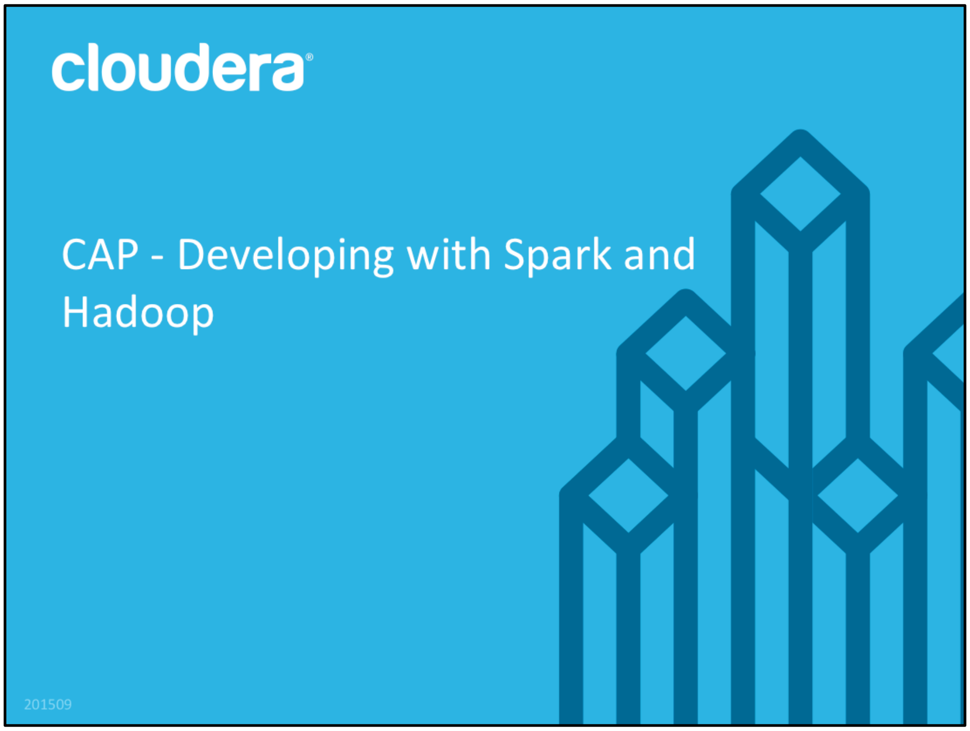

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CAP - Developing with Spark and Hadoop

201509

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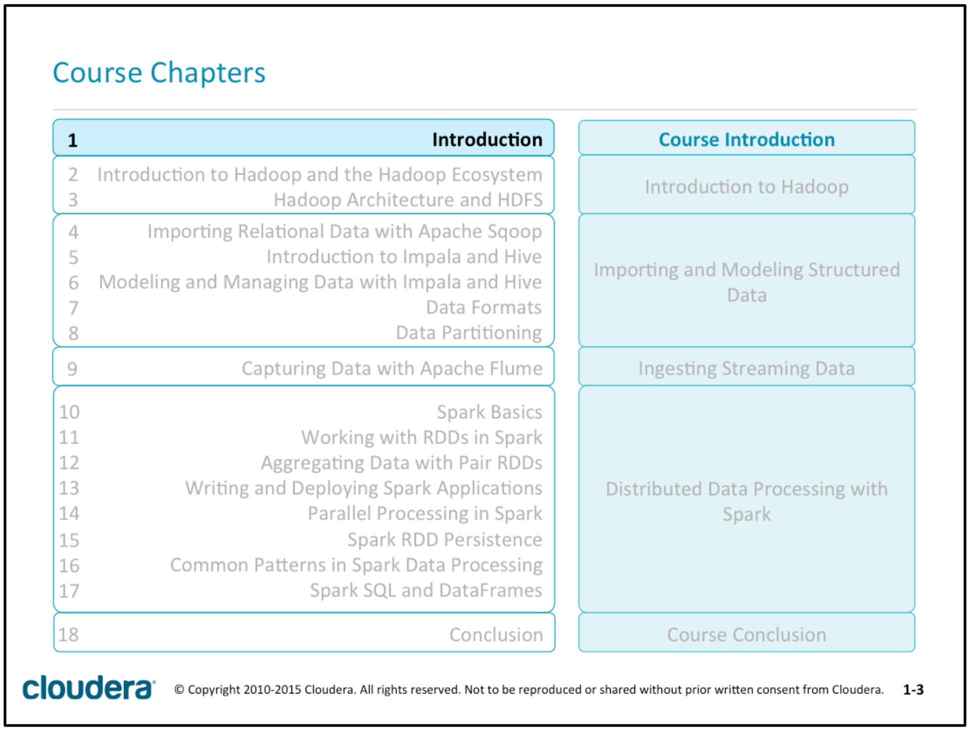
Introduction

Chapter 1



Course Chapters

1	**Introduction**	**Course Introduction**
2	Introduction to Hadoop and the Hadoop Ecosystem	Introduction to Hadoop
3	Hadoop Architecture and HDFS	
4	Importing Relational Data with Apache Sqoop	Importing and Modeling Structured Data
5	Introduction to Impala and Hive	
6	Modeling and Managing Data with Impala and Hive	
7	Data Formats	
8	Data Partitioning	
9	Capturing Data with Apache Flume	Ingesting Streaming Data
10	Spark Basics	Distributed Data Processing with Spark
11	Working with RDDs in Spark	
12	Aggregating Data with Pair RDDs	
13	Writing and Deploying Spark Applications	
14	Parallel Processing in Spark	
15	Spark RDD Persistence	
16	Common Patterns in Spark Data Processing	
17	Spark SQL and DataFrames	
18	Conclusion	Course Conclusion

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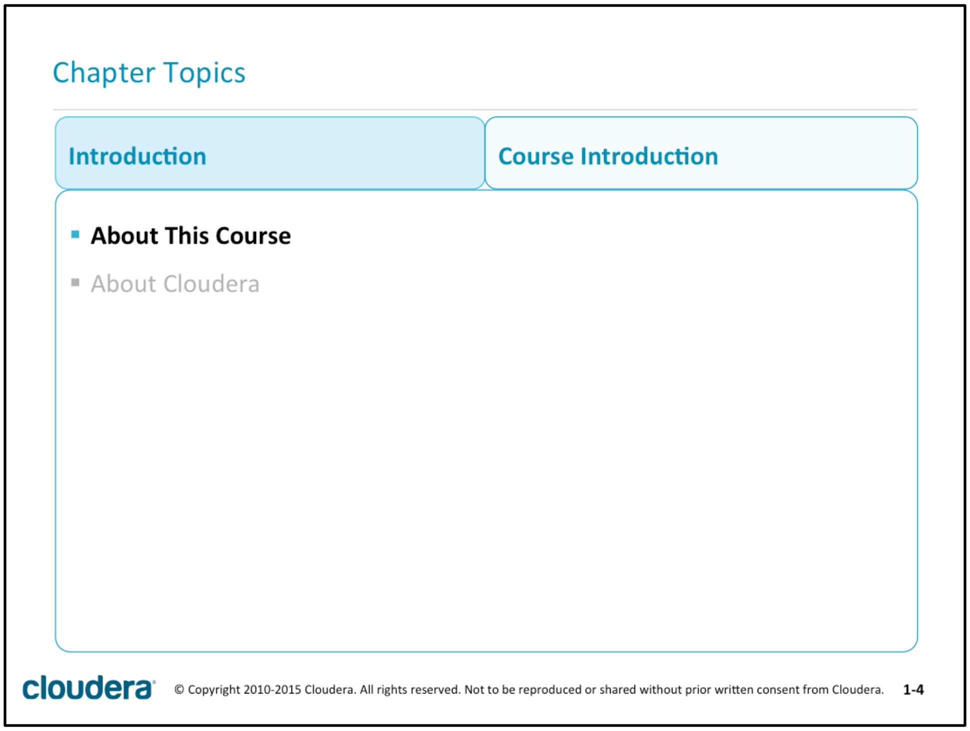
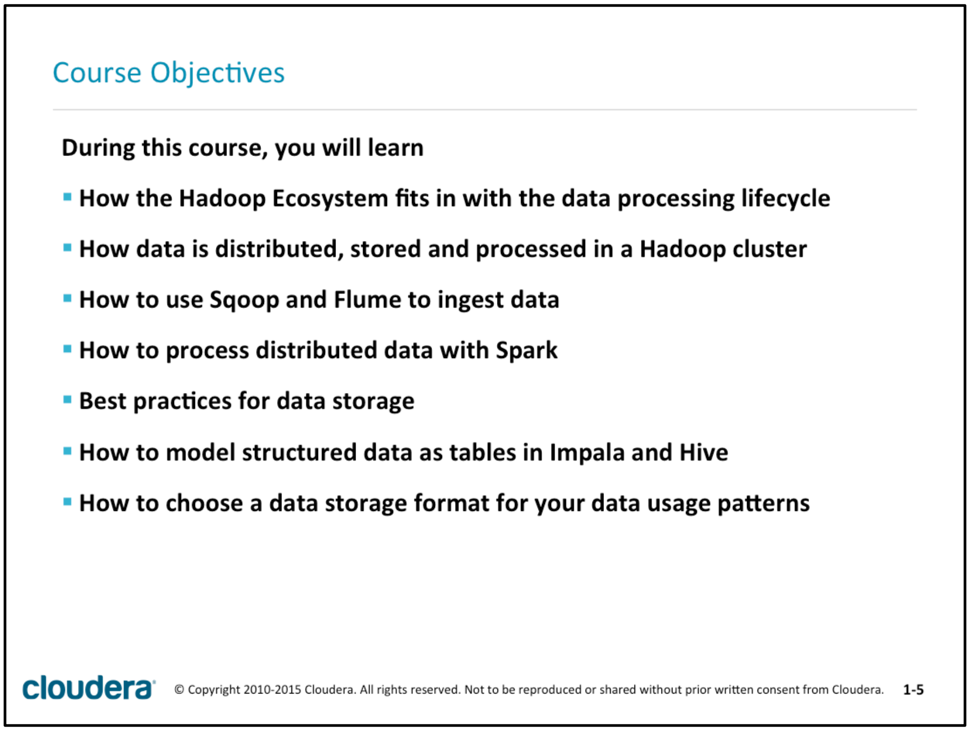


Chapter Topics

Introduction | **Course Introduction**

- **About This Course**
- About Cloudera

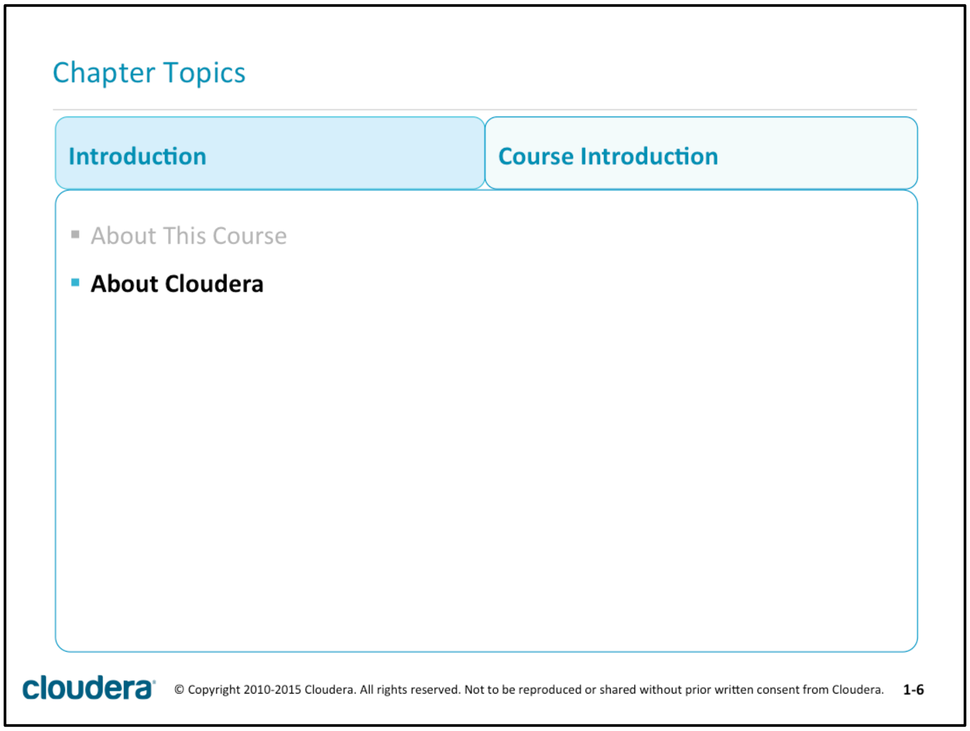
This slide shows the main topics covered in the current chapter. The current section is highlighted to illustrate the topic about to be covered.



Course Objectives

During this course, you will learn

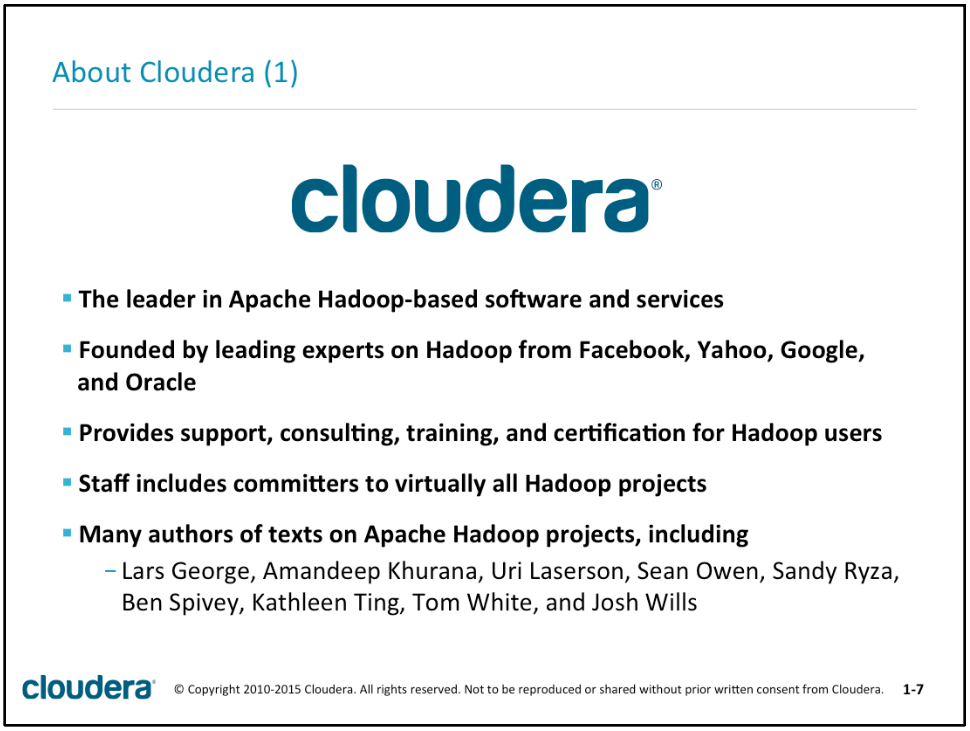
- **How the Hadoop Ecosystem fits in with the data processing lifecycle**
- **How data is distributed, stored and processed in a Hadoop cluster**
- **How to use Sqoop and Flume to ingest data**
- **How to process distributed data with Spark**
- **Best practices for data storage**
- **How to model structured data as tables in Impala and Hive**
- **How to choose a data storage format for your data usage patterns**



Chapter Topics

Introduction | **Course Introduction**

- About This Course
- **About Cloudera**



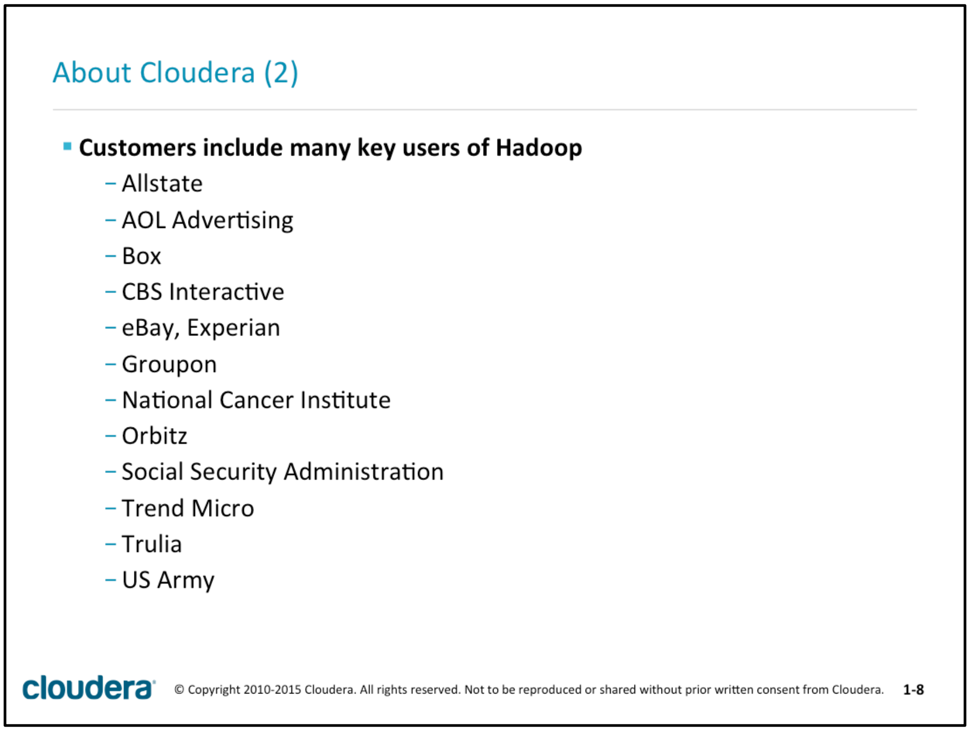
About Cloudera (1)

cloudera®

- **The leader in Apache Hadoop-based software and services**
- **Founded by leading experts on Hadoop from Facebook, Yahoo, Google, and Oracle**
- **Provides support, consulting, training, and certification for Hadoop users**
- **Staff includes committers to virtually all Hadoop projects**
- **Many authors of texts on Apache Hadoop projects, including**
  - Lars George, Amandeep Khurana, Uri Laserson, Sean Owen, Sandy Ryza, Ben Spivey, Kathleen Ting, Tom White, and Josh Wills

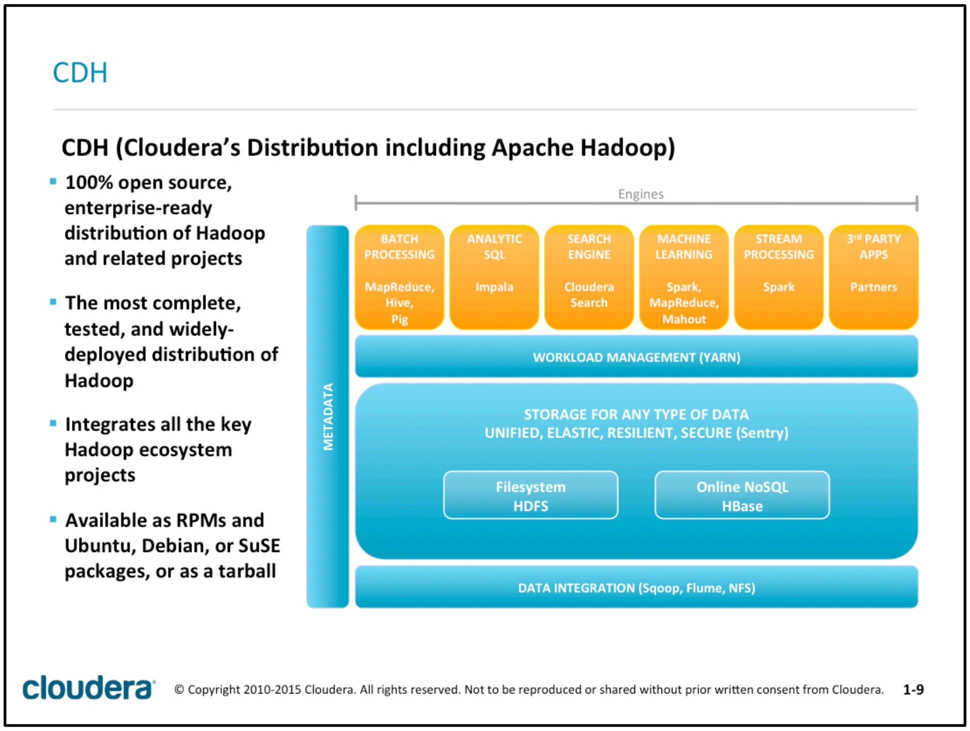
Cloudera was founded in 2008. Our staff also includes the ASF chairperson and creator of Hadoop, Doug Cutting, as well as many involved in the project management committee (PMC) of various Hadoop-related projects. The person who literally wrote the book on Hadoop, Tom White, works for Cloudera, as does the person who wrote the first book on HBase, Lars George.

There are many other Cloudera employees who have written or co-authored books on Hadoop-related topics, and you can find an up-to-date list here [`http://www.cloudera.com/content/cloudera/en/developers/home/hadoop-ecosystem-books.html`].



About Cloudera (2)

- **Customers include many key users of Hadoop**
  - Allstate
  - AOL Advertising
  - Box
  - CBS Interactive
  - eBay, Experian
  - Groupon
  - National Cancer Institute
  - Orbitz
  - Social Security Administration
  - Trend Micro
  - Trulia
  - US Army



CDH

CDH (Cloudera's Distribution including Apache Hadoop)

- 100% open source, enterprise-ready distribution of Hadoop and related projects
- The most complete, tested, and widely-deployed distribution of Hadoop
- Integrates all the key Hadoop ecosystem projects
- Available as RPMs and Ubuntu, Debian, or SuSE packages, or as a tarball

Engines

BATCH PROCESSING
MapReduce, Hive, Pig

ANALYTIC SQL
Impala

SEARCH ENGINE
Cloudera Search

MACHINE LEARNING
Spark, MapReduce, Mahout

STREAM PROCESSING
Spark

3rd PARTY APPS
Partners

METADATA

WORKLOAD MANAGEMENT (YARN)

STORAGE FOR ANY TYPE OF DATA
UNIFIED, ELASTIC, RESILIENT, SECURE (Sentry)

Filesystem HDFS

Online NoSQL HBase

DATA INTEGRATION (Sqoop, Flume, NFS)

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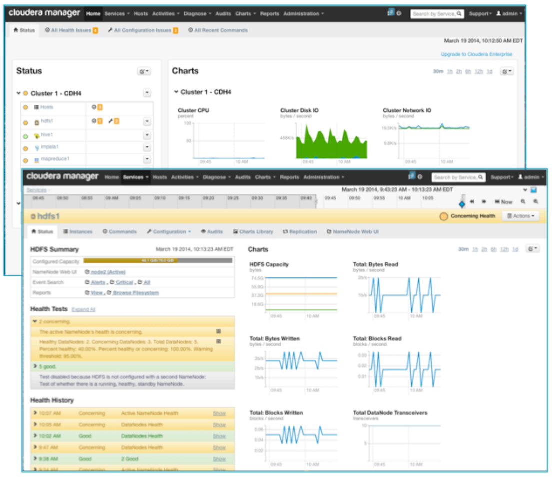
You can think of CDH as analogous to what RedHat does with Linux: although you could download the "vanilla" kernel from kernel.org, in practice, nobody really does this. CDH is a tested and validated Hadoop distribution which includes Apache Hadoop and all the complementary tools you'll be learning about in this course. All of this is completely open source and available under the Apache license from Cloudera's website.

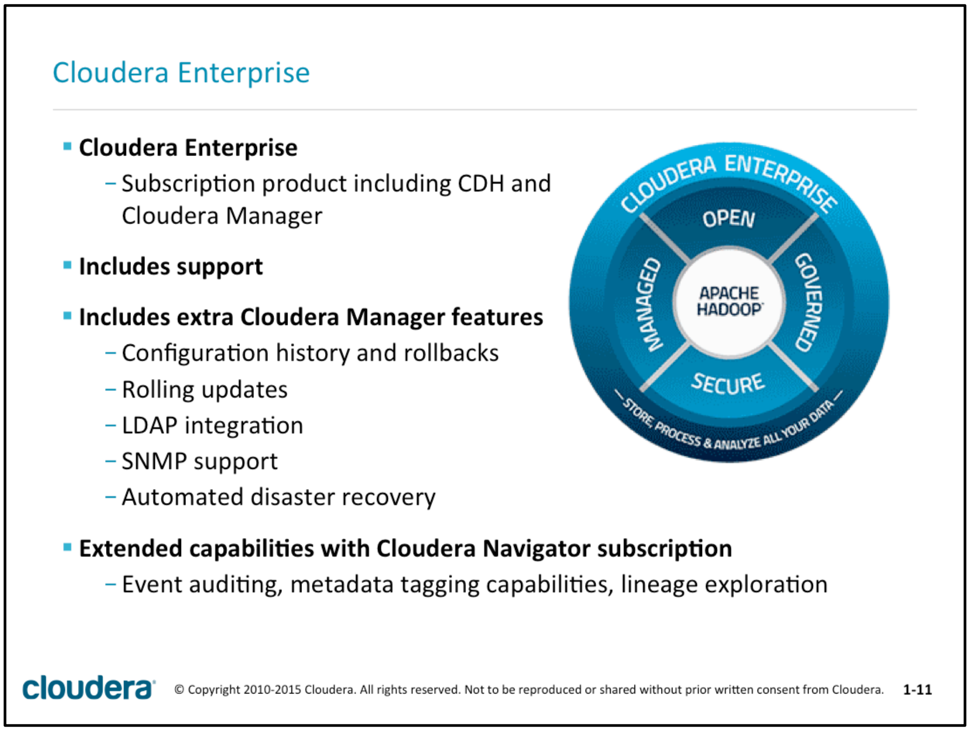
Cloudera Express

- **Cloudera Express**
  - Completely free to download and use
- **The best way to get started with Hadoop**
- **Includes CDH**
- **Includes Cloudera Manager**
  - End-to-end administration for Hadoop
  - Deploy, manage, and monitor your cluster



Main point: Cloudera Express is free, and adds Cloudera-specific features on top of CDH, in particular Cloudera Manager (CM).

Note: Cloudera Express previously imposed a 50 node limit, but it no longer does.



Cloudera Enterprise

- **Cloudera Enterprise**
  - Subscription product including CDH and Cloudera Manager
- **Includes support**
- **Includes extra Cloudera Manager features**
  - Configuration history and rollbacks
  - Rolling updates
  - LDAP integration
  - SNMP support
  - Automated disaster recovery
- **Extended capabilities with Cloudera Navigator subscription**
  - Event auditing, metadata tagging capabilities, lineage exploration

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LDAP = Lightweight Directory Access Protocol
SNMP = Simple Network Management Protocol