Allied Telesis™

Uninterrupted Transport Services for Kobe Electric Railway Customers

Kobe Electric Railway, in Hyogo, Japan, selects an Allied Telesis network solution, providing reliability and high performance in an easy to use, robust package.

Introduction

Kobe Electric Railway is a railway company in Japan. They provide safe, secure and comfortable railway services in 46 railway stations across and around Kobe city, in Hyo⁻ go.

A new company vision, established in 2008, saw Kobe Electric Railway aim to enhance their services in terms of functionality and safety. To meet this vision, the company needed a highly available network that provided uninterrupted service, yet was simply to use and maintain.

Allied Telesis was an easy choice to provide the right solution. Kobe Electric Railway have now achieved their goal – to provide safe, secure and comfortable railway services, supported by a highly reliable and high capacity network.

Customer Profile

Kobe Electric Railway Co. Ltd. was founded in March, 1926. The company's main office is in Kobe, capital city of the Hyogo prefecture in Japan. They have 562 employees, running 46 railway stations and 69.6 kilometers of railway line, servicing millions of people each year. Kobe Electric Railway also provide a wide range of community-focused services, including real estate, supermarkets, railway station kiosks, restaurants and child care.

As well as the advanced electronic technology that today's modern railway employs, such as electronic tickets and electronic commuter passes, Kobe Electric Railway also provides electronic equipment, including entrance gates and ticket machines, in all of its stations to improve the level of user-friendliness.

Kobe Electric Railway's railroad lines cross a number of popular tourist destinations located in beautiful natural settings, such as Rokko and the Arima Hot Springs, and new residential towns. The railway attracts scores of passengers, some commuting to work or school, and some just enjoying leisure activities.

The company's mission statement reads as follows:

> **Create a pleasant environment for passengers, and contribute to the local community by providing safe, secure and comfortable services.**

To fulfill this mission, in 2008 the company established their "Group Vision 2012," a new mid-term management plan for the fiscal years 2008 – 2012. Under this plan, the company has built a robust safety control system, and is providing ongoing improvements to enhance the safety of both the railway station facilities and the trains themselves. These improvements include developing new electronic equipment, for example entrance gates and ticketing machines, to provide electronic ticket functions and services; upgrading station facilities to prevent criminal activities and improve the level of public security; and introducing elderly-friendly electronic tickets.

Kobe
JAPAN

Kobe is the capital city of the Hyo⁻ go Prefecture of Japan, located in the Kinki region on Honshu Island. Kobe is the sixth-largest city in Japan and is a prominent port city with a population of about 1.5 million.

Kobe was one of the first cities to open for trade with the West following the end of the policy of seclusion, and has since been known as a cosmopolitan port city. Today it is Japan's fourth busiest container port.

The city is the point of origin and namesake of Kobe beef, and is the site of one of Japan's most famous hot spring resorts, Arima Onsen.

Summertime weather throughout Hyo⁻ go is hot and humid. During the winter, the north side tends to get lots of snow, while the south side only gets occasional flurries.

Customer requirements

Reliable, high performing, future proof, easy to use and cost effective.

Of Kobe Electric Railway's 46 stations, only 8 are physically manned by staff. An 'Inter-Station Remote System' was introduced in April, 2000, which allows staff working at major stations to operate ticket machines and entrance gates located in unattended stations. This system, however, 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, among other issues.

It became clear that Kobe Electric Railway needed to upgrade their network. 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 respond to future planned image and sound applications.

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

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

"With our old network, it took a long time to identify the cause of the problem when there was network failure. A highly-reliable, large-capacity next generation network was essential in order to launch new electronic equipment, and a new inter-station remote control system.

Maintaining safety is essential when providing railway services. We had to re-build our network urgently, because after we introduced the new electronic equipment, increased data traffic caused the network to become congested."

Hironari Tatsuki
Information System Officer,
Engineering Department,Railway Service Headquarters, Kobe Electric Railway Co. Ltd.

Challenges

Kobe Electric Railway need to maintain uninterrupted operation 24 hours a day, 365 days a year. This was made more complex by the fact that each night, stations undergo night time maintenance which requires the power to be temporarily turned off. It was of utmost importance that the new network support this, without affecting other stations.

"The power supply is temporarily stopped in some of our stations almost every night because of the maintenance work performed after the last trains have finished their operation. It is therefore essential for us to create a new network that does not affect other stations in these cases," says Kazuya Moriuchi of the Electric Section in the Engineering Department, Railway Service Headquarters, Kobe Electric Railway Ltd.
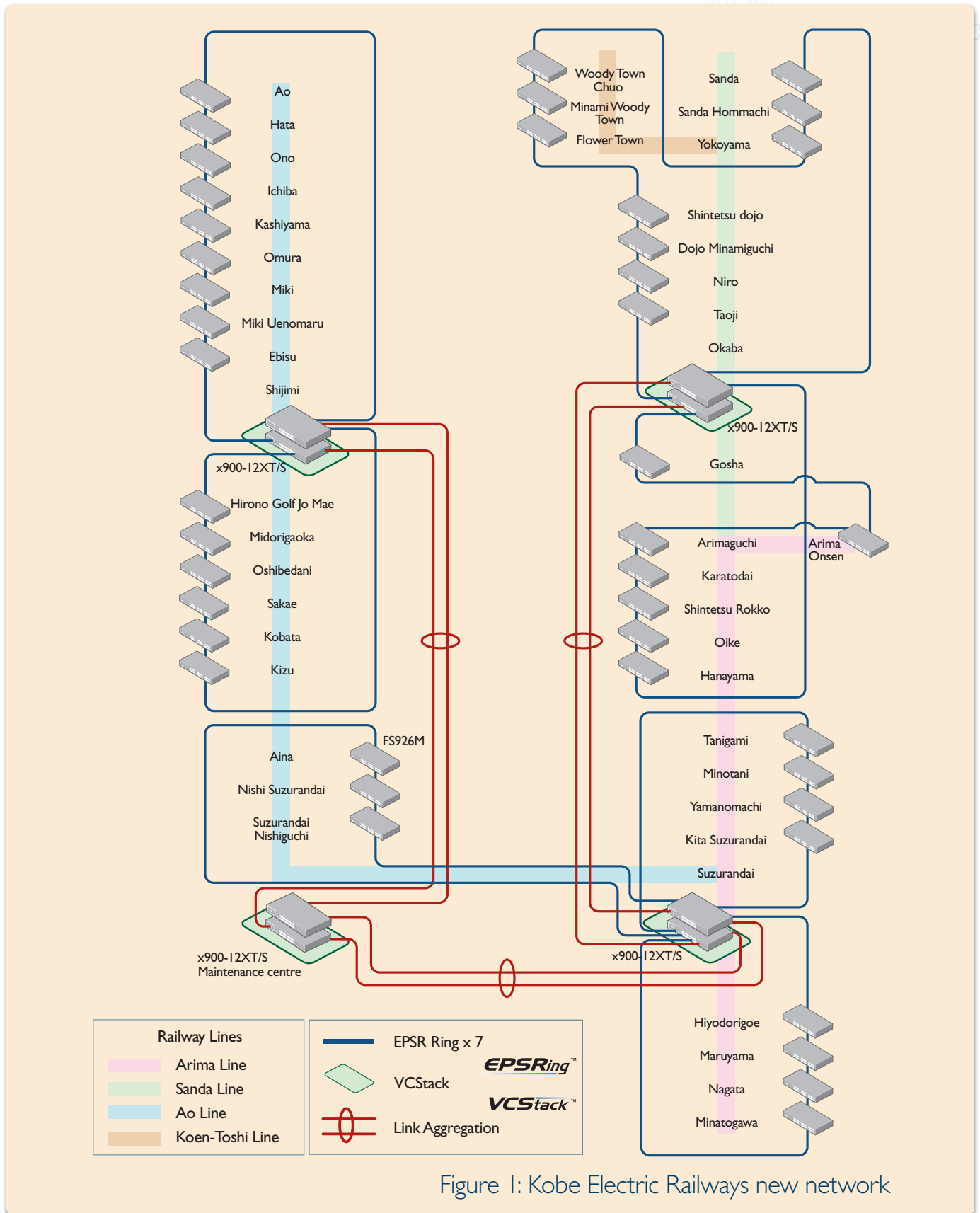
The solution

Figure 1: Kobe Electric Railways new network

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

EPSR Ring x 7
VCStack
Link Aggregation

Kobe Electric Railway now have a new 'mission-critical' inter-station remote system network featuring Allied Telesis x900 Series Advanced Gigabit Layer 3+ Expandable Switches.

The new network utilizes Allied Telesis Ethernet Protected Switched Ring (EPSR) technology, as well as Virtual Chassis Stacking (VCStack™) with link aggregation, achieving maximum network bandwidth and resiliency.

Highly-reliable ring network achieved by EPSR and VCStack

The next-generation network design divides the overall network into three major blocks, Suzurandai, Okaba and Shijimi stations, with seven different EPSR rings.

Pairs of x900-12XT/S are located in the three major stations, acting as single virtual chassis using VCStack. These virtual switches are connected using link aggregation, for complete link and device redundancy. If a link or device in the stack fails, the traffic is seamlessly routed to the other, ensuring there is minimal network disruption.

EPSR is Allied Telesis' flagship solution when you need extremely fast failover between nodes in a resilient ring of switches. EPSR enables rings to recover within as little as 50ms, preventing a node or link failure from affecting the network, even when demanding applications are in use.

AT-FS926M Layer 2 Intelligent switches are used in the unmanned stations, connected to the x900 virtual chassis in the main stations as part of one of the seven EPSR rings.

This high-speed next-generation network enables extremely fast data transmission to electronic equipment located in the 46 different stations. Fujitsu Network Solutions Limited (FNETS) undertook the new network installation for Kobe Electric Railway.

''These particular products of Allied Telesis meet the requirements of Kobe Electric Railway when it comes to both functionality and cost performance. An increasing number of our clients seek switch redundancy, because a network forms the lifeline of their businesses, but there are often significant equipment costs. Allied Telesis' products offer an alternative – they provide the right solution at the right price, improving not just a company's network but also their cost performance''
                                    - Hideaki Fujiwara, Fujitsu Network Solutions Limited.

''VCStack enables the pairs of x900-12XT/S 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.''

''A large amount of data will be transmitted to the major stations when we introduce our planned large-capacity applications. Multiple rings will enable efficient data traffic management''

Hironari Tatsuki

Information System Officer, Engineering Department,Railway Service Headquarters, Kobe Electric Railway Co. Ltd.

Benefits of the new solution

The Allied Telesis products' provide advanced technology, ensuring Kobe Electric Railway meet their goal – to provide safe, secure and comfortable railway services.
Kobe Electric Railway's new network is now:

- ■ Reliable
- ■ High performing
- ■ Easy to use
- ■ Future-proof
- ■ Cost-effective
- ■ Secure
- ■ Backed up by superior service and support

Reliable
Kobe Electric Railway now enjoy uninterrupted network service 24 hours a day, 365 days a year.

VCStack
The x900 series switches use VCStack, which delivers chassis-like resiliency and redundancy features without the high price tag. The virtual network core created with VCStack provides fast failover for uninterrupted network service.

Ethernet Protected Switched Ring (EPSR)
EPSR provides extremely fast failover between the switches. EPSR enables rings to recover within as little as 50ms,

preventing a node or link failure from affecting data transfer around the seven rings that make up the new network.

These sophisticated high availability features ensure traffic flow continues even during outages, so Kobe Electric Railway's advanced automated ticketing and station management systems always function reliably.

High-performing
Kobe Electric railway now has a high capacity network, which allows the Inter-Station Remote System to perform efficient data transmission. In the past, limited network bandwidth prevented electronic ticket information from being transmitted in a timely fashion. With gigabit links connecting the stations together in high-speed, large-capacity EPSR rings, data transmission is now completed instantly.

The non-blocking architecture and Quality of Service (QoS) features of the network core ensure wire-speed delivery of all critical network traffic.

Easy to use
Kobe Electric railway now enjoy a simple network structure facilitating easy maintenance procedures.

VCStack
The x900 switches at the three main stations use VCStack, so they appear as single virtual chassis - with a single IP address to simplify management. VCStack increases port density and resiliency without increasing management complexity.

AlliedWare Plus
The x900 series switches run the advanced AlliedWare Plus Layer 3 Fully Featured Operating System, delivering a rich feature set and an industry-standard CLI. AlliedWare Plus is Allied Telesis' next generation operating system, providing advanced IPv4 and IPv6 features combined with even greater robustness and ease of management.

The industry standard Command Line Interface (CLI) reduces training requirements, and

a Graphical User Interface (GUI) provides a web-based mechanism to configure and monitor the switches.

AlliedWare Plus features secure remote management options, including SNMPv3 and SSH.

Future proof
The new infrastructure will easily respond to future planned image and sound applications, with ample bandwidth available. Kobe Electric Railway can add additional fiber to the rings, increasing bandwidth for multiple gigabit connections between stations if required.

Cost effective
Kobe Electric Railway have made use of some existing infrastructure, cutting down on their overall costs. Plus, with VCStack and Alliedware Plus, Kobe Electric Railway can easily operate their network, lessening the need for IT staff and lowering their administration and support costs – thus reducing their Total Cost of Ownership (TCO).

Secure
Advanced security features are available to protect the network. The Allied Telesis switches support Network Access Control (NAC) giving unprecedented control over network user access.

Superior service and support
Allied Telesis service and support engineers tested the network prior to installation to ensure it would provide non-stop access and high performance.

Ongoing Partnership
Allied Telesis continue to support Kobe Electric Railway and their new network.

Kobe Electric Railway are considering using the new network to send images and sound. This would integrate their existing infrastructure running the surveillance cameras and intercoms, with the new next-generation data network.

Kobe Electric Railway and Allied Telesis have signed a five-year maintenance service contract.

About Allied Telesis

Founded in Japan in 1987 and with offices worldwide, Allied Telesis is a leading provider of networking infrastructure and flexible, interoperable network solutions. The Company provides reliable video, voice and data network solutions to clients in multiple markets including government, healthcare, defense, education, retail, hospitality, and network service providers.

Allied Telesis is committed to 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

Allied Telesis   the **solution** : the **network**

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