SD-WAN PROOF-OF-CONCEPT TESTING

INTRODUCTION

Software-Defined Wide Area Networking (SD-WAN) has become a cost-effective and alternative solution for enterprises needing to connect multiple offices. The ability to use consumer-grade links for business-class services, which can be provisioned at a lower cost than using traditional dedicated links, is accelerating SD-WAN adoption across the globe. Furthermore SD-WAN's visibility, scalability, performance, integrated security and control benefits have meant that it's top of mind for many enterprises.

With a plethora of SD-WAN products and services claiming varying levels of features and sophistication, network professionals are frequently finding that they are not only overwhelmed with vendor choice. More importantly, they do not have an environment in which to properly test and compare products.

CHALLENGES IN TESTING SD-WAN

Enterprises are not normally allowed to use the production networks for any type of testing and it's unlikely that a test network exists that mimics the planned SD-WAN circuits. Provisioning new networks, that will only be used for testing, will increase project costs and time-scales. Real networks are inflexible when it comes to configuring different network scenarios and the variable conditions needed in which to properly exercise the SD-WAN solution. These issues can be overcome with access to an adaptable test environment.

WHAT MAKES A SUCCESSFULL TEST ENVIRONMENT

There are three key factors to consider when building an effective test network to ensure that the SD-WAN solution conforms to its specification:

1. **Accuracy:** The test network topology must accurately mimic the proposed real-world networks and settings including bandwidth, latency, hops and packet delay variation

2. **Controllability:** It must be possible to manually or automatically adjust the test network state from 'good' to 'bad' so that the changes in the SD-WAN solution can be observed and the effect on application performance assessed

3. **Repeatability:** Once testing is complete it must be possible to restore the network state so that each test is repeated under identical conditions to ensure that comparisons between SD-WAN products are meaningful

In addition to the above, SD-WAN providers needing to build a lab to showcase their SD-WAN products with the customer's network topology should ensure that the test network can be adapted to create point-to-point, the internet and multiple cloud environments.

INTRODUCING SOFTWARE DEFINED-VIRTUAL TEST NETWORK (SD-VTN)

A Software Defined-Virtual Test Network (SD-VTN) lets you easily create any network topology including point-to-point, hub and spoke, partially and fully meshed. Normal properties for each circuit are configured whether that's DSL, 4G/LTE, 5G, MPLS, Satellite, Cloud, etc as well as any routing requirements.

INTRODUCING SOFTWARE DEFINED-VIRTUAL TEST NETWORK (SD-VTN) CONT/.

The SD-WAN solution is connected to the Virtual Test Network and will function exactly as if it was using real world circuits. As packets are transmitted across the Virtual Test Network, the SD-WAN product will actively monitor the quality of each link. When impairments such as packet loss, high latency or packet delay variation are applied to one or more links, the SD-WAN product can be observed to ensure that it reacts accordingly.

The results of functional and performance tests can be assessed to verify the resilience of the solution under a range of network conditions to assess if the quality of service (QoS) can still be maintained. With this information available you will have a clear understanding of how the SD-WAN product will work with your applications, workloads and networks. Only then it is possible to select the appropriate SD-WAN solution knowing that it's the right decision for your requirements.
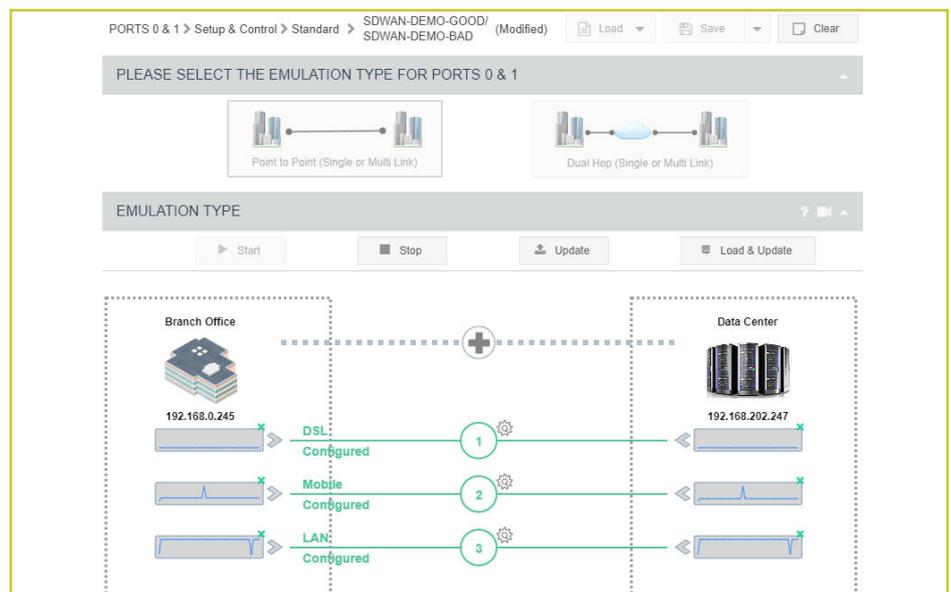
In this example, NE-ONE Network Emulator has been configured to provision (emulate) three Networks Circuits - DSL, Mobile and LAN circuits. Each circuit can independently have its properties (quality & availability) updated dynamically.

ADDITIONAL BENEFITS OF VIRTUAL TEST NETWORKS

The SD-VTN isn't only useful for proof-of-concepts but can also enhance other business processes too:
- Training environments can be made more realistic by including real-world network considerations
- Support Teams can recreate the same conditions as customers reporting issues from branch offices
- SD-WAN updates and upgrades can be verified before installing in the production environment
- New applications, particularly those that are data intensive or require high quality network like Video Conferencing, IoT, AI or Virtual Reality, can be stress tested to find out their real limitations

ITRINEGY'S VIRTUAL TEST NETWORK SOLUTIONS

For over 10 years enterprises and governments across the globe have trusted iTrinegy's Virtual Test Network solutions in some of the most sophisticated and demanding projects.

## ITRINEGY'S VIRTUAL TEST NETWORK SOLUTIONS CONT/.

NE-ONE

With iTrinegy's NE-ONE Network Emulator select and run the type of point-to-point or point to-point multi-link, dual-hop network scenario you require. You can dynamically adjust the network conditions using the unique Network Scenario Builder or automatically using CLI/API.
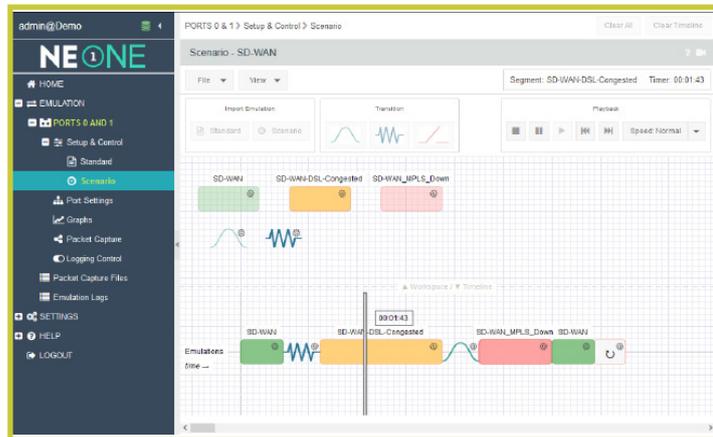
The unique drag & drop Network Scenario Builder & Player lets you easily create timebased network scenarios to test how the proposed SD-WAN solution handles variations in network quality and availability.

INE

Where you need to map multiple network links in a cloud, internet or large numbers of devices in a more complex network environment, our INE range with its network drawing interfaces and ability to connect 200+ devices are the ideal choice.
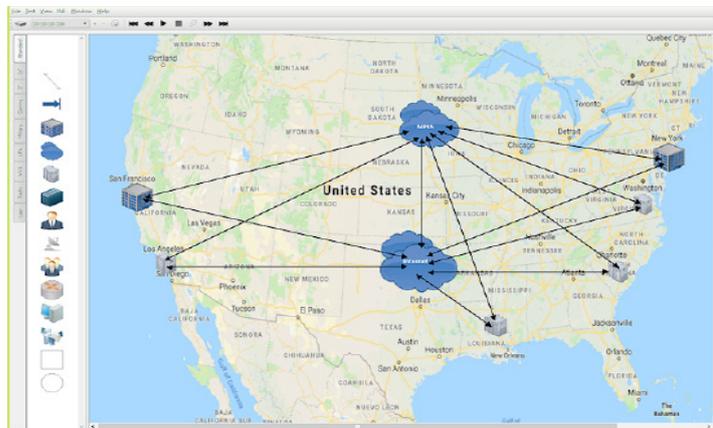
Using the INE Drawing Interface it is easy to create a wide variety of network topologies including SD-WAN environments

PLATFORMS

Both the INE and NE-ONE range of Network Emulators are available as physical and Virtual Appliances for the ESXi and KVM hypervisors.

SUMMARY

Choosing the right SD-WAN solution for your organization is not easy but the evaluation period can be shortened and confidence in the decision process increased by using a Virtual Test Network. Risks can be identified and mitigated before investments in SD-WAN are committed resulting in significant cost savings, faster implementation and increased customer satisfaction.

iTrinegy is an established world leader in Networked Application Performance and is trusted by governments, military organizations and enterprises across the globe. To learn more please contact your local iTrinegy representative.

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