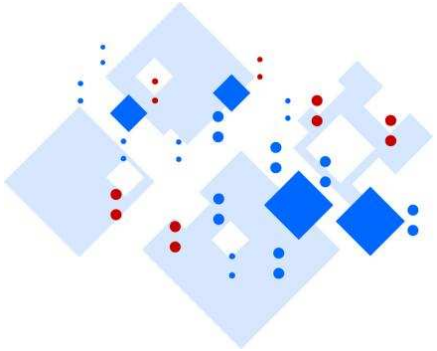

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OPC-UA Solutions

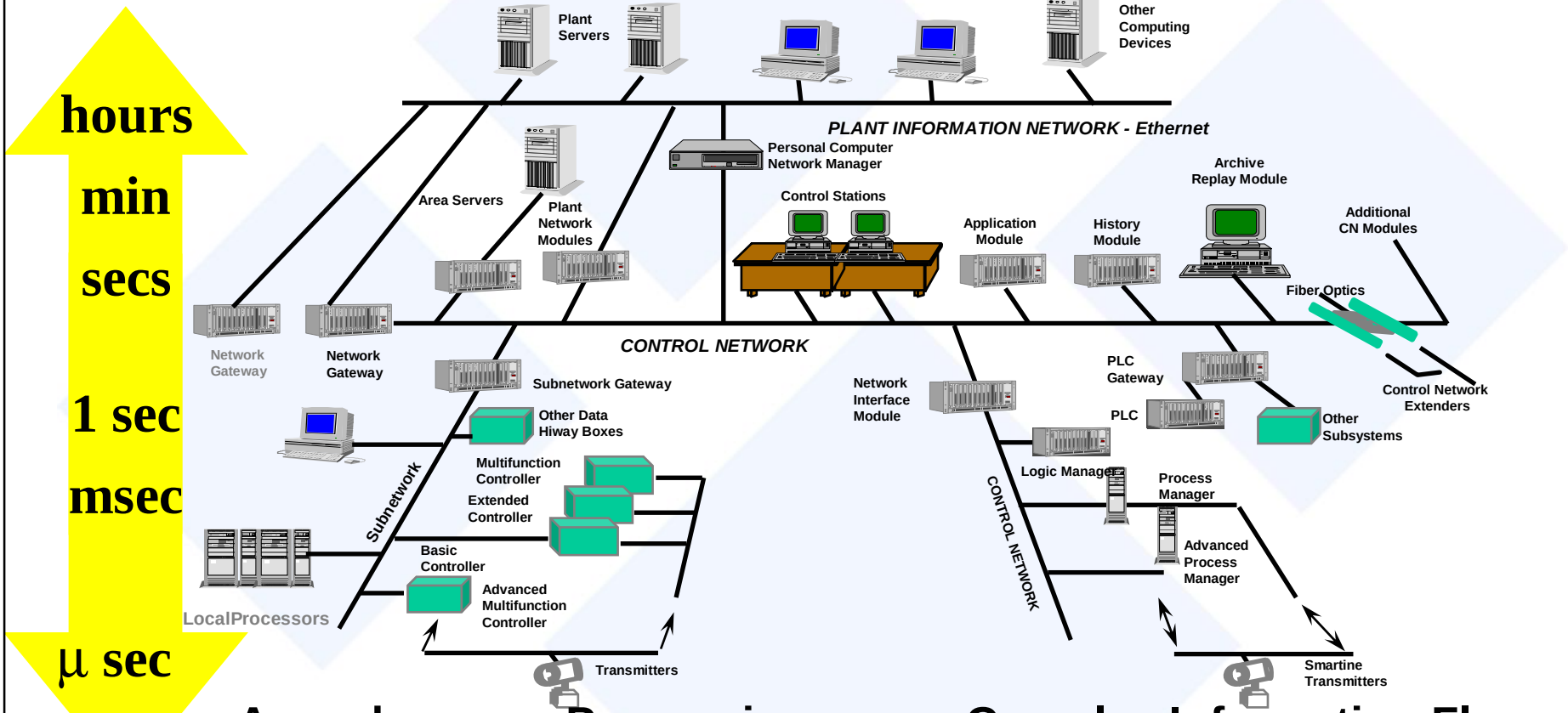
What real world problems can be solved with UA?

Jim Luth

OPC Foundation Technical Director

October 2006

The Plant : a Complex Environment with many opportunities for standards for interoperability

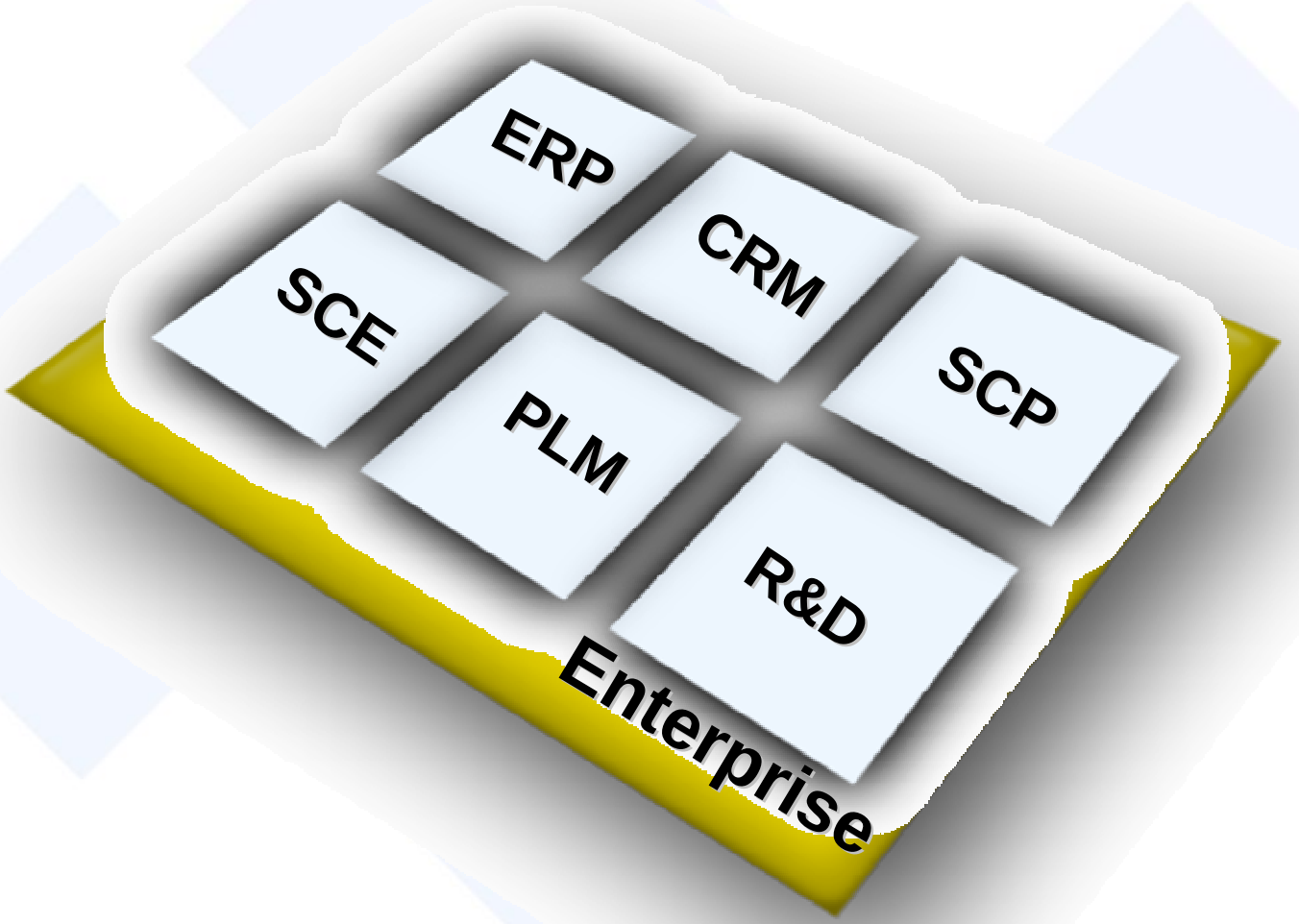


- Asynchronous Processing
- Multiple Interfaces
- Mission Critical
- How To Manage Changes?

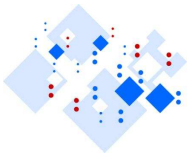
- Complex Information Flows
- Multi-vendor
- Proprietary

Numerous Incompatible Protocols

Numerous Incompatible Tiers



New features in Unified Architecture



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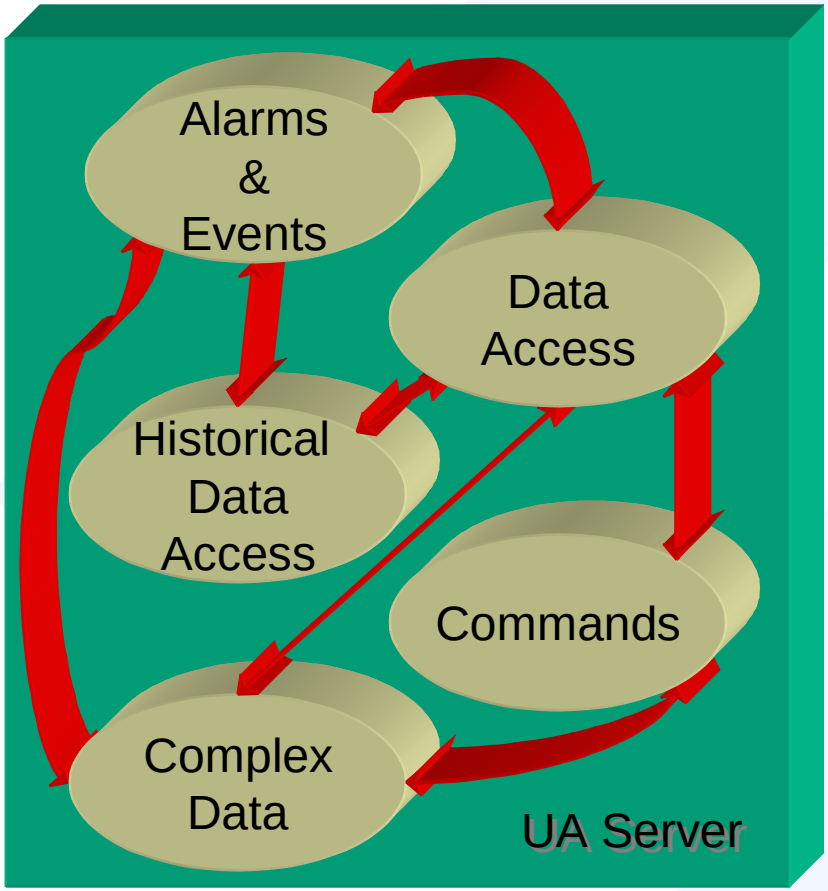
Highlight of some features new to UA that were not available in previous OPC interfaces…

New Communications Underpinnings

- Based on standards for the Web
  - XML, WSDL, SOAP, WS-*
- WS-Policy negotiates protocol and encoding
- WS-SecureConversation provides secured sessions
- Optimized for the Intranet
  - OPC Binary encoding over TCP

OPC Interface Unification



- SOA (Service Oriented Architecture)
- Single set of Services
  - Query, Read, Write, Subscribe…
- Named/Typed relationships between nodes.

The UA Server embodies the functionality of existing OPC Servers using a single set of services

New Security Model

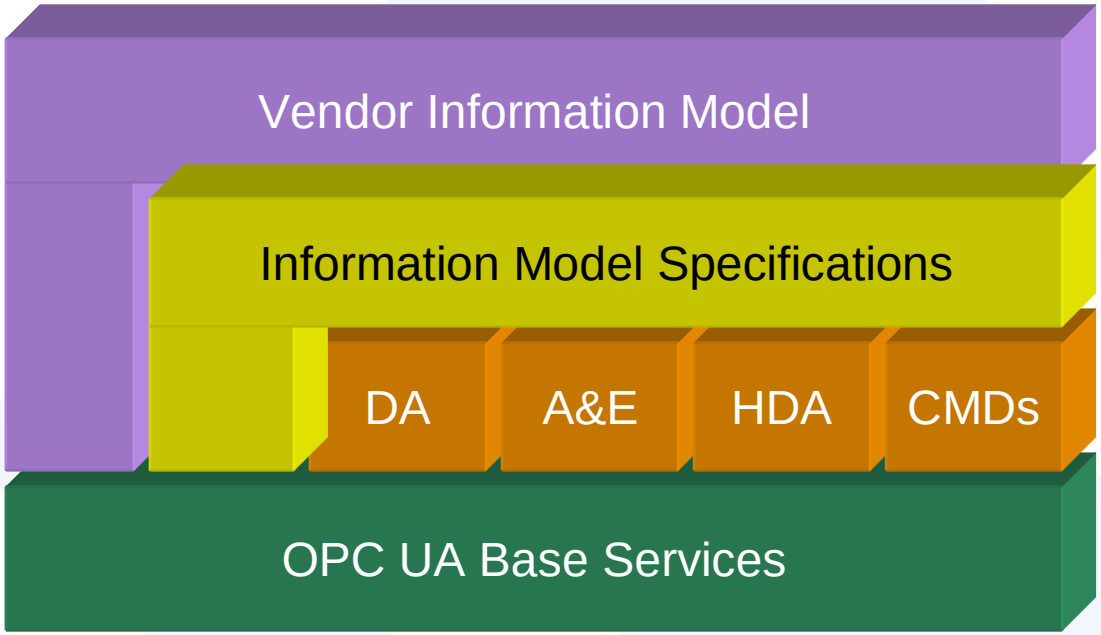
- UA Clients present credentials to UA Servers (x509 certs on both sides).

- UA Servers require authentication and authorization.
  - Access control can be fine-grained down to the property level.
- Optional message signing and encryption.

New Complex Data Features

- Tells clients how to parse structured data
- Allows use of XML Schemas for describing XML data
- Defines OPC Binary data description language that uses XML to describe binary data structures
- Allows client to access device specific data descriptions (e.g. Fieldbus Foundation OD)

Designed to expose models



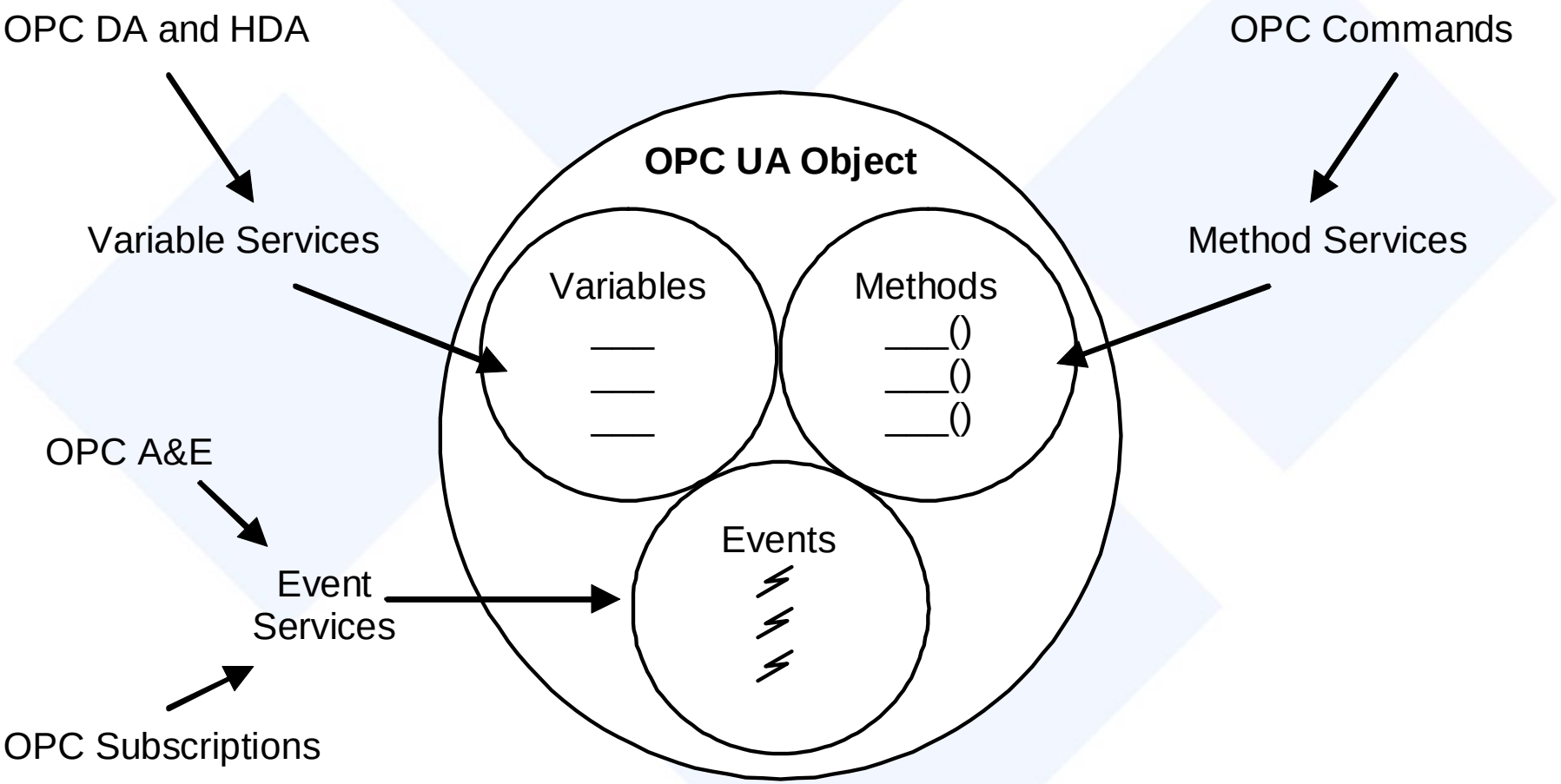
IEC, ISA, MIMOSA …

OPC Information Model

All Necessary Services

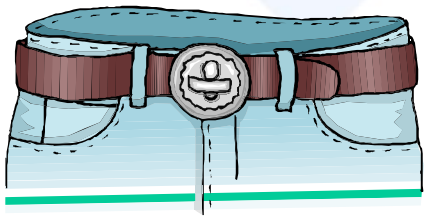
Clients written to just the base can still discover and access all data from the derived layers!

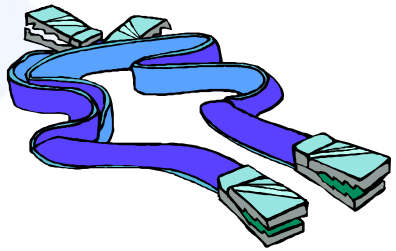
Unified Object Model



Robustness

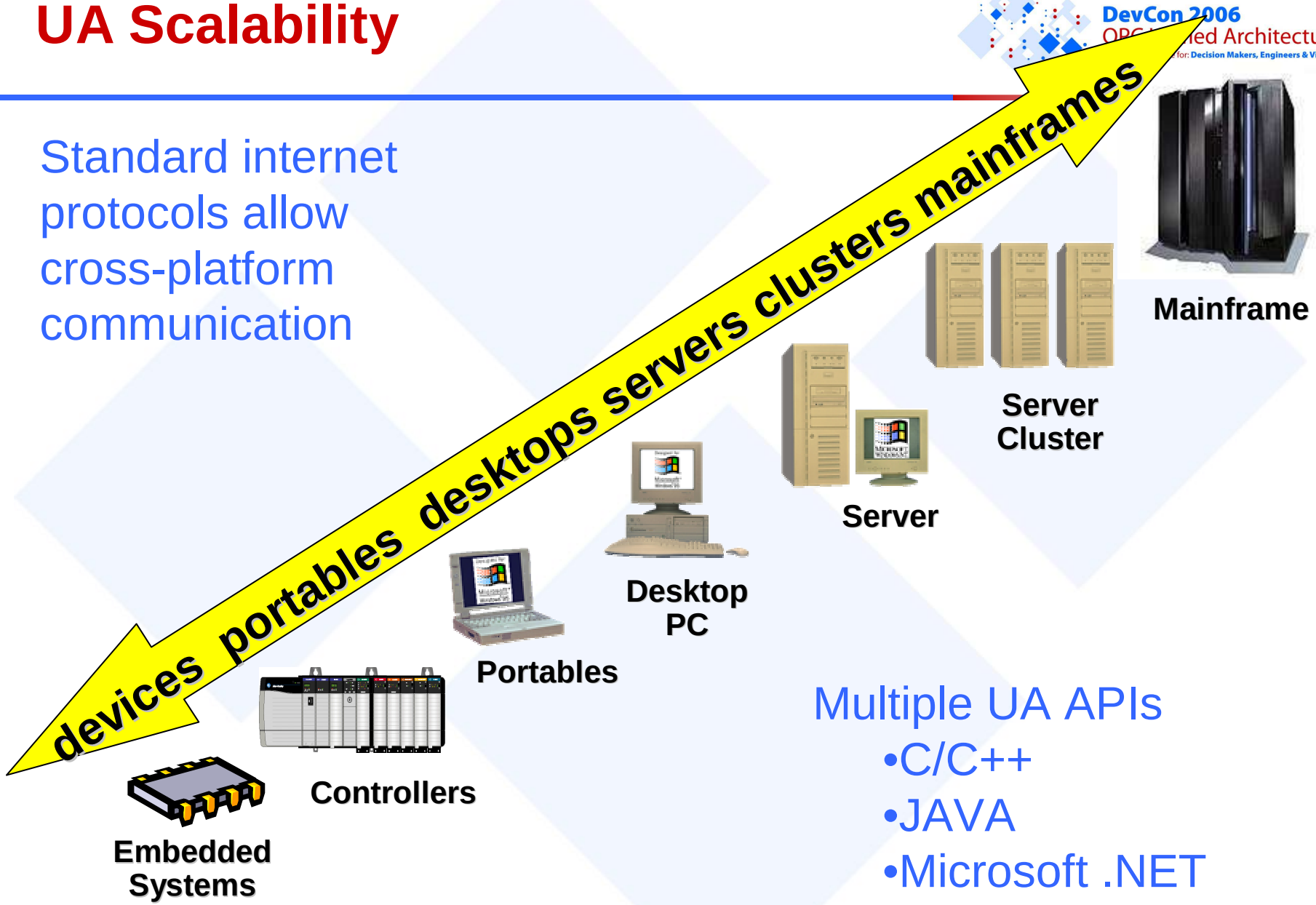
- Subscription Update Features
  - Keep-alive (heartbeat) messages
    - Allows clients to detect a failed server or channel
  - Sequence Numbers in each update message
    - Allows client re-sync to obtain missed messages
  - Decouples callback channel from notification mechanism, allowing callback channel to be reset without loss of data
- Redundancy Features
  - Designed for easy (optional) redundancy of both Clients and Servers
    - e.g. re-sync request can be sent to a backup server





UA Scalability

Standard internet protocols allow cross-platform communication



Multiple UA APIs

- C/C++
- JAVA
- Microsoft .NET

Existing OPC Features Retained

- Address Space visibility through browsing & query
- Efficient report-by-exception communication
- Similar base information models for easy adapters

Example Problems Solved

with UA Solutions…

Remote Access

- PROBLEM: I need fast, secure remote access to data via the internet to my supply chain partner.

- SOLUTION: OPC-UA using HTTP and UA Binary encoding

ISA S95 Modeled Plant

- PROBLEM: I modeled my plant using ISA S95 and I want the metadata in the model available as well as the real-time data.

- SOLUTION: OPC-UA is designed to expose model metadata and there will be a UA companion spec. for S95

OPC in device

- PROBLEM: I want to supply an OPC interface to my device without the use of an external Windows PC

- SOLUTION: OPC-UA is cross-platform and embeddable

Java based ERP

- PROBLEM: My Java based ERP system needs data from MES and the factory floor

- SOLUTION: OPC volunteers are creating a UA communication stack and API in Java

Redundancy

- PROBLEM: EDF needs redundancy in nuclear applications

- SOLUTION: UA defines how redundancy is done for consistency between all UA applications

Questions?

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