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Journey to the West:
Integrating Cisco IOS-XR with OCP Technologies

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Journey to the West

- 16th Century Chinese novel and folklore by Wu Cheng-en.

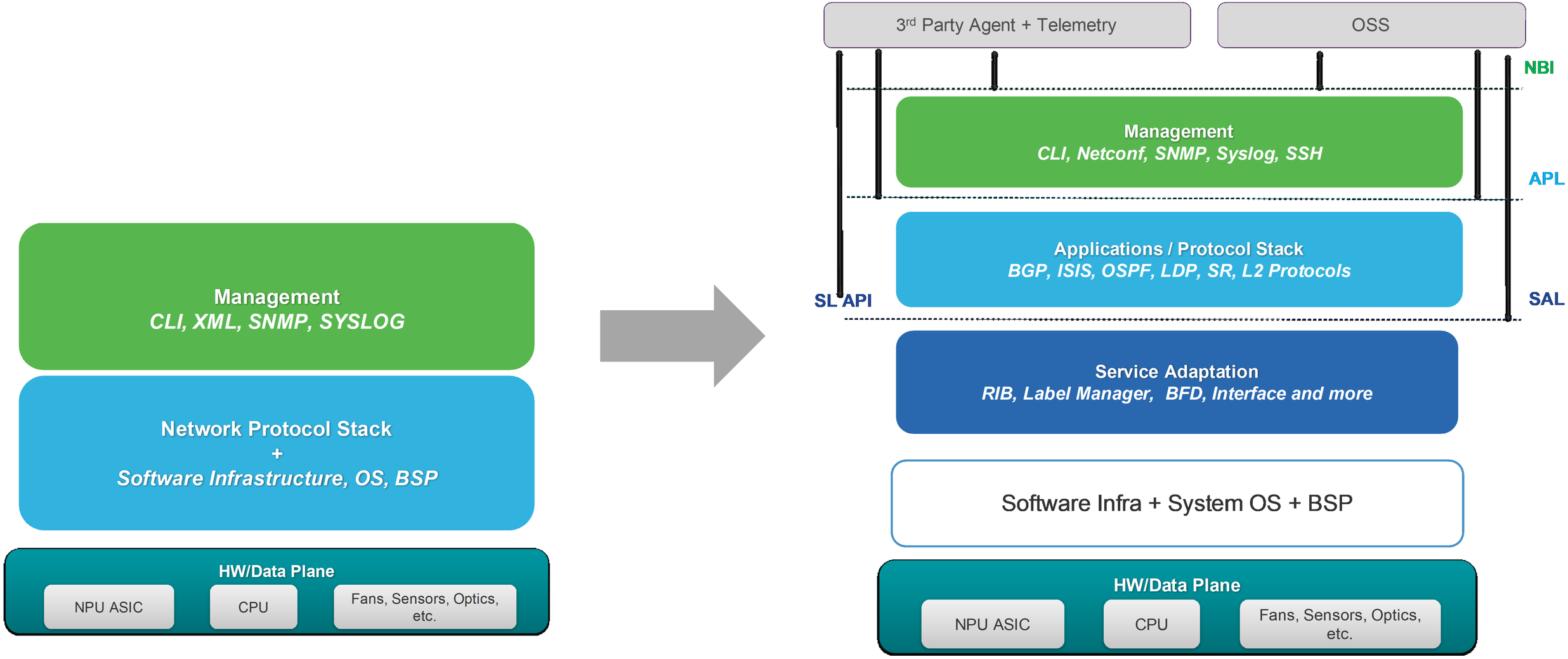
- An extended account of the original "Journey to the West (India)" by Xuanzang in the 6th Century AD

- Led to **Neo-Confucianism**
  a creative reinterpretation of the traditional Confucian core to meet new intellectual and spiritual expectations, intrinsically shaping the Chinese culture for years to come.

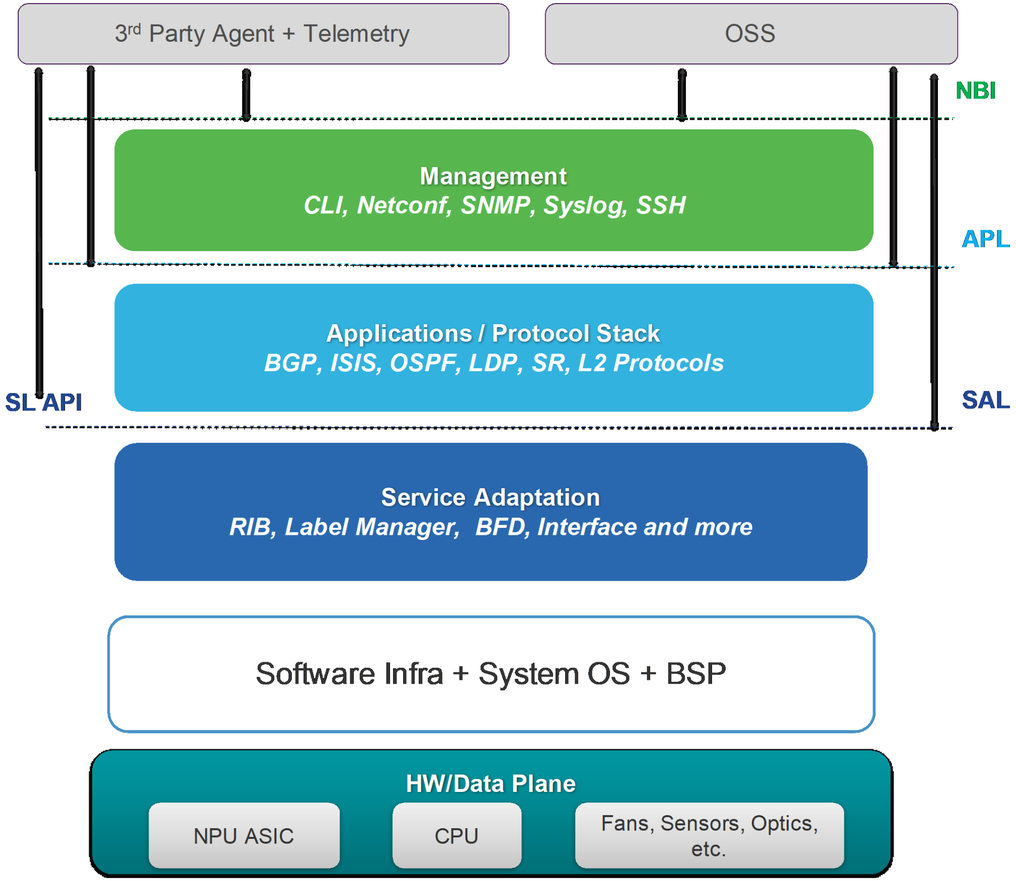
IOS-XR's "Journey to the West":

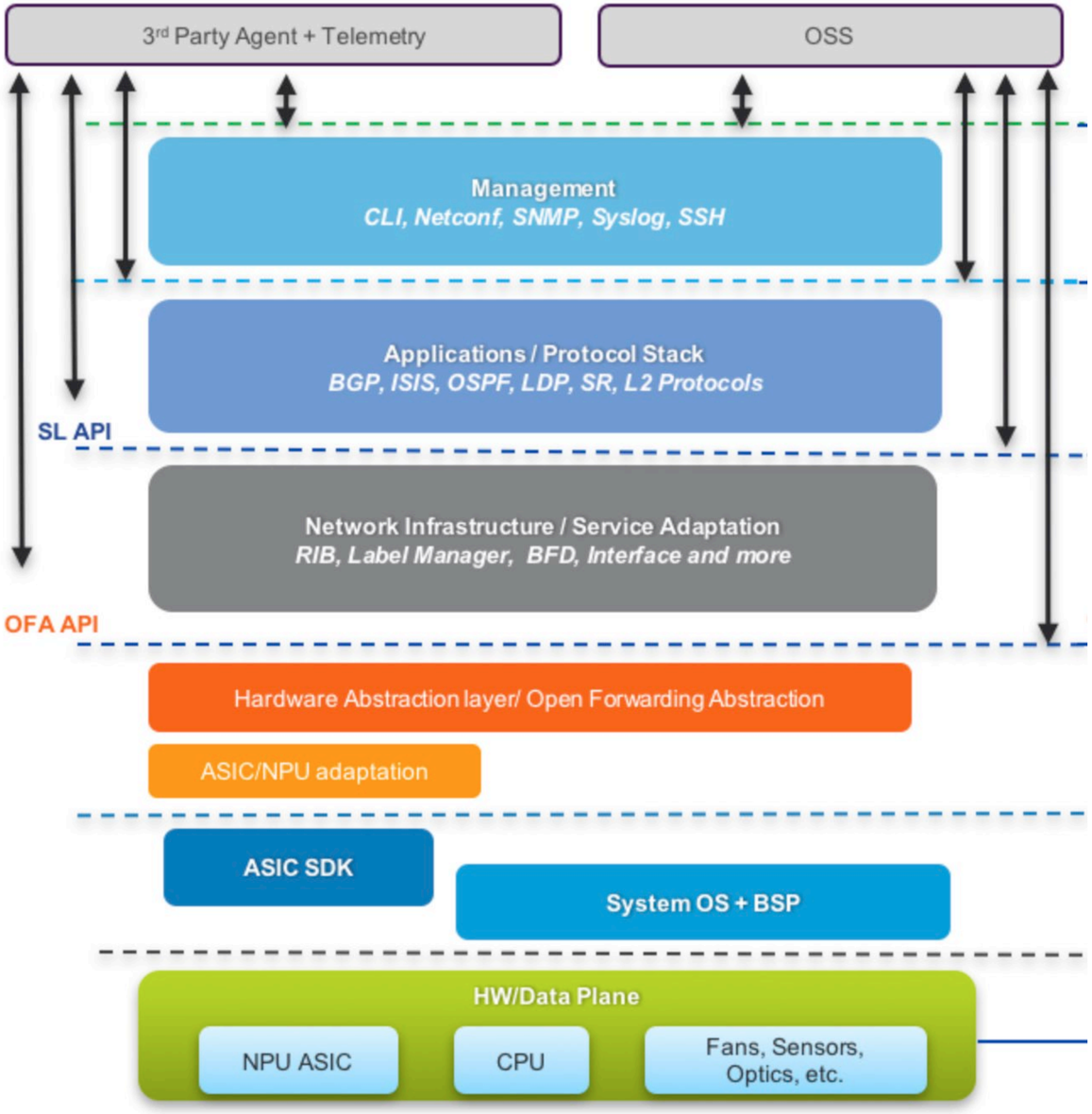
Incremental Disaggregation

Disaggregating the Software Layers:

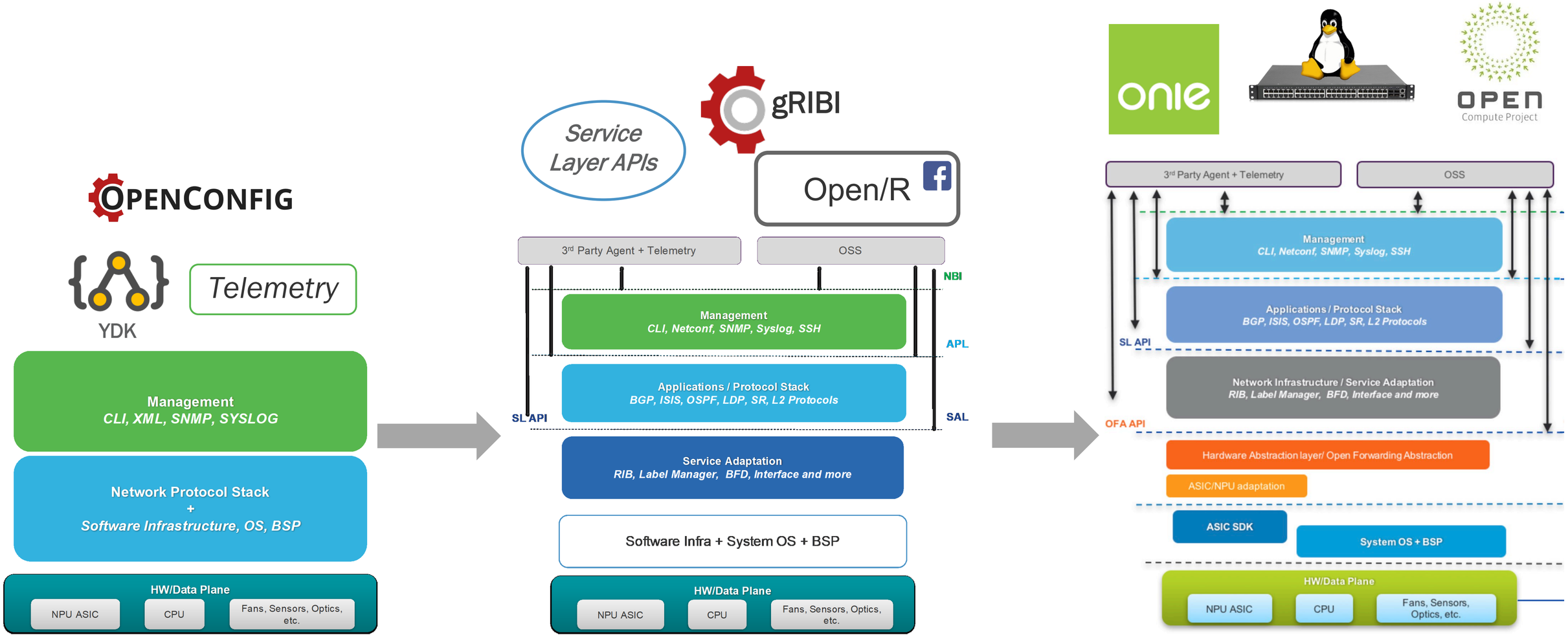


Disaggregating the HW from the SW:





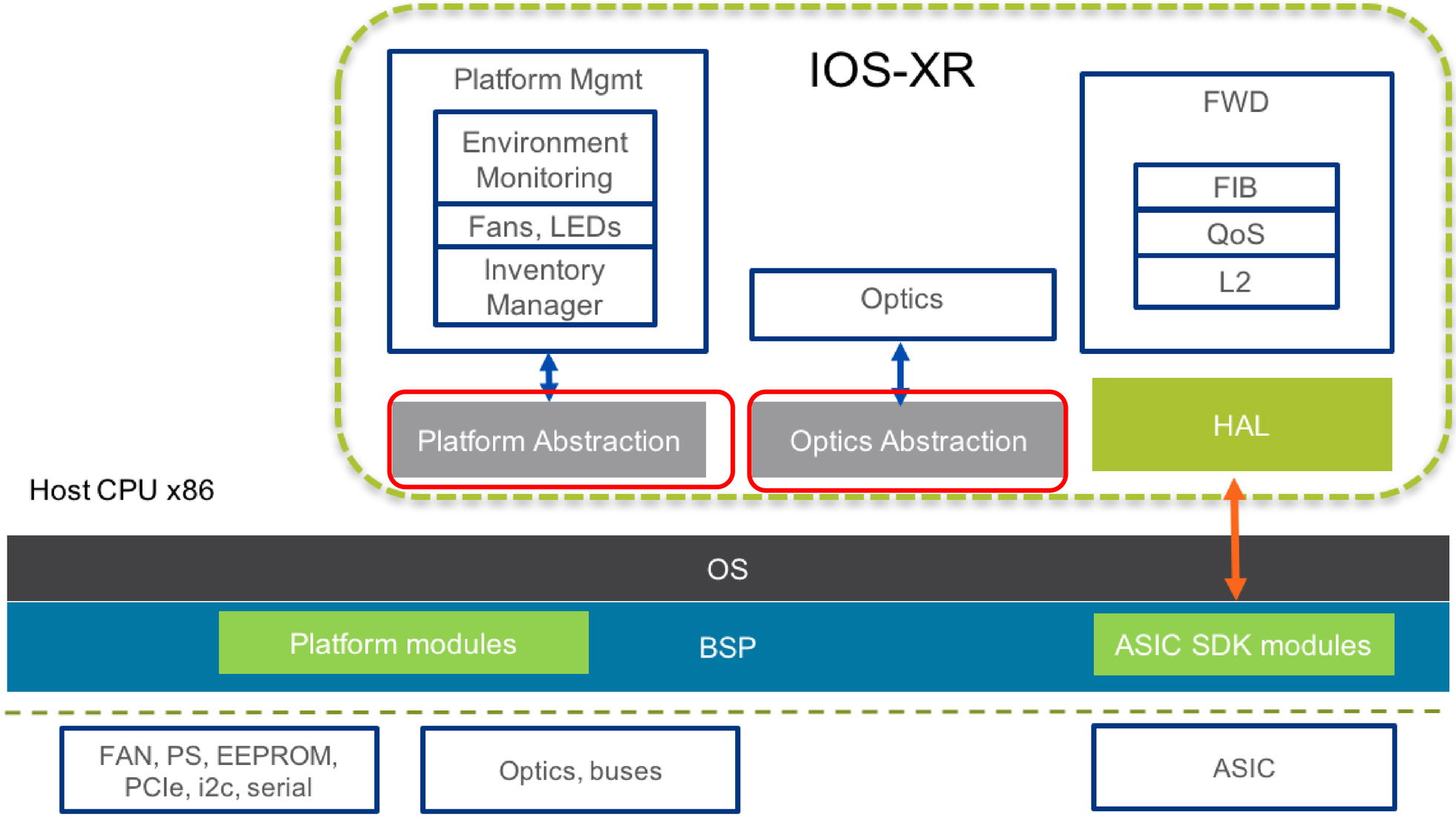
Disaggregating the stack, one use case at a time



Networking

The Road to HW-SW Disaggregation for IOS-XR

Integration Architecture:



Get Started Here : https://xrdocs.github.io/cloud-scale-networking/blogs/2018-03-08-enabling-ios-xr-on-third-party-network-hardware/

Decision Stages: Selecting the Hardware

The Network integrator may choose the Hardware based on :

- Port Density
- ASIC and Platform capabilities

Typically, being OCP compliant will plug the platform into the ecosystem: with platform modules pushed to the ONL (Open Network Linux) git repo: ([https://github.com/opencomputeproject/OpenNetworkLinux)](https://github.com/opencomputeproject/OpenNetworkLinux) for example.

Decision Stages: Integrating with the Platform

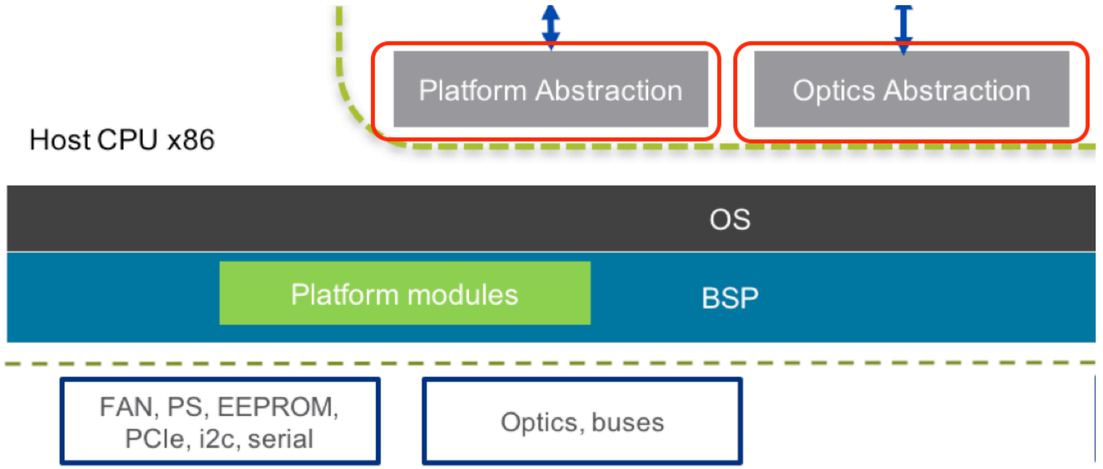
- Typically Platform capabilities are exposed through modules published in the ONL git repo (https://github.com/opencomputeproject/OpenNetworkLinux)

- These modules usually get integrated as kernel modules into the NOS.

- The capabilities can be exposed to the higher layers of the stack either through

    - ONLP (Open Network Linux Platform) Abstraction layers (See https://opennetlinux.org/docs/porting)

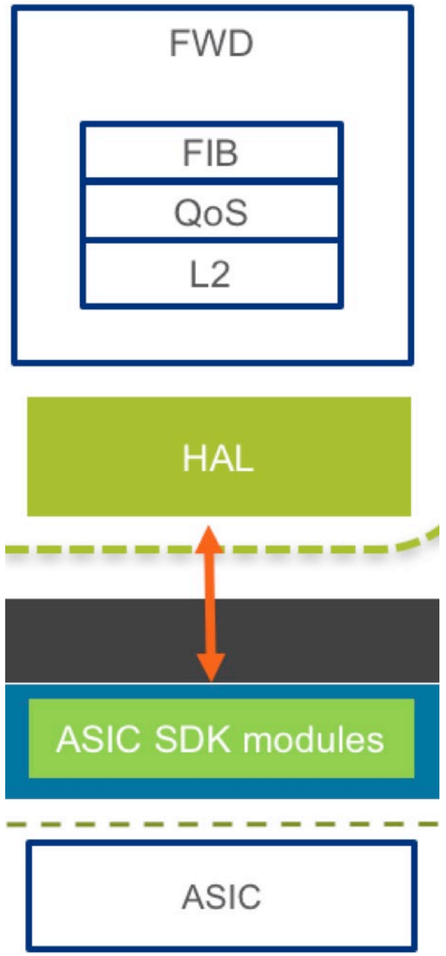
    - Directly hooking the NOS abstraction layers with the kernel /sys/fs paths exposed by the modules.



Decision Stages: Integrating with the ASIC

- The ASIC SDK comes from the ASIC vendor. This may be licensed (either by the integrator or Software vendor).

- The ASIC SDK may also be exposed as an Open API:
  For example, Broadcom provides an Open API on top of their SDK called OpenNSL for integration with a Hardware Abstraction Layer (HAL) in the NOS.



Decision Stages: Creating an Installer image

- Currently the OCP ecosystem utilizes ONIE as the image installation/bootloader paradigm.
- The required IOS-XR image is packaged up into an ONIE compatible installer image
- Whitebox devices can then download and install IOS-XR image via a DHCP server.

Cisco and the OCP

Working with the OCP Community:

Leveraging the current ecosystem

- Currently IOS-XR Leverages the Vendor Modules published in the ONL Git repo (https://github.com/opencomputeproject/OpenNetworkLinux)
- The Vendor module capabilities are directly integrated into IOS-XR through /sys/fs paths.
- The ONLP ”write” capabilities such as handling fan speeds based on temperature sensor data (specific to platform) are leveraged.
- Great Documentation for individual projects such as ONIE, ONLP.

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Supported Hardware?

- We are working on Platform enablement on a case-by-case basis.
- Selection of Hardware is an important decision stage driven by Customers (operators and/or Network Integrators)
- As part of this process, currently enabled platforms by End of 2018:
    - Edgecore AS5916-XKS : OCP-ACCEPTED™
    - Edgecore AS7816-64X : OCP-ACCEPTED™

- More integrations planned based on customer requirements

Can we Play with IOS-XR on OCP-ACCEPTED hardware already?

- Limited availability (LA) of IOS-XR on supported third-party hardware for **select** customers towards the end of 2018.
- If you'd like to be involved, get in touch with your nearest friendly Cisco Systems Engineer (SE)/ Account Manager (AM)
- General Availability (GA) of IOS-XR on supported third-party hardware around Mid-2019
- For any other questions, requirement discussions, contact us at: xrwb-external@cisco.com

Demo time!

Working with the OCP Community:
Our Learnings

- **Enhancements to optics drivers** - especially in supporting newer optics, some minor API enhancements
- **Events from ONLP :** Currently everything is based on polling
- **Uniformity in platform data from BMC:** varies across vendors

- **Test scripts for ONLP?**

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