

# **Using Advanced SQL Techniques to Create Your Own Reports**

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## **1. Overview of the Trams Database**

There are Six Major Table Groupings. Some Tables are common to both TBO and CB and others are only for TBO or CB.

- Profiles
- Invoices
- Payments
- ResCards (CB Only)
- Activities (CB Only)
- G/L (TBO Only)

## **1. Overview of the Trams Database**

### **Profiles**

- All profile types (Leisure, Corporate, Vendor, Agent and Other) are stored in the Profile table.
- Addresses are stored in the Address table.
- Communications (Phone, Fax, Email) are in the Communications table.
- Most other tables point back to the Profile table
- Invoices point to a Client Profile
- Bookings point to a Vendor Profile.
- AgentBkgs point to an Agent Profile.
- Payments can point to any type of Profile.

## **1. Overview of the Trams Database**

### **Invoices**

- An Invoice can contain one or more Bookings.
- Each Booking can contain one or more Segments.
- UDID and AgentBkg entries are below the Booking level.
- You can check if a booking is voided by checking ClientPayStatus\_LinkCode='V'.

## **1. Overview of the Trams Database**

### **Payments**

- All payment types (Received, Made, Deposit, Withdrawal) are stored in the Payment table.
- Payments that apply to invoices create one or more PayDtl records so that a single payment can link to multiple invoices.

### **G/L (TBO Only)**

- G/L Account information is stored in the GL Table; G/L Account Balances are in the GLDetail table (for multiple balance sheets).
- Journal Entries are stored in the JE and JEDtl (line item) tables.

## **1. Overview of the Trams Database**

### **ResCards (CB Only)**

- A ResCard can contain one or more ResCardReservations.
- A ResCardReservation can contain one or more ResCardProviders and one or more ResCardSegments.

### **Activities (CB Only)**

- All Activity Types (Notes, Reminders, Mailers) Are stored in the Activity table.

## 2. Sample Queries

- Profile Queries
- Invoice/Booking Queries
- Payment Queries
- CityPair Queries
- Getting a single record match in a master/detail (one-to-many) situation

## 2. Sample Queries

### Profile Queries

- All Client Profiles

```
Select P.ProfileNo, P.Name  
From Profile P  
Where P.ProfileType_LinkCode In ('I','C')
```

- By Profile Group

```
Select P.Profileno, P.Name  
From Marketing M  
Join Profile P On P.ProfileNo=M.Profile_LinkNo  
Where M.MarketingValue='BIGSPENDER'
```

## 2. Sample Queries

### Profile Queries

- By Marketing Code (CB Only)

- Profiles where each of 3 Marketing Codes is selected

```
select p.profileno, p.name
from profilemarketing pm1
  join profilemarketing pm2 on
pm2.profile_linkno=pm1.profile_linkno
  join profilemarketing pm3 on
pm3.profile_linkno=pm1.profile_linkno
  join profile p on pm1.profile_linkno=p.profileno
where pm1.code_linkno=83 and
      pm2.code_linkno=117 and
      pm3.code_linkno=43
```

## 2. Sample Queries

### Profile Queries

- By Marketing Code (CB Only)

- Profiles where any of 3 Marketing Codes is selected

```
select p.profileno, p.name
from profilemarketing pm1
  join profile p on p.profileno=pm1.profile_linkno
where pm1.code_linkno=83
union
select p.profileno, p.name
from profilemarketing pm2
  join profile p on p.profileno=pm2.profile_linkno
where pm2.code_linkno=117
union
select p.profileno, p.name
from profilemarketing pm3
  join profile p on p.profileno=pm3.profile_linkno
where pm3.code_linkno=43
```

Note: The UNION keyword by itself will eliminate duplicate rows.

## 2. Sample Queries

### Profile Queries

- Profiles With Invoice Activity In The Last Year

```
Select P.ProfileNo, P.Name  
From Profile P  
where P.ProfileType_LinkCode In ('I','C') And  
Exists (Select InvoiceNo From Invoice Where  
Client_LinkNo=P.ProfileNo And  
IssueDate>='Today'-365)
```

## 2. Sample Queries

### Profile Queries

- Profiles With No Invoice Activity In The Last Year

```
Select P.ProfileNo, P.Name  
From Profile P  
Left Join Invoice I on I.Client_LinkNo=P.ProfileNo And  
I.IssueDate>='Today'-365  
where P.ProfileType_LinkCode In ('I','C') And  
I.InvoiceNo Is Null
```

## 2. Sample Queries

### Invoice/Booking Queries

- Client Sales By Travel Type

```
Select P.ProfileNo, P.Name ClientName, T.TravelType, Sum(B.TotalFare)
From Invoice I
Left Join Booking B On B.Invoice_LinkNo=I.InvoiceNo
Left Join Profile P On P.ProfileNo=I.Client_LinkNo
Left Join TravelType T On T.TravelTypeNo=B.TravelType_LinkNo
Where I.IssueDate Between '1/1' And 'today' And
B.ClientPayStatus_LinkCode <> 'V'
Group By P.ProfileNo, P.Name, T.TravelType
```

*We have to group by ProfileNo since we may have duplicate profile names.*

## 2. Sample Queries

### Invoice/Booking Queries

- Preferred Vendor Sales By Travel Category

```
Select P.ProfileNo, P.Name VendorName, TC.TravelCategory, Sum(B.TotalFare)
From Invoice I
Left Join Booking B On B.Invoice_LinkNo=I.InvoiceNo
Left Join Profile P On P.ProfileNo=B.Vendor_LinkNo
Left Join TravelType TT on TT.TravelTypeNo=B.TravelType_LinkNo
Left Join TravelCategory TC On
TC.TravelCategoryNo=TT.TravelCategory_LinkNo
Where I.IssueDate Between '1/1' And 'today' And
B.ClientPayStatus_LinkCode <> 'V' And
P.PreferredVendor='Y'
Group By P.ProfileNo, P.Name, TC.TravelCategory
```

## 2. Sample Queries

### Payment Query

- C/C Payment Information By Credit Card Type. This example demonstrates how to look up a credit card type based on the first 2 digits of the credit card number.

```
Select Y.PaymentDate, Y.Amount, P.Name, T.Code, Y.CkCCNo
From Payment Y
  Join Profile P On P.ProfileNo=Y.Profile_LinkNo
  Join CCNo_Lookup L On
L.CCNo=Cast(f_mid(f_fixccno(Y.CkCCNo))||'00',0,2) As Integer
  Join CCTypes T On T.TypeNo=L.CCType_LinkNo
Where Y.PaymentDate Between '1/1' And 'today' And
Y.PayMethod_LinkNo In (3,5) And
T.TypeNo=0
```

## 2. Sample Queries

### CityPair Query

- **Each Air Booking can be made up of one or more City Pairs (Legs) and each City Pair can be made up of one or more Segments. A City Pair includes Origin and Final Destination information as well as Fare and FareBasis for all of the corresponding segments.**

```
Select CP.DepartCity, CD.CityName, CP.ArriveCity, CA.CityName, CP.Fare,
CP.FareBasis,
  B.ValidAL, B.PassengerName, B.StartingTicketNo, I.InvoiceNumber
From CityPair CP
  Left Join Invoice I On I.InvoiceNo=CP.Invoice_LinkNo
  Left Join Booking B On B.BookingNo=CP.Booking_LinkNo
  Left Join City CD On CP.DepartCity=CD.City
  Left Join City CA On CP.ArriveCity=CA.City
  Left Join Profile VP On VP.ProfileNo=B.Vendor_LinkNo
Where CP.DepartDateTime between '1/1' And 'today' And
I.Paystatus_LinkCode <> 'V' And
I.InvoiceType_LinkCode='S' And
B.ClientPayStatus_LinkCode <> 'V'
```

## 2. Sample Queries

**Getting a single record match in a master/detail (one to-many) situation.**

- **Profile Example Using Joins**

- The Profile entity is made up of numerous tables since a given profile can have multiple addresses, phone numbers, etc.
- Many times, you need profile data like name, address, city/state/zip, and phone but only want one result row. To get a single row result, you need to specify just the primary address, phone, etc.

## 2. Sample Queries

**Getting a single record match in a master/detail (one-to-many) situation.**

- **Profile Example Using Joins, Cont'd.**

```
Select P.ProfileNo, P.ProfileType_LinkCode, P.Name,  
A.Address1, A.Address2, A.City, A.State, A.Zip,  
CP.CommValue, CF.CommValue, CE.CommValue  
From Profile P  
Left Join AddrInstance AI On AI.Profile_LinkNo=P.ProfileNo And AI.AddrType_LinkNo=1  
Left Join Address A On A.AddressNo=AI.Address_LinkNo  
Left Join Communication CP On Cp.Profile_LinkNo=ProfileNo And  
CP.CommType_LinkNo=2 And CP.IsPrimary='Y'  
Left Join Communication CF On CF.Profile_LinkNo=ProfileNo And  
CF.CommType_LinkNo=1 and CF.IsPrimary='Y'  
Left Join Communication CE On CE.Profile_LinkNo=ProfileNo And  
CE.CommType_LinkNo=3 and CE.IsPrimary='Y'
```

We use Left Outer Joins so that profiles that don't contain address or phone information will still return results (the missing fields will be blank).

## 2. Sample Queries

### Getting a single record match in a master/detail (one-to-many) situation.

- Invoice Example Using A Combination Of Joins and Sub-Selects
  - Each invoice can have multiple bookings so how do I run a query that shows one result per invoice where I don't know which booking to include or where I want to include certain information from a single booking and summarized information from all bookings?

## 2. Sample Queries

### Getting a single record match in a master/detail (one-to-many) situation.

- Invoice Example Using A Combination Of Joins and Sub-Selects, Cont'd.
  - Example: Show the invoice number, issue date, invoice type, first passenger name (passenger name from the first booking on the invoice), and sum of Booking total fares.

```
Select I.InvoiceNumber, I.IssueDate, I.InvoiceType_LinkCode, B.PassengerName,  
(Select Sum(TotalFare) From Booking Where Invoice_Linkno=I.Invoiceno) TotalFare  
From Invoice I  
Left Join Booking B on B.BookingNo=(Select Min(BookingNo+0) From Booking Where  
Invoice_Linkno=I.Invoiceno)
```

The "+0" above is required to work around an optimizer bug.  
You can omit it, but the query will not be as fast.

## References

### Trams Data Dictionaries

<http://www.Trams.com/dd/index.shtml>

### SQL Books/Tutorials

- Teach Yourself SQL in 21 Days, 2nd Edition  
[\*http://members.tripod.com/er4ebus/sql/ch01.htm\*](http://members.tripod.com/er4ebus/sql/ch01.htm)
- SQL For Smarties, Joe Celko

# Thank You!

Check your Survival Guide to find  
the location of your next class.