NVMe OFA Open Source Windows Driver

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Agenda

- Status Update
- Driver Architecture
- Driver Features
- Future

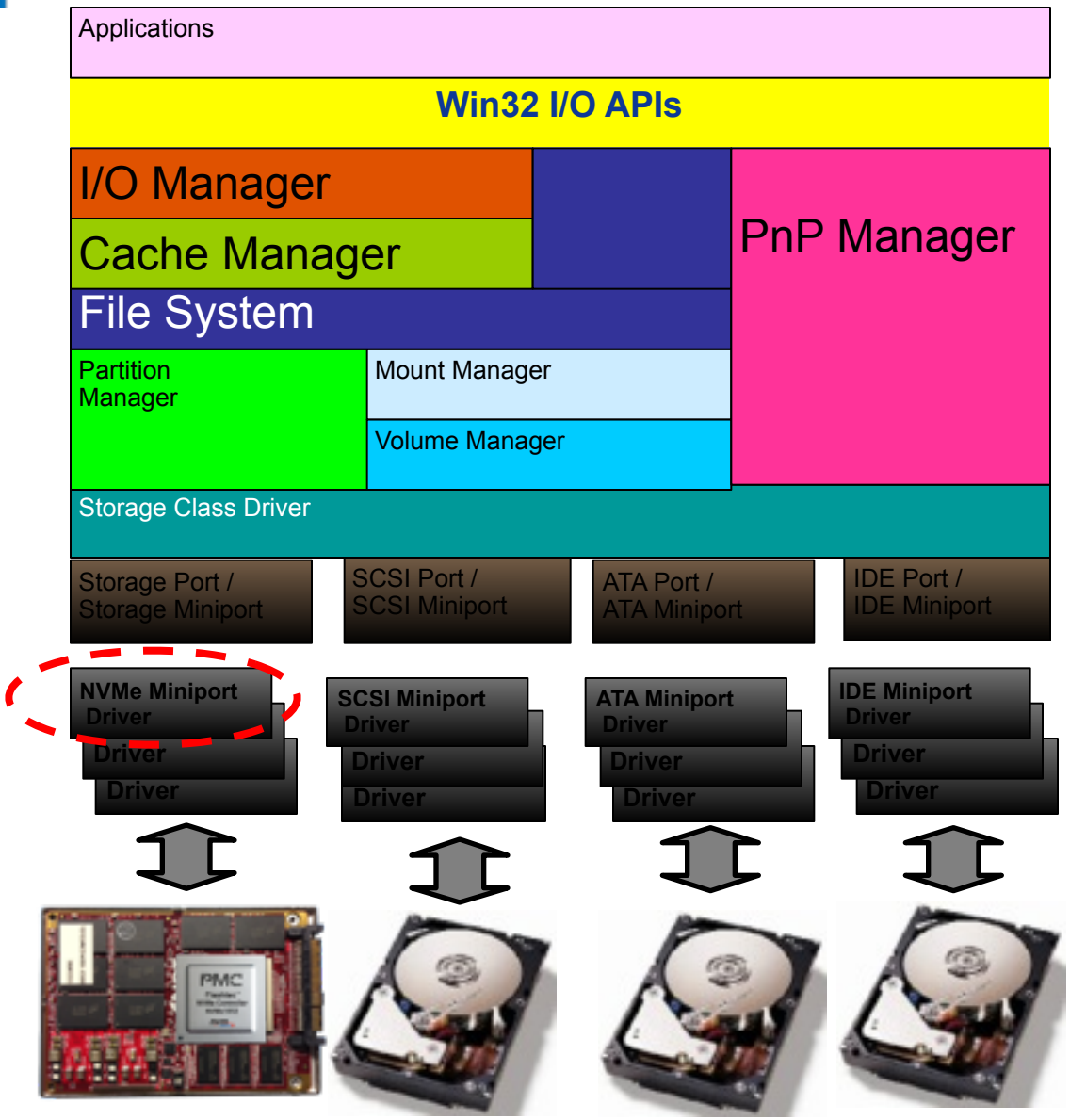
Status Update

Release 1	• Q2 2012 (released) • 64-bit support on Windows* 7, Windows* Server 2008 R2 • Mandatory features
Release 1.1	• Q4 2012 (released) • Added 64-bit support Windows* 8 • Public IOCTLs and Windows* 8 Storport updates
Release 1.2	• Q2 2013 (released) • Added 64-bit support on Windows* Server 2012 • Signed executable drivers
Release 1.3	• Q2 2014 (released) • Added 32-bit support on all supported OS versions • Hibernation and better MUMA group support

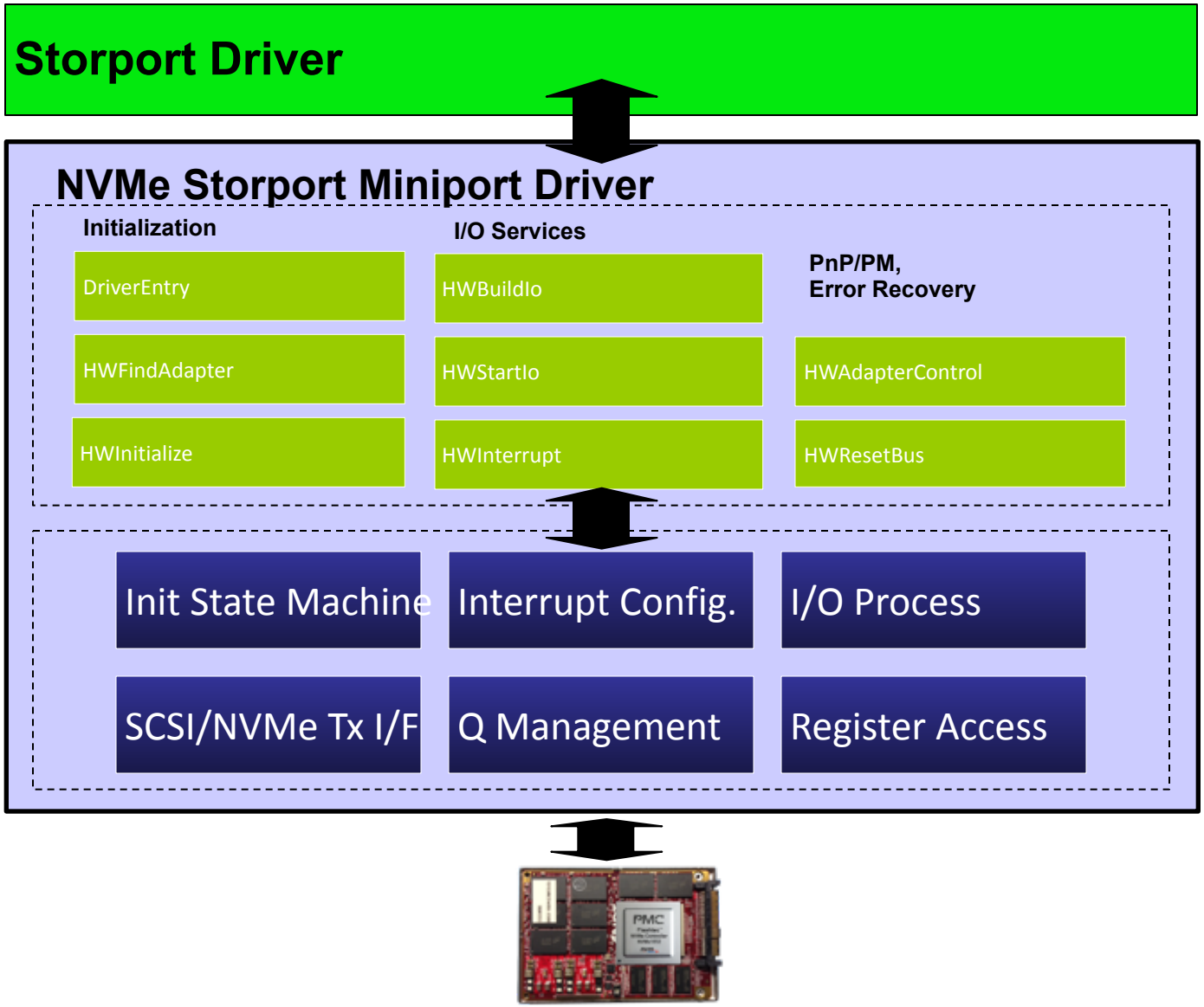
Four major releases of the Windows* OFA community driver since 2012
Code contributions from Huawei, PMC, Intel, LSI, and SanDisk

*Other names and brands may be claimed as the property of others.

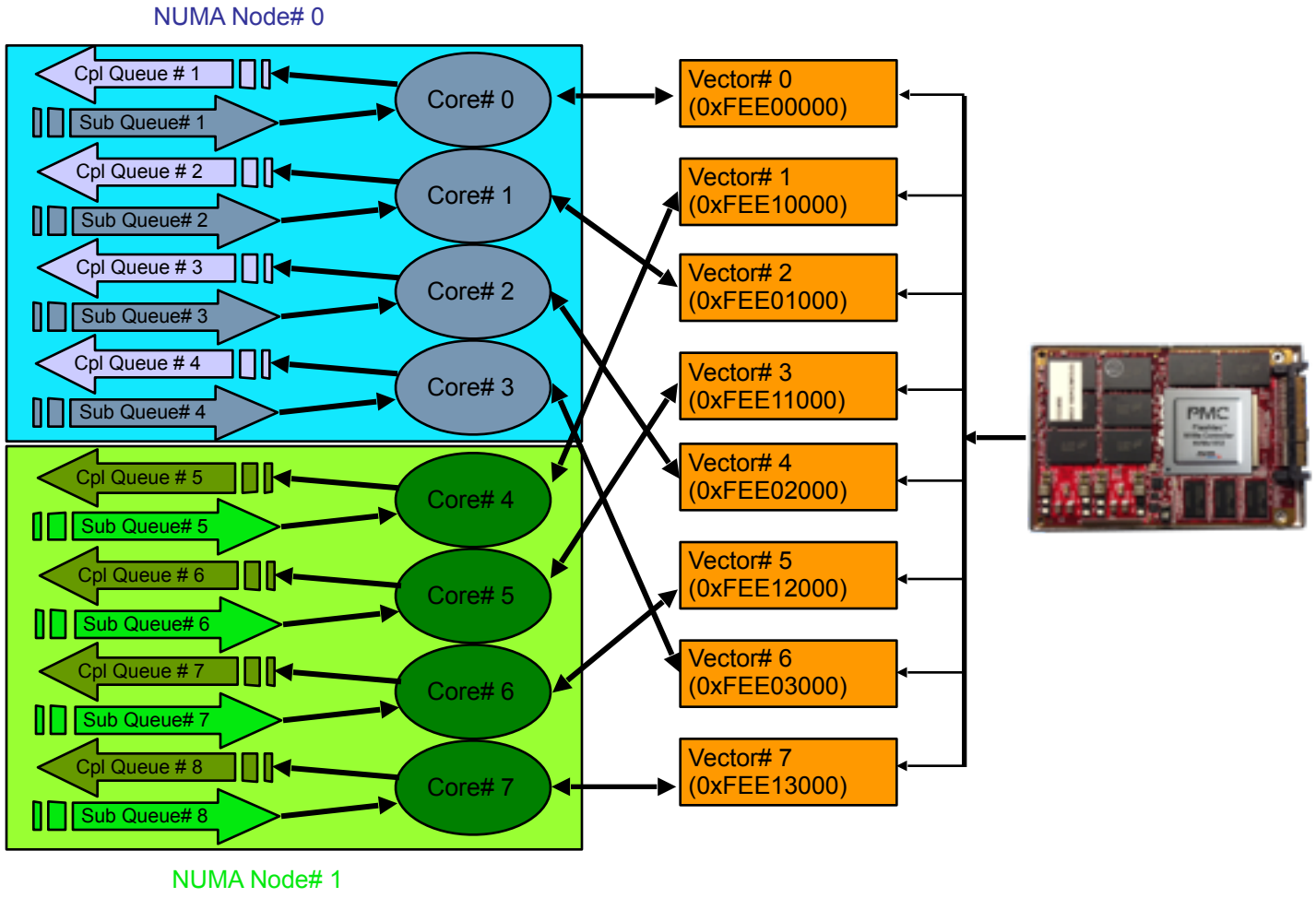
Windows Storage Architecture



Driver Architecture



Queue-Core-Vector Mappings



System Features Overview

Features	Supported
NVMe Specification	1.0e
Windows Versions (32-bit and 64-bit)	7, 8, Server 2008R2, Server 2012
NUMA Optimized Queues and Memory	Dedicated IO queues per CPU core Single Admin Queue for all CPU cores Queue memory allocated local to NUMA Node
Interrupt	MSI-X (Vectors mapped to NUMA optimized IO Queue Pairs) MSI INTX
Queue Arbitration / Priority	Round Robin only 1:1 mapping between Submission and Completion queues
Pass Through	Yes (with DeviceIoControl())
Multiple Namespaces	Up to 16, Mapped to Bus 0, Tgt 0, LUN 0-15
Registry Parameters	Name Space, Max Transfer Size, Admin Queue Size, IO Queue size, Interrupt Coalescing Time/Entries)
End-to-End Protection	No

Future Features

- 1.4 Release (end of 2014)
  - WHQL Certification test
  - Driver Trace feature
  - Hot Plug / Swap support
  - NVM Format Enhancement
- 2015 and Beyond
  - NVMe 1.1b/1.2 features
  - T10 end-to-end protection

Need your contribution to write the future

OFA NVMe Driver Working Group

- Founding Companies
  - PMC – Chairperson, Code maintainer
  - Intel
  - Avago (LSI, SandForce)
- To Contribute
  - Join the mailing list
  - Email your patch to the WG mailing list
  - Code is checked in if approved by two out of three founding companies

Useful Information

- Join the Driver Mailing List to Contribute
  - http://lists.openfabrics.org/cgi-bin/mailman/listinfo/nvmewin
- Development Tools Description
  - https://www.openfabrics.org/index.php/developer-tools/windows-tools.html
- Driver Source Code
  - http://svn.openfabrics.org/svnrepo/nvmewin