Informix 4GL to Genero
Bring Your Code Into the Future
by Lester Knutsen

Webcast on September 22, 2015
2:00pm EDT
Lester Knutsen is President of Advanced DataTools Corporation, and has been building large Data Warehouse and Business Systems using Informix Database software since 1983. Lester focuses on large database performance tuning, training and consulting. Lester is a member of the IBM Gold Consultant program and was presented with one of the Inaugural IBM Data Champion awards by IBM. Lester was one of the founders of the International Informix Users Group and the Washington Area Informix User Group.

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www.advanceddatatools.com
703-256-0267 x102
Agenda

- Introduction
- Converting Informix 4GL Code to Genero
  - Demo
  - Conversion Steps
- About Four Js Genero by Stacey M. Osborn, Sales, Four Js
Example Code

• DBPrivileges – 4GL program developed in 1993 to manage Informix database user and group privileges
  – Add Users
  – Add Groups
  – Grant and Revoke Table Privileges
  – Grant and Revoke Database Privileges

• Written in Informix 4GL 4.X
### DBPrivileges – 4GL

![Database Privileges Screenshot]

**User Login:** [James]  
**Group Name:** [GroupB]  
**Description:** [Group B]

**Database Access:** [C][CONNECT]

<table>
<thead>
<tr>
<th>Table</th>
<th>Grantor</th>
<th>Select</th>
<th>Update</th>
<th>Insert</th>
<th>Delete</th>
<th>Index</th>
<th>Alter</th>
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</table>
DBPrivileges – 4Js No GUI

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<td>N</td>
<td>N</td>
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</tr>
</tbody>
</table>
```
DBPrivileges – 4Js GUI
DBPrivileges – 4Js Web
DBPrivileges -4Js on iPad

Genero HTML5 Web Client

DB Privileges
by
Advanced DataTools Corporation
4510 Maxfield Drive
Annandale, VA 22003
703-256-0267
Copyright 1993 Advanced DataTools Corporation
BETA-RELEASE 1.4

Enter database name:

OK Cancel
4Js iPad App Stores Demo

<table>
<thead>
<tr>
<th>Customer ID</th>
<th>Customer</th>
<th>Address</th>
<th>State</th>
<th>Zipcode</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>Keyes Frances</td>
<td>3199 Sterling Court</td>
<td>Sunnyvale</td>
<td>94085</td>
<td>408-277-7245</td>
</tr>
<tr>
<td>112</td>
<td>Lawson Margaret</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>113</td>
<td>Beatty Lana</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>Albertson Frank</td>
<td></td>
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<td>115</td>
<td>Grant Alfred</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>Parmelee Jean</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>Spies Arnold</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>Baxter Dick</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>Shorter Bob</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Advanced DataTools
Demo

• First – Make Sure the Old Code Compiles and you have all the source files
• Upgrade old code to current release of engine
• Create a Makefile to compile everything
Using 4Js Compiler – File Extensions

- Screens (per)
  - form.frm -> form.42f
- Modules (C)
  - program.o -> program.42m
- Modules (RDS)
  - program.4go -> program.42m
- Programs (C)
  - program.4ge -> program.42r
- Programs (RDS)
  - program.4gi -> program.42r
Using 4Js Compiler

- Screens (.per)
  - Informix 4GL
    - `form4gl form.per -> form.frm`
  - 4Js
    - `fglform form.per -> form.42f`

- Message File
  - Informix 4GL
    - `mkmessage myhelp.msg myhelp.iem`
  - 4Js
    - `fglmkmsg myhelp.msg myhelp.iem`
Using 4Js Compiler

- Informix RDS P-code Compile
  - Informix 4GL
    - fglpc module.4gl
  - 4Js
    - fglcomp module.4gl

- Informix RDS P-code Link
  - Informix 4GL
    - cat m1.4go m24go ...> prog.4gi
  - 4Js
    - fgllink -o prog.42r m1.42m m2.42m ..
Using 4Js Compiler

- Informix IDS C-Compile
  - Informix 4GL
    - c4gl -c module.4gl
  - 4Js
    - fglcomp module.4gl

- Informix IDS C-code Link
  - Informix 4GL
    - c4gl -o prog.4ge m1.4gl m2.4gl ..
  - 4Js
    - fgllink -o prog.42r m1.42m m2.42m ..
Makefiles and 4Js

## Makefile Defines
## To Compile Genero

ALL = $(42R) $(42F) $(GLOBAL)

42R = dbpriv.42r  # Genero Linker output
42F = dtgrp.42f dtgrpmem.42f dtpub.42f dttab.42f dtuser.42f dtlogo.42f
GLOBAL = dtglobal.4gl  # 4GL Globals

## Genero Object Modules

42M = dtpriv.42m dtsql.42m dtglobal.42m dtlog.42m dtmenu.42m \
grpad.42m grpmem.42m grpquery.42m grptab.42m grpupd.42m \
pubtab.42m tabquery.42m tabusr.42m \
usradd.42m usrquery.42m usrtab.42m usrupd.42m
Makefiles and 4Js

## Makefile rules
## Rule to compile Genero forms
.per.42f:
   fglform $*

## Rule to link Genero 4GL modules to globals
$(42M):
   $(GLOBAL) $@

## Rule to link Genero object modules to create executable
$(42R):
   $(42M) $(GLOBAL)
   fglink $(42M) -o $(42R)

## Rule to compile 4GL to Genero p-code modules
.4gl.42m: $(GLOBAL)
   fglcomp -c $<
Challenges of Upgrading Old Code – Perform Screens

• Precise code – missing commas
• Screen array field sizes do not match
• Screen field sizes too small for WORDWRAP
Challenges of Upgrading Old Code – 4GL Code

- Precise code – old compiler does not check the number of values passed or returned between functions and calling program
  - Functions returned unexpected number of values
  - Functions called with parameters where none were defined
  - Functions called with 1 value where 2 were defined
  - Functions with multiple return statements all returning different types or numbers of values
GUI Paradigm Shift

- Challenges of the Web
- Keyboard Function Keys and ONKEY Clause
- Proportional Space Fonts
- Boring Screens
Questions?

Send follow-up questions to lester@advanceddatatools.com
About Four Js Genero
by
Stacey M. Osborn, Sales, Four Js
Outline of Webinar

➢ Explain the IBM and Four Js business relationship

➢ Tell me more about Four Js as a company

➢ Why make changes to I4GL apps that have worked for 20+ years?

➢ What is Genero Enterprise- Suite of products?

➢ 3 Migration steps

➢ How do I4GL programmers get started?

➢ Next steps – contacts/ evals/ promos
What is the IBM & Four Js connection?

- IBM and Four Js have been technical business partners for 20+ years on an international level.
- IBM chose Genero by Four Js as the preferred “modernization tool” for I4GL and sold licenses under IBM Genero for several years with very successful migration efforts.
- In a joint statement, July 2015, IBM and Four Js agreed the 4GL/Genero communities would be best serviced through Four Js directly. Four Js is proactively engaging IBM Genero customers and the transition of technical support has proven best for end users.
- IBM’ers Shawn Moe and Jeff Treece continue to support Four Js as the preferred “modernization tool” and evangelize Genero.
- *IBM channel partners are now working with Four Js to migrate existing 4GL customers and sell Four Js Genero Enterprise*
Tell me more about Four Js

- Founded in 1992 by Jean-Georges Schwartz
- Offices in US, UK, France, Latin America, Iberica, ASIAPAC
- US brand-name customers include the NFL, Sears, Skechers, Sungard Public, McDonald’s, CVS to name a few
- Over 22 million licenses sold!
- **US Technical Support Engineers all have over 11+ years employment with Four Js and avg 20+ years of Informix 4GL exp**
- Leader in the ‘Informix-4gl migration vs complete rewrite’ market
Why make changes to I4GL apps that have worked for 20+ years?

We agree! As Lester demonstrated.....

Stick with a coding structure that proves to be solid and timeless BUT with added features to keep up with the modernized apps driven by user demands.

This is Genero Enterprise!
Genero Enterprise - a suite of products

- **BDL** - Programming Language + compiler + Runtime System
- **Studio** – Graphical Integrated Development Environment
- Web Services API’s
- Application Server
- Graphical clients
  - Desktop Client (Windows, Linux, Mac)
  - Universal Web Client (HTML5/CSS/JS based)
- Report Writer
- Genero Mobile
Genero Enterprise Suite: BDL

- Efficient & Comprehensive high level language to quickly get information in/out of a database to display it to screen
- It has proven over the year to be a great choice to design sophisticated business / intensive data entry type of applications
- Informix 4gl backward compatible means legacy code / screens / reports can be used as a base
- Superset of 1-4gl, very easy to pick up for those that program already with Informix
- New features, widgets and APIs added every year in order to always extend the developer’s possibilities while not compromising the core business logic
  - Genero BDL is a full language that doesn’t depend on 4gl as a requirement. You can write brand-new applications/modules with it to complement your legacy one
- Developer can code manually or use a code generator
Genero Enterprise Suite: Studio IDE

- For better productivity or to accelerate adoption for programmers coming from different environments, Four Js provides a Graphical Integrated Development Environment called Studio.
- Note that you can work with Genero using command line only.
Productivity - Studio IDE modules
Studio IDE – Screen Designer
Studio IDE – Report Designer

Genero introduction
Studio IDE – Business Application Modeling

Model Driven Design to generate business logic
Genero Enterprise Suite: Open Architecture

- **Write once, deploy anywhere**
- P-code is OS cross-platform like Java Byte code
  - OS support: Linux, Windows, Mac, AIX, SUN, HP, …
- Database agnostic when using Four J’s ODI
  - Informix, SqlServer, Oracle, DB2, Mysql, …
- Our Dynamic Virtual machine loads DLLs at runtime (like Apache)
  - XML & JSON API
  - Web Services API
  - Utils/Mathematical API
  - Custom C/Java functions
- Cross front-end User Interface protocol based on DOM/XML
- Thin client, n-tier Architecture
Genero Enterprise Suite: Interoperability

- **Four Js Web Services API** is a 12 years old mature BDL extension to the language
- Allows to create consumer programs as well as create or reuse 4gl business logic to convert it as Service provider programs
  - Supports most common Styles & Protocols *(Doc, RPC, RESTful, SOAP)*
- In most cases, the code can be generated
  - With the help of a WSDL file
- We also provide a **Java Bridge API** to natively call Java Utility APIs from 4gl
Genero Enterprise Suite: Front-Ends

- Still supports Informix ASCII code without a change
- 4gl screens (.per) are backward compatible with Genero UI but in order to maximize the possibilities, a migration is recommended.
- The Server or DVM sends the same XML back to each front-ends
- Desktop Clients available as well as Web Clients
Desktop Application
Genero Enterprise Suite: Web Front-End (GWC-HTML5)

- **Clean and Responsive**
  - Without changing the Business Logic or the code, will look & feel like a Desktop application
- **Distributable**
  - The client only needs to have a web browser, there is no vendor specific software to install on the user’s PC/Device/OS
- **Highly customizable**
  - via HTML5, CSS3 & JavaScript
  - snippet driven for better granularity
  - therefore allows Browser specific tuning
- New generation of Web client will be released with our coming V3
Equivalent Web Application
Genero Enterprise Suite: Report Writer

Genero Report Writer allows you to create and publish new business report designs as part of your applications.

- **Separates real code from Report Design**
  - This means an intermediate phase of redesign is now possible using Four Js Report Designer.

- Supports various formats: HTML, PDF, Excel, Word
- High performance
- **API-Driven**
- Easy to maintain or to add reports to an existing data definition
- Not an ad-hoc/BI analytics product like Crystal Report or COGNOS
## Customer Order

<table>
<thead>
<tr>
<th>Item ID</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
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<td>Grandfather clock</td>
<td>1.00</td>
<td>122.00</td>
<td>122.00</td>
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<tr>
<td>FU-008-A</td>
<td>Office chair</td>
<td>1.00</td>
<td>129.00</td>
<td>129.00</td>
</tr>
<tr>
<td>FU-011-A</td>
<td>Table lamp</td>
<td>1.00</td>
<td>27.00</td>
<td>27.00</td>
</tr>
<tr>
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<td>1.20</td>
<td>1.20</td>
</tr>
<tr>
<td>SU-001-D</td>
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<td>1.20</td>
<td>1.20</td>
</tr>
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<td>1.00</td>
<td>6.10</td>
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</tr>
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</table>

**Order Date:** 10/25/2011

**Order No.:** 5

**Origin:** MTC

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**Office Supplies**

4 Avenue de Paris
78000 Versailles
Phone: +33 (0) 1 23 45 67 89
FAX: +33 (0) 1 23 45 67 89

**Customer Code:** Imaging

Fred Boggs
177 Elm Crescent
BMW SAF London
United Kingdom
Sophisticated Business reports: Graphs + Sub-reports
3 Migration steps: do it at your own pace

Step 1: Straight recompile
- No changes to the business logic or forms
- Will run in ASCII/console mode in place for I4gl
- Will run in GUI ‘as-is’ in ‘traditional’ mode: not beautified but functional
- For reports, Legacy engine still works as-is
- Or you can choose to run Genero Report writer in ‘traditional mode’ as well
- Very quick process: Application will be functional but may require esthetic tweaks
- [http://4js.com/company/ibm-i4gl-to-genero/stores-demo-example/#toggle-id-4](http://4js.com/company/ibm-i4gl-to-genero/stores-demo-example/#toggle-id-4)
3 Migration steps: do it at your own pace

- **Step 2:** Modify screens only
  - Toolbars, TopMenu
  - Tables, Treeviews
  - Containers like foldertabs, groups, …
  - Widgets: Dropboxes, Images, Date pickers, …

- Note that you might need to redesign your global window management as all open window will popup a new container in GUI
3 Migration steps: do it at your own pace

- Step 3: Adapt Business Logic for advanced/new design and UI capabilities
  - Multiple Dialogs/Focus
  - Drag & Drop
  - Web Components
- Genero BDL is a full language that doesn’t depend on I4gl as a requirement. You can write brand-new applications/modules with it to complement your legacy one
Consuming GoogleMap Web Service
Web Component Chart - Drag & Drop
Four Js & Four Promos in 2015

- Project: modernizing I4GL applications with Genero Enterprise/ Mobile 2.5
  Promo: **REPURPOSE** your 4GL renewal funds to receive **dollar for dollar credit**

- Project: migrating IBM Genero customers to Four Js Genero 2.5
  Promo: **FREE** – simply call Stacey at **972.786.0921** to get started!

- Project: upgrade BDS TUI, BDS licenses to Genero 2.5
  Promo: **TRADE IN** your licenses for a **dollar for dollar credit** towards Genero 2.5

- Project: Maintenance Amnesty for existing Four Js customers – true-up and co-term existing expired licenses.
  Promo: **BOGO** Buy one and get one free maintenance support.

**REWARD:** With all Four Promotions, Four Js is set to release Genero 3.0 in December. With Genero 2.5 current maintenance contracts, your organization will be entitled to the benefits and features listed here for Genero 3.0 at **NO COST! NO COST! NO COST!**
Where to get started

- Genero BDL is a superset of Informix 4gl, it is very easy to pick up
- Investigate more on your customized migration plan
- Get trained - your choice: instructor led or self paced
- Four Js will work with ADT to assist in achieving a technical win through a small proof of concept at minimum or no charge.
- Please ask Lester or Stacey for details

- [info@advanceddatatools.com](mailto:info@advanceddatatools.com) and / or [smosborn@4js.com](mailto:smosborn@4js.com)
For an evaluation license with full developer, compiler and debugger features, please contact

Stacey Osborn – Sales Account Executive - smosborn@4js.com
Next Webcast

Informix Storage and RAID5

*Doing Storage the Right Way!*

*By Art Kagel*

- Date: October 20, 2015
- Time: 2:00pm EST
Informix Training in 2015

• October 12-15, 2015
  – Informix for Database Administrators

• All courses can be taken online on the web from your desk or at our training center in Virginia.

• We guarantee to NEVER cancel a course and will teach a course as long as one student is registered!
Informix Support and Training from the Informix Champions!

Advanced DataTools is an Advanced Level IBM Informix Data Management Partner, and has been an authorized Informix partner since 1993. We have a long-term relationship with IBM, with priority access to high-level support staff, technical information, and Beta programs. Our team has been working with Informix since its inception, and includes 8 Senior Informix Database Consultants, 4 IBM Champions, 2 IIUG Director’s Award winners, and an IBM Gold Consultant. We have Informix specialists Lester Knutsen and Art Kagel available to support your Informix performance tuning and monitoring requirements!

- Informix Remote DBA Support Monitoring
- Informix Performance Tuning
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