IEEE P802.11  
Wireless LANs

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| IEEE 802.11  Register of IEEE 802.11 LoA requests | | | | |
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|  |  |  |  |  |

Abstract

This document contains a register of LoA requests sent by the IEEE 802.11 working group (WG) chair in response to “holder” notifications under the IEEE-SA patent policy.

It also records “Negative” LoAs notified to the WG chair by the PatCom administrator.

NOTE: As stated in Clause 6.2 of the [IEEE SA Standards Board Bylaws](https://standards.ieee.org/about/policies/bylaws/sect6-7.html),

"IEEE is not responsible for  
1. Identifying Essential Patent Claims for which a license may be required;  
2. Determining the validity, essentiality, or interpretation of Patent Claims;  
3. Determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory; or,  
4. Determining whether an implementation is a Compliant Implementation."

The information provided in this document was submitted to the Working Group Chair, and provided AS IS. No validation has been made with respect to the information, and no assumptions should be made with regard to the accuracy of the information.

# Change record

R23: Response regarding Hedwig Wireless Technologies affiliates

R22: Addition of Hedwig Wireless Technologies affiliates (Golden Eye Technology LLC and Ukpik Mobile Technologies LLC) request

R20/21: Addition of 2024 January Communication Systems LLC/date correction

R19: Update (closed) to Carlos Rios/Terabit Wireless request

R18: Addition of Carlos Rios/Terabit Wireless request

R17: Addition of Mitsubisi Ecectric Corporation request

R16: Addition of SK Teleconm request/response

R15: Addition of NOTE in abstract per IEEE staff request

# Introduction

IEEE 802.11 working group participants and members have certain obligations and rights as described under the IEEE Standards Association (IEEE-SA) patent policy. Under that policy, the WG chair also has the obligation to respond to notifications about possible holders of potentially essential patent claims by sending out requests for LoAs. The WG chair’s obligation in regard of any particular holder notification is complete once the holder has received the request.

This policy is described here: <https://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6>.

The patent committee (PatCom) of IEEE-SA has published answers to some frequently asked questions here: <https://standards.ieee.org/faqs/patents.pdf>

This document makes available to participants the status of all requests for LoAs made in IEEE 802.11 since October 2013.

## Format of request sent to patent holder

The full text of an email sent to the patent holder is not reproduced here for brevity.

The request sent by the WG chair to a patent holder can be essentially reconstructed by using the information provided below and the template letter provided here: <https://development.standards.ieee.org/myproject/Public/mytools/mob/cover_letter.doc>

## Format of entries

Each entry relates to a single “holder notification”, named after the potentially essential patent holder.

The next level are events related to:

1. The date of a holder notification (if recorded as such)
2. Outgoing LoA request letter
3. Any responses and follow-up reminders
4. Any discovery of an accepted LoA

## Some PatCom FAQ entries

Some of FAQ entries are reproduced below (from the version as approved on 2015-09-01).

**11. When does the IEEE send out a request for a Letter of Assurance?**

The Working Group chair or, where appropriate, the Sponsor chair will send out a request for a Letter of Assurance whenever the chair is notified, at any time and by any means, that the [Proposed] IEEE Standard may require the use of a potential Essential Patent Claim.

**18. How do I find out if a particular company has submitted an Accepted Letter of Assurance?**

Accepted Letters of Assurance are listed on the IEEE-SA’s web site at <http://standards.ieee.org/about/sasb/patcom/patents.html>. Letters of Assurance accepted after 31 December 2006 will be posted on the web site as they are accepted and Letters of Assurance accepted prior to that date will be posted over time.

**64. Can a Working Group chair provide participants with a list of requested LOAs?**

Yes. The Working Group chair should maintain a list of the requests that the chair (or his/her designee) has made and the date of each request. The chair may make this information available to participants in the working group and should make it available to participants upon request.

**65. How does a participant know if a Letter of Assurance has been requested from a particular company?**

A participant may ask the Working Group chair whether he or she has requested an LOA from that company. Accepted Letters of Assurance are available on the IEEE’s web site.

# Open LoA requests

These are requests that the WG chair will or has recently take/taken action on in the form of a follow-up LoA request.

1. 2025 SRC Software Inc.
   1. Holder notification via email 2025-05-02
   2. Request for LOA
      1. Sent 2025-05-12 to Hitoshi Morioka ([hmorioka@src-soft.com](mailto:hmorioka@src-soft.com))
2. 2024 Communication Systems LLC
   1. Holder notification via email 2024-01-26
   2. Request for LOA
      1. Sent 2024-02-27 to Ali Atefi ([ali@commsystems.co](mailto:ali@commsystems.co) )
3. Mitsubishi Electric Corporation
   1. Holder notification via email 2023-03-15
   2. Request for LOA
      1. Sent 2023-03-16 to Takao Tominaga ([Tominaga.Takao@eb.MitsubishiElectric.co.jp](mailto:Tominaga.Takao@eb.MitsubishiElectric.co.jp) )
4. 2020 Communication Systems LLC
   1. Holder notification via email 2020-02-01
   2. Request for LOA
      1. Sent 2020-03-01 to Ali Atefi ([ali@commsystems.co](mailto:ali@commsystems.co) )
5. 2018 Communication Systems LLC
   1. Holder notification via email 2018-06-25
   2. Request for LOA
      1. Sent 2018-07-07 to Ali Atefi ([ali@commsystems.co](mailto:ali@commsystems.co) )

# Closed LoA requests – resulting in positive LoA

1. Carlos Rios, Terabit Wireless
   1. Holder notification during 802.11 opening plenary, 2023-09-11
   2. Request for LOA
      1. Sent 2023-09-13 to Carlos Rios ([carlos@terabitwireless.com](mailto:carlos@terabitwireless.com)) from Robert Stacey, acting Chair
      2. Project P802.11bn
   3. Closed. One accepted LOA was received 2023-10-25.
2. 2021 SK Telecom
   1. Holder notification via email 2021-03-03
   2. Request for LOA
      1. Sent 2021-03-04 to Injoon Song ([ijsong@sk.com](mailto:ijsong@sk.com) )
      2. Project P802.11ax
   3. Closed. One accepted LOA was received 2021-03-08.
3. 2018 Siemens Corporation TGax
   1. Holder notification via email 2018-03-20
   2. Request for LoA
      1. Sent 2018-03-27 to Hans-Jeorg Meuller ([hans-joerg.mueller@siemens.com](mailto:hans-joerg.mueller@siemens.com))
      2. Project TGax
      3. Cited Patent: US 2015/0212505 A1
         1. Related to the dynamic transmit power adjustment feature
   3. Response from Hans-Jeorg Meuller ([hans-joerg.mueller@siemens.com](mailto:hans-joerg.mueller@siemens.com)) acknowledging reception
   4. Closed. One accepted LOA was received 2019-01-04.
4. 2018 Endiio Engineering GmbH
   1. Request for an LoA
      1. Sent 2018-02-27 to Tolgay Ungan ([ungan@endiio.com](mailto:ungan@endiio.com))
      2. Project P802.11ba (Wake-up Radio)
   2. Closed. One accepted LOA was received on 2018-05-04.
5. Microsoft 2015 TGai
   1. Request for LoA
      1. Sent 2015-08-15 to [stdsreq@microsoft.com](mailto:stdsreq@microsoft.com)
      2. Project P802.11ai
      3. Cited patents:
         1. US6101499
            1. Related to IETF RFC 4862, “IPv6 Stateless Address Autoconfiguration,”
         2. US6834341, US7085924, US7089415
            1. Related to IETF RFC 6696, “EAP Extensions for the EAP Re-authentication Protocol (ERP),” July 2012.
   2. Reminder sent (same address) 2016-03-03
   3. Response 2016-04-13 from Peggy Maloney “the LOA related to 802.11ai will be filed with shortly”
6. Broadcom 2014 TGai
   1. Request for LoA
      1. Sent 2014-08-13 to Joseph Lee
      2. Project P802.11ai
      3. Cited Patent application US 13/183,542
   2. Follow-up sent 2014-11-13
   3. Response 2014-11-14 indicates to communicate with Neil Vohra
   4. Follow-up sent 2015-10-22
   5. Response 2015-10-23 from Neil Vohra indicating their intention to send an LoA
   6. Response 2015-10-31 from Neil Vohra indicating that an LoA had been filed
   7. Closed. Accepted Blanket P802.11ai LoA received 2015-10-29
7. Huawei 2013 TGai
   1. Request for LoA
      1. Sent 2013-10-21 to the Director of Licensing ([licensing@huawei.com](mailto:licensing@huawei.com))
      2. Project P802.11ai
      3. Cited patent applications
         1. PCT/CN2013/070263
         2. US 13/669,001
         3. US 13/717,423
         4. US 13/626,482
         5. PCT/CN2013/070125
   2. Accepted blanket LoA for LoA received 2013-08-13
8. Intel P802.11 (REVmc) 2015
   1. Notification received in P802.11 (REVmc) sponsor ballot from voter in a comment.
   2. Request for LoA
      1. Sent 2015-05-04 to [standards.licensing@intel.com](mailto:standards.licensing@intel.com)
      2. Project P802.11 (current revision project)
      3. Cited patent application WO2015041708 (A1)
   3. Closed. Accepted blanked LoA citing P802.11 revision project (PAR approved 2012-08-30) received 2015-07-06.
9. Interdigital 2013 TGai
   1. Request for LoA
      1. Sent 2013-10-22 to Bradley N. Ditty
      2. Acknowledged 2013-10-28
      3. Cited patent applications
         1. US 13/738,589
         2. PCT/US2013/020982
   2. Closed. Three accepted LoAs were received on 2013-10-31
10. LGE 2013
    1. Request for LoA
       1. Sent 2013-10-22 to Soo Lee
       2. Cited patent applications
          1. PCT/KR2012/008220
          2. PCT/KR2012/006820
          3. PCT/KR2012/007271
    2. Response 2013-10-24 from Jason Jeongsoo Lee indicating they had submitted LoAs several months earlier
    3. Closed: Accepted blanket LoA for TGai received 2013-08-14
11. Marvell 2013 TGai
    1. Request for LoA
       1. Sent 2013-10-13 to Horace Ng.
       2. Cited patent application US 13/462,972
    2. Acknowledged 2014-12-02
    3. Follow-up request sent 2014-08-12
    4. Follow-up request sent 2014-11-13
    5. Acknowledged 2014-11-14
    6. Closed: Accepted LoA received 2014-12-05
12. Siemens TGai 2013
    1. Request for LoA
       1. Sent 2013-10-23 to Hans-Joerg Mueller
       2. Project P802.11ai
       3. Cited
          1. Patent application PCT/EP2006/050190
          2. Patent PCT/EP2005/051752
    2. Acknowledged 2013-10-24
    3. Follow-up sent 2014-08-12
    4. Email from PatCom administrator received 2014-08-12
       1. Indicated that an LoA had been accepted
    5. Closed. Accepted blanket LoA on P802.11ai received 2014-05-05
13. IHP GmbH TGaz 2016
    1. Request for LoA
       1. Sent 2016-09-16 to [zernick@ihp-microelectronics.com](mailto:zernick@ihp-microelectronics.com)
       2. Project P802.11az
       3. Cited patent
          1. Registration Number of German Patent: 102016217277.8
          2. Title of Patent: "Precise Positioning Using Time of Arrival with Pseudo-Synchronized Anchor Nodes"
    2. Acknowledgement of receipt of request
       1. 2016-10-11
       2. Mr Marco Dannemann, IHP-Solutions GmbH.
    3. LoA filed November 2016.

# Closed LoA requests – not resulting in positive LoA

These are requests where the 802.11 chair has determined that the notification of a request for LoA was received, and where no positive LoA has been received.

1. Hedwig Wireless Technologies affiliates (Golden Eye Technology LLC, Ukpik Mobile Technologies LLC, etc.)
   1. Information from Section E and F of <https://standards.ieee.org/wp-content/uploads/import/governance/patcom/loa-802_11ax-Hedwig-24Jul2024.pdf>
   2. Request for LOA
      1. Sent 2024-08-01 to Christian Dubuc ([chris@harfangip.com](https://intel-my.sharepoint.com/personal/robert_stacey_intel_com/Documents/Documents/802.11/LOA/chris@harfangip.com))
   3. Telecon held with Curtis Dodd
   4. Email response received on 2024-08-15. Declines to submit LOA on behalf of affiliates.
2. Texas A&M University System
   1. Request for LoA
      1. Sent 2014-09-29 to Dr Steven R Garrett
      2. Projects: P802.11n, P802.11ac and P802.11ad
      3. Cited patents:
         1. 8,359,522 Low density parity check decoder for regular LDPC codes
         2. 8,418,023  Low density parity check decoder for irregular LDPC codes
         3. 8,555,140 Low density parity check decoder for irregular LDPC codes
         4. 8,656,250 Low density parity check decoder for regular LDPC codes
         5. 20140181612 - Low density parity check decoder.
   2. Follow-up sent 2014-11-13
   3. Follow-up sent 2015-01-06 to Mr R Bonilla
   4. Telephone conversation 2015-01-22 with Steven Garret. Purpose of the call was to point to where they could obtain information on the IEEE-SA patent process, as they were unfamiliar with how to respond.
   5. No further will be action by the WG chair
      1. They are known to be aware of the notification, and the IEEE-SA process
3. Nokia 2013 TGai
   1. Request for LoA
      1. Sent 2013-10-21 to Moilanen Kalle
      2. Cited
         1. Patent application EP20120183646
         2. Patent US 13/234,463
      3. Acknowledged 2013-10-22
      4. Follow-up request sent 2014-08-12
      5. Nokia responded 2014-08-13: “IPR declaration has not been submitted as the current understanding is that the below mentioned IPR is not essential for IEEE 802.11ai. If we become aware of contrary information Nokia shall submit the IPR declaration accordingly”
      6. Closed 2014-08-13.
4. NTT 2015 TGai
   1. Request for LoA
      1. Sent 2015-10-01 to Kengo Nagata
      2. Project P802.11ai
      3. References ISO/IEC 14888-3:2006, and LoA to ISO by NTT <http://isotc.iso.org/livelink/livelink?func=ll&objId=16494782&objAction=Open&nexturl=%2Flivelink%2Flivelink%3Ffunc%3Dll%26objId%3D16231513%26objAction%3Dbrowse%26viewType%3D1>
   2. Closed. Response 2015-10-26 from Yasuhiko Inoue (NTT) indicating that research in NTT shows that the patents have expired.
5. Blackberry 2015 TGai
   1. Request for LoA
      1. Sent 2015-08-14 to Paul Carpenter
      2. Project P802.11ai
      3. Cited patents owned by Certicom Corporation on the follow topics
         1. ISO/IEC 14888-3:2006, “Information technology – Security techniques – Digital signatures with appendix – Part 3: Discrete logarithm based mechanisms.  Within this standard, P802.11ai uses the Elliptic Curve Digital Signature
         2. Algorithm (ECDSA).  Essential patent claims for ECDSA are declared in ECSDA LoAs:
            1. http://publicaa.ansi.org/sites/apdl/Patent%20Letters/PL337.pdf.pdf
            2. <http://isotc.iso.org/livelink/livelink/fetch/2000/2122/3770791/16231513/1999-09-02_CerticomCorporation_9796-3.pdf?nodeid=16494873&vernum=-2>
         3. IETF RFC 6090, “Fundamental Elliptic Curve Cryptography Algorithms,” Feb. 2011.
            1. <https://datatracker.ietf.org/ipr/search/?draft=&rfc=6090&submit=rfc&doctitle=&group=&holder=&iprtitle=&patent>=
         4. IETF RFC 3279, “Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile,” Apr. 2002.
            1. <https://datatracker.ietf.org/ipr/2541/>
   2. Response 2015-12-02 from Elizabeth Pham indicates that they don’t believe an LoA is necessary as the cited IP is incorporated by reference from a published other standard, and an LoA has been supplied for the standard thus referred to.
   3. Closed 2015-12-02.
6. Renasis 2013 TGai
   1. Request for LoA
      1. Sent 2013-11-11 to Taylor Davis
      2. Project P802.11ai
      3. Cited patent application US 13/183,542
   2. Response 2012-11-11 from Taylor Davis
      1. “I will pass your request to the appropriate person”
   3. Follow-up request sent 2014-08-12
   4. Response 2014-08-12 from Taylor Davis
      1. “It appears that the referenced patent has since been assigned to Broadcom Corporation.  See: <http://assignments.uspto.gov/assignments/q?db=pat&pub=20130016648>.”
   5. Closed: no LoA will be forthcoming from this holder.
7. IBM 2016 TGai
   1. Holder notification 2015-08-14
   2. Request for LoA
      1. Sent 2016-01-07 to Marcia Courtemanche, IBM (email)
      2. Cited patent: US5953420
         1. Related to IETF RFC 5280, “Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile,” May 2008
   3. Request acknowledged 2016-01-19
8. HP 2015 TGai
   1. Request for LoA
      1. Sent 2015-08-14 to Tony McQuinn (Hewlett-Packard Co.)
      2. Project P802.11ai
      3. Cited patent US5848159
         1. In relation to IETF RFC 3447, “Public-Key Cryptography Standards (PKCS) #1: RSA Cryptography Specification Version 2.1.”
   2. Response received 2016-02-24.
      1. From Michele Y. Antis, Senior Counsel, IP Transactions & Counseling, Hewlett Packard Enterprise Company
      2. Indicates that the cited RFC is incorporated by reference into P802.11ai, and thus HPE does not believe that an LoA is necessary.
9. Nokia 2015 TGai
   1. Holder notification from 802.11 member received 2015-10-13
   2. Request for LoA
      1. Sent 2015-10-22 to Kalle Moilanen
      2. Project P802.11ai
      3. Cited
         1. Patent application US 2013/0155933 A1
         2. Patent US 8,843,629 B2
   3. Reminder sent 2016-03-03 to Kalle Moilanen
   4. Acknowledgement received 2016-03-18 from Kalle Moilanen

# Closed LoA requests – other

These are requests for an LoA where where it has been determined that the request has been received, and where the 802.11 chair is unwilling and/or unable to assert whether a positive LoA has been received.

1. Qualcomm 2014 TGah
   1. Request for LoA
      1. Sent 2014-01-19 to Fabian Gonell
      2. Project P802.11ah
      3. Citing list of potentially essential patents in letter from Qualcomm to PatCom.
   2. Follow-up request sent 2014-08-12
   3. Follow-up request sent 2014-11-14
   4. Notification from PatCom received 2014-12-03
      1. Contained a copy of a letter from Qualcomm to PatCom sent 2014-12-03 citing claimed potentially essential patents.
   5. A number of documents were received from Qualcomm by PatCom, but none resulted in an accepted LoA.
   6. Letter sent 2015-09-01 by Fabian Gonell to Patcom
      1. Indicates that “all of Qualcomm’s Essential Patent Claims with respect to the 802.11ah Standard are subject to the Accepted Letter of Assurance filed by CSR, plc on March 6, 2009.”
   7. Document posted 2015-09-02 on 802.11 document server by Rolf de Vegt (Qualcomm)
      1. <https://mentor.ieee.org/802.11/dcn/15/11-15-1029-02-00ah-proposed-resolution-for-comments-on-missing-loa.docx>
      2. Embeds the 2015-09-01 letter from Fabian Gonell
   8. Document posted 2015-09-03 on 802.11 document server by Rolf de Vegt (Qualcomm)
      1. <https://mentor.ieee.org/802.11/dcn/15/11-15-1127-01-00ah-response-to-document-1076.docx>
      2. Responds to document 1076r0.
      3. Concludes “The CSR LoA applies to the Qualcomm Essential Patent Claims for 802.11ah.”
   9. Closed
      1. Qualcomm are aware of the LoA request and have responded as shown above.

# Known “Negative” LoAs

The following is a list of some negative LoAs. It is updated when the PatCom administrator notifies the WG chair of a negative LoA.

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Company** | **Standard** | **Link** |
| 2010-10-13 | Rukus Wireless Inc | 802.11v | http://standards.ieee.org/about/sasb/patcom/loa-negative-802\_11v-Ruckus-13oct2010.pdf |
| 2016-01-13 | Nokia Technologies Oy | 802.11ad | http://standards.ieee.org/about/sasb/patcom/negative-loa-802\_11ad-nokia-13Jan2016.pdf |
| 2016-01-13 | Nokia Technologies Oy | 802.11af | http://standards.ieee.org/about/sasb/patcom/negative-loa-802\_11af-nokia-13Jan2016.pdf |
| 2016-03-18 | Nokia Technologies Oy | 802.11n | http://standards.ieee.org/about/sasb/patcom/negative-loa-802\_11n-nokia-18Mar2016.pdf |
| 2016-09-27 | Telefon-  aktiebolaget  LM Ericsson | 802.11ah | http://standards.ieee.org/about/sasb/patcom/negative-loa-802\_11ah-ericsson-27Sep2016.pdf |
| 2016-09-27 | Telefon-  aktiebolaget  LM Ericsson | 802.11ax | http://standards.ieee.org/about/sasb/patcom/negative-loa-802\_11ax-ericsson-27Sep2016.pdf |
| 2016-10-07 | Nokia Technologies Oy | 802.11ah | http://standards.ieee.org/about/sasb/patcom/negative-loa-802\_11ah-nokia-07Oct2016.pdf |
| 2016-10-07 | Nokia Technologies Oy | 802.11ai | <http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ai-nokia-07Oct2016.pdf> |
| 2017-03-15 | InterDigital Patent Holdings Inc | 802.11ax | <https://standards.ieee.org/about/sasb/patcom/neg-loa-802_11ax-IPH-15Mar2017.pdf> |
| 2018-02-14 | Panasonic Corporation | 802.11ax | <https://standards.ieee.org/about/sasb/patcom/neg-loa-802_11ax-panasonic-14Feb2018.pdf> |
| 2018-02-14 | Panasonic Corporation | 802.11ay | <https://standards.ieee.org/about/sasb/patcom/neg-loa-802_11ay-panasonic-14Feb2018.pdf> |