

Acronis®

NEW GENERATION DATA PROTECTION



Smart Nation meets privacy-preserving analytics

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Acronis Singapore R&D Centre

Agenda

Problem and Objective

Our Innovation

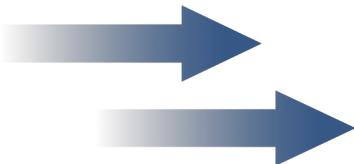
Value Proposition

Singapore & the World

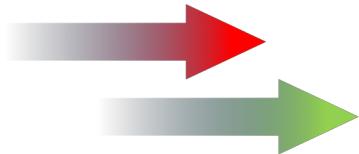


Attack vs Defense

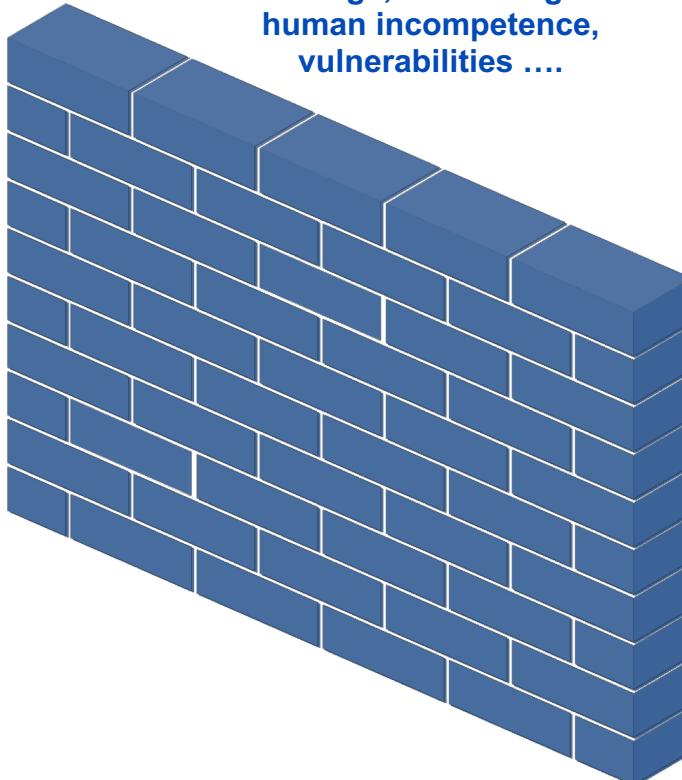
Known vectors



Unknown vectors



Software bugs, mis-configurations,
human incompetence,
vulnerabilities



DataDanzaScope



Distrust
So much data.....so little insights
Wanted framework for
collaborative work among
partners, contractors, vendors,
ISV and service providers

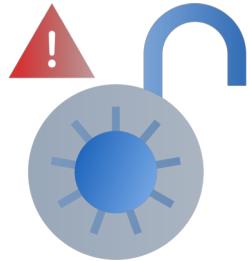
Malicious entities
Wannacry, Mirai, Kovter.....an ever expanding
soup of malwares and related
actors.

JOIN without REVEALING !!

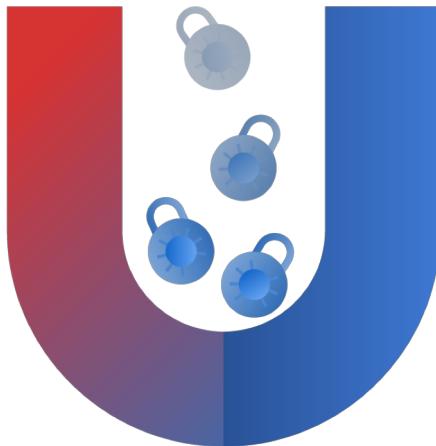


The Problem

How to securely combine, aggregate and analyze data from disparate sources to reveal insights that are hidden otherwise?



Sharing sensitive
data as-is is **too risky**
and often illegal



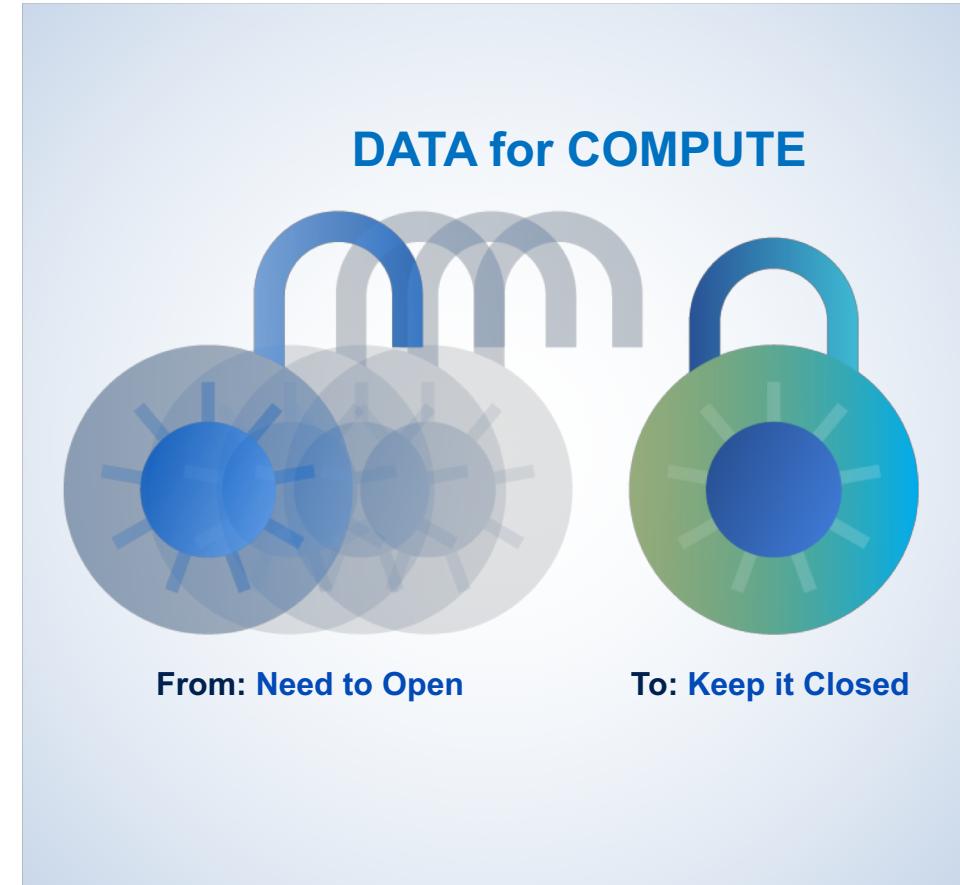
Encrypted data with off-the-shelf cyber security products is **useless for analysis**

Objective

Singapore's vision for a Smart nation mandates data-driven planning and forecasting

“A collaborative data analysis platform that guarantees data security and privacy in the absence of mutual trust facilitates this vision.”

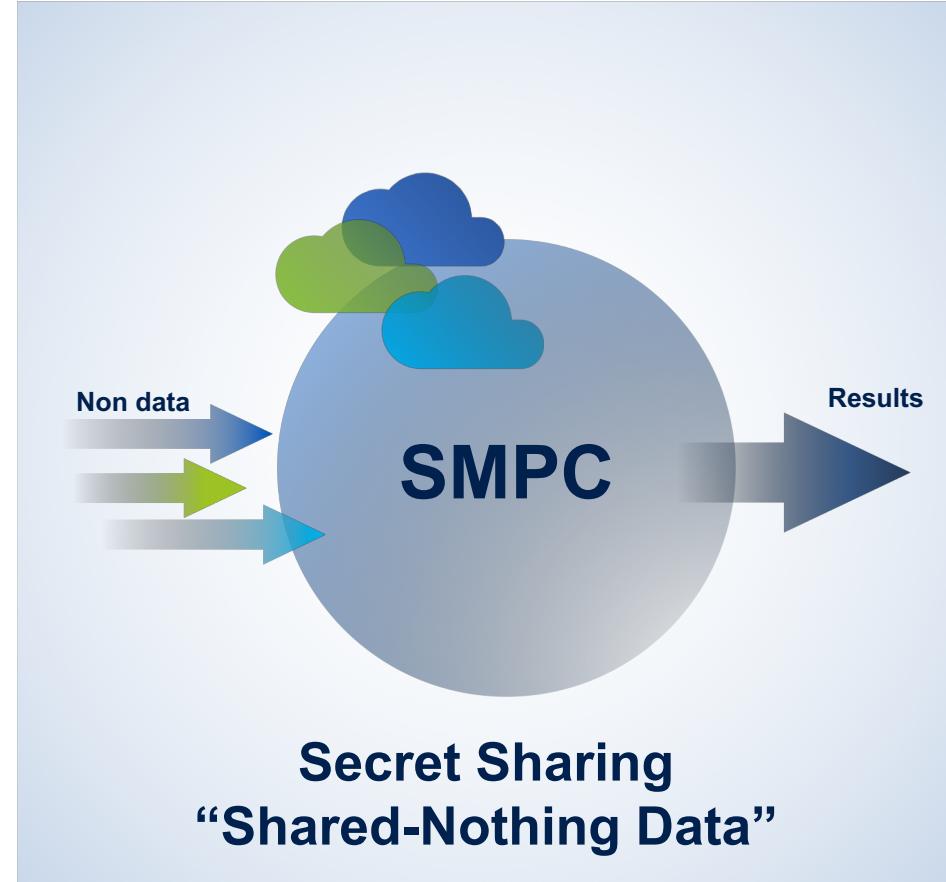
Such a platform will have direct application for: Finance / Banking / Insurance, Threat Intelligence, Healthcare, Government Agencies.



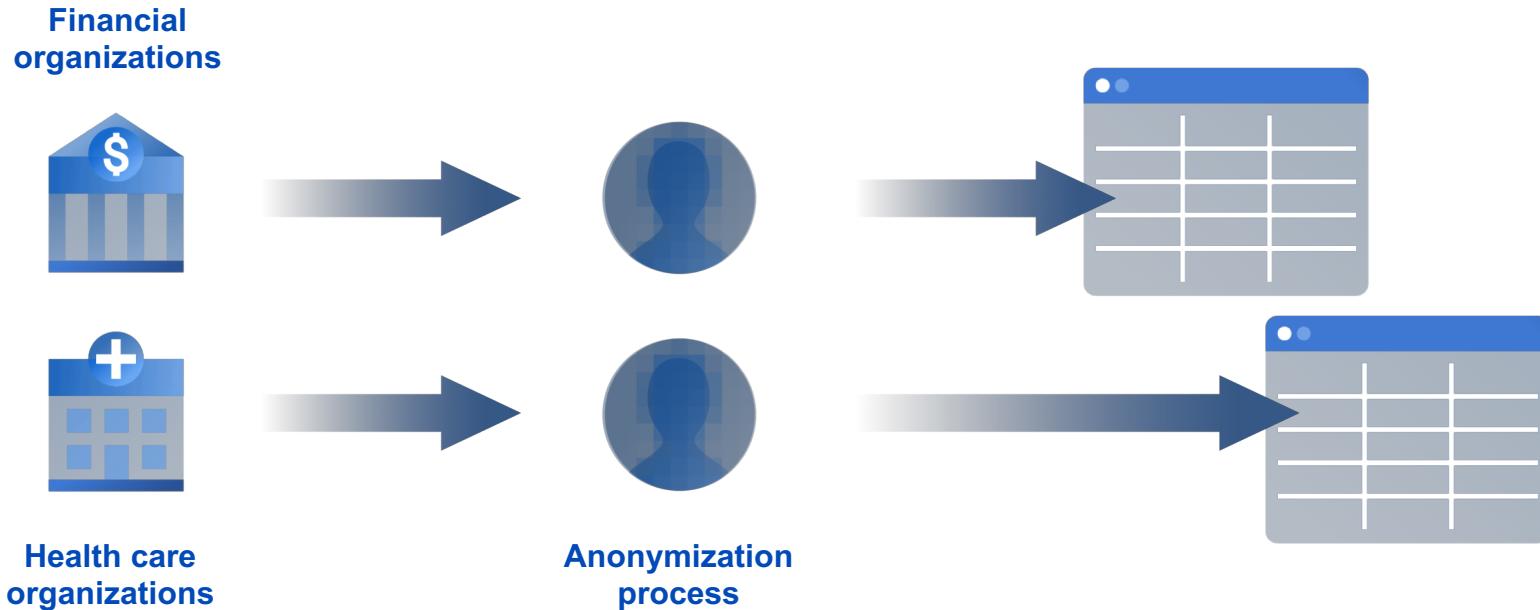
The Solution. Secure Multi-Party Computation (SMPC)

Enabler of seamless data integration
between variety of organization without risk
of privacy breach – a key requirement of
Smart Nation development

- SMPC guarantees that none of the parties learn the inputs
- SMPC gives everybody the aggregated output of computation
- SMPC is able to operate with malicious agents in the system
- SMPC is key-less unlike homomorphic systems

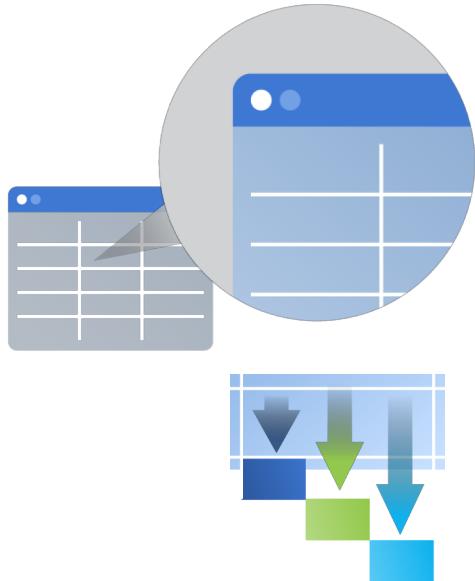


Data submission from multiple parties

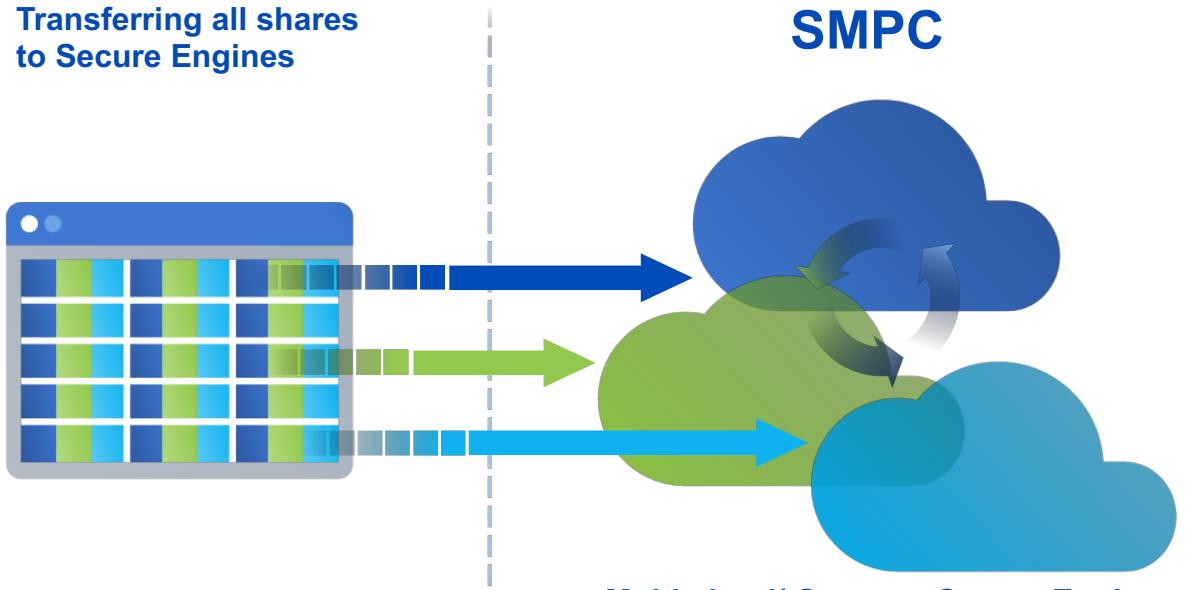


Data splitting into shares

Every cell is split into secret shares



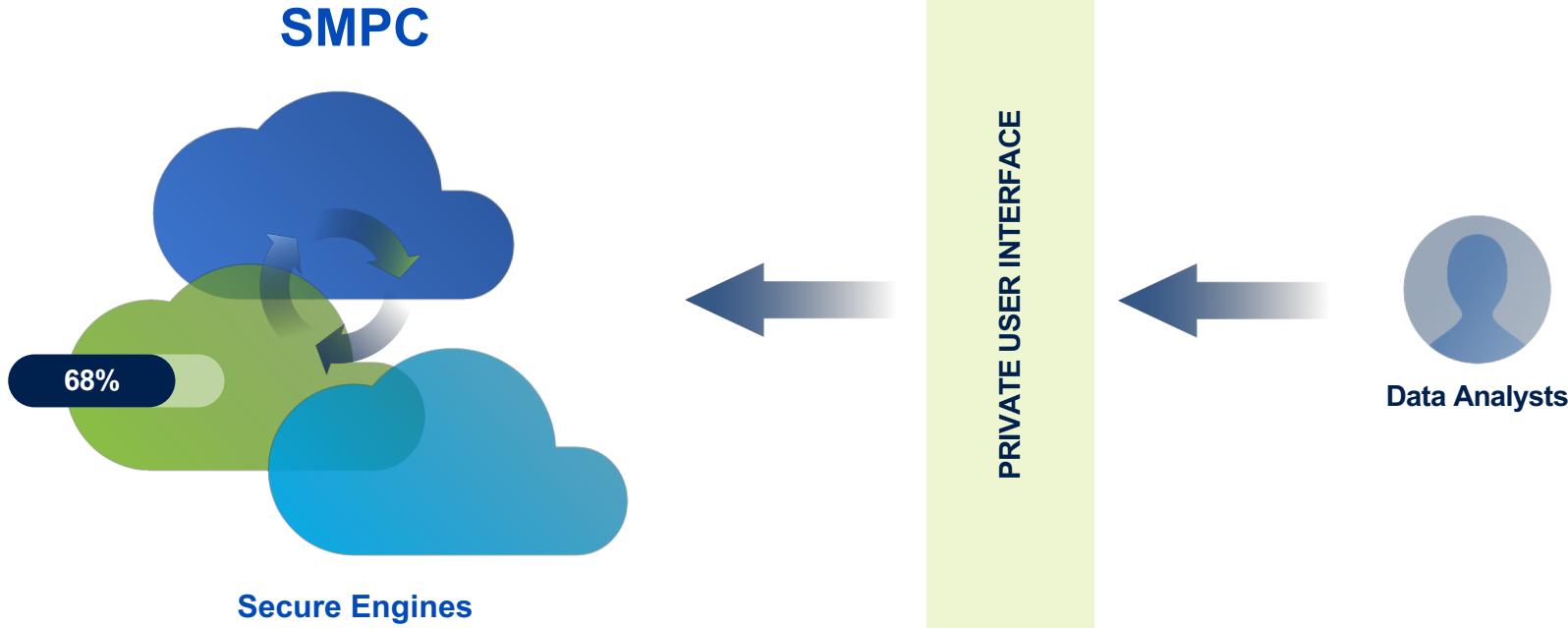
Transferring all shares to Secure Engines



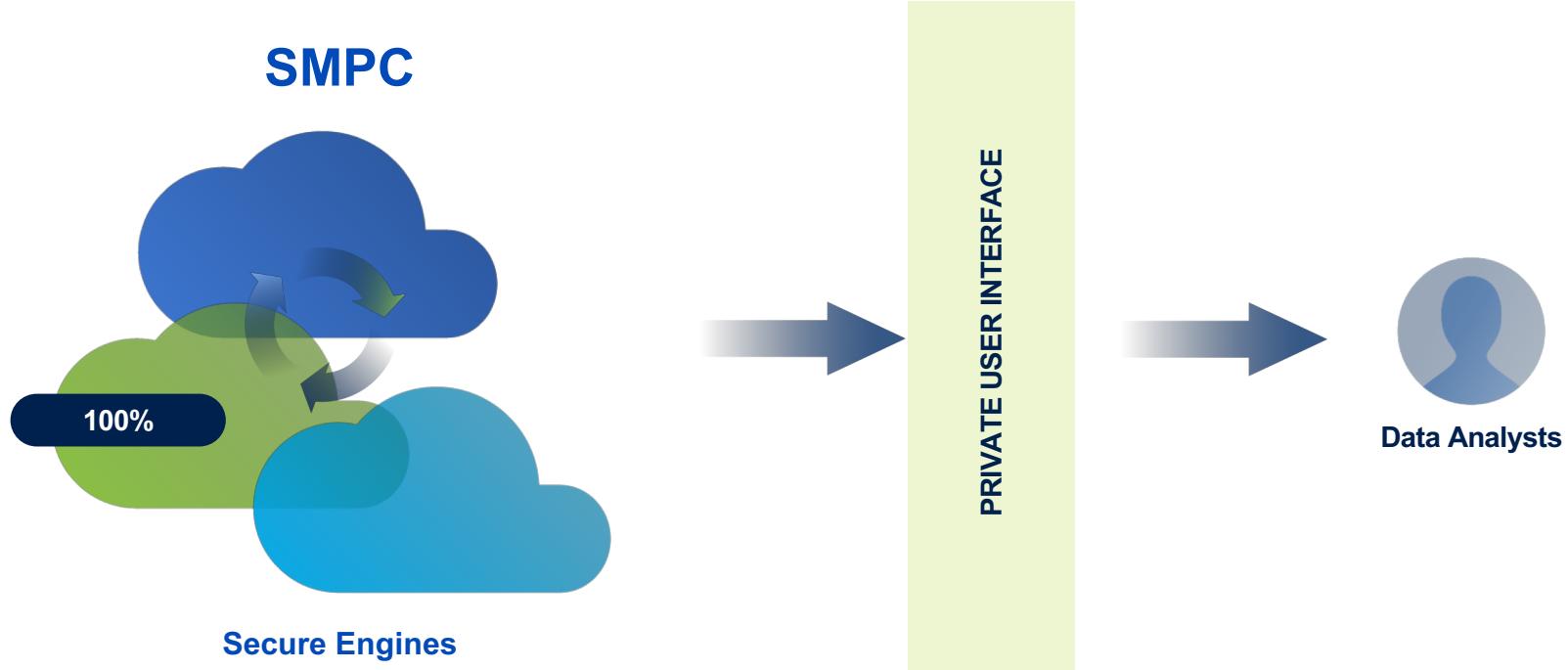
Multi-cloud/ On-prem Secure Engines

No one party learns the actual data

Query parameters submission



Results retrieval



Platform Actors



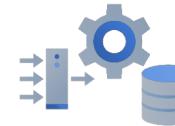
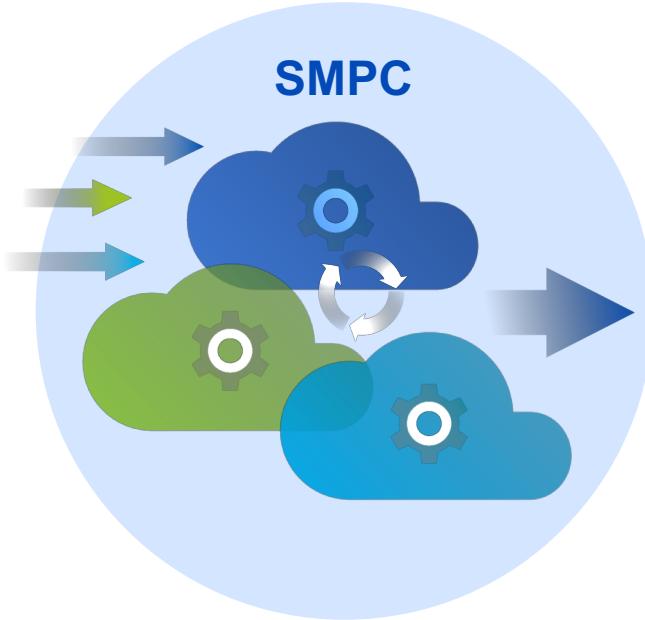
Data Sources

Entities / individuals who are generators and providers of data



Data Contributors

Businesses / companies who collect and store data from the sources and contribute them for aggregate analysis/study



The Platform (SMPC)

The medium where the contributed data is being aggregated and analysed as per requests of the Data Queries



Data Querying Party

Government agencies or authorized organizations that are analyzing the aggregated data in order to produce value for the people in the country

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Acronis SMPC Trial Platform

Acronis Singapore R&D Centre

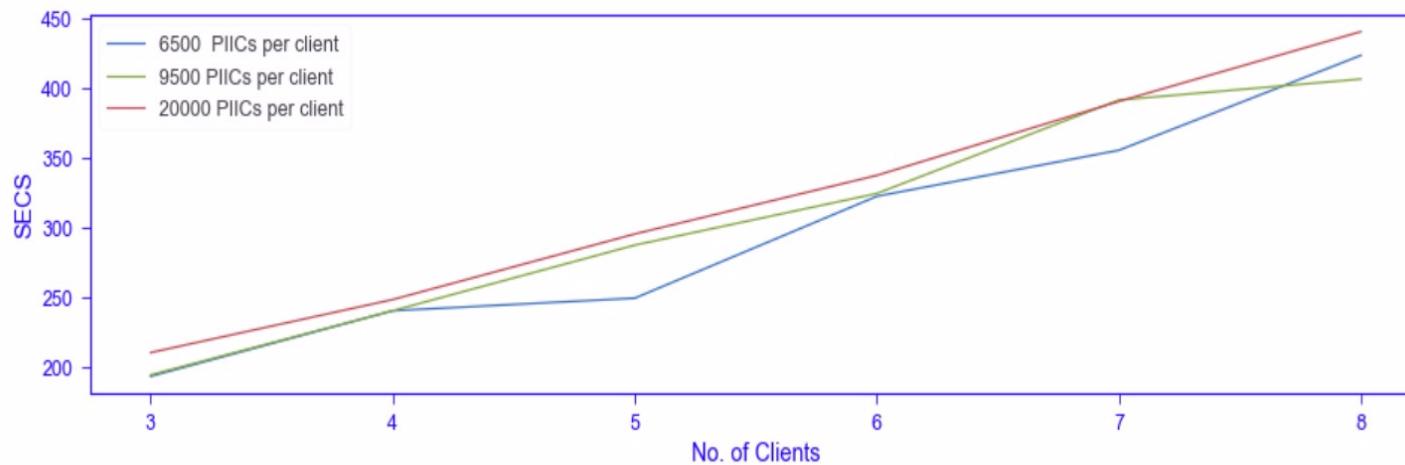
Acronis SMPC Trial Platform

The screenshot shows the Acronis SMPC Trial Platform interface. On the left, there is a sidebar with the Acronis logo and navigation options: 'CLIENT' (selected) and 'QUERY'. The main area is titled 'SMPC' and contains the text 'Submit data to SMPC engine below'. Below this is a form with a file upload input labeled 'Select a CSV file to upload' and a 'Browse' button, followed by a 'submit' button. Two blue callout boxes point to this section: one pointing to the 'CLIENT' option in the sidebar labeled 'Multiple input parties', and another pointing to the file upload area labeled 'Secure and anonymized data submission'.

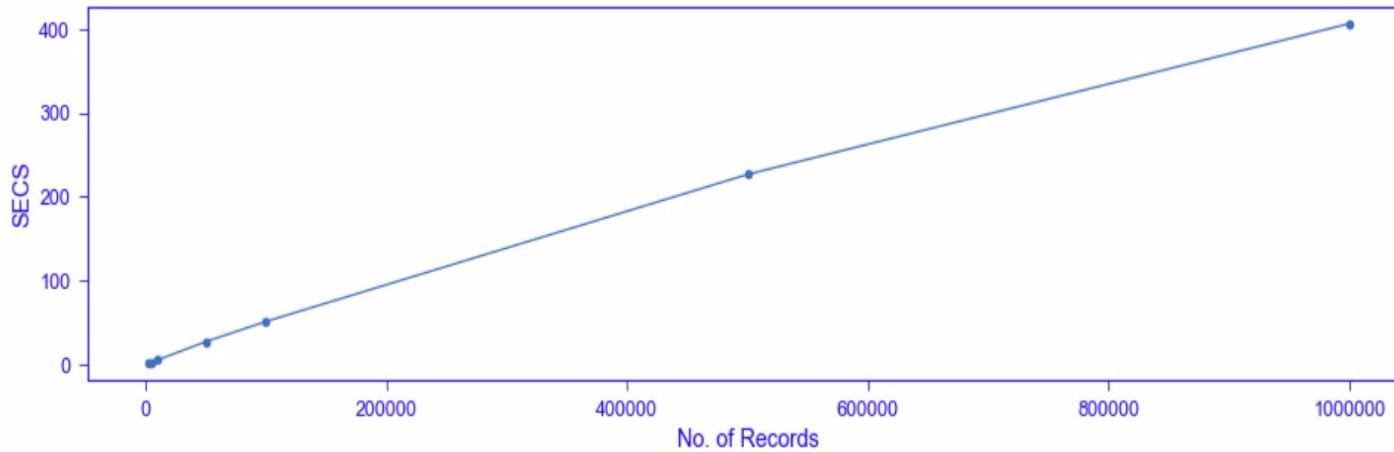
The screenshot shows the Acronis SMPC Trial Platform interface. On the left, there is a sidebar with the Acronis logo and navigation options: 'CLIENT' (selected) and 'QUERY'. The main area is titled 'SMPC' and contains the text 'Submit queries to SMPC engine below'. Below this is a 'Report Generation' tab and an 'Ad-hoc Querying' tab. A red button labeled 'Terminate Session' is visible. A dropdown menu is open under 'Type of query', showing 'Percentile of Savings (Inner join)' as the selected option. Other options listed in the dropdown include 'Percentile of Savings (Outer join)', 'Mean Term Insurance', and 'Count based income tax'. A blue callout box points to the 'Ad-hoc Querying' tab labeled 'Secure compute on joined data'.



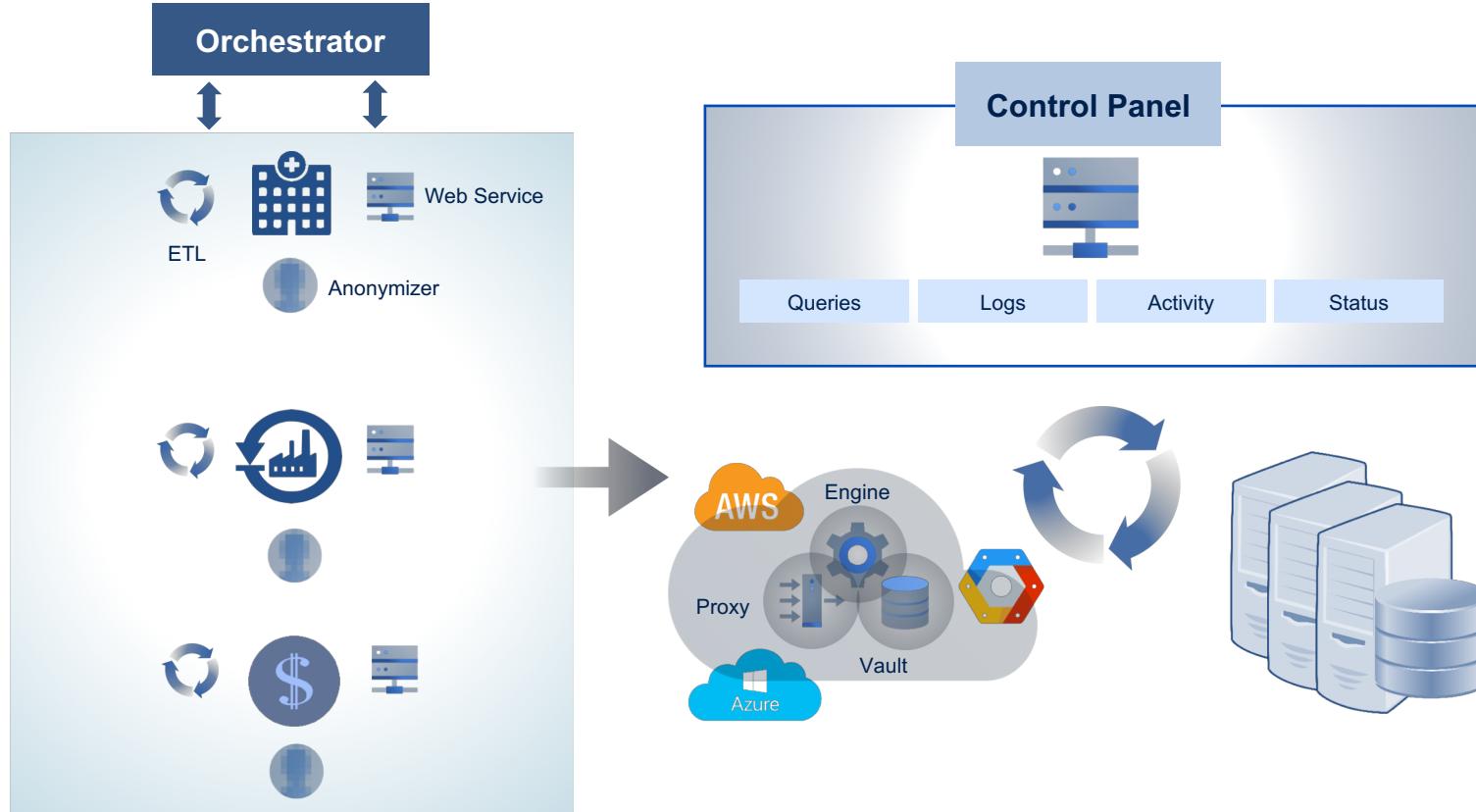
Platform performance



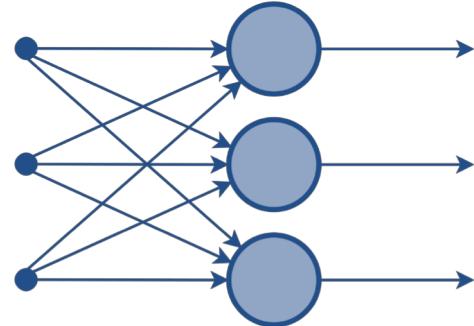
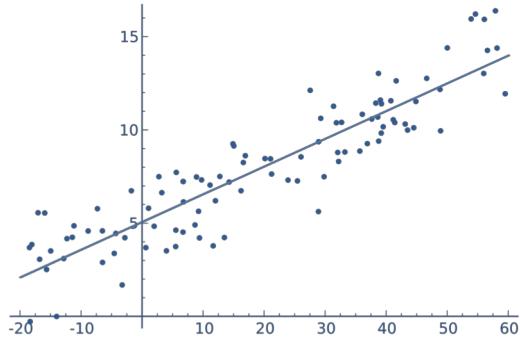
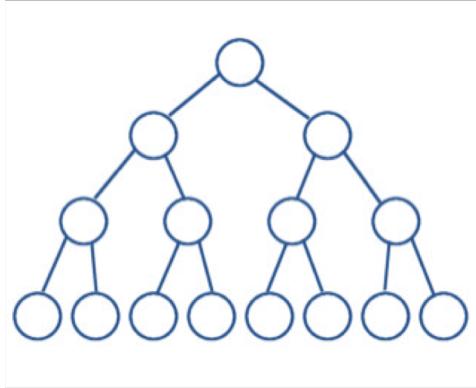
Platform performance



Platform architecture



“Secure – Private” Analytics



Secure Advanced Analytics

Classification, Regression, Neural nets and many more.

The Value Proposition



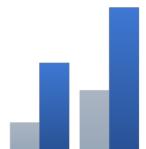
Deep insights

- Data driven policy and decision making.
- Improved visibility and execution of programs.



Monetization

- Unlock new streams of revenue and profitability from data you already own.
- Quicker ROI



Competitive advantage

- Leverage right information at right time.
- Data driven marketing.



Regulation and compliance

GDPR, PDPA.

Beneficiaries:

Governments and state bodies • Banks, insurance and financial institutions • Medical and healthcare players
• Research and academia • Retail and consumer • and many more...



SMPC stories from the world!



Centar
ESTONIAN CENTRE FOR
APPLIED RESEARCH

JAN 1 Advising on the development of concept government revenue base



local go extend accour metho The air financial-based r costs ir

EU

Students and Taxes correlation study

Estonian Center
of Applied Research

10 Million+ records from two
mutually exclusive govt. agencies:
Aggregation and statistical
analysis with privacy.



meae.gov.mt*

THE MINISTRY ENTITIES MEDIA TENDERS AND QUOT

LAUNCH OF THE 'GUIDELINES TO INCREASE AND RETAIN WOMEN IN ICT'

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EU

Payroll processing on public cloud

Ministry of Finance
of Malta (MFIN)

Collaborative processing
of data from taxpayers, employers, banks
and SMEs on public cloud with guarantees
on confidentiality and privacy.



Singapore at a glance

Singapore Residents By Ethnic Group, End June, Annual (2017)



Year	Chinese	Malay	Indian	Others
2008	~2.8M	~0.1M	~0.1M	~0.1M
2009	~2.8M	~0.1M	~0.1M	~0.1M
2010	~2.8M	~0.1M	~0.1M	~0.1M
2011	~2.8M	~0.1M	~0.1M	~0.1M
2012	~2.8M	~0.1M	~0.1M	~0.1M
2013	~2.8M	~0.1M	~0.1M	~0.1M
2014	~2.8M	~0.1M	~0.1M	~0.1M
2015	~2.8M	~0.1M	~0.1M	~0.1M
2016	~2.8M	~0.1M	~0.1M	~0.1M
2017	~2.8M	~0.1M	~0.1M	~0.1M

Domestic Export

European Union Africa Oceania Europe

USA

Government programs

Evidence-Based
Policymaking

Increase availability and use of data in
to build evidence about government
programs, while protecting privacy and
confidentiality.



Potential adopters in Singapore



Singapore Government
Integrity • Service • Excellence



Ministry of Education
SINGAPORE



15th ANNIVERSARY

Work with us!



Collaborators | Partners | Trials | Demos

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