



VyOS
Networks



/ SOLUTION BRIEF

BROADBAND NETWORK GATEWAY

Introduction

A **Broadband Network Gateway (BNG)**—also known as a **Broadband Remote Access Server (BRAS)**—is a critical network function in service provider networks. It acts as the **aggregation and termination point for broadband subscriber sessions**, managing traffic from residential and enterprise customers accessing the internet or private services. It handles essential functions like **establish sessions**, user authentication, IP address assignment, enforce traffic policies and QoS, and track usage for billing and analytics.

A configurable **Broadband Network Gateway (BNG)** will help you overcome this need, as you can allow your router to communicate with external devices and servers in order to establish connectivity with your subscribers through logical sessions.

There are two types of logical sessions:

■ PPPoE Subscriber Session

The PPP-over-Ethernet (PPPoE) subscriber session is established using the point-to-point protocol (PPP) that runs between the customer-premises equipment (CPE) and the broadband network gateway (BNG). It is designed for managing how data is transmitted over Ethernet, and it allows a single server connection to be divided between multiple clients.

■ IPoE Subscriber Session

The IP-over-Ethernet (IPoE) subscriber session is established using the IP connection that runs between the CPE and the BNG; IP addressing is done using the DHCP protocol. IPoE is essentially DHCP triggered subscriber interfaces. Users are “authenticated” through the combination of incoming interface and MAC address. This identifies the physical location of the user based on the queue they are connected to.

Key Benefits

- Reasonable and competitive pricing so you can get maximum flexibility
- Unified CLI for management to configure and setup your BNG so you can forget about using multiple applications/Configuration interfaces
- Integration with AAA server that authenticates subscribers and keeps an account of subscriber sessions
- Acts as DHCP server to provide IP addresses to the clients
- Provides both Layer 2 and Layer 3 connectivity and routes IP traffic through an internet service provider’s backbone network to the internet
- Applies limits to the services provided to customers, limiting access to sensitive data or valuable resources with a powerful firewall
- Guarantee quality of service (QoS) by ensuring or limiting the desired traffic

Requirements to Deploy BNG

In order to deploy VyOS as BNG we should meet a couple requirements.

First of all we need to know that Hardware requirements may vary depending on throughput being managed, the subscriber sessions quantity and additional features to be used on VyOS. You can use any **VyOS**

Supported Hardware to deploy BNG.

We recommend the following specifications for each scenario:

- **For +2k sessions and a throughput of 2Gbps:**

- At least 4 cores with 3 Ghz or more.
- Minimum RAM of 8GB

- **For +10k sessions and a throughput of 10Gbps:**

- At least 8 cores with 3 Ghz or more.
- Minimum RAM of 16GB

- **For +20k sessions and a throughput of 40Gbps:**

- At least 8 cores with 3Ghz or more
- Minimum RAM of 16GB DDR4
- An Intel X/XL710 NIC or Intel x520 NIC

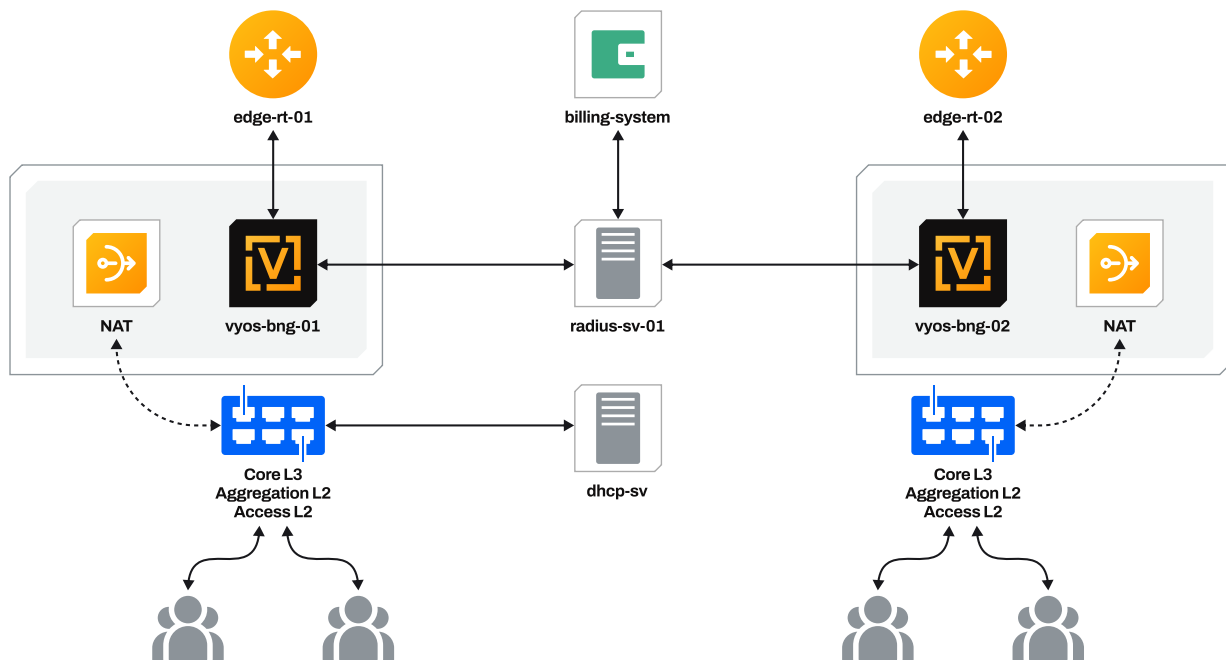
- **A RADIUS server in order to provide AAA (Authentication, Authorization and Accounting). If desired, you can use more than one RADIUS server.**

- **A Billing system with a Database.**

- **An Edge Router device**

How does it Work?

- **VyOS as BNG**, works by using the **ACCEL-PPP** application, which is **already integrated** inside VyOS.
- Both Protocols **IPoE** and **PPPoE** are supported. However **we usually recommend using PPPoE** sessions when deploying BNG.
- Following the recommendation, the **“vyos-bng-01”** device must be configured with PPPoE server containing:
 - An Access Concentrator Name
 - RADIUS as the Authentication mode
 - One Interface in which is it going to serve requests (for example eth1)
 - A client IP address pool (it can be sourced from 'radius-sv-01')



- You must sync your **“billing-system”** your **“radius-sv-01”** server. This will grant you operational controls like traffic accounting and charges calculation
- Additionally you can apply QoS policies in order to limit or guarantee traffic by rules.