SOLUTION BRIEF

Intel® IoT Technology
Smart Agriculture

Infiswift Accelerates Connected Agriculture with Intel

The infiswift IoT platform based on high-performance Intel® architecture enables more efficient agricultural operations.

The UN Food and Agriculture Organization of the United Nations predicts that the world will need to produce 70 percent more food in order to feed the 9.6 billion people that will inhabit the planet by 2050.[1] The agriculture industry faces considerable challenges as it strives to sustain itself today and prepare for future demands. These include an increasing need for fresh water—with agriculture consuming 70 percent of the world's fresh water supply—and the impact of climate change.[1]

In order to meet these global demands, food producers and vendors need smarter data collection and simpler data integration. Most data now is of low quality, collected manually, and often cannot be accessed and shared between applications. It is critical for farmers and producers to gather higher quality data and control that data, particularly when third-parties are involved. Existing solutions are often not designed for agriculture and, as a result, do not meet the requirements of the industry.

Technology already plays a key role in the modern farm, accessing data from connected things, such as sensors, equipment, and even drones. Analyzing this data at the edge (where sensors, equipment, and devices are located) and in the cloud can help the agriculture industry to more accurately and quickly increase yield, monitor environmental conditions and farm equipment, control fertilizer and pesticide application, assess variables from nutrients to growth patterns, detect disease, and improve resource utilization.

Infiswift is an agriculture-specific IoT platform that provides the foundation and services to help farms build connected solutions that improve operations.

How it works

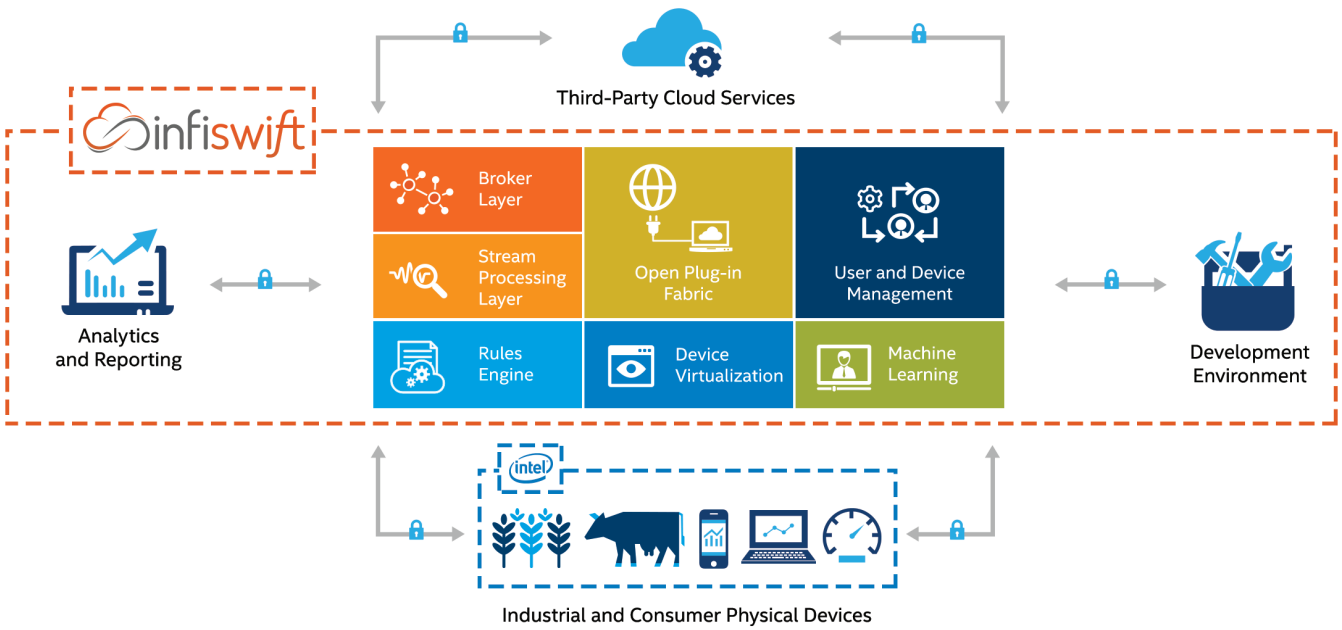


Figure 1. Infiswift connects physical products to each other and the cloud to enable the agriculture industry to gather, analyze, and act on relevant data

The Infiswift IoT Platform

Infiswift is a technology company that focuses on enabling connected services for the agriculture ecosystem. **Infiswift's expertise is in helping the agriculture industry build connected, data-rich solutions that help secure, gather, transmit, analyze, and act on key data**. This is all based on the long-term Intel® architecture roadmap to help ensure critical end-to-end security, reliability, and performance.

Infiswift works closely with farms, manufacturers, vendors, service providers, and more to help identify the Internet of Things (IoT) hardware and software solutions that will best meet their specific requirements and address their challenges.

The infiswift IoT platform combines an innovative edge-to-cloud connectivity and analytics software engine with robust Intel® architecture. It provides a streamlined solution for OEMs and service providers to build and deploy smart solutions for the agriculture industry. At the same time, these solutions bring considerable benefits to farmers, distributors, and others along the food supply chain.

With infiswift, the agriculture industry can collect better data, make better decisions, and streamline operations. Infiswift provides the "plumbing" to connect and manage devices, users, and cloud-based services. A patent-pending platform architecture powers scalability to potentially billions of endpoints using world-class security. Preconfigured features allow businesses to focus on getting their solution to market, rather than on back-end details.

Key Characteristics Enabling Agriculture to Benefit from IoT	
Interoperable Connect any new or legacy device from any vendor	**Secure** Use cutting-edge security from Intel, such as Intel® Trusted Platform Module and McAfee Embedded Control
Cost-effective Minimize hardware and software costs with a lightweight IoT solution	**Scalable** Powerful platform architecture and Intel® hardware foundation enable high-performance scalability
Simple Easy-to-use dashboards and interfaces act as a central management portal for holistic visibility into multiple systems	**Energy efficient** Minimal power requirements for operation of hardware and software at the edge
Flexible A protocol-agnostic platform to connect any device at the edge	**Integrated** Cloud, professional services, and API integrations streamline development and deployment of agriculture solutions
Near-real time Analyze streaming data to trigger alerts and notifications	**Distributed** Perform some analysis in the field, sending only certain data to the cloud for quicker action and data cost savings

Focus on Security

The infiswift IoT platform simplifies security management by providing end-to-end security including secure-by-default, defense-in-depth strategies at various levels. Security is also built into Intel® processors to increase protection at the hardware level for devices, gateways, routers, and cloud data centers. While each project has different security requirements that must be taken into account, knowing that top-end security is available is important.

With infiswift, clients can rely on:

- Industry-leading standards including SSLv3, AES, and SHA-256
- Industry-approved practices for key rotation and certificate management
- Protection of privacy through techniques such as Intel® Enhanced Privacy ID (Intel® EPID)
- Deployment of hardware-based solutions like TPM (Trusted Platform Module) or TEE (Trusted Execution Environment)
- Tamper-proof designs that can survive hostile host environments

Planting the Next Generation of Agricultural Insights

Agriculture is becoming more precise and efficient, with technology driving many operational changes and automating manual processes. From more effective watering practices to better management of the supply chain, it is crucial that farms maintain an advantage as the industry evolves. The infiswift IoT platform for agriculture enables farms and vendors to improve operations by connecting devices and making more precise decisions from the resulting insight. It can also help address challenges such as siloed data (e.g., where tractor data cannot be combined with warehouse data); legacy equipment that can't be easily replaced, but can be made smart; and competitors with optimized operations.

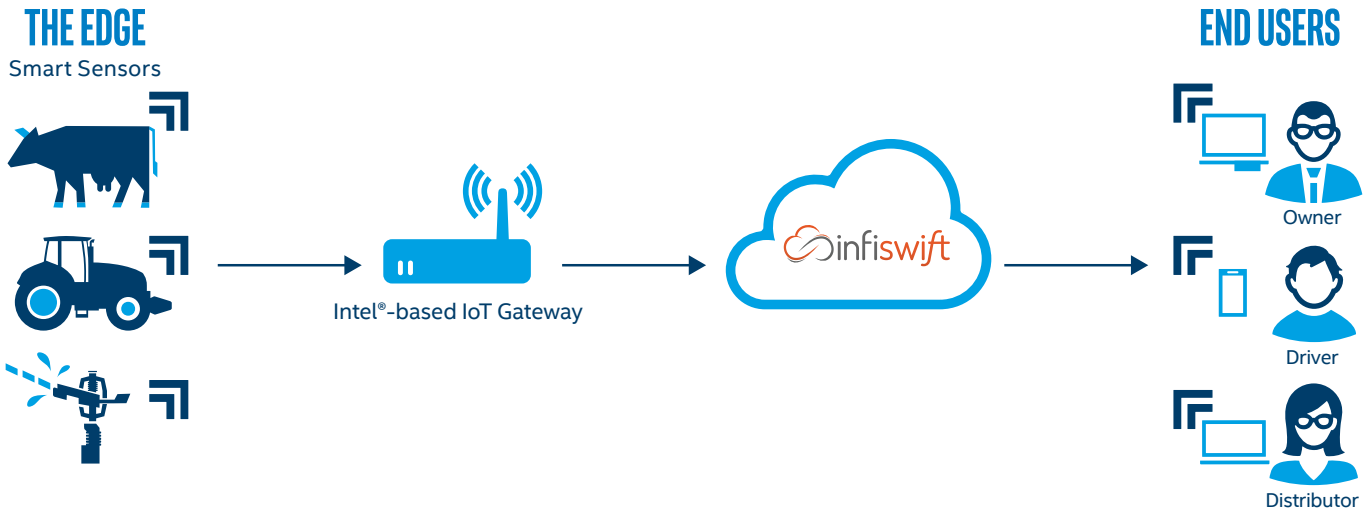
Infiswift's momentum in the agriculture arena has been growing steadily, with several implementations moving forward. The company is exploring collaborations with equipment manufacturers, service providers, and vendors who recognize the opportunity to implement IoT technology that can improve efficiencies and profits for their larger farming customers. Infiswift works closely with agricultural partners to develop the right connected solution from hardware selection to application development.

A typical farm implementation could include distributed intelligence at the edge—with smart sensors on livestock, machinery, irrigation, and feed systems—as well as centralized control and analytics for ongoing assessment of the operation as a whole. With the flexibility to integrate a wide range of data sources at low cost (due to wireless hardware advances), the infiswift platform can provide a great foundation for getting actionable insight from data. Different users—from owner to equipment operator to distributor—benefit from different types and amounts of information and can access custom dashboards, available via web and mobile, to visualize important data, analyses, and predictive information.

Infiswift Professional Services

Infiswift works directly with customers to create an optimal solution. Key steps in the process include:

- Situational analysis
- Platform optimization
- Hardware recommendations
- Custom application and dashboard development
- Training, system maintenance, and customer support



The Foundation for Smart Agriculture

Intel works closely with the agriculture industry to deliver smart Internet of Things (IoT) solutions based on standardized, scalable, reliable Intel® architecture. These solutions range from sensors and gateways to server and cloud technologies to data analytics algorithms and applications. Intel provides essential end-to-end capabilities—performance, manageability, connectivity, analytics, and advanced security—to help increase productivity, efficiency, and quality across the agriculture value chain. Intel can help food producers, OEMs, retailers, and transport companies use data to monitor, control, optimize, benchmark, and share data in near-real time for better decision making.

Common Agriculture Use Cases

Food distribution	Align harvest availability with transportation to help eliminate idle time and improve lot traceability
Accurate forecasting	Monitor actual vs. projected harvest in near-real-time
Inventory management	Track status of livestock, levels of stored grain, and more in near-real time
Supply chain and distribution	Operate more profitably based on market signals and just-in-time distribution
Weather planning	Integrate weather data to make better decisions
Process automation	Take actions automatically based on data (e.g., schedule sprinklers)
Asset management	Monitor farm vehicles and machines to optimize operations and manage preventive maintenance (e.g., optimize harvester routes using GPS)
Environmental monitoring	Monitor soil conditions, nutrients, irrigation, and growth patterns; monitor for disease, insect, and weed issues to take preventive measures
Livestock monitoring	Monitor variables such as body temperature, animal activity, pulse, food intake, and GPS position
Notification and alerts	Send automatic alerts or take action based on predefined events (e.g., if a cow is ready for reproduction, identify it for recall from the field)

The greatest value and improvement, however, comes from bringing these use cases together in a secure manner. If a farm can bring data from its supply chain together with real-time harvest and weather data, there's a lot more potential to make improvements and optimize. This makes interoperability between systems critical to the long-term value of any IoT-based solutions implemented by a farm, manufacturer, or service provider.

Conclusion

Infiswift speeds time-to-market for smart agriculture solutions with its industry-specific IoT solutions. With a foundation in standardized Intel architecture, infiswift brings a powerful and flexible platform to move the agriculture industry forward.

Now there's a clear pathway to commercialization of connected agricultural solutions for OEMs, manufacturers, vendors, service providers, and farmers.

Learn More

Infiswift is a general member of the Intel® IoT Solutions Alliance. From modular components to market-ready systems, Intel and the 400+ global member companies of the Alliance provide scalable, interoperable solutions that accelerate deployment of intelligent devices and end-to-end analytics. Close collaboration with Intel and each other enables Alliance members to innovate with the latest IoT technologies, helping developers deliver first-in-market solutions.

For more information about infiswift, please visit **infiswift.com** or contact us at **info@infiswift.com**.

For more information about Intel® IoT Technology and the Intel IoT Solutions Alliance, please visit **intel.com/iot**.

1. forbes.com/sites/federicoguerrini/2015/02/18/the-future-of-agriculture-smart-farming/#23f0f7ab337c.

0417/GR/CMD/PDF 335805-001US