

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

WILUS INSTITUTE OF STANDARDS AND TECHNOLOGY INC.,
Patent Owner.

Case No. IPR2025-00936
U.S. Patent No. 11,700,597

PATENT OWNER'S PRELIMINARY RESPONSE

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PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	Order, <i>Wilus Institute of Standards and Technology Inc., v. HP Inc.</i> , Case No. 2:24-cv-00752(June 11, 2025) (“Docket Control Order”)
2002	Excerpt from Exhibit H-22 to Invalidity Contentions Served on February 13, 2025 in <i>Institute of Standards and Technology Inc., v. HP Inc.</i> , Case No. 2:24-cv-00752-JRG-RSP.
2003	Interim Processes For PTAB Workload Management, https://www.uspto.gov/sites/default/files/documents/InterimProcesses-PTABWorkloadMgmt
2004	FAQs for Interim Processes for PTAB Workload Management), https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management
2005	Guidance on USPTO’s recission of “Interim Procedure for Discretionary Denials in AIA Parallel District Court Litigation”, March https://www.uspto.gov/sites/default/files/documents/guidance_memo_on_interim_procedure
2006	Excerpts from U.S. District Court – National Judicial Caseload Profile for the Eastern District 2025, https://www.uscourts.gov/sites/default/files/document/fcms_na_disprofile0331.2025 .
2007	Screenshot regarding Judge Rodney Gilstrap’s average time to trial from July 22, 2024 until from www.docketnavigator.com .
2008	Excerpts from Invalidity Contentions Served on February 13, 2025 in the consolidated case <i>and Technology Inc., v. HP Inc.</i> , Case No. 2:24-cv-00752-JRG-RSP.

Patent Owner's Preliminary Response
IPR2025-00936 (U.S. Patent No. 11,700,597)

2009	Dennis Crouch, Estoppel Gutted: A Pelican's Guide to https://patentlyo.com/patent/2025/05/estoppel-pelicans-litigation.html .
2010	Letter re “Notice of Wi-Fi 6 License offer” from Sisvel to Samsung Electronics Co., Ltd. 8, 2022
2011	Letter re “Notice of Wi-Fi 6 License Offer – Follow-up to our letter dated April communications” from Sisvel to Samsung Electronics Co., Ltd. with Attachments 1-2, October
2012	Declaration of Jin Sam Kwak
2013	List of Licensees to Wi-Fi 6 from Sisvel, https://www.sisvel.com/licensing-programmes/licensees .

I. Introduction

The Petition fails to establish that the alleged prior art discloses the element of “not [to use/using] a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed” in all challenged independent claims (i.e., Claims 1 and 9)¹. The signaling information in Lee indicates a trigger frame. The signaling information in Choudhury indicates whether a device is a low-power device or whether the device is in the same BSS as the access point. None of the alleged signaling information in the prior art indicates that “an operation based on the BSS color is not allowed.” The Petition’s attempt to perform word matching with Lee and Choudhury, even though those references teach something very different than what the patent claims, further demonstrates why the Petition fails to establish a reasonable likelihood that Petitioner would succeed in showing that the prior art discloses or renders obvious any of the challenged claims. For at least these reasons, the Board should deny institution.

¹ The Petition relied on additional references in combination with the primary references for some of the dependent claims. Patent Owner reserves the right to argue whether these references in fact qualify as prior art at a later stage.

II. Overview of the '597 Patent

The '597 Patent is a continuation of U.S. Pat. No. 11,129,163 (the "'163 Patent"), which is a continuation of PCT Application No. PCT/KR2017/002407 filed on March 6, 2017, which claims priority to the following Korean patent applications: 10-2016-0026684 filed on March 4, 2016; 10-2016-0029975 filed on March 12, 2016; 10-2016-0044465 filed on April 11, 2016; 10-2016-0057597 filed on May 11, 2016; 10-2016-0114821 filed on September 7, 2016. '597 Patent at 1:10-25.²

The '597 Patent describes techniques for next-generation wireless communication technology that is capable of efficiently utilizing bandwidth by simultaneously transmitting data between a plurality of terminals and base stations. *See* '597 Patent at 2:49-67. The '597 Patent's technology is utilized by products that implement the Wi-Fi 6 (IEEE 802.11ax) standard for wireless communications.

The '597 Patent addresses the issue of Basic Service Set (BSS) color collisions, which occur, e.g., in situations where two Wi-Fi networks' coverage overlap in space utilize the same BSS color value. The '597 Patent enables performing BSS color-based operations when there is a color

² Patent Owner's Discretionary Denial Brief (Paper 9) did not list these Korean patent applications that the '597 Patent claims priority to since they are not necessary for purposes of the discretionary denial brief.

collision, even though such operations can no longer be performed using the color that was the source of the collision.

Using BSS color is a new feature in Wi-Fi 6 that enables devices operating in the same frequency space to quickly distinguish between data units from their own BSS and those from another BSS by simply referencing the BSS color value contained in the HE PHY header. The figure below demonstrates a wireless environment with two different BSSs, where the BSSs' respective coverage spaces do not overlap.

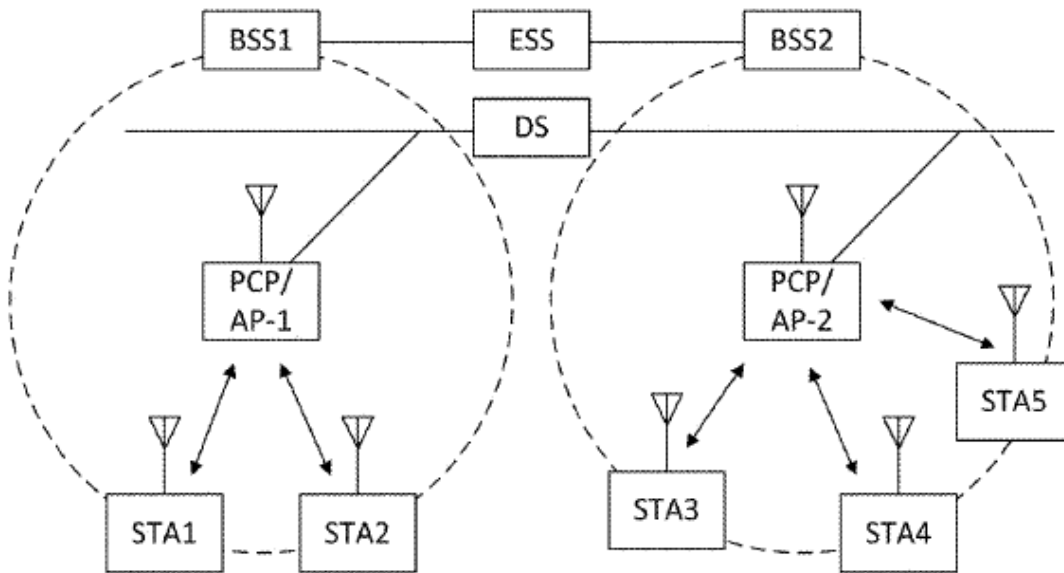


FIG. 1

'597 Patent, FIG. 1.

The BSS color is assigned a value from 0 to 63. The BSS color field is located in the high efficiency physical layer (HE PHY) header of a data unit.

A wireless communication terminal, such as a cellphone or a laptop, may receive a wireless signal that has a certain BSS color assigned to a given communication channel between a base wireless communication terminal, such as an Access Point (AP), and that wireless communication terminal. '597 Patent at 3:12-29. The wireless communication terminal can perform operations such as Network Allocation Vector (NAV) update and Clear Channel Assessment (CCA) adjustment, among other operations, based on the BSS color assigned to it.

One problem addressed by the '597 Patent is that in dense network environments, BSS color collisions occur when two or more BSSs operating on the same frequency channel (and overlapping in coverage area) use the same BSS color. *See* '597 Patent at 2:49-67, 10:53-11:7. In other words, a wireless communication terminal receives a signal with the same BSS color that device understands applies to it, even though the signal is intended for another device in a different BSS (albeit using the same BSS color). When a color collision is detected, the wireless communication terminal reports to the base wireless communication terminal, which will indicate that a color collision has occurred. '597 Patent at 3:26-30.

The '597 Patent is directed to handling operations based on BSS colors in the presence of BSS color collisions. *See, e.g.,* '597 Patent at 16:34-38

(describe an example problem when color collision occurs), FIG. 8 (illustrating color collision). Due to color collisions, operations based on BSS colors are no longer allowed since BSS colors cannot be reliably used to perform these operations. The '597 Patent recognizes color collisions. But instead of not performing the BSS color-based operations, the '597 Patent still performs BSS color-based operations, e.g., by using other techniques that do not use BSS color. *See, e.g.,* '597 Patent at 3:54-61.

Specifically, the patent teaches that, in the event of color collisions, operations based on BSS color are carried out by employing parameters different from the BSS color, *e.g.,* MAC address or other RXVECTOR parameters. *See, e.g.,* '597 Patent at Fig. 22, 15:9-20, 17:9-41.

Representative Claim 1 of the '597 Patent recites the following:

[1.1] A wireless communication terminal communicating wirelessly,
the wireless communication terminal comprising:

[1.2] a transceiver; and

[1.3] a processor,

[1.4] wherein the processor is configured to receive a physical layer convergence procedure (PLCP) Processing Data Unit (PPDU) by using the transceiver, and not to use a Basic Service Set (BSS) color indicated by the

PPDU when signaling information indicates that an operation based on the BSS color is not allowed,

[1.5] wherein the BSS color is an identifier of a BSS,

[1.6] wherein the signaling information is transmitted from a base wireless communication terminal to which the wireless communication terminal is associated.

Independent Claim 9 also recites similar elements as Claim 1.

A. Overview of the '597 Patent's File History

In the September 15, 2022 Office Action, the Examiner found that all claims are allowable because none of the prior art teaches “*not to use a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS is allowed, wherein the signaling information is transmitted from a base wireless communication terminal to which the wireless communication terminal is associated* in combination with other limitations recited in claims 21 and 29.” Ex-1002 at 66 (emphasis in original). The examiner found that the closest prior art is Noh (U.S. Publ. No. 20170094685), Chu (U.S. Pat. No. 10,045,340), Seok (U.S. Publ. No. 20170289987). Id. at 66-68. Examiner found that Noh discloses “A method is implemented by a station (STA) in a Wireless Local Area Network (WLAN) to update a Network Allocation Vector (NAV) maintained by the STA.” Id. at

66. Examiner found that Chu discloses that “when the frame corresponds to the same BSS as the device, process the frame utilizing the static CCA energy level, when the frame corresponds to an overlapping OBSS, processing the frame utilizing a dynamic CCA energy level.” Id. at 66-67. Examiner found that Seok discloses determining whether the PPDU is transmitted from a different Basic Service Set (BSS) from a BSS to which the STA belongs or the same BSS as the BSS to which the STA belongs. Id. at 67. Examiner then concluded that none of the prior art discloses the above emphasized elements. Id. at 66-68.

III. Level of Ordinary Skill in the Art

The Petition proposes that a POSITA “would have had a Bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, and at least 3 years of experience in the research, design or development of wireless communication devices, systems, and/or networks, or equivalent, as of [March 4, 2016]. Increased education experience can make up for less work experience and vice versa.” Petition at 4. To the extent that Petitioner requires that the required experience and/or education level to be acquired by March 4, 2016, Petitioner objects to this requirement because it is not relevant or needed for someone to be a POSITA. Patent Owner does not

otherwise challenge Petitioner's definition for purposes of this Preliminary Response.

IV. Claim Construction

"Petitioner submits that no formal claim constructions are necessary...." Petition at 3. Claim construction is currently ongoing in the District Court. Parties have identified terms for constructions in the District Court. For purposes of this Preliminary Response, claim construction is not necessary as Petitioner failed to demonstrate that the prior art discloses the claims. Patent Owner, however, reserves the right to propose constructions of the terms in a later stage.

V. The Petition Failed to Establish "Not [to Use/Using] a Basic Service Set (BSS) Color Indicated by the PPDU When Signaling Information Indicates an Operation based on the BSS Color is not Allowed" in all Challenged Claims

A. Lee (Ex-1005)

Lee (U.S. Publ. No. 2017/0223731) relates to performing CCA using BSS color. Ex-1005 at Abstract. Lee describes using the BSS color bit to determine whether a signal belongs to the BSS or another BSS (i.e. OBSS). *See, e.g.*, Lee at Abstract; Petition at 6. It changes the CCA level to a first level if the color indicates that the signal belongs to BSS, and changes the CCA to a second level if the color shows that the signal belongs to OBSS. Lee at Abstract; Petition at 6 ("Lee contemplates that different CCA levels may be

applied based on whether a frame is associated with the STA's BSS or another BSS.").

Lee also defines a coloring disable bit in addition to the BSS color bit, which indicates that the data unit is a trigger frame for a multi-user (e.g., OFDMA) based transmission. Lee at Abstract. A trigger frame can be used for resource allocation in the multi-user OFDMA transmission. "[I]f the coloring disable bit indicates that the frame corresponds to a trigger frame related to multiuser transmission, the STA does not perform the change of the CCA level irrespective of information indicated by the coloring bit." Lee at [0007].

The Petition points to the coloring disable bit as the claimed "signaling information." Petition at 11 ("Thus, a POSITA would have understood or found it obvious that Lee's coloring disable bit in the PPDU's HE-SIG field is signaling information."). But the coloring disable bit of Lee indicates that a frame containing that bit is a trigger frame; it does not indicate that "an operation based on the BSS color is not allowed," as is required by the claims of the '597 Patent. Lee at Abstract, [0007]. Indeed, Petition also admits that the coloring disable bit indicates a trigger frame. Petition at 7, *citing* Lee at [0067]-[0068]. In other words, despite being called a "disable bit," the disclosure of Lee does *not* teach the features recited in the claims of the '597 patent. The alleged signaling information (i.e., coloring disable bit in Lee)

does not actually indicate that “an operation based on the BSS color is not allowed” and instead indicates a trigger frame. Accordingly, the Petition failed to demonstrate a reasonable likelihood to succeed on the merits.

While the Petition argues that the CCA level change is the claimed “an operation based on the BSS color” (Petition at 13), the Petition failed to show the claimed element of “when signaling information indicates an operation based on the BSS color is *not allowed*.” *See, e.g.,* ’597 Patent, Claim 1 (emphasis added). Lee only discloses that the STA does not change CCA levels if the color disabling bit indicates that it is a trigger frame. Lee at [0007] (emphasis added). It does not teach whether changing CCA levels using the BSS color (or whether any operations based on the BSS color) is or is not allowed.

Moreover, the claim recites “*not to use a Basic Service Set (BSS) color* indicated by the PPDU when signaling information indicates an operation based on the BSS color is not allowed.” ’597 Patent, Claim 1 (emphasis added). In contrast, in Lee, even if the color disabling bit is received, CCA can still be performed using the BSS color. *See, e.g.,* Lee at [0069] (“If the coloring disable bit indicates that the frame corresponds to a trigger frame related to multiuser transmission, the change of the CCA level can be performed when an uplink frame is received.”). That is, Lee’s color disable

bit does not cause the system not to use BSS color; instead, Lee still uses BSS color for a device to recognize whether the data unit is from its own BSS or an overlapping BSS (OBSS). Lee at [0012]-[0013] (Lee determines whether to perform transmission in a protection section based on whether the coloring bit indicates the device's associated BSS or an OBSS). The Petition also agrees that Lee still uses BSS color to distinguish between BSS and OBSS. Petition at 12-13, *citing* Lee at [0067] (Lee further explains that a STA checks the coloring bit to determine whether '*the coloring bit indicates a BSS* to which the STA belongs thereto' or '*the coloring bit indicates a BSS* to which the STA does not belong.'") (emphasis in original).

In the end, Lee's method is directed to a different issue from the '597 Patent. Lee is about how to perform CCA using BSS colors or not to perform CCA at all if it is a trigger frame. Lee at Abstract, [0007]. It does not teach performing color-based operations (such as CCA level change) when the colors cannot be used, e.g., in a color collision. Indeed, Lee does not disclose anything remotely relevant to solving color collision issues for devices in multiple BSSs. Nor does Petition's use of an expert declaration fill this gap, as the expert declaration merely parrots the Petition.

B. Choudhury (Ex-1009)

Choudhury does not teach the '597 Patent either. While the '597 Patent

addresses the problems arising from BSS color collisions, Choudhury is directed to a different technical problem, namely managing interference in wireless networking environments. Choudhury at 1. Choudhury rests on the 802.11ah standard and proposes to modify the 802.11ah standard. The 802.11ah standard, however, is for a different frequency band and has different technical considerations compared to the '597 Patent, which relates to a Wi-Fi standard. Notably, the 802.11ah standard has been adopted for Internet of Things (IoT) devices operating in the sub-1 GHz band, which contrasts with Wi-Fi standards (such as 802.11ax) that utilize the 2.4 GHz, 5 GHz, and 6 GHz bands. Due to the IoT applications in the sub-1 GHz band, e.g., 900 MHz, with a significantly extended coverage (typically up to 1km), the 802.11ah standard does not need to consider the BSS color collision issue. As a result, a POSITA would not be looking at Choudhury in attempting to solve the problem in the '597 Patent, which arises from BSS color collisions.

Choudhury provides “mechanisms for managing channel use in ways that assure fairness to low power devices as well as additional more precise ways to manage access in general.” Choudhury at [0016]. Choudhury explains that with the increasingly varied power levels being served by wireless networks, an increased CCA threshold (associated with a high-power device) can lead to lower power level devices suffering interference and unfairness,

because “they are unable to be received at the increased CCA threshold and therefore prevent interfering transmissions from other stations.” Choudhury at [0009].

Choudhury proposes to solve this problem by using a 1-bit indicator called Low Power Bit in the SIG field to indicate whether a device is a low-power device. Choudhury at [0022]. Choudhury proposes an amendment to the previous 802.11ah standard (which described the COLOR field concept) where this Low Power Bit is to be used individually or in combination with the COLOR field to determine whether to allow or limit STAs' access to the channel. Choudhury at [0023], [0026]-[0027].

Choudhury proposes three variant embodiments of its approach:

- First variant: an indicator following the COLOR field described in 802.11ah is accompanied by a low power indicator.
- Second variant: a low power indicator is used without the use of the COLOR field concept.
- Third variant: a modified version of the COLOR field concept is used, without a separate Low Power indicator.

Choudhury at [0024]. None of the three embodiments, however, teaches the '597 Patent.

The Petition argued that the “Low Power / High Interference Indicator” (i.e., the Low Power Bit) and the COLOR field meet the claimed “signaling information.” Petition at 53. But this theory fails because the alleged signaling

information does not “indicate[] that an operation based on the BSS color is not allowed.” Choudhury at [0023]. The Low Power Bit is “an indication that a device is operating at low power or is otherwise unusually susceptible to interference or is experiencing interference.” Choudhury at [0023]. It does not indicate that “an operation based on the BSS color is not allowed” as required by the claims. Instead, the BSS color field indicates whether the data unit is in the same BSS—the basic feature of prior art uses of the BSS color concept. Choudary at [0021] (“Each BSS has a different color [field] that enables STA to know (with high probability) whether the transmission is within their BSS or not after decoding the SIG field.”).

The table cited in the Petition (reproduced below) does not help the Petitioner either.

COLOR Field	Low Power/High Interference Indicator	Receiving STA
Not used	1	Limit Access
Not used	0	Allow Access
STA in same BSS (that is, same COLOR field as receiving STA)	0 or 1	Limit Access
STA in different BSS (different COLOR field from receiving STA)	0	Allow Access
STA in different BSS (different COLOR field from receiving STA)	1	Limit Access

Choudhury at [0029]; Petition at 51. The rows 1-2 of the table demonstrate the second variant in Choudhury, where “a low power indicator is used without the use of the COLOR field concept.” Choudhury at [0024]. Here, “a

low power indicator is used to indicate all other STAs that they should refrain from using the channel if they are able to decode the SIG field.” Choudhury at [0028]. In other words, the lower power indicator of Choudhury (and in particular as shown in rows 1-2) is not for indicating whether *an operation based on the BSS color* is allowed or not allowed, as required by the claims.

Rows 3-5 of the table demonstrate the first variant of Choudhury where “an indicator following the COLOR field concept described in 802.11ah, may include or be accompanied by a lower power indicator.” Choudhury at [0023]. Accordingly, Choudhury uses the COLOR field in these rows to determine whether the data unit is in the same BSS, which runs directly afoul of the claim language of “*not to use a Basic Service Set (BSS) color* indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed.” *See, e.g.,* ’597 Patent, Claim 1 (emphasis added).

Specifically, in the third row of the table, the Low Power bit indicator is essentially irrelevant, as it can be set to either 0 or 1, since the behavior of the receiving STA is determined solely by the COLOR field. Based on the COLOR field value, if there is an ongoing intra-BSS transmission, the STA does not re-use the channel. Choudhury at [0025]. Thus, in the third row of the table, Choudhury still uses the BSS color, which contravenes the claim’s requirement of “not to use a Basic Service Set (BSS) color.”

As to the fourth and fifth rows, the COLOR field is still used, to determine whether a data unit is from OBSS. If it is from OBSS, the STA avoids transmitting or applies a lower CCA threshold if the SIG field also includes a Low Power indicator bit set to 1 (as indicated in the fifth row of the table). But if it is from OBSS and if the Low Power bit is set to 0, the STA may access the channel without any restriction (as indicated in the fourth row of the table).

Thus, the first variant of Choudhury teaches using both the COLOR field and the Low Power indicator in the SIG field to determine if a STA monitoring the signal field is allowed to access the channel or needs deferred channel access. Choudhury at [0026]. It does not teach “*not to use a Basic Service Set (BSS) color*” in the claims of the ’597 Patent.

The Petitioner also points to the value “0000” in the COLOR field in the third variant of Choudhury. Petition at 53-54. But this third variant of Choudhury still uses the COLOR field. Choudhury at [0024] (“In a third variant, a modified version of the COLOR field concept is used, without a separate low power indicator.”). Indeed, Choudhury describes that “the first three bits of the COLOR bit can be used to set the basic service set identification (BSS ID) and the fourth bit can be used as a low power/high access.” Choudhury at [0029]. Again, this shows that the COLOR is still used,

i.e., to determine whether the data unit is in the same BSS in the first three bits along with an indication of whether the device is low power.

Choudhury also discloses that the entire 4-bit COLOR field can be used to express whether it is low power or high interference devices, where “1111 may be used for low power devices or 0000 may be used for high interference devices.” Choudhury at [0029]. Here, contrary to the Petition (Petition at 53-54), the 0000 in Choudhury does not indicate “an operation based on the BSS color is not allowed” as required in the claim; instead, it indicates whether it is a lower power or a high interference device. Choudhury at [0029].

According to Choudhury, a receiving station is configured to receive a PPDU and to apply some limitations to the channel access, such as a lower CCA threshold or inhibition to the channel use, to avoid interference when the “Low Power/High Interference Indicator or the COLOR ‘0000’ value of the received PPDU indicates that the device is susceptible to interference. Choudhury at [0030]. Because the “Low Power/High Interference Indicator or the COLOR’ ‘0000’ value does not indicate that “an operation based on the BSS color is not allowed”, it would not have been obvious to a POSITA not using the BSS color based on said signaling information.

VI. Conclusion

For the foregoing reasons, the Petition fails to demonstrate at least the element of “not [to use/using] a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed” of independent Claims 1 and 9 is present in the prior art that the Petition relies upon for this limitation. Accordingly, the Petition fails to establish that it has a reasonable likelihood to succeed on the merits, and it should not be instituted.

Dated: September 2, 2025

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CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24

I certify that there are 3,782 words in this paper, excluding the portions exempted under 37 C.F.R. § 42.24(a)(1), according to the word count tool in Microsoft Word.

Dated: September 2, 2025

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CERTIFICATE OF SERVICE

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