

Cognitive services (Module 2)

Cognitive services are wide range of AI capabilities to be used in Applications.

↳ accessed through endpoint (specific URL) & subscription Key

⇒ End point: HTTP address through which REST interface can access the service

↳ REST: representational state transfer: a kind of API architecture

↳ API: set of definitions & protocols for building & integrating app. sw (contract between the information provider & user)

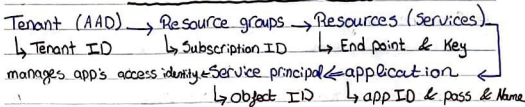
↳ is submitting data in JSON format over an HTTP request.

↳ The data could be POST, PUT, GET requests depends on the function being called.

↳ SDK: software development kit; It includes packages that can be installed to use service-specific libraries.

Azure Active Directory: Cloud-based identity and access mang. service

↳ Tenant: represents an organization that has specific domain name and ID, each tenant can include multiple applications & users. A tenant is a dedicated instance of Azure AD that will contain the resource groups & apps.



To access Key vault via an application, we ^{give} ~~add~~ the object ID of the service principal ~~in~~ the permission to access the Key vault by specific way (get-push ... etc).

Azure Key Vault : azure service to store keys & passwords.
The access to it is granted to security principles.

To regenerate the primary subscription key for a cog. ser :
⇒ it is preferred to switch the apps to use the secondary key to minimize the service interruption while the regeneration.

Azure alerts : used to configure notifications for resources.

Azure Monitor : collect metrics for resources at regular intervals to track indicators of resources.

Diagnostic logging : capture rich operational data, which can be used to analyze usage & troubleshoot problems.

Container : resource that encapsulates the necessary runtime components for a specific app or service in an "image".

↳ Containers make the app portable across hosts as it no more depends on the OS or the HW.

⇒ Local containers can be hosted on Docker server, while on the cloud can be Azure Container Instance (ACI) or Azure Kubernetes service (AKS) cluster.

Container image : is unchangeable file that is used to construct the run-time environment for the application. Containers need to run in image to exist.

⇒ Cog. Service Container images : each provides a subset of Cog. Ser. functionality. Images can be used on cloud containers or pulled on a local device.

⇒ Access : Container endpoint only, No Key.
↳ Configurations : connect container for Cog. Ser. resource via Key & Endpoint.

Text Analytics: a cognitive service that provides advanced NLP over raw text. Ex: language detection, sentiment analysis, etc.

→ text analytics supports multi-service & single-service access

- ↳ create a Cog. ser. resource for multi-services under single end point & authenticate the text service on it
- ↳ create a text analytics resource for a single-service.

Sentiment analysis: quantify how positive or negative the text is.

Named entity recognition: detect references to entities (people, locations, ...)

* **Entity linking**: identify specific entities by providing reference links

Detect language $\xrightarrow{\text{then}}$ Extract key phrases / Analyze sentiment /
language is prerequisite \leftarrow Extract entities / Extract linked entities.

Translator: a cognitive service that provides a multilingual text translation API; It also supports multi-service & single-service

↳ Multiservice through connecting the cognitive service to the regional translator resource.

↳ this method requires the key & location of the Cog. ser. to be written in the header of the JSON file sent to the regional translator end-point

↳ Key to ensure subscription & location to connect to the closer regional translator.

⇒ **Translator vs Transliteration**: translation converts the phonetic of word from language to another.

Microsoft AI-102

Cog. Ser. (Speech) (M4)

Speech Service & Speech \leftrightarrow Text, Speech translation, Speaker recognition, Intent recognition.

⇒ Speech service is available as multi-service & single-service

↳ Just like text-analytics, to be used as multi-service, we build the Cog. Ser. & authenticate the speech service on it.

↳ This is exactly how multi-service is done & by connecting or authenticating many services to the same Cog. ser. using the same end point.

Speech-to-text APIs → 1- short audios : up to 60 seconds

↳ 2- Primary & for longer audios or batch (group) transcription.

⇒ Proxy server : is a server application that act as an intermediary between the client and a resource.

⇒ Using Speech \leftrightarrow text : we create proxy client for Azure resource & this is named SpeechRecognizer / SpeechSynthesizer Object.

↳ Speech synthesizer : generates spoken language by machine on the basis of written input.

↳ Config. options : different voices, styles, & roles that affect the tone

↳ Speech synthesis markup language (SSML) :

↳ specify a speaking style

↳ Phonemes : phonetic pronunciations

↳ Prosody : pitch, timbre, speaking rate