AIRBIQUITY AND WIND RIVER

Airbiquity® and Wind River® are collaborating to integrate key technologies for the development of an end-to-end software lifecycle management solution for connected and autonomous vehicles, spanning vehicle to cloud. The solution enables secure and intelligent over-the-air (OTA) software updates and data management.

Proper and proactive management of software over the course of a vehicle's lifecycle is becoming increasingly important to enhance performance, maintain value, and address safety and security threats. Using OTA, automotive OEMs can securely transmit diagnostic and operational data and efficiently deploy software updates to mitigate recall expenses and enable new vehicle features.

Together, Wind River and Airbiquity provide the automotive industry an open and flexible OTA solution combining market-leading software technology components to create a comprehensive, interoperable, pre-validated OTA solution backed by the expertise of two industry-leading software technology companies. An integrated solution combining Wind River Edge Sync and Airbiquity OTAmatic® also has applicability to multiple nonautomotive IoT sectors, such as medical, industrial, aerospace, military, and telecommunications.

Wind River is contributing Edge Sync, a highly modular OTA update and software lifecycle management solution. Airbiquity is contributing OTAmatic, a cloud-based OTA service including OTA orchestration, campaign management, software and data management, and Uptane-based security framework capabilities.

KEY COLLABORATION BENEFITS

- The pre-integrated solution brings together the expertise of both companies, while demonstrating key OTA benefits to automotive OEMs and suppliers such as flexibility, ease of integration, and modularity.
- Wind River is a proven expert in delivering safe and secure IoT software and solutions for mission-critical systems. Airbiquity is a pioneer in automotive telematics and a global leader in connected vehicle service delivery.
- Together, the two companies offer comprehensive experience and geographic coverage for automotive software and service delivery:

    – Proven concept, prototype, and production experience
    – 400+ engineering, test, and quality assurance personnel
    – Global customer service and support coverage
    – Resource alignment with leading automotive service centers

Ecosystem Component
Airbiquity OTAmatic

Solutions
Automotive

Value

- Combined expertise that supports flexibility, ease of integration, and modularity
- Safe and secure coverage of automotive software and service delivery

WHEN IT MATTERS, IT RUNS ON WIND RIVER

KEY SOLUTION COMPONENTS

Wind River Edge Sync agent and differential system:

- **Secure vehicle OTA logic:** Vehicle side logic for communication to and from the cloud, download/upload, coordination of multi-ECU updates, data collection, error handling and reporting, and rollback and recovery. Security is reinforced via Uptane Security Framework integration.

- **Differential generation and application:** Server and vehicle side solution for generation and application of differential updates optimized to operate in bandwidth and memory constrained environments with support for critical automotive update use cases:

  – Supports A/B, streaming, in-place updates, and differential and full updates within a single update client

  – Supports multiple compression methods with configurable compression levels, depending on allotted memory

Airbiquity OTAmatic service delivery:

- **OTAmatic service delivery platform:** Cloud side solution for policy-based campaign management, software and data management, bandwidth management, and Uptane security framework integration.

- **OTAmatic OTA orchestrator and data agent:** Vehicle side solution for managing dynamic data collection and a comprehensive framework for efficiently creating, executing, and updating on-board edge analytic modules.
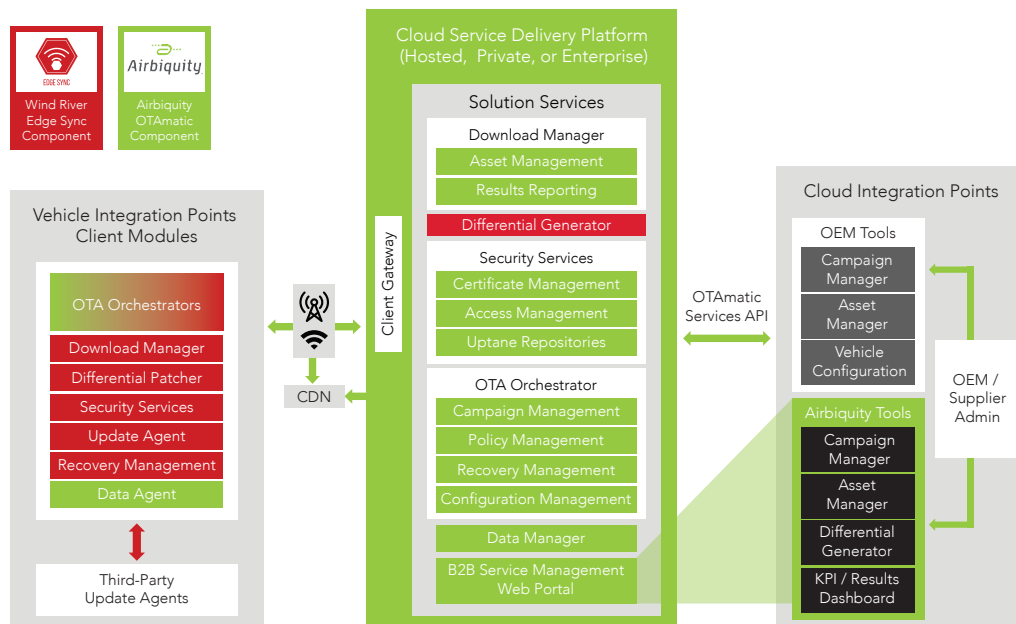

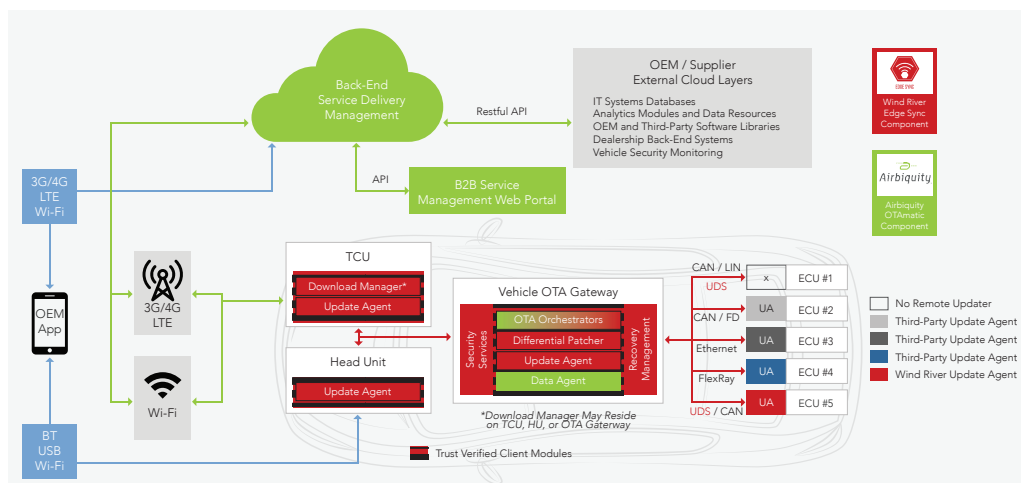*Figure 1. OTA solution architecture and integration summary*

Figure 2. OTA solution vehicle deployment summary

SUPPORTED OTA USE CASES

The Wind River–Airbiquity OTA solution is specifically designed to meet the unique needs of automotive and to assist automakers in managing an increasingly complex software and data environment. The solution handles both multi-ECU software updates and data management and is available for production deployment.

- Single and multi-ECU software updates
  - Unified Diagnostic Services (UDS) updates for secondary and legacy ECUs

- Multiple and parallel software updates
  - Sequential and parallel installations
  - Firmware, system, application, and HMI

- Advanced OTA software update orchestration
  - Preconditions, priorities, and dependencies
  - Fault and error detection, recovery, and rollback

- Defense-in-depth security approach
  - Compromise-resilient Uptane software security system
  - Standards-based confidentiality, integrity, and authenticity

- Pre- and post-installation scripting
  - Saving and restoration of ECU configurations

- Multiple bus support
  - CAN, Ethernet, MOST, and FlexRay

- Dynamic and flexible data management framework
  - Definable collection: Frequency, triggers, logs, DTCs
  - Upgradable in-vehicle edge analytic modules
  - Data transfer from vehicle to cloud to analytics resources

WIND

- Back end service management portal
  - Step-by-step campaign configuration processes for software and data management
- Vehicle configuration web portal
  - Definition and management of vehicle ECU inventories
  - Regulatory vehicle certification compliance
- Campaign-specific consumer notifications
  - In-vehicle displays and smartphone application HMI
- Comprehensive campaign reporting
  - Collective and individual campaign results

WIND RIVER EDGE SYNC

Edge Sync provides a solution to allow for rapid, safe, and secure updates to software and firmware to continuously improve the value of the car and customer experiences on a long-term basis. It also includes technology that enables the smallest differential update when conducting OTA updates. Keeping updates minimal reduces distribution time and cost, update transmission time, and memory required on automotive electronic control units (ECUs).

AIRBIQUITY OTAMATIC

OTAmatic is a multi-ECU OTA solution that securely orchestrates and automates vehicle software updates and data management from the cloud. OTAmatic provides a sophisticated OTA service with highly refined vehicle and device targeting, discrete policy and privacy controls, customizable consumer communications, multilayer cybersecurity protection, and solution deployment flexibility.

SUMMARY

OTA is an increasingly important use case for automotive OEMs to support connected and autonomous vehicles. Together, Wind River and Airbiquity offer a highly competitive OTA software lifecycle management solution comprised of leading vehicle and cloud OTA software technologies backed by comprehensive deployment experience and geographic coverage for the automotive industry.