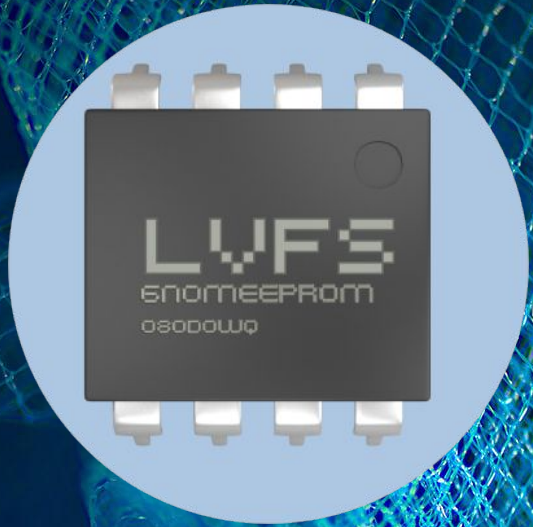
Firmware Update Management with LVFS & fwupd

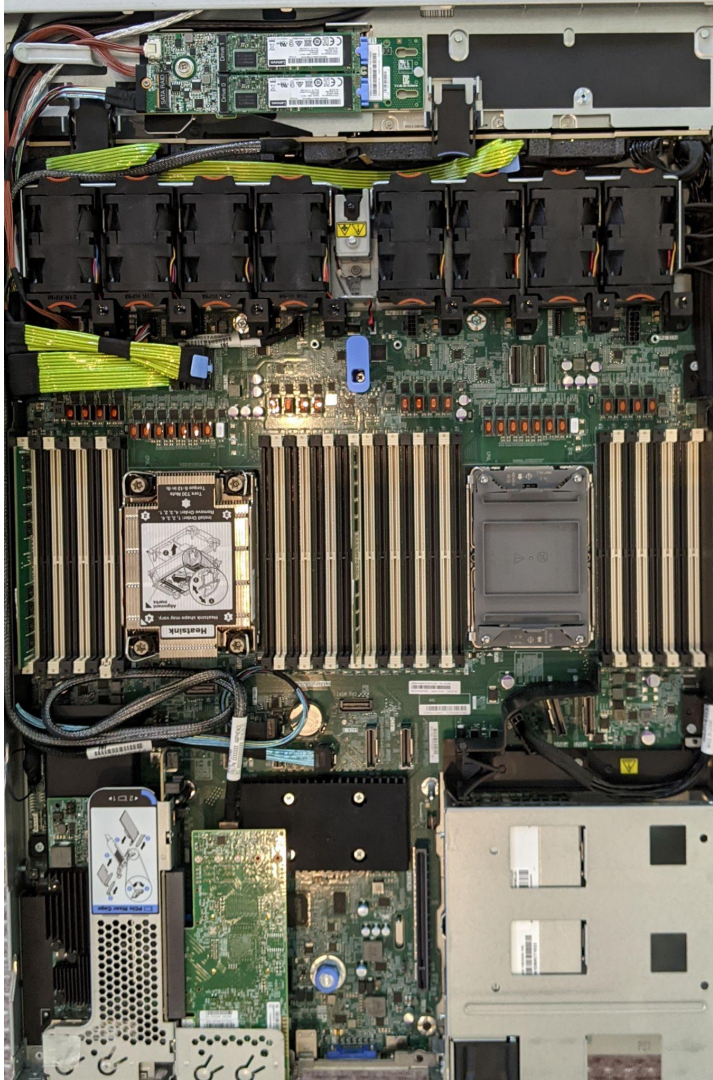


Richard Hughes, Red Hat

2025

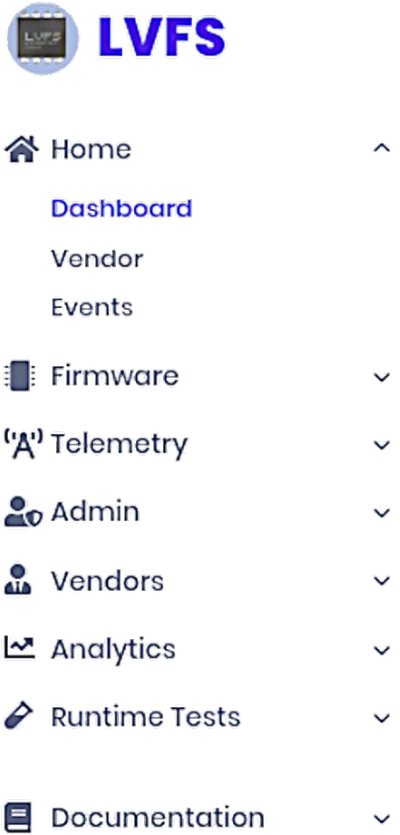
What you're going to see

- Who am I anyway?
- Introduction to **LVFS** and **fwupd**.
- What is the **problem**?
- What already **exists**?
- What do customers **want**?
- What hardware vendors **have to do**
- Key takeaways and **questions**



Who am I?

- Building OSS for ~20y
- Obsessing about firmware updates for ~7 years
  - I work with over 140 hardware vendors!
  - OEMs, ODMs, ISVs, IBVs, IHVs and more!



What is the LVFS?

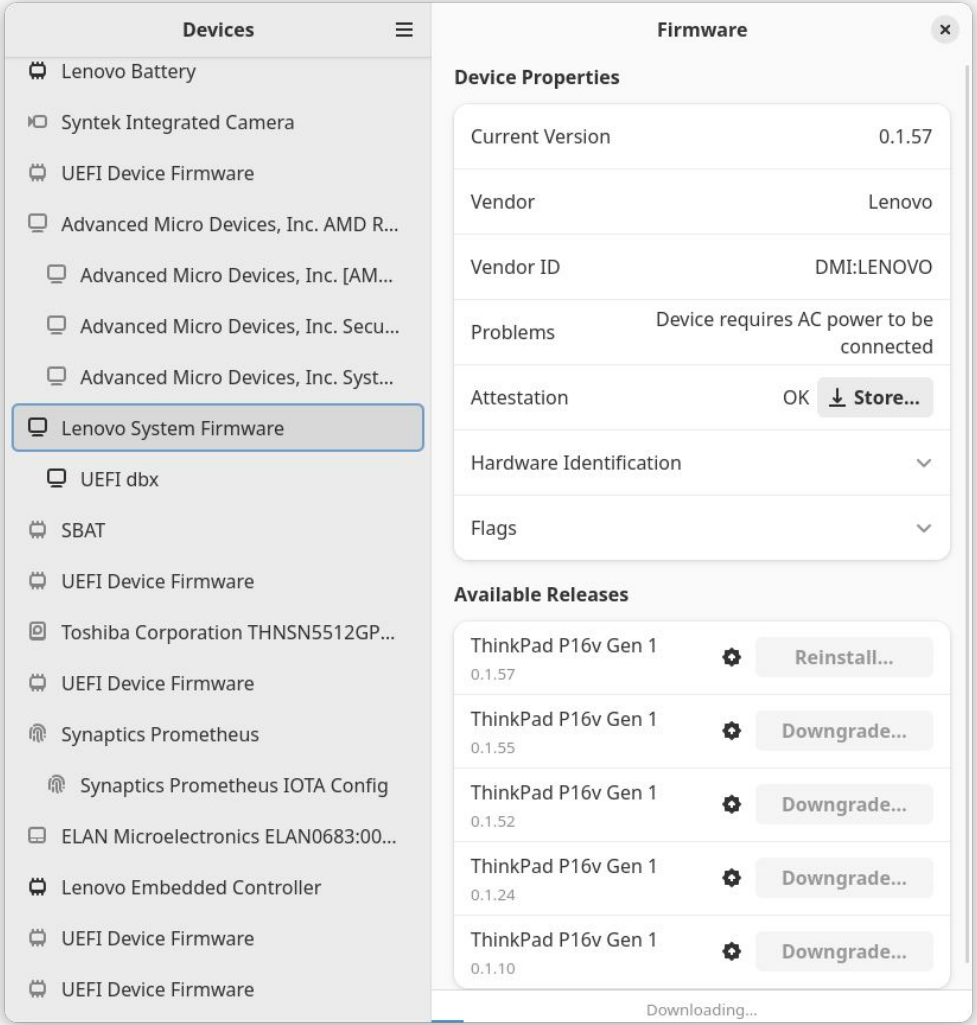
Linux Vendor Firmware Service is the website providing metadata and firmware hosted at **https://fwupd.org/**

- 140 vendors uploading
- 120M downloads to end users, 60k/day!
- 1,800 different devices:
  - Laptop, desktop and peripherals.
- There are very few updates for servers!

What is fwupd?

This is the **mechanism**.

- 90 different vendor protocols supported
- Many different vendors can use the same code in fwupd
- Most vendors don't need to contribute code at all!



The Problem

- Firmware is **difficult to deploy**
  - **Vendor-specific** solutions
  - Cannot be deployed automatically
  - Updated out-of-band

No server vendor is *officially* using LVFS.

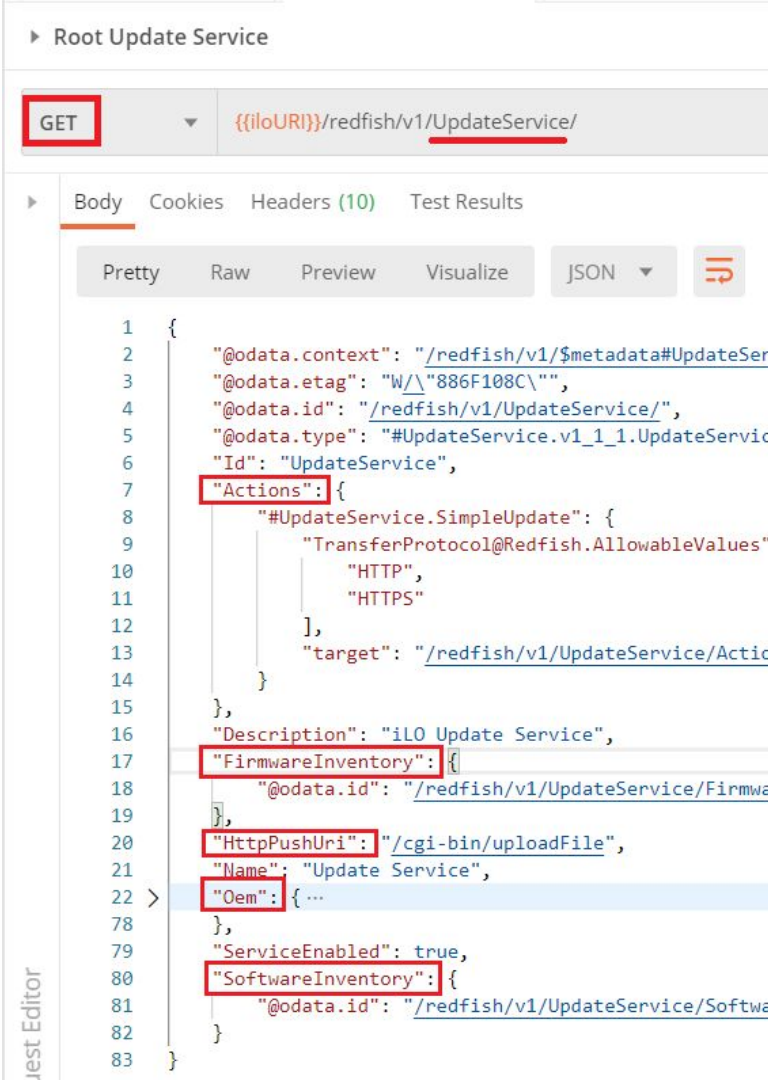
"There are many impossible tasks out of the box" – **Criteo**

"When you have to deal with raw IPMI it's a real nightmare" – **Scaleway**

What Exists Now?

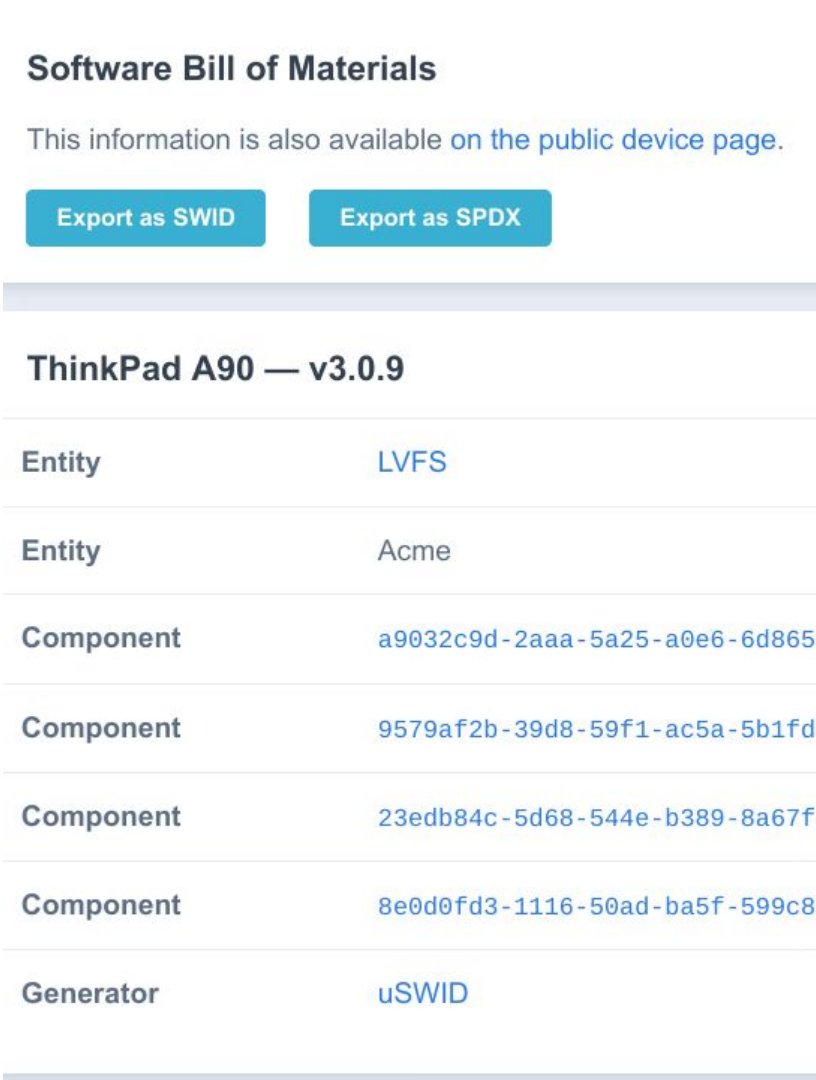
Redfish plugin in fwupd

- With IPMI user auto-provisioning
- Hardcoded and ephemeral credentials
  - SMBIOS Type 42
- Tested with:
  - **Lenovo** ThinkSystem SR650v2 (XCC)
  - **HPE** Gen10 & Gen10+ (iLOv5)
  - **Dell** *REDACTED* (iDRAC)
  - **SuperMicro** *REDACTED* (SMC)
  - **Advantech** *REDACTED* (ASMB)
  - **OpenBMC**



What Exists Now? (cont...)

- Full support for **BKCs**
- SBOM support – embed in the image and get a:
  - **CISA/CRA** public HTML page
  - **CycloneDX** export
  - **SWID** export
  - **SPDX** export



What Customers Want

- Firmware updates that can be mirrored internally
  - **Without internet access**!
- Firmware updates that can be deployed on specific groups of hardware over several days in a specific order with CI/CD.
  - **Without BKC restrictions!**
- Update descriptions with clear and understandable release notes

What Customers Want (2)

- A **heterogeneous solution** without management planes or host-agents
  - With no changes between generations!
  - To be able to **fix issues themselves**
    - Fixes to vendor specific tools take months or **years**
  - A vendor-specific solution is not "*value add*" – it's "*added pain*"
- Customers choose vendor devices with LVFS support? 👍👎

What Vendors Have To Do

- Get a free LVFS vendor account and upload firmware
  - This can be **any engineer** or PM

- Install Linux (Fedora, Ubuntu, etc) on the host and test:
  - IPMI auto-provisioning of user (SMBIOS type 42)
  - Check that devices look as expected:
    - Version of `12.34` rather than `1.2.3.4`
    - No backup (other version) devices show
  - Updating and downgrading firmware
  - Write good release notes, with CVE details

What Vendor Have To Do (cont….)

- Sanity check what I say: Ask your existing customers – **Do they want LVFS support**? 👍👎
- Check that the firmware uploaded to the LVFS can be mirrored onto private networks, **without a customer subscription** in place.
- Engage marketing with this
  - Also available to existing customers!
- Make the firmware public on the LVFS

Key Takeaways

- What the hardware vendors are providing now is **not** what their customers want to use.
- Providing updates on the LVFS is safe, **free** and well understood.
- Deploying updates on Linux probably **already works** using Redfish
- Vendors that choose to provide updates via LVFS/fwupd **may be the preferred vendor** for future contracts.
- Email me! **richard@hughsie.com** 😅

Questions?