

OPC-UA Provides Scaleable Communication between the Plant Floor and Enterprise

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Keywords

OPC Foundation, Unified Architecture, OPC-UA, EDDL, FDT, .NET

Summary

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plant floor systems and enterprise systems. Information about the assets of the plant floor systems needs to be provided to the business applications in the enterprise world, providing real-time information to make effective decisions. Therefore, it is important to understand the OPC Foundation's Unified Architecture (OPC-UA) functionality and its capability to integrate plant floor systems to the enterprise.

Analysis

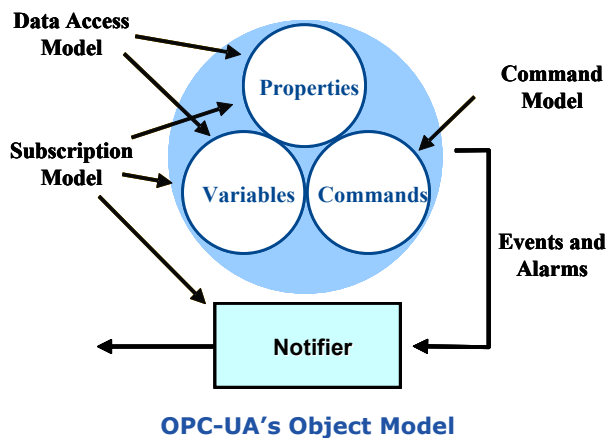
The OPC Foundation has been in the business of developing standards and components that promote interoperability between multiple technology providers for the past ten years. When the OPC Foundation first began, the focus was on developing a standard interface for data and information acquisition between software applications in plant floor systems and the multitude of devices on the plant floor. This provided a huge benefit to manufacturers who no longer had to contend with a myriad of troublesome, hard to maintain custom interfaces or drivers. The OPC Foundation then expanded its reach beyond data access, defining additional standards that began the process of taking data and converting it into information, thereby facilitating interoperable functionality between multiple technology providers for alarming systems and historical data access systems. The



world was simple as multiple technology provider interoperability was localized and defined to be constrained inside the corporate firewall. As the OPC Foundation began to expand its reach and extend the OPC Data Access (OPC-DA) specification to exchange data with applications that were outside the corporate firewall, a whole new way of facilitating integration between enterprise systems and plant floor systems with multiple technology provider interoperability began to be realized.

Interoperability between Enterprise and Plant Floor Systems

OPC-UA is the new series of specifications that embodies the OPC Foundation's vision of providing secure, reliable interoperability for moving data and information from the plant floor to the enterprise. OPC-UA is intended



to expand the framework for moving information between applications in the enterprise space by taking the existing OPC specifications and integrating them all together, leveraging Web Services as the key technology enabler in the new architecture. Applications such as asset management and true resource modeling and utilizations can be performed by using OPC-UA specifications to move data and information.

The OPC-UA combines functionality across existing OPC specifications, providing a service oriented architecture that facilitates interoperability across corporate firewalls and across platforms in a secure, reliable fashion. By front-ending data as a wrapper on top of the OPC installed base, OPC-UA defines wrapper technology that supports existing OPC installations, which will be enabled to the new architecture. Wrappers are generally applied at the application domain level. They act as clients and servers to the

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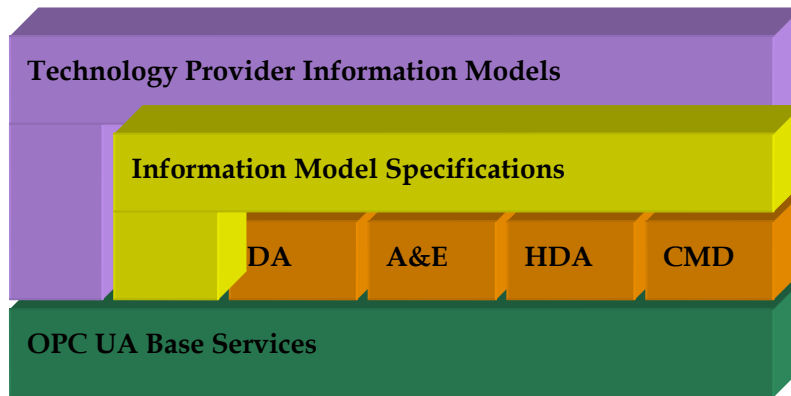
encapsulated component. Wrapper components are added to existing OPC servers and clients to make them look like an object in OPC-UA. This is significant since existing installed OPC-based products will be able to be supplemented to support the new OPC-UA services and not have to be replaced.

One of OPC-UA's visions is to provide a base foundation of services for discovery, read/write and subscription capabilities, moving information that is described in the specifications of the other industry standards organizations focused on information modeling. The services that OPC-UA provides for secure, reliable communications information are also the result of collaboration with other Web services standards organizations that span industries outside of manufacturing. Leveraging the information model of OPC-UA facilitates complete data access and exchange services with secure transactional capability via OPC-UA services for configuration data, diagnostic data, and runtime operational data.

The OPC Foundation continues to encourage the use of Microsoft technology as the building block for the OPC Foundation Unified Architecture core services. Furthermore, Microsoft's Windows Vista will play a key role and provides the right infrastructure to deploy OPC-UA, but is not required to build an OPC-UA component. The focus of the OPC Foundation Unified Architecture continues to remain steadfast on platform independence for the core services.

Scalability to Extend Plant Floor System Lifecycle

OPC-UA was developed to be a scalable architecture that will maximize the lifecycle of the typical plant floor system. It was also designed to support legacy devices and systems, allowing the integration of data and information



OPC-UA Integration of Information Models and Objects from Existing OPC Specifications

from legacy devices and systems into the plant floor system as well as expanding their reach to provide information to the enterprise. The functionality of the core OPC-UA specifications is basically services and information. For example, the only fundamental difference between data access and alarms is really the type of information that is required to

be communicated. The OPC philosophy is to be the "how" for moving the "what". The "what" is the information that is being defined by multiple automation vendors in multiple consortiums with respect to their specific

domains. The OPC Foundation is collaborating with consortiums in both the enterprise and plant floor system spaces.

OPC-UA Deployed at the Device Level

Scalability also creates justification for the deployment of OPC-UA at the device level as a mechanism to improve reliability. This presents an opportunity with respect to determinism and performance for building exception-based systems where detection of, for example, data change and alarm annunciation is best when pushed down to the lowest point in the system. OPC-UA has defined a scalable architecture and many of the technology providers are already lining up to deploy it down into the devices since it is based on Web services. Collaborative efforts that the OPC Foundation is doing with EDDL and FDT also embrace the model of pushing server functionality down into the devices, with these efforts focusing on discovery, configuration, diagnostics and asset management.

OPC-UA will be released at ARC's 14th Annual Forum, Driving Enterprise Performance through Next Generation Manufacturing Concepts, held June 26-28, 2006 in Boston, MA. For more info: www.arcweb.com. More information on OPC-UA is available on the OPC Foundation website at <http://www.opcfoundation.org/UA>.

Recommendations

- Manufacturers should look to OPC-UA as a means to integrate functionality between plant floor systems and the enterprise.
- Technology providers should embrace OPC-UA to provide interoperability between current and legacy products as well as to the enterprise.
- Enterprise suppliers should embrace OPC-UA as an integration tool to automation equipment that provides critical data and information.
- Manufacturers should consider membership in the OPC Foundation to ensure that their feedback and interests are addressed.

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