Executive Briefing
GDPR: Getting your data ready for heavy, new EU privacy regulations

Steve Ross, Director, Product Management
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Disclaimer

GDPR is a complex and detailed regulation.

There’s no single method or solution that will make all organizations compliant.

This presentation is intended to help organizations understand how Big Data platforms such as Cloudera software and services can be used to help comply with certain aspects of EU General Data Protection Regulation (GDPR) requirements. Applicability of any of these capabilities depends on each organization’s own requirements specific to their business. Every organization should determine its own needs with regard to GDPR and then evaluate solutions for suitability to those needs. The information contained in this presentation is not intended to be and should not be construed to be legal advice. Organizations must not rely on the information herein and they should obtain legal advice from their own legal counsel or other professional legal services provider.
General Data Protection Regulation (GDPR)

- Enforced from May 25 2018
- Rights of the consumer
  - Right to be forgotten/erasure
  - Right to access information
  - Right to data portability
  - Right for processing to be restricted

- Personal Data
  - Across people, process and technology
  - Impacts how personal data is collected and used

- Substantial penalties
  - Heavy fines for violations
  - Up to 20M Euros or 4% of the annual global turnover for the preceding financial year

- Obligations of the organization
  - Any organization with any users in the EU needs to be compliant
  - Includes companies based outside the EU, processing personal data from EU residents in connection with the offering any goods or services or monitoring user behavior
  - Includes data processor and data controller
Examples of personal data
Seven Key Principles of GDPR

- **Lawfulness, fairness, transparency**
  How do I track personal data?

- **Accountability**
  How can I demonstrate compliance? How do I report breaches in 72 hrs?

- **Storage limitation**
  How do I erase individual data records upon request when the file systems are immutable?

- **Integrity and confidentiality**
  How do I apply IT controls to prevent unauthorized access?

- **Purpose limitation**
  How do I track consent while using data science tool choice?

- **Data minimization**
  How can I anonymize personal data? How do I prevent unlawful data transfers?

- **Accuracy**
  What is a low-overhead way to fix data?
The path to GDPR compliance includes...

- **Stakeholder awareness**
  - Make sure stakeholders are fully aware of the GDPR and the impact it will have on the organisation. Ensure that key messages are understood by the Board and senior management - and gain buy-in for remediation and change programmes.

- **Readiness assessment**
  - Conduct a Readiness assessment to understand how near or far away your organisation is from relevant new requirements of the GDPR and the potential effort required.

- **Data inventories and mapping**
  - Compile an inventory of the personal data that is collected, who it is shared with and what controls govern its use. Authorities will expect this information to be made readily available.

- **Governance**
  - Use the GDPR to assess your holistic approach to privacy - do you have a Data Protection Officer? Who is ultimately accountable? How are you going to bring together different areas of the business to manage privacy risks on an ongoing basis?

- **Legal and compliance**
  - Review approaches to capturing consent. Re-draft privacy notices and determine how compliance will be demonstrated.

- **Technology**
  - Deploy technology and processes to bring about a Privacy By Design culture, and create robust breach management procedures, consider masking and encryption.

- **Data**
  - Ensure the organisation has the right data governance practices to respond efficiently to the new rights afforded to individuals, such as the rights to erasure and portability.

**Source:** Cognizant

Where are you along this path?
How big data solutions can help accelerate GDPR compliance
A single place to secure and govern for GDPR compliance

For data that is stored on a single platform, there is a single place to secure and govern for GDPR compliance, across all analytic workloads.
The Seven Principles of GDPR

1. Integrity and Confidentiality
2. Accountability
3. Lawfulness, fairness and transparency
4. Purpose limitation
5. Data Minimization
6. Accuracy
7. Storage Limitation
## How big data solutions can help

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Pillars of a comprehensive compliance solution

GDPR principles: Integrity, Confidentiality, Accountability, Lawfulness, Fairness, Transparencty

**Perimeter**
Guarding access to the cluster itself

**Access**
Defining what users and applications can do with data

**Visibility**
Reporting on where data came from and how it’s being used

**Data**
Protecting data in the cluster from unauthorized visibility

**Technical concepts:**
- Authentication
- Network isolation
- Permissions
- Authorization
- Auditing
- Lineage
- Encryption, tokenization, data masking
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**Cloudera Manager**

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**Cloudera Navigator**

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Protecting data in the cluster from unauthorized visibility

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**Navigator Encrypt & Key Trustee**
Governance: auditing, lineage, metadata

Capabilities:
- Inescapable, detailed audit – enabling forensics
- Full tracking of personal data
- Lineage tracking and visualization
Enterprise-grade encryption & key management

**Encryption**
- ALL data at rest: HDFS, HBase, metadata databases, temp files, ingest paths
- ALL data on the wire

**Key Management**
- Automated key replication & backup
- HSM backed key protection

**Redaction**
- Sensitive data in logs

**Legend**
- Metadata Store
- Encrypted Data
- Encryption Key

- Manager
- Navigator
- Impala
- Hive
- Sentry
- HDFS
- Kudu & HBase
- Navigator Key Trustee
- Log Files
- Ingest Paths, Temp/Spill files
- HSM (optional)
Enterprise-wide breach detection

**Detect**
Detect advanced threat leveraging machine learning models

**Investigate**
Search across Apache Spot’s user, endpoint, and network open data models for full context and accelerated investigation

**Respond**
Use Apache Spot open data models and Cloudera Navigator to see if the threat is widespread
# How big data solutions can help

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**Cloudera Data Science Workbench**: keep data governed |
| **Data Minimization** | Removing or anonymising data where possible. Preventing unlawful data transfers outside the EU while still enabling outsourcing. | **Cloudera Navigator**: tags can indicate allowed purpose, time limit  
**Apache Sentry**: Redacted views |
| **Accuracy**         | Finding a low-overhead way to fix data.                                             | **Apache Kudu**: Fast updates of individual records                                    |
| **Storage Limitation** | Deleting individual personal data records in Hadoop and Cloud storage, since those file systems are immutable. | **Apache Kudu**: Fast erasure of individual records  
**HDFS and Cloud storage options** |
Fine-grained access control and data masking

Apache Sentry for column-level permissions and views with masking and row filtering
(optional) Cloudera partners enable dynamic masking and tokenization
The right to erasure - challenges

1. **Existing data architectures** may spread personal data across many objects
2. **Self-service** generates derived datasets also subject to GDPR
3. **Volume and variety** means any solution needs to scale
4. **Storage capabilities** limit erasure options
   - HDFS and cloud object stores are “immutable”
Erasing individual records on HDFS and cloud storage

- Concentrate personal data in a small number of “lookup tables”
- Replace personal data in most locations with anonymized or pseudonymised data
- Instead of deleting records upon request, add them to a “to be deleted” list
- Execute a periodic batch job to remove “to be deleted” records by rewriting entire files/tables

Issue: The re-write step could render the cluster unusable for a period of time
Erasing individual records on Kudu
Laptop vs Centralized Data Science

**“Laptop Data Science”**

Typical Big Data Environment

- Data scientists pull data to their laptops so they can run their own tools

  - Copy personal data to laptops
  - Fails GDPR compliance audit
  - Potential data breach

**Centralized Data Science**

- Personal data remains governed
- Purpose limitation enforced

Cloudera Data Science Workbench
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What’s Next

● May 25, 2018 is 78 days away

● If you haven’t yet started the foundational activities, start them now!

● Come talk to us this afternoon at “Meet the Experts: GDPR” to learn more
Questions?
Thank you

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