

## Alcatel-Lucent Triple-Play Services over Existing Copper

End-to-end Voice, HSIA, Video and IPTV Solution over Existing CAT3 Infrastructure for Hotels

In the hospitality industry guest satisfaction is the key to business success. Hotel operators are constantly focused on improving the guest experience to ensure the guest will want to return. In addition, attracting new customers and finding ways to boost RevPAR and profitability is critical for their success. At the same time, hotels must do this while optimizing operations and lowering costs. This is even more important in today's economic environment. Just as including wine on the food menu can increase revenue per available seat-hour (RevPASH) in a restaurant, a compelling in-room entertainment and high speed Internet offerings can boost revenue per available room (RevPAR) in a hotel environment. In a new hotel, it is relatively easy and inexpensive to ensure such advanced services can be delivered to each guest room. The challenge is in providing the same experience to guests that stay in older facilities with aged infrastructure. The cost of rewiring along with the loss of revenue while the rooms are out of service could easily exceed the benefit of offering these advanced services. In many cases, it is simply not an option to allocate significant budgets to upgrade the Category 3 and shielded twisted pair wiring/infrastructure in the current economic environment. The Alcatel-Lucent Triple-Play Services over Existing Copper solution, which addresses end-to-end voice, HSIA, video and IPTV services can be a very attractive alternative to copper replacement.

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### Experience & Leadership

- # 1 DSL supplier worldwide
- 210+ ISAM Customers worldwide
- €2.5B in R&D investment
- 8 Nobel prizes & 26,000+ active patents

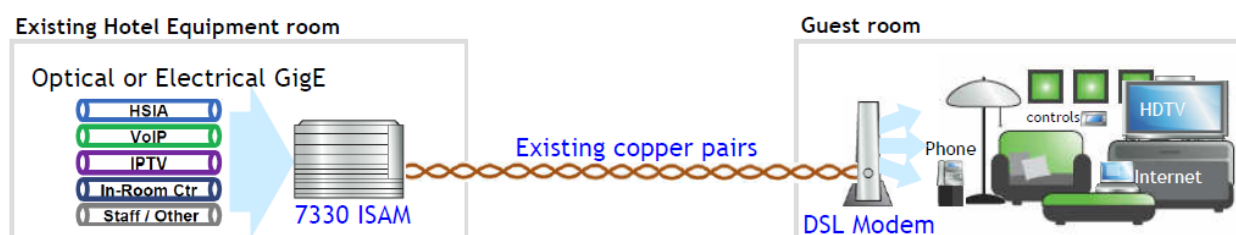
Digital Subscriber Line (DSL) has long been the choice of service providers around the world to deliver high bandwidth data services to their subscribers over the very same copper wires that were installed to support basic telephone services. Recent advancements in DSL technology have allowed service providers to deliver highly competitive high speed video and Internet/data services without the need to replace their aging telephone wires. Alcatel-Lucent is the leader of this DSL technology with numerous deployments globally.

The Alcatel-Lucent Triple-Play Services over Existing Copper solution allow hoteliers to leverage this proven DSL technology to offer voice, high speed Internet and video services within a hotel environment, eliminating the need to upgrade existing in-building category-3 or twisted pair wiring.

## How it works

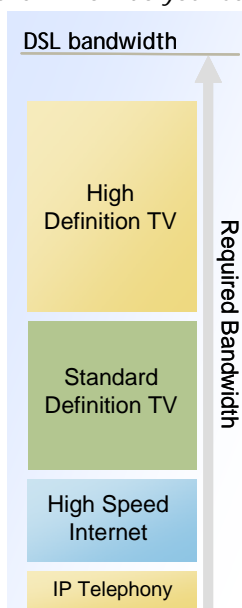
Central to the Alcatel-Lucent Triple-Play Services over Existing Copper solution is the 7330 ISAM fiber-to-the-node (FTTN) which is an IP/Ethernet based Digital Subscriber Line Access Multiplexer (IP DSLAM). The 7330 connects to existing hotel network and delivers advanced services to each room over copper pairs. A small form factor DSL modem is placed in the guest room to convert the DSL signal to Ethernet and WiFi which is then connected to the CPEs (customer premise equipments) in the guest room including set top boxes, personal computers and IP phones (figure 1).

Figure 1: Typical Hotel DSL deployment model



DSL technology selection starts with the service. Each specific service offering (e.g., HSIA, VoIP, IPTV, VOD) in a guest room represents a certain amount of bandwidth to the DSLAM. As there are multiple DSL technology options, stacking these services up into an overall service profile is crucial to selecting the right type of DSL for your hotel (figure 2).

Figure 2: How do your services stack up?



Once the overall bandwidth requirements of the service offering are defined, the optimum solution for your hotel can be engineered. There are two DSL technologies that are ideally suited to Hotel deployments.

- i. Asynchronous DSL (ADSL2+) has a theoretical maximum bandwidth of 25Mbps with typical performance in the 15 to 20 Mbps range.
- ii. Very High Speed DSL (VDSL2) has a theoretical maximum bandwidth of 100 Mbps with typical Hotel performance in the 25 to 40 Mbps range.

VDSL2 offers higher speed over shorter distances whereas ADSL2 provides lower comparative speed over longer comparative distances.

In a typical HDTV environment, VDSL2 provides more than enough bandwidth to provide a comprehensive telephony, high speed Internet access (wired and wireless) and enhanced video and IPTV services.

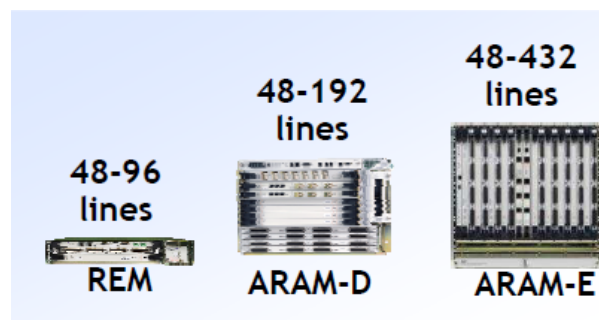
The bandwidth that can be provided to each room ultimately depends on the length and condition of the copper cable. Category 3 cables, commonly known as Cat-3, use an unshielded twisted copper pair (UTP). This type of cable was popular among computer network administrators in the early 1990s. Alcatel-Lucent research shows that about 60% of cabling systems in existing hotels is Cat-3. While this cable type is not well suited for building Ethernet networks, it is very well suited for supporting DSL services with predictable results. DSL performance on older Cat 1 or unspecified cable can vary widely.

### Not every hotel is the same

Whether your hotel consists of a single stand alone building or a large campus with multiple buildings, the Alcatel-Lucent Triple-Play Services over Existing Copper solution can ideally meet your unique requirements.

The 7330 ISAM FTTN platform offers unsurpassed flexibility in terms of product size, density and network topologies. There are three basic shelf sizes available for the 7330 ranging from a compact REM shelf supporting up to 96 rooms or end points, a high density ARAM-D shelf supporting up to 192 rooms, to a very high density ARAM-E shelf supporting up to 432 rooms or end points (Figure 3). Multiple 7330 ISAM FTTN shelves can be used together to address the needs of larger campuses where multiple equipment rooms and/or buildings require multiple DSLAMS to access the existing copper pairs.

*Figure 3: Sized for your application*



The 7330 ISAM FTTN uses a unique distributed DSLAM concept which allows low cost REM or ARAM-D remote shelves to be deployed in multiple locations. Each shelf is then connected to a host shelf which aggregates the traffic from each REM and connects to the core network over as little as one Gigabit Ethernet network connection. This solution provides maximum flexibility by allowing

DSLAMS to be deployed anywhere that they are needed while reducing costs by leveraging the intelligence of the DSLAM host at remote locations where the REMS are deployed.

There are two types of host shelves available. The ARAM-D shelf (generally the right choice for most hotels) is capable of supporting up to 192 rooms while simultaneously functioning as a host with up to 12 Gigabit Ethernet connections to remote shelves. Figure 4 below provides a simple example of two most common deployment options. This model can be expanded to multiple buildings with multiple remote shelves if required.

Figure 4 - Common DSL-based Deployment Options over Existing Copper

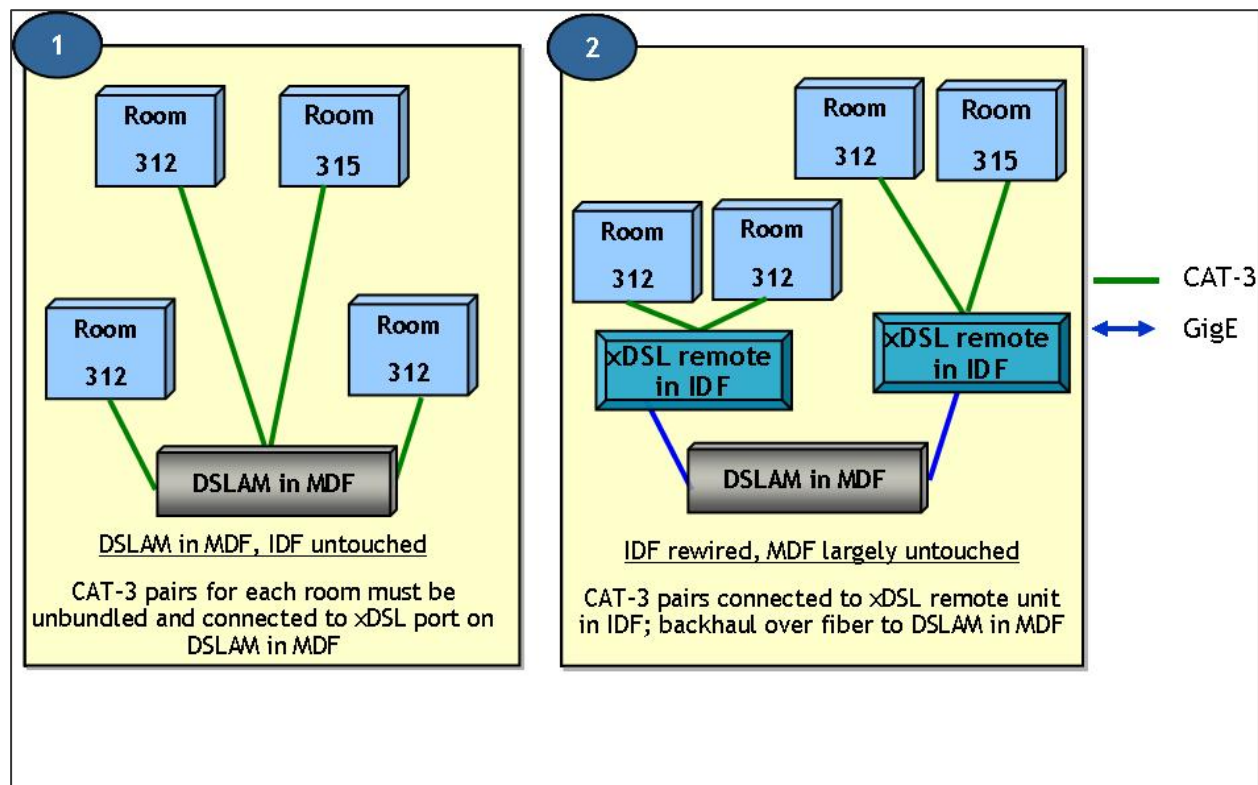


Figure 5: Remote Aggregator



In cases where no DSL services are required at the host location, the 7330 ISAM Remote Aggregator (RA) can be used (figure 5). Capable of supporting up to 24 Gigabit Ethernet connections to remote shelves, the 7330 RA is ideally suited to large campuses where numerous remote DSLAMs are required. With so many DSLAMs to serve, the

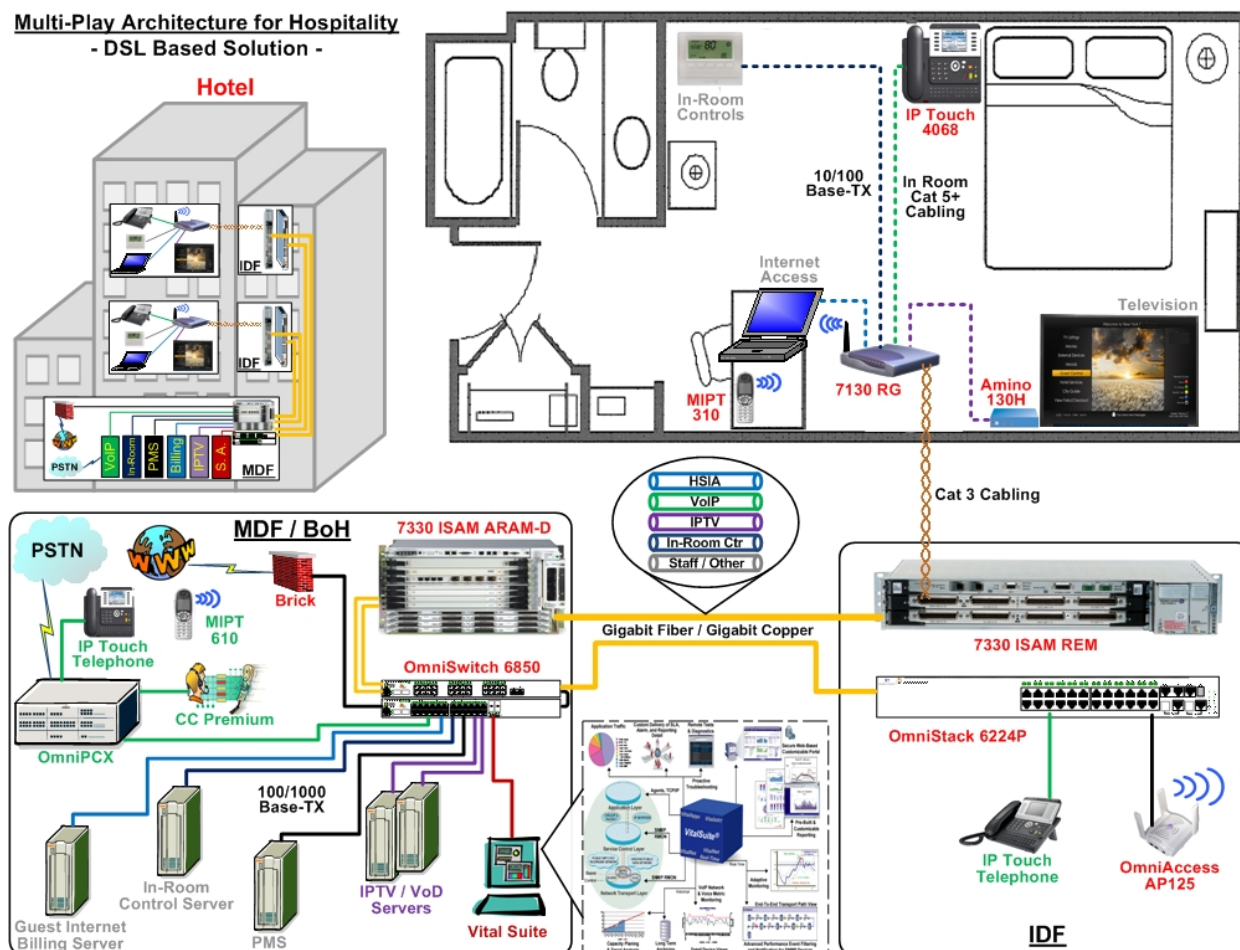
remote aggregator has the added advantage of supporting up to two 10Gbps connections to the core network.

### Part of a complete solution

The Alcatel-Lucent Triple-Play Services over Existing Copper solution is a complete solution, addressing end-to-end needs of voice, high speed Internet access and high quality video and IPTV services by reusing the existing CAT-3 cabling/infrastructure. This CAT-3 cabling — the same twisted pair copper cable that provides analog or digital dial tone to every guest room telephone is widely deployed in hotels around the

world. The solution provides the necessary infrastructure to support an advanced network that enables the delivery of enhanced services to improve guest satisfaction and hotel operations (figure 6).

Figure 6: Alcatel-Lucent DSL-based triple-play architecture for hospitality



The Alcatel-Lucent 7330 ISAM provides the necessary transport and connectivity requirements to support multiple virtual networks, Quality of Service, IP Multicast Support, and security to provide true Ethernet based services over an existing Cat 3 hotel infrastructure. The 7330 ISAM uplinks to an OmniSwitch Ethernet Switch/Router by supporting industry standard Ethernet based protocols such as 802.1Q, 802.1x, 802.1p, IGMP, and more.

The Alcatel-Lucent Triple-Play Services over Existing Copper solution supports multiple DSL technologies. However for a complete end-to-end triple play service that includes: voice, high speed Internet access, enhanced entertainment, video on demand over high definition IPTV, the VDSL2 technology is most well suited. Additional support for IP/Ethernet based services such as voice, Internet/data, video, and wireless applications can be provided in the IDF by the Alcatel-Lucent OmniStack 6200 family of data switches. The OmniStack 6200 can provide connectivity for Wireless Access points deployed in hallways and common areas, public space IP Phones, and other Ethernet based devices.

To deliver end-to-end applications, Alcatel-Lucent offers a powerful Gateway solution for use in guest rooms. With the use of this Alcatel-Lucent Cellpipe 7130 RG gateway, multiple ports of Ethernet connectivity are made available in the guest room to support the delivery of IP-based services, such as High Speed Internet, VoIP, and IPTV. The Alcatel-Lucent Cellpipe 7130 RG also includes a Wireless LAN access point to provide wireless access to guest, staff, business travelers, wireless phones, and any other device that uses 802.11b/g as a means of connectivity and transport. The Ethernet then is connected to the DSLAM which uses CAT3 with sufficient bandwidth to carry all these services.

Traffic from the 7330 ISAM and the OmniStack 6224 in the IDF is delivered to the MDF over Gigabit fiber or Gigabit copper. However, this traffic is aggregated and managed by two elements, the Alcatel-Lucent 7330 ISAM ARAM-D and the OmniSwitch 6850. The Alcatel-Lucent OmniSwitch 6850 is a very powerful and robust stackable Layer 2 and Layer 3 data switch. The OmniSwitch 6850 is also a very cost-effective core switch/router solution where high port density is not needed and a chassis based solution is not required. The OmniSwitch 6850 can be stacked 8 units high for increased port density and redundancy.

The transparent connectivity between the Alcatel-Lucent 7330 ISAM DSL solution and the Alcatel-Lucent OmniSwitch 6850 allows ease of creating, supporting, and managing multiple networks all sharing a common infrastructure. Guest access will be confined to the Guest networks. IPTV, VoIP, Administrative, In-room, and every other system will be secure in their respective networks whether they are traveling over Cat 3, Cat 5, or Cat 6.

The main value of the Alcatel-Lucent Triple-Play Services over Existing Copper solution is to reuse the existing infrastructure at the hotel to offer support for new technology. The DSL-based solution creates a solid foundation to support IP based High Definition Television and Enhanced guest entertainment and television based services. The Cellpipe 7130 gives 4 ports of Ethernet in the Guest Room for the hotelier to use however they see fit. The Cellpipe 7130 provide Wireless HSIA in the guest room and to staff to enhance guest satisfaction and improve operations and efficiency through the effective use of technology.

## Partnering with Alcatel-Lucent

Alcatel-Lucent has extensive experience helping hotel operators around the world get the best from their communication technology architecture. It has successfully partnered with hotel operators to deploy dynamic, IP-based communications that include wired and wireless LANs/WANs, IP telephony, unified communication, contact center, security, VoD and IPTV applications.

By working with Alcatel-Lucent hotel operators get a strategic communications partner who can provide an end-to-end solution based on its own hotel-specific products. In addition Alcatel-Lucent can innovate and customize its complete portfolio of products to integrate seamlessly with existing infrastructures and with products from key third party partners providing PMS, in room control systems, IPTV systems, and more.

With this one-stop-shop, end-to-end approach hoteliers avoid the pitfalls inherent in mismatched point



solutions. Each hotel gets a tailored, secure, always on, IP-based communications network that will enhance operations, improve business processes, create new services, and generate new revenue opportunities.

An Alcatel-Lucent hotel communications solution is designed from the ground up to connect people — guests and employees — with the network in a way that brings the network, people, processes, and knowledge together as one. As a result, employees will be more agile, mobile, knowledgeable and fast. Operational efficiency will be improved. Guests will receive market-differentiating customer service. And the entire network will be better positioned to leverage new communications products and applications as they emerge.



Table 1. Key Products Snapshot for DSL Solution

Product Name	Key Benefits	Key Features
Alcatel-Lucent Cellpipe 7130 RG Gateway	<p>compact and secured solution</p> <p>Cost effective</p> <p>Proven and tested solution</p> <p>Faster implementation</p>	<ul style="list-style-type: none"> <li>○ supports multiple ports of Ethernet connectivity enough for all "in room" needs (HSIA, Wi-Fi, VoIP, IPTV and other in room connectivity)</li> <li>○ Line interface type (VDSL2)</li> <li>○ Routing and forwarding modes (bridged, routed)</li> <li>○ LAN-side PC connectivity (USB, Ethernet, wireless)</li> <li>○ Voice support options (POTS, ISDN, VoIP)</li> <li>○ QoS and security options for different type of applications</li> <li>○ TR-069 management interface for management and zero-touch configuration (including TR-104 for voice)</li> </ul>
Alcatel-Lucent 7330 Intelligent Services Access Manager (ISAM) ARAM-D	<p>Leverages existing copper, reducing CAPEX</p> <p>Reduces risk of ATM to IP transformation, allowing an overlay instead of upgrading working nodes</p> <p>Leverages standard Ethernet technology</p> <p>Provides bandwidth to offer enhanced services in the hotel guest room - VoIP, HSIA, IPTV, VOD</p> <p>No need to touch IDF; CAT3 pairs for each room unbundled/connected to DSLAM in MDF</p>	<ul style="list-style-type: none"> <li>○ 24 Gb/s switching fabric</li> <li>○ Up to eight GigE uplinks</li> <li>○ Up to 12 GigE expansion links</li> <li>○ QoS, IGMP, Multicasting and security features needed for advanced access networks</li> <li>○ ADSL2plus, VDSL/VDSL2 with bonding service units</li> <li>○ Full element management support</li> </ul>
Alcatel-Lucent 7330 Intelligent Services Access Manager (ISAM) REM	<p>Small form factor for maximum flexibility remote deployments</p> <p>Cost-effective solution for small, hard-to-reach locations</p> <p>MDF largely untouched; only IDF rewired</p> <p>Full feature parity with other 7330 ISAM ARAM-D</p>	<ul style="list-style-type: none"> <li>○ Low-profile (2RU) shelf</li> <li>○ Vertical and horizontal mounting options</li> <li>○ Utilizes existing 7330 FTTN DSL plug-in units</li> <li>○ Non-blocking, distributed processing architecture</li> <li>○ 48-port capacity (96 Future)</li> <li>○ 1x1GE downlink to 7330 Host Shelf or Remote Aggregator (Future 2 x 1GE)</li> <li>○ Temperature hardened</li> </ul>
Alcatel-Lucent OmniStack 6200	<p>Highly available network edge for key applications such as IP voice communications, WLAN, IPTV, HSIA</p> <p>Reduces the complexity with industry-standard CLI and simplified stack management with standard Ethernet cabling</p>	<ul style="list-style-type: none"> <li>○ Simplified manageability with easy to use web GUI</li> <li>○ 255 VLAN support</li> <li>○ High availability with redundancy</li> <li>○ Ensure quality of service with 802.1p, TOS, DSCP marking</li> <li>○ Advanced security via 802.1x based authentication</li> </ul>
Alcatel-Lucent OmniSwitch 6850	<p>High availability - the virtual chassis minimizes network downtime, reduces operational complexity and cost and increases availability</p> <p>Server Aggregation - its small form factor, high performance and rich feature set makes it a great aggregation solution for space-limited data centers.</p>	<ul style="list-style-type: none"> <li>○ Choice of power-over-Ethernet (PoE) and non-PoE switches or models Triple-speed 10/100/1000 interfaces and 10Gig uplinks</li> <li>○ Fast Ethernet interfaces upgradeable to Gigabit via a software license key without any network reconfiguration</li> <li>○ Advanced quality of service (QoS) to support mission critical applications</li> <li>○ Gigabit fiber interfaces ( SFP) supporting 100BaseX, dual-speed and 1000BaseX optical transceivers</li> <li>○ Multi-layered Security includes user authentication, quarantine VLANs, access control lists, encryption for secure management, denial of service protection and more</li> </ul>



For more information visit: [www.alcatel-lucent.com/hospitality](http://www.alcatel-lucent.com/hospitality)

*Visit the product pages for more product specific information:*

[Alcatel-Lucent 7330 ISAM fiber-to-the-node \(FTTN\)](#)

[Cellpipe 7130 RG](#)

[IP Touch 4068](#)

[Alcatel-Lucent IPTouch 310 WLAN Handsets](#)

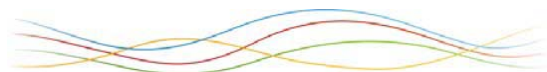
[OmniStack 6224-p](#)

[OmniSwitch 6850](#)

[OmniAccess AP 125](#)

[VitalSuite](#)

[VPN Firewall Brick](#)



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