

ACL Digital Virtual B-RAS Solution

Overview

Surging broadband subscriber base and the advent of more bandwidth-hungry network services have clearly started highlighting issues with the traditional BRAS - Broadband remote access server solutions in the existing broadband service deployments. These proprietary hardware-based solutions are not adaptive to the fluctuating market demand for scale, performance and newer functionalities.

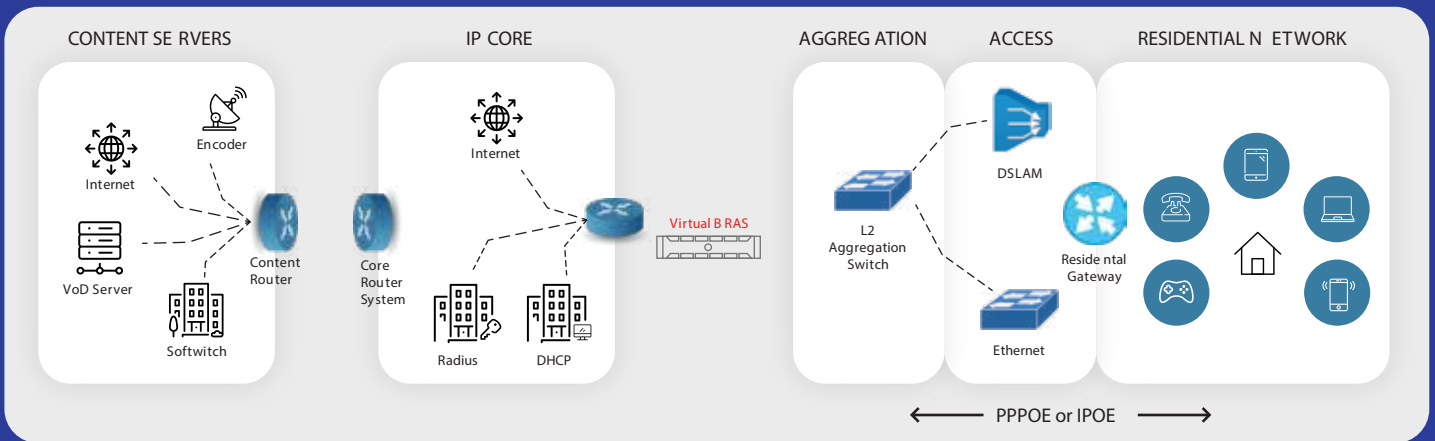
With the proliferation of high-speed internet access and multimedia demand, it is hightime the operators leapfrog from this expensive monolithic hardware-based BRAS to a future-proof, software-based BRAS solution that ACL Digital can offer.

Our framework is designed and developed to eliminate these shortfalls in the traditional approach, by decoupling the network functions from proprietary purpose build hardware appliances and run them as virtual software appliances running on any standard x86 processor-based platforms - COTS or as a virtual network function in cloud computing infrastructures.

High-performance fast path processing is achieved using DPDK libraries and drivers, and delivers line rate performance on 1G, 10G, and 40G NIC's. These virtual instances can be provisioned in different compute flavors to meet the on-demand scale and throughput requirements.

The highly modular architecture of our solution makes it flexible to choose and plug, only the required functional features, from the superset of many optional features we offer, thereby improving resource utilization. The operators need not pay for the functionalities he does not want and does not require the long wait for hardware box upgrades. Virtual upgradation of network elements via software decreases hardware obsolescence and is easier to implement.

Operators can roll out new software enhancements for improved functionality with no delay of waiting for hardware capabilities and life-cycles, thereby accelerating service innovation. The solution works with all the standards compliant devices in both (upstream and downstream) directions, thereby allowing it to be deployable in both greenfield and brownfield solutions.

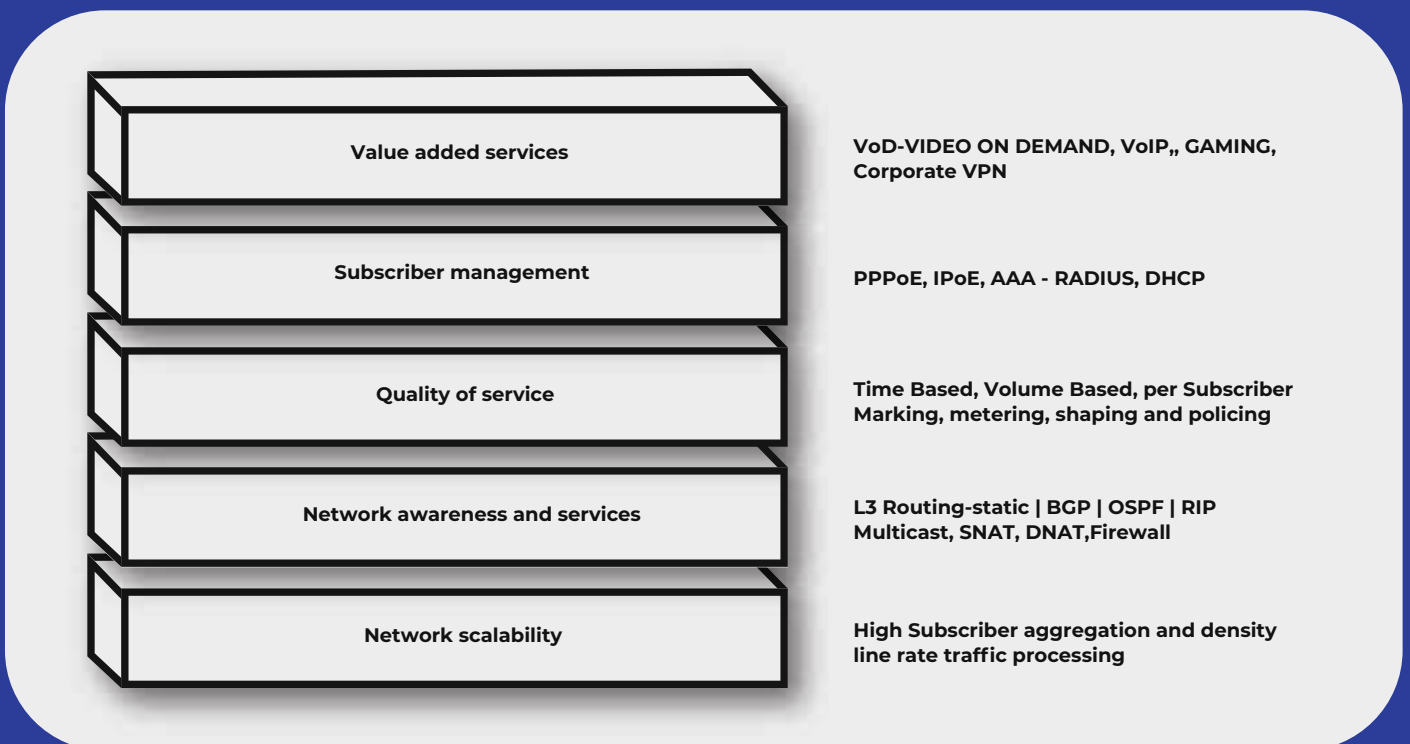


Like in any Broadband service deployment solutions, our vBRAS - Virtual Broadband remote access server - sits at the edge of the service providers' core network and aggregates user sessions from the access networks and has the function of managing all access network traffic and other critical functions - like to allow access and authentication for thousands of subscribers, establishing and monitoring their sessions management and controlling the user line rate.

This BRAS is effectively the first IP hop from where a subscriber's IP traffic is processed for onward routing. A service provider can inject his policy management and QoS in regional and access networks. Our solution provides session establishment through two of the most commonly used access communication protocols.

- PPP over Ethernet (PPPoE): Use the point to point (PPP) protocol
- IP over Ethernet (IPoE): Use IP protocol

This dual stack support means, that our solution supports thousands of both IPoE and PPPoE users to coexist simultaneously.



Highlights

- › Control plane acceleration to deliver 10,000 to 2,56,000 PPPoE, IPoE subscriber sessions
- › Data plane acceleration to achieve line rate performance with 1G, 10G and 40Gbps with few processing cores
- › Performance scales linearly with the number of processing cores
- › Dynamic Bandwidth management and Application based QOS at the subscriber level
- › AAA capabilities for Subscriber Authentication, Authorization and Accounting
- › Dual stack support for PPPoE and IPoE users coexisting simultaneously
- › IPv4 and IPv6 addressing schemes with support for Dynamic Routing Protocols
- › All forms of Network Address Translation (NAT) support at Interface level
- › High Availability of services in Active-Active or Active-Standby mode
- › Open, standards based solution
- › Offers significant CAPEX/OPEX benefit to the service providers

Platform Support

Support for different virtual environments (KVM/Xen)

Deployable on a VM or bare metal on

- › Intel x86 COTS Platforms
- › Public cloud platforms (AWS, GCP)
- › OpenStack orchestrated instances
- › Virtualization support for VirtIO, SR-IOV, PCI Pass-through

User Access Protocols

- › PPP over Ethernet - PPPoE
- › IP over Ethernet - IPoE

User Billing protocol

- › RADIUS

Policy Protocol

- › Change of Authorization - COA

User Accounting Protocol

- › RADIUS

User Access Protocols

- › PAP - Password Authentication Protocol
- › CHAP - Challenge Handshake Authentication Protocol
- › RADIUS - Remote Access Dial In User Service

IPv4 Support

- › DNS client
- › ICMP
- › ARP
- › DHCP server, client and relay
- › IPv4 ACL

IPv6 Support

- › DHCPv6 server and client
- › NDP - Neighbour Discovery Protocol
- › ICMPv6
- › IPv6 ACL

Dynamic Bandwidth Management

- › Bandwidth Class and policy with CIR and PIR
- › IQoS - Traffic marking based on trTcm(Two Rate Three Colour Meter)
- › EQoS - Based on DPDK's hierarchical scheduler
- › Dropper - Uses Random Early Detection(RED) or Weighted Random Early Detection(WRED) for congestion avoidance
- › Application based QoS support based on deep packet inspection

Management Features

- › CLI for device configuration
- › Extensive logging support and per session logging
- › RESTful API's which can be used by 3rd party tools
- › Elegant web based GUI for configuration and monitoring

Tunnelling (Optional)

- › MPLS
- › EoGRE

Layer 3 routing

- › OSPFv2, OSPFv3
- › RIPv1, RIPv2, RIPng
- › BGPv4

Network Address Translation

- › SNAT
- › DNAT
- › Masquerading

VLAN Stacking

- › 802.1Q
- › 802.1AD

Firewall

- › IP tuple based
- › State-full
- › Application aware firewall / AVC (Optional)

Layer 3 VPN (Optional)

- › Site to Site and Remote access
- › IPSec Transport and Tunnel mode

Security (Optional)

- › IPS - Intrusion Prevention System
- › IDS - Intrusion Detection System
- › DPI - Deep Packet Inspection

Our Services

Virtual function development, integration and testing

- › PPP, PPPoE, IPoE, RADIUS, PAP/CHAP, DHCP
- › OSPF, RIP, BGP, MPLS, IPSec
- › NAT, Firewall, Subscriber and Application-aware Security enforcement
- › Dynamic per session QoS management

DPDK based Virtual B-RAS optimization

- › Data Plane acceleration
- › Scaling performance proportional to number of cores

Virtual B-RAS orchestration

- › Openstack based orchestration, Quantum/Neutron integration
- › Orchestration logic extensions and management framework integration
- › Orchestration layer integration with OSS/BSS

Virtual B-RAS testing and Test Automation development

- › Functional, Performance, Load and Stress testing
- › KVM and Openstack infrastructure staging and orchestration
- › End-to-End test strategies for NFV architectures

Management framework enhancements

- › Physical and Virtual appliance aware
- › SDN Controller integration
- › NFV/SDN management layer integration with OSS/BSS

Virtual B-RAS sustenance engineering

- › Bug fixes, Updates and Patch management
- › Upgrades and Release management

Virtual B-RAS deployment

- › Telco infrastructure audit, vB-RAS staging in Telco environment
- › Set up orchestration services, OSS/BSS integration
- › End-to-end Service Validation
- › Service Roll-out management

Operations Support

- › Service Desk implementation
- › Provisioning & Configuration management
- › Service Monitoring & Service Assurance
- › L2/L3 Technical support

RFC COMPLIANCE LIST

- › RFC 1661, The Point-to-Point Protocol (PPP)
- › RFC 1570, PPP LCP Extensions
- › RFC 1332, PPP IP Control Protocol (IPCP)
- › RFC 1334 PAP PPP Authentication Protocols
- › RFC 2865 RADIUS
- › RFC 2328 OSPFv2
- › RFC 1058/RFC 2453 for RIPv1/RIPv2 for IPv4
- › RFC 2080 RIPng for IPv6
- › RFC 4271 BGP -4
- › RFC 2698 for packet metering using trTCM algorithm

ACL Digital is a design-led Digital Experience, Product Innovation, Engineering and Enterprise IT offerings leader. From strategy, to design, implementation and management we help accelerate innovation and transform businesses. ACL Digital is a part of ALTEN group, a leader in technology consulting and engineering services.

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