



# Secure Use of Cloud Computing in the Finance Sector ANNEXES

DECEMBER 2015



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## Annex A: List of consulted regulations

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### A.1 German Banking Act

[http://www.bafin.de/SharedDocs/Downloads/EN/Aufsichtsrecht/dl\\_kwg\\_en.pdf?\\_\\_blob=publicationFile](http://www.bafin.de/SharedDocs/Downloads/EN/Aufsichtsrecht/dl_kwg_en.pdf?__blob=publicationFile)

- The banking act section § 25a KWG requires banks to have a sound business organization, and in particular an effective risk management, including continuity plans (especially for the IT systems)
- Section § 25b KWG regulates outsourcings of banks
- Minimum requirements for risk management (MaRisk) are a BaFin circular that sets down the requirements of § 25 a KWG and § 25 b KWG in more detail:  
[https://www.bafin.de/SharedDocs/Downloads/DE/Rundschreiben/dl\\_rs1210\\_erlaeuterungen\\_ba.pdf?\\_\\_blob=publicationFile&v=3](https://www.bafin.de/SharedDocs/Downloads/DE/Rundschreiben/dl_rs1210_erlaeuterungen_ba.pdf?__blob=publicationFile&v=3)

### A.2 Bank of Italy regulation (Circolare n. 263)

[http://www.bancaditalia.it/competi/vigilanza/normativa/archivio-norme/circolari/c263/263CIRC\\_15AGG.pdf](http://www.bancaditalia.it/competi/vigilanza/normativa/archivio-norme/circolari/c263/263CIRC_15AGG.pdf)

- Chapter 7 - Outsourcing,
- Chapter 8 - Information Systems (including Cloud Computing)

### A.3 Czech Decree No. 163/2014 Coll., on the performance of the activity of banks, credit unions and investment firms

[http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/en/legislation/decrees/decrees\\_163\\_2014.pdf](http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/en/legislation/decrees/decrees_163_2014.pdf)

### A.4 Czech Law No. 181/2014 Coll. on Cyber Security

<https://www.govcert.cz/download/nodeid-556/>

### A.5 Dutch Financial Supervision Act (Wft)

<https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/brieven/2009/11/16/engelse-vertaling-van-de-wft/act-on-financial-supervision.pdf>

### A.6 Finnish Regulations and guidelines 1/2012 - Outsourcing in supervised entities belonging to the financial sector

[http://www.finanssivalvonta.fi/en/Regulation/Regulations/New/Documents/01\\_2012.M3\\_en.pdf](http://www.finanssivalvonta.fi/en/Regulation/Regulations/New/Documents/01_2012.M3_en.pdf)

### A.7 Luxembourg regulation on professional secrecy (Article 41 of the Law of 5 April 1993 on the financial sector)

- Luxembourg Circular CSSF 12/552 (as amended) on Central administration, internal governance and risk management. Chapter 7.4 on Outsourcing:  
[http://www.cssf.lu/fileadmin/files/Lois\\_reglements/Circulaires/Hors\\_blanchiment\\_terrorisme/cssf12\\_552\\_eng\\_upd241114.pdf](http://www.cssf.lu/fileadmin/files/Lois_reglements/Circulaires/Hors_blanchiment_terrorisme/cssf12_552_eng_upd241114.pdf)
- Several CSSF annual reports;  
The chapters dedicated to the Supervision of Information Systems contain opinions and recommendations related to IT hot topics or observations done in the course of the supervision of financial entities'

information systems. Those recommendations have no legal force but addresses are nevertheless expected to follow them:

- Annual report 2009, cf. Section 2.2. Cloud computing and virtualization  
[http://www.cssf.lu/fileadmin/files/Publications/Rapports\\_annuels/Rapport\\_2009/RA2009\\_eng\\_Chap\\_09.pdf](http://www.cssf.lu/fileadmin/files/Publications/Rapports_annuels/Rapport_2009/RA2009_eng_Chap_09.pdf)
- Annual report 2010, cf. Section 2.2. Virtualisation and mutualisation of network protection systems:  
[http://www.cssf.lu/fileadmin/files/Publications/Rapports\\_annuels/Rapport\\_2010/RA\\_2010\\_Chap9\\_eng.pdf](http://www.cssf.lu/fileadmin/files/Publications/Rapports_annuels/Rapport_2010/RA_2010_Chap9_eng.pdf)
- Annual report 2011, cf. Section 2.2. Use of cloud computing by financial institutions:  
[http://www.cssf.lu/fileadmin/files/Publications/Rapports\\_annuels/Rapport\\_2011/RA2011\\_chapter\\_10\\_eng.pdf](http://www.cssf.lu/fileadmin/files/Publications/Rapports_annuels/Rapport_2011/RA2011_chapter_10_eng.pdf)
- Annual report 2012, cf. Section 2.3: Remote management of a Virtual Desktop Infrastructure and 2.6 Office tools in the cloud  
[http://www.cssf.lu/fileadmin/files/Publications/Rapports\\_annuels/Rapport\\_2012/RA2012\\_EN\\_chapter11.pdf](http://www.cssf.lu/fileadmin/files/Publications/Rapports_annuels/Rapport_2012/RA2012_EN_chapter11.pdf)

#### **A.8 Central Bank of Greece regulation ΠΔΤΕ 2597/2007 on outsourcing**

<http://www.bankofgreece.gr/pages/en/supervision/legal/creditinstitutions/supervisionrules/control.aspx>

#### **A.9 National Bank of Slovakia Methodological Instruction of the Banking Supervision Division No. 6/2004 on the utilisation of outsourcing by banks**

<http://www.nbs.sk/en/financial-market-supervision/banking-sector-supervision/recommendations-and-methodical-instructions/methodical-guidance/mi-of-the-banking-supervision-division-no-6-2004>

#### **A.10 National Bank of Slovakia Methodological Instruction of the Banking Supervision Division No. 7/2004 on the audit of information systems security of banks and branch offices of foreign banks**

<http://www.nbs.sk/en/financial-market-supervision/banking-sector-supervision/recommendations-and-methodical-instructions/methodical-guidance/mi-of-the-banking-supervision-division-no-7-2004>

#### **A.11 Circular del Banco de España 3/2008**

<http://www.bde.es/f/webbde/SJU/normativa/circulares/c200803.pdf>

#### **A.12 National Bank of Croatia Guidelines on information systems management**

<http://www.hnb.hr/supervizija/h-smjernice-za-upravljanje-informacijskim-sustavom.pdf>

#### **A.13 National Bank of Croatia Guidelines on risk management of information systems**

<http://www.hnb.hr/supervizija/kreditne%20unije/h-smjernice-informacijski-sustav-kreditne-unije.pdf>

#### **A.14 Bank of England Prudential Regulation Authority Rulebook**

<http://www.prarulebook.co.uk>



## A.15 Central Bank of Cyprus

[http://www.centralbank.gov.cy/nqcontent.cfm?a\\_id=13841](http://www.centralbank.gov.cy/nqcontent.cfm?a_id=13841)

## Annex B: Survey for Financial Institutions and CSPs

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### B.1 Questionnaire: The Industry perspective

1. Organization residency (Country):

2. Your organization is a (Please mark with "X"):

Bank	
Investment firm	
Payment processor	
RTGS manager	
Central counterparty	
Clearing house	
Professional association	
Cloud Service Provider	
Other (please specify)	

3. What is your level or responsibility (Please mark with "X")?

C-level Executive	
Manager	
Staff	

4. Which of the following best describes your professional role as it related to information technology (Please mark with "X")?

IS Assurance / Security / Audit / Risk Management	
Information Systems Management or IT Professional	
Network/Enterprise Architect	
CSO/CISO	
Line of business (LOB) owner	
Other (please specify)	

5. Which best describes the size of your company (Please mark with "X")?

1 – 99 employees	
100 – 499 employees	
500 – 999 employees	
1000 – 4,999 employees	
Greater than 5,000 employees	

NOTE for the Cloud Service Providers (CSP): All the questions that follow are addressing to Financial Institutions, if you are a CSP please reply to the question based on your experience in interacting with Financial Institution customers or potential customers.

6. Has the organisation you work for ever used cloud services (Please mark with “X”)?

Yes (please specify*)	
No	

\*If you answered YES, please specify which cloud services have you used (Please mark with “X” all options that apply):

Scenario	Public Cloud	Private Cloud
Email		
ERP (Finance & Accounting)		
ERP (Human capital management)		
Collaboration and content management platforms		
Application development/ test environment		
Storage /Disaster discovery/ Data archiving		
Processing capacity		
Spam management		
CRM (ie. Salesforce or similar)		
Marketing tools (i.e. radian6)		
Virtual desks		
Big Data Services		
Mobile Security Elements		
Data analysis & Intelligence		
Financial Services		
Backend Services		
Customer support/ticketing		
Human Resources		
Other (please specify)		

7. If you have replied YES to Q.6 please select from the options listed the one that best describe you situation (Please mark with “X”):

In our organisation we started using cloud services NOT being aware that we were using cloud services	
In our organisation we started using cloud services being aware that we were using cloud services	

8. Which cloud services are you interested in adopting (Please mark with “X” all options that apply):

Scenario	Public Cloud	Private Cloud
Email		
ERP (Finance & Accounting)		
ERP (Human capital management)		
Collaboration and content management platforms		
Application development/ test environment		
Storage /Disaster discovery/ Data archiving		
Processing capacity		
Spam management		
CRM (ie. Salesforce or similar)		
Marketing tools (i.e. radian6)		
Virtual desks		
Big Data Services		
Mobile Security Elements		
Data analysis & Intelligence		
Financial Services		
Backend Services		
Customer support/ticketing		
Human Resources		
Other (please specify)		

9. What is (would be) your primary reason for adopting cloud computing? (Please mark with “X” all options that apply)

Reduction in TCO	
Flexible infrastructure capacity	
Reduced time for provisioning	
Optimisation of in-house technical and human resources	
Service Value	
Infrastructure Deployment Automation (through API services)	
Better security	
Mobility	
Flexible payment models (pay as you go)	
Reduced time to market/value	
More advanced applications and updates	
Broader reach/collaboration	
Business continuity	
Other (please specify)	

10. Which of the following describes your company’s approach to Cloud Computing (Please mark with “X”)?

We have a strict no-Cloud policy	
We do not have a clear strategy around cloud computing	
We have already developed a cloud strategy	
Other (please describe your company’s approach)	

11.A If 10 is answered a: We have a strict no-Cloud policy.

Please describe the reason of your policy (Please mark with “X” all options that apply):

We believe we don't need Cloud Computing services	
Security concerns	
Privacy concerns	
We are waiting for a wider adoption from the industry	
Legal/Regulatory/Supervision compliance	
Concerns over government surveillance	
Concerns over public breach notification	
Cloud providers do not comply with our internal policies	

**11.B If 10 is answered b: We do not have a clear strategy around cloud computing.**

Please describe the reason of your approach (Please mark with “X” all options that apply):

We are yet to see the real value of Cloud Computing	
We have not found any service appealing to us	
We have not really looked into it	
Every business unit can deploy Cloud Computing strategies we revise each project individually	
Regulation restrictions prevent us from using the cloud	
Concerns over government surveillance	
Concerns over public breach notification	

**11.C If 10 is answered c: We have already developed a cloud strategy**

Please describe your approach (Please mark with “X” all options that apply):

Strict private-cloud only policy	
Mostly relying on in-house IT and moving non-critical services to the cloud	
Integration of in-house services with public cloud	
A mix of private and public cloud	
Mostly public cloud	
Initial test beds	

**12. If you have a strict private-cloud only policy, please describe the reason of your policy (Please mark with “X” all options that apply):**

We are confident this is all we need	
Security concerns	
Data Residency	
Data Retention/Destruction	
Privacy	
Compliance	
We are waiting for a wider adoption of public cloud services from the industry	

**13. Are you aware of specific regulatory requirements related to cloud computing adoption (Please mark with “X”)?**

Yes	
No	

14. Do you need to notify/ consult National Supervisory Authorities before the adoption of cloud-based solutions (Please mark with “X”)?

Yes, I do because it is mandatory (if yes, please specify in which cases)	
Yes, I do it on voluntary basis (if yes, please specify in which cases)	
No, because it is not mandatory	
No, because I’m not aware of it	
No. Other, please specify	

15. Have you or your team developed a detailed corporate risk assessment of Cloud Computing (Please mark with “X”)?

Yes	
No	

16. Please rank your security concerns regarding cloud computing (score 1-5<sup>1</sup>)

Loss of control of the data (Governance)	
User account control	
Provider Lock-In	
Isolation failures	
Compliance and legal issues	
Data confidentiality	
Integrity	
Availability	
Secure deletion	
Malicious insider	
Lack of auditing features	
Lack of transparency	
Data loss	
Data breach	
User activity monitoring/visibility	
Lack of Forensics capabilities	

<sup>1</sup>  
 1 - definitely not relevant / important  
 2 - only marginally relevant  
 3 - relevant / important  
 4 - highly relevant  
 5 - critical

17. Is there a specific service or feature that you would appreciate from cloud providers? (Please mark with “X” all options that apply)

Increased transparency and better auditing controls	
Better data-encryption tools	
Privacy Enhanced Technologies	
Forensics and e-discovery tools	
Physical audit of the data center	
Audit the service remotely	
Receive the logs in real time	
Better solution for data classification	
Better accountability framework and control over the supply chain	
Clearer policy and better tools for data portability	
Clearer policy and better tools for service portability	
Clarity on responsibility and liability attribution	
Incident reporting mechanism	
Other (please specify)	

18. Which areas present the main challenges for migrating to cloud-based solutions? (Please mark with “X” all options that apply)

The migration of EDW (Enterprise Data Warehouse) to Big Data / Cloud-based EDW	
High Frequency Trading solutions	
Integrated Platforms (e.g. ERPs)	
Logs collections and analysis (e.g. for Security Incidents detection, analysis and response)	
Regulatory obligations for data retention and archival	
Disaster Recovery / Business Continuity	
Other (please specify)	

19. Which are the mitigation measures implemented during migration to cloud services (Please mark with “X” all options that apply):

Information Assurance and Security Certifications	
Right to Audit	
Avoid Vendor Lock-in	
Request clearly defined SLAs from the CSPs	
Develop exit strategies	
Do not move any client’s data to the cloud.	
Required a deep auditing permission in case of an incident.	
Require security measures to be thoroughly implemented (malware detection and removal, forensic readiness, etc.)	
Penalty clauses in case of incident	
Other (please describe)	

20. If you are adopting or are planning to adopt cloud services what kind of security requirements does your organization strictly require? (Please mark with “X” all options that apply)

We do not move any client’s data to the cloud	
We require a deep auditing permission in case of an incident	
We require security measures to be thoroughly implemented (malware detection and removal, forensic readiness, etc.)	
Penalty clauses in case of incident	
Other (please describe)	

21. How do you ensure the compliance to regulations and internal procedures by the service providers? (Please mark with “X” all options that apply)

SLA	
Specific clauses in the contract (e.g. right to audit)	
Certification	
Other (please specify)	

22. Please list the regulatory requirements you need to comply to? (Please mark with “X” all options that apply)

National regulations (Please specify)	
Data Protection	
Corporate Governance	
PCI-DSS	
PA-DSS	
Basel 3	
GLBA	

23. Have you had any security incident related to cloud services (Please mark with “X”)?

Yes	
No	

**IF YES (OPTIONAL)**

*What kind of incident?*

Data leakage	
Data availability	
Detected malware	
Unauthorized access	
Service abuse	
Other	

## Annex C: Survey for Regulators

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### C.1 Questionnaire: The Regulators' perspective

1. Name of the organization:
2. Country:
3. Roles and Responsibilities of the organization:
4. Specific Information security and risk management responsibilities:
5. Name of the Interviewee:
6. Roles and Responsibilities of the Interviewee:
7. Please assess your knowledge/expertise about information security (Please mark with "X"):

None – Poor	
Medium	
Proficient / Expert	

8. Please assess your knowledge/expertise about cloud computing (Please mark with "X"):

None – Poor	
Medium	
Proficient / Expert	

9. Please provide an estimation of the level of knowledge/expertise about information security in your organization (Please mark with "X"):

None – Poor	
Medium	
Proficient / Expert	

10. Please provide an estimation of the level of knowledge/expertise about cloud computing in your organization (Please mark with "X"):

None – Poor	
Medium	
Proficient / Expert	

11. Please provide an assessment of the attitude of your organization toward new technologies (Please mark with “X”):

Very conservative	
Conservative	
Progressive	
Very Progressive	

12. Do you believe that cloud computing services can bring benefits to the Financial Sector? If so, which ones? (Please mark with “X” all options that apply)

Reduction in TCO	
Flexible infrastructure capacity	
Reduced time for provisioning	
Optimisation of in-house technical and human resources	
Service Value	
Infrastructure Deployment Automation (through API services)	
Better security	
Mobility	
Flexible payment models (pay as you go)	
Reduced time to market/value	
More advanced applications and updates	
Broader reach/collaboration	
Business continuity	
Other (please specify)	

13. Which are the risks that you perceive as connected to the adoption of cloud computing in Financial Institutions? Please rank your security concerns regarding cloud computing (score 1-5<sup>2</sup>)

Loss of control of the data (Governance)	
User account control	
Provider Lock-In	
Isolation failures	
Compliance and legal issues	
Data confidentiality	
Integrity	
Availability	
Secure deletion	
Malicious insider	
Lack of auditing features	
Lack of transparency	
Data loss	
Data breach	
User activity monitoring/visibility	
Lack of Forensics capabilities	

14. I believe that in house ICT is riskier than Public Cloud: TRUE / FALSE. Please elaborate

15. I believe that in house ICT is riskier than Private Cloud: TRUE / FALSE. Please elaborate

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2

1 - definitely not relevant / important  
 2 - only marginally relevant  
 3 - relevant / important  
 4 - highly relevant  
 5 - critical

16. I believe that Cloud computing should be used in the following scenarios (Please mark with “X” all options that apply)

Scenario	Public Cloud	Private Cloud
Never in the financial sector		
Email		
ERP (Finance & Accounting)		
ERP (Human capital management)		
Collaboration and content management platforms		
Application development/ test environment		
Storage /Disaster discovery/ Data archiving		
Processing capacity		
Spam management		
CRM (ie. Salesforce or similar)		
Marketing tools (i.e. radian6)		
Virtual desks		
Big Data Services		
Mobile Security Elements		
Data analysis & Intelligence		
Financial Services		
Backend Services		
Customer support/ticketing		
Human Resources		
Other (please specify)		

17. Please estimate the level of adoption of cloud computing in financial sector (Please mark with “X”):

Very Low	
Low	
Medium	
High	
Very High	

18. What Financial Institutions should do to mitigate the risks related to cloud computing? (Please mark with “X” all options that apply)

Information Assurance and Security Certifications	
Right to Audit	
Avoid Vendor Lock-in	
Request clearly defined SLAs from the CSPs	
Develop exit strategies	
Do not move any client’s data to the cloud.	
Required a deep auditing permission in case of an incident.	
Require security measures to be thoroughly implemented (malware detection and removal, forensic readiness, etc.)	
Penalty clauses in case of incident	
Other (please describe)	

19. Which are the security requirements a Financial Institution should fulfill to be able to safely move the cloud?

20. Which are the regulatory requirements a Financial Institution should fulfill to be able to move the cloud? (Please mark with “X” all options that apply)

National regulations (Please specify)	
Data Protection	
Corporate Governance	
PCI-DSS	
PA-DSS	
Basel 3	
GLBA	

24. Do you require Financial Institutions to notify you if/when they are adopting cloud services (Please mark with “X”)? :

Yes, Always	
Yes, Only when moving critical services or sensitive data	
Yes, Only when moving to a Public Cloud	
Yes, Only when moving critical services or sensitive data in a Public Cloud	
NO, but we do appreciate voluntary notification	
NO	

25. Is there a specific service or feature that you believe should be introduced in the cloud offering to make service more suitable for the Financial Sector? (Please mark with “X” all options that apply)

Increased transparency and better auditing controls.	
Better data-encryption tools	
Privacy Enhanced Technologies	
Forensics and e-discovery tools	
Physical audit of the data center	
Audit the service remotely	
Receive the logs in real time	
Better solution for data classification	
Better accountability framework and control over the supply chain	
Clearer policy and better tools for data portability	
Clearer policy and better tools for service portability	
Clarity on responsibility and liability attribution	
Incident reporting mechanism	
Other	

26. Which of the following do you believe best describes Financial Institutions approach to Cloud Computing (Please mark with "X")?

They have a strict no-Cloud policy	
They do not have a clear strategy around cloud computing	
They have already developed a cloud strategy	
Other (please describe your company's approach below)	

## Annex D: List of consulted sources

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1. Financial Firm Secures its Private Cloud: **Beyondtrust** Customer Success Story  
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7. The sixth largest bank in Spain, **Bankinter**, uses the Amazon cloud to run credit risk simulations in 20 minutes, down from 23 hours before.  
<http://www.forbes.com/sites/tomgroenfeldt/2014/06/26/some-banks-are-heading-to-the-cloud-more-are-planning-to/>
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15. ComputerWeekly.com. (2015). Dutch bank ING puts HR services in the cloud.  
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## ENISA

European Union Agency for Network  
and Information Security  
Science and Technology Park of Crete (ITE)  
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