Pragmatic Works

Data Security in Power BI
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Thank you Sponsors

Something about me...

- At Pragmatic Works for over 3 years
- Married 25 years this summer
- 4 kids – 22, 20, 18, 16
- Survived the Azure Infrastructure Exam – 70-533
- Partner Cloud Solution Architect with Microsoft
- Blog: www.dataonwheels.com
- Linked In: https://www.linkedin.com/in/dataonwheels Connect with me

The Case for Power BI
What sets Power BI apart?

- Continual Improvement

- Real-time Dashboards

- Natural Language

- Integration with Excel

- Custom Visualizations

- Integration with Power Apps and Flow

- Quick Insights with Azure Machine Learning
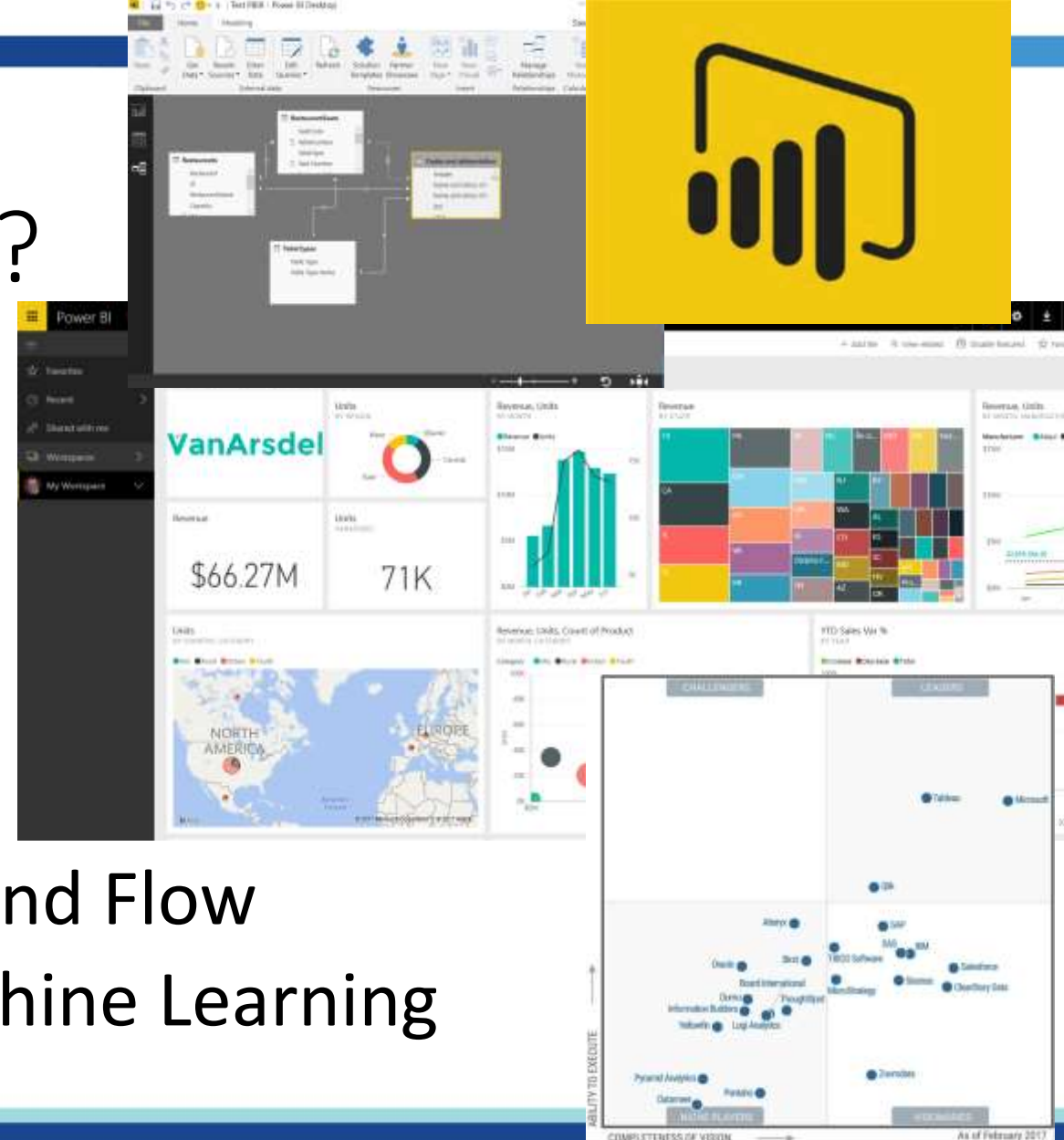
Common Security Concerns

- Can I trust the cloud? Can I trust Azure?

- Who owns my data and access to it?

- Does a hybrid scenario expose my datacenter?

- Who can publish data to the cloud?
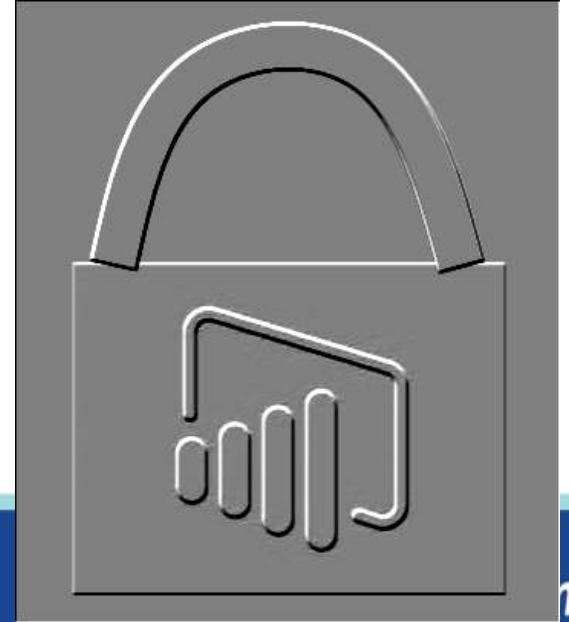
Data Compliance and Security in Power BI

Compliance

HIPAA/HITECH   EU Model Clauses   ISO/IEC 27001   ISO/IEC 27018   UK G-Cloud

Microsoft Trust Center

Encryption

Data at Rest

Data Source	Metadata	Data
Live Connection (Analysis Services)	Nothing stored except database name encrypted in Azure SQL DB	Nothing Stored
Direct Query (SQL Server, Oracle, etc.)	Encrypted in Azure Blob Storage	Nothing Stored
Pushed or streamed data	Encrypted in Azure Blob Storage	Depending on version, encrypted in either Azure Blob Storage or Azure SQL Database
Data loaded into model (data may be refreshable or nonrefreshable)	Encrypted in Azure Blob Storage	Encrypted in Azure Blob Storage
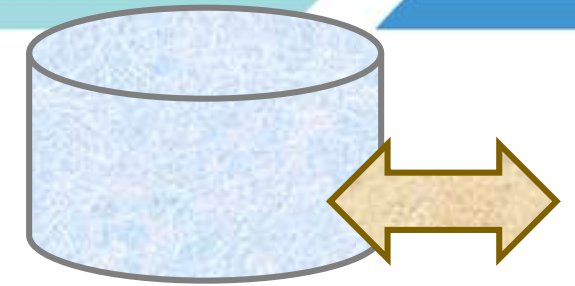
Data in Transit
All data is encrypted using HTTPS to connect from the data source to the Power BI Service

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Data in Use
Data is cached for all connection types including DirectQuery
Cached data is encrypted and stored in an Azure SQL Database

On-premises Data Gateway

- All communication and data in transit is encrypted with HTTPS

- Data Source credentials encrypted in service, key maintained on-premises

- Outgoing ports only, gateway monitors service bus for requests

- No data is stored on the gateway and the gateway service account should not have access to data sources

- Gateway access is limited on the service
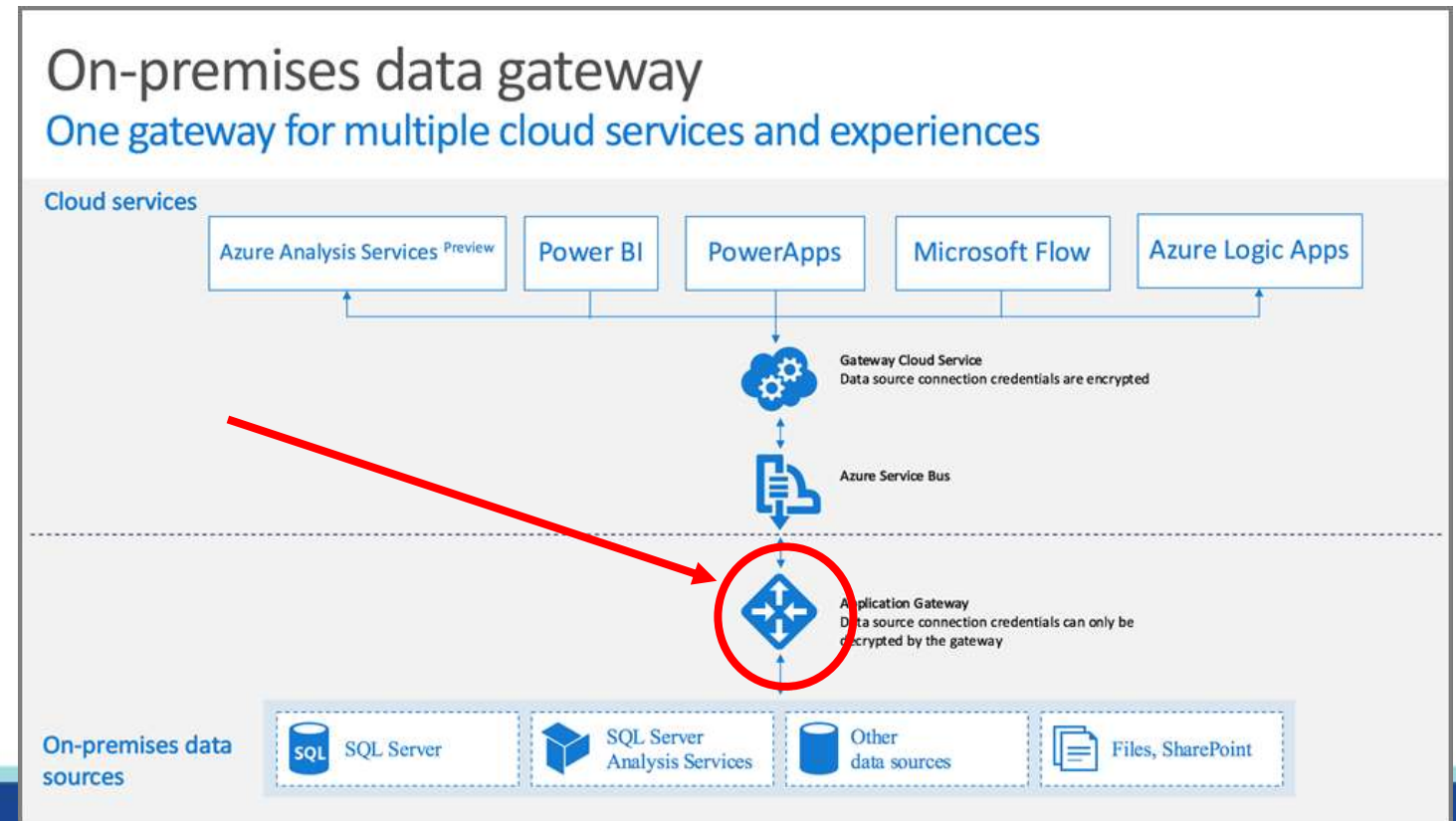
Admin Portal and Tenant Settings

- Share content with external users

  - Recommend this is disabled

- Publish to web

  - Recommend this is disabled

- Export Data, Export to PowerPoint, Printing

  - Evaluate for you needed

- Content packs

  - Allow or disallow publishing for the entire organization

PSA: Admin Portal and Tenant Settings

- Share content with external users
  - **Recommend this is disabled**

- Publish to web
  - **Recommend this is disabled**

- ## Where to disable these features

  - They are on by default

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Row Level Security

- Row Level Security with Power BI
- Works in Workspaces with members with read permissions only
- Uses DAX expressions
- Implemented in Power BI Desktop
- Row Level Security with Live Connections
- SQL Server Analysis Services only
- Uses EffectiveUserName through gateway
- Data Source connections require Admin access in SSAS

Collaboration and Data Security

Power BI Apps & App Workspaces

- Supports shared development

- Supports staged deployment

- Apps keep the content organized together unlike content packs

- **Power BI Apps support deploying Read Only assets for distribution to Pro Users and Premium Users**

- **Can only add users to workspaces (no security groups)**

Power BI Premium and Readonly Users

- Supports Readonly Using Apps
- Supports "unlimited" readonly, free users
- Contributors require Power BI Pro licenses

- Power BI Premium is "server based" thus providing additional security via physical separation of server assets.

- Entry level – P1 $5000/month

Groups, groups, groups

- Office 365 Supports 4 Types of Groups
  - Office 365 – recommended by Microsoft, not necessarily admins
    - Used with Power BI Workspaces
    - Pro users can create from Power BI
    - Managed by user membership, does not support other groups
  - Distribution List – email support
  - Mail-enabled Security Group – like a typical AD Group with an email
  - Security Group – a typical AD Group, no email

Sharing Discussion

- Why share?
  - Not bound to workspace and app scope
  - One off scenarios, validation, testing
- Sharing cannot be prevented within your organization
  - Any pro user can share content
- Sharing can be turned off for sharing outside your organization

Guest Users, Email, Sharing "outside the walls"

- Significantly enhanced in January 2018 and March 2018
- **Guest Users creation can be limited in Power BI Tenant Settings, Office 365 Security Settings, and Azure Active Directory Settings**
- Email sharing "Share your Power BI content with anyone by email"
  - Done the same way as normal sharing
  - Email can be personal (e.g. @gmail.com) or a different organization
  - Power BI Apps can be shared the same way
- **If you allow Power BI Pro users to share this way, you are giving them permission to create guest accounts in Azure Active Directory**

Auditing and Logging

Auditing Power BI

- Dashboard Usage Metrics
  - Newly released
  - Dashboard view
  - 90 days of data
  - Up to 24 hour lag in data
  - Available to the report designers
  - Views, viewers, shares
  - Customizable options

- Usage Metrics in Admin Portal
  - Subscription view
  - Only available to Power BI Admins
  - Users, groups, assets
  - Fixed view

Audit Logs in Office 365

- Some of the Power BI Activites Logged
  - Viewed Power BI Dashboard
  - Edited Power BI Dashboard
  - Shared Power BI Dashboard
  - Created Power BI Dashboard
  - Deleted Power BI Dashboard
  - Printed Power BI Dashboard
  - Exported Power BI tile data
  - **Viewed Power BI Report**
  - Deleted Power BI Report
  - Printed Power BI Report Page
  - Analyzed Power BI dataset

- Downloaded Power BI Report
- Exported Power BI report visual data
- Published Power BI Report
- Deleted Power BI datasets
- Created Power BI Group
- Added Power BI Group members
- Created organizational content pack
- Updated organization's Power BI settings
- Started Power BI trial
- Started Power BI extended trial

Sample Log Content

- Parameters
  - Activities: "Created Power BI Dashboards"
  - Date Range: 5/1/17 to 6/11/17
  - Users: not set
  - Results 4 results found   Filter results   Export results ▾

Date ▾	IP address	User	Activity	Item	Detail
2017-06-08 10:29:14	174.30.246.192	steve@dataonwheels.com	Created Power BI dashboard	Power BI Mapping Dashboard	
2017-05-19 13:43:23	167.220.152.7	mike.dostal@dataonwheels.com	Created Power BI dashboard	.VanArsdel With RLS	
2017-05-09 11:14:54	63.239.226.253	steve@dataonwheels.com	Created Power BI dashboard	.VanArsdel2	
2017-05-09 11:14:54	63.239.226.253	steve@dataonwheels.com	Created Power BI dashboard	.VanArsdel2	

Power BI Audit Log Analytics Solution

- Steve Howard, @AngryAnlaytics, Microsoft TSP
- Powershell -> CSV -> Power BI solution
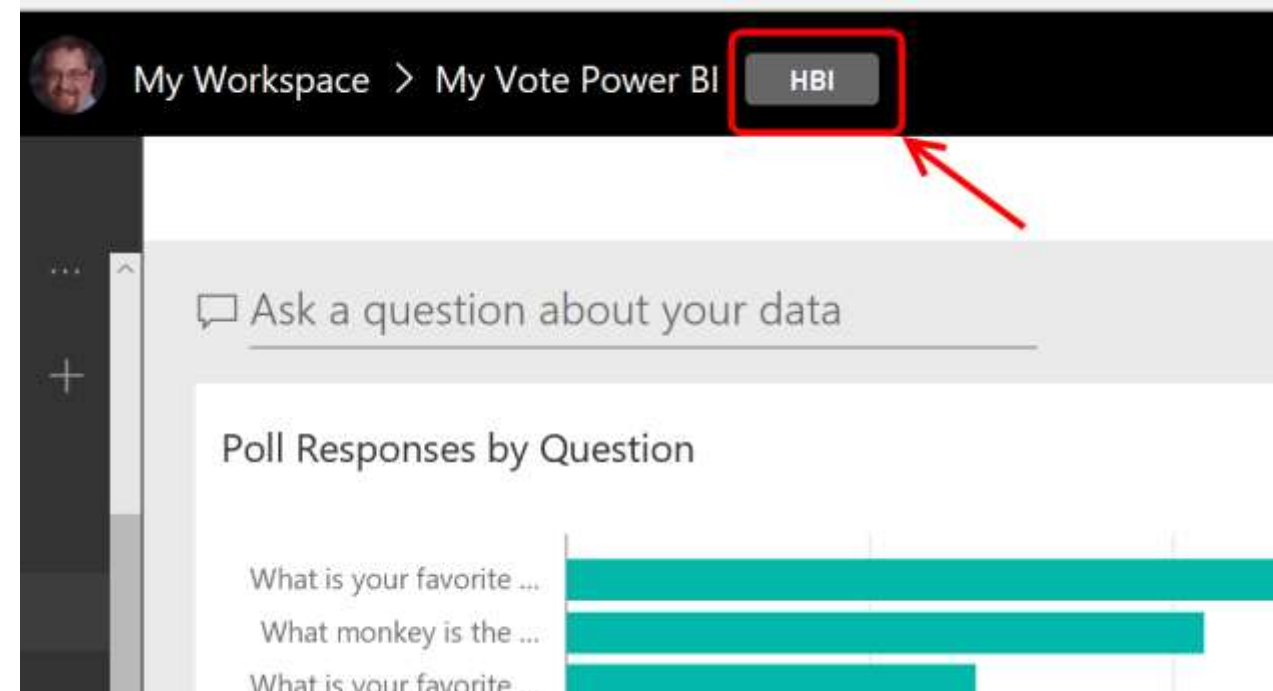- http://angryanalyticsblog.azurewebsites.net/index.php/2018/02/16/power-bi-audit-log-analytics-solution/

Report Usage

- Content creators can see report and dashboard usage metrics

Data Classification

- Labeling not security
- Requires processes and rules, but not automatically enforceable
- Only on dashboards
- Set up in Tenant Settings

Wrap Up

- Power BI manages data security very well
- Power BI is continually improving (e.g. tenant settings were released early in 2017, Premium later in 2017)
- Most roadblocks to Power BI use are internal politics not real issues with Power BI
- Power BI is not perfect – still looking for that Read Only license

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- RESOURCES:

- www.dataonwheels.com – Category: Power BI Data Security
  - https://dataonwheels.wordpress.com/category/power-bi-data-security/
  - 5 posts on Compliance and Encryption, Gateway, Sharing, Classification and Privacy Levels, and RLS

- Microsoft Trust Center - https://www.microsoft.com/en-us/trustcenter

- Power BI Security - https://powerbi.microsoft.com/en-us/documentation/powerbi-admin-power-bi-security/

- Power BI Training – www.pragmaticworks.com

- Audit Logging - http://angryanalyticsblog.azurewebsites.net/index.php/2018/02/16/power-bi-audit-log-analytics-solution/