

Cloud Performance Benchmark Series

Network Performance: Rackspace.com

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ver. 0.3a



1. Overview

This document details a network performance benchmark of the Rackspace.com cloud. TCP/UDP bandwidths and latencies within and across different deployment regions of are included.

2. Setup

We explored whether different instances are connected differently and concluded that the connection backplane is the same, or at least bottlenecks are clearly lying elsewhere. The experimental setup was thus based on small instances. As observed network performance varies naturally with usage peaks and time of day, experiments were repeated at four different times of day.

Bandwidth, delay jitter and datagram loss were measured using the Iperf benchmarking framework. Unlike other network benchmarking tools, Iperf consumes very few system resources, thus resulting in more precise measurements. Round-trip latency was defined as $\frac{1}{2}$ of the time taken for a single packet to be echoed back, and measured using custom designed code. This was also performed for both TCP and UDP.

The following peer pairs were considered in the experimental setup:

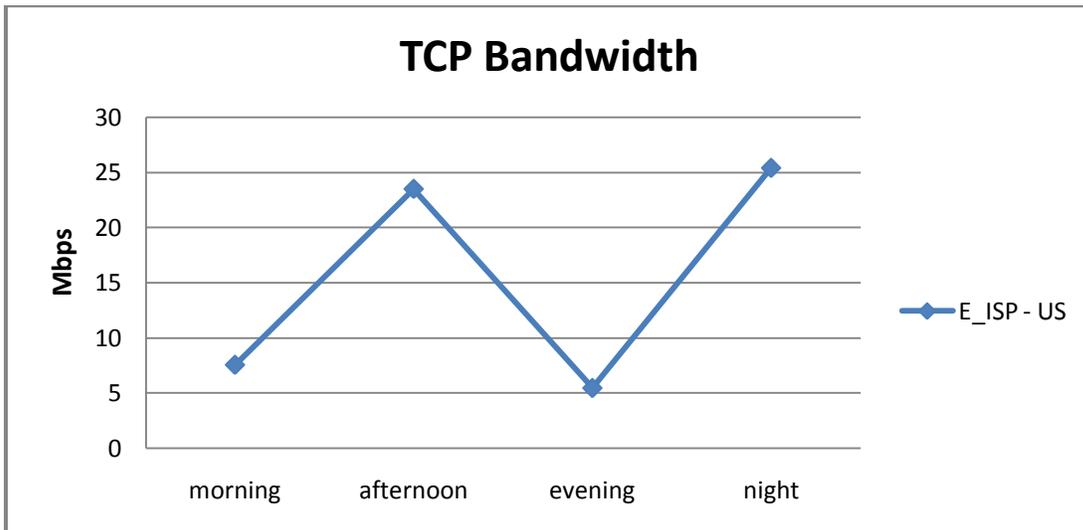
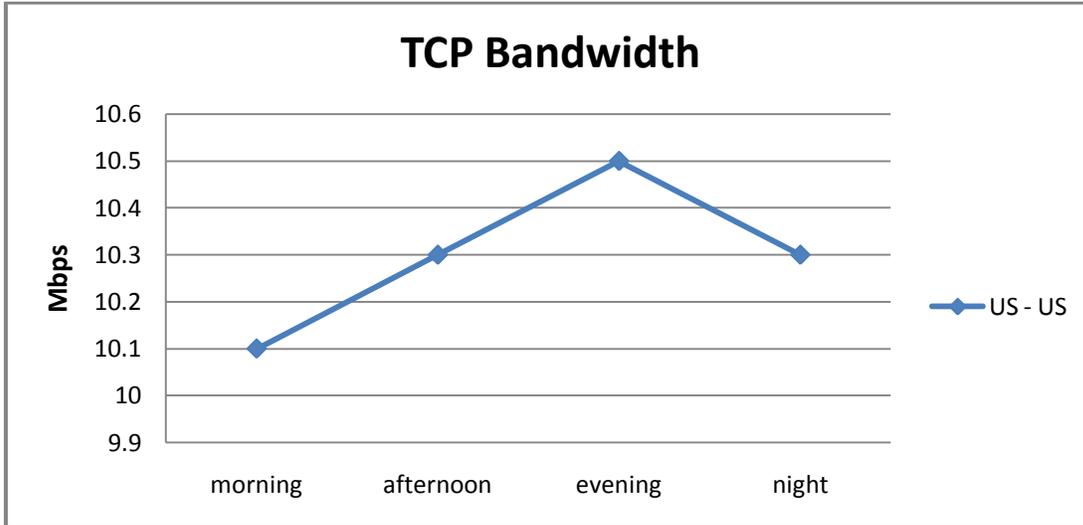
- Within rackspace US regions
- Between local clients (Stony Brook, NY) and US region

All benchmarks were (repeatedly) repeated at four different times of the day – Morning (around 6am), Afternoon (around 12noon), Evening (around 6pm), and Night (around 12am) Eastern Time mid-week. Averages are presented for each time.

3. Results

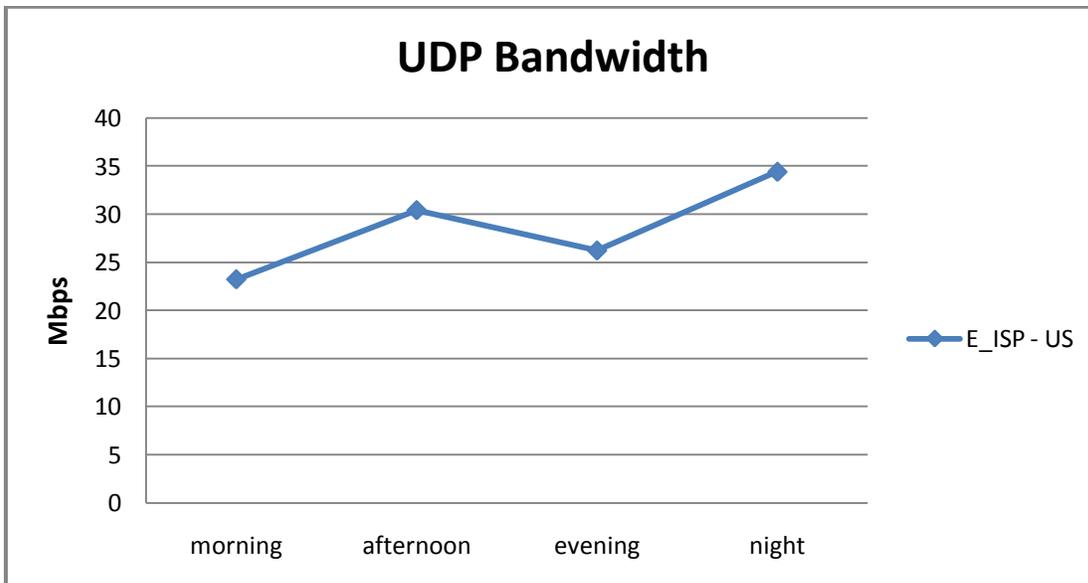
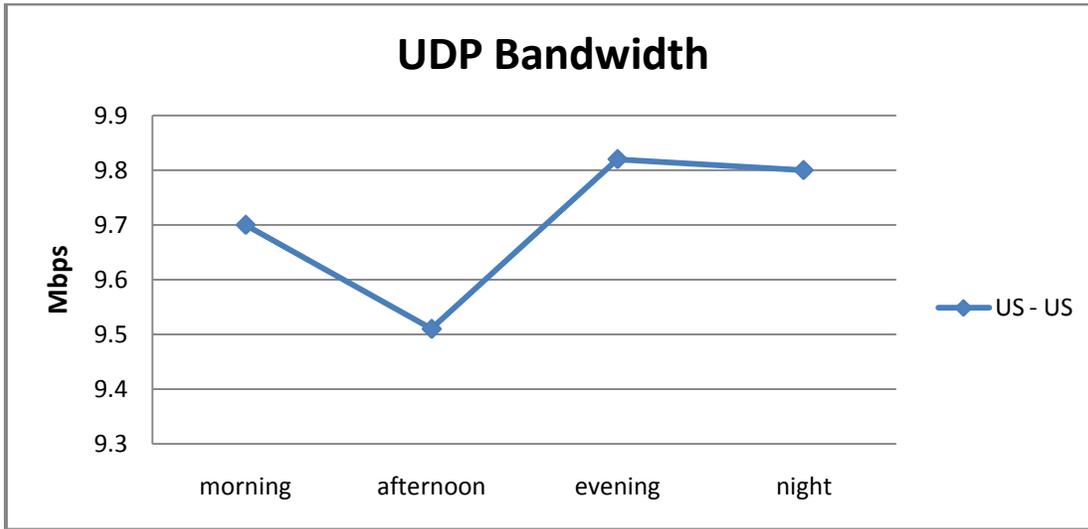
3.1. Bandwidth

3.1.1. TCP Bandwidth.



Observation: Afternoon and night-time TCP bandwidth between our ISP and rackspace is the highest within the day and also exceeds the intra-region bandwidth. Surprisingly, intra-region TCP bandwidth is at times lower than the bandwidth between our ISP and rackspace! This may suggest some intra-cloud traffic shaping.

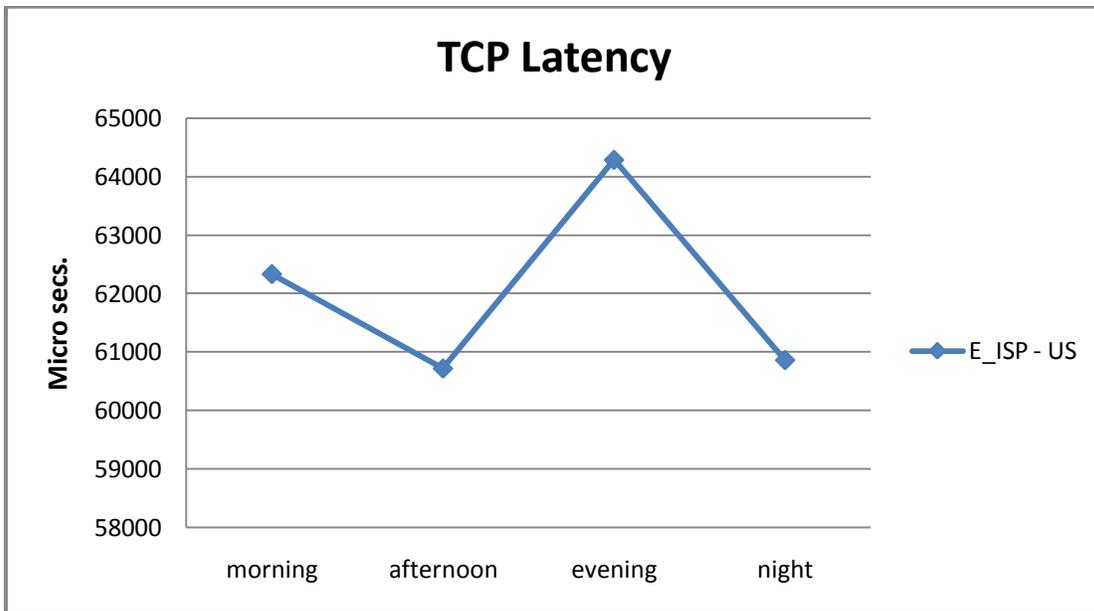
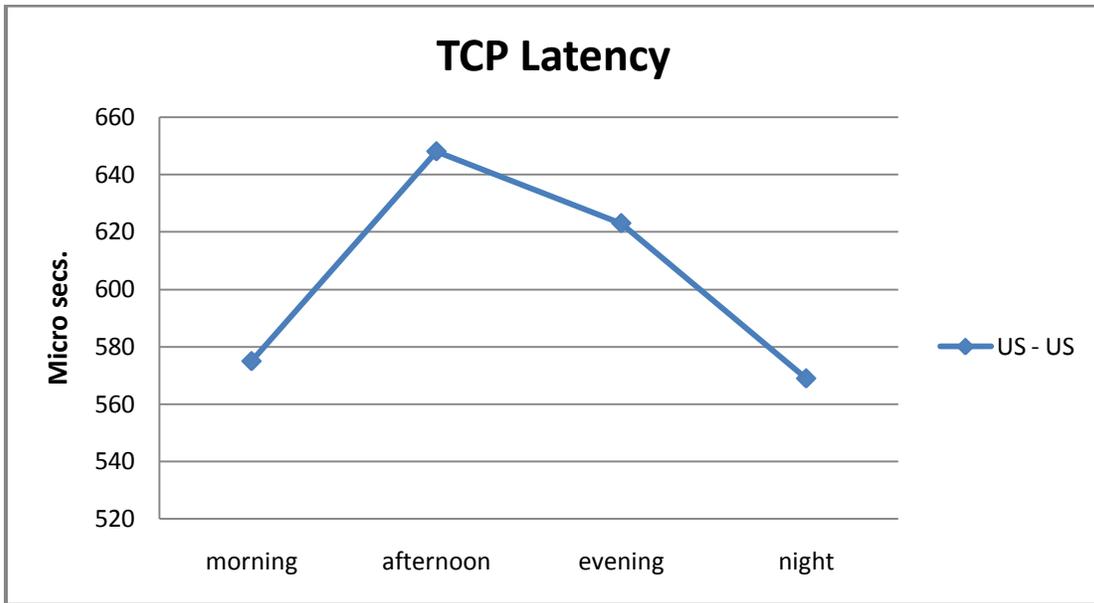
3.1.2. UDP Bandwidth



Observation: Surprisingly, intra-region UDP bandwidth is significantly lower than the bandwidth between our ISP and rackspace! This may suggest some intra-cloud traffic shaping.

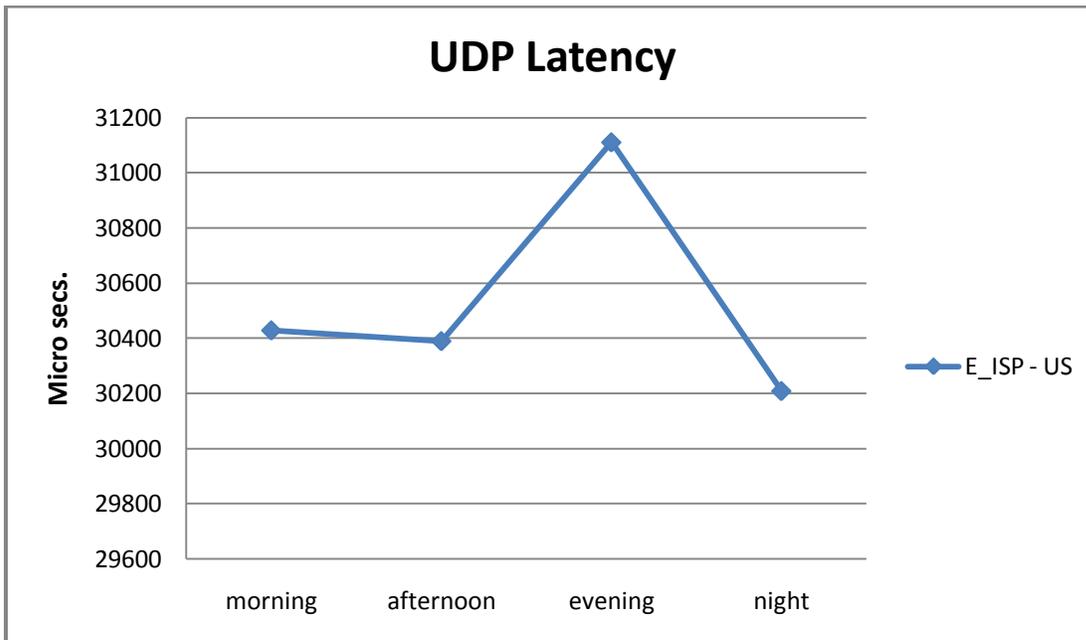
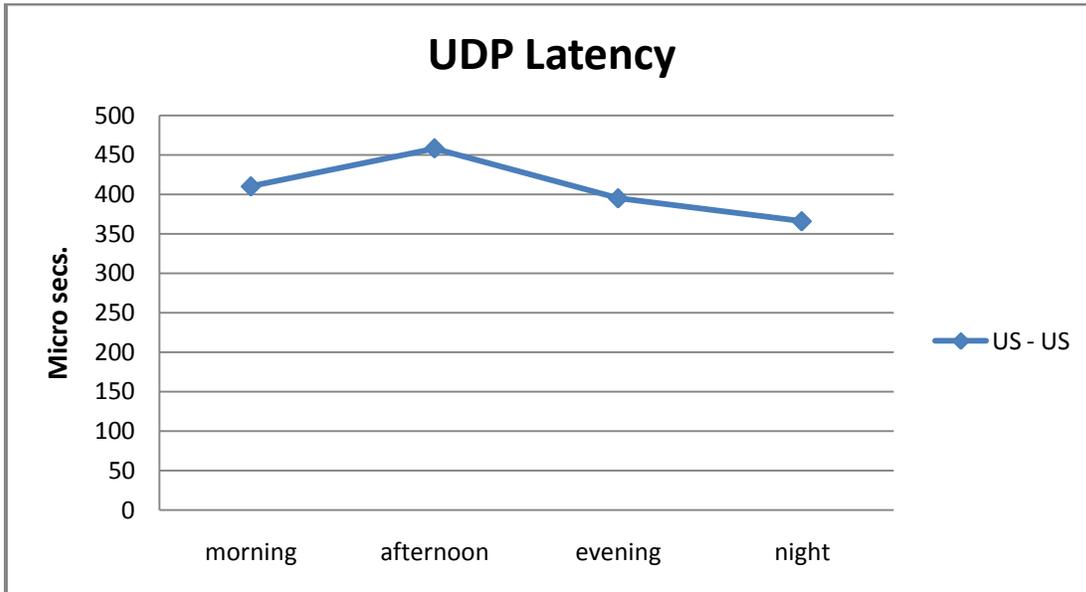
3.2. Latency

3.2.1. TCP Latency



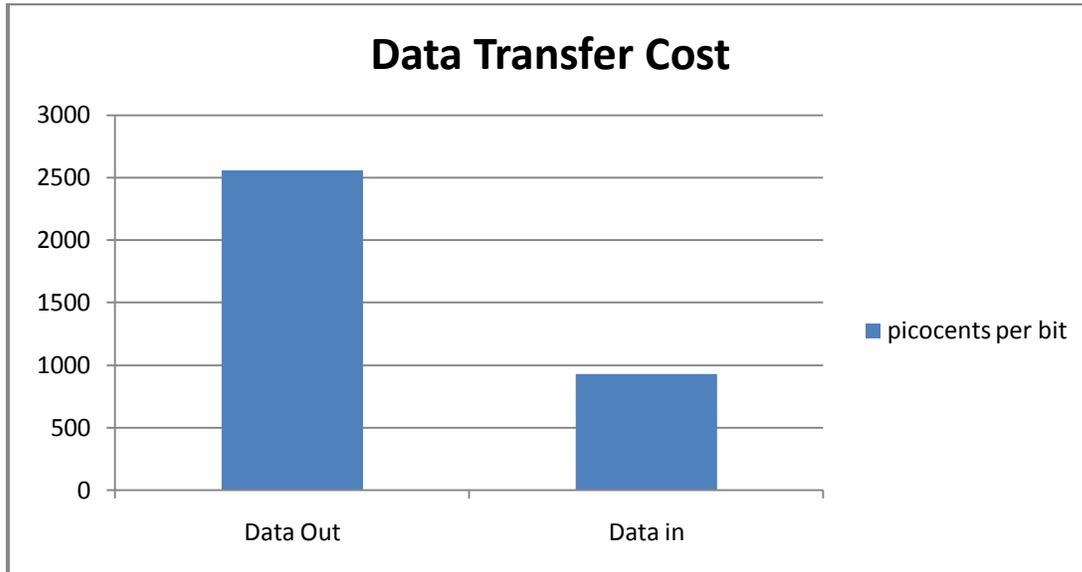
Observation: Intra-region latency is sub-ms as expected. 60ms+ times are observed from our ISP to the rackspace machines.

3.2.2. UDP Latency



Observation: Intra-region UDP latency is <0.5ms. 30ms+ times are observed from our ISP to the rackspace servers.

3.3. Data Transfer Costs



Observation: Rackspace features a flat rate for Data Transfer. As per our previous estimates, rackspace is paying a bottom line of no more than 700 picocents/bit ingres. This suggests a markup of about 25% for ingres traffic.