

# Hybrid Connectivity: Data Center to Google Cloud

Network operations teams are increasingly asked to troubleshoot and maintain network connections outside of their control. Cloud migration, SaaS app adoption and hybrid work all represent shifts in how organizations interact with networks. With less visibility into the networks that drive business forward, network operations need to update their approach to network observability.

In order to regain control over connectivity, it's crucial to baseline application and network performance in order to proactively validate the network paths between business-critical apps, networks, and end users. The use case described below is common for app migration and ongoing hybrid cloud deployments, with active layers 3, 4, and 7 monitoring from customer data centers to multiple cloud regions.

## Observability Focus

For hybrid connectivity, the first step is to baseline and proactively validate the connection between the data center and cloud regions. By having this visibility teams can quickly isolate the error domain between the data center, ISP, Google cloud edge, cloud backbone and application environment. Using AppNeta's continuous performance analysis to determine if the selected Google Cloud Standard or Premium tiers are appropriate for the customer applications and user base.



## SLA Validation

For executives and management, understanding the overall health of network and application environments requires an active approach.

The Application Quality dashboard highlights a general trend of performance for both Layer 3 and Layer 7 over time and across multiple locations. This specific dashboard shows two data center locations to two different cloud service providers: Google Cloud and Azure.



## Route Determination

Quickly identify the traffic routes and who owns the last mile and upstream peering relationships. This view can be shown as each specific hop or “Networks” aggregated by Autonomous System numbers.

This view can be used to compare the routes, route changes, ISPs, and CSPs for the enterprise environment. With filtering on the page, network operations can identify common environments or the status of network and application paths.



## Continuous Performance Data

Baseline the network delivery path from a Denver, CO data center to an internet responder hosted in Azure. The purpose of this path is to establish the baseline or network performance metrics.

This specific example shows poor performance beginning on/ around February 13th and ending on February 18th indicated by the sudden drop in network capacity.

## Compare Across Providers

Operations teams can baseline network performance from the same Denver, CO data center to an enterprise application hosted in Google Cloud. This provides a comparison across cloud providers.

This example shows the same poor performance beginning on or around February 13th and ending on February 18th. This confirms what was seen on the previous screen. This tells us the issue is not the cloud service provider related as we identified poor performance across multiple cloud endpoints.



## Application Context

After isolating an issue to the application, network operations can use web app performance data to understand where issues are occurring in the app. Users can compare network versus application performance via Selenium-based synthetics or HTTP tests.

The Milestone breakdown can also identify performance issues across multiple page loads or application requests representing logical changes in workflows for users.

## Root Cause

In the case depicted, the backup ISP managing the traffic was highlighted across the pages and was compared to the primary ISP. The backup at this location has less bandwidth and is more susceptible to poor performance when the link is highly utilized shown with the Google Cloud link. This is an extremely relevant use case for SD-WAN conversations as many enterprises use basic broadband to carry business-critical application workloads. While this is fine in practice, it is important to understand when those links can't support the organization.