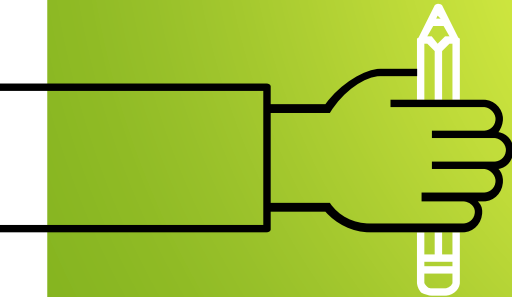
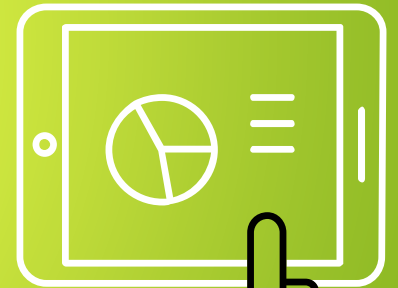


RTUG

Relius Technology User Group



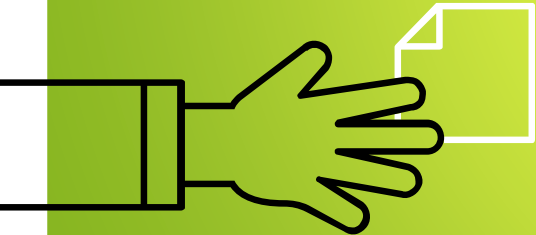
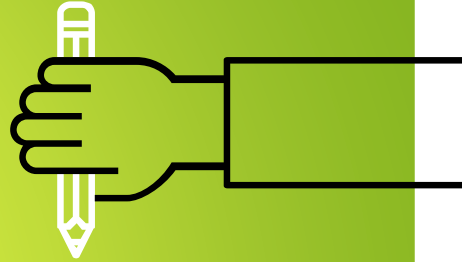
Rob Klobukowski, Co-Chair – TPS Group
Douglas Walker, Co-Chair - Sentinel Benefits & Financial Group
Vijay Guru – FIS

AGENDA

- ▶ What is RTUG?
- ▶ Relius Technology Roadmap by Vijay Guru
- ▶ Hot Button Topics
- ▶ First Meeting - January 17, 2019
- ▶ How do we join?



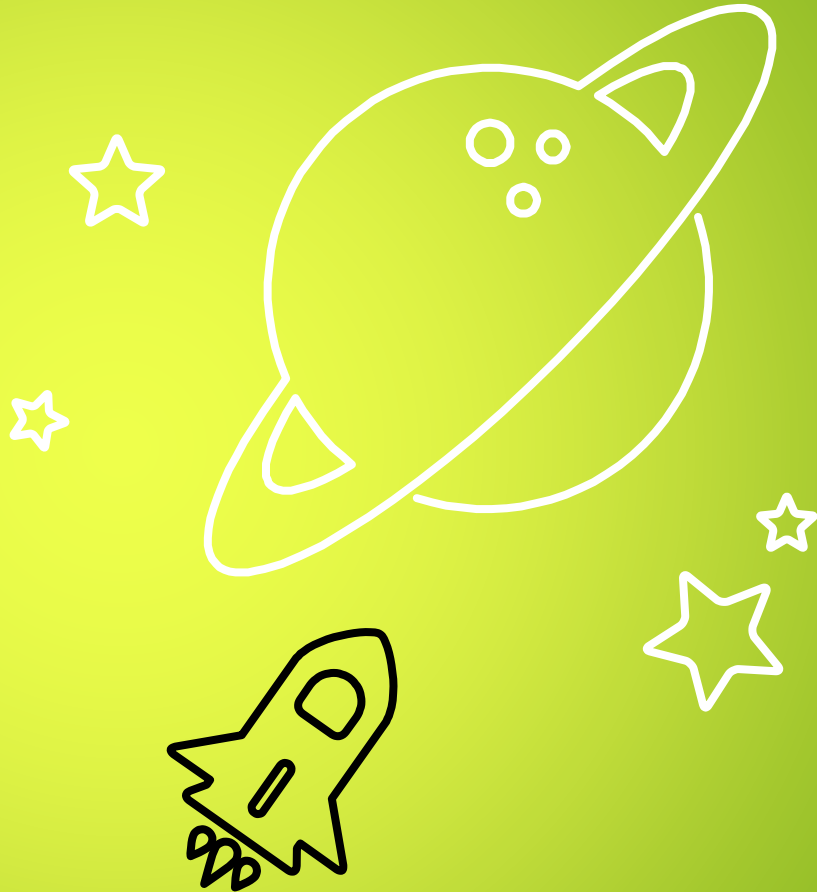
WHAT IS **RTUG?**



CONCEPT

The Relius Technology User Group (RTUG) has two primary goals.

1. Be a unified customer voice for technology issues and feature requests for Relius installed clients
2. A central repository for technology best practices and documentation

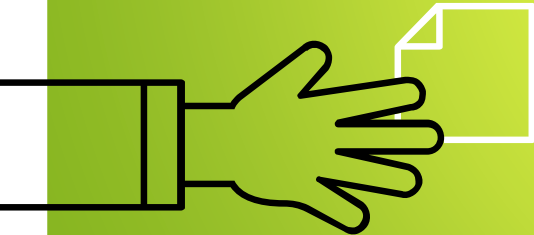
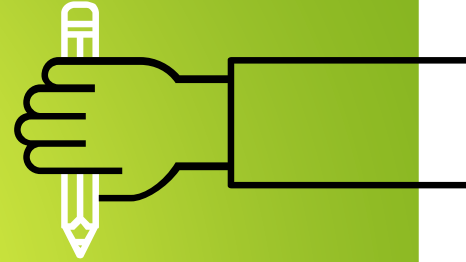


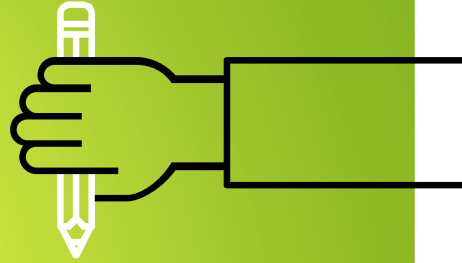


We work closely with the folks of FIS Technology to set agendas and topics most relevant to the technology side of FIS Administration. Topics can include anything from current Relius technology issues to high-level infrastructure planning recommendations based on FIS's roadmap (Oracle, etc.)



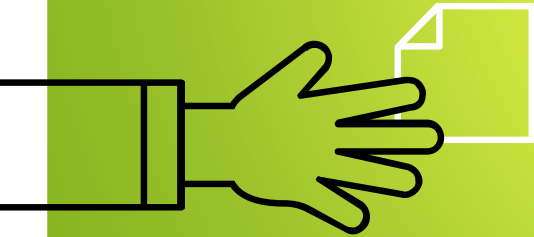
Relius Technology Roadmap





Relius Mobile

Platform and Framework



Relius Mobile Framework

The Difference Between **NATIVE, WEB & HYBRID** MOBILE APPLICATIONS



Native applications are coded in the native language of the device (e.g Objective C for iOS, Java for Android). They are run directly on the device.

- ✓ Access Native APIs
- ✓ Distribute through App Stores
- ✗ Run on multiple platforms



Web applications are coded in HTML, CSS and JavaScript. They are served through the Internet and run through a browser.

- ✗ Access Native APIs
- ✗ Distribute through App Stores
- ✓ Run on multiple platforms



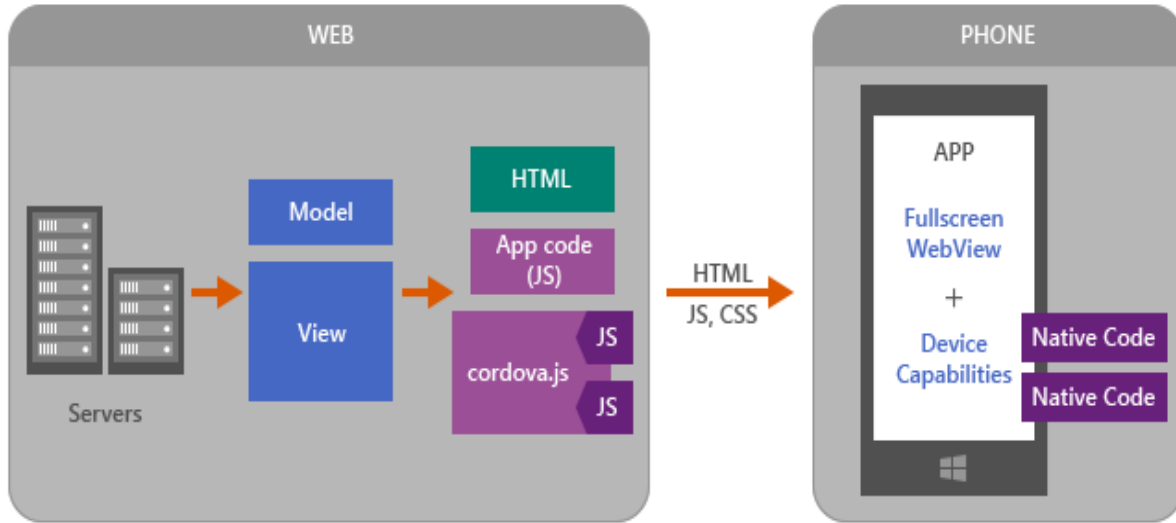
Hybrid applications are coded in HTML, CSS and JavaScript*. They are run through an invisible browser that is packaged into a native application.

- ✓ Access Native APIs
- ✓ Distribute through App Stores
- ✓ Run on multiple platforms

*There are other ways to create hybrid applications, but this is the most popular

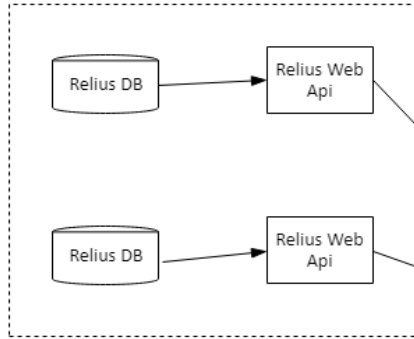


Relius Mobile Framework



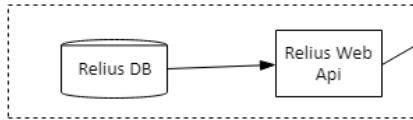
Relius Mobile Deployment

Relius FIS Hosted



Relius Admin is deployed as single tenant applications with 300 clients hosted by FIS and 300 deployed on client premises

Relius Installed - Client Hosted



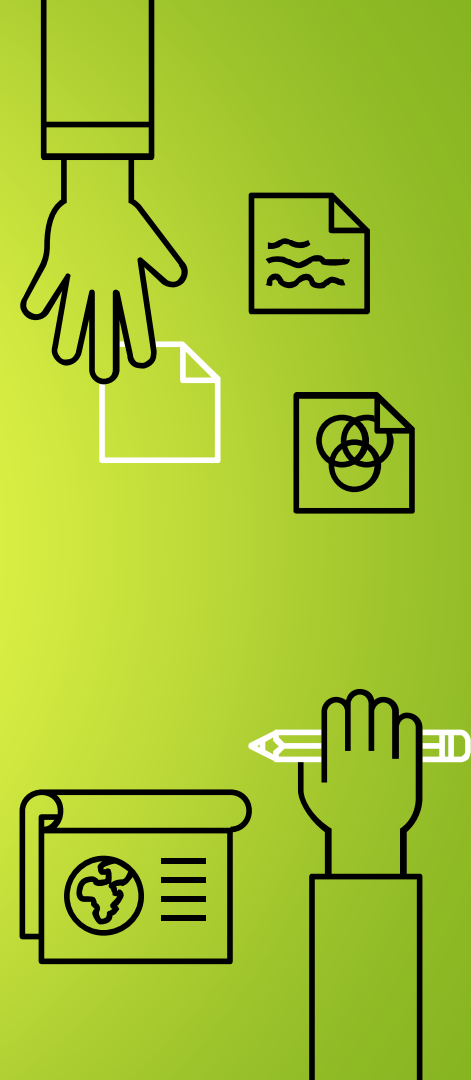
Relius Web Api is an existing ASP .Net Web API project, with an Angular UI.

New Mobile-specific controllers will wrap around existing back end logic.

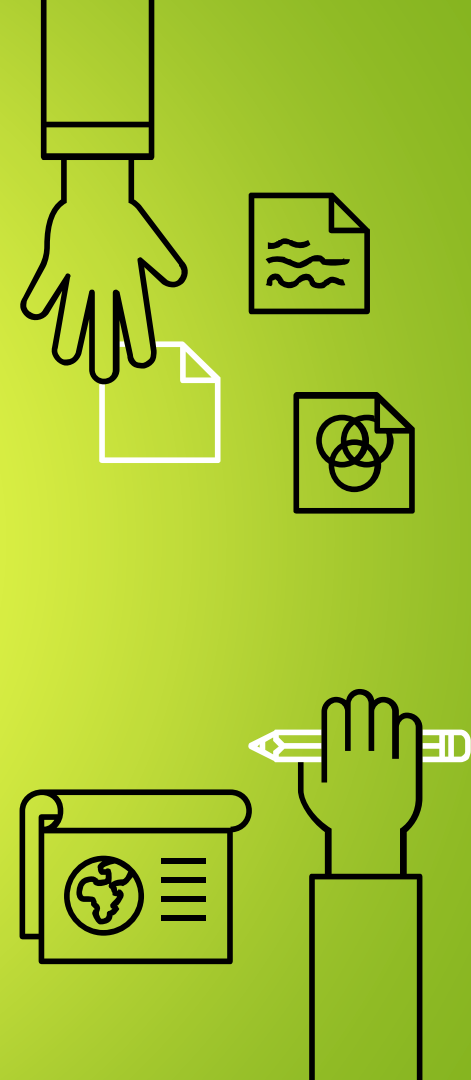
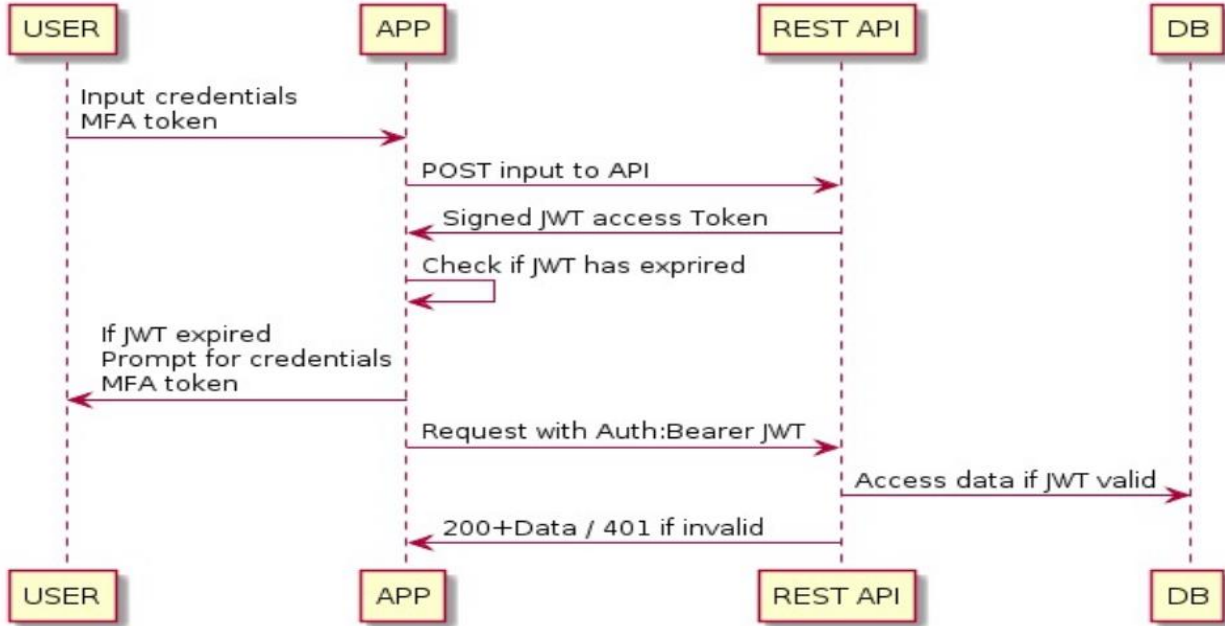
Client-specific Angular Ionic Multi platform Mobile App Using RUF UI Framework.

Client branded versions of the App will be released to stores using client-specific store accounts.

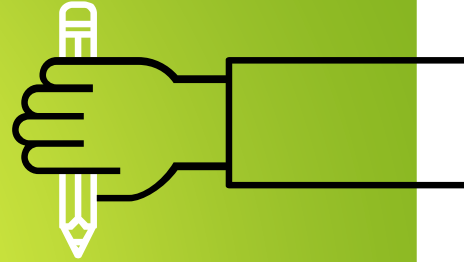
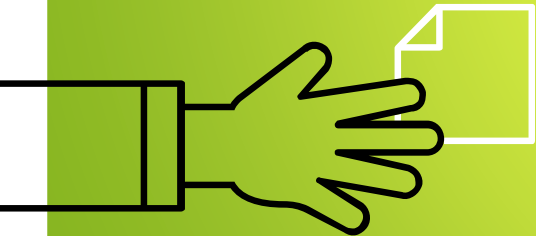
We need to build the branded versions from one source code, and provide step by step instructions for client/support to publish packages to stores.



Relius Mobile Security

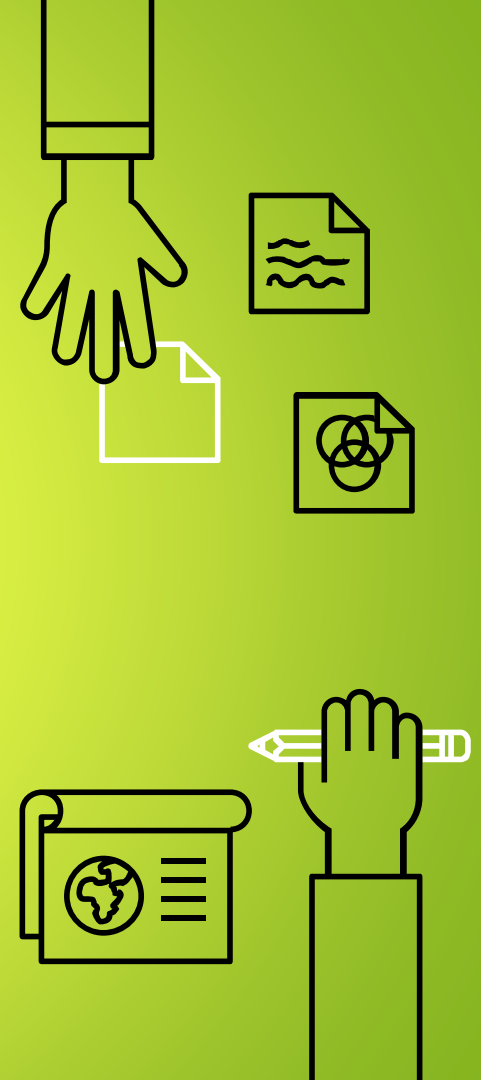
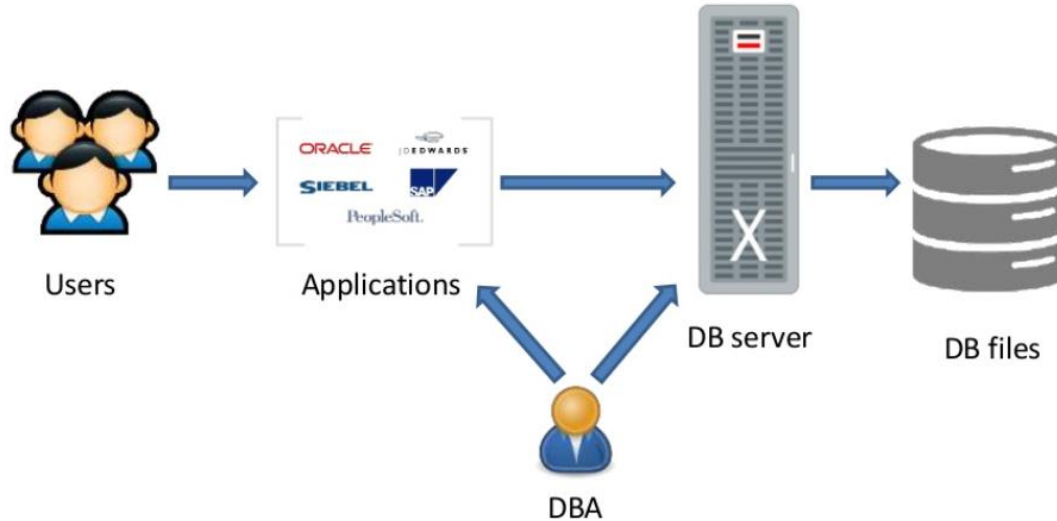


Oracle TDE



Oracle TDE

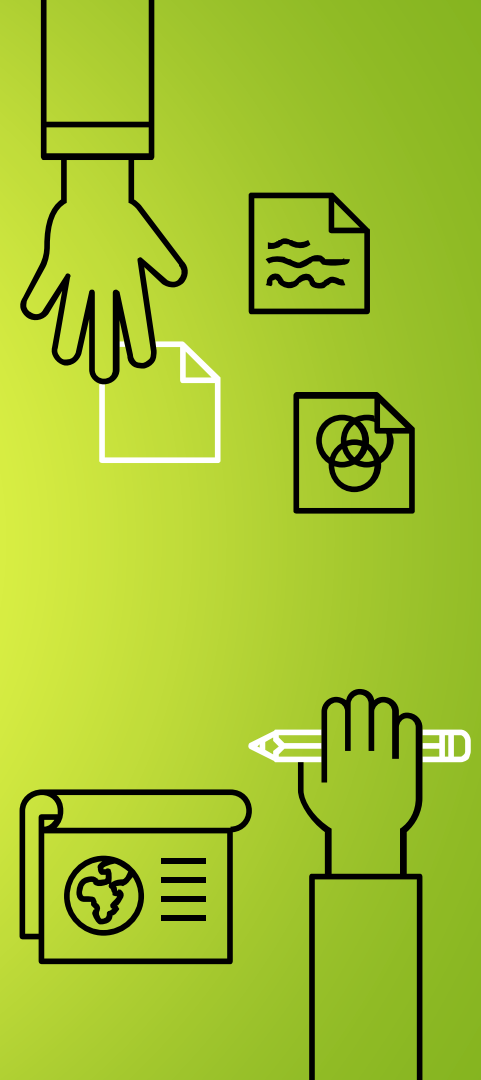
Typical Deployment of Databases



Oracle TDE

What is TDE?

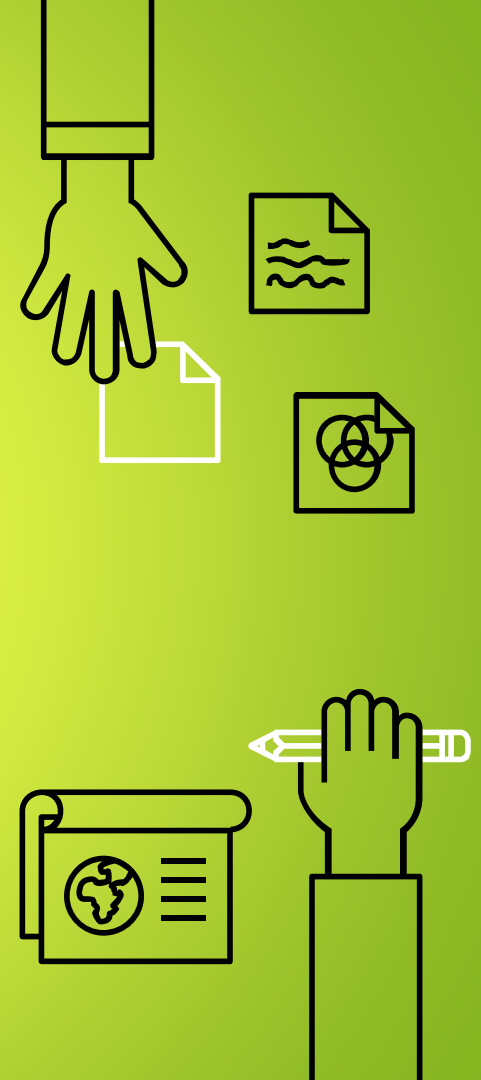
- An Oracle advanced security feature that allows to **encrypt data-at-rest completely transparent to applications**
- It is not an access control mechanism for Oracle database users
- Notice that the data is encrypted only at rest – when the database server processes the data in the SQL layer, data records are decrypted and processed



Oracle TDE

Why TDE/Encryption?

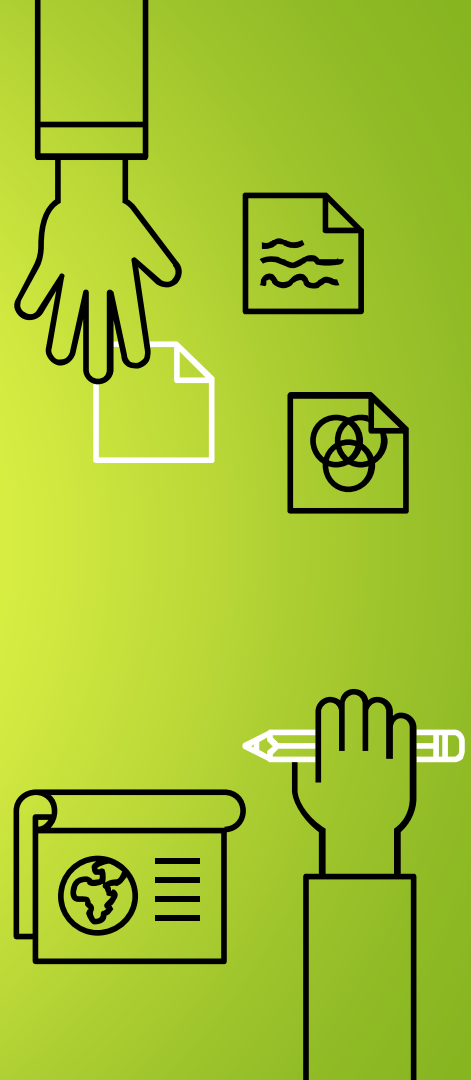
- If attackers can gain access to the operating system as a powerful user (e.g. root or oracle), they can bypass the database and have **direct access to data**. Encryption can protect database files stored in the disk
- Also, many **regulatory compliance** requires encrypting data at rest



Oracle TDE

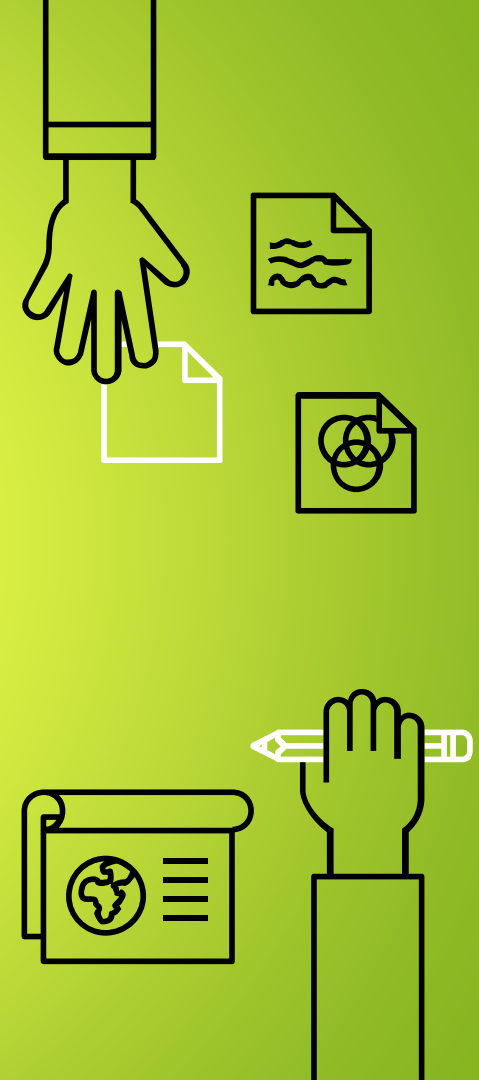
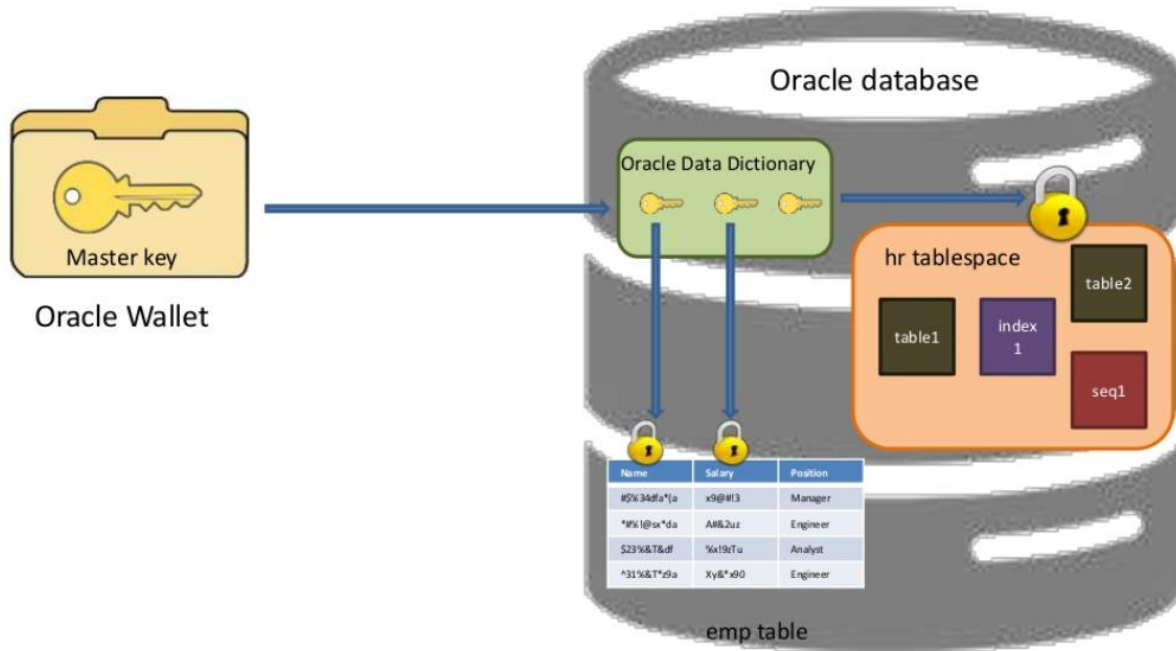
Encryption Options Available

- DBMS_CRYPTO – client side encryption
- TDE
 - Column encryption (10gR2 onwards)
 - Tablespace encryption (11gR1 onwards)
- In this presentation, we only look at TDE



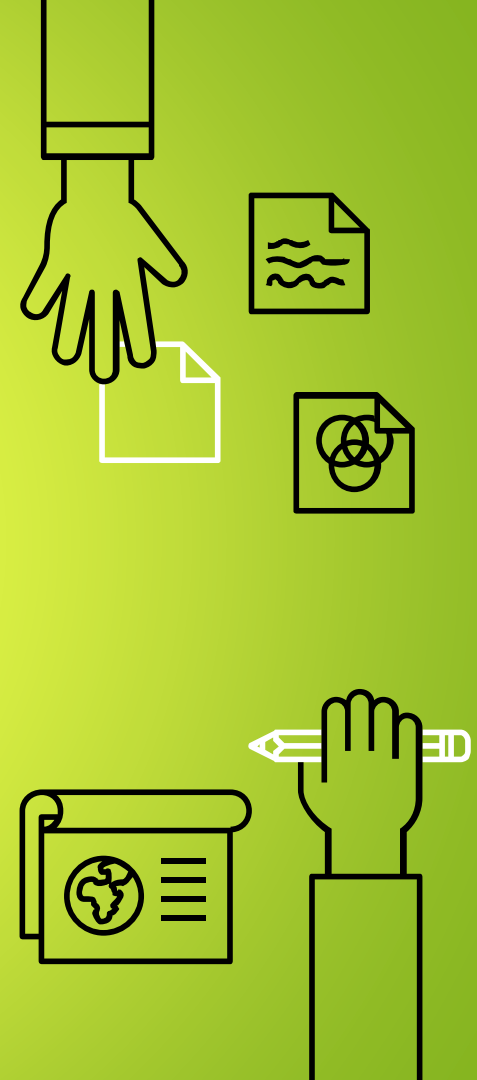
Oracle TDE

TDE Setup



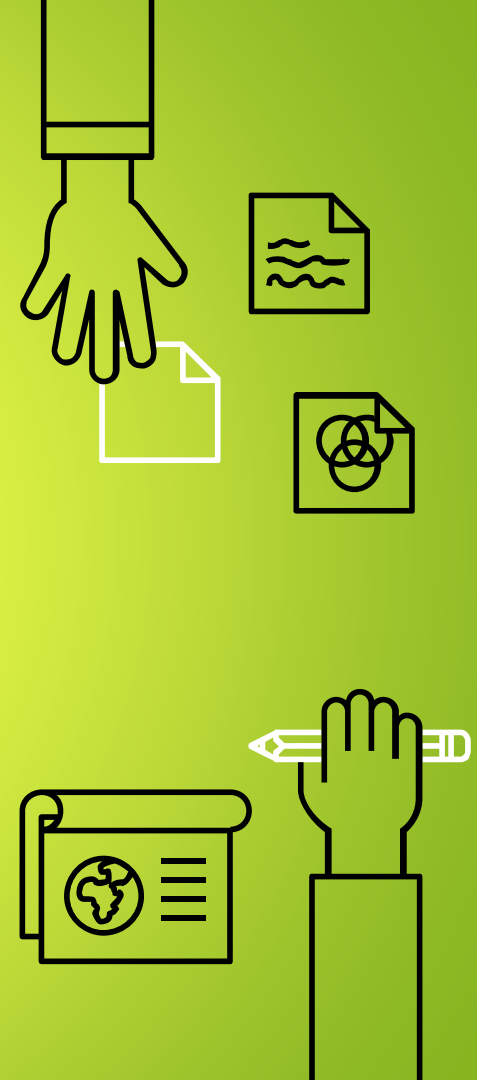
Oracle Wallet

- A PKCS#12 formatted file residing outside of the database (residing in the file system)
- Encrypted using password based encryption as defined in PKCS#5
- Holds the TDE master key
- It is a good practice to setup the wallet outside of the \$ORACLE_BASE and grant minimal privileges to the wallet folder



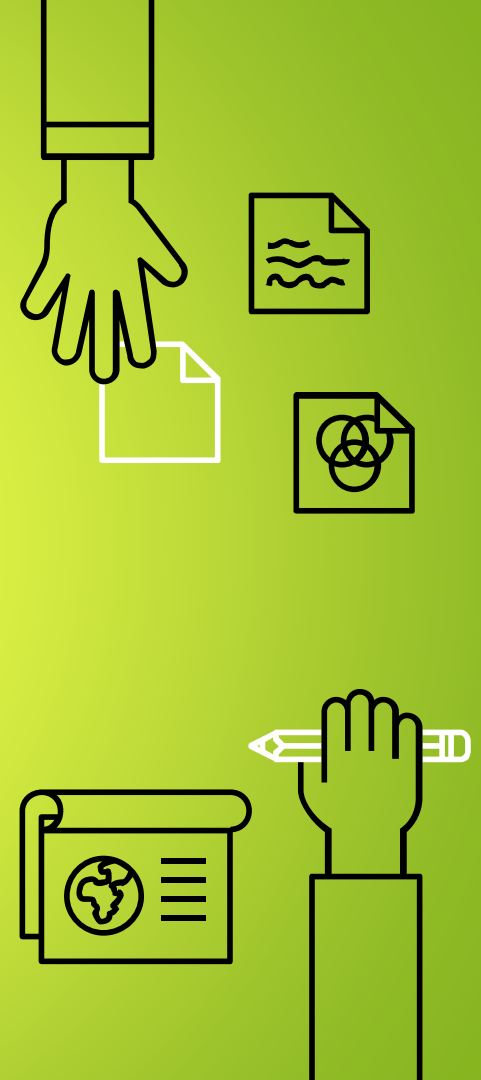
Two-Tier Key Architecture

- Master key is stored in an Oracle Wallet (keystore)
- Tablespace or table (column) keys are stored in the database itself in the Oracle data dictionary – they are encrypted using the master key
- If HSM is used for the Oracle Wallet, master key is not fetched to the database to decrypt the tablespace/table keys

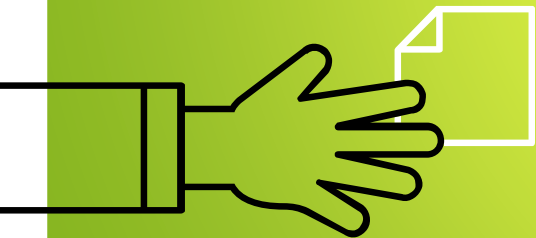
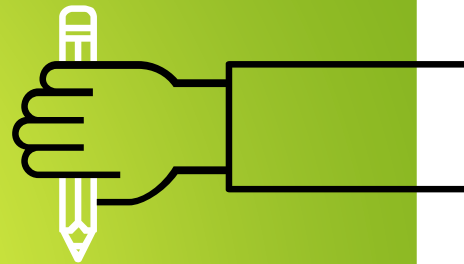


Column vs. Tablespace Encryption

Column Encryption	Tablespace Encryption
Column encryption is expensive; so, use it only if less than 5% of all the application table needs encryption	Use when most of the application data are sensitive
Does not support hardware crypto acceleration	Supports hardware crypto acceleration
Supports only B-tree indexes	Does not have such a restriction
Support rekeying of data	Does not support rekeying of data
Can encrypt existing tables	Cannot encrypt existing tablespaces

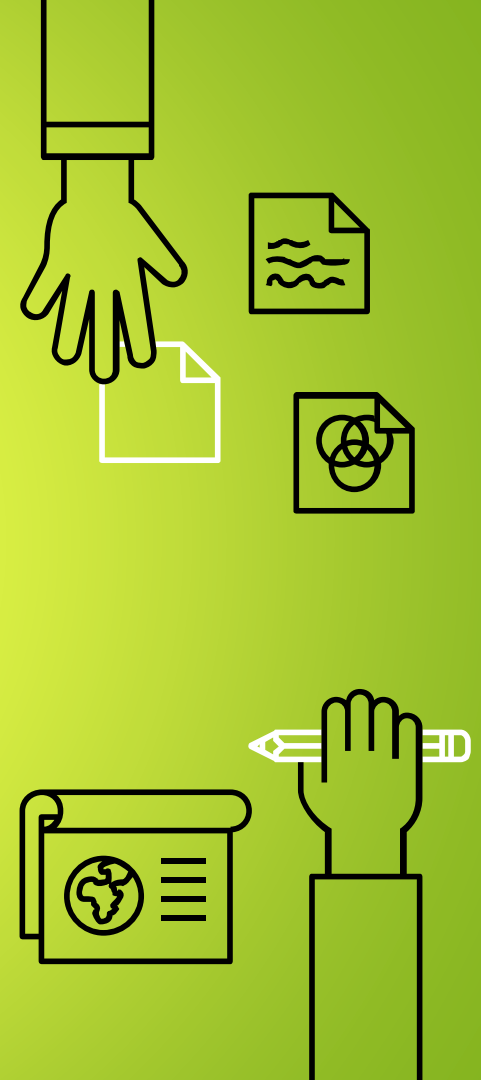


Hot Button Topics

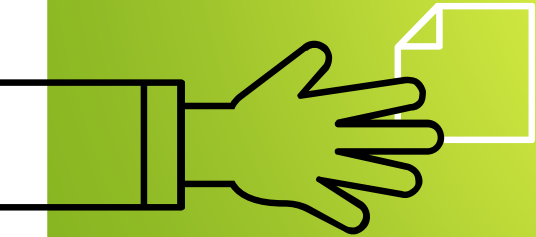
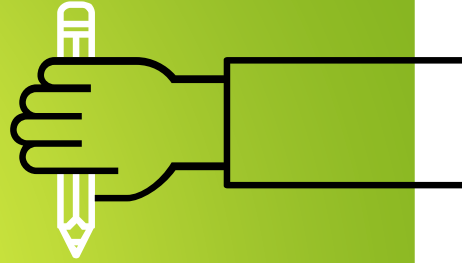


Hot Button Topics

- ▶ Oracle Best Practices Overview
 - Scheduled Jobs
 - Password Maintenance
- ▶ Virtualization
- ▶ Oracle 12c
- ▶ What are your Hot Button Topics?



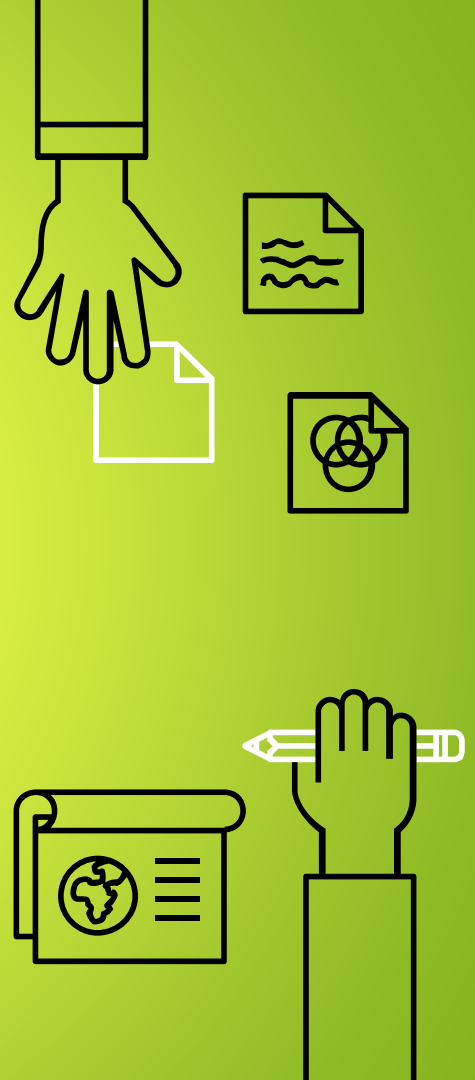
First Meeting January 17, 2019



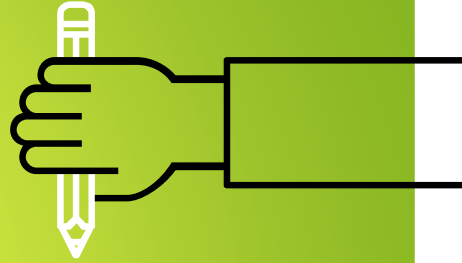
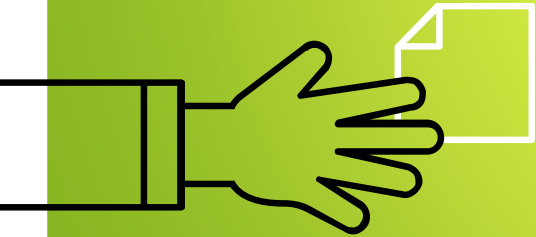
January 17, 2019

Anticipated Agenda Topics

- ▶ Oracle 12c (when, what changes made, deadlines for conversion, etc.)
- ▶ Virtual database servers
- ▶ Improved handling of STP Agents (There are some work arounds...)
- ▶ Oracle Best Practices documentation (Continued discussion)
- ▶ General Open Discussion

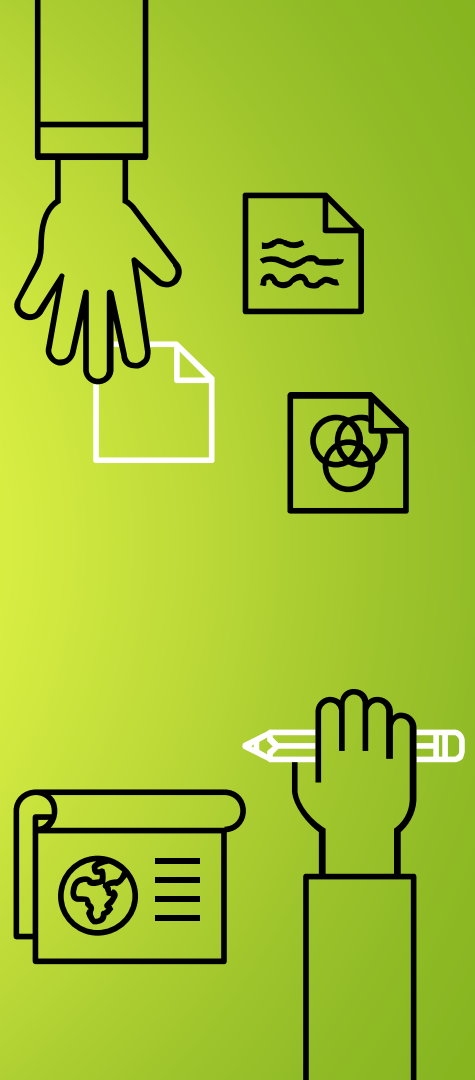


How do we
join?



Membership Details

- ▶ We welcome members from any part of the country who provide technical guidance for FIS Relius Administration (installed).
- ▶ We do not charge a membership fee
- ▶ Registration fees for our meetings (if any) are kept as low as possible.
- ▶ We charge only what is needed to cover the cost of the meeting.



RTUG

Relius Technology User Group

- ▶ <https://relius.net/events/ListUserGroups.aspx>
- ▶ Click on Relius Technology
- ▶ Click the Registration link

