GenICam Austin Meeting Minutes – 2018-09-17/18

1. Welcome (Stefanie Breyer, National Instruments)

2. Agenda Review (Fritz Dierks, Basler)

3. Homework Status/Voting Members (Fritz Dierks, Basler)
   - Active Silicon – GenICam website
   - Allied Vision – GenTL Validation Framework, Embedded
   - AVAL DATA – Multiple Language Support
   - Basler – GenICam 3.1, GenDC, Embedded, Ticket cleanup, VS 2017 support
   - Baumer – CLProtocol 1.2, GenTL Producer Framework
   - MathWorks – GenICam 3.1
   - MATRIX VISION – GenICam 3.1, PFNC
   - Matrox – SFNC 2.4, GenDC
   - MVTec – GenICam 3.1, GenDC, Administration, GenTL SFNC proposal
   - NI – GenDC, Meeting host, cmake
   - SICK – GenDC
   - Silicon Software – Processing Results
   - STEMMER IMAGING – GenDC, Modular Logging, GenCP 1.3
   - Teledyne DALSA – GenDC, GenApi headers
   - Toshiba TELI – GenApi/GenTL Python bindings

4. GenApi (Hartmut Nebelung, Basler)
   - #1955: Cleanup Ticket System
     - Closed many tickets that were untouched for a long time
   - #1975: Error handling in FileProtocolAdapter
     - -> new homework package
   - #1979: FWUpdate issues (since v1.0 release)
     - Break backwards compatibility? -> Yes, change it for GenICam 3.2
   - Working on GenICam 3.2 reference implementation
     - Use VS 2017 compiler for Windows
     - Updating Linux compilers
     - Merging several development branches (currently, there are about 16 branches)
       - Ask for status about open branches via mailing list
   - Visual Studio 2017 (Fritz Dierks, Basler)
     - Studio Version != Toolset Version
     - Proposal: Use Toolset value instead of Studio value for DLL naming, e.g.,
       `<GenICamLibrary>_VC141.dll`
     - Also: Change build directory names
   - Python bindings (Kazunari Kudo, Toshiba Teli)
     - Bug fixes and proof of stability
• GenTL Python Consumer ("Harvester")
• Distribution via Wheel
• Idea: Packaging as genicam2 modules via Wheel
  ➢ E.g., “from genicam2.genapi import NodeMap”
  ➢ Also: “genicam2.gentl”
• Building these packages as part of the GenICam build process?!
• Proposal: Include Python bindings in GenICam runtime packages, and in sync
  with distribution via Wheel
• Platform maintainers should build the bindings as part of build processes

• Miscellaneous (Christoph Zier, MVTec)
  • Include GenApi doxygen-based documentation in GenApi runtime package?
    ➢ New homework ticket
  • .NET Wrapper?
    ➢ Conclusion: GenApi .NET seems not to be important (anymore), in
      particular compared to Python
    ➢ ToDo: Clean up outdated code fragments in repository (possible
      homework ticket)

• Release CLProtocol v1.2 (Christoph Zierl, MVTec)
  • Ballot nearly finished (10x ACCEPTED, 6x ABSTAINS, 2 still missing)
  • Go through RC2 with 5 final clarifications/fixes
  • Vote: ACCEPTED, including the 2 missing ones, with 5x ABSTAINS

• GenApi C++ language feature compliance (Chris Koelling, National Instruments)
  • CMake and GCC
  • Google’s cpplint
    ➢ Opens a path for enforcing a common coding convention in GenICam

• GenApi Device Validation (Eric Bourbonnais, Teledyne DALSA)
  • MV TL standards are developing their own GenICam validation
  • Idea: Provide some code that can be integrated to the validation tool
    of the adopter standard
  • GenICam must make a claim that a device MUST pass the GenApi Validation
  • Conclusion: Interesting idea, more discussion needed

• Modular logging (Christopher Hartmann, STEMMER IMAGING)
  • Customizable logging output
  • Keep log4cpp or use custom logger
  • Mainly more tests and feedback is needed
  • Idea is to include it into GenICam 3.2 release (hopefully)

• Multi-Language support (Masahide Matsubara, AVAL DATA)
  • Idea: Separate resource files with localized texts for Name and Tooltip
  • Zip file includes XML and additional res files
  • Merging is done on the fly within GenApi after xml file loading
  • Conclusion: Yes, to be continued!

5. GenICam for Embedded (Fritz Dierks, Basler & Thomas Lück, Allied Vision)
• New EMVA standard dealing with Embedded Transport Layers
  • Chair: Thomas Lück, Allied Vision
  • Vice-chairs: Miho Akahide, SONY & Werner Feith, Euresys
- Working group: Adimec, Allied, Basler, Baumer, Euresys, Framos, SONY
- Idea: Use GenTL as standard interface
  - Promote using GenICam in embedded systems
  - Embedded cameras shall provide a GenTL Producer
  - V4L2 binding for GenICam
  - Map SFNC to V4L2 standard features
- Motivation: Transition from PC-based to Embedded Systems

- Challenges:
  - No standardized HW/TL
  - Firmware moves to host
  - Which camera API to use?
    - Linux classic approach: V4L2, dma_buf, gstreamer
    - Vendor specific approaches: NVIDIA libargus, Google HAL3 ...
    - Standards for MV: (OpenKCam), GenICam (!)
  - Need to promote GenICam to big Embedded players!
  - Zero Copy using dma_buf (GenTL manages buffer handles only)
  - Add GenTL to V4L2 converter to GenICam reference implementation

- MIPI CSI-2 D-PHY vs. SLVS-EC
  - MIPI CSI-2 D-PHY is currently used, but
  - SLVS-EC is the new trend
- ISP functions could be on camera or/and embedded host
- Next standard meeting here during IVSM Austin meeting on Sept 20th.
- Further roadmap
  - White paper planned for early 2019
  - First RC in 2020
  - Need for a GenICam sub group to force/support Embedded? Yes.

6. **GenTL (Rupert Stelz, STEMMER IMAGING)**
   - GenTL Validation Framework (Tom Kirchner, Allied Vision)
     - Bugfixes
     - GenTL Validation Framework now separate GenICam module
   - GenTL Producer Framework (Roman Moie, MVTec)
     - Several bugs and features since release of v1.0 in September 2017
     - New tickets, ready to be merged into SVN
       - Add support to hook on interface open/close in client code
       - Introduce GenTL Core mode allowing direct stream control by stream engine itself
       - Revise producer init/cleanup procedure
       - Added persistence support
     - Further open tickets
       - Deprecate TLSimu and port it to the producer framework
       - Implement a common one-click build for GenTL PF and GenApi
       - Write GenTL PF tests for stream and buffer modules
   - GenTL Validation Framework now separate GenICam module
   - Prepare release candidate and ask for feedback for some weeks
- Flows (Rupert Stelz, STEMMER IMAGING)
• Flow is transferred to a single (sub)buffer
• Flowset consists of certain flows (synchronized)
• Flows are transported via a stream
• Flow information should be available in the TL bootstrap
• New functions DSAnnounceFlowSet and DSAllocAndAnnounceFlowSet
• Buffer info provides FlowsetHandle instead of BufferHandle
• New payload format for GenDC
• Stream will carry flowsets instead of buffers
• Only flowsets can be revoked, not flows
• Early processing

7. GenTL SFNC (Mattias Johannesson, SICK)
• Already agreed proposals
  • Clarify events
  • PacketSize renegotiation
• Feature persistence
  • Issue: GenApi persistence algorithm use DeviceFeaturePersistenceStart/Stop
  • Proposal: Use generic “FeaturePersistenceStart/Stop” features instead
  • Change GenApi reference implementation to try generic one first? Yes.
• Release of GenTL SFNC 1.2 planned after next GenTL/GenDC releases

8. GenCP (Rupert Stelz, STEMMER IMAGING)
• GenCP 1.3 draft including stacked read/write commands and acknowledges
  • READMEM_STACKED CMD/ACK
  • WRITEMEM_STACKED CMD/ACK
• Clarification about the meaning of existing Device Version register
  • Conclusion: Introduce new register “Manufacturer Device Version” instead with well-defined meaning
• Release of GenCP 1.3 planned for around November 2018
• Further ideas:
  • Command queues
  • “Functions”

9. GenDC (Stephane Maurice, Matrox Imaging)
• Status: GenDC draft v0.92
  • Prefetch descriptor vs. preliminary descriptor vs. final descriptor
  • Introduced requirements (absolute & conditional)
• Go through open issues in the draft and vote on controversial issues:
  • Remove all the prefixes from the headers fields (even for the Part header)
  • Remove ContinuousContent flag in Container Header Description
  • Keep ComponentInvalid flag in Container Header Description
  • Remove the limitation of the possible use cases to Bayer only for the Variable fields -> Format flag
Voted that no GroupType will be defined and that this field stay there but will be reserved for future use.

- Remove GroupType, but keep GroupId in Component Header Description
- Require SFNC predefined values for the known Component types that will be always used by the transmitter
- Need PFNC predefined values represent known data types that are not Pixels or coordinates. Ex: Data8, Data8s, Data16, ...Data32f
- New chapter describing the Flow mechanism usage in relation with the GenDC Container was added
- New header format for the Flow table with full 8 bit version
- Need to create a ticket to discuss GenDC-related SFNC features in detail and finalize the text

- Next steps:
  - Prepare RC and start voting process
  - Release planned until end of year 2018

10. PFNC (Uwe Hagmaier, MATRIX VISION)
- Current status
  - New version 2.2 released with semiplanar pixel format
  - New pixel formats requested
    - 4x Semiplanar
    - Still open, waiting for feedback of TL standard chairs
- Request for new Pixel formats regarding the new polarized image sensors
  - Presentation from Allied Vision (Thomas Lück)
    - Continue with self-speaking pixel formats? Or go for more non-self-speaking, simple pixel formats
    - Conclusion: Defer pixel format request, start working group

11. SFNC (Stephane Maurice, Matrox Imaging)
- SFNC 2.4 released on 2018/6/22
- GenDC related features
  - Add value “GenDC” for TestPayloadFormatMode
  - ComponentIdValue predefined value for all known component types
  - SFNC new features related to GenDC Container format and control
    - GenDCDescriptor (IRegister)
    - GenDCFlowMappingTable (IRegister)
    - GenDCStreamingMode (Off, On, Mixed)
    - GenDCStreamingStatus (Off, On)
- PFNC addition related to GenDC
  - Data8, Data8s, Data8s, Data16, Data16s, ... Data32f
  - and probably CustomXXX
- Next SFNC Release will be v2.5

12. Marketing & Operations (Christoph Zierl, MVTec)
- Update on membership: 7 new member companies since last meeting
- Currently 15 contributing members
Module maintainers

- Decision: Make GenTL Producer Framework (GenTL PF) and GenTL Validation Framework (GenTL VF) separate GenICam modules
- Roman Moie (MVTec) as new GenTL PF maintainer
- Tom Kirchner (Allied Vision) as new GenTL VF maintainer

Roadmap

- Planned updated content of next GenICam Package Release
  - GenICam reference implementation 3.2 (incl. VS 2017 support)
  - GenApi Standard 2.1.2 (?)
  - SFNC 2.5
  - PFNC 2.3
  - GenTL 1.5
  - GenTL Producer Framework 2.0
  - GenTL Validation Framework 1.5.x
  - GenCP 1.3
  - GenDC 1.0
  - CLProtocol 1.2
  - License 1.7

- www.genicam.org
  - Updated text on “Introduction” page
  - Removed “Status” page
  - Regular updates on “News” page

Certification

- Continue work on GenTL Certification Procedures
- Integrate GenDC compliancy rules in GenICam License document

13. Processing results handling in GenICam (Andreas Beyer, Silicon Software)

Goals

- Preserve data structure
- Provide random access to fields
- Annotate results to convey their meaning
- Stay within bounds of XML and SFNC
- Do not define or restrict data organization inside buffer

Implementation

- Top hierarchy category “ProcessingResults” to announce independent data sets stored in buffer
- Sub categories announce iterable collections within each data entry
- Index is provided as feature “<categoryName>Index” of each (sub-)category
- Primitives are announced as features inside a category

14. GenICam and OPC UA Vision (Fritz Dierks, Basler on behalf of Ralf Lay, Silicon Software)

Tunneling GenICam through OPC-UA

- Exposing device features through OPC-UA
  - Converter to access GenICam feature tree through OPC-UA
  - Convert/filter/merge several GenICam feature trees
- Business Case “Support Access”
- SFNC for Vision Processing Systems?
- New GenICam Binding for OPC-UA?
- New subworking group (together with OPC Vision) to investigate possibilities and to develop first implementations
  - Basler, MATRIX Vision, Silicon Software, MVTec, Lucid, IDS, Allied Vision, Baumer, STEMMER IMAGING, Matrox

15. **Homework session (Fritz Dierks, Basler)**
- Go through homework list/items
- Next meeting:
  - 2019, March 25-29, hosted by CMV in Suzhou