

Born-Digital Media **Request** Workflow

Request	1
Acquisition	1
Research and Testing	1
Forensic Capture & Preservation	2
Forensic Capture	2
Staging	2
Photograph Media (varies)	3
Forensic Processing	4
Data Transfer & Storage	5

Request

1. Research contacts Lab staff with request. Request form link: <https://confluence.arizona.edu/x/lw0sBQ>.
2. Lab staff reviews requests and discusses any further information needed with researchers.
3. Transfers media from owner/original location to Digital Preservation Lab.

Acquisition

1. Place media in appropriate holding location.
2. Inventory media individually and place the descriptive information for each item in the [Born Digital Requests Tracking spreadsheet](#).

Research and Testing

1. Identify media type, format, if not already identified, as well as necessary workflow. If workflow exists for media, proceed to **Forensic Capture & Preservation**. If not, proceed to Step 2.
2. Identify original use of data on media
3. Research and document media/format-specific workflow and identify further peripherals/equipment needed for preservation
4. Acquire necessary peripherals, software, and equipment if necessary
5. Test software and hardware with test media

6. Generate proof-of-concept with test media if possible and necessary accompanying documentation
7. Based on identified workflow, formalize and optimize workflow

Forensic Capture & Preservation

Forensic Capture

Magnetic Disk

Floppy Disks (3.5", 5.25", 8", Zip)

Hard Disk Drives

Jaz disk

Optical Media

CD-ROM, WORM (CD-R), CD-RW, DVD, Blu-Ray

Memory Storage Devices

Flash Storage

Flash Drive

Solid State Disk Drive

Memory Card

Staging

1. Open up the Born-Digital Tracking sheet and check that corresponding media identifier and metadata has been inputted.
2. Per accession/media object, create a staging folder where you will be placing data temporarily while you process it. Name and structure it as below:

Example:

/azu_LastNameofResearcher_AbbreviationofWrittenTitleonMedia_BD001/

/azu_Hailley_GISPaper20_BD001

----/preservation

----/metadata

----/access

----/photo

3. If the media is a part of a collection with additional born-digital media for forensic processing, create an overarching staging folder:

/azu_LastNameofResearcher_DateofRequest

/azu_Hailley_GISPaper20_20190405

----/azu_Hailley_GISPaper20_BD001/

Photograph Media (varies)

- Prepare the photographing station.
- Place the media you are photographing in the middle of the copy stand base.
- Turn on and direct lights at a 45 degree angle towards the media, but not so directly that the reflection of the light is strong.
- Turn the camera on. The camera should be at a set height (XX) for most small removable media and will only show the copy stand base + media object. For larger objects (like laptops), adjust the camera height to XX.
- Photograph the front and back sides of the media.
- Photograph the front and back sides of the storage case for the media.
 - This is especially important if the case contains relevant writing or a barcode. (However, both the media and its case should have a unique ID handwritten on them).
 - Take three sets of 4 photos that are set to varying exposures:
 - To set the exposure, turn the camera on.
 - Make sure that the camera is set to M, for manual exposure settings
 - Then, click the button with the +/- signs that is situated on the right hand side of the camera.
 - Take photos of the front and back of the media at exposures 1/30, 1/60, and 1/100.
 - You can also use the timer function to help prevent blurry photos, especially with optical disks. This function is opposite the exposure function mentioned above.
- Upload images to the computer using the camera cable.
- Select the photos with the most similar lighting of the highest quality. Move them into the appropriate staging folder and delete all the photos on the camera before unmounting.
- Rename the photos with the barcode underscore and description of the image.
- Some descriptions you can use are:
 - MediaFront
 - MediaBack
 - CaseFront
 - CaseBack
 - Notes01
- An example for an optical disk would “azu_ms516_MediaFront”
- Save the photographs you have taken of the media in the barcoded folder for the disk image. These will later be dragged into the metadata folder that Brunnhilde generates.

Forensic Processing

Virus Check, PII/Sensitive Data Scan, Reporting, Checksums

Staff:

A. Running full Brunnhilde scan (DFXML, Virus Scan, Bulk_extractor, checksums)

(Primary/Ideal Scenario)

1. Open Linux terminal
2. Enter the following command:

```
brunnhilde.py --load_assets '/home/bcadmin/Desktop/Forensics and Reporting/LOAD_ASSETS' -w -b -d <Disk image or directory of files path> <path of location to generate metadata files> brunn_out
```

 1. For directories, omit the option “-d”
 2. The location to generate files should be the metadata file created earlier for the collection
 3. Brunnhilde.py can take a long time to process, depending on the size of the image being scanned

B. Manually extract files for scans

In some cases, Brunnhilde is not able to extract files from an image directly (and will report an error when you attempt to do so). In this situation, follow this alternate set of steps:

1. Open Bitcurator Disk Image Access
2. Click “Open Disk Image”
3. Select the location of the disk image (should be in the preservation folder). The program will begin to scan the file and generate DFXML.
4. Click “Select All” and then click “Export Selection” Choose the Access folder to export these files too
 - a. This might take some time, depending on the size of the image. For very large images (500 GB +), consider running overnight.
5. Navigate to /home/.bcfa
 - a. If you cannot see this folder, make sure to make hidden files visible. To do this, click the menu (three horizontal lines) next to the min/max/close buttons. There should be a check box for making hidden files visible. Check it.
6. Copy the DFXML file in this folder for the image you just extracted to the Metadata folder.
7. Continue with the Steps from Part A and scan the directory of extracted files, rather than the disk image.

C. If Neither A or B are successful (unable to extract files with either disk image access tools or brunnhilde), use FTK

1. Open FTK

2. Right click in the cases field and select “new”
3. Fill out a case name using the media identifier for the item. Click OK.
4. Once the case is created, it will prompt you to add evidence. Select “Acquired Image(s)” and select the disk image for the item.
5. You have two options for extracting the files.
 - a. Right click on the disk image in the evidence tree and select “mount image to drive.” This will mount the image to a virtual drive on the PC, which you can then copy/paste the files from.
 - b. Select all of the files from the file list, and then right click and select “export”

Data Transfer & Storage

Staff: (Currently Manual, plans to Automate)

1. Create temporary local backup on local storage (drobo)
2. Transfer completed object to born-digital/sc-appraisal (for special collections)
 - a . Digital Objects Must be reviewed within three years from the date of deposit
3. Once objects are appraised, objects must be deposited into storage. Email lbry-preservation@email.arizona.edu to request transfer to long-term storage.