

Key Takeaways

- Junosphere is a virtual environment that enables customers to create and run Junos routers and security systems in the cloud.
- TCO comparison is made between a testing project using the Junosphere networking environment and a physical test lab.
- The study finds 90% TCO savings for the Junosphere virtual environment as compared to the physical test lab and 31% project time savings.
- Junosphere enables testing on a scale that would be impossible using physical equipment; the virtual environment can be scaled to the full size of an operational network comprising hundreds of nodes.



Operational costs of Junosphere compared to ownership of physical lab equipment; Junosphere requires no power, space or cooling.

Economic Impact of Junosphere™

Understanding the Cost Benefits of Cloud-Based Network Modeling

Service providers and large enterprises struggle to implement lab environments that emulate their operational networks. Reproducing the scale of the network is not feasible in a lab. Acquiring and maintaining even small lab environments is difficult, time-consuming and expensive. It is essential, none-the-less, to thoroughly model, test and replicate topologies and protocols and model “what if” scenarios before rolling out new topologies, protocols or network services. This reduces risks and validates tools prior to their use in the operational network.

Junosphere is a virtual environment that enables users to create and run Junos™-based networks for large, scalable, realistic testing and modeling of practically anything a Juniper Networks router or security device can do. The routers within Junosphere are not a simulation but rather full-functioned instances of Junos software routers with full management, control, and data planes.

To evaluate the potential benefits of a cloud-based approach to network modeling, ACG Research conducted a total cost of ownership (TCO) comparison between a testing project using the Junosphere virtual environment and a physical test lab. We use an entry-level Juniper Networks router in the physical lab; because it runs Junos the behavior can be emulated accurately in Junosphere.

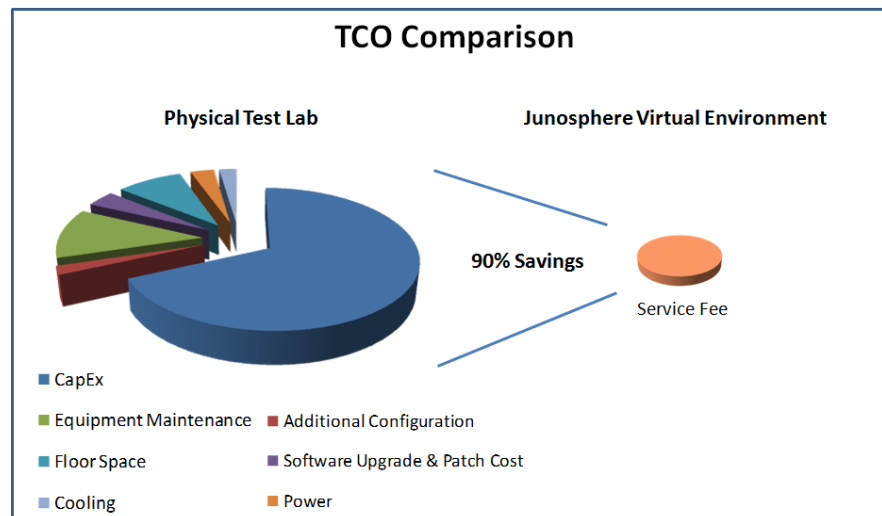


Figure 1. Total Cost of Ownership Analysis, Capital and Operational Costs; Junosphere Delivers 90% TCO Savings

The comparison considers a scenario (based on an actual Junosphere customer use case) where the network operator wants to model and evaluate a network topology change on a 200 node network, such as a

typical service provider or large enterprise would undertake. The testing procedures, number of network nodes, and router model are identical for the Junosphere virtual environment and the physical test lab.¹ The CapEx of the physical test lab accounts for much of the TCO. The majority of the OpEx of the physical lab is for equipment maintenance and environmental expenses: floor space, power, and cooling. These are costs related to ownership of the physical equipment.

The Junosphere environment is hosted in the cloud and generates no demand for power, space or cooling resources; therefore, it provides comparable testing capabilities at a much lower cost point even when CapEx is removed from the equation (see sidebar). The Junosphere networking environment also saves time. In this example it is estimated that the sequence of eight tests will take 31 percent less time using Junosphere than the physical lab. Time is saved because the initial set up is much shorter using Junosphere as are the configuration and set-up tasks for each of the eight test runs.

Even this analysis understates the full benefits of the Junosphere networking environment, because it is capable of testing a full scale network. In this analysis 200 nodes are used in the test, but Junosphere easily scales beyond this number. Modeling a 200 node network offers a much more accurate and meaningful test because network operators can see how protocol or topology changes behave at production scale. Furthermore, the cost of using the Junosphere virtual environment is still less than the cost of using the 25 node, eight test sequence modeled in the study because duplicate work is eliminated, and for this reason project time also is shorter. The full scale network test has greater power, enabling it to discover the actual behavior of the operational network and reduce the number of risks and unknowns because no compromises are made in the test scale.

Conclusion

The Junosphere virtual environment supports network modeling and testing that helps network operators rapidly qualify Junos OS features and releases, validate operational tools, and model protocol and network behavior. It has 90 percent lower TCO than an equivalent physical test lab. It requires no capital expenditures and produces test results in 31 percent less time than a physical test lab. Junosphere also enables testing on a scale that would be simply impossible using physical equipment; the virtual environment can be scaled to the full size of an operational network comprising hundreds of nodes. This capability provides more realistic network testing, which reduces operational risks, speeds time to implement changes and yields more predictable performance of operational tools.

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¹ To compare the virtual solution, which has no CapEx, with the physical solution (MX5 routers), the annual amortized cost of the CapEx of the physical solution is calculated for a five-year asset-life using a 10 percent discounting rate. The test project consumes 38 percent of a project year. All of the annual CapEx and OpEx for the physical solution are multiplied by 0.38 to prorate CapEx and OpEx items proportionately to the test duration.