Failure recovery for OpenFlow Networks

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OpenFlow is a novel technology designed at Stanford University which aims at decoupling the intelligence from the networking devices. The OpenFlow concept is based on the approach that the forwarding hardware of these devices can be programmed via external hardware named as controller.

Building a network is very costly and complicated. One of the reasons these networks are costly is that the networking devices are implemented with lots of functionalities. However, very little functionalities are required and used by customers. With the OpenFlow, all the functionalities can now be moved to the controller which can program many networking devices. Thus the OpenFlow has a capability to build the network at much lower cost.

Web conferencing. Video email. Multi-player games etc., we all know the types of data transmitted via the web. Can the service providers be certain to deliver all type of data without any interruption by using the OpenFlow approach? Can the network recover from failure without affecting the traffic?

We implement a failure recovery algorithm for the OpenFlow networks and emulate its behavior. We run the OpenFlow environment on German worldwide national topology where 14 devices are controlled by a single controller. We find that if a recovery decision is taken by the controller, it is difficult to achieve customer's failure recovery demand without affecting the traffic. We achieve an interruption of 180 to 310ms. The Interruption is called unaffected if it is within 50ms interval.

We believe that if the recovery action is taken by the networking devices without contacting controller, the network can be recovered from failure without affecting the traffic. In future we will implement a recovery mechanism on the devices itself and will try to achieve failure recovery demand without affecting the customer traffic.

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