

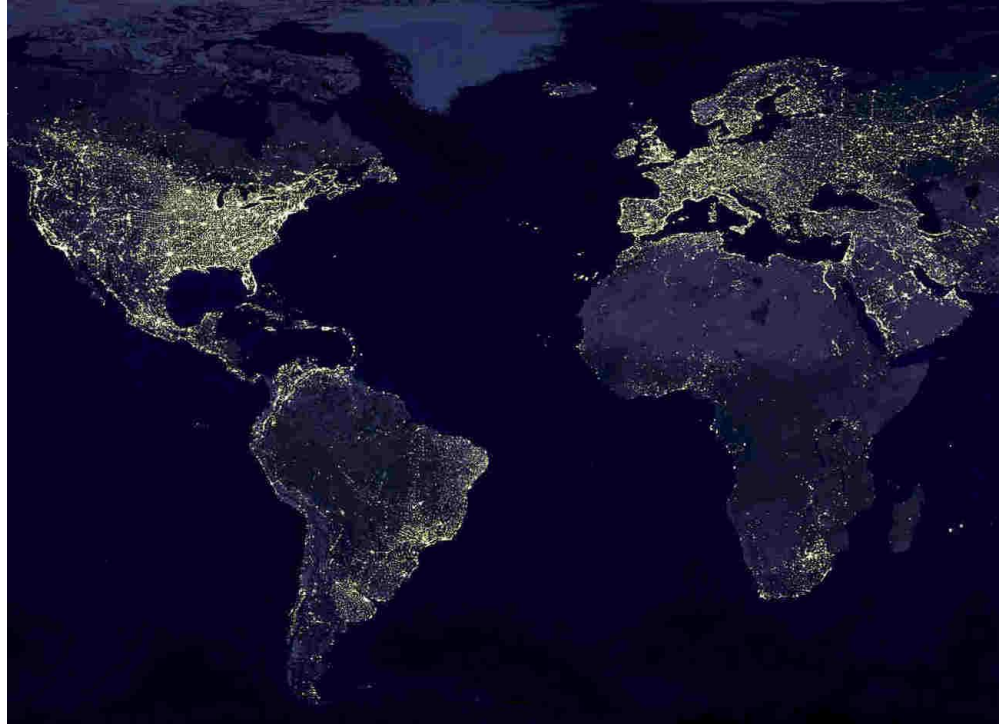
Clever Lighting: Leveraging Niagara for Revenue and IoT

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Lighting is the Perfect IoT Ekoskeleton



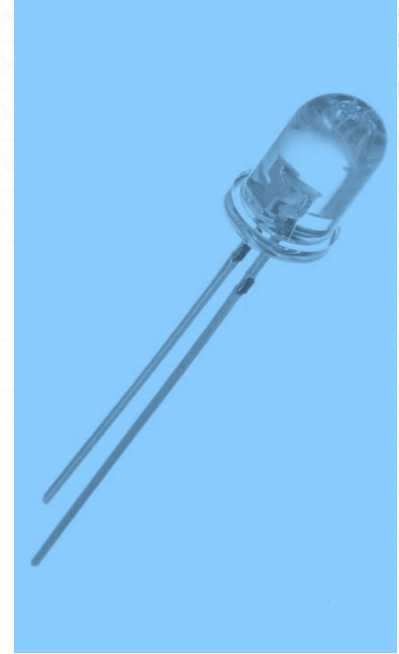
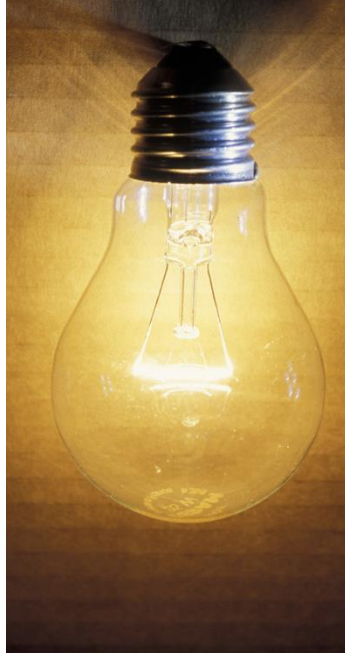
Lighting is the Perfect IoT Ekoskeleton



Lighting is the Perfect IoT Ekoskeleton



Lighting is Evolving



Clever Lighting

- Leveraging the uniqueness of LEDs and digital design for customer-valued, differentiated products
- ~\$1B Global Market
- Smart Endpoints = Sensor Data Points

Clever = Programmable + Intelligent



Smart = Clever + Connected

The New Business Case for Niagara + Clever

elitedali™
smart lighting controls

Software & hardware building blocks, enabling any suitable BMS, BAS, BEMS, or BACS platform based upon Tridium's Niagara FrameWork® to be a smart DALI® lighting commissioning and controls solution.

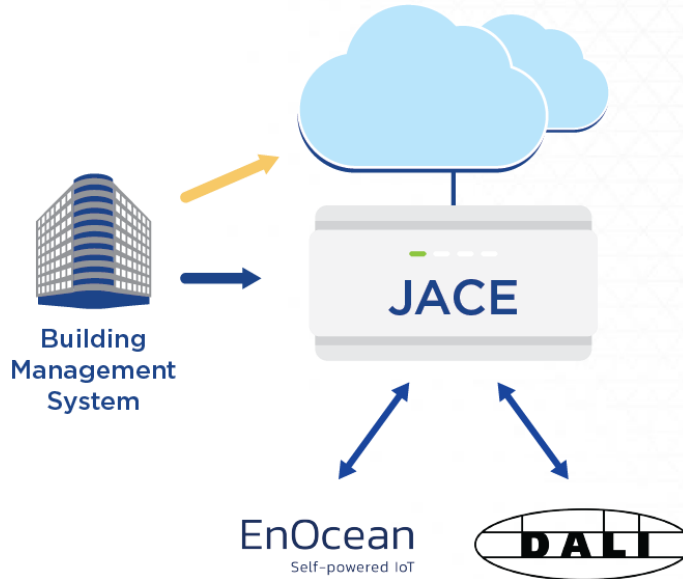
cns-enocean™
wireless | energy harvesting

Software & hardware building blocks, enabling, any suitable BMS, BAS, BEMS, or BACS platform based upon Tridium's Niagara FrameWork® to be a smart EnOcean® wireless commissioning and controls solution.

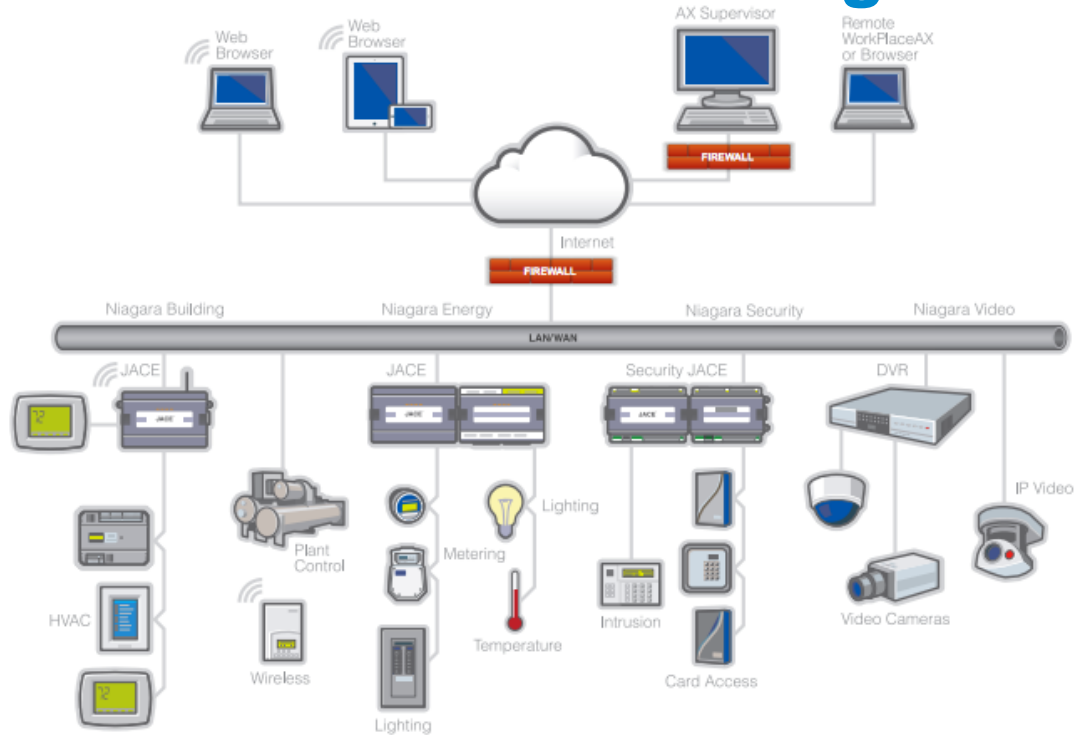
The New Business Case for Niagara + Clever

elitedali™ and cns-enocean™

- Direct & seamless BMS/BAS integration & device value data access
- **Native** Tridium® Niagara product
- Specialized for distribution centers, factories, office space, hospitals, hotels, educational facilities
- Empowers the Niagara Community to add its own significant IP and value.



The New Business Case for Niagara + Clever



The New Business Case for Niagara + Clever



- Why Communicate with Every Fixture?
 - No matter the code changes (Title 24), we can adapt
 - Take full advantage of future software updates
 - Better daylight harvesting
 - Easily adjustable lighting scenes

CASE STUDY



- What features are important to me today?
 - HVAC optimization
 - Space utilization
 - Classroom scenes
 - Plug loads
 - Proven energy savings reports

CASE STUDY



California State University
DOMINGUEZ HILLS

Before 100%

After 25%



CASE STUDY



- What do I see in the future?
 - Professor walks into room and lights and HVAC adjust to his or her preselected levels
 - Maintenance walks into the room and they are immediately connected to a database that corresponds to relevant room data
 - Age of carpet, paint, furniture, etc.
 - Last time cleaning was done or floor polishing
 - PMs or work logs
 - CO2 sensors, humidity, water leaks/flooding



- During February 2015, Eco Vox building analytics showed that **15 VAV units using lighting occupancy controls data** averaged 152 hours each with **flow reduced by 161 cfm from normal.**
 - **2.1% reduction** of total airflow through air handlers 2 and 3
 - **Saves 720 kWh**
 - **Reduction of some 80 therms of natural gas**, due to cooling saved at the chiller level

- Welch Hall has a total of 185 VAV units

$$185 / 15 = 12.33$$

$$720\text{kWh} * 12.33 = 8,878 \text{ kWh} * 12 \text{ months} = 106,531 \text{ kWh per year}$$

$$80 \text{ therms} * 12.33 = 986 \text{ therms} * 12 \text{ months} = 11,837 \text{ therms per year}$$

ECOVOX
ENERGY ANALYTICS

Smart Business = Clever + Niagara (Platforms & Products)

- A profitable extension for single service Niagara SIs – Lighting
- Create multiple system control (usually Lighting + HVAC)
 - Better Rol than single service
 - Unique offerings to differentiator your service from competitors
 - Small incremental work for large revenue increase
 - Broaden and enhance your reputation
- Create annuity solutions limited only by imagination and ability to execute!

Thank You

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