

Tackling six major hurdles to SDN adoption

Description

Abstract: Sdn Has Attracted Many Stakeholders In The Networking Industry In View Of The Many Advantages It Offers. However, In Order To Conclude Whether Sdn Does Indeed Deliver Its Promise In Real Networks, Several Functional And Performance Aspects Have To Be Examined Before Roll Out. Validating These Functional And Performance Aspects Would Enable A Better Understanding In Terms Of The Extent To Which Sdn Can Deliver Its Promise.

This Article Discusses Six Major Hurdles For Sdn Adoption And Suggests Some Ways By Which They Could Be Understood, Verified And Potentially Overcome.

Overview Of Sdn: Sdn Promises To Provide An Architecture That Empowers Enterprises And Service Providers To Realize A High Degree Of Network Automation, Agility And, A Decrease In Overall Costs Of The Network. By Decoupling The Control And Forwarding Planes, Sdn Provides A Logically Centralized Control And Programmable Layer. Thus Sdn Accelerates Service Deployment And Reduces Operating Expenses Across Multi-Vendor Platforms.

Hurdles For Sdn:

In Path Of Trying To Realize The Promise Of Sdn However, There Are Certain Major Hurdles That Sdn Implementers Could Potentially Face. Given Below Is A List Of Six Of These Potential Hurdles And The Ways To Tackle Them.

- **Lack of standards for total SDN deployment**

While Notable Standard Groups Such As Onf Focus On The Development And Standardization Of Sdn, The Industry Is Not Fully Equipped With Standards To Benchmark Sdn Implementations. This Indeed Challenges Sdn Adoption, Since The Scope Of Test Performance And Interworking Capabilities Of Sdn Have Not Been Defined. However, Onf's Conformance Test Specification For Openflow Protocol And A Recent Ietf Draft For Sdn Controller Benchmarking (Co-Authored By Veryx), Could Show A Standards-Based Pathway For Of Measuring Performance In A Standardized Manner.

- **Performance in centralized networks**

While Centralization Of Control Enables The Network To Be Highly Programmable And Agile, In Reality, It Could Also Tend To Create A Performance Bottlenecks. Hence, In Comparison With The Distributed

Networks, The Overall Performance Of Centralized Networks Is More Susceptible To Poor Quality Of Experience. The Network Must Be Capable To Support Dynamic Programming Without Compromising On Performance As Committed In The Slas. Thus, If Performance Characteristics Such As Latency And Throughput Are Tested At Various Instances, One Can Be Sure That The Sdn-Based Network Delivers Equal If Not Better Performance.

- **Lack of confidence in reliability of SDN approach**

Sdn's Single Point Of Control Leads To Concerns Regarding Its Reliability. Hence Sdn's Capability To Deliver High Availability And Resiliency Should Be Validated Especially Under Exceptional And Error Prone Conditions. In Order To Ensure The Controller's Capability In Guaranteeing Availability, Rapid Notification, Switching And Convergence Of Data Path During Failures, Need To Be Verified Since They Play A Crucial Role In Making Sdn Reliable.

- **Scalability for virtualized network**

Sdn Architecture Facilitates Both Physical And Virtual Networks In Order To Deliver Various Networking Services With Speed And Agility. For Sdn To Support Highly Flexible And Massively Scalable Architecture, Networks Need To Support Automated Provisioning Of Large Scale Flows. Thus, Before Deploying Sdn, The Network's Capabilities To Support Dynamic Provisioning Of Flows And The Degree Of Scalability Need To Be Verified. Moreover, Since Sdn Supports Dynamic Scalability, The Controller's Ability To Handle Infrastructure Modification Requests And The Extent To Which It Can Scale Should Be Verified.

- **Coexistence with legacy networks**

Sdn Allows End-To-End Network Automation Through Coordination And Integration With Devices At The Edge And Legacy Networks. An Sdn-Based Network Is Expected To Support Legacy Networking Elements And Frameworks, Which Would Enable To Support End-To-End Services. Thus, It Is Important To Verify The Interoperability Of Sdn Network With The Legacy Networks/Systems.

- **Vulnerabilities of centralization**

While Centralization Of Control Is Beneficial, Security Of Centralized Approach Is A Major Concern For Sdn Adopters, As It Could Hamper The Overall Network Availability. Hence Controller Support And Recovery Mechanisms From Possible Attacks Must Be Evaluated. In Addition, The 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 Test Solution

Veryx Offers Sdn Testing Solutions That Encompass Conformance, Performance Benchmarking And Network Emulation For Sdn Controllers And Switches. Veryx Pktblaster Sdn Is An Integrated Test Solution For Benchmarking Sdn Controllers. Veryx Attest Solution Offers Automated Test Cases That Comprehensively Test For Openflow Protocol Conformance.

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.

[Learn More About Veryx](#)

About Author

Charanya Balasubramanian Is Product Manager At Veryx Technologies. Charanya Handles Product Management Efforts For Sdn And Emerging Technologies At Veryx. She Has Over Five Years Of Experience In The Information And Communication Technologies (Ict) Industry Spanning Across Several Technologies Including Virtualization And Cloud Computing. She Holds A Master's Degree In Strategy And Marketing From Xlri, Jamshedpur And Bachelor's Degree In Computer Science And Engineering From Ssnce, Anna University, Chennai. Charanya Can Be Reached At Charanya.balasubramanian@Veryxtech.com.

References

Conformance Test Specification For Openflow Switch Specification 1.0.1 –

<https://www.opennetworking.org/Images/Stories/Downloads/Sdn-Resources/Onf-Specifications/Openflow-Test/Conformance-Test-Spec-Openflow-1.0.1.Pdf>

Benchmarking Methodology For Sdn Controller Performance – <https://tools.ietf.org/html/Draft-Bhuvan-Bmwg-Of-Controller-Benchmarking-01>