REVERSINGLABS

A Step-by-Step Walk Through of the ReversingLabs Software Assurance Service

How Software Development & Release Assess Security Readiness to Stop Supply Chain Risks

Erik Thoen

VP of Product Management, ReversingLabs

Thursday, October 28th, 1 PM ET

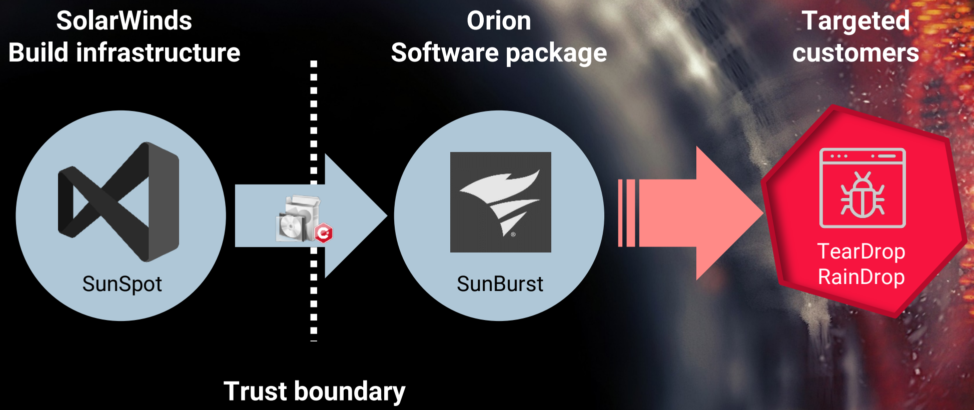
- Session will be recorded and will be sent to all registrants
- Please participate in poll questions throughout and survey at the end
- Questions will be answered at the end of the presentation

Agenda

- Supply chain attacks
- ReversingLabs approach
- Publisher and buyer workflows
- Demonstrations
- Deployment evolution
- Questions

SUNBURST

Attackers injected high quality rogue code through a build process compromise



DEFENDER'S PROBLEM

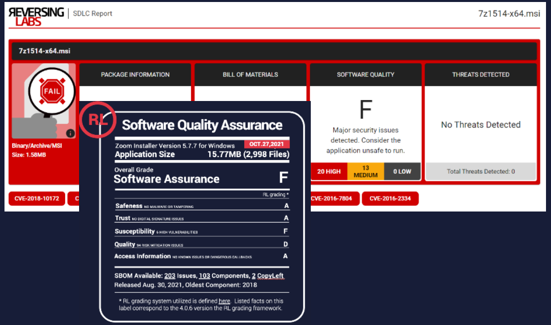
Not exploiting known vulnerabilities

Not known malware

Not poorly written code

Not using open-source libraries or code

Software Assurance Process Needed



SDLC Report 7z1514-x64.msi

7z1514-x64.msi

FAIL

Binary/Archive/MSI
Size: 1.58MB

PACKAGE INFORMATION | BILL OF MATERIALS | SOFTWARE QUALITY | THREATS DETECTED

F

Major security issues detected. Consider the application unsafe to run.

20 HIGH | 13 MEDIUM | 0 LOW

No Threats Detected

Total Threats Detected: 0

CVE-2018-10172 | CVE-2016-7804 | CVE-2016-2334

Software Quality Assurance

Zoom Installer Version 5.7.7 for Windows OCT.27,2021
Application Size 15.77MB (2,998 Files)

Overall Grade
Software Assurance F

RL grading *

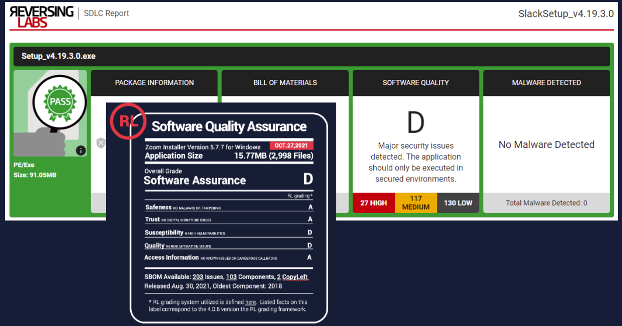
Safeness NO MALWARE OR TAMPERING	A
Trust NO DIGITAL SIGNATURE ISSUES	A
Susceptibility 6 HIGH VULNERABILITIES	F
Quality 94 RISK MITIGATION ISSUES	D
Access Information NO KNOWN ISSUES OR DANGEROUS CALLBACKS	A

SBOM Available: 203 Issues, 103 Components, 2 CopyLeft
Released Aug. 30, 2021, Oldest Component: 2018

* RL grading system utilized is defined here. Listed facts on this label correspond to the 4.0.6 version the RL grading framework.

SOFTWARE PRODUCERS

CODE IMPROVEMENT



SDLC Report SlackSetup_v4.19.3.0

Setup_v4.19.3.0.exe

PASS

PE/Exe
Size: 91.05MB

PACKAGE INFORMATION | BILL OF MATERIALS | SOFTWARE QUALITY | MALWARE DETECTED

D

Major security issues detected. The application should only be executed in secured environments.

27 HIGH | 117 MEDIUM | 130 LOW

No Malware Detected

Total Malware Detected: 0

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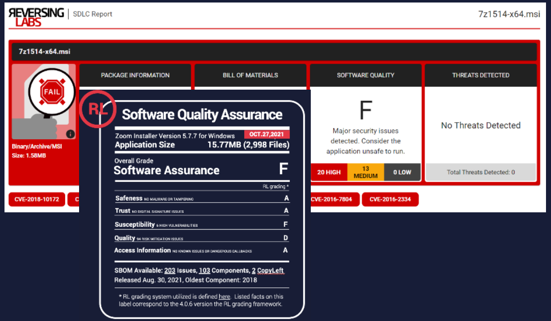
✓



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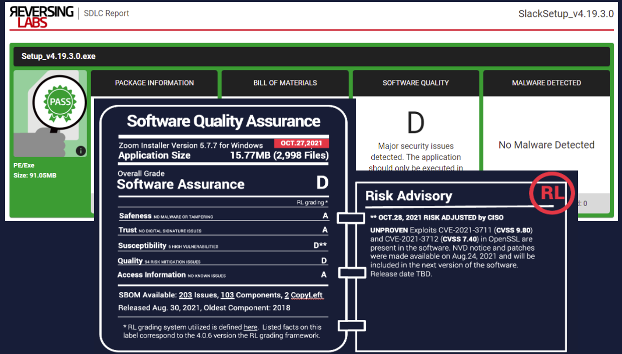
SOFTWARE BUYERS

RISK ASSESSMENT



SDLC Report SlackSetup_v4.19.3.0

Setup_v4.19.3.0.exe

PASS

PE/Exe
Size: 91.05MB

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Major security issues detected. The application should only be executed in

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SBOM Available: 203 Issues, 103 Components, 2 CopyLeft
Released Aug. 30, 2021, Oldest Component: 2018

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Risk Advisory

**** OCT.28, 2021 RISK ADJUSTED by CISO**

UNPROVEN Exploits CVE-2021-3711 (**CVSS 9.80**) and CVE-2021-3712 (**CVSS 7.40**) in OpenSSL are present in the software. NVD notice and patches were made available on Aug.24, 2021 and will be included in the next version of the software. Release date TBD.

✓

Approach

Defending the next supply chain attack

DESIRED STATE

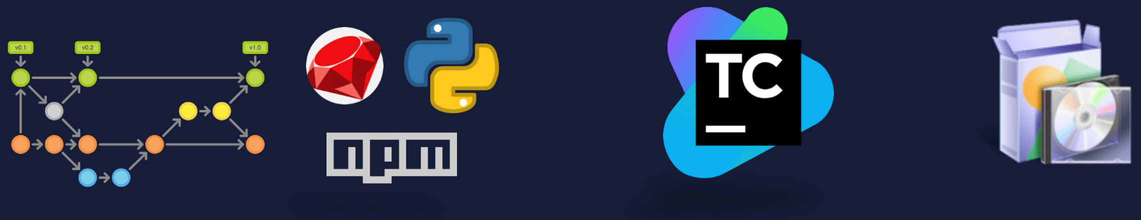
Defense requires a new analysis process

- Decomposing “golden” software image
- Describing underlying software behaviors
- Determining software deployment risks:

- Unknown behaviors ✓
- Known vulnerabilities ✓
- Enabled mitigations ✓
- Certificate validation ✓
- Sensitive information ✓
- Third party components ✓
- Embedded malware ✓

Publisher Workflow

Reduced supply chain risk



ReversingLabs

ReversingLabs

Source Control

Software Dependencies

Build Process

Release Image

Analyze software dependences before supply chain insertion

Release candidate software scan

AUTOMATED CHECKS

- ✓ No unknown behaviors
- ✓ No known vulnerabilities
- ✓ Enabled mitigations
- ✓ Properly signed packages
- ✓ No sensitive information
- ✓ Verified 3rd party libraries
- ✓ No embedded malware

RELEASE

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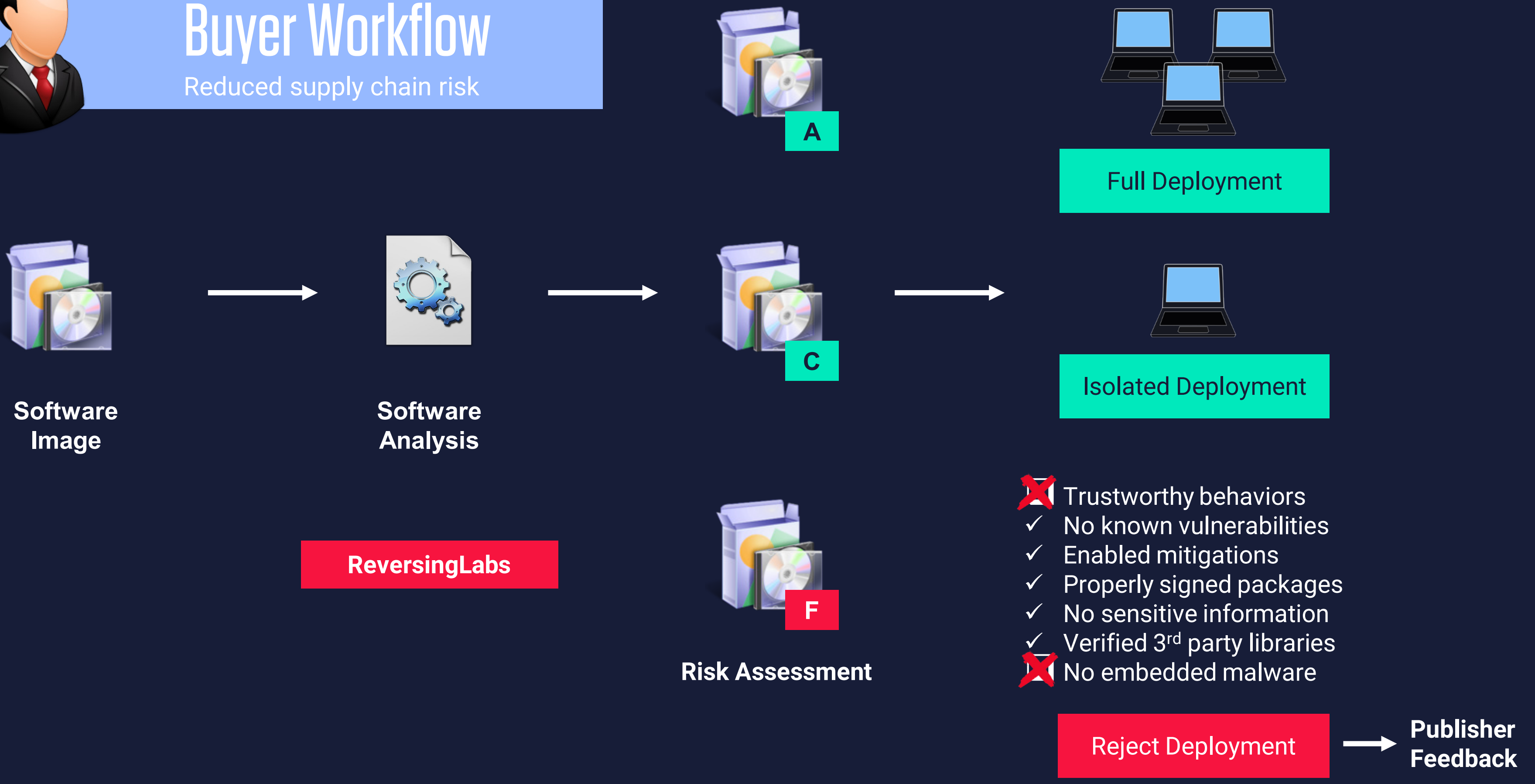
Buyer Workflow

Reduced supply chain risk



Software Image

Software Analysis

ReversingLabs

A

C

F

Risk Assessment

Full Deployment

Isolated Deployment

- ☒ Trustworthy behaviors
- ✓ No known vulnerabilities
- ✓ Enabled mitigations
- ✓ Properly signed packages
- ✓ No sensitive information
- ✓ Verified 3rd party libraries
- ☒ No embedded malware

Reject Deployment → Publisher Feedback

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Best Practices

New Capabilities for Compliance

WH.GOV

Executive Order on Improving the Nation's Cybersecurity

MAY 12, 2021 • PRESIDENTIAL ACTIONS

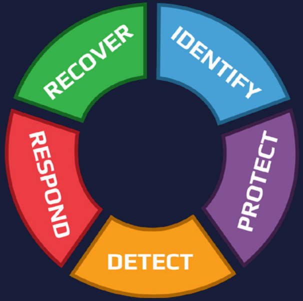
- Software Bill of Materials (SBOM)
- Component provenance
- Known and potential vulnerabilities

REVERSINGLABS carahsoft.

https://www.carahsoft.com/reversinglabs#contracts

NIST

Cybersecurity Framework



ReversingLabs Support

Identify:
- Asset Management
- Risk Assessment
- Supply Chain Risk Management

Protect:
- Data Security

Whitepaper: How ReversingLabs capabilities map to NIST CSF

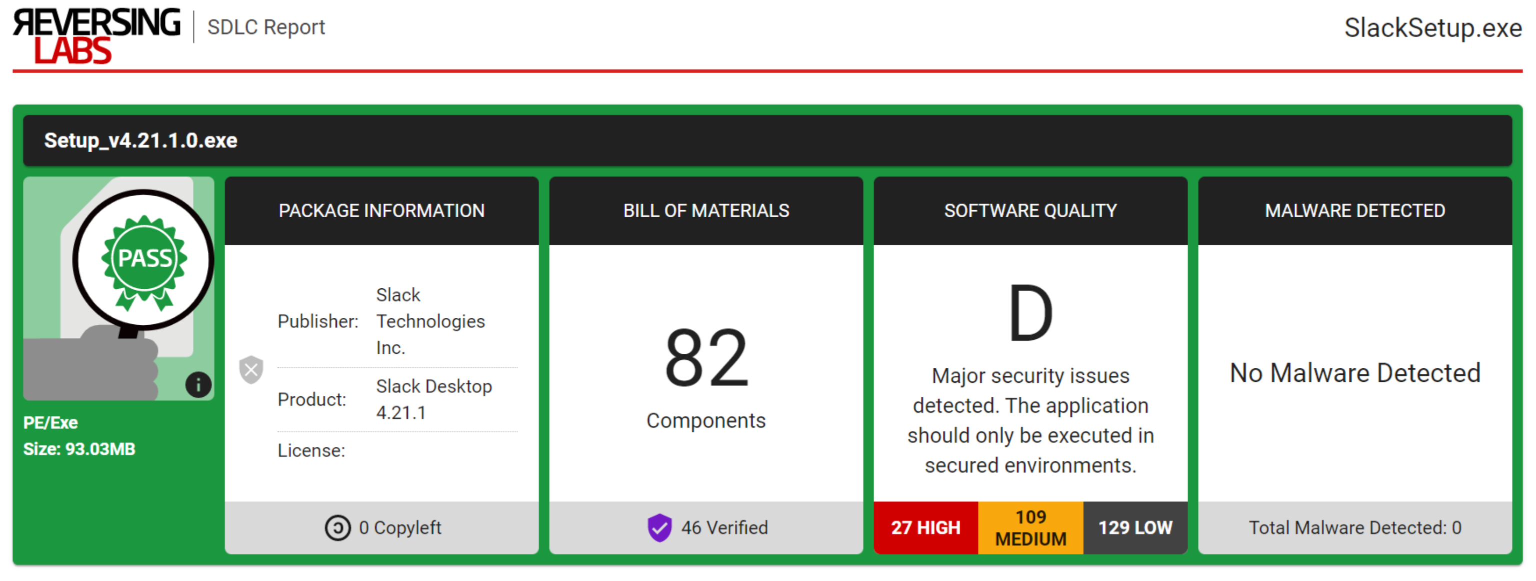
Poll Question #1:

What is your primary reason for researching an Application Security solution?

- We were breached
- Staying current given public attacks
- Executive directive to improve supply chain security and resiliency
- Existing AppSec tools not sufficient to verify software builds

Demo - Verified components

SlackSetup_v4.21.1.0



SDLC Report

SlackSetup.exe

Setup_v4.21.1.0.exe

PE/Exe
Size: 93.03MB

PACKAGE INFORMATION

Publisher:	Slack Technologies Inc.
Product:	Slack Desktop 4.21.1
License:	

0 Copyleft

BILL OF MATERIALS

82

Components

46 Verified

SOFTWARE QUALITY

D

Major security issues detected. The application should only be executed in secured environments.

27 HIGH	109 MEDIUM	129 LOW

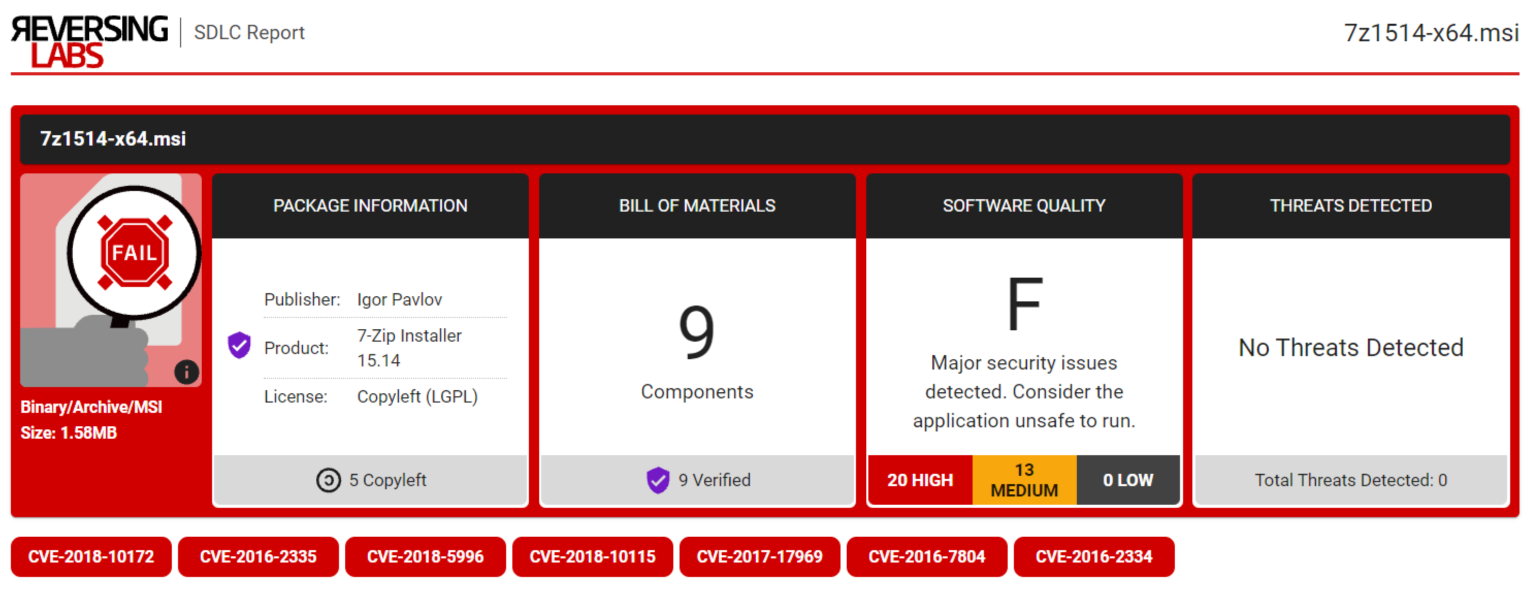
MALWARE DETECTED

No Malware Detected

Total Malware Detected: 0

Demo - Mitigated vulnerabilities

7z1514-x64.msi



SDLC Report

7z1514-x64.msi

7z1514-x64.msi

Binary/Archive/MSI
Size: 1.58MB

PACKAGE INFORMATION	BILL OF MATERIALS	SOFTWARE QUALITY	THREATS DETECTED
Publisher: Igor Pavlov Product: 7-Zip Installer 15.14 License: Copyleft (LGPL)	9 Components	F Major security issues detected. Consider the application unsafe to run.	No Threats Detected
5 Copyleft	9 Verified	20 HIGH · 13 MEDIUM · 0 LOW	Total Threats Detected: 0

CVE-2018-10172 CVE-2016-2335 CVE-2018-5996 CVE-2018-10115 CVE-2017-17969 CVE-2016-7804 CVE-2016-2334

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Poll Question #2:

What are your top software supply chain security issues?

- Software tampering (hidden malware, compromised libraries, unsigned software, misconfigured code)
- Code quality and vulnerable software
- Open-source risks (npm, GitHub, etc.)
- 3rd Party COTS verification

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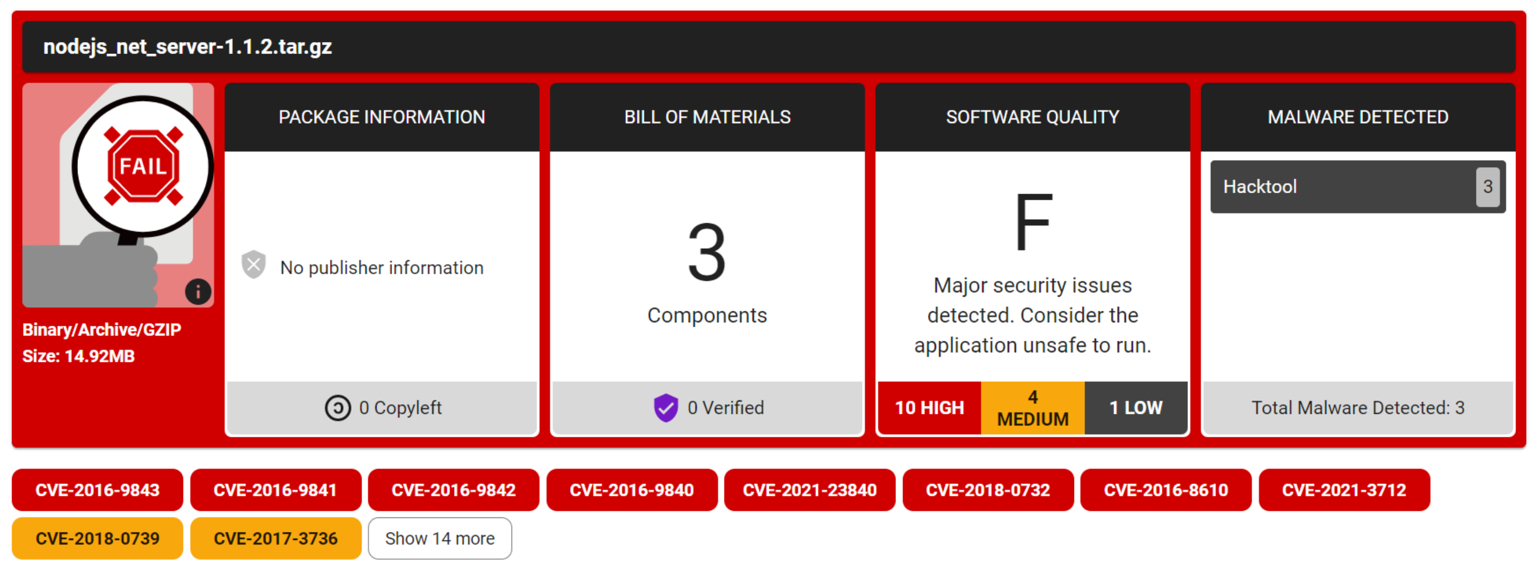
Demo - Trustworthy behaviors

nodejs_net_server-1.1.2.tar.gz



nodejs_net_server-1.1.2.tar.gz

Binary/Archive/GZIP
Size: 14.92MB

PACKAGE INFORMATION

No publisher information

0 Copyleft

BILL OF MATERIALS

3
Components

0 Verified

SOFTWARE QUALITY

F
Major security issues detected. Consider the application unsafe to run.

10 HIGH | 4 MEDIUM | 1 LOW

MALWARE DETECTED

Hacktool 3

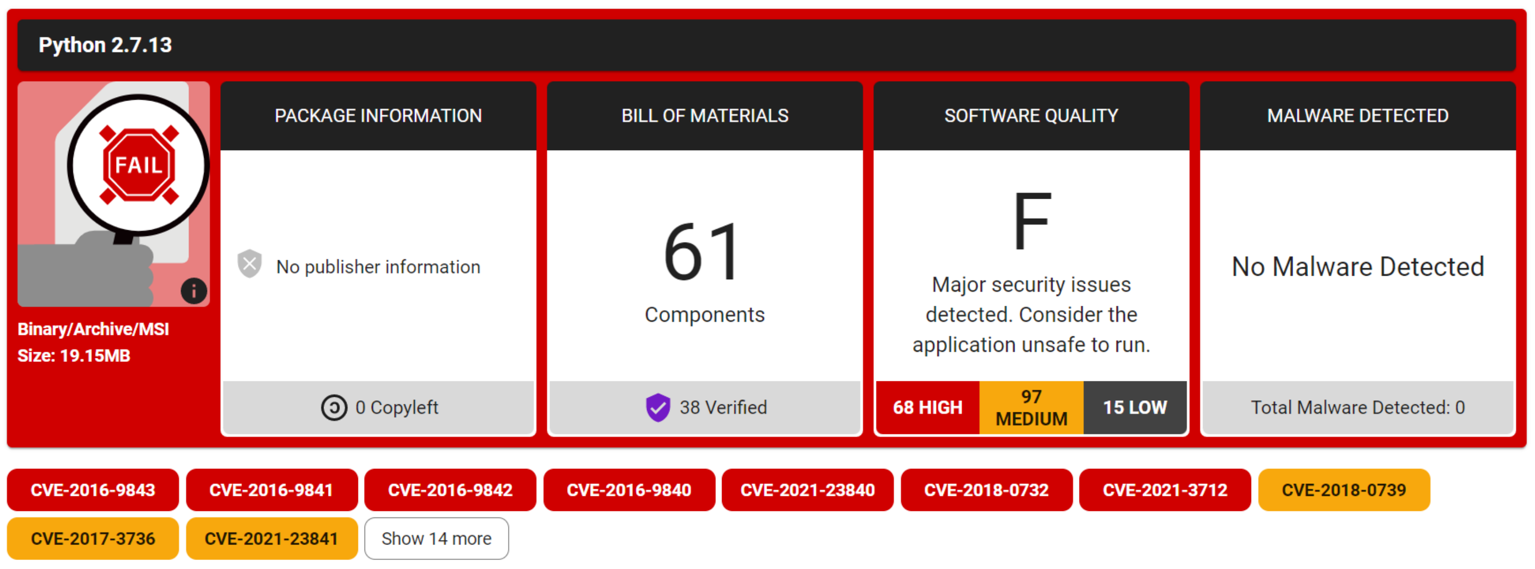
Total Malware Detected: 3

CVE-2016-9843 CVE-2016-9841 CVE-2016-9842 CVE-2016-9840 CVE-2021-23840 CVE-2018-0732 CVE-2016-8610 CVE-2021-3712

CVE-2018-0739 CVE-2017-3736 Show 14 more

Demo - Protected secrets

python-2.7.13.amd64.msi



Python 2.7.13

Binary/Archive/MSI
Size: 19.15MB

PACKAGE INFORMATION	BILL OF MATERIALS	SOFTWARE QUALITY	MALWARE DETECTED
No publisher information	61 Components	F Major security issues detected. Consider the application unsafe to run.	No Malware Detected
0 Copyleft	✓ 38 Verified	68 HIGH · 97 MEDIUM · 15 LOW	Total Malware Detected: 0

CVE-2016-9843 CVE-2016-9841 CVE-2016-9842 CVE-2016-9840 CVE-2021-23840 CVE-2018-0732 CVE-2021-3712 CVE-2018-0739
CVE-2017-3736 CVE-2021-23841 Show 14 more

Publisher Deployment Evolution

Phased Implementation

Software Assurance Managed Service

Initial Package Analysis

- ✓ Analyze key packages
- ✓ Provide reports
- ✓ Review and prioritize issues
- ✓ Evaluate component risks
- ✓ Discuss mitigation strategies
- ✓ Discuss development feedback

Differential Package Analysis

- ✓ Analyze new versions
- ✓ Provide differential reports
- ✓ Identify high-risk changes
- ✓ Evaluate component changes
- ✓ Modify mitigations strategies
- ✓ Modify development feedback

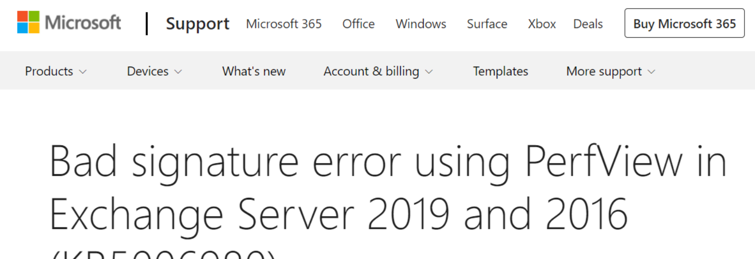
Automation

SA SaaS Integration

- ✓ Automatically analyze new versions
- ✓ Analysis history
- ✓ Re-analysis on emergent threats
- ✓ Alerting on risks

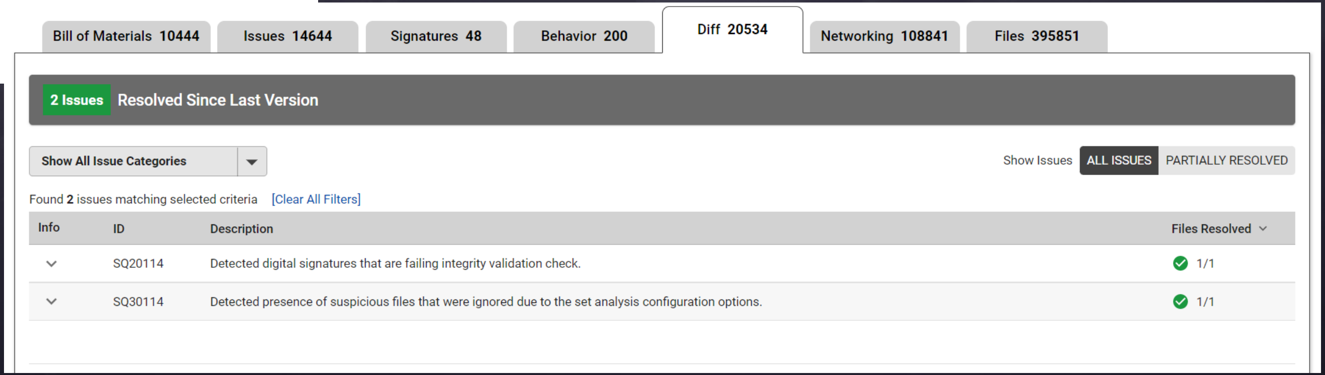
Demo - Differential analysis

ExchangeServer2016-x64-CU22.ISO


Microsoft | Support Microsoft 365 Office Windows Surface Xbox Deals Buy Microsoft 365
Products Devices What's new Account & billing Templates More support

Bad signature error using PerfView in Exchange Server 2019 and 2016 (KB5006980)

Exchange Server 2019, Exchange Server 2016



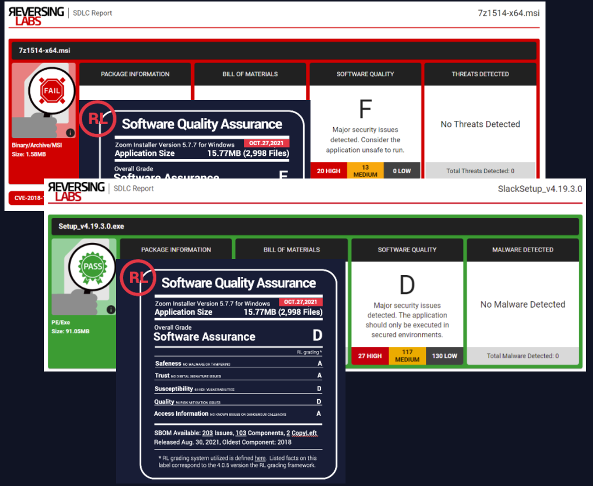
2 Issues Resolved Since Last Version

Found **2** issues matching selected criteria

Info	ID	Description	Files Resolved
	SQ20114	Detected digital signatures that are failing integrity validation check.	✓ 1/1
	SQ30114	Detected presence of suspicious files that were ignored due to the set analysis configuration options.	✓ 1/1

Shoring Software Assurance

MANAGED SERVICE FOR COMMERCIAL SOFTWARE AND OPEN SOURCE



ЯEVERSING LABS | SDLC Report 7z1514-x64.msi

7z1514-x64.msi

FAIL

Binary/Archive/MSI
Size: 1.58MB

CVE-2018-

PACKAGE INFORMATION | BILL OF MATERIALS | SOFTWARE QUALITY | THREATS DETECTED

Software Quality Assurance

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Overall Grade
Software Assurance F

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Total Threats Detected: 0

ЯEVERSING LABS | SDLC Report SlackSetup_v4.19.3.0

Setup_v4.19.3.0.exe

PASS

PE/Exe
Size: 91.05MB

PACKAGE INFORMATION | BILL OF MATERIALS | SOFTWARE QUALITY | MALWARE DETECTED

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Overall Grade
Software Assurance D

RL grading*

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Quality 94 RISK MITIGATION ISSUES	D
Access Information NO KNOWN ISSUES OR DANGEROUS CALLBACKS	A

SBOM Available: 203 Issues, 103 Components, 2 CopyLeft
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27 HIGH 117 MEDIUM 130 LOW

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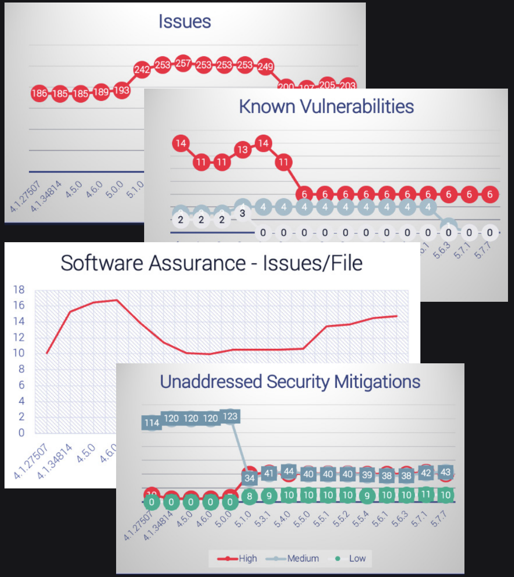
APPLICATION MONITORING MANAGED SERVICE FOR COMMERCIAL SOFTWARE AND OPEN SOURCE



ON-PREMISE SOFTWARE INSPECTION INFRASTRUCTURE

Malware and Software Integrity Inspection for Air-Gapped Networks and On-Premises Deployment

Summary

- Emerging supply chain attacks require a new approach
  - Decompose and analyze deployment image
- Determine software risk
  - Verified components
  - Mitigated vulnerabilities
  - Trustworthy behaviors
  - Protected secrets
  - Differential analysis
- Implement a continuous process for all releases

Questions?

- **Secure.software powered by ReversingLabs**

  https://www.secure.software/

secure.software
POWERED BY REVERSINGLABS

- **SolarWinds - SunBurst: the next level of stealth**

  https://blog.secure.software/sunburst-the-next-level-of-stealth

- **Codecov - It only takes one line of code to ruin your day**

  https://blog.secure.software/it-only-takes-one-line-of-code-to-ruin-your-day

- **Groundhog day: NPM package caught stealing browser passwords**

  https://blog.secure.software/groundhog-day-npm-package-caught-stealing-browser-passwords

- **Contact us to schedule a Demo!**

  https://register.reversinglabs.com/demo

GET STARTED

About Carahsoft

Carahsoft Technology Corp. is a trusted government IT solutions provider. The company combines technological expertise with a thorough understanding of the government procurement process to help Federal, State and Local Government agencies select and implement the best solution at the best possible value.

Need a government buying vehicle?

Carahsoft holds numerous contracts on behalf of ReversingLabs which makes the buying process easy.

For a list of Federal, State and Local buying vehicles see the Carahsoft site here.

For more information on ReversingLabs solutions, contact:

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REVERSINGLABS

Thank you

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reversinglabs.com