WAN Optimization with Riverbed Steelhead for Hitachi Data Ingestor and Hitachi Content Platform

Implementation Guide

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WAN Optimization with Riverbed™ Steelhead™ for Hitachi Data Ingestor and Hitachi Content Platform

Implementation Guide

This document describes how to implement an Hitachi Content Platform (HCP) / Hitachi Data Ingestor (HDI) environment with Riverbed™ Steelhead™ appliances.

In a WAN environment the causes of slow throughput are impacted by high latency, dropped packets congested network, and insufficient bandwidth to name a few, especially in branch office operations or longer distance international deployments.

The Riverbed Steelhead appliance is a WAN optimization solution that improves data migration performance by re-organizing, assigning priority and accelerating IP packets across the WAN.

With Riverbed Steelhead appliances, you can solve a range of problems affecting WANs and application performance, including:

- Insufficient WAN bandwidth
- Inefficient transport protocols in high-latency environments
- Inefficient application protocols in high-latency environments.

The Riverbed Steelhead appliance addresses the bandwidth, latency and packet loss issues that are common to remote offices. Riverbed’s optimization techniques and data reduction techniques are all performed in real-time to ensure best performance across the widest range of applications and WAN environments.

At the core of this integrated solution is HCP, an intelligent, multi-tenant, multi-tiered, and massively scalable intelligent object store.

The HDI provides a standard CIFS/NFS on-ramp into the HCP for remote or distributed environments and cloud deployments. The HDI at each location is mapped to its designated core infrastructure tenant on HCP. Within the tenant are a number of namespaces mapped to file systems.
The converged solution stack of HCP/HDI, along with the Riverbed Steelhead appliance and its optimization techniques when deployed over the WAN ensure the following benefits:

- Speed up application throughputs
- Reduce the use of WAN bandwidth
- Accelerate operations by reducing the time required to complete operations
Target Audience

This implementation guide is intended for engineers, support personnel, and administrators of systems involved in the deployment of an HCP/HDI environment using Riverbed Steelhead appliances. It documents applicable configuration options that allow the environment to meet the functionality targets. You need familiarity with the following to benefit from this document:

- Hitachi Data Ingestor
- Hitachi Content Platform
- Riverbed Steelhead appliance
- Network implementation
- Fibre channel implementation
Solution Components

Table 1 lists the components used in the solution.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitachi Data Ingestor</td>
<td>Version 4.0.0.1</td>
<td>2</td>
</tr>
<tr>
<td>VMware vSphere</td>
<td>Version 5.1</td>
<td>1</td>
</tr>
<tr>
<td>Hitachi Content Platform</td>
<td>Version 6.0.0.95</td>
<td>1</td>
</tr>
<tr>
<td>WAN simulator Linktropy min2™</td>
<td>Version 3.0.11</td>
<td>1</td>
</tr>
<tr>
<td>Riverbed Steelhead 7050</td>
<td>Version 8.0.2 (x86_64)</td>
<td>2</td>
</tr>
<tr>
<td>Microsoft Windows Server</td>
<td>Version 2008 R2 Enterprise Edition</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 1 shows the high level architecture and main components used in these solutions.
Solution Implementation

Your implementation checklist may vary based on your environment and business requirements. This implementation guide assumes the end user is familiar with installation of the following and that it is setup before you start the implementation of the solution.

- Hitachi Content Platform
- Hitachi Data Ingestor VMA
- Tenant created on HCP
- File system and its corresponding migration policy are in place on HDI VMA.
- CIFS /NFS mounted file system on Windows/Linux clients.

Deploying this solution includes the following procedures:

- Configure network connections on the Riverbed Steelhead appliance
- Connect to the Management Console and set the In-Path interfaces on the Riverbed Steelhead appliance
- Configure QoS and MX-TCP settings on the Riverbed Steelhead appliance for optimization
- Configure data reduction policy on Riverbed Steelhead client side for data reduction

Configure Network Connections on the Riverbed Steelhead Appliance

To connect to the Riverbed Steelhead appliance, take the following steps.

Plug the serial cable into the Serial/Console port and a terminal. Start your terminal emulation program with the following settings:

- Baud rate: 9600 bps
- Data bits: 8
- Parity: none
- Stop bits: 1
- vt100 emulation
- No flow control
1. Log in as administrator user (admin) and enter the default password (password).

2. Complete the configuration wizard. Server and client side will undergo the same configuration steps.

3. Enter all the necessary fields and leave the others default. In our labs, we set the following:
   - Hostname
   - Primary IP address
   - Netmask
   - Gateway
   - Primary DNS Server
   - Domain Name

4. The Steelhead appliance configuration wizard confirms and automatically saves your configuration settings.

The Riverbed Steelhead is typically deployed on a LAN, with communication between appliances taking place over a private WAN or VPN. Because optimization between Riverbed Steelhead appliances typically takes place over a secure WAN, it is not necessary to configure company firewalls to support Riverbed Steelhead appliance-specific ports.

Figure 2 depicts a typical deployment.

Figure 2

For optimal performance, you should minimize latency between Riverbed Steelhead appliances and their respective clients and servers. Riverbed Steelhead appliances should be as close as possible to your network end points.
Ideally, Riverbed Steelhead appliances optimize only traffic that is initiated or terminated at their local site. The best and easiest way to achieve this is to deploy the Riverbed Steelhead appliance where the LAN connects to the WAN, and not where any LAN-to-LAN or WAN-to-WAN traffic passes through the Riverbed Steelhead appliance.

To avoid duplex mismatches, manually configure the duplex settings on your router, switch, and Riverbed Steelhead WAN and LAN interfaces.

To connect the Riverbed Steelhead appliance to the network, use standard Ethernet straight through and crossover cables to connect to your network. The straight-through cables are for the primary LAN ports on the appliance to the LAN switch. The crossover cables are for the WAN port on the appliance to the WAN router.
Connecting to the Management Console

1. In order to connect to the management console, specify the IP address or server name on your web browser.

   Figure 3 displays the login screen to the GUI of the appliance.

2. Log in as administrator user (admin) and enter the default password (password).
3. On the Home page, click on Configure.
4. Select Networking > In-Path interfaces.
5. Select inpath0_1 from In-Path Interface Settings.
6. Specify the IP4 address.
7. Click Apply.
Figure 4 displays the In-Path Interfaces settings.

Configure > Networking > In-Path Interfaces

### In-Path Settings
- Enable Link State Propagation

#### In-Path Interface Settings:

<table>
<thead>
<tr>
<th>Interface</th>
<th>Optimization Interface</th>
<th>Management Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>inpath0_0</td>
<td>192.168.0.101/24</td>
<td>--</td>
</tr>
<tr>
<td>inpath0_1</td>
<td>172.17.38.47/24</td>
<td>--</td>
</tr>
</tbody>
</table>

#### inpath0_1 Interface
- Obtain IPv4 Address Automatically
- Specify IPv4 Address Manually

- **IPv4 Address:** 172.17.38.47
- **IPv4 Subnet Mask:** 255.255.255.0
- **In-Path Gateway IP:** 172.17.38.1

- **LAN Speed:** 1000M Negotiated: 1000Mb/s (auto) Duplex: Full Negotiated: full (auto)
- **WAN Speed:** Auto Negotiated: 100Mb/s (auto) Duplex: Auto Negotiated: full (auto)
- **MTU:** 1500 bytes
- **VLAN Tag ID:** 0

- Assign IPv6 Address
  - IPv6 Address:
  - IPv6 Prefix:
  - IPv6 Gateway:

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**Figure 4**

Configure QoS and MX-TCP Settings on Riverbed Steelhead Appliance for Better Throughput and Migration Performance

To achieve high throughput rates and improved migration performance, configure QoS & MX-TCP on the Steelhead appliance. This setting has to be applied on both client and server side.

Steelhead MX-TCP does two things well:

- Fills a WAN pipe with high latency
- Mitigates the effects of packet loss
Following are the steps to apply QoS and MX-TCP settings:

1. On the Home page, click on Configure.
2. Select Networking > Outbound QoS (Advanced).
3. Select the checkbox Enable QoS Shipping and Enforcement.
4. Select the checkbox Enable QoS on wan0_1 with WAN Bandwidth.
5. Enter the bandwidth speed to match the minimum guaranteed bandwidth configured. For testing it was set to 35840 and 102400 kb/sec.
6. Click Apply.

Figure 5 displays the Outbound QoS (Advanced) settings.

Configure > Networking > Outbound QoS (Advanced)  

Configure a Data Reduction Policy on Riverbed Steelhead Client Side for Data Reduction

The data reduction policy is set in the In-Path rules to determine the benefits of Riverbed Steelhead compression and de-duplication capabilities. The resulting effect of this policy is data reduction over WAN, reduction of bandwidth intake on the WAN side, and improved migration performance.

This policy has to be set on the client side only.
Take the following steps to set up the data reduction policy:

1. On the Home page, click on Configure.
2. Select Optimization > In-Path Rules.
3. Add a New In-Path rule.
4. For Type, select Auto Discover from the drop down list.
5. Type port 80 in the Port field.
6. For the Data Reduction Policy, select Normal from the drop down list.
7. Leave rest of the fields with their default values.
8. Click Apply.

Figure 6 displays the data reduction In-Path Rule settings.
Conclusion

By taking the steps outlined in this document, you should be prepared to deploy an HCP/HDI environment using Riverbed Steelhead appliances.
For More Information

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