Nokia Virtualized Broadband Network Gateway

VSR Release 15

- Virtualize the residential subscriber services edge to quickly address new market opportunities with a cloud-based service delivery model
- Elastically scale capacity using standard, open-source IT compute virtualization in a distributed edge or centralized data center environment
- Compatible with RADIUS authentication, authorization and accounting (AAA) to ease integration with legacy systems

Overview

The virtualized Broadband Network Gateway (vBNG) is a virtualized network function (VNF) delivered by the Nokia Virtualized Service Router (VSR). It supports subscriber service edge virtualization for internet retail and wholesale service delivery over xDSL and FTTx access technologies, with dual-stack IPoE and PPPoE session management and RADIUS authentication. Comprehensive application QoS and security policy enforcement, and captive web subscriber portals help deliver a personalized and rich cloud experience.

The vBNG functionality on the VSR is based on the field-proven Nokia Service Router Operating System (SR OS). The Nokia Network Services Platform (NSP) delivers VNF and element management and allows network operators to seamlessly manage physical and virtualized BNG system instances using existing OAM and AAA protocols and management practices.

The vBNG has been design-optimized for Linux 64-bit operating systems (CentOS, Red hat Enterprise Linux, and Ubuntu), in combination with the KVM/QEMU hypervisor. The vBNG can optionally be deployed using the Red Hat OpenStack Platform or RDO project distribution.

Virtualized Broadband Network Gateway

The virtualized Broadband Network Gateway (vBNG) is an essential network function for network operators and internet service providers (ISPs) offering retail and wholesale services to the residential market:
- Legacy Broadband Remote Access Server (BRAS) replacement to deliver residential internet access services using a virtualized platform with elastic scaling
- Advanced subscriber management capabilities to foster a more user-centric and differentiated online experience
- To complement existing BNG network equipment addressing basic high speed internet (HSI) and IPTV services with a more agile service delivery architecture for the cloud era

The Nokia VSR as a vBNG supports enhanced subscriber management and comprehensive IP edge routing features, and can be extended with additional service options as needed:
- Carrier-grade Network Address Translation (CG-NAT) to manage the transition to IPv6
- Application Assurance, for powerful application QoS, analytics and security policy enforcement
- Advanced features such as in-browser notifications, captive portals and URL filtering

The VSR supports OpenStack VNF on-boarding through Heat Orchestration Templates. The Nokia CloudBand software portfolio is available to facilitate hosting, orchestration, automation and management requirements.
Introducing cloud-optimized subscriber services

A carrier-grade vBNG solution that caters to your evolving needs

The vBNG function on the Nokia VSR is enabled by a flexible licensing scheme that allows upgrade of platform resources and system features as your needs evolve.

Technical specifications

The vBNG feature set for VSR OS Release 15 includes (but is not limited to):

- Flexible subscriber and services mapping with 1:1 or N:1 VLANs
- Numbered subscriber interfaces
- IPv4/IPv6 anti-spoofing
- Managed (ESM populated) ARP table
- Managed IPv6 neighbor cache
- Dual-stack Internet Protocol over Ethernet (PoE) sessions (DHCPv4/v6, SLAAC)
- Dual-stack Point-to-Point Protocol over Ethernet (PPPoE) sessions
- Managed routes (v4/v6)
- Local user database and RADIUS authentication
- RADIUS Change of Authorization (COA)
- Support for Gx interface to the Policy Control and Charging Function (PCRF) for dynamic, per-subscriber policy control
- Dynamic QoS overrides (SLA profile, queue and scheduler parameters)
- Dynamic filter overrides
- Accounting (per session, per host and per SLA-profile instance)
- HTTP redirect
- Data-triggered host creation
- Ingress policing/hierarchical policing
- Egress queues and shaping with configurable subscriber peak information rate (PIR)
- Port-scheduler with multiple levels (strict priority within levels and Weighted Round Robin (WRR) between levels)
- Subscriber scheduler with configurable subscriber PIR
- CG-NAT (additional license required)
  - Layer 2/subscriber-aware NAT
  - IPv4 address in LSN44, IPv6 prefix in NAT64, B4 element in Dual-Stack Lite
- Value-added service options (additional licenses required)
  - Per-application traffic control and identification
  - Internet Content Adaptation Protocol for URL classification-based filtering control
  - In-browser notifications (e.g., usage, security or maintenance alerts)
  - Local list URL filtering
  - TCP, DNS and Real-time Transport Protocol (RTP) performance measurement

Please refer to the Nokia VSR data sheet for system feature specifications and standards compliance.