Kenobi Versioning

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Kenobi versioning provides small online publishers with a simple, unified approach to naming, updating, and citing publications. However, it is easy to generalize to any scale of publication. Each document in a group is named using its date of creation or *inception*. This inception date is then combined with the group name variants to create the names and addresses that always point to the document's latest version. Snapshots of how the current document once looked, called *obsoletes*, replace versions. Kenobi names and addresses are compact, unique, durable, human-readable, and DOI compatible, and help maintain a simple relationship between document names, addresses, and citations.

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I. PUBLISHING IN AN ONLINE WORLD

Publishing makes civilization possible by *preserving* human knowledge across time and *distributing* it across space. In the past, the primary medium for accomplishing these two vital tasks was paper, which is bulky, slow to create and read, and requires human senses to use.

The combination of the Internet from the late 1900s and a vast expansion of electronically accessible storage in the early 2000s has ended this dependence on paper and other bulky media. In the past, publishers risked failure due to the difficulties of creating, distributing, and preserving paper copies of documents. The most significant risk now is that documents published online will get *lost* in the enormous flows of data and text across the Internet.

To keep their publications available and accessible to target audiences, online publishers need simple and consistent naming conventions to direct readers to online copies of their works. Two early examples of strategies for naming online publications are Digital Object Identifiers (DOI) [1] for compact, durable links to documents, and the arXiv naming system, which has similar goals for physics and other scientific articles [2].

Kenobi versioning is a similar strategy oriented towards helping small to medium volume publishers. Its date-based approach generates document names and addresses that are compact, unique, durable, human-readable, and fully compatible with DOI addresses.

II. A KENOBI VERSIONING EXAMPLE

Apabistia Publishing manages the *TAO Journal*, which seldom publishes more than 30 articles per month/issue. *TAO's* ISSN is 2694-4596, and its DOI prefix is 10.48034. *TAO* also has a dedicated domain https://tarxiv.org/ to hold all of its online published articles. The journal's full name is "TAO Journal," and its short name is "tao."

On November 6, 2020, Apabistia decided to write an article titled *Kenobi Versioning* that would explain how Apabistia names, updates, and cites its *TAO* articles. On December 15, 2020, Apabistia updated the article to include lessons learned from its early use.

The sections below describe the application of Kenobi versioning to the article with the same name.

III. DOCUMENTS AS CALENDAR EVENTS

The author's first step is to check Apabistia's Google-based *TAO Calendar*, which serves as the master index for naming *TAO* articles. Seeing that November 6, 2020, is available, he assigns that entire day to the article *Kenobi Versioning*. This day then becomes the *inception date* or *idate* of the article, meaning no other TAO article can use that day or any part of it.

If November 6 already belonged to another article, the author would have used the next open day, such as November 7. This leeway in choosing the inception date is perfectly acceptable since its primary goal is to provide a unique document identifier. Precision in capturing the exact origin date of the article is, in contrast, only the secondary objective.

This document uses Kenobi versioning. The online name always points to the most recent document version, while ob1, ob2,… suffixes indicate obsolete releases of the document.

Next, the author converts the calendar event for *Kenobi Versioning* into a text string using the international date format *yyyy-mm-dd*, giving 2020-11-06. International dates are used in part to avoid the ambiguities in order of various single-nation standards. More importantly, using this format ensures that, just as in ordinary numbers, the digits to the left are always larger than digits to the right. This left-to-right ordering of units by size ensures that the rightmost digit will always be the smallest unit of time, which turns out to be useful when converting calendar events into simple text strings.

Notice that even though the inception event for *Kenobi Versioning* spans two points of time in the calendar, it only requires one text string to specify. This single-text style of conversion is possible because Kenobi group calendars require that an inception event have the same width as the smallest unit of time used to specify it. For this example, that smallest unit is days.

IV. KENOBI PREFIXES

Once the article has an inception event scheduled in its document group calendar, all of the information needed to create the document's names and addresses is available.

Appending the inception date to the short name of the *TAO Journal* creates the *document identification prefix*:

tao.2020-11-06

This prefix balances the conflicting goals of brevity and uniqueness. The document prefix then becomes the leftmost part of the name of any Apabistia folder or file that contains information about the document, including the document itself.

One advantage of group-and-date prefixes is that they make name collisions much less likely when readers save items from many sources into the same folder, such as in a library folder. For example, suppose that the Kenobi journals *ZEN* and *TAO* both incepted articles on 2020-11-06. Using group-and-date prefixes, a reader can save the files tao.2020-11-06.pdf and zen.2020-11-06.pdf into the same folder without their filenames colliding.

The other advantage of the prefix is that it serves as a compact citation of the article, identifying in a human-readable format not only its journal but also the unique identifier of the article within that journal. The fact that the identifier is also a calendar date that provides data about its creation helps place it in a historical context.

V. KENOBI FOLDER AND FILE NAMES

Using this prefix, the online name of the PDF copy of the document becomes:

tao.2020-11-06.pdf

Its *abstract page* is this folder and browser index file:

tao.2020-11-06/index.html

The abstract page also serves as the DOI *landing page*.

The PDF article and abstract page are required. However, there is no limit to the number of files that can use the prefix to provide related information. For example, here is a file with bibliographic data in BibTeX format:

tao.2020-11-06 Bollinger - Kenobi Versioning.bib

For frequently referenced files such as the document itself, Kenobi rules recommend keeping the filename very short, such as nothing more than the prefix plus .pdf. However, other files with the same prefix can use longer file names to help anyone inspect the files discern their subject matter. Thus the above example of a bibliographic file lets anyone reviewing the folder know that this particular prefix is associated with the article whose author name is Bollinger and whose title is *Kenobi Versioning*.

VI. KENOBI URLS

The next step is to place the folders and files for the document into the online folder for *TAO Journal*. This journal has an unusually compact repository name because of its short domain name https://tarxiv.org, and because it only holds articles for *TAO Journal*. The web pages for the journal reside in a folder under the *publisher's* domain name, https://apabistia.org/TAO. This separation keeps the maintenance of Apabistia journals unified at one location while allowing the repository site to have a simple structure focused entirely on the articles themselves.

With https:// assumed, the resulting URLs for the *Kenobi Versioning* article, abstract page, and bibliography file are:

tarxiv.org/tao.2020-11-06.pdf
tarxiv.org/tao.2020-11-06/index.html
tarxiv.org/tao.2020-11-06 Bollinger - Kenobi Versioning.bib

Since browsers always look first for an index file when given a folder URL, typing tarxiv.org/tao.2020-11-06 shows the abstract page. Simply appending .pdf to the abstract page URL gives tarxiv.org/tao.2020-11-06.pdf, the article's address. By design, this simple relationship makes it easy to find the abstract page from the article URL, and vice-versa.

VII. KENOBI DOI

The Digital Object Identifier, or DOI, is a URL that is part of an international system to provide uniform online identifiers for publications, particularly academic articles. Every journal must request its own DOI prefix, to which it then appends a suffix for each article. The DOI prefix for *TAO Journal* is 10.48034. Like "tao," this serves as a short name for the journal. As with Kenobi names, the goal of a DOI is to be both compact and unique.

The Kenobi rule for creating a DOI document suffix is to strip out all non-numeric divider characters out of its inception date, which in this case gives the suffix:

20201106

There is no need to insert the "tao" short name for a DOI since the DOI prefix for *TAO* serves the same purpose. Combining the parts gives the DOI for the article:

https://doi.org/10.48034/20201106

Once created, the DOI must also be registered and assigned a *landing page* (the abstract page) to which it points, in this case, tarxiv.org/tao.2020-11-06.

VIII. KENOBI CITATIONS

The citation for *Kenobi Versioning*, including its DOI, is:

Bollinger, T., *Kenobi Versioning*, TAO **2020**, 1106 (2020).
https://doi.org/10.48034/20201106

Kenobi journals use special rules that maintain a close relationship between the naming and citing of articles. The first and most notable difference is that for a Kenobi journal, the *volume* is identical to the inception year, **2020**. In pre-electronic printing, volume numbers traditionally reflected the physical need to bundle articles together. The size of these bundles could vary greatly depending on the output, so one volume might cover a year, a fraction of a year, or multiple years, although one year was often a convenient packaging size. For this reason, paper-based publishers typically named such volumes using simple counting number names such as I, II, III, or 1, 2, 3.

For electronic publications in an increasingly networked world, however, there is much less need for this kind of bundling since networked users are far more likely to access only the articles they need and do so online. Thus it makes sense to dispense with the print-oriented style of labeling volumes with consecutive counting numbers and instead use a date-based volume number that ties each volume number to an actual calendar year. Since Kenobi uses the inception date to identify articles, utilizing the inception year as the volume number maintains a close relationship between how articles are named and cited.

Similarly, Kenobi citations reinterpret the paper-based idea of a *first page* as an *ePage*, that is, as an electronic page number that tells the reader where to find the article within its volume. The *ePage* is unrelated to the internal, reading-oriented page numbers of the article, which allows the internal page number to do what it is supposed to do: Help readers navigate the document in whatever their mode of viewing presents. Kenobi rules define the *ePage* as the remainder of the inception date, presented in four-digit *mmdd* format, with any leading zeros kept. Thus the *Kenobi Versioning* article has an ePage of 1106.

Kenobi citations do not typically use *issue* numbers since the month numbers that would be the most obvious candidates are already incorporated into the *ePage* and redundant. However, suppose a particular citation system requires or strongly prefers the use of an issue number also. In that case, it is always the same two-digit month used at the beginning of the *ePage*, which for this article is 11.

The last citation item is the publication year (2020). The publication year often is the same as or slightly later than the inception year but can be years later if an article has undergone many revisions.

IX. KENOBI DOCUMENT REVISIONS

On December 20, 2020, the author published an update to *Kenobi Versioning*. In the update, he included lessons learned from the early use of the method and provided more of the rationale behind the Kenobi rules. The original version thus became obsolete but was still useful to have online for reference.

In Kenobi, such an update results in the addition of one new filename, an *obsolete* file, to the original set of article, page, and bibliography files:

tarxiv.org/tao.2020-11-06.pdf
tarxiv.org/tao.2020-11-06.ob1.pdf
tarxiv.org/tao.2020-11-06/index.html
tarxiv.org/tao.2020-11-06 Bollinger - Kenobi Versioning.bib

The new file is the original November 6, 2020 version of *Kenobi Versioning* renamed. The original online name, tao.2020-11-06.pdf, has at the same time been *reassigned* to point to the latest version of the document. In Kenobi, the primary name of a document always refers to how that document appears *now*. In contrast, the obsolete or *ob* file is locked to the *specific* date of November 23, 2020.

Future updates will repeat this process by adding ob1, ob2, and so forth after the document prefix and before the file type.

Kenobi abstract pages should always contain a list of and links to all *ob* files for that document, so there is usually no need for a separate citation for obsoletes. If needed, the default Kenobi style for citing an obsolete version is to repurpose the unused *last page* entry of traditional citation formats to specify which obsolete:

Bollinger, T., *Kenobi Versioning*, TAO **2020**, 1106–ob1 (2020).
https://doi.org/10.48034/20201106

By default, the abstract page for a Kenobi document always includes links to any obsoletes it may have. Citations of obsoletes thus use the same DOI as the main document.

X. A PERSISTENT FOCUS ON THE PRESENT

An excellent example of how Kenobi versioning differs from traditional versioning occurs the first time the document is updated. This initial update results in the implicit or explicit creation of *two* new document labels, v1 and v2, traditional. However, in Kenobi, only *one* new label is created since the new version inherits the always-current primary name and address, and the earlier version

is renamed to ob1, Kenobi. Obsoletes also subtly change the time perspective in versioning. In paper-based publishing, the *first* document is the source of *later* versions, while in Kenobi publishing, the *current* document is the source of *earlier* obsoletes.

This persistent focus on the present is more in keeping with the rapid rate of change seen in both the content and context of documents within globally networked systems. It is the same reason why in software application updates, such as smartphone apps, the app's primary name always refers to the *latest* version of that software. While the context of human knowledge changes more slowly than that of software, similar pressures apply to online publishing of documents. Kenobi rules deal with this pressure more directly.

XI. DEFINING INCEPTION EVENTS

In Kenobi, a file's *name* tells when the publisher *created* (incepted) a document, while its *content* tells how the document looks *now*. Kenobi file names and contents thus serve as historical bookends that enclose the full histories of their documents. Obsoletes are snapshots of how the document looked at points between those bookends.

Depending on the type of documents in a group, publishers can choose from four main inception event types: submission, reservation, historical, and timestamp.

Submission events are useful for journals since they are equivalent to using receipt-of-document as the inception event. Group calendars that use submission-type inception events should choose an event time unit (e.g., hours) that is small enough to handle their full volume of tracked submissions. Articles that are never published remain on the group calendar, which can be useful if an article ends up having a complex history of rejections and revisions, yet eventually ends up published.

Reservation events are useful when the publication process begins with authors proposing titles and abstracts, such as for a conference. As with submission events, the group calendar should use inception events short enough to handle the expected rates of submissions. On a typical day, there should be no need to schedule colliding inception events more than a day or so into the future.

Historical events are useful for moving existing printed records online. One example would be using the dates in a chronological diary to create inception names that match the diary's entry dates.

Timestamp events are like historical events but without any intermediate capture in paper form. A Kenobi blog is an example of using human-scale timestamp events. Automated data recording at millisecond intervals with online publishing of each data event is an example of when Kenobi timestamp publishing at computerized speeds.

Overall, the goal is to use inception events definitions that are as intuitive as possible for that type of documents.

XII. USING SHORTER EVENTS FOR MORE IDS

Date-like one-day inception events provide up to 30 unique names per month or issue. However, publishers who produce more than one document per day per group can expand this number by appending smaller time units, such as hours, to that date. For example, the label 2020-11-06.23 (based on a 24-hour clock) refers to the last one-hour time slot on November 6, extending from 11 PM to midnight. Converting a document group calendar to a mix of only one-day events for Monday through Saturday and only one-hour events for Sunday expands the number of inception data ids from 30 to 120 per month, with the longer ids used only as needed for overflow periods.

A group calendar that uses only one-hour inception slots can provide unique ids for up to 720 document ids per month, which is far more than would typically be needed for human-scale publication. However, there are also more automated forms of publication. The concept of an *inception date* merges smoothly at higher rates with the idea of a *timestamp* or automated labeling of when an event occurred. Kenobi easily accommodates this gradual transition into automated document production by allowing inception events to use arbitrarily small units of time, such as hours, minutes, seconds, or even arbitrarily small decimal fractions of seconds:

2020-12-31	— inception *days*
2020-12-31.23	— inception *hours*
2020-12-31.23.59	— inception *minutes*
2020-12-31.23.59.59	— inception *seconds*
2020-12-31.23.59.59.999	— inception *milliseconds*

XIII. DETAILS OF KENOBI LABEL FORMATS

The remainder of this article provides a more detailed and formal description of Kenobi naming formats.

The full format of the text label of an inception event, or idate, is:

yyyy⟨⟩mm⟨⟩dd[[.][hh[[.]ee[[.]ss[[.]nnn…]]]][subsectionspec]

where ⟨⟩ is an optional separator for calendar dates, square brackets indicate optional components, and [.] indicates an optional period for separating smaller time units.

In the label, yyyy is the year, mm is the two-digit month, and dd is the two-digit day. These three inception date components are required. The hh is a two-digit hour using a 24-hour clock, ee is a two-digit minute, ss is a two-digit second, and .nnn… indicates an arbitrary number of pure decimal digits to indicate a decimal fraction of one second. The optional subsectionspec text string allows important items inside a document to be separatedly cited, such as chapters, page ranges, tables, or figures. Examples include ch5, pp14-15, table1, and figure2. While any inception event size below hours supports document production rates more typical of automated data logging, Kenobi labels support a smooth transition into such uses.

The format for the document prefix is:

gid.idate

The gid is the document group id, that is, the short text label for the group, e.g., tao for *TAO Journal*.

The two URLs required for each Kenobi document are:

https://gfolder/prefix/index.html
https://gfolder/prefix.pdf

The gfolder is the online folder that contains abstract pages and PDF documents for the group, including any obsoletes. The gfolder does *not* include journal or publisher web pages, which should reside in some other folder or even under a different domain name. In Kenobi, the gfolder is always just a library folder.

A third file that is optional but often useful is a text file containing bibliographic data. To help identify the entire prefix group, publishers can optionally add some basic identification information to the names of such files:

https://gfolder/prefix LastName - ArticleTitle.bib
https://gfolder/prefix/index.html
https://gfolder/prefix.pdf

The actual name and content of this optional file may vary greatly, but its name must begin with the document prefix.

Any number of such optional files can be added, provided only that their names begin with the prefix of the document with which they are associated.

Obsoletes append *ob* labels to the prefix:

https://gfolder/prefix.ob1.pdf
https://gfolder/prefix.ob2.pdf
https://gfolder/prefix LastName - ArticleTitle.bib
https://gfolder/prefix/index.html
https://gfolder/prefix.pdf

Each update becomes the new primary document, and the previous primary document becomes the next obsolete.

The default DOI (a URL) for an article is:

https://doi.org/DoiPrefix/yyyymmdd

The yyyymmdd part is just the inception date with all non-numeric characters stripped out. Publishers can leave out the short document id since the journal DOI prefix serves the same purpose. The result still retains uniqueness and a simple relationship to the Kenobi document name.

The DOI format when using shorter inception events is:

https://doi.org/DoiPrefix/yyyymmdd[hh[ee[ss[nnn…]]]]

Publishers who favor semantic content in their DOI labels over DOI recommendations can use this format to create longer suffix names that describe its content more clearly:

[gid[.]]yyyy⟨⟩mm⟨⟩dd[[.][hh[[.]ee[[.]ss[[.]nnn…]]]]

The gid is the short id for the document group (e.g., tao), ⟨⟩ is an optional date-fields separator character such as a hyphen or underline, and square brackets indicate optional characters and optional smaller time units.

The default format for citing a Kenobi journal article that uses one-day inception events for article tracking is:

Author, *Title*, Journal **yyyy**, mmdd (pppp).

The pppp is the publication (vs. inception) year.

The format for citing an obsolete version is:

Author, *Title*, Journal **yyyy**, mmdd–Obn (pppp).

The Obn is the obsolete number, e.g. ob1 or ob2.

If the article uses hour or smaller inception dates, the additional time information is appended like a decimal fraction after the *ePage* mmdd, using only digits. The extended *ePage* format is:

mmdd[.hh[ee[ss[nnn…]]]]

For example, a citation that uses one-hour inception events looks like this:

Author, *Title*, Journal **2020**, 1231.23 (2021).

XIV. SUMMARY

While the Kenobi versioning system addresses many of the same issues as the decades-older Digital Object Identifiers (DOI) [1] and arXiv identifier [2] efforts, its goal is not to create or enforce global standards. Instead, it merely attempts to provide interested small to medium-sized publishers with a well-defined starting point to customize document naming and management to their particular needs. Kenobi versioning also encourages the perspective that in a world dominated by globally networked online publishing, publishers should view change and evolution as the norm versus the exception.

[1] P. Attanasio, "The use of DOI in eContent value chain," *Multilingual European DOI Registration Agency (mEDRA)*, 2004.

[2] S. Warner, "Open Archives Initiative protocol development and implementation at arXiv," *arXiv preprint cs/0101027*, 23 1 2001.