

An aerial, top-down view of a dense railway track system. The tracks are made of metal rails and wooden sleepers, forming a complex network of lines and curves. In the lower right quadrant, a train is visible, moving along one of the tracks. The overall scene is in grayscale, with a dark, moody atmosphere. The text is overlaid in white, providing a high contrast against the dark background.

SHIFT**5**

MODERN OBSERVABILITY FOR ROLLING STOCK

<Presenter Name>

Most rail organizations spend millions on observability solutions for the IT systems that run their operations.

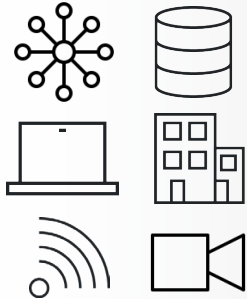
Shouldn't a \$2M locomotive have better observability than a \$1,500 laptop?



Elements of a typical railroad system

Information Technology (IT) TCP/IP-Based protocols

Back office



Communications



Wayside & Signaling



vs

Onboard Operational Technology (OOT)

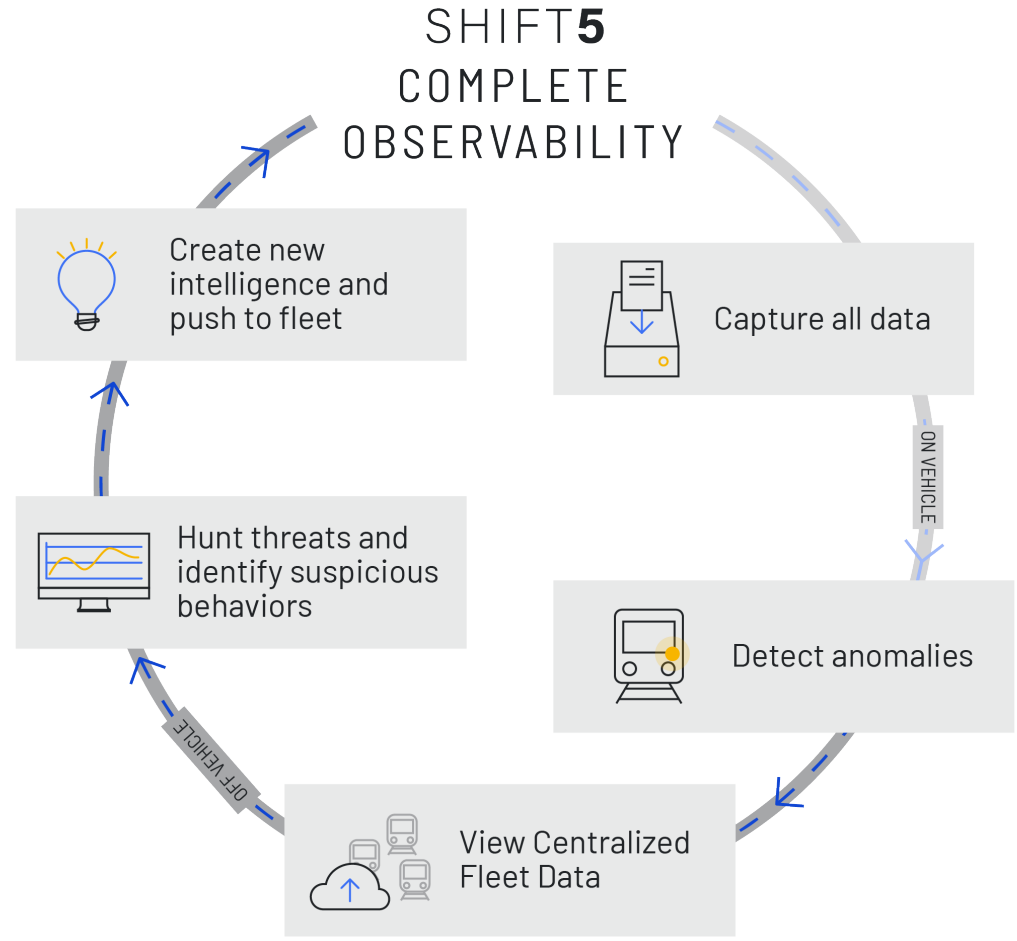
Serial-Based Protocols



- Engine Control Units
- Braking systems
- Propulsion systems
- Some Positive Train Control devices

CRITICAL VISIBILITY GAP into the serial data that powers critical onboard systems

Get Modern Observability with Shift5



The Shift5 Platform

Collect

- Shift5 captures data from on-board networks, including IP and serial bus networks
- Compression rate of >10:1 Starting at 512GB storage
- Supports streaming and air-gapped modes for offline and online capability

Analyze

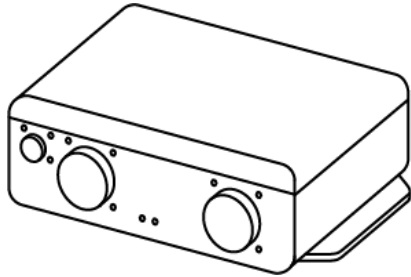
- Advanced algorithmic machine learning engine for continuous monitoring without false positives
- Behavioral heuristics with advanced statistical methods
- Detects anomalies and senses aircraft state
- Secures software upgrades to your legacy LRUs

View

- Visualizes complex aircraft network data and translates it into meaningful information
- Enables cyber analysts to conduct incident response, intrusion detection, and prevention
- APIs for data scientists

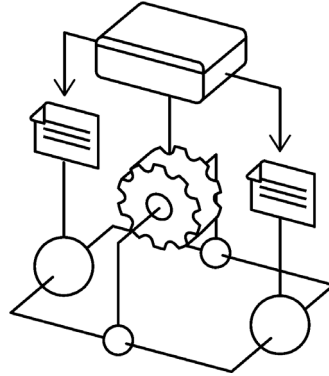
How Shift5 Works

Intake



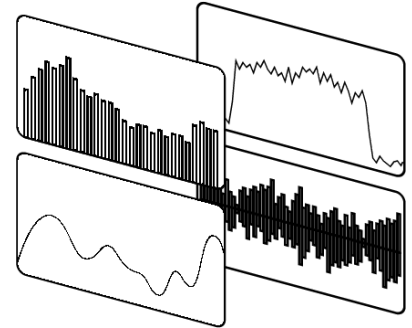
Full-Take Embedded Data Capture

Engine



Anomaly detection, logging, and alerting

Gauge Cluster

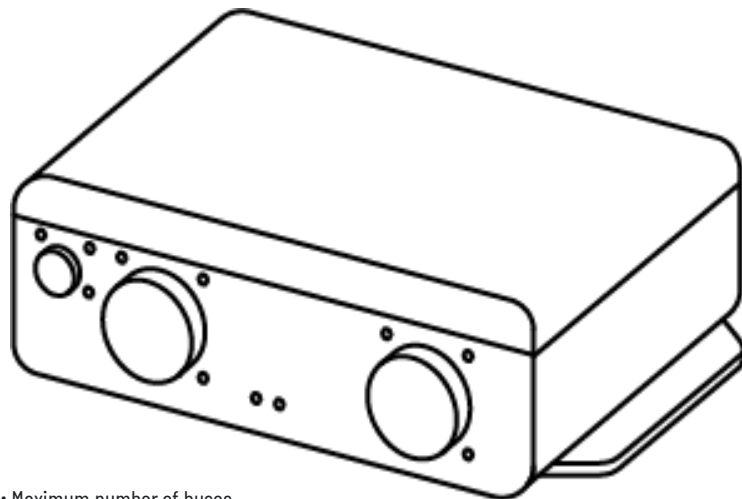


Visualization and Analysis

How Shift5 Works

Intake

- Deploys as Hardware or Software
- Minimal SWaP: This model is <100 in³, <5 lbs, <5-32 VDC power
- Full-take data capture: MIL-STD 1553, J1939, CAN 2.0, RS-232, RS-485, ARINC 429, and more
- Single device covers multiple buses and protocols (see chart)
- Compression rate of >10:1 Starting at 512GB of storage [6+ months of data]
- Supports streaming and air-gapped modes for offline and online capability



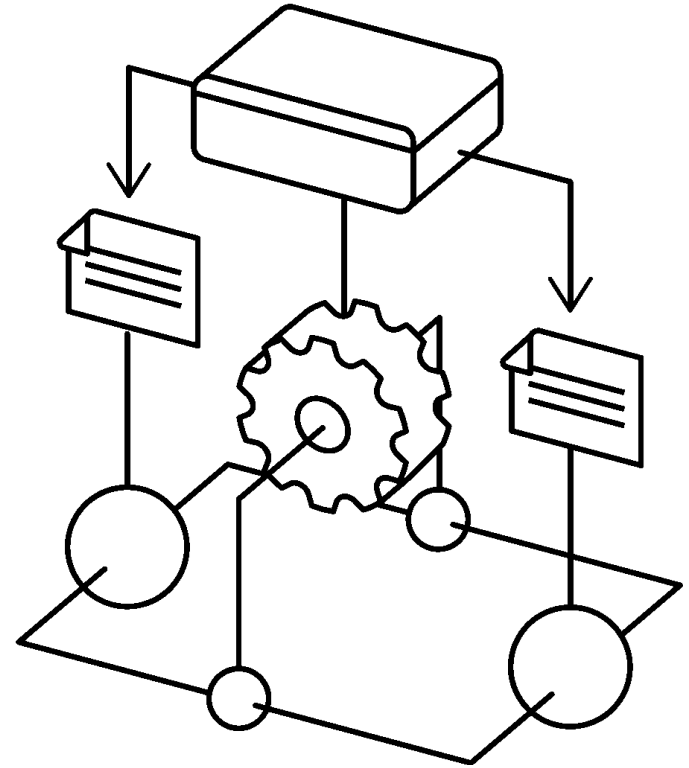
EXAMPLE: Maximum number of buses
(in the single protocol configuration)

Version	Mini PCIe slots	1553	429	CAN	RS422
100	3	6	18	12	6
200	4	8	24	16	8

How Shift5 Works

Engine

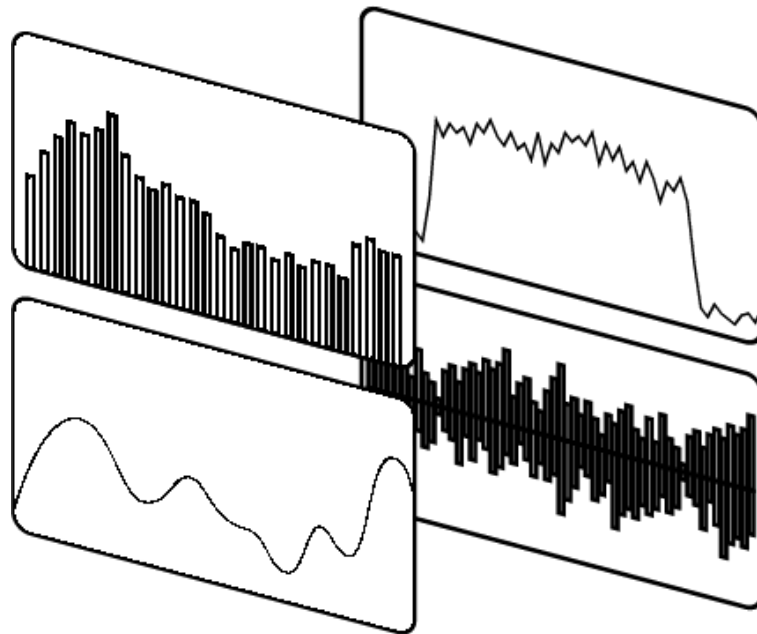
- Machine learning engine for continuous monitoring without false positives
- Combines behavioral heuristics with advanced statistical methods and machine learning algorithms
- Detects anomalies and senses vehicle state
- Logs and enforces vehicle software configurations
- Secures software upgrades
- Sends alerts and logs activity



How Shift5 Works

Gauge Cluster

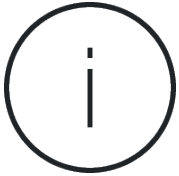
- Visualizes intake data to answer questions in near real-time across entire fleets
- Transforms complex OT network data into meaningful information
- Enables cyber analysts to conduct incident response, intrusion detection, and prevention
- APIs for data scientists
- Make sense of the big picture or drill-down into unit level details



Reveal Critical Insights Into Rolling Stock

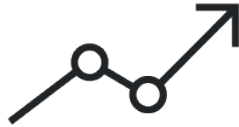
Modern Observability Starts Here

CYBERSECURITY & THREAT HUNTING



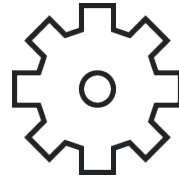
Protect the cyber attack surface and respond quickly to threats.

MAINTENANCE & OPERATIONS



Gain critical insights that improve operational efficiency.

REGULATORY COMPLIANCE



Automate and ease the burden of regulatory requirements.

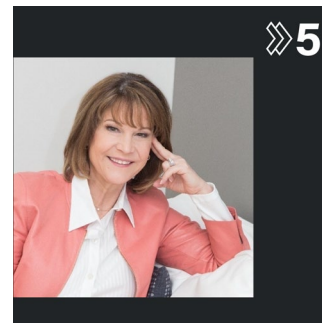
DATA AGGREGATION



Combine IT, IoT, and onboard OT data into a single view.

Next steps

Get a demo today.



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Next steps

Get a demo today.



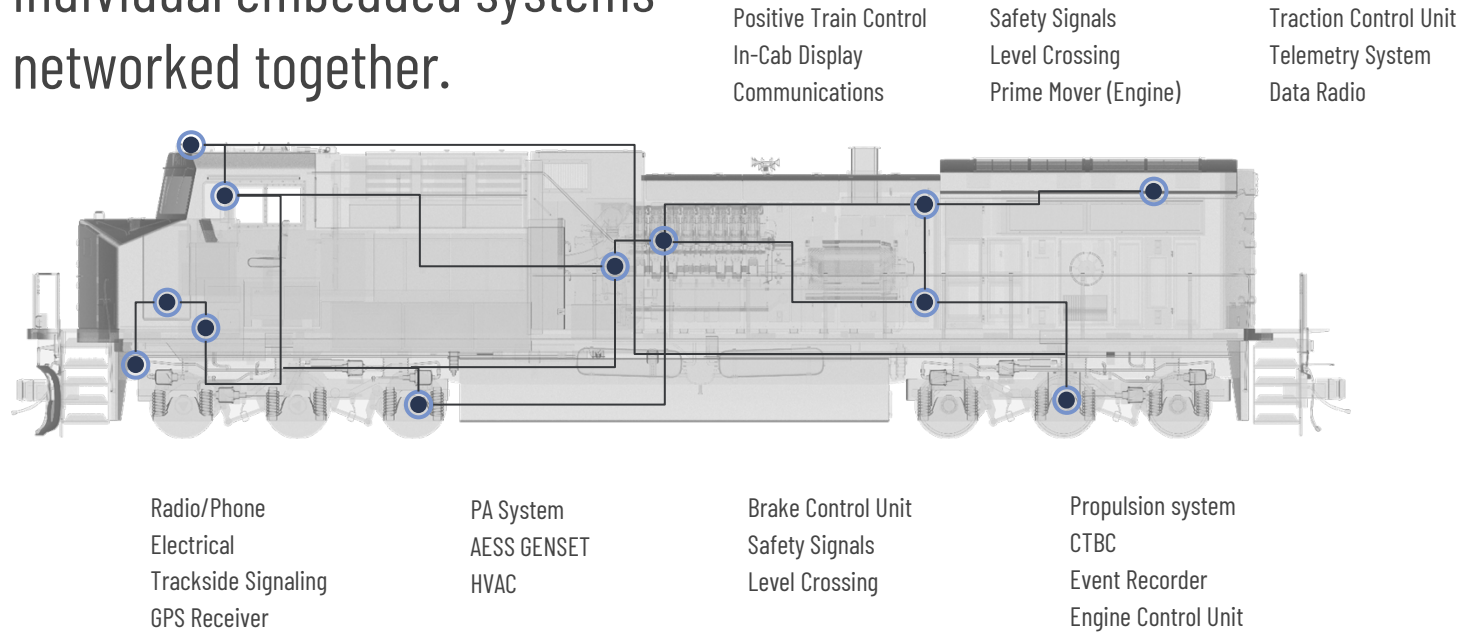
Andrew Dubbs
Commercial Account Executive
Andrew@shift5.io
650.995.3691

THANK YOU

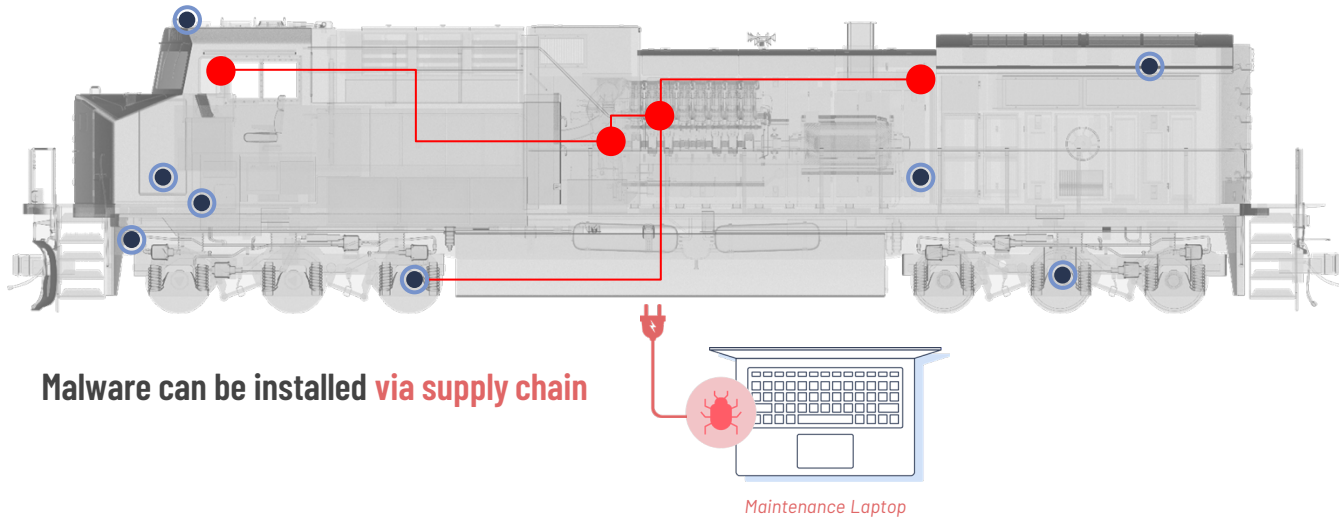
An aerial, top-down view of a dense and intricate railway track system. The tracks are made of metal rails and wooden sleepers, forming a complex web of lines that curve and cross each other. A single train is visible on one of the tracks in the lower right quadrant. The background shows some urban buildings and trees, but they are mostly obscured by the tracks. The overall image has a dark, monochromatic aesthetic with a blue bar at the bottom.

Backup Slides

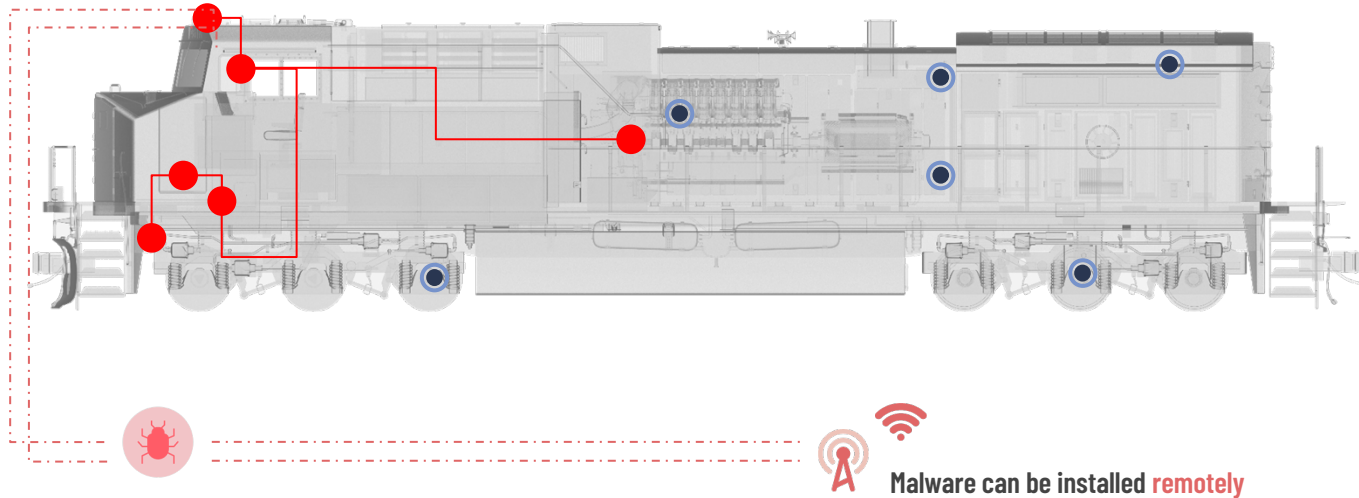
Rolling stock is made up of many individual embedded systems networked together.



Every connection
is a possible attack vector.



Every connection
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Why rail organizations choose Shift5

Deploy a single solution

- Flexible Platform deployment
- Vehicle agnostic
- SWaP optimized hardware
- Option to stream or store data

Capture all data

- Full serial bus data collection
- Any bus in any combination
- 1000+ hours of data retention
- Industry-leading compression

Create new intelligence

- Feed data into other systems
- Insights from correlated data
- Immediate value to SOC teams
- Build advanced interactions

Take a structured approach to rail asset cybersecurity

