

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMERICAN MEGATRENDS, INC.,
MICRO-STAR INTERNATIONAL CO., LTD,
MSI COMPUTER CORP.,
GIGA-BYTE TECHNOLOGY CO., LTD., AND
G.B.T., INC.,
Petitioner,

v.

KINGLITE HOLDINGS INC.,
Patent Owner.

Case IPR2015-01191
Patent 6,892,304 B1

Before PHILLIP J. KAUFFMAN, GLENN J. PERRY,
TREVOR M. JEFFERSON, and BRIAN J. McNAMARA,
Administrative Patent Judges.

PERRY, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

This is a Final Written Decision entered in an *inter partes* review instituted pursuant to 35 U.S.C. § 314. For reasons discussed below, we determine that Petitioner has not shown by a preponderance of the evidence that claims 1 and 4–8 of U.S. Patent No. 6,892,304 B1 (Ex. 1001, “the ’304 patent”) are unpatentable.

A. Procedural History

American Megatrends, Inc., Micro-Star International Co., Ltd., MSI Computer Corp., Giga-Byte Technology Co., Ltd., and G.B.T., Inc., (collectively, “Petitioner” filed a Petition (Paper 6, “Pet.”) to institute an *inter partes* review of claims 1–9, 11, 12, and 15 of Patent 6,892,304 B1 (“the ’304 patent”) pursuant to 35 U.S.C. § 311 *et seq.* Pet. 1. Patent Owner Kinglite Holdings Inc. filed a Preliminary Response (Paper 11, “Prelim. Resp.”) to the Petition.

Upon consideration of the Petition, Patent Owner’s Preliminary Response, and the associated evidence, we instituted *inter partes* review (Paper 13, “Dec. to Inst.”) of claims 1 and 4–8 on the following grounds. Dec. to Inst. 15.

Reference(s)	Basis	Claim(s) challenged
AMIBIOS, ¹ X.509, ² and Aegis ³	35 U.S.C. § 103	1, 4, 5, 7, and 8
AMIBIOS, X.509, Aegis, and Drews ⁴	35 U.S.C. § 103	6

After *inter partes* review was instituted, Patent Owner filed a Patent Owner's Response (Paper 21, "PO Resp.") and Petitioner filed a Petitioner's Reply (Paper 28, "Pet. Reply"). Petitioner filed a Motion to Exclude the deposition transcript of Dr. James Bottomley (Ex. 2008). Paper 33, "Mot. To Exclude." Patent Owner opposed the Motion to Exclude. Paper 36, "PO Reply to Mot. To Exclude." Patent Owner filed a Motion for Observations on the cross examination (Ex. 2011) of Subramonian Shankar. Paper 32, "Mot. Observ." Petitioner responded to Patent Owner's Motion for Observations. Paper 34, "Pet. Resp. to Observ." We heard oral argument on August 15, 2016, and a transcript of that argument was made of record. Paper 39, "Tr."

B. Related Matters

Petitioner indicates that the '013 Patent is involved in the following litigation. *Kinglite Holdings Inc. v. Giga-Byte Tech. Co. Ltd., et al.*, CV 14-

¹ *American Megatrends AMIBIOS 98 Technical Reference*, MAN-BIOS98-TX, 5/1/98 (Ex. 1013, "AMIBIOS").

² *International Telecommunication Union*, CCITT X.509, November 1988 (Ex. 1018, "X.509").

³ William A. Arbaugh, et al., *Automated Recovery in a Secure Bootstrap Process*, University of Pennsylvania Scholarly Commons, August 1997 (Ex. 1006, "Aegis").

⁴ U.S. Patent 6,539,480 B1, issued March 25, 2003 (Ex. 1007, "Drews").

Case IPR2015-01191
Patent 6,892,304 B1

04989 JVS (PJWx) (C.D. Ca); and *Kinglite Holdings Inc. v. Micro-Star Int'l Co. Ltd.*, et al., CV 14-03009 JVS (PJWx) (C.D. Ca). Pet. 9.

Petitioner indicates that the following *inter partes* reviews are related. *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01079 (U.S. Pat. No. 6,373,498 B1); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01081 (U.S. Pat. No. 5,987,604); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01094 (U.S. Pat. No. 6,401,202 B1); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01132 (U.S. Pat. No. 6,523,123 B2); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01133 (U.S. Pat. No. 5,732,268); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01140 (U.S. Pat. No. 6,519,659 B1); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01141 (U.S. Pat. No. 6,633,976 B1); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01188 (U.S. Pat. No. 5,836,013); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01189 (U.S. Pat. No. 5,836,013); *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01191 (U.S. Pat. No. 6,892,304 B1); and *American Megatrends Inc., et al. v. Kinglite Holdings Inc.*, IPR2015-01197 (U.S. Pat. No. 6,487,656 B1).

C. The '304 Patent (Ex. 1001)

1. Described Invention

The '304 Patent describes two aspects of invention. The first aspect relates to mapping ROM to virtual memory, and is not relevant to the challenged claims. The second aspect, to which the challenged claims are directed, relates to the application of key pair cryptography to requests

within a computer for a BIOS service. The '304 patent describes encrypting, with a private key of a key pair, a request seeking a BIOS service. Each encrypted service request is verified, using the corresponding public key, before that request is executed. Ex. 1001, Abstract.

Figure 8 of the '304 patent is reproduced below.

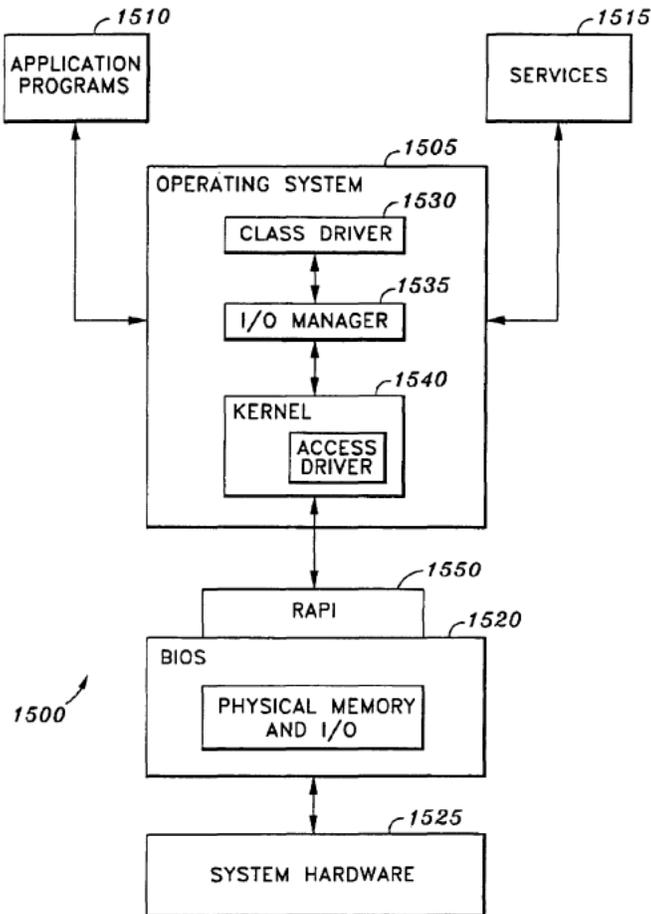


FIG. 8

Figure 8 is a functional block diagram illustrating the architecture of an operating system, which utilizes the system and method of the present invention. Ex. 1001, 3:5-7.

As shown in Figure 8, operating system 1505 and BIOS 1520 are logically between application programs 1510 and system hardware 1525.

When an application program requires a “service,” *e.g.* accessing a drive, it calls upon the BIOS to request the needed service. Ex. 1001, 19:61–20:4.

Basic Input/Output System (BIOS) 1520, typically embedded in non-volatile memory, includes drivers and software interfaces for hardware devices such as the console (keyboard and display), a printer, the auxiliary device (serial port), the computer's clock and the boot disk device.

Operating system 1505 includes class driver 1530, which interfaces with application programs 1510 and services 1515, and I/O Manager 1535. I/O Manager 1535 converts I/O requests from application programs 1510 and services 1515 (made via class driver 1530) into properly sequenced calls to various driver routines located in kernel 1540. When I/O Manager 1535 receives an I/O request, it uses function codes of the request to call one of several dispatch routines in a driver located in the kernel 1540. The kernel 1540 provides hardware-independent functions, called system functions, that are accessed by means of a software interrupt. The functions provided by kernel 1540 typically include file and directory management, memory management, character device input/output and time and date support, among others. In one embodiment, operating system 1505 is a Windows operating system. In alternate embodiments, operating system 1505 includes the Solaris or the AIX operating systems or other operating systems based on demand-paged virtual memory subsystems. *Id.* at 20:5–24.

Access driver 1545, located within the kernel 1540, is responsible for interfacing with the ROM Application Programming Interface (RAPI) 1550 to access or update data located in BIOS 1520 or access system hardware data via the BIOS. RAPI 1550 generally provides an interface for securely utilizing BIOS services or functions. *Id.* at 19:61–20:31.

2. Illustrative Claim

Claim 1 of the '304 Patent is illustrative of the challenged claims:

1. A system to securely utilize Basic Input and Output System (BIOS) services, comprising:
 - an access driver to generate a service request to utilize BIOS services, the service request including a service request signature created using a private key in a cryptographic key pair; and
 - an interface to verify the service request signature using a public key in the cryptographic key pair to ensure the integrity of the service request.

Ex. 1001, 23:64–24:4.

II. DISCUSSION

A. Claim Construction

The patent at issue will expire before a final written decision is issued. The Board's review of the claims of an expired patent is similar to that of a district court's review. Therefore, the principles set forth by the court in *Phillips v. AWH Corp.*, (words of a claim are generally given their ordinary and customary meaning' as understood by a person of ordinary skill in the art in question at the time of the invention) are applied because expired claims are not subject to amendment. We did not formally construe any claim terms in the Decision to Institute and we do not find it necessary to construe formally any particular claim terms in this Decision.

B. Overview of References Relied Upon by Petitioner

1. Overview of AMIBIOS (Ex. 1013)

AMIBIOS (Ex. 1013) is a 414 page technical reference describing in

detail a Basic Input Output System (“BIOS”) made available by American Megatrends. It describes BIOS data, port addresses, power on self-test, using interrupts, and power management. Ex. 1013.

2. X.509 (Ex. 1018)

X.509 (Ex. 1018) is a recommendation from the International Telecommunication Union, The International Telegraph, and Telephone Consultative Committee describing a framework for authenticating messages. It describes authentication, public key cryptography, hash functions, and management of keys and certificates. Ex. 1018, 3. X.509 describes a framework for authentication services in data communication networks, such as telecomm networks. It describes a signer and a recipient of messages using a key pair.

3. Aegis (Ex. 1006)

Aegis⁵ is a technical report of the department of computer and information science University of Pennsylvania entitled “Automated Recovery in a Secure Bootstrap Process.” It explains a secure bootstrap process which presumes a minimal amount of integrity, and which was prototyped on the Intel x86 architecture. It sequences a bootstrap process as a chain of progressively higher levels of abstraction, and requiring each layer to check a digital signature of the next layer before control is passed to it. Ex. 1006, Abstract.

4. Drews (Ex. 1007)

Drews describes securing the BIOS of a computer at manufacture and transferring trust post-manufacture. Ex. 1007, Title, Abstract. Figure 2 of

⁵ Aegis (Ex. 1006) is not the same paper as Ex. 1014 in IPR2015-01515, also referred to as “Aegis.”

Drews, reproduced below, is helpful in understanding its disclosure.

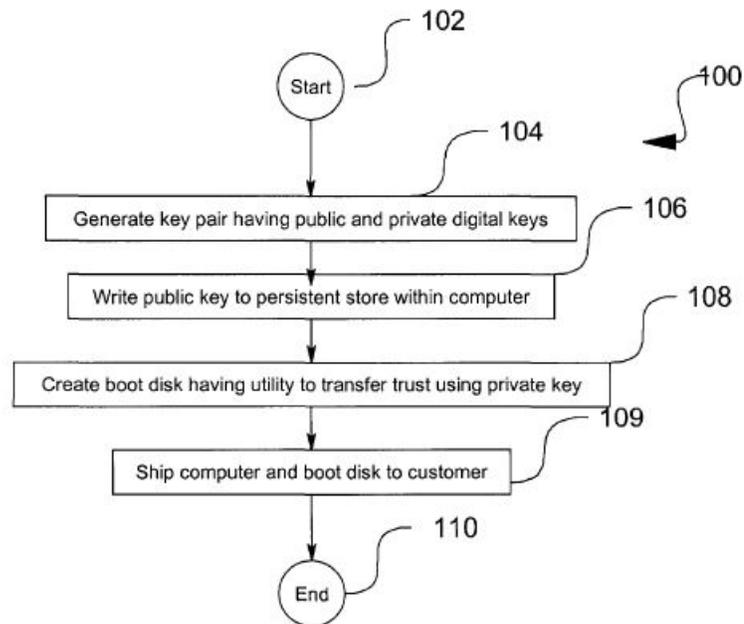


Figure 2 is a flowchart illustrating a manufacturing process (100) for a computer having a security module that prevents unauthorized individuals from tampering with a computer BIOS after it has been manufactured. The manufacturer generates (104) a unique key pair for each computer. The public key is stored (106) within the computer. The boot disk is secure at manufacture. A utility disk (108) provides transfer trust using a private key of the key pair. A security module (*see* Figure 1, below) is able to validate that a subsequent request to change configuration data was initiated by the current trusted authority by using the private key. Ex. 1007, 4:16–55.

B. Claims 1, 4, 5, 7, and 8

1. Overview of Challenge

Petitioner contends that claims 1, 4, 5, 7, and 8 of the '304 patent would have been obvious based on the combination of AMIBIOS, X.509,

and Aegis. Pet. 17–18. Petitioner supports its challenge with the declaration testimony of James Bottomley, Ph.D. (Ex. 1026). Patent Owner disagrees. *See generally* PO Resp.

The thrust of Petitioner’s challenge is that 1) it was known to use key pair cryptography for messaging; 2) in a computer, a BIOS service request is a message; and 3) therefore, one of ordinary skill would want to apply key pair cryptography to BIOS service requests and it would have been obvious to do so. Pet. 8, 19.

2. Priority Date

Petitioner disputes that the challenged claims are entitled to the October 9, 1997, priority date corresponding to the filing of Application 08/947,990 (“the ’990 Application”). Pet. 8–9. Petitioner argues that Application 09/679,450 (“the ’450 Application”), from which the ’304 patent issued, is a divisional application of Application 09/336,889 (“the ’889 Application”), which is a continuation-in-part (CIP) of the ’990 Application. *Id.* The CIP describes virtual memory, but does not mention, or relate to data authentication, public keys, private keys, digital signatures, or message security. Pet. 9 (citing Ex. 1003, 6–35). *Id.* Therefore, the challenged claims are not supported by the ’990 Application and their earliest possible effective date is June 18, 1999, the filing date of the ’889 Application. *Id.*

In its Preliminary Response, Patent Owner cites several examples of text from the Specification of the ’990 Application in order to trace support for the challenged claims. Prelim. Resp. 7–9. In our Decision to Institute, we indicated preliminary agreement with Patent Owner that a priority document need not describe the subject matter of the challenged claims *ipsis*

verbis (Prelim. Resp. 8), we were not persuaded of support by the portions of the '990 Specification Patent Owner cites to us. On the preliminary record, we concluded that the '304 patent challenged claims were not entitled to a priority date that would defeat the application of AMIBIOS as prior art.

Since our Decision to Institute there has been no further argument regarding whether the '304 patent is entitled to a priority date that would render AMIBIOS unavailable as prior art. Based on the record, as now fully developed, we consider Patent Owner's assertion of the October 9, 1997, priority date waived. We conclude that AMIBIOS should not be excluded as a reference based on a priority date of the '304 patent.

3. AMIBIOS as a Printed Publication

Patent Owner contends that AMIBIOS is not a "printed publication" citable as prior art against the '304 patent in this proceeding. PO Resp. 1–2. Patent Owner argues that there are "evidentiary issues" surrounding the AMIBIOS reference as a prior art publication. PO Resp. 1 (citing Paper 17).

We decided in IPR2015-01094, on substantially the same evidence as presented in this case, that AMIBIOS was available as a printed publication citation against Patent 6,401,202. We adopt the substantive reasoning set forth in that case, even though Patent Owner's challenge was raised procedurally in a different manor. We conclude that AMIBIOS is available for citation as a "printed publication."

4. Aegis as a Printed Publication

Patent Owner argues that Aegis is not citable as a "printed publication" against the '304 patent. PO Resp. 2. Patent Owner argues that Petitioner has not established that the date "August 1997" represents a

publication date. *Id.* (citing Ex. 1006, 1); nor that Aegis was publically available and distributed by the critical date. *Id.* at 2–4.

Patent Owner points to information printed on the first page of the article that includes a link. That information is reproduced below from page 2 of Patent Owner’s Reply, including Patent Owner’s annotation.

University of Pennsylvania Department of Computer and Information Science Technical Report No. MS-CIS-97-13.

This paper is posted at ScholarlyCommons. http://repository.upenn.edu/cis_reports/85
For more information, please contact repository@pobox.upenn.edu.

According to Patent Owner, following the identified link leads to a web page providing information about listed papers including authors, date of the version of the document, abstract, etc. PO Resp. 2–3 (citing Ex. 2006 (retrieved on February 12, 2016)). According to Patent Owner, there is also a link to download the paper, and a counter indicating that the paper was downloaded more than 470 times since October 30, 2006. *Id.* at 3. According to Patent Owner, the bottom of the webpage states for Aegis “Date Posted: 30 October 2006.” *Id.* Tracing the history of the website through the Internet Archive Machine shows the earliest date of the website as July 24, 2004. *Id.* at 3 (citing Ex. 2007).

Patent Owner further notes that there is no “copyright” printed on anywhere of the paper that may amount to prima facie proof of public distribution. PO Resp. 3 (citing 17 U.S.C. § 401(a)). Patent Owner also argues that Dr. Bottomley could not attest to the date. *Id.* He did not have personal knowledge regarding the existence of the paper. *Id.* (citing Ex. 2008, 20:12–16). Dr. Bottomley answered under cross-examination that he did not personally obtain the paper; nor has he ever accessed anything from the same database from which the paper was downloaded. *Id.* (citing Ex.

2008, 18:15–20:11).

Petitioner argues that Patent Owner’s challenge is based upon inquiry to a single website. There is other evidence of Aegis publication before the effective date of the ’304 patent. Pet. Reply 25. According to Petitioner, the Internet Society website shows that Aegis was a paper presented in a Symposium in March 11, 1998. *Id.* (citing Ex. 1029). Further, according to Petitioner, Aegis was cited by others prior to the ’304 patent critical date. *Id.* (citing Ex. 1030). Exhibit 1030 is an IEEE article published in the IEEE Communications Surveys in the first quarter of 1999. Pet. Reply 25. Petitioner points to Endnote 23 of Ex. 1030, which is a citation to Aegis, demonstrating its public availability at least as early as 1998. Pet. Reply 25 (citing Ex. 1030, p.15).

Petitioner also points to U.S. Pat. No. 6,327,652 (filed Jan 8, 1999) which references the Aegis “system” described in Aegis, which, according to Petitioner, further demonstrates Aegis’s public accessibility prior to the time of invention. Pet. Reply 25 (citing Ex. 1031, 3:30–35).

Petitioner has the burden of establishing Aegis as a printed publication. We conclude that Petitioner has not carried that burden.

The Internet Society website indicates only an “associated event” being “NDSS Symposium 1998.” We find no evidence of record indicating who attended the symposium or that copies were available there. Ex. 1029. The website itself bears a copyright notice dated 2016. It is not clear where its “associated event” data came from.

The IEEE article entitled “Active Networks: Applications, Security, Safety, and Architectures” by K....S, published in IEEE Communications Surveys “First Quarter 1999.” Petitioner argues that Aegis must have been

available as of the publication of this article, which cites Aegis in endnote 23. However, there is no evidence of record to suggest anything more than the author of the citing paper had a copy of Aegis or at least knew of it. There is no evidence of public accessibility.

Finally, Petitioner's reliance on the alleged citation of the Aegis "system" in US Patent 6,327,652 is to no avail. The article cited is not the Aegis reference. We have only Petitioner's argument that the article relates to a "system" that is the same system on which the method of the Aegis reference was carried out. What is cited is a different article having a different title and different number of pages. *See* Ex 1031, 3:30–35; *see also* Tr. 47:1–10 (acknowledging that it is a different article). There is no evidence in the record linking the two articles other than a commonality of authorship.

At most, Petitioner has demonstrated that a website created well after Aegis indicates that Aegis was presented at a symposium and an author of another paper had a copy of Aegis. We, therefore, conclude that Petitioner has not demonstrated Aegis to be available as a printed publication citation against the '304 patent.

Because Petitioner has not established Aegis as being citable against the '304 patent its challenge to claims 1, 4, 5, 7, and 8 fails. We conclude that Petitioner has not established by a preponderance of the evidence that claims 1, 4, 5, 7, and 8 are unpatentable based on AMIBIOS, X.509, and Aegis.

C. Claim 6

Petitioner's challenge to claim 6 also depends upon Aegis being a

viable reference against the '304 patent. We, therefore, conclude that Petitioner has not established by a preponderance of the evidence that claim 6 is unpatentable based on AMIBIOS, X.509, Aegis, and Drews.

III. CONCLUSIONS

All of Petitioner's challenges depend upon Aegis being citable as prior art against the claims. In view of our finding that Aegis is not citable, we are not persuaded by a preponderance of the evidence that it would have been obvious for one of ordinary skill at the time of the '304 patent invention to apply key pair cryptography to BIOS service requests, as claimed.

We need not reach either Petitioner's Motion to Exclude the transcript of the deposition of James Bottomley, Ph.D., or Patent Owner's Motion for Observations.

IV. ORDER

For the reasons given, it is

ORDERED that Petitioner's Motion to Exclude the deposition transcript of James Bottomley, Ph.D. is dismissed as moot;

FURTHER ORDERED that Patent Owner's Motion for Observations is dismissed as moot.

FURTHER ORDERED that claims 1 and 4–8 of U.S. Patent 6,892,304 B1 have not been shown to be unpatentable; and

FURTHER ORDERED that this is a Final Written Decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

Case IPR2015-01191
Patent 6,892,304 B1

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