Allied Telesis™

Smart Transportation Solutions

NETWORK SMARTER

Connection is our business

Allied Telesis designs and implements highly secure and flexible transportation networks. Our transportation solutions provide security and safety, alongside ultimate operational efficiency and enhanced, simple network management. Allied Telesis intelligent and converged networks are connecting roads, railways, airports, and shipping ports all over the world.

To achieve all these goals and more, Allied Telesis transportation solutions provide:

▶ **Resiliency**
Eliminate potentially life-threatening failures in traffic-controlling equipment. Optimize fault tolerance, and achieve extremely rapid recovery for reliable security video transmission and the remote control of key systems.

▶ **High performance**
Transmit large numbers of surveillance video feeds, enable rapid switching between monitored streams, while also transporting control, ticketing, information, entertainment, and other data.

▶ **Sophisticated management**
Conduct detailed network performance monitoring and comprehensive network event audits. Utilize Allied Telesis Autonomous Management Framework™ (AMF) to greatly reduce the time and cost of managing network infrastructure.

▶ **Security**
Eliminate network threats and enable risk-free integration with external agencies' networks.

▶ **Convergence**
Easily integrate video surveillance, ticketing, information, control, and other systems into a converged transportation network.

Transportation goals

▶ Ensure fast and efficient passenger movement.

▶ Provide real-time transportation updates for passengers.

▶ Simplify and automate ticketing and entry systems.

▶ Provide secure monitoring of public transportation systems.

▶ Reduce traffic congestion on city roads.

Transportation needs and objectives

At Allied Telesis, we know that transportation authorities everywhere face significant challenges. In today's fast-paced world, transportation systems must be designed to work together to reduce traffic congestion on city roads, ensure fast and efficient passenger movement, automate ticketing and entry systems, and provide a safe and secure passenger experience.

The electronic systems that enable modern passenger movement must be highly capable and sophisticated to support the many automated transportation access and control services that run simultaneously. This requires an extremely robust and high-functioning network.

Your transportation network must be resilient, since any failure in traffic controlling equipment could be life threatening. Extended temperature devices, and products that run on DC power, may be required to provide flexible deployment options.

High-performance is essential to allow for large numbers of video surveillance feeds, which run alongside ticketing, infotainment, live update, and control systems.

A modern transportation network is required to provide passengers with an enhanced experience, with features such as real-time wait and arrival times, and free Wi-fi on buses and trains. You also need a sophisticated management feature set to conduct detailed network performance monitoring, and of course, robust security is absolutely essential.

Finally, as your network converges data from multiple applications, these must be integrated for seamless management. Managing the network should be centralized, and as simple and efficient as possible.

Finding a network that meets all these needs can seem like an impossible task—but whether your network covers roadways, railways, shipping, or an airport, with an Allied Telesis Transportation Solution, it is both achievable and simple.

Why Allied Telesis?

Allied Telesis is an industry leader in networking solutions. With a proven history of delivering highly reliable and feature-rich advanced network solutions, and considerable experience in integrating transportation solutions, more and more transportation authorities are turning to Allied Telesis to achieve their objectives.

Allied Telesis Transportation Solutions provide the resiliency, high performance, sophisticated management, and security you need for your transportation network, both now and well into the future. Our innovative, high-value products meet your requirements for a robust and scalable solution, while still working within your budget.

With an Allied Telesis solution, you also get the significant technical, financial, and operational benefits that come from using a single network vendor from end-to-end across the network. You can avoid issues with interoperation, simplify support escalation paths, optimize network design, and avoid purchasing complications.

Read on to learn how Allied Telesis can provide enhanced operations for your organization.

Resiliency

ELIMINATE NETWORK DOWNTIME

Your network needs optimal resiliency to minimize the risk of dangerous and costly downtime. A failure in your network can disrupt systems, leading to congestion and the potential for accidents on roadways, or delays for public rail, air and harbor ferry services.

Allied Telesis products include state-of-the-art resiliency features to eliminate failures in traffic-controlling equipment. With an Allied Telesis Transportation solution, you can optimize fault tolerance, and achieve extremely rapid recovery for reliable video surveillance transmission and remote device control.

Our solution features a number of different sophisticated high availability features. Plus, our products work together to provide a robust and reliable network, ensuring data flow continues even during outages. You get a resilient network, leading to reduced traffic congestion on roads, and always-on security monitoring. The result is safe passenger movement, and effective operation.

Resiliency benefits

▶ Seamless network flow, even in demanding conditions.

▶ High performance at the core of your network.

▶ Higher bandwidth and optimum use of available bandwidth.

▶ Optimal network speed.

▶ Ensure continued delivery of essential services.

▶ Reduced risk of network outages.

▶ Continued service, even in the event of a power supply failure.

Allied Telesis advanced resiliency features

Ethernet Protection Switched Ring (EPSRing™)

EPSRing allows Allied Telesis products to form a protected ring of switches. A multiple ring EPSRing network can provide extremely high performance, with recovery in as little as 50ms. This is ideal for traffic control, passenger access systems, and video surveillance across an airport, a railway system, or city-wide metro network.

Virtual Chassis Stacking (VCStack™)

VCStack provides uninterrupted network service, and delivers chassis-like resiliency and redundancy features. Combined with Link Aggregation, VCStack provides a superior network solution with no single point of failure.

Environmentally-optimized equipment

Our backbone switching equipment is optimized for both outdoor and controlled-environment indoor deployment. Extended temperature products are built to handle the harshest environments. Feature-rich, high performance dual-band outdoor wireless routers provide connectivity where it's needed.

Built-in power redundancy

Power redundancy guarantees the continued delivery of essential services. Many of our key products reduce the risk of network outage with dual load-sharing PSUs, when only one is required to power the device.

Hot Swappable Power Supply Units (PSUs)

PSUs can be easily removed and replaced with no interruption to the network. Using two separate power sources (feed redundancy) provides even more power redundancy.

High Performance
REAL-TIME NETWORKING

High performance is a must for transportation systems. To reduce roadway congestion, you must control traffic, which requires accurate real-time information about traffic density, and the locations of accidents and maintenance work. Similar real-time data enables effective public transportation operation for buses, ferries, planes and trains, by monitoring queues, reducing waiting time, and providing live updates of arrival and departure information.

A number of transport management elements have been in place for some years, including electronic signs, video and still image feeds, centralized traffic light control, real-time bus arrival updates, and automated train station ticketing systems. These methods work most effectively when they are unified over a single communications infrastructure. The very best choice for this is IP over Ethernet. Our solution gives you industry-leading high performance, so you can easily transmit large numbers of video surveillance feeds alongside signal control systems, ticketing and access systems, as well as live update and infotainment for passengers.

Our advanced networking products ensure your network resources and applications are always available, with superior high performance features.

Allied Telesis high performance features
Superior Quality of Service (QoS)
Prioritize real-time data and manage bandwidth allocation to specific applications with superior QoS features, ensuring wirespeed delivery of all your critical IPv4 and IPv6 traffic.

High-speed Ethernet
Products that support Ethernet at 10, 40, or 100 Gigabits per second ensure maximum data throughput to support multiple simultaneous network applications.

EPSRing
With the ability to form high-speed network rings at multiples of 10, 40, or 100 Gigabits per second, EPSRing can provide extremely high performance for distributed networks. Provide virtually uninterrupted access to resources and online passenger movement and information systems.

Virtual Chassis Stacking (VCStack)
VCStack provides uninterrupted network service, and maximizes the use of available network bandwidth to guarantee access to information when you need it.

Layer 2 and Layer 3 multicasting
Feature-rich and high performance Layer 2 and Layer 3 multicasting allows transmission of large numbers of video surveillance feeds and enables rapid switching between monitored streams, which ensures video surveillance plays its key role in public transportation security and safety for passengers.

High performance benefits

- ▶ High system reliability.
- ▶ Maximum data throughput.
- ▶ Wirespeed connectivity.
- ▶ Rapid recovery from failures.
- ▶ Lower operational costs through no longer needing to maintain multiple systems.
- ▶ Higher data rates and a simple upgrade path to yet higher data rates in the future.
- ▶ Collection of more data for transport analysis and modelling that underlies future planning.

Sophisticated Management

COMPREHENSIVE, PROACTIVE MONITORING

Your transportation network requires a sophisticated management feature set that allows for clear, comprehensive visibility of network status, and proactive monitoring of network events and performance trends.

Effective network management requires centralized control and visibility, while reducing operational costs, as transportation networks tend to be very large and distributed over wide geographic areas. Safe and reliable passenger movement, whether by road, air, rail or sea, requires information and control systems to be always available and easily accessed. By reducing the expense and travel time involved in managing your transportation network, an effective solution is realized, which enables proactive monitoring and event recovery and keeps the network operating in peak condition.

Allied Telesis Transportation Solutions provide a full range of tools for monitoring network health and rapid alerting of network events. Our centralized network management system simplifies operation and automates network administration to eliminate errors, provide up-to-date network back-ups, and enable zero-touch network recovery.

Allied Telesis advanced management features

Allied Telesis Autonomous Management Framework™ (AMF)

AMF is a sophisticated suite of management tools that provides a simplified approach to network management. Common tasks are automated, and everyday running of the network is made extremely simple. Powerful features

Sophisticated management benefits

- ▶ Easily conduct detailed network performance monitoring and comprehensive network event audits.
- ▶ Clear, comprehensive visibility of network status.
- ▶ Proactive monitoring of network events and performance trends.
- ▶ Guaranteed confidentiality, with multiple secure options for monitoring and configuring devices.
- ▶ Reduced management overhead with integrated network services.
- ▶ Simplified administration with automated network security.

like centralized management, auto-backup, auto-upgrade, auto-provisioning, and auto-recovery enable plug-and-play networking and zero-touch management.

AMF is ideal for large transportation networks, which can be operated as a single virtual entity. Automated back-ups and firmware upgrades simplify the task of keeping the network operating at its peak. Automated network expansion and replacement reduce the time and effort required to solve network disruption, and enable plug-and-play replacement of units—ideal for large distributed environments.

Vista Manager EX—powerful network management and monitoring

Vista Manager EX is the intelligent way to monitor and manage your entire network. including AMF controlled switches and routers, wireless access points, and third party devices.

Single-pane-of-glass visibility improves network management. Enjoy complete network monitoring from the dashboard—including network details, status, event information and a topology map, where critical issues are highlighted for timely resolution. Intuitive access to powerful features like service and performance monitoring, control of wired and wireless devices, and automation tools makes networking easy.

AlliedWare Plus™

The advanced AlliedWare Plus Operating System delivers a rich feature set and an industry-standard Command Line Interface (CLI), with encrypted management options for maximum security.

Graphical User Interface (GUI)

As well as the AW+ CLI, switches and routers can be managed using the intuitive Device GUI for monitoring and management. Some models also feature the integrated Vista Manager mini for managing wired and wireless networks.

Security

ELIMINATE NETWORK THREATS

Security is paramount to your network. With passenger safety and efficient movement of public transportation at stake, you need to protect your network from external or internal attack. As well as the increasing risk of attack from the Internet, you must protect your sensitive information from insider interference. Our solution provides a number of cutting-edge security features to protect your network from the edge to the core.

Allied Telesis UTM Firewalls provide advanced threat protection in a fully integrated solution for today's networks. Network Access Control (NAC) provides total network security, mitigating threats to your network infrastructure, and Private Virtual LANs (VLANs) provide secure access to information. We offer robust security to eliminate network threats, and to enable risk-free integration with external agencies' networks.

Allied Telesis advanced security features

Unified Threat Management (UTM) Firewalls

Allied Telesis UTM Firewalls integrate multiple threat detection and protection capabilities into a purpose built solution, providing single-pass low-latency inspection of all network traffic. Ensure your WAN connectivity is completely secure, and maximize online access to digital assets and services.

Network Access Control (NAC)

NAC allows you unprecedented control over user access to your network. Allied Telesis NAC uses industry-standard features to provide this security optimally at the interface between the user and the network, assigning network access based on identity, access method, location, and end-point security status.

Private VLANs

Multiple users sharing the same VLAN can enjoy access to appropriate network resources, while communication between user ports is blocked.

Security benefits

▶ Protect your network from external attack.

▶ Maintain unprecedented control over user access to your network.

▶ Increase your overall reliability and performance, and make the network easier to maintain.

▶ Ensure continued operation of essential services.

▶ Control the use of network bandwidth, prioritizing critical network services and applications.

Advanced network traffic management

Powerful traffic filtering capabilities can be implemented to prevent malicious LAN-based attacks. Alongside port learning limits and hardware-based Denial of Service (DoS) defense, this provides a continually secure network environment.

Industry-leading Quality of Service (QoS)

Be confident that inappropriate or malicious use of the network won't stop your essential services. Comprehensive low-latency wirespeed QoS provides flow-based traffic management with full classification, prioritization, traffic shaping, and min/max bandwidth profiles. Enjoy boosted network performance and guaranteed delivery of business-critical services and applications. Time-critical services such as streaming video feeds take precedence over non-essential services such as file transfers.

Convergence
INTEGRATED SYSTEMS WITHIN A CONVERGED NETWORK

You need a network that encourages the use of public transportation, provides up-to-date traffic information on the Internet, enables smart toll road systems, or in the case of railway and ferry operations, automates ticketing and access at terminals. Integrating these multiple services within a single converged transportation network provides a singular approach to passenger movement control that is more easily managed and unified, as services share the communications infrastructure.

Whether your network covers roadways, railways, shipping or an airport, the convergence of multiple services creates for a streamlined service that is easier to manage and can add value for passengers. Enhanced services like free Wi-Fi on buses, real-time updates on arrival and departures, and advertising of local information can all be added to the systems that actually run the transportation service. When added to video surveillance for the safety and security of passengers and property, a transportation solution that encompasses a broad range of applications makes for a superior operation.

Allied Telesis offers a broad range of highly integrated networking products that fulfill the myriad requirements of the different portions of an advanced transportation network.

Allied Telesis advanced convergence features
An end-to-end network provider
With an Allied Telesis solution, you get the significant technical, financial, and operational benefits that come from using a single network vendor from end-to-end across the network. Avert issues with interoperation, simplify support escalation paths, optimize network design, and avoid purchasing complications.

Broad product portfolio
We offer a wide range of products:
- ▶ Powerful chassis-based network core switches
- ▶ Environmentally hardened switches for street-side nodes in high-speed distribution rings
- ▶ IADs as connection points for end devices
- ▶ Feature-rich wireless routers, optimized for outdoor deployment
- ▶ A broad range of pluggable optical devices (SFPs), supporting all speeds, media, and distances
- ▶ Secure, resilient switches for control center LANs

Convergence benefits

- ▶ Run multiple systems on a transportation network simultaneously in an integrated solution.
- ▶ Airports, railways, shipping ports, and roadways all benefit from a converged network infrastructure to run multiple systems.
- ▶ Surveillance cameras reduce criminal activity in public transportation areas.
- ▶ Centralized monitoring of IP-based surveillance video enhances security.
- ▶ Wireless communication to buses updates on-board fare card databases in real time.
- ▶ Up-to-date traffic information allows road users to make informed decisions about routes.
- ▶ Remote control of automated ticket and access systems for railways and ferries reduce costs.
- ▶ Real-time safety monitoring occurs within tunnels, at airports, railway stations, and ferry terminals.

System integration
Allied Telesis advanced IP network products easily handle the competing requirements of the many systems that are included in a converged transportation network.

Wireless connectivity
Allied Telesis outdoor wireless routers are ideal to provide the wireless link between the terrestrial network and buses or trains. The flexibility, high throughput, and reliability of our wireless routers enable them to integrate with a range of network designs, in a broad spectrum of environmental conditions.

High performance encrypted tunnels
Allied Telesis routers provide high performance encrypted tunnels to securely transport toll billing information across a roadway network, or ticketing payment information from automated unmanned railway stations.

Eastlink Tollway, Australia

The 39-kilometer EastLink tollway is the fastest and safest freeway in Melbourne. Connecting the four other freeways in Melbourne's east—the Eastern, Monash, Frankston and Peninsula Link freeways—EastLink is a vital part of Melbourne's transport network.

Requirements

This high-traffic, high-speed tollway in Melbourne, Australia needed a future-proof IP surveillance network, to enable a swift and safe freeway with no delays. The new network would monitor the entire freeway, including tunnels, using over 200 brand-new digital video cameras linked to EastLink's 24/7 control room. It had to be able to carry multiple video streams and enable real-time analytics from all cameras to detect hazards.

Solution

The new network features multiple high-speed rings and ultra-fast failover, spanning the entire tollway. Each roadside communications cabinet contains an Allied Telesis Industrial Ethernet switch, connecting multiple local cameras into the network. A pair of SwitchBlade x908 Gen2 switches are connected using VCStack™ with 40 Gigabit connectivity for high availability. AMF simplifies and automates administration, while Vista Manager EX enables graphical monitoring and management.

"Allied Telesis was an easy choice for us, thanks to not just their product range but also their proven reliability, plus experience with multicast video camera data. Form factor, temperature range, design, reliability, and comprehensive support right here in Melbourne—we got it all from core to edge, with this total solution from a single vendor," says Stuart Lindsay, Engineering & Project Delivery Manager for EastLink.

"With Allied Telesis, we now have greater network insight, improved reliability, and ease of maintenance."

Stuart Lindsay
Engineering & Project Delivery Manager for EastLink

Road user safety is the real winner here. The resilient new network enables always-on access to cameras, facilitating real-time analysis of critical data, while the benefits of high availability, increased capacity and ease of management ensure non-stop operation.

Bangkok Metropolitan Administration

TRAFFIC MONITORING SYSTEM BASED ON IP CAMERAS

With a population of nine million, Bangkok, the capital of Thailand, is a truly international city within this fast-developing Asian region. The Bangkok Metropolitan Administration (BMA) has overall jurisdiction for administration and public infrastructure in the municipal area, which is comprised of 50 separate local authorities. BMA selected the Allied Telesis solution for their traffic management system.

The traffic management system is an important part of their on-going development of the city's infrastructure, and works hand-in-hand with the improvements in public transportation and upgrading of safety management systems.
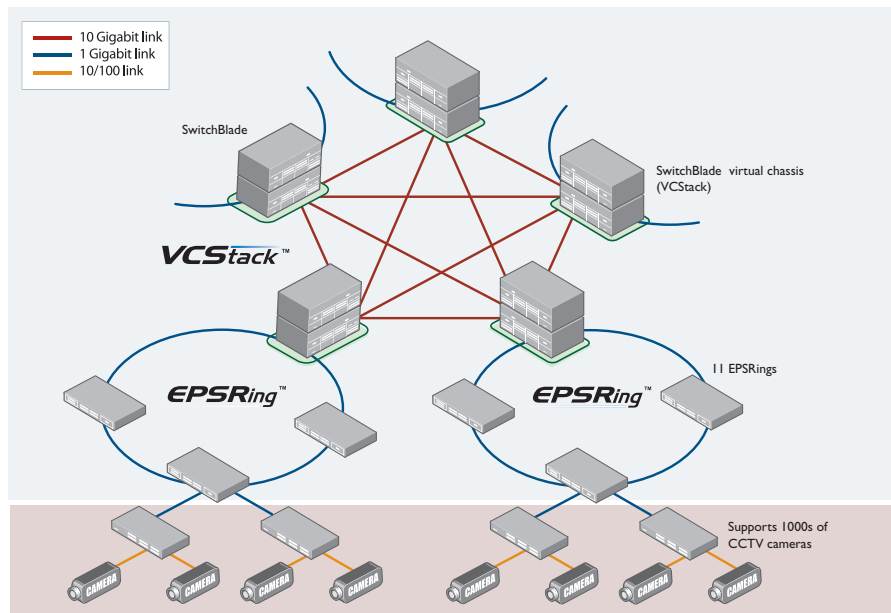
* Products shown in the diagram are only representative and may differ from those actually used.

Challenge
To install a reliable IP traffic surveillance system that covers the entire Bangkok metropolitan area.

Network requirements
▶ high bandwidth
▶ consistent high performance
▶ resilient to link and unit failure

Key criteria in selecting Allied Telesis
▶ highly reliable Gigabit switches
▶ excellent multicast IP
▶ resilient ring-based network design

Benefits provided by the new system
With this surveillance system installed, and running continuously 24/7, the city is able to deal more effectively with the daily traffic congestion. The city's five-year development plan includes a "Healthy City Development" guideline, developed by the WHO (World Health Organization). Part of the guideline is the implementation of a system to "Receive real-time images and information from all areas of Bangkok." The advanced IP surveillance system helps Bangkok achieve this goal.

Kobe Electric Railway Co., Ltd.

Kobe Electric Railway provides rail services across and around the city of Kobe, in Hyogo, Japan.

Requirements

The railway decided to enhance their services in terms of functionality and safety. The railway has 46 stations, of which only eight are physically manned by staff. This system was facing problems due to the increasing demand for high-speed network connections, and the need for a more stringent station surveillance system to maintain the level of security in the stations.

They needed a highly available network that provided uninterrupted service, yet was simply to use and maintain.

The new network had to be:

▶ **Reliable**
Kobe Electric Railway had to maintain uninterrupted operation 24 hours a day, 365 days a year.

▶ **High performing**
The company required a high-capacity, high-speed network to allow the Inter-Station Remote System to efficiently perform data transmission.

▶ **Future-proof**
The new high-speed infrastructure had to accomodate future planned applications.

▶ **Easy to use**
Kobe Electric Railway needed a simple network structure, facilitating easy maintenance.

▶ **Cost-effective**
Kobe Electric Railway wanted to make use of existing connections to cut down on their overall costs.

Solution

Kobe Electric Railway now has a new "mission-critical" inter-station remote system network, featuring Allied
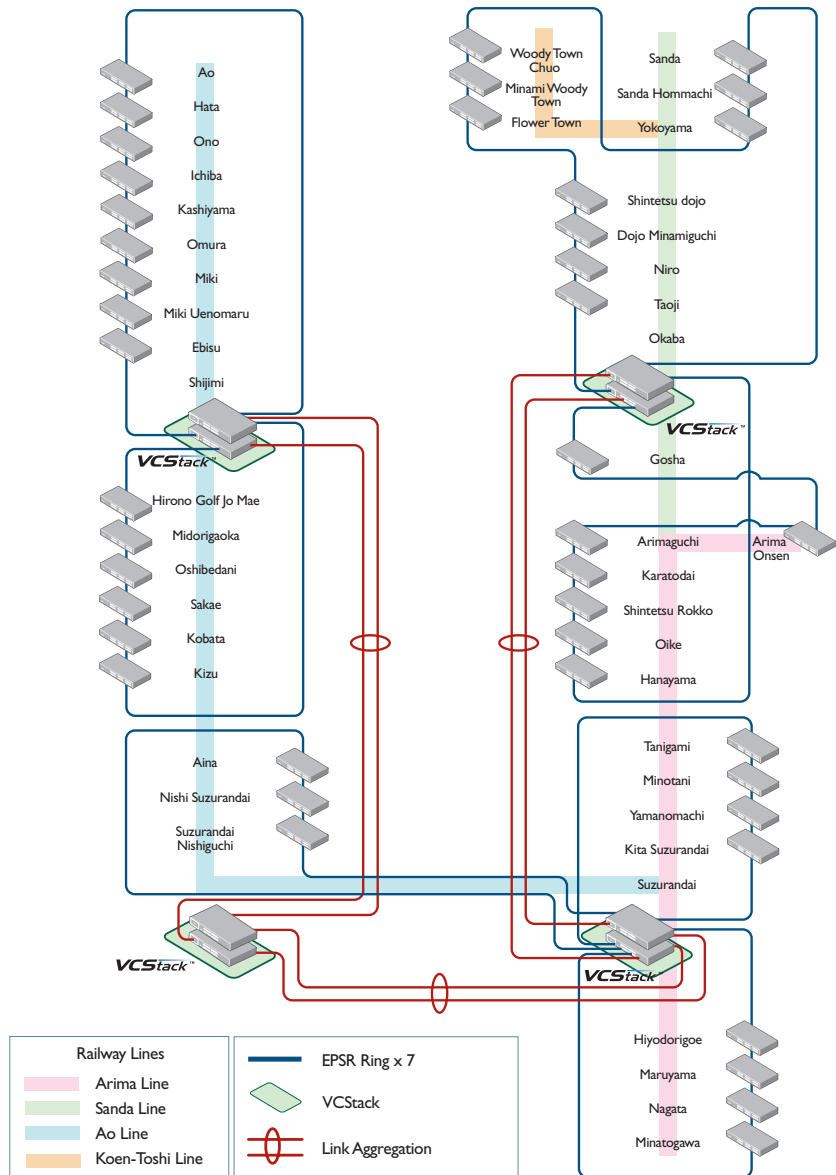
Telesis advanced Gigabit Layer 3+ expandable switches. Allied Telesis EPSRing technology provides high-speed resilient ring connectivity, which is perfect for railway station connectivity. VCStack with link aggregation achieves maximum network bandwidth and resiliency at each station.

Railway Lines
- Arima Line
- Sanda Line
- Ao Line
- Koen-Toshi Line

— EPSR Ring x 7
◇ VCStack
⬭ Link Aggregation

"VCStack enables the pairs of switches located in each station to be handled as a single switch, creating a simple network configuration which allows easy data traffic management. These products satisfy our requirements in terms of both functionality and cost performance."

Hironari Tatsuki
Information System Officer, Engineering Department, Railway Service Headquarters
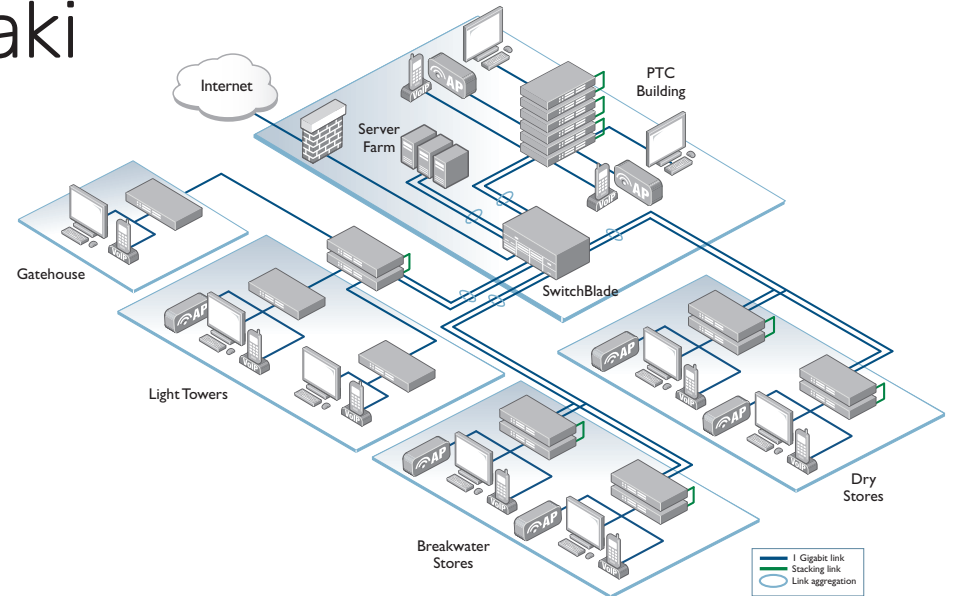
Port Taranaki

Port Taranaki, in New Plymouth, New Zealand, selects an Allied Telesis advanced solution for their network upgrade.

Requirements

Port Taranaki already had an advanced Allied Telesis network, but did not have corporate wireless capability. Wireless had become necessary due to the proliferation of laptops and other Wi-Fi capable devices. Staff increasingly needed business laptops and other wireless devices to access the network, for example, during meetings and in the boardroom and training rooms.

Solution

To upgrade its network, Port Taranaki again chose an Allied Telesis advanced solution to provide the high-performing network it needs. The port now has wireless equipment from the Allied Telesis UWC range, managed by the UWC controller, and complementing the rest of the existing Allied Telesis network.

Port Taranaki are very happy with their new wireless network:

▶ Staff wireless needs are totally met.

▶ They now have seamless mobility for network access around the port.

▶ They have VoIP phones, wireless connectivity, and application data all converged on their network.

▶ Management of the upgraded network has remained simple and effective.

▶ Service and support from Allied Telesis have been outstanding.

"Service has been brilliant. Allied Telesis staff have been very proactive and available onsite and for training. If ever we have a switch fail, Allied Telesis has been there the next day. In comparison to other vendors, Allied Telesis' service is much more proactive."

Michael Watson
IT Manager, Port Taranaki

Looking to the future

Intelligent transportation information systems have an exciting future. Integration of GPS, mobile wireless and IPv6 will undoubtedly yield some powerful applications for delivering traffic and road-condition information to drivers. Enhanced passenger services like free Wi-Fi on buses and trains, and at railway stations and airports, are already being offered, along with infotainment, live updates and local news and weather.

Significant research work is currently going into vehicle-to-vehicle and roadside-to-vehicle, communication systems to enhance collision avoidance and propagate hazard warnings for roadways networks. Public transport services like trains, ferries and buses are all enhancing the passenger experience, as well as sharing information for seamless multi-mode transportation across cities.

Allied Telesis has a long history of making leading-edge network technologies a commercial reality, and actively supports the next generation of transportation operations with advanced network solutions.

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About Allied Telesis

For nearly 30 years, Allied Telesis has been delivering reliable, intelligent connectivity for everything from enterprise organizations to complex, critical infrastructure projects around the globe.

In a world moving toward Smart Cities and the Internet of Things, networks must evolve rapidly to meet new challenges. Allied Telesis smart technologies, such as Allied Telesis Autonomous Management Framework™ (AMF) and Enterprise SDN, ensure that network evolution can keep pace, and deliver efficient and secure solutions for people, organizations, and "things"—both now and into the future.

Allied Telesis is recognized for innovating the way in which services and applications are delivered and managed, resulting in increased value and lower operating costs.

Visit us online at **alliedtelesis**.com

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