Cisco Connected Rail

Greater Safety, Mobility, and Efficiency

Cisco® Connected Rail is a set of reference architectures, validated network designs, Cisco and third-party network products, and Cisco Services for rail transportation owners and operators. Our Connected Rail solutions can be deployed onboard trains, trackside, and in stations to achieve a range of safety, mobility, and efficiency objectives.

The validated Cisco Connected Rail solutions enable rail operators to integrate aging, proprietary networks onto a highly reliable, interoperable IP network. With one connected network, operators can boost passenger safety while slashing network cost and complexity. You can team with service providers to deliver new high-speed voice, video, and data services to passengers. And you improve operational efficiencies (Figure 1).

Figure 1. Cisco Connected Rail Solutions Designed for Rail and Mass Transit Operators

Provide an IP network supporting both passenger services and vehicle operations applications for main line and metro rail.

Challenges in the Rail Industry

New safety mandates require automated capabilities between trains and backend systems. Meanwhile, passengers want mobile Internet access and more amenities while commuting and traveling.

Addressing these challenges is complicated. Much of the world's rail infrastructure is decades old. The high cost of maintaining these aging systems continues to rise. Aging systems also tend to fail more frequently, posing safety risks. Modern railcars and locomotives are often incompatible with outdated infrastructure. Proprietary, single-purpose networks are also incompatible with each other and have limited capacity.

All this means it's almost impossible to achieve end-to-end communications. Let alone deploy new mobility, video, and data services and passenger amenities. High sunk costs in existing infrastructure make it impractical to "rip and replace" systems. Not to mention the disruption to services this process would create.

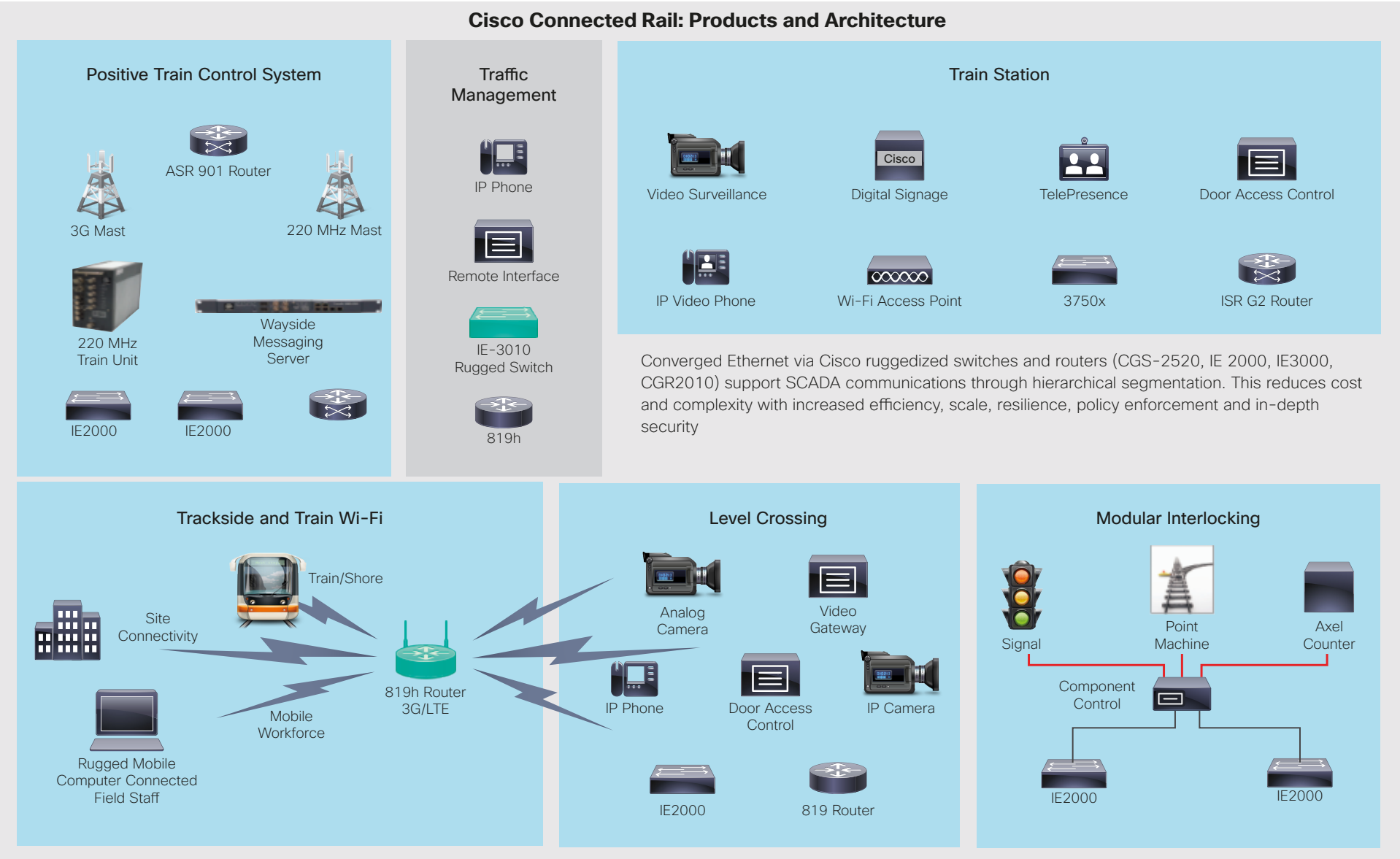
Converged Network Capabilities: The Future of Rail

Rail operators can see the need for adopting multifunction IP communications networks across their rail systems. A best-case scenario would have a converged network that complements existing systems while enabling smooth migration to next-generation capabilities. But how do you achieve that?

With Cisco Connected Rail.

The Cisco Connected Rail architecture contains validated network designs for **Cisco Connected Train, Connected Trackside, Connected Stations, and Positive Train Control** solutions (Figure 2). Validated designs support network interoperability through proven, well-established technologies to maximize implementation success. Together, these components help you future-proof new investments.

Figure 2. Cisco Connected Rail Overview



For Full Connected Rail Architecture High Resolution Diagram, Click Here

- Cisco Connected Train

  This solution includes an onboard, high-speed, wired and wireless IP network. It supports passenger services and operations applications for main line and metro rail.

- Cisco Connected Trackside

  This solution replaces multiple, older proprietary railway networks with a Cisco Unified MPLS Mobile Transport (UMMT) network. A single IP network supports operational services while reducing cost and complexity. Intelligent video surveillance systems increase safety and security for passengers and rail employees.

- Connected Station

  This Connected Rail component integrates multiple in-station networks and retail communication systems to a standards-based IP network.

- Positive Train Control

  Cisco Positive Train Control is the industry's first end-to-end rail communications network that complies with U.S. Rail Safety Improvement Act requirements. It integrates onboard, trackside, wayside, signaling, and back-office systems and is designed to help prevent train collisions, derailments and other human caused rail accidents.

Cisco Connected Rail solutions comprise a broad array of Cisco access and aggregation switches, ruggedized mobile IP and Embedded Services routers, Industrial Ethernet switches, intelligent IP surveillance cameras, and wireless LAN access points.

What's in It for Rail Operators?

With Connected Rail, you'll meet new safety compliance requirements and increasing demands for improved service levels and productivity. Other benefits to you:

- **Deployment success:** Validated network designs and proven products minimize deployment risk. And Cisco offers Strategy and Analysis, Assessment, Design, Deployment, Optimization, Product and Solution Support, and Operations Management services to help. Accelerate deployment, optimize efficiency, and simplify ongoing management of your Connected Rail solution with confidence – through Cisco Services. And Cisco Connected Rail solutions are expertly engineered. We pre-test your solution with you, so that you can confidently expect optimum performance when deployed.
- **Ability to scale:** The same digital data link and network used for onboard passenger services can also transmit information to train crews, monitor completed work, and send real-time diagnostics with locomotive information.
  And it's easy to add new services to the IP network. For instance, add video surveillance to improve passenger and asset security. Deliver secure mobile Wi-Fi services to passengers. Or give station and trackside employees new mobile communication capabilities. One network. More options.
- **Improved performance and resiliency:** The Cisco UMMT transport network is built for high reliability. It includes access, aggregation, and core network layers with field-proven ruggedized Ethernet switching at the edge. A multipath backhaul delivers sub-second reconvergence for high performance.
- **New business opportunities:** A network that delivers rich, flexible features creates new opportunities. Bundle high-speed mobile network services with ticket plans. Offer daily, weekly, or monthly data plans to frequent riders. Onboard passenger information systems can stream content to LCD screens and display location, weather, advertisements, or travel tips. Personal entertainment units may stream movies during long trips. Online ticketing and purchasing services give passengers greater convenience and offer rail operators cross-sell opportunities.

Why Turn to Cisco?

Cisco has been collaborating closely with rail customers and industry experts over the past several years. We listen to their input and have made major investments in our validated designs.

We're shaping the future of rail. And, we're committed. Only Cisco offers an end-to-end integrated solution that securely delivers high-speed voice, video, and data services onboard trains, in stations, at trackside, or when connecting the train and track.

Together with Cisco Services, Cisco Connected Rail solutions help customers achieve greater mobility and meet safety and compliance goals faster and more effectively than with other solutions that lack Cisco infrastructure capabilities.

Cisco Services

Cisco Services make networks, applications, and the people who use them work better together. From strategy to execution, we help you plan, build, manage, and support your Cisco Connected Rail Solution. We apply our industry leading experience to help you improve system operational efficiency, scalability, security, and profitability with an end-to-end approach that aligns outcomes to your business goals.

For More Information

For more information on Cisco Connected Rail solutions, visit http://www.cisco.com/go/connectedrail or contact your Cisco account representative.

To see how Cisco is helping to transform mass transit, check out this video.

C45-731578-00 05/14