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# D365FO Security and Licensing Made ‘Easy’

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- Blog: http://d365foblog.com
- Security Course: http://d365fosecurity.com
- Book: Security and Audit Field Manual: Dynamic 365 for Finance & Operations
- LinkedIn
- Microsoft MVP Profile

Background:

- Awarded Microsoft MVP in Business Applications in November 2019
- Have worked with AX since 2013
- Have worked with D365FO since 2016
- Have spoken at Summit (US & Europe), Focus, and local chapters around AX/D365FO security and have done webinars around native controls in both versions

# Agenda

- Role Based Security
- Security Layers
- Securable Objects
- Security Layer Hierarchy
- Security Setup in UI & AOT
- User Role Assignment & Setup
- User Licensing
- Tools to Help

# Security Model Overview

# Role Based Security

- Users are assigned to one or more roles
- Pessimistic security model
- Hierarchy based security model
  - Groups of securable objects are put within one security layer
  - Security layers built on top of each other
- Two main categories
  - Security Layers
  - Securable Objects

# Security Layers

- Roles
  - Broadest security layer
  - Represent a job function a user would perform
  - Account, Account Payable, etc
  - Made up of any number of sub-roles, duties, or privileges
- Duties
  - Middle security layer
  - Represents a general task a user would perform
  - Approve customer invoices, maintain budget plan, etc
  - Made up of any number of privileges
- Privileges
  - Most granular security layer, where object assignment occurs
  - Represents a very specific process a user would perform
  - Add a BOM Line, Edit Customer, etc

# Securable Objects

- Menu Items
  - Displays – linked to forms within D365FO, pages user goes to in UI
  - Outputs – reports users can export
  - Actions – actions users can perform (posting a PO/JE, cutting a check)
- Tables
  - Refers to SQL tables, where data is actually stored
- Data Entities
  - Combines multiple SQL tables to encapsulate a business concept (purchase orders, users, etc)
  - Allows for CRUD operations from external services
  - Does not require X++ knowledge to utilize / consume
- Service Operations
  - Externally facing API endpoints that can be used by external services
  - Requires X++ knowledge to utilize / consume

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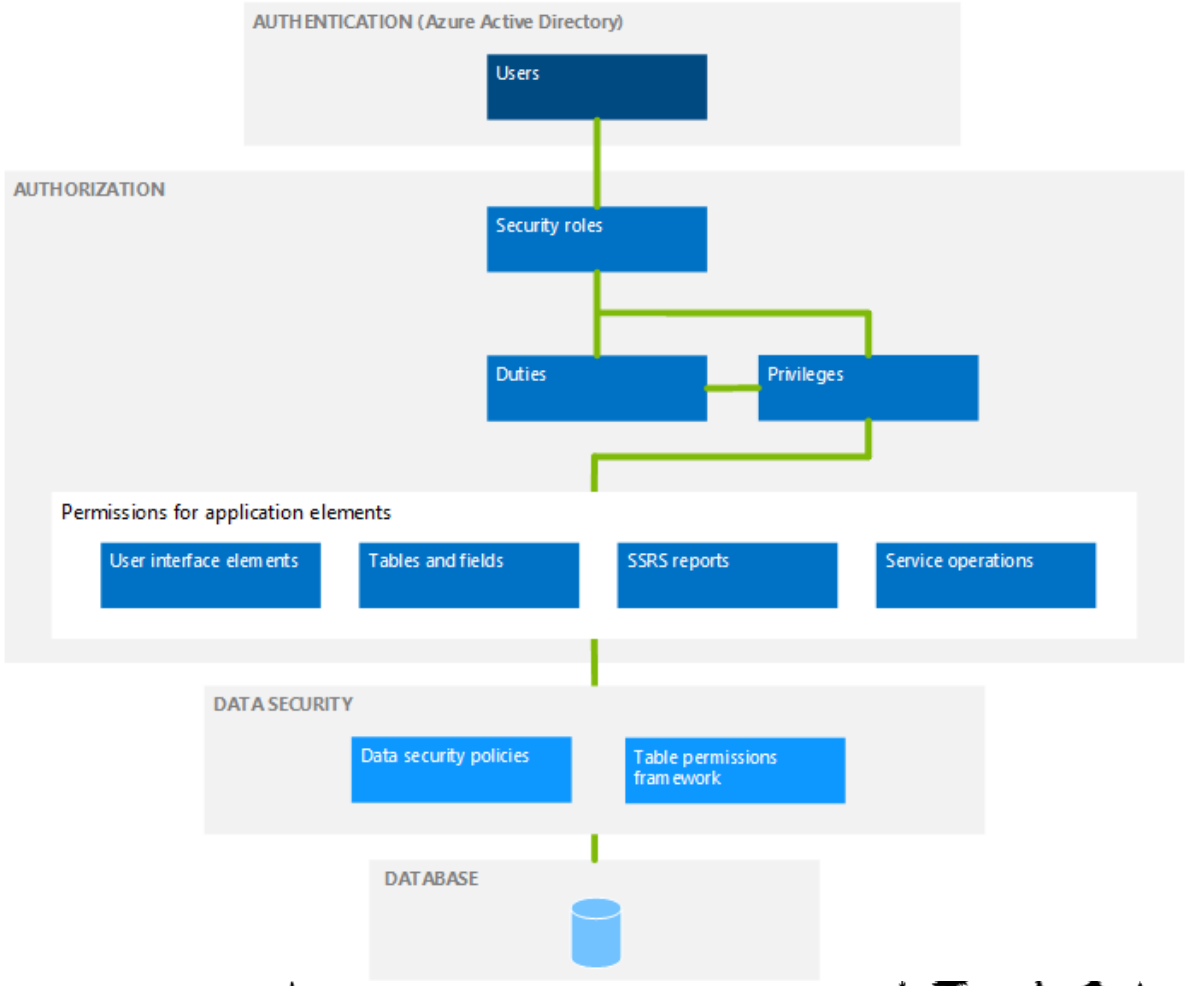
# Hierarchy Based Security Model

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# Role Setup & Assignment

- Template roles, duties, and privileges are delivered out of the box
- Roles, duties, and privileges are system wide (not per company/legal entity)
- User role assignments can be restricted by legal entity
  - By default, when a user is assigned a role it is assigned to all companies/legal entities in the environment
  - You can restrict this by explicitly granting a legal entity to the user role assignment
  - Once one company/legal entity is assigned to a user role assignment, a user only has that role access in the legal entity(ies) they assign to it
  - SecurityUserRole & OMUserRoleOrganization (SecurityUserRoleCondition) tables

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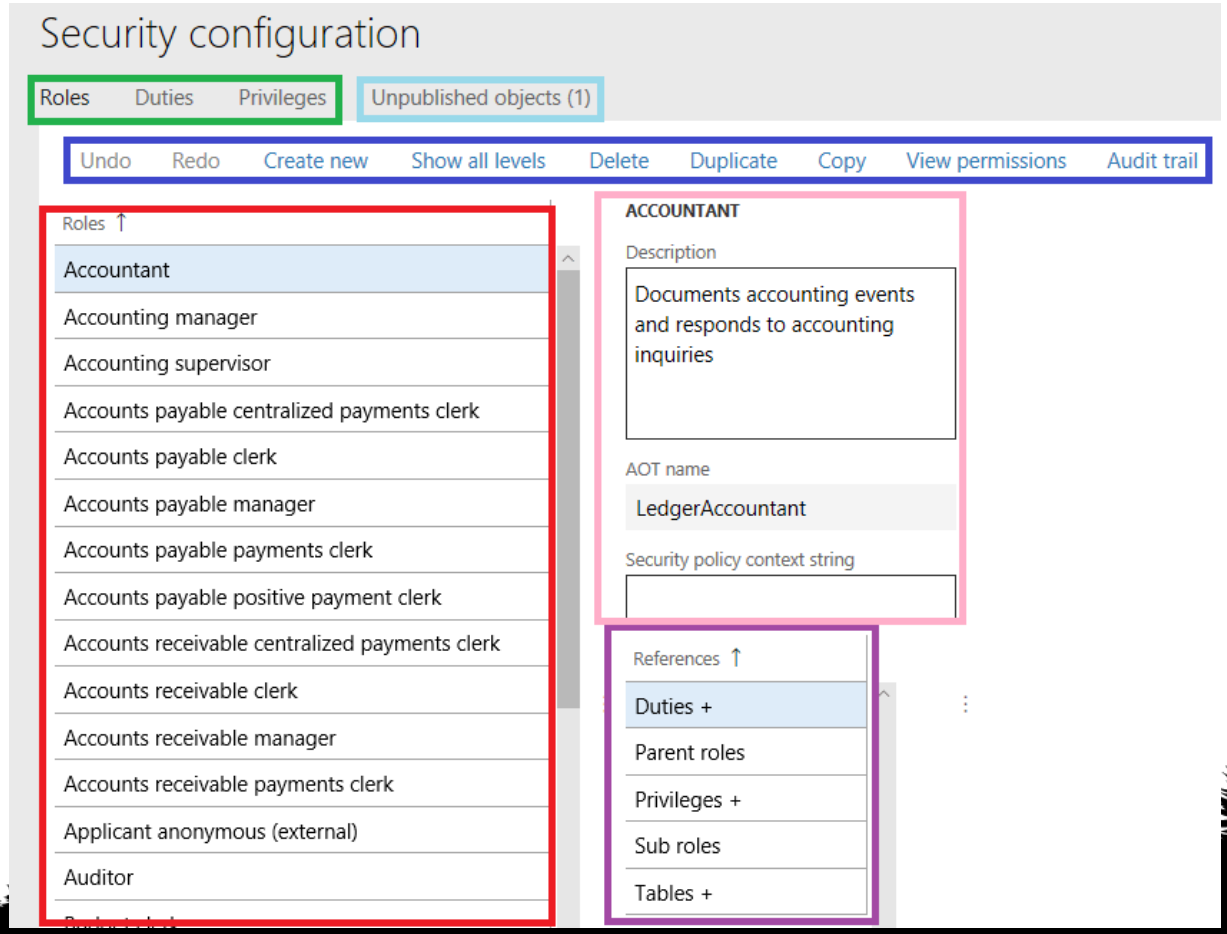
# Setting Up Security from User Interface

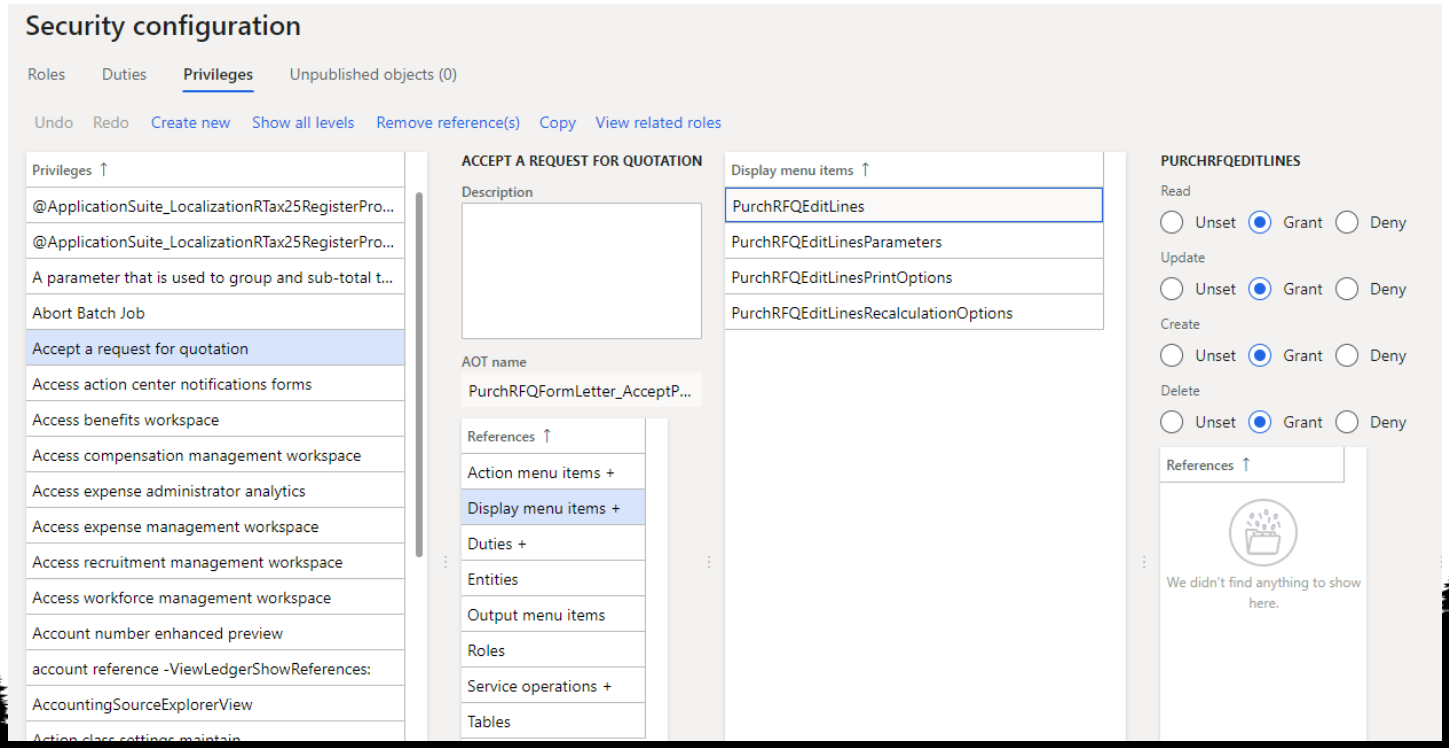
# Setting Up from the UI

- System Administration ->Security ->Security Configuration



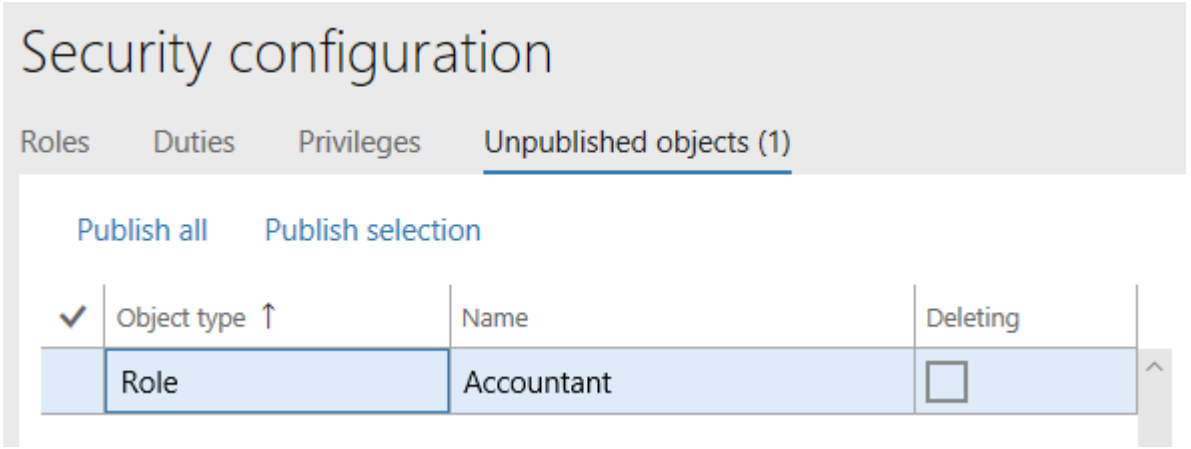
# UI – Security Object Access

- Object assignment occurs mostly in the privileges area
- Find the privilege you would like to modify, select the object type, the finally the object itself to modify its access



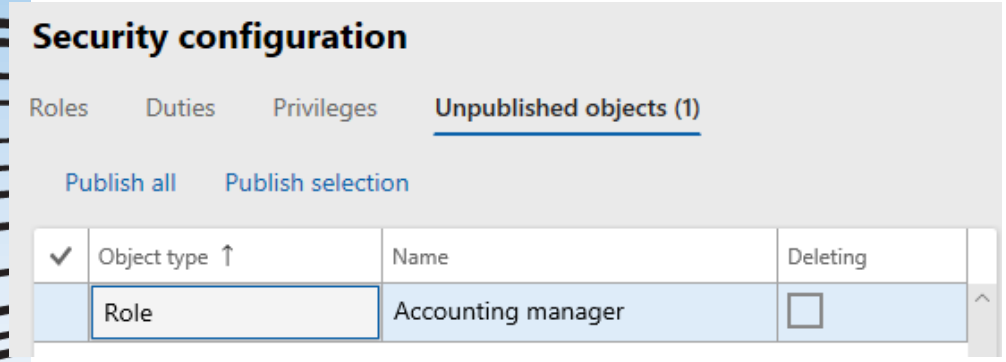
# Unpublished Objects

- When making a security change, is not immediately active
- Goes to an ‘Unpublished Objects’ area for review before publishing



# Where are Security Changes Stored?

- Security changes made in UI are stored as **data** in the database




| IDENTIFIER | DATA | ORIGINALDISKDATA |
|---|---|---|
| LedgerAccountant | <AxSecurityRole xmlns:i="http://www.w3.org/2001/XML... | <AxSecurityRole xmlns:i="http://www.w3.org/2001/X... |
| LedgerAccountingManager | <AxSecurityRole xmlns:i="http://www.w3.org/2001/XML... | <AxSecurityRole xmlns:i="http://www.w3.org/2001/X... |

# How to Migrate Security Changes?

- Security changes can be exported/imported via an XML file
- Found in System Administration -> Security Configuration -> Data tab -> Import/Export

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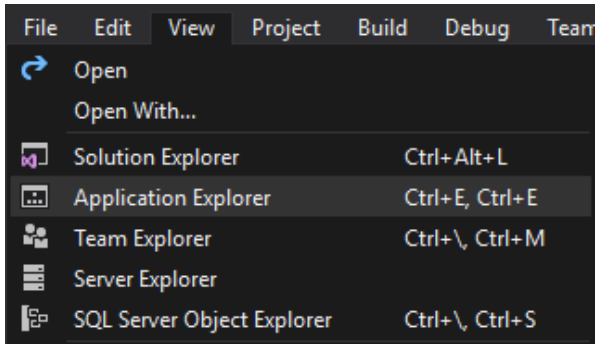
# Setting Up Security from AOT

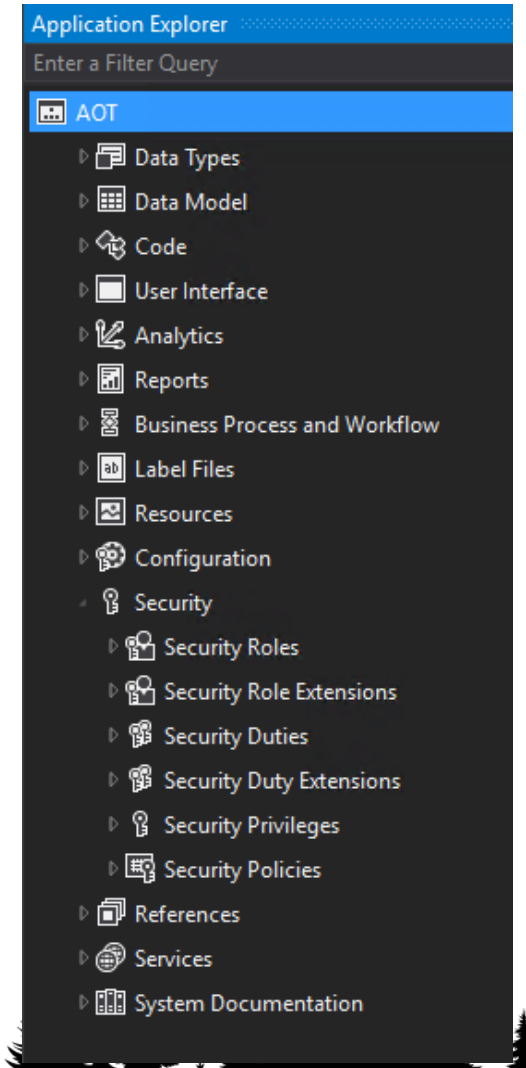
# How to Access AOT

- Can be found in development environment

by RDP-ing to it (if hosted in Azure) or a local VM

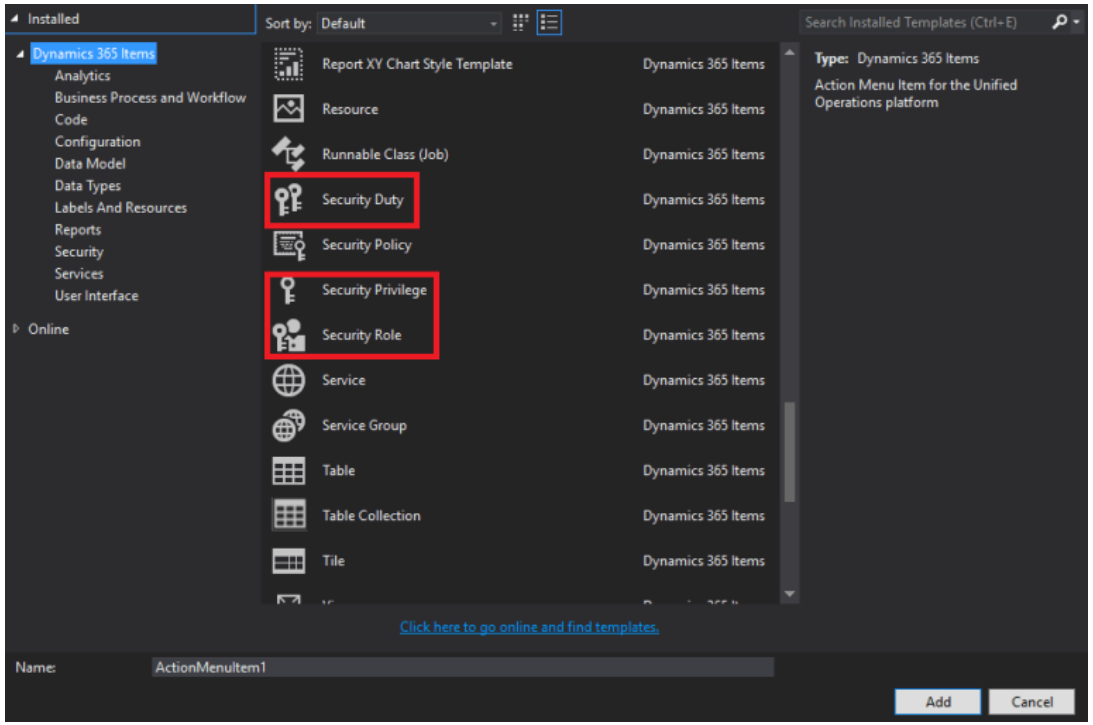
  - Will have modified version of Visual Studio
  - Go to View -> Application Explorer

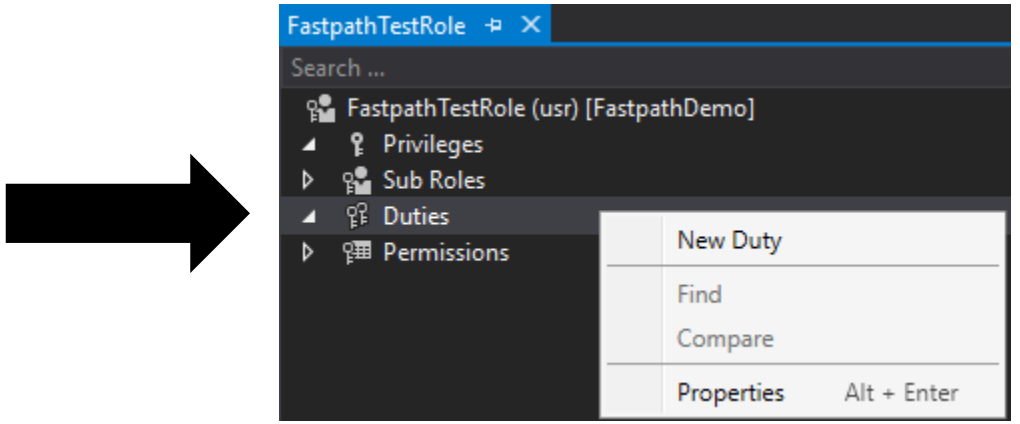


# AOT – Create Security

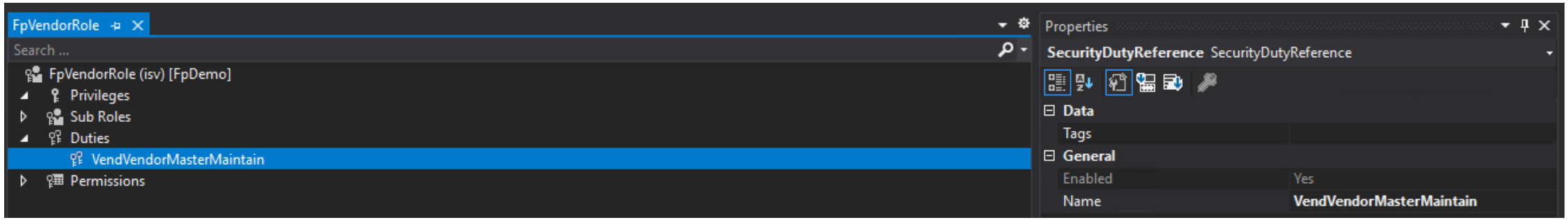
- Creating a role/duty/privilege



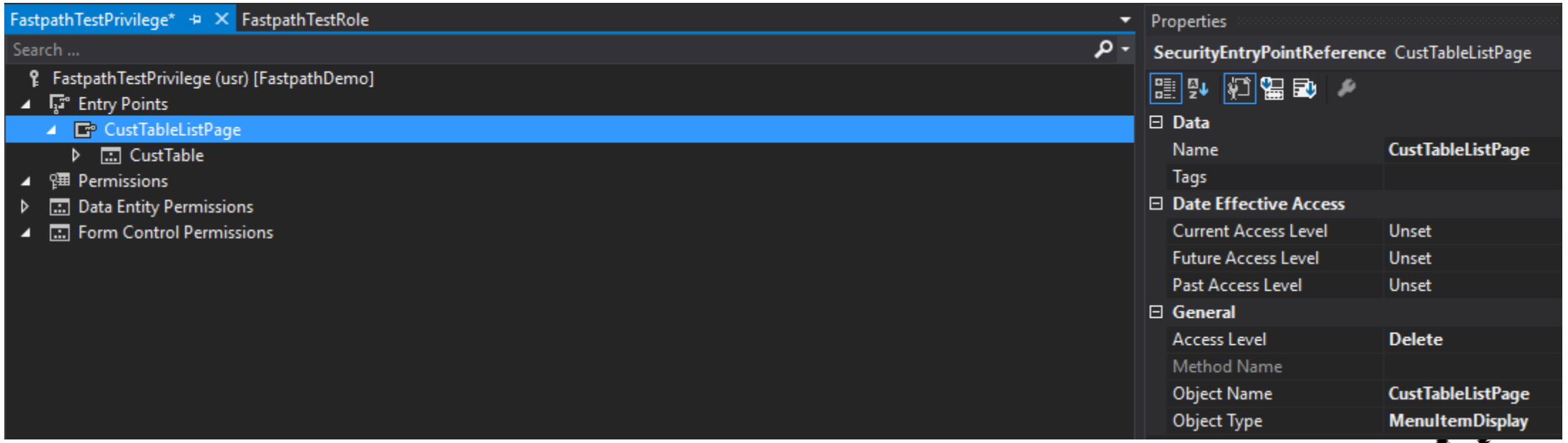
# AOT – Associate Security Layers

- Associating duty -> role



# AOT – Object Access

- At privilege level, Properties window will change for object access

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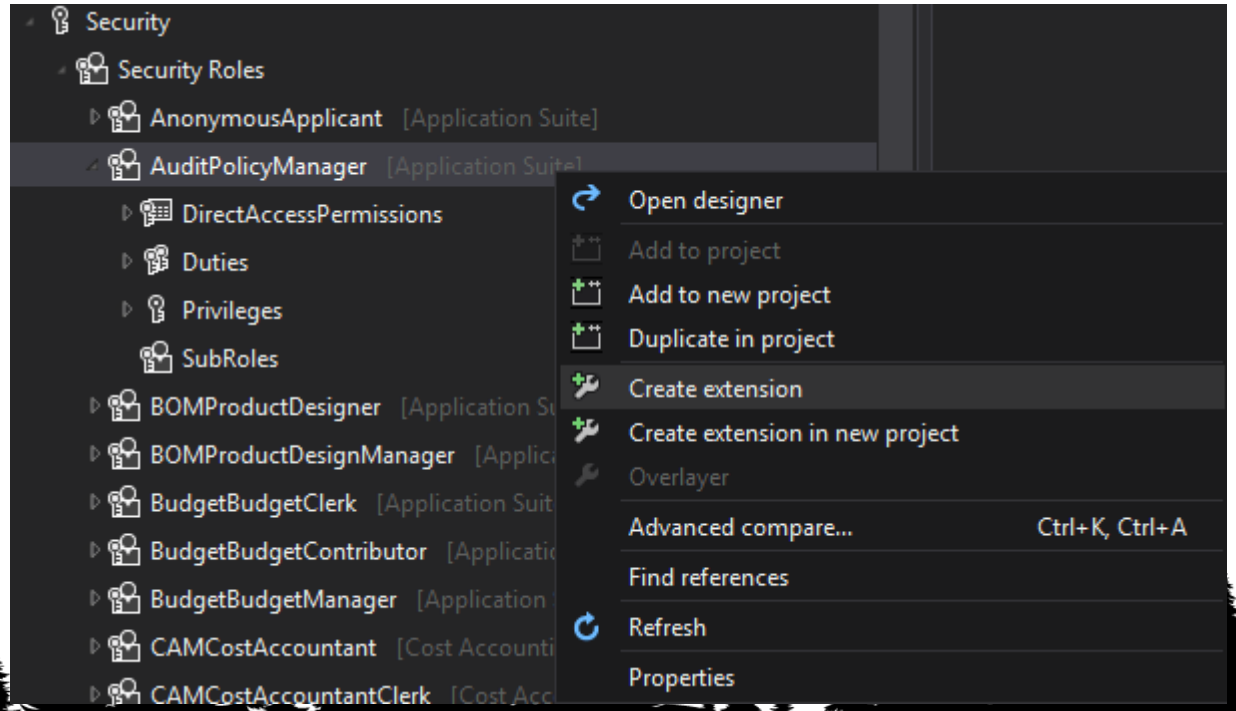
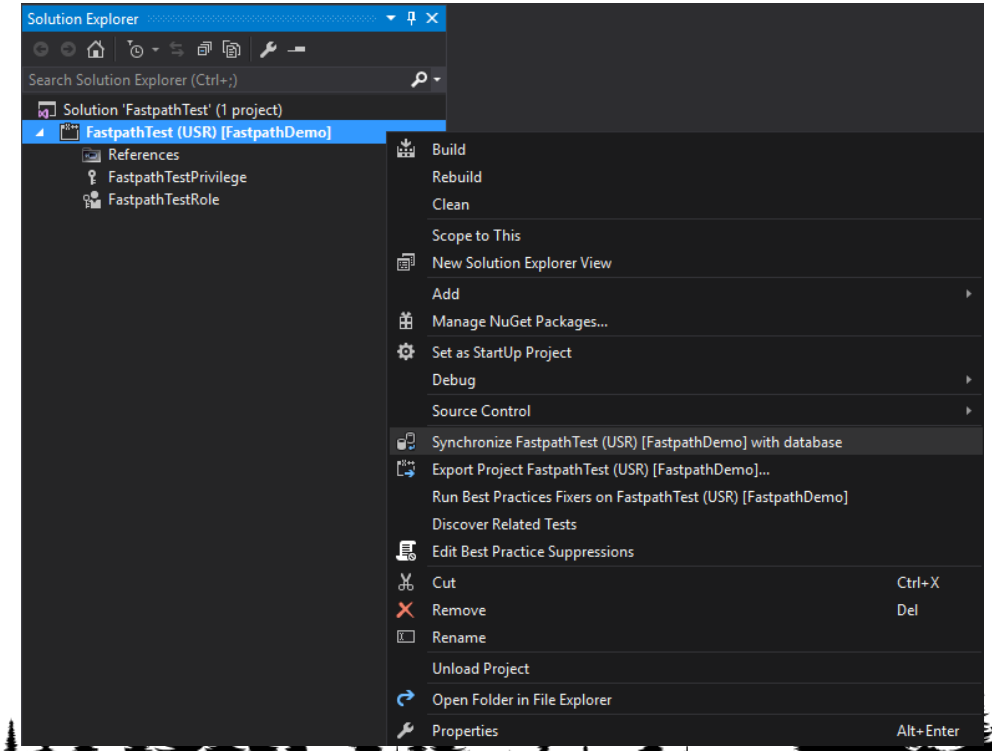
# Overlayer vs Extension

- You are unable to directly modify out of box security (overlayering) due to Microsoft's locking of models
- Instead, you must create an 'extension'



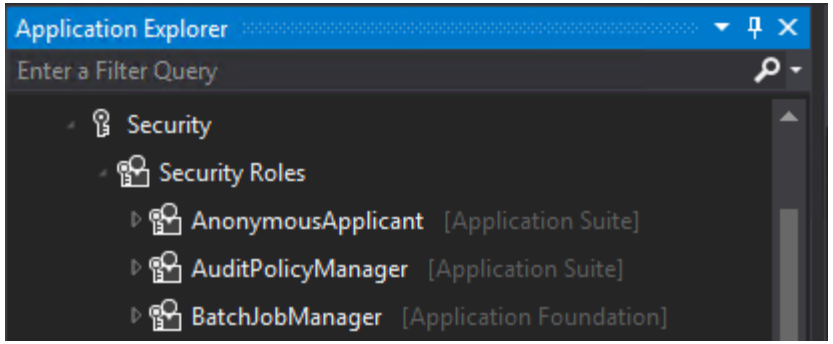
# AOT – Synchronize Database

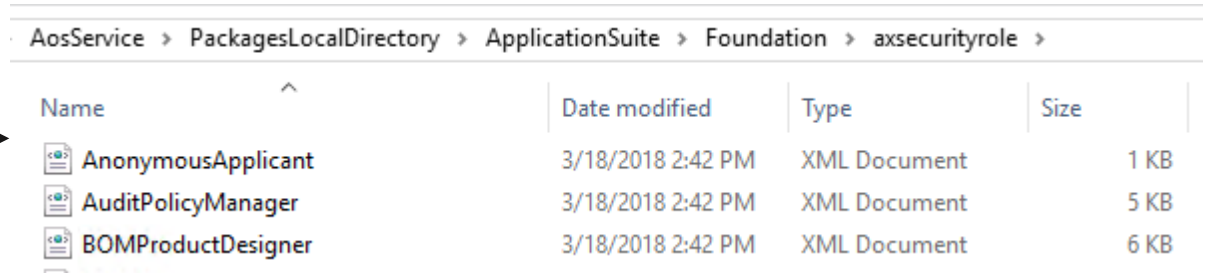
- Changes made to security in AOT do not go live immediately
- You must ‘synchronize’ the changes at the project level



# Where are Security Changes Stored?

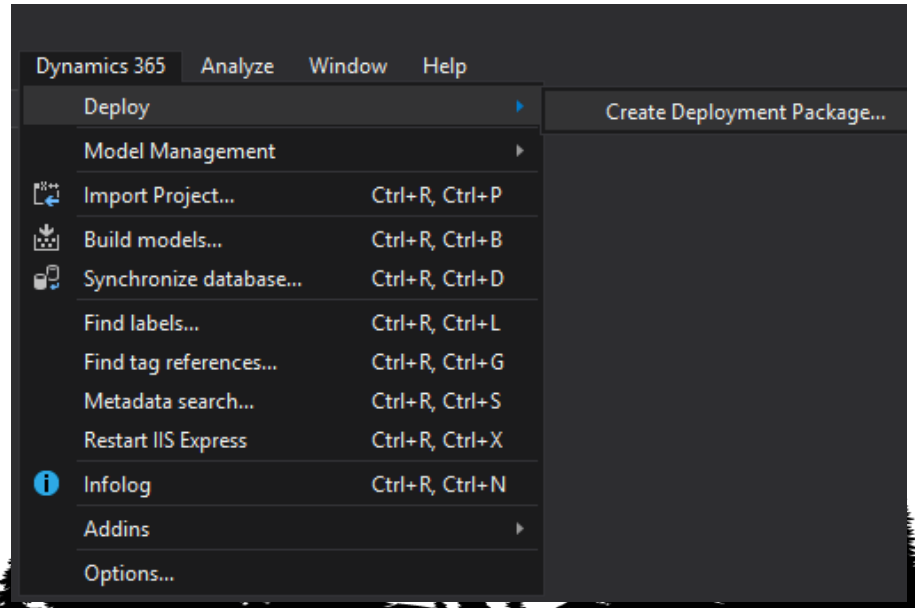
- Stored as ‘development artifacts’
- XML files



# Security Code Build

- Best practice is to use ALM model of the build server and code promotion
- Since security changes in AOT are code artifacts you can build a deployable package with the changes and move these to another environment

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# D365FO User Licensing

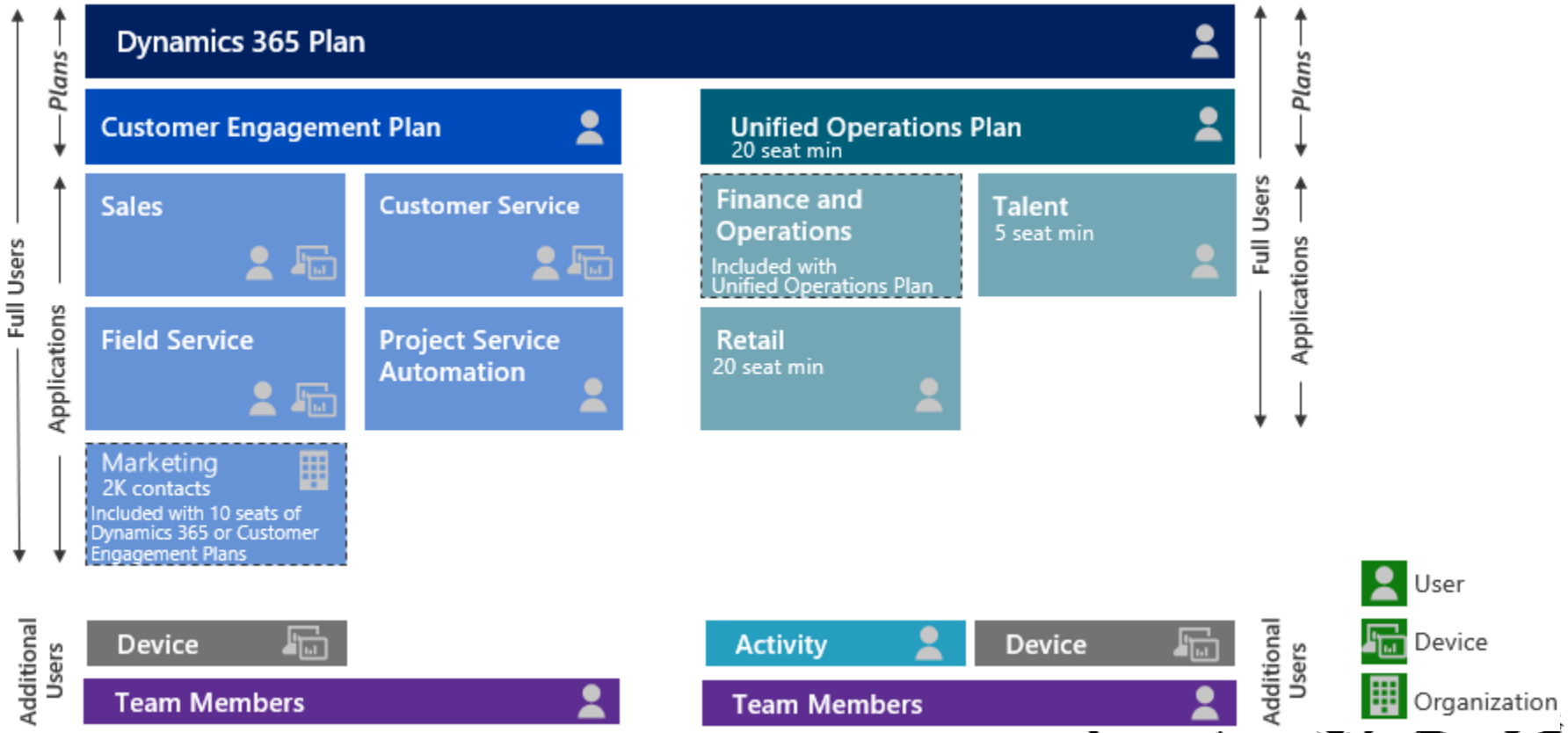
Security

Licensing

# User Licensing in D365FO

- Based on what a user is assigned, not what a user consumes / utilizes
- Three different license types:
  - Operations (Finance, Supply Chain Management, Retail, Talent)
  - Activity
  - Team Member
- Two different licensing methodologies currently used
  - Entry Point Based Licensing
  - Privilege Based Licensing

# Pre-October 2019 Licensing Model

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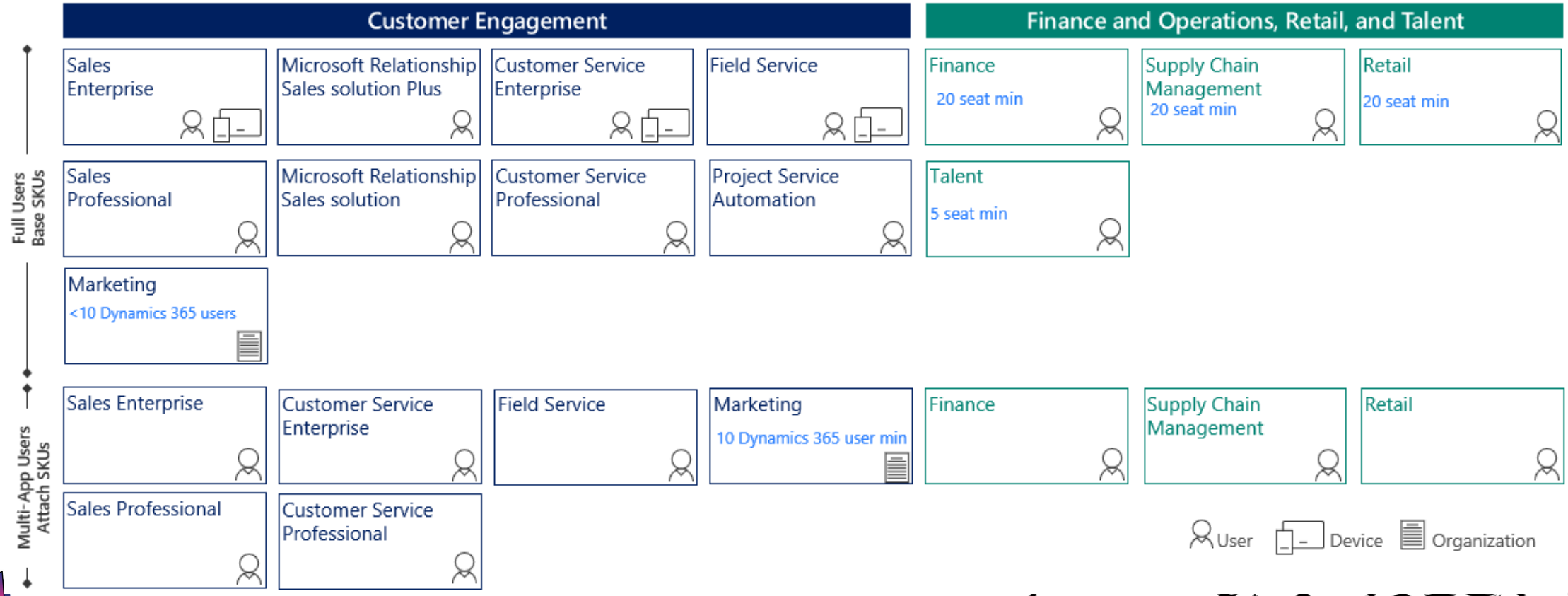
# Post-October 2019 Licensing Model

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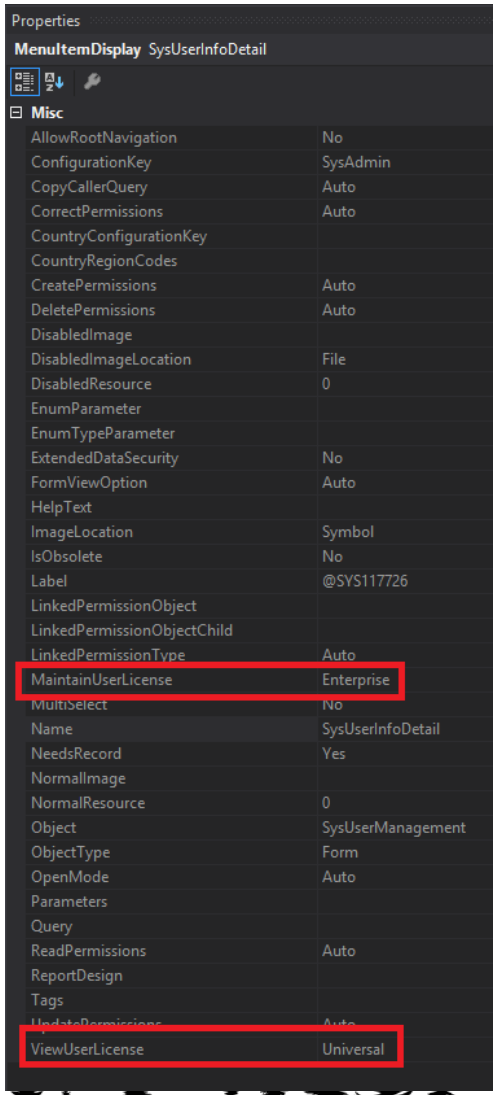
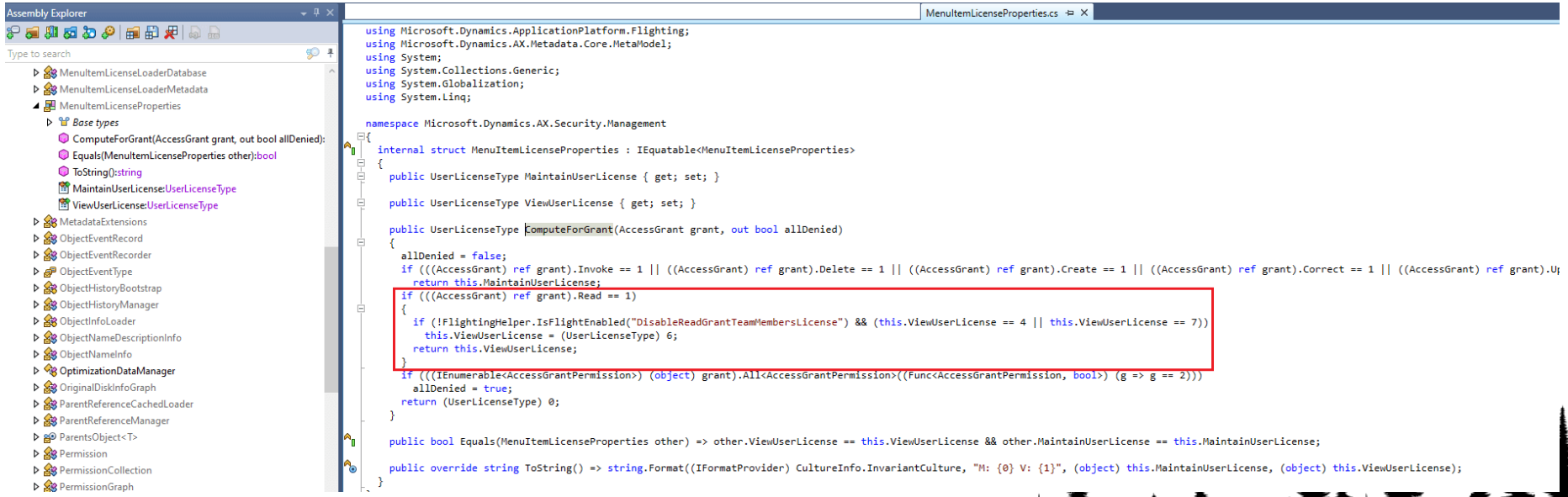
# Entry Point Based Licensing

- Based on access to entry points (menu items etc)
- Each entry point has two parameters
  - Maintain User License – used if access is Created, Update, Delete
  - View User License – used if access if Read
- It only takes one access at a higher license level for the user/role to require that higher license level



# Licensing Change in 10.0.34

- In 10.0.34 new feature flag introduced
  - DisableReadGrantTeamMemberLicense
- Forces all Read logic to require 'Team Member' license

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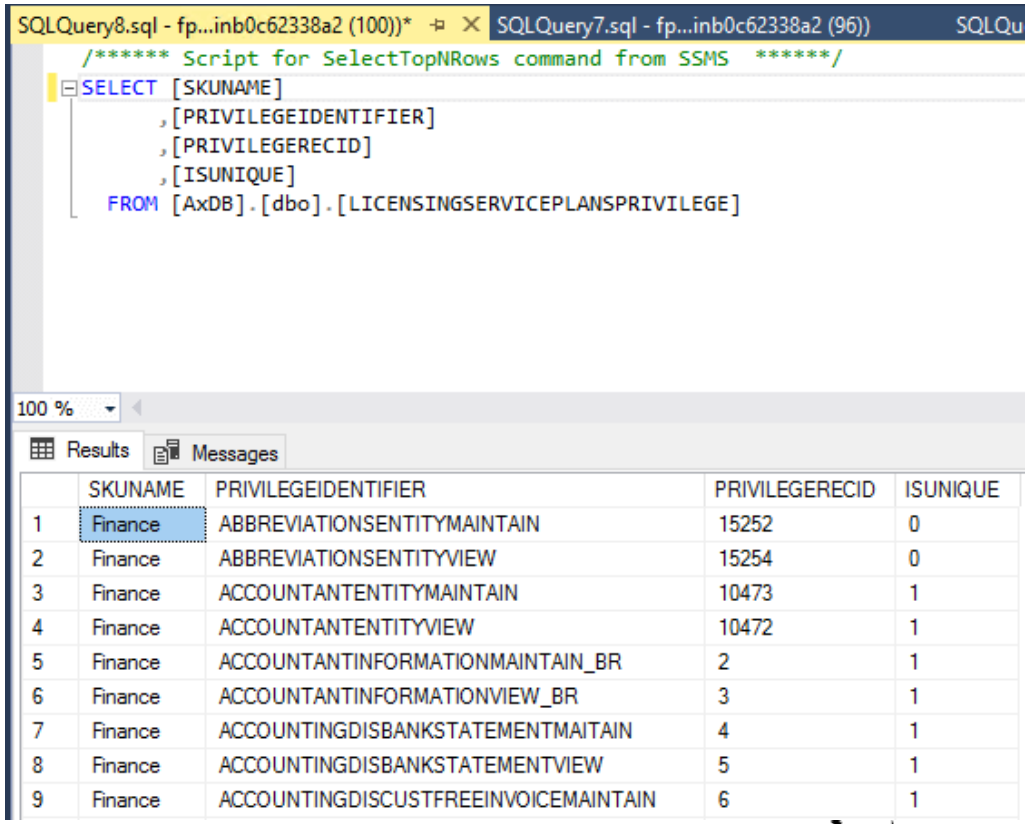
# Privilege Based Licensing

- Categorizes ‘Operations’ license into SKUs:
  - Finance
  - Supply Chain Management
  - Retail
  - Project Operations

- Based on which privileges a user is assigned

# Privilege Based Licensing

- Microsoft has designated certain privileges to require a particular license type
- Associations can be found in the LicensingServicePlansPrivilege table
- If user is assigned a privilege with IsUnique = 1 then that license is required
  - If multiple licenses are required will follow a base/attach model
- If IsUnique = 0 then **any** license listed will satisfy license requirement




| | SKUNAME | PRIVILEGEIDENTIFIER | PRIVILEGERECID | ISUNIQUE |
|---|---|---|---|---|
| 1 | Finance | ABBREVIATIONSENTITYMAINTAIN | 15252 | 0 |
| 2 | Finance | ABBREVIATIONSENTITYVIEW | 15254 | 0 |
| 3 | Finance | ACCOUNTANTENTITYMAINTAIN | 10473 | 1 |
| 4 | Finance | ACCOUNTANTENTITYVIEW | 10472 | 1 |
| 5 | Finance | ACCOUNTANTINFORMATIONMAINTAIN_BR | 2 | 1 |
| 6 | Finance | ACCOUNTANTINFORMATIONVIEW_BR | 3 | 1 |
| 7 | Finance | ACCOUNTINGDISBANKSTATEMENTMAITAIN | 4 | 1 |
| 8 | Finance | ACCOUNTINGDISBANKSTATEMENTVIEW | 5 | 1 |
| 9 | Finance | ACCOUNTINGDISCUSTFREEINVOICEMAINTAIN | 6 | 1 |

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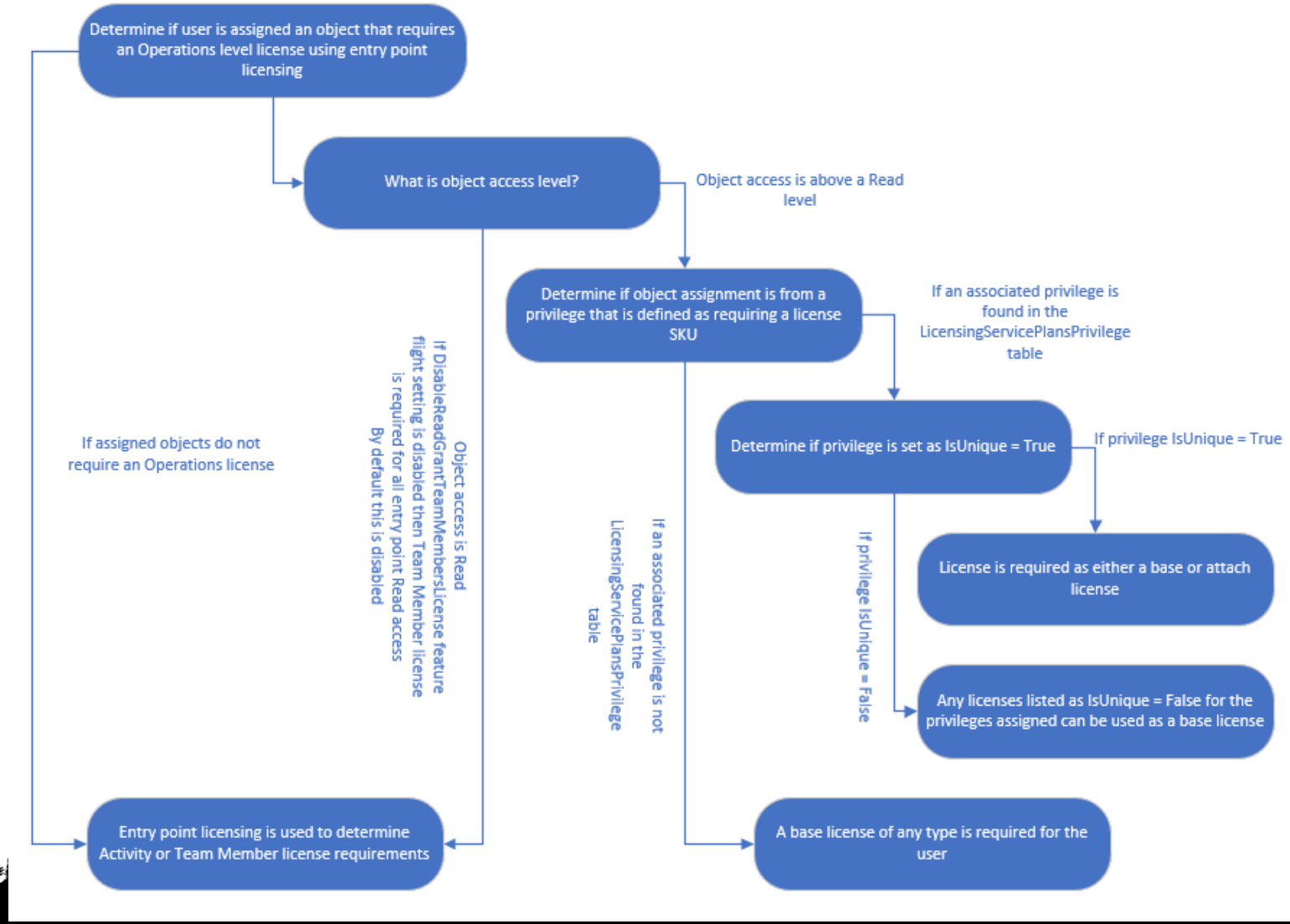
# Base / Attach Licensing Combinations

| Dynamics 365 base licenses per user | Dynamics 365 attach licenses per user | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commerce | CS Ent | CS Pro | Field Svc | Finance | HR | Proj Oper. | RA | Sales Ent | Sales Pro | SCM |
| Business Central Essentials | | | ● | | | | | | | ● | |
| Business Central Premium | | | ● | | | | | | | ● | |
| Commerce | | ● | ● | ● | ● | ● | ● | | ● | ● | ● |
| Customer Service Enterprise (CS) | | | | ● | | | | | ● | ● | |
| Customer Service Professional (CS) | | | | | | | | | | | |
| Field Service | | ● | ● | | | | | ● | ● | ● | |
| Finance | ● | ● | ● | ● | | ● | ● | | ● | ● | ● |
| Guides | | | | | | | | | | | |
| Human Resources (HR) | | ● | ● | ● | | | ● | | ● | ● | |
| Microsoft Relationship Sales solution Plus (MRSs Plus) | | ● | ● | ● | | ● | ● | | | | |
| Project Operations (Proj Oper.) | | ● | ● | ● | | ● | | | ● | ● | |
| Remote Assist (RA) | | | | | | | | | | | |
| Sales Enterprise | | ● | ● | ● | | | | | | | |
| Sales Premium | | ● | ● | ● | | ● | ● | | | | |
| Sales Professional | | | ● | | | | | | | | |
| Supply Chain Management (SCM) | ● | ● | ● | ● | ● | ● | ● | | ● | ● | |

# User Licensing Methodology

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# License Reporting

# View Permissions Report

View permissions

License: Finance

Filter

| Role | Sub role | Duty | Privilege | Resource type | Context \ Resource | Read | Update | Create | Delete | Correct | Invoke | License |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Accountant | | Manage fixed asset impairment | Generate asset impairment recognition test result | Menu item display | ASSETIMPAIRMENTRECOGNITION_JP | Grant | Grant | Grant | Grant | Grant | Grant | Finance |
| Accountant | | Manage fixed asset impairment | Generate asset impairment recognition test result | Menu item display | ASSETIMPAIRMENTRECOGNITION ... | Grant | Grant | Grant | Grant | Grant | Grant | Finance |
| Accountant | | Manage fixed asset impairment | Generate asset impairment recognition test result | Menu item display | ASSETIMPAIRMENTRECOGNITION ... | Grant | Grant | Grant | Grant | Grant | Grant | Finance |
| Accountant | | Manage fixed asset impairment | Generate asset impairment recognition test result | Menu item display | ASSETIMPAIRMENTRECOGNITIONT... | Grant | Grant | Grant | Grant | Grant | Grant | Finance |
| Accountant | | Manage fixed asset impairment | Generate asset impairment recognition test result | Menu item display | ASSETIMPAIRMENTRECOGNITIONT... | Grant | Grant | Grant | Grant | Grant | Grant | Finance |
| Accountant | | Manage fixed asset impairment | Generate asset impairment review | Menu item display | ASSETIMPAIRMENTCARRYINGCRN ... | Grant | Grant | Grant | Grant | Grant | Grant | Finance |
| Accountant | | Manage fixed asset impairment | Generate asset impairment review | Menu item display | ASSETIMPAIRMENTTESTRESULTENT... | Grant | Grant | Grant | Grant | Grant | Grant | Finance |
| Accountant | | Manage fixed asset impairment | Generate asset impairment review | Menu item display | ASSETIMPAIRMENTTRANSANALYSI ... | Grant | Grant | Grant | Grant | Grant | Grant | Finance |
| Accountant | | Maintain sales tax transactions | Generate domestic sales tax for customer expor ... | Menu item display | PLCUSTINVOICEJOURNALSAD | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Maintain sales tax transactions | Generate domestic sales tax for customer expor ... | Menu item action | PLCUSTINVOICEJOUREDITTAX_TAXIN | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Maintain sales tax transactions | Generate domestic sales tax for customer expor ... | Menu item action | PLCUSTINVOICEJOUREDITTAX_TAX ... | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Maintain electronic documents | Generate electronic documents | Menu item display | LEDGERRRGEOPERATIONGROUPIN ... | Grant | Grant | Grant | Grant | Grant | Unset | Operations |
| Accountant | | Maintain sales tax transactions | Generate Italian Modello 770 Report | Menu item output | TAXREPORT770EXPORT_IT | Grant | Grant | Unset | Unset | Unset | Unset | Finance |
| Accountant | | Manage fixed asset impairment | Generate journal line for asset impairment trans ... | Menu item action | ASSETCREATEJOURNAL_IMPAIRME ... | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Manage fixed asset impairment | Generate journal line for asset impairment trans ... | Menu item action | ASSETMULTIJOURNALIMPAIRMENT... | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Maintain fixed asset transacti ... | Generate journal line for asset impairment trans ... | Menu item action | ASSETCREATEJOURNAL_IMPAIRME ... | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Maintain fixed asset transacti ... | Generate journal line for asset impairment trans ... | Menu item action | ASSETMULTIJOURNALIMPAIRMENT... | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Maintain sales tax transactions | Generate OB declaration | Menu item action | TAXREPORT_EVATNL | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Maintain sales tax transactions | Generate Spanish VAT report | Menu item action | TAXREPORT_ES | Grant | Grant | Grant | Grant | Grant | Unset | Finance |
| Accountant | | Inquire into customer invoice ... | Generate tax document report | Menu item output | CZTAXDOCUMENTTABLE_CUST | Grant | Grant | Grant | Grant | Grant | Unset | Operations |
| Accountant | | Inquire into collections status | Generate tax document report | Menu item output | CZTAXDOCUMENTTABLE_CUST | Grant | Grant | Grant | Grant | Grant | Unset | Operations |

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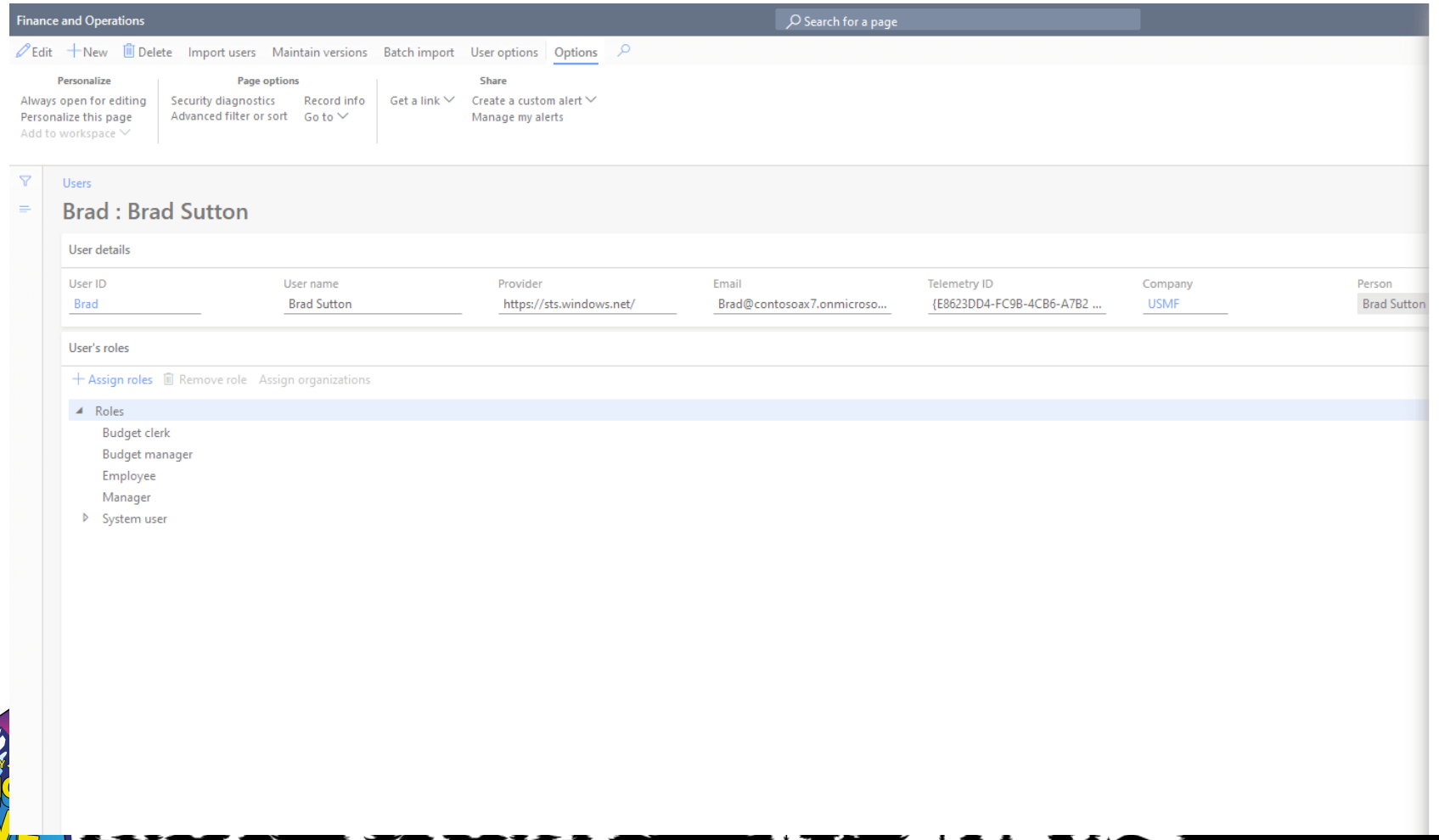
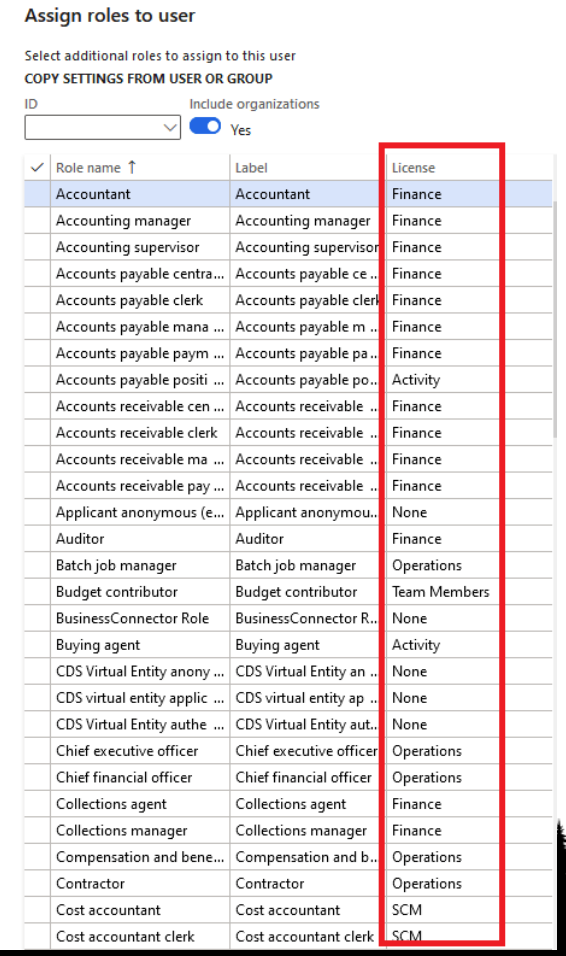
# Licenses During User Role Assignment




| Role name | Label | License |
|---|---|---|
| Accountant | Accountant | Finance |
| Accounting manager | Accounting manager | Finance |
| Accounting supervisor | Accounting supervisor | Finance |
| Accounts payable centra... | Accounts payable ce .. | Finance |
| Accounts payable clerk | Accounts payable clerk | Finance |
| Accounts payable mana ... | Accounts payable m .. | Finance |
| Accounts payable paym ... | Accounts payable pa .. | Finance |
| Accounts payable positi ... | Accounts payable po.. | Activity |
| Accounts receivable cen ... | Accounts receivable .. | Finance |
| Accounts receivable clerk | Accounts receivable .. | Finance |
| Accounts receivable ma ... | Accounts receivable .. | Finance |
| Accounts receivable pay ... | Accounts receivable .. | Finance |
| Applicant anonymous (e... | Applicant anonymou.. | None |
| Auditor | Auditor | Finance |
| Batch job manager | Batch job manager | Operations |
| Budget contributor | Budget contributor | Team Members |
| BusinessConnector Role | BusinessConnector R.. | None |
| Buying agent | Buying agent | Activity |
| CDS Virtual Entity anony ... | CDS Virtual Entity an .. | None |
| CDS virtual entity applic ... | CDS virtual entity ap .. | None |
| CDS Virtual Entity authe ... | CDS Virtual Entity aut.. | None |
| Chief executive officer | Chief executive officer | Operations |
| Chief financial officer | Chief financial officer | Operations |
| Collections agent | Collections agent | Finance |
| Collections manager | Collections manager | Finance |
| Compensation and bene... | Compensation and b.. | Operations |
| Contractor | Contractor | Operations |
| Cost accountant | Cost accountant | SCM |
| Cost accountant clerk | Cost accountant clerk | SCM |

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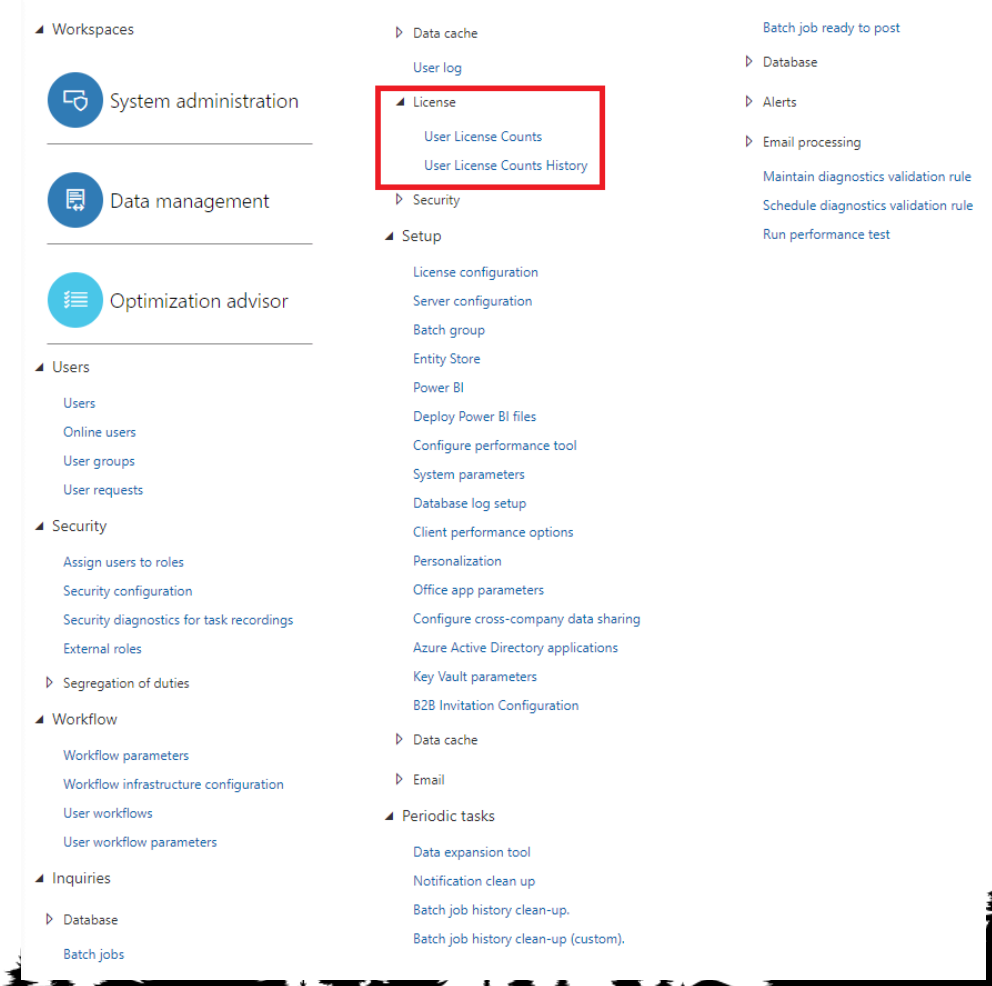
# User License Counts Reports

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# User License Counts Report

## Dynamics 365 for Finance and Operations User Count Report

Page 8 of 19
1/10/2018
2:00 AM

Excluding device users

Application version: 7.0.4709.41129

**gofastpath.com**

| Access License Type | Access License Type |
|---|---|
| Operations | 63 |

| Alias | Network domain | User name |
|---|---|---|
| TED@contosoax7.onmicrosoft.com | https://sts.windows.net/ | TED |

| Security Role | Access License Type |
|---|---|
| Dispatcher | Team Members |
| System user | Team Members |
| Transportation coordinator | Operations |

| Alias | Network domain | User name |
|---|---|---|
| STAN@contosoax7.onmicrosoft.com | https://sts.windows.net/ | STAN |

| Security Role | Access License Type |
|---|---|
| Employee | Team Members |
| Accountant | Operations |
| System user | Team Members |

| Alias | Network domain | User name |
|---|---|---|
| SIMON@contosoax7.onmicrosoft.com | https://sts.windows.net/ | SIMON |

| Security Role | Access License Type |
|---|---|
| Employee | Team Members |
| Retail operations manager | Operations |
| Retail store IT | Operations |
| System user | Team Members |

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# User License Estimator Report

| USER | FINANCE | SUPPLY CHAIN MANAGEMENT | RETAIL | PROJECT |
|---|---|---|---|---|
| Fastpath Service Account<br>fastpathaxservice@gofastpath.com<br>https://sts.windows.net/ | ● | ● | ● | ○ |

dat

| USER | FINANCE | SUPPLY CHAIN MANAGEMENT | RETAIL | PROJECT |
|---|---|---|---|---|
| RetailServiceAccount<br>RetailServerSystemAccount@dynamics.com<br>https://sts.windows.net/ | ● | ● | ● | ○ |

PSUS

| USER | FINANCE | SUPPLY CHAIN MANAGEMENT | RETAIL | PROJECT |
|---|---|---|---|---|
| PSUS Admin<br>AdminPSUS@contosoax7.onmicrosoft.com<br>https://sts.windows.net/ | ● | ○ | ○ | ○ |
| AprilPSUS<br>AprilPSUS@contosoax7.onmicrosoft.com<br>https://sts.windows.net/ | ● | ○ | ○ | ○ |
| bradpsus<br>bradpsus@contosoax7.onmicrosoft.com<br>https://sts.windows.net/ | ● | ○ | ○ | ○ |
| IngaPSUS<br>IngaPSUS@contosoax7.onmicrosoft.com<br>https://sts.windows.net/ | ○ | ● | ○ | ○ |

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# Licensing Price Update

- Takes effect October 1st 2024
- Does not impact Activity, Team Member
- Does not impact license minimums

| Product | Price before October 1, 2024 | Price as of October 1, 2024[2] |
|---|---|---|
| Microsoft Dynamics 365 Sales Enterprise | $95 | $105 |
| Microsoft Dynamics 365 Sales Device | $145 | $160 |
| Microsoft Dynamics 365 Sales Premium | $135 | $150 |
| Microsoft Microsoft Relationship Sales[3] | $162 | $177 |
| Microsoft Dynamics 365 Customer Service Enterprise | $95 | $105 |
| Microsoft Dynamics 365 Customer Service Device | $145 | $160 |
| Microsoft Dynamics 365 Field Service | $95 | $105 |
| Microsoft Dynamics 365 Field Service Device | $145 | $160 |
| Microsoft Dynamics 365 Finance | $180 | $210 |
| Microsoft Dynamics 365 Supply Chain Management | $180 | $210 |
| Microsoft Dynamics 365 Commerce | $180 | $210 |
| Microsoft Dynamics 365 Human Resources | $120 | $135 |
| Microsoft Dynamics 365 Project Operations | $120 | $135 |
| Microsoft Dynamics 365 Operations – Device | $75 | $85 |

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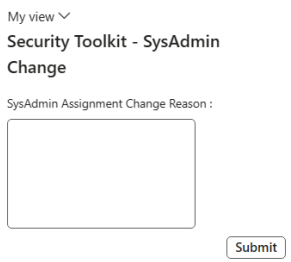
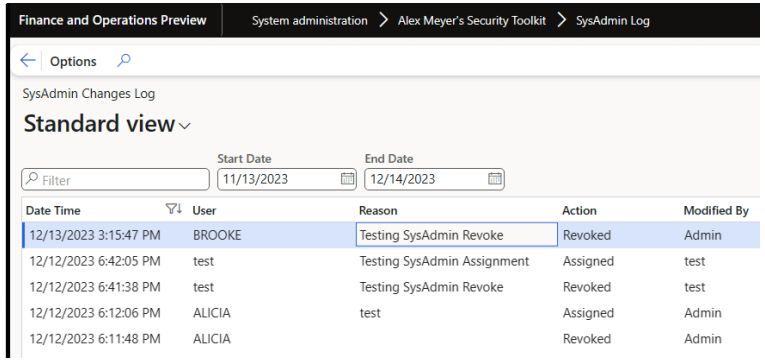
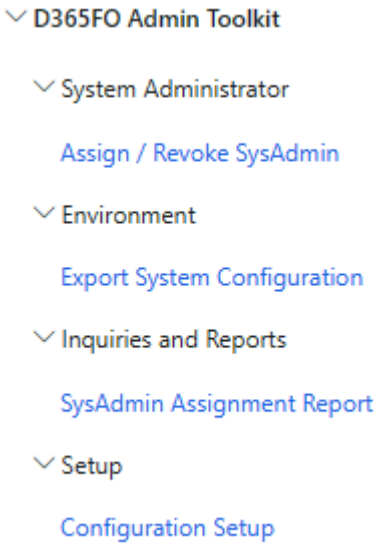
# Tools / Services to Help

# Free Tools – D365FO Admin Toolkit

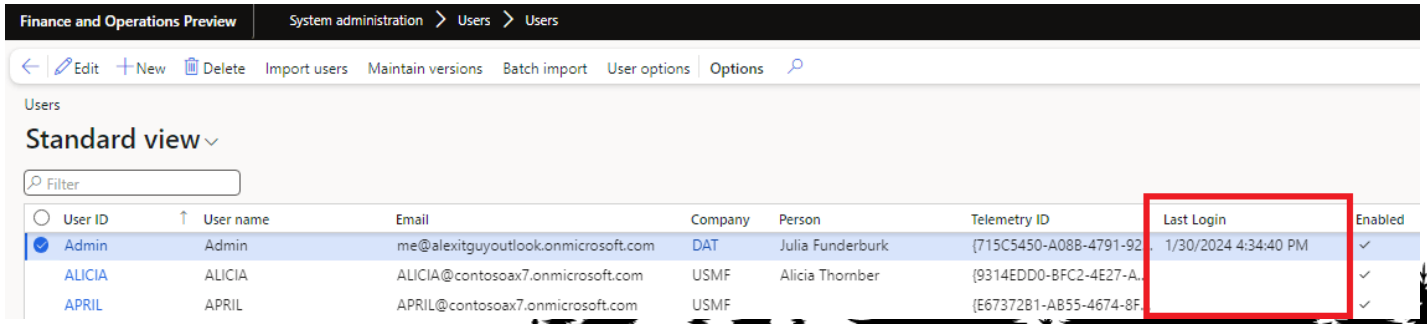
- More info here!




- Features include:
  - User self-service assignment / revoking of SysAdmin
  - SysAdmin assignment logging
  - Export System Configuration
  - Auto-disable users

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# Security and Licensing Help

- ISVs
  - Fastpath / Delinea
  - XPLUS
- Consulting
  - Protiviti
    - D365FO Template Roles
    - Microsoft Consulting Solutions
    - Security Risk Analysis
    - Security Implementations / Redesigns
    - User License Analysis
    - D365FO Implementation Help

# Resources

# Resources

D365FO Role-based Security

Introduction to Microsoft Dynamics 365 licensing

Security Roles & Licensing Whitepaper

Determining User Licenses in D365FO

Privilege License Excel File

Hidden Feature Flag Changing How User Licensing is Performed in D365FO

Setting Up Security in Dynamics 365 for Finance and Operations – Part I – From the User Interface

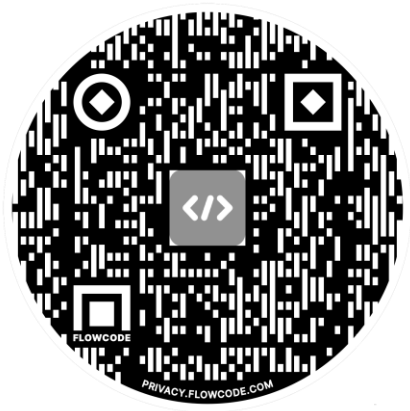
Setting Up Security in Dynamics 365 for Finance and Operations – Part II – From the AOT

Blog Posts:

- Current State of D365FO User License December 2020
- Current State of D365FO User Licensing October 2020
- Current State of D365FO User Licensing August 2020
- Current State of D365FO User Licensing July 2020
- Current State of D365FO User Licensing May 2020
- October 2019 User License Update to D365FO
- Current State of User Licensing in D365FO PU31

# Thank You / Questions?

- Contact Info:
- Email: alex.itguy@outlook.com
- Blog: http://d365foblog.com
- Security Course: http://d365fosecurity.com
- Book: Security and Audit Field Manual: Dynamic 365 for Finance & Operations




- LinkedIn
- Microsoft MVP Profile

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DYNAMICS USER GROUP

- dynamicsusergroup.com

live.dynamicscon.com

dynamicscon.com