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Accelerating Your Move to the Cloud

VMware vCloud Connector and Riverbed Steelhead WAN Optimization

VMWARE VCLOUD CONNECTOR AND RIVERBED STEELHEAD WAN OPTIMIZATION

Executive Summary

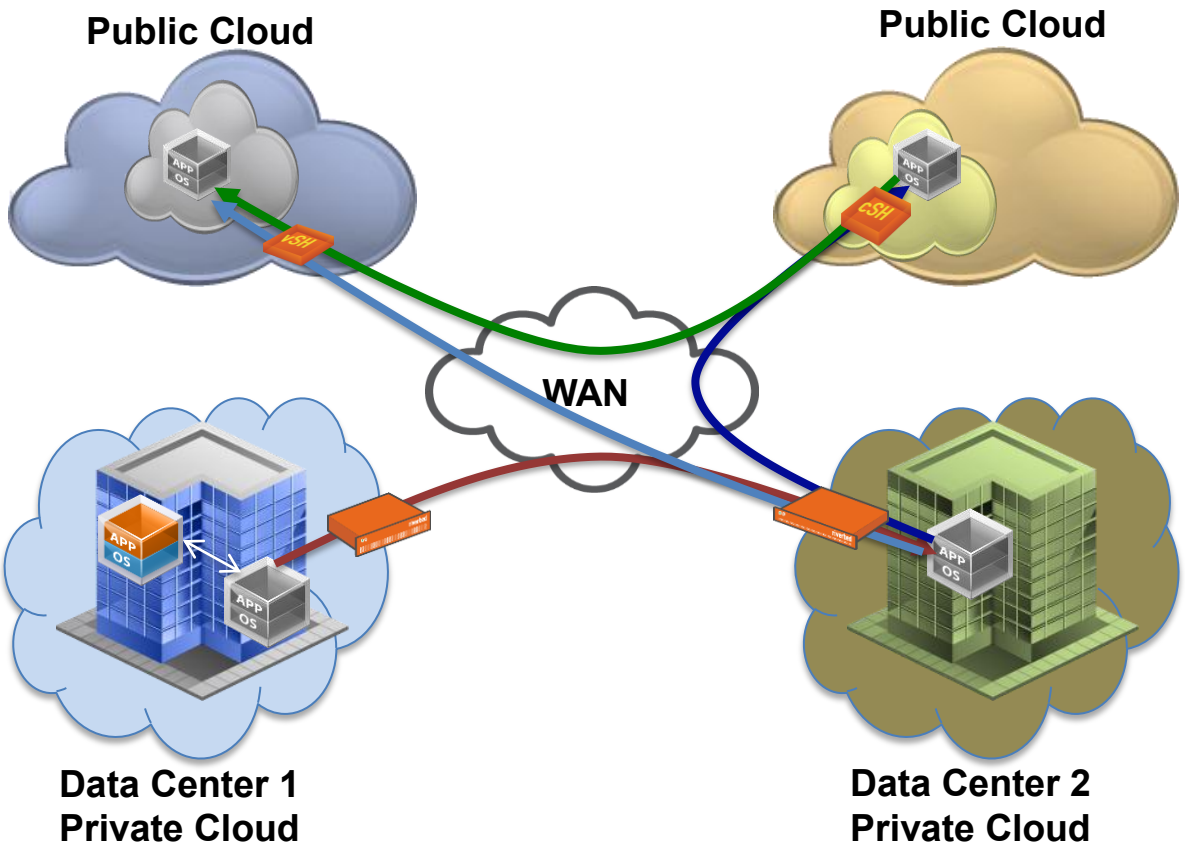
Cloud computing has changed the paradigm of computing within and beyond the boundaries of a data center, and with that, the Information Technology (IT) infrastructure has evolved. The use of hybrid cloud environments (a mix of private and public clouds) is optimal for enterprises that strive to utilize the cloud environments to bring choice, efficiency and scale to the IT infrastructure. With the adoption of hybrid cloud, the need to move workloads between the clouds in a secure and efficient manner becomes imperative. The VMware vCloud Connector® (VCC) working in conjunction with VMware vCloud Director® (vCD) allows IT managers to move workloads between VMware vCD clouds efficiently. The movement of data across the wide area networks (WAN) has challenges that need to be addressed in order to successfully move workloads between clouds. Riverbed Steelhead® WAN Optimization solutions are designed to work within and across cloud environments, to overcome the challenges and provide an optimal solution to make movement of data and workloads over long distances feasible.

Challenges

Workload mobility between hybrid clouds using wide area networks mandates:

- Common interface to move VMs between clouds
- Secure network connections between cloud providers
- Adequate WAN bandwidth to complete the transfer for a given latency
- WAN optimization to enable transfers over longer distances, and lower bandwidths

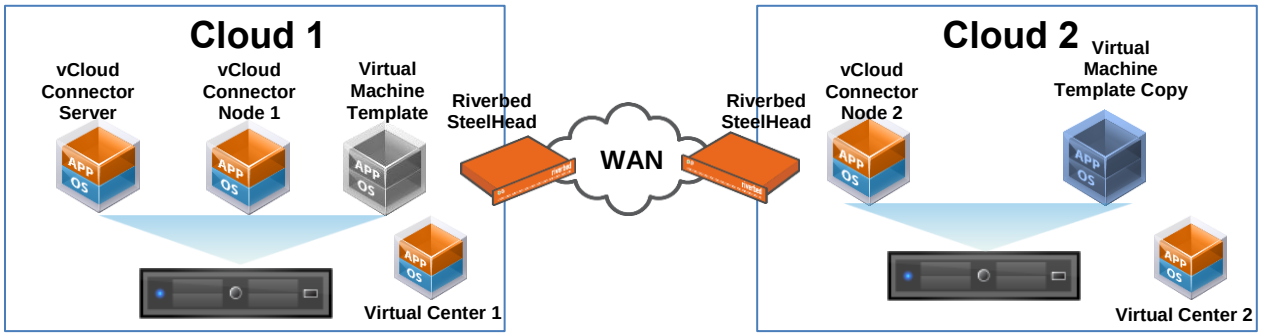
Solution Architecture



Solution Components

- **VMware vCloud Connector**
  - **vCloud Connector Server**
    vCloud Connector Server establishes the transport connections between the vCloud Connector Nodes
  - **vCloud Connector Nodes**
    vCloud Connector Node is the virtual appliance that is the data mover between the clouds

- **Riverbed Steelhead**
  - **Riverbed Steelhead Appliance**
    Riverbed Steelhead appliance is a hardware appliance that is available in desktop, 1U or 3RU form factors for WAN optimization
  - **Riverbed Virtual Steelhead**
    Riverbed Virtual Steelhead is a virtual appliance in a VM form factor
  - **Riverbed Cloud Steelhead**
    Riverbed Cloud Steelhead is a cloud-ready Virtual Steelhead



Solution Description

The solution is comprised of two distinct areas of technology integration. The solution is architected as:

1. The vCloud Connector server and nodes deployed in the two vCloud environments with WAN connectivity between the two clouds
2. Use of the appropriate Riverbed Steelhead in each of the clouds for WAN optimization. The Steelheads are configured to perform TCP optimizations to enable efficient data transfer between the clouds. The Steelheads can be configured in 4 modes depending on the service provider's preference. The modes are as follows:
   a. Physical to Physical Steelhead optimization
   b. Physical to Virtual Steelhead optimization
   c. Physical to Cloud Steelhead optimization
   d. Virtual to Cloud Steelhead optimization

The solution is architected as shown, with the vCloud Connector Server being installed in the source cloud and one vCloud Connector node installed in the source and target cloud respectively. The Riverbed Steelhead is configured at the edge of the WAN depending on the mode it is being deployed in. The Riverbed Steelheads are configured to perform TCP optimization depending on the WAN bandwidth and latency.

Solution Use Case

- Transfer VM workloads between multiple cloud providers
- Compatibility of VMs between disparate cloud providers
- Migrate applications from private cloud to public cloud providers

Solution Benefits

- Quick and efficient migration of applications from private to public cloud providers
- Increased transfer times by up to 75x
- Flexibility to select a public cloud provider without being "locked-in"

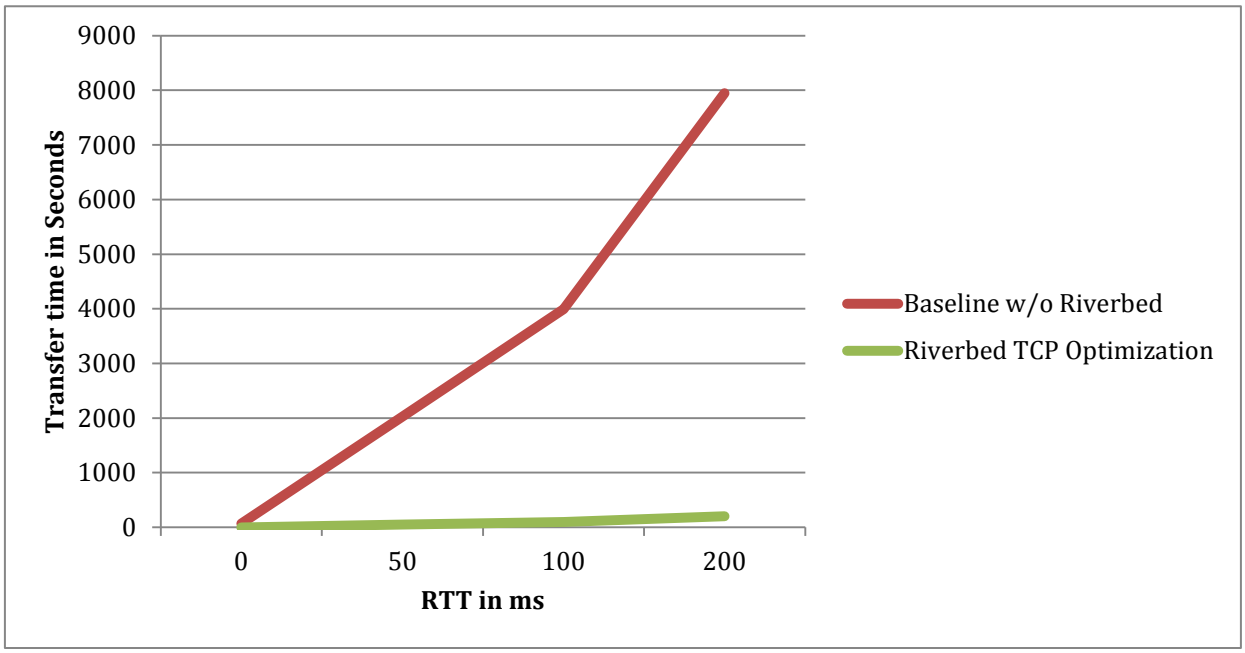
Test Scenarios and Test Results

An application VM template with 1GB RAM and 5GB storage was created for copying between two clouds. The VM template size for the transfer was 1.1 GB. The VM template was copied from one cloud under the control of on vCenter (vCenter 1) to another cloud under the control of a different vCenter (vCenter 2).

The tests were performed with different latencies between the clouds (0ms, 50ms, 100ms and 200ms) with and without WAN optimization. The effect of Riverbed Steelhead with a 1 Gbps WAN connection is shown in the chart below.

The results of the testing with the WAN optimized with the Steelhead is very evident in the chart below. At 200ms RTT the un-optimized transfer completed in 132mins 39 secs. With Steelhead optimization, the transfer completed in 1 min 45 secs.

Analogous improvements in transfer times were exhibited with smaller WAN bandwidths as well (OC12, OC3, DS3, 10mbps, T1).



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