



<http://www.sdnzone.com/topics/software-defined-network/articles/341797-sdn-the-local-loop.htm>

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SDN in the Local Loop

US Ignite is an independent not-for-profit organization whose primary objective is to foster the creation of Internet applications that can leverage the functionality of advanced networking technologies, including SDN. Two key goals are the creation of 60 next-gen apps that leverage technology not widely deployed today and 200 community test beds.

US Ignite has a wider ranging mission than that stated above and a visit to the site is really worthwhile. This article focuses on the presentation made by Glenn Ricart, founder and CTO, at the recent NetEvents Ethernet Innovation Summit, held at Silicon Valley's Computer History Museum. It represents the tip of a very large ICT iceberg.

Right now fiber to homes and offices would appear to be delivering data at Gigabit speeds, but in reality it's significantly slower. A more meaningful parameter is the responsiveness of the application and that will vary according to the number of "hops" the packets need to traverse the network. When Glenn increased the connection speed to his home network, taking it from 10 Mbps to 26 Mbps (a 160-percent increase), the result was an increase in responsiveness of only 23 percent. I had a similar disappointing experience when I paid for a higher-speed DSL connection to the Net.

Local clouds

The proposed solution is to employ a federation of local clouds. This is the best way to handle highly responsive, close to real-time applications. There's a lot of energy behind providing local cloud resources via "US Ignite Racks," so-named because they enable a good fraction of all the US Ignite applications. They are built on the GENI rack technology sponsored by the National Science Foundation. The racks "slice" the available resources dynamically and provide isolated slices for each application.

"GENI Racks," which employ both OpenFlow and OpenStack, are placed at strategic locations in the network where they provide programmable, low-latency, local computing and storage capabilities. They can also be partitioned and made a part of multiple slices as needed to best support the application.

Local cloud resources enable: direct manipulation of applications over the local network; cost-effective virtualization of public-benefit applications; responsive evaluation of complex models,

e.g. AutoCAD; home users to work with “big data” models without expensive scientific workstations.

Dynamic slicing

Dynamic network slicing is enabled using SDN technology. Instead of having a big fat dumb pipe, where different services grab all the bandwidth they can get, SDN allows a single physical network to be virtualized into multiple “slices” or logical networks, each isolated from one another and customized to specific applications or uses. Because this is carried out in software, new slices can be created dynamically as and when needed.

These situational extra channels can be employed for home healthcare and education applications. Isolation meets the requirements of financial applications, healthcare privacy, and public safety users. In addition, situational public networks can be created as needed – such as disaster response quickly using existing commercial resources

This is seriously smart stuff. The kind of stuff needed for smart cities.

The proof of the pudding

US Ignite’s “Next-Generation Summit,” June 24-26 in Chicago, will give developers, industry, communities, governments, foundations and universities working with software-defined networks, cloud computing and gigabit networks a place to gather, learn and showcase their work. Ricart indicated that around 20 next-gen applications will be demonstrated at this event.