

Benefits and challenges of SaaS migration in financial services

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Agenda

1. On premise vs SaaS
2. Why SaaS
3. What to consider when moving to SaaS
4. Live examples

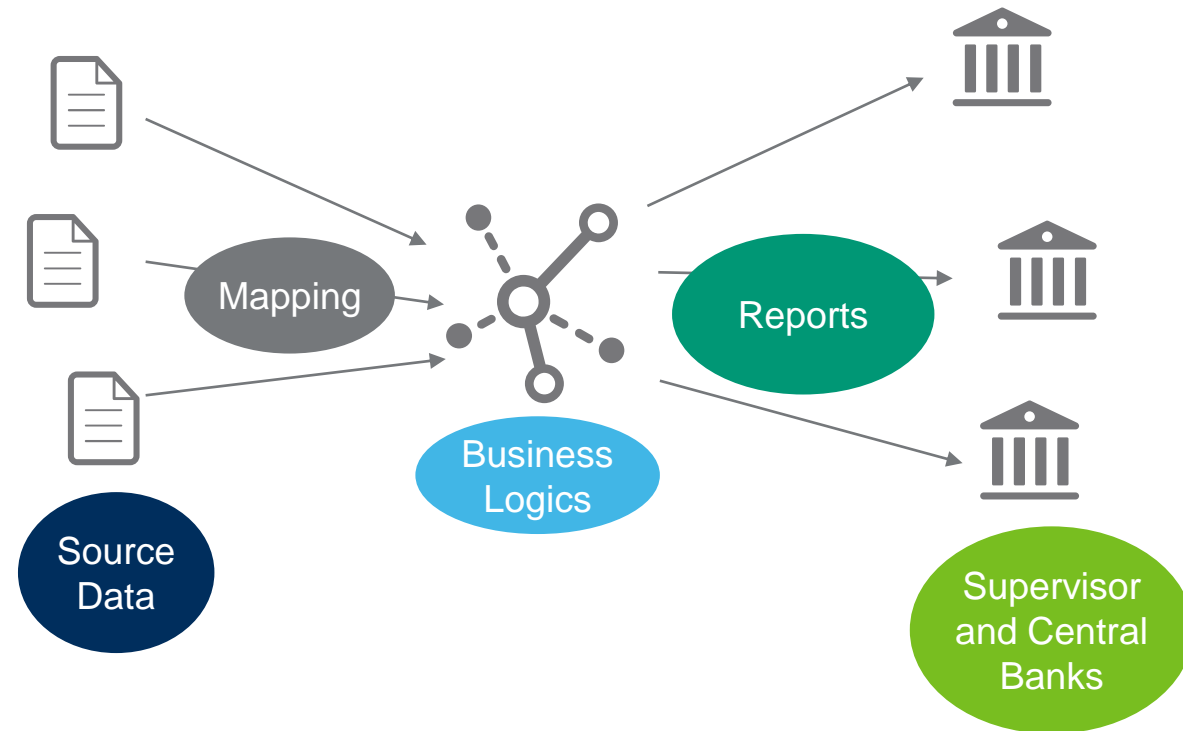
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On premise vs SaaS

Classic RegTech Implementation

On premise installation

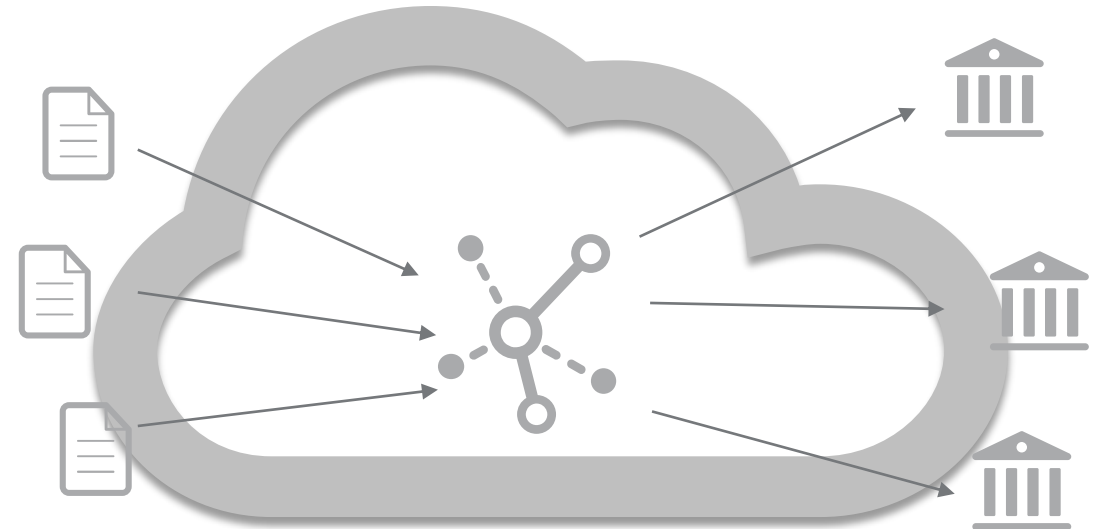
- » Regulatory and Compliance solutions (e.g. RWA engine, Statistical reports) require granular and comprehensive data
- » Solutions map and transform data to the expected format, eventually using advanced calculation engines
- » Reports are subsequently produced and sent to regulatory bodies



Shifting from on premise to SaaS

Implementation difference

- » On premise implementations involve:
 - Business users
 - IT department (for integration)
 - Vendor
 - › Except for internal development
 - › Generally, maintenance is provided
- » SaaS implementations are handled by the Vendor. The whole infrastructure is part of the offering and is transparent to the Bank. Business Users have direct access to the software
- » SaaS is hosted on the Cloud

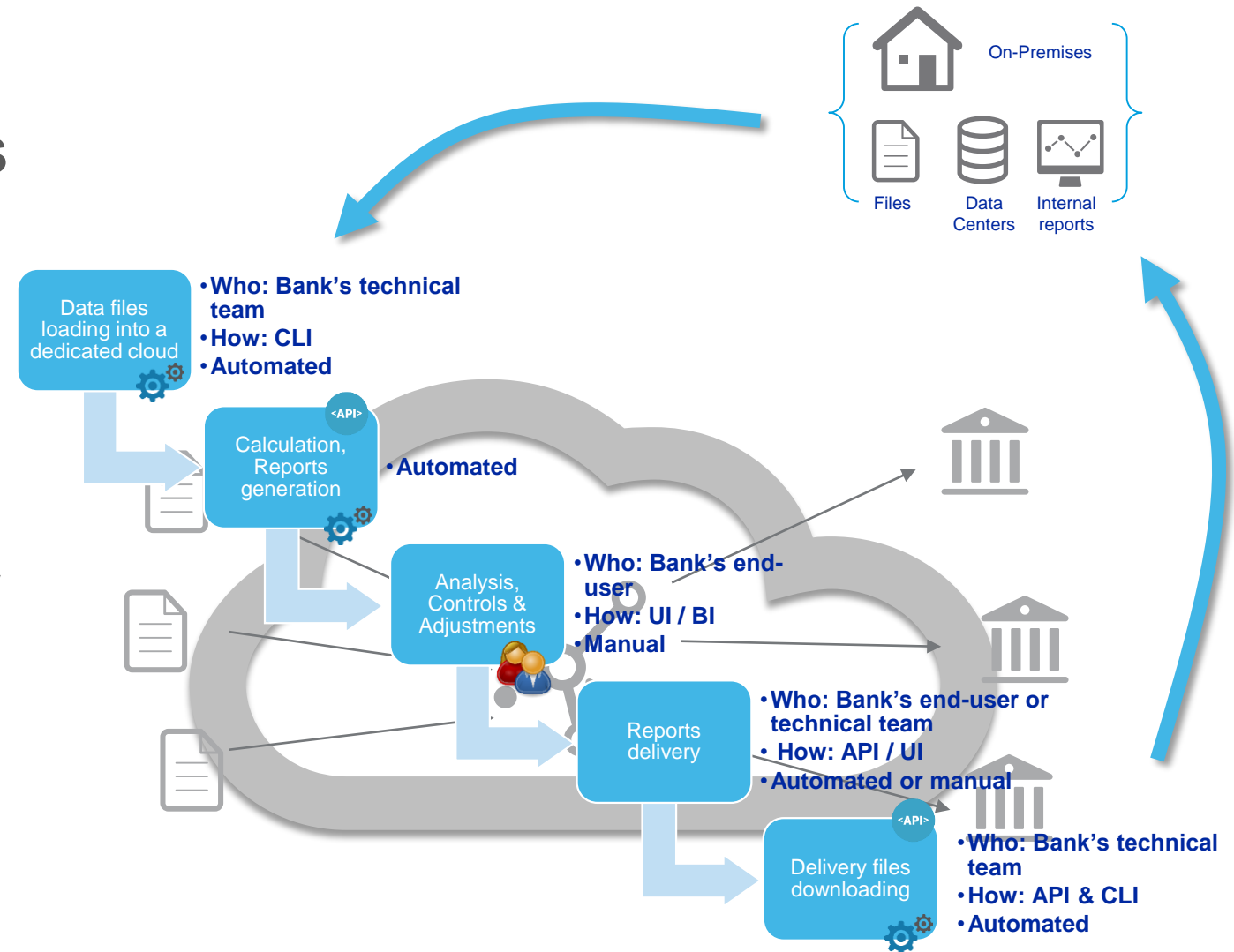


SaaS integration

Integration with bank's systems

» SaaS allows:

- Data upload and results download via native API or Command Line Interface
- User Access Management as per bank's Identity Management systems
- Scheduling and Automation within the solution or via APIs
- Simple administration and functional tasks via a User Interface



Services and Features provided by a SaaS

- ✓ Tenant Administration Interface
- ✓ User management (interface to your Identity Management Systems)
- ✓ Performance monitoring
- ✓ Infrastructure and platform administration (OS upgrades, middleware administration...)
- ✓ Secured data upload & secured storage management
- ✓ High availability (24/7 SLA, disaster recovery proof, Back-up)
- ✓ Transparent upgrade (fixes, security patches, versions)
- ✓ Ease of scaling up & down
- ✓ Compliant (cloud certifications, auditable, SOC2)

Flexible Environment Sizing

Besides Production, RegTech requires Development and Testing environments with correct sizing

Different purpose



Development

Designed to support the configuration of analytics when still in the implementation stage.

Main benefits are cost, simplicity & flexibility



Test

Designed to support all validation activities.
Usefull for functional test, performance test & pre-production validation.
Environment as big as the production environment for realistic test.

Main benefits are lower cost compared to production & simplicity



Production

Designed to support the production requirements.
Highest SLA.
Disaster Recovery Proof.
Compliant & Auditable.
Long-term archiving.

Main benefits are compliance, reliability & performance

Available in different sizes

Small

Standard

Premium

Less CPU

More CPU

The bank defines its requirements, not the sizing

Examples of requirements



99.9%

Uptime



12h

To reestablish service
after disaster



3h

To generate regulatory
reports for the global book

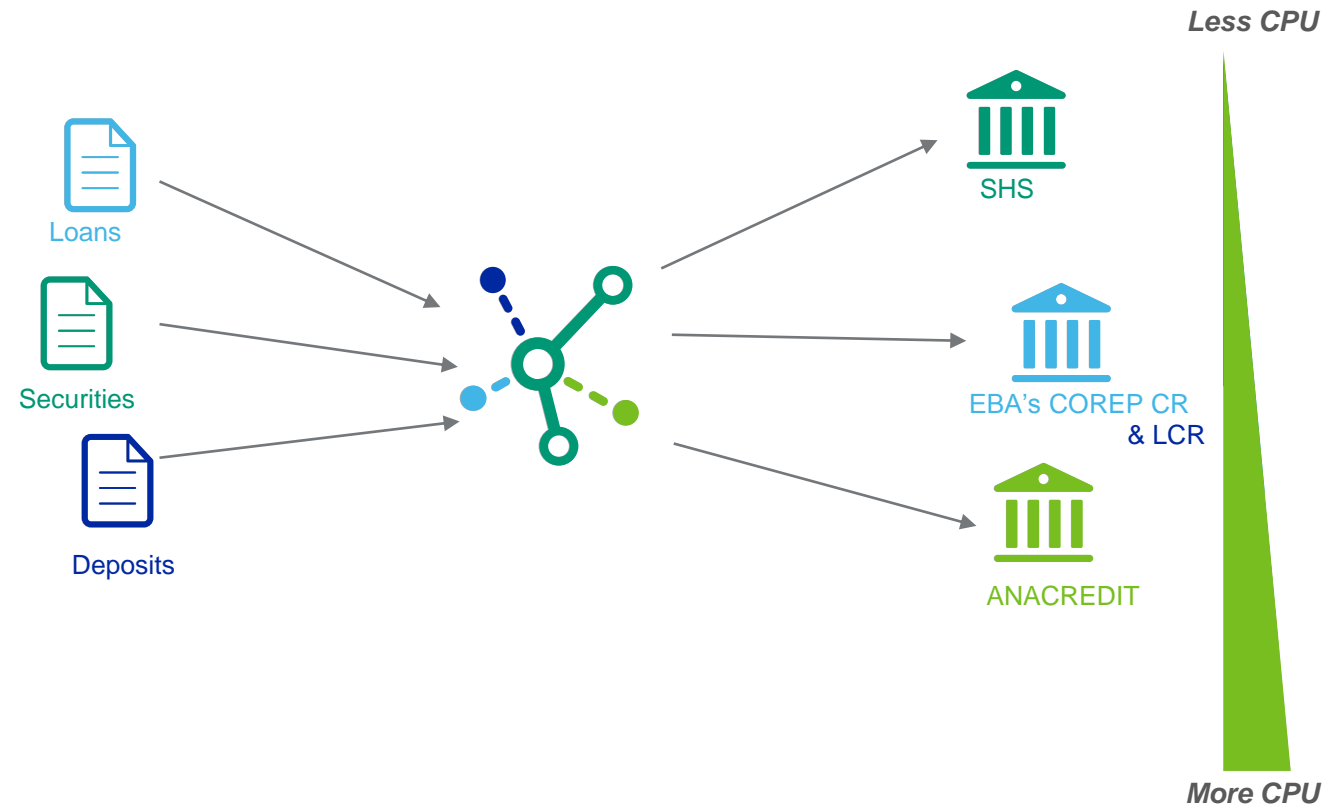
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Why SaaS

More flexible with your regulatory requirements

Scalable and adaptive solution for demanding requirements

- » Supervisors and central banks demand reporting:
 - More frequently,
 - More granular,
 - More comprehensive
- » Banks should still ensure consistency and data lineage
- » In a SaaS offering, vendors can leverage a single platform to fulfil more requirements, where bank's business users focus on providing new data and signing off reports



Implementing software faster

Focus on the regulatory requirements, not the infrastructure

- » Environments are instantaneously available
 - No need to wait IT Infrastructure to start the implementation
 - Get on-demand copies of production environments for testing and developing
- » Banks are focused on getting business data and validating reports – the configuration is part of the service
- » Be more agile to implement new requirement and aim at continuous improvements
- » Increase transparency, flexibility and productivity implementing new requirements
- » We expect SaaS project to be 30% more efficient versus on premise implementation (targeting both: faster installation and reduction of expenses)

Benefit the latest features

SaaS – always up to date

- » SaaS Vendor performs silent updates:
 - Performance improvements,
 - Security patches.
- » Some changes require your involvement:
 - New features and change in user interface
 - Improvement of data model and engines
- » A temporary environment with the new version can be delivered for tests
- » Tools to manage the upgrades:
 - Automated acceptance test
 - Gap analysis
 - New features toggle
- » Benefits :
 - Smooth & controlled transition to the new version.
 - Provide a safe place to try & fail to adapt to the new version without impacting the production or development environments.
 - No need to deploy a new infrastructure just for upgrade (which slow down upgrade adoption in too many cases).
 - It helps you to stay current on the most impacting regulation changes.

Always up to date with regulations

Regulatory maintenance

- » SaaS Vendors have access to the solution to maintain the business rules, e.g.:
 - Update in an existing regulation (e.g. Finalised Basel 3 rules)
 - Update in a taxonomy (e.g. from EBA taxonomy 2.6 to 2.7)
 - Adding new regulations (e.g. AnaCredit)
- » This is not a version upgrade but rather an update of the regulatory configuration
- » **Benefits :**
 - Always up to date with regulation
 - A flexible data model allows updates without changing software version

Long term cost reduction for infrastructure

With more services outsourced

» Cost Savings:

- Competition between cloud providers reduces costs of SaaS solutions
- SaaS technologies use open-source solutions (e.g. Hadoop), often less expensive than legacy solutions (e.g. on-premises database)

» Cost Control:

- SaaS customers have a better control on their IT costs as they are Paid on a subscription basis and Cancelable
- IT costs are dimensioned to the usage; flexibility is increased and you can pay-per-need (up and down scaling to adapt to new needs)
- SaaS solutions provide transparency on the costs of an application and help banks allocate it to the appropriate departments

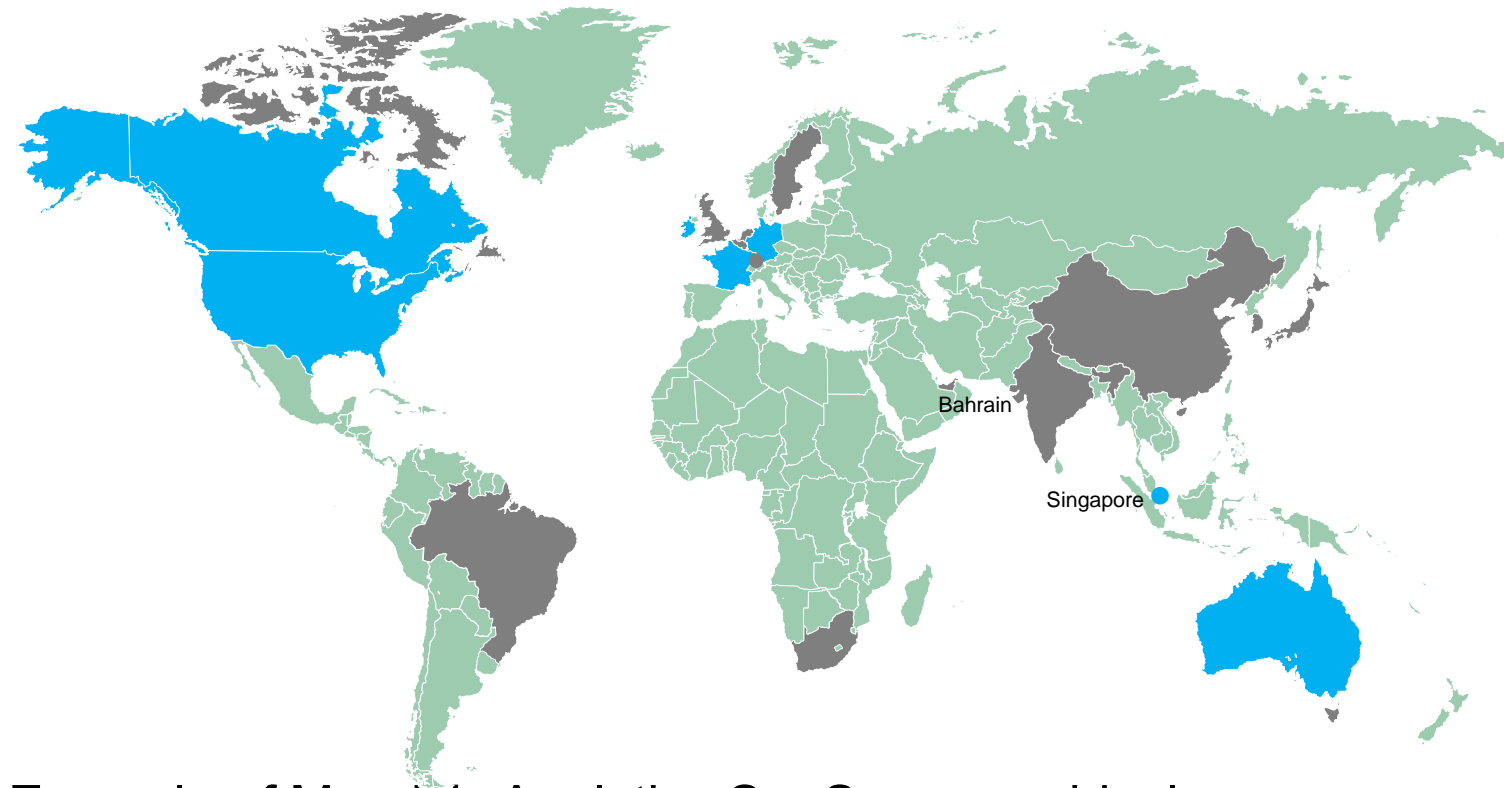
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What to consider when
moving to SaaS

Data Residency

Store and process your data where it makes sense from a compliance perspective

- Data should be stored in secured storage location which is allowed by your jurisdiction
- Data might be mirrored in another Disaster Recovery region of your choice to ensure the continuity of service should a disaster happen at a regional level.
- You may already have cloud storage which can be directly reused by the SaaS



Example of Moody's Analytics SaaS geographical coverage

Already available or planned in 2018

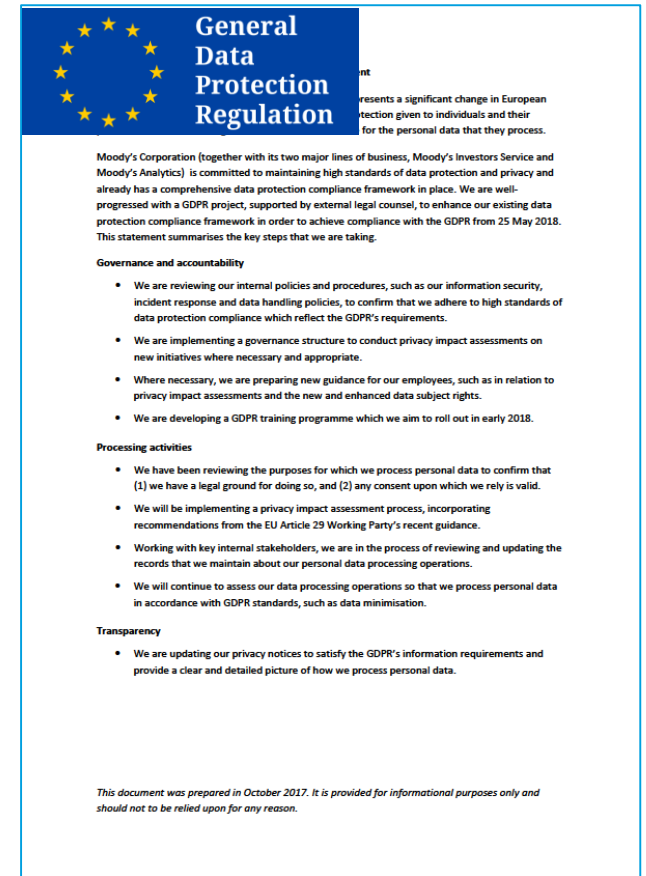
Future

No current plan

GDPR Compliance for EU Banks

SaaS solution should be aligned with your GDPR obligation

- » May 25th, 2018 - GDPR will become fully enforceable throughout the European Union.
- » SaaS provider must maintain high standards of data protection and privacy and have the necessary security policy in place to protect personal data within its company and systems.
- » Chief Privacy Officer is responsible for overseeing the data protection compliance framework (including GDPR compliance).
- » Commercial contracts must include the necessary obligations for Controllers and Processors as required under GDPR.



General Data Protection Regulation

nt represents a significant change in European protection given to individuals and their for the personal data that they process.

Moody's Corporation (together with its two major lines of business, Moody's Investors Service and Moody's Analytics) is committed to maintaining high standards of data protection and privacy and already has a comprehensive data protection compliance framework in place. We are well-progressed with a GDPR project, supported by external legal counsel, to enhance our existing data protection compliance framework in order to achieve compliance with the GDPR from 25 May 2018. This statement summarises the key steps that we are taking.

Governance and accountability

- We are reviewing our internal policies and procedures, such as our information security, incident response and data handling policies, to confirm that we adhere to high standards of data protection compliance which reflect the GDPR's requirements.
- We are implementing a governance structure to conduct privacy impact assessments on new initiatives where necessary and appropriate.
- Where necessary, we are preparing new guidance for our employees, such as in relation to privacy impact assessments and the new and enhanced data subject rights.
- We are developing a GDPR training programme which we aim to roll out in early 2018.

Processing activities

- We have been reviewing the purposes for which we process personal data to confirm that (1) we have a legal ground for doing so, and (2) any consent upon which we rely is valid.
- We will be implementing a privacy impact assessment process, incorporating recommendations from the EU Article 29 Working Party's recent guidance.
- Working with key internal stakeholders, we are in the process of reviewing and updating the records that we maintain about our personal data processing operations.
- We will continue to assess our data processing operations so that we process personal data in accordance with GDPR standards, such as data minimisation.

Transparency

- We are updating our privacy notices to satisfy the GDPR's information requirements and provide a clear and detailed picture of how we process personal data.

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Data encryption

- » Rely on strong encryption technology & practices.
- » Data must be encrypted end-to-end: In-Transit and At-Rest
- » Encryption Keys must not be accessible to SaaS providers and should be managed by the bank or a third party.
- » SaaS CloudOps should only administrate the service and have no access to data.

Business Continuity

Relying on a trusted partner

Business Continuity and Crisis Management services must be provided by a **Corporate Security & Business Continuity** department from the SaaS provider

Mission:

To support the SaaS provider to serve risk-sensitive financial markets, by enhancing its capabilities in managing and responding to unforeseen emergencies and crisis in an effective and efficient manner to enable the delivery of critical products and services at all times.

Security Incident Response must be provided by an **Incident Response Program & Incident Response Team** from the SaaS provider

Mission:

To prevent a serious loss of profits, information assets or public confidence by providing an immediate, skilful and effective response to any unexpected event involving SaaS's systems, databases, or networks. The IRP ensures consistency in handling security related incidents across all SaaS application services. The program incorporates documented methods of coordinating, tracking, responding and monitoring security incidents 24/7.

Stickiness and Reversibility

Ensure you still own the future of your RegTech strategy

- » SaaS means the software is managed by a third party and the data is hosted outside your systems
- » To anticipate change of strategy, make sure SaaS Vendors provide facilities for and commit to:
 - Getting the data back in a predefined format and in a secured channel
 - Deleting any existing data on their servers and provide a proof of deletion (from 3rd party)
 - Eventually helping to reinstall the solution on-premises
 - Providing all business rules used in SaaS

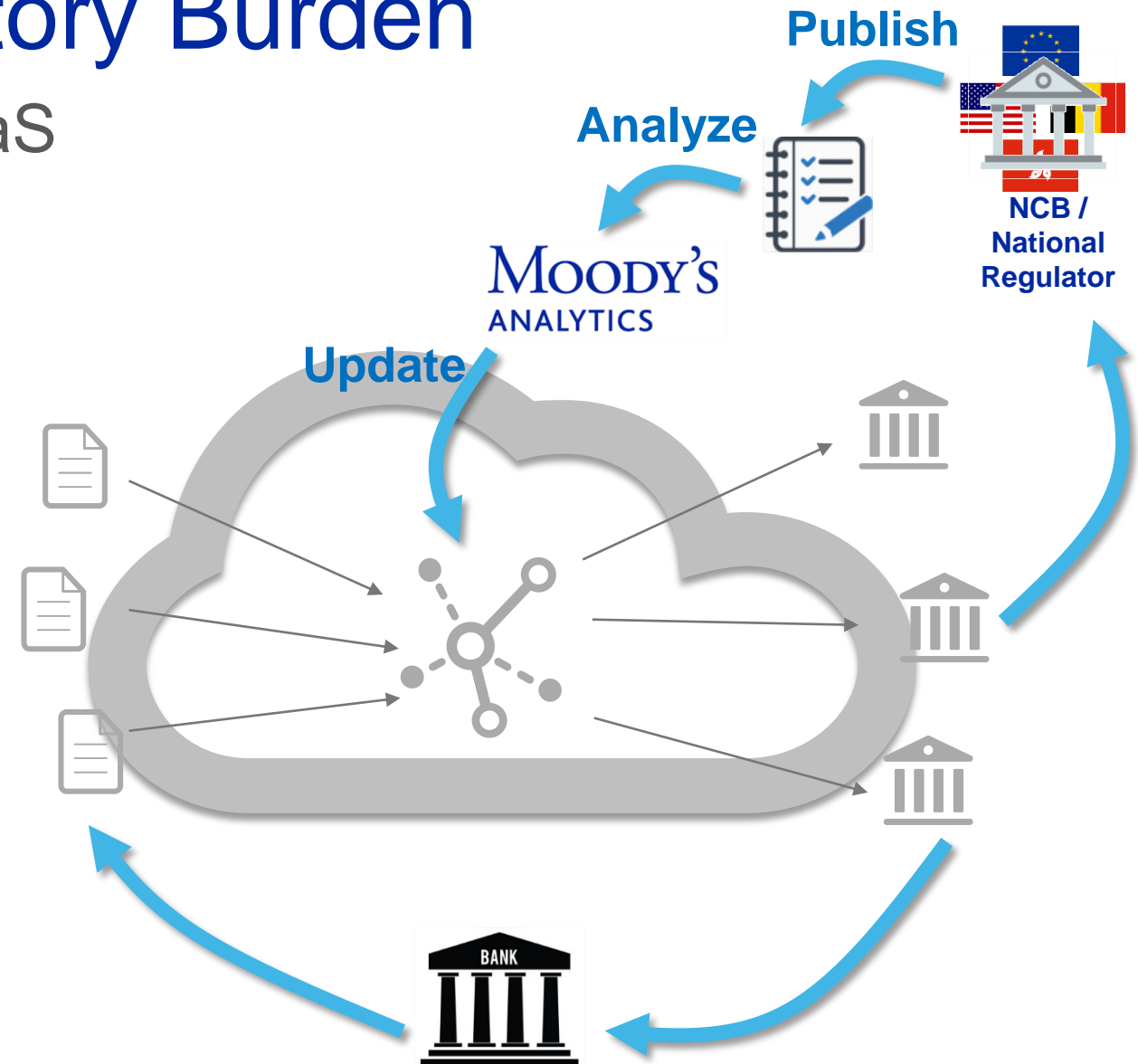
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Live examples

Outsourcing the Regulatory Burden

Moody's Regulatory Reporting SaaS

- » Moody's Analytics provides a SaaS solution to manage the latest regulatory and central banks requirements.
- » For instance, the ECB's AnaCredit reports can be generated through the SaaS solution.
- » Once a bank uses the solution, it can easily add new requirements, for instance:
 - ECB's SHS
 - Dutch RRE / CRE reports
 - EBA's SCV files



Hosted solution

Offering RiskFoundation Suite (RFOS) Hosted / SaaS

- » Current generation of RiskFoundation suite of products (RiskAuthority, RiskConfidence, ScenarioAnalyzer) will be hosted on Amazon Web Services (AWS), and delivered to clients as-a-service for an annual subscription
- » Oracle database will be offered as part of the hosted service, although clients will have the option to bring their own Oracle license

Interested banks:

- » Existing RiskFoundation clients that want to move to the cloud
- » New clients that want a fully outsourced solution

Benefits

- » Cheaper infrastructure & maintenance costs
- » Significantly shortened Implementation phase
- » Transparent continuous upgrade (fixes, patches, versions)
- » Ease of scaling up & down / elastic pricing
- » Compliant (Cloud certifications, auditable, SOC2)

RFOS hosted / SaaS: Key benefits

Focus on high-value tasks and not infrastructure

1

Cheaper infrastructure & maintenance costs, less hassles. Solution runs on AWS with high security standards; Annual subscription; Elasticity option; New data preparation functionalities (Paxata option); Functional upgrades services.

2

Faster & cheaper implementation for new needs. No on-prem. installation & infrastructure needed. Faster & cheaper implementation: circa 30% more efficient than on premises.

3

Proven & broad functionalities available immediately. Best-of-breed & proven solutions (RFO, RAY, RCO, SAE, QlikView). All-in competitive offering from MA (infra, database, software, services & support); Earlier / cheaper access to new functionalities.

Upcoming webinars in the series:

26 April 2018 | 9:30AM BST

SaaS security: best practices for minimizing risk

30 May 2018 | 9:30 AM BST

Data preparation in the Cloud to enable faster information insight

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Q&A

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