



WombatDialer: Effective answering-machine detection (AMD)

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In this tutorial we want to run a simple outbound campaign, in which we plan to play a file and wait for the receiver's acknowledgement by pressing 1. We also want to make sure that in case the receiver has an Answering Machine, we play a specific audio message that will be recorded by the machine.

```
-- AMD: Channel [Local/200@wdtrunk-00000000;1]. Changed state to STATE_IN_SILENCE
-- AMD: Channel [Local/201@wdtrunk-00000001;1]. ANSWERING MACHINE: silenceDuration:2500 initialSilence:2500
-- Executing [1@amddetect:4] NoOp("Local/201@wdtrunk-00000001;1", "AMD: MACHINE - INITIALSILENCE-2500-2500") in new stack
-- Executing [1@amddetect:5] GotoIf("Local/201@wdtrunk-00000001;1", "1?machine") in new stack
-- Goto (amddetect,1,14)
-- Executing [1@amddetect:14] UserEvent("Local/201@wdtrunk-00000001;1", "CALLSTATUS,Uniqueid:1466512087.2,V:AMD") in new stack
-- Executing [1@amddetect:15] WaitForSilence("Local/201@wdtrunk-00000001;1", "2500") in new stack
-- Waiting 1 time(s) for 2500 ms silence with 0 timeout
```

Setting up AMD

The first thing we need is to set up the Answering Machine Detector in Asterisk; this can be done using the embedded application AMD or a number of external tools. In this tutorial we cover the embedded AMD application.

The first thing we do is to configure the file *amd.conf* so that it resembles the following:

```
initial_silence           =                2500
greeting                  =                1500
after_greeting_silence   =                300
total_analysis_time      =                5000
min_word_length          =                120
between_words_silence    =                50
maximum_number_of_words  =                4
silence_threshold        =                384
```

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```

; Answering Machine Detection Configuration
;
[general]
total_analysis_time = 5000      ; Maximum time allowed for the algorithm to decide
                                ; on whether the audio represents a HUMAN, or a MACHINE
silence_threshold = 384        ; If the average level of noise in a sample does not reach
                                ; this value, from a scale of 0 to 32767, then we will consider
                                ; it to be silence.

; Greeting ;
initial_silence = 2500         ; Maximum silence duration before the greeting.
                                ; If exceeded, then the result is detection as a MACHINE.
after_greeting_silence = 300  ; Silence after detecting a greeting.
                                ; If exceeded, then the result is detection as a HUMAN
greeting = 1500               ; Maximum length of a greeting. If exceeded, then the
                                ; result is detection as a MACHINE.

; word detection ;
min_word_length = 120         ; Minimum duration of Voice to considered as a word
maximum_word_length = 5000    ; Maximum duration of a single Voice utterance allowed.
between_words_silence = 50    ; Minimum duration of silence after a word to consider
                                ; the audio what follows as a new word

maximum_number_of_words = 4   ; Maximum number of words in the greeting
                                ; If REACHED, then the result is detection as a MACHINE
                                ; WARNING: Releases prior to January 1 2016 documented
                                ; maximum_number_of_words as 'if exceeded, then MACHINE',
                                ; which did not reflect the true functionality. In Asterisk 14,
                                ; this functionality will change to reflect the variables' name.

```

These are the default parameters used to detect a machine and they may need some tweaking for your local market and spoken language.

Configuring the extension

We then need to create a special dialplan extension:

```

[amddetect]
exten => 1,n,Answer
exten => 1,n,Background(beep)
exten => 1,n,AMD(${AMD_EXTRA})
exten => 1,n,NoOp("AMD: ${AMDSTATUS} - ${AMDCAUSE}")
exten => 1,n,GotoIf("${AMDSTATUS}" = "MACHINE")?machine)
exten => 1,n,Set(TIMEOUT(response)=5)
exten => 1,n,Playback(/var/lib/asterisk/sounds/custom/${HUMANMSG})
exten => 1,n,Read(ack,,1)
exten => 1,n,GotoIf("${ack}" = "1")?confirmed)
exten => 1,n,Hangup
exten => 1,n(confirmed),UserEvent(CALLSTATUS,Uniqueid:${UNIQUEID},V:OK)
exten => 1,n,Wait(1)
exten => 1,n,Hangup
exten => 1,n(machine),UserEvent(CALLSTATUS,Uniqueid:${UNIQUEID},V:AMD)
exten => 1,n,WaitForSilence(2500)
exten => 1,n,Playback(/var/lib/asterisk/sounds/custom/${MACHINMSG})
exten => 1,n,UserEvent(CALLSTATUS,Uniqueid:${UNIQUEID},V:AMDALL)

```

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```
exten => 1,n,Wait(1)
exten => 1,n,Hangup
```

```
exten => _X.,n,Answer()
exten => _X.,n,Playback(vm-from)
exten => _X.,n,SayDigits(${CALLERID(ani)})
exten => _X.,n,Wait(1.25)
exten => _X.,n,SayDigits(${CALLERID(ani)}) ; playback again in case of missed digit
exten => _X.,n,Return()

;
; For more information on applications, just type "core show applications" at your
; friendly Asterisk CLI prompt.
;
; "core show application <command>" will show details of how you
; use that particular application in this file, the dial plan.
; "core show functions" will list all dialplan functions
; "core show function <COMMAND>" will show you more information about
; one function. Remember that function names are UPPER CASE.

[amddetect]
exten => 1,n,Answer
exten => 1,n,Background(beep)Effective answering-machine detection
exten => 1,n,AMD(${AMD_EXTRA})
exten => 1,n,NoOp("AMD: ${AMDSTATUS} - ${AMDCAUSE}")
exten => 1,n,GotoIf("${AMDSTATUS}" = "MACHINE"?machine)
exten => 1,n,Set(TIMEOUT(response)=5)
exten => 1,n,Playback(/var/lib/asterisk/sounds/custom/${HUMANMSG})
exten => 1,n,Read(ack,,1)
exten => 1,n,GotoIf("${ack}" = "1"?confirmed)
exten => 1,n,Hangup
exten => 1,n(confirmed),UserEvent(CALLSTATUS,Uniqueid:${UNIQUEID},V:OK)
exten => 1,n,Wait(1)
exten => 1,n,Hangup
exten => 1,n(machine),UserEvent(CALLSTATUS,Uniqueid:${UNIQUEID},V:AMD)
exten => 1,n,WaitForSilence(2500)
exten => 1,n,Playback(/var/lib/asterisk/sounds/custom/${MACHINEMSG})
exten => 1,n,UserEvent(CALLSTATUS,Uniqueid:${UNIQUEID},V:AMDALL)
exten => 1,n,Wait(1)
exten => 1,n,Hangup
```

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Setting up the End-Point

This extension will be considered an end-point of type PHONE that points to [1@amddetect](tel:1@amddetect).

Edit end-point

On server: Asterisk 11 .24 ▼

EP Type: Phone ▼

Description: amddetect

Max Channels: 10

Located at [extension]: 1

Located at [context]: amddetect

Security key:

Queue Parameters

Queue name:

Boost Factor: 1

Max waiting calls: 2

Reverse dialing:

Manual preview:

Find:

Replace:

     

How does it work?

When we answer the call, we play a short beep to make sure that the channel is up, and then we start AMD detection. The call will be blocked until AMD detection is complete; so there is a definite tradeoff between quick and accurate detection.

To make things easier during testing, we print the result of the detection and its cause on the Asterisk console. On the campaign itself, we define two campaign variables that will hold the names of audio files to be played back in either case:

- **HUMANMSG:** is the audio file to be played back to humans
 - **MACHINMSG:** is the audio file to be played to answering machines
- Though this is not strictly needed, you can tweak the parameters of the AMD detector by editing the Extra AMD settings on the campaigns; these are passed as parameters to the AMD detector; if blank, defaults are used.

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The final status for answered calls will be:

- **TERMINATED:**
a call that went to a human that did not acknowledge it
 - **TERMINATED/OK:**
a call that went to a human that acknowledged it
 - **TERMINATED/AMD:**
a call that went to AMD but was hung up before the message was played completely
 - **TERMINATED/AMDALL:**
a call that went to AMD and the message was played completely.
- You can use these call statuses to decide how to reschedule those calls, and to create new lists or blacklist some specific numbers.

Fax detection works in a very similar way, but it kicks in automatically when enabled on a channel.

Statistics for selected calls		Calls per trunk				Call outcomes			
Number of calls:	2	Asterisk 11 .24 Tk 11 .24				TERMINATED AMDALL			
Total talk length:	0:12	N.	%	Avg.W	Avg.T	N.	%	Avg.W	Avg.T
Total wait pre:	0:00	2	100%	0:01	0:06	2	100%	0:01	0:06
Total wait after:	0:03								
Total used time:	0:15								

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