



Technical Buyers Guide to Voximplant Platform

Selecting the right APIs and SDKs for your company

What does CPaaS do?

CPaaS, or Communications Platform as a Service, is a platform that offers APIs and SDKs to embed communications channels such as voice, video, and messaging into business services.

CPaaS simplifies access to cloud communications. Instead of building their own communications infrastructure from scratch, developers add real-time communications with a few lines of code.

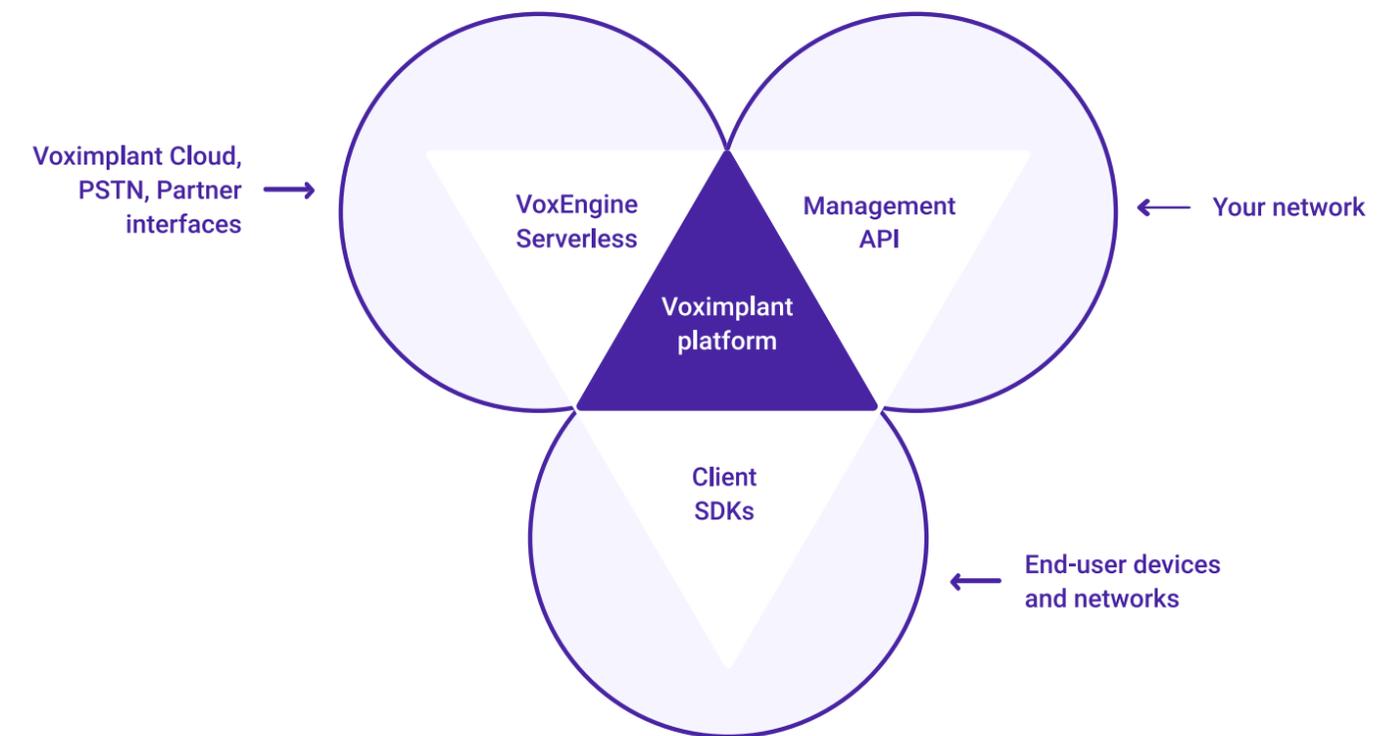
CPaaS is about customization. Think of it as a Lego constructor where you can build communications apps for e-commerce, fintech, delivery services, and more. You get a set of different blocks and decide which ones you want to put together and in which order.

The Voximplant Architecture

Voximplant Platform is the most powerful voice-first communications platform enabling anyone to build like a pro. These APIs and SDKs are used by developers that want to integrate voice, video, messaging, SIP trunking, and natural language processing into their products.

Unlike standard CPaaS options, Voximplant Platform comes with robust developer tools, and pre-built AI integrations to Google, Amazon, Microsoft, IBM, and more. All of this helps developers and PMs enhance customer experience without adding months of development time.

Voximplant Platform is designed to simplify the development of communications services. There are three components — VoxEngine, Client SDKs, and Management APIs — that developers use to build Voximplant-based apps.



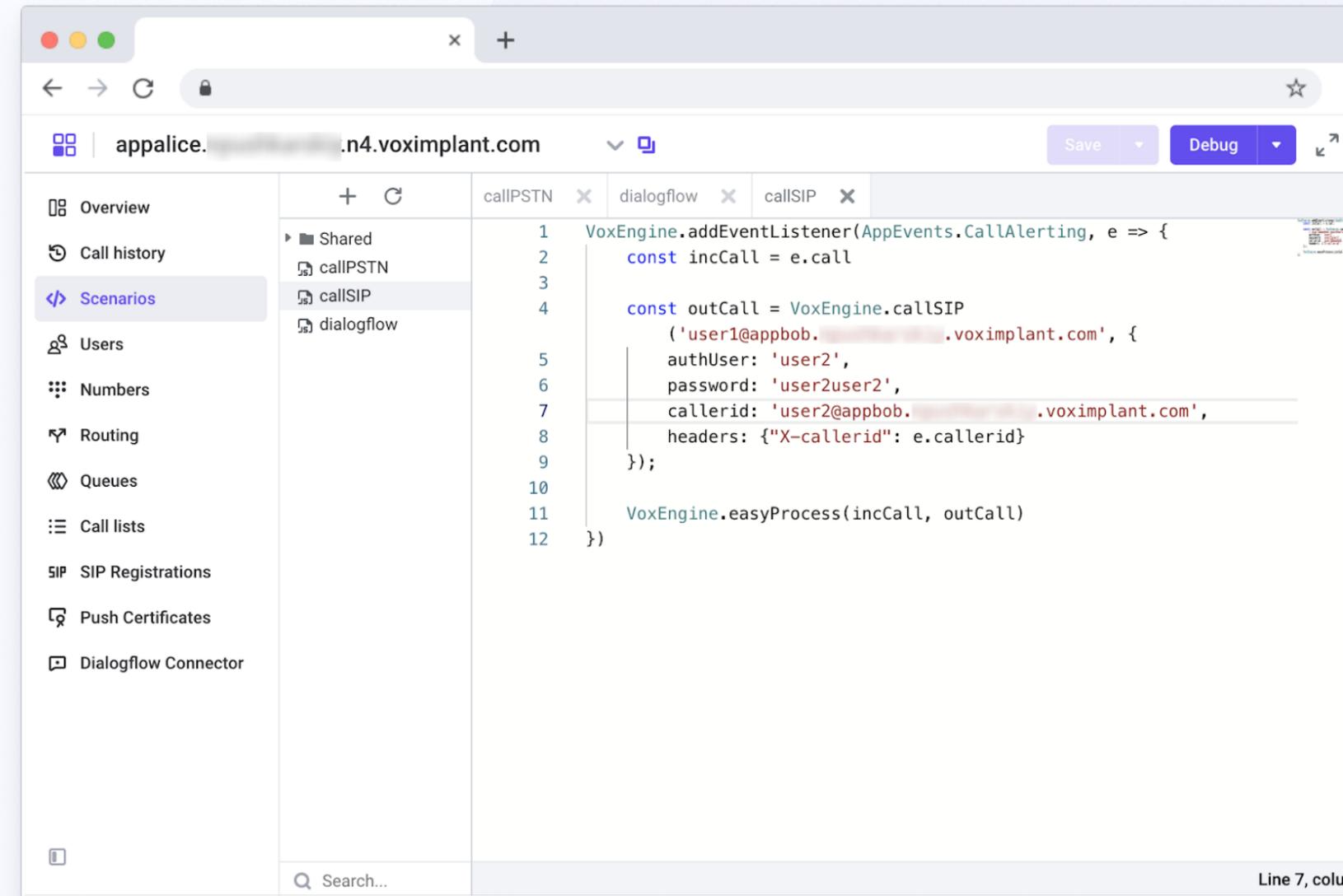
Voximplant Platform components

VoxEngine Powers Serverless Computing

VoxEngine is a serverless application runtime environment. The term “serverless” doesn’t mean that there are no servers. They exist on our side. VoxEngine runs apps, controls server-side logic and app state. Developers focus on business logic and individual app functions.

With VoxEngine, developers can integrate voice, video, and messaging apps into their services without the need to set up and scale their own servers. There is also a built-in Cloud IDE that allows developers to edit, execute, and debug their code from within a web browser.

With VoxEngine, your code is executed automatically when a call arrives at the platform. Your cloud-based app controls PSTN calls, a session initiated by a mobile or web app, or a SIP session delivered to endpoint devices.



The screenshot shows a web browser window displaying the VoxEngine interface. The address bar shows the URL 'appalice. .n4.voximplant.com'. The interface includes a sidebar with navigation options: Overview, Call history, Scenarios (selected), Users, Numbers, Routing, Queues, Call lists, SIP Registrations, Push Certificates, and Dialogflow Connector. The main area shows a code editor with the following JavaScript code:

```
1 VoxEngine.addEventListener(AppEvents.CallAlerting, e => {
2   const incCall = e.call
3
4   const outCall = VoxEngine.callSIP
5     ('user1@appbob. .voximplant.com', {
6     authUser: 'user2',
7     password: 'user2user2',
8     callerid: 'user2@appbob. .voximplant.com',
9     headers: {"X-callerid": e.callerid}
10  });
11  VoxEngine.easyProcess(incCall, outCall)
12 }
```

Building a scenario with VoxEngine

Client SDKs for Mobile and Web



Video conference built using the Voximplant Flutter SDK

Voximplant's Web and Mobile SDKs contain libraries with functions to control cloud-based apps from any modern platform: [Web](#), [iOS](#), [Android](#), [React Native](#), [Flutter](#), and [Unity](#). We provide complete support for initiation and termination of voice, video and messaging sessions.

Web and Mobile SDKs use the WebRTC technology for audio and video calls by default. For instance, if you build a video conference or a click-to-call service, you will use WebRTC.

WebRTC is currently supported by all well-known browsers such as Google Chrome, Mozilla Firefox, Safari, Opera and other Chromium-based browsers, in both their desktop and mobile app versions.

Management APIs for Controlling Your Apps

The Voximplant Management API provides developers with the control of Voximplant accounts and services. The Management API consists of three parts:

- **Provisioning API**

Create and edit accounts, as well as child accounts with a couple of clicks. Imagine you resell Voximplant Platform to clients under special pricing conditions. Instead of manually changing rates for each account, you can create one and then clone settings with the `cloneAccount` method.

```
curl
"https://api.voximplant.com/platform_api/CloneAccount/?account_name=account-template&new_account_name=my-account-name&new_account_email=my_email%40mail.ru&new_account_password=1234567&parent_account_api_key=3175a161-b59a-4715-8d8d-4944585e2025"
```

[CloneAccount code example from documentation](#)

- **Control API**

Start VoxEngine sessions, programmatically control active sessions, and exchange information with them. Also, this API can either create multiple calls in one session or be replaced by the `CreateCallList` method.

```
curl
"https://api.voximplant.com/platform_api/StartScenarios/?account_id=1&api_key=eec34e6c-a0eb-46c5-a001-1c2b65343bac&rule_id=1&script_custom_data=mystr"
```

[StartScenarios example from documentation](#)

- **Phone number API**

Responsible for operations related to phone numbers, caller IDs, and SIP registrations. For instance, you can buy phone numbers, activate them, and check if they support SMS.

```
curl
"https://api.voximplant.com/platform_api/AttachPhoneNumber/?account_id=1&api_key=eec36d6c-a0eb-46b5-a006-1c2b65343bac&country_code=US&phone_category_name=GEOGRAPHIC&country_state=CA&phone_region_id=1100&phone_count=1"
```

[AttachPhoneNumber example from documentation](#)



In many cases, the Management API speeds up the development process. Imagine that you need to add 1,000 users. You can do it manually via Control Panel, or you can automate the process and integrate with your existing codebase or CRM via the Management API.

We offer client libraries for popular programming languages such as Go, Python, PHP, node.js, .NET, and Java.

Platform Capabilities

Voximplant Platform offers comprehensive capabilities for voice, video, and messaging communications.

Imagine that integrating communications into your product is like building a house. You already have a saw and a hammer in the form of classes and functions. Now you need the materials — features that will be your building blocks.

See the Voximplant's list of functions and pick up the required materials to create your unique solution.

Programmable Voice

Voximplant's voice features extend your app to add services such as voice notifications, call tracking and interactive voice response (IVR) menus.

For instance, [Flowwow, a platform for flower shops and florists, built a Smart IVR](#) that uses speech synthesis and recognition to automatically handle inbound customer requests. Once a call is received, the IVR asks and interprets the caller's questions. If the voice bot can't help, or the customer needs a specific live agent, it routes calls to the responsible shop.

[S7 Airlines, one of the largest airlines in Russia, implemented a click-to-call solution](#) using Voximplant's virtual phone numbers, speech synthesis and recognition, and call recordings. When a customer issue occurs, customers make a call to S7 agents with one click. All calls are sent to the IVR system. When the request topic is determined, the call is redirected to an appropriate agent. Calls are recorded and stored for further customer service analysis.

Feature	Description	Voice	Video	SMS	IP Messaging	SIP
Phone numbers	Buy mobile, landline, and toll-free phone numbers. There are also test numbers that are designed for debugging purposes and creating demo apps.	✓		✓		✓
Audio call recordings	Allows users to record audio calls. Recorded media files are stored in the Voximplant cloud for three months by default. Customers can make a request and extend the storage time.	✓				✓
SIP trunking	A virtual alternative to a traditional phone line in IP telephony. SIP trunks carry media data over the IP network.	✓	✓			✓

Feature	Description	Voice	Video	SMS	IP Messaging	SIP
SIP registration	Allows users to register customer existing SIP phones or SIP endpoints with the Voximplant cloud.	✓				✓
Speech synthesis/TTS	An AI-powered tool that converts text into a human-sounding voice in real time. Developers use TTS when building IVRs and other voice apps. Voximplant has 150 voice options provided by Google Speech Cloud, Amazon Polly, Yandex Speech Cloud, Microsoft Azure TTS, and Tinkoff VoiceKit.	✓				✓
Speech recognition/STT/ASR	An AI-powered tool that converts speech to text during a call or afterwards for further processing and analysis. Voximplant's STT supports 118 different languages and dialects provided by Google Speech Cloud, Microsoft Azure STT, Amazon Transcribe, and Yandex Speech Cloud.	✓	✓			✓
Voicemail detection/VMD	An AI-based tool that helps to recognize a voicemail when you call your customers. Our VMD system is pre-trained to ensure 99% detection accuracy.	✓				✓
Virtual phone numbers	A standard phone number that doesn't lock down to a specific phone.	✓	✓		✓	✓
Long codes	A standard 10-digit phone number used to send and receive voice calls and SMS.	✓		✓		✓
Call transcriptions	A result of STT converting. Transcriptions are automatically saved to a text file at the end of the call.	✓	✓			

Feature	Description	Voice	Video	SMS	IP Messaging	SIP
Call forking	If a developer uses the callUser function and the same login credentials for all endpoints, his connected devices will simultaneously ring once a call arrives. Works the same as when somebody calls your Skype running on your PC and mobile phone at the same time.	✓	✓		✓	✓
Secure SIP	Developers can secure their SIP calls with TLS, a cryptographic protocol providing end-to-end security.	✓				✓
Call lists	Makes it possible to upload a CSV file with a list of customer phone numbers. For instance, Predictive Dialing System, or "PDS", can start calling customers from this list, string by string.	✓				
Dialogflow ES/CX 1-click integration	Allows users to connect Dialogflow bot with customer web and mobile services. ES agent is suitable for short conversations and has been praised for its simplicity. CX agent is an advanced voicebot type that is suitable for long conversations over 10 minutes. CX voicebots can transfer calls to live agents and users can interrupt voicebots so that it starts to listen again.	✓				✓
IBM Watson integration	The module allows streaming video calls to any CDNs supporting the RTMP protocol such as YouTube, Twitch, and Restream.io .	✓				✓
Opus	A Voximplant's audio codec which has a low algorithmic delay – 26.5 ms by default. Opus has the flexibility to reduce delay to as low as 5 ms by trading off quality or bitrate.	✓				✓
Hold	Allows users to put voice calls on hold and resuming them if needed. While the caller is waiting on hold, the system can play some music.	✓				✓

Feature	Description	Voice	Video	SMS	IP Messaging	SIP
SIP whitelisting	IP addresses (or networks) that are allowed to make calls through your Voximplant account without SIP authorization. For instance, if you have your phone number that is forwarded to SIP, you can forward it to Voximplant and use your call scenarios to process inbound calls.	✓				✓
Call queues	Allow users to handle large call volumes — for instance, in peak hours. While an agent speaks with a caller, all other users are waiting in a queue, with optional waiting music being played and/or the synthesized message informing the users about the remaining waiting time.	✓				✓
Predictive Dialing System/PDS	An improved version of auto dialers. PDS knows how many agents are free, busy, and the average call time. PDS uses these metrics to predict the moment when agents will be available to connect with a new callee.	✓				✓
HD audio	In the HD mode, audio is being mixed at 48KHz, all audio sources with a lower sample rate will be resampled to 48KHz.	✓				✓
Call handling	Programmatically control the entire call flow. Bridge calls between callers or play text to speech or sound files.	✓				✓
Black list	Calls from phone numbers placed on the black list will be automatically rejected.	✓	✓			✓
Global variables	Variables are key/value pairs that you can add to a specific scenario.	✓	✓	✓	✓	✓

Messaging

With Voximplant messaging capabilities, developers can build messaging flows into their apps and reach customers over the channels they already use.

The messaging capability includes an SMS API, IP Messaging, and a Bot API:

- **SMS API**

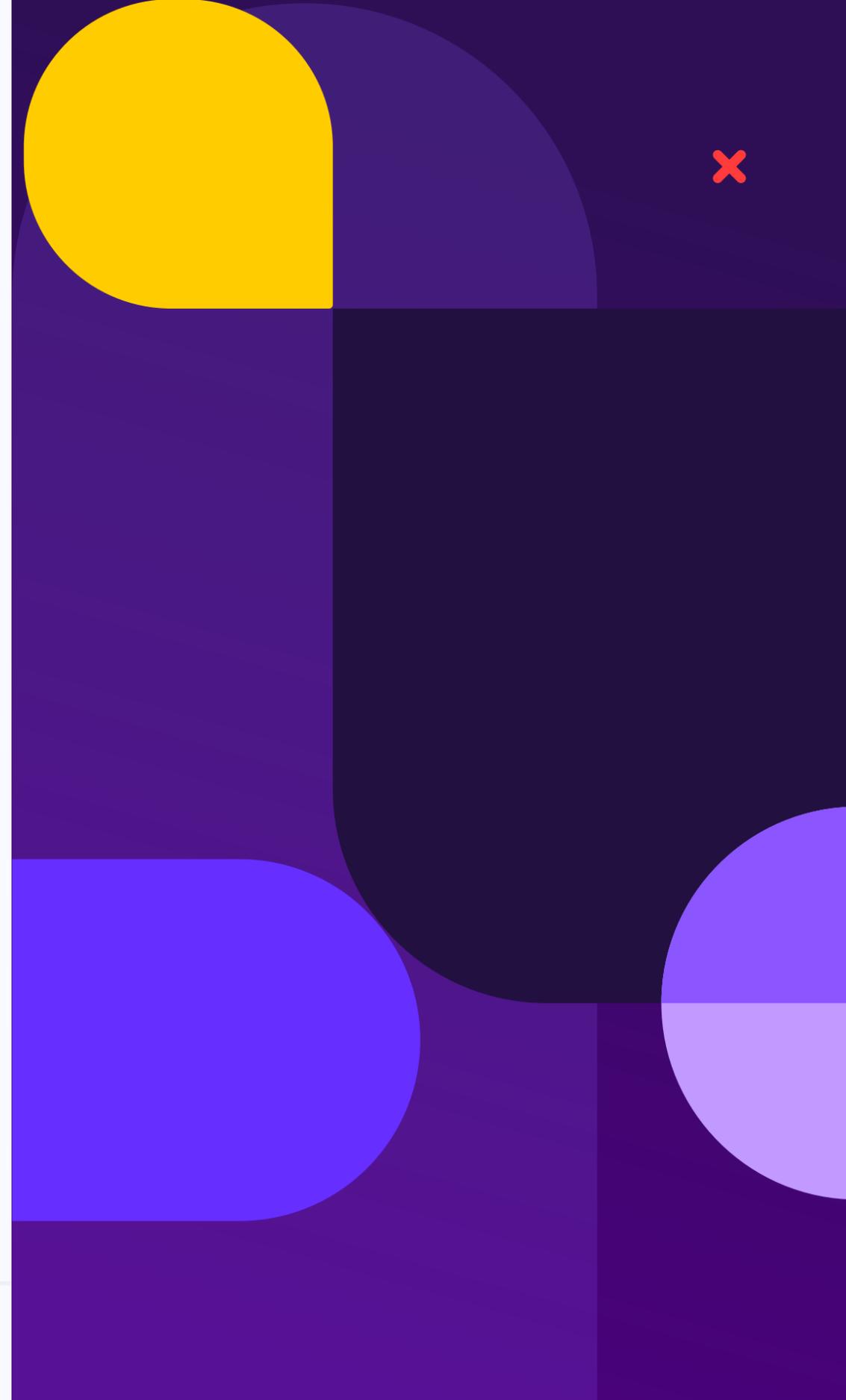
Implement P2P text messaging for customer-agent communications or A2P service to send large volumes of simultaneous messages such as product announcements and 2FA passwords.

- **IP Messaging**

Embed in-app user-to-user and group chats as well as push notifications. Improve your app with rich messaging features such as file sharing and typing indicators.

- **Bot API**

Connect to external services such as another instant messaging system or a text bot platform.



For instance, retailers use IP messaging to send customers push notifications at each stage in the order fulfilment process — when the purchased item is packed, has left the warehouse, and is delivered. Push notifications are also useful to send 2FA passwords.

Developers of fintech services build AI-powered chatbots to automatically serve customers. Conversational bots can handle customer requests such as the location of the nearest ATM address.

Feature	Description	Voice	Video	SMS	IP Messaging	SIP
Push notifications	Allows users to send data from an app server to a customer computing device. Voximplant has integrated support with Apple Push Notification Service (ANPS) and Google's Firebase Cloud Messaging (FCM).	✓	✓		✓	
Local storage sync	Conversations and messages can be saved to and loaded from a local app storage.				✓	
A2P SMS	A one-way SMS that is used for sending 2FA passwords, mobile marketing, voting, alerts, and notifications. Designed for bulk messaging needs, A2P SMS must be enabled by Voximplant support team on request.			✓		
Short codes	A part of A2P SMS. A shortened five- or six-digit phone number. Voximplant supports short codes in 28 countries including the US, the UK and Canada.			✓		

Feature	Description	Voice	Video	SMS	IP Messaging	SIP
Alphanumeric Sender ID	A part of A2P SMS. Allows you to use a company name instead of digit code.			✓		
P2P SMS	A two-way text messaging between two participants — for instance, between a customer and a support agent.			✓		
Message history	Displays the full history of SMS and IP messages. Customers can filter messages related to a specific number for a specified period of time. Retrieve your API history programmatically to create your own reports.	✓	✓	✓	✓	✓
Typing indicators	Allows you to see if a chat participant is typing.				✓	
Read receipts	Displays if the sent message is seen.				✓	
Delivery status	Allows you to see if a sent message is queued, dispatched, aborted, rejected, delivered, failed, or expired.			✓	✓	
Unified login	Voximplant Platform allows developers to use one user ID for multiple devices. Unread messages are synchronized across all devices.				✓	

Programmable Video

Build apps that scale from peer-to-peer calls to server-based video conferencing. The Voximplant video service includes a distributed network of SFU servers for video conferences with up to 50 endpoints, and it supports WebRTC for any kind of calls.

Users can join a video conference or video stream using any device that can view video. Voximplant offers automated bandwidth optimization, media controls, and recordings.

[Leroy Merlin, a French home improvement and gardening retailer, implemented video interviews](#) based on the Voximplant architecture.

An employee can enter their work ID, learn the interview rules, and record a test video before starting a task. The HR department gets access to the video recording once the task is completed.



Feature	Description	Voice	Video	SMS	IP Messaging	SIP
4K video resolution	Voximplant allows developers to implement video calls with up to 3840x2160p resolution.		✓			
Video recording	Developers can initiate recording for both one-on-one and conference video calls. URLs to recorded files are available both from the cloud-side JS API and from the client-side HTTP API.		✓			
Simulcast	Our media servers adapt the video quality to each endpoint independently. Users won't experience freezing and connection drops regardless of their network conditions.		✓			
Screen sharing	Allows you to share the entire screen or one of the active windows during a video call. Customers use screen sharing so other chat participants can see what you do in real time.		✓			
StreamingAgent	The module allows streaming video calls to any CDNs supporting the RTMP protocol such as YouTube, Twitch, and Restream.io .		✓			
Unified conference model	Handle PSTN, SIP, native mobile, and WebRTC endpoints in the same conference.	✓	✓			✓
H.264	A video codec that Voximplant uses to decode and encode video data during live streaming.		✓			

Common Solutions Built

Previously, we briefly mentioned some platform use cases such as IVRs, audio and video conferences. This section provides a deeper dive into solutions that developers from various industries build the most.

You're not tied to the solutions listed below. Think of it as a reference. You can create exactly the same solutions using [our tutorials](#), as well as completely new ones, which have not yet been done on the platform. Your imagination is the only limit.

Solution	Description	Voice	Video	SMS	IP Messaging	SIP
Voicebots	A voice alternative of chatbots. Developers use voicebots in Smart IVRs to automate the processing of inbound call traffic. For outbound call campaigns, voicebots help to perform marketing surveys, notify customers about promotions, or remind them to top up their accounts.	✓				✓
Phone-to-phone calls	Connect any phone numbers worldwide according to customer requirements.	✓	✓			✓
Phone-to-app calls	Perform calls between phones and apps, both mobile and web.	✓	✓			✓
App-to-app calls	Perform P2P audio and video calls between web and mobile apps.	✓	✓			✓
App-to-phone calls	Make outbound calls from your web or mobile app to phones.	✓	✓			✓

Solution	Description	Voice	Video	SMS	IP Messaging	SIP
Voice notifications	Allows you to call and inform customers about special offers, upcoming deliveries, or reminders to pay a bill using voicebots or pre-recorded messages.	✓				✓
Interactive Voice Response/IVR	An automated telephony system that interacts with callers using DTMF or voice inputs.	✓				✓
Auto attendants	A voice menu that allows callers to be transferred to a specific agent or department without going through a telephone operator or receptionist.	✓				✓
Auto dialers	Automatically dials phone numbers and switches the call to a free agent. Auto dialers eliminate the need for agents to place phone calls manually and idle time, waiting for the callee to answer.	✓				✓
Programmable callback	Callers can feel frustrated while wasting time in the queue. Developers can manage Intelligent IVR to tell the caller that he can press some key — for instance, # or * — to hang up the call, but stay in the queue. When the queue reaches the customer, the platform initiates a call to the latter.	✓				✓
Playing audio to a call	Allows you to send an audio stream during a call or replace dialing tones when the connection has not yet been established.	✓				✓
Two-factor authentication/2FA	The security feature that requires a user to enter the one-time verification code sent as a text message, voice or push notification to his computing device.	✓		✓	✓	✓

Solution	Description	Voice	Video	SMS	IP Messaging	SIP
IP PBX	A business telephony system that connects VoIP users over the SIP protocol. IP PBX can also switch a call to standard phones using PSTN gateways.	✓	✓			✓
Click-to-call	Allows you to call a company representative with one click from a web or mobile app.	✓	✓			✓
Phone number masking	Keep communicating parties anonymous during the communications session. Hide the customer's and agent's real phone numbers. Especially useful for delivery and taxi services.	✓			✓	✓
Call tracking	Allows you to track which ads and marketing channels bring phone calls.	✓				✓
Cloud contact center	A tailor-made virtual contact center to manage business communications — voice, IP messaging, or SMS.	✓	✓	✓	✓	✓
Live streaming	Voximplant provides developers with the video streaming API that allows many viewers to watch a call.		✓			
Video conferencing	A server-based video call with up to 50 participants. Developers can build one-to-one and one-to-many video conferences with the versatile management of media elements, streams, etc.		✓			✓

Solution	Description	Voice	Video	SMS	IP Messaging	SIP
Intelligent routing	Users can set the routing logic of an inbound call or message by agent skills and availability. For instance, you can set language skills and automatically route calls from Spanish numbers to Spanish-speaking agents. Manage Smart IVR to identify topic requests and route an inquiry to the proper department.	✓			✓	
Speech analytics	Analyzes real-time or recorded calls and extracts data for automated analysis and action, such as the use of certain keywords, script adherence, speech rate, or average handle time.	✓				
Audio conferences	There are two options for Voximplant audio conferences: one-to-many conferences with up to 49 participants and many-to-many ones with up to 100 endpoints. You can connect and mix PSTN/SIP endpoints in a single conference.	✓				✓
Chatbots	An AI-powered text channel that can handle standard customer requests. For instance, banking services leverage chatbots to help customers to find the nearest ATM. Can be used on websites, web and mobile apps.			✓	✓	
Upgrading to a video call	Developers can switch from a voice to a video call without interrupting the communication session.	✓	✓			✓
Group chats	Text chat rooms for more than two participants. Voximplant developers can create group chats up to 1,000 participants.				✓	
Video calls	Build P2P video calls for two participants and server-based ones for many endpoints.		✓			

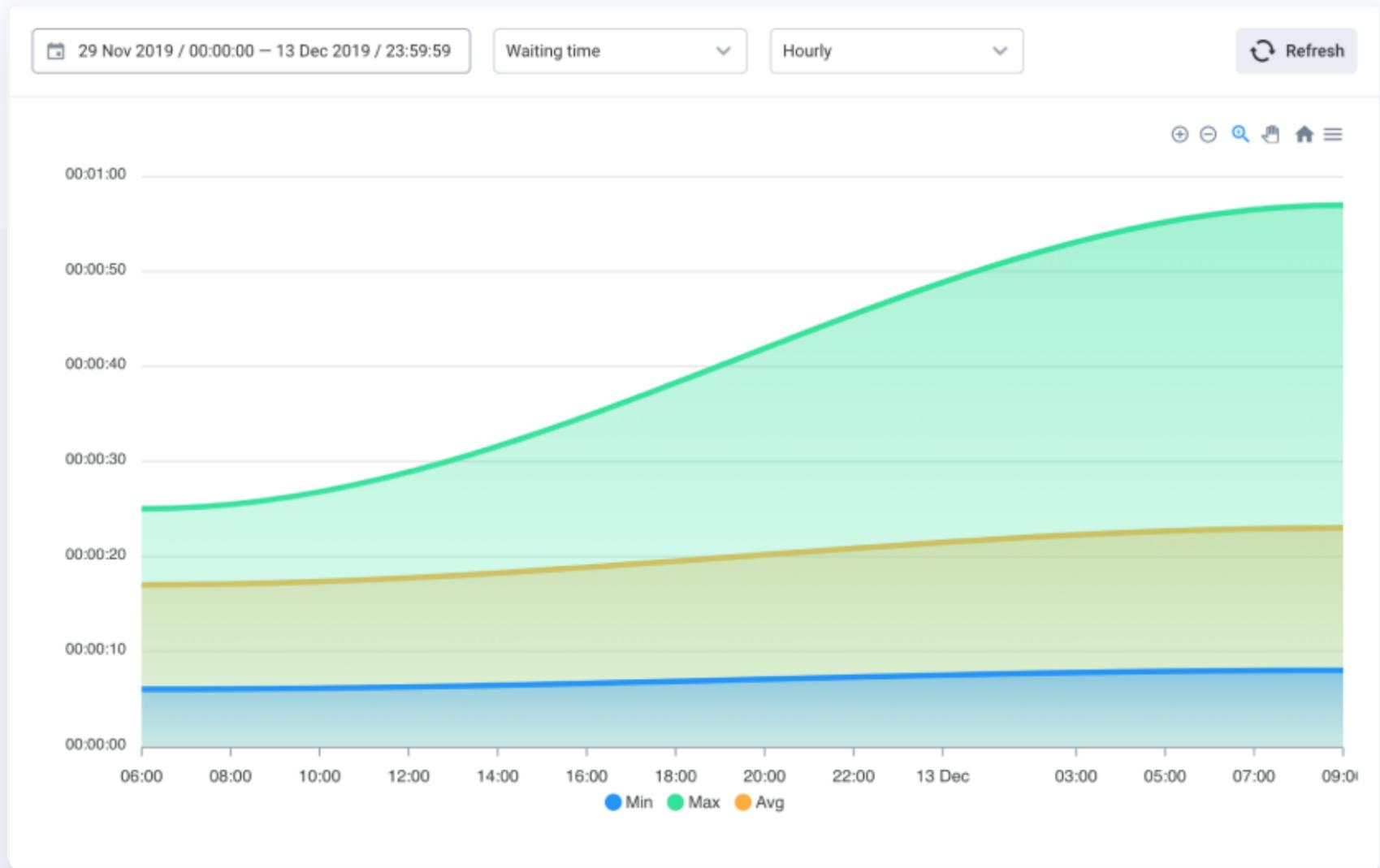
Analytics

In [the control panel](#), developers can see analytics across call queues, number of calls, subscription usage details, as well as platform status. Let's dig into how developers track their activities in real time.

ACD Queue Statistics

Developers can choose a specific app and see the list of related ACD queues. Here, you can see the live queue statistics such as serviced calls, waiting calls, and ready agents.

ID	Name	Serviced calls	Waiting calls	Ready operators	All operators	Action
^ 789	MAIN	0	0	1	1	Report
Priority	Max queue size	Max waiting time	Modified	Priority weight		
100	Unlimited	Unlimited	05.12.2019 17:28:42	High		
Queue live statistics						
Serviced calls 0						
Operator	Caller	Start time	Waiting time			
Waiting calls 0						
Caller	Start time	Waiting time				
Ready operators 1						
Operator	Ready time					
user1	00:00:07					



For those who want to see extended stats of a specific queue, click the Report button. It visually displays the minimum, maximum and average waiting time for the following criterias:

- Waiting time
- Speed of answer
- Abandonment time
- Handling time
- Talk time
- After call work
- Service level
- Call summary

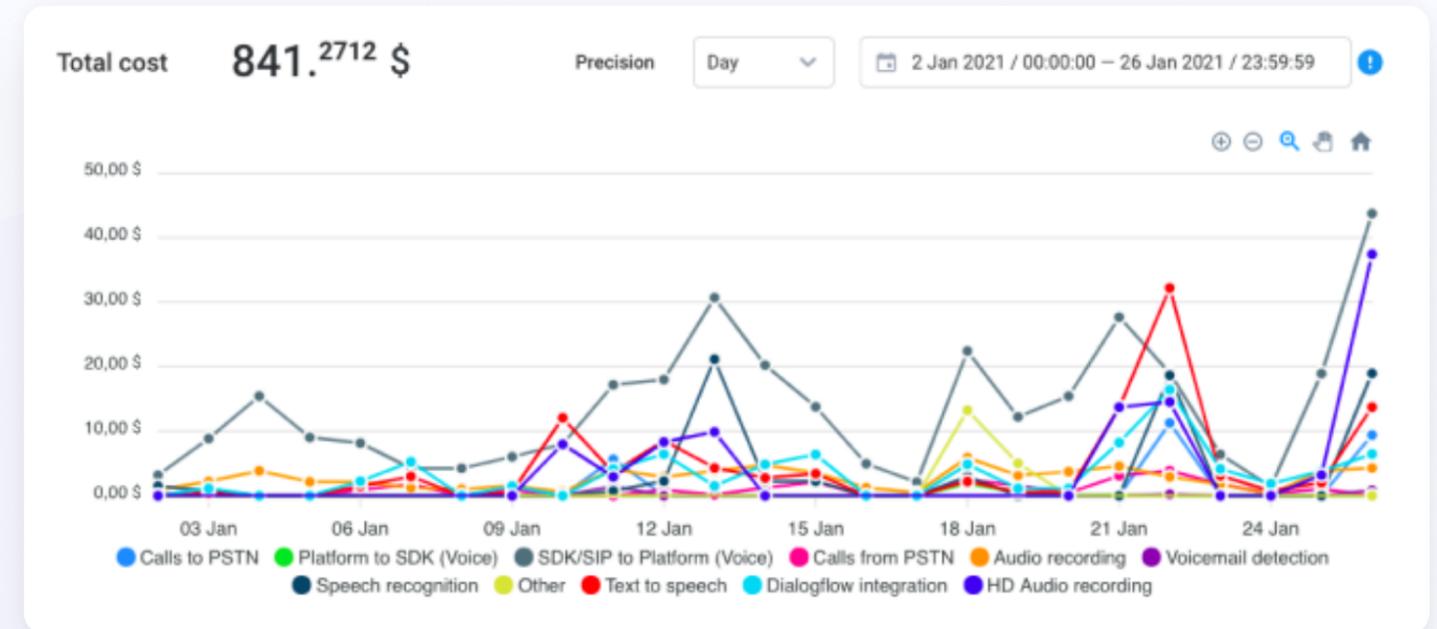
Subscription Usage Details

Voximplant's pay-as-you-go pricing gives a fair and transparent price for whatever you build. See for yourself. Go to the billing section and observe the detailed dashboard with your account charges. Alternatively, Voximplant offers volume discounts and committed use pricing to those that expect high volumes and reach out.



Platform Status

Voximplant Platform maintains a redundant architecture designed to ensure reliable high availability service. In the Platform status section, you can see call engine, SIP, WebRTC connectivity, and other systems uptime.



Voximplant Security and Compliance

Developers can build and scale their apps with enterprise-grade security that meets global compliance, including HIPAA, GDPR and ISO 27001.



GDPR Compliance

If you store and manage the data of individuals living in the European Union, GDPR affects you. GDPR is designed to increase data protection around personal information for EU citizens. Voximplant Platform is committed to being GDPR compliant to make it easy for our customers to access the European marketz

ISO 27001 Compliance

Voximplant Platform was audited by the British Standards Institution (BSI) and was certified in relation to the process "Software Development and VoIP Solutions Based on the CPaaS Model" for compliance with the requirements of ISO/IEC 27001: 2013.

ISO 27001 certification shows Voximplant's customers that the company is fully capable of protecting their data and providing them with the respective assurances.

HIPAA Compliance

In Voximplant, we strive to provide a platform trusted by customers and patients. We are HIPAA eligible and can offer BAAs, Business Associate Agreements, across all our products including Voice, Video, IP Messaging, and SMS APIs.

HIPAA compliance ensures we protect the confidentiality and mobility of health information for individuals and entire medical institutions.

Voximplant Security and Compliance

End-to-End Encryption

Voximplant's end-to-end encryption prevents hackers from accessing customers' sensitive data. We use E2EE for all data transfers and storage in the cloud. SSL is also used for protecting confidential data.

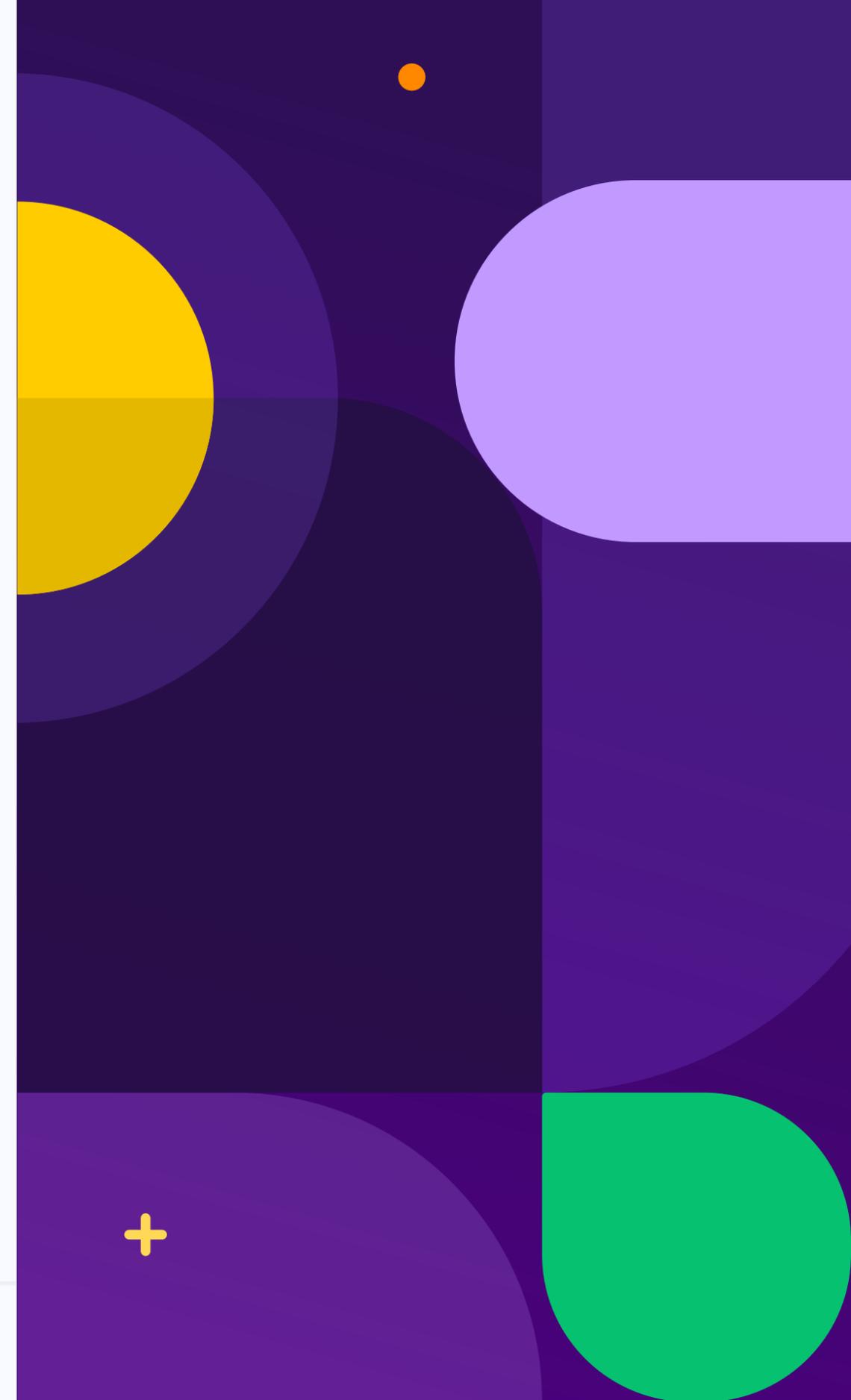
Secure SIP

To eliminate SIP communications vulnerabilities, Voximplant supports SIP TLS and SRTP for signaling and media security. We offer a range of key negotiation protocols for SRTP media security for compatibility with existing infrastructure and SIP clients:

- SDES
- DTLS

Once your traffic hits our network, we protect it by assigning all inbound and outbound streams to the same media server. This minimizes exposure of these streams when we need to decrypt media. All signalling is encrypted as it traverses our network.

We routinely evaluate patches and updates to secure your Voximplant-based apps. Companies in security-centric industries choose us because of our robust security, compliance, and privacy.



Voximplant for Startups and Nonprofits

We help startups and non-profit organizations to grow and scale.

Startups Program

Voximplant for Startups was created to help startups in their early stages of development. Qualified startups can get \$1,000 in one-time credits to Platform as well as discounts to our Kit product.

To qualify for the startup program, you must:

- Have funding of at least \$50,000
- Have been in existence for 5 years or less
- Not be a paying customer of Voximplant

Explore the startup program

Nonprofits Program

Voximplant for Nonprofits was designed to give back to the nonprofits that give so much to our communities. Receive 20% discount on all Platform products as well as discounts on our Kit product.

This program is available only to qualifying US nonprofits with 501(c)(3) designation and to US public libraries. Public libraries must either have valid 501(c)(3) nonprofit status or be listed in [the Institute of Museum and Library Services \(IMLS\) database](#). Nonprofits will be required to provide the IRS Letter of Determination proving 501(c)(3) status prior to discounts being awarded.

Explore the nonprofit program

Professional Services and Customer Support

If you don't have time or a dedicated development team, you can [delegate your task to the Voximplant team](#). Our experts will help you write custom code and build a solution.

If you ever have questions, we maintain a global customer support team ready to provide 24/7 assistance wherever you are. Contact us using chat, email, or phone. There is also the [Discord developer community](#) that shares their experiences and can answer questions about our APIs, libraries, and SDKs.



MESSAGING



```
1 function onCallConne
2 } call.say('Please
3 }
4 function onPlaybackF
5 const agent = Vox
6 } VoxEngine.easyPro
7 }
8 function onAgentConn
9 call.record({ster
```



VIDEO



VOICE

TELEPHONY



Let's Get Started

We hope you have found this guide helpful. Sign up online to start building now or contact one of our experts. They can help you choose the right solution and provide useful information.

[Sign up](#)

[Contact us](#)