What Does Alice in Wonderland Teach Us about SDN?
Due: January 1, 2014

Should *Alice in Wonderland* be required reading for IT professionals? That question seems strange as most people think of *Alice in Wonderland* as being just a children's story. As it turns out, the author of the book, Lewis Carroll, was a Mathematician and there is a scene in his children's story has a lot of relevance for those IT professionals that are evaluating SDN.

The scene that I am thinking of is comprised of the following dialogue between Alice and the Cheshire Cat.

Alice: "Would you tell me, please, which way I ought to go from here?"

Cheshire Cat: 'That depends a good deal on where you want to get to."

Alice: "I don't much care where."

Cheshire Cat: "Then it doesn't matter which way you go."

Alice: "As long as I get somewhere."

Cheshire Cat: "Oh, you are sure to do that, if only you walk long enough."

We Mathematicians have long speculated that the Cheshire Cat's last comment was Lewis Carroll playfully interjecting the concept of infinity into the story. Independent of that, the preceding dialogue has a message for IT organizations that are analyzing SDN. That message is that any analysis of SDN solution architectures and subtending protocols is totally irrelevant until the IT organization identifies which use cases it is hoping to address by implementing SDN.

To highlight why the *Alice in Wonderland* message is relevant to the analysis of SDN solutions, assume that the use case that an IT organization is attempting to respond to is the need to support the dynamic movement, replication and allocation of virtual workloads. The IT organization can respond to this use case by implementing network virtualization. Relative to SDN, there are two approaches to implementing network virtualization. One approach is fabric-based and includes a controller, protocols such as OpenFlow and the ability to manipulate the OpenFlow tables in each network element. The other approach is based on overlay networks, a controller and protocols such as VXLAN. Part of the appeal of overlay networks is that they are network agnostic. One thing that means is that at least theoretically, these solutions can run on top of any network.

The situation is quite different if the use case that the IT organization is interested in is something other than supporting the dynamic movement of workloads; e.g., making it easier to implement QoS or enabling applications to dynamically request services from the network. In order to respond to these use cases IT organizations need to implement

an SDN solution that communicates with the individual network elements. IT organizations will not be able to respond to these use cases with an overlay solution because as previously stated, overlay solutions are network agnostic.

As discussed above, knowing the use case or use cases that are of interest enables an IT organization to understand the viability of both fabric-based and overlay-based SDN solution. In addition, knowing the use case(s) of interest also enables an IT organization to do a thorough analysis of SDN solutions. For example, assume that one of the use cases that is of interest to an IT organization is enabling applications to dynamically request the types of services (e.g., QoS, security) that they want from the network. When analyzing SDN solutions, the IT organization should have the vendor explain how the various components of their SDN solution, such as the northbound and the southbound APIs, enable that use case.

A while ago there was a popular book entitled *Everything I Need to Know I Learned in Kindergarten.* I am not suggesting that everything a network organization needs to know about SDN can be found in *Alice in Wonderland*. What I am suggesting is that whereas Alice didn't know where she wanted to end up, a successful analysis of SDN requires that IT organizations have a very clear idea of where they want to end up.