

# Firebird Conference Prague 2005

- Building up an ERP System based on Firebird and Web Services
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# Firebird Conference Prague 2005

- The content:
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- Migration from 4 GL to CFML – CSS – Java
- Transfertex is a printing company for Textile Industry producing ThermoTransfer Paper
- More at “[www.tfx.de](http://www.tfx.de)” (260 employees, 40 Mio Euro)

# The situation:

- 12+ years running Interbase (FB1.0.3...1.5)
- 10 year production on HP UX and Cognos Powerhouse 4GL on HP Terminals
- Most background processing based on C ( C++) programming with Embedded SQL
- 80+ User in a 24/7 environment
- A lot of interfaces to other subsystems and Databases: DB2 V2.1 / OS2 and Oracle 8.0..5 / Windows
- Intranet and Extranet servers already running

# The need to migrate to new technologies

- Cognos Inc. stopped Interbase in year 2000 with the day of being OpenSource !
- We shd move to Oracle or M\$SQL and keep PH 4GL
- A road map has to be found in order to have a reasonable future for our system (beyond buying SAP)
- We decided to kick Cognos and keep Firebird!
- Enable graphical GUI --> pictures!
- Platform independent and MAC support

# Building ERP System

- The hardest thing to find a technology which is suitable and lasts for next years and covers all needs of today and future
- This was the choice for us:  
**Macro Media Coldfusion web application server technology**
- We checked Netfrastructure (was 2<sup>nd</sup> ) also Delphi, JSP , C++
- We use **JAYBIRD 1.5.4 Type4 JDBC driver** and a translation of characters “Umlauts” from HP-UX charset to Windows/Linux/MAC

# Why ColdFusion?

- High versatile for integration of databases, graphical processing incl. PDF, file processing
- “Came to live” as database manipulating language as a add-on to HTML pages --> “dbml”
- Platform independent
- Knowledge, skills was given
- Huge base of installation, market leader , top 5 software companies (Adobe)
- Scalable, flexible to 10..1000 users
- reasonable pricing
- Projects were successfully done (Intranet, external Webservices ) by Transfertex

# What is needed...before starting

- A project plan, structure, schedule
- Training ---> Indoor workshops
- A common design guideline!
- Resulting in a Application Framework
- Pilote applications
- Dedication and strong commitment from the management, team and users!
-

# The basics...

- The data dictionary:
  - Tfx set up a data dictionary /repository for every field used in the app (forms, reports etc.)
  - The dictionary is held in a FB 1.5 database
  - The forms and formfields are built “onthe fly” and default- or database values are filled into the fields
  - The DD is driven by stored procedures and the caching mechanism of ColdFusion server



# The basics...

- FRAME WORK is the hardest stuff !
  - The framework took us 12 month to create and is still to be optimized
  - The FRW is a derivation of Hal Helmes **FUSEBOX technique**
  - The View, Processing and Controlling layers are separated **ModelViewController**
  - The “screens” used within the application contain HTML,JavaScript, HTMLforms, CSS and PDF (so we can do “Flash” but not is used now)
  - Proofed transaction capabilities and especially on concurrency updates!
  - CfComponents to step into Object oriented programming

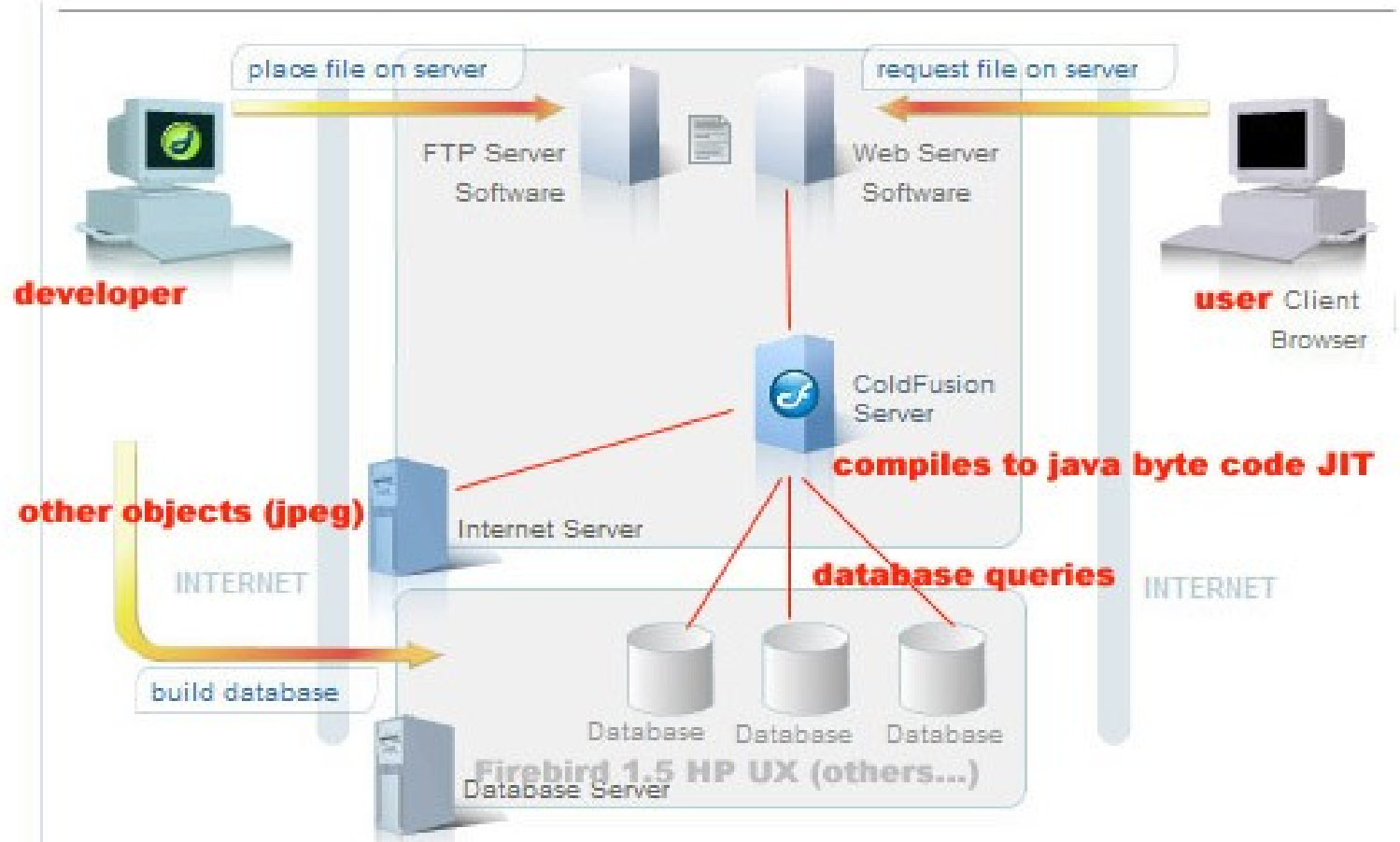
# How it works basically...



## ColdFusion Overview

A simple html file containing CFTAG and CFFunctions is passed from the Webserver (Apache) to the ColdFusion App Server.

about CF from MM website ...



# What is different to client server apps?

- Web pages are stateless!!!
- Every page request is a mini “programm” for itself start/end transaction in 1 request!
- They are platform independent
- Webapp Server allows highflexible integration of other web-services
- Problem: user need to refresh pages to get updated data
- DANGER: user can overwrite other later changes by their colleagues
- ---> work-around for OPTIMISTIC LOCKING

# How to prevent users to overwrite previous changes

- We introduced a **TIMESTAMP** flag for each record
- `upd_timestamp` date/time/milliseconds
- Keeps track by a pre-update-trigger
- Every record read into the webpages has a invisible timestamp
- In case of an update action this “timestamp” is compared to that one which is to update – if the timestamps are not equal - an error is given “record changed pls re-fetch data”
- By this we prevent users to undo updates with inconsistent data

# Gaining Performance

- Use **Stored Procedures** like query statements
  - `<cfquery name="sp1" datasource="fb1">`
  - `Select * from sp1 ( myinput1,..) </cfquery>`
  - Gives a result set or fires heavy transactions within the database
- **Caching data** of queries by add “cachetime” to the `<cfquery >`
- **Query of Query** mechanism allows to work with a “live query” 1x run 100x use without re-run
- Heavy usage of the **Application scope** (put all you need of variables into memory of App Server)
- There a lot of caching techniques for CFMX

# Example getting details from the data dictionary

- **<cftransaction action="BEGIN">**
- **<cftry>**
- **<cfset xQuery="SELECT**  
A.FELDORT,A.FELDNAME,A.FELDLABEL,A.FELDTITEL,A.FELDKURZINFO,A.FELDBESCHREIBUNG,A.FELDSPANID,A.FELDDATAID,A.FELDTAB,A.FELDCHECK,A.FELDREQ,A.FELDNULERL,A.FELDTYP,A.FELDLAENGE,A.FELDZEILEN,A.FELDSPALTEN,A.FELDCASE,A.FELDDEC,A.FELDBWZ,A.FELDCHECKEDIF,A.FELDINITVALCHK,A.FELDINITVAL,A.FELDPATTERNCHK,A.FELDPATTERN,A.FELDINCLUDECHK,A.FELDINCLUDE,A.FELDEXCLUDECHK,A.FELDEXCLUDE,A.FELDDEFVALCHK,A.FELDDEFVAL,A.FELDMINVALCHK,A.FELDMINVAL,A.FELDMAXVALCHK,A.FELDMAXVAL  
**FROM SP\_GET\_DATA\_INI ('#attributes.ModulName#', '#Field#', '#session[url.instance].language#') A ">**
- **<cfquery datasource="#application.ds\_tfx\_dd#" name="q\_DataIni\_get">#PreserveSingleQuotes(xQuery)#</cfquery>**
- **<cfcatch type="Database"><cfinclude template="#application.webroot#globals/cf/include/inc\_dbcatch.cfm"></cfcatch>**
- **</cftry>**
- **...**
- **<cftransaction action="commit" >**
- **</cftransaction>**
- **ONCE PERFORMED IT IS HELD IN CACHE and takes 0ms to be fetched!**

# Design reusable code

- CustomTags application wide pieces of code dynamic generation of screens, tables and forms
- Coldfusion components CFC OOP
- Queries are held in queryaction templates
- Stored Procedures database
- Unique navigation methods in global JavaScript code
- “Layout and look” in CSS
- Allow only 1 type of Webbrowser “Mozilla” and “Firefox”

# About performance:

- A lot of influence factors! DB/APPs/Client
- The modules are compiled into Java JIT and stored into the APPs Cache Memory
- We had bad performance due the way our framework was first designed and worked
- But now this is not an issue anymore – we do quite a lot preparing and sharing of screen/forms content from apps memory and NOW we have stable and fast modules
- Today FIREBIRD is the bottleneck, so we hope for an improvement by FB1.5.2 (FB1.0.3)



# Debugging !

- Total Time      Avg Time    Count    Template
- 2078 ms    2078 ms    1  
C:\cf\system3\modules\au\10\11\index.cfm
- 2000 ms    2000 ms    1  
C:\cf\system3\modules\au\10\11\inc\_find\_1.cfm
- **1577 ms    394 ms    4**  
**C:\cf\system3\globals\cf\CustomTags\queryaction.cfm**
- 48 ms    0 ms    99  
C:\cf\system3\globals\cf\include\inc\_data\_ini\_get.cfm
- 16 ms    0 ms    743  
C:\cf\system3\globals\cf\CustomTags\fmask.cfm
- 15 ms    1 ms    11    0 ms    0 ms    2  
C:\cf\system3\globals\cf\CustomTags\flabel.cfm
- 0 ms    0 ms    1  
C:\cf\system3\globals\cf\CustomTags\translate.cfm
- 0 ms    0 ms    11    C:\cf\system3\globals\cf\include\inc\_finit.cfm
- C:\cf\system3\globals\cf\include\inc\_fparam\_read.cfm
- 0 ms    0 ms    4    C:\cf\system3\modules\au\10\11\qry\_data.cfm
- 0 ms      STARTUP, PARSING, COMPILING, LOADING, &  
SHUTDOWN
- **2078 ms      TOTAL EXECUTION TIME**

# Scaling ...

- Coldfusion Standard Srv for Workgroups  
2...20 concurrent users (1400 US\$)
- Coldfusion Enterprise Srv 20...100 under  
embeddedJRUN what suitable for us (6000\$)
- Coldfusion Enterprise under  
BEA, WebSphere, SUN One etc ...
- + Clustering by Hardware or Software

# Our systems Production

- DatabaseServer FB103/FB1.5.2 under HP UX L3000 2x 875 PA Risc 4GB RAM RAID-1/striped disk SCSI LVD 5\*36GB, 100Mbit
- AppServer 2x Opteron 275 DUAL CORE AMD WIN2003 Webedition 4GB RAM 1000Mbit; ColdFusion CFMX ENTERPRISE & Apache 2.0.49, Jaybird 1.5.4
- AppServer 1x Opteron 248 2GB RAM 1000Mbit; WINXP Pro; ColdFusion CFMX 7 STD & Apache 2.0.49, Jaybird 1.5.4

# From Terminal to Webclient

WS92 C:\HindSoft\SYSTEM2.W92

File Edit Config Options Trouble Print Help

ENTER STOP BREAK PRINT SCR PRINT FF PRINT CLOSE HRESET SCREEN

0111/au0301 Abfrage: DESSIN mgrch

Suchen Zyl Rückst Mit-/Aus-Dess Coord Statistik ProdPlan ALLES

Dessin: 51202 /6 Kunde:

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Stat: Gültig Erfasst: 16.07.2001

S/O-Datum-Ist: 17.10.2001 S/O-Aktion: H022

Gravurdatum-Plan: 17.08.2001 Gravurdatum-Ist: 17.08.2001

Löschdatum-Plan: \_\_\_\_\_ Löschdatum-Ist: \_\_\_\_\_

Max. Rückst. Datum: \_\_\_\_\_ Reduktion von: \_\_\_\_\_

Identbreite-Dessin: \_\_\_\_\_

DDS-Eignung techn: J DDS-Versatz: H

Max. Arbeitsbreite mm: 2970 Schnittbreite in mm: 220

Zentriert: N Motiv-Richtung: vertical

Dessinart/Trendgruppe: Stripes Novelty HT Deko Komm. \_\_\_\_\_

Umfang/Seitenrapport(mm) 640 / 685,80

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Id InfoNr Druckform-Kz Kz Infotext Anz-Info's: \_\_ /\_\_

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01

02

03

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Mehr... Hinweis Hilfe Seite zurück Seite vor Kombi. beenden Programm beenden

Telnet system2 HP 2:1 OVR 10:55 Mon Nov 07

# The Webclient

au0301 - Mozilla

File Edit View Go Bookmarks Tools Window Help

Back Forward

<http://system3.tfx.de/cf/system3/entry/index.cfm?Instanz=mgrch%5F103> Search

Print



0111 Transfertex GmbH & Co.

transfertex

au Auftragsbearbeitung

03 Verwaltung Auftragsdaten

01 Standardabfragen Verkauf

Benutzer: mgrch  
Sprache:   
Regional:   
Instanz: 103


Suchen Hardcopy Legende Ende

Dessin : 51202 NMK-Kz :N

Verkaufsabfrage: DESSIN

**DESSINSTAMM:**

Status:	999
Status-Text:	Gültig
Erfassungsdatum:	16.07.2001
Dessin:	51202
Anz.Zylinder:	6
Anz.grav.Zylinder:	6
Kunden-Nr.:	1
Kundenkurzbez:	TRANSFERTEX
Land:	D
Dessin-Typ-Nr.:	2800
Dessin-Typ:	Stripes Novelty
TrendGrpNr:	2110
Trendgruppe:	HT Deko Komm.
Seitenrapport (mm) :	685,80
DDS-Versatz:	H
GravDatumPlan:	17.08.2001
Gravurdatum-Ist:	17.08.2001
S/o-Plandatum:	21.08.2001
S/oDatumIst:	17.10.2001
S/oAktion:	H022
LoeschDatumPlan:	



# The Webclient

System/3 - Mozilla

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an Auftragsbearbeitung

10 Listen Kunden

17 Auftragsliste f. Versacker

Benutzer: agsch  
Sprache:   
Regional:   
Instanz: 21

Erfassen Suchen Galerie > >> Legende Ende

Seite 1 von 3 / Datensatz 1 bis 40 von 91

Kundenkennzeichen	Land	Lieferdatum	Auftrags-Nr.	Pos.-Nr.	Auftragsart	Liefermenge	Detail-Status	IS-Legende	Vers-Art	Dessin	Colorit
LEIE-DECO	B	11.02.2005	429711	1	LP	500,00	80	A	L30W	50982	1004
LEIE-DECO	B	11.02.2005	429711	2	PF	1.000,00	80	A	L30W	50982	1017
LEIE-DECO	B	11.02.2005	429711	3	PF	2.000,00	80	A	L30W	51018	1022
LEIE-DECO	B	11.02.2005	429711	4	PF	1.000,00	80	A	L30W	51018	1028
LEIE-DECO	B	11.02.2005	429711	5	PF	1.000,00	80	A	L30W	51340	1015
LEIE-DECO	B	11.02.2005	429711	6	LP	1.000,00	80	A	L30W	50825	1007
LEIE-DECO	B	11.02.2005	429711	7	LP	500,00	80	A	L30W	51823	1011
LEIE-DECO	B	11.02.2005	429711	8	PF	750,00	80	A	L30W	51803	1003
LEIE-DECO	B	11.02.2005	429711	9	PF	750,00	80	A	L30W	51803	1011
LEIE-DECO	B	11.02.2005	429711	10	LP	500,00	80	A	L30W	51967	1002

# Terminal to Webclient

WS92 C:\MiniSoft\SYSTEM2.WS2

File Edit Config Options Trouble Print Help

ENTER STOP BREAK PRINT SCR PRINT FF PRINT CLOSE HRESET SCREEN

0111/110409 Rezept-Musterung mgrch

Erfassen Ändern

Zylinder: 1

Ausgangs-FNR.....: EA22AA PES-Serie 2003

Ausgangs-Gewicht kg: 12,000

E-GELB 94	E-ROT 95	E-SCHW. 97	VERSCHN. 10	SPIRIT. 01
94	95	97	10	1
7. 251,60	524,40			4. 224,00

Korrekturen:

Muster-FNR.....: EA22AA

Muster-Gewicht kg..: 12,000

E-GELB 94	E-ROT 95	E-SCHW. 97	VERSCHN. 10	SPIRIT. 01
94	95	97	10	1

Die FNR ist zu:

- 1 farbstark
- 2 farbschwach
- 3 bunt
- 4 unbunt
- 5 E-GELB 94
- 6 E-ROT 95

Keine Korrektur

Mehr... Hinweis Hilfe

Programm beenden

Telnet system2 HP 9:51 OVR

Start UNION of 2 Datasources... SonicWALL Global VPN Cl... WS92 C:\MiniSoft\SY... 11:00 Mon Nov 07







# **We are still at the beginning...**

- We plan to migrate more then 1000 screens to coldfusion technique
- Next step could be Rich-Internet-App build on CFComponents and FLEX2.0 (a flash compiler)

# Thank you

- More infos...
- [www.coldfusion.com](http://www.coldfusion.com)
- [www.macromedia.com](http://www.macromedia.com)
- [www.snappmx.com](http://www.snappmx.com)
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