

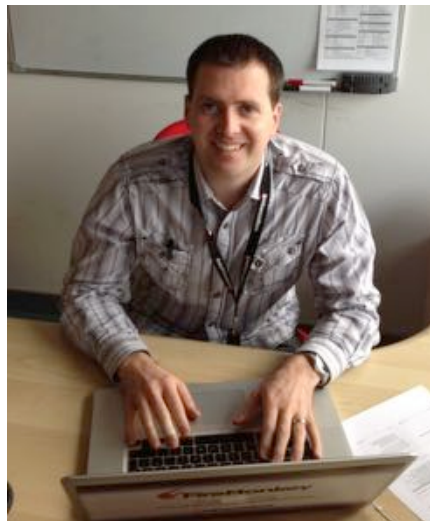


Embed, Deploy, Relax

# InterBase XE7 – First Look!

LIVE!!

## About your presenter



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**Associate Product Manager (InterBase)**

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<http://DelphiABall.co.uk>

@DelphiABall



# Agenda – InterBase Product Address

- Embarcadero - Overview
- InterBase XE7
  - Product Address
  - What's new!
- Change Views
- Disaster Recovery
- Data security at work – Across the Product lifecycle
- Going Mobile
- Summary, Q&A

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# Embarcadero

# Embarcadero Technologies

- Founded 1993
- 3.2 Million Customers - 97% of Fortune 2000
- 35+ Product Awards – Consistent Innovation
- 500+ Employees in 29 Countries



# Embarcadero Product Portfolio

Design

Develop

Deliver



## Application Development

The complete solution to build connected apps for Windows, OS X, iOS, Android, gadgets, and wearables.



## Data Modeling & Architecture

Intelligent design and modeling for enterprise information architecture.



## Database Management & Optimization

Development, administration and performance tuning for database platforms.

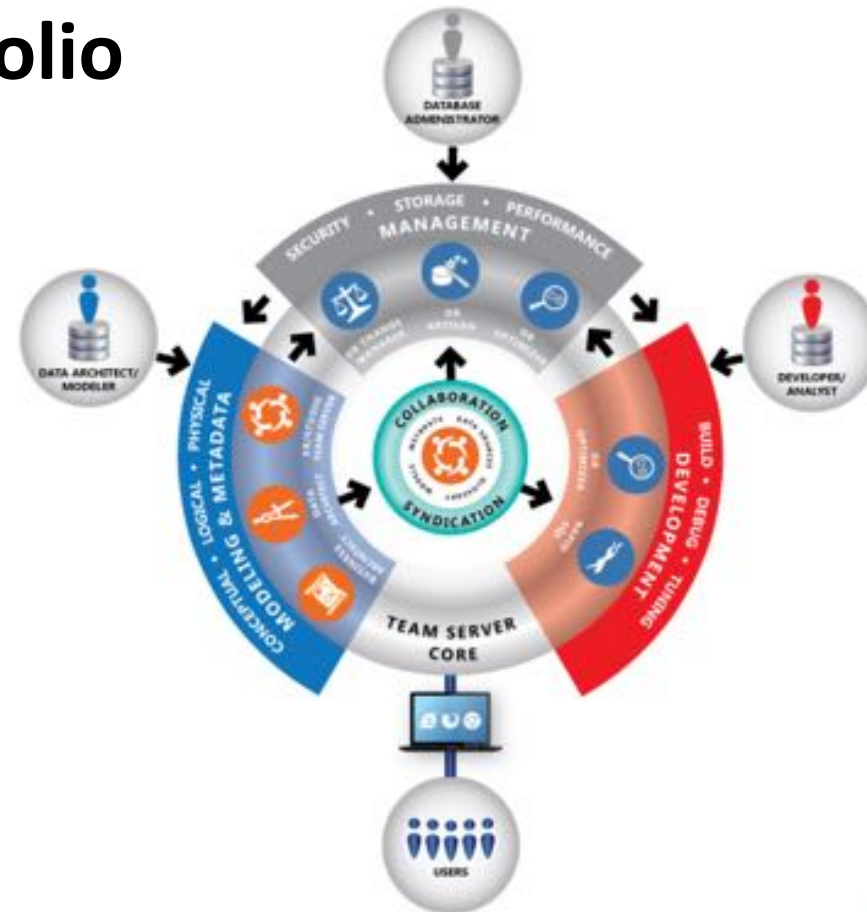


## Database Tools Portfolio

The complete database management and modeling solution for delivering significant productivity gains across a broad set of DBMS platforms.

# Database Tools Portfolio

Whether collaborating on large-scale data models, managing heterogeneous database environments or developing SQL for optimal performance, the Embarcadero database tools deliver significant productivity gains across a broader set of DBMS platforms.





Embed, Deploy, Relax

## Product Address



Embed, Deploy, Relax

# INTERBASE

*Kick start* your applications with must have data security, synchronization and disaster recovery features. Build it once then *Embed, Deploy, Relax!*



# Your data on your devices!

From smartphones, tablets and laptops to servers,  
locally or in the cloud. Manage your data safely  
everywhere!



Server



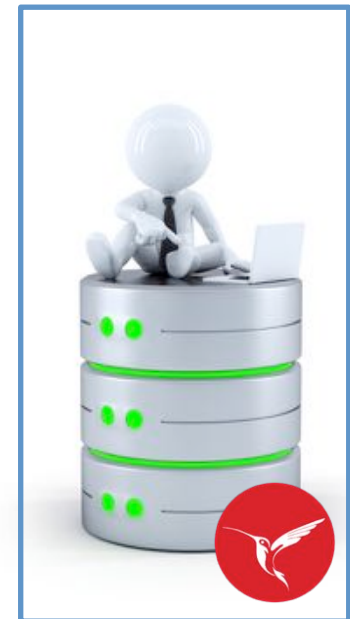
ToGo / IBLite



XE -Server

# InterBase; an “Embeddable” Database!

1. Can be deployed as part of your product
  - Silent install options
  - Integrate the installer
2. Also deployable as a library for
  - Standalone applications
  - Client driver



## Bonev Soft Audting Ltd - AJUR

More than 5,000 Bsoft customers use AJUR to provide **financial reports to tax authorities** and various other stakeholders; as well as to **closely manage their supply chains**.

Their customers include major enterprises such as

- Overgas Holding
- Sinergon Holding
- Armeets
- Cargill
- EY
- PwC
- Bulgarian Military

“We evaluated many database technologies and InterBase had the right mix of ease of use, speed, high performance and scalability for our needs.”

*Valentin Bonev, Managing Partner, Project Manager and CIO*



<http://www.embarcadero.com/resources/case-studies>





# InterBase - in the Internet of Things

## Embed

Small 4MB footprint

Full ANSI SQL-92 Support



## Deploy

Flexible platform support: Windows, Linux, Mac OS X, iOS & Android & Cloud

Platform independent DB – Seamlessly copy your DBs across platforms

## Relax

Zero administration with automatic crash recovery and self-tuning engine

Protect sensitive data with strong AES encryption



## Low Cost



IBLite - Runtime royalty FREE version of InterBase

IBToGo – Price performance leader



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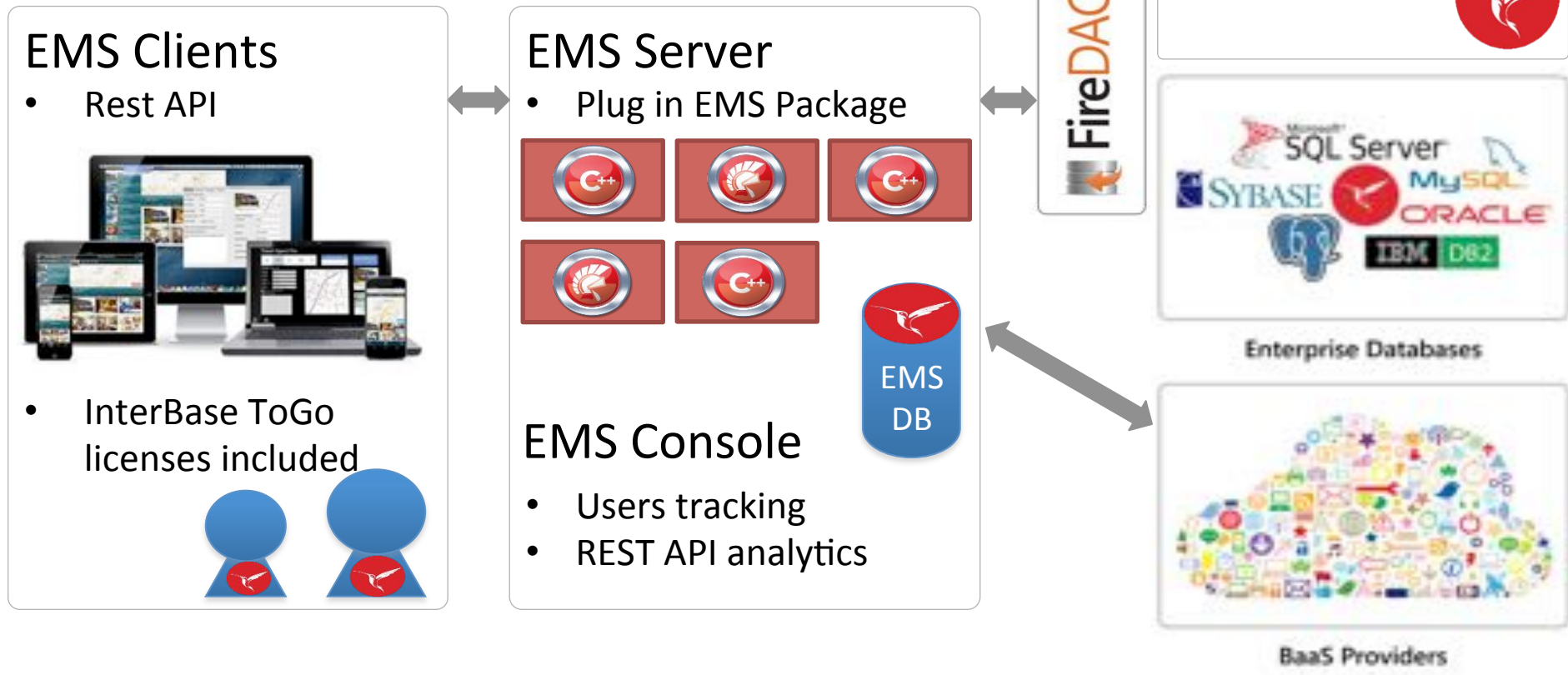
# InterBase – Editions

INSTALLED	<ol style="list-style-type: none"> <li><b>1. Server Edition</b> <ul style="list-style-type: none"> <li>– 1 to unlimited connections</li> </ul> </li> <li><b>2. Desktop Edition</b> <ul style="list-style-type: none"> <li>– Same as server, but local connections only.</li> </ul> </li> </ol>
LIBRARY	<ol style="list-style-type: none"> <li><b>3. ToGo Edition</b> <ul style="list-style-type: none"> <li>– Embedded version  </li> </ul> </li> <li><b>4. IBLite Edition</b> <ul style="list-style-type: none"> <li>– Feature limited version of ToGo <ul style="list-style-type: none"> <li>• 100mb on disk</li> <li>• No encryption</li> <li>• Single thread connection</li> </ul> </li> </ul> </li> </ol>

TRIAL	<ol style="list-style-type: none"> <li><b>1. Free 90 day Server trial</b> <ul style="list-style-type: none"> <li>– Full featured server edition</li> <li>– 20 users / 80 connections</li> </ul> </li> <li><b>3. ToGo Edition</b> <ul style="list-style-type: none"> <li>– Embedded Version</li> </ul> </li> </ol>
DEVELOPMENT	<ol style="list-style-type: none"> <li><b>1. Developer Edition</b> <ul style="list-style-type: none"> <li>– 20 users / 80 connections</li> <li>– Weak encryption only</li> <li>– Time-limited connection</li> </ul> </li> <li><b>1,3 SDK Pack</b> <ul style="list-style-type: none"> <li>– Full featured licenses</li> <li>– Time-limited (Similar to trial)</li> </ul> </li> </ol>

\*ToGo and IBLite do not offer UDFs on iOS / Android due to platform requirements around excluding external libraries in application bundles for security reasons.

# Enterprise Mobility Services





# InterBase® XE7 - Embed, Deploy, Relax

- Overview

- Highly scalable, powerful, embeddable database.
- Small memory and on-disk footprint,
- Simple installation / deployment
- Encryption built into all paid versions\*
- Near zero administration
- Self-tuning engine
- Low TCO

- Notable Features

- Full-featured DBMS
  - SQL92 compliant
  - SQL Domains
- ACID compliant / Multi-version architecture
- **NEW** - Powerful Change Tracking (Change Views)
- Automatic crash recovery
- SMP - Multiple core support
- Fully featured in all editions
  - *Some features limited in run-time royalty free IBLite*
- Database monitoring and statistics built in

- Security

- Embedded user & role based authentication
- Full database, table or column encryption
  - DES (weak)
  - AES (strong 256bit) encryption
- Decryption by user / user role
- Allows developers to focus on creating fast, resilient applications.

- Disaster Recovery

- Journaling & Point In time recovery
- Data dumps
- **NEW** – Incremental data dumps
- Partial backups

- Also....

- Window Direct I/O support & Amazon EC2 certified
- Tight integration into Embarcadero Development tools, but also works with Visual Studio, Xcode, Eclipse, Ruby, PHP etc
- ODBC



**embarcadero**



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## What's New

Run Faster,  
Run Longer,  
Code Smarter

## XE Edition - Introduced

- Support for Dynamic SQL in Stored Procedures.
- Improved large objects handling.
- Optimized performance for large objects with Stream methods
- Improved Security
- Stronger password protection with cryptographic hash function
- Improved Scalability
- Faster Database sweep
- Larger database support



# XE3 Edition - Introduced

## New platforms

- ToGo
  - iOS
  - Android
- IBLite (Free edition)
  - iOS
  - Android
  - Windows
  - Mac OS X
- 64bit ODBC driver
- JDBC driver updates
- Physical Database Portability between
  - Windows,
  - Mac OS X
  - Linux
  - iOS
  - Android



## Core features in InterBase XE7 (DeltaForce)

- Linux 64bit & new Linux Platforms
- 64bit Transaction ID's
- Change Views
- Speed!
  - Processor management
  - Indexes
  - Backup and DR
- New developer API's
- ODS Update (16)
- OpenSSL update



## 64 Bit Linux Server

- Linux 32bit & new 64bit builds
  - Same ODS – Develop on windows, deploy to Linux
- Supporting
  - NEW - Ubuntu 14
  - RHEL 6 & 7
  - SUSE 11
- Connect to it from any client
  - Windows, Mac OSX, Linux, Android or iOS



## Speed improvements

- Improve SMP performance
- Index Manager enhancements
  - Faster key management
  - Partial segment selectivity
- Multi-generational engine optimisations.
  - Read Committed (for long running databases)
- Incremental data dumps



# Index Manager

- Index Manager enhancements
  - Algorithm improvements
  - Partial index usage (e.g. F1, F2, F3)
- Benefit...
  - Only the relevant part of the Index is used = faster execution
  - Create fewer indexes

F1	F2	F3
10	20	30
10	21	42
15	10	86

## Other new features & changes

- OpenSSL updates 1.0.1i
- Larger Transaction ID's
  - At 10,000 transactions a second = 150 years running
    - Moved from 32bit to 48bit 64bit
  - High demand systems, less need to backup and restore your database!
- Services API for Journaling and Online Dumps
- ODS 13 and above only supported
  - Ability to restore to older versions (for older development systems)





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## What our customers say

## Bio-Nuclear

- Distributor of quality clinical lab products and instruments
- Uses InterBase as their sole database for their lab and medical device solutions



# ManagementPlus™ Health Care Information Systems

- Deliver a high value solution with industry leading features at a lower price point than the competition
- Over 2000 professional users
- Customers sizing 1 to 300+ users
- Provide an easy to use, intuitive software interface for medical practices
- Respond quickly to industry regulations and customer requirements with new feature releases
- Reduce or eliminate complex database administration requirements



ManagementPlus ships with the InterBase database for reliable data management of confidential patient records...

...“Just about the only thing our customers need to do is run the backup utility from time to time.”

*Bryan Thorell, Development Manager,  
ManagementPlus*

# Siemens Healthcare Diagnostics

- Global leader in vitro diagnostics and performance driven solutions
- 14000+ employees, serving 30,000 customers in 120 countries
- Uses Delphi and InterBase for their Microbiology division for control instrumentation, patient results, reports and more

**SIEMENS**  
medical



# GivenHansco

- Software tool for concrete batch controls, dispatch, GPS vehicle tracking and business accounting functions
- Required powerful, zero maintenance full featured SQL database
- Uses InterBase as the sole database for small single and large hundred plant operations

<http://www.embarcadero.com/resources/case-studies>



*“InterBase is simple, straightforward, easy to install, easy to upgrade! It just works!”*

*Craig Hansen, Vice President*



**embarcadero®**

# PAR Spring-Miller

- Embedded, Desktop, Workgroup
  - Easy to install
  - Very small footprint
- Runs on multiple platforms
  - Win 32, Win x64, Mac OS X, Linux
- Near-zero administration
- High performing, scalable and powerful!
- Tight integration with RAD Studio, Delphi & C++Builder

*“SpaSoft’s customers require that our application respond within seconds. With InterBase’s high performance and small size, the application is able to easily meet the demands of our clients.*

*The performance is truly amazing!”*

Product Development Director, Springer-Miller



# Electrolux

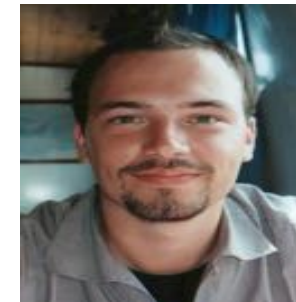
- Global leader in appliances
  - 40 million units across 150 markets
- Certus Management Information System (CMIS)
- Vital performance statistics for washers



*Thinking of you*  
**Electrolux**

*"It's so simple to include  
InterBase in my application.  
InterBase is amazing!"*

*Magnus Flysjo, CMIS developer*





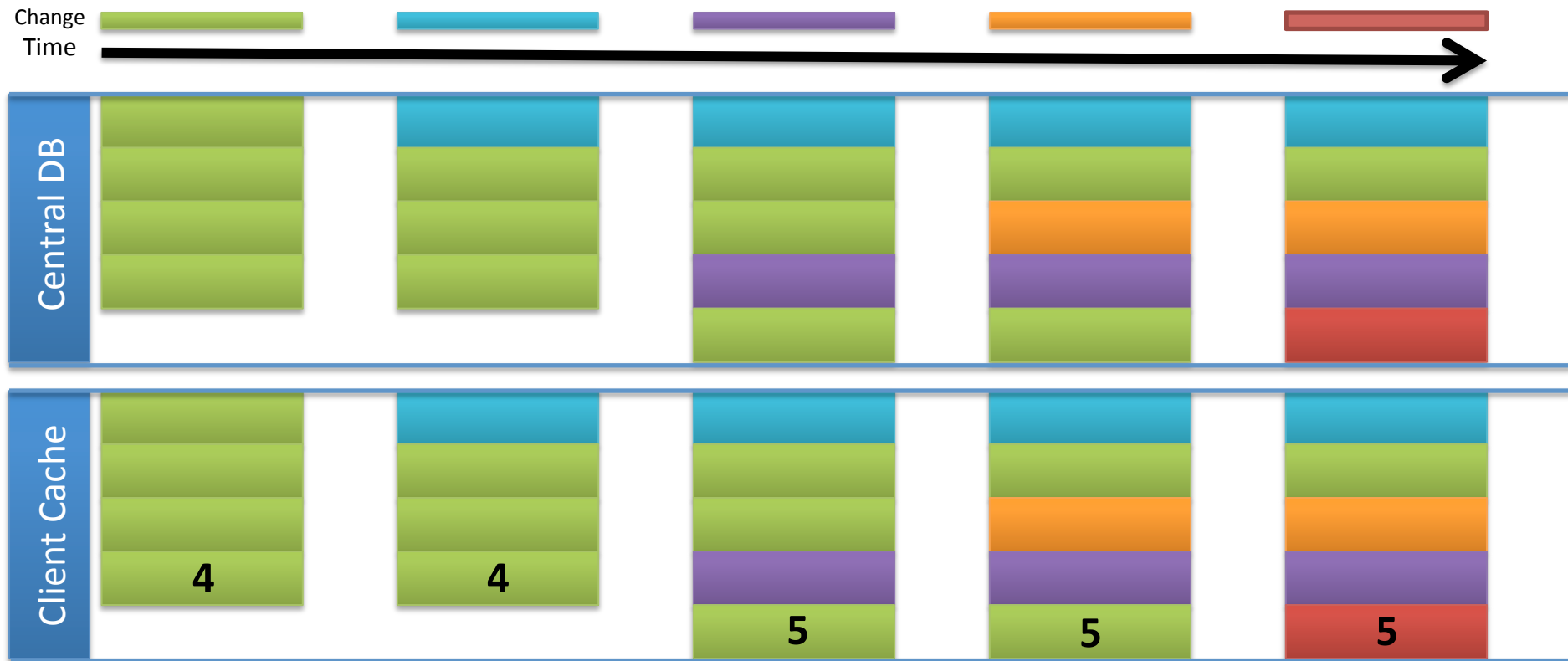
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# Introduction to Change Views

## What is Change View's?

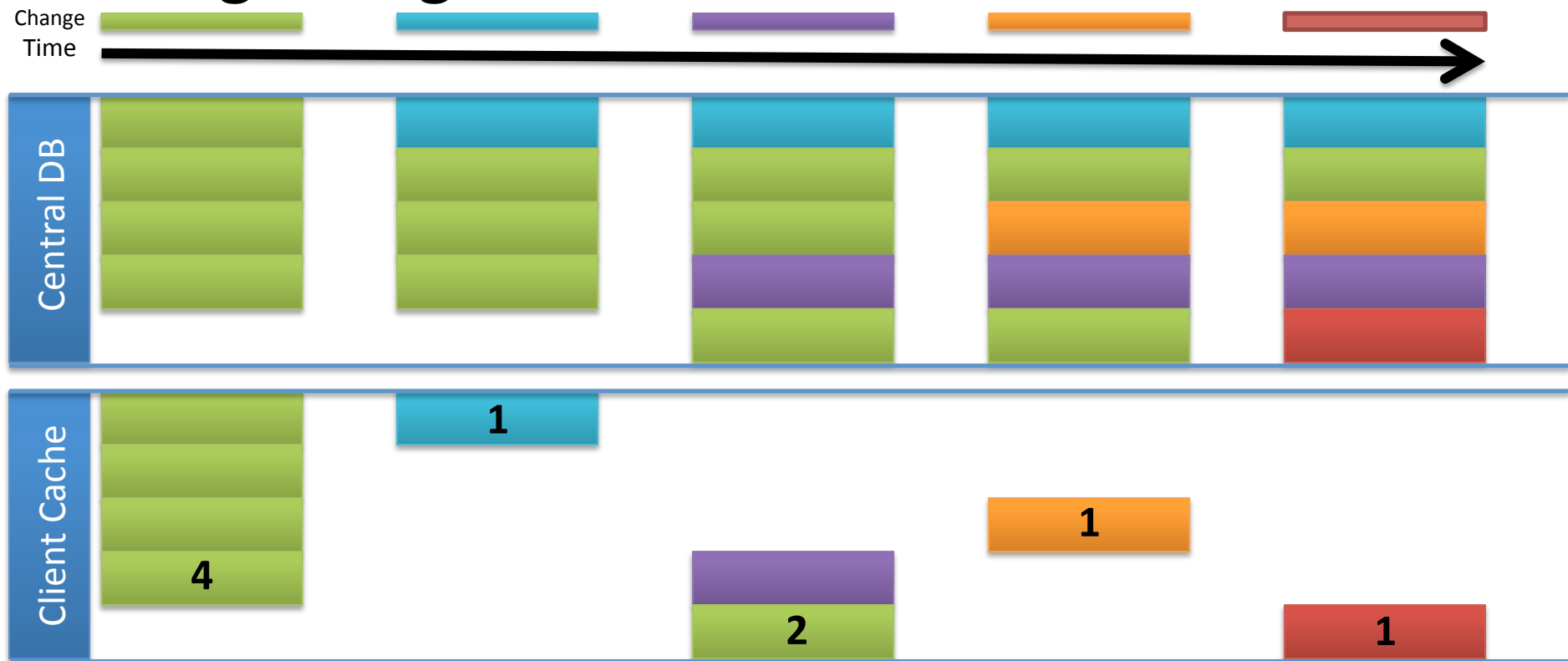
- A new “subscription based” model to “subscribe” to data and identify what data has changed in the database.
- Subscriptions can run both
  - During a connection
  - Spanning connections and time
- Each subscriber can have multiple devices each subscribed

# Traditional Data Briefcase



Virtual field packets sent:  $4 + 4 + 5 + 5 + 5 = 23$

# Using Change Views



Virtual field packets sent:  $4 + 1 + 2 + 1 + 1 = 9$

## Change Views – How they work

- A subscription is created to specific data that allows you to identify at a column/field level what data has been changed.
- Multiple users can subscribe to the same subscription configuration.
- A Subscription can be any mix of tables / columns
- Each user can subscribe multiple devices, each with their own tracking id
- Do not report back your changes, only what others have changed!
- Runs across connections / no need to stay connected
- Can be short or long lived.
- Included within all InterBase licenses, excluding IBLite (Free) edition.



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## Change Views – Why?

# Why? How this improves over trigger based logging?

## Triggers

- High “cost” at run time
- Verbose database logs
- Hard to query what is changed
  - Multiple changes = multiple log records / actions on the same data
- Suited to small scale synchronisation / replication only

## Change Views

- Near zero DB speed effect
- Minimal on-disk size
- Field level granularity
- SQL language features to identify changes
  - Easily get change sets
- Highly scalable

## Why? How this improves over date based fields?

### Date Fields

- Verbose database tables
- Increased disk usage
- Complex management
- Simultaneous updates can lead to date stamp conflicts
- Risks around date being wrong
- Hard to identify what you knew about

### Change Views

- Near zero DB speed effect
- Easy to add after database is designed / live
- No table metadata changes
- Ability to automatically filters your changes from queries
- Simpler SQL to find changes



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# Change View Subscriptions

Language and Demo

# Create Subscription

```
CREATE SUBSCRIPTION sub_ceo_multidevice
ON EMPLOYEE FOR ROW (INSERT, UPDATE, DELETE),
    CUSTOMER FOR ROW (INSERT, UPDATE, DELETE),
    SALES FOR ROW (UPDATE),
    DEPARTMENT (LOCATION) FOR ROW (UPDATE)
DESCRIPTION 'Subscribe to multiple changes for CEO using
multiple devices';
```

# Granting & Revoking Subscription Access

- GRANT and REVOKE commands similar to Privileges for accessing tables

**GRANT** SUBSCRIBE **ON** SUBSCRIPTION <subscription\_name> **TO** <user\_name>

**REVOKE** SUBSCRIBE **ON** SUBSCRIPTION <subscription\_name> **FROM** <user\_name>

# Using Subscription

```
SET SUBSCRIPTION sub_ceo_multidevice AT 'tablet' ACTIVE;
```

```
/* Modify DEPARTMENT.location='Austin, TX' for department 180 */
```

```
SELECT DEPARTMENT, LOCATION FROM DEPARTMENT WHERE DEPT_NO=180;
```

```
UPDATE DEPARTMENT SET LOCATION='Austin, TX' WHERE DEPT_NO=180;
```

```
SELECT DEPARTMENT, LOCATION FROM DEPARTMENT WHERE DEPT_NO=180;
```

```
SET SUBSCRIPTION sub_ceo_multidevice AT 'tablet' INACTIVE;
```

```
COMMIT;
```

## System Table Updates

- RDB\$SUBSCRIPTIONS
- RDB\$SUBSCRIBERS
- RDB\$RELATIONS
- RDB\$RELATION\_FIELDS
- RDB\$USER\_PRIVILEGES (added Subscribe)



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## Disaster Recovery

Context, Incremental Backups,  
Journaling & Point in Time

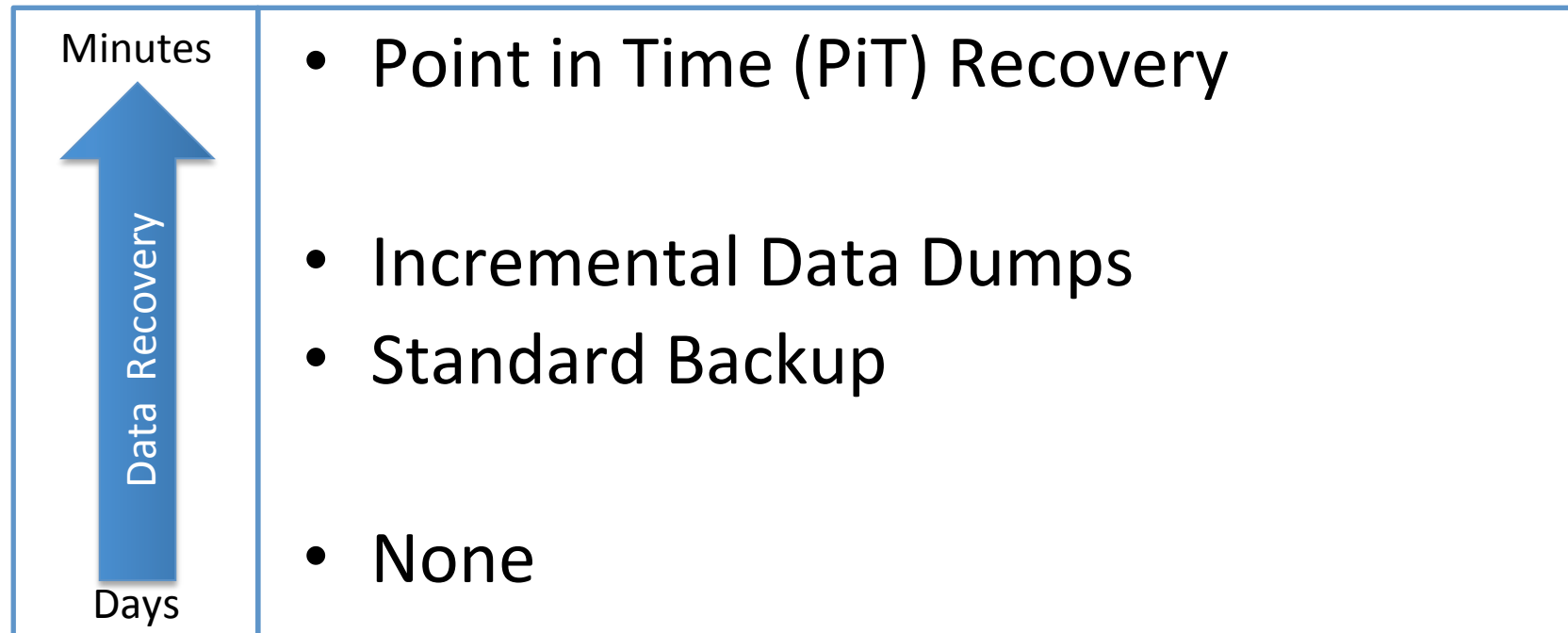
# What's the worst that can happen?

- 60% of companies that lose their data will shut down within 6 months of the disaster
- 31% of PC users have lost all of their files due to events beyond their control
- Companies that lost their data center for 10 days or more due to a disaster :
  - 50% filed for bankruptcy immediately
  - 93% filed for bankruptcy within one year of the disaster.
- 34% of companies fail to test their tape backups.
  - 77% of those that do have found tape back-up failures.
- 6% of all PCs will suffer an episode of data loss in any given year



<https://www.bostoncomputing.net/consultation/databackup/statistics/>

## Levels of Disaster recovery





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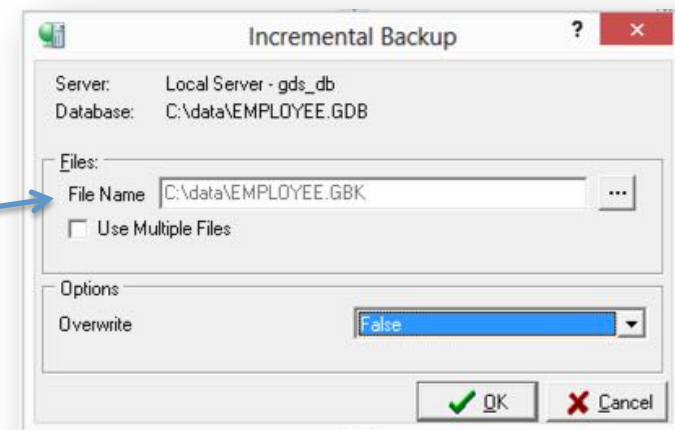
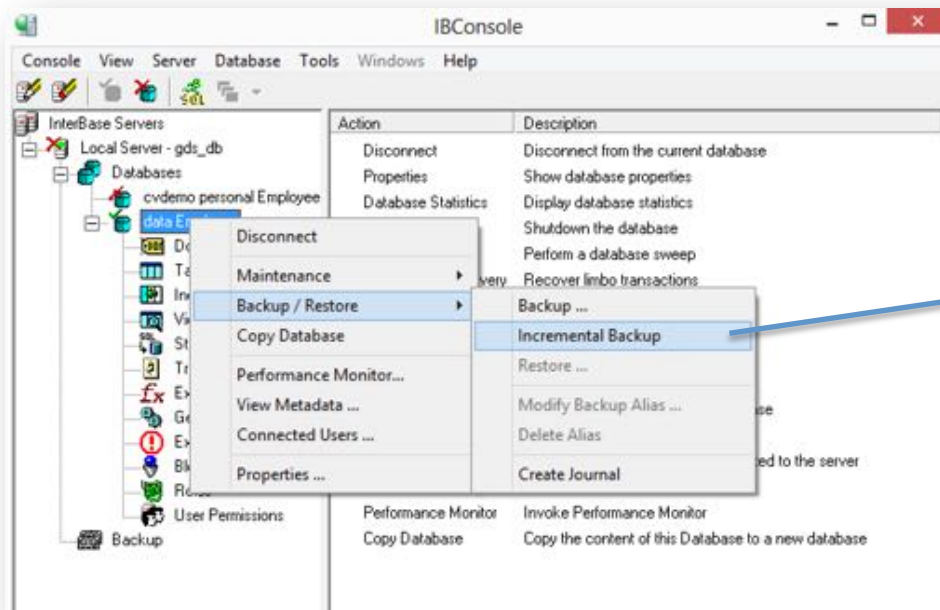
# Incremental Data Dumps

# Data Dumps

- What is a Data Dump?
  - ReadOnly Database
    - Ideal for reporting system and load spreading of read only data.
  - Complete backup
    - ReadOnly to ReadWrite via gfix command
- The value Distinguished Data Dumps brings:
  - Lower disk usage
    - Highly optimised I/O page writing
  - Faster processing
    - Delta tracking technology
    - Faster push of changes
    - = Less processor power & lower running costs!

# Data Dump Example code....

- `gbak -dump <sourcedb> <destinationdb>`





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# Journaling

## Journal Archives

- Combines Synchronous (forced) write protection with better performance.
- Allows databases to recover from a complete loss of an InterBase server machine to within a few minutes of when the disaster occurred, or to a specific point in time.
- Introduced in 2007 for Server Editions.

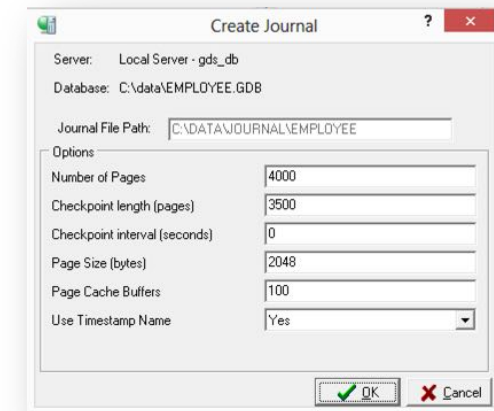
## Key Terms - Journaling, Journal Archives

Feature	Description	Notes
Journals	Contains one or more journal files	<i>Security of forced writes, with speed of forced writes disabled.</i>
Journal Files	Each database write transaction recorded as it happens	1..x journal files = Journal
Journal Checkpoints	Points in time (defined by size of date) for page changes to write to database	<ul style="list-style-type: none"><li>• More checkpoints = quicker recovery</li><li>• Few check points = faster performance</li></ul>
Journal Archives	Directory with full database dump AND all the journal files since the dump	Required for PiT recovery. Destination does not require InterBase installed

# Creating a Journal

CREATE JOURNAL [<journal-file-specification>] [LENGTH <number-of-pages> [PAGES]]

- [CHECKPOINT LENGTH <number-of-pages> [PAGES]]
- [CHECKPOINT INTERVAL <number-of-seconds> [SECONDS]]
- [PAGE SIZE <number-of-bytes> [BYTES]]
- [PAGE CACHE <number-of-buffers> [BUFFERS]]
- [[NO] TIMESTAMP NAME]
- [[NO] PREALLOCATE <number-of-pages> [PAGES]];



The CREATE JOURNAL statement causes all subsequent write operations on a database to be done asynchronously – you can re-enable if you wish, but this will lose the performance gain provided by Journaling in favour of faster recovery time

# Disabling Journaling

- DROP JOURNAL;

# Creating a Journal Archive

- `CREATE JOURNAL ARCHIVE <journal archive directory>`
- Initiates the first dump
- The directory path can be a
  - local drive,
  - a mapped drive,
  - or an UNC path (file APIs permitting)
- No `<journal archive directory>` specified?
  - Uses directory created from `CREATE JOURNAL`
  - (Recommended is to state remote path)

## Journal Archive – House Keeping

- `gbak -archive_database <dbname>`
- Performs a full, physical dump or archive directory
- Reduces archive files required to create live db.
- `gbak -archive_journals <dbname>`
  - Run regularly!!
- `gfix -archive_dumps <number> db_name`

## Point in Time Recovery

- `gbak -archive_recover [-until <timestamp>]  
<archive_dbname> <local_dbname>`
- It is recommended that you start building a new archive soon after a successful recovery event:
  - `gbak -archive_database`
  - `gbak -archive_journals`



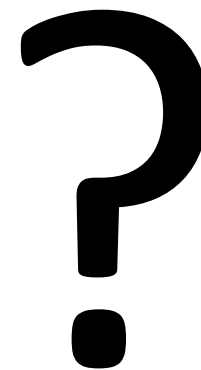
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## Data Security – Across the product life cycle

Are you exposed?

## Where to start? Questions about data?

- What data is to be collected?
- Who should see it?
- Where is it going?
- How is it getting there?
- How is it being stored?
- Is my backup secure?



Consider a data dictionary / business glossary!

# Typical roles in data management

- Responsibilities & roles in data management
  - **Data Controller / Data Steward**
    - a person who (either alone or jointly or in common with other persons) determines the purposes for which and the manner in which any personal data are, or are to be processed
  - **Data Processors**
    - in relation to personal data, means any person (other than an employee of the data controller) who processes the data on behalf of the data controller



# Enforcing who should see what data!

- Avoid privilege abuse
  - Inappropriate use of access rights
    - Export data
    - Run scripts
  - Unauthorised privilege elevation
    - Converting low level access to high level
  - Should a developer see the HR data when they work on an application?



# Privilege Abuse – What you can do?

- Use embedded user security
- Avoid excessive privileges
  - Set access to required data only
  - Use multiple DB users
    - Role based authentication (ISO 9001)
    - Select, Inserts, Updates, Delete, Reference, Execute
      - `GRANT <ROLE NAME> TO <USER>;`
- Change default DB owner from default



# What else does protection look like?



- Start with Encryption!
- The big misconception (Simon Rice - ICO)
  - Let's get this one out of the way first. A common misconception is that just requiring users to login to a device, or service, with a username and password provides an equivalent level of protection to encryption. This isn't the case. A password or PIN to control access to a device isn't encryption and it isn't enough to protect against unauthorised or unlawful access. In practice a password can be easily circumvented and full access to the data can be achieved.

<http://www.ico.org.uk/news/blog/2013/why-encryption-is-important-to-data-security>



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**When its gone wrong...**

Data security, the real cost.

# Risk Case Study - NHS Surrey



- Large organization
- Number of computers and drives disposed of
  - Approximately 1570 hard drives holding confidential sensitive personal data relating to an unknown number of patients and staff
- Case details
  - No previous similar security breach that the Commissioner is aware of
  - Data was recovered on drives only by using file recovery programs
  - Data controller received written assurances from the company that the hard drives would be physically destroyed
  - Data was **not encrypted**
- Issued penalty notice. (£200,000)
- [http://www.ico.org.uk/enforcement/~media/documents/library/Data\\_Protection/Notices/nhs-surrey-monetary-penalty-notice.pdf](http://www.ico.org.uk/enforcement/~media/documents/library/Data_Protection/Notices/nhs-surrey-monetary-penalty-notice.pdf)

## Risk Case Study - Alaska state - \$1.7 million fine

- Alaska's state Medicaid agency has agreed to pay a \$1.7 million federal fine for the loss of an **unencrypted** USB drive that may have contained protected patient information, and for failing to take action to safeguard health information on Medicaid recipients.

- <http://www.infosecurity-magazine.com/view/26630/>



## BlueCross BlueShield of Tennessee - \$1.5 million fine

- U.S. health insurance company BlueCross BlueShield of Tennessee (BCBST) is being fined \$1.5 million for a 2009 data breach in which **unencrypted information** on some one million BlueCross members was **stolen**..
- ...also agreed to a 450-day "corrective action plan" that includes encrypting all at-rest data...
- 57 hard drives were stolen from a data storage closet
- unencrypted data that included about 600,000 audio recordings of customer support calls and more than 300,000
- <http://nakedsecurity.sophos.com/2012/03/15/health-insurer-fined-data-breach/>



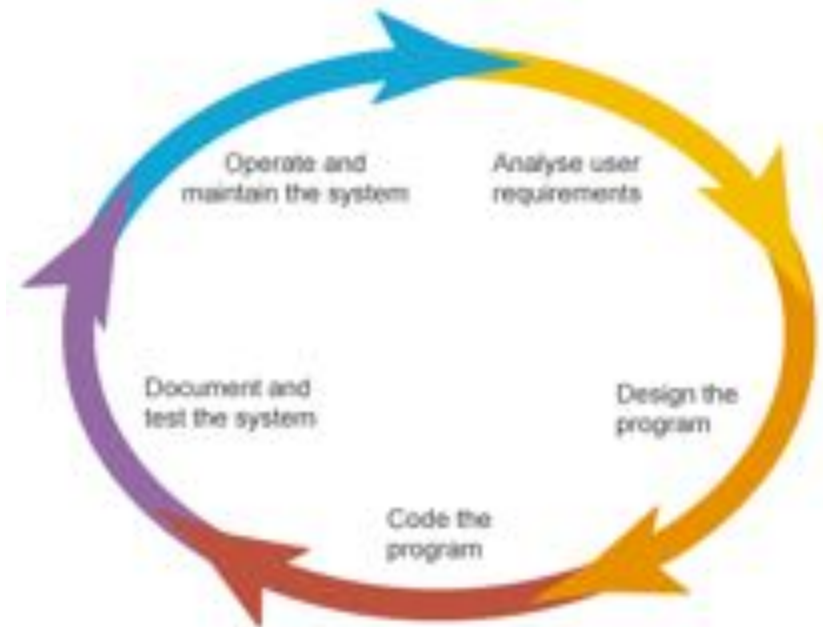
## Beyond the fines...

- Customer churn increase (typically 3% to 4%)
- Notification costs
  - Regulatory
  - Customer
- Customer Hotlines
- Discounts for future products / services
- Credit monitoring subscriptions
- In house communication



## Summary : Security – Across the product life cycle

- Protection of “data-at-rest”
  - On site, off site, on device
- Safe transport of data
  - OTW & physically
- Reducing lifetime risk of mistakes or abuse leading to data breach
  - Data layer rules = lower risk





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## OTW encryption

256bit AES Strength

## OTW Encryption

- Provided using SSL v3 and TLS v1 security protocols
- SSL uses the X.509 standard for its public key infrastructure
- Both the InterBase client and server must have the X.509 files installed to use OTW encryption
- All X.509 PKI (Public Key Infrastructure) files must be in PEM (Private Enhanced Mail) format

# Certificates

- PEM formatted files that contains the CA signed certificate
- Private Key (on server – do not distribute)
  - clientCertFile
  - IBSSL\_SERVER\_CERTFILE
- Public key certificate
  - serverPublicPath (client)
  - serverPublicFile (client)
  - IBSSL\_SERVER\_CAFILE (server)
  - IBSSL\_SERVER\_CAPTH (server)

InterBase Ops Guide  
Chapter 5



Embed, Deploy, Relax

# On Disk Encryption

# On Disk Encryption

- Encryption (AES / DES)
  - AES 256bit - Recommended
  - DES 56bit - (weak) encryption
- SYSDSO - System Database Security Owner
  - Creates a System Encryption Password (SEP).
  - Creates the encryption keys.
  - Grants the database owner access to the encryption keys, which s/he then uses to encrypt the database and/or its columns.
- Data Definition Guide
  - Chapter 13 Encrypting Your Data

# Demo

- On Disk Encryption



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# Going Mobile!

InterBase & RAD Studio

## IBLite & ToGo

- InterBase XE3
- Easy upgrade from IBLite to ToGo
- PA Server
- Deployment options
- FireDAC components

## IBLite is Free!

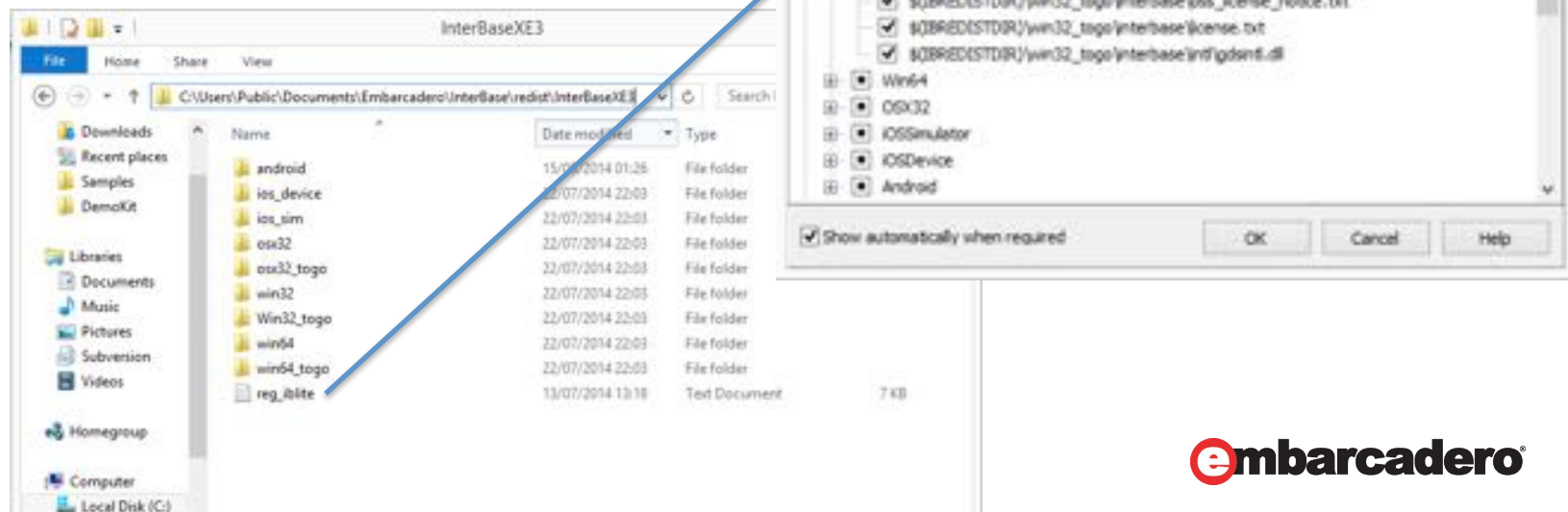
- Runtime royalty free version of InterBase
- Available on Windows, OS X, iOS and Android
- Binary compatible on all XE3 platforms and editions
- Directly upgradable to InterBase ToGo
  - Full encryption support
  - No limit on database size

## IBLite v SQLite

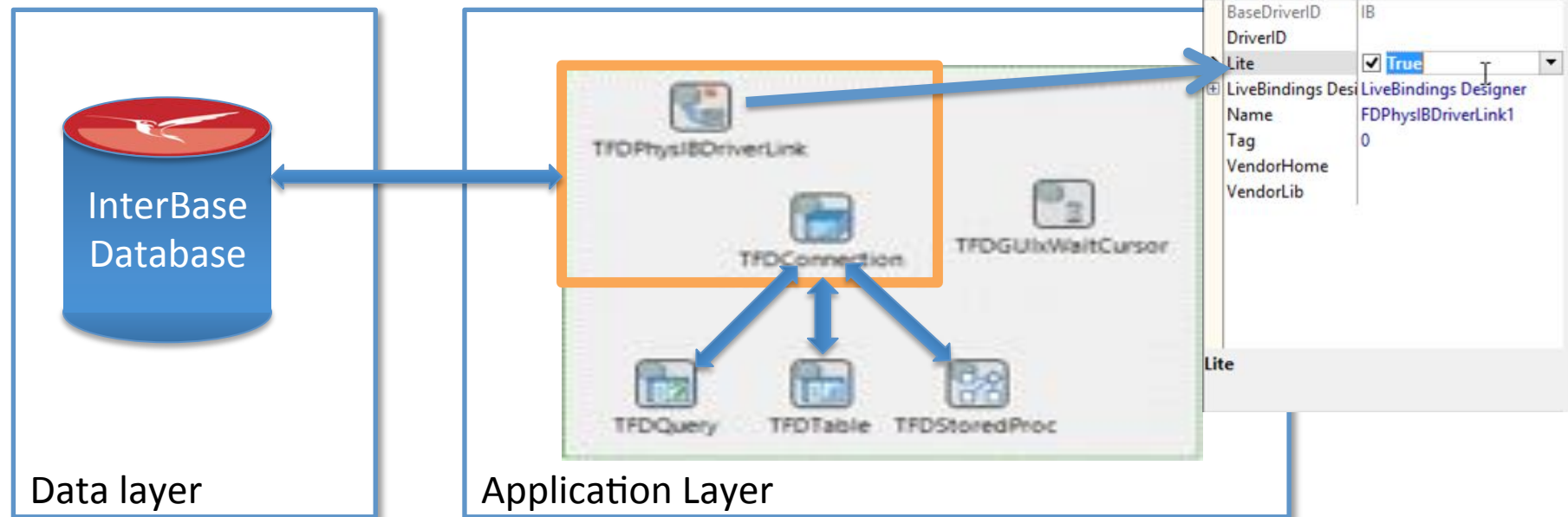
Features	IBLite	SQLite
Full SQL 92 support	Yes	No
Triggers	Yes	Yes
Stored Procedures	Yes	No
User Security	Yes	No (file system only)
Encryption built in	No	No
Upgrade for Encryption	Yes	3 <sup>rd</sup> Party
Disk storage	100mb	Not limited

# License & Deployment

1. <http://reg.embarcadero.com>
2. Download license file
3. Deployment Options



# Database Components





Embed, Deploy, Relax

# Hidden Gems



Embed, Deploy, Relax

# Dynamic SQL in Stored Procedures

Hidden gem from InterBase XE

# Dynamic Stored Procedure – No rows returned

## EXECUTE STATEMENT <statement>

<statement> ::= a SQL statement returning no rows of data

### Example:

```
CREATE PROCEDURE EXEC_STMT_NO_RET (proc_name varchar(20))
AS
DECLARE VARIABLE EMPNO INT;
DECLARE VARIABLE EXECSTMT;
BEGIN
    SELECT MAX(EMP_NO) from EMPLOYEE into EMPNO;

    EXECSTMT = 'EXECUTE PROCEDURE' || proc_name || '(' || cast (EMPNO as varchar(10)) || ')';

    EXECUTE STATEMENT EXECSTMT;
END
```

## Dynamic Stored Procedure – 1 or no rows returned

**EXECUTE STATEMENT** <select-statement> INTO :<var>[, :<var>..]

<select-statement> ::= SQL statement returning one or no rows of data

<var> ::= valid procedure variable, the ":" is optional.

### Example:

```
CREATE PROCEDURE EXEC_STMT_SINGLETON (TABLE_NAME VARCHAR(50))
AS
DECLARE VARIABLE MAXEMPNO

BEGIN
    EXECUTE STATEMENT 'SELECT MAX(EMP_NO) FROM' || TABLE_NAME INTO :MAXEMPNO;

SUSPEND
END
```

## Dynamic Stored Procedure – Many rows returned

### Example:

```
CREATE PROCEDURE EXEC_STMT_ANY (TABLE_NAME VARCHAR(50), INT_FIELD INTEGER)
RETURNS
(INT_RETVAR INTEGER)
AS
DECLARE VARIABLE IFIELD INTEGER
BEGIN

FOR EXECUTE STATEMENT

'SELECT' || INT_FIELD || 'FROM' || TABLE_NAME INTO :IFIELD
DO
    IF (IFIELD = 0) THEN
        INT_RETVAR=0;
    ELSE
        INT_RETVAR = INT_RETVAR+IFIELD;
    SUSPEND;

END
```



Embed, Deploy, Relax

## Array DML

Speed up your queries



Embed, Deploy, Relax

## Services API



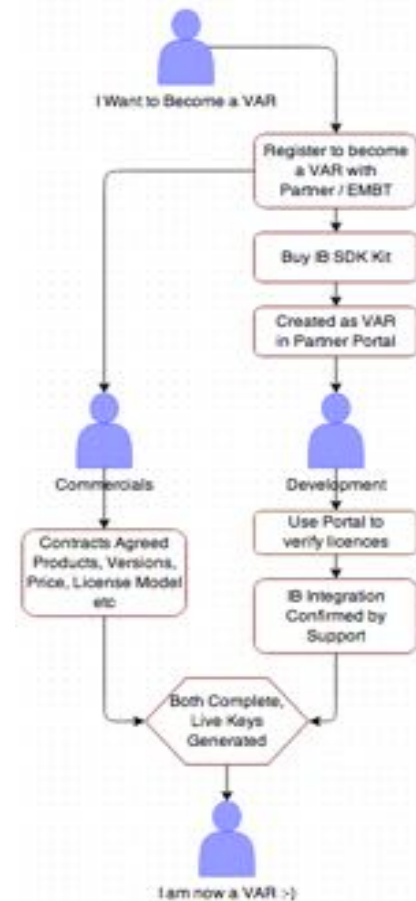
Embed, Deploy, Relax

## VAR / OEM Program

Get involved with more control

## InterBase VAR Program

- SDK Pack \$99 / €99 / £71
- No-Nonsense VAR agreement
- Online Portal
- Low risk signup
- Empower development, testing, sales, support.



# What is in the SDK pack?

- Full 256bit AES encryption
  - (not available from developer editions)
- Licenses valid for 1 year
  - InterBase Server
  - InterBase Desktop
  - InterBase ToGo (mobile and desktop)
- Unlimited usage silent install license files
  - Valid for 60 days at a time.



<https://embarcadero.secure.force.com/InterBaseVARSummary>

# InterBase VAR License Portal

[Logout](#)[Account Information](#) [Licenses](#) [Statements](#) [FAQ](#) [Contact Us](#)

## Welcome

Welcome to the InterBase License Summary Portal. This portal is specifically designed to help Embarcadero InterBase VAR's as well as those using iBUnit to see usage information that is captured around your InterBase installs.

For VAR's, this data is used to calculate estimates for your billing. If you are not a full VAR, then please see the FAQ's page for further information about additional benefits you can get with being more involved with InterBase.

If you have any questions on the portal data, please contact your account representative via the link below.

## Partner Information

[Send email to Account Representative](#)

Account: InterBase Test Account  
Email: [interbase@designer-software.net](mailto:interbase@designer-software.net)

Contact: Stephen InterBaseTest  
Phone:



https://embarcadero.secure.force.com/InterBaseVARSummary

**embarcadero**

InterBase VAR License Portal

Account Information Licenses Statements FAQ Contact Us

**Licenses**

This page shows your registered licenses and also the licenses that are currently active. If you have any questions about the licenses then please contact your account representative.

**Installs** [Download Entire Install History](#) [Send email to Account Representative](#)

Product	Serial Number	Install	Reinstall	License Holder	Install History
<b>Licenses</b>					
Product	Serial Number	Quantity	Product ID	License Administrator	
InterBase XE3 To-Go Edition with 1 User License - ESD		2	981236	Ian Base	
InterBase XE3 To-Go Edition with 1 User License - ESD		2	981236	Ian Base	
InterBase XE3 Server Edition with 1 User License - ESD		1	981235	Ian Base	
InterBase XE3 ToGo Mobile (SDK)		1	985840	Stephen InterBaseTest	
InterBase XE3 VAR Program SDK Pack1 Year Term License		1	985840	Stephen InterBaseTest	
		1	985840	Stephen InterBaseTest	
InterBase XE3 Server - 1 User (SDK)		1	985840	Stephen InterBaseTest	
		1	985840	Stephen InterBaseTest	
		1	985840	Stephen InterBaseTest	
InterBase XE3 ToGo Edition 1 User (SDK)		1	985840	Stephen InterBaseTest	
InterBase XE3 VAR Program SDK Pack1 Year Term License		1	983131	Ian Base	
		1	983131	Ian Base	
		1	983131	Ian Base	
		1	983131	Ian Base	
		1	983131	Ian Base	
		1	983131	Ian Base	
		1	983131	Ian Base	

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- Download Detailed Install History

<https://embarcadero.secure.force.com/interBaseVARSummary>

## InterBase VAR License Portal

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### Statements

[Send email to Account Representative](#)

Below are you InterBase VAR online summary statements. For any questions about your statement please contact your account representative.

Billing Cycle	Status	Invoice Date	Products	Serial Number	Quantity	Total Price
January, 2014	Not Invoiced		Product InterBase XE3 VAR Program SDK Pack1 Year Term License		1	\$1
December, 2013	Not Invoiced		Product InterBase XE3 VAR Program SDK Pack1 Year Term License		1	\$1
December, 2013	Not Invoiced		Product InterBase XE3 VAR Program SDK Pack1 Year Term License		1	\$1

# Online Statements



# Pricing

Version	Deployments	New (Euro)	Upgrade (Euro)
<b>ToGo</b> <ul style="list-style-type: none"> <li>Embedded version</li> <li>Windows, Mac, iOS, Android</li> </ul>	1	€62	€31
	20	€832	€499
	100	€2,080	€1,248
<b>Desktop</b> <ul style="list-style-type: none"> <li>Multiple local connections</li> <li>Windows Only</li> </ul>	1	€62	€31
	20	€832	€499
	100	€2,080	€1,248

Version	Server +Users (Simultaneous)	New User List Price (Euro)
<b>Server Edition</b> <ul style="list-style-type: none"> <li>Including support for 8 cores</li> <li>Windows, Linux, Mac OS X, Solaris</li> </ul>	1	€208
	5	€728
	10	€1,248
	25	€2,600
	50	€4,160
	Unlimited	€6,760
<b>Server Edition</b>	+ 8 cores	€728

- From only €20.80 / €12.48 per license
- Volume discount and bespoke pricing available through InterBase VAR Program
- EMS Pricing

# EMS

## Enterprise Mobility Services

Enterprise Mobility Services (EMS) securely expose custom APIs, access Enterprise data with SQL database connectors, and provides InterBase Server and ToGo licenses. The service also includes API hosting and data storage and is available for on-premise or private cloud deployment on services such as Amazon and Rackspace.

✓ Enterprise Data Access

✓ Custom API Hosting

✓ Data Storage

✓ On-Premise or Private Cloud

Free	Bronze	Silver	Gold	Platinum
5 Dev. Licenses	50 users	500 users	1,000 users	5,000 users
Free	€4,440	Contact sales	Contact sales	Contact sales



Embed, Deploy, Relax

# Summary

Followed by Q&A



# InterBase® XE7 - Embed, Deploy, Relax

- Overview

- Highly scalable, powerful, embeddable database.
- Small memory and on-disk footprint,
- Simple installation / deployment
- Encryption built into all paid versions\*
- Near zero administration
- Self-tuning engine
- Low TCO

- Notable Features

- Full-featured DBMS
  - SQL92 compliant
  - SQL Domains
- ACID compliant / Multi-version architecture
- **NEW** - Powerful Change Tracking (Change Views)
- Automatic crash recovery
- SMP - Multiple core support
- Fully featured in all editions
  - *Some features limited in run-time royalty free IBLite*
- Database monitoring and statistics built in

- Security

- Embedded user & role based authentication
- Full database, table or column encryption
  - DES (weak)
  - AES (strong 256bit) encryption
- Decryption by user / user role
- Allows developers to focus on creating fast, resilient applications.

- Disaster Recovery

- Journaling & Point In time recovery
- Data dumps
- **NEW** – Incremental data dumps
- Partial backups

- Also....

- Window Direct I/O support & Amazon EC2 certified
- Tight integration into Embarcadero Development tools, but also works with Visual Studio, Xcode, Eclipse, Ruby, PHP etc
- ODBC



## Check list

- ✓ User security built in
- ✓ 256 bit AES Encryption
  - ✓ Potentially outside domain
- ✓ Works on multiple operating systems
- ✓ Allow for zero DBA access
- ✓ Easy to test
  - ✓ Data access in the data layer not code
  - ✓ Not reliant on OS features or versions
- ✓ Disaster recovery capabilities



<http://embt.co/IB-5-28>

Data security is a hot topic right now. When it comes to securing your data and applications, small changes can make a massive difference. If you want to learn how to help reduce the risk of being hit by the next Heartbleed and how to reduce the time and effort to managing security, then this webinar is for you.

Topics covered in this on-demand webinar include:

- Preventing privilege abuse using role based authentication
- Avoiding database communication protocol vulnerabilities
- Parameterized queries and defending against SQL injection
- The dangers of unencrypted file storage and backups
- Consistent security across multiple platforms with InterBase



Watch this on-demand webinar and gain knowledge in these important areas of data security. You'll learn about these potential dangers and how to address them before it's too late. You will also learn why the database of choice for so many enterprises and VARs is InterBase.



## Mobilizing Enterprise Data

Top 5 Mistakes and How to Avoid Them!



<http://embt.co/MobEntWP>

Many businesses today are looking to identify opportunities to increase efficiency in their business processes and to expand opportunity by using apps on mobile devices.

Mobile is well suited to new working practices from a technology standpoint, but there are a number of issues that organizations must consider from legal and practical perspectives to ensure the best outcome in the longer term. These include:

- Data governance to enterprise architecture
- Data protection compliance
- Business risk with off-site data
- Storage and management of at-rest data on device
- Operation change / reliance risk

This report summarizes the challenges of mobilizing data for business and articulates the most common mistakes that organizations make, alongside providing guiding principles for mobilizing enterprise data.



## Additional useful InterBase Links

- Embarcadero Product Pages

<http://www.embarcadero.com/products/interbase>

<http://www.embarcadero.com/products/interbase/product-demos>

- Extensive Documentation

<http://docs.embarcadero.com/products/interbase/>

- Video Tutorials

<http://www.embarcadero.com/products/interbase/interbase-labs>

# Systems management - ISO

- Information technology
  - Security techniques
  - Information security management systems
  - Requirements
- ISO 27001:2005 - Current
- ISO 27001:2013 - Draft
- [http://en.wikipedia.org/wiki/ISO/IEC\\_27001:2005](http://en.wikipedia.org/wiki/ISO/IEC_27001:2005)

## Q&A



Embed, Deploy, Relax

[www.embarcadero.com/products/interbase](http://www.embarcadero.com/products/interbase)

@InterBase

@DelphiABall



**e**mbarcadero®