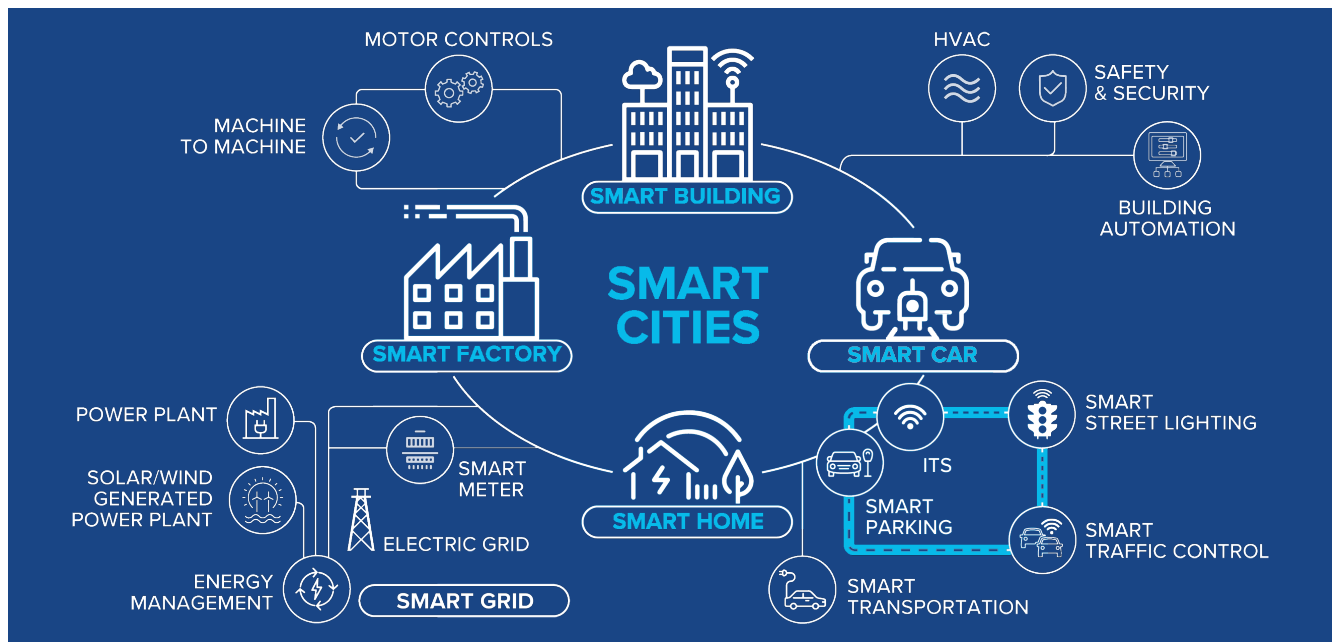


# Build Faster Networks

**Introducing the New ISO/IEC 14908-8 Standard for High-Speed  
Wireline Communications and Control Networks**



# Is Your Network Ready?



**50 Billion by 2025**

Connected Devices\*



**\$4+ Trillion**

Revenue Opportunity



**25+ Million**

Applications



**5+ Billion**

Connected People



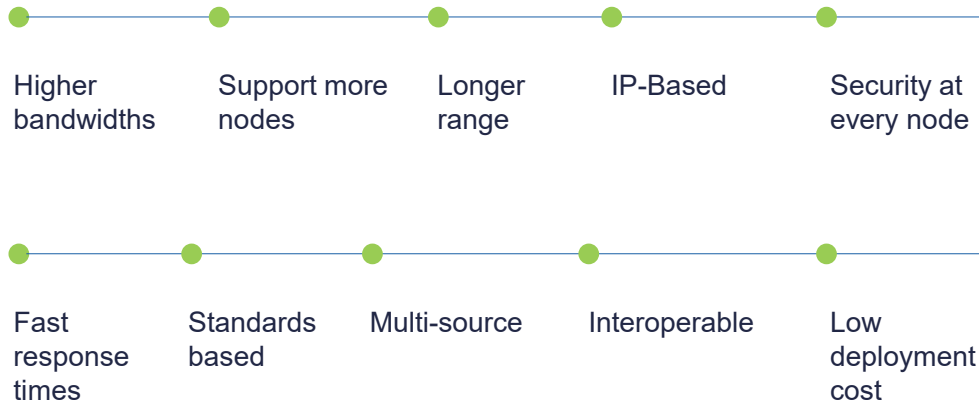
**50+ Trillion**

GBs of Data

\*Statista 2021



# Smart City Communications Requirements



# Existing Technology Requires Tough Tradeoffs



## SERIAL

Long range, but slow and size-limited



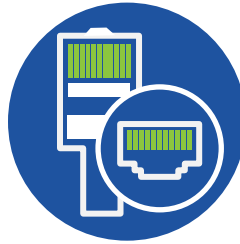
## WIRELESS

Easy to deploy, but needs line of sight



## NB POWER LINE

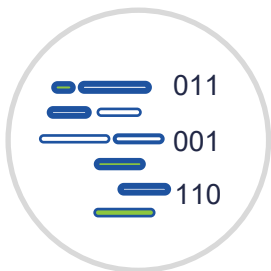
Lowest deployment cost, but slow and size-limited



## ETHERNET

Very fast, but cost can be prohibitive

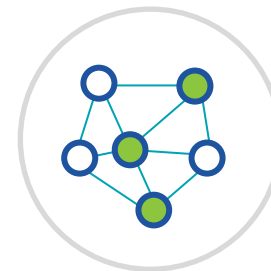
# Advantages of HD-PLC



Megabit Data Rates



Ranges Up to Several km



Up to 1024 Nodes



Crypto-Strong Encryption

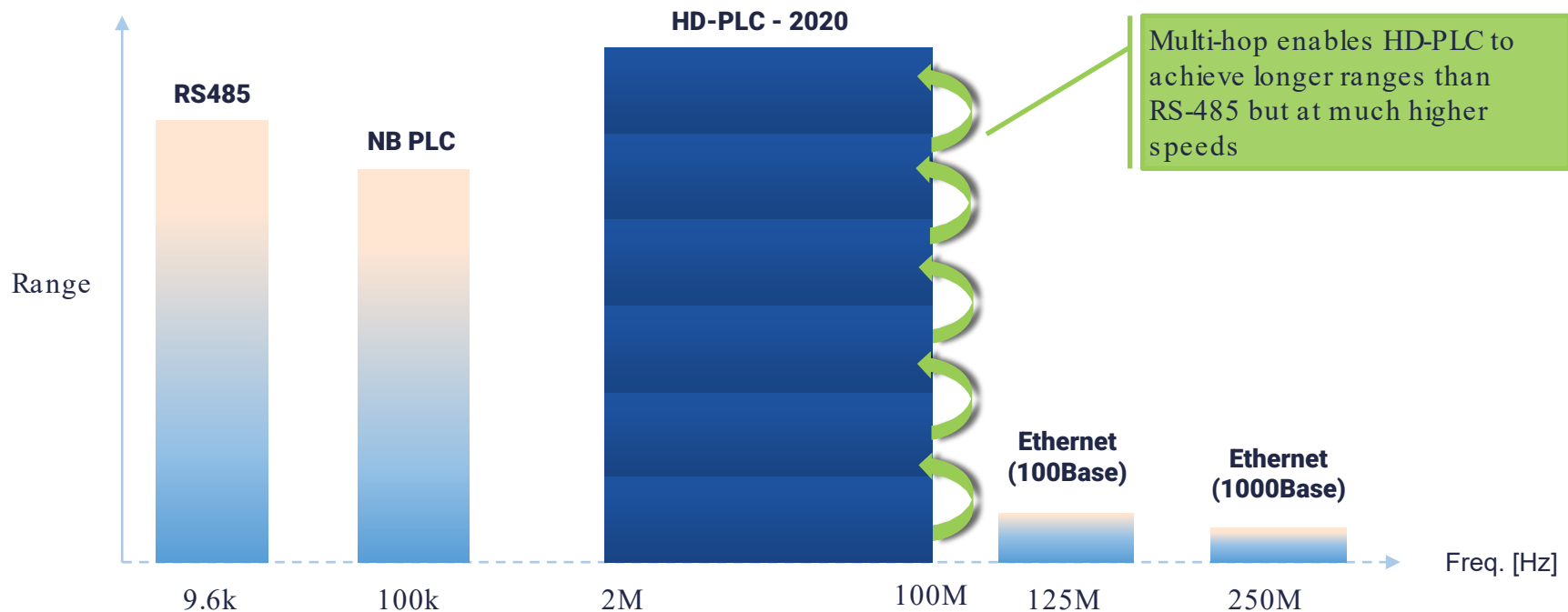


IP-Based Mesh Networking



Over ANY Wire

# HD-PLC Leaps Past Other Technologies



This chart shows how HD-PLC stacks up against other wireline technologies. With multi-hop technology, HD-PLC is able to deliver broadband speeds over the long distances one normally expects to find in only low-speed approaches like RS-485.

# What Is HD-PLC?

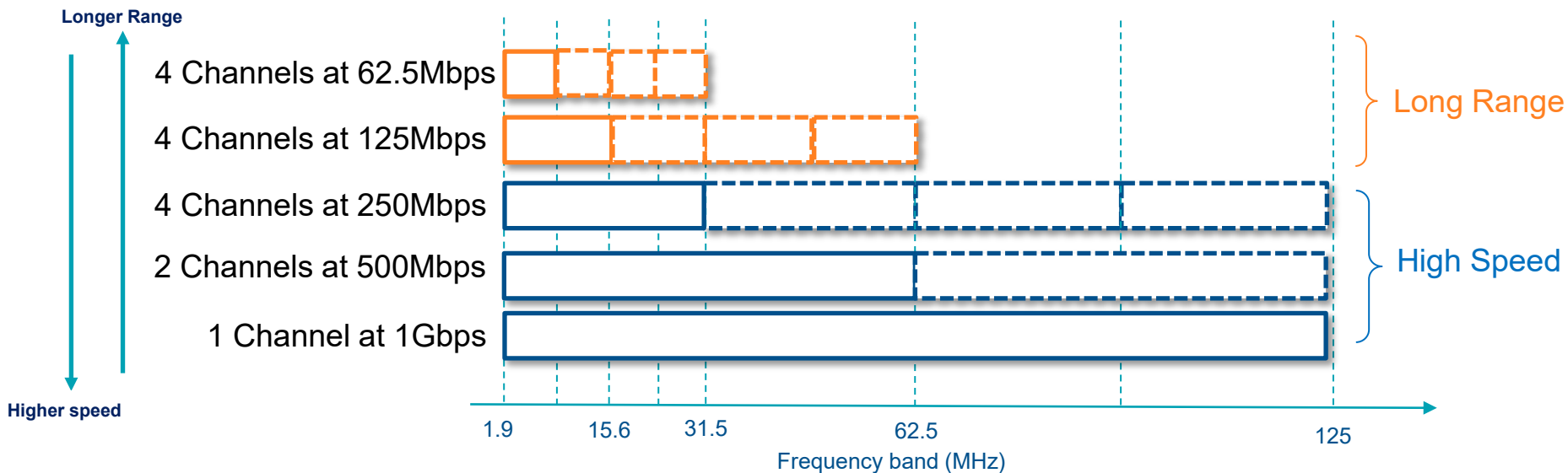
Advanced Wireline Communication Technology Delivering Long-Range,  
Secure, Bi-directional, IP-based, High-Speed Communication over ANY WIRE.

Standard	IEEE1901-2020, & ISO/IEC14908-8
Frequency Band	2 – 125MHz
Modulation	Flexible Channel Wavelet OFDM
Transmission PHY Rate	1Gbps
Access Method	CSMA/CA, Dynamic Virtual Token Passing
Security	AES 128-bit Encryption
Error Correction	Reed-Solomon/LDPC-CC
Coexistence	ISP (Inter-System Protocol)
Routing	CMSR (ITU-T G.9905)
IP Support	IPv6 (IETF)



# IEEE1901-2020: Flexible Channel Wavelet OFDM

## Single Standard – World of Applications



**15 User Selectable Frequency Channels**



# CMSR: A Giant Leap Forward for LON Networks

ITU-T G.9905 Centralized Matric-Based Source Routing Extends Range, Robustness & Scalability



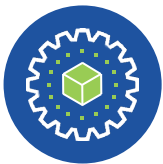
## MULTI-HOP CAPABILITY

Extends range up to 10x; supports distances up to several km; scalable up to 1024 nodes



## MESH NETWORKING

Selects best route based on link quality; improves coverage and system robustness



## INDUSTRIAL-GRADE PERFORMANCE

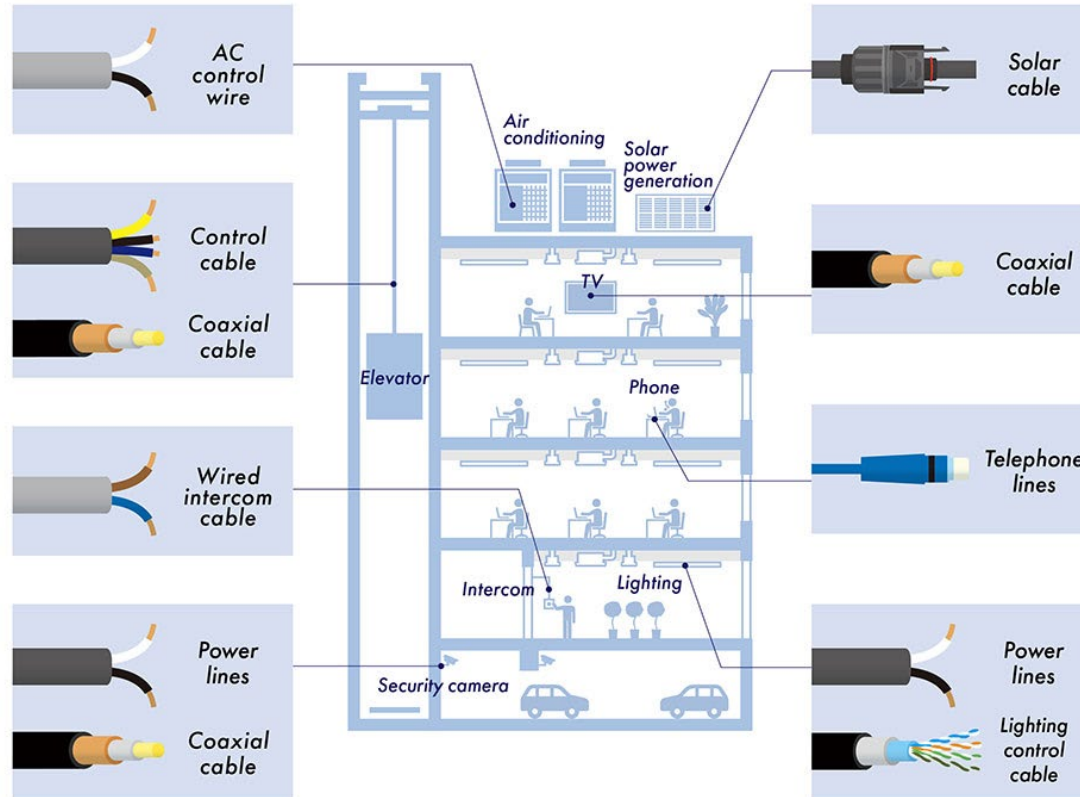
Ideal for time-varying transmissions; low control overhead; routing load independent of number of nodes

# HD-PLC: Purpose-Built for Industrial IoT

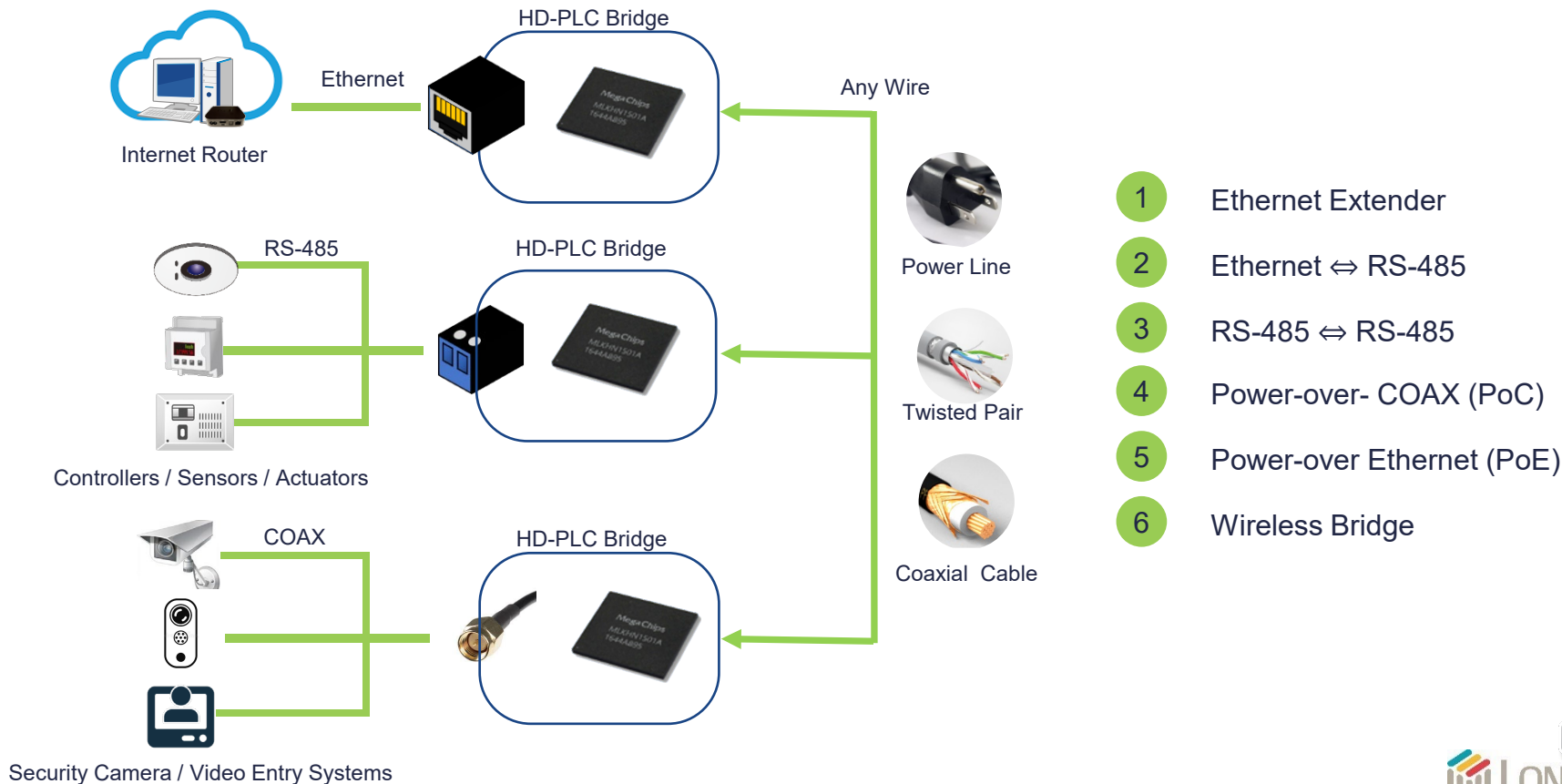
	RS485	IEEE 1901-2020 (HD-PLC)	IEEE 802.3 (Ethernet)
PHY Speed (bps)	10M	1G	10M/100M/1G
Max Range (m)	10	2,000+	100
No. of Nodes	64	1024	100
IP-Based	X	✓	✓
High Security	X	✓	✓
Plug-and-Play	X	✓	X
Free Topology	X	✓	X
Ether and Serial Bridging	X	✓	X
Repeater Functionality	X	✓	X
Wiring	Twisted pair	Any wire	CAT5

Robustness of  
RS-485 with the  
Performance of  
Ethernet

# Integrating Islands of Automation



# Simple Bridging Enables System Convergence



# Key Takeaways

- ✓ HD-PLC is the most advanced high-speed wireline communication standard for Smart Cities
- ✓ Based on IEEE1901-2020 PHY/MAC, and ITU G.9905 routing standards
- ✓ Adopted by ISO/IEC 14908-8 Standard for High-Speed Wireline Communications and Control Networks
- ✓ Provides higher data rates, more security, and wider coverage than RS-485
- ✓ Provides longer range, IETF IPv6, higher # of nodes, and lower cost than Ethernet
- ✓ Works on any wires (power lines, twisted-pair, CAT5, RG58, COAX...)
- ✓ Protocol independent: can support LON, BACnet, KNX, MODBUS...
- ✓ Free topology provides flexibility and freedom in your network designs
- ✓ Interoperability and certification provided by HD-PLC Alliance and Lonmark International
- ✓ Multi-source solution (chip/module/box) to ensure availability and support





# The New High-Speed Network

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