MiaRec

Data Redaction-User-Guide

MiaRec, Inc.

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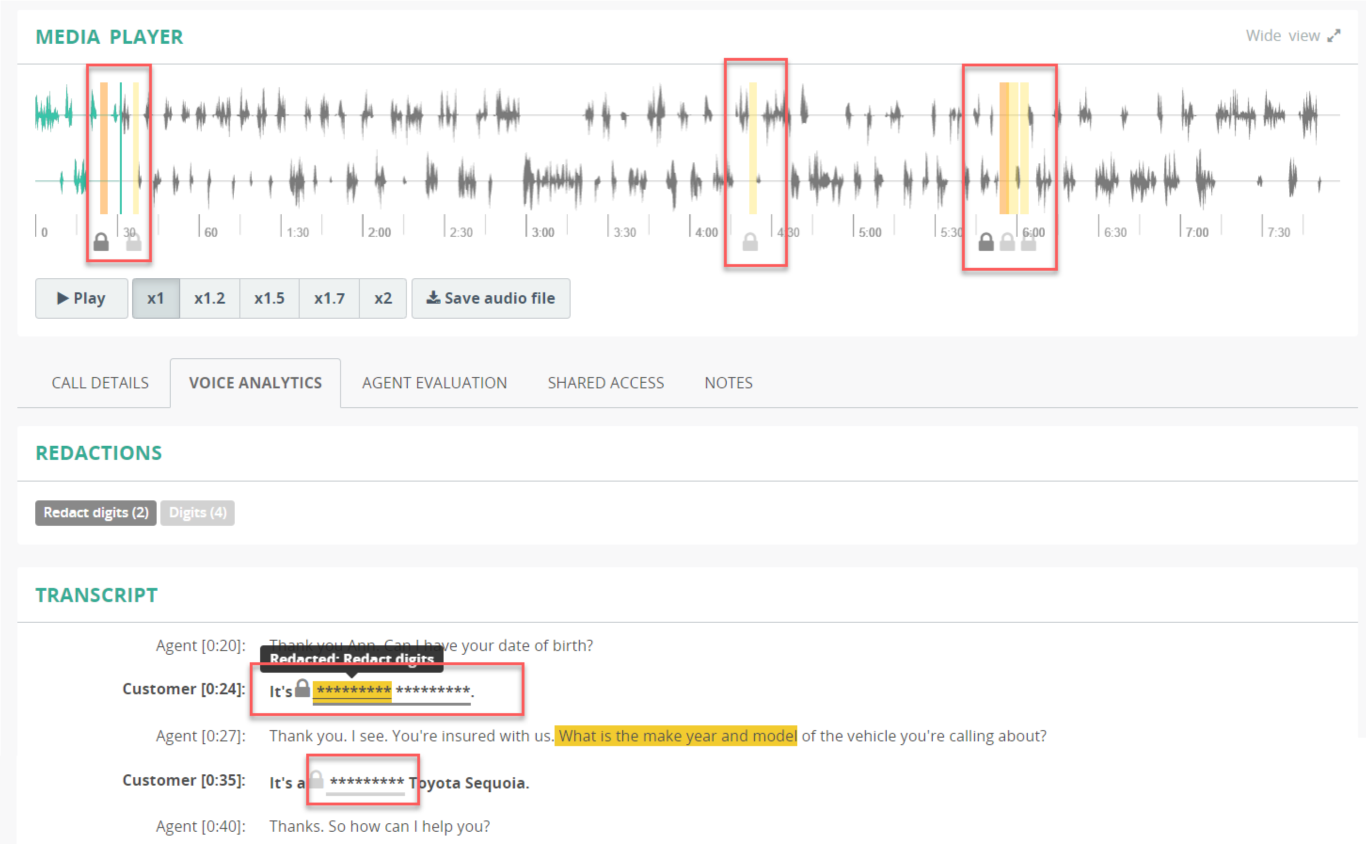
1. About Data Redaction

Redaction is used to remove sensitive content from the transctipts and audio recordings. For example, you can use data redaction to eliminate or mask sensitive personal information such as credit card numbers, phone numbers, or dates of birth from call recordings.

MiaRec data redaction engine relies upon the use of redaction rules to locate text in transcripts to redact (see MQL Reference Guide). Data is redacted from both transcripts and the associated audio files.

> ⚠ **Important**
>
> The redaction feature is designed to identify and remove sensitive data. However, due to the predictive nature of machine learning (i.e. transcription) and the variability of human language, MiaRec Data Redaction may not identify and remove all instances of sensitive data in your transcripts and recordings.
>
> Since both false positive and false negative errors can occur, it is important to understand how both types of errors might affect your overall system. False negatives could lead to personal information leakage. False positives could lead to non-sensitive data being recognized as sensitive and thus redacted.
>
> We strongly recommend that you review any redacted output to ensure it meets your needs.



Agent [0:20]: Thank you Ann. Can I have your date of birth?

Customer [0:24]: It's ********** **********.

Agent [0:27]: Thank you. I see. You're insured with us. What is the make year and model of the vehicle you're calling about?

Customer [0:35]: It's a ********** Toyota Sequoia.

Agent [0:40]: Thanks. So how can I help you?

1.1 How to Apply Data Redaction: Best Practices

- Create a set of redaction rules and test them on a few individual recordings.
- Use advanced search criteria (on the **Recordings** > **Advanced Search** page), and find recordings in your platform that represent good candidates for redaction, for example, if you target calls with credit card number information, then search

by words "credit card" or even just words "card" or "number". Tag those recordings as a testing dataset with a custom tag, for example, "test-redaction".

- Run a job in a test mode (highlight only) on the recordings that were selected for testing.
- Review the highlighted results and fine-tune the redaction rules as necessary.
- Once the results are satisfactory, configure a job to run periodically in production mode.
- Periodically, do a manual spot check if the redaction rules are still applicable to a new vocabulary that agents may use in conversations.

2. Configure Data Redaction

2.1 Add New Rule

To create a new rule, navigate to **Administration > Speech Analytics > Data Redaction** page, click the **Add** button to create a new rule or the **Edit** button to modify the existing rule.

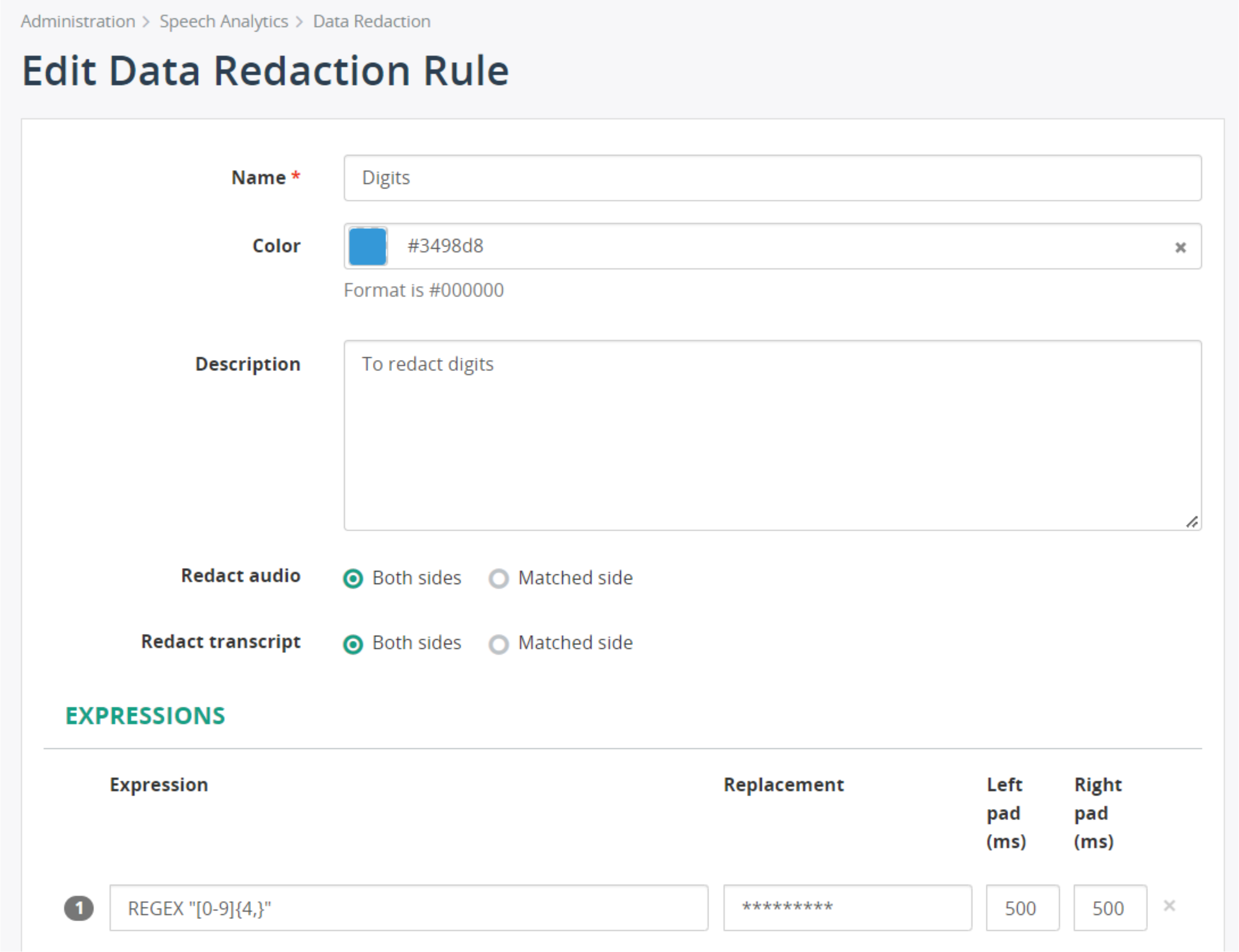
On the Edit Data Redaction Rule page, you can configure:

- Name of the rule
- Color, which helps to visually distinguish different rules in the redaction results, when multiple rules apply to the same recording
- Optional description
- The option to redact the transcript/audio of the matched side or both sides (see **Note 1**)
- One or multiple expressions to match sensitive data

> **Note 1. Redact both sides vs the matched side only**
>
> MiaRec application by default records audio in two-channel format (stereo), where each side of a conversation is stored in a separate audio channel (left and right).
>
> In most cases, we recommend redacting data in both audio channels due to a potential echo effect in the audio signal. Echo is a common flaw in telephony when the spoken words on one side of a conversation are replayed back on another side with a slight delay and distortion.
>
> Let's look at a common case of redacting credit card numbers in recordings. A target for redaction would be a caller speaking consecutive digits after an agent spoke some trigger phrases like "What is your credit card number?" or "What is a three-digit security code?". Due to the echo effect, the spoken digits can be heard in both audio channels, possibly with slight distortion, for example, a clear "five" on one side and a distorted "fine" on another side. If a redaction is applied to one side only, sensitive data could be potentially recovered from the echoed signal.
>
> Another common case is when an agent repeats after the caller each spoken word as some form of confirmation.
>
> A redaction of both sides provides extra safety in removing sensitive data.

For each expression, you can configure the **Replacement** text that will substitute the original text in a transcript, for example, `******` or `[redacted]`, and left and right padding (see **Note 2**).

> **Note 2. Left and right padding**
>
> The padding setting specifies how much data will be redacted to the left and right side from the targeted data.
>
> We recommend redacting at least 500ms to the left and right from the detected sensitive data to compensate for the negative effects of echo and potential inaccuracy in transcription timestamps.
>
> Transcription timestamps can fluctuate for 200-300ms on average from the ground truth. Such small fluctuation is hardly noticeable by a human, but can expose a word or two in audio if not redacted properly.



Edit Data Redaction Rule

Name * Digits

Color #3498d8 ×

Format is #000000

Description To redact digits

Redact audio ● Both sides ○ Matched side

Redact transcript ● Both sides ○ Matched side

EXPRESSIONS

	Expression	Replacement	Left pad (ms)	Right pad (ms)
1	REGEX "[0-9]{4,}"	*********	500	500

2.1.1 Expression Examples

This chapter demonstrates a few common examples of using the expression syntax to redact sensitive data in call recordings. We will demonstrate the capabilities of the engine by gradually increasing the complexity of redaction rules.

Goal: redact a credit card number from call recordings.

To perform a redaction, we will use the MQL expression to search for sensitive data in a transcript.

Assuming a credit card number consists of 16 digits, we could specify a simple rule, like:

```
R"[0-9]{16}"
```

Such a rule will search for the digits 0 to 9 that appear in a text exactly 16 times, for example, like in the phrase **"My credit card number is 1234567890123456"**.

In reality, a credit card number could be pronounced by a speaker in many different ways:

1. each digit spoken individually, like in **"My credit card number is 1 2 3 4 5 6 7 ..."**
2. digits are spoken in groups, like in **"My credit card number is 1234 5678 ..."**
3. digits are separated by a dash or other punctuation symbol, like in **"My credit card number is 1234-5678-..."**
4. a speaker uses filler words like in **"My credit card number is 1234 um 5689 ..."**
5. the digits are not a credit card number at all, like in **"A tracking number is 123456789"**

To cover all those variations, we need a more sophisticated rule. Let's improve it.

Our next try will be the following rule:

```
R"[0-9][0-9\-\,. ]{2,}[0-9]"
```

This rule will search for a single digit 0 to 9 at the beginning of a text (defined by the first `[0-9]` expression), then, it expects to find two or more digits or punctuation symbols (defined by the middle `[0-9\-\,. ]{2,}` expression), and, finally, it expects to find a single digit in the end (defined by the last `[0-9]` expression).

Such an expression would allow us to match all of the above-mentioned variations of the credit card number, but it will match the tracking number phrase as well, which we don't want to redact.

To exclude the tracking number from a redaction, we can improve the expression further and add a trigger phrase to the search expression:

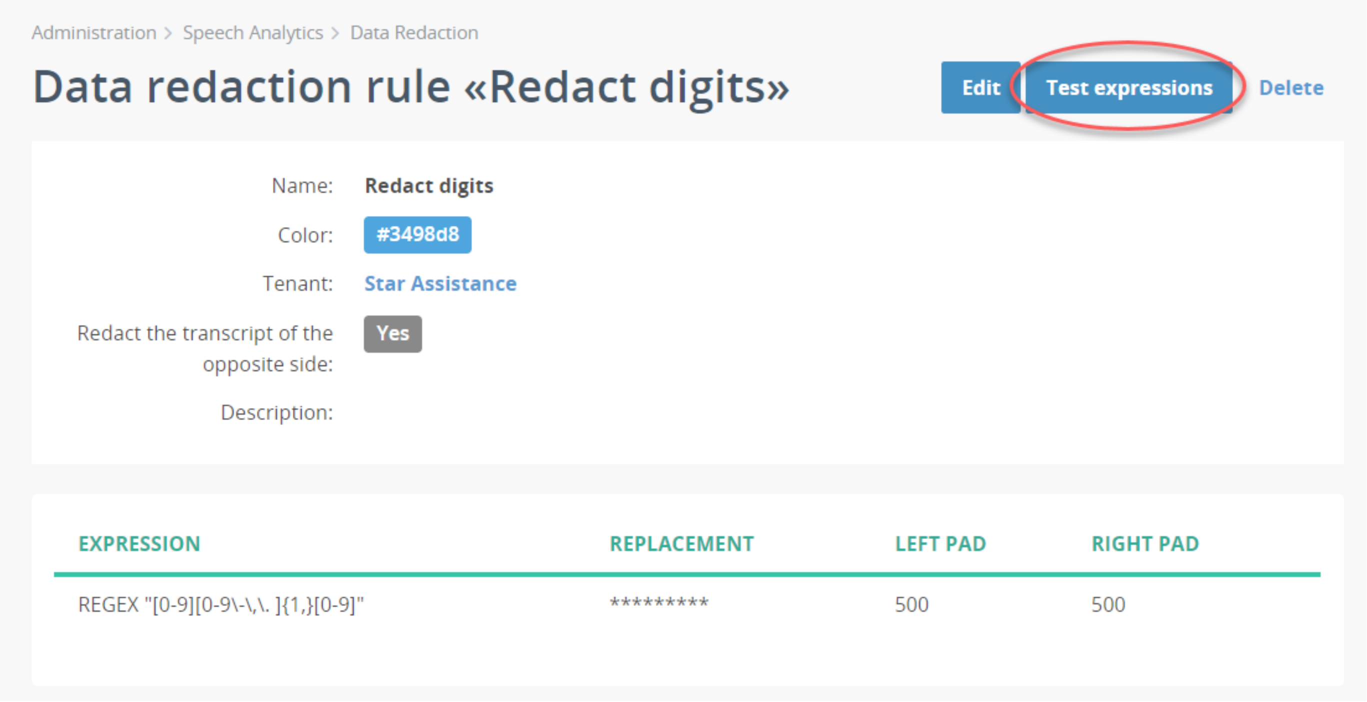
```
R"[0-9][0-9\-\,. ]{2,}[0-9]" AFTER:10 ("credit card" OR "card number")
```

In this new expression, we use the operator `AFTER:10`, which instructs the redaction engine to search only for the digits that are spoken after triggering phrases "credit card" or "card number". `10` in `AFTER:10` means a maximum allowed distance between a trigger phrase and the searched digits (a distance is specified in words).

With such an expression, we can redact the digits that are related to credit card numbers but ignore moments in conversations when digits are spoken in other contexts.

We recommend testing the expression rules on your real call recordings before enabling the rule in production.

To test the expression, click the **Test Expressions** button and follow the instructions in the Test Expressions section.



Data redaction rule «Redact digits»

Name: Redact digits

Color: #3498d8

Tenant: Star Assistance

Redact the transcript of the opposite side: Yes

Description:

EXPRESSION	REPLACEMENT	LEFT PAD	RIGHT PAD
REGEX "[0-9][0-9\-\,\.]{1,}[0-9]"	*********	500	500

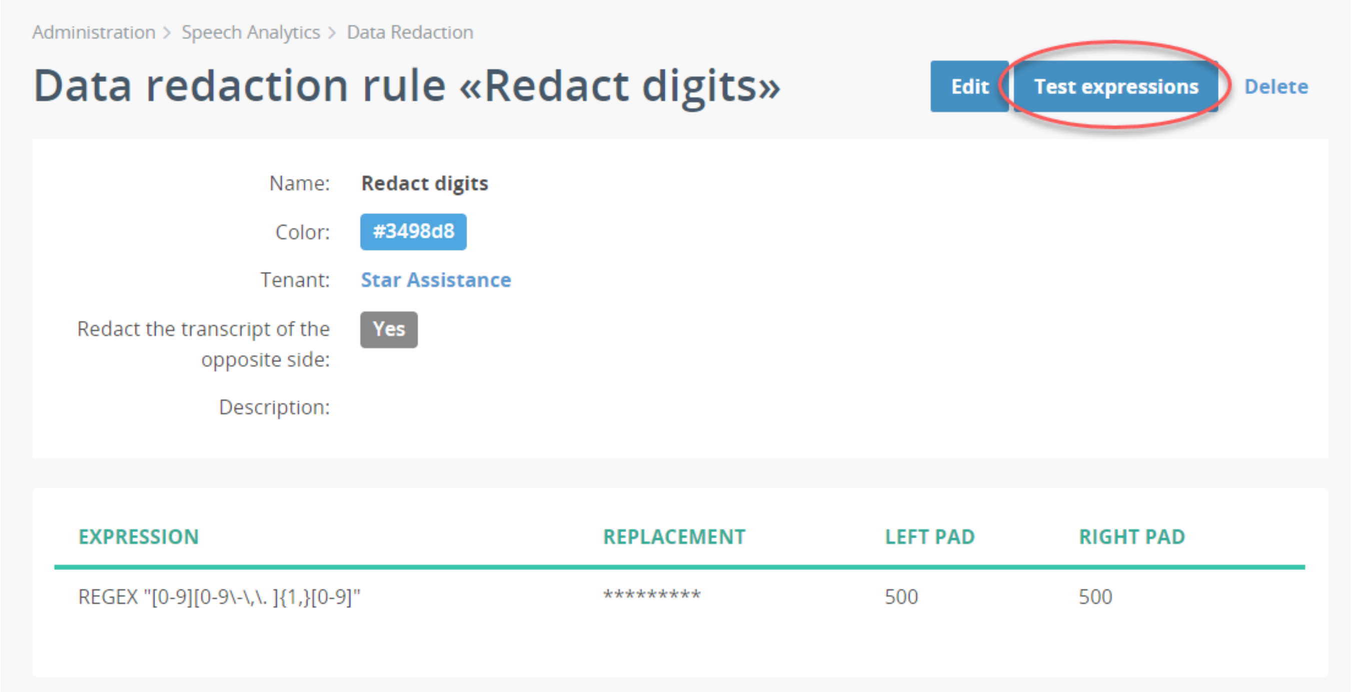
2.2 Test Expression

The Test Expression page allows you to test the expression rule on real call recordings without altering the original transcript and audio file.

2.2.1 Procedure

To test the expression rule:

1. On the **Data Redaction** page, navigate to the existing data redaction rule and click **Test Expressions**.



Administration > Speech Analytics > Data Redaction

Data redaction rule «Redact digits»

Name: Redact digits

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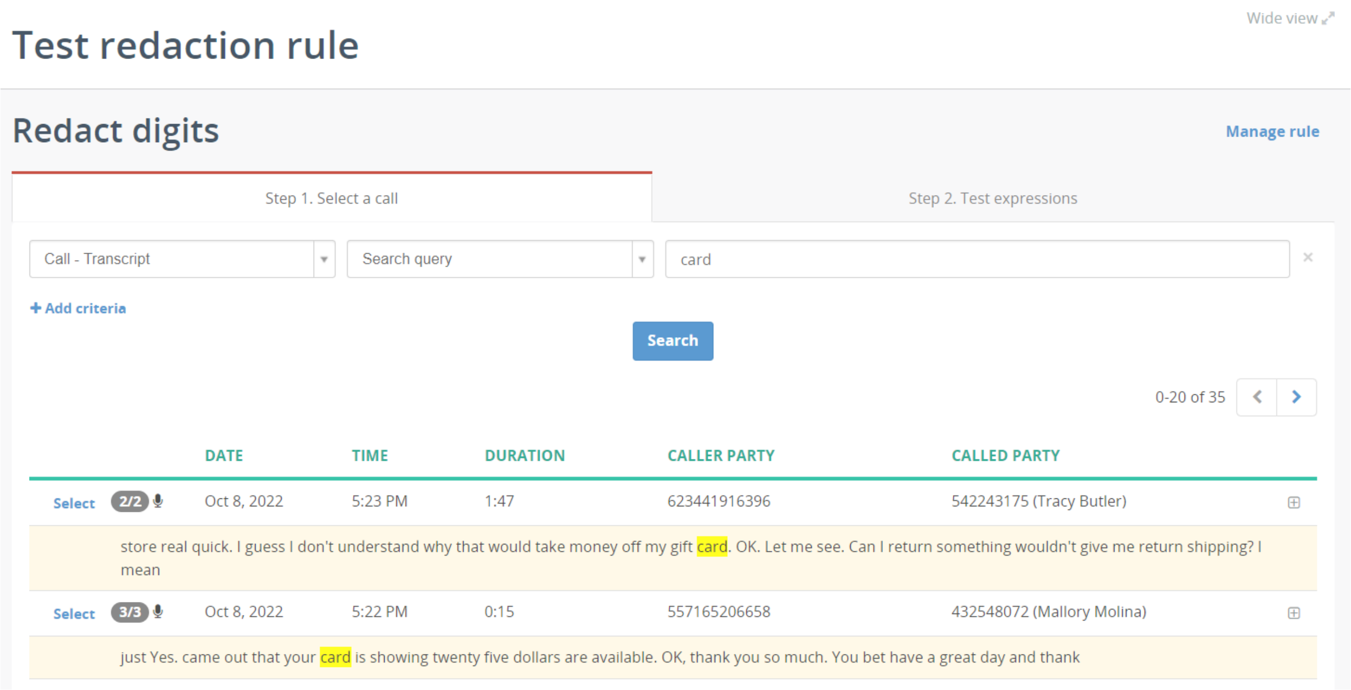
Tenant: Star Assistance

Redact the transcript of the opposite side: Yes

Description:

EXPRESSION	REPLACEMENT	LEFT PAD	RIGHT PAD
REGEX "[0-9][0-9\-\,\.]{1,}[0-9]"	*********	500	500

2. On the **Step 1** tab, select a call, on which you want to test your expression. You can apply filtering criteria to quickly find the target call recording.



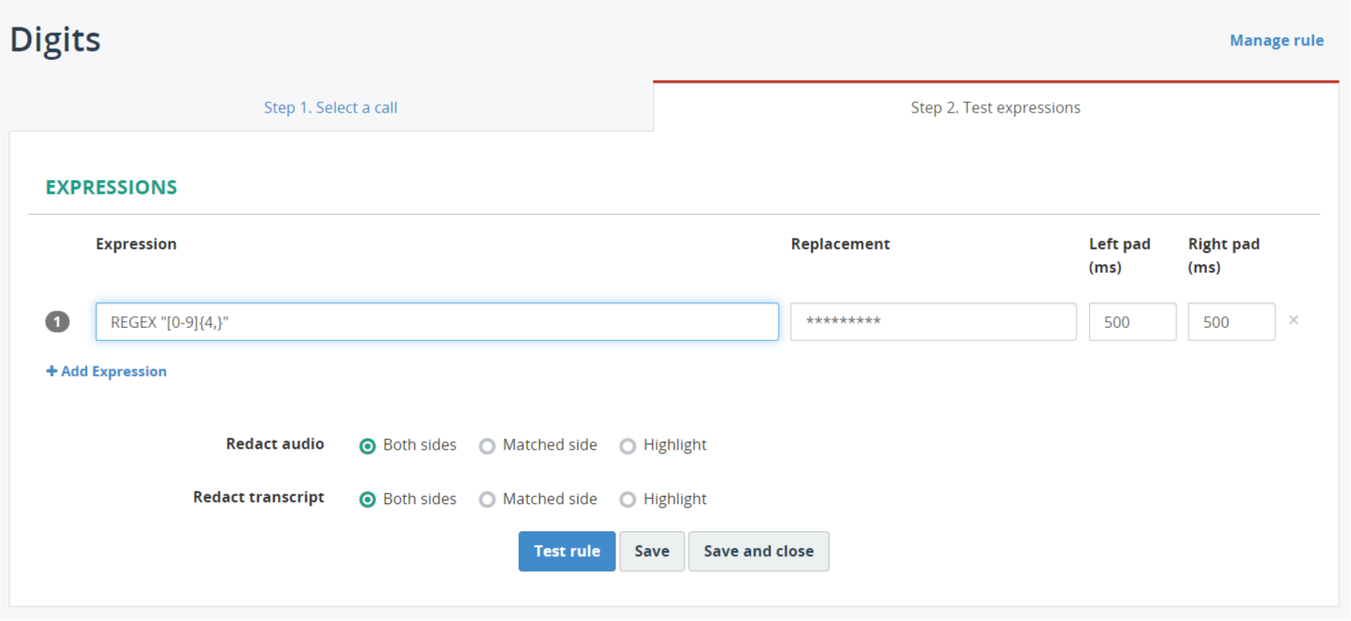
Test redaction rule

Redact digits

Call - Transcript | Search query | card

	DATE	TIME	DURATION	CALLER PARTY	CALLED PARTY
Select 2/2	Oct 8, 2022	5:23 PM	1:47	623441916396	542243175 (Tracy Butler)
	store real quick. I guess I don't understand why that would take money off my gift card. OK. Let me see. Can I return something wouldn't give me return shipping? I mean				
Select 3/3	Oct 8, 2022	5:22 PM	0:15	557165206658	432548072 (Mallory Molina)
	just Yes. came out that your card is showing twenty five dollars are available. OK, thank you so much. You bet have a great day and thank				

3. On the **Step 2** tab, apply the desired changes to the expression rules, if necessary and click **Test rule** to run a simulated data redaction process.



Digits

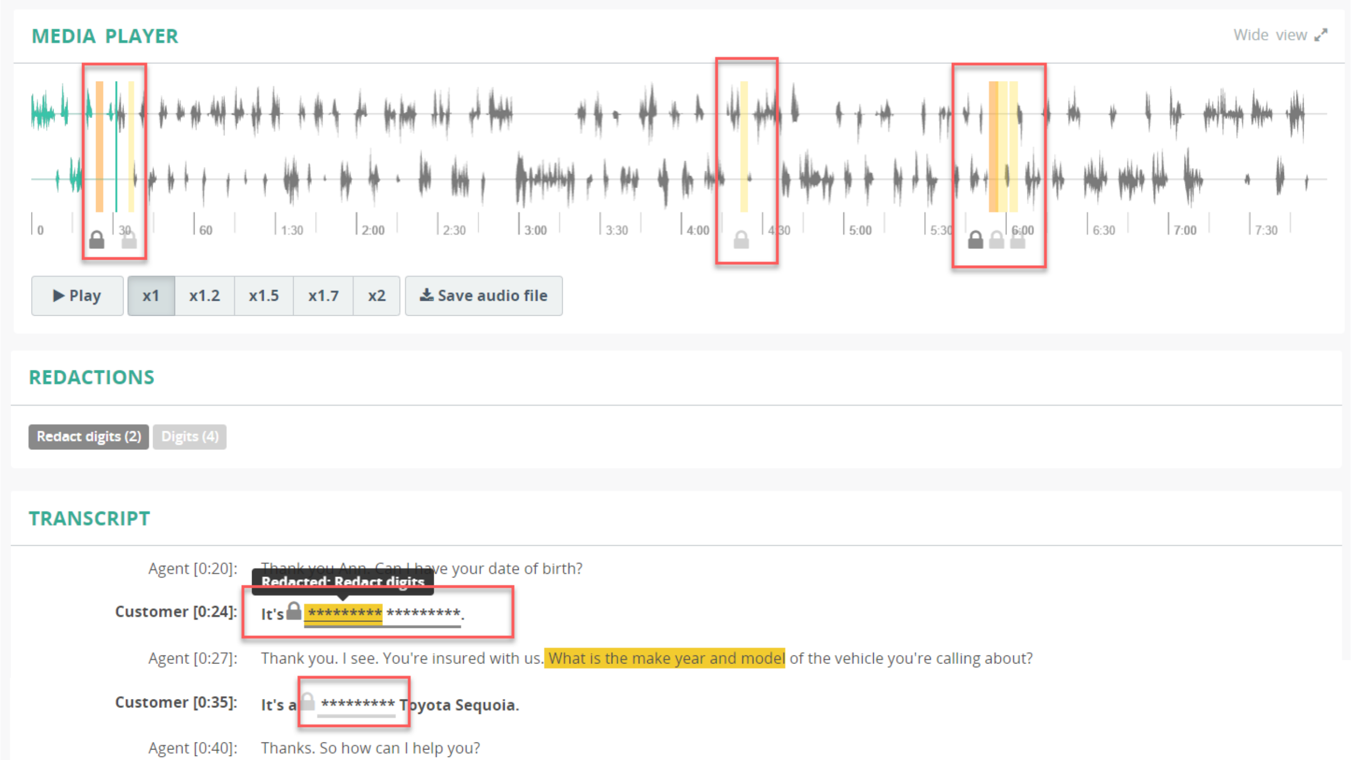
EXPRESSIONS

	Expression	Replacement	Left pad (ms)	Right pad (ms)
1	REGEX "[0-9]{4,}"	*********	500	500

Redact audio ● Both sides ○ Matched side ○ Highlight

Redact transcript ● Both sides ○ Matched side ○ Highlight

4. Review the results of the redaction for any mistakes and adjust the rule as necessary. Hover over the redacted text to see what rule was applied.



MEDIA PLAYER

REDACTIONS

TRANSCRIPT

Agent [0:20]: Thank you Ann. Can I have your date of birth?

Redacted: Redact digits

Customer [0:24]: It's ********* *********.

Agent [0:27]: Thank you. I see. You're insured with us. What is the make year and model of the vehicle you're calling about?

Customer [0:35]: It's a ********* Toyota Sequoia.

Agent [0:40]: Thanks. So how can I help you?

When you are satisfied with the results, click the **Save** or **Save and close** button to save the redaction rule, if it was edited.

We recommend testing rules on multiple call recordings to confirm that rule covers a variability of spoken language.

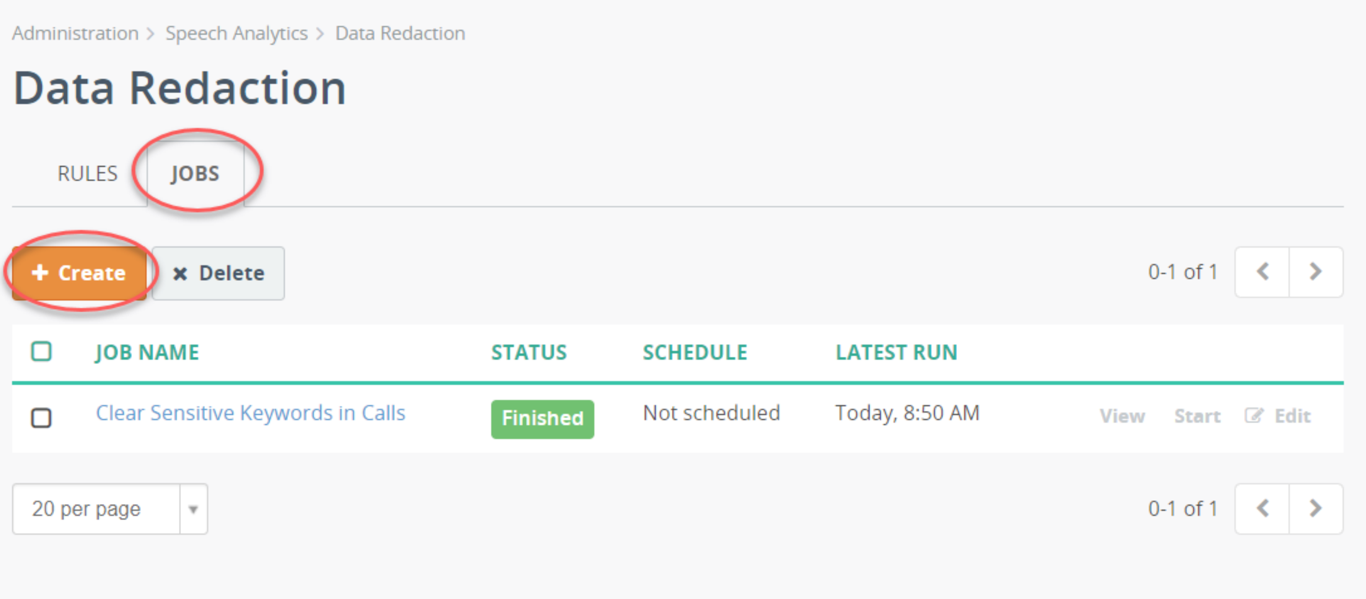
2.3 Run the Job

Prerequisites:

- Data redaction works on transcribed recordings only.

2.3.1 Create the job

Navigate to **Administration > Speech Analytics**, switch to the **JOBS** tab and click **Create** to create a new job.

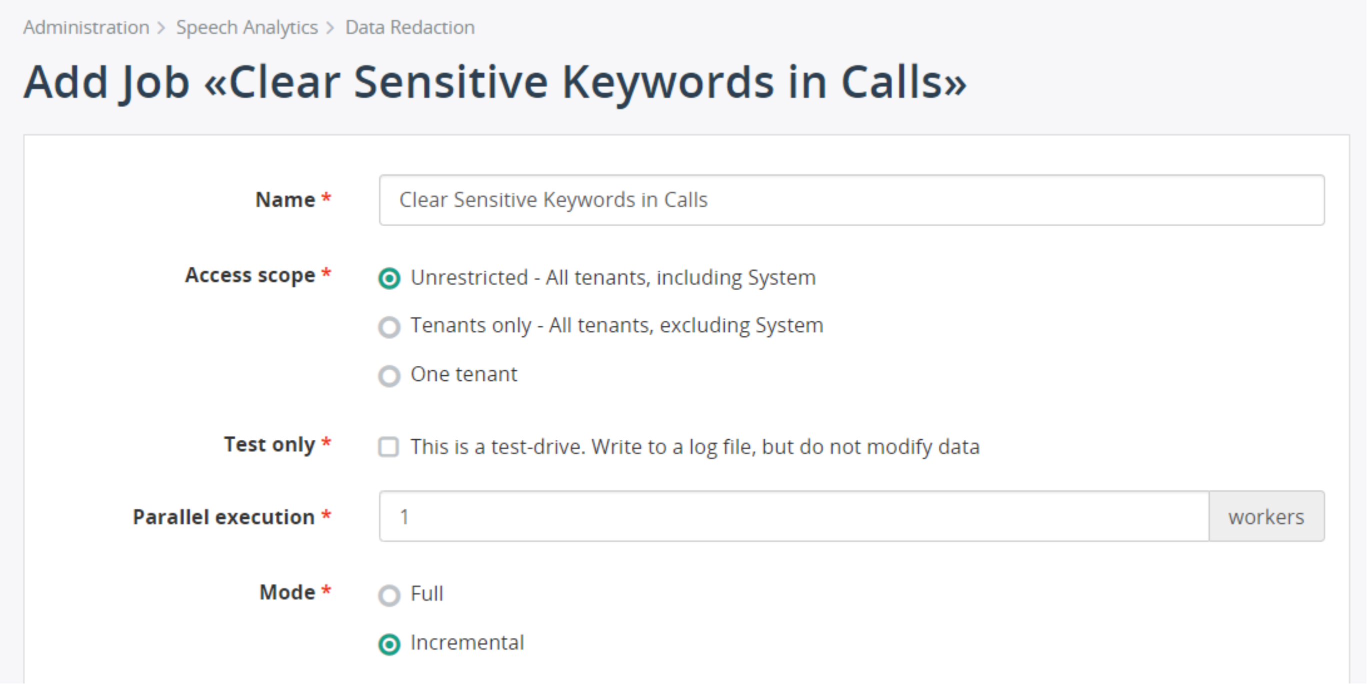


Administration > Speech Analytics > Data Redaction

Data Redaction

☐	JOB NAME	STATUS	SCHEDULE	LATEST RUN	
☐	Clear Sensitive Keywords in Calls	Finished	Not scheduled	Today, 8:50 AM	View Start Edit

Fill out the required configuration parameters:



Administration > Speech Analytics > Data Redaction

Add Job «Clear Sensitive Keywords in Calls»

Name * Clear Sensitive Keywords in Calls

Access scope *
● Unrestricted - All tenants, including System
○ Tenants only - All tenants, excluding System
○ One tenant

Test only * □ This is a test-drive. Write to a log file, but do not modify data

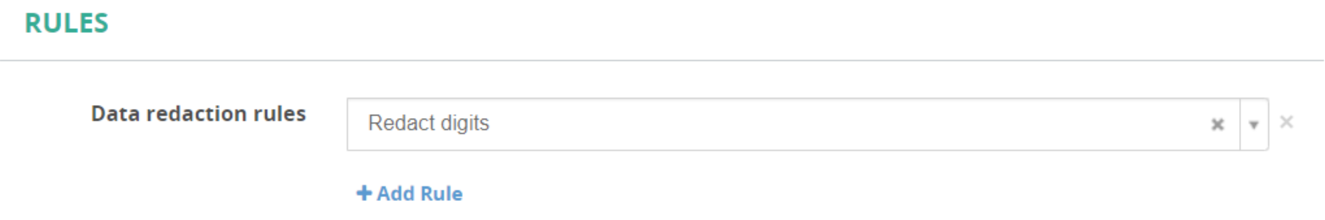
Parallel execution * 1 workers

Mode *
○ Full
● Incremental

- **Name** - give the job a distinctive name.
- **Access Scope** - specify for which tenants this job applies. This setting is visible only for a multi-tenant environment.
- **Test Only** - enable this option to run a job in a testing mode
- **Mode** - full or incremental mode.
    - **Full** - will process all the recordings every time the job is run.
    - **Incremental** - remembers which records have been already processed and do not process them on the next job run.

2.3.2 Rules

Under the Rules section, choose the previously configured rules, that should be applied to the recordings.

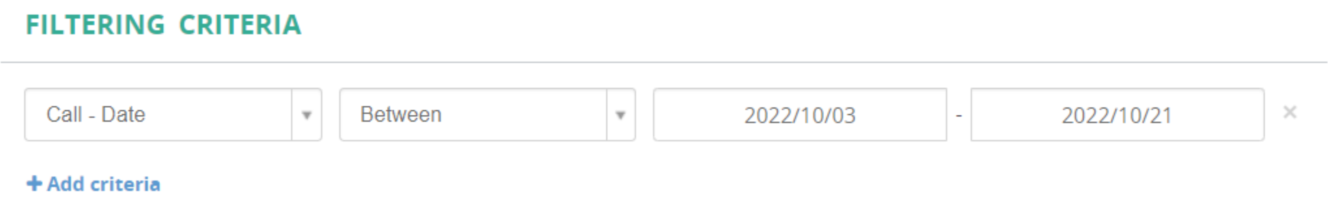


RULES

Data redaction rules: Redact digits

2.3.3 Filtering Criteria

The optional filtering criteria allow you to limit what call recordings will be processed. For example, you can process the calls for a specified date interval.

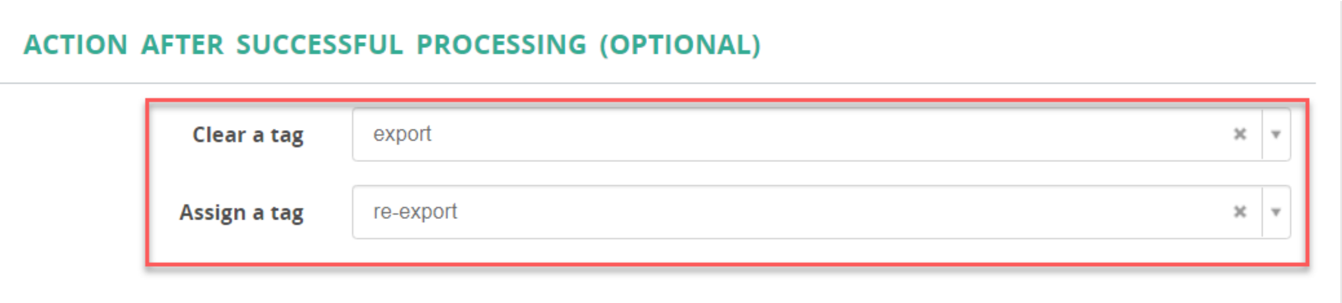


FILTERING CRITERIA

Call - Date | Between | 2022/10/03 - 2022/10/21

2.3.4 Action After Successful Processing

Optionally, you can clear/assign a tag once recordings are processed. With this capability, you can create a chain of post-processing, and mark it with relevant flags. For example, you can process the recordings and mark them with a relevant tag. Then, you can email the recordings with this tag. And once the recordings are sent via email, you tell the system to clear the tag from the recordings.



ACTION AFTER SUCCESSFUL PROCESSING (OPTIONAL)

Clear a tag: export

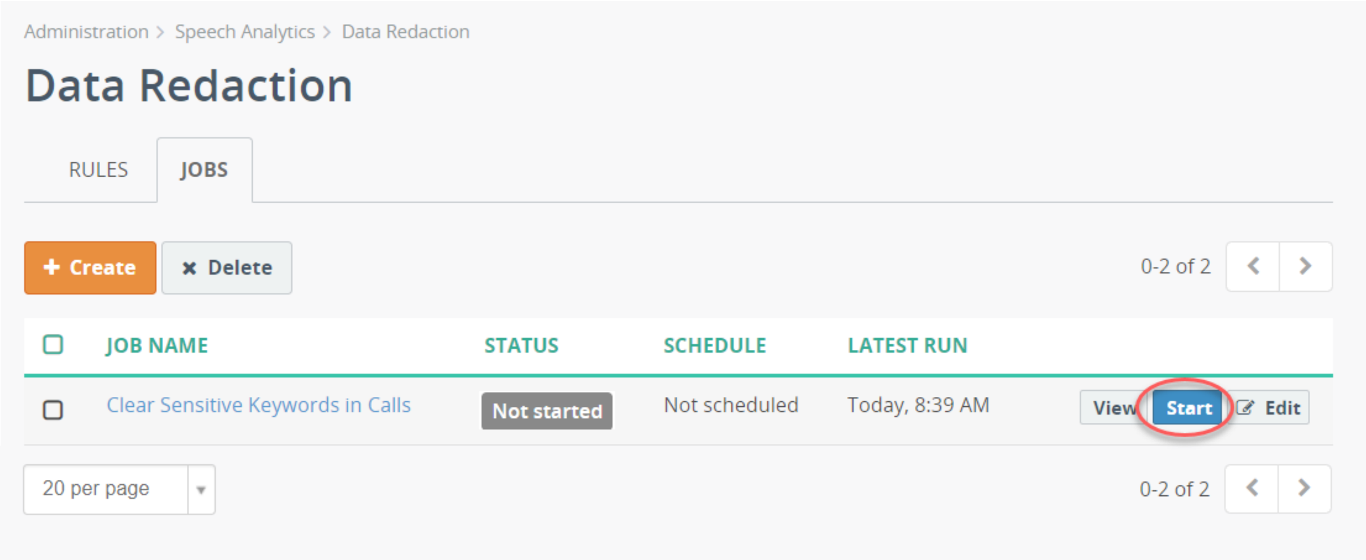
Assign a tag: re-export

For more information about other settings that can be applied to the job, see Advanced Settings.

Click **Save** to save your changes.

2.3.5 Start the job

To start the job manually, navigate to the **JOBS** tab and click the **Start** button next to the target job.



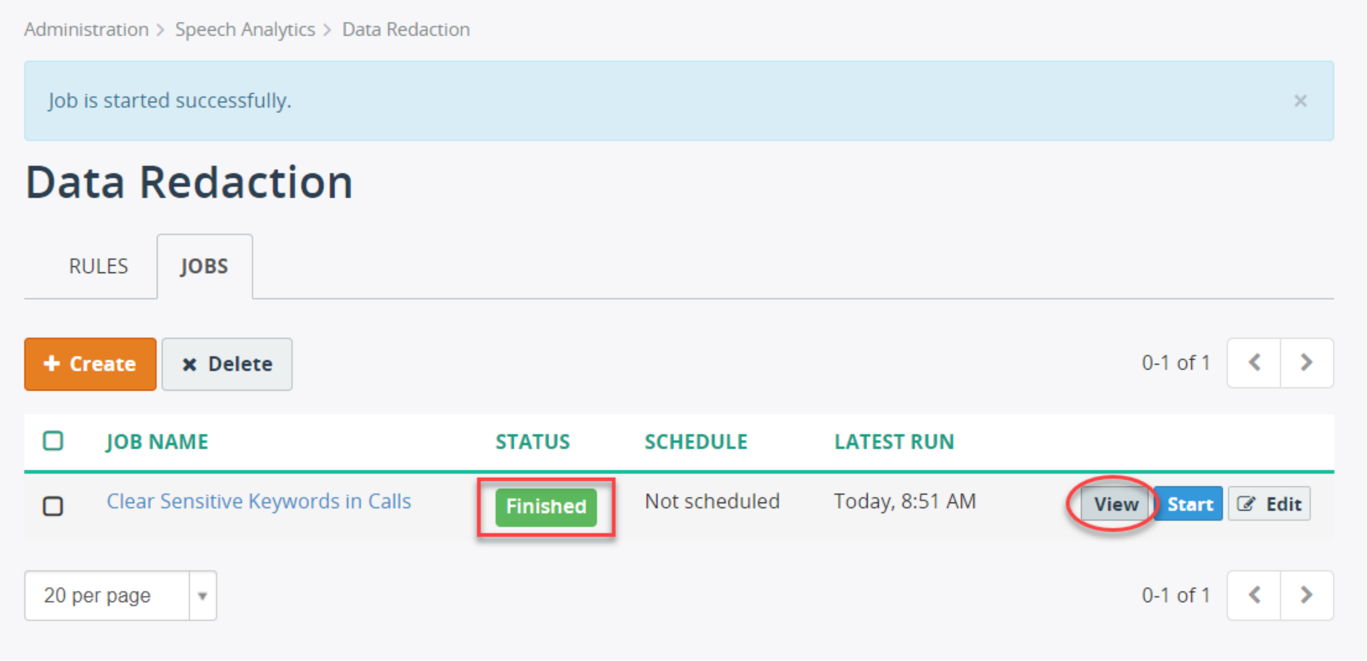
Administration > Speech Analytics > Data Redaction

Data Redaction

□	JOB NAME	STATUS	SCHEDULE	LATEST RUN
□	Clear Sensitive Keywords in Calls	Not started	Not scheduled	Today, 8:39 AM

The message will appear informing you that the job has started. The **Status** flag will also inform you whether the run has been finished, aborted or is in progress.

Click **View** to see the results of the job run.



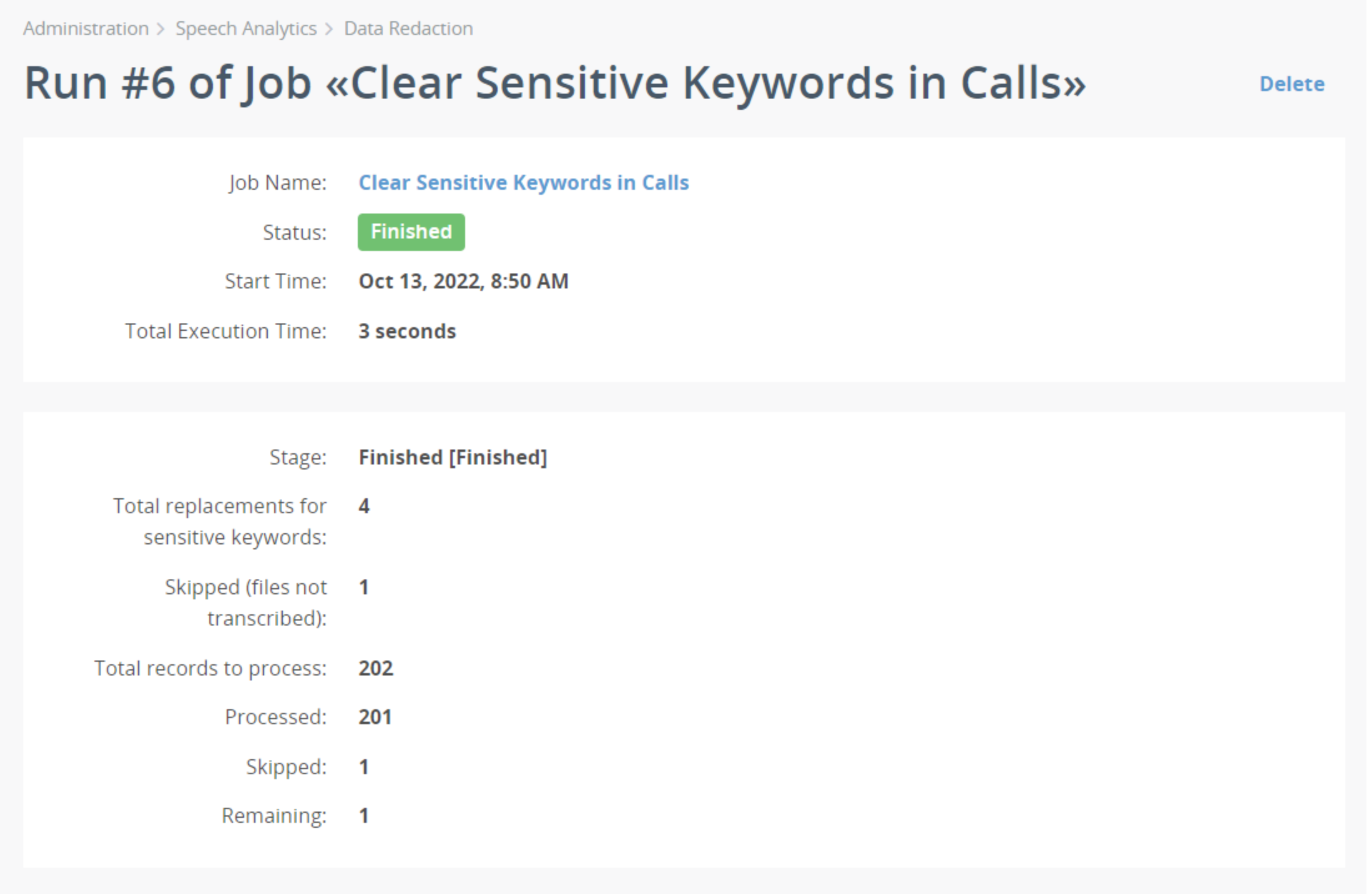
Administration > Speech Analytics > Data Redaction

Job is started successfully.

Data Redaction

□	JOB NAME	STATUS	SCHEDULE	LATEST RUN	
□	Clear Sensitive Keywords in Calls	Finished	Not scheduled	Today, 8:51 AM	View Start Edit

The page with job results will display the number of processed records and the number of replaced keywords, if any.



Administration > Speech Analytics > Data Redaction

Run #6 of Job «Clear Sensitive Keywords in Calls»

Job Name: Clear Sensitive Keywords in Calls

Status: Finished

Start Time: Oct 13, 2022, 8:50 AM

Total Execution Time: 3 seconds

Stage: Finished [Finished]

Total replacements for sensitive keywords: 4

Skipped (files not transcribed): 1

Total records to process: 202

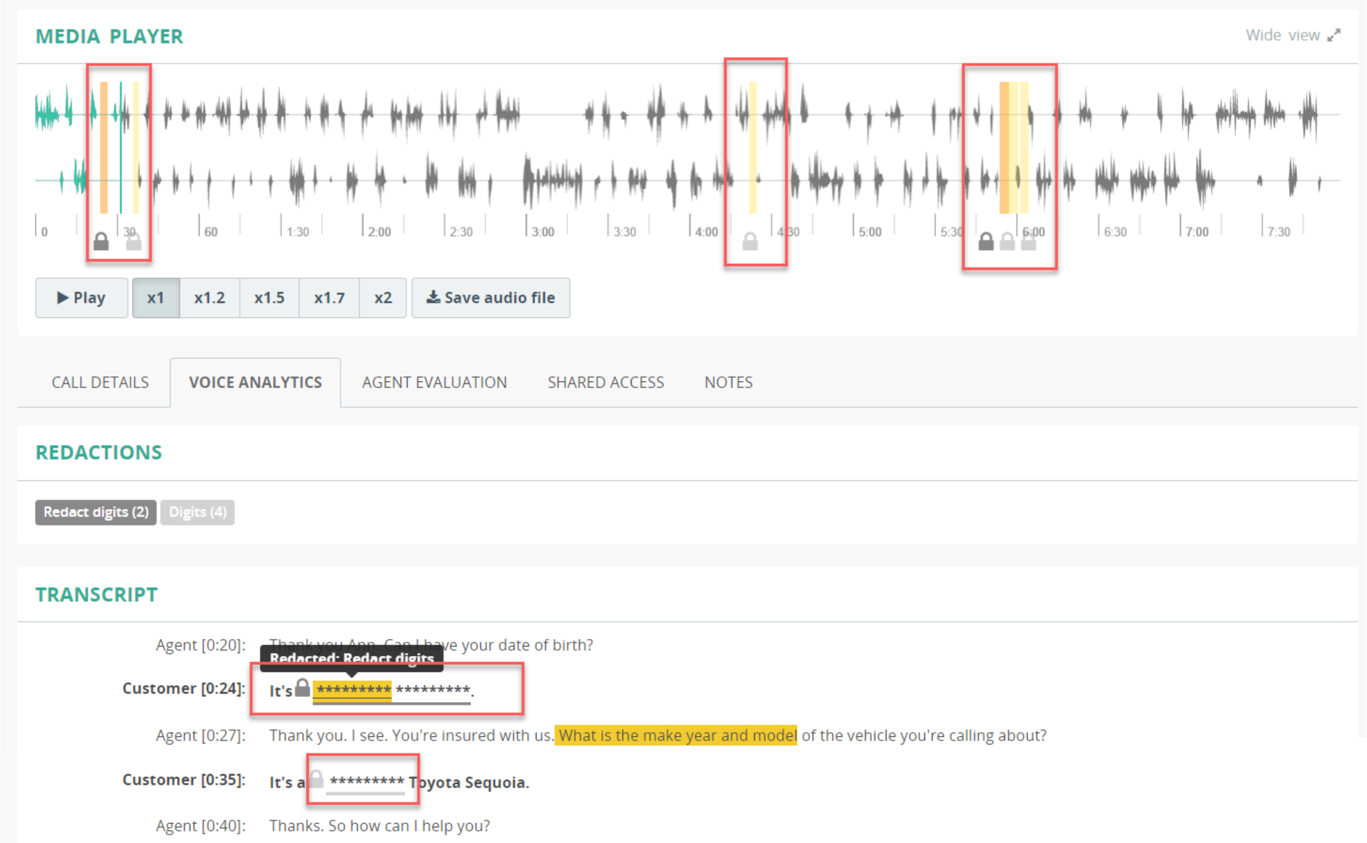
Processed: 201

Skipped: 1

Remaining: 1

2.4 Review Redaction Results

The following screenshot demonstrates the results of data redaction, where sensitive data is removed from both the audio file and transcription.



Agent [0:20]: Thank you Ann. Can I have your date of birth?

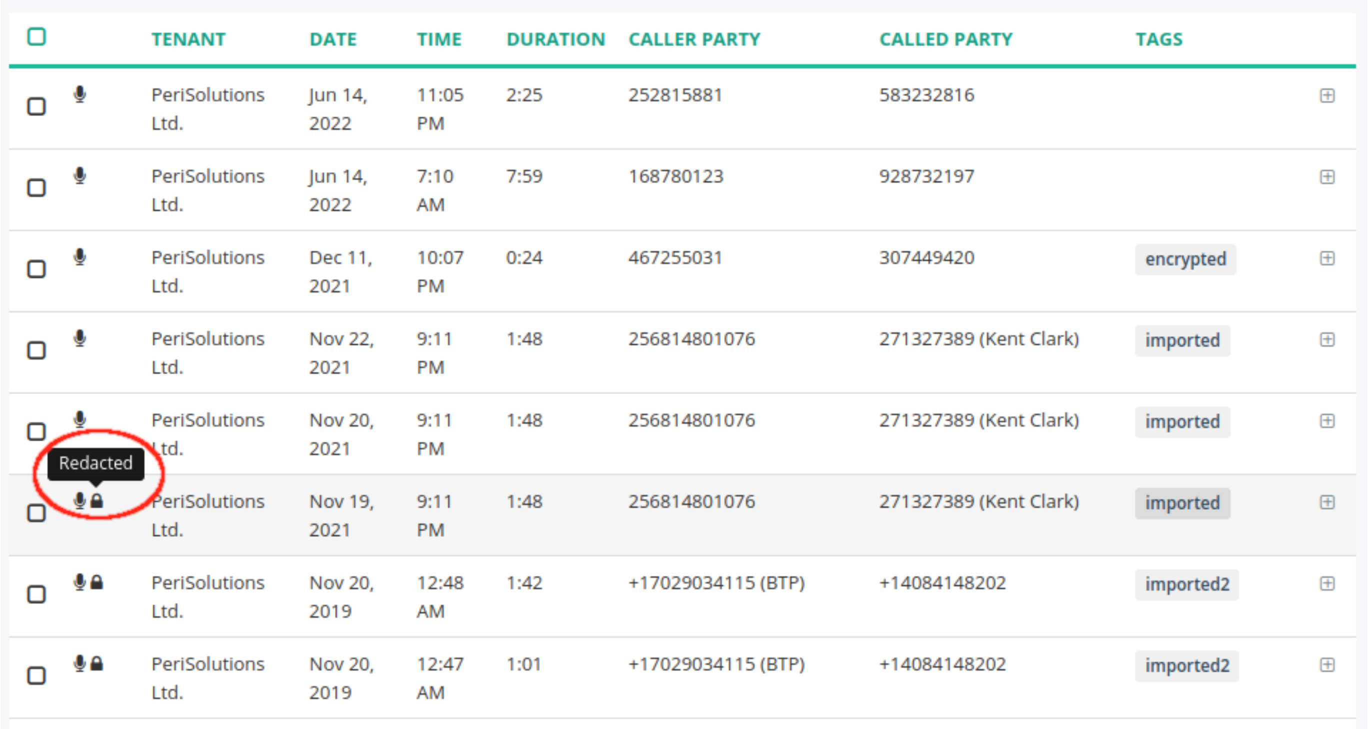
Customer [0:24]: It's ********* *********.

Agent [0:27]: Thank you. I see. You're insured with us. What is the make year and model of the vehicle you're calling about?

Customer [0:35]: It's a ********* Toyota Sequoia.

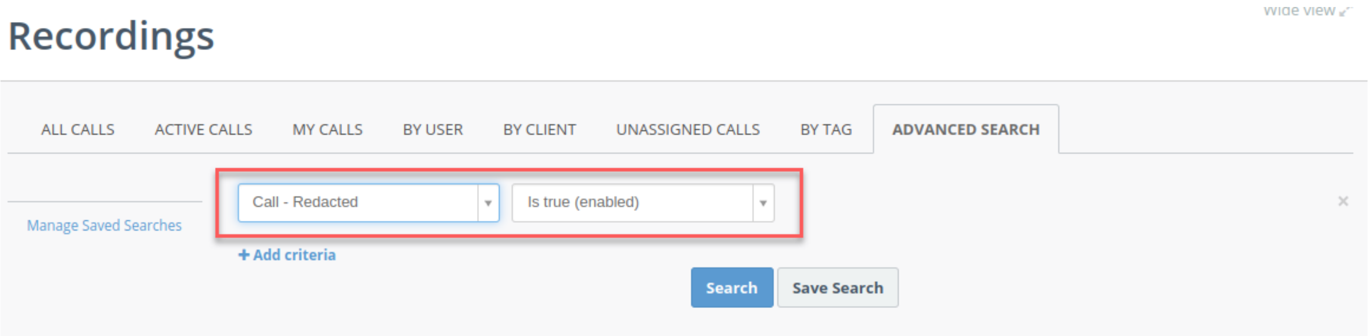
Agent [0:40]: Thanks. So how can I help you?

When browsing through the recordings, you can quickly track which calls contain redacted data by spotting the lock icon next to the file.

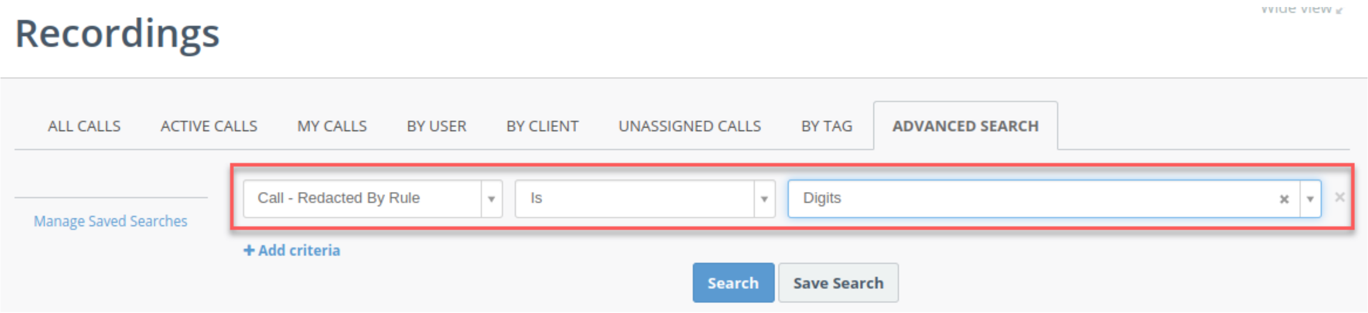


□		TENANT	DATE	TIME	DURATION	CALLER PARTY	CALLED PARTY	TAGS	
□	🎙	PeriSolutions Ltd.	Jun 14, 2022	11:05 PM	2:25	252815881	583232816		⊞
□	🎙	PeriSolutions Ltd.	Jun 14, 2022	7:10 AM	7:59	168780123	928732197		⊞
□	🎙	PeriSolutions Ltd.	Dec 11, 2021	10:07 PM	0:24	467255031	307449420	encrypted	⊞
□	🎙	PeriSolutions Ltd.	Nov 22, 2021	9:11 PM	1:48	256814801076	271327389 (Kent Clark)	imported	⊞
□	🎙	PeriSolutions Ltd.	Nov 20, 2021	9:11 PM	1:48	256814801076	271327389 (Kent Clark)	imported	⊞
□	🎙🔒	PeriSolutions Ltd.	Nov 19, 2021	9:11 PM	1:48	256814801076	271327389 (Kent Clark)	imported	⊞
□	🎙🔒	PeriSolutions Ltd.	Nov 20, 2019	12:48 AM	1:42	+17029034115 (BTP)	+14084148202	imported2	⊞
□	🎙🔒	PeriSolutions Ltd.	Nov 20, 2019	12:47 AM	1:01	+17029034115 (BTP)	+14084148202	imported2	⊞

Also, you can use the advanced search and apply **Call - Redacted** and **Call - Redacted By Rule** filtering criteria to search call recordings with redacted data.



Call - Redacted ▾ Is true (enabled) ▾



Call - Redacted By Rule ▾ Is ▾ Digits × ▾