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BotProbe - The Platform for **Voicebot Quality Assurance.**

BotProbe is a purpose-built platform designed exclusively for testing Conversational AI voicebots. It replicates real customer interactions by placing or receiving calls and guiding conversations toward defined outcomes, allowing enterprises to validate whether their voicebots perform reliably, respond accurately, and maintain consistent audio quality across customer journeys.

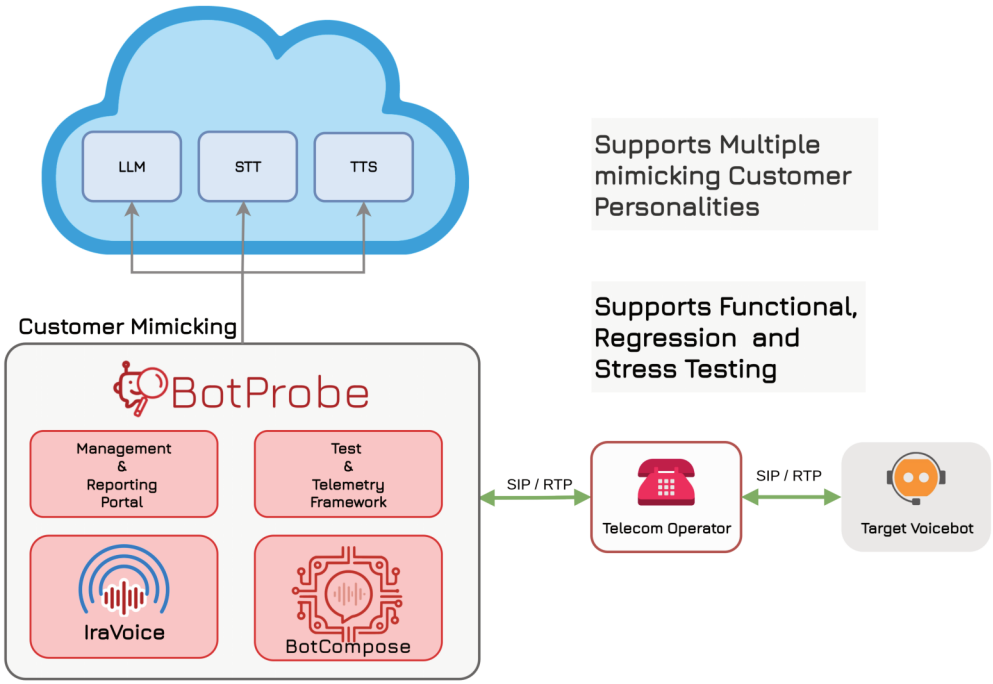
Voicebots handle multiple types of customer requests, each following different conversational paths. As new features are added or updates are rolled out, the risk of breaking existing flows increases, and manually testing every variation quickly becomes impractical. BotProbe addresses this challenge by automating the testing process, ensuring that no functionality is compromised during upgrades and that customer experiences remain seamless.

BotProbe's testing framework brings together specialized components into a unified platform for end-to-end validation of voicebot performance under real-world conditions. **IraVoice**, Epicode's telephony stack, manages call delivery and audio processing. **BotCompose**, the orchestration engine, enables the creation of complex voicebot scenarios. A Management and Reporting Portal provides clear access to results, analytics, and quality metrics, while the Test and Telemetry Framework ensures continuous monitoring, data collection, and validation across the testing life cycle.

HIGHLIGHTS

- End-to-end testing for voicebots and IVRs
- Realistic call simulation with inbound and outbound flows
- Seamless integration with PBX, SIP, and cloud AI
- Advanced reporting with conversational and network insights
- Supports functional, regression, and stress testing
- Cloud, on-premise, or hybrid deployment options
- MOS, jitter, and packet loss tracking
- Monitor latency, silence, and dead air events
- Scalable testing with thousands of concurrent calls

Architecture



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Configuration and Connectivity

Testing starts in the BotProbe Management Portal, where users define the target voicebot, call type, and numbers, then create call flow scenarios with checkpoints linked to personas and bot types. BotProbe connects via any SIP trunk—PSTN for realistic customer paths or Direct SIP for cost-efficient scale and integrates with leading cloud providers for STT, LLM, and TTS. Custom providers can also be added, ensuring flexible, scalable, and reliable testing in any enterprise setup.

Customer Mimicking Bot Types

BotProbe simulates customers in three ways. The TTS Response Bot generates dynamic, human-like replies for testing natural conversations. The Recorded Response Bot uses pre-recorded persona-based audio for consistent, controlled interactions. The Sequential Playback Bot replays pre-sequenced clips to measure capacity, latency, and audio quality under scale. Together, these options test both conversational intelligence and system stability.

Testing Modes Supported by BotProbe

BotProbe supports three modes to validate accuracy, reliability, and scalability. **Functional Tests** validate specific call flows with single calls to ensure expected behavior. **Regression Tests** run all defined scenarios with configurable concurrency to confirm updates haven't broken existing functionality. **Stress Tests** measure performance under heavy load by maintaining concurrent calls until the required total is reached, replacing each completed call with a new one.

End-to-End Call Flow

When a scenario is executed, BotProbe simulates a customer by placing or receiving a call to the voicebot. During the conversation, the customer-mimicking bot interacts according to the defined persona and checkpoints. Once the call ends, a verification engine checks if all checkpoints were met and if the voicebot responded within acceptable limits. For outbound bots, BotProbe answers on its assigned number and engages the bot in the same realistic manner.

Key Performance Indicators Tracked

BotProbe tracks a comprehensive set of KPIs to validate both performance and customer experience. **Voicebot Response Latency** measures the gap between when a simulated customer finishes speaking and when the voicebot replies, ensuring responsiveness stays within predefined thresholds. Any delays beyond these limits are flagged, helping teams detect slowdowns that may frustrate customers, though pinpointing whether the issue stems from speech recognition, language modeling, or text-to-speech requires internal log analysis. **Voicebot Response Accuracy** verifies that the bot's replies align with expected outcomes and conversational context, highlighting not just correctness but also consistency across different scenarios.

Detailed reports capture which checkpoints passed, failed, or were skipped, giving teams a clear, audit-ready view of reliability and problem areas. **Speech Quality Metrics** evaluate every call in real time using industry-standard benchmarks. Mean Opinion Score (MOS), with values near 4.5, indicates excellent clarity and natural audio quality. Quality Percentage combines jitter, packet loss, and delay, where 100% reflects a fully impairment-free call. BotProbe also tracks packet loss and skipped packets to measure transmission reliability, jitter statistics to gauge audio stability under varying conditions, and bytes/packets sent and received to verify balanced media flow and prevent one-way communication issues.

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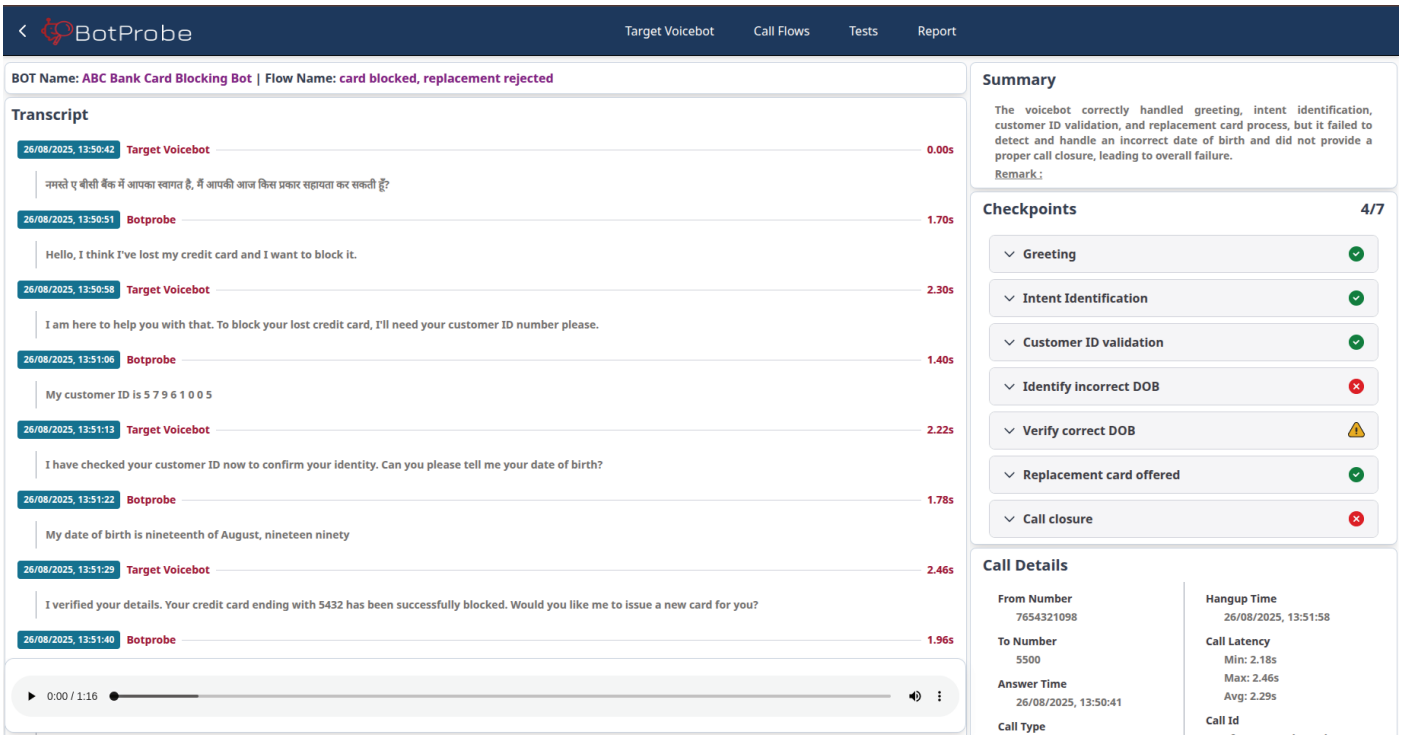

Silence and Dead Air: BotProbe measures unexpected silence during calls, highlighting moments when the voicebot stops responding or becomes unresponsive.

Interrupt Handling: The system records whether the voicebot interrupts the customer mid-sentence, how often it occurs, and at which points in the conversation.

Escalation Detection: BotProbe also detects when a call is escalated to a human agent and records the exact checkpoint where the transfer happens.

BotProbe Reports

BotProbe provides a comprehensive suite of reports via its portal, offering detailed insights into voicebot and IVR performance across multiple dimensions.

Test-Level Reports summarize execution with metrics like calls dialed, answered, failed, success rates, average duration, response latency, and mean MOS.

Quality & Network Reports flag anomalies such as jitter or packet loss and link them to checkpoint failures.

Advanced Analytics provide persona sensitivity analysis, scenario comparisons, stress test degradation, and failure correlations to reveal performance variations under different conditions.

Checkpoint-Level Reports show pass rates per checkpoint, highlight weak spots, and track latency compliance with percentile distributions.

Behavioral Analysis Reports examine interruptions, silence, unexpected transfers, and persona-specific issues.

Call-Level Reports detail individual calls with recordings, transcripts, latency markers, call records, and scenario audits, including silence-trigger events and classification of responses.

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Checkpoint Compliance Detailed

Identify Incorrect DOB

12/09/2025 - 15/09/2025

Calls Handled	Calls Verified	Overall Latency Failure	Overall Verify Failure
200	195	7%	12%

BREAKDOWN

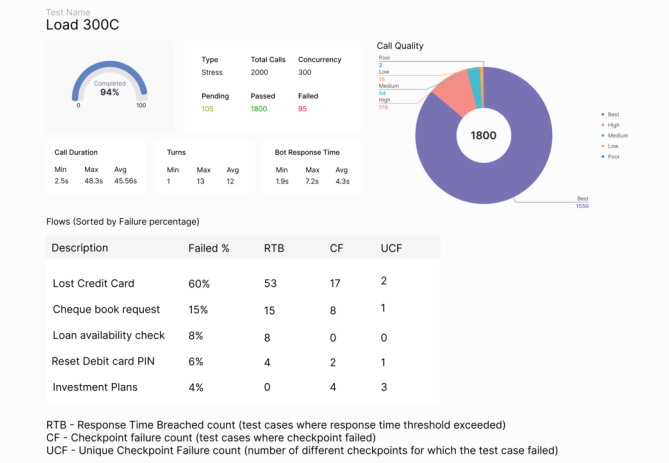
Latency Compliance

Response time

	Checkpoint name	SLA	SLA Breach	Min	Mean	Max
1	Greeting	3s	1%	2.75s	3.1s	3.5s
2	Intent Identification	4s	1%	3.5s	4.1s	4.5s
3	Customer ID Validation	3s	0%	2.5s	2.75s	3s
4	Identify incorrect DOB	4s	2%	3.75s	4.1s	4.5s
5	Verify Correct DOB	4s	3%	3.5s	4.1s	4.5s
6	Replacement Card Offered	3s	0%	2.5s	2.75s	3s
7	Call Closure	4s	0%	3s	3.5s	4s

Checkpoint Compliance

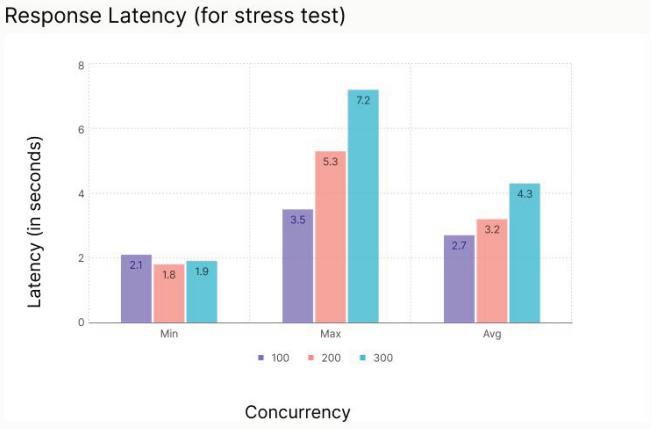
Checkpoint Name	Expected Behavior	Failure Rate
Greeting	Tester should start with a...	0%
Intent Identification	Block your credit card since...	0%
Customer ID Validation	Share customer ID 57961005...	0%
Identify incorrect DOB	Should say DOB as 1990-08-13...	10%
Verify Correct DOB	Enter the DOB as 1985-07-08...	2%
Replacement Card Offered	Offer replacement card...	0%
Call Closure	End the call with a proper greeting..	0%



Flows (Sorted by Failure percentage)

Description	Failed %	RTB	CF	UCF
Lost Credit Card	60%	53	17	2
Cheque book request	15%	15	8	1
Loan availability check	8%	8	0	0
Reset Debit card PIN	6%	4	2	1
Investment Plans	4%	0	4	3

RTB - Response Time Breached count (test cases where response time threshold exceeded)
CF - Checkpoint failure count (test cases where checkpoint failed)
UCF - Unique Checkpoint Failure count (number of different checkpoints for which the test case failed)



Conclusion

BotProbe brings structure, depth, and precision to the complex task of testing conversational AI voicebots and IVRs. By combining realistic call simulation, flexible connectivity, powerful orchestration, and advanced reporting, it ensures enterprises can continuously validate performance, even as systems evolve and scale. With its ability to measure both conversational accuracy and technical quality under real-world conditions, BotProbe helps teams deliver voice experiences that are consistent, reliable, and customer-ready. Ultimately, it empowers enterprises to innovate with confidence, knowing that every update, feature, and deployment is backed by thorough and automated testing.

About Us

Epicode is a telephony middleware products company established in the year 2020. We work with ISV's to develop real-time voice applications in the AI driven customer experience domain. Our business model is tailored to the below mentioned attributes.

- Develop API based backend software products with a primary focus on system engineering.
- Expertise in developing real time voice applications with distributed architecture.
- The "Go to Market Strategy" would be "OEM partnerships" with a B2B approach, selling only to systems integrators, technology partners, and business application developers.
- Adopt proven and field-tested best-of-breed open source platforms as part of our product stack.

As a consciously chosen design strategy, our OEM products are designed based on the partner's business requirements or use cases. The Epicode solution architects make sure that the products are optimised for specific deployment environments as prescribed by our business application partners, be it on-premise or pure cloud environments like AWS, Google or Azure cloud.

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