Secure Wired Communication for AI-Driven Smart Infrastructure

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LONMark International and Nessum Alliance

AHR Expo 2026

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Scope of disclosure:
Open to public

AGENDA

- Smart Building Market Overview
  - Market Trend/Requirements

  Speaker: Nobu Kodama, Marketing WG Chair - Nessum Alliance

- Introduction to IEEE1901-2020 Nessum
  - Nessum-Wire Specifications
  - Technology Comparison

  Speaker: Nobu Kodama, Technical Marketing - Nessum Alliance

- Introduction to Nessum and Building Automation Protocols
  - Lonworks/BACnet over Nessum

  Speaker: Ken Tamukai, Technical Advisor - Nessum Alliance

- Introduction to Nessum Alliance
  - Mission and Initiatives
  - Certification / Interoperability

  Speaker: Kota Matsuo, Sr. Vice-President - Nessum Alliance

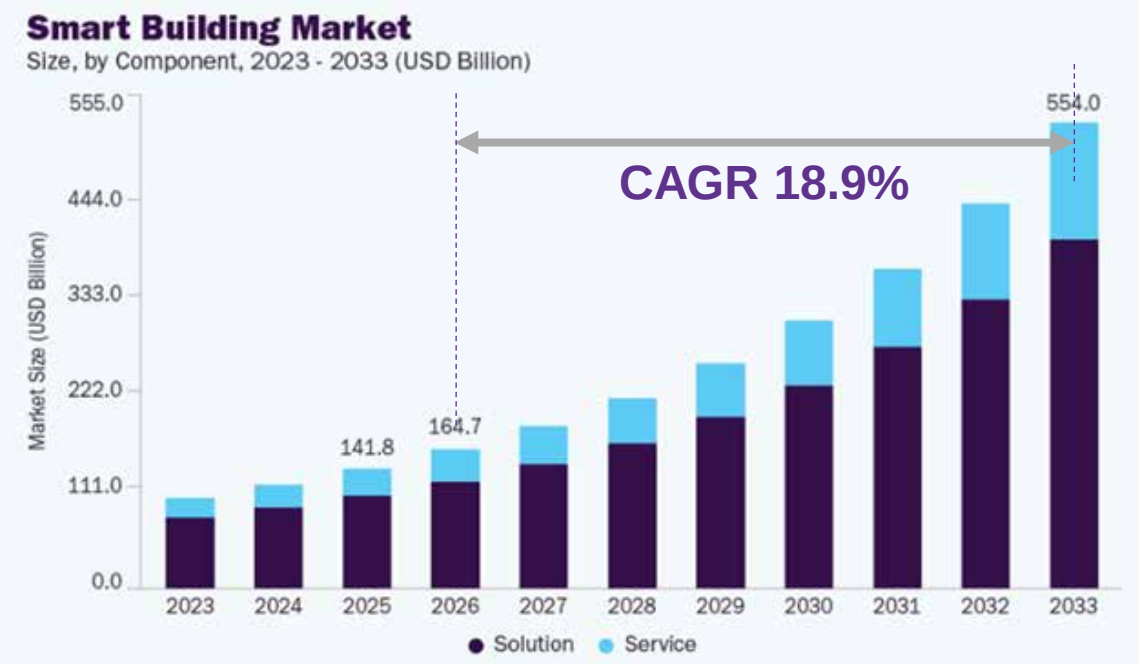
Speaker Bio

- Established the fundamental technologies of **Nessum**
- Holds key patents related to Nessum and served as the Development Leader for the Nessum-IP Core
- Currently serves as an Active Member of the Nessum Alliance, driving marketing.
- Dedicated to expanding the global awareness and adoption of Nessum to empower industries with advanced connectivity.

Nobu Kodama

Chair of Marketing Working Group, Nessum Alliance

Global Smart Building Market Forecast



SOURCE: https://www.grandviewresearch.com/industry-analysis/global-smart-buildings-market

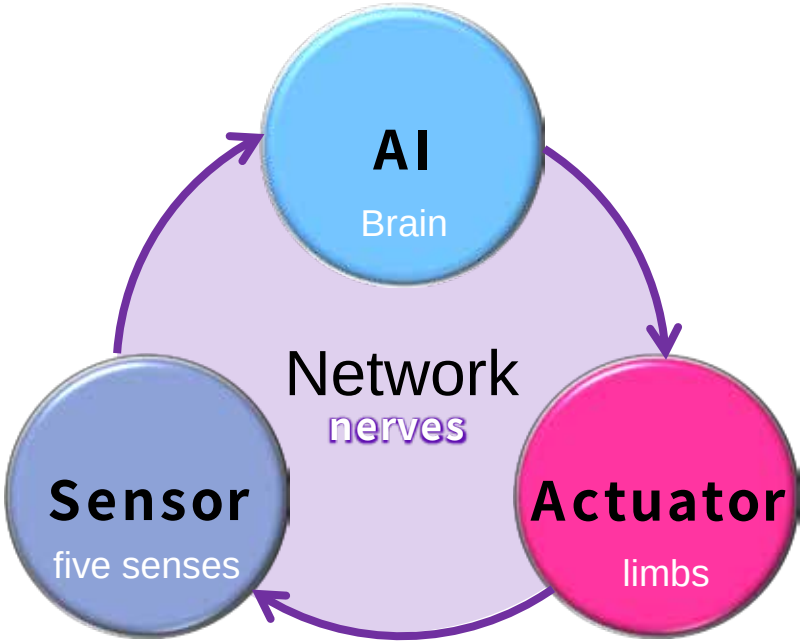
Key Drivers of High Growth

1. **Decarbonization (GX):** Strengthening energy-saving regulations to achieve carbon neutrality.
2. **Redefining workplace value:** Enhancing worker productivity and well-being.
3. **Labor Shortage:** The urgent need for unmanned and automated building management and maintenance.

Against the backdrop of decarbonization (GX) and labor shortages, buildings are dramatically evolving into “autonomous infrastructure.”

Smart Building Components

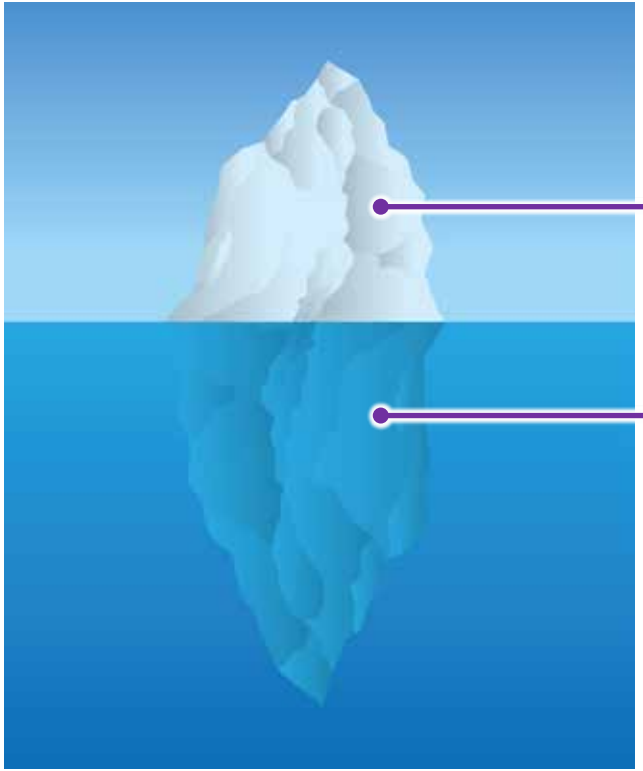
The success or failure of AI, the “brain,” hinges entirely on the quality of the “network,” its nervous system.



Network reconstruction is necessary, but...

Infrastructure reconstruction costs hindering Smart Building adoption

The success or failure of AI implementation hinges on how effectively the underlying “infrastructure reconstruction costs” can be managed.



Visible cost: approx. 30%

- AI Applications / Software:
  Flashy dashboards, analytics tools, and user apps.

Hidden massive costs: approx. 70%

- Physical infrastructure:
  LAN cabling, power wiring, hub expansion.
- Existing equipment retrofits:
  Replacement of old controllers, analog-to-digital signal conversion.
- Security design:
  Segmentation to prevent external attacks, advanced configuration.

Smart Building Network Requirements

> 100Mbps — Higher bandwidths

1024 Nodes — Support more nodes

> 3000m — Longer range

IPv6 — IP-Based

AES-128 — Security at every node

< 2ms — Fast response times

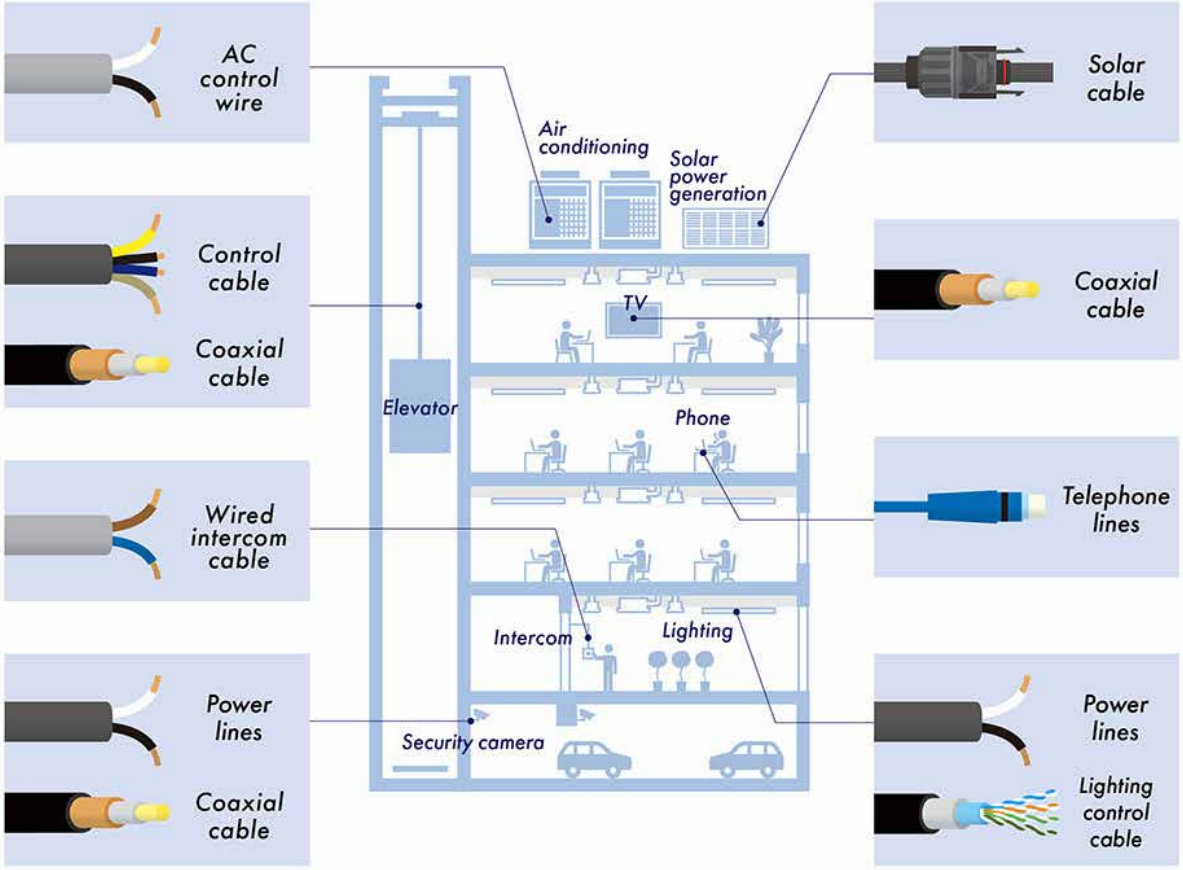
IEEE1901/ ITU G.9905 — Standards based

Chips/ Modules — Multi-source

nessum — Interoperable/ Certification

No New Wires — Low deployment cost

Simple Bridging Enables System Convergence



Takeaways

- Nessum-Wire is the most advanced wireline communication standard today
- 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 Nessum Alliance
- Multi-source solution (chip/module/box) to ensure availability and support

Aiming for Standard Adoption in Smart Building Communication Infrastructure

Thank you

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