

Oracle Hospitality OPERA Cloud Services



Network and Communications Guidelines

OPERA Cloud Services is a cloud-based mobile-enabled platform for next generation hotel management that can scale from small single property environments to large hotel chains with many thousands of rooms using the same underlying architecture.

To connect to OPERA Cloud, the hotel operator needs to select an internet service with sufficient bandwidth to support the operational needs of a hotel operation. Attempting to deploy OPERA Cloud over an unreliable or slow network results in slow application performance, low staff productivity, and ultimately a poor guest experience.

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Architecture

The architecture of OPERA Cloud has been designed to operate securely using the public Internet from redundant and highly scalable Oracle Cloud Data Centers. This ensures that users with different form factors like desktop, tablet, or mobile can access the same data.

For OPERA to perform well there are a number of network considerations that must be satisfied.

To ensure application performance is as expected, you must consider three main areas:

- Latency
- Available Bandwidth
- Jitter/Loss

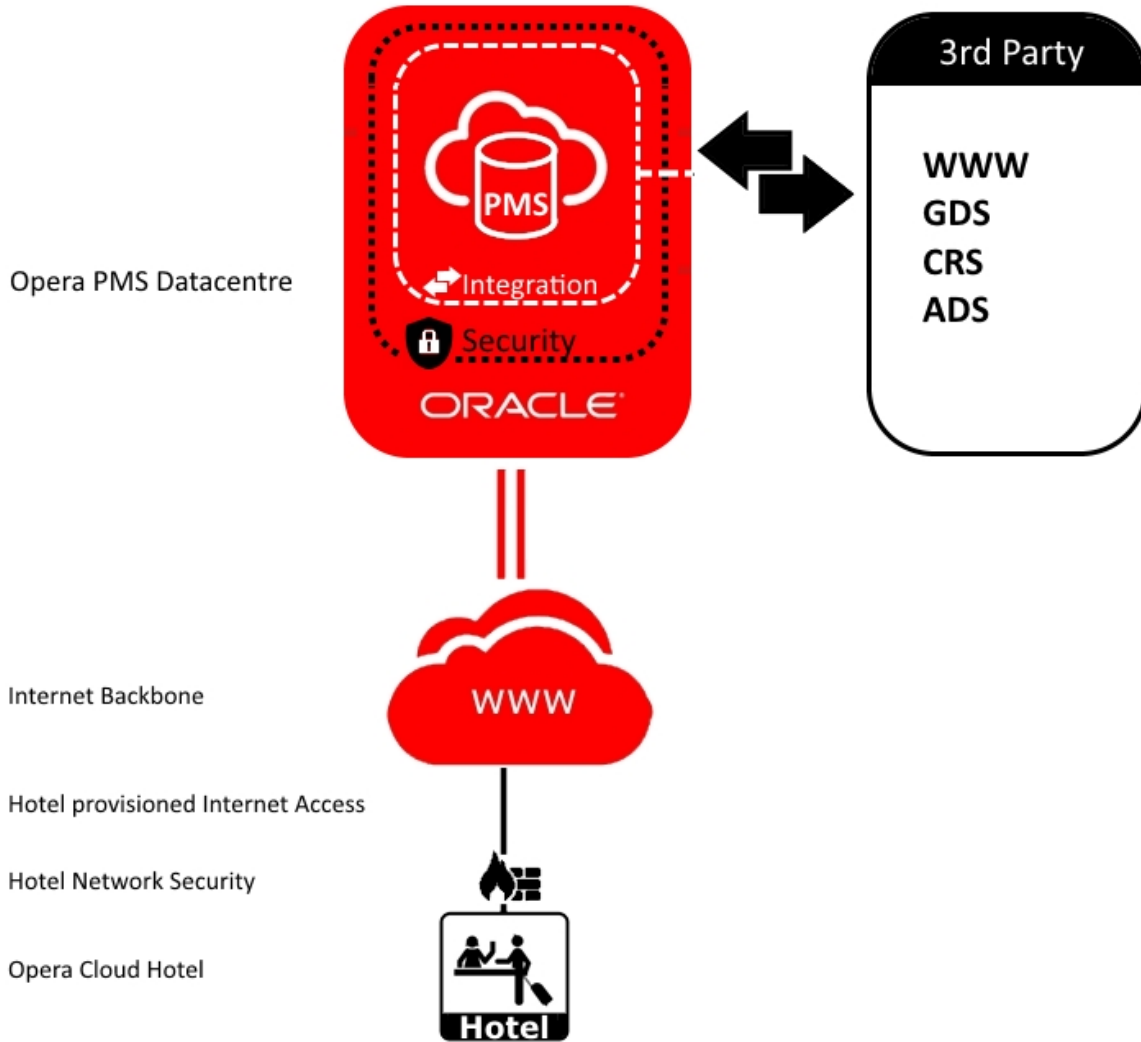


Figure 1. Showing the orientation of the data center, backbone networks and subscribing hotels.

Latency

Latency is the measurement of time taken for network packets to traverse a network and is a function of a number of factors, most notably distance from the data center, access technology, last-mile bandwidth, and network contention. It is the single biggest factor that affects perceived application performance and can easily be tested by performing a network 'traceroute' test.

Table 1 below indicates recommended latency limitations when using OPERA Cloud. This should also take into account the type of hotel operation considered.

For example, high transactional operations with a heavy peak check-in/out workload should have an average latency to the data center under 200 ms. Beyond this, while the application continues to run, the user experience will degrade.

Latency	Business Class hotel High Transactional Volume	Resort Style Medium Transactional Volume	Small and Boutique Style Low Transactional Volume
1-200 ms	✓	✓	✓
201-300 ms		✓	✓

Table 1. Recommended latency limitations for OPERA Cloud.

How should latency be measured?

Traceroutes can be used to measure latency from the client network to the datacenter over the public Internet as shown in figure 2. This test also confirms that the client site is using the most efficient path available.

Akamai IP Acceleration.

To better control the variable and often inconsistent routing experienced whilst traversing the public internet, Oracle often leverages the Akamai IP Acceleration (IPA) network to ensure packets are routed efficiently. This product dynamically routes traffic from clients accessing OPERA to the closest Akamai node which then completes the network transfer. This service relies on clients using a local DNS provider to ensure they are routed to the closest Akamai node.

Oracle Hospitality
Cloud Data Center

INTERNET

Hotel Network

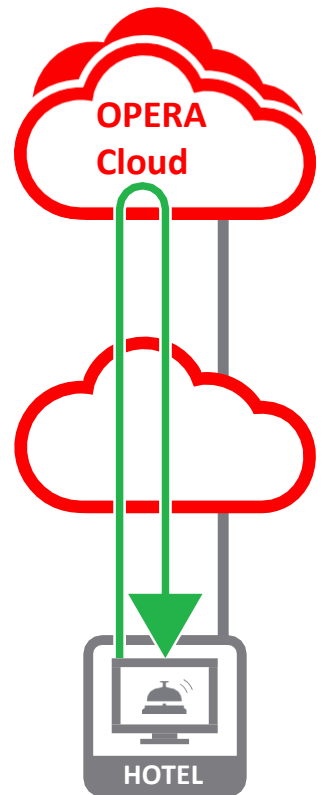


Figure 2. Showing packet originating from subscribing hotel to facility edge. By using the traceroute utility, both the network latency and path taken to the datacenter will be displayed.

Which Oracle Data Centers should be used?

Globally, OPERA Cloud will be available from major regional locations with each major regional presence (US, EMEA & AP) leveraging a minimum of two geographically redundant data centers to ensure that full geographic failover can be provided if required. A consistent design approach also allows all regions to adhere to a globally consistent service-level agreement depending on user requirements.

Oracle Hospitality's infrastructure team will determine which regional data center facilities to use by taking into account the geographic location of the hotel chain, the

type of hotel operations and, most importantly, the network performance between the subscribing hotels and the hosting data center facility.

It is also possible to use multiple facilities; however, this can add to the cost and complexity and depends on the hotel's size, growth strategy, and existing central reservation systems.



Figure 3. Geographic location of OPERA Cloud data centers.

Bandwidth Considerations Per Hotel

Network bandwidth refers to the data rate and is a measure of a network's ability to transfer data.

In most networks, it is usually limited by the capacity of the local network edge access link between the subscribing hotel and its core network backbone, as shown at right.

When designing the type of circuit required for OPERA Cloud, it is important the following requirements are adequately scoped:

- Total number of physical workstations within the property which will be required to access OPERA Cloud.
- If existing links are utilized, ensure sufficient free bandwidth is available during peaks.

Core Network Backbone

Network Edge Access Links

Hotel Network Security

Subscribing Hotel

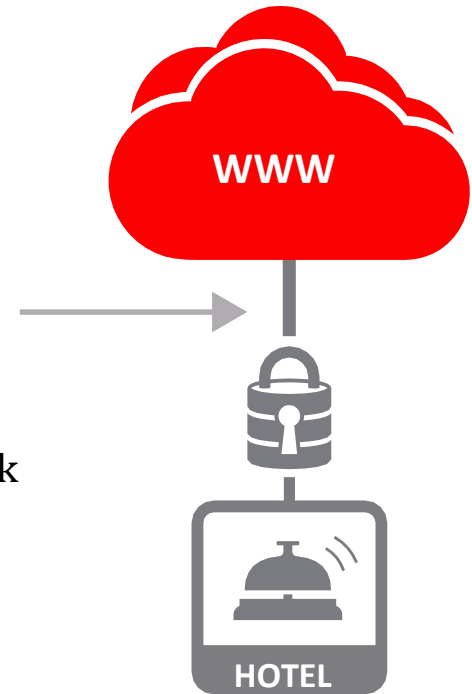


Figure 4. Showing network edge 'last mile' links which are typically limiting factors in corporate network designs.

Bandwidth Calculations

During the normal operation of OPERA Cloud, the bandwidth requirements are relatively small; however, these do peak when a user requests data to print or requires a download of exported data. To calculate this, the following formula can be used as a guide:

Recommended minimum bandwidth (Mbps) per hotel=(W×0.3)

Where: W=Total Physical Workstations

This formula results in the following bandwidth estimations. Depending on the available bandwidth tiers, the local access link should always be rounded up from the value calculated in table 3.

Workstations	Bandwidth (Mbps)
5	1.5
10	3
25	7.5
50	15
100	30
150	45

Table 3: Site bandwidth requirements by workstation count.

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