

---

# INTRODUCING THE ETHERNET ALLIANCE POWER-OVER-ETHERNET CERTIFICATION PROGRAM

**May 1, 2018**

---



# Foreword

- **Opinions expressed during this presentation are the views of the presenters, and should not be considered the views or positions of the Ethernet Alliance.**

EA CERTIFIED & PD Logo™, EA CERTIFIED & PSE Logo™, ETHERNET ALLIANCE™, and the EA Logo™ are trademarks and certification marks of The Ethernet Alliance in the United States and other countries. Unauthorized use strictly prohibited.

# The Ethernet Alliance



We are a global community of end users, system vendors, component suppliers and academia

## ➤ Our Mission

- Promote technologies and products based on existing and emerging IEEE 802 Ethernet standards
- Accelerate industry adoption
- Demonstrate multi-vendor interoperability

## The Voice of Ethernet



# Today's Speakers



**John D'Ambrosia**  
Chairman, Ethernet Alliance  
Huawei, Senior Principal Engineer



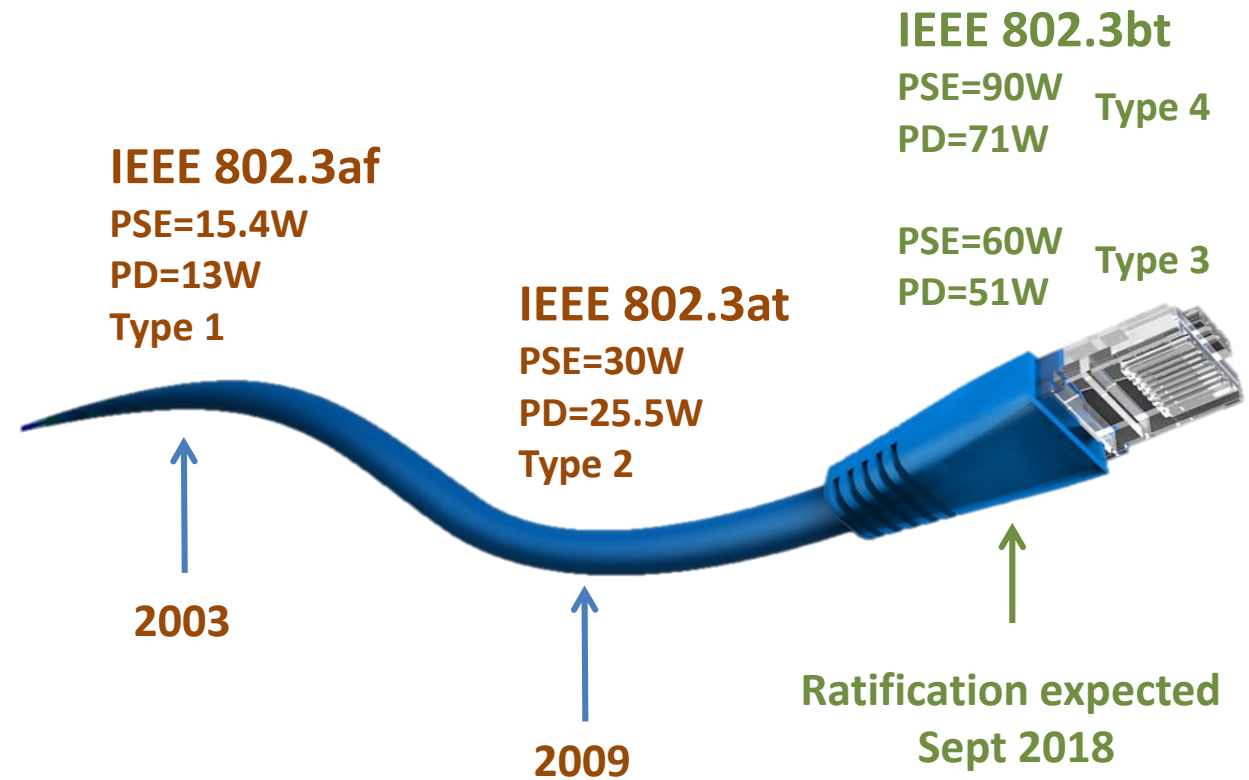
**Thomas Lewis**  
Texas Instruments  
PoE Applications & Marketing Manager

# What is Power-Over Ethernet?



“Power over Ethernet or PoE describes any of several standardized or ad-hoc systems which pass electrical power along with data on Ethernet cabling.”

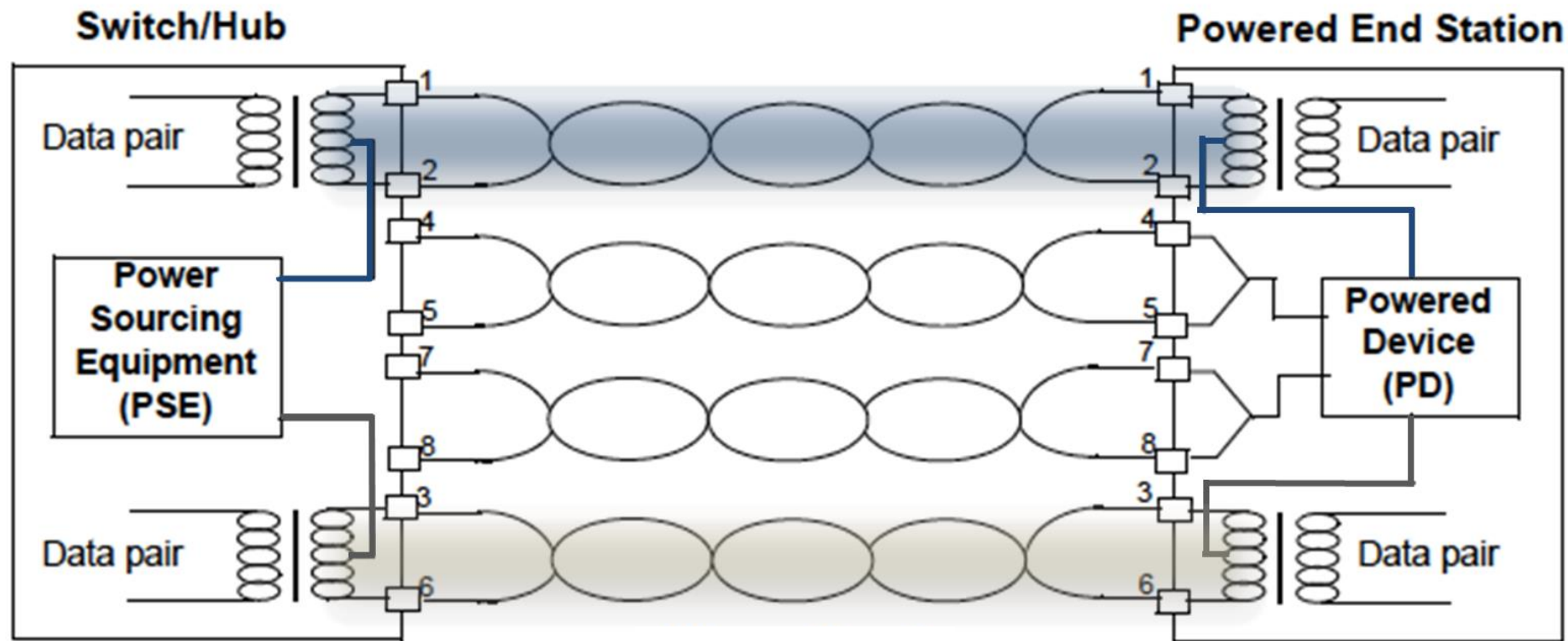
Wikipedia,  
the Internet's Source of  
Approximate Truth



# PoE Provides a “Power Overlay” to Ethernet



- Power is injected by the PSE (Power Source Equipment) on the isolated side of the transformer
- The PD (Powered Device) picks it up on the isolated side of the transformer
- Detection check to enable data compatibility with non-PoE devices
- Power Classification to minimize wasted power and help with power budgeting



An Isolated DC/DC maintains isolation to low voltage circuits



Certifications awarded at the **SYSTEM**,  
not component, level.

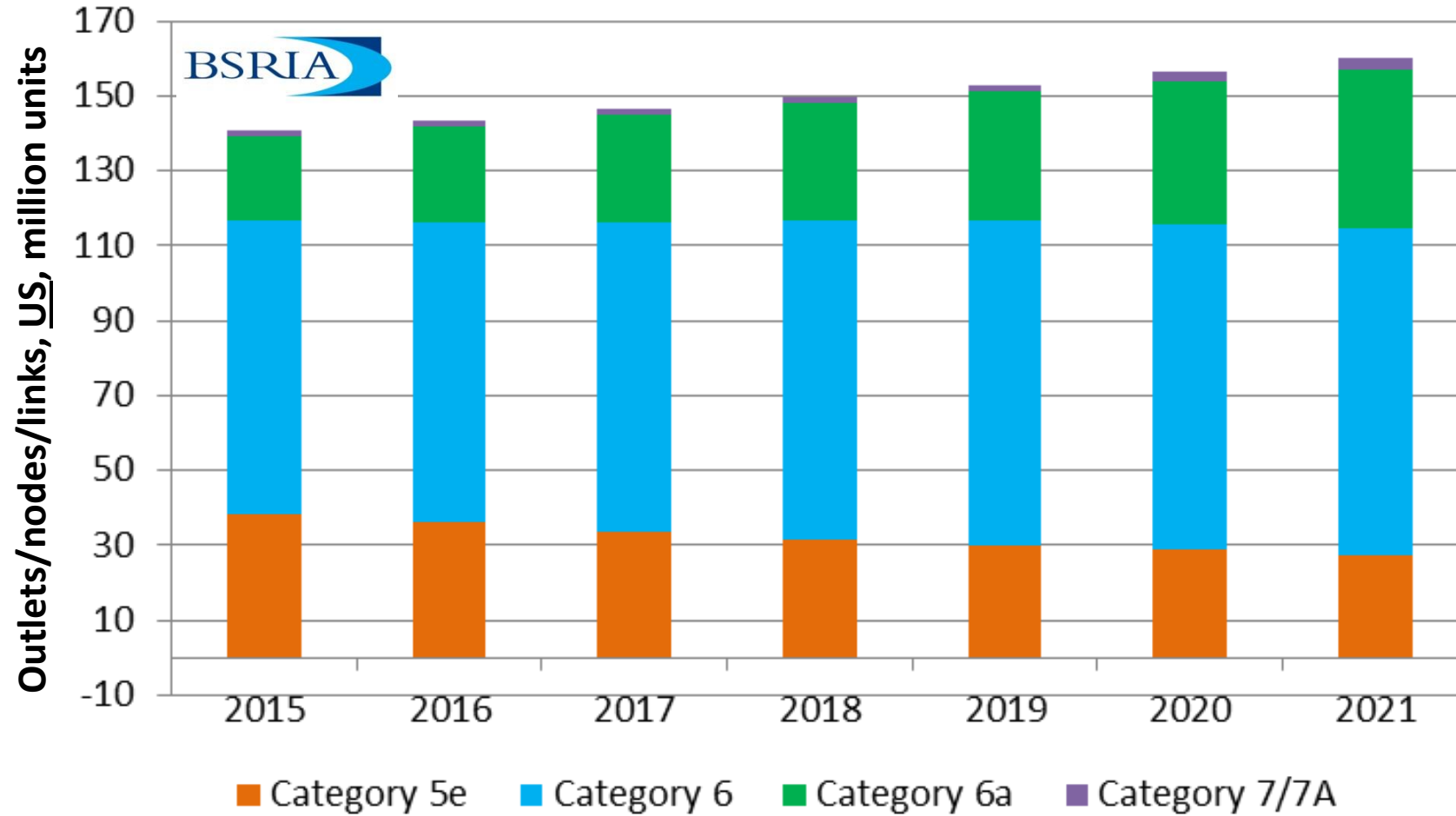
Image courtesy of Microsemi

# What are the IEEE Std. 802.3-2015™ Types and Classes?



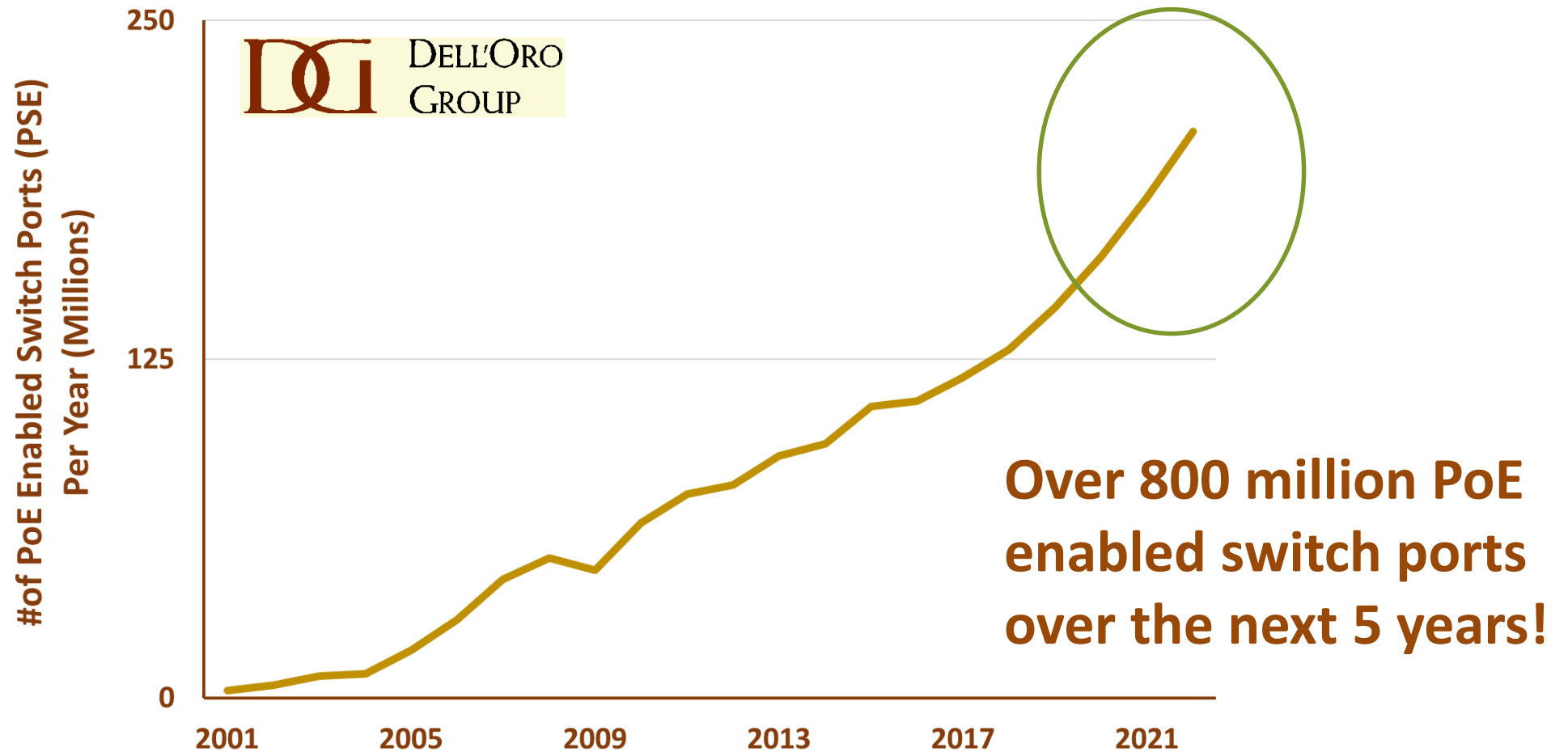
Class	Type	# Pairs	Power Sourced at PSE	Available Power at PD
0	1	2	15.4W	13.0W
1	1	2	4W	3.84W
2	1	2	7W	6.49W
3	1	2	15.4W	13.0W
4	2	2	30W	25.5W

# Installed Twisted Pair Base: Estimated Worldwide Outlets



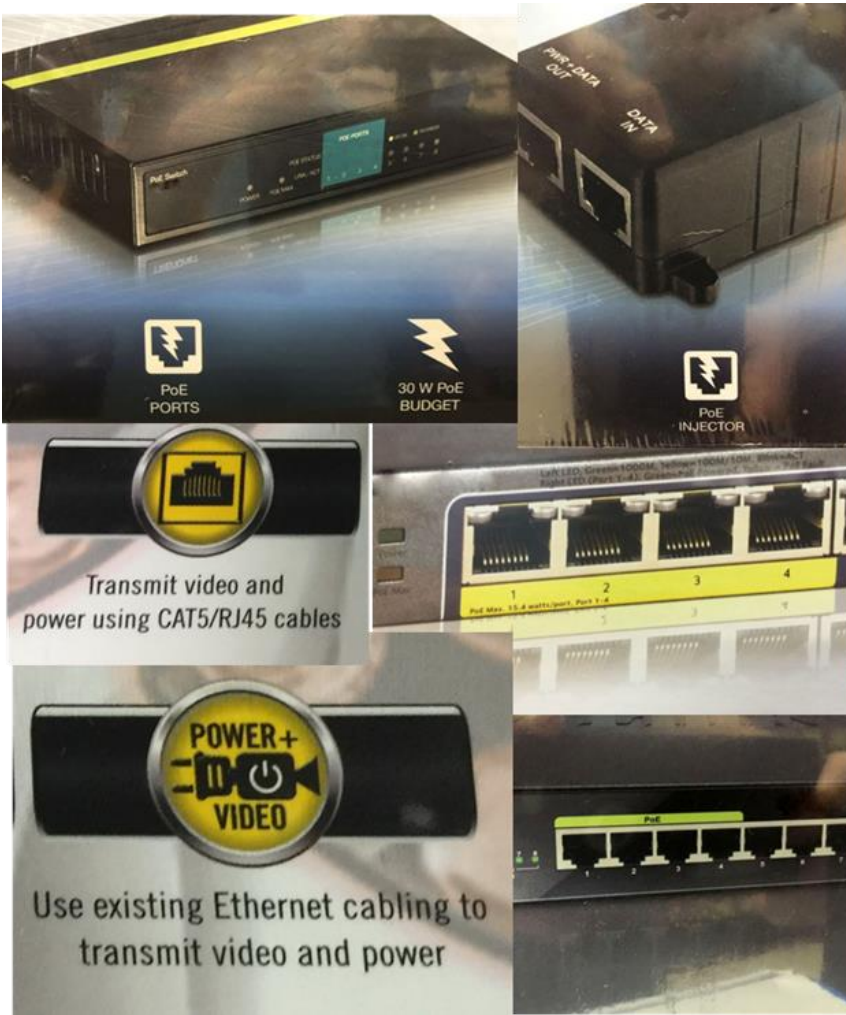
Source: BSRIA survey and modelling May 2017

# PoE Enabled Switch Ports Forecast



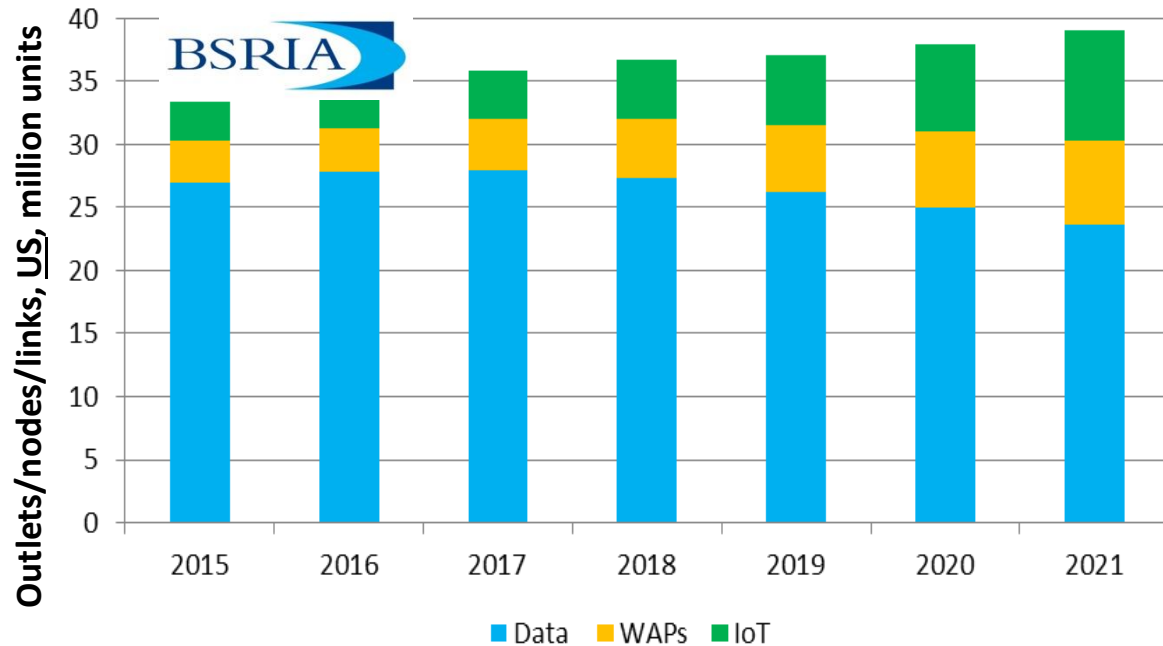
Source: Dell'Oro Group, Feb 2018

# Today's Market Confusion

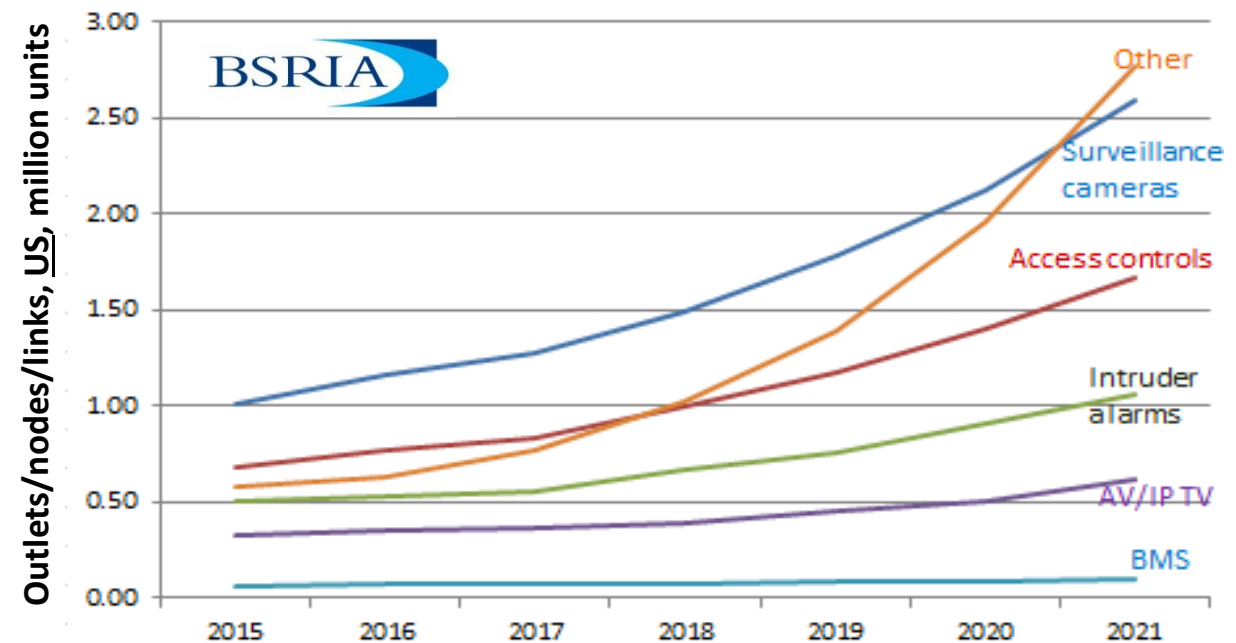


- **How do you tell?**
  - Standard?
  - Non-Standard?
- **Results**
  - Interoperability Problems
  - Customer Frustration
  - Support Costs

# Network links/nodes sales and growth, USA



## “IoT” Breakout



Source: BSRIA survey and modelling May 2017

Other: Lighting, digital signage, point of sales/card readers, white boards, smoke detection, room booking

# Need for Change

- **#1 complaint of potential new “PoE adopters” and/or PoE installers is the development of an interoperable system**
- **Technology image is tarnished by non-interoperable systems**
- **Business channel has to account for high customer service/applications support to help debug non-interoperable systems = higher costs for everyone**
- **Situation is about to grow exponentially due to forecasted demand increase**

# IEEE 802.3bt Types and Classes



Assigned Class	Type	# Pairs	Power Sourced at PSE (W)	Available Power at PD (W)
1	3	2 or 4	4	3.84
2	3	2 or 4	7	6.49
3	3	2 or 4	15.4	13
4	3	2 or 4	30	25.5
5	3	4	45	40
6	3	4	60	51
7	4	4	75	62
8	4	4	90	71.3

- The anticipated IEEE 802.3bt standard adds:
  - Ability to send power over all 4 pairs
  - Types 3 and 4
  - Classes 5-8
  - Available Power levels up to 71.3 W
- Ratification expected Sept 2018

# 802.3bt Driver #1

New Features Coming to Traditional End Equipment



## Telepresence



## 802.11ac & Increased # of Bands



## TPZ, Heaters, Analytics



# 802.3bt Driver #2

## Emerging PoE Applications



### *Network Attached Storage*



### *Building Automation*



### *Power Gateways*



### *Industrial Controls*



### *Entertainment*



### *Access Control*



# Introducing the Ethernet Alliance PoE Certification Program



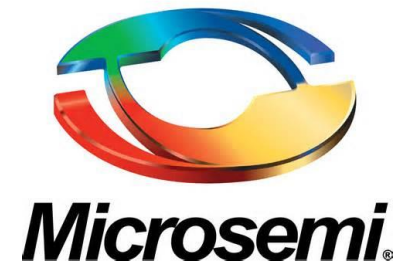
*Is Your  
PoE Equipment  
EA-Certified?*



# PoE Certification Program Goals

- **End Users**
  - Easy identification of interoperable PoE Systems
  - Plug and Play
- **The Industry**
  - Continuing proliferation of IEEE 802.3-based PoE Systems
  - Minimize support issues & cost due to interoperability problems
- **Better overall experience for everyone!**

# PoE Certification Program Members



# What Does the Logo Mean?

- Meets Ethernet Alliance Certification Test Plan
  - Based on IEEE Std 802.3™-2015 PoE Specifications
- Confidence of interoperability between certified products
- PSE / PD Logo Distinction
- Class Number indicates maximum class supported
- Easy Interoperability: PSE Class must be greater than or equal to PD Class



*PSE Class "4" Logo*



*PD Class "1" Logo*

# Certified PoE Enabled PSE Products



Respective images courtesy of Cisco, HPE Aruba, Huawei, and Microsemi.

# 5 Easy Steps To Certification

1. Sign Certification Mark License Agreement (CMLA)
2. Certification Application
3. Testing (1<sup>st</sup> or 3<sup>rd</sup> Party)
4. Receive Certification
5. Follow Logo Usage Guidelines when promoting product



EA Certified  
TM

# Certification Fees



- **Two Components**
  - Program fees (Ethernet Alliance)
  - Testing fees (UNH-IOL)
    - Auditing for 1<sup>st</sup> Party Testing
    - 3<sup>rd</sup> Party Testing
- **Ethernet Alliance Membership Benefits**
  - Lower CMLA Fee
  - Lower Application Fees
  - May Perform 1<sup>st</sup> Party Testing with approved 3<sup>rd</sup> Party test equipment

# Programs Fees



Fees	Normal	EA Member	Notes
CMLA License	\$7,500	\$5,000	One time fee at time of signing CMLA.
Certification Application	\$2,500	\$1,000	One time fee per device
Derivative Works Application	\$250	\$100	One time fee per device

**Note – Companies can join the Ethernet Alliance to only participate in the PoE Certification Program, for as low as US \$3,000.**

See <https://ethernetalliance.org/about-us/how-to-join/>

# Certification Testing Fees



Test Options		Fee	Note
3 <sup>rd</sup> party Testing	UNH-IOL	PSE:\$4,999 PD - \$2,999	<ul style="list-style-type: none"> <li>• Same cost for all</li> </ul>
1 <sup>st</sup> Party Testing *  (Using Approved Test Equipment)	Audit Only	\$8,999 per year	<ul style="list-style-type: none"> <li>• Requires Ethernet Alliance Membership</li> <li>• Covers audit for one testing location</li> <li>• Brand Protection Audits for the EA</li> <li>• Provides Resources are available for auditing and conflict resolution</li> <li>• Data Clearinghouse activities of UNH-IOL</li> </ul>
	Full Service	\$15,000 per year	<ul style="list-style-type: none"> <li>• Same as “Audit Only”</li> <li>• Plus - six 3<sup>rd</sup> Party Testing Services of new devices annually. (Based on 1<sup>st</sup> come 1<sup>st</sup> serve)</li> </ul>

\* Cost waived for existing UNH-IOL PoE Members

# Partnership & 3<sup>RD</sup> Party Testing



University of New Hampshire  
InterOperability  
Laboratory



- PoE Certification Program Audit / Test House
- 25+ years of testing experience including many certification programs
- Incorporates best practices from existing Certification programs



# 1<sup>st</sup> Party Testing



- Ethernet Alliance Members Only
- Belong to UNH-IOL Audit Program
- Using approved 3<sup>rd</sup> Party Equipment



<https://ea-poe-cert.iol.unh.edu/approved-test-equipment>

- Automated Testing & Reporting where applicable

EA PoE Certification Test - PSE				EA Certification: Pass		
February 17 2018 3:41 PM		Test Mode: 30 Watt PHY				
PSE Tested: Sample Type-2 PSE		Version: 4.2.13				
EA Summary						
EA Test ID	EA Test Name	Overlapping EA Test Coverage	Parameter Count	PASS Outcomes	FAIL Outcomes	Pass/Fail
1.1	Valid PSE Pinout		1	1	0	Pass
1.2	Open Circuit Voltage	1.1 Valid PSE Pinout	1	1	0	Pass
1.3	Detector Circuit Output Voltage	1.1 Valid PSE Pinout	5	5	0	Pass
1.4	PD Signature Detection Limits	2.14 Apply Power	3	3	0	Pass
1.5	Physical Layer Classification		8	8	0	Pass
1.6	Physical Layer Class Timing		4	4	0	Pass
1.7	Allowed Class Permutations		2	2	0	Pass
1.8	New Detection Cycle	2.14 Apply Power	2	2	0	Pass
1.9	Alternative B Back-off Cycle		2	1	0	Pass
2.10	Power Feed Ripple and Noise		2	2	0	Pass
2.11	Load Regulation		4	4	0	Pass
2.12	Voltage Transients		2	2	0	Pass
2.13	Power Turn-On Timing	1.8 New Detection Cycle	1	1	0	Pass
2.14	Apply Power		1	1	0	Pass
3.15	Overload Current Detection Range		3	3	0	Pass
3.16	Output Current at Short Circuit	3.15 Overload Current Detection Range	2	2	0	Pass
3.17	Output Current in Startup Mode		3	3	0	Pass
3.18	Range of Timode Timer	3.23 Turn Off Time Limits	1	1	0	Pass
3.19	PD MPS Dropout Current Limit		1	1	0	Pass
3.20	PD MPS Time for Validity		1	1	0	Pass
3.21	AC MPS Signal Parameters					N/A
3.22	AC MPS Signature					N/A
3.23	Turn Off Time Limits		1	1	0	Pass
5.26	TLV Frame Definition					N/A
5.27	Data Link Layer Class Timing					N/A
5.28	PD Request Field Change					N/A
5.29	PSE In Sync with PD					N/A
				EA Certification: Pass		

Images courtesy of Sifos Technologies

# Derivative Products

- **Derivative Products are not substantially different from products already certified**
- **Examples of allowable changes**
  - Model number change
  - Manufacturer's name change
  - Device description on Ethernet Alliance registry (Information form info)
  - Firmware revision number change
- **Note – Further details provided in PoE Certification Program Reference Guide**

# Links of Interest

- [The Ethernet Alliance](#)
- [Ethernet Alliance PoE Certification Program](#)
- [PoE Certification Test Plan Request](#)
- **Certification Mark License Agreement**
  - [Ethernet Alliance Members](#)
  - [Non-Ethernet Alliance Members](#)
- [Certified Product Registry](#)
- [Approved 3<sup>rd</sup> Party Test Equipment](#)
- [Press Releases](#)
- [White Papers](#)
- [FAQ](#)
- [Joining the Ethernet Alliance](#)

# Keep The Date – UNH-IOL PoE Certification Test Event



- **Week of June 25, 2018**
- **UNH-IOL, Durham, NH**
- **Special Incentives**
  - **\$2,500 discount on CMLA**
  - **1 Application fee covers up to 3 products**
    - **Members - \$1,000**
    - **Non-Members - \$2,500**
  - **More information may be found at:**  
<https://www.iol.unh.edu/event/2018/06/test-event-ea-poe-certification-program>



# DISCUSSION



NEXT  
ETHERNET  
ERA



ethernet alliance

If you have any questions or comments, please email [admin@ethernetalliance.org](mailto:admin@ethernetalliance.org)

Ethernet Alliance: visit [www.ethernetalliance.org](http://www.ethernetalliance.org)

 Join the Ethernet Alliance [LinkedIn group](#)

 Follow @EthernetAllianc on Twitter

 Visit the Ethernet Alliance on [Facebook](#)