Beyond PDF – Exchange and Publish Scores with MusicXML

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Agenda

- Introduction to MusicXML
- MusicXML status and progress in the past year
- Possible future directions for MusicXML
- Interactive discussions throughout

What is MusicXML?

- The standard open format for exchanging digital sheet music between applications
- Invented by Michael Good at Recordare in 2000
- Developed collaboratively by a community of hundreds of musicians and software developers over the past 13 years
- Available under an open, royalty-free license that is friendly for both open-source and proprietary software
- Supported by over 160 applications worldwide

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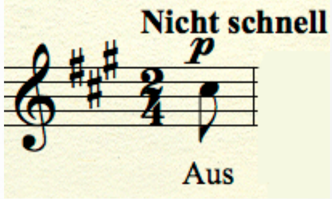
What’s Wrong With Using PDF?

- PDF: Portable Document Format
- The standard format for exchanging and distributing final form documents
- High graphical fidelity
- But it has no musical knowledge
  - No playback
  - No alternative layouts
  - Limited editing and interactivity
- PDF duplicates paper – it does not take advantage of the interactive potential for digital sheet music

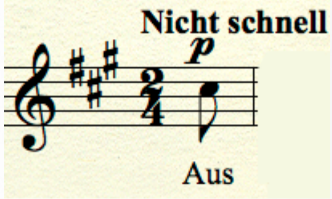
MusicXML Is a Notation Format

- Music is represented using the semantic concepts behind common Western music notation
- Includes both how a score looks and how it plays back
- Includes low-level details of the appearance of a particular engraving, or the nuances of a particular performance
  - Allows transfer of music between applications with high visual fidelity
  - Also allows the visual details to be ignored when appropriate
  - The best display for paper is often not the best for an interactive application



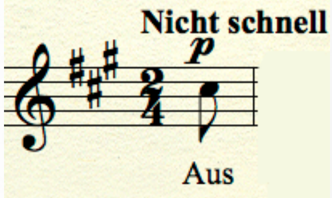
in MusicXML (1 of 3)

```
<part id="P1">
  <measure implicit="yes" number=”0" width="179">
    <attributes>
      <divisions>24</divisions>
      <key>
        <fifths>3</fifths>
        <mode>major</mode>
      </key>
      <time>
        <beats>2</beats>
        <beat-type>4</beat-type>
      </time>
      <clef>
        <sign>G</sign>
        <line>2</line>
      </clef>
    </attributes>
```



in MusicXML (2 of 3)

```
<direction placement="above” directive=“yes”>
   <direction-type>
     <words default-y="25" font-size="10.5"
       font-weight="bold”>Nicht schnell</words>
   </direction-type>
   <sound tempo="42"/>
 </direction>
 <direction placement="above">
   <direction-type>
     <dynamics default-y="10" relative-x="-5">
       <p/>
     </dynamics>
   </direction-type>
   <sound dynamics="54"/>
 </direction>
```



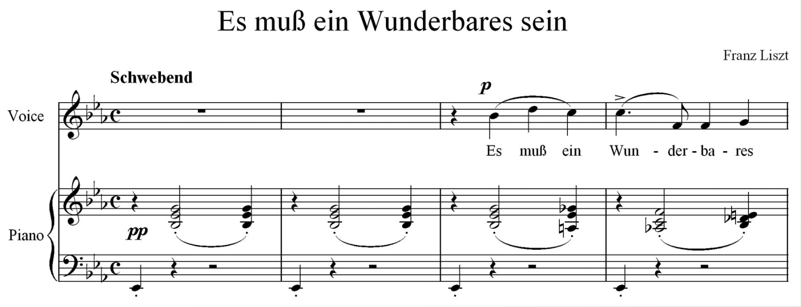
in MusicXML (3 of 3)

```
  <note default-x="141">
    <pitch>
      <step>C</step>
      <alter>1</alter>
      <octave>5</octave>
     </pitch>
     <duration>12</duration>
     <voice>1</voice>
     <type>eighth</type>
     <stem default-y="-50">down</stem>
     <lyric default-y="-80" number="1">
       <syllabic>single</syllabic>
       <text>Aus</text>
     </lyric>
  </note>
</measure>
```

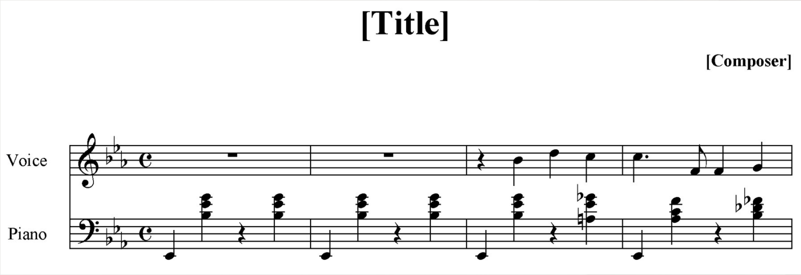
MusicXML as an Archival Format

- MusicXML is an XML format, with all its advantages:
  - Files can be opened in any computer text editor
  - Fully internationalized via Unicode
  - Files are human-readable as well as machine-readable
  - Can use all the standard XML tools developed by larger industries than the music industry
- Backward compatibility: all valid MusicXML 1.0 files are also valid MusicXML 3.0 files
- MusicXML license allows continued development of the format by anyone, not just MakeMusic
- Already implemented by over 160 programs

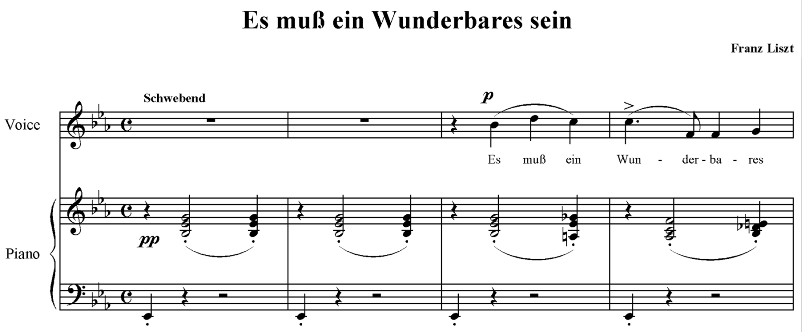
Sibelius to Finale: MusicXML vs MIDI



Original as entered into Sibelius



Imported into Finale via MIDI



Imported into Finale via MusicXML

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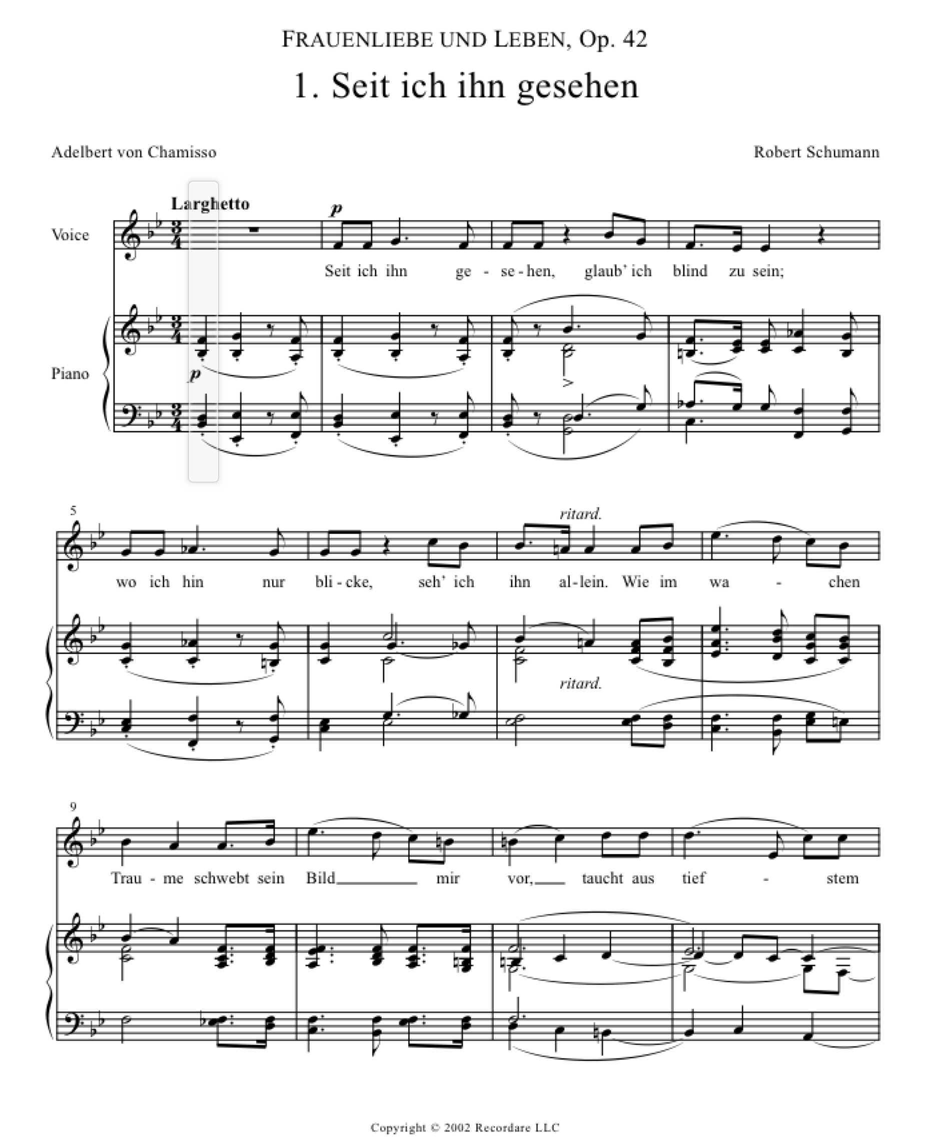
Original Finale file



FRAUENLIEBE UND LEBEN, Op. 42

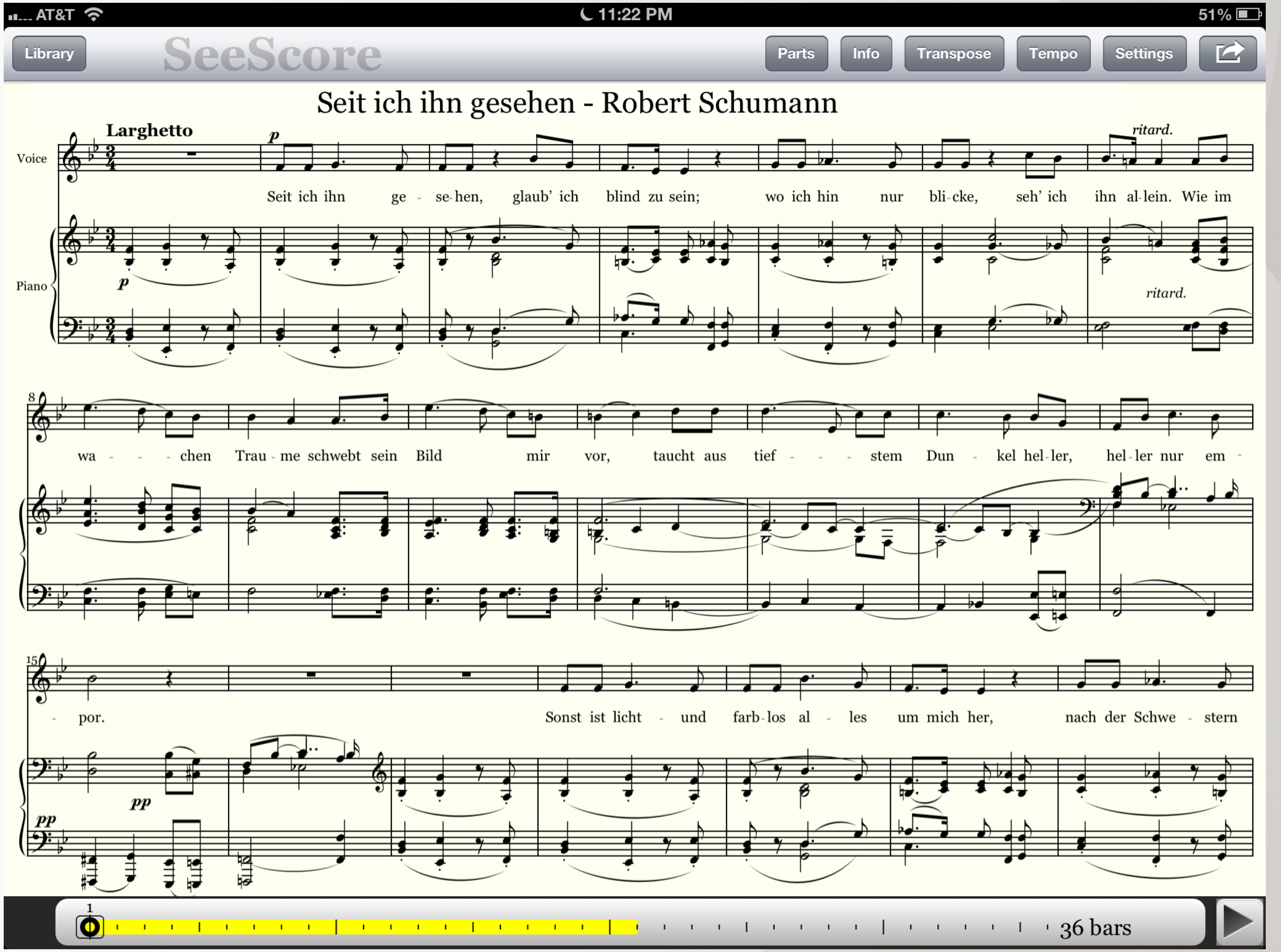
1. Seit ich ihn gesehen

Adelbert von Chamisso

Robert Schumann

Larghetto
Voice
Piano
p
p
Seit ich ihn ge - se - hen, glaub' ich blind zu sein;
5
ritard.
wo ich hin nur bli - cke, seh' ich ihn al - lein. Wie im wa - chen
ritard.
9
Trau - me schwebt sein Bild mir vor, taucht aus tief - stem

MusicXML Reflowed in SeeScore


AT&T
11:22 PM
51%
Library
SeeScore
Parts
Info
Transpose
Tempo
Settings
Seit ich ihn gesehen - Robert Schumann
Larghetto
Voice
Piano
p
ritard.
Seit ich ihn ge - se-hen, glaub' ich blind zu sein; wo ich hin nur bli-cke, seh' ich ihn al-lein. Wie im
8
wa - - - chen Trau - me schwebt sein Bild mir vor, taucht aus tief - - - stem Dun - kel hel-ler, hel-ler nur em -
15
- por. Sonst ist licht - und farb-los al - les um mich her, nach der Schwe - stern
pp
1
36 bars

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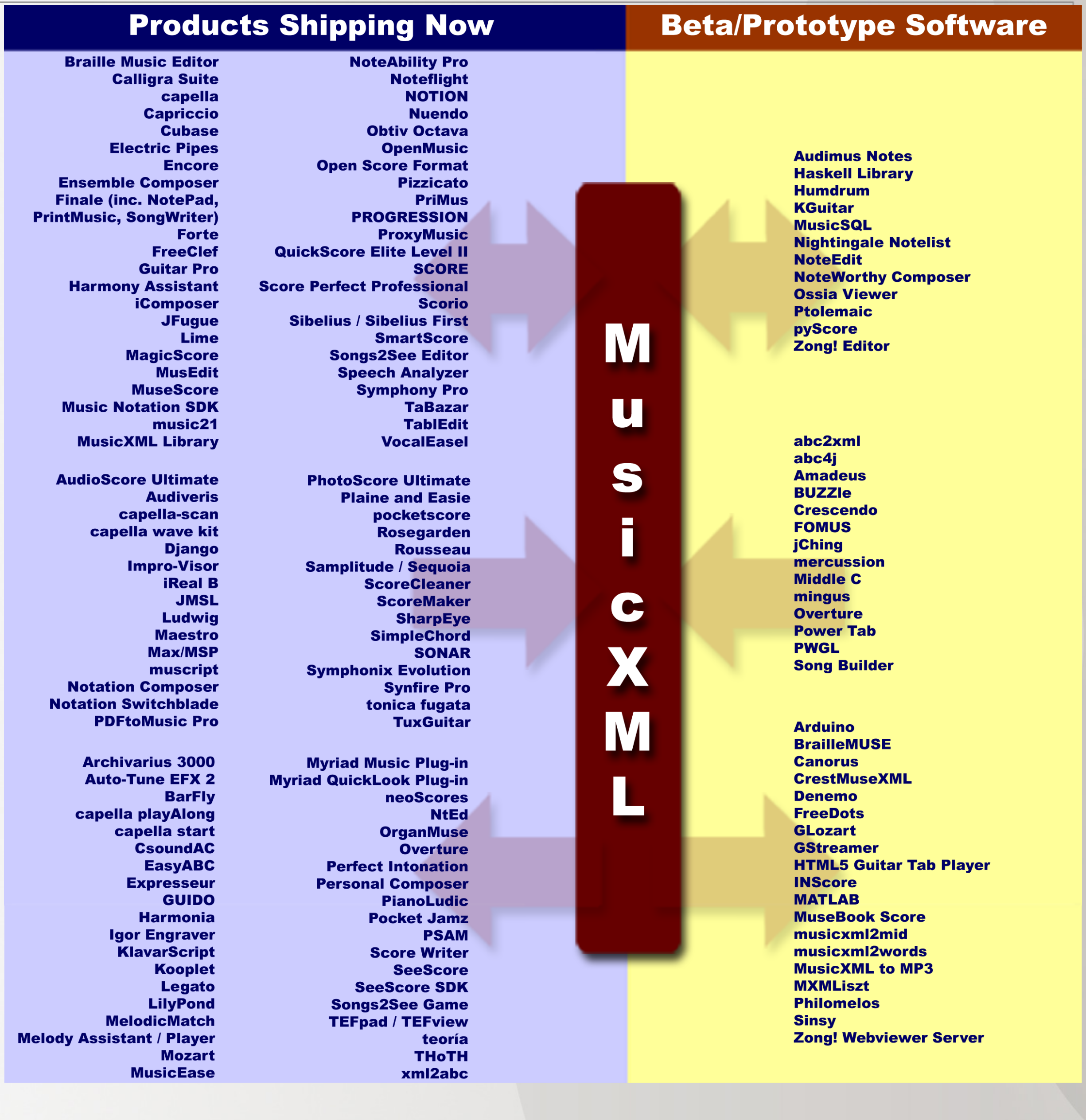
Who Uses MusicXML

Usage map as of April 2013



Products Shipping Now

Braille Music Editor
Calligra Suite
capella
Capriccio
Cubase
Electric Pipes
Encore
Ensemble Composer
Finale (inc. NotePad, PrintMusic, SongWriter)
Forte
FreeClef
Guitar Pro
Harmony Assistant
iComposer
JFugue
Lime
MagicScore
MusEdit
MuseScore
Music Notation SDK
music21
MusicXML Library

NoteAbility Pro
Noteflight
NOTION
Nuendo
Obtiv Octava
OpenMusic
Open Score Format
Pizzicato
PriMus
PROGRESSION
ProxyMusic
QuickScore Elite Level II
SCORE
Score Perfect Professional
Scorio
Sibelius / Sibelius First
SmartScore
Songs2See Editor
Speech Analyzer
Symphony Pro
TaBazar
TablEdit
VocalEasel

AudioScore Ultimate
Audiveris
capella-scan
capella wave kit
Django
Impro-Visor
iReal B
JMSL
Ludwig
Maestro
Max/MSP
muscript
Notation Composer
Notation Switchblade
PDFtoMusic Pro

PhotoScore Ultimate
Plaine and Easie
pocketscore
Rosegarden
Rousseau
Samplitude / Sequoia
ScoreCleaner
ScoreMaker
SharpEye
SimpleChord
SONAR
Symphonix Evolution
Synfire Pro
tonica fugata
TuxGuitar

Archivarius 3000
Auto-Tune EFX 2
BarFly
capella playAlong
capella start
CsoundAC
EasyABC
Expresseur
GUIDO
Harmonia
Igor Engraver
KlavarScript
Kooplet
Legato
LilyPond
MelodicMatch
Melody Assistant / Player
Mozart
MusicEase

Myriad Music Plug-in
Myriad QuickLook Plug-in
neoScores
NtEd
OrganMuse
Overture
Perfect Intonation
Personal Composer
PianoLudic
Pocket Jamz
PSAM
Score Writer
SeeScore
SeeScore SDK
Songs2See Game
TEFpad / TEFview
teoría
THoTH
xml2abc

Beta/Prototype Software

Audimus Notes
Haskell Library
Humdrum
KGuitar
MusicSQL
Nightingale Notelist
NoteEdit
NoteWorthy Composer
Ossia Viewer
Ptolemaic
pyScore
Zong! Editor

abc2xml
abc4j
Amadeus
BUZZle
Crescendo
FOMUS
jChing
mercussion
Middle C
mingus
Overture
Power Tab
PWGL
Song Builder

Arduino
BrailleMUSE
Canorus
CrestMuseXML
Denemo
FreeDots
GLozart
GStreamer
HTML5 Guitar Tab Player
INScore
MATLAB
MuseBook Score
musicxml2mid
musicxml2words
MusicXML to MP3
MXMLiszt
Philomelos
Sinsy
Zong! Webviewer Server

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Publishing Scores in MusicXML

- MusicXML is the way that scores get from desktop applications like Finale and Sibelius to the new wave of mobile applications

- No DRM controls built-in, though these have been added in the MusicXML-based Open Score Format

- For copyrighted music, MusicXML has usually been a Business-to-Business format, not Business-to-Consumer

- Many sites available with public domain MusicXML scores: see www.musicxml.com/music-in-musicxml

What’s New With MusicXML?

- New and improved application support
- MusicXML/Dolet support cases now available at www.finalemusic.com/support
- New book *Structuring Music through Markup Languages: Designs and Architectures*
- MusicXML documentation project
- New musicxml.com web site

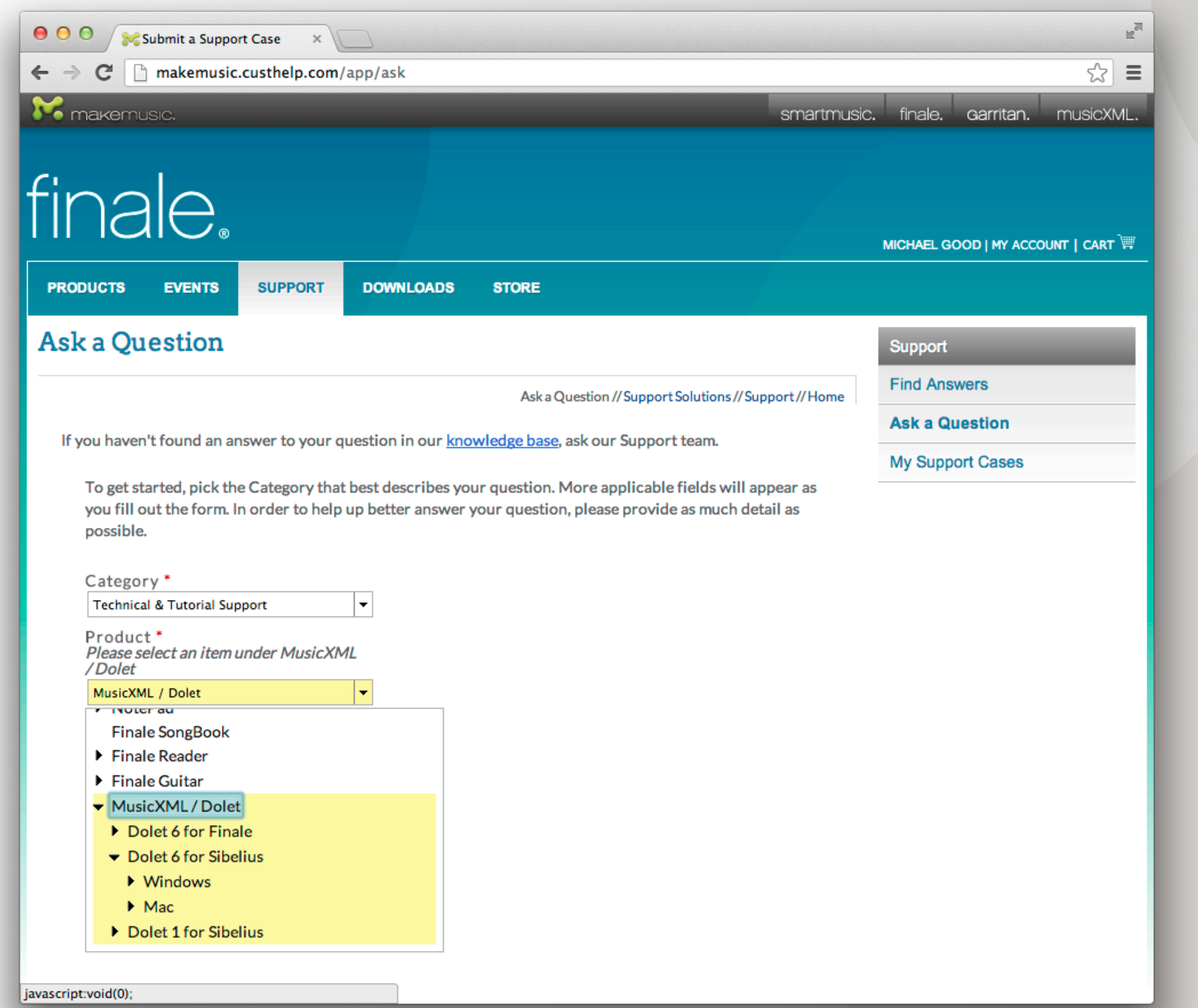
New MusicXML Applications

- Reads and Writes MusicXML
  - Ensemble Composer
  - Music Notation SDK
- Writes MusicXML
  - iReal B
  - Symphonix Evolution
- Reads MusicXML
  - capella start
  - SeeScore SDK
  - TEFpad / TEFview
- First MusicXML apps for Android

MusicXML Applications Released (Previously in Beta)

- Reads and Writes MusicXML
  - Music21
  - OSF Packaging Toolkit
  - Songs2See Editor
- Writes MusicXML
  - Synfire Pro
- Reads MusicXML
  - neoScores
  - Songs2See Game

MusicXML / Dolet Support Case



Submit a Support Case
makemusic.custhelp.com/app/ask
makemusic.
smartmusic. finale. Garritan. musicXML.
finale.
MICHAEL GOOD | MY ACCOUNT | CART
PRODUCTS EVENTS SUPPORT DOWNLOADS STORE

Ask a Question

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If you haven't found an answer to your question in our knowledge base, ask our Support team.

To get started, pick the Category that best describes your question. More applicable fields will appear as you fill out the form. In order to help up better answer your question, please provide as much detail as possible.

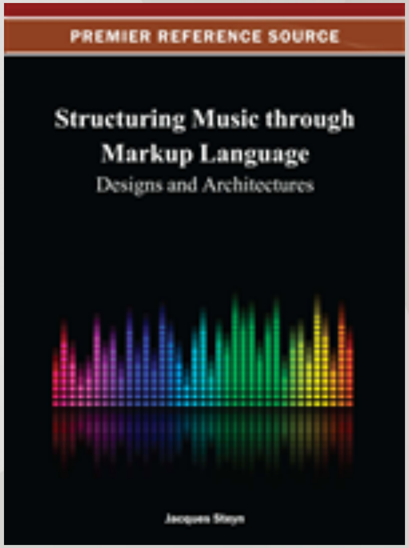
Category *
Technical & Tutorial Support

Product *
Please select an item under MusicXML / Dolet
MusicXML / Dolet

- Notepad
- Finale SongBook
- Finale Reader
- Finale Guitar
- MusicXML / Dolet
  - Dolet 6 for Finale
  - Dolet 6 for Sibelius
    - Windows
    - Mac
  - Dolet 1 for Sibelius

Structuring Music through Markup Language

- New book edited by Jacques Steyn published by IGI Global
- Describes use of XML for music beyond common Western music notation, including
  - Physics
  - Classification
  - Interactivity
  - Movement
  - Expressiveness in performance
  - Acoustic instruments
- Includes retrospective on “MusicXML: The First Decade”



PREMIER REFERENCE SOURCE

Structuring Music through Markup Language

Designs and Architectures

Jacques Steyn

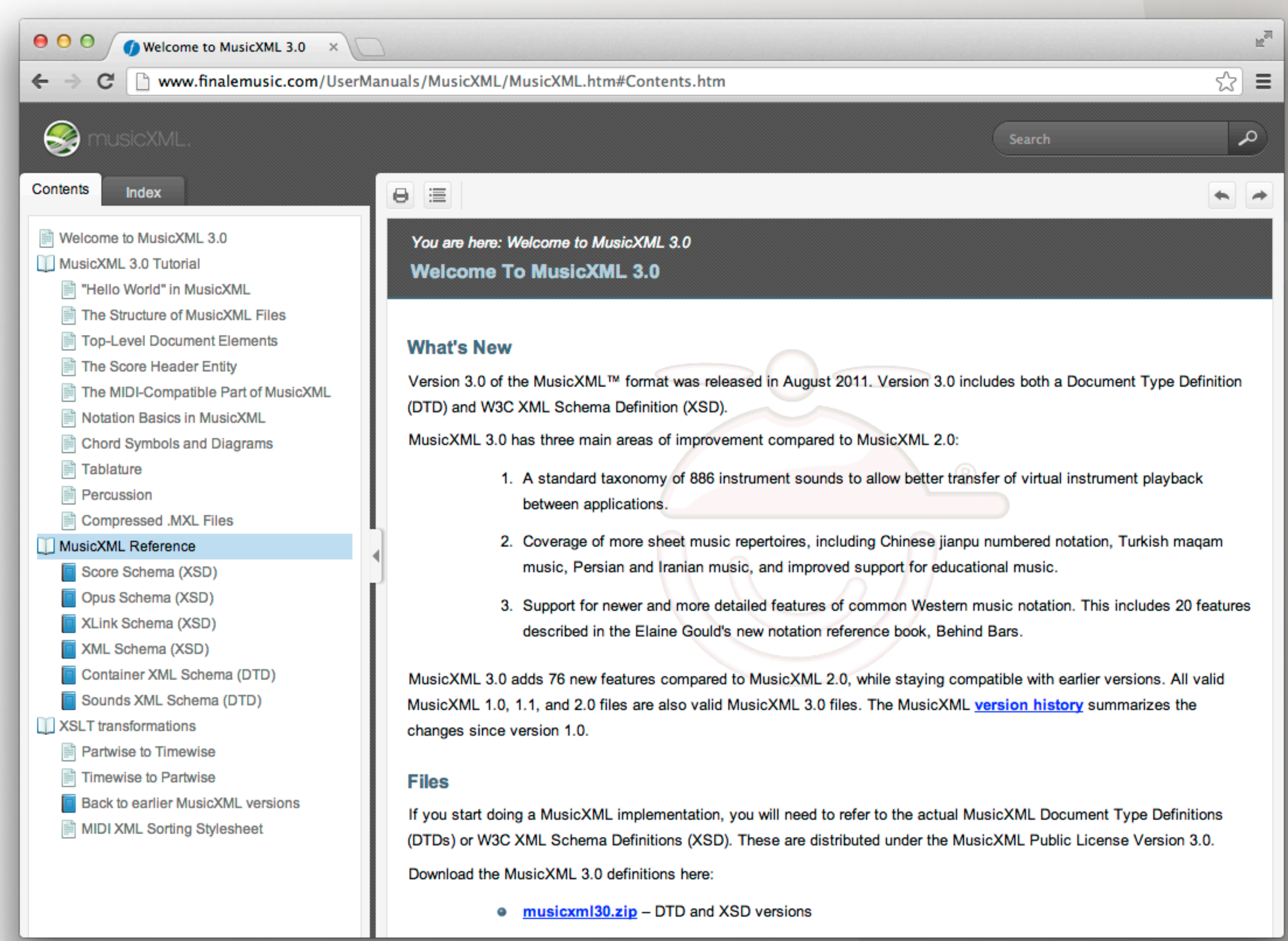
MusicXML Documentation: Goals

- Feedback from shows and the MusicXML mailing list last year was that MusicXML's biggest need was better documentation, not more features
- Current documentation is scattered across tutorial, DTDs, XSDs, example files, and more
- Documentation in DTDs and XSDs is sometimes vague, especially for more complex corner cases
- Writing a full spec is a daunting undertaking; what can we deliver in a year to make life better for developers?

The Online MusicXML Reference

- http://www.musicxml.com/UserManuals/MusicXML/MusicXML.htm
- Takes the text from the MusicXML DTDs and XSDs and puts into an online, indexed reference document
- Adds visual examples for individual MusicXML elements
- Adds the MusicXML 3.0 tutorial
- Includes the MusicXML XSLT stylesheets as-is

MusicXML Documentation Home Page


Welcome to MusicXML 3.0
www.finalemusic.com/UserManuals/MusicXML/MusicXML.htm#Contents.htm
musicXML
Search
Contents
Index

You are here: Welcome to MusicXML 3.0

Welcome To MusicXML 3.0

What's New

Version 3.0 of the MusicXML™ format was released in August 2011. Version 3.0 includes both a Document Type Definition (DTD) and W3C XML Schema Definition (XSD).

MusicXML 3.0 has three main areas of improvement compared to MusicXML 2.0:

1. A standard taxonomy of 886 instrument sounds to allow better transfer of virtual instrument playback between applications.
2. Coverage of more sheet music repertoires, including Chinese jianpu numbered notation, Turkish maqam music, Persian and Iranian music, and improved support for educational music.
3. Support for newer and more detailed features of common Western music notation. This includes 20 features described in the Elaine Gould's new notation reference book, Behind Bars.

MusicXML 3.0 adds 76 new features compared to MusicXML 2.0, while staying compatible with earlier versions. All valid MusicXML 1.0, 1.1, and 2.0 files are also valid MusicXML 3.0 files. The MusicXML version history summarizes the changes since version 1.0.

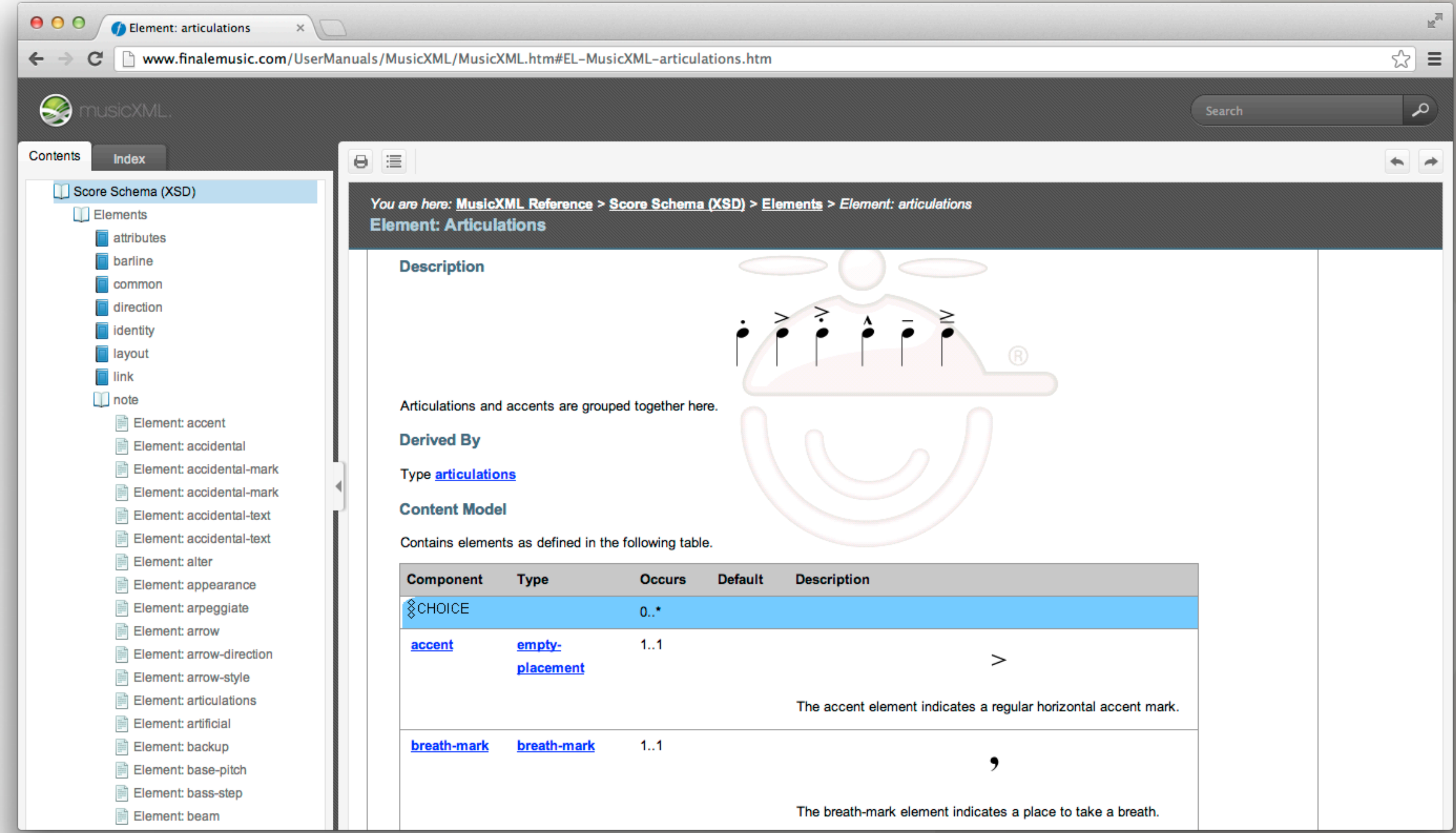
Files

If you start doing a MusicXML implementation, you will need to refer to the actual MusicXML Document Type Definitions (DTDs) or W3C XML Schema Definitions (XSD). These are distributed under the MusicXML Public License Version 3.0.

Download the MusicXML 3.0 definitions here:

- musicxml30.zip – DTD and XSD versions

Documentation Example: Articulations


Element: articulations
www.finalemusic.com/UserManuals/MusicXML/MusicXML.htm#EL-MusicXML-articulations.htm
musicXML
Search
Contents
Index

You are here: **MusicXML Reference** > **Score Schema (XSD)** > **Elements** > *Element: articulations*

Element: Articulations

Description

Articulations and accents are grouped together here.

Derived By

Type articulations

Content Model

Contains elements as defined in the following table.

Component	Type	Occurs	Default	Description
CHOICE		0..*		
accent	empty-placement	1..1		> The accent element indicates a regular horizontal accent mark.
breath-mark	breath-mark	1..1		, The breath-mark element indicates a place to take a breath.

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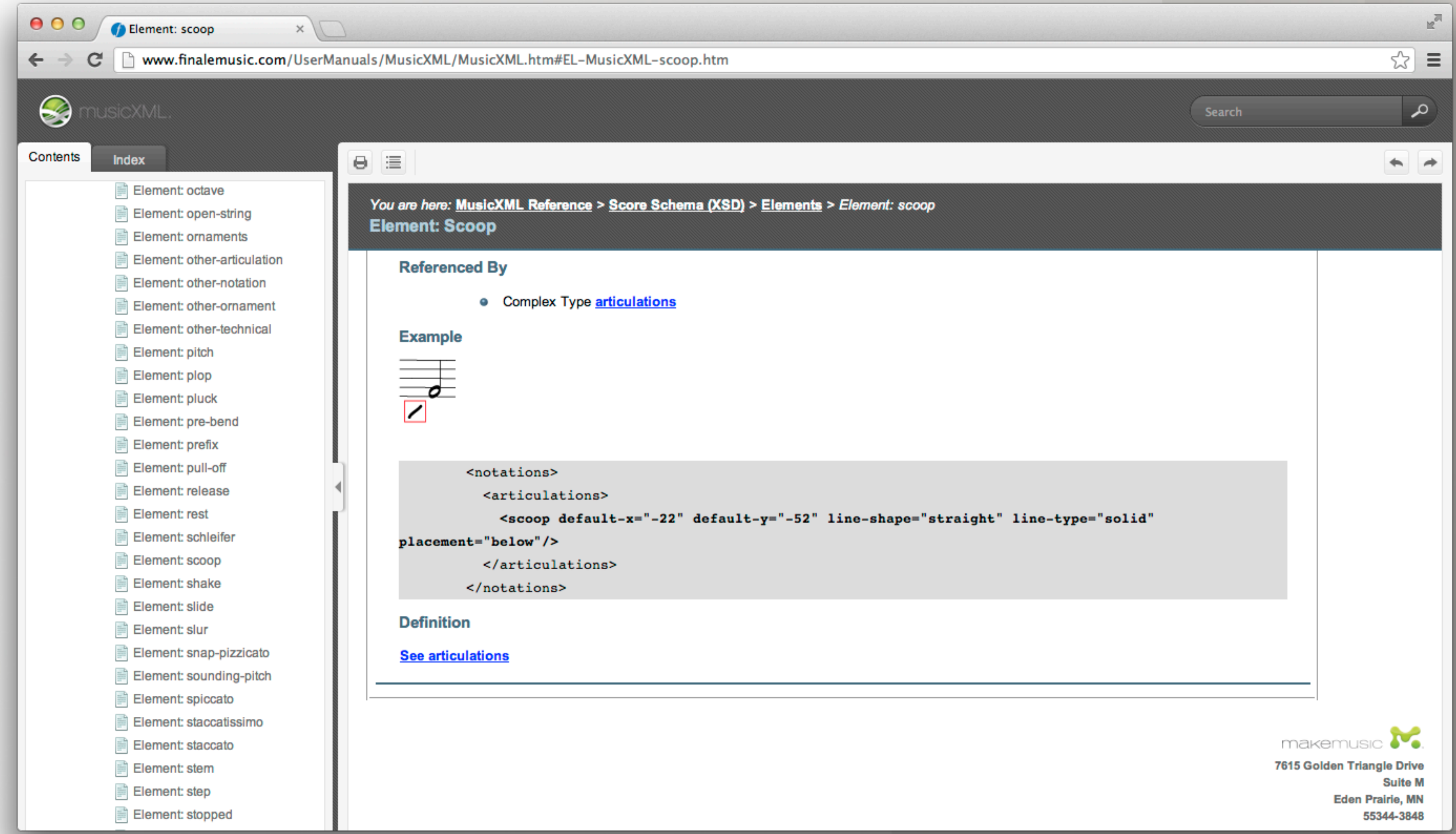
Documentation Example: Scoop



Element: scoop
www.finalemusic.com/UserManuals/MusicXML/MusicXML.htm#EL-MusicXML-scoop.htm
musicXML.
Search
Contents
Index

You are here: **MusicXML Reference** > **Score Schema (XSD)** > **Elements** > *Element: scoop*

Element: Scoop

Referenced By

- Complex Type articulations

Example

```
        <notations>
          <articulations>
            <scoop default-x="-22" default-y="-52" line-shape="straight" line-type="solid"
placement="below"/>
          </articulations>
        </notations>
```

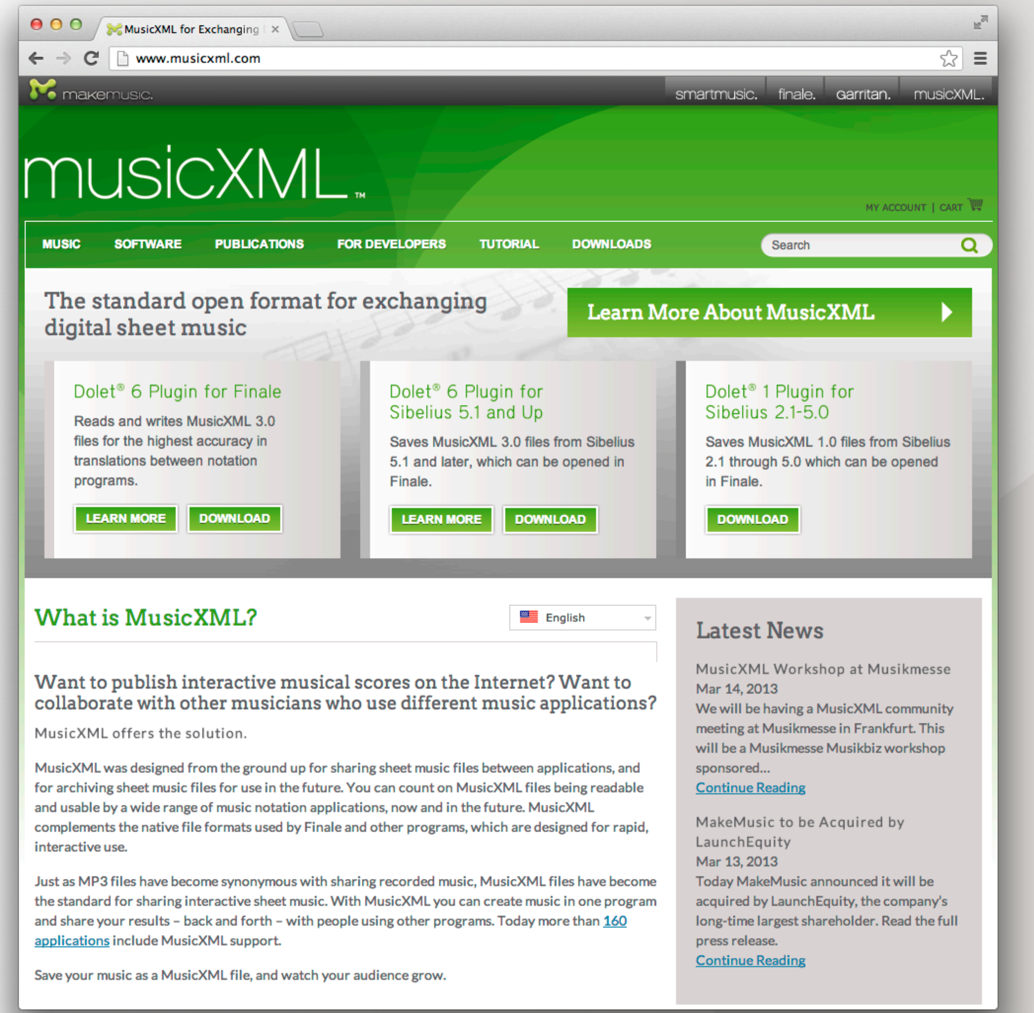
Definition

See articulations

makemusic
7615 Golden Triangle Drive
Suite M
Eden Prairie, MN
55344-3848

makemusic.

New MusicXML.com Website



The standard open format for exchanging digital sheet music

Dolet® 6 Plugin for Finale

Reads and writes MusicXML 3.0 files for the highest accuracy in translations between notation programs.

Dolet® 6 Plugin for Sibelius 5.1 and Up

Saves MusicXML 3.0 files from Sibelius 5.1 and later, which can be opened in Finale.

Dolet® 1 Plugin for Sibelius 2.1-5.0

Saves MusicXML 1.0 files from Sibelius 2.1 through 5.0 which can be opened in Finale.

What is MusicXML?

Want to publish interactive musical scores on the Internet? Want to collaborate with other musicians who use different music applications?

MusicXML offers the solution.

MusicXML was designed from the ground up for sharing sheet music files between applications, and for archiving sheet music files for use in the future. You can count on MusicXML files being readable and usable by a wide range of music notation applications, now and in the future. MusicXML complements the native file formats used by Finale and other programs, which are designed for rapid, interactive use.

Just as MP3 files have become synonymous with sharing recorded music, MusicXML files have become the standard for sharing interactive sheet music. With MusicXML you can create music in one program and share your results – back and forth – with people using other programs. Today more than 160 applications include MusicXML support.

Save your music as a MusicXML file, and watch your audience grow.

Latest News

MusicXML Workshop at Musikmesse
Mar 14, 2013
We will be having a MusicXML community meeting at Musikmesse in Frankfurt. This will be a Musikmesse Musikbiz workshop sponsored...
Continue Reading

MakeMusic to be Acquired by LaunchEquity
Mar 13, 2013
Today MakeMusic announced it will be acquired by LaunchEquity, the company's long-time largest shareholder. Read the full press release.
Continue Reading

Future Directions of MusicXML

- What are the best ways to improve digital sheet music exchange using MusicXML in the future?
- Some of the things we hear:
  - More features to cover more details of music notation, visual formatting, and playback
  - A tighter specification / Better documentation
  - Conformance test suites / More comprehensive examples
  - Better support in Finale as a reference implementation
  - It's working fine as-is

Future Directions: Features

- We have collected over 90 new feature requests for the MusicXML format
- As expected after 4 releases, these are increasingly more unusual notation features, or more detailed formatting
- Stability is important: we don't want to make incompatible changes to the format
- What missing format features are causing the most grief?

Future Directions: Documentation

- Current documentation addresses many issues, but not the tighter specification
- Doing this right is expensive, so we need to better understand the benefits
- Where are the real problems?
  - Music notation is inherently messy
  - Digital music notation has often created for printed appearance, not playback or semantics, and specs won’t fix a GIGO problem
  - MusicXML emphasizes selective encoding, but that can make life more difficult for reading programs
  - For current ambiguities, is discussion on the mailing list sufficient for now to solve implementation problems?
  - Will a better spec really help the worst MusicXML implementations?

Future Directions: Test Suites

- Documentation now provides more isolated examples of individual features than sample files have done
- Still no “official” test suite
- Reinhold Kainhofer has an unofficial test suite
- How big a problem is this?
  - Notation developers should already have their own test suites
  - A MusicXML-only test suite can really only cover import; might it discourage implementing export as well?

Future Directions: Reference Implementation

- Improve Finale's support as a MusicXML reference implementation
- Business needs and technical restrictions emphasized export over import while Recordare was independent
- With MakeMusic acquisition, this dynamic changes
- Of course we encourage all developers to improve their MusicXML support: better interchange makes for a better marketplace
- What limitations in the Finale MusicXML implementation are causing the most problems?

Staying in Touch

- MusicXML mailing list: www.musicxml.com/for-developers/mailing-list/
- Shows: Musikmesse, NAMM, SF MusicTech
- Twitter: @MusicXML
- Facebook: www.facebook.com/MusicXML
- Is it time to move the mailing list to a web forum?
  - Greater accessibility and searchability: the list archives are currently password-protected for privacy and anti-spam
  - Forums are often easier to use overall
  - Considering doing this as part of an upgrade to forum software
  - Any preferences for forum software?