

areaDetector at Diamond

**Reporting use and recent developments at DLS
EPICS/areaDetector developers meeting
APS, June 2018**

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areaDetectors at DLS

- **GigE cameras using aravisGigE**
- **Pilatus**
- **Eiger**
- **PCO**
- **Andor**
- **XMAP**
- **electronAnalysers**
- **dtaq ADCs**

DLS in-house developments and collaborations

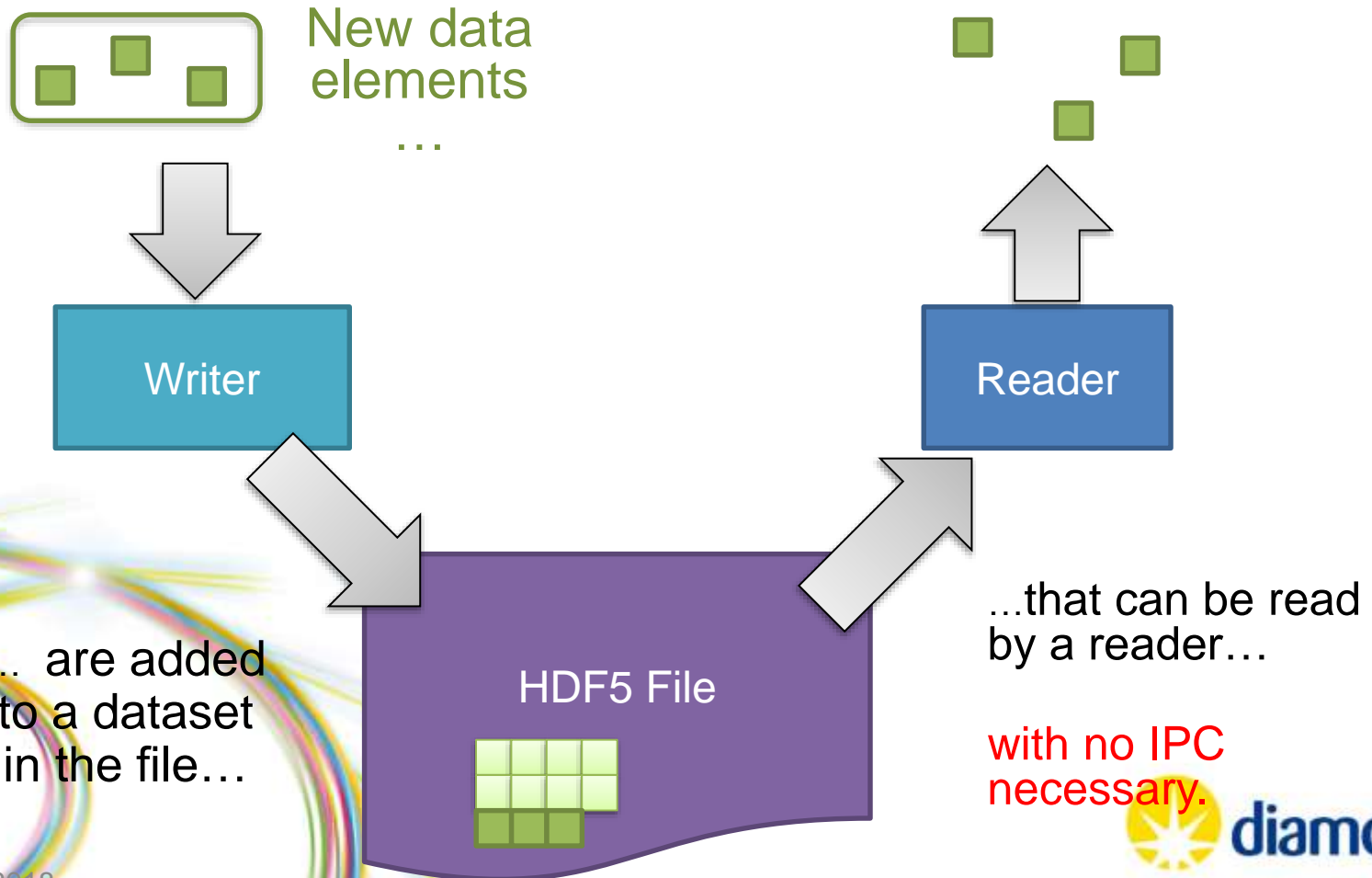
- **Excalibur**
- **Percival**
- **Merlin**
- **Xspress**
- **PanDaBox**
 - Not really an areaDetector but with an areaDetector driver!

DLS Environment

- **RHEL6**
 - EPICS Base R3.14.12.3
 - areaDetector 1-9 (!)
 - But it just works...
 - ADCore
 - 2-2, 2-3, 2-4, 2-6
- **RHEL7 (transitioning)**
 - EPICS Base R3.14.12.7
 - .. Followed by EPICS 7
 - ADCore 2-6
 - .. Followed by 3-x

HDF5 SWMR

- **Single Writer Multiple Reader**
- **Process data while it is being written to file**



areaDetector NDFileHDF5

- **Now with SWMR support**
 - Only available with HDF5 \geq 1.10
 - Optional enable/disable
 - SWMR only works on POSIX file systems – not NFS/Samba/CIFS
- **Multiple dimensions in addition to the 2+1D**
 - Arrange data by scan dimension

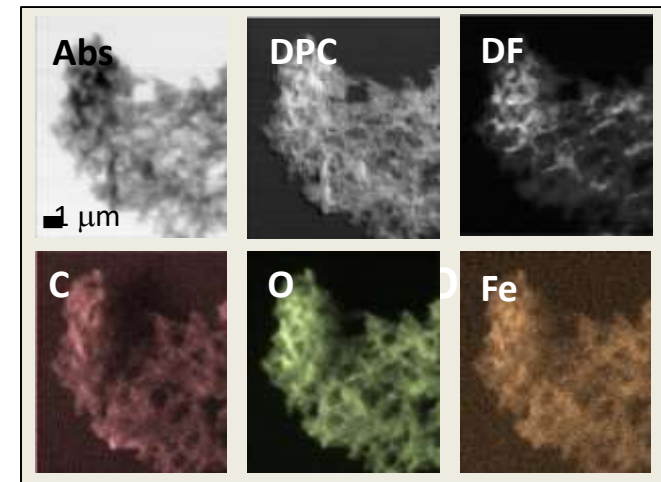
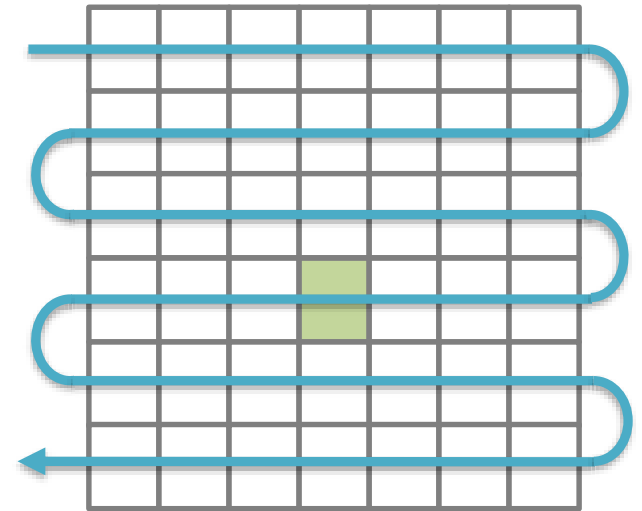
```
SWMR Support
SWMR supported Supported
SWMR mode Off Off
SWMR active Off
SWMR callbacks 0

More
```

Mapping Project

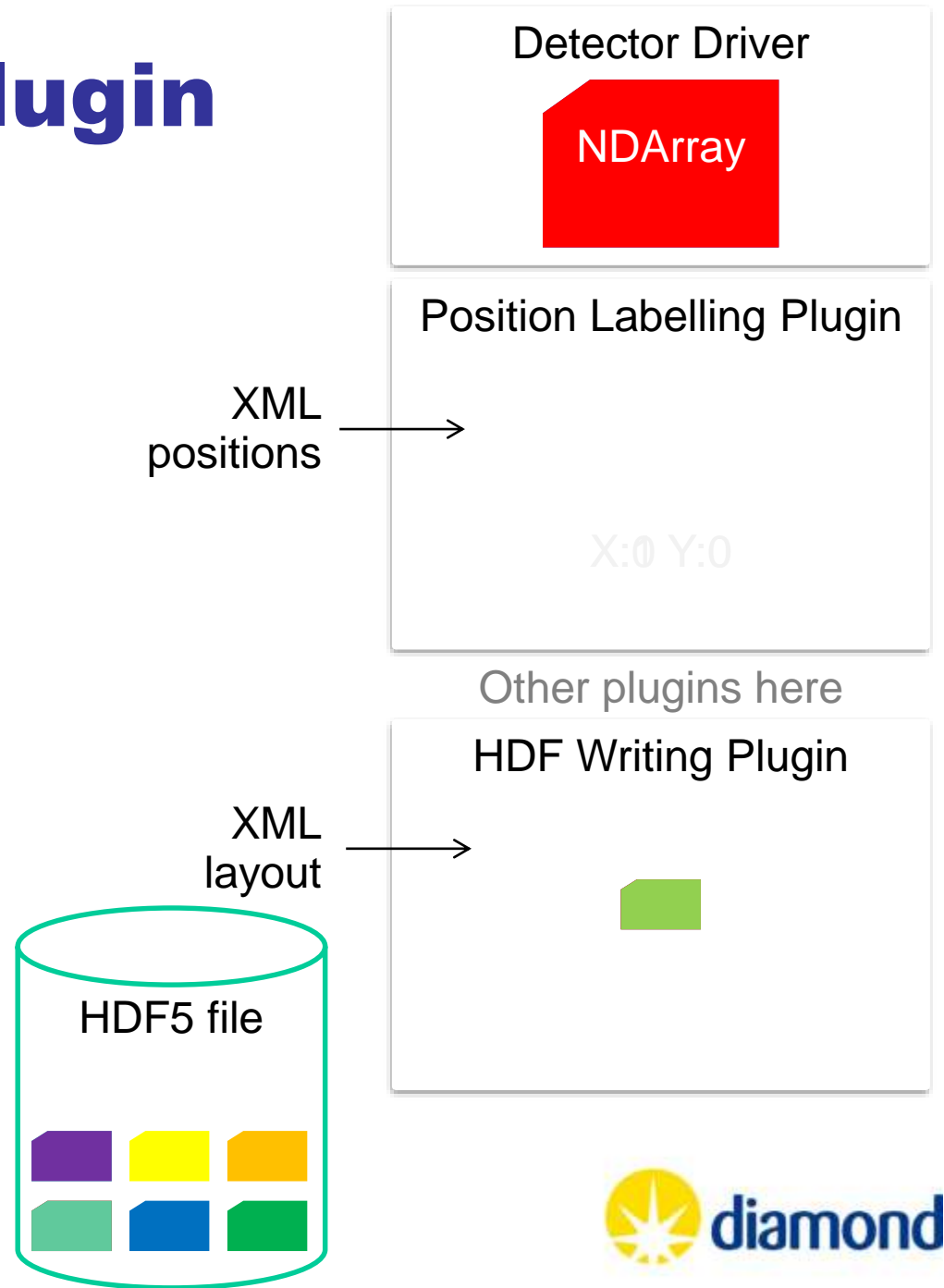
- **Basic ‘mapping’ is simple: 2D raster-scan**
- **Add multiple dimensions**
- **Non-linear scans**

- **Performance using hardware triggers**
 - Continuous scans
 - Zebra or Panda
- **Live viewing through HDF5 files**
 - Images, spectra
- **Live processing of HDF5 files**
 - Pipelines triggered on scan start



Position Plugin

- Snake scan
- Write data in snake pattern
- Leave gaps for dropped frames
- Rewind and overwrite data
- Monitor HDF5 for live updates



Future

- Even faster detectors...
- Increased use of beamtime == larger datasets
- Compression?
 - Blosc filter already on HDF5 file writer (Xiaoqiang Wang, PSI)
 - NDAarray support for compressed frames?
- New ways of storing and processing?
 - Object Storage – S3 File Writer plugin?
 - Streaming to in-house or external cloud?