

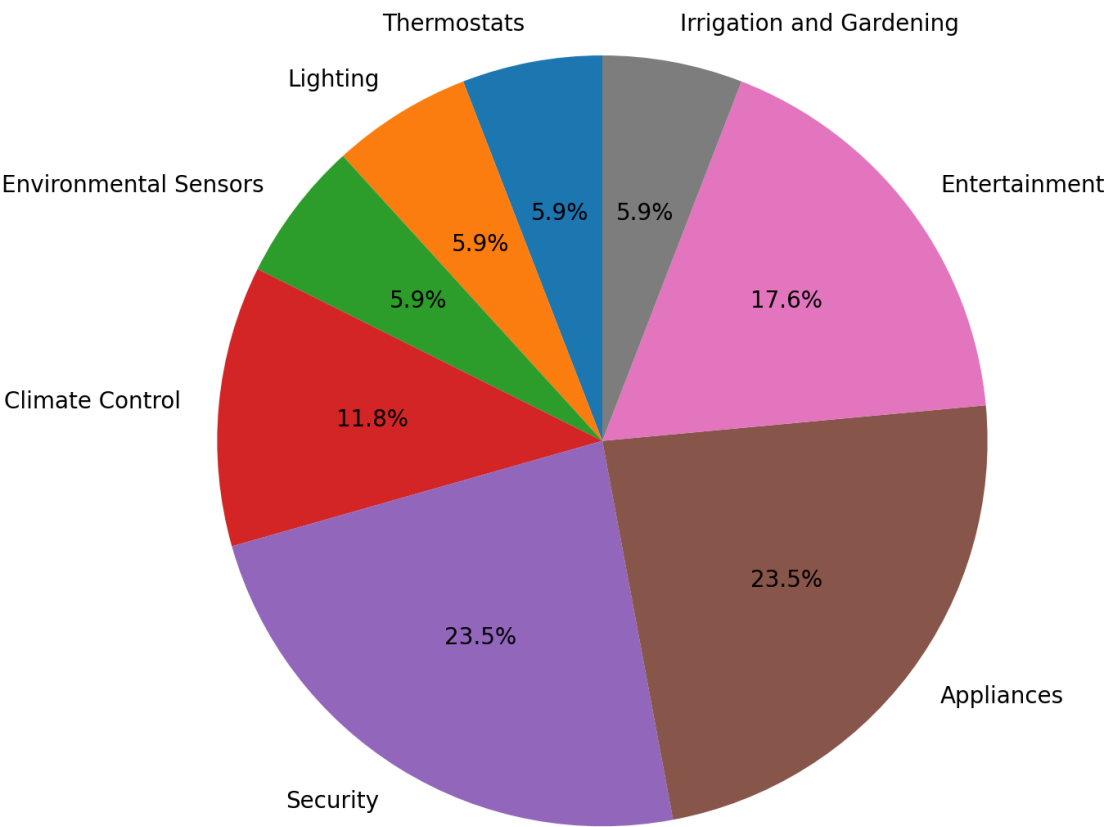
Findings:

For this sample data, we can see that most devices fall under the security category. Realistically though lighting, and temperature sensors would be the highest in a smart home. This graph helps the User/Admin to visualise quickly what IOT devices are connected to the smart home.

Device Type & Count

device_type_category	count
Thermostats	1
Lighting	1
Environmental Sensors	1
Climate Control	2
Security	4
Appliances	4
Entertainment	3
Irrigation and Gardening	1

Device Type Category Distribution

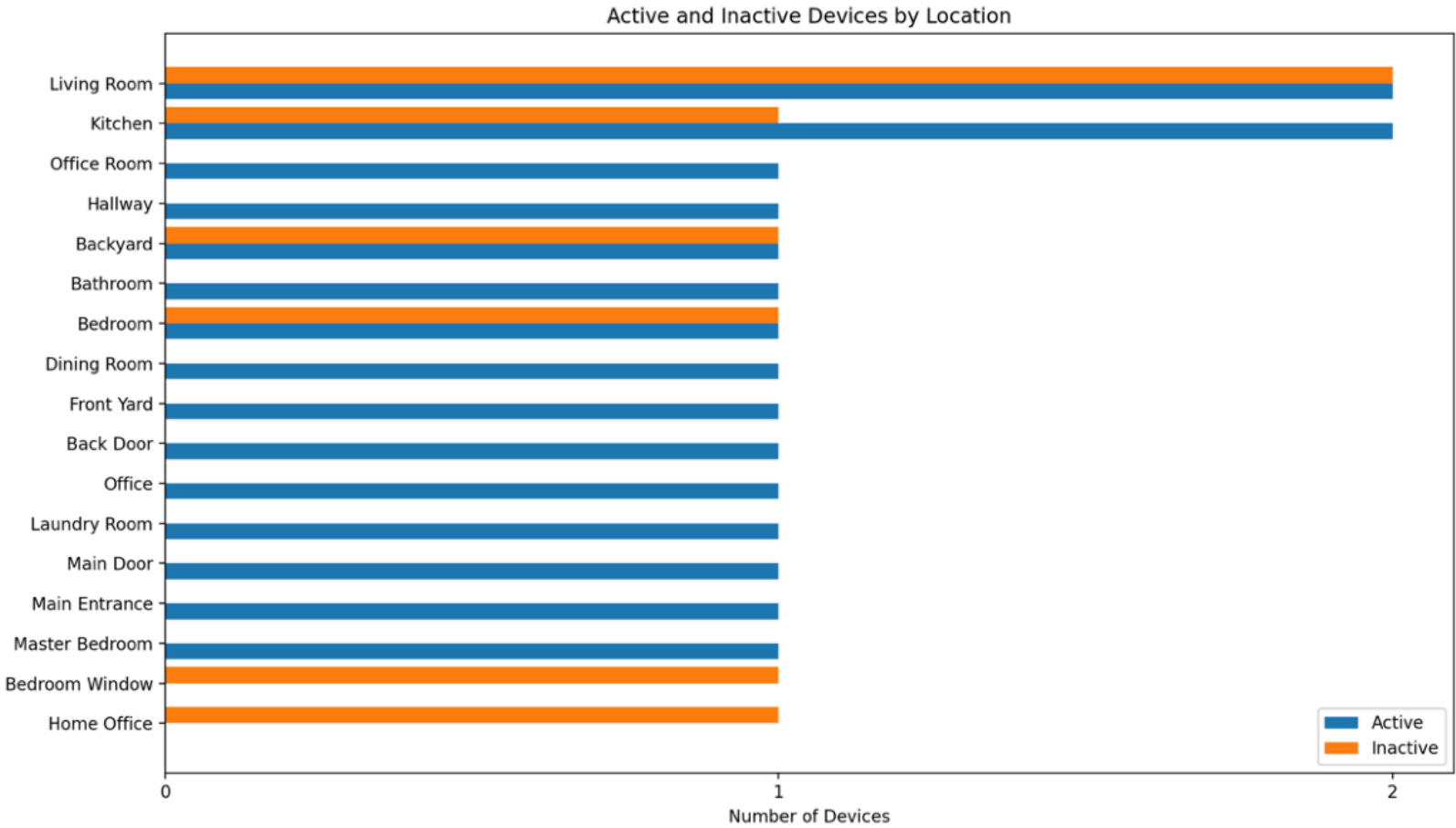


Findings:

For this sample data, we can see which devices are active/inactive and their location. This data helps the User/Admin to quickly locate IOT devices around their smart home. It also helps with tracking the ongoing status of the IOT devices.

Device location & Status

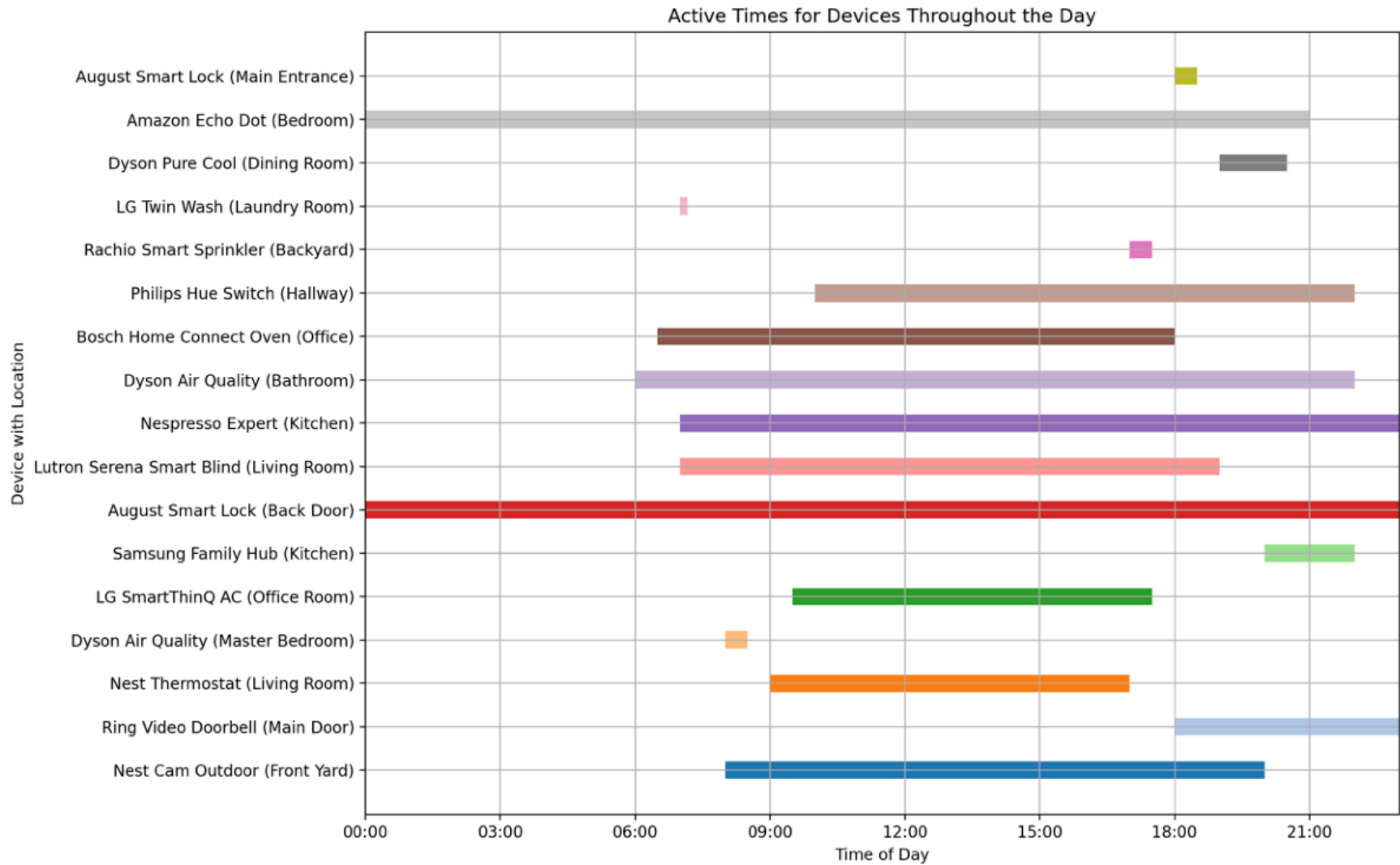
device_name	device_location	is_active
Nest Thermostat	Living Room	1
Philips Hue Switch	Kitchen	0
Philips Hue Switch	Hallway	1
Dyson Air Quality	Master Bedroom	1
Dyson Air Quality	Bathroom	1
LG SmartThinQ AC	Office Room	0
LG SmartThinQ AC	Bedroom	0
Dyson Pure Cool	Living Room	1
Dyson Pure Cool	Dining Room	1
Nest Cam Outdoor	Front Yard	0
Nest Cam Outdoor	Backyard	1
Ring Video Doorbell	Main Door	1
August Smart Lock	Back Door	1
August Smart Lock	Main Entrance	1
Lutron Serena Smart Blind	Bedroom Window	0
Lutron Serena Smart Blind	Living Room	1
Samsung Family Hub	Kitchen	1
Bosch Home Connect Oven	Office	1
Nespresso Expert	Kitchen	1
LG Twin Wash	Laundry room	1
Sony Bravia Smart TV	Living room	0
Sonos Beam	Home Office	0
Amazon Echo Dot	Bedroom	1
Rachio Smart Sprinkler	Backyard	1



Findings:

For this sample data, we can see the usage times for each device. This data helps the User/Admin to determine the periods of activity for all their devices, and it facilitates planning and cost effective energy usage.

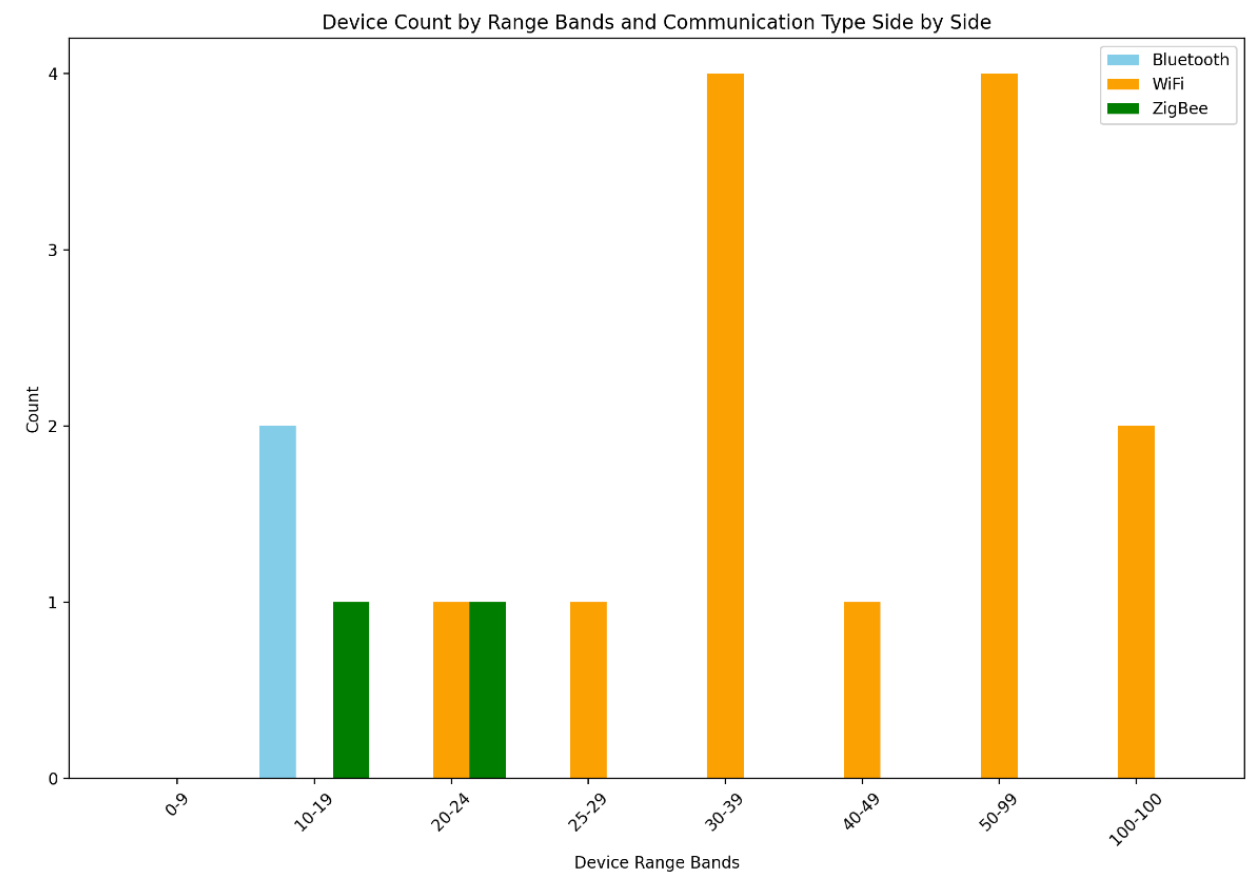
Device Usage Patterns		
device_name_with_location	active_from	active_to
Nest Thermostat (Living Room)	2023-11-01 08:00:00	2023-11-01 20:00:00
Philips Hue Switch (Hallway)	2023-11-02 18:00:00	2023-11-02 23:00:00
Dyson Air Quality (Master Bedroom)	2023-11-01 09:00:00	2023-11-01 17:00:00
Dyson Air Quality (Bathroom)	2023-11-02 08:00:00	2023-11-02 08:30:00
LG SmartThinQ AC (Office Room)	2023-11-01 09:30:00	2023-11-01 17:30:00
Dyson Pure Cool (Dining Room)	2023-11-02 20:00:00	2023-11-02 22:00:00
Nest Cam Outdoor (Front Yard)	2023-11-01 00:00:00	2023-11-01 23:59:59
Ring Video Doorbell (Main Door)	2023-11-01 07:00:00	2023-11-01 19:00:00
August Smart Lock (Back Door)	2023-11-01 23:00:00	2023-11-02 07:00:00
August Smart Lock (Main Entrance)	2023-11-02 22:00:00	2023-11-03 06:00:00
Lutron Serena Smart Blind (Living Room)	2023-11-02 06:30:00	2023-11-02 18:00:00
Samsung Family Hub (Kitchen)	2023-11-01 10:00:00	2023-11-01 22:00:00
Bosch Home Connect Oven (Office)	2023-11-02 17:00:00	2023-11-02 17:30:00
Nespresso Expert (Kitchen)	2023-11-02 07:00:00	2023-11-02 07:10:00
LG Twin Wash (Laundry Room)	2023-11-02 19:00:00	2023-11-02 20:30:00
Amazon Echo Dot (Bedroom)	2023-11-02 21:00:00	2023-11-03 00:00:00
Rachio Smart Sprinkler (Backyard)	2023-11-02 18:00:00	2023-11-02 18:30:00



Findings:

Here we can see the communication range bands and the number of devices that fall under it. This information can aid the User/Admin to plan the setting up of their IOT devices, thereby ensuring all devices are connected. It's critical when device location can impact the connectivity of the IOT device.

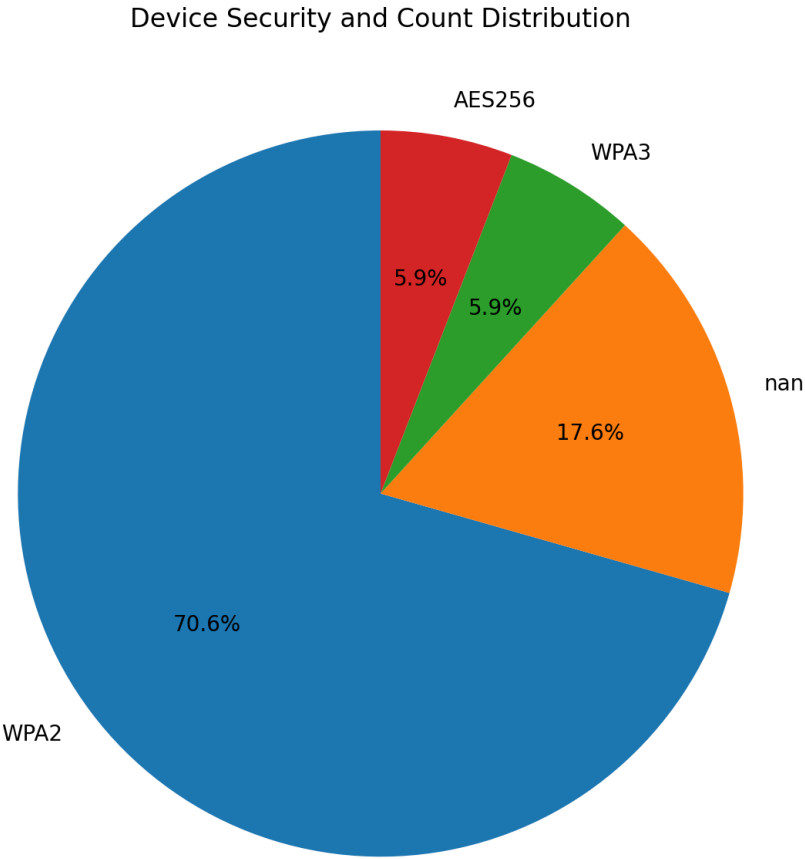
Device Ranges			
device_name	device_range	device_communication	device_type_category
Nest Thermostat	30	WIFI	Thermostats
Philips Hue Switch	10	ZigBee	Lighting
Dyson Air Quality	50	WIFI	Environmental Sensors
LG SmartThinQ AC	100	WIFI	Climate Control
Dyson Pure Cool	30	WIFI	Climate Control
Nest Cam Outdoor	25	WIFI	Security
Ring Video Doorbell	30	WIFI	Security
August Smart Lock	10	Bluetooth	Security
Lutron Serena Smart Blind	20	ZigBee	Security
Samsung Family Hub	50	WIFI	Appliances
Bosch Home Connect Oven	50	WIFI	Appliances
Nespresso Expert	10	Bluetooth	Appliances
LG Twin Wash	30	WIFI	Appliances
Sony Bravia Smart TV	50	WIFI	Entertainment
Sonos Beam	40	WIFI	Entertainment
Amazon Echo Dot	20	WIFI	Entertainment
Rachio Smart Sprinkler	100	WIFI	Irrigation and Gardening



Findings:

Here we can see the what security protocols are in use.
This information is critical to the User/Admin as it enables them to quickly track IOT devices that can lead to security vulnerabilities.

Device Security	
device_security_protocol	device_count
WPA2	12
AES256	1
WPA3	1
None	3

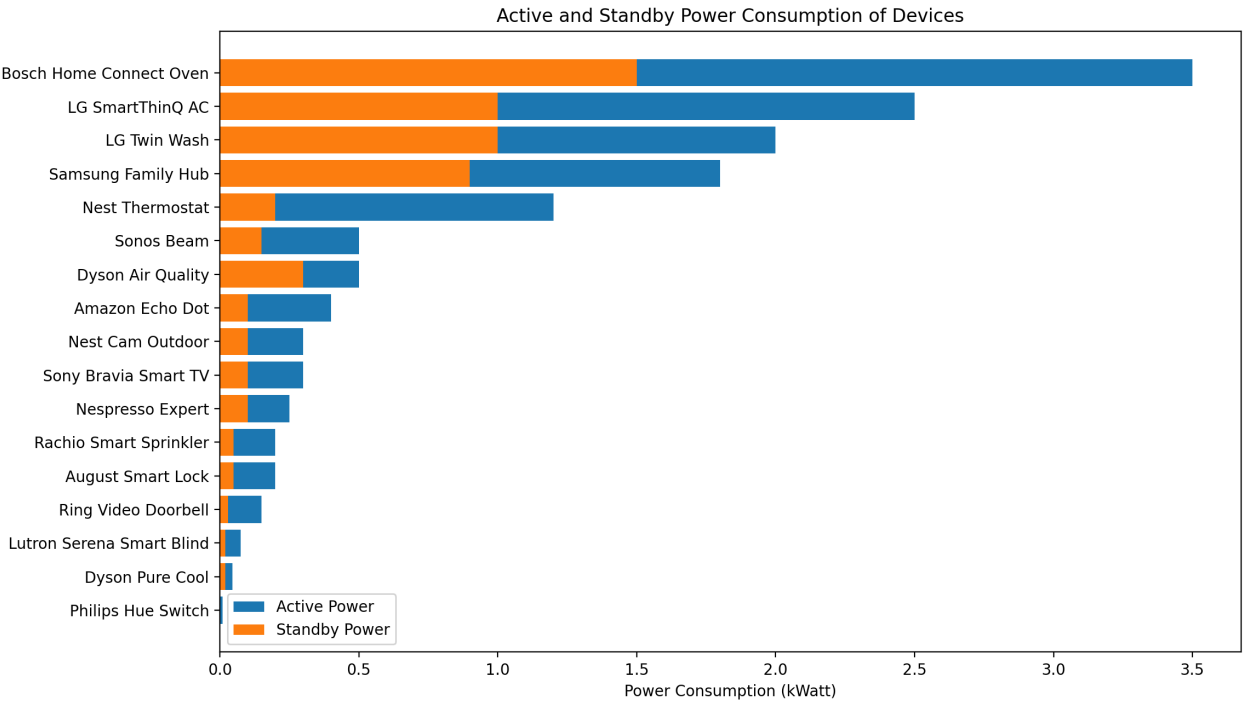


Findings:

Here we can visualise the power consumption of all devices connected to the smart home. This can aid the User/Admin to cost effectively plan the operating schedules of their IOT device. It also helps to narrow down power hungry devices that may require removal or substitution.

Device power

device_name	device_activePower	device_standbyPower
Nest Thermostat	1.2	0.2
Philips Hue Switch	0.01	0.001
Dyson Air Quality	0.5	0.3
LG SmartThinQ AC	2.5	1
Dyson Pure Cool	0.045	0.02
Nest Cam Outdoor	0.3	0.1
Ring Video Doorbell	0.15	0.03
August Smart Lock;	0.2	0.05
Lutron Serena Smart Blind	0.075	0.02
Samsung Family Hub	1.8	0.9
Bosch Home Connect Oven	3.5	1.5
Nespresso Expert	0.25	0.1
Sony Bravia Smart TV	0.3	0.1
Sonos Beam	0.5	0.15
Amazon Echo Dot	0.4	0.1
Rachio Smart Sprinkler	0.2	0.05
LG Twin Wash	2.0	1.0



Findings:

Finally, this data allows the User/Admin to monitor their average/highest energy consumption per IOT device. It provides means in which the User can verify that energy consumption is normal and allows for quick discovery of any anomalies.

Avg/Highest Energy

device_name_with_location	year	month	average_energy_consumed
Amazon Echo Dot (Bedroom)	2023	11	3.3
August Smart Lock (Back Door)	2023	11	2.4
August Smart Lock (Main Entrance)	2023	11	2.4
Bosch Home Connect Oven (Office)	2023	11	36
Dyson Air Quality (Bathroom)	2023	11	7.2
Dyson Air Quality (Master Bedroom)	2023	11	8.8
Dyson Pure Cool (Dining Room)	2023	11	0.53
Dyson Pure Cool (Living Room)	2023	11	0.48
LG SmartThinQ AC (Bedroom)	2023	11	24
LG SmartThinQ AC (Office Room)	2023	11	36
LG Twin Wash (Laundry Room)	2023	11	25
Lutron Serena Smart Blind (Bedroom Window)	2023	11	0.48
Lutron Serena Smart Blind (Living Room)	2023	11	1.085
Nespresso Expert (Kitchen)	2023	11	2.4
Nest Cam Outdoor (Backyard)	2023	11	2.4
Nest Cam Outdoor (Front Yard)	2023	11	7.0
Nest Thermostat (Living Room)	2023	11	16.8
Philips Hue Switch (Hallway)	2023	11	0.069
Philips Hue Switch (Kitchen)	2023	11	0.024
Rachio Smart Sprinkler (Backyard)	2023	11	1.2
Ring Video Doorbell (Main Door)	2023	11	2.16
Samsung Family Hub (Kitchen)	2023	11	32.4
Sonos Beam (Home Office)	2023	11	3.6
Sony Bravia Smart TV (Living Room)	2023	11	2.4

