

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT7550199

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| <b>SUBMISSION TYPE:</b>   | NEW ASSIGNMENT                    |
| <b>NATURE OF CONVEYANCE:</b>  | ASSIGNMENT                        |
| <b>SEQUENCE:</b>  | 2                                 |
| <b>CONVEYING PARTY DATA</b>   |                                   |
| <b>Name</b>   | <b>Execution Date</b>             |
| MANDIANT, INC.  | 10/08/2021                        |
| <b>RECEIVING PARTY DATA</b>   |                                   |
| <b>Name:</b>  | FIREEYE SECURITY HOLDINGS US LLC  |
| <b>Street Address:</b>  | 601 MCCARTHY BLVD.                |
| <b>City:</b>  | MILPITAS                          |
| <b>State/Country:</b>   | CALIFORNIA                        |
| <b>Postal Code:</b>   | 95035                             |
| <b>PROPERTY NUMBERS Total: 1</b>  |                                   |
| <b>Property Type</b>  | <b>Number</b>                     |
| <b>Application Number:</b>  | 17157968                          |
| <b>CORRESPONDENCE DATA</b>  |                                   |
| <b>Fax Number:</b>  | (714)546-9035                     |
| <i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i> |                                   |
| <b>Phone:</b>   | 7146415100                        |
| <b>Email:</b>   | jngo@rutan.com                    |
| <b>Correspondent Name:</b>  | RUTAN & TUCKER, LLP               |
| <b>Address Line 1:</b>  | 18575 JAMBOREE ROAD, 9TH FLOOR    |
| <b>Address Line 4:</b>  | IRVINE, CALIFORNIA 92612          |
| <b>ATTORNEY DOCKET NUMBER:</b>  | P01-2073 102407.0133P2            |
| <b>NAME OF SUBMITTER:</b>   | WILLIAM W. SCHAAL, REG. NO. 39018 |
| <b>SIGNATURE:</b>   | /William W. Schaal/               |
| <b>DATE SIGNED:</b>   | 09/21/2022                        |
| <b>Total Attachments: 24</b>  |                                   |
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**PATENT ASSIGNMENT**

THIS PATENT ASSIGNMENT (this “**Assignment**”), dated as of October 8, 2021 (“**Effective Date**”), is entered into by and between Mandiant, Inc. (f/k/a FireEye, Inc.), a Delaware corporation (“**Assignor**”), and FireEye Security Holdings US LLC, a Delaware limited liability company and wholly owned subsidiary of Magenta Buyer LLC (“**Assignee**”).

**RECITALS**

A. Assignor is the sole owner of the patents and patent applications set forth on **Schedule A** attached hereto (the “**Listed Patents**”); and

B. Assignor and Assignee, as assignee of Polaris Buyer LLC, have entered into an Asset Purchase Agreement, dated as of May 29, 2021 (the “**Purchase Agreement**”), pursuant to which Assignor has agreed to assign, sell and transfer the Transferred Patents (as defined in the Purchase Agreement), including but not limited to each of the Listed Patents unto Assignee.

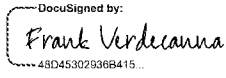
NOW, THEREFORE, for good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, subject to the terms of the Purchase Agreement, Assignor does hereby assign, sell and transfer unto Assignee, Assignor’s ownership of the Transferred Patents, including but not limited to the Listed Patents, including, without limitation, (i) any United States, international and foreign counterparts or equivalents of any of the foregoing, applications or certificates of invention based upon or covering any portion of any of the foregoing, (ii) any reissues, divisionals, renewals, extensions, provisionals, continuations, continuations-in-part, reexaminations, substitutions or revisions of any of the foregoing, (iii) any other patents, applications or extensions that claim priority to or through any of the foregoing, and (iv) the rights to enforce, and recover and retain any damages or obtain equitable relief for or collect license fees and/or royalties, for the past, ongoing, or future infringement, misappropriation, or use of any of the foregoing. Assignor does further consent to the recordation of this Assignment with any governmental agency.

*[Remainder of page intentionally left blank]*

**IN WITNESS WHEREOF**, this Assignment has been duly executed and delivered by a duly authorized representative of each of the parties as of the Effective Date.

**ASSIGNOR**

**MANDIANT, INC.**

By:  \_\_\_\_\_  
DocuSigned by:  
Frank Verdecanna  
48D453029368415...


Name: Frank Verdecanna

Title: EVP and Chief Financial Officer

[Signature Page to Patent Assignment]

ASSIGNEE

FIREEYE SECURITY HOLDINGS US LLC

By:   
Name: Marc Bala  
Title: Secretary

## Schedule A

### UNITED STATES

| FireEye Docket No. | Title  | Filing Date | All Inventors   | Prosecution Status | Appl/Pat # | Google Patents  |
|--------------------|--|-------------|---|--------------------|------------|---|
| P01-1001           | System and method of detecting computer worms  | 3/31/2005   | Ashar Aziz  | ISSUED             | 8528086    | <a href="https://patents.google.com/patent/US8528086">https://patents.google.com/patent/US8528086</a> |
| P01-1002           | System and Method of Containing Computer Worms   | 6/13/2005   | Ashar Aziz  | ISSUED             | 8549638    | <a href="https://patents.google.com/patent/US8549638">https://patents.google.com/patent/US8549638</a> |
| P01-1003           | Computer Worm Defense System and Method  | 6/13/2005   | Ashar Aziz  | ISSUED             | 8006305    | <a href="https://patents.google.com/patent/US8006305">https://patents.google.com/patent/US8006305</a> |
| P01-1004           | Dynamic Signature Creation and Enforcement   | 7/28/2006   | Ashar Aziz; Jayaraman Manni; Ramesh Radhakrishnan; Wei-Lung Lai                     | ISSUED             | 8375444    | <a href="https://patents.google.com/patent/US8375444">https://patents.google.com/patent/US8375444</a> |
| P01-1005           | Virtual Machine with Dynamic Data Flow Analysis  | 6/19/2006   | Ashar Aziz; Osman Ismael; Ramesh Radhakrishnan                                      | ISSUED             | 8584239    | <a href="https://patents.google.com/patent/US8584239">https://patents.google.com/patent/US8584239</a> |
| P01-1006           | Heuristic Based Capture with Replay to Virtual Machine                                   | 4/20/2006   | Adrian Drzewiecki; Ashar Aziz; Jayaraman Manni; Muhammad Amin; Ramesh Radhakrishnan | ISSUED             | 8171553    | <a href="https://patents.google.com/patent/US8171553">https://patents.google.com/patent/US8171553</a> |
| P01-1007           | Malware Containment on Connection  | 3/12/2007   | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai   | ISSUED             | 8566946    | <a href="https://patents.google.com/patent/US8566946">https://patents.google.com/patent/US8566946</a> |
| P01-1008           | Malware Containment and Security Analysis on Connection                                  | 3/12/2007   | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai   | ISSUED             | 8539582    | <a href="https://patents.google.com/patent/US8539582">https://patents.google.com/patent/US8539582</a> |
| P01-1009           | Systems and Methods for Malware Attack Prevention  | 3/12/2007   | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai   | ISSUED             | 8898788    | <a href="https://patents.google.com/patent/US8898788">https://patents.google.com/patent/US8898788</a> |
| P01-1010           | Systems and Methods for Malware Attack Detection and Identification                      | 3/12/2007   | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai   | ISSUED             | 8881282    | <a href="https://patents.google.com/patent/US8881282">https://patents.google.com/patent/US8881282</a> |
| P01-1011           | Systems and Methods for Detecting Encrypted Bot Command & Control Communication Channels | 11/30/2007  | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai   | ISSUED             | 8204984    | <a href="https://patents.google.com/patent/US8204984">https://patents.google.com/patent/US8204984</a> |
| P01-1012           | Systems and Methods for Detecting Communication Channels of Bots                         | 11/30/2007  | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai   | ISSUED             | 8561177    | <a href="https://patents.google.com/patent/US8561177">https://patents.google.com/patent/US8561177</a> |
| P01-1013           | Prospective Client Identification Using Malware Attack Detection                         | 2/21/2007   | Ashar Aziz  | ISSUED             | 9027135    | <a href="https://patents.google.com/patent/US9027135">https://patents.google.com/patent/US9027135</a> |
| P01-1014           | Systems and Methods for Detecting Malicious Network Content                              | 11/3/2008   | Ashar Aziz; Stuart Gresley Staniford  | ISSUED             | 8850571    | <a href="https://patents.google.com/patent/US8850571">https://patents.google.com/patent/US8850571</a> |
| P01-1015           | Detecting Malicious Network Content Using Virtual Environment Components                 | 1/23/2009   | Bahman Mahbod; Jayaraman Manni; Muhammad Amin; Osman Ismael; Samuel Yie             | ISSUED             | 8793787    | <a href="https://patents.google.com/patent/US8793787">https://patents.google.com/patent/US8793787</a> |
| P01-1016           | Network-Based Binary File Extraction and Analysis for Malware Detection                  | 9/30/2009   | Ashar Aziz; Fengmin Gong; Jayaraman Manni; Muhammad Amin; Upendran Loganathan       | ISSUED             | 8832829    | <a href="https://patents.google.com/patent/US8832829">https://patents.google.com/patent/US8832829</a> |
| P01-1017           | Electronic Message Analysis for Malware Detection  | 4/18/2011   | Ashar Aziz; Henry Uyeno; Jayaraman Manni; Muhammad Amin; Stuart Gresley Staniford   | ISSUED             | 9106694    | <a href="https://patents.google.com/patent/US9106694">https://patents.google.com/patent/US9106694</a> |

| FireEye Docket No. | Title   | Filing Date | All Inventors  | Prosecution Status | Appl. Pat. # | Google Patents  |
|--------------------|---|-------------|--|--------------------|--------------|---|
| P01-1018           | Systems and Methods for Detecting Malicious PDF Network Content   | 1/21/2011   | Ashar Aziz; Stuart Gresley Staniford   | ISSUED             | 8997219      | <a href="https://patents.google.com/patent/US8997219">https://patents.google.com/patent/US8997219</a> |
| P01-1019           | Detecting Malicious Network Content   | 2/24/2012   | Ashar Aziz; Stuart Gresley Staniford; Muhammad Amin; Henry Uyeno; Samuel Yie                 | ISSUED             | 9519782      | <a href="https://patents.google.com/patent/US9519782">https://patents.google.com/patent/US9519782</a> |
| P01-1020           | Policy Based Capture with Replay to Virtual Machine   | 3/16/2012   | Ashar Aziz; Stuart Gresley Staniford; Ramesh Radhakrishnan; Muhammad Amin; Adrian Drzewiecki | ISSUED             | 8291499      | <a href="https://patents.google.com/patent/US8291499">https://patents.google.com/patent/US8291499</a> |
| P01-1021           | Network-based binary file extraction and analysis for malware detection   | 1/13/2012   | Ashar Aziz; Fengmin Gong; Jayaraman Manni; Muhammad Amin; Upendran Loganathan                | ISSUED             | 8935779      | <a href="https://patents.google.com/patent/US8935779">https://patents.google.com/patent/US8935779</a> |
| P01-1022           | Systems and Methods for Detecting Malicious PDF Network Content   | 5/10/2012   | Stuart Gresley Staniford; Ashar Aziz   | ISSUED             | 9118715      | <a href="https://patents.google.com/patent/US9118715">https://patents.google.com/patent/US9118715</a> |
| P01-1023           | Malware Defense System and Method   | 9/27/2012   | Ashar Aziz   | ISSUED             | 8689333      | <a href="https://patents.google.com/patent/US8689333">https://patents.google.com/patent/US8689333</a> |
| P01-1024           | Systems and Methods for Computer Worm Defense   | 10/12/2012  | Ashar Aziz   | ISSUED             | 8516593      | <a href="https://patents.google.com/patent/US8516593">https://patents.google.com/patent/US8516593</a> |
| P01-1025           | Systems and methods for automatically detecting backdoors   | 2/23/2013   | Abhishek Singh; Jayaraman Manni  | ISSUED             | 8990944      | <a href="https://patents.google.com/patent/US8990944">https://patents.google.com/patent/US8990944</a> |
| P01-1031           | System and Method for Detecting Exfiltration Content  | 3/13/2013   | Darien Kindlund; James Bennett; Julia Wolf   | ISSUED             | 9565202      | <a href="https://patents.google.com/patent/US9565202">https://patents.google.com/patent/US9565202</a> |
| P01-1033           | Detecting bootkits resident on compromised computers  | 3/15/2013   | Abhishek Singh; Michael Vincent; Muhammad Amin; Zheng Bu                                     | ISSUED             | 9251343      | <a href="https://patents.google.com/patent/US9251343">https://patents.google.com/patent/US9251343</a> |
| P01-1035           | Optimized Resource Allocation for Virtual Machines Within a Malware Content Detection System  | 5/10/2013   | Osman Ismael   | ISSUED             | 9495180      | <a href="https://patents.google.com/patent/US9495180">https://patents.google.com/patent/US9495180</a> |
| P01-1036           | Systems, Apparatus and Method for Using Malware Analysis Results to Drive Adaptive Instrumentation of Virtual Machines to Improve Exploit Detection | 9/30/2013   | Osman Ismael   | ISSUED             | 9736179      | <a href="https://patents.google.com/patent/US9736179">https://patents.google.com/patent/US9736179</a> |
| P01-1038.02        | Injection of Content Processing Delay in an Endpoint  | 11/2/2015   | Ashar Aziz; Osman Ismael   | ISSUED             | 9912681      | <a href="https://patents.google.com/patent/US9912681">https://patents.google.com/patent/US9912681</a> |
| P01-1039.02        | System and method for IPS and VM-based detection of suspicious objects  | 3/27/2014   | Ashar Aziz; Muhammad Amin; Zheng Bu  | ISSUED             | 9756074      | <a href="https://patents.google.com/patent/US9756074">https://patents.google.com/patent/US9756074</a> |
| P01-1043           | Framework for multi-phase analysis of mobile applications   | 2/23/2013   | Ashar Aziz; Osman Ismael   | ISSUED             | 9009822      | <a href="https://patents.google.com/patent/US9009822">https://patents.google.com/patent/US9009822</a> |
| P01-1044           | Framework For Efficient Security Coverage Of Mobile Software Applications   | 2/23/2013   | Ashar Aziz; Osman Ismael; Hui Xue; Dawn Song; Noah Johnson; Prashanth Mohan                  | ISSUED             | 9176843      | <a href="https://patents.google.com/patent/US9176843">https://patents.google.com/patent/US9176843</a> |
| P01-1045           | Framework For Efficient Security Coverage Of Mobile Software Applications Installed On Mobile Devices   | 2/23/2013   | Osman Ismael; Dawn Song  | ISSUED             | 9009823      | <a href="https://patents.google.com/patent/US9009823">https://patents.google.com/patent/US9009823</a> |

| FireEye Docket No. | Title   | Filing Date | All Inventors   | Prosecution Status | Appl. Pat. # | Google Patents  |
|--------------------|---|-------------|---|--------------------|--------------|---|
| P01-1047           | Framework for Computer Application Analysis of Sensitive Information Tracking   | 2/23/2013   | Osman Ismael; Dawn Song; Phung-Te Ha; Peter Gilbert; Hui Xue                    | ISSUED             | 9159035      | <a href="https://patents.google.com/patent/US9159035">https://patents.google.com/patent/US9159035</a>   |
| P01-1048           | Framework For Efficient Security Coverage Of Mobile Software Applications Using Symbolic Execution To Reach Regions of Interest Within an Application                   | 2/23/2013   | Ashar Aziz; Osman Ismael; Dawn Song; Hui Xue                                    | ISSUED             | 9367681      | <a href="https://patents.google.com/patent/US9367681">https://patents.google.com/patent/US9367681</a>   |
| P01-1049           | Framework For Efficient Security Coverage Of Mobile Software Applications That Is Usable To Harden In The Field Code  | 2/23/2013   | Ashar Aziz; Osman Ismael  | ISSUED             | 9824209      | <a href="https://patents.google.com/patent/US9824209">https://patents.google.com/patent/US9824209</a>   |
| P01-1055           | Malicious Content Analysis Using Simulated User Interaction Without User Involvement  | 3/13/2013   | Alex Pilipenko; Darien Kindlund; Emmamel Thieux; Michael Vincent; Muhammad Amin | ISSUED             | 9104867      | <a href="https://patents.google.com/patent/US9104867">https://patents.google.com/patent/US9104867</a>   |
| P01-1056           | File Extraction from Memory Dump for Malicious Content Analysis   | 3/13/2013   | Emmanuel Thieux; Muhammad Amin; Osman Ismael                                    | ISSUED             | 9355247      | <a href="https://patents.google.com/patent/US9355247">https://patents.google.com/patent/US9355247</a>   |
| P01-1061           | Distributed Systems and Methods for Automatically Detecting Unknown Bot and Botnets   | 3/14/2013   | Ali Islam; Ashar Aziz; Atif Mushtaq; Todd Rosenberry                            | ISSUED             | 9430646      | <a href="https://patents.google.com/patent/US9430646">https://patents.google.com/patent/US9430646</a>   |
| P01-1063           | Correlation and Consolidation of Analytic Data for Holistic View of a Malware Attack  | 3/14/2013   | Jayaraman Manni; Michael Berrow; Philip Eun                                     | ISSUED             | 9311479      | <a href="https://patents.google.com/patent/US9311479">https://patents.google.com/patent/US9311479</a>   |
| P01-1065           | Malicious Content Analysis with Multi-Version Application Support within Single Operating Environment   | 3/13/2013   | Emily Jing; Muhammad Amin; Yasir Khalid; Muhammad Rizwan                        | ISSUED             | 9626509      | <a href="https://patents.google.com/patent/US9626509">https://patents.google.com/patent/US9626509</a>   |
| P01-1066.03        | Detecting Delayed Activation Malware Using a Run-time monitoring Agent and Time-Dilation Logic  | 6/29/2016   | Michael Vincent   | ISSUED             | 10817606     | <a href="https://patents.google.com/patent/US10817606">https://patents.google.com/patent/US10817606</a> |
| P01-1067           | User Interface with Real-Time Visual Playback Along with Synchronous Textual Analysis Log Display and Event/Time Index for Anomalous Behavior Detection in Applications | 2/23/2013   | Adrian Mettler; Ashar Aziz; Harnish Goradia; Noah Johnson; Osman Ismael         | ISSUED             | 9195829      | <a href="https://patents.google.com/patent/US9195829">https://patents.google.com/patent/US9195829</a>   |
| P01-1069           | Page Replacement Code Injection   | 9/30/2013   | Osman Ismael; Phung-Te Ha; Seva Tonkonoh  | ISSUED             | 10089461     | <a href="https://patents.google.com/patent/US10089461">https://patents.google.com/patent/US10089461</a> |
| P01-1070.02        | System and Method for Detecting Malicious Links in Electronic Messages  | 7/18/2013   | Henry Uyeno; Vinay Pidathala  | ISSUED             | 9300686      | <a href="https://patents.google.com/patent/US9300686">https://patents.google.com/patent/US9300686</a>   |
| P01-1071           | System and Method for Network Behavior Detection  | 3/20/2014   | James Bennett; Zheng Bu   | ISSUED             | 9241010      | <a href="https://patents.google.com/patent/US9241010">https://patents.google.com/patent/US9241010</a>   |
| P01-1076           | Zero-Day Discovery System   | 6/24/2013   | Yichong Lin; Zheng Bu   | ISSUED             | 10133863     | <a href="https://patents.google.com/patent/US10133863">https://patents.google.com/patent/US10133863</a> |
| P01-1080           | System and Method for Detecting Phishing Using Password Prediction  | 6/28/2013   | Angshuman Mukherjee; Henry Uyeno; Mohan Samuelraj; Muhammad Amin                | ISSUED             | 9888016      | <a href="https://patents.google.com/patent/US9888016">https://patents.google.com/patent/US9888016</a>   |
| P01-1086           | System and Method for Detecting Time-Bomb Malware   | 6/24/2013   | Darien Kindlund; Michael Vincent; Sai Vashisht; Sushant Paithane                | ISSUED             | 9536091      | <a href="https://patents.google.com/patent/US9536091">https://patents.google.com/patent/US9536091</a>   |
| P01-1087           | Classifying Sets of Malicious Indicators for Detecting Command and Control  | 5/13/2013   | Ali Islam; Zheng Bu   | ISSUED             | 9635039      | <a href="https://patents.google.com/patent/US9635039">https://patents.google.com/patent/US9635039</a>   |



| FireEye Docket No. | Title  | Filing Date | All Inventors  | Prosecution Status | Appl. Pat. # | Google Patents  |
|--------------------|--|-------------|--|--------------------|--------------|---|
|                    | Communications Associated with Malware   |             |  |                    |              |   |
| P01-1088           | Fuzzy Hash of Behavioral Results   | 9/30/2013   | Ali Mesdaq; Paul Westin  | ISSUED             | 9294501      | <a href="https://patents.google.com/patent/US9294501">https://patents.google.com/patent/US9294501</a>   |
| P01-1089           | Dynamically Adaptive Framework and Method for Classifying Malware Using Intelligent Static, Emulation and Dynamic Analyses | 9/30/2013   | Michael Vincent; Ali Mesdaq; Emmanuel Thioux; Abhishek Singh; Sai Vashisht | ISSUED             | 9171160      | <a href="https://patents.google.com/patent/US9171160">https://patents.google.com/patent/US9171160</a>   |
| P01-1091           | Systems and methods for scheduling analysis of network content for malware   | 6/24/2013   | Ashar Aziz; Stuart Gresley Staniford                                       | ISSUED             | 8990939      | <a href="https://patents.google.com/patent/US8990939">https://patents.google.com/patent/US8990939</a>   |
| P01-1092           | System and Method of Detecting Time-Delayed Malicious Traffic  | 6/28/2013   | Ashar Aziz   | ISSUED             | 8635696      | <a href="https://patents.google.com/patent/US8635696">https://patents.google.com/patent/US8635696</a>   |
| P01-1093           | System and Method for Detecting Malicious Traffic Using a Virtual Machine Configured with a Select Software Environment    | 6/28/2013   | Ashar Aziz   | ISSUED             | 9356944      | <a href="https://patents.google.com/patent/US9356944">https://patents.google.com/patent/US9356944</a>   |
| P01-1096           | Threat-Aware Microvisor  | 3/28/2014   | Ashar Aziz; Osman Ismael   | ISSUED             | 9740857      | <a href="https://patents.google.com/patent/US9740857">https://patents.google.com/patent/US9740857</a>   |
| P01-1097           | Micro-Virtualization Architecture for Threat-Aware Microvisor Deployment in a Node of a Network Environment                | 3/28/2014   | Ashar Aziz; Osman Ismael   | ISSUED             | 9292686      | <a href="https://patents.google.com/patent/US9292686">https://patents.google.com/patent/US9292686</a>   |
| P01-1099           | Secure Communications Between Peers Using a Verified Virtual Trusted Platform Module                                       | 9/9/2016    | Osman Ismael; Hendrik Tews   | ISSUED             | 10592678     | <a href="https://patents.google.com/patent/US10592678">https://patents.google.com/patent/US10592678</a> |
| P01-1100.02        | Technique for Verifying Exploit/Malware at Malware Detection Appliance Through Correlation with Endpoints                  | 9/7/2016    | Ashar Aziz; Osman Ismael   | ISSUED             | 10826933     | <a href="https://patents.google.com/patent/US10826933">https://patents.google.com/patent/US10826933</a> |
| P01-1102           | System and Method for Detecting Malicious Traffic while Reducing False Positives   | 8/28/2013   | Ashar Aziz   | ISSUED             | 8776229      | <a href="https://patents.google.com/patent/US8776229">https://patents.google.com/patent/US8776229</a>   |
| P01-1105           | System, Apparatus and Method For Classifying a File as Malicious Using Static Scanning                                     | 9/30/2013   | Abhishek Singh; Angshuman Mukherjee; Muhammad Amin; Yichong Lin; Zheng Bu  | ISSUED             | 10192052     | <a href="https://patents.google.com/patent/US10192052">https://patents.google.com/patent/US10192052</a> |
| P01-1107           | Advanced Persistent Threat (APT) Detection Center  | 9/30/2013   | Thoufique Haq; Vinay Pidathala; Jinjian Zhai                               | ISSUED             | 9628507      | <a href="https://patents.google.com/patent/US9628507">https://patents.google.com/patent/US9628507</a>   |
| P01-1110.02        | System and Method for Run-time Object Classification   | 3/27/2014   | Ashar Aziz; Vinay Pidathala; Zheng Bu                                      | ISSUED             | 9747446      | <a href="https://patents.google.com/patent/US9747446">https://patents.google.com/patent/US9747446</a>   |
| P01-1111           | Multistage System and Method for Analyzing Obfuscated Content for Malware  | 7/1/2014    | Abhishek Singh; Amit Malik; Shivani Deshpande; Wei Zheng                   | ISSUED             | 9690936      | <a href="https://patents.google.com/patent/US9690936">https://patents.google.com/patent/US9690936</a>   |
| P01-1112           | Detection efficacy of virtual machine-based analysis with application specific events                                      | 2/5/2014    | Sai Vashisht; Sushant Paithane   | ISSUED             | 9262635      | <a href="https://patents.google.com/patent/US9262635">https://patents.google.com/patent/US9262635</a>   |
| P01-1113           | Dynamically Remote Tuning of a Malware Content Detection System  | 3/31/2014   | Darien Kindlund; Emmanuel Thioux; Michael Vincent; Sai Vashisht            | ISSUED             | 9223972      | <a href="https://patents.google.com/patent/US9223972">https://patents.google.com/patent/US9223972</a>   |
| P01-1115           | Infection Vector and Malware Tracking with an Interactive User Display   | 6/26/2014   | Harnish Goradia  | ISSUED             | 10805340     | <a href="https://patents.google.com/patent/US10805340">https://patents.google.com/patent/US10805340</a> |

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| P01-1116           | Dynamic Guest Image Creation and Rollback  | 3/21/2014   | Harnish Goradia  | ISSUED             | 10242185     | <a href="https://patents.google.com/patent/US10242185">https://patents.google.com/patent/US10242185</a> |
| P01-1117           | System, Apparatus and Method for Conducting on-the-fly Decryption of Encrypted Objects for Malware Detection                 | 11/21/2013  | Ali Islam  | ISSUED             | 9189627      | <a href="https://patents.google.com/patent/US9189627">https://patents.google.com/patent/US9189627</a>   |
| P01-1118.02        | System and Method for Enhanced Security of Storage Devices   | 11/7/2014   | Eric Chan; Gregory J. Snyder; Osman Ismael   | ISSUED             | 9921978      | <a href="https://patents.google.com/patent/US9921978">https://patents.google.com/patent/US9921978</a>   |
| P01-1119           | System, Apparatus and method for Detecting a Malicious Attack Based on Static Analysis of a Multiflow Object                 | 3/31/2014   | Muhammad Amin; Shivani Deshpande; Yasir Khalid   | ISSUED             | 9432389      | <a href="https://patents.google.com/patent/US9432389">https://patents.google.com/patent/US9432389</a>   |
| P01-1120           | Methods and Systems for Unauthorized Activity Defense  | 8/19/2013   | Ashar Aziz   | ISSUED             | 9306960      | <a href="https://patents.google.com/patent/US9306960">https://patents.google.com/patent/US9306960</a>   |
| P01-1121           | System and method of detecting malicious content   | 9/30/2013   | Ashar Aziz   | ISSUED             | 9838416      | <a href="https://patents.google.com/patent/US9838416">https://patents.google.com/patent/US9838416</a>   |
| P01-1132           | System and method for analyzing suspicious network data  | 11/12/2013  | Ashar Aziz; Osman Ismael; Ramesh Radhakrishnan   | ISSUED             | 8984638      | <a href="https://patents.google.com/patent/US8984638">https://patents.google.com/patent/US8984638</a>   |
| P01-1133           | System and Method for Malware Containment  | 10/21/2013  | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai  | ISSUED             | 9071638      | <a href="https://patents.google.com/patent/US9071638">https://patents.google.com/patent/US9071638</a>   |
| P01-1134           | System and Method for Bot Detection  | 10/11/2013  | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai  | ISSUED             | 9628498      | <a href="https://patents.google.com/patent/US9628498">https://patents.google.com/patent/US9628498</a>   |
| P01-1135.02        | Trusted Threat-Aware Microvisor  | 1/21/2015   | Ashar Aziz; Osman Ismael   | ISSUED             | 9680862      | <a href="https://patents.google.com/patent/US9680862">https://patents.google.com/patent/US9680862</a>   |
| P01-1136.02        | Exploit Detection System with Threat-Aware Microvisor  | 3/28/2014   | Ashar Aziz; Osman Ismael   | ISSUED             | 9507935      | <a href="https://patents.google.com/patent/US9507935">https://patents.google.com/patent/US9507935</a>   |
| P01-1137           | System and Method for Offloading Packet Processing and Static Analysis Operations  | 3/28/2014   | Madhusudan Challa; Masood Mehmood; Muhammad Amin; Ramaswamy Ramaswamy; Shrikishna Karandikar | ISSUED             | 9591015      | <a href="https://patents.google.com/patent/US9591015">https://patents.google.com/patent/US9591015</a>   |
| P01-1150           | Intrusion Prevention and Remedy System   | 6/24/2014   | Hatem Eyada  | ISSUED             | 10084813     | <a href="https://patents.google.com/patent/US10084813">https://patents.google.com/patent/US10084813</a> |
| P01-1151           | System and Method for Malware Analysis Using Thread-Level Event Monitoring   | 9/22/2014   | Michael Vincent; Sai Vashisht; Sushant Patihane  | ISSUED             | 10671726     | <a href="https://patents.google.com/patent/US10671726">https://patents.google.com/patent/US10671726</a> |
| P01-1167.02        | Returned Oriented Programming Detection  | 6/20/2014   | Emmanuel Thioux; Michael Vincent   | ISSUED             | 9594912      | <a href="https://patents.google.com/patent/US9594912">https://patents.google.com/patent/US9594912</a>   |
| P01-1168.02        | Computer Exploit Detection Using Heap Spray Pattern Matching   | 6/20/2014   | Emmanuel Thioux; Michael Vincent   | ISSUED             | 9438623      | <a href="https://patents.google.com/patent/US9438623">https://patents.google.com/patent/US9438623</a>   |
| P01-1169.02        | Shellcode Validation   | 6/20/2014   | Emmanuel Thioux  | ISSUED             | 9973531      | <a href="https://patents.google.com/patent/US9973531">https://patents.google.com/patent/US9973531</a>   |
| P01-1170.02        | Verification of Trusted Threat-Aware Microvisor  | 2/6/2015    | Hendrik Tews; Osman Ismael   | ISSUED             | 10002252     | <a href="https://patents.google.com/patent/US10002252">https://patents.google.com/patent/US10002252</a> |
| P01-1172           | Interactive Infection Visualization for Improved Exploit Detection and Signature Generation for Malware and Malware Families | 9/29/2014   | Anil Gupta; Hirendra Rathor; Kaushal Dalal   | ISSUED             | 10027689     | <a href="https://patents.google.com/patent/US10027689">https://patents.google.com/patent/US10027689</a> |

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| P01-1176           | System, Device and Method for Detecting a Malicious Attack Based on Direct Communications Between Remotely Hosted Virtual Machines and Malicious Web Servers | 6/26/2014   | Shrivani Karandikar, Muhammad Amin, Shivani Deshpande, Yasir Khalid  | ISSUED             | 9398028      | <a href="https://patents.google.com/patent/US9398028">https://patents.google.com/patent/US9398028</a>   |
| P01-1177.02        | Distributed Aggregation Technique for Detecting Lateral Movement of Stealthy Cyber-Attacks   | 3/31/2016   | Ashar Aziz   | FILED              | 15/087,476   |   |
| P01-1178           | Determining Duplicate Objects for Malware Using Environmental/Context Information  | 9/30/2014   | Arsen Movsesyan; Alexander Otvagin   | ISSUED             | 9781144      | <a href="https://patents.google.com/patent/US9781144">https://patents.google.com/patent/US9781144</a>   |
| P01-1179           | Modularized Database Architecture Using Vertical Partitioning for a State Machine  | 12/23/2014  | Arsen Movsesyan; Vineet Kumar; Alexander Otvagin   | ISSUED             | 9467460      | <a href="https://patents.google.com/patent/US9467460">https://patents.google.com/patent/US9467460</a>   |
| P01-1182           | Selective System Call Monitoring   | 3/25/2015   | Phung-Te Ha; Wei Xu  | ISSUED             | 9690606      | <a href="https://patents.google.com/patent/US9690606">https://patents.google.com/patent/US9690606</a>   |
| P01-1183           | System and Method of Detecting Delivery of Malware Using Cross-Customer Data   | 8/22/2014   | Alex Rivlin; Divyesh Mehra; Henry Uyeno; Vinay Pidathala   | ISSUED             | 9363280      | <a href="https://patents.google.com/patent/US9363280">https://patents.google.com/patent/US9363280</a>   |
| P01-1189.02        | Storing network bidirectional flow data and metadata with efficient processing technique   | 8/19/2014   | Christopher Hayes Fauerbach; Dennis Lee Edwards; Randy Caldejon  | ISSUED             | 9426071      | <a href="https://patents.google.com/patent/US9426071">https://patents.google.com/patent/US9426071</a>   |
| P01-1190.02        | Efficient Access to Sparse Packets in Large Repositories of Stored Network Traffic   | 2/5/2015    | Christopher Hayes Fauerbach; Dennis Lee Edwards  | ISSUED             | 9537972      | <a href="https://patents.google.com/patent/US9537972">https://patents.google.com/patent/US9537972</a>   |
| P01-1191           | Intelligent Context Aware User Interaction for Malware Detection   | 12/30/2014  | Sai Vashisht; Sushant Paithane; Yasir Khalid   | ISSUED             | 9838417      | <a href="https://patents.google.com/patent/US9838417">https://patents.google.com/patent/US9838417</a>   |
| P01-1193           | System and method for analyzing packets  | 6/30/2014   | Ashar Aziz; Ramesh Radhakrishnan; Osman Ismael   | ISSUED             | 9282109      | <a href="https://patents.google.com/patent/US9282109">https://patents.google.com/patent/US9282109</a>   |
| P01-1196           | Framework For Iterative Analysis of Mobile Software Applications   | 9/24/2014   | Ashar Aziz; Dawn Song; Osman Ismael  | ISSUED             | 9225740      | <a href="https://patents.google.com/patent/US9225740">https://patents.google.com/patent/US9225740</a>   |
| P01-1198           | Verification of Complex Software Code Using Modularized Components   | 9/9/2016    | Osman Ismael; Hendrik Tews; Ashar Aziz   | ISSUED             | 10025691     | <a href="https://patents.google.com/patent/US10025691">https://patents.google.com/patent/US10025691</a> |
| P01-1201           | System and Method for Determining Data Entropy to Identify Malware   | 1/25/2007   | Chad McMillan; Jason Garman  | ISSUED             | 8069484      | <a href="https://patents.google.com/patent/US8069484">https://patents.google.com/patent/US8069484</a>   |
| P01-1202           | System and Method for Data Preservation and Retrieval  | 2/1/2008    | David Merkel; Jason Shiffer; Kevin Mandia; Lois Cozzi; Matthew Frazier                                     | ISSUED             | 7937387      | <a href="https://patents.google.com/patent/US7937387">https://patents.google.com/patent/US7937387</a>   |
| P01-1203           | Method and System for Collaboration During an Event  | 2/1/2008    | David Merkel; Jason Shiffer; Kevin Mandia; Lois Cozzi; Matthew Frazier; Matthew Pepe                       | ISSUED             | 9106630      | <a href="https://patents.google.com/patent/US9106630">https://patents.google.com/patent/US9106630</a>   |
| P01-1204           | Method and system for collecting and organizing data corresponding to an event   | 2/1/2008    | Eric Helvey; James Butler; Jason Shiffer; Matthew Frazier; Peter Villadsen; Scott Hogsten; Sean Cunningham | ISSUED             | 8949257      | <a href="https://patents.google.com/patent/US8949257">https://patents.google.com/patent/US8949257</a>   |
| P01-1205           | Method and System for Analyzing Data Related to an Event   | 2/1/2008    | Eric Helvey; James Butler; Jason Shiffer; Matthew Frazier; Scott Hogsten; Sean Cunningham; Theodore Wilson | ISSUED             | 8566476      | <a href="https://patents.google.com/patent/US8566476">https://patents.google.com/patent/US8566476</a>   |

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| P01-1206           | System and method for forensic identification of elements within a computer system   | 8/1/2008    | James Butler   | ISSUED             | 8881271      | <a href="https://patents.google.com/patent/US8881271">https://patents.google.com/patent/US8881271</a>   |
| P01-1208           | System and Method for Data Preservation and Retrieval  | 3/28/2011   | David Merkel; Jason Shiffer; Kevin Mandia; Matthew Frazier; Matthew Pepe                                   | ISSUED             | 8793278      | <a href="https://patents.google.com/patent/US8793278">https://patents.google.com/patent/US8793278</a>   |
| P01-1209           | System to Bypass a Compromised Mass Storage Device Driver Stack and Methods Thereof  | 3/15/2012   | Aaron LeMasters  | ISSUED             | 9275229      | <a href="https://patents.google.com/patent/US9275229">https://patents.google.com/patent/US9275229</a>   |
| P01-1210           | Physical Memory Forensics System and Method  | 7/27/2012   | James Butler   | ISSUED             | 9268936      | <a href="https://patents.google.com/patent/US9268936">https://patents.google.com/patent/US9268936</a>   |
| P01-1211.02        | System and Method to Create a Number of Breakpoints in a Virtual Machine via Virtual Machine Trapping Events   | 4/24/2013   | Antony Saba; Robert Jung   | ISSUED             | 10572665     | <a href="https://patents.google.com/patent/US10572665">https://patents.google.com/patent/US10572665</a> |
| P01-1212.02        | Identification of Obfuscated Computer Items Using Visual Algorithms  | 8/19/2013   | David Ross; Jason Shiffer  | ISSUED             | 9690935      | <a href="https://patents.google.com/patent/US9690935">https://patents.google.com/patent/US9690935</a>   |
| P01-1213.02        | Timeline Wrinkling System and Method   | 9/24/2013   | David Ross   | ISSUED             | 9633134      | <a href="https://patents.google.com/patent/US9633134">https://patents.google.com/patent/US9633134</a>   |
| P01-1214.02        | System and Method for the Programmatic Runtime Deobfuscation of Obfuscated Software Utilizing Virtual Machine Introspection and Manipulation of Virtual Machine Guest Memory Permissions | 5/13/2013   | Antony Saba; Robert Jung   | ISSUED             | 9459901      | <a href="https://patents.google.com/patent/US9459901">https://patents.google.com/patent/US9459901</a>   |
| P01-1215.02        | System and Method to Visualize User Sessions   | 9/16/2013   | Theodore Wilson  | ISSUED             | 9824211      | <a href="https://patents.google.com/patent/US9824211">https://patents.google.com/patent/US9824211</a>   |
| P01-1217.02        | System and Method Employing Structured Intelligence to Verify and Contain Threats at Endpoints   | 3/17/2014   | Joseph Faber; Joseph Nardone; Kevin Arunski; Robert Dana; Sean Cunningham                                  | ISSUED             | 9413781      | <a href="https://patents.google.com/patent/US9413781">https://patents.google.com/patent/US9413781</a>   |
| P01-1219           | System and method to communicate sensitive information via one or more untrusted intermediate nodes with resilience to disconnected network topology                                     | 8/5/2014    | Sean Cunningham  | ISSUED             | 9912644      | <a href="https://patents.google.com/patent/US9912644">https://patents.google.com/patent/US9912644</a>   |
| P01-1221           | Method and System for Collecting and Organizing Data Corresponding to an Event   | 8/2/2013    | Eric Helvey; James Butler; Jason Shiffer; Matthew Frazier; Peter Villadsen; Scott Hogsten; Sean Cunningham | FILED              | 13/957,695   |   |
| P01-1222           | Method and System for Collecting and Organizing Data Corresponding to an Event   | 8/2/2013    | Eric Helvey; James Butler; Jason Shiffer; Matthew Frazier; Peter Villadsen; Scott Hogsten; Sean Cunningham | ISSUED             | 10146810     | <a href="https://patents.google.com/patent/US10146810">https://patents.google.com/patent/US10146810</a> |
| P01-1245           | Analytics-Based Security Monitoring System and Method  | 4/13/2015   | Justin Neumann   | ISSUED             | 9654485      | <a href="https://patents.google.com/patent/US9654485">https://patents.google.com/patent/US9654485</a>   |
| P01-1274           | System and Method for Virtual Analysis of Network Data   | 6/30/2014   | Ashar Aziz; Osman Ismael; Ramesh Radhakrishnan   | ISSUED             | 9912684      | <a href="https://patents.google.com/patent/US9912684">https://patents.google.com/patent/US9912684</a>   |
| P01-1275           | System and Method for Detecting Malicious Network Content Using Virtual Environment Components   | 7/28/2014   | Bahman Mahbod; Jayaraman Manni; Muhammad Amin; Osman Ismael; Samuel Yie                                    | FILED              | 14/444,943   |   |

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| P01-1277           | System and Method for Signature Generation  | 2/25/2014   | Ashar Aziz  | ISSUED             | 9591020      | <a href="https://patents.google.com/patent/US9591020">https://patents.google.com/patent/US9591020</a>   |
| P01-1278           | Improved Exploit Detection of Malware and Malware Families  | 9/29/2014   | Hirendra Rathor; Kaushal Dalal  | ISSUED             | 9773112      | <a href="https://patents.google.com/patent/US9773112">https://patents.google.com/patent/US9773112</a>   |
| P01-1281.02        | Microvisor-Based Malware Detection Appliance Architecture   | 12/8/2015   | Osman Ismael  | ISSUED             | 9934376      | <a href="https://patents.google.com/patent/US9934376">https://patents.google.com/patent/US9934376</a>   |
| P01-1283           | Framework for Classifying an Object as Malicious with Machine Learning for Deploying Updated Predictive Models    | 12/22/2014  | Abhishek Singh; Ali Mesdaq; Anirban Das; Varun Jain                           | ISSUED             | 9690933      | <a href="https://patents.google.com/patent/US9690933">https://patents.google.com/patent/US9690933</a>   |
| P01-1285.02        | Zero-day Rotating Guest Image Profile   | 6/30/2015   | Asim Zafar; Eirij Qureshi; Darien Kindlund                                    | ISSUED             | 10075455     | <a href="https://patents.google.com/patent/US10075455">https://patents.google.com/patent/US10075455</a> |
| P01-1299.02        | System and Method for Protecting a Software Component Running in a Virtual Machine Using a Virtualization Layer   | 6/30/2016   | Udo Steinberg   | ISSUED             | 10642753     | <a href="https://patents.google.com/patent/US10642753">https://patents.google.com/patent/US10642753</a> |
| P01-1304           | System And Method For Threat Detection And Identification   | 10/31/2014  | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai                                     | ISSUED             | 10284574     | <a href="https://patents.google.com/patent/US10284574">https://patents.google.com/patent/US10284574</a> |
| P01-1306.02        | Late Load Technique for Deploying a Virtualization Layer Underneath a Running Operating System                    | 8/5/2016    | Neeraj Kulkarni; Udo Steinberg  | ISSUED             | 10108446     | <a href="https://patents.google.com/patent/US10108446">https://patents.google.com/patent/US10108446</a> |
| P01-1310.02        | Technique for Establishing Secure Communication Between Host and Guest Processes of a Virtualization Architecture | 8/15/2016   | Udo Steinberg   | ISSUED             | 10846117     | <a href="https://patents.google.com/patent/US10846117">https://patents.google.com/patent/US10846117</a> |
| P01-1312.02        | System and Method of Threat Detection Under Hypervisor Control  | 6/29/2016   | Atul Kabra; Julian Stecklina; Hirendra Rathor; Udo Steinberg                  | ISSUED             | 10033759     | <a href="https://patents.google.com/patent/US10033759">https://patents.google.com/patent/US10033759</a> |
| P01-1313.02        | Method to Detect Forgery and Exploits Using Last Branch Recording Registers                                       | 6/29/2016   | Jonas Pfoh; Phung-Te Ha   | ISSUED             | 10621338     | <a href="https://patents.google.com/patent/US10621338">https://patents.google.com/patent/US10621338</a> |
| P01-1314.02        | Technique for Protecting Guest Processes Using a Layered Virtualization Architecture                              | 8/5/2016    | Udo Steinberg   | ISSUED             | 10447728     | <a href="https://patents.google.com/patent/US10447728">https://patents.google.com/patent/US10447728</a> |
| P01-1324.02        | Exploit Detection System  | 6/15/2015   | Anil Gupta; Harinath Ramchetty; Japneet Singh                                 | ISSUED             | 10148693     | <a href="https://patents.google.com/patent/US10148693">https://patents.google.com/patent/US10148693</a> |
| P01-1334.02        | Virtual System and Method for Securing External Network Connectivity  | 6/30/2016   | Udo Steinberg   | ISSUED             | 11113086     | <a href="https://patents.google.com/patent/US11113086">https://patents.google.com/patent/US11113086</a> |
| P01-1348.02        | Code Injection for Remediation of Content Processing in an Endpoint   | 10/23/2015  | Osman Ismael  | ISSUED             | 10474813     | <a href="https://patents.google.com/patent/US10474813">https://patents.google.com/patent/US10474813</a> |
| P01-1351           | Dynamic Content Activation for Automated Analysis of Embedded Objects   | 3/30/2015   | Sai Vashisht; Sushant Paithane  | ISSUED             | 9438613      | <a href="https://patents.google.com/patent/US9438613">https://patents.google.com/patent/US9438613</a>   |
| P01-1353           | Methods of Identifying Heap Spray Attacks Using Memory Anomaly Detection  | 9/7/2016    | Sushant Paithane; Sai Vashisht  | ISSUED             | 10430586     | <a href="https://patents.google.com/patent/US10430586">https://patents.google.com/patent/US10430586</a> |

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| P01-1354           | Methods for Detecting File Altering Malware in VM Based Analysis  | 3/31/2015   | Raymond Yang; Sai Vashisht; Sushant Paithane; Yasir Khalid                        | ISSUED             | 9483644      | <a href="https://patents.google.com/patent/US9483644">https://patents.google.com/patent/US9483644</a>   |
| P01-1355.02        | Selective Virtualization for Security Threat Detection  | 3/25/2016   | Michael Vincent; Sushant Paithane   | ISSUED             | 10417031     | <a href="https://patents.google.com/patent/US10417031">https://patents.google.com/patent/US10417031</a> |
| P01-1356           | Detecting Malware Based on Reflection   | 4/23/2015   | Abhishek Singh; Varun Jain  | ISSUED             | 9594904      | <a href="https://patents.google.com/patent/US9594904">https://patents.google.com/patent/US9594904</a>   |
| P01-1358           | System and Method for Malware Containment   | 2/11/2015   | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai   | ISSUED             | 9197664      | <a href="https://patents.google.com/patent/US9197664">https://patents.google.com/patent/US9197664</a>   |
| P01-1360           | System, Apparatus and Method for Automatically Verifying Exploits Within Suspect Objects and Highlighting the Display Information Associated with the Verified Exploits | 2/11/2015   | Ashar Aziz; Muhammad Amin; Osman Ismael; Zheng Bu                                 | ISSUED             | 9306974      | <a href="https://patents.google.com/patent/US9306974">https://patents.google.com/patent/US9306974</a>   |
| P01-1361.02        | Centralized Aggregation Technique for Detecting Lateral Movement of Advanced Persistent Threat Attacks in a Network   | 3/31/2016   | Ashar Aziz  | ISSUED             | 10454950     | <a href="https://patents.google.com/patent/US10454950">https://patents.google.com/patent/US10454950</a> |
| P01-1362.02        | Leveraging Behavior-based Rules for Malware Family Classification   | 12/11/2015  | Abdul Salam; Farrukh Shahzad; Fahim Abbassi                                       | ISSUED             | 10176321     | <a href="https://patents.google.com/patent/US10176321">https://patents.google.com/patent/US10176321</a> |
| P01-1378           | System and Method for Detecting Interpreter-based Exploit Attacks   | 9/29/2015   | Sushant Paithane; Sai Vashisht  | ISSUED             | 10033747     | <a href="https://patents.google.com/patent/US10033747">https://patents.google.com/patent/US10033747</a> |
| P01-1379           | Systems and Methods for Analyzing Malicious PDF Network Content   | 3/30/2015   | Ashar Aziz; Stuart Gresley Staniford  | ISSUED             | 9438622      | <a href="https://patents.google.com/patent/US9438622">https://patents.google.com/patent/US9438622</a>   |
| P01-1380           | Systems and Methods for Malware Attack Prevention   | 11/24/2014  | Jayaraman Manni; Wei-Lung Lai; Ashar Aziz   | ISSUED             | 10165000     | <a href="https://patents.google.com/patent/US10165000">https://patents.google.com/patent/US10165000</a> |
| P01-1381.02        | Virtual System and Method with Threat Protection  | 6/30/2016   | Udo Steinberg   | ISSUED             | 10,395,029   | <a href="https://patents.google.com/patent/US10395029">https://patents.google.com/patent/US10395029</a> |
| P01-1383           | Cyber Attack Early Warning System   | 9/30/2015   | Divyesh Mehra; Abhishek Singh   | ISSUED             | 9825989      | <a href="https://patents.google.com/patent/US9825989">https://patents.google.com/patent/US9825989</a>   |
| P01-1386.02        | System and Method for Protecting a Software Component Running in a Virtual Machine Through Virtual Interrupts by the Virtualization Layer                               | 6/30/2016   | Udo Steinberg   | ISSUED             | 10726127     | <a href="https://patents.google.com/patent/US10726127">https://patents.google.com/patent/US10726127</a> |
| P01-1387.02        | System and Method for Protecting Memory Pages Associated with a Process Using a Virtualization Layer  | 6/30/2016   | Udo Steinberg   | ISSUED             | 10216927     | <a href="https://patents.google.com/patent/US10216927">https://patents.google.com/patent/US10216927</a> |
| P01-1390           | Electronic Message Analysis for Malware Detection   | 6/22/2015   | Ashar Aziz; Henry Uyeno; Jayaraman Manni; Muhammad Amin; Stuart Gresley Staniford | ISSUED             | 10027690     | <a href="https://patents.google.com/patent/US10027690">https://patents.google.com/patent/US10027690</a> |
| P01-1391           | Malicious Content Analysis Using Simulated User Interaction Without User Involvement  | 7/20/2015   | Emmanuel Thioux   | ISSUED             | 9912698      | <a href="https://patents.google.com/patent/US9912698">https://patents.google.com/patent/US9912698</a>   |
| P01-1392           | Detection and Classification of Exploit Kits  | 9/30/2015   | Josh Gomez; Abhishek Singh  | ISSUED             | 9825976      | <a href="https://patents.google.com/patent/US9825976">https://patents.google.com/patent/US9825976</a>   |
| P01-1393.02        | Mobile Application Risk Analysis  | 6/30/2016   | Raymond Wei; Zhang Lei Wang   | ISSUED             | 10715542     | <a href="https://patents.google.com/patent/US10715542">https://patents.google.com/patent/US10715542</a> |

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| P01-1400           | System and Method for Multi-Application, Multi-Plugin Analysis for Use in Detecting a Malicious Attack  | 11/10/2015  | Sushant Paithane; Sai Vashisht; Yasir Khalid; Alex Pilipenko; Muhammad Rizwan | ISSUED             | 10284575     | <a href="https://patents.google.com/patent/US10284575">https://patents.google.com/patent/US10284575</a> |
| P01-1401           | Malware analysis in accordance with an analysis plan  | 10/23/2015  | Ali Mesdaq; Michael Vincent; Emmanuel Thioux; Abhishek Singh; Sai Vashisht    | ISSUED             | 9910988      | <a href="https://patents.google.com/patent/US9910988">https://patents.google.com/patent/US9910988</a>   |
| P01-1402           | System and Method for Classifying Malware Within Content Created During Analysis of a Specimen  | 10/23/2015  | Michael Vincent; Ali Mesdaq; Emmanuel Thioux; Abhishek Singh; Sai Vashisht    | ISSUED             | 10515214     | <a href="https://patents.google.com/patent/US10515214">https://patents.google.com/patent/US10515214</a> |
| P01-1403           | Detection of Credential Spearphishing Attacks Using Email Analysis  | 9/30/2015   | Ali Mesdaq; Abhishek Singh; Varun Jain  | ISSUED             | 10601865     | <a href="https://patents.google.com/patent/US10601865">https://patents.google.com/patent/US10601865</a> |
| P01-1405           | Method to Detect Application Execution Hijacking Using Memory Protection  | 9/30/2015   | Amit Malik; Raghav Pande; Aakash Jain   | ISSUED             | 10,210,329   | <a href="https://patents.google.com/patent/US10210329">https://patents.google.com/patent/US10210329</a> |
| P01-1411.02        | Exploit of Privileges Detection Framework   | 6/29/2016   | Michael Vincent; Sai Vashisht; Jonas Pfoh                                     | ISSUED             | 10565378     | <a href="https://patents.google.com/patent/US10565378">https://patents.google.com/patent/US10565378</a> |
| P01-1413           | Malicious Message Analysis System   | 12/30/2015  | Abhishek Singh  | ISSUED             | 10050998     | <a href="https://patents.google.com/patent/US10050998">https://patents.google.com/patent/US10050998</a> |
| P01-1418.02        | Cyber-Security Framework for Application of Virtual Features  | 6/29/2016   | Shivani Deshpande; Yasir Khalid; Gregory Templeman                            | FILED              | 15/197,653   |   |
| P01-1424           | Susceptible Environment Detection System  | 12/31/2015  | Yasir Khalid; Shivani Deshpande   | ISSUED             | 9824216      | <a href="https://patents.google.com/patent/US9824216">https://patents.google.com/patent/US9824216</a>   |
| P01-1425           | Malware Detection System with Contextual Analysis   | 12/31/2015  | Yasir Khalid; Alexander Otvagin; Sai Vashisht                                 | ISSUED             | 10581874     | <a href="https://patents.google.com/patent/US10581874">https://patents.google.com/patent/US10581874</a> |
| P01-1437           | System and Method for Triggering Analysis of an Object for Malware in Response to Modification of that Object   | 12/30/2015  | Vineet Kumar; Alexander Otvagin; Nikita Borodulin                             | ISSUED             | 10133866     | <a href="https://patents.google.com/patent/US10133866">https://patents.google.com/patent/US10133866</a> |
| P01-1442           | Detecting Delayed Activation Malware Using a Primary Controller and Plural Time Controllers   | 6/29/2016   | Michael Vincent   | ISSUED             | 10706149     | <a href="https://patents.google.com/patent/US10706149">https://patents.google.com/patent/US10706149</a> |
| P01-1449           | Technique for Implementing Memory Views Using a Layered Virtualization Architecture   | 9/6/2016    | Osman Ismael; Udo Steinberg   | ISSUED             | 10191861     | <a href="https://patents.google.com/patent/US10191861">https://patents.google.com/patent/US10191861</a> |
| P01-1453           | System and Method for Malware Containment   | 11/23/2015  | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai                                     | ISSUED             | 10,068,091   | <a href="https://patents.google.com/patent/US10068091">https://patents.google.com/patent/US10068091</a> |
| P01-1455.02        | Enhanced Malware Detection for Generated Object   | 6/19/2017   | Sushant Paithane; Sai Vashisht  | ISSUED             | 10581879     | <a href="https://patents.google.com/patent/US10581879">https://patents.google.com/patent/US10581879</a> |
| P01-1461           | User Interface with Real-time Visual Playback Along with Synchronous Textual Analysis Log Display and Event/Time Index for Anomalous Behavior Detection in Applications | 11/23/2015  | Adrian Mettler; Ashar Aziz; Harnish Goradia; Noah Johnson; Osman Ismael       | ISSUED             | 10019338     | <a href="https://patents.google.com/patent/US10019338">https://patents.google.com/patent/US10019338</a> |
| P01-1462           | Framework For Efficient Security Coverage Of Mobile Software Applications Using Machine Learning  | 10/12/2015  | Osman Ismael; Dawn Song; Phung-Te Ha; Peter Gilbert; Hui Xue                  | ISSUED             | 9594905      | <a href="https://patents.google.com/patent/US9594905">https://patents.google.com/patent/US9594905</a>   |

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| P01-1463           | Framework For Efficient Security Coverage Of Mobile Software Applications   | 11/2/2015   | Ashar Aziz; Dawn Song; Osman Ismael; Noah Johnson; Prashanth Mohan; Hui Xue | ISSUED             | 9792196      | <a href="https://patents.google.com/patent/US9792196">https://patents.google.com/patent/US9792196</a>   |
| P01-1464           | System, Apparatus and Method for Conducting on-the-fly Decryption of Encrypted Objects for Malware Detection  | 11/16/2015  | Ali Islam   | ISSUED             | 9560059      | <a href="https://patents.google.com/patent/US9560059">https://patents.google.com/patent/US9560059</a>   |
| P01-1465           | Dynamically Remote Tuning of a Malware Content Detection System   | 12/28/2015  | Darien Kindlund; Emmanuel Thioux; Michael Vincent; Sai Vashisht             | ISSUED             | 10341363     | <a href="https://patents.google.com/patent/US10341363">https://patents.google.com/patent/US10341363</a> |
| P01-1475           | Micro-Virtualization Architecture for Threat-Aware Microvisor Deployment in a Node of a Network Environment   | 1/28/2016   | Ashar Aziz; Osman Ismael  | ISSUED             | 9946568      | <a href="https://patents.google.com/patent/US9946568">https://patents.google.com/patent/US9946568</a>   |
| P01-1476           | System and Method for Network Behavior Detection  | 1/15/2016   | James Bennett; Zheng Bu   | ISSUED             | 10432649     | <a href="https://patents.google.com/patent/US10432649">https://patents.google.com/patent/US10432649</a> |
| P01-1485           | System and Methods for Advanced Malware Detection Placement of Transition Events  | 6/22/2016   | Alex Pilipenko; Phung-Te Ha   | ISSUED             | 10169585     | <a href="https://patents.google.com/patent/US10169585">https://patents.google.com/patent/US10169585</a> |
| P01-1487.02        | Ransomware Detection and Mitigation   | 7/24/2017   | Anil Gupta; Japneet Singh   | ISSUED             | 10503904     | <a href="https://patents.google.com/patent/US10503904">https://patents.google.com/patent/US10503904</a> |
| P01-1490.02        | Malware Detection Verification and Enhancement Using Detection Systems Located at the Network Periphery and Endpoint Devices  | 3/29/2017   | Ashar Aziz; Osman Ismael  | ISSUED             | 10893059     | <a href="https://patents.google.com/patent/US10893059">https://patents.google.com/patent/US10893059</a> |
| P01-1491.02        | Malware Detection Verification and Enhancement By Coordinating Endpoint and Malware Detection Systems   | 6/26/2017   | Ashar Aziz; Osman Ismael  | ISSUED             | 10462173     | <a href="https://patents.google.com/patent/US10462173">https://patents.google.com/patent/US10462173</a> |
| P01-1502.02        | Dynamic Adaptive Defense for Cyber-security Threats   | 4/1/2016    | Fred Brott; Paul Smith; Thomas Bernard; David Scott                         | ISSUED             | 10129290     | <a href="https://patents.google.com/patent/US10129290">https://patents.google.com/patent/US10129290</a> |
| P01-1520           | Improving Detection Efficacy of Virtual Machine-Based Analysis With Application Specific Events   | 2/12/2016   | Sai Vashisht; Sushant Paithane  | ISSUED             | 9916440      | <a href="https://patents.google.com/patent/US9916440">https://patents.google.com/patent/US9916440</a>   |
| P01-1522           | Fuzzy hash of behavioral results  | 3/21/2016   | Ali Mesdaq; Paul Westin   | ISSUED             | 9912691      | <a href="https://patents.google.com/patent/US9912691">https://patents.google.com/patent/US9912691</a>   |
| P01-1523           | System, Apparatus and Method for Automatically Verifying Exploits Within Suspect Objects and Highlighting the Display Information Associated with the Verified Exploits | 10/19/2016  | Zheng Bu; Muhammad Amin; Ashar Aziz   | ISSUED             | 10476909     | <a href="https://patents.google.com/patent/US10476909">https://patents.google.com/patent/US10476909</a> |
| P01-1524           | Hypervisor-based Selective Virtualization for Security Threat Detection   | 9/16/2019   | Sushant Paithane; Michael Vincent   | FILED              | 16/572537    |   |
| P01-1525           | System and Method for Detecting Malicious Links in Electronic Messages  | 3/28/2016   | Vinay Pidathala; Henry Uyeno  | ISSUED             | 9888019      | <a href="https://patents.google.com/patent/US9888019">https://patents.google.com/patent/US9888019</a>   |
| P01-1528           | Systems and methods for computer worm defense   | 4/4/2016    | Ashar Aziz  | ISSUED             | 9516057      | <a href="https://patents.google.com/patent/US9516057">https://patents.google.com/patent/US9516057</a>   |
| P01-1529           | Electronic Device for Aggregation, Correlation and Consolidation of Analysis Attributes   | 4/11/2016   | Jayaraman Manni; Michael Berrow; Philip Eun                                 | ISSUED             | 9641546      | <a href="https://patents.google.com/patent/US9641546">https://patents.google.com/patent/US9641546</a>   |



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| P01-1530           | System and Method to Detect Premium Attacks on Electronic Networks and Electronic Devices   | 6/28/2016   | Alex Rivlin; Naveed Alam; Vinoth Duraisamy   | ISSUED             | 10121000     | <a href="https://patents.google.com/patent/US10121000">https://patents.google.com/patent/US10121000</a> |
| P01-1542           | Advanced Malware Detection Using Similarity Analysis  | 9/29/2016   | Jimmy Su   | ISSUED             | 10491627     | <a href="https://patents.google.com/patent/US10491627">https://patents.google.com/patent/US10491627</a> |
| P01-1543           | System and Method for Detecting Malicious Traffic Using a Virtual Machine Environment   | 5/27/2016   | Ashar Aziz   | ISSUED             | 9661018      | <a href="https://patents.google.com/patent/US9661018">https://patents.google.com/patent/US9661018</a>   |
| P01-1544           | File Extraction from Memory Dump for Malicious Content Analysis   | 5/27/2016   | Osman Ismael; Muhammad Amin; Emmamel Thiooux   | ISSUED             | 10198574     | <a href="https://patents.google.com/patent/US10198574">https://patents.google.com/patent/US10198574</a> |
| P01-1546           | Arrangement for Efficient Search and Retrieval of Indexes Used to Locate Captured Packets   | 7/20/2016   | Randy Caldejon; Dennis Lee Edwards; Christopher Hayes Fauerbach                              | ISSUED             | 9876701      | <a href="https://patents.google.com/patent/US9876701">https://patents.google.com/patent/US9876701</a>   |
| P01-1571           | System and Method for Managing Formation and Modification of a Cluster within a Malware Detection System                            | 9/30/2016   | Mumtaz Siddiqui  | ISSUED             | 10,476,906   | <a href="https://patents.google.com/patent/US10476906">https://patents.google.com/patent/US10476906</a> |
| P01-1572           | System and Method for Managing Sensor Enrollment  | 9/30/2016   | Mumtaz Siddiqui  | ISSUED             | 10601863     | <a href="https://patents.google.com/patent/US10601863">https://patents.google.com/patent/US10601863</a> |
| P01-1573           | Cluster Configuration within a Scalable Malware Detection System  | 9/30/2016   | Alexander Otvagin; Sakthi Subramanian; Krisis Krilovs; Diptesh Chatterjee; Prakhyath Rajanna | ISSUED             | 10785255     | <a href="https://patents.google.com/patent/US10785255">https://patents.google.com/patent/US10785255</a> |
| P01-1574.02        | Timeout Management Services in Scalable Malware Detection System  | 12/27/2016  | Alexander Otvagin; Mumtaz Siddiqui   | ISSUED             | 10671721     | <a href="https://patents.google.com/patent/US10671721">https://patents.google.com/patent/US10671721</a> |
| P01-1575           | Distributed Malware Detection System and Submission Workflow Thereof  | 9/30/2016   | Alexander Otvagin  | ISSUED             | 10616266     | <a href="https://patents.google.com/patent/US10616266">https://patents.google.com/patent/US10616266</a> |
| P01-1590           | System and Method of Detecting Delivery of Malware Based on Indicators of Compromise from Different Sources                         | 6/6/2016    | Alex Rivlin; Divyesh Mehra; Henry Uyeno; Vinay Pidathala                                     | ISSUED             | 9609007      | <a href="https://patents.google.com/patent/US9609007">https://patents.google.com/patent/US9609007</a>   |
| P01-1591           | Methods and System for Hiding Transition Events for Malware Detection   | 6/30/2016   | Phung-Te Ha  | ISSUED             | 10341365     | <a href="https://patents.google.com/patent/US10341365">https://patents.google.com/patent/US10341365</a> |
| P01-1595.02        | Methods and Apparatus for Graphical User Interface Environment for Creating Threat Response Courses of Action for Computer Networks | 6/22/2016   | Christopher Nelson Bailey; Bernd Constant; Juan Manuel Vela                                  | ISSUED             | 10536484     | <a href="https://patents.google.com/patent/US10536484">https://patents.google.com/patent/US10536484</a> |
| P01-1605           | Cyber-Security System and Method for Weak Indicator Detection and Correlation to Generate Strong Indicators                         | 6/29/2017   | Sundar Jeyaraman; Ramu Ramaswamy   | ISSUED             | 10601848     | <a href="https://patents.google.com/patent/US10601848">https://patents.google.com/patent/US10601848</a> |
| P01-1606           | Multi-Vector Detection and Analysis   | 12/27/2016  | Sakthi Subramanian   | ISSUED             | 10,523,609   | <a href="https://patents.google.com/patent/US10523609">https://patents.google.com/patent/US10523609</a> |
| P01-1607.02        | Enterprise Search   | 11/3/2017   | Steven Ross; Ai Duong; Larry King; Jack Young  | ISSUED             | 10795991     | <a href="https://patents.google.com/patent/US10795991">https://patents.google.com/patent/US10795991</a> |
| P01-1608           | Network Based Malware Detection   | 7/18/2016   | Shrikrishna Karandikar; Muhammad Amin; Shivani Deshpande; Yasir Khalid                       | ISSUED             | 9661009      | <a href="https://patents.google.com/patent/US9661009">https://patents.google.com/patent/US9661009</a>   |

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| P01-1610           | Technique for Malware Detection Capability Comparison of Network Security Devices  | 11/22/2016  | Yasir Khalid; Nadeem Shahbaz  | ISSUED             | 10587647     | <a href="https://patents.google.com/patent/US10587647">https://patents.google.com/patent/US10587647</a> |
| P01-1615           | System and Method for Detecting Malicious Traffic Using a Virtual Machine Configured with a Select Software Environment  | 8/1/2016    | Ashar Aziz  | ISSUED             | 10567405     | <a href="https://patents.google.com/patent/US10567405">https://patents.google.com/patent/US10567405</a> |
| P01-1616           | Correlation and Consolidation of Analytic Data for Holistic View of a Malware Attack   | 8/2/2016    | Sean Cunningham; Robert Dana; Joseph Nardone; Joseph Faber; Kevin Arunski | ISSUED             | 10033748     | <a href="https://patents.google.com/patent/US10033748">https://patents.google.com/patent/US10033748</a> |
| P01-1632           | Distributed Systems and Methods for Automatically Detecting Unknown Bot and Botnets  | 8/29/2016   | Ali Islam; Todd Rosenbergy; Atif Mushtaq; Ashar Aziz                      | ISSUED             | 10200384     | <a href="https://patents.google.com/patent/US10200384">https://patents.google.com/patent/US10200384</a> |
| P01-1633           | Modular architecture for analysis database   | 9/1/2016    | Arsen Movsesyan; Vineet Kumar; Alexander Otvagin                          | ISSUED             | 9787706      | <a href="https://patents.google.com/patent/US9787706">https://patents.google.com/patent/US9787706</a>   |
| P01-1634           | Detection of Phishing Attacks Using Similarity Analysis  | 3/24/2017   | Rundong Liu   | ISSUED             | 10904286     | <a href="https://patents.google.com/patent/US10904286">https://patents.google.com/patent/US10904286</a> |
| P01-1635           | Systems and methods for analyzing PDF documents  | 9/2/2016    | Ashar Aziz; Stuart Gresley Staniford                                      | ISSUED             | 9954890      | <a href="https://patents.google.com/patent/US9954890">https://patents.google.com/patent/US9954890</a>   |
| P01-1637.02        | Cyber-Security System And Method For Detecting Escalation Of Privileges Within An Access Token   | 3/14/2019   | Atul Kabra; Japneet Singh; Ratnesh Pandey                                 | FILED              | 16/353984    |   |
| P01-1638           | System and Method for the Programmatic Runtime Deobfuscation of Obfuscated Software Utilizing Virtual Machine Introspection and Manipulation of Virtual Machine Guest Memory Permissions | 10/3/2016   | Antony Saba; Robert Jung  | ISSUED             | 10380343     | <a href="https://patents.google.com/patent/US10380343">https://patents.google.com/patent/US10380343</a> |
| P01-1640.02        | Ransomware File Modification Prevention Technique  | 6/29/2018   | Yasir Khalid; Nadeem Shahbaz; Raghunath Konda                             | ISSUED             | 10893068     | <a href="https://patents.google.com/patent/US10893068">https://patents.google.com/patent/US10893068</a> |
| P01-1641           | System and method for detecting file altering behaviors pertaining to a malicious attack   | 10/31/2016  | Raymond Yang; Sai Vashisht; Sushant Paithane; Yasir Khalid                | ISSUED             | 9846776      | <a href="https://patents.google.com/patent/US9846776">https://patents.google.com/patent/US9846776</a>   |
| P01-1644.02        | Adaptive Virtual machine Snapshot Update Framework for Malware Behavioral Analysis   | 6/19/2017   | Sai Vashisht; Phung-Te Ha; Sushant Paithane; Sumer Deshpande              | ISSUED             | 10552610     | <a href="https://patents.google.com/patent/US10552610">https://patents.google.com/patent/US10552610</a> |
| P01-1645           | Optimized Resource Allocation for Virtual Machines Within a Malware Content Detection System   | 11/14/2016  | Osman Ismael  | ISSUED             | 10469512     | <a href="https://patents.google.com/patent/US10469512">https://patents.google.com/patent/US10469512</a> |
| P01-1651.02        | Subscription-Based Malware Detection Architecture  | 3/29/2018   | Mumtaz Siddiqui; Manju Radhakrishnan; Deepak Agarwal                      | FILED              | 15/940,352   |   |
| P01-1652           | Efficient Access to Sparse Packets in Large Repositories of Stored Network Traffic   | 12/2/2016   | Christopher Hayes Fauerbach; Dennis Lee Edwards                           | ISSUED             | 9674298      | <a href="https://patents.google.com/patent/US9674298">https://patents.google.com/patent/US9674298</a>   |
| P01-1653           | Subscriber Based Protection System   | 12/5/2016   | Ashar Aziz  | ISSUED             | 9838411      | <a href="https://patents.google.com/patent/US9838411">https://patents.google.com/patent/US9838411</a>   |
| P01-1654           | System and Method for Predicting and Mitigating Cybersecurity System Misconfigurations   | 3/29/2018   | Wei Quan; Raghunath Konda   | ISSUED             | 10826931     | <a href="https://patents.google.com/patent/US10826931">https://patents.google.com/patent/US10826931</a> |

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| P01-1655           | Method for Detecting Malware Within Network Content  | 12/12/2016  | Ashar Aziz; Stuart Gresley Staniford; Muhammad Amin; Henry Uyeno; Samuel Yie                  | ISSUED             | 10282548     | <a href="https://patents.google.com/patent/US10282548">https://patents.google.com/patent/US10282548</a> |
| P01-1656.02        | Data Extraction System for Malware Analysis  | 6/19/2017   | Sai Vashisht; Phung-Te Ha; Durvesh Ashok Raut; Sushant Paithane                               | ISSUED             | 10902119     | <a href="https://patents.google.com/patent/US10902119">https://patents.google.com/patent/US10902119</a> |
| P01-1657           | System and Method for Detecting Time-Bomb Malware  | 12/29/2016  | PAITHANE SUSHANT; VINCENT MICHAEL; VASHISHT SAI; KINDLUND DARIEN                              | ISSUED             | 10083302     | <a href="https://patents.google.com/patent/US10083302">https://patents.google.com/patent/US10083302</a> |
| P01-1658           | System and Method for Bot Detection  | 4/17/2017   | Ashar Aziz; Wei-Lung Lai; Jayaraman Manni   | ISSUED             | 10587636     | <a href="https://patents.google.com/patent/US10587636">https://patents.google.com/patent/US10587636</a> |
| P01-1661           | System and method for detecting malicious activity based on at least one environmental property  | 2/6/2017    | Darien Kindlund; Julia Wolf; James Bennett  | ISSUED             | 9934381      | <a href="https://patents.google.com/patent/US9934381">https://patents.google.com/patent/US9934381</a>   |
| P01-1662           | System and method for offloading packet processing and static analysis operations  | 3/6/2017    | Madhusudan Challa; Masood Mehmood; Muhammad Amin; Ramaswamy Ramaswamy; Shrikrishna Karandikar | ISSUED             | 9787700      | <a href="https://patents.google.com/patent/US9787700">https://patents.google.com/patent/US9787700</a>   |
| P01-1663           | System and Method for Signature Generation   | 3/6/2017    | Ashar Aziz  | ISSUED             | 10511614     | <a href="https://patents.google.com/patent/US10511614">https://patents.google.com/patent/US10511614</a> |
| P01-1664           | System and Method of Detecting Delivery of Malware Using Cross-Customer Data   | 3/27/2017   | Alex Rivlin; Divyesh Mehra; Henry Uyeno; Vinay Pidathala                                      | ISSUED             | 10027696     | <a href="https://patents.google.com/patent/US10027696">https://patents.google.com/patent/US10027696</a> |
| P01-1665           | System and Method for Preventing Malware Evasion   | 9/27/2017   | Phung-Te Ha; Min Li   | ISSUED             | 10747872     | <a href="https://patents.google.com/patent/US10747872">https://patents.google.com/patent/US10747872</a> |
| P01-1667           | Phishing Attack Detection  | 10/1/2017   | Pavan Chitturi; Surya Rao   | ISSUED             | 10805346     | <a href="https://patents.google.com/patent/US10805346">https://patents.google.com/patent/US10805346</a> |
| P01-1669           | Advanced Persistent Threat (APT) Detection Center  | 4/17/2017   | Thoufique Haq; Jinjian Zhai; Vinay Pidathala  | ISSUED             | 10735458     | <a href="https://patents.google.com/patent/US10735458">https://patents.google.com/patent/US10735458</a> |
| P01-1670           | Malicious Content Analysis with Multi-Version Application Support Within Single Operating Environment  | 4/17/2017   | Yasir Khalid; Muhammad Amin; Emily Jing   | ISSUED             | 10025927     | <a href="https://patents.google.com/patent/US10025927">https://patents.google.com/patent/US10025927</a> |
| P01-1679           | Classifying Sets of Malicious Indicators for Detecting Command and Control Communications Associated with Malware  | 4/24/2017   | Ali Islam; Zheng Bu   | ISSUED             | 10033753     | <a href="https://patents.google.com/patent/US10033753">https://patents.google.com/patent/US10033753</a> |
| P01-1681           | Correlation and Consolidation of Analytic Data for Holistic View of a Malware Attack   | 5/1/2017    | Jayaraman Manni; Michael Berrow; Philip Eun   | ISSUED             | 10122746     | <a href="https://patents.google.com/patent/US10122746">https://patents.google.com/patent/US10122746</a> |
| P01-1683           | Analytics-Based Security Monitoring System and Method  | 5/12/2017   | Justin Neumann  | ISSUED             | 10104102     | <a href="https://patents.google.com/patent/US10104102">https://patents.google.com/patent/US10104102</a> |
| P01-1690           | System, Device and Method for Detecting a Malicious Attack Based on Direct Communications Between Remotely Hosted Virtual Machines and Malicious Web Servers | 5/19/2017   | Shrikrishna Karandikar; Muhammad Amin; Shivani Deshpande; Yasir Khalid                        | ISSUED             | 9838408      | <a href="https://patents.google.com/patent/US9838408">https://patents.google.com/patent/US9838408</a>   |
| P01-1692.02        | Subscription-Based Malware Detection   | 3/29/2018   | Mumtaz Siddiqui; Manju Radhakrishnan  | ISSUED             | 10791138     | <a href="https://patents.google.com/patent/US10791138">https://patents.google.com/patent/US10791138</a> |
| P01-1693.02        | Attribute-Controlled Malware Detection   | 3/29/2018   | Mumtaz Siddiqui; Manju Radhakrishnan; Deepak Agarwal  | ISSUED             | 10798112     | <a href="https://patents.google.com/patent/US10798112">https://patents.google.com/patent/US10798112</a> |

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| P01-1696           | Multistage System and Method for Analyzing Obfuscated Content for Malware   | 6/26/2017   | Amit Malik; Shivani Deshpande; Wei Zheng; Abhishek Singh                                      | ISSUED             | 10657251     | <a href="https://patents.google.com/patent/US10657251">https://patents.google.com/patent/US10657251</a> |
| P01-1699           | Framework for Classifying an Object as Malicious with Machine Learning for Deploying Updated Predictive Models      | 6/26/2017   | Abhishek Singh; Ali Mesdaq; Anirban Das; Varun Jain   | ISSUED             | 10366231     | <a href="https://patents.google.com/patent/US10366231">https://patents.google.com/patent/US10366231</a> |
| P01-1701           | Dynamic Adaptive Defense for Cyber-security Threats   | 4/28/2017   | Fred Brott; Paul Smith; Thomas Bernard; David Scott   | ISSUED             | 10505972     | <a href="https://patents.google.com/patent/US10505972">https://patents.google.com/patent/US10505972</a> |
| P01-1703.02        | Platform and Method for Enhanced Cyber-Attack Detection and Response Employing a Global Data Store                  | 12/17/2018  | Sai Vashisht; Alexander Otvagin   | FILED              | 16/222194    |   |
| P01-1707           | Systems, Apparatus and Method for Reconfiguring Virtual Machines  | 8/14/2017   | Osman Ismael  | ISSUED             | 11075945     | <a href="https://patents.google.com/patent/US11075945">https://patents.google.com/patent/US11075945</a> |
| P01-1710           | System and Method for Run-time Object Classification  | 8/28/2017   | Zheng Bu; Vinay Pidathala; Ashar Aziz   | ISSUED             | 10467411     | <a href="https://patents.google.com/patent/US10467411">https://patents.google.com/patent/US10467411</a> |
| P01-1711           | Multi-level Control for Enhanced Resource Management and Object Evaluation Management                               | 9/29/2017   | Manju Radhakrishnan; Alexander Otvagin; Mumtaz Siddiqui                                       | ISSUED             | 10554507     | <a href="https://patents.google.com/patent/US10554507">https://patents.google.com/patent/US10554507</a> |
| P01-1712           | System and Method for Enforcing Compliance with Subscription Requirements for Cyber-Attack Detection Service        | 9/29/2017   | Manju Radhakrishnan; Mumtaz Siddiqui  | ISSUED             | 10848397     | <a href="https://patents.google.com/patent/US10848397">https://patents.google.com/patent/US10848397</a> |
| P01-1720           | System and Method for Offloading Packet Processing and Static Analysis Operations                                   | 10/9/2017   | Madhusudan Challa; Masood Mehmood; Muhammad Amin; Ramaswamy Ramaswamy; Shrikrishna Karandikar | ISSUED             | 10454953     | <a href="https://patents.google.com/patent/US10454953">https://patents.google.com/patent/US10454953</a> |
| P01-1721.02        | Phishing Website Detection using Deep Convolutional Neural Network  | 6/8/2018    | Bala Rajagopalan; Rahul Mohandas; Santhosh Ramachandran; Vamsi Kumar Kurva                    | ISSUED             | 10834128     | <a href="https://patents.google.com/patent/US10834128">https://patents.google.com/patent/US10834128</a> |
| P01-1725           | Security Cloud Service Framework for Hardening in the Field Code of Mobile Software Applications                    | 11/17/2017  | Ashar Aziz; Osman Ismael  | ISSUED             | 10,181,029   | <a href="https://patents.google.com/patent/US10181029">https://patents.google.com/patent/US10181029</a> |
| P01-1726           | Intelligent Context Aware User Interaction for Malware Detection  | 12/4/2017   | Sai Vashisht; Sushant Paithane; Yasir Khalid  | ISSUED             | 10798121     | <a href="https://patents.google.com/patent/US10798121">https://patents.google.com/patent/US10798121</a> |
| P01-1727           | Cyber Attack Early Warning System   | 11/17/2017  | Divyesh Mehra; Abhishek Singh   | ISSUED             | 10873597     | <a href="https://patents.google.com/patent/US10873597">https://patents.google.com/patent/US10873597</a> |
| P01-1728           | Susceptible Environment Detection System  | 11/17/2017  | Yasir Khalid; Shivani Deshpande   | ISSUED             | 10445502     | <a href="https://patents.google.com/patent/US10445502">https://patents.google.com/patent/US10445502</a> |
| P01-1729           | Framework For Efficient Security Coverage Of Mobile Software Applications   | 10/16/2017  | Ashar Aziz; Osman Ismael; Hui Xue; Dawn Song; Noah Johnson; Prashanth Mohan                   | ISSUED             | 10296437     | <a href="https://patents.google.com/patent/US10296437">https://patents.google.com/patent/US10296437</a> |
| P01-1733           | System and Methods for Computer Worm Defense  | 12/4/2017   | Ashar Aziz  | ISSUED             | 10097573     | <a href="https://patents.google.com/patent/US10097573">https://patents.google.com/patent/US10097573</a> |
| P01-1735.02        | Platform and Method for Performing Cybersecurity Analyses Employing an Intelligence Hub with a Modular Architecture | 12/17/2018  | Sai Vashisht; Alexander Otvagin   | FILED              | 16/223107    |   |
| P01-1736.02        | Platform and Method for Retroactive Reclassification  | 12/17/2018  | Alexander Otvagin; Sai Vashisht   | FILED              | 16/222,501   |   |

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|                    | Employing a Cybersecurity-Based Global Data Store  |             |  |                    |              |   |
| P01-1737           | System and Method for Automatically Generating Malware Detection Rule Recommendations                                      | 3/30/2018   | Victor Fang; Wei Quan; Richard Lai; Robert Venal; Benjamin Chang           | ISSUED             | 11003773     | <a href="https://patents.google.com/patent/US11003773">https://patents.google.com/patent/US11003773</a> |
| P01-1739.02        | System and Method for Automatically Prioritizing Rules for Cyber-Threat Detection and Mitigation                           | 3/14/2019   | Chinmoy Dey; Christopher Glycer; Paul Schottland                           | FILED              | 16/353988    |   |
| P01-1741.02        | Multi-vector Malware Detection Data Sharing System for Improved Detection  | 3/14/2019   | Sai Vashisht; Sushant Paithane   | FILED              | 16/353982    |   |
| P01-1747.02        | Methods and Apparatus for Cyberattack Detection via Endpoint Source Key Exchange   | 9/23/2019   | Christopher Glycer; Andrew Davis; Seth Summersett                          | FILED              | 16/578,986   |   |
| P01-1749           | System And Method For Distributed Cluster Configuration Monitoring And Management  | 6/28/2018   | Alexey Yakymovych; Alexander Otvagin                                       | FILED              | 16/022644    |   |
| P01-1750           | Intelligent System for Mitigating Cybersecurity Risk by Analyzing Domain Name System Traffic                               | 9/28/2018   | Ralph Casey; Ken Bagnall; John Jensen                                      | FILED              | 16/146,211   |   |
| P01-1791           | System And Method For Detecting Repetitive Cybersecurity Attacks Constituting An Email Campaign                            | 6/27/2018   | Jijo Xavier; Robert Venal  | ISSUED             | 11075930     | <a href="https://patents.google.com/patent/US11075930">https://patents.google.com/patent/US11075930</a> |
| P01-1796           | Post-intrusion detection of Cyber-Attacks During Lateral Movement Within Enterprise Networks                               | 6/29/2018   | Sundar Jeyaraman; Ramu Ramaswamy   | ISSUED             | 10855700     | <a href="https://patents.google.com/patent/US10855700">https://patents.google.com/patent/US10855700</a> |
| P01-1798.02        | System and Method for Improved End-to-End Cyber-security Machine Learning and Deployment                                   | 7/30/2018   | Sai Vashisht; Victor Fang; Rahul Khul                                      | FILED              | 16/049,687   |   |
| P01-1799           | System and Method for Mitigating Cyberattacks Against Processor Operability by a Guest Process                             | 9/13/2018   | Min Li; Phung-Te Ha  | FILED              | 16/130,944   |   |
| P01-1802           | System and Method for Virtual Analysis of Network Data   | 3/5/2018    | Ashar Aziz; Osman Ismael; Ramesh Radhakrishnan                             | ISSUED             | 10623434     | <a href="https://patents.google.com/patent/US10623434">https://patents.google.com/patent/US10623434</a> |
| P01-1804           | Malicious Content Analysis Using Simulated User Interaction Without User Involvement                                       | 3/5/2018    | Emmanuel Thioux  | ISSUED             | 10848521     | <a href="https://patents.google.com/patent/US10848521">https://patents.google.com/patent/US10848521</a> |
| P01-1805           | System and Method for Detecting Malicious Links in Electronic Messages   | 2/5/2018    | Vinay Pidathala; Henry Uyeno   | ISSUED             | 10505956     | <a href="https://patents.google.com/patent/US10505956">https://patents.google.com/patent/US10505956</a> |
| P01-1806           | Dynamically Adaptive Framework and Method for Classifying Malware Using Intelligent Static, Emulation and Dynamic Analyses | 3/5/2018    | Ali Mesdaq; Michael Vincent; Emmanuel Thioux; Abhishek Singh; Sai Vashisht | ISSUED             | 10713362     | <a href="https://patents.google.com/patent/US10713362">https://patents.google.com/patent/US10713362</a> |
| P01-1807           | Fuzzy Hash of Behavioral Results   | 3/5/2018    | Ali Mesdaq; Paul Westin  | ISSUED             | 10218740     | <a href="https://patents.google.com/patent/US10218740">https://patents.google.com/patent/US10218740</a> |
| P01-1808           | Improving Detection Efficacy of Virtual Machine-Based Analysis With Application Specific Events                            | 3/12/2018   | Sai Vashisht; Sushant Paithane   | ISSUED             | 10534906     | <a href="https://patents.google.com/patent/US10534906">https://patents.google.com/patent/US10534906</a> |

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| P01-1809           | Verification of Trusted Threat-Aware Microvisor  | 6/18/2018   | Hendrik Tews; Osman Ismael  | FILED              | 16/011,495   |   |
| P01-1812           | System and Method for Selectively Processing Content After Identification and Removal of Malicious Content                   | 12/21/2018  | Zain Gardezi  | FILED              | 16/231089    |   |
| P01-1816.02        | System and Method for Detecting Cyberattacks Impersonating Legitimate Sources  | 12/23/2019  | Zain Gardezi; Mohsin Saeed; Hassan Ahmad; Fahim Abbassi; Farrukh Shahzad          | FILED              | 16/725674    |   |
| P01-1845           | System and method for detecting malicious activity based on at least one environmental property                              | 4/2/2018    | Darien Kindlund; Julia Wolf; James Bennett  | ISSUED             | 10467414     | <a href="https://patents.google.com/patent/US10467414">https://patents.google.com/patent/US10467414</a> |
| P01-1848           | Micro-Virtualization Architecture for Threat-Aware Microvisor Deployment in a Node of a Network Environment                  | 4/16/2018   | Ashar Aziz; Osman Ismael  | ISSUED             | 10740456     | <a href="https://patents.google.com/patent/US10740456">https://patents.google.com/patent/US10740456</a> |
| P01-1849           | Microvisor-Based Malware Detection Appliance Architecture  | 4/2/2018    | Osman Ismael  | ISSUED             | 10528726     | <a href="https://patents.google.com/patent/US10528726">https://patents.google.com/patent/US10528726</a> |
| P01-1854           | Electronic Message Analysis for Malware Detection  | 7/16/2018   | Ashar Aziz; Henry Uyeno; Jayaraman Manni; Muhammad Amin; Stuart Gresley Staniford | ISSUED             | 10757120     | <a href="https://patents.google.com/patent/US10757120">https://patents.google.com/patent/US10757120</a> |
| P01-1855           | Malicious Content Analysis with Multi-Version Application Support Within Single Operating Environment                        | 7/16/2018   | Yasir Khalid; Muhammad Amin; Emily Jing   | FILED              | 16/036,873   |   |
| P01-1856           | Interactive Infection Visualization for Improved Exploit Detection and Signature Generation for Malware and Malware Families | 7/16/2018   | Anil Gupta; Hirendra Rathor; Kaushal Dalal  | ISSUED             | 10868818     | <a href="https://patents.google.com/patent/US10868818">https://patents.google.com/patent/US10868818</a> |
| P01-1857           | System and Method of Detecting Delivery of Malware Using Cross-Customer Data   | 7/16/2018   | Alex Rivlin; Divyesh Mehra; Henry Uyeno; Vinay Pidathala                          | ISSUED             | 10404725     | <a href="https://patents.google.com/patent/US10404725">https://patents.google.com/patent/US10404725</a> |
| P01-1859           | System and Method for Bootkit Detection  | 9/27/2018   | Andrew Davis; Fred House; Ryan Fisher   | FILED              | 16/144,781   |   |
| P01-1864           | Malicious Message Analysis System  | 8/13/2018   | Abhishek Singh  | ISSUED             | 10581898     | <a href="https://patents.google.com/patent/US10581898">https://patents.google.com/patent/US10581898</a> |
| P01-1868           | System and Method for Scanning Remote Services to Locate Stored Objects with Malware   | 12/21/2018  | Sai Vashisht  | FILED              | 16/231074    |   |
| P01-1869.02        | System and Method for Retrieval and Analysis of Operational Data From Customer, Cloud-Hosted Virtual Resources               | 8/30/2019   | Sai Vashisht; Rahul Khul; Sumer Deshpande; Sushant Paitlane                       | FILED              | 16/557512    |   |
| P01-1870.02        | Automated System for Triage of Customer Issues   | 12/24/2019  | Sai Vashisht; Rahul Khul  | FILED              | 16/726723    |   |
| P01-1880           | System and Method for Detecting Time-Bomb Malware  | 9/24/2018   | Sushant Paitlane; Michael Vincent; Sai Vashisht; Darien Kindlund                  | ISSUED             | 10335738     | <a href="https://patents.google.com/patent/US10335738">https://patents.google.com/patent/US10335738</a> |
| P01-1881           | Intrusion Prevention and Remedy System   | 9/24/2018   | Hatem Eyada   | ISSUED             | 10757134     | <a href="https://patents.google.com/patent/US10757134">https://patents.google.com/patent/US10757134</a> |
| P01-1883           | User Interface with Real-Time Visual Playback Along with Synchronous Textual Analysis Log Display and Event/Time             | 7/9/2018    | Adrian Mettler; Ashar Aziz; Harnish Goradia; Noah Johnson; Osman Ismael           | ISSUED             | 10929266     | <a href="https://patents.google.com/patent/US10929266">https://patents.google.com/patent/US10929266</a> |

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|                    | Index for Anomalous Behavior Detection in Applications   |             |   |                    |              |   |
| P01-1886           | Classifying Sets of Malicious Indicators for Detecting Command and Control Communications Associated with Malware            | 7/23/2018   | Ali Islam; Zheng Bu   | ISSUED             | 10637880     | <a href="https://patents.google.com/patent/US10637880">https://patents.google.com/patent/US10637880</a> |
| P01-1887           | System and Method for Detecting Interpreter-based Exploit Attacks  | 7/23/2018   | Sushant Paithane; Sai Vashisht  | ISSUED             | 10887328     | <a href="https://patents.google.com/patent/US10887328">https://patents.google.com/patent/US10887328</a> |
| P01-1888           | System and method for verifying a cyberthreat  | 7/23/2018   | Sean Cunningham; Robert Dana; Joseph Nardone; Joseph Faber; Kevin Arunski | ISSUED             | 10701091     | <a href="https://patents.google.com/patent/US10701091">https://patents.google.com/patent/US10701091</a> |
| P01-1900           | Correlation and Consolidation of Analytic Data for Holistic View of a Malware Attack   | 11/5/2018   | Jayaraman Manni; Michael Berrow; Philip Eun                               | ISSUED             | 10812513     | <a href="https://patents.google.com/patent/US10812513">https://patents.google.com/patent/US10812513</a> |
| P01-1901           | Dynamic Adaptive Defense for Cyber-security Threats  | 11/9/2018   | Fred Brott; Paul Smith; Thomas Bernard; David Scott                       | ISSUED             | 10616265     | <a href="https://patents.google.com/patent/US10616265">https://patents.google.com/patent/US10616265</a> |
| P01-1908           | System and Method for Supporting Cross-Platform Data Verification  | 6/28/2019   | Robert Beard; Robin Caron   | FILED              | 16/457573    |   |
| P01-1909.02        | Seamless Endpoint Rule Update Mechanism  | 2/20/2020   | Robin Caron; Robert Beard; Neeraj Kulkarni                                | FILED              | 16/796541    |   |
| P01-1910.02        | System to Detect and Protect Against Cybersecurity Attacks on Servers  | 8/30/2019   | Sai Vashisht; Ishan Sharma  | FILED              | 16/557483    |   |
| P01-1920           | System and Method for Triggering Analysis of an Object for Malware in Response to Modification of that Object                | 11/16/2018  | Vineet Kumar; Alexander Otvagin; Nikita Borodulin                         | ISSUED             | 10872151     | <a href="https://patents.google.com/patent/US10872151">https://patents.google.com/patent/US10872151</a> |
| P01-1921           | Analytics-Based Security Monitoring System and Method  | 10/15/2018  | Justin Neumann  | ISSUED             | 10728263     | <a href="https://patents.google.com/patent/US10728263">https://patents.google.com/patent/US10728263</a> |
| P01-1922           | Late Load Technique for Deploying a Virtualization Layer Underneath a Running Operating System                               | 10/15/2018  | Neeraj Kulkarni; Udo Steinberg  | FILED              | 16/160,923   |   |
| P01-1926           | Exploit Detection System   | 12/3/2018   | Anil Gupta; Harinath Ramchetty; Japneet Singh                             | ISSUED             | 10666686     | <a href="https://patents.google.com/patent/US10666686">https://patents.google.com/patent/US10666686</a> |
| P01-1931.02        | Method, Apparatus, and Computer-Readable Medium for Encoding Repetition and Definition Level Values for Semi-Structured Data | 5/25/2016   | Sattam Alsubaiee; Vinayak Borkar  | ISSUED             | 10,866,940   | <a href="https://patents.google.com/patent/US10866940">https://patents.google.com/patent/US10866940</a> |
| P01-1943           | Dynamic Guest Image Creation and Rollback  | 3/25/2019   | Harnish Goradia   | ISSUED             | 11,068,587   | <a href="https://patents.google.com/patent/US11068587">https://patents.google.com/patent/US11068587</a> |
| P01-1947           | Method to Detect Application Execution Hijacking Using Memory Protection   | 2/15/2019   | Amit Malik; Raghav Pande; Aakash Jain                                     | FILED              | 16/277907    |   |
| P01-1949           | System and Method for Identifying and Mitigating Cyberattacks through Malicious Position-Independent Code Execution          | 9/27/2019   | Steve Davis   | FILED              | 16/586794    |   |
| P01-1951.02        | System and Method for Enhanced Malware Analysis of Electronic  | 9/29/2020   | Sai Vashisht; Alexander Otvagin   | FILED              | 17/037544    |   |

| FireEye Docket No. | Title   | Filing Date | All Inventors   | Prosecution Status | Appl. Pat. # | Google Patents  |
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|                    | Messages Based on Dynamic Rendering   |             |   |                    |              |   |
| P01-1971           | System and Method for Multi-Application, Multi-Plugin Analysis for Use in Detecting a Malicious Attack  | 5/6/2019    | Sushant Paithane; Sai Vashisht; Yasir Khalid; Alex Pilipenko; Muhammad Rizwan                 | ISSUED             | 10834107     | <a href="https://patents.google.com/patent/US10834107">https://patents.google.com/patent/US10834107</a> |
| P01-1972           | System And Method For Threat Detection And Identification   | 5/6/2019    | Ashar Aziz; Jayaraman Manni; Wei-Lung Lai   | ISSUED             | 11082435     | <a href="https://patents.google.com/patent/US11082435">https://patents.google.com/patent/US11082435</a> |
| P01-1976.02        | System and Method for Circumventing Evasive Code for Cyberthreat Detection  | 12/23/2020  | Sai Vashisht; Sushant Paithane; Imtiyaz Yunus Pathan  | FILED              | 17/133379    |   |
| P01-1978           | Framework for Classifying an Object as Malicious with Machine Learning for Deploying Updated Predictive Models  | 7/29/2019   | Abhishek Singh; Ali Mesdaq; Anirban Das; Varun Jain   | ISSUED             | 10902117     | <a href="https://patents.google.com/patent/US10902117">https://patents.google.com/patent/US10902117</a> |
| P01-1979           | Dynamically Remote Tuning of a Malware Content Detection System   | 7/1/2019    | Darien Kindlund; Emmanuel Thioux; Michael Vincent; Sai Vashisht                               | FILED              | 16/459536    |   |
| P01-1980           | System and Method of Detecting Delivery of Malware Using Cross-Customer Data  | 8/30/2019   | Alex Rivlin; Divyesh Mehra; Henry Uyeno; Vinay Pidathala                                      | ISSUED             | 11019081     | <a href="https://patents.google.com/patent/US11019081">https://patents.google.com/patent/US11019081</a> |
| P01-1985.02        | Run-Time Configurable Cybersecurity System  | 12/23/2020  | Sai Vashisht; Sagar Khangan   | FILED              | 17/133397    |   |
| P01-1991.02        | Subscription and Key Management System  | 12/23/2020  | Sai Vashisht; Sumer Deshpande   | FILED              | 17/133411    |   |
| P01-2005           | Methods and Apparatus for Graphical User Interface Environment for Creating Threat Response Courses of Action for Computer Networks                                     | 12/18/2019  | Christopher Nelson Bailey; Bernd Constant; Juan Manuel Vela                                   | ISSUED             | 10986134     | <a href="https://patents.google.com/patent/US10986134">https://patents.google.com/patent/US10986134</a> |
| P01-2006           | Methods and Apparatus for Graphical User Interface Environment for Creating Threat Response Courses of Action for Computer Networks                                     | 12/18/2019  | Christopher Nelson Bailey; Bernd Constant; Juan Manuel Vela                                   | ISSUED             | 11063985     | <a href="https://patents.google.com/patent/US11063985">https://patents.google.com/patent/US11063985</a> |
| P01-2011           | System, Apparatus and Method for Automatically Verifying Exploits Within Suspect Objects and Highlighting the Display Information Associated with the Verified Exploits | 11/8/2019   | Zheng Bu; Muhammad Amin; Ashar Aziz   | ISSUED             | 11089057     | <a href="https://patents.google.com/patent/US11089057">https://patents.google.com/patent/US11089057</a> |
| P01-2012           | System and method for offloading packet processing and static analysis operations   | 3/6/2017    | Madhusudan Challa; Masood Mehmood; Muhammad Amin; Ramaswamy Ramaswamy; Shrikrishna Karandikar | ISSUED             | 11082436     | <a href="https://patents.google.com/patent/US11082436">https://patents.google.com/patent/US11082436</a> |
| P01-2016           | Malware Detection Verification and Enhancement By Coordinating Endpoint and Malware Detection Systems   | 10/28/2019  | Ashar Aziz; Osman Ismael  | FILED              | 16/666335    |   |
| P01-2023           | System and Method for Detecting Malicious Traffic Using a Virtual Machine Configured with a Select Software Environment   | 2/14/2020   | Ashar Aziz  | FILED              | 16/791933    |   |
| P01-2025.02        | Automated Enforcement of Security Policies in Cloud and Hybrid Infrastructure Environments  | 1/23/2018   | Lisun Kung; Jose Renato Santos; Sarowar Golam Sikder  | ISSUED             | 10721275     | <a href="https://patents.google.com/patent/US10721275">https://patents.google.com/patent/US10721275</a> |



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| P01-2028           | Distributed Malware Detection System and Submission Workflow Thereof   | 4/6/2020    | Alexander Otvagin                                    | FILED              | 16/840584    |                |
| P01-2029           | Dynamic Adaptive Defense for Cyber-security Threats  | 4/6/2020    | Fred Brott; Paul Smith; Thomas Bernard; David Scott  | FILED              | 16/841,383   |                |
| P01-2055           | Automated Enforcement of Security Policies in Cloud and Hybrid Infrastructure Environment                                    | 6/22/2020   | Lisun Kung; Jose Renato Santos; Sarowar Golam Sikder | FILED              | 16/908,681   |                |
| P01-2059           | Technique for Verifying Exploit/Malware at Malware Detection Appliance Through Correlation with Endpoints                    | 11/2/2020   | Ashar Aziz; Osman Ismael                             | FILED              | 17/087550    |                |
| P01-2062           | Detecting Delayed Activation Malware Using a Run-time monitoring Agent and Time-Dilation Logic                               | 10/26/2020  | Michael Vincent                                      | FILED              | 17/080,786   |                |
| P01-2063           | Enterprise Search  | 10/5/2020   | Steven Ross; Ai Duong; Larry King; Jack Young        | FILED              | 17/063618    |                |
| P01-2066           | Subscription-Based Malware Detection   | 9/28/2020   | Mumtaz Siddiqui; Manju Radhakrishnan                 | FILED              | 17/035538    |                |
| P01-2067           | Attribute-Controlled Malware Detection   | 3/29/2018   | Mumtaz Siddiqui; Manju Radhakrishnan; Deepak Agarwal | FILED              | 17/063648    |                |
| P01-2072           | Malware Detection Verification and Enhancement Using Detection Systems Located at the Network Periphery and Endpoint Devices | 1/11/2021   | Ashar Aziz; Osman Ismael                             | FILED              | 17/146417    |                |
| P01-2073           | Detection of Phishing Attacks Using Similarity Analysis  | 1/25/2021   | Rundong Liu  | FILED              | 17/157968    |                |
| P01-2081           | System And Method For Detecting Repetitive Cybersecurity Attacks Constituting An Email Campaign                              | 7/26/2021   | Jijo Xavier; Robert Venal                            | FILED              | 17/385,835   |                |

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| IP Right: IP Right ID | Country Code | Title  | Filing Date | All Inventors  | Prosecution Status | Appl. Pat. # |
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| P01-1017.03EP         | EP           | Electronic Message Analysis for Malware Detection  | 2/23/2012   | Ashar Aziz; Henry Uyeno; Jayaraman Manni; Muhammad Amin; Stuart Gresley Stanford | FILED              | 12774315.1   |
| P01-1017.04JP         | JP           | Electronic Message Analysis for Malware Detection  | 2/23/2012   | Ashar Aziz; Henry Uyeno; Jayaraman Manni; Stuart Gresley Stanford; Muhammad Amin | ISSUED             | 6013455      |
| P01-1018.04JP         | JP           | Systems and Methods for Detecting Malicious PDF Network Content                              | 1/19/2012   | Ashar Aziz; Osman Ismael   | ISSUED             | 5878560      |
| P01-1035.03EP         | EP           | Optimized Resource Allocation for Virtual Machines Within a Malware Content Detection System | 11/10/2015  | Osman Ismael   | FILED              | 13884161.4   |
| P01-1035.04JP         | JP           | Optimized Resource Allocation for Virtual Machines Within a Malware Content Detection System | 6/28/2013   | Osman Ismael   | ISSUED             | 6419787      |

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| P01-1039.05JP         | JP           | System, Apparatus and Method for Automatically Verifying Exploits Within Suspect Objects and Highlighting the Display Information Associated with the Verified Exploits | 12/23/2014  | Ashar Aziz; Zheng Bu; Muhammad Amin; Osman Ismael                                 | ISSUED             | 6441957    |
| P01-1086.03           | EP           | System and Method for Detecting Time-Bomb Malware   | 6/23/2014   | Darien Kindlund; Sushant Paithane; Sai Vashisht; Michael Vincent                  | ISSUED             | 3014513    |
| P01-1086.04           | DE           | System and Method for Detecting Time-Bomb Malware   | 6/23/2014   | Darien Kindlund; Sushant Paithane; Sai Vashisht; Michael Vincent                  | ISSUED             | 3014513    |
| P01-1086.05           | FR           | System and Method for Detecting Time-Bomb Malware   | 6/23/2014   | Darien Kindlund; Sushant Paithane; Sai Vashisht; Michael Vincent                  | ISSUED             | 3014513    |
| P01-1086.06           | GB           | System and Method for Detecting Time-Bomb Malware   | 6/23/2014   | Darien Kindlund; Sushant Paithane; Sai Vashisht; Michael Vincent                  | ISSUED             | 3014513    |
| P01-1086.07           | IE           | System and Method for Detecting Time-Bomb Malware   | 6/23/2014   | Darien Kindlund; Sushant Paithane; Sai Vashisht; Michael Vincent                  | ISSUED             | 3014513    |
| P01-1086.08           | NL           | System and Method for Detecting Time-Bomb Malware   | 6/23/2014   | Darien Kindlund; Sushant Paithane; Sai Vashisht; Michael Vincent                  | ISSUED             | 3014513    |
| P01-1086.09           | IT           | System and Method for Detecting Time-Bomb Malware   | 6/23/2014   | Darien Kindlund; Sushant Paithane; Sai Vashisht; Michael Vincent                  | ISSUED             | 3014513    |
| P01-1502.03           | EP           | Dynamic Adaptive Defense for Cyber-security Threats   | 10/2/2014   | Fred Brott; Paul Smith  | FILED              | 14850557.1 |
| P01-1595.04           | EP           | Methods and Apparatus for Graphical User Interface Environment for Creating Threat Response Courses of Action for Computer Networks                                     | 6/22/2016   | BAILEY Christopher Nelson; CONSTANT Bernd; VELA Juan Manuel                       | ISSUED             | 3311301    |
| P01-1595.05           | DE           | Methods and Apparatus for Graphical User Interface Environment for Creating Threat Response Courses of Action for Computer Networks                                     | 6/22/2016   | BAILEY Christopher Nelson; CONSTANT Bernd; VELA Juan Manuel                       | ISSUED             | 3311301    |
| P01-1595.06           | FR           | Methods and Apparatus for Graphical User Interface Environment for Creating Threat Response Courses of Action for Computer Networks                                     | 6/22/2016   | BAILEY Christopher Nelson; CONSTANT Bernd; VELA Juan Manuel                       | ISSUED             | 3311301    |
| P01-1595.07           | GB           | Methods and Apparatus for Graphical User Interface Environment for Creating Threat Response Courses of Action for Computer Networks                                     | 6/22/2016   | BAILEY Christopher Nelson; CONSTANT Bernd; VELA Juan Manuel                       | ISSUED             | 3311301    |
| P01-1605.03           | EP           | Cyber-Security System and Method for Weak Indicator Detection and Correlation to Generate Strong Indicators   | 6/29/2018   | Sundar Jeyaraman; Ramu Ramaswamy  | FILED              | 18750547.4 |
| P01-1882              | EP           | Electronic Message Analysis for Malware Detection   | 12/11/2017  | Ashar Aziz; Henry Uyeno; Jayaraman Manni; Muhammad Amin; Stuart Gresley Staniford | FILED              | 17206478.4 |

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