Presented to:

British Computer Society, London

November 2014

Presented by:

Abraham Zaaiman (Abri)

John Bisseru

Polymach Systems Limited

A New Computing Paradigm
Introduction

Overview

Concept

Components

Configurations

Applications

Roadmap

Summary
Introducing Polymach ...

... a NoSQL object store technology

Polymach Fornax is a NoSQL object storage and processing system which:

- Is fast, secure & reliable
- Small footprint
- Configurable
- Easy to use and to program
- Extensible
The Origins Of Polymach ...

... relates to the laws of nature
Overview
Polymach objects ...

- Fornax objects are entirely self-contained
- Needs only a Fornax DLL to function
- All information stored in object form
- All information communicated in object form
- All information processed in object form
- Objects are self-protecting
- Machine independent
- Access controlled
- Encrypted (optionally)
- Contains both code and data
Concept
Polymach Fornax creates and manages virtual processing platform:

- Polymach is the client-side API
- Fornax is the processing and storage engine
- Information communicated, stored and processed in Polymach Binary Format
The Polymach API & Fornax Engine ...

Polymach API Provides:
- IDE friendly interface to Fornax universe
- Ports for C# is available on .NET 4 and 4.5
- Ports for C++ under test (from previous versions)
- Remote Fornax and in-process Fornax configurations
- Polymach is a DLL (approx. 120 KB, including a Fornax Engine)
- Extensions to Java, Perl, Python, C: on request.

Fornax:
- One engine instance per storage file
- Multiple Fornax instances per engine
- No locking
- Fast
- Small footprint
- Secure
Components
Fornax Main Components ...

... logical components

- Association Manager
- Handles Manager
- Index Manager
- Space Manager
- Search Manager
- Stores Manager
- File Manager
- FDB
Fornax Stores ...

Store

Class

Class

Class Instances

Class Instances

Index

Index
Introduction
Overview
Concept
Components
Configurations
Applications
Roadmap
Summary
Polymach Application (Thick Client) ...
Polymach (Thin Client) ...

Application using Fornax Databases on two different computers.

Input → Application → Display

Polymach API

Transport (Network, Pipes, Files, Messaging, Physical Memory)

Disk Based Database

Fornax Engine Computer A

Fornax Engine Computer A

Disk Based Database
Polymach Virtual Machine Interface ...

Polymach API to/from Virtual Machine.

Polymach API (DLL) Translates to/from Polymach Object format

Application Calls to Polymach

Virtual Machine Object (as transported) (Hardware independent format)

Memory Database

Fornax Engine Stores and executes objects in Polymach Object Format

Disk Database
Polymach Objects ...
Applications
Polymach Applications: Dispatch Management ...
Polymach Applications: Access Management 1 ...
## Polymach Applications: Access Management 2 ...

### Display Access Events

<table>
<thead>
<tr>
<th>EID</th>
<th>Date/Time</th>
<th>In/Out</th>
<th>Vehicle License</th>
<th>Vehicle Make</th>
<th>Vehicle Colour</th>
<th>Driver Name</th>
<th>Driver ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>DWFP2923FS</td>
<td>CHEVROLET</td>
<td>White / Wt</td>
<td>A</td>
<td>18006</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FYT3868C</td>
<td>CHEVROLET</td>
<td>White / Wt</td>
<td>D</td>
<td>70008</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-O</td>
<td>FK4460FS</td>
<td>CHEVROLET</td>
<td>White / Wt</td>
<td>G</td>
<td>30062</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FL6825FS</td>
<td>VOLVO</td>
<td>Silver / Silver</td>
<td>H</td>
<td>40063</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FMD611FS</td>
<td>CHEVROLET</td>
<td>Silver / Silver</td>
<td>I</td>
<td>48062</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FJK292FS</td>
<td>CHEVROLET</td>
<td>Mascot / Br...</td>
<td>E</td>
<td>94063</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-O</td>
<td>FRR5407FS</td>
<td>CHEVROLET</td>
<td>White / Wt</td>
<td>M</td>
<td>33064</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FB7299FS</td>
<td>CHEVROLET</td>
<td>Silver / Silver</td>
<td>E</td>
<td>74062</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>BG2190DF</td>
<td>ISUZU</td>
<td>White / White</td>
<td>T</td>
<td>10064</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FLN7220FS</td>
<td>OPEL</td>
<td>Silver / Silver</td>
<td>A</td>
<td>59065</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FLR075FS</td>
<td>VOLKSWAGEN</td>
<td>Silver / Silver</td>
<td>L</td>
<td>65060</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FML666FS</td>
<td>CHEVROLET</td>
<td>Silver / Silver</td>
<td>D</td>
<td>87061</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>CSM40MGF</td>
<td>ISUZU</td>
<td>White / Wt</td>
<td>J</td>
<td>60066</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FLT047FS</td>
<td>CHEVROLET</td>
<td>White / Wt</td>
<td>M</td>
<td>86066</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FFH747FS</td>
<td>NISSAN</td>
<td>White / Wt</td>
<td>N</td>
<td>58067</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>CR459FLG</td>
<td>MAZDA</td>
<td>Silver / Silver</td>
<td>R</td>
<td>86065</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>FMN433FS</td>
<td>CHEVROLET</td>
<td>White / Wt</td>
<td>S</td>
<td>65063</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-O</td>
<td>FJP518FS</td>
<td>CHEVROLET</td>
<td>White / Wt</td>
<td>I</td>
<td>79068</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>CKY788FS</td>
<td>MERCEDES</td>
<td>Silver / Silver</td>
<td>A</td>
<td>47068</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>BN451FS</td>
<td>ISUZU</td>
<td>White / Wt</td>
<td>N</td>
<td>26067</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>DS9311S</td>
<td>FORD</td>
<td>White / Wt</td>
<td>R</td>
<td>76062</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>CLG331FS</td>
<td>ALFA ROMEO</td>
<td>Red / Roof</td>
<td>J</td>
<td>63068</td>
</tr>
<tr>
<td>elD1...</td>
<td>2014/07/29</td>
<td>%FM-IN</td>
<td>HPK513EC</td>
<td>CHEVROLET</td>
<td>Silver / Silver</td>
<td>L</td>
<td>46063</td>
</tr>
</tbody>
</table>
Polymach Utilities Programmer 1 ...
### Polymach Utilities Programmer 2 ...

<table>
<thead>
<tr>
<th>Type</th>
<th>Displacement</th>
<th>Index</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>atom</td>
<td>11</td>
<td>0</td>
<td>data word(162, 55, 65, 22)</td>
</tr>
<tr>
<td>atom</td>
<td>22</td>
<td>0</td>
<td>address word(39, 55, 47, 60, 0, 0)</td>
</tr>
<tr>
<td>nucleus</td>
<td>39</td>
<td>[0][0]</td>
<td>engine unit(0)</td>
</tr>
<tr>
<td>nucleus</td>
<td>47</td>
<td>[0][1]</td>
<td>requester unit(0)</td>
</tr>
<tr>
<td>nucleus</td>
<td>55</td>
<td>[0][2]</td>
<td>dbindex byte(0)</td>
</tr>
<tr>
<td>nucleus</td>
<td>60</td>
<td>[0][3]</td>
<td>session byte(0)</td>
</tr>
<tr>
<td>atom</td>
<td>65</td>
<td>[1]</td>
<td>request word(0, 0, 0, 0, 0, 0)</td>
</tr>
<tr>
<td>atom</td>
<td>82</td>
<td>[1][0]</td>
<td>reference word(0, 0, 107, 0, 0)</td>
</tr>
<tr>
<td>nucleus</td>
<td>95</td>
<td>[1][0][0]</td>
<td>class string(database)</td>
</tr>
<tr>
<td>atom</td>
<td>107</td>
<td>[1][0][1]</td>
<td>method word(116, 134, 143)</td>
</tr>
<tr>
<td>nucleus</td>
<td>118</td>
<td>[1][0][1][0]</td>
<td>name string(databaseOpen)</td>
</tr>
<tr>
<td>atom</td>
<td>134</td>
<td>[1][0][1][1]</td>
<td>argument word(0, 150, 175)</td>
</tr>
<tr>
<td>nucleus</td>
<td>150</td>
<td>[1][0][1][1][0]</td>
<td>name string(21) (c:\ProgramData\Fornax)</td>
</tr>
<tr>
<td>atom</td>
<td>175</td>
<td>[1][0][1][1][1]</td>
<td>name string(3)</td>
</tr>
<tr>
<td>atom</td>
<td>176</td>
<td>[1][0][1][1][2]</td>
<td>response word(0)</td>
</tr>
<tr>
<td>atom</td>
<td>182</td>
<td>[2]</td>
<td>response word(0, 197, 191)</td>
</tr>
<tr>
<td>nucleus</td>
<td>191</td>
<td>[2][0]</td>
<td>error word(0)</td>
</tr>
<tr>
<td>nucleus</td>
<td>197</td>
<td>[2][1]</td>
<td>error string(2)</td>
</tr>
</tbody>
</table>

**Selector**

- New Object
- Add Atom
- Add Nucleus
- Add Instruction
- Delete
- Modify
- Repack

**Controls**

- Close
- Save
- Load
- Help

**Selected Item**

- nucleus 150: [1][0][1][1][1][0]: name string(21) (c:\ProgramData\Fornax)
Previous release: Polymach V2.1 C++ (C builder 6) (Windows)

Current release: Fornax - Polymach V12.0 C#, dot net 4.0, 4.5

The Future …

• C# V70 Polymach, dot net 4.5 with C++ V70 Fornax (Windows) Dec 2014
• Polymach - Fornax for iOS and OSX – Q1 2015
• Fornax C++ V70 for Android, Q2 2015
• Fornax C++ V70 for Linux, Unix, Solaris, Q3 2015
• Polymach V70 Java port for use with C++ V70 Fornax engine Q4 2015
• Fornax C++ V70 for IBM mainframe, est. 2016/2017
Introduction
Overview
Concept
Components
Configurations
Applications
Roadmap
Summary