PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT5743245

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
AVI SHUA	09/26/2019

RECEIVING PARTY DATA

Name:	ORCA SECURITY LTD.
Street Address:	65 YIGAL ALON ST.
City:	TEL AVIV
State/Country:	ISRAEL
Postal Code:	6744316

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	16585967

CORRESPONDENCE DATA

Fax Number: (908)274-3113

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.

Phone: 908-274-3111
Email: pair@mb-ip.com
Correspondent Name: M&B IP ANALYSTS, LLC
Address Line 1: 500 HEADQUARTERS PLAZA
Address Line 4: MORRISTOWN, NEW JERSEY 07960-7070

ATTORNEY DOCKET NUMBER:	ORCA P1414
NAME OF SUBMITTER:	MICHAEL BEN-SHIMON
SIGNATURE:	/Michael Ben-Shimon/
DATE SIGNED:	09/27/2019
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 2
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.
- External customers may access SCORE content via PAIR using the Supplemental Content tab.

PTO/AIA/15 (10-17)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	ORCA P1414
First Named Inventor	Avi SHUA
Title	TECHNIQUES FOR SECURING VIRTUAL MACHINES
Priority Mail Express® Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: **Commissioner for Patents**
P.O. Box 1450
Alexandria, VA 22313-1450

1. ☐ **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. ☑ **Applicant asserts small entity status.** See 37 CFR 1.27
3. ☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. ☑ **Specification** [*Total Pages* 19] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. ☑ **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 4]
6. **Inventor's Oath or Declaration** [*Total Pages* 2] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. ☑ Newly executed (original or copy)
   b. ☐ A copy from a prior application (37 CFR 1.63(d))
7. ☑ **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   ☐ Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
   a. ☐ Computer Readable Form (CRF)
   b. ☐ Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
   c. ☐ Statements verifying identity of above copies

ACCOMPANYING APPLICATION PAPERS

10. ☐ **Assignment Papers** (cover sheet & document(s))
    Name of Assignee _____
11. ☐ **37 CFR 3.73(c) Statement** (*when there is an assignee*) ☐ **Power of Attorney**
12. ☐ **English Translation Document** (*if applicable*)
13. ☑ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
14. ☐ **Preliminary Amendment**
15. ☐ **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. ☐ **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. ☐ **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. ☐ **Other:** _____

***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).

19. CORRESPONDENCE ADDRESS

☑ The address associated with Customer Number: 122066 **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		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.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	ORCA P1414
	Application Number	
Title of Invention	TECHNIQUES FOR SECURING VIRTUAL MACHINES	

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.
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.

Secrecy Order 37 CFR 5.2:

☐ 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 i	IL

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** i	IL

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **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**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	**Suggested Figure for Publication (if any)**	

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.

Application Data Sheet 37 CFR 1.76	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:	● Customer Number	US Patent Practitioner	○ 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		Remove
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

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.

Application Data Sheet 37 CFR 1.76	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)[i] 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).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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

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.

Application Data Sheet 37 CFR 1.76	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.

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.

Application Data Sheet 37 CFR 1.76	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.

Applicant 1 Remove

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.

Clear

● 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:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Orca Security LTD.		
Mailing Address Information For Applicant:			
Address 1	65 Yigal Alon St.		
Address 2			
City	Tel Aviv	**State/Province**	
Country	IL	Postal Code	6744316
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

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.

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.

Application Data Sheet 37 CFR 1.76	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.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	Orca Security LTD.

Mailing Address Information For Assignee including Non-Applicant Assignee:

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. Add

Signature:

Remove

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. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	ORCA P1414
	Application Number	
Title of Invention	TECHNIQUES FOR SECURING VIRTUAL MACHINES	

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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.

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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

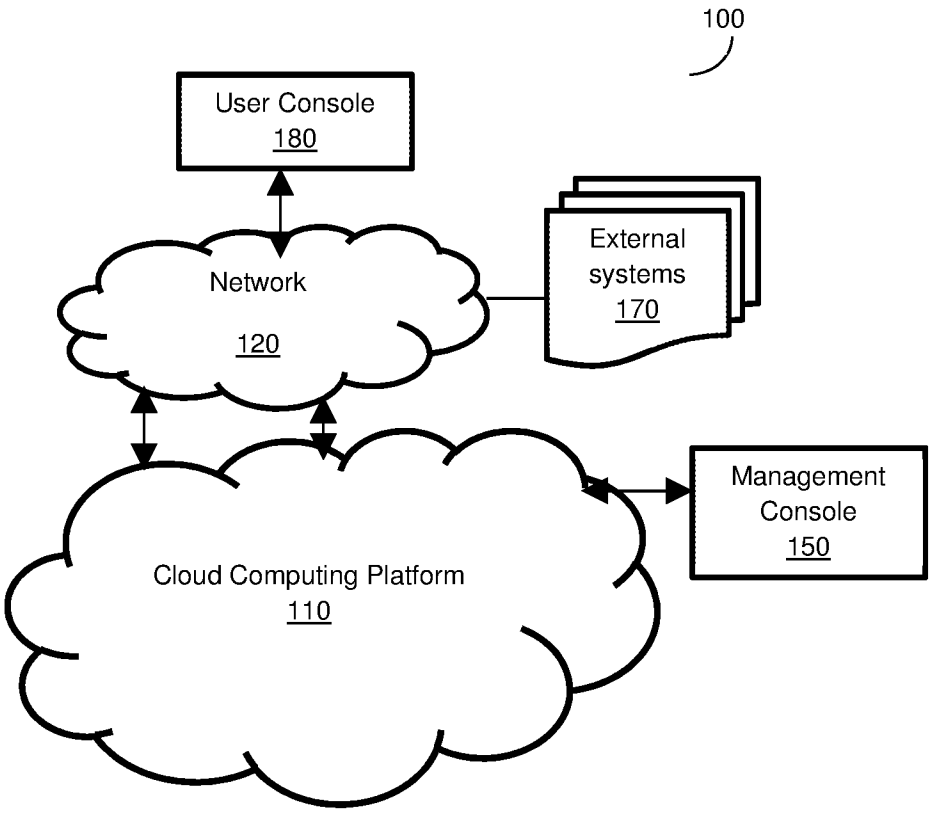
100
User Console
180
Network
120
External
systems
170
Management
Console
150
Cloud Computing Platform
110

FIG. 1A

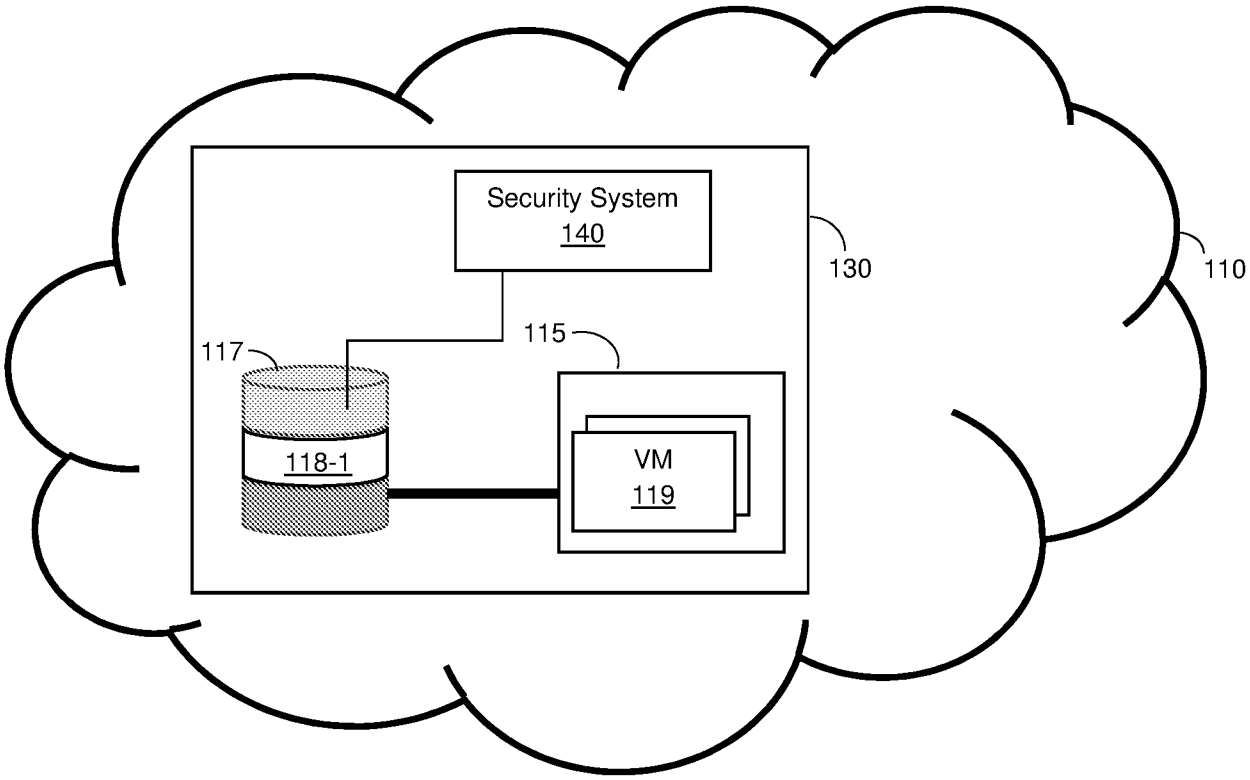

FIG. 1B

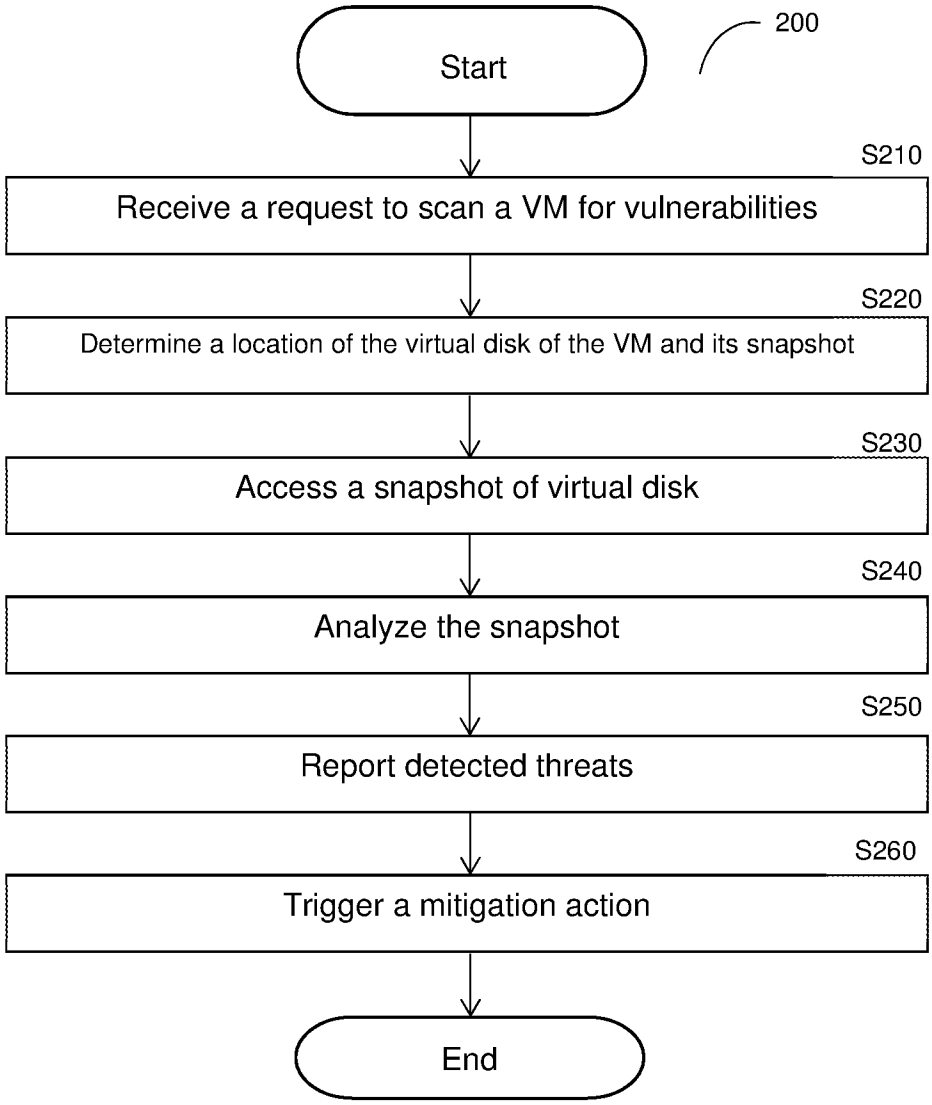
200
Start
S210
Receive a request to scan a VM for vulnerabilities
S220
Determine a location of the virtual disk of the VM and its snapshot
S230
Access a snapshot of virtual disk
S240
Analyze the snapshot
S250
Report detected threats
S260
Trigger a mitigation action
End

FIG. 2

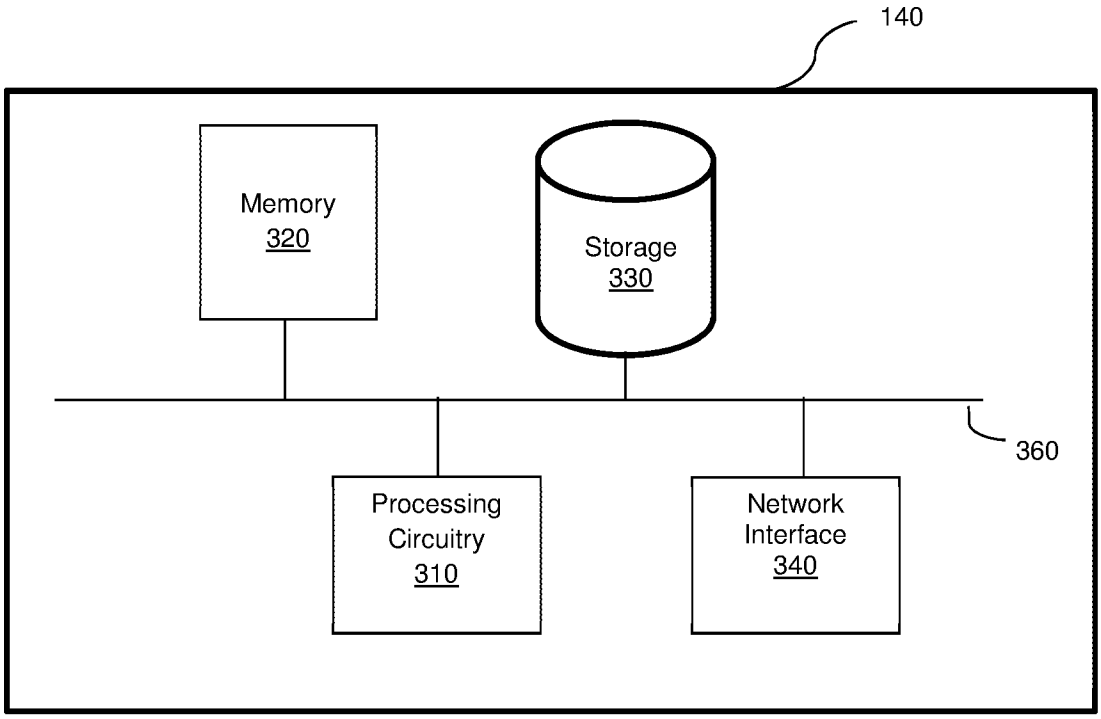
140
Memory
320
Storage
330
360
Processing
Circuitry
310
Network
Interface
340

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 unknow 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 unknow 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 be 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.

PTO/SB/08a (02-18)
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(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Avi SHUA
Art Unit	
Examiner Name	
Attorney Docket Number	ORCA P1414

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	2	9177145	B2	2015-11-03	Todorović	Entire Document
	3	9519781	B2	2016-12-13	Golshan et al.	Entire Document
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	First Named Inventor	Avi SHUA
	Art Unit	
	Examiner Name	
	Attorney Docket Number	ORCA P1414

	2	20140137190	A1	2014-05-15	Carey et al.	Entire Document
	3	20150052520	A1	2015-02-19	Crowell et al.	Entire Document
	4	20170011138	A1	2017-01-12	Venkatesh et al.	Entire Document
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	Filing Date	
	First Named Inventor	Avi SHUA
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	Attorney Docket Number	ORCA P1414

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael Ben-Shimon/	Date (YYYY-MM-DD)	2019-09-27
Name/Print	Michael Ben-Shimon	Registration Number	69610

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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**

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

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Warnings:					
Information:					
2	Application Data Sheet	ORCA_P1414_ads_20190927.pdf	1255992 3db8c806245085050ccc44af5ffd394ec5a7520e	no	8
Warnings:					
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3	Oath or Declaration filed	ORCA_P1414_decl_assign_20190927.pdf	55385 414298e49c6e074e33f5d91eeedba5faeff1ff00	no	2
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4		ORCA_P1414_spec_drawings_20190927.pdf	150044 28a272aecae325dc98d50866ec204e60d4ea559c	yes	23

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Drawings-only black and white line drawings	20	23
Abstract	19	19
Claims	14	18
Specification	1	13

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Warnings:					
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6	Fee Worksheet (SB06)	fee-info.pdf	36686 82dfa5e999d5932e50bee12d11f4df149fb3a36f	no	2
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Name	Avi Shua		
Title	CEO		

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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

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

Payment information:

Submitted with Payment	no

File Listing:

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

Warnings:

Information:	
Total Files Size (in bytes):	121490

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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
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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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART 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

FILING RECEIPT

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

OC000000112283007

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

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Title 35, United States Code, Section 184

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
16/585,967

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	21 minus 20 =	* 1	x 50 =	50	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 230 =	0.00			
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).			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	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT A	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT A	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT A	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT B	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT B	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT B	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** 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 found in the appropriate box in column 1.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/585,967	Filing Date 09/27/2019	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ 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).				
☐ 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

AMENDMENT	01/23/2020	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ 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.	

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Orca Security LTD.	Examiner: PATEL ASHOKKUMAR
Serial No.: 16/585,967	Art Unit: 2491
Filing Date: 27-SEP-2019	Confirmation No.: 9843
For: TECHNIQUES FOR SECURING VIRTUAL MACHINES	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 unknow 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 ~~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.

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

Instantiate ~~a~~an 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

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

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		ORCA_P1414_prel_amend_20200123.pdf	40058 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:			
	Total Files Size (in bytes):	40058	

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<u>New Applications Under 35 U.S.C. 111</u>
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<u>National Stage of an International Application under 35 U.S.C. 371</u>
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<u>New International Application Filed with the USPTO as a Receiving Office</u>
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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

PUBLICATION NOTICE

OC000000118849079

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

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. 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 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 Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/AIA/82A (07-13)
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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/AIA82B 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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PTO/AIA/82B (07-13)
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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

(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: 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		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 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

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 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); (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

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

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	As_Filed_POA_15635_0003.pdf	179988 5a0cafe0a8dc27d23b4f281e3eb55b1b24fa414d	no	4

Warnings:

Information:	
Total Files Size (in bytes):	179988

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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 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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United States Patent and Trademark Office
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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

POWER OF ATTORNEY NOTICE

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

OC000000125717835

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

OC000000125717867

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**.

/zabraha/

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

EXAMINER
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

Office Action Summary	Application No. 16/585,967	Applicant(s) SHUA, Avi	
	Examiner HASSAN SAADOUN	Art Unit 2435	AIA (FITF) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 01/23/2020.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-21 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-21 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, 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 or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 09/27/2019 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 09/27/2019.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

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 <u>provisional</u> 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

(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

/YOGESH PALIWAL/
Primary Examiner, Art Unit 2435

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

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date 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					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date 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)
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*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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	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*			
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.

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

/HASSAN SAADOUN/ Examiner, Art Unit 2435	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	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

/HASSAN SAADOUN/ Examiner, Art Unit 2435	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	2435

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

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

CLAIM		DATE								
Final	Original	01/25/2022								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
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	17	✓								
	18	✓								
	19	✓								
	20	✓								
	21	✓								

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Avi SHUA
Art Unit	
Examiner Name	
Attorney Docket Number	ORCA P1414

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	10412109	B2	2019-09-10	Loureiro et al.	Entire Document
	2	9177145	B2	2015-11-03	Todorović	Entire Document
	3	9519781	B2	2016-12-13	Golshan et al.	Entire Document
	4	9563777	B2	2017-02-07	Deng et al.	Entire Document
	5	9798885	B2	2017-10-24	Deng et al.	Entire Document

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	1	20070266433	A1	2007-11-15	Moore	Entire Document

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Avi SHUA
	Art Unit	
	Examiner Name	
	Attorney Docket Number	ORCA P1414

	2	20140137190	A1	2014-05-15	Carey et al.	Entire Document
	3	20150052520	A1	2015-02-19	Crowell et al.	Entire Document
	4	20170011138	A1	2017-01-12	Venkatesh et al.	Entire Document
	5	20180255080	A1	2018-09-06	Paine	Entire Document
	6	20180293374	A1	2018-10-11	Chen	Entire Document

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Avi SHUA
	Art Unit	
	Examiner Name	
	Attorney Docket Number	ORCA P1414

EXAMINER SIGNATURE			
Examiner Signature	/HASSAN SAADOUN/	Date Considered	01/18/2022

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

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H..S./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	
	Filing Date	
	First Named Inventor	Avi SHUA
	Art Unit	
	Examiner Name	
	Attorney Docket Number	ORCA P1414

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

X A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael Ben-Shimon/	Date (YYYY-MM-DD)	2019-09-27
Name/Print	Michael Ben-Shimon	Registration Number	69610

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 37 CFR 1.14. This collection is estimated to take 1 hour 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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Visuals Query Results 0 Selected Relevance None

1 - 50 846,402 results

1. **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 | 01-JUN-2012 | World Congress on Internet Security (WorldCIS-2012) (Page(s): 117-122)

2. **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 | 01-JUL-2016 | IBM Journal of Research and Development

3. **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 | 01-NOV-2018 | 2018 IEEE 8th International Symposium on Cloud and Service Computing (SC2) (Page(s): 57-66)

4. **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 | 01-JUL-2016 | IBM Journal of Research and Development

5. **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 | 01-JUN-2012 | Proceedings Title: 2012 International Conference on Cyber Security, Cyber Warfare and Digital Forensic (CyberSec) (Page(s): 219-224)

6. **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 | 01-APR-2012 | 2012 2nd Baltic Congress on Future Internet Communications (Page(s): 72-79)

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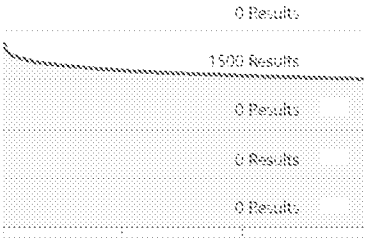

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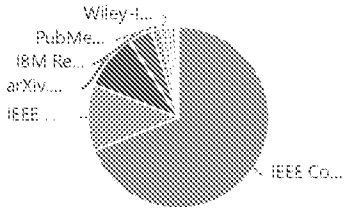

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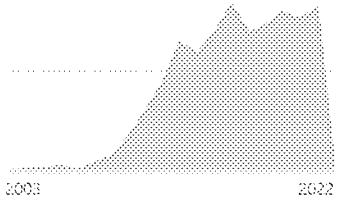

More Visuals

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Pg. 093

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

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

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

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Cloud computing architecture and forensic investigation challenges
G Al Sadi - International Journal of Computer Applications, 2015 - Citeseer
... Regardless of **accessing** cloud servers, a number of **potential** evidences can be collected ... own data but the right of deleting the original **snapshot** of data is reserved for cloud provider. In case ... provided by third parties that may contain **potential threats** like malicious codes. Thus, ...
Save Cite Cited by 5 Related articles All 4 versions Import into EndNote

Multiparameter **analysis** of aero-icing problems **using** proper orthogonal decomposition and multidimensional interpolation
M Fossati, WG Habashi - AIAA journal, 2013 - arc.aiaa.org
... the **analysis**, this approach is iterated N S times, excluding at each iteration a different **snapshot**. Eventually, the errors at each **snapshot location** ... These conditions pose serious **threats** to airworthiness, because the aircraft is supposed to fly for up to 45 min in a continuous icing ...
Save Cite Cited by 38 Related articles All 7 versions Import into EndNote

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 data**base 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** ...
Save Cite Cited by 840 Related articles All 56 versions Import into EndNote

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' ...
Save Cite Cited by 3 Related articles All 3 versions Import into EndNote

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 '...
Save Cite Cited by 10 Related articles All 3 versions Import into EndNote

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 ...
Save Cite Cited by 12 Related articles All 9 versions Import into EndNote

What's on the Horizon? An In-Depth Forensic **Analysis** of Android and iOS Applications
FE Salamh, MM Mirza, S Hutchinson, YH Yoon... - ... Access, 2021 - ieeexplore.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 ...
Save Cite Import into EndNote

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 ...
Save Cite Cited by 9 Related articles Import into EndNote

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**. ...

Save Cite Related articles All 2 versions Import into EndNote

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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6 search queries

1. ↪ Any field contains security of virtual (disks OR assets OR machines) in a cloud environment
AND Any field contains determine a location of "snapshot" of a virtual (machine OR disk OR asset) in a cloud environment
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)
AND Any field contains alerting threats based on priority
SCOPE: Everything / Search everything
01/25/2022

2. ↪ Any field contains security of virtual (disks OR assets OR machines) in a cloud environment
AND Any field contains determine a location of "snapshot" of a virtual (machine OR disk OR asset) in a cloud environment
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)
SCOPE: Everything / Search everything
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3. ↪ Any field contains security of virtual (disks OR assets OR machines) in a cloud environment
AND Any field contains determine a location of "snapshot" of a virtual (machine OR disk OR asset) in a cloud environment
AND Any field contains accessing a snapshot of a virtual (machine OR disk OR asset) based on "snapshot location"
SCOPE: Everything / Search everything
01/25/2022

4. ↪ Any field contains security of virtual (disks OR assets OR machines) in a cloud environment
AND Any field contains determine a location of "snapshot" of a virtual (machine OR disk OR asset) in a cloud environment
SCOPE: Everything / Search everything
01/25/2022

5. ↪ Any field contains security of virtual (disks OR assets OR machines) in a cloud environment
AND Any field contains determine a location of a virtual (machine OR disk OR asset) in a cloud environment
SCOPE: Everything / Search everything
01/25/2022

6. security of virtual (disks OR assets OR machines) in a cloud environment
SCOPE: label / Search everything
01/25/2022

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 identifi$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 identifi$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 identifi$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 identifi$5 identify$3) near2 (snapshot snap?shot	(US-PGPUB; USPAT)	OR	ON	ON	2022/01/20 12:09 PM

		image copy replicat$3 clon$3) near3 ((virtual near2 disk) "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.					
L10	26	((determin$4 identifi$5 identify$3) near2 (snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 disk) "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; 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 12:13 PM
L11	7	((determin$4 identifi$5 identify$3) near2 (snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 disk) "VM"))	(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,	OR	ON	ON	2022/01/20 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

		"20180293374" OR "9177145" OR "9519781" OR "9563777" OR "9798885").pn. AND ((snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 disk) "VM"))					
L15	0	("10412109" OR "20070266433" OR "20140137190" OR "20150052520" OR "20170011138" OR "20180255080" OR "20180293374" OR "9177145" OR "9519781" OR "9563777" OR "9798885").pn. AND ((virtual near2 disk) "VM") near5 (location spot place site placement area)	(US-PGPUB; USPAT)	OR	ON	ON	2022/01/20 01:58 PM
L16	11	((determin$4 identifi$5 identify$3) near2 (threat malware malicious attack) near9(snapshot snap?shot image copy replicat$3 clon$3) near5 ((virtual near2 disk) "VM")).ti,ab,bsum.	(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; IBM_TDB)	OR	ON	ON	2022/01/20 02:19 PM
L17	30	((determin$4 identifi$5 identify$3) near2 (threat malware malicious attack) near9(snapshot snap?shot image copy replicat$3 clon$3) near5 ((virtual near2 disk) "VM"))	(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; IBM_TDB)	OR	ON	ON	2022/01/20 02:20 PM
L18	1919	(snapshot snap?shot	(US-PGPUB; USPAT;	OR	ON	ON	2022/01/20

		image copy replicat$3 clon$3) near3 ((virtual near2 disk) "VM") near5 (location spot place site placement area)	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; IBM_TDB)				02:30 PM
L19	130	(determin$4 identifi$5 identify$3) near2 (location spot place site placement area) near5(snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 disk) "VM")	(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; IBM_TDB)	OR	ON	ON	2022/01/20 02:31 PM
L20	117	L19 AND (@ad<"20190128")	(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; IBM_TDB)	OR	ON	ON	2022/01/20 02:33 PM
L21	58	L20 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	(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,	OR	ON	ON	2022/01/20 02:33 PM

		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.	PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L22	226	(determin$4 identifi$5 identify$3) near2 (location spot place site placement area) near5(snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 (disk machine)) OR "VM")	(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; IBM_TDB)	OR	ON	ON	2022/01/21 09:45 AM
L23	210	L22 AND (@ad<"20190128")	(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; IBM_TDB)	OR	ON	ON	2022/01/21 09:46 AM
L24	116	L23 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; 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; IBM_TDB)	OR	ON	ON	2022/01/21 09:46 AM

		G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc.					
L25	6	((determin$4 identifi$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")) SAME cloud near2 (asset service)	(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; IBM_TDB)	OR	ON	ON	2022/01/25 09:01 AM
L26	92	((determin$4 identifi$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)	(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; IBM_TDB)	OR	ON	ON	2022/01/25 09:15 AM
L27	24	((determin$4 identifi$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) AND (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; IBM_TDB)	OR	ON	ON	2022/01/25 09:25 AM
L28	21	L27 AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR	(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,	OR	ON	ON	2022/01/25 09:29 AM

		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, 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; IBM_TDB)				
L29	57	L26 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; 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; IBM_TDB)	OR	ON	ON	2022/01/25 09:30 AM
L30	193	(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) "VM")	(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; IBM_TDB)	OR	ON	ON	2022/01/25 09:54 AM
L31	96	L30 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	(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,	OR	ON	ON	2022/01/25 09:55 AM

		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.	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; IBM_TDB)				
L32	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)	(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; IBM_TDB)	OR	ON	ON	2022/01/25 10:11 AM
L33	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)	(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; IBM_TDB)	OR	ON	ON	2022/01/25 10:14 AM
L34	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;	OR	ON	ON	2022/01/25 10:15 AM

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

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	2	(((determin$4 identifi$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 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 10:19 AM

		(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.					
N3	0	((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)).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 10:20 AM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Techniques for Securing Virtual Machines	)	Group Art Unit: 2435
	)	
	)	Examiner: SAADOUN, HASSAN
Application No.: 16/585,967	)	
	)	
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 unknow 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 unknow 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

PTO/AIA/22 (10-20)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 15635.0003-00000
Application Number 16/585,967	Filed September 27, 2019
For TECHNIQUES FOR SECURING VIRTUAL MACHINES	
Art Unit 2435	Examiner SAADOUN HASSAN

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):

		Fee	Small Entity Fee	Micro Entity Fee	
☑	One month (37 CFR 1.17(a)(1))	$220	$110	$55	$ 110.00
☐	Two months (37 CFR 1.17(a)(2))	$640	$320	$160	$
☐	Three months (37 CFR 1.17(a)(3))	$1,480	$740	$370	$
☐	Four months (37 CFR 1.17(a)(4))	$2,320	$1,160	$580	$
☐	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/	June 1, 2022
Signature	Date
Christopher C. Johns	(202) 408-4000
Typed or printed name	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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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.

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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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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
16/585,967	06/01/2022 05:32:45 PM ET	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	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1007	E202261H33372511	Wanda Whittington

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2251	EXTENSION FOR RESPONSE WITHIN FIRST MONTH	110.00	1	110.00
			TOTAL 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

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New International Application Filed with the USPTO as a Receiving Office

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
16/585,967	**06/01/2022 05:32:45 PM ET**	**15635.0003-00000**

Title of Invention

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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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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.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/585,967	Filing Date 09/27/2019	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ 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).				
☐ 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

AMENDMENT	06/01/2022	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 21	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $240 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ 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".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING 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/	24 June 2022
Signature	Date
Gerson Panitch	
Typed or printed name	
Attorney of record	202-408-4080
Title	Telephone Number

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

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.

This collection of information is required by 37 CFR 1.321. 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.

Electronic Patent Application Fee Transmittal

Application Number:	16585967
Filing Date:	27-Sep-2019
Title of Invention:	TECHNIQUES FOR SECURING VIRTUAL MACHINES
First Named Inventor/Applicant Name:	Avi SHUA
Filer:	Christopher Charles Johns/Elizabeth Samuels
Attorney Docket Number:	15635.0003-00000

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

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

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer Filed	15635_0003_00000_TD.pdf	192287 105a4f436ebe48619bed339b1e48eb62cb23817c	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38208 7aa5cd36e1dd44adfdea4e1791898c4b1261ede6	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	230495		

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.

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
* 16/585,967 *	16/585,967	SHUA, Avi	
	Examiner	**Art Unit**	
	SAADOUN, HASSAN	2435	

Document Code - DISQ	**Internal Document - DO NOT MAIL**

TERMINAL DISCLAIMER	☑ APPROVED	☐ DISAPPROVED
Date Filed: **24 June 2022**	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

/PAMELA A YOUNG/

Technology Center: **OPLC**

Telephone: **(571)272-3622**

_____

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
Alexandria, Virginia 22313-1450
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.

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)

22852 7590 07/07/2022

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

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.

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_____
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. _____

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

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.

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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.

Notice of Allowability	Application No. 16/585,967	Applicant(s) SHUA, Avi	
	Examiner HASSAN SAADOUN	Art Unit 2435	AIA (FITF) Status 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** or send an inquiry to **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. ☑ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/HASSAN SAADOUN/ Examiner, Art Unit 2435	/JOSEPH P HIRL/ 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

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

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date 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 Country Code-Number-Kind Code	Date 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.

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	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	Set	Ranking	Version
	/		/					

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

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	2435

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G06F	/	9	/	455

NON-CLAIMED				
H04L	/	9	/	40

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
726	23

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

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

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	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/ Examiner, Art Unit 2435 (Assistant Examiner)	29 June 2022 (Date)	**Total Claims Allowed:** 19	
/JOSEPH P HIRL/ Supervisory Patent Examiner, Art Unit 2435 (Primary Examiner)	30 June 2022 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	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/ Examiner, Art Unit 2435	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	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/ Examiner, Art Unit 2435	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/585,967	SHUA, Avi
	Examiner	**Art Unit**
	HASSAN SAADOUN	2435

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

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

CLAIM		DATE								
Final	Original	01/25/2022	06/29/2022							
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	2	✓	=							
	3	✓	=							
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	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

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

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

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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 identifi$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 identifi$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 identifi$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 identifi$5 identify$3) near2 (snapshot snap?shot	(US-PGPUB; USPAT)	OR	ON	ON	2022/01/20 12:09 PM

		image copy replicat$3 clon$3) near3 ((virtual near2 disk) "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.					
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		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)				
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L16	11	((determin$4 identifi$5 identify$3) near2 (threat malware malicious attack) near9(snapshot snap?shot image copy replicat$3 clon$3) near5 ((virtual near2 disk) "VM")).ti,ab,bsum.	(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; IBM_TDB)	OR	ON	ON	2022/01/20 02:19 PM
L17	30	((determin$4 identifi$5 identify$3) near2 (threat malware malicious attack) near9(snapshot snap?shot image copy replicat$3 clon$3) near5 ((virtual near2 disk) "VM"))	(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; IBM_TDB)	OR	ON	ON	2022/01/20 02:20 PM
L18	1919	(snapshot snap?shot	(US-PGPUB; USPAT;	OR	ON	ON	2022/01/20

		image copy replicat$3 clon$3) near3 ((virtual near2 disk) "VM") near5 (location spot place site placement area)	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; IBM_TDB)				02:30 PM
L19	130	(determin$4 identifi$5 identify$3) near2 (location spot place site placement area) near5(snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 disk) "VM")	(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; IBM_TDB)	OR	ON	ON	2022/01/20 02:31 PM
L20	117	L19 AND (@ad<"20190128")	(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; IBM_TDB)	OR	ON	ON	2022/01/20 02:33 PM
L21	58	L20 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	(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,	OR	ON	ON	2022/01/20 02:33 PM

		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.	PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L22	226	(determin$4 identifi$5 identify$3) near2 (location spot place site placement area) near5(snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 (disk machine)) OR "VM")	(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; IBM_TDB)	OR	ON	ON	2022/01/21 09:45 AM
L23	210	L22 AND (@ad<"20190128")	(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; IBM_TDB)	OR	ON	ON	2022/01/21 09:46 AM
L24	116	L23 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; 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; IBM_TDB)	OR	ON	ON	2022/01/21 09:46 AM

		G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc.					
L25	6	((determin$4 identifi$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")) SAME cloud near2 (asset service)	(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; IBM_TDB)	OR	ON	ON	2022/01/25 09:01 AM
L26	92	((determin$4 identifi$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)	(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; IBM_TDB)	OR	ON	ON	2022/01/25 09:15 AM
L27	24	((determin$4 identifi$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) AND (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; IBM_TDB)	OR	ON	ON	2022/01/25 09:25 AM
L28	21	L27 AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR	(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,	OR	ON	ON	2022/01/25 09:29 AM

		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, 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; IBM_TDB)				
L29	57	L26 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; 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; IBM_TDB)	OR	ON	ON	2022/01/25 09:30 AM
L30	193	(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) "VM")	(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; IBM_TDB)	OR	ON	ON	2022/01/25 09:54 AM
L31	96	L30 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	(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,	OR	ON	ON	2022/01/25 09:55 AM

		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.	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; IBM_TDB)				
L32	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)	(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; IBM_TDB)	OR	ON	ON	2022/01/25 10:11 AM
L33	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)	(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; IBM_TDB)	OR	ON	ON	2022/01/25 10:14 AM
L34	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;	OR	ON	ON	2022/01/25 10:15 AM

			JPO; DERWENT; IBM_TDB)				
L35	2	"10944778"	(US-PGPUB; USPAT)	OR	ON	ON	2022/01/27 06:23 PM
L36	3	"16585967"	(US-PGPUB; USPAT)	OR	ON	ON	2022/06/13 02:12 PM
L37	0	"Orca near2 Security".as. AND ((determin$4 identifi$5 identify$3) near2 (snapshot snap?shot image copy replicat$3 clon$3) near3 (virtual "VM")).clm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/06/13 02:13 PM
L38	2	(SHUA near2 Avi).in. AND ((determin$4 identifi$5 identify$3) near2 (snapshot snap?shot image copy replicat$3 clon$3) near3 (virtual "VM")).clm.	(US-PGPUB; USPAT; IBM_TDB)	OR	ON	ON	2022/06/13 02:13 PM
L39	31	((determin$4 identifi$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; USOCR)	OR	ON	ON	2022/06/13 02:14 PM
L40	15	((determin$4 identifi$5 identify$3) near2 (snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 disk) "VM")) SAME (threat malware malicious attack) AND	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/06/13 02:14 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.					
L41	26	((determin$4 identifi$5 identify$3) near2 (snapshot snap?shot image copy replicat$3 clon$3) near3 ((virtual near2 disk) "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; 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
L42	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) AND	(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,	OR	ON	ON	2022/06/13 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

		malicious attack) near7 (priority order)	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)				
L46	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)	(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

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	2	(((determin$4 identifi$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

		G06F11/3476 OR H04L63/1408 OR H04L63/1425).cpc.					
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 (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 10:19 AM
N3	0	((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)).clm. AND (H04L63/1416 OR G06F9/45558 OR G06F11/1464 OR G06F16/128 OR H04L63/1433 OR H04L63/1441 OR G06F2009/45562 OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/01/25 10:20 AM

		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.					
N4	0	((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 hack$3) near7 (priority order preference)).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	2022/06/13 02:18 PM
N5	1	((access$3 obtain$3 retriev$3) near2 (snapshot snap?shot image copy replicat$3 clon$3 backup) near5(location spot place site 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	(US-PGPUB; USPAT)	OR	ON	ON	2022/06/13 02:18 PM

		attack)).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.					
N6	2	(((determin$4 identifi$5 identify$3) near2 (location spot place site 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	2022/06/13 02:19 PM

Discover Map US20200244678 TIC

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 | 2016-11-01 | 4 | 2016 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 | 2012-08-01 | 4 | Proceedings Title: 2012 International Conference on Cyber Security, Cyber Warfare and Digital Forensic (CyberSec) (Page(s): 219-224)

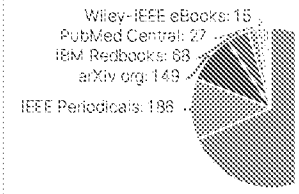
Enabling secure multitenancy in cloud computing: Challenges and approaches

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,...

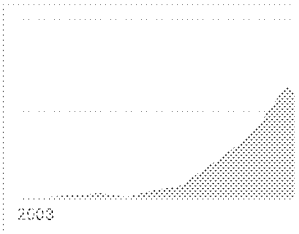
IEEE Xplore | IEEE Conferences | 2012-04-01 | 4 | 2012 2nd Baltic Congress on Future Internet Communications (Page(s): 72-79)

Relevance

Collections



Publication Date



Charts based on top 1500 results

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Result 1

Pg. 168

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
16/585,967	**07/22/2022 10:57:55 AM ET**	**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-IssueFeeTransmittal-07-22-2022.pdf	1	Issue Fee Payment (PTO-85B)	176 KB
15635-0003-00000CommentsOnStatementofResonsForAllowance7-22-2022.pdf	2	Post Allowance Communication - Incoming	16 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)

15635-0003-00000-IssueFeeTransmittal-07-22-2022.pdf	98A3684CE5ABEE8B1BE0283BC177A27AEE337519FACAD140D4559F1BBF2C2170341EB2E9236471BF4D117B7F9AAABBF114D42B90D57EAC74105494D32252BA52
15635-0003-00000CommentsOnStatementofResonsForAllowance7-22-2022.pdf	B78E10A8F37F920F385210CF23C6E924946EAFA1283414D6135C8B311F69B71291588212CC7D23759DA22E731077015DB673AF87DEC6329F2CBCD9D9FE6178F8

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.

PATENT
Attorney Docket No. 15635.0003-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Techniques for Securing Virtual Machines	)	Group Art Unit: 2435
	)	
	)	Examiner: SAADOUN, HASSAN
Application No.: 16/585,967	)	
	)	
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

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
16/585,967	07/22/2022 10:57:55 AM ET	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	AUTHORIZED BY	Christopher Johns
CUSTOMER #	22852	FILING DATE	09/27/2019
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Avi SHUA

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1007	E20227LA59093610	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.

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

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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)

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

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.

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: Orca Security LTD.

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

☒ 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 /Christopher C. Johns/ Date 22 July 2022

Typed or printed name Christopher C. Johns Registration No. 68,664

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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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;

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete if Known	
				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*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		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*	Cite No.[3]	Document Number Number-Kind Code[4] *(if known)*	Issue or Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		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*	Cite No.[1]	Foreign Patent Document Country Code[5] Number[6] Kind Code[7] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	Translation[8]

NONPATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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[6]

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:

[1] Applicant's unique citation designation number (optional).
[2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04.

[3] Applicant's unique citation designation number (optional).
[4] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04.
[5] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).
[6] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[7] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible.
[8] 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**.

PATENT
Attorney Docket No. 15635.0003-00000

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.

Application No.	*Filing date*
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

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APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
16/585,967	**08/22/2022 03:53:21 PM ET**	**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 IDS Transmittal 08.22.2022.pdf	2	Transmittal Letter	93 KB
15635.0003-00000 As-filed - PTO-SB08.pdf	2	Information Disclosure Statement (IDS) Form (SB08)	113 KB

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Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)

15635.0003-00000 As-Filed IDS Transmittal 08.22.2022.pdf	11BB877DB88775713552AA71DB7D8CE9F0FBEFA2804035DCC34E4D6CDAD65A14A9C237CA35E85F05C3C8314493D8AA19294B51B9315399409E19A61C863A3D37
15635.0003-00000 As-filed - PTO-SB08.pdf	1D8A435FCD830A87C58141796E8ECB822AD7C889611F3D33E42EB5A026827445FCAF8B07903D7E133E1076AF9716244D584C0FA034CF58E3735D8506CA46D649

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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.