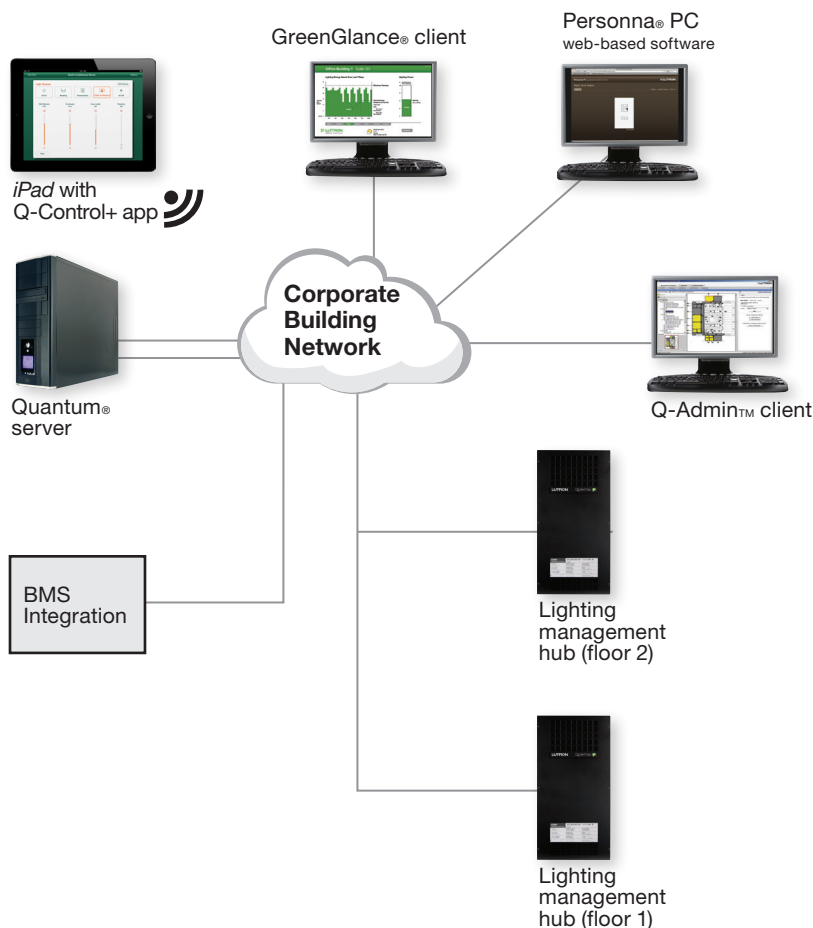


Lutron®/Tridium® BACnet® Integration



Quantum® Overview



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The Lutron® Quantum® system is the total light management system that incorporates lighting controls, motorized window shades, digital ballasts and LED drivers, centralized dimming and switching panels, and sensors together under one system/software umbrella. It is a processor-based system and the processor(s) reside in the hubs shown in the diagram above. In a typical building, you will typically have at least 1 hub per floor connected over the building network or a dedicated network for the lighting system.

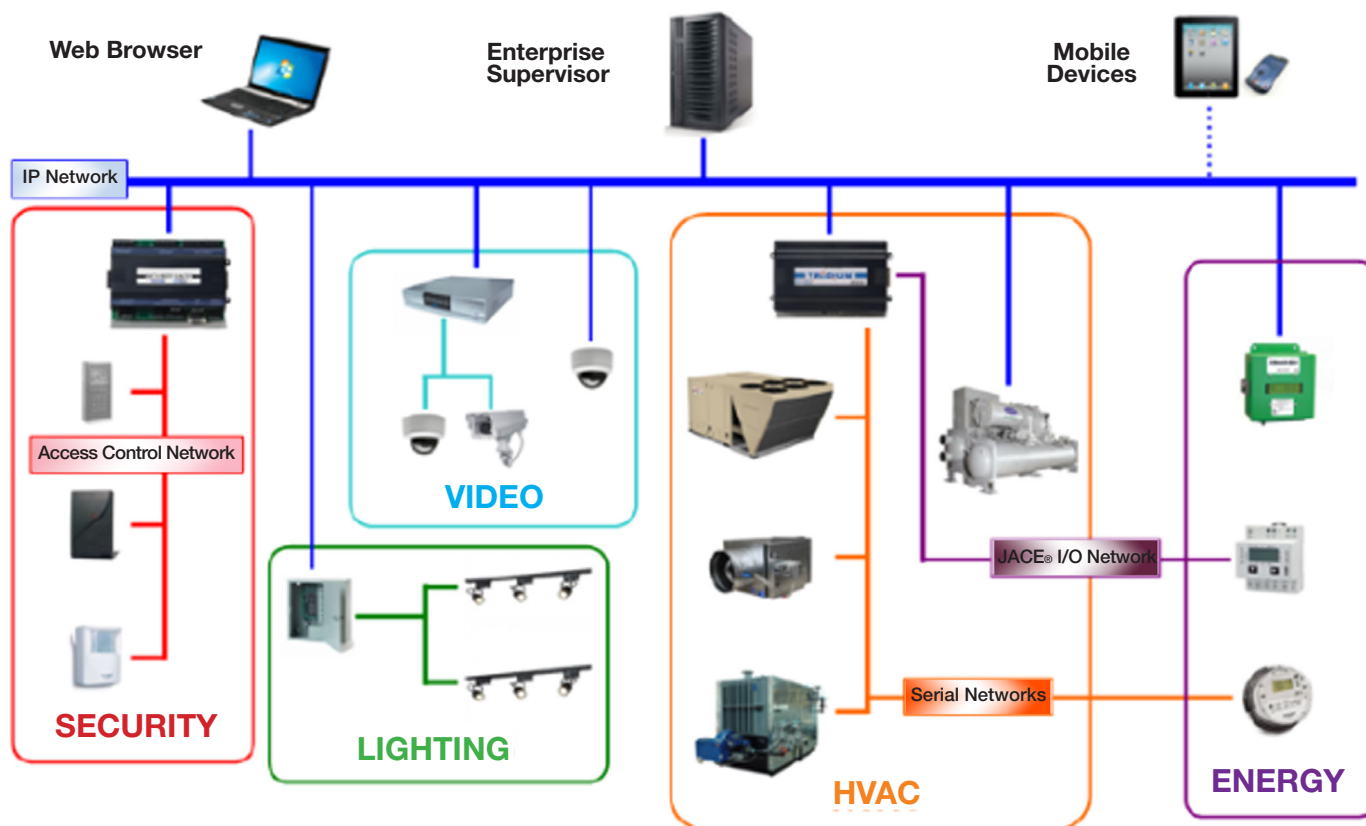
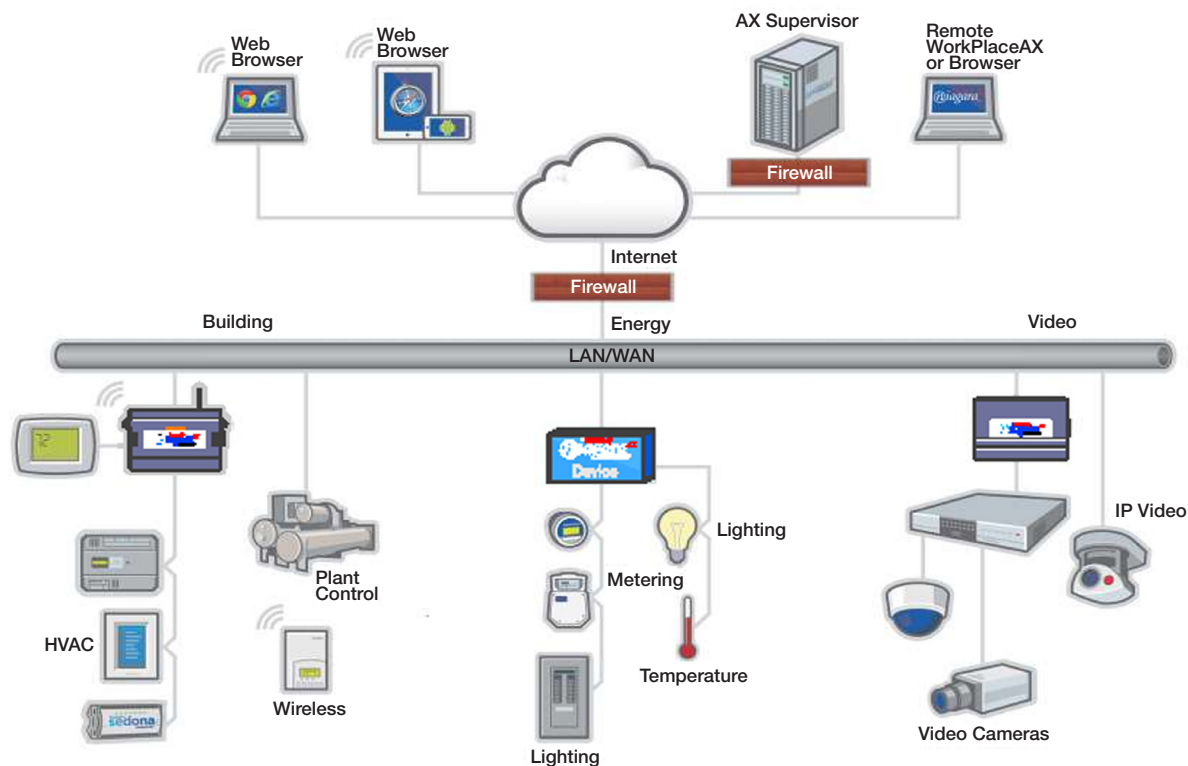
Quantum® can seamlessly and reliably integrate with other building systems. The BACnet®/IP protocol is the primary means of integration. BACnet® is embedded or native in the Quantum® processors, which means no external interfaces or gateways are required in order to communicate with other systems. Only a single point of connection is needed on the Quantum® network for total and complete communication to the entire system. The diagram above shows a Quantum® server. The server is used for historical data logging for the reports used in the Quantum® software. It is NOT required for BACnet® integration. Only a Lighting Management Hub is required.

Additionally, the Quantum® system has been tested by BACnet® Testing Laboratories (BTL) and is certified to comply with all of their necessary interoperability requirements.

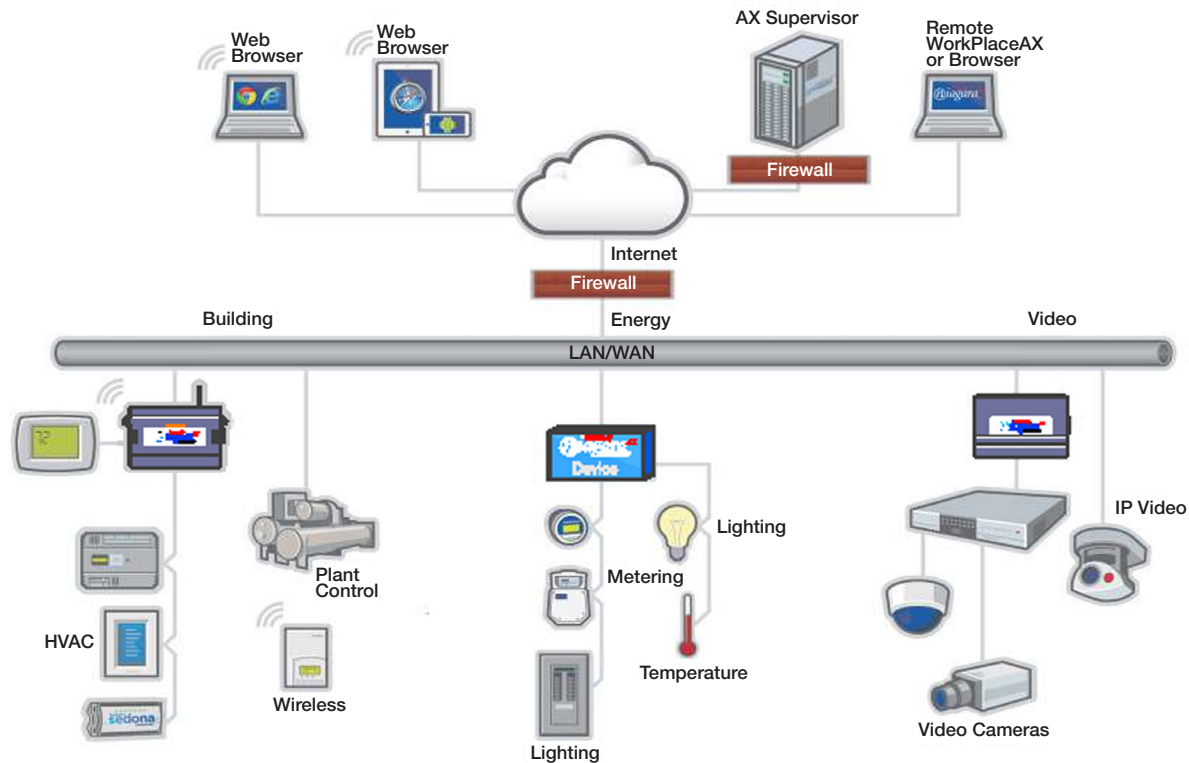
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Niagara® Overview

Tridium® Enterprise Integration Architecture



Tridium® Enterprise Integration Architecture

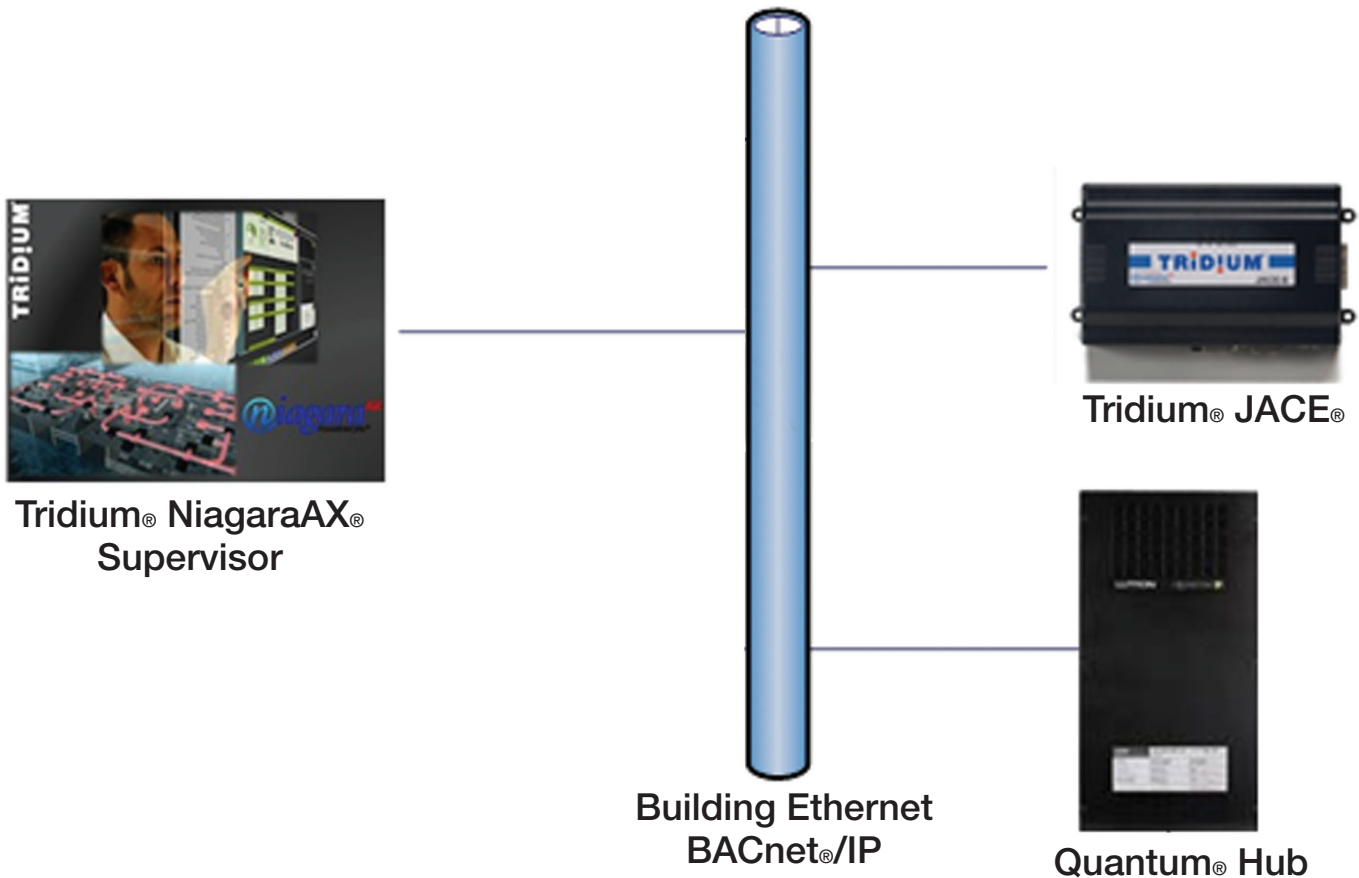


The Niagara® platform using a BACnet® Driver enables the operator to monitor and command Lutron® objects from a User Interface. Tridium® is the global leader in software frameworks, open platforms, automation infrastructure technology and device-to-enterprise integration solutions. Tridium® technologies extend connectivity, integration and interoperability to the millions of devices deployed in the market today and empower manufacturers to develop intelligent equipment systems and smart devices that enable collaboration and communication between the enterprise and edge assets. Customers include manufacturers, systems integrators and end-users worldwide involved in the Building Automation, Security, Residential, Energy, Telecom, M2M and Medical industries who embrace our technology to develop smart devices, connect machines-to-machines and deliver pervasive automation solutions.

Integration Overview

Tridium® NiagaraAX® Supervisor and a JACE® from one Tridium® OEM partner can be used to monitor and control the Lutron® Quantum® system using the BACnet® protocol. The BACnet® protocol is a non-proprietary open communication software standard published by ASHRAE.

Topology



Communication Protocol

- Communication between NiagaraAX® and Lutron is BACnet®/IP
- BACnet®/IP uses Broadcast UDP and Peer-to-Peer UDP on any standard Ethernet network
- Tridium® JACE® is compatible with 10/100 Mb/s, half-duplex or full duplex

BACnet® Testing Laboratories Listing

Tridium® and Lutron® devices are BTL Listed:

- AX Supervisor is BTL-Listed as B-AWS
- JACE® Controllers are BTL-Listed as B-BC
- Lutron® Quantum® Lighting Control System is BTL-Listed as B-ASC



How to Set Up Integration:

What needs to be done in the Lutron® Quantum® system

1. BACnet® is native to the Quantum® processor. However, in order to enable this capability, a BACnet® software license must be purchased for the job.
2. With the BACnet® software license, the Lutron® service representative will turn on the BACnet® capability using the DeviceIP setup software tool. Only one processor per subsystem will be enabled. This processor will act as the master for all BACnet® communications for the subsystem.
3. If the Quantum® processor and NiagaraAX® systems are not on the same subnet, a BACnet® Broadcast Management Device (BBMD) is required by the integrator. The Quantum® processor supports foreign device registration of BBMD. The IP address of the BBMD should be given to the Lutron® field service representative during setup (if required).
4. The BACnet® network number of the BACnet® virtual network for the Lutron® Quantum® system will need to be set to a different BACnet® network number than set in the Tridium® JACE®. Coordinate with the Tridium® representative on-site.

What needs to be done in the NiagaraAX® system

1. In a NiagaraAX® Station, connections to BACnet® devices are supported through a BACnet® link layer using BACnet®/IP communication protocol.
2. Add a BACnet® Network to the Drivers container in the Navigation Tree. This can either be accomplished by dragging and dropping the network from the BACnet® palette or by clicking the “New” button in the Driver Manager view and selecting the BACnet® Network.
3. The JACE®, by default, acts as a BACnet® router and sets the BACnet®/IP network address. The default BACnet® network number is 1. Make sure the BACnet® virtual network number in the Lutron® processor is set to a different BACnet® number than the JACE®.
4. Using the BACnet® device manager discover the Lutron® BACnet® devices and objects. Lutron® BACnet® objects are Analog Values, Binary Values and Multistate Values which will be associated to Niagara® Integer, Boolean, and Enumeration types.
5. Value objects, unlike input and output objects, cannot be identified as writable so all discovered Lutron® objects will all be discovered as read-only and the integrator will need to manually identify all objects that are writable.

What to Integrate:

Data sharing:

Lutron exposes lighting objects as BACnet® Analog objects, Binary objects and Multi-State objects. This will allow the NiagaraAX® platform to use BACnet® services to monitor and command the lighting objects.

Most devices and objects from the Lutron® system are virtual BACnet® objects. Virtual devices are area-based so they correspond to a geographical area of the building (e.g., conference room, private office, etc.). Virtual device names are job specific and created at the time of Lutron® database creation, which is done in-house at Lutron® Headquarters just prior to startup. To simplify the integration process, it is recommended that the integrator and Lutron® field service representative coordinate on area naming conventions. For a summary of Lutron® BACnet® objects, naming conventions, and functionality, reference the additional tables located in the Lutron® BACnet® PICS statement. To get the latest PICS statement that corresponds to the Quantum® software version you are running, contact any Lutron® representative or find them at www.lutron.com/quantum under the “Product Specification Submittals” section.

Scheduling

There are two approaches that can be employed for scheduling the lighting system:

Approach 1: The NiagaraAX® platform supports schedules which can be used to directly command the Lutron® lighting objects. The schedule can be viewed and modified using NiagaraAX® scheduling.

Approach 2: The Lutron® Quantum® system can support the schedule and the Quantum® Q-Admin™ software can be used to view and modify events. The Tridium® NiagaraAX® system can enable/disable an entire timeclocks, per subsystem, through BACnet® binary objects.

History

The Lutron® system does share historical information (power usage, occupancy, etc.) through Binary, Analog, and Multi-State objects, which can be used for trending. The reporting module within the Lutron® Q-Admin™ software can also be used to view historical trends of these objects.

Alarms

The Lutron® system does share asset and maintenance data appropriate for alarms (lamp failure, ballast failures, low battery failures on wireless devices, etc.) through Binary, Analog, and Multi-State objects. The NiagaraAX® system can be used to alarm the Lutron® lighting objects to display in the Alarm Status or Graphics application at the AX Supervisor. The alerts module within the Lutron® Q-Admin™ software can also be used to configure and view alerts.

Common Integration Examples

- A BMS system can trigger load-shed events in the Quantum® system.
- Occupancy sensor status can be shared with the HVAC system to set back temperatures when areas become unoccupied.
- The Quantum® energy usage information can be shared with the BMS to eliminate the need to add costly energy meters.

Important Integration Notes:

- The JACE®, by default, acts as a BACnet® router and sets the BACnet® /IP network address. The default BACnet® network number is 1. Make sure the BACnet® virtual network number in the Lutron® processor is set to a different BACnet® number than the JACE®.
- Value objects from the Lutron® system, unlike input and output objects, cannot be identified as writable so all discovered Lutron® objects will all be discovered as read-only and the integrator will need to manually identify all objects that are writable.
- To simplify the integration process, it is recommended that the integrator and Lutron® field service representative or project manager assigned to the job coordinate on area/point naming conventions when designing the job, not during installation.
- Use BACnet®/IP to integrate to Lutron.
- Coordinate with Lutron to disable Lutron® schedule if Niagara® schedules are used.
- “Who-Is” requests should be separated by a minimum of 10 seconds. More frequent requests may cause communication issues due to the number of points available in the Lutron® system through a single IP address.

Key contacts if you need assistance on a job:

Lutron:

Pre-Sale Support: systemsalesengineers@lutron.com

Post-Sale Support: 1.800.523.9466; systemsupport@lutron.com

Tridium®:

Sales Support: 877.305.1745, option 2

salessupport@tridium.com

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BACnet is a registered trademark of ASHRAE.

Tridium, Niagara, NiagaraAX and JACE are registered trademarks of Tridium Inc.

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