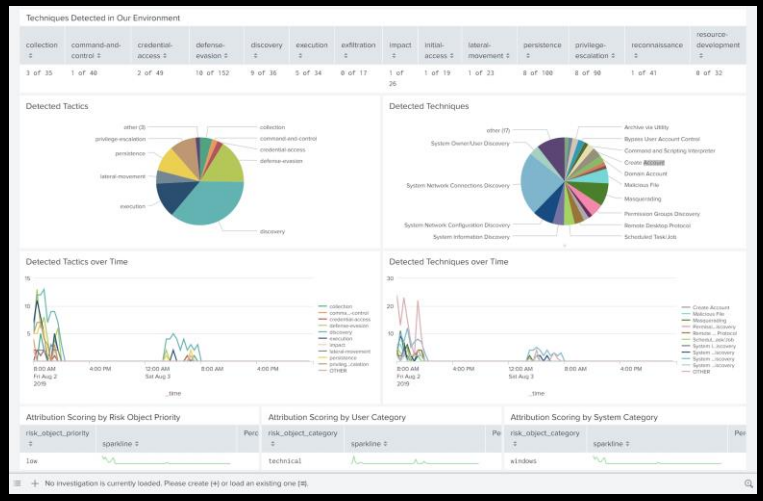


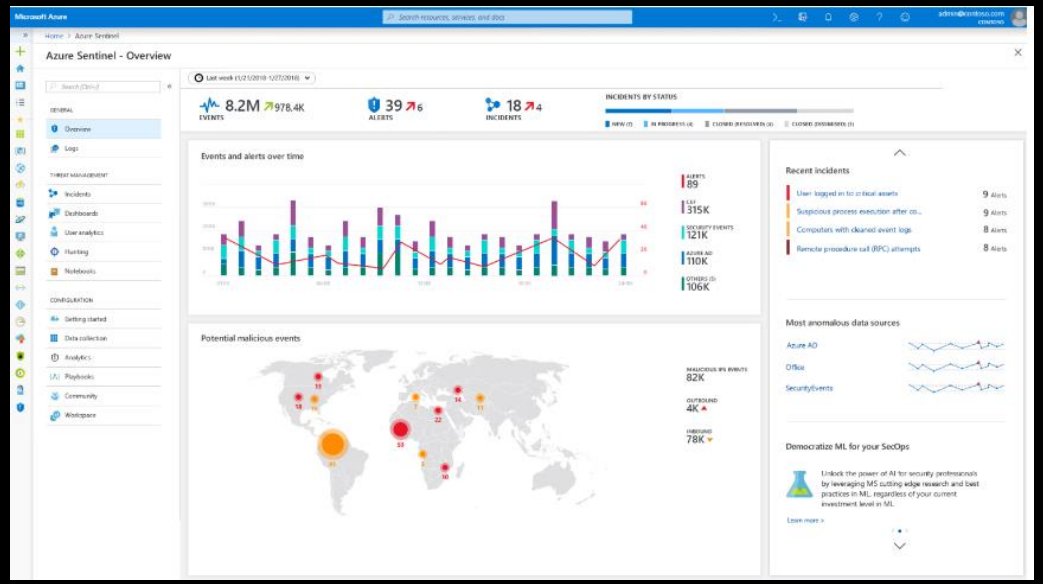
Security Information & Event Management (SIEM)

Beispiel:

- Azure Sentinel
- Splunk

- Zentrales Logging
- Multicloud/Hybrid
- Anomalieerkennung (ML)
- Echtezeit Warnungen





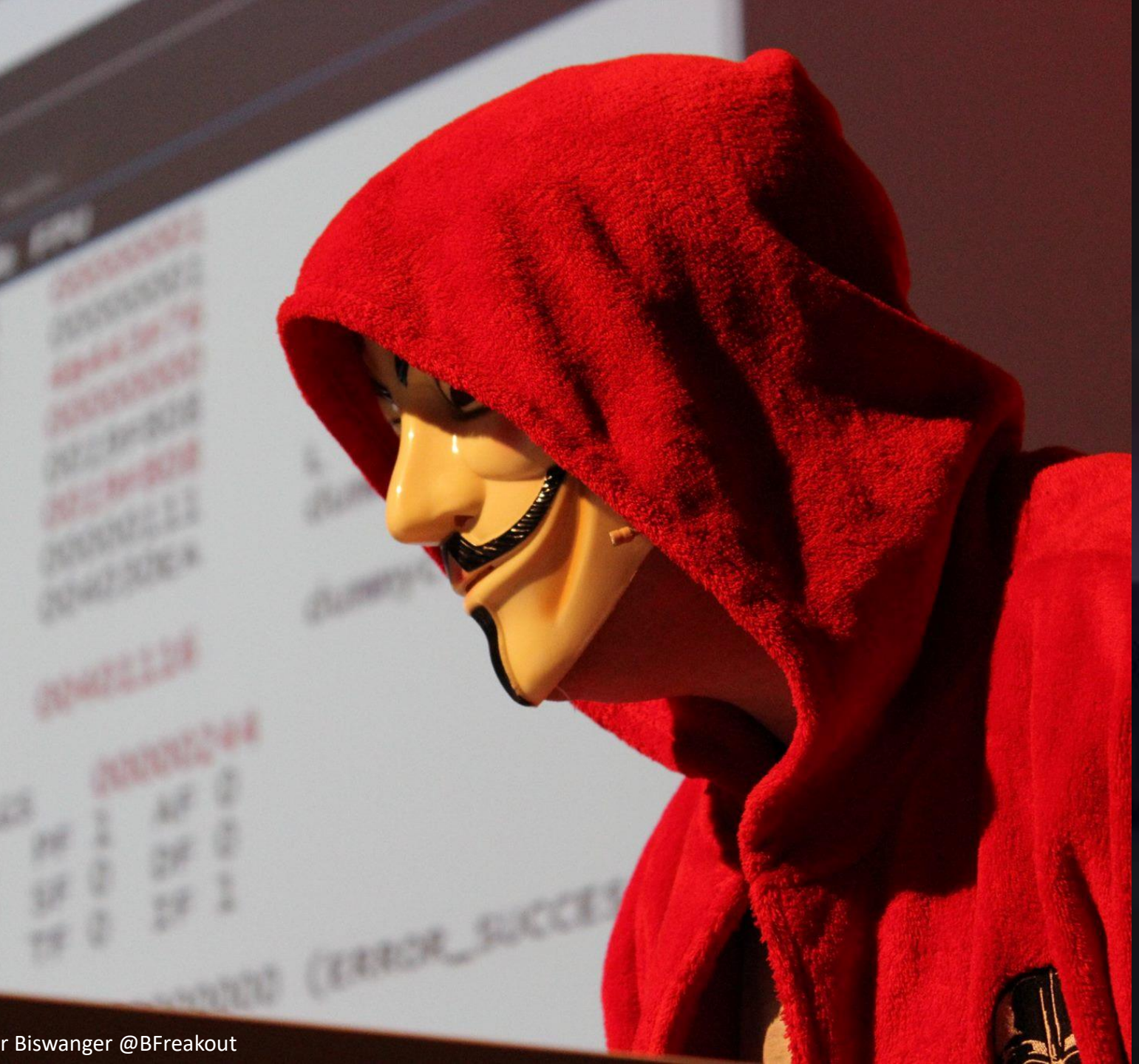
6 tips to integrate security into your DevOps practices

1. **Build a security-first culture across the business**
2. **Integrate security in the early stages of the development lifecycle**
3. **Monitor and observe continuously with purpose**
4. **Embrace everything-as-code**
5. **Realize compliancy with policy automation**
6. **Secure and visualize your software supply chain**

https://azure.microsoft.com/en-us/resources/6-tips-to-integrate-security-into-your-devops-practices/

Wenn wir über Sicherheit sprechen…

- ~~„Wir hatten bisher noch nie einen Sicherheitsvorfall“~~
- ~~„Unsere Entwickler sind Experten“~~
- ~~„Unsere Firma ist zu unwichtig, um angegriffen zu werden“~~
- ~~„Wir haben uns schon gut abgesichert“~~
- ~~„Unsere Firewalls sind sicher“~~
- „Wir müssen was tun!“
- „Sicherheit hat oberste Priorität!“
- „Wenn wir einen Sicherheitsvorfall hatten, dann ist es zu spät!“



Vielen Dank

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