



# Microsoft Azure & IBM Cloud Services

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# Microsoft Azure

## Compute

Networking

Storage

Web + Mobile

Containers

Databases

AI + Cognitive Services

Data + Analytics

Internet of Things

Enterprise Integration

Security + Identity

Developer Tools

Monitoring + Management

Other Clouds



# Compute



## Linux Virtual Machines

Provision virtual machines of Ubuntu, Red Hat, and more



## Windows Virtual Machines

Provision virtual machines for SQL Server, SharePoint, and more



## Virtual Machine Scale Sets

Manage and scale 10s to 1000s of Linux and Windows virtual machines



## Web Apps

Quickly create and deploy mission critical Web apps at scale



## App Service

Deploy web apps on Linux using containers



## Functions

Process events with serverless code



## Batch

Cloud-scale job scheduling and compute management



## Service Fabric

Develop microservices and orchestrate containers on Windows or Linux



## Cloud Services

Create highly available, infinitely scalable cloud applications and APIs



# Networking



## Networking Overview

An integrated view of the networking services in Azure



## Virtual Network

Provision private networks, optionally connect to on-premises datacenters



## Load Balancer

Deliver high availability and network performance to your applications



## Application Gateway

Layer 7 Load Balancer with built-in HTTP load balancing and delivery control



## VPN Gateway

Establish secure, cross-premises connectivity



## Azure DNS

Host your DNS domain in Azure



## CDN

Deliver content to end-users through a robust network of global data centers



## Traffic Manager

Route incoming traffic for high performance and availability



## ExpressRoute

Dedicated private network fiber connections to Azure

# Storage



## Storage

Durable, highly available, and massively scalable cloud storage



## Blob Storage

Massively scalable object storage for unstructured data



## Disks

Disks storage for VMs



## File Storage

Simple, distributed, cross platform file system



## Queue Storage

Durable queues for large-volume cloud services



## Data Lake Store

Hyperscale repository for big data analytics workloads



## StorSimple

Hybrid cloud storage for enterprises that improves data security



## Backup

Simple and reliable server backup to the cloud



## Site Recovery

Orchestrate protection and recovery of private clouds

# Web + Mobile



## Web Apps

Quickly create and deploy mission critical Web apps at scale



## Mobile Apps

Build and host the backend for any mobile app



## API Apps

Easily build and consume Cloud API



## Logic Apps

Automate the access and use of data across clouds without writing code



## CDN

Deliver content to end-users through a robust network of global data centers



## Media Services

Encode, store, and stream video and audio at scale



## Search

Fully managed search-as-a-service



## Mobile Engagement

Increase app usage and user retention



## Notification Hubs

A scalable, push notification engine for quickly sending millions of messages

# Container



## Azure Container Service

Scale and orchestrate containers using Kubernetes, DC/OS or Docker Swarm



## Azure Container Registry

Store and manage container images across all types of Azure deployments



## Azure Container Instances

Easily run containers with a single command



## App Service

Deploy web apps on Linux using containers



## Batch

Cloud-scale job scheduling and compute management



## Service Fabric

Develop microservices and orchestrate containers on Windows or Linux

# Databases



## SQL Database

Managed relational database-as-a-service



## SQL Data Warehouse

Elastic data warehouse-as-a-service with enterprise-class features



## SQL Server Stretch Database

Dynamically stretch on-premises SQL Server databases to Azure



## Azure Cosmos DB

Globally distributed, multi-model database for any scale



## PostgreSQL

Managed PostgreSQL database service for app developers



## MySQL

Managed MySQL database service for app developers



## Redis Cache

High throughput, low latency data access to build fast/scalable applications



## Data Factory

Orchestrate and manage data transformation and movement



# AI + Cognitive Services



## Computer Vision

Distill actionable information from images



## Face

Detect, identify, analyze, organize, and tag faces in photos



## Bing Web Search

Connect powerful web search to your apps



## Custom Speech Service

Overcome speech recognition barriers



## Custom Vision Service

A customizable web service that learns to recognize specific content in imagery



## Video Indexer

Search, edit, analyze, and learn from your videos



## Language Understanding Intelligent Services (LUIS)

Teach your apps to understand commands from your users



## Bing Custom Search

Build the search results you're looking for

# Data + Analytics



## HDInsight

Provision cloud Hadoop, Spark, R Server, Hbase, and Storm clusters



## Machine Learning

Powerful cloud-based predictive analytics tool to enable predictive maintenance



## Stream Analytics

Real-time data stream processing from millions of IoT devices



## Data Catalog

Enable self-service data source discovery across the enterprise



## Data Lake Analytics

Distributed analytics service that makes big data easy



## Data Lake Store

Hyperscale repository for big data analytics workloads



## Data Factory

Orchestrate and manage data transformation and movement



## Power BI Embedded

Embed fully interactive, stunning data visualizations in your applications



## Analysis Services

Enterprise-grade data modeling in the cloud

# IOT



## IoT Developer Center

Get started connecting your devices



## Azure IoT Hub

Connect, monitor, and control billions of IoT assets



## IoT Hub Device Provisioning Service

Zero-touch, just-in-time provisioning for Azure IoT Hub



## Azure IoT Suite

Capture and analyze untapped data to improve business results



## Event Hubs

Receive telemetry from millions of devices



## Stream Analytics

Real-time data stream processing from millions of IoT devices



## Machine Learning

Powerful cloud-based predictive analytics tool to enable predictive maintenance



## Notification Hubs

A scalable, push notification engine for quickly sending millions of messages



## Time Series Insights

Instantly explore and analyze time-series data

# Enterprise Integration



## Logic Apps

Automate the access and use of data across clouds without writing code



## Service Bus

Connect across private and public cloud environments



## API Management

Publish APIs to developers, partners, and employees securely and at scale



## StorSimple

Hybrid cloud storage for enterprises that improves data security



## SQL Server Stretch Database

Dynamically stretch on-premises SQL Server databases to Azure



## Data Factory

Orchestrate and manage data transformation and movement



## Biztalk Services

Seamlessly integrate the enterprise and the cloud

# Security + Identity



## Security Center

Prevent, detect, and respond to threats with increased visibility



## Key Vault

Learn how to manage cryptographic keys and secrets



## Azure Active Directory

Synchronize on-premises directories and enable single sign-on



## Azure Active Directory B2C

Consumer identity and access management in the cloud



## Active Directory Domain Services

Join Azure virtual machines to a domain without domain controllers



## Multi-Factor Authentication

Safeguard access to your data and apps with an extra level of authentication



## Security Information

Learn how Azure provides a secure infrastructure to build cloud solutions

# Developer Tools



## Visual Studio Team Services

Services for teams to share code, track work, and ship software



## Azure DevTest Labs

Quickly create environments using reusable templates and artifacts



## Application Insights

Detect, triage, and diagnose issues in your web apps and services



## API Management

Publish APIs to developers, partners, and employees securely and at scale



## HockeyApp

Deploy mobile apps, collect feedback and crash reports, and monitor usage

# Monitoring + Management



## Application Insights

Detect, triage, and diagnose issues in your web apps and services



## Log Analytics

Learn how to transform machine data into operational intelligence



## Automation

Simplify cloud management with process automation



## Backup

Simple and reliable server backup to the cloud



## Site Recovery

Orchestrate protection and recovery of private clouds



## Scheduler

Run your jobs on simple or complex recurring schedules



## Azure Monitor

Highly granular and real-time monitoring data for any Azure resource



## Billing

Learn how to read/understand the usage and bill for your Azure subscription



## Azure Advisor

Improve the cost effectiveness, performance, high availability, and security of your Azure resources

# Other Clouds



## **Microsoft Azure US Government**

Build and host applications for US Government missions in a dedicated instance of Azure



## **Microsoft Azure Germany**

Build and host applications in compliance with German regulations as well as key international standards, with additional control by a data trustee



## **Microsoft Azure Stack**

Deliver Azure services from your own datacenter with this new hybrid cloud platform





IBM Cloud

## Compute

Bare metal servers

POWER8 servers

Virtual servers

## Storage

Block storage

File storage

Object storage

## Networking

Direct link

Load balancing

Network appliances

Virtual private network

## High-speed data transfer

## Data & analytics

Advanced analytics

Business analytics (US)

Cloud databases

Data and analytics platform

Data integration and governance

Data warehousing

Enterprise content management

Hadoop

Spark

DataWorks

## Data sets

Twitter insights

Weather data

## Streaming video

## IoT (US)

## Application platform

Application server

Runtimes

Application deployment

Cloud Foundry

Containers

Microservices

## DevOps (US)

Application lifecycle management

Application management

Continuous delivery

IT operations analytics

IT operations management

Methodologies

Software development and testing (US)

## Security

Hardware security module

Identity and access management

Intel TXT

## Hybrid integration

API gateway

API management

Cloud integration

Message queue

## Mobile

Mobile application development

Mobile security and device management

## Cloud management

Cloud brokerage

Cloud orchestration

## Business process management

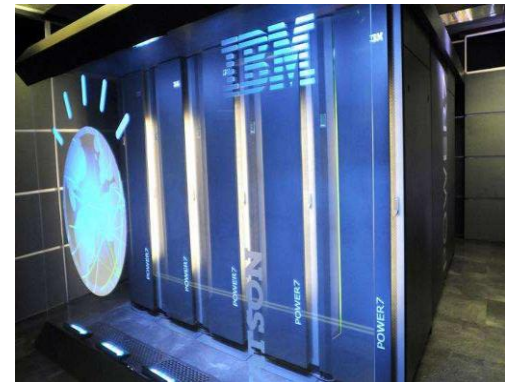
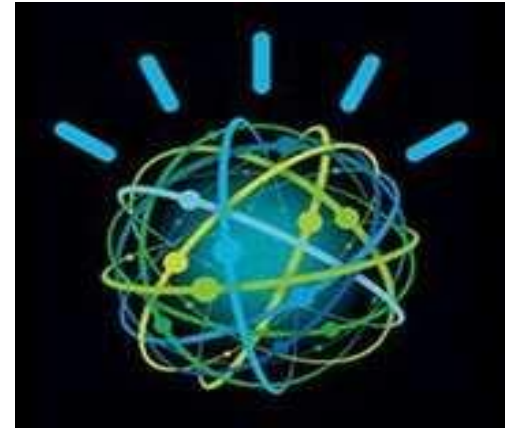
Business rules

## Blockchain (US)

## Watson

# IBM Watson's project started 2007

- Project started in 2007, lead David Ferrucci
- Initial goal: create a system able to process natural language & extract knowledge faster than any other computer or human
- Jeopardy! was chosen because it's a huge challenge for a computer to find the questions to such "human" answers under time pressure
- Watson was NOT online!
- Watson weighs the probability of his answer being right – doesn't ring the buzzer if he's not confident enough
- Which questions Watson got wrong almost as interesting as which he got right!



# Watson – a Workload Optimized System

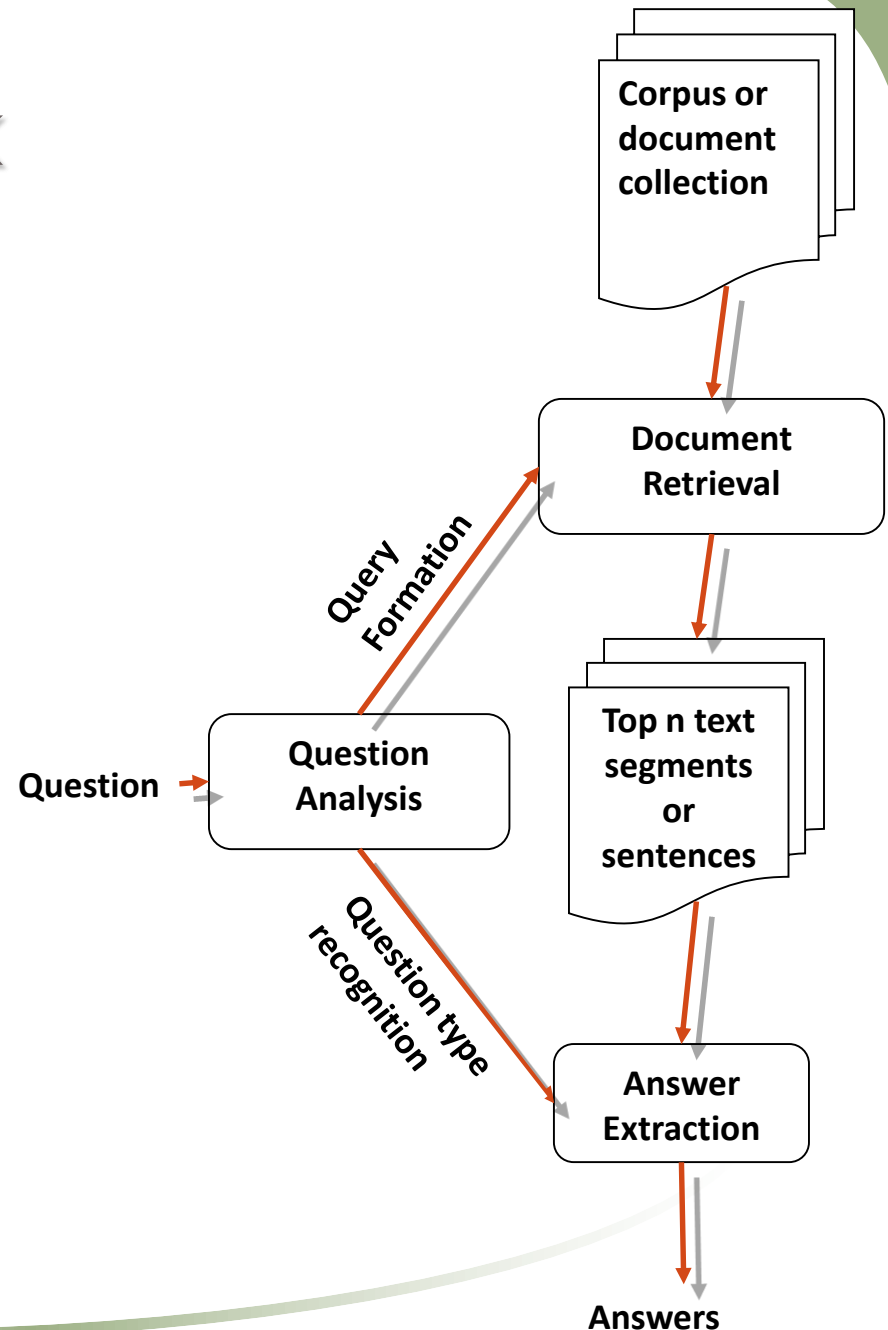
- 90 x IBM Power 750 servers
- 2880 POWER7 cores
- POWER7 3.55 GHz chip
- 500 GB per sec on-chip bandwidth
- 10 Gb Ethernet network
- 15 Terabytes of memory
- 20 Terabytes of disk, clustered
- Can operate at 80 Teraflops
- Runs IBM DeepQA software
- Scales out with and searches vast amounts of unstructured information with UIMA & Hadoop open source components
- Linux provides a scalable, open platform, optimized to exploit POWER7 performance
- 10 racks include servers, networking, shared disk system, cluster controllers



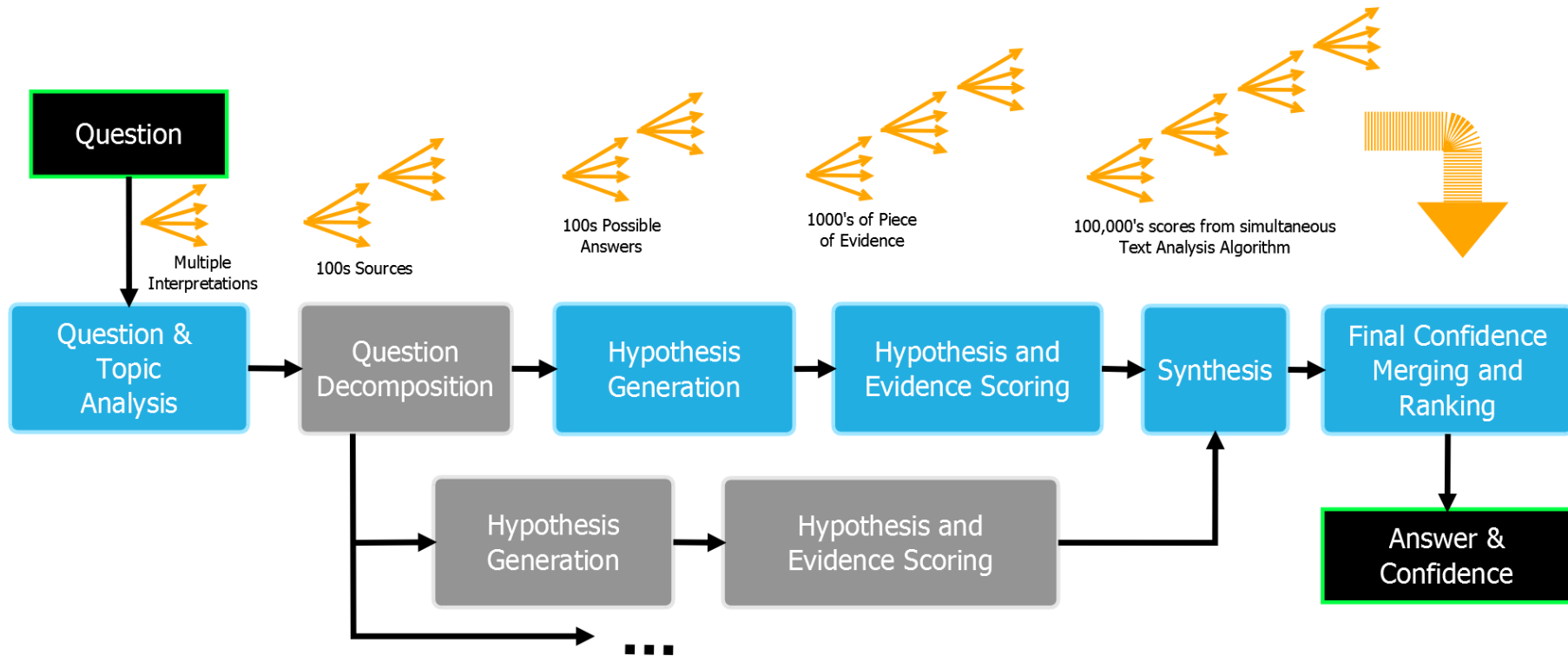
# Generic Framework

The majority of current question answering systems designed to answer factoid questions consist of three distinct components:

- 1) question analysis,
- 2) document or passage retrieval and finally
- 3) answer extraction.



# Basic Architecture



# Potential Business Applications

**Healthcare / Life Sciences:** Diagnostic Assistance, Evidenced-Based, Collaborative Medicine

**Tech Support:** Help-desk, Contact Centers



**Enterprise Knowledge Management and Business Intelligence**

**Government:** Improved Information Sharing and security





THANK  
YOU

