Overview

Architecture

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The CONTROL platform is built on Zequenze's core framework architecture, designed for scalability and performance. The system is organized into three main layers that work together to provide comprehensive device and service management capabilities.

Architecture Layers

Machine Interfaces

The interface layer handles all communication protocols and external connections:

- TR069
- MQTT
- Web Server
- Additional protocol adapters

Application Layer

The application layer provides core management functionality:

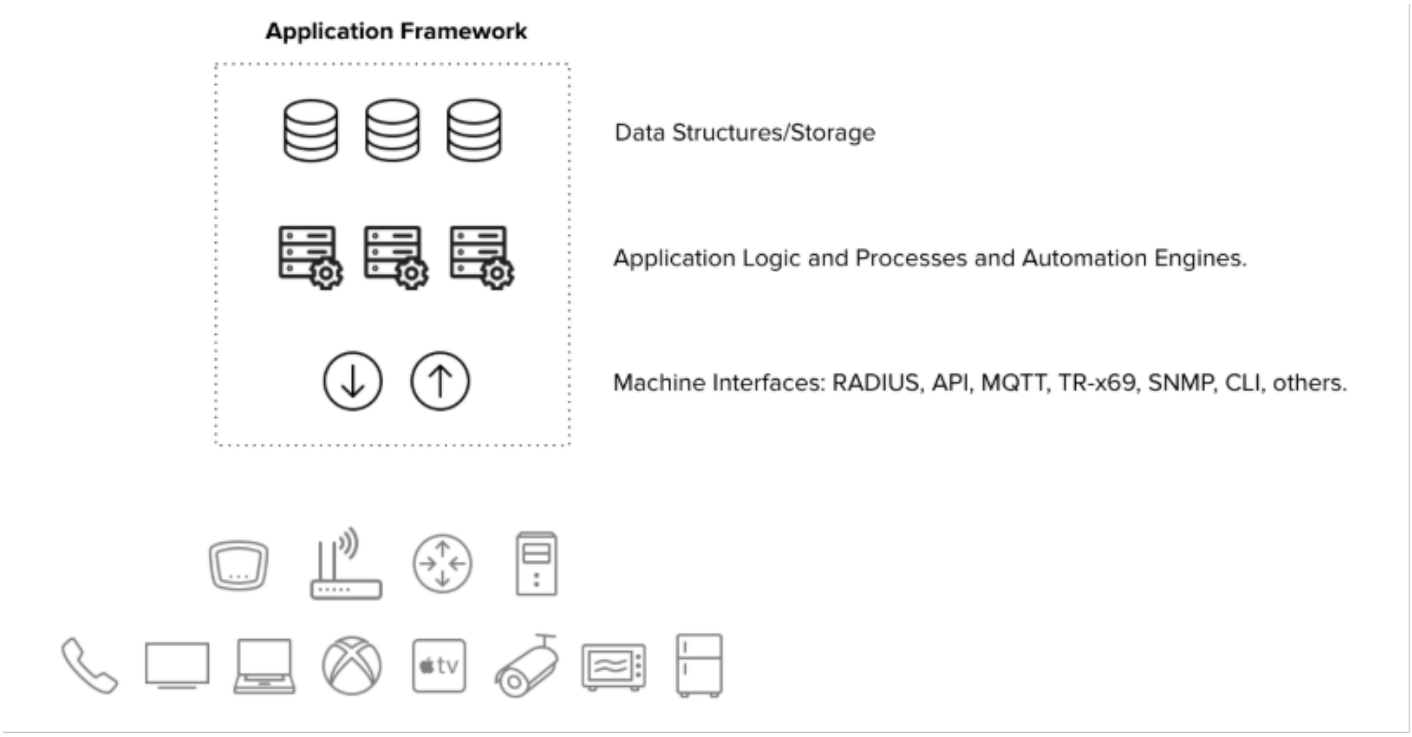
- Device Management
- Service Management
- Firmware Manager
- Additional management applications

Databases

The data layer stores and manages:

- Device records
- Metrics and telemetry data
- Configuration data
- Additional operational data

Architecture Diagram



Scalability

Each architectural layer can be scaled horizontally independently, allowing you to optimize resources based on specific requirements:

- **Traffic volume** – Scale interface layers to handle increased connection loads
- **Activity levels** – Scale application layers to process more operations
- **Data size** – Scale database layers to accommodate growing data storage needs

Related Documentation

- What is CONTROL?
- Specifications

Specifications

Overview

CONTROL is a carrier-grade device management platform designed for service providers requiring comprehensive multi-vendor and multi-protocol device management capabilities.

Platform Characteristics

Carrier-Grade Architecture

- **Multi-protocol and multi-vendor support**: Enables management of diverse device ecosystems through multiple southbound protocols including TR-069, MQTT, SNMP, API, and CLI
- **Standards compliance**: Full adherence to Broadband Forum Device Management Specifications
  - CPE WAN Management Protocol (TR-069 Amendment 6)
- **Cloud-native design**: Horizontally scalable cloud-based architecture for enterprise-grade performance
- **OSS/BSS integration**: Seamless integration with Service Provider operational and business support systems through flexible APIs

Core Functionalities

Device Lifecycle Management

- Automated device onboarding
- Comprehensive firmware management
- Bulk provisioning capabilities

Configuration Management

- Device general information and configuration
- WAN technologies: LTE, GPON, Cable, DSL
- LAN and WiFi configuration
- CWMP protocol configuration
- Services configuration
- Configuration scripting and automation

Diagnostics and Troubleshooting

- TR-143 based device diagnostics
- Advanced CLI for technical troubleshooting
- Real-time device monitoring

Scalable Database Architecture

- Integrated database for high-scale deployments supporting millions of device records
- Native database integration with optional support for external database systems
- Multiple device provisioning methods:
  - Web-based GUI
  - Bulk provisioning
  - Auto-onboarding
  - External API integration

Flexible Management Interface

Dual Access Methods

- Intuitive web-based GUI for manual operations
- Comprehensive API for automation and integration

Role-Based Access Control

- Customizable privileges based on user and organization profiles
- Support for multiple user types: call center users, NOC operators, engineering staff

Reports and Analytics

Comprehensive Reporting

- Device-based reports
- Location and group-based analytics
- Interactive heatmaps

Data Analysis and Export

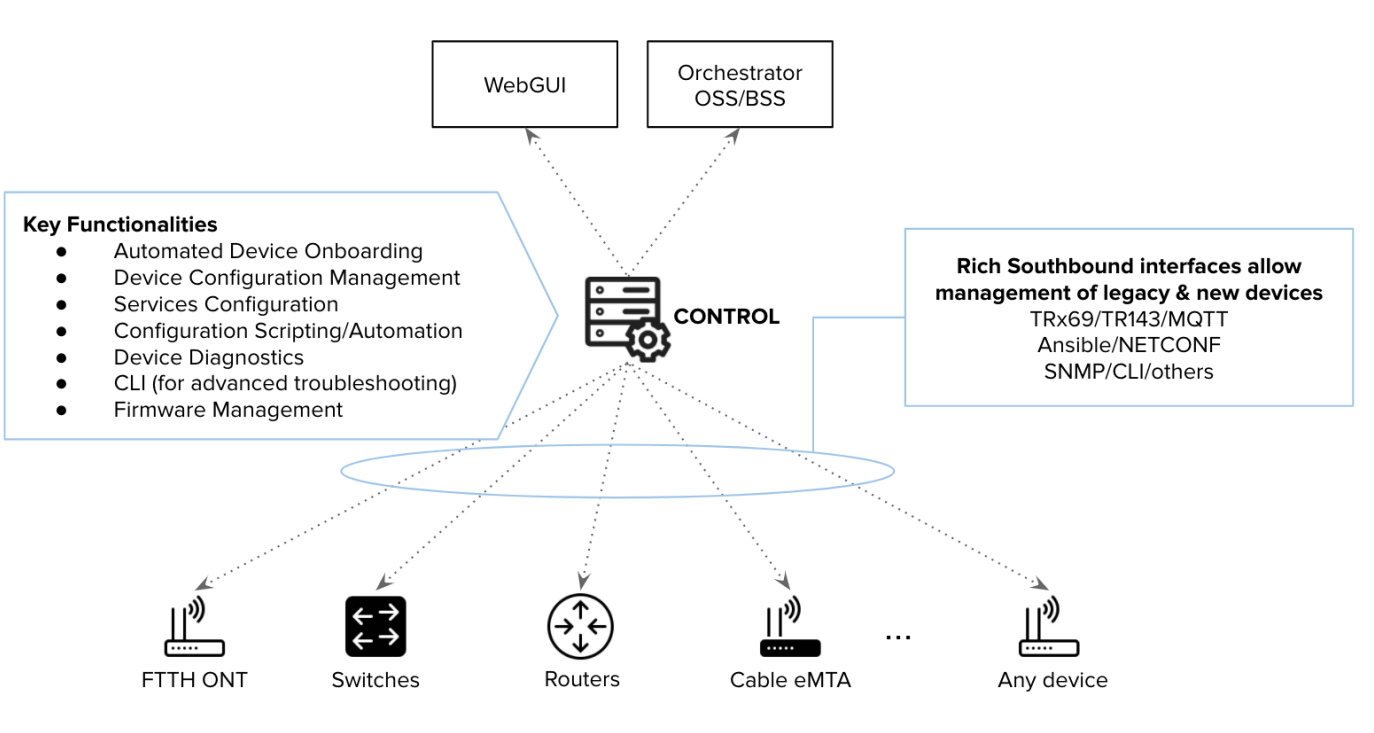
- Historical metrics tracking for any device parameter
- Multiple export formats: CSV, API, and more
- Custom reporting capabilities

Further Reading

What is CONTROL?

Overview

CONTROL is a multivendor and multiprotocol Device Management Platform, also known as an ACS (Automated Configuration Server). It enables service providers to efficiently manage and support customer premises equipment (CPE) regardless of manufacturer or device model.



Key Capabilities

CONTROL provides comprehensive device management functionalities designed for service provider operations:

- **Automated Device Onboarding** – Streamlined provisioning of new devices
- **Device Configuration Management** – Centralized configuration control and version management
- **Services Configuration** – Service-level parameter configuration and deployment
- **Configuration Scripting/Automation** – Script-based workflows for bulk operations
- **Device Diagnostics** – Real-time monitoring and diagnostic tools
- **CLI Access** – Command-line interface for advanced troubleshooting
- **Firmware Management** – Centralized firmware updates and version control

Protocol Support

CONTROL communicates with managed devices through standard and secure southbound protocols, including:

- TR-069 (CWMP)
- MQTT
- SNMP
- CLI
- Additional vendor-specific protocols

This multi-protocol approach ensures unified device management across different brands and models through a single platform.

User Interface

Web-Based GUI

CONTROL features a comprehensive web-based graphical user interface for configuration, settings management, and troubleshooting. The interface supports role-based access control with differentiated privilege levels:

- **Read-only** – View configuration and status information
- **Read-write** – Modify device settings and configurations
- **Admin** – Full platform administration capabilities

RESTful API

All configuration settings and management actions are accessible through a flexible RESTful API, enabling seamless integration with existing OSS/BSS platforms and custom automation workflows.

Additional Resources

- Architecture
- Specifications