

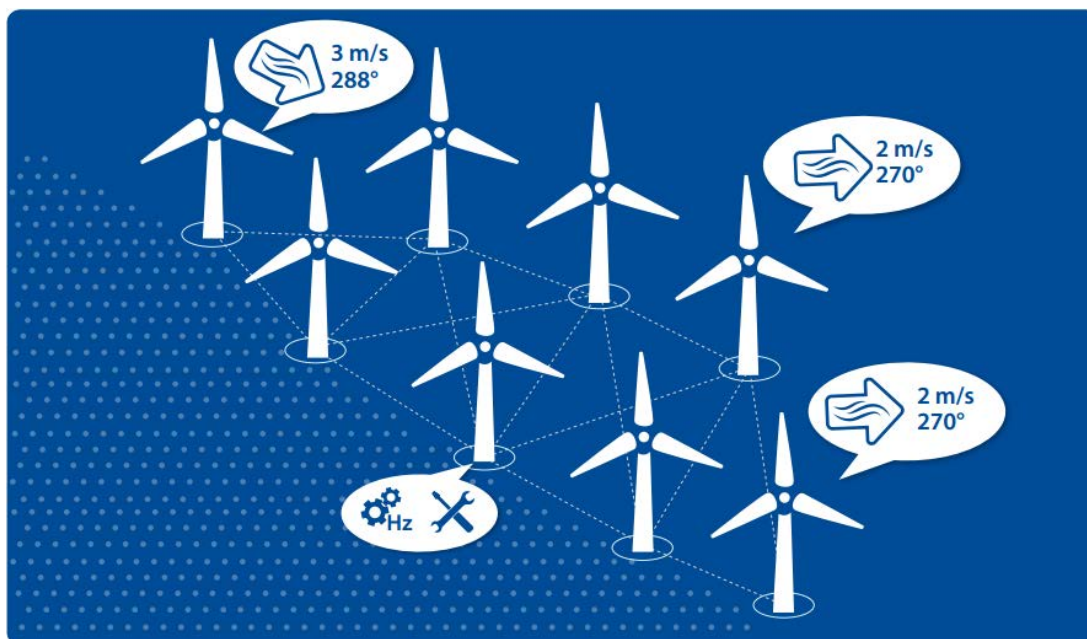
## Frequently Asked Questions (FAQ)

# Industrial Internet of Things

## What is the Industrial Internet of Things?

The Industrial Internet of Things (Industrial IoT) is made up of a multitude of devices connected by communications software. The resulting systems, and even the individual devices that comprise it, can monitor, collect, exchange, analyze, and instantly act on information to intelligently change their behavior or their environment -- all without human intervention.

An example of one such Industrial IoT system would be a wind farm. Each windmill in the farm is equipped with many sensors and software that allows it to communicate with all the other windmills and even request repairs. To optimize power generation, each windmill automatically adjusts its settings and behavior based on data it receives and processes from the system, such as changes in wind speed and direction. Such environmental changes may result not only directly from the weather, but also from the behavior of other windmills.



## How is It Different from the Internet of Things?

There are two perspectives on how the Industrial IoT differs from the IoT.

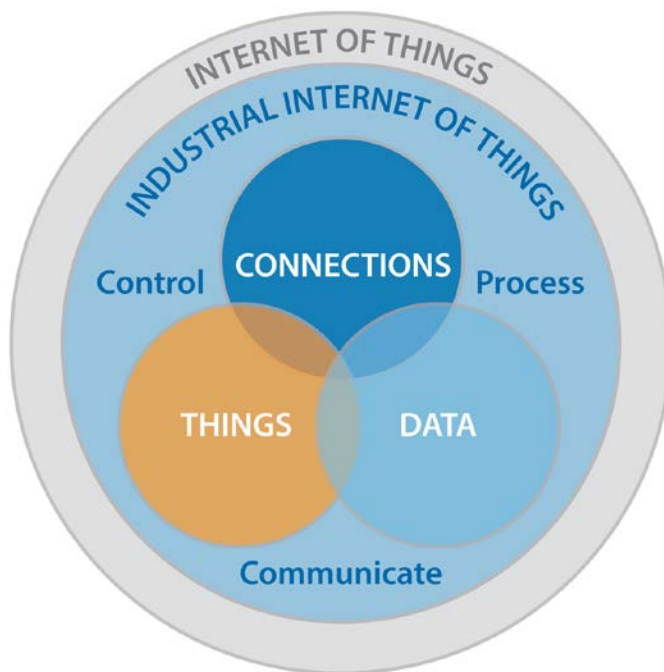
The first perspective is that there are two distinctly separate areas of interest. The Industrial IoT connects critical machines and sensors in high-stakes industries such as healthcare, energy,

transportation and industrial control. These are systems in which failure often results in life-threatening or other emergency situations. On the other hand, IoT systems tend to be consumer-level devices such as wearable fitness tools, smart home thermometers and automatic pet feeders. They are important and convenient, but breakdowns do not immediately create emergency situations.

The second perspective sees the Industrial IoT as the infrastructure that must be built before IoT applications can be developed. In other words, the IoT, to some extent, depends on the Industrial IoT.

For example, many networked home appliances can be classified as IoT gadgets, such as a refrigerator that can monitor the expiration dates of the milk and eggs it contains, and remotely-programmable home security systems. On the Industrial Internet side, utilities are enabling better load balancing by taking power management decisions down to the neighborhood level. What if they could go all the way down to individual appliances? Suppose users could selectively block power to their devices during high-demand scenarios? Your DVR might power down if it wasn't recording your favorite show, but your refrigerator would continue to work, resulting in less food spoilage. You could set your washer and dryer to be non-functional, and make an exception with a quick call from your smartphone. Rolling blackouts could be a thing of the past.

Innovators are only beginning to imagine the possibilities that may be achieved by taking advantage of devices and systems that can communicate and act in real time, based on information they exchange amongst themselves. As the Industrial IoT becomes better defined and developed, more impactful IoT applications can and will be created.



#### **Internet of Things:**

Everyday consumer-level devices connected to one another and made smarter and slightly self-aware.

Examples: consumer cell phone, smart thermostat

#### **Industrial Internet of Things:**

Equipment and systems in industries and businesses where failures can be disastrous.

Examples: individual health monitors and alert systems in hospitals

## **Why Should You Care about the Industrial IoT?**

The Industrial IoT focuses strongly on intelligent cyber-physical systems. These systems comprise machines connected to computers that interpret, analyze and make decisions almost instantly, based on sensor data from many widely distributed sources.

The Industrial IoT enables the smart system in your car that brakes automatically when it detects an obstacle in the road. It enables the patient monitoring system in hospitals to track everything from a patient's heart rate to their medication intake. It enables a mining machine or space robot to safely and efficiently operate where humans can't.

The world is building more and more intelligent machines that interact with other machines, with their environments, with data centers and with humans.

## Which Companies and Organizations Support the Industrial IoT?

General Electric coined the term Industrial Internet in late 2012. It is effectively synonymous with the Industrial Internet of Things, and abbreviated as Industrial IoT or IIoT.

Many companies and organizations are realizing the potential and significance of the Industrial IoT. A recent study conducted by Appinions and published in Forbes listed RTI as the #1 most influential company for the Industrial Internet of Things. Other influencers included Google, Cisco, GE, Omron, DataLogic and Emerson Electric. For the complete list, see <http://dj.appinions.com/iiot-july-2014/>.

The Industrial Internet Consortium also advocates for the advancement of the Industrial IoT. It is a fast-growing not-for-profit organization that manages and advances the growth of the Industrial IoT through the collaborative efforts of its member companies, industries, academic institutions and governments. Founding members include AT&T, Cisco Systems Inc., General Electric, IBM and Intel. RTI CEO Stan Schneider serves on the IIC Steering Committee. For details, see <http://www.iiconsortium.org/>.

## What Role Does RTI Play in the Industrial IoT?

Vast amounts of data are generated and transmitted between devices, system sensors and real-time systems. Real-time doesn't just mean fast -- it means as fast as machines can react, even if there are thousands of devices in a system, and hundreds of thousands of messages traveling through the system. The connectivity software simply has to work (reliability) and work fast (speed), no matter how many devices are involved (scalability), and help secure confidential system information (security) along the way.

Although the Industrial IoT was only recently labeled, RTI has been providing intelligent cyber-physical systems with connectivity software for decades. See <http://www.rti.com/industries/iiot.html>.

RTI Connex<sup>®</sup> DDS is smart network connectivity software (middleware) that works on any system, on any device, and with massive amounts of data to support the real-time needs of the Industrial IoT. Connex DDS middleware primarily uses a publish-subscribe communication pattern with a data-centric approach. This means that instead of sending messages, devices actually send (publish) current data states through the network, along with all the information necessary to understand that data state. Devices with Connex DDS software can choose to receive (subscribe to) only the data they need, when they need it.

Connex DDS middleware has proven itself in many industries, including healthcare, aerospace and defense, transportation and energy. One of its most significant advantages is that it offers true interoperability; it can seamlessly work with and between any systems, allowing them to work together whether they are decades old, or built with the newest available technology.

For details, see <http://www.rti.com/products/index.html>. Connex DDS is fully compatible with the DDS standard maintained by the Object Management Group.