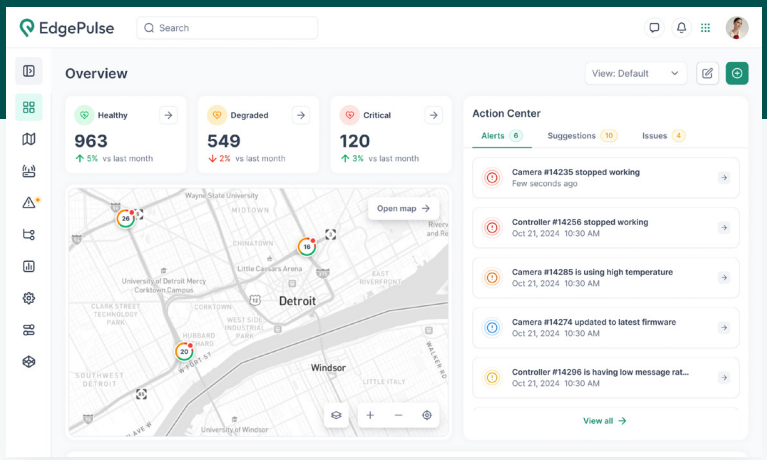
EdgePulse

A Unified Platform for Monitoring and Managing ITS Devices

EdgePulse is a robust platform designed to help Intelligent Transportation System (ITS) managers and IT departments maintain their critical infrastructure effortlessly. EdgePulse offers real-time visibility, intuitive management tools, and proactive alerts, all through a user-friendly, map-based interface. With EdgePulse, managing complex networks of ITS devices like sensors, RSUs, processors, controllers, and routers is seamless, efficient, and reliable.



Key Features

Comprehensive Device Monitoring

Full Network Visibility: Monitor all ITS devices that support SNMP (Simple Network Management Protocol) to ensure optimal performance.

Enhanced RSU Support: Native support for NTCIP 1218 enables detailed insights into 5.9 GHz Connected Vehicle C-V2X-based Roadside Units. C-V2X-based Roadside Units.

Automated Device Discovery

Quick Setup: Automatically discover SNMP supported devices for fast and efficient setup.

New Device Detection: As new devices are deployed, EdgePulse automatically detects and adds them to the dashboard.

Firmware Management & Remote Upgrades

Firmware Tracking: Identify devices running outdated firmware versions, ensuring that all devices stay up-to-date and secure.

Remote Firmware Upgrades: Remotely upgrade firmware on supported devices directly from the EdgePulse platform, simplifying maintenance and improving device performance.

Security Credential Management System (SCMS)

Credential Status Tracking: Monitor the Enrollment and Application certificates status for each RSU to ensure secure communications.

Certificate Management: Identify RSUs that have failed to renew their security certificates, helping to maintain a secure and compliant ITS network.

AI-Enhanced Analytics & Reporting

Performance Monitoring: Monitor key metrics like uptime, response times, and device health with interactive graphs and charts, and historical trends.

AI-Curated Reports: Receive instant, customized reports as AI reviews and synthesizes key metrics, trends, and tailored recommendations to support informed decision-making.

Interactive Map-Based Dashboard

Map-based Device Management: Visualize and manage all devices on an intuitive map-based dashboard, with options to filter status by device type, roadway corridor, or network region.performance.

Real-Time Device Status: View device statuses instantly and pinpoint issues for efficient, centralized troubleshooting.

Remote Device Management

Seamless Management: Remotely configure, update, and troubleshoot devices from a single platform, reducing on-site maintenance.

Auto Backup & Quick Restore: Automatically save and restore device configurations for fast, minimal-downtime hardware replacements.

Connected Vehicle (V2X) Suite

MAP and TIM Message Creation: Visual, map-based tools make it easy to edit, and manage MAP and TIM messages across your RSU network.

Validation & Scheduling: AI-assisted validation ensures SAE J2735 compliance, with advanced scheduling tools for targeted message delivery.

Proactive Alerts with Custom Triggers

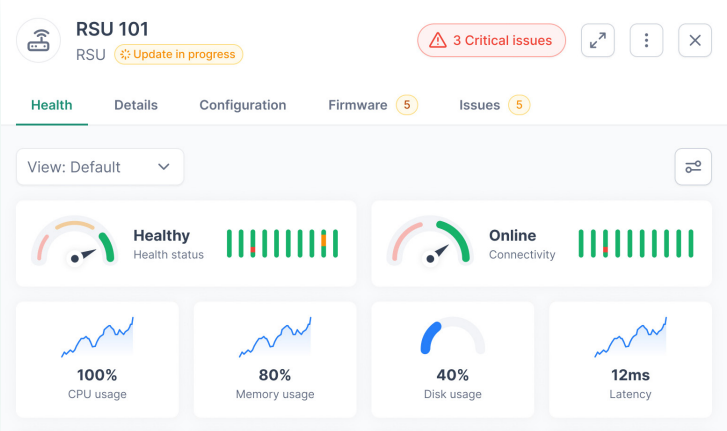
Dynamic Alerts: Receive real-time notifications when devices go offline or any metric falls outside a set range.

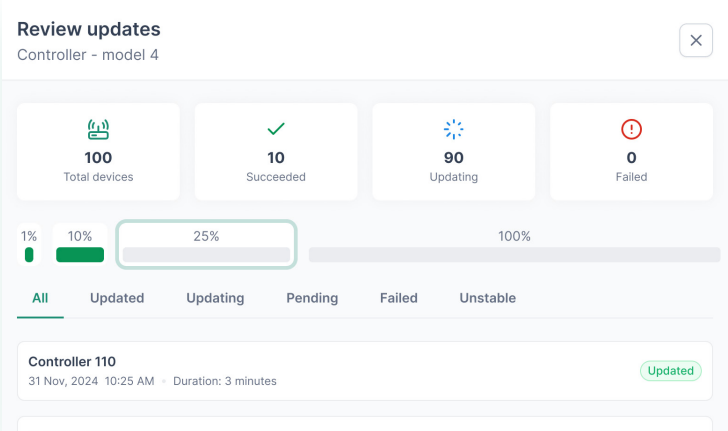
Customizable Alerting System: Use our custom expression language to set up alerts tailored to your specific network needs, ensuring timely responses to critical events.

API Access & Workflow Automation

Comprehensive API Access: hare monitoring data including V2X, device performance, and network health with external tools for enhanced insights and data accessibility.

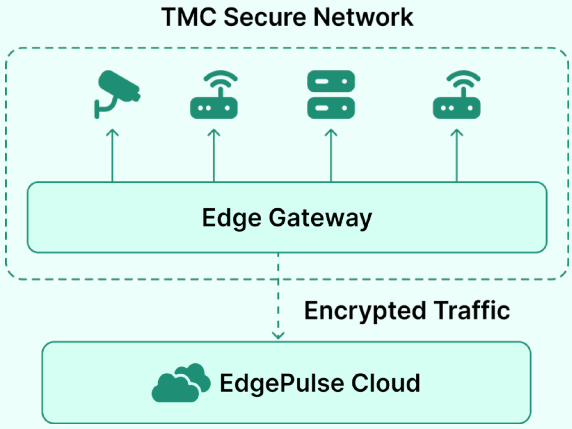
Automated Workflows: Integrate with third-party systems to automate device management, enabling real-time control and streamlined ITS operations.





Secure Communication Architecture

The Edge Gateway, deployed within the TMC data center, enables secure, streamlined communication without requiring inbound network access. It initiates monitoring and management from within the TMC through network isolation, using TLS-encrypted outbound-only connections to the cloud to ensure robust security without open inbound ports.



System Requirements

Environment Requirements

OS	Linux (CentOS, Ubuntu, RHEL)
CPU	8-Core, 64-bit with KVM
Memory	16 GB+
Storage	250 GB+ SSD
Network	1 Mbps+ with VLAN access

Security Specifications

Network Security	HTTPS/TLS, IP whitelisting, VLAN access for device discovery/monitoring
Encryption	AES-256 (at rest), TLS 1.2+ (in transit)

Standards & Conformance

EdgePulse provides comprehensive health monitoring and management for ITS devices, conforming to these standards:

NTCIP Standards

NTCIP 1218: Roadside Units (RSUs)

NTCIP 1201: Global Object Definitions

NTCIP 1202: Actuated Traffic Signal Controller (ASC) Units

NTCIP 1102: Octet Encoding Rules (OER) Base Protocol

NTCIP 1103: Transportation Management Protocols

NTCIP 1203: Dynamic Message Signs (DMS)

NTCIP 1103: Transportation Management Protocols

NTCIP 1204: Environmental Sensor Station (ESS)

NTCIP 1205: Closed Circuit Television (CCTV) Camera Control

NTCIP 1206: Data Collection and Monitoring (DCM) Devices

NTCIP 1207: Ramp Meter Control (RMC) Units

NTCIP 1208: Closed Circuit Television (CCTV) Switching

NTCIP 1209: Transportation Sensor Systems (TSS)

NTCIP 1211: Signal Control and Prioritization (SCP)

NTCIP 2202: Internet (TCP/IP and UDP/IP) Transport Profile

NTCIP 9014: Infrastructure Standards Security Assessment (ISSA)

Supported Protocols

SNMP, MQTT, HTTP/HTTPS, SSH, FTP, RTSP

Connected Vehicle V2X Standards

IEEE 1609, SAE J2735, CTI 4501/4502

Supported V2X Messages

SPaT, MAP, TIM, SRM, SSM, PSM, BSM, PSM2, RTCM, RWM, PVD, PDR, TUM, CCM, MSCM, WSA, RSM, PDC, TAM, TUMACK, SDSM, RGA

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