Lighting in BACnet 2023

David Fisher, Steve Karg, BACnet Lighting Applications Working Group

BACnet International

PLUGFEST 2023

History

- Lighting has always been part of BACnet
- 2001 LA-WG started to define Lighting-specific features
- Today BACnet has mechanisms for implementing complex lighting control interoperably

BACnet Lighting Applications Working Group

- This group will research, draft, and propose additions to the BACnet standard to support the requirements of lighting control applications.
- The group will work in cooperation with the NEMA Lighting Control Council, and the Illumination Engineering Society Controls Committee.

BACnet Lighting Applications Working Group (LA-WG)

- 35 members representing 30 organizations
  - 19 lighting organizations represented
  - 10 members are active in SSPC 135 (BACnet)
  - 6 members actively working on proposals
- Meet during SSPC or IES-NA meetings

Lighting Application Requirements

- Interoperable Methods For:
  - Blink Warn
  - Fade or Step to Level
  - Group or Zone Actions
  - Automatic Timeouts (CA - Title 24)
  - Scenes and Preset Levels
  - Dawn / Dusk Schedules
- Network Speed
- Standard Practices

What does the LA-WG do?

- Produce standard practice information
- Propose changes and additions to BACnet
  - Multiplexor Object
  - Lighting Output Object
- Monitor other BACnet working groups
  - BACnet conformance testing
  - Pulse Counter/Converter
  - Access Control
  - Load shed
  - Security

How does BACnet help Lighting?

- Lighting-specific BACnet objects LO, BLO and Channel
- Standardization of lighting operations, fade, ramp, step, toggle, blink warn
- Efficient distribution of multi-device simultaneous operations
- Incorporation of Color and Color Temperature concepts

Vendor-independent and Interoperable

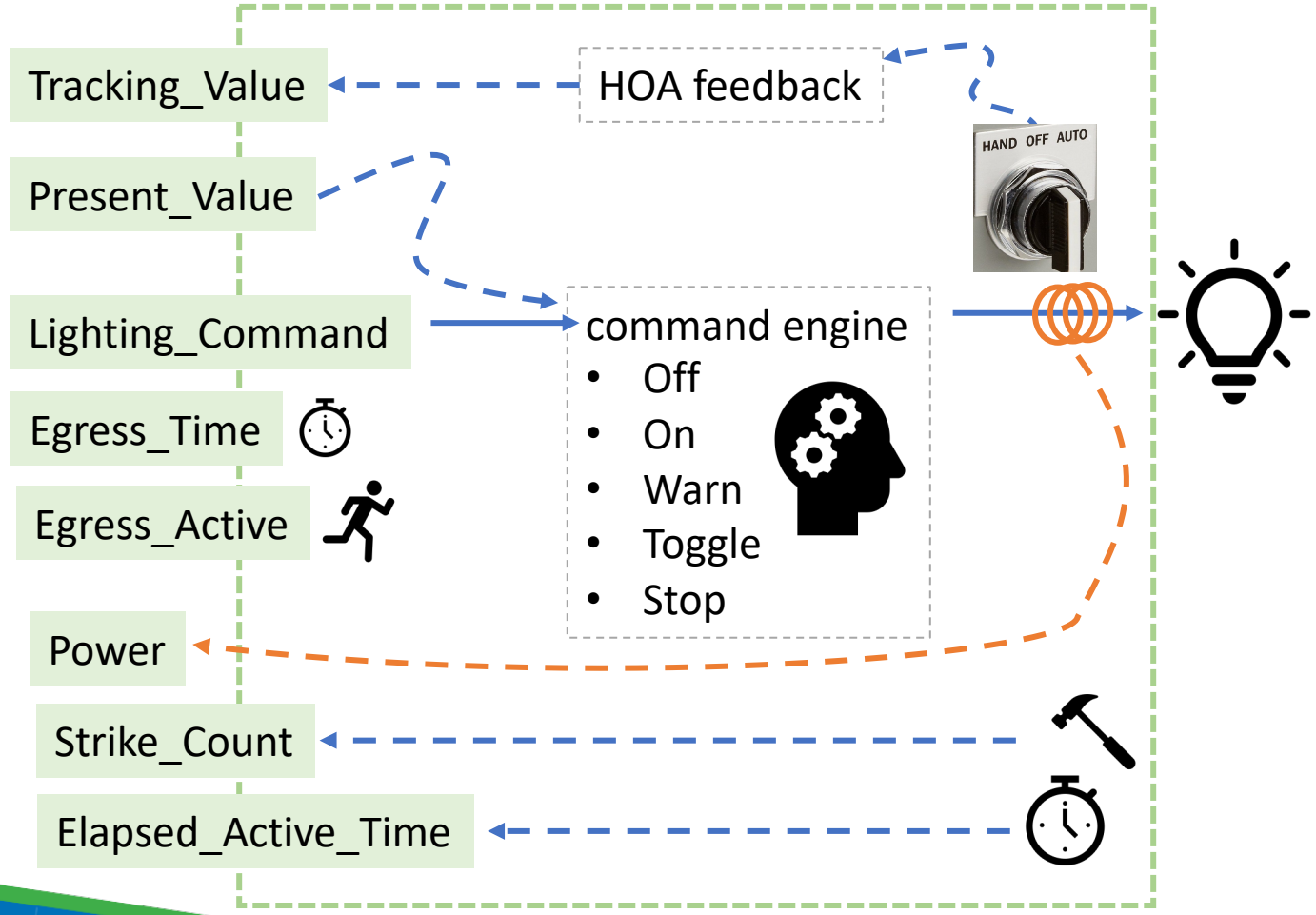
Why not just use BV and AV?

- no standardization of operations such as fade, ramp and step
- no standardization of blink warn
- no standardization of color
- no multi-device simultaneous operations

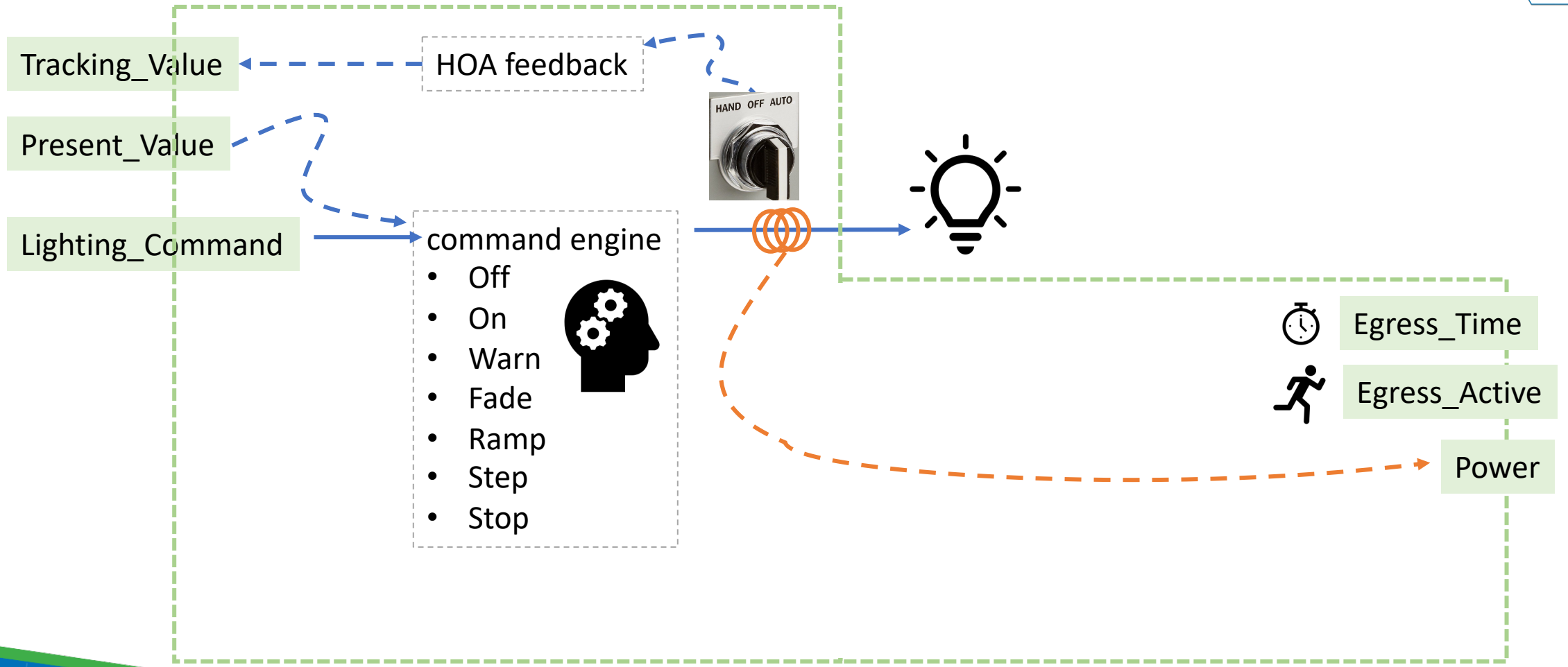
BV?

AV?

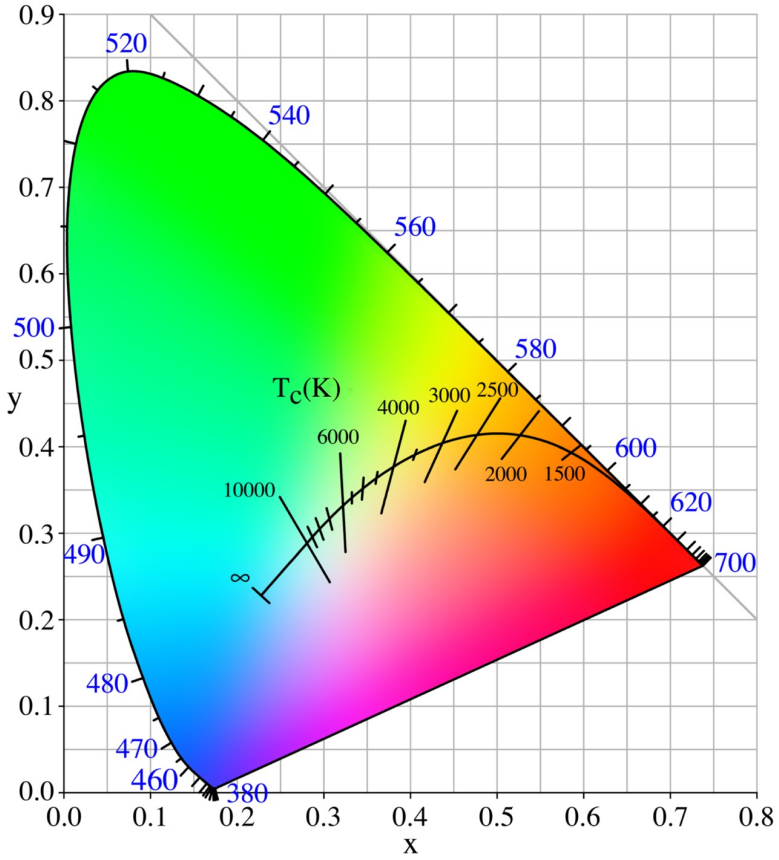
Binary Lighting Output (BLO)



Lighting Output (LO)

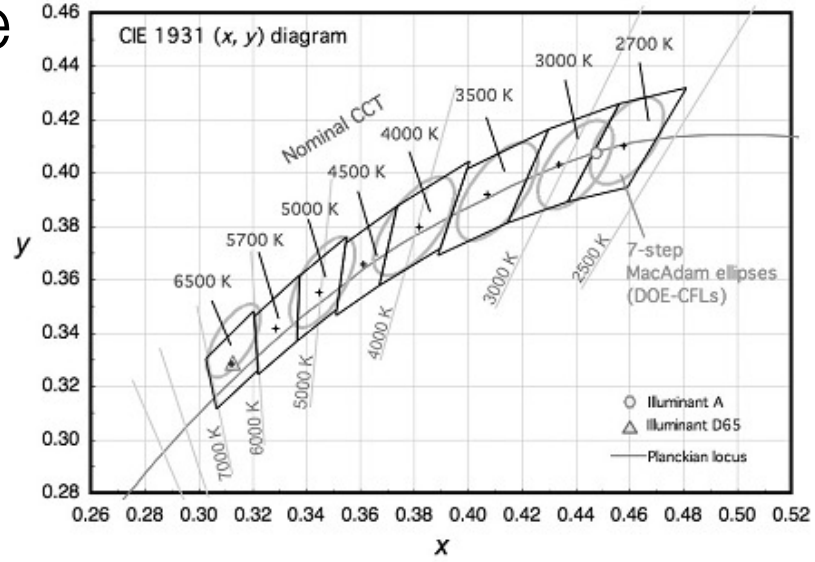


Color in BACnet

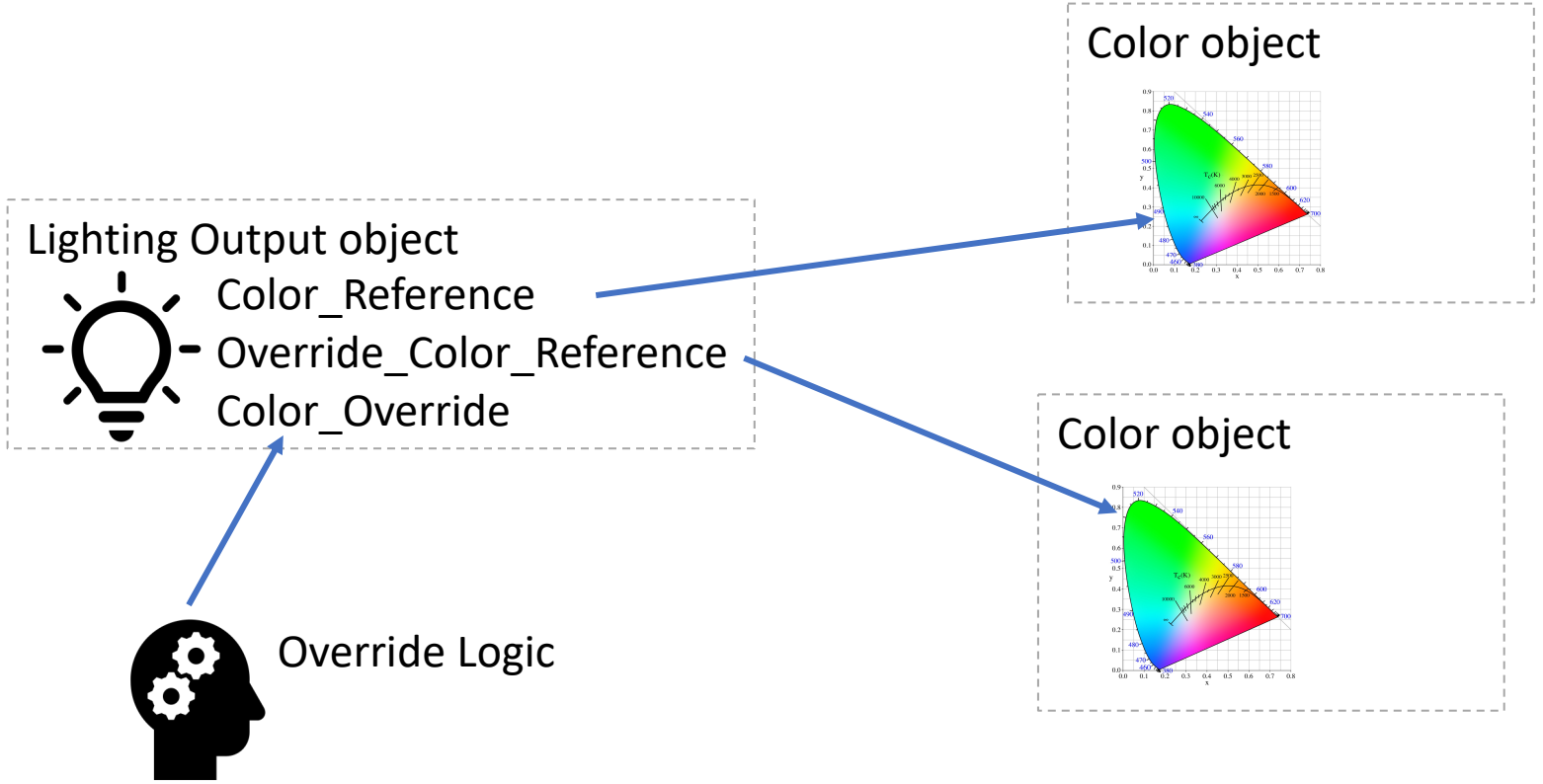


CIE 15: 2004 Chromaticity Diagram

- BACnet models color using the CIE 15:2004 Chromaticity Diagram as an (x,y) coordinate
- Color Temperature is in Kelvin as a point on the White Light Curve

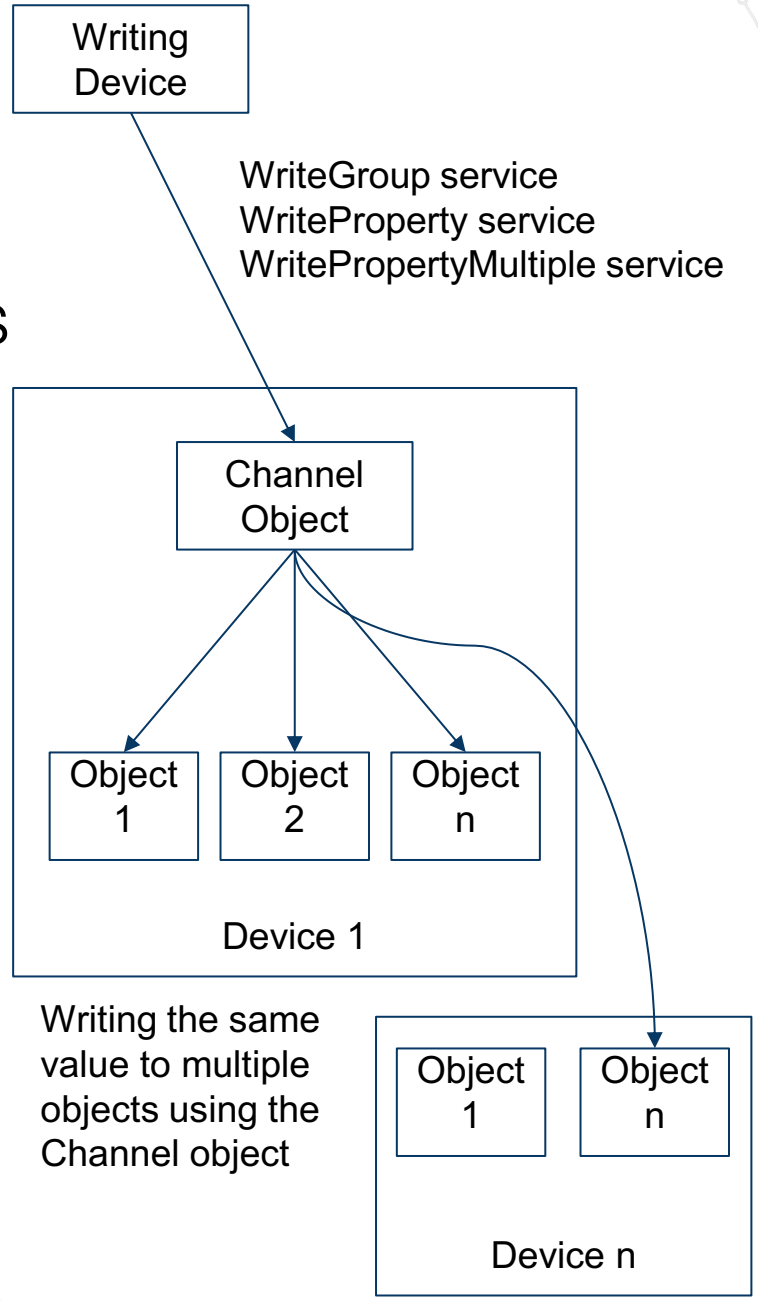


Color References



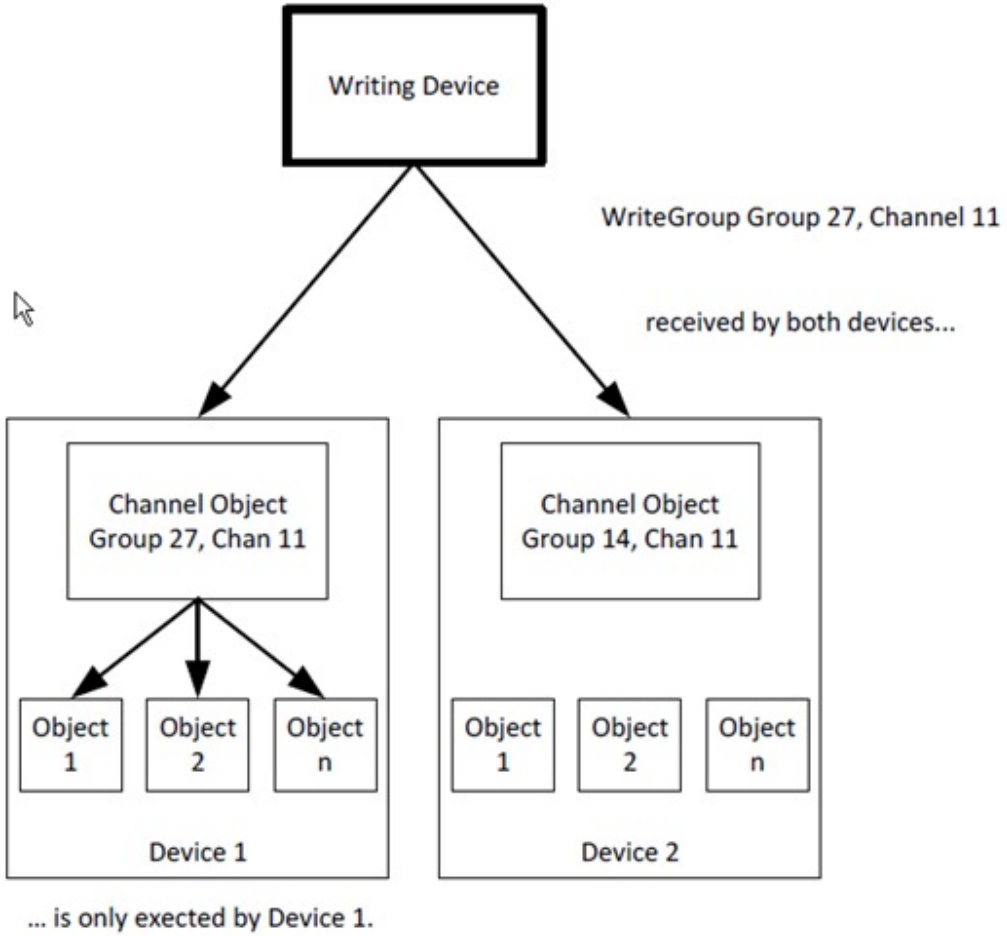
Channel Object

- Channel object can distribute values to multiple other objects
- Channel can be associated with multiple groups and logical “channels”



WriteGroup Service

- Single broadcast can reach many devices at the same time
- Targets specific “group” of devices
- Targets “logical channels”
- Can write multiple different values at the same time



Takeaways for Lighting in BACnet

- Robust and comprehensive object model
- Interoperable objects and standardized operations
- Suitable for interoperable control situations and workstation monitoring
- Addresses both Luminance and Color

Demo

BACnet International