GDAPI – Multiple Data Streams

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REVISION HISTORY

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1. REFERENCES

[1]—*Generic Device Application Programming Interface*
Version 3.0.0

[2]—*Print Console DSI of the GDAPI*

2. INTRODUCTION

2.1 Intended Audience

This document is intended for software developers who are using the GDAPI to drive devices that require or benefit from the delivery of concurrent streams of raster data. Such devices include:

- Trendsetter News 200
- Digital Offset Press

2.2 Pre-Requisites

Please refer to [1] for complete details of the GDAPI specification and definition of terms used here. Read the introductory material in [1] before reading this document.

2.3 Overview

Some devices can receive more than one stream of raster data simultaneously. This document describes how version 3.0.0 of the GDAPI can be used by a raster source to drive such devices. The configurations shown in this document are somewhat specific to the Creo **Print Console** implementation of the GDAPI, but the 3.0.0 version of the GDAPI specification provides the basic features required.

An example of a device that requires 2 streams of raster data is the Creo Trendsetter News 200, which has two imaging heads. Raster data is delivered to an imaging head via a SCSI port and image data must be provided to each SCSI port simultaneously in order to image on both heads. **Note** that a GDAPI client simply calls GDAPI_SendImageData to deliver the image data to each head and is not aware that the Print Console implementation is delivering the data via a SCSI port. The GDAPI_SendImageData function simply delivers raster data for:

- A given print session.
- A given separation within a print session.

A separation is associated with an imaging head or stream of raster data via the DATA_STREAM_SELECTION attribute. Details are given in this document and in [1].

Version 3.0.0 of the GDAPI contains a small number of changes that allow the raster source to handle each stream of raster data in one of the following ways:

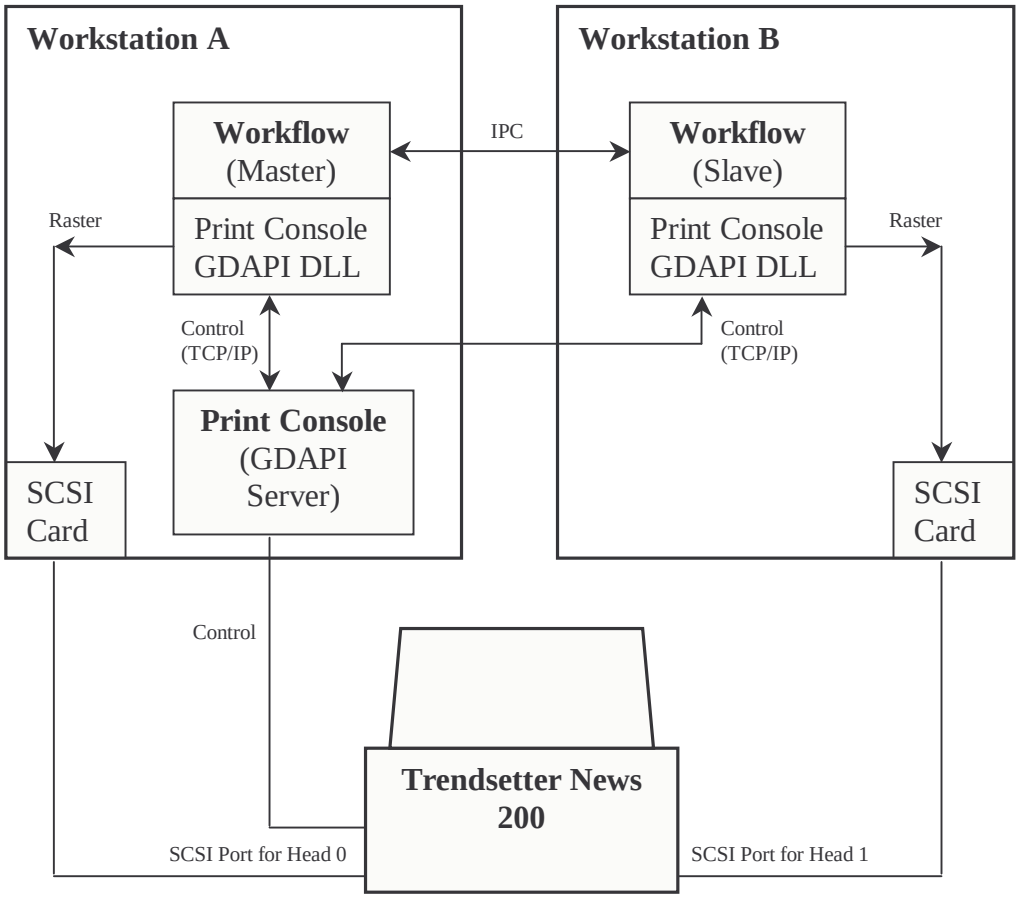
- **Recommended**
  Load an instance of the GDAPI DLL in a separate process for each concurrent

stream of raster data. The separate processes collaborate to deliver the concurrent streams of raster data for a given print session.

- Load one instance of the GDAPI DLL. This single instance will receive concurrent streams of raster data and deliver these for a given print session. It is up to the raster source to determine how the concurrent streams of raster data are delivered to the single instance of the GDAPI DLL.

2.4 Data Streams

2.5 Master and Slave Connections



This diagram shows a configuration of a master and slave GDAPI connection used to drive the Trendsetter News 200. The master and slave instances of the workflow can be on the same workstation.

The master connection will queue a print session with Print Console, tell the slave which separations within this print session will be handled by the master and which will be handled by the slave. The following sections show the sequence of events required to process a print session with this configuration.

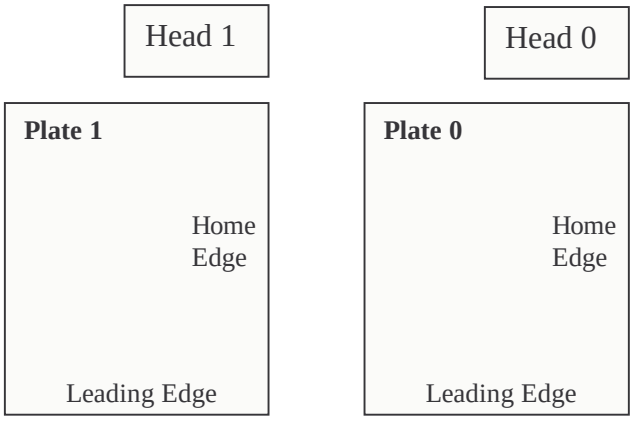
2.6 Trendsetter News 200

This device has two heads, a master imaging head and a slave imaging head. The following are some details that are relevant to a raster source. These details are current as of December 2001:

- Can you plot only to the master head? → Yes.
- Can you plot only to the slave head? → No. This will be supported later, but is more complex for the device to handle; therefore it is not supported now.
- Edge detect is performed on both the master and slave plates (when two broadsheet plates are loaded).

2.6.1 Image Offsets

Image offsets for each head on the News 200 are relative to the corner of the plate defined by the home and leading edges of the plate, this changes depending on the number of stacks loaded.



With two stacks loaded, the image offset for head 0 is relative to the leading and home edges of plate 0 and the image offset for head 1 is relative to the leading and home edges of plate 1.

With one stack loaded, the image offset for head 0 and head 1 is relative to the home and leading edge of the one plate.

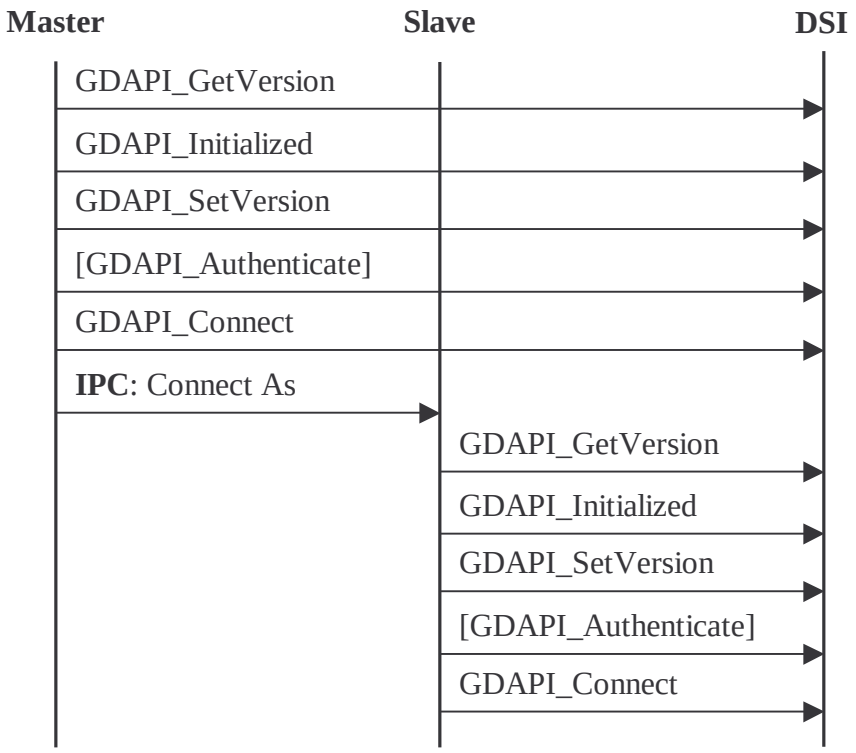
3. SCENARIOS

This section presents various scenarios to demonstrate the interaction required between master, slave and a Device Specific Implementation (DSI) of the GDAPI. Print Console is a DSI.

3.1 Startup

3.1.1 Determine Version and Connect

Optional function calls are shown in brackets [ ].



When driving multiple data streams:

- The master raster source must connect first. It will call GDAPI_Connect as follows:

```
GDAPI_Connect(
    “Name”,
    nInstance,     // the master must be instance 0
    rasterFormat );
```

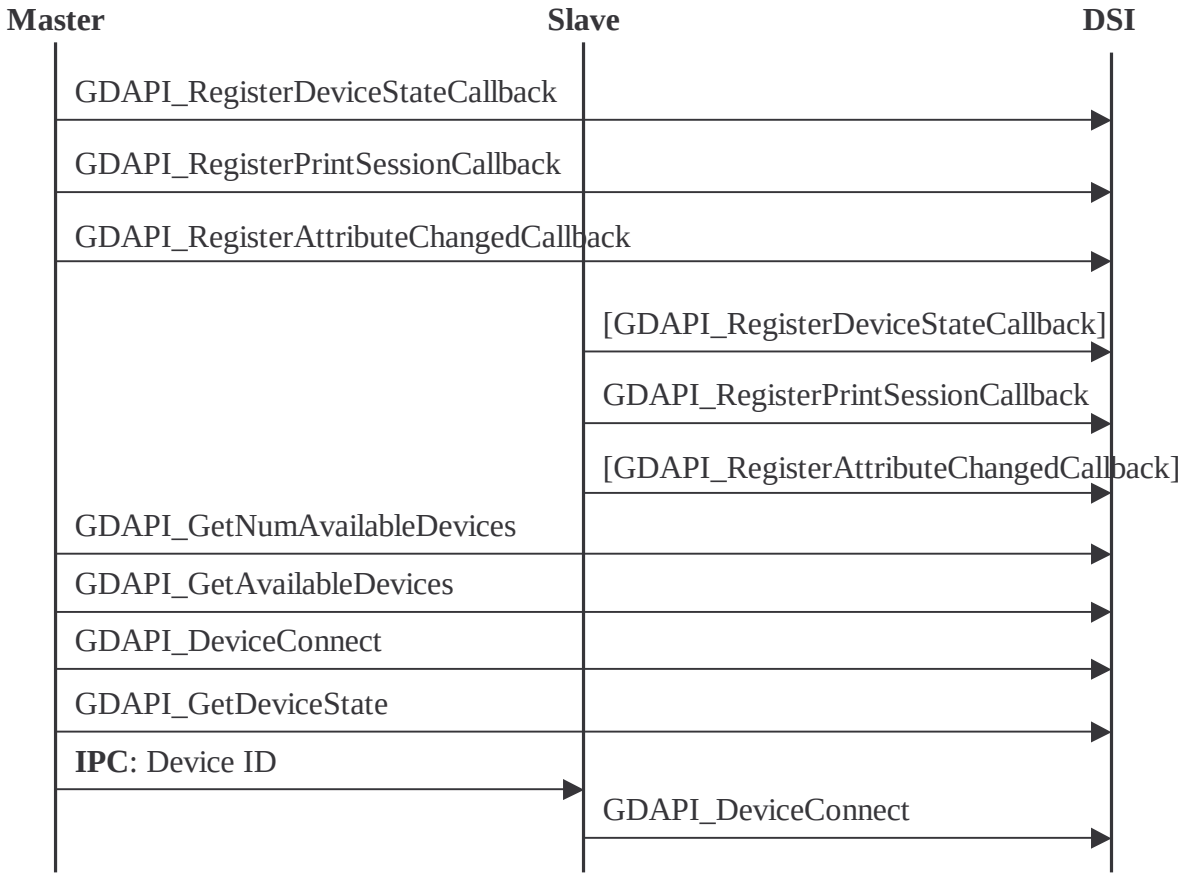
  It must then send a signal to the slave process to indicate that it is time to connect.

- The slave raster source will connect next and will call GDAPI_Connect as follows:

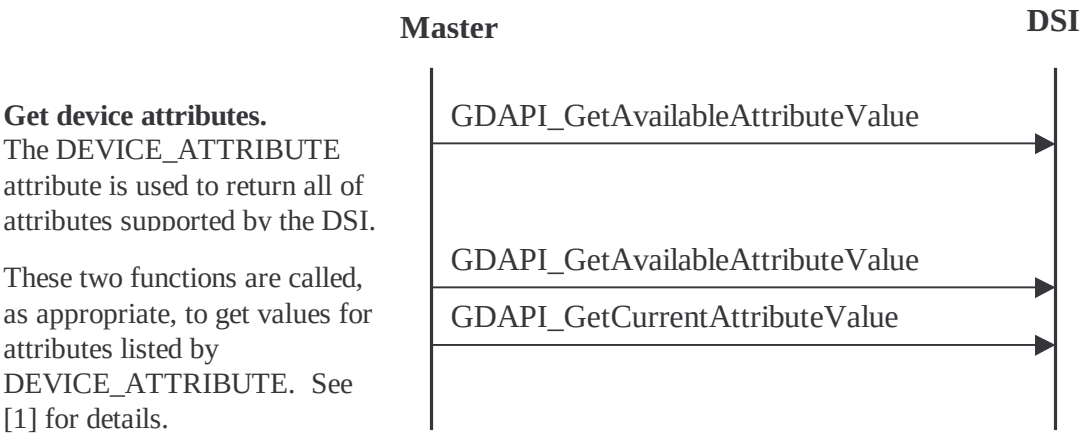
```
GDAPI_Connect(
    “Name”,         // use the same name as the master
    nInstance,      // set to 1
    rasterFormat );
```

3.1.2 Register Callbacks and Device Connection

Optional function calls are shown in brackets [ ].



3.1.3 Reading Attributes



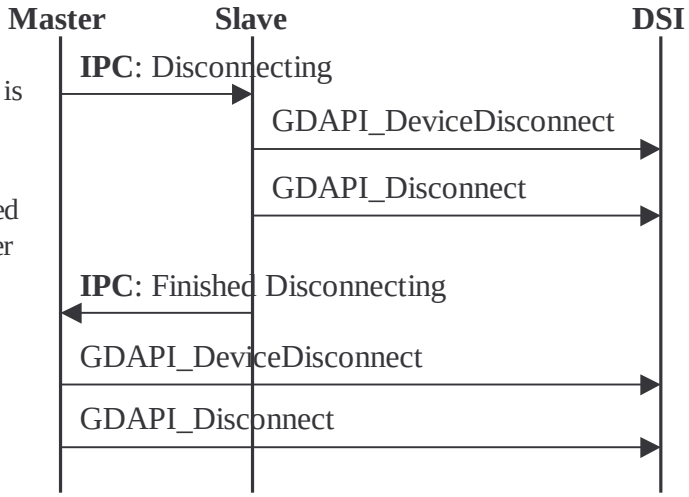
We are now ready to queue print sessions.

3.2 Device Disconnect & Raster Source Disconnect

The following calls are made to disconnect a device and the raster source:

GDAPI_DeviceDisconnect is called for *each* device previously connected.

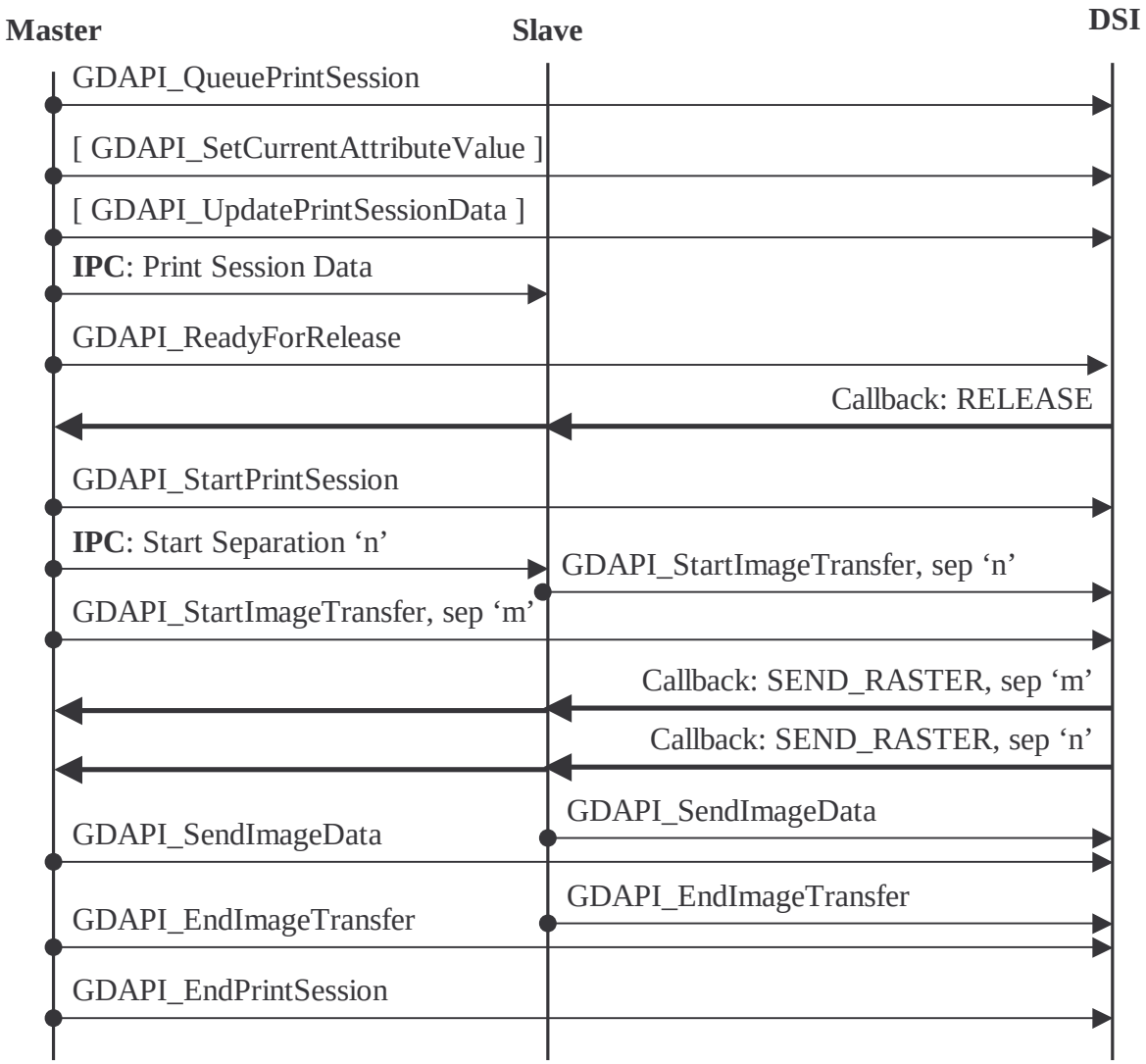
GDAPI_Disconnect is called *once* to disconnect the raster source.



Note that when the ‘master’ connection (instance 0) calls GDAPI_Disconnect that ‘slave’ connections will no longer be supported. It is recommended that slaves disconnect before the master connection.

3.3 Print Session

The following interaction occurs to queue and process a print session. Optional function calls are shown in brackets [ ].



4. ASSOCIATING SEPARATIONS AND DATA STREAMS

For some print sessions it is important to associate specific separations with specific data streams. The following sections discuss how data streams apply to the following devices:

- Trendsetter News 200
- Digital Offset Press (DOP)

4.1 Trendsetter News 200

The News 200 has 2 imaging heads, each of which can receive image data at the same time. The imaging heads are moved along the sub-scan direction on a single screw, as a result:

- One head is always ‘left of’ the other head.
- The two heads move together.

The News 200 can be loaded with a **one** stack of ‘panorama’ plates, such that each head images one half of the plate. In this case the raster source must ensure that separations are paired together correctly and associated with the correct imaging head; I.E. that a given image is ‘left of’ the image it is paired with.

The News 200 can be loaded with **two** stacks of ‘broadsheet’ plates, such that each head is associated with a single stack of plates and the image associated with a given head does not need to be coordinated.

The information provided by the DATA_STREAM attribute for the News 200 is:

- DATA_STREAM, available value, index 0:
    - DataStreamId: 0
      This ID is used to associate a separation with this data stream. This is accomplished using the DATA_STREAM_SELECTION attribute.
    - DataStreamUse: DATA_STREAM_HEAD_0.
      This status code translates to “Imaging head at home edge”.
    - MaxActiveDataStreams: 2
- DATA_STREAM, available value, index 1:

- DataStreamId: 1
  See the comments for DataStreamId given above.
- DataStreamUse: DATA_STREAM_HEAD_1.
  This status code translates to “Imaging head at away edge”.
- MaxActiveDataStreams: 2

When printing to panorama plates, a print session with 4 separations may be configured as follows:

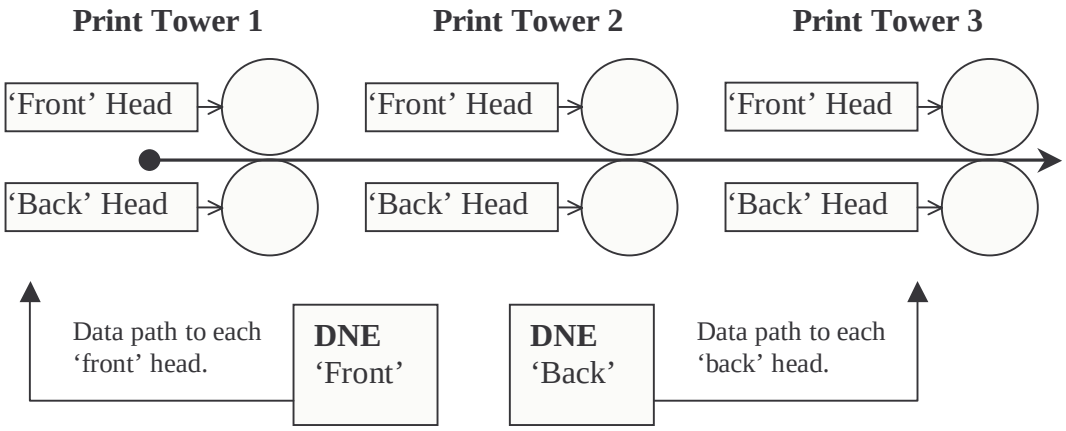
Separation	**DATA_STREAM_SELECTION**	**Comment**
0	0	Separations 0 and 1 are imaged on one plate; separation 0 is closest to the ‘home’ edge of the device.
1	1	
2	0	Separations 2 and 3 are imaged on one plate; separation 2 is closest to the ‘home’ edge of the device.
3	1	

Associating a separation with a data stream is accomplished via the DATA_STREAM_SELECTION attribute as follows, after the call to GDAPI_QueuePrintSession and before the call to GDAPI_ReadyForRelease:

```
GDAPI_SetCurrentAttributeValue(
    nDeviceId,
    nPrintSessionId,
    nSeparationId,
    ATTR_DATA_STREAM_SELECTION,
    sizeof( long ),
    (void*)&nHeadId );
```

4.2 Digital Offset Press (DOP)

The DOP has imaging heads integrated into the press. In one configuration of the DOP, each print tower has one head designated for the front of each page and a second head designated for the back of each page. This results in the following configuration:



A DNE hardware component collects data for all of the 'front' imaging heads or all of the 'back' imaging heads.

Currently each DNE receives image data sequentially before feeding data to each head simultaneously. If the DOP implementation were to support multiple data streams in its implementation of the GDAPI, and a workflow took advantage of the implementation, then the time required to load two DNE components could be cut in half.