



# Breaking Through All The Bits And Bytes To Bring Real Information Modeling To The Factory Floor

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# For those not familiar with Industrial Automation...

History...

Practices...

Limitations...

*Setting  
the Stage*

# Over 100 Years of Manufacturing....

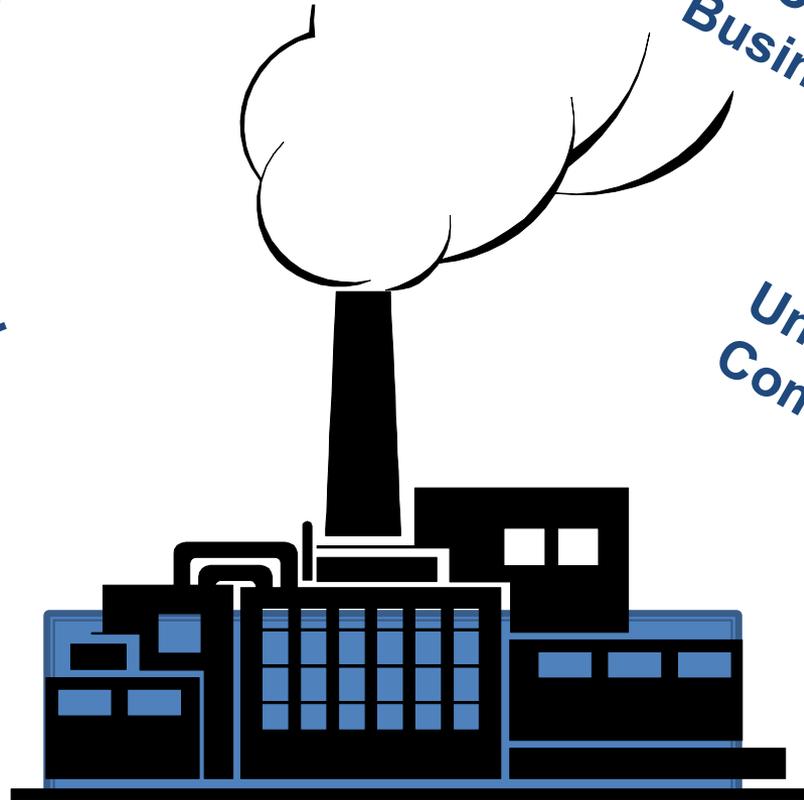
Little Ability to Externally Monitor...

Manual Recording...



Limited & Painful Connections to Business Systems...

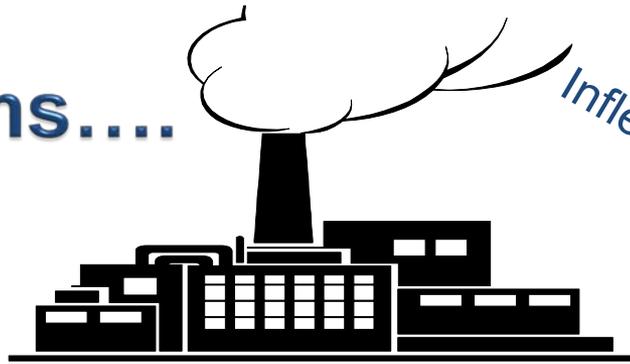
Unsecure Communications...



# Brittle Systems....

Limited Data Types

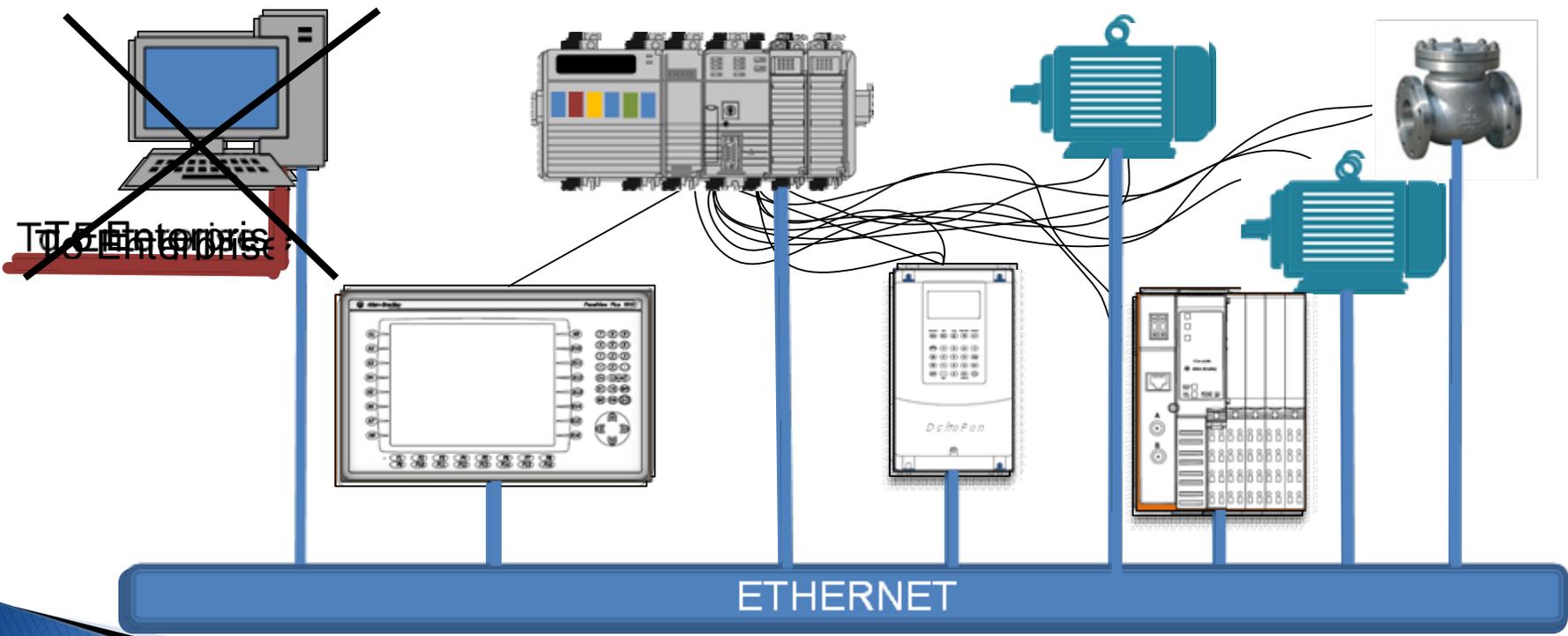
Incomplete Data Models



Inflexible Communication Model

Tightly Coupled Control

Inaccessible Data



# Many Problems To Solve

1. No Consistent Data Typing
2. No Access To Non-Control Data
3. No Consistent Access To Service Data
4. Difficult to Conform to Industry Standards
5. Only Point-to-Point Extensions
6. Inconsistent Mechanisms for Program Execution

**\$\$\$ - Expensive Integration Efforts**

....And Much Much More...

# Problems Not Limited to Factory Floor



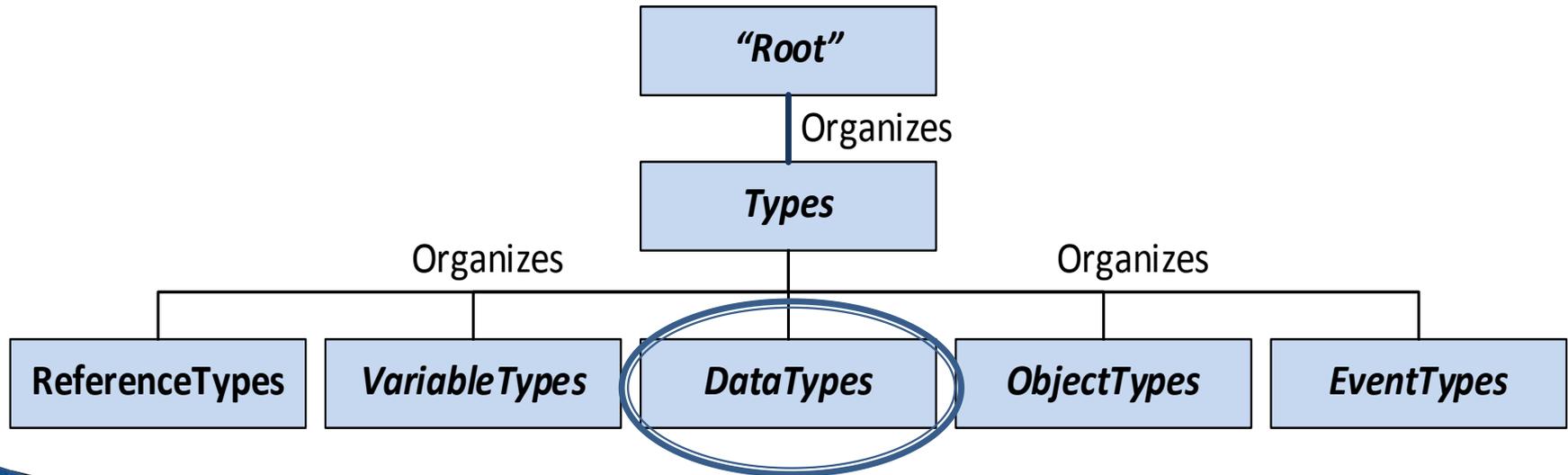
# Problems Are More Acute

1. More Data
2. Mobile Access
3. Integration of Enterprise and Devices
4. Archiving of More Data
5. IT People Wanting Access to Factory Data
6. More Dashboard Type Applications
7. More Database Type Applications
8. More Cloud Type Applications

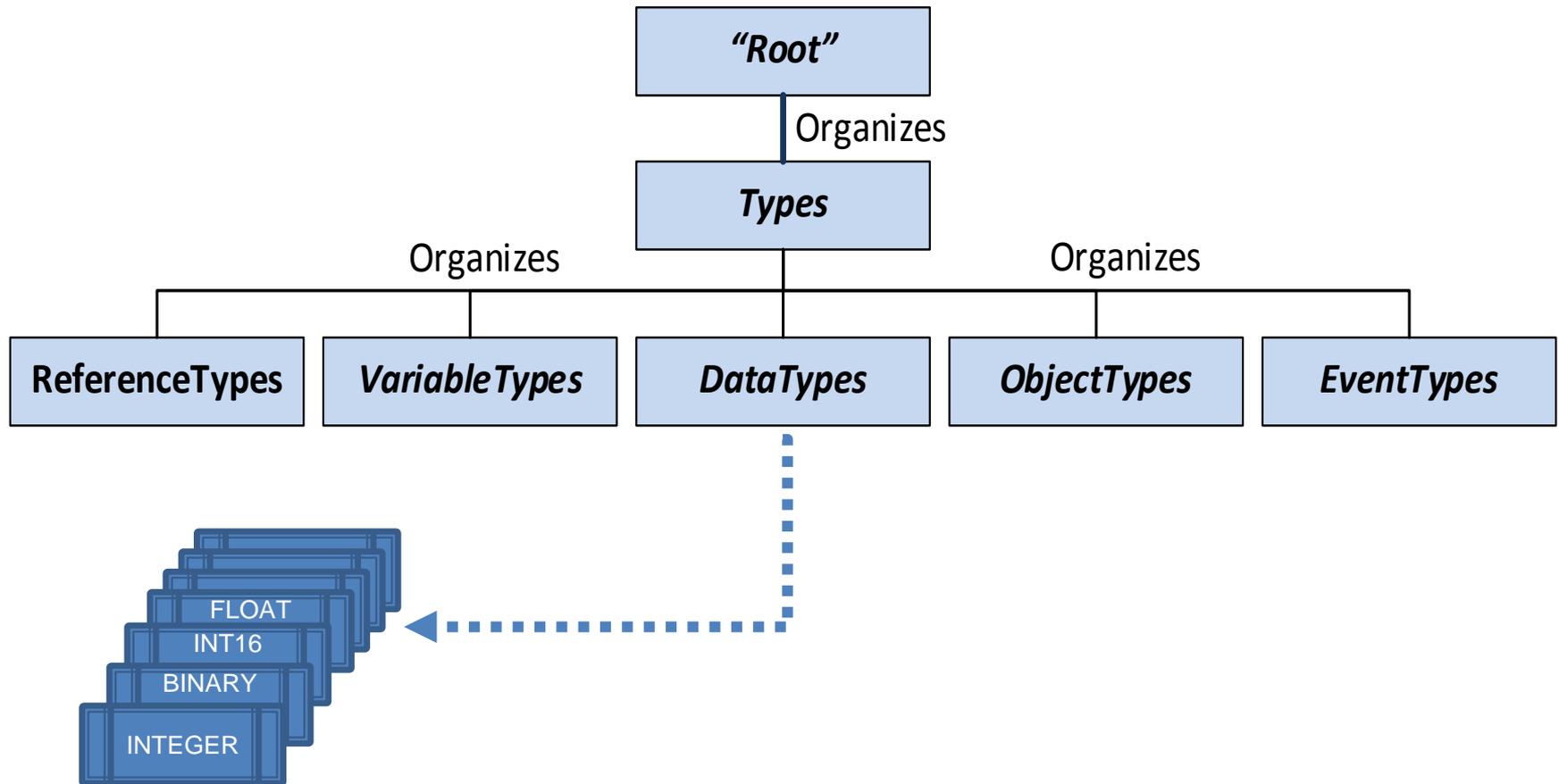


# OPC UA Data Type Model Overview

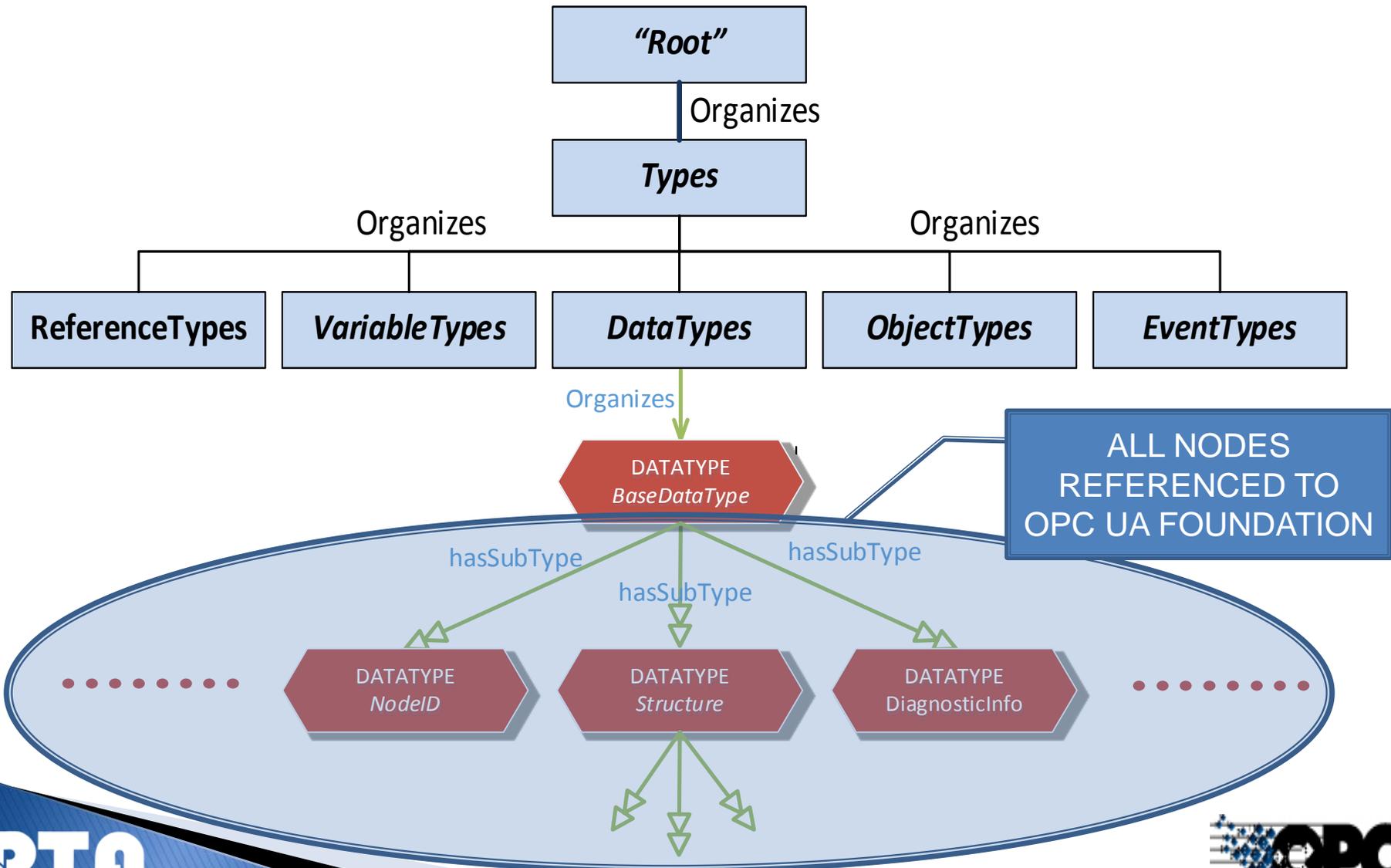
- ▶ Consistent Set of Built-In Data Types
- ▶ Set of Standard Types well-known UA Devices
- ▶ Extensible Type System
- ▶ Discoverable Types
- ▶ Types in the Address Space



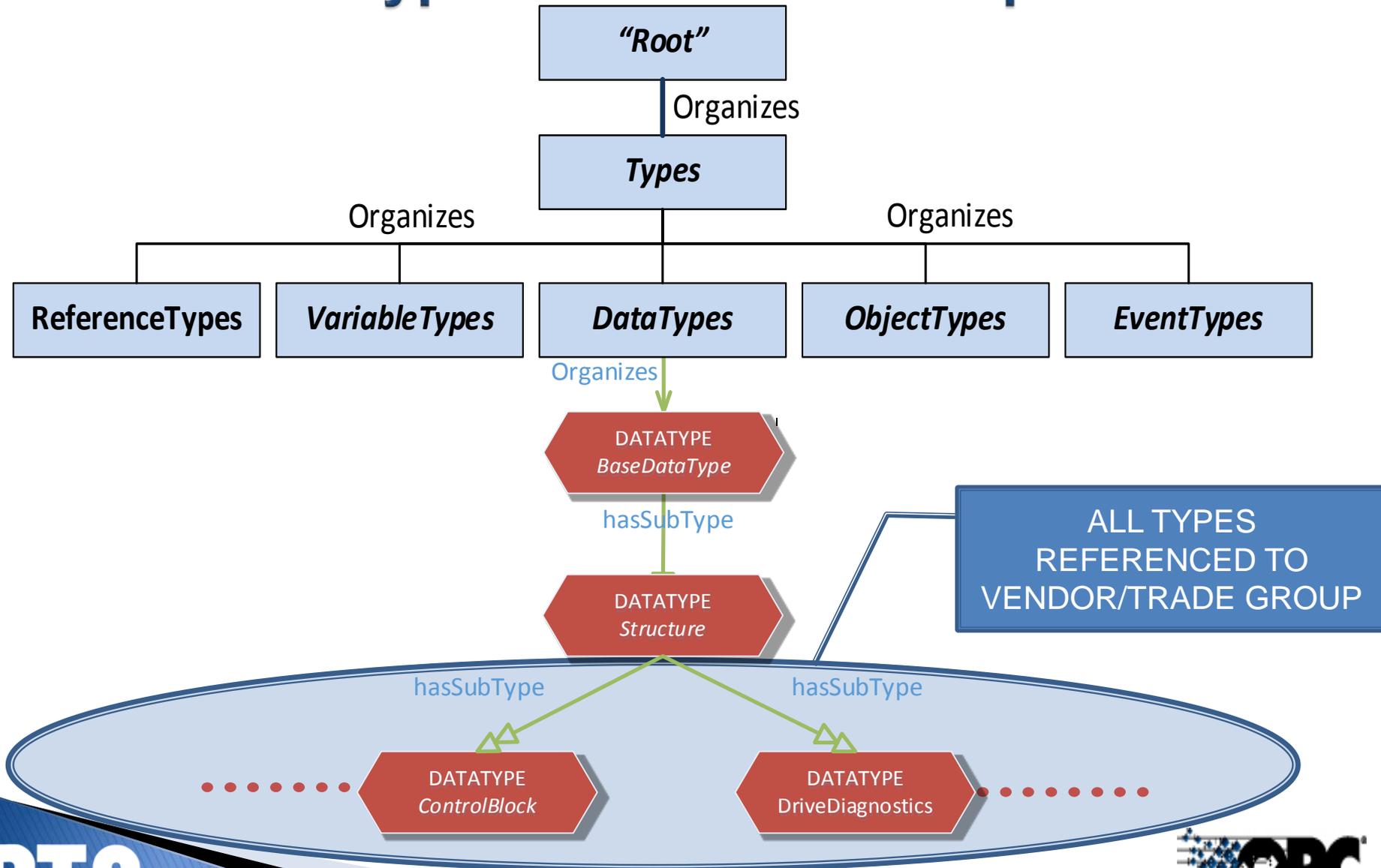
# Built In Types – Understood by all devices



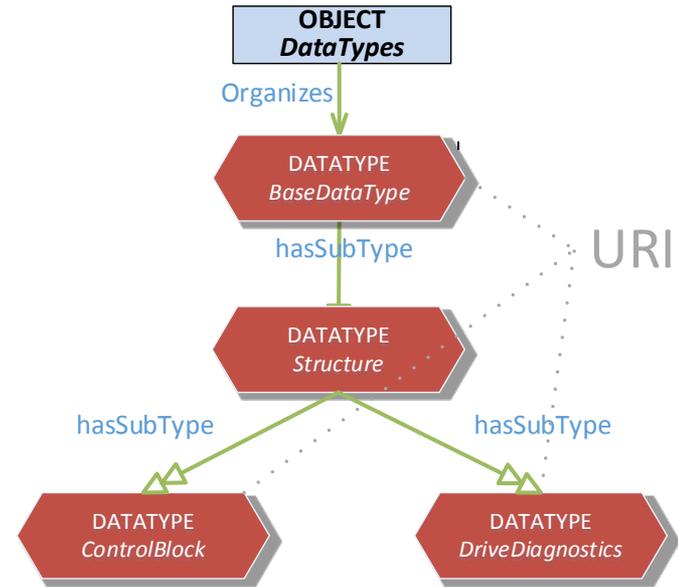
# Standard Types – Specific to UA



# Extensible Types – Vendor / Group Defined



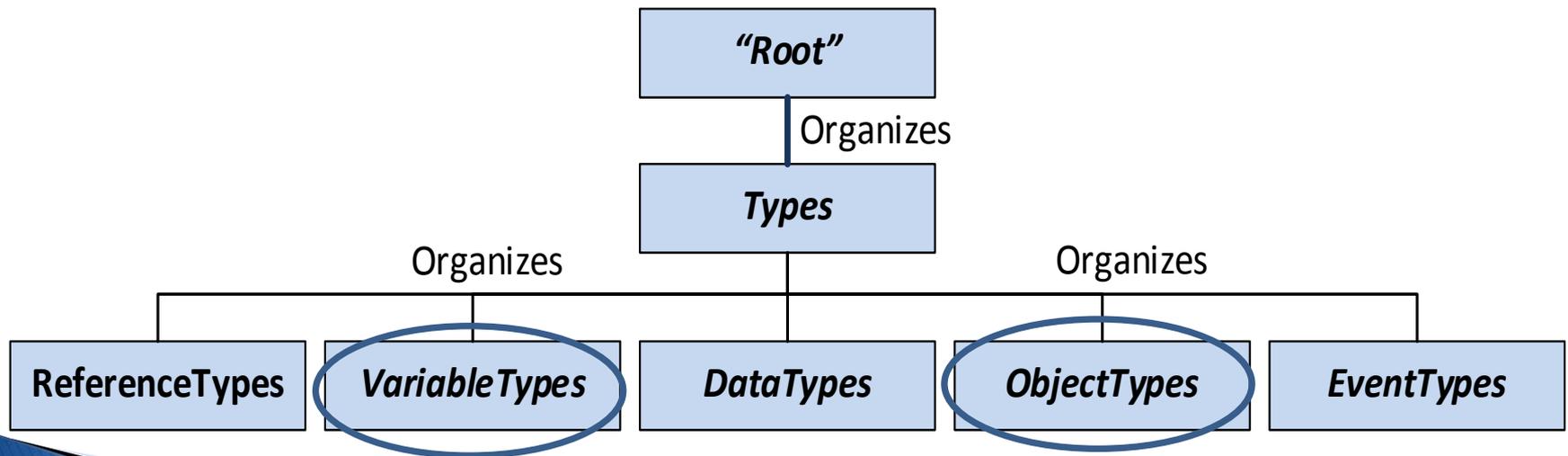
# Benefits Of The OPC UA Data Type System



- ➔ Provides Consistent Data Types for Common Types
- ➔ Clients Can Identify & Trace Type Definitions
- ➔ Clients Can Discover, Understand, Use New Types

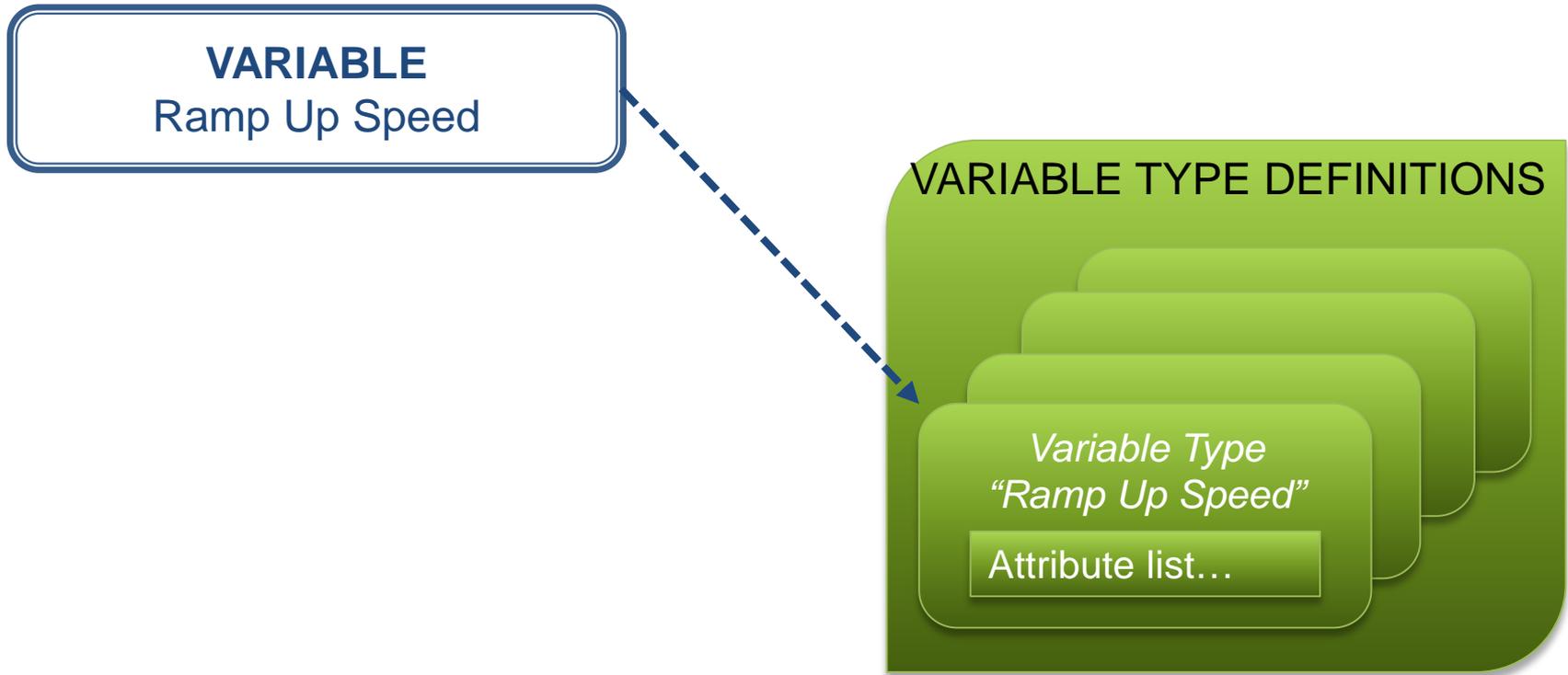
# OPC UA Object Type Model

- ▶ Variables, Objects or Groups of Objects
- ▶ Reusable and consistent across multiple applications
- ▶ Extensible & Discoverable
- ▶ Types in the Address Space



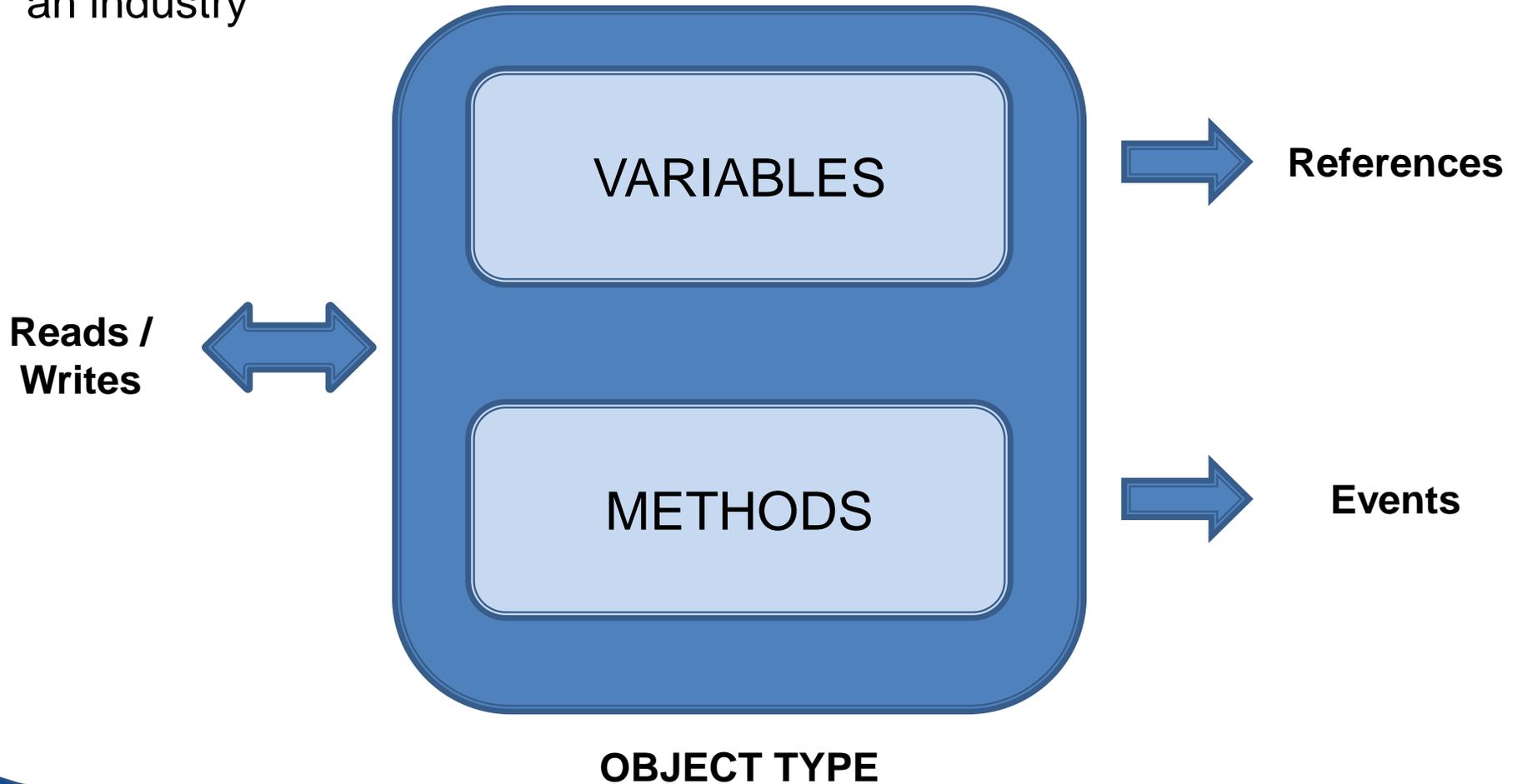
# Variable Types

Consistent reliable reusable variables throughout a device, process or industry wide applications



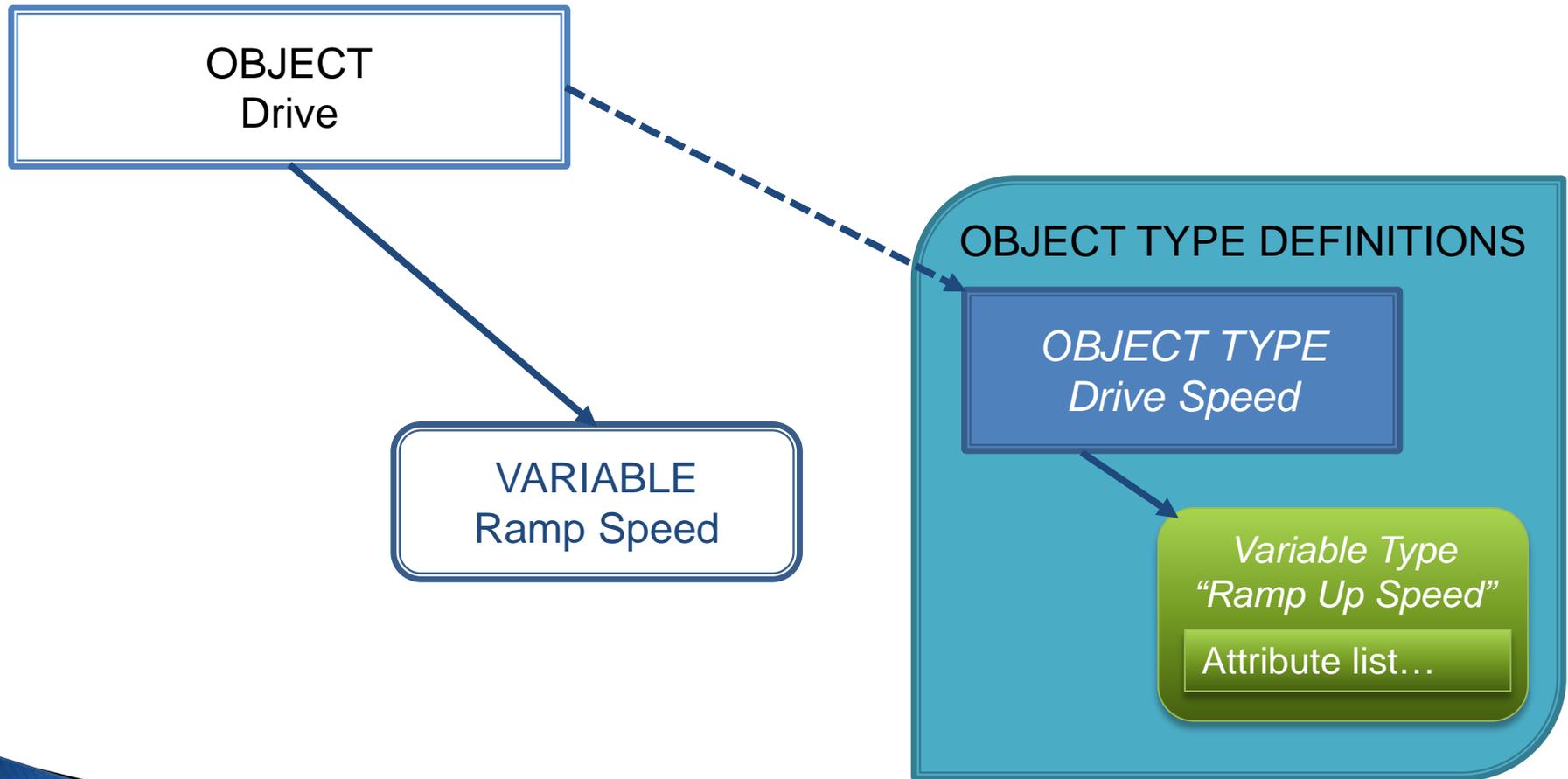
# Object Types

Consistent reliable reusable objects throughout a device, a process or an industry



# Simple Object Types

Object types can represent simple items

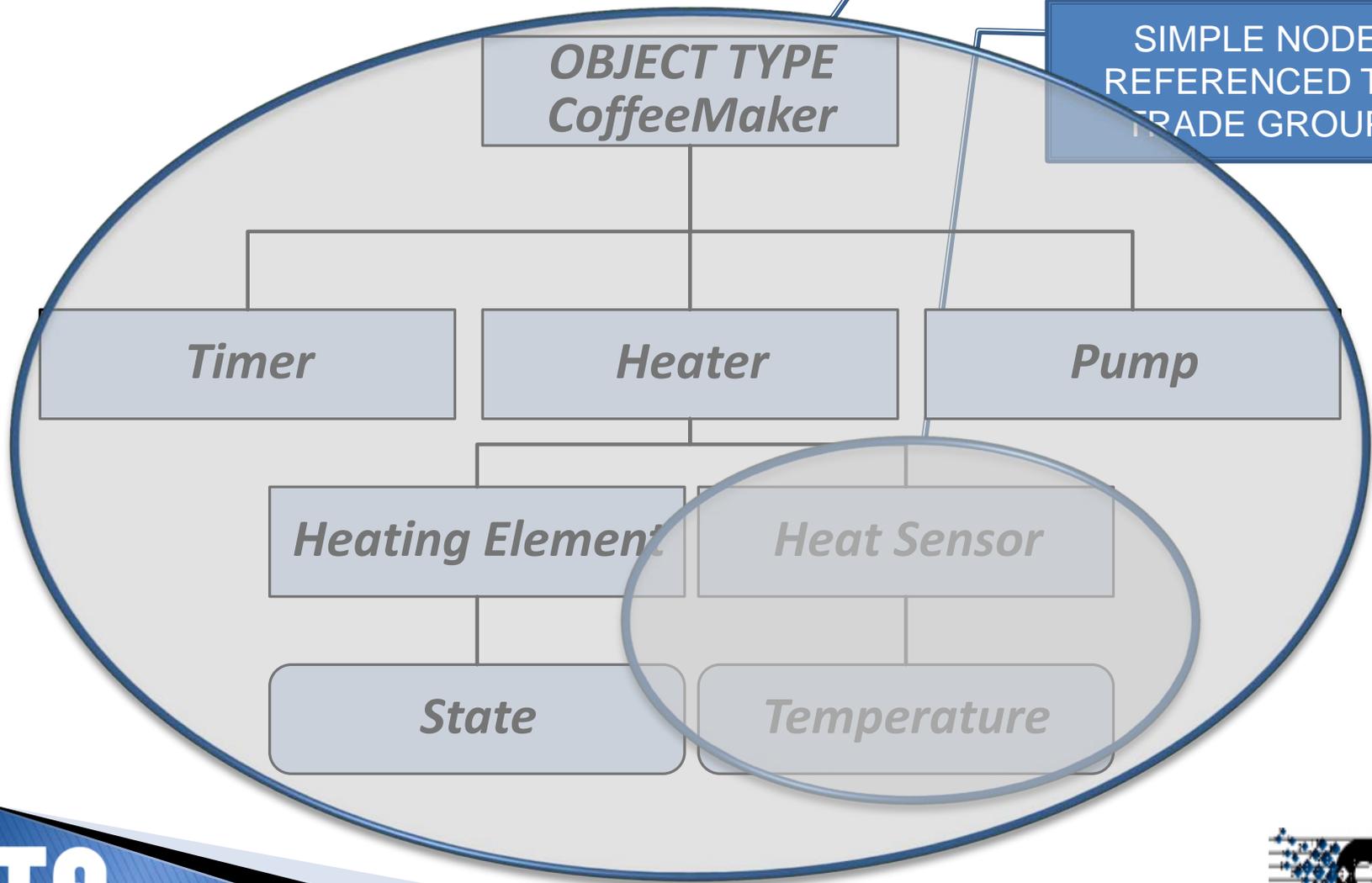


# Complex Object Types

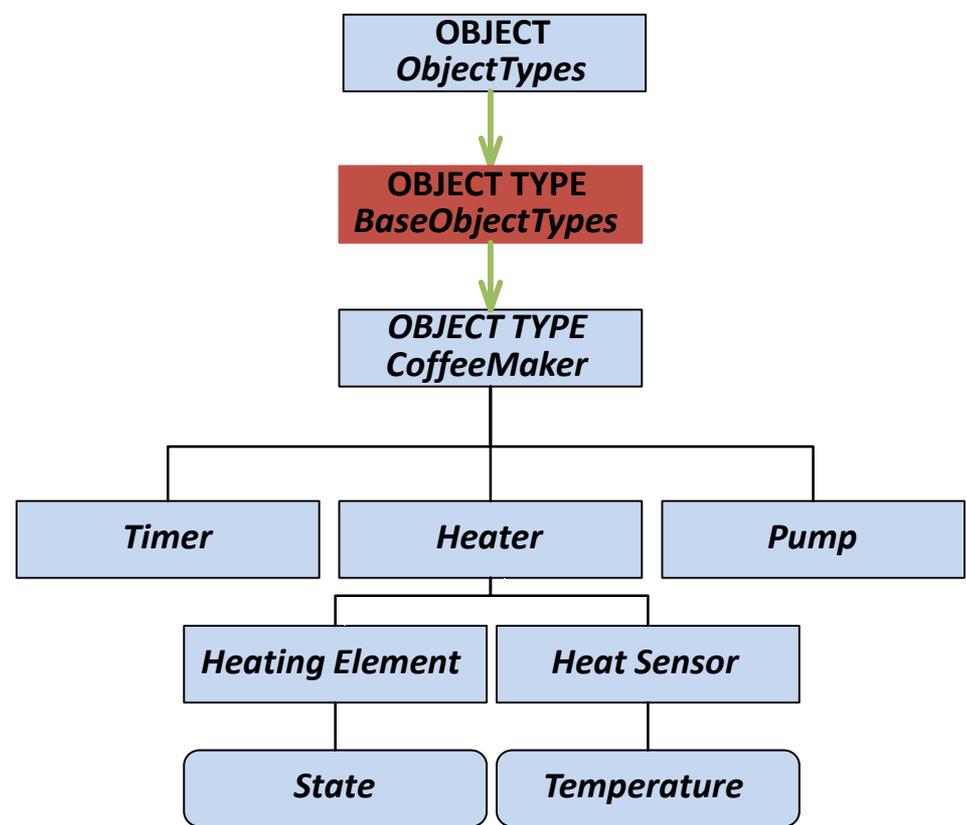
Object types can represent machines, processes or anything else.

ALL NODES  
REFERENCED TO  
TRADE GROUP

SIMPLE NODE  
REFERENCED TO  
TRADE GROUP



# Object Typing



- ➔ Clients Can Identify & Trace Type Definitions
- ➔ Provides Consistent Models for Components, Devices, Processes, Lines or Plants
- ➔ Clients Can Discover, Understand, Use New Types

# OPC UA PROVIDES MORE PEOPLE WITH MORE ACCESS TO MORE DATA...

Problem: Consistent Access To  
Data from Device to Device

Solution: Standardized,  
Discoverable, Consistent Types

Problem: Current Systems  
Deliver Data NOT Information

Solution: UA Designed To  
Deliver Information

## INFORMATION



## MODELING

Problem: Tedious and Difficult to  
Configure Client Devices

Solution: Standard Models  
Provide Ease Configuration

Problem: Difficult To Deploy  
Industry Wide Info Models

Solution: Models Referenced To  
Trade Group Standards

# Industrial Generator Manufacturer



→ System Design Difficulties

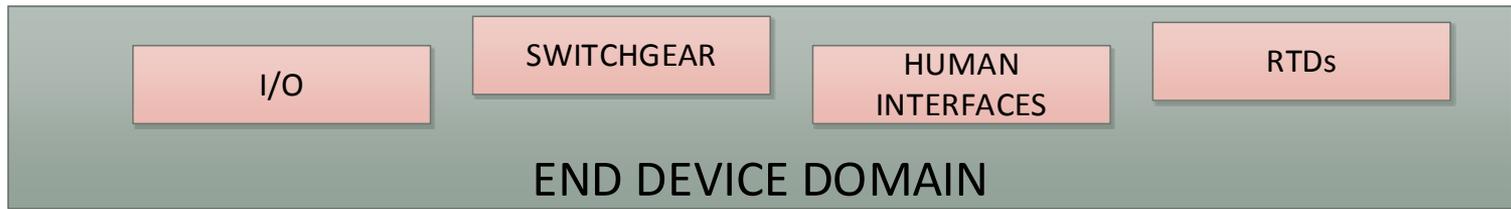
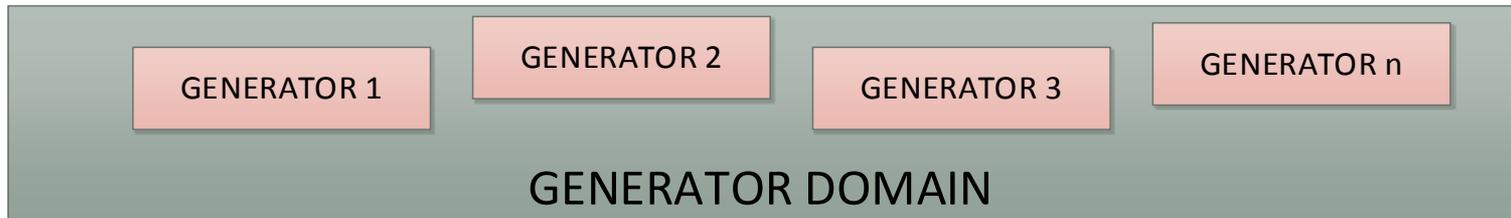
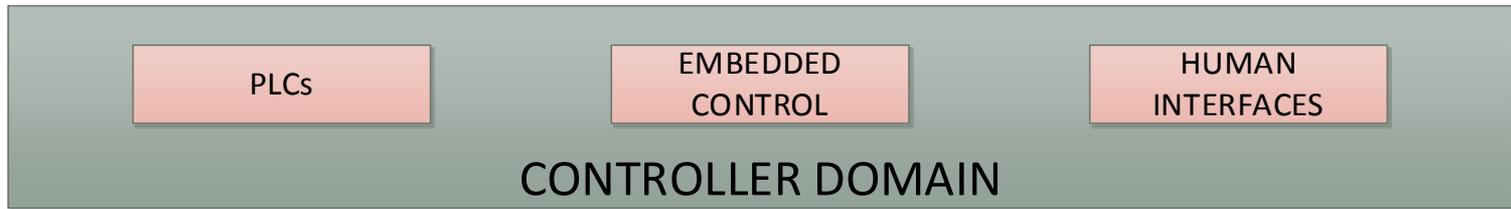
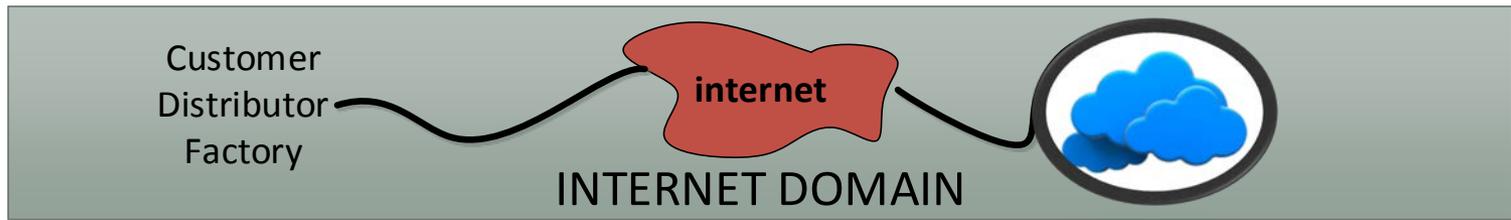
→ Integration Issues

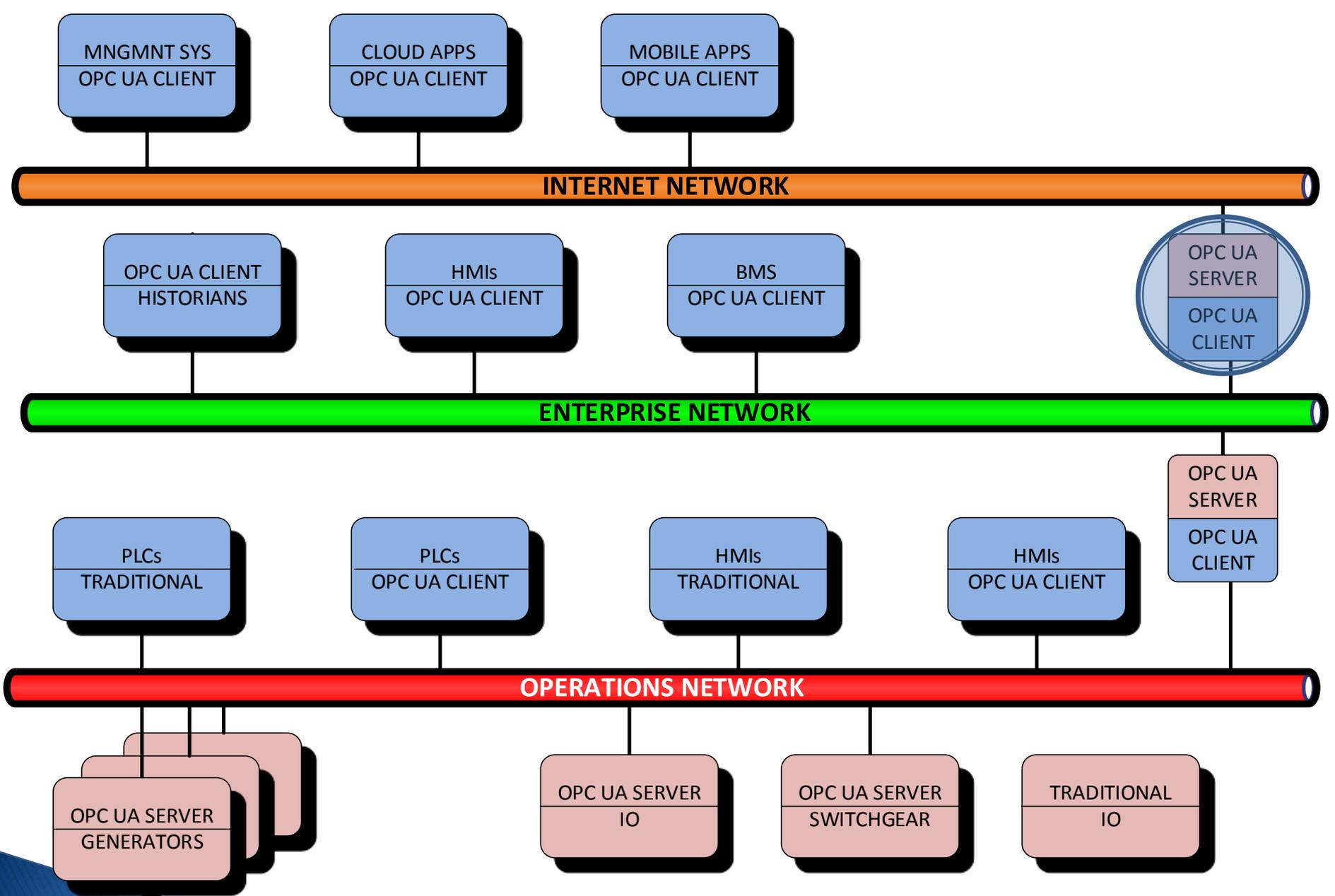
→ Lack of Secure Data Transfer

→ Data Consistency

→ Hard to Integrate with Business Systems

→ Phone & Tablet Access





# Benefits of OPC UA Support



➔ Ease of System Design

➔ Ease of Integration

➔ Data Consistency

➔ Secure Data Transfer

➔ Integration with Customer Business Systems

➔ Phone & Tablet Access



## Software Stacks

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## Industrial Automation Gateways



## Development Services