

1 802-1Q-2022-Rev-Editor-Please-Read

2 *This file should be useful to the IEEE staff editor for pre-publication editing of the final text of the standard,*
 3 *and will need to be updated with specific amendment and amendment draft information in the later stages of*
 4 *SA Ballot. It is also intended to be useful to new editors of amendments and revisions. Pre-publication*
 5 *editing marks the end of the process for an amendment, so a staff editor may choose to override some of*
 6 *what is specified here; that should not be done while the amendment is being developed. Please do not feel*
 7 *slighted if some information is basic FrameMaker. Any questions don't hesitate to contact me.*

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10 This book/directory/WinZip archive contains a complete set of sources both for P802.1Qdx and for a roll up
 11 of IEEE Std 802.1Q incorporating IEEE Std 802.1Q-2022, the published amendments IEEE Std 802.1Qcz,
 12 IEEE Std 802.1Qcw, and IEEE Std 802.1Qcj. A few of the pre-publication edits made to those amendments
 13 have been carried in principle to the text of other clauses, as a precursor to the Revision of
 14 IEEE Std 802.1Q-2022. Placeholders have been added for clauses (major and minor) to be added by
 15 P802.1Qdj which preceded this draft amendment to SA Ballot. The latest PDF of the present amendment
 16 text is included, but not (at present) the text of the roll up.

17 The amendment and the roll up pdfs may be rebuilt, to check for errors, so the file dates (and the date at
 18 the top corner of each page in the header) may have changed since this draft was first produced.

19 This file has been included in the FrameMaker books, to draw it to the attention of anyone maintaining this
 20 set of files, but it is Excluded in the book (i.e. does not feature in the printed book). It includes instructions as
 21 to how to generate the amendment and roll up pdfs, which files to attach to each, and how to extract or
 22 update the attached files.

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1. FrameMaker version

The FrameMaker files are in FrameMaker2020.

2. Files, filenames, and locations

All the files are in a single directory, or in its subdirectories. On my system this directory is 802-1Qdx, to distinguish it from other in-progress amendments to 802.1Q. A draft number designation may be included (e.g. 802-1Qdx-d1-3). This top-level directory can be renamed, and placed anywhere on another system. The subdirectories should not be renamed or moved elsewhere.

Two FrameMaker books are present and are used, with conditional text settings described below, to generate the 802-1Qdx amendment and the complete roll up. The 802-1Q.book is used to generate the roll up, while the 802-1Qdx.book includes just the required subset of .fm files to generate the amendment. This 'please-read' file is present but Excluded in both books, and is followed by files that provide information for the Working Group and SA Ballot participants respectively. 'Qdx-sa-ballot-cover.fm' should be Excluded prior to SA Ballot and for final publication, and 'Qdx-wg-cover.fm' should be Excluded during SA Ballot and for final publication.

The .fm files are all in the top-level 802-1Qdx directory. They all (apart from this one) have names beginning 'Q' and only the first few characters are required to uniquely identify each file and its clause. This is important for future maintenance so that when many files are open in FrameMaker tabs they can still be uniquely identified, reducing the chance of editing or copying text from the wrong file, including when snippets need to be taken verbatim from other 802.1 standards or future amendments. Do not rename these files, as repairing cross-references in a book with as many files as 802.1Q is a very tedious task even with FrameMaker support.

The Figures files, YANG trees, YANG files, and MIB files are in subdirectories (see below). The zip (or tar) file of the top-level directory includes those subdirectories and files.

3. Building the 802.1Q and 802.1Qdx books

After any significant change, first build the 802-1Q book as follows:

- Open the 802-1Q book, select the book file in the side window pane and use View>Show/Hide Conditional Text, select the Expression 'Final text' from the drop down list, deselect Show Condition Indicators, and press Apply. This will go through the book applying the conditional text expression.¹
 - Update the book. If the 802-1Qdx book was the last update, numbering inconsistencies between the book and the individual files will be reported but are not a cause for concern. Just check the popup box for 'Skip ...'. Repeating the book update is not necessary, but if you do the numbering inconsistencies should not be present on the second run.
- Apart from the (temporary) numbering inconsistencies, the 802-1Q book update should complete without errors. The complete 802.1Q roll up can now be printed, by printing the book (see below for instructions)

After the 802-1Q book has been updated, saved, and closed, the 802-1Qdx book can be opened, updated, and printed as follows:

- Open the 802-1Qdx book, select the book file in the side widow pane, and use View>Show/Hide Conditional Text with Expression 'Amendment text', selecting Show Condition Indicators before pressing Apply.
- Update the book. If the 802-1Q book was the last update, numbering inconsistencies will be reported, but should not be (as before) a cause for concern. Just check 'Skip ..'.

¹ This may take some time. On my Mac I often open the directory in Finder and do a search for 'lck'. This allows me to track progress through the book, as the lock files for its components are created and deleted, giving an indication that something positive is happening and FrameMaker has not simply crashed.

1 A large number of unresolved cross-references can be reported. These correspond to cross-reference
2 destinations that are in files included in the 802-1Qdx book but in text that is not to appear in the
3 amendment. The 802-1Q book update has checked that these cross-references are valid, so they can
4 be ignored. In the 802.1Qdx pdf they will naturally not be clickable (nowhere to go), but in a future
5 802.1Q Revision and in possible future amendments they will be present without any manual update
6 being required.

7 Save the 802-1Qdx book after the update. It can now be printed (see below).

8 4. Printing

9 When printing the 802.1Q and amendment books, and when including figures and non-trivial text (such as
10 equations) in the book sources it is important to appreciate that the rendering of text, fonts, and figures is
11 device and conversion method dependent. These dependencies go beyond the support of particular fonts on
12 particular devices.

13 — The rendering of text on screen uses a different program, from the rendering used by FrameMaker's
14 Save As PDF, which differs again from the rendering that results from printing to the Adobe PDF
15 printer which generates postscript which is then processed by Adobe Distiller to generate PDF.

16 — It is possible to generate PDF that looks fine on the screen but prints differently. The rules for figures
17 (see below) are intended to lower the risk of the latter.

18 — Recent minor updates to Frame 2020 claim to have made improvements to rendering, but the release
19 note explanations lack credibility. Save As PDF appears to have degraded since 2015.

20 The printing method described below produces PDF that renders correctly for the amendment and the roll
21 up. I have checked this with the following:

22 — Adobe Acrobat Reader and Reader DC on the Mac.

23 — Adobe Acrobat and Adobe Acrobat XI Pro on Windows 10.

24 — The PDF reader native to SugarSync on the iPhone, and in GoodReader on the iPhone.

25 — Printing from Acrobat Reader DC to a Canon Pixma printer.

26 This includes the rendering of equations in Annex V, **which is not correct in IEEE Std 802.1Q-2022** (as
27 first published, at least) on the iPhone and reportedly in other PDF readers (details unknown).

28 Correct rendering may depend on restricting fonts to those currently used, and on the rules for figures (see
29 below).

30 One challenge in printing the roll up of the two thousand odd pages appears to be running out of memory (or
31 FrameMaker or Distiller getting confused when memory is restricted). This is believed to be the cause of
32 print failures that report 'offending pdfMark' or similar errors. FrameMaker in some installations appeared to
33 suffer from memory leaks—whether this is Adobe's, Microsoft's, or someone else's fault, and whether this is
34 still an issue is not known. If printing issues are encountered it is wise to reboot or restart the system, and
35 minimize the number of applications that might compete for memory.

1 Subject to the above caveats the following print procedure has proved reliable for Frame 2020 version
 2 16.0.5.1096 and Adobe Acrobat Distiller [reporting Acrobat 7.0 (PDF 1.6) comparability, Adobe PostScript
 3 software version 3018.101] running under Windows 10 version 22H2 OS Build 19045.65 in a VMware
 4 Fusion virtual machine on an Mac (see Wikipedia for Windows 10 version history).

5 a) Select File>Print Setup, select paper size of 'Letter' (US, 8.5 X 11 inches) for any print output for
 6 distribution), and Portrait orientation :²

7 Select 'Properties' on the Print Setup and configure (or verify)³ the settings on each of the Layout,
 8 Paper/Quality, and Adobe PDF Settings as follows:

- 9 1) Adobe PDF Settings:
 - 10 i) Default Settings: Standard
 - 11 ii) Adobe PDF Security: None
 - 12 iii) Adobe PDF Output Folder: Prompt for Adobe PDF filename
 - 13 iv) Adobe PDF Page Size: Letter
 - 14 v) Replace Existing PDF: Always (but grayed out)
- 15 2) Adobe PDF Settings—Check boxes
 - 16 **i) View Adobe PDF results (unchecked)**
 - 17 ii) Add document information (checked)
 - 18 **iii) Rely on system fonts only; do not use document fonts (unchecked)**
 - 19 iv) Delete log files for successful jobs (checked)

20 NOTE—The remaining Print Setup properties (following) are probably defaults. I have never explicitly
 21 selected them, but include them here in case of any doubt.

- 22 3) Layout: Portrait, Pages per Sheet 1
- 23 4) Layout: Advanced... Graphic ...
 - 24 i) Print Quality: 1200
 - 25 ii) ICM Method: .. Disabled, ICM Intent: Pictures
 - 26 iii) Scaling: 100%
 - 27 iv) TrueType Font: Substitute with Font
- 28 5) Layout: Advanced... PostScript Options ...
 - 29 i) Optimize for Speed
 - 30 ii) TrueType Font Download Option: Automatic
 - 31 iii) PostScript Language Level: 3
 - 32 iv) Send PostScript Error Handler: Yes
 - 33 v) Mirrored Output: No
- 34 6) Paper/Quality ... Color

35 b) With the book selected in the side pane, select File>Print Book:

- 36 1) Set or verify check boxes in the pop-up as follows:
 - 37 i) Print Range: All, Odd Numbered Pages (checked), Even Numbered Pages (checked)
 - 38 ii) RegistrationMarks: None, Thumbnails (unchecked)
 - 39 iii) Copies: 1 Scale: 100%—Browse to select directory and filename
 - 40 iv) Print to File: A postscript (.ps) file⁴, Save Book As: Single File
 - 41 v) Print Separations (unchecked, grayed out)
 - 42 vi) Generate Acrobat Data (checked)

² These are probably the default settings in the US, but may need to be changed elsewhere.

³ If I restart FrameMaker, the default (physical) printer is selected, so I have to reselect the Adobe PDF Printer, but the settings for that printer remain unchanged. Whether that is true in other installations, I can't say.

⁴ In the past I have found printing to be slower and less reliable (more inclined to crash) if I select a network directory, allowing the Windows vm to write to my Apple file system. So I configure Print Book to write the .ps output file to my Windows Desktop. The 802.1Q output postscript file is large (~150 MB) so adequate space has to be provided.

- 1 2) Before selecting Print in the Print Book pop-up, select PDF Setup, and set or verify the settings
2 for the Settings, Bookmarks, Tags (Distiller), Links, and Tags tabs as follows: ⁵
3 Settings:
4 i) PDF Job Options: Standard
5 ii) Open PDF Document on Page 1 at Zoom Default ⁶
6 iii) **View Generated PDF in Acrobat (unchecked)** ⁷
7 iv) Generate Separate PDF document For Each Selected File (unchecked)
8 v) Registration Marks: None
9 vi) Page Size: Width: 612.0 pt Height: 792.0 pt
10 vii) Page Range: All
11 Bookmarks:
12 viii) Generate PDF Bookmarks (checked)
13 ix) Bookmarks Expanded through Level: All ⁸
14 x) **Include** **Paragraphs:** ⁹
15 AH1 ¹⁰ AH1,A.1 AH2 AH2,A.1.1 AH3 AH3,A.1.1.1
16 AH4 AH4,A.1.1.1
17 Annex
18 H1 H1,1 H2 H2,1.1 H3 H3,1.1.1
19 **H4** ¹¹ H4,1.1.1.1 **H5** H5,1.1.1.1.1
20 Introduction Title Title page
21 xi) Include Paragraph Tags in Bookmark Text (unchecked)
22 xii) Articles (unchecked) Thread by Text Frame
23 Tags (Distiller): Generate Tagged PDF (unchecked)
24 Links: Create Named Destinations for All Paragraphs (unchecked)
25 Tags: PDF Tag: First Level Headings, Style (blank), Included: Title ¹²
26 3) On the Print Book pop-up, press Print to create the named postscript file.
27 c) When the postscript file has been generate, run Adobe Distiller on that file
28 d) Attach the appropriate files (see below) to the generate PDF

⁵ These settings appear to be retained across restarts of FrameMaker, with the exception of Bookmarks as described below. These may not be the publication settings.

⁶ Despite this setting, Adobe Acrobat Reader DC remembers the page last viewed, and will reopen at that page, at least on my Mac.

⁷ This is left unchecked so distilling from postscript to PDF can be carried out separately, rather than through a continuous pipeline operation. This separation appears to have made printing more reliable, at least on my system.

⁸ I don't believe this is important, as Acrobat Reader allows the reader to expand or collapse bookmarks.

⁹ All others should be left in the Don't Include column. The AH2 and AH2,A.1.1.1 (and similar paragraphs) are both included as part of th gradual migration to the AH3 form (see below)

¹⁰ AH1 is indented one to the left using Bookmark Level, with AH2 etc. indented one further level each. Similarly for H2, H3, etc. Other included paragraphs including H1

¹¹ For to some reason I don't seem to be able to get FrameMaker to remember to include

¹² I don't know the practical impact of the Tags setting, and indeed if there is any.

1 5. Conditional text

2 Conditional text is used, as described above, to allow a single set of source files to produce both the
3 amendment and a roll up of 802.1Q. Its use is described briefly here and is hopefully sufficient for an
4 experienced editor, a longer 'work in progress' document is available on request.

5 A consistent set of condition tags (use View>Panels>Conditional Tags) is used throughout both books. This
6 consistency is important. Tag names and their appearance have been chosen to align with the IEEE Style
7 Guide's editing instructions: 'Change add', 'Change remove', 'Insert', 'Delete', 'Replace old', 'Replace new',
8 and 'Editing Instruction'. In addition to this set, 'Base hide' is used to mark text that will appear in the entire
9 802.1Q roll up, but is not to appear in the amendment, 'Not MIB Text' is used to mark text that is not to be
10 included in the text of an attached MIB extracted from the FrameMaker source file, 'Editor comment' is used
11 to mark temporary text that is to appear only in the amendment (it is distinguished by a Cyan background),
12 and 'Editor highlight' can be used to highlight text in amendment, final roll up text, or both. The conditional
13 tags 'Inserted' and 'Deleted', may be present—they are automatically created by FrameMaker to indicate
14 differences between compared files—but should not be used as part of document editing. Similarly
15 FM_PDF_Comments_Highlight and FM_PDF_Comments_Underline may be present and created by other
16 FrameMaker operations.

17 View>Show/Hide Conditional Text is used to select the text to be shown on the screen, and to be used for
18 printing (see [Building the 802.1Q and 802.1Qdx books](#) and [Printing](#) above), by checking 'Show as
19 Expression', selecting an appropriate 'Expression' from the drop down list, and checking or unchecking
20 'Show Condition Indicators' as appropriate. Most editing should be done with Expression 'Editor view'
21 which simply shows everything, with 'Show Condition Indicators' selected. This can be important when
22 copying in text to avoid duplicate cross-reference targets

23 Conditional text is used on the title page (the first page of frontmatter.fm) to selectively label the amendment
24 or the roll up text. The fourth line of frontmatter.fm uses paragraph style 'Revisionline'. In 'Editor View' this
25 reads:

26 (Amendment to IEEE Std 802.1Q-2022 as amended by IEEE Std 802.1Qcz-2023, IEEE Std 802.1Qcw-2023,
27 and IEEE Std 802.1Qcj-2023 ,and P802.1Qdx)

28 when the conditional text Expression 'Amendment text' is applied, it reads:

29 (Amendment to IEEE Std 802.1Q-2022 as amended by IEEE Std 802.1Qcz-2023, IEEE Std 802.1Qcw-2023,
30 and IEEE Std 802.1Qcj-2023 2)

31 and with 'Final text':

32 (IEEE Std 802.1Q-2022 as amended by IEEE Std 802.1Qcz-2023, IEEE Std 802.1Qcw-2023,
33 IEEE Std 802.1Qcj-2023, and P802.1Qdx)

34 The tenth and eleventh (possibly wrapping to twelfth) lines include the amendment number and title. In
35 'Final text' these are blank lines, retained to preserve the layout of the remainder of the page.

36 Use of conditional text means that there will also be (as immediately above) apparently superfluous blank
37 lines in the amendment text. These should left in the clauses of the standard, as attempts to remove than can
38 result in other items (particularly tables and figures) moving around, either in the amendment text or in the
39 roll up text. The blank lines are a small price to pay for a reliable roll up. Other fine detail in the use of
40 conditional text should be apparent from the sources, though it is worth mentioning that the use of Insert and
41 Delete to insert or remove entire table rows (which is often what is wanted) does not show up as a condition
42 indicator. Placing the cursor in the row will show the condition indicator in the bottom left of the widow
43 pane, along with the paragraph style. Of course the entire title page can be replaced for amendment
44 publication, as long as the dependencies on the page are fixed up.

45 Since the files contain 802.1Q text that is not in the amendment, there may be a temptation to apply 'obvious'
46 fixes to that base text, this should be resisted and is anyway pointless as there are likely to be other later
47 amendments already in draft which have already included that base text. Any pre-publication editing
48 changes to text that is included in later amendments will have to be manually rolled forward to those
49 amendments. The base text for these amendments may included incremental FrameMaker changes as part of

1 ongoing maintenance. A recently approved 802.1Q Revision project may also lead to changes in the base
2 text, for later publication. If these changes affect the base text of an amendment before approval of the
3 revision, they will have to be included in that amendment.

4 As each amendment 802.1Q project concludes SA ballot, the conditional text that will not appear in the roll
5 up is removed (i.e. 'Change remove', 'Delete', and 'Replace old' text is deleted) and text that is to be carried
6 forward is made unconditional (with the exception of 'Not MIB Text' which is left to support future MIB
7 maintenance).

8 **6. Draft numbers, dates, page headers and footers**

9 The project designation, draft number, and date used throughout the FrameMaker books occurs as ordinary
10 text only on the title page, i.e. on the first page of frontmatter.fm (with the exception of the contents of
11 YANG and MIB files. Other occurrences of the project and draft number (e.g. in the header of most pages)
12 are cross-references to this occurrence, and will update automatically with 'Edit>Update Book'. This is
13 convenient for draft development. It may not be what is wanted for final publication, but is explained here
14 both to allow its possible use and to indicate what would need to be done if an alternative approach is used.

15 Cross-references to text are used rather than updating variables throughout the book, because some variable
16 values are specific to individual documents. In particular each MIB file has its own 'LAST-UPDATED'
17 variable (which appears in the MIB twice, a variable being used to ensure the two instances do not differ)
18 and a 'MIB Copyright Year' which might differ from that for other MIBs. Using cross-references allows
19 each .fm document to be updated as usual by the Edit>Update Book, which has to be used after most
20 significant changes, and is customarily run before each printing anyway. That is easier than importing
21 variables across the book as a separate step, or set of document specific steps.

22 The second line of frontmatter.fm has paragraph style 'Designation'. In 'Editor View' this reads:

23 **IEEE P802.1Q-2022-Rev/D1.0 + P802.1Qdx/D1.3**

24 this has conditional tags, so when the conditional text Expression 'Amendment text' is applied, it reads:

25 **P802.1Qdx/D1.3**

26 this paragraph is cross-referenced by each header in a number of the Master Pages, including those for
27 Master Page 'Right' in most (if not all) of the documents (.fm files), and appears centered in the top line of
28 those headers. If the Expression 'Final text' is applied, the 'Designation' and the header top center reads:

29 IEEE P802.1Q-2022-Rev/D1.0 + P802.1Qdx/D1.3

30 The third line of frontmatter.fm uses paragraph style 'Date' and usually contains the FrameMaker built-in
31 variable 'Current Date (Long)', although that can be overridden by plaintext (or left simply blank) if
32 required. The referenced 'Date' text appears on the top right of each Master Page 'Right'.

33 The second line of each Master Page 'Right' header cross-references the seventh line 'Title, Standard for' and
34 eighth line 'Title-',¹³ which in both 'Amendment text' and 'Final text' are centered as:

35 Draft Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks

36 The third line of the header cross-references the amendment number and title on the frontmatter.fm first
37 page. If book has been updated with 'Final text' it will be blank, if with 'Amendment text' it will be:

38

39 The copyright statement in the footers of all the Master Pages 'Right' references the copyright statement on
40 the Master Page for the frontmatter file. This allows the year in that statement to be updated in only one
41 place. The footer's 'unapproved draft' statement is plain text, so updating these pages for final publication
42 requires their replacement (see below).

¹³ The cross-referencing supports the use of the clause formats and frontmatter file for drafting other standards, with minimal effort.

1 7. Master Pages

2 FrameMaker files from prior editions and amendments contained an accumulation of all the page layouts
3 and paragraph formats Imported by successive editors. The problems included unfindable (now hopefully
4 found and removed) and erratically reported cross-reference errors and font uses. Do **not** bulk import page
5 layouts from other sources. Unused Master Pages have to be deleted one at a time, file by file. For 802.1Q
6 this was several days of tedious, carpal tunnel stress inducing, work.

7 All of the documents (files) in the FrameMaker book from Clause 2 (Q02.fm) onwards use a single Master
8 Page 'Right'. No other Master Pages should be added to these files. If it is necessary to update these pages
9 (other than as already automatically done by cross-referencing - see above), then update the Clause 2 Master
10 Page, select all the following files in the book and Import>Formats.>Page Layouts from Clause 2. Clause 1
11 may have additional Master Pages for approved and unapproved first pages (as these lack, by past
12 convention, the header). The Table of Contents, List of Figures, and List of Tables files currently use the
13 same Master Page 'Right' as Clause 2. The frontmatter file has a few additional variants, whose purpose
14 should be clear.

15 8. Paragraph and other formats

16 FrameMaker files from prior editions and amendments contained a wide variety of paragraph formats. These
17 have been scrubbed and I would be grateful if they were not reintroduced, as it can take a long time to get a
18 clean set for future maintenance, particularly if overrides have been used, as each instance of use needs to be
19 checked for possible effects on numbering and pagination. The use of the same set of source files for the
20 amendment as for the roll up (which allows voters and editors to see the final effect of amendment on a
21 future revision, and serves as the base text for future amendments and revisions) depends on the selective
22 use of overrides for acceptable pagination.

23 The paragraph formats currently used were, with few exceptions, those used for IEEE Std 802.1Q-2022.
24 They do reflect development and experience over the years, but should now be mostly consistent (including,
25 e.g., list item spacing) and aligned (more or less, so far as the appearance of the final text is concerned) with
26 IEEE templates, and should not be changed without a lot of thought as any less than thorough updating may
27 result in unwanted errors (numbering changes, cross-reference failures, unwanted repagination etc.). This
28 'please read me' file uses slightly modified (reduced spacing) paragraph formats and should not be used as
29 the source for files in the standard.

30 Recent changes to paragraph formats include the ongoing replacement of some that use commas in their
31 names, e.g. H1 instead of H1,1 and H2 instead of H2,1.1. Using commas in paragraph format names is
32 recommended against by Adobe, as some capabilities use commas to separate named formats. In particular it
33 is possible to construct a cross-reference to a list item that automatically includes the nearest preceding
34 heading, whatever that heading is, if the heading format names do not include commas. However most of the
35 names of other paragraph format have, in the absence of any pressing need to change, been retained since
36 they are familiar to experienced editors.

37 The font size of the paragraph format 'EditingInstruction' as been deliberately reduced relative to its
38 predecessor 'ACEI,EditingInstruction'. This has been done to allow the paragraph to appear in the
39 amendment without undue effect on the 'Final text' roll up. To avoid the amendment's editing instructions
40 appearing in the wrong, or at least undesirable, places, editing instructions for figure replacement are
41 included within the anchored frame for the figure and editing instructions for tables are included in the table
42 title text box. A larger editing instruction font size would thus negatively impact table formatting and the
43 maximum allowable figure size.

44 Significant attention has been paid to pagination at some points in the draft, as a common source of errors or
45 ballot comments has been the movement of a related concept to a subsequent page. Placing related material
46 in the reader's view has been deemed more important than line spacing or blank space at a few points. In
47 some cases forcing a page break as part of the pagination of a significant header works equally well for both
48 amendment and final text, but more often the paragraph format controls for 'keep with previous paragraph',
49 'keep with next paragraph', and 'orphan' lines are used to produce acceptable pagination in both cases.

1 9. PDF Bookmarks

2 In the past, some PDF Bookmarks were added by the staff editor after PDF production because of oddities in
3 the bookmark choice or the use of inconvenient paragraph formats. The set of files for this project should
4 generate all the desired bookmarks, in the desired format, without the need for such post-processing.

5 The 'Title page' bookmark is produced for the Title page by including a white text 'Title page' paragraph
6 format (with text 'Title Page') on the first line of the Title page.

7 Similarly the PDF bookmarks for each Annex collect information from following visible 'Annex Type' and
8 'Annex Title' paragraphs by including white text cross-references in the 'Annex' paragraph. This also solves
9 the issue of how to get the 'Annex', 'Annex Type' and 'Annex Title' on a single line in the Table of Contents.

10 In the frontmatter some almost identical paragraphs differ only by whether they should generate PDF
11 Bookmarks or not. 'Title' and 'Introduction' generate bookmarks, while 'Title-' and 'Introduction-' do not
12 (provided that PDF Bookmarks are setup during printing as described above).

13 10. Figures

14 10.1 Drawing Tools

15 The figures either use FrameMaker's own embedded drawing tools for simple figures, or are in Visio .vsd
16 files (there are historic exceptions in the roll up, awaiting conversion, but not in this amendment) and are
17 imported as svg files. Visio has been used where FrameMaker's drawing tool does not or did not provide the
18 required detail of alignment accuracy (it is particularly bad at aligning grouped objects, particularly those
19 including text, and arrows made up to match UML conventions). No other drawing tools are to be used,
20 because of the possible maintenance burden.

21 10.2 Maintaining Visio figures

22 The original Visio .vsd (not .vsdx) files must be retained and supplied with any amendment. Recent
23 experience (FrameMaker 2020 version updates) has shown that FrameMaker's figure rendering can change
24 with FrameMaker version and no future editor should be left with the task of extracting figures from .fm
25 files and reconstructing them prior to inclusion in a different format. Note that simply saving an svg file is
26 not enough, as objects in svg files can move/change when reopened.

27 Any future edits to Visio figures must be done on the Visio files followed by saving them again as svg files
28 and reimporting them to FrameMaker. These source files must be kept up to date. Do not click on the figure
29 inside FrameMaker and edit in place, this has the annoying tendency to place the figures 'off grid' as well as
30 introducing differences between the source files and the final document. Failure to observe this rule has
31 already led to the necessity to run an entire corrigendum project - on another standard. Visio 2007 is
32 preferred to later releases.

33 10.3 Visio and svg file location and names

34 The Visio figures are in the subdirectory Figures in .vsd files named by clause, prefixed by '802-1Q-', e.g.,
35 '802-1Q-06-Figures.vsd' for figures in Clause 6 and '802-1Q-C-Figures.vsd' for figures in Annex C. Some of
36 the clauses have more than one .vsd file, e.g., '802-1Q-25-Figure-1.vsd' just contains Figure 25-1, while
37 '802-1Q-25-Figure-4-10.vsd' contains Figure 25-4 through Figure 25-10. The filename may include a suffix
38 indicating that it has been updated by this or a recent amendment

39 Each Figure in a Visio file is on its own page, which is named (or at least has a name prefix of) 'Fig '
40 followed by the figure number, e.g., 'Fig 25-1'.

41 When a Figure in the range indicated by the filename is actually drawn using FrameMaker's own tools, the
42 Visio file should contain a page named by the Figure number with text on the page stating that. If there is no
43 .vsd file for a given clause then no Visio figures have been included in that clause.

1 Each Visio figure is save (see below) to its own svg file, which is named (or a least has a name prefix of)
 2 'Fig ' followed by the figure number, e.g., 'Fig 25-1', with a possible amendment suffix. These svg files are in
 3 the same Figures directory.

4 **10.4 Visio figure sizes and other parameters**

5 The correct rendering of Visio figures is dependent on the units and the scaling (preferably the absence of
 6 scaling) of figures. The rendering process used to display a figure on the screen is not the same as that used
 7 to incorporate the figure in a PDF. Text and objects can be moved, font sizes changed, and text wrapped if
 8 inappropriate choices are made.

9 Figures are to be drawn using a page size of 6 inches x 9 inches (in Visio 2007 File>Page Setup>Page
 10 Size>Custom size: 6 in. x 9 in, File>Page Setup>Drawing Scale : No scale (1:1), File>Page Setup>Page
 11 Properties>Measurement units: inches. This is the total page area available on an IEEE Standard page. Use of
 12 these settings avoids scaling fonts and consequent rendering issues. Do not use centimeters or millimeters,
 13 these can result in odd font sizes (e.g. 8.02 points, which then render incorrectly on some devices). A scale
 14 of 25.4 millimeters to 2.54 millimeters does not behave as a 10:1 inch scale. Using a Ruler and Grid set to
 15 Fine (Tools>Ruler & Grid) with a magnification (View>Zoom) of 200% is generally convenient, with
 16 Tools>Snap&Glue set to Snap to: Grid and everything else (or most everything else) off. The displayed Grid
 17 is then 1/8 inch, which is 9 pt. In the FrameMaker file set Display Units and Font Units to 'Point' and Grid
 18 Spacing to 3.0 pt (View>Options). The combination of these settings allows the accurate placement of
 19 lines/boxes/objects in the Visio diagram on the FrameMaker together with any FrameMaker text boxes that
 20 are wanted for cross-reference purposes.

21 At present FrameMaker has a nasty, and random, habit of losing lines near the edges of a figure. To guard
 22 against this place a 1/4' square with white fill but no line at the top left and bottom right of the figure, and
 23 avoid using the right-hand and left-hand 1/8' (the grid dimension) for the drawing.

24 **10.5 Figure fonts and text**

25 All text in figures should be in Arial font, with no font sizes smaller than 6 pt.¹⁴ Figures are not to be scaled
 26 to render in smaller font sizes. The Wingdings, Windings2, and Symbol fonts are also used for useful
 27 symbols not in Arial.

28 Text in figures drawn using FrameMaker's own drawing tools should be in text boxes, and use an
 29 appropriate paragraph format. It is possible to add text to such a figure without putting

30 **10.6 Importing Visio figures**

31 The Visio figures in this draft are included by saving each figure in its own svg file and then importing that
 32 svg file into an Anchored Frame in a FrameMaker .fm file.^{15 16}

33 To save the Visio figure as an svg file, select the page in the Visio file and then Ctrl-A to select all the
 34 drawing objects (including the edge boxes mentioned above) on the page. This selection is important: if
 35 omitted the entire 'printer page' size is saved, which includes unwanted whitespace around the figure (at a
 36 minimum) and makes it harder to position the Figure in FrameMaker. Then use Save As to save the figure as
 37 .svg. In Visio 2007 this is all that is required, in Visio 2019 there is an option to include Visio data in the
 38 saved svg and this needs to be selected to get the right result (apparently, the actual format of the saved 'svg'
 39 file is anybody's guess).

¹⁴ Calibri is much less clear at 6 pt, and should be avoided. Calibri in existing figures will be replaced over time.

¹⁵ The quality of cut-and-paste (OLE included) Visio rendering has degraded over FrameMaker releases. Positioning of characters on longer lines can exhibit bunching and overlap. OLE inclusion itself has had problems with some FrameMaker release/Windows release/System combinations. One thing to look out for in old sources is an OLE inclusion that has failed to follow instructions and copied a Visio page using Visio's 'Copy Drawing' option. Such a copy includes the entire Visio file (though only showing the selected page) which can then lead to strange behavior when attempting to inspect the OLE included Visio in FrameMaker.

¹⁶ Some oddities have also been encountered with svg inclusion, but may have been related to the use of non-integral font sizes or grids that are not point/inch and may also have been fixed by recent FrameMaker updates. They occurred with objects grouped in Visio and were fixed by ungrouping those objects.

1 When saved and included as described and imported by 'reference' (see below) the svg file can be updated
2 and will be automatically positioned at the same place (from top and left in the Anchored Frame as before).

3 To import an svg figure file, first insert an Anchored Frame that is 432 pt (6 inches, the width of the
4 available area on the page and of the page in the Visio file as recommended above) or 426 pt (which makes
5 the Anchored Frame more visible on the page) wide in the FrameMaker document. This anchored frame will
6 include the figure and (in a text box) the Figure Title, and any other text boxes that need to move along
7 exactly with the figure (such as the Figure Title, the paragraph used to reference the figure as described
8 below, and any editing instruction related to the Figure).

9 Import the svg figure file by selecting the Anchored Frame, and using File>Import>File. The figure can be
10 imported by reference or by copy. Confusingly the result Object Properties will show both as copied into
11 document. If it has been importing by reference, Object Properties will show the referenced file. The
12 advantage of using copy is that the FrameMaker file now has no external dependencies. The advantage of
13 importing by reference is that the figure will auto-update (sometimes some modest prompt, like clicking on
14 the page is required) if the svg file is updated. This can be useful during standard development. To update a
15 figure imported by copy, select the figure in the Anchored Frame and repeat the import. This will replace the
16 figure with the updated svg.

17 Once the Figure has been added to FrameMaker in this way, it can be selected and Object Properties used to
18 tweak its position. Using a multiple of 3 pt for distance from the top and from the left of the frame will keep
19 it on grid and any automatic or semi-automatic update will keep that positioning.

20 The text in the included figure is searchable using the normal Acrobat searches of the PDF. This is very
21 important for the some figures.

22 **11. Cross-references to and from figures**

23 Cross-references to each figure (including in the content's list of figures) are to a paragraph of type 'Figure'
24 that is in a text frame within and at the top of the anchored frame that includes the figure. This means that
25 clicking on a cross-reference to the figure actually shows the figure on the screen, rather than showing the
26 figure title (which in IEEE Style is below the figure) at the top of the screen with the figure out of sight.

27 This improvement in figure cross-referencing has proved useful to users/reviewers. In particular it allows a
28 one-click 'Previous View' return to the source of the cross-reference. Each 'Figure' paragraph uses White text
29 (so it doesn't show up). 'Figure' paragraphs that have been worked on recently contains a cross-reference to
30 the corresponding 'Figure Title' (in the same anchored frame). There should be no need to change the
31 cross-reference, even if the text of the Figure Title is edited. In older figures the figure title has been simply
32 fixed in both paragraph types.

33 Cross-references from figures drawn in FrameMaker's own tools can be simply included in the figure.

34 Cross-referencing from Visio sourced figures can be done by careful placement of text boxes within the
35 anchored frame, aligning them on the 3 point grid.

1 **12. MIBs**

2 **12.1 MIB files**

3 Each of the MIB modules in the body of the standard is in a separate .fm file, and includes clickable
4 cross-references to the text in other clauses. Each MIB is also attached to the standard as plain text (UTF-8)
5 file, as well as being available for download from the 802.1 website. The text printed in the standard is (as
6 per IEEE rules for the standard) the definitive standard. See below for update instructions (if changes have
7 to be made to the MIB text), and for extracting and naming the UTF-8 MIB files.

8 The files in the subdirectory '802-1Q MIBs' (i.e. all the plain text MIB files for 802.1Q) are attached to the
9 802.1Q roll up.

10 MIB files that changed or added by an amendment are also copied to the subdirectory '802-1Qxx MIBs'
11 (where 'xx' identifies the amendment), and are attached to the amendment PDF.

12 P802.1Qdx does not change or add MIBs, so there is no '802-1Qdx MIBs' directory.

13 **12.2 MIB .fm file text, variables, paragraph formats, feather**

14 The text at the front of the MIB .file, comprising the clause header (e.g. 17.7 MIB modules, 17.7.1
15 Definitions for the IEEE8021-TC-MIB module, and any associated introductory text) is conditional text 'Not
16 MIB Text'. To see this, select some text and View>Panels>Conditional Tags (which can also be used to
17 change conditional text marking).

18 The LAST-UPDATED statement in each MIB uses the LAST-UPDATED variable for its .fm file, and this
19 variable is also used in the latest REVISION statement within that MIB. This variable should be updated
20 whenever any change, however small, is made to the MIB text. The file date for the .fm document is updated
21 whenever a book that includes the file is updated, so is completely useless for change tracking.

22 A single REVISION statement is added to a MIB that is changed (or added) as part of an amendment. This
23 REVISION statement can be changed at any time prior to publication, though any change after SA Ballot
24 should be purely editorial. The date in the REVISION statement uses the LAST-UPDATED variable, so the
25 dates in the two statements will remain synchronized. When the MIB is first updated as part of a project, the
26 value in the soon-to-be-prior REVISION statement should be converted to plain text before the variable is
27 updated (select the variable in the REVISION statement and click on the convert to plain text icon in the
28 Variables pod).

29 A MIB .fm file may also use 'MIB Copyright Year' and 'MIB Publication Year' variable. These have been
30 used to make updates easier when the final approval and change dates for the revision or amendment that
31 includes the latest MIB update are uncertain, e.g. around year end or some time in the future. When either of
32 these variables are part of identifying a completed revision or past amendment they should be converted to
33 text when convenient (simple conversion will not modify the plain text MIB). Note that the year of
34 publication is only needed to identify revisions (e.g. IEEE Std 801.Q-2022) and not for amendments (the
35 designation 802.1Qdx will not be reused).

36 The actual MIB text in each of the MIB .fm files uses the paragraph format 'Fixed Text'. This is use 8 pt
37 Courier New with a Line Space of 9 pt, and no hyphenation. This font size and line spacing allows the use of
38 the FrameMaker auto line numbering capability, whereas tighter spacing can result in only the first line on a
39 page being numbered. Numbering (Format>Document>Line Numbers ..) uses 7 pt Times Roman in Dark
40 Grey, 19 pt width, numbering restarting on each page. To prevent line spacing being stretched on nearly full
41 pages (which looks very odd in a MIB) Format>Page Layout>Line Layout is used to deselect 'Feather'.

1 **12.3 Extracting a plain text MIB from a FrameMaker .fm file**

2 Save the MIB text by using the following:

- 3 a) Show/Hide Conditional Text panel (View>Show/Hide Conditional Text) with 'Show as per
4 Expression' selected and Expression 'MIB Text'.¹⁷
- 5 b) File>Save As...Save as type>Text only... to save what is now visible, which should be just the text of
6 the MIB.
7 In the 'Save As Text' pop-up dialogue select 'Put a Carriage Return: Only between Paragraphs' and
8 'Encoding:UTF-8'.
- 9 c) Use a text editor¹⁸ to remove the Byte Order Mark (BOM) which Windows add even to UTF-8 files,
10 and to replace any 'gremlins' (e.g. handed quote marks) that might be in the file.
- 11 d) Saved the cleaned up file with Unix LF (Line Feed) line breaks and UTF-8 (no BOM) encoding.
- 12 e) Rename the file to replacing the clause or annex number prefix with "IEEE8021-", adding the year
13 date suffix (e.g. -202302220000Z) exactly as in th LAST-UPDATED field in the MIB, and replacing
14 the ,txt extension with .mib.

15 The updated MIB should be saved in both the '802-1Q MIBs' and the '802-1Qxx MIBs' directory for the 'xx'
16 amendment. Any updated MIB must be checked with 'smilint'. If you don't know how to do this get help
17 from an expert.

18 **13. YANG modules**

19 All the YANG modules for the 802-1Q roll up and the 802-1Qxx amendment are in the '802-1Q YANG'
20 subdirectory, in files with the module name and a '.yang' extension. Copies of the subset used by (and to be
21 attached to) the amendment are in the '802-1Qxx YANG' directory.

22 The YANG modules for this standard have been developed and maintained using a Git repository, as is
23 customary for YANG development. Any updates to a YANG module, including editorial changes, need to be
24 made by the relevant YANG expert(s), updated in the repository, checked with validation tools, and then
25 made available as a plain text (UTF-8) file with the module name and '.yang' extension as described above.

26 Each YANG module is included in its own 48.6.n clause in 48.6, and is initially imported from its .yang file
27 using 'Import by Reference'. This results in a 'Text Inset' which is not independently editable in FrameMaker,
28 thus guarding against accidental changes to the module. The paragraph type 'Fixed Text' (see discussion of
29 MIBs above) is applied to the imported text.

30 Text inset properties can be examined by double clicking on the text block. Most text insets will be set for
31 'Manual' update, although during draft development 'Automatic' updating can be used for YANG modules
32 that can be expected to change. If 'Automatic' updating is selected, replacement of the referenced file should
33 be sufficient to update the .fm file, although it is wise to check that this has happened and to click on text
34 inset to prompt the update and check the update setting if necessary.

35 When the file is first imported¹⁹ using File>Import File..., selecting the file, and using 'Import by Reference',
36 and pressing 'Import', an 'Unknown File Type' box will pop up. Select 'Convert From: Text', press 'Convert',
37 and on the next pop up select 'Treat Each Line as a Paragraph', 'Updating of Imported Text' as 'Manual' or
38 'Automatic' as wanted, and 'Encoding' as 'UTF-8'.

39 The YANG schema ('tree files') are similarly included in clause 48.5. All these files are in the 'YANG trees'
40 directory. They are not independently attached to either the roll up or the amendment.

¹⁷ If this is not already defined in the file it can be created using 'Build Expression' which is defined as 'Change add' or 'Insert'. This Expression thus excludes other conditional text, such as that only marked as 'Not MIB Text'. If there is ever a need to include 'Change add' text in the 'Not MIB Text' portion of the file, this Expression should be updated.

¹⁸ I use BBEdit or TextWrangler (on the Mac).

¹⁹ Or possibly replaced, by a module with a different name or in a different location, by selecting the imported text, using File>Import File, selecting the new file, and using 'Replace' (which will pop up instead of 'Import').

1 14. Files to be attached to the final pdf of the standard

2 The MIB modules in the '802-1Qxx MIBs' subdirectory (if present) and the YANG modules in the
3 '802-1Qxx YANG' subdirectory (again, if present) are to be attached to the published text of IEEE Std
4 802.1Qxx.

5 The MIB modules in the '802-1Q MIBs' subdirectory and the YANG modules in the '802-1Q YANG'
6 subdirectory are to be attached to the roll-up draft of P802.1Q-2022-Rev.