# PowerApps ALM using Managed Solutions

Agenda

- Understanding Environments and DLP Policies

- Single-environment ALM Strategies

- Exporting and Importing Canvas Apps and Flows

- Understanding Publishers and Solutions

- Exporting and Importing Solutions

- ALM using Managed Solutions

What is an Environment?

- Environment is container for PowerApps, Flow and CDS database
  - Each environment and its resources exist within a geographic region
  - Environment resources include PowerApps, Flows and CDS database
  - Environment represents a governance and security boundary
  - Every tenant is provisioning with a default environment
 - New environment can be provisioned with or without a CDS database
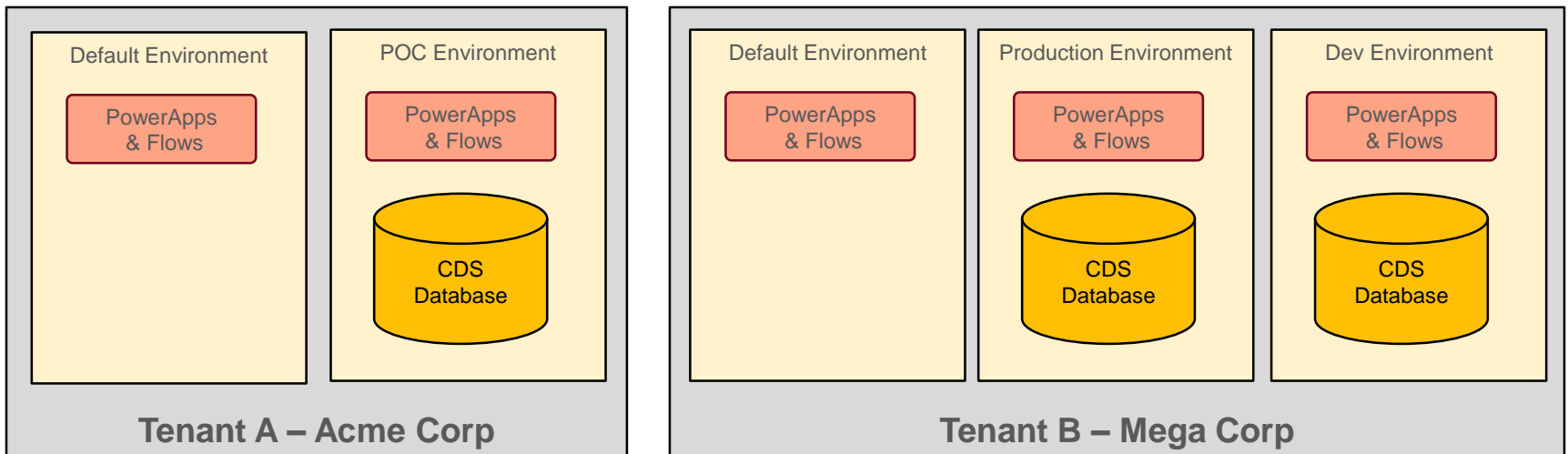
PowerApps and Dynamics 365 Convergence

- ## As of Dynamics 365 version 9

 - ### Dynamics 365 instance = PowerApps Environment with CDS DB
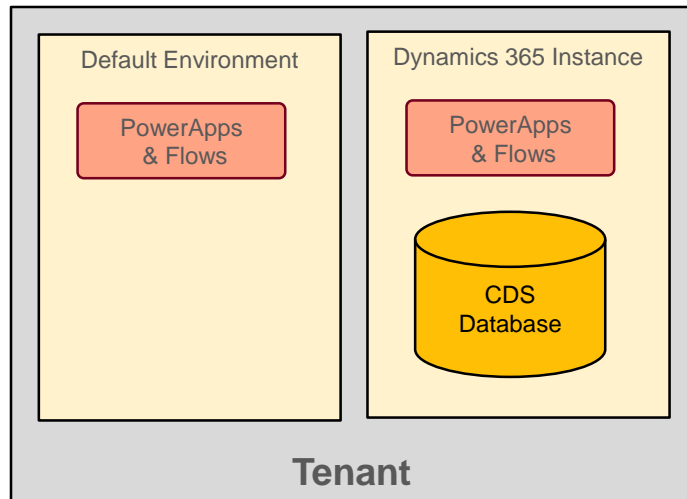
Managing Environments

- Environments managed in PowerApps Admin Center
  - You can view existing environments and configure security and access
  - You can create new environments
  - When creating an environment, you can optionally include CDS database
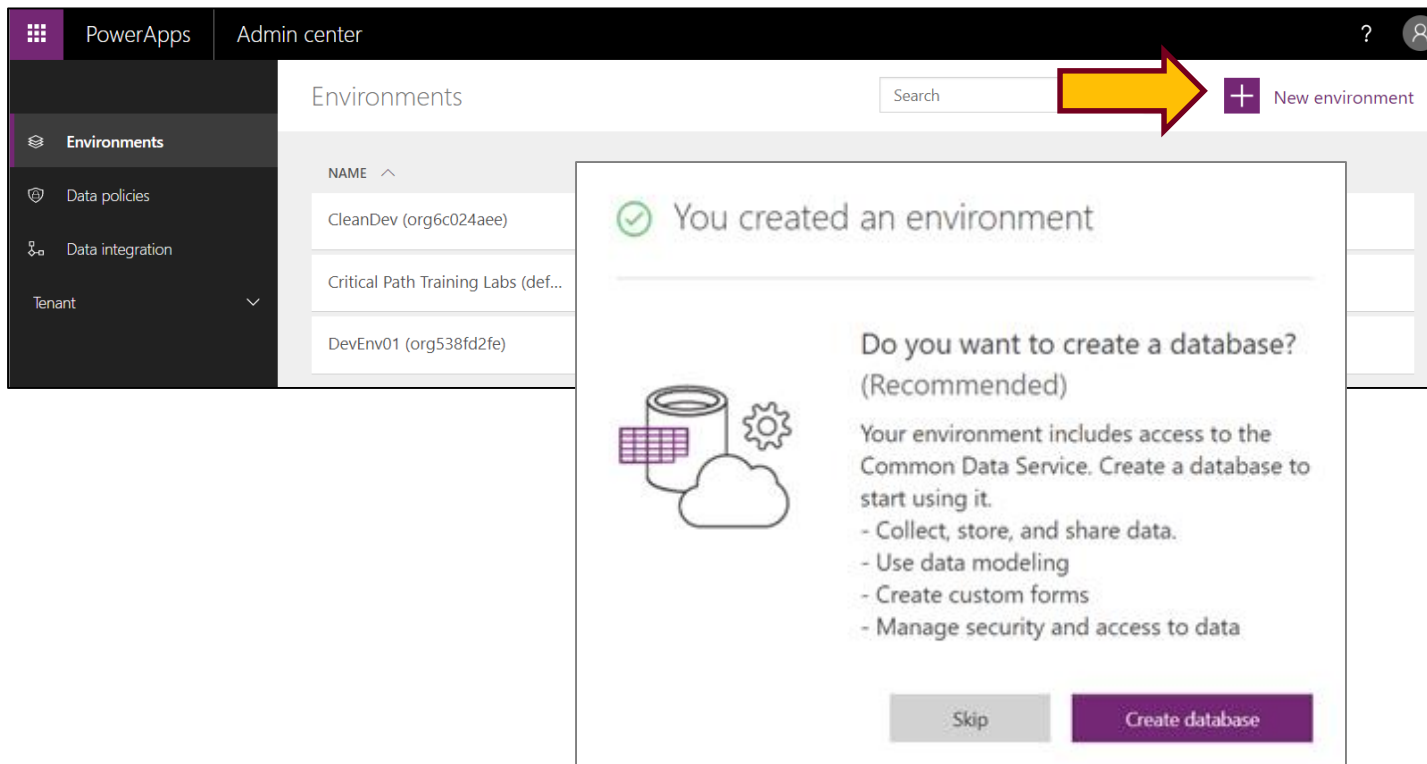
Environmental Regions

- Environment is created in specific region
  - You can choose at create time
  - All app components and CDS DB stored in region
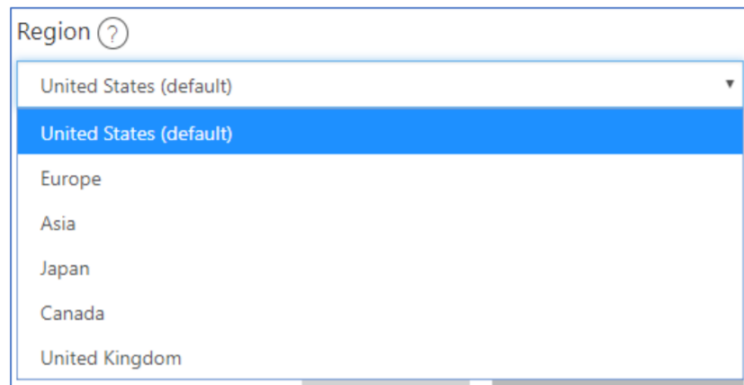
  - Issues to consider when creating environment
    - Create environment close to where users are located
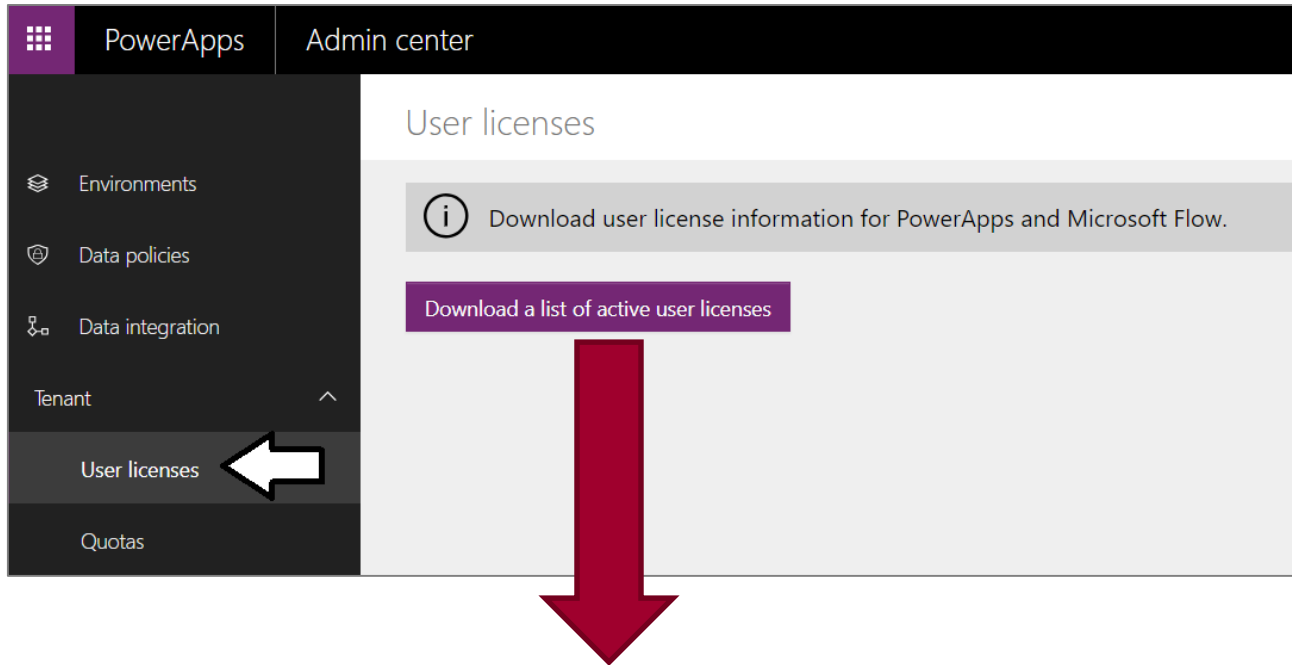   - Create environment in region required for data residency

Admin Licensing with PowerApps and Flow

| License Type	User/License Management	PowerApps Admin Portal	Manage Environments	Data Loss Policies	Dynamics 365 Admin Center
Global Admin with P2	Yes	Full access	Full access	Full access	Full access
Global Admin without P2	Yes	View DPL Policies and admin reports	No	Create global policies for all environments	Can View CDS instances
User Manager Role with P2	Yes	View Environments that are owned	Manage owned environments	Create policies for owned environments	No access
User Manager Role without P2	Yes	No access	No	No access	No access
Dynamics Admin Role with P2	View Only	View Environments that are owned	Manage owned environments	Create policies for owned environments	Full access
Dynamics Admin Role without P2	View Only	No access	No	No access	No access

Viewing User Licenses

Types of Environments

- Production
  - used for permanent work in an organization
- Default
  - Special type of production environment
- Sandbox
  - Non-production environment with environment reset feature
- Trial
  - Temporary environment used to support short term testing
- Developer
  - Environment created with the Community Plan license
  - Only supports a single user

PowerApps Community Plan

- PowerApps Community Plan offers free environment
  - Used to build solutions for PowerApps, Flows and CDS for Apps
  - Environment only allows for a single user
  - Sign up at https://powerapps.microsoft.com/en-us/communityplan/
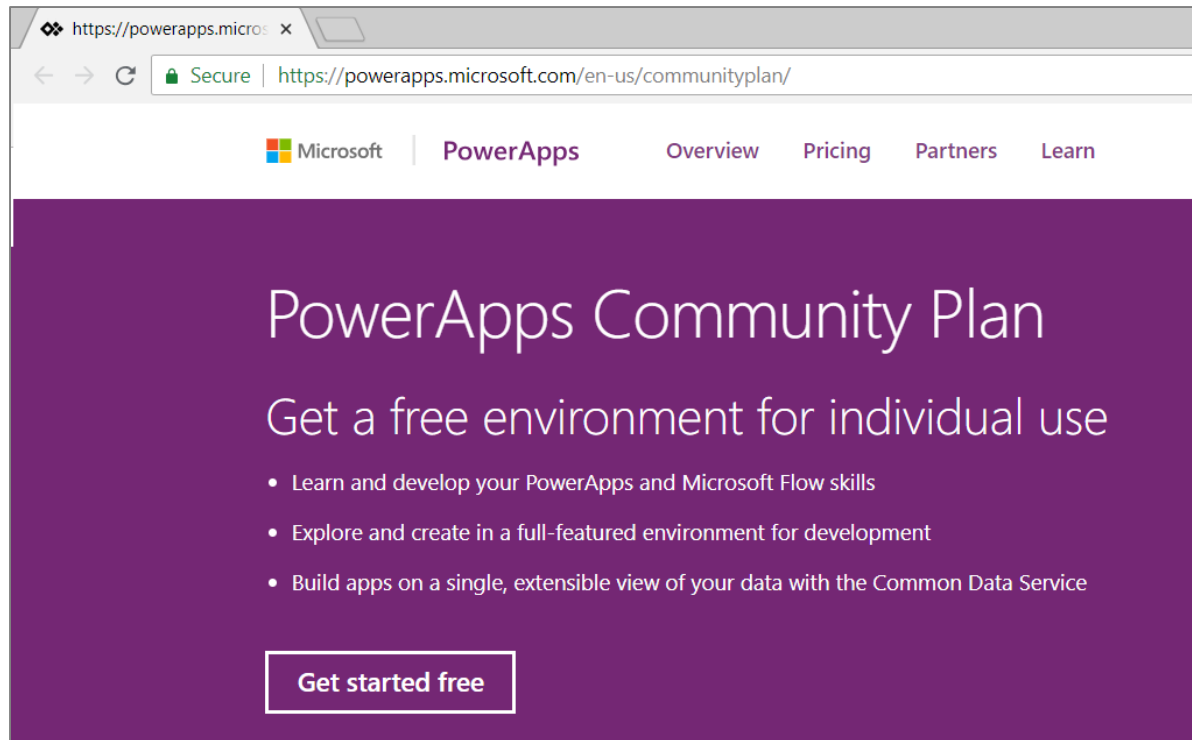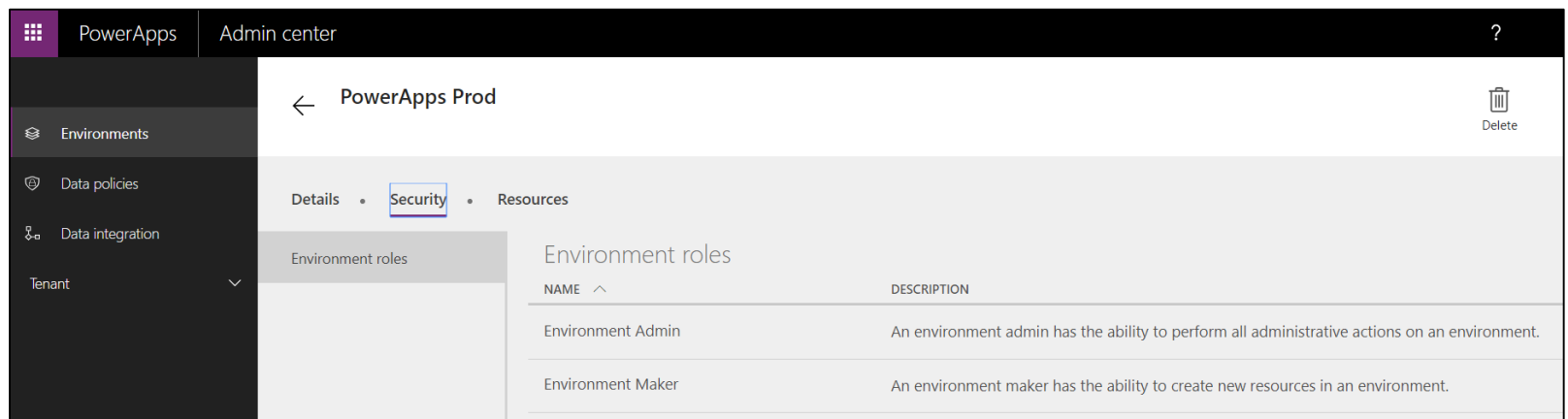
Default Environment

- Each tenant has default environment created in nearest Azure region
  - Default environment can't be disabled or deleted
  - Default environment automatically adds all tenant users to maker role
  - You can't remove users from maker role of default environment
  - Default environment provides self-service app & flow building to all licensed users

- Default environment does not yet support adding CDS database
  - Microsoft plans to eventually remove this limitation

- Default environment currently only place you can create gateway
  - Therefore, default environment only place to access on-premises data
  - Microsoft plans to eventually remove this limitation

Environment Security Roles (No CDS)

- Environment Administrator
  - Manage environment by adding/removing users
  - Creating the CDS database instance
  - Viewing and managing all resources in environment
  - Configure Data Loss Prevention policies

- Environment Maker
  - Create and share canvas apps and flows
  - Create and share connections and custom connectors
  - Create gateways and build connections through gateways

CDS Security Roles

- Environment requires CDS database to support…
  - Using and customizing standard entities
  - Creating custom entities
  - Creating model-driven applications
- Environment with CDS database has different security model
  - Security model switches from Environment roles to CDS roles

Environment
without CDS database

| Canvas App |
| Flow |
| Custom Connector |

Environmental Roles
(Maker/Admin)

Resource Permissions
(Owner/Contributor/User)

Environment
with CDS database

| Canvas App |
| Flow |
| Custom Connector |

CDS DB

~~Environmental Roles~~
~~(Maker/Admin)~~

Resource Permissions
(Owner/Contributor/User)

CDS Roles
(Admin/Customizer/etc)
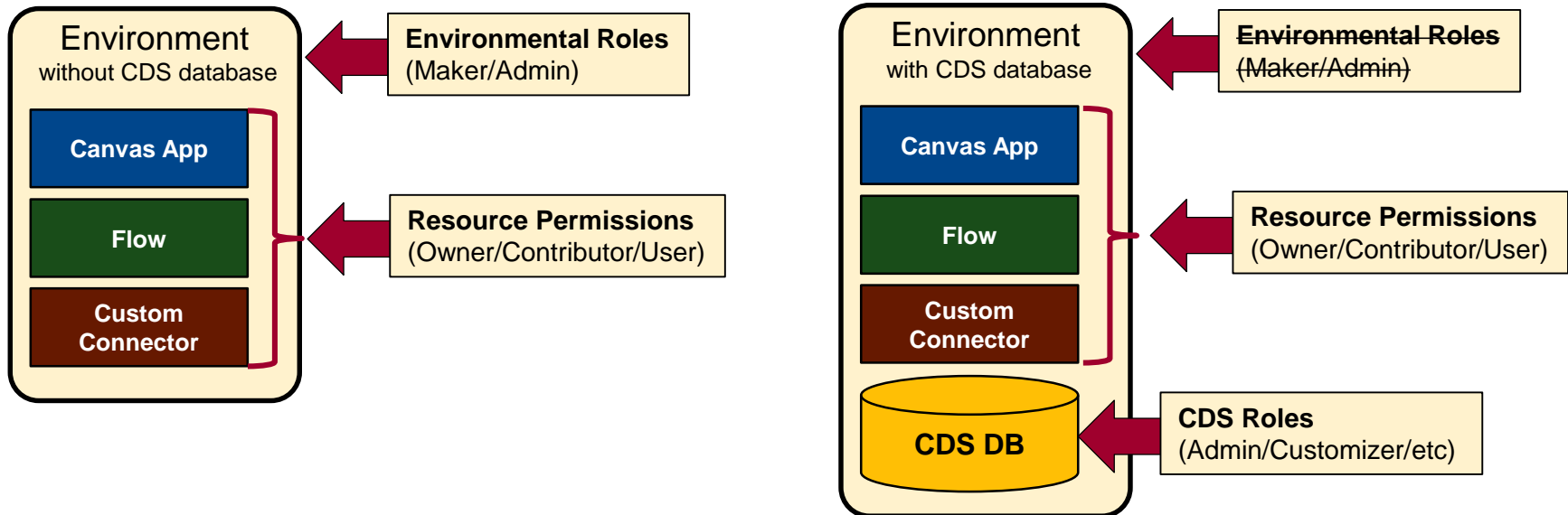
CDS Database Roles

- System Administrator
  - Environment Admin promoted to System Administrator
  - Complete ability to customize and administer environment
  - Full read-write access to data in the database.

- System Customizer
  - Full permission to customize the environment

- Environment Maker
  - Create new apps, connections, gateways and flows

- Common Data Service User
  - Ability to run apps but no ability to customize the system
  - This role is commonly copied to make custom security roles

- Delegate
  - Special role to give a user permission to Act on behalf of another user

Agenda

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- ➤ Configuring Data Loss Prevention Policies
- • Sharing and Versioning Canvas Apps and Flows
- • Exporting and Importing Canvas Apps and Flows
- • Installing and Configuring an On-Premises Data Gateway
- • Packaging and Deploying Custom Solutions

Data Loss Prevention Policies

- **Data is critical in an organization's success**
  - It needs to be readily available for decision-making
  - Needs to be protected so it's not shared with audiences that should not have access to the data

- **Data Loss Prevention (DLP) Policies**
  - PowerApps provides a way to protect your data by providing the ability to create and enforce policies
  - You can define which consumer services/connectors specific business data may be shared with

Data Loss Prevention Policies

- **Benefits of a DLP policy**
  - Ensures data is managed in a uniform manner across the organization.
  - Prevents important business data from being accidentally published to services such as social media sites.

- **Example:** Prevent business data stored in SharePoint from being automatically published to a Twitter feed.
  - Create a DLP policy that blocks SharePoint data from being used as the source for tweets.

Data Loss Prevention (DLP) Policies

- DLP policies determine of what connectors can be used
  - Allowed connectors configured as **Business data only**
  - Disallowed connectors classified as **No business data allowed**

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Configuring User Access to Apps & Flows

- Sharing apps differs between these scenarios
  - App is a canvas app
  - App is a model-driven app

- For canvas apps
  - Shared with users, Azure AD Groups or entire org

- For model-driven apps
  - Shared by adding user to a CDS security role

Sharing PowerApps

- There are 3 level of app permissions:
  - **Can Use**: Users/groups can run the app but cannot edit or share the app
  - **Can Edit**: Users/groups can run, edit publish and share the app
  - **Owner**: Can Edit permission + ability to add other contributors

Sharing a Flow

Owners

Adding another owner allows others to edit, update and delete this flow. All owners can also access the run history and add or remove other owners.
Learn more

Add a user or group as owner

Enter names, email addresses, or user groups

Maxwell Smart
MaxwellS@pbibc0820.onMicrosoft.com

Connections Used

Owners of the flow will have full access to all connections in the flow and the content within the connected accounts. Owners are not required to add connections to their own accounts, and can take any actions in existing connections and their content.

SharePoint
student@pbibc0820.onmicrosoft.com
Owners with access to this connection can:
Read list and library names, as well as the names of the columns
Create, read, update, copy and delete files and metadata
Create, read, update, and delete list items

Embedded connections

Everyone listed as an owner will have access to all these connections and will only be able to use them in this flow.
Learn more

Only add owners to a flow if you wish to share full access to all connections and the content within them. If you want to have someone else edit a flow offline without granting access to connections, you can export your flow. Learn more

OK   Cancel

Sharing a Connection

Application Players

- Application players used by consumers to run apps
  - Can be used to run both canvas apps or model-drive apps
  - Apps available to user discovered at **web.powerapps.com**
  - Dynamics 365 users see apps at **home.dynamics.com**

- Application players available for install on mobile devices
  - Currently, there are separate apps for canvas and model-driven
  - Microsoft plans single app for canvas and model-driven in future

App Versioning in PowerApps

- PowerApps keeps version history for apps saved to cloud
  - Accessible via https://web.powerapps.com
  - Restore, delete, and publish versions

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Exporting a Canvas App

# Importing a Canvas App

Exporting a Flow

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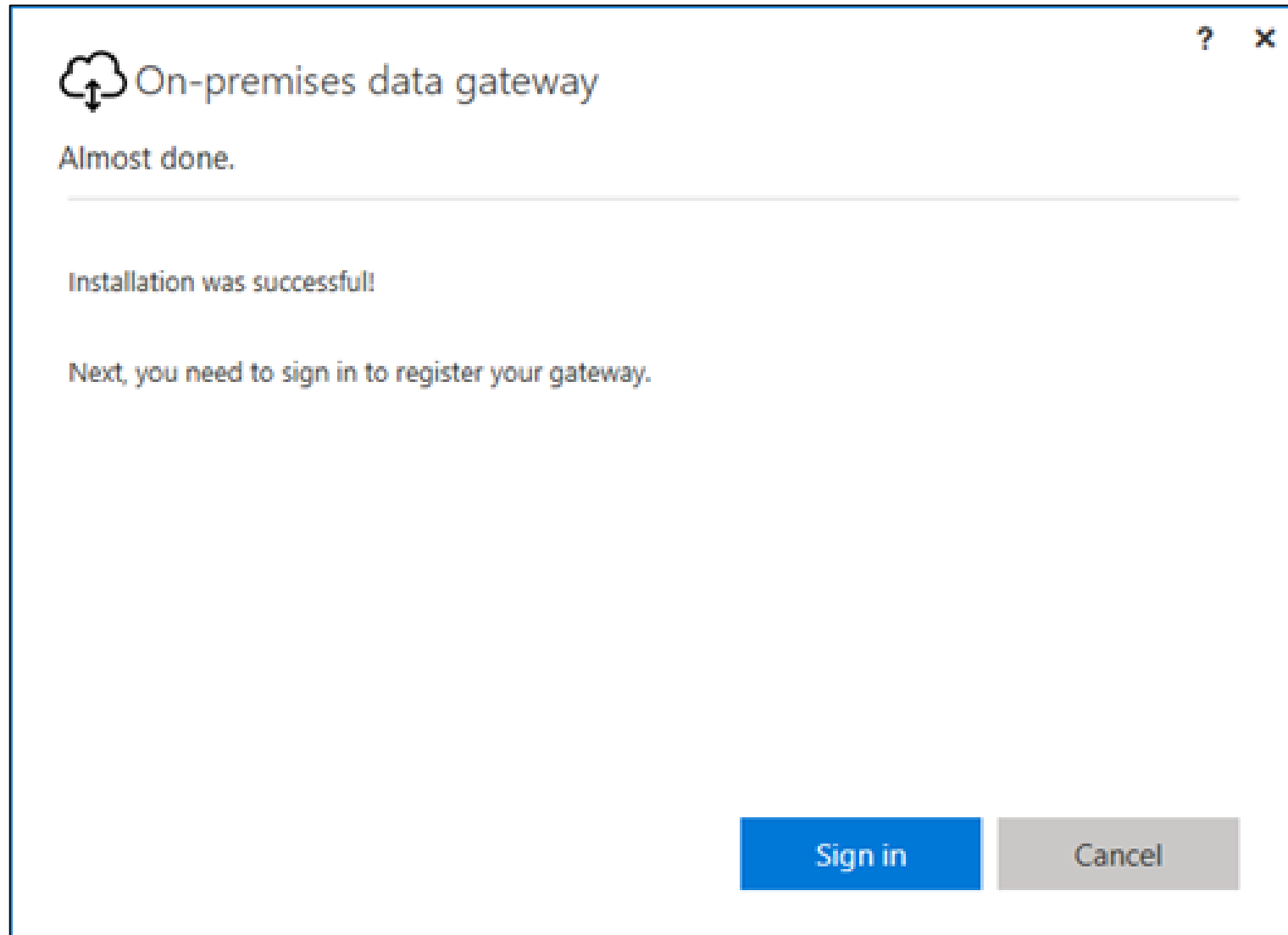- • Packaging and Deploying Custom Solutions

On-premises Data Gateway

- Gateway used to connect to on-premises data sources
  - Runs on PC or server in local network
  - Used run on server joined to local Active Directory domain
  - Extracts data and returns it to Power BI service
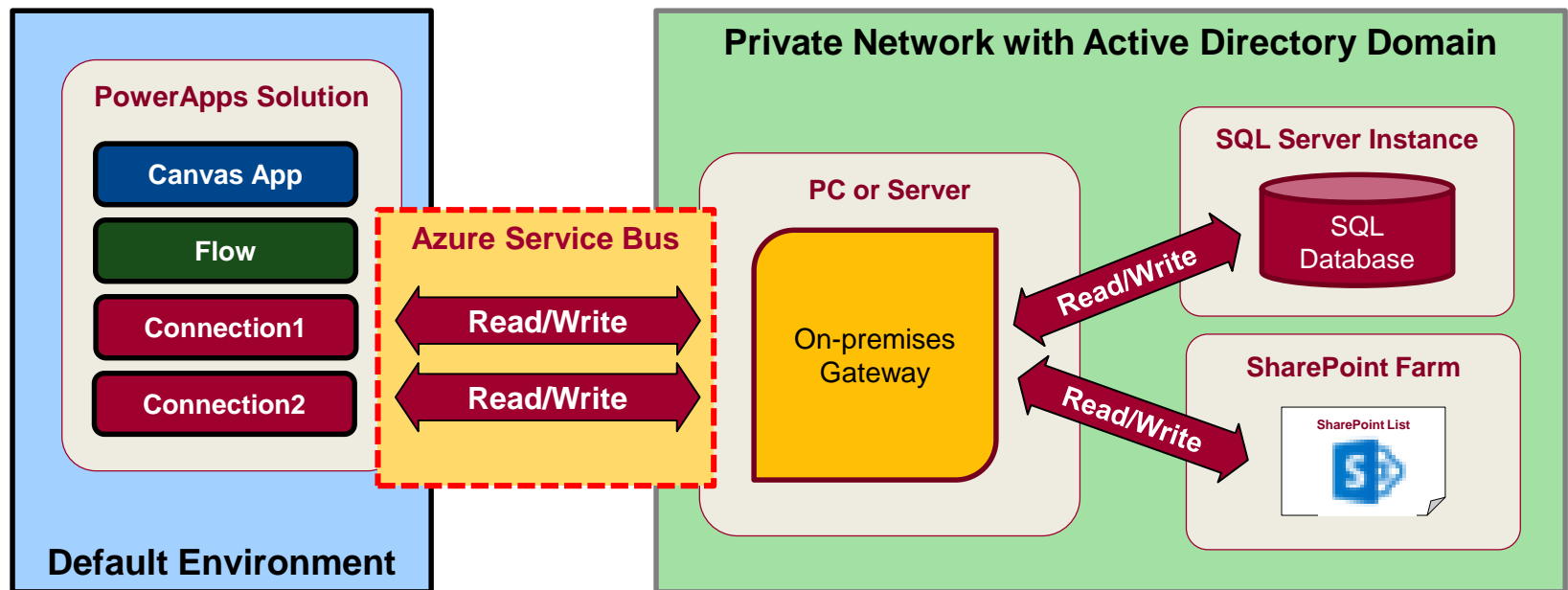
On-Premises Gateway Installation

On-prem Gateway Names & Recovery Keys

Getting the Gateway Up and Running

Outbound Ports – On-Premises Gateway

- ## Gateway communicates through outbound ports
  - ### Gateway does not require inbound ports

Domain names	Outbound ports	Description
*.powerbi.com	443	HTTPS
*.analysis.windows.net	443	HTTPS
*.login.windows.net	443	HTTPS
*.servicebus.windows.net	5671-5672	Advanced Message Queuing Protocol (AMQP)
*.servicebus.windows.net	443, 9350-9354	Listeners on Service Bus Relay over TCP (requires 443 for Access Control token acquisition)
*.frontend.clouddatahub.net	443	HTTPS
*.core.windows.net	443	HTTPS
login.microsoftonline.com	443	HTTPS
*.msftncsi.com	443	Used to test internet connectivity if the gateway is unreachable by the Power BI service.

Using a Gateway to Create a Connection

On-Premises Data Gateway

- On-Premises Gateway required to access on-premises data
  - Gateway used by Power BI, PowerApps, Flow and Logic Apps
  - Download installer: http://go.microsoft.com/fwlink/?LinkID=820931

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ALM Principals

- Source code system should be authoritative source
  - No reliance on a running CDS environment
  - Using branches for release management
  - Viewing and approving changes at granular level

- Developer isolation
  - All builders have their own isolated environments in which to work

- Full automation of ALM procedures
  - Create repeatable processes for build, test and deployment
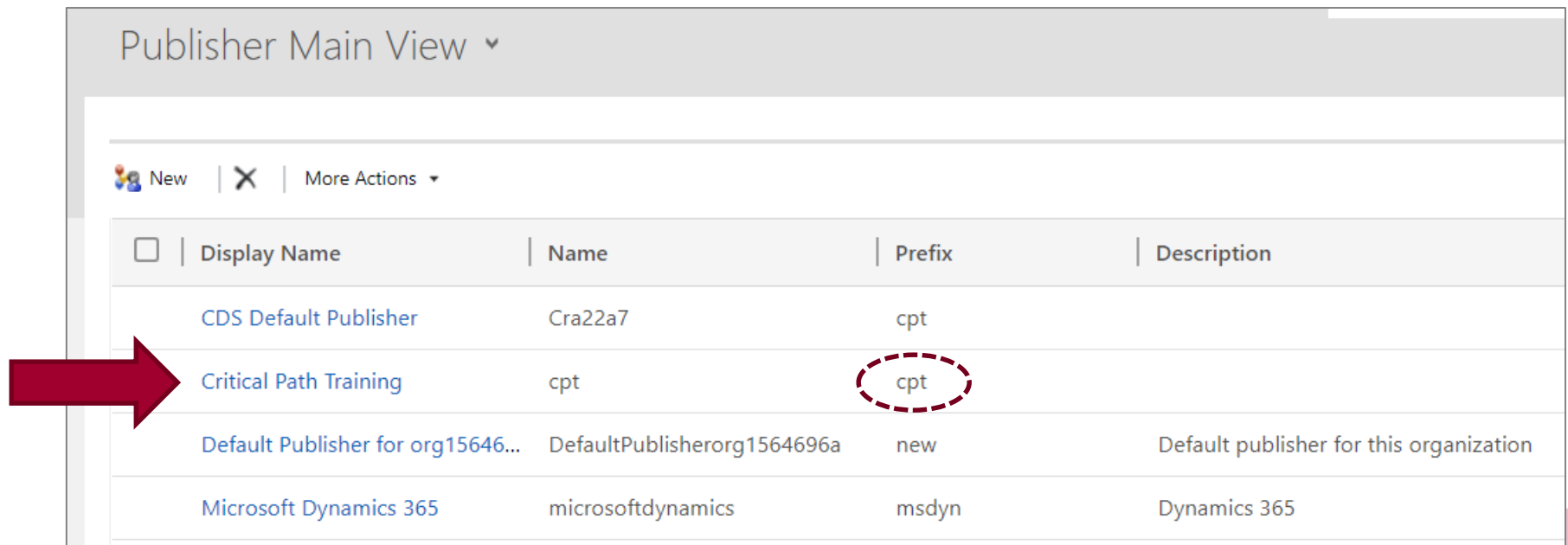 - Continuous delivery and development

Introduction to Solutions

- Solutions used to move configuration between environments
  - Solutions used to move metadata (e.g. custom entity, model-driven apps)
  - Solutions not used to move business data itself

- Solutions can be managed or unmanaged
  - Unmanaged solutions is "open" solution which allows changes
  - Managed solutions are locked down and do not allow changes.
  - During development, you work with an unmanaged solution
  - When you export solutions, export is created as managed or unmanaged

- When you import a managed solution, it is in lockdown mode
  - You cannot modify or remove application components or customization
  - Managed solution is serviceable and upgradable
  - Uninstalling managed solution removes everything

Publishers and Solutions

- CDSA solutions used to distribute applications
  - Provides means to conduct ALM
- CDSA Publishers
  - Profile used to provide identity for CDSA solutions
  - You should create new publisher when distributing solutions

Creating a New CDSA Solution

Adding Solution Components

+ New ∨	+ Add existing ∨	🗑 Delete	⊢→ Export ∨	▭ Publish all customizations

App >

Dashboard >

Entity

Flow

Process

Report

Other >

Canvas app	>	Phone form factor
Model-driven app		Tablet form factor

2-Column overview

3-Column overview

3-Column overview (varied width)

4-Column overview

Connection role

Email template

Field security profile

Mail merge template

Option set

Security role

Web resource

CDSA Security Roles

- User access to CDS data based on roles
  - Environment security configured in terms of business units
  - CDS pre-defines common security roles
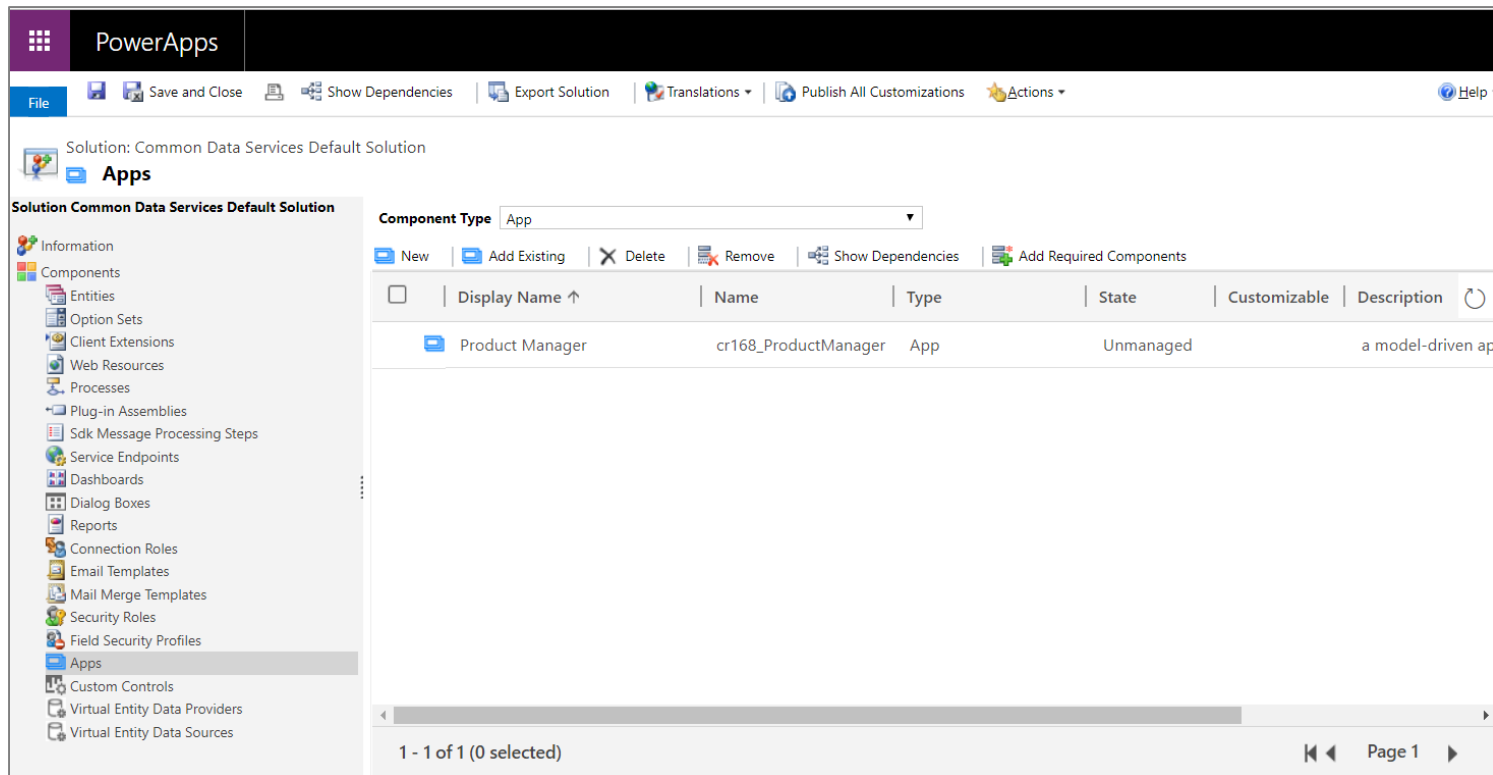 - You can define custom security roles as well

Security Role Configuration – Core Records

- Roles define access to specific entities
  - Permissions include **create**, **read**, **write**, **delete**, etc.
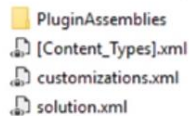
Solution Explorer

- Solution Explorer provides top-level view of customizations
  - Can be challenging to find in current UI experience

Solution Packager

- Used to store the solution zip components in organized folder structure

- Make source control and differencing much easier

- Allows for both unmanaged and managed files to be in source control
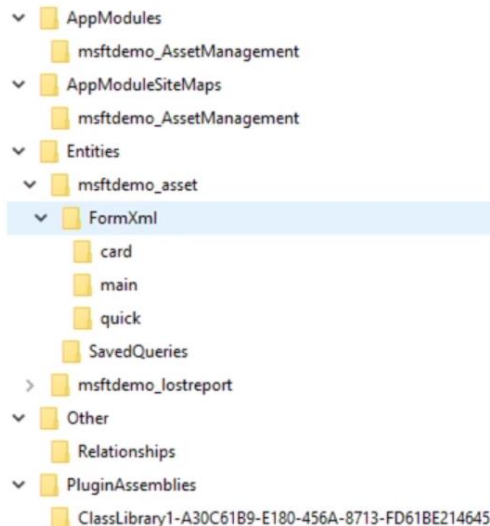
Installing Solutions

- Solutions can depend on other solutions
  - You can't install solution until you install dependencies

- How do you install solutions?
  - Solution Manager
  - Package Deployer tool

- Package deployer tool
  - can be run interactively
  - can be run from PowerShell
  - can be run by installing from AppSource marketplace

Installing Unmanaged Solutions

- When you import an unmanaged solution…
    - changes merged in with other unmanaged changes
    - Unmanaged solutions cannot be removed as a unit
    - Merged changes removed by manually removing items
    - administrator must publish unmanaged changes to have any non-schema (e.g. display labels) changes be visible to other users

Summary

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