



FAKULTÄT FÜR ELEKTROTECHNIK
UND INFORMATIONSTECHNIK

Using IEC 61499 for Virtual Commissioning

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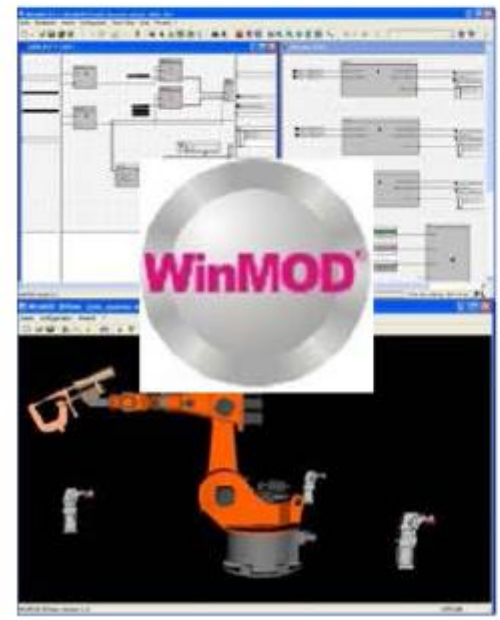
Venkata Naveen Bantu, Otto-von-Guericke-University Magdeburg

Virtual Commissioning

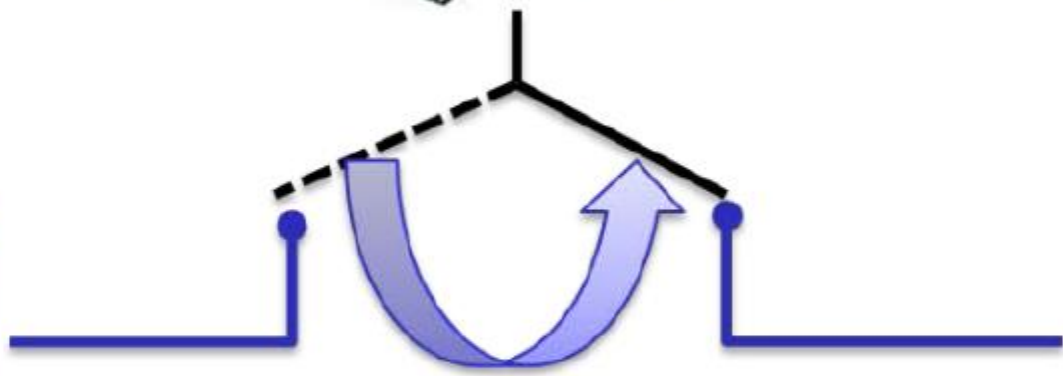


Control

Virtual production system



Physical production system



Benefits of virtual commissioning



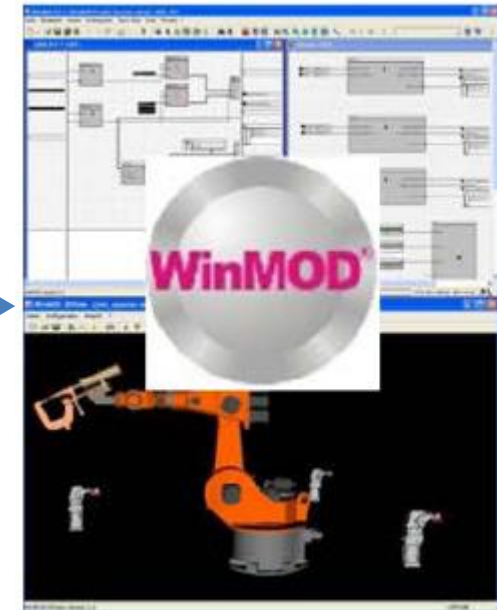
Source: [LDS12]



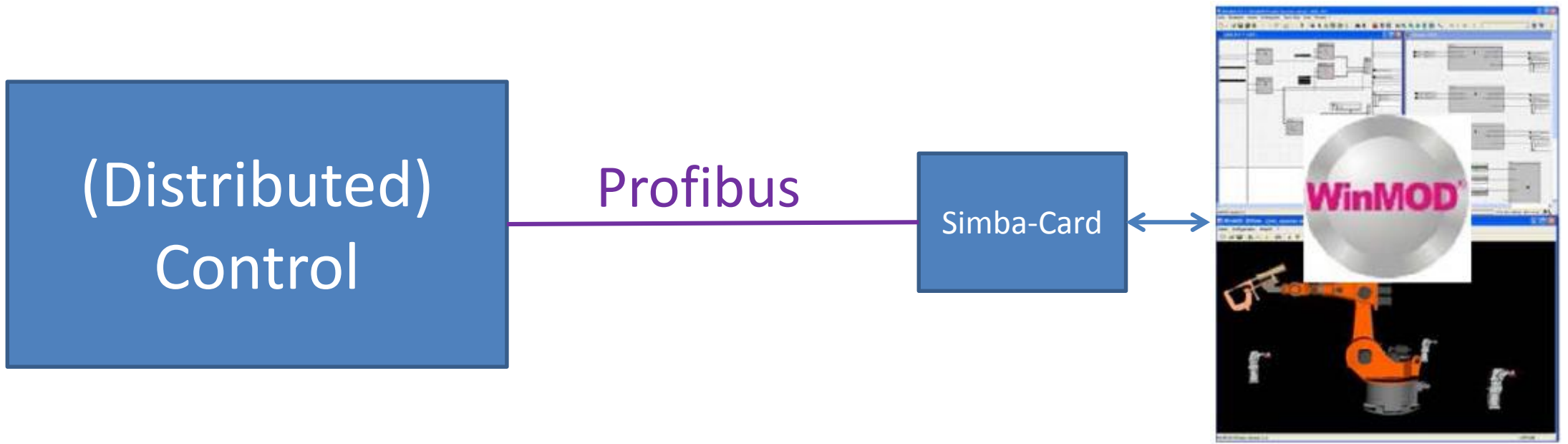
Control system architecture ?

(Distributed)
Control

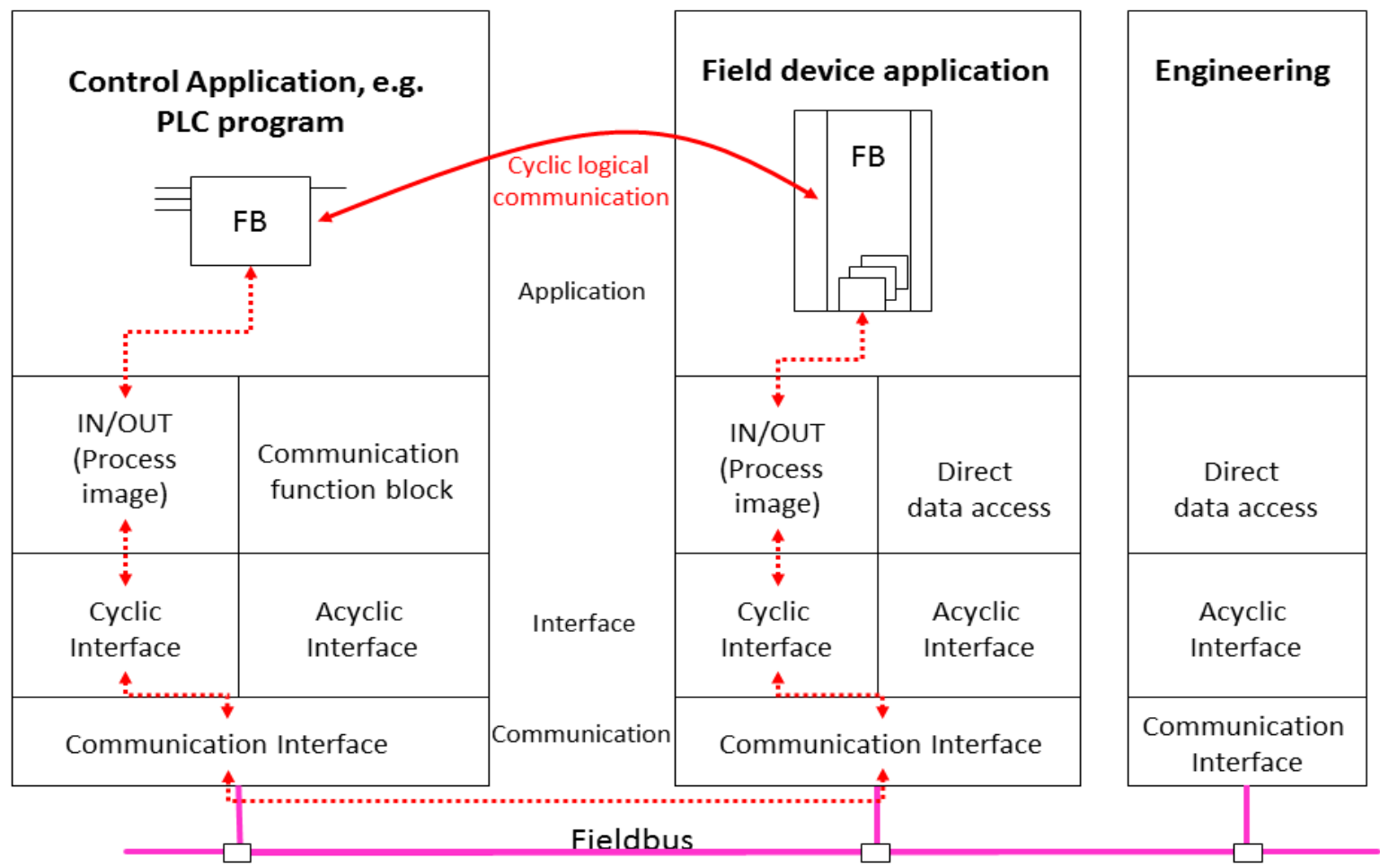
?



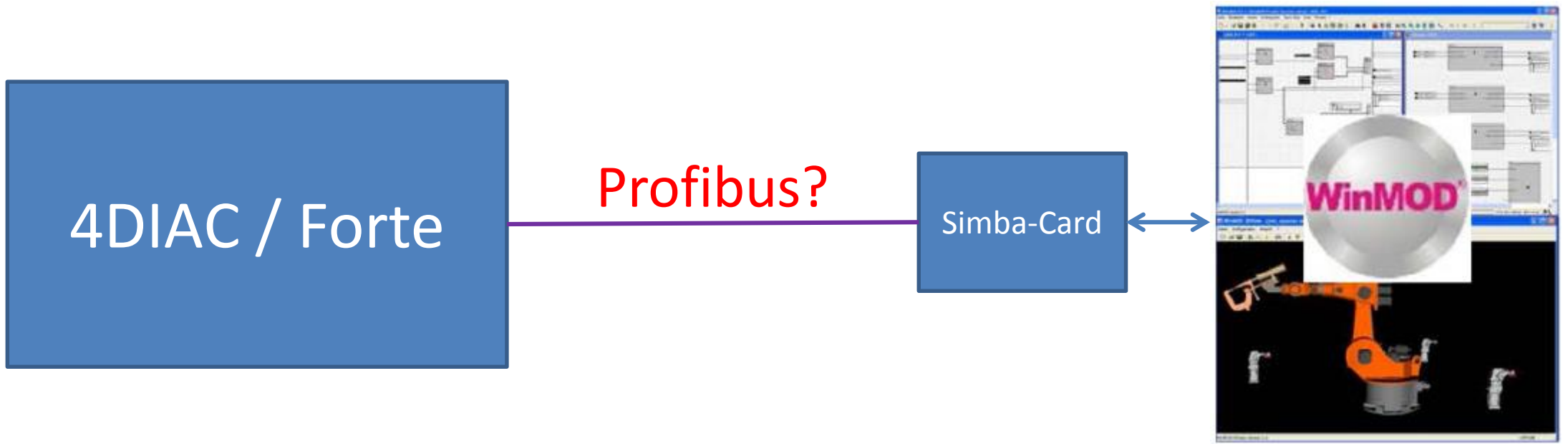
Control system architecture



Profibus: Cyclic communication



Control system architecture





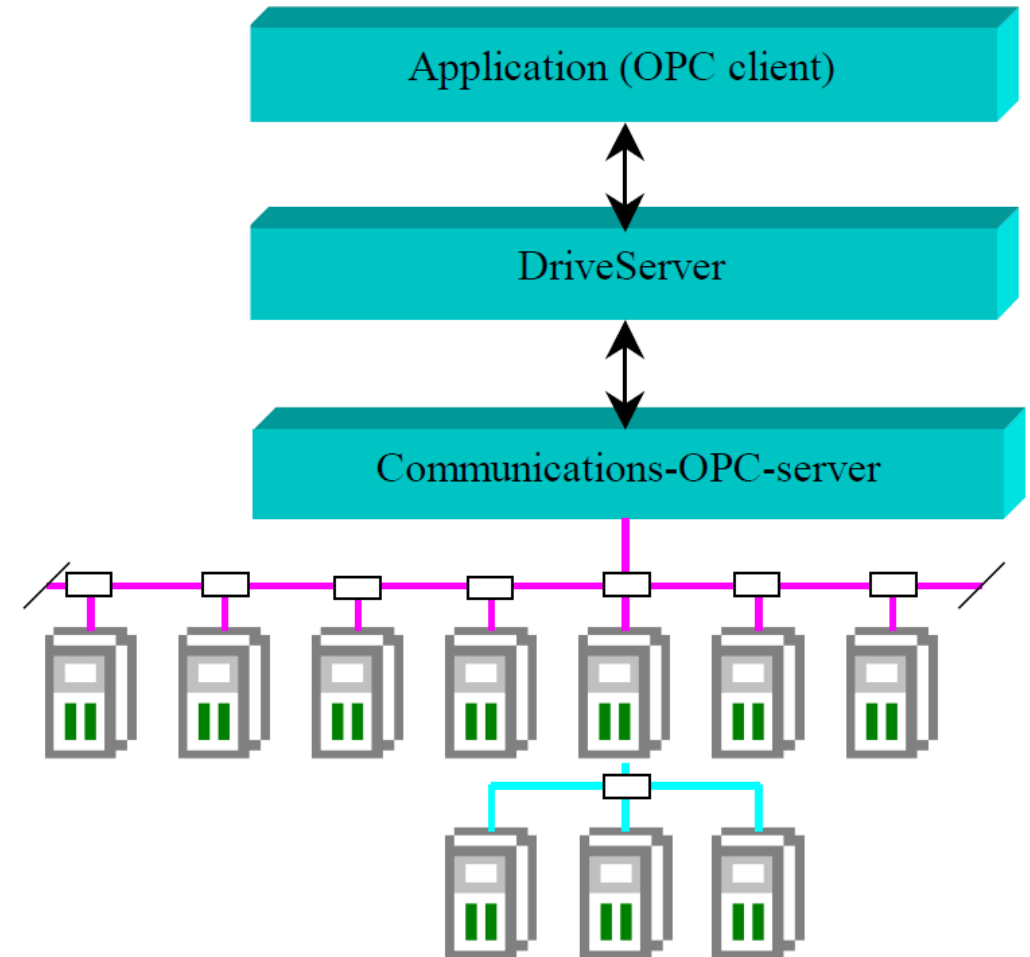
Fieldbus integration

- Based on DriveServer-Specification
- Supports different fieldbusses
 - Profibus
 - Interbus
 - CAN
- Access to device parameters is defined by item names

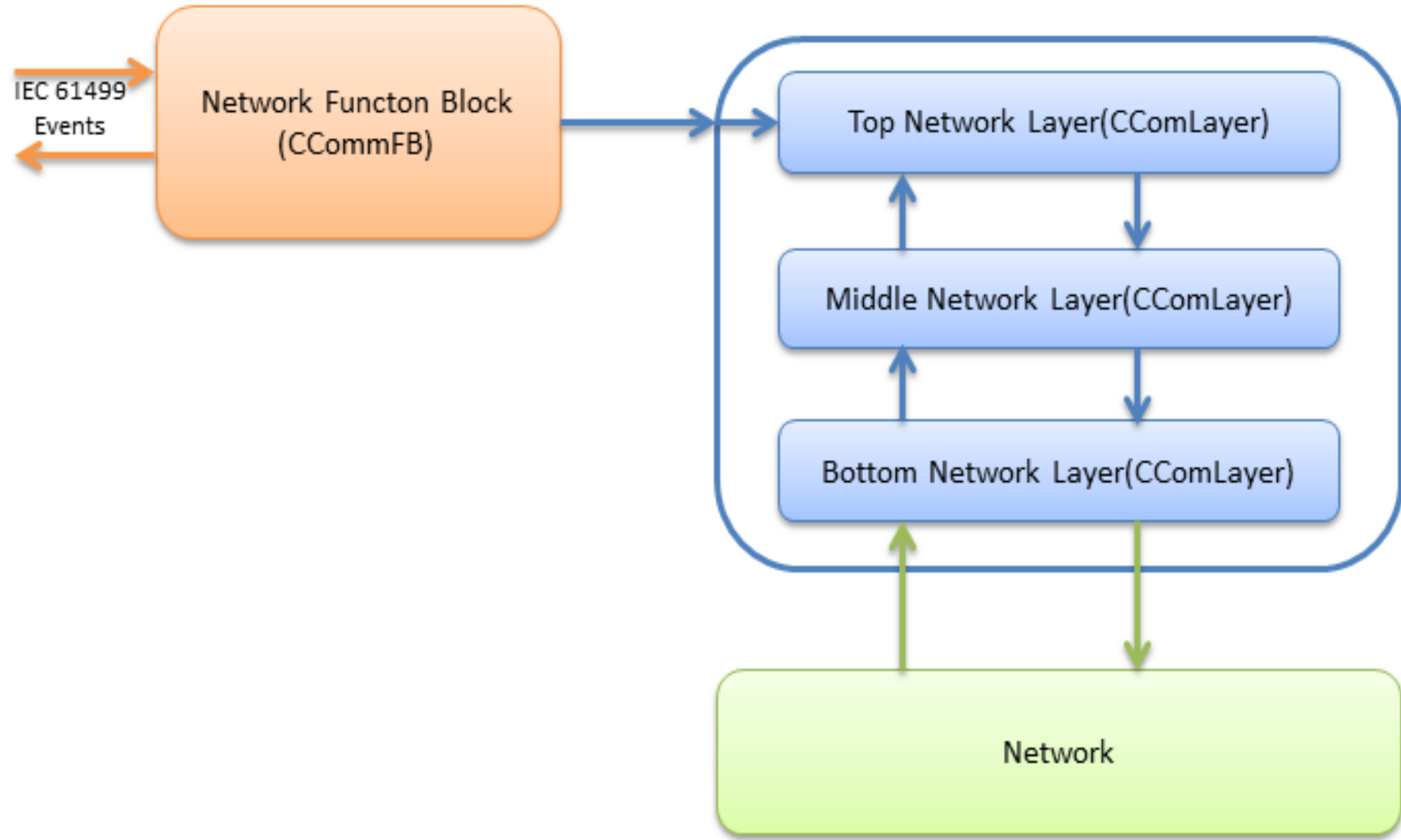
`<item_tag> := <device_tag><parameter_tag>`

Fieldbus

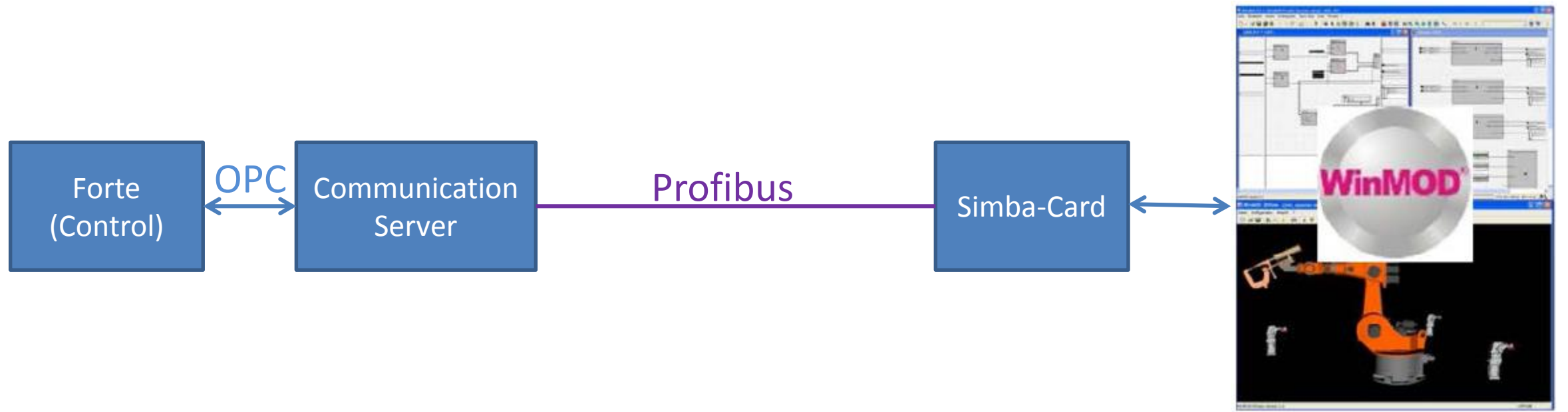
Drives with
subsystems



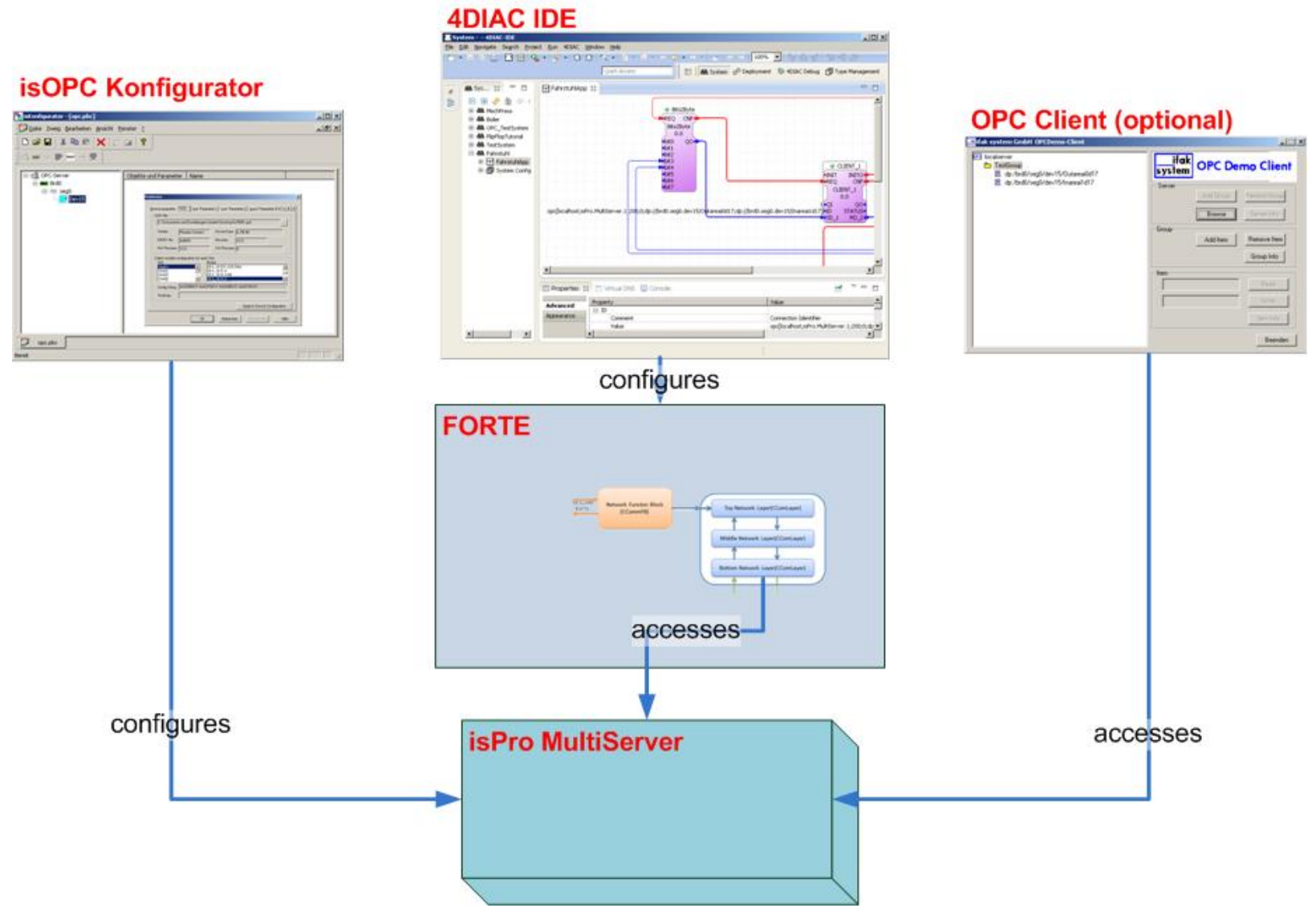
Integration into Forte: OPC Client Communication



Control system architecture

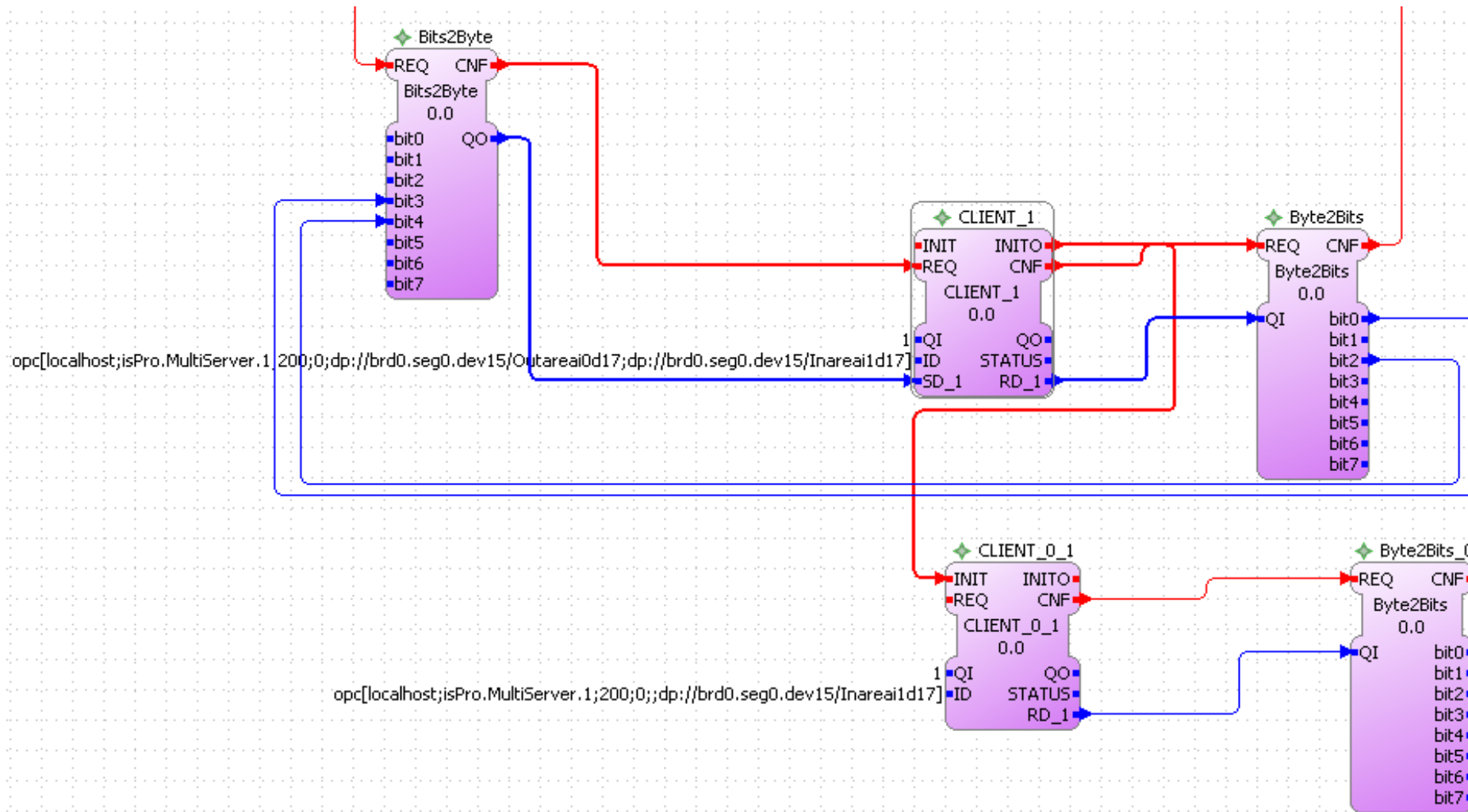


SW Structure

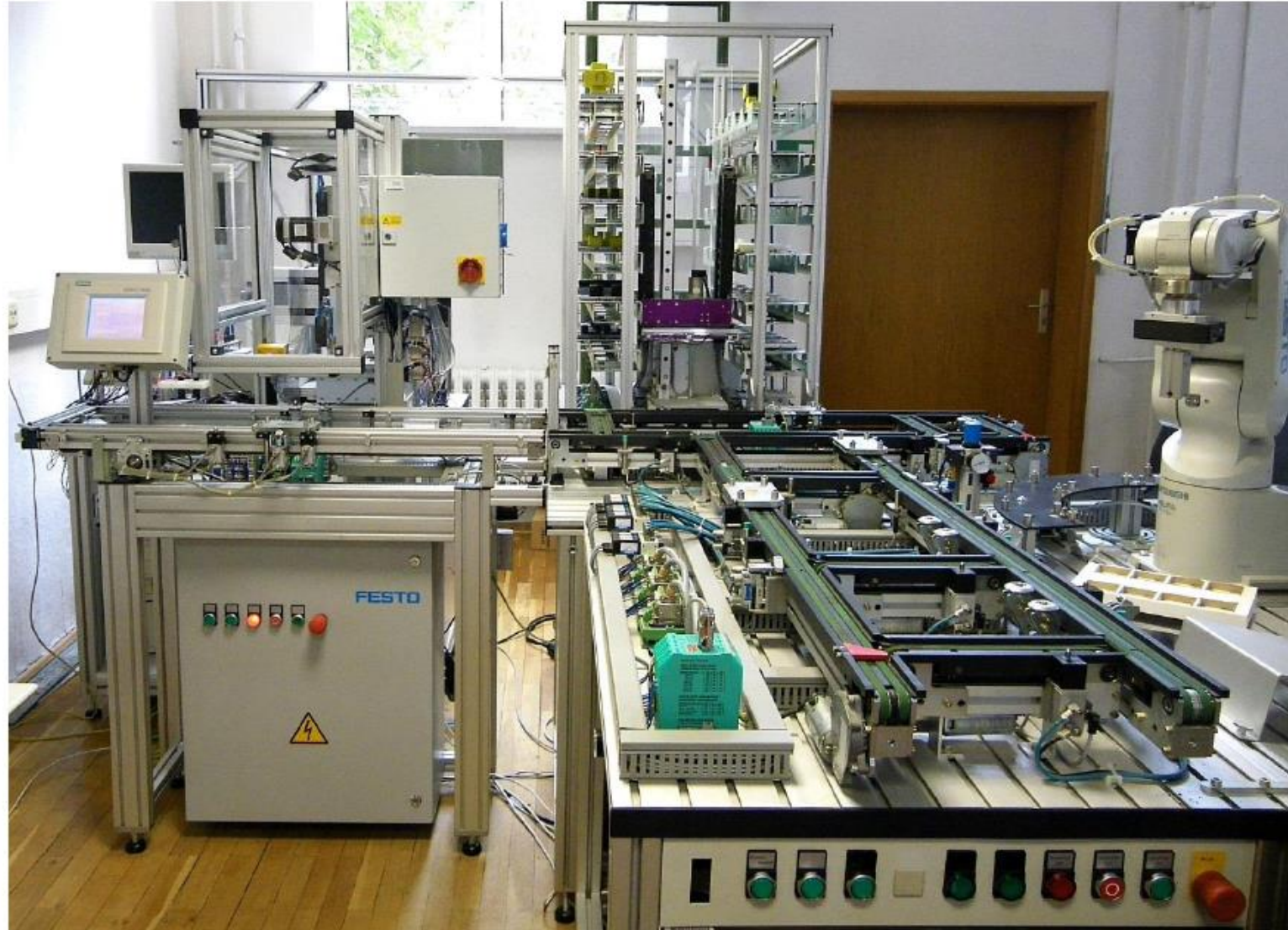




Access to the OPC Server with Client FBs



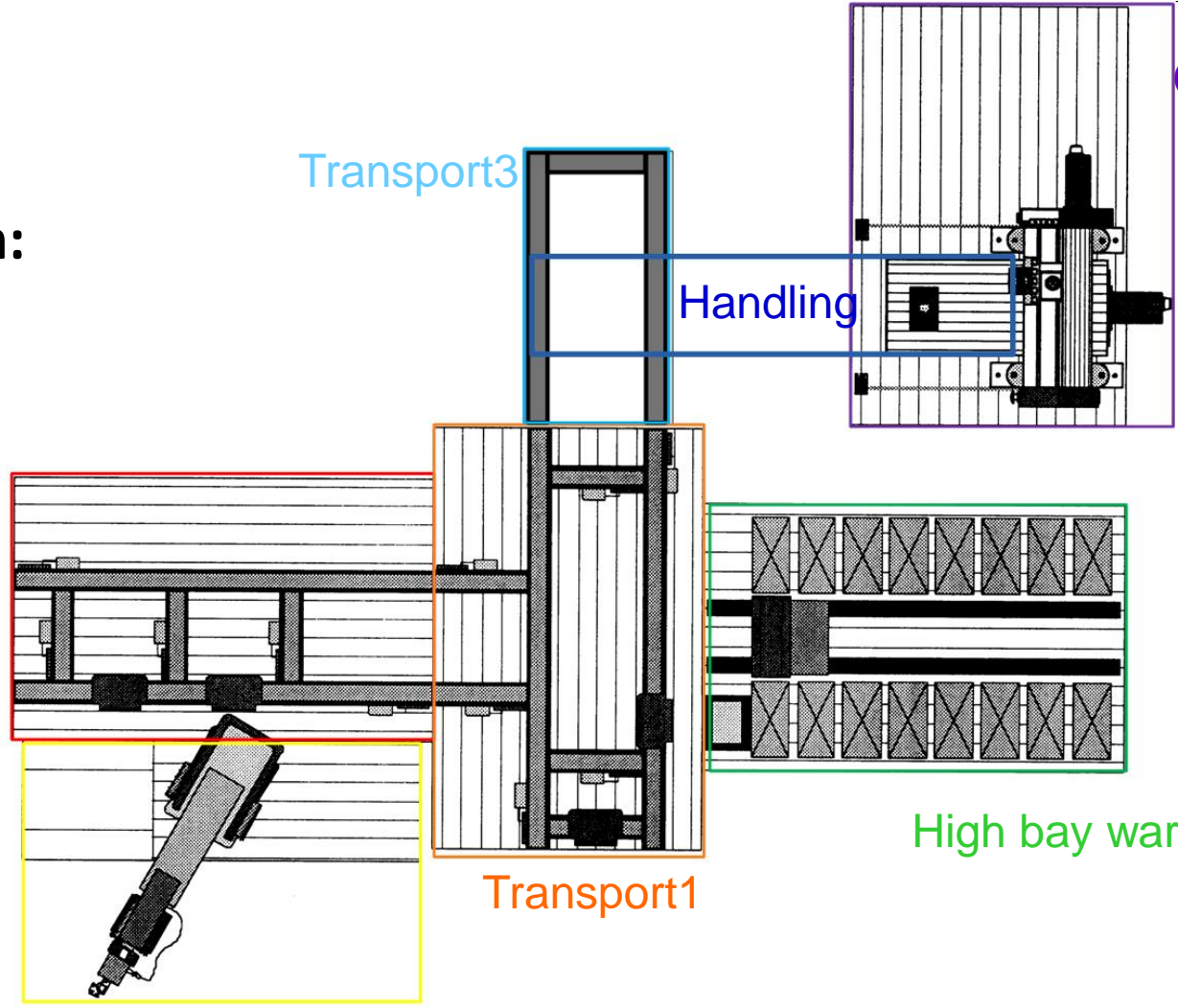
Proof of concept: control for Flexible Manufacturing System



Control of Flexible Manufacturing system

Transportsystem:
53 Inputs
33 Outputs

Robot: 9 Inputs
4 Outputs
Roboter +
Vision



CNC-Station

HBW:
15 Inputs
12 Outputs



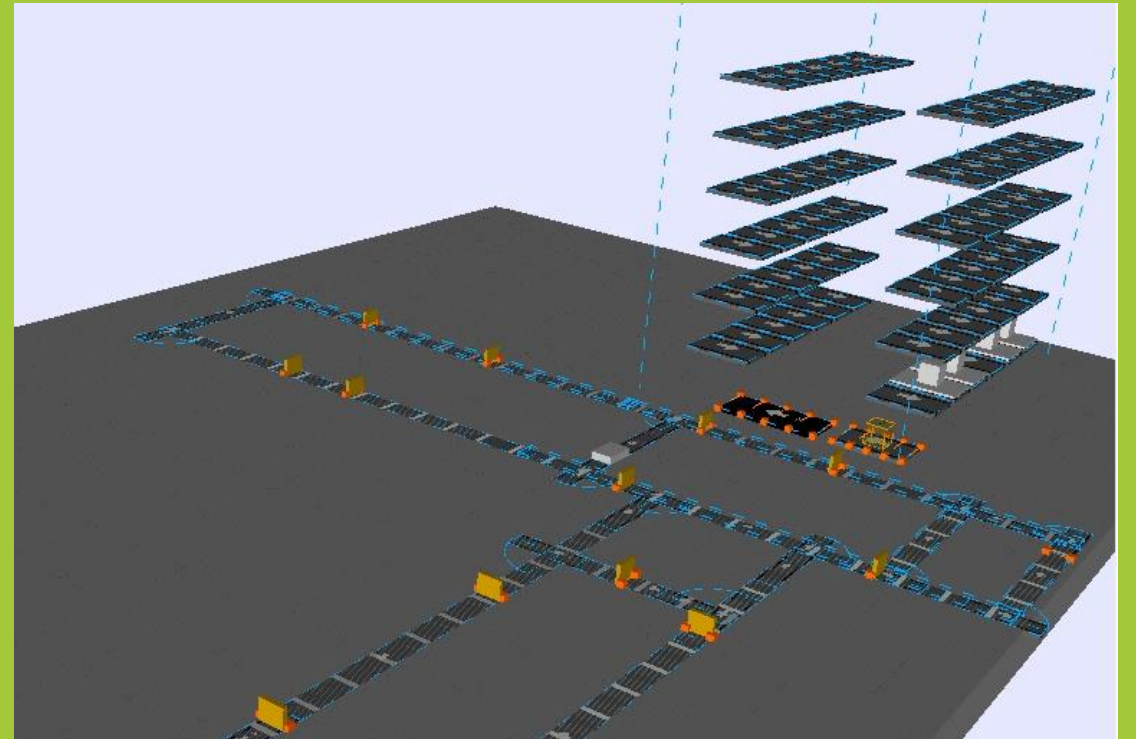
Summary

- Virtual commissioning based on IEC 61499 control (4DIAC)
- Integration of fieldbus communication via OPC (based on DriveServer specification)
- Proof of concept with small system (77 inputs / 45 outputs)

Questions?

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Sources

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- [Die12] Diedrich, C.: Lecture Communication Systems 2012, Magdeburg, 2012.
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- [Had14] Hadlich, T.: Implementing PROFIBUS Support for FORTE. IFAT–LIA 1 /2014. Technical Report. http://ifatwww.et.uni-magdeburg.de/~hadlich/en/publications/Report2014-1_Implementing_PROFIBUS_Support_for_FORTE.pdf , Magdeburg, 2014.
- [Ban15] Bantu, V. N.: Design of control with virtual commissioning. Master thesis, Magdeburg, 2015.