

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5743245

|                                                                                                                                                                                                 |                                                            |                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------|
| <b>SUBMISSION TYPE:</b>                                                                                                                                                                         | NEW ASSIGNMENT                                             |                       |
| <b>NATURE OF CONVEYANCE:</b>                                                                                                                                                                    | ASSIGNMENT                                                 |                       |
| <b>CONVEYING PARTY DATA</b>                                                                                                                                                                     |                                                            |                       |
|                                                                                                                                                                                                 | <b>Name</b>                                                | <b>Execution Date</b> |
|                                                                                                                                                                                                 | AVI SHUA                                                   | 09/26/2019            |
| <b>RECEIVING PARTY DATA</b>                                                                                                                                                                     |                                                            |                       |
| <b>Name:</b>                                                                                                                                                                                    | ORCA SECURITY LTD.                                         |                       |
| <b>Street Address:</b>                                                                                                                                                                          | 65 YIGAL ALON ST.                                          |                       |
| <b>City:</b>                                                                                                                                                                                    | TEL AVIV                                                   |                       |
| <b>State/Country:</b>                                                                                                                                                                           | ISRAEL                                                     |                       |
| <b>Postal Code:</b>                                                                                                                                                                             | 6744316                                                    |                       |
| <b>PROPERTY NUMBERS Total: 1</b>                                                                                                                                                                |                                                            |                       |
|                                                                                                                                                                                                 | <b>Property Type</b>                                       | <b>Number</b>         |
|                                                                                                                                                                                                 | Application Number:                                        | 16585967              |
| <b>CORRESPONDENCE DATA</b>                                                                                                                                                                      |                                                            |                       |
| <b>Fax Number:</b>                                                                                                                                                                              | (908)274-3113                                              |                       |
| <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>                                                                                                                                                                                   | 908-274-3111                                               |                       |
| <b>Email:</b>                                                                                                                                                                                   | pair@mb-ip.com                                             |                       |
| <b>Correspondent Name:</b>                                                                                                                                                                      | M&B IP ANALYSTS, LLC                                       |                       |
| <b>Address Line 1:</b>                                                                                                                                                                          | 500 HEADQUARTERS PLAZA                                     |                       |
| <b>Address Line 4:</b>                                                                                                                                                                          | MORRISTOWN, NEW JERSEY 07960-7070                          |                       |
| <b>ATTORNEY DOCKET NUMBER:</b>                                                                                                                                                                  | ORCA P1414                                                 |                       |
| <b>NAME OF SUBMITTER:</b>                                                                                                                                                                       | MICHAEL BEN-SHIMON                                         |                       |
| <b>SIGNATURE:</b>                                                                                                                                                                               | /Michael Ben-Shimon/                                       |                       |
| <b>DATE SIGNED:</b>                                                                                                                                                                             | 09/27/2019                                                 |                       |
|                                                                                                                                                                                                 | This document serves as an Oath/Declaration (37 CFR 1.63). |                       |
| <b>Total Attachments: 2</b>                                                                                                                                                                     |                                                            |                       |
| source=ORCA_P1414_decl_assign_20190927#page1.tif                                                                                                                                                |                                                            |                       |
| source=ORCA_P1414_decl_assign_20190927#page2.tif                                                                                                                                                |                                                            |                       |

## DECLARATION AND ASSIGNMENT FOR PATENT APPLICATIONS

As a below named inventor (designated as "the undersigned"), I hereby declare that:

This declaration is directed to: ☒ The attached application, or  
☐ United States Application No. \_\_\_ filed on \_\_

The application is entitled:

### TECHNIQUES FOR SECURING VIRTUAL MACHINES

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the above-identified application.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

**POWER OF ATTORNEY:** I hereby appoint all attorneys and agents of **M&B IP ANALYSTS, LLC** who are listed under the USPTO Customer Number shown below as my attorneys to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith.

Address all correspondence to **CUSTOMER NUMBER 122066**.

The undersigned hereby acknowledges that any willful false statement made in this declaration is punishable under 18 U.S.C. §1001 by fine or imprisonment of not more than five (5) years, or both.

### ASSIGNMENT

WHEREAS, **Orca Security LTD.**, having an address at **65 Yigal Alon St., Tel Aviv 6744316 ISRAEL** (hereinafter "ASSIGNEE"), is desirous of acquiring the entire right, title and interest in, to and under the above-identified application and invention, and to any Letters Patent(s) that may be granted therefor.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, the undersigned has sold, assigned, transferred and set over, and by these presents does hereby sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventor's certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

## DECLARATION AND ASSIGNMENT FOR PATENT APPLICATIONS

The undersigned authorizes and requests the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

The undersigned covenants and agrees that he has full right to convey the entire interest herein assigned, and has not executed, and will not execute, any agreement in conflict herewith.

The undersigned further covenants and agrees that he will communicate to the said ASSIGNEE, its successors, legal representatives and assigns, any facts known respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

In witness whereof, executed by the undersigned on the date opposite the undersigned name.

Full name of inventor: Avi SHUA

**Inventor's Signature:**  **Date:** 09/26/2019

Residence: Tel Aviv, ISRAEL

Post Office Address: c/o Orca Security LTD., 65 Yigal Alon St., Tel Aviv 6744316 ISRAEL

## SCORE Placeholder Sheet for IFW Content

Application Number: 16585967

Document Date: 09/27/2019

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via DAV or via the SCORE web page.
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Under the Paperwork Reduction Act of 1995 no persons are required to respond to a collection of information unless it displays a valid OMB control number.

|                                                                                                                                     |  |                                                       |  |
|-------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------|--|
| <b>UTILITY<br/>PATENT APPLICATION<br/>TRANSMITTAL</b><br><br><i>(Only for new nonprovisional applications under 37 CFR 1.53(b))</i> |  | Attorney Docket No. <b>ORCA P1414</b>                 |  |
|                                                                                                                                     |  | First Named Inventor <b>Avi SHUA</b>                  |  |
|                                                                                                                                     |  | Title <b>TECHNIQUES FOR SECURING VIRTUAL MACHINES</b> |  |
|                                                                                                                                     |  | Priority Mail Express® Label No.                      |  |

|                                                                                                            |                                                                                             |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>APPLICATION ELEMENTS</b><br><i>See MPEP chapter 600 concerning utility patent application contents.</i> | <b>Commissioner for Patents</b><br><b>P.O. Box 1450</b><br><b>Alexandria, VA 22313-1450</b> |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <input type="checkbox"/> <b>Fee Transmittal Form</b><br>(PTO/SB/17 or equivalent)<br>2. <input checked="" type="checkbox"/> <b>Applicant asserts small entity status.</b><br>See 37 CFR 1.27<br>3. <input type="checkbox"/> <b>Applicant certifies micro entity status.</b> See 37 CFR 1.29.<br>Applicant must attach form PTO/SB/15A or B or equivalent.<br>4. <input checked="" type="checkbox"/> <b>Specification</b> [Total Pages <u>19</u> ]<br>Both the claims and abstract must start on a new page.<br>(See MPEP § 608.01(a) for information on the preferred arrangement)<br>5. <input checked="" type="checkbox"/> <b>Drawing(s)</b> (35 U.S.C. 113) [Total Sheets <u>4</u> ]<br>6. <b>Inventor's Oath or Declaration</b> [Total Pages <u>2</u> ]<br>(including substitute statements under 37 CFR 1.64 and assignments<br>serving as an oath or declaration under 37 CFR 1.63(e))<br>a. <input checked="" type="checkbox"/> Newly executed (original or copy)<br>b. <input type="checkbox"/> A copy from a prior application (37 CFR 1.63(d))<br>7. <input checked="" type="checkbox"/> <b>Application Data Sheet</b> * See note below.<br>See 37 CFR 1.76 (PTO/AIA/14 or equivalent)<br>8. <b>CD-ROM or CD-R</b><br>in duplicate, large table, or Computer Program (Appendix)<br><input type="checkbox"/> Landscape Table on CD<br>9. <b>Nucleotide and/or Amino Acid Sequence Submission</b><br>(if applicable, items a. – c. are required)<br>a. <input type="checkbox"/> Computer Readable Form (CRF)<br>b. <input type="checkbox"/> Specification Sequence Listing on:<br>i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or<br>ii. <input type="checkbox"/> Paper<br>c. <input type="checkbox"/> Statements verifying identity of above copies | <b>ACCOMPANYING APPLICATION PAPERS</b><br>10. <input type="checkbox"/> <b>Assignment Papers</b><br>(cover sheet & document(s))<br>Name of Assignee _____<br>11. <input type="checkbox"/> <b>37 CFR 3.73(c) Statement</b> <input type="checkbox"/> <b>Power of Attorney</b><br>(when there is an assignee)<br>12. <input type="checkbox"/> <b>English Translation Document</b><br>(if applicable)<br>13. <input checked="" type="checkbox"/> <b>Information Disclosure Statement</b><br>(PTO/SB/08 or PTO-1449)<br><input type="checkbox"/> Copies of citations attached<br>14. <input type="checkbox"/> <b>Preliminary Amendment</b><br>15. <input type="checkbox"/> <b>Return Receipt Postcard</b><br>(MPEP § 503) (Should be specifically itemized)<br>16. <input type="checkbox"/> <b>Certified Copy of Priority Document(s)</b><br>(if foreign priority is claimed)<br>17. <input type="checkbox"/> <b>Nonpublication Request</b><br>Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35<br>or equivalent.<br>18. <input type="checkbox"/> <b>Other:</b> _____<br>_____<br>_____<br>_____ |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**\*Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).  
 (2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

|                                                                                                                                                                |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>19. CORRESPONDENCE ADDRESS</b>                                                                                                                              |          |
| <input checked="" type="checkbox"/> The address associated with Customer Number: <u>122066</u> <b>OR</b> <input type="checkbox"/> Correspondence address below |          |
| Name                                                                                                                                                           |          |
| Address                                                                                                                                                        |          |
| City                                                                                                                                                           | State    |
| Country                                                                                                                                                        | Zip Code |
| Telephone                                                                                                                                                      | Email    |

|                   |                      |                                   |            |
|-------------------|----------------------|-----------------------------------|------------|
| Signature         | /Michael Ben-Shimon/ | Date                              | 2019-09-27 |
| Name (Print/Type) | Michael Ben-Shimon   | Registration No. (Attorney/Agent) | 69610      |

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                          |                        |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------|------------|
| <b>Application Data Sheet 37 CFR 1.76</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          | Attorney Docket Number | ORCA P1414 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                          | Application Number     |            |
| Title of Invention                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TECHNIQUES FOR SECURING VIRTUAL MACHINES |                        |            |
| <p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p> |                                          |                        |            |

**Secrecy Order 37 CFR 5.2:**

|                          |                                                                                                                                                                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.) |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Inventor Information:**

|                                                                                                                                             |            |                        |                                   |        |        |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------|-----------------------------------|--------|--------|
| Inventor                                                                                                                                    | 1          |                        |                                   |        | Remove |
| Legal Name                                                                                                                                  |            |                        |                                   |        |        |
| Prefix                                                                                                                                      | Given Name | Middle Name            | Family Name                       | Suffix |        |
|                                                                                                                                             | Avi        |                        | SHUA                              |        |        |
| Residence Information (Select One)    US Residency    •    Non US Residency    Active US Military Service                                   |            |                        |                                   |        |        |
| City                                                                                                                                        | Tel Aviv   |                        | Country of Residence <sup>i</sup> | L      |        |
| Mailing Address of Inventor:                                                                                                                |            |                        |                                   |        |        |
| Address 1                                                                                                                                   |            | c/o Orca Security LTD. |                                   |        |        |
| Address 2                                                                                                                                   |            | 65 Yigal Alon St.      |                                   |        |        |
| City                                                                                                                                        | Tel Aviv   |                        | State/Province                    |        |        |
| Postal Code                                                                                                                                 | 6744316    |                        | Country <sup>i</sup>              | IL     |        |
| All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button. |            |                        |                                   |        |        |

**Correspondence Information:**

|                                                                                                                                       |                |           |              |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------|--------------|
| Enter either Customer Number or complete the Correspondence Information section below.<br>For further information see 37 CFR 1.33(a). |                |           |              |
| <input type="checkbox"/> An Address is being provided for the correspondence Information of this application.                         |                |           |              |
| Customer Number                                                                                                                       | 122066         |           |              |
| Email Address                                                                                                                         | pair@mb-ip.com | Add Email | Remove Email |

**Application Information:**

|                                         |                                          |                                           |                                     |
|-----------------------------------------|------------------------------------------|-------------------------------------------|-------------------------------------|
| Title of the Invention                  | TECHNIQUES FOR SECURING VIRTUAL MACHINES |                                           |                                     |
| Attorney Docket Number                  | ORCA P1414                               | Small Entity Status Claimed               | <input checked="" type="checkbox"/> |
| Application Type                        | Nonprovisional                           |                                           |                                     |
| Subject Matter                          | Utility                                  |                                           |                                     |
| Total Number of Drawing Sheets (if any) | 4                                        | Suggested Figure for Publication (if any) |                                     |

IPR2025-01087

Orca Security EX1024 Page 7

|                                           |                                          |                        |            |
|-------------------------------------------|------------------------------------------|------------------------|------------|
| <b>Application Data Sheet 37 CFR 1.76</b> |                                          | Attorney Docket Number | ORCA P1414 |
|                                           |                                          | Application Number     |            |
| Title of Invention                        | TECHNIQUES FOR SECURING VIRTUAL MACHINES |                        |            |

## Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

|                                                        |                          |                                            |
|--------------------------------------------------------|--------------------------|--------------------------------------------|
| Application number of the previously filed application | Filing date (YYYY-MM-DD) | Intellectual Property Authority or Country |
|                                                        |                          |                                            |

## Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

## Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

|                    |                                                  |                        |                                                         |
|--------------------|--------------------------------------------------|------------------------|---------------------------------------------------------|
| Please Select One: | <input checked="" type="radio"/> Customer Number | US Patent Practitioner | <input type="radio"/> Limited Recognition (37 CFR 11.9) |
| Customer Number    | 122066                                           |                        |                                                         |

## Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

|                          |                               |                          |                                    |
|--------------------------|-------------------------------|--------------------------|------------------------------------|
| Prior Application Status | Pending                       | <a href="#">Remove</a>   |                                    |
| Application Number       | Continuity Type               | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
|                          | Claims benefit of provisional | 62797718                 | 2019-01-28                         |

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

[Add](#)

|                                           |                                          |                        |            |
|-------------------------------------------|------------------------------------------|------------------------|------------|
| <b>Application Data Sheet 37 CFR 1.76</b> |                                          | Attorney Docket Number | ORCA P1414 |
|                                           |                                          | Application Number     |            |
| Title of Invention                        | TECHNIQUES FOR SECURING VIRTUAL MACHINES |                        |            |

## Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)<sup>i</sup> the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

| Application Number | Country <sup>i</sup> | Filing Date (YYYY-MM-DD) | Access Code <sup>i</sup> (if applicable) |
|--------------------|----------------------|--------------------------|------------------------------------------|
|                    |                      |                          |                                          |

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

|                                           |                                          |                        |            |
|-------------------------------------------|------------------------------------------|------------------------|------------|
| <b>Application Data Sheet 37 CFR 1.76</b> |                                          | Attorney Docket Number | ORCA P1414 |
|                                           |                                          | Application Number     |            |
| Title of Invention                        | TECHNIQUES FOR SECURING VIRTUAL MACHINES |                        |            |

## Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

**NOTE:** This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

### 1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

**A. Priority Document Exchange (PDX)** - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

**B. Search Results from U.S. Application to EPO** - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

### 2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

**NOTE:** Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

|                                           |                                          |                        |            |
|-------------------------------------------|------------------------------------------|------------------------|------------|
| <b>Application Data Sheet 37 CFR 1.76</b> |                                          | Attorney Docket Number | ORCA P1414 |
|                                           |                                          | Application Number     |            |
| Title of Invention                        | TECHNIQUES FOR SECURING VIRTUAL MACHINES |                        |            |

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------|
| <b>Applicant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                                        | <a href="#">Remove</a>                           |
| <p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> <p style="text-align: right;"><a href="#">Clear</a></p> |                                          |                                                  |
| <input checked="" type="radio"/> Assignee                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Legal Representative under 35 U.S.C. 117 | Joint Inventor                                   |
| Person to whom the inventor is obligated to assign.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          | Person who shows sufficient proprietary interest |
| If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                  |
| <div style="border: 1px solid black; height: 20px; width: 100%;"></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          |                                                  |
| Name of the Deceased or Legally Incapacitated Inventor: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                                  |
| If the Applicant is an Organization check here. <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |                                                  |
| Organization Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Orca Security LTD.                       |                                                  |
| <b>Mailing Address Information For Applicant:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                  |
| Address 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 65 Yigal Alon St.                        |                                                  |
| Address 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                          |                                                  |
| City                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Tel Aviv                                 | State/Province                                   |
| Country                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | IL                                       | Postal Code                                      |
| Phone Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                          | Fax Number                                       |
| Email Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                          |                                                  |
| Additional Applicant Data may be generated within this form by selecting the Add button. <a href="#">Add</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                          |                                                  |

## Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

|                                           |                                          |                        |            |
|-------------------------------------------|------------------------------------------|------------------------|------------|
| <b>Application Data Sheet 37 CFR 1.76</b> |                                          | Attorney Docket Number | ORCA P1414 |
|                                           |                                          | Application Number     |            |
| Title of Invention                        | TECHNIQUES FOR SECURING VIRTUAL MACHINES |                        |            |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|---------------------------------------|
| Assignee                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                  |                |                                       |
| Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication. |                    |                |                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | <input type="button" value="Remove"/> |
| If the Assignee or Non-Applicant Assignee is an Organization check here.                                                                                                                                                                                                                                                                                                                                                                               |                    |                | <input checked="" type="checkbox"/>   |
| Organization Name                                                                                                                                                                                                                                                                                                                                                                                                                                      | Orca Security LTD. |                |                                       |
| <b>Mailing Address Information For Assignee including Non-Applicant Assignee:</b>                                                                                                                                                                                                                                                                                                                                                                      |                    |                |                                       |
| Address 1                                                                                                                                                                                                                                                                                                                                                                                                                                              | 65 Yigal Alon St.  |                |                                       |
| Address 2                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |                                       |
| City                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Tel Aviv           | State/Province |                                       |
| Country i                                                                                                                                                                                                                                                                                                                                                                                                                                              | IL                 | Postal Code    | 6744316                               |
| Phone Number                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    | Fax Number     |                                       |
| Email Address                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                |                                       |
| Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.                                                                                                                                                                                                                                                                                                                                      |                    |                | <input type="button" value="Add"/>    |

**Signature:**

**NOTE:** This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is **not** checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

|                                                                                     |                      |           |                   |                                    |
|-------------------------------------------------------------------------------------|----------------------|-----------|-------------------|------------------------------------|
| Signature                                                                           | /Michael Ben-Shimon/ |           | Date (YYYY-MM-DD) | 2019-09-27                         |
| First Name                                                                          | Michael              | Last Name | Ben-Shimon        | Registration Number                |
|                                                                                     |                      |           |                   | 69610                              |
| Additional Signature may be generated within this form by selecting the Add button. |                      |           |                   | <input type="button" value="Add"/> |

|                                           |                                          |                        |            |
|-------------------------------------------|------------------------------------------|------------------------|------------|
| <b>Application Data Sheet 37 CFR 1.76</b> |                                          | Attorney Docket Number | ORCA P1414 |
|                                           |                                          | Application Number     |            |
| Title of Invention                        | TECHNIQUES FOR SECURING VIRTUAL MACHINES |                        |            |

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## DECLARATION AND ASSIGNMENT FOR PATENT APPLICATIONS

As a below named inventor (designated as "the undersigned"), I hereby declare that:

This declaration is directed to: ☒ The attached application, or  
☐ United States Application No. \_\_\_ filed on \_\_

The application is entitled:

### TECHNIQUES FOR SECURING VIRTUAL MACHINES

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the above-identified application.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

**POWER OF ATTORNEY:** I hereby appoint all attorneys and agents of **M&B IP ANALYSTS, LLC** who are listed under the USPTO Customer Number shown below as my attorneys to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith.

Address all correspondence to **CUSTOMER NUMBER 122066**.

The undersigned hereby acknowledges that any willful false statement made in this declaration is punishable under 18 U.S.C. §1001 by fine or imprisonment of not more than five (5) years, or both.

### ASSIGNMENT

WHEREAS, **Orca Security LTD.**, having an address at **65 Yigal Alon St., Tel Aviv 6744316 ISRAEL** (hereinafter "ASSIGNEE"), is desirous of acquiring the entire right, title and interest in, to and under the above-identified application and invention, and to any Letters Patent(s) that may be granted therefor.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, the undersigned has sold, assigned, transferred and set over, and by these presents does hereby sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title and interest in, to and under the said invention, and the said United States application and all divisions, renewals and continuations thereof, and all Patents of the United States which may be granted thereon and all reissues and extensions thereof; and all applications for industrial property protection, including, without limitation, all applications for patents, utility models, and designs which may hereafter be filed for said invention in any country or countries foreign to the United States, together with the right to file such applications and the right to claim for the same the priority rights derived from said United States application under the Patent Laws of the United States, the International Convention for the Protection of Industrial Property, or any other international agreement or the domestic laws of the country in which any such application is filed, as may be applicable; and all forms of industrial property protection, including, without limitation, patents, utility models, inventor's certificates and designs which may be granted for said invention in any country or countries foreign to the United States and all extensions, renewals and reissues thereof;

## DECLARATION AND ASSIGNMENT FOR PATENT APPLICATIONS

The undersigned authorizes and requests the Commissioner of Patents and Trademarks of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents or other evidence or forms of industrial property protection on applications as aforesaid, to issue the same to the said ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

The undersigned covenants and agrees that he has full right to convey the entire interest herein assigned, and has not executed, and will not execute, any agreement in conflict herewith.

The undersigned further covenants and agrees that he will communicate to the said ASSIGNEE, its successors, legal representatives and assigns, any facts known respecting said invention, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuing, reissue and foreign applications, make all rightful oaths, and generally do everything possible to aid the said ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper protection for said invention in all countries.

In witness whereof, executed by the undersigned on the date opposite the undersigned name.

Full name of inventor: Avi SHUA

**Inventor's Signature:**  **Date:** 09/26/2019

Residence: Tel Aviv, ISRAEL

Post Office Address: c/o Orca Security LTD., 65 Yigal Alon St., Tel Aviv 6744316 ISRAEL

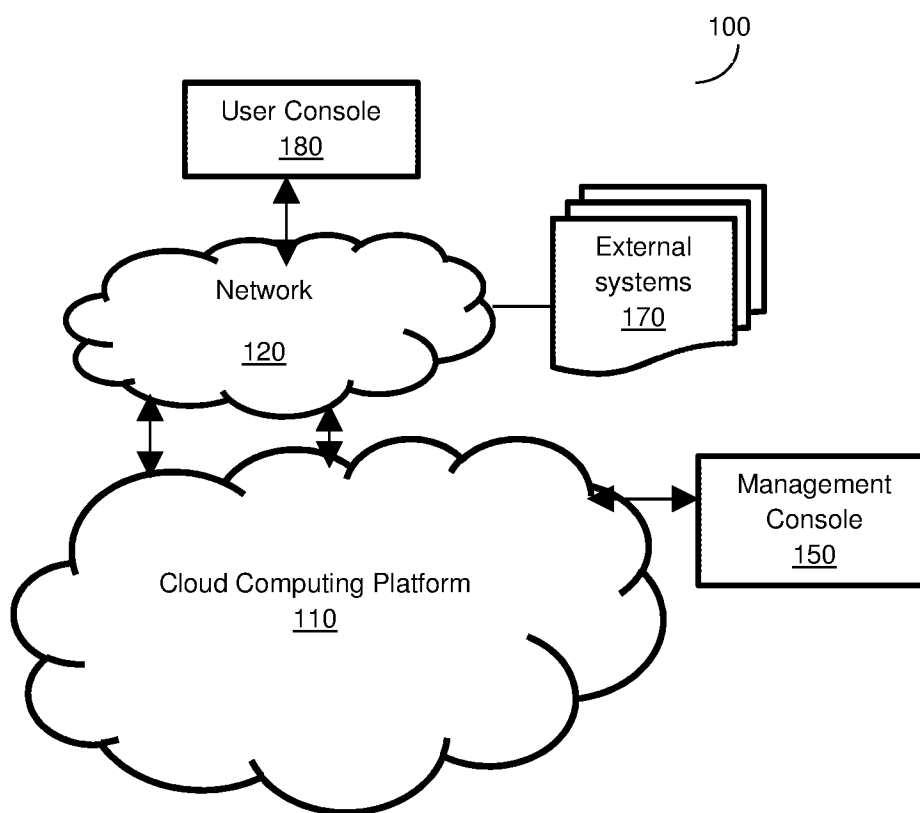


FIG. 1A

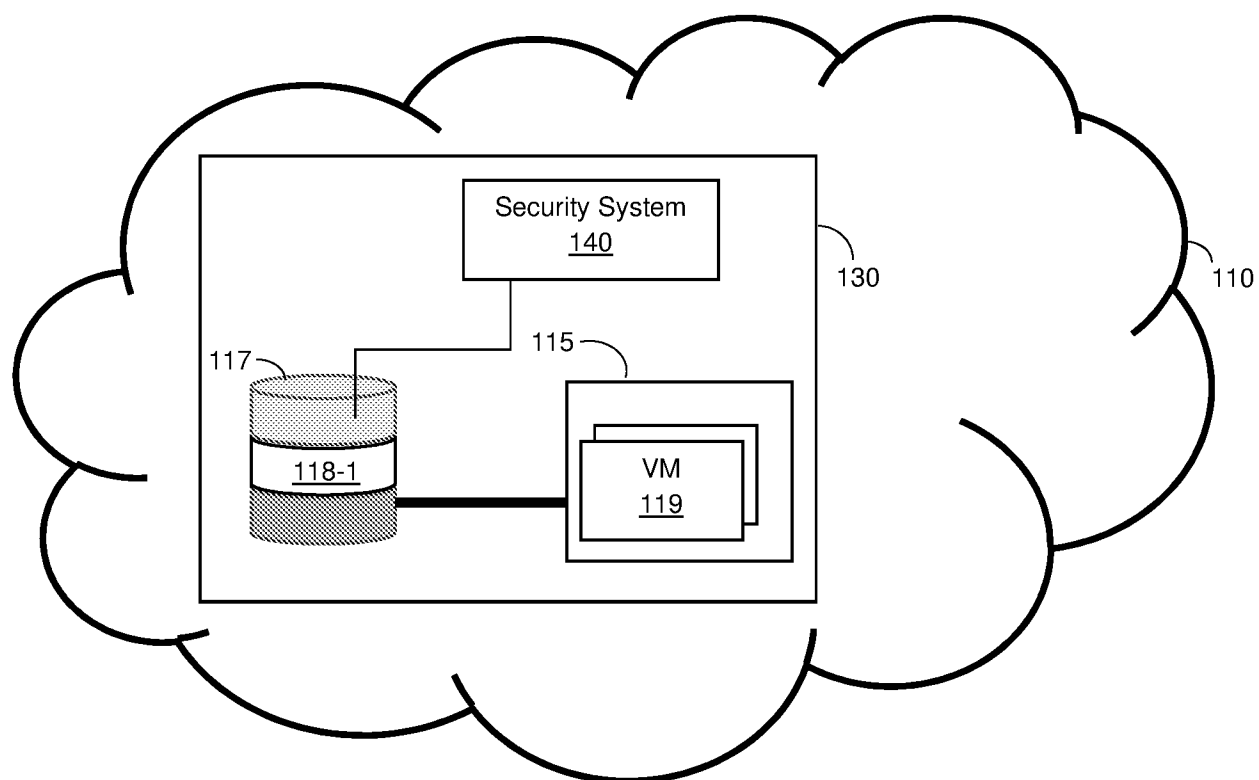


FIG. 1B

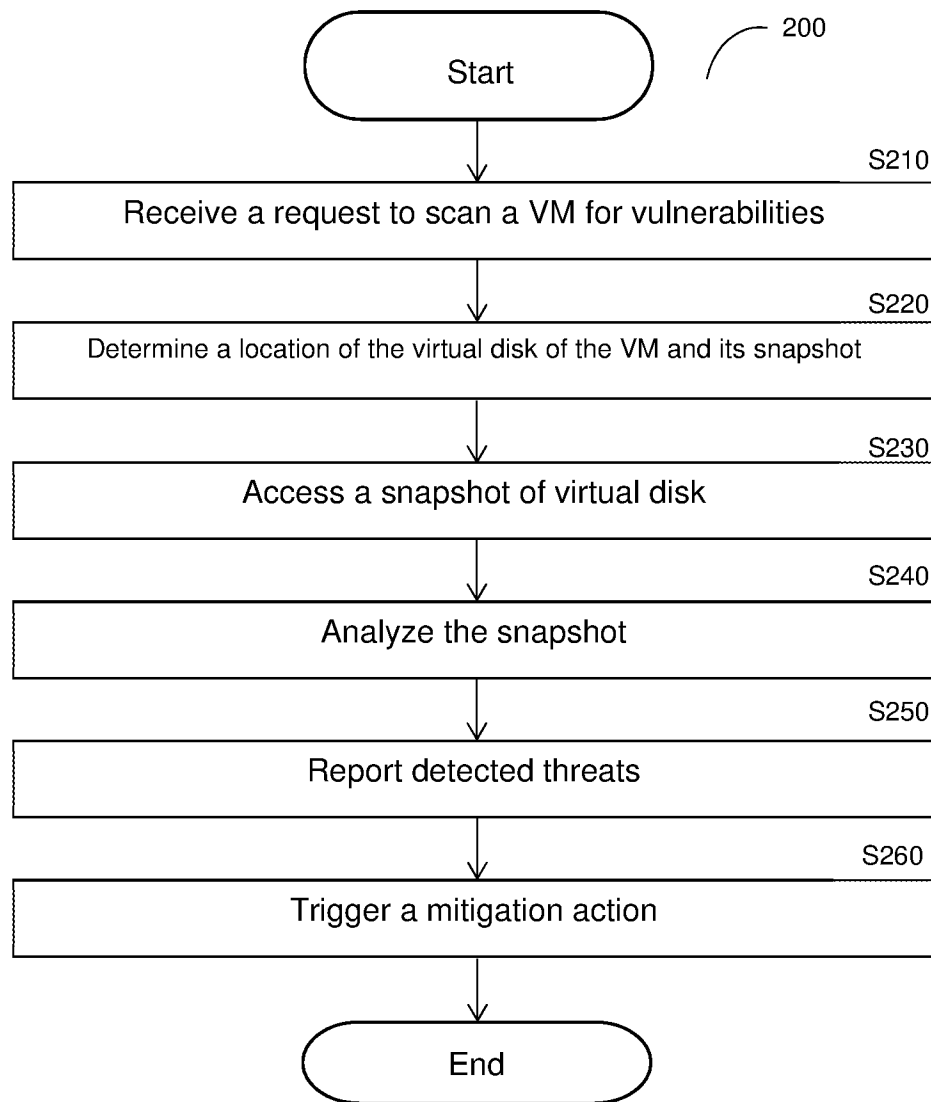


FIG. 2

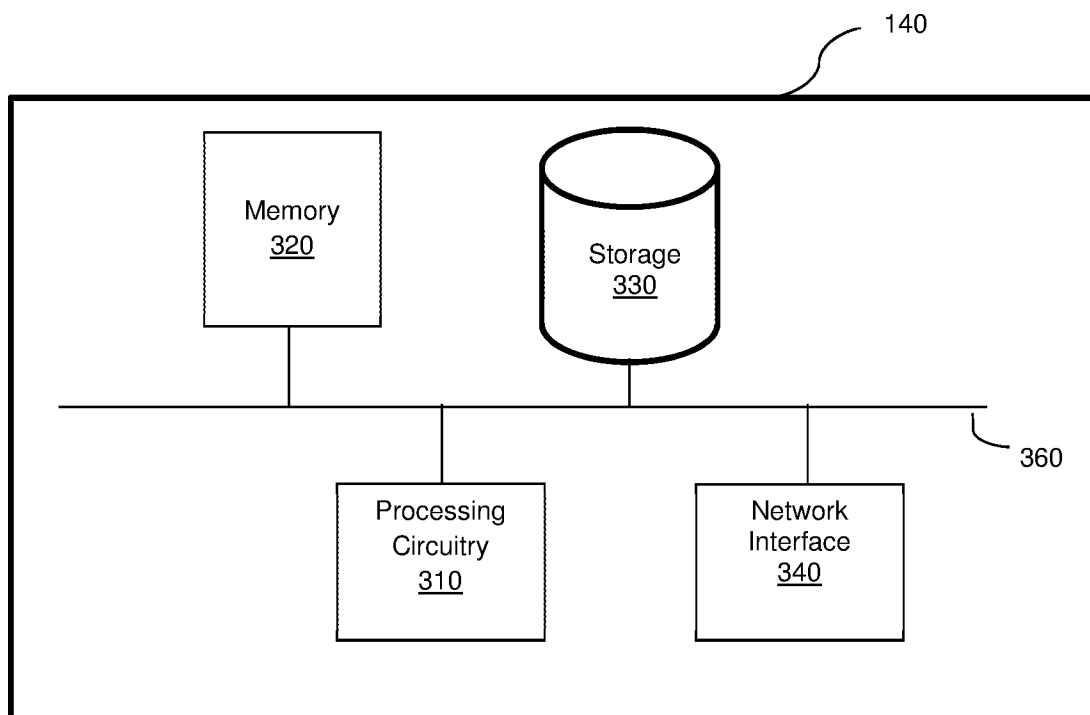


FIG. 3

**ABSTRACT**

A system and method for securing virtual cloud assets in a cloud computing environment against cyber threats. The method includes: determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment; accessing the snapshot of the virtual disk based on the determined location; analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and alerting detected potential cyber threats based on a determined priority.

## CLAIMS

What is claimed is:

1. A method for securing virtual cloud assets in a cloud computing environment against cyber threats, comprising:
  - determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;
  - accessing the snapshot of the virtual disk based on the determined location;
  - analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and
  - alerting detected potential cyber threats based on a determined priority.
2. The method of claim 1, further comprising:
  - prioritizing each detected of potential cyber threats based on their respective risk to the protected virtual cloud asset; and
  - mitigating a potential cyber threat posing a risk to the protected virtual cloud asset.
3. The method of claim 1, wherein determining the location of the snapshot of at least one virtual disk further comprises:
  - determining a virtual disk allocated to the protected virtual cloud asset.
4. The method of claim 2, further comprising:
  - querying a cloud management console of the cloud computing platform to determine the location of the snapshot and the location of the virtual disk.
5. The method of claim 1, further comprising:
  - taking a new snapshot of the protected virtual cloud asset, when an existing snapshot cannot be located.

6. The method of claim 1, wherein analyzing the snapshot of the protected virtual machine further comprises:

parsing a copy of the snapshot; and

scanning the parsed copy to detect the potential cyber threats, wherein the potential cyber threats include known and unknown vulnerabilities, and wherein the detection is based on a type of vulnerability.

7. The method of claim 6, wherein scanning the parsed copy further comprises any one of:

checking configuration files of applications and operating system installed in the protected virtual machine;

verifying access times to files by the operating system installed in the operating machine;

analyzing system logs to deduce what applications and modules executed in the protected virtual cloud asset; and

analyzing machine memory stored in the snapshot to deduce what applications and modules executed in the protected virtual cloud asset.

8. The method of claim 6, further comprising:

instantiating a copy of the protected virtual machine from the snapshot; and

monitoring all activity performed by the instance of the protected virtual cloud asset.

9. The method of claim 6, wherein scanning the parsed copy further comprises any one of:

reading process identification number (PID) files; and

checking if the at least the PID files access times match against process descriptors.

10. The method of claim 1, wherein the protected virtual cloud asset includes any one of: a virtual machine, a software container, a micro-service.

11. A non-transitory computer readable medium having stored thereon instructions for causing a processing circuitry to execute a process, the process comprising:
  - determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;
  - accessing the snapshot of the virtual disk based on the determined location;
  - analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and
  - alerting detected potential cyber threats based on a determined priority.
12. A system for securing virtual cloud assets in a cloud computing environment against cyber threats, comprising:
  - a processing circuitry; and
  - a memory, the memory containing instructions that, when executed by the processing circuitry, configure the system to:
    - determine a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;
    - access the snapshot of the virtual disk based on the determined location;
    - analyze the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and
    - alert detected potential cyber threats based on a determined priority.
13. The system of claim 12, wherein the system is further configured to:
  - prioritize each detected of potential cyber threats based on their respective risk to the protected virtual cloud asset; and
  - mitigate a potential cyber threat posing a risk to the protected virtual cloud asset.

14. The system of claim 12, wherein determining the location of the snapshot of at least one virtual disk further comprises:
- determining a virtual disk allocated to the protected virtual cloud asset.
15. The system of claim 13, wherein the system is further configured to:
- query a cloud management console of the cloud computing platform to determine the location of the snapshot and the location of the virtual disk.
16. The system of claim 12, wherein the system is further configured to:
- take a new snapshot of the protected virtual cloud asset, when an existing snapshot cannot be located.
17. The system of claim 12, wherein analyzing the snapshot of the protected virtual machine further comprises:
- parsing a copy of the snapshot; and
  - scanning the parsed copy to detect the potential cyber threats, wherein the potential cyber threats include known and unknown vulnerabilities, and wherein the detection is based on a type of vulnerability.
18. The system of claim 17, wherein scanning the parsed copy further comprises any one of:
- checking configuration files of applications and operating system installed in the protected virtual machine;
  - verifying access times to files by the operating system installed in the operating machine;
  - analyzing system logs to deduce what applications and modules executed in the protected virtual cloud asset; and
  - analyzing machine memory stored in the snapshot to deduce what applications and modules executed in the protected virtual cloud asset.
19. The system of claim 17, wherein the system is further configured to:

instantiate a copy of the protected virtual machine from the snapshot; and  
monitor all activity performed by the instance of the protected virtual cloud asset.

20. The system of claim 17, wherein scanning the parsed copy further comprises any one of:

reading process identification number (PID) files; and  
checking if the at least the PID files access times match against process descriptors.

21. The system of claim 12, wherein the protected virtual cloud asset includes any one of: a virtual machine, a software container, a micro-service.

## TECHNIQUES FOR SECURING VIRTUAL MACHINES

**[001]** This application claims the benefit of U.S. Provisional Application No. 62/797,718 filed on January 28, 2019, the contents of which are hereby incorporated by reference.

### TECHNICAL FIELD

**[002]** This disclosure relates generally to cyber-security systems and, more specifically, to techniques for securing virtual machines.

### BACKGROUND

**[003]** Organizations have increasingly adapted their applications to be run from multiple cloud computing platforms. Some leading public cloud service providers include Amazon®, Microsoft®, Google®, and the like.

**[004]** Virtualization is a key role in a cloud computing, allowing multiple applications and users to share the same cloud computing infrastructure. For example, a cloud storage service can maintain data of multiple different users.

**[005]** In one instance, virtualization can be achieved by means of virtual machines. A virtual machine emulates a number of “computers” or instances, all within a single physical device. In more detail, virtual machines provide the ability to emulate a separate operating system (OS), also referred to as a guest OS, and therefore a separate computer, from an existing OS (the host). This independent instance is typically isolated as a completely standalone environment.

**[006]** Modern virtualization technologies are also adapted by cloud computing platforms. Examples for such technologies include virtual machines, software containers, and serverless functions. With their computing advantages, applications and virtual machines running on top of virtualization technologies are also vulnerable to some cyber threats. For example, virtual machines can execute vulnerable software applications or infected operating systems.

**[007]** Protection of a cloud computing infrastructure, and particularly of virtual machines can be achieved via inspection of traffic. Traditionally, traffic inspection is performed by a network device connected between a client and a server (deployed in a cloud computing

platform or a data center) hosting virtual machines. Traffic inspection may not provide an accurate indication of the security status of the server due to inherent limitations, such as encryption and whether the necessary data is exposed in the communication.

**[008]** Furthermore, inspection of computing infrastructure may be performed by a network scanner deployed out of path. The scanner queries the server to determine if the server executes an application that possess a security threat, such as vulnerability in the application. The disadvantage of such a scanner is that the server may not respond to all queries by the scanner, or not expose the necessary data in the response. Further, the network scanner usually communicates with the server, and the network configuration may prevent it. In addition, some types of queries may require credentials to access the server. Such credentials may not be available to the scanner.

**[009]** Traffic inspection may also be performed by a traffic monitor that listens to traffic flows between clients and the server. The traffic monitor can detect some cyber threats, e.g., based on the volume of traffic. However, the monitor can detect threats only based on the monitored traffic. For example, misconfiguration of the server may not be detected by the traffic monitor. As such, traffic monitoring would not allow detection of vulnerabilities in software executed by the server.

**[0010]** To overcome the limitations of traffic inspection solutions, some cyber-security solutions, such as vulnerability management and security assessment solutions are based on agents installed in each server in a cloud computing platform or data center. Using agents is a cumbersome solution for a number of reasons, including IT resources management, governance, and performance. For example, installing agents in a large data center may take months.

**[0011]** It would therefore be advantageous to provide a security solution that would overcome the deficiencies noted above.

## **SUMMARY**

**[0012]** A summary of several example embodiments of the disclosure follows. This summary is provided for the convenience of the reader to provide a basic understanding of such embodiments and does not wholly define the breadth of the disclosure. This summary is not an extensive overview of all contemplated embodiments, and is intended to neither identify key or critical elements of all embodiments nor to delineate the scope

of any or all aspects. Its sole purpose is to present some concepts of one or more embodiments in a simplified form as a prelude to the more detailed description that is presented later. For convenience, the term “some embodiments” or “certain embodiments” may be used herein to refer to a single embodiment or multiple embodiments of the disclosure.

**[0013]** Certain embodiments disclosed herein include a method for securing virtual cloud assets in a cloud computing environment against cyber threats, comprising: determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment; accessing the snapshot of the virtual disk based on the determined location; analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and alerting detected potential cyber threats based on a determined priority.

**[0014]** Certain embodiments disclosed herein also include a non-transitory computer readable medium having stored thereon instructions for causing a processing circuitry to execute a process, the process comprising: determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment; accessing the snapshot of the virtual disk based on the determined location; analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and alerting detected potential cyber threats based on a determined priority.

**[0015]** Certain embodiments disclosed herein also include a system for securing virtual cloud assets in a cloud computing environment against cyber threats, comprising: a processing circuitry; and a memory, the memory containing instructions that, when executed by the processing circuitry, configure the system to: determine a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment; access the snapshot of the virtual disk based on the determined location; analyze the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and alert detected potential cyber threats based on a determined priority.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0016]** The foregoing and other objects, features, and advantages of the disclosed embodiments will be apparent from the following detailed description taken in conjunction with the accompanying drawings.

**[0017]** Figures 1A and 1B are network diagrams utilized to describe the various embodiments.

**[0018]** Figure 2 is a flowchart illustrating a method detecting cyber threats, including potential vulnerabilities in virtual machines executed in a cloud computing platform according to some embodiments.

**[0019]** Figure 3 is an example block diagram of the security system according to an embodiment.

### **DETAILED DESCRIPTION**

**[0020]** It is important to note that the embodiments disclosed herein are only examples of the many advantageous uses of the innovative teachings herein. In general, statements made in the specification of the present application do not necessarily limit any of the various claimed embodiments. Moreover, some statements may apply to some inventive features but not to others. In general, unless otherwise indicated, singular elements may be in plural and vice versa with no loss of generality. In the drawings, like numerals refer to like parts through several views.

**[0021]** Figs. 1A and 1B show an example network diagram 100 utilized to describe the various embodiments. A cloud computing platform 110 is communicably connected to a network 120. Examples of the cloud computing platform 110 may include a public cloud, a private cloud, a hybrid cloud, and the like. Examples for a public cloud, but are not limited to, AWS® by Amazon®, Microsoft Azure®, Google Cloud®, and the like. In some configurations, the disclosed embodiments operable in on premise virtual machines environments. The network 120 may be the Internet, the world-wide-web (WWW), a local area network (LAN), a wide area network (WAN), and other networks.

**[0022]** The arrangement of the example cloud computing platform 110 is shown in Fig. 1B. As illustrated, the platform 110 includes a server 115 and a storage 117, serving as the storage space for the server 115. The server 115 is a physical device hosting at least one virtual machine (VM) 119. The VM 119 is a protected VM, which may be any

virtual cloud asset including, but not limited to, a software container, a micro-service, a serverless function, and the like.

**[0023]** The storage 117 emulates virtual discs for the VMs executed in by the server 115. The storage 117 is typically connected to the server 115 through a high-speed connection, such as optic fiber allowing fast retrieval of data. In other configurations, the storage 117 may be part of the server 115. In this example illustrated in Fig. 1B, virtual disk 118-1 is allocated for the VM 119. The server 115, and hence the VM 119, may be executed in a client environment 130 within the platform 110.

**[0024]** The client environment 130 is an environment within the cloud computing platform 110 utilized to execute cloud-hosted applications of the client. A client may belong to a specific tenant. In some example embodiment, the client environment 130 may be part of a virtualized environment or on-premises virtualization environment, such as a VMware® based solution.

**[0025]** Also deployed in the cloud computing platform 110 is a security system 140 configured to perform the various disclosed embodiments. In some embodiments, the system 140 may be part of the client environment 130. In an embodiment, the security system 140 may be realized as a physical machine configured to execute a plurality of virtual instances, such as, but not limited to virtual machines executed by a host server. In yet another embodiment, the security system 140 may be realized as a virtual machine executed by a host server. Such a host server is a physical machine (device) and may be either the server 115, a dedicated server, a different shared server, or another virtualization-based computing entity, such as a serverless function.

**[0026]** In an embodiment, the interface between the client environment 130 and the security system 140 can be realized using APIs or services provided by the cloud computing platform 110. For example, in AWS, a cross account policy service can be utilized to allow interfacing the client environment 130 with the security system 140.

**[0027]** In the deployment, illustrated in Fig. 1, the configuration of resources of the cloud computing platform 110 is performed by means of the management console 150. As such, the management console 150 may be queried on the current deployment and settings of resources in the cloud computing platform 110. Specifically, the management console 150 may be queried, by the security system 140, about as the location (e.g., virtual

address) of the virtual disk 118-1 in the storage 117. The system 140 is configured to interface with the management console 150 through, for example, an API.

**[0028]** In some example embodiments, the security system 140 may further interface with the cloud computing platform 110 and external systems 170. The external systems may include intelligence systems, security information and event management (SIEM) systems, and mitigation tools. The external intelligence systems may include common vulnerabilities and exposures (CVE®) databases, reputation services, security systems (providing feeds on discovered threats), and so on. The information provided by the intelligence systems may detect certain known vulnerabilities identified in, for example, a CVE database.

**[0029]** According to the disclosed embodiments, the security system 140 is configured to detect vulnerabilities and other cyber threats related to the execution VM 119. The detection is performed while the VM 119 is live, without using any agent installed in the server 115 or the VM 119, and without relying on cooperation from VM 119 guest OS. Specifically, the security system 140 can scan and detect vulnerable software, non-secure configuration, exploitation attempts, compromised asserts, data leaks, data mining, and so on. The security system 140 may be further utilized to provide security services, such as incident response, anti-ransomware, and cyber insurance by accessing the security posture.

**[0030]** In some embodiments, the security system 140 is configured to query the cloud management console 150 for the address of the virtual disk 118-1 serving the VM 119 and a location of the snapshot. A VM's snapshot is a copy of the machine's virtual disk (or disk file) at a given point in time. Snapshots provide a change log for the virtual disk and are used to restore a VM to a particular point in time when a failure error occurs. Typically, any data that was writable on a VM becomes read-only when the snapshot is taken. Multiple snapshots of a VM can be created at multiple possible point-in-time restore points. When a VM reverts to a snapshot, current disk and memory states are deleted and the snapshot becomes the new parent snapshot for that VM.

**[0031]** The snapshot of the VM 119 is located and may be saved from the virtual disk 118-1 is accessed by the system 140. In an embodiment, the VM's 119 snapshot may be copied to the system 140. If such a snapshot does not exist, the system 140 may take a

new snapshot, or request such an action. The snapshots may be taken at a predefined schedule or upon predefined events (e.g., a network event or abnormal event). Further, the snapshots may be accessed or copied on a predefined schedule or upon predefined events. It should be noted that when the snapshot is taken or copied, the VM 119 still runs.

**[0032]** It should be noted that the snapshot of the virtual disk 118-1 may not be necessary stored in the storage 117, but for ease of the discussion it is assumed that the snapshot is saved in the storage 117. It should be further noted that the snapshot is being accessed without cooperation of the guest, virtual OS of the virtual machine.

**[0033]** The snapshot is parsed and analyzed by the security system 140 to detect vulnerabilities. This analysis of the snapshot does not require any interaction and/or information from the VM 119. As further demonstrated herein, the analysis of the snapshot by the system 140 does not require any agent installed on the server 115 or VM 119.

**[0034]** Various techniques can be utilized to analyze the snapshots, depending on the type of vulnerability and cyber threats to be detected. Following are some example embodiments for techniques that may be implemented by the security system 140.

**[0035]** In an embodiment, the security system 140 is configured to detect whether there is vulnerable code executed by the VM 119. The VM 119 being checked may be running, paused, or shutdown. To this end, the security system 140 is configured to match installed application lists, with their respective versions, to a known list of vulnerable applications. Further, the security system 140 may be configured to match the application files, either directly (using binary comparison) or by computing a cryptographic hash against database of files in vulnerable applications. The matching may be also on sub-modules of an application. Alternatively, the security system 140 may read installation logs of package managers used to install the packages of the application.

**[0036]** In yet another embodiment, the security system 140 is configured to verify whether the vulnerability is relevant to the VM 119. For example, if there is a vulnerable version or module not in use, the priority of that issue is reduced dramatically.

**[0037]** To this end, the security system 140 may be configured to check the configuration files of the applications and operating system of the VM 119; to verify access times to

files by the operating system; and/or to analyze the active application and/or system logs in order to deduce what applications and modules are running.

**[0038]** In yet another embodiment, the security system 140 may instantiate a copy of the VM 119 and/or a subset of applications of the VM 119 on the server 115 or a separate server and monitor all activity performed by the instance of the VM. The execution of the instance of the VM is an isolated sandbox, which can be a full VM or subset of it, such as a software container (e.g., Docker® container) or another virtualized instances. The monitored activity may be further analyzed to determine abnormality. Such analysis may include monitoring of API activity, process creation, file activity, network communication, registry changes, and active probing of the said subset in order to assess its security posture. This may include, but not limited to, actively communicating with the VM 119, using either legitimate communicate and/or attack attempts, to assess its posture and by that deriving the security posture of the entire VM 119.

**[0039]** In order to determine if the vulnerability is relevant to the VM 119, the security system 140 is configured to analyze the machine memory, as reflected in the page file. The page file is saved in the snapshot and extends how much system-committed memory (also known as “virtual memory”) a system can back. In an embodiment, analyzing the page file allows deduction of running applications and modules by the VM 119.

**[0040]** In an embodiment, the security system 140 is configured to read process identification number (PID) files and check their access or write times, which are matched against process descriptors. The PID can be used to deduce which processes are running, and hence the priority of vulnerabilities detected in processes existing on the disk. It should be noted the PID files are also maintained in the snapshot.

**[0041]** In yet another embodiment, the security system 140 is configured to detect cyber threats that do not represent vulnerabilities. For example, the security system 140 may detect and alert on sensitive data not being encrypted on the logical disk, private keys found on the disks, system credentials stored clearly on the disk, risky application features (e.g., support of weak cipher suites or authentication methods), weak passwords, weak encryption schemes, a disable address space layout randomization (ASLR) feature, suspicious manipulation to a boot record, suspicious PATH, LD\_LIBRARY\_PATH, or LD\_PRELOAD definitions, services running on startup, and the like.

**[0042]** In an embodiment, the security system 140 may further monitor changes in sensitive machine areas, and alert on unexpected changes (e.g., added or changed application files without installation). In an example embodiment, this can be achieved by computing a cryptographic hash of the sensitive areas in the virtual disk and checking for differences over time.

**[0043]** In some embodiments, the detected cyber threats (including vulnerabilities) are reported to a user console 180 and/or a security information and event management (SIEM) system (not shown). The reported cyber threats may be filtered or prioritized based in part on their determined risk. Further, the reported cyber threats may be filtered or prioritized based in part on the risk level of the machine. This also reduces the number of alerts reported to the user.

**[0044]** In an embodiment, any detected cyber threats related to sensitive data (including personally identifiable information, PII) is reported at a higher priority. In an embodiment, such data is determined by searching for the PII, analyzing the application logs to determine whether the machine accessed PII/PII containing servers, or whether the logs themselves contain PII, and searching the machine memory, as reflected in the page file, for PII.

**[0045]** In an embodiment, the security system 140 may determine the risk of the VM 119 based on communication with an untrusted network. This can be achieved by analyzing the VM's 119 logs as saved in the virtual disk and can be derived from the snapshot.

**[0046]** In an example embodiment, the security system 140 may cause an execution of one or more mitigation actions. Examples of such actions may include blocking traffic from untrusted networks, halting the operation of the VM, quarantining an infected VM, and the like. The mitigation actions may be performed by a mitigation tool and not the system 140.

**[0047]** It should be noted that the example implementation shown in Fig. 1 is described with respect to a single cloud computing platform 110 hosting a single VM 119 in a single server 115, merely for simplicity purposes and without limitation on the disclosed embodiments. Typically, virtual machines are deployed and executed in a single cloud computing platform, a virtualized environment, or data center and can be protected without departing from the scope of the disclosure. It should be further noted that the

disclosed embodiments can operate using multiple security systems 140, each of which may operate in a different client environment.

**[0048]** Fig. 2 shows an example flowchart 200 illustrating a method for detecting cyber threats including potential vulnerabilities in virtual machines executed in a cloud computing platform according to some embodiments. The method may be performed by the security system 140.

**[0049]** At S210, a request, for example, to scan a VM for vulnerabilities is received. The request may be received, or otherwise triggered every predefined time interval or upon detection of an external event. An external event may be a preconfigured event, such as a network event or abnormal event including, but not limited to, changes to infrastructure such as instantiation of an additional container on existing VM, image change on a VM, new VM created, unexpected shutdowns, access requests from unauthorized users, and the like. The request may at least designate an identifier of the VM to be scanned.

**[0050]** At S220, a location of a snapshot of a virtual disk of the VM to be scanned is determined. In an embodiment, S220 may include determining the virtual disk allocated for the VM, prior to determining the location of the snapshot. As noted above, this can be achieved by querying a cloud management console. At S230, a snapshot of the virtual disk is accessed, or otherwise copied.

**[0051]** At S240, the snapshot is analyzed to detect cyber threats and potential vulnerabilities. S240 may also include detecting cyber threats that do not represent vulnerabilities. Examples for cyber threats and vulnerabilities are provided above.

**[0052]** In an embodiment, S240 may include comparing the snapshot to some baseline, which may include, but is not limited to, a copy of the image used to create the VM, (e.g., lists of applications, previous snapshots), cryptographic hashes gathered in the previous scan, analyzing logs of the VMs, instantiating a copy of the VM and executing the instance or applications executed by the VM in a sandbox, analyzing the machine memory, as reflected in the page file, or any combination of these techniques. Some example embodiments for analyzing the snapshots and the types of detected vulnerabilities and threats are provided above.

**[0053]** At S250, the detected cyber threats and/or vulnerabilities are reported, for example, as alerts. In an embodiment, S250 may include filtering and prioritizing the

reported alerts. In an embodiment, the prioritization is based, in part, on the risk level of a vulnerable machine. The filtering and prioritizing allow to reduce the number of alerts reported to the user. The filtering can be done performed on external intelligence on the likelihood of this vulnerability being exploited, analyzing the machine configuration in order to deduce the vulnerability relevancy, and correlating the vulnerability with the network location, and by weighting the risk of this machine being taken over by the attacker by taking into consideration the criticality of the machine in the organization based by the contents stored or other assets accessible from the VM 110.

**[0054]** At optional S260, a mitigation action may be triggered to mitigate a detected threat or vulnerability. A mitigation action may be executed by a mitigation tool and triggered by the system 140. Such an action may include blocking traffic from untrusted networks, halting the operation of the VM, quarantining an infected VM, and the like.

**[0055]** Fig. 3 is an example block diagram of the security system 140 according to an embodiment. The security system 140 includes a processing circuitry 310 coupled to a memory 320, a storage 330, and a network interface 340. In an embodiment, the components of the security system 140 may be communicatively connected via a bus 360.

**[0056]** The processing circuitry 310 may be realized as one or more hardware logic components and circuits. For example, and without limitation, illustrative types of hardware logic components that can be used include field programmable gate arrays (FPGAs), application-specific integrated circuits (ASICs), application-specific standard products (ASSPs), system-on-a-chip systems (SOCs), general-purpose microprocessors, microcontrollers, digital signal processors (DSPs), and the like, or any other hardware logic components that can perform calculations or other manipulations of information.

**[0057]** The memory 310 may be volatile (e.g., RAM, etc.), non-volatile (e.g., ROM, flash memory, etc.), or a combination thereof. In one configuration, computer readable instructions to implement one or more embodiments disclosed herein may be stored in the storage 330.

**[0058]** In another embodiment, the memory 320 is configured to store software. Software shall be construed broadly to mean any type of instructions, whether referred to as

software, firmware, middleware, microcode, hardware description language, or otherwise. Instructions may include code (e.g., in source code format, binary code format, executable code format, or any other suitable format of code). The instructions, when executed by the one or more processors, cause the processing circuitry 310 to perform the various processes described herein. Specifically, the instructions, when executed, cause the processing circuitry 310 to determine over-privileged roles vulnerabilities in serverless functions.

**[0059]** The storage 330 may be magnetic storage, optical storage, and the like, and may be realized, for example, as flash memory or other memory technology, CD-ROM, Digital Versatile Disks (DVDs), hard-drives, SSD, or any other medium which can be used to store the desired information. The storage 330 may store communication consumption patterns associated with one or more communications devices.

**[0060]** The network interface 340 allows the security system 140 to communicate with the external systems, such as intelligence systems, SIEM systems, mitigation systems, a cloud management console, a user console, and the like.

**[0061]** It should be understood that the embodiments described herein are not limited to the specific architecture illustrated in Fig. 3, and other architectures may be equally used without departing from the scope of the disclosed embodiments.

**[0062]** The various embodiments disclosed herein can be implemented as hardware, firmware, software, or any combination thereof. Moreover, the software is preferably implemented as an application program tangibly embodied on a program storage unit or computer readable medium consisting of parts, or of certain devices and/or a combination of devices. The application program may be uploaded to, and executed by, a machine comprising any suitable architecture. Preferably, the machine is implemented on a computer platform having hardware such as one or more central processing units (“CPUs”), a memory, and input/output interfaces. The computer platform may also include an operating system and microinstruction code. The various processes and functions described herein may be either part of the microinstruction code or part of the application program, or any combination thereof, which may be executed by a CPU, whether or not such a computer or processor is explicitly shown. In addition, various other peripheral units may be connected to the computer platform such as an additional data storage unit

and a printing unit. Furthermore, a non-transitory computer readable medium is any computer readable medium except for a transitory propagating signal.

**[0063]** As used herein, the phrase “at least one of” followed by a listing of items means that any of the listed items can be utilized individually, or any combination of two or more of the listed items can be utilized. For example, if a system is described as including “at least one of A, B, and C,” the system can include A alone; B alone; C alone; A and B in combination; B and C in combination; A and C in combination; or A, B, and C in combination.

**[0064]** All examples and conditional language recited herein are intended for pedagogical purposes to aid the reader in understanding the principles of the disclosed embodiment and the concepts contributed by the inventor to furthering the art, and are to be construed as being without limitation to such specifically recited examples and conditions. Moreover, all statements herein reciting principles, aspects, and embodiments of the disclosed embodiments, as well as specific examples thereof, are intended to encompass both structural and functional equivalents thereof. Additionally, it is intended that such equivalents include both currently known equivalents as well as equivalents developed in the future, i.e., any elements developed that perform the same function, regardless of structure.

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

| Electronic Patent Application Fee Transmittal |          |                                          |        |                      |
|-----------------------------------------------|----------|------------------------------------------|--------|----------------------|
| Application Number:                           |          |                                          |        |                      |
| Filing Date:                                  |          |                                          |        |                      |
| Title of Invention:                           |          | TECHNIQUES FOR SECURING VIRTUAL MACHINES |        |                      |
| First Named Inventor/Applicant Name:          |          | Avi SHUA                                 |        |                      |
| Filer:                                        |          | Michael Ben-Shimon/Chelsea Wuesthoff     |        |                      |
| Attorney Docket Number:                       |          | ORCA P1414                               |        |                      |
| Filed as Small Entity                         |          |                                          |        |                      |
| Filing Fees for   Utility under 35 USC 111(a) |          |                                          |        |                      |
| Description                                   | Fee Code | Quantity                                 | Amount | Sub-Total in USD(\$) |
| Basic Filing:                                 |          |                                          |        |                      |
| UTILITY FILING FEE (ELECTRONIC FILING)        | 4011     | 1                                        | 75     | 75                   |
| UTILITY SEARCH FEE                            | 2111     | 1                                        | 330    | 330                  |
| UTILITY EXAMINATION FEE                       | 2311     | 1                                        | 380    | 380                  |
| Pages:                                        |          |                                          |        |                      |
| Claims:                                       |          |                                          |        |                      |
| CLAIMS IN EXCESS OF 20                        | 2202     | 1                                        | 50     | 50                   |
| Miscellaneous-Filing:                         |          |                                          |        |                      |
| Petition:                                     |          |                                          |        |                      |

| Description                       | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|-----------------------------------|----------|----------|--------|----------------------|
| Patent-Appeals-and-Interference:  |          |          |        |                      |
| Post-Allowance-and-Post-Issuance: |          |          |        |                      |
| Extension-of-Time:                |          |          |        |                      |
| Miscellaneous:                    |          |          |        |                      |
| Total in USD (\$)                 |          |          |        | 835                  |

## Electronic Acknowledgement Receipt

|                                             |                                          |
|---------------------------------------------|------------------------------------------|
| <b>EFS ID:</b>                              | 37300648                                 |
| <b>Application Number:</b>                  | 16585967                                 |
| <b>International Application Number:</b>    |                                          |
| <b>Confirmation Number:</b>                 | 9843                                     |
| <b>Title of Invention:</b>                  | TECHNIQUES FOR SECURING VIRTUAL MACHINES |
| <b>First Named Inventor/Applicant Name:</b> | Avi SHUA                                 |
| <b>Customer Number:</b>                     | 122066                                   |
| <b>Filer:</b>                               | Michael Ben-Shimon/Chelsea Wuesthoff     |
| <b>Filer Authorized By:</b>                 | Michael Ben-Shimon                       |
| <b>Attorney Docket Number:</b>              | ORCA P1414                               |
| <b>Receipt Date:</b>                        | 27-SEP-2019                              |
| <b>Filing Date:</b>                         |                                          |
| <b>Time Stamp:</b>                          | 15:50:08                                 |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)              |

### Payment information:

|                                          |                  |
|------------------------------------------|------------------|
| Submitted with Payment                   | yes              |
| Payment Type                             | CARD             |
| Payment was successfully received in RAM | \$835            |
| RAM confirmation Number                  | E20199QF50275882 |
| Deposit Account                          |                  |
| Authorized User                          |                  |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

IPR2025-01087

|                 |                                                     |                                       |                                          |                  |                  |
|-----------------|-----------------------------------------------------|---------------------------------------|------------------------------------------|------------------|------------------|
|                 |                                                     |                                       |                                          |                  |                  |
| File Listing:   |                                                     |                                       |                                          |                  |                  |
| Document Number | Document Description                                | File Name                             | File Size(Bytes)/ Message Digest         | Multi Part /.zip | Pages (if appl.) |
| 1               | Transmittal of New Application                      | ORCA_aia0015_transmittal_20190927.pdf | 308802                                   | no               | 2                |
|                 |                                                     |                                       | 4e6aacc8d6170822feca31125777eeb5866065d4 |                  |                  |
| Warnings:       |                                                     |                                       |                                          |                  |                  |
| Information:    |                                                     |                                       |                                          |                  |                  |
| 2               | Application Data Sheet                              | ORCA_P1414_ads_20190927.pdf           | 1255992                                  | no               | 8                |
|                 |                                                     |                                       | 3db8c806245085050ccc44af5ffd394ec5a7520e |                  |                  |
| Warnings:       |                                                     |                                       |                                          |                  |                  |
| Information:    |                                                     |                                       |                                          |                  |                  |
| 3               | Oath or Declaration filed                           | ORCA_P1414_decl_assign_20190927.pdf   | 55385                                    | no               | 2                |
|                 |                                                     |                                       | 414298e49c6e074e33f5d91eedba5faeff1ff00  |                  |                  |
| Warnings:       |                                                     |                                       |                                          |                  |                  |
| Information:    |                                                     |                                       |                                          |                  |                  |
| 4               |                                                     | ORCA_P1414_spec_drawings_20190927.pdf | 150044                                   | yes              | 23               |
|                 |                                                     |                                       | 28a272aeca325dc98d50866ec204e60d4ea559c  |                  |                  |
|                 | Multipart Description/PDF files in .zip description |                                       |                                          |                  |                  |
|                 | Document Description                                |                                       | Start                                    | End              |                  |
|                 | Drawings-only black and white line drawings         |                                       | 20                                       | 23               |                  |
|                 | Abstract                                            |                                       | 19                                       | 19               |                  |
|                 | Claims                                              |                                       | 14                                       | 18               |                  |
|                 | Specification                                       |                                       | 1                                        | 13               |                  |
| Warnings:       |                                                     |                                       |                                          |                  |                  |
| Information:    |                                                     |                                       |                                          |                  |                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                    |                             |                                          |    |   |
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| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Information Disclosure Statement (IDS) Form (SB08) | ORCA_P1414_ids_20190927.pdf | 1053623                                  | no | 5 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                    |                             | f2f4cc617f81a2f435ead69e7b5f68b5156312b6 |    |   |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                    |                             |                                          |    |   |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                    |                             |                                          |    |   |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Fee Worksheet (SB06)                               | fee-info.pdf                | 36686                                    | no | 2 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                    |                             | 82dfa5e999d5932e50bee12d11f4df149fb3a36f |    |   |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                    |                             |                                          |    |   |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                    |                             |                                          |    |   |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                    |                             | 2860532                                  |    |   |
| <p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p> |                                                    |                             |                                          |    |   |

## POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

| Application Number | Filing Date |
|--------------------|-------------|
|                    |             |

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

122066

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

**Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:**

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Orca Security LTD.

- ☐ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

### SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

Name

Avi Shua

Title

CEO

**NOTE:** Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 1.

IPR2025-01087

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Acknowledgement Receipt

|                                             |                                          |
|---------------------------------------------|------------------------------------------|
| <b>EFS ID:</b>                              | 37312303                                 |
| <b>Application Number:</b>                  | 16585967                                 |
| <b>International Application Number:</b>    |                                          |
| <b>Confirmation Number:</b>                 | 9843                                     |
| <b>Title of Invention:</b>                  | TECHNIQUES FOR SECURING VIRTUAL MACHINES |
| <b>First Named Inventor/Applicant Name:</b> | Avi SHUA                                 |
| <b>Customer Number:</b>                     | 122066                                   |
| <b>Filer:</b>                               | Ryan Michael McCormick/Chelsea Wuesthoff |
| <b>Filer Authorized By:</b>                 | Ryan Michael McCormick                   |
| <b>Attorney Docket Number:</b>              | ORCA P1414                               |
| <b>Receipt Date:</b>                        | 30-SEP-2019                              |
| <b>Filing Date:</b>                         |                                          |
| <b>Time Stamp:</b>                          | 12:51:14                                 |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)              |

### Payment information:

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

### File Listing:

| Document Number | Document Description | File Name                           | File Size(Bytes)/<br>Message Digest                | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------------------------|----------------------------------------------------|------------------|------------------|
| 1               | Power of Attorney    | ORCA_P1414_poa_aia0082_20190927.pdf | 121490<br>6d075820fe4ed2171197a1f869c142fc2ebc251e | no               | 2                |

### Warnings:

IPR2025-01087

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 121490 |
| <p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |        |



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
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P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION<br>NUMBER | FILING or<br>371(c) DATE | GRP ART<br>UNIT | FIL FEE REC'D | ATTY. DOCKET NO | TOT CLAIMS | IND CLAIMS |
|-----------------------|--------------------------|-----------------|---------------|-----------------|------------|------------|
| 16/585,967            | 09/27/2019               |                 | 835           | ORCA P1414      | 21         | 3          |

**CONFIRMATION NO. 9843**

122066  
M&B IP Analysts, LLC  
500 Headquarters Plaza  
Morristown, NJ 07960-7070

## FILING RECEIPT



Date Mailed: 11/01/2019

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

**Please verify the accuracy of the data presented on this receipt.** If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

### Inventor(s)

Avi SHUA, Tel Aviv, ISRAEL;

### Applicant(s)

Orca Security LTD., Tel Aviv, ISRAEL;

### Assignment For Published Patent Application

Orca Security LTD., Tel Aviv, ISRAEL

**Power of Attorney:** The patent practitioners associated with Customer Number 122066

### Domestic Priority data as claimed by applicant

This appln claims benefit of 62/797,718 01/28/2019

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

**Permission to Access Application via Priority Document Exchange:** Yes

**Permission to Access Search Results:** Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

**If Required, Foreign Filing License Granted:** 10/30/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/585,967**

**Projected Publication Date:** 07/30/2020

**Non-Publication Request:** No

**Early Publication Request:** No

**\*\* SMALL ENTITY \*\***

**Title**

TECHNIQUES FOR SECURING VIRTUAL MACHINES

**Preliminary Class**

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

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**Title 37, Code of Federal Regulations, 5.11 & 5.15**

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| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |                                  |          |                                    |               | Application or Docket Number<br>16/585,967 |                    |                               |                    |                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------|------------------------------------|---------------|--------------------------------------------|--------------------|-------------------------------|--------------------|--------------------|
| <b>APPLICATION AS FILED - PART I</b>                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                               |                    |                    |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               | (Column 2)                       |          | SMALL ENTITY                       |               | OR<br>OTHER THAN SMALL ENTITY              |                    |                               |                    |                    |
| FOR                                                                                                                                                                                                                                                                                                                                                                                                        | NUMBER FILED                                                                                                                                                                                                                  | NUMBER EXTRA                     | RATE(\$) | FEE(\$)                            |               | RATE(\$)                                   | FEE(\$)            |                               |                    |                    |
| BASIC FEE<br>(37 CFR 1.16(a), (b), or (c))                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                                                                                                                                                                                           | N/A                              | N/A      | 75                                 |               | N/A                                        |                    |                               |                    |                    |
| SEARCH FEE<br>(37 CFR 1.16(k), (l), or (m))                                                                                                                                                                                                                                                                                                                                                                | N/A                                                                                                                                                                                                                           | N/A                              | N/A      | 330                                |               | N/A                                        |                    |                               |                    |                    |
| EXAMINATION FEE<br>(37 CFR 1.16(o), (p), or (q))                                                                                                                                                                                                                                                                                                                                                           | N/A                                                                                                                                                                                                                           | N/A                              | N/A      | 380                                |               | N/A                                        |                    |                               |                    |                    |
| TOTAL CLAIMS<br>(37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                                                           | 21                                                                                                                                                                                                                            | minus 20 = *                     | 1        | x 50 =                             | 50            |                                            |                    |                               |                    |                    |
| INDEPENDENT CLAIMS<br>(37 CFR 1.16(h))                                                                                                                                                                                                                                                                                                                                                                     | 3                                                                                                                                                                                                                             | minus 3 = *                      |          | x 230 =                            | 0.00          |                                            |                    |                               |                    |                    |
| APPLICATION SIZE FEE<br>(37 CFR 1.16(s))                                                                                                                                                                                                                                                                                                                                                                   | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). |                                  |          |                                    | 0.00          |                                            |                    |                               |                    |                    |
| MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |                                  |          |                                    | 0.00          |                                            |                    |                               |                    |                    |
| * If the difference in column 1 is less than zero, enter "0" in column 2.                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                               |                                  |          | TOTAL                              | 835           | TOTAL                                      |                    |                               |                    |                    |
| <b>APPLICATION AS AMENDED - PART II</b>                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                               |                    |                    |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               | (Column 2)                       |          | (Column 3)                         |               | SMALL ENTITY                               |                    | OR<br>OTHER THAN SMALL ENTITY |                    |                    |
| AMENDMENT A                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               | CLAIMS REMAINING AFTER AMENDMENT |          | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE(\$)                                   | ADDITIONAL FEE(\$) |                               | RATE(\$)           | ADDITIONAL FEE(\$) |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Total<br>(37 CFR 1.16(i))                                                                                                                                                                                                     | *                                | Minus    | **                                 | =             | x                                          | =                  |                               | x                  | =                  |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Independent<br>(37 CFR 1.16(h))                                                                                                                                                                                               | *                                | Minus    | ***                                | =             | x                                          | =                  |                               | x                  | =                  |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                         |                                  |          |                                    |               |                                            |                    |                               |                    |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                               |                    |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                  |          |                                    |               | TOTAL<br>ADD'L FEE                         |                    |                               | TOTAL<br>ADD'L FEE |                    |
| AMENDMENT B                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               | CLAIMS REMAINING AFTER AMENDMENT |          | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE(\$)                                   | ADDITIONAL FEE(\$) |                               | RATE(\$)           | ADDITIONAL FEE(\$) |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Total<br>(37 CFR 1.16(i))                                                                                                                                                                                                     | *                                | Minus    | **                                 | =             | x                                          | =                  |                               | x                  | =                  |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Independent<br>(37 CFR 1.16(h))                                                                                                                                                                                               | *                                | Minus    | ***                                | =             | x                                          | =                  |                               | x                  | =                  |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                         |                                  |          |                                    |               |                                            |                    |                               |                    |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                               |                    |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                  |          |                                    |               | TOTAL<br>ADD'L FEE                         |                    |                               | TOTAL<br>ADD'L FEE |                    |
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.<br>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".<br>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".<br>The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1. |                                                                                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                               |                    |                    |

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|                                                                                                                                 |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------|---------------|---------------------------|----------|---------------------------------------|--|
| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875                                               |                                                                                          |                                                                                                                                                                                                                               |              | Application or Docket Number<br>16/585,967 |               | Filing Date<br>09/27/2019 |          | <input type="checkbox"/> To be Mailed |  |
| ENTITY: <input type="checkbox"/> LARGE <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> MICRO                 |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
| <b>APPLICATION AS FILED - PART I</b>                                                                                            |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
|                                                                                                                                 |                                                                                          | (Column 1)                                                                                                                                                                                                                    | (Column 2)   |                                            |               |                           |          |                                       |  |
| FOR                                                                                                                             |                                                                                          | NUMBER FILED                                                                                                                                                                                                                  | NUMBER EXTRA |                                            | RATE (\$)     |                           | FEE (\$) |                                       |  |
| <input type="checkbox"/> BASIC FEE<br>(37 CFR 1.16(a), (b), or (c))                                                             |                                                                                          | N/A                                                                                                                                                                                                                           | N/A          |                                            | N/A           |                           |          |                                       |  |
| <input type="checkbox"/> SEARCH FEE<br>(37 CFR 1.16(k), (l), or (m))                                                            |                                                                                          | N/A                                                                                                                                                                                                                           | N/A          |                                            | N/A           |                           |          |                                       |  |
| <input type="checkbox"/> EXAMINATION FEE<br>(37 CFR 1.16(o), (p), or (q))                                                       |                                                                                          | N/A                                                                                                                                                                                                                           | N/A          |                                            | N/A           |                           |          |                                       |  |
| TOTAL CLAIMS<br>(37 CFR 1.16(i))                                                                                                |                                                                                          | minus 20 = *                                                                                                                                                                                                                  |              | x \$50 =                                   |               |                           |          |                                       |  |
| INDEPENDENT CLAIMS<br>(37 CFR 1.16(h))                                                                                          |                                                                                          | minus 3 = *                                                                                                                                                                                                                   |              | x \$230 =                                  |               |                           |          |                                       |  |
| <input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))                                                                  |                                                                                          | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). |              |                                            |               |                           |          |                                       |  |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))                                                      |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
| * If the difference in column 1 is less than zero, enter "0" in column 2.                                                       |                                                                                          |                                                                                                                                                                                                                               |              |                                            | TOTAL         |                           |          |                                       |  |
| <b>APPLICATION AS AMENDED - PART II</b>                                                                                         |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
|                                                                                                                                 |                                                                                          | (Column 1)                                                                                                                                                                                                                    |              | (Column 2)                                 | (Column 3)    |                           |          |                                       |  |
| <b>AMENDMENT</b>                                                                                                                | 01/23/2020                                                                               | CLAIMS REMAINING AFTER AMENDMENT                                                                                                                                                                                              |              | HIGHEST NUMBER PREVIOUSLY PAID FOR         | PRESENT EXTRA | RATE (\$)                 |          | ADDITIONAL FEE (\$)                   |  |
|                                                                                                                                 | Total<br>(37 CFR 1.16(i))                                                                | * 21                                                                                                                                                                                                                          | Minus        | ** 21                                      | = 0           | x \$50 =                  |          | 0                                     |  |
|                                                                                                                                 | Independent<br>(37 CFR 1.16(h))                                                          | * 3                                                                                                                                                                                                                           | Minus        | *** 3                                      | = 0           | x \$230 =                 |          | 0                                     |  |
|                                                                                                                                 | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                           |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
|                                                                                                                                 | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
|                                                                                                                                 |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               | TOTAL ADD'L FEE           |          | 0                                     |  |
|                                                                                                                                 |                                                                                          | (Column 1)                                                                                                                                                                                                                    |              | (Column 2)                                 | (Column 3)    |                           |          |                                       |  |
| <b>AMENDMENT</b>                                                                                                                |                                                                                          | CLAIMS REMAINING AFTER AMENDMENT                                                                                                                                                                                              |              | HIGHEST NUMBER PREVIOUSLY PAID FOR         | PRESENT EXTRA | RATE (\$)                 |          | ADDITIONAL FEE (\$)                   |  |
|                                                                                                                                 | Total<br>(37 CFR 1.16(i))                                                                | *                                                                                                                                                                                                                             | Minus        | **                                         | =             | x \$0 =                   |          |                                       |  |
|                                                                                                                                 | Independent<br>(37 CFR 1.16(h))                                                          | *                                                                                                                                                                                                                             | Minus        | ***                                        | =             | x \$0 =                   |          |                                       |  |
|                                                                                                                                 | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                           |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
|                                                                                                                                 | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
|                                                                                                                                 |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               | TOTAL ADD'L FEE           |          |                                       |  |
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.                                           |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               | LDRC                      |          |                                       |  |
| ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".                                       |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               | /EVA V GILLIS/            |          |                                       |  |
| *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".                                        |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |
| The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1. |                                                                                          |                                                                                                                                                                                                                               |              |                                            |               |                           |          |                                       |  |

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Orca Security LTD.

Serial No.: 16/585,967

Filing Date: 27-SEP-2019

For: TECHNIQUES FOR SECURING  
VIRTUAL MACHINES

Examiner: PATEL ASHOKKUMAR

Art Unit: 2491

Confirmation No.: 9843

Docket No.: ORCA P1414

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

**PRELIMINARY AMENDMENT**

Sir:

Prior to calculation of the filing fee and examination, please amend the above-identified application as follows:

Amendments to the **Claims** begin on page 2 of this paper.

**Remarks** begin on page 7 of this paper.

### **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Original) A method for securing virtual cloud assets in a cloud computing environment against cyber threats, comprising:

determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;

accessing the snapshot of the virtual disk based on the determined location;

analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and

alerting detected potential cyber threats based on a determined priority.

2. (Original) The method of claim 1, further comprising:

prioritizing each detected of potential cyber threats based on their respective risk to the protected virtual cloud asset; and

mitigating a potential cyber threat posing a risk to the protected virtual cloud asset.

3. (Original) The method of claim 1, wherein determining the location of the snapshot of at least one virtual disk further comprises:

determining a virtual disk allocated to the protected virtual cloud asset.

4. (Original) The method of claim 2, further comprising:

querying a cloud management console of the cloud computing platform to determine the location of the snapshot and the location of the virtual disk.

5. (Original) The method of claim 1, further comprising:

taking a new snapshot of the protected virtual cloud asset, when an existing snapshot cannot be located.

6. (Currently Amended) The method of claim 1, wherein analyzing the snapshot of the protected virtual cloud asset~~machine~~ further comprises:

parsing a copy of the snapshot; and

scanning the parsed copy to detect the potential cyber threats, wherein the potential cyber threats include known and unknow vulnerabilities, and wherein the detection is based on a type of vulnerability.

7. (Currently Amended) The method of claim 6, wherein scanning the parsed copy further comprises any one of:

checking configuration files of applications and operating system installed in the protected virtual cloud asset~~machine~~;

verifying access times to files by the operating system installed in the operating ~~machine~~system;

analyzing system logs to deduce what applications and modules executed in the protected virtual cloud asset; and

analyzing machine memory stored in the snapshot to deduce what applications and modules executed in the protected virtual cloud asset.

8. (Currently Amended) The method of claim 6, further comprising:

instantiating ~~a~~an instance copy of the protected virtual cloud asset~~machine~~ from the snapshot; and

monitoring all activity performed by the instance copy of the protected virtual cloud asset.

9. (Currently Amended) The method of claim 6, wherein scanning the parsed copy further comprises any one of:

reading process identification number (PID) files; and

checking if the at least access times of the PID files ~~access times~~ match against process descriptors.

10. (Original) The method of claim 1, wherein the protected virtual cloud asset includes any one of: a virtual machine, a software container, a micro-service.

11. (Currently Amended) A non-transitory computer readable medium having stored thereon instructions for causing a processing circuitry to execute a process for securing virtual cloud assets in a cloud computing environment against cyber threats, the process comprising:

- determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;

- accessing the snapshot of the virtual disk based on the determined location;

- analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and

- alerting detected potential cyber threats based on a determined priority.

12. (Original) A system for securing virtual cloud assets in a cloud computing environment against cyber threats, comprising:

- a processing circuitry; and

- a memory, the memory containing instructions that, when executed by the processing circuitry, configure the system to:

- determine a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;

- access the snapshot of the virtual disk based on the determined location;

- analyze the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and

- alert detected potential cyber threats based on a determined priority.

13. (Original) The system of claim 12, wherein the system is further configured to:

- prioritize each detected of potential cyber threats based on their respective risk to the protected virtual cloud asset; and

mitigate a potential cyber threat posing a risk to the protected virtual cloud asset.

14. (Original) The system of claim 12, wherein determining the location of the snapshot of at least one virtual disk further comprises:

determining a virtual disk allocated to the protected virtual cloud asset.

15. (Currently Amended) The system of claim 13, wherein the system is further configured to:

query a cloud management console of the cloud computing ~~platform~~ environment to determine the location of the snapshot and the location of the virtual disk.

16. (Original) The system of claim 12, wherein the system is further configured to:

take a new snapshot of the protected virtual cloud asset, when an existing snapshot cannot be located.

17. (Currently Amended) The system of claim 12, wherein analyzing the snapshot of the protected virtual cloud asset~~machine~~ further comprises:

parsing a copy of the snapshot; and

scanning the parsed copy to detect the potential cyber threats, wherein the potential cyber threats include known and unknown vulnerabilities, and wherein the detection is based on a type of vulnerability.

18. (Currently Amended) The system of claim 17, wherein scanning the parsed copy further comprises any one of:

checking configuration files of applications and operating system installed in the protected virtual cloud asset~~machine~~;

verifying access times to files by the operating system installed in the operating ~~machines~~system;

analyzing system logs to deduce what applications and modules executed in the protected virtual cloud asset; and

analyzing machine memory stored in the snapshot to deduce what applications and modules executed in the protected virtual cloud asset.

19. (Currently Amended) The system of claim 17, wherein the system is further configured to:

Instantiate ~~aan instance~~ copy of the protected virtual cloud asset~~machine~~ from the snapshot; and

monitor all activity performed by the instance copy of the protected virtual cloud asset.

20. (Currently Amended) The system of claim 17, wherein scanning the parsed copy further comprises any one of:

reading process identification number (PID) files; and

checking if the access times of at least the PID files ~~access times~~ match against process descriptors.

21. (Original) The system of claim 12, wherein the protected virtual cloud asset includes any one of: a virtual machine, a software container, a micro-service.

### **R E M A R K S**

By the foregoing amendments, various claims have been amended to correct certain antecedent deficiencies. The amendments to the claims are proper and justified and are supported by the specification and claims as originally filed.

Any fee due this paper may be charged to, or overpayment credited to, deposit account **50-6438**.

Respectfully submitted,  
M&B IP Analysts, LLC

/Michael Ben-Shimon/

Michael Ben-Shimon

Reg. No.: 69,610

**Mail all correspondence to:**

CUSTOMER NO.: 122066

## Electronic Acknowledgement Receipt

|                                             |                                          |
|---------------------------------------------|------------------------------------------|
| <b>EFS ID:</b>                              | 38378187                                 |
| <b>Application Number:</b>                  | 16585967                                 |
| <b>International Application Number:</b>    |                                          |
| <b>Confirmation Number:</b>                 | 9843                                     |
| <b>Title of Invention:</b>                  | TECHNIQUES FOR SECURING VIRTUAL MACHINES |
| <b>First Named Inventor/Applicant Name:</b> | Avi SHUA                                 |
| <b>Customer Number:</b>                     | 122066                                   |
| <b>Filer:</b>                               | Michael Ben-Shimon/Wendy Perrault        |
| <b>Filer Authorized By:</b>                 | Michael Ben-Shimon                       |
| <b>Attorney Docket Number:</b>              | ORCA P1414                               |
| <b>Receipt Date:</b>                        | 23-JAN-2020                              |
| <b>Filing Date:</b>                         | 27-SEP-2019                              |
| <b>Time Stamp:</b>                          | 15:26:05                                 |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)              |

### Payment information:

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

### File Listing:

| Document Number | Document Description | File Name                          | File Size(Bytes)/<br>Message Digest               | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|------------------------------------|---------------------------------------------------|------------------|------------------|
| 1               |                      | ORCA_P1414_prel_amend_20200123.pdf | 40058<br>877272cc7e27b2570b20bc4295f5890b1c383e5f | yes              | 7                |

| Multipart Description/PDF files in .zip description |       |     |  |
|-----------------------------------------------------|-------|-----|--|
| Document Description                                | Start | End |  |
| Preliminary Amendment                               | 1     | 1   |  |
| Claims                                              | 2     | 6   |  |
| Applicant Arguments/Remarks Made in an Amendment    | 7     | 7   |  |

**Warnings:**

**Information:**

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|-------------------------------------|-------|
| <b>Total Files Size (in bytes):</b> | 40058 |
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**  
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**  
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**  
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 16/585,967         | 09/27/2019            | Avi SHUA              | ORCA P1414             |

**CONFIRMATION NO. 9843**

122066  
M&B IP Analysts, LLC  
500 Headquarters Plaza  
Morristown, NJ 07960-7070

## PUBLICATION NOTICE



\*OC000000118849079\*

**Title:**TECHNIQUES FOR SECURING VIRTUAL MACHINES

**Publication No.**US-2020-0244678-A1

**Publication Date:**07/30/2020

## NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at [www.uspto.gov](http://www.uspto.gov). The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at [www.uspto.gov](http://www.uspto.gov) using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

## TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

|                        |                                          |
|------------------------|------------------------------------------|
| Application Number     | 16585967                                 |
| Filing Date            | 2019/09/27                               |
| First Named Inventor   | Avi SHUA                                 |
| Title                  | TECHNIQUES FOR SECURING VIRTUAL MACHINES |
| Art Unit               | 3600                                     |
| Examiner Name          |                                          |
| Attorney Docket Number | 15635.0003-00000                         |

### SIGNATURE of Applicant or Patent Practitioner

|                                                    |                    |                     |            |
|----------------------------------------------------|--------------------|---------------------|------------|
| Signature                                          | /Wei Yuan/         | Date (Optional)     | 05/18/2021 |
| Name                                               | Wei Yuan           | Registration Number | 71772      |
| Title (if Applicant is a juristic entity)          | Patent Attorney    |                     |            |
| Applicant Name (if Applicant is a juristic entity) | Orca Security LTD. |                     |            |

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



\*Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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## POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

|                    |             |
|--------------------|-------------|
| Application Number | Filing Date |
|                    |             |

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☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

22852

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City

State

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Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Orca Security LTD.

- ☐ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

### SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

Name

Avi Shua

Title

CEO

**NOTE:** Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☒ Total of 1 forms are submitted.

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IPR2025-01087

**POWER OF ATTORNEY BY APPLICANT**

No more than ten (10) patent practitioners total may be appointed as set forth below by name and registration number. This page need not be submitted if appointing the Patent Practitioner(s) associated with a Customer Number (see form PTO/AIA/82B):

| Name | Registration<br>Number |
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## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Acknowledgement Receipt

|                                             |                                          |
|---------------------------------------------|------------------------------------------|
| <b>EFS ID:</b>                              | 42752980                                 |
| <b>Application Number:</b>                  | 16585967                                 |
| <b>International Application Number:</b>    |                                          |
| <b>Confirmation Number:</b>                 | 9843                                     |
| <b>Title of Invention:</b>                  | TECHNIQUES FOR SECURING VIRTUAL MACHINES |
| <b>First Named Inventor/Applicant Name:</b> | Avi SHUA                                 |
| <b>Customer Number:</b>                     | 122066                                   |
| <b>Filer:</b>                               | Wei Yuan/Maria Poulakos                  |
| <b>Filer Authorized By:</b>                 | Wei Yuan                                 |
| <b>Attorney Docket Number:</b>              | ORCA P1414                               |
| <b>Receipt Date:</b>                        | 18-MAY-2021                              |
| <b>Filing Date:</b>                         | 27-SEP-2019                              |
| <b>Time Stamp:</b>                          | 14:55:11                                 |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)              |

### Payment information:

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

### File Listing:

| Document Number | Document Description | File Name                   | File Size(Bytes)/<br>Message Digest               | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-----------------------------|---------------------------------------------------|------------------|------------------|
| 1               | Power of Attorney    | As_Filed_POA_15635_0003.pdf | 179988<br>5a0cfe0a8dc27d23b4f281e3eb55b1b24fa414d | no               | 4                |

### Warnings:

IPR2025-01087

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| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 179988 |
| <p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |        |



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|--------------------|-----------------------|-----------------------|------------------------|
| 16/585,967         | 09/27/2019            | Avi SHUA              | ORCA P1414             |

**CONFIRMATION NO. 9843**

**POWER OF ATTORNEY NOTICE**



\*OC000000125717835\*

122066  
M&B IP Analysts, LLC  
150 Morristown Road  
Suite 205  
Bernardsville, NJ 07924-2626

Date Mailed: 05/21/2021

**NOTICE REGARDING CHANGE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 05/18/2021.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/zabraha/



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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 16/585,967         | 09/27/2019            | Avi SHUA              | 15635.0003-00000       |

**CONFIRMATION NO. 9843**

**POA ACCEPTANCE LETTER**

22852  
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
LLP  
901 NEW YORK AVENUE, NW  
WASHINGTON, DC 20001-4413



Date Mailed: 05/21/2021

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/18/2021.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

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| APPLICATION NO.                                                                                               | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------------------------------------------------------------------------------------|-------------|----------------------|---------------------|------------------|
| 16/585,967                                                                                                    | 09/27/2019  | Avi SHUA             | 15635.0003-00000    | 9843             |
| 22852                                                                                                         | 7590        | 02/03/2022           | EXAMINER            |                  |
| FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER<br>LLP<br>901 NEW YORK AVENUE, NW<br>WASHINGTON, DC 20001-4413 |             |                      | SAADOUN, HASSAN     |                  |
|                                                                                                               |             |                      | ART UNIT            | PAPER NUMBER     |
|                                                                                                               |             |                      | 2435                |                  |
|                                                                                                               |             |                      | NOTIFICATION DATE   | DELIVERY MODE    |
|                                                                                                               |             |                      | 02/03/2022          | ELECTRONIC       |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

regional-desk@finnegan.com



### DETAILED ACTION

1. This office action is in response to the application filed on **01/23/2020**. **Claims 1-21** are pending and are examined.

### *Priority*

2. Applicant's benefit claim is hereby acknowledged of the provisional application No. **62/797,718** filed on **January 28, 2019**, which papers have been placed on record in the file.

### *Statutory Double Patenting*

3. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process... may obtain a patent therefor..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the claims that are directed to the same invention so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

4. Claims 1-21 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of both claims 1-21 of copending Application No. US **17/330,998** and claims 1-19 of copending Application No. US **16/750,556**. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

**Allowable Subject Matter**

5. Claims **1-21** are allowed.

The following is an examiner's statement of reasons for allowance:

6. The closest prior arts made of records are, Golan et al. (U.S Patent No. **10,944,778 B1**, referred to as **Golan**), Derbeko et al. (U.S Patent No. **10,536,471 B1**, referred to as **Derbeko**) and Deng et al. (U.S Pub No. **2017/0103212 A1**, referred to as **Deng**).

**Golan** discloses a method and system for implementing risk-based cyber security. Specifically, the disclosed method and system entail evaluating risk as a decision threshold for conducting cyber security assessments of system images within cloud computing environments. Further, the disclosed method and system pivot on intelligence pertaining to the latest cyber threats and/or vulnerabilities found worldwide.

**Derbeko** discloses a system and a method of detecting malware in a virtual machine (VM), the method comprising periodically creating snapshots of the VM, analyzing each of the snapshots in comparison to one or more previous snapshots to determine whether anomalies exist, and based on a threshold amount of anomalies detected, scanning the VM to determine whether malware is detected.

**Deng** discloses determining which snapshot deltas tend to occur in: (i) healthy virtual machines (VMs) that have been subject to an attack yet remained healthy, and/or (ii) unhealthy VMs that have apparently been adversely affected by an attack. Snapshot

deltas that occur in at least some (or more preferably all) of the healthy VM subset provide information about software changes (for example, updates, configuration changes) that may be helpful. Snapshot deltas that occur in at least some (or more preferably all) of the unhealthy VM subsets provide information about software changes (for example, updates, configuration changes) that may be unhelpful.

7. However, regarding claims **1 and 11**, the prior art of **Golan, Derbeko and Deng** when taken in the context of the claim as a whole do not disclose nor suggest, “determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment; accessing the snapshot of the virtual disk based on the determined location; analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and alerting detected potential cyber threats based on a determined priority.”.

8. Regarding claim **12**, the prior art of **Golan, Derbeko and Deng** when taken in the context of the claim as a whole do not disclose nor suggest, “determine a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment; access the snapshot of the virtual disk based on the determined location; analyze the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and alert detected potential cyber threats based on a determined priority.”.

9. **Claims 2-10** depend on **claim 1** and **claims 13-21** depend on **claim 12**, and are of consequence allowed.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HASSAN SAADOUN whose telephone number is (571)272-8408. The examiner can normally be reached Mon-Fri 9:00-5:00.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hirl can be reached on 571-272-3685. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197

Application/Control Number: 16/585,967  
Art Unit: 2435

Page 6

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Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HASSAN SAADOUN/  
Examiner, Art Unit 2435

/YOGESH PALIWAL/  
Primary Examiner, Art Unit 2435

|                                   |                                       |  |                                                         |             |
|-----------------------------------|---------------------------------------|--|---------------------------------------------------------|-------------|
| <b>Notice of References Cited</b> | Application/Control No.<br>16/585,967 |  | Applicant(s)/Patent Under<br>Reexamination<br>SHUA, Avi |             |
|                                   | Examiner<br>HASSAN SAADOUN            |  | Art Unit<br>2435                                        | Page 1 of 1 |

U.S. PATENT DOCUMENTS

| * |   | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Name                         | CPC Classification | US Classification |
|---|---|--------------------------------------------------|-----------------|------------------------------|--------------------|-------------------|
| * | A | US-10536471-B1                                   | 01-2020         | Derbeko; Philip              | G06F21/53          | 1/1               |
| * | B | US-20180137032-A1                                | 05-2018         | Tannous; Samuel Joseph       | G06F11/3664        | 1/1               |
| * | C | US-20170103212-A1                                | 04-2017         | Deng; Yu                     | G06F3/0619         | 1/1               |
| * | D | US-11068353-B1                                   | 07-2021         | Ved; Amber                   | G06F9/45558        | 1/1               |
| * | E | US-20160094568-A1                                | 03-2016         | Balasubramanian; Swaminathan | G06F9/45558        | 726/23            |
| * | F | US-20160004449-A1                                | 01-2016         | LAKSHMAN; Avinash            | G06F3/0604         | 711/162           |
| * | G | US-20130191643-A1                                | 07-2013         | Song; Zhexuan                | H04L9/3265         | 713/176           |
| * | H | US-10944778-B1                                   | 03-2021         | Golan; Oron                  | H04L63/1491        | 1/1               |
|   | I |                                                  |                 |                              |                    |                   |
|   | J |                                                  |                 |                              |                    |                   |
|   | K |                                                  |                 |                              |                    |                   |
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|                                                                                                                 |                                              |                                                             |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| <b><i>Search Notes</i></b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |
|                                                                                                                 | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |

| CPC - Searched*                                                                                                                                                                                                                                                                                                                                        |            |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|
| Symbol                                                                                                                                                                                                                                                                                                                                                 | Date       | Examiner |
| CPC Classification Search (H04L63/1416 or G06F9/45558 or G06F11/1464 or G06F16/128 or H04L63/1433 or H04L63/1441 or G06F2009/45562 or G06F2009/45583 or G06F2009/45587 or G06F2009/45591 or G06F2009/45595 or G06F2201/84 or G06F2201/815 or G06F2201/86 or G06F11/1451 or G06F11/301 or G06F11/3476 or H04L63/1408 or H04L63/1425) limited with text. | 01/25/2022 | HS       |

| CPC Combination Sets - Searched* |      |          |
|----------------------------------|------|----------|
| Symbol                           | Date | Examiner |
|                                  |      |          |

| US Classification - Searched* |          |      |          |
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| Search Notes                                                        |            |          |
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| Search Notes                                                        | Date       | Examiner |
| PE2E class limited with text search. (See Search History).          | 01/25/2022 | HS       |
| PE2E inventor and assignee search. (See Search History).            | 01/25/2022 | HS       |
| PE2E text search. (See Search History).                             | 01/25/2022 | HS       |
| PE2E Interference Search. (See Search History).                     | 01/25/2022 | HS       |
| NPL search. (STIC, Google Scholar and IP.com) (See Search History). | 01/25/2022 | HS       |

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|---------------------------------------------|--|

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|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| <b><i>Search Notes</i></b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |
|                                                                                                                 | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |

| Interference Search |                                                                                                                                             |            |          |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|
| US Class/CPC Symbol | US Subclass/CPC Group                                                                                                                       | Date       | Examiner |
| H04L                | 63/1416, 63/1433, 63/1441, 63/1408, 63/1425.                                                                                                | 01/25/2022 | HS       |
| G06F                | 9/45558, 11/1464, 16/128, 2009/45562, 2009/45583, 2009/45587, 2009/45591, 2009/45595, 2201/84, 2201/815, 2201/86, 11/1451, 11/301, 11/3476. | 01/25/2022 | HS       |

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|---------------------------------------------|--|

|                                                                                                                    |                                              |                                                             |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| <b><i>Index of Claims</i></b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |
|                                                                                                                    | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |

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|---|-----------------|---|-------------------|---|---------------------|---|-----------------|
| ✓ | <b>Rejected</b> | - | <b>Cancelled</b>  | N | <b>Non-Elected</b>  | A | <b>Appeal</b>   |
| = | <b>Allowed</b>  | ÷ | <b>Restricted</b> | I | <b>Interference</b> | O | <b>Objected</b> |

| CLAIMS                                                                                                                                                                                       |          |            |  |  |  |  |  |  |  |  |
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| <input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47 |          |            |  |  |  |  |  |  |  |  |
| CLAIM                                                                                                                                                                                        |          | DATE       |  |  |  |  |  |  |  |  |
| Final                                                                                                                                                                                        | Original | 01/25/2022 |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 1        | ✓          |  |  |  |  |  |  |  |  |
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|                                                                                                                                                                                              | 12       | ✓          |  |  |  |  |  |  |  |  |
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Application Number

Filing Date

First Named Inventor

Avi SHUA

Art Unit

Examiner Name

Attorney Docket Number

ORCA P1414

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|                   | 1       | 10412109      | B2                     | 2019-09-10 | Loureiro et al.                                 | Entire Document                                                        |
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| First Named Inventor   | Avi SHUA   |  |
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| Examiner Name          |            |  |
| Attorney Docket Number | ORCA P1414 |  |

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|---|-------------|----|------------|------------------|-----------------|
| 2 | 20140137190 | A1 | 2014-05-15 | Carey et al.     | Entire Document |
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**EXAMINER SIGNATURE**

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| Name/Print | Michael Ben-Shimon   | Registration Number | 69610      |

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## Bibliographic Data

Application No: 16/585,967

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No

☐ Met After Allowance

Verified and Acknowledged:

/HASSAN  
SAADOUN/

Examiner's Signature

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Title:

TECHNIQUES FOR SECURING VIRTUAL MACHINES

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| 09/27/2019            | 726   | 2435           | 15635.0003-00000    |
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### APPLICANTS

Orca Security LTD., Tel Aviv, ISRAEL

### INVENTORS

Avi SHUA, Tel Aviv, ISRAEL

### CONTINUING DATA

This application has PRO of 62797718 01/28/2019

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G Al Sadi - International Journal of Computer Applications, 2015 - Citeseer

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## Paxos made live: an engineering perspective

TD Chandra, R Griesemer, J Redstone - ... of the twenty-sixth annual ACM ..., 2007 - dl.acm.org

... We describe our experience in building a fault-tolerant **database using** the Paxos consensus ... In this case, the read operation at the master runs the **risk** of returning stale data. Since read ... We implemented a general mechanism that allows an application to pass **snapshot location** ...

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## Protecting privacy in location-based services through location anonymization **using** cloaking algorithms **based** on connected components

PS Saravanan, SR Balasundaram - Wireless Personal Communications, 2018 - Springer

... the process; then the **potential users'** requests to be cloaked **based** on their location-context ... against **snapshot location** attacks can be achieved in O(e) computation time **using** ... To combat these **threats**, this study suggests a graph model **based** cloaking algorithm to protect users' ...

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## Assessing the reliability of digital evidence from live investigations involving encryption.

CJ Hargreaves - 2009 - core.ac.uk

... power, image the machine **using** a write blocker and then **analyse** the acquired image.

This ... 101 Figure 13: PGP interface for creating a new **virtual disk**. .....

, which is used to simplify creation of **snapshots** by copying the .vmdk and .vmem files to the '...

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## Interactions between convection and a moist vortex associated with an extreme rainfall event over southern West Africa

M Maranan, AH Fink, P Knippertz - Monthly Weather ..., 2019 - journals.ametsoc.org

... of the rainfall events in the Sahel with a view to the **analysis** of climatic variability. Int. J. ... ,

2013: Updated **analyses** of temperature and precipitation extreme indices since the beginning

... Diongue-Niang, 2005: **Analysis** of the African easterly jet, **using** aircraft observations from the ...

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## What's on the Horizon? An In-Depth Forensic **Analysis** of Android and iOS Applications

FE Salami, MM Mirza, S Hutchinson, YH Yoon - ... Access, 2021 - ieeeexplore.ieee.org

... information recovered from some mobile apps that might pose a certain level of security **risks**

to the user's privacy. ... Refer to Table 6 for the **Snapshot location** for ... This database also

contained URL's to **potential** shared media; however, when the URL's are **accessed** through a ...

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## Windows forensic **analysis**

RD Pittman, D Shaver - Handbook of Digital Forensics and Investigation, 2010 - Elsevier

... is an **access** control list (ACL) that governs read-write-execute **access** to Windows files and

... the **virtual** CD-Rom device is 6&38b32a79&0, it is likely that the complimentary **virtual Disk**

... \\_restore(...) \RP### **snapshot location** can be parsed and viewed the same as any registry ...

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## Enforcing privacy for location based services

AS Saxena, V Goyal, D Bera - 2019 - repository.iiitd.edu.in

... **Using** this, we aim to derive an additional strategy together with obfuscation that can provide complete ... and the service provider are named as **snapshot Location-based** Services; whereas those which require ... Definitely, any drift of user **base** may put big money into high **risk**. ...

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## Cataglyphis: An autonomous sample return rover

Y Gu, N Ohi, K Lassak, J Strader, L Kogan... - Journal of Field ... , 2018 - Wiley Online Library

... , 56 The robot then visits each **snapshot location** in sequence in order to return home., 58 ... **opportunities** to perform gyro bias removal and to update the pitch and roll angles **using** the ... toward the next waypoint in order to reduce the **potential risk** of getting stuck at one location. ...

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Everything



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AND Any field contains accessing a snapshot of a virtual (machine OR disk OR asset) based on "snapshot location"  
AND Any field contains analyzing snapshot of virtual (machine disk asset) for (threat OR malware OR malicious OR attack)  
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AND Any field contains analyzing snapshot of virtual (machine disk asset) for (threat OR malware OR malicious OR attack)  
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## PE2E SEARCH - Search History (Prior Art)

| Ref # | Hits    | Search Query                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DBs               | Default Operator | Plurals | British Equivalents | Time Stamp          |
|-------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|---------|---------------------|---------------------|
| L1    | 3       | "16585967"                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/18 09:01 AM |
| L2    | 2781668 | Orca Security LTD.as.                                                                                                                                                                                                                                                                                                                                                                                                                                                             | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/18 11:10 AM |
| L3    | 5067    | SHUA, Avi.in.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/18 11:11 AM |
| L6    | 0       | "Orca near2 Security".as. AND ( (determin\$4 identify\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 (virtual "VM")).clm.                                                                                                                                                                                                                                                                                                                        | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/20 11:50 AM |
| L7    | 2       | (SHUA near2 Avi).in. AND ( (determin\$4 identify\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 (virtual "VM")).clm.                                                                                                                                                                                                                                                                                                                             | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/20 11:51 AM |
| L8    | 31      | ( (determin\$4 identify\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 (virtual "VM")) SAME (threat malware malicious attack) AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR G06F2009/45562 OR G06F2009/45583 OR G06F2009/45587 OR G06F2009/45591 OR G06F2009/45595 OR G06F2201/84 OR G06F2201/815 OR G06F2201/86 OR G06F11/1451 OR G06F11/301 OR G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc. | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/20 11:55 AM |
| L9    | 15      | ( (determin\$4 identify\$5 identify\$3) near2 (snapshot snap?shot                                                                                                                                                                                                                                                                                                                                                                                                                 | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/20 12:09 PM |

|     |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L10 | 26 | image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))<br>SAME (threat malware<br>malicious attack) AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.                                                                            |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|     |    | ( (determin\$4 identifi\$5<br>identify\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))<br>SAME (threat malware<br>malicious attack) AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT;<br>USOCR; FIT (AU, AP,<br>AT, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, OA, RU, SU, WO,<br>MC, MD, MY, NL, NO,<br>NZ, PH, PL, PT, RO,<br>RS, SE, SG, SI, SK,<br>TH, TN, TR, TW, UA,<br>VN); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>12:13 PM |
| L11 | 7  | ( (determin\$4 identifi\$5<br>identify\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))                                                                                                                                                                                                                                                                                                                                                                                                                          | (US-PGPUB; USPAT;<br>USOCR; FIT (AU, AP,<br>AT, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,                                                                                                                                                                                                                          | OR | ON | ON | 2022/01/20<br>12:17 PM |

|     |    |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                      |    |    |    |                     |
|-----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---------------------|
|     |    | near5 (location spot place site placement area) SAME (threat malware malicious attack) AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR G06F2009/45562 OR G06F2009/45583 OR G06F2009/45587 OR G06F2009/45591 OR G06F2009/45595 OR G06F2201/84 OR G06F2201/815 OR G06F2201/86 OR G06F11/1451 OR G06F11/301 OR G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc. | HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)                                                                                                                           |    |    |    |                     |
| L12 | 7  | ( (determin\$4 identifi\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 ((virtual near2 disk) "VM")) near5 (location spot place site placement area) SAME (threat malware malicious attack)                                                                                                                                                                               | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2022/01/20 12:17 PM |
| L13 | 11 | ("10412109" OR "20070266433" OR "20140137190" OR "20150052520" OR "20170011138" OR "20180255080" OR "20180293374" OR "9177145" OR "9519781" OR "9563777" OR "9798885").pn.                                                                                                                                                                                                                                | (US-PGPUB; USPAT)                                                                                                                                                                                                                                                                                                    | OR | ON | ON | 2022/01/20 01:54 PM |
| L14 | 3  | ("10412109" OR "20070266433" OR "20140137190" OR "20150052520" OR "20170011138" OR "20180255080" OR                                                                                                                                                                                                                                                                                                       | (US-PGPUB; USPAT)                                                                                                                                                                                                                                                                                                    | OR | ON | ON | 2022/01/20 01:56 PM |

|     |      |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L15 | 0    | "20180293374" OR<br>"9177145" OR<br>"9519781" OR<br>"9563777" OR<br>"9798885").pn. AND<br>((snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))                                                                                                           | (US-PGPUB; USPAT)                                                                                                                                                                                                                                                                                                                                                 | OR | ON | ON | 2022/01/20<br>01:58 PM |
| L16 | 11   | ("10412109" OR<br>"20070266433" OR<br>"20140137190" OR<br>"20150052520" OR<br>"20170011138" OR<br>"20180255080" OR<br>"20180293374" OR<br>"9177145" OR<br>"9519781" OR<br>"9563777" OR<br>"9798885").pn. AND<br>((virtual near2 disk)<br>"VM") near5 (location<br>spot place site<br>placement area) | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>02:19 PM |
| L17 | 30   | ( (determin\$4 identifi\$5<br>identify\$3) near2 (threat<br>malware malicious<br>attack) near9(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3) near5<br>((virtual near2 disk)<br>"VM"))                                                                                                     | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>02:20 PM |
| L18 | 1919 | (snapshot snap?shot                                                                                                                                                                                                                                                                                  | (US-PGPUB; USPAT;                                                                                                                                                                                                                                                                                                                                                 | OR | ON | ON | 2022/01/20             |

|     |     |                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L19 | 130 | image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM") near5<br>(location spot place site<br>placement area)                                                                            | USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                      | OR | ON | ON | 02:30 PM               |
| L20 | 117 | (determin\$4 identifi\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3) near3<br>((virtual near2 disk)<br>"VM") | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>02:31 PM |
| L20 | 117 | L19 AND<br>(@ad<"20190128")                                                                                                                                                                              | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>02:33 PM |
| L21 | 58  | L20 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR     | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,                                                                                                                      | OR | ON | ON | 2022/01/20<br>02:33 PM |

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|-----|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L22 | 226 | G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.<br><br>(determin\$4 identifi\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3) near3<br>((virtual near2 (disk<br>machine)) OR "VM") | PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)<br><br>(US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/21<br>09:45 AM |
| L23 | 210 | L22 AND<br>(@ad<"20190128")                                                                                                                                                                                                                                                                                                                                                                       | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                                                                                                                          | OR | ON | ON | 2022/01/21<br>09:46 AM |
| L24 | 116 | L23 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR                                                                               | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                                                                                                                          | OR | ON | ON | 2022/01/21<br>09:46 AM |

|     |    |                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L25 | 6  | G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.<br>( (determin\$4 identify\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3<br>backup) near3 ((virtual<br>near2 (disk machine))<br>"VM")) SAME cloud<br>near2 (asset service) | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:01 AM |
| L26 | 92 | ( (determin\$4 identify\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3<br>backup) near3 ((virtual<br>near2 (disk machine))<br>"VM")) AND cloud<br>near2 (asset service)                                                           | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:15 AM |
| L27 | 24 | ( (determin\$4 identify\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3<br>backup) near3 ((virtual<br>near2 (disk machine))<br>"VM")) AND cloud<br>near2 (asset service)<br>AND (threat malware<br>malicious attack)               | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:25 AM |
| L28 | 21 | L27 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR                                                                                                                                                                                                             | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,                                                                                                                                                                                                                          | OR | ON | ON | 2022/01/25<br>09:29 AM |

|     |     |                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
|     |     | G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.                                                                                                                     | HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                                                                                                                                             |    |    |    |                        |
| L29 | 57  | L26 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:30 AM |
| L30 | 193 | (access\$3 obtain\$3<br>retriev\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3 backup)<br>near5(location spot<br>place site placement<br>area) near3 (virtual<br>near2 (disk machine)<br>"VM")                                                                                                                                                        | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:54 AM |
| L31 | 96  | L30 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR                                                                                                                                                                                              | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:55 AM |

|     |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |    |    |                        |
|-----|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L32 | 1 | <p>G06F2009/45591 OR<br/>G06F2009/45595 OR<br/>G06F2201/84 OR<br/>G06F2201/815 OR<br/>G06F2201/86 OR<br/>G06F11/1451 OR<br/>G06F11/301 OR<br/>G06F11/3476 OR<br/>H04L63/1408 OR<br/>H04L63/1425).cpc.</p> <p>(access\$3 obtain\$3<br/>retriev\$3) near2<br/>(snapshot snap?shot<br/>image copy replicat\$3<br/>clon\$3 backup)<br/>near5(location spot<br/>place site placement<br/>area) near3 (virtual<br/>near2 (disk machine<br/>asset service) "VM")<br/>SAME (analyz\$3<br/>inspect\$3 process\$3)<br/>near2 (virtual near2<br/>(disk machine asset<br/>service)) near7 (threat<br/>malware malicious<br/>attack)</p> | <p>NO, NZ, OA, PH, PL,<br/>PT, RO, RS, RU, SE,<br/>SG, SI, SK, SU, TH,<br/>TN, TR, TW, UA, VN,<br/>WO); FPRS; EPO;<br/>JPO; DERWENT;<br/>IBM_TDB)</p> <p>(US-PGPUB; USPAT;<br/>USOCR; FIT (AP, AT,<br/>AU, BE, BG, BR, BY,<br/>CA, CH, CN, CS, CU,<br/>CZ, DD, DE, DK, EA,<br/>EE, EP, ES, FI, FR, GB,<br/>HR, HU, ID, IE, IL, IS,<br/>IT, JP, KR, LT, LU, LV,<br/>MA, MC, MD, MY, NL,<br/>NO, NZ, OA, PH, PL,<br/>PT, RO, RS, RU, SE,<br/>SG, SI, SK, SU, TH,<br/>TN, TR, TW, UA, VN,<br/>WO); FPRS; EPO;<br/>JPO; DERWENT;<br/>IBM_TDB)</p> | OR | ON | ON | 2022/01/25<br>10:11 AM |
| L33 | 2 | <p>(analyz\$3 inspect\$3<br/>process\$3) near2<br/>(virtual near2 (disk<br/>machine asset service))<br/>near7 (threat malware<br/>malicious attack) SAME<br/>(alert\$3 notif\$ warn\$3)<br/>near3 (threat malware<br/>malicious attack) near7<br/>(priority order)</p>                                                                                                                                                                                                                                                                                                                                                      | <p>(US-PGPUB; USPAT;<br/>USOCR; FIT (AP, AT,<br/>AU, BE, BG, BR, BY,<br/>CA, CH, CN, CS, CU,<br/>CZ, DD, DE, DK, EA,<br/>EE, EP, ES, FI, FR, GB,<br/>HR, HU, ID, IE, IL, IS,<br/>IT, JP, KR, LT, LU, LV,<br/>MA, MC, MD, MY, NL,<br/>NO, NZ, OA, PH, PL,<br/>PT, RO, RS, RU, SE,<br/>SG, SI, SK, SU, TH,<br/>TN, TR, TW, UA, VN,<br/>WO); FPRS; EPO;<br/>JPO; DERWENT;<br/>IBM_TDB)</p>                                                                                                                                                       | OR | ON | ON | 2022/01/25<br>10:14 AM |
| L34 | 2 | <p>(analyz\$3 inspect\$3<br/>process\$3) near2<br/>(virtual near2 (disk<br/>machine asset service))<br/>near7 (threat malware<br/>malicious attack) SAME<br/>(alert\$3 notif\$ warn\$3)<br/>near3 (threat malware<br/>malicious attack) near7<br/>(priority order<br/>preference)</p>                                                                                                                                                                                                                                                                                                                                       | <p>(US-PGPUB; USPAT;<br/>USOCR; FIT (AP, AT,<br/>AU, BE, BG, BR, BY,<br/>CA, CH, CN, CS, CU,<br/>CZ, DD, DE, DK, EA,<br/>EE, EP, ES, FI, FR, GB,<br/>HR, HU, ID, IE, IL, IS,<br/>IT, JP, KR, LT, LU, LV,<br/>MA, MC, MD, MY, NL,<br/>NO, NZ, OA, PH, PL,<br/>PT, RO, RS, RU, SE,<br/>SG, SI, SK, SU, TH,<br/>TN, TR, TW, UA, VN,<br/>WO); FPRS; EPO;</p>                                                                                                                                                                                      | OR | ON | ON | 2022/01/25<br>10:15 AM |

|     |   |            |                                                |    |    |    |                        |
|-----|---|------------|------------------------------------------------|----|----|----|------------------------|
| L35 | 2 | "10944778" | JPO; DERWENT;<br>IBM_TDB)<br>(US-PGPUB; USPAT) | OR | ON | ON | 2022/01/27<br>06:23 PM |
|-----|---|------------|------------------------------------------------|----|----|----|------------------------|

## PE2E SEARCH - Search History (Interference)

| Ref # | Hits | Search Query                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | DBs               | Default Operator | Plurals | British Equivalents | Time Stamp             |
|-------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|---------|---------------------|------------------------|
| N1    | 2    | (( (determin\$4 identify\$5 identify\$3) near2 (location spot place site placement area) near5(snapshot snap?shot image copy replicat\$3 clon\$3 backup) near3 ((virtual near2 (disk machine)) "VM")) AND cloud near2 (asset service)).clm. AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR G06F2009/45562 OR G06F2009/45583 OR G06F2009/45587 OR G06F2009/45591 OR G06F2009/45595 OR G06F2201/84 OR G06F2201/815 OR G06F2201/86 OR G06F11/1451 OR G06F11/301 OR G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc. | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/25<br>10:18 AM |
| N2    | 1    | ((access\$3 obtain\$3 retriev\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3 backup) near5(location spot place site placement area) near3 (virtual near2 (disk machine asset service) "VM") SAME (analyz\$3 inspect\$3 process\$3) near2 (virtual near2 (disk machine asset service)) near7 (threat malware malicious attack) ).clm. AND                                                                                                                                                                                                         | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/25<br>10:19 AM |

|    |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |    |    |    |                        |
|----|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|------------------------|
|    |   | (H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.                                                                                                                                                                                                                                                                                    |                   |    |    |    |                        |
| N3 | 0 | ((analyz\$3 inspect\$3<br>process\$3) near2<br>(virtual near2 (disk<br>machine asset service))<br>near7 (threat malware<br>malicious attack) SAME<br>(alert\$3 notif\$ warn\$3)<br>near3 (threat malware<br>malicious attack) near7<br>(priority order<br>preference)).clm. AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT) | OR | ON | ON | 2022/01/25<br>10:20 AM |

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

|                                                 |   |                           |
|-------------------------------------------------|---|---------------------------|
| In re Application of:                           | ) |                           |
|                                                 | ) |                           |
| <b>Techniques for Securing Virtual Machines</b> | ) | Group Art Unit: 2435      |
|                                                 | ) |                           |
| Application No.: 16/585,967                     | ) | Examiner: SAADOUN, HASSAN |
|                                                 | ) |                           |
| Filed: 09/27/2019                               | ) |                           |
|                                                 | ) | Confirmation No.: 9843    |
| For: Avi SHUA                                   | ) |                           |

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Commissioner:

**AMENDMENT**

Applicants are appreciative of the Examiner's indication in the non-Final Office Action mailed on February 3, 2022, that all the pending the claims are allowed, subject to a statutory double patenting rejection. In response, Applicant submits the following amendments and explains why statutory double patenting does not apply in this case.

**Amendments to the Claims** are reflected in the listing of claims in this paper.

**Remarks** follow the amendment sections of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Original) A method for securing virtual cloud assets in a cloud computing environment against cyber threats, comprising:
  - determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;
  - accessing the snapshot of the virtual disk based on the determined location;
  - analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and
  - alerting detected potential cyber threats based on a determined priority.
2. (Currently Amended) The method of claim 1, further comprising:
  - prioritizing each of the detected ~~[[of]]~~ potential cyber threats based on their respective risk to the protected virtual cloud asset; and
  - mitigating a potential cyber threat posing a risk to the protected virtual cloud asset.
3. (Original) The method of claim 1, wherein determining the location of the snapshot of at least one virtual disk further comprises:
  - determining a virtual disk allocated to the protected virtual cloud asset.
4. (Currently Amended) The method of claim 2, further comprising:
  - querying a cloud management console of the cloud computing environment ~~platform~~ to determine the location of the snapshot and the location of the virtual disk.
5. (Canceled).
6. (Previously Presented) The method of claim 1, wherein analyzing the snapshot of the protected virtual cloud asset further comprises:

- parsing a copy of the snapshot; and
- scanning the parsed copy to detect the potential cyber threats, wherein the potential cyber threats include known and unknown vulnerabilities, and wherein the detection is based on a type of vulnerability.
7. (Previously Presented) The method of claim 6, wherein scanning the parsed copy further comprises any one of:
- checking configuration files of applications and operating system installed in the protected virtual cloud asset;
  - verifying access times to files by the operating system installed in the operating system;
  - analyzing system logs to deduce what applications and modules executed in the protected virtual cloud asset; and
  - analyzing machine memory stored in the snapshot to deduce what applications and modules executed in the protected virtual cloud asset.
8. (Previously Presented) The method of claim 6, further comprising:
- instantiating an instance copy of the protected virtual cloud asset from the snapshot; and
  - monitoring all activity performed by the instance copy of the protected virtual cloud asset.
9. (Previously Presented) The method of claim 6, wherein scanning the parsed copy further comprises any one of:
- reading process identification number (PID) files; and
  - checking if the at least access times of the PID files match against process descriptors.

10. (Original) The method of claim 1, wherein the protected virtual cloud asset includes any one of: a virtual machine, a software container, a micro-service.
11. (Previously Presented) A non-transitory computer readable medium having stored thereon instructions for causing a processing circuitry to execute a process for securing virtual cloud assets in a cloud computing environment against cyber threats, the process comprising:
  - determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;
  - accessing the snapshot of the virtual disk based on the determined location;
  - analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and
  - alerting detected potential cyber threats based on a determined priority.
12. (Original) A system for securing virtual cloud assets in a cloud computing environment against cyber threats, comprising:
  - a processing circuitry; and
  - a memory, the memory containing instructions that, when executed by the processing circuitry, configure the system to:
    - determine a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment;
    - access the snapshot of the virtual disk based on the determined location;
    - analyze the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and
    - alert detected potential cyber threats based on a determined priority.
13. (Original) The system of claim 12, wherein the system is further configured to:
  - prioritize each detected of potential cyber threats based on their respective risk to the protected virtual cloud asset; and

mitigate a potential cyber threat posing a risk to the protected virtual cloud asset.

14. (Original) The system of claim 12, wherein determining the location of the snapshot of at least one virtual disk further comprises:

determining a virtual disk allocated to the protected virtual cloud asset.

15. (Previously Presented) The system of claim 13, wherein the system is further configured to:

query a cloud management console of the cloud computing environment to determine the location of the snapshot and the location of the virtual disk.

16. (Canceled).

17. (Previously Presented) The system of claim 12, wherein analyzing the snapshot of the protected virtual cloud asset further comprises:

parsing a copy of the snapshot; and

scanning the parsed copy to detect the potential cyber threats, wherein the potential cyber threats include known and unknown vulnerabilities, and wherein the detection is based on a type of vulnerability.

18. (Previously Presented) The system of claim 17, wherein scanning the parsed copy further comprises any one of:

checking configuration files of applications and operating system installed in the protected virtual cloud asset;

verifying access times to files by the operating system installed in the operating system;

analyzing system logs to deduce what applications and modules executed in the protected virtual cloud asset; and

analyzing machine memory stored in the snapshot to deduce what applications and modules executed in the protected virtual cloud asset.

19. (Previously Presented) The system of claim 17, wherein the system is further configured to:

Instantiate an instance copy of the protected virtual cloud asset from the snapshot; and monitor all activity performed by the instance copy of the protected virtual cloud asset.

20. (Previously Presented) The system of claim 17, wherein scanning the parsed copy further comprises any one of:

reading process identification number (PID) files; and  
checking if the access times of at least the PID files match against process descriptors.

21. (Original) The system of claim 12, wherein the protected virtual cloud asset includes any one of: a virtual machine, a software container, a micro-service.

## **REMARKS**

Applicants are appreciative of the Examiner's indication that all claims (1-21) contain allowable subject matter. The present response is intended to place the application in condition for allowance.

### **I. Status of the Claims**

Claims 2 and 4 are amended for clarity. Applicant respectfully asserts that no new subject matter is added.

Claims 5 and 16 are canceled without prejudice or disclaimer of the subject matter thereof.

Claims 1-21 stand rejected under the doctrine statutory double patenting over claims 1-21 of co-pending Application No. 17/330,998 (referred to hereinafter as the '998 application) and claims 1-19 of co-pending Application No. 16/750,556 (referred to hereinafter as the '556 application).

In view of the amendments above, the amendments that are concurrently being made in the co-pending '998 application, and the remarks below, Applicant respectfully traverses the statutory double patenting rejection.

### **II. Statutory Double Patenting Rejection**

The Examiner provisionally rejected claims 1-21 on the grounds of statutory double patenting with respect to claims 1-21 of the '998 application and claims 1-19 of the '556 application. In a concurrently filed Amendment in the '998 application, the claims are changed to obviate the statutory double patenting rejection issued in the instant application. The claims of the '556 application significantly differ from those of this application, and therefore there should be no statutory double patenting rejection for the reasons discussed below.

Regarding the provisional double patenting rejection with respect to the '998 application

In a concurrently filed response to a non-Final Office Action issued in the co-pending '998 application, independent claims 1, 11, and 12 are amended to include the subject matter of claim 5 of the '998 application. Thus, claims 1, 11, and 12 of the '998 application now recite, *inter alia*, “*taking a new snapshot of the protected virtual cloud asset, when an existing snapshot cannot be located*”, the subject matter of which **is not included** in claim 1 of the instant Application. Accordingly, claim 1 of the instant Application differs from independent claims 1, 11, and 12 of the '998 application, at least as to “*taking a new snapshot of the protected virtual cloud asset, when an existing snapshot cannot be located.*”

Claim 1 (and its dependent claims) therefore overcome the statutory double patenting rejection with respect to the '998 application. Claims 11 and 12 (and their dependent claims) recite the subject matter of claim 1 in computer readable medium and system form, respectively, and similarly overcome the provisional double patenting rejection with respect to the '998 application.

Regarding the statutory double patenting rejection with respect to the '556 application

Claim 1 of the instant Application relates to a **cloud computing environment**, (e.g., an active or inactive environment), whereas the co-pending '556 application specifically relates to securing virtual cloud assets while these assets are **at rest** (e.g., inactive). Thus, the subject matter of claim 1 of the instant application differs substantially from that recited in claim 1 of the co-pending '556 application, and a statutory double patenting rejection is not appropriate. More specifically, Claim 1 of the instant Application recites, *inter alia*, “*A method for securing virtual cloud assets **in a cloud computing environment** against cyber threats,*” whereas claim 1 of the '556 application recites, *inter alia*, “*A method for securing virtual cloud assets **at rest** against cyber threats.*” Therefore, the statutory double patenting rejection in view of the '556 application should be withdrawn for a first reason.

In addition, Claim 1 of the instant Application further recites, *inter alia*, “determining a location of a **snapshot** of at least one virtual disk” (emphasis added), whereas claim 1 of the ‘556 application recites, *inter alia*, “determining a location of a **view** of at least one virtual disk” (emphasis added). The two are not the same, and therefore, the statutory double patenting rejection in view of the ‘556 application should be withdrawn for a second reason.

Moreover, Claim 1 of the instant Application recites, *inter alia*, “wherein the virtual cloud asset **is instantiated** in the cloud computing environment” (emphasis added), whereas claim 1 of the ‘556 application recites, *inter alia*, “wherein the **virtual cloud asset is at rest**” (emphasis added). The two are not the same, and therefore, the statutory double patenting rejection in view of the ‘556 application should be withdrawn for a third reason.

Even further, Claim 1 of the instant Application recites, *inter alia*, “accessing the **snapshot** of the virtual disk” (emphasis added), whereas claim 1 of the ‘556 application recites, *inter alia*, “accessing the **view** of the virtual disk” (emphasis added). The two are not the same, and therefore, the statutory double patenting rejection in view of the ‘556 application should be withdrawn for a fourth reason.

Finally, Claim 1 of the instant Application recites “analyzing the **snapshot** of the protected virtual cloud asset” (emphasis added), whereas claim 1 of the ‘556 application recites “analyzing the **view** of the protected virtual cloud asset ... **wherein the virtual cloud asset is inactive during the analysis**” (emphasis added). The two are not the same, and therefore, the statutory double patenting rejection in view of the ‘556 application should be withdrawn for a fifth reason.

Accordingly, at least these noted differences between the limitations of independent claim 1 of the instant Application versus independent claim 1 of the ‘556 application point to substantially different subject matter claimed by each.

These differences render improper the statutory double patenting rejection of claims 1-21 with regard to the '556 application.

Claim 1 (and its dependent claims) therefore overcome the statutory double patenting rejection with respect to the '556 application. Claims 11 and 12 (and their dependent claims) recite the subject matter of claim 1 in computer readable medium and system form, respectively, and similarly overcome the statutory double patenting rejection with respect to the '556 application.

### **CONCLUSION**

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: 1 June 2022

By: /Christopher C. Johns/

Christopher C. Johns

Reg. No. 68,664

(202) 408-4000

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|                                                             |                                    |                                                     |
|-------------------------------------------------------------|------------------------------------|-----------------------------------------------------|
| <b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b> |                                    | Docket Number (Optional)<br><b>15635.0003-00000</b> |
| Application Number<br><b>16/585,967</b>                     | Filed<br><b>September 27, 2019</b> |                                                     |
| For<br><b>TECHNIQUES FOR SECURING VIRTUAL MACHINES</b>      |                                    |                                                     |
| Art Unit<br><b>2435</b>                                     | Examiner<br><b>SAADOUN HASSAN</b>  |                                                     |

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

|                                                                   | <u>Fee</u> | <u>Small Entity Fee</u> | <u>Micro Entity Fee</u> |                  |
|-------------------------------------------------------------------|------------|-------------------------|-------------------------|------------------|
| <input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1)) | \$220      | \$110                   | \$55                    | \$ <u>110.00</u> |
| <input type="checkbox"/> Two months (37 CFR 1.17(a)(2))           | \$640      | \$320                   | \$160                   | \$ _____         |
| <input type="checkbox"/> Three months (37 CFR 1.17(a)(3))         | \$1,480    | \$740                   | \$370                   | \$ _____         |
| <input type="checkbox"/> Four months (37 CFR 1.17(a)(4))          | \$2,320    | \$1,160                 | \$580                   | \$ _____         |
| <input type="checkbox"/> Five months (37 CFR 1.17(a)(5))          | \$3,160    | \$1,580                 | \$790                   | \$ _____         |

☐ Applicant asserts small entity status. See 37 CFR 1.27.☐ Applicant certifies micro entity status. See 37 CFR 1.29.  
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.☐ A check in the amount of the fee is enclosed.☐ Payment by credit card. Form PTO-2038 is attached.☐ The Director has already been authorized to charge fees in this application to a Deposit Account.☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to  
Deposit Account Number 06-0916.☒ Payment made via EFS-Web.**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant.☒ attorney or agent of record. Registration number 68,664.☐ attorney or agent acting under 37 CFR 1.34. Registration number \_\_\_\_\_./Christopher C. Johns/

Signature

June 1, 2022

Date

Christopher C. Johns

Typed or printed name

(202) 408-4000

Telephone Number

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below\*.☐ \* Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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PATENT AND TRADEMARK OFFICE

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## ELECTRONIC PAYMENT RECEIPT

APPLICATION #  
16/585,967

RECEIPT DATE / TIME  
06/01/2022 05:32:45 PM ET

ATTORNEY DOCKET #  
15635.0003-00000

### Title of Invention

TECHNIQUES FOR SECURING VIRTUAL MACHINES

### Application Information

APPLICATION TYPE Utility - Nonprovisional Application  
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 9843

FILED BY Wanda Whittington

PATENT CENTER # 60696946

AUTHORIZED BY Christopher Johns

CUSTOMER # 22852

FILING DATE 09/27/2019

CORRESPONDENCE  
ADDRESS -

FIRST NAMED  
INVENTOR Avi SHUA

### Payment Information

PAYMENT METHOD  
CARD / 1007

PAYMENT TRANSACTION ID  
E202261H33372511

PAYMENT AUTHORIZED BY  
Wanda Whittington

| FEE CODE         | DESCRIPTION                                  | ITEM PRICE(\$) | QUANTITY | ITEM TOTAL(\$) |
|------------------|----------------------------------------------|----------------|----------|----------------|
| 2251             | EXTENSION FOR RESPONSE<br>WITHIN FIRST MONTH | 110.00         | 1        | 110.00         |
| TOTAL<br>AMOUNT: |                                              |                |          | \$110.00       |

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#### New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

#### National Stage of an International Application under 35 U.S.C. 371

IPR2025-01087  
Orca Security EX1024 Page 121

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

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## ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #  
**16/585,967**

RECEIPT DATE / TIME  
**06/01/2022 05:32:45 PM ET**

ATTORNEY DOCKET #  
**15635.0003-00000**

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under 35 USC 111(a)

PATENT # -

CONFIRMATION # 9843

FILED BY Wanda Whittington

PATENT CENTER # 60696946

FILING DATE 09/27/2019

CUSTOMER # 22852

FIRST NAMED  
INVENTOR Avi SHUA

CORRESPONDENCE  
ADDRESS -

AUTHORIZED BY Christopher Johns

### Documents

**TOTAL DOCUMENTS: 4**

| DOCUMENT                                    |        | PAGES | DESCRIPTION                                                     | SIZE (KB) |
|---------------------------------------------|--------|-------|-----------------------------------------------------------------|-----------|
| 15635-0003-00000AMENDMENT-as-filed.pdf      |        | 10    | -                                                               | 64 KB     |
| 15635-0003-00000AMENDMENT-as-filed-A....pdf | (1-1)  | 1     | Amendment/Request for Reconsideration-After Non-Final Rejection | 13 KB     |
| 15635-0003-00000AMENDMENT-as-filed-CLM.pdf  | (2-6)  | 5     | Claims                                                          | 24 KB     |
| 15635-0003-00000AMENDMENT-as-filed-REM.pdf  | (7-10) | 4     | Applicant Arguments/Remarks Made in an Amendment                | 41 KB     |

15635-0003-00000EOT-  
signed.pdf

2

Extension of Time

167 KB

## Digest

| DOCUMENT                                    | MESSAGE DIGEST(SHA-512)                                                                                                          |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 15635-0003-00000AMENDMENT-as-filed.pdf      | AD5568C4964709CED1B24C569B6C1EBFFB34694A1EE7766BF2897EB10394A293E4E887F5B90CFC1136D38E8D6906223D92C6D14EC112E00B7E51D1DDEE6806CD |
| 15635-0003-00000AMENDMENT-as-filed-A....pdf | DC6C6E7B5B15A1787AFECAA0FBE41049A433022E5E488E4B9EAB440F63F2BCFCCFB448DE90A1A9DB801ADCDF8E7A49E414E18E0BA8809CA712064C9FB55C41E9 |
| 15635-0003-00000AMENDMENT-as-filed-CLM.pdf  | B60D6D0C405CB0F0B590933BEE0FF18F94B9041E2BD3CC334C9B9DCFA15F71B14C6674CFD3704AFCF9180B3DBFE63E44E1D4814B31CDC881B4D0C579AAD9E5C3 |
| 15635-0003-00000AMENDMENT-as-filed-REM.pdf  | 4D87567B7176A47E8A8911D247D136E17EF6AB6524ACF08F2DA102AF90AB69C94B21FB2D9C7356307E381D66138D053471AEAB802CC34A8997584025BCA7EC89 |
| 15635-0003-00000EOT-signed.pdf              | 31E97405B2CBAD57E549BE20130E73221D1387EC3CE631D122B6DEAF030BAC130D30C93A4726CDF606DCB0CBA4DFE71BE5C966C45B5F8954F45E988F582CB291 |

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| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875 | Application or Docket Number<br>16/585,967 | Filing Date<br>09/27/2019 | <input type="checkbox"/> To be Mailed |
|-----------------------------------------------------------------------------------|--------------------------------------------|---------------------------|---------------------------------------|

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

### APPLICATION AS FILED - PART I

| FOR                                                                        | (Column 1)<br>NUMBER FILED                                                                                                                                                                                                    | (Column 2)<br>NUMBER EXTRA | RATE (\$) | FEE (\$) |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------|----------|
| <input type="checkbox"/> BASIC FEE<br>(37 CFR 1.16(a), (b), or (c))        | N/A                                                                                                                                                                                                                           | N/A                        | N/A       |          |
| <input type="checkbox"/> SEARCH FEE<br>(37 CFR 1.16(k), (i), or (m))       | N/A                                                                                                                                                                                                                           | N/A                        | N/A       |          |
| <input type="checkbox"/> EXAMINATION FEE<br>(37 CFR 1.16(o), (p), or (q))  | N/A                                                                                                                                                                                                                           | N/A                        | N/A       |          |
| TOTAL CLAIMS<br>(37 CFR 1.16(i))                                           | minus 20 = *                                                                                                                                                                                                                  |                            | x \$50 =  |          |
| INDEPENDENT CLAIMS<br>(37 CFR 1.16(h))                                     | minus 3 = *                                                                                                                                                                                                                   |                            | x \$230 = |          |
| <input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))             | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). |                            |           |          |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) |                                                                                                                                                                                                                               |                            |           |          |
| * If the difference in column 1 is less than zero, enter "0" in column 2.  |                                                                                                                                                                                                                               |                            | TOTAL     |          |

### APPLICATION AS AMENDED - PART II

|                                                                                                                                 |                                                                                          | (Column 1)                       |       | (Column 2)                         | (Column 3)    | RATE (\$)           | ADDITIONAL FEE (\$) |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------|-------|------------------------------------|---------------|---------------------|---------------------|
| <b>AMENDMENT</b>                                                                                                                | 06/01/2022                                                                               | CLAIMS REMAINING AFTER AMENDMENT |       | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA |                     |                     |
|                                                                                                                                 | Total<br>(37 CFR 1.16(i))                                                                | * 20                             | Minus | ** 21                              | = 0           | x \$50 =            | 0                   |
|                                                                                                                                 | Independent<br>(37 CFR 1.16(h))                                                          | * 3                              | Minus | *** 3                              | = 0           | x \$240 =           | 0                   |
|                                                                                                                                 | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                           |                                  |       |                                    |               |                     |                     |
|                                                                                                                                 | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) |                                  |       |                                    |               |                     |                     |
|                                                                                                                                 |                                                                                          |                                  |       |                                    |               | TOTAL ADD'L FEE     | 0                   |
| <b>AMENDMENT</b>                                                                                                                |                                                                                          | CLAIMS REMAINING AFTER AMENDMENT |       | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$)           | ADDITIONAL FEE (\$) |
|                                                                                                                                 | Total<br>(37 CFR 1.16(i))                                                                | *                                | Minus | **                                 | =             | x \$0 =             |                     |
|                                                                                                                                 | Independent<br>(37 CFR 1.16(h))                                                          | *                                | Minus | ***                                | =             | x \$0 =             |                     |
|                                                                                                                                 | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                           |                                  |       |                                    |               |                     |                     |
|                                                                                                                                 | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) |                                  |       |                                    |               |                     |                     |
|                                                                                                                                 |                                                                                          |                                  |       |                                    |               | TOTAL ADD'L FEE     |                     |
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.                                           |                                                                                          |                                  |       |                                    |               | SLIE                |                     |
| ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".                                       |                                                                                          |                                  |       |                                    |               | /JOCELYN M GASKINS/ |                     |
| *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".                                        |                                                                                          |                                  |       |                                    |               |                     |                     |
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REJECTION OVER A PENDING "REFERENCE" APPLICATION**

Docket Number (Optional)

15635.0003-00000

In re Application of: Avi SHUA

Application No.: 16/585,967

Filed: 09-27-2019

For: TECHNIQUES FOR SECURING VIRTUAL MACHINES

The applicant, Orca Security LTD., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 17/330,998, filed, 05-26-2021, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent granted on the pending **reference** application expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 33,751

/Gerson S. Panitch/

Signature

24 June 2022

Date

Gerson Panitch

Typed or printed name

Attorney of record

Title

202-408-4080

Telephone Number

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included.

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Patent Application Fee Transmittal

|                                                       |                                             |                 |               |                             |
|-------------------------------------------------------|---------------------------------------------|-----------------|---------------|-----------------------------|
| <b>Application Number:</b>                            | 16585967                                    |                 |               |                             |
| <b>Filing Date:</b>                                   | 27-Sep-2019                                 |                 |               |                             |
| <b>Title of Invention:</b>                            | TECHNIQUES FOR SECURING VIRTUAL MACHINES    |                 |               |                             |
| <b>First Named Inventor/Applicant Name:</b>           | Avi SHUA                                    |                 |               |                             |
| <b>Filer:</b>                                         | Christopher Charles Johns/Elizabeth Samuels |                 |               |                             |
| <b>Attorney Docket Number:</b>                        | 15635.0003-00000                            |                 |               |                             |
| Filed as Large Entity                                 |                                             |                 |               |                             |
| <b>Filing Fees for    Utility under 35 USC 111(a)</b> |                                             |                 |               |                             |
| <b>Description</b>                                    | <b>Fee Code</b>                             | <b>Quantity</b> | <b>Amount</b> | <b>Sub-Total in USD(\$)</b> |
| <b>Basic Filing:</b>                                  |                                             |                 |               |                             |
| <b>Pages:</b>                                         |                                             |                 |               |                             |
| <b>Claims:</b>                                        |                                             |                 |               |                             |
| <b>Miscellaneous-Filing:</b>                          |                                             |                 |               |                             |
| <b>Petition:</b>                                      |                                             |                 |               |                             |
| <b>Patent-Appeals-and-Interference:</b>               |                                             |                 |               |                             |
| <b>Post-Allowance-and-Post-Issuance:</b>              |                                             |                 |               |                             |
| <b>Extension-of-Time:</b>                             |                                             |                 |               |                             |

| Description                      | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|----------------------------------|----------|----------|--------|----------------------|
| Miscellaneous:                   |          |          |        |                      |
| STATUTORY OR TERMINAL DISCLAIMER | 1814     | 1        | 170    | 170                  |
| Total in USD (\$)                |          |          |        | 170                  |

## Electronic Acknowledgement Receipt

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| <b>EFS ID:</b>                              | 46037771                                    |
| <b>Application Number:</b>                  | 16585967                                    |
| <b>International Application Number:</b>    |                                             |
| <b>Confirmation Number:</b>                 | 9843                                        |
| <b>Title of Invention:</b>                  | TECHNIQUES FOR SECURING VIRTUAL MACHINES    |
| <b>First Named Inventor/Applicant Name:</b> | Avi SHUA                                    |
| <b>Customer Number:</b>                     | 22852                                       |
| <b>Filer:</b>                               | Christopher Charles Johns/Elizabeth Samuels |
| <b>Filer Authorized By:</b>                 | Christopher Charles Johns                   |
| <b>Attorney Docket Number:</b>              | 15635.0003-00000                            |
| <b>Receipt Date:</b>                        | 24-JUN-2022                                 |
| <b>Filing Date:</b>                         | 27-SEP-2019                                 |
| <b>Time Stamp:</b>                          | 12:12:16                                    |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                 |

### Payment information:

|                                          |                  |
|------------------------------------------|------------------|
| Submitted with Payment                   | yes              |
| Payment Type                             | CARD             |
| Payment was successfully received in RAM | \$ 170           |
| RAM confirmation Number                  | E20226NC13334225 |
| Deposit Account                          |                  |
| Authorized User                          |                  |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

IPR2025-01087

| <b>File Listing:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                           |                         |                                          |                  |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------|------------------------------------------|------------------|------------------|
| Document Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Document Description      | File Name               | File Size(Bytes)/<br>Message Digest      | Multi Part /.zip | Pages (if appl.) |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Terminal Disclaimer Filed | 15635_0003_00000_TD.pdf | 192287                                   | no               | 2                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |                         | 105a4f436ebe48619bed339b1e48eb62cb23817c |                  |                  |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                         |                                          |                  |                  |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                           |                         |                                          |                  |                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Fee Worksheet (SB06)      | fee-info.pdf            | 38208                                    | no               | 2                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |                         | 7aa5cd36e1dd44adfdea4e1791898c4b1261ede6 |                  |                  |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                         |                                          |                  |                  |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                           |                         |                                          |                  |                  |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                           |                         | 230495                                   |                  |                  |
| <p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                           |                         |                                          |                  |                  |

|                                                           |                                                  |                                                                 |  |
|-----------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------|--|
| <b><i>Application Number</i></b><br><b>* 16/585,967 *</b> | <b>Application/Control No.</b><br><br>16/585,967 | <b>Applicant(s)/Patent under Reexamination</b><br><br>SHUA, Avi |  |
|                                                           | <b>Examiner</b><br>SAADOUN, HASSAN               | <b>Art Unit</b><br>2435                                         |  |
| <b>Document Code - DISQ</b>                               |                                                  | <b>Internal Document - DO NOT MAIL</b>                          |  |

|                                        |                                                                |                                             |
|----------------------------------------|----------------------------------------------------------------|---------------------------------------------|
| <b>TERMINAL<br/>DISCLAIMER</b>         | <input checked="" type="checkbox"/> <b>APPROVED</b>            | <input type="checkbox"/> <b>DISAPPROVED</b> |
| Date Filed: <b><u>24 June 2022</u></b> | <b>This patent is subject<br/>to a Terminal<br/>Disclaimer</b> |                                             |

|                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------|
| <b>Approved/Disapproved by:</b>                                                                                          |
| /PAMELA A YOUNG/<br><br>Technology Center: <b><u>OPLC</u></b><br><br>Telephone: <b><u>(571)272-3622</u></b><br><br>_____ |



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
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www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

22852 7590 07/07/2022  
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
LLP  
901 NEW YORK AVENUE, NW  
WASHINGTON, DC 20001-4413

|                 |              |
|-----------------|--------------|
| EXAMINER        |              |
| SAADOUN, HASSAN |              |
| ART UNIT        | PAPER NUMBER |
| 2435            |              |

DATE MAILED: 07/07/2022

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 16/585,967      | 09/27/2019  | Avi SHUA             | 15635.0003-00000    | 9843             |

TITLE OF INVENTION: TECHNIQUES FOR SECURING VIRTUAL MACHINES

| APPLN. TYPE    | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE   |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL         | \$600         | \$0.00              | \$0.00               | \$600            | 10/07/2022 |

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at [www.uspto.gov/PatentMaintenanceFees](http://www.uspto.gov/PatentMaintenanceFees).**

# PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

22852 7590 07/07/2022  
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
LLP  
901 NEW YORK AVENUE, NW  
WASHINGTON, DC 20001-4413

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

|                         |
|-------------------------|
| (Typed or printed name) |
| (Signature)             |
| (Date)                  |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 16/585.967      | 09/27/2019  | Avi SHUA             | 15635.0003-00000    | 9843             |

TITLE OF INVENTION: TECHNIQUES FOR SECURING VIRTUAL MACHINES

| APPLN. TYPE    | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE   |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL         | \$600         | \$0.00              | \$0.00               | \$600            | 10/07/2022 |

| EXAMINER        | ART UNIT | CLASS-SUBCLASS |
|-----------------|----------|----------------|
| SAADOUN, HASSAN | 2435     | 726-023000     |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 \_\_\_\_\_

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2 \_\_\_\_\_

3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. \_\_\_\_\_

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_



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Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.                                       | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------------------------------------|-------------|----------------------|---------------------|------------------|
| 16/585,967                                            | 09/27/2019  | Avi SHUA             | 15635.0003-00000    | 9843             |
| 22852                                                 | 7590        | 07/07/2022           | EXAMINER            |                  |
| FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER<br>LLP |             |                      | SAADOUN, HASSAN     |                  |
| 901 NEW YORK AVENUE, NW                               |             |                      | ART UNIT            | PAPER NUMBER     |
| WASHINGTON, DC 20001-4413                             |             |                      | 2435                |                  |

DATE MAILED: 07/07/2022

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

### Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or suspected violation of Federal or State law.

|                               |                                      |                                  |                                 |
|-------------------------------|--------------------------------------|----------------------------------|---------------------------------|
| <b>Notice of Allowability</b> | <b>Application No.</b><br>16/585,967 | <b>Applicant(s)</b><br>SHUA, Avi |                                 |
|                               | <b>Examiner</b><br>HASSAN SAADOUN    | <b>Art Unit</b><br>2435          | <b>AIA (FITF) Status</b><br>Yes |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 06/01/2022.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-4,6-15 and 17-21. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

a) ☐ All      b) ☐ Some\*      c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)<br>2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____<br>3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material _____<br>4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date. _____ | 5. <input type="checkbox"/> Examiner's Amendment/Comment<br>6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance<br>7. <input type="checkbox"/> Other _____ |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                             |                                                               |
|---------------------------------------------|---------------------------------------------------------------|
| /HASSAN SAADOUN/<br>Examiner, Art Unit 2435 | /JOSEPH P HIRL/<br>Supervisory Patent Examiner, Art Unit 2435 |
|---------------------------------------------|---------------------------------------------------------------|

***Notice of Pre-AIA or AIA Status***

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

**Response to Amendment**

2. The Amendment filed **06/01/2022** has been entered. Claims **2 and 4** have been amended. Claims **5 and 16** are canceled. Claims **1-4, 6-15 and 17-21** are pending in this application.
3. Applicant's arguments filed on **06/01/2022** with respect to **claims 1-21 Statutory Double Patenting** rejection with respect to **claims 1-21** of copending applications **17/330,998 and 16/750,556** have been fully considered and persuasive. The rejection has been withdrawn.
4. **Note:** The terminal disclaimer filed on **06/25/2022** disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Number **17/330,998** has been reviewed and is accepted. The terminal disclaimer has been recorded.

**Allowable Subject Matter**

5. Claims **1-4, 6-15 and 17-21** are allowed.

The following is an examiner's statement of reasons for allowance:

6. The closest prior arts made of records are, Golan et al. (U.S Patent No. **10,944,778 B1**, referred to as **Golan**), Derbeko et al. (U.S Patent No. **10,536,471 B1**, referred to as **Derbeko**) and Deng et al. (U.S Pub No. **2017/0103212 A1**, referred to as **Deng**).

**Golan** discloses a method and system for implementing risk-based cyber security. Specifically, the disclosed method and system entail evaluating risk as a decision threshold for conducting cyber security assessments of system images within cloud computing environments. Further, the disclosed method and system pivot on intelligence pertaining to the latest cyber threats and/or vulnerabilities found worldwide.

**Derbeko** discloses a system and a method of detecting malware in a virtual machine (VM), the method comprising periodically creating snapshots of the VM, analyzing each of the snapshots in comparison to one or more previous snapshots to determine whether anomalies exist, and based on a threshold amount of anomalies detected, scanning the VM to determine whether malware is detected.

**Deng** discloses determining which snapshot deltas tend to occur in: (i) healthy virtual machines (VMs) that have been subject to an attack yet remained healthy, and/or (ii) unhealthy VMs that have apparently been adversely affected by an attack. Snapshot deltas that occur in at least some (or more preferably all) of the healthy VM subset provide information about software changes (for example, updates, configuration changes) that may be helpful. Snapshot deltas that occur in at least some (or more

preferably all) of the unhealthy VM subsets provide information about software changes (for example, updates, configuration changes) that may be unhelpful.

7. However, regarding claims **1 and 11**, the prior art of **Golan, Derbeko and Deng** when taken in the context of the claim as a whole do not disclose nor suggest,

“determining a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment; accessing the snapshot of the virtual disk based on the determined location; analyzing the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and alerting detected potential cyber threats based on a determined priority.”.

8. Regarding claim **12**, the prior art of **Golan, Derbeko and Deng** when taken in the context of the claim as a whole do not disclose nor suggest, “determine a location of a snapshot of at least one virtual disk of a protected virtual cloud asset, wherein the virtual cloud asset is instantiated in the cloud computing environment; access the snapshot of the virtual disk based on the determined location; analyze the snapshot of the protected virtual cloud asset to detect potential cyber threats risking the protected virtual cloud asset; and alert detected potential cyber threats based on a determined priority.”.

9. **Claims 2-4 and 6-10** depend on **claim 1** and **claims 13-15 and 17-21** depend on **claim 12**, and are of consequence allowed.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HASSAN SAADOUN whose telephone number is (571)272-8408. The examiner can normally be reached Mon-Fri 9:00-5:00.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hirl can be reached on 571-272-3685. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HASSAN SAADOUN/  
Examiner, Art Unit 2435

/JOSEPH P HIRL/  
Supervisory Patent Examiner, Art Unit 2435

|                                   |                                       |  |                                                         |             |
|-----------------------------------|---------------------------------------|--|---------------------------------------------------------|-------------|
| <b>Notice of References Cited</b> | Application/Control No.<br>16/585,967 |  | Applicant(s)/Patent Under<br>Reexamination<br>SHUA, Avi |             |
|                                   | Examiner<br>HASSAN SAADOUN            |  | Art Unit<br>2435                                        | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * |   | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Name                         | CPC Classification | US Classification |
|---|---|--------------------------------------------------|-----------------|------------------------------|--------------------|-------------------|
| * | A | US-10944778-B1                                   | 03-2021         | Golan; Oron                  | H04L63/1491        | 1/1               |
| * | B | US-10536471-B1                                   | 01-2020         | Derbeko; Philip              | G06F21/53          | 1/1               |
| * | C | US-20170103212-A1                                | 04-2017         | Deng; Yu                     | G06F3/0619         | 1/1               |
| * | D | US-11068353-B1                                   | 07-2021         | Ved; Amber                   | G06F9/45558        | 1/1               |
| * | E | US-20160094568-A1                                | 03-2016         | Balasubramanian; Swaminathan | G06F9/45558        | 726/23            |
| * | F | US-20160004449-A1                                | 01-2016         | LAKSHMAN; Avinash            | G06F3/0604         | 711/162           |
| * | G | US-20130191643-A1                                | 07-2013         | Song; Zhexuan                | H04L9/3265         | 713/176           |
|   | H |                                                  |                 |                              |                    |                   |
|   | I |                                                  |                 |                              |                    |                   |
|   | J |                                                  |                 |                              |                    |                   |
|   | K |                                                  |                 |                              |                    |                   |
|   | L |                                                  |                 |                              |                    |                   |
|   | M |                                                  |                 |                              |                    |                   |

**FOREIGN PATENT DOCUMENTS**

| * |   | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Country | Name | CPC Classification |
|---|---|--------------------------------------------------|-----------------|---------|------|--------------------|
|   | N |                                                  |                 |         |      |                    |
|   | O |                                                  |                 |         |      |                    |
|   | P |                                                  |                 |         |      |                    |
|   | Q |                                                  |                 |         |      |                    |
|   | R |                                                  |                 |         |      |                    |
|   | S |                                                  |                 |         |      |                    |
|   | T |                                                  |                 |         |      |                    |

**NON-PATENT DOCUMENTS**

| * |   | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
|---|---|-------------------------------------------------------------------------------------------|
|   | U |                                                                                           |
|   | V |                                                                                           |
|   | W |                                                                                           |
|   | X |                                                                                           |

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

|                                                                                                                  |                                              |                                                             |  |
|------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|--|
| <b>Issue Classification</b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |  |
|                                                                                                                  | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |  |

| CPC    |   |      |   |       |      |            |
|--------|---|------|---|-------|------|------------|
| Symbol |   |      |   |       | Type | Version    |
| H04L   | / | 63   | / | 1416  | F    | 2013-01-01 |
| G06F   | / | 9    | / | 45558 | I    | 2013-01-01 |
| H04L   | / | 63   | / | 1441  | I    | 2013-01-01 |
| G06F   | / | 16   | / | 128   | I    | 2019-01-01 |
| G06F   | / | 11   | / | 1464  | I    | 2013-01-01 |
| H04L   | / | 63   | / | 1433  | I    | 2013-01-01 |
| G06F   | / | 2009 | / | 45583 | A    | 2013-01-01 |
| G06F   | / | 2009 | / | 45587 | A    | 2013-01-01 |
| G06F   | / | 2009 | / | 45595 | A    | 2013-01-01 |
| G06F   | / | 2009 | / | 45562 | A    | 2013-01-01 |
| G06F   | / | 2009 | / | 45591 | A    | 2013-01-01 |
| G06F   | / | 2201 | / | 84    | A    | 2013-01-01 |

| CPC Combination Sets |   |   |   |      |         |
|----------------------|---|---|---|------|---------|
| Symbol               |   |   |   | Type | Version |
| /                    | / | / | / |      |         |

|                                                                                     |                        |                                    |                        |
|-------------------------------------------------------------------------------------|------------------------|------------------------------------|------------------------|
| /HASSAN SAADOUN/<br>Examiner, Art Unit 2435<br>(Assistant Examiner)                 | 29 June 2022<br>(Date) | <b>Total Claims Allowed:</b><br>19 |                        |
| /JOSEPH P HIRL/<br>Supervisory Patent Examiner, Art Unit 2435<br>(Primary Examiner) | 30 June 2022<br>(Date) | O.G. Print Claim(s)<br>1           | O.G. Print Figure<br>2 |

|                                                                                                                         |                                              |                                                             |
|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| <b><i>Issue Classification</i></b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |
|                                                                                                                         | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |

|                                     |   |   |       |
|-------------------------------------|---|---|-------|
| <b>INTERNATIONAL CLASSIFICATION</b> |   |   |       |
| <b>CLAIMED</b>                      |   |   |       |
| G06F                                | / | 9 | / 455 |
| <b>NON-CLAIMED</b>                  |   |   |       |
| H04L                                | / | 9 | / 40  |

|                                   |                 |
|-----------------------------------|-----------------|
| <b>US ORIGINAL CLASSIFICATION</b> |                 |
| <b>CLASS</b>                      | <b>SUBCLASS</b> |
| 726                               | 23              |

|                            |                                          |  |  |  |  |  |
|----------------------------|------------------------------------------|--|--|--|--|--|
| <b>CROSS REFERENCES(S)</b> |                                          |  |  |  |  |  |
| <b>CLASS</b>               | <b>SUBCLASS (ONE SUBCLASS PER BLOCK)</b> |  |  |  |  |  |
|                            |                                          |  |  |  |  |  |

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|-------------------------------------------------------------------------------------|------------------------|------------------------------------|------------------------|
| /HASSAN SAADOUN/<br>Examiner, Art Unit 2435<br>(Assistant Examiner)                 | 29 June 2022<br>(Date) | <b>Total Claims Allowed:</b><br>19 |                        |
| /JOSEPH P HIRL/<br>Supervisory Patent Examiner, Art Unit 2435<br>(Primary Examiner) | 30 June 2022<br>(Date) | O.G. Print Claim(s)<br>1           | O.G. Print Figure<br>2 |

|                                                                                                                  |                                              |                                                             |
|------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| <b>Issue Classification</b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |
|                                                                                                                  | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☒ T.D.
 ☐ R.1.47

| CLAIMS |          |       |          |       |          |       |          |       |          |       |          |       |          |       |          |
|--------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|
| Final  | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original |
| 1      | 1        | 9     | 10       | 17    | 19       |       |          |       |          |       |          |       |          |       |          |
| 2      | 2        | 10    | 11       | 18    | 20       |       |          |       |          |       |          |       |          |       |          |
| 3      | 3        | 11    | 12       | 19    | 21       |       |          |       |          |       |          |       |          |       |          |
| 4      | 4        | 12    | 13       |       |          |       |          |       |          |       |          |       |          |       |          |
| -      | 5        | 13    | 14       |       |          |       |          |       |          |       |          |       |          |       |          |
| 5      | 6        | 14    | 15       |       |          |       |          |       |          |       |          |       |          |       |          |
| 6      | 7        | -     | 16       |       |          |       |          |       |          |       |          |       |          |       |          |
| 7      | 8        | 15    | 17       |       |          |       |          |       |          |       |          |       |          |       |          |
| 8      | 9        | 16    | 18       |       |          |       |          |       |          |       |          |       |          |       |          |

|                                                                                     |                        |                                    |                        |
|-------------------------------------------------------------------------------------|------------------------|------------------------------------|------------------------|
| /HASSAN SAADOUN/<br>Examiner, Art Unit 2435<br>(Assistant Examiner)                 | 29 June 2022<br>(Date) | <b>Total Claims Allowed:</b><br>19 |                        |
| /JOSEPH P HIRL/<br>Supervisory Patent Examiner, Art Unit 2435<br>(Primary Examiner) | 30 June 2022<br>(Date) | O.G. Print Claim(s)<br>1           | O.G. Print Figure<br>2 |

|                                                                                                          |                                              |                                                             |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| <b>Search Notes</b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |
|                                                                                                          | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |

| CPC - Searched*                                                                                                                                                                                                                                                                                                                                               |            |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|
| Symbol                                                                                                                                                                                                                                                                                                                                                        | Date       | Examiner |
| CPC Classification Search (H04L63/1416 or G06F9/45558 or G06F11/1464 or G06F16/128 or H04L63/1433 or H04L63/1441 or G06F2009/45562 or G06F2009/45583 or G06F2009/45587 or G06F2009/45591 or G06F2009/45595 or G06F2201/84 or G06F2201/815 or G06F2201/86 or G06F11/1451 or G06F11/301 or G06F11/3476 or H04L63/1408 or H04L63/1425) limited with text.        | 01/25/2022 | HS       |
| CPC Classification Search (H04L63/1416 or G06F9/45558 or G06F11/1464 or G06F16/128 or H04L63/1433 or H04L63/1441 or G06F2009/45562 or G06F2009/45583 or G06F2009/45587 or G06F2009/45591 or G06F2009/45595 or G06F2201/84 or G06F2201/815 or G06F2201/86 or G06F11/1451 or G06F11/301 or G06F11/3476 or H04L63/1408 or H04L63/1425) limited with text update. | 06/13/2022 | HS       |

| CPC Combination Sets - Searched* |      |          |
|----------------------------------|------|----------|
| Symbol                           | Date | Examiner |
|                                  |      |          |

| US Classification - Searched* |          |      |          |
|-------------------------------|----------|------|----------|
| Class                         | Subclass | Date | Examiner |
|                               |          |      |          |

\* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

|                                             |  |
|---------------------------------------------|--|
| /HASSAN SAADOUN/<br>Examiner, Art Unit 2435 |  |
|---------------------------------------------|--|

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|----------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| <b>Search Notes</b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |
|                                                                                                          | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |

| Search Notes                                                        |            |          |
|---------------------------------------------------------------------|------------|----------|
| Search Notes                                                        | Date       | Examiner |
| PE2E class limited with text search. (See Search History).          | 01/25/2022 | HS       |
| PE2E inventor and assignee search. (See Search History).            | 01/25/2022 | HS       |
| PE2E text search. (See Search History).                             | 01/25/2022 | HS       |
| PE2E Interference Search. (See Search History).                     | 01/25/2022 | HS       |
| NPL search. (STIC, Google Scholar and IP.com) (See Search History). | 01/25/2022 | HS       |
| PE2E class limited with text search update. (See Search History).   | 06/13/2022 | HS       |
| PE2E inventor and assignee search update. (See Search History).     | 06/13/2022 | HS       |
| PE2E text search update. (See Search History).                      | 06/13/2022 | HS       |
| PE2E Interference Search update. (See Search History).              | 06/13/2022 | HS       |
| NPL search update. (IP.com). (See Search History).                  | 06/29/2022 | HS       |

| Interference Search |                                                                                                                                             |            |          |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|
| US Class/CPC Symbol | US Subclass/CPC Group                                                                                                                       | Date       | Examiner |
| H04L                | 63/1416, 63/1433, 63/1441, 63/1408, 63/1425.                                                                                                | 01/25/2022 | HS       |
| G06F                | 9/45558, 11/1464, 16/128, 2009/45562, 2009/45583, 2009/45587, 2009/45591, 2009/45595, 2201/84, 2201/815, 2201/86, 11/1451, 11/301, 11/3476. | 01/25/2022 | HS       |
| H04L                | 63/1416, 63/1433, 63/1441, 63/1408, 63/1425.                                                                                                | 06/13/2022 | HS       |
| G06F                | 9/45558, 11/1464, 16/128, 2009/45562, 2009/45583, 2009/45587, 2009/45591, 2009/45595, 2201/84, 2201/815, 2201/86, 11/1451, 11/301, 11/3476. | 06/13/2022 | HS       |

|                                             |  |
|---------------------------------------------|--|
| /HASSAN SAADOUN/<br>Examiner, Art Unit 2435 |  |
|---------------------------------------------|--|

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|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| <b><i>Index of Claims</i></b><br> | <b>Application/Control No.</b><br>16/585,967 | <b>Applicant(s)/Patent Under Reexamination</b><br>SHUA, Avi |
|                                                                                                                    | <b>Examiner</b><br>HASSAN SAADOUN            | <b>Art Unit</b><br>2435                                     |

|   |                 |   |                   |   |                     |   |                 |
|---|-----------------|---|-------------------|---|---------------------|---|-----------------|
| ✓ | <b>Rejected</b> | - | <b>Cancelled</b>  | N | <b>Non-Elected</b>  | A | <b>Appeal</b>   |
| = | <b>Allowed</b>  | ÷ | <b>Restricted</b> | I | <b>Interference</b> | O | <b>Objected</b> |

| CLAIMS                                                                                                                                                                                       |          |            |            |  |  |  |  |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|------------|--|--|--|--|--|--|--|
| <input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input checked="" type="checkbox"/> T.D. <input type="checkbox"/> R.1.47 |          |            |            |  |  |  |  |  |  |  |
| CLAIM                                                                                                                                                                                        |          | DATE       |            |  |  |  |  |  |  |  |
| Final                                                                                                                                                                                        | Original | 01/25/2022 | 06/29/2022 |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 1        | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 2        | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 3        | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 4        | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 5        | ✓          | -          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 6        | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 7        | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 8        | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 9        | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 10       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 11       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 12       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 13       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 14       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 15       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 16       | ✓          | -          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 17       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 18       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 19       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 20       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              | 21       | ✓          | =          |  |  |  |  |  |  |  |
|                                                                                                                                                                                              |          |            |            |  |  |  |  |  |  |  |
|                                                                                                                                                                                              |          |            |            |  |  |  |  |  |  |  |
|                                                                                                                                                                                              |          |            |            |  |  |  |  |  |  |  |
|                                                                                                                                                                                              |          |            |            |  |  |  |  |  |  |  |

## Bibliographic Data

Application No: 16/585,967

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No

☐ Met After Allowance

Verified and Acknowledged:

/HASSAN  
SAADOUN/

Examiner's Signature

Initials

Title:

TECHNIQUES FOR SECURING VIRTUAL MACHINES

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| FILING or 371(c) DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. |
|-----------------------|-------|----------------|---------------------|
| 09/27/2019            | 726   | 2435           | 15635.0003-00000    |
| <b>RULE</b>           |       |                |                     |

### APPLICANTS

Orca Security LTD., Tel Aviv, ISRAEL

### INVENTORS

Avi SHUA, Tel Aviv, ISRAEL

### CONTINUING DATA

This application has PRO of 62797718 01/28/2019

### FOREIGN APPLICATIONS

### IF REQUIRED, FOREIGN LICENSE GRANTED\*\*

10/30/2019

**\*\* SMALL ENTITY \*\***

### STATE OR COUNTRY

ISRAEL

### ADDRESS

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER

LLP

901 NEW YORK AVENUE, NW

WASHINGTON, DC 20001-4413

UNITED STATES

### FILING FEE RECEIVED

\$835

## PE2E SEARCH - Search History (Prior Art)

| Ref # | Hits    | Search Query                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DBs               | Default Operator | Plurals | British Equivalents | Time Stamp          |
|-------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|---------|---------------------|---------------------|
| L1    | 3       | "16585967"                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/18 09:01 AM |
| L2    | 2781668 | Orca Security LTD.as.                                                                                                                                                                                                                                                                                                                                                                                                                                                             | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/18 11:10 AM |
| L3    | 5067    | SHUA, Avi.in.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/18 11:11 AM |
| L6    | 0       | "Orca near2 Security".as. AND ( (determin\$4 identify\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 (virtual "VM")).clm.                                                                                                                                                                                                                                                                                                                        | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/20 11:50 AM |
| L7    | 2       | (SHUA near2 Avi).in. AND ( (determin\$4 identify\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 (virtual "VM")).clm.                                                                                                                                                                                                                                                                                                                             | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/20 11:51 AM |
| L8    | 31      | ( (determin\$4 identify\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 (virtual "VM")) SAME (threat malware malicious attack) AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR G06F2009/45562 OR G06F2009/45583 OR G06F2009/45587 OR G06F2009/45591 OR G06F2009/45595 OR G06F2201/84 OR G06F2201/815 OR G06F2201/86 OR G06F11/1451 OR G06F11/301 OR G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc. | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/20 11:55 AM |
| L9    | 15      | ( (determin\$4 identify\$5 identify\$3) near2 (snapshot snap?shot                                                                                                                                                                                                                                                                                                                                                                                                                 | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/20 12:09 PM |

|     |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L10 | 26 | image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))<br>SAME (threat malware<br>malicious attack) AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.                                                                            | (US-PGPUB; USPAT;<br>USOCR; FIT (AU, AP,<br>AT, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, OA, RU, SU, WO,<br>MC, MD, MY, NL, NO,<br>NZ, PH, PL, PT, RO,<br>RS, SE, SG, SI, SK,<br>TH, TN, TR, TW, UA,<br>VN); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>12:13 PM |
| L11 | 7  | ( (determin\$4 identifi\$5<br>identify\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))<br>SAME (threat malware<br>malicious attack) AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT;<br>USOCR; FIT (AU, AP,<br>AT, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,                                                                                                                                                                                                                          | OR | ON | ON | 2022/01/20<br>12:17 PM |

|     |    |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                      |    |    |    |                     |
|-----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---------------------|
|     |    | near5 (location spot place site placement area) SAME (threat malware malicious attack) AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR G06F2009/45562 OR G06F2009/45583 OR G06F2009/45587 OR G06F2009/45591 OR G06F2009/45595 OR G06F2201/84 OR G06F2201/815 OR G06F2201/86 OR G06F11/1451 OR G06F11/301 OR G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc. | HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)                                                                                                                           |    |    |    |                     |
| L12 | 7  | ( (determin\$4 identifi\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 ((virtual near2 disk) "VM")) near5 (location spot place site placement area) SAME (threat malware malicious attack)                                                                                                                                                                               | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2022/01/20 12:17 PM |
| L13 | 11 | ("10412109" OR "20070266433" OR "20140137190" OR "20150052520" OR "20170011138" OR "20180255080" OR "20180293374" OR "9177145" OR "9519781" OR "9563777" OR "9798885").pn.                                                                                                                                                                                                                                | (US-PGPUB; USPAT)                                                                                                                                                                                                                                                                                                    | OR | ON | ON | 2022/01/20 01:54 PM |
| L14 | 3  | ("10412109" OR "20070266433" OR "20140137190" OR "20150052520" OR "20170011138" OR "20180255080" OR                                                                                                                                                                                                                                                                                                       | (US-PGPUB; USPAT)                                                                                                                                                                                                                                                                                                    | OR | ON | ON | 2022/01/20 01:56 PM |

|     |      |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L15 | 0    | "20180293374" OR<br>"9177145" OR<br>"9519781" OR<br>"9563777" OR<br>"9798885").pn. AND<br>((snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))                                                                                                           | (US-PGPUB; USPAT)                                                                                                                                                                                                                                                                                                                                                 | OR | ON | ON | 2022/01/20<br>01:58 PM |
| L16 | 11   | ("10412109" OR<br>"20070266433" OR<br>"20140137190" OR<br>"20150052520" OR<br>"20170011138" OR<br>"20180255080" OR<br>"20180293374" OR<br>"9177145" OR<br>"9519781" OR<br>"9563777" OR<br>"9798885").pn. AND<br>((virtual near2 disk)<br>"VM") near5 (location<br>spot place site<br>placement area) | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>02:19 PM |
| L17 | 30   | ( (determin\$4 identifi\$5<br>identify\$3) near2 (threat<br>malware malicious<br>attack) near9(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3) near5<br>((virtual near2 disk)<br>"VM"))                                                                                                     | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>02:20 PM |
| L18 | 1919 | (snapshot snap?shot                                                                                                                                                                                                                                                                                  | (US-PGPUB; USPAT;                                                                                                                                                                                                                                                                                                                                                 | OR | ON | ON | 2022/01/20             |

|     |     |                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
|     |     | image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM") near5<br>(location spot place site<br>placement area)                                                                            | USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                      |    |    |    | 02:30 PM               |
| L19 | 130 | (determin\$4 identifi\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3) near3<br>((virtual near2 disk)<br>"VM") | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>02:31 PM |
| L20 | 117 | L19 AND<br>(@ad<"20190128")                                                                                                                                                                              | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/20<br>02:33 PM |
| L21 | 58  | L20 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR     | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,                                                                                                                      | OR | ON | ON | 2022/01/20<br>02:33 PM |

|     |     |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |    |    |                        |
|-----|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L22 | 226 | G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.<br><br>(determin\$4 identifi\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3) near3<br>((virtual near2 (disk<br>machine)) OR "VM") | PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)<br><br>(US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/21<br>09:45 AM |
| L23 | 210 | L22 AND<br>(@ad<"20190128")                                                                                                                                                                                                                                                                                                                                                                       | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                                                                                                                          | OR | ON | ON | 2022/01/21<br>09:46 AM |
| L24 | 116 | L23 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR                                                                               | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                                                                                                                          | OR | ON | ON | 2022/01/21<br>09:46 AM |

|     |    |                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
| L25 | 6  | G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.<br><br>( (determin\$4 identify\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3<br>backup) near3 ((virtual<br>near2 (disk machine))<br>"VM")) SAME cloud<br>near2 (asset service) | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:01 AM |
| L26 | 92 | ( (determin\$4 identify\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3<br>backup) near3 ((virtual<br>near2 (disk machine))<br>"VM")) AND cloud<br>near2 (asset service)                                                               | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:15 AM |
| L27 | 24 | ( (determin\$4 identify\$5<br>identify\$3) near2<br>(location spot place site<br>placement area)<br>near5(snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3<br>backup) near3 ((virtual<br>near2 (disk machine))<br>"VM")) AND cloud<br>near2 (asset service)<br>AND (threat malware<br>malicious attack)                   | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:25 AM |
| L28 | 21 | L27 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR                                                                                                                                                                                                                 | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,                                                                                                                                                                                                                          | OR | ON | ON | 2022/01/25<br>09:29 AM |

|     |     |                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
|     |     | G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.                                                                                                                     | HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                                                                                                                                             |    |    |    |                        |
| L29 | 57  | L26 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:30 AM |
| L30 | 193 | (access\$3 obtain\$3<br>retriev\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3 backup)<br>near5(location spot<br>place site placement<br>area) near3 (virtual<br>near2 (disk machine)<br>"VM")                                                                                                                                                        | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:54 AM |
| L31 | 96  | L30 AND (H04L63/1416<br>OR G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR                                                                                                                                                                                              | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>09:55 AM |

|     |   |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |                        |
|-----|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------|
|     |   | G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.                                                                                                                                                                                                  | NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB)                                                                                                                                                                                                                          |    |    |    |                        |
| L32 | 1 | (access\$3 obtain\$3<br>retriev\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3 backup)<br>near5(location spot<br>place site placement<br>area) near3 (virtual<br>near2 (disk machine<br>asset service) "VM")<br>SAME (analyz\$3<br>inspect\$3 process\$3)<br>near2 (virtual near2<br>(disk machine asset<br>service)) near7 (threat<br>malware malicious<br>attack) | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>10:11 AM |
| L33 | 2 | (analyz\$3 inspect\$3<br>process\$3) near2<br>(virtual near2 (disk<br>machine asset service))<br>near7 (threat malware<br>malicious attack) SAME<br>(alert\$3 notif\$ warn\$3)<br>near3 (threat malware<br>malicious attack) near7<br>(priority order)                                                                                                                                     | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT;<br>IBM_TDB) | OR | ON | ON | 2022/01/25<br>10:14 AM |
| L34 | 2 | (analyz\$3 inspect\$3<br>process\$3) near2<br>(virtual near2 (disk<br>machine asset service))<br>near7 (threat malware<br>malicious attack) SAME<br>(alert\$3 notif\$ warn\$3)<br>near3 (threat malware<br>malicious attack) near7<br>(priority order<br>preference)                                                                                                                       | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;                              | OR | ON | ON | 2022/01/25<br>10:15 AM |

|     |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                |    |    |    |                        |
|-----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----|----|----|------------------------|
| L35 | 2  | "10944778"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | JPO; DERWENT;<br>IBM_TDB)<br>(US-PGPUB; USPAT) | OR | ON | ON | 2022/01/27<br>06:23 PM |
| L36 | 3  | "16585967"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | (US-PGPUB; USPAT)                              | OR | ON | ON | 2022/06/13<br>02:12 PM |
| L37 | 0  | "Orca near2<br>Security".as. AND (<br>(determin\$4 identifi\$5<br>identify\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 (virtual<br>"VM")).clm.                                                                                                                                                                                                                                                                                                                                                                                 | (US-PGPUB; USPAT;<br>USOCR)                    | OR | ON | ON | 2022/06/13<br>02:13 PM |
| L38 | 2  | (SHUA near2 Avi).in.<br>AND ( (determin\$4<br>identifi\$5 identify\$3)<br>near2 (snapshot<br>snap?shot image copy<br>replicat\$3 clon\$3) near3<br>(virtual "VM")).clm.                                                                                                                                                                                                                                                                                                                                                                                         | (US-PGPUB; USPAT;<br>IBM_TDB)                  | OR | ON | ON | 2022/06/13<br>02:13 PM |
| L39 | 31 | ( (determin\$4 identifi\$5<br>identify\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 (virtual<br>"VM")) SAME (threat<br>malware malicious<br>attack) AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT;<br>USOCR)                    | OR | ON | ON | 2022/06/13<br>02:14 PM |
| L40 | 15 | ( (determin\$4 identifi\$5<br>identify\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))<br>SAME (threat malware<br>malicious attack) AND                                                                                                                                                                                                                                                                                                                                                            | (US-PGPUB; USPAT;<br>USOCR)                    | OR | ON | ON | 2022/06/13<br>02:14 PM |

|     |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                       |    |    |    |                        |
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| L41 | 26 | (H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                       |    |    |    |                        |
|     |    | ( (determin\$4 identify\$5<br>identify\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))<br>SAME (threat malware<br>malicious attack) AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,<br>SG, SI, SK, SU, TH,<br>TN, TR, TW, UA, VN,<br>WO); FPRS; EPO;<br>JPO; DERWENT) | OR | ON | ON | 2022/06/13<br>02:15 PM |
| L42 | 7  | ( (determin\$4 identify\$5<br>identify\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3) near3 ((virtual<br>near2 disk) "VM"))<br>near5 (location spot<br>place site placement<br>area) SAME (threat<br>malware malicious<br>attack) AND                                                                                                                                                                                                                                                                                                                | (US-PGPUB; USPAT;<br>USOCR; FIT (AP, AT,<br>AU, BE, BG, BR, BY,<br>CA, CH, CN, CS, CU,<br>CZ, DD, DE, DK, EA,<br>EE, EP, ES, FI, FR, GB,<br>HR, HU, ID, IE, IL, IS,<br>IT, JP, KR, LT, LU, LV,<br>MA, MC, MD, MY, NL,<br>NO, NZ, OA, PH, PL,<br>PT, RO, RS, RU, SE,                                                                                   | OR | ON | ON | 2022/06/13<br>02:15 PM |

|     |   |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                             |    |    |    |                     |
|-----|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---------------------|
|     |   | (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR G06F2009/45562 OR G06F2009/45583 OR G06F2009/45587 OR G06F2009/45591 OR G06F2009/45595 OR G06F2201/84 OR G06F2201/815 OR G06F2201/86 OR G06F11/1451 OR G06F11/301 OR G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc. | SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)                                                                                                                                                                                                                                       |    |    |    |                     |
| L43 | 7 | ( (determin\$4 identifi\$5 identify\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3) near3 ((virtual near2 disk) "VM")) near5 (location spot place site placement area) SAME (threat malware malicious attack)                                                                                    | (US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT) | OR | ON | ON | 2022/06/13 02:15 PM |
| L44 | 2 | (analyz\$3 inspect\$3 process\$3) near2 (virtual near2 (disk machine asset service)) near7 (threat malware malicious attack) SAME (alert\$3 notif\$ warn\$3) near3 (threat malware malicious attack) near7 (priority order preference)                                                                         | (US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT) | OR | ON | ON | 2022/06/13 02:16 PM |
| L45 | 2 | (analyz\$3 inspect\$3 process\$3) near2 (virtual near2 (disk machine asset service)) near7 (threat malware malicious attack) SAME (alert\$3 notif\$ warn\$3) near3 (threat malware                                                                                                                             | (US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,                                                                                                                                   | OR | ON | ON | 2022/06/13 02:16 PM |

|     |   |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |    |    |                     |
|-----|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---------------------|
| L46 | 1 | malicious attack) near7 (priority order)<br><br>(access\$3 obtain\$3 retriev\$3) near2 (snapshot snap?shot image copy replicat\$3 clon\$3 backup) near5(location spot place site placement area) near3 (virtual near2 (disk machine asset service) "VM") SAME (analyz\$3 inspect\$3 process\$3) near2 (virtual near2 (disk machine asset service)) near7 (threat malware malicious attack) | MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)<br><br>(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT) | OR | ON | ON | 2022/06/13 02:16 PM |
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## PE2E SEARCH - Search History (Interference)

| Ref # | Hits | Search Query                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | DBs               | Default Operator | Plurals | British Equivalents | Time Stamp          |
|-------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|---------|---------------------|---------------------|
| N1    | 2    | (( (determin\$4 identif\$5 identify\$3) near2 (location spot place site placement area) near5(snapshot snap?shot image copy replicat\$3 clon\$3 backup) near3 ((virtual near2 (disk machine)) "VM")) AND cloud near2 (asset service)).clm. AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR G06F2009/45562 OR G06F2009/45583 OR G06F2009/45587 OR G06F2009/45591 OR G06F2009/45595 OR G06F2201/84 OR G06F2201/815 OR G06F2201/86 OR G06F11/1451 OR G06F11/301 OR | (US-PGPUB; USPAT) | OR               | ON      | ON                  | 2022/01/25 10:18 AM |

|    |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |    |    |    |                        |
|----|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|------------------------|
| N2 | 1 | G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.<br>((access\$3 obtain\$3<br>retriev\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3 backup)<br>near5(location spot<br>place site placement<br>area) near3 (virtual<br>near2 (disk machine<br>asset service) "VM")<br>SAME (analyz\$3<br>inspect\$3 process\$3)<br>near2 (virtual near2<br>(disk machine asset<br>service)) near7 (threat<br>malware malicious<br>attack) ).clm. AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT) | OR | ON | ON | 2022/01/25<br>10:19 AM |
| N3 | 0 | ((analyz\$3 inspect\$3<br>process\$3) near2<br>(virtual near2 (disk<br>machine asset service))<br>near7 (threat malware<br>malicious attack) SAME<br>(alert\$3 notif\$ warn\$3)<br>near3 (threat malware<br>malicious attack) near7<br>(priority order<br>preference)).clm. AND<br>(H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR                                                                                                                                                                                                                                                                                                                                                                                                                        | (US-PGPUB; USPAT) | OR | ON | ON | 2022/01/25<br>10:20 AM |

|    |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |    |    |    |                        |
|----|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|------------------------|
| N4 | 0 | G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc.<br>((analyz\$3 inspect\$3<br>process\$3) near2<br>(virtual near2 (disk<br>machine asset service))<br>near7 (threat malware<br>malicious attack) SAME<br>(alert\$3 notif\$ warn\$3)<br>near3 (threat malware<br>malicious attack<br>hack\$3) near7 (priority<br>order preference)).clm.<br>AND (H04L63/1416 OR<br>G06F9/45558 OR<br>G06F11/1464 OR<br>G06F16/128 OR<br>H04L63/1433 OR<br>H04L63/1441 OR<br>G06F2009/45562 OR<br>G06F2009/45583 OR<br>G06F2009/45587 OR<br>G06F2009/45591 OR<br>G06F2009/45595 OR<br>G06F2201/84 OR<br>G06F2201/815 OR<br>G06F2201/86 OR<br>G06F11/1451 OR<br>G06F11/301 OR<br>G06F11/3476 OR<br>H04L63/1408 OR<br>H04L63/1425).cpc. | (US-PGPUB; USPAT) | OR | ON | ON | 2022/06/13<br>02:18 PM |
| N5 | 1 | ((access\$3 obtain\$3<br>retriev\$3) near2<br>(snapshot snap?shot<br>image copy replicat\$3<br>clon\$3 backup)<br>near5(location spot<br>place site area) near3<br>(virtual near2 (disk<br>machine asset service)<br>"VM") SAME (analyz\$3<br>inspect\$3 process\$3)<br>near2 (virtual near2<br>(disk machine asset<br>service)) near7 (threat<br>malware malicious                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (US-PGPUB; USPAT) | OR | ON | ON | 2022/06/13<br>02:18 PM |

|    |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |    |    |    |                        |
|----|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|------------------------|
| N6 | 2 | <p>attack) ).clm. AND<br/>(H04L63/1416 OR<br/>G06F9/45558 OR<br/>G06F11/1464 OR<br/>G06F16/128 OR<br/>H04L63/1433 OR<br/>H04L63/1441 OR<br/>G06F2009/45562 OR<br/>G06F2009/45583 OR<br/>G06F2009/45587 OR<br/>G06F2009/45591 OR<br/>G06F2009/45595 OR<br/>G06F2201/84 OR<br/>G06F2201/815 OR<br/>G06F2201/86 OR<br/>G06F11/1451 OR<br/>G06F11/301 OR<br/>G06F11/3476 OR<br/>H04L63/1408 OR<br/>H04L63/1425).cpc.</p> <p>(( (determin\$4 identifi\$5<br/>identify\$3) near2<br/>(location spot place site<br/>area) near5(snapshot<br/>snap?shot image copy<br/>replicat\$3 clon\$3<br/>backup) near3 ((virtual<br/>near2 (disk machine))<br/>"VM")) AND cloud<br/>near2 (asset<br/>service)).clm. AND<br/>(H04L63/1416 OR<br/>G06F9/45558 OR<br/>G06F11/1464 OR<br/>G06F16/128 OR<br/>H04L63/1433 OR<br/>H04L63/1441 OR<br/>G06F2009/45562 OR<br/>G06F2009/45583 OR<br/>G06F2009/45587 OR<br/>G06F2009/45591 OR<br/>G06F2009/45595 OR<br/>G06F2201/84 OR<br/>G06F2201/815 OR<br/>G06F2201/86 OR<br/>G06F11/1451 OR<br/>G06F11/301 OR<br/>G06F11/3476 OR<br/>H04L63/1408 OR<br/>H04L63/1425).cpc.</p> | (US-PGPUB; USPAT) | OR | ON | ON | 2022/06/13<br>02:19 PM |
|----|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|------------------------|

1 - 50

Security challenges and countermeasures for trusted virtualized computing environments

Today, virtualization technology is ubiquitously woven into nearly every technical field and conversation, taking place in the world of Information Technology (IT), because it can provide various benefits in terms of cost effectiveness, availability, hardware utilization, resource protection, remote .

IEEE Xplore : IEEE Conferences : 2012-08-01 : 4 : World Congress on Internet Security (WorldCIS-2012) (Page(s): 117-122)

Security intelligence for cloud management infrastructures

In this paper, we address the problem of protecting cloud infrastructures and customer workloads via smart auditing and logging, satisfying regulatory and compliance requirements. We observe that traditional approaches of logging and auditing events in cloud-scale infrastructures will not be...

IEEE Xplore : IBM Periodicals : 2016-07-01 : 4 : IBM Journal of Research and Development

Get Your Head Out of the Clouds: The Illusion of Confidentiality & Privacy

The cloud has been leveraged for many applications across different industries. Despite its popularity, the cloud technologies are still immature. The security implications of cloud computing also dominate the research space. Many confidentiality-and integrity-based (C-I) security controls...

IEEE Xplore : IEEE Conferences : 2018-11-01 : 4 : 2018 IEEE 8th International Symposium on Cloud and Service Computing (SC2) (Page(s): 57-66)

Closing the loop: Network and in-host monitoring tandem for comprehensive cloud security visibility

Cloud computing has not only become attractive for organizations and end-users but also for attackers that use cloud environments to exploit the offered economies of scale—a cloud environment consists of a large set of systems with an excellent network connectivity setup and similar configurations....

IEEE Xplore : IBM Periodicals : 2016-07-01 : 4 : IBM Journal of Research and Development

Hierarchical secure virtualization model for cloud

Cloud services are providing on-demand resources via virtualization technologies. This will make cloud computing a potential target for cyber attacks. Most proposed security models for virtualization are working above virtualization on host OS. Almost all proposed cloud security models suffers from...

IEEE Xplore : IEEE Conferences : 2012-06-01 : 4 : Proceedings Title: 2012 International Conference on Cyber Security, Cyber Warfare and Digital Forensics (CyberSec) (Page(s): 219-224)

Enabling secure multitenancy in cloud computing: Challenges and approaches

Cloud computing provides a multitenant feature that enables an IT asset to host multiple tenants, improving its utilization rate. The feature provides economic benefits to both users and service providers since it reduces the management cost and thus lowers the subscription price. Many users are,...

IEEE Xplore : IEEE Conferences : 2012-04-01 : 4 : 2012 2nd Baltic Congress on Future Internet Communications (Page(s): 72-79)

Relevance

Collections

Wiley-IEEE eBooks: 15

PubMed Central: 27

IBM Redbooks: 68

arXiv.org: 149

IEEE Periodicals: 186

Publication Date

2500

Charts based on top 1500 results

More V

Result 1

https://iq.ip.com/discover

IPR2025-01087

Orca Security EX1024 Page 168

1/1



## ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #  
**16/585,967**

RECEIPT DATE / TIME  
**07/22/2022 10:57:55 AM ET**

ATTORNEY DOCKET #  
**15635.0003-00000**

### Title of Invention

TECHNIQUES FOR SECURING VIRTUAL MACHINES

### Application Information

APPLICATION TYPE Utility - Nonprovisional Application  
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 9843

FILED BY Wanda Whittington

PATENT CENTER # 60804667

FILING DATE 09/27/2019

CUSTOMER # 22852

FIRST NAMED  
INVENTOR Avi SHUA

CORRESPONDENCE  
ADDRESS -

AUTHORIZED BY Christopher Johns

### Documents

**TOTAL DOCUMENTS: 2**

| DOCUMENT                                                                         | PAGES | DESCRIPTION                                | SIZE (KB) |
|----------------------------------------------------------------------------------|-------|--------------------------------------------|-----------|
| 15635-0003-00000-<br>IssueFeeTransmittal-07-22-<br>2022.pdf                      | 1     | Issue Fee Payment (PTO-85B)                | 176 KB    |
| 15635-0003-<br>00000CommentsOnStatemen<br>tofResonsForAllowance7-22-<br>2022.pdf | 2     | Post Allowance Communication<br>- Incoming | 16 KB     |

### Digest

| DOCUMENT | MESSAGE DIGEST(SHA-512) |
|----------|-------------------------|
|----------|-------------------------|

|                            |                                                   |
|----------------------------|---------------------------------------------------|
| 15635-0003-00000-          | 98A3684CE5ABEE8B1BE0283BC177A27AEE337519FACAD140  |
| IssueFeeTransmittal-07-22- | D4559F1BBF2C2170341EB2E9236471BF4D117B7F9AAABBF11 |
| 2022.pdf                   | 4D42B90D57EAC74105494D32252BA52                   |

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|                            |                                                    |
|----------------------------|----------------------------------------------------|
| 15635-0003-                | B78E10A8F37F920F385210CF23C6E924946EAFA1283414D613 |
| 00000CommentsOnStatementof | 5C8B311F69B71291588212CC7D23759DA22E731077015DB673 |
| ResonsForAllowance7-22-    | AF87DEC6329F2CBCD9D9FE6178F8                       |
| 2022.pdf                   |                                                    |

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

#### **New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

#### **National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

#### **New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

|                                                 |   |                           |
|-------------------------------------------------|---|---------------------------|
| In re Application of:                           | ) |                           |
|                                                 | ) |                           |
| <b>Techniques for Securing Virtual Machines</b> | ) | Group Art Unit: 2435      |
|                                                 | ) |                           |
| Application No.: 16/585,967                     | ) | Examiner: SAADOUN, HASSAN |
|                                                 | ) |                           |
| Filed: 09/27/2019                               | ) |                           |
|                                                 | ) | Confirmation No.: 9843    |
| For: Avi SHUA                                   | ) |                           |

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Commissioner:

**COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE**

Applicants are appreciative of the Examiner's allowance of the pending claims on July 7, 2022. Without withdrawing the allowed claims from issue, Applicant submits these comments.

In the Notice of Allowance, the Examiner made certain characterizations and assertions regarding the allowed claims. Although Applicant agrees with the Examiner's ultimate conclusion that the claims are patentable, Applicant does not necessarily agree with all of the characterizations and assertions made or suggested in regard to the Examiner's reasons for allowance. For instance, Applicant submits that each of the allowed claims is patentable based on the subject matter defined by the claim language and the combination of recitations within the claims, and not based solely on the recitations discussed during examination.

Should the Examiner disagree with the Applicant's comments on the Examiner's Statement of Reasons for Allowance, the Examiner is invited to contact the undersigned, in order to resolve such disagreement.

Please charge any fees due in connection with the filing of this paper to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: 22 July 2022

By: /Christopher C. Johns/  
Christopher C. Johns  
Reg. No. 68,664  
(202) 408-4000



## ELECTRONIC PAYMENT RECEIPT

APPLICATION #  
16/585,967

RECEIPT DATE / TIME  
07/22/2022 10:57:55 AM ET

ATTORNEY DOCKET #  
15635.0003-00000

### Title of Invention

TECHNIQUES FOR SECURING VIRTUAL MACHINES

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APPLICATION TYPE Utility - Nonprovisional Application  
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 9843

FILED BY Wanda Whittington

PATENT CENTER # 60804667

AUTHORIZED BY Christopher Johns

CUSTOMER # 22852

FILING DATE 09/27/2019

CORRESPONDENCE  
ADDRESS -

FIRST NAMED  
INVENTOR Avi SHUA

### Payment Information

PAYMENT METHOD  
CARD / 1007

PAYMENT TRANSACTION ID  
E20227LA59093610

PAYMENT AUTHORIZED BY  
Wanda Whittington

| FEE CODE      | DESCRIPTION       | ITEM PRICE(\$) | QUANTITY | ITEM TOTAL(\$) |
|---------------|-------------------|----------------|----------|----------------|
| 2501          | UTILITY ISSUE FEE | 600.00         | 1        | 600.00         |
| TOTAL AMOUNT: |                   |                |          | \$600.00       |

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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#### National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage

IPR2025-01087

submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

# PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

22852 7590 07/07/2022

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
LLP  
901 NEW YORK AVENUE, NW  
WASHINGTON, DC 20001-4413

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

|                         |
|-------------------------|
| (Typed or printed name) |
| (Signature)             |
| (Date)                  |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 16/585,967      | 09/27/2019  | Avi SHUA             | 15635.0003-00000    | 9843             |

TITLE OF INVENTION: TECHNIQUES FOR SECURING VIRTUAL MACHINES

| APPLN. TYPE    | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE   |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL         | \$600         | \$0.00              | \$0.00               | \$600            | 10/07/2022 |

| EXAMINER        | ART UNIT | CLASS-SUBCLASS |
|-----------------|----------|----------------|
| SAADOUN, HASSAN | 2435     | 726-023000     |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Finnegan, Henderson,  
2 Farabow, Garrett &  
3 Dunner LLP

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Orca Security LTD.

Tel Aviv, Israel

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

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☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. \_\_\_\_\_

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Christopher C. Johns/

Date 22 July 2022

Typed or printed name Christopher C. Johns

Registration No. 68,664



| APPLICATION NO. | ISSUE DATE | PATENT NO. | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|------------|------------|---------------------|------------------|
| 16/585,967      | 08/30/2022 | 11431735   | 15635.0003-00000    | 9843             |

22852 7590 08/10/2022

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
LLP  
901 NEW YORK AVENUE, NW  
WASHINGTON, DC 20001-4413

## ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

### **Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)** (application filed on or after May 29, 2000)

The Patent Term Adjustment is 381 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

**INVENTOR(s)** (Please see PAIR WEB site <http://pair.uspto.gov> for additional inventors):

Avi SHUA, Tel Aviv, ISRAEL;

**APPLICANT(s)** (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Orca Security LTD., Tel Aviv, ISRAEL;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit [SelectUSA.gov](http://SelectUSA.gov).

|                                                                                                          |   |    |   |                          |                    |
|----------------------------------------------------------------------------------------------------------|---|----|---|--------------------------|--------------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br><i>(Use as many sheets as necessary)</i> |   |    |   | <b>Complete if Known</b> |                    |
|                                                                                                          |   |    |   | Application Number       | 16/585,967         |
|                                                                                                          |   |    |   | Filing Date              | September 27, 2019 |
|                                                                                                          |   |    |   | First Named Inventor     | Avi SHUA           |
|                                                                                                          |   |    |   | Group Art Unit           | 2435               |
|                                                                                                          |   |    |   | Examiner Name            | Saadoun, Hassan    |
| Sheet                                                                                                    | 1 | of | 1 | Attorney Docket Number   | 15635.0003-00000   |

| U.S. PATENTS                   |                       |                                          |                                         |                                                 |                                                                           |
|--------------------------------|-----------------------|------------------------------------------|-----------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------|
| Examiner Initials <sup>*</sup> | Cite No. <sup>1</sup> | Document Number                          | Issue or Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
|                                |                       | Number-Kind Code <sup>2</sup> (if known) |                                         |                                                 |                                                                           |
|                                |                       | US-10/944,778 B1                         | 03-2021                                 | Golan, Oron                                     |                                                                           |
|                                |                       | US-10/536,471 B1                         | 01-2020                                 | Derbeko, Philip                                 |                                                                           |
|                                |                       | US-11/068,353 B1                         | 07-2021                                 | Ved, Amber                                      |                                                                           |
|                                |                       | US-9/268,689 B1                          | 02-2016                                 | Chen, Grace Jing                                |                                                                           |
|                                |                       | US-10/469,304 B1                         | 11-2019                                 | Kempe, Gregory Jonathan                         |                                                                           |

| U.S. PUBLISHED PATENT APPLICATIONS |                       |                                          |                                         |                                                 |                                                                           |
|------------------------------------|-----------------------|------------------------------------------|-----------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------|
| Examiner Initials <sup>*</sup>     | Cite No. <sup>3</sup> | Document Number                          | Issue or Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
|                                    |                       | Number-Kind Code <sup>4</sup> (if known) |                                         |                                                 |                                                                           |
|                                    |                       | US-2017/0103212 A1                       | 04-2017                                 | Deng, Yu                                        |                                                                           |
|                                    |                       | US-2016/0094568 A1                       | 03-2016                                 | Balasubramanian, Swaminathan                    |                                                                           |
|                                    |                       | US-2016/0004449 A1                       | 01-2016                                 | Lakshman, Avinash                               |                                                                           |
|                                    |                       | US-2013/0191643 A1                       | 07-2013                                 | Song, Zhexuan                                   |                                                                           |
|                                    |                       | US-2018/0137032 A1                       | 05-2018                                 | Tannous, Samuel Joseph                          |                                                                           |
|                                    |                       | US-2008/0189788 A1                       | 08-2008                                 | Bahl, Pradeep                                   |                                                                           |
|                                    |                       | US-2016/0364255 A1                       | 12-2016                                 | Chefalas, Thomas E.                             |                                                                           |
|                                    |                       | US-2011/0289584 A1                       | 11-2011                                 | Palagummi, Siva Sai Prasad                      |                                                                           |

**Note: Submission of copies of U.S. Patents and published U.S. Patent Applications is not required.**

| FOREIGN PATENT DOCUMENTS       |                       |                                                                                 |                                |                                                 |                                                                           |                          |
|--------------------------------|-----------------------|---------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------|---------------------------------------------------------------------------|--------------------------|
| Examiner Initials <sup>*</sup> | Cite No. <sup>1</sup> | Foreign Patent Document                                                         | Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | Translation <sup>8</sup> |
|                                |                       | Country Code <sup>5</sup> Number <sup>6</sup> Kind Code <sup>7</sup> (if known) |                                |                                                 |                                                                           |                          |
|                                |                       |                                                                                 |                                |                                                 |                                                                           |                          |
|                                |                       |                                                                                 |                                |                                                 |                                                                           |                          |

| NONPATENT LITERATURE DOCUMENTS |                       |                                                                                                                                                                                                                                                                 |                          |
|--------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Examiner Initials <sup>*</sup> | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | Translation <sup>9</sup> |
|                                |                       |                                                                                                                                                                                                                                                                 |                          |

|                    |  |                 |  |
|--------------------|--|-----------------|--|
| Examiner Signature |  | Date Considered |  |
|--------------------|--|-----------------|--|

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

PTO Notes regarding this form:

<sup>1</sup> Applicant's unique citation designation number (optional).

<sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>3</sup> Applicant's unique citation designation number (optional).

<sup>4</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>5</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).

<sup>6</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

<sup>7</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible.

<sup>8</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

|                              |   |                           |
|------------------------------|---|---------------------------|
| In re Application of:        | ) |                           |
|                              | ) |                           |
| Avi SHUA                     | ) | Group Art Unit: 2435      |
|                              | ) |                           |
| Application No.: 16/585,967  | ) | Examiner: Saadoun, Hassan |
|                              | ) |                           |
| Filed: September 27, 2019    | ) | Confirmation No.: 9843    |
|                              | ) |                           |
| For: TECHNIQUES FOR SECURING | ) |                           |
| VIRTUAL MACHINES             | ) |                           |

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**Via EFS-Web**

Dear Commissioner:

**INFORMATION DISCLOSURE STATEMENT**

Pursuant to 37 C.F.R. §§ 1.56, Applicant submits the documents on the attached listing and requests that the documents be made of record and placed in the file of this application.

Furthermore, because the related applications associated with this submission are identified in Office records as sharing priority with the instant application, it is assumed that the Examiner has already considered these related applications and the references cited during their prosecution to the patentability of the claims of the instant application. Nevertheless, in a further abundance of caution, Applicant identifies the related applications below.

| <i>Application No.</i> | <i>Filing date</i> |
|------------------------|--------------------|
| 17/330,998             | 05/26/2021         |
| 17/361,861             | 06/29/2021         |

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claim in the application and Applicant determines that the cited documents do not constitute "prior art" under United States law, Applicant reserves the right to present to the U.S. Patent and Trademark Office the relevant facts and law regarding the appropriate status of such documents.

Applicant further reserves the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

Please charge any fee due in connection with the filing of this Statement to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: August 22, 2022

By: /Christopher C. Johns/  
Christopher C. Johns  
Reg. No. 68,664  
Phone: 202-408-4000



## ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #  
**16/585,967**

RECEIPT DATE / TIME  
**08/22/2022 03:53:21 PM ET**

ATTORNEY DOCKET #  
**15635.0003-00000**

### Title of Invention

TECHNIQUES FOR SECURING VIRTUAL MACHINES

### Application Information

APPLICATION TYPE Utility - Nonprovisional Application  
under 35 USC 111(a)

PATENT # 11431735

CONFIRMATION # 9843

FILED BY Sharon Horton

PATENT CENTER # 60894931

FILING DATE 09/27/2019

CUSTOMER # 22852

FIRST NAMED  
INVENTOR Avi SHUA

CORRESPONDENCE  
ADDRESS -

AUTHORIZED BY Christopher Johns

### Documents

**TOTAL DOCUMENTS: 2**

| DOCUMENT                                                       | PAGES | DESCRIPTION                                           | SIZE (KB) |
|----------------------------------------------------------------|-------|-------------------------------------------------------|-----------|
| 15635.0003-00000 As-Filed<br>IDS Transmittal<br>08.22.2022.pdf | 2     | Transmittal Letter                                    | 93 KB     |
| 15635.0003-00000 As-filed -<br>PTO-SB08.pdf                    | 2     | Information Disclosure<br>Statement (IDS) Form (SB08) | 113 KB    |

Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

### Digest

DOCUMENT

MESSAGE DIGEST(SHA-512)

IPR2025-01087

Orca Security EX1024 Page 181

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|                                                          |                                                                                                                                  |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 15635.0003-00000 As-Filed IDS Transmittal 08.22.2022.pdf | 11BB877DB88775713552AA71DB7D8CE9F0FBEFA2804035DCC34E4D6CDAD65A14A9C237CA35E85F05C3C8314493D8AA19294B51B9315399409E19A61C863A3D37 |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|

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|                                          |                                                                                                                                   |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 15635.0003-00000 As-filed - PTO-SB08.pdf | 1D8A435FCD830A87C58141796E8ECB822AD7C889611F3D33E42EB5A026827445FCAAF8B07903D7E133E1076AF9716244D584C0FA034CF58E3735D8506CA46D649 |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

| <b>DISCLAIMER IN A PATENT UNDER 37 CFR 1.321(a)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Name of Patentee<br><b>Orca Security LTD.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Docket Number (optional)<br><b>15635.0003-00000</b> |
| Patent Number<br><b>11431735</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Date Patent Issued<br><b>30 August 2022</b>         |
| Title of Invention<br><b>TECHNIQUES FOR SECURING VIRTUAL MACHINES</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                     |
| <p>Patentee hereby disclaims:</p> <p><input checked="" type="checkbox"/> the following complete claim(s) in the above-identified patent: <u>1-7, 9-17, 19</u>.</p> <p><input type="checkbox"/> the terminal part of the term of the above-identified patent beginning on the date: _____.</p> <p><input type="checkbox"/> the entire term of the above-identified patent.</p> <p>The disclaimer is binding on the patentee and its successors or assigns.</p> <p>The extent of patentee's ownership interest in the above-identified patent is: <u>100% (Reel/Frame 050520/0770)</u>.</p> <p>The fee for this disclaimer is set forth in 37 CFR 1.20(d) and is being paid in the following manner:</p> <p><input checked="" type="checkbox"/> payment by the USPTO patent electronic filing system.</p> <p><input type="checkbox"/> the Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. _____.</p> <p><input type="checkbox"/> payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> a check in the amount of the fee is enclosed.</p> <p><b>WARNING:</b> Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on form PTO-2038.</p> <p>The undersigned is:</p> <p><input type="checkbox"/> patentee. If patentee is a juristic entity, the undersigned is authorized to act on behalf of the juristic entity.</p> <p><input checked="" type="checkbox"/> attorney or agent of record.</p> |                                                     |
| Signature<br><b>/Christopher C. Johns/</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Date<br><b>17 April 2024</b>                        |
| Name (printed/typed)<br><b>Christopher C. Johns</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Practitioner registration number<br><b>68,664</b>   |
| <b><u>Note:</u></b> See 37 CFR 1.4(d) for signature requirements and certifications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                     |

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). <https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf>

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- 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
- 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
- 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
- 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
- 8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
- 9) the Office of Personnel Management (OPM) for personnel research purposes; and
- 10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.



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PATENT AND TRADEMARK OFFICE

P.O. Box 1450  
Alexandria, VA 22313 - 1450  
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## ELECTRONIC PAYMENT RECEIPT

APPLICATION #  
16/585,967

RECEIPT DATE / TIME  
04/17/2024 04:09:42 PM Z ET

ATTORNEY DOCKET #  
15635.0003-00000

### Title of Invention

TECHNIQUES FOR SECURING VIRTUAL MACHINES

### Application Information

APPLICATION TYPE Utility - Nonprovisional Application  
under 35 USC 111(a)

PATENT # 11431735

CONFIRMATION # 9843

FILED BY Wanda Whittington

PATENT CENTER # 65134623

AUTHORIZED BY Christopher Johns

CUSTOMER # 22852

FILING DATE 09/27/2019

CORRESPONDENCE  
ADDRESS -

FIRST NAMED  
INVENTOR Avi SHUA

### Payment Information

PAYMENT METHOD  
CARD / 1007

PAYMENT TRANSACTION ID  
E20244GG10346702

PAYMENT AUTHORIZED BY  
Wanda Whittington

| FEE CODE         | DESCRIPTION                                            | ITEM PRICE(\$) | QUANTITY | ITEM TOTAL(\$) |
|------------------|--------------------------------------------------------|----------------|----------|----------------|
| 2814             | STATUTORY DISCLAIMER,<br>INCLUDING TERMINAL DISCLAIMER | 170.00         | 1        | 170.00         |
| TOTAL<br>AMOUNT: |                                                        |                |          | \$170.00       |

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#### New Applications Under 35 U.S.C. 111

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#### National Stage of an International Application under 35 U.S.C. 371

IPR2025-01087  
Orca Security EX1024 Page 185

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



## ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #  
**16/585,967**

RECEIPT DATE / TIME  
**04/17/2024 04:09:42 PM Z ET**

ATTORNEY DOCKET #  
**15635.0003-00000**

### Title of Invention

TECHNIQUES FOR SECURING VIRTUAL MACHINES

### Application Information

APPLICATION TYPE Utility - Nonprovisional Application  
under 35 USC 111(a)

PATENT # 11431735

CONFIRMATION # 9843

FILED BY Wanda Whittington

PATENT CENTER # 65134623

FILING DATE 09/27/2019

CUSTOMER # 22852

FIRST NAMED  
INVENTOR Avi SHUA

CORRESPONDENCE  
ADDRESS -

AUTHORIZED BY Christopher Johns

### Documents

**TOTAL DOCUMENTS: 1**

| DOCUMENT                | PAGES | DESCRIPTION               | SIZE (KB) |
|-------------------------|-------|---------------------------|-----------|
| Disclaimer - sb0043.pdf | 2     | Terminal Disclaimer Filed | 269 KB    |

### Digest

| DOCUMENT                | MESSAGE DIGEST(SHA-512)                                                                                                                   |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Disclaimer - sb0043.pdf | FE5B410882B350AB2E1EA99060342D6DEF3E758BBB1BD95AD<br>BC1D087BDB75E75EC0FD0C71AC854A605F9C50F6B274FF28<br>82A03B7B2EED91B2E16D4159978BBF62 |

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as

IPR2025-01087  
Orca Security EX1024 Page 187

described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

|                                                    |                                                  |                                                                 |  |
|----------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------|--|
| <b>Application Number</b><br><b>* 16/585,967 *</b> | <b>Application/Control No.</b><br><br>16/585,967 | <b>Applicant(s)/Patent under Reexamination</b><br><br>SHUA, Avi |  |
|                                                    | <b>Examiner</b><br>SAADOUN, HASSAN               | <b>Art Unit</b><br>2435                                         |  |
| <b>Document Code - DISQ</b>                        |                                                  | <b>Internal Document - DO NOT MAIL</b>                          |  |

|                                         |                                                        |                                                        |
|-----------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| <b>TERMINAL DISCLAIMER</b>              | <input type="checkbox"/> <b>APPROVED</b>               | <input checked="" type="checkbox"/> <b>DISAPPROVED</b> |
| <b>Date Filed: <u>17 April 2024</u></b> | <b>This patent is subject to a Terminal Disclaimer</b> |                                                        |

|                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Approved/Disapproved by:</b><br><br>/KIMBERLY R WHITE/<br><br><b>Technology Center: <u>OPLC</u></b><br><br><b>Telephone: <u>(571)272-6179</u></b><br><br><u>TD form is missing. Please resubmit information on form PTO/AIA/26 (04-14). No additional fee is required with resubmission.</u> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

WIZ, INC.  
Petitioner,

v.

ORCA SECURITY LTD,  
Patent Owner.

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IPR2024-00220  
Patent 11,431,735 B2

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Before RICHARD M. LEBOVITZ, DANIEL J. GALLIGAN, and  
GARTH D. BAER, *Administrative Patent Judges*.

LEBOVITZ, *Administrative Patent Judge*.

DECISION  
Denying Institution of *Inter Partes* Review  
35 U.S.C. § 314

## I. INTRODUCTION

Wiz, Inc. filed a petition for *inter partes* review of claims 1–7, 9–17, and 19 (“the challenged claims”) of U.S. Patent No. 11,431,735 B2 (Ex. 1001, “the ’735 patent”). Paper 2. Orca Security Ltd. (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 6 (“Prelim. Resp.”).

For the reasons discussed below, we do not institute an *inter partes* review of any challenged claim.

## II. DISCUSSION

Patent Owner argues that the Petition is moot and an IPR cannot be instituted because a statutory disclaimer was filed with the U.S. Patent and Trademark Office disclaiming all challenged claims 1–7, 9–17, and 19 of the ’735 patent. Prelim. Resp. 1; *see also* Ex. 2001 (Disclaimer in Patent under 37 C.F.R. § 1.321(a), Form PTO/SB/43 (11-23), filed Apr. 17, 2024).

Under 37 C.F.R. § 42.107(e), “[t]he patent owner may file a statutory disclaimer under 35 U.S.C. 253(a) in compliance with § 1.321(a) of this chapter, disclaiming one or more claims in the patent,” and “[n]o *inter partes* review will be instituted based on disclaimed claims.”

A statutory disclaimer is “considered as part of the original patent” as of the date on which it is “recorded” in the Office. 35 U.S.C. § 253(a). “A statutory disclaimer under 35 U.S.C. § 253 has the effect of canceling the claims from the patent and the patent is viewed as though the disclaimed claims had never existed in the patent.” *Guinn v. Kopf*, 96 F.3d 1419, 1422 (Fed. Cir. 1996). *See also Raytheon Technologies Corporation v. General Electric Company*, 993 F.3d 1374, n.4 (Fed. Cir. 2021) (“Disclaimed claims are treated as if they never existed.”)

For a disclaimer to be “recorded” in the Office, the document filed by the patent owner must:

- (1) Be signed by the patentee, or an attorney or agent of record;
  - (2) Identify the patent and complete claim or claims, or term being disclaimed. A disclaimer which is not a disclaimer of a complete claim or claims, or term will be refused recordation;
  - (3) State the present extent of patentee’s ownership interest in the patent; and
  - (4) Be accompanied by the fee set forth in [37 C.F.R.] § 1.20(d).
- 37 C.F.R. § 1.321(a). “[N]othing in the statutes or regulations requires any action by the [Patent Office] for a disclaimer to be ‘recorded.’” *Vectra Fitness, Inc. v. TNWK Corp.*, 162 F.3d 1379, 1382 (Fed. Cir. 1998).

From our review of Exhibit 2001 and the Office’s public records, we conclude that a disclaimer of claims 1–7, 9–17, and 19 of the ’735 patent under 35 U.S.C. § 253(a) has been recorded in the Office as of April 17, 2024. Ex. 2001. Because the Board cannot institute trial on disclaimed claims and all of the challenged claims have been disclaimed here, no *inter partes* review will be instituted. *See Gen. Elec. Co. v. United Techs. Corp.*, IPR2017-00491, Paper 9 (PTAB July 6, 2017) (precedential) (denying institution of *inter partes* review under rule 37 C.F.R. § 42.107(e) based on disclaimer).

### III. ORDER

In consideration of the foregoing, it is hereby ORDERED that pursuant to 35 U.S.C. § 314(a), no *inter partes* review of the challenged claims of U.S. Patent No. 11,431,735 B2 is instituted.

IPR2024-00220  
Patent 11,431,735 B2

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### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv, IL. TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 17, 2024, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-7, 9-17 and 19 of said patent.

*(Official Gazette, July 2, 2024)*

### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv (IL). TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 17, 2024, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-7, 9-17 and 19 of said patent.

*(Official Gazette, September 17, 2024)*

### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv (IL). TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 14, 2024, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-7, 9-17 and 19 of said patent.

*(Official Gazette, December 10, 2024)*

### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv (IL). TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 17, 2024, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-7, 9-17, 19 of said patent.

*(Official Gazette, March 25, 2025)*

### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv (IL). TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 17, 2024, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-7, 9-17, 19 of said patent.

*(Official Gazette, April 8, 2025)*

### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv (IL). TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 17, 2024, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-7, 9-17, 19 of said patent.

*(Official Gazette, May 6, 2025)*

### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv (IL). TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 17, 2024, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-17, 9-17, 19 of said patent.

*(Official Gazette, June 3, 2025)*

### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv (IL). TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 17, 2025, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-7, 9-17, 19 of said patent.

*(Official Gazette, July 8, 2025)*

### **Disclaimer**

**11,431,735 B2** - Avi Shua, Tel Aviv (IL). TECHNIQUES FOR SECURING VIRTUAL MACHINES. Patent dated August 30, 2022. Disclaimer filed April 17, 2024, by the assignee, Orca Security LTD.

I hereby disclaim the following complete Claims 1-7, 9-17, 19 of said patent.

*(Official Gazette, August 12, 2025)*