Energy · Quality · Controllability℠

NLCs For Small/Medium Buildings: Lessons Learned and New Frameworks

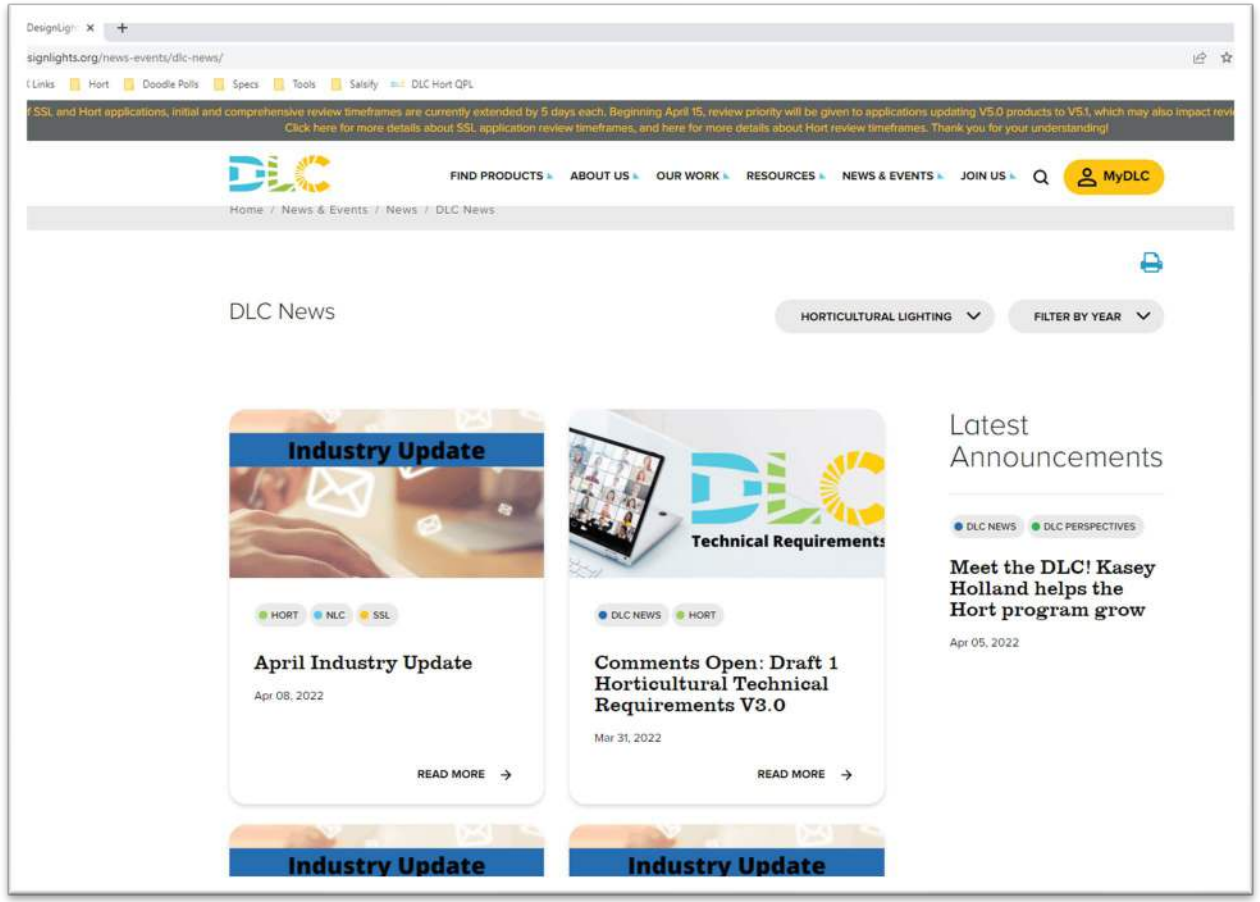
July 16, 2025

designlights.org

Welcome!

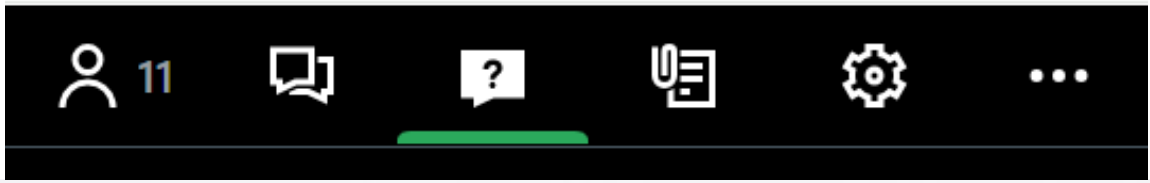
- **Slides and recorded webinar will be posted** on the *DLC News & Events* page at https://designlights.org shortly after today's presentation

- All attendees are automatically muted



Webinar Orientation

- **Questions will be answered at the end during a live Q&A**
  - **Type questions into the Question pane to submit for Q&A**



Agenda

- Welcome & Introductions
- Overview of DLC, NLCs + LLLCs
- 3 Steps for any NLC
- Frank Agraz, FSG
- Kirby Corkill, Jarvis Lighting
- Round Table / Q&A

Presenters & Hosts

Jason Jeunnette
Technical Manager

Frank Agraz
Director of Engineering,
Facility Solutions Group

Kirby Corkill
Team Leader, Jarvis Lighting

The DesignLights Consortium is an independent, nonprofit organization providing decision makers with data and resources on quality lighting, controls, and integrated building systems to reduce energy, carbon, and light pollution.

SSL V6.0: Driving Adoption of Connected Lighting

Advance energy efficiency and support decarbonization

Strengthen the SSL QPL by expanding eligibility

Drive greater adoption of controls

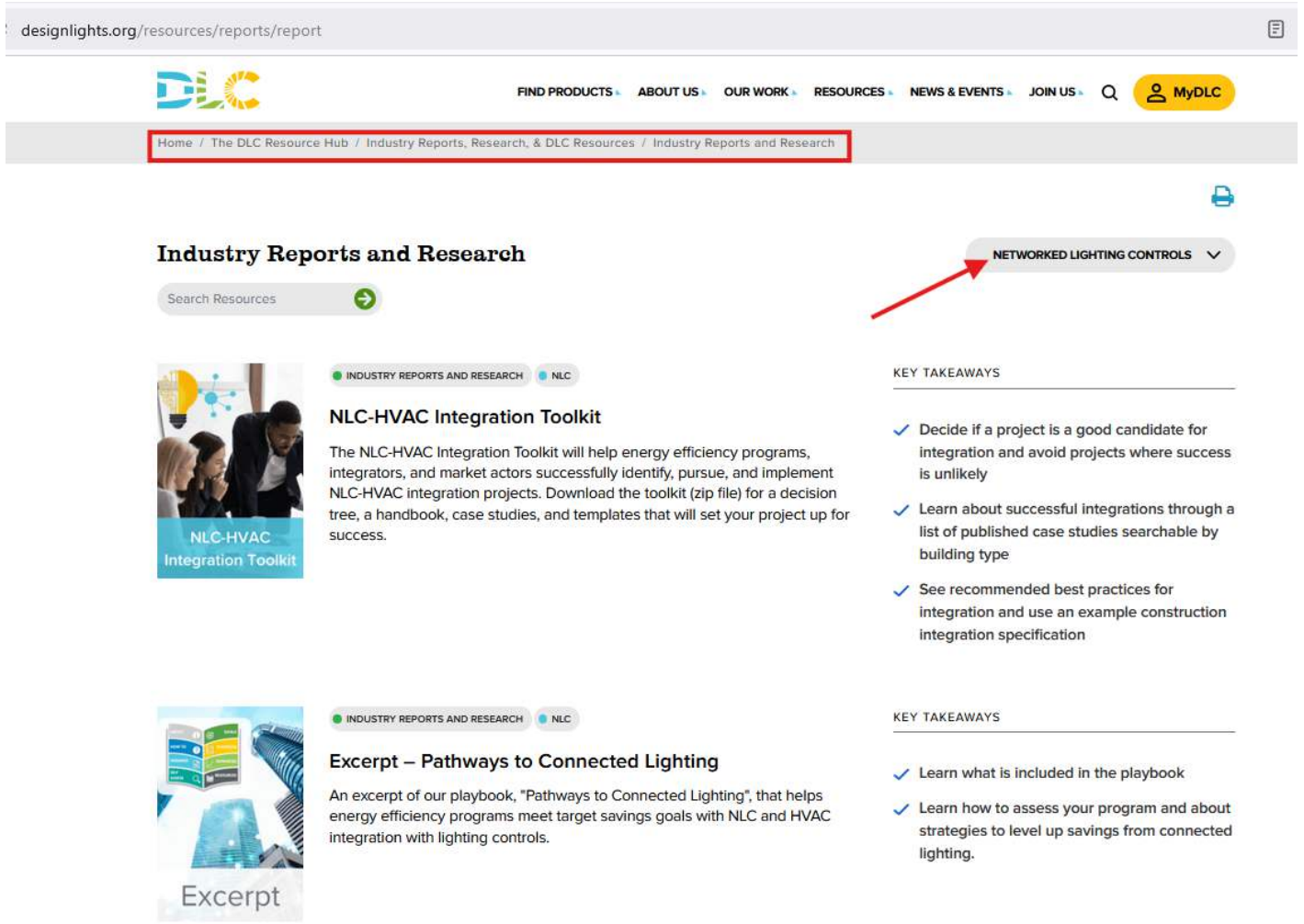
Mitigate light pollution

SSL V6 Controls Categories

Category	Name
1	No Integral Controls
2	Controls Ready Product
3	Product with One Integral Sensor Function
4	Product with Two or More Integral Sensor Functions
5	Product with Networked Controller
6	Product with Networked Controller and Two or More Integral Sensor Functions (LLLC)

DLC Networked Lighting Controls - Publicly Available Reports

- [Future-Proofing Energy Efficiency with Networked Lighting Controls]
- [Evaluating the Non-Energy Benefits of Advanced Networked Lighting Controls]
- [Energy Savings from Networked Lighting Control (NLC) Systems with and without LLLC]
- [Interoperability for Networked Lighting Controls]
- [Energy Savings Potential of DLC Commercial Lighting and Networked Lighting Controls]
- [Energy Savings from Networked Lighting Control (NLC) Systems]

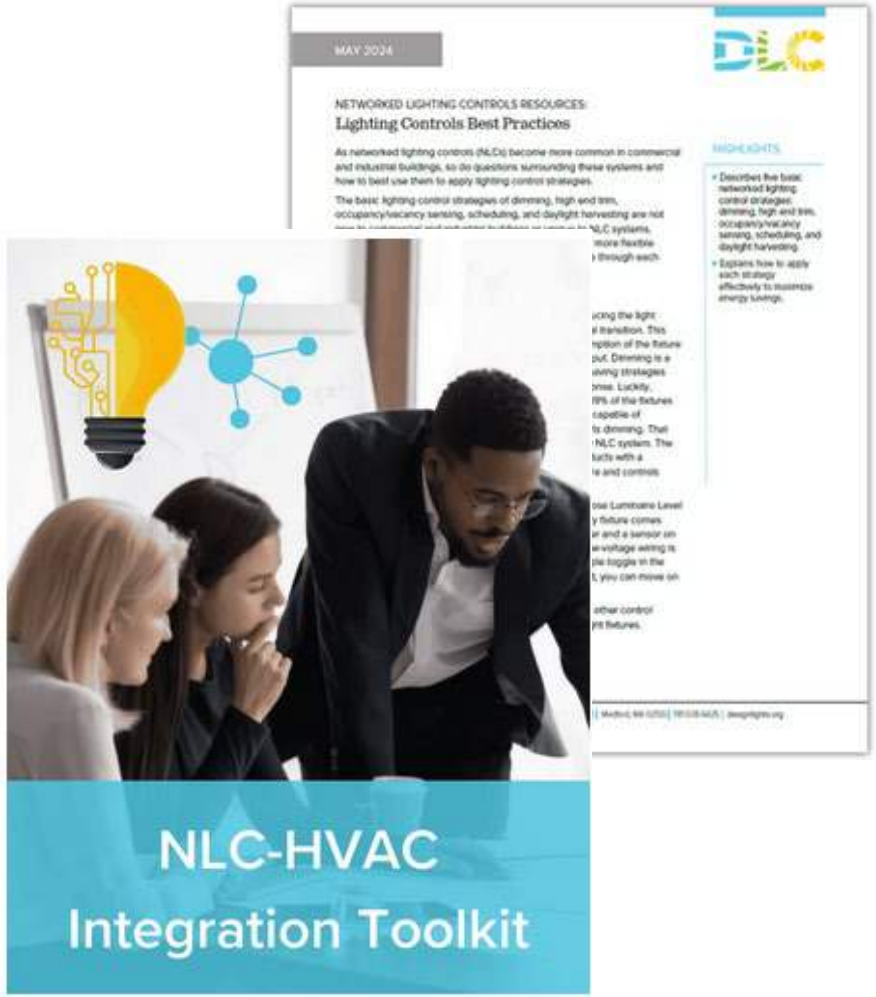


DLC Networked Lighting Controls - Publicly Available Resources

- Lighting Controls Best Practices
- NLC-HVAC Integration Toolkit

Controls Best Practices

TOOLKIT



Blogs:

- Here's How Networked Lighting Controls Can Level Up Energy Efficiency Efforts
- Replace Old Lighting with the Best LED Solutions from our QPLs

DLC Networked Lighting Controls - Member-Exclusive Resources

- **Lighting Controls and Technical Reference Manuals: Updates to Enhance Energy Savings**

  Includes:
  - TRM research report
  - TRM workpaper template with resources

- **Kickstarting Connected Lighting in Energy Efficiency Programs: New DLC Playbook**

  Includes:
  - Program Self Assessment
  - Clarifying Program Goals and Objectives
  - Specific program strategies
  - Advanced program strategies
  - Useful resources for implementation

TRM Research Blog

Lighting Controls and Technical Reference Manuals: Updates to Enhance Energy Savings

May 28, 2025

Kickstarting Connected Lighting in Energy Efficiency Programs: New DLC Playbook

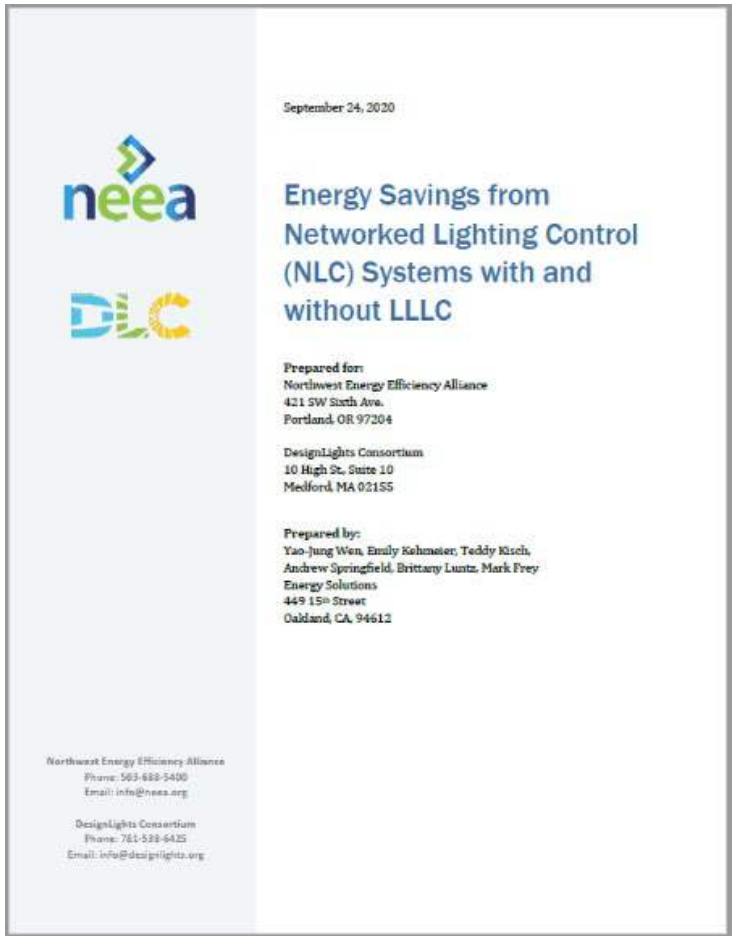
Jan 29, 2025

Pathways Playbook Excerpt

The Big Picture

~3 Million Buildings Nationwide

DLC Study: Avg. 49% Energy Savings with NLCs



September 24, 2020

neea

DLC

Energy Savings from Networked Lighting Control (NLC) Systems with and without LLLC

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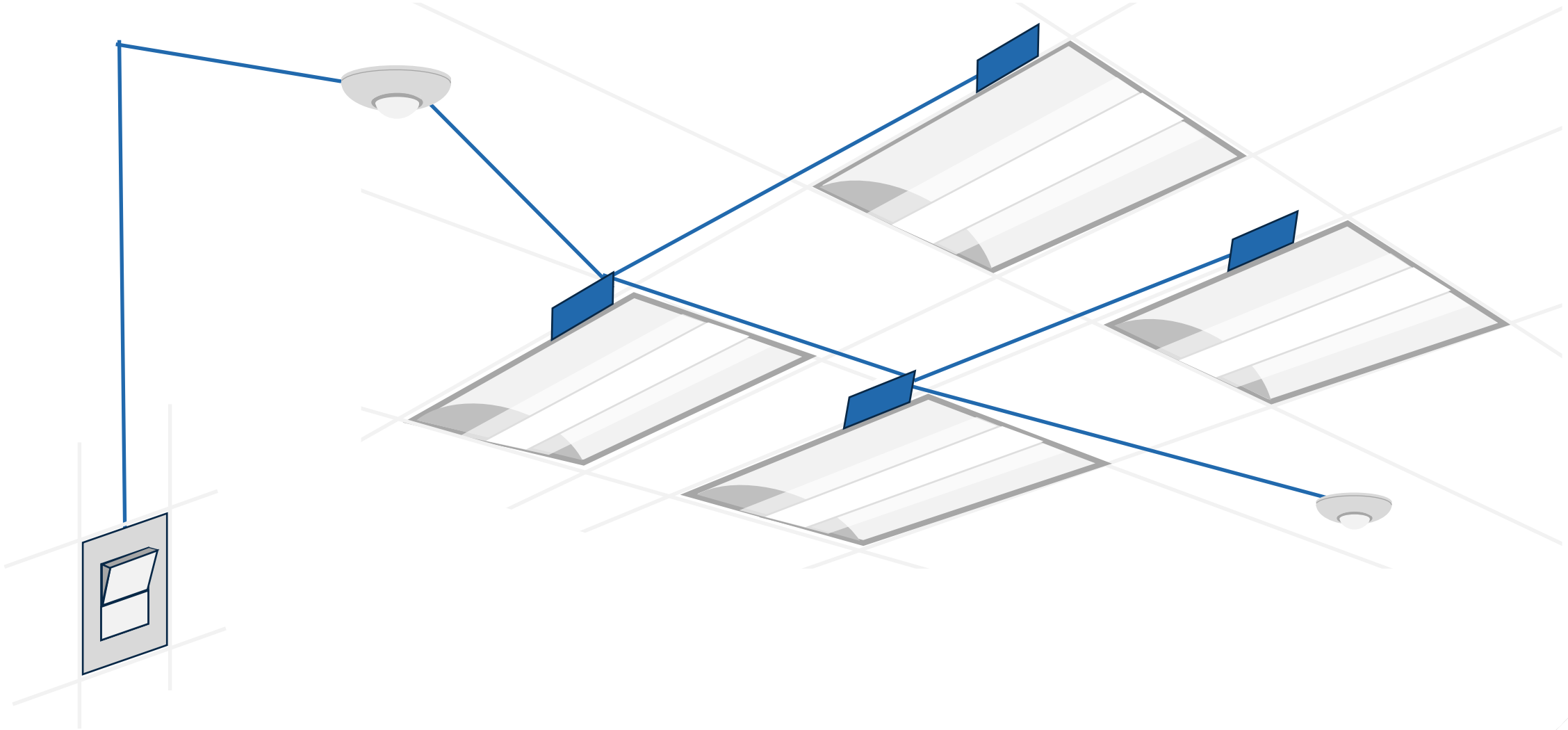
TWh Annually

NLC + LLLC Overview

Define “Networked Lighting Control” (NLC)



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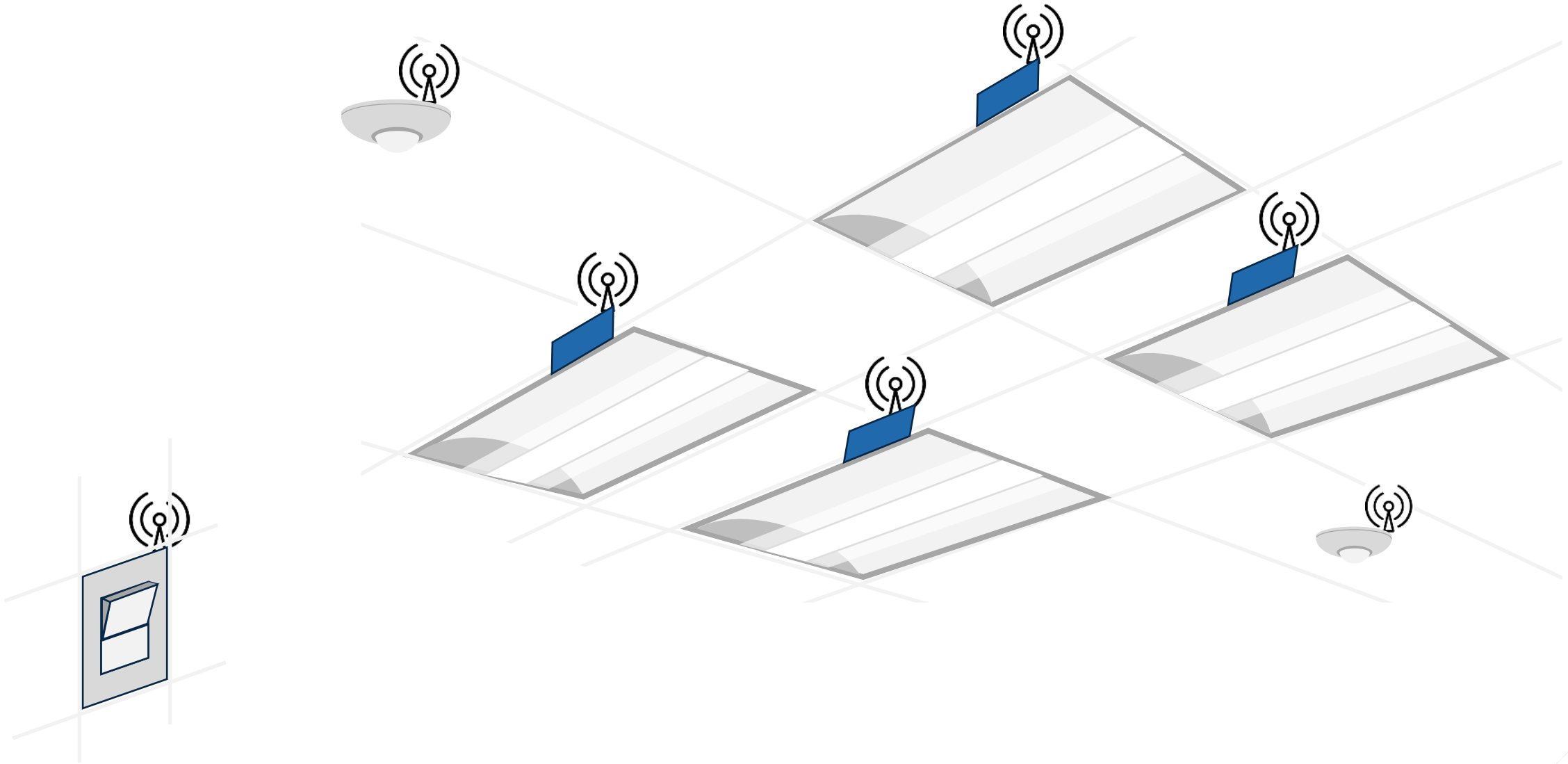

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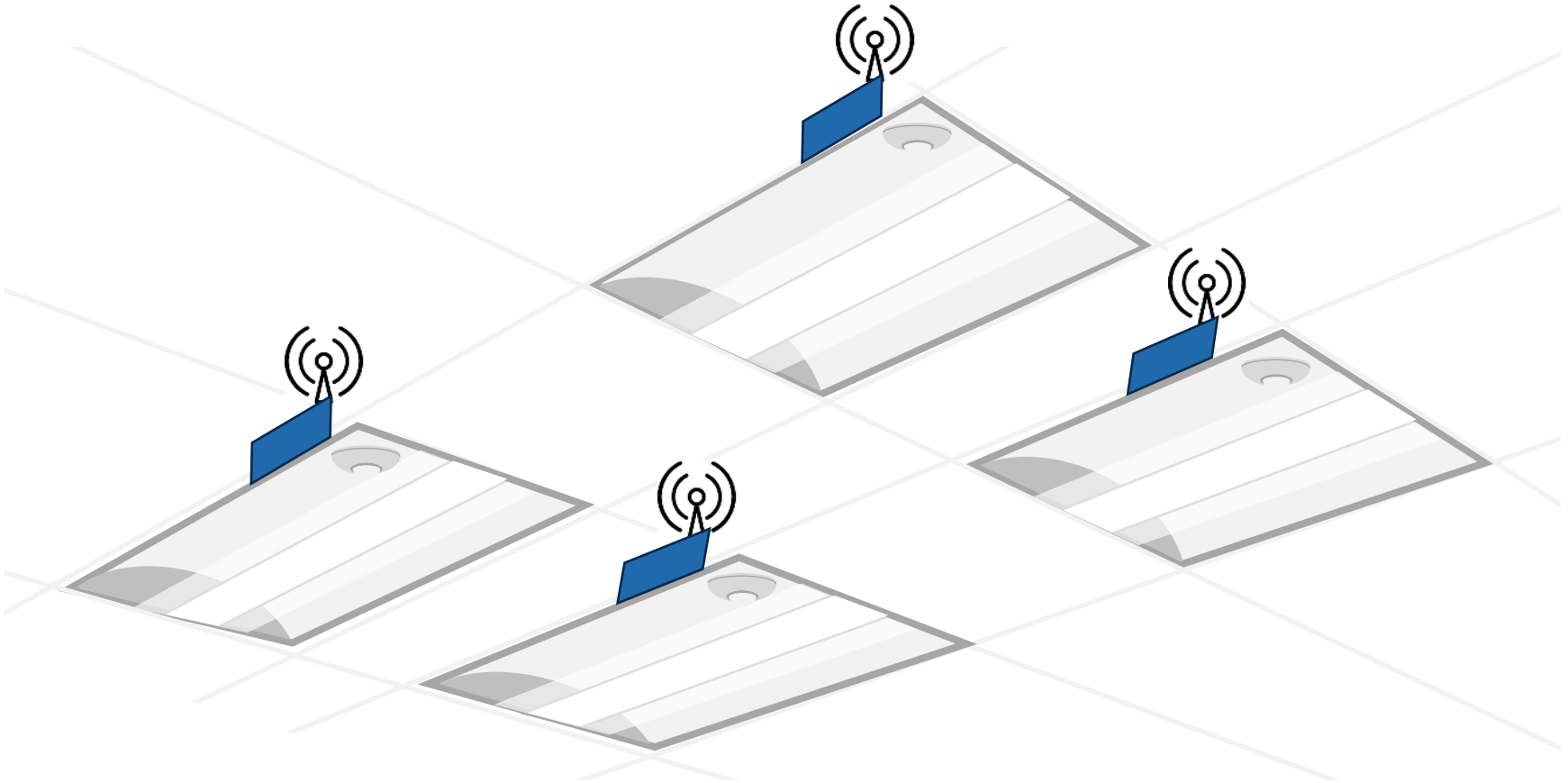
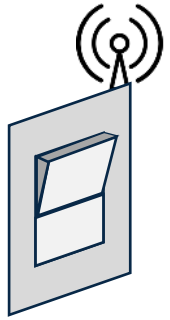
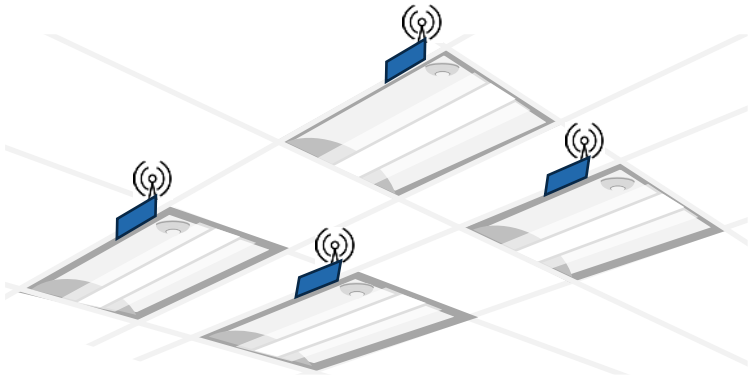
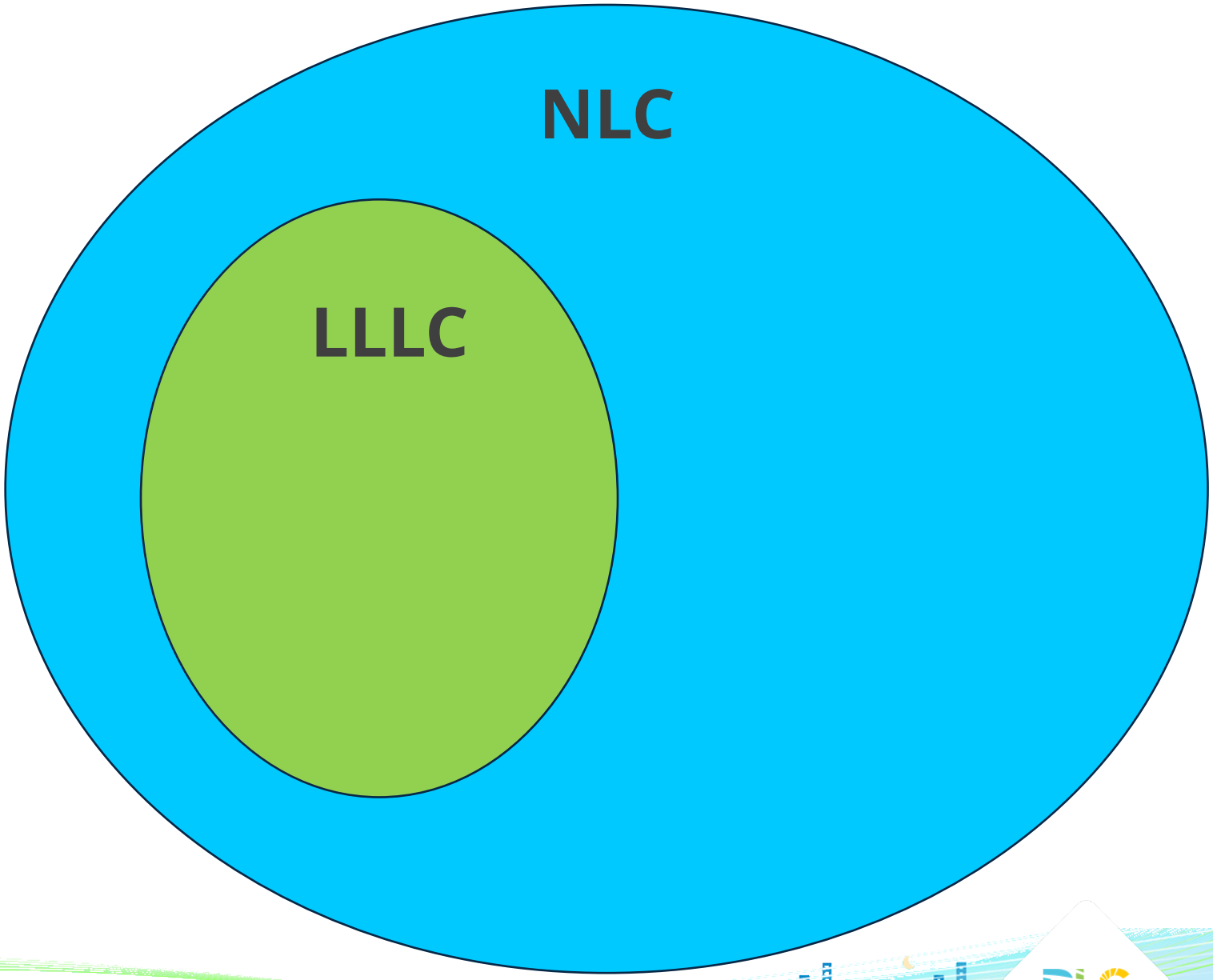




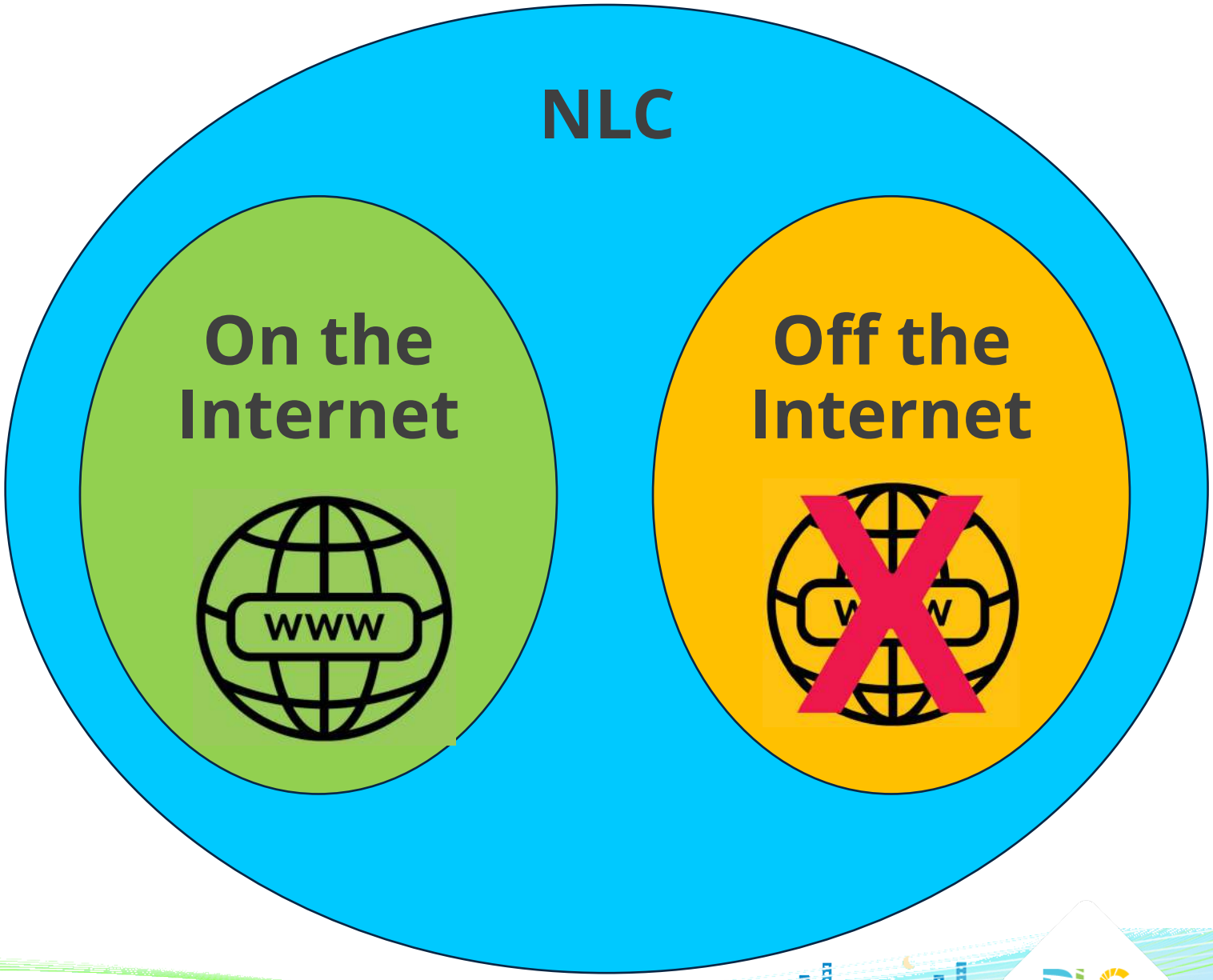
LLLC = sensors on every luminaire

LLLC is a type of NLC



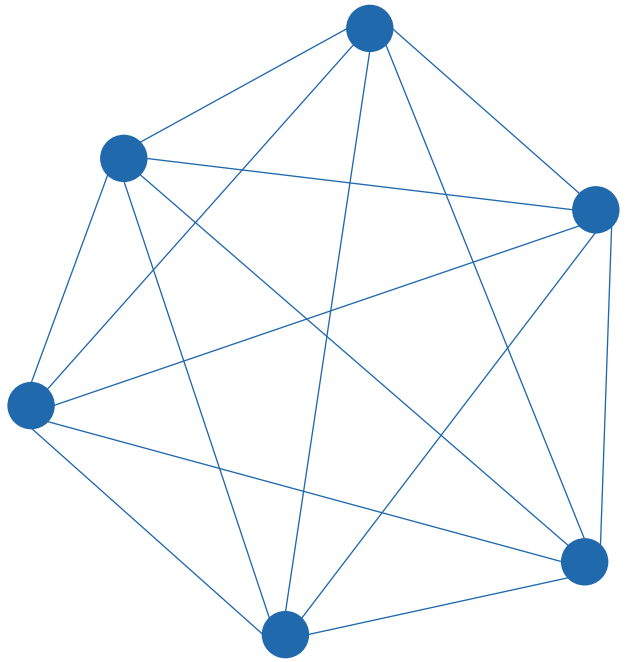


NLC can be on the Internet or not

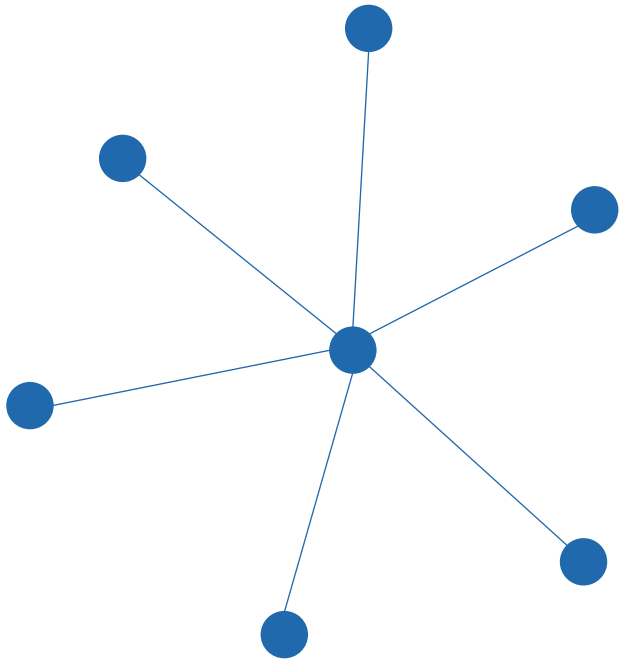


Some NLCs access the Internet occasionally through a phone

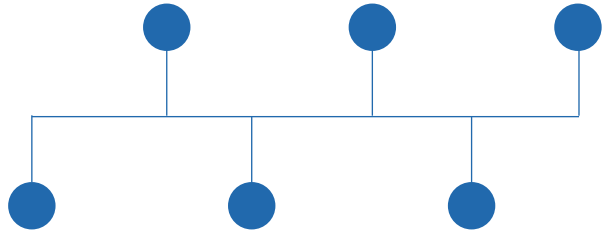
Network Typologies



Mesh



Star

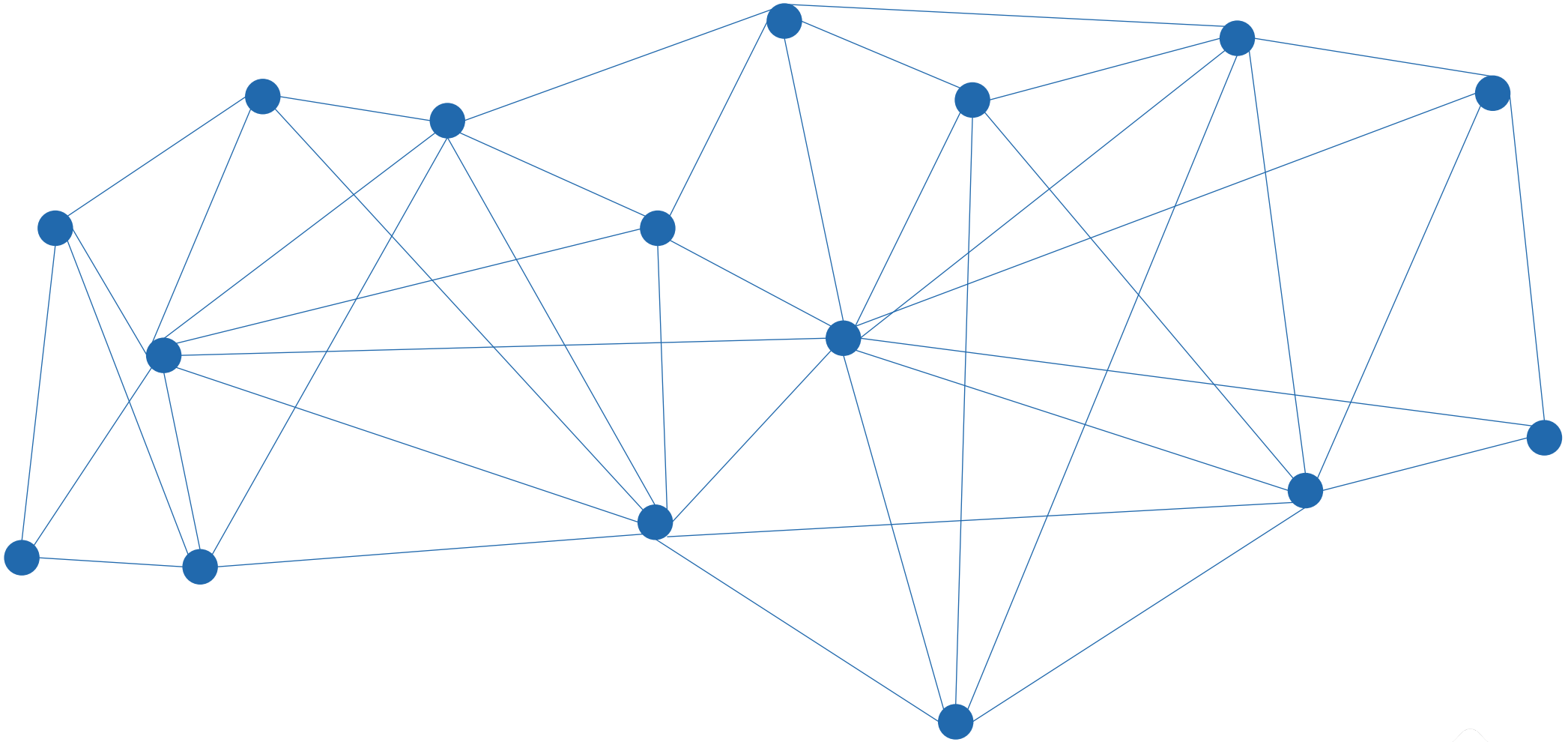


Bus

Orchestra


artıbir
uninvited
jazz band

Jazz Band



Why Does This Matter?

Large Buildings

- 100s or 1000s of Luminaires
- Likely has a BMS
- Dedicated Building Staff

Lighting Control Strategies

- Occupancy Sensing
- Daylight Harvesting
- Local Control
- Scheduling
- Shade Integration
- BMS/HVAC Integration
- Energy Monitoring/Reporting
- Space Utilization

Small/Medium Buildings

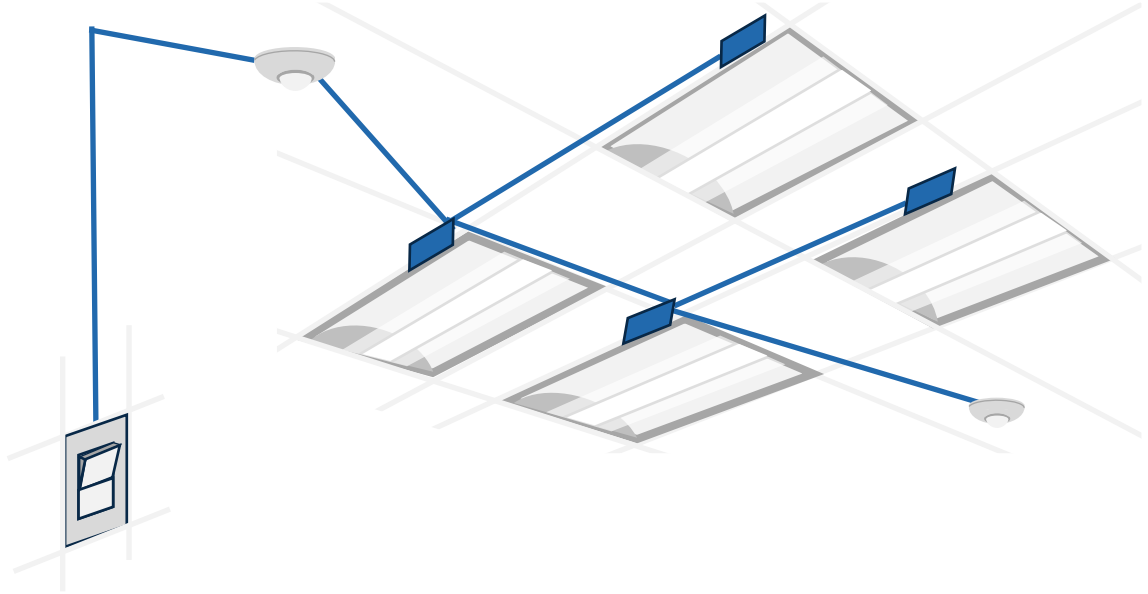
- 10s or 100s of Luminaires
- Usually no BMS
- Shared Building Staff

Lighting Control Strategies

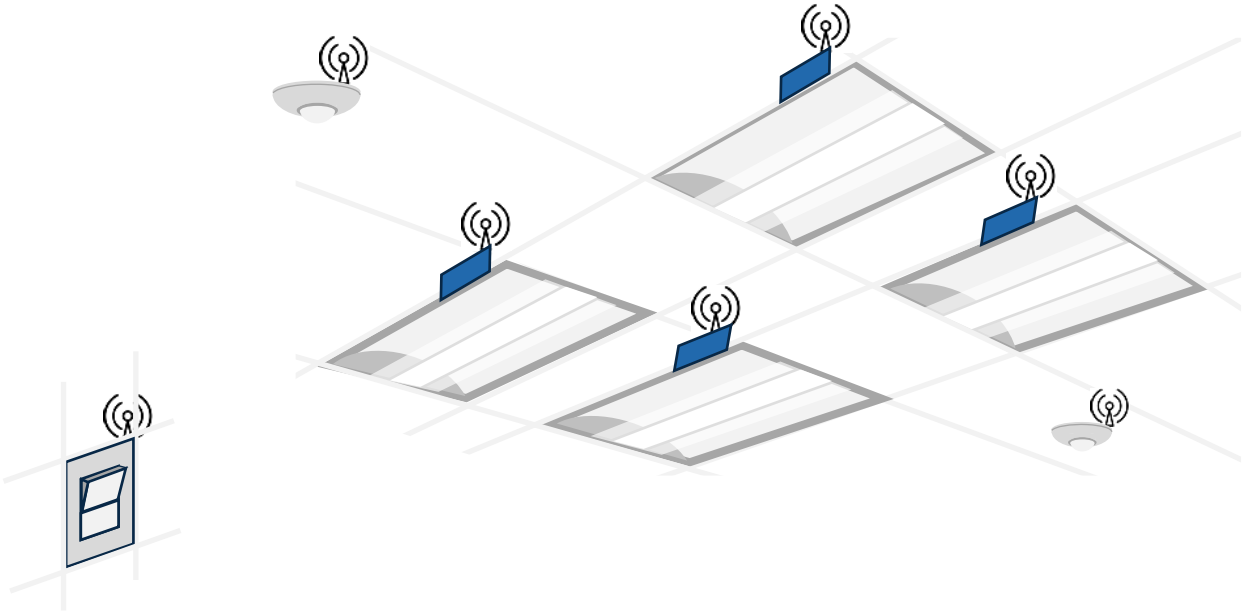
- Occupancy Sensing
- Daylight Harvesting
- Local Control
- Scheduling?
- HVAC Integration?

3 Steps for Any NLC

Step 1 – Build The Network

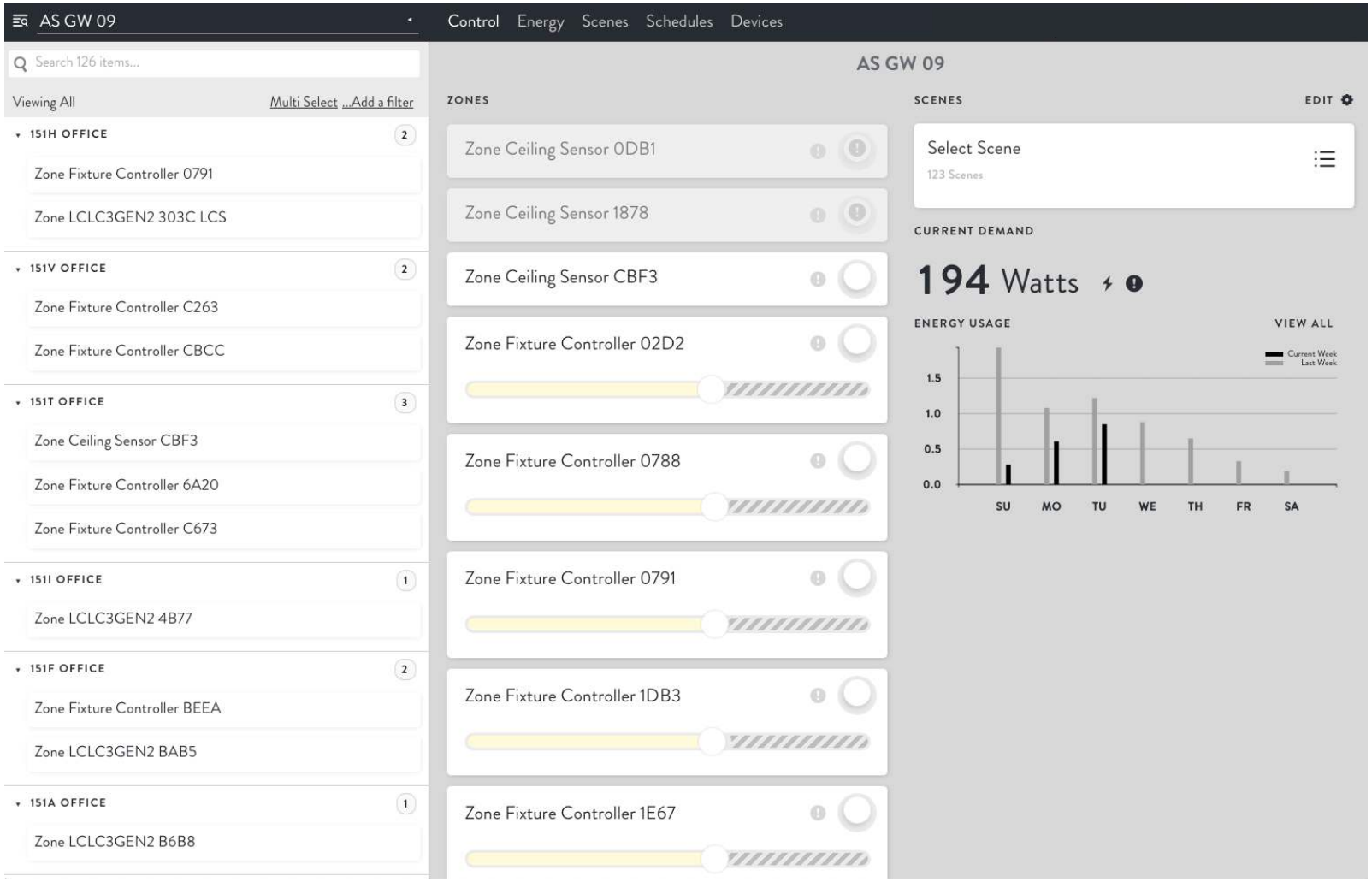


Connect Wired Devices



Join Wireless Nodes

Step 2 – Organize The Network



Step 3 – Apply Control Strategies

High End Trim?
Daylight Harvesting?
Occupancy/Vacancy Sensing?
Scheduling?
Scene Control?
Personal Control?

Sequences Of Operation By Controlled Room

Unique ID - Loc Ref# - Room Name	Room Type	High End Trim	Dim?	Daylight Enabled?	Occ / Vac	Sensor Grouped or Discrete	Timeout Length (min)	Occ. Level	Unocc. Level
1 - Classroom 31	Classroom / Lecture Hall / Training Room	75%	Y	Y	Vac.	Grouped	10	100%	0%
2 - Classroom 30	Classroom / Lecture Hall / Training Room	75%	Y	Y	Vac.	Grouped	10	100%	0%
3 - Classroom 29	Classroom / Lecture Hall / Training Room	75%	Y	Y	Vac.	Grouped	10	100%	0%
4 - Library 28	Library	75%	Y	Y	Vac.	Grouped	20	100%	0%
8 - Library	Library	75%	Y	Y	Vac.	Grouped	20	100%	0%
11 - Library 28A	Storage Room ≥50 ft2	65%	Y	N	Occ.	Discrete	5	100%	0%
13 - Library 28C	Storage Room <50 ft2	65%	Y	N	Occ.	Discrete	5	100%	0%
14 - Library 28D	Storage Room <50 ft2	65%	Y	N	Occ.	Discrete	5	100%	0%

Frank Agraz, FSG

Networked Lighting Controls

Lessons Learned

Audit with Controls in Mind

- Existing Controls
- Control Zones
- Occupancy Pattern
- Integration
- Data/Asset Tracking

Priority vs Features vs Budget

- Wireless Flexibility
- Automation vs User control
- App-Based commissioning
- “Control-Ready” luminaires
- Proprietary vs Open system
- Labor considerations

Other Considerations

- Power: Battery vs Line Voltage
- Scalability
- Access to Ceiling
- Zone/Grouping Flexibility
- Facility IT Coordination

Kirby Corkill, Jarvis Lighting

MAKE THE PLAN,

WORK THE PLAN

MAKE THE PLAN

- **Make the plan ahead of time**
- **Include all decision makers**
- **Keep plan functional and avoid fancy**
- **Consider real-world limitations**
- **Communicate the plan to all relevant parties**
  (End customers, person commissioning, installers, IT department)

WORK THE PLAN

- Right equipment in the right spot
- Person commissioning commissions as planned
- Actually communicate with end-users

BEFORE I DO ANYTHING,

I ASK MYSELF,

‘WOULD AN IDIOT DO THAT?’

AND IF THE ANSWER IS YES,

I DO NOT DO THAT THING

-DWIGHT SCHRUTE

MANAGING EXPECTATIONS AND CHANGES

- Make sure space is functional.
- Resist changing the plan before customers have had time to get comfortable with the changes.
- If there are functional issues, address them by re-making the plan. Avoid ‘impulse’ fixes that haven’t been thought through.

WHAT NOT TO DO

Do not put all the sensors on one side of the building and all the wireless control modules on the other.

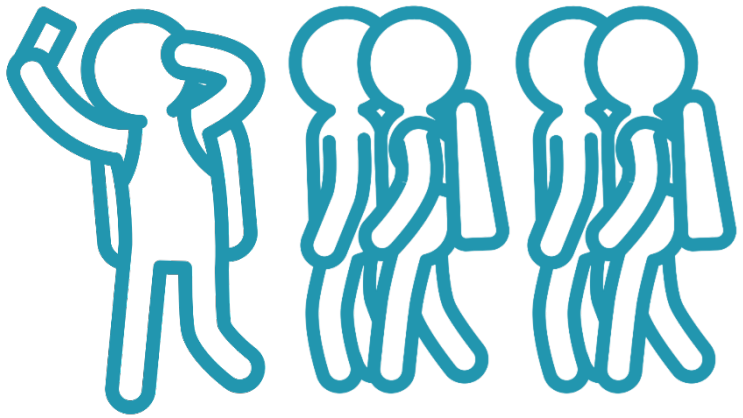
WHAT NOT TO DO

Do not try to install an internet gateway in a building that has no internet.

WHAT NOT TO DO

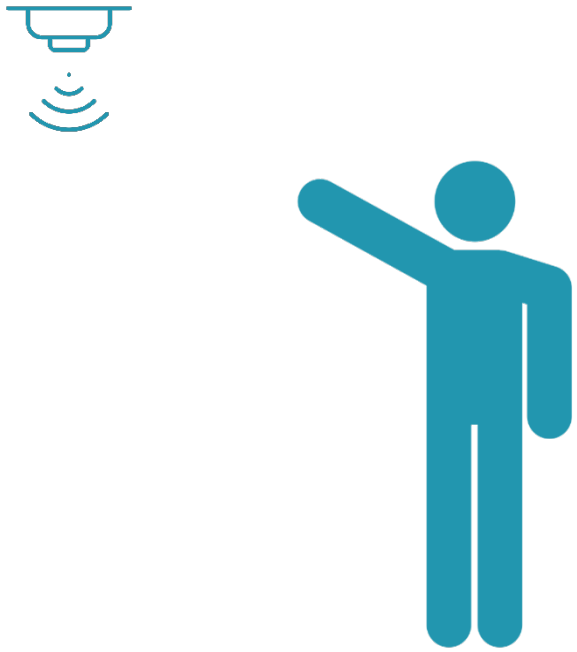
Do not try to run a wireless network through a mountain.

WHAT NOT TO DO



Do not let customers follow you around negotiating the settings for each room.

WHAT NOT TO DO



Do not forget to tell the building staff that sensors turn the lights off automatically.

Questions?

(type in question pane)

Thank You!

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