

ARCHITECTING THE AUTOMOTIVE NETWORK:

4 NETWORK OBSERVABILITY STRATEGIES FOR MANUFACTURING, RETAIL, AND CONNECTED VEHICLES



EXECUTIVE SUMMARY

The automotive industry is undergoing a fundamental transition driven by electric vehicle production, software-defined mobility, and digitized retail. As manufacturers modernize their facilities, the underlying network architecture supporting these operations has grown more complex. IT and operational technology networks are converging on the factory floor, while global supply chains depend on flawless connectivity. Dealerships require uninterrupted access to digital services, and connected vehicles demand continuous cloud communication for critical updates. Traditional network monitoring approaches fail to capture the reality of these distributed environments.

This ebook details four specific strategies for implementing network observability to provide the intelligence required to isolate faults and validate performance across the end-to-end automotive ecosystem.



Network observability is emerging as the preferred term for describing network monitoring and troubleshooting solutions

Network Observability - EMA Research Report



#1

AUTOMATED FAULT ISOLATION FOR CONVERGED FACTORY ENVIRONMENTS

Modern automotive manufacturing facilities integrate hundreds of distinct systems, merging information technology infrastructure with operational technology. When connectivity drops on an active assembly line, network engineers receive excessive redundant alerts from switches, industrial control systems, and application servers. Manually analyzing these notifications to isolate the fault drastically increases the time to resolution. Production downtime carries an immense financial cost, making manual triage unsustainable. Implementing unified observability across both environments allows teams to correlate disparate events automatically using precise flow analysis, identifying the exact device or software failure instantly and bypassing the excessive volume of symptom-based alerts.

ACTIONABLE INSIGHT

Deploy unified telemetry collection that ingests and correlates IT and OT data simultaneously. This strategy immediately isolates the root cause and prevents engineers from evaluating irrelevant alerts.



More than 55% of the alerts network monitoring tools generate are false alarms or issues that don't require a fix

Network Observability - EMA Research Report



#2

CONFIGURATION STANDARDIZATION ACROSS GLOBAL ASSEMBLY LINES

Automotive production relies on a vast network of global logistics hubs and assembly plants. Operating at this scale requires absolute consistency in network infrastructure. When engineers manually execute configuration changes via command-line interfaces, the probability of human error increases significantly. A single typographical error during a routine switch update can halt an entire manufacturing line. Legacy configuration management practices lacks the speed to identify unauthorized changes or revert errors quickly. High availability requires strict auditing of device states and the programmatic deployment of standardized configurations across global facilities to prevent configuration deviations and localized outages.

ACTIONABLE INSIGHT

Transition away from manual device configuration by implementing centralized, automated network configuration management. Ensure the system includes automated auditing and instantaneous rollback capabilities to restore functional states.



30% of network-related problems are caused by manual errors, such as bad configuration changes

Network Management Megatrends - EMA Research Report

#3

MONITORING APPLICATION EXPERIENCE FOR DEALERSHIP NETWORKS

The automotive retail experience relies heavily on seamless digital interactions. Dealerships require persistent connections to dealer management systems and consumer financing portals to operate effectively. Network teams face significant visibility gaps because remote locations typically utilize VPN or SD-WAN running over local internet service providers. When an application performs poorly, traditional monitoring methods cannot locate where packet loss or latency occurs across the public internet path. Engineers need precise, hop-by-hop data detailing the performance of the overlay network and provider underlay to accurately diagnose connectivity degradation and hold service providers accountable.

ACTIONABLE INSIGHT

Deploy lightweight active testing endpoints at dealership locations to continuously measure the network path. This method provides definitive evidence of provider latency and isolates performance degradation to specific routing hops.



95% of organizations don't get all the ISP information they want

**Cloud and internet usage generates network observability blind spots -
Dimensional Research Survey**

#4

VALIDATING CLOUD TRANSIT FOR CONNECTED VEHICLE INFRASTRUCTURE

The transition toward electric and software-defined vehicles has exponentially increased reliance on public and hybrid cloud environments. Automotive manufacturers depend on cloud infrastructure for backend services, including over-the-air software updates and smart charging integrations. The primary difficulty is that conventional monitoring tools lose visibility the moment traffic exits the corporate firewall. IT teams cannot diagnose issues occurring within the infrastructure of major cloud providers, leading to extended service outages. Maintaining operational control over connected vehicle services requires continuous network path analysis that extends through external cloud networks and transit environments.

ACTIONABLE INSIGHT

Extend network observability beyond the corporate perimeter by continuously monitoring the external infrastructure. Analyze traffic paths directly into cloud provider networks to quickly identify external routing failures causing service disruption.



Fewer than 25% of organizations have tools that can answer all their questions about their networks

Network Observability - EMA Research Report

UNIFYING THE NETWORK MONITORING ARCHITECTURE

Automotive infrastructure managers routinely struggle with fragmented monitoring systems that separate factory operations, dealership networks, and cloud environments into isolated data sets. When a critical connectivity failure occurs, engineers waste valuable time cross-referencing these disconnected systems instead of analyzing the actual network fault. A unified architecture that consolidates telemetry across the entire automotive ecosystem resolves this operational limitation.

Integrating active path testing, device configuration auditing, and automated fault correlation eliminates visibility gaps from the operational technology layer directly to public cloud providers. This structural consolidation allows network professionals to accurately isolate performance degradation globally.

ACTIONABLE INSIGHT

Standardize your network configuration and telemetry collection onto a single, comprehensive observability architecture. Consolidating IT, OT, and cloud data reduces time-to-resolution and provides the exact architectural evidence required to validate performance.



Nearly 59% of organizations are likely to replace their incumbent network observability tools over the next two years

Network Observability - EMA Research Report





Explore Network Observability by Broadcom to learn how it can help you consolidate the vision of your network infrastructure.

<https://networkobservability.broadcom.com/>

