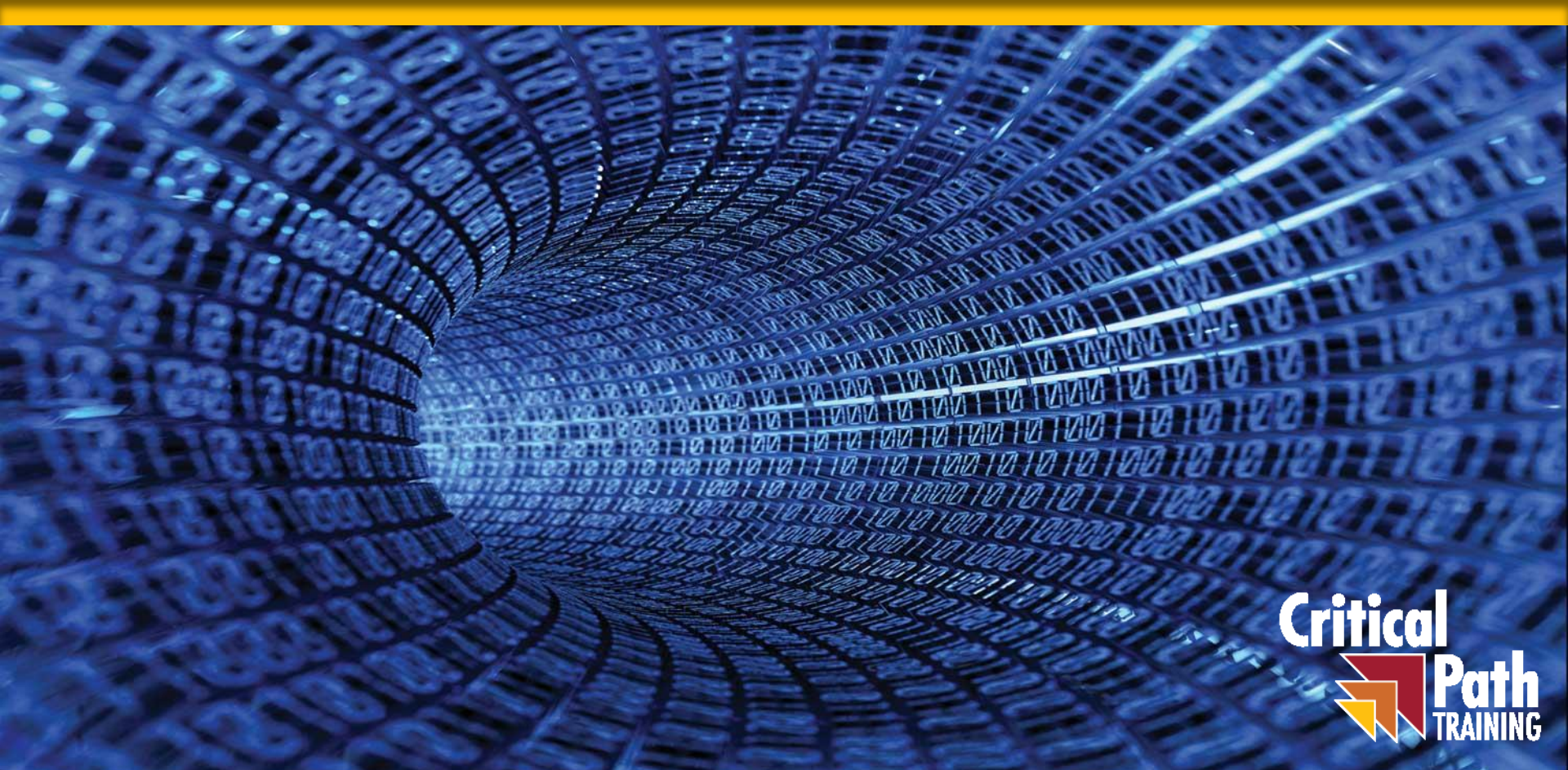


Managing Application Lifecycle with PowerApps and Flow



Best Resource for Learning PowerApps ALM

- Administering a PowerApps Enterprise Deployment
 - Whitepaper by David Yack of Colorado Technology Consultants
 - <https://aka.ms/powerappsadminwhitepaper>



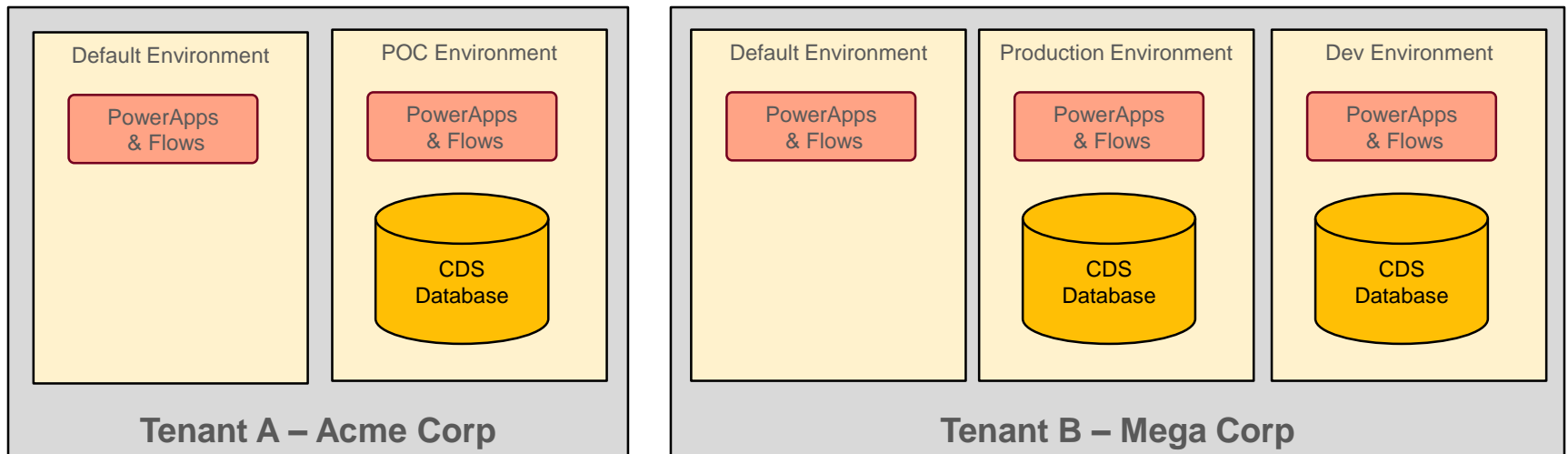
Agenda

- Understanding Environments
- 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



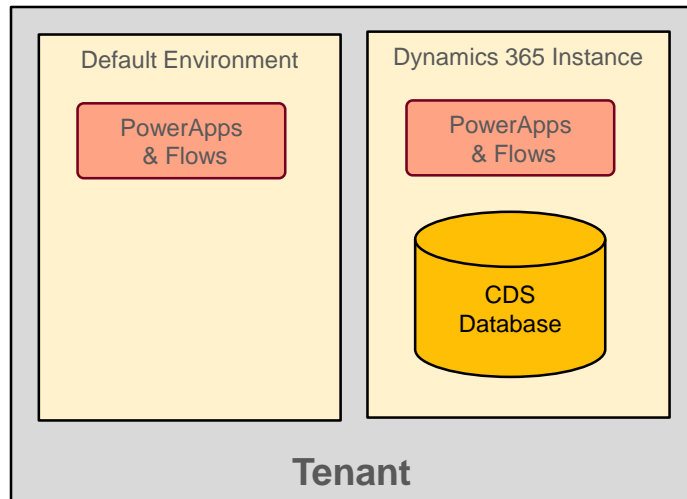
What is an Environment?

- 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



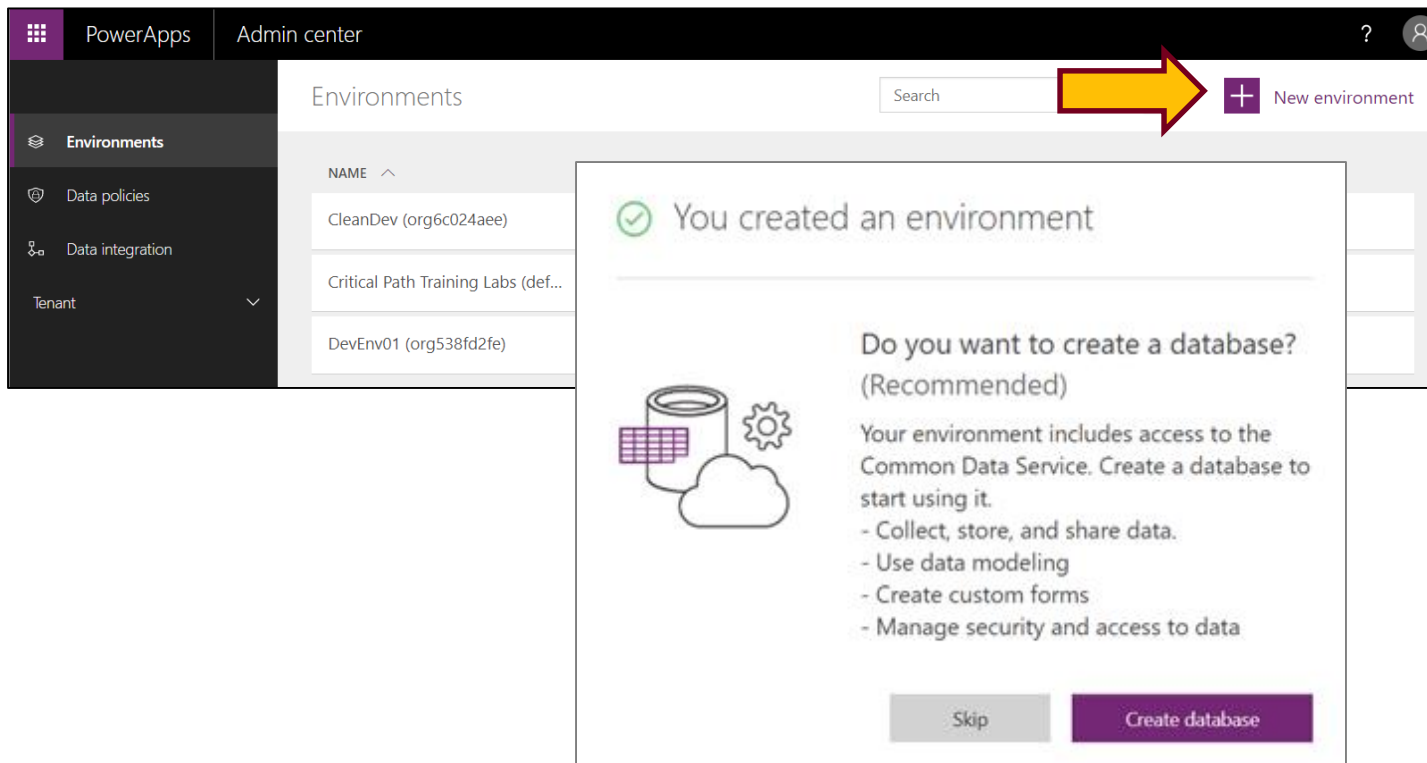
PowerApps and Dynamics 365 Convergence

- As of Dynamics 365 version 9
 - Dynamics 365 instance = PowerApps Environment with CDS DB



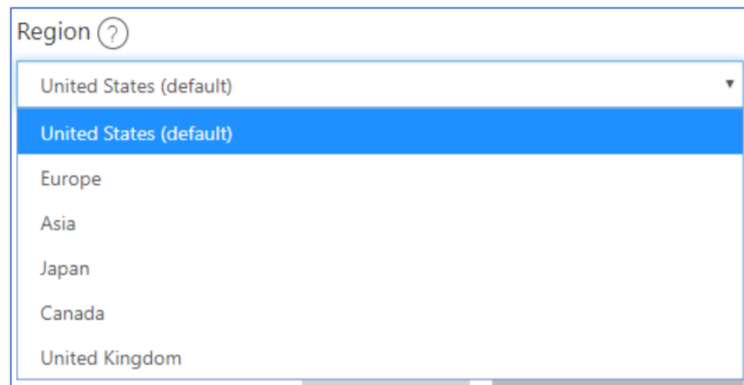
Managing Environments

- 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

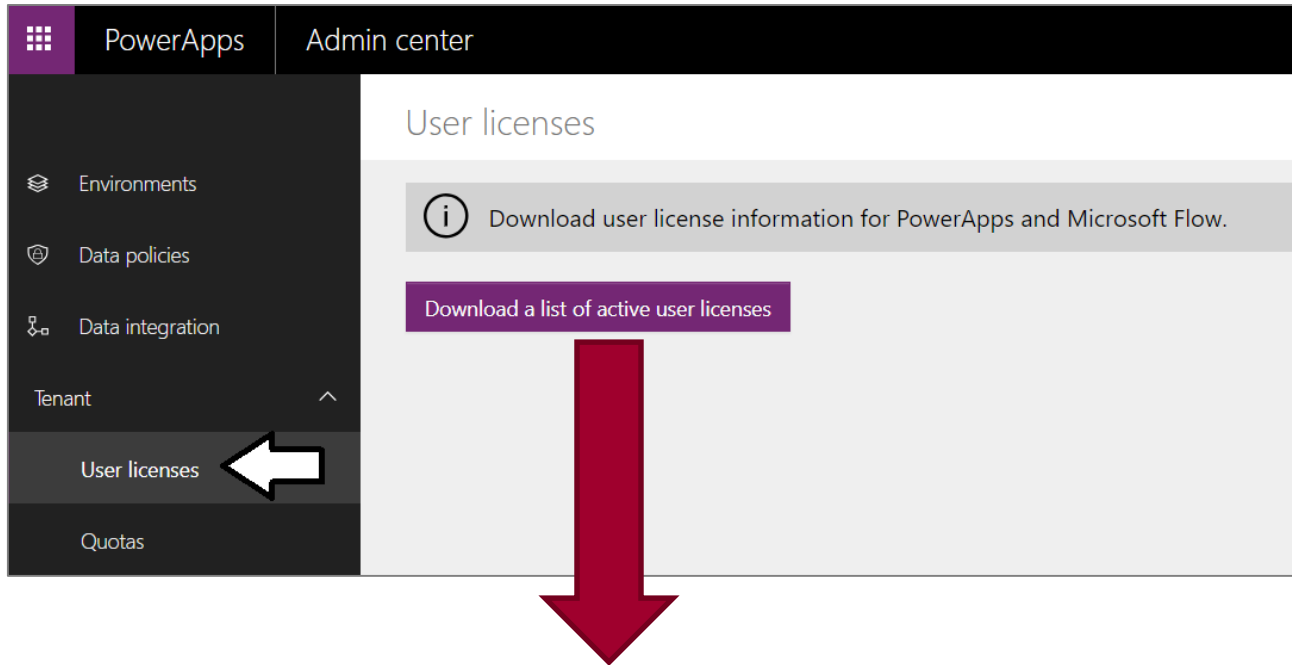


Admin Licensing with PowerApps and Flow

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



	A	B	C	D	E	F
1	User Name	Email Address	Service	License	License Assigned Date	Is Trial
2	Stu Dent	student@pbibc0820.onmicrosoft.com	PowerApps Plan 2	Microsoft PowerApps Plan 2	8/23/2018 13:23	FALSE
3	Stu Dent	student@pbibc0820.onmicrosoft.com	Flow for Office 365	Office 365 Enterprise E5	8/18/2018 22:21	FALSE
4	Stu Dent	student@pbibc0820.onmicrosoft.com	Flow Free	Microsoft Flow Free	8/23/2018 18:13	TRUE
5	Stu Dent	student@pbibc0820.onmicrosoft.com	Flow Plan 2	Microsoft PowerApps Plan 2	8/23/2018 13:23	FALSE
6	Stu Dent	student@pbibc0820.onmicrosoft.com	PowerApps for Office 365	Office 365 Enterprise E5	8/18/2018 22:21	FALSE
7	James Bond	jamesb@pbibc0820.onmicrosoft.com	PowerApps Plan 2	Microsoft PowerApps Plan 2	8/24/2018 18:29	FALSE
8	James Bond	jamesb@pbibc0820.onmicrosoft.com	Flow for Office 365	Office 365 Enterprise E5	8/21/2018 17:38	FALSE
9	James Bond	jamesb@pbibc0820.onmicrosoft.com	Flow Plan 2	Microsoft PowerApps Plan 2	8/24/2018 18:29	FALSE
10	James Bond	jamesb@pbibc0820.onmicrosoft.com	PowerApps for Office 365	Office 365 Enterprise E5	8/21/2018 17:38	FALSE



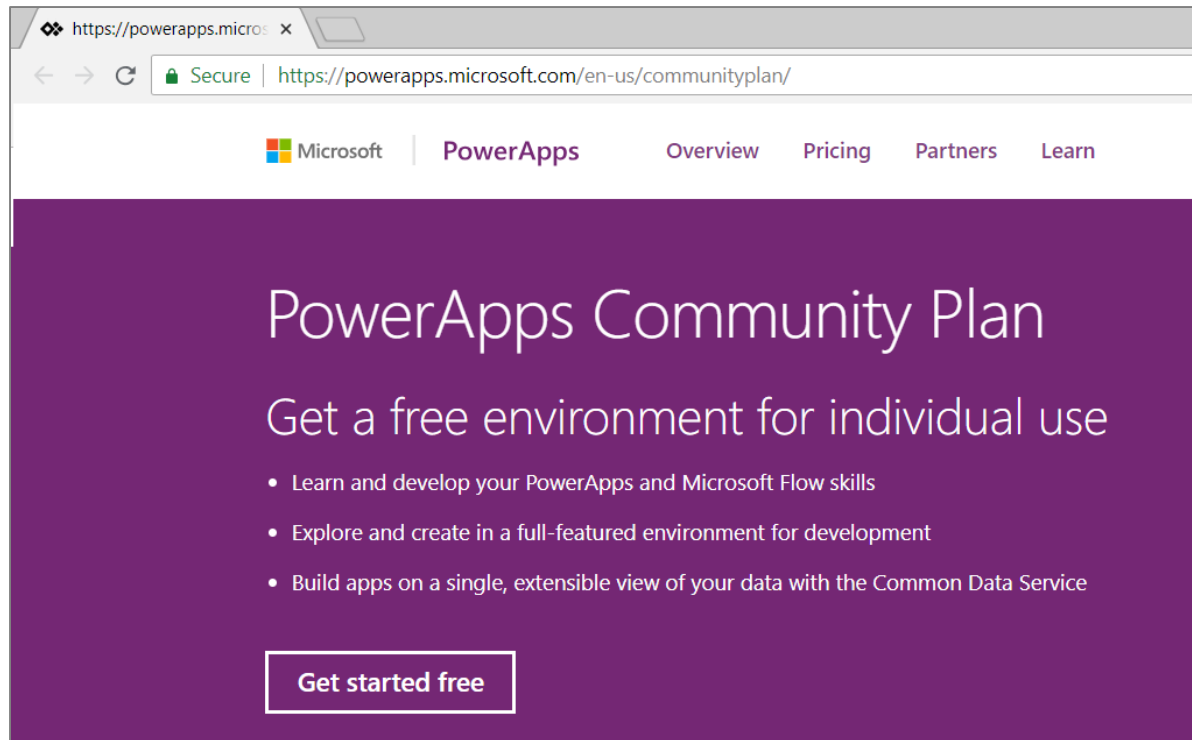
Types of Environments

- 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/>



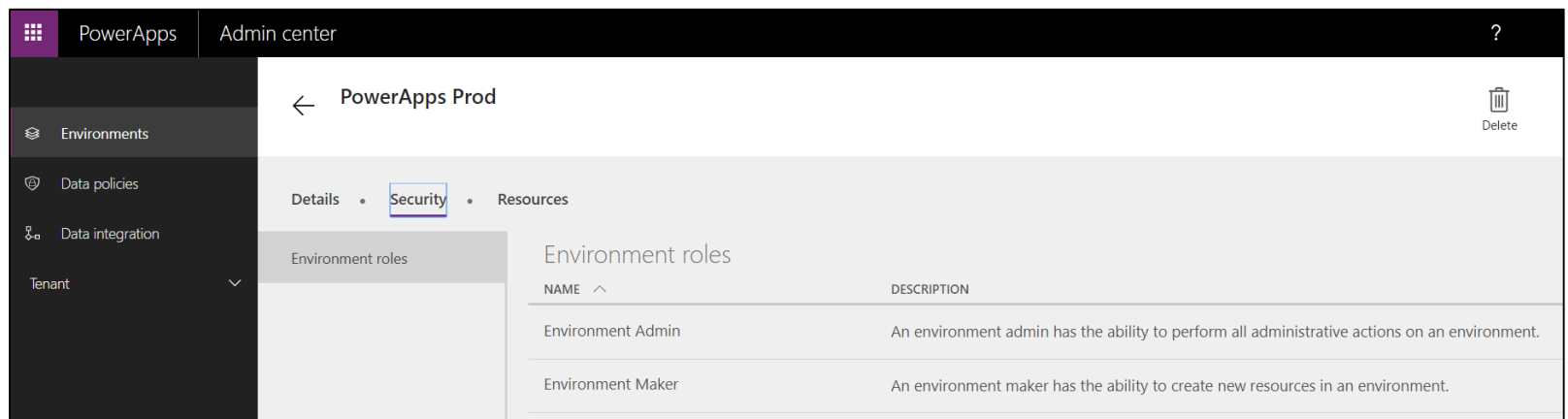
Default Environment

- 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



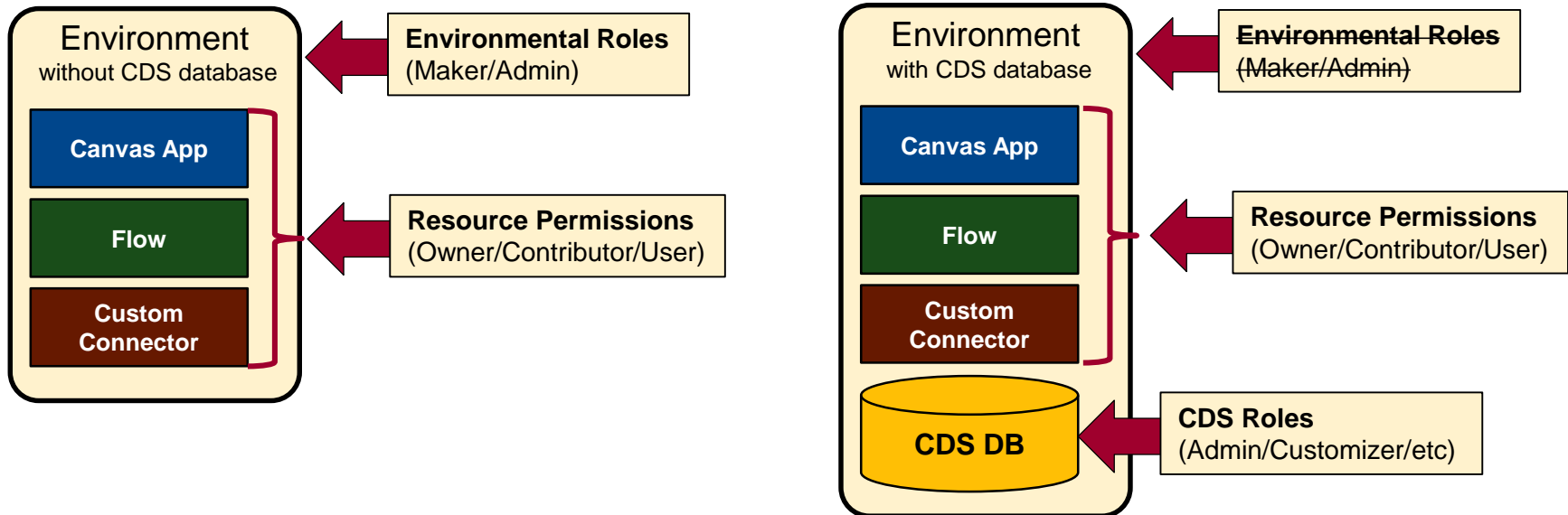
The screenshot shows the PowerApps Admin center interface. The top navigation bar includes 'PowerApps' and 'Admin center'. The left sidebar lists 'Environments', 'Data policies', 'Data integration', and 'Tenant'. The main content area is for 'PowerApps Prod' and shows the 'Security' tab selected. Under 'Environment roles', there is a table with two roles: 'Environment Admin' and 'Environment Maker'.

NAME	DESCRIPTION
Environment Admin	An environment admin has the ability to perform all administrative actions on an environment.
Environment Maker	An environment maker has the ability to create new resources in an environment.



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



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



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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**

Data Policy Name Wingtip Production Environment Policy ✓ Save Policy ✕ Close

Environments • Data groups






Categorize these connectors into one of two data groups, "Business data only" and "No business data allowed". Users will be prevented from creating flows and apps that combine connectors from the "Business data only" and "No business data allowed" data groups. [Learn more](#)

Business data only ...

Add Excel Online (Business) SQL Server SharePoint OneDrive for Business

No business data allowed (Default)

Add PowerApps for Admins Power platform for Admins Dynamics 365 Salesforce

Error

Using these connections together conflicts with the company data loss prevention policies. Click [here](#) to learn more.

[More](#)

Ok

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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

The screenshot shows the 'Share' tab for a PowerApp named 'SP Photo'. At the top, it shows the app icon, name, and dates: 'Created: 08/24/2018' and 'Modified: 08/24/2018'. Below this is a navigation bar with 'Details', 'Share' (selected), 'Versions', 'Settings', and 'Analytics (preview)'. A green checkmark indicates 'Version 1 is published.' Below this is a text input field for 'Enter names, email addresses, or user groups'. There is a button '+ Add everyone in my org' with a help icon. A checkbox 'Send an email invitation (optional)' is checked. Below this is a table titled 'Shared with' with columns 'Name', 'Email', and 'Permission'. The table lists three users: Stu Dent (Owner), Austin Powers (Can use), and Carrie Mathison (Can edit). Each row has a dropdown for the permission and a close button. At the bottom are 'Cancel' and 'Save' buttons.

← **SP Photo**
Created: 08/24/2018 Modified: 08/24/2018

Details • **Share** • Versions • Settings • Analytics (preview)

✓ Version 1 is published.

Enter names, email addresses, or user groups

+ Add everyone in my org ?

☒ Send an email invitation (optional)

Shared with

Name	Email	Permission ?
Stu Dent	student@pbibc0820.onmicrosoft.com	Owner ▼ ×
Austin Powers	AustinP@pbibc0820.onMicrosoft.com	Can use ▼ ×
Carrie Mathison	CarrieM@pbibc0820.onMicrosoft.com	Can edit ▼ ×

Cancel Save



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
MaxwellIS@pbibc0820.onmicrosoft.com



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](#)

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



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
















SQL Server
Created: 08/25/2018 Modified: 08/25/2018

 Edit  Delete

Details • Share

+ Add everyone in my org 

This connection is currently shared with

Name	Email	Permission 
 Stu Dent	student@pbibc0820.onmicrosoft.com	Owner  
 Jason Bourne	JasonB@pbibc0820.onMicrosoft.com	Can use  
 Carrie Mathison	CarrieM@pbibc0820.onMicrosoft.com	Can edit  
 Jack Bauer	JackB@pbibc0820.onMicrosoft.com	Can use + share  

Cancel Save



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

Details	•	Share	•	<u>Versions</u>	•	Settings
PowerApps keeps a version history of your apps.						
VERSION	MODIFIED	MODIFIED BY	POWERAPPS RELEASE ?	PUBLISHED	COMMENT	
3	8/11/2017 11:30:26 PM	MOD Administrator	2.0.676		↑ Publish this version	
2	8/11/2017 11:24:14 PM	MOD Administrator	2.0.676		↺ Restore	🗑 Delete
1	8/11/2017 1:04:45 AM	MOD Administrator	2.0.676	Live	↺ Restore	🗑 Delete



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Exporting a Canvas App

PowerApps

Home

Learn

Apps

Data

Create an app Play Edit Share Export package (preview) Delete

Apps in PowerApps Prod

Export package

Package details

Created by Stu Dent on 08/27/2018

Name *

Product Manager

Environment

PowerApps Prod

Description

A simple canvas app created with PowerApps

Review Package Content

Choose your export options and add comments to provide instruction or add version notes.

NAME	RESOURCE TYPE	IMPORT SETUP	ACTION
Product Manager	App	Create as new	

Related resources

NAME	RESOURCE TYPE	IMPORT SETUP	ACTION
WingtipSalesDB cpt.database.windows.net	SQL Server Connection	Select during import	

Export Cancel



ProductManager_20180827190242.zip

Importing a Canvas App

PowerApps

Environment
Prod Env (org2dd4e23c)

+ Create an app ← Import package (preview) ⇄ cft Dynamics 365

Import package



Package details
Created by Stu Dent on 08/27/2018

Name
Product Manager



Environment
PowerApps Prod

Description
A simple canvas app created with PowerApps

Review Package Content
Choose your import options.

NAME	RESOURCE TYPE	IMPORT SETUP	ACTION
 Product Manager	App	Create as new	

Related resources

NAME	RESOURCE TYPE	IMPORT SETUP	ACTION
 WingtipSalesDB cpt.database.windows.net	SQL Server Connection	Select during import	

Import Cancel

Exporting a Flow

The screenshot displays a list of four flows in the Microsoft Flow (Power Automate) interface. Each flow entry includes an icon, a title, and a timestamp of '3 days ago'. The flows are: 'Upload to SP Photos', 'Proposal Approval Process', 'Idea Tracker', and 'My New Flow 123'. A large black arrow points from the 'My New Flow 123' entry to a context menu that appears when the three-dot menu icon is clicked. The context menu contains the following options: 'Run now', 'Save As', 'See analytics', 'Submit as template', 'Export', and 'Delete'. A smaller black arrow points from the 'Export' option to a sub-menu that contains two choices: 'Package (.zip)' and 'Logic Apps template (.json)'. Another black arrow points from the three-dot menu icon in the top right of the flow list to the context menu.

Flow Name	Icon	Last Modified
Upload to SP Photos	[Icon]	3 days ago
Proposal Approval Process	[Icon]	3 days ago
Idea Tracker	[Icon]	3 days ago
My New Flow 123	[Icon]	3 days ago

- Run now
- Save As
- See analytics
- Submit as template
- Export
 - Package (.zip)
 - Logic Apps template (.json)
- Delete



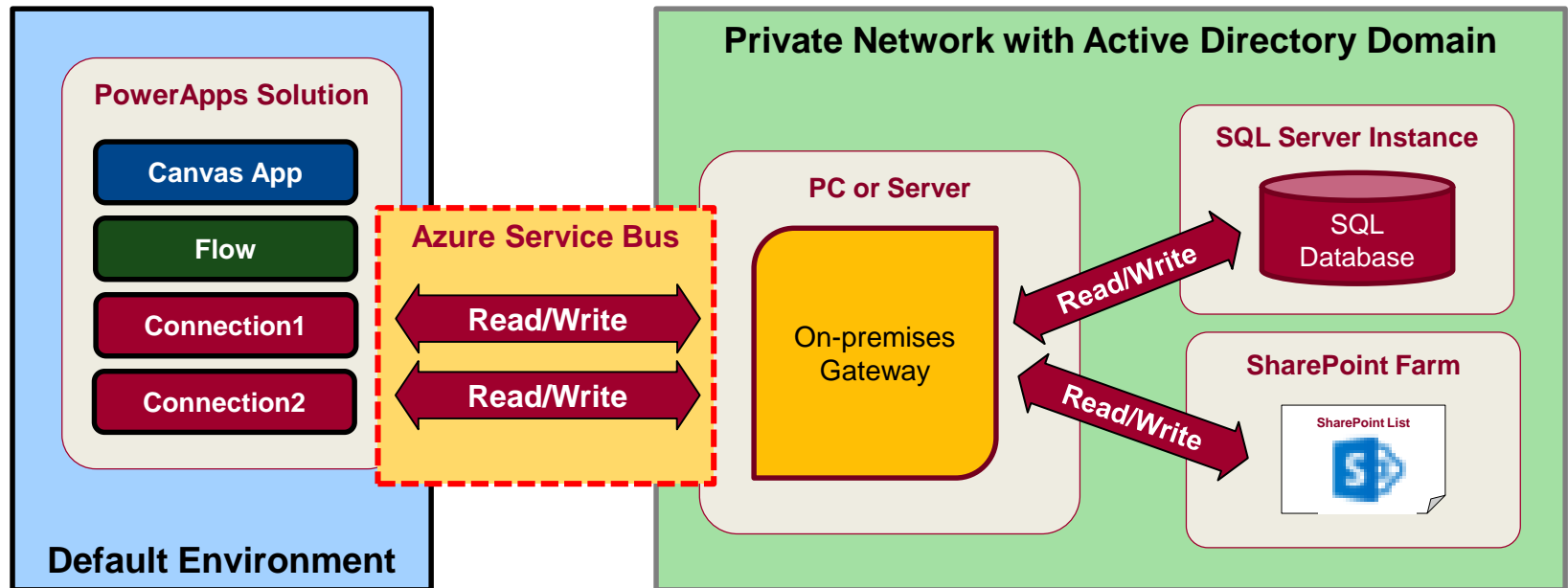
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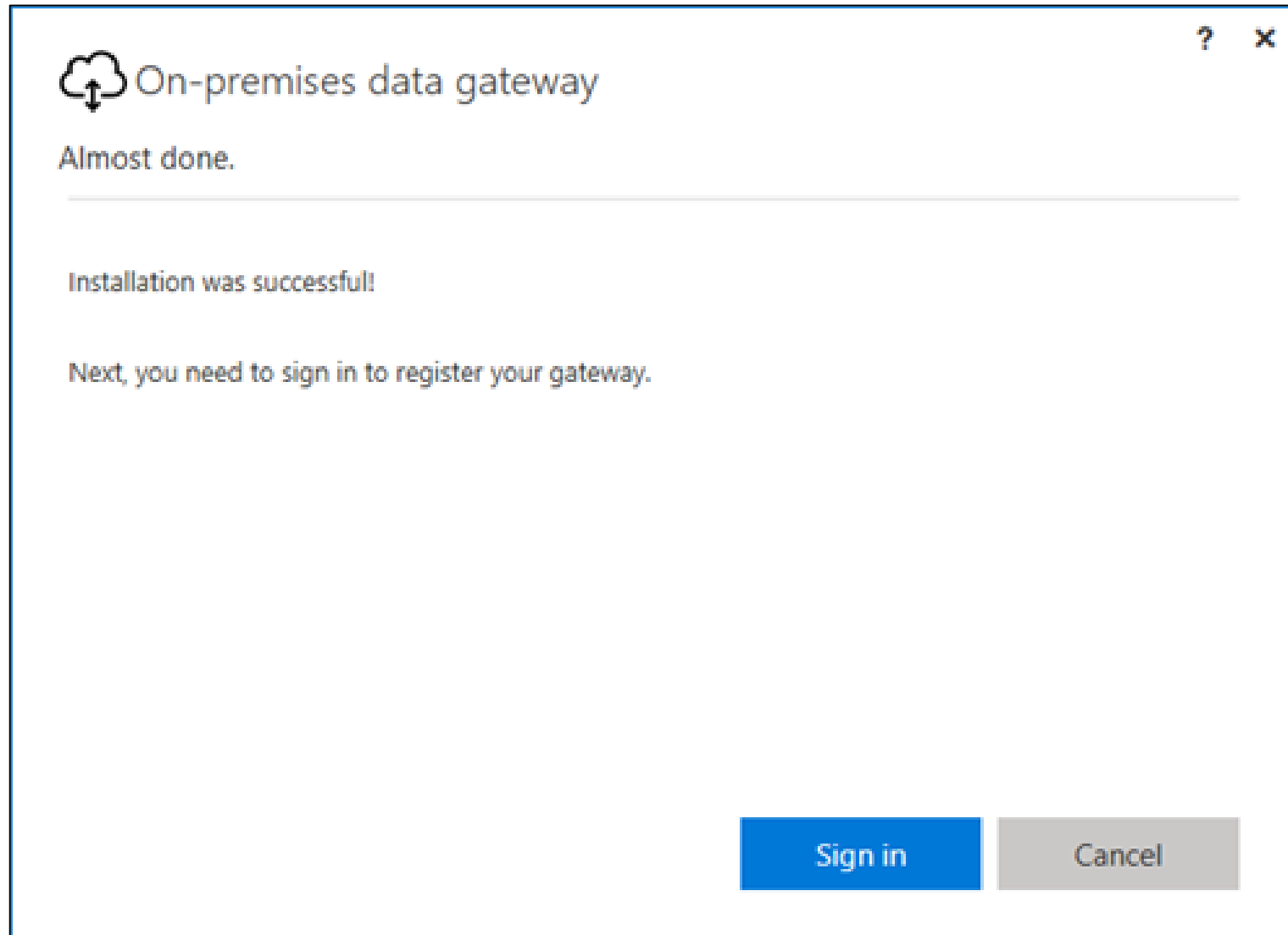


On-premises Data Gateway


- 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

 On-premises data gateway ? ✕

You are signed in as Student@PowerBiBootcamp.onmicrosoft.com and are ready to register the gateway.

New on-premises data gateway name

Recovery key (8 character minimum)


 This key is needed to restore the gateway and can't be changed. Record it in a safe place.

Confirm recovery key

< < Back Configure Cancel



Getting the Gateway Up and Running

 On-premises data gateway?x


Status

Service Settings

Diagnostics

Network

Connectors

 The gateway Teds GW is online and ready to be used.


Gateway version number: 14.16.6792.1 (August 2018)

☒ Help us improve the on-premises data gateway by sending usage information to Microsoft.
[Read the privacy statement online](#)


Logic Apps, Azure Analysis Services
North Central US

[Create a gateway in Azure](#)

PowerApps, Microsoft Flow
Default environment

 Ready

Power BI
Default environment

 Ready

Close



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

The screenshot displays the PowerApps interface with the 'Teds GW' gateway configuration. The left sidebar shows the 'Data' section expanded, with 'Gateways' selected. The main area shows the 'Users' tab for 'Teds GW', listing three users: Stu Dent, Maxwell Smart, and Emma Peel. Below the list, the 'Gateway permissions for Maxwell Smart' are shown, with 'DB2' and 'File System' checked.

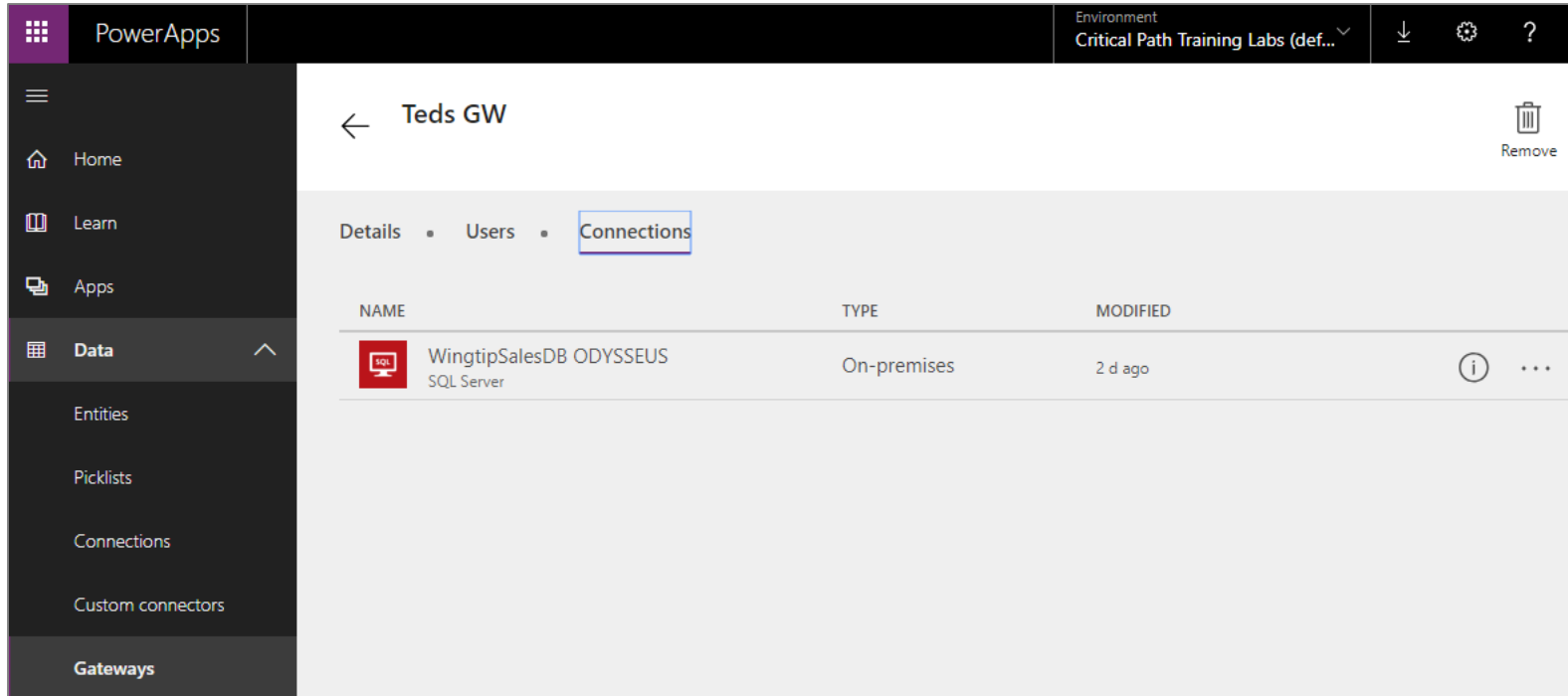
On the right, a 'SQL Server' connection dialog is open. It contains the following fields and options:

- Display name ***: WingtipSalesDB ODYSSEUS
- How do you want to connect to your data?**:
☐ Connect directly (cloud-services)
☒ Connect using on-premises data gateway (?)
- SQL server name ***: ODYSSEUS
- SQL database name ***: WingtipSalesDB
- Authentication Type**: Windows (dropdown)
- Username ***: CptStudent
- Password ***: (masked with dots)
- Choose a gateway ***: Teds GW (dropdown)


At the bottom of the dialog are 'Cancel' and 'Save' buttons.

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>



The screenshot displays the PowerApps portal interface. On the left is a dark sidebar with navigation options: Home, Learn, Apps, Data (selected), Entities, Picklists, Connections, Custom connectors, and Gateways. The top header shows 'PowerApps' and the environment 'Critical Path Training Labs (def...)'. The main content area is titled 'Teds GW' and has a 'Remove' button. Below the title are tabs for 'Details', 'Users', and 'Connections' (which is selected and highlighted with a blue box). A table lists the connections:

NAME	TYPE	MODIFIED
 WingtipSalesDB ODYSSEUS SQL Server	On-premises	2 d ago

Each row in the table includes an information icon (i) and a more options icon (three dots) on the right.



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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



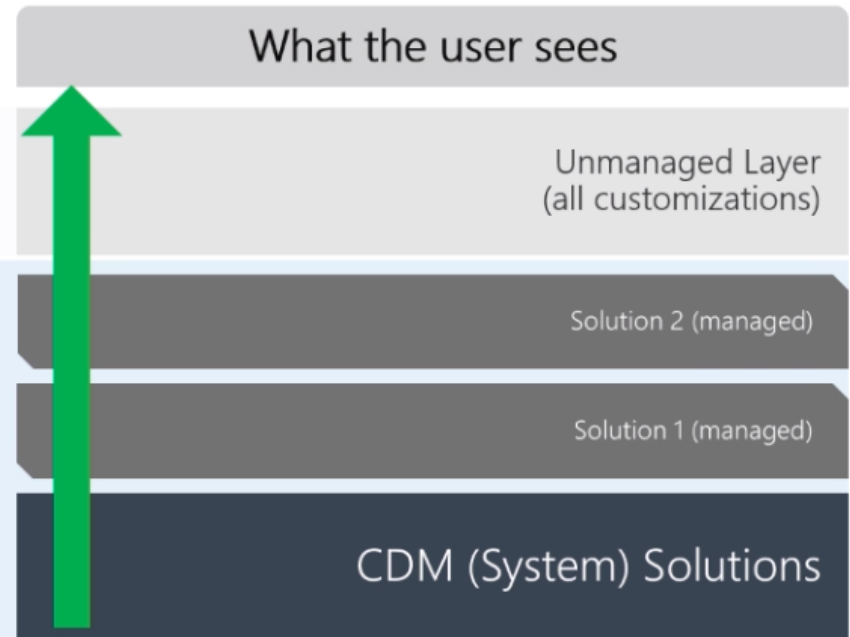
Solution Layering in the CDS

The order of installation and customization matters!

An unmanaged customization can be overridden by a managed solution in some circumstances

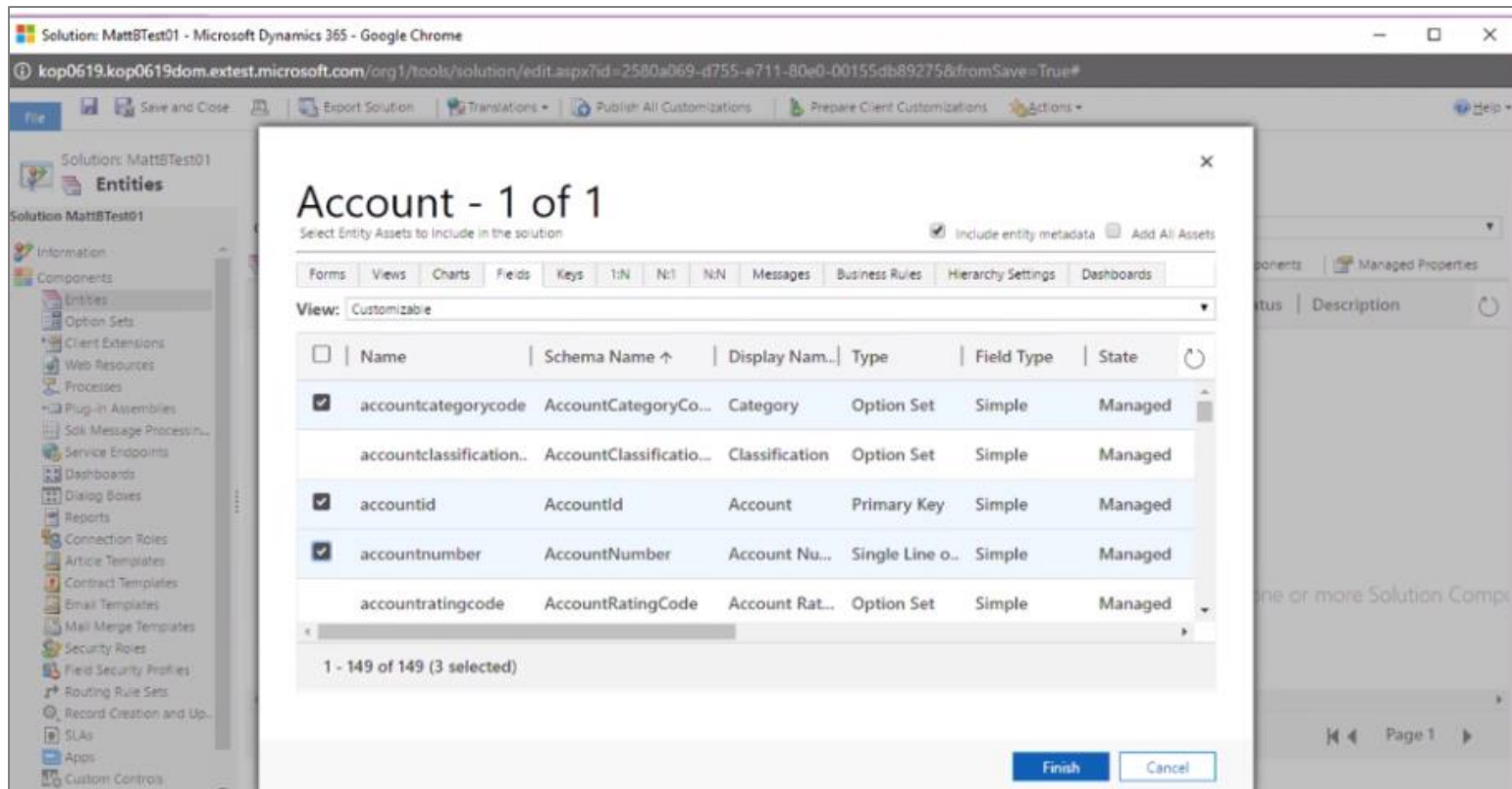
Unmanaged
Single layer

Managed Solutions
Multiple layers
One per managed solution



Solution Segmentation

- Allows for choice of adding all assets or picking specific assets



Managed Solution Actions



Update

Replaces existing solution with new components in same layer
Does not delete – unused components will remain in the system
Overwrite or keep unmanaged customizations



Patch

Create specific fixes and updates to solutions deployed as patch's
Additive only – no delete scenarios
Layers on top of parent solution, but does not impact layers above.



Upgrade

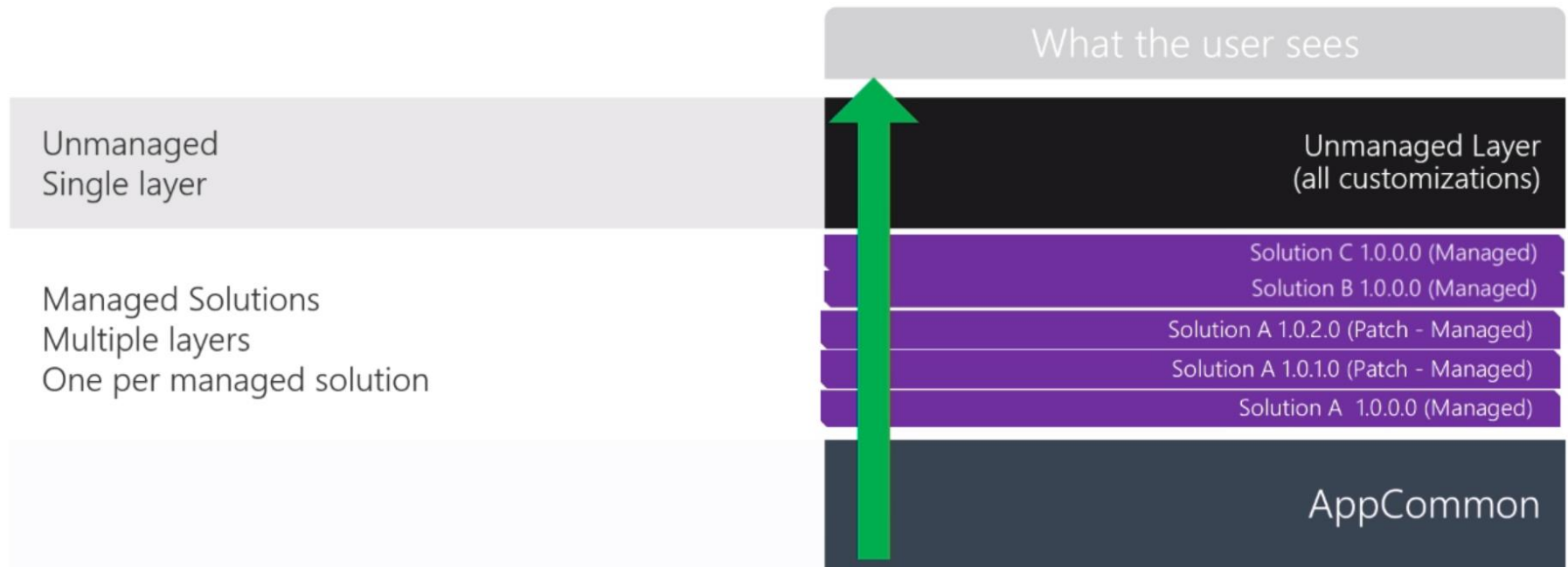
Upgrade Functionality
Remove unused assets
Run upgrade logic



Adding Patches to a deployment

The order of installation and customization matters!

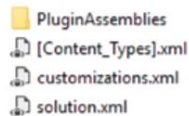
An unmanaged customization can be overridden by a managed solution in some circumstances



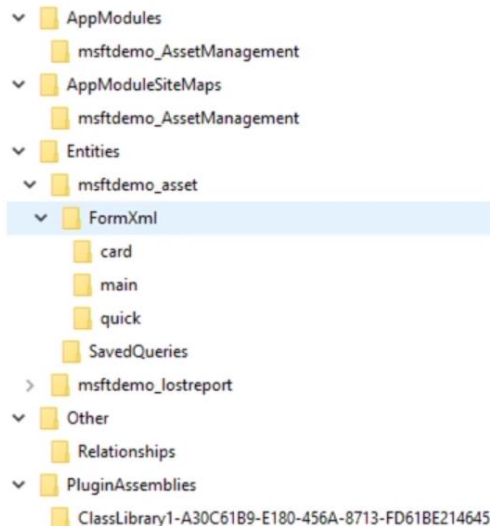
Solution Packager

- 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

Solution zip file contents



Solution Packager Structure



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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