SOLUTION BRIEF

Communications Service Providers
SDN Controller

Sanctum Networks* Builds Orchestrated Broadband Service Delivery Platform

Sanctum Networks' Jupiter* lets service providers better manage data flows throughout a customer network. Jupiter is a software defined networking (SDN) controller and orchestration platform that utilizes software agents to distribute SDN visibility and programmability.

Overview

The growing usage of cloud computing has hastened the convergence of internet and cloud technologies and increased the demand for "everything as a service" cloud-based offerings. This is creating tremendous pressure on conventional fixed-function service gateways, which require new hardware or an upgrade to be scaled up to meet the demands of cloud services delivery. Additionally, with the proliferation of over-the-top (OTT) competitors, communications service providers (CommSPs) and direct-to-home (DTH) TV providers are feeling an impact on their services revenues. This pressure is driving the need for solutions that can enable commercially viable service innovation and accelerate service rollouts.

Sanctum Networks,* working with Intel® technology and the Intel® Network Builders ecosystem, has developed Jupiter,* a next-generation software defined networking (SDN) controller and orchestration platform. Jupiter aims to solve the critical bottleneck of visibility and programmability of customer network behavior. It introduces an open, standards-based innovation platform that allows any service provider to rapidly extend the reach and impact of multidevice broadband experience, bringing improved service deployment agility for the service providers.

The Challenge

SDN replaces a high-cost networking paradigm that was based on fixed-function routers that required ASICs to make local routing decisions for each packet. These routers utilized expensive hardware with proprietary interfaces. This situation led enterprises and communications service providers to become overly dependent on established vendors for network functionality, or meant uneven service delivery, interoperability, and end-to-end management challenges in a multivendor network. Now, with Jupiter providing a network-wide control plane, the network can be constructed in a simpler, less expensive, more agile, and open way that leverages widely available Intel® architecture-based server platforms.

The lack of network agility today is impacting consumer networks where a revolution in personalized and alternative content is underway. As content consumption is becoming more personalized, defined viewing habits are becoming a thing of the past. Rapid personalization is increasingly blurring the line between the primary and secondary screen as millennial consumers can watch a show on their TV while also consuming content on a phone or laptop. Not only is the line between the primary and secondary devices blurring, but so are the viewing schedules as time- and place-shifting technologies that stream content to you when and where you want grow in popularity. These technologies erase the lines between live, on-demand, and time-shifted viewing experiences. As this change

has put more pressure on the network as well as on the content distribution, service providers are challenged to build a network with the service agility to keep up with customer demands profitably.

Sanctum Networks' Jupiter is designed to change this paradigm through an access-agnostic, distributed SDN solution that puts the control of network services and data flows back into the hands of service providers with no vendor lock in. This frees providers to focus on deploying network services that deliver the value that customers expect.

The Solution

Sanctum Networks' Jupiter is an end-to-end orchestration solution comprising an orchestration engine combined with a lightweight SDN controller that can be deployed in residential gateways, cloud servers, or other locations at the core or edge of the network.

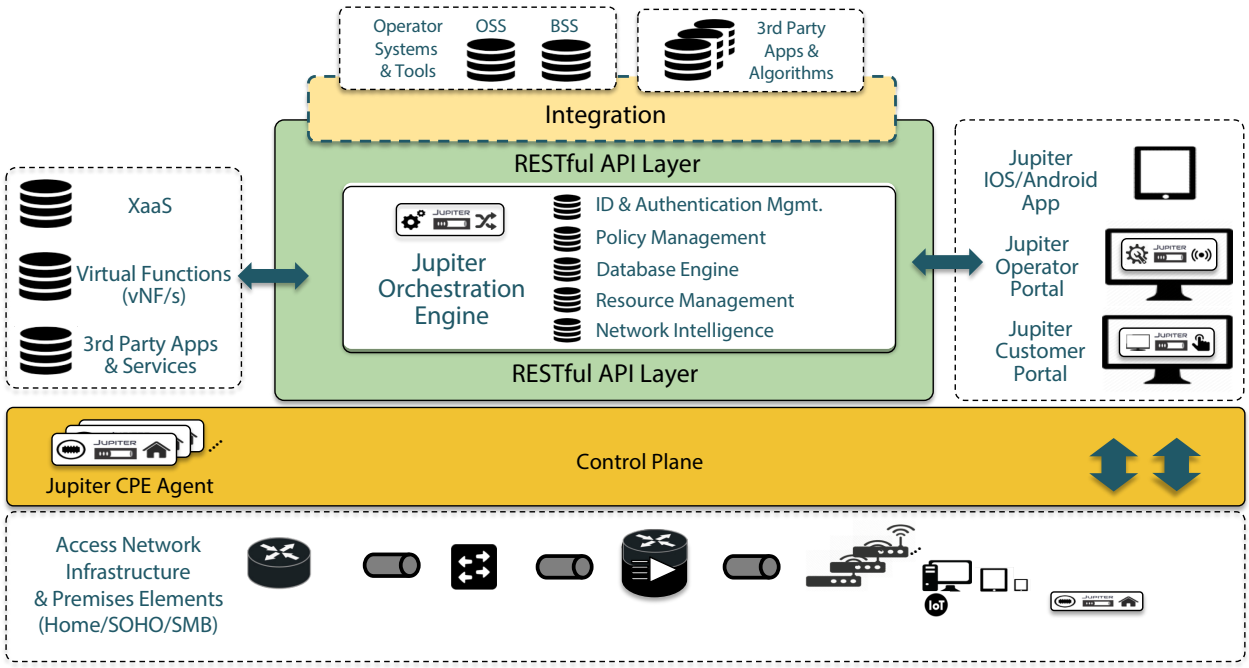

Figure 1. Jupiter Architecture.[1]

The Jupiter Orchestration Engine sits in the core of the network and accepts data from the distributed Jupiter Agents over an elastic message bus. The orchestration engine coordinates data flow routing and provides extensive services, including authentication management, policy management, network intelligence, and resource management.

Distributed throughout the network are Jupiter Agents, the unique lightweight, fault-tolerant, and security-enabled software controllers that collect intelligence and enforce policies throughout the network.

Jupiter Agents can operate autonomously throughout the network to enforce policies when they apply to the local users. Because the Jupiter Agent resides on the switch or piece of network equipment near where the policy is enforced, control plane data traffic is minimized. Once policies are defined and pushed to Jupiter Agents, the result is an end-to-end SDN-based network that allows for high performance and programmability across any switch, router, server, network interface card (NIC), or customer premises devices that support OpenFlow* or NETCONF/Yang. This innovative approach of using distributed intelligent agents gives enterprises much better control over quality of service (QoS) and quality of experience (QoE) for applications, services, and users.

The lightweight distributed nature of the Jupiter Agent works together with the central controller to deliver network-wide control, which helps internet service providers and communications service providers to achieve horizontal scale. In addition, the solution leverages REST APIs, providing an open vertical integration capability with a wide range of third parties. Requiring a low memory footprint of as little as 4 MB, each Jupiter Agent can be deployed on small customer premises equipment (CPE) with very low compute power, such as modems, Wi-Fi routers, set-top boxes, and more. This provides granular access and control for service providers beyond the CPE into the home or office, allowing them to proactively service their customers' networks. Jupiter gives the operator the ability to the gather key data analytics, make real-time network decisions, and provision new monetized services to subscribers.

The Jupiter Orchestrator features a visibility layer that provides a simultaneous network view to service providers and their customers. Network managers can initiate a new service via a fully featured provider portal, which configures the network service as well as all of the data flows required for that service. Customers meanwhile get a refined level of visibility into their connected devices and their behaviors.

The Jupiter SDN solution enables network features such as zero-touch provisioning, offline management, virtual

customer edge, dynamic interconnects, virtual core and aggregation, network access control at the user and device level to greatly simplify broadband subscription rollouts, virtualized broadband services delivery, and convergence of triple/quad play services.

Powered by Intel® Technology

Sanctum has collaborated with Intel to optimize the Jupiter orchestration and agent stack to run on a wide range of Intel technologies including the Intel® Puma™ 6 SoCs and Intel Puma 7 SoCs, Intel® AnyWAN™ GRX750 network processors, Intel Atom® processors, and Intel® Xeon® Scalable processors. An important technology built into the solution is the Data Plane Development Kit, an open source family of libraries that accelerate packet processing and have been optimized for workloads running on Intel® CPU architectures.

Conclusion

With its pioneering distributed architecture enabled by lightweight, access-agnostic agent technology, Jupiter enables service providers to derive all of the benefits of SDN. This greatly reduces network complexity. As the world of connected devices magnifies, the benefits of service delivery convergence are many, and the potential Jupiter brings to service providers and their end customers is immense. Jupiter Agents can extend controller features to the network edge and can leverage emerging 5G and European Telecommunications Standards Institute (ETSI)* multi-access edge computing (MEC) to bridge the application-consumer gap, giving consumers compelling new ways to consume content and bringing about an era of connected engagements.

About Sanctum Networks

Sanctum Networks is an SDN product and technology company pioneering access-agnostic internet management and orchestration solutions for a variety of consumer cross sections. Its solutions are currently in use by service providers, private enterprises, public organizations, and individual users worldwide. Learn more at http://www.sanctumnetworks.com.

About Intel® Network Builders

Intel Network Builders is an ecosystem of infrastructure, software, and technology vendors coming together with communications service providers and end users to accelerate the adoption of solutions based on network functions virtualization (NFV) and software defined networking (SDN) in telecommunications and data center networks. The program offers technical support, matchmaking, and co-marketing opportunities to help facilitate joint collaboration through to the trial and deployment of NFV and SDN solutions. Learn more at http://networkbuilders.intel.com.

[1] Figure provided courtesy of Sanctum Networks.

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