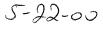
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Docket Number:

92,00013 92,00013

PROVISIONAL APPLICATION FOR PATENT COVER SHEET (Large Entity)

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

ש			INVENT	OR(S)/APPL	ICANT(S)			
Given Name (first and mi	iddle [if any]) Family Name or Surname Residence (City and either State or Foreign Country)					or Foreign Country)		
Nimrod Itzhak Vered Yigal Mordechai Edery David R. Kroll				Moshav Mismeret #81, Goosh Tel-Mond 40695, Israel Hashikma 11, POB 1115, Pardesia 42815, Israel 1233 Klee Court, Sunnyvale, CA 94087				
Additional inve	Additional inventors are being named on page 2 attached hereto							
		TITLE	OF THE IN	VENTION (2	30 characters	s max)		
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Direct all corresponden	ce to:		CORRES	PONDENCE	ADDRESS	(11)	2384	LO
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City	Palo Alto			State	CA		ZIP	94304-1043
Country	US			Telephone	650-856-6500		Fax	650-856-3619
		ENCLOSE	D APPLIC	ATION PART	S (check all	that apply)		•
Specification	Numbe	er of Pages	6					
Drawing(s)	Number	r of Sheets	1		Other (sp	ecify)		
METHOD OF	PAYMENT O	OF FILING F	EES FOR	THIS PROVI	SIONAL APP	LICATION	FOR PATEN	IT (check one)
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The invention was made by No. Yes, the name of th						agency of the	United States	Government.
Respectfully submittee	h A	-Sh			D	ATE	Мау	, 17, 2000
TYPED or PRINTED NAME Marc A. Sockol				REGISTRATION NO. 40,823 (if appropriate)				
TELEPHONE	65	0-856-650	0		,			

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[Page 1 of 2]

P19LARGE/REV04



Docket Number:

40492.00013

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[Page 2 of 2]

P19LARGE/REV04



ijn.

PROVISIONAL APPLICATION FOR UNITED STATES PATENT IN THE NAME

of

NIMROD ITZHAK VERED, YIGAL MORDECHAI EDERY AND DAVID R. KROLL

for

COMPUTER NETWORK MALICIOUS CODE **RUN-TIME MONITORING**

DOCKET NO. 40492.00013

Please direct communications to: **GRAHAM & JAMES LLP** 600 Hansen Way Palo Alto, CA 94304-1043 (650) 856-6500 Express Mail Number: EL515156294US





Product Management

Computer Network Malicious Code Run-time Monitoring (Patent Application)

Nimrod Vered, Director Product Management Yigal Edery, Director R&D Dave Kroll, Director of Marketing

Abstract

A network security content-inspection server with a sandbox agent that performs runtime monitoring of application programs (e.g. Executables (.exe files) or ActiveX controls) received over the Internet or an Intranet. Static scanning at the network server level (e.g., HTTP proxy server or plug-in to an existing Proxy or Firewall server) identifies application programs and wraps the application programs with a sandbox agent. During runtime of the program at the client computer, the sandbox agent self-extracts and modifies certain programs running in the memory, thereby creating a sandbox environment that monitors for security policy violations. Execution of an instruction is prevented in the event of a policy violation.

Claims

- 1) A method of detecting application programs while arriving through the Internet or Intranet (e.g. SMTP, HTTP or FTP traffic) and wrapping them with a sandbox agent.
- 2) The method of claim 1, wherein the computer network includes a server and client computers, and wherein the wrapping takes place at the server, wherein the executing the application program takes place at the client.
- 3) The method of claim 1, wherein the sandbox agent contains the code needed to create the sandbox environment without instrumenting the original application program.
- 4) The method of claim 1, further using a white list to create exception list of those application programs that are not to be wrapped with the sandbox agent.
- 5) The method of claim 4, wherein the identification of those specific application programs that are not to be wrapped will be done using either MD-5 hash for all the users or all the application programs for a specific user or a group of users.
- 6) A method of creating a sandbox environment for a secure execution of an application program on a client computer while no installation of a software module is taking place.
- 7) The method of claim 6, wherein the sandbox agent checks the specific client computer security policy before starting the execution of the application program.
- 8) The method of claim 6, wherein the sandbox agent facilitates a filtering layer where all of the application programs calls are compared in to the given security policy.

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Product Management

9) The method of claim 8, wherein if the application program violated the security program it will be either automatically stopped from running or the user will manually stop it from running. In both cases a message will be presented to the computer user.

Field of Invention

The invention pertains to computer network security and specifically to secure execution of program applications.

Background

The rapid development of the Internet brought the concept of distributed computing, where small application programs 'travel' over the Internet from Web servers to client computers and execute on the clients, saving the processing resources of the servers. This concept is now being implemented by businesses worldwide, especially in the era of ecommerce. Because of the connectivity that the Internet provides, computer users are sharing and opening more programs voluntarily. In addition, there are active Web programs run automatically in Web browsers without user permission. Hackers are taking advantage of technologies and techniques to develop malicious code for attacking unsuspecting and protected computer users.

Executable programs (.exe) are a popular technology used to create self-contained programs for commercial use as well as for hacking purposes. An example of commercial usage of executables is in the e-greeting card/e-games market where tens of thousands of small executable programs are sent between users every day. An example of a popular hacking tool that is delivered as an executable is Back Orifice, a remote access tool used to take control of PCs. There are many tools available freely on the Internet that allow hackers to combine or "bind" a benign e-greeting card and a malicious attack together so only the greeting card will be visible to the user.

However, no products exist that monitor the behavior of executable programs during runtime. Many computer users have been attacked while running executables that they trusted. Often, as with a computer worm attack, malicious code arrives from a spoofed e-mail source, which the user might trust without knowing that the e-mail was spoofed.

Executable files are written in a low-level computer language and cannot be scanned by a gateway server because its behavior can only be determined at the time it runs on a specific computer. In fact, its behavior might change from computer to computer or may have instructions only to execute on a specific date or at a specific time

Hence programs that will be able to monitor application programs during runtime are needed.

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