

# **Changes Between Journal Article Tag Suite (JATS) NISO/JATS 1.3 and JATS 1.4d1**

(in Response to Comments on NISO Z39.96-2021 (JATS 1.3)  
through April 2023)

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February 2024

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# NISO JATS Change History: JATS 1.3 to JATS 1.4d1

JATS 1.3 version (ANSI/NISO Z39.96-2021) is the latest voted release of ANSI/NISO standard JATS. This current committee draft version (JATS 1.4d1 2024) is fully backward compatible with JATS 1.3 (2021), as well as with JATS 1.0 (2012), JATS 1.1 (2015), and JATS 1.2 (2019). Any document valid to JATS 1.0, 1.1, 1.2, OR 1.3 will be valid to the JATS 1.4d1 Committee Draft of the same JATS Tag Set.

Changes to JATS 1.3 to produce JATS 1.4d1 were made in response to user comments on the previous JATS versions. These are incremental changes, adding new functionality such as multi-lingual documents, new collaboration naming elements, and the latest release of the NISO Access License and Indicators (ALI).

## 1. Module File Names

All JATS module filenames are tied to the version of their release, so all modules have been renamed to incorporate “1-4d1” in the name. For example, a module that used to be named “JATS-list1.ent” or “JATS-list1-3.ent” is now named “JATS-list1-4d1.ent”.

## 2 Catalog and Formal Public Identifiers in JATS 1.4d1

New catalog files (catalog-jats-v1-4d1-no-base.xml and catalog-jats-v1-4d1-with-base.xml) are provided as version 1.4d1 catalogs, with a publication date of February 01, 2024.

In these catalogs, each JATS-named module has been given a publication date of February 01, 2024 and a new Formal Public Identifier (fpi) in which JATS “v1.3” became “v1.4d1”. For example, the JATS default classes file (JATS-default-classes1-4d1.ent) has the new fpi:

```
-//NLM//DTD JATS (Z39.96) Default Element Classes Module v1.4d1 20240201//EN
```

## 3 Element Related Changes

New elements discussed in this section were added to all three JATS Tag Sets, unless otherwise noted.

### 3.1 Added Legends and Languages

- Legend (<legend>) — A list or table of symbols, characters, terms, or abbreviations, with explanations of their meaning.
- Content Language (<content-language>) — The new JATS multi-language mechanism is largely attribute-based, but did add one new element. The <content-language> element identifies one of the possibly several primary languages used in the article, by containing an ISO 639 two-letter code. When tagging a multi-lingual document, the element <content-language> should appear once for each language used in the document.

## 3.2 Redesigning Collaboration Tagging

The process for tagging a collaboration named as a contributor has been redesigned to provide element-level access to the name of the collaboration and to help alleviate confusion. Three new elements describe what can be recorded concerning a collaboration in the context of a contributor element (<contrib>):

- <collab-name> — Contains the name of a group of contributors who are credited under a single name, such as a committee or a project credited as a contributor. This element holds only the name of the collaboration and no other content.
- <collab-name-alternatives> — Wrapper element for more than one version of a single collaboration name, for example, the name of a laboratory in more than one language or script.
- <collab-wrap> — Contains the metadata concerning the collaboration, such as the name (or names) of the collaboration, the role or roles it played, the names of the individuals who comprise the collaboration, an address, etc.

These new elements replace the former collaboration elements, so the previous elements <collab> and <collab-alternatives> are now deprecated.

## 3.3 Elements Changed (Modified Content Models)

The element content model changes discussed in this section were made in all three JATS Tag Sets, unless otherwise noted.

- <aff> — Added <abbrev> to <aff> in Publishing and Authoring to allow capture of what Crossref calls “institution acronyms”. The Archiving model already allowed <abbrev> in <aff>.
- <anonymous> — Allowed textual content inside <anonymous>, which has been an EMPTY element in Publishing and Authoring, for use in open peer review. Archiving already allowed content inside <anonymous>.
- <article-meta> — Element <content-language> added to <article-meta> as part of the multi-language article changes.
- <author-notes> — was made repeatable. (Archiving and Publishing only)
- <award-group> — Element <award-name> was made repeatable to allow for multiple languages.
- <boxed-text> — Element <caption> was made repeatable to allow for multiple languages.
- <chem-struct-wrap> — Element <caption> was made repeatable to allow for multiple languages.
- <custom-meta-group> — was made repeatable everywhere it is used.
- <disp-formula-group> — Element <caption> was made repeatable to allow for multiple languages.

- `<fig>` — Element `<caption>` was made repeatable to allow for multiple languages. (Authoring only)
- `<front-stub>` — (Archiving and Publishing only) Element `<content-language>` added to `<front-stub>` (the metadata for sub-articles) as part of the multi-language article changes.
- `<graphic>` and `<media>` — The element `<custom-meta-group>` was added to both `<graphic>` and `<media>`.
- `<journal-meta>` — (Archiving and Publishing only) The elements `<journal-id>`, `<publisher>`, and `<custom-meta-group>` were all made repeatable for multi-lingual documents.
- `<legend>` — was added to the content models of the following elements: `<boxed-text>`, `<chem-struct-wrap>`, `<disp-formula>`, `<disp-formula-group>`, `<fig>`, `<fig-group>` (in Archiving and Publishing only), `<graphic>`, `<media>`, `<table-wrap>`, and `<table-wrap-group>` (in Archiving and Publishing only).
- `<object-id>` — was added to the content model for `<def-list>`.
- `<sec-meta>` — The element `<permissions>` was made repeatable for multi-lingual documents.
- `<string-date>` — Allowed the element `<string-date>` to be used anywhere a `<date>` was used, except `<history>` in Publishing (Authoring has no `<history>` element.) (Full change is Authoring only; Archiving and Publishing already allowed this most places.)
- `<supplementary-material>` — Element `<caption>` was made repeatable to allow for multiple languages. (Authoring only)
- `<table-wrap>` — Element `<caption>` was made repeatable to allow for multiple languages. (Authoring only)

### 3.4 Elements Deprecated Starting in JATS 1.4d1

The JATS Tag Libraries identify each deprecated element or attribute (using the text “(deprecated)” in the element/attribute name and the phrase “This element/attribute is deprecated” in the description. The Tag Library usually suggests alternative tagging.

The following elements are deprecated for the first time in 1.4d1:

- `<collab>`
- `<collab-alternatives>`
- `<history>` (Archiving and Publishing only)
- `<std>`
- `<std-organization>` (do not use)
- `<trans-abstract>` (Archiving and Publishing only)
- `<trans-source>`
- `<trans-subtitle>` (Archiving and Publishing only)
- `<trans-title>`
- `<trans-title-group>` (Archiving and Publishing only)

## 4 Attribute Related Changes

New attributes discussed in this section were added to all three JATS Tag Sets, unless otherwise noted.

### 4.1 New Attributes for Multi-language Mechanism

The ability for JATS articles to be tagged in more than one language (true multi-language support) has been added by creating these attributes to enable encoding of different language variants.

- **@lang-grouping** — Placed on the <processing-meta> element as a flag to indicate that this document uses the @lang-group attribute and associated multi-language attributes to group and describe multiple language content.
- **@lang-group** — Placed on two or more elements (such as figures or sections) to indicate that these elements are part of the same language group (that is, they represent the same content in different languages). This attribute is the heart of the JATS multi-lingual mechanism
- **@lang-focus** — How members of a language group are related to each other, for example, one of the languages might be the “primary” language and the other language(s) “secondary”. Takes a set value list.
- **@lang-focus-custom** — Provides values for @lang-focus outside the set value list.
- **@lang-source** — What was the role of the person/entity who created this language variant? For example: author, translator, a machine translation. Takes a set value list.
- **@lang-source-custom** — Provides values for @lang-source outside the set value list.
- **@lang-variant** — Names the type of language variant for a member of a language group, for example, a translation or an original. Takes a set value list.
- **@lang-variant-custom** — Provides values for @lang-variant outside the set value list.
- **@lang-translate** — Should the content of this element be translated? Possibilities are “yes” or “no”. There is no default and this attribute is not required.

These multi-language attributes were added to JATS elements as follows:

- The attribute @lang-grouping was added to <processing-meta>.
- Both @xml:lang and the full set of multi-language attributes were added to <self-uri>.
- All of the multi-language attributes just described, except @lang-grouping, were added to every element that could already take an @xml:lang attribute, with the exceptions of <article> and <milestone-end>.

This means that the multi-language attributes were added to:

- <abbrev>
- <abbrev-journal-title> (Archiving and Publishing only)
- <abstract>
- <ack>

- <addr-line>
- <address>
- <aff>
- <alt-text>
- <alt-title>
- <annotation>
- <anonymous>
- <answer>
- <answer-set>
- <app>
- <app-group>
- <array>
- <article-title>
- <article-version>
- <attrib>
- <author-comment>
- <author-notes> (Archiving and Publishing only)
- <award-desc>
- <award-group>
- <award-id>
- <award-name>
- <bio>
- <bold>
- <boxed-text>
- <caption>
- <chapter-title>
- <chem-struct>
- <chem-struct-wrap>
- <city>
- <code>
- <collab>
- <collab-name>
- <collab-wrap>
- <comment>
- <conf-acronym>
- <conf-date>
- <conf-loc>
- <conf-name>
- <conf-num>
- <conf-sponsor>
- <conf-theme>
- <conference>
- <contrib-id>
- <contributed-resource-group>
- <copyright-holder>
- <copyright-statement>

- <corresp> (Archiving and Publishing only)
- <country>
- <custom-meta>
- <custom-meta-group>
- <data-title>
- <date-in-citation>
- <day>
- <def>
- <def-item>
- <def-list>
- <degrees>
- <disp-formula>
- <disp-formula-group>
- <disp-quote>
- <edition>
- <element-citation>
- <email>
- <era>
- <etal>
- <event> (Archiving and Publishing only)
- <event-desc> (Archiving and Publishing only)
- <explanation>
- <ext-link>
- <fig>
- <fig-group> (Archiving and Publishing only)
- <fixed-case>
- <fn>
- <fn-group>
- <fpage>
- <funding-group>
- <funding-source>
- <funding-statement>
- <glossary>
- <gov>
- <graphic>
- <index-term>
- <inline-formula>
- <inline-graphic>
- <inline-media>
- <inline-supplementary-material>
- <institution>
- <institution-id>
- <issue>
- <issue-id>
- <issue-sponsor> (Archiving and Publishing only)
- <issue-issue-subtitle> (Archiving and Publishing only)



- <issue-title>
- <issue-title-group> (Archiving and Publishing only)
- <italic>
- <journal-id>
- <journal-subtitle> (Archiving and Publishing only)
- <journal-title> (Archiving and Publishing only)
- <journal-title-group> (Archiving and Publishing only)
- <kwd-group>
- <label>
- <legend>
- <license>
- <license-p>
- <list>
- <list-item>
- <long-desc>
- <lpage>
- <media>
- <milestone-start> (Archiving and Publishing only)
- <mixed-citation>
- <monospace>
- <month>
- <name>
- <named-content>
- <nlm-citation>
- <note> (Archiving and Publishing only)
- <notes> (Archiving and Publishing only)
- <on-behalf-of>
- <open-access>
- <option>
- <overline>
- <overline-start> (Archiving only)
- <p>
- <page-range>
- <part-title>
- <patent>
- <permissions>
- <person-group>
- <postal-code>
- <prefix>
- <preformat>
- <price>
- <principal-award-recipient>
- <principal-investigator>
- <product>
- <pub-date> (Archiving and Publishing only)
- <publisher"> (Archiving and Publishing-only)

- <publisher-loc>
- <publisher-name>
- <question>
- <question-preamble>
- <question-wrap>
- <question-wrap-group>
- <rb>
- <ref>
- <ref-list>
- <related-article>
- <related-object>
- <resource-group>
- <resource-id>
- <resource-name>
- <response> (Archiving and Publishing only)
- <role>
- <roman>
- <rt>
- <sans-serif>
- <sc>
- <season>
- <sec>
- <see>
- <see-also>
- <self-uri>
- <series>
- <series-text> (Archiving and Publishing only)
- <series-title> (Archiving and Publishing only)
- <sig> (Archiving and Publishing only)
- <size>
- <source>
- <speaker>
- <speech>
- <state>
- <statement>
- <std>
- <std-organization>
- <strike>
- <string-conf> (Archiving only)
- <string-date>
- <string-name>
- <styled-content>
- <sub>
- <sub-article> (Archiving and Publishing only)
- <subj-group>
- <subtitle>

- <suffix>
- <sup>
- <supplement>
- <supplementary-material>
- <support-description>
- <support-group>
- <support-source>
- <table-wrap>
- <table-wrap-group> (Archiving and Publishing only)
- <target>
- <term>
- <textual-form>
- <title-group>
- <trans-abstract> (Archiving and Publishing only)
- <trans-source>
- <trans-subtitle> (Archiving and Publishing only)
- <trans-title>
- <trans-title-group> (Archiving and Publishing only)
- <underline>
- <underline-start> (Archiving only)
- <unstructured-kwd-group> (Archiving only)
- <uri>
- <verse-group>
- <verse-line>
- <version>
- <volume>
- <volume-id>
- <volume-issue-group> (Archiving and Publishing only)
- <x> (Archiving only)
- <xref>
- <year>

## 4.2 Attribute Value/Suggested Value Changes

New attribute values discussed in this section were added to all three JATS Tag Sets, unless otherwise noted.

Attribute suggested value lists that changed included:

- **@article-type** — For the element <article>, four previously suggested **@article-type** values were deleted from the list: “clinical-instruction”, “dissertation”, “partial-retraction”, and “reprint”.

Eleven new suggested values were added, including “data-paper”, “interview”, and “tutorial”. See **@article-type** for the complete suggested list. Since this is a list of suggested common article types, a JATS user can feel free to use new values not in the list.

- **@publisher-type** — For the citation elements (<mixed-citation> and <element-citation>), the value “standards-body” was removed from the suggested values list.
- **@question-response-type** — Added the value “custom” to the values for the **@question-response-type** attribute and a new attribute (**@custom-type**) to the element <question>.

### 4.3 Changes in Recommended Practice

- **@mimetype** and **@mime-subtype** (Note: While these attributes will not be deprecated, best practice is to avoid using **@mimetype** and **@mime-subtype** as separate attributes. Instead, combine mimetype and mime-subtype values separated by a slash inside **@mimetype** (e.g., `<code>mimetype="application/excel"</code>`).

### 4.4 Existing Attributes to New Locations

The modified attribute lists discussed in this section were added to all three JATS Tag Sets, unless otherwise noted.

- **@rid** — Added to <abbrev>
- **@content-type** — Added to <anonymous>, <author-notes> (Archiving and Publishing only), <inline-graphic> (Authoring only), <institution-wrap>, <permissions>
- **@sort-key** — Added to <index-term>
- **@specific-use** — Added to <author-notes> (Archiving and Publishing only), <institution-wrap>, <permissions>
- **Vocabulary Attributes** — Added **@vocab**, **@vocab-identifier**, **@vocab-term**, and **@vocab-term-identifier** to <see> and <see-also>
- **@xml:lang** — Added to the following elements, to allow for multi-language documents:
  - <article-version>
  - <author-notes> (Archiving and Publishing only)
  - <journal-title-group> (Archiving and Publishing only)
  - <license-p>
  - <permissions>
  - <publisher> (Archiving and Publishing only)
  - <title-group>

The attribute **@xml:lang** was also added to the face markup elements, to allow for multi-language documents:

- <bold>
- <italic>
- <monospace>
- <overline>
- <overline-start> (Archiving only)
- <roman>
- <sans-serif>
- <sc>
- <strike>

- <sub>
- <sup>
- <underline>
- <underline-start> (Archiving only)

## 5 New/Replacement Modules for the Suite

The following new modules were added to either the DTD Suite modules or the XSD suite modules, or both:

- **New ALI Module** — The NISO RP-22-2021, Access & License Indicators (2021 Revision) has been revised to version 1.0.1. JATS will update the JATS XSD schema versions to reference a new JATS-specific ALI schema module. JATS DTDs will add a new attribute `@applies_to` to the `<ali:license_ref>` element.  
(Note: The latest ALI XSD makes the attribute `@start_date` on the element `<ali:free_to_read>` required. Unfortunately, the previous version of ALI used by JATS had this `@start_date` as an optional attribute. JATS cannot require this attribute, as that would be a backwards-incompatible JATS change. Therefore, JATS has created its own JATS-specific XSD schema module, and, in both the DTD and XSD versions of the ALI schema, the attribute `@start_date` on the element `<ali:free_to_read>` will be optional.)
- **The MathML 3.0 Schema module** was updated to the 2014 edition, which will remove some extraneous error/warning messages. In the 2014 edition, the W3C removed an ambiguity issue with the model of `<mml_annotation>`. The changes are type-related so the MathML 3.0 DTD modules are unchanged.
- **BITS Multi-language Attribute Overrides** — The new module “bits-multi-lingual-atts1-4d1.ent” was created to override all the content-element attribute lists in the BITS Embedded Index Term and Question/Answer modules to add the multi-lingual attributes. These changes were put into a separate module to make the module easy to discard when (if) BITS adds multi-lingual modeling.

## 6 Parameter Entity Changes

### 6.1 New Parameter Entities

The Parameter Entities discussed in this section were added in all three JATS Tag Sets, unless otherwise noted.

#### 6.1.1 New For Classes and Mixes

The following class or mix Parameter Entities were added:

- `%collab-name.class;`                      `%collab-wrap.class;`
- `%custom-meta-group.class;`              `%legend.class;`
- `%permissions.class;`                      `%private-char.class;`
- `%table-display.class;`

### 6.1.2 New For Element Models

The following parameter entities were added:

- %collab-name-alternatives-elements;
- %collab-name-elements;
- %collab-wrap-model;
- %content-language-elements;
- %legend-model;

### 6.1.3 New for Attribute Lists/Values

The following parameter entities were added:

- %collab-name-alternatives-atts;
- %collab-name-atts;
- %collab-wrap-atts;
- %content-language-atts;
- %lang-focus-atts;
- %lang-focus-types;
- %lang-source-atts;
- %lang-source-types;
- %lang-variant-atts;
- %lang-variant-types;
- %legend-atts;
- %multi-lang-atts;

### 6.1.4 For Modules

The following parameter entities were added:

- %bits-multi-lingual-atts.ent;

## 6.2 Modified Parameter Entities

The Parameter Entities discussed in this section were modified in all three JATS Tag Sets, unless otherwise noted.

### 6.2.1 For Classes and Mixes

The following class or mix Parameter Entities were modified:

- References Class — For all the citation, related material, and product elements, added <collab-name> and <collab-name-alternatives> to the %references.class;.
- Name Class — For the <contrib> and <person-group> elements, added <collab-name> and <collab-name-alternatives> to %name.class;.
- Contributor Information Class — (Publishing only) Added <fn> to <contrib> (through %contrib-info.class>). (Change not made in Authoring; Footnote already present in Archiving.)

## 6.2.2 For Element Models and Attribute Lists

The following parameter entities were modified for JATS 1.4d1:

- %abbrev-atts;
- %abbrev-journal-title-atts; (Archiving and Publishing only)
- %abstract-atts;
- %ack-atts;
- %addr-line-atts;
- %address-atts;
- %aff-atts;
- %alt-text-atts;
- %alt-title-atts;
- %annotation-atts;
- %anonymous-atts;
- %answer-atts;
- %answer-set-atts;
- %answer-types;
- %app-atts;
- %app-group-atts;
- %app-model;
- %array-atts;
- %article-atts;
- %article-meta-model;
- %article-title-atts;
- %article-version-atts;
- %attrib-atts;
- %author-comment-atts;
- %author-notes-atts; (Archiving and Publishing only)
- %award-desc-atts;
- %award-group-atts;
- %award-group-model;
- %award-id-atts;
- %award-name-atts;
- %bio-atts;
- %block-alternatives-atts; (Archiving and Publishing only)
- %bold-atts;
- %boxed-text-atts;
- %boxed-text-model;
- %caption-atts;
- %chapter-title-atts;
- %chem-struct-atts;
- %chem-struct-wrap-atts;
- %chem-struct-wrap-model;
- %citation-atts;
- %citation-elements;
- %city-atts;

- %code-atts;
- %collab-atts;
- %comment-atts;
- %conf-acronym-atts;
- %conf-date-atts;
- %conf-loc-atts;
- %conf-name-atts;
- %conf-num-atts;
- %conf-sponsor-atts;
- %conf-theme-atts;
- %conference-atts;
- %contrib-id-atts;
- %contrib-id-model;
- %contrib-model;
- %contributed-resource-group-atts;
- %copyright-holder-atts;
- %copyright-statement-atts;
- %corresp-atts; (Archiving and Publishing only)
- %country-atts;
- %custom-meta-atts;
- %custom-meta-group-atts;
- %data-title-atts;
- %date-in-citation-atts;
- %day-atts;
- %def-atts;
- %def-item-atts;
- %def-list-atts;
- %def-list-model;
- %degrees-atts;
- %disp-formula-atts;
- %disp-formula-elements;
- %disp-formula-group-atts;
- %disp-formula-group-model;
- %disp-formula-model;
- %disp-quote-atts;
- %display-atts;
- %dtd-version;
- %edition-atts;
- %element-citation-atts;
- %email-atts;
- %era-atts;
- %etal-atts;
- %event-atts; (Archiving and Publishing only)
- %event-desc-atts; (Archiving and Publishing only)
- %event-model; (Archiving and Publishing only)
- %explanation-atts;



- %ext-link-atts;
- %fig-atts;
- %fig-group-atts; (Archiving and Publishing only)
- %fig-group-model; (Archiving and Publishing only)
- %fig-model;
- %fixed-case-atts;
- %fn-atts;
- %fn-group-atts;
- %fpage-atts;
- %front-stub-model; (Archiving and Publishing only)
- %funding-group-atts;
- %funding-source-atts;
- %funding-statement-atts;
- %glossary-atts;
- %gov-atts;
- %graphic-atts;
- %graphic-model;
- %index-term-atts;
- %inline-formula-atts;
- %inline-graphic-atts;
- %inline-media-atts;
- %inline-supplementary-material-atts;
- %institution-atts;
- %institution-id-atts;
- %institution-wrap-atts;
- %issue-atts;
- %issue-id-atts;
- %issue-part-atts;
- %issue-sponsor-atts; (Archiving and Publishing only)
- %issue-subtitle-atts; (Archiving and Publishing only)
- %issue-title-atts;
- %issue-title-group-atts; (Archiving and Publishing only)
- %italic-atts;
- %journal-id-atts;
- %journal-meta-model; (Archiving and Publishing only)
- %journal-subtitle-atts; (Archiving and Publishing only)
- %journal-title-atts; (Archiving and Publishing only)
- %journal-title-group-atts; (Archiving and Publishing only)
- %kwd-group-atts;
- %label-atts;
- %license-atts;
- %license-p-atts;
- %license-ref-atts;
- %list-atts;
- %list-item-atts;
- %long-desc-atts;

- %lpage-atts;
- %media-atts;
- %media-model;
- %milestone-start-atts; (Archiving and Publishing only)
- %mixed-citation-atts;
- %monospace-atts;
- %month-atts;
- %name-atts;
- %named-content-atts;
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