

# SOFTWARE DEFINED NETWORKING (SDN) SCALE-OUT

## SDN Solves Scaling Struggles

Networks are provisioned based on a worst-case scenario; the network is set up to be able to run at its maximum capacity, even when the demand is not. With today's trend, where customers are seeking increased efficiency, networks that dynamically adapt to their surroundings are a perfect answer. Software Defined Networking (SDN) is a new technology that is perfectly poised to solve this problem.

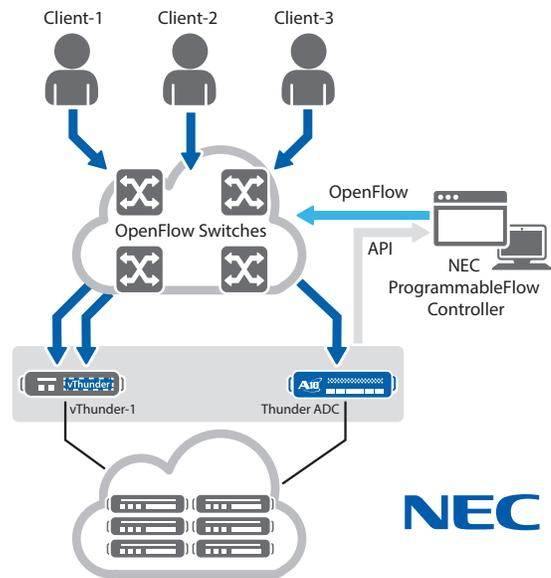
SDN solves network capacity issues by abstracting network elements to create an open environment where network resources can be orchestrated to provide a network that is fast, open, scalable and simple to manage. New SDN solutions are being proposed, in an effort to increase network efficiency by taking information from the Application Layer and then using that information to control the network and increase application responsiveness.

## A10 and NEC Scale-out Solution

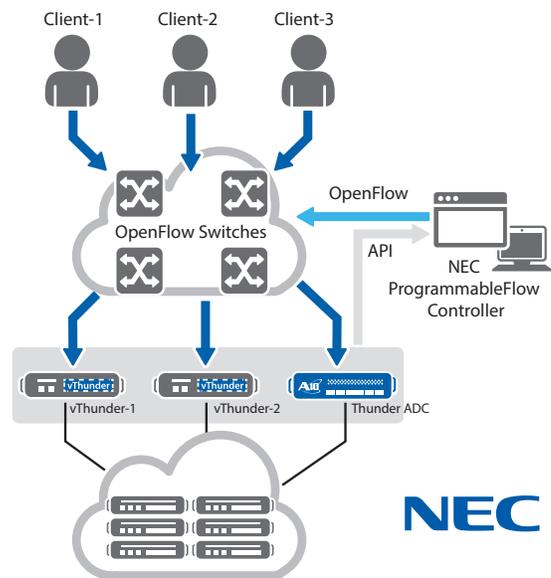
A10 Networks® has created a solution that integrates its Thunder® ADC line of application delivery controllers (ADC) into an SDN environment, comprised of NEC ProgrammableFlow® switches, third party OpenFlow switches, and NEC's ProgrammableFlow Controller. In this solution, two vThunder virtual appliances and one Thunder ADC hardware appliance are hosting a Web service that is accessed by three clients simultaneously.

The A10 Thunder and vThunder ADCs interact with NEC's ProgrammableFlow Controller, resulting in a dynamic scaling solution where user-flows are dynamically redistributed among the available ADCs when they get added or removed.

The switching network is managed by NEC's ProgrammableFlow Controller, using the OpenFlow protocol. The NEC Controller has a RESTful API, which functions as a Northbound API (NB API) interface for A10 ADCs to control the network flows within the OpenFlow switching network. The available ADCs are fully synchronized and are aware of one another's flows, and instruct the NEC ProgrammableFlow Controller to distribute the user traffic amongst them.



Initially, the A10 ADCs analyze the flows to each ADC, and instruct the ProgrammableFlow Controller to distribute the network traffic from end-users between the two active ADCs: vThunder-1 and Thunder ADC. At this point, end-user traffic is distributed in such a way that vThunder-1 receives traffic from Client-1 and Client-2; vThunder-1 receives traffic from Client-3.



When vThunder-2 is powered on, the NEC ProgrammableFlow Controller is instructed through its API to redistribute the traffic flows in the SDN network, so that each A10 device receives traffic from only one client.

This environment dynamically scales up when additional ADC capacity is added. The A10 ADCs provide automatic redundancy for end-user traffic, so that sessions are not impaired while the network remaps end-user flows during downtime of an ADC.

## A10 SDN Evolution

With the A10 Networks Thunder ADC and vThunder virtual appliances, A10 continues to innovate SDN-based solutions to dynamically adapt to application demands. The scale-out solution can easily be expanded, providing the following use cases:

- **Surge Relief:** If an A10 ADC suddenly is presented with a flow that causes the ADC to work at near-maximum capacity, it can instruct the PFC controller to temporarily relieve it and send new flows to other ADCs in the network.
- **Load-Balancing-as-You-Grow:** Imagine an organization, a start-up for example, which starts out with ADCs that initially meets its needs, and grows more successful over time; this means its ADC capacity requirements grow as well. The organization adds a newer, higher capacity ADC but the existing older ADC does not have to be decommissioned; the PFC controller is simply instructed to balance flows based on each ADC's capacity.
- **Right-sized Networks:** Network resources do not have to be available 100% of the time. Usually, network utilization has peak-times over the day. For example, fixed-interval software updates (Microsoft's Patch Tuesday) result in predictable network peaks. Enterprises often do not need all their resources available outside of standard working hours. Fewer ADCs can be enabled and other parts of the network can be switched off during the quiet hours. This decision can be made based on time of the day, but also based on the amount of user traffic, or CPU utilization, for example. This results in a much more efficient network, saving power usage and reduced cooling requirements.

A10 provides the highest performing ADC solutions in the industry. When integrated with NEC's ProgrammableFlow SDN products, A10 ADCs provide significant performance advantages.

A10 hardware ADC solutions scale from entry-level appliances up to the highest performance ADCs in the industry, and the highest, greenest efficiency in terms of performance per Watt, and performance per dollar.

The A10 ADC solution is also available as a virtual appliance, making A10 a logical choice for SDN and Software Defined Data Center (SDDC) solutions.

## Conclusion

With A10 Networks leveraging NEC's ProgrammableFlow SDN products, a more dynamic and highly scalable ADC solution is created.

SDN technologies are rapidly evolving, and as A10 continues its technical leadership in the ADC market, more flexible SDN solutions are soon to be expected.

SDN networks can provide appropriately provisioned and more efficient solutions, lower power consumption, increased scalability and flexibility. Together, these efficiencies provide tangible business benefits, including:

- Reduced cost
- Reduced opportunity for human error
- Quicker service deployment
- Quicker time to market

The joint A10 and NEC solution exhibited in this brief demonstrates how SDN solves real-world capacity problems for your growing business.

## Next Steps

To learn more about A10 Networks products and solutions, please contact your A10 representative or visit [www.a10networks.com](http://www.a10networks.com).

## About A10 Networks

A10 Networks is a leader in application networking, providing a range of high-performance application networking solutions that help organizations ensure that their data center applications and networks remain highly available, accelerated and secure. Founded in 2004, A10 Networks is based in San Jose, California, and serves customers globally with offices worldwide. For more information, visit: [www.a10networks.com](http://www.a10networks.com)

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To learn more about the A10 Thunder Application Service Gateways and how it can enhance your business, contact A10 Networks at: [www.a10networks.com/contact](http://www.a10networks.com/contact) or call to talk to an A10 sales representative.

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