Publish-Subscribe Middleware
For
Agricultural Applications

Agenda

• Motivation for a Middleware

• Client-server vs. publish-subscribe paradigm

• Ongoing and future work
Motivation for a Middleware

- Heterogeneous network
- Nontrivial global communication for e.g. fleet-management

Abstract view of normal applications

- Application must handle network issues
- Difficult and time-consuming
- Low interoperability and wasted potential
A possible solution

- Middleware handles network issues
- Faster development time
- Higher interoperability and better use of potential

Diagram:

- Database on Farm LAN and/or other Database via Internet
- Positioning and harvester listening application on tractor using ad-hoc communication
- Positioning and tank measurement application on harvester using ad-hoc communication
- Application logic
- Middleware
- Physical network

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Client-Server Paradigm

- Tight coupling between client and server
- Problem: Servers must always be available to clients at a known network address and given time

Client-Server Limitations
Client-Server Limitations

- Connection lost!

Abstract view of the Publish-Subscribe Paradigm
Basis for our Middleware

Database on Farm LAN and/or other FMIS via Internet

Positioning and harvester listening application on tractor using ad-hoc communication

Positioning and tank measurement application on harvester using ad-hoc communication

Application logic

Physical network

Conclusion

- Higher interoperability between agricultural applications
- Removal of tight client-server coupling
Ongoing and future work

• Verify applicability of Middleware in real-life harvesting session at Research Centre Foulum, DK

• Optimize usage of machinery by providing real-time situational awareness for all units

• Future: Extend middleware for global coverage

Questions?