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Study on application to home network of OpenFlow technology

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The OpenFlow technology separates "Routing and Switching function" and "Configuration function" that existed in one device conventionally. Furthermore, it realizes programmable network by doing intensive configuration. It is expected as to solve the various problems which have occurred in the data center.

On the other hand, in home network, various application including "Control system" and "Stream data communications system" are mixed although being small, and traffic having a different property occurs. Also, depending on user behavior, the traffic has a feature bigger time variations. The home network is undesirable to perform newly exclusive information communication line by UTP cables. It is bad choice but often use the medium which ability for communication such as power line and wireless is unstable. Therefore it is not unusual for enough communication quality to fall into the situation not to be provided.

In this study, study on the use to home network of OpenFlow technology which has been used in the conventional Enterprise network and Data center.

Development history of OpenFlow technology, investigate current standard specification. Furthermore, analyze it about problems of home network.

The application of OpenFlow technology to consider whether the situation of home network can improve.

Investigated "OpenFlow technology and home network" and extracted problems. "QoS is necessary to change setting of setting of a depending on the use situation to convey ability for communication to the maximum" problem was investigated whether be resolved by changing the ToS at OpenFlow technology.

Take up some examples of this problem and built a virtual network using an OpenFlow technology.

- Unicast
- L2 switch
- Traffic monitor
- QoS Switch

After confirming that the ToS can be changed by the virtual network, turned into OpenFlow switch a broadband router for home use. Actually to build a home network using the OpenFlow technology. And performed speed inspection.

In "QoS is necessary to change setting of setting of a depending on the use situation to convey ability for communication to the maximum" problem, if OpenFlow Switch uses a broadband router for home use, it is considered to be effective if a line speed of less than 30Mbps. Because communication speed has been improved by about 25% when utilizing the OpenFlow in speed inspection in PLC. But the communication medium that high-speed communication such as wired is possible largely decreases speed. OpenFlow is used in various companies such as Google Inc.. Therefore, the cause is lacking in a performance without enough specifications as OpenFlow Switch with the released general broadband router for home use now.

If the communication speed of less than 30Mbps at broadband router for home use by this study, it was found to be sufficient to obtain a OpenFlow benefits.

But not recognized whether it is effective in the line speed more than 30Mbps. In late years it can expect that the broadband router for home use does a performance enhancement because the performance enhancement of the small apparatus which including a smartphone is remarkable. Therefore, the evaluation of high-speed communication is considered to be verified after it has been improving the performance of home broadband router.

Furthermore, when OpenFlow was used, designer and administrator mentioned the mechanism of a home network keeps moving problem when being not home, and showed a countermeasure.

In addition, The OpenFlow switch is one in this study, but home network that combines multiple OpenFlow switches Construction is not yet available. These issues want to with future challenges.