UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

NORDIC INTERACTIVE TECHNOLOGIES LLC, Plaintiffs, v. LG ELECTRONICS INC., and LG ELECTRONICS U.S.A., INC., Defendants.	Civil Action No. _6:21-cv-438 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Nordic Interactive Technologies LLC ("Nordic"), for its Complaint against Defendants LG Electronics Inc. ("LGE") and LG Electronics U.S.A. Inc. ("LGEUS") (collectively "Defendants" or "LG") state as follows:

NATURE OF THE CASE

1. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*, including 35 U.S.C. §§ 271, 281, 283, 284, and 285.

THE PARTIES

2. Plaintiff Nordic is a limited liability company organized and existing under the laws of the State of Texas, with its principal place of business at 5204 Bluewater Drive, Frisco, Texas 75036.

3. Defendant LGE is a corporation organized under the laws of South Korea, with its principal place of business at LG Twin Towers, 128 Yeoui-daero, Yeongdungpo-gu, Seoul, 07366, South Korea. Defendant LGE directly and/or through one or more of its subsidiaries, affiliates,

and/or intermediaries, including through Defendant LGEUS, conducts business in and is doing business in Texas and in this District and elsewhere in the United States, including, without limitation, using, offering to sell, selling, and/or importing mobile communications devices such as mobile phones, smartphones, and tablet PCs that embody the patented technology, enabling third party distributors and resellers to sell and offer to sell mobile communications devices, and enabling end-user purchasers to use such devices in this District. LGE is a parent corporation of Defendant LGEUS.

4. Defendant LGEUS is a corporation organized under the laws of the State of Delaware, with regular and established places of business in Texas at least at 9420 Research Blvd, Austin, Texas 78759; 21251-2155 Eagle Parkway, Fort Worth, Texas 76177; and 14901 Beach St, Fort Worth, TX 76177. LGEUS's registered agent for service of process in the State of Texas is Corporation Service Company, 211 E. 7th Street, Suite 620 Austin, TX 78701-3218. LGEUS has its headquarters at 1000 Sylvan Avenue, Englewood Cliffs, NJ 07632. Upon information and belief, LGEUS supports LGE's smartphone, mobile device, tablets, and TV business in the United States with local logistics, local sales, repair, and technical support in the United States. Upon information and belief, LGEUS has also established warehouse locations in the United States. Defendant LGEUS conducts business in and is doing business in Texas and in this District and elsewhere in the United States, including, without limitation, using, offering to sell, selling, and/or importing mobile communications devices such as mobile phones, smartphones, tablet PCs, and TVs that embody the patented technology, enabling third party distributors and resellers to sell and offer to sell mobile communications devices, and enabling end-user purchasers to use such devices in this District.

5. Upon information and belief, LGE controls and is the majority owner of LGEUS. LGE and LGEUS design, manufacture, use, import into the United States, sell, and/or offer for sale in the United States smartphones and other mobile devices under the "LG" brand.

6. Upon information and belief, LGE and its United States-based subsidiaries including LGEUS (which act as part of a global network of overseas sales and manufacturing subsidiaries on behalf of LGE) have operated as agents of one another and as parts of the same business group to work in concert together and enter into agreements with one another that are nearer than arm's length. For example, LGE alone and through at least LGEUS's activities, conducts business in the United States, including importing, distributing, and selling mobile devices that infringe the Patents in Suit in Texas and in this District. Through offers to sell, sales, imports, distributions, and other related agreements to transfer ownership of Defendants' mobile devices with distributors and customers operating in and maintaining a significant business presence in the United States and in this District, and/or its U.S. subsidiary LGEUS, LGE does business in Texas, and in this District.

7. Defendants offer for sale, and/or sell smartphones, other mobile devices, and TVs throughout the United States, including within this District that incorporate the infringing technologies.

8. Defendants have and/or maintain authorized sellers and sales representatives that offer and sell products pertinent to this Complaint throughout the State of Texas, including this District and to consumers throughout this District, such as: AT&T Store at 4330 W Waco Drive, Waco, Texas 76710; Verizon Authorized Retailer at 2812 W Loop 340, Suite# H-12, Waco, Texas, 76711; Best Buy at 4627 S Jack Kultgen Expy, Waco, Texas 76706; and Amazon.com.

JURISDICTION AND VENUE

9. This action arises under the patent laws of the United States, Title 35 of the United States Code ("U.S.C.") § 101 *et seq.*

10. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

11. This Court has personal jurisdiction over Defendants because, directly or through intermediaries, each Defendant has committed acts within the Western District of Texas giving rise to this action and/or has established minimum contacts with the Western District of Texas such that the exercise of jurisdiction would not offend traditional notions of fair play and substantial justice.

12. For example, LGEUS maintains regular and established place of business at 9420 Research Blvd, Austin, Texas 78759. LGEUS's registered agent for service of process in the State of Texas is Corporation Service Company, 211 E. 7th Street, Suite 620 Austin, TX 78701-3218.

13. Further, on information and belief, LGE directs and controls the actions of LGEUS such that it too maintains regular and established offices in the Western District of Texas, including at 9420 Research Blvd, Austin, Texas 78759.

14. In addition, Defendants have placed or contributed to placing infringing products into the stream of commerce via an established distribution channel knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas.

15. On information and belief, Defendants also have each derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of infringing products.

16. Venue is proper under 28 U.S.C § 1391(b)-(c) and 28 U.S.C. § 1400.

17. In particular, LGE is a corporation organized and existing under the laws of the Republic of Korea, and LGEUS has maintained regular and established places of business at 9420 Research Blvd, Austin, Texas 78759.

18. On information and belief, each Defendant exercises direction and control over the performance of each other Defendant, or they form a joint enterprise such that the performance by one Defendant is attributable to each other Defendant.

THE ASSERTED PATENTS

19. On September 15, 2009, U.S. Patent Number 7,590,097 (the "'097 Patent"), entitled "Device Detection and Service Discovery System and Method for a Mobile Ad Hoc Communications Network," was duly and legally issued by the United States Patent and Trademark Office. A true and correct copy of the '097 Patent is attached as Exhibit A to this Complaint.

20. The '097 Patent issued from U.S. patent application Serial Number 10/662,407, filed on September 16, 2003, and discloses and relates to communications between devices in a wireless communications network.

21. The '097 Patent claims patent-eligible subject matter and is valid and enforceable.

22. Nordic is the sole owner of all rights, title, and interest in and to the '097 Patent including the right to sue for and collect past, present, and future damages and to seek and obtain injunctive or any other relief for infringement of the '097 Patent.

23. On February 5, 2002, U.S. Patent Number 6,345,095 (the "'095 Patent"), entitled "Telephone Number Area Code Preprocessor," was duly and legally issued by the United States Patent and Trademark Office. A true and correct copy of the '095 Patent is attached as Exhibit B to this Complaint.

24. The ’095 Patent issued from U.S. patent application Serial Number 09/291,213, filed on April 14, 1999, and discloses and relates to apparatus and method for processing telephone numbers.

25. The ’095 Patent claims patent-eligible subject matter and is valid and enforceable.

26. Nordic is the sole owner of all rights, title, and interest in and to the ’095 Patent including the right to sue for and collect past damages and any other relief for infringement of the ’095 Patent.

THE ACCUSED PRODUCTS

27. Defendants make, use, sell, offer for sale, and/or import into the United States consumer electronics that infringe at least claims 19-24 of the ’097 Patent (the “’097 Accused Products”).

28. The ’097 Accused Products include: (1) all LG electronic devices running Android Mobile Operating System 4.1 or later versions, incorporating the Bluetooth 2.1 or later version standard using Extended Inquiry Response; (2) all LG electronic devices running Chrome OS incorporating the Bluetooth 2.1 or later version standard using Extended Inquiry Response; and (3) all LG electronic devices running Android Mobile Operating System that support Wi-Fi Direct.

29. Such ’097 Accused Products include, but are not limited to, various versions and sizes of the LG Nexus 4 E960, LG G3 S, LG G Flex2, LG Stylus 2, LG V40 ThinQ, LG G Pad, LG Stylo 6, LG k51, LG Wing, LG Q70, LG V60, LG Velvet, LG Gram, LG G Pad 5, LG G Pad F2, LG G Pad F, LG G Pad X, LG G Pad X II, LG G Pad II, LG G Pad, and all other devices running Android Mobile Operating System 4.1 or later incorporating versions of Bluetooth 2.1 or later.

30. Such ’097 Accused Products further include, but are not limited to, various versions and sizes of the LG Nexus 4 E960, LG G3 S, LG G Flex2, LG Stylus 2, LG V40 ThinQ, LG G

Pad, LG Stylo 6, LG k51, LG Wing, LG Q70, LG V60, LG Velvet, LG Gram, LG G Pad 5, LG G Pad F2, LG G Pad F, LG G Pad X, LG G Pad X II, LG G Pad II, LG G Pad, and all other devices running Android Mobile Operating System that support Wi-Fi Direct.

31. Such '097 Accused Products also include, but are not limited to, the LG Chromebase and all other devices running Chrome OS and incorporating versions of Bluetooth 2.1 or later.

32. Defendants made, used, sold, offered for sale, and/or imported into the United States consumer electronics that infringed at least claims 16 and 30 of the '095 Patent (the "'095 Accused Products").

33. The '095 Accused Products include all LG electronic devices running Android Mobile Operating System supporting telephony functionalities.

34. Such '095 Accused Products include, but are not limited to, the LG Stylus 2, LG G Flex2, LG Nexus 4 E960, LG G3 S, LG V10, LG V20, LG V30, LGV35, LG V40, LG V50, and all other devices running Android Mobile Operating System supporting telephony functionalities.

COUNT I – INFRINGEMENT OF THE '097 PATENT

35. Nordic hereby realleges paragraphs 1 through 41 as though fully set forth herein.

36. Defendants directly and/or through its subsidiaries, affiliates, agents, and/or business partners, have in the past and continue to directly infringe at least claims 19-24 of the '097 Patent pursuant to 35 U.S.C. §§ 271(a) by making, using, selling, or offering to sell, and/or importing in the United States, the '097 Accused Products.

37. With regards to claim 19, the '097 Accused Products incorporating the Bluetooth 2.1 or later version standard using Extended Inquiry Response, each provide a method for performing device detection and service discovery in a mobile ad hoc communications network, comprising:

Representative Product

LG V40 ThinQ

Platform
Android™ 8.1 (Oreo)
Processor
Qualcomm Snapdragon™ 845 up to 2.8 GHz x 4 + 1.7 GHz x 4 Octa-Core
Memory
6 GB RAM
Storage
64 GB (46.5 GB usable)
Bluetooth® Wireless Technology Version
5.0
Network
GSM, UMTS, LTE
Frequencies
GSM 850/900/1800/1900 MHz; UMTS B1, B2, B4, B5; LTE Bands 2/4/5/12/14/29/30/46/66; International Roaming 1/3/7/20/38/39/40/41

1.2 DISCOVERY SERVICES

As the number of services that can be provided over Bluetooth links increases it is becoming more important to help the users to locate, identify and accept the desired services.

The Bluetooth protocol stack defined in the core specification contains:

1. Device discovery services via the Inquiry and Inquiry Scan procedures

2. Extended Inquiry Response (EIR) information packets that may be sent during the Inquiry response procedure to provide the device name and other identifying information during the inquiry procedure (only possible if both devices support EIR)

3. Service Discovery Protocol that is used to locate services that are available on devices in the vicinity of the inquiring device.

Bluetooth Discovery Whitepaper, Service Discovery Applications, page 4, section 1.2 https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

4.2 DISCOVERY WHEN EIR IS SUPPORTED

EIR (available in V2.1 + EDR and later core specifications) provides a possible mechanism for service-related information to be sent in response to inquiry. The minimum required information is the user name for the Responder. Other information is optional but may be adequate for the automated selection or user selection of the devices to further interrogate for service information.

Bluetooth Discovery Whitepaper, Service Discovery Applications, page 12, section 4.2 https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

38. conducting an inquiry to discover nearby devices,

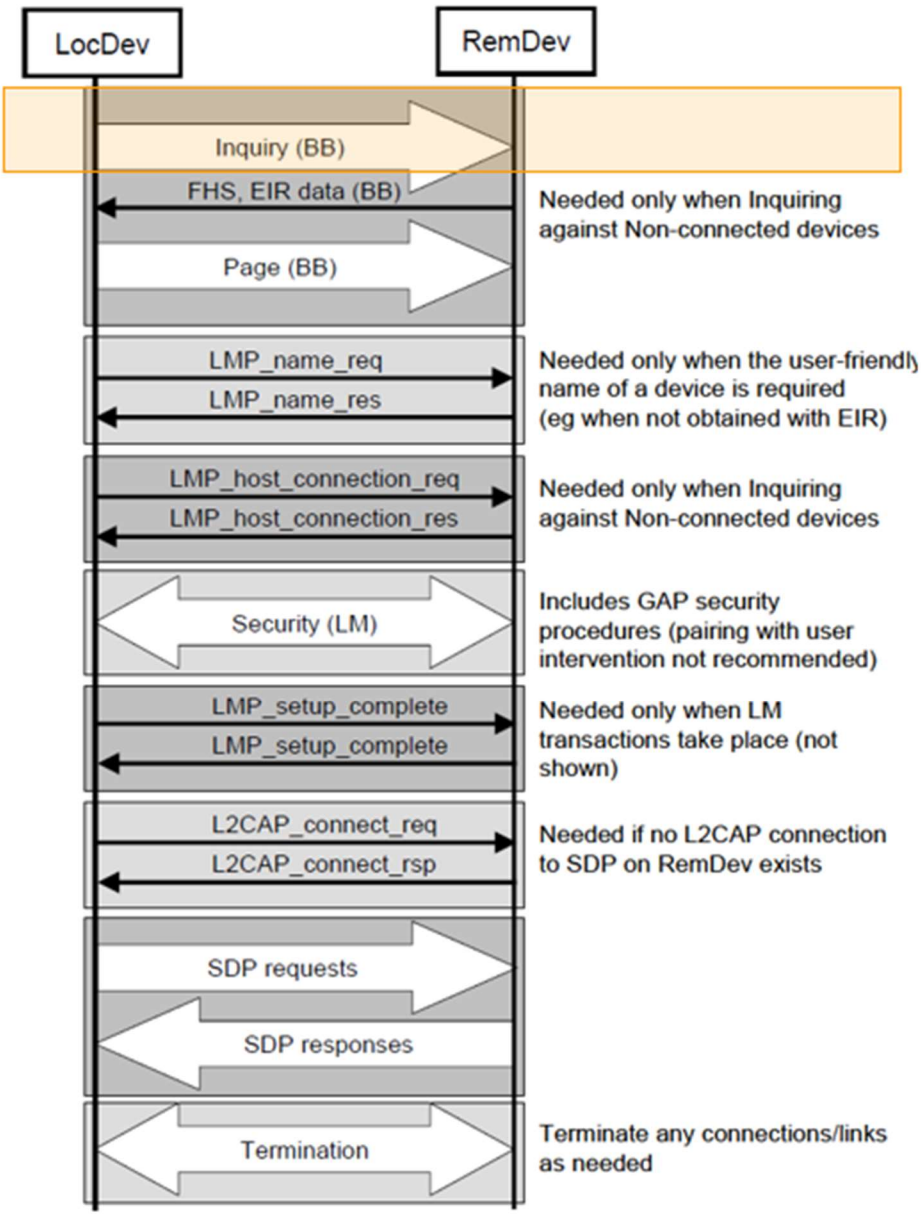


Figure 4.2: Bluetooth processes in support of a SrvDscApp

Bluetooth Discovery Whitepaper, Service Discovery Applications, page 15, section 4.4
https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

39. determining, whether a discovered nearby device provides an indication that it may include a middleware software,

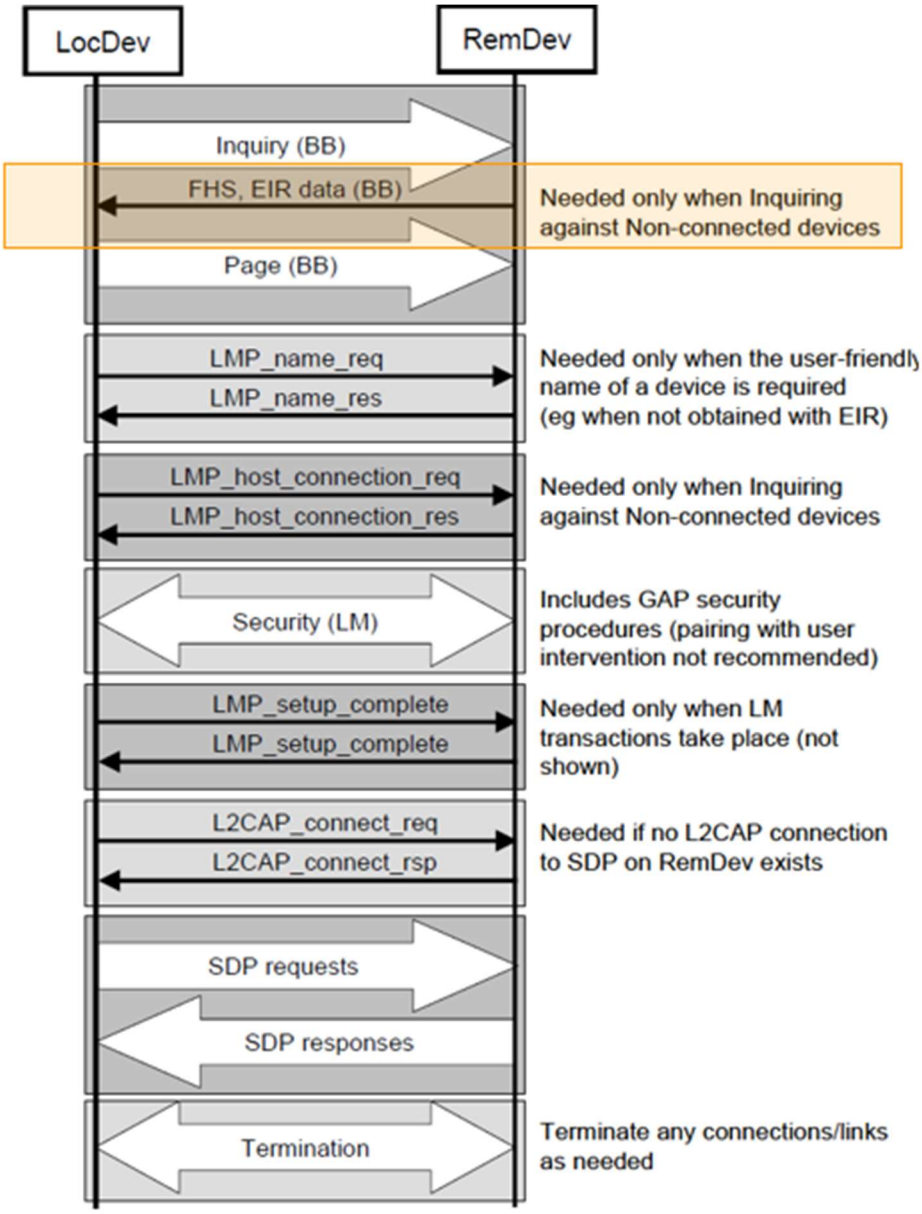


Figure 4.2: Bluetooth processes in support of a SrvDscApp

Bluetooth Discovery Whitepaper, Service Discovery Applications, page 15, section 4.4
https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

40. the middleware software configured for providing application and service discovery;

2.5 SEARCHING FOR SERVICES

[..]

The capability search for service records based on the values of arbitrary attributes is not provided. Rather, the capability is provided to search only for attributes whose values are Universally Unique Identifiers1 (UUIDs). Important attributes of services that can be used to search for a service are represented as UUIDs.

41. when the discovered nearby device does not provide an indication that it may include the middleware software:

4.2 DISCOVERY WHEN EIR IS SUPPORTED

EIR (available in V2.1 + EDR and later core specifications) provides a possible mechanism for service-related information to be sent in response to inquiry. The minimum required information is the user name for the Responder. Other information is optional but may be adequate for the automated selection or user selection of the devices to further interrogate for service information.

It is recommended that service-related information be included in EIR responses. The information can be used by the Initiator to reduce the number of devices to page and perform full SDP – this implies that association of devices can be performed more quickly with EIR. For example if a user wishes to find a device that can render stereo audio the Initiator should focus on devices that have sent EIR responses indicating the A2DP Snk service class. If the user of the Initiator chooses to use that Responder the local A2DP profile will comply with the A2DP profile requirements, thereby performing full SDP searches on the A2DP Snk service record. The benefit of EIR here is that the user finds a suitable stereo rendering device more quickly than if the Initiator paged all Responders to perform SDP (including those devices that do not have the A2DP service)

42. disconnect communication session establishment with the discovered nearby device;

4.2 DISCOVERY WHEN EIR IS SUPPORTED

EIR (available in V2.1 + EDR and later core specifications) provides a possible mechanism for service-related information to be sent in response to inquiry. The minimum required information is the user name for the Responder. Other information is optional but may be adequate for the automated selection or user selection of the devices to further interrogate for service information.

It is recommended that service-related information be included in EIR responses. The information can be used by the Initiator to reduce the number of devices to page and perform full SDP – this implies that association of devices can be performed more quickly with EIR. For example if a user wishes to find a device that can render stereo audio the Initiator should focus on devices that have sent EIR responses indicating the A2DP Snk service class. If the user of the Initiator chooses to use that Responder the local A2DP profile will comply with the A2DP profile requirements, thereby performing full SDP searches on the A2DP Snk service record. The benefit of EIR here is that the user finds a suitable stereo rendering device more quickly than if the Initiator paged all Responders to perform SDP (including those devices that do not have the A2DP service)

Bluetooth Discovery Whitepaper, Service Discovery Applications, page 12, section 4.2 https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

43. when the discovered nearby device provides an indication that it may include the middleware software:

4.2 DISCOVERY WHEN EIR IS SUPPORTED

EIR (available in V2.1 + EDR and later core specifications) provides a possible mechanism for service-related information to be sent in response to inquiry. The minimum required information is the user name for the Responder. Other information is optional but may be adequate for the automated selection or user selection of the devices to further interrogate for service information.

It is recommended that service-related information be included in EIR responses. The information can be used by the Initiator to reduce the number of devices to page and perform full SDP – this implies that association of devices can be performed more quickly with EIR. For example if a user wishes to find a device that can render stereo audio the Initiator should focus on devices that have sent EIR responses indicating the A2DP Snk service class. If the user of the Initiator chooses to use that Responder the local A2DP profile will comply with the A2DP profile requirements, thereby performing full SDP searches on the A2DP Snk service record. The benefit of EIR here is that the user finds a suitable stereo rendering device more quickly than if the Initiator paged all Responders to perform SDP (including those devices that do not have the A2DP service)

Bluetooth Discovery Whitepaper, Service Discovery Applications, page 12, section 4.2 https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

44. creating a wireless short-range communication connection to discovered nearby device;

7.3 LINK ESTABLISHMENT

Whenever the SrvDscApp needs to connect to a specific Responder for performing SDP, the Initiator follows the Link Establishment procedure in the Geriatric Access Profile The time lag before entering this state and the amount of time available for the link establishment may be constrained existing connections.

7.4 CONNECTABLE MODE

Devices that have responded to an inquiry will need to enter page scan state in order to allow the discovering device to connect, request device name, and perform SDP. Therefore, a device that is Discoverable should also be Connectable. As an example, if the Responder has sent an EIR response it should enter Connectable state because the Initiator will likely connect to perform full SDP searches using one or more of the service UUIDs included in the EIR response.

Bluetooth Discovery Whitepaper, Service Discovery Applications, page 21, sections 7.3 and 7.4 https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

45. confirming whether said nearby device includes the middleware software by requesting corresponding information from said nearby device via the wireless short-range communication connection;

In case 2, when both devices support EIR, some time may be saved as the application code can examine the EIR response to determine if the user criteria are met. Having EIR does not eliminate the need for an SDP search to obtain further information about a specific profile, such as its RFCOMM port number, or supported features bits. However, if the goal is to display a list of suitable devices for the user, EIR can reduce the number of connections and SDP searches that are needed for that task.

Bluetooth Discovery Whitepaper, Service Discovery Applications, page 12, section 4.1 https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

7.4 CONNECTABLE MODE

Devices that have responded to an inquiry will need to enter page scan state in order to allow the discovering device to connect, request device name, and perform SDP. Therefore, a device that is Discoverable should also be Connectable. As an example, if the Responder has sent an EIR response it should enter Connectable state because the Initiator will likely connect to perform full SDP searches using one or more of the service UUIDs included in the EIR response.

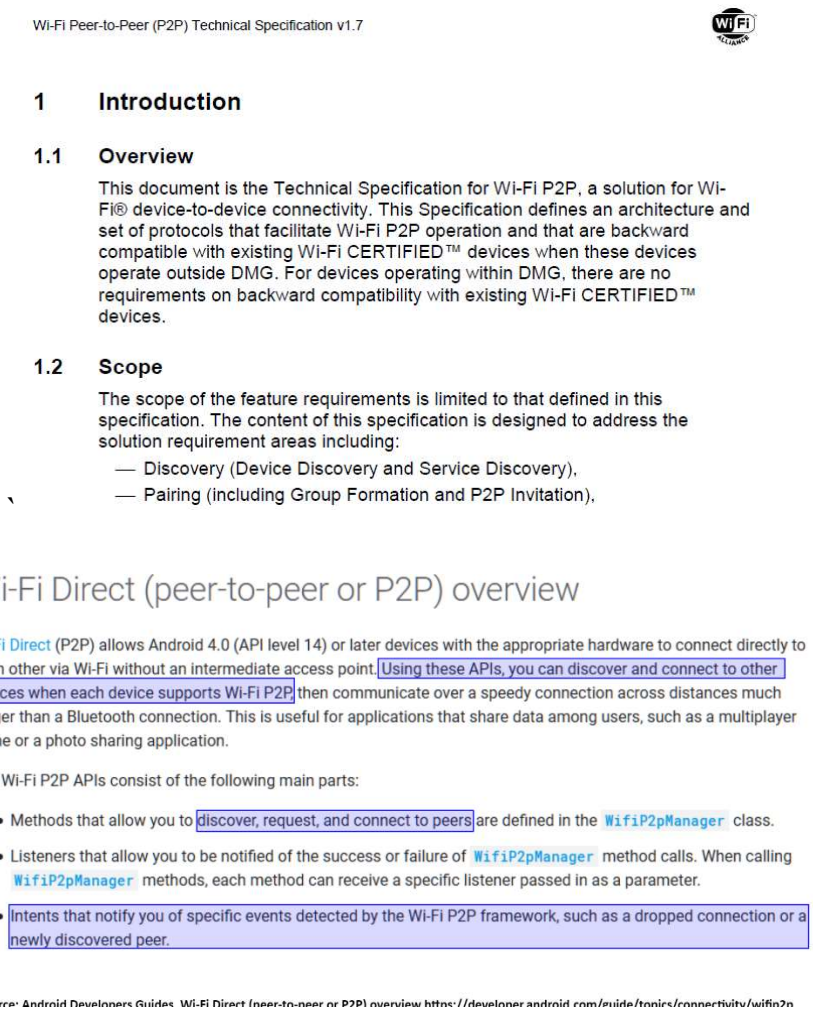
Bluetooth Discovery Whitepaper, Service Discovery Applications, page 21, section 7.4 https://www.bluetooth.org/docman/handlers/DownloadDoc.ashx?doc_id=144841

46. and when said nearby device includes the middleware software: executing the middleware software to perform application and service discovery with said nearby device.

If the client, or an application associated with the client, decides to use a service, it opens a separate connection to the service provider in order to utilize the service. SDP provides a mechanism for discovering services and their attributes (including associated service access protocols), but it does not provide a mechanism for utilizing those services (such as delivering the service access protocols).

Bluetooth Specification Version 2.1 + EDR [vol 3] page 116, section 2.1 https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=241363

47. With regards to claim 19, the ’097 Accused Products incorporating the Bluetooth 2.1 or later version standard incorporation Wi-Fi direct provide a method for performing device detection and service discovery in a mobile ad hoc communications network, comprising:



Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7

1 Introduction

1.1 Overview

This document is the Technical Specification for Wi-Fi P2P, a solution for Wi-Fi® device-to-device connectivity. This Specification defines an architecture and set of protocols that facilitate Wi-Fi P2P operation and that are backward compatible with existing Wi-Fi CERTIFIED™ devices when these devices operate outside DMG. For devices operating within DMG, there are no requirements on backward compatibility with existing Wi-Fi CERTIFIED™ devices.

1.2 Scope

The scope of the feature requirements is limited to that defined in this specification. The content of this specification is designed to address the solution requirement areas including:

— Discovery (Device Discovery and Service Discovery),

— Pairing (including Group Formation and P2P Invitation),

Wi-Fi Direct (peer-to-peer or P2P) overview

Wi-Fi Direct (P2P) allows Android 4.0 (API level 14) or later devices with the appropriate hardware to connect directly to each other via Wi-Fi without an intermediate access point. Using these APIs, you can discover and connect to other devices when each device supports Wi-Fi P2P, then communicate over a speedy connection across distances much longer than a Bluetooth connection. This is useful for applications that share data among users, such as a multiplayer game or a photo sharing application.

The Wi-Fi P2P APIs consist of the following main parts:

- Methods that allow you to discover, request, and connect to peers are defined in the `WifiP2pManager` class.
- Listeners that allow you to be notified of the success or failure of `WifiP2pManager` method calls. When calling `WifiP2pManager` methods, each method can receive a specific listener passed in as a parameter.
- Intents that notify you of specific events detected by the Wi-Fi P2P framework, such as a dropped connection or a newly discovered peer.

Source: Android Developers Guides, Wi-Fi Direct (peer-to-peer or P2P) overview https://developer.android.com/guide/topics/connectivity/wifip2p

48. conducting an inquiry to discover nearby devices,

3.1.2.1 Basic mechanisms of Device Discovery

The objective of P2P Device Discovery is to find P2P Devices and quickly determine the P2P Device to which a connection will be attempted. In-band P2P Device Discovery consists of two major phases: Scan and Find, which are described in detail in the following sections. Alternatively, if two P2P Devices support NFC, the user may specify the target device by touching the P2P Device's NFC Interface to the corresponding device's NFC Interface. Such NFC Out-of-Band Device Discovery is defined in Section 3.1.2.7.

In-band Device Discovery uses Probe Request and Probe Response frames to exchange device information. When operating outside DMG, the P2P Devices in a P2P Group are discovered via a Probe Response frame from the P2P Group Owner. When operating within DMG, P2P Devices in a P2P Group are normally discovered via an SSW frame received in response to a DMG Beacon transmission as described in Section 11.1.4.3 of IEEE 802.11-REVmc [11]; Probe Request and Probe Response frames are subsequently used to exchange device information. Alternatively, Probe Request and Probe Response frames may be used instead of SSW frames for devices that do not use beamforming.

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Page 25 of 201 *https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17*

android.net.wifi.p2p

Added in API level 14

Kotlin | **Java**

Provides classes to create peer-to-peer (P2P) connections with Wi-Fi Direct.

Using these APIs, you can discover and connect to other devices when each device supports Wi-Fi Direct, then communicate over a speedy connection across distances much longer than a Bluetooth connection. The primary class you need to work with is `WifiP2pManager`, which you can acquire by calling `getSystemService(WIFI_P2P_SERVICE)`. The `WifiP2pManager` includes APIs that allow you to:

- Initialize your application for P2P connections by calling `initialize()`
- Discover nearby devices by calling `discoverPeers()`
- Start a P2P connection by calling `connect()`
- And more

Source: Android Developers Reference, android.net.wifi.p2p https://developer.android.com/reference/android/net/wifi/p2p/package-summary

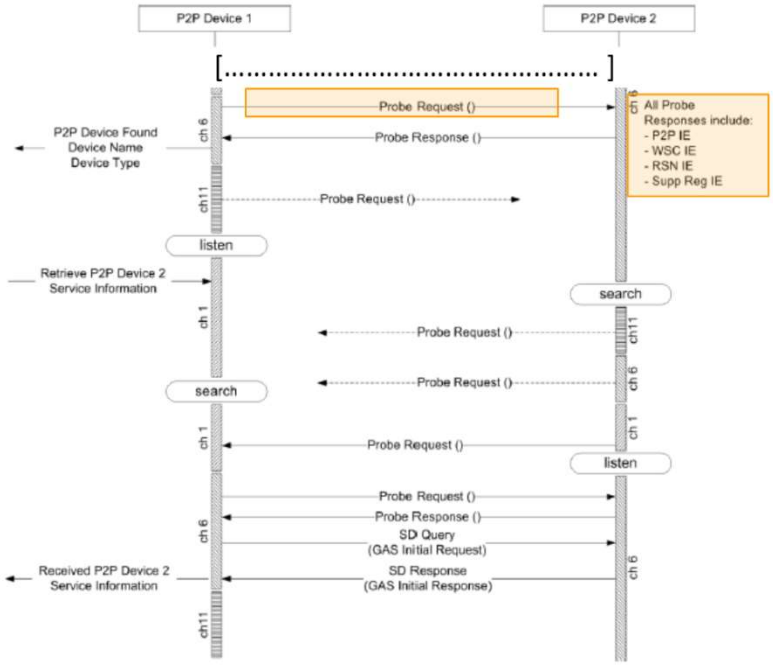


Figure 9—Example of Service Discovery procedure when operating outside DMG

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Page 43 of 201 https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17

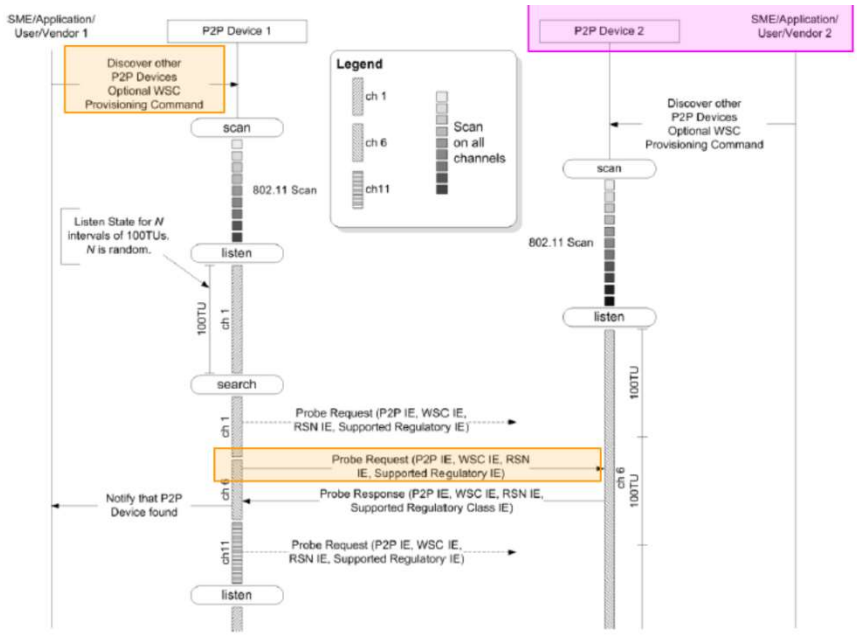


Figure 5—Example In-band Device Discovery procedures for a P2P Device operating outside DMG

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Page 31 of 201 https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17

49. determining, whether a discovered nearby device provides an indication that it may include a middleware software,

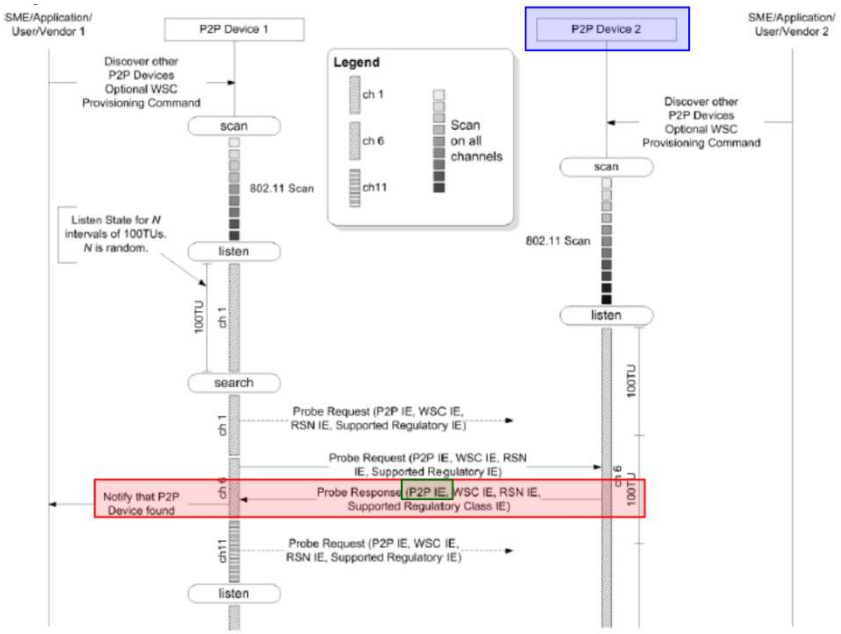


Figure 5—Example In-band Device Discovery procedures for a P2P Device operating outside DMG

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Page 31 of 201 *https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17*

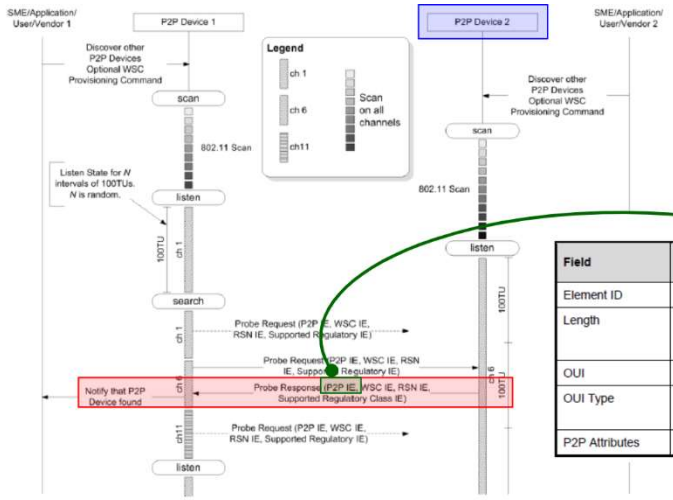


Table 4—P2P IE format

Field	Size (octets)	Value (Hexadecimal)	Description
Element ID	1	0xDD	IEEE 802.11 vendor specific usage.
Length	1	variable	Length of the following fields in the IE in octets. The Length field is a variable, and set to 4 plus the total length of P2P attributes.
OUI	3	50 6F 9A	Wi-Fi Alliance specific OUI.
OUI Type	1	0x09 (to be assigned)	Identifying the type or version of P2P IE. Setting to 0x09 indicates Wi-Fi Alliance P2P v1.0.
P2P Attributes	variable		One of more P2P attributes appear in the P2P IE.

Figure 5—Example In-band Device Discovery procedures for a P2P Device operating outside DMG

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Pages 31 and 89 of 201 *https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17*

Table 5—General format of P2P attribute

Field	Size (octets)	Value (Hexadecimal)	Description
Attribute ID	1	variable	Identifying the type of P2P attribute. The specific value is defined in Table 6.
Length	2	variable	Length of the following fields in the attribute.
Attributes body field	variable		Attribute-specific information fields.

Table 4—P2P IE format

Field	Size (octets)	Value (Hexadecimal)	Description
Element ID	1	0xDD	IEEE 802.11 vendor specific usage.
Length	1	variable	Length of the following fields in the IE in octets. The Length field is a variable, and set to 4 plus the total length of P2P attributes.
OUI	3	50 6F 9A	Wi-Fi Alliance specific OUI.
OUI Type	1	0x09 (to be assigned)	Identifying the type or version of P2P IE. Setting to 0x09 indicates Wi-Fi Alliance P2P v1.0.
P2P Attributes	variable		One of more P2P attributes appear in the P2P IE.

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Pages 89 and 90 of 201 https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17

Table 5—General format of P2P attribute

Field	Size (octets)	Value (Hexadecimal)	Description
Attribute ID	1	variable	Identifying the type of P2P attribute. The specific value is defined in Table 6.
Length	2	variable	Length of the following fields in the attribute.
Attributes body field	variable		Attribute-specific information fields.

Table 6—P2P Attribute ID definitions

Attribute ID	Notes
0	Status
1	Minor Reason Code
2	P2P Capability

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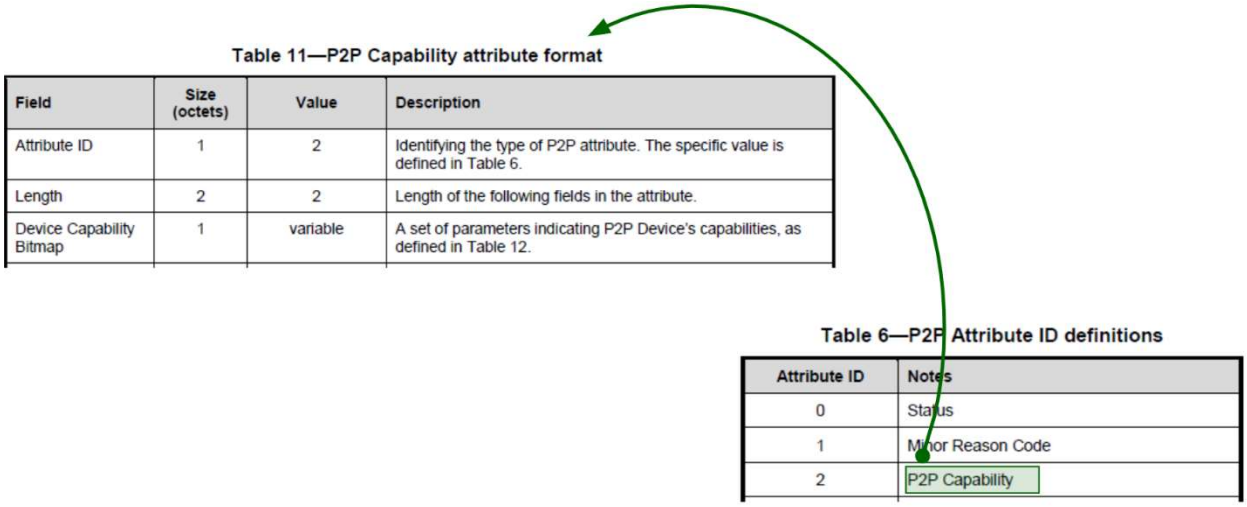


Table 11—P2P Capability attribute format

Field	Size (octets)	Value	Description
Attribute ID	1	2	Identifying the type of P2P attribute. The specific value is defined in Table 6.
Length	2	2	Length of the following fields in the attribute.
Device Capability Bitmap	1	variable	A set of parameters indicating P2P Device's capabilities, as defined in Table 12.

Table 6—P2P Attribute ID definitions

Attribute ID	Notes
0	Status
1	Minor Reason Code
2	P2P Capability

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Pages 90 and 94 of 201 https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17

50. the middleware software configured for providing application and service discovery;

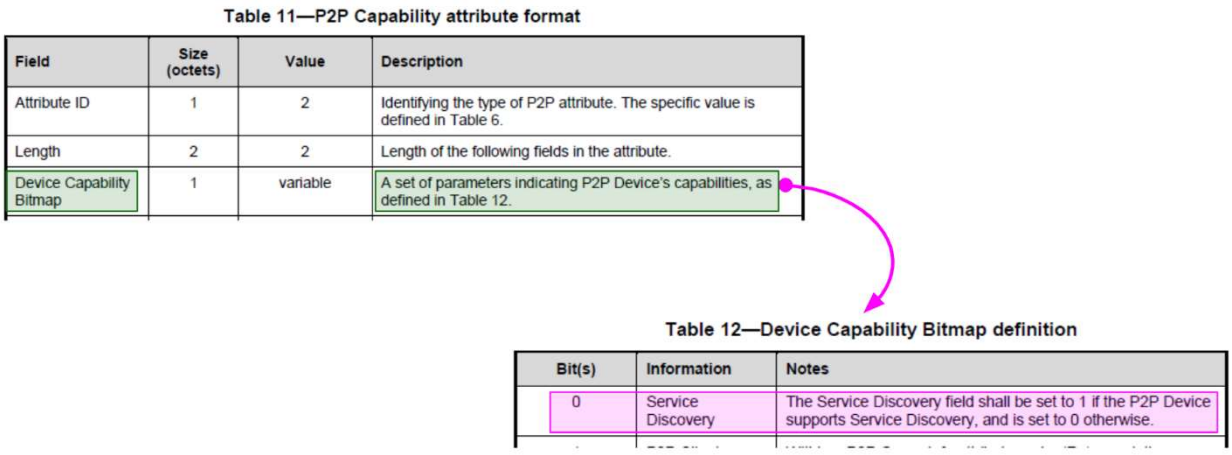


Table 11—P2P Capability attribute format

Field	Size (octets)	Value	Description
Attribute ID	1	2	Identifying the type of P2P attribute. The specific value is defined in Table 6.
Length	2	2	Length of the following fields in the attribute.
Device Capability Bitmap	1	variable	A set of parameters indicating P2P Device's capabilities, as defined in Table 12.

Table 12—Device Capability Bitmap definition

Bit(s)	Information	Notes
0	Service Discovery	The Service Discovery field shall be set to 1 if the P2P Device supports Service Discovery, and is set to 0 otherwise.

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Pages 94 and 95 of 201 https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17

3.1 P2P discovery

3.1.1 Introduction

P2P Discovery enables P2P Devices to quickly find each other and form a connection.

P2P Discovery consists of the following major components:

— **Device Discovery** facilitates two P2P Devices arriving on a common channel and exchanging device information (e.g. device name and device type).

— **Service Discovery** is an optional feature that allows a P2P Device to discover available higher-layer services prior to forming a connection.

— **Group Formation** is used to determine which device will be the P2P Group Owner and form a new P2P Group.

— **P2P Invitation** is used to invoke a Persistent P2P Group or invite a P2P Device to join an existing P2P Group.

Note – During P2P Discovery, a DMG STA can ignore P2P public action frames received outside of a beacon interval if it does not know how to respond to such frames.

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Page 25 of 201 *https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17*

With peer discovery using `discoverPeers(WifiP2pManager.Channel, WifiP2pManager.ActionListener)`, an application discovers the neighboring peers, but has no good way to figure out which peer to establish a connection with. For example, if a game application is interested in finding all the neighboring peers that are also running the same game, it has no way to find out until after the connection is setup. Pre-association service discovery is meant to address this issue of filtering the peers based on the running services.

With pre-association service discovery, an application can advertise a service for a application on a peer device prior to a connection setup between the devices. Currently, DNS based service discovery (Bonjour) and Upnp are the higher layer protocols supported. Get Bonjour resources at dns-sd.org and Upnp resources at upnp.org As an example, a video application can discover a Upnp capable media renderer prior to setting up a Wi-fi p2p connection with the device.

[...]

discoverServices — Added in API level 16

```
public void discoverServices (WifiP2pManager.Channel c,
                WifiP2pManager.ActionListener listener)
```

Initiate service discovery. A discovery process involves scanning for requested services for the purpose of establishing a connection to a peer that supports an available service.

Source: Android Developers Reference, WifiP2pManager https://developer.android.com/reference/android/net/wifi/p2p/WifiP2pManager.html

51. when the discovered nearby device does not provide an indication that it may include the middleware software: disconnect communication session establishment with the discovered nearby device;

3.1 P2P discovery

3.1.1 Introduction

P2P Discovery enables P2P Devices to quickly find each other and form a connection.

P2P Discovery consists of the following major components:

- **Device Discovery** facilitates two P2P Devices arriving on a common channel and exchanging device information (e.g. device name and device type).
- **Service Discovery** is an optional feature that allows a P2P Device to discover available higher-layer services prior to forming a connection.
- **Group Formation** is used to determine which device will be the P2P Group Owner and form a new P2P Group.
- **P2P Invitation** is used to invoke a Persistent P2P Group or invite a P2P Device to join an existing P2P Group.

Note – During P2P Discovery, a DMG STA can ignore P2P public action frames received outside of a beacon interval if it does not know how to respond to such frames.

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Page 25 of 201 *https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17*

With peer discovery using `discoverPeers(WifiP2pManager.Channel, WifiP2pManager.ActionListener)`, an application discovers the neighboring peers, but has no good way to figure out which peer to establish a connection with. For example, if a game application is interested in finding all the neighboring peers that are also running the same game, it has no way to find out until after the connection is setup. Pre-association service discovery is meant to address this issue of filtering the peers based on the running services.

With pre-association service discovery, an application can advertise a service for a application on a peer device prior to a connection setup between the devices. Currently, DNS based service discovery (Bonjour) and Upnp are the higher layer protocols supported. Get Bonjour resources at dns-sd.org and Upnp resources at upnp.org As an example, a video application can discover a Upnp capable media renderer prior to setting up a Wi-fi p2p connection with the device.

[...]

discoverServices — Added in API level 16

```
public void discoverServices (WifiP2pManager.Channel c,
            WifiP2pManager.ActionListener listener)
```

Initiate service discovery. A discovery process involves scanning for requested services for the purpose of establishing a connection to a peer that supports an available service.

Source: Android Developers Reference, WifiP2pManager https://developer.android.com/reference/android/net/wifi/p2p/WifiP2pManager.html

52. when the discovered nearby device provides an indication that it may include the middleware software: creating a wireless short-range communication connection to discovered nearby device;

With peer discovery using `discoverPeers(WifiP2pManager.Channel, WifiP2pManager.ActionListener)`, an application discovers the neighboring peers, but has no good way to figure out which peer to establish a connection with. For example, if a game application is interested in finding all the neighboring peers that are also running the same game, it has no way to find out until after the connection is setup. Pre-association service discovery is meant to address this issue of filtering the peers based on the running services.

With pre-association service discovery, an application can advertise a service for a application on a peer device prior to a connection setup between the devices. Currently, DNS based service discovery (Bonjour) and Upnp are the higher layer protocols supported. Get Bonjour resources at dns-sd.org and Upnp resources at upnp.org As an example, a video application can discover a Upnp capable media renderer prior to setting up a Wi-fi p2p connection with the device.

[...]

discoverServices

Added in API level 16

```
public void discoverServices (WifiP2pManager.Channel c,
                WifiP2pManager.ActionListener listener)
```

Initiate service discovery. A discovery process involves scanning for requested services for the purpose of establishing a connection to a peer that supports an available service.

Source: Android Developers Reference, WifiP2pManager https://developer.android.com/reference/android/net/wifi/p2p/WifiP2pManager.html

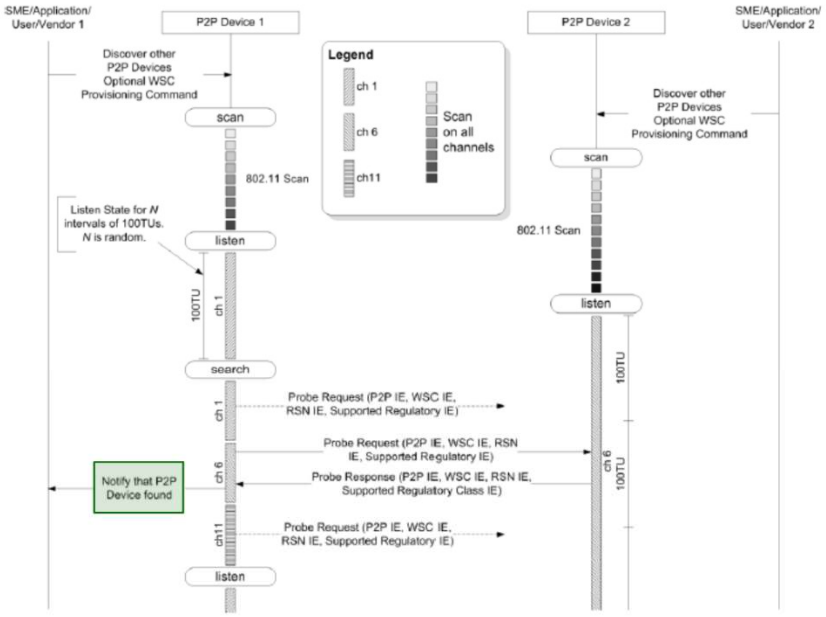


Figure 5—Example In-band Device Discovery procedures for a P2P Device operating outside DMG

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Page 31 of 201 *https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17*

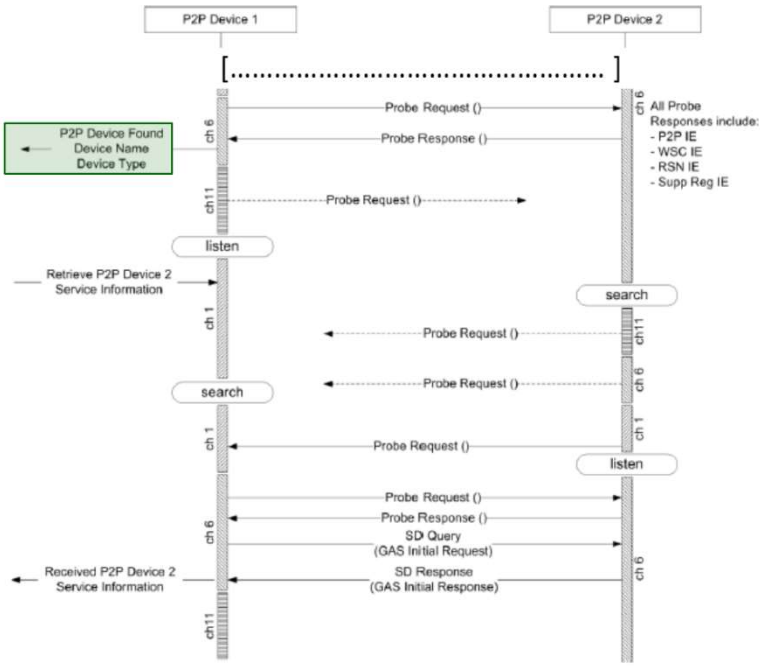


Figure 9—Example of Service Discovery procedure when operating outside DMG

53. confirming whether said nearby device includes the middleware software by requesting corresponding information from said nearby device via the wireless short-range communication connection;

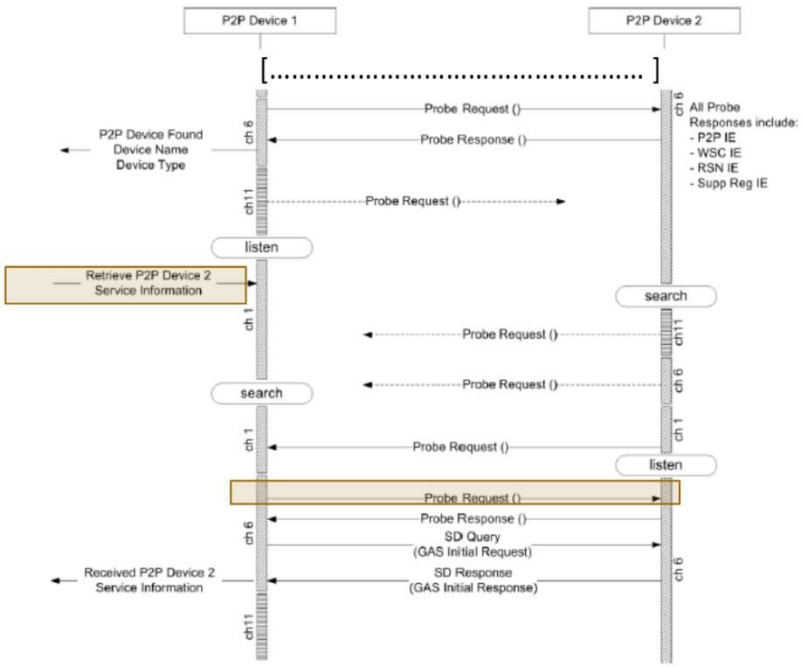


Figure 9—Example of Service Discovery procedure when operating outside DMG

54. and when said nearby device includes the middleware software: executing the middleware software to perform application and service discovery with said nearby device.

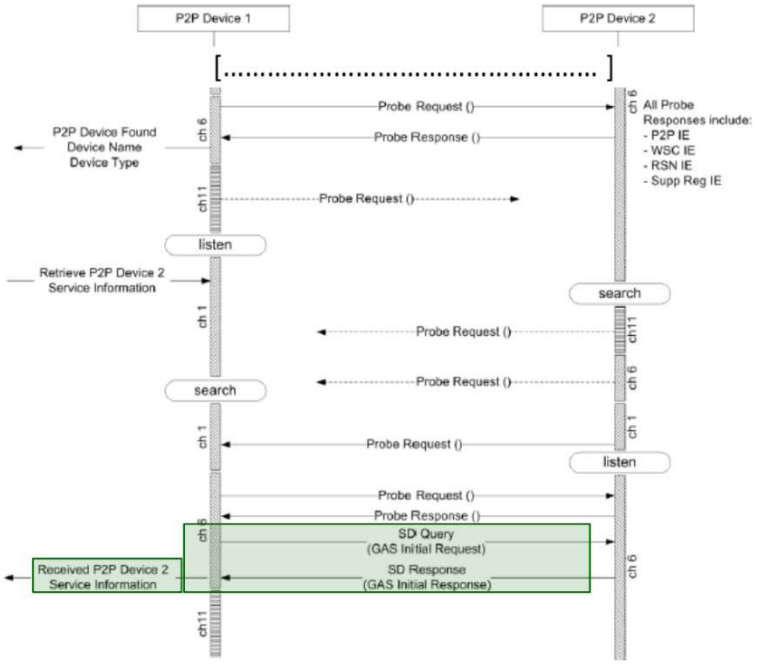


Figure 9—Example of Service Discovery procedure when operating outside DMG

3.1.3 Service Discovery procedures

The Service Discovery procedure is an optional frame exchange that may be performed at any time to any discovered P2P Device, for example following a successful Device Discovery procedure prior to group formation. This procedure can be used to determine compatibility information on the services offered by a P2P Device. This protocol is extensible and flexible so that it enables different higher layer service advertisement protocol types such as Bonjour [4] and UPnP [5].

The Service Discovery procedure leverages the Generic Advertisement Service (GAS) protocol/frame exchange as defined in IEEE 802.11-2012 [1]. The Service Discovery procedure uses GAS with unicast standard public action frames with a vendor specific body. It may be a single or multiple GAS Initial Request and Response action frame exchange. The requesting P2P Device transmits one or more GAS Initial Request frames. A target P2P Device that supports Service Discovery responds with one or more GAS Initial Response frames. It is assumed that service information is readily available within a P2P Device supporting Service Discovery and the GAS Initial Response frame shall be returned without delay after receiving a GAS Initial Request.

Wi-Fi Peer-to-Peer (P2P) Technical Specification v1.7, Page 38 of 201 https://www.wi-fi.org/file/wi-fi-peer-to-peer-p2p-technical-specification-v17

55. Defendants have had actual notice of the ’097 Patent and the infringement alleged herein at least as early as November 29, 2018.

56. Defendants have failed to take adequate steps to determine whether or not they were infringing or would infringe the ’097 Patent, despite having been on notice of and lacking permission to practice the ’097 Patent.

57. Therefore, Defendants are liable for infringement of the ’097 Patent and its infringement has been and continues to be willful in nature.

58. Plaintiff Nordic has incurred and will continue to incur substantial damages, including monetary damages.

59. Plaintiff Nordic has been and continues to be irreparably harmed by Defendants’ infringement of the ’097 Patent.

60. Therefore, Plaintiff Nordic is entitled to an injunction, actual and/or compensatory damages, reasonable royalties, pre-judgment and post-judgment interest, enhanced damages, and costs.

COUNT II – INFRINGEMENT OF THE ’095 PATENT

61. Nordic hereby realleges paragraphs 1 through 41 as though fully set forth herein.

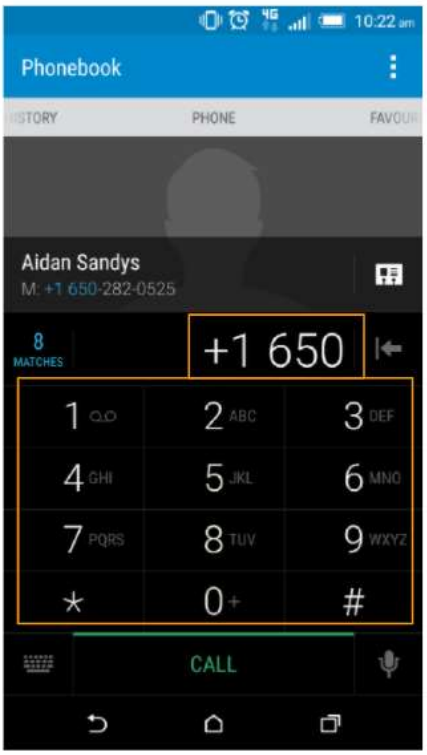
62. Defendants directly and/or through its subsidiaries, affiliates, agents, and/or business partners, have in the past and continue to directly infringe at least claims 16 and 30 of the ’095 Patent pursuant to 35 U.S.C. §§ 271(a) by making, using, selling, or offering to sell, and/or importing in the United States, the ’095 Accused Products.

63. Regarding claim 16, the ’095 Accused Products each provide a method for processing telephone numbers, comprising the steps of:

Representative Product

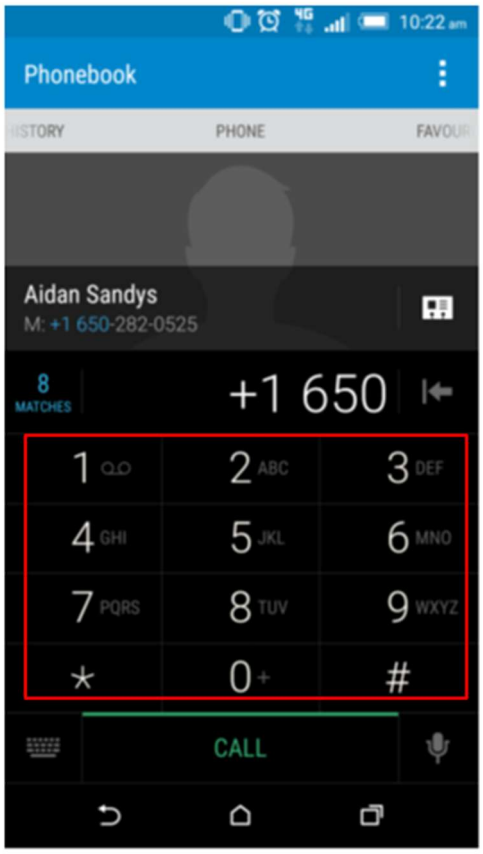
LG V40 ThinQ

Platform
Android™ 8.1 (Oreo)
Processor
Qualcomm Snapdragon™ 845 up to 2.8 GHz x 4 + 1.7 GHz x 4 Octa-Core
Memory
6 GB RAM
Storage
64 GB (46.5 GB usable)
Bluetooth® Wireless Technology Version
5.0
Network
GSM, UMTS, LTE
Frequencies
GSM 850/900/1800/1900 MHz; UMTS B1, B2, B4, B5; LTE Bands 2/4/5/12/14/29/30/46/66; International Roaming 1/3/7/20/38/39/40/41



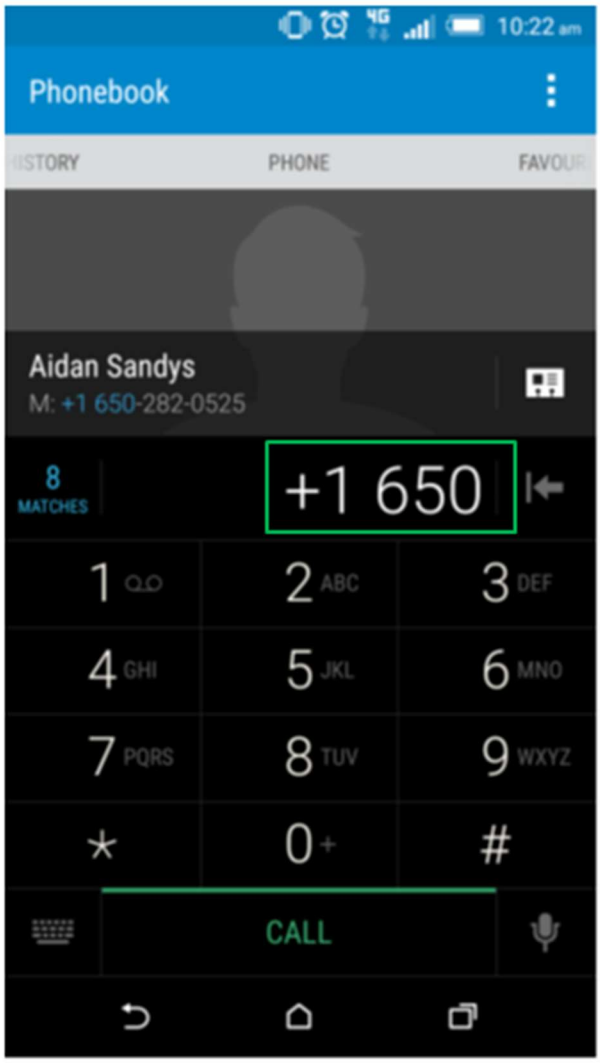
Source: Android Lollipop 5.0.1 (Screenshot)

64. monitoring call initiation signals from a calling party;



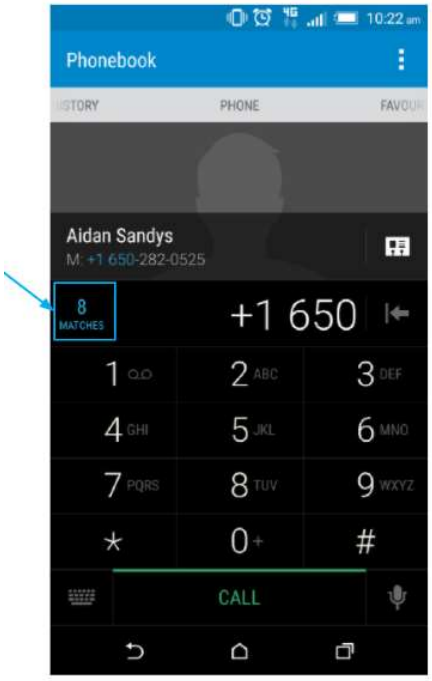
Source: Android Lollipop 5.0.1 (Screenshot)

65. receiving, responsive to the monitoring step, called party information;



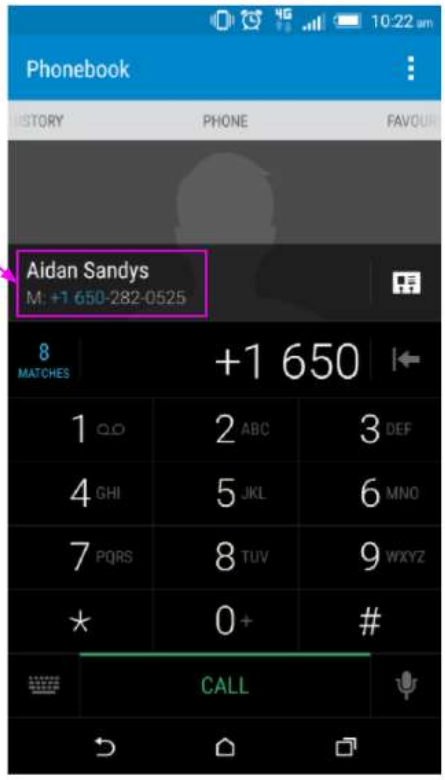
Source: Android Lollipop 5.0.1 (Screenshot)

66. producing, responsive to the called party information, a list of telephone numbers; and



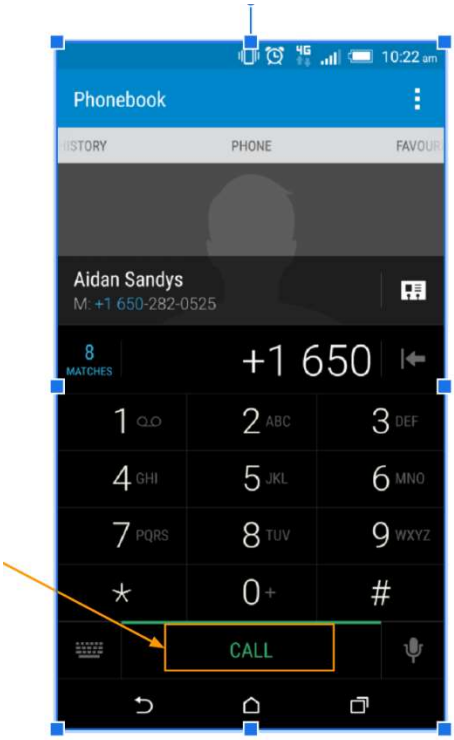
Source: Android Lollipop 5.0.1 (Screenshot)

67. selecting, responsive to the producing step, a target telephone number from the list of telephone numbers.



Source: Android Lollipop 5.0.1 (Screenshot)

68. Regarding claim 30, the ’095 Accused Products each perform the method of claim 16, further includes the step of initiating, responsive to the selecting step, a call to the target telephone number through a telecommunications network.



Source: Android Lollipop 5.0.1 (Screenshot)

69. Defendants have had actual notice of the ’095 Patent and the infringement alleged herein at least as early as November 29, 2018.

70. Defendants have failed to take adequate steps to determine whether or not they were infringing or would infringe the ’095 Patent, despite having been on notice of and lacking permission to practice the ’095 Patent.

71. Therefore, Defendants are liable for infringement of the ’095 Patent and its infringement has been willful in nature.

72. Plaintiff Nordic has incurred substantial damages, including monetary damages.

73. Plaintiff Nordic has been irreparably harmed by Defendants' infringement of the '095 Patent.

74. Therefore, Plaintiff Nordic is entitled, actual and/or compensatory damages, reasonable royalties, pre-judgment and post-judgment interest, enhanced damages, and costs.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff Nordic requests that judgment be entered in favor of Nordic and against the Defendants, and that Nordic be granted the following relief:

i. A declaration that the '097 Patent is valid and enforceable;

ii. A declaration that the '095 Patent is valid and enforceable;

iii. A declaration that Defendants have directly infringed one or more claims of the '097 Patent, either literally and/or under the doctrine of equivalents;

iv. A declaration that Defendants have directly infringed one or more claims of the '095 Patent, either literally and/or under the doctrine of equivalents;

v. An award of damages sufficient to compensate Nordic for Defendants' infringement of the '097 Patent pursuant to 35 U.S.C. § 284;

vi. An award of damages sufficient to compensate Nordic for Defendants' infringement of the '095 Patent pursuant to 35 U.S.C. § 284;

vii. An award of prejudgment and post-judgment interest pursuant to 35 U.S.C. § 284;

viii. A payment of ongoing royalties in an amount to be determined for any continued infringement after the date that judgement is entered;

ix. Treble damages for willful infringement as permitted under 35 U.S.C. § 284;

x. An award of attorneys' fees incurred in prosecuting this action, on the basis that this is an exceptional case provided by 35 U.S.C. § 285;

xi. Enjoin each Defendant, its officers, subsidiaries, agents, servants, and employees, and all persons in active concert with any of the foregoing from further infringement of the '097 Patent; and

xii. Such other and further relief as this Court shall deem appropriate.

JURY DEMAND

Plaintiff demands a trial by jury of any and all issues triable of right before a jury pursuant to Rule 38 of the Federal Rules of Civil Procedure.

RESERVATION OF RIGHTS

Plaintiff's investigation is ongoing, and certain material information remains in the sole possession of Defendants or third parties, which will be obtained via discovery herein. Plaintiff expressly reserves the right to amend or supplement the causes of action set forth herein in accordance with Rule 15 of the Federal Rules of Civil Procedure.

DATED April 29, 2021.

Respectfully submitted,

By: /s/ Neal Massand
Neal Massand
Texas Bar No. 24039038
nmassand@nilawfirm.com
Stevenson Moore V
Texas Bar No. 24076573
smoore@nilawfirm.com

NI, WANG & MASSAND, PLLC
8140 Walnut Hill Ln., Ste. 500
Dallas, TX 75231
Tel: (972) 331-4600
Fax: (972) 314-0900

ATTORNEY FOR PLAINTIFF NORDIC INTERACTIVE TECHNOLOGIES LLC