



**Hewlett Packard
Enterprise**



The Internet of Things

Turning ordinary things into extraordinary business outcomes

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“One-third of enterprises report using IoT, with another third planning to do so.”¹

– Forrester Research

Resources:

View the IDC infographic to learn its predictions on IoT.

There's something in it for everyone:

- **Creators** improve design and operations, enhance field performance, and increase customer value.
- **Enablers** differentiate their services, increase customer value, and generate new revenue.
- **Operators** increase revenue, improve operations, reduce operational risk, and enhance productivity.

The Internet of Things (IoT)—billions of devices connected and communicating with each other and with businesses—promises dramatic enhancements in efficiency, opportunities for new products and business models, and the potential for greater customer intimacy.

This brochure will help you see how your business might apply the IoT technology to create innovative new offerings, increase business efficiency, enhance decision making, and manage and reduce risk. And we'll show you why Hewlett Packard Enterprise is the partner you need to help you turn the possibilities into positive business outcomes.

What is the Internet of Things?

The Internet of Things is a network of physical devices with embedded technology that can communicate their status, operation, location, and environment. The key elements of IoT are:

- **Devices**—that collect and communicate data and actuators that can act upon the data
- **Data**—information collected by devices that enables monitoring, automation, and analysis
- **Connectivity**—to move data to where it can best be acted upon by other devices or people and analyzed for predictive insights

Analysts predict tens of billions of sensors will be installed within the next five years. Simple applications use sensors to detect and report movement, temperature, or utility consumption and perform other basic monitoring tasks. More robust applications can perform real-time monitoring and response. Advanced systems might enable interaction among devices, so they can dynamically adjust to changing conditions. Data can be stored at the sensor, the network edge, the data center, or in the cloud. And the data can drive a range of applications from simple status to predictive models that provide new insights.

Apply IoT to your business

IoT solutions can connect you to customers, business operations, and the environment to a degree never before realized. Here are some things IoT could do for your business.

Enable innovative new offerings

IoT technology can turn products into services and sales transactions into subscriptions. For example, HPE Instant Ink service integrates sensors into printer ink cartridges to automatically resupply ink when customers run low.

Increase business efficiency

Connected sensors and actuators provide the data to identify waste and to adjust operations to changing conditions. Labor-intensive monitoring and meter reading can be delegated to Internet-connected smart meters. In the energy industry, for example, operators use data from in-pipeline sensors and aerial surveys—integrated with operational databases—to increase the efficiency and safety of employees and the community.

Enhance decision making

IoT solutions can provide the data to make data-driven decisions based on what's really happening. Product developers can design smart, connected products that report exactly which features their users are using and how. Utilization and wear data for assets lets managers determine where they should be deployed for best return and when they should be retired and replaced. Manufacturers can measure process yields and reject rates and make corrections quickly.

¹ Forrester Research, “Forrester Predictions 2016: IoT's Impact Inside Companies,” Frank E. Gillett and Michele Pelino, November 16, 2015.

Resources:

- Read how HPE is [helping power companies](#) turn down the heat.
- Hear how building successful business outcomes with the Internet of Things is already [a reality with HPE](#).
- Hear an engaging video "[What if Machines could talk?](#)" from HPE.

Manage and reduce risk


Sensors can monitor environmental factors and alert facilities and operations managers when unsafe conditions develop. They can spot security threats and speed response. And they can monitor compliance with industry and government regulations to protect companies from the penalties of non-compliance.

The elements of an IoT solution


While some applications are familiar, what's new about IoT is the convergence of low-cost sensors, Internet connectivity, big data analytics, cloud and edge compute platforms, and custom applications, scaled to business and underscored with security. A successful IoT solution requires all of the following elements, integrated and working together.

IOT REQUIREMENT


HPE OFFERS

 **Ubiquitous, reliable, secure connectivity**
 IoT is an integral part of today's digital workplace and must be underpinned by reliable, secure network connectivity, location-based services and analytics, and flexible data gateways. To control operating expenses, these systems need zero-touch cloud managed configuration and multi-vendor operations management options and must support both legacy and new IoT network infrastructure including cellular, wired, and Wi-Fi networks. They also need location-based services and gateway devices to extract contextual information, accelerate decision making, and extract business intelligence.


Aruba wireless and wired LANs, ClearPass Network Access Control, AirWave Operation Management, Meridian Beacons, **HPE communications IoT platform**, Edgeline Gateways

 **End-to-end, proactive, defense-in-depth security**
 Data must be protected from theft, modification, and exploitation from the instant it is created, in transit through the network, at rest in data stores, and when in use by applications. Application developers must ensure deployed code is free of vulnerabilities that hackers could exploit. And security surveillance systems must monitor all elements of IoT services to detect and block breaches and enable rapid remediation.


HPE Enterprise Security solutions including HPE Atalla and Voltage data protection solutions, HPE Fortify application security, and HPE ArcSight Security Information and Event Management solution

 **Contextual, insightful, at-scale data**
 IoT technology can produce data in volumes that defy traditional storage and processing techniques. It requires new approaches to extract the business insight it hides. Data from things is one of the major factors driving the new technology and analytics approaches of big data.

Purpose-built, proven, best-in-class **analytics and compute platforms** integrated with our services and partner ecosystem (HPE Vertica, HPE IDOL, Hadoop, SAP HANA, HPE ProLiant, HPE Apollo)

 **Distributed, deep, edge-to-the-cloud compute**
 To store and process data in the volumes produced by IoT, especially in real-time applications, processing must move out of the central data center and closer to where the data is generated. IoT developers must find the right balance of cloud, central processing, and edge computing to enable each IoT solution.

HPE platforms including HPE Edgeline, HPE Moonshot, HPE Apollo, HPE ProLiant, and HPE Helion Cloud System

 **Open, extensive, partner-driven ecosystem**
 IoT solutions depend on the availability of innovative, secure, analytics-based applications that meet the needs of different businesses and industries. Many of those applications will be enabled by open technology platforms designed to get applications to the market quickly, to enable integration among applications, and to launch and manage them with standard deployment and administration tools. This requires an ecosystem of companies enabled by education, tools, and support from major technology providers like HPE.

Intel®, **IoT development and integration labs**, participation in Industries 4.0, the Industrial Internet Consortium, the oneM2M standard, and the IP for Smart Objects (IPSO) alliance.

“We’re at the dawn of a connected world that will enable firms to use software to monitor customers’ real-world experiences and respond across the full range of consumer and business-to-business scenarios.”²

– Forrester Research

Our IoT expertise and experience can make you successful

HPE brings decades of experience in computing, networking, and security spanning the entire IT landscape—from the data center, through the cloud, across hybrid infrastructures, and on any device. HPE consultants have cross-industry experience in computing and networking as well as deep experience in big data analytics, technology integration, and other fields central to IoT. We’re helping organizations like yours use the Internet of Things (IoT) services to become more competitive and more efficient, all with reduced integration risks and accelerated time to value. Here are a few examples:

We helped **Auckland Transport** increase usage of public and shared transportation while reducing emissions and congestion. Our solution captures more than 2000 video feeds and analyzes 200 of them in real time. The result is improved public safety and security and enhanced quality of life for citizens.

Kaeser Compressors, a leading innovator in compressed air systems technology, needed real-time data feeds from globally distributed customer equipment to identify potential failures before they happened. Our solution with SAP HANA is expected to result in \$10 million annual savings and a 60 percent reduction in down time.

DS Virgin Racing Formula E Team sits at the forefront of new technology development and deployment within the FIA Formula E Championship using trackside sensors and video analytics to optimize its performance. HPE Vertica and HPE Autonomy help enable live and post-race data analysis around energy management, regenerative braking, temperature, throttle and brake pressure, as well as timings and race strategy.

Learn more

We hope this brochure has jostled your imagination, and you’re beginning to see the possibilities for the Internet of Things in your business. There are no IoT point solutions. Enabling extraordinary business outcomes requires the components we describe, integrated and working together.

With one of the broadest technology portfolios in the industry, we can provide the components for you to build your own IoT, or we can create a platform for you to build your solutions on. In either case, we provide guidance and consulting from vision through execution. Visit the **[HPE IoT website](#)** to learn more. Or contact us to learn how to turn the possibilities into positive business outcomes.

² Forrester Research, “Brief: The Internet Of Things Will Transform Customer Engagement,” Frank E. Gillett, May 11, 2015.



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