Solutions Guide

Allied Telesis™

VCStack - Powerful Simplicity

VCStack™

the **solution** : the **network**

Powerful Simplicity

Today's enterprises rely on Information Technology resources and applications for accessing business-critical information and for day-to-day work. A high availability infrastructure is no longer a luxury —maintaining resource availability and data security is now of paramount importance.

Productivity is adversely affected when any of the following occur:

- loss of access to the Internet
- loss of access to internal servers and intranet
- loss of IP telephony services
- loss of customer access to public servers

It is vital, even for a small enterprise, to keep high availability considerations at the center of network design. The availability of network resources is maximized with an Allied Telesis Virtual Chassis Stacking (VCStack™) solution, providing continuous and immediate access to information when required.

Better than ever

Allied Telesis Virtual Chassis Stacking (VCStack) solution is now even better.

Long Distance Stacking

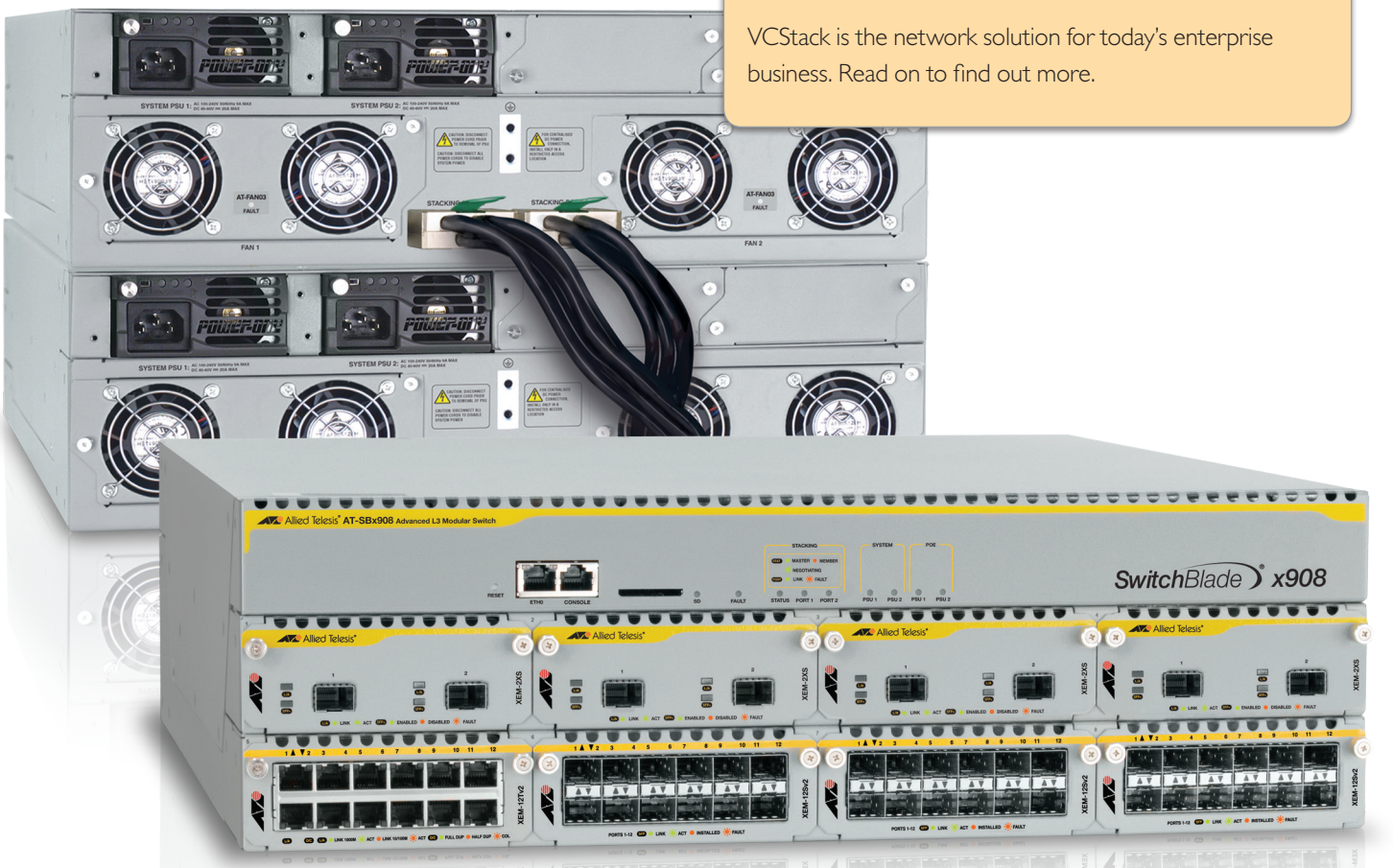
As well as connecting collocated switches, a VCStack can be formed over long distance fiber links for a truly distributed network core.

Advanced Features

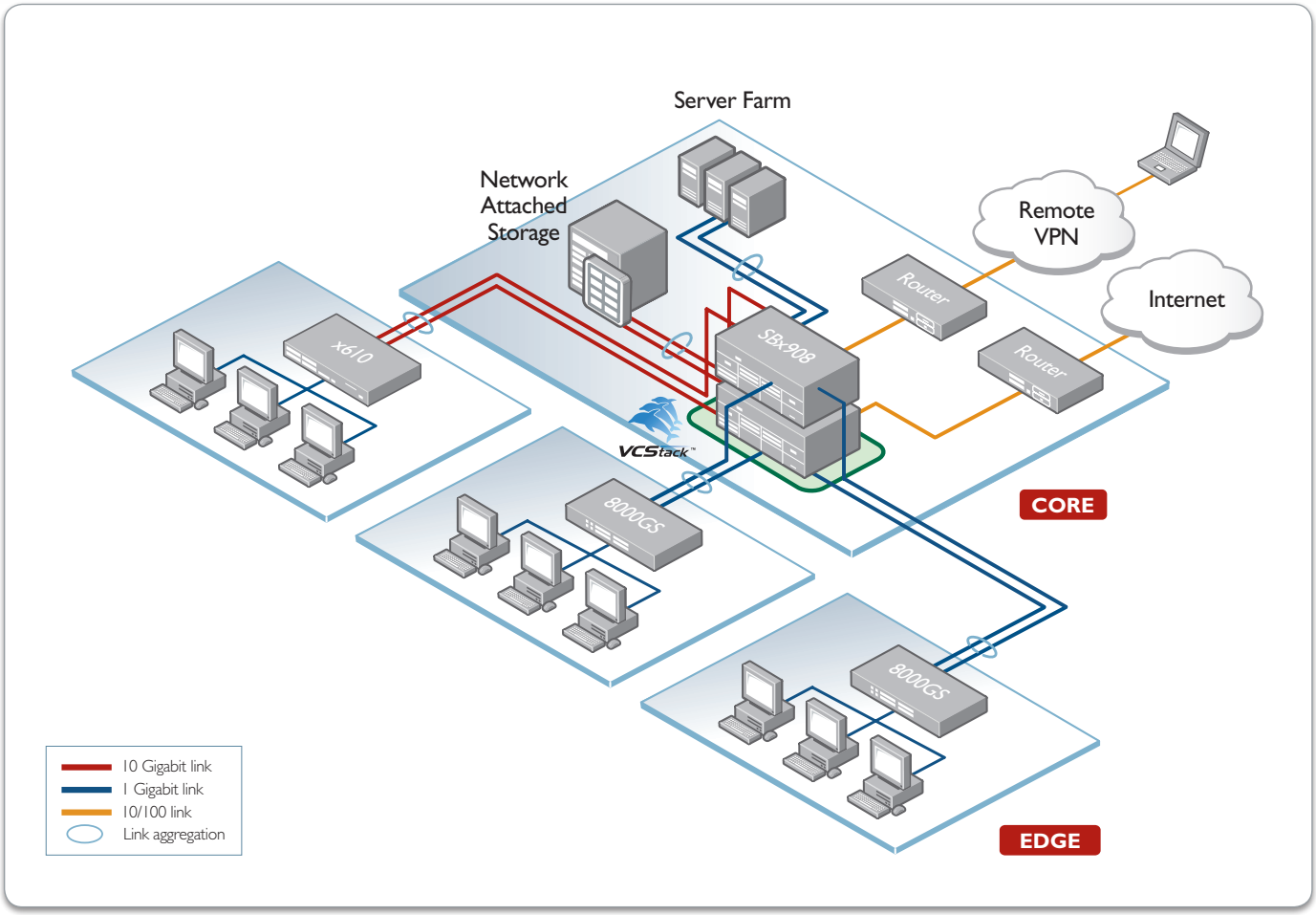
In addition to using the full power of the network and simplifying network management, VCStack also provides advanced features such as:

- Fast Failover – minimizes network downtime
- Virtual MAC – maximizes network connectivity
- Rolling Reboot – provides continuity of service
- Provisioning – pre-configure network devices
- Remote Login – flexible management of devices

VCStack is the network solution for today's enterprise business. Read on to find out more.



The VCStack Solution



Prior to the advent of VCStack, high availability in enterprise networks was achieved by provisioning redundant links (with STP) and redundant routers (with VRRP). In normal operation, bandwidth and routing power would sit idle in the network.

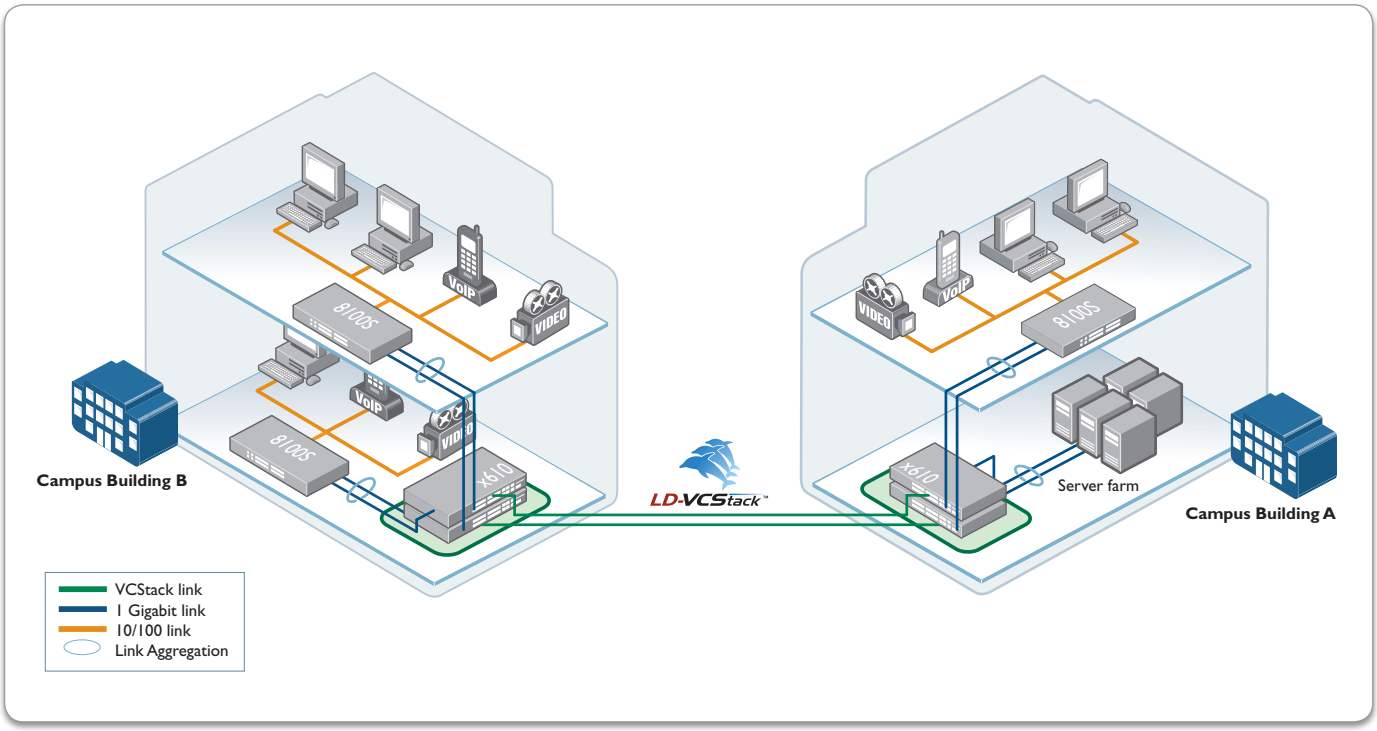
With VCStack, Allied Telesis now provides a truly resilient network. In normal operation, all bandwidth and all routing power in the network are fully available for use all the time. If a link or device fails, some of the bandwidth or forwarding power will be lost, but the network will still be fully operational and all remaining resources will continue to be fully utilized.

Using VCStack at the core of your network allows multiple switches to appear as a single virtual chassis. This virtual chassis acts as a single switch, simplifying management.

The above diagram shows link aggregation between the core VCStack and edge switches. With link aggregation across ports on different virtual chassis members, there is no perceptible disruption in the case of a link failure, and the full bandwidth of the network is available. Link aggregation is also used to connect network resources, such as servers, across the virtual chassis members. This ensures device and path resiliency.

Virtualization of the network core ensures access to information when you need it, and this versatile solution can scale from meeting the needs of the small business right up to the larger enterprise.

Long Distance Stacking



Long distance stacking enables the VCStack solution to provide a distributed network core.* The increased distance provided by fiber stacking connectivity means that members of the virtual chassis do not have to be collocated, but can be kilometers apart.

All of the benefits and powerful features of VCStack remain exactly the same — Allied Telesis long distance stacking provides a genuine distributed virtual network core.

The diagram shown here illustrates a campus where the VCStack network core is distributed across two separate buildings. By having two stack members in each location, the benefits of using link aggregation between the core and edge switches remain. The complete distributed virtual chassis provides a solution with no single point of failure, and a single management entity.

The powerful VCStack solution offers uninterrupted network access and high availability of critical resources, and yet is very simple to manage with almost plug-and-play configuration. This provides an ideal core for a data mirroring solution, where the server farm is duplicated across two sites for disaster recovery purposes.

Whether your virtual chassis is located in the same equipment rack, or distributed across the campus, VCStack provides resiliency, scalability and ease of management.

VCStack makes networking reliable and simple.

* *Long Distance Stacking is available on x610 Series switches.*

VCStack Benefits

VCStack provides a highly available solution for uninterrupted network access, providing powerful management options while remaining simple to configure.

High Availability

Ensuring the availability of critical data and online resources is a major consideration for businesses today. The power of the VCStack solution is in the removal of any single point of failure in the network. This, along with the VCStack's full use of the bandwidth available in the network, creates a powerful solution. The following additional features serve to maximize data and resource availability.

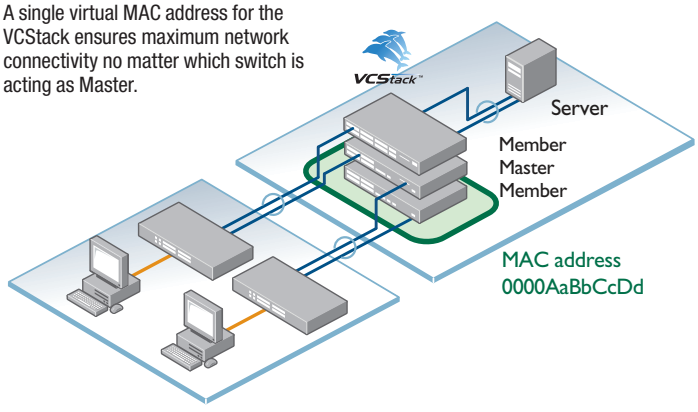
Link Aggregation across stack members provides bandwidth and resiliency

Aggregated links from access switches to the VCStack can terminate on different stack members. If a link in the aggregation is removed or fails, there is little network disruption. The VCStack reacts almost instantly when an aggregated link fails, and the data forwarding process adapts to the loss of the link with almost no packet loss.

Virtual MAC maximizes network connectivity

When a VCStack is central to network design, this virtual chassis uses a virtual MAC address for communication with other devices. As this single virtual MAC address is used for the complete VCStack, there is no change of MAC address if a new stack member is required to become master. In conjunction with Fast Failover, this ensures maximum continuity of network service, as there is no need for other devices in the network to learn a new MAC address into their MAC or ARP tables.

Virtual MAC
A single virtual MAC address for the VCStack ensures maximum network connectivity no matter which switch is acting as Master.



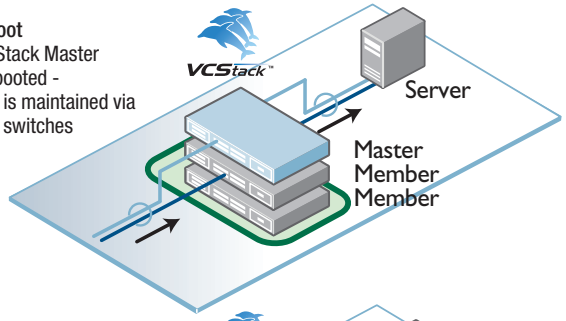
Resiliency Link provides intelligent recovery options

The dedicated stacking link is backed up by a further resiliency link. If the stacking link fails, communications between the stack members is maintained to enable graceful reconfiguration.

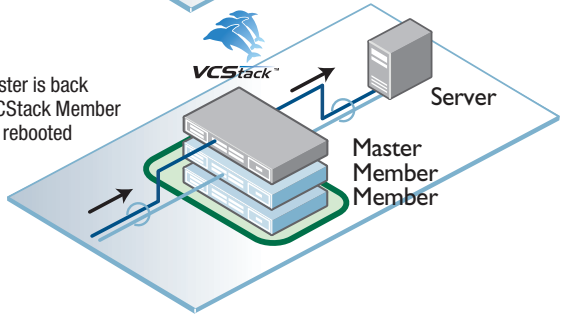
Rolling Reboot provides continuity of service

A major benefit of the VCStack solution is that it provides unit resiliency – if one unit in the stack goes down, the other members of the stack continue to forward data. It is desirable for this continuity of service to persist even when the stack is being rebooted. Rolling reboot maintains continuous service by rebooting the stack in a rolling sequence, so that there is at least one unit actively forwarding data at all times during the stack reboot sequence.

Rolling Reboot
First the VCStack Master switch is rebooted - connectivity is maintained via the Member switches



Once the Master is back online, the VCStack Member switches are rebooted



Fast Failover minimizes network downtime

Fast Failover provides for nearly uninterrupted network service. In a VCStack environment, one of the stack members acts as the master switch, and provides decision making for the virtual chassis. All of the other VCStack members are in active standby, also having learnt routing and forwarding information for the network to ensure that if the Master were to fail, another member is able to seamlessly assume control of the virtual chassis with absolutely minimal network downtime. Failover and recovery can be completed in as few as 3 seconds.

VCStack Benefits

Powerful Management

VCStack is very simple to configure with almost plug-and-play functionality for initial setup. This simplicity is maintained for network administrators, as the stack appears as a single virtual chassis for ongoing management and monitoring of performance, which can be done using the industry standard Command Line Interface (CLI), or an intuitive Graphical User Interface (GUI). The following features make powerful functionality available to the network administrator and support staff to further enhance the VCStack solution.

Remote Login allows flexible management of devices

Management of a VCStack is simplified for network administrators, as the stack acts as a single virtual chassis. Occasionally however, it can be desirable to login to a specific member of the stack. For example to manage feature licences per individual unit. Remote login facilitates this by allowing a user on the master switch to log into the CLI of another stack member. Configuration commands are still applied to all stack members, but 'show' commands, and commands that access the file system are executed locally. Consequently, the management interface into the VCStack provides the best of both worlds – the VCStack can be managed as a single unit, or as individual units, depending on which is more convenient for the task at hand.

Provisioning for pre-configuration of network devices

To add flexibility to the management of a VCStack, provisioning provides the ability to pre-configure (or configure 'offline') the switch ports of devices that are not currently physically present. This allows a network administrator to configure the ports of an additional VCStack member, or expansion module (XEM) before it is actually hot-swapped in. On the physical addition of the unit, the configuration is automatically applied, minimizing network disruption. The power of provisioning is further increased as a VCStack will retain interface configuration for a device that is removed, facilitating effortless hot-swap of units if required.

Configuration Synchronization automates file management

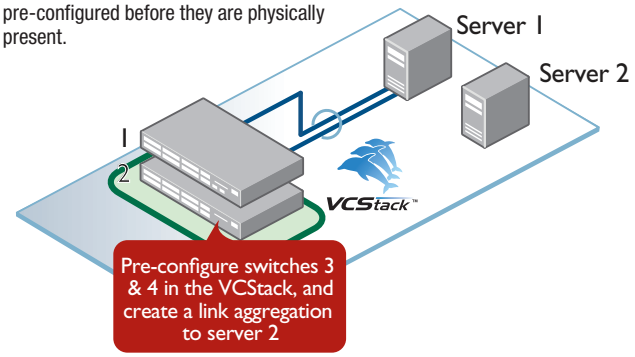
The configuration file that is loaded when the stack starts is called the startup-config. If the startup-config on the master switch is updated, the new startup-config is automatically saved to flash memory on all stack members. Similarly, it is automatically copied to any unit that subsequently joins the stack. This ensures that no updates will be lost on master failover or stack unit replacement.

Extensive Statistics support network management

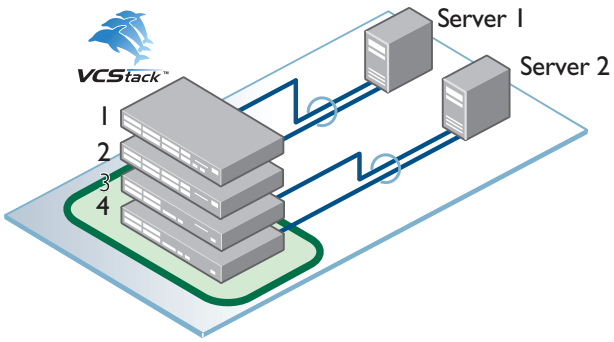
To facilitate managing network resources effectively, network administrators require as much information as possible about traffic volume and resource use. Extensive statistics available from a VCStack virtual chassis provide a wealth of information about data throughput on a per-port, per-resource, or traffic type basis. This ensures the network administrator is fully informed and able to manage resources to best meet application and user requirements.

Providing exceptionally high network availability and simplicity of operation, backed up with powerful management options that can be used as required, VCStack is truly the solution for today's enterprise networks.

Provisioning
Switches can be added to the stack and pre-configured before they are physically present.

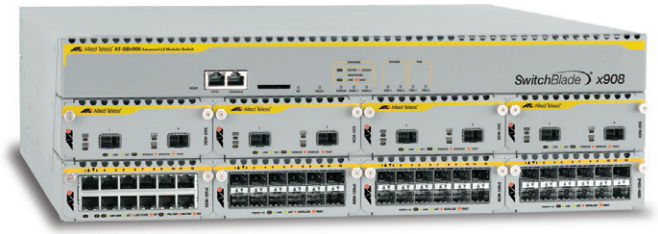


Switches 3 and 4 are automatically configured when they are connected.



VCStack Products

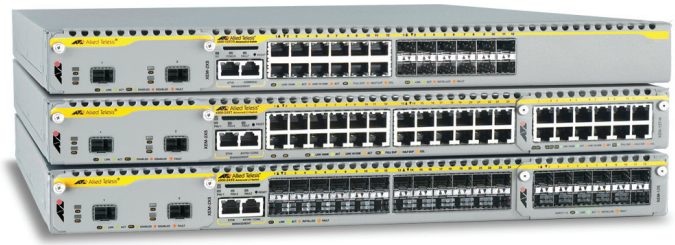
The following Allied Telesis products support VCStack Virtual Chassis Stacking. The x610 series supports Long Distance Stacking.



SwitchBlade® x908

ADVANCED LAYER 3 MODULAR SWITCHES

The Allied Telesis SwitchBlade™ x908 advanced Layer 3 modular switch offers high flexibility and port density in a small physical size, providing scalable and versatile switching solutions for today's Enterprise networks. Each chassis supports eight high-speed 60Gbps expansion bays, and can also be paired in a VCStack.



x900 12 & 24

ADVANCED LAYER 3 SWITCHES

The x900 Layer 3+ switches have high-speed 60Gbps expansion bays which provide a high level of port flexibility and application versatility unmatched by any other 1RU Gigabit Ethernet switch on the market. The expansion modules can be used in a variety of configurations to provide tailored solutions that meet wide-ranging physical networking requirements. Multiple units can form a Virtual Chassis Stack with the XEM-STK expansion module.

x600 Series

ADVANCED LAYER 3 GIGABIT STACKABLE EDGE SWITCHES

The Allied Telesis x600 series is an advanced series of stackable switches providing high performance, flexibility and reliability. The x600 series provides high levels of Network Access Control (NAC) security making them ideal for the entry point into a corporate network. High speed 10Gbps uplinks and high speed stacking of up to four switches ensures excellent performance, while optional redundant power supplies can ensure network availability.

x610 Series

ADVANCED LAYER 3 GIGABIT ETHERNET STACKABLE SWITCHES

The Allied Telesis x610 series is the high performing and scalable solution for today's networks, providing an extensive range of port-density and uplink-connectivity options. 24-port and 48-port versions are available with optional 10 Gigabit uplinks and PoE+ ports. The ability to stack up to eight units includes using fiber for long distance stacking. The x610 Series can connect anything from a small workgroup right up to a large business.

About Allied Telesis Inc.

Allied Telesis is a world class leader in delivering IP/Ethernet network solutions to the global market place. We create innovative, standards-based IP networks that seamlessly connect you with voice, video and data services.

Enterprise customers can build complete end-to-end networking solutions through a single vendor, with core to edge technologies ranging from powerful 10 Gigabit Layer 3 switches right through to media converters.

Allied Telesis also offer a wide range of access, aggregation and backbone solutions for Service Providers. Our products range from industry leading media gateways which allow voice, video and data services to be delivered to the home and business, right through to high-end chassis-based platforms providing significant network infrastructure.

Allied Telesis' flexible service and support programs are tailored to meet a wide range of needs, and are designed to protect your Allied Telesis investment well into the future.

For further information visit us online at **alliedtelesis**.com

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North America Headquarters | 19800 North Creek Parkway | Suite 100 | Bothell | WA 98011 | USA | T: +1 800 424 4284 | F: +1 425 481 3895
Asia-Pacific Headquarters | 11 Tai Seng Link | Singapore | 534182 | T: +65 6383 3832 | F: +65 6383 3830
EMEA & CSA Operations | Antareslaan 18 | 2132 JE Hoofddorp | Netherlands | T: +31 23 5656800 | F: +31 23 5575466

alliedtelesis.com

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