



### AGENDA

- ▶ Introduction
- ▶ Let's Talk IoT
- ▶ Protocols, Standards & Terms
- ▶ Z-Wave!
- ▶ The Reality of It All
- ▶ It's Not A Thing; Capitalize On The Opportunity!

### MITCHELL KLEIN

- ▶ URC
  - ▶ Director of Business Development
- ▶ Stay Tuned
  - ▶ Founding & Managing Partner
- ▶ Media Systems
  - ▶ President/CEO
- ▶ Tweeter Etc.
  - ▶ Director Sales & Operations
- ▶ CEDIA
  - ▶ President, VP, Treasurer, Board Member
  - ▶ Chairman Professional Development Committee

### WHO WE ARE

Formed in January 2005, the Z-Wave Alliance is a consortium of leading companies in the home technology space dedicated to solidifying Z-Wave as the standard for wireless home control products.

Alliance members lead the home controls market, providing leading edge products and systems that deliver increased comfort, convenience, energy conservation, safety and security.

[www.Z-WaveAlliance.org](http://www.Z-WaveAlliance.org)



### MEMBERSHIP LEVELS

- Principal**
  - Principal Members form the Board of Directors
  - Principal Membership by invitation
  - Sets direction of Alliance, defines goals, approves budget
- Full**
  - Holds a valid technology license for Z-Wave technology
  - Develops and/or manufactures Z-Wave enabled products
- Affiliate**
  - Distributors and/or resellers of Z-Wave enabled products
  - Non-manufacturing Z-Wave business interest
- Integrator**
  - Companies and individuals providing installation services for Z-Wave enabled products

### CERTIFIED INSTALLER TRAINING

**Empowering Installers**

- ▶ Provides installers with the know-how and tools to design, implement and maintain Z-Wave smart home solutions
- ▶ Saves installers time and money while boosting customer satisfaction
- ▶ Enables consumer confidence in Z-Wave, better experience for the end user + less returns







Look for the badge!

### CERTIFIED INSTALLER TOOLKIT

**Coming Late Fall 2016**

- ▶ Web server allows toolkit to be placed in customer's Z-Wave network; connect to it via web browser & WiFi
- ▶ Z-Wave Network Sniffer: displays info about Z-Wave transmissions
- ▶ Spectrum analyzer
- ▶ WiFi, Ethernet plus USB ports for future capabilities.






LET'S TALK IOT

THIRTY YEARS AGO...



### SMART HOME – TO – IOT



### WHAT IS THE IOT?

**The Internet of Things**




"The Internet of Things will be as transformative to the world as was the Industrial Revolution"

**What is the Internet of Things?** *noun:* A network of internet-connected objects able to collect and exchange data. Commonly abbreviated IoT.


### WHAT IS THE IOT – WHY IS IT SO IMPORTANT?

"In the not too distant future, hundreds of millions, then billions, of individuals and businesses, with billions, then trillions of smart, communicating devices, will stretch the boundaries of today's business and social systems and create the potential to change the way we work, learn, entertain, and innovate"



- Harbor research, "Smart Systems & Internet of Things Perspective" 2014

### ANALYSTS – IOT WILL BE BIG



4 Billion Connected People


\$4 Trillion Revenue Opportunity

25+ Million Apps

25+ Billion Embedded and Intelligent Systems

50 Trillion GB of Data

### ANALYSTS – IOT WILL BE BIG




51 Million

5100 Million

51 Billion

\$1 Trillion (in double-stacked pallets)

### WHAT IS THE IOT?



**CONNECTED HOMES**  
Smart Thermostats  
Smart Appliances  
WLAN Systems  
Security  
Smart Lighting  
Entertainment Systems

**CONNECTED CARS**  
Safety  
Vehicle diagnostics  
Entertainment and Navigation  
Fleet Management

**WEARABLES**  
Fitness Bands  
Smart Watches  
Smart Glasses  
Action Cameras

**INDUSTRIAL INTERNET**  
Real Time Analytics  
Factory Automation  
Robotics  
Supply Chain Efficiency

**CONNECTED CITIES**  
Smart Meter Technology  
Smart Traffic Lights  
Smart Parking Meters  
Electric Vehicle Charging  
Real Time Analytics

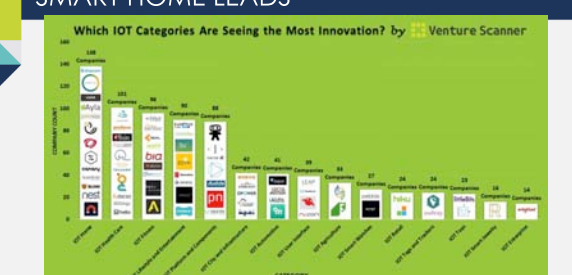
### Internet of Things Landscape 2016



© Mark Turk (ghemrock), David Forst (ghemrock) & Tommaso Caputo (ghemrock) | GEM, S.P.A. 2016

### SMART HOME LEADS

Which IoT Categories Are Seeing the Most Innovation? by Venture Scanner



Category	Innovation Count
Smart Home	121
Wearables	98
Connected Cars	94
Industrial Internet	88
Connected Cities	82
Smart Agriculture	42
Smart Retail	41
Smart Energy	39
Smart Manufacturing	33
Smart Transportation	27
Smart Healthcare	24
Smart Education	23
Smart Entertainment	22
Smart Security	21
Smart Infrastructure	19
Smart Logistics	18
Smart Public Safety	17
Smart Environmental	16
Smart Agriculture (continued)	15
Smart Retail (continued)	14

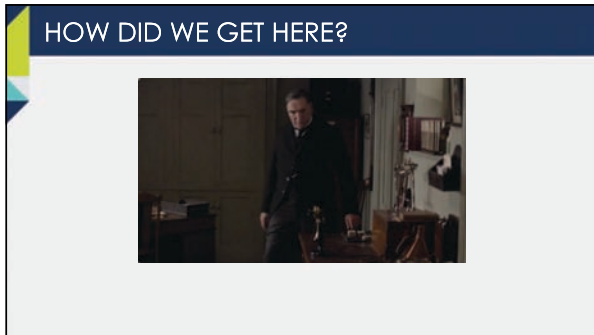
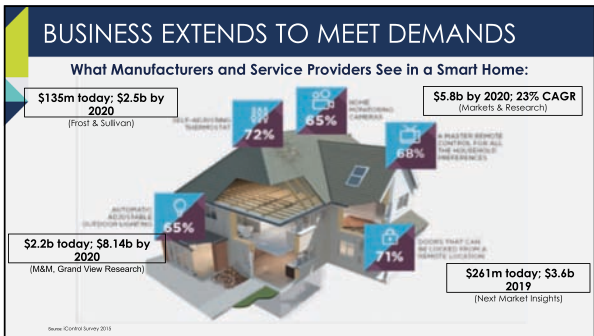
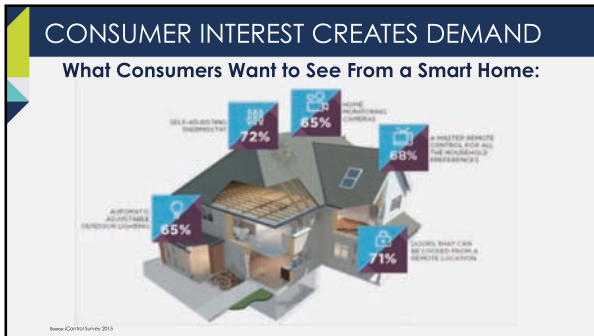
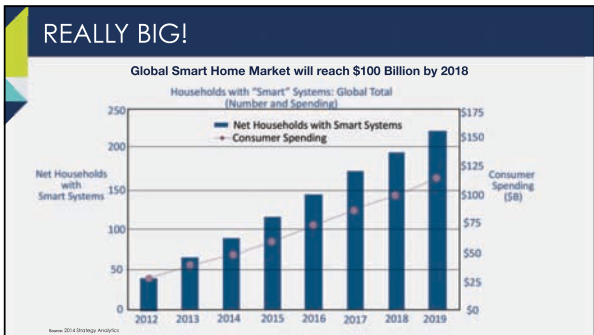
### HOW BIG IS THE SMART HOME MARKET?

- A Smart Home by Any Other Name
  - Connected Home
  - Automated Home
  - IoT Home
  - %\$#@ Home

**Global Market = USD \$46.97b in 2016; \$121.73b by 2022**

- 14.07% CAGR through 2022 worldwide
- Now moving from early adopters into mainstream use

(Source: Markets & Markets 2016)



### HOW WILL THE IOT CREATE OPPORTUNITIES?

- Extension of existing products and services
- Disruption of legacy business practices and limitations
- Creation of new B2B and B2C products and services
- The winners:** Integrators need to creatively imagine – and implement – fully developed systems; and whole "marketplaces".


### WHAT IS IT THAT YOU DO?

- ▶ Music
- ▶ Video
- ▶ Lighting
- ▶ Communication

**PROTOCOLS, STANDARDS & TERMS – OH MY!**  
ARE YOU CONFUSED YET?

### M2M


- ▶ **M2M: Machine to machine** refers to direct communication between devices using any communications channel, including wired and wireless.
  - ▶ Simple
  - ▶ Reliable



### CLOUD


**Cloud** is Internet-based computing/control that provides shared processing resources and data to computers and other devices on demand.

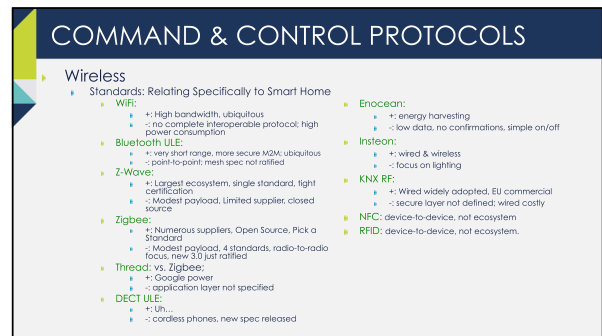
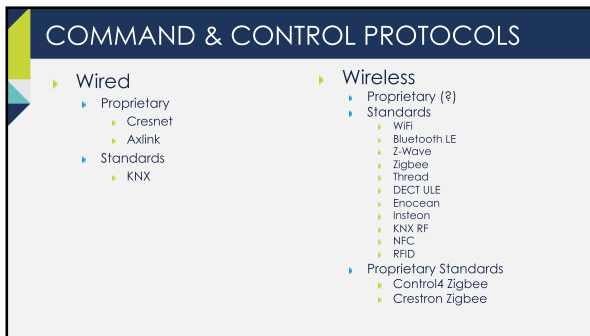
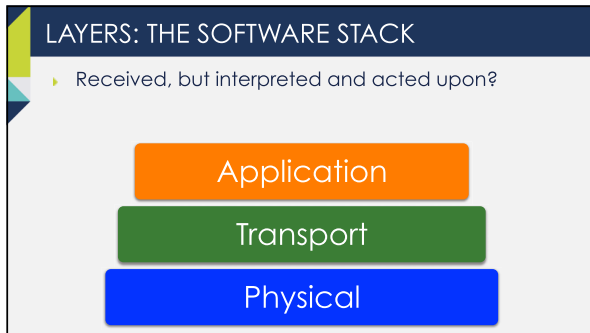
Wikipedia




### M2M VS. CLOUD


- ▶ **M2M:**
  - ▶ Secure
  - ▶ Immediate
  - ▶ Reliable
  - ▶ Remote Access
- ▶ **Cloud:**
  - ▶ Ubiquitous Remote Access; device independent
  - ▶ Standards Interoperability
  - ▶ Updates, Rapid Deployment
  - ▶ Big Data, Analytics
  - ▶ Messaging







## Z-WAVE TECHNOLOGY




- Designed **specifically for the smart home**
- Z-Wave is an **interoperable, backwards compatible** & wireless RF-based communications protocol designed for control, monitoring + status reading in residential and light commercial environments.
- Developed as a low power, mesh network technology over a decade ago, Z-Wave **operates in the sub-1GHz band** (no interference with Wi-Fi, Bluetooth, etc)
- Over **1500 Z-Wave certified products** in the global marketplace; **50 million Z-Wave devices** shipped worldwide
- Wireless mesh networking means **every node is a repeater**; ultra low power requirements are ideal for battery powered IoT devices (locks, t-stats, sensors)

Z-Wave is a Global Standard  
ITU-T G.9959  
ITU  
Ratified Feb. 2012

## Z-WAVE: LEADER IN SMART HOME IOT

### Over 50 Million Z-Wave Devices Deployed


- ~20 Million Z-Wave devices in 2015
- ~\$1 Billion product sales 2015
- ~\$1 Billion services market 2015



- Z-Wave in 12 Million homes**
  - Z-Wave Gateways in 10% of U.S. households
  - 90% U.S. Market Share in Home Security Monitoring Providers
  - Most Teleco offerings are based on Z-Wave
- The Largest interoperable ecosystem**
  - Over 1500 Home Devices
  - 375 Z-Wave Device Manufacturers

## Z-WAVE IS A WIRELESS MESH NETWORK


### What does that mean?



- Provides the best scalability
- Every node can be a repeater
- Extremely robust
- Large range for even the largest homes, working around obstacles and wireless dead spots.

## Z-WAVE IS INTEROPERABLE


### What does that mean?



- Interoperability defined at Applications layer – products from different manufactures work together.
- Guaranteed backwards-compatible
- Not just the radios talking - product interoperating.
- Interoperability ensures all players –big and small- can enter the market.
- Interoperability means everyone has more choices— from service providers to consumers.

## Z-WAVE IS SECURE

### What does that mean?



- Z-Wave = securely encrypted
- Z-Wave uses industry-standard AES128 encryption
- The Z-Wave certification process ensures that Z-Wave smart devices are secure.

Additional features:

- Signal Jam Detection
- Tunneling of Z-Wave over IP (ZiP) traffic to eliminate cloud vulnerability

## CERTIFICATION

### Certification differentiates Z-Wave from other competitors

#### What does that mean?




- Ensures all Z-Wave products work together, creating the largest interoperable ecosystem
- More products. More brands. More choice.
- Keeps the brand strong in the market.
- Ensures all Z-Wave products work together.
- There are over 1500 certified products on the market today.

## POWER CONSUMPTION

### Z-Wave = Energy Efficient

**What does that mean?**

- Z-Wave's power efficiency is the most advanced among all of today's (and tomorrow's) wireless protocols.
- Ideal for battery operated smart home products – i.e., locks, thermostats, sensors.
- Battery-operated devices will have much longer battery life with Z-Wave than with power hungry technologies like Wi-Fi.




## Power of the Ecosystem

### Z-Wave is the #1 Choice for Leading Service Providers

International reach is wide & growing

- ADT Digital Life: 300,000 subscribers in 82 markets in US
- vivint: 1 million + subscribers
- ADT Pulse: 1.4 million subscribers
- ALARM.COM: 2.4 million residential & business subscribers



## MAJOR ADOPTERS

Lighting	Thermostat	Locks	Service Providers	Security Companies	Retailers
COOPER Wiring Devices	Honeywell	Kwikset	BellAliant	ADT	amazon.com
LEVITON	RCS	SCHLAGE	CenturyLink	2GIG TECHNOLOGIES	LOWE'S
GE	Radio Thermostat	Yale	Verizon	vivint.	
ON-Q	TRANE		ADT DigitalLife	ALARM.COM	
Legend			orange		
			SK telecom	Honeywell	


## HOME CONTROL TECHNOLOGIES

	Z-Wave	ZIGBEE	Thread	BT Smart	WiFi	ULE	ENOCAN
Network topology	Mesh	Mesh	Mesh	Star/Point-to-Point	Star	Star	Mesh
Application level Interoperability	Yes	Fragmented	No	No	No	Yes	Limited
Application level Certification	Yes	Yes	No	No	No	Yes	Self certification
Installer toolset	Built-in	3 <sup>rd</sup> party	?	3 <sup>rd</sup> party	3 <sup>rd</sup> party	3 <sup>rd</sup> party	3 <sup>rd</sup> party
Two way Low Latency on battery	Yes	Yes – non interoperable	No	Yes	No	No	No
Power usage	Low	Low	Low	Low	High	Low	Low
Range – Direct	Medium	Medium	Medium	Long	Long	Long	Medium
Range – Routed	Long	Long	Long	No routing	No routing	No routing	Medium

## 2.4GHZ

### Wi-Fi

- No complete interoperable command and control ecosystem based on this technology; every vendor has its own application.
- There are fewer than 50 Wi-Fi products designed for control and automation that provide cross-brand, cross-manufacturer interoperability.
- High power consumption of Wi-Fi makes it impractical for battery operated devices.



## OTHER 2.4GHZ

### ZigBee 3.0

- ZigBee 3.0 is optional at the applications level and is not required for ZigBee certification.
- Only one of its standards, ZigBee Home Automation 1.2 offers any cross-brand interoperability, with only 244 products to date.
- Operates in the crowded 2.4GHz band which means susceptible to latency and dropped packets





### OTHER 2.4GHZ

#### Bluetooth Smart

- Bluetooth Smart is point to point applications, limited to small networks.
- No interoperable command and control products to date.
- The Bluetooth Mesh protocol not yet available
  - Broadcast vs. multicast



### OTHER 2.4GHZ

#### Thread


- The Thread protocol is still emerging.
- Standard was published in July, 2015
- Still no certified products announced
- Thread will not address product-level interoperability leaving that level of standardization up to the manufacturers.



### COMPLEMENTING THE CLOUD


#### Z-Wave Interoperability Complements The Cloud

- Devices can speak to other Z-Wave devices without an internet connection
  - Keeps local control local, with no latency issues for simple commands
  - With Z-Wave, no data leaves your home unless you want it to.



### What About IP?

#### Z-Wave for IP Addresses Them All



### Z-WAVE TODAY & TOMORROW

**Z-Wave is:**

- Flexible
- Innovative
- Future-proof
- Designed specifically for the smart home
- Relevant today and tomorrow




THE REALITY OF IT ALL

### BARRIERS TO MAINSTREAM ADOPTION

**TC TechCrunch** "The latest efforts to harmonize the [Smart Home] experience do not succeed in simplifying implementation, the ambition may as well be put on ice for another 10 years."

**The New York Times** "Whatever brand you choose, know that nothing will work exactly as it should. Expect random errors and mysterious failures."

**THE VERGE** "Home automation is a mess — same as it's been for the last decade."

**FORTUNE** "... a truly smart and intuitive home is still the stuff of science fiction."

### BARRIERS TO MAINSTREAM ADOPTION

- ▶ Lack of clear and compelling use cases
- ▶ Difficulty educating consumers
- ▶ Burden on consumers to understand interoperability
- ▶ Difficulty of installation
- ▶ Poor product reliability (think Wink, Revolv)
- ▶ Lack of post installation support
- ▶ Security / privacy concerns



**THE OPPORTUNITY**  
NOW WHAT?

### THE INTEGRATION OPPORTUNITY

- ▶ Expert Customer Care
- ▶ Whole House Music
- ▶ Home Theater
- ▶ Security
- ▶ Lighting
- ▶ Now... what other magic?

### TROJAN HORSE – APPLE + SIRI



### TROJAN HORSE – AMAZON + ALEXA



### TROJAN HORSE: VOICE CONTROL

- Beyond Siri & Alexa:
  - Comcast X1 remote, Cox
  - Samsung Smart TV
  - Honeywell WiFi Thermostat
  - LG Vacuum Cleaner
  - Sony Smart Watch 3
  - Vocca Light
  - Sonos...

**ABIresearch**  
Research Consulting Analysts Engage

**Voice Control Will Become the Bedrock for Smart Home Applications**  
ABI Research Forecasts More Than 120 Million Voice-Enabled Devices Will Ship in 2021  
New York, New York - 15 Aug 2016

### OPPORTUNITY: VOICE CONTROL

"Controlling your home with voice commands is no longer a someday technology – *it's here*. The landscape is evolving quickly and represents another fantastic opportunity for CEDIA members to position themselves as the trusted technology experts in the home"

Charlie Kindel, Director of Alexa Smart Home at Amazon

### OPPORTUNITY OR CHALLENGE? VOICE CONTROL

Table full of remotes vs. Home Screen vs. HOME

### OTHER POPULAR TECH: USE CASE

- How do you leverage the popularity of tech devices?
  - Voice Control: Siri, Alexa, Cortana, Josh.ai...
  - Video Doorbell

### SECURITY

- Securing the Smart Home: *opportunity or vulnerability?*
  - Network appliances, Routers, WAPs, etc
  - Devices

**Hackers Make the First-Ever Ransomware for Smart Thermostats**  
August 7, 2016 // 10:00 AM EST

### THE INTEGRATION OPPORTUNITY

"Early on, we found that if you called what we do 'home automation', people liked it but they would not spend money on it. But if you called it 'peace of mind' and anchored it on home security, then people knew they need to have that and would spend \$35 to \$45 a month on it"

- Letha McLaren, CMO iControl

### THE INTEGRATION OPPORTUNITY

- ▶ Security leads smart home adoption




### THE INTEGRATION OPPORTUNITY

- ▶ Moving from a proprietary system to a Monitored home: **Security is driving adoption**
  - ▶ Security
  - ▶ Fire – smoke
  - ▶ Temperature
  - ▶ Water
  - ▶ Gas
  - ▶ Electric...

### THE INTEGRATION OPPORTUNITY

From Monitored to Managed Home

- ▶ Adding services to monitoring
- ▶ Making repairs before failure
- ▶ What services?
  - ▶ Energy
  - ▶ Access
  - ▶ Network



### THE INTEGRATION OPPORTUNITY



### OWN YOUR CUSTOMERS

Where does your business come from?

- ▶ Referrals?
  - ▶ Waiting for the phone to ring?
- ▶ Advertising?
  - ▶ Got Budget?
- ▶ Existing Customers – REACH OUT

### BE "MY GUY"

**Your go-to technology resource/provider, help desk**

Tell them what's Hot, New: reinforce New Tech

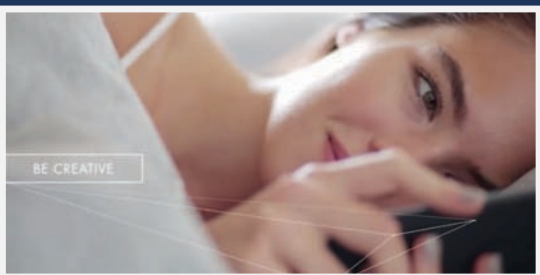
- ▶ New tech is always being introduced
- ▶ Social Media
- ▶ Website
- ▶ Events.

**MESSAGING: IOT IS NOT A THING**

What are we selling?



**MESSAGING – IOT IS NOT A THING**




**MESSAGING: IOT IS NOT A THING**

▶ Use Case



**MESSAGING: IOT IS NOT A THING**

- ▶ Uber
  - ▶ Connected Cars vs. Transportation as a Service (TaaS)
- ▶ Solar City
  - ▶ (EaaS)
- ▶ Britta
  - ▶ WiFi - Water filters (WFaaS)
- ▶ Sonos
  - ▶ (Maas)



**MESSAGING: IOT IS NOT A THING**



**THE IOT OPPORTUNITY: IT'S NOT A THING!**

**CLEAR AND COMPELLING USE CASES**

- ▶ Movie Night
- ▶ Never Come Home To A Dark House
- ▶ Warm welcome
- ▶ Bedtime
- ▶ Safety First
- ▶ Monitor Your Second Home.



### THE IOT OPPORTUNITY


**WHAT HAVE WE LEARNED:**

- ▶ IoT is ENORMOUS – changes everything
  - ▶ Stake your ground
- ▶ IoT is not a thing
- ▶ Expand your thinking / business
  - ▶ More technologies
  - ▶ Creative applications
- ▶ Messaging: Use cases
- ▶ Own your customer
- ▶ Z-Wave Rocks!

An illustration of a person's head and shoulders from the chest up. The person has brown hair and is holding a pen to their chin. Above their head is a glowing yellow lightbulb with rays emanating from it, symbolizing an idea or innovation.

### JOIN US!

- ▶ [www.ZwaveAlliance.org](http://www.ZwaveAlliance.org)
- ▶ Integrator50 - \$50 discount

The Z-Wave Alliance logo, featuring a stylized blue 'Z' with three curved lines above it, followed by the text 'Z WAVE' in blue and 'ALLIANCE' in green below it.

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