

SPMD Usecase For Buildings

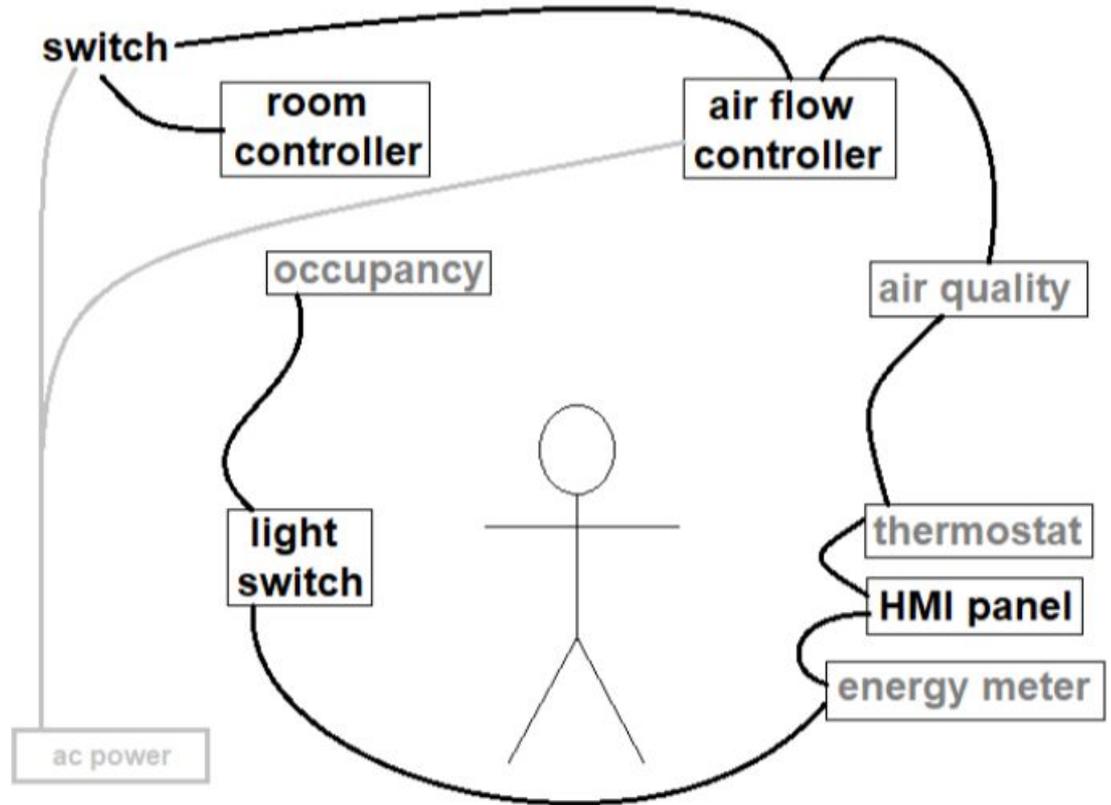
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Topology

The room controller communicates with the sensors and actuators

The air flow controller includes a 24VAC motor.

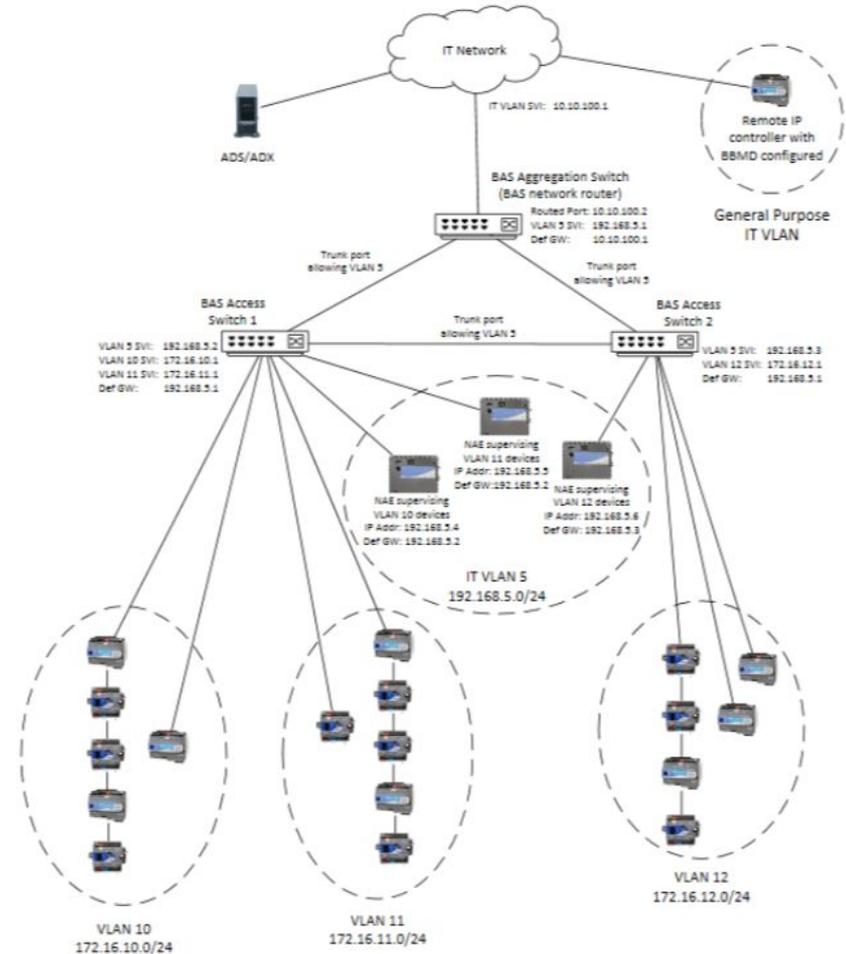
The other components are physical inputs/outputs.



Penetration of IP networking

IP has high penetration in the market for security cameras and lighting. Penetration is low for access control and HVAC (which are still RS-485).

For HVAC, penetration is moving from 1% of devices to 10% of devices. SPMD is probably a key technology going from 10% to 100%.



BACnet standard

Much of the market is tied to the BACnet standard, which assures customers of interoperability between the offerings of the principle vendors.

In November 2019, BACnet adopted a specification for BACnet/SC. This option uses HTTPS for transport. This is the only viable path to message encryption. It is the first step towards cybersecurity, and will provide a push towards IP hardware as soon as vendors have a software implementation of the new standard.

Usecase: HVAC controls for building

Item	Min Value	Desired value	Extra information
Supported nodes on one mixing segment	8	16	
Minimum supported cable length	30 m	60 m	Circumference of a room
Acceptable cable gauges	22, 24, 26		Typical. We could also use thicker wire.
Required power for a node	2 W	5 W max	
Required initial power allocation	0.5 W	1 W	
60V voltage OK ?	yes		
Interoperability level for the application	Plug&play		
Pass through or T connection	Pass through		The stubs for T would not be long enough. Everything is 0.5 to 1.5 m above the floor. The ceiling height is 2.5 to 4 meters.
Hotpluggability	yes		Can tolerate a 30 sec dropout