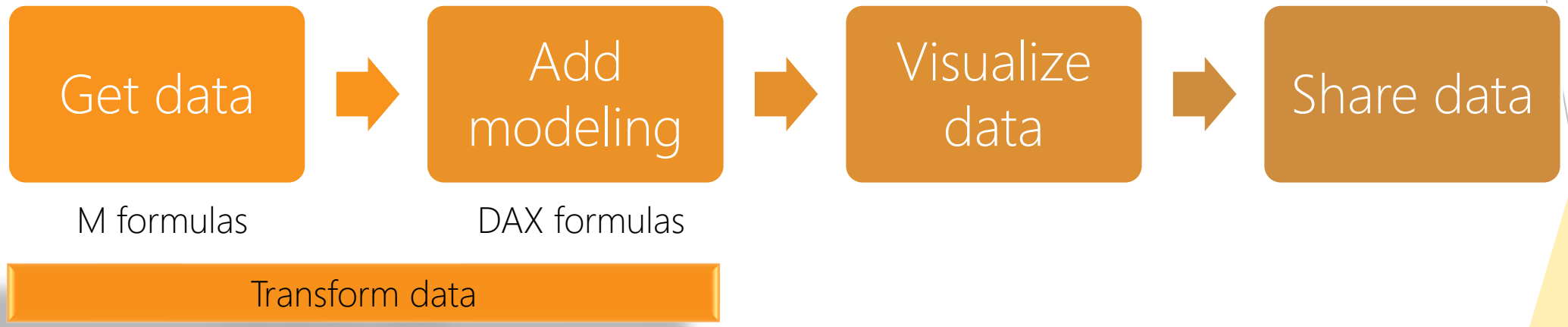
DA-100 course

Analyzing Data with Microsoft Power BI

Power BI Workflow



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M Function main categories

- Date
- DateTime
- DateTimeZone
- Day
- Duration
- List
- Number
- Table
- Text
- Time

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Date functions

- Date.AddDays
- Date.AddMonths
- Date.AddQuarters
- Date.AddWeeks
- Date.AddYears
- Date.Day
- Date.DayOfWeek
- Date.DayOfWeekName
- Date.DayOfYear
- Date.DaysInMonth
- Date.EndOfDay
- Date.EndOfMonth
- Date.EndOfQuarter
- Date.EndOfWeek
- Date.EndOfYear
- Date.From
- Date.FromText
- Date.IsInCurrentDay
- Date.IsInCurrentMonth
- Date.IsInCurrentQuarter
- Date.IsInCurrentWeek
- Date.IsInCurrentYear
- Date.IsInNextDay
- Date.IsInNextMonth
- Date.IsInNextNDays
- Date.IsInNextNMonths
- Date.IsInNextNQuarters
- Date.IsInNextNWeeks
- Date.IsInNextNYears
- Date.IsInNextQuarter
- Date.IsInNextWeek
- Date.IsInNextYear
- Date.IsInPreviousDay
- Date.IsInPreviousMonth
- Date.IsInPreviousNDays
- Date.IsInPreviousNMonths
- Date.IsInPreviousNQuarters
- Date.IsInPreviousNWeeks
- Date.IsInPreviousNYears
- Date.IsInPreviousQuarter
- Date.IsInPreviousWeek
- Date.IsInPreviousYear
- Date.IsInYearToDate
- Date.IsLeapYear
- Date.Month
- Date.MonthName
- Date.QuarterOfYear
- Date.StartOfDay
- Date.StartOfMonth
- Date.StartOfQuarter
- Date.StartOfWeek
- Date.StartOfYear
- Date.ToRecord
- Date.ToText
- Date.WeekOfMonth
- Date.WeekOfYear
- Date.Year

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DateTime functions

- DateTime.AddZone
- DateTime.Date
- DateTime.FixedLocalNow
- DateTime.From
- DateTime.FromFileTime
- DateTime.FromText
- DateTime.IsInCurrentHour
- DateTime.IsInCurrentMinute
- DateTime.IsInCurrentSecond
- DateTime.IsInNextHour
- DateTime.IsInNextMinute
- DateTime.IsInNextNHours
- DateTime.IsInNextNMinutes
- DateTime.IsInNextNSeconds
- DateTime.IsInNextSecond
- DateTime.IsInPreviousHour
- DateTime.IsInPreviousMinute
- DateTime.IsInPreviousNHours
- DateTime.IsInPreviousNMinutes
- DateTime.IsInPreviousNSeconds
- DateTime.IsInPreviousSecond
- DateTime.LocalNow
- DateTime.Time
- DateTime.ToRecord
- DateTime.ToText

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DateTimeZone functions

- DateTimeZone.FixedLocalNow
- DateTimeZone.FixedUtcNow
- DateTimeZone.From
- DateTimeZone.FromFileTime
- DateTimeZone.FromText
- DateTimeZone.LocalNow
- DateTimeZone.RemoveZone
- DateTimeZone.SwitchZone
- DateTimeZone.ToLocal
- DateTimeZone.ToRecord
- DateTimeZone.ToText
- DateTimeZone.ToUtc
- DateTimeZone.UtcNow
- DateTimeZone.ZoneHours
- DateTimeZone.ZoneMinutes

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Day values

- Day.Friday
- Day.Monday
- Day.Saturday
- Day.Sunday
- Day.Thursday
- Day.Tuesday
- Day.Wednesday

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Duration functions

- Duration.Days
- Duration.From
- Duration.FromText
- Duration.Hours
- Duration.Minutes
- Duration.Seconds
- Duration.ToRecord
- Duration.TotalDays
- Duration.TotalHours
- Duration.TotalMinutes
- Duration.TotalSeconds
- Duration.ToText

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Json and Xml functions

- Json.Document
- Json.FromValue
- Xml.Tables

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List functions

- List.Accumulate
- List.AllTrue
- List.Alternate
- List.AnyTrue
- List.Average
- List.Buffer
- List.Combine
- List.Contains
- List.ContainsAll
- List.ContainsAny
- List.Count
- List.Covariance
- List.Dates
- List.DateTimes
- List.DateTimeZones
- List.Difference
- List.Distinct
- List.Durations
- List.FindText
- List.First
- List.FirstN
- List.Generate
- List.InsertRange
- List.Intersect
- List.IsDistinct
- List.IsEmpty
- List.Last
- List.LastN
- List.MatchesAll
- List.MatchesAny
- List.Max
- List.MaxN
- List.Median
- List.Min
- List.MinN
- List.Mode
- List.Modes
- List.NonNullCount
- List.Numbers
- List.PositionOf
- List.PositionOfAny
- List.Positions
- List.Product
- List.Random
- List.Range
- List.RemoveFirstN
- List.RemoveItems
- List.RemoveLastN
- List.RemoveMatchingItems
- List.RemoveNulls
- List.RemoveRange
- List.Repeat
- List.ReplaceMatchingItems
- List.ReplaceRange
- List.ReplaceValue
- List.Reverse
- List.Select
- List.Single
- List.SingleOrDefault
- List.Skip
- List.Sort
- List.Split
- List.StandardDeviation
- List.Sum
- List.Times
- List.Transform
- List.TransformMany
- List.Union
- List.Zip

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Number functions

- Number.Abs
- Number.Acos
- Number.Asin
- Number.Atan
- Number.Atan2
- Number.BitwiseAnd
- Number.BitwiseNot
- Number.BitwiseOr
- Number.BitwiseShiftLeft
- Number.BitwiseShiftRight
- Number.BitwiseXor
- Number.Combinations
- Number.Cos
- Number.Cosh
- Number.E
- Number.Epsilon
- Number.Exp
- Number.Factorial
- Number.From
- Number.FromText
- Number.IntegerDivide
- Number.IsEven
- Number.IsNaN
- Number.IsOdd
- Number.Ln
- Number.Log
- Number.Log10
- Number.Mod
- Number.NaN
- Number.NegativeInfinity
- Number.Permutations
- Number.PI
- Number.PositiveInfinity
- Number.Power
- Number.Random
- Number.RandomBetween
- Number.Round
- Number.RoundAwayFromZero
- Number.RoundDown
- Number.RoundTowardZero
- Number.RoundUp
- Number.Sign
- Number.Sin
- Number.Sinh
- Number.Sqrt
- Number.Tan
- Number.Tanh
- Number.ToText

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Table functions

- Table.AddColumn
- Table.AddIndexColumn
- Table.AddJoinColumn
- Table.AddKey
- Table.AggregateTableColumn
- Table.AlternateRows
- Table.Buffer
- Table.Column
- Table.ColumnCount
- Table.ColumnNames
- Table.ColumnsOfType
- Table.Combine
- Table.CombineColumns
- Table.Contains
- Table.ContainsAll
- Table.ContainsAny
- Table.DemoteHeaders
- Table.Distinct
- Table.DuplicateColumn
- Table.ExpandListColumn
- Table.ExpandRecordColumn
- Table.ExpandTableColumn
- Table.FillDown
- Table.FillUp
- Table.FilterWithDataTable
- Table.FindText
- Table.First
- Table.FirstN
- Table.FirstValue
- Table.FromColumns
- Table.FromList
- Table.FromPartitions
- Table.FromRecords
- Table.FromRows
- Table.FromValue
- Table.FuzzyJoin
- Table.FuzzyNestedJoin
- Table.Group
- Table.HasColumns
- Table.InsertRows
- Table.IsDistinct
- Table.IsEmpty
- Table.Join
- Table.Keys
- Table.Last
- Table.LastN
- Table.MatchesAllRows
- Table.MatchesAnyRows
- Table.Max
- Table.MaxN
- Table.Min
- Table.MinN
- Table.NestedJoin
- Table.Partition
- Table.PartitionValues
- Table.Pivot
- Table.PositionOf
- Table.PositionOfAny
- Table.PrefixColumns
- Table.Profile
- Table.PromoteHeaders
- Table.Range
- Table.RemoveColumns
- Table.RemoveFirstN
- Table.RemoveLastN
- Table.RemoveMatchingRows
- Table.RemoveRows
- Table.RemoveRowsWithErrors
- Table.RenameColumns
- Table.ReorderColumns
- Table.Repeat
- Table.ReplaceErrorValues
- Table.ReplaceKeys
- Table.ReplaceMatchingRows
- Table.ReplaceRelationshipIdentity
- Table.ReplaceRows
- Table.ReplaceValue
- Table.ReverseRows
- Table.RowCount
- Table.Schema
- Table.SelectColumns
- Table.SelectRows
- Table.SelectRowsWithErrors
- Table.SingleRow
- Table.Skip
- Table.Sort
- Table.Split
- Table.SplitColumn
- Table.ToColumns
- Table.ToList
- Table.ToRecords
- Table.ToRows
- Table.TransformColumnNames
- Table.TransformColumns
- Table.TransformColumnTypes
- Table.TransformRows
- Table.Transpose
- Table.Unpivot
- Table.UnpivotOtherColumns
- Table.View
- Table.ViewFunction

Text functions

- Text.AfterDelimiter
- Text.At
- Text.BeforeDelimiter
- Text.BetweenDelimiters
- Text.Clean
- Text.Combine
- Text.Contains
- Text.End
- Text.EndsWith
- Text.Format
- Text.From
- Text.FromBinary
- Text.InferNumberType
- Text.Insert
- Text.Length
- Text.Lower
- Text.Middle
- Text.NewGuid
- Text.PadEnd
- Text.PadStart
- Text.PositionOf
- Text.PositionOfAny
- Text.Proper
- Text.Range
- Text.Remove
- Text.RemoveRange
- Text.Repeat
- Text.Replace
- Text.ReplaceRange
- Text.Reverse
- Text.Select
- Text.Split
- Text.SplitAny
- Text.Start
- Text.StartsWith
- Text.ToBinary
- Text.ToList
- Text.Trim
- Text.TrimEnd
- Text.TrimStart
- Text.Upper

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Time functions

- Time.EndOfHour
- Time.From
- Time.FromText
- Time.Hour
- Time.Minute
- Time.Second
- Time.StartOfHour
- Time.ToRecord
- Time.ToText

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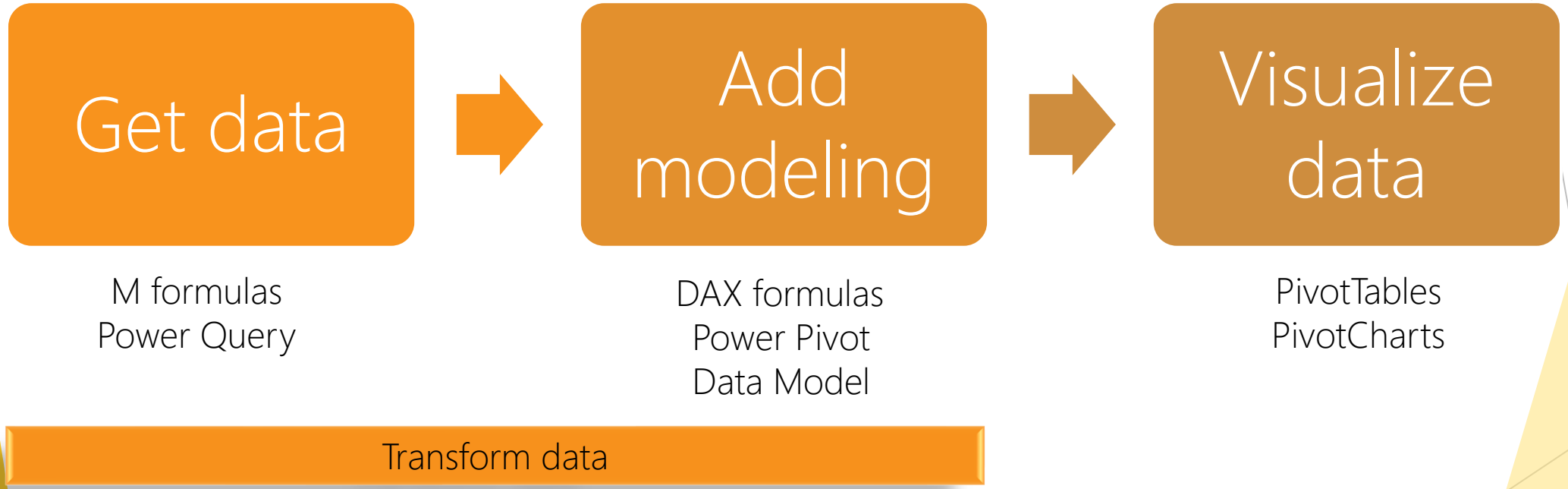
Get and Transform Workflow



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Power BI Desktop versus Power BI Service

- Power BI Desktop
  - Many data sources
  - Transforming
  - Shaping & modeling
  - Measures
  - Calculated columns
  - Python
  - Themes
  - RLS creation
- Power BI Service
  - Some data sources
  - Dashboards
  - Apps & Workspaces
  - Sharing
  - Dataflow creation
  - Paginated reports
  - RLS management
  - Gateway connections
- Both
  - Reports
  - Visualizations
  - Security
  - Filters
  - Bookmarks
  - Q&A
  - R visuals

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Power BI Service – Free versus Pro

- Both Free and Pro have:
  - Connect to data sources
  - Publish to Web
  - Export to PowerPoint, Excel and CSV
- Only Pro has:
  - Peer-to-peer sharing
  - Apps distribution and workspaces
  - Email subscription
  - Embed APIs and controls
  - Analyze in Excel and Analyze in Power BI Desktop

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Power BI Service Terminology

- Datasets
- Reports
- Dashboards
- My Workspace
- Other Workspaces
- Apps
- Security Groups

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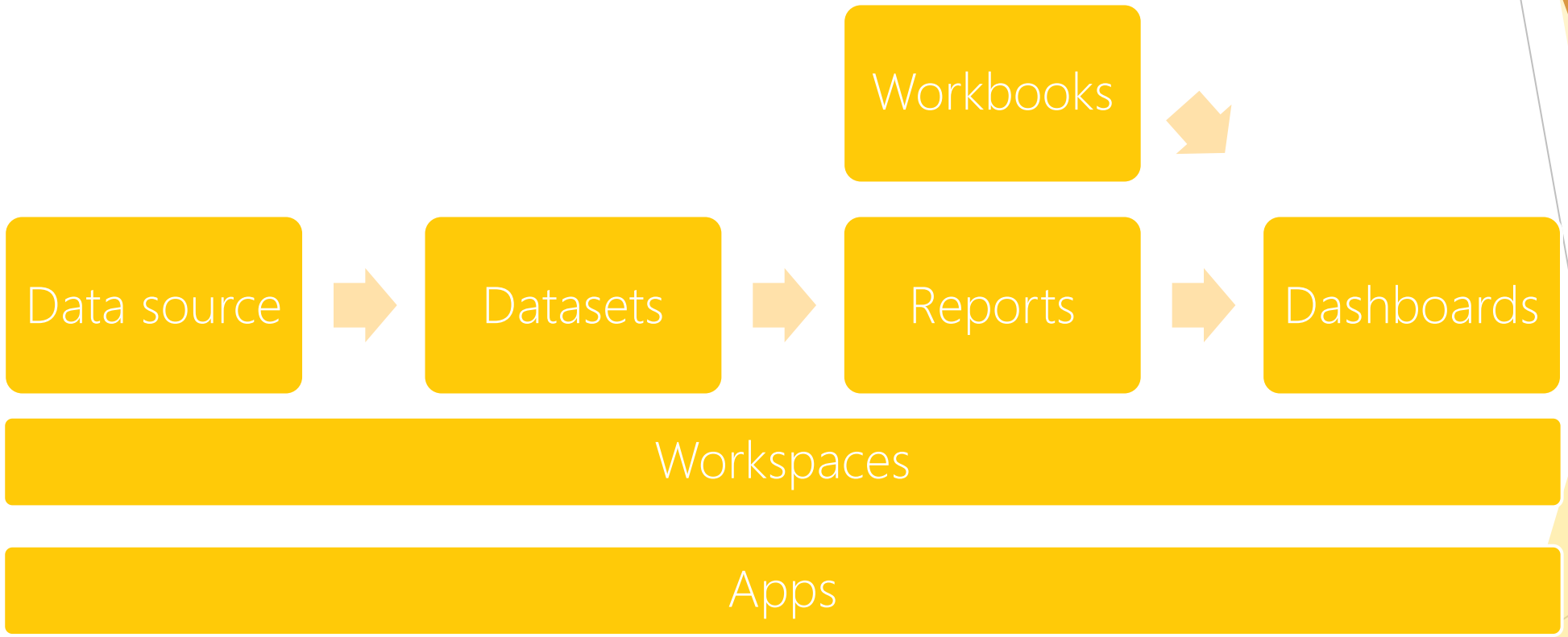
Power BI Service Terminology



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On-premises data gateway (personal mode): Data Sources

- All online data sources shown in Power Query.
- All on-premises data sources shown in Power Query except for Hadoop file (HDFS) and Microsoft Exchange.
- All online data sources shown in Power Pivot.
- All on-premises data sources shown in Power Pivot except for Hadoop file (HDFS) and Microsoft Exchange.

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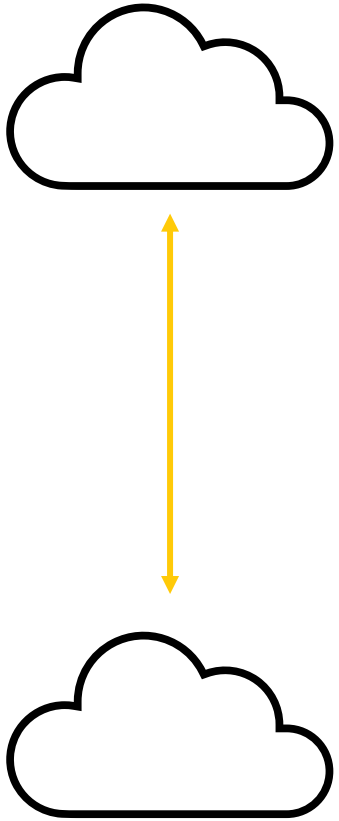
Location of datasets

- Data sources that reside in the cloud
  - Credentials can be edited in “Data source credentials”.



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Location of datasets

- Data sources that reside on-premises
- Data sources from both on-premises and cloud

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Differences in on-premises data gateway

	On-premises data gateway ~~(Enterprise)~~	On-premises data gateway (personal mode)
Cloud services supported	Power BI, PowerApps, Azure Logic Apps, Power Automate, Azure Analysis Services, dataflows	Power BI (one per user, not one per computer)
Runs	As configured by users who have access to the gateway	As you for Windows authentication and as configured by you for other authentication types
Can install only as computer admin; centralized gateway and data source management; LiveConnect support for Analysis Services; DirectQuery support	Yes	No
Import data and schedule refresh	Yes	Yes
Supports R and Python	No	Yes

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Refresh

- Up to 8 times a day for Power BI Pro
- Up to 48 times a day for Power BI Premium
- May take up to an hour to start.
- Cannot take longer than two hours to refresh (five hours for Premium)
- Will no longer refresh if:
  - There is a failure four times in a row, or
  - No report which uses this dataset has been viewed in the last two months.
- Option to "Send refresh failure notification emails to me" and "Email these users when the refresh fails".

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Roles in the new workspaces

- Admin
  - Update and delete the workspace.
  - Add/remove people, including other admins.
  - Allow Contributors to update the app for the workspace
- Member (or above)
  - Add members or others with lower permissions.
  - Publish and change permissions for an app
  - Update an app.
  - Share an item or share an app.
  - Allow others to reshare items.
  - Feature apps on colleagues' Home

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Roles in the new workspaces

- Contributor
  - **Update an app (if allowed)**
  - Feature dashboards and reports on colleagues' Home
  - Create, edit, and delete content in the workspace.
  - Publish reports to the workspace, delete content.
  - Create a report in another workspace based on a dataset in this workspace.
  - Copy a report (if you have Build permission for the dataset).
  - If you have permissions on the Gateway:
    - Schedule data refreshes via the on-premises gateway
    - Modify gateway connection settings.
- Viewers
  - View and interact with an item
    - Need Power Pro BI license, or items in a Power BI Premium workspace.
  - Read data stored in workspace dataflows

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Recommend a Development Lifecycle Strategy

- Requirements
  - Power BI Premium workspace
  - One workspace per pipeline
  - Capacity admin
- Advantages
  - Increased productivity
  - Faster delivery of content
  - Less chance of error

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Recommend a Development Lifecycle Strategy

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SalesPipeline

Access Settings ...

Development Learn more

No workspace has been assigned to this stage.

Test Learn more

No workspace has been assigned to this stage.

Production Learn more

No workspace has been assigned to this stage.

Assign a workspace for this pipeline

This is where you'll manage, update, and move your workspace content through the deployment stages, all the way until it reaches your users. Learn more

Assign a workspace

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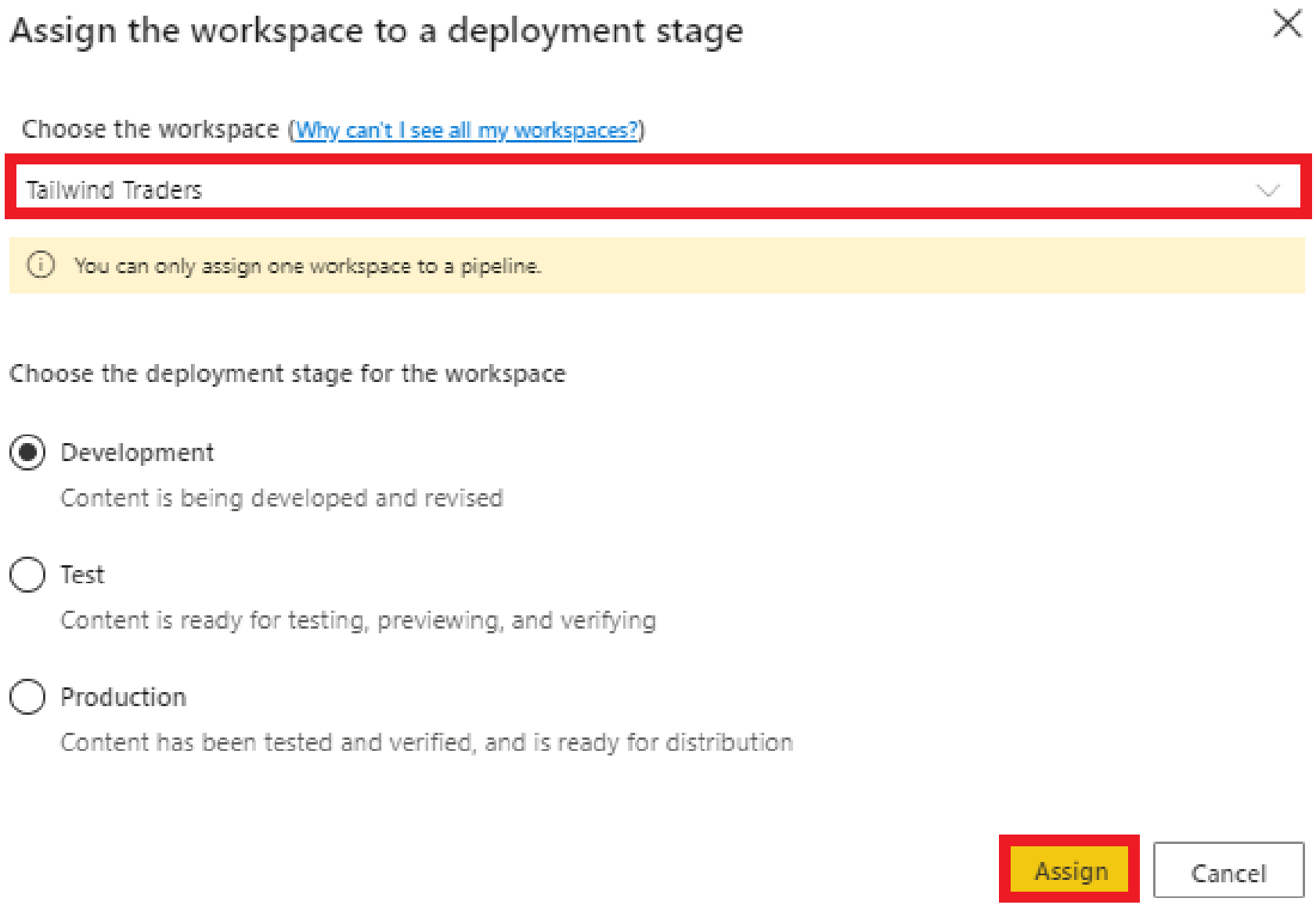
Development – Testing – Production



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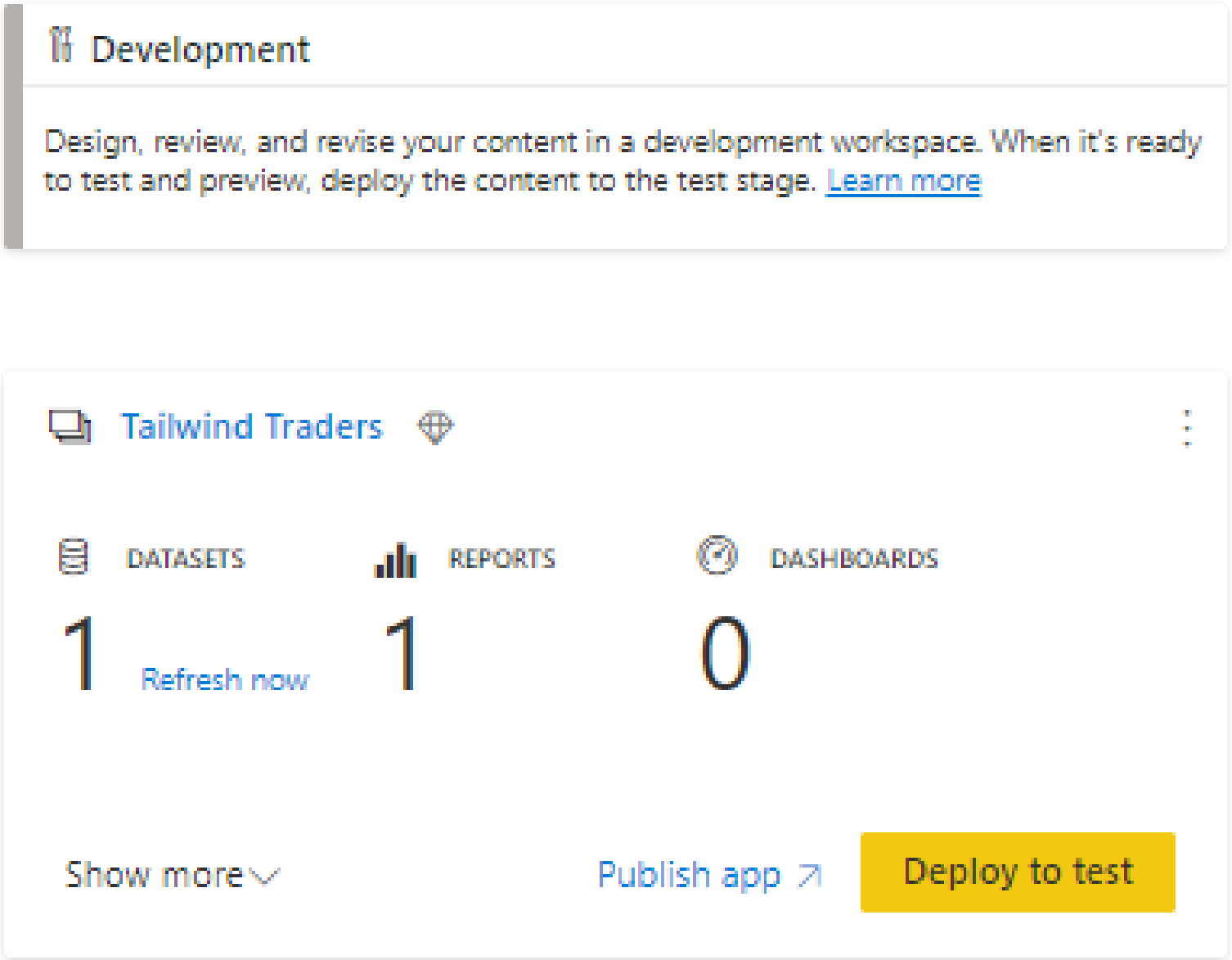
Development – Testing – Production



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Development – Testing – Production

Test

Test and verify your content in a preproduction workspace. When it's ready to distribute, deploy the content to the production stage. Learn more

Data source rules

No rules were added yet

Define the data source that will be connected to this dataset.

Add rule

Data source rules

Some data sources aren't supported by deployment pipelines. Learn more

Replace this data source	With this
c:\users\ data\dev\orders.csv	c:\users\data\test\orders.csv

Add rule

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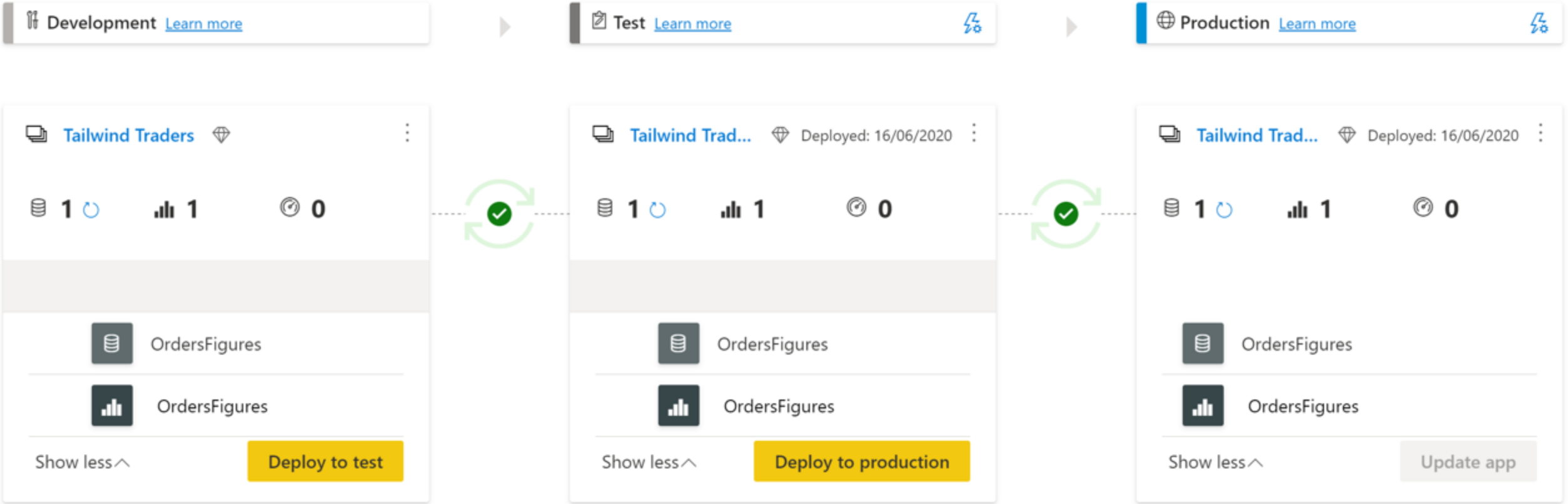
Development – Testing – **Production**



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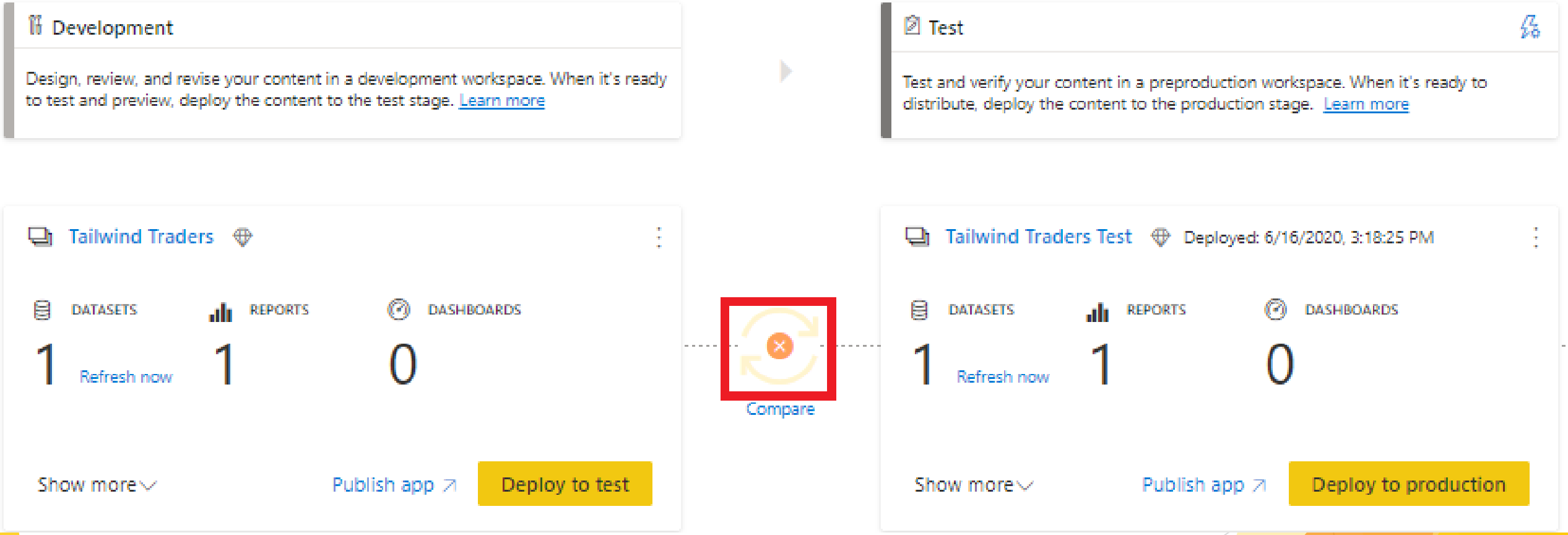
Comparison



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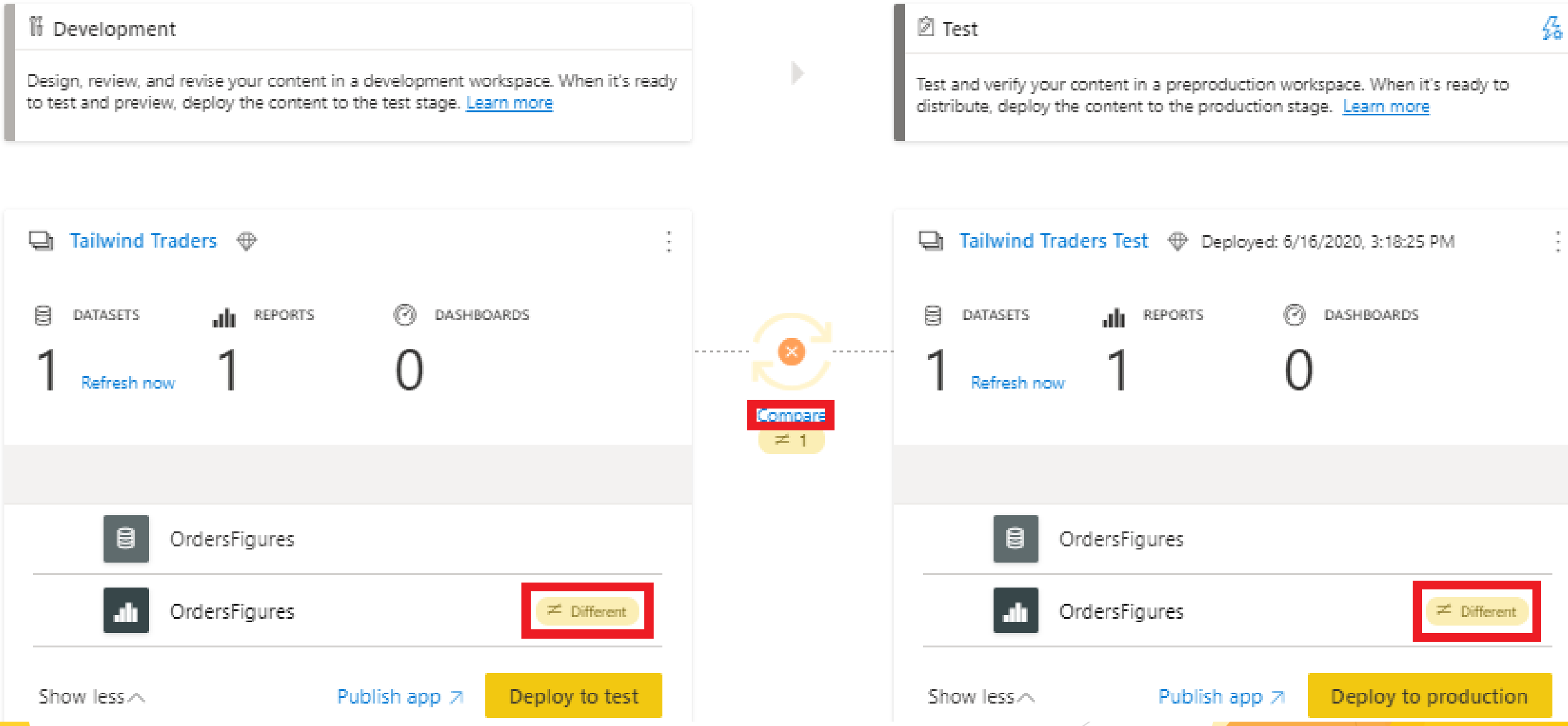
Comparison



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