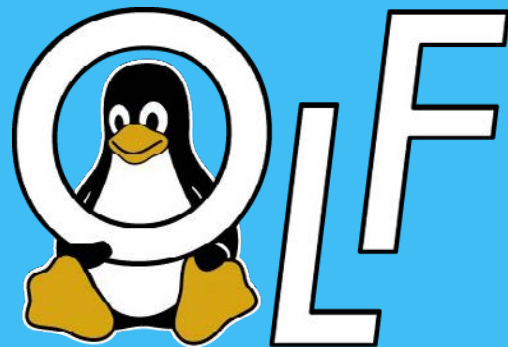


Home Assistant

Ohio Linux Fest | 9/9/2023

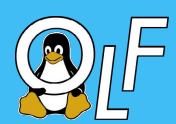
Logan Arnett
Matt Arnett





Agenda

1. What is Home Assistant (HA)?
2. Why use HA vs other platforms?
3. Hardware & system setup
4. HA Runtime Environments
5. External access
6. HA Use Cases & IoT
7. Live demo
8. Tips & lessons learned



0. Quick poll

1. How many have used **Home Assistant**?
2. How many have used **another security/IoT system**?
3. How many have not used any security/IoT system
(**true beginners**)?



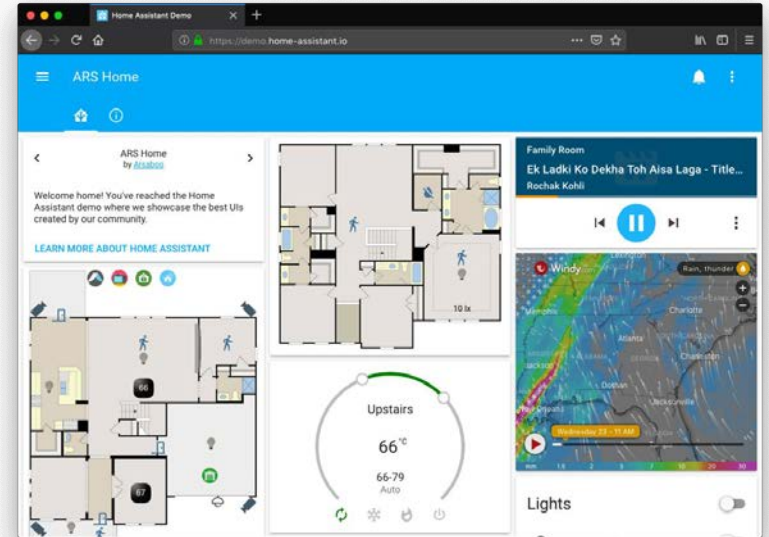
IoT = Internet of Things

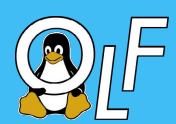


1. What is Home Assistant (HA)?

“**Open source** home automation that puts **local control** and **privacy** first. Powered by a worldwide community of tinkerers and DIY enthusiasts. Perfect to run on a Raspberry Pi or a local server.”

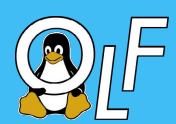
<https://www.home-assistant.io/>





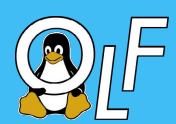
1. What is Home Assistant (HA)?

Very quick peek!



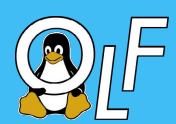
2. Why use HA vs other platforms?

Home Assistant	Vendor Platforms
FOSS	closed source
privacy: video footage & IoT device activity kept local	vendor cloud service lock-in/fees & fee increases, habits/data exposed



2. Why use HA vs other platforms?

Home Assistant	Vendor Platforms
hardware freedom, mix & match	one vendor for hardware
choice of IoT protocol (<i>Zigbee, Z-Wave, Matter, WiFi, Bluetooth, other</i>)	typically one IoT standard protocol supported (<i>or non-standard</i>)



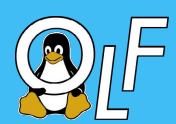
2. Why use HA vs other platforms?

Home Assistant	Vendor Platforms
highly customizable (1,900+ <i>plugins</i>)	may not be versatile or extendable
great support (<i>active discord server, YouTube tutorials, online help docs, Reddit & more</i>)	varied levels of support



2. Why use HA vs other platforms?

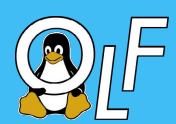
Home Assistant	Vendor Platforms
monthly updates, backup/restore <i>(core engine, mobile app, 10+ years 9/13/13)</i>	varied levels of updates
large & active dev community <i>(open source, github issues)</i>	for profit solutions come & go <i>(Arlo cameras 4/23, Google Nest Secure 4/24, Hive Leak detect 9/23, Hive Cams & System 9/25)</i>



3. Hardware & System Setup

Our path...

Many options.



3. Hardware & System Setup



Image credit: <https://www.microcenter.com/site/stores/sharonville.aspx?storeid=71>

3. Hardware & System Setup



Build a dedicated PC, buy cameras, IoT devices



3. Hardware & System Setup

Download and install a VM



<https://www.virtualbox.org>



<https://www.linux-kvm.org>

vmware®

<https://www.vmware.com/>

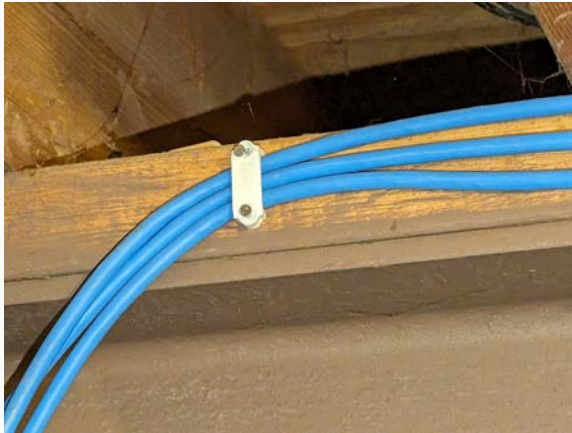


Prep & run ethernet cables for computer, switch & PoE cameras.



3. Hardware & System Setup

Router & PoE (Power over Ethernet) switch setup (set static camera IPs)



3. Hardware & System Setup

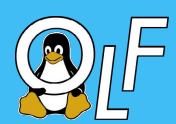
Install PoE cameras.



3. Hardware & System Setup

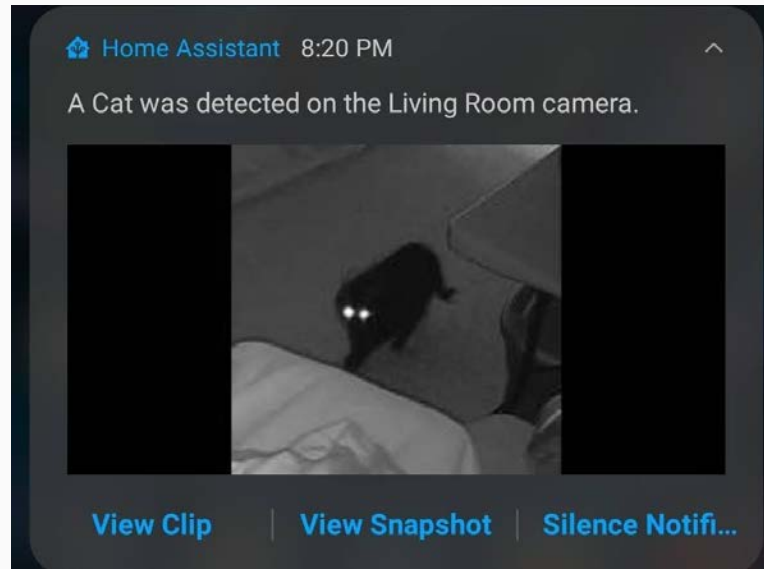
Drill through brick wall, drywall patching





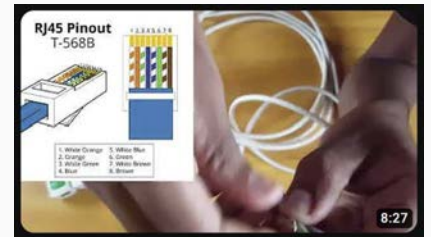
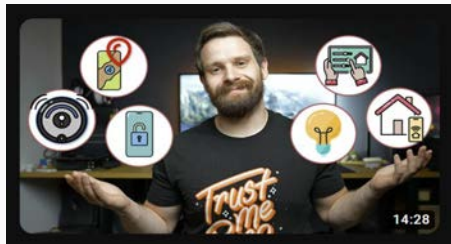
3. Hardware & System Setup

Detect wild animals at night!



3. Hardware & System Setup

Several YouTube videos can help with all of this!



4. HA Runtime Environments

Home Assistant Yellow

- Home Assistant Operating System



ASUS Tinkerboard



- Home Assistant Operating System
- Home Assistant Container
- Home Assistant Core



macOS



- Home Assistant Operating System (VM)
- Home Assistant Core



Raspberry Pi



- Home Assistant Operating System
- Home Assistant Container
- Home Assistant Core



Generic x86-64 (e.g. Intel NUC)



- Home Assistant Operating System
- Home Assistant Container
- Home Assistant Core



Linux



- Home Assistant Operating System (VM)
- Home Assistant Container
- Home Assistant Core
- Home Assistant Supervised



ODROID



- Home Assistant Operating System
- Home Assistant Container
- Home Assistant Core



Windows



- Home Assistant Operating System (VM)
- Home Assistant Core



Alternative

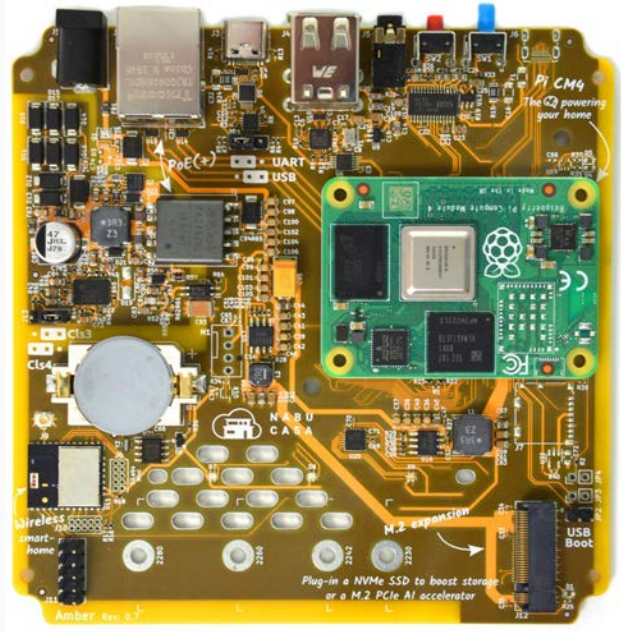


VM's not covered by other categories, NAS installations and community guides



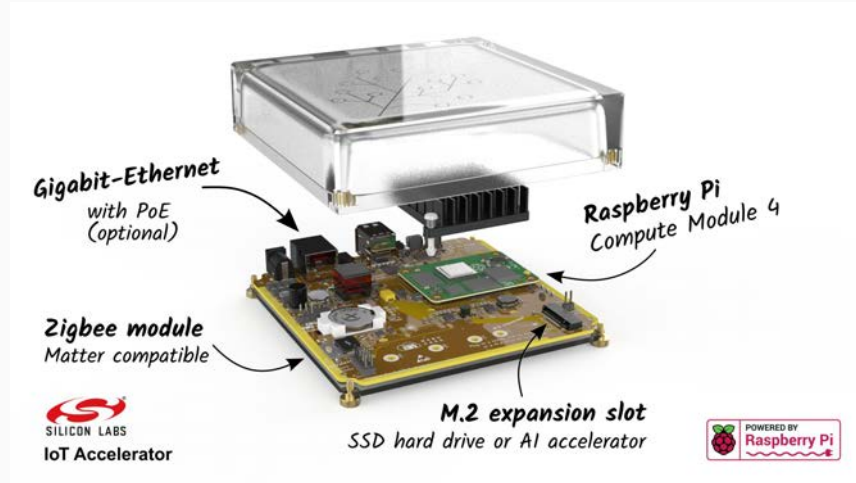
4. Runtime Environments

Home Assistant **YELLOW**



~\$190 Pi CM4,
16GB SSD,
Zigbee

Or use the \$125
kit and add your
own Pi compute
module & SSD.





5. External mobile access, notifications

Use your own **local VPN**.

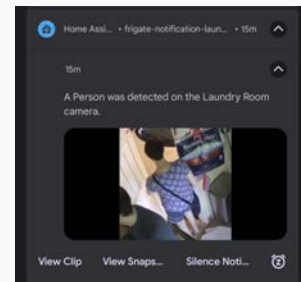
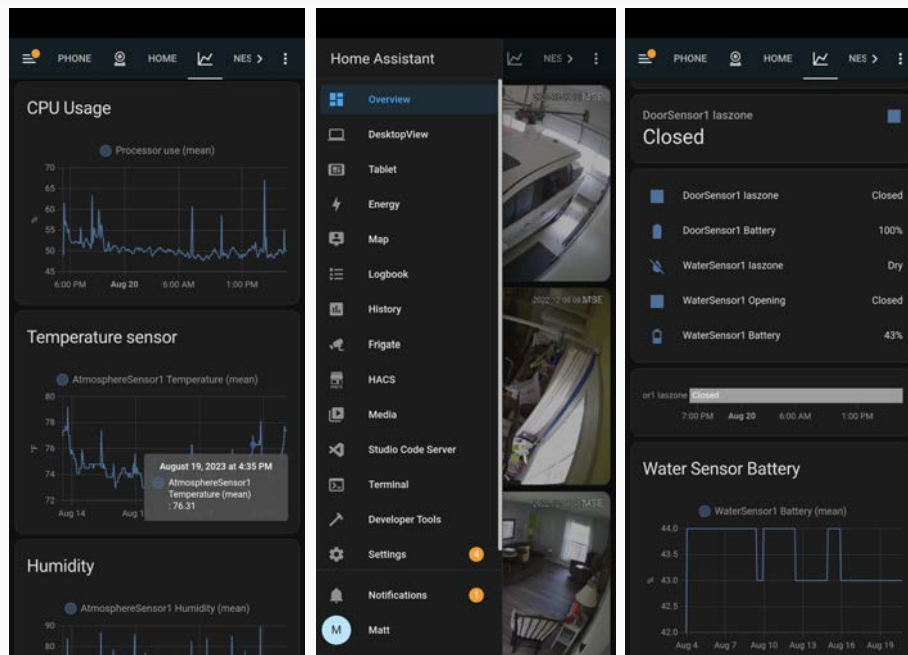
Or, support HA dev team with **Nabu Casa** (\$65/year) remote access (1 month free trial).

<https://www.nabucasa.com/>



NABU
CASA

credits: https://play.google.com/store/apps/details?id=io.homeassistant.companion.android&hl=en_US&gl=US&pli=1



6. HA Use Cases

Sensors

- water leak, water level, soil moisture, temperature, humidity, gas, door/window open, motion detection, pressure, light, vibration, human presence & count, lightning detector, CO2, gas, distance, wind speed



6. HA Use Cases

Devices

- lights, smart outlet, sirens, switch, door lock, wearable health device, curtain/shades motor, energy monitor, smoke alarm, button pushers, pet feeder

Image: <https://a.co/d/3RBPWUm> (Amazon)



6. HA Use Cases

- Turn water main valve off with leak detection
- Play a sound/siren when a person is detected
- Turn on lights based on people in a zone



6. IoT - Communication Protocols

Zigbee vs Z-Wave vs Matter vs Bluetooth vs WiFi vs other

Do your research!

- Pros & Cons with each.
- Cost differences.
- Open vs closed protocol.
- Private vs vendor cloud required.
- Bandwidth vs distance.
- Mesh vs limited mesh vs no mesh.
- # of devices allowed.
- Battery life.
- Reliability.



1999



2004



matter

Oct '22

<https://en.wikipedia.org/wiki/Zigbee>
<https://en.wikipedia.org/wiki/Z-Wave>

Images: <https://commons.wikimedia.org/wiki/File:Bluetooth.svg>
https://commons.wikimedia.org/wiki/File:WiFi_Logo.svg
[https://en.wikipedia.org/wiki/Matter_\(standard\)](https://en.wikipedia.org/wiki/Matter_(standard))

6. IoT - Communication Protocols

Zigbee vs Z-Wave vs Matter vs Bluetooth vs WiFi vs other

**Home Assistant
supports all of them!**



1999



2004



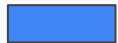
matter

Oct '22



6. IoT w/Zigbee

Zigbee Terms



coordinator



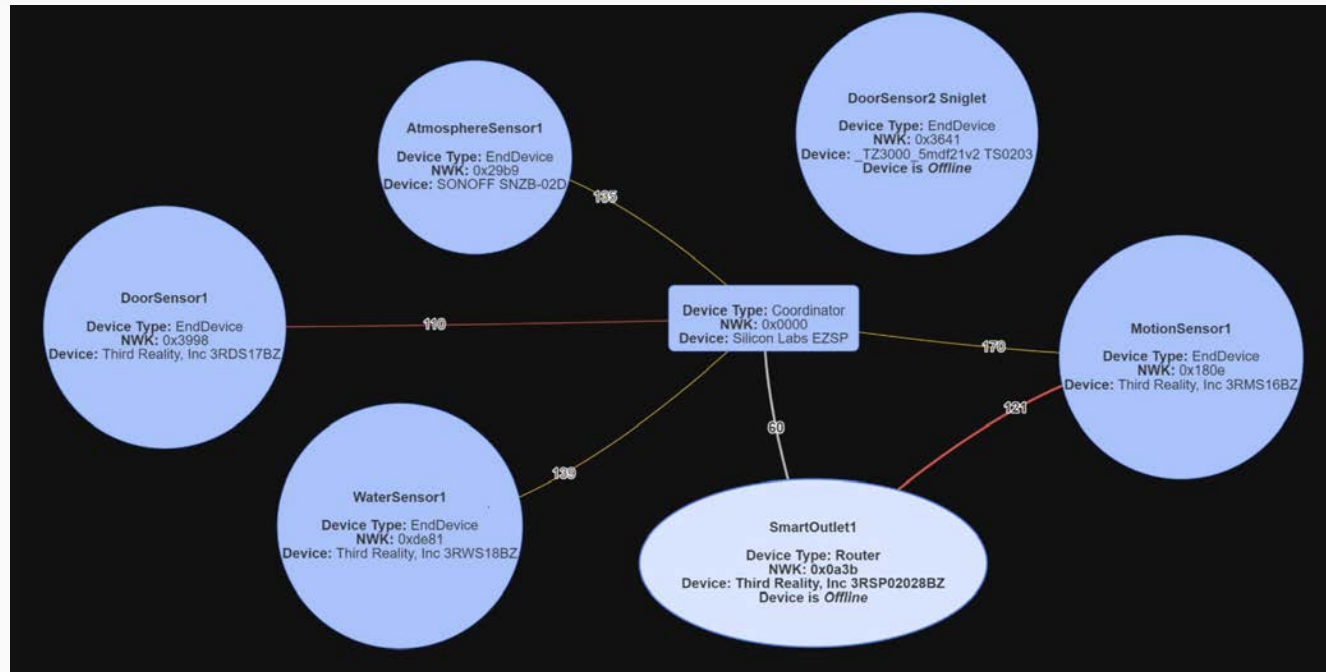
router



end device

0-255

LQI - Link Quality
Indication



6. IoT w/Zigbee

Zigbee Terms

- **coordinator**
- router
- end device
- LQI - Link Quality Indication



6. IoT w/Zigbee

Zigbee Terms

- coordinator
- **router**
- end device
- LQI - Link Quality Indication

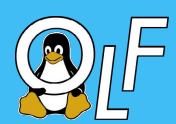


6. IoT w/Zigbee

Zigbee Terms

- coordinator
- router
- **end device**
- LQI - Link Quality Indication





6. IoT w/Zigbee

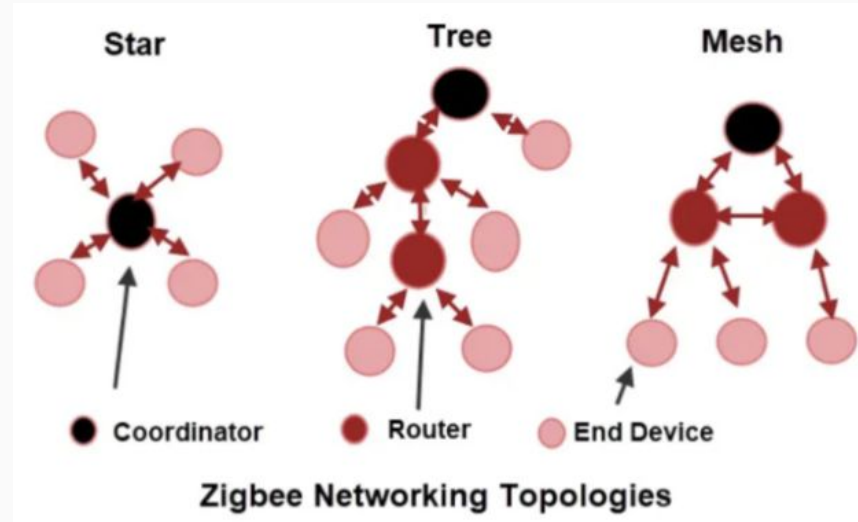
Zigbee Terms

- coordinator
- router
- end device
- **LQI - Link Quality Indication**

Scale 0 - 255

< 200 = high error rate

200 = 80% quality



7. Live demo



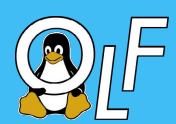
Live
demo!

Ohio Linux Fest 2013



7. Live demo

- General overview
- Dashboards
- Create a dashboard
- Update a dashboard
- Devices
- Charts
- Motion/object detection
- Water sensor
- Trigger lamp on/off
- Motion sensor
- Temperature & humidity sensor
- Config door sensor
- Notifications



7. Live demo

btw...

11 year old laptop!!

5 year old SSD!!

8. Tips, lessons learned

- Plan ahead for the location of cameras and a central location for the HA computer.
- Buy based on your needs.



8. Tips, lessons learned

- Pick a sensor protocol first (Zigbee, Z-Wave, etc).
- Do your research and buy one sensor first to test before buying many.
- Some sensors come with batteries, some do not (extra cost).



Images: <https://commons.wikimedia.org/wiki/File:Bluetooth.svg>
https://commons.wikimedia.org/wiki/File:WiFi_Logo.svg
[https://en.wikipedia.org/wiki/Matter_\(standard\)](https://en.wikipedia.org/wiki/Matter_(standard))
<https://en.wikipedia.org/wiki/Zigbee>
<https://en.wikipedia.org/wiki/Z-Wave>



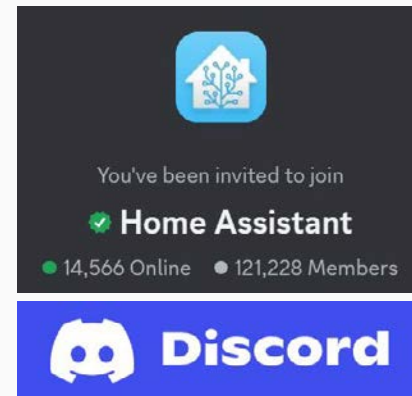
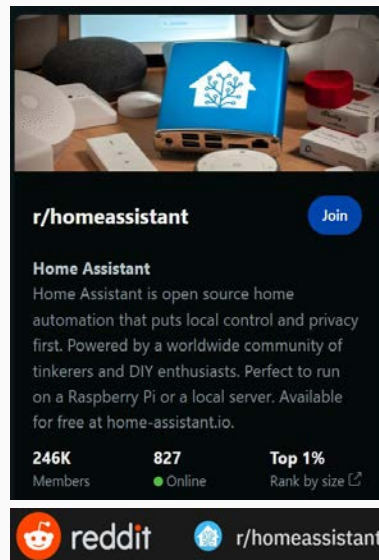
8. Tips, lessons learned

- Do your research for cameras and don't think you need to spend top dollar.
- Camera - WiFi, battery/electric, PoE



8. Tips, lessons learned

- Expect a learning curve. This is DIY. It's fun to learn!
- Seek help from YouTube, Discord, HA Community forum, Reddit.
- Tweak settings as needed, ie Frigate settings (zones, % confidence for alerts, frame rate)



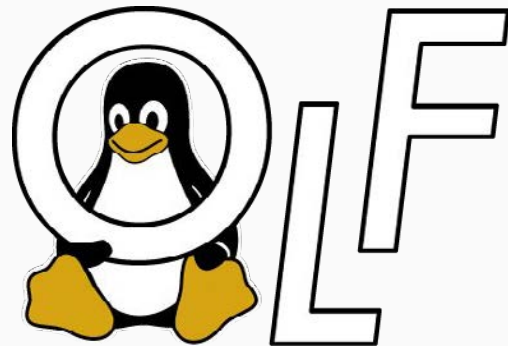


Home Assistant

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9/9/2023

Logan Arnett
Matt Arnett

Thank you!!
Questions?



Scan for
presentation
& links





Home Assistant

Ohio Linux Fest
9/9/2023

Logan Arnett
Matt Arnett

