



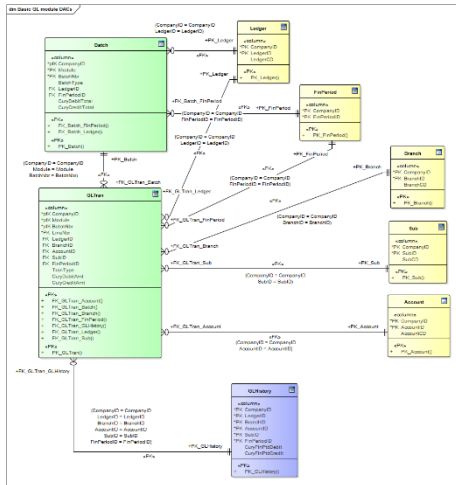
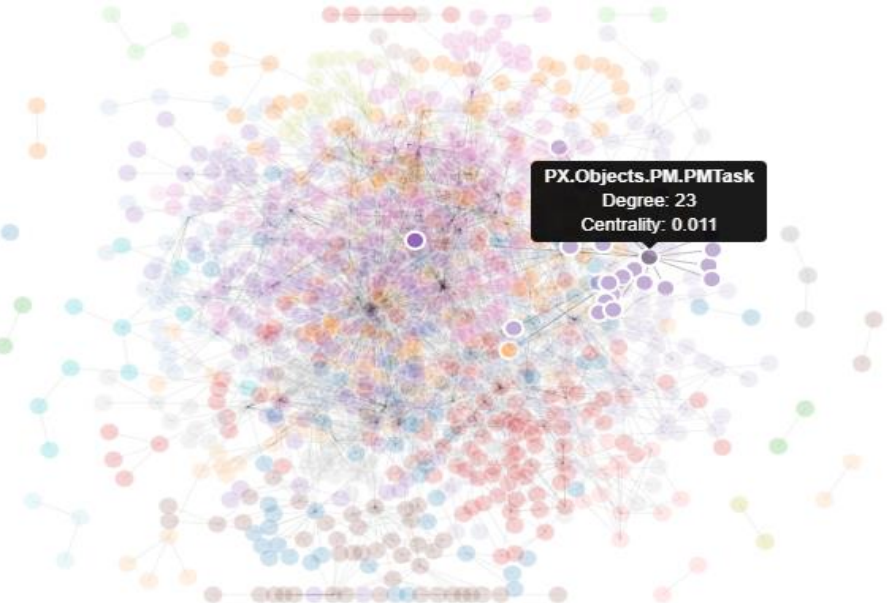
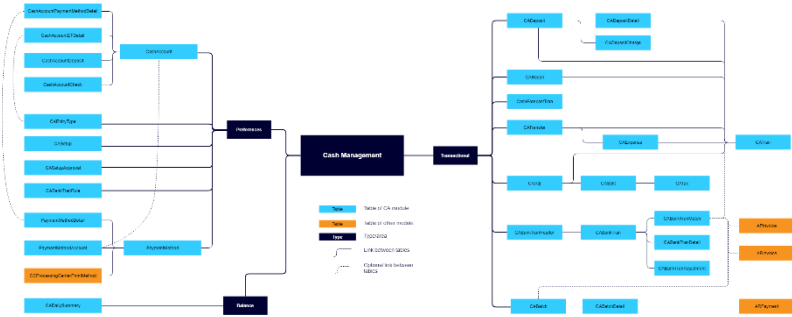
## Acumatica ERP Database Schema

# Cloud xRP Summit

Virtual Developer Conference

Dmitrii Naumov

# Framework Database Schema vs Application Database Schema



# Agenda

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- Tables structure:
  - Multi tenancy
  - Audit fields
  - Notes and files
  - tstamp and balance tables
  - Deleteddatabase records and foreign keys
  - Derived tables, aliases and projections, extensions
- Optimization
  - Query cache
  - API and reports optimizations.

# Schema Explorer

- DB Structure Explorer - SM402000
- Functional Description – [https://help-2019r1.acumatica.com/\(W\(40\)\)/Help?ScreenId=ShowWiki&pageid=ec2728d3-ea18-4287-bb73-796161873d6c](https://help-2019r1.acumatica.com/(W(40))/Help?ScreenId=ShowWiki&pageid=ec2728d3-ea18-4287-bb73-796161873d6c)

Merged DB Structure ★

< > ⌂ >|

DAC Full Name:  🔍

Class Name:   Has Incoming

Namespace:   Has Outgoing

Short Name:

Base Class:

INCOMING REFERENCES    OUTGOING REFERENCES

🏠 + ✎ ✕ ⏪ ⏩ 🗑️

Child Table	Child Key Fields	Parent Table	Parent Key Fields	Achieved By	Behavior
> <a href="#">APRegister</a>	vendorID	BAccount	bAccountID	DeclareReferenceA...	Restrict
<a href="#">VendorPaymentMethodDetail</a>	bAccountID	BAccount	bAccountID	ParentAttribute	Cascade
<a href="#">ARRegister</a>	customerID	BAccount	bAccountID	DeclareReferenceA...	Restrict
<a href="#">Address</a>	bAccountID	BAccount	bAccountID	ParentAttribute	Cascade
<a href="#">BAccount</a>	parentBAccountID	BAccount	bAccountID	DeclareReferenceA...	Restrict
<a href="#">Contact</a>	bAccountID	BAccount	bAccountID	ParentAttribute	Cascade
<a href="#">CRRRelation</a>	refNoteID	BAccount	noteID	ParentAttribute	Cascade
<a href="#">Location</a>	bAccountID	BAccount	bAccountID	ParentAttribute	Cascade
<a href="#">Contract</a>	approverID	BAccount	bAccountID	DeclareReferenceA...	Restrict

## Tables Structure

# Typical Table Structure

## Columns

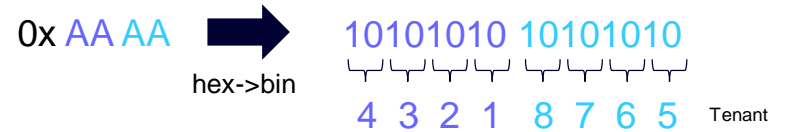
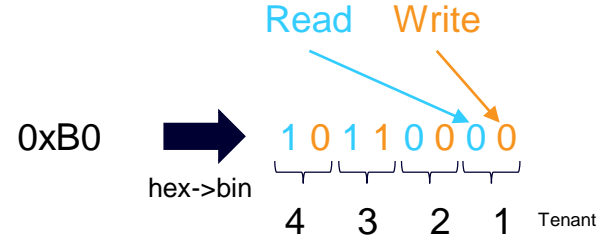
- CompanyID (PK, int, not null)
- ...
- ...
- CreatedByID (uniqueidentifier, not null)
- CreatedByScreenID (char(8), not null)
- CreatedDateTime (datetime, not null)
- LastModifiedByID (uniqueidentifier, not null)
- LastModifiedByScreenID (char(8), not null)
- LastModifiedDateTime (datetime, not null)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

```
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



# Audit Fields

---

LastModifiedDateTime

LastModifiedByID – User PKID

LastModifiedByScreenID

CreatedDateTime

CreatedByID – User PKID

CreatedByScreenID

```
#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

Sales Orders ★

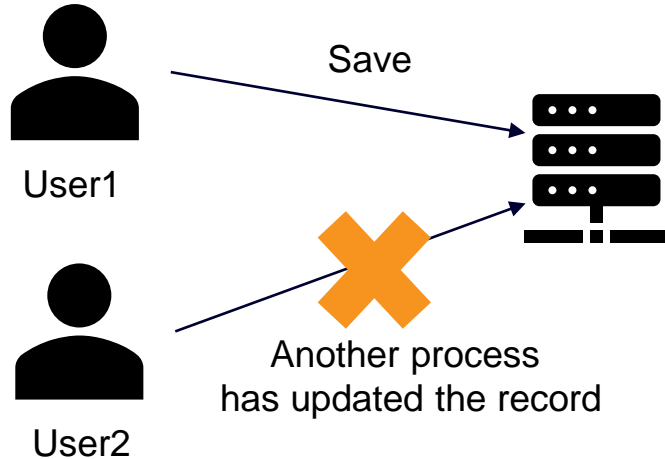
ALL RECORDS MY SALES ORDERS

Order Type: All Status: All Date: All Customer: All

		On Typ	Order Nbr.	Status	Date	Sched. Shipment	Customer	Customer Nam
			SO <a href="#">SO004781</a>	Open	6/3/2019	6/3/2019	ABARTENDE	USA Bartend
			QT <a href="#">QT000393</a>	Completed	6/3/2019	6/3/2019	ABARTENDE	USA Bartend
			SO <a href="#">SO004780</a>	Open	5/24/2019	5/24/2019	ABARTENDE	USA Bartend
			SO <a href="#">SO004779</a>	Completed	3/1/2019	3/1/2019	BOULDERCR	Boulder Cour
			SO <a href="#">SO004778</a>	Completed	3/1/2019	3/1/2019	ABARTENDE	USA Bartend
			SO <a href="#">SO004777</a>	Completed	3/22/2019	3/22/2019	FDICOC CIA	Cocciatari Piz
			SO <a href="#">SO004776</a>	Completed	3/22/2019	3/22/2019	FDIMINN	Minneapolis F
			SO <a href="#">SO004775</a>	Completed	3/15/2019	3/15/2019	FDIGREEN	Green Cooks
			SO <a href="#">SO004774</a>	Back Order	3/15/2019	3/15/2019	FDIWEST	Southwest Fc
			SO <a href="#">SO004773</a>	Completed	3/8/2019	3/8/2019	FDIGREEN	Green Cooks
			SO <a href="#">SO004772</a>	Completed	3/1/2019	3/1/2019	FDIQVIK	Qvik Process
			IN <a href="#">AR006797</a>	Completed	3/31/2019	3/31/2019	CARIBBEAN	Caribbean Se

# TStamp

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

<https://asiablog.acumatica.com/2019/02/concurrent-update.html>

[https://help-2019r1.acumatica.com/\(W\(3\)\)/Help?ScreenId=ShowWiki&pageid=8d904e5f-2b8c-4d82-a8f5-bc863f8ffc8f](https://help-2019r1.acumatica.com/(W(3))/Help?ScreenId=ShowWiki&pageid=8d904e5f-2b8c-4d82-a8f5-bc863f8ffc8f)

# Balance Tables

---

```
[Serializable]
[CADailySummaryAccumulator]
[PXPrimaryGraph(typeof(CATranEnq), Filter = typeof(CAEnqFilter))]
[PXCacheName(Messages.CADailySummary)]
99+ references | Lesin Stanislav, 226 days ago | 1 author, 1 change | 1 work item
public partial class CADailySummary : IBqlTable
{
    CashAccountID
    TranDate
    AmtReleasedClearedDr
    AmtUnreleasedClearedDr
    AmtReleasedUnclearedDr
    AmtUnreleasedUnclearedDr
    AmtReleasedClearedCr
    AmtUnreleasedClearedCr
    AmtReleasedUnclearedCr
    AmtUnreleasedUnclearedCr
}
```

# DeletedDatabaseRecord

---

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

# Derived Tables, Aliases, Projections, Extensions

```
    ]])  
    [PXCacheName(Messages.ARInvoice)]  
    [PXTable()]  
99+ references | Innokentiy Burak, 177 days ago | 5 authors, 14 changes | 1 work item  
public partial class ARInvoice : ARRegister, IInvoice  
{
```

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

99+ references | Lesin Stanislav, 226 days ago | 1 author, 1 change | 1 work item

```
public partial class ARInvoiceWithDL : IBqlTable
```

```
{
```

```
    CustomerID
```

```
    SharedCreditCustomerID
```

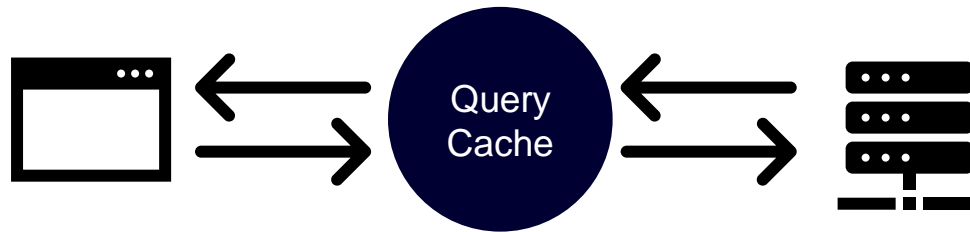
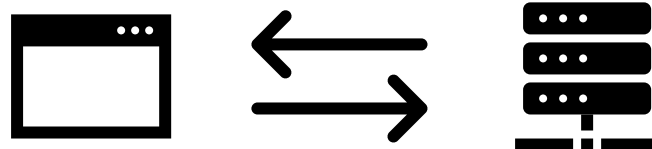
```
    BranchID
```

```
    CustomerLocationID
```

# Optimizations

# Query Cache

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# API and Reports Optimizations

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Optimizations

PXDependOnFields attribute

```
[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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