# The Internet of Things

It's All Connected

Fact. There are currently 1.5 devices for every human being on the planet. All over the world, sensors, smart objects, and other devices are connecting through the reach and power of the Internet. And they're dynamically generating, analyzing, and communicating intelligence to increase operational efficiency, power new business models, and improve quality of life. Connecting the unconnected is the Internet of Things (IoT). Let Cisco help you harness this incredible opportunity.
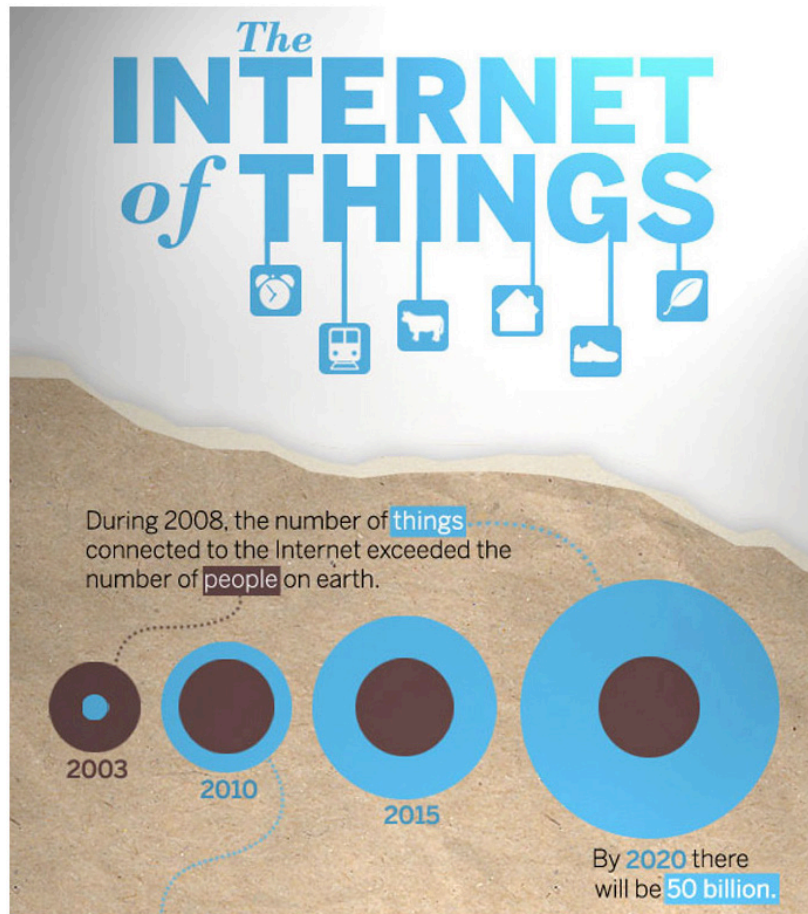
For full infographic, see http://share.cisco.com/internet-of-things.html

How Does the IoT Affect Your World?

The exponential increase in connected devices is producing a deluge of valuable data to store, sort, and apply. This explosion of data and data analytics is generating new, more sophisticated ways to redesign processes and create new business opportunities. Of course, all of this data-crunching - and new, connected applications like video surveillance and smart meters - challenges your network capacity and your security protocols. You need expanded, adaptable, secure infrastructure to keep up as we approach 50 billion connected devices by 2020.

On the Leading Edge

Cisco can help you manage and bring intelligence to the IoT with industry-leading solutions that feature:

- **Network expertise** – Manage and bring intelligence to multiple enterprise-class networks at a scale of billions of connections
- **Leading IP-based security** – Optimize scalability, which is crucial given the massive number of sensors and data being connected to and moving over the network
- **Multilayer architectural approach** – Support your move to an IoT connected network with seamless, end-to-end management without the need for an entirely new infrastructure
- **Highly scalable and secure, ruggedized, resilient solutions** – Perform effectively under extreme conditions
- **Multi-protocol support** – Promote normalization and connectivity across different network environments

Put the IoT to Work for You

Cisco can help you turn the IoT into a hard-working asset to facilitate growth with benefits such as:

- Data-driven operational efficiencies that reduce inventory, downtime, and time to market
- A greater ability to support business evolution from a reliable, transparent technology foundation that is compatible with future technology releases
- New business opportunities and revenue streams
- Reduced risk from a holistic, more easily managed security approach to address physical and cyber vulnerabilities
- Faster and better decision making through informed prioritization

A High Voltage Win-Win

Great River Energy in Minnesota wanted to expand intelligent monitoring capabilities at remote plants and improve visibility into its energy management system. It chose ruggedized Cisco® Industrial Ethernet 3000 Series Switches to intelligently connect sensors and controllers, operational processes, and people. In return Great River Energy gained visibility into disparate control systems, contained management and deployment costs, and gained the flexibility to cost-effectively scale where needed.

Read the entire case study.

IoT in Action: Utilities Harness the Power of the IoT

A devastating ice storm brings down miles upon miles of power lines leaving tens of thousands of customers without power. An optimally connected system allows for faster triage, more collaborative decision-making, better communications, and a more productive workforce response. The result is restoration of power well ahead of customer expectations. Energy operators can find ways to optimize the productivity of investment in new and existing facilities, and integrate more distributed energy resources onto the grid. We offer end-to-end solutions and services to help you bridge the gaps within your grid and field networks to provide powerful grid, security, and operations services.

New Connections	What They Mean
• Cisco Connected Grid Portfolio	• Increased value from visibility into distribution network
	• Critical infrastructure needs secured to mitigate cyber attacks
	• Resource optimization to help manage OPEX and the bottom line
	• Reduced outage and downtime demands from internal costs and customer expectations

IoT in Action: Mining New Efficiencies

From a centralized control room, managers for a massive, multisite mining operation direct the flow of materials from mines to concentrators to smelters to refineries - making sure the right quantities arrive at the right time for optimal operational efficiency. Meanwhile, maintenance engineers seated at the next console can monitor equipment spread across thousands of square miles, performing remote troubleshooting and dramatically reducing repair turnaround time.

New Connections	What They Mean
• IoT Network Architecture	• Centralized monitoring and control of material shipments and processing
• Connected Factory Smart Solution	• 24-hour remote troubleshooting and maintenance dispatch
	• Enterprise-wide, onsite visibility
	• Reduced turnaround time on decisions
	• Consistent enforcement and documentation of business policies, safety regulations, and compliance activities

IoT in Action: Improved Security

An intruder attempts to enter company headquarters. His presence is detected and every move is followed with pan-tilt-zoom cameras. Exterior doors are automatically locked and nearby security managers are alerted to the threat.

New Connections	What They Mean
• Physical access control	• Improved security at multiple locations
• Video surveillance	• Central monitoring capabilities
• Facial recognition video analytics	• Annual cost savings of US$653,000
• Event recognition video analytics	

IoT in Action: Safe and Efficient Mass Transit

Passenger trains hurtle along tracks and under city streets at speeds up to 80 kilometers per hour, while buses transport even more commuters in bustling metropolitan areas. Traffic controllers in a centralized operating center can monitor the speed, status, and location of every train or vehicle within the transit system through the same converged IP-based networks that provide Wi-Fi access to passengers aboard the trains. Cameras located along tracks, roadways, and in transit stations allow for continuous security surveillance that increases rider safety and satisfaction. The entire system is heavily secured against virtual and physical intruders.

New Connections	What They Mean
• Compact, ruggedized routers, switches, and access points located on board trains, along tracks and in stations • Cisco Wireless Control System • Access points with Fast Roaming technology in tunnels and stations • High-definition video surveillance and IPICS • Cisco Adaptive Security Appliances • Cisco Premium Mobile Broadband	• Ability to monitor and track every train or vehicle on live, interactive maps • Highly secure, seamless, and uninterrupted roaming across multiple wireless networks covering an entire mass transit service area • Ability to offer value-added passenger services like onboard Wi-Fi, location-based mobility apps, live scheduling and routing, etc. • Centralized monitoring and remote troubleshooting • Increased transit system security • Increased ridership and enhanced passenger experience • Support mission-critical transit applications with proven wireless broadband technology

Why Cisco?

With 30 years' experience Cisco is the recognized leader in networking products and services. With support from Cisco and our ecosystem of IoT partners, you can move to an IoT connected network without an entirely new infrastructure, while supporting comprehensive, seamless management end to end. Our multi-layer architectural approach accelerates solution performance in an open, flexible, and manageable way to inspire new business models for innovative, agile, and efficient operations. We also provide the industry's broadest portfolio of integrated security solutions for exceptional visibility and continuous advanced threat protection.

Learn More

For additional information, visit the Internet of Things.