**Tarmin GridBank: Upstream Oil & Gas**
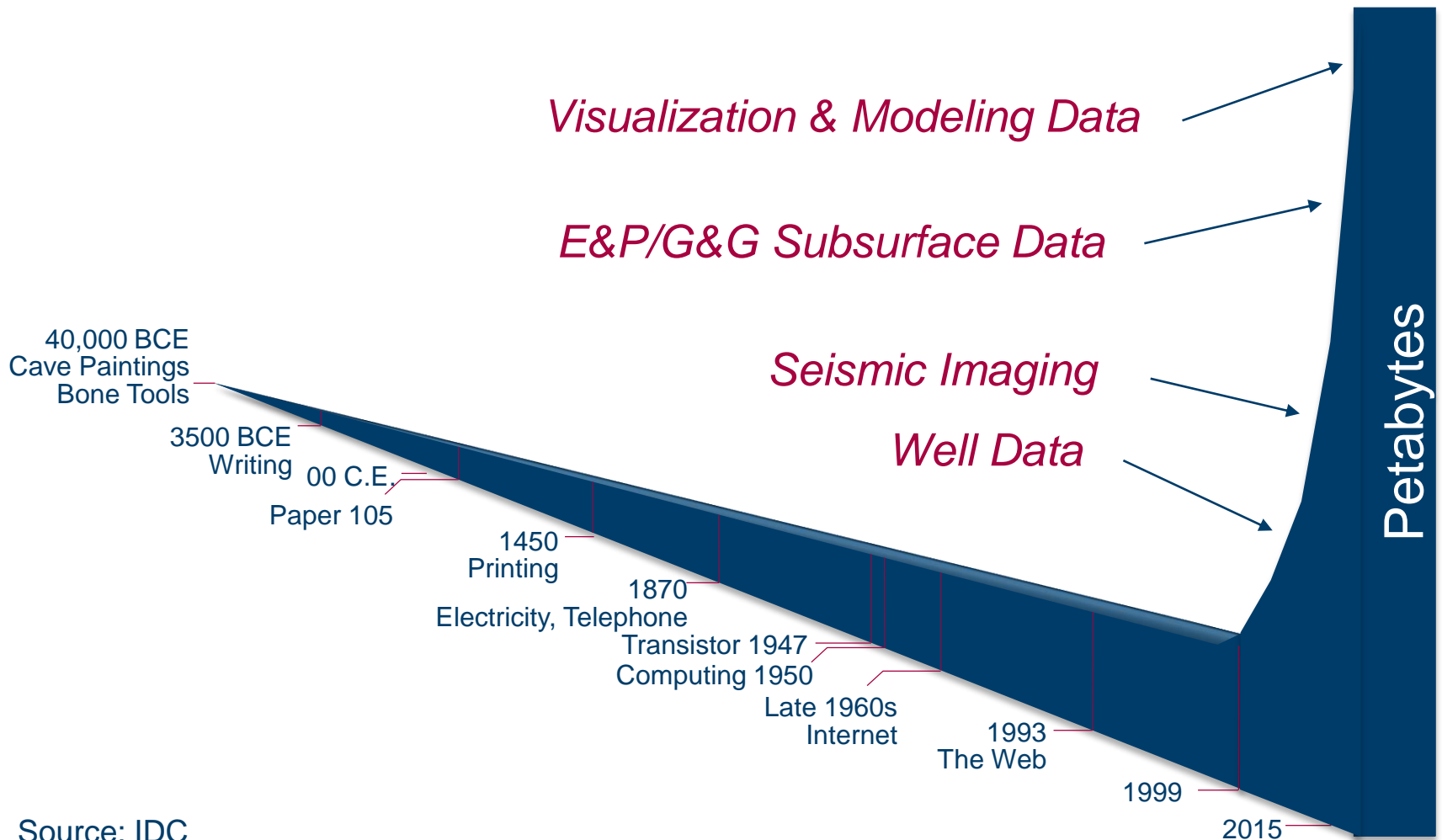
# Tarmin. Where Data Defines Value.

**TARMIN**
Where Data Defines Value.

## About Tarmin

- Founded in 2007

- Corporate Headquarters: Boston, London

- Pioneer of Data Defined Storage

- Solution: GridBank Data Management Platform

Gartner 2013
CoolVendor

STORAGE AWARDS
THE STORRIES XI

2014 WINNER
DCS awards

cfi.co
OIL & GAS
AWARDS 2014

WORLD FINANCE 100

CIO 100
HONOREE 2014

# Oil & Gas Sector Data Growth

Visualization & Modeling Data

E&P/G&G Subsurface Data

Petabytes

40,000 BCE
Cave Paintings
Bone Tools

3500 BCE
Writing

00 C.E.

Paper 105

1450
Printing

1870
Electricity, Telephone

Transistor 1947
Computing 1950

Late 1960s
Internet

1993
The Web

1999

2015

Seismic Imaging

Well Data

Source: IDC

# Trends and Challenges in the Oil & Gas Industry

| Challenges | | Opportunities | |
|---|---|---|---|
| **Storage Economics** | • Shrinking investment into storage & data silos | **Unify Data Repositories** | • Lower TCO through data consolidation |
| **Data Volumes** | • Massively growing geologic image data | **Massive Scalability** | • Scale to very large, rapidly growing data sets |
| **Data Assets** | • Long term archive until viable exploitation | **Retention Management** | • Archive & protect with tape or cloud |
| **Data Mobility** | • Huge data flows from global seismic surveys | **Multi-Site** | • Local low latency availability & replication |
| **Data Access** | • On-demand availability of well data digital assets | **Enterprise Search** | • Search & retrieval of industry .SEGY files |
| **Discovery** | • Accelerated discovery of natural resources | **Analytics Integration** | • Value from data for insight & decisions |

# E&P Workflow Requires Different Tiers of Storage

**Acquisition** → **Processing** → **Interpretation** → **Simulation** → **Engineering** → **Project Archiving**

← **Oil and Gas Data Management** →

**Fast Disk** → **Near line Disk** → **Secure Archive Storage**
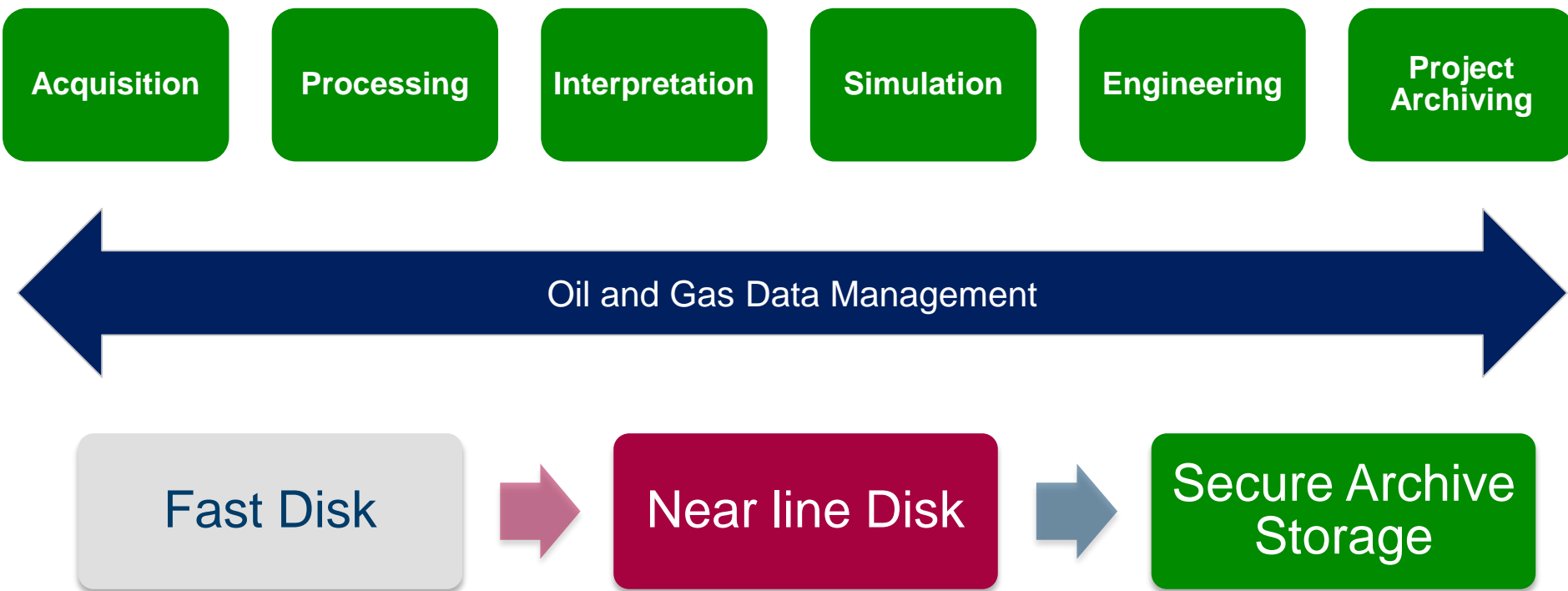
# GridBank Feature Set

## Reduce TCO

- Optimize Data Storage & Limit Volume Growth
- Reduce TCO with Data Consolidation
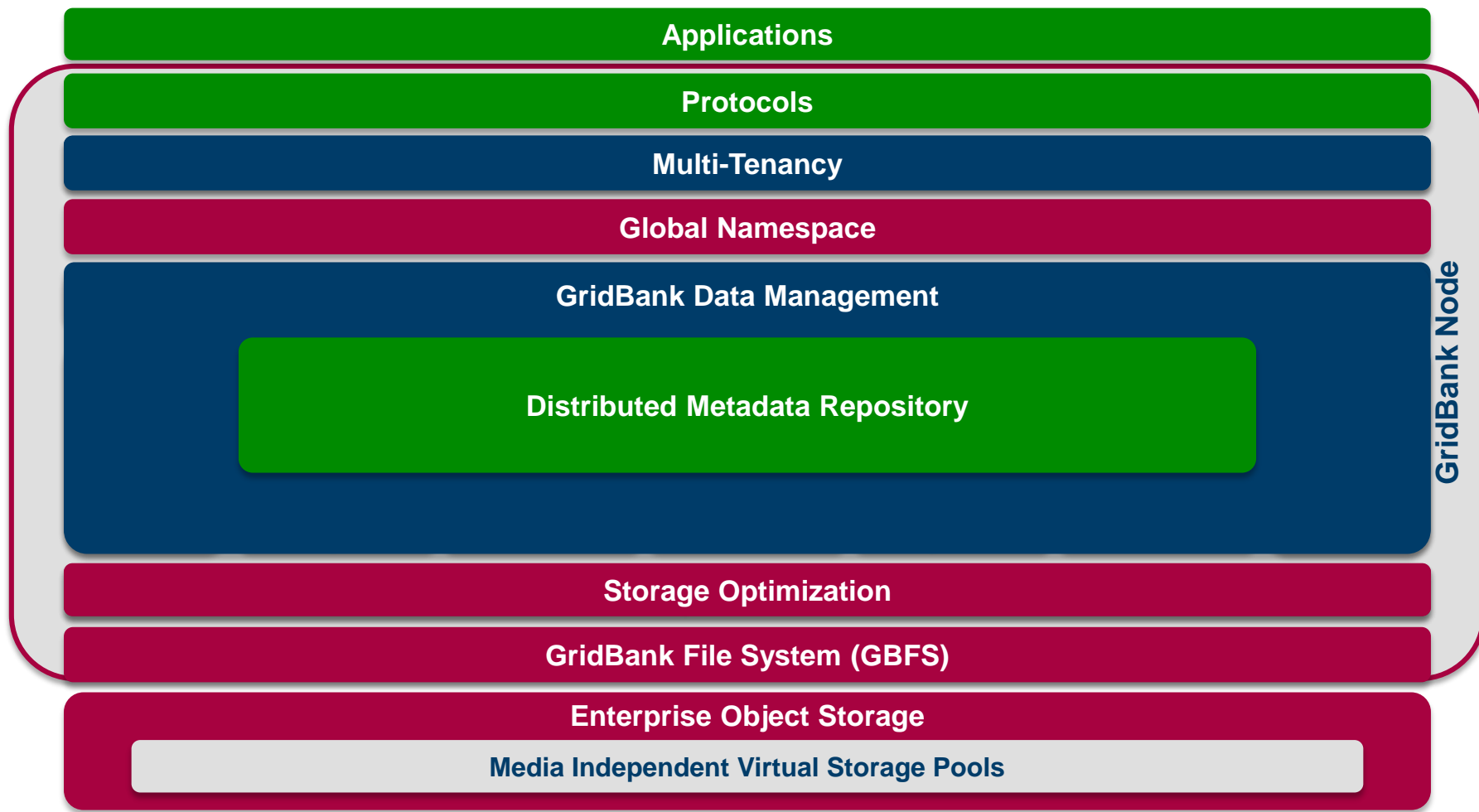- Evade Data Silos with Media Independence

## Mitigate Risk for Long-term

- Data Governance for Retention & Compliance
- AD-Integrated Security & Authentication
- High Availability Global Replication & Mobility
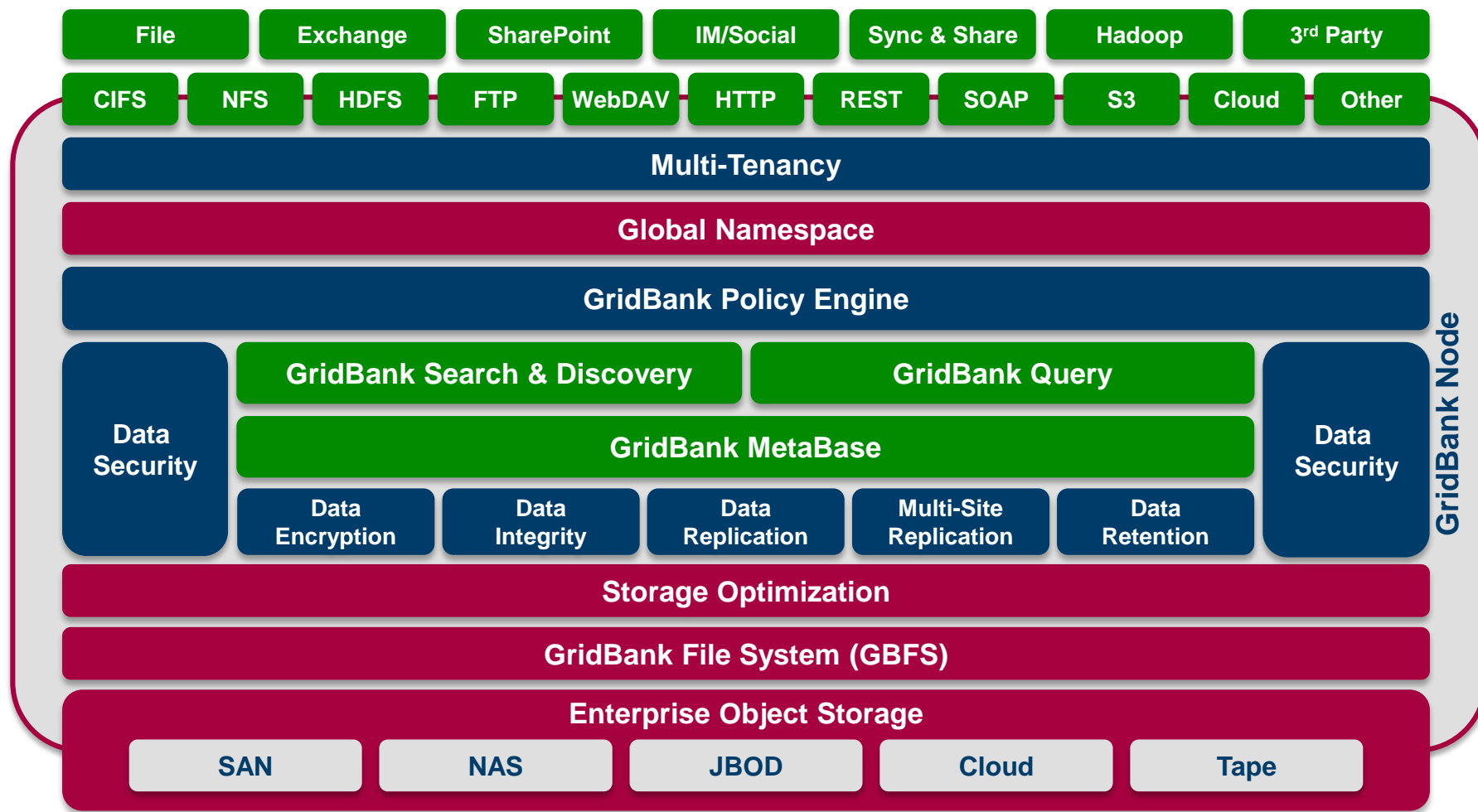
## Grow Business Potential

- Enterprise-wide Unified Search & e-Discovery
- On Demand Access to All Data
- Accelerated Competitive Advantage

# GridBank Solution

**Applications**

**Protocols**

**Multi-Tenancy**

**Global Namespace**

**GridBank Data Management**

**Distributed Metadata Repository**

**Storage Optimization**

**GridBank File System (GBFS)**

**Enterprise Object Storage**

**Media Independent Virtual Storage Pools**

**GridBank Node**

# GridBank Solution

| File | Exchange | SharePoint | IM/Social | Sync & Share | Hadoop | 3rd Party |
|------|----------|------------|-----------|--------------|--------|-----------|

| CIFS | NFS | HDFS | FTP | WebDAV | HTTP | REST | SOAP | S3 | Cloud | Other |
|------|-----|------|-----|--------|------|------|------|-----|-------|-------|

**GridBank Node**

## Multi-Tenancy

## Global Namespace

## GridBank Policy Engine

| Data Security | GridBank Search & Discovery | GridBank Query | Data Security |
|---------------|------------------------------|----------------|---------------|
| | GridBank MetaBase | | |
| | Data Encryption / Data Integrity / Data Replication / Multi-Site Replication / Data Retention | | |

## Storage Optimization

## GridBank File System (GBFS)

## Enterprise Object Storage

| SAN | NAS | JBOD | Cloud | Tape |
|-----|-----|------|-------|------|

# GridBank File System for Reduced TCO

## Consolidated Infrastructure for Operational Efficiencies

- Eliminates storage silos
- Increases utilization
- Massively scalable to multi-PB

## Optimized Data Stores

- Distributed Object Dedupe & compression limits volume growth & footprint
- Flexible & dynamic multi-site features
- Improved FTE/TB ratio

## Lower Overall Cost of Storage

- Media Independent Storage: allows use of lower cost disk, tape or cloud
- Automated content-driven policy based tiering
- Future proof long-term storage architecture

# GridBank Data Management for Reduced Risk

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## Retention Management

Long Term Retention Periods

WORM Protection

## Replication

Distributed Object Dedupe

Bandwidth Optimized Remote Access

## Security & Protection

Prevent Unauthorized Access

Encryption

## Data Integrity

CRC Self-Healing Model

Tamper-Proof Storage

# GridBank MetaBase for Accelerated Discovery

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## Unification of Data and Metadata

- Ingestion & indexing of 550+ standard and industry specific file types including SEG-Y and SEG-D, LAS, DLAS, and raster files
- Unified catalogue of all oilfield, well and bore log files and metadata

## Accelerated Access to All Data

- On-demand high availability access to all information
- Unified search & discovery across all consolidated data sources

## Sustained Competitive Advantage

- Simplifies analysis & exploitation of massive amounts of data sets
- Real time insights & more accurate decision-making

# GridBank Deployment Diagram

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**Windows/Linux Clients** CIFS/NFS

**Mobile Device**

**Outlook Clients**

**GridBank Web Access**

File Servers (Windows)

Exchange Servers

SharePoint Server

Cloud/LAN/WAN IP Network

Big Analytics Integration

Social Media / IM Server

File Servers (Linux)

**Protocols**

**Multi-Tenancy**

**Global Namespace**

**GridBank Virtualized Storage Pools: Site 1**

SAN / NAS / JBOD   Tape   Cloud

**GridBank Data Management: Site 1**

GridBank Communication Infrastructure

**GridBank Data Management: Site 2**

GridBank Communication Infrastructure

**GridBank Virtualized Storage Pools: Site 2**

SAN / NAS / JBOD   Tape   Cloud

# Oil and Gas Use Case

## Oil & Gas Use Case

- Global Upstream Oil & Gas Exploration & Discovery Operations
- Massive Data Growth from Seismic Resolution
- Consolidation Across Heterogeneous Storage Arrays after M&A Activity
- Continuous Access to Distributed End Points
- Single Point of Truth for All Corporate Data
- Long Term Digital Access Retention

## Tarmin Solution

- GridBank Sites Multi-TB Array
- Variable Chunk Object Dedupe & Compression
- Global Namespace File System Virtualization
- Site-Based Data Replication & Integrity Checking
- Policy-Based Archival & Information Governance
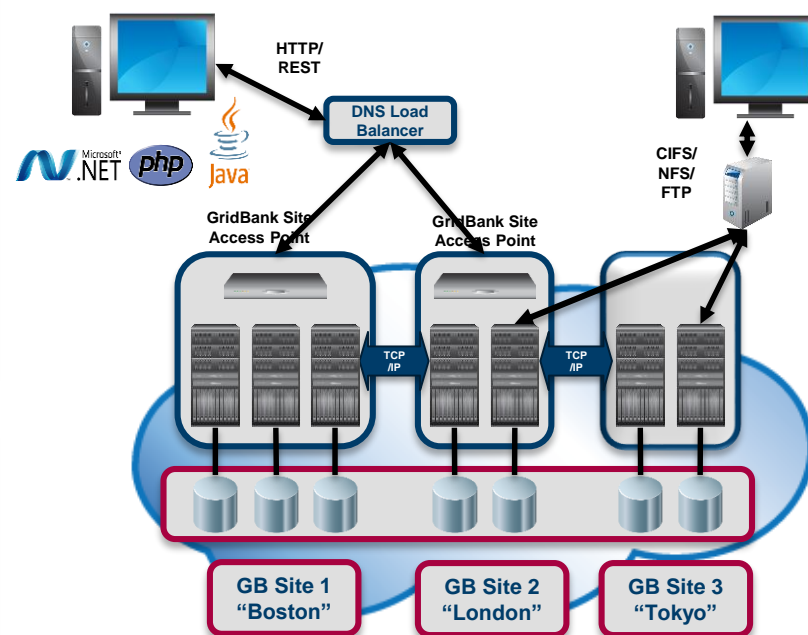
# Testimonials

"The rapid growth of our company is generating more and more data… GridBank allows us to store and protect our G&G data and create a platform for improving business efficiency while reducing TCO"

• David Edwards, Group Head of Information Systems, Premier Oil, Plc.

"We are very impressed with GridBank and see it as an important part of our strategy for ensuring customers achieve unmatched value from their relationship with bright**solid**"

Richard Higgs, Managing Director, bright**solid** Online Technology

"The object platform industry is just getting started in capturing a bigger piece of the scale-out unstructured data storage… opportunity, which IDC has forecast will be worth $27 billion by 2017 and is… becoming known as the "data-defined storage" market."

• Ashish Nadkarni, Research Director, Storage Systems, IDC

![TARMIN — Where Data Defines Value.]

# GridBank Benefits: Oil and Gas

**Reduced Total Cost of Ownership**

- Higher storage utilization with simplified management & administration

**Extensible & Scalable**

- Across all data disciplines, applications & locations

**High Availability**

- Instant on demand access to business critical information

**Long Term Retention**

- Simple & efficient information governance model

**Retrieve Data across Silo Boundaries**

- Retrieve well data across dispersed heterogeneous data stores

**Accelerated Discovery**

- Faster-time-to-discovery through leveraging unstructured data as a strategic asset

# GridBank Benefits

## Data Defined Storage

- Takes a single, holistic, comprehensive data centric approach
- Consolidates application data across large, distributed locations & cloud
- Provides big data insight & analytics & application integration

### Data Consolidation

- Massively Scalable Architecture
- Reduce TCO
- Enhance Operational Efficiencies

### Data Management

- Simplify Data Management
- Enforce Compliance
- Reduce Business Risk

### Data Value

- Accelerate Discovery
- Drive Revenue Growth
- Increase Competitive Advantage

![TARMIN — Where Data Defines Value.]
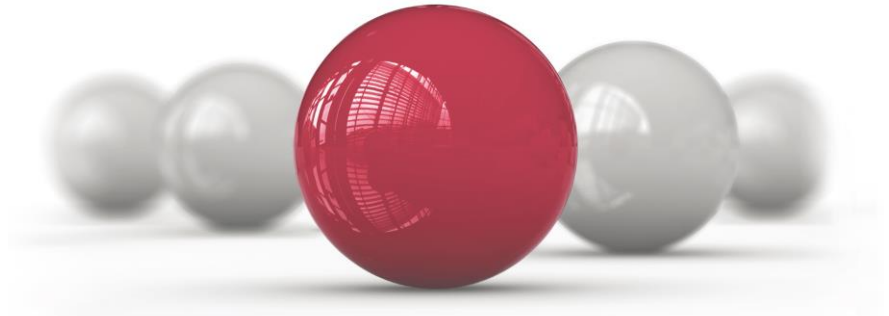
*Thank You!*

*Questions & Answers*

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