

Overview of Zentri Silicon-To-Cloud™ Platform for Connected Products



This is an overview of the Zentri Silicon-To-Cloud™ Platform which helps companies that make industrial, commercial, and consumer products such as thermostats, cameras, industrial equipment etc., to build and launch connected products. This helps product companies to stay connected, manage, monitor and control products that are deployed in the field.

Audience

This document is primarily intended for product managers and product line managers who are building products that can take advantage of wireless connectivity to transform their business from a 'product-only' business to a 'connected experience'.

Use Cases for Silicon-To-Cloud Platform

Some example use cases for the Zentri Silicon-To-Cloud platform are:

A kitchen appliance that can receive recipes from a smartphone, allows remote updates for firmware and new features, and lets the user save and store their settings in the cloud.

A drilling equipment manufacturer who uses wireless sensors to monitor the status of the drilling equipment components. The firmware and software of the equipment fleet might need to be upgraded from a central location and the data collected from the equipment might need to be securely transmitted to a cloud off the premises for trend analysis.

An industrial lighting company deploys hundreds of light fixtures in various large commercial spaces. The company is interested in monitoring the energy consumption, the failure rates of the bulbs, and providing preventive maintenance. The lighting fixtures need to be equipped with Wi-Fi connectivity, software on the product to collect sensor information and

transmit to a cloud of customer choice, and a management system that allows the product software to be upgraded over the air. If the light is an emergency light with a battery, the results of automatic battery tests indicating battery health are reported to the cloud ensuring there is never a moment where the business is caught off-guard in an emergency situation.

What is the Silicon-To-Cloud™ Platform?

The Silicon-To-Cloud platform is a thin, resource efficient software stack that spans:

- the embedded software that runs on wireless hardware which is part of the product that needs to be wirelessly connected,
- a cloud based service for managing and monitoring of products that are in-market,
- and a mobile app software development kit (SDK) which forms the foundation of a mobile app that can manage and control the product.

A key component of the platform is ZentriOS, a revolutionary operation system purpose-built for secure connectivity for commercial grade IoT use cases. ZentriOS runs on both Zentri Wi-Fi and Bluetooth LE modules and on the hardware from major silicon vendors such as Broadcom, NXP, ST Microelectronics, Freescale and Atmel. This is the key for secure,

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authenticated connectivity to the cloud and mobile app.



ZentriOS for Wi-Fi is a highly optimized embedded operating system that runs on a connected product. ZentriOS provides a command-driven and scripting interface to communications, sensor peripheral, file system and OTA wireless upgrade functions. A ZentriOS connected device provides a secure wireless connection to any ZentriOS connected device including wireless modules provided by ZentriOS as well as major silicon vendors.

ZentriOS for Bluetooth LE is an embedded application that provides a product with Bluetooth Low Energy (BLE) wireless connectivity. ZentriOS is designed to substantially reduce design effort and aid time-to-market in applications requiring BLE connectivity to other BLE capable devices including smart phones and tablets. ZentriOS is designed to run on BLE modules and is fully licensed for use on all BLE modules designed and manufactured by Zentri as well as major silicon vendors.

A host MCU communicates with ZentriOS via a UART or SPI serial interface. A mobile or browser app communicates with ZentriOS via the HTTP web server RESTful API / Websockets or by a local or remote terminal interface. The local or remote host sends commands to control the operation of the

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application and to exchange data with other devices on the network. ZentriOS provides a powerful set of commands to enable host control, together with a large number of variables to enable host configuration. Beyond commands and variables, ZentriOS provides a rich feature set for wireless, network, peripheral and file system command and control.

ZentriOS is the secure connectivity OS for hundreds of thousands of products today. The range of products it powers include low power applications, high response/low latency applications to products that need the highest level of security trusted by financial institutions.

Zentri Device Management Service



The Zentri Device Management Service (DMS) is part of the Zentri cloud service portfolio which is primarily used by product companies to manage products through the entire lifecycle. When the product is manufactured, ZentriOS provides a secure identity for the product allowing it to be able to connect to the Device Management Service.

The Device Management Service provides a robust, reliable secure rollout of features and bug fixes to all products in the field. The update can include firmware, files, media, records and

configuration information. The DMS provides a 'DropBox for Devices' – a cloud hosted file system that mirrors the device data which becomes useful for backup and recovery of products. The service also has deep product inventory capabilities that include product specification, modules used, location of an in-field product, and software version.

A key platform feature, which contributes to the openness of the platform, is the APIs that the Device Management Service offers:

Device Management Service Dashboard API – this allows customers to compose a single pane of glass that can incorporate functionality from the device management service as well as data from other operational data supplied by corporate systems.

Device API – used by ZentriOS powered devices to connect to the Device Management Service.

Rest easy, the platform is open avoiding lock in – the device management service is not required for use in production.

Zentri Cloud Connector Service for Monitoring and Control



The Cloud Connector is part of Zentri's cloud service portfolio which is a service that allows customers to leverage their existing cloud such

as Amazon Web Services, Microsoft Azure, etc. The Cloud Connector acts as shim that aggregates connectivity to products and connects to the service using REST or Websockets to a customer cloud. The Cloud Connector securely mediates the delivery of data such as analytics from the product to the cloud service. In addition, it can also be used to control the product after it has been deployed to the field.

This is a unique service since it allows product companies to avoid vendor lock-in as well ensuring data collected from products remains under the control of the product company.

If the product company needs to fast-track a connected service and has not picked a cloud service provider, Zentri offers a managed service for cloud based monitoring and control. This is an optional service that product companies can choose when it fits their needs.

Cloud Connector Dashboard API – this allows customers to compose a single pane of glass that can incorporate functionality from the control and monitoring of products as well data from other operational data supplied by corporate systems using REST APIs.

Cloud Connector API – this is currently used by ZentriOS powered devices to connect to the Cloud Connector using REST or Websockets.

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Zentri Mobile App SDK



The third and an important component of the Silicon-To-Cloud platform is a mobile app SDK that allows customers to build iOS and Android apps that can connect, control, and manage their products. These apps are usually built for end user interaction with the product and as such the developer focus is rightly on user experience, interaction design, and product features.

The SDK offers a set of core capabilities that are provided as a library for the app developer. A key capability is the ability to provision devices on a wireless network with a familiar

and simple user experience akin to Apple devices or Google Chromecast. The SDK also activates devices with the cloud services offered by Zentri. In addition, the SDK simplifies the discovery of products in a wireless network. A key part of the app and product experience is the latency impact when apps go through the cloud to connect to the product – the mobile app SDK determines automatically when to connect directly to the product and when to use the cloud.

Conclusion and Call-To-Action

The three major components of the Silicon-To-Cloud platform enable product companies to add Wi-Fi or Bluetooth LE connectivity to a product, manage, monitor and control the product using a cloud service, and build mobile apps for a great user experience. This allows product companies to launch connected products and services in 6-9 months.

Connect with Zentri to schedule a customized demonstration and get started with the journey of launching connected product experiences that are reliable and secure.