Check Image Ingestion

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1 Check Image Ingestion

by Bruno C. Quint

We use this notebook to check image ingestion on the Summit and at NCSA. It queries one or more exposures using Butler3 and print out the metadata.

Let's start importing Butler Gen3

[1]:
```
import lsst.daf.butler as dafButler
```

Use the following cell to tell the notebook if you are running it from the Summit (True) or from NCSA (False).

[2]:
```
summit = False
```

Now let's instanciate Butler depending on whether you are running this notebook on the Summit or not.

[3]:
```
if summit:
    butler = dafButler.Butler("/repo/LSSTComCam/")
else:
    butler = dafButler.Butler("/repo/main/")
```

Use the following cell to query your data. You only need to update the `exposure` based on the image ID.

[6]:
```
data_id = {'instrument': 'LSSTComCam', 'detector': 0, 'exposure': 2022012500001}
```

Now you can query the data and print its metadata. The next cell should print the data's header. Make sure that it has consistent target name, observatory name, coordinates, etc.

[7]:
```
raw = butler.get('raw', dataId=data_id, collections=["LSSTComCam/raw/all"])
print(raw.getMetadata())
```

```
<IPython.core.display.HTML object>

SIMPLE = 1
// file does conform to FITS standard
EXTEND = 1
// FITS dataset may contain extensions
COMMENT = [ "  FITS (Flexible Image Transport System) format is defined in
```

'Astronomy", " and Astrophysics', volume 376, page 359; bibcode:
2001A&A…376..359H", "= '   '", "---- Date, night and basic image
information ----", "= '   '", "---- Telescope info, location, observer
----", "= '   '", "---- Pointing info, etc. ----", "= '   '", "----
Image-identifying used to build OBS-ID ----", "= '   '", "---- Test Stand
information ----", "= '   '", "---- Information from Camera (Common block)
----", "= '   '", "---- Filter/grating information ----", "= '   '",
"---- Exposure-related information ----", "= '   '", "---- Header
information ----", "---- Information from Camera per sensor ----", "= '
'", "---- Geometry from Camera ----", "= '   '", "---- Checksums ----"]
ORIGIN = "LSST DM Header Service"
// FITS file originator
TIMESYS = "TAI"
// The time scale used
DATE = "2022-01-25T14:40:34.069"
// Creation Date and Time of File
DATE-OBS = "2022-01-25T14:40:53.001"
// Date of the observation (image acquisition
DATE-BEG = "2022-01-25T14:40:53.001"
// Time at the start of integration
DATE-END = "2022-01-25T14:41:08.439"
// end date of the observation
MJD = 59604.611505424
// Modified Julian Date that the file was written
MJD-OBS = 59604.611724546
// Modified Julian Date of observation
MJD-BEG = 59604.611724546
// Modified Julian Date derived from DATE-BEG
MJD-END = 59604.611903231
// Modified Julian Date derived from DATE-END
OBSID = "CC_O_20220125_000001"
// ImageName from Camera StartIntergration
GROUPID = "2022-01-25T14:40:52.807"
IMGTYPE = "OBJECT"
// BIAS, DARK, FLAT, OBJECT
BUNIT = "adu"
// Brightness units for pixel array
FACILITY = "Vera C. Rubin Observatory"
// Facility name
TELESCOP = "Simonyi Survey Telescope"
// Telescope name
INSTRUME = "ComCam"
// Instrument used to obtain these data
OBSERVER = "LSST"
// Observer name(s)
OBS-LONG = -70.749417000000
// [deg] Observatory east longitude
OBS-LAT = -30.244639000000

```
// [deg] Observatory latitude
OBS-ELEV = 2663.0000000000
// [m] Observatory elevation
OBSGEO-X = 1818938.9400000
// [m] X-axis Geocentric coordinate
OBSGEO-Y = -5208470.9500000
// [m] Y-axis Geocentric coordinate
OBSGEO-Z = -3195172.0800000
// [m] Z-axis Geocentric coordinate
RA = 312.51320916667
// RA commanded from pointing component
DEC = -39.708480277778
// DEC commanded from pointing component
RASTART = 312.51322262750
// RA of telescope from AZSTART and ELSTART
DECSTART = -39.708480298038
// DEC of telescope from AZSTART and ELSTART
RAEND = 312.51352353569
// RA of telescope from AZEND and ELEND
DECEND = -39.708480645761
// DEC of telescope from AZEND and ELEND
ROTPA = 4.9406564584125e-316
// Rotation angle relative to the sky (deg)
ROTCOORD = "sky"
// Telescope Rotation Coordinates
HASTART = -2.5772832229256
// [HH:MM:SS] Telescope hour angle at start
ELSTART = 57.234629389447
// [deg] Telescope zenith distance at start
AZSTART = 117.27475403951
// [deg] Telescope azimuth angle at start
AMSTART = 1.1887582304354
// Airmass at start
HAEND = 0.0000000000000
// [HH:MM:SS] Telescope hour angle at end
ELEND = 57.292380398907
// [deg] Telescope zenith distance at end
AZEND = 117.28318038133
// [deg] Telescope azimuth angle at end
AMEND = 0.0000000000000
// Airmass at end
TRACKSYS = "RADEC"
// Tracking system RADEC, AZEL, PLANET, EPHEM
RADESYS = "ICRS"
// Equatorial coordinate system FK5 or ICRS
FOCUSZ = 0.0000000000000
// Focus Z position
OBJECT = "HD 198190"
```

```
// Name of the observed object
CAMCODE = "CC"
// The code for the camera (AT/CC/MC)
CONTRLLR = "O"
// The controller (e.g. O for OCS, C for (A)CCS)
DAYOBS = "20220125"
// The observation day as defined by image name
SEQNUM = 1
// The sequence number from the image name
TESTTYPE = "OBJECT"
// Test Type: BIAS:DARK:FLAT:OBS:PPUMP:QE:SFLAT
EMUIMAGE = ""
// Image being emulated
TSTAND = "EOCCv2_SUM"
// The Test Stand used
IMAGETAG = "31e938c1d43f60cf"
// DAQ Image id
OBSANNOT = ""
// Observing annotation
FILTBAND = "i"
// Name of the filter band
FILTER = "i_06"
// Name of the physical filter
FILTSLOT = 1
// Filter home slot
FILTPOS = 3813.0400000000
// Filter measured position of slide
EXPTIME = 15.000000000000
// Exposure time in seconds
SHUTTIME = 15.000000000000
// Shutter exposure time in seconds
DARKTIME = 15.536943912506
// Dark time in seconds
FILENAME = "CC_O_20220125_000001.fits"
// Original file name
HEADVER = "2.9.3"
// Version of header
CCD_MANU = "ITL"
// CCD Manufacturer
CCD_TYPE = 2
// CCD Model Number
CCD_SERN = "23166"
// Manufacturers CCD Serial Number
LSST_NUM = "ITL-3800C-229"
// LSST Assigned CCD Number
SEQCKSUM = "2552520002"
// Checksum of Sequencer
SEQNAME = "FP_ITL_2s_ir2_v25.seq"
```

```
// SequenceName from Camera
REBNAME = "LCA-13574-061"
// Name of the REB
CONTNUM = "418249883"
// CCD Controller (WREB) Serial Number
TEMP_SET = -100.00000000000
// Temperature set point (deg C)
CCDTEMP = -103.95114898682
// Measured temperature (deg C)
CCDSLOT = "S00"
// Name of the CCD Slot (SXx)
RAFTBAY = "R22"
// Name of the RAFT Bay (Rnn)
OVERH = 64
// Over-scan pixels
OVERV = 48
// Vert-overscan pix
PREH = 0
// Pre-scan pixels
CHECKSUM = <Unknown>
// checksum for the current HDU
DATASUM = <Unknown>
// checksum of the data records
XTENSION = "IMAGE"
// IMAGE extension
BITPIX = 32
// number of bits per data pixel
NAXIS = 2
// number of data axes
NAXIS1 = 576
// length of data axis 1
NAXIS2 = 2048
// length of data axis 2
PCOUNT = 0
// required keyword; must = 0
GCOUNT = 1
// required keyword; must = 1
INHERIT = 1
// Inherits global header
EXTNAME = "Segment10"
DATASEC = "[1:509,1:2000]"
DETSEC = "[509:1,1:2000]"
DETSIZE = "[1:4072,1:4000]"
DTV1 = 510
// detector transformation vector
DTV2 = 0
// detector transformation vector
DTM1_1 = -1.0000000000000
```

```
// detector transformation matrix
DTM2_2 = 1.0000000000000
// detector transformation matrix
DTM1_2 = 0
// detector transformation matrix
DTM2_1 = 0
// detector transformation matrix
HIERARCH ASTRO METADATA FIX MODIFIED = 0
HIERARCH ASTRO METADATA FIX DATE = "2022-01-25T14:46:14.431049"
```

This is an alternative way to query for metadata. Right now, you might see a couple of NaN's. This is a known issue and there is work on it (DM-32298).

[8]:
```
metadata = butler.get('raw.visitInfo', dataId=data_id, collections=["LSSTComCam/
 ↪raw/all"])
print(metadata)
```

```
VisitInfo(exposureId=2022012500001000, exposureTime=15, darkTime=15.5369,
date=2022-01-25T14:41:00.719882996, UT1=nan, ERA=6.01622 rad,
boresightRaDec=(nan, +nan), boresightAzAlt=(nan, +nan), boresightAirmass=nan,
boresightRotAngle=8.62307e-318 rad, rotType=0, observatory=nanW, nanN  nan,
weather=Weather(nan, nan, nan), instrumentLabel='LSSTComCam', id=2022012500001)
```

[ ]:
```

```