

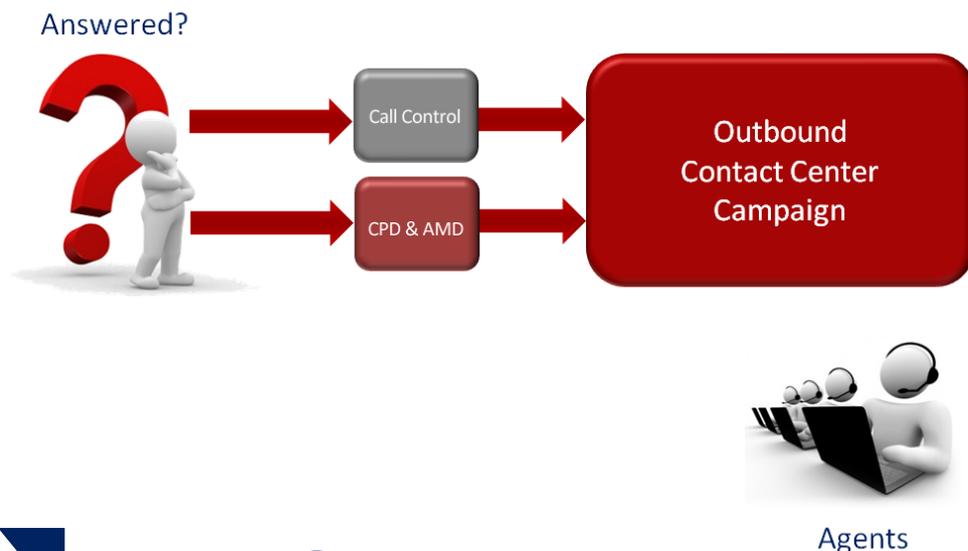
## Enhance Your Outbound Voice Campaign Success Rates with AudioCodes' Call Progress Detectors and Answering Machine Detectors

### Introduction

Outbound and blended campaigns enable enterprises to proactively reach their customers and prospects. For many, this plays a valuable role in ensuring a superior service outcome for customers and ensures efficient and effective use of agent resources.

CPD (Call Progress Detection also known as CPA - Call Progress Analysis) and AMD ( Answering Machine Detection) are a sophisticated set of algorithms embedded in contact center software and gateway hardware that help provide context in identifying and classifying outbound calls. CPD automatically detects pre-connect events such as no-answers, busy signals and disconnects while AMD detects post-connect events (i.e. who or what answers the call) in order for the contact center to decide where the call is directed – whether it's back to a live agent (AMD detects a human answer), an automated message (AMD detects an answering machine), or back in the queue to retry later (CPD detects a busy line).

CPD and AMD are critical components of predictive dialing because they cover all the bases for the outcome following an outbound call– whether it's answered by a human, goes to voicemail, or gets a busy signal. CPD allows the dialer to recognize when a call is not answered by a live person, thereby contributing to the productivity of the outbound function by screening the calls that do not need to go to a live agent. The more precise the CPD function is, the more productive the call center will be.



## **Step 1 – Dialing**

The first step in an automated outbound dialing call setup process involves proactively contacting customers, account holders and/or prospects. An outbound dialer is typically a server that has been preconfigured to place calls automatically, under the control of a software application, to a list of customers or prospects, as per campaign scripts. When calling consumers at home it is typical for only one in five calls to be answered by a live call recipient. Dialers solve this problem by using mathematical modeling or virtual simulation to determine the appropriate number of calls to make at any one time in order to maximize agent productivity. This relieves agents of the dialing function and provides them with a steady flow of live contacts only.

## **Step 2 – Call Progress Detection**

The next step is performing CPD and AMD, which takes place as the outbound call is being established (pre-connect) and answered (post-connect). The idea is for the connection dialer to guarantee contacts by screening or filtering no-answers, busy signals and disconnects to present only live speakers to agents.

Essentially, CPA employs a number of media processing algorithms – detection functions are provided by AudioCodes' DSP boards that are part of AudioCodes gateways. DSPs listen on the line and determine what is happening and who or what answers the call. The software is designed to distinguish between busy signals and other network conditions in addition to answering machines and live speakers.

AudioCodes' DSP modules will detect the frequency, noise level and energy of the audio signal in order to distinguish whether the call is answered by a person or if a voicemail greeting is being presented on the line. Additional media processing functions are used to detect information from the telephone network – DTMF and call progress tones, such as ringing, busy/engaged, voicemail, special information tones (SIT or 'triple tones') and fax tones.

## **Step 3 – Call Management**

The final step involves managing the call, depending on the results of the CPD. For example, if a call is answered by a person, it needs to be transferred to an available agent.

Note that in some countries strict rules about the nature of any automated message playback or automated calling are enforced by the appropriate regulatory authorities.

If CPD determines that the call was answered by voicemail, a pre-recorded or text-to-speech (TTS) synthesized message can be played. Such messages can be utilized to inform the customer about the nature of the call or to provide the customer with a number to call back, which might be considered good

## AudioCodes' Differentiators

### Beep Detection

By detecting the exact end of the answering machine message (i.e. the beep), the automated outbound messaging system can insert the voice message at the right time and then end the call. The ability to automatically leave messages on answering machines is a frequently requested feature as most outbound calling campaigns can benefit from this advanced feature. Automated messaging reduces the number of callbacks to a client, reduces long distance costs, and saves valuable agent time.

### Customize Call Progress Tones

The ability to reliably detect Call Progress Tones is critical to the accuracy and the efficiency of the outbound voice campaign. In order to increase the accuracy as well as to allow for simple regional customization, AudioCodes introduced the concept of tones file. As opposed to most other solutions, Call Progress Tones are not hardcoded into the firmware but rather uploaded into the device as a file.

### Multi-language/country Answering Machine Detection (AMD)

To further improve the AMD accuracy, AudioCodes introduced a new enhancement that provides support for multi-language/country Answering Machine Detection (AMD). This is achieved by the new Multi-AMD Sensitivity table. The table provides up to 4 different AMD Sensitivity suites (selected by the new AMDSensitivityParameterSuit parameter), where each suite comprises up to 16 different sensitivity permutations (selected by the new AMDSensitivityLevel parameter).

### Per Call Answering Machine Detection

Support of hosted outbound services often requires the ability to configure different sensitivity and customization levels to different users (e.g. tenants). AudioCodes is now able to support the configuration of AMD support levels on a per call basis based on the called number or Trunk Group.

### Call Progress Detection Options and Configuration

Answering Machine Detection can be activated and de-activated only after a channel is already open. For specific configuration parameters, please refer to our OAM guide or specific User Manual.

The screenshot displays the 'IPMedia Settings' configuration page. The left sidebar shows a tree view with 'IPMedia Settings' selected. The main content area lists the following parameters:

Parameter	Value
IPMedia Detectors	Enable
Enable Answer Detector	Enable
Answer Detector Activity Delay	10
Answer Detector Silence Time	30
Answer Detector Redirection	0
Answer Detector Sensitivity	3
Answer Machine Detector Sensitivity	3
Enable AGC	Enable
AGC Slope	3
AGC Redirection	0
AGC Target Energy	19
Enable Energy Detector	Disable
Energy Detector Quality Factor	4
Energy Detector Threshold	3
Enable Pattern Detector	Disable
Active Speakers Min Interval	20

## CPD Accuracy

A common question about call progress and answering machine detection is regarding its accuracy. The examples below provides a snapshot of actual data taken from a live production site employing AudioCodes Mediant-based AMD version 5.8 and a select set of configuration settings as listed below:

### Test Case #1:

- Test period: August 15th, 2009 from 20:00 to 23:00 Local time
- AudioCodes Gateway Configuration: AMDTIMEOUT=20000; AnswerDetectorSensitivity=2 ; AMDDETECTION SENSITIVITY=3; AMDDDecisionParam5 = 1600
- Call Origination: India
- Calling Destination: Various households in the USA
- Total Outbound Calls: 450 calls

### Test Results:

- Answered: 77.1%
- Answering Machine Detected: 19.3%
- Answering Machine Leakage\*\*: 2% (Significantly lower than the mandated 3% requirement by Ofcom regulation)
- Nothing On-the-Line: 1.5%

### Test Case #2:

- Test period: August 15th, 2009 from 23:00 to 03:00 Local time
- AudioCodes Gateway Configuration: AMDTIMEOUT=20000; AnswerDetectorSensitivity=2 ; AMDDETECTION SENSITIVITY=3; AMDDDecisionParam5 = 600
- Call Origination: India
- Calling Destination: Various households in the USA
- Total Outbound Calls: 1121 calls

### Test Results:

- Answered: 59.3%
- Answering Machine Detected: 38.1%
- Answering Machine Leakage\*\*: 1.3% (Significantly lower than the mandated 3% requirement by Ofcom regulation)
- Nothing On-the-Line: 1.25%

\* Note that percentages may not total to 100% due to rounding.

\*\* In rare cases, the system may mistake an answering machine for a live call and deliver it to an agent - this is called Answering Machine Leakage (AML).

## FCC and International Compliance

Consumers have spoken loud and clear: Call abandonment (dead air) is a nuisance that will not be tolerated. When used generically, a dialer can reach far more contacts than can actually be connected to available agents. The resulting abandoned calls, or dead air that customers experience when they answer their telephones, has many countries correcting this issue by imposing stiff penalties for exceeding specified limits. Several years ago, the U.S. Federal Trade Commission responded with regulations limiting the number of abandoned calls. In the following year the U.K. Office of Communications (“Ofcom”) enacted similar rules against silent calls, and other countries are following suit. This means businesses are under pressure from two opposite directions: On one hand they must have an outbound communications strategy in place that enables them to reach more live customers, and on the other hand, they are being forced to meet more and more stringent regulations.

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1. Double the number of AMD and voice sensitivity adjustment levels from eight (8) to sixteen (16) levels.
2. Improved algorithms for sub second call resolution for call transfers using ISDN ECT, RLT or TBCT Call Transfers between B-Channels of Different Trunks for IP-to-Tel Calls, and TBCT ISDN Transfer for 5ESS ISDN Variant.
3. Special Information Tone (SIT) detection logs for analytics to provide the outcome of every outbound call.
4. SIP “beep” detection. A legacy requirement that has been brought forward to our SIP call control protocol based upon a new market demand to detect an answering machine beep and enable leaving a message on the customer’s voice mail or answering machine.

## Technology Ownership

The technology used in the call progress and answering machine detection algorithms comes from the world-class AudioCodes research and development team, ensuring an organic ability to provide continued enhancements.

## DSP Architecture Advantages

AudioCodes call progress and answering machine technology is embedded within media gateways and media servers and is implemented on highly-efficient AudioCodes’ digital signal processors (DSP) – the same technology used to make mobile smart phones smaller, cheaper and use less power for longer battery life. DSPs are far more efficient at executing the signal processing tasks required to detect tones, eliminate echo, provide encryption, reduce noise or compress speech.

## Intelligent Gateways Save Money

By hosting the call progress, AMD and other tone detection algorithms in the AudioCodes DSP-powered media gateways, Outbound Campaign systems can often eliminate some or all HMP-based media servers improving operational efficiency and overall reducing TCO.

## Conclusions

AudioCodes media gateways with Outbound Campaign Server enable customer care applications to efficiently and accurately perform outbound calls, identifying live answers, answering machines and other call completion conditions without the expense of additional servers, software or specialized PCI boards.

## Reference

An excellent example of Genesys and AudioCodes working together can be found in the Adepra case study

## About AudioCodes

AudioCodes Ltd. (NasdaqGS: AUDC) designs, develops and sells advanced Voice over IP (VoIP) and converged VoIP and Data networking products and applications to Service Providers and Enterprises. AudioCodes is a VoIP technology market leader focused on converged VoIP & data communications and its products are deployed globally in Broadband, Mobile, Cable, and Enterprise networks. The company provides a range of innovative, cost-effective products including Media Gateways, Multi-Service Business Gateways, Session Border Controllers (SBC), Residential Gateways, IP Phones, Media Servers and Value Added Applications. AudioCodes' underlying technology, VolPerfectHD™, relies on AudioCodes' leadership in DSP, voice coding and voice processing technologies. AudioCodes High Definition (HD) VoIP technologies and products provide enhanced intelligibility and a better end user communication experience in Voice communications.

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