IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

QOMPLX LLC, *Plaintiff,* v. MICROSOFT CORPORATION, *Defendant*.	Case No. 1:25-cv-01383 **JURY TRIAL DEMANDED**

DEFENDANT MICROSOFT CORPORATION'S PRELIMINARY INVALIDITY CONTENTIONS

Pursuant to this Court's Standing Order Governing Proceedings (OGP) 4.4–Patent Cases ("OGP") and the Scheduling Order in this case (Dkt. No. 39), Defendant Microsoft Corporation ("Defendant" or "Microsoft") hereby provides its Preliminary Invalidity Contentions ("Invalidity Contentions") with respect to the claims identified by Plaintiff by QOMPLX LLC ("Qomplx") in its November 24, 2025 Preliminary Infringement Contentions ("Infringement Contentions") for U.S. Patent Nos. 12,218,934 ("the '934 patent"), 12,231,426 ("the '426 patent"), 12,231,627 ("the '627 patent"), 12,301,628 ("the '628 patent"), 12,143,424 ("the '424 patent"), and 11,539,663 ("the '663 patent") (collectively, the "Asserted Patents"). Microsoft is concurrently producing any prior art references incorporated into its Invalidity Contentions. Microsoft also reserves the right to supplement these Invalidity Contentions in response to information learned in fact or expert discovery or further investigation, including, but not limited to, identification of additional prior art and information learned in response to any third-party subpoenas it may serve in this litigation.

I. PRELIMINARY STATEMENT

In its Infringement Contentions, Qomplx asserts the following claims (collectively, the "Asserted Claims") as allegedly being infringed by Microsoft:

Asserted Patent	Asserted Claims
U.S. Patent No. 12,218,934	1-2, 4-5, 9, 11-12, 14-15, 18, 20-21, 24, 26, 28-29
U.S. Patent No. 12,231,426	1, 3, 5, 9, 11, 13
U.S. Patent No. 12,231,627	1-3, 5-6, 11-14, 16-18, 22, 24, 27-28
U.S. Patent No. 12,301,628	1, 4-6, 9-11, 13-15, 17, 20, 22
U.S. Patent No. 12,143,424	1-3, 5, 7, 9-11, 13
U.S. Patent No. 11,539,663	1

Should Qomplx amend its infringement theories, or should the Court allow Qomplx to later assert additional infringement theories or additional claims not identified in Qomplx's Infringement Contentions, Microsoft reserves the right to supplement its Invalidity Contentions to address those additional infringement theories or additional claims. Microsoft's Invalidity Contentions are responsive at least to the same level of specificity of Qomplx's Infringement Contentions. By providing these contentions, Microsoft in no way admits to the adequacy or accuracy of Qomplx's Infringement Contentions.

These Invalidity Contentions are based on Microsoft's current knowledge, understanding, and belief of Qomplx's infringement theories and of the facts and other information reasonably available as of the date of these Invalidity Contentions. Microsoft's investigation, discovery, and analysis of information related to this action is ongoing. Microsoft reserves the right to supplement its Invalidity Contentions in response to information learned in fact or expert discovery or further investigation, including identification of additional prior art. Additional discovery and/or orders of the Court, including the claim construction order, may also require Microsoft to amend or further supplement these Invalidity Contentions, and Microsoft expressly reserves the right to do so as the case proceeds. These contentions represent Microsoft's good-faith effort to provide a comprehensive identification of prior art relevant to this case, but Microsoft reserves the right to modify and/or further supplement the prior art identified in these Invalidity Contentions at a later time with, or based upon, pertinent information that may be subsequently discovered.

A. <u>Incorporation By Reference</u>

Microsoft incorporates by reference all contentions, charts, prior art references, and other statements relating to any ground of invalidity identified by any potential or actual licensee to the Asserted Patent and by any party in any other past, present, and future litigation involving the

Asserted Patent and patents related to the Asserted Patent, including but not limited to the litigation captioned *Qomplx LLC v. Palo Alto Networks, Inc.*, 2:25-cv-913 (E.D. Tex.).

Microsoft incorporates by reference all grounds of invalidity identified in any reexamination, *inter partes* review, or other post-issuance review of the Asserted Patent that has been or may be filed, including but not limited to IPR2026-00182, IPR2026-00183, and IPR2026-00184. Microsoft also incorporates by reference the production of documents associated with any grounds for invalidity for the Asserted Patent identified in this paragraph. Microsoft also incorporates any grounds of invalidity known to Qomplx or any affiliated party whether or not disclosed.

Microsoft requests that Qomplx produce all such contentions, prior art, and related documents and communications, including from every case involving the Asserted Patent, as soon as they are served on, or become known to, Qomplx. Microsoft also requests that Qomplx produce all prior art to the Asserted Patent of which it is aware.

B. <u>No Waiver</u>

Nothing in these Invalidity Contentions is intended, nor should be construed, as a waiver of any claim construction argument, noninfringement position or, argument under 35 U.S.C. § 112. Microsoft's statements herein (including the accompanying claim charts) reflect Microsoft's present understanding of the purported scope of the claims as alleged by Qomplx in its Infringement Contentions (as best those contentions can be understood in light of their present deficiencies).

Microsoft reserves its rights to challenge any of the claim terms herein under 35 U.S.C. § 112 beyond the grounds outlined in any responses to interrogatories related to invalidity that may be served, including by arguing that they are indefinite, not supported by the written

description, or not enabled. Nothing stated herein shall be construed as a waiver of any argument available under 35 U.S.C. §§ 101, 102, 103, and/or 112.

C. <u>No Admission</u>

Nothing disclosed herein is an admission or acknowledgement that any product, system, unit, apparatus and/or method accused of infringement by Qomplx in its Infringement Contentions (the "Accused Products"), or any of Microsoft's other products, systems, units, apparatuses, and/or methods, infringes any of the Asserted Claims.

Qomplx appears to rely upon overly broad constructions of the Asserted Claims in its Infringement Contentions. At the same time, Qomplx's Infringement Contentions are in most cases too general, vague, and disconnected to discern Qomplx's infringement theories and how exactly Qomplx contends each Accused Product meets or practices each element of the Asserted Claims. For example, Qomplx's Infringement Contentions fail to clearly identify the aspects or features of the Accused Products that Qomplx contends meet the elements of the Asserted Claims. As a result, Microsoft has been prejudiced in its ability to prepare these Invalidity Contentions. In addition, Qomplx's Infringement Contentions, in many cases, fail to put Microsoft on notice of Qomplx's interpretation of the Asserted Claims, further prejudicing Microsoft's ability to identify relevant prior art.

Qomplx has not put forth a fulsome doctrine of equivalents theory in its Infringement Contentions. For example, Qomplx's allegations contain only generic and conclusory recitations of the doctrine without any supporting detail or explanation, such as:

> Based on Qomplx's analysis to date, this element appears to be practiced literally, including as charted above. Any differences between the charted material and this claim element are expected to be insubstantial, in which case the element is expected to be practiced under the Doctrine of Equivalents. For example, the technology described above performs substantially the same function in substantially the same way to achieve substantially the same result as this claim element.

See, e.g., Infringement Contentions, Ex. C at 4. This is not a sufficiently articulated theory that Microsoft can respond to in forming its defenses. Qomplx's Infringement Contentions do not identify why the accused features are allegedly "equivalent," or why any differences are allegedly "insubstantial" such that Microsoft can reasonably form its defenses. Any attempt by Qomplx to present doctrine of equivalents arguments in the future would be severely prejudicial to Microsoft. To the extent that Qomplx is later permitted by the Court to amend its Infringement Contentions to cure any deficiencies or to pursue any currently undisclosed doctrine of equivalents theories, Microsoft expressly reserves the right to further supplement or amend these Invalidity Contentions to address any such amendments.

To the extent that any of the prior art references disclose the same functionality or feature of any of the Accused Products, Microsoft reserves the right to argue that said feature or functionality does not practice any element of any of the Asserted Claims, and to argue, in the alternative, that if said feature or functionality is found to practice any element of any of the Asserted Claims, then the prior art reference demonstrates that the element is not novel, is obvious, and/or is otherwise not patentable.

D. <u>Representativeness</u>

Attached hereto are representative claim charts that demonstrate how the Asserted Claims of the Asserted Patent are invalid in view of certain prior art or combinations of prior art. The references cited in the attached claim charts may disclose the limitations of the Asserted Claims expressly and/or inherently, and/or they may be relied upon to show the state of the art in the relevant timeframe. The suggested obviousness combinations may be presented in conjunction with or in the alternative to Microsoft's contentions regarding anticipation. These obviousness combinations should not be construed to suggest that any reference included in any combination is not anticipatory in its own right.

Microsoft's claim charts cite to particular teachings and disclosures of the prior art as applied to features of the Asserted Claims. However, persons of ordinary skill in the art ("POSITA") generally may view an item of prior art in the context of other publications, literature, products, and understanding. As such, the cited portions are only examples, and Microsoft reserves the right to rely on uncited portions of the prior art references and on other publications, expert testimony, and other evidence as aids in understanding and interpreting the cited portions, as providing context thereto, and as additional evidence that the prior art discloses a claim limitation or any of the Asserted Claims as a whole. Microsoft further reserves the right to rely on uncited portions of the prior art references, other publications, and testimony, including expert testimony, to establish bases for combinations of certain cited references that render the Asserted Claims obvious.

The citations and discussion in the charts are organized by claim (and claim limitation) for convenience, but each limitation or claim section applies to the larger context of each claim, to any related dependent or independent claims, as well as all claims containing similar limitations or elements. For example, citations as to any recited limitation, step, or component in the claims apply wherever each such limitation, step, or component is repeated elsewhere in the claim or patent. Where Microsoft cites to a particular drawing or figure in the attached claim charts, the citation encompasses the description of the drawing or figure, as well as any text associated with the drawing or figure. Similarly, where Microsoft cites to particular text concerning a drawing or figure, the citation encompasses that drawing or figure as well. Relatedly, certain portions of patent or other prior art disclosures build upon other disclosures, even if they are referred to as a separate or alternative embodiment. Thus, Microsoft's citations to structures or functions incorporate by references all disclosures to related structures or

functions, including any additional detail provided as to the operation or design of those structures or functions.

E. Reservation Of Rights.

Prior art not included in this disclosure may become relevant. Microsoft is currently unaware of the extent, if any, to which Qomplx will contend that limitations of the Asserted Claims are not disclosed in the prior art identified by Microsoft. Microsoft reserves the right to identify other references that would have made the addition of the allegedly missing limitation to the disclosed device, system and/or method obvious, and/or show that the allegedly missing limitation would have been known or readily apparent to one of ordinary skill in the art at the time of the invention in light of the disclosure of the prior art at issue.

Microsoft reserves its rights to rely upon Qomplx's forthcoming document production and discovery responses and will seek to supplement its Invalidity Contentions with prior art contained in the production and/or referenced in the discovery responses once such production is made, such responses are provided, and Microsoft has had a fair opportunity to review, analyze, and chart such prior art. Microsoft also reserves the right to amend its Invalidity Contentions with any additional potential prior art known by Qomplx but not yet disclosed to Microsoft.

Microsoft provides these Invalidity Contentions only for the claims asserted by Qomplx but reserves the right to seek invalidation of all claims in the Asserted Patent.

F. Ongoing Investigation.

Microsoft's investigation is ongoing, and Microsoft expressly reserves the right to amend its Invalidity Contentions, disclosures, and document production to account for evidence uncovered as its investigation continues. Such amendments include identifying and relying on additional references that may result from Microsoft's further search and analysis. Microsoft reserves the right to supplement these contentions in light of any additional prior art of which

Qomplx is aware and did not disclose to Microsoft in discovery, or that might be subsequently disclosed by Qomplx in response to Microsoft's discovery requests. Microsoft anticipates issuing subpoenas to third parties believed to have knowledge, documentation and/or corroborating evidence concerning some of the prior art listed herein and/or additional prior art. These third parties include, but are not limited to, the authors, employers of authors, inventors, assignees, or former or current employees of assignees, of the references identified in these Invalidity Contentions. For example, Microsoft anticipates issuing subpoenas to potential prior artists including but not limited to individuals and entities responsible for the development of certain prior art systems, devices, apparatuses, methods, protocols, etc. Microsoft reserves the right to supplement these Invalidity Contentions in light of any newly discovered information produced by these or other entities and/or companies from which Microsoft may seek discovery.

I. U.S. PATENT NO. 12,218,934

A. The '934 Priority Date

Qomplx's Infringement Contentions allege that the Asserted Claims of the '934 patent are entitled at least to the priority date October 19, 2017. To the extent Qomplx alleges that any prior art relied on in these Invalidity Contentions does not qualify as prior art to the Asserted Patent, Microsoft reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later conception/reduction to practice or priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Microsoft identifies the following references as anticipating and/or rendering obvious one or more of the Asserted Claims of the '934 patent under 35 U.S.C. §§ 102 and/or 103, whether

considered alone or in combination with the references identified in each respective exhibit.[1] The table of anticipating and/or rendering obvious references below is exemplary and does not constitute an admission that any reference not listed below does not also anticipate and/or render obvious the claims of the ’934 patent. Further, Microsoft contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table:

Exhibit	Reference	Filing Date	Issue/Publication Date
A-1	U.S. Patent No. 9,762,576 to Dispensa	2/26/2009	9/12/2017
A-2	U.S. Patent No. 11,265,329 to Koottayi	5/05/2020[2]	3/01/2022
A-3	U.S. Patent No. 8,266,682 to Lee	4/15/2008	9/11/2012
A-4	U.S. Patent No. 10,432,605 to Lester	10/15/2018[3]	10/01/2019
A-5	U.S. Patent No. 9,955,349 to McClintock	8/19/2016	4/24/2018
A-6	U.S. Patent No. 11,184,392 to Thomas	12/18/2018[4]	11/23/2021
A-7	U.S. Patent No. 7,908,645 to Varghese	4/28/2006	3/15/2011
A-8	U.S. Patent No. 9,148,424 to Yang	3/13/2015	9/29/2015
A-9	U.S. Patent Application Publication No. 2018/0027006 to Zimmermann	2/24/2016	1/25/2018
A-12	U.S. Patent No. 10,063,654 to Kirti	6/24/2015	8/28/2018
A-13	*Expert Oracle and Java Security by* Coffin (2011)	N/A	2011

In addition, Microsoft identifies a non-exhaustive list of prior art products or prior art systems that, alone, or in combination with the additional references identified in each respective

[1] One or more of the charted prior art references are prior art by virtue of being entitled to the filing date of earlier application, such as a provisional application or parent application.

[2] Koottayi claims priority to a provisional application dated March 31, 2017.

[3] Lester claims priority to applications filed on September 23, 2013, March 20, 2012, September 21, 2012, and April 22, 2013.

[4] Thomas claims priority to a parent application filed on June 30, 2016.

exhibit, anticipate or render obvious the Asserted Claims of the ’934 patent under Qomplx’s overbroad infringement theories, which Microsoft disputes. Each of the prior art systems were publicly known or used or offered for sale prior to the critical date of the ’934 patent, as described in each system’s respective claim chart.

Microsoft continues to investigate the systems and products and reserves the right to supplement the contentions and accompanying claim charts after further discovery and investigation. Microsoft also reserves the right to rely on fact or expert witness testimony to establish the public knowledge, use, availability, sale, or offer for sale of any systems described below. Although additional information and prior art systems may be obtained through discovery, such prior art systems include at least the following:

Exhibit	Products/Systems	Date
A-10	Azure Active Directory and its predecessor systems	On information and belief, available no later than 2008
A-11	Microsoft Account Platform (MSA) and its predecessor systems, including, but not limited to Microsoft Passport and windows Live ID	On information and belief, available no later than 2012

In addition, Microsoft identifies the following additional prior art patents and publications that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the ’934 patent in addition to demonstrating the state of the art.[5] The list below further includes an additional, non-exhaustive list of prior art patents and publications that, alone, or in combination, anticipate or render obvious the Asserted Claims of the ’934 patent under Qomplx’s overbroad infringement theories, which Microsoft disputes.

[5] Microsoft reserves the right to rely on any prior art systems described in the following publications.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 7,949,716 to Alperovitch	Jan. 24, 2007	May 24, 2011
U.S. Patent No. 9,117,074 to Srivastava	May 18, 2011	Aug. 25. 2015
U.S. Patent No. 9,148,424 to Yang	Mar. 13, 2015	Sep. 29, 2015
U.S. Patent No. 9,294,476 to Lurey	Feb. 18, 2015	Mar. 22, 2016
U.S. Patent No. 9,301,968 to Novack	Sep. 24, 2013	Jul. 12, 2016
U.S. Patent No. 9,392,456 to Disraeli	Sep. 24, 2013	Jul. 12, 2016
U.S. Patent No. 10,147,065 to Yiftachel	Mar. 30, 2015	Dec. 4, 2018
U.S. Patent No. 10,243,960 to Potash	Mar. 3, 2017	Mar. 26, 2019
U.S. Patent No. 10,375,119 to Aronowitz	Jul. 28, 2016	Aug. 6, 2019
U.S. Patent No. 10,673,841 to Lee	Feb. 19, 2018	Jun. 2. 2020
U.S. Patent No. 11,082,453 to Reddem	Oct. 3, 2019	Aug. 3, 2021
U.S. Patent No. 11,113,370 to Toth	Dec. 5, 2018	Sep. 7, 2021
U.S. Patent No. 11,265,329 to Koottayi	May 5, 2020	Mar. 1, 2022
U.S. Patent No. 11,290,464 to Badhwar	Dec. 18, 2019	Mar. 29, 2022
U.S. Patent No. 11,575,692 to Romero Zambrano	Dec. 4, 2020	Feb. 7, 2023
U.S. Patent No. 11,606,372 to Peppe	Dec. 19, 2017	Mar. 14, 2023
U.S. Patent No. 11,818,159 to Miller	Dec. 10, 2020	Nov. 14, 2023
U.S. Patent No. 11,936,664 to Numainville	Mar. 14, 2020	Mar. 19, 2024
U.S. Patent No. 12,008,568 to Chang	Apr. 11, 2022	Jun. 11, 2024
U.S. Patent No. 12,132,731 to Sholtis	Mar. 31, 2022	Oct. 29, 2024
U.S. Patent Application Publication No. 2005/0097320 to Golan	Sep. 13, 2004	May 5, 2005
U.S. Patent Application Publication No. 2006/0282660 to Varghese	Apr. 28, 2006	Dec. 14, 2006
U.S. Patent Application Publication No. 2009/0300744 to Guo	Jun. 2, 2008	Dec. 3, 2009
U.S. Patent Application Publication No. 2010/0211996 to McGeehan	Dec. 23, 2009	Aug. 19, 2010
U.S. Patent Application Publication No. 2013/0254857 to Bajenov	Mar. 20, 2012	Sep. 26, 2013
U.S. Patent Application Publication No. 2014/0007179 to Moore	Jun. 29, 2012	Jan. 2, 2014

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent Application Publication No. 2014/0289833 to Briceno	Mar. 18, 2014	Sep. 25, 2014
U.S. Patent Application Publication No. 2015/0087265 to Disraeli	Sep. 24, 2013	Mar. 26, 2015
U.S. Patent Application Publication No. 2015/0089568 to Sprague	Oct. 30, 2013	Mar. 25, 2015
U.S. Patent Application Publication No. 2015/0150090 to Carroll	Jan. 30, 2015	May 28, 2015
U.S. Patent Application Publication No. 2016/0112397 to Mankovskii	Oct. 16, 2014	Apr. 21, 2016
U.S. Patent Application Publication No. 2016/0191412 to Tatourian	Dec. 27, 2014	Jun. 30, 2016
U.S. Patent Application Publication No. 2016/0197907 to Bajenov	Mar. 14, 2016	Jul. 7, 2016
U.S. Patent Application Publication No. 2016/0300059 to Abrams	Jun. 21, 2016	Oct. 13, 2016
U.S. Patent Application Publication No. 2017/0214712 to Maxell	Jan. 25, 2016	Jul. 27, 2017
U.S. Patent Application Publication No. 2017/0318008 to Mead	Jul. 7, 2017	Nov. 2, 2017
U.S. Patent Application Publication No. 2018/0034859 to Aronowitz	Jul. 28, 2016	Feb. 1, 2018
U.S. Patent Application Publication No. 2018/0176208 to Lee	Feb. 19, 2018	Jun. 21, 2018
U.S. Patent Application Publication No. 2018/0189470 to Kim	Jun. 24, 2016	Jul. 5. 2018
U.S. Patent Application Publication No. 2019/0044942 to Gordon	Jul. 31, 2018	Feb. 7, 2019
U.S. Patent Application Publication No. 2020/0036759 to Reddem	Oct. 3, 2019	Jan. 30, 2020
U.S. Patent Application Publication No. 2021/0110014 to Turgeman	Dec. 17, 2020	Apr. 15, 2021
U.S. Patent Application Publication No. 2022/0224688 to Sholtis	Mar. 31, 2022	Jul. 14, 2022

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent Application Publication No. 2024/0073231 to Vasudevan	Jul. 25, 2023	Feb. 29, 2024
International Patent No. 2016/086269 to Speak	Dec. 1, 2015	Jun. 9, 2016
U.S. Patent No. 9,448,852 to Vemulapalli	Aug. 28, 2009	Sep. 20, 2016

Title	Author/Publisher	Date
CA Risk Analytics	ca Technologies	2014
RSA Adaptive Authentication, A Comprehensive Authentication & Fraud Detection Platform	EMC Corporation	2013
RSA Risk-Based Authentication, Using a Risk-Based Approach to Address a Changing Threat Landscape	EMC Corporation	2013
Strong Multifactor Online Authentication Security for the Enterprise	Bharosa Inc.	2006
Usable Multi-Factor Authentication and Risk-Based Authorization	Larry Koved / International Business Machines Corp.	June 2015
Who Are You? A Statistical Approach Measuring User Authenticity	David Mandell Freeman, Sakshi Jain, Markus Durmuth, Battista Biggio, Giorgio Giacinto / NDSS '16	Feb. 21-24, 2016

In addition, Microsoft identifies the following additional products or prior art systems that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the '934 patent in addition to demonstrating the state of the art. The list below further includes an additional, non-exhaustive list of products or prior art systems that, alone, or in combination, anticipate or render obvious the Asserted Claims of the '934 patent under Qomplx's overbroad infringement theories, which Microsoft disputes.

System	Available Date
PhoneFactor	On information and belief, available no later than 2007

System	Available Date
FreeOTP	On information and belief, available no later than 2013
Duo Mobile from Duo Security	On information and belief, available no later than 2011
Apple two-step authentication with push notification	On information and belief, available no later than 2017
Google Authenticator, including two-step authentication with push notifications	On information and belief, available no later than 2010
RSA SecurID product and other adaptive authentication and risk-based authentication tools	On information and belief, available no later than 2011
Bharosa's Authenticator and Tracker	On information and belief, available no later than 2007
CA Technologies Risk Analytics	On information and belief, available no later than May 2017
Facebook/Meta Login Approvals and other multi-factor authentication tools	On information and belief, available no later than 2011

Discovery and Microsoft's investigation is ongoing. Microsoft reserves the right to further supplement these Invalidity Contentions with prior art uncovered through discovery. For example, Microsoft may supplement these contentions with additional prior art systems.

To the extent any item of prior art cited above is deemed not to disclose and/or render obvious, explicitly or inherently, any limitation of the Asserted Claims of the '934 patent, Microsoft reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Microsoft has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. The Asserted Claims are Anticipation and/or Rendered Obvious

Some or all of the Asserted Claims of the '934 patent are invalid as anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and/or 103 in view of each of the primary prior art

references identified in the claim charts included in Exhibits A-1 through A-13 as well as A-103, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

The U.S. Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007) emphasized that inventions arising from ordinary innovation, ordinary skill, or common sense should not be patentable. *Id*. at 1732, 1738, 1742–1743, 1746. A patent claim may be obvious if the combination of elements was obvious to try or if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, Section 103 likely bars its patentability. *Id*. at 1740. The Court stated that courts should "look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id*. at 1740–41. *KSR* does not mandate evidence of a motivation or suggestion to combine prior art references. *See TGIP, Inc. v. AT&T Corp*., 527 F. Supp. 2d 561, 580–81 (E.D. Tex. 2007). "[A] court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ" to resolve the question of obviousness. *KSR*, 127 S. Ct. at 1741.

Based on all of these considerations, as further detailed in Exhibits A-1 to A-13 as well as A-103, a POSITA would have combined the teachings of the prior art references discussed and charted in those exhibits. The combinations of these references would have rendered obvious to one of ordinary skill in the art the subject matter of the Asserted Claims of the ’934 patent. The references identified in Exhibits A-1 to A-13 as well as A-103 are analogous prior art to the subject matter of the Asserted Claims and, for at least the reasons set forth below, are properly combinable. Because these prior art references exist within a single field of art, particularly one in which individuals in the field often shared and/or collaborated on their work, it would have been obvious for a person of skill in the art to look from one piece of prior art to another in order to find any missing functionality they desired to implement. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the ’934 patent.

By way of example only, the following combinations render obvious the Asserted Claims of the ’934 patent:

- A-1 (Dispensa) in view of A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-2 (Koottayi) in view of A-1 (Dispensa), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-3 (Lee) in view of A-1 (Dispensa), A-2 (Koottayi), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-4 (Lester) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-5 (McClintock) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-6 (Thomas) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-7 (Varghese) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-8 (Yang) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-9 (Zimmerman) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-10 (Azure AD) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-11 (MSA), A-12 (Kirti), A-13 (Coffin), and/or A-103

- A-11 (MSA) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-12 (Kirti), A-13 (Coffin), and/or A-103.

- A-12 (Kirti) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-13 (Coffin), and/or A-103

- A-13 (Coffin) in view of A-1 (Dispensa), A-2 (Koottayi), A-3 (Lee), A-4 (Lester), A-5 (McClintock), A-6 (Thomas), A-7 (Varghese), A-8 (Yang), A-9 (Zimmerman), A-10 (Azure AD), A-11 (MSA), A-12 (Kirti) and/or A-103.

Numerous prior art references, including those identified in the attached exhibits, reflect common knowledge and the state of the prior art before the earliest claimed effective filing date of the ’934 patent. As it would be unduly burdensome to create detailed claim charts for all of the invalidating combinations, for at least the reasons described in these invalidity contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those identified in the attached exhibits, to meet the limitations of the Asserted Claims of the ’934 patent. Microsoft’s inclusion of exemplary

combinations, in view of the factors and motivations identified here, does not preclude Microsoft from identifying other invalidating combinations and/or motivations as appropriate.

No showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, because each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR*, 127 S. Ct. at 1739–40 (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id*. at 1742. Nevertheless, in addition to the information contained herein, Microsoft hereby identifies additional motivations and reasons to combine the cited art.

One or more combinations of the prior art references identified herein would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to combine the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompts variations based on predictable design incentives and/or market forces either in the same field or a different one. In addition, the combinations of the prior art references identified above would have been obvious because the combinations represent the known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation or reason to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution; the existence of a known need or problem in the field of endeavor at the time of the invention; and the background knowledge that would have been possessed by a person having ordinary skill in the art. For example, the prior art references are generally directed to the same problems. Thus, a skilled artisan seeking to solve these problems would look to these cited references in combination.

Thus, the motivation or reason to combine the teachings of the prior art references disclosed herein is found in the references themselves and in: (1) the nature of the problems being solved; (2) the express, implied, and inherent teachings of the prior art; (3) the knowledge of a POSITA; (4) the fact that the prior art is generally directed towards the same problems; and/or (5) the predictable results obtained in combining the different elements of the prior art; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Microsoft incorporates by reference all prior art identified in the prosecution histories and background sections of the ’934 patent. Microsoft expects to rely on the testimony of one or more expert witnesses and documents referenced by those expert witnesses in support of these contentions and incorporate those forthcoming expert reports as if fully set forth herein.

Microsoft contends that there are no secondary considerations of non-obviousness evidencing the validity of any of the Asserted Claims. Secondary considerations of non-obviousness, also referred to as objective indicia of non-obviousness, "can include copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, awards or other industry praise for the invention, and skepticism of skilled artisans before the invention." *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1368 (Fed. Cir. 2013). "A nexus between the merits of the claimed invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision." *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 668 (Fed. Cir. 2000). Moreover, even if a nexus exists, secondary considerations of non-obviousness "simply cannot overcome [a] strong prima facie showing of obviousness." *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1368 (Fed. Cir. 2008). Qomplx has not established the existence of any objective indicia of non-obviousness or secondary considerations. Microsoft reserves the right to supplement their contentions to respond to any such arguments or evidence should Qomplx be permitted to raise them in the future. While discovery in this case is ongoing, and Microsoft's investigation continues (which will include expert discovery), to the extent Qomplx contends that one or more Asserted Claims is not obvious based on secondary considerations recognized by relevant authority Microsoft contends such allegations are without merit. Microsoft reserves the right to supplement their contentions to respond to any such evidence should Qomplx be permitted to raise it in the future.

D. Other Invalidity Grounds

Microsoft hereby identifies grounds of invalidity based on (1) lack of written description under 35 U.S.C. § 112; (2) lack of enablement under 35 U.S.C. § 112; and (3) ineligible subject

matter under 35 U.S.C. § 101. These contentions shall not be construed as an admission that any claim construction advanced by Microsoft in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Microsoft from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Qomplx's purported construction of the claim language or of other positions advanced by Qomplx during the course of this litigation. Microsoft's Invalidity Contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Qomplx's alleged scope of the Asserted Claims of the '934 patent. Consequently, Microsoft only identifies the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description under 35 U.S.C. § 112

The Asserted Claims are invalid under 35 U.S.C. § 112, because the '934 patent does not provide sufficient written description to establish that the alleged inventors were in possession of the full scope of the alleged inventions recited in the Asserted Claims at the time the '934 patent was filed. *See, e.g.*, *Ariad v. Lilly*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc); *LizardTech Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005) (finding claims invalid under 35 U.S.C. § 112 where the specification failed to include a written description of the full scope of the claimed invention); *In re Katz Interactive Call Processing Pat. Litig.*, 639 F.3d 1303, 1320 (Fed. Cir. 2011) ("[W]hen analyzing whether a patent meets the written description requirement, one cannot 'bootstrap' the knowledge of a person of ordinary skill in the art ('POSITA') into the analysis and fill the gap in the disclosure through obviousness.").

The following terms render one of more of the Asserted Claims invalid for lack of written description under 35 U.S.C. § 112, as the specification of the '934 patent does not demonstrate that the inventors were in possession of the claimed subject matter:

Claim Terms	Claim(s)
"receive a request to authenticate a client, wherein the request comprises an identifier and a password . . . cause the client to be prompted to complete the additional verification method" "receiving a request to authenticate a client, wherein the request comprises an identifier and a password . . . causing the client to be prompted to complete the additional verification method"	1, 11, 18, 26
"receive a request to authenticate a client . . . store, in a multidimensional time-series database, information about the request . . . retrieving, from the multidimensional time-series database, historical information about previous access requests associated with the user account, and determining, based at least on the historical information, whether the user account is associated with a previous access request to a network resource, wherein the previous access request to the network resource is anomalous relative to a baseline profile of access requests" "receiving a request to authenticate a client . . storing, in a multidimensional time-series database, information about the request . . . retrieving, from the multidimensional time-series database, historical information about previous access requests associated with the user account, determining, based at least on the historical information, whether the user account is associated with a previous access request to a network resource, wherein the previous access request to the network resource is anomalous relative to a baseline profile of access requests"	1, 11
"receive a request to authenticate a client . . . store, in a multidimensional time-series database, information about the request . . . retrieving, from the multidimensional time-series database, historical information about previous access requests associated with the user account, and determining, based at least on the historical information, whether the user account is associated with a plurality of requests to authenticate comprising a brute force attack" "receiving a request to authenticate a client . . . storing, in a multidimensional time-series database, information about the request . . . retrieving, from the multidimensional time-series database, historical information about previous access requests associated with the user account, and determining, based at least on the historical information, whether the user account is associated with a plurality of requests to authenticate comprising a brute force attack"	18, 26
"select an additional verification method from a plurality of verification methods"	1, 11, 18, 26

Claim Terms	Claim(s)
" selecting an additional verification method from a plurality of verification methods"	
"wherein the historical information about previous access requests associated with the user account comprises historical information about previous requests to authenticate, wherein the previous requests to authenticate comprise the identifier"	2, 12
"wherein determining whether the additional verification is required to grant access further comprises processing an external threat intelligence feed."	4, 14, 20, 28
"determine that a probable cyberattack is detected" "determining that a probable cyberattack is detected"	5, 15, 21, 29

2. Lack of Enablement under 35 U.S.C. § 112(a)

The Asserted Claims are also invalid under 35 U.S.C. § 112, because the '934 patent does not enable one of ordinary skill in the art to make and/or use the full scope of certain recited elements of the Asserted Claims of the '934 patent without undue experimentation. *See, e.g.*, *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) ("The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation."); *Trustees of Bos. Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018) ("to be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'").

The following terms render one of more of the Asserted Claims invalid for lack of enablement under 35 U.S.C. § 112, as the claims, specification, and prosecution histories would not enable one of skill in the art to practice the claimed invention(s) without undue experimentation:

Claim Terms	Claim(s)
"determine that a probable cyberattack is detected" "determining that a probable cyberattack is detected"	5, 15, 21, 29

3. Ineligible Subject Matter under 35 U.S.C. § 101

The Asserted Claims of the '934 patent are also invalid for failing to recite patentable subject matter under 35 U.S.C. § 101.

In *Alice Corp. Pty. v. CLS Bank, Int'l*, 573 U.S. 208 (2014), the Supreme Court established a two-part test for determining whether a claim is patent eligible under 35 U.S.C. § 101. First, the court must determine whether the claims at issue are directed to any of the following patent-ineligible subject matter: laws of nature, natural phenomena, or abstract ideas. *Id.* at 217-18. Second, if the claims are directed to ineligible subject matter, the court must then consider the claim elements—both individually and as an ordered combination—to determine whether they provide an "inventive concept." *Id.* Merely implementing an abstract idea using well-known computer components or functions or limiting the idea to a particular technological environment is insufficient to transform the claimed abstract idea into a patent-eligible application. *Id.* at 220-26. The "inventive concept" inquiry further examines whether the additional elements, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activity. *Id.* at 221-22 (finding "conventional steps" insufficient to supply an "inventive concept"); *see also Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (requiring under the second step of the *Alice* test the "claim limitations involve more than performance of 'well-understood, routine, [and] conventional activities previously known to the industry'") (citations omitted).

Each of the Asserted Claims of the ’934 patent are directed to no more than the abstract idea of requiring additional authentication based on a previous request for access. *See, e.g.*, *Universal Secure Registry LLC v. Apple, Inc.*, 10 F.4th 1342, 1354-55 (Fed. Cir. 2021) (claims directed to abstract idea of verifying a person's identity by combining several conventional verification techniques*); Dropbox, Inc. v. Synchronoss Techs., Inc.*, 815 F. App'x 529, 532 (Fed. Cir. 2020) (affirming district court decision that claims were directed to abstract idea of “(1) associating a security level with a data resource, (2) associating a security level with a mode of identification of a user, and then (3) ensuring that the user's security level is sufficiently high to meet the security level of the data resource to access the data resource”); *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1351 (Fed. Cir. 2016) (claims directed to collecting data from multiple data sources, analyzing the data, and displaying the results were abstract); *Fraud Free Transactions LLC v. Ping Identity Corp.*, 780 F. Supp. 3d 460, 468 (D. Del. 2025) (claims directed to abstract idea of adjusting identification requirements based on the risk associated with a request for access); *Peoplechart Corp. v. Wintrust Bank, N.A.*, 543 F. Supp. 3d 594, 601 (N.D. Ill. 2021) (collecting cases where claims “directed at using multiple authentication methods for information security” were abstract).

Moreover, each of the Asserted Claims of the ’934 patent are patent-ineligible because they fail to provide an inventive concept. Indeed, aside from the recited abstract idea, the claim elements of each of the Asserted Claims of the ’934 patent, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activities. For example, the following claim elements represent conventional computer methods, architectures, and protocols:

Claim Element	Claim(s)
“computer system”	1, 11, 18, 26
“nontransitory machine-readable storage media”	1, 18
“network”	1, 11, 26
“client”	1, 11, 18, 26
“identifier”	1, 11, 18, 26
“password”	1, 11, 18, 26
“receiving a request”	1, 11, 18, 26
“storing … information”	1, 11, 18, 26
“a multidimensional time-series database”	1, 11, 18, 26
“determining”	1, 11, 18, 26
“retrieving … historical information”	1, 11, 18, 26
“selecting an additional verification method”	1, 11, 18, 26

Indeed, the specification of the ’934 patent acknowledges that elements of the invention are well-understood, routine and conventional. For example, the specification states:

- “at least some of the features or functionalities of the various aspects disclosed herein may be implemented on one or more general-purpose computers associated with one or more networks.” ’934 patent at 13:12-22.

- “Computing device 10 may be, for example, any one of the computing machines listed in the previous paragraph, or indeed any other electronic device capable of executing software- or hardware-based instructions according to one or more programs stored in memory.” *Id*. at 13:32-36.

- “Processors 21 may carry out computing instructions under control of an operating system 22 such as, for example, a version of MICROSOFT WINDOWSTM operating system, APPLE macOSTM or iOSTM operating systems, some variety of the Linux operating system, ANDROIDTM operating system, or the like.” *Id*. at 15:59-65.

- “Input devices 28 may be of any type suitable for receiving user input, including for example a keyboard, touchscreen, microphone (for example, for voice input), mouse, touchpad, trackball, or any combination thereof.” *Id*. at 16:4-7.

- "Output devices 27 may be of any type suitable for providing output to one or more users, whether remote or local to system 20, and may include for example one or more screens for visual output, speakers, printers, or any combination thereof." *Id*. at 16:7-11.

- "Memory 25 may be random-access memory having any structure and architecture known in the art, for use by processors 21, for example to run software." *Id*. at 16:12-14.

- "Storage devices 26 may be any magnetic, optical, mechanical, memristor, or electrical storage device for storage of data in digital form…." *Id*. at 16:14-17.

- "Clients 33 and servers 32 may communicate with one another via … any network topology known in the art…." *Id*. at 16:32-39.

- "Networks 31 may be implemented using any known network protocols…." *Id*. at 16:40-41.

Finally, the dependent claims do not transform the abstract idea into patent-eligible subject matter, because they add only "well-known, routine, and conventional functions," *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n*, 776 F.3d 1343, 1348 (Fed. Cir. 2014), or "merely provide additional criteria" for "performance of the same basic process." *Dropbox*, 815 F. App'x at 533. For example, the dependent claims recite:

- "the historical information about previous access requests associated with the user account comprises historical information about previous requests to authenticate" (claims 2, 12).

- "determining whether the additional verification is required to grant access further comprises processing endpoint data from entities connected to the network" (claims 3, 13, 19, 27).

- "determining whether the additional verification is required to grant access further comprises processing an external threat intelligence feed" (claims 4, 14, 28).

- "delivering an alert" when "a probable cyberattack is detected" (claims 5, 15, 21).

- "deny the request" when the additional the additional verification fails (claim 8)

- the computer system is "a plurality of physical computing machines" (claims 9, 24).

- the computer system is "a plurality of virtual computing machines" (claims 10, 25).

II. U.S. PATENT NO. 12,231,426

A. The ’426 Priority Date

Qomplx’s Infringement Contentions allege that the Asserted Claims of the ’426 patent are entitled at least to the priority date October 19, 2017. To the extent Qomplx alleges that any prior art relied on in these Invalidity Contentions does not qualify as prior art to the Asserted Patent, Microsoft reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later conception/reduction to practice or priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Microsoft identifies the following references as anticipating and/or rendering obvious one or more of the Asserted Claims of the ’426 patent under 35 U.S.C. §§ 102 and/or 103, whether considered alone or in combination with the references identified in each respective exhibit.[6] The table of anticipating and/or rendering obvious references below is exemplary, and does not constitute an admission that any reference not listed below does not also anticipate and/or render obvious the claims of the ’426 patent. Further, Microsoft contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table:

Exhibit	Reference	Application Date	Issue/Publication Date
B-1	U.S. Patent No. 9,762,576 to Dispensa	2/26/2009	9/12/2017
B-2	U.S. Patent No. 11,265,329 to Koottayi	5/05/2020[7]	3/01/2022
B-3	U.S. Patent No. 8,266,682 to Lee	4/15/2008	9/11/2012

[6] One or more of the charted prior art references are prior art by virtue of being entitled to the filing date of earlier application, such as a provisional application or parent application.

[7] Koottayi claims priority to a provisional application dated March 31, 2017.

Exhibit	Reference	Application Date	Issue/Publication Date
B-4	U.S. Patent No. 10,432,605 to Lester	10/15/2018[8]	10/01/2019
B-5	U.S. Patent No. 9,955,349 to McClintock	8/19/2016	4/24/2018
B-6	U.S. Patent No. 11,184,392 to Thomas	12/18/2018[9]	11/23/2021
B-7	U.S. Patent No. 7,908,645 to Varghese	4/28/2006	3/15/2011
B-8	U.S. Patent No. 9,148,424 to Yang	3/13/2015	9/29/2015
B-9	U.S. Patent Application Publication No. 2018/0027006 to Zimmermann	2/24/2016	1/25/2018
B-12	U.S. Patent No. 10,063,654 to Kirti	6/24/2015	8/28/2018
B-13	*Expert Oracle and Java Security by* Coffin (2011)	N/A	2011

In addition, Microsoft identifies a non-exhaustive list of prior art products or prior art systems that, alone, or in combination with the additional references identified in each respective exhibit, anticipate or render obvious the Asserted Claims of the ’426 patent. Each of the prior art systems were publicly known or used or offered for sale prior to the critical date of the ’426 patent, as described in each system’s respective claim chart under Qomplx’s overbroad infringement theories, which Microsoft disputes.

Microsoft continues to investigate the systems and products and reserves the right to supplement the contentions and accompanying claim charts after further discovery and investigation. Microsoft also reserves the right to rely on fact or expert witness testimony to establish the public knowledge, use, availability, sale, or offer for sale of any systems described

[8] Lester claims priority to applications filed on September 23, 2013, March 20, 2012, September 21, 2012, and April 22, 2013.

[9] Thomas claims priority to a parent application filed on June 30, 2016.

below. Although additional information and prior art systems may be obtained through discovery, such prior art systems include at least the following:

Exhibit	Products/Systems	Date
B-10	Azure Active Directory and its predecessor systems	On information and belief, available no later than 2008
B-11	Microsoft Account Platform (MSA) and its predecessor systems, including, but not limited to Microsoft Passport and windows Live ID	On information and belief, available no later than 2012

In addition, Microsoft identifies the following additional prior art patents and publications that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the '426 patent in addition to demonstrating the state of the art.[10] The list below further includes an additional, non-exhaustive list of prior art patents and publications that, alone, or in combination, anticipate or render obvious the Asserted Claims of the '426 patent under Qomplx's overbroad infringement theories, which Microsoft disputes.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 7,949,716 to Alperovitch	Jan. 24, 2007	May 24, 2011
U.S. Patent No. 9,117,074 to Srivastava	May 18, 2011	Aug. 25. 2015
U.S. Patent No. 9,148,424 to Yang	Mar. 13, 2015	Sep. 29, 2015
U.S. Patent No. 9,294,476 to Lurey	Feb. 18, 2015	Mar. 22, 2016
U.S. Patent No. 9,301,968 to Novack	Sep. 24, 2013	Jul. 12, 2016
U.S. Patent No. 9,392,456 to Disraeli	Sep. 24, 2013	Jul. 12, 2016
U.S. Patent No. 10,147,065 to Yiftachel	Mar. 30, 2015	Dec. 4, 2018
U.S. Patent No. 10,243,960 to Potash	Mar. 3, 2017	Mar. 26, 2019
U.S. Patent No. 10,375,119 to Aronowitz	Jul. 28, 2016	Aug. 6, 2019

[10] Microsoft reserves the right to rely on any prior art systems described in the following publications.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 10,673,841 to Lee	Feb. 19, 2018	Jun. 2. 2020
U.S. Patent No. 11,082,453 to Reddem	Oct. 3, 2019	Aug. 3, 2021
U.S. Patent No. 11,113,370 to Toth	Dec. 5, 2018	Sep. 7, 2021
U.S. Patent No. 11,265,329 to Koottayi	May 5, 2020	Mar. 1, 2022
U.S. Patent No. 11,290,464 to Badhwar	Dec. 18, 2019	Mar. 29, 2022
U.S. Patent No. 11,575,692 to Romero Zambrano	Dec. 4, 2020	Feb. 7, 2023
U.S. Patent No. 11,606,372 to Peppe	Dec. 19, 2017	Mar. 14, 2023
U.S. Patent No. 11,818,159 to Miller	Dec. 10, 2020	Nov. 14, 2023
U.S. Patent No. 11,936,664 to Numainville	Mar. 14, 2020	Mar. 19, 2024
U.S. Patent No. 12,008,568 to Chang	Apr. 11, 2022	Jun. 11, 2024
U.S. Patent No. 12,132,731 to Sholtis	Mar. 31, 2022	Oct. 29, 2024
U.S. Patent Application Publication No. 2005/0097320 to Golan	Sep. 13, 2004	May 5, 2005
U.S. Patent Application Publication No. 2006/0282660 to Varghese	Apr. 28, 2006	Dec. 14, 2006
U.S. Patent Application Publication No. 2009/0300744 to Guo	Jun. 2, 2008	Dec. 3, 2009
U.S. Patent Application Publication No. 2010/0211996 to McGeehan	Dec. 23, 2009	Aug. 19, 2010
U.S. Patent Application Publication No. 2013/0254857 to Bajenov	Mar. 20, 2012	Sep. 26, 2013
U.S. Patent Application Publication No. 2014/0007179 to Moore	Jun. 29, 2012	Jan. 2, 2014
U.S. Patent Application Publication No. 2014/0289833 to Briceno	Mar. 18, 2014	Sep. 25, 2014
U.S. Patent Application Publication No. 2015/0087265 to Disraeli	Sep. 24, 2013	Mar. 26, 2015
U.S. Patent Application Publication No. 2015/0089568 to Sprague	Oct. 30, 2013	Mar. 25, 2015
U.S. Patent Application Publication No. 2015/0150090 to Carroll	Jan. 30, 2015	May 28, 2015
U.S. Patent Application Publication No. 2016/0112397 to Mankovskii	Oct. 16, 2014	Apr. 21, 2016

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent Application Publication No. 2016/0191412 to Tatourian	Dec. 27, 2014	Jun. 30, 2016
U.S. Patent Application Publication No. 2016/0197907 to Bajenov	Mar. 14, 2016	Jul. 7, 2016
U.S. Patent Application Publication No. 2016/0300059 to Abrams	Jun. 21, 2016	Oct. 13, 2016
U.S. Patent Application Publication No. 2017/0214712 to Maxell	Jan. 25, 2016	Jul. 27, 2017
U.S. Patent Application Publication No. 2017/0318008 to Mead	Jul. 7, 2017	Nov. 2, 2017
U.S. Patent Application Publication No. 2018/0034859 to Aronowitz	Jul. 28, 2016	Feb. 1, 2018
U.S. Patent Application Publication No. 2018/0176208 to Lee	Feb. 19, 2018	Jun. 21, 2018
U.S. Patent Application Publication No. 2018/0189470 to Kim	Jun. 24, 2016	Jul. 5. 2018
U.S. Patent Application Publication No. 2019/0044942 to Gordon	Jul. 31, 2018	Feb. 7, 2019
U.S. Patent Application Publication No. 2020/0036759 to Reddem	Oct. 3, 2019	Jan. 30, 2020
U.S. Patent Application Publication No. 2021/0110014 to Turgeman	Dec. 17, 2020	Apr. 15, 2021
U.S. Patent Application Publication No. 2022/0224688 to Sholtis	Mar. 31, 2022	Jul. 14, 2022
U.S. Patent Application Publication No. 2024/0073231 to Vasudevan	Jul. 25, 2023	Feb. 29, 2024
International Patent No. 2016/086269 to Speak	Dec. 1, 2015	Jun. 9, 2016
U.S. Patent No. 9,448,852 to Vemulapalli	Aug. 28, 2009	Sep. 20, 2016

Title	Author/Publisher	Date
CA Risk Analytics	ca Technologies	2014
RSA Adaptive Authentication, A Comprehensive Authentication & Fraud Detection Platform	EMC Corporation	2013

RSA Risk-Based Authentication, Using a Risk-Based Approach to Address a Changing Threat Landscape	EMC Corporation	2013
Strong Multifactor Online Authentication Security for the Enterprise	Bharosa Inc.	2006
Usable Multi-Factor Authentication and Risk-Based Authorization	Larry Koved / International Business Machines Corp.	June 2015
Who Are You? A Statistical Approach Measuring User Authenticity	David Mandell Freeman, Sakshi Jain, Markus Durmuth, Battista Biggio, Giorgio Giacinto / NDSS '16	Feb. 21-24, 2016

In addition, Microsoft identifies the following additional products or prior art systems that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the '426 patent in addition to demonstrating the state of the art. The list below further includes an additional, non-exhaustive list of products or prior art systems that, alone, or in combination, anticipate or render obvious the Asserted Claims of the '426 patent under Qomplx's overbroad infringement theories, which Microsoft disputes.

Publication Title/System	Available Date
PhoneFactor	On information and belief, available no later than 2007
FreeOTP	On information and belief, available no later than 2013
Duo Mobile from Duo Security	On information and belief, available no later than 2011
Apple two-step authentication with push notification	On information and belief, available no later than 2017
Google Authenticator, including two-step authentication with push notifications	On information and belief, available no later than 2010
RSA SecurID product and other adaptive authentication and risk-based authentication tools	On information and belief, available no later than 2011
Bharosa's Authenticator and Tracker	On information and belief, available no later than 2007

Publication Title/System	Available Date
CA Technologies Risk Analytics	On information and belief, available no later than May 2017
Facebook/Meta Login Approvals and other multi-factor authentication tools	On information and belief, available no later than 2011

Discovery and Microsoft's investigation is ongoing. Microsoft reserves the right to Discovery and Microsoft's investigation is ongoing. Microsoft reserves the right to further supplement these Invalidity Contentions with prior art uncovered through discovery. For example, Microsoft may supplement these contentions with additional prior art systems.

To the extent any item of prior art cited above is deemed not to disclose and/or render obvious, explicitly or inherently, any limitation of the Asserted Claims of the '426 patent, Microsoft reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Microsoft has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. The Asserted Claims are Anticipation and/or Rendered Obvious

Some or all of the Asserted Claims of the '426 patent are invalid as anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and/or 103 in view of each of the primary prior art references identified in the claim charts included in Exhibits B-1 through B-13 as well as B-103, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

The U.S. Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007) emphasized that inventions arising from ordinary innovation, ordinary skill, or common sense should not be patentable. *Id*. at 1732, 1738, 1742–1743, 1746. A patent claim may be obvious if the combination of elements was obvious to try or if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, Section 103 likely bars its patentability. *Id*. at 1740. The Court stated that courts should "look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id*. at 1740–41. *KSR* does not mandate evidence of a motivation or suggestion to combine prior art references. *See TGIP, Inc. v. AT&T Corp*., 527 F. Supp. 2d 561, 580–81 (E.D. Tex. 2007). "[A] court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ" to resolve the question of obviousness. *KSR*, 127 S. Ct. at 1741.

Based on all of these considerations, as further detailed in B-1 through B-13 as well as B-103, a POSITA would have combined the teachings of the prior art references discussed and charted in those exhibits. The combinations of these references would have rendered obvious to one of ordinary skill in the art the subject matter of the Asserted Claims of the '426 patent. The references identified in B-1 through B-13 as well as B-103 are analogous prior art to the subject matter of the Asserted Claims and, for at least the reasons set forth below, are properly

combinable. Because these prior art references exist within a single field of art, particularly one in which individuals in the field often shared and/or collaborated on their work, it would have been obvious for a person of skill in the art to look from one piece of prior art to another in order to find any missing functionality they desired to implement. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the ’426 patent.

By way of example only, the following combinations render obvious the Asserted Claims of the ’426 patent:

- B-1 (Dispensa) in view of B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-2 (Koottayi) in view of B-1 (Dispensa), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-3 (Lee) in view of B-1 (Dispensa), B-2 (Koottayi), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-4 (Lester) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-5 (McClintock) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-6 (Thomas) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-7 (Varghese) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-8 (Yang) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-9 (Zimmerman) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-10 (Azure AD) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-11 (MSA), B-12 (Kirti), B-13 (Coffin), and/or B-103

- B-11 (MSA) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-12 (Kirti), B-13 (Coffin), and/or B-103.

- B-12 (Kirti) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-13 (Coffin), and/or B-103.

- B-13 (Coffin) in view of B-1 (Dispensa), B-2 (Koottayi), B-3 (Lee), B-4 (Lester), B-5 (McClintock), B-6 (Thomas), B-7 (Varghese), B-8 (Yang), B-9 (Zimmerman), B-10 (Azure AD), B-11 (MSA), B-12 (Kirti), and/or B-103.

Numerous prior art references, including those identified in the attached exhibits, reflect common knowledge and the state of the prior art before the earliest claimed effective filing date of the ’426 patent. As it would be unduly burdensome to create detailed claim charts for all of the invalidating combinations, for at least the reasons described in these invalidity contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those identified in the attached exhibits, to meet the limitations of the Asserted Claims of the ’426 patent. Microsoft’s inclusion of exemplary combinations, in view of the factors and motivations identified here, does not preclude Microsoft from identifying other invalidating combinations and/or motivations as appropriate.

No showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, because each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR*, 127 S. Ct. at 1739–40 (rejecting the Federal Circuit’s “rigid” application of the teaching, suggestion, or motivation to combine test, instead espousing an

"expansive and flexible" approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id*. at 1742. Nevertheless, in addition to the information contained herein, Microsoft hereby identifies additional motivations and reasons to combine the cited art.

One or more combinations of the prior art references identified herein would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to combine the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompts variations based on predictable design incentives and/or market forces either in the same field or a different one. In addition, the combinations of the prior art references identified above would have been obvious because the combinations represent the known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation or reason to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution; the existence of a known need or problem in the field of endeavor at the time of the invention; and the background knowledge that would have been possessed by a person having ordinary skill in the art. For

example, the prior art references are generally directed to the same problems. Thus, a skilled artisan seeking to solve these problems would look to these cited references in combination.

Thus, the motivation or reason to combine the teachings of the prior art references disclosed herein is found in the references themselves and in: (1) the nature of the problems being solved; (2) the express, implied, and inherent teachings of the prior art; (3) the knowledge of a POSITA; (4) the fact that the prior art is generally directed towards the same problems; and/or (5) the predictable results obtained in combining the different elements of the prior art; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Microsoft incorporates by reference all prior art identified in the prosecution histories and background sections of the ’426 patent. Microsoft expects to rely on the testimony of one or more expert witnesses and documents referenced by those expert witnesses in support of these contentions and incorporate those forthcoming expert reports as if fully set forth herein.

Microsoft contends that there are no secondary considerations of non-obviousness evidencing the validity of any of the Asserted Claims. Secondary considerations of non-obviousness, also referred to as objective indicia of non-obviousness, “can include copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, awards or other industry praise for the invention, and skepticism of

skilled artisans before the invention." *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1368 (Fed. Cir. 2013). "A nexus between the merits of the claimed invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision." *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 668 (Fed. Cir. 2000). Moreover, even if a nexus exists, secondary considerations of non-obviousness "simply cannot overcome [a] strong prima facie showing of obviousness." *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1368 (Fed. Cir. 2008). QOMPLX has not established the existence of any objective indicia of non-obviousness or secondary considerations. Microsoft reserves the right to supplement their contentions to respond to any such arguments or evidence should QOMPLX be permitted to raise them in the future. While discovery in this case is ongoing, and Microsoft's investigation continues (which will include expert discovery), to the extent QOMPLX contends that one or more Asserted Claims is not obvious based on secondary considerations recognized by relevant authority Microsoft contends such allegations are without merit. Microsoft reserves the right to supplement their contentions to respond to any such evidence should QOMPLX be permitted to raise it in the future.

D. Other Invalidity Grounds

Microsoft hereby identifies grounds of invalidity based on (1) lack of written description under 35 U.S.C. § 112; (2) lack of enablement under 35 U.S.C. § 112; and (3) ineligible subject matter under 35 U.S.C. § 101. These contentions shall not be construed as an admission that any claim construction advanced by Microsoft in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Microsoft from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to QOMPLX's purported construction of the claim language or of other positions advanced by QOMPLX during the

course of this litigation. Microsoft's Invalidity Contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as QOMPLX's alleged scope of the Asserted Claims of the '426 patent. Consequently, Microsoft only identifies the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description under 35 U.S.C. § 112

The Asserted Claims are invalid under 35 U.S.C. § 112, because the '426 patent does not provide sufficient written description to establish that the alleged inventors were in possession of the full scope of the alleged inventions recited in the Asserted Claims at the time the '426 patent was filed. *See e.g. Ariad v. Lilly*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc); *LizardTech Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005) (finding claims invalid under 35 U.S.C. § 112 where the specification failed to include a written description of the full scope of the claimed invention); *In re Katz Interactive Call Processing Pat. Litig.*, 639 F.3d 1303, 1320 (Fed. Cir. 2011) ("[W]hen analyzing whether a patent meets the written description requirement, one cannot 'bootstrap' the knowledge of a person of ordinary skill in the art ('POSITA') into the analysis and fill the gap in the disclosure through obviousness.").

The following terms render one of more of the Asserted Claims invalid for lack of written description under 35 U.S.C. § 112, as the specification of the '426 patent does not demonstrate that the inventors were in possession of the claimed subject matter:

Claim Terms	Claim(s)
"receive a request to authenticate a client, wherein the request comprises a first identifier and a password, store, in a multidimensional time-series database, information about the request, determine whether the password corresponds to a first user account identified by the first identifier . . . retrieving, from the multidimensional time-series database, historical information about previous access requests associated with the first user account, and determining, based at least on the historical information, whether the first user account is associated with a previous request to	1, 9

Claim Terms	Claim(s)
authenticate, wherein the previous request to authenticate comprised a second identifier not associated with the first user account” “receiving a request to authenticate a client, wherein the request comprises a first identifier and a password, storing, in a multidimensional time-series database, information about the request, determining whether the password corresponds to a first user account identified by the first identifier . . . retrieving, from the multidimensional time-series database, historical information about previous access requests associated with the first user account, determining, based at least on the historical information, whether the first user account is associated with a previous request to authenticate, wherein the previous request to authenticate comprised a second identifier not associated with the first user account”	
“receive a request to authenticate a client, wherein the request comprises a first identifier and a password . . . cause the client to be prompted to complete the additional verification method” “receiving a request to authenticate a client, wherein the request comprises a first identifier and a password . . . causing the client to be prompted to complete the additional verification method”	1, 9
“select an additional verification method from a plurality of verification methods” “selecting an additional verification method from a plurality of verification methods”	1, 9
“wherein determining whether the additional verification is required to grant access further comprises processing an external threat intelligence feed” “wherein determining whether the additional verification is required to grant access further comprises processing an external threat intelligence feed”	3, 11
“determine that a probable cyberattack is detected” “determining that a probable cyberattack is detected”	5, 13

2. Lack of Enablement under 35 U.S.C. § 112(a)

The Asserted Claims are also invalid under 35 U.S.C. § 112, because the ’426 patent does not enable one of ordinary skill in the art to make and/or use the full scope of certain recited

elements of the Asserted Claims of the ’426 patent without undue experimentation. *See, e.g.*, *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) (“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.”); *Trustees of Bos. Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018) (“to be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’”).

The following terms render one of more of the Asserted Claims invalid for lack of enablement under 35 U.S.C. § 112, as the claims, specification, and prosecution histories would not enable one of skill in the art to practice the claimed invention(s) without undue experimentation:

Claim Terms	Claim(s)
“receive a request to authenticate a client, wherein the request comprises a first identifier and a password, store, in a multidimensional time-series database, information about the request, determine whether the password corresponds to a first user account identified by the first identifier . . . retrieving, from the multidimensional time-series database, historical information about previous access requests associated with the first user account, and determining, based at least on the historical information, whether the first user account is associated with a previous request to authenticate, wherein the previous request to authenticate comprised a second identifier not associated with the first user account” “receiving a request to authenticate a client, wherein the request comprises a first identifier and a password, storing, in a multidimensional time-series database, information about the request, determining whether the password corresponds to a first user account identified by the first identifier . . . retrieving, from the multidimensional time-series database, historical information about previous access requests associated with the first user account, determining, based at least on the historical information, whether the first user account is associated with a previous request to authenticate, wherein the previous request to authenticate comprised a second identifier not associated with the first user account”	1, 9
“determine that a probable cyberattack is detected”	5, 13

Claim Terms	Claim(s)
"determining that a probable cyberattack is detected"	

3. Ineligible Subject Matter under 35 U.S.C. § 101

The Asserted Claims of the '426 patent are also invalid for failing to recite patentable subject matter under 35 U.S.C. § 101.

In *Alice Corp. Pty. v. CLS Bank, Int'l*, 573 U.S. 208 (2014), the Supreme Court established a two-part test for determining whether a claim is patent eligible under 35 U.S.C. § 101. First, the court must determine whether the claims at issue are directed to any of the following patent-ineligible subject matter: laws of nature, natural phenomena, or abstract ideas. *Id.* at 217-18. Second, if the claims are directed to ineligible subject matter, the court must then consider the claim elements—both individually and as an ordered combination—to determine whether they provide an "inventive concept." *Id.* Merely implementing an abstract idea using well-known computer components or functions or limiting the idea to a particular technological environment is insufficient to transform the claimed abstract idea into a patent-eligible application. *Id.* at 220-26. The "inventive concept" inquiry further examines whether the additional elements, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activity. *Id.* at 221-22 (finding "conventional steps" insufficient to supply an "inventive concept"); *see also Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (requiring under the second step of the *Alice* test the "claim limitations involve more than performance of 'well-understood, routine, [and] conventional activities previously known to the industry'") (citations omitted).

Each of the Asserted Claims of the '426 patent are directed to no more the abstract idea of requiring additional authentication based on a previous request for access. *See, e.g.*, *Universal*

Secure Registry LLC v. Apple, Inc., 10 F.4th 1342, 1354-55 (Fed. Cir. 2021) (claims directed to abstract idea of verifying a person's identity by combining several conventional verification techniques); *Dropbox, Inc. v. Synchronoss Techs., Inc.*, 815 F. App'x 529, 532 (Fed. Cir. 2020) (affirming district court decision that claims were directed to abstract idea of "(1) associating a security level with a data resource, (2) associating a security level with a mode of identification of a user, and then (3) ensuring that the user's security level is sufficiently high to meet the security level of the data resource to access the data resource"); *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1351 (Fed. Cir. 2016) (claims directed to collecting data from multiple data sources, analyzing the data, and displaying the results were abstract); *Fraud Free Transactions LLC v. Ping Identity Corp.*, 780 F. Supp. 3d 460, 468 (D. Del. 2025) (claims directed to abstract idea of adjusting identification requirements based on the risk associated with a request for access); *Peoplechart Corp. v. Wintrust Bank, N.A.*, 543 F. Supp. 3d 594, 601 (N.D. Ill. 2021) (collecting cases where claims "directed at using multiple authentication methods for information security" were abstract).

Moreover, each of the Asserted Claims of the '426 patent are patent-ineligible because they fail to provide an inventive concept. Indeed, aside from the recited abstract idea, the claim elements of each of the Asserted Claims of the '426 patent, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activities. For example, the following claim elements represent conventional computer methods, architectures, and protocols:

Claim Element	**Claim(s)**
"computer system"	1, 9, 19, 26
"nontransitory machine-readable storage media"	1, 19

Claim Element	Claim(s)
“network”	9, 26
“client”	1, 9, 19, 26
“identifier”	1, 9, 19, 26
“password”	1, 9, 19, 26
“receiving a request”	1, 9, 19, 26
“storing … information”	1, 9, 19, 26
“a multidimensional time-series database”	1, 9, 19, 26
“determining”	1, 9, 19, 26
“retrieving … historical information”	1, 9, 19, 26
“selecting an additional verification method”	9, 26

Indeed, the specification of the ’426 patent acknowledges that elements of the invention are well-understood, routine and conventional. For example, the specification states:

- “at least some of the features or functionalities of the various aspects disclosed herein may be implemented on one or more general-purpose computers associated with one or more networks.” ’426 patent at 13:12-22.

- “Computing device 10 may be, for example, any one of the computing machines listed in the previous paragraph, or indeed any other electronic device capable of executing software- or hardware-based instructions according to one or more programs stored in memory.” *Id*. at 13:32-36.

- “Processors 21 may carry out computing instructions under control of an operating system 22 such as, for example, a version of MICROSOFT WINDOWSTM operating system, APPLE macOSTM or iOSTM operating systems, some variety of the Linux operating system, ANDROIDTM operating system, or the like.” *Id*. at 15:59-65.

- “Input devices 28 may be of any type suitable for receiving user input, including for example a keyboard, touchscreen, microphone (for example, for voice input), mouse, touchpad, trackball, or any combination thereof.” *Id*. at 16:4-7.

- “Output devices 27 may be of any type suitable for providing output to one or more users, whether remote or local to system 20, and may include for example one or more screens for visual output, speakers, printers, or any combination thereof.” *Id*. at 16:7-11.

- "Memory 25 may be random-access memory having any structure and architecture known in the art, for use by processors 21, for example to run software." *Id*. at 16:12-14.

- "Storage devices 26 may be any magnetic, optical, mechanical, memristor, or electrical storage device for storage of data in digital form…." *Id*. at 16:14-17.

- "Clients 33 and servers 32 may communicate with one another via … any network topology known in the art…." *Id*. at 16:32-39.

- "Networks 31 may be implemented using any known network protocols…." *Id*. at 16:40-41.

Finally, the dependent claims do not transform the abstract idea into patent-eligible subject matter, because they add only "well-known, routine, and conventional functions," *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n*, 776 F.3d 1343, 1348 (Fed. Cir. 2014), or "merely provide additional criteria" for "performance of the same basic process." *Dropbox*, 815 F. App'x at 533. For example, the dependent claims recite:

- "determining whether the additional verification is required to grant access further comprises processing endpoint data from entities connected to the network" (claims 2, 10, 20, 27).

- "determining whether the additional verification is required to grant access further comprises processing an external threat intelligence feed" (claims 3, 21, 28).

- "delivering an alert" when "a probable cyberattack is detected" (claims 5, 13, 17, 23, 30).U.S. Patent No. 12,301,627

III. U.S. PATENT NO. 12,231,627

A. The '627 Priority Date

Despite having the burden of proof, Qomplx fails to demonstrate that any asserted claim of the '627 patent is entitled to a priority date earlier than the filing date of the patent, *i.e.*, September 20, 2024.

Qomplx's Infringement Contentions allege that all Asserted Claims of the '627 patent are entitled to a priority date of at least as early as January 30, 2020, except for Claims 2, 3, 11, 12, and 13, which are entitled to a priority date of at least as early as April 22, 2021. However,

Qomplx provides no evidence or analysis to demonstrate that the Asserted Claims of the ’627 patent are entitled to a priority date before the patent’s filing date. In this regard, a patent claim is entitled to the benefit of the filing date of an earlier filed application only if the disclosure of the earlier application provides both written description support and an enabling disclosure for the patent claim as required by 35 U.S.C. § 112, ¶ 1. Qomplx provides no such showing. Microsoft expressly reserves the right to amend its contentions if/when Qomplx amends its priority date contentions and/or produces evidence relating to alleged conception and/or reduction to practice.

To the extent Qomplx alleges that any prior art relied on in these Invalidity Contentions does not qualify as prior art to the Asserted Patent, Microsoft reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later conception/reduction to practice or priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Microsoft identifies the following references as anticipating and/or rendering obvious one or more of the Asserted Claims of the ’627 patent under 35 U.S.C. §§ 102 and/or 103, whether considered alone or in combination with the references identified in each respective exhibit. The table of anticipating and/or rendering obvious references below is exemplary, and does not constitute an admission that any reference not listed below does not also anticipate and/or render obvious the claims of the ’627 patent. Further, Microsoft contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table:

Exhibit	Reference	Application Date	Issue/Publication Date
C-1	U.S. Patent No. 10,503,911 to Chari	7/20/2018	12/10/2019
C-2	Leman Akoglu, et al., *Graph-based Anomaly Detection and Description: A Survey* ("Akoglu")	--	4/28/2014
C-3	U.S. Patent Application Publication No. 2018/0219919 to Crabtree	11/27/2017	08/02/2018
C-4	Emaad A. Manzoor, et al., *Fast Memory-efficient Anomaly Detection in Streaming Heterogeneous Graphs* ("Manzoor")	--	2/22/2016
C-5[11]	William Eberle, et al., *Scalable anomaly detection in graphs* ("Eberle 2015")	--	2015
C-5	William Eberle, et al., A Partitioning Approach to Scaling Anomaly Detection in Graph Streams ("Eberle 2014")	--	2014
C-5	William Eberle, et al., Graph-Based Anomaly Detection Applied to Homeland Security Cargo Screening ("Eberle 2012")	--	2012
C-5	William Eberle, et al., Identifying Anomalies in Graph Streams Using Change Detection ("Eberle 2016")	--	August 14, 2016
C-5	William Eberle, et al., Identifying Threats Using Graph-based Anomaly Detection ("Eberle 2009")	--	2009
C-5	William Eberle, et al., Scalable Anomaly Detection in Graphs ("Eberle 2015")	--	2015
C-6	U.S. Patent Application Publication No. 2020/0167787 to Kursun	11/26/2018	5/28/2020
C-7	U.S. Patent No. 9,141,790 to Roundy	9/30/2013	9/22/2015

[11] The Eberle references describe the same system in six different publications.

Exhibit	Reference	Application Date	Issue/Publication Date
C-8	U.S. Patent Application Publication No. 2018/0336437 to Cheng	5/16/2018	11/22/2018
C-9	U.S. Patent No. 11,818,157 to Maor	12/31/2019	11/14/2023
C-10	U.S. Patent No. 9,967,265 to Peer	09/29/2015	05/08/2018
C-11	U.S. Patent Application Publication No. 2020/0177617 to Hadar	08/29/2019	06/04/2020

In addition, Microsoft identifies a non-exhaustive list of prior art products or prior art systems that, alone, or in combination with the additional references identified in each respective exhibit, anticipate or render obvious the Asserted Claims of the ’627 patent under Qomplx’s overbroad infringement theories, which Microsoft disputes. Each of the prior art systems were publicly known or used or offered for sale prior to the critical date of the ’627 patent, as described in each system’s respective claim chart.

Microsoft continues to investigate the systems and products and reserves the right to supplement the contentions and accompanying claim charts after further discovery and investigation. Microsoft also reserves the right to rely on fact or expert witness testimony to establish the public knowledge, use, availability, sale, or offer for sale of any systems described below. Although additional information and prior art systems may be obtained through discovery, such prior art systems include at least the following:

Exhibit	Products/Systems	Date
C-12	Specter Ops BloodHound	August 29, 2016

In addition, Microsoft identifies the following additional prior art patents and publications that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the '627 patent in addition to demonstrating the state of the art.[12] The list below further includes an additional, non-exhaustive list of prior art patents and publications that, alone, or in combination, anticipate or render obvious the Asserted Claims of the '627 patent under Qomplx's overbroad infringement theories, which Microsoft disputes.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 7,624,448 to Coffman	Mar. 4, 2006	Nov. 24, 2009
U.S. Patent No. 8,370,902 to Davis	Jan. 29, 2010	Feb. 5, 2013
U.S. Patent No. 8,490,193 to Sarraute Yamada	Sep. 8, 2010	Jul. 16, 2013
U.S. Patent No. 8,495,743 to Kraemer	May 1, 2006	Jul. 23, 2013
U.S. Patent No. 9,083,748 to Monahan	Dec. 14, 2005	Jul. 14, 2015
U.S. Patent No. 9,141,790 to Roundy	Sep. 30, 2013	Sep. 22, 2015
U.S. Patent No. 9,292,695 to Bassett	Apr. 10, 2014	Mar. 22, 2016
U.S. Patent No. 9,876,815 to Sultan	Sep. 2, 2016	Jan. 23, 2018
U.S. Patent No. 9,967,265 to Peer	Sep. 29, 2015	May 8, 2018
U.S. Patent No. 9,979,738 to Holland	Mar. 18, 2016	May 22, 2018
U.S. Patent No. 9,992,219 to Hamlet	Nov. 12, 2015	Jun. 5, 2018
U.S. Patent No. 10,038,713 to Vasseur	May 6, 2014	Jul. 31, 2018
U.S. Patent No. 10,043,006 to Puri	Jun. 16, 2016	Aug. 7, 2018
U.S. Patent No. 10,205,735 to Apostolopoulos	Jan. 20, 2017	Feb. 12, 2019
U.S. Patent No. 10,305,917 to Chen	Jul. 19, 2016	May 28, 2019
U.S. Patent No. 10,313,382 to Noel	Mar. 29, 2016	Jun. 4, 2019
U.S. Patent No. 10,409,665 to Steiner	Jun. 5, 2015	Sep. 10, 2019
U.S. Patent No. 10,425,429 to Bassett	Mar. 21, 2016	Sep. 24, 2019
U.S. Patent No. 10,454,753 to Sasturkar	Apr. 23, 2017	Oct. 22, 2019

[12] Microsoft reserves the right to rely on any prior art systems described in the following publications.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 10,484,405 to Dasgupta	Jan. 23, 2015	Nov. 19, 2019
U.S. Patent No. 10,503,911 to Chari	Jul. 20, 2018	Dec. 10, 2019
U.S. Patent No. 10,530,796 to Patterson	Sep. 6, 2017	Jan. 7, 2020
U.S. Patent No. 10,592,324 to Puri	May 11, 2016	Mar. 17, 2020
U.S. Patent No. 10,592,516 to Azvine	Mar. 22, 2016	Mar. 17, 2020
U.S. Patent No. 10,728,272 to Ranjha	Dec. 17, 2014	Jul. 28, 2020
U.S. Patent No. 10,791,131 to Nor	May 28, 2017	Sep. 29, 2020
U.S. Patent No. 10,810,257 to Van Rest	Aug. 27, 2015	Oct. 20, 2020
U.S. Patent No. 10,884,891 to Awad	Dec. 11, 2014	Jan. 5, 2021
U.S. Patent No. 10,909,241 to Puri	Jul. 2, 2018	Feb. 2, 2021
U.S. Patent No. 11,184,385 to Hadar	Aug. 29, 2019	Nov. 23, 2021
U.S. Patent No. 11,212,299 to Gamble	May 1, 2019	Dec. 28, 2021
U.S. Patent No. 11,227,227 to Goldschmidt	May 8, 2018	Jan. 18, 2022
U.S. Patent No. 11,244,270 to Gill	May 22, 2020	Feb. 8, 2022
U.S. Patent No. 11,563,770 to Mizrahi	Apr. 14, 2021	Jan. 23, 2023
U.S. Patent No. 11,663,500 Rogers	May 5, 2020	May 30, 2023
U.S. Patent No. 11,818,157 to Maor	Dec. 31, 2019	Nov. 14, 2023
U.S. Patent No. 12,015,631 to Morgan	Mar. 30, 2021	Jun. 18, 2024
U.S. Patent Application Publication No. 2015/0074806 to Roundy	Sep. 30, 2013	Mar. 12, 2015
U.S. Patent Application Publication No. 2016/0078532 to Bartlett	Apr. 10, 2015	Mar. 17, 2016
U.S. Patent Application Publication No. 2017/0192872 to Awad	Jan. 12, 2017	Jul. 6, 2017
U.S. Patent Application Publication No. 2018/0075038 to Azvine	Mar. 22, 2016	Mar. 15, 2018
U.S. Patent Application Publication No. 2018/0336437 to Cheng	May 16, 2018	Nov. 22, 2018
U.S. Patent Application Publication No. 2019/0342307 to Gamble	May 1, 2019	Nov. 7, 2019
U.S. Patent Application Publication No. 2020/0167787 to Kursun	Nov. 26, 2018	May 28, 2020

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent Application Publication No. 2020/0177617 to Hadar	Aug. 29, 2019	Jun. 4, 2020

Title	Author/Publisher	Date
A Partitioning Approach to Scaling Anomaly Detection in Graph Streams	William Eberle, Lawerence Holder / IEEE	2014
An adaptive algorithm for anomaly and novelty detection in evolving data streams	Mohamed-Rafik Bouguelia, Slawomir Nowaczyk, Amir H. Payberah / Springer	May 12, 2018
Fast Memory-efficient Anomaly Detection in Streaming Heterogeneous Graphs	Emaad Manzoor, Sadegh M. Milajerdi, Lwman Akoglu / KDD ‘16	Aug. 13-17, 2016
Graph based anomaly detection and description: a survey	Leman Akoglu, Hanghang Tong, Danai Koutra / Springer	Jul. 5, 2014
Graph-Based Anomaly Detection Applied to Homeland Security Cargo Screening	William Eberle, Lawerence Holder, Beverly Massengill / Association for the Advancement of Artificial Intelligence	2012
Identifying Anomalies in Graph Streams Using Change Detection	William Eberle, Lawerence Holder / MLG ‘16	Aug. 14, 2016
Identifying Threats Using Graph-based Anomaly Detection	William Eberle, Lawerence Holder, Diane Cook	2009
Incremental Anomaly Detection in Graphs	William Eberle, Lawerence Holder / IEEE Xplore	2013
Overview on Attach Graph Generation and visualization Technology	Shengwei Yi, Yong Peng, Qi Xiong, Ting Wang, Zhonghua Dai, Haihui Gao, Junfeng Xu, Jiteng Wang, Lijuan Xu / IEEE Xplore	
tdGraphEmbed: Temporal Dynamic Graph-Level Embedding	Moran Beladev, Lior Rokah, Gilad Katz, Ido Guy, Kira Radinsky / CIKM ‘20	Oct. 19-23, 2020

Title	Author/Publisher	Date
Time-Series Event Prediction with Evolutionary State Graph	Wenjie Hu, Yang Yang, Ziqiang Cheng, Carl Yang, Xiang Ren / WSDM '21	Mar. 8-12, 2021
Use of Attach Graphs in Security Systems	Vivek Shandilya, Chris B. Simmons, Sajjan Shiva / Journal of Computer Networks and Communications	Oct. 20, 2014
Wireless Cyber-Physical Systems Performance Evaluation through a Graph Database Approach	Mohamed Kashef, Yongkang Liy, Karl Montgomery, Richard Candell / NIST National Institute of Standards and Technology	Apr. 2021

In addition, Microsoft identifies the following additional prior art that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the '627 patent in addition to demonstrating the state of the art. The list below further includes an additional, non-exhaustive list of prior art publications, products, or prior art systems that, alone, or in combination, anticipate or render obvious the Asserted Claims of the '627 patent under Qomplx's overbroad infringement theories, which Microsoft disputes.

Author	Publication Title/System	Issue/ Publication/ Available Date[13]
Paterva	Maltego Graph	2008
DuoSecurity	CloudMapper	Feb. 20, 2018
Lyft Engineering	Cartography	Mar. 19, 2019
Ou et al.	MulVAL: A Logic-based Network Security Analyzer	Aug. 2005
RedSeal	RedSeal Attack Path Analysis	2004
Skybox	Attack Surface Management	2002

[13] Microsoft reserves the right to rely on any prior art systems described in the following publications.

Discovery and Microsoft's investigation is ongoing. Microsoft reserves the right to further supplement these Invalidity Contentions with prior art uncovered through discovery. For example, Microsoft may supplement these contentions with additional prior art systems.

To the extent any item of prior art cited above is deemed not to disclose and/or render obvious, explicitly or inherently, any limitation of the Asserted Claims of the '627 patent, Microsoft reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Microsoft has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. The Asserted Claims are Anticipation and/or Rendered Obvious

Some or all of the Asserted Claims of the '627 patent are invalid as anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and/or 103 in view of each of the primary prior art references identified in the claim charts included in Exhibits C-1 through C-12, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

The U.S. Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007) emphasized that inventions arising from ordinary innovation, ordinary skill, or common sense should not be patentable. *Id*. at 1732, 1738, 1742–1743, 1746. A patent claim may be obvious if the combination of elements was obvious to try or if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. When a work is available in one field of endeavor, design incentives and other market forces can

prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, Section 103 likely bars its patentability. *Id*. at 1740. The Court stated that courts should "look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id*. at 1740–41. *KSR* does not mandate evidence of a motivation or suggestion to combine prior art references. *See TGIP, Inc. v. AT&T Corp*., 527 F. Supp. 2d 561, 580–81 (E.D. Tex. 2007). "[A] court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ" to resolve the question of obviousness. *KSR*, 127 S. Ct. at 1741.

Based on all of these considerations, as further detailed in Exhibits C-1 through C-12, a POSITA would have combined the teachings of the prior art references discussed and charted in those exhibits. The combinations of these references would have rendered obvious to one of ordinary skill in the art the subject matter of the Asserted Claims of the '627 patent. The references identified in Exhibits C-1 through C-12 are analogous prior art to the subject matter of the Asserted Claims and, for at least the reasons set forth below, are properly combinable. Because these prior art references exist within a single field of art, particularly one in which individuals in the field often shared and/or collaborated on their work, it would have been obvious for a person of skill in the art to look from one piece of prior art to another in order to find any missing functionality they desired to implement. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the '627 patent.

By way of example only, the following combinations render obvious the Asserted Claims of the ’627 patent:

- C-1 (Chari) in view of C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-2 (Akoglu) in view of C-1 (Chari), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-3 (Crabtree) in view of C-1 (Chari), C-2 (Akoglu), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-4 (Manzoor) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-5 (Eberle) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-6 (Kursun) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-7 (Roundy) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-8 (Cheng), C-9 (Maor), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-8 (Cheng) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-9 (Maor), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-9 (Maor) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-10 (Peer), C-11 (Hadar), and/or C-12 (BloodHound).

- C-10 (Peer) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-11 (Hadar), and/or C-12 (BloodHound).

- C-11 (Hadar) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-10 (Peer), and/or C-12 (BloodHound).

- C-12 (BloodHound) in view of C-1 (Chari), C-2 (Akoglu), C-3 (Crabtree), C-4 (Manzoor), C-5 (Eberle), C-6 (Kursun), C-7 (Roundy), C-8 (Cheng), C-9 (Maor), C-10 (Peer), and/or C-11 (Hadar).
- C-8 (Cheng) in view of C-7 (Roundy).
- C-1 (Chari) in view of C-2 (Akoglu).
- C-1 (Chari) in view of C-3 (Crabtree) and/or C-4 (Manzoor).
- C-9 (Maor) in view of C-1 (Chari).
- C-9 (Maor) in view of C-3 (Crabtree) and/or C-5 (Eberle).

Numerous prior art references, including those identified in the attached exhibits, reflect common knowledge and the state of the prior art before the earliest claimed effective filing date of the ’627 patent. As it would be unduly burdensome to create detailed claim charts for all of the invalidating combinations, for at least the reasons described in these invalidity contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those identified in the attached exhibits, to meet the limitations of the Asserted Claims of the ’627 patent. Microsoft’s inclusion of exemplary combinations, in view of the factors and motivations identified here, does not preclude Microsoft from identifying other invalidating combinations and/or motivations as appropriate.

No showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, because each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR*, 127 S. Ct. at 1739–40 (rejecting the Federal Circuit’s “rigid” application of the teaching, suggestion, or motivation to combine test, instead espousing an “expansive and flexible” approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is “a person of ordinary creativity, not an automaton” and “in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces

of a puzzle." *Id*. at 1742. Nevertheless, in addition to the information contained herein, Microsoft hereby identifies additional motivations and reasons to combine the cited art.

One or more combinations of the prior art references identified herein would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to combine the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompts variations based on predictable design incentives and/or market forces either in the same field or a different one. In addition, the combinations of the prior art references identified above would have been obvious because the combinations represent the known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation or reason to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution; the existence of a known need or problem in the field of endeavor at the time of the invention; and the background knowledge that would have been possessed by a person having ordinary skill in the art. For example, the prior art references are generally directed to the same problems. Thus, a skilled artisan seeking to solve these problems would look to these cited references in combination.

Thus, the motivation or reason to combine the teachings of the prior art references disclosed herein is found in the references themselves and in: (1) the nature of the problems

being solved; (2) the express, implied, and inherent teachings of the prior art; (3) the knowledge of a POSITA; (4) the fact that the prior art is generally directed towards the same problems; and/or (5) the predictable results obtained in combining the different elements of the prior art; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Microsoft incorporates by reference prior art from the prosecution histories and background sections of the ’627 patent. Microsoft expects to rely on the testimony of one or more expert witnesses and documents referenced by those expert witnesses in support of these contentions and incorporate those forthcoming expert reports as if fully set forth herein.

Microsoft contends that there are no secondary considerations of non-obviousness evidencing the validity of any of the Asserted Claims. Secondary considerations of non-obviousness, also referred to as objective indicia of non-obviousness, “can include copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, awards or other industry praise for the invention, and skepticism of skilled artisans before the invention.” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc*., 711 F.3d 1348, 1368 (Fed. Cir. 2013). “A nexus between the merits of the claimed invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision.” *Ruiz v. A.B. Chance Co.*, 234 F.3d 654,

668 (Fed. Cir. 2000). Moreover, even if a nexus exists, secondary considerations of non-obviousness "simply cannot overcome [a] strong prima facie showing of obviousness." *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1368 (Fed. Cir. 2008). Qomplx has not established the existence of any objective indicia of non-obviousness or secondary considerations. Microsoft reserves the right to supplement their contentions to respond to any such arguments or evidence should Qomplx be permitted to raise them in the future. While discovery in this case is ongoing, and Microsoft's investigation continues (which will include expert discovery), to the extent Qomplx contends that one or more Asserted Claims is not obvious based on secondary considerations recognized by relevant authority Microsoft contends such allegations are without merit. Microsoft reserves the right to supplement their contentions to respond to any such evidence should Qomplx be permitted to raise it in the future.

D. Other Invalidity Grounds

Microsoft hereby identifies grounds of invalidity based on (1) lack of written description under 35 U.S.C. § 112; (2) lack of enablement under 35 U.S.C. § 112; and (3) ineligible subject matter under 35 U.S.C. § 101. These contentions shall not be construed as an admission that any claim construction advanced by Microsoft in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Microsoft from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Qomplx's purported construction of the claim language or of other positions advanced by Qomplx during the course of this litigation. Microsoft's Invalidity Contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Qomplx's alleged scope of the Asserted Claims of the '627 patent. Consequently, Microsoft only identifies the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description under 35 U.S.C. § 112

The Asserted Claims are invalid under 35 U.S.C. § 112, because the ’627 patent does not provide sufficient written description to establish that the alleged inventors were in possession of the full scope of the alleged inventions recited in the Asserted Claims at the time the ’627 patent was filed. *See e.g. Ariad v. Lilly*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc); *LizardTech Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005) (finding claims invalid under 35 U.S.C. § 112 where the specification failed to include a written description of the full scope of the claimed invention); *In re Katz Interactive Call Processing Pat. Litig.*, 639 F.3d 1303, 1320 (Fed. Cir. 2011) (“[W]hen analyzing whether a patent meets the written description requirement, one cannot ‘bootstrap’ the knowledge of a person of ordinary skill in the art (‘POSITA’) into the analysis and fill the gap in the disclosure through obviousness.”).

The following terms render one of more of the Asserted Claims invalid for lack of written description under 35 U.S.C. § 112, as the specification of the ’627 patent does not demonstrate that the inventors were in possession of the claimed subject matter:

Claim Terms	Claim(s)
store in the hardware memory a representation of a first graph, wherein the representation of the first graph comprises representations of a first plurality of nodes corresponding to a first plurality of entities and further comprises representations of a first plurality of edges, wherein the first graph is a directed graph,	1
wherein the first plurality of entities comprises a plurality of accounts and a plurality of resources, and	1
wherein each edge of the first plurality of edges corresponds to a respective relationship between a respective pair of entities;	1
receive streaming data comprising time-stamped data about events relating to one or more entities of the first plurality of entities,	1
based on a first portion of the streaming data, identify a first entity that does not correspond to any of the first plurality of nodes, wherein the first entity is not of the first plurality of entities,	1

Claim Terms	Claim(s)
based on a second portion of the streaming data, wherein the second portion is not identical to the first portion, identify a first relationship between a pair of entities of the first plurality of entities that does not correspond to any of the first plurality of edges,	1
modify, in the hardware memory, the representation of the first graph to generate a modified representation of the first graph, wherein the modified representation of the first graph comprises a representation of a first node corresponding to the first entity and a representation of a first edge corresponding to the first relationship, wherein the first node is not of the first plurality of nodes and the first edge is not of the first plurality of edges,	1
identify, based on the modified representation of the first graph, an attack path that could be involved in an attack involving the first entity, wherein identifying the attack path comprises:	1
identifying a second entity that can be reached using the first entity, wherein the second entity corresponds to a second node, and the second node is related by one or more edges to the first node corresponding to the first entity in the modified representation of the first graph; and,	1
identifying a third entity that can be reached using the second entity, wherein the third entity corresponds to a third node, and the third node is related by one or more edges to the second node in the modified representation of the first graph; and	1
generate a report comprising an identification of the first entity and at least one of the second entity and the third entity.	1
identifying a first plurality of event flows that include a first anomalous event associated with the first entity.	2
identifying a point of origin for the first anomalous event based on the first plurality of event flows.	3
The computer system of claim 1, wherein the modified representation of the first graph comprises a representation of a node corresponding to the first entity, wherein the first entity is identified based on active reconnaissance results.	5
The computer system of claim 1, wherein the modified representation of the first graph comprises a representation of a node corresponding to the first entity, wherein the first entity is identified based on passive reconnaissance results.	6
The computer system of claim 1, wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that determine whether an event, of the events relating to one or more entities of	11

Claim Terms	Claim(s)
the first plurality of entities, is anomalous, wherein determining whether the event is anomalous comprises:	
determining that the event relates to the first entity,	11
determining at least one behavior pattern associated with the first entity, and	11
comparing the event to the at least one behavior pattern.	11
The computer system of claim 11, wherein comparing the event to the at least one behavior pattern comprises using a threshold.	12
The system of claim 11, wherein comparing the event to the at least one behavior pattern further comprises:	13
determining that the first entity is associated with a resource,	13
wherein the resource is a sensitive resource.	13
The computer system of claim 1, wherein the computer system comprises a plurality of physical computing machines.	14
The computer system of claim 1, wherein at least one entity of the first plurality of entities is at least one of a user, a place, a device, a resource, a group, or a service.	16
The computer system of claim 1, wherein the representation of the first graph comprises a representation of at least one node that does not correspond to an entity.	17
store in the hardware memory a representation of a first graph, wherein the representation of the first graph comprises representations of a first plurality of nodes corresponding to a first plurality of entities and further comprises representations of a first plurality of edges, wherein the first graph is a directed graph,	18
wherein the first plurality of entities comprises a plurality of accounts and a plurality of resources, and	18
wherein each edge of the first plurality of edges corresponds to a respective relationship between a respective pair of entities;	18
identify, based on the representation of the first graph, a first plurality of attack paths comprising a first entity of the first plurality of entities, wherein each attack path of the first plurality of attack paths targets a second entity of the first plurality of entities,	18
receive streaming data comprising time-stamped data about events relating to one or more entities of the first plurality of entities,	18
based on a first portion of the streaming data, identify a third entity that does not correspond to any of the first plurality of nodes, wherein the third entity is not of the first plurality of entities,	18

Claim Terms	Claim(s)
based on a second portion of the streaming data, wherein the second portion is not identical to the first portion, identify a first relationship between a pair of entities of the first plurality of entities that does not correspond to any of the first plurality of edges,	18
modify, in the hardware memory, the representation of the first graph to generate a modified representation of the first graph, wherein the modified representation of the first graph comprises a representation of a node corresponding to the third entity and an edge corresponding to the first relationship, wherein the node is not of the first plurality of nodes and the edge is not of the first plurality of edges, and	18
identify, based on the modified representation of the first graph, a second plurality of attack paths comprising the first entity, wherein each attack path of the second plurality of attack paths targets the second entity, and wherein an attack path of the second plurality of attack paths comprises the third entity.	18
The computer system of claim 18, wherein a portion of the representation of the first graph is derived from reconnaissance data received by the computer system from a plurality of computer systems,	22
wherein a first computer system of the plurality of computer systems performs passive reconnaissance, and	22
wherein a second computer system of the plurality of computer systems performs active reconnaissance.	22
The computer system of claim 18, further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that analyze an attack path of the plurality of attack paths using a graph analysis algorithm.	24
The computer system of claim 18, wherein the representation of the first graph comprises an identification of the third entity as a sensitive resource, and wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that generate a report that identifies the third entity as a sensitive resource.	27
The computer system of claim 18, wherein the representation of the first graph comprises an identification of a security vulnerability associated with the third entity, and wherein an attack path of the second plurality of attack paths is based on the security vulnerability.	28

2. Lack of Enablement under 35 U.S.C. § 112(a)

The Asserted Claims are also invalid under 35 U.S.C. § 112, because the ’627 patent does not enable one of ordinary skill in the art to make and/or use the full scope of certain recited elements of the Asserted Claims of the ’627 patent without undue experimentation. *See, e.g.*, *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) (“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.”); *Trustees of Bos. Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018) (“to be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’”).

The following terms render one of more of the Asserted Claims invalid for lack of enablement under 35 U.S.C. § 112, as the claims, specification, and prosecution histories would not enable one of skill in the art to practice the claimed invention(s) without undue experimentation:

Claim Terms	Claim(s)
store in the hardware memory a representation of a first graph, wherein the representation of the first graph comprises representations of a first plurality of nodes corresponding to a first plurality of entities and further comprises representations of a first plurality of edges, wherein the first graph is a directed graph,	1
wherein the first plurality of entities comprises a plurality of accounts and a plurality of resources, and	1
wherein each edge of the first plurality of edges corresponds to a respective relationship between a respective pair of entities;	1
receive streaming data comprising time-stamped data about events relating to one or more entities of the first plurality of entities,	1
based on a first portion of the streaming data, identify a first entity that does not correspond to any of the first plurality of nodes, wherein the first entity is not of the first plurality of entities,	1

Claim Terms	Claim(s)
based on a second portion of the streaming data, wherein the second portion is not identical to the first portion, identify a first relationship between a pair of entities of the first plurality of entities that does not correspond to any of the first plurality of edges,	1
modify, in the hardware memory, the representation of the first graph to generate a modified representation of the first graph, wherein the modified representation of the first graph comprises a representation of a first node corresponding to the first entity and a representation of a first edge corresponding to the first relationship, wherein the first node is not of the first plurality of nodes and the first edge is not of the first plurality of edges,	1
identify, based on the modified representation of the first graph, an attack path that could be involved in an attack involving the first entity, wherein identifying the attack path comprises:	1
identifying a second entity that can be reached using the first entity, wherein the second entity corresponds to a second node, and the second node is related by one or more edges to the first node corresponding to the first entity in the modified representation of the first graph; and,	1
identifying a third entity that can be reached using the second entity, wherein the third entity corresponds to a third node, and the third node is related by one or more edges to the second node in the modified representation of the first graph; and	1
generate a report comprising an identification of the first entity and at least one of the second entity and the third entity.	1
identifying a first plurality of event flows that include a first anomalous event associated with the first entity.	2
identifying a point of origin for the first anomalous event based on the first plurality of event flows.	3
The computer system of claim 1, wherein the modified representation of the first graph comprises a representation of a node corresponding to the first entity, wherein the first entity is identified based on active reconnaissance results.	5
The computer system of claim 1, wherein the modified representation of the first graph comprises a representation of a node corresponding to the first entity, wherein the first entity is identified based on passive reconnaissance results.	6
The computer system of claim 1, wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that determine whether an event, of the events relating to one or more entities of	11

Claim Terms	Claim(s)
the first plurality of entities, is anomalous, wherein determining whether the event is anomalous comprises:	
determining that the event relates to the first entity,	11
determining at least one behavior pattern associated with the first entity, and	11
comparing the event to the at least one behavior pattern.	11
The computer system of claim 11, wherein comparing the event to the at least one behavior pattern comprises using a threshold.	12
The system of claim 11, wherein comparing the event to the at least one behavior pattern further comprises:	13
determining that the first entity is associated with a resource,	13
wherein the resource is a sensitive resource.	13
The computer system of claim 1, wherein the computer system comprises a plurality of physical computing machines.	14
The computer system of claim 1, wherein at least one entity of the first plurality of entities is at least one of a user, a place, a device, a resource, a group, or a service.	16
The computer system of claim 1, wherein the representation of the first graph comprises a representation of at least one node that does not correspond to an entity.	17
store in the hardware memory a representation of a first graph, wherein the representation of the first graph comprises representations of a first plurality of nodes corresponding to a first plurality of entities and further comprises representations of a first plurality of edges, wherein the first graph is a directed graph,	18
wherein the first plurality of entities comprises a plurality of accounts and a plurality of resources, and	18
wherein each edge of the first plurality of edges corresponds to a respective relationship between a respective pair of entities;	18
identify, based on the representation of the first graph, a first plurality of attack paths comprising a first entity of the first plurality of entities, wherein each attack path of the first plurality of attack paths targets a second entity of the first plurality of entities,	18
receive streaming data comprising time-stamped data about events relating to one or more entities of the first plurality of entities,	18
based on a first portion of the streaming data, identify a third entity that does not correspond to any of the first plurality of nodes, wherein the third entity is not of the first plurality of entities,	18

Claim Terms	Claim(s)
based on a second portion of the streaming data, wherein the second portion is not identical to the first portion, identify a first relationship between a pair of entities of the first plurality of entities that does not correspond to any of the first plurality of edges,	18
modify, in the hardware memory, the representation of the first graph to generate a modified representation of the first graph, wherein the modified representation of the first graph comprises a representation of a node corresponding to the third entity and an edge corresponding to the first relationship, wherein the node is not of the first plurality of nodes and the edge is not of the first plurality of edges, and	18
identify, based on the modified representation of the first graph, a second plurality of attack paths comprising the first entity, wherein each attack path of the second plurality of attack paths targets the second entity, and wherein an attack path of the second plurality of attack paths comprises the third entity.	18
The computer system of claim 18, wherein a portion of the representation of the first graph is derived from reconnaissance data received by the computer system from a plurality of computer systems,	22
wherein a first computer system of the plurality of computer systems performs passive reconnaissance, and	22
wherein a second computer system of the plurality of computer systems performs active reconnaissance.	22
The computer system of claim 18, further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that analyze an attack path of the plurality of attack paths using a graph analysis algorithm.	24
The computer system of claim 18, wherein the representation of the first graph comprises an identification of the third entity as a sensitive resource, and wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that generate a report that identifies the third entity as a sensitive resource.	27
The computer system of claim 18, wherein the representation of the first graph comprises an identification of a security vulnerability associated with the third entity, and wherein an attack path of the second plurality of attack paths is based on the security vulnerability.	28

3. Ineligible Subject Matter under 35 U.S.C. § 101

The Asserted Claims of the ’627 patent are also invalid for failing to recite patentable subject matter under 35 U.S.C. § 101.

In *Alice Corp. Pty. v. CLS Bank, Int’l*, 573 U.S. 208 (2014), the Supreme Court established a two-part test for determining whether a claim is patent eligible under 35 U.S.C. § 101. First, the court must determine whether the claims at issue are directed to any of the following patent-ineligible subject matter: laws of nature, natural phenomena, or abstract ideas. *Id.* at 217-18. Second, if the claims are directed to ineligible subject matter, the court must then consider the claim elements—both individually and as an ordered combination—to determine whether they provide an “inventive concept.” *Id.* Merely implementing an abstract idea using well-known computer components or functions or limiting the idea to a particular technological environment is insufficient to transform the claimed abstract idea into a patent-eligible application. *Id.* at 220-26. The “inventive concept” inquiry further examines whether the additional elements, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activity. *Id.* at 221-22 (finding “conventional steps” insufficient to supply an “inventive concept”); *see also Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (requiring under the second step of the *Alice* test the “claim limitations involve more than performance of ‘well-understood, routine, [and] conventional activities previously known to the industry’”) (citations omitted).

Each of the Asserted Claims of the ’627 patent are directed to no more than the abstract idea of collecting, analyzing, and generating reports regarding network event anomalies. *See SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1167 (Fed. Cir. 2018) (claims directed to “selecting certain information, analyzing it using mathematical techniques, and reporting or displaying the results of the analysis” are abstract); *Elec. Power Grp. LLC v. Alston S.A.*, 830

F.3d 1350, 1353 (Fed. Cir. 2016) (claims reciting steps of "receiving a plurality of data streams," "analyzing events in real-time from the plurality of data streams," "displaying the event analysis results and diagnoses," and "updating the measurements from the data streams" were abstract); *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n,* 776 F.3d 1343 (Fed. Cir. 2014).

Moreover, each of the Asserted Claims of the '627 patent are patent-ineligible because they fail to provide an inventive concept. Indeed, aside from the recited abstract idea, the claim elements of each of the Asserted Claims of the '627 patent, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activities. For example, the following claim elements represent conventional computer methods, architectures, and protocols:

Claim Element	Claim(s)
"computer system"	1, 18
"hardware memory"	1, 18
"nontransitory machine-readable storage media"	1, 18
"store" a data structure	1, 18
"receive streaming data comprising time stamped data"	1, 18
"identify" data in a data structure	1, 18
"modify" a data structure	1, 18
"generate a report"	1

Indeed, the specification of the '627 patent acknowledges that elements of the invention are well-understood, routine and conventional. For example, the specification states:

- "'Database' may be used to refer to relational database management systems known in the art…" '627 patent at 8:52-54.

- "any group of data storage systems of databases referred to herein may be included together in a single database management system operating on a single machine, or they may be included in a single database management system operating on a cluster of machines as is known in the art." *Id*. at 9:4-8.

- "any single database (…) may be implemented on a single machine, on a set of machines using clustering technology, on several machines connected by one or more messaging systems known in the art, or in a master/slave arrangement common in the art." *Id*. at 9:9-14.

- "publicly-available information may be used to identify vulnerabilities that may be exploited with further active penetration testing." *Id*. at 13:40-42.

- "Initially 3120, the DCG may be used to identify all behavior interactions between affected processes and resources, using established known behavior patterns and event correlations to iterate over the affected nodes in a CPG until all relationships have been identified." *Id*. at 21:64-22:1.

- "While the use of 3'd party search tools 1915 is in no way required, and proprietary or other self-developed search tools may be used, there are numerous 3'd party search tools 1915 available on the Internet, many of them available for use free of charge, that are convenient for purposes of performing external and internal reconnaissance of an organization's infrastructure." *Id*. at 26:25-31.

- "Non-limiting examples of external reconnaissance data 2120 include domains and IP information, data breach information, organization information such as corporate structures, key employees, etc., open port information, information regarding which organizations are current targets of cyber-attacks, network vulnerability information, system version and patch/update information, known and possible exploits, and publicly available information." *Id*. at 27:44-51.

- "at least some of the features or functionalities of the various aspects disclosed herein may be implemented on one or more general-purpose computers associated with one or more networks." *Id*. at 29:51-55.

- "Computing device 10 may be configured to communicate with a plurality of other computing devices, such as clients or servers, over communications networks such as a wide area network a metropolitan area network, a local area network, a wireless network, the Internet, or any other network, using known protocols for such communication, whether wireless or wired." *Id*. at 30:9-15.

- "Processors 21 may carry out computing instructions under control of an operating system 22 such as, for example, a version of MICROSOFT WINDOWSTM operating system, APPLE macOSTM or iOSTM operating systems, some variety of the Linux operating system, ANDROIDTM operating system, or the like." *Id*. at 32:31-37.

- "Input devices 28 may be of any type suitable for receiving user input, including for example a keyboard, touchscreen, microphone (for example, for voice input), mouse, touchpad, trackball, or any combination thereof." *Id*. at 32:43-46.

- "Output devices 27 may be of any type suitable for providing output to one or more users, whether remote or local to system 20, and may include for example one or more screens for visual output, speakers, printers, or any combination thereof." *Id*. at 32:46-50.

- "Memory 25 may be random-access memory having any structure and architecture known in the art, for use by processors 21, for example to run software." *Id*. at 32:51-53.

- "Storage devices 26 may be any magnetic, optical, mechanical, memristor, or electrical storage device for storage of data in digital form…." *Id*. at 32:53-55.

- "Clients 33 and servers 32 may communicate with one another via … any network topology known in the art…." *Id*. at 33:4-10.

- "Networks 31 may be implemented using any known network protocols, including for example wired and/or wireless protocols." 33:12-14.

"If a claim's only 'inventive concept' is the application of an abstract idea using conventional and well-understood techniques, the claim has not been transformed into a patent-eligible application of an abstract idea." *BSG Tech LLC v. Buyseasons, Inc.*, 899 F.3d 1281, 1290-91 (Fed. Cir. 2018); *Elec. Power Grp.*, 830 F.3d at 1355 (claims that did "not even require a new source or type of information, or new techniques for analyzing it" lacked an inventive concept).

Finally, the dependent claims do not transform the abstract idea into patent-eligible subject matter, because they add only "well-known, routine, and conventional functions," *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n*, 776 F.3d 1343, 1348 (Fed. Cir. 2014), or "merely provide additional criteria" for "performance of the same basic process." *Dropbox*, 815 F. App'x at 533. For example, the dependent claims recite:

- "identifying a first plurality of event flows that include a first anomalous event associated with the first entity." (claims 2).

- "identifying a point of origin for the first anomalous event based on the first plurality of event flows." (claims 3).

- "the report is an alert" (claims 10).
- the computer system is "a plurality of physical computing machines" (claims 14).
- the computer system is "a plurality of virtual computing machines" (claims 15).

IV. U.S. PATENT NO. 12,301,628

A. The '628 Priority Date

Despite having the burden of proof, Qomplx fails to demonstrate that any asserted claim of the '628 patent is entitled to a priority date earlier than the filing date of the patent, *i.e.*, September 20, 2024.

Qomplx's Infringement Contentions allege that the Asserted Claims of the '628 patent are entitled at least to the priority date April 22, 2021. However, Qomplx provides no evidence or analysis to demonstrate that the Asserted Claims of the '628 patent are entitled to a priority date before the patent's filing date. In this regard, a patent claim is entitled to the benefit of the filing date of an earlier filed application only if the disclosure of the earlier application provides both written description support and an enabling disclosure for the patent claim as required by 35 U.S.C. § 112, ¶ 1. Qomplx provides no such showing. Microsoft expressly reserves the right to amend its contentions if/when Qomplx amends its priority date contentions and/or produces evidence relating to alleged conception and/or reduction to practice.

To the extent Qomplx alleges that any prior art relied on in these Invalidity Contentions does not qualify as prior art to the Asserted Patent, Microsoft reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later conception/reduction to practice or priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Microsoft identifies the following references as anticipating and/or rendering obvious one or more of the Asserted Claims of the ’628 patent under 35 U.S.C. §§ 102 and/or 103, whether considered alone or in combination with the references identified in each respective exhibit. The table of anticipating and/or rendering obvious references below is exemplary, and does not constitute an admission that any reference not listed below does not also anticipate and/or render obvious the claims of the ’628 patent. Further, Microsoft contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table:

Exhibit	Reference	Application Date	Issue/Publication Date
D-1	U.S. Patent No. 10,503,911 to Chari	7/20/2018	12/10/2019
D-2	Leman Akoglu, et al., *Graph-based Anomaly Detection and Description: A Survey* (“Akoglu”)	--	4/28/2014
D-3	U.S. Patent Application Publication No. 2018/0219919 to Crabtree	11/27/2017	08/02/2018
D-4	Emaad A. Manzoor, et al., *Fast Memory-efficient Anomaly Detection in Streaming Heterogeneous Graphs* (“Manzoor”)	--	2/22/2016
D-5[14]	William Eberle, et al., *Scalable anomaly detection in graphs* (“Eberle 2015”)	--	2015
D-5	William Eberle, et al., A Partitioning Approach to Scaling Anomaly Detection in Graph Streams (“Eberle 2014”)	--	2014
D-5	William Eberle, et al., Graph-Based Anomaly Detection Applied to Homeland Security Cargo Screening (“Eberle 2012”)	--	2012

[14] The Eberle references describe the same system in six different publications.

Exhibit	Reference	Application Date	Issue/Publication Date
D-5	William Eberle, et al., Identifying Anomalies in Graph Streams Using Change Detection ("Eberle 2016")	--	August 14, 2016
D-5	William Eberle, et al., Identifying Threats Using Graph-based Anomaly Detection ("Eberle 2009")	--	2009
D-5	William Eberle, et al., Scalable Anomaly Detection in Graphs ("Eberle 2015")	--	2015
D-6	U.S. Patent Application Publication No. 2020/0167787 to Kursun	11/26/2018	5/28/2020
D-7	U.S. Patent No. 9,141,790 to Roundy	9/30/2013	9/22/2015
D-8	U.S. Patent Application Publication No. 2018/0336437 to Cheng	5/16/2018	11/22/2018
D-9	U.S. Patent No. 11,818,157 to Maor	12/31/2019	11/14/2023
D-10	U.S. Patent No. 9,967,265 to Peer	09/09/2015	05/08/2018
D-11	U.S. Patent Application Publication No. 2020/0177617 to Hadar	08/29/2019	06/04/2020

In addition, Microsoft identifies a non-exhaustive list of prior art products or prior art systems that, alone, or in combination with the additional references identified in each respective exhibit, anticipate or render obvious the Asserted Claims of the '628 patent under Qomplx's overbroad infringement theories, which Microsoft disputes. Each of the prior art systems were publicly known or used or offered for sale prior to the critical date of the '628 patent, as described in each system's respective claim chart.

Microsoft continues to investigate the systems and products and reserves the right to supplement the contentions and accompanying claim charts after further discovery and investigation. Microsoft also reserves the right to rely on fact or expert witness testimony to

establish the public knowledge, use, availability, sale, or offer for sale of any systems described below. Although additional information and prior art systems may be obtained through discovery, such prior art systems include at least the following:

Exhibit	Products/Systems	Date
D-12	Specter Ops BloodHound	Aug. 29, 2016

In addition, Microsoft identifies the following additional prior art patents and publications that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the '628 patent in addition to demonstrating the state of the art.[15] The list below further includes an additional, non-exhaustive list of prior art patents and publications that, alone, or in combination, anticipate or render obvious the Asserted Claims of the '628 patent under Qomplx's overbroad infringement theories, which Microsoft disputes.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 7,624,448 to Coffman	Mar. 4, 2006	Nov. 24, 2009
U.S. Patent No. 8,370,902 to Davis	Jan. 29, 2010	Feb. 5, 2013
U.S. Patent No. 8,490,193 to Sarraute Yamada	Sep. 8, 2010	Jul. 16, 2013
U.S. Patent No. 8,495,743 to Kraemer	May 1, 2006	Jul. 23, 2013
U.S. Patent No. 9,083,748 to Monahan	Dec. 14, 2005	Jul. 14, 2015
U.S. Patent No. 9,141,790 to Roundy	Sep. 30, 2013	Sep. 22, 2015
U.S. Patent No. 9,292,695 to Bassett	Apr. 10, 2014	Mar. 22, 2016
U.S. Patent No. 9,876,815 to Sultan	Sep. 2, 2016	Jan. 23, 2018
U.S. Patent No. 9,967,265 to Peer	Sep. 29, 2015	May 8, 2018
U.S. Patent No. 9,979,738 to Holland	Mar. 18, 2016	May 22, 2018
U.S. Patent No. 9,992,219 to Hamlet	Nov. 12, 2015	Jun. 5, 2018
U.S. Patent No. 10,038,713 to Vasseur	May 6, 2014	Jul. 31, 2018

[15] Microsoft reserves the right to rely on any prior art systems described in the following publications.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 10,043,006 to Puri	Jun. 16, 2016	Aug. 7, 2018
U.S. Patent No. 10,205,735 to Apostolopoulos	Jan. 20, 2017	Feb. 12, 2019
U.S. Patent No. 10,305,917 to Chen	Jul. 19, 2016	May 28, 2019
U.S. Patent No. 10,313,382 to Noel	Mar. 29, 2016	Jun. 4, 2019
U.S. Patent No. 10,409,665 to Steiner	Jun. 5, 2015	Sep. 10, 2019
U.S. Patent No. 10,425,429 to Bassett	Mar. 21, 2016	Sep. 24, 2019
U.S. Patent No. 10,454,753 to Sasturkar	Apr. 23, 2017	Oct. 22, 2019
U.S. Patent No. 10,484,405 to Dasgupta	Jan. 23, 2015	Nov. 19, 2019
U.S. Patent No. 10,503,911 to Chari	Jul. 20, 2018	Dec. 10, 2019
U.S. Patent No. 10,530,796 to Patterson	Sep. 6, 2017	Jan. 7, 2020
U.S. Patent No. 10,592,324 to Puri	May 11, 2016	Mar. 17, 2020
U.S. Patent No. 10,592,516 to Azvine	Mar. 22, 2016	Mar. 17, 2020
U.S. Patent No. 10,728,272 to Ranjha	Dec. 17, 2014	Jul. 28, 2020
U.S. Patent No. 10,791,131 to Nor	May 28, 2017	Sep. 29, 2020
U.S. Patent No. 10,810,257 to Van Rest	Aug. 27, 2015	Oct. 20, 2020
U.S. Patent No. 10,884,891 to Awad	Dec. 11, 2014	Jan. 5, 2021
U.S. Patent No. 10,909,241 to Puri	Jul. 2, 2018	Feb. 2, 2021
U.S. Patent No. 11,184,385 to Hadar	Aug. 29, 2019	Nov. 23, 2021
U.S. Patent No. 11,212,299 to Gamble	May 1, 2019	Dec. 28, 2021
U.S. Patent No. 11,227,227 to Goldschmidt	May 8, 2018	Jan. 18, 2022
U.S. Patent No. 11,244,270 to Gill	May 22, 2020	Feb. 8, 2022
U.S. Patent No. 11,563,770 to Mizrahi	Apr. 14, 2021	Jan. 23, 2023
U.S. Patent No. 11,663,500 Rogers	May 5, 2020	May 30, 2023
U.S. Patent No. 11,818,157 to Maor	Dec. 31, 2019	Nov. 14, 2023
U.S. Patent No. 12,015,631 to Morgan	Mar. 30, 2021	Jun. 18, 2024
U.S. Patent Application Publication No. 2015/0074806 to Roundy	Sep. 30, 2013	Mar. 12, 2015
U.S. Patent Application Publication No. 2016/0078532 to Bartlett	Apr. 10, 2015	Mar. 17, 2016
U.S. Patent Application Publication No. 2017/0192872 to Awad	Jan. 12, 2017	Jul. 6, 2017

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent Application Publication No. 2018/0075038 to Azvine	Mar. 22, 2016	Mar. 15, 2018
U.S. Patent Application Publication No. 2018/0336437 to Cheng	May 16, 2018	Nov. 22, 2018
U.S. Patent Application Publication No. 2019/0342307 to Gamble	May 1, 2019	Nov. 7, 2019
U.S. Patent Application Publication No. 2020/0167787 to Kursun	Nov. 26, 2018	May 28, 2020
U.S. Patent Application Publication No. 2020/0177617 to Hadar	Aug. 29, 2019	Jun. 4, 2020

Title	Author/Publisher	Date
A Partitioning Approach to Scaling Anomaly Detection in Graph Streams	William Eberle, Lawerence Holder / IEEE	2014
An adaptive algorithm for anomaly and novelty detection in evolving data streams	Mohamed-Rafik Bouguelia, Slawomir Nowaczyk, Amir H. Payberah / Springer	May 12, 2018
Fast Memory-efficient Anomaly Detection in Streaming Heterogeneous Graphs	Emaad Manzoor, Sadegh M. Milajerdi, Lwman Akoglu / KDD ‘16	Aug. 13-17, 2016
Graph based anomaly detection and description: a survey	Leman Akoglu, Hanghang Tong, Danai Koutra / Springer	Jul. 5, 2014
Graph-Based Anomaly Detection Applied to Homeland Security Cargo Screening	William Eberle, Lawerence Holder, Beverly Massengill / Association for the Advancement of Artificial Intelligence	2012
Identifying Anomalies in Graph Streams Using Change Detection	William Eberle, Lawerence Holder / MLG ‘16	Aug. 14, 2016
Identifying Threats Using Graph-based Anomaly Detection	William Eberle, Lawerence Holder, Diane Cook	2009
Incremental Anomaly Detection in Graphs	William Eberle, Lawerence Holder / IEEE Xplore	2013
Overview on Attach Graph Generation and visualization Technology	Shengwei Yi, Yong Peng, Qi Xiong, Ting Wang, Zhonghua Dai, Haihui Gao, Junfeng Xu,	

Title	Author/Publisher	Date
	Jiteng Wang, Lijuan Xu / IEEE Xplore	
tdGraphEmbed: Temporal Dynamic Graph-Level Embedding	Moran Beladev, Lior Rokah, Gilad Katz, Ido Guy, Kira Radinsky / CIKM '20	Oct. 19-23, 2020
Time-Series Event Prediction with Evolutionary State Graph	Wenjie Hu, Yang Yang, Ziqiang Cheng, Carl Yang, Xiang Ren / WSDM '21	Mar. 8-12, 2021
Use of Attach Graphs in Security Systems	Vivek Shandilya, Chris B. Simmons, Sajjan Shiva / Journal of Computer Networks and Communications	Oct. 20, 2014
Wireless Cyber-Physical Systems Performance Evaluation through a Graph Database Approach	Mohamed Kashef, Yongkang Liy, Karl Montgomery, Richard Candell / NIST National Institute of Standards and Technology	Apr. 2021

In addition, Microsoft identifies the following additional prior art that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the '628 patent in addition to demonstrating the state of the art. The list below further includes an additional, non-exhaustive list of prior art publications, products, or prior art systems that, alone, or in combination, anticipate or render obvious the Asserted Claims of the '628 patent under Qomplx's overbroad infringement theories, which Microsoft disputes.

Author	Publication Title/System	Issue/ Publication/ Available Date[16]
Paterva	Maltego Graph	2008
SpecterOps	BloodHound	Aug. 29, 2016
DuoSecurity	CloudMapper	Feb. 20, 2018
Lyft Engineering	Cartography	Mar. 19, 2019

[16] Microsoft reserves the right to rely on any prior art systems described in the following publications.

Author	Publication Title/System	Issue/ Publication/ Available Date[16]
Ou et al.	MulVAL: A Logic-based Network Security Analyzer	Aug. 2005
RedSeal	RedSeal Attack Path Analysis	2004
Skybox	Attack Surface Management	2002

Discovery and Microsoft's investigation is ongoing. Microsoft reserves the right to further supplement these Invalidity Contentions with prior art uncovered through discovery. For example, Microsoft may supplement these contentions with additional prior art systems.

To the extent any item of prior art cited above is deemed not to disclose and/or render obvious, explicitly or inherently, any limitation of the Asserted Claims of the '628 patent, Microsoft reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Microsoft has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. The Asserted Claims are Anticipation and/or Rendered Obvious

Some or all of the Asserted Claims of the '628 patent are invalid as anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and/or 103 in view of each of the primary prior art references identified in the claim charts included in Exhibits D-1 through D-12, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

The U.S. Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007) emphasized that inventions arising from ordinary innovation, ordinary skill, or common sense should not be patentable. *Id*. at 1732, 1738, 1742–1743, 1746. A patent claim may be obvious if the combination of elements was obvious to try or if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, Section 103 likely bars its patentability. *Id*. at 1740. The Court stated that courts should "look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id*. at 1740–41. *KSR* does not mandate evidence of a motivation or suggestion to combine prior art references. *See TGIP, Inc. v. AT&T Corp*., 527 F. Supp. 2d 561, 580–81 (E.D. Tex. 2007). "[A] court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ" to resolve the question of obviousness. *KSR*, 127 S. Ct. at 1741.

Based on all of these considerations, as further detailed in Exhibits D-1 through D-12, a POSITA would have combined the teachings of the prior art references discussed and charted in those exhibits. The combinations of these references would have rendered obvious to one of ordinary skill in the art the subject matter of the Asserted Claims of the '628 patent. The references identified in Exhibits D-1 through D-12 are analogous prior art to the subject matter of the Asserted Claims and, for at least the reasons set forth below, are properly combinable.

Because these prior art references exist within a single field of art, particularly one in which individuals in the field often shared and/or collaborated on their work, it would have been obvious for a person of skill in the art to look from one piece of prior art to another in order to find any missing functionality they desired to implement. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the ’628 patent.

By way of example only, the following combinations render obvious the Asserted Claims of the ’628 patent:

- D-1 (Chari) in view of D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-2 (Akoglu) in view of D-1 (Chari), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-3 (Crabtree) in view of D-1 (Chari), D-2 (Akoglu), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-4 (Manzoor) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-5 (Eberle) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-6 (Kursun) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-7 (Roundy) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-8 (Cheng), D-9 (Maor), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-8 (Cheng) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-9 (Maor), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-9 (Maor) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-10 (Peer), D-11 (Hadar), and/or D-12 (BloodHound).

- D-10 (Peer) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-11 (Hadar), and/or D-12 (BloodHound).

- D-11 (Hadar) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-10 (Peer), and/or D-12 (BloodHound).

- D-12 (BloodHound) in view of D-1 (Chari), D-2 (Akoglu), D-3 (Crabtree), D-4 (Manzoor), D-5 (Eberle), D-6 (Kursun), D-7 (Roundy), D-8 (Cheng), D-9 (Maor), D-10 (Peer), and/or D-11 (Hadar).

- D-8 (Cheng) in view of D-7 (Roundy).

- D-1 (Chari) in view of D-2 (Akoglu).

- D-1 (Chari) in view of D-3 (Crabtree) and/or D-4 (Manzoor).

- D-9 (Maor) in view of D-1 (Chari).

- D-9 (Maor) in view of D-3 (Crabtree) and/or D-5 (Eberle).

Numerous prior art references, including those identified in the attached exhibits, reflect common knowledge and the state of the prior art before the earliest claimed effective filing date of the ’628 patent. As it would be unduly burdensome to create detailed claim charts for all of the invalidating combinations, for at least the reasons described in these invalidity contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those identified in the attached exhibits, to meet the limitations of the Asserted Claims of the ’628 patent. Microsoft’s inclusion of exemplary combinations, in view of the factors and motivations identified here, does not preclude Microsoft from identifying other invalidating combinations and/or motivations as appropriate.

No showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, because each combination of art would

have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR*, 127 S. Ct. at 1739–40 (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id*. at 1742. Nevertheless, in addition to the information contained herein, Microsoft hereby identifies additional motivations and reasons to combine the cited art.

One or more combinations of the prior art references identified herein would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to combine the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompts variations based on predictable design incentives and/or market forces either in the same field or a different one. In addition, the combinations of the prior art references identified above would have been obvious because the combinations represent the known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation or reason to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution; the existence of a

known need or problem in the field of endeavor at the time of the invention; and the background knowledge that would have been possessed by a person having ordinary skill in the art. For example, the prior art references are generally directed to the same problems. Thus, a skilled artisan seeking to solve these problems would look to these cited references in combination.

Thus, the motivation or reason to combine the teachings of the prior art references disclosed herein is found in the references themselves and in: (1) the nature of the problems being solved; (2) the express, implied, and inherent teachings of the prior art; (3) the knowledge of a POSITA; (4) the fact that the prior art is generally directed towards the same problems; and/or (5) the predictable results obtained in combining the different elements of the prior art; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Microsoft incorporates by reference prior art from the prosecution histories and background sections of the ’628 patent. Microsoft expects to rely on the testimony of one or more expert witnesses and documents referenced by those expert witnesses in support of these contentions and incorporate those forthcoming expert reports as if fully set forth herein.

Microsoft contends that there are no secondary considerations of non-obviousness evidencing the validity of any of the Asserted Claims. Secondary considerations of non-obviousness, also referred to as objective indicia of non-obviousness, “can include copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the

claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, awards or other industry praise for the invention, and skepticism of skilled artisans before the invention." *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1368 (Fed. Cir. 2013). "A nexus between the merits of the claimed invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision." *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 668 (Fed. Cir. 2000). Moreover, even if a nexus exists, secondary considerations of non-obviousness "simply cannot overcome [a] strong prima facie showing of obviousness." *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1368 (Fed. Cir. 2008). Qomplx has not established the existence of any objective indicia of non-obviousness or secondary considerations. Microsoft reserves the right to supplement their contentions to respond to any such arguments or evidence should Qomplx be permitted to raise them in the future. While discovery in this case is ongoing, and Microsoft's investigation continues (which will include expert discovery), to the extent Qomplx contends that one or more Asserted Claims is not obvious based on secondary considerations recognized by relevant authority Microsoft contends such allegations are without merit. Microsoft reserves the right to supplement their contentions to respond to any such evidence should Qomplx be permitted to raise it in the future.

D. Other Invalidity Grounds

Microsoft hereby identifies grounds of invalidity based on (1) lack of written description under 35 U.S.C. § 112; (2) lack of enablement under 35 U.S.C. § 112; and (3) ineligible subject matter under 35 U.S.C. § 101. These contentions shall not be construed as an admission that any claim construction advanced by Microsoft in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Microsoft from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these

contentions shall not be construed as an admission of or acquiescence to Qomplx's purported construction of the claim language or of other positions advanced by Qomplx during the course of this litigation. Microsoft's Invalidity Contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Qomplx's alleged scope of the Asserted Claims of the '628 patent. Consequently, Microsoft only identifies the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description under 35 U.S.C. § 112

The Asserted Claims are invalid under 35 U.S.C. § 112, because the '628 patent does not provide sufficient written description to establish that the alleged inventors were in possession of the full scope of the alleged inventions recited in the Asserted Claims at the time the '628 patent was filed. *See e.g. Ariad v. Lilly*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc); *LizardTech Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005) (finding claims invalid under 35 U.S.C. § 112 where the specification failed to include a written description of the full scope of the claimed invention); *In re Katz Interactive Call Processing Pat. Litig.*, 639 F.3d 1303, 1320 (Fed. Cir. 2011) ("[W]hen analyzing whether a patent meets the written description requirement, one cannot 'bootstrap' the knowledge of a person of ordinary skill in the art ('POSITA') into the analysis and fill the gap in the disclosure through obviousness.").

The following terms render one of more of the Asserted Claims invalid for lack of written description under 35 U.S.C. § 112, as the specification of the '628 patent does not demonstrate that the inventors were in possession of the claimed subject matter:

Claim Terms	Claim(s)
store in the hardware memory a representation of a first graph, wherein the representation of the first graph comprises representations of a first plurality of nodes corresponding to a first plurality of entities and further comprises representations of a first plurality of edges, wherein the first graph is a directed graph,	1

Claim Terms	Claim(s)
wherein the first plurality of entities comprises a plurality of accounts and a plurality of resources,	1
wherein each edge of the first plurality of edges corresponds to a respective relationship between a respective pair of entities of the first plurality of entities;	1
receive streaming data comprising time-stamped data about events relating to one or more entities of the first plurality of entities;	1
based on a first portion of the streaming data, identify a first entity that does not correspond to any of the first plurality of nodes, wherein the first entity is not of the first plurality of entities;	1
based on a second portion of the streaming data, wherein the second portion is not identical to the first portion, identify a first relationship between a pair of entities of the first plurality of entities that does not correspond to any of the first plurality of edges;	1
modify, in the hardware memory, the representation of the first graph to generate a modified representation of the first graph, wherein the modified representation of the first graph comprises a representation of a first node corresponding to the first entity and a representation of a first edge corresponding to the first relationship, wherein the first node is not of the first plurality of nodes and the first edge is not of the first plurality of edges;	1
for an anomalous event associated with a node in the modified representation of the first graph, perform a first correlation using the modified representation of the first graph to identify a first plurality of correlated nodes, wherein each of the first plurality of correlated nodes corresponds to a respective event or resource, wherein each respective event or resource is associated with the anomalous event, and wherein each of the first plurality of correlated nodes is connected by a respective edge of a second plurality of edges to the node associated with the anomalous event in the modified representation of the first graph;	1
for one or more of the first plurality of correlated nodes, perform a further correlation using the modified representation of the first graph to identify a second plurality of correlated nodes, wherein each of the second plurality of correlated nodes is connected through a respective edge of a third plurality of edges to the respective node of the first plurality of correlated nodes in the modified representation of the first graph;	1
generate a representation of a second graph comprising representations of one or more of the first plurality of correlated nodes, representations of one or more of the second plurality of correlated nodes, representations of one or more of the second plurality of edges, and representations of one or more of the third plurality of edges, wherein one or more of the second plurality of edges together with one or more of the third plurality of edges represent	1

Claim Terms	Claim(s)
one or more event flows that could be involved in a cybersecurity attack; and	
generate a report comprising information associated with the one or more event flows.	1
The computer system of claim 1, wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that identify the anomalous event.	4
The computer system of claim 4, wherein the anomalous event is identified by comparing one or more of the events relating to one or more entities of the first plurality of entities to a pattern of normal event behavior.	5
The computer system of claim 1, wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that identify a portion of the modified representation of the first graph that matches a known attack pattern, wherein the portion of the modified representation of the first graph comprises the node associated with the anomalous event.	6
The computer system of claim 1, wherein at least one entity of the first plurality of entities is at least one of a user, a place, a device, a resource, an activity, an event, a group, or a service.	9
The computer system of claim 1, wherein at least some of the edges of the second plurality of edges or of the third plurality of edges in the representation of the second graph are assigned a numerical weight that indicates a likelihood of a successful cybersecurity attack gaining access from one node to another.	10
store in the hardware memory a representation of a first graph, wherein the representation of the first graph comprises representations of a first plurality of nodes corresponding to a first plurality of entities and further comprises representations of a first plurality of edges, wherein the first graph is a directed graph,	11
wherein the first plurality of entities comprises a plurality of accounts and a plurality of resources,	11
wherein each edge of the first plurality of edges corresponds to a respective relationship between a respective pair of entities of the first plurality of entities,	11
wherein a representation of a first node of the first plurality of nodes includes information about a first security vulnerability associated with a first entity, wherein the first node corresponds to the first entity, and	11

Claim Terms	Claim(s)
wherein the first security vulnerability is identified based on a database of known security vulnerabilities;	11
receive streaming data comprising time-stamped data about events relating to one or more entities of the first plurality of entities,	11
based on a first portion of the streaming data, identify a second entity that does not correspond to any of the first plurality of nodes, wherein the second entity is not of the first plurality of entities,	11
identify a second security vulnerability associated with the second entity,	11
based on a second portion of the streaming data, wherein the second portion is not identical to the first portion, identify a first relationship between a pair of entities of the first plurality of entities that does not correspond to any of the first plurality of edges,	11
modify, in the hardware memory, the representation of the first graph to generate a modified representation of the first graph, wherein the modified representation of the first graph comprises a representation of a second node corresponding to the second entity and a representation of a first edge corresponding to the first relationship, wherein the second node is not of the first plurality of nodes and the first edge is not of the first plurality of edges, and wherein the modified representation of the first graph includes information about the second security vulnerability associated with the second entity,	11
for a first event associated with a node in the modified representation of the first graph, perform a first correlation using the modified representation of the first graph to identify a first plurality of correlated nodes, wherein each of the first plurality of correlated nodes corresponds to a respective event or resource, wherein each respective event or resource is associated with the first event, and wherein each of the first plurality of correlated nodes is connected by a respective edge of a second plurality of edges to the node associated with the first event in the modified representation of the first graph,	11
for one or more of the first plurality of correlated nodes, perform a further correlation using the modified representation of the first graph to identify a second plurality of correlated nodes, wherein each of the second plurality of correlated nodes is connected through a respective edge of a third plurality of edges to the respective node of the first plurality of correlated nodes in the modified representation of the first graph,	11
generate a representation of a second graph comprising representations of one or more of the first plurality of correlated nodes, representations of one or more of the second plurality of correlated nodes, representations of one or more of the second plurality of edges, and representations of one or more of the third plurality of edges,	11

Claim Terms	Claim(s)
wherein one or more of the second plurality of edges together with one or more of the third plurality of edges represents one or more event flows that could be involved in a cybersecurity attack, and	11
generate a report comprising information associated with the one or more event flows.	11
The computer system of claim 11, wherein the further correlation using the modified representation of the first graph further identifies a plurality of respective correlated edges that each involve the respective event or resource.	13
The computer system of claim 11, wherein the first event is an anomalous event.	14
The computer system of claim 13, wherein the first event is identified by comparing one or more of the events relating to one or more entities of the first plurality of entities to a pattern of normal event behavior.	15
The computer system of claim 11, wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that identify a portion of the modified representation of the first graph that matches a known attack pattern, wherein the portion of the modified representation of the first graph comprises the node associated with the first event.	17
The computer system of claim 11, wherein at least one entity of the first plurality of entities is at least one of a user, a place, a device, a resource, an activity, an event, a group, or a service.	20
The computer system of claim 11, wherein the node associated with the first event corresponds to a third security vulnerability.	22

2. Lack of Enablement under 35 U.S.C. § 112(a)

The Asserted Claims are also invalid under 35 U.S.C. § 112, because the ’628 patent does not enable one of ordinary skill in the art to make and/or use the full scope of certain recited elements of the Asserted Claims of the ’628 patent without undue experimentation. *See, e.g.*, *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) (“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without

undue experimentation."); *Trustees of Bos. Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018) ("to be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'").

The following terms render one of more of the Asserted Claims invalid for lack of enablement under 35 U.S.C. § 112, as the claims, specification, and prosecution histories would not enable one of skill in the art to practice the claimed invention(s) without undue experimentation:

Claim Terms	Claim(s)
store in the hardware memory a representation of a first graph, wherein the representation of the first graph comprises representations of a first plurality of nodes corresponding to a first plurality of entities and further comprises representations of a first plurality of edges, wherein the first graph is a directed graph,	1
wherein the first plurality of entities comprises a plurality of accounts and a plurality of resources,	1
wherein each edge of the first plurality of edges corresponds to a respective relationship between a respective pair of entities of the first plurality of entities;	1
receive streaming data comprising time-stamped data about events relating to one or more entities of the first plurality of entities;	1
based on a first portion of the streaming data, identify a first entity that does not correspond to any of the first plurality of nodes, wherein the first entity is not of the first plurality of entities;	1
based on a second portion of the streaming data, wherein the second portion is not identical to the first portion, identify a first relationship between a pair of entities of the first plurality of entities that does not correspond to any of the first plurality of edges;	1
modify, in the hardware memory, the representation of the first graph to generate a modified representation of the first graph, wherein the modified representation of the first graph comprises a representation of a first node corresponding to the first entity and a representation of a first edge corresponding to the first relationship, wherein the first node is not of the first plurality of nodes and the first edge is not of the first plurality of edges;	1
for an anomalous event associated with a node in the modified representation of the first graph, perform a first correlation using the	1

Claim Terms	Claim(s)
modified representation of the first graph to identify a first plurality of correlated nodes, wherein each of the first plurality of correlated nodes corresponds to a respective event or resource, wherein each respective event or resource is associated with the anomalous event, and wherein each of the first plurality of correlated nodes is connected by a respective edge of a second plurality of edges to the node associated with the anomalous event in the modified representation of the first graph;	
for one or more of the first plurality of correlated nodes, perform a further correlation using the modified representation of the first graph to identify a second plurality of correlated nodes, wherein each of the second plurality of correlated nodes is connected through a respective edge of a third plurality of edges to the respective node of the first plurality of correlated nodes in the modified representation of the first graph;	1
generate a representation of a second graph comprising representations of one or more of the first plurality of correlated nodes, representations of one or more of the second plurality of correlated nodes, representations of one or more of the second plurality of edges, and representations of one or more of the third plurality of edges, wherein one or more of the second plurality of edges together with one or more of the third plurality of edges represent one or more event flows that could be involved in a cybersecurity attack; and	1
generate a report comprising information associated with the one or more event flows.	1
The computer system of claim 1, wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that identify the anomalous event.	4
The computer system of claim 4, wherein the anomalous event is identified by comparing one or more of the events relating to one or more entities of the first plurality of entities to a pattern of normal event behavior.	5
The computer system of claim 1, wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that identify a portion of the modified representation of the first graph that matches a known attack pattern, wherein the portion of the modified representation of the first graph comprises the node associated with the anomalous event.	6
The computer system of claim 1, wherein at least one entity of the first plurality of entities is at least one of a user, a place, a device, a resource, an activity, an event, a group, or a service.	9

Claim Terms	Claim(s)
The computer system of claim 1, wherein at least some of the edges of the second plurality of edges or of the third plurality of edges in the representation of the second graph are assigned a numerical weight that indicates a likelihood of a successful cybersecurity attack gaining access from one node to another.	10
store in the hardware memory a representation of a first graph, wherein the representation of the first graph comprises representations of a first plurality of nodes corresponding to a first plurality of entities and further comprises representations of a first plurality of edges, wherein the first graph is a directed graph,	11
wherein the first plurality of entities comprises a plurality of accounts and a plurality of resources,	11
wherein each edge of the first plurality of edges corresponds to a respective relationship between a respective pair of entities of the first plurality of entities,	11
wherein a representation of a first node of the first plurality of nodes includes information about a first security vulnerability associated with a first entity, wherein the first node corresponds to the first entity, and	11
wherein the first security vulnerability is identified based on a database of known security vulnerabilities;	11
receive streaming data comprising time-stamped data about events relating to one or more entities of the first plurality of entities,	11
based on a first portion of the streaming data, identify a second entity that does not correspond to any of the first plurality of nodes, wherein the second entity is not of the first plurality of entities,	11
identify a second security vulnerability associated with the second entity,	11
based on a second portion of the streaming data, wherein the second portion is not identical to the first portion, identify a first relationship between a pair of entities of the first plurality of entities that does not correspond to any of the first plurality of edges,	11
modify, in the hardware memory, the representation of the first graph to generate a modified representation of the first graph, wherein the modified representation of the first graph comprises a representation of a second node corresponding to the second entity and a representation of a first edge corresponding to the first relationship, wherein the second node is not of the first plurality of nodes and the first edge is not of the first plurality of edges, and wherein the modified representation of the first graph includes information about the second security vulnerability associated with the second entity,	11

Claim Terms	Claim(s)
for a first event associated with a node in the modified representation of the first graph, perform a first correlation using the modified representation of the first graph to identify a first plurality of correlated nodes, wherein each of the first plurality of correlated nodes corresponds to a respective event or resource, wherein each respective event or resource is associated with the first event, and wherein each of the first plurality of correlated nodes is connected by a respective edge of a second plurality of edges to the node associated with the first event in the modified representation of the first graph,	11
for one or more of the first plurality of correlated nodes, perform a further correlation using the modified representation of the first graph to identify a second plurality of correlated nodes, wherein each of the second plurality of correlated nodes is connected through a respective edge of a third plurality of edges to the respective node of the first plurality of correlated nodes in the modified representation of the first graph,	11
generate a representation of a second graph comprising representations of one or more of the first plurality of correlated nodes, representations of one or more of the second plurality of correlated nodes, representations of one or more of the second plurality of edges, and representations of one or more of the third plurality of edges,	11
wherein one or more of the second plurality of edges together with one or more of the third plurality of edges represents one or more event flows that could be involved in a cybersecurity attack, and	11
generate a report comprising information associated with the one or more event flows.	11
The computer system of claim 11, wherein the further correlation using the modified representation of the first graph further identifies a plurality of respective correlated edges that each involve the respective event or resource.	13
The computer system of claim 11, wherein the first event is an anomalous event.	14
The computer system of claim 13, wherein the first event is identified by comparing one or more of the events relating to one or more entities of the first plurality of entities to a pattern of normal event behavior.	15
The computer system of claim 11, wherein the computer system is further configured to execute software instructions stored on nontransitory machine-readable storage media comprising software instructions that identify a portion of the modified representation of the first graph that matches a known attack pattern, wherein the portion of the modified representation of the first graph comprises the node associated with the first event.	17

Claim Terms	Claim(s)
The computer system of claim 11, wherein at least one entity of the first plurality of entities is at least one of a user, a place, a device, a resource, an activity, an event, a group, or a service.	20
The computer system of claim 11, wherein the node associated with the first event corresponds to a third security vulnerability.	22

3. Ineligible Subject Matter under 35 U.S.C. § 101

The Asserted Claims of the ’628 patent are also invalid for failing to recite patentable subject matter under 35 U.S.C. § 101.

In *Alice Corp. Pty. v. CLS Bank, Int’l*, 573 U.S. 208 (2014), the Supreme Court established a two-part test for determining whether a claim is patent eligible under 35 U.S.C. § 101. First, the court must determine whether the claims at issue are directed to any of the following patent-ineligible subject matter: laws of nature, natural phenomena, or abstract ideas. *Id*. at 217-18. Second, if the claims are directed to ineligible subject matter, the court must then consider the claim elements—both individually and as an ordered combination—to determine whether they provide an “inventive concept.” *Id*. Merely implementing an abstract idea using well-known computer components or functions or limiting the idea to a particular technological environment is insufficient to transform the claimed abstract idea into a patent-eligible application. *Id.* at 220-26. The “inventive concept” inquiry further examines whether the additional elements, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activity. *Id.* at 221-22 (finding “conventional steps” insufficient to supply an “inventive concept”); *see also Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (requiring under the second step of the *Alice* test the “claim limitations involve more than performance of ‘well-understood, routine, [and] conventional activities previously known to the industry’”) (citations omitted).

Each of the Asserted Claims of the ’628 patent are directed to no more than the abstract idea of collecting, analyzing, and generating reports regarding network event anomalies. *See SAP Am., Inc. v. InvestPic, LLC,* 898 F.3d 1161, 1167 (Fed. Cir. 2018) (claims directed to “selecting certain information, analyzing it using mathematical techniques, and reporting or displaying the results of the analysis” are abstract); *Elec. Power Grp. LLC v. Alston S.A.,* 830 F.3d 1350, 1353 (Fed. Cir. 2016) (claims reciting steps of “receiving a plurality of data streams,” “analyzing events in real-time from the plurality of data streams,” “displaying the event analysis results and diagnoses,” and “updating the measurements from the data streams” were abstract); *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass’n,* 776 F.3d 1343 (Fed. Cir. 2014).

Moreover, each of the Asserted Claims of the ’628 patent are patent-ineligible because they fail to provide an inventive concept. Indeed, aside from the recited abstract idea, the claim elements of each of the Asserted Claims of the ’628 patent, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activities. For example, the following claim elements represent conventional computer methods, architectures, and protocols:

Claim Element	**Claim(s)**
“computer system”	1, 11
“hardware memory”	1, 11
“nontransitory machine-readable storage media”	1, 11
“store” a data structure	1, 11
“receive streaming data comprising time stamped data”	1, 11
“identify” data in a data structure	1, 11

Claim Element	Claim(s)
"modify" a data structure	1, 11
"generate a report"	1

Indeed, the specification of the '628 patent acknowledges that elements of the invention are well-understood, routine and conventional. For example, the specification states:

- "'Database' may be used to refer to relational database management systems known in the art…" '628 patent at 8:54-56.
- "any group of data storage systems of databases referred to herein may be included together in a single database management system operating on a single machine, or they may be included in a single database management system operating on a cluster of machines as is known in the art." *Id*. at 9:6-10.
- "any single database (…) may be implemented on a single machine, on a set of machines using clustering technology, on several machines connected by one or more messaging systems known in the art, or in a master/slave arrangement common in the art." *Id*. at 9:11-16.
- "publicly-available information may be used to identify vulnerabilities that may be exploited with further active penetration testing." *Id*. at 13:42-44.
- "Initially 3120, the DCG may be used to identify all behavior interactions between affected processes and resources, using established known behavior patterns and event correlations to iterate over the affected nodes in a CPG until all relationships have been identified." *Id*. at 21:66-22:3.
- "While the use of 3'd party search tools 1915 is in no way required, and proprietary or other self-developed search tools may be used, there are numerous 3'd party search tools 1915 available on the Internet, many of them available for use free of charge, that are convenient for purposes of performing external and internal reconnaissance of an organization's infrastructure." *Id*. at 26:27-33.
- "Non-limiting examples of external reconnaissance data 2120 include domains and IP information, data breach information, organization information such as corporate structures, key employees, etc., open port information, information regarding which organizations are current targets of cyber-attacks, network vulnerability information, system version and patch/update information, known and possible exploits, and publicly available information." *Id*. at 27:45-52.

- "at least some of the features or functionalities of the various aspects disclosed herein may be implemented on one or more general-purpose computers associated with one or more networks." *Id*. at 29:55-58.

- "Computing device 10 may be configured to communicate with a plurality of other computing devices, such as clients or servers, over communications networks such as a wide area network a metropolitan area network, a local area network, a wireless network, the Internet, or any other network, using known protocols for such communication, whether wireless or wired." *Id*. at 30:7-18.

- "Processors 21 may carry out computing instructions under control of an operating system 22 such as, for example, a version of MICROSOFT WINDOWSTM operating system, APPLE macOSTM or iOSTM operating systems, some variety of the Linux operating system, ANDROIDTM operating system, or the like." *Id*. at 32:31-40.

- "Input devices 28 may be of any type suitable for receiving user input, including for example a keyboard, touchscreen, microphone (for example, for voice input), mouse, touchpad, trackball, or any combination thereof." *Id*. at 32:46-49.

- "Output devices 27 may be of any type suitable for providing output to one or more users, whether remote or local to system 20, and may include for example one or more screens for visual output, speakers, printers, or any combination thereof." *Id*. at 32:49-53.

- "Memory 25 may be random-access memory having any structure and architecture known in the art, for use by processors 21, for example to run software." *Id*. at 32:54-56.

- "Storage devices 26 may be any magnetic, optical, mechanical, memristor, or electrical storage device for storage of data in digital form…." *Id*. at 32:56-61.

- "Clients 33 and servers 32 may communicate with one another via … any network topology known in the art…." *Id*. at 33:7-13.

- "Networks 31 may be implemented using any known network protocols, including for example wired and/or wireless protocols." 33:15-17.

"If a claim's only 'inventive concept' is the application of an abstract idea using conventional and well-understood techniques, the claim has not been transformed into a patent-eligible application of an abstract idea." *BSG Tech LLC v. Buyseasons, Inc.*, 899 F.3d 1281, 1290-91 (Fed. Cir. 2018); *Elec. Power Grp.*, 830 F.3d at 1355 (claims that did "not even require a new source or type of information, or new techniques for analyzing it" lacked an inventive concept).

Finally, the dependent claims do not transform the abstract idea into patent-eligible subject matter, because they add only "well-known, routine, and conventional functions," *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n*, 776 F.3d 1343, 1348 (Fed. Cir. 2014), or "merely provide additional criteria" for "performance of the same basic process." *Dropbox*, 815 F. App'x at 533.

V. U.S. PATENT NO. 12,143,424

A. The '424 Priority Date

Qomplx's Infringement Contentions allege that the Asserted Claims of the '424 patent are entitled at least to the priority date October 28, 2015. To the extent Qomplx alleges that any prior art relied on in these Invalidity Contentions does not qualify as prior art to the Asserted Patent, Microsoft reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later conception/reduction to practice or priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Microsoft identifies the following references as anticipating and/or rendering obvious one or more of the Asserted Claims of the '424 patent under 35 U.S.C. §§ 102 and/or 103, whether considered alone or in combination with the references identified in each respective exhibit.[17] The table of anticipating and/or rendering obvious references below is exemplary, and does not constitute an admission that any reference not listed below does not also anticipate and/or render obvious the claims of the '424 patent. Further, Microsoft contends that any prior art reference in

[17] One or more prior art references are prior art by virtue of being entitled to the filing date of earlier application, such as a provisional application or parent application.

the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table:

Exhibit	Reference	Application Date	Issue/Publication Date
E-1	U.S. Patent No. 8,732,300 to Barsness	1/10/2011	5/20/2014
E-2	U.S. Patent Application Publication No. 2014/0059185 to Siripurapu	10/31/2013	2/27/2014
E-3	U.S. Patent Application Publication No. 2009/0327668 to Sudzilouski	6/27/2008	12/31/2009
E-4	U.S. Patent Application Publication No. 2007/0174233 to Ginis	1/10/2006	7/26/2007
E-5	U.S. Patent Application Publication No. 2016/0275123 to Lin	3/18/2015	9/22/2016
E-6	U.S. Patent Application Publication No. 2010/0122065 to Dean	1/12/2010	5/13/2010
E-7	U.S. Patent No. 10,387,225 to Guigui	9/30/2015	8/20/2019
E-8	U.S. Patent No. 10,095,547 to Kulkarni	3/14/2016[18]	10/09/2018
E-9	U.S. Patent Application Publication No. 2016/0269247 to Chakradhar	3/14/2016[19]	9/15/2016

In addition, Microsoft identifies a non-exhaustive list of prior art products or prior art systems that, alone, or in combination with the additional references identified in each respective exhibit, anticipate or render obvious the Asserted Claims of the ’424 patent under Qomplx’s overbroad infringement theories, which Microsoft disputes. Each of the prior art systems were

[18] Kulkarni claims priority to provisional applications dated June 1, 2015 and March 13, 2015.

[19] Chakradhar claims priority to a provisional application dated March 13, 2015.

publicly known or used or offered for sale prior to the critical date of the ’424 patent, as described in each system’s respective claim chart.

Microsoft continues to investigate the systems and products and reserves the right to supplement the contentions and accompanying claim charts after further discovery and investigation. Microsoft also reserves the right to rely on fact or expert witness testimony to establish the public knowledge, use, availability, sale, or offer for sale of any systems described below. Although additional information and prior art systems may be obtained through discovery, such prior art systems include at least the following:

Exhibit	Products/Systems	Date
E-10	Google’s MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow	On information and belief, available no later than (respectively): December 2004; April 2006; April 2015

In addition, Microsoft identifies the following additional prior art that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the ’424 patent in addition to demonstrating the state of the art.[20] The list below further includes an additional, non-exhaustive list of prior art publications, products, or prior art systems that, alone, or in combination, anticipate or render obvious the Asserted Claims of the ’424 patent under Qomplx’s overbroad infringement theories, which Microsoft disputes.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 6,732,354 to Ebeling	Apr. 23, 2002	May 4, 2004
U.S. Patent No. 7,571,258 to Mukund	Nov. 19, 2003	Aug. 4, 2009
U.S. Patent No. 8,639,847 to Blaszczak	May 26, 2011	Jan. 28, 2014
U.S. Patent No. 8,688,850 to Branson	May 11, 2007	Apr. 1, 2014

[20] Microsoft reserves the right to rely on any prior art systems described in the following publications.

U.S. Patent No. 8,732,300 to Barsness	Jan. 10, 2011	May 20, 2014
U.S. Patent No. 8,776,062 to Garbow	Sep. 10, 2007	Jul. 8, 2014
U.S. Patent No. 8,826,291 to Kato	Jul. 20, 2012	Sep. 2, 2014
U.S. Patent No. 9,185,156 to Marty	Feb. 14, 2013	Nov. 10, 2015
U.S. Patent No. 9,344,751 to Ream	May 8, 2015	May 17, 2016
U.S. Patent No. 9,722,862 to Baulier	Jul. 23, 2015	Aug. 1, 2017
U.S. Patent No. 9,910,714 to Knox	Jun. 29, 2015	Mar. 6, 2018
U.S. Patent No. 9,933,918 to Stanfill	Sep. 2, 2015	Apr. 3, 2018
U.S. Patent No. 10,044,548 to Glines	Oct. 15, 2013	Aug. 7, 2018
U.S. Patent No. 10,095,547 to Kulkarni	Mar. 14, 2016[21]	Oct. 9, 2018
U.S. Patent No. 10,191,768 to Bishop	Dec. 31, 2015[22]	Jan. 29, 2019
U.S. Patent No. 10,255,322 to Gladkikh	Apr. 27, 2018[23]	Apr. 9, 2019
U.S. Patent No. 10,387,225 to Guigui	Sep. 30, 2015	Aug. 20, 2019
U.S. Patent No. 10,579,937 to Brand	May 12, 2015	Mar. 3, 2020
U.S. Patent Application Publication No. 2003/0009399 to Boerner	Mar. 22, 2001	Jan. 9, 2003
U.S. Patent Application Publication No. 2007/0174233 to Ginis	Jan. 10, 2006	Jul. 26. 2007
U.S. Patent Application Publication No. 2009/0327668 to Sudzilouski	Jun. 27, 2008	Dec. 31, 2009
U.S. Patent Application Publication No. 2010/0122065 to Dean	Jan. 12, 2010	May 13, 2010
U.S. Patent Application Publication No. 2013/0239115 to Kato	Jul. 20, 2012	Sep. 12, 2013
U.S. Patent Application Publication No. 2014/0136590 to Marty	Feb. 14, 2013	May 15, 2014
U.S. Patent Application Publication No. 2016/0092557 to Stojanovic	Sep. 24, 2015	Mar. 31, 2016
U.S. Patent Application Publication No. 2016/0179063 to De Baynast De Septfontaines	Dec. 17, 2014	Jun. 23, 2016

[21] Kulkarni claims priority to provisional applications dated June 1, 2015 and March 13, 2015.

[22] Bishop claims priority to a provisional application dated September 16, 2015.

[23] Gladkikh claims priority to parent patents filed on July 30, 2015 and July 31, 2014.

U.S. Patent Application Publication No. 2016/0275123 to Lin	Mar. 18, 2015	Sep. 22, 2016
U.S. Patent Application Publication No. 2016/0358102 to Bowers	Jun. 5, 2015	Dec. 8, 2016
U.S. Patent Application Publication No. 2017/0090893 to Aditya	Sep. 29, 2016[24]	Mar. 30, 2017
U.S. Patent Application Publication No. 2016/0269247 to Chakradhar	Mar. 14, 2016[25]	Sep. 15, 2016
U.S. Patent Application Publication No. 2014/0059185 to Siripurapu	Oct. 31, 2013	Feb. 27, 2014
WIPO International Patent Application Publication No. 2016/177405 to Peterfreund	May 5, 2015	Nov. 10, 2016

Title	Author/Publisher	Date
A Deep-Dive into Flink's Network Stack	Nico Kruber / Apache Flink	Jun. 5, 2019
Apache FlinkTM: Stream and Batch Processing in a Single Engine	Paris Carbone, Stephan Ewen, Seif Haridit, Asterios Katsifodimos, Voker Markl, Kostas Tzoumas / IEEE	Dec. 2015
Data Clustering: Algorithms and Applications	Charu C. Aggarwal, Chandan K. Reddy / Chapman & Hall/CRC	Aug. 21, 2013
Drizzle: Fast and Adaptable Stream Processing at Scale	Shivaram Venkataraman, Aurojit Panda, Kay Ousterhout, Michael Armbrust, Ali Ghodsi, Michael J. Franklin, Benjamin Recht, Ion Stoica / SOSP '17: Proceedings of the 26th Symposium on Operating Systems Principles	Oct. 28, 2017
Dynamic re-optimization techniques for stream processing engines and object stores	Naresh Kumar Reddy Rapolu / Purdue University	Spring 2015
FlumeJava: Easy, Efficient Data-Parallel Pipelines	Craig Chambers, Ashish Raniwala, Frances Perry, Stephen Adams, Robert R. Henry, Robert Bradshaw, Nathan Weizenbaum /	Jun. 5, 2010

[24] Aditya claims priority to a provisional application dated September 29, 2015.

[25] Chakradhar claims priority to a provisional application dated March 13, 2015.

	ACM SIGPLAN Notices, Volume 45, Issue 6	
Getting Started with Storm: Continuous Streaming Computation with Twitter's Cluster Technology	Jonathan Leibiusky , Gabriel Eisbruch , Dario Simonassi / O'Reilly	Oct. 16, 2012
Hadoop in Action	Chuck Lam / Manning Publications	Dec. 25, 2010
Hadoop Real-World Solutions Cookbook	Jonathan R. Owens, Jon Lentz, Brian Femiano / Packt	Feb. 11, 2013
Hadoop: The Definitive Guide: Storage and Analysis at Internet Scale	Tom White / O'Reilly	May 5, 2015
Handbook of Cloud Computing	Borko Furht, Armando Escalante / Springer	Sept. 29, 2010
Learning Storm	Ankit Jain, Anand Nalya / Packt	Aug. 26, 2014
MapReduce Design Patterns: Building Effective Algorithms and Analytics for Hadoop and Other Systems	Donald Miner, Adam Shook / O'Reilly	Jan. 15, 2013
MapReduce: Simplified Data Processing on Large Clusters	Jeffrey Dean, Sanjay Ghemawat / OSDI'04: Proceedings of the 6th conference on Symposium on Operating Systems Design & Implementation - Volume 6	Dec. 6, 2004
MapReduce: Simplified Data Processing on Large Clusters	Jeffrey Dean, Sanjay Ghemawat / Communications of the ACM, Volume 51, Issue 1	Jan. 1, 2008
Pipelets: self-organizing software pipelines for many-core architectures	Janmartin Jahn, Jörg Henkel / DATE '13: Proceedings of the Conference on Design, Automation and Test in Europe	Mar. 18, 2013
Storm Applied: Strategies for real-time event processing	Sean T. Allen, Matthew Jankowski, Peter Pathirana / Manning	Apr. 12, 2015
Storm Blueprints: Patterns for Distributed Real-Time Computation	P. Taylor Goetz, Brian O'Neill / Packt	Mar. 26, 2014

Twitter Heron: Stream Processing at Scale	Sanjeev Kulkarni, Nikunj Bhagat, Maosong Fu, Vikas Kedigehalli, Christopher Kellogg, Sailesh Mittal, Jignesh M. Patel, Karthik Ramasamy, Siddarth Taneja / SIGMOD '15: Proceedings of the 2015 ACM SIGMOD International Conference on Management of Data	May 27, 2015

In addition, Microsoft identifies the following additional products or prior art systems that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claims of the ’424 patent in addition to demonstrating the state of the art. The list below further includes an additional, non-exhaustive list of products or prior art systems that, alone, or in combination, anticipate or render obvious the Asserted Claims of the ’424 patent under Qomplx’s overbroad infringement theories, which Microsoft disputes.

Systems	Available Date
Google's FlumeJava and related implementations/variants, such as Apache Flume and Google Cloud Dataflow	On information and belief, available no later than (respectively): May 2009; June 2012; April 2015
Apache Storm and related implementations/variants, including Twitter Heron	On information and belief, available no later than (respectively): September 2011; June 2015

Discovery and Microsoft’s investigation is ongoing. Microsoft reserves the right to further supplement these Invalidity Contentions with prior art uncovered through discovery. For example, Microsoft may supplement these contentions with additional prior art systems.

To the extent any item of prior art cited above is deemed not to disclose and/or render obvious, explicitly or inherently, any limitation of the Asserted Claims of the ’424 patent, Microsoft reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of

ordinary skill in the art, even if Microsoft has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. The Asserted Claims are Anticipation and/or Rendered Obvious

Some or all of the Asserted Claims of the ’424 patent are invalid as anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and/or 103 in view of each of the primary prior art references identified in the claim charts included in Exhibits E-1 through E-10, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

The U.S. Supreme Court in *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007) emphasized that inventions arising from ordinary innovation, ordinary skill, or common sense should not be patentable. *Id*. at 1732, 1738, 1742–1743, 1746. A patent claim may be obvious if the combination of elements was obvious to try or if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent’s claims. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, Section 103 likely bars its patentability. *Id*. at 1740. The Court stated that courts should “look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *Id*. at 1740–41. *KSR* does not mandate evidence of a motivation or

suggestion to combine prior art references. *See TGIP, Inc. v. AT&T Corp*., 527 F. Supp. 2d 561, 580–81 (E.D. Tex. 2007). "[A] court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ" to resolve the question of obviousness. *KSR*, 127 S. Ct. at 1741.

Based on all of these considerations, as further detailed in Exhibits E-1 through E-10, a POSITA would have combined the teachings of the prior art references discussed and charted in those exhibits. The combinations of these references would have rendered obvious to one of ordinary skill in the art the subject matter of the Asserted Claims of the '424 patent. The references identified in Exhibits E-1 through E-10 are analogous prior art to the subject matter of the Asserted Claims and, for at least the reasons set forth below, are properly combinable. Because these prior art references exist within a single field of art, particularly one in which individuals in the field often shared and/or collaborated on their work, it would have been obvious for a person of skill in the art to look from one piece of prior art to another in order to find any missing functionality they desired to implement. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the '424 patent.

By way of example only, the following combinations render obvious the Asserted Claims of the '424 patent:

- E-1 (Barsness) in view of E-2 (Siripurapu), E-3 (Sudzilouski), E-4 (Ginis), E-5 (Lin), E-6 (Dean), E-7 (Guigui), E-8 (Kulkarni), E-9 (Chakradhar), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-2 (Siripurapu) in view of E-1 (Barsness), E-3 (Sudzilouski), E-4 (Ginis), E-5 (Lin), E-6 (Dean), E-7 (Guigui), E-8 (Kulkarni), E-9 (Chakradhar), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-3 (Sudzilouski) in view of E-1 (Barsness), E-2 (Siripurapu), E-4 (Ginis), E-5 (Lin), E-6 (Dean), E-7 (Guigui), E-8 (Kulkarni), E-9 (Chakradhar), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-4 (Ginis) in view of E-1 (Barsness), E-2 (Siripurapu), E-3 (Sudzilouski), E-5 (Lin), E-6 (Dean), E-7 (Guigui), E-8 (Kulkarni), E-9 (Chakradhar), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-5 (Lin) in view of E-1 (Barsness), E-2 (Siripurapu), E-3 (Sudzilouski), E-4 (Ginis), E-6 (Dean), E-7 (Guigui), E-8 (Kulkarni), E-9 (Chakradhar), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-6 (Dean) in view of E-1 (Barsness), E-2 (Siripurapu), E-3 (Sudzilouski), E-4 (Ginis), E-5 (Lin), E-7 (Guigui), E-8 (Kulkarni), E-9 (Chakradhar), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-7 (Guigui) in view of E-1 (Barsness), E-2 (Siripurapu), E-3 (Sudzilouski), E-4 (Ginis), E-5 (Lin), E-6 (Dean), E-8 (Kulkarni), E-9 (Chakradhar), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-8 (Kulkarni) in view of E-1 (Barsness), E-2 (Siripurapu), E-3 (Sudzilouski), E-4 (Ginis), E-5 (Lin), E-6 (Dean), E-7 (Guigui), E-9 (Chakradhar), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-9 (Chakradhar) in view of E-1 (Barsness), E-2 (Siripurapu), E-3 (Sudzilouski), E-4 (Ginis), E-5 (Lin), E-6 (Dean), E-7 (Guigui), E-8 (Kulkarni), and/or E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow)

- E-10 (Google's MapReduce and related implementations/variants, such as Apache Hadoop and Google Cloud Dataflow) in view of E-1 (Barsness), E-2 (Siripurapu), E-3 (Sudzilouski), E-4 (Ginis), E-5 (Lin), E-6 (Dean), E-7 (Guigui), E-8 (Kulkarni), and/or E-9 (Chakradhar)

Numerous prior art references, including those identified in the attached exhibits, reflect common knowledge and the state of the prior art before the earliest claimed effective filing date of the ’424 patent. As it would be unduly burdensome to create detailed claim charts for all of the invalidating combinations, for at least the reasons described in these invalidity contentions, it

would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those identified in the attached exhibits, to meet the limitations of the Asserted Claims of the ’424 patent. Microsoft’s inclusion of exemplary combinations, in view of the factors and motivations identified here, does not preclude Microsoft from identifying other invalidating combinations and/or motivations as appropriate.

No showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, because each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR*, 127 S. Ct. at 1739–40 (rejecting the Federal Circuit’s “rigid” application of the teaching, suggestion, or motivation to combine test, instead espousing an “expansive and flexible” approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is “a person of ordinary creativity, not an automaton” and “in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id*. at 1742. Nevertheless, in addition to the information contained herein, Microsoft hereby identifies additional motivations and reasons to combine the cited art.

One or more combinations of the prior art references identified herein would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to combine the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompts variations based on predictable design incentives and/or market forces either in the same field or a different one. In

addition, the combinations of the prior art references identified above would have been obvious because the combinations represent the known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation or reason to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution; the existence of a known need or problem in the field of endeavor at the time of the invention; and the background knowledge that would have been possessed by a person having ordinary skill in the art. For example, the prior art references are generally directed to the same problems. Thus, a skilled artisan seeking to solve these problems would look to these cited references in combination.

Thus, the motivation or reason to combine the teachings of the prior art references disclosed herein is found in the references themselves and in: (1) the nature of the problems being solved; (2) the express, implied, and inherent teachings of the prior art; (3) the knowledge of a POSITA; (4) the fact that the prior art is generally directed towards the same problems; and/or (5) the predictable results obtained in combining the different elements of the prior art; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Microsoft incorporates by reference prior art from the prosecution histories and background sections of the ’424 patent. Microsoft expects to rely on the testimony of one or more expert witnesses and documents referenced by those expert witnesses in support of these contentions and incorporate those forthcoming expert reports as if fully set forth herein.

Microsoft contends that there are no secondary considerations of non-obviousness evidencing the validity of any of the Asserted Claims. Secondary considerations of non-obviousness, also referred to as objective indicia of non-obviousness, “can include copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, awards or other industry praise for the invention, and skepticism of skilled artisans before the invention.” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1368 (Fed. Cir. 2013). “A nexus between the merits of the claimed invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision.” *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 668 (Fed. Cir. 2000). Moreover, even if a nexus exists, secondary considerations of non-obviousness “simply cannot overcome [a] strong prima facie showing of obviousness.” *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1368 (Fed. Cir. 2008). Qomplx has not established the existence of any objective indicia of non-obviousness or secondary considerations. Microsoft reserves the right to supplement their contentions to respond to any such arguments or evidence should Qomplx be permitted to raise them in the future. While discovery in this case is ongoing, and Microsoft’s investigation continues (which will include expert discovery), to the extent Qomplx contends that one or more Asserted Claims is not obvious based on secondary considerations recognized by relevant authority Microsoft contends

such allegations are without merit. Microsoft reserves the right to supplement their contentions to respond to any such evidence should Qomplx be permitted to raise it in the future.

D. Other Invalidity Grounds

Microsoft hereby identifies grounds of invalidity based on (1) lack of written description under 35 U.S.C. § 112; (2) lack of enablement under 35 U.S.C. § 112; and (3) ineligible subject matter under 35 U.S.C. § 101. These contentions shall not be construed as an admission that any claim construction advanced by Microsoft in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Microsoft from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Qomplx's purported construction of the claim language or of other positions advanced by Qomplx during the course of this litigation. Microsoft's Invalidity Contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Qomplx's alleged scope of the Asserted Claims of the '424 patent. Consequently, Microsoft only identifies the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description under 35 U.S.C. § 112

The Asserted Claims are invalid under 35 U.S.C. § 112, because the '424 patent does not provide sufficient written description to establish that the alleged inventors were in possession of the full scope of the alleged inventions recited in the Asserted Claims at the time the '424 patent was filed. *See e.g. Ariad v. Lilly*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc); *LizardTech Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005) (finding claims invalid under 35 U.S.C. § 112 where the specification failed to include a written description of the full scope of the claimed invention); *In re Katz Interactive Call Processing Pat. Litig.*, 639 F.3d 1303, 1320 (Fed. Cir. 2011) ("[W]hen analyzing whether a patent meets the written description

requirement, one cannot 'bootstrap' the knowledge of a person of ordinary skill in the art ('POSITA') into the analysis and fill the gap in the disclosure through obviousness.").

The following terms render one of more of the Asserted Claims invalid for lack of written description under 35 U.S.C. § 112, as the specification of the '424 patent does not demonstrate that the inventors were in possession of the claimed subject matter:

Claim Terms	Claim(s)
"any pipeline output message"	5
"any stream of input data"	3, 11
"apply"	1, 2, 3, 5, 7, 9, 10, 11, 13
"at least one of"	1, 2, 3, 5, 7, 9, 10, 11, 13
"determine"	1, 2, 3, 5, 7, 9, 10, 11, 13
"determined identification"	9, 10, 11, 13
"determined information"	1, 2, 3, 5, 7
"distinct"	1, 2, 3, 5, 7, 9, 10, 11, 13
"distributed computing cluster"	1, 2, 3, 5, 7, 9, 10, 11, 13
"fifth computer system"	3, 5
"first computer system"	1, 2, 3, 5, 7, 9, 10, 11, 13
"first data"	1, 2, 3, 5, 7, 9, 10, 11, 13
"first input feed"	1, 2, 3, 5, 7, 9, 10, 11, 13
"first pipeline output messages"	1, 2, 3, 5, 7, 9, 10, 11, 13
"first plurality of computer systems"	1, 2, 3, 5, 7, 9, 10, 11, 13
"first stream of input data"	1, 2, 3, 5, 7, 9, 10, 11, 13

Claim Terms	Claim(s)
“first transformation pipeline”	1, 2, 3, 5, 7, 9, 10, 11, 13
“fourth computer system”	1, 2, 3, 5, 7, 11, 13
“identification”	9, 10, 11, 13
“identifies”	9, 10, 11, 13
“identify”	3, 5, 11
“in accordance with”	1, 2, 3, 5, 7, 9, 10, 11, 13
“information about”	1, 2, 3, 5, 7
“non-linear”	2, 3, 5, 10, 11
“not configured”	3, 5, 11
“represents”	1, 2, 3, 5, 7
“respective”	1, 2, 3, 5, 7, 9, 10, 11, 13
“second computer system”	1, 2, 3, 5, 7, 9, 10, 11, 13
“second input feed”	3, 11
“second pipeline output messages”	1, 2, 3, 5, 7
“second plurality of computer systems”	1, 2, 3, 5, 7, 9, 10, 11, 13
“second stream of input data”	3, 11
“second transformation pipeline”	1, 2, 3, 5, 7, 9, 10, 11, 13
“substantially in real time”	1, 2, 3, 5, 7, 9, 10, 11, 13
“third computer system”	1, 2, 3, 5, 7, 9, 10, 11, 13
“third pipeline output messages”	5
“transmit”	1, 2, 3, 5, 7, 9, 10, 11, 13
“a first plurality of computer systems, wherein each respective computer system of the first plurality of computer systems comprises a memory that stores a respective first data, wherein the respective first data represents a respective portion of a distributed computational graph, and wherein the distributed computational graph describes a	1, 2, 3, 5, 7

Claim Terms	Claim(s)
flow of output data of a first transformation pipeline to an input of a second transformation pipeline, wherein a first computer system of the first plurality of computer systems is configured to: receive a first stream of input data from a first input feed, process the first stream of input data substantially in real time by executing software instructions that apply the first transformation pipeline to the first stream of input data to generate first pipeline output messages, process the respective first data stored in the memory of the first computer system to determine information about the second transformation pipeline, and transmit the first pipeline output messages to a second computer system of the first plurality of computer systems in accordance with the determined information, wherein the second computer system is configured to: receive the first pipeline output messages, and process the first pipeline output messages substantially in real time by executing software instructions that apply the second transformation pipeline to the first pipeline output messages to generate second pipeline output messages, wherein the first and second computer systems are distinct”	
“and a second plurality of computer systems”	1, 2, 3, 5, 7, 9, 10, 11, 13
“wherein a third computer system of the first plurality of computer systems is configured to execute software instructions that cause a fourth computer system of the second plurality of computer systems to execute software instructions that apply at least one of the first transformation pipeline and the second transformation pipeline”	1, 2, 3, 5, 7
“wherein at least one of the first transformation pipeline and the second transformation pipeline is non-linear”	2
“wherein the third computer system of the first plurality of computer systems is configured to: identify a fifth computer system of the first plurality of computer systems, wherein the fifth computer system is not configured to apply the first transformation pipeline to any stream of input data, and cause the fifth computer system to process a second stream of input data received from a second input feed substantially in real time by executing software instructions that apply the first transformation pipeline to the second stream of input data”	3
“wherein the third computer system of the first plurality of computer systems is configured to: identify a fifth computer system of the first plurality of computer systems, wherein the fifth computer system is not configured to apply the second transformation pipeline to any pipeline output message, and cause the fifth computer system to process third pipeline output messages substantially in real time by	5

Claim Terms	Claim(s)
executing software instructions that apply the second transformation pipeline to the third pipeline output messages”	
“wherein the first computer system is further configured to transmit the first pipeline output messages to the fourth computer system of the second plurality of computer systems, wherein the first computer system is distinct from the fourth computer system, and wherein the second computer system is distinct from the fourth computer system”	7
“a first plurality of computer systems, wherein each respective computer system of the first plurality of computer systems comprises a respective memory that stores a respective first data that: describes at least a respective portion of a configuration of a first transformation pipeline, and identifies at least a second transformation pipeline, wherein a first computer system of the first plurality of computer systems is configured to: receive a first stream of input data from a first input feed, process the first stream of input data substantially in real time by executing software instructions that apply the first transformation pipeline to the first stream of input data to generate first pipeline output messages, process the respective first data to determine an identification of the second transformation pipeline, and transmit the first pipeline output messages to a second computer system of the first plurality of computer systems in accordance with the determined identification, wherein the second computer system is configured to: receive the first pipeline output messages, and process the first pipeline output messages substantially in real time by executing software instructions that apply the second transformation pipeline to the first pipeline output messages, wherein the first and second computer systems are distinct; and a second plurality of computer systems”	9, 10, 11, 13
“wherein a third computer system of the first plurality of computer systems is configured to execute software instructions that cause the second plurality of computer systems to execute at least one of the first transformation pipeline and the second transformation pipeline”	9, 10, 11, 13
“wherein one or more of the first transformation pipeline and the second transformation pipeline is non-linear”	10
“wherein the third computer system of the first plurality of computer systems is configured to: identify a fourth computer system of the first plurality of computer systems, wherein the fourth computer system is not configured to apply the first transformation pipeline to any stream of input data, and cause the fourth computer system to process a second stream of input data received from a second input feed substantially in real time by executing software instructions that apply the first transformation pipeline to the second stream of input data”	11

2. Lack of Enablement under 35 U.S.C. § 112(a)

The Asserted Claims are also invalid under 35 U.S.C. § 112, because the ’424 patent does not enable one of ordinary skill in the art to make and/or use the full scope of certain recited elements of the Asserted Claims of the ’424 patent without undue experimentation. *See, e.g.*, *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) (“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.”); *Trustees of Bos. Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018) (“to be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’”).

The following terms render one of more of the Asserted Claims invalid for lack of enablement under 35 U.S.C. § 112, as the claims, specification, and prosecution histories would not enable one of skill in the art to practice the claimed invention(s) without undue experimentation:

Claim Terms	Claim(s)
“any pipeline output message”	5
“any stream of input data”	3, 11
“apply”	1, 2, 3, 5, 7, 9, 10, 11, 13
“at least one of”	1, 2, 3, 5, 7, 9, 10, 11, 13
“cause”	1, 2, 3, 5, 7, 9, 10, 11, 13
“computer system”	1, 2, 3, 5, 7, 9, 10, 11, 13
“configuration”	9, 10, 11, 13

Claim Terms	Claim(s)
“describes”	1, 2, 3, 5, 7, 9, 10, 11, 13
“determine”	1, 2, 3, 5, 7, 9, 10, 11, 13
“determined identification”	9, 10, 11, 13
“determined information”	1, 2, 3, 5, 7
“distinct”	1, 2, 3, 5, 7, 9, 10, 11, 13
“distributed computational graph”	1, 2, 3, 5, 7
“distributed computing cluster”	1, 2, 3, 5, 7, 9, 10, 11, 13
“executing”	1, 2, 3, 5, 7, 9, 10, 11, 13
“fifth computer system”	3, 5
“first computer system”	1, 2, 3, 5, 7, 9, 10, 11, 13
“first data”	1, 2, 3, 5, 7, 9, 10, 11, 13
“first input feed”	1, 2, 3, 5, 7, 9, 10, 11, 13
“first pipeline output messages”	1, 2, 3, 5, 7, 9, 10, 11, 13
“first plurality of computer systems”	1, 2, 3, 5, 7, 9, 10, 11, 13
“first stream of input data”	1, 2, 3, 5, 7, 9, 10, 11, 13
“first transformation pipeline”	1, 2, 3, 5, 7, 9, 10, 11, 13
“flow”	1, 2, 3, 5, 7
“fourth computer system”	1, 2, 3, 5, 7, 11, 13
“generate”	1, 2, 3, 5, 7, 9, 10, 11, 13
“identification”	9, 10, 11, 13
“identifies”	9, 10, 11, 13
“identify”	3, 5, 11

Claim Terms	Claim(s)
“in accordance with”	1, 2, 3, 5, 7, 9, 10, 11, 13
“information about”	1, 2, 3, 5, 7
“non-linear”	2, 3, 5, 10, 11
“not configured”	3, 5, 11
“one or more”	10, 11
“portion”	1, 2, 3, 5, 7, 9, 10, 11, 13
“process”	1, 2, 3, 5, 7, 9, 10, 11, 13
“receive”	1, 2, 3, 5, 7, 9, 10, 11, 13
“received”	3, 11
“represents”	1, 2, 3, 5, 7
“respective”	1, 2, 3, 5, 7, 9, 10, 11, 13
“second computer system”	1, 2, 3, 5, 7, 9, 10, 11, 13
“second input feed”	3, 11
“second pipeline output messages”	1, 2, 3, 5, 7
“second plurality of computer systems”	1, 2, 3, 5, 7, 9, 10, 11, 13
“second stream of input data”	3, 11
“second transformation pipeline”	1, 2, 3, 5, 7, 9, 10, 11, 13
“substantially in real time”	1, 2, 3, 5, 7, 9, 10, 11, 13
“third computer system”	1, 2, 3, 5, 7, 9, 10, 11, 13
“third pipeline output messages”	5
“transmit”	1, 2, 3, 5, 7, 9, 10, 11, 13
“a first plurality of computer systems, wherein each respective computer system of the first plurality of computer systems comprises a memory that stores a respective first data, wherein the respective	1, 2, 3, 5, 7

Claim Terms	Claim(s)
first data represents a respective portion of a distributed computational graph, and wherein the distributed computational graph describes a flow of output data of a first transformation pipeline to an input of a second transformation pipeline, wherein a first computer system of the first plurality of computer systems is configured to: receive a first stream of input data from a first input feed, process the first stream of input data substantially in real time by executing software instructions that apply the first transformation pipeline to the first stream of input data to generate first pipeline output messages, process the respective first data stored in the memory of the first computer system to determine information about the second transformation pipeline, and transmit the first pipeline output messages to a second computer system of the first plurality of computer systems in accordance with the determined information, wherein the second computer system is configured to: receive the first pipeline output messages, and process the first pipeline output messages substantially in real time by executing software instructions that apply the second transformation pipeline to the first pipeline output messages to generate second pipeline output messages, wherein the first and second computer systems are distinct”	
“and a second plurality of computer systems”	1, 2, 3, 5, 7, 9, 10, 11, 13
“wherein a third computer system of the first plurality of computer systems is configured to execute software instructions that cause a fourth computer system of the second plurality of computer systems to execute software instructions that apply at least one of the first transformation pipeline and the second transformation pipeline”	1, 2, 3, 5, 7
“wherein at least one of the first transformation pipeline and the second transformation pipeline is non-linear”	2
“wherein the third computer system of the first plurality of computer systems is configured to: identify a fifth computer system of the first plurality of computer systems, wherein the fifth computer system is not configured to apply the first transformation pipeline to any stream of input data, and cause the fifth computer system to process a second stream of input data received from a second input feed substantially in real time by executing software instructions that apply the first transformation pipeline to the second stream of input data”	3
“wherein the third computer system of the first plurality of computer systems is configured to: identify a fifth computer system of the first plurality of computer systems, wherein the fifth computer system is not configured to apply the second transformation pipeline to any pipeline output message, and cause the fifth computer system to process third pipeline output messages substantially in real time by	5

Claim Terms	Claim(s)
executing software instructions that apply the second transformation pipeline to the third pipeline output messages”	
“wherein the first computer system is further configured to transmit the first pipeline output messages to the fourth computer system of the second plurality of computer systems, wherein the first computer system is distinct from the fourth computer system, and wherein the second computer system is distinct from the fourth computer system”	7
“a first plurality of computer systems, wherein each respective computer system of the first plurality of computer systems comprises a respective memory that stores a respective first data that: describes at least a respective portion of a configuration of a first transformation pipeline, and identifies at least a second transformation pipeline, wherein a first computer system of the first plurality of computer systems is configured to: receive a first stream of input data from a first input feed, process the first stream of input data substantially in real time by executing software instructions that apply the first transformation pipeline to the first stream of input data to generate first pipeline output messages, process the respective first data to determine an identification of the second transformation pipeline, and transmit the first pipeline output messages to a second computer system of the first plurality of computer systems in accordance with the determined identification, wherein the second computer system is configured to: receive the first pipeline output messages, and process the first pipeline output messages substantially in real time by executing software instructions that apply the second transformation pipeline to the first pipeline output messages, wherein the first and second computer systems are distinct; and a second plurality of computer systems”	9, 10, 11, 13
“wherein a third computer system of the first plurality of computer systems is configured to execute software instructions that cause the second plurality of computer systems to execute at least one of the first transformation pipeline and the second transformation pipeline”	9, 10, 11, 13
“wherein one or more of the first transformation pipeline and the second transformation pipeline is non-linear”	10
“wherein the third computer system of the first plurality of computer systems is configured to: identify a fourth computer system of the first plurality of computer systems, wherein the fourth computer system is not configured to apply the first transformation pipeline to any stream of input data, and cause the fourth computer system to process a second stream of input data received from a second input feed substantially in real time by executing software instructions that apply the first transformation pipeline to the second stream of input data”	11

Claim Terms	Claim(s)
"wherein the first computer system is further configured to transmit the first pipeline output messages to a fourth computer system of the second plurality of computer systems, wherein the first computer system is distinct from the fourth computer system, and wherein the second computer system is distinct from the fourth computer system"	13

3. Ineligible Subject Matter under 35 U.S.C. § 101

The Asserted Claims of the '424 patent are also invalid for failing to recite patentable subject matter under 35 U.S.C. § 101.

In *Alice Corp. Pty. v. CLS Bank, Int'l*, 573 U.S. 208 (2014), the Supreme Court established a two-part test for determining whether a claim is patent eligible under 35 U.S.C. § 101. First, the court must determine whether the claims at issue are directed to any of the following patent-ineligible subject matter: laws of nature, natural phenomena, or abstract ideas. *Id.* at 217-18. Second, if the claims are directed to ineligible subject matter, the court must then consider the claim elements—both individually and as an ordered combination—to determine whether they provide an "inventive concept." *Id.* Merely implementing an abstract idea using well-known computer components or functions or limiting the idea to a particular technological environment is insufficient to transform the claimed abstract idea into a patent-eligible application. *Id.* at 220-26. The "inventive concept" inquiry further examines whether the additional elements, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activity. *Id.* at 221-22 (finding "conventional steps" insufficient to supply an "inventive concept"); *see also Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (requiring under the second step of the *Alice* test the "claim limitations involve more than performance of 'well-understood, routine, [and] conventional activities previously known to the industry'") (citations omitted).

Each of the Asserted Claims of the ’424 patent are directed to no more than the abstract idea of using mathematical algorithms to perform predictive analytics. *See FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1092 (Fed. Cir. 2016) (patent ineligible claims disclosed “ways to detect fraud and misuse by identifying unusual patterns in users' access of sensitive data”); *PurePredictive, Inc. v. H20.AI, Inc.*, C.A. No. 17-3049-WHO, 2017 WL 3721480, at *5 (N.D. Cal. Aug. 29, 2017) (finding ineligible claims directed to “the abstract concept of using mathematical algorithms to perform predictive analytics”), *aff’d*, 741 F. App’x 802 (Fed. Cir. 2018).

Moreover, each of the Asserted Claims of the ’424 patent is patent-ineligible because they fail to provide an inventive concept. Indeed, aside from the recited abstract idea, the claim elements of each of the Asserted Claims of the ’424 patent, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activities. For example, the following claim elements represent conventional computer methods, architectures, and protocols:

Claim Element	**Claim(s)**
“computer system”	1, 9
“memory”	1, 9
“stores” data	1, 9
“receive” data or messages	1, 9
“process” data or messages “in real time”	1, 9
“transmit” messages	1, 9

Indeed, the specification of the ’424 patent acknowledges that elements of the invention are well-understood, routine and conventional. For example, the specification states:

- "'Database' may be used to refer to relational database management systems known in the art…" '424 patent at 10:12-14.

- "any group of data storage systems of databases referred to herein may be included together in a single database management system operating on a single machine, or they may be included in a single database management system operating on a cluster of machines as is known in the art." *Id*. at 10:31-35.

- "any single database (…) may be implemented on a single machine, on a set of machines using clustering technology, on several machines connected by one or more messaging systems known in the art, or in a master/slave arrangement common in the art." *Id*. at 10:36-40.

- "at least some of the features or functionalities of the various aspects disclosed herein may be implemented on one or more general-purpose computers associated with one or more networks." *Id*. at 10:67-11:2.

- "Computing device 10 may be configured to communicate with a plurality of other computing devices, such as clients or servers, over communications networks such as a wide area network a metropolitan area network, a local area network, a wireless network, the Internet, or any other network, using known protocols for such communication, whether wireless or wired." *Id*. at 11:25-31.

- "Processors 210 may carry out computing instructions under control of an operating system 220 such as, for example, a version of MICROSOFT WINDOWSTM operating system, APPLE macOSTM or iOSTM operating systems, some variety of the Linux operating system, ANDROIDTM operating system, or the like." *Id*. at 13:23-29.

- "Input devices 270 may be of any type suitable for receiving user input, including for example a keyboard, touchscreen, microphone (for example, for voice input), mouse, touchpad, trackball, or any combination thereof." *Id*. at 13:35-38.

- "Output devices 27 may be of any type suitable for providing output to one or more users, whether remote or local to system 20, and may include for example one or more screens for visual output, speakers, printers, or any combination thereof." *Id*. at 13:39-43.

- "Memory 240 may be random-access memory having any structure and architecture known in the art, for use by processors 21, for example to run software." *Id*. at 13:43-45.

- "Storage devices 26 may be any magnetic, optical, mechanical, memristor, or electrical storage device for storage of data in digital form…." *Id*. at 13:45-48.

- "Clients 330 and servers 320 may communicate with one another via … any network topology known in the art…." *Id*. at 13:63-14:3.

- "Networks 310 may be implemented using any known network protocols, including for example wired and/or wireless protocols." 14:3-5.

Finally, the dependent claims do not transform the abstract idea into patent-eligible subject matter, because they add only "well-known, routine, and conventional functions," *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n*, 776 F.3d 1343, 1348 (Fed. Cir. 2014), or "merely provide additional criteria" for "performance of the same basic process." *Dropbox*, 815 F. App'x at 533.

VI. U.S. PATENT NO. 11,539,663

A. The '663 Priority Date

Qomplx's Infringement Contentions allege that the Asserted Claim of the '663 patent is entitled at least to the priority date May 14, 2019. To the extent Qomplx may argue that the '663 patent deserves an earlier priority date, Qomplx has not met this burden of proof and fails to demonstrate that any Asserted Claim of the '663 patent is entitled to a priority date earlier than May 14, 2019. To the extent Qomplx alleges that any prior art relied on in these Invalidity Contentions does not qualify as prior art to the Asserted Patent, Microsoft reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later conception/reduction to practice or priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Microsoft identifies the following references as anticipating and/or rendering obvious the Asserted Claim of the '663 patent under 35 U.S.C. §§ 102 and/or 103, whether considered alone or in combination with the references identified in each respective exhibit. The table of anticipating and/or rendering obvious references below is exemplary, and does not constitute an admission that any reference not listed below does not also anticipate and/or render obvious the claims of the '663 patent. Further, Microsoft contends that any prior art reference in the attached

charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table:

Exhibit	Reference	Application Date	Issue/Publication Date
F-1	U.S. Patent Application Publication No. 2015/0281355 to Maturana ("Maturana")	10/27/2014	10/1/2015
F-2	U.S. Patent Application Publication No. 2015/0178113 to Dake ("Dake")	12/24/2013	6/25/2015
F-3	U.S. Patent Application Publication No. 2012/0246639 to Kashyap ("Kashyap")	3/24/2011	9/27/2012
F-4	U.S. Patent Application Publication No. 2014/0351906 to Sorenson ("Sorenson")	8/8/2014	11/27/2014
F-5	U.S. Patent No. 8,514,868 to Hill ("Hill")	6/19/2009	8/20/2013
F-6	U.S. Patent No. 8,792,491 to Jackowski ("Jackowski")	8/12/2010	7/29/2014
F-7	U.S. Patent No. 10,027,637 to Coimbatore ("Coimbatore")	3/12/2015	7/17/2018
F-8	U.S. Patent No. 9,253,159 to Chauhan ("Chauhan")	5/4/2012	2/2/2016
F-9	U.S. Patent No. 11,336,724 to Agarwal ("Agarwal")	4/25/2019	5/17/2022
F-10	U.S. Patent Application Publication No. 2018/0115519 to Bonomi ("Bonomi")	10/26/2017	4/26/2018

In addition, Microsoft identifies the following additional prior art that may be combined with any of the prior art set forth herein (and the attached Exhibits) to render obvious the Asserted Claim of

the ’663 patent in addition to demonstrating the state of the art.[26] The list below further includes an additional, non-exhaustive list of prior art publications, products, or prior art systems that, alone, or in combination, anticipate or render obvious the Asserted Claim of the ’663 patent under Qomplx’s overbroad infringement theories, which Microsoft disputes.

Patent No.	Filed Date	Issued/Publication Date
U.S. Patent No. 7,003,482 to Margoscin	Dec. 10, 1999	Feb. 21, 2006
U.S. Patent No. 7,519,814 to Rochette	Sep. 13, 2004	Apr. 14, 2009
U.S. Patent No. 8,464,332 to Lin	Mar. 27, 2011	Jun. 11, 2013
U.S. Patent No. 8,514,868 to Hill	Jun. 19, 2009	Aug. 20, 2013
U.S. Patent No. 8,601,134 to Sorenson III	Jun. 30, 2011	Dec. 3, 2013
U.S. Patent No. 8,612,566 to Ferris	Jul. 20, 2012	Dec. 17, 2013
U.S. Patent No. 8,775,599 to Bansal	Jun. 19, 2012	Jul. 8, 2014
U.S. Patent No. 8,792,491 to Jackowski	Aug. 12, 2010	Jul. 29, 2014
U.S. Patent No. 9,003,395 to Gaither	Aug. 10, 2012	Apr. 7, 2015
U.S. Patent No. 9,009,352 to Yee	Mar. 28, 2012	Apr. 14, 2015
U.S. Patent No. 9,104,454 to Ashok	Jan. 14, 2013	Aug. 11, 2015
U.S. Patent No. 9,224,697 to Sorenson III	Aug. 8, 2014	Dec. 29, 2015
U.S. Patent No. 9,253,159 to Chauhan	May 4, 2012	Feb. 2, 2016
U.S. Patent No. 9,253,252 Agarwal	May 4, 2012	Feb. 2, 2016
U.S. Patent No. 9,336,060 to Nori	Jun. 17, 2011	May 10, 2016
U.S. Patent No. 9,342,357 Grueneberg	Sep. 11, 2014	May 17, 2016
U.S. Patent No. 9,348,652 to Raghu	Jul 2, 2012	May 24, 2016
U.S. Patent No. 9,590,872 to Jagtap	Mar. 14, 2013	Mar. 7, 2017
U.S. Patent No. 9,838,476 to Maturana	Oct. 27, 2014	Dec. 5, 2017
U.S. Patent No. 9,929,964 to Saavedra	Nov. 19, 2015	Mar. 27, 2018
U.S. Patent No. 10,027,637 to Coimbatore	Mar. 12, 2015	Jul. 17, 2018
U.S. Patent No. 10,298,670 to Ben-Shaul	Sep. 5, 2017	May 21, 2019
U.S. Patent No. 10,425,411 to Huang	Mar. 13, 2014	Sep. 24, 2019
U.S. Patent No. 10,462,210 to Mayer	Feb. 13, 2015	Oct. 29, 2019
U.S. Patent No. 10,521,447 to Cahana	Nov. 14, 2016	Dec. 31, 2019
U.S. Patent No. 10,579,403 to Antony	Sep. 21, 2015	Mar. 3, 2020
U.S. Patent No. 10,817,530 to Siebel	Mar. 23, 2015	Oct. 27, 2020
U.S. Patent No. 10,965,530 to Lin	May 20, 2019	Mar. 30, 2021
U.S. Patent No. 11,163,791 to Patel	Jan. 23, 2019	Nov. 2, 2021
U.S. Patent No. 11,336,724 to Agarwal	Apr. 25, 2019	May 17, 2022
U.S. Patent No. 11,716,271 to Braddy	Apr. 22, 2021	Aug. 1, 2023

[26] Microsoft reserves the right to rely on any prior art systems described in the following publications.

U.S. Patent Application Publication No. 2005/0060722 to Rochette	Sep. 13, 2004	Mar. 17, 2005
U.S. Patent Application Publication No. 2007/0294676 to Mellor	Jun. 19, 2007	Dec. 20, 2007
U.S. Patent Application Publication No. 2012/0216181 to Arcese	May 3, 2012	Aug. 23, 2012
U.S. Patent Application Publication No. 2012/0246639 to Kashyap	Mar. 24, 2011	Sep. 27, 2012
U.S. Patent Application Publication No.2012/028454 to Stewart	Apr. 19, 2012	Nov. 1, 2012
U.S. Patent Application Publication No. 2012/0281706 to Agarwal	May 4, 2012	Nov. 8, 2012
U.S. Patent Application Publication No. 2012/0284405 to Ferris	Jul. 20, 2012	Nov. 8, 2012
U.S. Patent Application Publication No. 2012/0324069 to Nori	Jun. 17, 2011	Dec. 20, 2012
U.S. Patent Application Publication No. 2013/0132956 to Ashok	Jan. 14, 2013	May 23, 2013
U.S. Patent Application Publication No. 2013/0152080 to Sachindran	Dec. 12, 2011	Jun. 13, 2013
U.S. Patent Application Publication No. 2013/0283364 to Chang	Apr. 24, 2012	Oct. 24, 2013
U.S. Patent Application Publication No. 2013/0339505 to Bansal	Jun. 19, 2012	Dec. 19, 2013
U.S. Patent Application Publication No. 2014/0304804 to Lee	Mar. 31, 2014	Oct. 9, 2014
U.S. Patent Application Publication No. 2014/0351906 to Sorenson III	Aug. 8, 2014	Nov. 27, 2014
U.S. Patent Application Publication No. 2015/0178113 to Dake	Dec. 24, 2013	Jun. 25, 2015
U.S. Patent Application Publication No. 2015/0281355 to Maturana	Oct. 27, 2014	Oct. 1, 2015
U.S. Patent Application Publication No. 2016/0048408 to Madhu	Aug. 7, 2015	Feb. 18, 2016
U.S. Patent Application Publication No. 2016/0077869 to Grueneberg	Sep. 11, 2014	Mar. 17, 2016
U.S. Patent Application Publication No. 2017/0310547 to Lin	Apr. 20, 2017	Oct. 26, 2017
U.S. Patent Application Publication No. 2017/0366606 to Ben-Shaul	Sep. 5, 2017	Dec. 21, 2017
U.S. Patent Application Publication No. 2018/0115519 to Bonomi	Oct. 16, 2017	Apr. 26, 2018
U.S. Patent Application Publication No. 2018/0189470 to Kim	Jun. 24, 2016	Jul. 5, 2018
U.S. Patent Application Publication No. 2018/0198756 to Dawes	Mar. 10, 2014	Jul. 12, 2018

U.S. Patent Application Publication No. 2018/0293284 to Shah	Apr. 10, 2017	Oct. 11, 2018
U.S. Patent Application Publication No. 2019/0026138 to Cao	Jul.20, 2017	Jan. 24, 2019
U.S. Patent Application Publication No. 2019/0065213 to Li	Jan. 26, 2018	Feb. 28, 2019
European Patent Application No. 2,012,490 to Luther	Jul. 6, 2007	Jan. 7, 2009

Title	Author/Publisher	Date
A Middleware Toolkit for Client-Initiated Service Specialization	Greg Eisenhauer, Fabian E. Bustamante, Karsten Schwan / Georgia Institute of Technology	2001
Cloud Computing Bible	Barrie Sosinksy / Wiley Publishing, Inc.	2011
Contextualization: Providing One-Click Virtual Clusters	Katarzyna Keahey, Tim Freeman / IEEE Xplore	2008
Docker: Lightweight Linux Containers for Consistent Development and Deployment	Dirk Merkel / Linux Journal	Mar. 2014
Fog Computing and Its Role in the Internet of Things	Flavio Bonomi, Rodolfo Milito, Jiang Zhu, Sateesh Addepalli / MCC ‘12	Aug. 17, 2012
Fog Data: Enhancing Telehealth Big Data Through Fog Computing	Harishchandra Dubey, Jing Yang, Nick Constant, Amir Mohammad Amiri, Qing Yang, Kunal Makodiya / ASE BD&SI ‘15	2015
Frameworks for Component-Based Client/Server Computing	Scott M. Lewandowski / ACM Computing Surveys	Mar. 1998
Infrastructure deployment over the Cloud	Carlos de Alfonso, Miguel Caballer, Fernando Alvarruiz, German Molto, Vicente Hernandez / IEEE Xplore	2011
IT Autopilot: A flexible IT service management and delivery platform for small and medium business	S. Mastrianni, D.F. Bantz, K.A. Beaty, T. Chefalas, S. Jalan, G. Kar, A. Kochut, D.J. Lan, L. O’Connell, A. Sailer, G. Wang, Q.B. Wang, D.G. Shea / IBM Systems Journal, 46(3)	2007
Open Virtualization Format White Paper, ver. 1.0.0	Distributed management Task Force, Inc. (DMTF)	Feb. 6, 2009
Open Virtualization Format White Paper, ver. 2.0.0	Distributed management Task Force, Inc. (DMTF)	Apr. 4, 2014

Open Virtualization Format White Paper, ver. 2.1.1	Distributed management Task Force, Inc. (DMTF)	Aug. 27, 2015
Reinventing virtual appliances	X. Jin, R. Willenborg, Y. Zhao, C. Sun, L. He, Z. Chen, Y. Chen, Q. Wang / International Business Machines Corporation, IBM J. of Res. And Dev. 53(4)	2009
Secure Outsourcing of Virtual Appliance	Yubin Xia, Yutao Liy, Haibing Guan, Yunji Chen, Tianshi Chen, Binyu Zang, Haibo Chen / IEEE Transactions on Cloud Computing	Jul.-Sep. 2017
Toward Efficient Virtual Appliance Delivery with Minimal Manageable Virtual Appliances	Gabor Kecskemeti, Gabor Terstyanszky, Peter Kacsuk, Zsolt Nemeth / IEEE Xplore / IEEE Trans. On Services Comput., 7(2)	Apr.-Jun. 2014

Discovery and Microsoft's investigation is ongoing. Microsoft reserves the right to further supplement these Invalidity Contentions with prior art uncovered through discovery. For example, Microsoft may supplement these contentions with additional prior art systems.

To the extent any item of prior art cited above is deemed not to disclose and/or render obvious, explicitly or inherently, any limitation of the Asserted Claims of the '663 patent, Microsoft reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Microsoft has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. The Asserted Claims are Anticipation and/or Rendered Obvious

The Asserted Claim of the '663 patent is invalid as anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and/or 103 in view of each of the primary prior art references identified in the claim charts included in Exhibits F-1 through F-10, which identify specific examples of

where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

The U.S. Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007) emphasized that inventions arising from ordinary innovation, ordinary skill, or common sense should not be patentable. *Id*. at 1732, 1738, 1742–1743, 1746. A patent claim may be obvious if the combination of elements was obvious to try or if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, Section 103 likely bars its patentability. *Id*. at 1740. The Court stated that courts should "look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id*. at 1740–41. *KSR* does not mandate evidence of a motivation or suggestion to combine prior art references. *See TGIP, Inc. v. AT&T Corp*., 527 F. Supp. 2d 561, 580–81 (E.D. Tex. 2007). "[A] court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ" to resolve the question of obviousness. *KSR*, 127 S. Ct. at 1741.

Based on all of these considerations, as further detailed in Exhibits F-1 to F-10, a POSITA would have combined the teachings of the prior art references discussed and charted in those exhibits. The combinations of these references would have rendered obvious to one of ordinary skill in the art the subject matter of the Asserted Claim of the ’663 patent. The references identified in Exhibits F-1 to F-10 are analogous prior art to the subject matter of the Asserted Claims and, for at least the reasons set forth below, are properly combinable. Because these prior art references exist within a single field of art, particularly one in which individuals in the field often shared and/or collaborated on their work, it would have been obvious for a person of skill in the art to look from one piece of prior art to another in order to find any missing functionality they desired to implement. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the ’663 patent.

By way of example only, the following combinations render obvious the Asserted Claims of the ’663 patent:

- F-1 (Maturana) in view of F-2 (Dake), F-3 (Kashyap), F-4 (Sorenson), F-5 (Hill), F-6 (Jackowski), F-7 (Coimbatore), F-8 (Chauhan), F-9 (Agarwal) and/or F-10 (Bonomi).
- F-2 (Dake) in view of F-1 (Maturana), F-3 (Kashyap), F-4 (Sorenson), F-5 (Hill), F-6 (Jackowski), F-7 (Coimbatore), F-8 (Chauhan), F-9 (Agarwal) and/or F-10 (Bonomi).
- F-3 (Kashyap) in view of F-1 (Maturana), F-2 (Dake), F-4 (Sorenson), F-5 (Hill), F-6 (Jackowski), F-7 (Coimbatore), F-8 (Chauhan), F-9 (Agarwal) and/or F-10 (Bonomi).
- F-4 (Sorenson) in view of F-1 (Maturana), F-2 (Dake), F-3 (Kashyap), F-5 (Hill), F-6 (Jackowski), F-7 (Coimbatore), F-8 (Chauhan), F-9 (Agarwal) and/or F-10 (Bonomi).
- F-5 (Hill) in view of F-1 (Maturana), F-2 (Dake), F-3 (Kashyap), F-4 (Sorenson), F-6 (Jackowski), F-7 (Coimbatore), F-8 (Chauhan), F-9 (Agarwal) and/or F-10 (Bonomi).
- F-6 (Jackowski) in view of F-1 (Maturana), F-2 (Dake), F-3 (Kashyap), F-4 (Sorenson), F-5 (Hill), F-7 (Coimbatore), F-8 (Chauhan), F-9 (Agarwal) and/or F-10 (Bonomi).

- F-7 (Coimbatore) in view of F-1 (Maturana), F-2 (Dake), F-3 (Kashyap), F-4 (Sorenson), F-5 (Hill), F-6 (Jackowski), F-8 (Chauhan), F-9 (Agarwal) and/or F-10 (Bonomi).

- F-8 (Chauhan) in view of F-1 (Maturana), F-2 (Dake), F-3 (Kashyap), F-4 (Sorenson), F-5 (Hill), F-6 (Jackowski), F-7 (Coimbatore), F-9 (Agarwal) and/or F-10 (Bonomi).

- F-9 (Agarwal) in view of F-1 (Maturana), F-2 (Dake), F-3 (Kashyap), F-4 (Sorenson), F-5 (Hill), F-6 (Jackowski), F-7 (Coimbatore), F-8 (Chauhan) and/or F-10 (Bonomi).

- F-10 (Bonomi) in view of F-1 (Maturana), F-2 (Dake), F-3 (Kashyap), F-4 (Sorenson), F-5 (Hill), F-6 (Jackowski), F-7 (Coimbatore), F-8 (Chauhan) and/or F-9 (Agarwal).

Numerous prior art references, including those identified in the attached exhibits, reflect common knowledge and the state of the prior art before the earliest claimed effective filing date of the ’663 patent. As it would be unduly burdensome to create detailed claim charts for all of the invalidating combinations, for at least the reasons described in these invalidity contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those identified in the attached exhibits, to meet the limitations of the Asserted Claims of the ’663 patent. Microsoft’s inclusion of exemplary combinations, in view of the factors and motivations identified here, does not preclude Microsoft from identifying other invalidating combinations and/or motivations as appropriate.

No showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, because each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR*, 127 S. Ct. at 1739–40 (rejecting the Federal Circuit’s “rigid” application of the teaching, suggestion, or motivation to combine test, instead espousing an “expansive and flexible” approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is “a person of ordinary creativity, not an automaton” and “in many cases a person

of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id*. at 1742. Nevertheless, in addition to the information contained herein, Microsoft hereby identifies additional motivations and reasons to combine the cited art.

One or more combinations of the prior art references identified herein would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to combine the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompts variations based on predictable design incentives and/or market forces either in the same field or a different one. In addition, the combinations of the prior art references identified above would have been obvious because the combinations represent the known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation or reason to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution; the existence of a known need or problem in the field of endeavor at the time of the invention; and the background knowledge that would have been possessed by a person having ordinary skill in the art. For example, the prior art references are generally directed to the same problems. Thus, a skilled artisan seeking to solve these problems would look to these cited references in combination.

Thus, the motivation or reason to combine the teachings of the prior art references disclosed herein is found in the references themselves and in: (1) the nature of the problems being solved; (2) the express, implied, and inherent teachings of the prior art; (3) the knowledge of a POSITA; (4) the fact that the prior art is generally directed towards the same problems; and/or (5) the predictable results obtained in combining the different elements of the prior art; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Microsoft incorporates by reference prior art from the prosecution histories and background sections of the ’663 patent. Microsoft expects to rely on the testimony of one or more expert witnesses and documents referenced by those expert witnesses in support of these contentions and incorporate those forthcoming expert reports as if fully set forth herein.

Microsoft contends that there are no secondary considerations of non-obviousness evidencing the validity of any of the Asserted Claims. Secondary considerations of non-obviousness, also referred to as objective indicia of non-obviousness, “can include copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, awards or other industry praise for the invention, and skepticism of skilled artisans before the invention.” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1368 (Fed. Cir. 2013). “A nexus between the merits of the claimed

invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision." *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 668 (Fed. Cir. 2000). Moreover, even if a nexus exists, secondary considerations of non-obviousness "simply cannot overcome [a] strong prima facie showing of obviousness." *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1368 (Fed. Cir. 2008). Qomplx has not established the existence of any objective indicia of non-obviousness or secondary considerations. Microsoft reserves the right to supplement their contentions to respond to any such arguments or evidence should Qomplx be permitted to raise them in the future. While discovery in this case is ongoing, and Microsoft's investigation continues (which will include expert discovery), to the extent Qomplx contends that one or more Asserted Claims is not obvious based on secondary considerations recognized by relevant authority Microsoft contends such allegations are without merit. Microsoft reserves the right to supplement their contentions to respond to any such evidence should Qomplx be permitted to raise it in the future.

D. Other Invalidity Grounds

Microsoft hereby identifies grounds of invalidity based on (1) lack of written description under 35 U.S.C. § 112; (2) lack of enablement under 35 U.S.C. § 112; and (3) ineligible subject matter under 35 U.S.C. § 101. These contentions shall not be construed as an admission that any claim construction advanced by Microsoft in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Microsoft from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Qomplx's purported construction of the claim language or of other positions advanced by Qomplx during the course of this litigation. Microsoft's Invalidity Contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Qomplx's alleged scope of the Asserted Claims of

the ’663 patent. Consequently, Microsoft only identifies the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description under 35 U.S.C. § 112

The Asserted Claim is invalid under 35 U.S.C. § 112, because the ’663 patent does not provide sufficient written description to establish that the alleged inventors were in possession of the full scope of the alleged inventions recited in the Asserted Claims at the time the ’663 patent was filed. *See e.g. Ariad v. Lilly*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc); *LizardTech Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005) (finding claims invalid under 35 U.S.C. § 112 where the specification failed to include a written description of the full scope of the claimed invention); *In re Katz Interactive Call Processing Pat. Litig.*, 639 F.3d 1303, 1320 (Fed. Cir. 2011) (“[W]hen analyzing whether a patent meets the written description requirement, one cannot ‘bootstrap’ the knowledge of a person of ordinary skill in the art (‘POSITA’) into the analysis and fill the gap in the disclosure through obviousness.”).

The following terms render one of more of the Asserted Claims invalid for lack of written description under 35 U.S.C. § 112, as the specification of the ’663 patent does not demonstrate that the inventors were in possession of the claimed subject matter:

Claim Terms	Claim(s)
automatically install	1
automatically load a plurality of stored configurations	1
virtual appliance software application	1

2. Lack of Enablement under 35 U.S.C. § 112(a)

The Asserted Claim is also invalid under 35 U.S.C. § 112, because the ’663 patent does not enable one of ordinary skill in the art to make and/or use the full scope of certain recited elements of the Asserted Claims of the ’663 patent without undue experimentation. *See, e.g.*,

United States v. Telectronics, Inc., 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) ("The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation."); *Trustees of Bos. Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018) ("to be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'").

The following terms render one of more of the Asserted Claims invalid for lack of enablement under 35 U.S.C. § 112, as the claims, specification, and prosecution histories would not enable one of skill in the art to practice the claimed invention(s) without undue experimentation:

Claim Terms	Claim(s)
automatically install	1
programming instructions	1
automatically load a plurality of stored configurations on the midserver	1
apply a plurality of transformations	1

3. Ineligible Subject Matter under 35 U.S.C. § 101

The Asserted Claims of the '663 patent are also invalid for failing to recite patentable subject matter under 35 U.S.C. § 101.

In *Alice Corp. Pty. v. CLS Bank, Int'l*, 573 U.S. 208 (2014), the Supreme Court established a two-part test for determining whether a claim is patent eligible under 35 U.S.C. § 101. First, the court must determine whether the claims at issue are directed to any of the following patent-ineligible subject matter: laws of nature, natural phenomena, or abstract ideas. *Id.* at 217-18. Second, if the claims are directed to ineligible subject matter, the court must then consider the claim elements—both individually and as an ordered combination—to determine whether they

provide an "inventive concept." *Id*. Merely implementing an abstract idea using well-known computer components or functions or limiting the idea to a particular technological environment is insufficient to transform the claimed abstract idea into a patent-eligible application. *Id.* at 220-26. The "inventive concept" inquiry further examines whether the additional elements, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activity. *Id.* at 221-22 (finding "conventional steps" insufficient to supply an "inventive concept"); *see also Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (requiring under the second step of the *Alice* test the "claim limitations involve more than performance of 'well-understood, routine, [and] conventional activities previously known to the industry'") (citations omitted).

Each of the Asserted Claims of the '663 patent are directed to no more than the abstract idea of using an intermediary to collect, process, and transmit information. *See Elec. Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) ("collecting information, including when limited to particular content …, is within the realm of abstract ideas"); *CyberFone Sys., LLC v. CNN Interactive Group, Inc.*, 558 F. App'x 988, 992 (Fed. Cir. 2014) ("collecting information in classified form, then separating and transmitting that information according to its classification, is an abstract idea that is not patent-eligible"); *AI Visualize, Inc. v. Nuance Commc'ns, Inc.*, 97 F.4th 1371, 1378 (Fed. Cir. 2024) ("the steps of obtaining, manipulating, and displaying data, particularly when claimed at a high level of generality, are abstract concepts"); *Intell. Ventures I, LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1341 (Fed. Cir. 2017) (claims were directed to "the abstract idea of organizing, displaying, and manipulating data"); *Intell. Ventures I LLC v. Capital One Bank*, 792 F.3d 1363, 1371 (Fed. Cir. 2015) (claims involving "entry of data into a computer database, the breakdown and organization of that

entered data …, and the transmission of information derived from that entered data" were abstract); *First-Class Monitoring, LLC v. United Parcel Serv. of Am., Inc.*, 389 F. Supp. 3d 456, 467 (E.D. Tex. 2019) (claims regarding "requesting, collecting, analyzing, and transmitting information" were abstract).

Moreover, each of the Asserted Claims of the '663 patent is patent-ineligible because they fail to provide an inventive concept. Indeed, aside from the recited abstract idea, the claim elements of each of the Asserted Claims of the '663 patent, both individually and as an ordered combination, merely represent well-understood, routine, and conventional activities. For example, the following claim elements represent conventional computer methods, architectures, and protocols:

Claim Element	**Claim(s)**
"midserver"	1, 4
"processor"	1, 4
"memory"	1, 4
"virtual appliance"	1, 4
"Load a plurality of stored configurations":	1, 4
"Establish a secure network connection"	1, 4
"Receive data over a local network"	1, 4
"Apply a plurality of transformations to at least a portion of the received data"	1, 4
"Retransmit the received data over the secure connection as a single data stream"	1, 4

Indeed, the specification of the '663 patent acknowledges that elements of the invention are well-understood, routine and conventional. For example, the specification states:

- The “midserver” “should have only the minimum software necessary to operate”(*id.* at 16:16-21); “may be deployed as a single instance, or as a cluster depending on the traffic volume”(*id.* at 14:35-38); “may be placed anywhere on the network”(*id.* at 14:38-40); and “may be tailored to the organizational environment and the specific overall network architecture”(*id.* at 14:41-43).

- “virtual appliance” is “a virtual image pre-installed with only the minimal software on configurations required to initiate the deployment process” using known and then-available programs.” *Id.* at 16:14-21.

- “at least some of the features or functionalities of the various aspects disclosed herein may be implemented on one or more general-purpose computers associated with one or more networks.” *Id*. at 19:21-30.

- “processor” includes “a microcontroller, a microcomputer, a programmable logic controller, an application-specific integrated circuit, and any other programmable circuit.” *Id.* at 20:24-29.

- “Processors 21 may carry out computing instructions under control of an operating system 22 such as, for example, a version of MICROSOFT WINDOWSTM operating system, APPLE macOSTM or iOSTM operating systems, some variety of the Linux operating system, ANDROIDTM operating system, or the like.” *Id*. at 22:2-8.

- “Input devices 270 may be of any type suitable for receiving user input, including for example a keyboard, touchscreen, microphone (for example, for voice input), mouse, touchpad, trackball, or any combination thereof.” *Id*. at 22:14-18.

- “Output devices 27 may be of any type suitable for providing output to one or more users, whether remote or local to system 20, and may include for example one or more screens for visual output, speakers, printers, or any combination thereof.” *Id*. at 14:18-22.

- “Memory 25 may be random-access memory having any structure and architecture known in the art, for use by processors 21, for example to run software.” *Id*. at 22:23-25.

- “Storage devices 26 may be any magnetic, optical, mechanical, memristor, or electrical storage device for storage of data in digital form….” *Id*. at 22:25-30.

- “Clients 33 and servers 32 may communicate with one another via … any network topology known in the art….” *Id*. at 22:44-51.

- “Networks 310 may be implemented using any known network protocols, including for example wired and/or wireless protocols.” 14:3-5.

Finally, the dependent claims do not transform the abstract idea into patent-eligible subject matter, because they add only “well-known, routine, and conventional functions,”

Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n, 776 F.3d 1343, 1348 (Fed. Cir. 2014), or "merely provide additional criteria" for "performance of the same basic process." *Dropbox*, 815 F. App'x at 533.

I. DOCUMENT PRODUCTION PURSUANT TO THIS COURT'S STANDING ORDER GOVERNING PROCEEDINGS (OGP) 4.4–PATENT CASES

A. Documents Related to Accused Instrumentalities

With the express reservation of rights to further supplement its Invalidity Contentions, and based on its current understanding of Qomplx's Infringement Contentions, Microsoft has produced or is producing or making available for inspection, concurrently with these Invalidity Contentions, documents sufficient to show the operation of aspects or elements of the Accused Instrumentalities identified by Qomplx's Infringement Contentions, to the extent Microsoft could understand those contentions. Microsoft will also make source code available for inspection sufficient to show the operation of aspects or elements of the Accused Instrumentalities subject to the entry of an agreed Protective Order in this case.

B. Documents Related to Prior Art

Pursuant to the Court's OGP, Microsoft has produced or is producing and making available for inspection concurrently with its Invalidity Contentions, documents reflecting the prior art references identified above and/or in the attached charts in connection with Microsoft's Invalidity Contention disclosures. Microsoft's search for prior art references, additional documentation, and/or corroborating evidence concerning prior art systems is ongoing. Accordingly, Microsoft reserves the right to continue to supplement its production as Microsoft obtains additional prior art references, documentation, and/or corroborating evidence concerning invalidity during the course of discovery.

Dated: January 26, 2026

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CERTIFICATE OF SERVICE

The undersigned certifies that on January 26, 2026, all counsel of record who are deemed to have consented to electronic service are being served with a copy of this document via electronic mail.

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