Health Enterprise Platform: How to Proceed?

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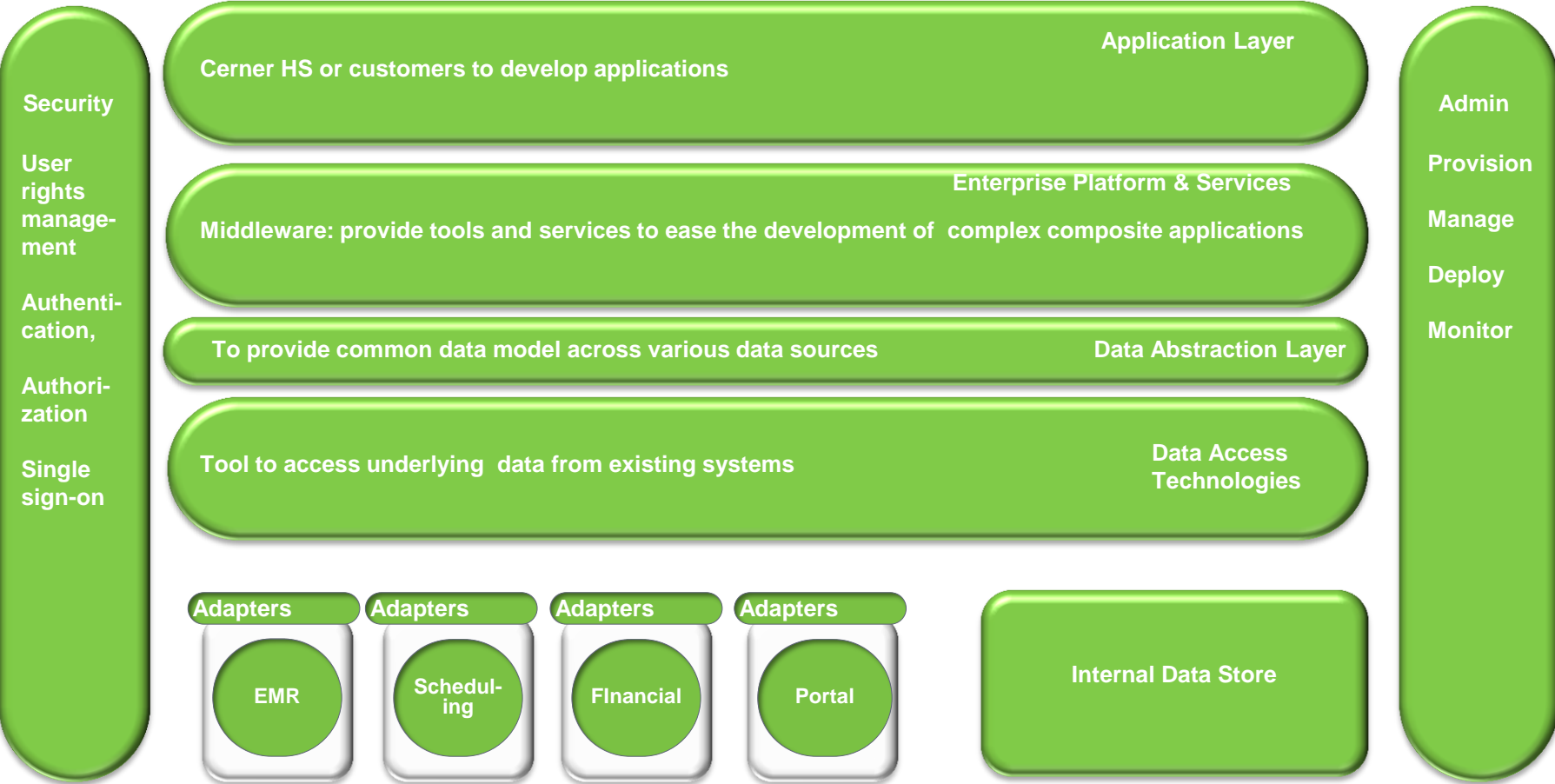
June 17, 2015

Conceptual View
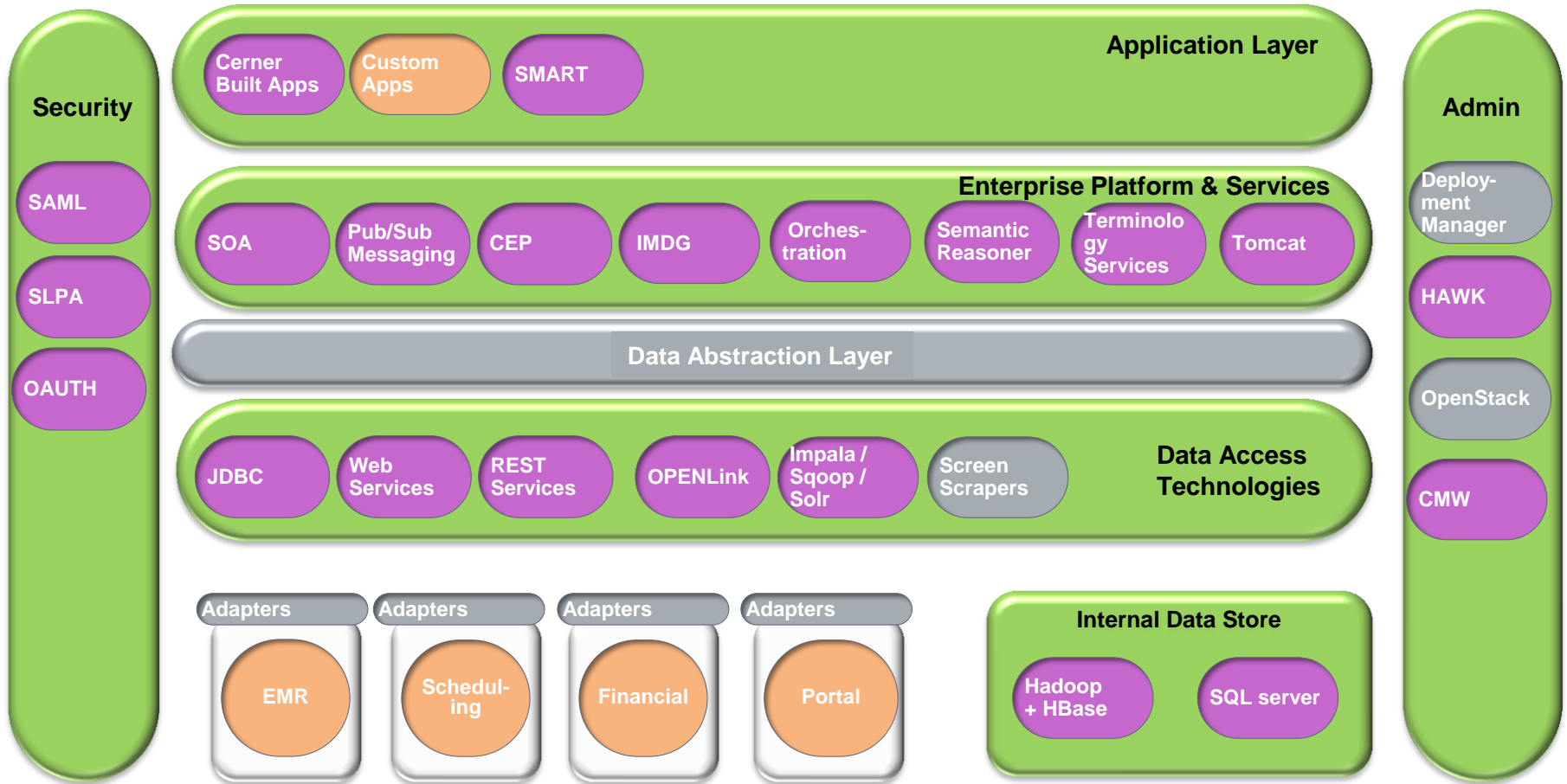
Conceptual Diagram

Application Layer

Cerner HS or customers to develop applications

Enterprise Platform & Services

Middleware: provide tools and services to ease the development of complex composite applications

To provide common data model across various data sources — Data Abstraction Layer

Tool to access underlying data from existing systems — Data Access Technologies

Security

User rights manage-ment

Authenti-cation,

Authori-zation

Single sign-on

Admin

Provision

Manage

Deploy

Monitor

Adapters — EMR

Adapters — Schedul-ing

Adapters — FInancial

Adapters — Portal

Internal Data Store

Cerner

Component Diagram

Application Layer

- Cerner Built Apps
- Custom Apps
- SMART

Security
- SAML
- SLPA
- OAUTH

Enterprise Platform & Services
- SOA
- Pub/Sub Messaging
- CEP
- IMDG
- Orchestration
- Semantic Reasoner
- Terminology Services
- Tomcat

Data Abstraction Layer

Data Access Technologies
- JDBC
- Web Services
- REST Services
- OPENLink
- Impala / Sqoop / Solr
- Screen Scrapers

Admin
- Deployment Manager
- HAWK
- OpenStack
- CMW

Adapters — EMR
Adapters — Scheduling
Adapters — Financial
Adapters — Portal

Internal Data Store
- Hadoop + HBase
- SQL server

Legend:
- Existing components
- Client's existing components
- New components for interoperability

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Example Use Case:
Care Management

Functional Data Flow

Example Application – Data Flow
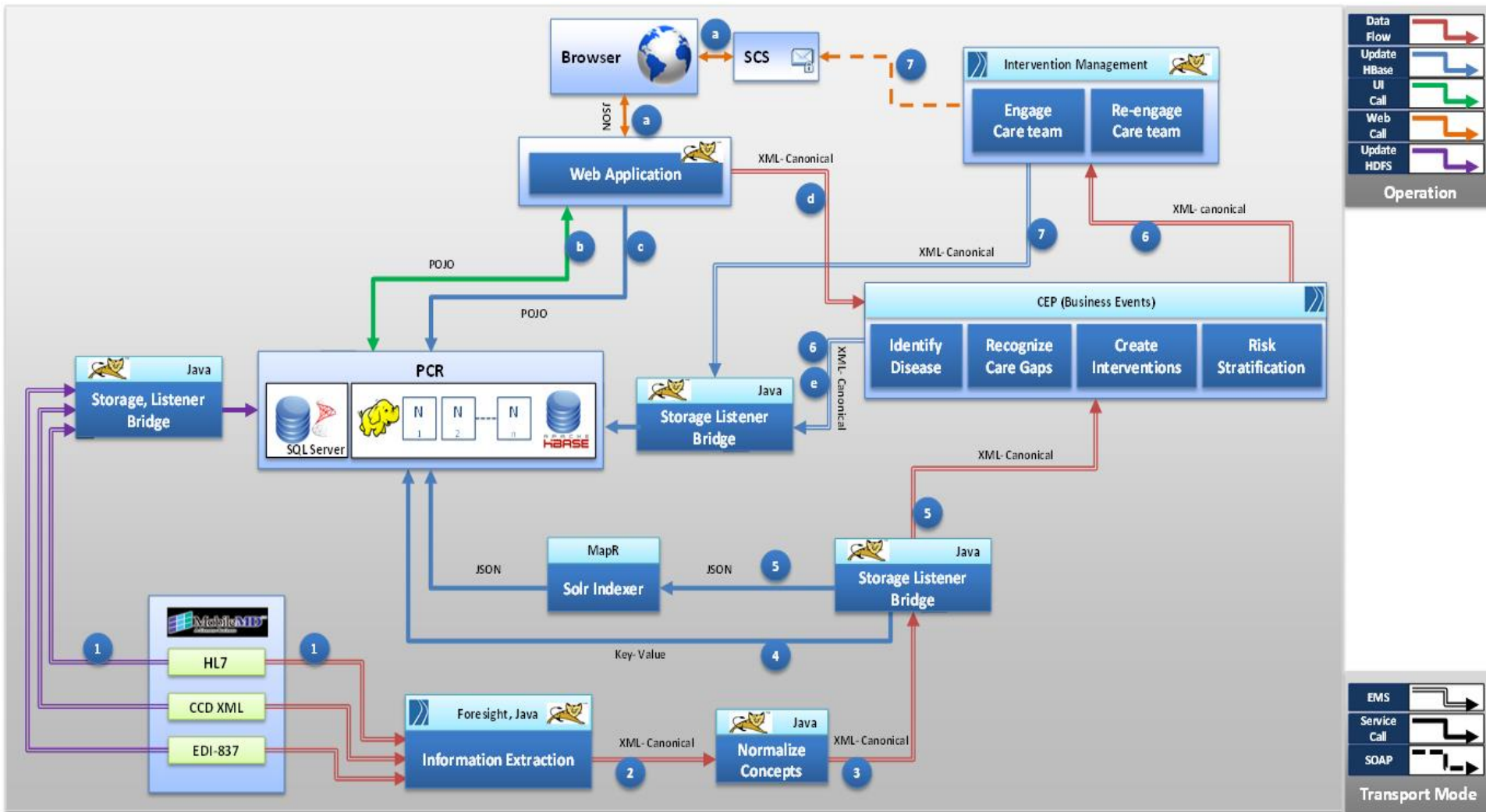
Application Example -- Operations

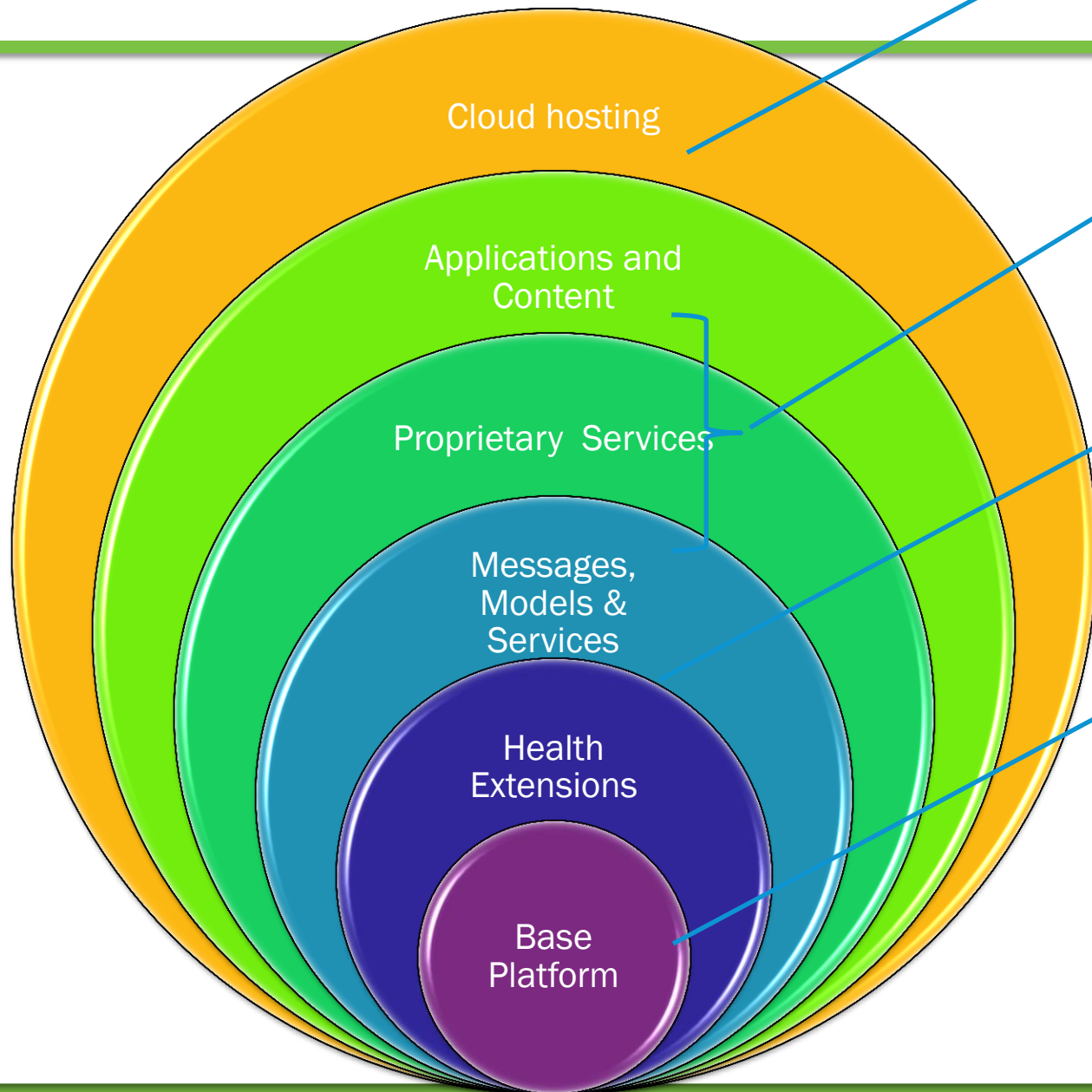| Op #	Operation
1	Publish raw message on the EMS to: Extract information Store in the raw data in PCR (HDFS)
2	Publish extracted structured information as a Canonical XM on the EMS
3	Publish semantic normalized structure information as a Canonical XM on the EMS
4	Store semantic normalized structure data into PCR (HBase)
5	Publish semantic normalized structure information for CEP Index semantic normalized structure data with Solr
6 e	Publish Identified patient intervention information to be assigned to a Care Team member Publish Identified patient intervention data to be saved in the PCR (HBase)
7	Publish assigned care team member intervention data to be saved in the PCR (HBase) Send secure message to patient for the patient interventions
a	HTTP REST call from UI to view Care Management functionality HTTP call from UI to view secure messages
b	Query/response for UI data from PCR (Hbase, Solr)
c	Update PCR(HBase) with updates from UI
d	Publish Message to EMS for UI updates on interventions

How to Proceed

Data Center

CareXcell

Health Enterprise Platform

TIBCO

Cloud hosting

Applications and Content
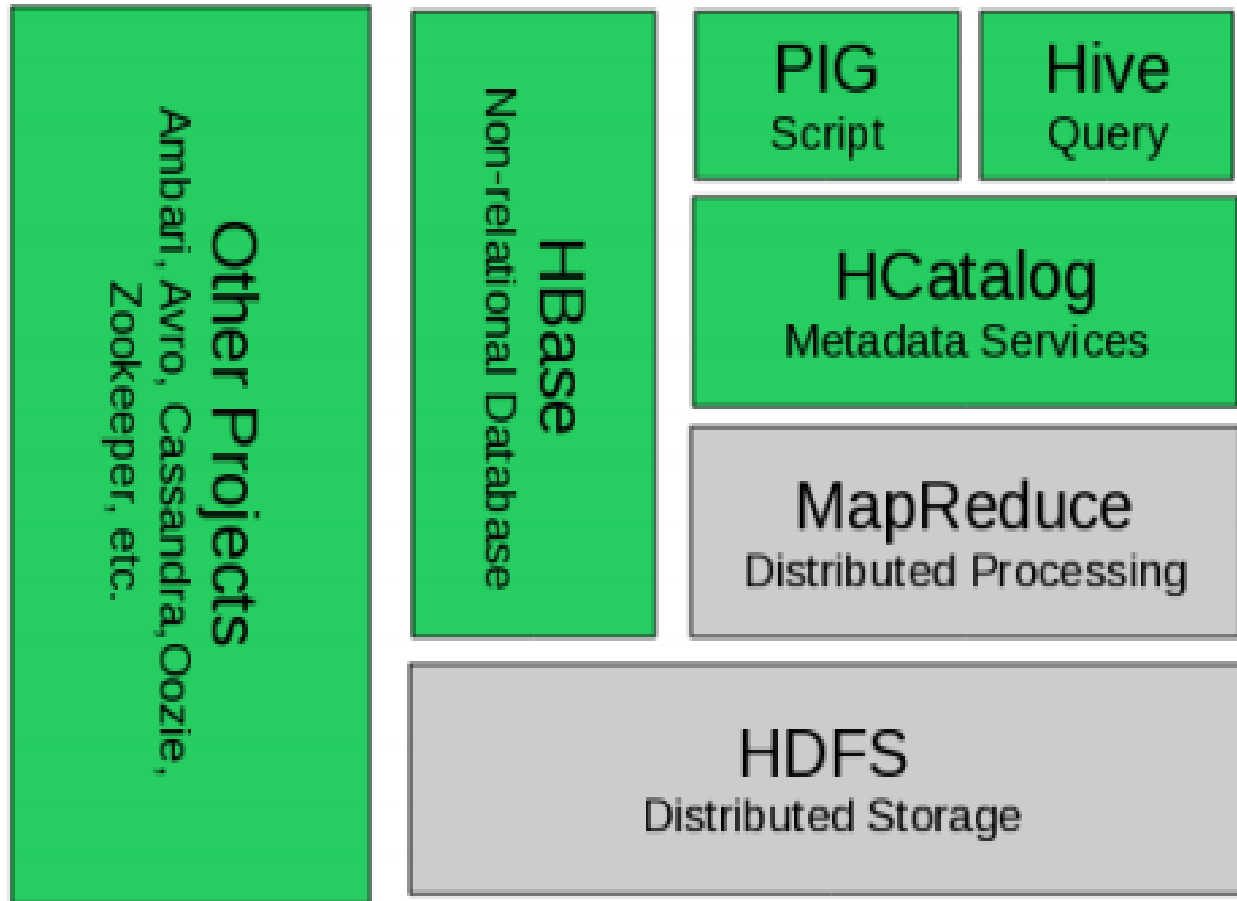
Proprietary Services

Messages, Models & Services

Health Extensions

Base Platform
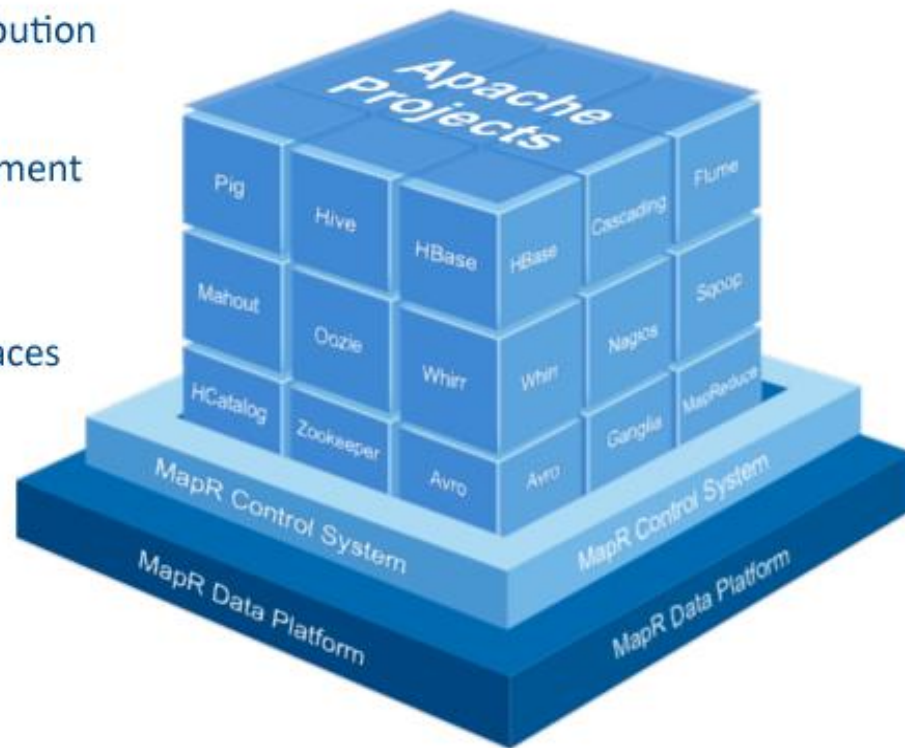
Cerner

"Hadoop" is Transitioning from This...

Source: "Apache Hadoop YARN: Moving beyond MapReduce and Batch Processing with Apache Hadoop 2," Murthy, Arun, Addison Wesley 2013
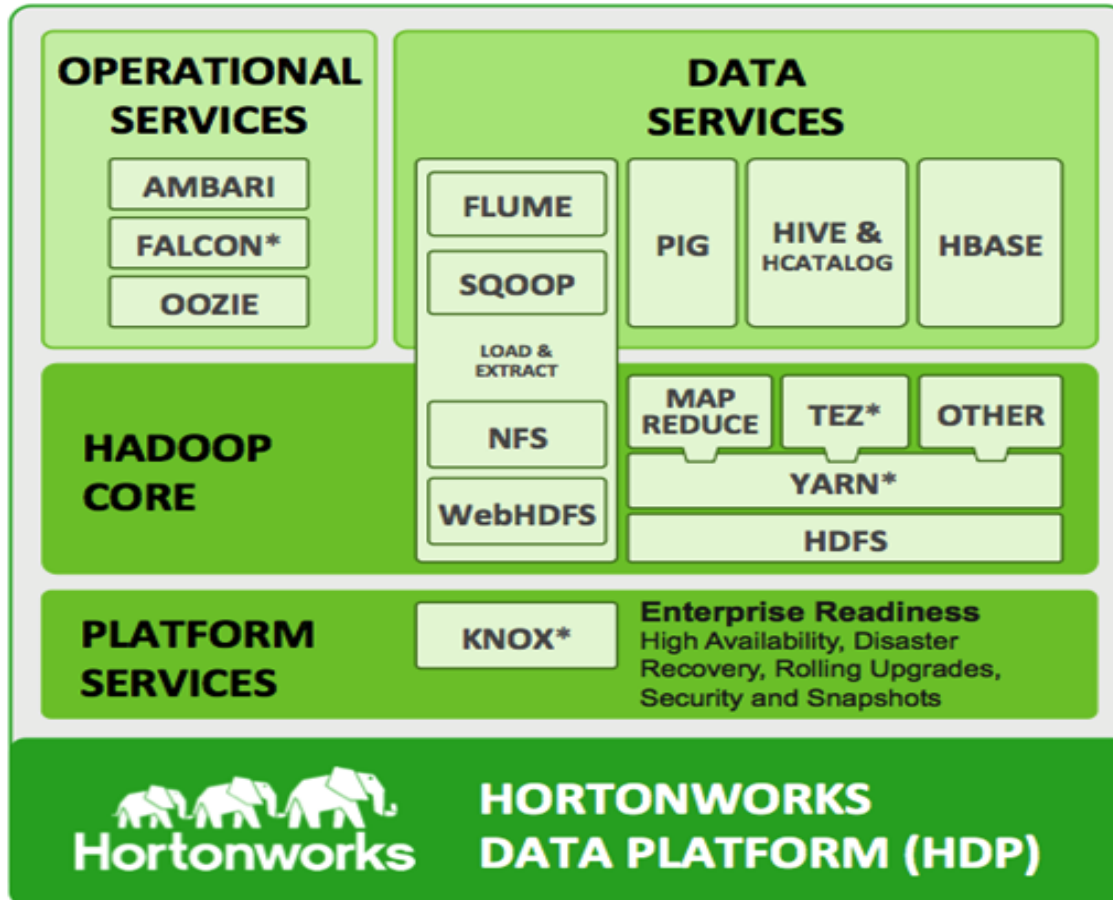
...To This

MapR Distribution for Apache Hadoop

- Complete Hadoop distribution

- Comprehensive management suite

- Industry-standard interfaces

- Combines open source packages with Enterprise-grade dependability
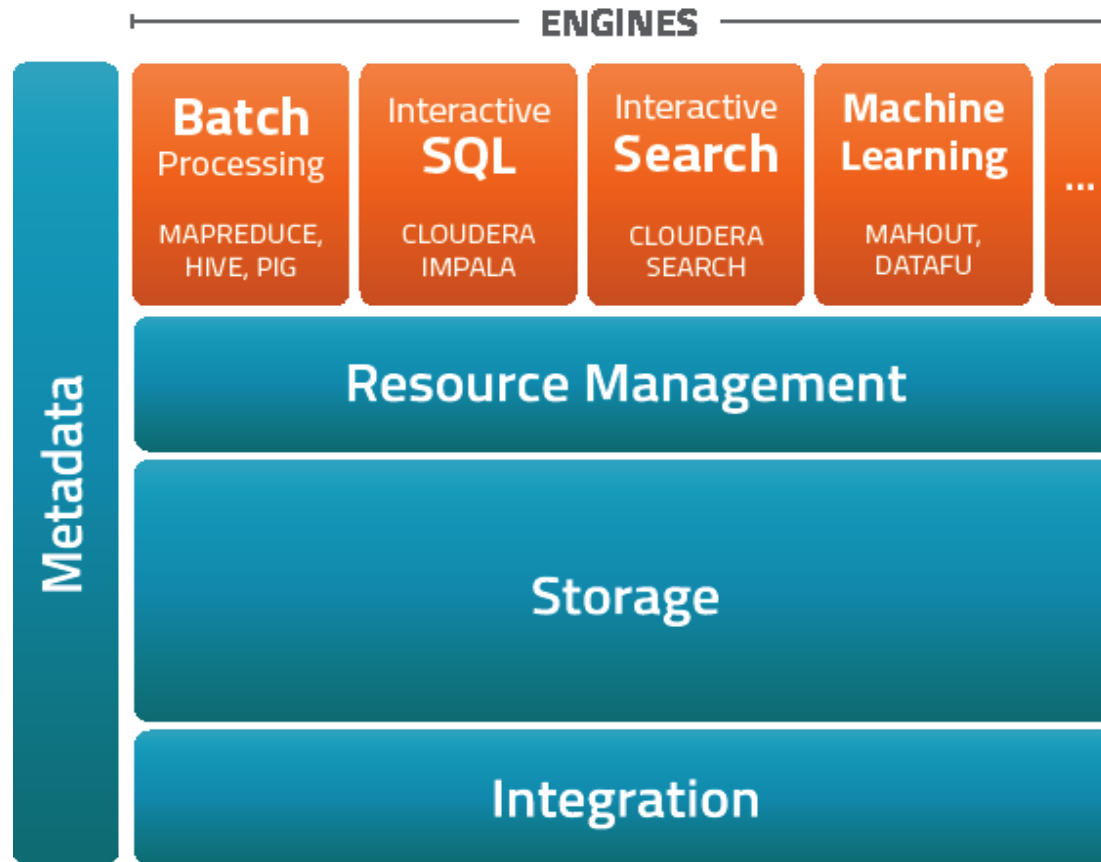
- Higher performance

Source: http://www.mapr.com/products/product-tour#developers

...And This

Source: http://hortonworks.com/products/hdp/

…And This

ENGINES

Batch Processing
MAPREDUCE, HIVE, PIG

Interactive **SQL**
CLOUDERA IMPALA

Interactive **Search**
CLOUDERA SEARCH

Machine Learning
MAHOUT, DATAFU

…

Metadata

Resource Management

Storage

Integration

cloudera

Cloudera's Distribution Including Apache Hadoop (CDH)

Source: http://www.cloudera.com/content/cloudera/en/products/cdh.html

Cerner

Data Center

All

CareXcell

HSPC

Health Enterprise Platform

CDH Health

CDH

TIBCO

Cloud hosting

Applications and Content

Proprietary Services

Messages, Models & Services

Proposed HEP

Health Extensions

HEP

Base Platform