UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

FOUR BATONS WIRELESS, LLC Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD.; and SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Case No. 2:24-CV-0284-JRG **JURY TRIAL DEMANDED**

DEFENDANTS' INVALIDITY CONTENTIONS

Pursuant to the Local Patent Rules and the Court's Scheduling Order, Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, "Samsung" or "Defendants") provide these Invalidity Contentions with respect to the Asserted Claims of U.S. Patent Nos. 8,798,006 (the "'006 patent"), 8,239,671 (the "'671 patent"), 7,502,348 (the "'348 patent"), and 8,073,436 (the "'436 patent") (collectively, the "Asserted Patents") identified by Four Batons Wireless LLC ("Four Batons" or "Plaintiff") in its Infringement Contentions.

The Asserted Claims, as reflected in Plaintiff's Infringement Contentions, are as follows:

U.S. Patent No.	Asserted Claims
8,798,006	1–8, 16
8,239,671	1–4, 6–8, 10–11, 18–19
7,502,348	1–6, 13–17
8,073,436	1–17, 19

As detailed further below, the Asserted Claims of the Asserted Patents are anticipated by, or obvious in view of, one more of the prior art references produced at SAMSUNG_FB_0000083399 - SAMSUNG_FB_0000092049. The Asserted Claims are invalid

pursuant to pre-AIA 35 U.S.C. §§102 and/or 103, as well as invalid under 35 U.S.C. §§101 and/or 112.

I. PRELIMINARY STATEMENT

These invalidity contentions and eligibility contentions are based on Defendants' current knowledge, understanding, and belief of the Asserted Patents and prior art, of Plaintiff's infringement theories (inasmuch as they can be inferred from its Infringement Contentions), and of the facts and other information available as of the date of these invalidity contentions. Defendants' investigation, discovery, and analysis of information related to this action is ongoing. Additional discovery, elucidation of Plaintiff's impermissibly vague infringement contentions, and/or orders of the Court may require Defendants to amend or supplement these invalidity contentions and eligibility contentions, and Defendants expressly reserve the right to do so as the case proceeds. These contentions represent Defendants' good-faith effort to provide a comprehensive identification of prior art relevant to this case, but Defendants reserve the right to modify or supplement their prior art list and invalidity contentions and eligibility contentions at a later time with, or based upon, pertinent information that may be subsequently discovered.

A. No Waiver

Nothing in these invalidity contentions and eligibility contentions is intended, nor should be construed, as a waiver of any noninfringement position or argument under 35 U.S.C. §§ 101 or 112. Defendants' statements herein (including the accompanying claim charts) reflect Defendants' present understanding of the purported scope of the claims as alleged by Plaintiff in its Infringement Contentions (as best those contentions can be understood in light of their present deficiencies).

The patent claims have yet to be construed. As a result, Defendants have based these invalidity contentions and eligibility contentions upon its knowledge and understanding of the

potential scope of the Asserted Claims at this time, and, in part, upon the apparent interpretations of the Asserted Claims advanced by Plaintiff in its Infringement Contentions. Defendants may disagree with Plaintiff's interpretation of the meaning of many terms and phrases in the Asserted Claims. Defendants have provided these invalidity contentions and eligibility contentions based in part on their present understanding of Plaintiff's apparent constructions and interpretations of the Asserted Claims. These invalidity contentions and eligibility contentions do not represent Defendants' agreement or view as to the proper interpretation of any claim term contained therein. Any similarity between any apparent claim interpretation in any of Defendants' charts of prior art reference and Plaintiff's contentions is not an admission or agreement with Plaintiff about the meaning of any claim term, but rather a reflection of the fact that the subject matter Plaintiff believes is claimed is present in the prior art, or that the claims are otherwise invalid. These invalidity contentions and eligibility contentions are made in the alternative, and should not be interpreted to rely upon, or in any way affect, the non-infringement arguments Defendants may assert in this case. Defendants reserve the right to amend, supplement, or materially modify its invalidity contentions and eligibility contentions as the case proceeds. Defendants also reserve the right to amend, supplement, or materially modify its invalidity contentions and eligibility contentions based on any infringement and/or additional claim construction positions that Plaintiff may take in this case.

Defendants also reserve the right to amend, supplement, or materially modify their invalidity contentions and eligibility contentions in response to any claim construction or interpretation positions that Plaintiff may take. Defendants also reserve the right to assert that a claim is indefinite, not enabled, or fails to meet the written description requirement of 35 U.S.C. §

112 based on any claim construction or interpretation position Plaintiff may take in this case or based on any claim construction the Court may further adopt in this case.

B. No Admission

Nothing disclosed herein is an admission or acknowledgement that any product accused of infringement by Plaintiff in its Infringement Contentions ("Accused Products"), or any of Defendants' other products or services, infringes any of the Asserted Claims.

Defendants also note that Plaintiff appears to rely on overly broad interpretations of the Asserted Claims. At the same time, Plaintiff's Infringement Contentions are in most places too general and vague to discern Plaintiff's infringement theories and how exactly Plaintiff contends each Accused Product meets or practices each element of the Asserted Claims. As a result, Defendants have been prejudiced in their ability to prepare these Invalidity Contentions. In addition, Plaintiff's Infringement Contentions, in many cases, continue to fail to put Defendants on notice of Plaintiff's interpretation of the Asserted Claims, further prejudicing Defendants' ability to identify relevant prior art. To the extent that Plaintiff is later permitted by the Court to amend its Infringement Contentions to cure the deficiencies of its current contentions or to pursue any currently undisclosed doctrine of equivalents theories, Defendants expressly reserve the right to supplement or amend these Invalidity Contentions to account for such amendments.

If any of the prior art references disclose the same functionality or feature of any of the Accused Products, Defendants reserve 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.

Attached hereto are representative claim charts that identify where the elements of the Asserted Claims of the Asserted Patents may be found in the prior art and further identifying why those elements are not novel or non-obvious. The references cited in the attached claim charts may disclose the limitations of the Asserted Claims expressly and/or inherently. The suggested obviousness combinations may be presented in conjunction with or in the alternative to Defendants' 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. Further, to the extent that Plaintiff contends that any of the references identified do not constitute prior art under pre-AIA 35 U.S.C. §102, Defendants reserve the right to rely upon other prior art references in the same patent family with substantially identical disclosures as evidence of invalidity based on the same theories as those disclosed below.

C. Reservation of Rights

Prior art not currently included in this disclosure may become relevant. Defendants are currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the prior art identified by Defendants. Defendants reserve the right to identify other references that would have made the addition of the allegedly missing limitation to the disclosed device or method obvious 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. Defendants further reserve the right to rely on any of the references produced at SAMSUNG_FB_0000083399 - SAMSUNG_FB_0000092049 in order to demonstrate the state of art at the alleged times of

invention and as evidence of the knowledge of one of ordinary skill in the art[1] in support of any motivations to modify or combine the charted prior art references with other references or knowledge.

Plaintiff may also be aware of additional prior art that is not known to Defendants. To the extent that Plaintiff produces additional prior art responsive to Defendants' discovery requests after these contentions are served, Defendants may supplement their invalidity contentions with prior art contained in such production once they have had a fair opportunity to review, analyze, and chart such prior art. Defendants reserve the right to amend their invalidity contentions with any additional potential prior art known by Plaintiff but not yet disclosed to Defendants.

Defendants provide these invalidity contentions and eligibility contentions only for the claims that have been asserted by Plaintiff, but reserve the right to seek invalidation of all claims in each of the Asserted Patents.

D. Ongoing Investigation

Defendants' investigation is ongoing, and Defendants expressly reserve the right to amend their disclosures and document production to account for evidence uncovered as their investigation continues. Such amendments include identifying and relying on additional references that may result from Defendants' further search and analysis. Defendants reserve the right to supplement these contentions in light of any additional prior art of which Plaintiff is aware and did not disclose to Defendants in discovery, or that might be subsequently disclosed by Plaintiff in response to Defendants' discovery requests. Defendants anticipate issuing subpoenas to third parties believed to have knowledge, documentation and/or corroborating evidence concerning some of the prior art

[1] For purposes of these Invalidity Contentions and Eligibility Contentions, the term "general knowledge" includes the common knowledge and common sense of a PHOSITA as well as the general knowledge of PHOSITAs in the field.

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 or previous assignees, of the references identified in these invalidity contentions. For example, Defendants anticipate issuing subpoenas to potential prior artists including but not limited to individuals and entities responsible for the development of prior art systems. Defendants reserve the right to supplement these contentions in light of any newly discovered information produced by these or other companies from which Defendants may seek discovery.

E. Incorporation by Reference

Defendants herein incorporate by reference all arguments made in any IPR petitions challenging the Asserted Patents, filed by Defendants or any other party, including any filings either on or after the filing of these Invalidity Contentions.

II. PRIORITY DATES OF THE CLAIMS OF THE ASSERTED PATENTS

Plaintiff asserted the following priority dates for the Asserted Claims in its Infringement Contentions:

Patent	Claims	Priority Date
’006 patent	1-8, 16	March 17, 2005, as well as the dates of any subsequent applications
’671 patent	1-4, 6-8, 10-11, 18-19	April 20, 2006
’348 patent	1-6, 13-17	April 1, 2005
’436 patent	1-17, 19	January 31, 2006, as well as the dates of any subsequent applications

Defendants contend that the asserted claims of the Asserted Patents are not entitled to these priority dates because the applications to which they claim priority do not provide written description support for one or more limitations of the asserted claims. For example, each of the asserted claims of the ’006 patent requires “said mobile device performing said comparing of said

multiple interfaces concurrently in real time during use of a current interface." However, U.S. Provisional Application 60/662,749, from which the '006 patent claims priority, does not provide written description support for this feature.

III. THE '006 PATENT IS INVALID

Defendants contend that the prior art references charted in Exhibits A-1 through A-13 and/or described below anticipate and/or render obvious, alone or in combination, one or more of the Asserted Claims of the '006 patent.

A. Identification of Prior Art

1. The '006 Patent is Anticipated by the Prior Art

Some or all of the Asserted Claims of the '006 patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits A-1 through A-13, 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.

Defendants identify the following references as anticipating one or more of the Asserted Claims of '006 patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the '006 patent. Further, Defendants contend 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 tables.

a) Prior Art Patents and Applications

Number	Published/Issued Date	Short Name	Exhibit Number
US20050043026A1	February 24, 2005	Brok	A-1
US20040170191A1	September 2, 2004	Guo	A-2
US20050090259A1	April 28, 2005	Jain	A-3
US20040151136A1	August 5, 2004	Gage	A-4
US20050002379A1	January 6, 2005	Bye	A-5
US20040077341A1	April 22, 2004	Chandranmenon	A-6
US20020075876A1	June 20, 2002	Yoshikawa	A-7
WO2005027556A1	March 24, 2005	Prasad	A-8
US20040067754A1	April 8, 2004	Gao	A-9

b) Prior Art Publications

Author or Publisher	Title	Publication/Use Date	Short Name	Exhibit Number
H.R. Neave and P.L. Worthington	DISTRIBUTION-FREE TESTS	1988	Neave	A-10
Bruce R. Fay	JMASM4: Critical Values For Four Nonparametric And/Or Distribution-Free Tests Of Location For Two Independent Samples	November 1, 2002	Fay	A-11

c) Prior Art Systems

On information and belief, the systems identified below were in public use, on sale, or otherwise available to the public before the priority dates of the Asserted Patents. Defendants'

further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional relevant prior art system and/or further information regarding the systems identified below, or other relevant prior art systems. Defendants reserve the right to supplement these Invalidity Contentions, based on subsequent investigation and discovery, including from third parties.

- The Nokia 9500 Communicator ("Nokia 9500") (Exhibit A-12).
- The Palm Treo 650 with Enfora Wi-Fi Adapter ("Treo 650") (Exhibit A-13)

Defendants additionally identify and rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed above. Defendants further incorporate Defendants reserve the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendants also incorporate by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '006 patent, Defendants contend 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 Defendants have not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2. The '006 Patent is Obvious Over the Prior Art.

To the extent Plaintiff argues that any limitation of the asserted claims of the '006 patent are not explicitly disclosed by an item of prior art identified above and in Exhibits A-1 through A-13, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art

and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid as obvious under 35 U.S.C. § 103.

a) Exemplary Combinations

Below is a listing of exemplary combinations of references that would render obvious the '006 Asserted Claims. In addition to the exemplary combinations of references below, the combination of (1) any of the references listed as anticipatory in Section III.A.1 with the knowledge of one of ordinary skill or (2) any of the exemplary combinations listed below with the knowledge of ordinary skill would render obvious the '006 Asserted Claims. For obviousness combinations identified for any dependent claim, a combination identified for any base claim from which that dependent claim depends may also apply to render obvious the dependent claim. In addition, to the extent a combination of three or more references is identified for any claim, a combination of any subset of the three references may also apply to render the claim obvious.

These identified combinations are exemplary, and Samsung reserves the right to identify additional combinations during expert discovery and later stages of the case.

(1) Claims 1-3, 5-8, and 16

- Brok in view of one or more of Guo, Chandranmenon, Neave, and Fay.
- Guo in view of one or more of Brok, Chandranmenon, Neave and Fay.
- Jain in view of one or more of Brok, Guo, Chandranmenon, Neave, and Fay.
- Gage in view of one or more of Brok, Guo, Chandranmenon, Neave, and Fay.
- Bye in view of one or more of Brok, Guo, Gage, Chandranmenon, Neave, and Fay.
- Chandranmenon in view of one or more of Brok, Guo, Neave and Fay.
- Yoshikawa in view of one or more of Brok, Guo, Jain, Gage, Chandranmenon, Prasad, Neave, and Fay.

- Prasad in view of one or more of Brok, Guo, Jain, Gage, Bye, Chandranmenon, Yoshikawa, Neave, and Fay.
- Gao in view of one or more of Brok, Guo, Jain, Gage, Bye, Chandranmenon, Yoshikawa, Prasad, Neave, and Fay.
- Nokia 9500 in view of one or more of Brok, Guo, Chandranmenon, Neave, and Fay.
- Treo 650 in view of one or more of Brok, Guo, Chandranmenon, Neave, and Fay.

(2) Claim 4

The same exemplary combinations listed above for Claim 3 apply to dependent Claim 4. Additional exemplary combinations for Claim 4 are listed below:

- Brok in view of one or more of Guo, Chandranmenon, Gage, Neave, and Fay.
- Guo in view of one or more of Brok, Chandranmenon, Gage, Neave, and Fay.
- Jain in view of one or more of Brok, Guo, Gage, Chandranmenon, Neave, and Fay.
- Chandranmenon in view of one or more of Brok, Guo, Gage, Neave, and Fay.
- Nokia 9500 in view of one or more of Guo, Gage, Neave, and Fay.
- Treo 650 in view of one or more of Brok, Guo, Chandranmenon, Gage, Neave, and Fay.

b) Motivation to Combine

No showing of a specific motivation to combine prior art is required to combine the references disclosed herein (*see e.g.,* Section III.A.1) and in the attached charts (Exhibits A-1 to A-9), as each combination of art would have yielded expected results and at most would simply represent a known alternative to one of skill in the art. *See Apple Inc. v. Samsung Elecs. Co*., 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co*., 869

F.3d 1336, 1344 (Fed. Cir. 2017); *see also KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 414 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, and instead applying an "expansive and flexible" approach). Indeed, the Supreme Court held that a PHOSITA 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." *KSR*, 550 U.S. at 419. Nevertheless, in addition to the information contained in the section immediately above and elsewhere in these contentions, Samsung hereby identifies motivations and reasons to combine.

One or more combinations of the prior art references identified above 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. *See Apple*, 839 F.3d at 1077; *Intercontinental Great Brands*, 869 F.3d at 1344. In addition, it would have been obvious to try combining 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 prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. *See ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed. Cir. 2016); *Sanofi-Aventis Deutschland GmbH v. Glenmark Pharms. Inc., USA*, 748 F.3d 1354, 1360 (Fed. Cir. 2014); *Bayer Pharma AG v. Watson Labs., Inc.*, 874 F.3d 1316, 1329 (Fed. Cir. 2017); *see also KSR*, 550 U.S. at 419. Further, the combinations of the prior art references identified above and in the claim charts would have been obvious because the combinations represent known potential options with a reasonable expectation of success. *See InTouch Techs., Inc. v. VGO Comms., Inc.*, 751 F.3d 1327, 1347 (Fed. Cir. 2014).

Additional evidence that there would have been a motivation 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 encompassed by the Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged inventions; and the background knowledge that would have been possessed by a PHOSITA. *See Arctic Cat Inc. v. Bombardier Recreational Prod. Inc.*, 876 F.3d 1350, 1359 (Fed. Cir. 2017); *Intercontinental Great Brands*, 869 F.3d at 1344; *Unwired Planet, LLC v. Samsung Inc.*, 841 F.3d 995, 1003 (Fed. Cir. 2016); *Norgren Inc. v. Int'l Trade Comm'n*, 699 F.3d 1317, 1322-23 (Fed. Cir. 2012).

The motivation to combine the teachings of the prior art references disclosed herein is also found in the references themselves and in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of PHOSITAs; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (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. *See KSR*, 550 U.S. at 416-21.

Furthermore, it would have been obvious to combine any of the prior art in in Exhibits A-1 through A-12 with each other, at least because all of these references relate to mobile devices and wireless networking or are applicable to these technologies.

For example, Brok relates to "[a] communication system selection algorithm (SSA) implemented by a mobile station chooses between available systems to select a system to serve the mobile station." Brok at Abstract. Guo relates "generally to wireless networks, and more particularly, to a wireless networking environment that includes more than one type of wireless network." Guo at [0001]. Gage relates to "[a] method for providing network communication to a wireless device through a plurality of wireless protocol links." Gage at Abstract. Similarly, Bye "relates generally to communication networks supporting multimedia packetized communications, and more particularly to a system for managing the quality of service provided by a wireless local area network." Bye at [0002]. Chandranmenon discloses "[a] mobile node [that] comprises: a plurality of network interfaces, each with a respective device driver; a network layer; a multi-interface driver capable of communication with each network interface by way of the respective device driver for that network interface." Chandranmenon at Abstract. Yoshikawa discloses a "base apparatus and a terminal apparatus," where the "base apparatus is configured to receive a broadcast television signal and convert a selected television program (channel) of the television signal to a communication signal to be transmitted to the terminal apparatus for display of the television program." Yoshikawa at [0009]. Further, "[t]he terminal apparatus" affords an end user "a portable television display device that may be selectively used in a wireless (radio) or wireline mode." *Id.* Prasad relates to a "[m]ethod and device for deciding a handover of a communication link between a mobile device and a current network to one of a number of available networks." Prasad at Abstract. Gao, moreover, relates to "[a] method, system, and business model … for

supporting handover between a mobile host and a corresponding node located in a heterogeneous network." Gao at Abstract. The Nokia 9500 device "has a separate GSM radio and wireless LAN radio. Switching off the device by pressing the power key on the device cover switches off both radios." Nokia 9500 Manual at 9. The Treo 650 device is "designed to work on a CDMA high-speed wireless data network." Treo Manual at 166. Further, the Treo 650 can access a Wi-Fi network when used with an Enfora Wi-Fi Adapter. *See* Enfora Manual at 6-7.

(1) "a mobile device comparing in substantially real-time the qualities of multiple interfaces, including at least one cellular radio interface and at least one wireless local area network interface, of said mobile device that connect to heterogeneous networks"

To the extent Plaintiff contends that any of the references identified in Section III.A.1 do not disclose "a mobile device comparing in substantially real-time the qualities of multiple interfaces, including at least one cellular radio interface and at least one wireless local area network interface, of said mobile device that connect to heterogeneous networks" as required by independent claims 1-3, the claims are nevertheless obvious.

For example, Brok discloses an "SSA runs continuously while the mobile unit is conducting a data session. The SSA therefore continuously determines a best available system (i.e., preferred candidate system) based on monitored conditions and the preferences of the primary service provider and/or user. By having already determined the best available system, the mobile unit is prepared to perform a handoff whenever the conditions associated with the currently serving system make it necessary to switch systems. Thus, the handoff proceeds seamlessly, even when the mobile unit is being handed off to a ***disparate type of network***." Brok at [0040] (emphasis added).

As another example, Guo discloses that "[i]f wireless network service becomes available from both the ***WWAN interface and the WLAN interface*** at the same moment, the Multi-Network

Manager component 1006 sends two Network Available notifications to the Policy Manager component 1010 notifying it that both the WWAN and the WLAN have become available, as well as each of the wireless network's quality of service statistics. One of the Policy Manager component's 1010 configured policies instructs the Policy Manager component 1010 to automatically select the wireless network that provides the highest quality of service. By comparing the quality of service statistics provided by the Multi-Network Manager component 1006, the Policy Manager component 1010 is able to determine the wireless network currently providing the highest quality of service and initiate entry into that wireless network." Guo at [0102].

Chandranmenon, moreover, discloses "Mobile IP has been implemented only on devices with one network interface. Newer end user devices are equipped with multiple kind of wireless (e.g., 3G and 802.11) and wired (e.g., Ethernet) network interfaces. Since the availability of networks corresponding to these interfaces is variable, there is a desire for software that automatically manages these interfaces and provides seamless mobility to an application." Chandranmenon at [0004].

Thus, it would have been obvious to modify and/or combine any of the references identified in Section III.A.1 with these teachings in a manner that renders obvious "said mobile device performing said comparing of said multiple interfaces concurrently in real time during use of a current interface." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite

number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(2) "using path quality metrics that are independent of how the QoI is measured"

To the extent Plaintiff contends that any of the references identified in Section III.A.1 do not disclose "using path quality metrics that are independent of how the QoI is measured" as required by independent claims 1-3, the claims are nevertheless obvious.

For example, Brok discloses "[t]he SSA compares the available systems according to conditions (e.g., bit rate and access cost), which are monitored for each available system. While comparing systems, the SSA applies a set of preference rules to the received measurements. The preference rules may include a set of service provider preference rules, which are either automatically or per user request downloaded to the mobile client from the primary service provider with whom the user subscribes. These rules may also include preferences configured by the user. Preference rules may also specify criterion for excluding certain systems such as cost incurred if connected to the system, data rates provided by the system, or other such |criterion|" Brok at [0007].

As another example, Guo discloses that "[t]he extent of the geographical coverage area of a wireless network cell, i.e., the wireless network cell size, may vary within a wireless network type as well as between types of wireless network. Average wireless network cell size is an example of a wireless network characteristic that differentiates types of wireless network, for

example, a wireless wide area network (WWAN) typically has a larger average wireless network cell size than a wireless local area network (WLAN). In what follows, a wireless wide area network and a wireless local area network are utilized as illustrative examples of different wireless network types, however, wireless network cell size need not be a distinguishing feature of the different wireless network types that comprise a wireless networking environment suitable for incorporating aspects of the invention. A key distinguishing feature of a network type is its quality of service (QoS) attributes, for example, bandwidth, data packet delay statistics (in wireless networks where digital data is broken up into data packets), security (including privacy and anti-fraud measures), cost efficiency and the like." Guo at [0041].

Chandranmenon, moreover, discloses that "[i]n other variations, the bandwidth of the interface is taken into account by the interface selection algorithm. In some embodiments, all score calculation may include terms for signal strength, bandwidth and user priority. In other embodiments, a bandwidth term may only be included if the signal strength is greater than the low threshold L (for the current interface) or greater than the high threshold H (for any other interface). In further embodiments, the bandwidth can be used as a proxy for user preference, or as default measure of user preference, which the user is free to change. When bandwidth is used in the score calculation, static bandwidth may be used, due to the difficulty in measuring the precise dynamic bandwidth at any moment." Chandranmenon at [0086].

Thus, it would have been obvious to modify and/or combine any of the references identified in Section III.A.1 with these teachings in a manner that renders obvious "said mobile device performing said comparing of said multiple interfaces concurrently in real time during use of a current interface." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one

known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(3) "said method including said mobile device [comparing path quality as a quickest change detection problem for observations from a new interface or] comparing path quality based on sequential two sample tests"

To the extent Plaintiff contends that any of the references identified in Section III.A.1 do not disclose "said method including said mobile device comparing path quality as a quickest change detection problem for observations from a new interface or comparing path quality based on sequential two sample tests" as required by independent claims 1 and 3, the claims are nevertheless obvious.

For example, a PHOSITA would have been motivated to modify any of the references identified in Section III.A.1, or combine them with Neave and/or Fay which disclose sequential two-sample tests. Moreover, a PHOSITA would have understood that the teachings of Neave and/or Fay are applicable to these references. as corroborated at least by U.S. Patent No. 7,398,052 ("Spirito").

Spirito relates to "a method and apparatus for determining if a signal received by a mobile user equipment in a communication system is transmitted via a direct or indirect communication

link." Spirito at 1:14-17. To make this determination, Spirito discloses "[a] statistical approach" that is "advantageous." *Id.*, 4:61-62. In particular, Spirito's mobile station is able to determine whether a set of observations (i.e., propagation delay and signal power of received signals) indicate that the signals were or were not received over a direct link "by using Hypothesis Testing techniques which are well known in the art of statistical analysis." *Id.*, 10:58-11:3.

As such, a PHOSITA would have been motivated to apply statistical analysis techniques, such as those disclosed in Neave and/or Fay, to the mobile device and wireless networking systems disclosed in Brok, Guo, Gage, Jain, Chandranmenon, Prasad, Yoshikawa, and Bye, and would have had a reasonable expectation of success in doing so. Indeed, Neave discloses various "tests suitable for when one sample, two samples, association between two samples and more than two samples (or data of a more complex form) are available for analysis." Neave at xv. Further, as Neave discloses, a "big advantage of distribution-free techniques [disclosed by Neave and Fay] is that they can easily cope with … less-detailed data, unlike more traditional statistical methods." Neave at 5. Thus, a PHOSITA would have recognized such techniques as being suitable to real-time wireless communication. Indeed, Fay confirms this. Fay discloses, for example, that "Rosenbaum's Test of Location," a particular type of two-sample test, is "quick in the sense that the method is easily remembered and the statistic, based on the length of an extreme run, easily calculated." Fay at 491.

Thus combining any of Brok, Guo, Gage, Jain, Chandranmenon, Prasad, Yoshikawa, and Bye with either Fay or Neave would have involved nothing more than a combination of well-known prior art elements according to known methods to yield predictable results. Further, in view of Spirito's use of statistical techniques and hypothesis testing, a PHOSITA would have been motivated to similarly apply statistical techniques to any of the above mobile device and wireless

networking references because doing so would have involved nothing more than the application of a known technique (statistical analysis in the form of two-sample testing) to a known mobile device ready for improvement to yield predictable results.

(4) "said method including said mobile device performing a one-sample change point detection method or performing a non-parametric and on-line two-sample method"

To the extent Plaintiff contends that any of the references identified in Section III.A.1 do not disclose "said method including said mobile device performing a one-sample change point detection method or performing a non-parametric and on-line two-sample method" as required by independent claim 2. the claim is nevertheless obvious.

For example, a PHOSITA would have been motivated to modify any of the references identified in Section III.A.1, or combine them with Neave and/or Fay which disclose on-line two-sample methods. Moreover, a PHOSITA would have understood that the teachings of Neave and/or Fay are applicable to these references. as corroborated at least by U.S. Patent No. 7,398,052 ("Spirito").

Spirito relates to "a method and apparatus for determining if a signal received by a mobile user equipment in a communication system is transmitted via a direct or indirect communication link." Spirito at 1:14-17. To make this determination, Spirito discloses "[a] statistical approach" that is "advantageous." *Id.*, 4:61-62. In particular, Spirito's mobile station is able to determine whether a set of observations (i.e., propagation delay and signal power of received signals) indicate that the signals were or were not received over a direct link "by using Hypothesis Testing techniques which are well known in the art of statistical analysis." *Id.*, 10:58-11:3.

As such, a PHOSITA would have been motivated to apply statistical analysis techniques, such as those disclosed in Neave and/or Fay, to the mobile device and wireless networking systems disclosed in Brok, Guo, Gage, Jain, Chandranmenon, Prasad, Yoshikawa, and Bye, and would

have had a reasonable expectation of success in doing so. Indeed, Neave discloses various "tests suitable for when one sample, two samples, association between two samples and more than two samples (or data of a more complex form) are available for analysis." Neave at xv. Further, as Neave discloses, a "big advantage of distribution-free techniques [disclosed by Neave and Fay] is that they can easily cope with … less-detailed data, unlike more traditional statistical methods." Neave at 5. Thus, a PHOSITA would have recognized such techniques as being suitable to real-time wireless communication. Indeed, Fay confirms this. Fay discloses, for example, that "Rosenbaum's Test of Location," a particular type of two-sample method, is "quick in the sense that the method is easily remembered and the statistic, based on the length of an extreme run, easily calculated." Fay at 491.

Thus combining any of Brok, Guo, Gage, Jain, Chandranmenon, Prasad, Yoshikawa, and Bye with either Fay or Neave would have involved nothing more than a combination of well-known prior art elements according to known methods to yield predictable results. Further, in view of Spirito's use of statistical techniques and hypothesis testing, a PHOSITA would have been motivated to similarly apply statistical techniques to any of the above mobile device and wireless networking references because doing so would have involved nothing more than the application of known technique (statistical analysis in the form of two-sample testing) to a known mobile device ready for improvement to yield predictable results.

(5) "said mobile device performing said comparing of said multiple interfaces concurrently in real time during use of a current interface"

To the extent Plaintiff contends that any of the references identified in Section III.A.1 do not disclose "said mobile device performing said comparing of said multiple interfaces concurrently in real time during use of a current interface" as required by independent claims 1-3, the claims are nevertheless obvious.

For example, Brok discloses an "SSA runs continuously ***while the mobile unit is conducting a data session***. The SSA therefore continuously determines a best available system (i.e., preferred candidate system) based on monitored conditions and the preferences of the primary service provider and/or user. By having already determined the best available system, the mobile unit is prepared to perform a handoff whenever the conditions associated with the currently serving system make it necessary to switch systems. Thus, the handoff proceeds seamlessly, even when the mobile unit is being handed off to a disparate type of network." Brok at [0040] (emphasis added).

As another example, Guo discloses a "Multi-Network Manager component 1006 ***continuously monitors each wireless network interface*** 1002, 1004 via the network device interface 1008, for example, monitoring wireless network availability, sampling received signal strength and collecting advertised transmission times. In an embodiment of the invention, the Multi-Network Manager component 1006 initiates the sending of probing data packets in order to measure the data packet collision probability in a wireless network that transmits data in packets. In an embodiment of the invention, the Multi-Network Manager component 1006 further processes the wireless network statistics that it collects and periodically and on request, provides them to a Policy Manager component 1010." Guo at [0088] (emphasis added).

Thus, it would have been obvious to modify and/or combine any of the references identified in Section III.A.1 with these teachings in a manner that renders obvious "said mobile device performing said comparing of said multiple interfaces concurrently in real time during use of a current interface." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar

devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(6) "said mobile device selecting one of said interfaces based on said comparing"

To the extent Plaintiff contends that any of the references identified in Section III.A.1 do not disclose "said mobile device selecting one of said interfaces based on said comparing" as required by independent claims 1-3, the claims are nevertheless obvious.

For example, Brok discloses that "the SSA compares the various measurements/conditions in order to determine a preferred candidate system for each of the disparate types of networks available. The preferred candidate system represents the "best" available network for each network according to the measurements/conditions. For example, when multiple valid 3G service providers are detected in the environment, along with a set of valid 802.11 WLANs and a set of valid Bluetooth WLANs, a preferred candidate system is selected for each of the set of 3G systems, the set of 802.11 systems, and the set of Bluetooth systems." Brok at [0031].

In another example, Guo discloses that "Policy Manager component 1010 receives quality of service statistics and wireless network status notifications for each wireless network for which the mobile computing device 102 has a wireless network interface 1002, 1004 from the Multi-Network Manager 1006 and utilizes the information in making wireless network vertical handoff

decisions consistent with the configured wireless network vertical roaming policies. For example, if the configured policy is automatically handoff to the wireless network able to provide the highest quality of service and the mobile computing device 102 user (not shown) has utilized one of the mobile computing device 102 applications 1012 to define quality of service solely.in terms of residual bandwidth, then the Policy Manager component 1010 does initiate a vertical handoff to a candidate wireless network that has a higher estimated residual bandwidth, as provided by the Multi-Network Manager component 1006." Guo at [0091].

Chandranmenon discloses "[i]n a preferred embodiment, the operation of the system is as follows: Once, the client is installed, the client GUI 102 allows the user to create a profile, containing a login/network access identifier, the mobile node's home IP address, and its home agent's IP address, security associations between the mobile node the home agent. It also allows the user to pick a subset from the available network interfaces to be used for roaming, and assigns them priorities. As the client is started up, and the user is logged in, the system brings up all the selected interfaces. From then on, it continuously selects an interface based on the user assigned priority, the signal strength of the network, and the availability of a mobility agent (such as a foreign agent) on the network; to use as the current interface. Once the interface is selected, the mobile IP protocol implementation sends out a solicitation message on that network to locate a foreign agent on that network. If the foreign agent is available, its registers itself with the home agent, through that foreign agent. Once the registration is complete, the driver layer is notified of the change in the current interface, and from then on the driver forwards all the outgoing traffic through the selected physical interface." Chandranmenon at [0055].

Thus, it would have been obvious to modify and/or combine any of the references identified in Section III.A.1 with these teachings in a manner that renders obvious "said mobile device

performing said comparing of said multiple interfaces concurrently in real time during use of a current interface." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(7) "the mobile device having limited knowledge of the quality of the current path"

To the extent Plaintiff contends that any of the references identified in Section III.A.1 do not disclose "the mobile device having limited knowledge of the quality of the current path" as required by dependent claim 4, the claim is nevertheless obvious.

For example, Guo discloses that "data packet collision probability (PCP) also serves as a wireless network quality of service measure. In an embodiment of the invention, data packet collision probability is calculated as follows. The mobile computing device 102 transmits probing data packets of a known size (e.g., 1000 bytes) at a known rate (e.g., 100 per second) for a known period of time (e.g., 1 second). The data packet collision probability is calculated as the ratio of the number of unacknowledged probing data packets to the total number of transmitted probing data packets." Guo at [0069].

As another example, Gage discloses an "illustrated embodiment of FIG. 6, two links, 802.11 and CDMA, are available. ***If the link qualities are unknown*** (e.g., at initialization, the link qualities will be unknown), a priority is given to monitoring the 802.11 link because the cost of the 802.11 link is generally lower than the cost of the CDMA link. Hence, it is assumed for the sake of example, that the MCL checks the suitability of the 802.11 link first, if it is available. Therefore, in FIG. 6, the quality of the 802.11 link is monitored, as indicated at box 600." Gage at [0042].

Thus, it would have been obvious to modify and/or combine any of the references identified in Section III.A.1 with these teachings in a manner that renders obvious "the mobile device having limited knowledge of the quality of the current path." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

B. Enablement and Written Description

Based on Defendants' present understanding of Plaintiff's asserted scope of the claims of the '006 patent, to the extent such positions can be understood from Plaintiff's Infringement Contentions, Defendants assert that the Asserted Claims of the '006 patent are invalid under 35

U.S.C. § 112 for failure to provide a written description that enables the full scope of the Asserted Claims based on at least the following claim terms, phrases, or limitations:

- "said mobile device performing said comparing of said multiple interfaces concurrently in real time during use of a current interface"
- "quickest change detection problem for observations from a new interface"
- "sequential two sample tests"
- "one-sample change point detection method"
- "a non-parametric and on-line two-sample method"
- "the mobile device having limited knowledge of the quality of the current path"

Based on Defendants' present understanding of Plaintiff's Infringement Contentions and apparent interpretation of the scope of the Asserted Claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C. Indefiniteness

Based on Defendants' present understanding of Plaintiff's asserted scope of the claims of the '006 patent, to the extent such positions can be understood from Plaintiff's Infringement Contentions, Defendants assert that the Asserted Claims of the '006 patent are invalid under 35 U.S.C. § 112 for reciting at least the following claim terms, phrases, or limitations:

- "A method for substantially real-time comparison of quality of interfaces (QoIs) by mobile devices having multiple heterogeneous interfaces that communicate over heterogeneous wireless networks,"
- "a mobile device comparing in substantially real-time the qualities of multiple interfaces"
- "using path quality metrics that are independent of how the QoI is measured"
- "a quickest change detection problem for observations from a new interface"
- "sequential two sample tests"
- "a one-sample change point detection method"
- "a non-parametric and on-line two-sample method"
- "said mobile device performing said comparing of said multiple interfaces concurrently in real time during use of a current interface"
- "without the mobile device knowing values for mean and median, performing a test of which interface has a higher mean or median"

- "having insufficiently many measurements for an estimate of the mean quality of the current path and its variance"
- "observations are not matched"
- "performing a test of the difference in average quality by testing for a difference in a location of samples"
- "performing the two sample test even when the mobile has more than two interfaces"

Based on Defendants' present understanding of Plaintiff's Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the specification and during prosecution, and given Plaintiff's apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

D. The Asserted Claims of the '006 Patent Are Invalid for Obviousness-Type Double Patenting

"Obviousness-type double patenting is a 'judicially created doctrine grounded in public policy (a policy reflected in the patent statute)' that 'prevent[s] the extension of the term of a patent, even where an express statutory basis for the rejection is missing, by prohibiting the issuance of the claims in a second patent not patentably distinct from the claims of the first patent.'" *Boehringer Ingelheim Int'l GmbH v. Barr Labs., Inc.*, 592 F.3d 1340, 1346 (Fed. Cir. 2010). "A later claim that is not patentably distinct from, i.e., is obvious over[ ] or anticipated by, an earlier claim is invalid for obviousness-type double patenting." *Abbvie Inc. v. Mathilda & Terence Kennedy Inst. of Rheumatology Tr.*, 764 F.3d 1366, 1374 (Fed. Cir. 2014).

Here, claims 1-8 and 16 of the '006 patent are invalid for obviousness-type double patenting in view of claims 1-14 of U.S. Patent No. 7,885,185 ("the '185 patent"), which is the immediate parent of the '006 patent.

IV. THE ’671 PATENT IS INVALID

Defendants contend that the prior art references charted in Exhibits B-1 through B-12 and/or described below anticipate and/or render obvious, alone or in combination, one or more of the Asserted Claims of the ’671 patent.

A. Identification of Prior Art

1. The ’671 Patent is Anticipated by the Prior Art

Some or all of the Asserted Claims of the ’671 patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits B-1 through B-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.

Defendants identify the following references as anticipating one or more of the Asserted Claims of ’671 patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the ’671 patent. Further, Defendants contend 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 tables

a) Prior Art Patents and Applications

Number	Published/Issued Date	Short Name	Exhibit Number
U.S. 8,027,304	September 27, 2011	Forsberg	B-1
U.S. 2004/0103282	May 27, 2004	Meier	B-2

U.S. 7,787,627	August 31, 2010	Sood '627	B-3
U.S. 7,969,945	June 28, 2011	Navali	B-4
U.S. 7,602,918	October 13, 2009	Mizikovsky	B-5
U.S. 2004/0242228	December 2, 2004	Lee	B-6
U.S. 2005/0032506	February 10, 2005	Walker '506	B-7

b) Prior Art Publications

Author or Publisher	Title	Publication/Use Date	Short Name	Exhibit Number
IEEE Computer Society	IEEE Std 802.11i-2004	July 23, 2004	802.11i	B-8
Y. Ohba	AAA-Key Derivation with Lower-Layer Parameter Binding	June 2005	Ohba	B-9
Bernard Aboba	EAP Key Management Framework 05	February 18, 2005	Aboba 2005	B-10

c) Prior Art Systems

On information and belief, the systems identified below were in public use, on sale, or otherwise available to the public before the priority dates of the Asserted Patents. Defendants' further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional relevant prior art system and/or further information regarding the systems identified below, or other relevant prior art systems. Defendants reserve the right to supplement these Invalidity Contentions, based on subsequent investigation and discovery, including from third parties.

- Cisco Aironet 1130AG (Exhibit B-11)

- Intel PRO/Wireless 2915ABG (Exhibit B-12)

Defendants additionally identify and rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed above. Defendants reserve the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendants also incorporate by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '671 patent, Defendants contend 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 Defendants have not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2. The '671 Patent is Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the '671 patent are not explicitly disclosed by an item of prior art identified above and in Exhibits B-1 through B-12, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid as obvious under 35 U.S.C. § 103.

a) Exemplary Combinations

Below is a listing of exemplary combinations of references that would render obvious the '671 Asserted Claims. In addition to the exemplary combinations of references below, the combination of (1) any of the references listed as anticipatory in Section IV.A.1 with the

knowledge of one of ordinary skill or (2) any of the exemplary combinations listed below with the knowledge of ordinary skill would render obvious the ’671 Asserted Claims. For obviousness combinations identified for any dependent claim, a combination identified for any base claim from which that dependent claim depends may also apply to render obvious the dependent claim. In addition, to the extent a combination of three or more references is identified for any claim, a combination of any subset of the three references may also apply to render the claim obvious.

These identified combinations are exemplary, and Samsung reserves the right to identify additional combinations during expert discovery and later stages of the case.

(1) Claims 1-4, 6-8, 10, 11, 18, 19

- Lee in view of one or more of Forsberg, Ohba, Sood ’627, Arkko 2005, Aboba 2005, 802.11i, Navali, Meier, and Krawczyk.
- Aboba 2005 in view of one or more of Sood ’627, Arkko 2005, Lee, Ohba, 802.11i, Meier, and Krawczyk.
- Sood ’627 in view of one or more of Forsberg, Ohba, Arkko, 802.11i, Lee, Aboba 2005, Navali, and Krawczyk.
- Meier in view of one or more of Sood ’627, Arkko 2005, Lee, Aboba 2005, 802.11i, Forsberg, and Navali, Ohba 2005, and Krawczyk.
- Ohba in view of one or more of Sood ’627, Arkko 2005, 802.11i, Lee, Aboba 2005, and Krawczyk.
- Cisco Aironet 1130AG in view of one or more of Forsberg, Ohba, Sood ’627, Arkko 2005, Lee, Aboba 2005, Meier, and Krawczyk.
- Intel PRO/Wireless 2915ABG in view of one or more of Forsberg, Ohba, Sood ’627, Arkko 2005, Lee, and Aboba 2005, Meier, and Krawczyk.

b) Motivation to Combine

No showing of a specific motivation to combine prior art is required to combine the references disclosed herein (*see e.g.,* Section IV.A.1) and in the attached charts (Exhibits B-1 through B-12), as each combination of art would have yielded expected results and at most would simply represent a known alternative to one of skill in the art. *See Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co.*, 869 F.3d 1336, 1344 (Fed. Cir. 2017); *see also KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 414 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, and instead applying an "expansive and flexible" approach). Indeed, the Supreme Court held that a PHOSITA 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." *KSR*, 550 U.S. at 419. Nevertheless, in addition to the information contained in the section immediately above and elsewhere in these contentions, Samsung hereby identifies motivations and reasons to combine.

One or more combinations of the prior art references identified above 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. *See Apple*, 839 F.3d at 1077; *Intercontinental Great Brands*, 869 F.3d at 1344. In addition, it would have been obvious to try combining 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 prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. *See ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed. Cir. 2016); *Sanofi-Aventis Deutschland GmbH v.*

Glenmark Pharms. Inc., USA, 748 F.3d 1354, 1360 (Fed. Cir. 2014); *Bayer Pharma AG v. Watson Labs., Inc.*, 874 F.3d 1316, 1329 (Fed. Cir. 2017); *see also KSR*, 550 U.S. at 419. Further, the combinations of the prior art references identified above and in the claim charts would have been obvious because the combinations represent known potential options with a reasonable expectation of success. *See InTouch Techs., Inc. v. VGO Comms., Inc.*, 751 F.3d 1327, 1347 (Fed. Cir. 2014).

Additional evidence that there would have been a motivation 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 encompassed by the Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged inventions; and the background knowledge that would have been possessed by a PHOSITA. *See Arctic Cat Inc. v. Bombardier Recreational Prod. Inc.*, 876 F.3d 1350, 1359 (Fed. Cir. 2017); *Intercontinental Great Brands*, 869 F.3d at 1344; *Unwired Planet, LLC v. Samsung Inc.*, 841 F.3d 995, 1003 (Fed. Cir. 2016); *Norgren Inc. v. Int'l Trade Comm'n*, 699 F.3d 1317, 1322-23 (Fed. Cir. 2012).

The motivation to combine the teachings of the prior art references disclosed herein is also found in the references themselves and in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of PHOSITAs; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (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. *See KSR*, 550 U.S. at 416-21.

Furthermore, it would have been obvious to combine any of the prior art in the references disclosed herein and in Exhibits B-1 through B-12 with each other, at least because all of these references relate to methods for authenticating a computing device to a network. *See, e.g.*, Forsberg at Abstract; Meier at Abstract; Sood '627 at 1:8-25; Navali at Abstract; Mizikovsky at Abstract; Lee at Abstract; Walker '506 at Abstract; 802.11i at ii; Arkko 2005 at 1-2; Ohba at 3; Aboba 2005 at 1; Krawczyk at 1-2; Intel PRO/Wireless 2915ABG Product Overview at p.1; Cisco Aironet 1130AG Series Data Sheet at p1.

(1) "A channel binding method"

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "a channel binding method", the claims are nevertheless obvious. For example, Forsberg discloses "the MN is able to derive AP specific SKs based on the information that the AP is advertising on the access link." Forsberg at 3:7-10. Forsberg further explains that, "[a]t a high level, the KDF is fed with the KR key and AP identity information and the result is a session key that is bound to the AP's identity. This mechanism is called channel binding." *Id.* at 10-13.

As another example, Ohba discloses "an alternate mechanism for creating a binding between a AAA-Key and EAP lower-layer parameters without need for an EAP method to carry the EAP lower-layer parameters." Ohba at 3. This alternate mechanism bind a key binding blob to to an "AAA-key." *Id.* at 7. This effectively "requires the EAP authenticator to have sent the same key-binding-blob to the EAP server as the one the EAP peer constructs from the lower-layer parameters obtained via the lower-layer protocol." *Id.* at 8.

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(2) "deriving a channel binding key from a channel binding master key bound to a key binding blob using a key derivation function"

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "deriving a channel binding key from a channel binding master key bound to a key binding blob using a key derivation function", the claims are nevertheless obvious. For example, Meier discloses a "new key hierarchy" for the 802.11 protocol. Meier at [0183]. In this new hierarchy, "the top of the hierarchy 100 is the NSK 102" and "[f]rom the NSK 102 is generated the KRK and BTK." *Id.* at [0184]. This key generation procedure uses "a PRF with the NSK, BSSID, STA-ID, NonceSTA and NonceSCM as parameters." *Id.* Then, "[f]rom the BTK 106 b is generated the PTKSN using a PRF with the BTK, RN and BSSID as parameters." *Id.*

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(3) "said key binding blob is a string that is constructed from static parameters advertised from an authenticator"

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "said key binding blob is a string that is constructed from static parameters advertised from an authenticator", the claims are nevertheless obvious. For example, Sood '627 discloses constructing a blob from static parameters including an "MD-ID" and an "SSID." Sood '627 at Fig. 5. This blob is subsequently bound to "PMK-R0." *Id.* Sood explains that "The MD-ID field 563 may include a name defined by a network administrator and advertised by one or more access points within a mobility domain (e.g., the mobility domain 290 of FIG. 2)." *Id.* at 7:38-41. The SSID "may include a value be defined by the IEEE 802.11 family of standards." *Id.* at 6:63-7:26. Additionally, Sood '627 discloses constructing a "PMK-R0-Name" from "MD-ID" and "SSID"

and subsequently constructing a blob from "PMK-R0-Name" and "R1KH-ID." *Id.* at Fig. 6. This blob is subsequently bound to "PMK-R1." *Id.* Sood explains that "The NAS identifier field 624 (e.g., R1KH-ID) … may be advertised in a beacon, a probe response, or a neighbor report." *Id.* at 8:21-42.

As another example, Arkko 2005 discloses that "in IEEE 802.11 networks a rogue operator can actually advertise the same identity (BSSID or SSID) as the local operator." Arkko 2005 at 5. Arkko 2005 further discloses "SSID" and "BSSID" as two parameters that may be authenticated between a server and a supplicant. *See* Arkko 2005 at 3, 10.

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(4) "the identity of the authenticator is one of said parameters"

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "the identity of the authenticator is one of said parameters", the claims are nevertheless obvious. For example, Forsberg discloses binding the "Public Identity of the Api" to a session key. Forsberg at 2:51-63. As another example, Aboba 2005 discloses binding the "B-Called-Station-Id = AP B MAC address" and "C-Called-Station-Id = AP C MAC address" to AAA Keys. Aboba 2005 at 21. As another example, Lee discloses binding "the MAC address of a new-AP" to "PMKnext." Lee at [0081].

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(5) "using an extensible authentication protocol server"

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "using an extensible authentication protocol server" to perform the method steps of claims 6, the claims are nevertheless obvious. For example, Lee discloses an embodiment in which "a higher-layer server (accounting server) manages neighbor APs for each AP and provides the neighbor APs with proactive keys necessary for roaming when an STA accesses the AP." Lee at [0062]. This higher layer server "generate PMKs for APs neighboring to a particular AP and transmits them to the neighbor APs." *Id.* at [0102].

As another example, Aboba 2005 discloses that the AAA key is "derived by the peer and EAP server." Aboba 2005 at 15. "Where a backend authentication server is present, the AAA-Key is transported from the backend authentication server to the authenticator." *Id.*

As another example, Ohba discloses that "the EAP peer and EAP server derives a AAA-Key from the MSK" and the AAA-key is "transferred from the EAP server and the EAP authenticator." Ohba at 4, 7.

As another example, Sood '627 discloses that a "NAS 330 may generate a plurality of second-level derived authentication keys based on the first-level derived authentication key. The NAS 330 may receive the first-level derived authentication key from an authentication server." Sood '627 at 5:55-63. The first-level derived authentication key may be generated by the authentication serve. *See id.* at 6:63-7:26.

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or

products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(6) "static parameters advertised from an authenticator using an authenticator-supplicant protocol."

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "static parameters advertised from an authenticator using an authenticator-supplicant protocol", the claims are nevertheless obvious. For example, Aboba 2005 discloses that "IEEE 802.11 [IEEE80211] also provides integrated discovery support utilizing Beacon and/or Probe Request/Response frames, allowing the peer (known as the station or STA) to determine the MAC address and capabilities of one or more authenticators (known as Access Point or APs)." Aboba 2005 at 8.

As another example, Lee discloses that network parameters may be broadcast in an "802.11 Boacon [*sic.*]." Lee at Fig. 12. Lee further confirms that a device may search for access points "simply by listening for beacon messages." *Id.* at [0019].

As another example, 802.11i discloses that a device may receive "a Beacon or Probe Response frame from a MAC address with which it has not completed a 4-Way Handshake." 802.11i at 19. Similarly, 802.11i notes that a device and an access point "establish an initial

security association" and the first step is the device "selecting among APs that advertise an appropriate SSID." *Id.* at 64

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(7) "using the channel binding master key for protecting an authenticator-supplicant protocol."

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "using the channel binding master key for protecting an authenticator-supplicant protocol", the claims are nevertheless obvious. For example, Sood '627 discloses that "the MSK may be used to generate a first-level derived authentication key such as, for example, a pairwise master key (PMK)." Sood '627 at 6:56-59. Furthermore, "The NAS 330 may generate a plurality of second-level derived authentication keys based on the first-level derived authentication key." *Id.* at 5:55-57. Additionally, "The subscriber station 220 and the access point 230 may mutually

derive session keys for the session based on a corresponding second-level derived authentication key." *Id.* at 9:2-5. These session keys are used by access points "to establish a communication session with the subscriber station." *Id.* at 13:49-53.

As another example, Lee discloses "An AP generates PMKs for neighbor APs managed in its AP-neighborhood graph and transmits the PMKs to the neighbor APs using a proactive caching technique accomplished by the IAPP protocol. When an STA roams to one of the neighbor APs, a security system operates based on the PMK provided to the neighbor AP, thereby enabling fast roaming." Lee at [0076].

As another example, Aboba 2005 discloses that a AAA-Keys may be derived from an AMSK. Aboba 2005 at 21. Later, a PMK is generated from an AAA-Key according to "PMK = AAA-Key(0,31)." *Id.* at 68. Furthermore, "the PTK is derived from the PMK." *Id.* The first 128 bits of the PTK "is used to provide data origin authenticity in the TSK derivation" while the remaining bits of the PTK form "Temporal Key 1" and Temporal Key 2" the usage of which are ciphersuit specific. *Id.*

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on

design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(8) "a server and the supplicant create a channel binding key used for an authenticator"

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "a server and the supplicant create a channel binding key used for an authenticator", the claims are nevertheless obvious. For example, Sood '672 discloses that "the authentication server 210 and the subscriber station 220 (e.g., via a supplicant) may communicate with each other to generate the MSK." Sood '627 at 6:51-62. Further, "[b]ased on the MSK, the authentication server 210 may generate a first-level derived authentication key."

As another example, Lee discloses an embodiment in which "[h]igher-layer servers manage neighbor APs for individual APs by their AP-neighborhood graphs. When necessary, the servers generate PMKs for APs neighboring to a particular AP and transmits them to the neighbor APs." Lee at [0102]. Furthermore, "the STA can directly generate PMKnext from next APmac received from AP_AP_B." *Id.* at [0083].

As another example, Aboba 2005 discloses that "the backend authentication server provides keying material to additional authenticators in order to facilitate fast handoff." Aboba 2005 at 21. Additionally, "keying material is derived on both the peer and the EAP server" including "in situations where it is necessary to pre-establish EAP security associations in order to decrease handoff or roaming latency." *Id.* at 7, 9.

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method".

For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(9) "the server transfers the channel binding key to the authenticator"

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "the server transfers the channel binding key to the authenticator", the claims are nevertheless obvious. For example, Sood '672 discloses that "the authentication server 210 may encrypt or wrap the first-level derived authentication key and forward the first-level derived authentication key to the access point 230 (420)." Sood '627 at 7:64-8:2.

As another example, Lee discloses that "a higher-layer server (accounting server) manages neighbor APs for each AP and provides the neighbor APs with proactive keys necessary for roaming when an STA accesses the AP." Lee at [0062].

As another example, Aboba 2005 discloses that "[w]here a backend authentication server is present, the AAA-Key is transported from the backend authentication server to the authenticator, wrapped within the AAA-Token." Aboba 2005 at 14.

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(10) "the supplicant and the authenticator verify proof of possession of the channel binding key over an authenticator-supplicant protocol."

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "the supplicant and the authenticator verify proof of possession of the channel binding key over an authenticator-supplicant protocol", the claims are nevertheless obvious. For example, Forsberg discloses a method to associate a device to an access point that includes the access point "send[ing] re-association confirm message to the UE. This message is signed with the newly derived ciphering key and the context id and new RLID are encrypted." Forsberg at 13:17-23.

As another example, Ohba discloses that "the EAP peer and the EAP authenticator verify the possession of the AAA-Key via a secure association protocol to establish a secure association." Ohba at 8.

As another example, 802.11i discloses a "4-Way Handshake" procedure that operates to "Confirm that a live peer holds the PMK." 802.11i at 15-16. In 802.11i, a "KCK" derived from the PTK is "used by IEEE 802.1X to provided data origin authenticity in the 4-Way Handshake." *Id.* at 76.

As another example, Aboba 2005 discloses that the AAA-Key is "divided into two halves, the "Peer to Authenticator Encryption Key" (Enc-RECV-Key) and "Authenticator to Peer Encryption Key" (Enc-SEND-Key)." Aboba 2005 at 15. Additionally, Aboba 2005 discloses that an "EAPOL-Key Confirmation Key (KCK) is used to provide data origin authenticity in the TSK derivation. It utilizes the first 128 bits (bits 0-127) of the PTK." *Id.* at 68.

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(11) "said key derivation function is computed based on CBK =kdf+(CBMK, KBB)"

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "said key derivation function is computed based on CBK =kdf+(CBMK, KBB)", the claims are nevertheless obvious. For example, Ohba discloses the function "AAA-Key = KDF(MSK, AAA-Key-name|key-binding-blob)." Ohba at 7.

As another example, Sood discloses the functions "PMK-R0 = KDF-256(MSK, "R0 Key Derivation", SSID || MD-ID || R0KH-ID || 0x00 || SPA)," "PMK-R1 = KDF-256(PMK-R0, "R1 Key Derivation", PMK-R0-Name || R1KH-ID || 0x00 || SPA)," and "PTK = KDF-PTKLen(PMK-R1, "PTK Key Derivation", SNonce || ANonce || R0HK-ID || R1KH-ID || BSSID || SPA)." Sood '627 at Figs. 5-7.

As another example, 802.11i discloses the function "PTK ← PRF-X(PMK, "Pairwise key expansion", Min(AA,SPA) ‖ Max(AA,SPA) ‖ Min(ANonce,SNonce) ‖ Max(ANonce,SNonce))." 802.11i at 76.

As another example, Meier discloses a function to generate a KRK and a BTK defined as "PRF-384(NSK, "Cisco Key Management Base Key Generator" | BSSID | STA-ID | Nonce STA | NonceSCM)." Meier at Fig. 1. Additionally, Meier discloses the function "$MIC_{MN}1314$ = HMAC-MD5(KRK, MN-ID‖BSSID‖$RSNIE_{MN}$‖Timestamp‖RN)." *Id.* at [0246].

As another example, Krawczyk discloses a mechanism for message authentication using cryptographic has functions that "can be used with any iterative cryptographic hash function, e.g., MD5, SHA-1, in combination with a secret shared key." Krawczyk at 1.

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to

known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(12) "wherein said authenticator is an EAP authenticator, and wherein the EAP authenticator receives and processes the channel binding key as a Master Session Key (MSK)."

To the extent Plaintiff contends that any of the references identified in Section IV.A.1 do not disclose "wherein said authenticator is an EAP authenticator, and wherein the EAP authenticator receives and processes the channel binding key as a Master Session Key (MSK)", the claims are nevertheless obvious. For example, Ohba discloses that "[w]hen an authentication and authorization procedure for a network access service succeeds using EAP with an EAP authentication method that is capable of generating a Master Session Key (MSK), a AAA-Key is derived from the MSK and transferred from the EAP server and the EAP authenticator." Ohba at 4.

As another example, Aboba 2005 discloses that an "AAA-Key" is "A key derived by the peer and EAP server, used by the peer and authenticator in the derivation of Transient Session Keys (TSKs)." Aboba 2005 at 14. Furthermore, "in existing implementations the MSK is used as the AAA-Key." *Id.*

It would have been obvious to modify and/or combine any of the references identified in Section IV.A.1 with these teachings in a manner that renders obvious "a channel binding method". For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

B. Enablement and Written Description

Based on Defendants' present understanding of Plaintiff's asserted scope of the claims of the '671 patent, to the extent such positions can be understood from Plaintiff's Infringement Contentions, Defendants assert that the Asserted Claims of the '671 patent are invalid under 35 U.S.C. § 112 for failure to provide a written description that enables the full scope of the Asserted Claims based on at least the following claim terms, phrases, or limitations:

- "a channel binding master key bound to a key binding blob using a key derivation function" (Claims 1, 6)
- "EAP" / "extensible authentication protocol" (Claims 2, 6, 19)
- "without said extensible authentication protocol authenticator needing to carry said access network parameters in extensible authentication protocol authentication methods" (Claim 6)

- "wherein said key binding blob is an octet-string that is constructed from static parameters advertised from an authenticator using an authenticator-supplicant protocol." (Claim 7)

- "a network side authenticator and said supplicant using the channel binding master key for protecting an authenticator-supplicant protocol." (Claim 8)

- "said key derivation function is computed based on CBK =kdf+(CBMK, KBB), where CBK represents channel binding key, CBMK represents channel binding master key, and KBB represents key binding blob." (Claim 18)

Based on Defendants' present understanding of Plaintiff's Infringement Contentions and apparent interpretation of the scope of the Asserted Claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C. Indefiniteness

Based on Defendants' present understanding of Plaintiff's asserted scope of the claims of the '671 patent, to the extent such positions can be understood from Plaintiff's Infringement Contentions, Defendants assert that the Asserted Claims of the '671 patent are invalid under 35 U.S.C. § 112 for reciting at least the following claim terms, phrases, or limitations:

- "key binding blob" (Claims 1, 6, 7, 11, 18)

- "[deriving a/to derive said] channel binding key from a channel binding master key bound to a key binding blob using a key derivation function" (Claims 1, 6)

- "without needing to carry [the parameters]/[said access network parameters]" (Claims 1, 6)

- "EAP" / "extensible authentication protocol" (Claims 2, 6, 19)

- "said parameters" (Claims 3, 4)

- "for use by the extensible authentication protocol authenticator as an extensible authentication protocol master session key" (Claim 6)

- "said key binding blob is an octet-string that is constructed from static parameters advertised from an authenticator using an authenticator-supplicant protocol." (Claim 7)

- "the channel binding key is derived from a channel binding master key bound to a key binding blob associated with the authenticator using a key derivation function" (Claim 11)

- "said key derivation function is computed based on CBK =kdf+(CBMK, KBB), where CBK represents channel binding key, CBMK represents channel binding master key, and KBB represents key binding blob." (Claim 18)

- "the EAP authenticator receives and processes the channel binding key as a Master Session Key (MSK)." (Claim 19)

Based on Defendants' present understanding of Plaintiff's Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the specification and during prosecution, and given Plaintiff's apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

D. 35 U.S.C. § 112 ¶ 4

35 U.S.C. § 112 ¶ 4 requires that "a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed." The Federal Circuit has held that "a violation of § 112, ¶ 4 renders a patent invalid just as violations of other paragraphs of § 112 would." *Pfizer, Inc. v. Ranbaxy Laboratories Ltd.*, 457 F.3d 1284, 1292 (Fed. Cir. 2006). A dependent claim may violate § 112 ¶ 4 when the claim fails to specify "a further limitation beyond those incorporated in [the independent claim]." *Hitkansut LLC v. United States*, 119 Fed. Cl. 258, 268 (2014).

Defendants assert that at least asserted claims 2 and 7 of the ’671 patent are invalid for failing to comply with 35 U.S.C. § 112 ¶ 4. In particular, claims 2 and 7 fail to specify a further limitation beyond the limitations incorporated in claim 1.

V. THE ’348 PATENT IS INVALID

Defendants contend that the prior art references charted in Exhibits C-1 through C-9 and/or described below anticipate and/or render obvious, alone or in combination, one or more of the Asserted Claims of the ’348 patent.

A. Identification of Prior Art

1. The ’348 Patent is Anticipated by the Prior Art

Some or all of the Asserted Claims of the ’348 patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits C-1 through C-9, 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.

Defendants identify the following references as anticipating one or more of the Asserted Claims of ’348 patent under 35 U.S.C. § 102. The table of anticipating references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the ’348 patent. Further, Defendants contend 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 tables

a) Prior Art Patents and Applications

Number	Published/Issued Date	Short Name	Exhibit Number
US5883899A	March 16, 1999	Dahlman	C-1
US20040218575A1	November 4, 2004	Ibe	C-2
US20020147008A1	October 10, 2002	Kallio	C-3
US20040018841A1	January 29, 2004	Trossen ’841	C-4
US20040165563A1	August 26, 2004	Hsu	C-5
US7957352B2	June 7, 2011	Vanghi	C-6
US20030193910A1	October 16, 2003	Shoaib	C-7
US20040005894A1	January 8, 2004	Trossen ’894	C-8

b) Prior Art Systems

On information and belief, the systems identified below were in public use, on sale, or otherwise available to the public before the priority dates of the Asserted Patents. Defendants’ further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional relevant prior art system and/or further information regarding the systems identified below, or other relevant prior art systems. Defendants reserve the right to supplement these Invalidity Contentions, based on subsequent investigation and discovery, including from third parties.

- Motorola CN620 (Exhibit C-9)

Defendants additionally identify and rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed

above. Defendants further incorporate Defendants reserve the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendants also incorporate by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the ’348 patent, Defendants contend 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 Defendants have not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2. The ’348 Patent is Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the ’348 patent are not explicitly disclosed by an item of prior art identified above and in Exhibits C-1 through C-9, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid as obvious under 35 U.S.C. § 103.

a) Exemplary Combinations

Below is a listing of exemplary combinations of references that would render obvious the ’348 Asserted Claims. In addition to the exemplary combinations of references below, the combination of (1) any of the references listed as anticipatory in Section V.A.1 with the knowledge of one of ordinary skill or (2) any of the exemplary combinations listed below with the knowledge of ordinary skill would render obvious the ’348 Asserted Claims. For obviousness combinations identified for any dependent claim, a combination identified for any base claim from which that

dependent claim depends may also apply to render obvious the dependent claim. In addition, to the extent a combination of three or more references is identified for any claim, a combination of any subset of the three references may also apply to render the claim obvious.

These identified combinations are exemplary, and Samsung reserves the right to identify additional combinations during expert discovery and later stages of the case.

(1) Claims 1, 2, and 13

- Dahlman in view of one or more of Kallio and Hsu
- Kallio in view of one or more of Dahlman and Hsu
- Hsu in view of one or more of Dahlman and Kallio
- Vanghi in view of one or more of Dahlman, Kallio, and Hsu
- Motorola CN620 in view of one or more of Dahlman, Kallio, Hsu, and Vanghi

(2) Claims 3, 4, 14, and 15

- Dahlman in view of one or more of Kallio, Hsu, Trossen ’841, Trossen ’894, and Ibe
- Kallio in view of one or more of Dahlman, Hsu, Trossen ’841, Trossen ’894, and Ibe
- Hsu in view of one or more of Dahlman, Kallio, Trossen ’841, Trossen ’894, and Ibe
- Vanghi in view of one or more of Dahlman, Kallio, Hsu, Trossen ’841, Trossen ’894, and Ibe
- Motorola CN620 in view of one or more of Dahlman, Kallio, Hsu, Vanghi, Trossen ’841, Trossen ’894, and Ibe

(3) Claims 5, 6, 16, and 17

- Dahlman in view of one or more of Kallio, Hsu, Trossen '841, Trossen '894, Ibe, and Shoaib
- Kallio in view of one or more of Dahlman, Hsu, Trossen '841, Trossen '894, Ibe, and Shoaib
- Hsu in view of one or more of Dahlman, Kallio, Trossen '841, Trossen '894, Ibe, and Shoaib
- Vanghi in view of one or more of Dahlman, Kallio, Hsu, Trossen '841, Trossen '894, Ibe, and Shoaib
- Motorola CN620 in view of one or more of Dahlman, Kallio, Hsu, Vanghi, Trossen '841, Trossen '894, Ibe, and Shoaib

b) Motivation to Combine

No showing of a specific motivation to combine prior art is required to combine the references disclosed herein (*see e.g.,* Section V.A.1) and in the attached charts (Exhibits C-1 through C-9), as each combination of art would have yielded expected results and at most would simply represent a known alternative to one of skill in the art. *See Apple Inc. v. Samsung Elecs. Co*., 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co*., 869 F.3d 1336, 1344 (Fed. Cir. 2017); *see also KSR Int'l Co. v. Teleflex, Inc*., 550 U.S. 398, 414 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, and instead applying an "expansive and flexible" approach). Indeed, the Supreme Court held that a PHOSITA 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." *KSR*, 550 U.S. at 419. Nevertheless, in addition to the

information contained in the section immediately above and elsewhere in these contentions, Samsung hereby identifies motivations and reasons to combine.

One or more combinations of the prior art references identified above 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. *See Apple*, 839 F.3d at 1077; *Intercontinental Great Brands*, 869 F.3d at 1344. In addition, it would have been obvious to try combining 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 prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. *See ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed. Cir. 2016); *Sanofi-Aventis Deutschland GmbH v. Glenmark Pharms. Inc., USA*, 748 F.3d 1354, 1360 (Fed. Cir. 2014); *Bayer Pharma AG v. Watson Labs., Inc.*, 874 F.3d 1316, 1329 (Fed. Cir. 2017); *see also KSR*, 550 U.S. at 419. Further, the combinations of the prior art references identified above and in the claim charts would have been obvious because the combinations represent known potential options with a reasonable expectation of success. *See InTouch Techs., Inc. v. VGO Comms., Inc.*, 751 F.3d 1327, 1347 (Fed. Cir. 2014).

Additional evidence that there would have been a motivation 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 encompassed by the Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged inventions; and the background knowledge that would have been possessed by a PHOSITA. *See*

Arctic Cat Inc. v. Bombardier Recreational Prod. Inc., 876 F.3d 1350, 1359 (Fed. Cir. 2017); *Intercontinental Great Brands*, 869 F.3d at 1344; *Unwired Planet, LLC v. Samsung Inc.*, 841 F.3d 995, 1003 (Fed. Cir. 2016); *Norgren Inc. v. Int'l Trade Comm'n*, 699 F.3d 1317, 1322-23 (Fed. Cir. 2012).

The motivation to combine the teachings of the prior art references disclosed herein is also found in the references themselves and in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of PHOSITAs; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (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. *See KSR*, 550 U.S. at 416-21.

Furthermore, it would have been obvious to combine any of the prior art in Exhibits C-1 through C-9 with each other, at least because all of these references relate to wireless networks and techniques for performing a handover from one network to another. *See, e.g.*, Dahlman at 1:17-25; Kallio at [0002]; Hsu at Abstract; Vanghi at 1:13-17; Trossen '841 at [0003]; Trossen '894 at [0003]; Ibe at Abstract; Shoaib at [0002], [0006].

(1) "having the mobile device use at least one silent period of an application to temporarily connect to at least one target network"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "having the mobile device use at least one silent period of an application to temporarily

connect to at least one target network" as required by independent claim 1, the claims are nevertheless obvious. For example, Hsu discloses that "MS 300 may decide to scan for WLAN coverage based on one or more factors," including, for example, "application status (e.g., on-going packet data session)." Hsu at [0082]. Additionally, Hsu explains that, "[t]he MS may choose not to scan for WLAN while active data session in the cellular network." *Id.* at [0062]. Instead, "[a]fter the MS becomes idle in the cellular network, the MS tunes away from the cellular network to scan for the WLAN." *Id.* Hsu also discloses that, "[i]f the MS detects WLAN coverage, the MS tunes back to the cellular network to notify the WLAN search result." *Id.* at [0064].

As another example, Dahlman discloses that, "[f]or the purposes of seamless handover, the mobile station's receiver can use the idle time to receive time slots from the new base station and use known synchronization techniques to synch to the new base station before the handover occurs, thereby speeding up the handover process by establishing communication with the new base station before dropping its connection with the old base station." Dahlman at 9:65–10:9. Dahlman also discloses that the receiver can use the idle time to scan multiple other frequencies. *Id.* at 9:33-44.

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "having the mobile device use at least one silent period of an application to temporarily connect to at least one target network." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of

identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(2) "having the mobile device use the at least one silent period to connect to the target network so that the mobile device receives advertisement messages from the target network"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "having the mobile device use the at least one silent period to connect to the target network so that the mobile device receives advertisement messages from the target network" as required by dependent claim 3, the claims are nevertheless obvious. For example, Hsu explains that "a WLAN may be advertised by a beacon transmitted by the WLAN." Hsu at [0008]. Hsu further discloses that "[t]he MS tunes to WLAN frequencies and actively or passively scans for the WLAN beacon." *Id.* at [0064]. Hsu also discloses that a "MS 300 may decide to scan for WLAN coverage based on one or more factors," including "an application status (e.g., on-going packet data session)." *Id.* at [0082]. To do so, Hsu explains that "the MS 300 listens for the WLAN beacon sent by the AP 320 on WLAN frequencies." *Id.*

As another example, Kallio discloses that, "[d]uring an IDLE mode, the Mobile Station (MS) 150 is first camped in a GSM network 100 and measures GSM neighbors and other radio so as to determine, via a GSM radio, base station identification information regarding to a WLAN cell like an ordinary GSM cell. The WLAN cell broadcasts GSM cell information messages

continuously or only when new Mobile Station or new device attempts to make contact via the wireless LAN 200." Kallio at [0035].

As another example, Ibe explains that "Agent discovery is the process by which the Foreign Agent advertises its availability on its network to the roaming Mobile Nodes. A Foreign Agent periodically broadcasts the agent discovery message, which enables the Mobile Nodes to obtain their COA. If a Mobile Node does not receive the agent discovery message within some predefined time interval after it has connected to the subnet, it broadcasts an agent solicitation message that asks the available Foreign Agents in the subnet to identify themselves to the Mobile Node." Ibe at [0010].

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "having the mobile device use the at least one silent period to connect to the target network so that the mobile device receives advertisement messages from the target network." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(3) "having the mobile device use the at least one silent period to establish a layer-2 connection or association with the target network for receiving IP-layer or high layer advertisements from the target network"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "having the mobile device use the at least one silent period to establish a layer-2 connection or association with the target network for receiving IP-layer or high layer advertisements from the target network" as required by dependent claim 4, the claims are nevertheless obvious. For example, Hsu explains that "a WLAN may be advertised by a beacon transmitted by the WLAN." Hsu at [0008]. Hsu further discloses that "[t]he MS tunes to WLAN frequencies and actively or passively scans for the WLAN beacon." *Id.* at [0064]. Hsu also discloses that a "MS 300 may decide to scan for WLAN coverage based on one or more factors," including "an application status (e.g., on-going packet data session)." *Id.* at [0082]. To do so, Hsu explains that "the MS 300 listens for the WLAN beacon sent by the AP 320 on WLAN frequencies." *Id.*

As another example, Kallio discloses that, "[d]uring an IDLE mode, the Mobile Station (MS) 150 is first camped in a GSM network 100 and measures GSM neighbors and other radio so as to determine, via a GSM radio, base station identification information regarding to a WLAN cell like an ordinary GSM cell. The WLAN cell broadcasts GSM cell information messages continuously or only when new Mobile Station or new device attempts to make contact via the wireless LAN 200." Kallio at [0035].

As another example, Ibe explains that "Agent discovery is the process by which the Foreign Agent advertises its availability on its network to the roaming Mobile Nodes. A Foreign Agent periodically broadcasts the agent discovery message, which enables the Mobile Nodes to obtain their COA. If a Mobile Node does not receive the agent discovery message within some predefined

time interval after it has connected to the subnet, it broadcasts an agent solicitation message that asks the available Foreign Agents in the subnet to identify themselves to the Mobile Node." Ibe at [0010].

Furthermore, Trossen '841 explains that "[w]hen the mobile node 111 changes its point of attachment from the current access point 113 to another access point connected to the same current access router 114 a network layer (layer 2) handover occurs, which is transparent to the routing at the IP layer. When the mobile node 111 changes its point of attachment from the current access point 113 to another access point 121 connected to another access router 122, also an IP layer handover occurs, preferably as defined by the Mobile IP of the IETF." Trossen '841 at [0034]; *see also* Trossen '894 at [0034]. Trossen '841 further discloses that, "[i]n order to prepare also for the coming IP level handover, the IP address of the potential next access routers 117 and 122 that connect to the potential next access points 115, 121 are identified." Trossen '841 at [0037]; *see also* Trossen '894 at [0037]. Trossen '841 discloses that, "[i]n some cases the AP beacon comprises the IP address of the access router the AP is connected to." Trossen '841 at [0037]; *see also* Trossen '894 at [0037].

Trossen '894 also explains that, before "the mobile node 111 sends a message including the identified address information of the new access router 122 to the current access router 114," "the mobile node identifies a potential new access router 122 to be involved in access router capability information transfer." Trossen '894 at [0043]. Trossen '894 discloses that the mobile may indicate the access router 122 by its L2 address or its IP address, and that "[s]ometimes the access point 121 beacon may include the IP address of the associated access router 122, and in such a case the mobile node 111 may forward it directly to the appropriate network node, here the serving access router 114." *Id.*

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "having the mobile device use the at least one silent period to establish a layer-2 connection or association with the target network for receiving IP-layer or high layer advertisements from the target network." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(4) "having the mobile device use the at least one silent period to perform layer-2, layer-3 or application layer authentication with the target network"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "having the mobile device use the at least one silent period to perform layer-2, layer-3 or application layer authentication with the target network" as required by dependent claim 5, the claims are nevertheless obvious. For example, Kallio discloses that "a Mobile Station (MS) 150 serves as the user's interface with the GSM network 100 and the wireless LAN 200, and includes a removable Subscriber Identity Module (SIM) card or chip (not shown) which contains an authentication algorithm for confirming the identity of the user (customer) and information

necessary to allow the user to roam in different coverage areas of different technologies." Kallio at [0024].

As another example, Hsu discloses that, "[a]fter the MS 300 detects WLAN coverage, receives the WLAN beacon, the MS 300 uses certain criteria to handover a packet data session from the cellular network to the WLAN. The criteria may include whether the MS is idle in cellular network (i.e., no dedicated channel) or whether the WLAN signal strength is stable, etc." Hsu at [0082]. Hsu also explains that, as part of handing over a packet data session, "the MS tunes to WLAN and performs access authentication and optionally Mobile IP registration to handover its packet data session to WLAN." Hsu at [0064]; *see also id.* at [0065] ("If the MS detects WLAN coverage, the MS does not return to the cellular network to notify the WLAN search result. Instead, the MS proceeds to perform WLAN access authentication and optionally Mobile IP registration to handover its packet data session to WLAN.").

As another example, Ibe discloses that "[t]he Control Server authenticates the device using whatever authentication scheme applies in the corporate network. For example, if the corporate network uses the IEEE 802.1X scheme, then the Access Controller is the authenticator that relays authentication requests from the devices to the authentication server (i.e., Control Server) in the wired network. The authentication process is typically carried out according to standard protocols and approaches. After the laptop has been successfully authenticated, it obtains its IP address through a DHCP server." Ibe at [0042].

As another example, Trossen '841 explains that "the potential next access router 122 analyses the received application context information and, based on the data in the information elements that relate to pro-active procedures, implements them. The necessity of the pro-active procedures may be explicitly indicated in the application context information, and/or the access

router may be able to determine the necessity based on the received information. Examples of such pro-active actions include reservation of resources for a defined quality of service, reservation of a defined transcoding entity for the use of mobile node, initialization of defined authentication procedures, or contacting defined communication entities in preparation of the expected handover." Trossen '841 at [0046].

As another example, Shoaib discloses "pre-authenticating a mobile terminal with the target network before the actual handover takes place." Shoaib at [0018].

And as noted previously, Trossen '841 explains that "[w]hen the mobile node 111 changes its point of attachment from the current access point 113 to another access point connected to the same current access router 114 a network layer (layer 2) handover occurs, which is transparent to the routing at the IP layer. When the mobile node 111 changes its point of attachment from the current access point 113 to another access point 121 connected to another access router 122, also an IP layer handover occurs, preferably as defined by the Mobile IP of the IETF." Trossen '841 at [0034]; *see also* Trossen '894 at [0034].

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "having the mobile device use the at least one silent period to perform layer-2, layer-3 or application layer authentication with the target network." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work

in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(5) "having the mobile device perform the following handoff actions during the at least one silent period: a) discovering neighboring network information"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "having the mobile device perform the following handoff actions during the at least one silent period: a) discovering neighboring network information" as required by dependent claim 6, the claims are nevertheless obvious. For example, Dahlman discloses "scan[ning] a list of andidate [*sic*] frequencies during idle time slot(s), so that the system will determine a reliable handover candidate if the signal quality on its current link degrades beneath a predetermined quality threshold." Dahlman at 2:44–59.

As another example, Hsu discloses "scan for WLAN coverage based on one or more factors," including "application status (e.g., on-going packet data session)." Hsu at [0082]. Further, Hsu discloses that "if the MS is idle in the cellular network (i.e., no dedicated channel), the MS may decide to scan for WLAN coverage based on one or more factors, e.g., user command, pre-configured preference, WLAN availability advertisement as received from the cellular network, etc." *Id.* at [0061].

As another example, Ibe explains that "Agent discovery is the process by which the Foreign Agent advertises its availability on its network to the roaming Mobile Nodes. A Foreign Agent periodically broadcasts the agent discovery message, which enables the Mobile Nodes to obtain their COA. If a Mobile Node does not receive the agent discovery message within some predefined

time interval after it has connected to the subnet, it broadcasts an agent solicitation message that asks the available Foreign Agents in the subnet to identify themselves to the Mobile Node." Ibe at [0010].

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "having the mobile device perform the following handoff actions during the at least one silent period: a) discovering neighboring network information." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(6) "having the mobile device perform the following handoff actions during the at least one silent period: … b) obtaining a local IP address from the target network"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "having the mobile device perform the following handoff actions during the at least one silent period: … b) obtaining a local IP address from the target network" as required by dependent claim 6, the claims are nevertheless obvious. For example, Hsu discloses that, "[a]fter the MS 300 detects WLAN coverage, receives the WLAN beacon, the MS 300 uses certain criteria

to handover a packet data session from the cellular network to the WLAN. The criteria may include whether the MS is idle in cellular network (i.e., no dedicated channel) or whether the WLAN signal strength is stable, etc." Hsu at [0082]. Hsu also explains that, as part of handing over a packet data session, "the MS tunes to WLAN and performs access authentication and optionally Mobile IP registration to handover its packet data session to WLAN." Hsu at [0064]; *see also id.* at [0065] ("If the MS detects WLAN coverage, the MS does not return to the cellular network to notify the WLAN search result. Instead, the MS proceeds to perform WLAN access authentication and optionally Mobile IP registration to handover its packet data session to WLAN.").

As another example, Ibe discloses that "[t]he authentication process is typically carried out according to standard protocols and approaches. After the laptop has been successfully authenticated, it obtains its IP address through a DHCP server." Ibe at [0042].

As another example, Trossen '841 explains that "Mobile IP, as defined in Request for Comments (RFC) 2002, is an enhancement of the Internet Protocol version 4 (IPv4) that adds mechanisms for forwarding Internet traffic to mobile nodes when they are connecting through a network other than their home network. Similar mechanisms have been developed for Internet Protocol version 6, referred to as IPv6. Each mobile node is assigned a permanent home address on its home network and a care-of address that identifies the current location of the device within a network and its subnets. Each time a mobile node moves to a different network, it acquires a new care-of address. A mobility agent (also known as Home Agent) on the home network associates each permanent address with its care-of address." Trossen '841 at [0007]; *see also* Trossen '894 at [0007].

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious ""having the mobile device perform the following handoff actions during the at least one silent period: … b) obtaining a local IP address from the target network." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(7) "having the mobile device perform the following handoff actions during the at least one silent period: … c) performing authentication with the target network"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "having the mobile device perform the following handoff actions during the at least one silent period: … c) performing authentication with the target network" as required by dependent claim 6, the claims are nevertheless obvious. For example, Kallio discloses that "a Mobile Station (MS) 150 serves as the user's interface with the GSM network 100 and the wireless LAN 200, and includes a removable Subscriber Identity Module (SIM) card or chip (not shown) which contains an authentication algorithm for confirming the identity of the user (customer) and

information necessary to allow the user to roam in different coverage areas of different technologies." Kallio at [0024].

As another example, Hsu discloses that, "[a]fter the MS 300 detects WLAN coverage, receives the WLAN beacon, the MS 300 uses certain criteria to handover a packet data session from the cellular network to the WLAN. The criteria may include whether the MS is idle in cellular network (i.e., no dedicated channel) or whether the WLAN signal strength is stable, etc." Hsu at [0082]. Hsu also explains that, as part of handing over a packet data session, "the MS tunes to WLAN and performs access authentication and optionally Mobile IP registration to handover its packet data session to WLAN." Hsu at [0064]; *see also id.* at [0065] ("If the MS detects WLAN coverage, the MS does not return to the cellular network to notify the WLAN search result. Instead, the MS proceeds to perform WLAN access authentication and optionally Mobile IP registration to handover its packet data session to WLAN.").

As another example, Ibe discloses that "[t]he Control Server authenticates the device using whatever authentication scheme applies in the corporate network. For example, if the corporate network uses the IEEE 802.1X scheme, then the Access Controller is the authenticator that relays authentication requests from the devices to the authentication server (i.e., Control Server) in the wired network. The authentication process is typically carried out according to standard protocols and approaches. After the laptop has been successfully authenticated, it obtains its IP address through a DHCP server." Ibe at [0042].

As another example, Trossen '841 explains that "the potential next access router 122 analyses the received application context information and, based on the data in the information elements that relate to pro-active procedures, implements them. The necessity of the pro-active procedures may be explicitly indicated in the application context information, and/or the access

router may be able to determine the necessity based on the received information. Examples of such pro-active actions include reservation of resources for a defined quality of service, reservation of a defined transcoding entity for the use of mobile node, initialization of defined authentication procedures, or contacting defined communication entities in preparation of the expected handover." Trossen '841 at [0046].

As another example, Shoaib discloses "pre-authenticating a mobile terminal with the target network before the actual handover takes place." Shoaib at [0018].

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "having the mobile device perform the following handoff actions during the at least one silent period: … c) performing authentication with the target network." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(8) "switching the mobile device's layer-2 connection to the target network"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "when a target network is selected and an actionable silent period is detected, switching the mobile device's layer-2 connection to the target network" as required by dependent claim 14, the claims are nevertheless obvious. For example, Trossen '841 explains that a handoff (or any change in connection) from one point of attachment to another involves switching (or creating) a layer-2 connection: "When the mobile node 111 changes its point of attachment from the current access point 113 to another access point connected to the same current access router 114 a network layer (layer 2) handover occurs, which is transparent to the routing at the IP layer. When the mobile node 111 changes its point of attachment from the current access point 113 to another access point 121 connected to another access router 122, also an IP layer handover occurs, preferably as defined by the Mobile IP of the IETF." Trossen '841 at [0034]; *see also* Trossen '894 at [0034].

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "when a target network is selected and an actionable silent period is detected, switching the mobile device's layer-2 connection to the target network." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use

in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(9) "after having the mobile device start said at least one handoff action, in the event that the current network continues to satisfy the mobile device's requirements, having the mobile device switch its network connection back to the current network"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "after having the mobile device start said at least one handoff action, in the event that the current network continues to satisfy the mobile device's requirements, having the mobile device switch its network connection back to the current network" as required by dependent claim 16, the claims are nevertheless obvious. For example, Dahlman discloses a mobile device performing a handoff based on whether a current network is above or below a predetermined quality threshold. Dahlman at 2:44–59 ("In TDMA systems, for example, the mobile station can be directed to scan a list of andidate [*sic*] frequencies during idle time slot(s), so that the system will determine a reliable handover candidate if the signal quality on its current link degrades beneath a predetermined quality threshold.").

As another example, Kallio discloses that a handover may only be requested if a current cell transmission level exceeds a threshold, for example, after receiving four measurement reports. Kallio at [0013]. For example, Kallio discloses that "the Mobile Station (MS) may drop off the GSM neighbor cells for a period of four measurement reports. At the same time, the Base Station (BS) may detect the number of GSM neighbor cells, when the played GSM cell is reported and the played GSM cell rx-level exceeds the threshold. After the four GSM measurement reports are

received and the played GSM cell rx-level still exceeds the threshold, the handover is requested." *Id.*

As another example, Ibe discloses that that a connection may "be automatically handed off to the WLAN without losing the connection when the user loses the signal of the WWAN." Ibe at [0018]. Ibe further provides that "The handoff is a mobile device-initiated handoff in which the mobile device (or laptop in this example) continuously measures the signal strength while it is in the WLAN to determine when it needs to be handed over to the WWAN. When the received signal strength indicator falls below a predefined threshold, the mobile device initiates the handoff process." *Id.* at [0045].

As another example, Shoaib discloses "a method of handing over from a first network to a second network that includes operating a mobile terminal via a first network, evaluating at least one criteria of either the first network or a second network and initiating a trigger that causes a handover from the first network to the second network so that the mobile terminal operates via the second network." Shoaib at [0014]. Shoaib further discloses that at least one such criteria is a "local signal criteria" that "look[s] at signal strength of the current point of attachment" and determines whether the signal strength is satisfactory. *Id.* at [0072].

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "after having the mobile device start said at least one handoff action, in the event that the current network continues to satisfy the mobile device's requirements, having the mobile device switch its network connection back to the current network." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve

similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(10) "after having the mobile device start said at least one handoff action, in the event that the current network does not continue to satisfy the mobile device's requirements, having the mobile device perform the remaining handoff steps to finish a handoff"

To the extent Plaintiff contends that any of the references identified in Section V.A.1 do not disclose "after having the mobile device start said at least one handoff action, in the event that the current network does not continue to satisfy the mobile device's requirements, having the mobile device perform the remaining handoff steps to finish a handoff" as required by dependent claim 17, the claims are nevertheless obvious. For example, Dahlman discloses a mobile device performing a handoff based on whether a current network is above or below a predetermined quality threshold. Dahlman at 2:44–59 ("In TDMA systems, for example, the mobile station can be directed to scan a list of andidate [*sic*] frequencies during idle time slot(s), so that the system will determine a reliable handover candidate if the signal quality on its current link degrades beneath a predetermined quality threshold.").

As another example, Kallio discloses that a handover may only be requested if a current cell transmission level exceeds a threshold, for example, after receiving four measurement reports. Kallio at [0013]. For example, Kallio discloses that "the Mobile Station (MS) may drop off the

GSM neighbor cells for a period of four measurement reports. At the same time, the Base Station (BS) may detect the number of GSM neighbor cells, when the played GSM cell is reported and the played GSM cell rx-level exceeds the threshold. After the four GSM measurement reports are received and the played GSM cell rx-level still exceeds the threshold, the handover is requested." *Id.*

As another example, Ibe discloses that that a connection may "be automatically handed off to the WLAN without losing the connection when the user loses the signal of the WWAN." Ibe at [0018]. Ibe further provides that "The handoff is a mobile device-initiated handoff in which the mobile device (or laptop in this example) continuously measures the signal strength while it is in the WLAN to determine when it needs to be handed over to the WWAN. When the received signal strength indicator falls below a predefined threshold, the mobile device initiates the handoff process." *Id.* at [0045].

As another example, Shoaib discloses "a method of handing over from a first network to a second network that includes operating a mobile terminal via a first network, evaluating at least one criteria of either the first network or a second network and initiating a trigger that causes a handover from the first network to the second network so that the mobile terminal operates via the second network." Shoaib at [0014]. Shoaib further discloses that at least one such criteria is a "local signal criteria" that "look[s] at signal strength of the current point of attachment" and determines whether the signal strength is satisfactory. *Id.* at [0072].

It would have been obvious to modify and/or combine any of the references identified in Section V.A.1 with these teachings in a manner that renders obvious "after having the mobile device start said at least one handoff action, in the event that the current network does not continue to satisfy the mobile device's requirements, having the mobile device perform the remaining

handoff steps to finish a handoff." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

B. Enablement and Written Description

Based on Defendants' present understanding of Plaintiff's asserted scope of the claims of the '348 patent, to the extent such positions can be understood from Plaintiff's Infringement Contentions, Defendants assert that the Asserted Claims of the '348 patent are invalid under 35 U.S.C. § 112 for failure to provide a written description that enables the full scope of the Asserted Claims based on at least the following claim terms, phrases, or limitations:

- "while the mobile device is using the current network to transport application traffic and the current network satisfies the mobile device's requirements" (claim 1)
- "having the mobile device use at least one silent period of an application to temporarily connect to at least one target network" (claim 1)
- "having the mobile device connect successfully to the target network" (claim 15)
- "before a current actionable silent period expires, having the mobile device enter an information discovery phase to listen to the target network's advertisement messages to learn information needed to perform handoffs at different protocol layers to the target network" (claim 15)

Based on Defendants' present understanding of Plaintiff's Infringement Contentions and apparent interpretation of the scope of the Asserted Claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C. Indefiniteness

Based on Defendants' present understanding of Plaintiff's asserted scope of the claims of the '348 patent, to the extent such positions can be understood from Plaintiff's Infringement Contentions, Defendants assert that the Asserted Claims of the '348 patent are invalid under 35 U.S.C. § 112 for reciting at least the following claim terms, phrases, or limitations:

- "while the mobile device is using the current network to transport application traffic and the current network satisfies the mobile device's requirements" (claim 1)
- "at least one silent period of an application" (claim 1)
- "having the mobile device use at least one silent period of an application to temporarily connect to at least one target network" (claim 1)
- "to proactively perform at least one handoff action" (claim 1)
- "wherein said mobile device sends or receives substantially no traffic over the current access network during the at least one silent period" (claim 2)
- "having said mobile device select a target network to which the mobile may switch to" (claim 13)
- "when a target network is selected and an actionable silent period is detected, switching the mobile device's layer-2 connection to the target network" (claim 14)
- "having the mobile device connect successfully to the target network" (claim 15)
- "if the current actionable silent period has not expired after the information discovery phase, having the mobile device start at least one handoff action" (claim 15)
- "after having the mobile device start said at least one handoff action, in the event that the current network continues to satisfy the mobile device's requirements, having the mobile device switch its network connection back to the current network" (claim 16)

- "after having the mobile device start said at least one handoff action, in the event that the current network does not continue to satisfy the mobile device's requirements, having the mobile device perform the remaining handoff steps to finish a handoff" (claim 17)

Based on Defendants' present understanding of Plaintiff's Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the specification and during prosecution, and given Plaintiff's apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

VI. THE '436 PATENT IS INVALID

Defendants contend that the prior art references charted in Exhibits D-1 through D-8 and/or described below anticipate and/or render obvious, alone or in combination, one or more of the Asserted Claims of the '436 patent.

A. Identification of Prior Art

1. The '436 Patent is Anticipated by the Prior Art

Some or all of the Asserted Claims of the '436 patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references identified in the claim charts included in Exhibits D-1 through D-8, 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.

Defendants identify the following references as anticipating one or more of the Asserted Claims of '436 patent under 35 U.S.C. § 102. The table of anticipating references below is

exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate the claims of the ’436 patent. Further, Defendants contend 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 tables

a) Prior Art Patents and Applications

Number	Published/Issued Date	Short Name	Exhibit Number
US7539175	August 31, 2006	White ‘175	D-1
US2005/0239497A1	October 27, 2005	Bahl	D-2
US 2004/0165563A1	August 26, 2004	Hsu	D-3
US20050197080A1	March 4, 2005	Ulupinar	D-4
WO2000019750A1	April 6, 2000	Sallberg	D-5
US20030130001A1	July 10, 2003	Weisshaar	D-6

b) Prior Art Publications

Author or Publisher	Title	Publication/Use Date	Short Name	Exhibit Number
M. Lott et al.	Interworking of WLAN and 3G systems	Oct. 2004	Lott	D-7

c) Prior Art Systems

On information and belief, the systems identified below were in public use, on sale, or otherwise available to the public before the priority dates of the Asserted Patents. Defendants’ further investigation and/or subsequent discovery from Plaintiff or third parties with knowledge regarding prior art systems may reveal additional relevant prior art system and/or further

information regarding the systems identified below, or other relevant prior art systems. Defendants reserve the right to supplement these Invalidity Contentions, based on subsequent investigation and discovery, including from third parties.

- Nokia Communicator 9500
- Nokia N90
- Nokia N91
- MOTOMESH 1.0 Mesh Wireless Router
- Palm T|X
- Sony CLIE NZ90 (Exhibit D-8)
- Motorola CN620

Defendants additionally identify and rely on any system, product, or public knowledge or use that embodies or otherwise incorporates any of the prior art patents and publications listed above. Defendants further incorporate Defendants reserve the right to identify and rely on systems that represent different versions or are otherwise related variations of the identified systems. Defendants also incorporate by reference any and all other prior art systems identified in any other case brought by Plaintiff and/or involving the Asserted Patents.

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the ’436 patent, Defendants contend 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 Defendants have not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

2. The ’436 Patent is Obvious Over the Prior Art

To the extent Plaintiff argues that any limitation of the asserted claims of the ’436 patent are not explicitly disclosed by an item of prior art identified above and in Exhibits D-1 through D-8, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid as obvious under 35 U.S.C. § 103.

a) Exemplary Combinations

Below is a listing of exemplary combinations of references that would render obvious the ’436 Asserted Claims. In addition to the exemplary combinations of references below, the combination of (1) any of the references listed as anticipatory in Section VI.A.1 with the knowledge of one of ordinary skill or (2) any of the exemplary combinations listed below with the knowledge of ordinary skill would render obvious the ’436 Asserted Claims. For obviousness combinations identified for any dependent claim, a combination identified for any base claim from which that dependent claim depends may also apply to render obvious the dependent claim. In addition, to the extent a combination of three or more references is identified for any claim, a combination of any subset of the three references may also apply to render the claim obvious.

These identified combinations are exemplary, and Samsung reserves the right to identify additional combinations during expert discovery and later stages of the case.

(1) Claims 1-7 and 10-14

- White ’175 in view of one or more of Hsu, Bahl, Sallberg, Ulupinar, Raghuram, Knapp, Famolari, Henry, Magalhaes, Weisshaar, Nokia Communicator 9500, Sony CLIE NZ90, and Motorola CN620.

- Bahl in view of one or more of White ’175, Hsu, Lott, Ulupinar, Raghuram, Henry, Magalhaes, Weisshaar, Knapp, Famolari, Nokia Communicator 9500, Sony CLIE NZ90, and Motorola CN620.

(2) Claim 8

- White '175 in view of one or more of Hsu, Bahl, Sallberg, Ulupinar, Raghuram, Knapp, Famolari, Henry, Weisshaar, Nokia Communicator 9500, Sony CLIE NZ90, Motorola CN620, Farzannejad, and Laha.

- Bahl in view of one or more of White '175, Hsu, Lott, Ulupinar, Raghuram, Knapp, Famolari, Henry, Weisshaar, Nokia Communicator 9500, Sony CLIE NZ90, Motorola CN620, Farzannejad, and Laha.

(3) Claim 9

- White '175 in view of one or more of Hsu, Bahl, Sallberg, Ulupinar, Raghuram, Knapp, Famolari, Henry, Weisshaar, Nokia Communicator 9500, Sony CLIE NZ90, Motorola CN620, Wehrenberg, and Ranta.

- Bahl in view of one or more of White '175, Hsu, Lott, Ulupinar, Raghuram, Knapp, Famolari, Henry, Weisshaar, Nokia Communicator 9500, Sony CLIE NZ90, Motorola CN620, Wehrenberg, and Ranta.

(4) Claims 15-17 and 19

- White '175 in view of one or more of Hsu, Bahl, Sallberg, Ulupinar, Raghuram, Knapp, Famolari, Henry, Weisshaar, Nokia Communicator 9500, Sony CLIE NZ90, Motorola CN620, Farzannejad, Laha Wehrenberg, and Ranta.

- Bahl in view of one or more of White '175, Hsu, Lott, Ulupinar, Raghuram, Weisshaar, Knapp, Famolari, Nokia Communicator 9500, Sony CLIE NZ90, Motorola CN620, Farzannejad, Laha, Wehrenberg, and Ranta.

b) Motivation to Combine

No showing of a specific motivation to combine prior art is required to combine the references disclosed herein (*see e.g.,* Section VI.A.1) and in the attached charts (Exhibits D-1 - D-8), as each combination of art would have yielded expected results and at most would simply represent a known alternative to one of skill in the art. *See Apple Inc. v. Samsung Elecs. Co*., 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co*., 869 F.3d 1336, 1344 (Fed. Cir. 2017); *see also KSR Int'l Co. v. Teleflex, Inc*., 550 U.S. 398, 414 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to

combine test, and instead applying an "expansive and flexible" approach). Indeed, the Supreme Court held that a PHOSITA 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." *KSR*, 550 U.S. at 419. Nevertheless, in addition to the information contained in the section immediately above and elsewhere in these contentions, Samsung hereby identifies motivations and reasons to combine.

One or more combinations of the prior art references identified above 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. *See Apple*, 839 F.3d at 1077; *Intercontinental Great Brands*, 869 F.3d at 1344. In addition, it would have been obvious to try combining 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 prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. *See ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed. Cir. 2016); *Sanofi-Aventis Deutschland GmbH v. Glenmark Pharms. Inc., USA*, 748 F.3d 1354, 1360 (Fed. Cir. 2014); *Bayer Pharma AG v. Watson Labs., Inc.*, 874 F.3d 1316, 1329 (Fed. Cir. 2017); *see also KSR*, 550 U.S. at 419. Further, the combinations of the prior art references identified above and in the claim charts would have been obvious because the combinations represent known potential options with a reasonable expectation of success. *See InTouch Techs., Inc. v. VGO Comms., Inc.*, 751 F.3d 1327, 1347 (Fed. Cir. 2014).

Additional evidence that there would have been a motivation 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 encompassed by the Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged inventions; and the background knowledge that would have been possessed by a PHOSITA. *See Arctic Cat Inc. v. Bombardier Recreational Prod. Inc.*, 876 F.3d 1350, 1359 (Fed. Cir. 2017); *Intercontinental Great Brands*, 869 F.3d at 1344; *Unwired Planet, LLC v. Samsung Inc.*, 841 F.3d 995, 1003 (Fed. Cir. 2016); *Norgren Inc. v. Int'l Trade Comm'n*, 699 F.3d 1317, 1322-23 (Fed. Cir. 2012).

The motivation to combine the teachings of the prior art references disclosed herein is also found in the references themselves and in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of PHOSITAs; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (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. *See KSR*, 550 U.S. at 416-21.

Furthermore, it would have been obvious to combine any of the prior art in in Exhibits D-1 through D-8 with each other, at least because all of these references relate to wireless networking and/or methods for controlling a mobile device's use of network interfaces. *See, e.g.*, White '175

at 1:23-28; Sallberg at Abstract; Ulupinar at Abstract; Bahl at Abstract; Hsu at Abstract; Lott at 507.

(1) "silent periods being brief intervals during which an application running on said mobile has no application traffic to send or receive"

To the extent Plaintiff contends that any of the references identified in Section VI.A.1 do not disclose "silent periods being brief intervals during which an application running on said mobile has no application traffic to send or receive," the claims are nevertheless obvious. For example, Hsu discloses an "example … when the laptop 600 has a current packet data session with the cellular network 606" and "the laptop [] detect[s] a strong WLAN signal through the resident tuner." Hsu at [0095]. In this scenario, Hsu explains that "the laptop may switch to the WLAN if the packet data session currently has no data pending transfer so as to minimize service interruption (e.g., downloading a file)." Hsu at [0096]. Hsu further discloses that "an application is active" when it is "sending/receiving data." Hsu at [0029].

As another example, Barany discloses a "discontinuous transmission (DTX) mode." Barany at 2:13-15. As explained in Barany, "[w]hen a mobile station is not transmitting, such as when a user is not talking, and there is no other traffic to communicate, the mobile station can enter into DTX mode to save power and also to reduce interference with other mobile stations." Barany at 2:15-19. As Barany further explains, "[d]uring DTX, a channel between the mobile station and the base station is idle (that is, no traffic is being communicated)." Barany at 2:19-21.

As another example, Bichot discloses a method for controlling a mobile terminal that determines whether there is an active call and, "for a mobile terminal that moves into a wireless LAN area from within a 3G cell, the handoff be effected when there are no existing active calls." Bichot at 6:21-29. Likewise, for example, Nizri discloses an "idle mode" that is a state where a mobile station is "between calls." Nizri at [0004].

As a another example, Henry discloses a "sequence of steps for scheduling access to multiple interfaces so as to minimize internal interference" and explains that "[a]n interface is said to be inactive when it is not receiving or transmitting data." Henry at 5:16-20.

It would have been obvious to modify and/or combine any of the references identified in Section VI.A.1 with these teachings in a manner that renders obvious "silent periods being brief intervals during which an application running on said mobile has no application traffic to send or receive." For example, the combination would have amounted to combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; use of known technique to improve similar devices (methods, or products) in the same way; applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or a teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(2) "having said mobile control radio interface processes based on both of said application awareness and said operating situation awareness"

To the extent Plaintiff contends that any of the references identified in Section VI.A.1 do not disclose "having said mobile control radio interface processes based on both of said application awareness and said operating situation awareness," the claims are nevertheless obvious. For example, Bahl discloses a "wireless network/interface selection scheme" that "can be used at any of a variety of circumstances during the operation of a computing device that includes one or more

wireless network interfaces capable of connecting to any one of multiple differing networks." Bahl at [0081]. These circumstances include "policy, network SSID, speed, congestion, interference, throughput, battery life, range, connectivity, security, cost per bit, and application throughput requirements." Bahl at [0081]. Bahl further explains that "[a] proper weight (WCW) is given to the range 914 factor based on the requirements of applications running on the station and the kind of mobility of the computing device (STA) itself." Bahl at [0113].

As another example, Ulupinar discloses a "Diversity Control Unit" with "multiple inputs for indicators, among them channel operating conditions 305, error rates 310, signal strength measurements 315, power control parameters 320 (e.g., power control subchannel), battery level readings 325, Quality of Service requirements 330, application requirements 335, user settings 340, higher layer control 345, transmitter control 350, and pilot channel information 355." Ulupinar at [0028].

As another example, the Sony CLIE NZ90 controls radio interface processes based on both application awareness and operating situation awareness. For example, upon information and belief, if the Sony CLIE NZ90 has a battery level over 20% and an application requiring internet connection is opened, the Sony CLIE NZ90 will connect to the internet using, *e.g.*, Bluetooth. *See* Hands-on Review: Sony Clie NZ90, Palm Infocenter, March 4, 2003 (available at https://www.palminfocenter.com/news/5065/sony-clie-nz90-review) ("Palm Infocenter") ("Another aspect of power management is that certain features will become unavailable as the battery is depleted. For instance at 35% you can't continue to use the flash, at 30% the camera function stops, and at 20% Bluetooth is turned off to conserve power."); PEG-NZ90 Operating Instructions, Sony Corporation, June 5, 2003 (available at https://www.sony.com/electronics/support/res/manuals/W000/W0008867M.pdf) ("Operating

Instructions") ("Start browsing websites, sending or receiving e-mail. Internet connection starts automatically.").

(3) "using a first interface that is heterogeneous to said second interface such as to use both said first and second heterogeneous interfaces concurrently during said silent period to support said first application"

To the extent Plaintiff contends that any of the references identified in Section VI.A.1 do not disclose "using a first interface that is heterogeneous to said second interface such as to use both said first and second heterogeneous interfaces concurrently during said silent period to support said first application," the claims are nevertheless obvious. For example, White '175 discloses a "mobile terminal" that "can 'load-share' traffic, i.e., it can distribute segments of traffic over a full set of heterogeneous networks, significantly improving the reliability and availability of communications." White '175 at Abstract. White '175 further provides that "users could 'sum' capacity across a set of networks to realize the bandwidth needed for high quality images or video, i.e. a mobile terminal can operate over multiple channels at the same time. An officer in a remote part of a metropolitan area could receive the same high quality images of suspects as his/her colleagues that are within range of a police WiFi network." White '175 at 21:62-22:21.

As another example, Hsu discloses a "Mobile Station (MS)" that "has two tuners that can tune to a cellular frequency and the WLAN frequency simultaneously." Hsu at [0077]. As Hsu explains, "[i]n this way, the MS 300 may scan for WLAN coverage while also scanning for cellular pages. Thus, the MS 300 detects WLAN coverage and performs system selection between WLAN and the cellular system using one tuner for each access medium." Hsu at [0077].

As another example, Raghuram discloses a method for "allow[ing] a multi-mode wireless communication device to more quickly select a channel or collect service provider information."

Raghuram at [0020]. As explained in Raghuram, "[t]his is done by simultaneously operating receivers using two different radio access technologies." Raghuram at [0020].

As another example, Laroia discloses "[m]ethods and apparatus which allow a wireless terminal (302) to simultaneously maintain connections with multiple base stations (304, 306)." Laroia at Abstract. In particular, Laroia explains that "When making the switch there can be an overlapping period of time. In this time the benefits of having two connections are evident. For example, the wireless terminal 302 may continue to transmit its data flows to first base station 304 in order to finish serving the data packets, which are in the middle of transmission, while the data flows of new, different data packets to the second base station 306, also start. The different data packets transmitted to the first and second base stations 304, 306 may include, e.g., IP packets representing different portions of the same message or file. The simultaneous data transmissions to two base stations 304, 306 is possible because the two connections are over two different communications channels." Laroia at [0073]. Moreover, Laroia explains that "[t]he technologies and/or spectrum used by distinct simultaneous connections can be the same or different." Laroia at [0032].

As a further example, Famolari discloses "[d]ata packets [] transmitted from a first access network to a first interface of a multiple interface device (MID), and identical data packets [] transmitted concurrently from a second access network to a second interface of the MID." Famolari at Abstract.

As a further example, Sugirtharaj discloses "[a] system and method in a packet-switched radio access network of sending data packets over a radio interface from a Mobile Station (MS) to a Radio Network Controller (RNC) using multiple data transmission paths. When the MS launches a new application through a first base station (BS1), a Multi-path Context Activator (MCA) in the

RNC determines whether the bandwidth required by the new application exceeds the bandwidth capacity of the radio interface portion of the first data transmission path. If so, the RNC identifies a second BS (BS2) that has the capacity to provide a portion of the radio interface bandwidth required. The MS then transmits separate data streams to BS1 and BS2 as over the radio interface." Sugirtharaj at Abstract.

As a further example, Magalhaes explains that "[m]ultiplexing is a very well understood communication technique for transmitting multiple streams through a single interface." Magalhaes at 1. Magalhaes further explains that "[i]nverse multiplexing is used to transmit a single stream through multiple interfaces." Magalhaes at 1. Magalhaes then discloses a "technique for using inverse multiplexing for aggregating bandwidth from heterogeneous network interfaces." Magalhaes at 1. Likewise, Einsiedler discloses an "architecture could see both, the mobile network as well as the fixed network as a packet pipe for IP." Einsiedler at 1.

(4) "having said mobile control processes of said mobile … based on said mobile running a non-real-time application thereon or a real-time application thereon"

To the extent Plaintiff contends that any of the references identified in Section VI.A.1 do not disclose "having said mobile control processes of said mobile … based on said mobile running a non-real-time application thereon or a real-time application thereon," the claims are nevertheless obvious. For example, Sugirtharaj discloses a method that "includes the steps of providing the MS with a first data transmission path through a first base station (BS1) and, when the MS launches a new real-time application, sending a new registration message from the MS to a server such as a Serving GPRS Service Node (SGSN) that performs radio access bearer control." Sugirtharaj at 1:59-64.

As another example, Farzannejad discloses that "[t]he phone control unit 42 here has a battery energy sensor 44, which senses the energy level of the battery 48. First a video telephone

session is started in the same ways in the first embodiment, step 68. The battery sensor 44 then detects a low energy level of the battery, step 70, and signals this to the phone control unit 42. The phone control unit 42 notifies the user in the already described manner, step 72, and then requests a handover to a second link having a lower level of information content, step 74. This is done in order to save energy and enable the session to go on a bit longer than it would otherwise be allowed to."

As another example, Korpela discloses a "mobile terminal" that, "[w]hen the user wishes to initiate a session, either a voice call or a data session using a computer, fax or videophone connected to the I/O port 17, the terminal control device 15 determines the type of session (i.e. the application) and selects the best available protocol to use (if several different data formats could support the session)." Korpela at 7:39-45.

As another example, White '175 discloses that "[r]eal-time applications will preferably use SIP to set up real-time session over the SCTP protocol." White '175 at 8:34-35. White '175 further explains that "[t]he databases 112-118 could contain a real-time list of each user's active traffic flows mapped to QoS classes applied to the set of available paths. Each class has specified values for a combination of the attributes to satisfy its specification. For example, four classes could be used so that conversational and streaming applications could be related to time-sensitive paths, and interactive and background applications could be related to bursty, best-effort delivery paths." White '75 at 12:5-20.

As another example, Bahl discloses that "priorities are potentially assigned to data traffic handled by the VCDs according to a variety of factors that generally reflect the individual needs of a user/application from which the data originates." Bahl at [0055]. Bahl further explains that "initial priority is based upon an application type (e.g., a DVD viewer program), the type of data

(e.g., phone conversation), or the destination of the data (a DVD player)." Bahl at [0055]. Moreover, Bahl explains that "a proper weight (WCW) is given to the range 914 factor based on the requirements of applications running on the station and the kind of mobility of the computing device (STA) itself." Bahl at [0113]. With reference to "the requirements of applications running on the station," Bahl further explains that "low limits on latency, jitter, and packet loss for Voice over IP and A/V streaming applications require minimal handoffs for optimal user experience." Bahl at [0113].

As another example, Laha discloses a "packet control component of an apparatus in one example monitors a data stream that comprises a plurality of data packets. The plurality of data packets comprise one or more first data packets associated with a real-time application and one or more second data packets non-associated with the real-time application. Upon a detection in the data stream of a data packet of the one or more first data packets, the packet control component initiates a network treatment for the data packet that is different from one or more network treatments applicable to the one or more second data packets." Laha at Abstract.

(5) "having said mobile control processes of said mobile … based on said mobile moving or not moving"

To the extent Plaintiff contends that any of the references identified in Section VI.A.1 do not disclose "having said mobile control processes of said mobile … based on said mobile moving or not moving," the claims are nevertheless obvious. For example, Bahl discloses a "wireless network/interface selection scheme" that "can be used at any of a variety of circumstances during the operation of a computing device that includes one or more wireless network interfaces capable of connecting to any one of multiple differing networks." Bahl at [0081]. As Bahl explains, "[a] proper weight (WCW) is given to the range 914 factor based on the requirements of applications running on the station and the kind of mobility of the computing device (STA) itself." With

reference to "the kind of mobility of the computing device (STA) itself," Bahl further explains that "a STA that is moving will experience more handoffs if the 802.11a wireless technology is used. Handoff, in turn, affects latency, jitter, and packet loss." Bahl at [0113].

As another example, Ranta provides a "method for operating a mobile station" that considers *inter alia* the variable "MOTION_THRESHOLD," which is "the limit between the decision as to whether the MS 100 is stationary or is moving." Ranta at Abstract, [0054].

As another example, Lott discloses "location-based triggers, which take into account the distance to the BS/AP or cell borders, and velocity-based triggers. The latter ones are already proposed within UTRAN standardisation in the HCS (hierarchical cell structure) scenario via rules for fast-moving terminals. If the velocity is too high, handover to macro cells is prioritised to provide efficient radio resource control by saving capacity in micro cells for local low-mobility users." Lott at 510.

As another example, Ng discloses a handoff method that predicts whether a terminal is "moving away" from a particular base station. *E.g.*, Ng at 11.

As another example, Wehrenberg discloses an accelerometer "to detect a movement including an acceleration and/or de-acceleration of the portable device." Wehrenberg at [0051]. Based on a detection of movement, Wehrenberg discloses activating or deactivating "one or more interfaces of the portable device." Wehrenberg at [0101].

B. Enablement and Written Description

Based on Defendants' present understanding of Plaintiff's asserted scope of the claims of the '436 patent, to the extent such positions can be understood from Plaintiff's Infringement Contentions, Defendants assert that the Asserted Claims of the '436 patent are invalid under 35 U.S.C. § 112 for failure to provide a written description that enables the full scope of the Asserted Claims based on at least the following claim terms, phrases, or limitations:

- "further including having said mobile control use of said interfaces by using a second interface, during a silent period of a second application running on said mobile and using said second interface, to support a first application running on said mobile and using a first interface that is heterogeneous to said second interface such as to use both said first and second heterogeneous interfaces concurrently during said silent period to support said first application" (Claim 1)

Based on Defendants' present understanding of Plaintiff's Infringement Contentions and apparent interpretation of the scope of the Asserted Claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the Asserted Patents and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

C. Indefiniteness

Based on Defendants' present understanding of Plaintiff's asserted scope of the claims of the '436 patent, to the extent such positions can be understood from Plaintiff's Infringement Contentions, Defendants assert that the Asserted Claims of the '436 patent are invalid under 35 U.S.C. § 112 for reciting at least the following claim terms, phrases, or limitations:

- "having said mobile control use of said interfaces" (Claim 1)
- "use both said first and second heterogeneous interfaces concurrently during said silent period" (Claim 1)
- "having said mobile be aware of its applications running on it" (Claims 1, 15)
- "having said mobile be aware of its operating situation" (Claims 1, 15)
- "application awareness" (Claims 1-4, 15, 19)
- "situation awareness" (Claims 1-4, 15, 19)
- "silent period" (Claims 1, 5-9, 11, 13-15, 17, 19)
- "said silent periods being brief intervals during which an application running on said mobile has no application traffic to send or receive" (Claims 1, 17, 19)
- "brief interval" (Claims 1, 17, 19)
- "use both said first and second heterogeneous interfaces concurrently during said silent period to support said first application" (Claim 1)
- "said first and second heterogeneous interfaces are used concurrently during said silent period to support application traffic of said first application for enhanced bandwidth support by transmitting packetized application traffic for said first application concurrently over both said first and second heterogeneous interfaces" (Claim 13)
- "certain process"/"certain processes" (Claim 10, 15, 17)

- "said silent period" (Claims 11, 13, 14)
- "a desired level" (Claim 11)
- "determining if the secondary interface qualifies to assist" (Claim 12)
- "transparent to and without interference to operation of said first application" (Claim 14)

Based on Defendants' present understanding of Plaintiff's Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the specification and during prosecution, and given Plaintiff's apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

VII. OTHER RELEVANT REFERENCES

Defendants reserve the right to rely on the prior art references identified in connection with one of the Asserted Patents in connection with any other of the Asserted Patents. Defendants further reserve the right to rely on any reference cited in or incorporated into the Asserted Patents. In addition, Defendants hereby cite the following additional references as being relevant to the subject matter claimed in the Asserted Patents. Defendants reserve the right to rely on one or more of the following references as anticipatory references under 35 U.S.C. § 102, as further evidence of obviousness under 35 U.S.C. § 103, as background references demonstrating the state of the art, as a limitation upon the doctrine of equivalents, or for any other purpose. Based on further investigation and discovery, based on positions that Plaintiff may take regarding the scope of the asserted claims, and/or based on the Court's claim construction, Defendants reserve the right to revise these contentions and to rely on these references to prove the invalidity of the Asserted Patents in a manner consistent with this Court's Rules and with the Federal Rules of Civil Procedure.

A. ’006 Patent

1. Prior Art Patents and Applications

Number	Published/Issued Date	Short Name
US6389285B1	5/14/2002	Escamilla
WO2003094546A1	11/13/2003	Billhartz
US 7398052 B2	7/8/2008	Spirito
US5790536A	8/4/1998	Mahany
EP1215930A2	6/19/2002	Bar-On
US6804532B1	10/12/2004	Moon
US7103024B2	9/5/2006	Wilson
US20040267928A1	12/30/2004	Petrus
US20060009211A1	1/12/2006	Sato
US6907243B1	6/14/2005	Patel
US7733822B2	6/8/2010	Gidwani
US6757543B2	6/29/2004	Moran
US20030100308A1	5/29/2003	Rusch
US20050233715A1	10/20/2005	Laroia
GB2333423A	7/21/1999	Jovin
US 2006/0084417 A1	4/20/2006	Melpignano
US7257105B2	8/14/2007	Molteni

2. Prior Art Publications

Author or Publisher	Title	Publication/Use Date	Short Name
Qian Zhang et al.	Efficient mobility management for vertical handoff between WWAN and WLAN	November 2003	Zhang
S. Balasubramaniam et al.	Vertical Handover Supporting Pervasive Computing in Future Wireless Networks	May 2004	Balasubramaniam
M. Lott et al.	Interworking of WLAN and 3G systems	October 5, 2004	Lott
P.M.L. Chan et al.	Mobility management incorporating fuzzy logic for a heterogeneous IP environment	December 2001	Chan
Wenhui Zhang	Handover decision using fuzzy MADM in heterogeneous networks	March 21-25, 2004	Zhang 2004
George Edwards et al.	Fuzzy handoff algorithms for wireless communication	March 16, 2000	Edwards
I.G. Kazantsev et al.	Statistical detection of defects in radiographic images in nondestructive testing	May 2002	Kazantsev
S.S. Mthombeni	Performance evaluation of GPRS/802.11b mobile-node initiated handover based on signal strength criteria	November 2004	Mthombeni

Author or Publisher	Title	Publication/Use Date	Short Name
Hongyang Bing et al.	Performance analysis of vertical handover in a UMTS-WLAN integrated network	September 7-10, 2003	Bing
P. Kasapidis et al.	Reliability of channel quality in cellular systems based on packet transmission	June 8-10, 1994	Kasapidis
Vinay J. Ribeiro et al.,	pathChirp: Efficient Available Bandwidth Estimation for Network Paths	April 2003	Ribeiro
Manish Jain et al.	End-to-End Available Bandwidth: Measurement Methodology, Dynamics, and Relation with TCP Throughput*	August 19-23, 2002	Jain 2002
Kevin Lai et al.	Measuring Link Bandwidths Using a Deterministic Model of Packet Delay	2000	Lai
Ningning Hu	Evaluation and Characterization of Available Bandwidth Probing Techniques	August 2003	Hu
Tricha Anjani et al.	A New Path Selection Algorithm for MPLS Networks Based on Available Bandwidth Estimation	2002	Anjani
R. S. Prasad et al.	Bandwidth estimation: metrics, measurement techniques, and tools	December 31, 2003	Prasad 2003
Stefan Saroiu et al.	SProbe: A Fast Technique for Measuring Bottleneck Bandwidth in Uncooperative Environments	2002	Saroiu

Author or Publisher	Title	Publication/Use Date	Short Name
Vijay K. Garg	IS-98 CDMA AND CDMA 2000	2000	Garg
B.K. Ghosh and P.K. Sen, eds.	HANDBOOK OF SEQUENTIAL ANALYSIS	1991	Ghosh
James J. Higgins	INTRODUCTION TO MODERN NONPARAMETRIC STATISTICS	2004	Higgins
Wayne W. Daniel	APPLIED NONPARAMETRIC STATISTICS	1990	Daniel
Nitis Mukhopadhyay et al. (eds.)	APPLIED SEQUENTIAL METHODOLOGIES, REAL-WORLD EXAMPLES WITH DATA ANALYSIS	2004	Mukhopadhyay
Peter Nemenyi et al.	STATISTICS FROM SCRATCH	1977	Nemenyi
Nokia Corporation	Nokia 9500 Communicator User Guide	2004-2005	Nokia 9500 Manual
Palm, Inc.	Using your Treo™ 650 Smartphone by Palm	2005	Treo 650 Manual
Enfora Inc.	Enfora® Wi-Fi® Adapter for Treo 600/650 Smartphone Users' Guide Revision 1.00	2005	Enfora Manual
Gizmodo.com	Enfora Wi-Fi Sled for Treo	January 10, 2005	Enfora Article

B. '671 Patent

1. Prior Art Patents and Applications

Number	Published/Issued Date	Short Name
U.S. 2002/0120844	August 29, 2002	Faccin

U.S. 2007/0274266	November 29, 2007	Oyama
U.S. 7,483,409	January 27, 2009	Zheng
U.S. 9,300,641	March 29, 2016	Laitinen
U.S. 2002/0018569	February 14, 2002	Panjwani
U.S. 8,370,638	February 5, 2013	Duane
U.S. 7,657,037	February 2, 2010	Callas
U.S. 8,630,420	January 14, 2014	Galante
U.S. 7,647,508	January 12, 2010	Sood ’508
K.R. 100527632	November 9, 2005	Chang
U.S. 9,015,473	April 21, 2015	Costa ’473
U.S. 2006/0077925	April 13, 2006	Rune ’925
U.S. 2003/0235305	December 25, 2003	Hsu
U.S. 2003/0200450	October 23, 2003	England
U.S. 9,425,958	August 23, 2016	Vennelakanti
U.S. 7,676,041	March 9, 2010	Horn
U.S. 8,532,304	September 10, 2013	Asokan
C.N. 1,553,730	December 8, 2004	Zhu
U.S. 7,882,349	February 1, 2011	Cam-Winget
U.S. 8,335,317	December 18, 2012	Vanstone
U.S. 2005/0232429	October 20, 2005	Chowdhury

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U.S. 2007/0097934	May 3, 2007	Walker ’934
U.S. 7,339,915	March 4, 2008	Jakkahalli
U.S. 8,050,232	November 1, 2011	Sachs
U.S. 2009/0129386	May 21, 2009	Rune ’386
U.S. 7,890,745	February 15, 2011	Qi
U.S. 8,621,201	December 31, 2013	Costa ’201

2. Prior Art Publications

Author or Publisher	Title	Publication/Use Date	Short Name
J. Arkko & P. Eronen	Authenticated Service Information for the Extensible Authentication Protocol	May 3, 2005	Arkko 2005
Jon Callas	Identity-Based Encryption with Conventional Public-Key Infrastructure	February 18, 2005	Callas 2005
Yih-Chun Hu	SEAD: secure efficient distance vector routing for mobile wireless ad hoc networks	2003	Hu
Bernard Aboba	Extensible Authentication Protocol (EAP)	November 14, 2004	Aboba 2004
D. M’Raihi	HOTP: An HMAC-Based One-Time Password Algorithm RFC4226	December 2005	M’Raihi
Xuhua Ding	Simple Identify-Based Cryptography with Mediated RSA	April 2003	Ding

Author or Publisher	Title	Publication/Use Date	Short Name
Carlisle M. Adams	On The Security of Key Derivation Functions	September 2004	Adams
J. Arkko	Extensible Authentication Protocol Method for UMTS Authentication and Key Agreement	April 5, 2004	Arkko 2004
Jose Puthenkulam	The Compound Authentication Binding Problem	April 5, 2004	Puthenkulam
Adi Shamir	Identity-Based Cryptosystems and Signature Schemes	2000	Shamir
D. Balfanz	Secret handshakes from pairing-based key agreements	2003	Balfanz
ETSI	ETSI TS 133 220 V6.3.0	December 2004	TS 133 220
H. Krawczyk	HMAC: Keyed-Hashing for Message Authentication	February 1997	Krawczyk

C. '348 Patent

1. Prior Art Patents and Applications

Number	Published/Issued Date	Short Name
US20050163078A1	July 28, 2005	Oba
US6512750B1	January 28, 2003	Palenius
US7215958B2	February 20, 2003	Kovacs
WO2004056144A1	July 1, 2004	Yang
US5483668A	January. 9, 1996	Malkamaki

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US7327754B2	September 4, 2003	Mills
US7356595B2	April 25, 2002	Soininen
CA2376004A1	December 28, 2000	Lupien
US5920549A	July 6, 1999	Bruckert
JP3405928B2	May 12, 2003	Takahashi
JP3286881B2	May 27, 2002	Shibuya
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US20040266426A1	December 30, 2004	Marsh
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US20040137902A1	July 15, 2004	Chaskar ’902
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2. Prior Art Publications

Author or Publisher	Title	Publication/Use Date	Short Name
Nokia	3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Requirements for support of radio resource management (FDD) (Release 4)	October 1, 2006	Nokia
C. Guo	A Seamless and Proactive End-to-End Mobility Solution for Roaming Across	June 1, 2004	Guo

Author or Publisher	Title	Publication/Use Date	Short Name
	Heterogeneous Wireless Networks		
M. Siebert et al.	Enhanced Measurement Procedures for Vertical Handover in Heterogeneous Wireless Systems	September 2003	Siebert
J. Korhonen	Introduction to 3G Mobile Communications	2003	Korhonen
A. O'Neill et al.	Routing and Handoff in the Edge Mobility Architecture	October 1, 2000	O'Neill
M. Manninen	WCDMA RADIO INTERFACE Radio Resource Management and 3GPP Radio Parameters	2004	Manninen
S. Waharte et al.	Selective Active Scanning for Fast Handoff in WLAN using Sensor Networks	January 2004	Waharte
A. Misra et al.	IDMP-based fast handoffs and paging in IP-based 4G mobile networks	2002	Misra
F. Barcelo et al.	Channel holding time distribution in public telephony systems (PAMR and PCS)	August 6, 2002	Barcelo
B. Jabbari et al.	Teletraffic Modeling and Analysis of Flexible Hierarchical Cellular Networks with Speed-Sensitive Handoff Strategy	1997	Jabbari
W. Chen et al.	An Adaptive Scheme for Vertical Handoff in Wireless Overlay Networks	August 2004	Chen

Author or Publisher	Title	Publication/Use Date	Short Name
A. Adya et al.	Architecture and techniques for diagnosing faults in IEEE 802.11 infrastructure networks	September 26, 2004	Adya
A. Hasswa et al.	Generic Vertical Handoff Decision Function for Heterogeneous Wireless Networks	March 2005	Hasswa
A. Nizhner et al.	Power-Adaptive Network Processors	December 15, 2003	Nizhner
A. Mishra *et al.*	An Empirical Analysis of the IEEE 802.11 MAC Layer Handoff Process	January 2003	Mishra
W. Li *et al.*	A Reliable Active Scanning Scheme for the IEEE 802.11 MAC Layer Handoff	August 2003	Li
F. Feng *et al.*	Explicit Proactive Handoff with Motion Prediction for Mobile IP	March 2004	Feng

D. '436 Patent

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Number	Published/Issued Date	Short Name
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US20030193910A1	Oct. 16, 2002	Shoaib
US2006/0193295	Aug. 31, 2006	White '295
US2007/0140161	Jun. 21, 2007	Silverman
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US20050096086A1	May 5, 2005	Singamsetty
JP2003318978A	November 7, 2003	Kawahara
US20040196786A1	October 7, 2004	Laha
US20060015621A1	January 19, 2006	Quinn
US2005/0190747A1	Sep. 1, 2005	Sindhwani

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Author or Publisher	Title	Publication/Use Date	Short Name
R. Wakikawa	Multiple Care-of Address Registration	Oct. 2006	Wakiwaka
L. Magalhaes et al.	End-to-end inverse multiplexing for mobile hosts	Nov. 5, 2003	Magalhaes
H. Einsiedler et al.	Mobility Support for a Future Communication Architecture	Sept. 2001	Einsiedler
R. Kravets et al.	Transport Level Mechanisms for Bandwidth Aggregation on Mobile Hosts	Nov. 2001	Kravets
C. Carter	User Devices Cooperating to Support Resource Aggregation	Jun. 2002	Carter
L. Magalhaes	A Transport Layer Approach to Host Mobility	2005	Magalhaes 2005

Author or Publisher	Title	Publication/Use Date	Short Name
R. Zheng	On-demand Power Management for Ad Hoc Networks	Jul. 09, 2003	Zheng
R. Kravets, et al.	Application-driven Power Management for Mobile Communication	Sep. 2000	Kravets 2000
C. Perkins	RFC 3344 - IP Mobility Support for IPv4	August 2002	Perkins 2002
C. Perkins	RFC 2002 - IP Mobility Support	October 1996	Perkins 1996
J. Solomon	RFC 2290 - Mobile-IPv4 Configuration Option for PPP IPCP	February 1998	Solomon 1998
L Dai, et al.	Inverse Multiplexing in Short-Range Multiplexing in Short-Range Multi-Transport Wireless Communications	March 17, 2003	Dai
K. Sklower, et al.	The PPP Multilink Protocol (MP)	November 1994	Sklower
Cisco	Multilink PPP for DDR - Basic Configuration and Verification	September 9, 2005	Cisco
R. Rejaie, et al.	RAP: An end-to-end rate-based congestion control mechanism for realtime streams in the Internet	August 6, 2002	Rejaie
K. Xu, et al.	TCP behavior across multihop wireless networks and the wired internet	September 28, 2002	Xu

Author or Publisher	Title	Publication/Use Date	Short Name
V. Brik, et al.	Eliminating handoff latencies in 802.11 WLANs using Multiple Radios: Applications, Experience, and Evaluation	August 4, 2005	Brik

VIII. SUBJECT-MATTER ELIGIBILITY OF THE ASSERTED PATENTS

Section 101 "defines the subject matter that may be patented under the Patent Act." *Bilski v. Kappos*, 561 U.S. 593, 601 (2010). Under § 101, the scope of patentable subject matter encompasses "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." *Id.* (quoting 35 U.S.C. § 101). These categories are not limitless, § 101 contains an important exception—abstract ideas are not patentable. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208 (2014). The determination of whether a claim recites patent-eligible subject matter under § 101 is guided by the two-step analytical framework set forth in *Alice*, *id.* at 2355. The first step requires determining whether the claims are directed to an abstract idea. *Id.* If so, the second step requires determining whether the claim elements, considered individually and as an ordered combination, "amount to significantly more" than the patent-ineligible concept. *Id.*

The first step in the Alice/Mayo test is to examine the fundamental concept, or the "focus" of the claim and determine whether the claim as a whole is directed to an abstract idea. *See Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015) ("Under step one of Mayo/Alice, the claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter."). While courts should be careful not to oversimplify the claims at this stage of the analysis, the analysis should not focus on excess verbiage or

implementation details, but instead focus on the "concept embodied by the majority of the limitations." *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014); *see also Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1256 (Fed. Cir. 2016) (examining claim after being "stripped of excess verbiage"). Transformation into a patent-eligible claim requires "more than simply stating the abstract idea while adding the words 'apply it.'" *Id.* (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.,* 132 S. Ct. 1289, 1294 (2012)). Also, a claim is not meaningfully limited if it includes only token or insignificant pre- or post-solution activity—such as merely identifying a technological environment. *Mayo*, 132 S. Ct. at 1297–98, 1300–01. Finally, "simply appending conventional steps, specified at a high level of generality," to abstract ideas cannot make those ideas patentable. *Mayo*, 132 S. Ct. at 1300; *see also Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1323 (Fed. Cir. 2012) ("Such a broad and general limitation does not impose meaningful limits on the claim's scope.").

The Federal Circuit has clarified that a relevant inquiry at Mayo/Alice step one is to "ask whether the claims are directed to a specific improvement in the capabilities of computing devices, or, instead, 'a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool.'" *Core Wireless Licensing S.A.R.L. v. LG Elecs., Inc.*, 880 F.3d 1356, 1361-62 (Fed. Cir. 2018) (quoting *Enfish, LLC*, 822 F.3d at 1336). In *Core Wireless Licensing*, the Federal Circuit noted that in Enfish, "unlike claims that merely 'add[ ] conventional computer components to well-known business practices,' the claimed self-referential table was 'a specific type of data structure designed to improve the way a computer stores and retrieves data in memory.'" *Id.* (quoting *Enfish*, 822 F.3d at 1338–39). The Federal Circuit further emphasized that claims directed to the improvement in the functioning of a computer must teach a specific and new method that enables a computer "to do things it could not do before." *Id.* For example, in *Finjan, Inc. v. Blue Coat*

Systems, Inc., the Federal Circuit "held claims directed to a behavior-based virus scanning method directed to patent eligible subject matter because they 'employ[ ] a new kind of file that enables a computer security system to do things it could not do before, ..." *Id.* (citing *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299 (Fed. Cir. 2018)).

As further disclosed in Ex. A-14, the '006 patent is directed to patent ineligible subject matter under 35 U.S.C. § 101.

As further disclosed in Ex. B-13, the '671 patent is directed to patent ineligible subject matter under 35 U.S.C. § 101.

As further disclosed in Ex. C-10, the '348 patent is directed to patent ineligible subject matter under 35 U.S.C. § 101.

As further disclosed in Ex. D-9, the '436 patent is directed to patent ineligible subject matter under 35 U.S.C. § 101.

These Eligibility Contentions address only those claims that Plaintiff has asserted in its Infringement Contentions against Defendants. Defendants incorporate by reference any and all other subject matter eligibility contentions that have or will be served in this case or any other case brought by Plaintiff and/or involving the Asserted Patents. Defendants incorporate by reference any and all other bases for invalidity identified during prosecution, reexamination, or any other proceeding before the United States Patent and Trademark Office regarding the Asserted Patents, or any other patents in the same family as any Asserted Patent.

Dated: November 18, 2024

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CERTIFICATE OF SERVICE

I hereby certify that on November 18, 2024 a true and correct copy of the foregoing document was served by electronic mail on all counsel of record.

/s/ Massiel Rivera