Generic Protocols Evaluation Project

2017-11-23 Project Kick Off Meeting

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AGENDA

2. First definition of Generic Protocols Evaluation project
3. Review and refine initial goals of the project
4. Review Scope & first list of “existing technologies”
5. Practicalities - issue tracker, mailing list, meeting setup
6. Presentation of project participants, background, interest and planned participation
7. Participant feedback on goals – prioritization
8. Free form discussion - immediate thoughts? other technologies to be aware of? Partitioning the work into different areas of investigation
9. Review actions, next steps.
GENIVI Vehicle Domain Interaction Strategy

Deliver open standard interfaces and code that bridge multiple car software domains

- Enables cross-industry, collaborative effort
- Addresses an industry-wide challenge of domain interaction
- Simplifies development and improves solution quality
- Leverages expertise already existing in GENIVI community
Vehicle Domain Interaction Strategy - Resources

- Large interest since GENIVI first announced the Vehicle Domain Interaction Strategy – leading to many questions

- To meet the demand we have created a Frequently Asked Questions document for the most common questions: http://tinyurl.com/DIROFAQ

- Please refer to the FAQ for general questions about Vehicle Domain Interaction Strategy.

- Also: - Strategy Home Page (Wiki): http://tinyurl.com/DIROHOME
  - Strategy KickOff Slides and Recorded Webinar ^ links on Home page
  - Project registration/survey (fill in, to be kept informed)
(Reminder)
Project Candidates Identified During AMM Workshops in Seoul

1. Graphics sharing & Distributed HMI Compositing
2. Developing or Extending Hypervisor APIs
3. Determining Preferred Generic Communication Protocols
4. User Input Distribution and Coordination
5. System Health/Debugging/Analysis (incl. Log & Trace)
6. Distributed System Lifecycle / Node State
7. Network Traffic routing & accounting (priority/bandwidth/payment…)
8. (Distributed) Audio management
9. Distributed User / Login / Profile management
Why is this project needed?

“Too many choices, too much diversity, too much boiler-plate code, adaption layers, and incompatibility”
Why is this project needed?

As automotive software engineers we have (at least) “5 dimensions of incompatibility…”
- Network protocol standards
- Data encoding
- Programming languages
- Programming APIs (bindings,...)
- Hardware / CPU architecture specifics (byte order,...)

but wait! there’s more!
… IDLs, Tools, Modeling tools? UML?, ...
Vehicle Domain Interaction Strategy = multiple projects

• **TODAY**: Start Project #2
  Generic Protocols Evaluation
Scope and definitions (first proposal)

- **Generic Protocol (in this context)**
  
  “Network (*and IPC) protocols acting primarily as a transparent data carrier, applicable to many different application domains, but including convenience features above that of a plain data stream (socket). For example: data encoding, segmenting, opaque target addressing, routing, peer authentication, delivery guarantee, data integrity and service-discovery.”

- In other words, we are concerned with OSI model levels 5-6 (approx.)
- To reduce scope – focused on segmented, atomic, event/message-based semantics more than “streaming data”
- *IPC needs to be in scope, because of shared parts (data encoding), similarity, and that network-transparency is often a design goal.*
Project Goals proposal (high level)

• Analyze choices among a vast number of messaging protocols & encodings
• Reach consensus on preferred options: Among 10-15 choices, find 3-5 recommended (and for which scenarios they are recommended)
Project Goals proposal (detailed)

• Project participants gain thorough understanding of available choices
• Deep dive: SOME/IP - where is it applicable, and where is it not? Similarly for RESTful web interfaces and a few others.
• Produce or identify technology demonstrators newly created or (if exists already) found and highlighted.
• Publish hard data on learning: Performance, resource needs.
• Evaluate popularity / probability to encounter
• **Reduce scope of “preferred” choices in industry**
• Document applicability and recommendations
• Promote *open* standards and implementations across industry
• Summarize and create (implementation) documentation for recommended choices
Areas to explore

• Flexibility & network transparency, etc.
• Interface Description Languages: Franca IDL ↔ others
• Tooling:
  • Code generation & bindings
  • Documentation
  • Runtime evaluation / debugging
• Concrete programming APIs, e.g.: Common API C++
• System modeling: Franca +
Existing technologies to explore

- MQTT, WAMP, AMQP, XMPP, SOME/IP, CoAP, REST-ful HTTP, D-Bus, gRPC,… Protobufs, MsgPack, JSON, Thrift, Avro
- Franca IDL – current state, and future needs
Practicalities

• Need clear commitments from project participants
• A project to achieve results! Those willing to actually work will organize (or self-organize) around a functioning meeting schedule.
• Volunteers for project leader?
• Time poll, or just set a time?
• Mailing list: genivi-projects @lists.genivi.org

JIRA tracker
(https://at.projects.genivi.org/jira/projects/GPRO)
• Keep in touch: https://www.surveymonkey.com/r/JZJV5KP
Remaining Agenda

• Presentation of project participants, background, interest and planned participation

• Optional / time permitting
  • Time for first evaluation of candidates, comments
  • Free form discussion
    • - immediate thoughts?
    • - other technologies to be aware of?
    • - Partitioning the work into different areas of investigation
  • Participant feedback on goals – prioritization

• Review actions, next steps.
END
BACKUP SLIDES

1. (if needed to support conversation)
Supporting ECU architecture picture (example)
1. Register yourself to projects on the on-line GENIVI Domain Interaction form & survey (https://www.surveymonkey.com/r/JZJV5KP)

2. Projects #2, and #4 – meeting times to be announced
   – register your interest on the on-line form (https://www.surveymonkey.com/r/JZJV5KP)

3. Questions? Philippe Robin philippe.robin@technoveo.com
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   Use the community mailing list! genivi-projects@lists.genivi.org