Acumatica ERP Database Schema

Cloud xRP
Summit
Virtual Developer Conference

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Framework Database Schema vs Application Database Schema
Agenda

• Tables structure:
  • Multi tenancy
  • Audit fields
  • Notes and files
  • tstamp and balance tables
  • Deleted database records and foreign keys
  • Derived tables, aliases and projections, extensions

• Optimization
  • Query cache
  • API and reports optimizations.
Schema Explorer

- DB Structure Explorer - SM402000
Tables Structure
Typical Table Structure

- **Columns**
  - `CompanyID` (PK, int, not null)
  - `...`
  - `CreatedByID` (uniqueidentifier, not null)
  - `CreatedByScreenID` (char(8), not null)
  - `CreatedDateTime` (datetime, not null)
  - `LastModifiedByID` (uniqueidentifier, not null)
  - `LastModifiedByScreenID` (char(8), not null)
  - `LastModifiedDateTime` (datetime, not null)
  - `DeletedDatabaseRecord` (bit, not null)
  - `tstamp` (timestamp, not null)
  - `NoteID` (uniqueidentifier, null)

```java
public partial class CARecon : IBqlTable
{
  
  ...
  
  NoteID
  CreatedByID
  CreatedByScreenID
  CreatedDateTime
  LastModifiedByID
  LastModifiedByScreenID
  LastModifiedDateTime
  tstamp
}
```
Multi Tenancy Support

CompanyID – Tenant ID.

CompanyMask – Is used to share data between tenants

\[\begin{align*}
0xB0 &\quad \text{hex->bin} \quad 10110000 \\
0x\text{AA}\text{AA} &\quad \text{hex->bin} \quad 1010101010101010
\end{align*}\]
Audit Fields

<table>
<thead>
<tr>
<th>LastModifiedDateTime</th>
<th>LastModifiedByID – User PKID</th>
<th>LastModifiedByScreenID</th>
</tr>
</thead>
<tbody>
<tr>
<td>CreatedDateTime</td>
<td>CreatedByID – User PKID</td>
<td>CreatedByScreenID</td>
</tr>
</tbody>
</table>

```csharp
#region CreatedByID
1 reference | 0 changes | 0 authors, 0 changes
public abstract class CreatedByID : PX.Data.BQL.BqlGuid.Field<createdByID> { }

[PXDBCreatedByID]
0 references | 0 changes | 0 authors, 0 changes
public virtual Guid? CreatedByID
{
    get;
    set;
}
#endregion
```
NoteID

Referenced tables:

- Note
- NoteDoc
- …KvExt
Another process has updated the record.

https://asiablog.acumatica.com/2018/03/another-process-has-added-updated-deleted.html


https://help-2019r1.acumatica.com/(W(3))/Help?ScreenId=ShowWiki&pageid=8d904e5f-2b8c-4d82-a8f5-bc863f8fffc8f
Balance Tables

```csharp
[Serializable]
[CDailySummaryAccumulator]
[PXPrimaryGraph(typeof(CATranEnq), Filter = typeof(CAEnqFilter))]
[PXCacheName(Messages.CADailySummary)]

```

```
public partial class CADailySummary : IBqlTable
{
    CashAccountID
    TranDate
    AmtReleasedClearedDr
    AmtUnreleasedClearedDr
    AmtReleasedUnclearedDr
    AmtUnreleasedUnclearedDr
    AmtReleasedClearedCr
    AmtUnreleasedClearedCr
    AmtReleasedUnclearedCr
    AmtUnreleasedUnclearedCr
}
```
DeletedDatabaseRecord

- ARRegister
- APRegister
- Batch
- CARecon
- ...

Acumatica
The Cloud ERP
Derived Tables, Aliases, Projections, Extensions

```csharp
[Serializable]
[PXProjection(typeof(Select5<Standalone.ARIInvoice,
    InnerJoin<ARRegister,
    ...)
    GroupBy<ARRegister.refNbr,
    GroupBy<ARRegister.docType,
    Min<ARDunningLetterDetail.released>>>))]

public partial class ARInvoiceWithDL : IBqlTable
{
    CustomerID
    SharedCreditCustomerID
    BranchID
    CustomerLocationID
}
```
Optimizations
API and Reports Optimizations

Optimizations

PXDependOnFields attribute

```csharp
[PXString(1, IsFixed = true)]
22 references | 0 changes | 0 authors, 0 changes
public virtual string DrCr
{
    [PXDependsOnFields(typeof(docType))]
    get
    {
        return ARInvoiceType.DrCr(this._DocType);
    }
    set
    {
    }
}
```
Thank you!

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