Advanced SQL: Running Queries and Accessing the TRAMS Database

Dan Palley, CTO, TRAMS, Inc.

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 Crystal Reports/Database Newsgroup

news://news.trams.com/general.crystalreporting

TRAMS Data Dictionaries

http://www.trams.com/dd/index.thtml

SQL Books/Tutorials

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