Whitepaper

plivo

The Carrier Network: **What Powers Quality in Voice & SMS APIs**

As companies modernize and streamline how they engage with customers, they're increasingly turning to communications platforms, particularly Communications Platform as a Service (CPaaS) offerings, to build communications workflows using common programming languages.

With CPaaS offering a comparatively easy way to increase the efficiency of reaching customers around the world, demand is spiking. Globally, IDC forecasts the CPaaS market will grow to $17.7 billion in 2024, up from $4.3 billion in 2019.

Using these platforms, companies can leverage APIs to easily integrate communications features into their web and mobile applications for various use cases such as:

- Voice calling
- Call forwarding
- Voice and SMS notifications
- Two-factor authentication
- One-time passwords

Yet not all communications platforms offer the same levels of quality. While user experience, API documentation, and price are important factors to consider when choosing a platform, carrier network quality should be the primary factor in the decision process, as it underpins the functionality and service quality of the entire platform.

Within the CPaaS space, different providers have built divergent carrier networks and infrastructure that ultimately affect voice quality and SMS deliverability.

These differences can also be seen among non-CPaaS vendors that are trying to capture the momentum of the CPaaS space, including both legacy carriers and wholesale aggregators that are attempting to tack on APIs to their offerings. Yet many of these providers have either not put in the work to build premium carrier networks and infrastructure, might not be as technically advanced, or they might not be as committed to developing solid APIs as some CPaaS vendors.

Thus, many solutions in the market fall short, and companies need to be aware of what differentiates carrier network quality among communications providers' offerings.

In this paper, we'll discuss:

1. The complexity of delivering a high quality of service
2. How carrier complexity creates additional business obstacles
3. The challenges inherent in building a high-quality carrier network
4. Why communications platforms should put carrier network quality front & center

The Complexity of Delivering a High Quality of Service

While to some extent a strong carrier network depends on the breadth of coverage, too often, companies think having access to a large number of global markets is the end-all-be-all. Yet wide coverage does not mean that the coverage is good in terms of delivering quality of service, Instead, delivering quality of service depends on a number of intertwining factors, including:

The quality of the local carriers used within each region
Not all carriers are created equally. For markets with multiple carriers, there can be differences between carriers in terms of their own network coverage, interoperability with the communications platform, bandwidth, ability to troubleshoot issues and overall technical capabilities.

The number and location of hops used to connect calls:
The number and distance of connections (also known as hops) your calls take before reaching their destination can have a significant impact on quality. Hops can be affected by factors such as the:

- Location of a call's origination and destination
- Carriers involved in transmitting the call
- Infrastructure of the underlying communications platform

For example, large Tier-1 carriers connect to local carriers through a point of presence (PoP). Typically, these PoPs are not distributed in every region across the globe. Instead, they might be located only in high-traffic areas to service large geographic regions. That means the route to certain regions might involve going through multiple PoPs and/or traveling further to a regional PoP located outside the destination region.

Adding hops or not taking an optimal route can add latency, which can significantly decrease call quality.

The communications platform's network infrastructure and monitoring systems

In addition to PoPs, communication platforms can vary in terms of the infrastructure they each have in place. Those that prioritize communications quality can rely on infrastructure that uses:

- Servers optimized for voice call processing, rather than regular servers, to provide more reliable quality of service
- Globally located test nodes, which are physical devices that simulate end-user devices to test quality in real-time for both voice and SMS
- Multiple network operations centers (NOCs), which monitor network performance around the clock and automatically escalate issues for quick resolution

The technology layer the communications platform uses to optimize call paths:

Related to the infrastructure layer, a communications platform's technology layer facilitates connections between the platform and local carrier networks. Connections may seem to happen instantly and effortlessly, but behind the scenes, a communication platform's algorithm must quickly determine the optimal call routing, based on factors such as:

- Number of hops
- Carrier route stability
- Time of day
- Region
- Local regulations

Platforms with poorly developed platform technology may experience noticeably inferior voice quality and total uptime. Thus, carrier network quality involves far more than just the number of markets served.

Companies searching for a high-quality communications platform need to find a solution provider that understands this complexity and has developed the carrier relationships, infrastructure and technology to consistently provide clear, reliable and compliant communications.

How Carrier Complexity Creates Additional Business Obstacles

Since carrier network quality involves multiple components beyond breadth of coverage, some CPaaS platforms and other communications providers that try to add on APIs end up falling short in terms of their overall voice and SMS capabilities.

Poor carrier network quality not only leads to issues like dropped calls and undelivered messages; it can also create business challenges for users, which undermines the customer experience businesses are trying to facilitate by using a communications platform in the first place.

For example, platforms that use least-cost routing (LCR) to connect calls based on the lowest-cost carriers might inadvertently connect to carriers that do not retain features like calling line identification (CLI). That means that customer service representatives or salespeople relying on caller ID to identify a customer or be able to reconnect with a customer if needed could be left without this information.

And as the name implies, LCR focuses on costs over quality, which can easily lead to connections that require additional hops or simply use unreliable carriers. As a result, these communications can end up costing the company more in terms of missed opportunities, particularly if dissatisfied end-users defect to a competitor.

LCR can also lead to issues with companies trying to deliver SMS messages to customers. For example, if a lower quality route does not retain the sender ID or if it changes the message content due to an unsupported character set, then those marketing or customer support messages are unlikely to be as effective as originally intended.

In fact, 89% of customers "say a quick response to an initial inquiry is important when deciding which company to buy from," finds Zendesk.2 Thus, companies that use communications platforms that drop calls, fail to send messages or run into other communications issues risk losing customers.

In addition to the customer experience issues related to LCR, customer experience challenges can arise due to:

Route blending

In an effort to improve reliability and ensure uptime, some service providers try to blend routes, i.e., combine services from multiple sources. However, route blending oftentimes means blending high-quality routes with cheaper, lower quality routes, which delivers quality inconsistencies but maximizes their margins. So companies that use communications platforms that leverage route blending could end running into the same kinds of issues as described with LCR.
Instead, businesses should look for communications platforms that ensure all routes consistently offer the same high quality of service. Leading CPaaS platforms do this by using strict carrier approval processes to ensure that high-quality alternative routes are always in place. Then, these platforms can use intelligent routing, where routes are selected based on real-time factors like quality and availability, rather than cost alone.

Lack of redundancy

Even reliable, high-quality carriers can have outages. So to ensure connectivity, a premium communications platform must have built-in redundancy, in terms of having both multiple carrier options in local markets and the technology to automatically load balance and divert traffic through other reliable carriers if one fails.

Otherwise, businesses risk being unable to complete calls or deliver messages to key markets.

Regulatory complexity

Beyond connecting to high-quality carriers, a communications platform needs the right infrastructure, technology and expertise to adhere to the numerous telecommunications regulations that can differ from market to market. For example, some countries such as France and India have regulations limiting the times when promotional messages can be sent, so a communications platform needs to be equipped to automatically prevent communications that run afoul of local regulations.

Businesses want to make sure their customer communications get delivered on time, in the right format, and in the right market, but they shouldn't have to be the experts in local telecom regulations. That should be left to the CPaaS provider.

As these examples show, businesses need their communications platform to solve a number of challenges that require more than just partnering with a few high-quality carriers. Instead, communications platforms need to carefully build global networks with a layer of redundancy, while also investing in the infrastructure, technology and expertise to solve the challenges that stem from carrier complexity.

The Challenges Inherent in Building a High-Quality Carrier Network

Building a premium carrier network from scratch isn't easy, especially for providers who don't have deep telecommunications expertise.

Since determining who the high-quality carriers are in each market takes a lot of time and resources, some communications platform providers try to shortcut building their own networks and instead use larger carriers who aggregate calls and SMS traffic.

Yet this approach is often cost-centric at the expense of quality, because aggregators do not necessarily prioritize top-quality local carriers. Moreover, a communication platform that leverages an aggregator could have multiple layers between themselves and the local carriers, which can make troubleshooting issues more difficult and lengthier. Instead of the communications platform being able to go directly to the source of the problem, service issues could quickly turn into a game of telephone, with multiple parties trying to figure out what went wrong.

Since partnering with large carriers who aggregate voice and SMS traffic is not the magic solution that provides businesses with top carrier quality, companies should instead look for communications platforms that not only work with Tier-1 carriers but also secure contracts directly with strong local carriers. Doing so can satisfy both the platform's and the end-users' quality requirements.

Yet even though this direct-connection approach seems like a clear choice for businesses, not every platform has this network, as it can be an incredibly time-intensive, relationship-oriented process. Each new carrier might take around six to nine months to onboard, and it can take several years to gain a critical mass, let alone full global coverage. That's why only a select few communications platform providers, including Plivo, have made the investment in building their own premium carrier network.

Because of the complexity behind carrier quality and the difficulty that goes into building a high-quality carrier network, companies searching for a communications API provider should ask potential providers quality assurance questions including:

1. Do you work directly with local carriers or via larger global carriers?
2. How do you assess and monitor the quality of the local carriers you work with?
3. Are the local carriers you work with local telecom operators that have direct connections to the local PSTN to minimize latency?
4. Do you have built-in redundancy in terms of multiple carrier connections and load balancing?
5. How do you maintain consistently fast connection speeds, i.e., what do you do to minimize hops?
6. How does your underlying infrastructure and technology support connections to high-quality carriers, e.g., do you use intelligent routing logic?
7. How do you detect and resolve issues in your network?
8. Will your platform help us adhere to local regulations?

Why Communications Platforms Should Put Carrier Network Quality Front and Center

Rather than looking at carrier connections as a commodity, companies should evaluate communications platforms based on whether they have built and can maintain high-quality carrier networks.

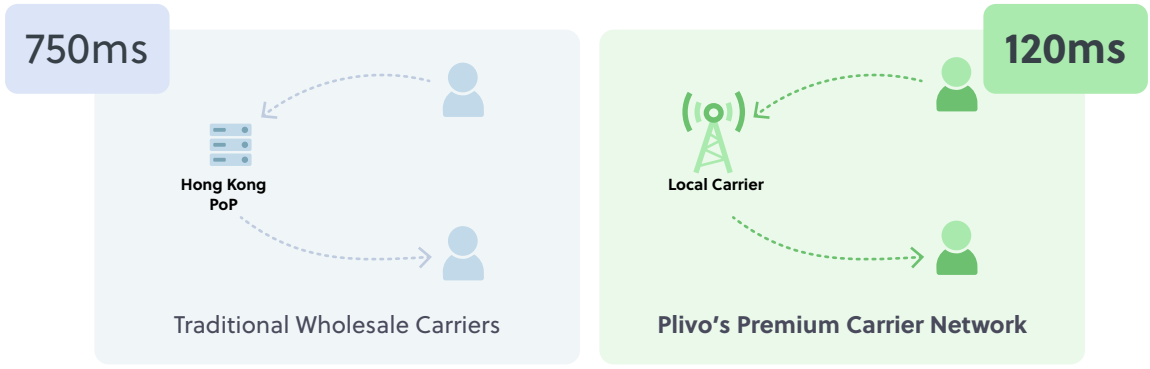
What does that look like?

For one, a leading CPaaS platform should only utilize Tier-1 carriers in regions where the Tier-1 carriers either operate their own local telecom networks or have direct connectivity with local telecom operators, as well as an in-country PoPs. Having this direct connectivity within each country can lead to reliable, high-quality connectivity so that your communications clearly and consistently go through in all connected markets. If that's not possible, then the platform should directly connect with local telecom networks on their own.

Plivo offers local connectivity in most of the 190+ countries we serve, and we eliminate multiple hops through our PoPs on all six major continents, which lowers the cost of routing and reduces latency.

In contrast, businesses using platforms that do not have these direct connections can suffer from inferior call quality and degraded message deliverability. Suppose you use a platform that connects to a Tier-1 wholesale carrier offering coverage in Australia, but the closest PoP for that carrier was located outside of the country, in a centralized region such as Hong Kong. That would mean local calls within Australia would be routed to Hong Kong before being routed to the receiver back in Australia.

This unnecessary routing can add at least 150 ms of latency to local calls, which could create a frustrating experience for customers, as there would likely be a noticeable delay between when they speak and when the customer service representative hears them.



Going a step further, businesses should look for communications platforms that not only aim to establish local connections to access quality networks but that also evaluate the differences in quality between local carriers. Otherwise, companies can still run into operational and customer experience issues, ranging from a lack of CLI to high message-failure rates.

Plivo's dedicated carrier relations team uses a strict evaluation process to only approve carriers that have met the highest industry standards. We then ensure interoperability with our platform to provide optimal customer experience, such as by including CLI in over 90% of all global destinations.

However, even with high-quality network partners, the nature of telecom means that errors and outages still occur. So businesses should also look for platforms that connect to multiple carriers in each country to ensure that there is no single point of failure, thereby providing peace of mind that calls and messages will consistently go through. Plivo's built-in redundancy allows for automatic routing through alternative carriers to minimize service disruption and quality degradation in the unlikely event of a carrier failure.

What can also separate communications platforms from one another is how they manage their networks. That can mean continuously battle-testing carrier connectivity, along with monitoring network activity and customer feedback, so that they can ensure their carrier partners continue to maintain high-quality service. They also need to test their own technology and infrastructure to ensure they can reliably optimize message delivery, call clarity, reduce latency and consistently find the highest-quality routing paths.

Moreover, selecting communications platforms that put quality front and center — in terms of how they both build their carrier

Scalability
Using a distributed routing strategy and multi-vendor interoperability can eliminate single points of failure, which better enables scaling.

Consistent CLI
By partnering with high-quality networks, platforms can more reliably offer CLI capabilities to provide a better user experience.

Instant Phone Number Provisioning
Seemingly small details like phone numbers can impact customer experience. For instance, customers are more likely to respond when they see a local number. Thus, businesses should look for a communications platform that maintains an optimal supply of mobile, fixed and toll-free phone numbers across regions, with an array of in-demand area codes, prefixes and number types that can be instantly provisioned.

Regulatory Expertise
Platforms that have local regulatory expertise help companies automatically keep up with requirements such as regional send time or frequency restrictions, which can help from both a compliance and customer experience perspective.

Not every communications platform, let alone CPaaS provider, has the same dedicated focus on carrier quality, and companies need to closely evaluate platforms based on factors such as:

- How they built their carrier networks, e.g., direct vs. aggregated connections
- Their infrastructure that affects call quality, speed and reliability
- Their technology that maintains connections and continually looks for ways to optimize communications
- Their ability to help you stay compliant and deliver the best end-customer experience
- Their customer service to quickly troubleshoot any communications issues for end-users or platform issues that your employees might experience

By looking at these factors holistically — rather than assuming carrier network quality is a given and that communications platforms are commodities — companies can find a solution that has a track record of reliability and the technical DNA to deliver APIs for a variety of communications use cases.

About Plivo

For businesses of all kinds, Plivo offers a simple, fast, and scalable way to modernize customer communications. Thousands of businesses use Plivo to quickly integrate Messaging and Voice calling into their applications to deliver better customer experiences. The Plivo team brings deep communications and modern software development experience to address the needs of today's businesses - quality, scale, speed, and agility. Plivo has direct relationships with over 1600+ carrier networks and connectivity in 190+ countries.

Want to learn more?

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