#### SUPPORTING STATEMENT

# United States Patent and Trademark Office Patent Trial and Appeal Board (PTAB) Actions (formerly Board of Patent Appeals and Interferences (BPAI) Actions) OMB CONTROL NO. 0651-0063 April 2017

#### A. JUSTIFICATION

# 1. Necessity of Information Collection

The Patent Trial and Appeal Board (PTAB or Board) is established by statute under 35 U.S.C. § 6. This statute directs, in relevant part, that PTAB shall "on written appeal of an applicant, review adverse decisions of examiners upon applications for patents pursuant to section 134(a)." PTAB has the authority, under 35 U.S.C. §§ 134 and 306 to decide appeals in applications and *ex parte* reexamination proceedings and under pre-AIA sections of the Patent Act, i.e., 35 U.S.C. §§ 134 and 315, to decide inter partes appeals. In addition, 35 U.S.C. § 6 establishes the membership of PTAB as the Director, the Deputy Director, the Commissioner for Patents, the Commissioner for Trademarks, and the Administrative Patent Judges. Each appeal is decided by a merits panel of at least three members of the Board.

The Board's responsibilities under the statute include the review of ex parte appeals from adverse decisions of examiners in those situations where a written appeal is taken by a dissatisfied applicant or patent owner. In *inter partes* reexamination appeals, PTAB reviews examiner's decisions adverse to a patent owner or a third-party requestor.

#### 2. Needs and Uses

The information in this collection can be submitted by mail, hand delivery, or facsimile when an applicant files a brief, petition, amendment, or request. These papers can also be filed as attachments through EFS-Web.

There are no forms associated with these items. However, they are governed by rules in Part 41. Failure to comply with the appropriate rule may result in dismissal of the appeal or denial of entry of the paper.

Ex parte appeals from adverse decisions by patent examiners in applications for patents and in reexamination proceedings filed pursuant to Chapter 30 of 35 U.S.C. are provided for by 35 U.S.C. §§ 134 and 306. The rules governing ex parte appeals are found at 37 CFR 41.1 through 41.54. Chapter 1200 of *The Manual of Patent Examining Procedure* sets forth the current procedures for appellants and patent examiners to follow in *ex parte* appeals. Sections 2273 through 2279 of *The Manual of Patent* 

Examining Procedure sets forth additional procedures for appellants and patent examiners to follow in *ex parte* appeals in a reexamination proceeding.

The PTAB disseminates certain information that it collects through various publications and databases. This information includes opinions, binding precedent, final decisions, and judgments in appeals.

Opinions authored by the PTAB have varying degrees of authority attached to them. There are precedential opinions, which when published, are binding and provide the criteria and authority that the PTAB will use to decide all other factually similar cases (until the opinion is overruled or changed by statute). There are informative opinions which are non-precedential. Informative opinions illustrate norms of PTAB decision-making for the public. The final type of PTAB opinion is the routine opinion. A routine opinion is also non-precedential. Routine opinions are all publicly available opinions which are not designated as precedential or informative. Since public policy favors a widespread publication of opinions, the PTAB publishes all publicly available opinions, even if the opinions are not binding precedent upon the PTAB.

An opinion of the PTAB made precedential by the procedures contained in the current or earlier versions of the Standard Operating Procedure 2 is considered to be binding precedent. Other PTAB opinions that are published or otherwise disseminated are not considered binding precedent of the PTAB.

The information collected, maintained, and used in this collection is based on OMB and USPTO guidelines. This includes the basic information quality standards established in the Paperwork Reduction Act (44 U.S.C. Chapter 35), in OMB Circular A-130, and in the USPTO information quality guidelines.

Table 1 lists the specific statutes and regulations authorizing the USPTO to collect this information and outlines how this information is used by the public and by the USPTO:

Table 1: Information Requirements and Needs and Uses of Information Collected

IC #	Requirement	Statute	Rule	Form #	Needs and Uses
1	Amendment	35 U.S.C. § 134	37 CFR 41.33	No Form Associated	<ul> <li>Used by the applicant to cancel pending, rejected claims that applicant does not wish to be considered on appeal by the PTAB.</li> <li>Used by the PTAB to determine which claims are on appeal.</li> </ul>
2	Appeal Brief	35 U.S.C. § 134	37 CFR 41.37	No Form Associated	Used by the applicant to set forth the claims, issues, and arguments on appeal to the PTAB. Used by the PTAB to aid in rendering a decision on the claims, issues, and arguments submitted by the applicant.

IC #	Requirement	Statute	Rule	Form #	Needs and Uses
3	Reply Brief	35 U.S.C. § 134	37 CFR 41.41	No Form Associated	Used by the applicant to respond to the examiner's answer. Used by the PTAB to aid in rendering a decision on the claims, issues, and arguments submitted by the applicant.
4	Request for Rehearing Before the PTAB	35 U.S.C. § 134	37 CFR 41.52	No Form Associated	<ul> <li>Used by the applicant to request reconsideration of a PTAB decision.</li> <li>Used by the PTAB to decide whether to grant or deny a request for reconsideration of a decision.</li> </ul>
5	Petitions to the Chief Administrative Patent Judge Under 37 CFR 41.3	35 U.S.C. § 134	37 CFR 41.3	No Form Associated	<ul> <li>Permits parties to petition the Chief Administrative Patent Judge on matters pending bfore the PTAB.</li> <li>Used by the PTAB to determine whether the necessary information has been provided to grant the petition.</li> </ul>

# 3. Use of Information Technology

The USPTO does not collect the amendments, the briefs, the requests, and the petitions through automated or mechanical means. The USPTO does not, at this time, offer electronic forms for the items in this collection. Parties may, however, file this information as attachments through EFS-Web.

EFS-Web allows customers to file applications and associated documents through their standard web browser and does not require any significant client-side components. Although there are no forms offered for the items in this collection through EFS-Web, parties may create these documents using the tools and processes that they already use and then convert those documents into standard portable document file (PDF) format and submit them through EFS-Web. EFS-Web provides immediate notification that the submission was received, automated processing of requests, and avoidance of postage or other paper delivery costs.

Correspondence officially submitted via EFS-Web is accorded a "receipt date," which is the date the correspondence was received by the USPTO. After a successful submission, an acknowledgement receipt containing the receipt date, the time the correspondence was received at the USPTO, and a full listing of the correspondence submitted, can be obtained from EFS-Web.

As PTAB gains more experience with the number, types, and complexities of the appeal papers filed as attachments through EFS-Web, PTAB will continue to review the results and any feedback to determine whether full electronic filing, offering PDF forms that can be completed and submitted online, will be beneficial. If it is found that full electronic filing is beneficial and PTAB decides to deploy a production system, the electronic forms, with their associated burdens, will be submitted to OMB for review and approval.

The PTAB uses the Appeals Case Tracking System (ACTS) to track the status of the patent appeal cases. ACTS allows the PTAB to track the status of the patent appeal cases and also provides relevant information pertaining to these cases. This is an internal system that manages the workflow throughout PTAB. ACTS is not designed to disseminate information or to provide status updates to the public.

PTAB's opinions and decisions for publicly available files are published on the USPTO's website. Precedential opinions are published on PTAB's home page through the USPTO's website. In late 1997, PTAB started disseminating opinions in support of PTAB's final decisions appearing in issued patents, reissue applications, and reexamination proceedings through the USPTO's electronic Freedom of Information Act (e-FOIA) website. Beginning in 2001, with the implementation of eighteen-month publication of applications under the American Inventors Protection Act of 1999, the PTAB also began posting final decisions for published applications through the e-FOIA wesite.

# 4. Efforts to Identify Duplication

This information is collected only when an applicant (or a patent owner) submits information for an *ex parte* appeal before the PTAB. This information is not collected elsewhere. Previously, this collection did contain some duplication in that certain copies of evidence previously submitted as part of the patent examination process were required to be resubmitted with the appeal brief. However, new rules have eliminated this requirement (the submission of certain appendices with the brief containing information already available at the USPTO). Therefore, this collection does not create a duplication of effort or collection of data.

## 5. Minimizing Burden to Small Entities

The same information is required from every applicant, and this information is not available from any other source. This information collection involves items which require the payment of fees by customers who may qualify as small entities or micro entities. In the 2014 renewal, the fees associated with this collection were located in 0651-0072. That collection has been discontinued and the fees have been returned to this collection.

Pursuant to section 10(b) of the Leahy-Smith America Invents Act (AIA), the USPTO provides a 50% reduction in the fees for certain filings by small entity applicants, such as independent inventors, small businesses, and nonprofit organizations who meet the definition of a small entity provided at 37 CFR 1.27. Also pursuant to section 10(b) of the AIA, the USPTO provides a 75% reduction in the fees set or adjusted under section 10(a) of the Act for certain filings by applicants who meet the definition of a micro entity provided at 35 U.S.C. § 123 and 37 CFR 1.29.

The reduced filing fees for small and micro entity filers of appeal briefs are listed at 37 CFR 41.20. No significant burden is placed on small or micro entities, in that small

entities must only identify themselves as such in order to obtain these benefits, and micro entities must only provide a certification of micro entity status. No formal statement is required. An assertion or certification of small or micro entity status, respectively, only needs to be filed once in an application or patent (although a fee may be paid in the micro entity amount only if the applicant or patentee is still entitled to micro entity status on the date the fee is paid).

# 6. Consequences of Less Frequent Collection

This information is collected only when an applicant (or patent owner) files an amendment, an appeal brief, a reply brief, a request for rehearing before the PTAB, or a petition to the Chief Administrative Patent Judge. This information is not collected elsewhere. Therefore, this collection of information could not be conducted less frequently. If this information was not collected, the PTAB could not ensure that an applicant (or patent owner) has submitted all of the information (and the applicable fees) necessary to initiate an appeal or to determine whether a request or a petition should be granted. If this information was not collected, the USPTO could not comply with the requirements of 35 U.S.C. § 134 and 37 CFR Part 41.

# 7. Special Circumstances in the Conduct of Information Collection

There are no special circumstances associated with this collection of information.

# 8. Consultation Outside the Agency

The 60-Day Federal Register Notice was published on February 17, 2017 (82 Fed Reg. 11017). The public comment period ended on April 18, 2017. No public comments were received.

In addition, the USPTO has long-standing relationships with groups from whom patent application data is collected, such as the American Intellectual Property Law Association (AIPLA), as well as patent bar associations, independent inventor groups, and users of our public facilities. Views expressed by these groups are considered in developing proposals for information collection requirements.

# 9. Payment or Gifts to Respondents

This information collection does not involve a payment or gift to any respondent. Response to this information collection is necessary to initiate appeal proceedings, to prepare the briefs, to request a rehearing before PTAB, and to petition the Chief Administrative Patent Judges.

## 10. Assurance of Confidentiality

Confidentiality of records involved in appeal proceedings is governed by statute (35 U.S.C. § 122) and regulation (37 CFR 1.11 and 1.14). The PTAB publishes certain

opinions and decisions concerning decided cases. Public availability to records involved in terminated and pending cases varies, depending upon statute and regulation.

To further define the boundaries of the confidentiality of patent applications in light of the eighteen-month publication of patent applications introduced under the American Inventors Protection Act of 1999, the USPTO amended 37 CFR 1.14 to maintain the confidentiality of applications that have not been published as a U.S. patent application. As amended, 37 CFR 1.14 provides that the public can obtain status information about the application, such as whether the application is pending, abandoned, or patented, whether the application has been published under 35 U.S.C. § 122(b), and the application "numerical identifier." This information can be supplied to the public under certain conditions. The public can also receive copies of an application-as-filed and the file wrapper, as long as it meets certain criteria. PTAB decisions relating to such applications can be published.

Applications filed through EFS-Web are maintained in confidence as required by 35 U.S.C. § 122(a) until the application is published or a patent is issued. confidentiality, security, integrity, authenticity, and non-repudiation of patent applications submitted electronically through EFS-Web are maintained using PKI technology and digital certificates for registered users. Applications electronically-filed by nonregistered users are protected using TLS or SSL protocols. The USPTO posts issued patents and application publications on its Web site. The information covered under this collection will not be released to the public unless it is part of an issued patent or application publication. Patent applicants and/or their designated representatives can view the current status of their patent application through the Patent Application Information Retrieval (PAIR) system. Access to patent applications that are maintained in confidence under 35 U.S.C. § 122(a) is restricted to the patent applicant and/or their designated representatives by the use of digital certificates, which maintain the confidentiality and integrity of the information transmitted over the Internet. The public can view the status and history information for published applications and granted patents via PAIR.

## 11. Justification for Sensitive Questions

None of the required information in this collection is considered to be of a sensitive nature.

## 12. Estimate of Hour and Cost Burden to Respondents

Table 2 calculates the burden hours and costs of this information collection to the public, based on the following factors:

#### Respondent Calculation Factors

The USPTO projects that it will receive 23,660 responses per year. The USPTO estimates that approximately 25% (5,915) of these responses will be from small entities and an additional 5% (1,183) of these responses will be from micro

entities. The USPTO also estimates that approximately 93% (22,003) of the responses will be filed electronically.

These estimates are based on the Agency's long-standing institutional knowledge of and experience with the type of information collected by these items.

#### Burden Hour Calculation Factors

The USPTO estimates that it takes the public approximately 2 to 32 hours to complete the briefs, amendments, requests, and petitions in this collection, depending on the complexity of the request. This includes the time to gather the necessary information, prepare the brief, petition, and other papers, and submit the completed request to the USPTO. The USPTO assumes that, on balance, it takes the same amount of time to gather the necessary information, prepare the brief, petition, and other papers, and submit it to the USPTO, whether the applicant submits it in paper form or electronically.

These estimates are based on the Agency's long-standing institutional knowledge of and experience with the type of information collected and the length of time necessary to complete responses containing similar or like information.

## Cost Burden Calculation Factors

The USPTO expects that all of the information in this collection will be prepared by an attorney. The USPTO uses a professional rate of \$410 per hour for respondent cost burden calculations, which is the mean rate for attorneys in private firms as shown in the 2015 Report of the Economic Survey, published by the Committee on Economics of Legal Practice of the American Intellectual Property Law Association (AIPLA).

Based on the Agency's long-standing institutional knowledge of and experience with the type of information collected, the Agency estimates \$410 is an accurate estimate of the cost per hour to collect this information.

**Table 2: Burden Hour/Burden Cost to Respondents** 

IC #	ltem	Hours (a)	Responses (yr) (b)	Burden (hrs/yr) (c) (a) x (b)	Rate (\$/hr) (d)	Total Cost (\$/hr) (e) (c) × (d)
1	Amendment	2	19	38	\$410.00	\$15,580.00
1	Electronic Amendment	2	248	496	\$410.00	\$203,360.00
2	Appeal Brief	32	1,135	36,320	\$410.00	\$14,891,200.00
2	Electronic Appeal Brief	32	15,077	482,464	\$410.00	\$197,810,240.00
3	Reply Brief	5	463	2,315	\$410.00	\$949,150.00
3	Electronic Reply Brief	5	6,151	30,755	\$410.00	\$12,609,550.00
4	Request for Rehearing Before the PTAB	5	31	155	\$410.00	\$63,550.00

IC #	Item	Hours (a)	Responses (yr) (b)	Burden (hrs/yr) (c) (a) x (b)	Rate (\$/hr) (d)	Total Cost (\$/hr) (e) (c) × (d)
4	Electronic Request for Rehearing Before the PTAB	5	411	2,055	\$410.00	\$842,550.00
5	Petitions to the Chief Administrative Patent Judge Under 37 CFR 41.3	4	9	36	\$410.00	\$14,760.00
5	Electronic Petitions to the Chief Administrative Patent Judge Under 37 CFR 41.3	4	116	464	\$410.00	\$190,240.00
	Totals		23,660	555,098		0

# 13. Total Annual (Non-hour) Cost Burden

The total annual (non-hour) cost burden for this collection is calculated in Table 3 below. There are filing fees and postage costs associated with this collection. These fees were previously located in collection 0651-0072, which has been discontinued. The fees have since been returned to this collection.

This collection has no maintenance, operation, capital start-up, or recordkeeping costs.

# <u>Postage</u>

The briefs, petitions, amendments, and requests may be submitted by mail through the United States Postal Service. The USPTO expects the items in this collection to be mailed by Express Mail using the flat rate envelope, which can accommodate both the varying submission weights of these submissions and the various postal zones. Using the Express Mail flat rate cost for mailing envelopes, the USPTO estimates that the average cost for sending these submissions by Express Mail will be \$6.45 and that approximately 1,657 papers will be mailed to the USPTO.

#### Fees

The fee burden associated with the items in this collection were previously located in collection 0651-0072, which has been discontinued.

**Table 3: Filing Fees** 

IC #	ltem	Annual Estimated Responses	Fee (\$)	Total Cost (\$)
2	Filing a Brief in Support of an Appeal in an Application or Ex Parte Reexamination Proceeding to the Board	16,202	\$0.00	\$0.00
2	Filing a brief in support of an appeal in an inter partes reexamination proceeding (large)	10	\$2,000.00	\$20,000.00
2	Filing a brief in support of an appeal in an inter partes reexamination proceeding (small)	1	\$1,000.00	\$1,000.00

2	Filing a brief in support of an appeal in an inter partes reexamination proceeding (micro)	1	\$500.00	\$500.00
2	Forwarding an Appeal in an Application or Ex Parte Reexamination Proceeding to the Board (large)	11,341	\$2,000.00	\$22,682,000.00
2	Forwarding an Appeal in an Application or Ex Parte Reexamination Proceeding to the Board (small)	4,051	\$1,000.00	\$4,051,000.00
2	Forwarding an Appeal in an Application or Ex Parte Reexamination Proceeding to the Board (micro)	810	\$500.00	\$405,000.00
2	Notice of appeal (large)	18,900	\$800.00	\$15,120,000.00
2	Notice of appeal (small)	6,750	\$400.00	\$2,700,000.00
2	Notice of appeal (micro)	1,350	\$200.00	\$270,000.00
	Total	59,416		\$45,249,500.00

**Table 4: Postage Costs** 

IC #	ltem	Response s	Postage Costs (\$)	Total Postage Cost (\$)
1	Amendment	19	\$6.45	\$122.55
2	Appeal Brief	1,135	\$6.45	\$7,320.75
3	Reply Brief	463	\$6.45	\$2,986.35
4	Request for Rehearing Before the PTAB	31	\$6.45	\$199.95
5	Petitions to the Chief Administrative Patent Judge Under 37 CFR 41.3	9	\$6.45	\$58.05
	Totals	1,657		\$10,687.65

Therefore, the total (non-hour) respondent cost burden for this collection is estimated to be \$45,260,187.65, which includes \$45,249,500.00 filing fees and \$10,687.00 in postage.

#### 14. Annual Cost to Federal Government

The USPTO expects that the amendments, reply briefs, and requests for rehearing before the PTAB will be processed by a GS-11, step 5 staff member. In the case of the appeal briefs, the USPTO expects that they will be processed by patent appeal specialists and a paralegal specialist in the GS-9, step 5 and GS-11, step 5 grades, respectively. For the petitions to the chief administrative patent judge under 37 CFR 41.3, the USPTO expects that they will be processed by a GS-5, step 1 staff member.

The USPTO estimates that it takes a GS-11, step 5 staff member approximately 6 minutes (0.10 hours) to process the amendments, reply briefs, and requests for rehearing before the PTAB at an estimated cost of \$46.96 per hour (GS-11/5 hourly rate of \$36.12 with 30% (\$10.84) added for benefits and overhead).

The USPTO estimates that it takes a GS-9, step 5 (patent appeal specialist) and a GS-11, step 5 (paralegal specialist) approximately 18 minutes (0.30 hours) to process the appeal brief at an estimated cost of \$38.81 per hour (GS-9/5 hourly rate of \$29.85 with 30% (\$8.96) added for benefits and overhead) and \$46.96 per hour (GS-11/5 hourly rate of \$36.12 with 30% (\$10.84) added for benefits and overhead), respectively.

The USPTO estimates that it takes a GS-5, step 1 staff member approximately 30 minutes (0.50 hours) to process the petitions to the chief administrative patent judge under 37 CFR 41.3 at an estimated cost of \$22.59 per hour (GS-5/1 hourly rate of \$17.38 with 30% (\$5.21) added for benefits and overhead).

Table 5 calculates the burden hours and costs to the Federal Government for processing this information collection:

**Table 5: Burden Hour/Cost to the Federal Government** 

IC #	ltem	Hours (a)	Respons es (yr) (b)	Burden (hrs/yr) (c) (a) x (b)	Rate (\$/hr) (d)	Total Cost (\$/hr) (e) (c) x (d)
1	Amendment	0.10	19	1.90	\$46.96	\$89.22
1	Electronic Amendment	0.10	248	24.80	\$46.96	\$1,164.61
2	Appeal Brief Patent Appeal Specialist Paralegal Specialist	0.30 0.30	1,135	340.50 340.50	\$38.81 \$46.96	\$13,214.81 \$15,989.88
2	Electronic Appeal Brief Patent Appeal Specialist Paralegal Specialist	0.30 0.30	15,077	4,523.10 4,523.10	\$38.81 \$46.96	\$175,541.51 \$212,404.78
3	Reply Brief	0.10	463	46.30	\$46.96	\$2,174.25
3	Electronic Reply Brief	0.10	6,151	615.10	\$46.96	\$28,885.10
4	Request for Rehearing Before the PTAB	0.10	31	3.10	\$46.96	\$145.58
4	Electronic Request for Rehearing Before the PTAB	0.10	411	41.10	\$46.96	\$1,930.06
5	Petitions to the Chief Administrative Patent Judge Under 37 CFR 41.3	0.50	9	4.50	\$22.59	\$101.66
5	Electronic Petitions to the Chief Administrative Patent Judge Under 37 CFR 41.3	0.50	116	58.00	\$22.59	\$1,310.22
	Total		23,660	10,522.00		0

# 15. Reasons for Changes in Burden from the Current Inventory

## A. Changes in collection since previous OMB approval in 2014

OMB previously approved the renewal of this information collection in April 2014. The current collection contains:

- 34,537 responses
- 858,683 burden hours
- \$334,027,687.00 in respondent hourly cost burden
- \$48,336.00 in annual (non-hour) costs

#### Changes due to agency activity

In 2016, the USPTO has submitted a change worksheet that returned fees to this collection, which were previously located in 0651-0072. Collection 0072 has been discontinued in order to prevent double counting. The fluctuation in numbers is a result of further modification to collection estimates.

# B. Changes proposed in this request to OMB

The proposed collection, as outlined in the tables above, seeks to modify the existing collection. The new collection contains an estimated:

- 23,660 responses
- 555,098 burden hours
- \$227,590,180.00 in respondent hourly cost burden
- \$45,260,187.65 in annual (non-hour) costs

## Change since 60-day and 30-day notices

Since the 60-day and 30-day notices, one fee (Request for Oral Hearing) has been removed in order to avoid double counting. The fee is currently part of collection 0651-0031.

## Change in respondent cost burden

The total respondent cost burden for this collection have decreased by \$106,437,507.00 (from \$334,027,687.00 to \$227,590,180.00) from the previous renewal of this collection in April 2014:

 Decrease in estimated burden hours. The total estimated burden hours have decreased from 858,683 in the 2014 renewal to 555,098 for the current renewal due to overall decreases in the estimated annual responses for this collection. This decline occurs in spite of the increased hourly respondent rates.

## Changes in responses and burden hours

For this renewal, the USPTO estimates that the annual responses will decrease by 10,877 (from 34,537 to 23,660) and the total burden hours will decrease by 303,585 (from 858,683 to 555,098) from the currently approved burden for this collection.

# Changes in annual (non-hour) costs

For this renewal, the USPTO estimates that the total annual (non-hour) costs will increase by \$45,211,851.65 (from \$48,336.00 to \$45,260,187.65). Below is the list of agency adjustments:

- Increase of \$45,249,500.00 in filing fees. In the 2014 renewal the collection contained no filing fees, as they had been moved to collection 0651-0072. That collection has been discontinued and for this renewal the fees have been returned to this collection.
- Decrease of \$37,648.35 in postage costs. This collection is currently approved with a total of \$48,336.00 in postage costs associated with mailing assignment recordation requests to the USPTO. For this renewal, the USPTO estimates that the postage costs for mailed items will decrease to \$10,687.65, primarily due to a decrease in the postage rate from \$19.99 to \$6.45 per year. \$19.99 is too high for Express Mail delivery, and \$6.45 is a more accurate estimate. Additionally, there will be 761 fewer mailed responses since the previous renewal.

## 16. Project Schedule

There is no plan to publish this information for statistical use.

# 17. Display of Expiration Date of OMB Approval

The forms in this information collection will display the OMB Control Number and the OMB expiration date.

## 18. Exception to the Certificate Statement

This collection of information does not include any exceptions to the certificate statement.

#### B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

This collection of information does not employ statistical methods.