Bioinformatics on the Microsoft Cloud

A USER’S PERSPECTIVE
Why (we) deploy in the Cloud

- Take advantage of load peaks
- Remove upfront (and often maintenance) costs
- Build to scale
Selected case studies

ConBind

• Regulatory Elements Analysis in the Cloud

Sensors Monitoring and Analytics

• Internet of Living Things
ConBind: motif-aware cross-species alignment for the identification of functional transcription factor binding sites

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ConBind

Front End
• Data Ingestion
• Results Exploration
• Export Results

Back End
• Store Genomes
• Run BLAST
• Run ConBind
• Store Results
ConBind on Microsoft Azure

- Data Ingestion
- Result Exploration
- Export

- BLAST
- Python
- C

- Genomes

Web App ➔ Service Bus ➔ Virtual Machine(s) ➔ Blob Storage

- Job Queue
- Job Status Topic

Table Storage ➔ Job Results
ConBind on Microsoft Azure

- Web App
- Service Bus
- Virtual Machine(s)
- Blob Storage
- Table Storage

- Auto Replication
- Auto Configuration
- Redundant
- Scalable
- No SQL Storage
- Scale out-of-box
- Decoupling
- Fully managed web server
- Support basically any server side
- Support staging
- Decoupling
ConBind 2.0 on Microsoft Azure

- ARM Templates
- Automatically scale compute nodes
- Stage data and execute pipelines
Internet of Living Things
Sensors Monitoring and Analytics

On Premises
- Data Exploration
- Alarms Notification

In the Cloud
- Data Ingestion
- Data Sanitization
- Real-Time Analytics
- Data Storage
Sensor Monitoring and Analytics on Microsoft Azure

- Data Exploration
- Data Export
- Alarms Notification
- On Premises
- Security and Isolation
- Service Bus
- Real-Time Notifications
- Stream Analytics
- Real-Time Analytics
- Event Hubs
- Sensor Data Ingestion
- Historical Data
- SQL Data Warehouse
- SQL

Virtual Network
Sensor Monitoring and Analytics on Microsoft Azure

- **On Premises**

- **Service Bus**
  - Scalability In Seconds
  - Scales independently compute and storage

- **Stream Analytics**
  - Real-Time Analytics
  - SQL-Like Aggregation

- **Event Hubs**
  - Scales to million of events p.s.
  - Rapid development

- **SQL Data Warehouse**

- **Virtual Network**
  - VPN
Sensor Monitoring and Analytics on Microsoft Azure

On Premises → Service Bus → Stream Analytics → Event Hubs

Virtual Network

SQL Data Warehouse → Machine Learning