GenICam Stresa Meeting Minutes – 2019-10-07/08

1. *Welcome and Introduction (Jochem Herrmann, EMVA & Andreas Ertl, Lakesight)*

2. *Agenda Review (Fritz Dierks, Basler)*

3. *Homework Status/Voting Members (Fritz Dierks, Basler)*
   - Active Silicon – SFNC CXP proposal, CLProtocol
   - Allied Vision – GenTL Validation Framework, GenTL Certification
   - Basler – GenICam 3.2, License
   - Baumer – SFNC proposal (lens control)
   - Hikvision – CLProtocol
   - IDS Imaging – SFNC proposal (lens control)
   - Mathworks – GenICam 3.2
   - MATRIX VISION – GenICam 3.2, PFNC
   - Matrox – SFNC 2.5, GenDC
   - MVTec – GenICam 3.2, GenTL Producer Framework, Administration, License
   - Omron Sentech – GenICam 3.2 file names, FWUpdate
   - SICK – GenDC SFNC, GenTL SFNC
   - Silicon Software – SFNC Processing Results
   - STEMMER IMAGING – C-Bindings, Python bindings, GenTL
   - Teledyne DALSA – GenICam device validation

4. *GenApi (Hartmut Nebelung, Basler)*
   - GenApi reference implementation v3.2
   - Status
     - Many feature branches were merged
     - Since October 4th, the RC4 is available
   - Compiler updates
     - #1952: Update of Linux compiler (Roman Moie, MVTec Software)
       - ➢ ARMh/sf 4.6.3 -> 4.9.4
       - ➢ ARM64 4.8.3 -> 4.9.4
       - ➢ Linux x64 4.2 -> 4.8.5
       - ➢ Remove linking with –static-libstdc++ -static-libgcc
       - ➢ Note that this breaks compatibility (since now gcc 4.8 is required)
     - Windows: VC11 15.8.2
     - macOS: clang6.1 -> clang10.0
   - New python bindings
     - Distribution of Wheel packages
     - Builds for python 3.4 – 3.7
     - Available for Linux x64_86, macOS, Windows x64
   - New Java bindings
     - Distribution of Jar packages

- Available for Linux x64_86 and Windows x564
- New Modular Logging
- Changes
  - #2165: Accept Chunks without Data
  - #2140: ChunkParser for GenDC
  - Bugfixes:
    - SelectorSet
    - FileProtocolAdapter (#1975, #2167)
    - FWUpdate (#1929)
    - Virtual destructors (#2055)
    - Hash computation (#2054)
    - Changing Baudrate (#2067)
    - CPPLint as prebuild step (#1991)
    - Mathparser (#2065, #2052)
    - Feature persistence (#2049)
    - Fix package names (#2124)
- Future Tasks
  - Improve Workflow for Development
    - Independent builds, separate releases, e.g. for language bindings
    - v3.2 took about half a year to get a RC4!
    - Do we need a "release manager" / "product owner" to better orchestrate the releases?
    - Change to lightweight build servers?
    - Make more use of Docker containers e.g., for language bindings
    - Need for a proposal how to manage the process

- Structured register access (Mattias Johannesson, SICK)
  - Problem: Linescan camera transfers timestamp and encoder data as chunks
  - Idea #1: Indexed structures similar to LUTs
    - Using a Register node the whole LUT can be read efficiently
    - However, there is not necessarily only 1 value in the chunk vector…
  - Idea #2: Extend XML with backwards compatibility
    - Extension added in the <Register> node
    - <ArrayOf>…</ArrayOf>
    - Thus, receiver does not need to flip the selector
    - Would then be fast enough
  - Can this be parsed directly by the XML?
  - Interesting idea to be further investigated

- Write validation for Persistence during FW Update (Eric Bourbonnais, Teledyne DALSA)
  - <ImposedAccessMode> to write also to Read-only nodes
  - Write to a Not-implemented node?
  - Always validate Non-streamable nodes for Write
  - Selector validation
  - Every one should look if the proposed change cause issues for them:

> ➢ Not-streamable selector that has dynamic values limitation
> ➢ Not- streamable selector that gets locked or unavailable
- ▪ Mitigation
  - ➢ New SFNC feature GenAPIStreamableVersion to decide which behavior

5. *SFNC (Stephane Maurice, Matrox Imaging)*
- SFNC 2.5 was released on May 27nd, 2019
- SFNC 2.6 Draft1 is in progress
- GenDC related features
  - ▪ As presented in Suzhou meeting
  - ▪ ChunkXMLEnable
- Still open issue #2128: Define ways to identify conditional mandatory features
- PtpClockId vs PtpClockID
  - ▪ The correct one is PtpClockID
- SFNC proposal from Open Optics Camera Interface (OOCI) group (Silvio Voitzsch, Baumer)
  - ▪ OpticControllerSelector/Initialize
  - ▪ OpticFeatureSelector/Status/Initialize/Value
  - -> continue proposal review and discussion!
- SFNC proposal: EncoderResolution (Mattias Johannesson, SICK)
  - ▪ Resolution of one encoder tick, e.g., mm per tick
- Add missing chunks
  - ▪ ChunkBinningHorizontal/Vertical
  - ▪ ChunkDecimationHorizontal/Vertical
  - ▪ ChunkLineSelector
  - ▪ ChunkLineSource
- Next SFNC release planned for next meeting

6. *PFNC (Uwe Hagmaier, MATRIX VISION)*
- Bug reported in PFNC format list for several R/G/B formats
  - ▪ Affects 10/12-bit R/G/B components
  - ▪ Not easy to fix because people rely on either number and/or name ☹
- Add pixel formats for polarized data
  - ▪ Idea is to have a pragmatic solution now
  - ▪ Two alternatives:
    - ➢ Filter array 90/45/135/0 is defined in spec (not flexible), e.g., POL22M1, POL44C1, POL22M1XY_8, POL44C1_12
    - ➢ Polarization angles defined by PFNC list (more flexible), e.g., GPOL22M_90_45_135_0_8, GPOL44C1_90_45_135_0_RGGB_12
  - ▪ Test vote: approx. 2/3 majority towards shorter (less flexible) approach
- YCrCb pixel format request
  - ▪ Still open, will again be sent to the mailing list

7. *GenDC (Stephane Maurice, Matrox Imaging)*

- GenDC v1.0 released in December 2018
- Adoptions
    - GenTL 1.6 (in ballot)
    - GEV 2.2 (waiting for GEV validation framework completion)
    - CXP 2.1 (to be finalized soon)
- Available tools
    - GEV simulator
    - Wireshark dissector
    - GenTL Producer Framework 3.0 (inkl. Viky sample producer)
- First vendor implementations under development
- Enhanced GenDC specification:
    - #2096: More explicit GenICam Chunk format description
    - Addition of XML Metadata as new PartType
        - Support fully self-described chunk data in a Container
- #2074: FlowOffset clarification

- Who controls the flows? (Eric Gross, National Instruments)
    - Possible workflow
        - On device open, driver reads capability bits
        - User sets up sensor image configuration
        - When starting acquisition, driver reads flow table and sets up transfer

8. *GenICam Device Validation (Eric Bourbonnais, Teledyne DALSA)*
- Current proposal for GenApi requirements:

    1. A GenICam description file MUST include a "Root" node with an ICategory interface. This node MUST also be marked as standard.

    2. A GenICam description file MUST include a "TLParamsLocked" Feature with an IInteger interface. This node MUST NOT be streamable. And it MUST be marked as standard.
    3. A GenICam description file MUST include a "Device" node with an IPort interface. This node MUST not be streamable. And it MUST be marked as standard.
    4. Readable features of a GenICam description file MUST be valid*.
    5. Readable features of a GenICam description file MUST stay valid* when related nodes are changed (in particle selector).
    6. When a Feature is readable and writable, it MUST be possible to write back the current node value. This does not apply to nodes with an ICommand interface.
    7. Swissknifes equations MUST be properly formed.
    8. Non-features nodes MUST NOT be marked as streamable.
    9. Streamable features MUST accept and correct invalid values when the validation option is false.
    10. All features that require **persistence** MUST be marked as streamable.
- Current proposal for SFNC requirements:
    1. SFNC features and enumeration entries MUST be marked as standard.
    2. Non SFCN features names and enumeration entries names MUST NOT be marked as Standard.

3. Standard features MUST use the interface specified in SFNC.
4. Non-features node MUST NOT be marked as standard except for the "Device" node.
5. Non-standard features MUST NOT include standard enumeration entry.
- Next step: Integrate proposals into GenApi standard text
- Make sure that readers don't think that these are all requirements

9. *GenCP (Rupert Stelz, STEMMER IMAGING)*
- GenCP 1.3 released in March 2019
- Currently, no concrete plans for next release

10. *GenTL SFNC (Mattias Johannesson, SICK)*
- Already agreed proposals for v1.2
    - Clarify events (#1305)
    - PacketSize renegotiation (#1942)
    - Feature persistence (#1985)
- Additions regarding GenTL 1.6
    - BufferPartDataType: Updates Jpeg++
    - BufferPartRegion/ComponentID: Marked "tentative 1.6" in 1.1.
    - Event NewBufferData
    - New entry for GenDC PayloadType
    - Maybe more to come regarding flows & segments
- Release v1.2 planned e/o 2019

11. *Marketing & Operations (Christoph Zierl, MVTec)*
- Update on membership: 16 new member companies since last meeting
- Currently 15 contributing members, see above
- Roadmap
    - Planned updated content of next GenICam Package Release end of Q2/2019
        - GenICam reference implementation 3.2 (RC4 in ballot)
        - GenApi Standard 2.1.1
        - SFNC 2.5
        - PFNC 2.3
        - GenTL 1.6
        - GenTL SFNC 1.1.1
        - GenTL Producer Framework 2.0 (not included in public download)
        - GenTL Validation Framework 1.5.0 (not included in public download)
        - GenCP 1.3
        - GenDC 1.0
        - CLProtocol 1.2
        - License 1.6
    - First guess about content of future GenICam Package Release in 2020
        - GenICam reference implementation **3.3 (?)**
        - GenApi Standard **2.2**
        - SFNC **2.6**
        - PFNC **2.4**

- ➢ GenTL 1.6
- ➢ GenTL SFNC **1.2**
- ➢ GenTL Producer Framework **3.0** (not included in public download) (in progress)
- ➢ GenTL Validation Framework 1.5.x (not included in public download)
- ➢ GenCP 1.3
- ➢ GenDC **1.1**
- ➢ CLProtocol 1.2
- ➢ License **1.7**
- Provide additional inverse GenICam logo
  - ▪ Yes, will be available in Trac
- Proposal done for #2035: Propose compliancy rules for GenICam GenDC
  - ▪ Will be included in License v1.7
- Continue work on #2122: Harmonize file names of released GenICam documents (between Trac and www.genicam.org)

12. *License (Fritz Dierks, Basler & Christoph Zierl, MVTec)*

- Background
- Current Status
  - ▪ No common proposal available until now
  - ▪ Ask group for guidance for further negotiation
- Objectives
  - ▪ GenICam Users <-> GenICam members
  - ▪ Reference Implementation <-> Standard Documents
  - ▪ GenICam logo and domain
- Three open issues:
  - ▪ Handling IP and copyright in a legally sound way
  - ▪ Covering EMVA's costs
  - ▪ Describing EMVA's role in GenICam rules
- Next steps
  - ▪ Webex session with EMVA and company lawyers (if needed)
  - ▪ Survey on the mailing list

13. *GenTL (Rupert Stelz, STEMMER IMAGING)*

- GenTL Validation Framework (Tom Kirchner, Allied Vision)
  - ▪ Working on GenTL VF 1.5.0
    - ➢ Minor bug fixes
    - ➢ Refactored build process by premake
    - ➢ Integrated all old test suites into one artefact with new GUI
    - ➢ Provide binaries
    - ➢ New documentation
  - ▪ GenTL VF 1.5.0 planned to be released e/o 2019
  - ▪ Work on GenTL VF 1.6
    - ➢ Chunk tester
    - ➢ Tests for GenTL 1.6
    - ➢ Certification

- ➢ Custom test suites
- GenTL Producer Framework (Roman Moie, MVTec)
  - GenTL PF = Starting Point for new GenTL Producer implementations
  - Release of v2.0 in August 2019
  - Prepare v3.0, RC will be available soon
    - ➢ Support GenTL 1.6, in particular GenDC (decoding in Viky, too)
    - ➢ Use user-controlled device/interface discovery timeouts
    - ➢ Allow alternative device IDs
    - ➢ Add cached logger
    - ➢ Support float registers in GenTL Core
    - ➢ Add support for custom buffer info commands
    - ➢ Add support for raw <Register> nodes
  - Open issues
    - ➢ #1889 (expose buffer nodemap)
    - ➢ #1988 (introduce GenTL Core mode allowing direct stream control)
    - ➢ Port TLSimu to GenTL PF
    - ➢ More tests needed
    - ➢ #2156 Release GenTL PF more explicitly
      - -> Put it on GenICam website? No, but as package in SVN
- GenTL 1.6 has been ACCEPTED by the group
  - Flow Concept
    - ➢ Now, the Producer provides data without interpretation
    - ➢ Segments are independent from its content
  - Stacked Info Functions
  - Minor Typos and Clarifications
- Currently, no concrete plans for next release
- GenTL C++ Bindings (Mattias Johannesson, SICK)
  - Using SWIG, maybe as project on github
  - Who is interested to join?

14. *Homework session (Fritz Dierks, Basler)*
- Go through homework list/items
- Next meeting:
  - 2020, week of May 25, hosted by Matrox in Montreal, Canada

15. *Initiatives related to GenICam*
- *Harvester (Kazunari Kudo, STEMMER IMAGING)*
  - Stable since April 2019
  - Many reported manufacturers and followers
  - Typical questions:
    - ➢ Use of defect equipment
    - ➢ Lack of python knowledge
- *OPC Machine Vision (Andreas Beyer, Silicon Software)*
  - OPC MV Part 1 already released

- ➢ Focus on data management methods and behavior control
  - ▪ OPC MV Part 2 now under preparation
    - ➢ Focus on Device Handling and Standardization of Results
- *OOCI - Open Optical Communication Interface (Erik Widding, Birger Engineering)*
  - ▪ Goal: Standardize camera interface for optical components inside of, or attached to, machine vision cameras
  - ▪ Scope:
    - ➢ Define feature names (SFNC)
    - ➢ Define protocol (GenCP)
    - ➢ Define physical interface(s)
    - ➢ Modularity (GenTP – Generic Tunneling Protocol)
- *GenICam for Embedded (Werner Feith, Euresys & Thomas Lück, Allied Vision)*
  - ▪ Status from EMVA IEVIS (Industrial Embedded Vision Interface Standard)
    - ➢ Started efforts to define modules within kernel mode using media control framework
    - ➢ GenTL producer as main kernel to user interface
    - ➢ Communication with MIPI about membership
  - ▪ Three layers:
    - ➢ User layer: GenICam
    - ➢ Kernel layer: Enable easy adaption of embedded boards
    - ➢ Hardware layer: Enhancing SLVS-EC /MIPI CSI-2.0-PHY
  - ▪ Next steps:
    - ➢ Communication with V4L group
    - ➢ Collaboration with MIPI group
    - ➢ Alignment on name for the standard
    - ➢ White paper about concepts and goals