White Paper

A Comprehensive Software Platform Designed
to Create Smart Device Applications

An Overview of Niagara^{AX}

Niagara^{AX} is a software framework specifically designed to address the challenges of building device-to-enterprise applications, Internet-enabled products and Internet-based automation systems. Niagara^{AX} provides a unified, feature rich platform which streamlines the development process significantly reducing implementation costs and time to market.

Niagara^{AX} creates a common environment that connects to almost any embedded device imaginable, regardless of manufacturer or communication protocol. Niagara^{AX} models the data and behavior of the devices into normalized software components, providing a seamless, uniform view of device data to the enterprise via a wide variety of IP-based protocols, XML-based connectivity options, and open API's. An N-1 Architecture

By transforming the data from diverse external systems into normalized components, Niagara^{AX} creates a development architecture that provides substantial benefits over gateway-based integration methods that suffer the complexity of an N-to-N architecture. The benefit – any device or system normalized by Niagara^{AX} immediately becomes compatible with any other system connected to the Framework, providing true inter-system interoperability and uniform data presentation to enterprise applications. As a result, developers don't have to spend any time creating, testing and revalidating multiple gateways.
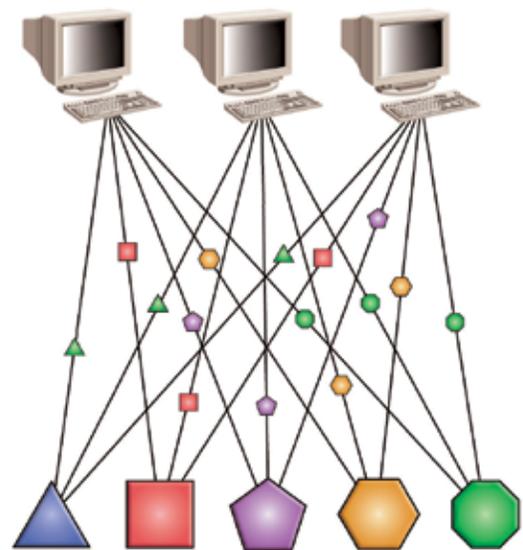
Unified Modeling of Diverse Systems and Data

Integrating geographically dispersed, multi-vendor devices into interoperable applications is a time-consuming and expensive endeavor. With Niagara^{AX}, the foundation of the application is already in place. Niagara^{AX}'s value proposition starts with its unique ability to model external systems and devices. This is accomplished by introducing a new factor into the equation of device-related application development – the Niagara^{AX} Component Model. This patented component model takes the data elements from the various devices – inputs, outputs, set-points, schedules, control parameters, etc., – and transforms them into normalized software components.

This conversion creates a database of objects that work coherently with each other in real time and unifies the entire development process, allowing developers to learn and work in one consistent environment, whether developing software to run on small embedded devices, or large scale server-side applications.

N-N: Lots of connections, complexity and costs creates a barrier to deployment of solutions.

Integrated Toolset

A comprehensive, integrated toolset is a fundamental part of the Framework and its value proposition for adopters. Niagara^{AX}'s graphical toolset enables non-programmers (domain experts) to build rich applications in a drag-and-drop environment.

Niagara^{AX} Overview

By visually "wiring" Niagara^{AX} components together, developers build control strategies, alarms, data logging, archiving, and scheduling applications as well as browser-based displays and reports. For programmers, Niagara^{AX}'s open APIs allow developers to extend the behavior of the platform and create their own unique products, applications, plug-ins, data views and business application logic.

Niagara^{AX}'s effectiveness in reducing development time and cost is enabled through its unique merger of automation, IT and Internet technologies into a single, scalable software platform that builds-in the resources needed to support advanced Web-services applications, enabling enterprise applications to read data, send commands, respond to alarms, etc., in real time anytime, anywhere.

Pre-Built Components Speed Development Projects
Key differentiating features of the Framework include:

Distributed Architecture
Gone are the days when developers had to connect all of the data from devices back to a "server in the sky" to build Web-based applications. Niagara^{AX}'s architecture allows applications to be dispersed to multiple, distributed computing devices that work cohesively as peers to create one unified system. Niagara^{AX} has been designed specifically to support large-scale applications that run across large numbers of devices or sites.

Scalable
Niagara^{AX} is unique in its ability to scale for use on different platforms. Developers can deploy the Framework in low-cost embedded devices designed to be deployed in the field, and can use it to build server-side applications. For maximum flexibility at the enterprise level, Niagara^{AX} can be used on a wide variety of hardware/OS platforms including Microsoft® Windows XP®, Linux™ and Solaris®.

The Niagara^{AX} Software Stack
This graphic shows the richness of the Niagara^{AX} Framework and the extent of services and functions it provides.
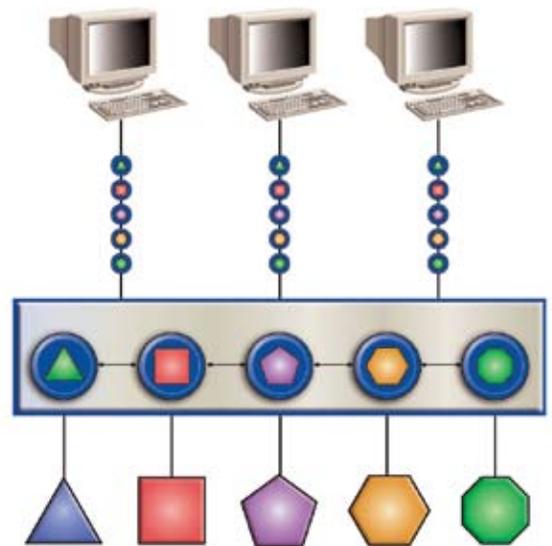
Integrated Control Capability
Niagara^{AX} includes a comprehensive control engine to execute applications ranging from local-loop control to system-wide global strategies and sophisticated business logic. This built-in capability allows applications to execute real-time control, process alarms, convey events back to the end-user and initiate real-time response across different systems.

Internet-Enabled
Support for Internet communications and Web services is infused throughout Niagara^{AX}, not added on. As a result businesses can quickly develop and deploy Web-enabled monitoring, control and service applications with a single toolset.

Extensible
Niagara^{AX} is highly flexible, enabling developers to extend the capabilities of the platform independent of

Tridium. Open APIs, extensive sample source code, a unique extensible component design, and comprehensive documentation, provide developers with the means to create custom applications specific to their business/industry, and even license their own proprietary developments.

Unified Development Environment
Developers use the same component model, APIs and graphical programming services across the hierarchy of device-to-enterprise applications. As a result, developers building end-to-end solutions become more productive by being able to work in the same programming environment with the same tools across the entire product stack.

Market Impact – Proven in Multiple Applications in Multiple Markets

Niagara^{AX} is proven – adopted in multiple markets to create solutions for real time monitoring, control and M2M applications. Today over 35,000 instances of Niagara are operating in over 5000 installations worldwide supporting money-saving, revenue producing applications like energy management, building systems automation, maintenance repair operations (MRO), service bureaus, total facilities management and "cradle-to-grave" product support services that enhance customer satisfaction, lower costs and generate new revenue streams.

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