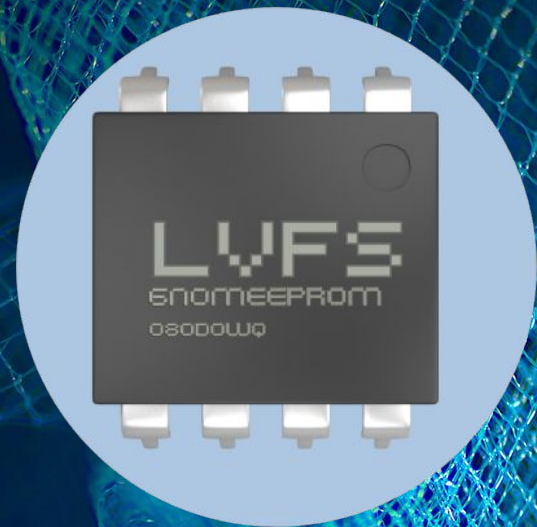


# Firmware Update Management with LVFS & fwupd

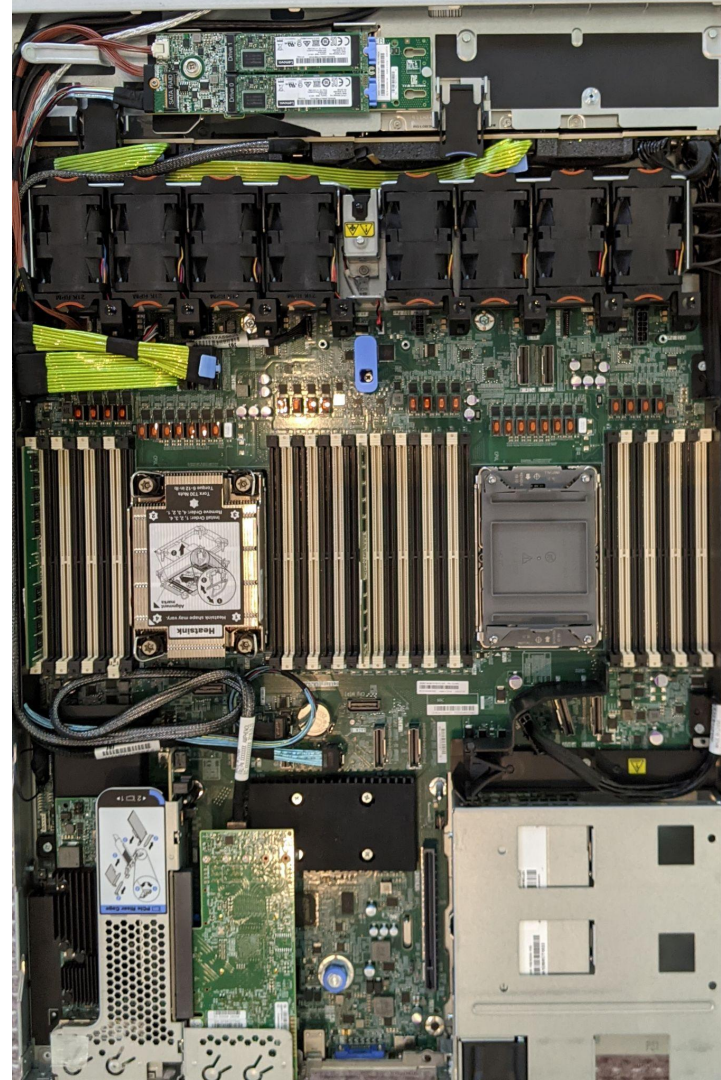
Richard Hughes, Red Hat



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/>**

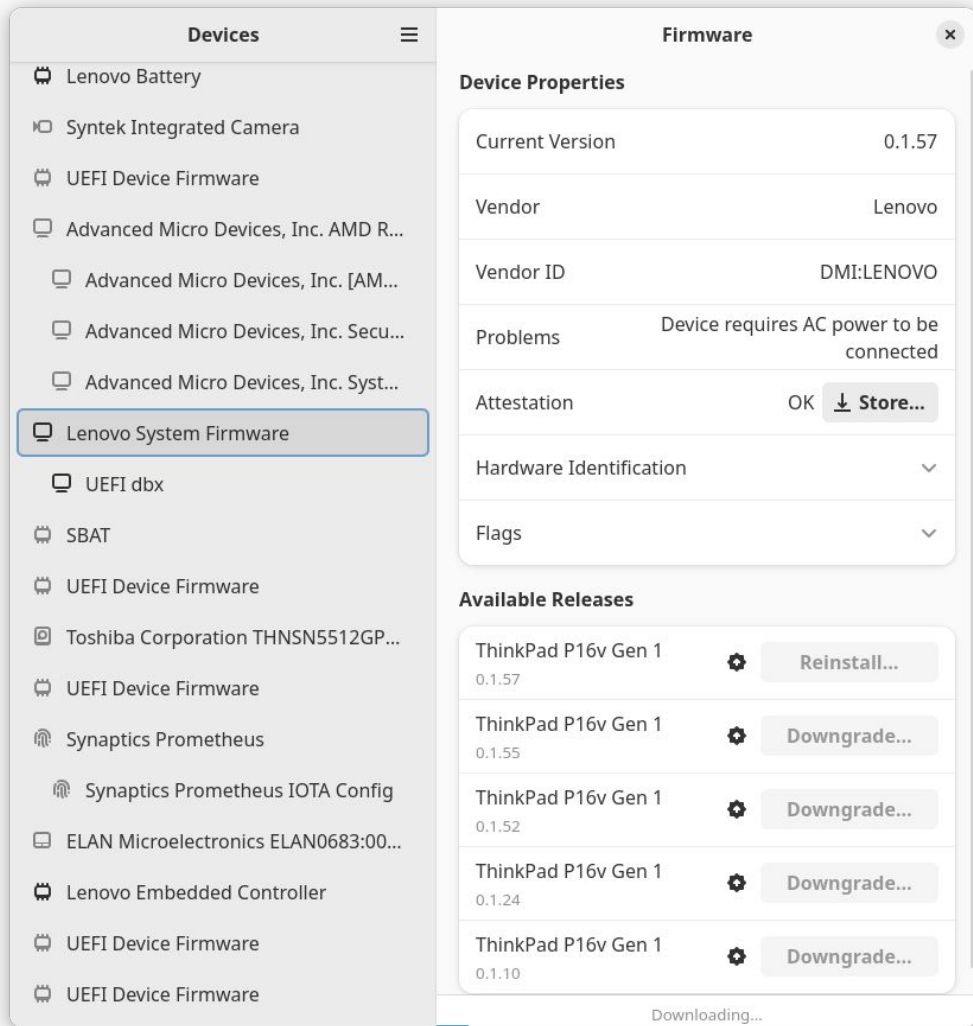
- 140 vendors uploading
- 120M downloads to end users, 60k/day!
- 1,800 different devices:
  - Laptop, desktop and peripherals.
- There are very few updates for servers!



# 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**

Root Update Service

GET [{{iloURI}}/redfish/v1/UpdateService/](#)

Body Cookies Headers (10) Test Results

Pretty Raw Preview Visualize JSON

```
1 {
2   "@odata.context": "/redfish/v1/$metadata#UpdateService",
3   "@odata.etag": "W/\"886F108C\"",
4   "@odata.id": "/redfish/v1/UpdateService/",
5   "@odata.type": "#UpdateService.v1_1_1.UpdateService",
6   "Id": "UpdateService",
7   "Actions": {
8     "#UpdateService.SimpleUpdate": {
9       "TransferProtocol@Redfish.AllowableValues":
10        "HTTP",
11        "HTTPS"
12      },
13     "target": "/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate"
14   },
15   "Description": "iLO Update Service",
16   "FirmwareInventory": {
17     "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"
18   },
19   "HttpPushUri": "/cgi-bin/uploadFile",
20   "Name": "Update Service",
21   "Oem": {
22     ...
23   },
24   "ServiceEnabled": true,
25   "SoftwareInventory": {
26     "@odata.id": "/redfish/v1/UpdateService/SoftwareInventory"
27   }
28 }
```

Test Editor

# 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

## Software Bill of Materials

This information is also available [on the public device page](#).

Export as SWID

Export as SPDX

### ThinkPad A90 — v3.0.9

Entity	LVFS
Entity	Acme
Component	a9032c9d-2aaa-5a25-a0e6-6d865
Component	9579af2b-39d8-59f1-ac5a-5b1fd
Component	23edb84c-5d68-544e-b389-8a67f
Component	8e0d0fd3-1116-50ad-ba5f-599c8
Generator	uSWID



# 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](mailto:richard@hughsie.com) 😊





# Questions?

