Making Buildings Smarter

Delivering value for building operations

WHY SMARTER MATTERS

Integrating smart building features—such as increasing connectivity, sensors, and security—can bring a range of benefits from operational insight to transforming occupant experiences. The savings for operations can be significant, including lower energy usage and maintenance costs. In addition to better return on investment (ROI), smart buildings are streamlining operational processes. To achieve these benefits, smart buildings take advantage of Internet of Things (IoT) connectivity to gather, analyze, and share data.

Smart buildings do not have to be new and upgrades need not be expensive. Solutions are currently available to retrofit existing buildings (known as "brownfield" deployments), and building managers are seeing payback on smart technology investments in as little as six months.[1]
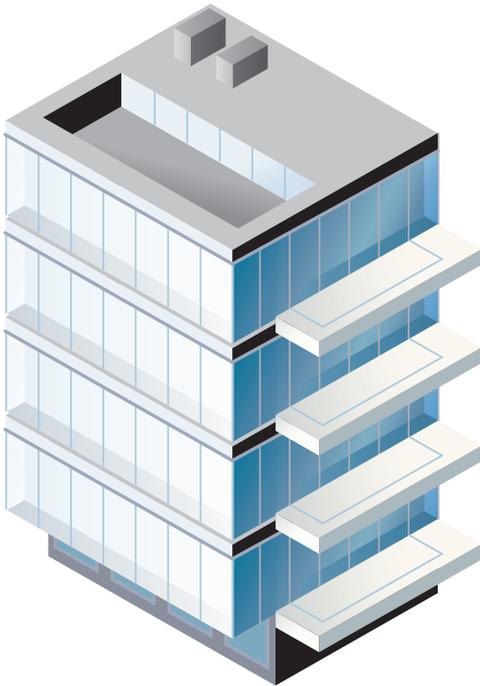
ROI Benefits
• Reduce OPEX costs
• Improve operations
• Increase occupant satisfaction
• Align business and operational strategy
• Increase asset value for intelligent buildings

SMART BUILDING COMPONENTS

The advantage for operations and occupant satisfaction can be significant. When connectivity is enabled for the core systems supporting building operations, these systems begin to process and act on data-driven intelligence.

Key components of a smart building include energy, HVAC, maintenance, security, safety, and communications. As seen in the table, when a building is smart and connected there can be significant benefits and a positive impact on ROI.

Key Building Systems

What to Connect	Why it Matters
OPERATIONAL EFFICIENCY	
HVAC Power Efficiency Generators Lighting Building Energy Management Systems (BEMs) Parts/Repairs Elevators Utilities Fire/Detectors Equipment Monitoring	• Code compliance • Rising energy costs • Rising costs for maintenance • Sustainability • Occupant comfort
OCCUPANT EXPERIENCE	
Internet and Wireless Connectivity Location-Based Services Smart Conference Rooms Asset Management for Equipment, Office/Storage Space, Parking, and Meeting Rooms	• Occupant safety and satisfaction • Competitive advantage • Increase asset value • Modernize buildings
SECURITY AND SAFETY	
Property Networks Systems Data Privacy Monitoring of IT Networks and Facility Security	• Digital threats on the rise • Business-critical data must be protected

SMART BUILDING STRATEGY: ACHIEVING MORE VALUE FROM CONNECTIVITY

Existing equipment previously presented a hurdle when integrating intelligence into older buildings. Systems, such as heating or lighting, were typically designed as standalone—they are not built to share data and use proprietary protocols. Today, there are technologies to address these issues, enabling integration of legacy systems and improving visibility into actionable intelligence. These solutions can also help building managers to measure more aspects of building operations, from space utilization to cross-system security.

When you implement a smart building strategy, you are putting a foundation in place to increase ROI. You are also "future-proofing" your building for an era in which technology is fast becoming ubiquitous.

Planning to address key parameters of scalability, manageability, and security can help ensure smart building investments support both current and future requirements.

Scalability

When smart building systems are based on compute technologies that scale, they have the performance to support more sensors, increase compute power, and meet evolving or expanding requirements. For instance, using standardized Intel® architecture simplifies scaling up or down based on application or facility requirements. Scalable Intel® IoT solutions are based on Intel® Quark™, Intel® Atom™, and Intel® Core™ processors.

Manageability

Instead of physically interacting with each device to perform management tasks, such as retrieving data, monitoring system health, or reactively responding to a failure, devices can be connected to a centralized console and managed remotely. New IoT devices called Gateways, can further simplify manageability by automating key processes, such as filtering and routing data between sensors and equipment and the cloud.

Security

Connectivity can bring new risks as data and systems are exposed to hackers and threats. Analysts predict that the ability to attack connected systems and networks will outpace the ability to defend them.[2] Intel® IoT solutions, such as the Intel® IoT Gateway, help provide end-to-end security in both the software and hardware layers.
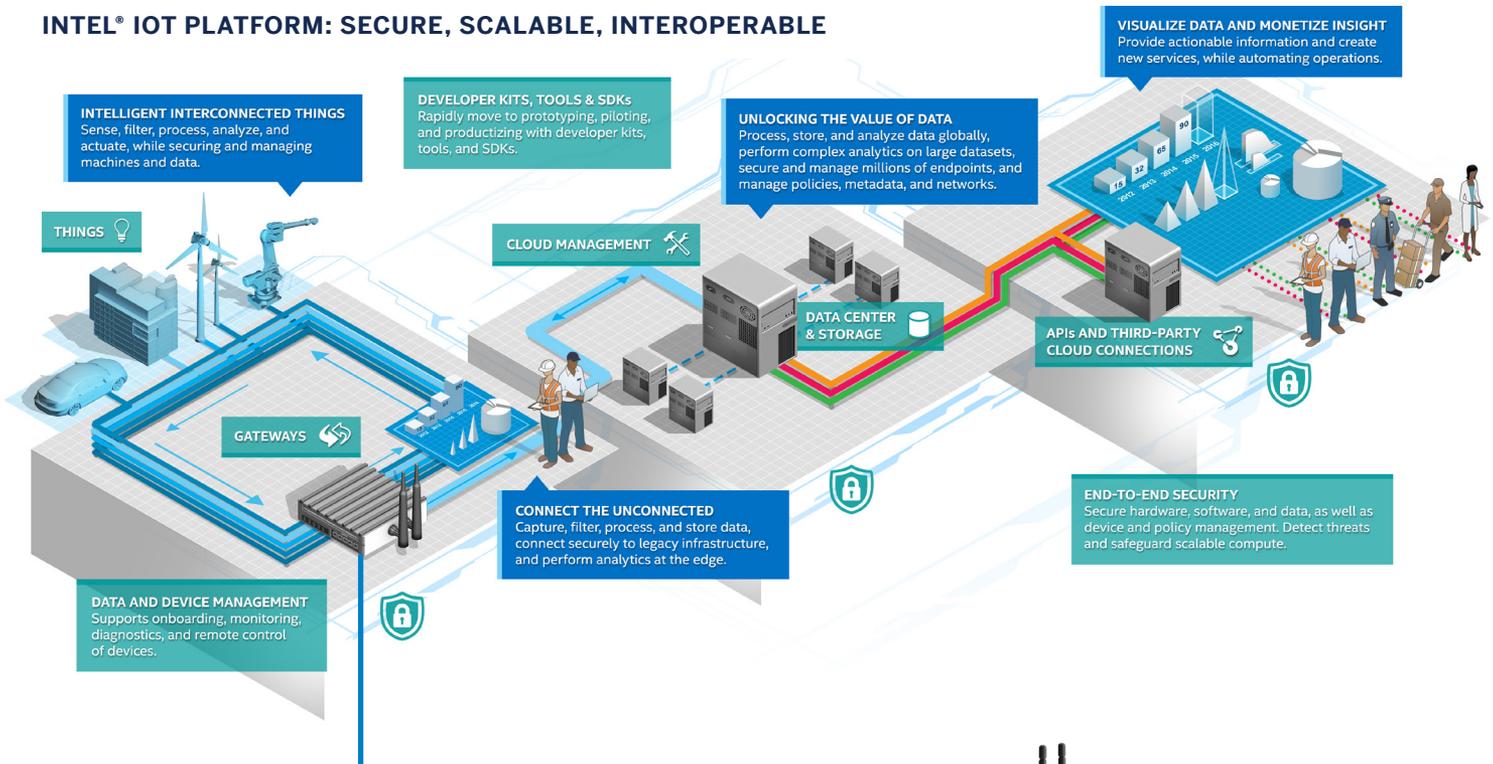
INTEL SOLUTIONS FOR SMART BUILDINGS

Intel® technology is the backbone of proven IoT solutions in smart buildings. It is helping billions of devices talk to each other and share valuable information, protecting sensitive data, and providing critical analytics and Application Program Interface (API) offerings.

The Intel® IoT Platform is an end-to-end reference model and family of products from Intel and the industry that provides a foundation for seamlessly and securely connecting devices, delivering trusted data to the cloud, and delivering value through analytics.

For example, the Intel® IoT Gateway offers a viable, affordable entry point into smart building connectivity. It helps save time and data transfer and storage costs by processing relevant data and allowing it to be acted upon before it's sent to cloud.

INTEL® IOT PLATFORM: SECURE, SCALABLE, INTEROPERABLE

VISUALIZE DATA AND MONETIZE INSIGHT
Provide actionable information and create new services, while automating operations.

INTELLIGENT INTERCONNECTED THINGS
Sense, filter, process, analyze, and actuate, while securing and managing machines and data.

DEVELOPER KITS, TOOLS & SDKs
Rapidly move to prototyping, piloting, and productizing with developer kits, tools, and SDKs.

UNLOCKING THE VALUE OF DATA
Process, store, and analyze data globally, perform complex analytics on large datasets, secure and manage millions of endpoints, and manage policies, metadata, and networks.

THINGS

CLOUD MANAGEMENT

DATA CENTER & STORAGE

APIs AND THIRD-PARTY CLOUD CONNECTIONS

GATEWAYS

CONNECT THE UNCONNECTED
Capture, filter, process, and store data, connect securely to legacy infrastructure, and perform analytics at the edge.

END-TO-END SECURITY
Secure hardware, software, and data, as well as device and policy management. Detect threats and safeguard scalable compute.

DATA AND DEVICE MANAGEMENT
Supports onboarding, monitoring, diagnostics, and remote control of devices.

INTEL® IOT GATEWAY

Along with providing essential connectivity, the Intel IoT Gateway acts as a data router and filter between data-generating sources—such as building sensors and intelligent equipment—and the cloud. It enhances data security, accelerates actionable insight, and more importantly, saves money. In addition, with the Intel IoT Gateway you can securely transfer only data that has operational relevance to the cloud, lowering costs for data transmission and cloud storage.

"Intel® technology-based intelligent gateway helped us acquire the intelligence we needed to drive a new energy-efficient building design. With our intelligent gateway, which integrates the powerful core technology of the Intel® Quark™ SoC X1000-based Intel® IoT Gateway and Tatung's outstanding software scheme and system integration, we are able to develop an energy conservation system that can lay the foundation for future energy-efficient office spaces."
Wen-Yen K. Lin, Chairperson of ECS and President of Tatung, ECS

With the Intel smart building solution, ECS anticipates an 8 percent increase in power savings in the first year. As the solution continues to enhance overall efficiency, gains are expected to increase, with energy savings up to 30 percent per year.

Read the case study ›

IN CONCLUSION

Integrating technology into buildings can save costs, improve maintenance and security, and future-proof properties for a connected, data-driven world.

It's possible to start small, with sensors and smart appliances, as well as to take advantage of data already being generated by existing equipment, such as HVAC systems.

Expanding the connectivity between systems can change the way buildings are managed and operated—with a direct, positive impact on ROI.

Solutions are available today to make your buildings smarter and help you move forward.

Learn more
Find case studies, videos, blogs, and other resources on Intel smart building and IoT solutions.

intel.com/iot/smartbuildings
intel.com/iot

Talk to Intel or your solution provider about the potential for your building.
intel.com/iot/smartbuildings

Find a solution provider.
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1. Jim Young, CEO and Founder, Realcomm, 2015.

2. Rand Group, 2015, www.randgroup.com

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