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Czarny et al.

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(54) **COMPUTER SECURITY VULNERABILITY ASSESSMENT**

(71) Applicant: **OPSWAT, Inc.**, San Francisco, CA (US)

(72) Inventors: **Benjamin Czarny**, San Francisco, CA (US); **Jianpeng Mo**, Burlingame, CA (US); **Ali Rezafard**, Millbrae, CA (US); **David Matthew Patt**, Kansas City, MO (US)

(73) Assignee: **OPSWAT, Inc.**, San Francisco, CA (US)

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H04L 29/06 (2006.01)
G06F 17/30 (2006.01)
G06F 21/57 (2013.01)

(52) **U.S. Cl.**
CPC ***H04L 63/1433*** (2013.01); ***G06F 17/30289*** (2013.01); ***G06F 21/577*** (2013.01); ***H04L 63/1425*** (2013.01)

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CPC H04L 63/1433; H04L 63/1425; H04L 29/06904; G06F 21/577; G06F 17/30289
USPC 726/25
See application file for complete search history.

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Primary Examiner — Hadi Armouche
Assistant Examiner — Shahriar Zarrineh
(74) *Attorney, Agent, or Firm* — The Mueller Law Office, P.C.

(57) **ABSTRACT**

Computer security vulnerability assessment is performed with product binary data and product vulnerability data that correspond with product identification data. A correspondence between the product binary data and the product vulnerability data is determined, and a binaries-to-vulnerabilities database is generated. The binaries-to-vulnerabilities database is used to scan binary data from a target device to find matches with the product binary data. A known security vulnerability of the target device is determined based on the scanning and the correspondence between the product binary data and the vulnerability data. In some embodiments, the target device is powered off and used as an external storage device to receive the binary data therefrom.

10 Claims, 8 Drawing Sheets

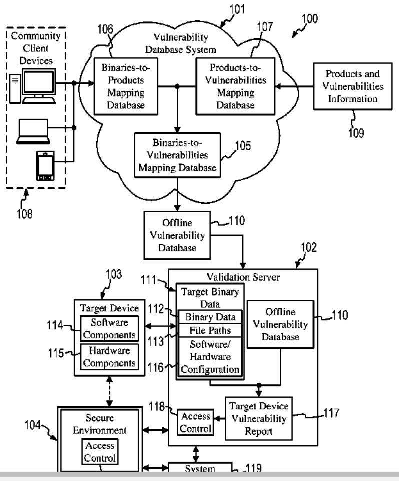
100
101
Vulnerability Database System
106
107
Community Client Devices
Binaries-to-Products Mapping Database
Products-to-Vulnerabilities Mapping Database
Products and Vulnerabilities Information
109
Binaries-to-Vulnerabilities Mapping Database
105
108
Offline Vulnerability Database
110
102
Validation Server
103
111
Target Binary Data
112
Binary Data
File Paths
113
Software/ Hardware Configuration
116
Offline Vulnerability Database
110
Target Device
Software Components
114
Hardware Components
115
118
Access Control
Target Device Vulnerability Report
117
104
Secure Environment
Access Control
System
119

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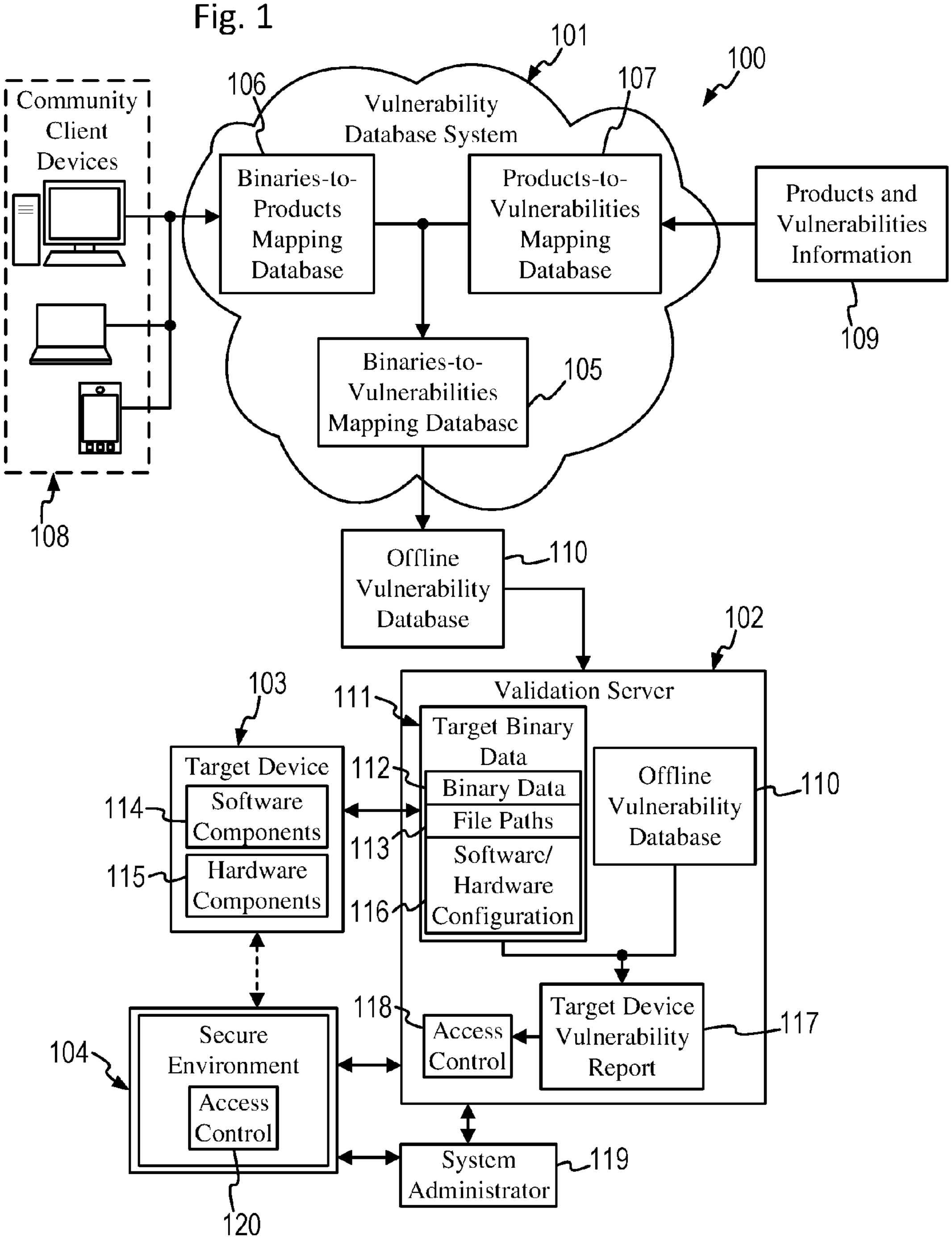
Fig. 1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Offline Vulnerability Database
110
118
Access Control
Target Device Vulnerability Report
117
104
Secure Environment
Access Control
System Administrator
119
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Fig. 2

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Product	Version	Binary Files
ESET Endpoint Security	5.0.2214.4	Exe1_sha256, Exe2_sha256, Dll3_sha256, ...
ESET Endpoint Security	5.0.1055.2	Exe1_sha256, Exe4_sha256, Dll5_sha256, ...
ESET Endpoint Security	4.2.3330.1	Exe1_sha256, Exe2_sha256, Dll5_sha256, ...
ESET Endpoint Security	4.0.1211.2	Dll3_sha256, Dll5_sha256, Exe1_sha256, ...
JAVA	7.11	Dll9_sha256, Dll12_sha256, Dll13_sha256, ...
…	…	…

Fig. 3

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Product	Version	Known Vulnerabilities
ESET Endpoint Security	5.0.2214.4	Vulner_1, Vulner_2, Vulner_3, Vulner_4, ...
ESET Endpoint Security	5.0.1055.2	Vulner_1, Vulner_2, Vulner_5, Vulner_6, ...
ESET Endpoint Security	4.2.4230.1	Vulner_1, Vulner_2, Vulner_7, Vulner_8, ...
ESET Endpoint Security	4.0.1211.2	Vulner_1, Vulner_2, Vulner_3, Vulner_6, ...
Adobe Flash	3.0.5	Vulner_2, Vulner_9, Vulner_10, …
…	…	…

Fig. 4

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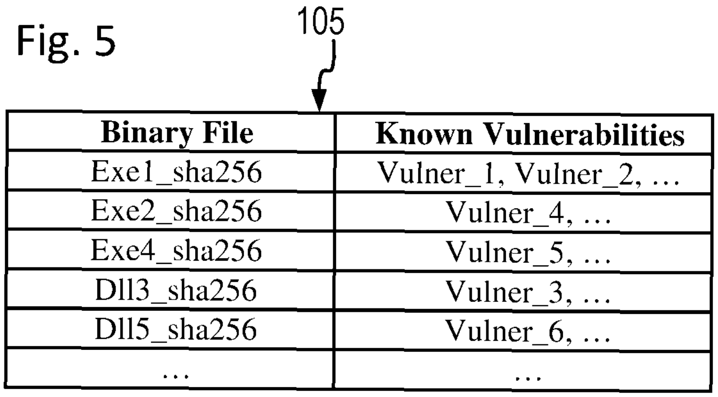
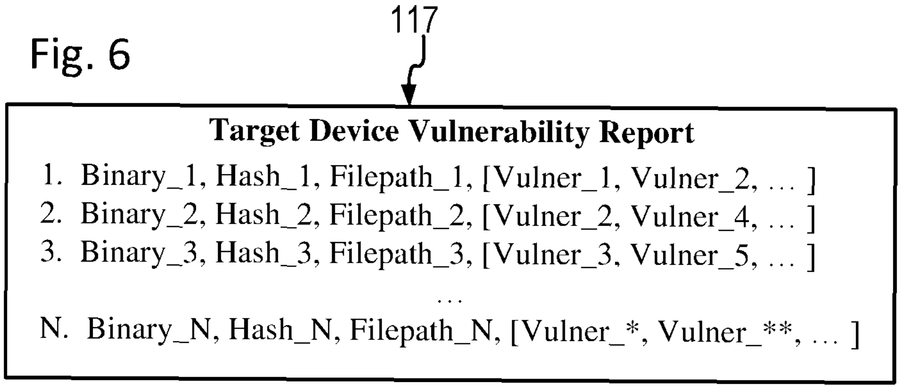
Product	Version	Binary Files	Known Vulnerabilities
ESET Endpoint Security	5.0.2214.4	Exe1_sha256, Exe2_sha256, Dll3_sha256, ...	Vulner_1, Vulner_2, Vulner_3, Vulner_4, ...
ESET Endpoint Security	5.0.1055.2	Exe1_sha256, Exe4_sha256, Dll5_sha256, ...	Vulner_1, Vulner_2, Vulner_5, Vulner_6, ...
ESET Endpoint Security	4.2.3330.1	Exe1_sha256, Exe2_sha256, Dll5_sha256, ...	Vulner_1, Vulner_2, Vulner_4, Vulner_6, ...
ESET Endpoint Security	4.0.1211.2	Dll3_sha256, Dll5_sha256, Exe1_sha256, ...	Vulner_1, Vulner_2, Vulner_3, Vulner_6, ...
JAVA	7.11	Dll9_sha256, Dll12_sha256, Dll13_sha256, ...	
Adobe Flash	3.0.5		Vulner_2, Vulner_9, Vulner_10, …
…	…	…	…

Fig. 5



Binary File	Known Vulnerabilities
Exe1_sha256	Vulner_1, Vulner_2, …
Exe2_sha256	Vulner_4, …
Exe4_sha256	Vulner_5, …
Dll3_sha256	Vulner_3, …
Dll5_sha256	Vulner_6, …
…	…

Fig. 6



Target Device Vulnerability Report

1. Binary_1, Hash_1, Filepath_1, [Vulner_1, Vulner_2, …]
2. Binary_2, Hash_2, Filepath_2, [Vulner_2, Vulner_4, …]
3. Binary_3, Hash_3, Filepath_3, [Vulner_3, Vulner_5, …]

…

N. Binary_N, Hash_N, Filepath_N, [Vulner_*, Vulner_**, …]

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