VES-1012
VDSL Ethernet Switch

VDSL, the fastest offering of DSL, provides a much higher bandwidth than other DSL technologies. Ethernet over VDSL extends Ethernet over single-pair copper wiring at distances of up to 1.5km. This technology provides a cost-effective, readily available, and rapidly deployable solution that offers needed bandwidth to multi-tenant units (MTUs).

VDSL has changed the fundamental economics of broadband services for the MTU marketplace. Tenants don't have to suffer the limited bandwidth. Even small to medium-sized corporations can receive the same services as large companies. With VDSL, MTUs gain a cost-effective broadband solution that preserves their existing infrastructure, and in the process, building owners or service providers receive a compelling new source for revenue generation.

ZyXEL's VDSL solution is comprised of a VDSL Ethernet switch, the VES-1012, and a CPE modem, the Prestige841. The VES-1012 multiplexes traffic from 8 or 12 VDSL subscribers into two 100M Ethernet ports that connect to any Ethernet switch or broadband router. With the VES-1012, Ethernet over VDSL can run up to 1.5km at the speed of 5Mbps, which proves to be a promising technology and revenue generation tool for building owners and service providers.

Benefits

Bandwidth of 5 to 15 Mbps Per Port in Full Duplex
Allows building owners and service providers to offer a variety of value-added services ranging from broadband Internet access to bandwidth-consuming video applications.

Broadband over Existing Telephone Wires
With VDSL, broadband service could be offered using the existing copper wires. New revenue could be generated with minimum installation time and expense.

Co-existence with Plain Old Telephone Service (POTS),
Digital Phones and ISDN
VDSL can be implemented quickly, even if building owners have just one phone line per tenant. The existing POTS or ISDN services could be kept while adding new broadband services.

New Advances for Broadband Service Offering
The VLAN feature in the VES-1012 offers the benefits of both security and performance. Multicasting design improves network bandwidth utilization for bandwidth-consuming application, such as video on demand. New mechanisms, such as 802.1p, have also emerged to ensure quality of service. The new advances in the VES-1012 enable service providers to turn on broadband service to more customers quickly and at a lower cost than previously possible.

MTU-oriented Services
When service providers bring fiber closer to the end users, VDSL becomes the best solution for delivering broadband service to people working or living insides the buildings, such as business parks, apartments, dormitories, campus and hospitality.

Scalable Platform for Future Expansion
The flexible design of the VES-1012 allows service providers to start VDSL service at a minimum cost. As the number of subscribers and applications grow, the additional VES-1012 can be added to increase the available customer base.

ZyXEL
Unleash Networking Power

Specifications

Dimensions

- 440 mm (L) x 300 mm (D) x 44.5 mm (H)
- Rack mountable enclosure

Uplink Interface

- Two 10/100 Ethernet ports
- RJ-45 connector

VDSL Interface

- 12-port VDSL
- One Telco 50 connector to CPE
- Ethernet over VDSL
- Transmission rate: 5, 10, 15Mbps for symmetric/asymmetric
- Power back-off algorithm
- Rate Adaptation

POTS / ISDN Interface

- Built-in POTS/ISDN Splitter
- 12-port POTS/ISDN
- One Telco 50 connector to PBX or CO

LED and Switch

- Power: Light on & off: Power on or off
- System
  - Light off: System not ready or failed
  - Light on: System ready and running ok
  - Light flashing: System booting
- Alarm: Light on & off: alarm on or off
- VDSL
  - Light on: Link on
  - Light flashing: link active
  - Light off: link is down or no connection
- Ethernet
  - Green light: 10M Ethernet
  - Orange light: 100M Ethernet
  - Light off: Ethernet not ready or failed
  - Light on: Ethernet link ok; color will indicate if 10 or 100M LAN is on
  - Light flashing: Snd/Rcv
- Power switch: for power on or off

Switching

- Switching fabric: 5.2Gbps
- Non-blocking
- Frame size: 1522 bytes
- Forwarding frame: 802.3, 802.1q, Ethernet II, PPPoE
- Prevent the forwarding of corrupted packets
- Pause frame disposal

System Control

- Alarm/Status Surveillance
  - Automatic alarm and status report
  - Alarm/event history
  - LED indication for alarm and system status
- Performance monitoring
  - Line rate
- Configuration
  - VLAN setting
  - VDSL line rate setting (bandwidth control)
  - Software upgrade and download from EMS (through FTP/TFTP)
  - Default configuration
  - BOOTP/DHCP client
- Security and Memory Backup
  - Support login authorization and security levels
  - Provides non-volatile memory to back-up system database
  - Keep previous system parameters during re-booting
- Self diagnostics
  - FLASH memory
  - DRAM
  - LAN port
  - Line interface loop-back test
  - Remote reset

Ethernet

- Support 802.3/3u/3x
- Back pressure flow control for half duplex
- Flow control for full duplex (802.3x)

VLAN

- Port-based VLAN
- Tag-based VLAN
- No. of VLAN IDs: 4096

Port Trunking

- Static port trunking for bandwidth aggregation
- Support 802.3ad (*)

QoS

- 802.1p
- 4-priority queues

Spanning Tree

- 802.1d
- Support redundant backbone connections and loop free networks

Multicast

- Support IGMP snooping, GMRP
- Broadcast storm control

Bridging

- 12K MAC addresses
- MAC address filtering
- MAC counting

Network Management

- Interface: RS-232C (DB-9) for command line interface
- SNMP manageable
- Status display and event report from web-based management
- RMON: four RMON groups 1, 2, 3, 9 (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis (*)
- Support Telnet
- Provide fault, performance, configuration, and security managements

MIB

- SNMP MIB II (RFC1213)
- RFC1493
- RFC2674 (*)

Temperature

- Operating: 0˚C ~ 50˚C
- Storage: -25˚C ~ 70˚C

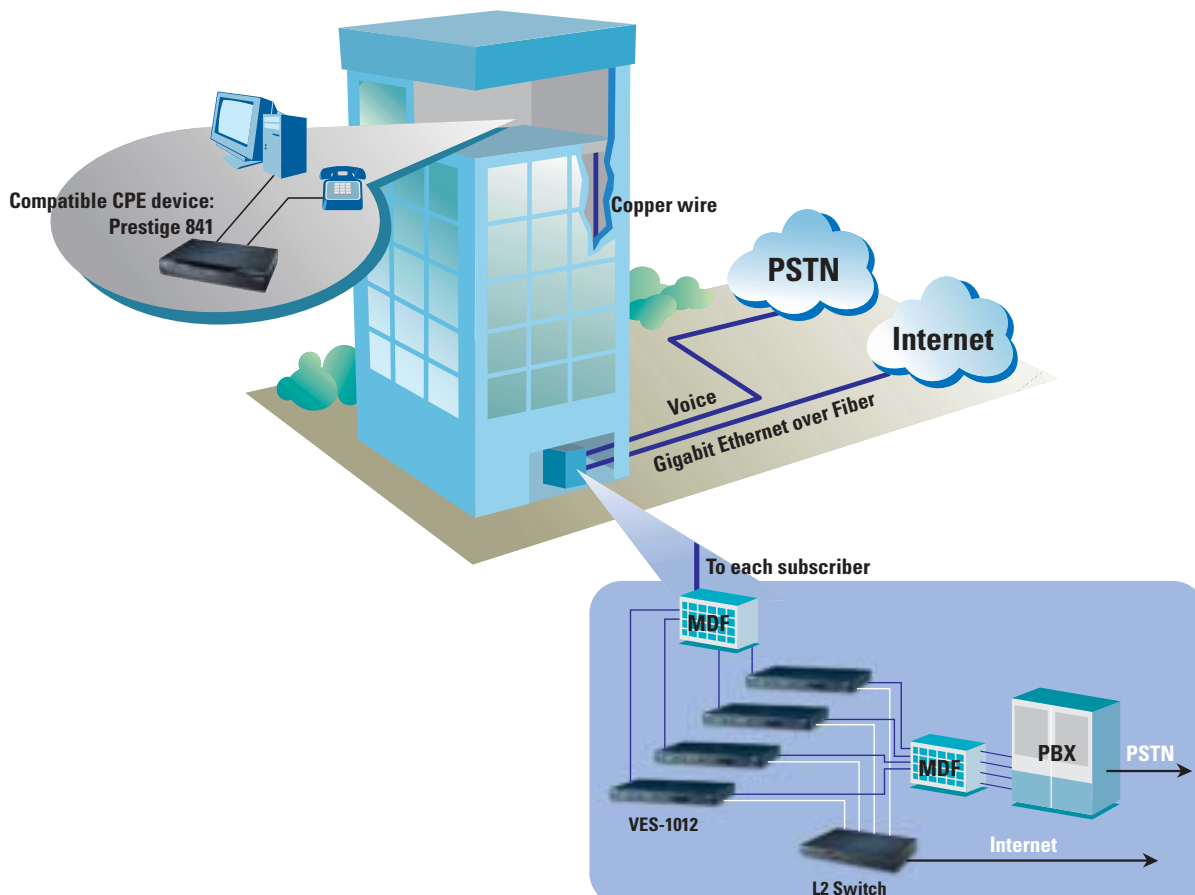## Humidity

- 5 ~ 90% (non-condensing)

Power

- 100 ~ 240VAC, 50 ~ 60Hz

Certification

- Safety
  - UL1950
  - CSA C22.2 No. 950
  - EN60950, EN41003
- EMC
  - FCC Part 15 Class A
  - EN55022 Class A

(*) for future release

Application Diagram

Prestige 841
Compatible CPE

VES-1012 **VDSL Ethernet Switch**

Specifications

Dimensions
- 181 mm (L) x 128 mm (D) x 36 mm (H)
- Standalone box

VDSL Interface
- One RJ-11 connector
- Ethernet over VDSL
- Transmission rate: 5, 10, 15Mbps for symmetric /asymmetric
- Power back-off algorithm

POTS Interface
- One RJ-11 connector
- POTS splitter built-in

Ethernet Interface
- One 10/100 Ethernet port
- RJ-45 connector

LED and Switch
- Power: Light on & off: System on or off
- VDSL
  - Light on: Link on
  - Light flashing: link active
  - Light off: link is down or no connection
- Ethernet
  - Green light: 10M Ethernet
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  - Light off: Ethernet not ready or failed
  - Light on: Ethernet link ok; color will indicate if 10 or 100M LAN is on
  - Light flashing: Snd/Rcv
- Power switch: for power on or off

System Control
- Firmware upgrade from VES-1012
- Plug and play

Network Protocols
- IEEE 802.3/3u/3x
- Flow control in full duplex mode
- Back pressure in half duplex mode
- Transparent bridging

Temperature
- Operating: 0˚C ~ 50˚C
- Storage: -25˚C ~ 70˚C

Humidity
- 10 ~ 90% (non-condensing)

Power
- 110V or 240VAC, 50 ~ 60Hz

Certification
- Safety
  - UL1950
  - CSA C22.2 No. 950
  - EN60950, EN41003
- EMC
  - FCC Part 15 Class B
  - EN55022 Class B

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Unleash Networking Power

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