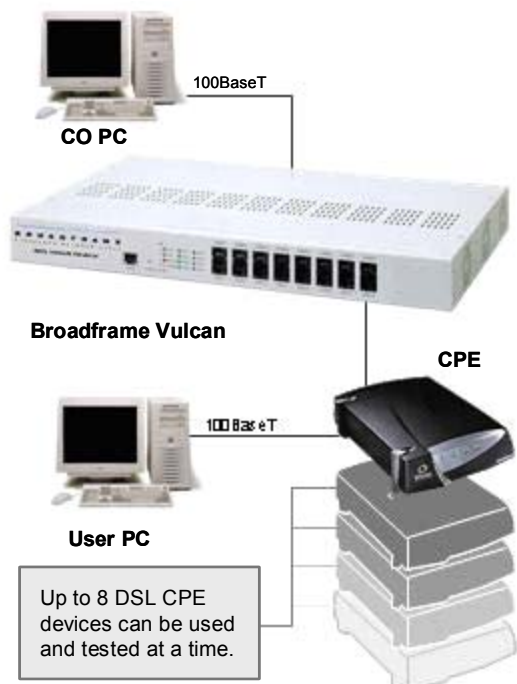


## Introduction

The Broadframe™ Vulcan provides a very cost-effective network emulator/simulator for development, test and demonstration of ADSL CPE equipment. The Broadframe Vulcan simulates an ADSL Access Multiplexer (DSLAM) and an access concentrator with a sample of Internet content to provide the experience of a live Internet connection. Vulcan is an excellent tool for ADSL product developers, test engineers, test technicians, and field sales representatives who benefit from connecting their products to a virtual Internet in a controlled environment.

## Functional Description

The Vulcan ADSL Network Simulator consists of a chassis with 8 ADSL ports with 8 CO-side POTS ports and application software that runs on a Central Office-side PC (CO PC).



Vulcan is controlled by an high performance communications processor with RAM and FLASH memory and connects via Ethernet to a user-supplied CO PC.

A simple HTML Graphical User Interface (GUI) utility runs on the Vulcan and is accessed via a web browser on the CO PC. The GUI is used to configure the Vulcan unit and controls such parameters as IP address and VPI/VCI settings.

Any web server application can run on the CO PC and act as an ISP or virtual Internet for the user's application.

From a network view, the user's CPE products (up to eight) plug into the ADSL ports on Vulcan which is then connected via Ethernet to the virtual Internet. Once connected to the virtual Internet, the CPE products can ping IP addresses on the Internet side of Vulcan. Connection to the Vulcan virtual Internet allows the user to develop, test or demonstrate their product or application over a live network.



## Features

- ◆ ADSL Internet simulation for evaluation, development, testing, and demonstration of CPE equipment.
  - Supports ftp, ping, http
  - Connects to virtual Internet with user-supplied CO PC
- ◆ Powerful GUI provides extensive access and control of the ADSL CO chipset that allows users to:
  - Analyze line performance reported by the chipset.
  - Monitor/set key parameters such as down/upstream bits rates, carrier mask, noise, power, HEC errors
- ◆ ADSL Encapsulation Protocol Support
  - RFC 1483/2684 LLC/SNAP
  - RFC 2364 PPPoA VC MUX/
  - RFC 2364 PPPoA LLC NLPID
- ◆ ADSL Interfaces (8) – ATU-C Compliance
  - ITU-T G.992.1 (G.DMT) Annex A
  - ITU-T G.992.2 (G.Lite)
  - ANSI T1.413 Issue 2
- ◆ POTS Interfaces (8)
  - Provide analog voice to PBX or PSTN switch
- ◆ Ethernet Port (1)
  - 10/100 Base T port for connection to CO PC
- ◆ Serial RS 232 Console Port (1)
  - Local configuration
- ◆ Utility Software
  - Simple, Quick Configuration of System Parameters
    - ATM VPC/VCI settings
    - ADSL encapsulation protocol
    - IP addresses
    - PPP parameters

## Applications

The Broadframe Vulcan is portable and easy to configure, which makes it ideal for many applications.

- ◆ Initial development of a CPE product when modem synchronization and basic network connection needs to be established on new designs.
- ◆ ADSL interoperability and conformance testing of CPE products.
- ◆ Performance analysis over a controlled DSL connection.
- ◆ Demonstration/training device for DSL equipment in virtually any location.
- ◆ Production testing of multiple CPE products.

## Encapsulation Protocol Support

ITU and ANSI specify the Layer 1 standards for ADSL; these specifications do not describe the higher level protocols. As a result, there are many data and voice protocols being deployed. The Broadframe Vulcan supports the following popular ADSL encapsulation protocols:

- RFC 1483/2684 LLC/SNAP
- RFC 2364 PPPoA VC MUX
- RFC 2364 LLC NLPID
- RFC 2516 PPPoE (Optional)

## User Interface

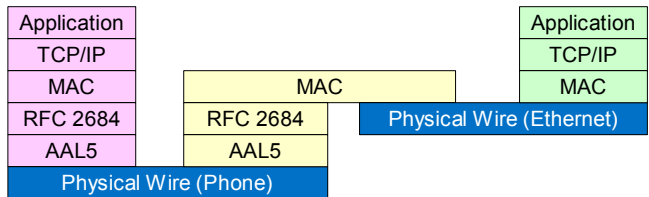
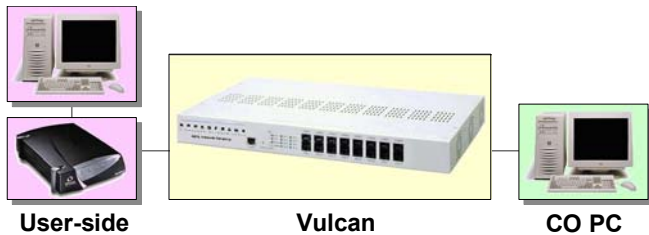
The user interface that configures, controls, and monitors the Vulcan system is an HTML GUI application that is accessed via a web browser on the CO PC.

The Vulcan Configuration user interface controls the following functions of the Broadframe Vulcan:

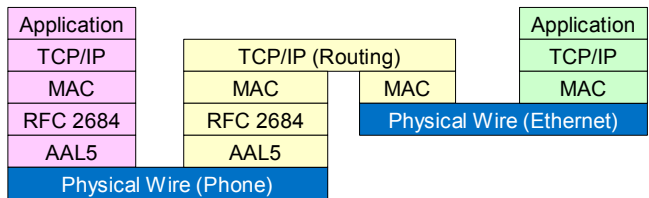
The Version 2.0 user interface controls the following functions of the Broadframe Liberator:

- ◆ Configuring system parameters for the Vulcan system, including:
  - Encapsulation protocol selection
  - Vulcan Ethernet and ADSL IP addresses and default gateway
  - ATM VPI/VCI
  - PPP parameters such as login username, password, access concentrator name and service name

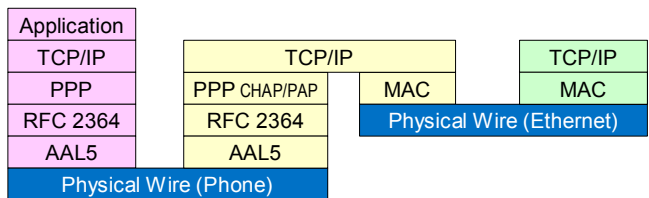
Vulcan ships with factory default system parameters, which are easily modifiable via the user interface.



**RFC 2684 LLC/SNAP Diagram - Vulcan bridging**



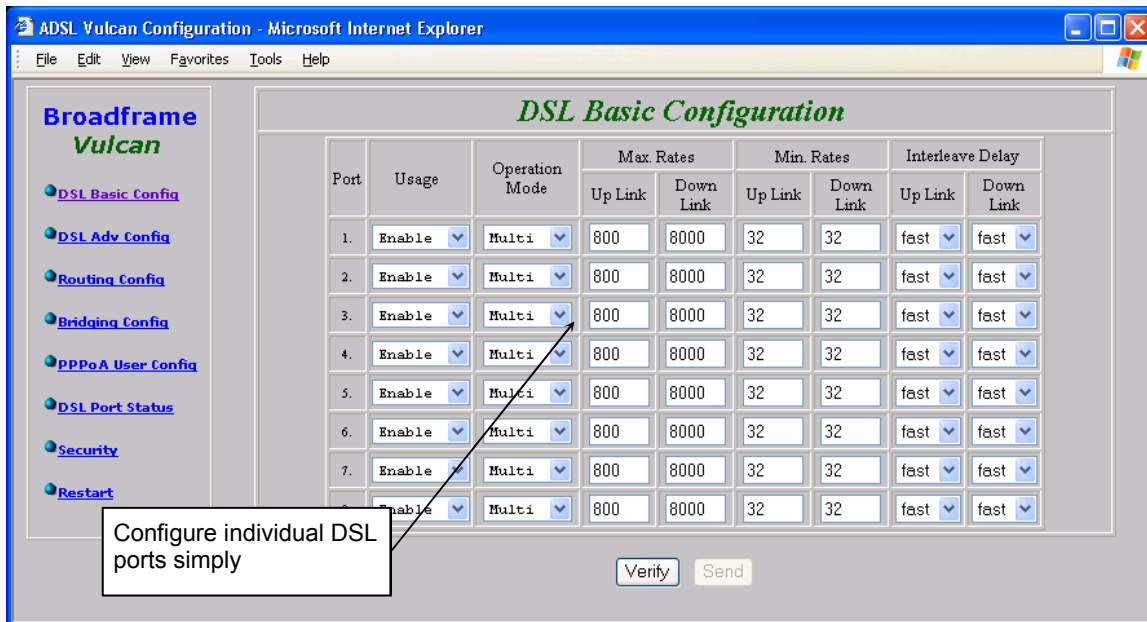
**RFC 2684 LLC/SNAP Diagram - Vulcan routing**



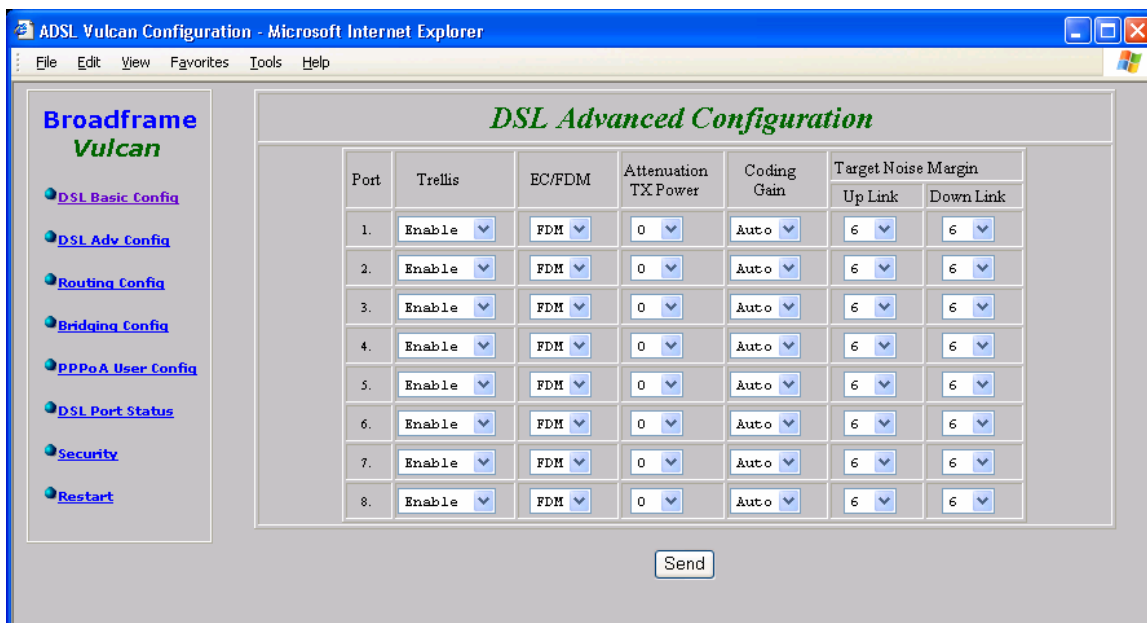
**RFC 2364 PPPoA Diagram**

Diagrams start on the next page.

## User Interface Diagrams



**Basic Configuration** –Desired physical parameters for the connection (upper/lower connection rates, etc).



**Advanced Configuration** – More physical configuration options (target noise margins, power gain, etc)

## User Interface Diagrams (continued)

**Routing Configuration**

LAN: IP: 172.241.254 Netmask: 255.255.0.0

DSL Port	Routing	PPPoA	IP	Netmask	VPI	VCI	Remote IP	Auth.
1.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.0.0.2	255.255.255.0	0	35	10.0.0.1	CHAP
2.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.0.1.2	255.255.255.0	0	35	10.0.1.1	CHAP
3.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.0.2.2	255.255.255.0	0	35	10.0.2.1	CHAP
4.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.0.3.2	255.255.255.0	0	35	10.0.3.1	CHAP
5.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.0.4.2	255.255.255.0	0	35	10.0.4.1	CHAP
6.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.0.5.2	255.255.255.0	0	35	10.0.5.1	CHAP
7.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.0.6.2	255.255.255.0	0	35	10.0.6.1	CHAP
8.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10.0.7.2	255.255.255.0	0	35	10.0.7.1	CHAP

Routing Table for DSL Port:

DSL Port	Network Address	Netmask	Gateway Address
1.	192.168.1.0	255.255.255.0	10.0.0.1
2.	192.168.2.0	255.255.255.0	10.0.1.1
3.	192.168.3.0	255.255.255.0	10.0.2.1
4.	192.168.4.0	255.255.255.0	10.0.3.1
5.	192.168.5.0	255.255.255.0	10.0.4.1
6.	192.168.6.0	255.255.255.0	10.0.5.1
7.	192.168.7.0	255.255.255.0	10.0.6.1
8.	192.168.8.0	255.255.255.0	10.0.7.1

Ethernet:  NAT

Routing Table:

DSL Port	Network Address	Netmask	Gateway Address
1.	0.0.0.0	0.0.0.0	172.24.190.254
2.			
3.			
4.			
5.			
6.			
7.			
8.			

RIP

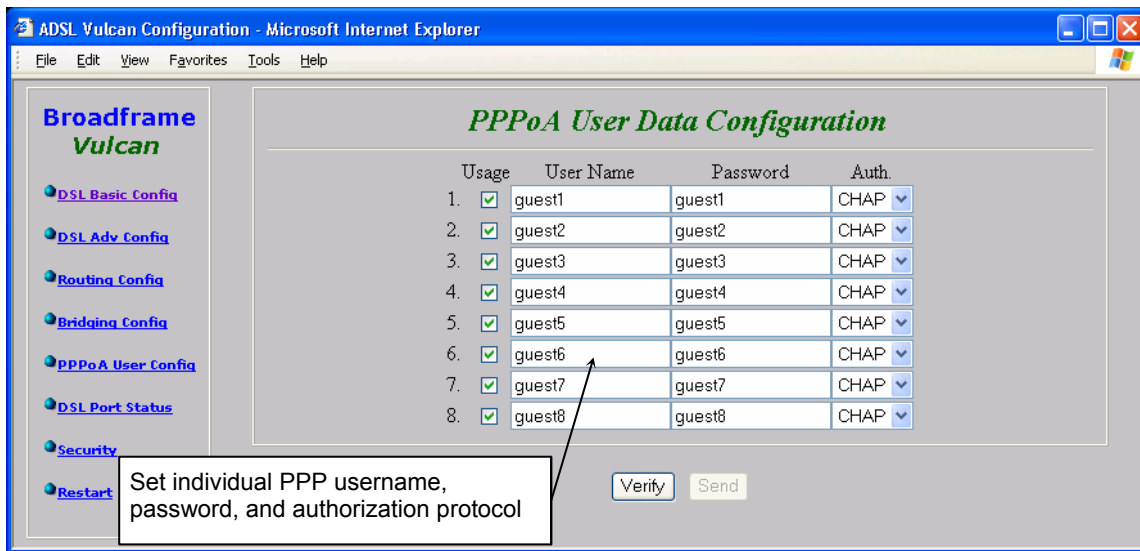
Routing Configuration –RFC 2384 LLC/SNAP – Routing mode configuration

**Bridging Configuration**

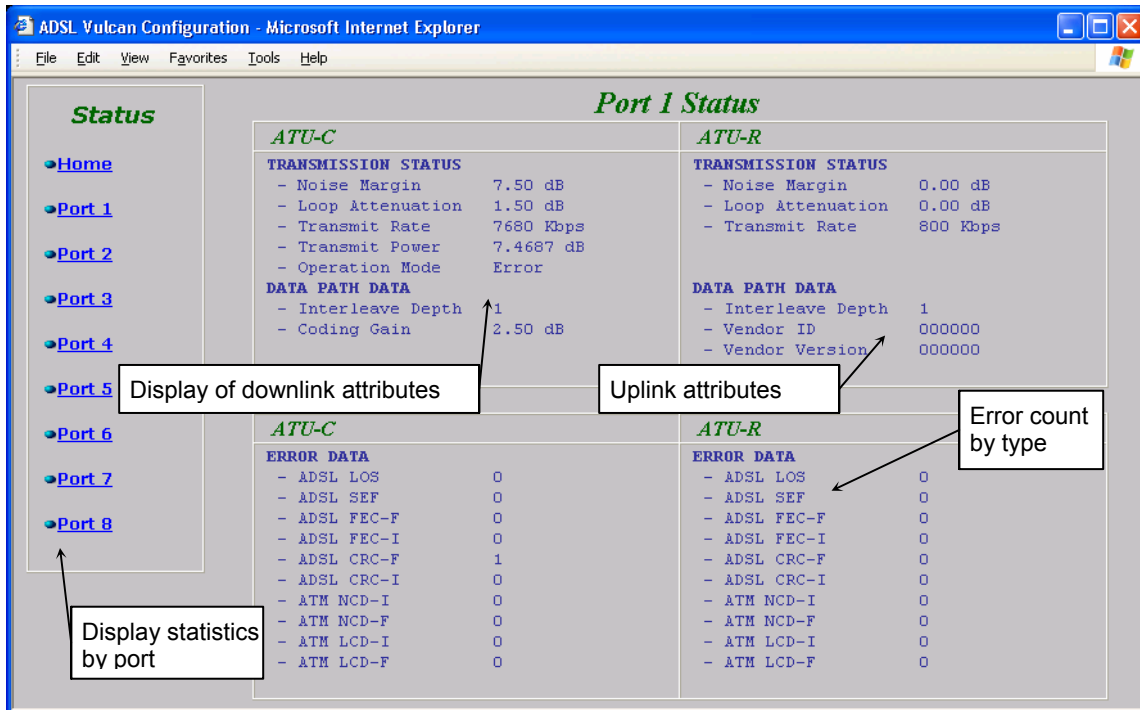
DSL Port	Enable	VPI	VCI	Port Filter	IP Filter
					Legal IP 1
1.	<input type="checkbox"/>	0	88	<input type="checkbox"/>	
2.	<input type="checkbox"/>	0	88	<input type="checkbox"/>	
3.	<input type="checkbox"/>	0	88	<input type="checkbox"/>	
4.	<input type="checkbox"/>	0	88	<input type="checkbox"/>	
5.	<input type="checkbox"/>	0	88	<input type="checkbox"/>	
6.	<input type="checkbox"/>	0	88	<input type="checkbox"/>	
7.	<input type="checkbox"/>	0	88	<input type="checkbox"/>	
8.	<input type="checkbox"/>	0	88	<input type="checkbox"/>	

Routing Configuration –RFC 2384 LLC/SNAP – Bridging mode configuration

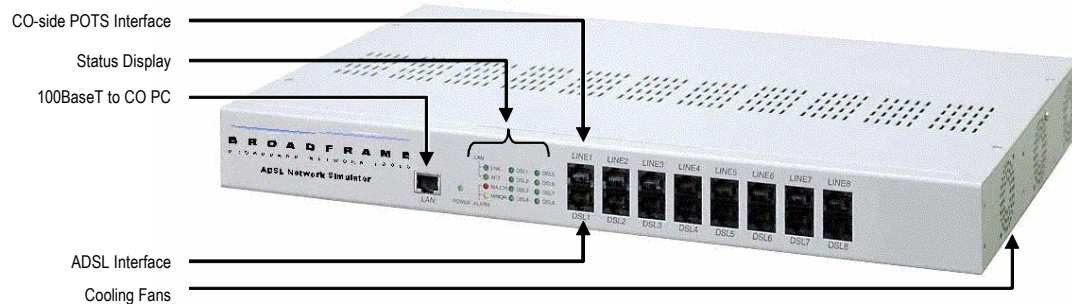
## User Interface Diagrams (continued)



**PPPoA Configuration** –Configure security information for PPP over ATM protocol RFC 2364



**Port Status** – Display the physical attributes of each port after showtime.



## Mechanical/Electrical

Item	Limit
<b>Power</b>	
Voltage	100-240 VAC
Frequency	50/60 Hz
Power	40 W (Maximum)
Fuses	2 x 2A, 250V fuse
<b>Operating Environment</b>	
Temperature	5 – 45°C
Humidity	0% to 95%, non-condensing
<b>Dimensions and Weight</b>	
Height *	1.77" (45 mm)
Width *	17" (433 mm)
Depth *	10.35" (263mm)
Weight	9.45 lbs (4.3 Kg)
<b>Certification</b>	
FCC	Complies with FCC Part 15 Paragraph 15.103(c)

## Warranty

Vulcan is provided with a one year warranty, including parts and labor.

## PC Requirements

The Broadframe Vulcan is controlled with a user-supplied CO PC. The CO PC configuration is defined below.

- ◆ 10BaseT Ethernet interface
- ◆ A Web Browser that supports Frame and Java Script 1.2. Microsoft IE 4.0/Netscape 6 or higher is recommended.
- ◆ No requirements for operating system.

## For Product and Ordering Information

Please contact:

**Address** 4029 S. Capital of Texas Hwy  
Suite 220  
Austin, TX 78704

**Email:** sales@broadframe.com

**Web:** www.broadframe.com/

**Tel:** +1 512 373 4225

**Fax:** +1 512 373 4181

