CoDaBix.com

SMART FACTORY – Industrie 4.0

The industrial Middleware for any type of connection.

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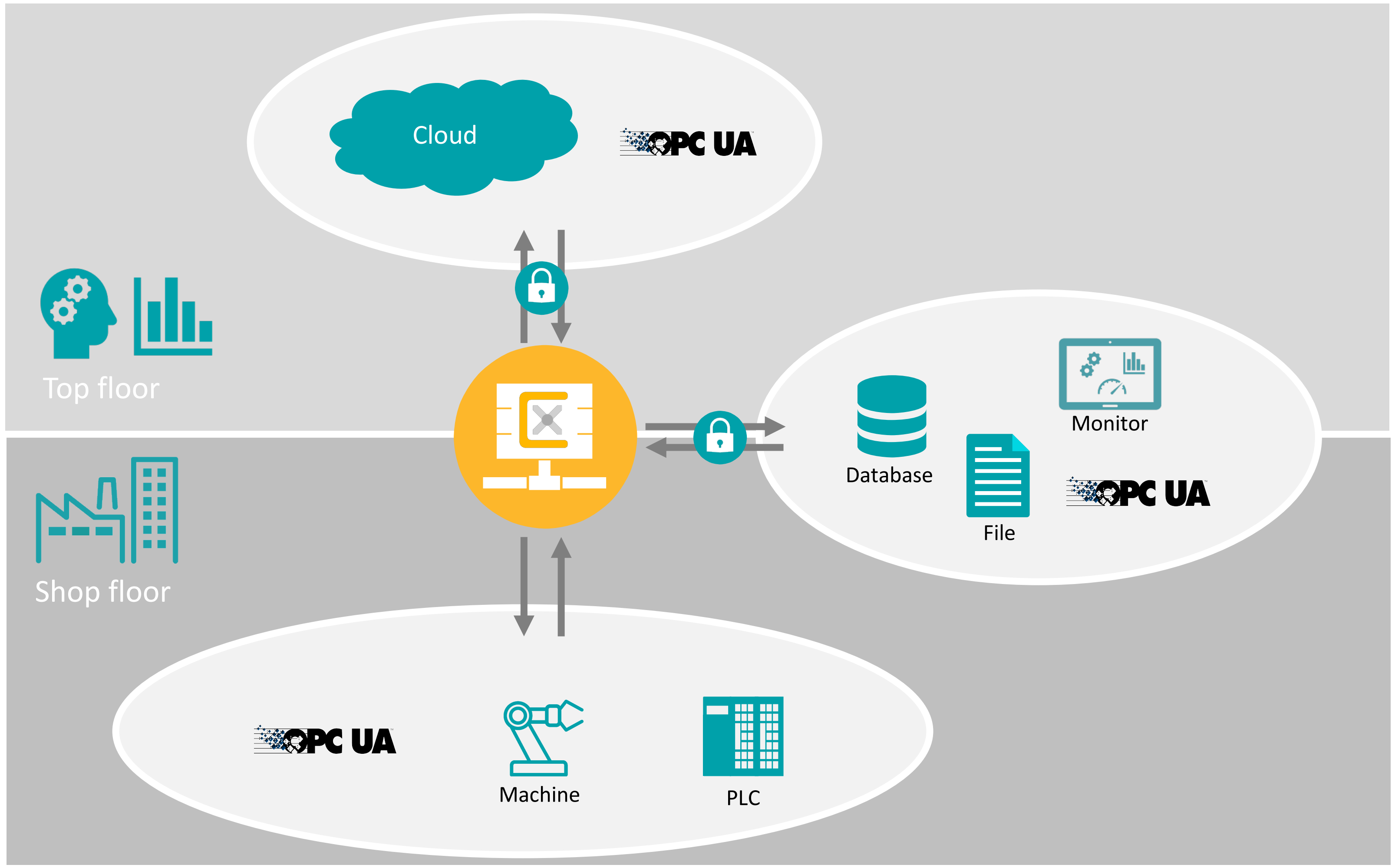
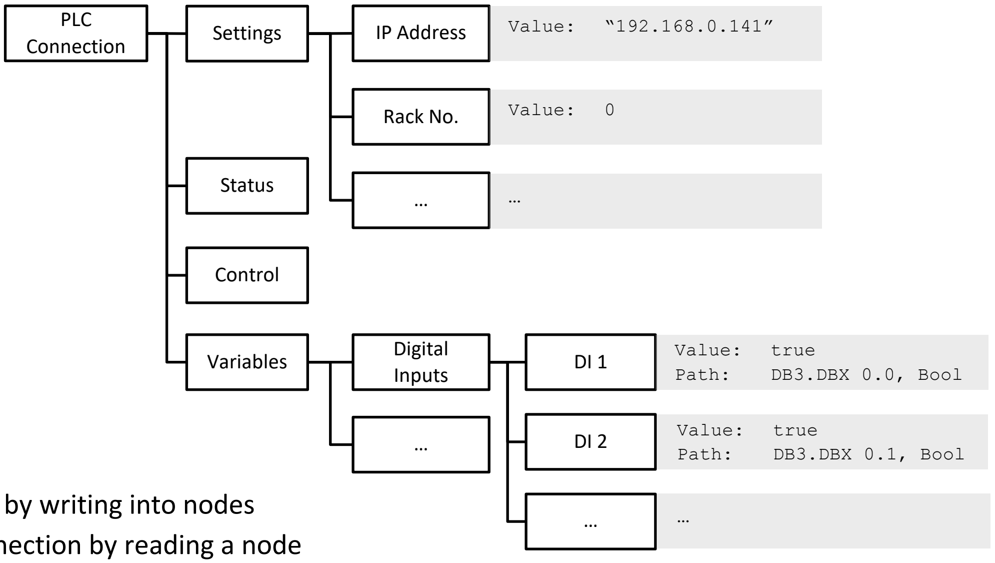
From shop floor to top floor



Unified architecture over all interfaces

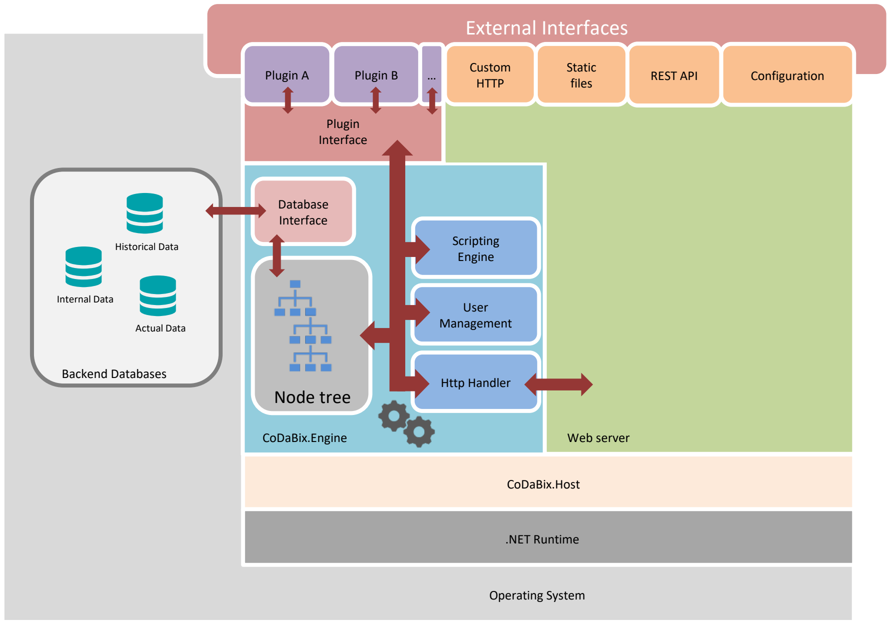
- Everything is a node
  - Only thing to handle is a node
  - Interface will not change
  - Completely mappable to **OPC UA**

- Examples
  - Controlling a connection
    - Settings are stored in nodes
      - Addresses
      - Timeouts
      - …
    - Starting and stopping is performed by writing into nodes
    - Getting the current status of a connection by reading a node
  - Accessing process data
    - A PLC variable is represented by a node
  - Remote-Procedure-Call on the server
    - A Method node is called



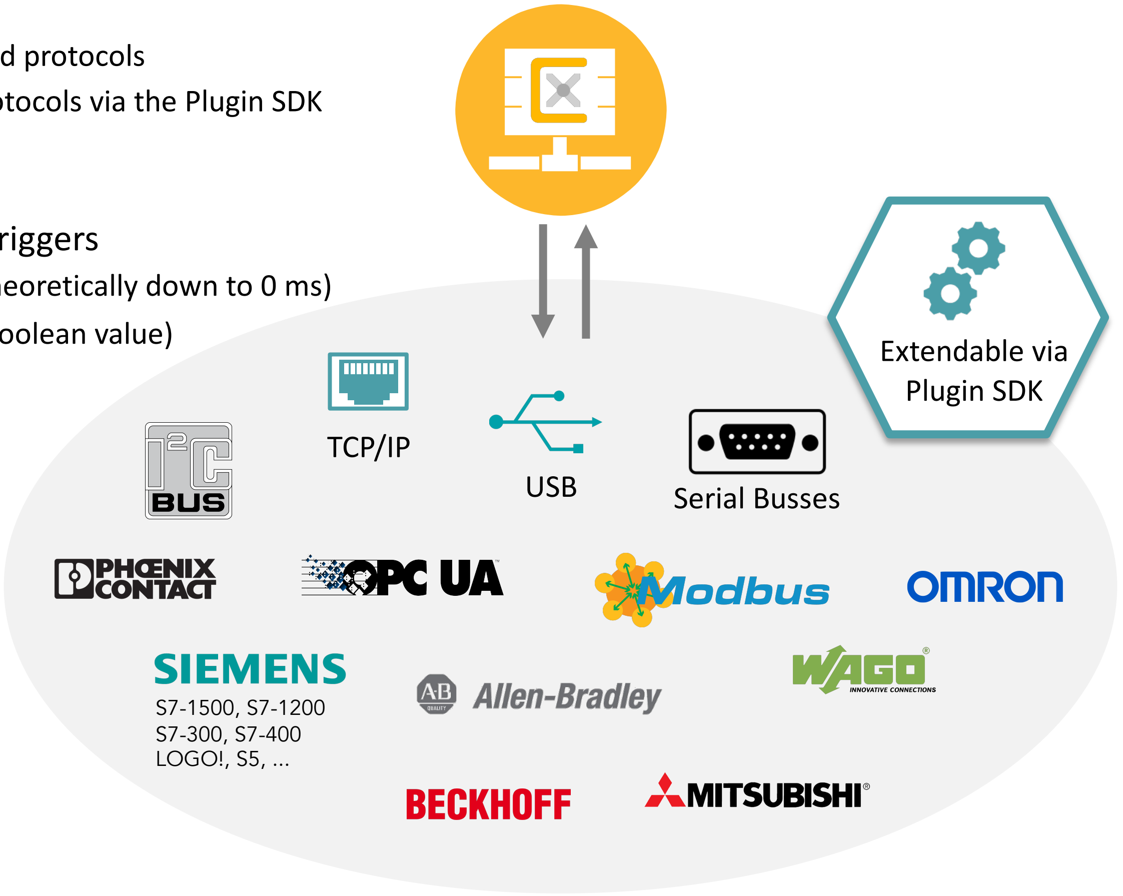
System architecture

- Modular plugin system
  - Easily extendable
  - No need to restart the system
  - Resource saving
- Integrated web server
  - Remote configuration via web technology
  - Deployment of web apps
  - Serving static files
- Database backend
  - Configuration storage
  - Historical data
- Process automation & customization
  - Online scripting engine
  - User-defined node structure



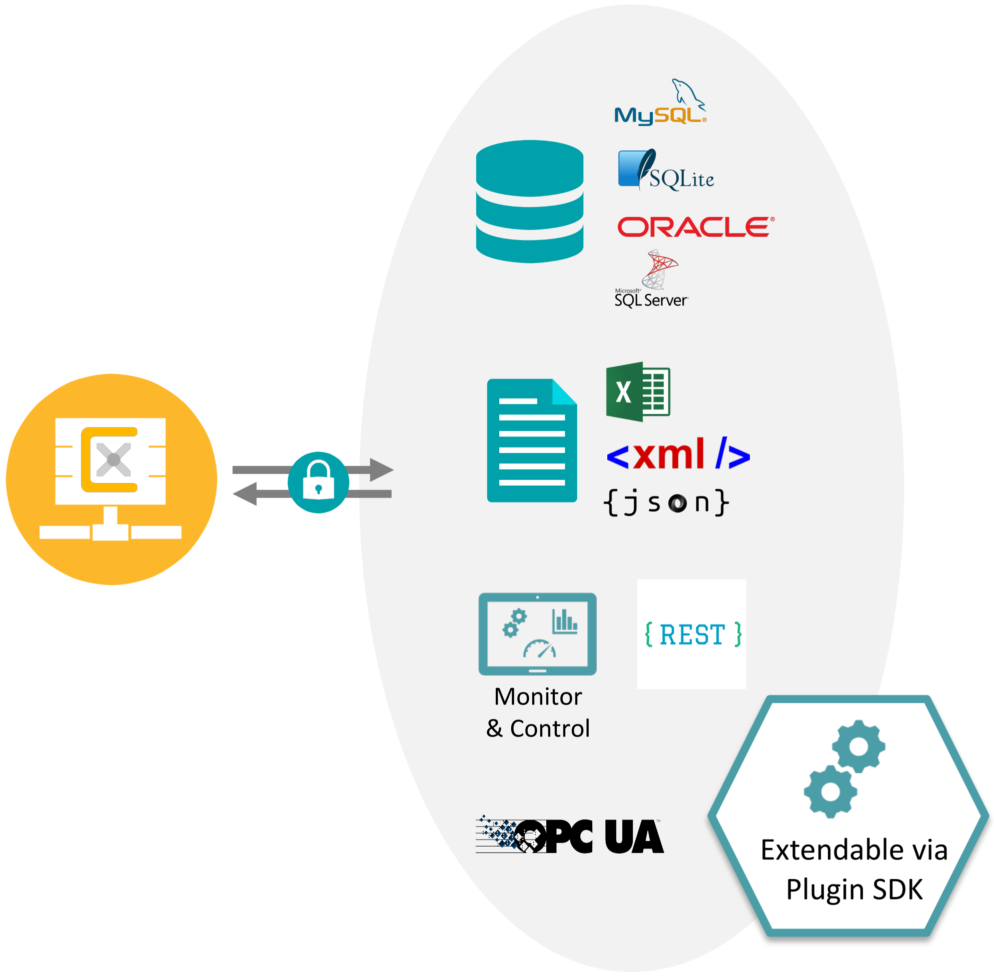
Connect to production machines and sensors

- Connect to any device
  - Plenty of already implemented protocols
  - Extendable by proprietary protocols via the Plugin SDK (upcoming feature)
- Read real time data based on triggers
  - Timer trigger (sample rates theoretically down to 0 ms)
  - Event trigger (e.g. edge of a boolean value)
  - Conditional trigger
- Create historical data
  - Integrated database
  - Snapshot a set of values
  - On value change or trigger based



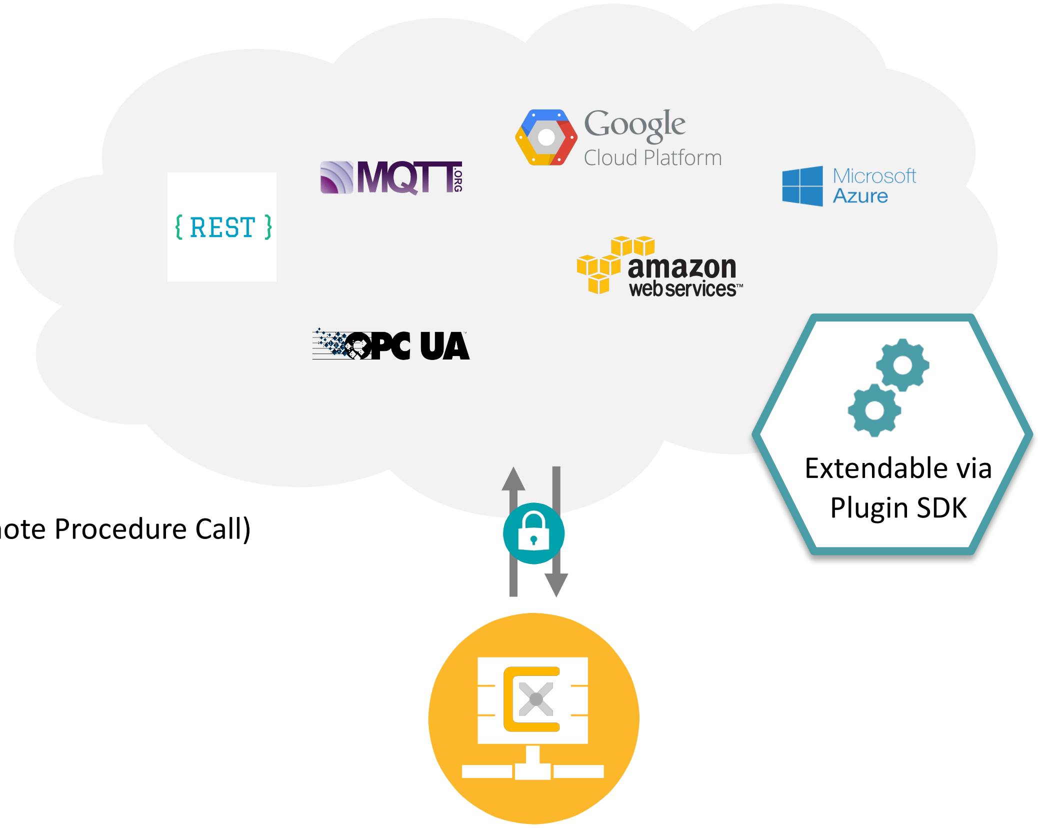
Synchronize, exchange and monitor data

- Horizontal data exchange for e.g.
  - Synchronizing workstations
  - Sharing data between MES and machines
- Export to and import from
  - Existing database
  - Structured file
- Monitor and control data in real time
  - CoDaBix® Dashboard
  - Custom HMI based on REST JSON API



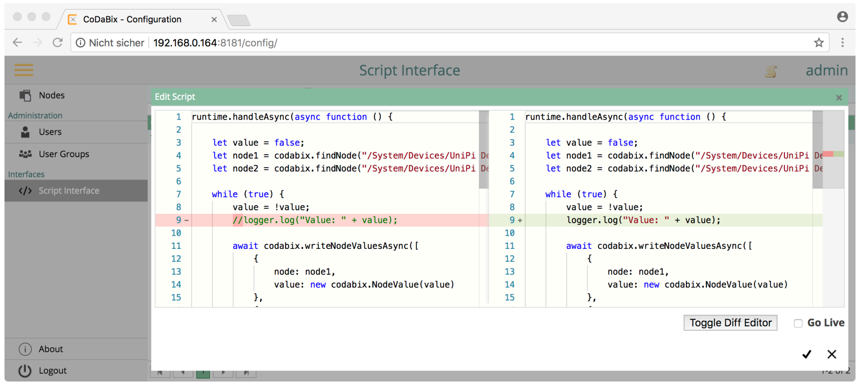
Access cloud services

- Publish your data
  - Convert data into required format
  - Execute on triggers
- Remote monitoring
  - Interpret data in real time and publish results
- Remote control
  - Fetch and validate data from cloud
  - Execute user-defined function (Remote Procedure Call)



Automate and customize with built-in Scripting Engine

- TypeScript programming language
  - Standard JavaScript libraries available
  - Interface for node access
  - Compiles to .NET Intermediate Language at runtime
- Online editor
  - IntelliSense
    - Syntax highlighting
    - Tooltips
    - Autocompletion
  - Diff view
- Use cases
  - Create conditional triggers
  - Process data
  - Automate the control of machines and processes
  - Export data to files
  - Add custom functionality



```
runtime.handleAsync(async function () {

    let value = false;
    let node1 = codabix.findNode("/System/Devices/UniPi De
    let node2 = codabix.findNode("/System/Devices/UniPi De

    while (true) {
        value = !value;
-       //logger.log("Value: " + value);

        await codabix.writeNodeValuesAsync([
            {
                node: node1,
                value: new codabix.NodeValue(value)
            },
```

```
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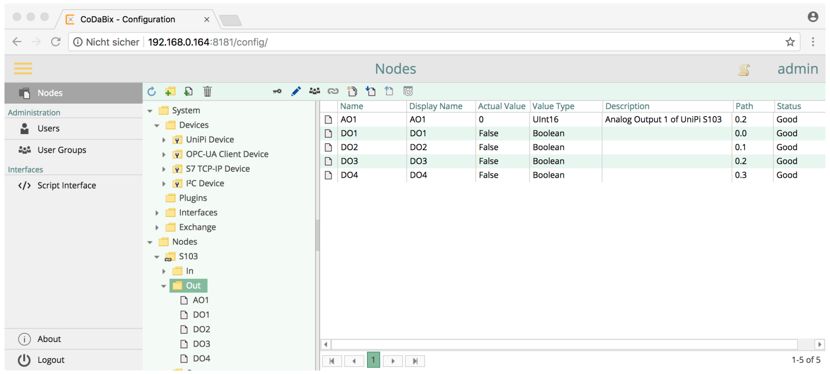
Configuration and administration

- Configuration via web interface
  - Remote access
  - Browser based
  - No compatibility issues
- Node management
  - Create node links
  - User defined node structure
  - Import and export configuration as XML
- Access control
  - User groups management
  - Configurable for every subtree
- Operation of CoDaBix®
  - Execution as system service
  - Backup functionality

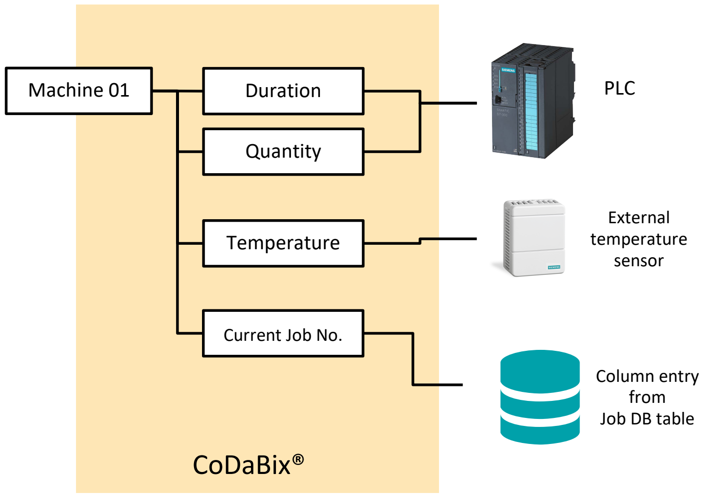


Name	Display Name	Actual Value	Value Type	Description	Path	Status
AO1	AO1	0	UInt16	Analog Output 1 of UniPi S103	0.2	Good
DO1	DO1	False	Boolean		0.0	Good
DO2	DO2	False	Boolean		0.1	Good
DO3	DO3	False	Boolean		0.2	Good
DO4	DO4	False	Boolean		0.3	Good

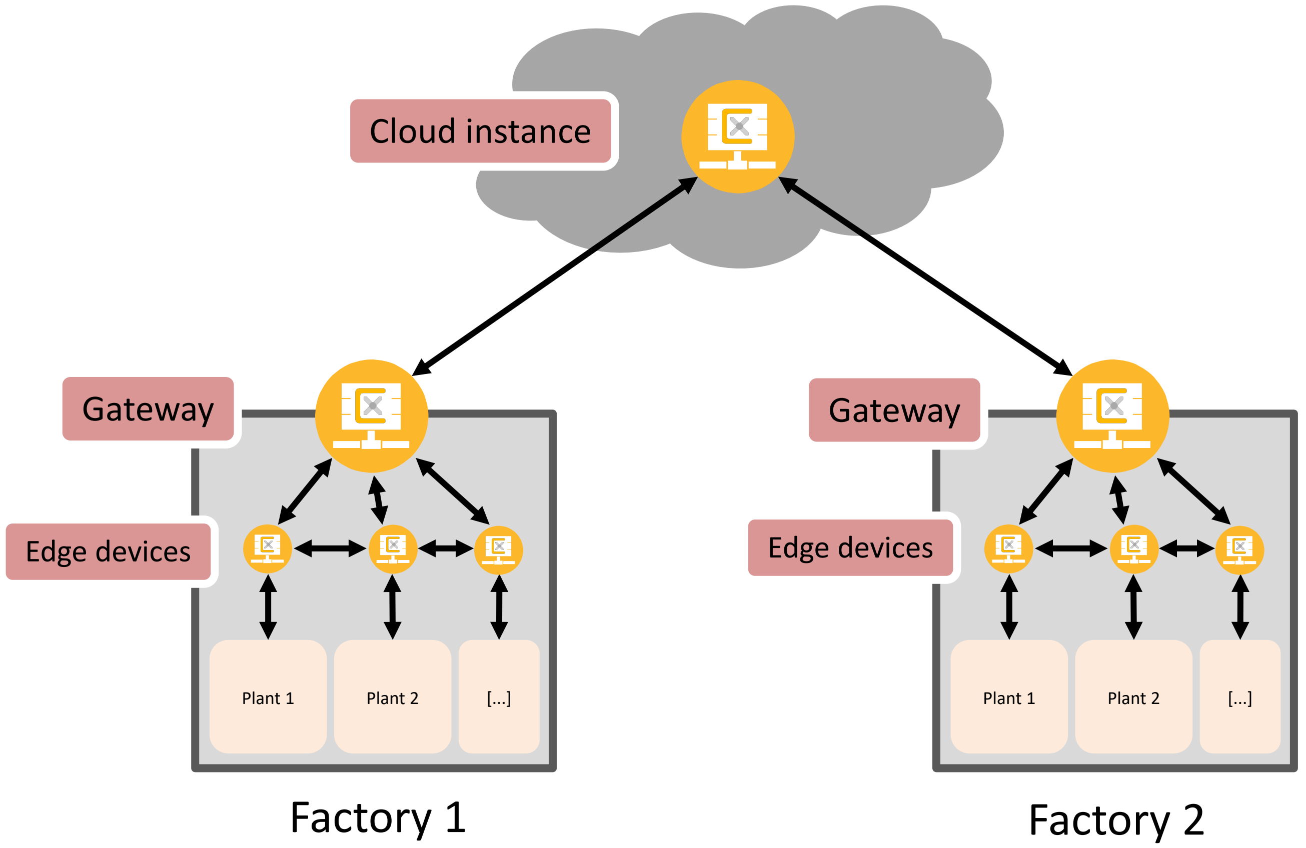
Unify, harmonize and extend interfaces

- Node structuring and linking
  - Design interfaces according to requirements
  - Restructure machine data
  - Aggregate data from various sources
  - Decouple interface from underlying data source

- Custom node action handler
  - Implement virtual machine nodes
  - Handle data conversion and scaling on the fly
  - Create notifications on definable conditions



Uniform infrastructure



Cascade multiple CoDaBix instances

- Data collection
  - Collect and buffer data locally
  - Bundle and publish data
  - By-pass connection breakdowns
- Remote Management
  - Configure and manage plugins
  - Roll out updates
  - Configure Operating System properties
- Private Cloud
  - Keep your data local
  - Integrated historical database
  - Access data via interfaces
    - REST JSON API
    - OPC UA Server
    - MQTT

Supported systems

- Operating Systems
  - Windows 7 SP 1, Windows 8, Windows 10 (with .NET Framework 4.7.2)
  - Windows Server 2008 and upwards
  - Every OS supported by the .NET Core Runtime
    - Linux
      - Red Hat Enterprise Linux
      - CentOS
      - Oracle
      - Fedora
      - Debian
      - Ubuntu
      - Mint
      - openSUSE
      - Alpine Linux
    - Mac OS 10.13 and upwards
    - Docker Container
- Hardware
  - Recommended: Dual-Core CPU, 4 GB RAM
  - Runs on Raspberry Pi 2, 3 and 4
  - ARM32, ARM64, x86, x64 platforms

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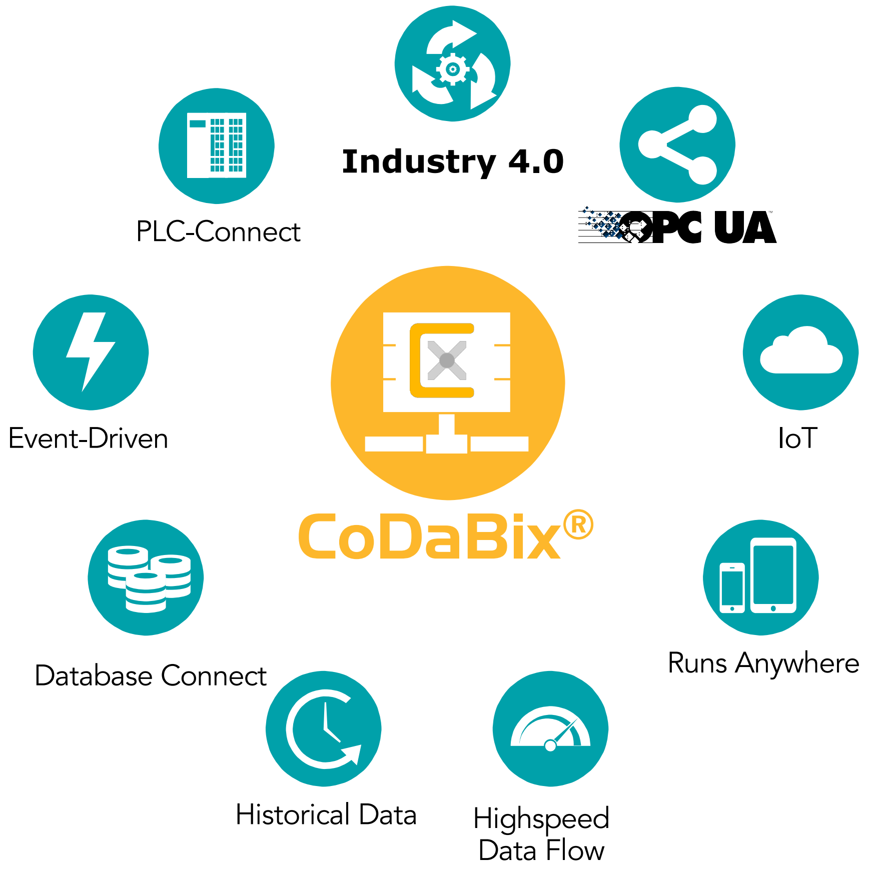
Industry 4.0
PLC-Connect
OPC UA
Event-Driven
IoT
CoDaBix®
Database Connect
Runs Anywhere
Historical Data
Highspeed Data Flow