



# Open Network Install Environment



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*The real danger is not that computers will begin to think like men, but that men will begin to think like computers.*

Sydney J. Harris

## Overview

What Is ONIE?

Lessons Learned

ONIE Development

Project Needs

## Network OS Install Environment

- Provides an environment for network OS installer discovery and execution
- Defined by its behaviors
- Implemented using a modern Linux kernel and BusyBox based initramfs

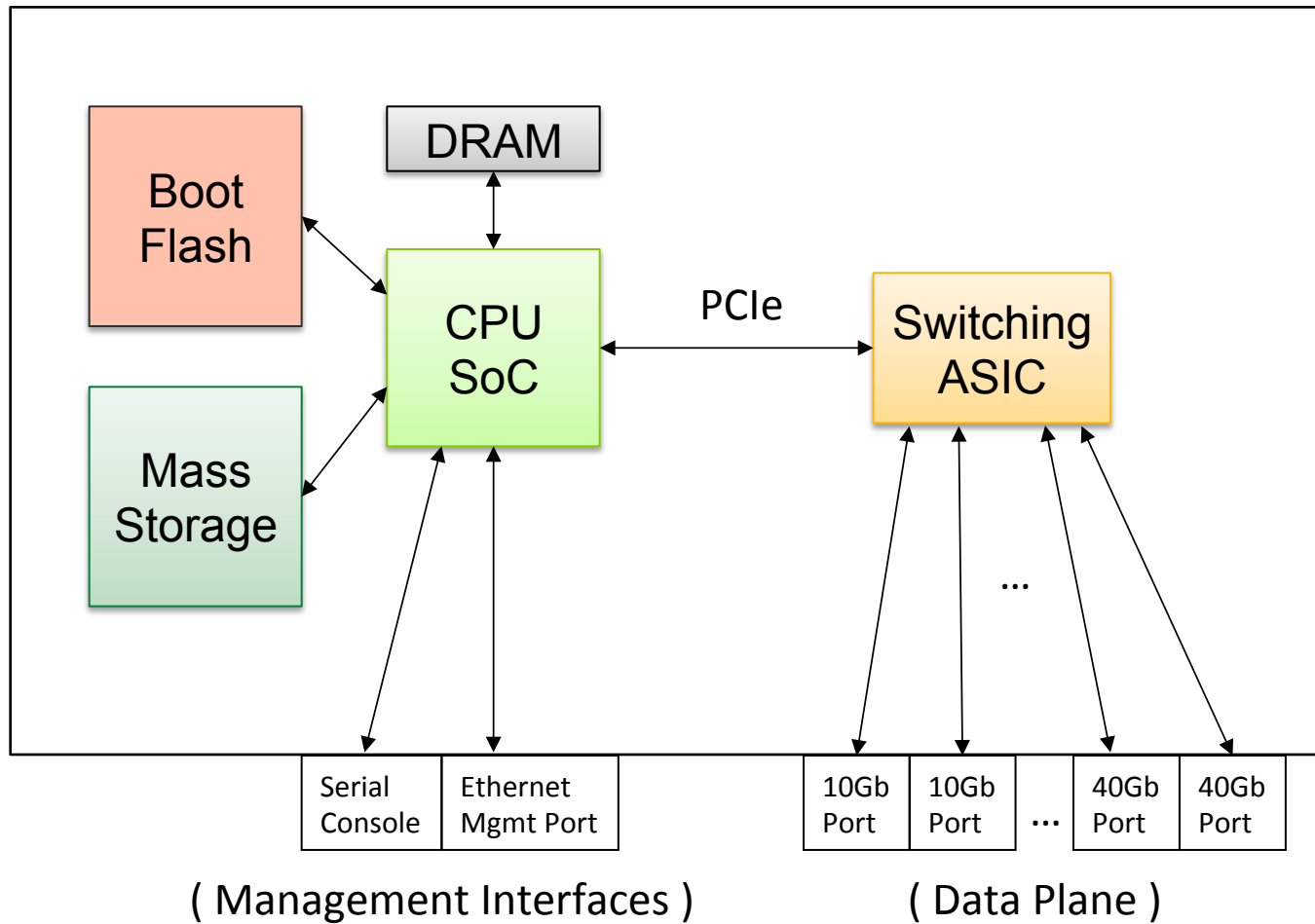
## An Open Source Project

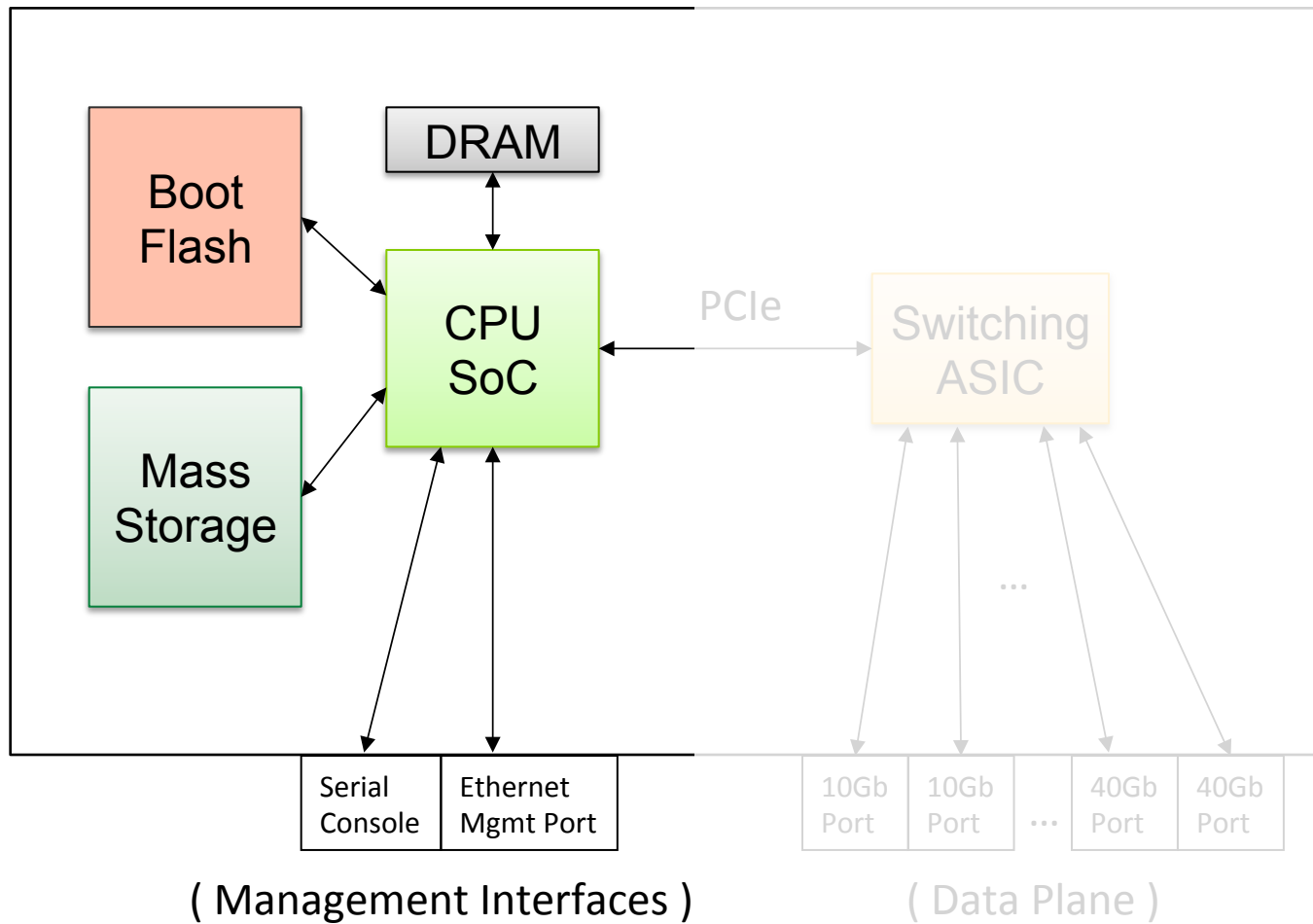
- <https://github.com/onie/onie/>

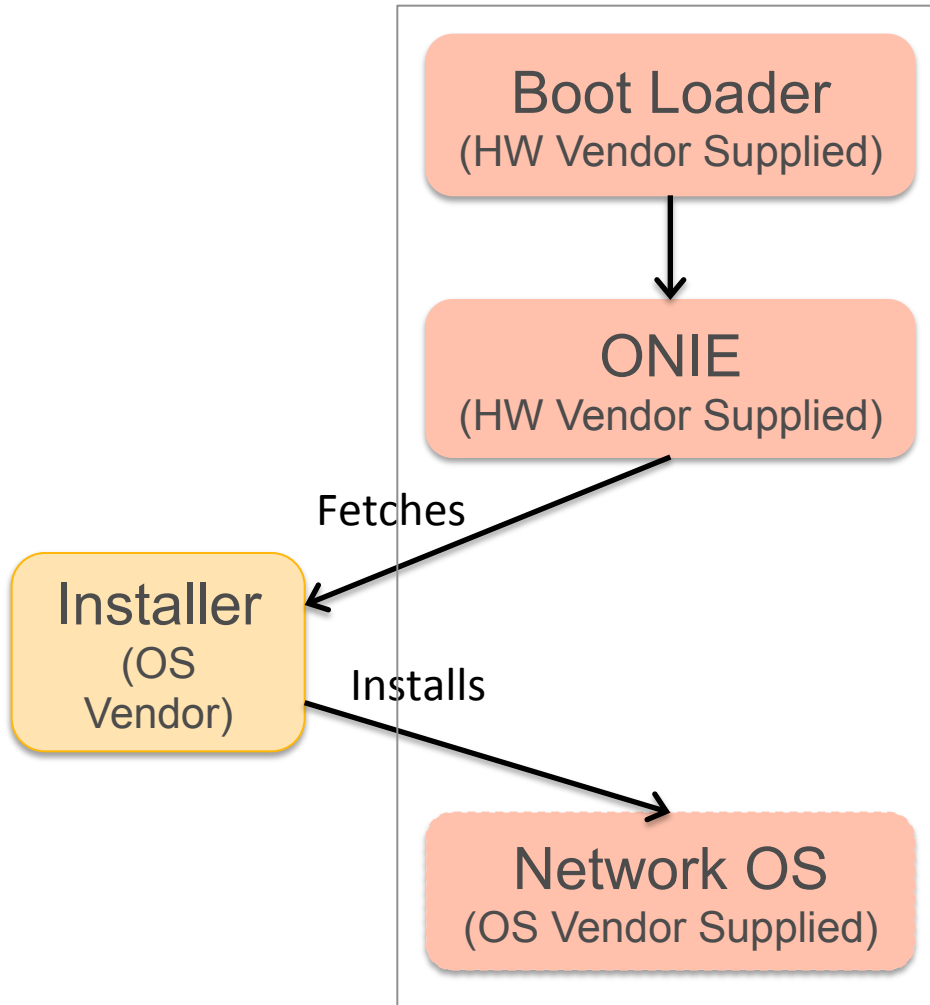
Evolving ...

In Production Now – <http://www.onie.org/members/>









## Boot Loader

- Low Level boot loader, configures CPU complex
- Loads and boots ONIE from flash

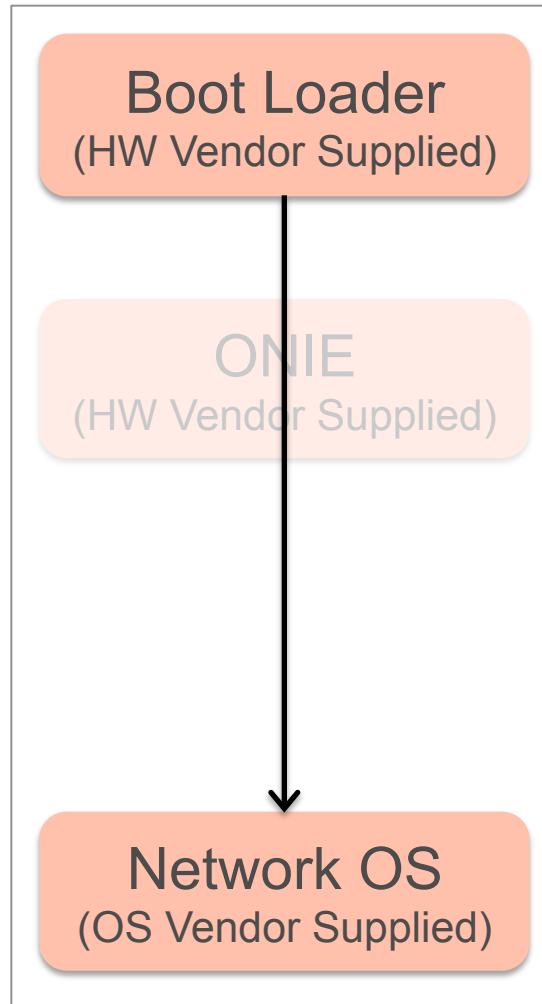
## ONIE

- Linux OS with Busybox
- Configures management Ethernet interface
- Locates and executes installer from network
- Provides tools and environment for installer

## OS Installer

- Available from network or USB
- Linux executable
- Installs vendor OS into mass storage





## Boot Loader

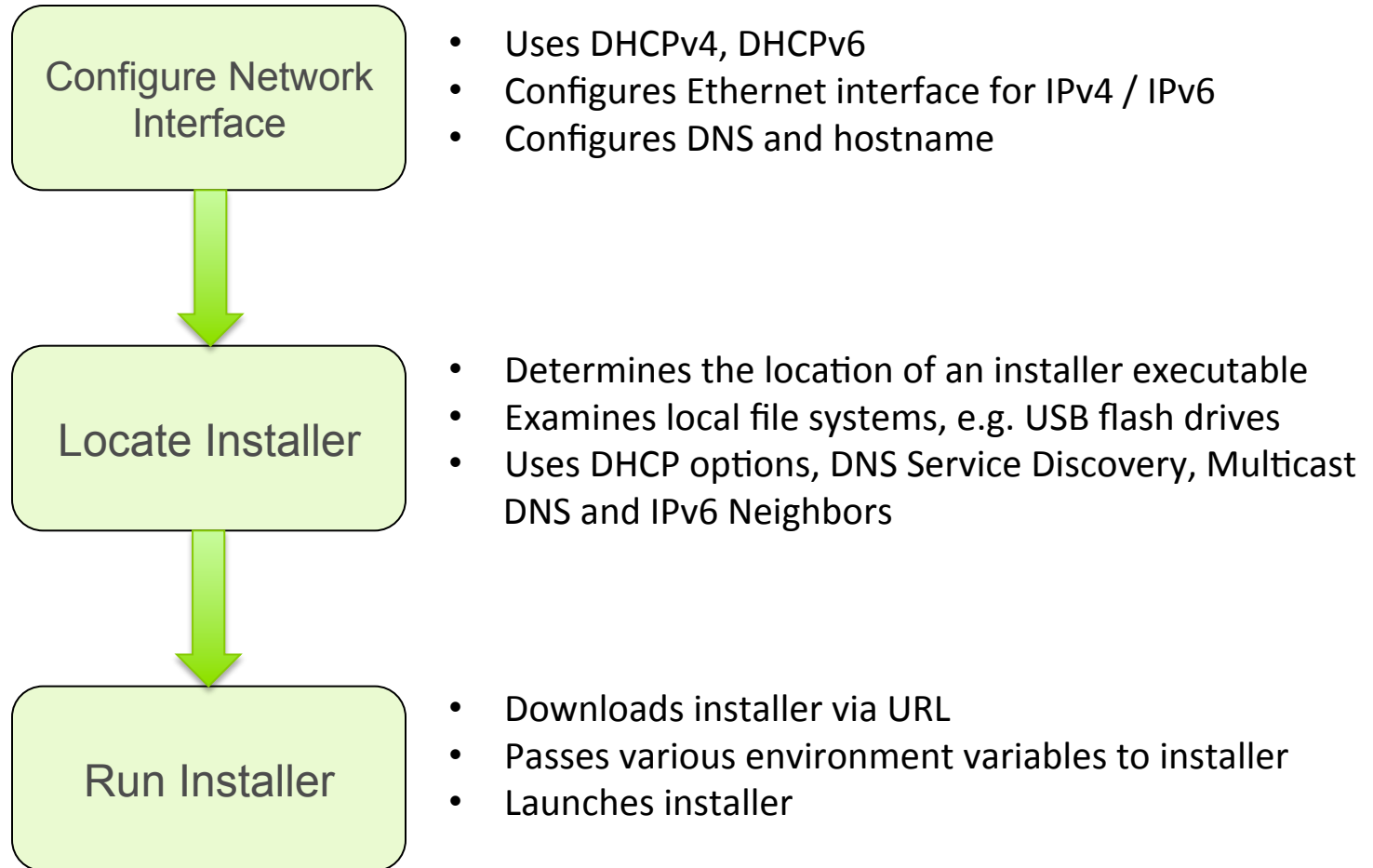
- Low Level boot loader, configures CPU complex
- Loads and boots OS vendor’s installed OS

## ONIE

- Still exists in the flash, but is not used
- Available for uninstall / re-install operations

## Network OS

- Configures Switching ASIC
- Runs Network Protocols
- Provides CLI



Reinstall	Invalidate currently installed OS and return to the “out of box” provisioning state
Uninstall	Completely wipe everything, except ONIE, off of the box
Rescue	Reboot box into ONIE for repair, debug and forensics
Update	Install a new ONIE version

Provide a mechanism for a network OS to invoke the above behaviors.

## Hardware Platforms

- Diverse mix of CPU complex designs, even within a single CPU family.
- HW Vendors need freedom to customize ONIE
- Need mechanism to run HW vendor diag

## Recurring Themes

- TLV based EEPROM format widely adopted
- Common HW designs reduce development time

## Support Multiple CPU Architectures

- x86, ARM, MIPS
- Maintain ONIE behaviors across architectures

## Testing and Compliance

- Enhance and extend regression test suites
- Develop compliance test suites

## New Features

- DHCPv6
- DNS Service Discovery / Multicast DNS discovery
- HW Vendor diagnostic

## Releases

- Quarterly release cadence
- Ongoing maintenance
- Enhancements

## Based on coreboot ([www.coreboot.org](http://www.coreboot.org))

- Open source
- Low level x86, board specific initialization
- Loads and executes a 2<sup>nd</sup> stage payload

## Requirements of 2<sup>nd</sup> stage

- Select from a range of OS images and boot options
- Mutable state, e.g. persistent environment variables
- Networking, e.g. netboot an ONIE rescue image

## Interesting Contenders

- GRUB2 – <http://www.gnu.org/software/grub/>
- Tianocore (UEFI) – <http://www.tianocore.org/>

Leaning towards GRUB2, as it appears simpler and less encumbered.



## ONIE Behaviors with GRUB2

- Clear path to implement “install” “reinstall”, “rescue” and “upgrade” behaviors as GRUB2 menu items
- Installers can mutate grub.cfg to add a menu entry for the installed network OS
- Simple for HW vendors to add “diag” menu entry

## Administrative

- Finalize and ratify OCP charter
- Finalize and ratify ONIE OCP draft specification with community
- Meeting cadence, e.g. monthly phone conference
- Area specialists, contributors

## ONIE Websites

- Main Page: <http://www.onie.org/>
- Source Code: <https://github.com/onie/onie/>
- Documentation: <http://onie.github.io/onie/>



Thank You!

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