

IECEx

O-PAS™, THE STANDARD OF STANDARDS, & INDUSTRY 4.0



GLOBAL Road Show

—
KNOWLEDGE WITHOUT BORDERS

smar
Technology Company

PATS

Smar Technological Update Program

WHO WE ARE



SMAR has headquarter in São Paulo, the richest Brazilian state, it has major industrial complex and infrastructure of ports, international airports, highways and railways. Responsible for 33.9% of the Brazilian GDP.

SMAR brand was created in 1974, specialized in providing industrial process control and automation solutions.

SMAR develops, manufactures and sells instruments, Controllers, hardware and software for the measurement, control, operation and management of maintenance assets. Provides Project, Factory Acceptance Test, Site Acceptance Test, Site Integration Test, Commissioning, Start-up, fieldbus certification and Technical Assistance services.



OUR HISTORY | TIMELINE



70s

Control Panel

Digital Distributed Control System
Single loop controller
Multi Loop Controller

80s

Supervision Software
Digital Field Interface FF
Programmable logical controller

90s

HART controllers,
Foundation Fieldbus and
Profibus DP
Flow Computer
System302 Solution

2000s

Evolution of System302
More powerful controllers
Asset Management

2010s

O-PAS Configurator
IoT, MobileHMI, AutomationML,
FB Technology
Orchestration

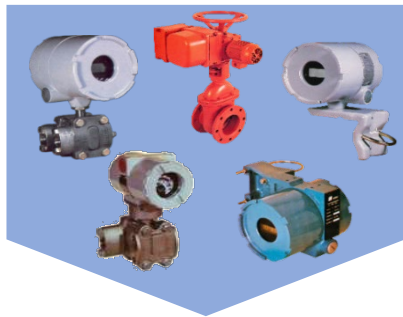
2020s

system 302
Open Digital Ecosystem

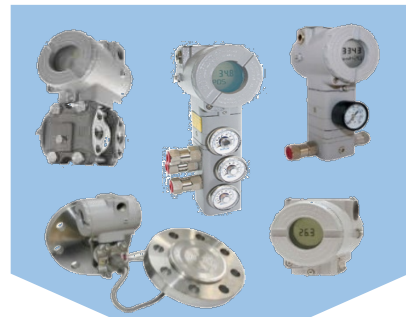
THE OPEN GROUP
OPEN PROCESS AUTOMATION™
FORUM



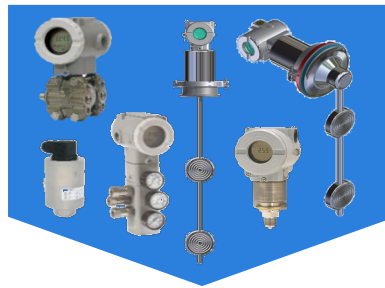
April 1974,
Smar was born



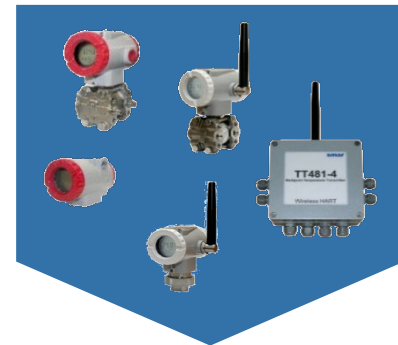
Capacitive Cell Pressure
Sensor
Analog Transmitter
Electric Actuator



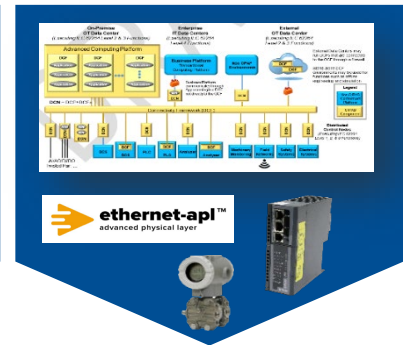
Pneumatic Positioner and
Converters
HART, Foundation Fieldbus
and Profibus PA technologies



High Performance
Transmitter
Density and Concentration
Transmitter
In-Line Transmitter



SIL transmitters
wireless transmitters



APL transmitters
O-PAS DCNs



smar
First in Fieldbus



THE *Open* GROUP

Leading the standards development and open / neutral technology certification for manufacturers and suppliers

The Open Group is a global consortium which promotes business through the use of technology standards

More than 800 companies which include customers, systems and solutions suppliers, tools developers, system integrators, academical institutes and consultants in several knowledge fields



MISSION: standard based, open, safe and interoperable process control architecture

The forum is a group based on end users, suppliers, systems' integrators, standards organizations and academies consensus.

It addresses technical and commercial questions for process automation purposes.

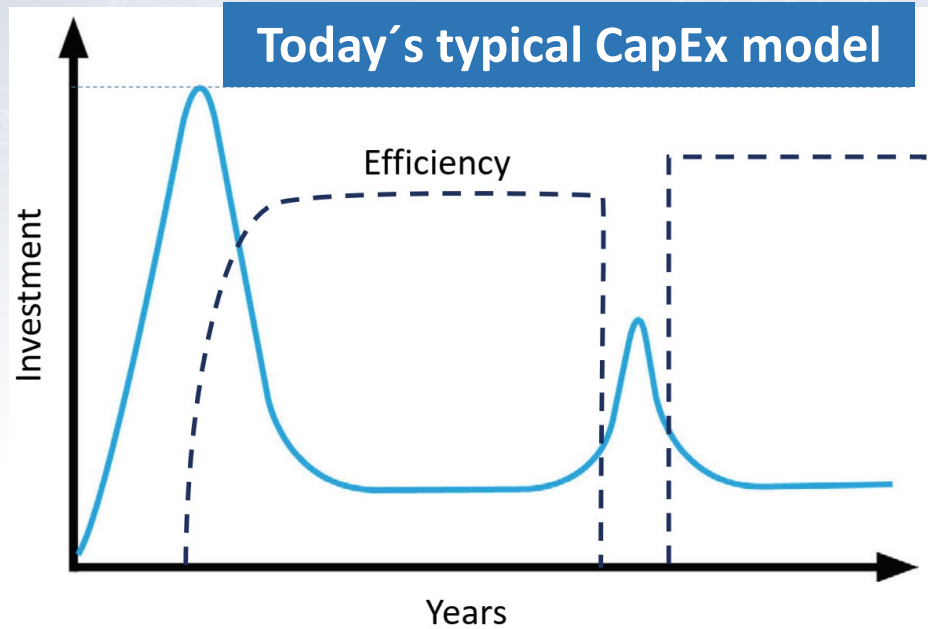
OPAF Members – Partial List

PATS

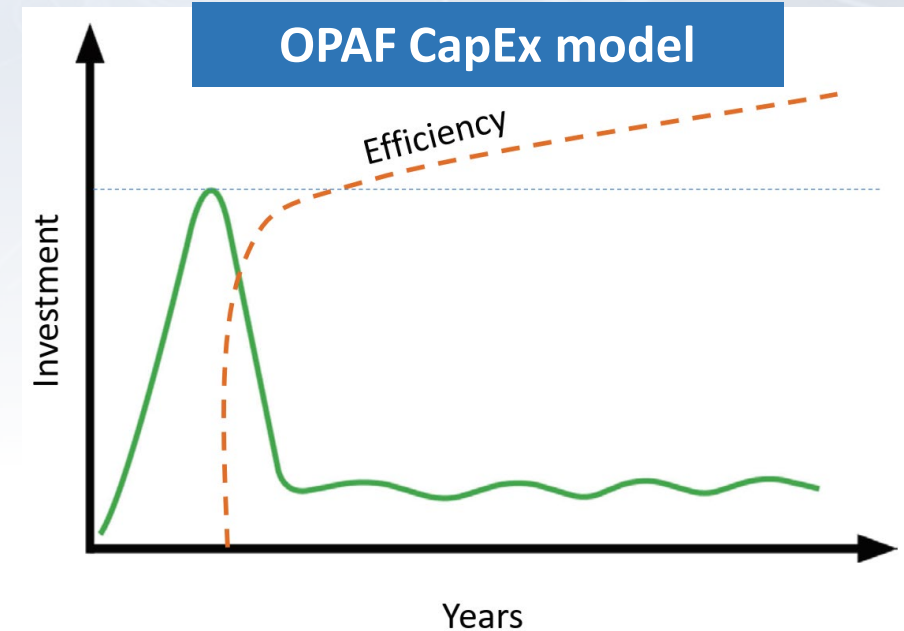


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OPA-S: Economic Benefits



- High initial investment
- Small or no incremental improvement
- Long plant stops for upgrade



- Low initial investment
- Constant incremental improvement
- Increased efficiency over time
- Flexibility
- No plant stops for upgrade

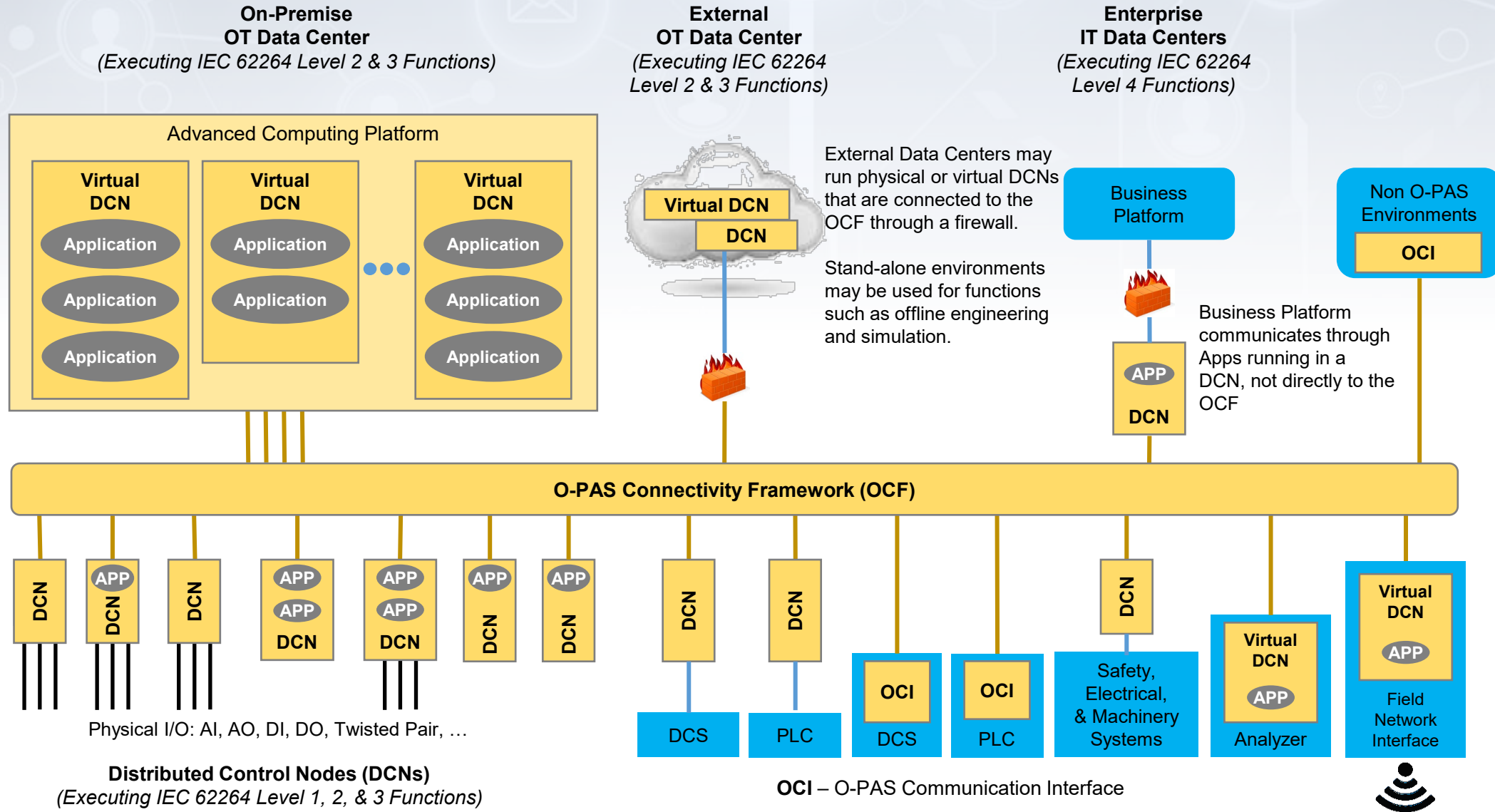
<https://cplaneai.com/resources/>

source: "Open Standards in Process Automation The Key to Industrial Profitability" White Paper, CPLANE.ai, 2018.

A central objective of OPAF is to enable the development of **process automation systems** with components from **multiple vendors without** the need for **custom integration**. This requires a high level of the following quality attributes:

- Interchangeability;
- Interoperability;
- Portability;
- Modularity.

O-PAS™ – Open, distributed, heterogenous, multi-vendor control system



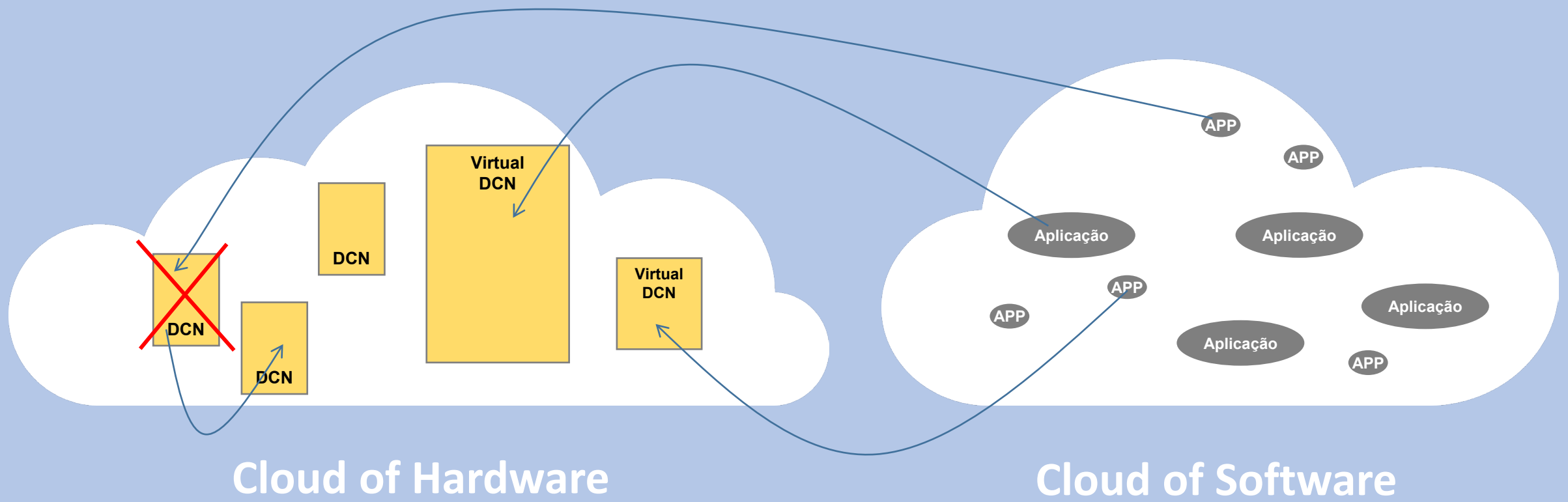
Legend

- O-PAS Conformant Component
- Non O-PAS Conformant Component

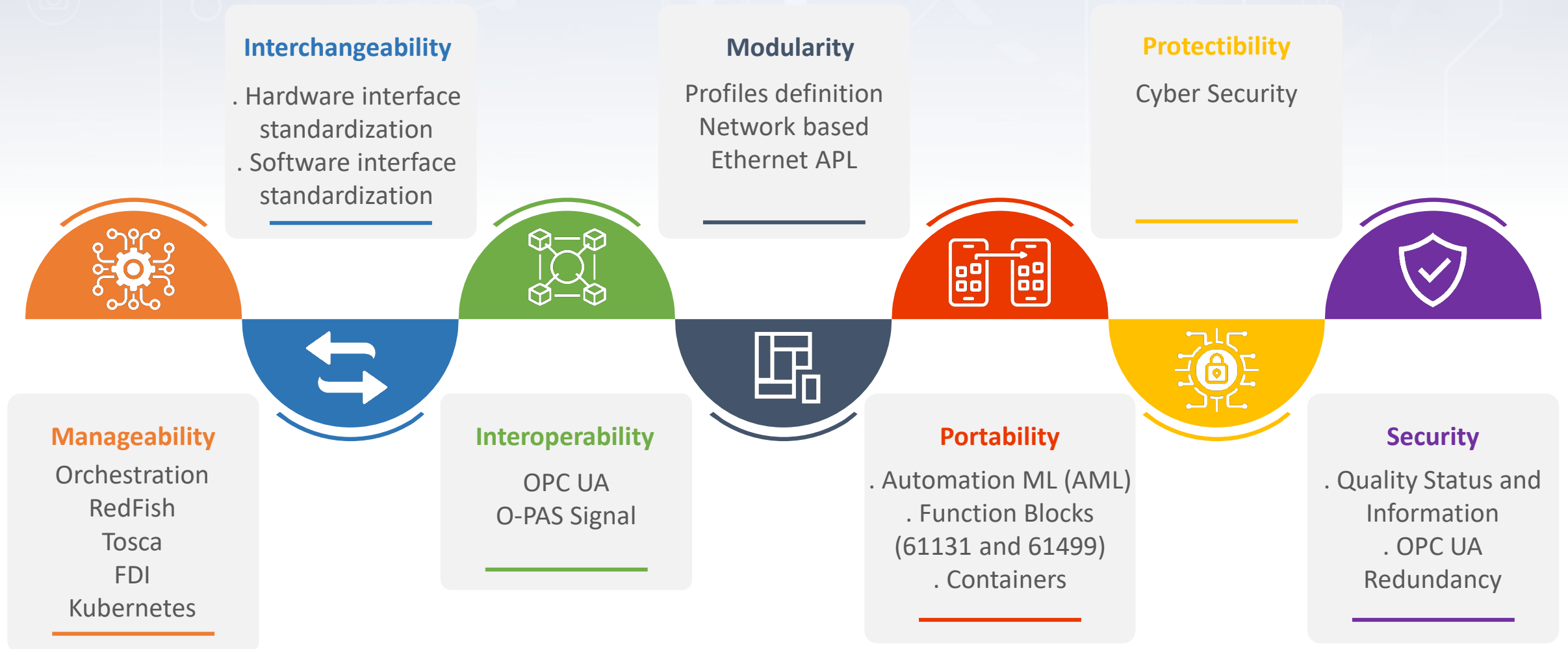
O-PAS Architecture – HW and SW decoupling



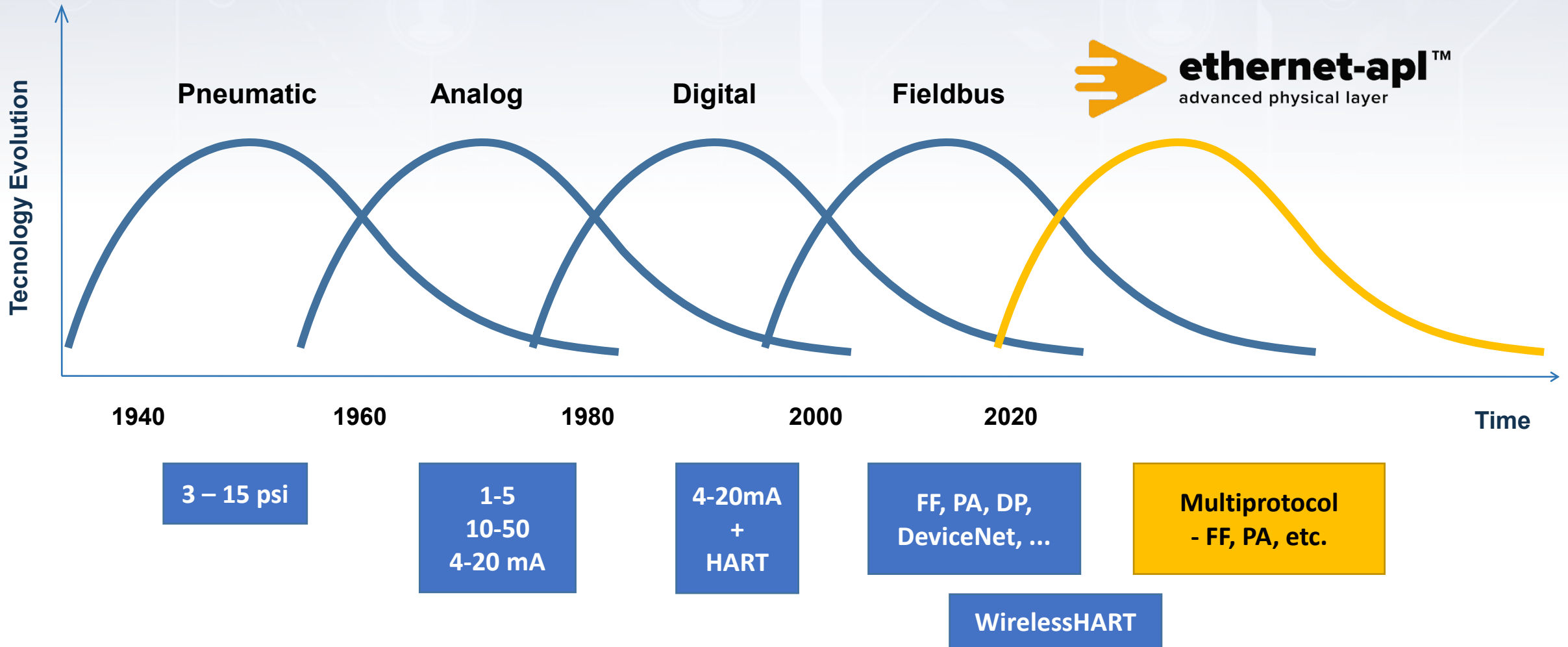
O-PAS Architecture – HW and SW decoupling



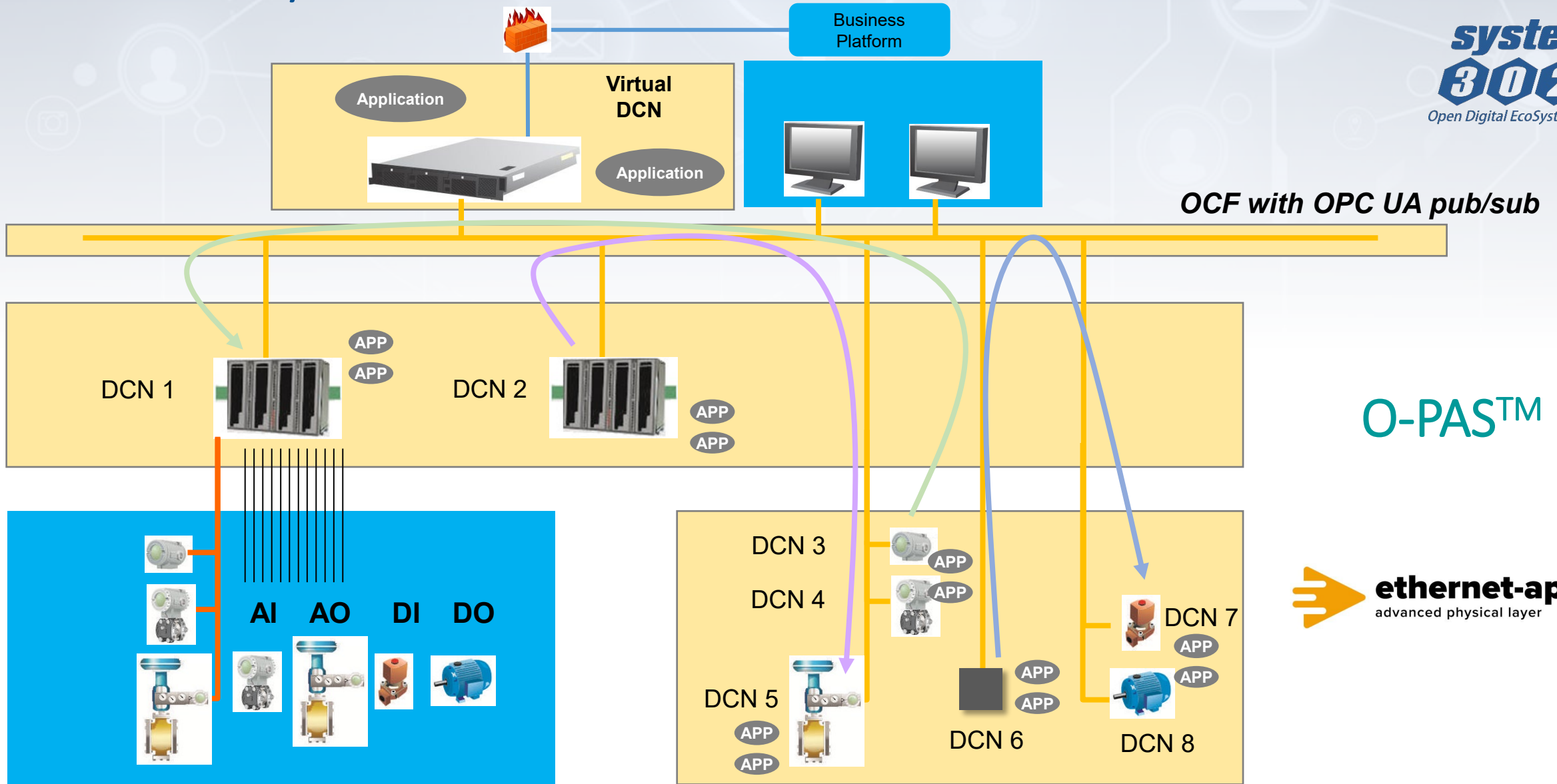
Specifications x Quality Attributes



Modularity – Ethernet APL

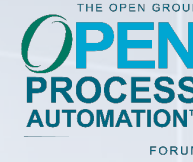


Modularity – Ethernet APL



System302 with Nova Line

New Options of Control and IOs



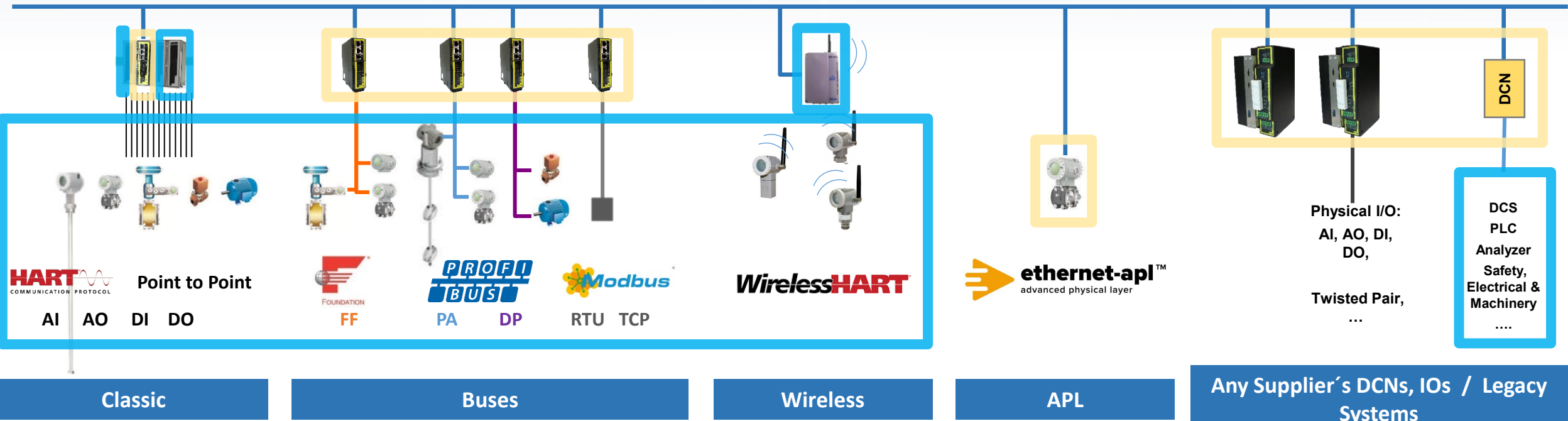
O-PAS
Conformant
Component

Non O-PAS
Conformant
Component

O-PAS Connectivity Framework (OCF)

Ethernet APL

High Speed Ethernet (HSE)



HART
COMMUNICATION PROTOCOL
Point to Point
AI AO DI DO

FOUNDATION
FF

PROFIBUS
PA DP

Modbus
RTU TCP

WirelessHART

ethernet-apl
advanced physical layer

Physical I/O:
AI, AO, DI,
DO,
Twisted Pair,
...

DCS
PLC
Analyzer
Safety,
Electrical &
Machinery
....

Classic

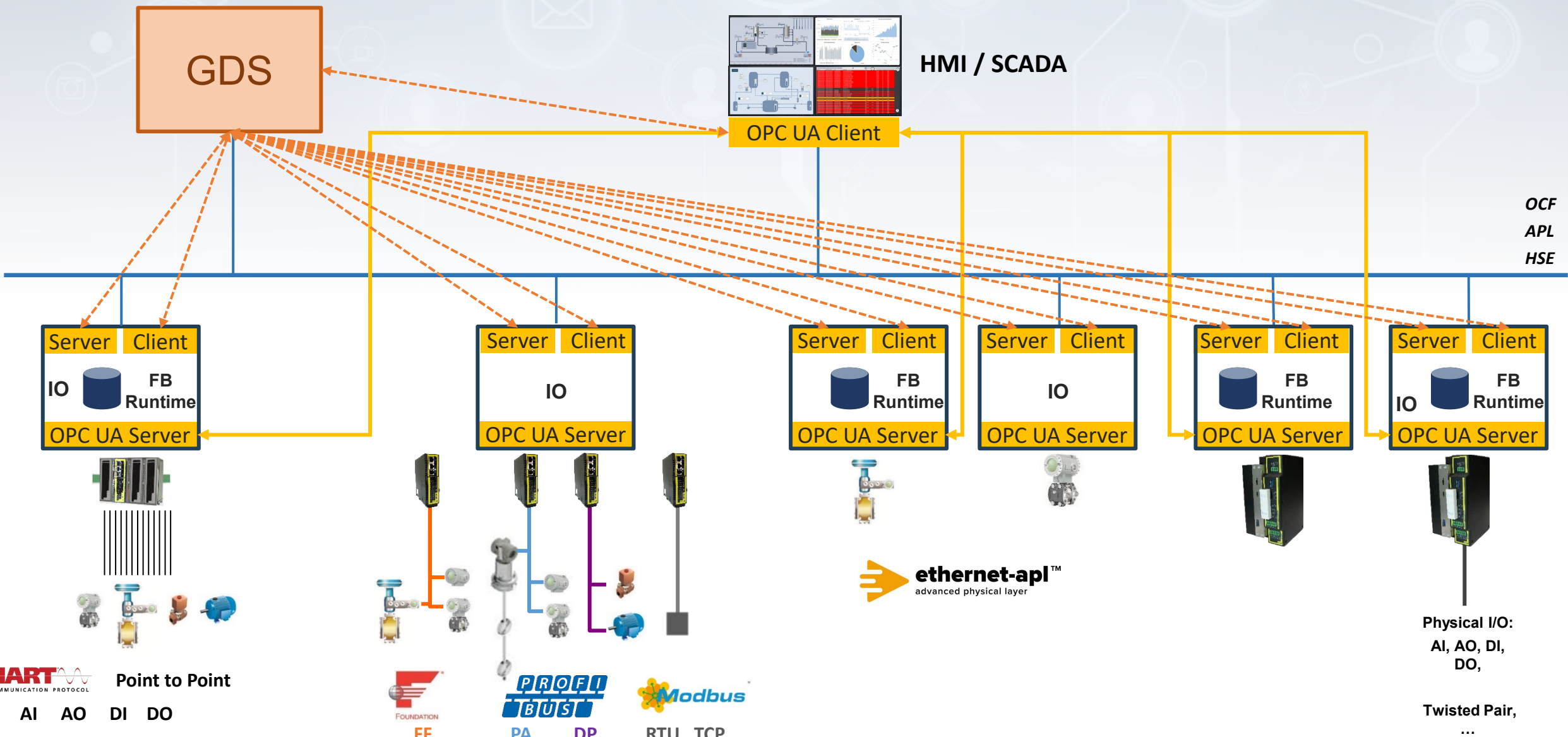
Buses

Wireless

APL

Any Supplier's DCNs, IOs / Legacy Systems

Supervision



HART
COMMUNICATION PROTOCOL
Point to Point
AI AO DI DO
smar

FOUNDATION
FF
PROFIBUS
PA DP
Modbus
RTU TCP

ethernet-apl™
advanced physical layer

Physical I/O:
AI, AO, DI,
DO,
Twisted Pair,
...