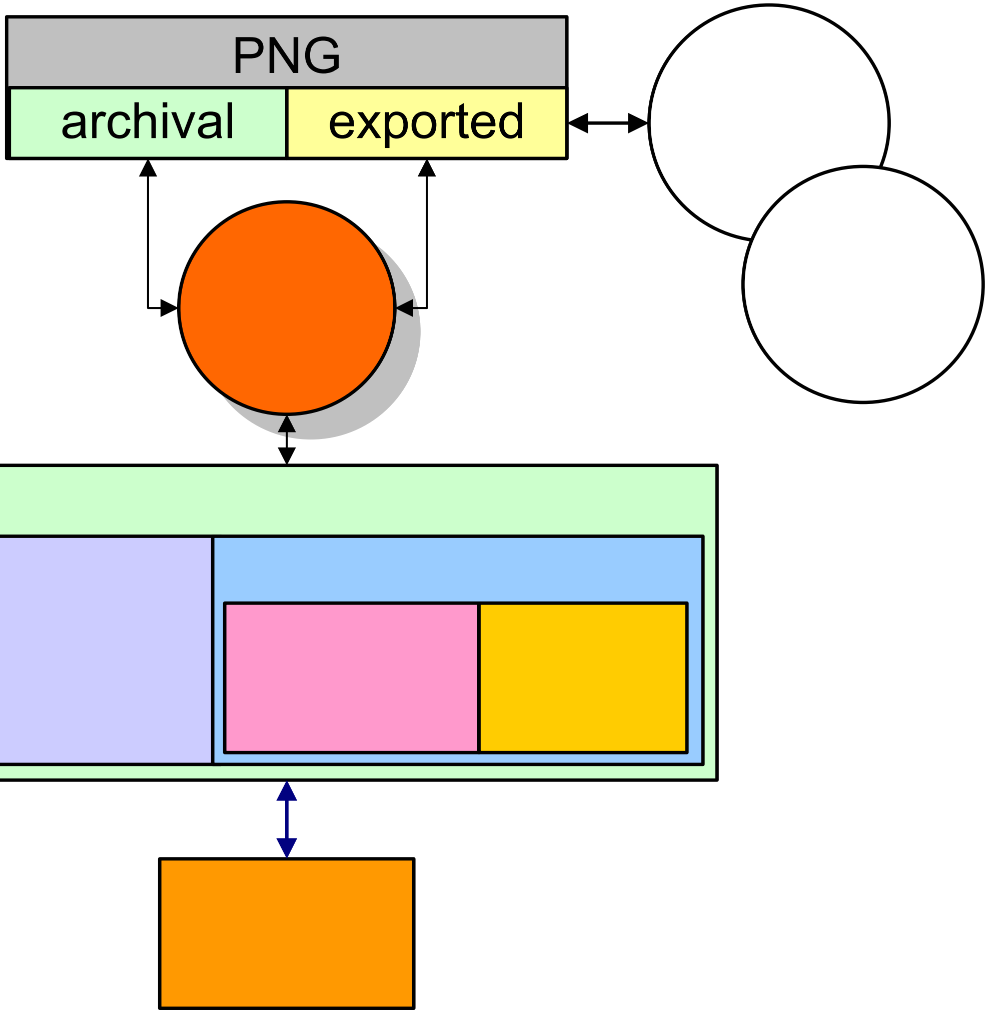
PNG for VSv3 – Tine Java IO API

- the design goal is to provide a simple and consistent interface for saving/loading of TINE IMAGE to PNG file

- two ways of writing/reading PNG files:
  - 'archival' - loading/saving of TINE IMAGE contents with exact reconstruction of image

  - 'export' saving and 'import' loading
    - exporting of image to other application,
    - initial TINE image can not be reconstructed by importing,
    - used for loading in arbitrary PNG files and construct 'best matching' TINE IMAGE.

PNG for VSv3 – Tine Java IO API



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PNG for VSv3 – Java API

- **package**: de.desy.acop.video.timageio
- **classes**:
  - **TImageIO** - a class containing static convenience methods for performing saving and loading.
  - **TImageMetadata** – a class represents metadata (non-image data) associated with TINE images
  - **TBufferedImage** – a class containing Java BufferedImage and TImageMetadata.

PNG for VSv3 – TImageIO class

- **`TImageIO`** contains the following static methods:
  - `TBufferedImage read(File input) throws IOException;`
  - `TBufferedImage read(URL input) throws IOException;`
  - `TBufferedImage read(InputStream input) throws IOException;`
  - `TBufferedImage read(ImageInputStream stream) throws IOException;`
  - `boolean write(TBufferedImage timage, File output) throws IOException;`
  - `boolean write(TBufferedImage timage, ImageOutputStream output) throws IOException;`

PNG for VSv3 – TBufferedImage class

- **TBufferedImage** contains the following constructors:

  -
    ```
    TBufferedImage(IMAGE timage);
    ```

  -
    ```
    TBufferedImage(IMAGE timage,
            TImageMetadata metadata);
    ```

  -
    ```
    TBufferedImage(BufferedImage image,
            TImageMetadata metadata);
    ```

  -
    ```
    TBufferedImage(BufferedImage image,
            PNGMetadata pngMetadata);
    ```

  -
    ```
    TBufferedImage(IMAGE timage,
            TImageMetadata metadata,
            boolean isExportMode,
            ColorMap colorMap)
    ```

PNG for VSv3 – TBufferedImage class

- **`TBufferedImage`** contains the following public methods:
  - `BufferedImage getImage();`
  - `TImageMetadata getMetadata();`
  - `IMAGE toIMAGE(boolean rejectNonArchival);`

PNG for VSv3 – TImageMetadata class

- **Consists of TINE IMAGE headers and:**
  - Optional software description
  - Optional comment
  - md5 hash of image data
  - Optional user text tags
  - Optional binary data

- **constructors:**
  - `TImageMetadata(PNGMetadata pngMetadata);`
  - `TImageMetadata(IMAGE timage);`

- **public methods:**
  - `PNGMetadata toPngMetadata()`
  - `int getPngColorType()`
  - `boolean isExportMode()`

PNG for VSv3 – Examples

```
// decode PNG file into Java Image + Metadata
TBufferedImage tbi = TImageIO.read(file);
IMAGE ti = tbi.toIMAGE(false); // converts to IMAGE

BufferedImage bi = tbi.getImage(); // image
TImageMetadata mtd = tbi.getMetadata(); // metadata

// save IMAGE in “archival” mode to PNG
TImageIO.write(new TBufferedImage(ti), file);

// save IMAGE in “export” mode to PNG
TImageMetadata mdt = new TImageMetadata(ti);
... // adjust metadata if needed
TImageIO.write(new TBufferedImage(ti, mdt, true,
  ColorMap.JET), file);
```

PNG for VSv3 – Task list

- extend API to save image sequences and image sequences with attached background image bits
- consider XMP (the Extensible Metadata Platform) instead of proprietary iTXT chunks