Exabyte+ Initiative

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OVERVIEW

• Objectivity Products
• Large Deployments
• New Challenge
• Problem
• Solution
Objectivity/DB

- Federated object-oriented database platform
- Single Logical View across distributed persistent objects
- Eliminates the OO language to database mapping layer
- Ultra-fast object navigation
- Customizable, distributed query engine
- Dynamic schema changes and low administration overheads
- Interoperability across multiple languages and platforms
- High Availability
- Grid and cloud environment enabled
Distributed Architecture

Enhances scalability and availability
InfiniteGraph...

• Dedicated Graph API
• Easy to use and deploy
• Java now, C# soon...
• Built on Objectivity/DB
• Fully interoperable
ODBMS Evolution

• 1980s
  – “Performance, Performance, Performance!”
  – Primarily scientific and engineering applications

• 1990s
  – Reliability and Scalability
  – New languages and Operating Systems
  – Large deployments in the scientific domain

• 2000s
  – **BaBar stored over a Petabyte at SLAC**
  – Query languages
  – Performance and scalability
  – Grids and Clouds
  – Embedded systems, government and more...
Storage Architecture

64 bit Object Identifier (OID)

3456 - 7890 - 1234 - 56
Logical Database #
Logical Container #
Logical Page #
Logical Slot #

Associations

Federated Database
Partition
Database
Container
Object
VArray

Host
File
Object Cluster
Logical Page
Logical Slot
Physical Page
Physical Slot

Signifies 1 to many

Single Logical View of Millions of Exabytes
Requirements

• Vehicle collects 200 Terabytes per day
• Has to be ingested, correlated and analyzed
• Application triggers alerts
• Data will be moved to a “central” repository after the vehicle lands

• CHALLENGE: There will be 1000+ vehicles!
• That’s 200 Petabytes per day
Physical Address Space

- Objectivity/DB provides a single logical view
- But... there’s a practical limit to the total physical storage space...
- With 4 billion container files, each limited to 40 GB for administrative reasons, the maximum address space is **160 Exabytes**
- Would run out of space after 800 days
## Stretch the OID

### #DB - Container - Page - Slot

<table>
<thead>
<tr>
<th>From:</th>
<th>16 bits</th>
<th>16 bits</th>
<th>16 bits</th>
<th>16 bits</th>
</tr>
</thead>
<tbody>
<tr>
<td>To:</td>
<td>16 bits</td>
<td>32 bits</td>
<td>32 bits</td>
<td>16 bits</td>
</tr>
</tbody>
</table>

Address space will be ~80 Nonabytes

(80 million Exabytes)
Questions?

- objectivity.com - White papers, downloads etc.
- EMAIL: info @ objectivity.com

- infinitegraph.com - WPs, downloads etc.
- EMAIL: info @ infinitegraph.com

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