Invited Talk

VirtualWire: System Support for Live Migrating Virtual Networks Across Clouds

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Abstract

Despite significant advances in enabling live virtual machine (VM) migration within a virtualized—cloud—infrastructure, cross-cloud live migration remains an ad hoc, complex process. To create a network environment in which live migration can occur, clouds are beginning to expose virtual networks as a service. Connecting, managing and maintaining membership and routing information for—possibly incompatible—virtual networks as VMs migrate between clouds is non-trivial for both cloud providers and cloud users. This talk presents VirtualWire, a system in which cloud providers offer—instead of a virtual network abstraction—a connect/disconnect primitive that is much easier to manage. VirtualWire offers cloud users a consistent method to create complex logical network topologies in which the virtual network fabric itself is able to be elastically stretched or live migrated within or between clouds. Leveraging nested virtualization, we have implemented and evaluated VirtualWire across third-party clouds, including Amazon EC2, achieving cross-cloud live migration of VMs and network components with as low as 1.4 s of downtime.

Categories & Subject Descriptors:

C.2.5 [Computer Systems Organization]: Local and wide-Area Networks
D.4.7 [Operating Systems]: Organization and Design

General Terms: Design, Experimentation, Measurement, and Performance

Keywords: Network Virtualization, Hybrid Clouds, Live Migration

Bio

Hani Jamjoom is a Research Manager at IBM T. J. Watson Research Center (Yorktown Heights, NY). He manages the Next Generation Platforms group, focusing on system-level and nested virtualization, network virtualization and software defined networks, and their application in enabling multi-cloud loosely coupled enterprise systems. Dr. Jamjoom joined IBM after receiving his Ph.D. degree from The University of Michigan (Ann Arbor, MI) in 2004. Before that, he completed his M.Eng. degree from Cornell University (Ithaca, NY) in 1997 and B.S. degree from Rose-Hulman Institute of Technology (Terre Haute, IN) in 1995. Dr. Jamjoom has received numerous awards for his technical contributions to IBM's products and services, including three Outstanding Technical Achievement Awards, an Outstanding Innovation Award, and two Research Division Awards.

VTDC'13, June 18, 2013, New York, NY, USA.
ACM 978-1-4503-1985-0/13/06.