

Cisco IOx and Fog Applications



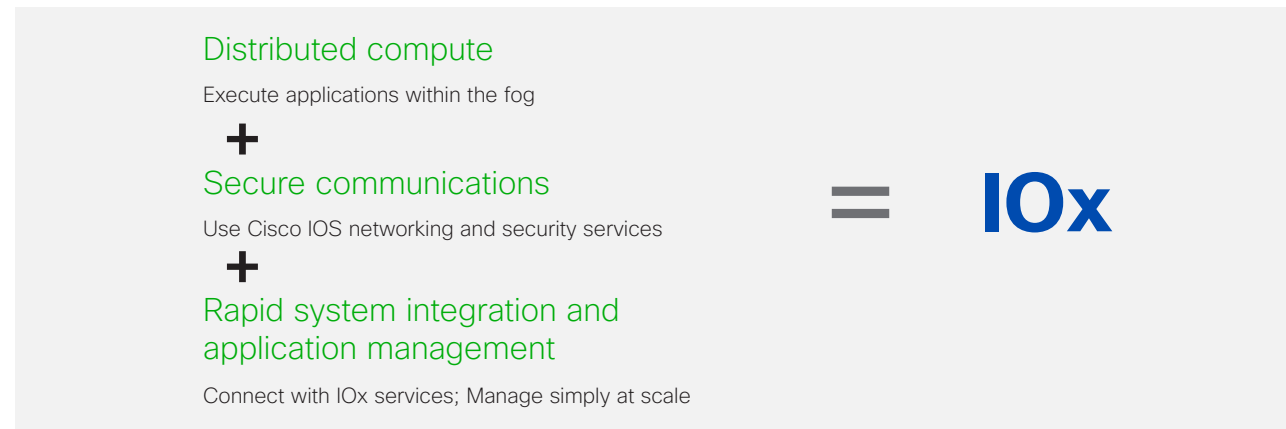
Benefits

- **Transformation of IoT data into new digital business value:** Build new business with the ability to process high volumes of data in the fog and deliver closed loop system control in real time.
- **Rapid time to value:** Reach business outcomes associated with IoT initiatives more rapidly with application execution within the fog.
- **Broad scope of impact:** Reach production deployment rapidly with fog application management and execution at IoT scale.

Harness IoT Data, Deliver Insight, Drive Digital Business Forward

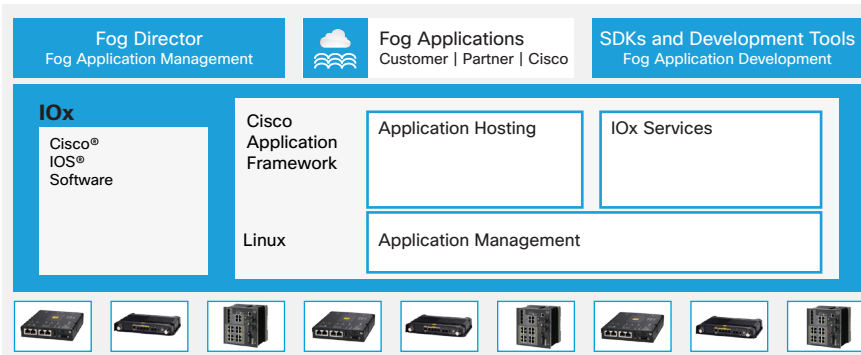
Businesses ranging from corporations in manufacturing and energy to public sector organizations such as cities and transportation authorities have used IoT technologies to produce high impact business outcomes, including faster product introductions, more engaging services, and increased operating efficiency.

The Cisco® IoT portfolio integrates the essential IoT elements required for customer success. IOx combines IoT application execution within the fog, secure connectivity with Cisco IOS® Software, and powerful services for rapid, reliable integration with IoT sensors and the cloud.



By bringing application execution capability to the source of IoT data, customers overcome challenges with high volumes of data and the need for automated, near-real-time system responsiveness. (See Figure 1.)

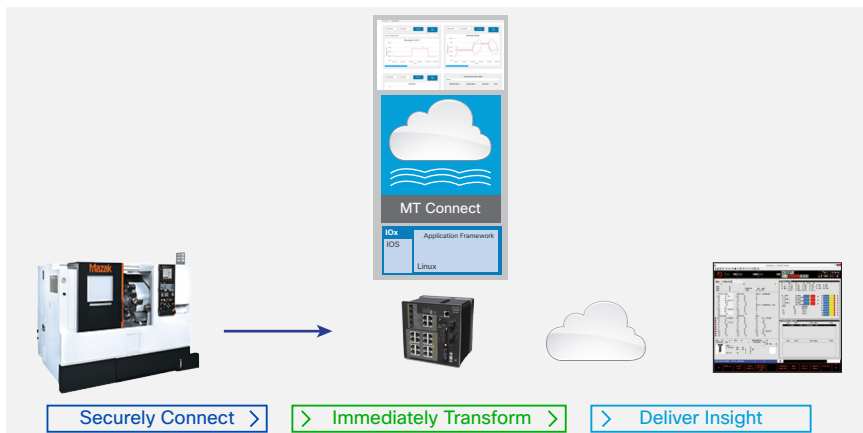
Figure 1. Cisco IOx Application Environment



Accelerate Time to Value for IoT-Driven Digital Business

Fog applications offer customers and ecosystem partners the ability to transform IoT sensor data and perform control functions within the distributed network infrastructure. With the support of IOx resident on routers, switches, and compute modules, the distributed IoT network functions as the compute environment for fog applications. With the secure connectivity services and common application framework offered by IOx and fog applications, customers have delivered business outcomes rapidly with their IoT initiatives. Examples across industry include:

- Manufacturing companies connect machines, transform sensor data, and perform real-time analytics to predict when maintenance is necessary and increase overall equipment effectiveness (OEE).



- Mobile network operators manage their cell tower assets remotely. With real-time insight from fog applications, they make sure of proper operation, prevent theft, and save money.
- Utilities drive up grid reliability using fog applications to transform SCADA data into real-time insight and control.

Cisco IOx Components

- Cisco IOx:** Cisco IOx brings together Cisco IOS software, the industry-leading networking operating system, and Linux, the leading open-source platform. With Cisco IOx, your developers benefit from familiar processes and open-source tools prevalent with Linux while generating applications that execute on Cisco IoT network infrastructure.
- Fog Director:** Cisco Fog Director allows administrators to manage, administer, monitor, and troubleshoot fog applications running in the Cisco IOx environment remotely over the network.
- SDK and development tools:** Cisco IOx SDK is a collection of tools and methodology guidelines to help developers package their applications for execution on IOx-enabled network infrastructure products.
- Fog applications:** Fog applications ready for execution on IOx-enabled infrastructure may be supplied by ecosystem partners and/or Cisco or developed with a range of common programming languages.

Why Cisco?

- Analyze megabytes of data every second
- Respond in milliseconds
- Connect securely to IoT sensor data and cloud applications

Only Cisco delivers the capability to execute IoT applications within the distributed network infrastructure known as fog. The Cisco IOx application framework offers consistent management and hosting across network infrastructure products, including Cisco routers, switches, and compute modules. IOx allows application developers to work in the familiar Linux application environment with their choice of languages and programming models with open-source development tools.