SMPTE 425-0:2014
Revision of SMPTE 425-0:2012-06

SMPTE ROADMAP

SMPTE Bit-Serial Interfaces at 3 Gb/s — Roadmap for the 425 Document Suite

Document Roadmap

The SMPTE 425 suite of documents defines the mapping of various source image formats onto a single link, dual link and quad link serial digital interfaces operating at a nominal rate of 3 Gb/s. This informative "roadmap" describes the documents in the SMPTE 425 suite. The SMPTE 425 series documents specify a virtual interface that is carried on a physical link specified by SMPTE ST 424.

1 SMPTE ST 425-1 – Source Image Format and Ancillary Data Mapping for the 3 Gb/s Serial Interface

SMPTE ST 425-1 defines the mapping of various source image formats onto a single link serial digital interface operating at a nominal rate of 3 Gb/s. This standard defines three mapping formats: Level A, Level B Dual-Link mapping and Level B Dual-Stream mapping as described below.

Level A specifies the direct mapping of various uncompressed video image formats and the direct mapping of packetized data into a serial digital interface operating at a nominal rate of 3 Gb/s. It also defines the carriage of ancillary data such as the audio data, the audio control packets, the payload ID, the time code, etc., for these direct mappings.

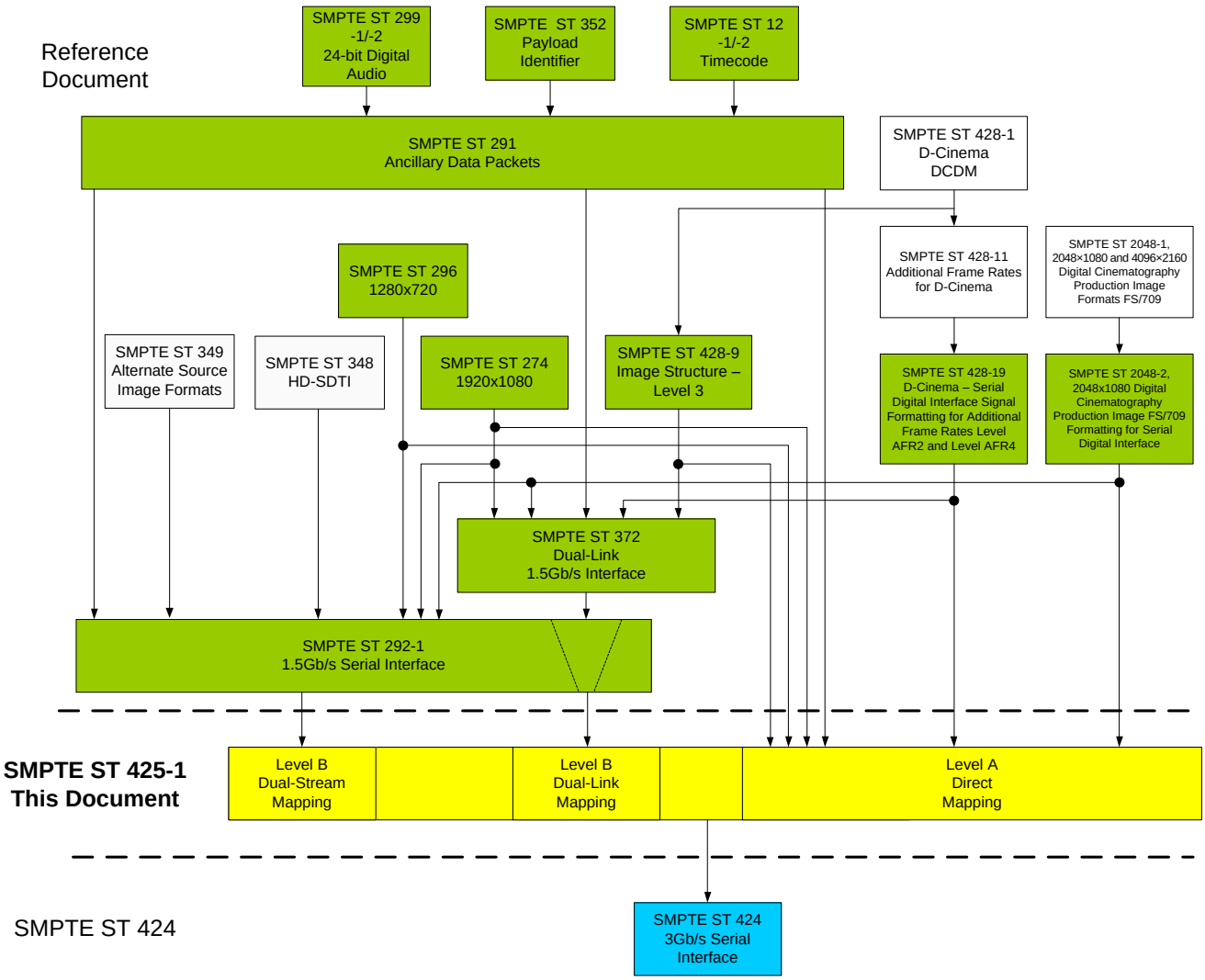
Level B Dual-Link mapping specifies the mapping of the SMPTE ST 372 Dual Link 1.5 Gb/s interface into a serial digital interface operating at a nominal rate of 3 Gb/s.

Level B Dual-Stream mapping specifies the mapping of two of the SMPTE ST 292-1 1.5 Gb/s HD-SDI interfaces into a serial digital interface operating at a nominal rate of 3 Gb/s.

Uncompressed video image formats or packetized data, and all applicable ancillary data such as the audio data, the audio control packets, the payload ID, the time code, etc., shall be mapped into SMPTE ST 372 Dual Link and 2 x SMPTE ST 292-1 interfaces prior to mapping into the virtual interfaces.

Approved
February 20, 2014

1.1 SMPTE ST 425-1 Document Roadmap illustrating “Data Flow Hierarchy”



Document Roadmap Color Legend

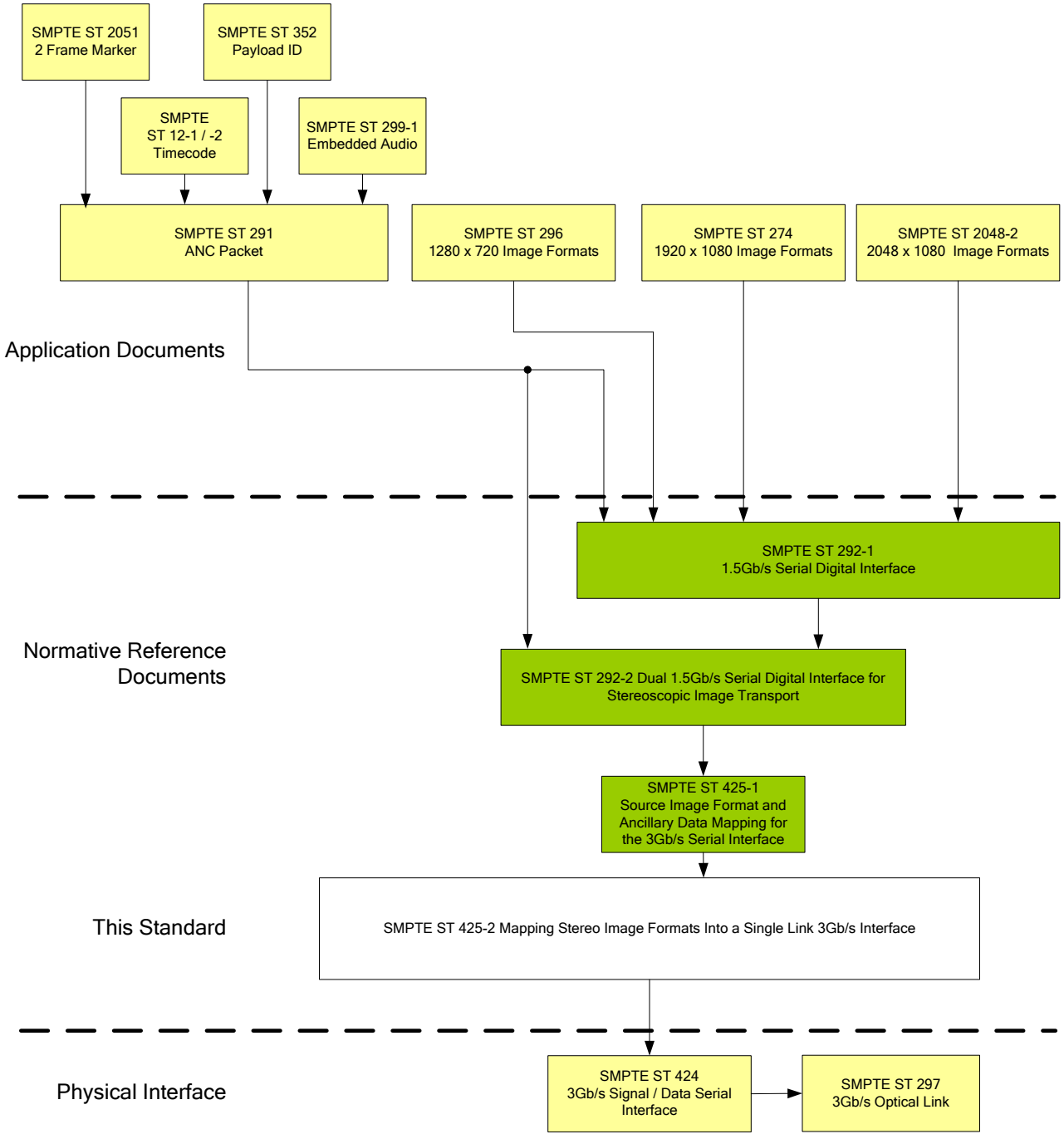
- Normative reference document
- Informative document
- This document
- Referencing document

2 SMPTE ST 425-2 – Source Image Format and Ancillary Data Mapping for Stereoscopic Image Formats on a Single-Link 3 Gb/s Serial Interface

SMPTE ST 292-2 defines a means of transporting stereoscopic images over 2 x 1.5 Gb/s (nominal) serial interfaces. The stereoscopic image formats to be transported by SMPTE ST 292-2 are those 4:2:2 10-bit image formats having a sampling frequency of 74.25 MHz or 74.25/1.001 MHz.

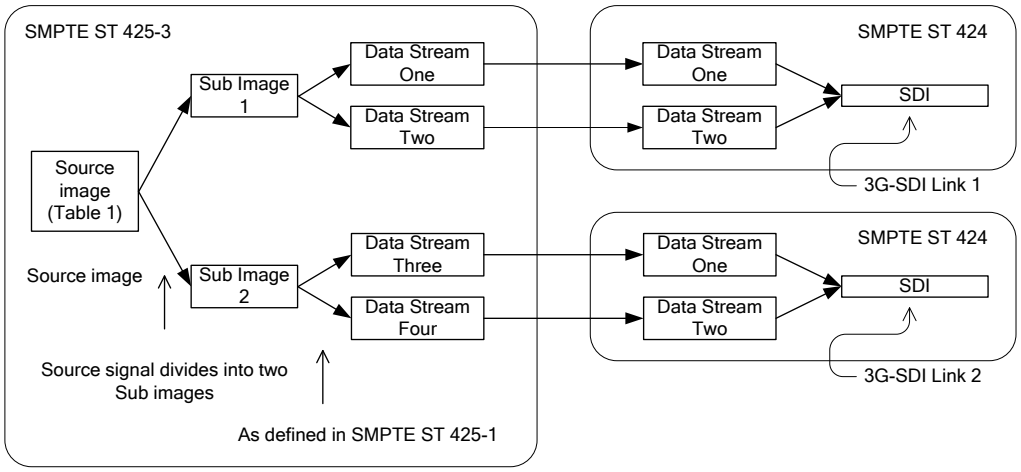
SMPTE ST 425-2 defines the mapping of the stereoscopic image formats referenced in SMPTE ST 292-2 into a single 3 Gb/s (nominal) serial interface, including a payload identifier that will identify the Left Eye and Right Eye (Le and Re) images, audio and other associated ancillary data.

2.1 SMPTE ST 425-2 Document Roadmap

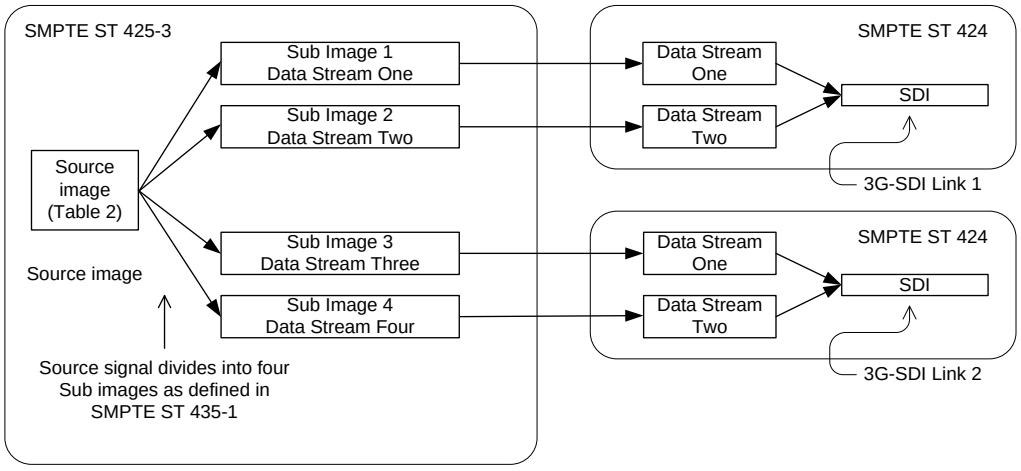


3 SMPTE ST 425-3 – Image Format and Ancillary Data Mapping for the Dual Link 3 Gb/s Serial Interface

SMPTE ST 425-3 defines the mapping of the image formats of 1920×1080 and 2048×1080 pixels complying with 4:2:2 and 4:4:4 10-bit and 12-bit image formats at frame rates above 30 frames per second defined by SMPTE ST 274, ST 2048-1 and ST 2048-2 into four parallel 10-bit data streams (known as data stream one, data stream two, data stream three and data stream four) of a 40-bit virtual interface, followed by the mapping of these four 10-bit data streams onto the Dual Link 3 Gb/s Serial Interface (3G-SDI Link 1 and Link 2) via two 20-bit virtual interfaces. The mapping process is illustrated below.



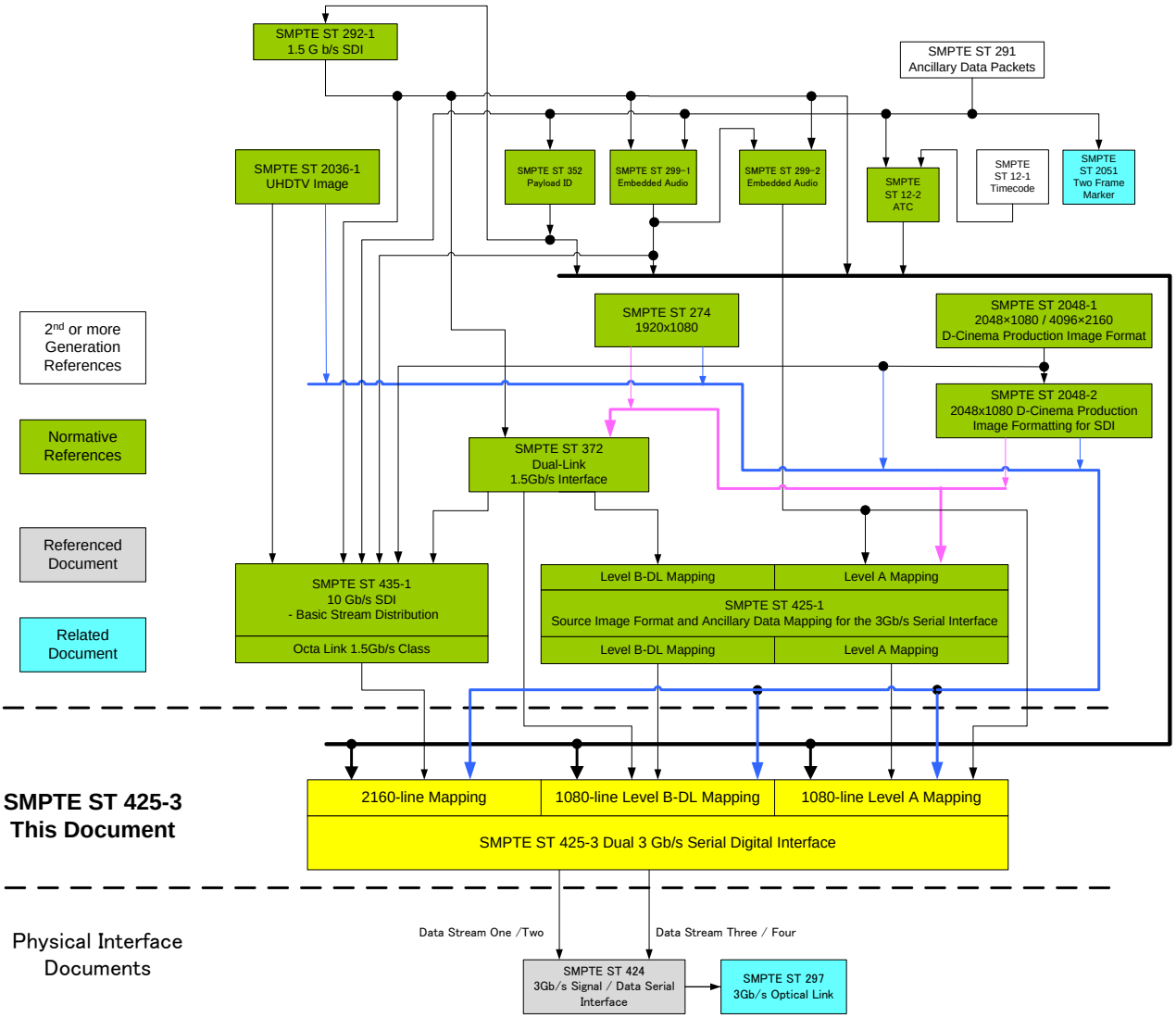
SMPTE ST 425-3 also defines the the mapping of the image formats of 3840×2160 and 4096×2160 pixels complying with 4:2:2 and 4:2:0 10-bit image formats at frame rates up to and including 30 frames per second defined by SMPTE ST 2048-1 and ST 2036-1 into four parallel 10-bit data streams (known as data stream one, data stream two, data stream three and data stream four) of a 40-bit virtual interface, followed by the mapping of these four 10-bit data streams onto the Dual Link 3 Gb/s Serial Interface (3G-SDI Link 1 and Link 2) via two 20-bit virtual interfaces. The mapping process is illustrated below.



SMPTE ST 425-3 also defines the carriage of ancillary data such as the audio data, the audio control packets, the payload identifier and the time code.

3.1 SMPTE ST 425-3 Document Roadmap

This road map shows the relationships through SMPTE ST 425-3, its reference documents and bibliographies.

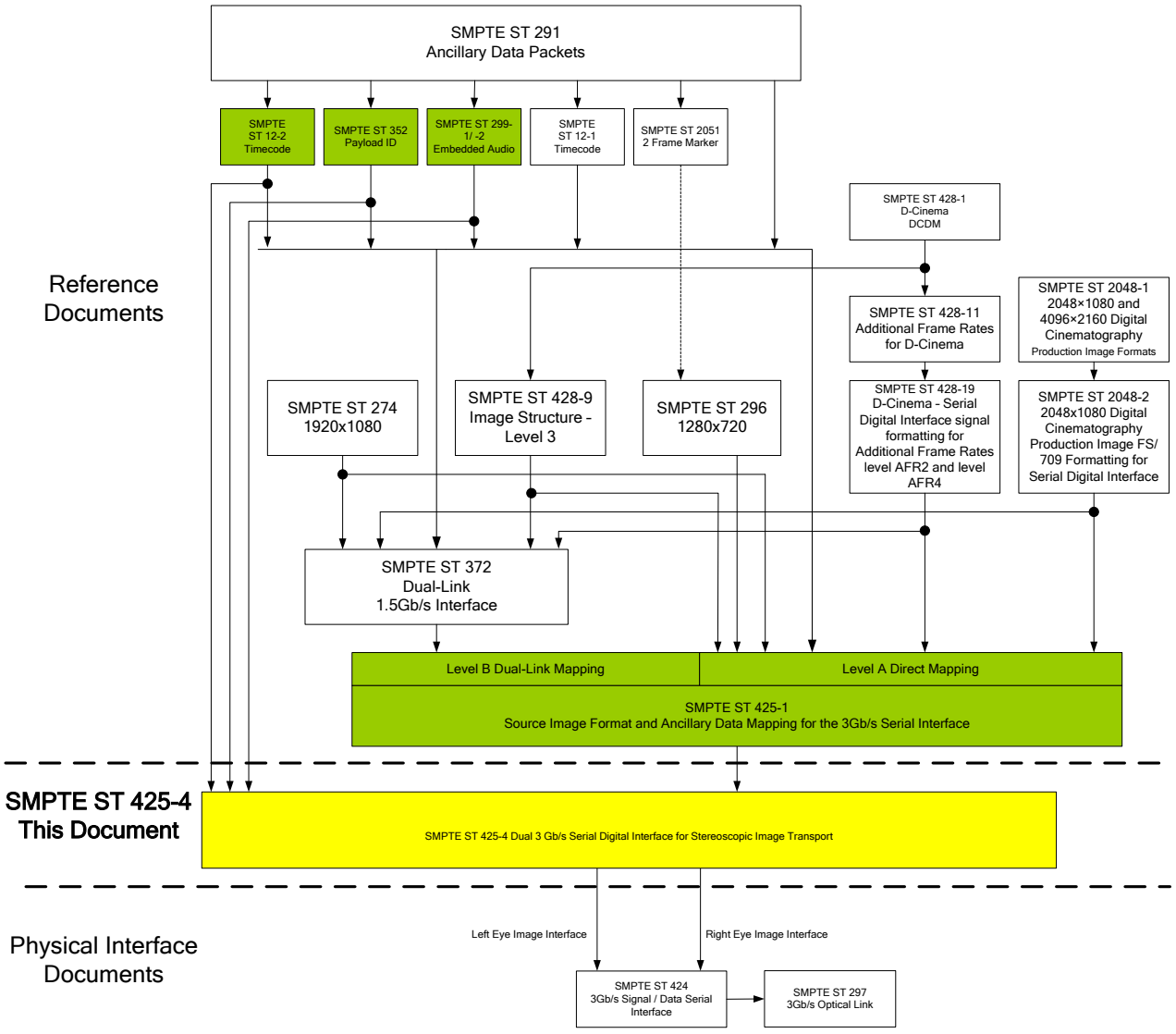


4 SMPTE ST 425-4 – Dual 3 Gb/s Serial Digital Interface for Stereoscopic Image Transport

SMPTE ST 425-4 defines a means of transporting stereoscopic images (Left eye and Right eye images) using an interface consisting of two streams based on the SMPTE ST 425-1 data structures. The Left eye images are carried on one stream of the interface and the Right eye images are carried on the other stream.

The stereoscopic image formats to be transported using this standard are the 4:2:2 and 4:4:4 image formats defined by SMPTE ST 274, ST 296, ST 2048-2, ST 428-9 or ST 428-19, which have a payload capacity of nominally 3 Gb/s and can be transported by a single SMPTE ST 424 serial interface.

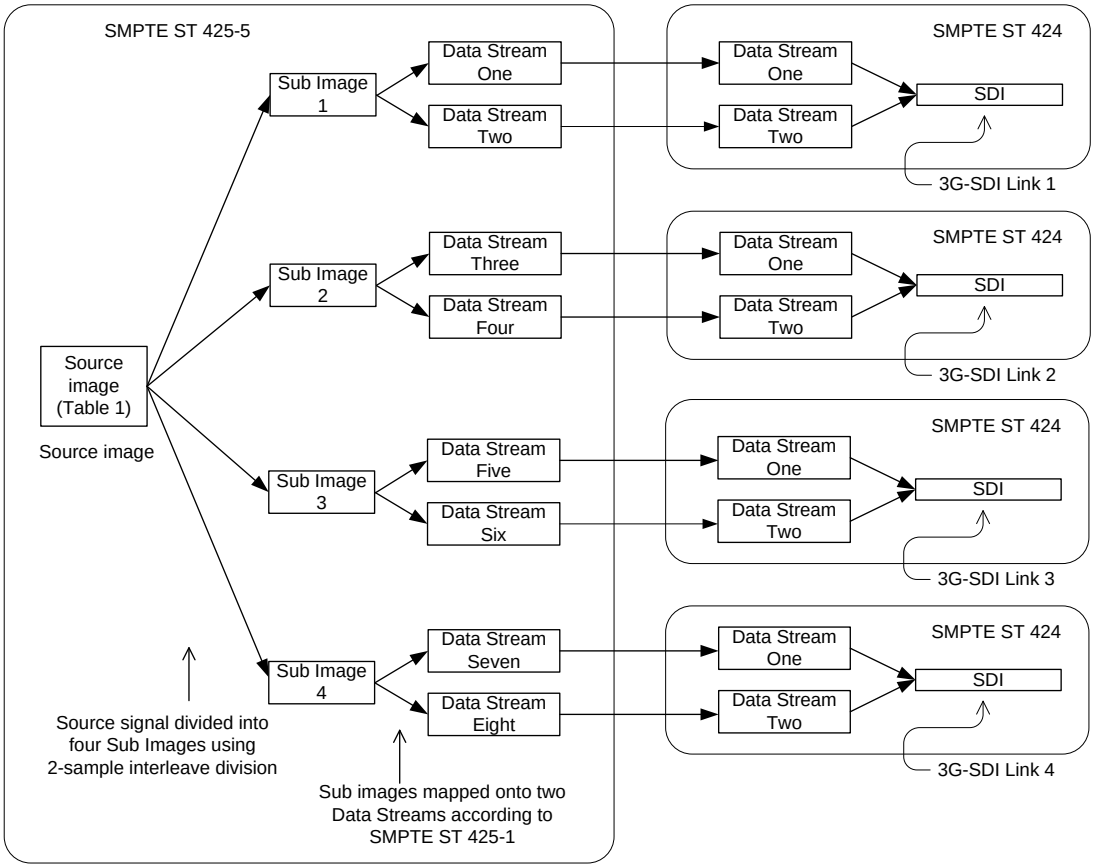
4.1 SMPTE ST 425-4 Document Roadmap



5 SMPTE ST 425-5 – Image Format and Ancillary Data Mapping for the Quad Link 3 Gb/s Serial Interface

SMPTE ST 425-5 defines the the mapping of the image formats of 3840×2160 and 4096×2160 pixels complying with 4:2:2 and 4:2:0 10-bit image formats at frame rates above 30 and up to and including 60 frames per second defined by SMPTE ST 2048-1 and ST 2036-1. SMPTE ST 425-5 also defines the mapping of the image formats of 3840×2160 and 4096×2160 pixels complying with 4:2:2 and 4:4:4 10-bit and 12-bit image formats at frame rates up to and including 30 frames per second defined by SMPTE ST 2048-1 and ST 2036-1.

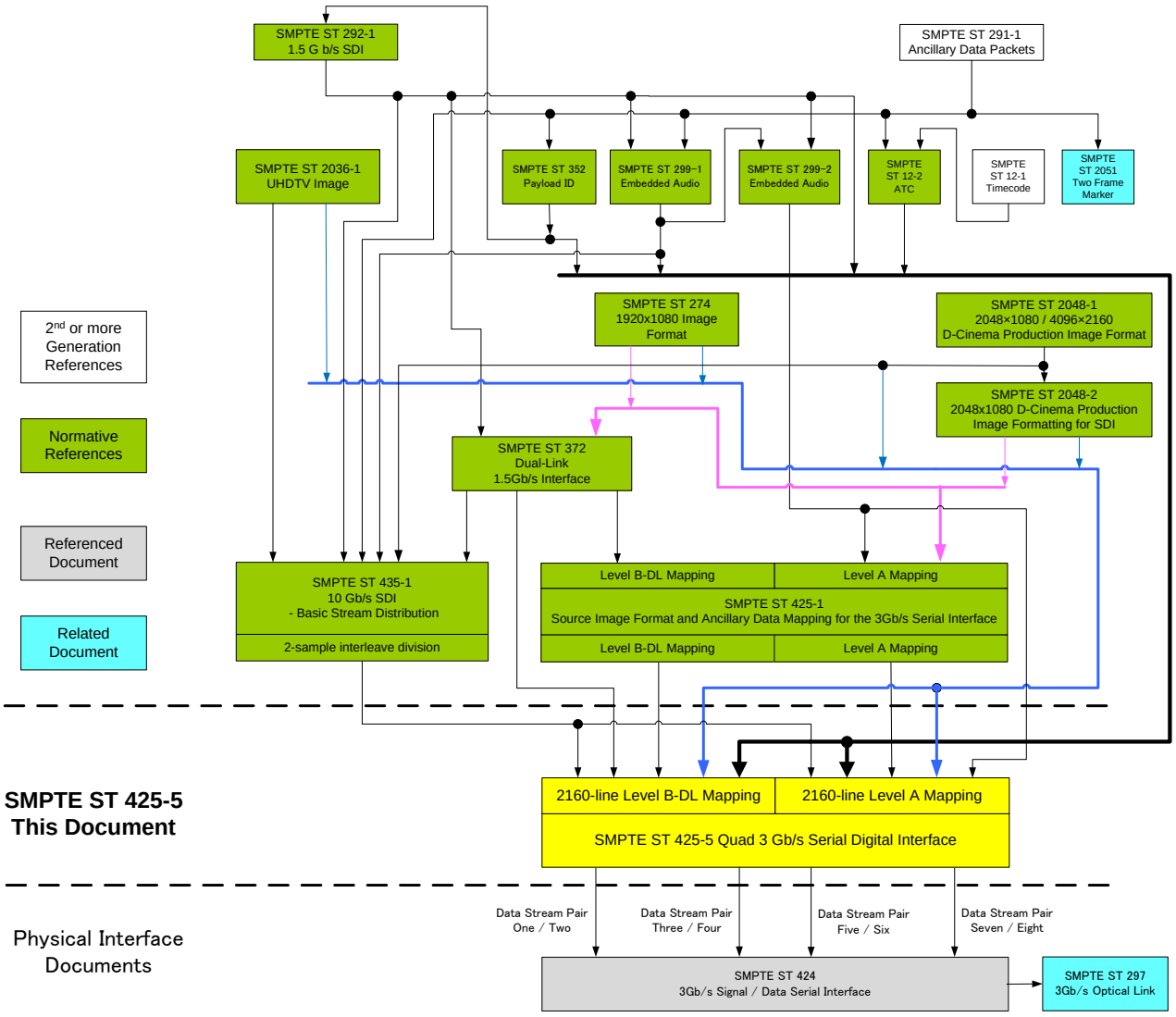
These images are mapped into eight parallel 10-bit data streams (known as data stream one, data stream two, data stream three, data stream four, data stream five, data stream six, data stream seven and data stream eight) of an 80-bit virtual interface, followed by the mapping of these eight 10-bit data streams onto the Quad Link 3 Gb/s Serial Interface (3G-SDI Link 1, Link 2, Link 3 and Link 4) via four 20-bit virtual interfaces. The mapping process is illustrated below.



SMPTE ST 425-5 also defines the carriage of ancillary data such as the audio data, the audio control packets, the payload identifier and the time code.

5.1 SMPTE ST 425-5 Document Roadmap

This road map shows the relationships through SMPTE ST 425-5, its reference documents and bibliographies.

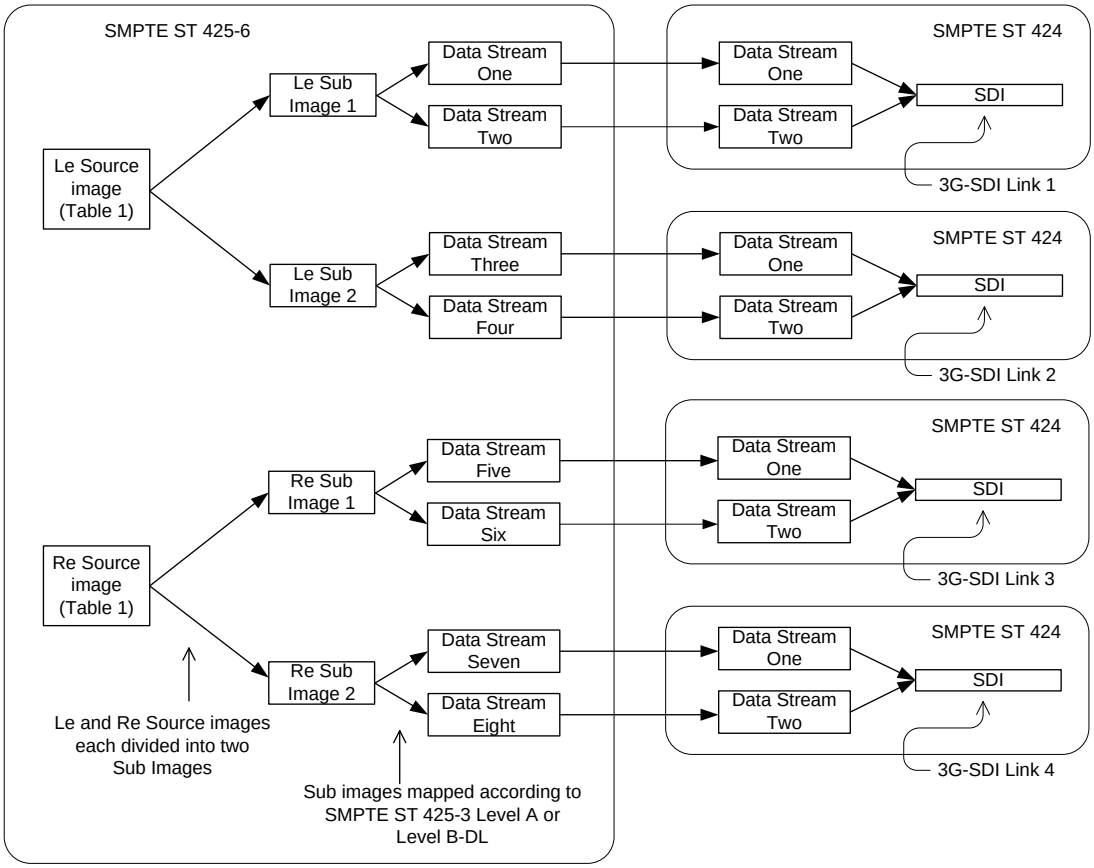


6 SMPTE ST 425-6 – Quad 3 Gb/s Serial Digital Interface for Stereoscopic Image Transport

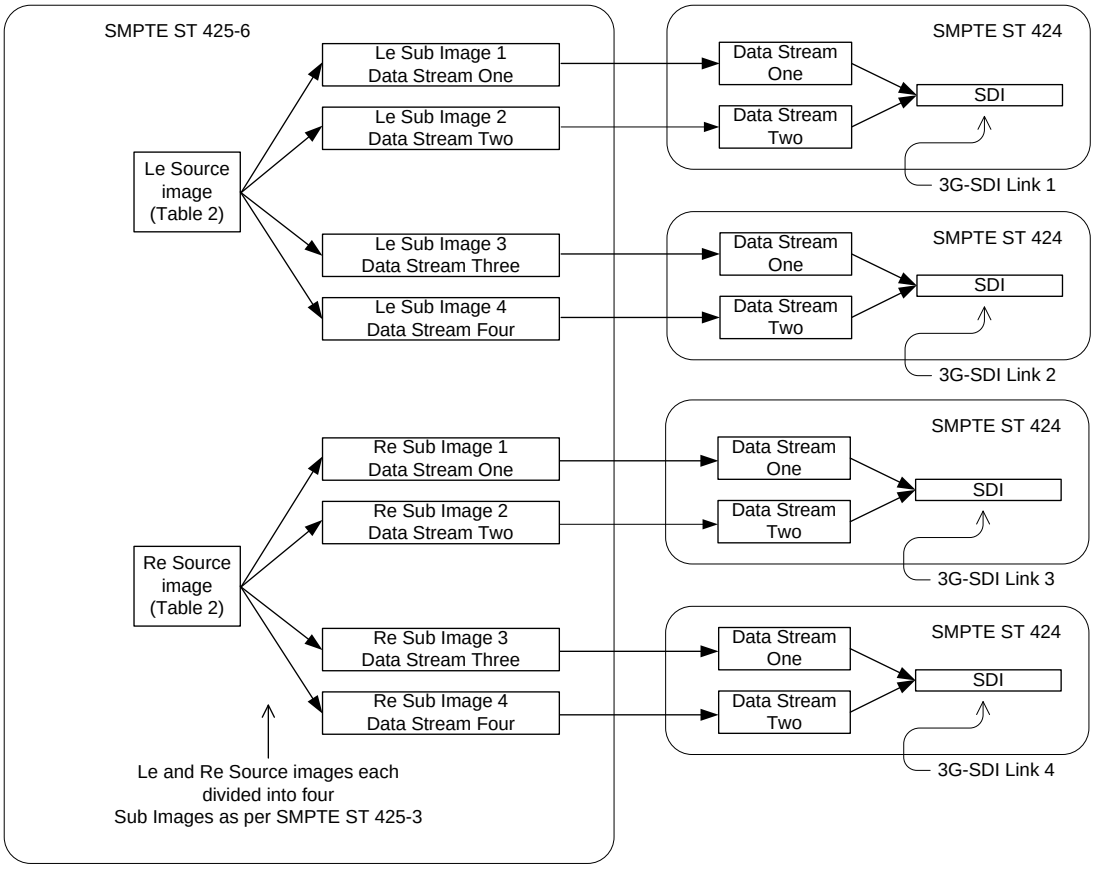
SMPTE ST 425-6 defines a means of transporting stereoscopic images (Left eye and Right eye images) using an interface consisting of pairs of four data streams based on the SMPTE ST 425-3 data structures. The Left eye images are carried on four data streams of the interface and the Right eye images are carried on the other four data streams. The Left eye and Right eye images are each mapped onto the respective four data streams in accordance with the mapping rules of SMPTE ST 425-3.

The stereoscopic image formats to be transported using this standard are the 4:2:2 and 4:4:4 image formats enumerated in SMPTE ST 425-3. Mapping structures for the video essence and ancillary data are as defined in SMPTE ST 425-3.

SMPTE ST 425-6 also defines the carriage of ancillary data such as the audio data, the audio control packets, the payload identifier and the time code.



Overview of the 1080-line Image Mapping



Overview of the 2160-line Image Mapping

6.1 SMPTE ST 425-6 Document Roadmap

This road map shows the relationships through SMPTE ST 425-6, its reference documents and bibliographies.