

# A Universal Platform for Building Energy Management

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# Outline

1 Overview of Idea

2 Wake-on-LAN

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# Overview of Idea

- Control power states of computers remotely on the LAN
- Reduce power consumption of desktop PCs and/or servers
- Monitor power consumption using WeMo switch

# Wake-on-LAN

- Ability to wake up computer from sleep state or turn on from off state
- Initiated with a *magic packet* which is a string of 6 bytes, all 255 (0xFFFFFFFFFFFF), followed by sixteen repetitions of target computers 6-byte MAC address

## Cons

- Computers can only be turned on
- Computer will need to be turned off by disconnecting AC power with WeMo Switch
- Wake on AC can be configured in most BIOS to allow the computer to boot immediately upon reconnection to AC power
- Requires specific motherboard and NIC
- Wired network connection needed

- Intelligent Platform Management Interface (IPMI) provides management capabilities independent of the CPU and OS
- Interacts with Baseboard Management Controller (BMC) to interact with different components of the motherboard and computer
- Can remotely turn on, turn off, and power cycle servers through LAN connection
- Monitor system temperature, voltage, and fans

## Cons

- Only server motherboards are manufactured with BMCs
- Dedicated network port needed
- May be very complicated to implement in BEMOSS
- Will need to purchase dedicated server with BMC

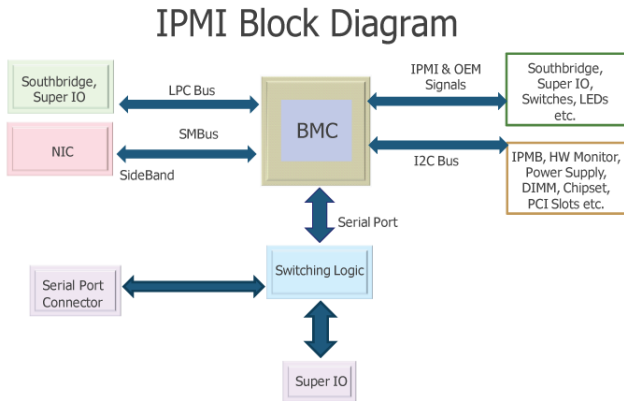


Figure: Image taken from [3]

# Summary

- May find different device instead do to the complexity and lack of feasibility of this idea
- Still need to do a lot of research on this topic
- Scheduling could be implemented to turn computers/servers on/off at certain points in the day

# For Further Reading I



openHAB

openHAB site

<https://www.openhab.org>



Wake-on-LAN

Wake-on-LAN wiki page

<https://en.wikipedia.org/wiki/Wake-on-LAN>



IPMI

IPMI wiki page

[https://en.wikipedia.org/wiki/  
Intelligent\\_Platform\\_Management\\_Interface](https://en.wikipedia.org/wiki/Intelligent_Platform_Management_Interface)



Any Questions?