The Linkage Between SDN and NFV
by Dr. Jim Metzler

Until recently, the conventional wisdom in the IT industry in general, and on the part of the ONF (Open Networking Foundation) and the ETSI NFV ISG (European Telecommunications Standards Institute, Network Function Virtualization, Industry Specification Group) in particular, was that was that SDN and NFV were separate topics and didn't need to be formally coordinated. That conventional wisdom officially changed in March 2014 when the ONF and the ETSI NFV ISG announced the signing of a Memorandum of Understanding (MOU).

As part of the announcing the MOU[1], the ONF and ETSI said that "Together the organizations will explore the application of SDN configuration and control protocols as the base for the network infrastructure supporting NFV, and conversely the possibilities that NFV opens for virtualizing the forwarding plane functions." Also as part of the announcement, the ONF released a document entitled the *OpenFlow-enabled SDN and NFV Solution Brief*[2]. The solution brief showcases how operators are combining NFV and SDN to achieve the common goals of both technologies to achieve greater agility of the networks. It discusses the network challenges that operators will need to overcome to implement NFV, and presents use cases that demonstrate how OpenFlow-enabled SDN can meet the need for automated, open, and programmable network connectivity to support NFV.

Marc Cohn of Ciena is the unofficial liaison between the ONF and the ETSI and he recently wrote a great blog on the near-term future of NFV[3]. When I talked with Marc, he pointed out that the ETSI NFV ISG was founded about eighteen months ago by a group of thirteen service providers and that the ISG's membership has since grown to thirty-three service providers and over two hundred organizations in total. He also pointed out that the ISG has recently increased the number of POCs that it is sponsoring from nine to eighteen[4].

Marc emphasized that there is significant substance behind the MOU and that there is a definite understand on the part of the people working on the various initiatives that the work the ongoing work that the ONF does relative to L4 to L7 functionality will be influenced by the work of the ISG. This approach marks a distinct change from when the NFV initiative got underway in late 2012. At that time the common perception was that NFV was the low hanging fruit and that SDN was the long term vision. Marc said that the current perception is that SDN and NFV are inextricably linked. He backed that statement up by saying that half of the use cases[5] that the ISG has defined are cloud based and require the type of dynamic network functionality that SDN

[1] http://www.rethink-wireless.com/2014/03/19/etsi-nfv-group-closer-operator-sdn.htm
[2] https://www.opennetworking.org/images/stories/downloads/sdn-resources/solution-briefs/sb-sdn-nvf-solution.pdf
[3] http://www.etsi.org/technologies-clusters/technologies/nfv?tab=3
[4] http://www.etsi.org/technologies-clusters/technologies/nfv/nfv-poc

[5] http://www.etsi.org/deliver/etsi_gs/NFV/001_099/001/01.01.01_60/gs_NFV001v010101p.pdf

provides, but which is not provided by a traditional network architecture. Two of those uses cases ("Network Functions Virtualization Infrastructure as a Service" and "Virtual Network Function Forwarding Graph" are described in *OpenFlow-enabled SDN and NFV Solution Brief*.

One of the interesting aspects of the ETSI NFV ISG is that it has a two year life span that expires in January 2015. As a result, there is work underway to identify what happens after that. Marc said that one of the likely characteristics of the next stage in NFV development, which is being referred to as NFV Phase 2, is that there will be more emphasis on the implementation of NFV and he added that the results of the ongoing POCs would be shared at the appropriate time. Another likely characteristic is leveraging open source initiatives such as OpenStack and OpenDayLight. A third likely characteristic of NFV Phase 2 is building enough momentum around NFV to influence the appropriate standards bodies.

Even before they signed the MOU, both the ONF and the ISG had a lot of work to get done. Trying to link their activities runs the risk of adding overhead and slowing down the work of each group. I believe, however, that the benefits of working together far outweigh the risk. For example, what the ISG refers to as virtual network function forwarding graph is what the ONF thinks of as service chaining. It would seem counterproductive to have these two organizations work in isolation from each other on topics such as these.