Slide 1

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PROMISE ELITMIND ITMAGINATION *Imagine it. Done.* THEOBALD SOFTWARE

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dbWatch querona Data Scientist as a Service UBS VOLVO *Volvo Group IT*

STRATEGIC PARTNER
Microsoft

Slide 2

What are all those Azure* and Power* services and why do I want them?

Dr Greg Low
SQL Down Under
greg@sqldownunder.com

Slide 3

Who is Greg?

- CEO and Principal Mentor at SDU
- Data Platform MVP
- Microsoft Regional Director
- Certified Master for SQL Server
- Author
- Past PASS global board member

SQL DOWN UNDER
Microsoft Regional Director
MVP Microsoft Most Valuable Professional
Microsoft CERTIFIED Master

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Slide 4

What we'll cover

(Lots in a hurry)
- SQL databases
- Other data services
- Analytics, Apps, and Automation
- IoT and Intelligence
- Identity

(Most time spent on things you might not have seen)

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Slide 5

What we're not discussing: IaaS

On premises | Hybrid Cloud

Shared
Lower cost

Platform as a service | Software as a service

Infrastructure as a service | Azure SQL Database Virtualized Databases

Virtual | SQL Server in Azure VM Virtualized Machines

Physical | SQL Server Private Cloud Virtualized Machines + Appliances

SQL Server Physical Machines (raw iron)

Dedicated Higher cost

Higher administration | Lower administration | Off premises

Image: MSDN

Slide 6

Why PaaS and SaaS?

- Avoid infrastructure costs
  - Servers, storage, networking, middleware
- Billing by the hour
- Add resources dynamically
  - Without extra resource-related staff
- Declarative management

Image: Keith Allison (2012)
https://www.flickr.com/photos/keithallison/7655696048/

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Why PaaS?

- Faster development
- Better supporting infrastructure
- Existing tools
- Basis of most future apps

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SQL Database
A managed cloud database for app developers

- Same codebase
  – Some differences
- Built-in HA and failover
- Scale up/down dynamically
  – DTUs
  – Tiers determine features
- Threat detection
- Auto-administration ?
- Auto-tuning?

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Elastic DB options

- Multi-tenant options
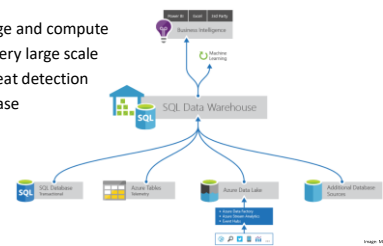- Up to 400 DBs per pool
- eDTUs
- Elastic query
- Elastic jobs

Image: MSDN

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SQL Data Warehouse
True cloud elasticity for freedom with control

- Decoupled storage and compute
- Easy to achieve very large scale
- Auditing and threat detection
- Integrated Polybase

Image: MSDN

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Storage
Offload the heavy lifting of data centre management

- Storage types:
  – BLOB
  – Table (NOSQL lite)
  – Disk (premium storage), File
  – Queue
- Full REST API
- Integration in SSMS
- Azure Storage Explorer

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Azure Search
Cloud search service for web and mobile app development

- Rapid provisioning & scale
- Natural language processing
- Integrated indexers
- Geo-spatial search
- Ranking-based results

Image: MSDN

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Azure Cosmos DB
Globally distributed, multi-model database service

- Limitless scale NOSQL database
- Focus on storing and retrieving JSON
- Low latency
- Global replication
- SQL-like language
- Auto-indexing
- Consistency levels

```
1 SELECT food.id,
2        food.description,
3        food.tags,
4        food.foodGroup
5 FROM food
6 WHERE food.foodGroup = "Snacks" and food.id = "19015"
```

```
{
    "id": "19015",
    "description": "Snacks, granola bars, hard, plain",
    "tags": [
    {
        "name": "snacks"
    },
    {
        "name": "granola bars"
    },
    {
        "name": "hard"
    },
    {
        "name": "plain"
```

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Demo: Storage and CosmosDB

- SSMS and storage
- Azure Storage Explorer
- CosmosDB – Query Playground

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Azure Analysis Services
Proven analytics engine

- Tabular data model as a service
- Larger data than Power BI
- Accelerate time to delivery
- Familiar tools and usage
- Licensing
  - Developer, Basic, Standard
  - Measured in QPUs

Image: MSDN
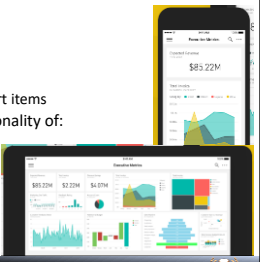
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Power BI

- Cloud-based portal
  - Dashboards, reports, and Q&A
  - Can edit in portal
  - Can deploy some SSRS and mobile report items
- Desktop tool integrates previous functionality of:
  - Power Query, Power Pivot, Power View
- Windows, iOS, Android apps
  - PCs, tablets, and phones
- Custom visuals and developer interfaces

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Demo: Power BI and Custom Visuals

- Power BI
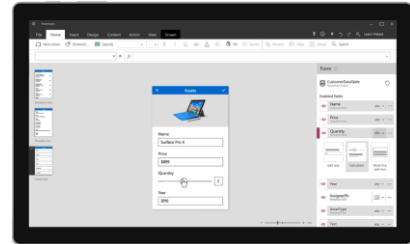- Custom visuals gallery (moving to Office Store)

Power Apps

Image: PowerApps.com

Logic Apps
Quickly build powerful integration solutions

- Visually create business workflows and logic
- Integrate with both SaaS and enterprise apps
- Automate EAI, B2B/EDI processes
- Large number of out of the box connectors
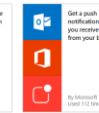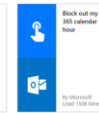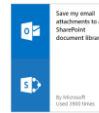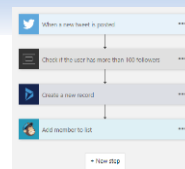- Targeted at B2B/enterprise messaging

Flow

Work less, do more

Azure Functions
Process events with a serverless code architecture

- Support for many languages
  - Including JavaScript, C#, F#
  - Scripting options Python, PHP, Bash, Batch and PowerShell
- On call or timer-based processing
- Serverless
  - Web
  - Stream processing
  - Mobile back-ends, etc.

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Tap into the Internet of your things with Azure IoT Suite

- Becoming very important, very fast
- Instant provisioning
- Large volumes of data
- Real-time analytics
  - Predictive
  - Monitoring
- Some preconfigured solutions

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Event Hubs
Cloud-scale telemetry ingestion from websites, apps and any streams of data

- Log events
  - HTTP(S) interface
  - AMQP support (cross platform)
  - Millions per second
  - Time-based buffering
- Elastic scale
- Native client libraries

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Stream Analytics
Real-time stream processing in the cloud

- Real time event processing
  - At very high speed
  - Locate gaps, correct out-of-order data
  - Power BI supports streaming datasets
- SQL like language
- Correlate
  - Streams of data
  - Reference data
- Time-based window aggregates
  - Hopping, jumping, tumbling
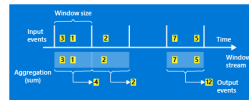
```
SELECT System.TimeStamp AS WindowEnd, TollId, COUNT(*)
FROM Input TIMESTAMP BY EntryTime
GROUP BY TollId, TumblingWindow(Duration(hour, 1), Offset(millisecond, -1))
```

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Machine Learning
Powerful cloud-based analytics, now part of Cortana Intelligence Suite

- Cloud-based predictive analytics platform
- Solid data science base
  - Microsoft Professional Program for Data Science
- Provision externally callable predictive web services
- Embedded R, Python, and SQL support (SQL Lite)

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Demo: Machine Learning

- Machine Learning

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Cortana Intelligence Suite
Turn your data into intelligent action

- Superb set of available services
  - Many, many more coming
- REST-based webservice calls
- Augment application power
- Many FPGA based engines

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Cortana - Language

Language Understanding Intelligent Service PREVIEW
Teach your apps to understand commands from your users

Text Analytics API PREVIEW
Easily evaluate sentiment and topics to understand what users want

Web Language Model API PREVIEW
Use the power of predictive language models trained on web-scale data

Bing Spell Check API
Detecting and correcting spelling mistakes in your app

Translator Text API
Easily conduct automatic text translation with a simple REST API call

Cortana – Speech, Search, Knowledge

Bing Speech API PREVIEW
Convert speech to text and back again to understand user intent

Speaker Recognition API PREVIEW
Use speech to identify and authenticate individual speakers

Translator Speech API
Easily conduct real-time speech translation with a simple REST API call

Custom Speech Service
Overcome speech recognition barriers like speaking style, background noise, and vocabulary

Bing Search APIs
Web, image, video and news search APIs for your app

Bing Autosuggest API
Give your app intelligent autosuggest options for searches

Recommendations API PREVIEW
Predict and recommend items that your customers want

Academic Knowledge API PREVIEW
Tap into the wealth of academic content in the Microsoft Academic Graph

Image: MSDN

Cortana - Vision

Face API PREVIEW
Detect, analyse, organise and tag faces in photos

Emotion API PREVIEW
Personalise user experiences with emotion recognition

Computer Vision API PREVIEW
Distil actionable information from images

Content Moderator PREVIEW
Automated image, text and video moderation

Image: MSDN

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Azure Active Directory
Identity and access management for the cloud

- Cloud-based AD
  - MFA
  - Cloud-based password reset
  - Widespread app adoption
- Hybrid options possible
  - AAD Connect
  - Directory services
  - AAD will eventually become core AD
  - Used by gateways to on-premises data
- Critical to tackle this early

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Call to Action !

- Try them all (all have free tiers)
  - And there are many more (Data Lake, Data Factory, HDInsight, etc.)
- Microsoft Professional Program for Data Science
- For SQL, get our new Tools
  - Register at www.sqldownunder.com
- Dream a little ☺

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Dream a little

Thanks !

Thanks!
greg@sqldownunder.com
http://www.sqldownunder.com

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