Ensuring SDN Controller Performance In Real Time Networks

Description

Abstract: Sdn Promises Many Benefits And Has Been Attracting Many Stakeholders Across The Communication Industry. However, In Order For These Benefits To Be Realized, The Network Has To Support Certain Key Capabilities. Validating The Extent To Which These Capabilities Have Been Supported, With Specific Metrics, Would Provide A Better Basis And Hence A Higher Confidence In Moving Forward With Sdn-Based Architectures.

This Article Provides An Overview Of Sdn Benefits And The Key Capabilities That Have To Be Validated In An Sdn Controller, In Order To Practically Realize The Promise Of Sdn.

Overview Of Sdn Benefits

Service Providers And Enterprises Face Limitations In Meeting The Explosive Demand For Mobility And Bandwidth In The Next Generation Of Networks: Complexity, Inability To Scale And Vendor Dependence.

Sdn Has Emerged As A Networking Architecture Design To Overcome The Aforementioned Challenges. Sdn Enables Network Programmability, Thus Accelerating Service Introduction And Reducing Operating Expenses Across Multi-Vendor Platforms. By Decoupling The Control And Forwarding Planes, Sdn Ensures That The Distributed Network Intelligence And States Are Logically Centralized. Further, It Abstracts The Underlying Network Infrastructure From Applications And Provides A Means To Avert Vendor Lock-In Solutions.

As A Result, Data Center And Cloud Service Providers Gain Unprecedented Network Control And Automation Support And When Also Coupled With The Network Virtualization Paradigm, Are Able To Offer Diverse Set Of Services For Various Business Needs.

Thus Sdn Provides An Architecture That Enables Enterprises And Service Providers Realize Their Vision Of Highly Scalable, Flexible And Dynamic Networks.

Need For Sdn Testing

While The Promise Of Sdn Is Appealing, The Stakeholders Who Deliver And Utilize Sdn Capabilities Need To Be Assured Of The Performance Of This New Networking Model. This Necessitates Specialized

Testing Of Networks Supporting This Model To Ensure That The Performance Expectations Are Met In A Consistent Manner.

Networks Should Support Automated Provisioning Of Large Scale Applications To Speed Up The Application Delivery. Thus, Before Deploying Sdn The Network's Capabilities To Support Dynamic Provisioning Of Flows And The Degree Of Scalability Have To Be Verified.

It Is Crucial To Ensure That The Devices Which Form Part Of The Network Infrastructure Are Verified For Packet Processing, Forwarding Behavior And Quality-Of-Service Delivery. In Addition To This Network Management, Provisioning And Control Capabilities Of The Network Must Also Be Verified.

We Will Specifically Cover The Control Plane Aspects That Need To Be Verified As Part Of The Sdn Controller Below.

Key Aspects In Testing The Sdn Controller

The Obvious Starting Point For Verification In The Controller Would Be That Of Topology Discovery. The Controller's Ability To Abstract The Network Infrastructure And Provide A Centralized Control Plane To Network Applications For Enabling Various Network Services And Support Interfaces Should Be Validated.

Further, As Sdn Enables Dynamic Networking, The Controller's Capability To Support Real-Time **Configuration Change Detection** When Virtual Networks Are Rapidly Modified, Has To Be Tested.

Besides This, Sdn Also Provides Scope For Network Optimization And Innovation By Supporting Dynamic, On-Demand Provisioning Of End-User Services In Real Time. In Such Scenarios, It Is Necessary To Measure The **Controller's Performance** Aspects Such As Throughput And Latency.

While Centralization Of Control Is Beneficial, It Could Hamper The Overall Network Availability. Thus Controller Support For **High Availability** In Terms Of Quick Failure Recovery Mechanisms During Failure Must Be Evaluated. Moreover, Sdn Supports **Dynamic Scalability**. Hence The Controller's Ability To Handle Infrastructure Modification Requests And The Extent To Which It Can Scale Has To Be Measured.

Sdn Architecture Facilitates Both Physical And Virtual Networks In Order To **Deliver Various Networking Services** With Speed And Agility. Therefore, Controller Support For These Services Including Load Balancing, Wan Optimization And Bandwidth-On-Demand Services Must Be Verified.

In Addition To These, **Security** Is A Major Concern For Sdn Adopters. Therefore, Support For Enabling Real-Time Traffic Monitoring, Pro-Active Detection And Prevention Of Malicious Attacks, Authentication And Authorization Access To Controller Have To Be Verified.

Veryx's Solution

Veryx Pktblaster Sdn Controller Is An Integrated Test Solution For Benchmarking Sdn Controllers. Pktblaster Sdn Is A Software-Based Solution That Runs On Bare Metal Servers Or On Hypervisors. It Simulates Hundreds Of Switches And Millions Of Flows To Measure The Controller's Performance And Scalability Aspects. In Addition, It Supports Emulation Of Hundreds Of Switches To Verify The Functionality And Reliability Aspects Of The Controller.

About Veryx Technologies

Veryx Technologies Provides Innovative Testing, Automation, And Monitoring Solutions For Developing And Deploying Communication Networks. Veryx Delivers Superior Value To Its Customers Through The Design, Development And Deployment Of Comprehensive, High Quality, Flexible Products In The Testing Domain. Veryx Products Are Well Complemented By The Professional Services That It Offers To Its Customers.

About Author

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