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2019

Deploying PET for Secure Data Collaboration at scale

ACAS - August 15th 2020

Jonathan Rouach
CEO, co-founder

Data Collaboration | Waze will not report my speed violations to law enforcement, the insight is private



Data Collaboration | We need data insights from combined data sources to fight global challenges



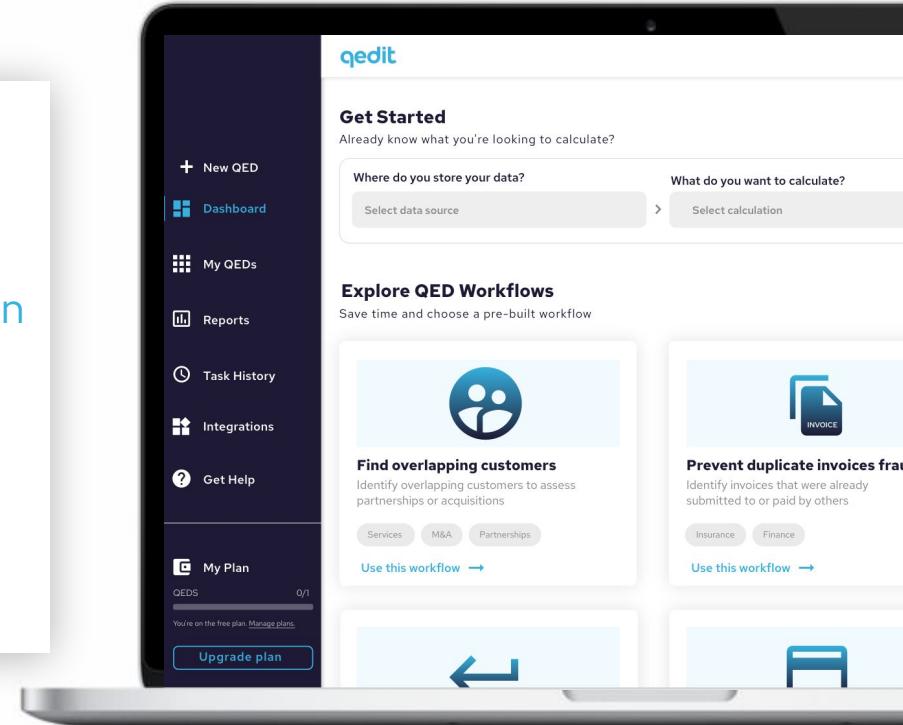
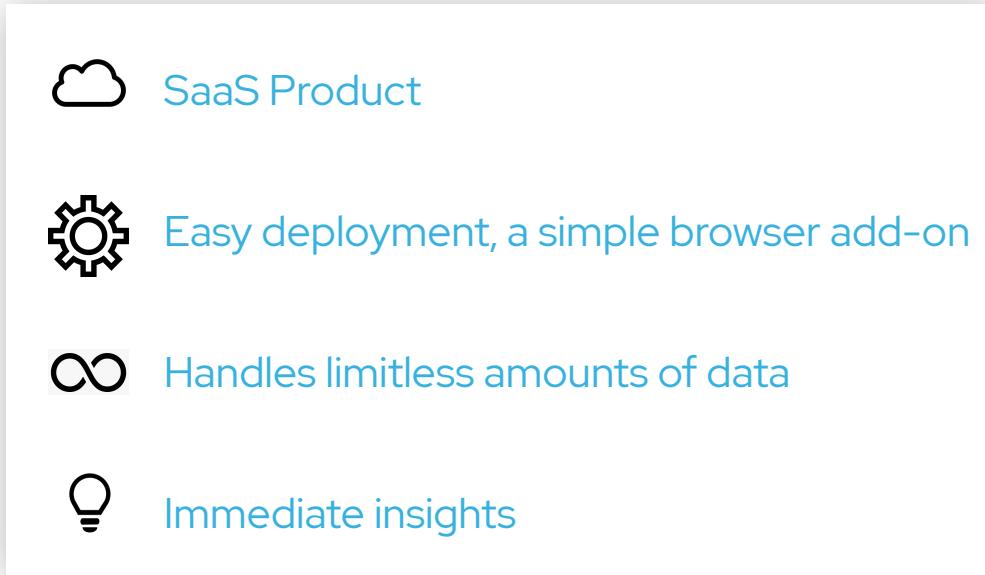
qedit



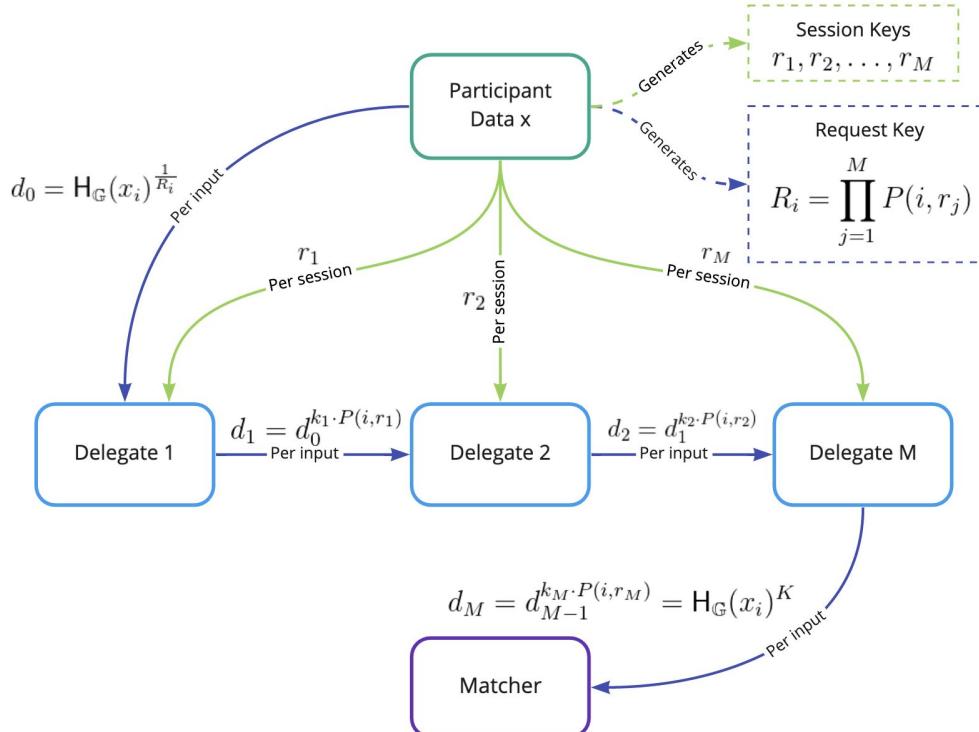
Privacy Enhancing Techniques | DP to protect inputs, ZKP to trust outputs, MPC and HE to mix data



Market deployment at scale | PET abstracted away, practical (delegated) solutions prioritize convenience

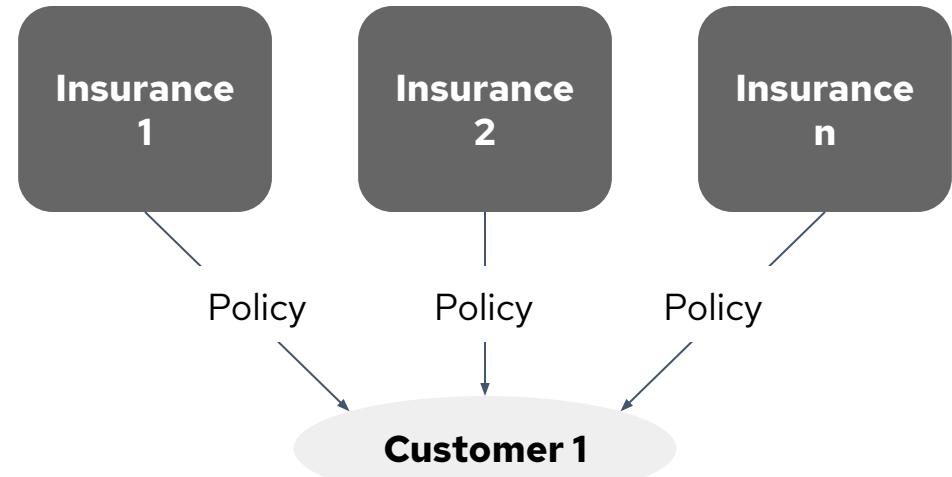


Delegated PSI | matching rows participants



Market readiness | Secure Data Collaboration to find over-insured customers, identity validation

Title	Insurance policy stacking detection
Objective	Identify policy stacking customers across several insurance companies, identity validation, without sharing data
Participants	Group of insurance companies



Select QED

Loan Stacking ▾

+ New QED

Explore

Results

Participants

Data Management

Forum

Task History

My Plan

QEDS

1/3

Up to 10,000 records
Updated weekly

Upgrade plan

Get Started

Already know what you're looking to calculate?

[Guided setup](#)

Where do you store your data?

Select data source

What do you want to calculate?

Select calculation

Where do you want to write the results?

Select output location

Explore QED Workflows

Save time and choose a pre-built workflow

All

Insurance

Certification

Identity



Find overlapping customers

Identify overlapping customers to assess partnerships or acquisitions

Services

M&A

Partnerships

[Use this workflow →](#)

Prevent duplicate invoices fraud

Identify invoices that were already submitted to or paid by others

Insurance

Finance

[Use this workflow →](#)

Identity information verification

Validate the information you collected with others

Ecommerce

Banking

Insurance

[Use this workflow →](#)[Get Help](#)

Select QED

Loan Stacking

Get Started

Already know what you're looking to calculate?

Need help? Follow the step-by-step guide

[Guided setup](#)[+ New QED](#)

Explore

Results

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Task History

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1/3

Up to 10,000,000 records
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Where do you store your data?

[Select data source](#)

What do you want to calculate?

[Select calculation](#)

Where do you want to write the results?

[Select output location](#)

Explore QED Workflows

Save time and choose a pre-built workflow

[All](#)[Insurance](#)[Certification](#)[Identity](#)

< >



Verify application information

Check application information you collected against other industry data source

[Insurance](#) [Finance](#) [Services](#)[Use this workflow →](#)

Prevent duplicate invoices fraud

Identify invoices that were already submitted to or paid by others

[Insurance](#) [Finance](#)[Use this workflow →](#)

Detect policy stacking

Identify number of held life insurance policies and total in-force amount

[Insurance](#) [Finance](#)[Use this workflow →](#)[Get Help](#)

Detect policy stacking workflow

X

1

Select data source

2

Select output location

3

Invite others & activate QED

Select policy data source



Excel

Excel



Sapiens Reinsurance



Oracle



TAI

TAI Life Reinsurance



SAP



LOGiQ3

Get Help

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Search

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Cut Copy Format Painter

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General Conditional Formatting Insert Cells

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Clipboard qedit Start QEDIT

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Policy Number	SSN	First Name	Middle Initial	Last Name	Date of Birth	Place of Birth	Face Amount					
2	18-00000001	004-16-8556	Carisa	E	Ansley	1975-09-20	17109	150000					
3	18-00000002	002-32-6316	Trey	C	Mandez	1999-01-11	27893	180000					
4	18-00000003	004-76-7331	Earnestine	J	Kerber	1996-04-17	26101	1000000					
5	18-00000004	470-30-9277	Columbus	A	Locust	1989-09-21	41051	600000					
6	18-00000005	222-58-2045	Julietta	A	Turman	1974-08-11	20901	900000					
7	18-00000006	483-88-4914	Afton	G	Gaeta	1991-04-16	11566	1000000					
8	18-00000007	503-32-0453	Alva	S	Roehrig	1951-03-12	08540	300000					
9	18-00000008	577-23-3064	Gaye	M	Berney	1998-06-13	19111	275000					
10	18-00000009	478-39-7459	Sidney	J	Jarman	1950-08-25	41018	850000					
11	18-00000010	521-03-3285	Malik	D	Riveria	1953-01-18	27265	250000					
12	18-00000011	649-14-0550	Jacob	E	Demos	1981-02-11	37066	250000					
13	18-00000012	448-86-3209	Deadra	P	Guynes	1959-08-13	55082	250000					
14	18-00000013	530-74-4574	Erika	M	Higbee	1981-05-16	30240	250000					
15	18-00000014	189-03-6000	Pia	S	Culbreath	1953-05-19	32725	100000					
16	18-00000015	690-14-3027	Molly	A	Gertz	1988-02-18	48067	115000					
17	18-00000016	680-32-6571	Sol	M	Dietrick	1965-07-18	15068	100000					
18	18-00000017	221-46-2560	Ai	D	Cowles	1958-04-24	41018	130000					
19	18-00000018	009-46-0082	Marx	A	Longstreet	1965-04-10	52240	500000					
20	18-00000019	517-10-4716	Dana	L	Seo	1956-04-21	49509	500000					
21	18-00000020	002-38-6689	Abram	M	Mcgown	1966-05-23	24540	475000					
22	18-00000021	005-54-5805	Lekisha	C	Wiechmann	1966-09-25	55014	400000					
23	18-00000022	428-56-9535	Mana	J	Hertel	1974-07-28	50158	500000					
24	18-00000023	221-09-5800	Catrina	A	Cosner	1957-07-11	10451	150000					
25	18-00000024	653-22-4723	Jinny	B	Parillo	1965-03-22	08360	150000					
26	18-00000025	444-23-2276	Azucena	K	Strang	1958-04-27	75126	180000					
27	18-00000026	500-72-2939	Brad	T	Hallott	1993-01-19	04103	1000000					

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A2 18-00000001

	A	B	C	D	E	F	G	H	I	J	QEDIT
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7	18-00000006	483-88-4914	Afton	G	Gaeta	1991-04-16	11566	1000000			
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11	18-00000010	521-03-3285	Malik	D	Riveria	1953-01-18	27265	250000			
12	18-00000011	649-14-0550	Jacob	E	Demos	1981-02-11	37066	250000			
13	18-00000012	448-86-3209	Deadra	P	Guynes	1959-08-13	55082	250000			
14	18-00000013	530-74-4574	Erika	M	Higbee	1981-05-16	30240	250000			
15	18-00000014	189-03-6000	Pia	S	Culbreath	1953-05-19	32725	100000			
16	18-00000015	690-14-3027	Molly	A	Gertz	1988-02-18	48067	115000			
17	18-00000016	680-32-6571	Sol	M	Dietrick	1965-07-18	15068	100000			
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20	18-00000019	517-10-4716	Dana	L	Seo	1956-04-21	49509	500000			
21	18-00000020	002-38-6689	Abram	M	Mcgown	1966-05-23	24540	475000			
22	18-00000021	005-54-5805	Lekisha	C	Wiechmann	1966-09-25	55014	400000			
23	18-00000022	428-56-9535	Mana	J	Hertel	1974-07-28	50158	500000			
24	18-00000023	221-09-5800	Catrina	A	Cosner	1957-07-11	10451	150000			
25	18-00000024	653-22-4723	Jinny	B	Parillo	1965-03-22	08360	150000			
26	18-00000025	444-23-2276	Azucena	K	Strang	1958-04-27	75126	180000			
27	18-00000026	500-72-2939	Brad	T	Wallott	1993-01-19	04103	1000000			

Input Data

qedit

Detect Policy Stacking

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=Sheet1!A1:H10001

Show the uploaded encrypted data

Overwrite existing records

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Clipboard

Search: A2 18-00000001

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Sheet1 Hashed and Encrypted Data Results Analysis

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QEDIT Input Data

Detect Policy Stacking

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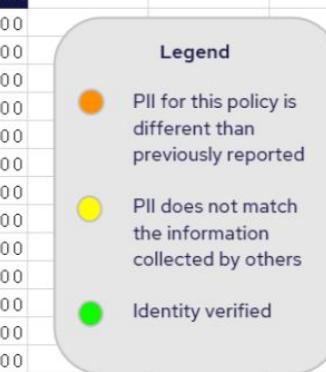
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A2 : 004-16-8556

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1	SSN	First Name	Middle Initial	Last Name	Date of Birth	Place of Birth	#of Policies	Total In-Force				Input Data
2	004-16-8556	Carisa	E	Ansley	1975-09-20	17109	2	450000				
3	002-32-6316	Trey	C	Mandez	1999-01-11	27893	1	180000				
4	004-76-7331	Earnestine	J	Kerber	1996-04-17	26101	1	1000000				
5	470-30-9277	Columbus	A	Locust	1989-09-21	41051	1	600000				
6	222-58-2045	Julietta	A	Turman	1974-08-11	20901	3	5400000				
7	483-88-4914	Afton	G	Gaeta	1991-04-16	11566	7	7000000				
8	503-32-0453	Alva	S	Roehrig	1951-03-12	08540	1	300000				
9	577-23-3064	Gaye	M	Berney	1998-06-13	19111	1	275000				
10	478-39-7459	Sidney	J	Jarman	1950-08-25	41018	12	10200000				
11	521-03-3285	Malik	D	Riveria	1953-01-18	27265	1	250000				
12	649-14-0550	Jacob	E	Demos	1981-02-11	37066	3	1500000				
13	448-86-3209	Deadra	P	Guynes	1959-08-13	55082	2	1000000				
14	530-74-4574	Erika	M	Higbee	1981-05-16	30240	1	250000				
15	189-03-6000	Pia	S	Culbreath	1953-05-19	32725	1	100000				
16	690-14-3027	Molly	A	Gertz	1988-02-18	48067	2	230000				
17	680-32-6571	Sol	M	Dietrick	1965-07-18	15068	1	100000				
18	221-46-2560	Ai	D	Cowles	1958-04-24	41018	1	130000				
19	009-46-0082	Marx	A	Longstreet	1965-04-10	52240	3	2250000				
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26	444-23-2276	Azucena	K	Strang	1958-04-27	75126	5	450000				
27	500-72-2920	Bred	I	Hollott	1993-01-19	04103	3	6000000				

Sheet1 Hashed and Encrypted Data



qedit

Detect Policy Stacking

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Show the uploaded encrypted data

Overwrite existing records

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Stacked policies count

Stacked Policies Category	Count
1	504
2 to 5	1484
6 to 10	897
over 10	163

Stacked policies amount

Stacked Policies Category	Amount
Up to \$1M	872
\$1M to \$5M	1758
\$5M to \$10M	433
\$10M to \$35M	2
Over \$35M	0

Distribution of stacked policies

Category	Percentage
Up to \$1M	~45%
\$1M to \$5M	~35%
\$5M to \$10M	~10%
\$10M to \$35M	~5%
Over \$35M	~5%

Distribution of stacked policies (industry)

Category	Percentage
Up to \$1M	~45%
\$1M to \$5M	~35%
\$5M to \$10M	~10%
\$10M to \$35M	~5%
Over \$35M	~5%

qedit Start QEDIT

Input Data

qedit

Detect Policy Stacking

Download template

=Sheet1!A1:H10001

Show the uploaded encrypted data

Overwrite existing records

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SUBMIT

Hashed and Encrypted Data Results Analysis

Research | Zero-Knowledge Proofs standardization, advances on very large proving circuits



NIST
Standardization partner



SIEVE DARPA project



Thanks :)

Q&A

jon@qed-it.com

Key messages | Deploying Practical Privacy

Enhancing Techniques for Secure Data Collaboration

- You use encryption to secure data, Privacy Enhancing Technique to secure the insights from the data
 - Users trust Waze not to report speed violations to the Police
 - We need data insights to fight global threats, fraud etc. but data aggregation went too far
 - You need DP for protecting inputs, ZKP for trusting outputs, and MPC and HE for mixing data sources
- To deploy in the market, PET must be abstracted away, practical solutions have to prioritize convenience
 - Practical means cloud, the infrastructure is trusted (for now), but not the other actors
 - We solve painful data collaboration problems using delegated PET protocols, at scale
- The market is ready to embrace PET, we need to meet the demand in convenience and scale
 - Insurance policy stacking, the excel demo
 - Research is still needed, for example to solve large circuits as in DARPA SIEVE