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Solution Data Sheet

Disaggregated Aggregation Router

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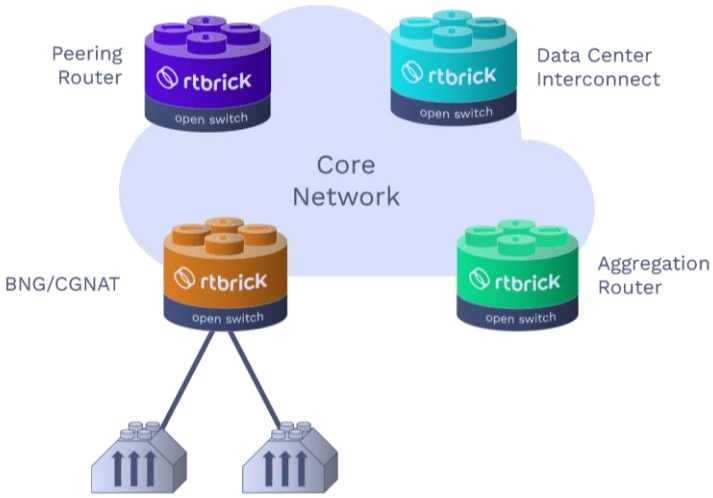
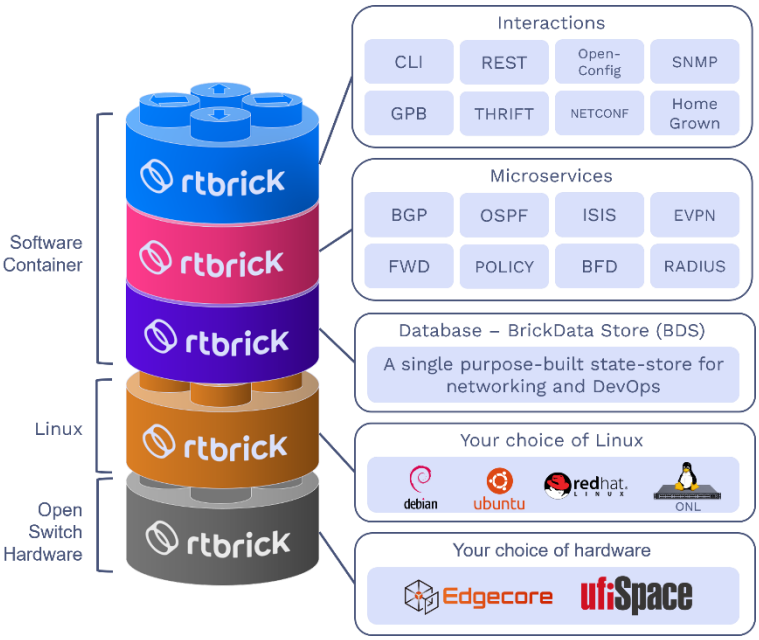
Over recent years ‘cloud-native’ service providers have developed ways to build and run massive data centers with a high degree of automation, to reduce operational overheads and deliver levels of service agility beyond traditional carrier infrastructure. RtBrick’s disaggregated open BNG brings these same benefits to carrier access networks, by using agile methodologies and the same battle-hardened DevOps cloud automation tools that have been adopted by the world’s biggest cloud providers.



Architecture

The RtBrick Aggregation Router is provided by RtBrick Full



Stack software, which takes advantage of the latest merchant silicon running on powerful bare-metal switches to give you

Benefits

RtBrick’s disaggregated BNG delivers:

- **Greater agility** – you can add new services in minutes rather than weeks
- **Reduced risk** – no more vendor lock-in and a simpler automated operating environment
- **Cloud cost-levels** – leverage low-cost merchant silicon and automate your operations like an ‘Internet-native’

Agility

ZTP (Zero-Touch-Provisioning) ensures that each switch is booted, provisioned and operational without requiring manual intervention. This means that you can add capacity, or roll-out new service features, in a matter of minutes instead of days or weeks.

The software itself is developed using Agile methodologies so that features are rapidly prototyped and implemented, reducing the time-to-market for new services.

Reduced risk

RtBrick’s BNG software also allows you to pick and mix between the latest silicon and the best available software . It is also compiled for your specific use-case, using only the features you need. With an order of magnitude fewer lines of code, and a single state database rather than hundreds, the whole system is less complex, less prone to bugs and has much faster restart times.

Cloud cost-levels

Now you can take advantage of the low cost-points of merchant silicon on your choice of bare-metal switches, significantly reducing your capex bill. And opex costs can be reduced by automating your operations, using ZTP and the same Web2.0 operational tools that the ‘cloud-natives’ use to run their infrastructure.

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high-performance at a fraction of the cost of conventional monolithic router systems.

The router is delivered as a Linux container and packaged for bare-metal switches within a Debian installation for a seamless experience out-of-the-box. Linux handles peripherals such as LEDs, temperature sensors, and other platform management tasks. The entire networking stack, including the forwarding elements, is implemented in user-space as containerized processes.

Deployment Options

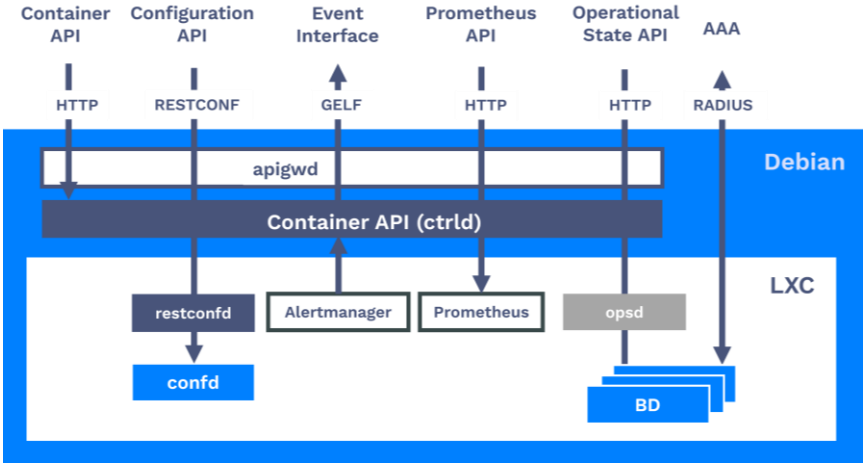
The Multiservice Edge Router can be provided on a single low-cost bare-metal switch, typically in a 1RU or 2RU format.

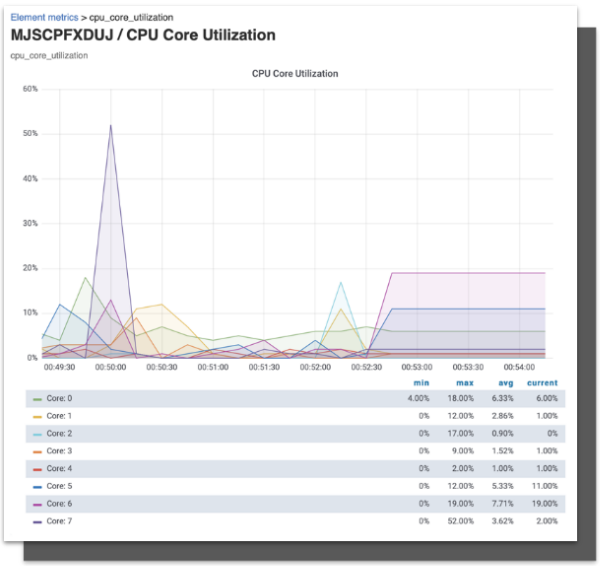
Typical Open Switch

It can also support BNG and CGNAT functions if needed.

Management and Operations

RtBrick's Management API has been designed to simplify the integration with your existing OSS and BSS systems. It reduces the amount of time and effort required to make your disaggregated network operational, and it leverages widely-adopted industry tools and programming languages. RtBrick's API is 'consumer-driven' – which means you can use the formats and languages of your choice, rather than have them imposed on you by a vendor. This allows you to build a client in Python, Go or Java, for example, as you prefer. And the APIs are all edited in Swagger, which is also a widely understood tool used by developers.





RtBrick API data extraction: example screenshot

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License and Support Options

RtBrick's Aggregation Router software is offered as a routing instance required per physical switch. The per-switch license varies depending on the type of switch it is linked to, for example switches using either Q2A or Q2C chips from Broadcom.

If the software is also performing BNG or CGNAT functions, then there is an addition network-wide subscriber license which varies depending on feature-set required.

Instance-based licenses are perpetual and linked to the hardware they were purchased on. Network-wide licenses are perpetual and migratable as the network grows.

All licenses require additional purchase of service, support and upgradability licenses on an annual, 3-year or 5-year basis. Service licenses entitle the operator to maintenance support for existing deployments as well as to receive release updates, i.e. newer versions of the same functional release.

RtBrick Aggregation Router Features

The following list may include some roadmap features—please check with us for the latest details.

Feature	Description
Base OS	· RBFS LXC container based on Debian12
Supported hardware	· Edgecore: CSR440, AGR400, AGR420 · UfiSpace: S9510-28DC, S9600-32X, S9600-72XC and S9600-102CX
L3 Protocols*	· **BGP** - , L2VPN, FlowSpec), L3VPN, Segment Routing, Enhanced Route Refresh, Authentication with TCP MD5/TCP AO, Route Reflection, Multipath, Addpath, 4-Byte AS, BGP Capability Advertisement, BGP Communities (Normal, Extended, Large), Revised Error Handling, Route Policy, Rib-in visibility, Hostname Capability, Segment Routing Underlay RFC 1997, 2385, 2545, 2918, 3107, 4271, 4360, 4364, 4456, 4486, 4659, 4760, 4798, 4893, 5492, 5549, 6513, 6608, 6793, 7313, 7606, 7911, 8092, 8669, draft-walton-bgp-hostname-capability-02, draft-kumar-idr-link-local-nexthop-02 · **OSPFv2** - Refresh and Flooding Reduction, Route Policy, Segment Routing, Loop prevention in L3VPN, Multi-area Adjacency, Opaque LSA RFC 2328, 3137, 3509, 4136, 4576, 4577, 5185, 5250, draft-ietf-ospf-segment-routing-extensions-24 · **ISIS** - IPv4 and IPv6, Transient Blackhole Avoidance, Route Policy, Segment Routing, Hostname Exchange Support, Cryptographic Authentication, Restart Signaling, Extended IPv4 and IPv6 reachability, PoI TLV Support, Flood Filtering RFC 1195, 3277, 5301, 5302, 5303, 5304, 5306, 5308, 6232, 7775, 7794, ietf-isis-segment-routing-09

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Feature	Description
L3 Protocols* (Continued)	· **MPLS** - LDP, Segment Routing (ISIS, OSPFv2, BGP) · **LDP** - Authentication with TCP MD5/TCP AO, Support for IPv4/v6, Targeted-LDP, Route Policy RFC 5036
L2 Protocols*	· L2VPN - EVPN-VPWS, BGP-signaled L2VPN, Static Ethernet Pseudowire (L2X) local & remote, ingress VLAN Operations, Uni & Bi-directional, QoS support, incoming Traffic Match RFC 8214, 6624, draft-ietf-l2vpn-vpls-bgp-02
Multicast	· Multicast - PIM-SSM, MVPN, IGMP v2/3 RFC 2236, 3376, 4609, 3569, 6513
Security	· **Control Plane Policing** · **BGP Flowspec** · **Sflow** · **BGP RPKI Router** · **TCP MDS/AO** support for BGP & LDP · **BGP GTSM** RFC 5036 8955, 8210, 5925, 5082, sflow.org/sflow_version_5.txt
Timing	· Precision Time Protocol (PTP) ITU-T G.8275.1 (PTP IEEE 1588-2008 · Synchronous Ethernet/SyncE ITU-T G.8261 and ITU-T G.8264
User Interface	· **CLI** · **RBFS REST API** - authenticated access, finegrained access and control · **RESTCONF** - abstracted model based configuration · **OpsD** - Abstracted Model based Operational Commands · **SNMPv2C/v3**

*RFC and draft compliance partial except as specified

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