



BizSource
USER GROUP
CROATIA

Techniques for optimizing Dynamics 365 Business Central

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Agenda

- 🌐 Data types
- 🌐 Event recorder
- 🌐 Async/parallel
- 🌐 Included fields
- 🌐 Partial records
- 🌐 Calc based methods
- 🌐 Tri-state locking





Built-in data types

Data Types

int

char

string

array

timestamp

date

time

datetime

bo

Built-in data types

🌐 Optimized for performance and server resource consumption

Text builder

Media &
MediaSet

Dictionary

List



Demo – Data types

Event recorder



Event recorder

- Subscribe to events to extend the functionality
- Record events of some business process
- Captures events from the same session

Record Events

Event Type ↑ <i>Trigger Event</i>	Hit Count 1	Object Type ↑ Page	Object Name Sales Invoice Subf...	Event Name ↑ OnAfterGetRecordEvent
<i>Trigger Event</i>	1	Page	Sales Invoice Subf...	OnAfterGetRecordEvent
<i>Trigger Event</i>	1	Page	Sales Invoice Subf...	OnAfterGetRecordEvent
<i>Trigger Event</i>	1	Page	Sales Invoice Subf...	OnAfterGetRecordEvent
<i>Trigger Event</i>	1	Page	Sales Invoice Subf...	OnAfterGetRecordEvent
<i>Custom Event</i>	1	Page	Sales Invoice Subf...	OnAfterUpdateEditableOnRow
<i>Custom Event</i>	1	Page	Sales Invoice Subf...	OnBeforeCalculateTotals
<i>Custom Event</i>	1	Page	Sales Invoice Subf...	OnBeforeUpdateTypeText
⋮ <i>Custom Event</i>	1	Page	Sales Invoice Subf...	OnBeforeUpdateTypeText
<i>Custom Event</i>	1	Page	Sales Invoice Subf...	OnBeforeUpdateTypeText
<i>Custom Event</i>	1	Page	Sales Invoice Subf...	OnBeforeUpdateTypeText
<i>Custom Event</i>	1	Page	Sales Invoice Subf...	OnBeforeUpdateTypeText
<i>Trigger Event</i>	6	Page	G/L Posting Preview	OnAfterGetRecordEvent
<i>Trigger Event</i>	1	Page	G/L Posting Preview	OnOpenPageEvent



Demo – Event recorder



onous

vs.

Asynch

Async in BC



Asynchronous programming

synchronous, single thread of control



synchronous, two threads of control



asynchronous





Async/parallel in BC

🔄 Moving focus from UI to background

🔄 Different ways to achieve

Page
Background task

StartSession

Task

Job Queue

Limits



Description	Limit	Description	Limit
Background Session max concurrency	10	Child sessions max concurrency	5
Background session max queue length	100	Scheduled tasks max concurrency	5



Demo – Async/parallel

Included fields



Included fields



„When an index contains all the columns needed to satisfy a query, it is called a **covering index**¹.“

¹ Covering index = Included fields



Included fields

keys

```
{
```

```
// Before
```

```
key(K1; ItemNo, LastModifiedDate, Description, Description2)
```

```
{}
```

```
// After
```

```
key(K2; ItemNo, LastModifiedDate)
```

```
{
```

```
  IncludedFields = Description, Description2;
```

```
}
```

```
}
```



Demo – Included fields

Partial records



Partial records

🔄 Loading subset of fields from database

🔄 Avoid JOIN

🔄 JIT loading

SetLoadFields

AddLoadFields

AreFieldsLoaded

LoadFields

SetBaseLoadFields



Demo – Partial records



Without SetLoadFields

```
SELECT "50100"."timestamp","50100"."Entry No_","50100"."Description","50100"."Description 2","50100"."Amount","50100"."Amount 2","50100"."Amount 3","50100"."Amount 4","50100"."Amount 5","50100"."Start Date","50100"."Color","50100"."Color 2","50100"."Color 3","50100"."Car No_","50100"."Car No _ 2","50100"."Car No_ 3","50100"."Car No_ 4","50100"."Car No_ 5","50100_e7"."End Date","50100"."$systemId","50100"."$systemCreatedAt","50100"."$systemCreatedBy","50100"."$systemModifiedAt","50100"."$systemModifiedBy" FROM "CRONUS".dbo."CRONUS Danmark A_S$Demo$4f09c3af-fe51-4b4d-ade3-f2aee1c28a06" "50100" WITH(READUNCOMMITTED) JOIN "CRONUS".dbo."CRONUS Danmark A_S$Demo$66122ea4-ae42-4836-88d1-aa3a3e123a8e" "50100_e7" WITH(READUNCOMMITTED) ON ("50100"."Entry No_" = "50100_e7"."Entry No_") WHERE ("50100"."Car No_"=@0) ORDER BY "Entry No_" ASC OPTION(FAST 50)
```

With SetLoadFields



```
SELECT "50100"."timestamp","50100"."Entry No_","50100"."Amount","50100"."Start Date","50100"."Car No_","50100"."$systemId","50100"."$systemCreatedAt","50100"."$systemCreatedBy","50100"."$systemModifiedAt","50100"."$systemModifiedBy" FROM "CRONUS".dbo."CRONUS Danmark A_S$Demo$4f09c3af-f  
e51-4b4d-ade3-f2aee1c28a06" "50100" WITH(READUNCOMMITTED) WHERE ("50100"."Car No_"=@0) ORDER BY "Entry No_" ASC OPTION(FAST 50)
```



Calc methods



Calc methods

 Faster then looping

 CalcFields **vs** SetAutoCalcFields

 CalcSums





Demo – Calc methods



Tri-state locking



Locking - table hints

READUNCOMMITTED

READCOMMITTED

UPDLOCK





Demo – Locking

BC 22 and before

```
local procedure TwoStateLocking()
var
    Item: Record Item;
begin
    Item.FindFirst();  <= READUNCOMMITTED

    Item.Description := 'demo desc';
    Item.Modify();

    DoCalculationsWithNewItem();
end;
```

1 reference

```
local procedure DoCalculationsWithNewItem()
var
    Item: Record Item;
begin
    Item.FindLast();  <= UPDLOCK

    //some calculations
end;
```



BC 23 and after

```
local procedure TriStateLocking()
var
    Item: Record Item;
begin
    Item.FindFirst();    <= READUNCOMMITTED

    Item.Description := 'demo desc';
    Item.Modify();

    DoCalculationsWithNewItem();
end;
```

1 reference

```
local procedure DoCalculationsWithNewItem()
var
    Item: Record Item;
begin
    Item.FindLast();    <= READCOMMITTED

    //some calculations
end;
```



Feature Management

Feature Management

✓ Saved

Feature Management: All



Edit List



Feature		Automatically enabled from	Automatically enabled from version	Enabled for	Get started	Current Company Status	Update Start Date/Time
Feature Update: Replace the existing EU 3-Party Trade Purch...	Learn more	2025 Wave 1 (from April to Se...	26.0	None	—	Disabled	
Feature Update: Enable use of new extensible exchange rate...	Learn more	2025 Wave 1 (from April to Se...	26.0	None	—	Disabled	
Feature Update: Enable use of new extensible invoice postin...	Learn more	2025 Wave 1 (from April to Se...	26.0	None	—	Disabled	
Feature Update: Enable use of G/L currency revaluation	Learn more	2025 Wave 2 (from October 20...	27.0	None	—	Disabled	
Feature: Convert user group permissions	Learn more	2024 Wave 2 (from October 20...	25.0	All Users	—	Enabled	
Feature Update: Enable use of package tracking in physical i...	Learn more	2025 Wave 2 (from October 20...	27.0	None	—	Disabled	
Feature Update: Use new communication texts for reminder...	Learn more	2025 Wave 2 (from October 20...	27.0	None	—	Disabled	
Feature Update: Replace the existing Intrastat functionality ...	Learn more	2024 Wave 2 (from October 20...	25.0	None	—	Disabled	
Feature: Enable using SAF-T Audit Files Exports	Learn more	2025 Wave 1 (from April to Se...	26.0	None	—	Disabled	
Feature Update: New sales pricing experience	Learn more	2025 Wave 1 (from April to Se...	26.0	None	—	Disabled	
Feature Update: Auto-save with every field change	Learn more	2024 Wave 2 (from October 20...	25.0	All Users	Try it out	Enabled	
Feature: Enable using bulk operations for Shopify connector	Learn more	2025 Wave 1 (from April to Se...	26.0	None	—	Disabled	
Feature Update: Use new customer and item templates in S...	Learn more	2024 Wave 2 (from October 20...	25.0	None	—	Disabled	
→ Feature: Enable Tri-State locking in AL	Learn more	2024 Wave 2 (from October 20...	25.0	All Users	—	Enabled	


Find out more!


<https://bcinternals.com/posts/tri-state-locking/>


<https://youtu.be/Z1avFd77I18>



The graphic features a green and orange background with a torn-paper effect. It includes two circular headshots of speakers, a logo for BC/NAV Tech Days 2024, and the event title.

 Mads Gram

 Torben Wind Meyhoff

 **BC/NAV
TECH
DAYS
2024**
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**Microsoft Presents:
Tri-State Locking: Reducing
locking in the runtime**

Q & A





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Thank you!