



High-level architecture

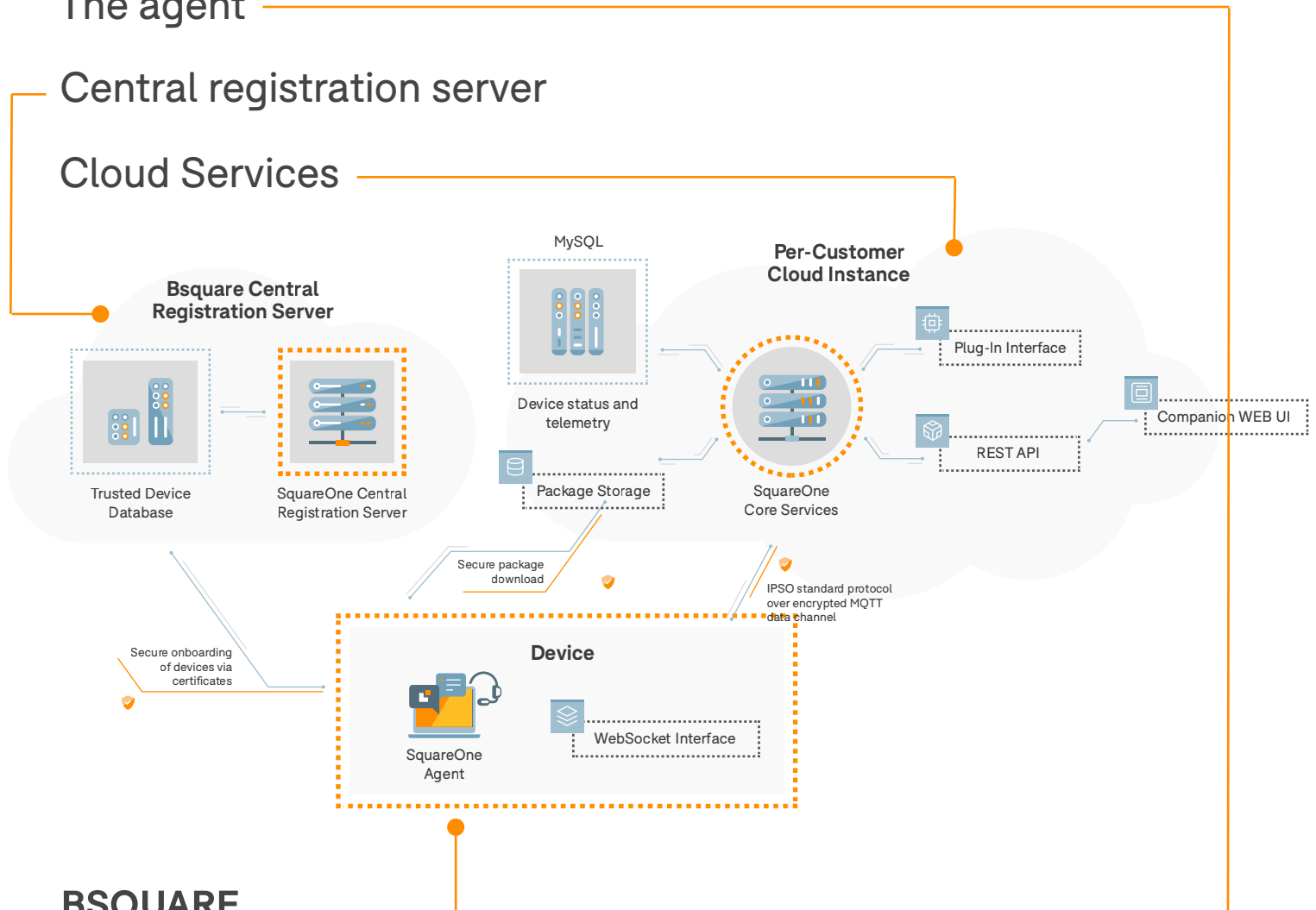
SquareOne is a software suite that empowers interconnected systems with secure core functions. It addresses diverse applications, from device management to expediting custom IoT system development. Across operating systems and devices, SquareOne ensures security, scalability, and adaptability.

Explore the architecture to learn how SquareOne was designed both for cloud integration or edge data capture, seamlessly scaling from tests to production.

The agent

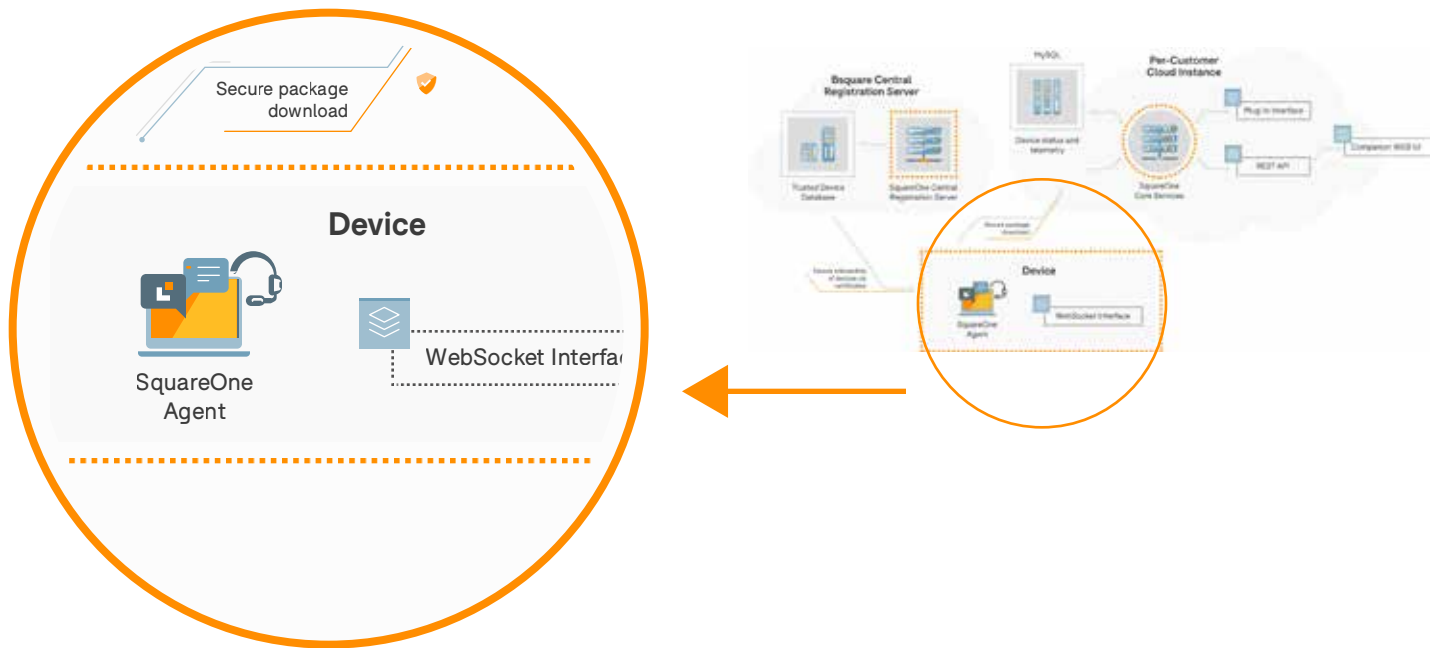
Central registration server

Cloud Services



The Agent

The SquareOne agent, a compact multi-OS software element, operates on each system-managed device, facilitating secure bidirectional communication. It adapts to a wide array of devices, including IoT gateways, vending machines, medical devices, and point-of-sale terminals.



Key advantages:

Lightweight: The agent operates as a compact background process (Windows Service or Linux Daemon), capable of coexisting with current device software..

Multi-OS Support: Out of the box, Linux, Windows, and Android agents are provided, enabling SquareOne to oversee diverse device fleets using a unified interface. Support for other RTOS environments can be explored through direct contact.

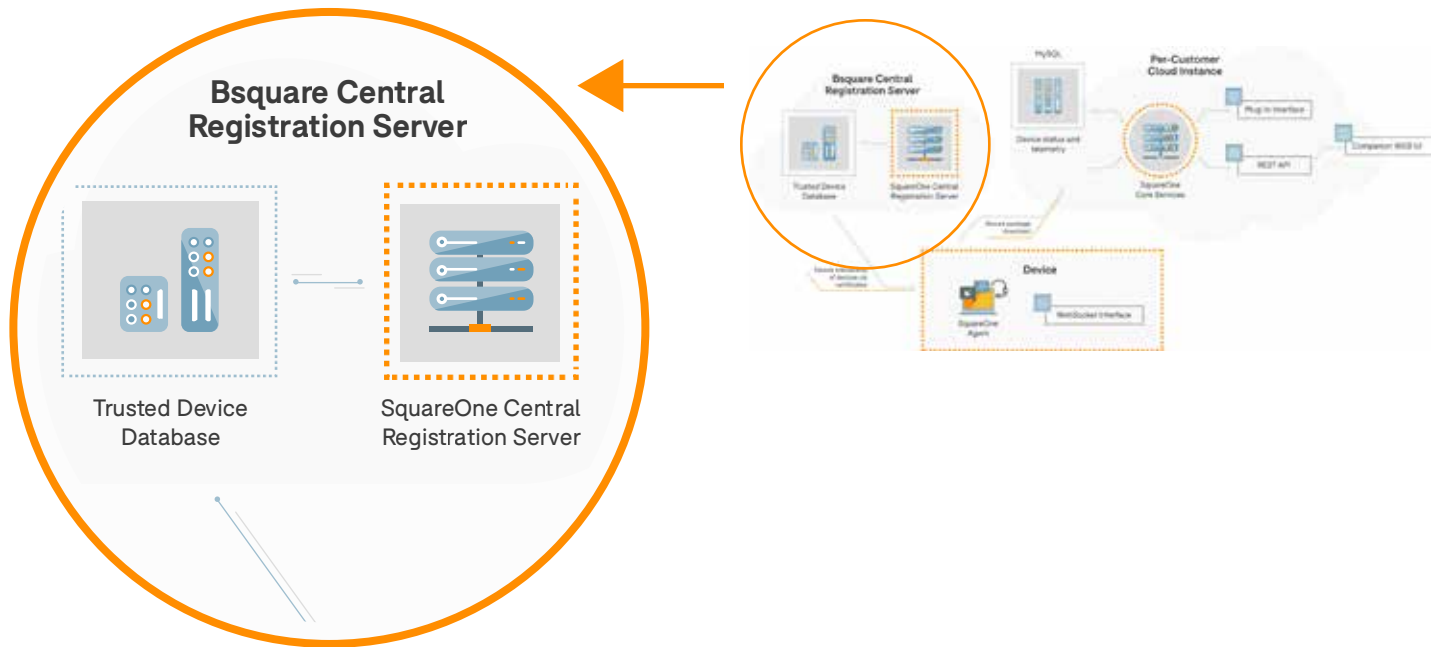
Robust: The agent is engineered to manage sporadic connectivity by intelligently storing and retransmitting communications upon link restoration.

Extensible: The SquareOne Agent features a documented WebSocket interface, enabling other device software to engage in data exchange for local data processing..



Central registration server

This SquareOne system manages the onboarding of new devices, utilizing a certificate challenge for device authentication.



The Central Registration Server manages the following:

Device registration: When a new device connects to SquareOne, it first must pass a certificate challenge with the central registration server. Upon success, it is given a unique per-device MQTT certificate and is routed to the appropriate SquareOne cloud.

Tenant management: Each cloud instance of SquareOne can support multiple “tenants” if required. Each tenant has its own isolated set of devices, groups, users

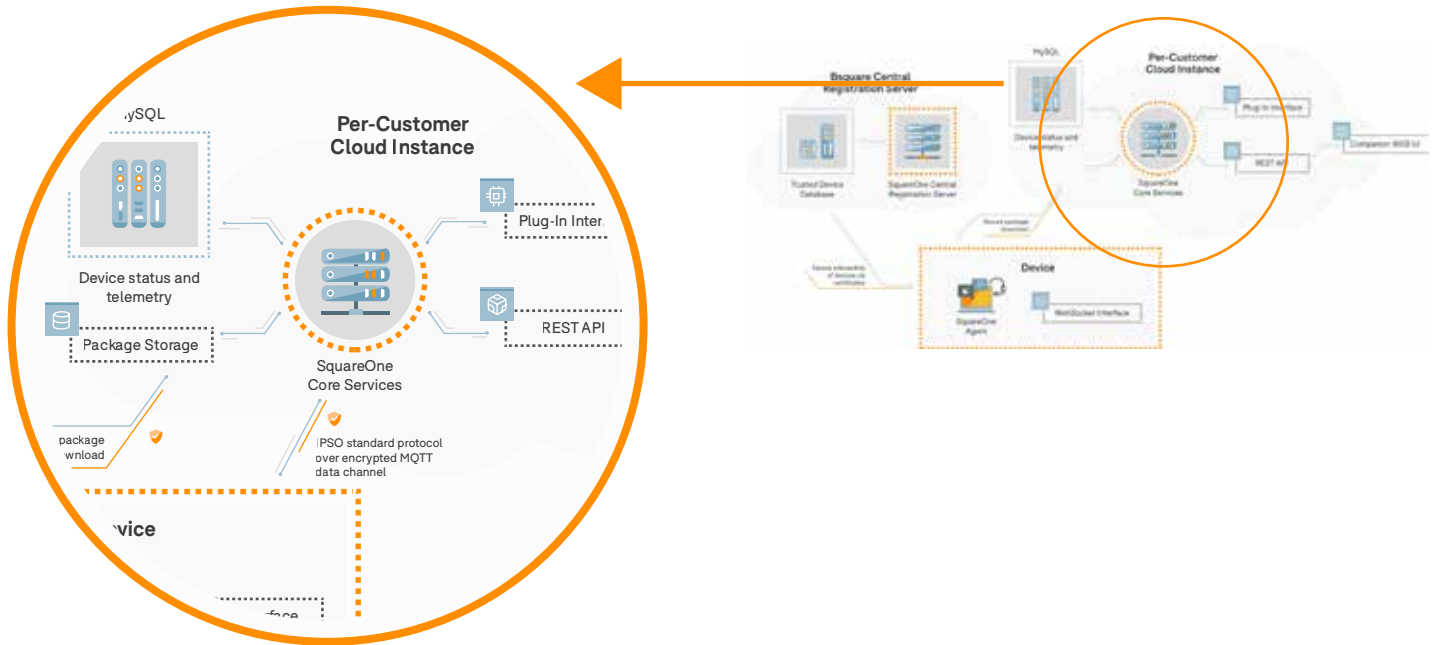
etc, which provides more flexibility when supporting multiple separate clients. The central registration server allows new tenants to be created as needed in an instance of SquareOne.

User management: Each tenant has a set of associated users. Using the central registration server, you can manage user access to tenants and assign specific permissions.

Certificate management: New device certificates can be created and old ones revoked, managing the devices that are allowed to connect to SquareOne, and the routing of registration requests to the required tenant.

Cloud services

This serves as the primary SquareOne cloud system for all post-device registration interactions. It comprises an intuitive Web UI and a meticulously documented RESTful API.



Cloud services enables:

MQTT Communication: Devices establish encrypted MQTT connections to the cloud. We adopt the IPSO open standard for easy extension of SquareOne, enabling seamless transmission of your system data.

Secure Package Download: Updated software packages are downloaded through a secure HTTPS connection.

Remote Screen/Terminal Access: Remote access capabilities function through a secured WebRTC tunnel connecting the device and the operator's web browser.

Companion Web UI: An intuitive web interface offers complete device management, including remote monitoring, package control, troubleshooting, and maintenance.

REST API: The entire Companion Web UI functionality is accessible through a well-documented REST API, facilitating integration with external automation and existing systems.

Device Data: As depicted in the architecture diagram, data moves bidirectionally between the cloud and device. Device-generated telemetry is stored in the cloud database, accessible through the Companion Web UI or REST API. This data is used to assess device health.