



# Open Process Automation: Status of Standards and Industry Adoption

R. Donald Bartusiak, Ph.D.

[don.bartusiak@csi-automation.com](mailto:don.bartusiak@csi-automation.com)

President, Collaborative Systems Integration  
Co-chair, Open Process Automation Forum

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1. Motivation: End User pain points and value opportunities
2. Status and outlook of the Open Process Automation Standard (O-PAS™), business ecosystem building, and conformance certification
3. Current status of End User companies' OPA projects
4. How End User companies can get started to learn and use O-PAS based systems

# 1.1 Motivation

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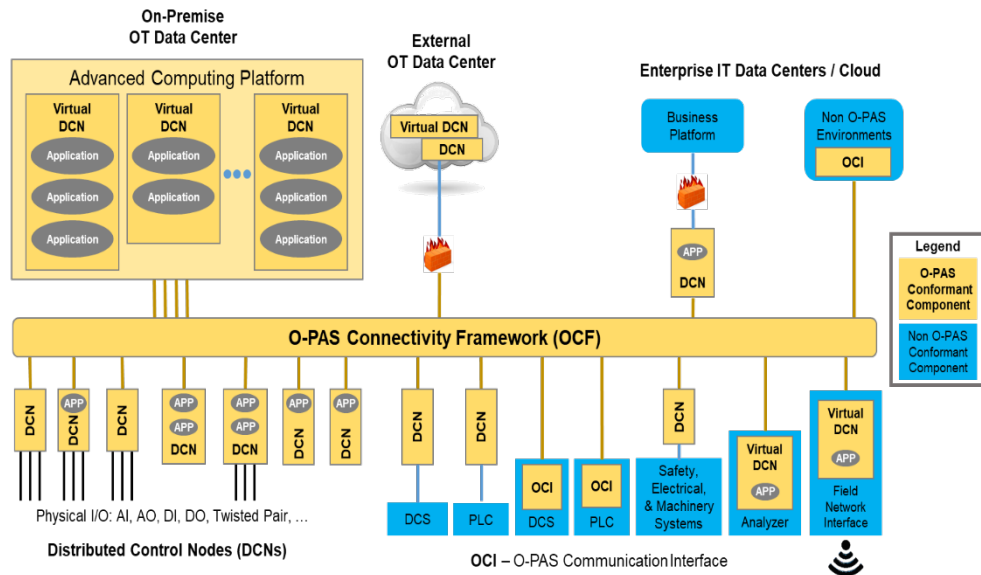
End User pain points and value opportunities:

- lack of interoperability and inability to reuse their control applications between systems from different suppliers
- excess cost of system upgrades due to close, proprietary couplings between components
- barriers to value generation from introduction of new technology – hardware or software

# 1.2 Vision



- A standards-based, open, secure, interoperable process automation architecture



- Industry standard interfaces and networks
- Interoperable hardware
- Open software access
- Designed-in security

- [Open Process Automation™ Forum](#) of The Open Group
  - Founded Nov 2016
  - Currently 118 member organizations
    - 22 operating companies
    - 6 of 7 global DCS companies
  - Join to benefit and influence!

## Open Process Automation™ Forum Members – Partial List



# 2.1 O-PAS Standard



- Version 2.1 – Preliminary ([link](#)) published on 17 May 2021

O-PAS Part	Subject matter	Referenced standards
Part 1	Technical architecture	IEC 62264 (ISA 95)
Part 2	Security	IEC 62443 (ISA 99)
Part 3	Profiles	n.a.
Part 4	Connectivity framework	IEC 62541 (OPC UA)
Part 5	System management	DMTF (Redfish)
Part 6 (.1 - .6)	Information and exchange models	IEC 62714 (AutomationML) IEC 61131 and 61499 IEC 62682 (ISA 18)
Part 7	Physical platform	“whitespace”

- Comments from all industry encouraged; Email to [ogspeccs@opengroup.org](mailto:ogspeccs@opengroup.org)
- Interoperability Workshop #2 planned for Jan 2022
- O-PAS Version 3 themes:
  - Application portability (Part 8)
  - Distributed Control Node physical platform (Part 7)
  - System orchestration (“systemness”) (Part 9)

# 2.2 Business ecosystem building



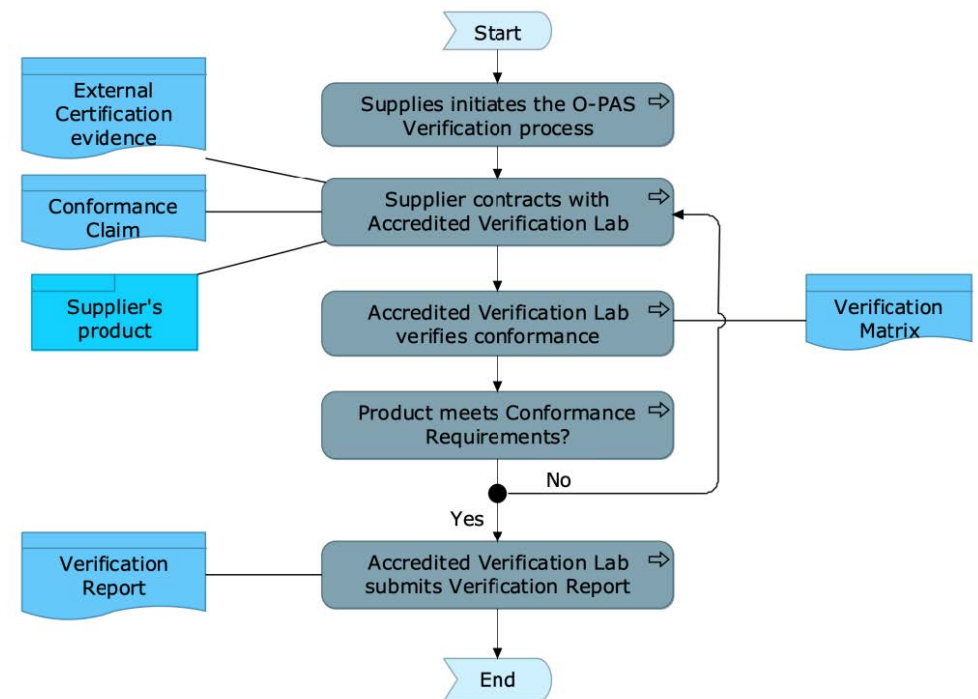
- *OPA Business Guide 2.0: Value Proposition and Business Case* in final review ([link to V1](#))
  - Business scenarios (by industry verticals)
  - Stakeholder roles in O-PAS business ecosystem: End Users, System integrators, Suppliers, Service providers
  - Conformance, Certification, Contracting
- Marketing and Outreach: “Industry Adoption” theme
  - End User Caucus meeting (Jul 2021; 179 attendees)
- Liaison relationships
  - OPC Foundation
  - NAMUR
  - Control System Integrators Association
  - ISA
  - Others
- Coming events and publications
  - *OPA Business Guide 2.1* (4Q21)
  - Meeting at ARC Forum, Orlando FL (Feb 2022)
  - *O-PAS Standard V2.1 – Final* (2Q22)
  - *O-PAS Implementation Guide* (mid-2022)

# 2.3 Conformance certification



- *OPA Certification Policy* ([link](#)) published in Feb 2020
  - Verification
  - Certification
  - Registry
  - Product certification lifecycle
- Agreements with multiple O-PAS Verification Labs in-development
- Certification Wave 1
  - Operational by 1Q22
  - Profiles:
    - Security: Part 2, SEC-F-001
    - Connectivity: Part 4, OCF-001, NET-001/002
    - System management: Part 5, OSM-001/002/003
    - Physical platform: Part 7, DCP-001

O-PAS Verification Process



# 3.1 End User prototypes and test beds

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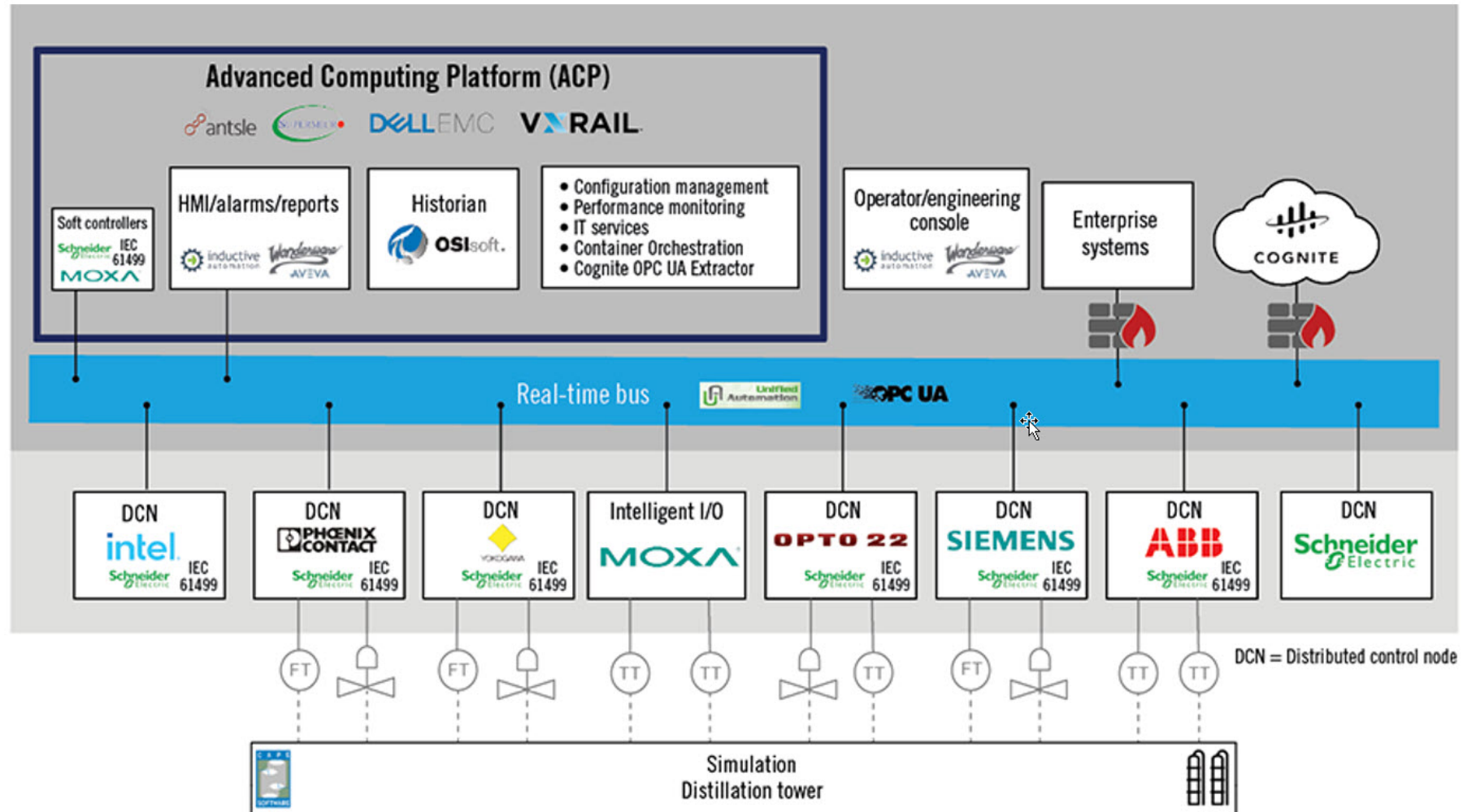
- ExxonMobil
- BASF
- Koch Industries – Georgia Pacific
- Saudi Aramco
- Petronas
- Coalition for Open Process Automation



# 3.2 ExxonMobil



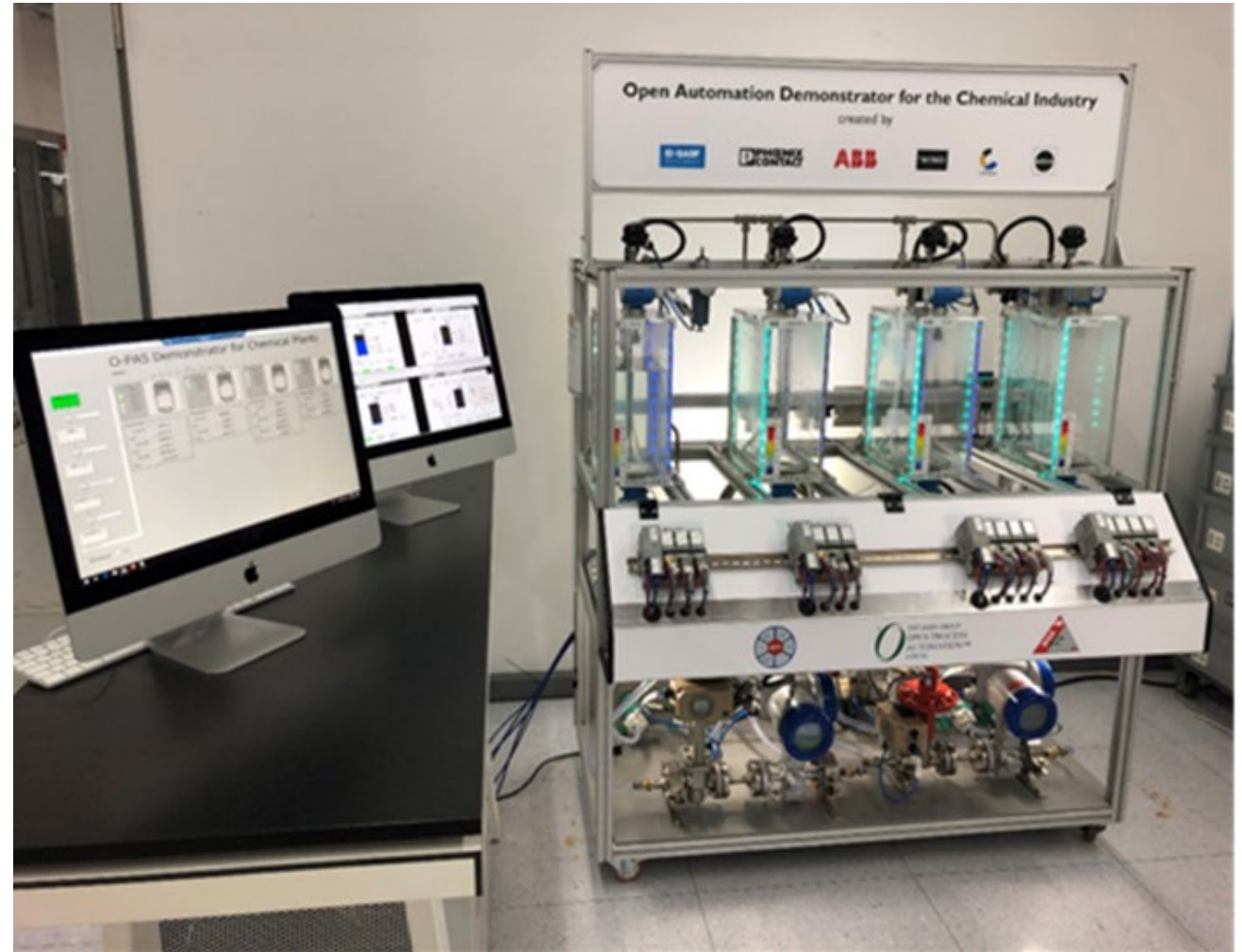
- ExxonMobil's 3<sup>rd</sup> OPA system
- Components shown in figure
- Systems integration: Yokogawa
- Testing and staging for field trial
  - ~2,000 I/O
  - Startup 1H2023



# 3.3 BASF



- Demonstrate:
  - OPA
  - MTP
  - NOA
- Components:
  - DCN: Phoenix Contact plcNext
  - OCF: OPC UA
  - ACP: HPE computer with Wind River Titanium Controller hypervisor
  - Software: ABB 800xA
  - Valves: Samson
- Systems integration:
  - TU – Dresden
  - Codewrights



# 3.4 Georgia Pacific



- Components:
  - DCNs
    - Rockwell
    - Phoenix Contact
    - Siemens
    - Schneider Electric
    - Stahl
    - Yokogawa
- Systems integration:
  - Hargrove
  - Siemens
- Portable unit for demonstrations at multiple paper mills

# 3.5 Saudi Aramco and Petronas

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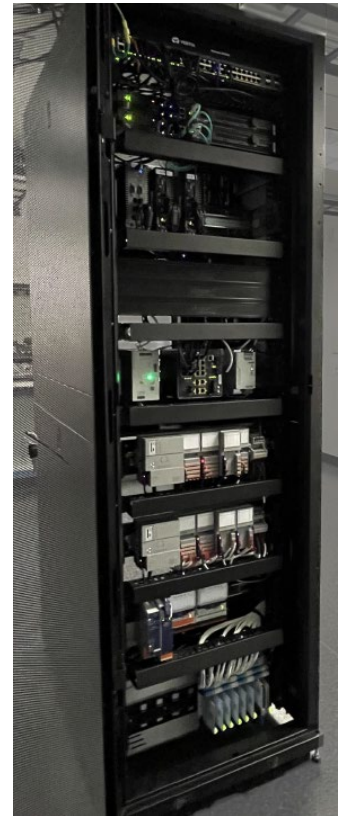
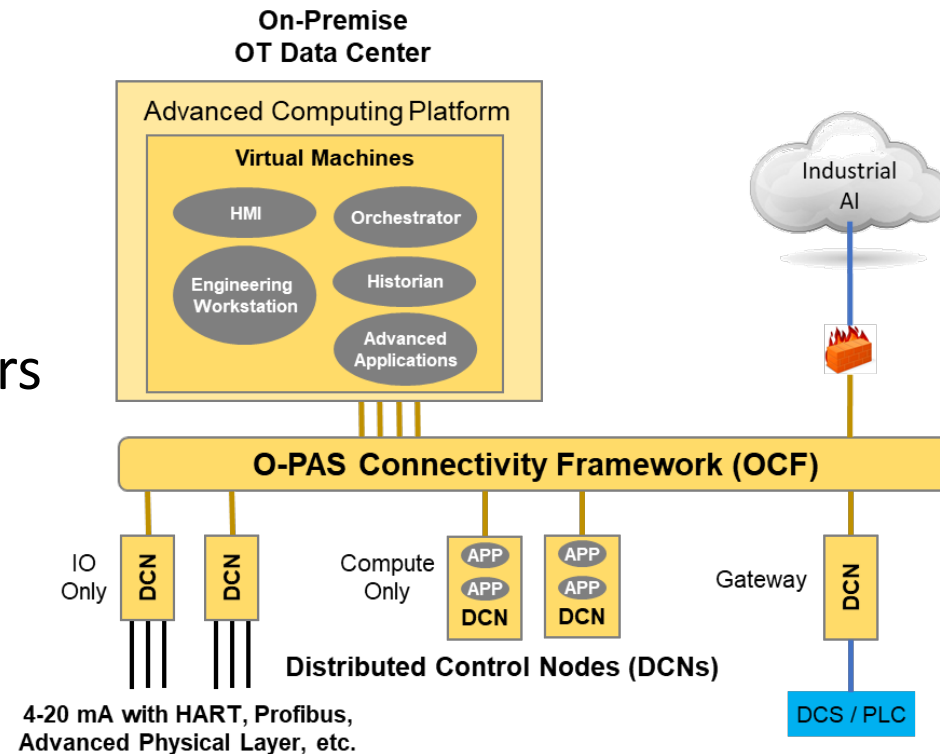


- Saudi Aramco
  - Test bed in Dhahran, KSA
  - Systems integration: Schneider Electric
- Petronas
  - Test bed in Malaysia
  - Announced Feb 2021

# 3.6 Coalition for Open Process Automation



- Small-scale functional system and structured training program
- Systems integration by *Collaborative Systems Integration* and *CPLANE.ai*
- Components from *OPAS-aligned* suppliers
  - *Phoenix Contact, CODESYS, Nova SMAR, Stahl, ASRock Industrial, Vecow, Supermicro, Yokogawa*
- Benefits demonstration goals:
  - Increase value generation
  - Reduce total cost of ownership
  - Secure by design and adaptation



[COPAcontrol.org](http://COPAcontrol.org)

# Summary

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- O-PAS Standard Version 2.1 Preliminary ([link](#)) published in May 2021. Requesting comments from all of industry to [ogspecs@opengroup.org](mailto:ogspecs@opengroup.org)
- O-PAS Certification Wave 1 ([link](#)) operational by 1Q22
- To benefit from and influence the O-PAS Standard, join the OPA Forum
  - Mike Hickey ([m.hickey@opengroup.org](mailto:m.hickey@opengroup.org))
- At least 5 End User companies are building OPA prototypes or test beds with multiple *OPAS-aligned* system integrators and suppliers
- OPA starter kits and training are being developed by *OPAS-knowledgeable* system integrators