Open Source Examples of Digital Asset Management and Photography Workflow

Prepared Nov 2015 For BLU [Boston Linux & UNIX]

Christoph Doerbeck
Agenda

It's not often that I get to blend my 2 personal passions (OSS & Photography)
So thank you for your interest and time today!

- Photography 101
  - From noob to professional in 20 minutes
  - Guaranteed or your money back!

- Definitions of:
  - Digital Asset Management?
  - Photography Workflow

- Stepping through the Workflow with Opensource Examples

- Some Batch Processing Examples with Digikam
- Some Detailed Post Processing Examples with Gimp
House Keeping
Who Am I

- Christoph Doerbeck
  - cdoerbec@blu.org
  - christoph@linuxsoup.com
- Currently (9+ yrs)
  - Principal Solutions Architect, Red Hat Inc.
- Previously (15+ yrs)
  - UNIX Admin
    - Ultrix, HP/UX, AIX, Linux, Solaris
    - Education, R&D, Retail, Financial
  - Instructor (corporate education)
- BLU member/contributor 12+ yrs
- BS Computer Science Engineering
My Disclaimer

Although I try pretty darn hard to research and present interesting material, I make no claim that what I report is entirely accurate. This document & presentation is intended for consumption by responsible individuals in the spirit of sharing knowledge about Linux and Open Source Software (OSS). If you wreck you system(s) and/or data based on materials discussed here, you cannot hold me, those I work for OR the bar tenders that serve me... responsible.
Background
Cross Section of a Modern Camera

- **SLR Design**
  - 1949
  - Shared light path
  - View finder sees exactly what film will capture

- **DSLR Design**
  - 1991 by Kodak
  - Replaced film with CCD
  - Otherwise, pretty much the same design

- **Development of Digital imaging began circa 1969**

Simplified View of a Modern Camera

- Aperture Blades
- Pentaprism
- Viewfinder
- Sensor
- Shutter

ISO
- 50
- 100
- 200
- 400
- 800
- 1600
- 3200

- 1" - 1/2 - 1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250
<table>
<thead>
<tr>
<th>Net Effect</th>
<th>Shutter Speeds</th>
<th>F-Stops</th>
<th>ISO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 sec</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>More Light</td>
<td>1/2</td>
<td>2.0</td>
<td>3200</td>
</tr>
<tr>
<td></td>
<td>1/4</td>
<td>2.8</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td>1/8</td>
<td>4.0</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>1/15</td>
<td>5.6</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>1/30</td>
<td>8</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>1/60</td>
<td>11</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>1/125</td>
<td>16</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>1/250</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Less Light</td>
<td>1/500</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/1000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Shutter Speeds, F-Stops, ISOs**

Whole Stops

[Boston Linux & UNIX || http://www.blu.org]
The Science of Photography

- Photography is the science of capturing light
  - If the sensor is like a sponge, it needs X amount of light (water) to soak
    - Too little X and image is under exposed
    - Too much X and image is over exposed (blown out)
  - Modern Cameras have a built in meter which measures reflected light
    - If you want 100% accuracy, get a meter and measure the "incident light"

- We judge a capture by it's "Image Quality" (IQ)
  - sharpness
  - dynamic range (DR) = color depth, color accuracy, contrast
  - noise
  - other lens induced factors: CA, Glare, Distortion, Bokeh, etc...
The Art of Photography

- Photography is the art of capturing and evoking emotion
  - Composition: Geometry/Lines, Framing, Mergers
  - Perspective
  - Lighting
  - Negative Space
  - Tension
  - Motion and Panning
  - Specialty Cameras, Lenses & Tools
    - ex: CZ, Leica, Rolleiflex, Hasselblad, Large Format, Film vs. Digital
- We judge a capture by ????
  - some things work, some don't
  - it's up for interpretation, it's art after all...
Pro's & Con's of the Big 3
For the purposes of today, I'm calling A/S/ISO the Big 3

• I'm not trying to be absolute, but generally speaking:
  – Aperture
    • Open = decreased DOF (depth of field / blurry background)
    • Closed = increased DOF
    • *Ex: portraits, nice blurry/soft background is pleasant. Which one do you pick?*
  – Shutter Speed
    • Slow = increased DR, decreased noise, blurry results from shake or motion.
    • Fast = decreased DR, increased noise, less blur from camera shake
    • *Ex: sports, you want moving players to look sharp. Which one do you pick?*
  – ISO
    • Slow = needs more light, increased IQ
    • Fast = needs less light, reduced IQ
    • *Ex: museum, no flash allowed. Which one do you pick?*
Last Thoughts

• If you select Auto mode:
  – Camera is trying to balance the Big 3 all by itself

• If you select an Assisted Auto mode:
  – Portrait mode: open aperture, face detection, focus on eye's, subject lock
  – Landscape mode: closed aperture, most focus points, HDR?

• If you put the camera in a "Priority Mode"
  – You pick 1 of the Big 3, camera counter balances with the other 2

• What about full Manual Mode?
  – You do all 3 settings, period. You get EXACTLY what you command.

• Auto Focus is not perfect. What are you aiming at?

• Other random thoughts
  – White Balance, RAW vs. JPEG, AEL, Exposure Compensation +/−
Digital Asset Management

  - photos, music, videos, podcasts, etc...

- DigiKAM does most of this very well
  - Similar to industry tools like Lightroom

- Darktable
  - [http://www.darktable.org/](http://www.darktable.org/)
  - another OSS workflow tool

- Plenty of live examples of DigiKam coming up...
Photography Workflow

• **General Consensus is:**
  
  (1) Camera Setup and Image Capture
  
  (2) Image off-load and storage
  
  (3) Digital Asset Management
    - Organizing, sorting, tagging images
    - Post-processing images
    - Exporting images
  
  (4) Backing up images
  
  (5) Printing or publishing images to the web
1. Camera Setup and Image Capture

- We have mostly covered this topic during the background

- Quick Discussion on RAW
  - Vendor Proprietary Formats
  - Adobe reverse engineered RAW formats and enable conversion to open standard
  - Adobe Lightroom was a game changing product
  - Sony ARW format requires newer flavors of Linux (I think!)
  - Shooting in RAW gives you 2 F-Stops of freedom to correct things in post

- Quick Discussion on RAW
  - Color space choices
  - Noise Reduction
  - HDR
  - Plenty more options to consider
2. Image off-load and storage

• Rapid Photo Downloader
  – Customize file & folder names with XIF fields
  – Automatic Backups
  – It's FAST!

• DigiKam
  – no personal experience
  – similar functionality
  – renaming rules not as robust?
3. Digital Asset Management Tasks

• All DigiKam for me at this point

• Let's go live and see examples of:
  • Organization
  • Sorting
  • Tagging
  • Post Processing
    • Internally with Editor, LightTable, and Batch Queue
    • Externally with Gimp
  • Exporting
    • ???
4. Asset Back Ups

• My Current Architecture
  – Server in basement with 3x 3TB drives, LVM RAID-1 (mirror)
  – Full photo pool (2002-2015) in single namespace/filesystem
  – Laptop has photos from 2015
  – periodic rsync
  – yes I've lost photos be being negligent

• Future Architecture
  – Server in basement with 3x 3TB drives with Gluster
  – Full photo pool in single namespace/filesystem
  – Laptop retains photos of current year
  – Photos immediately stored/backed-up to Gluster with OwnCloud
  – Gluster replicates to cloud (ex: AWS)
Stepping Through a Photography Workflow
Final Words
Thank You!