

Oracle Forms & REST Web Services

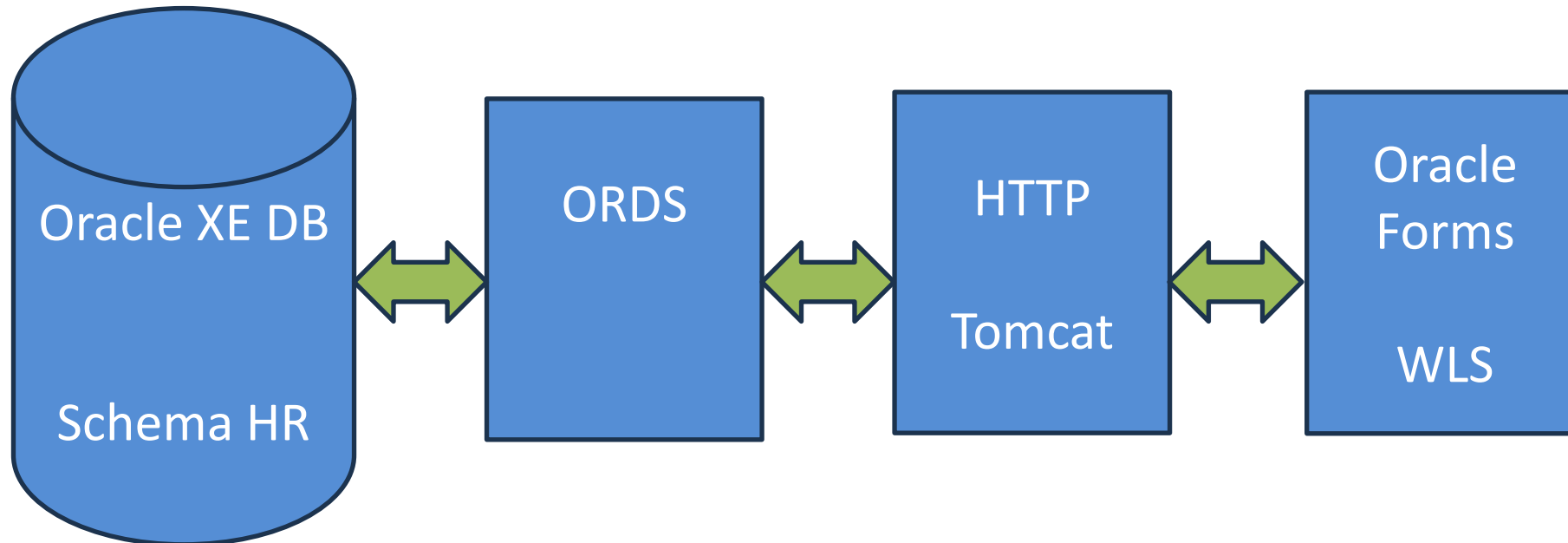
Gold
Partner

ORACLE

Oracle Forms & REST Web Services

Umgebungsüberblick

Beispiel Umgebung:



Oracle Forms & REST Web Services

Datenbank



Datenbank Tabelle Countries aus dem HR Beispiel:

Oracle SQL Developer : Tabelle HR.COUNTRIES@hr

File Edit View Navigate Execute Team Extras Window Help

Verbindungen

- Oracle-Verbindungen
 - hr
 - Tabellen (Gefiltert)
 - COUNTRIES
 - DEPARTMENTS
 - EMPLOYEES
 - JOB_HISTORY
 - JOBS
 - LOCATIONS
 - REGIONS

Willkommensseite | WLC | COUNTRIES_REST Body | hr | COUNTRIES_REST | PUT countries | hr~3 | COUNTRIES

Spalten | Daten | Model | Constraints | Zugriffsberechtigungen | Statistiken | Trigger | Flashback | Abhängigkeiten | Details | Partitionen | Indizes | SQL

	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	COUNTRY_ID	CHAR (2 BYTE)	No	(null)	1	Primary key of countries table.
2	COUNTRY_NAME	VARCHAR2 (60 BYTE)	Yes	(null)	2	Country name
3	REGION_ID	NUMBER	Yes	(null)	3	Region ID for the country. Foreign key to region_id col

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ORDS

ORDS Services auf die Tabelle Countries aus dem HR Beispiel:

Oracle SQL Developer : GET countries



The screenshot displays the Oracle SQL Developer interface. The 'REST-Entwicklung' (REST Development) pane on the left shows a tree structure for REST Data Services, including 'Berechtigungen' (Permissions), 'Module', and 'cc'. Under 'cc', there is a 'countries' folder containing 'GET', 'POST', and 'PUT' methods, and a 'countries/:ID' endpoint. The main editor window shows a PL/SQL procedure in the 'Arbeitsblatt' (Worksheet) tab. The procedure is as follows:

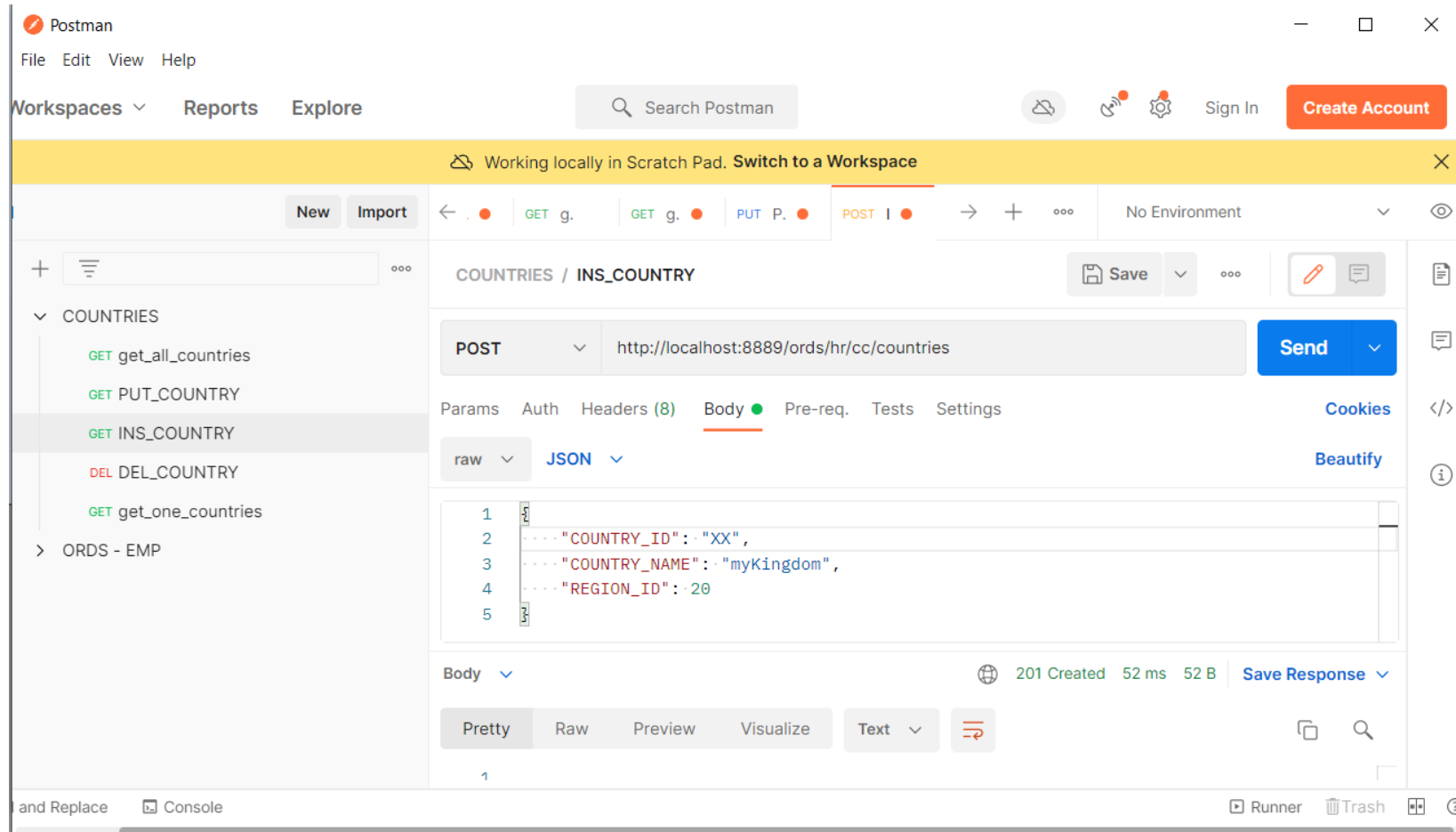
```
DECLARE
BEGIN
    INSERT INTO COUNTRIES (COUNTRY_ID,COUNTRY_NAME,REGION_ID)
        VALUES (:COUNTRY_ID, :COUNTRY_NAME, :Region_id);

    :status := 201;
EXCEPTION WHEN DUP_VAL_ON_INDEX THEN
    :status := 404;
WHEN OTHERS THEN
    HTP.p (SQLERRM);
    :status := 203;
END;
```

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HTTP

Zugriff auf die ORDS Services mittels Postman:



The screenshot displays the Postman application interface. The main workspace shows a REST client configuration for a POST request to the endpoint `http://localhost:8889/ords/hr/cc/countries`. The request body is set to JSON and contains the following data:

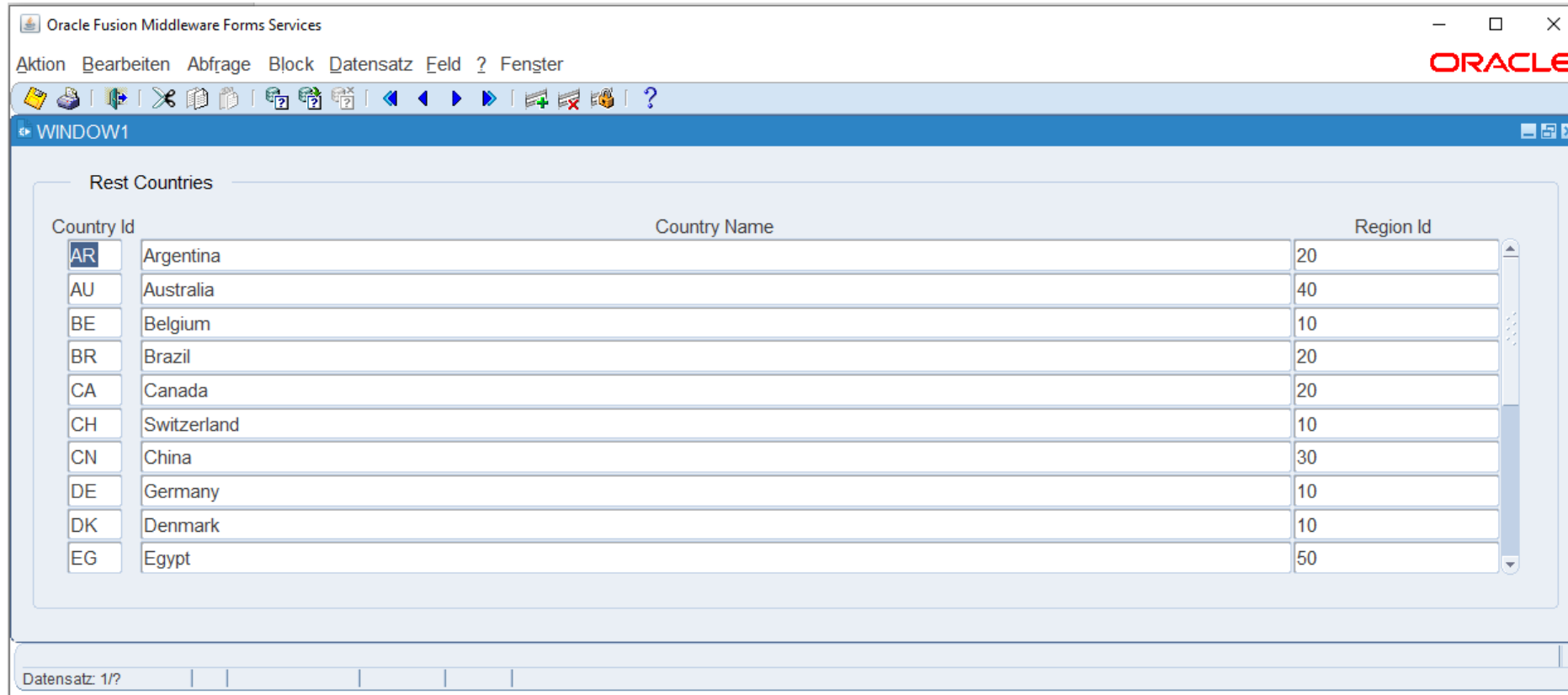
```
1 {
2   "COUNTRY_ID": "XX",
3   "COUNTRY_NAME": "myKingdom",
4   "REGION_ID": 20
5 }
```

The interface also shows a sidebar with a collection of endpoints under "COUNTRIES" and "ORDS - EMP". The status bar at the bottom indicates the request was successful with a 201 status code, 52 ms response time, and 52 B body size.

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Forms

Unser Ziel REST Daten in Forms zu nutzen:



The screenshot shows the Oracle Fusion Middleware Forms Services interface. The window title is "Oracle Fusion Middleware Forms Services". The menu bar includes "Aktion", "Bearbeiten", "Abfrage", "Block", "Datensatz", "Feld", "?", and "Fenster". The toolbar contains various icons for navigation and editing. The main content area displays a table titled "Rest Countries" with the following data:

Country Id	Country Name	Region Id
AR	Argentina	20
AU	Australia	40
BE	Belgium	10
BR	Brazil	20
CA	Canada	20
CH	Switzerland	10
CN	China	30
DE	Germany	10
DK	Denmark	10
EG	Egypt	50

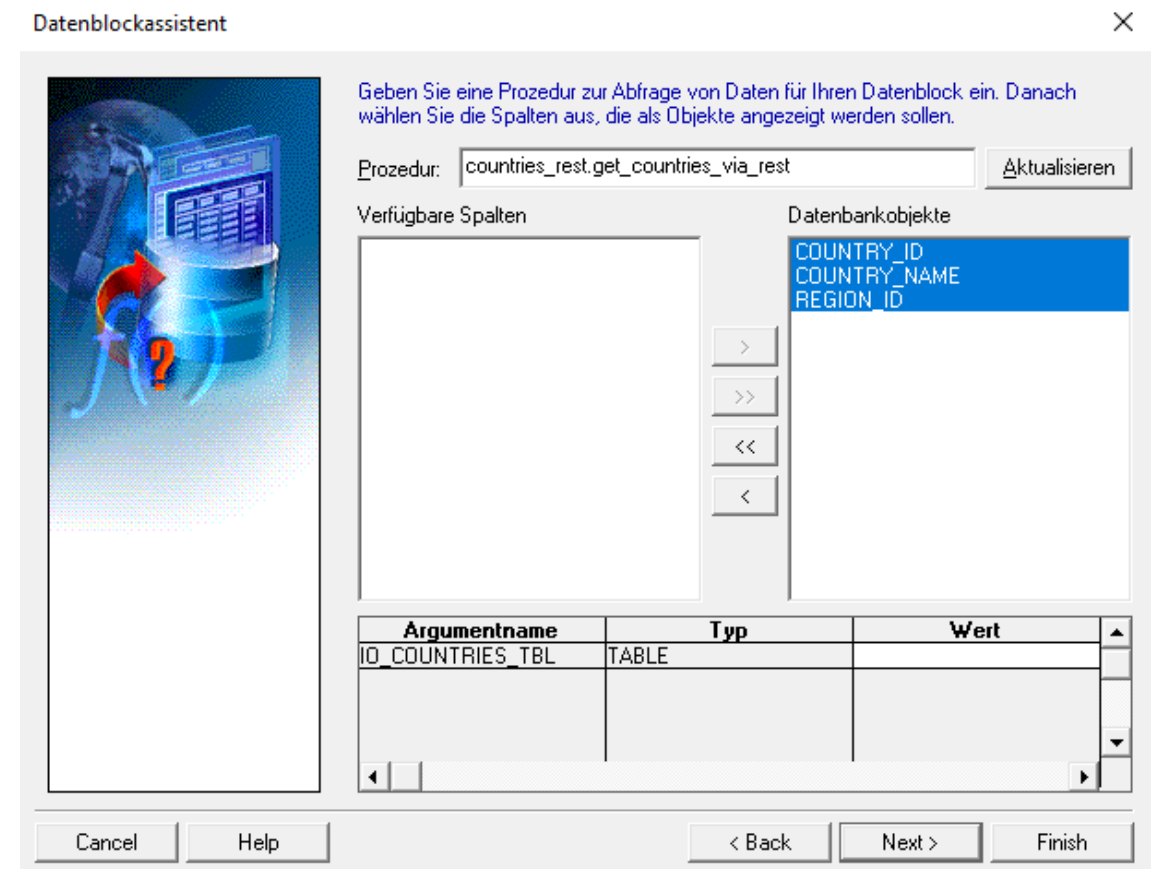
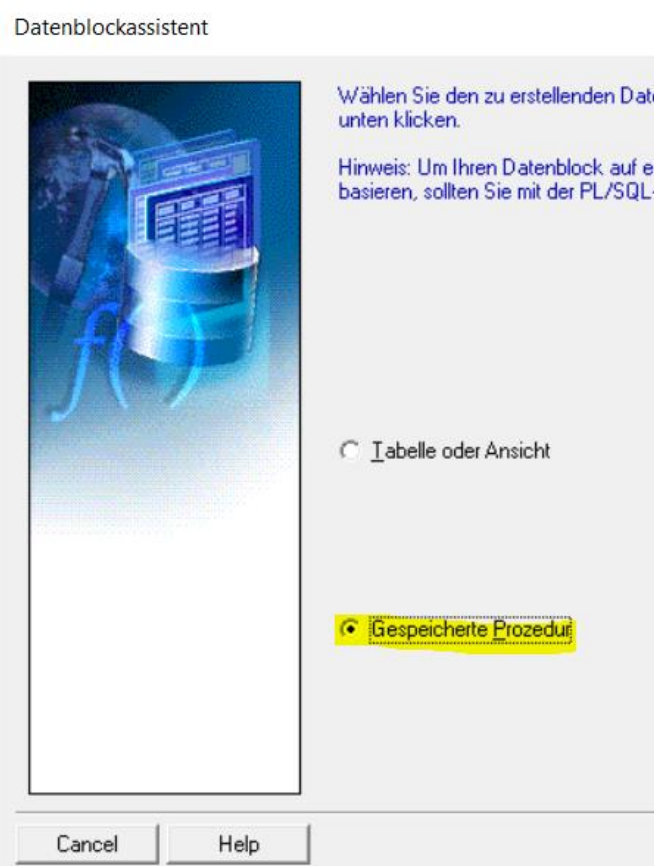
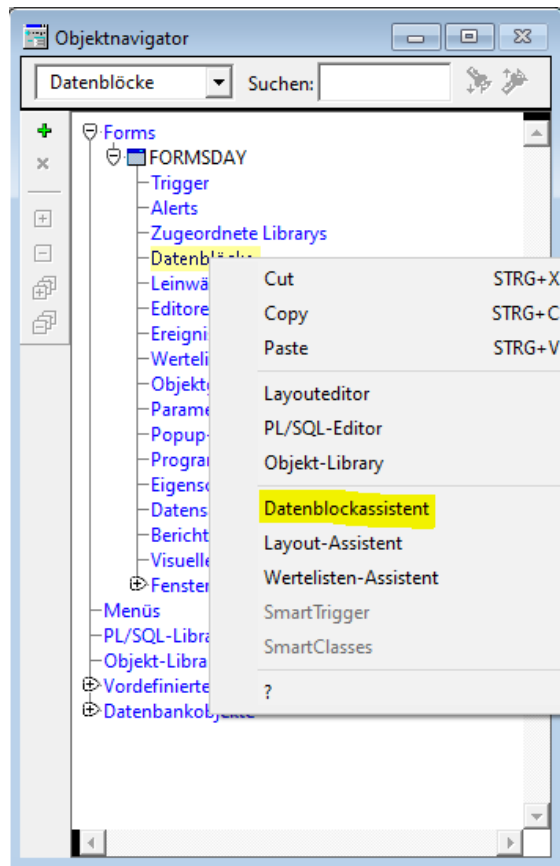
The status bar at the bottom indicates "Datensatz: 1/?".

Aber wie ?!

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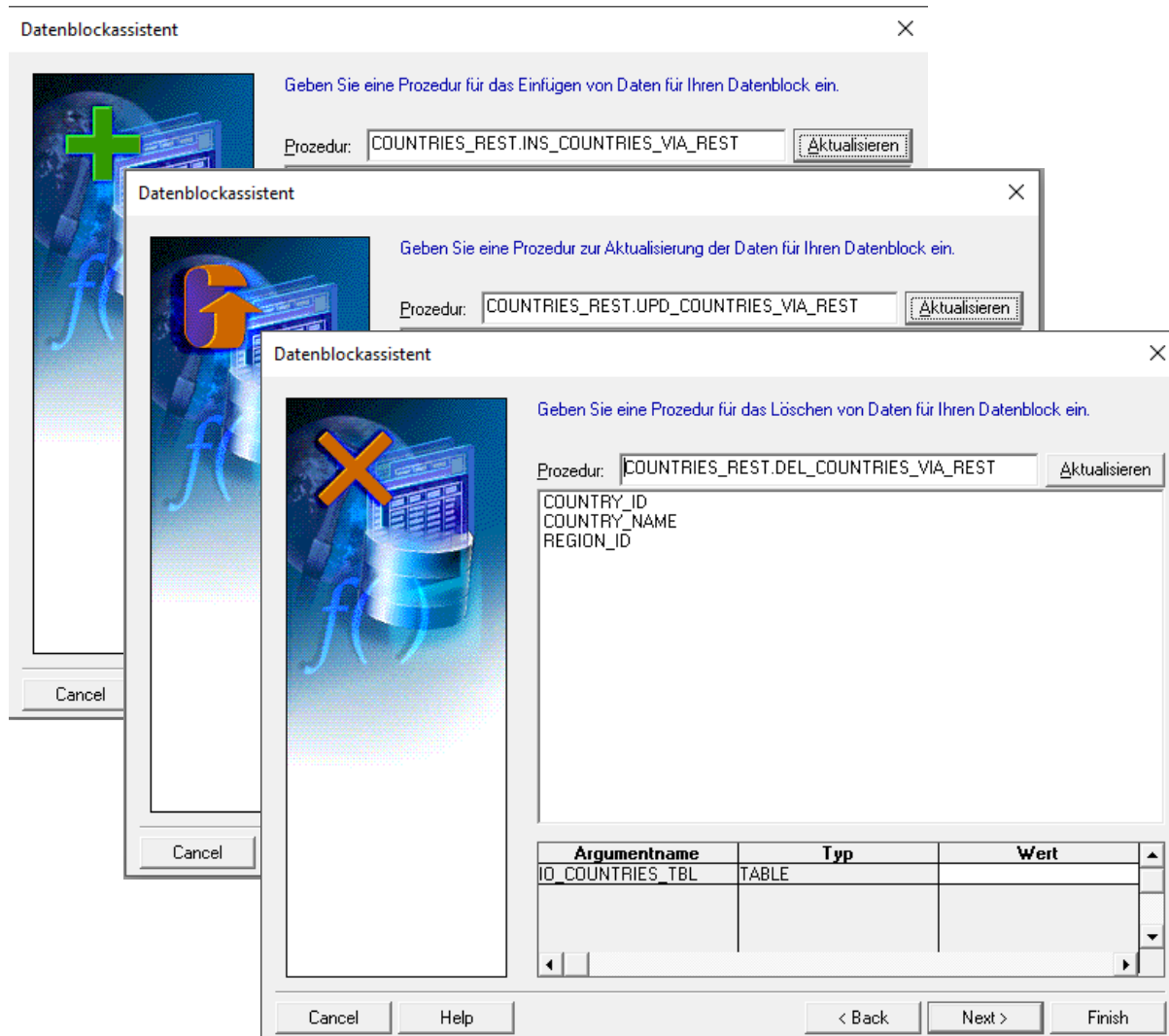
Forms

Einfach den Datenblockassistenten nutzen



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Forms



Datenblockassistent (Top): Geben Sie eine Prozedur für das Einfügen von Daten für Ihren Datenblock ein.
Prozedur: COUNTRIES_REST.INS_COUNTRIES_VIA_REST [Aktualisieren]

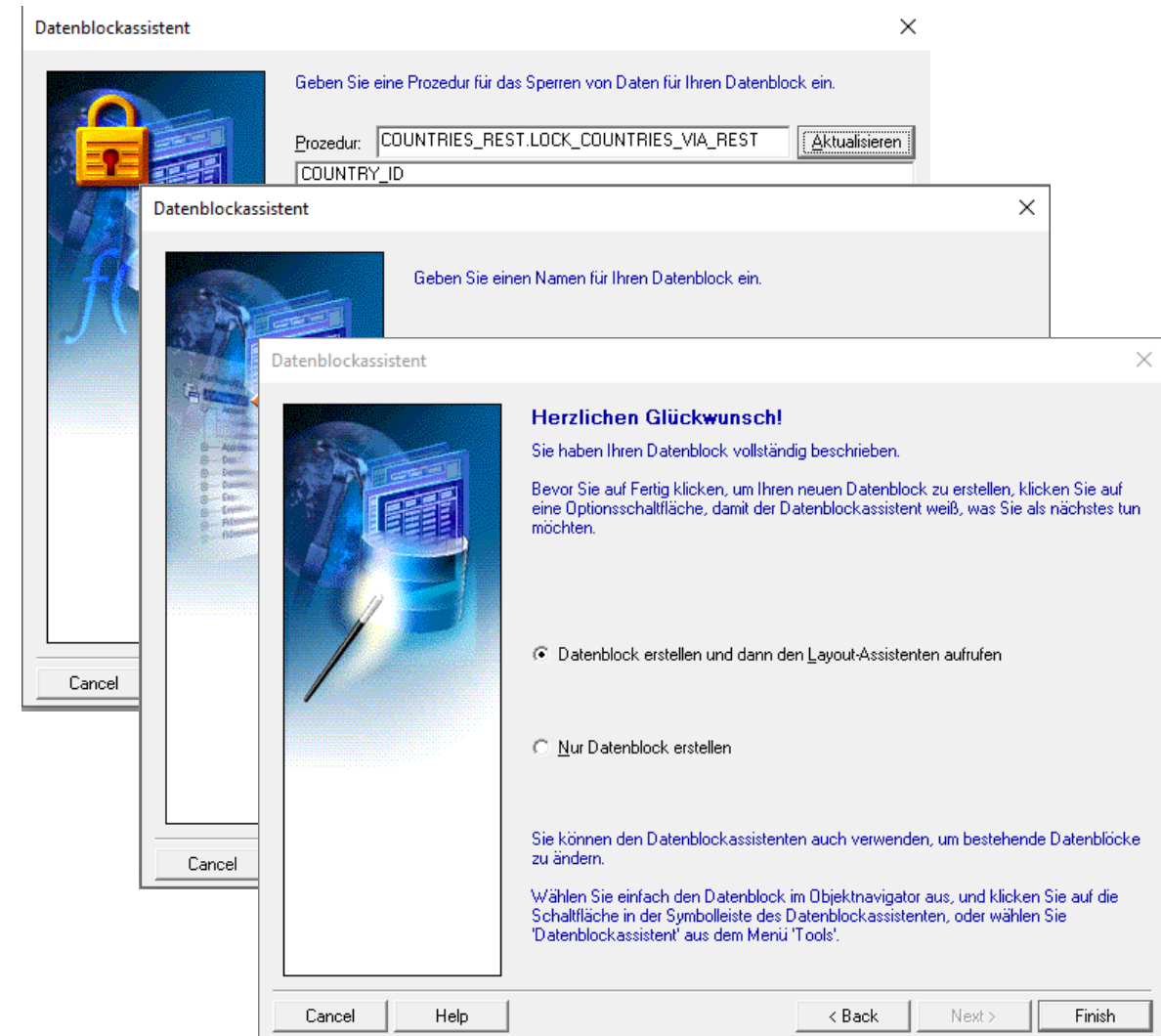
Datenblockassistent (Middle): Geben Sie eine Prozedur zur Aktualisierung der Daten für Ihren Datenblock ein.
Prozedur: COUNTRIES_REST.UPD_COUNTRIES_VIA_REST [Aktualisieren]

Datenblockassistent (Bottom): Geben Sie eine Prozedur für das Löschen von Daten für Ihren Datenblock ein.
Prozedur: COUNTRIES_REST.DEL_COUNTRIES_VIA_REST [Aktualisieren]

Argumentenliste:

Argumentname	Typ	Wert
ID_COUNTRIES_TBL	TABLE	

Buttons: Cancel, Help, < Back, Next >, Finish



Datenblockassistent (Top): Geben Sie eine Prozedur für das Sperren von Daten für Ihren Datenblock ein.
Prozedur: COUNTRIES_REST.LOCK_COUNTRIES_VIA_REST [Aktualisieren]
COUNTRY_ID

Datenblockassistent (Middle): Geben Sie einen Namen für Ihren Datenblock ein.

Datenblockassistent (Bottom):
Herzlichen Glückwunsch!
Sie haben Ihren Datenblock vollständig beschrieben.
Bevor Sie auf Fertig klicken, um Ihren neuen Datenblock zu erstellen, klicken Sie auf eine Optionsschaltfläche, damit der Datenblockassistent weiß, was Sie als nächstes tun möchten.

- Datenblock erstellen und dann den Layout-Assistenten aufrufen
- Nur Datenblock erstellen

Sie können den Datenblockassistenten auch verwenden, um bestehende Datenblöcke zu ändern.
Wählen Sie einfach den Datenblock im Objektnavigator aus, und klicken Sie auf die Schaltfläche in der Symbolleiste des Datenblockassistenten, oder wählen Sie 'Datenblockassistenten' aus dem Menü 'Tools'.

Buttons: Cancel, Help, < Back, Next >, Finish

Oracle Forms & REST Web Services

Package für die Stored Procedures – Allgemeine Funktionen

/* Record Definition für die ausgetauschte Tabelle */

```
TYPE country_record IS RECORD (  
    country_id VARCHAR2(2),  
    country_name VARCHAR2(60),  
    region_id NUMBER  
);
```

/* Definition der ausgetauschte Tabelle */

```
TYPE country_table IS  
    TABLE OF country_record INDEX BY BINARY_INTEGER;
```

/* Ausführen einer REST Anfrage */

```
FUNCTION send_web_request (  
    i_url      IN VARCHAR2,  
    i_data     IN CLOB,  
    i_method   IN VARCHAR2,  
    i_content_type IN VARCHAR2 DEFAULT NULL  
) RETURN CLOB;
```

Oracle Forms & REST Web Services

Package für die Stored Procedures – Abfrage



```
PROCEDURE get_countries_via_rest (io_countries_tbl IN OUT country_table)
IS
  CURSOR c_countries IS
    SELECT country_id, country_name, region_id FROM
      (SELECT country_id, country_name, region_id FROM JSON_TABLE
        (countries_rest.send_web_request(i_url => 'http://localhost:8889/ords/hr/cc/countries',
          i_data => NULL, i_method => 'GET'),
          '$.items[*]' COLUMNS (country_id VARCHAR2 ( 100 ) PATH '$.country_id',
            country_name VARCHAR2 ( 100 ) PATH '$.country_name',
            region_id NUMBER PATH '$.region_id')
        )
      );
  v_idx NUMBER := 1;
BEGIN
  FOR i IN c_countries LOOP
    io_countries_tbl(v_idx) := i;
    v_idx := v_idx + 1;
  END LOOP;
  RETURN;
END get_countries_via_rest;
```

Oracle Forms & REST Web Services

Package für die Stored Procedures – Abfrage



```
PROCEDURE get_countries_via_rest (io_countries_tbl IN OUT country_table)
IS
  CURSOR c_countries IS
    SELECT country_id, country_name, region_id FROM
      (SELECT country_id, country_name, region_id FROM JSON_TABLE
        (countries_rest.send_web_request(i_url => 'http://localhost:8889/ords/hr/cc/countries',
          i_data => NULL, i_method => 'GET'),
          '$.items[*]' COLUMNS (country_id VARCHAR2 ( 100 ) PATH '$.country_id',
            country_name VARCHAR2 ( 100 ) PATH '$.country_name',
            region_id NUMBER PATH '$.region_id')
        )
      );
  v_idx NUMBER := 1;
BEGIN
  FOR i IN c_countries LOOP
    io_countries_tbl(v_idx) := i;
    v_idx := v_idx + 1;
  END LOOP;
  RETURN;
END get_countries_via_rest;
```

Oracle Forms & REST Web Services

Package für die Stored Procedures – Einfügen



```
PROCEDURE ins_countries_via_rest (
    io_countries_tbl IN OUT country_table
) IS
    v_data      CLOB;
    v_erg       CLOB;
    v_num_rows  NUMBER;
BEGIN
    v_num_rows := io_countries_tbl.count;
    FOR i IN 1..v_num_rows LOOP
        v_data := '{"COUNTRY_ID": "' || io_countries_tbl(i).country_id
                || '", "COUNTRY_NAME": "' || io_countries_tbl(i).country_name
                || '", "REGION_ID": ' || io_countries_tbl(i).region_id || '}'';

        v_erg := countries_rest.send_web_request(
            i_url => 'http://localhost:8889/ords/hr/cc/countries',
            i_data => v_data, i_method => 'POST',
            i_content_type => 'application/json');
    END LOOP;
END ins_countries_via_rest;
```

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Package für die Stored Procedures – Aktualisieren



```
PROCEDURE upd_countries_via_rest (
    io_countries_tbl IN OUT country_table
) IS
    v_data      CLOB;
    v_erg       CLOB;
    v_num_rows  NUMBER;
BEGIN
    v_num_rows := io_countries_tbl.count;
    FOR i IN 1..v_num_rows LOOP
        v_data := '{"COUNTRY_ID": "' || io_countries_tbl(i).country_id
                || '", "COUNTRY_NAME": "' || io_countries_tbl(i).country_name
                || '", "REGION_ID": ' || io_countries_tbl(i).region_id || '}'';

        v_erg := countries_rest.send_web_request(
            i_url => 'http://localhost:8889/ords/hr/cc/countries',
            i_data => v_data, i_method => 'PUT',
            i_content_type => 'application/json');
    END LOOP;
END upd_countries_via_rest;
```

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Package für die Stored Procedures – Löschen

```
PROCEDURE del_countries_via_rest (
    io_countries_tbl IN OUT country_table
) IS
    v_url          VARCHAR2(32767);
    v_erg          CLOB;
    v_num_rows    NUMBER;

BEGIN
    v_num_rows := io_countries_tbl.count;
    FOR i IN 1..v_num_rows LOOP
        v_url := 'http://localhost:8889/ords/hr/cc/countries/'
                || io_countries_tbl(i).country_id
                || '?COUNTRY_ID='
                || io_countries_tbl(i).country_id;
        v_erg := countries_rest.send_web_request(i_url => v_url,
                                                i_data => NULL,
                                                i_method => 'delete');
    END LOOP;
END del_countries_via_rest;
```

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Package für die Stored Procedures – Sperren

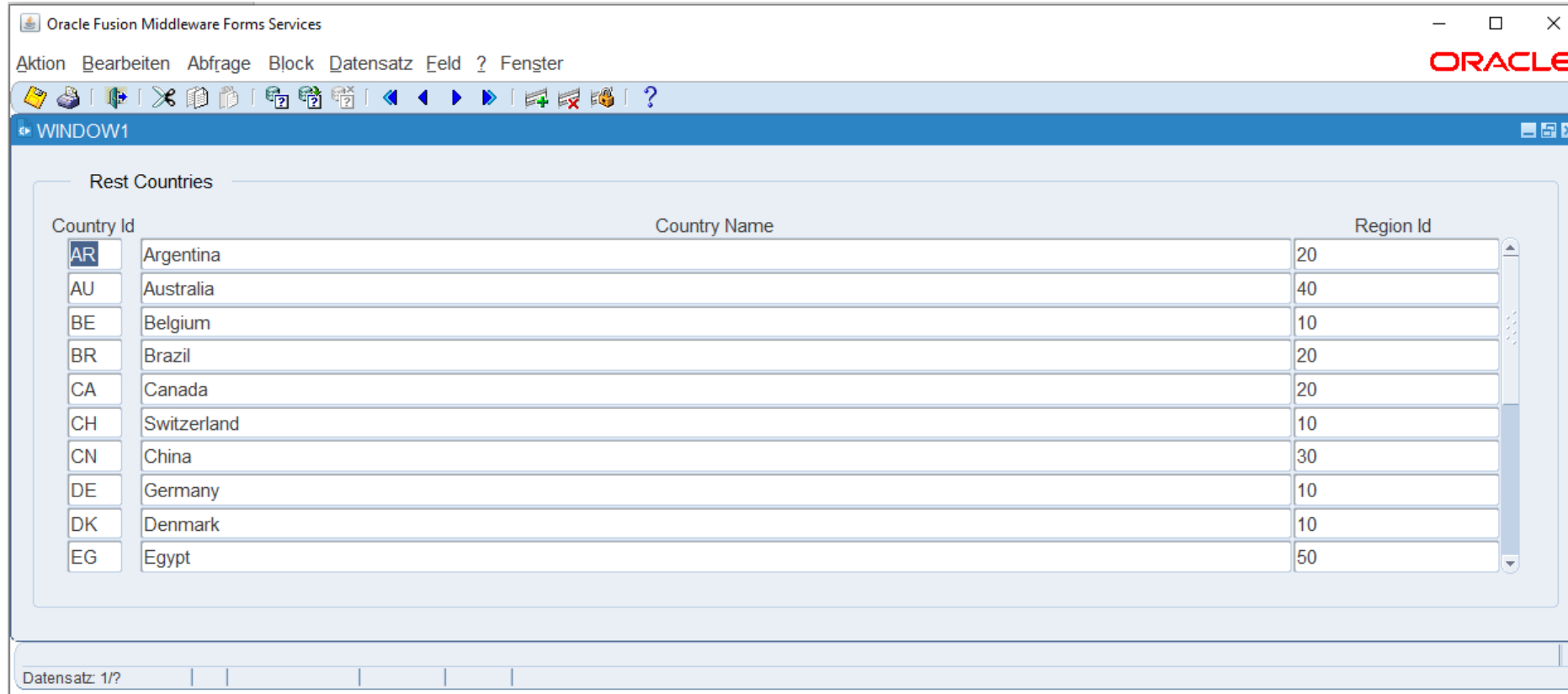
```
/* Hat keine Funktion aber ist von Forms benötigt,  
 * sonst gibt es ein FRM-40743.  
 */  
PROCEDURE lock_countries_via_rest (  
    io_countries_tbl IN OUT country_table  
) IS  
BEGIN  
    log_info(i_prozedur => 'ins_countries_via_rest',  
            i_meldung => io_countries_tbl.count ||  
                        ' Sätze nicht gesperrt.');
```

END;

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BR	Brazil	20
CA	Canada	20
CH	Switzerland	10
CN	China	30
DE	Germany	10
DK	Denmark	10
EG	Egypt	50

The status bar at the bottom indicates "Datensatz: 1/?".

Live

Danke für Ihr Interesse



Mail: christian.wille@der-it-macher.de

Web: www.der-it-macher.de



Königsdorfer Straße 25
82515 Wolfratshausen