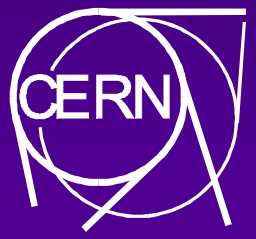


OLE for Process Control

Vito Baggiolini SL/CO

What is OPC?

- A controls API on top of DCOM middleware
- A set of industry standards for
  - data access (read/write of properties)
  - alarms and events
- Supported by ~200 companies
- Implemented on Windows NT, (D)COM

Why OPC at CERN?

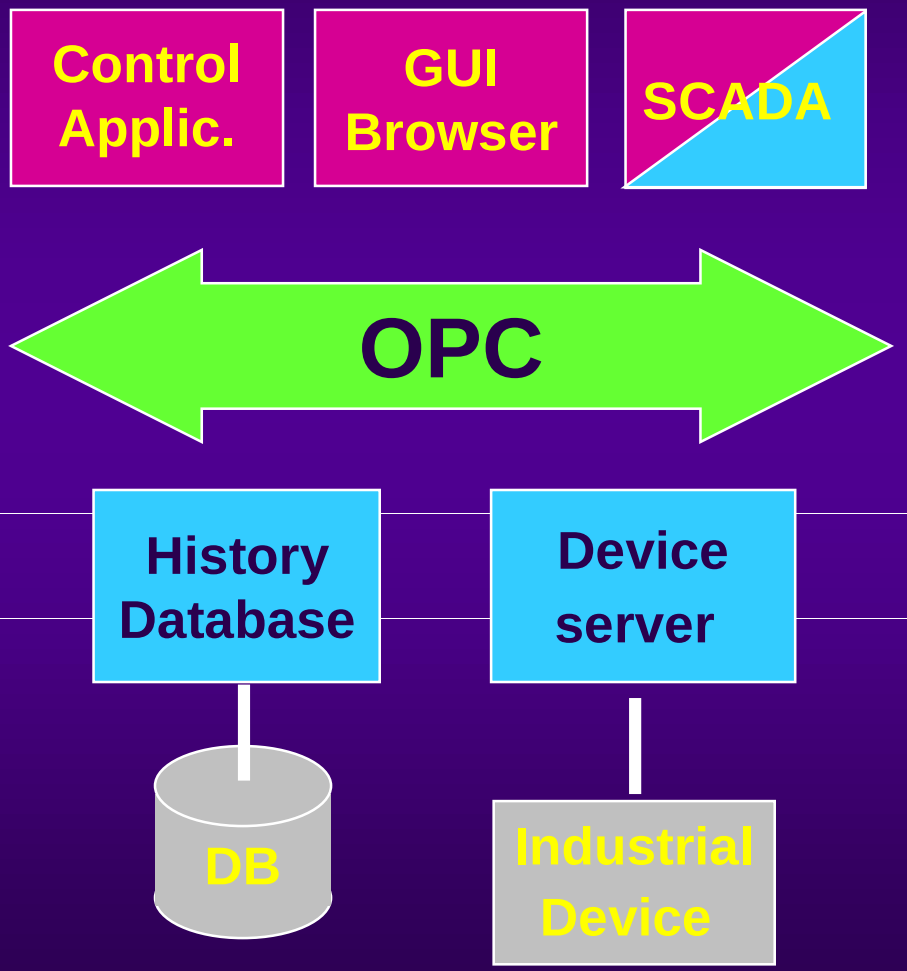
- Integration of industrial systems

- First broadly supported industry standard
- Supported by most SCADA systems
- Will be used by LHC experiments (JCOP)

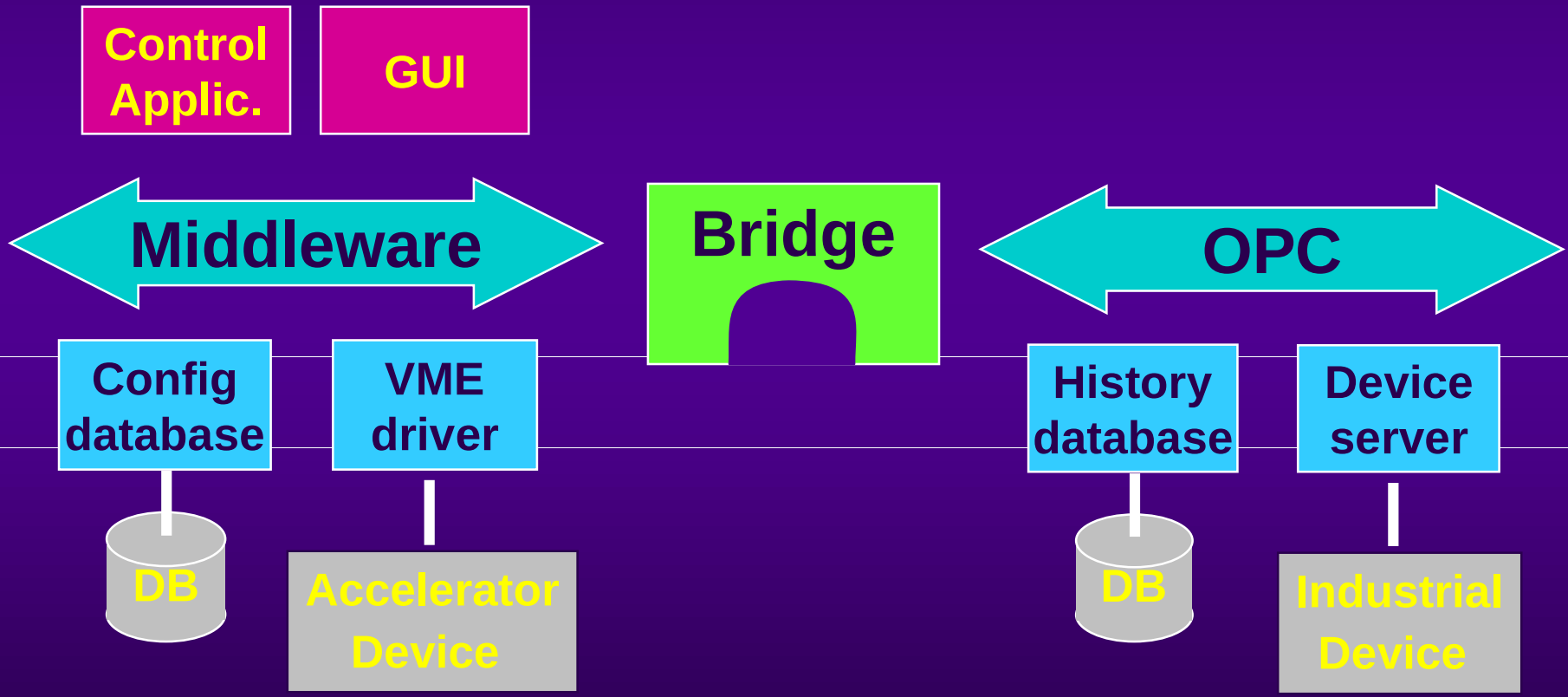
- Ideas for our own data access systems

Where does OPC fit?

- OPC is “Middleware”
- Communication between
  - Devices
  - Databases
  - Applications
- Client / server paradigm

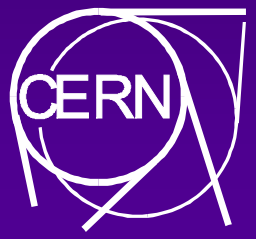


OPC Integration



OPC Servers

- OPC data server
  - Holds process data for clients
  - Client can read/write or subscribe to data
- OPC event & alarm server
  - Administrates events and alarm for clients
  - Client can subscribe to event notifications
- Both provide introspection
  - Client can browse available information

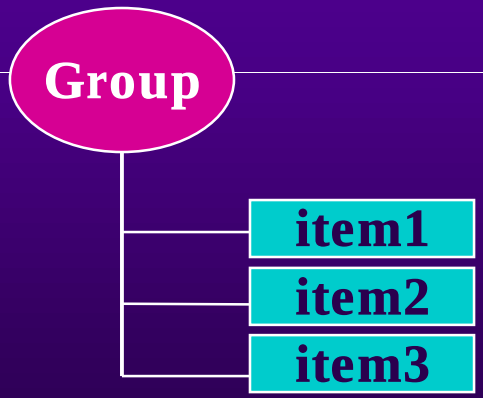


OPC Data Access

Version 2.0, October 1998

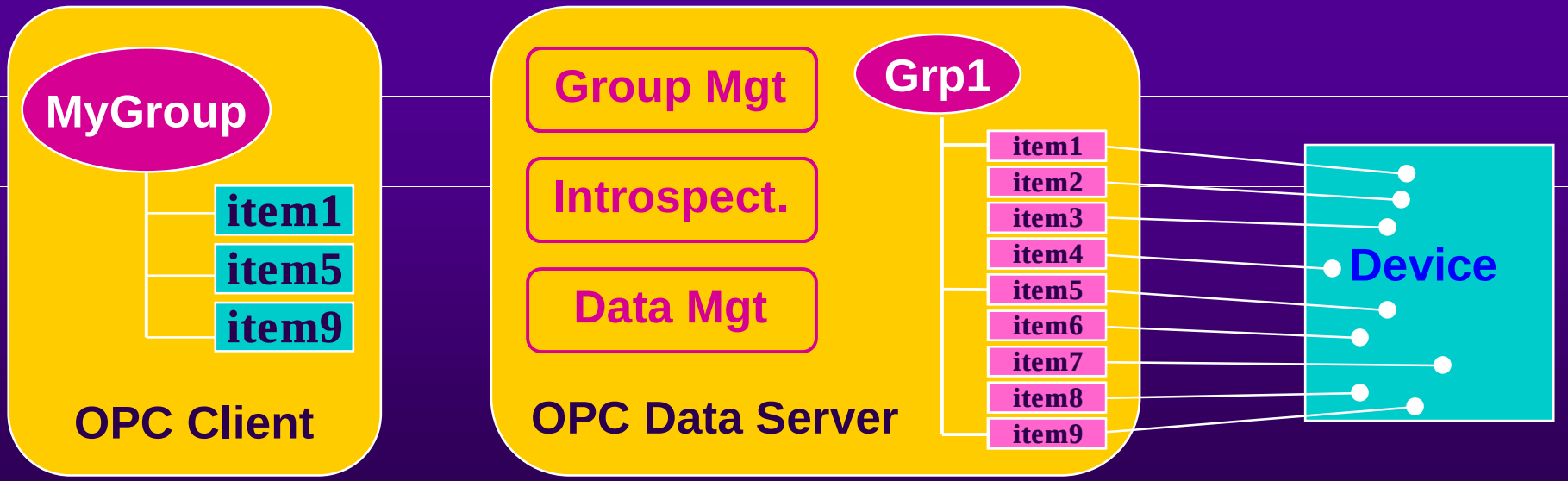
OPC Data Model

- OPC item (~ device properties)
  - Connection to a data source
- OPC group = collection of items
  - clients must use groups to access items



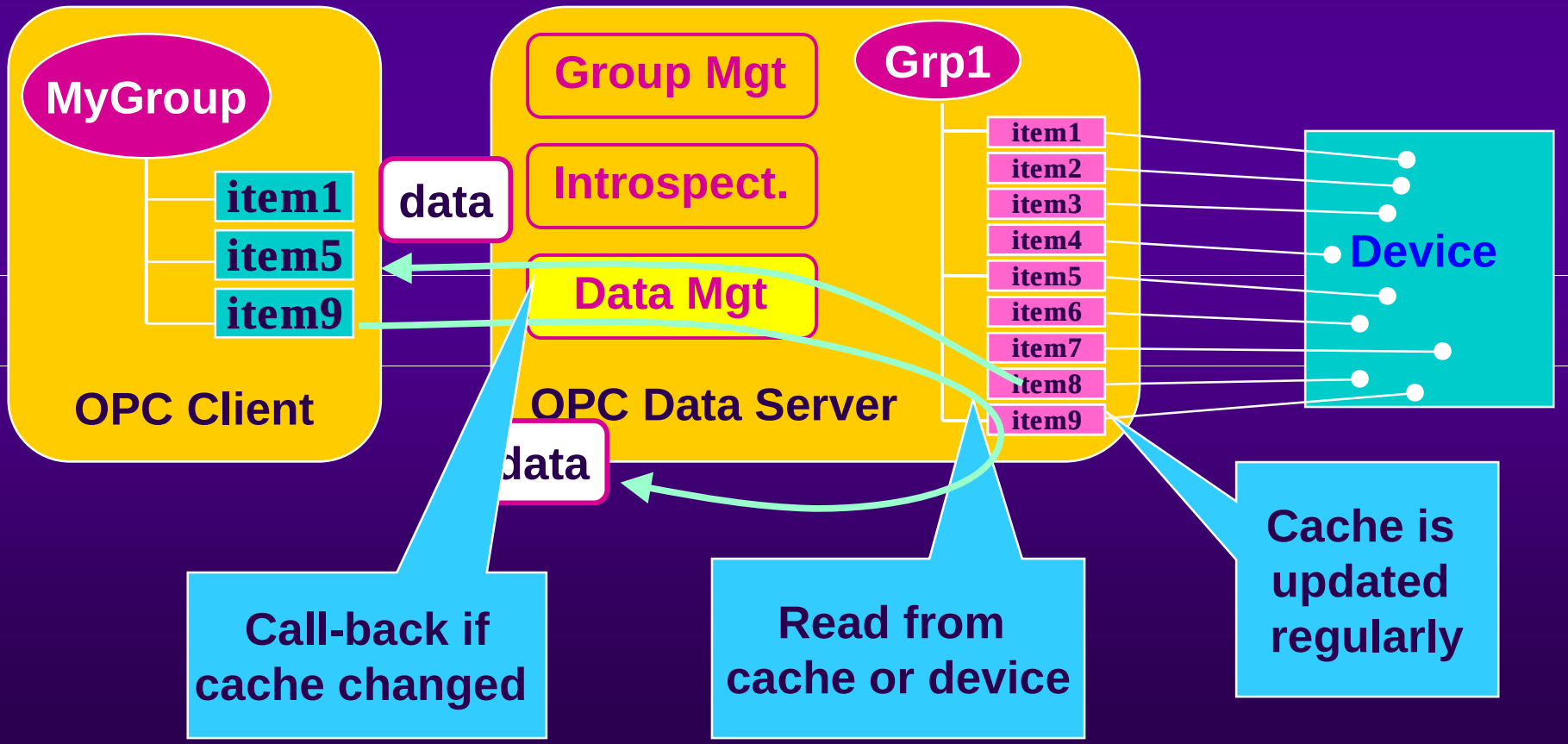
Data Access Setup

- Create group
- Browse & select items
- Configure data access parameters



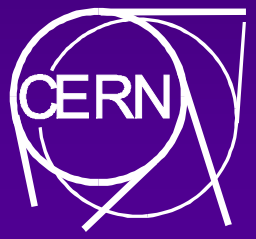
Data Access

- Read/write access
- Subscription based



Data Access Details

- **Item data (retrieved through I/O)**
  - **Value, Quality, Timestamp**
- **Data access configuration**
  - **Update rate** (frequency at which cache is updated)
  - **Deadband** (minimal variation considered as a change)

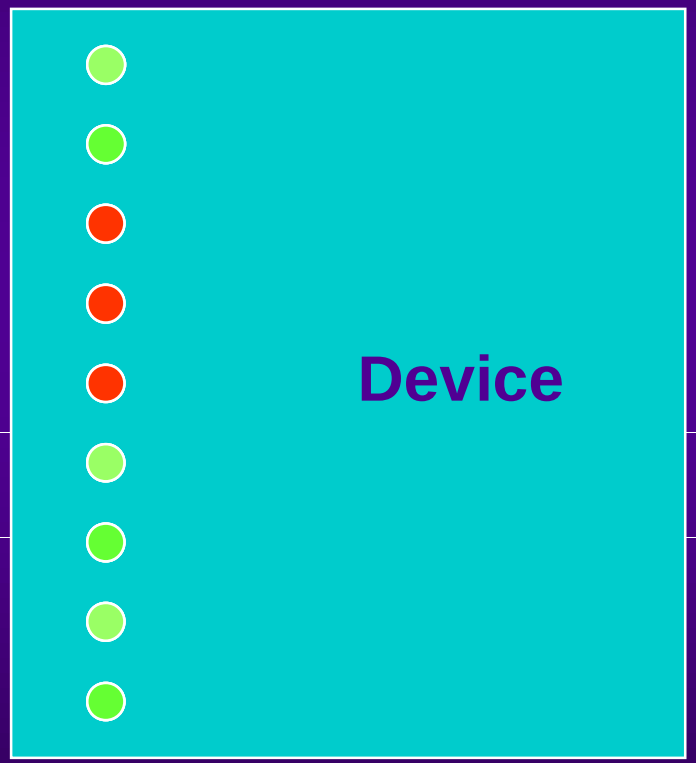


OPC Alarms & Events

Version 1.0 December 1998

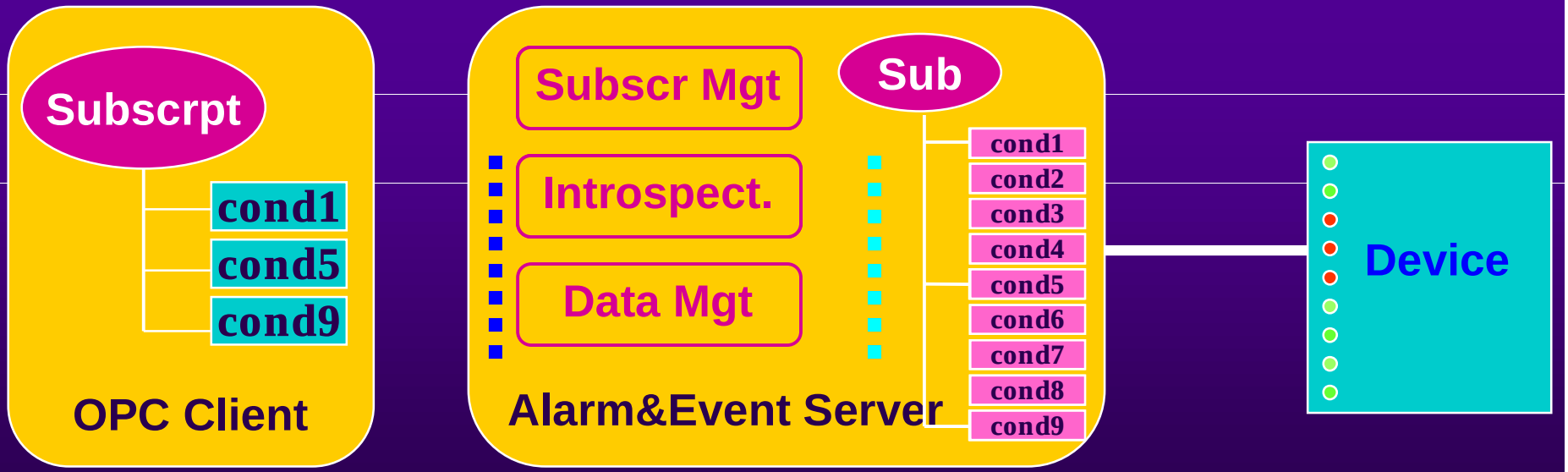
Concepts

- **Condition** (state)
- **Event** (state change)
- **Alarm** (change to abnormal state)



Event & Alarm Subscription

- Create subscription
- Choose events and alarm types
- Set up filters



Conclusions

- ✔ Very interesting concepts
  - We can learn from them
- ✔ Needed for industrial system integration
  - Industrial devices
  - SCADA systems

- ✗ Many OPC services are only optional
- ✗ Microsoft dominated
  - Needs Windows NT near devices
  - Based on DCOM