Watson Talks to IBM i

Tim Rowe – Business Architect, Application Development
Scott Forstie – Business Architect, Db2 for i
Demanding new approaches in technology and strategy
Digital Trends

- Everybody is talking about **digital reinvention**, creating new experiences and disrupting business models.

81% of shoppers conduct online research before making big purchases.
(Source: AdWeek, November 2014)

80% By 2020, 80% of the buying process is expected to occur without any direct human-to-human interaction.
(Source: Forrester)

$75B US in-store mobile payment volume will reach $75 billion this year.
(Source: Business Insider, June 2016)

**Facebook**
World’s most popular media owner **creates no content**

**Uber**
World’s largest taxi company owns no vehicles

But is that being digital **enough**...?
Customers are Shifting from Traditional Channels

**THEN**

Customer

**NOW**

Example of messaging platforms:
- Google+
- Twitter
- Facebook
- Instagram
- SMS
- Email
- Skype
Cognitive Systems

Cognitive computing is the simulation of human thought processes in a computerized model

Adaptive
Interactive (Expert System)
Natural Language Processing
Iterative and Stateful
Contextual
Reasoning Capacity
Machine Learning (AI)
Fast (Real Time)
Needs Big Data

Cognitive computing systems learn and interact naturally with people to extend what either humans or machine could do on their own
Building Blocks

Apps
• Mobile App
• Cloud Foundry

Services
• Cloudant DB
• Watson Visual Recognition
• Connect to my data center

Infrastructure
• Cloud Object Storage
• Bare Metal Servers
Watson is creating a new partnership between people and computers that **enhances**, **scales** and **accelerates** human expertise.
IBM i and IBM Watson
Extending Applications to Watson
Connecting Data to Watson

From IBM Japan

Watson Analytics

IBM Bluemix

Web Query for i with DataMigrator

Db2 for i

ETL

Db2 for LUW
Oracle
MS SQL
PostgreSQL

Data Connect
Secure Gateway

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OMNI – September, 2017
IBM i and IBM Watson
IBM i and Watson

Agenda
• What is Watson? What is Bluemix?
• Data Preparation, Data Connect, and Watson Analytics
• RPG and IWS and Open Source
• HTTP Functions, JSON_TABLE, & Watson Services
• Demos
  – You decide Tim’s and Scott’s fate…
  – Who is Jake and who is Elwood?
  (Watson will help)
Data Connect, Watson Analytics, Db2 Web Query Data Migrator
Connecting IBM i to Watson

Data Connect

Db2 for i

IBM Bluemix™

Watson Analytics

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Connecting IBM i to Watson

Data Connect

Db2 for i

HTTP Functions

IBM Bluemix™

Watson Analytics

IBM Watson
Services & APIs
Bluemix’s Data Connect

Added April, 2017
Moving data from Db2 for i to Watson Analytics
Moving Db2 for i data into Watson Analytics
Watson Analytics

What's the average salary by department?

Starting points:
- Most relevant: What drives SALARY?
- Most relevant: What is a predictive model for SALARY?
- Most relevant: What is the distribution of SALARY?
- Somewhat relevant: What are the values of SALARY for each DEPT?
Learning how to ask a good question

Watson Analytics & Db2 for i data

What is the relationship between SALARY and TITLE by DEPT?
Watson Analytics – Controlled visualization

How do the values of **SALARY** compare by **DEPT**?

![Bar Chart](chart.png)
Analysis and Discovery
What does it cost? (watson.analytics.ibmcloud.com)

Visit this site for complete pricing details:

<table>
<thead>
<tr>
<th></th>
<th>Free</th>
<th>Plus</th>
<th>Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upload spreadsheets, get visualizations, discover insights and build dashboards all on your own.</td>
<td>Get all the features of Free plus more storage and data sources, including databases and Twitter.</td>
<td>Get all the features of Plus plus a multi-user tenant to collaborate, more storage and more data.</td>
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<td></td>
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<td>Starting at $30.00 US$* per month per user</td>
<td>Starting at $80.00 US$* per month per user</td>
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<td><img src="#" alt="Purchase now" /></td>
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<tr>
<td>1 user</td>
<td>1 user</td>
<td>1 or more users</td>
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</tr>
<tr>
<td>1 MB of storage included</td>
<td>2 GB of storage included</td>
<td>100 GB of storage included</td>
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<td>Professional single user trial for first 30 days</td>
<td>Add storage in 100GB increments for a minimal fee</td>
<td>Add storage in 1000GB increments for a minimal fee</td>
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<td>Access relational databases, on prem and on cloud</td>
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<td>Access relational databases, on prem and on cloud</td>
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</tr>
<tr>
<td>Access 15 data connectors</td>
<td>Access 15 data connectors including IBM Cognos reports</td>
<td>Access 15 data connectors including IBM Cognos reports</td>
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<tr>
<td>Access Twitter data</td>
<td>Access Twitter data</td>
<td>Access Twitter data</td>
<td></td>
</tr>
<tr>
<td>Limited access to IBM Analytics Exchange offerings</td>
<td>Full access to IBM Analytics Exchange data &amp; offerings</td>
<td>Full access to IBM Analytics Exchange data &amp; offerings</td>
<td></td>
</tr>
</tbody>
</table>

*Price excludes sales tax and VAT
Data security in Watson Analytics

Details about the data security and other topics are answered here:


<table>
<thead>
<tr>
<th>Specifications for Watson Analytics</th>
<th>Standards</th>
<th>Encryption</th>
</tr>
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<tbody>
<tr>
<td>Data centers</td>
<td>SOC2 and ISO 27001</td>
<td>aes-cbc-essiv:sha256</td>
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<tr>
<td>Operating system</td>
<td>CentOS (see diagram A above)</td>
<td>SSL over http. HTTPS</td>
</tr>
<tr>
<td>Data storage platform</td>
<td>DB2, MongoDB</td>
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<td>Certifications targeted</td>
<td>ISO 27001 certified</td>
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<td>Regulatory Acts</td>
<td>HIPAA Ready Moving forward with FFIEC enablement</td>
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<td>Encryption (data at rest)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encryption (data in transit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logging vendor access</td>
<td>Syslog</td>
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</tbody>
</table>
Incorporating Social Media content

IBM Watson Analytics for Social Media

Social media analytics technology that helps you achieve a holistic view of consumers, your market and competitors—all from millions of online sources.

Sign up for free  Contact us for pricing

What it can do for your business
Incorporating Social Media content
#IBMi Tweets YTD
Watson Lexicon

“Watsoning”
[wat-sunning]
Verb

1. To utilize Watson Services or Watson Analytics from an IBM i
2. To amaze and astound your colleagues when you implement Watson technologies within your IBM i

WAAS – Watson As A Service
IBM i Data Centric Cognitive Consulting Workshop

The IBM Systems Lab Services team has a workshop to help clients develop their Cognitive strategy and more…

Discussion items include:
1. Cognitive application and database architecture(s)
2. Data access paths and analysis methods
3. Cognitive services access and use

Contact Mike Cain (mcain@us.ibm.com) for details
Watson and Data Preparation

- **The Data Lake has become a Data Ocean**
  - Data can be consolidated on Db2 for i prior to being moved to Watson
  - SQL on IBM i can turn non-traditional data into Watson consumable data
    For example: History log, Audit journal, Data Journal, Messages, Performance detail, ...

- **In many cases, data will need to be prepared in some manner**
  - Only the RPG programmer understands how the data is stored:
    - “If field COMPANY = 001, join to File B, else join to File C” logic;
    - Dates stored in non date data types
    - Multiple data elements stored in a single field
  - Formatting and Extracting the data as is required by the service

- **Shredding and/or stitching back together the data returned from the service**
  - Data may come into the IBM i in XML, JSON, or some other format
    - To incorporate this into your analytics or operational applications you want this back in Db2 for i
Db2 Web Query DataMigrator ETL Extension

- **Meta Data Driven Data Prep**
  - Automate consolidation, organization, “untangling” and optionally, the build of a data warehouse
  - Consolidate data from many different data sources
  - Data transformations as needed
  - Run data flows via the IBM i job scheduler

- **ETL (Extract, Transform, and Load)**
  - All components run in IBM i
  - Multiple load types can be defined

- **Integrated with Db2 Web Query**
  - Shared services and administration
Process Schematic

Augment Data with Weather info

Visualize/deploy insights with Db2 Web Query

Db2 Web Query for i DataMigrator

Db2 for i Datamart

Order, Product, Inventory and measurements (revenue, COGS) Information

Power Systems(IBM i)
RPG and IWS and Open Source
Connecting IBM i to Watson
For the Developer...

IBM i languages: Python, Node.JS, RPG
Connecting RPG to Watson

• Details in this document
  – Paul Tuohy "RPG TALKS TO WATSON"
• https://www.itjungle.com/2016/09/27/fhg092716-story01/

RPG Talks To Watson

Yes, RPG can talk to Watson. No special software required, nothing to install, nothing to configure. You just need to be on V7R1, have the ability to use embedded SQL and write just a few lines of code—none of which are complicated. To see how it works, all you have to do is copy/paste the display file and RPG code in this article, compile and call.

On the off chance that you don’t know what Watson is, Watson is the IBM computer that, in 2011, competed on the U.S. quiz show "Jeopardy!" against former winners Brad Rutter and Ken Jennings. Watson won by a mile.

Wikipedia describes Watson as "a question answering (QA) computing system that IBM"
Language Translator - Request URL -

- Clicked on the link for Language translation
- Under Translate/Get, Click on the option to "Translates the input text from the source language to the target language."
  - Input the following and click
    - model_id : ja-en
    - text : This is a test.
- “Request URL” is displayed
  - https://watson-api-explorer.mybluemix.net/language-translator/api/v2/translate?model_id=en-ja&text=This%20is%20a%20test.
  - The variable parts being the from and two languages (ja-en) and the encoded text (%20 is the encoding for a space).

Provided by IBM Japan
RPG Sample Program using Watson API

- This ILE RPG sample application uses the Watson API "Language Translator"
  - Translate the original sentence with “Language Translator” and output the result on the 5250 screen

※ Not recommend that your program should be green screen, don't want anyone to get the impression that there is any special web configuration, or anything like that, involved in this process.
ILE RPG Sample Program using Watson API
- Cooperative image of ILE RPG and Watson API -

- Use Db2 for i HTTP functions available on IBM i 7.1 and later
  - Provide REST HTTP method sample SQL procedure (function) in "SYSTOOLS" schema
  - REST call to Watson API using HTTPGETBLOB function

```
TOWATSOND.DSPF

TOWATSON.SQLRPGLE

SYSTOOLS.HTTPGETBLOB

CLOB

Get resource

Language Translator

HTTP GET Request

原文の
言語

訳文

訳文の
言語

言語
```

Provided by IBM Japan
RPG Sample Program using Watson API - Display File -

- Sample source : Display File “TOWATSOND.DSPF”
  - Input fields
    - FROMLANG
    - TOLANG
    - FROMTEXT
  - Output fields
    - TOTEXT
    - SQLCODEO
  - F3 : exit the program

---

Provided by IBM Japan
RPG Sample Program using Watson API - Main Procedure -

Sample source : ILERPG “TOWATSON.SQLRPGLE” 1/3

A) The data structure defines an array of language codes. The codes correspond to the number entered for the from/to languages on the screen (1 = English (en), 2 = Spanish (es) etc.).

B) The program loops through displaying the screen until F3 is pressed.

C) On every iteration of the loop, the program calls the translate_text() subprocedure, passing parameters for the from language code, to language code, from text and to text.

Provided by IBM Japan
RPG Sample Program using Watson API - Main Procedure -

Sample source : ILERP “TOWATSON.SQLRPGLE” 2/3

A) The HTTPGETCLOB function will return a CLOB. RPG does not recognize the CLOB data type so we define “textBack” as a variable with an SQL type of CLOB. When the program is compiled, this definition will result in a data structure with two sub fields – “textBack-Len” (which will contain the length of data returned) and “textBack_Data” (which will contain the data).

B) URLENCODE is called to encode the entered text. Encoding will translate any special characters that might cause problems (like & or <) to their coded equivalent.

Provided by IBM Japan
RPG Sample Program using Watson API
- transLate_Text() Sub procedure -

- Sample source: ILERPG "TOWATSON.SQLRPGLE" 3/3

C) Construct the URL to make a REST call to Watson to do the translation.

D) Use HTTPGETCLOB to make a REST call to Watson. The returned value is placed in the “textBack” CLOB defined earlier.

E) If data was returned, retrieve the indicated length of data “textBack_Len” from “textBack_Data”.

```
str1 = 'https://watson-api-explorer.mybluemix.net/' +
       'language-translator/api/v2/translate?model_id=' +
       fromLang + '-' + toLang + '&text=' + str2;
exec SQL
values char(systools.httpgetclob(:str1, ''), 256)
into :textBack;
toText = *blanks;
if (textBack_Len >0);
toText = %subSt(textBack_Data: 1: textBack_Len);
endIf;
return;
end-Proc;
```
RPG Sample Program using Watson API - Call program -

- CALL TOWATSON
  - Input the parameters of "Original language", "Translation language", "Original sentence" and enter

Provided by IBM Japan
Python and Watson

- IBM has published many examples of how to talk to Watson.
  - e.g. Python "Personality Insights" app
  - https://github.com/watson-developer-cloud/personality-insights-python
Python and Watson

Personality Insights Python Starter Application

The Watson Personality Insights service uses linguistic analytics to extract a spectrum of cognitive and social characteristics from the text data that a person generates through text messages, tweets, posts, and more.

Try the service

Mr. Vice President, my old colleague from Massachusetts and your new Speaker, John McCormack, Members of the 67th Congress, ladies and gentlemen:

This week we begin anew our joint and separate efforts to build the American future. But, sadly, we build without a man who linked a long past with the present and looked strongly to the future. "Mister Sam" Rayburn is gone. Neither this House nor the Nation is the same without him.

6437 words

Clear  Analyze
Python and Watson

Data Behind Your Personality

<table>
<thead>
<tr>
<th>Name</th>
<th>Value ± Sampling Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Big 5</strong></td>
<td></td>
</tr>
<tr>
<td>Openness</td>
<td>99% (± 5%)</td>
</tr>
<tr>
<td>Adventurousness</td>
<td>93% (± 5%)</td>
</tr>
<tr>
<td>Artistic interests</td>
<td>80% (± 10%)</td>
</tr>
<tr>
<td>Emotionality</td>
<td>21% (± 4%)</td>
</tr>
<tr>
<td>Imagination</td>
<td>44% (± 6%)</td>
</tr>
<tr>
<td>Intellect</td>
<td>99% (± 5%)</td>
</tr>
<tr>
<td>Authority-challenging</td>
<td>90% (± 8%)</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>63% (± 7%)</td>
</tr>
<tr>
<td>Achievement striving</td>
<td>87% (± 9%)</td>
</tr>
<tr>
<td>Cautiousness</td>
<td>92% (± 9%)</td>
</tr>
<tr>
<td>Dutifulness</td>
<td>66% (± 5%)</td>
</tr>
<tr>
<td>Orderliness</td>
<td>23% (± 6%)</td>
</tr>
<tr>
<td>Self-discipline</td>
<td>66% (± 4%)</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>34% (± 9%)</td>
</tr>
<tr>
<td>Extraversion</td>
<td>39% (± 5%)</td>
</tr>
<tr>
<td>Activity level</td>
<td>98% (± 7%)</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>92% (± 8%)</td>
</tr>
<tr>
<td>Cheerfulness</td>
<td>7% (± 10%)</td>
</tr>
<tr>
<td>Excitement-seeking</td>
<td>3% (± 8%)</td>
</tr>
<tr>
<td>Outgoing</td>
<td>12% (± 7%)</td>
</tr>
<tr>
<td>Gregariousness</td>
<td>2% (± 5%)</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>12% (± 2%)</td>
</tr>
</tbody>
</table>
Node.JS and Watson

- Personality Insights
  - Node.JS version
  - Output in a different format
  - https://github.com/watson-developer-cloud/personality-insights-nodejs
Node.JS and Watson

Summary
You are shrewd, excitable and guarded.
You are dispassionate: you do not frequently think about or openly express your emotions. You are independent: you have a strong desire to have time to yourself. And you are reserved: you are a private person and don't let many people in.
Your choices are driven by a desire for organization.
You are relatively unconcerned with both taking pleasure in life and tradition. You prefer activities with a purpose greater than just personal enjoyment. And you care more about making your own path than following what others have done.

How did we get this?

You are likely to
- be sensitive to ownership cost when buying automobiles
- like historical movies
- read often

You are unlikely to
- be influenced by social media during product purchases
- prefer style when buying clothes
- be influenced by brand name when making product purchases

<table>
<thead>
<tr>
<th>Personality</th>
<th>% = percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness</td>
<td>96%</td>
</tr>
<tr>
<td>Emotional range</td>
<td>95%</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>78%</td>
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</table>

<table>
<thead>
<tr>
<th>Consumer Needs</th>
<th>% = percentile</th>
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<tbody>
<tr>
<td>Structure</td>
<td>96%</td>
</tr>
<tr>
<td>Practicality</td>
<td>76%</td>
</tr>
<tr>
<td>Curiosity</td>
<td>75%</td>
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</table>

<table>
<thead>
<tr>
<th>Values</th>
<th>% = percentile</th>
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<tbody>
<tr>
<td>Stimulation</td>
<td>41%</td>
</tr>
<tr>
<td>Helping others</td>
<td>16%</td>
</tr>
<tr>
<td>Achievement</td>
<td>12%</td>
</tr>
</tbody>
</table>
Node.js and Watson

<table>
<thead>
<tr>
<th>Tweets and Replies</th>
<th>Body of Text</th>
<th>Your Twitter Personality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@Oprah (EN)</td>
<td></td>
<td>@KingJames (EN)</td>
</tr>
<tr>
<td>@DonFranciscoTV (ES)</td>
<td></td>
<td>@Trikaofficial (AR)</td>
</tr>
<tr>
<td>@pontifex_es (ES)</td>
<td></td>
<td>@faridyu (JA)</td>
</tr>
</tbody>
</table>

[Analyze]
Can Node.JS and Python programs integrate with IBM i data? YES!

- IBM i integration delivered with the languages
- Watson integration delivered with the languages
For the Developer…

IBM Bluemix™

Python & Node.JS toolkits for BlueMix

for Business

IBM Watson Services & APIs
Enabling easy extension of OSS for IBM i - XMLService

- Allows access to IBM i programs, service programs, shell commands, and even Db2!
- Can be called locally or remotely, stateful or stateless, very flexible!
- Toolkits are written for several languages, to make it even easier!
Python and Node.JS toolkits

- Node.JS itoolkit
  - https://bitbucket.org/litmis/nodejs-itoolkit

- Python itoolkit-lite
  - https://bitbucket.org/litmis/python-itoolkit
For the Developer…

Integrated Web Services (IWS)

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Using a REST API with Watson

Search flights

From ➔ To:
DALLAS to BOSTON
09/07/2017

For example: Flight from houston to CHICAGO

https://ibm-i-watson-test.mybluemix.net/

RPG
Findflights App

Web Server
IBM i ? Bluemix ?

Watson
Weather
News
Crime
Integrated Web Services (IWS) server enables IBM i APIs

- IWS Integrated in IBM i
  - First delivered in 2008 – SOAP only
- Since 2016 also delivers RESTful APIs with Open API specifications
- Wizard based creation
  - intuitive web-based graphical interface – just point and click
  - developers with or without IBM i skills can create RESTful APIs
- No new programming languages or development environments to learn
- Supports standard JSON and XML message formats
  - Translates to and from format of IBM i programs

Note: z/OS Connect is comparable to what IBM i has but IBM i easier to use and seems to be a nicer way to deploy programs as RESTful web services (based on AIX development comments)
Swagger is the key to integration

- A Swagger document is the REST API equivalent of a WSDL document for a SOAP-based web service
  - Specifies the list of resources that are available in the REST API and the operations that can be called on those resources
  - Specifies the list of parameters to an operation, including the name and type of the parameters
- Delivered on IWS end of 2016 (@ IBM i 7.1 and higher)
- Allows IBM i RESTful APIs to be exposed in various platforms, such as IBM Bluemix Platform and IBM API Connect
REST APIs

REST API

POST
GET
PUT
DELETE

HTTP Headers + JSON

Swagger Doc

Describes the API

IBM i

IWS Server

API Mapping Model

JSON / SoR xforms
Create-service
Read-service
Update-service
Delete-service

API Package

RPG *PGM

COBOL *PGM

Db2 for i

IBM Bluemix

IBM apiconnect

IBM Power Systems

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Connecting IBM i to Watson

IBM Bluemix™

Secure Gateway
Python & Node.JS toolkits for BlueMix
Integrated Web Services (IWS)

for Business

SQL
RPG
Node.JS or Python

Data Connect

Watson Analytics

IBM Watson Services & APIs

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OMNI – September, 2017
## Watson Resources

Use IBM Watson’s Language, Vision, Speech and Data APIs, directly from IBM i

<table>
<thead>
<tr>
<th>Language</th>
<th>Vision</th>
<th>Speech</th>
<th>Data Insights</th>
</tr>
</thead>
</table>
| **Natural Language Classifier**
Classify text sentences | **Visual Recognition**
Detect meaning included in image contents | **Speech to Text**
Convert speech to text | **Discovery (Unsupported Japanese)**
Add cognitive search and content analysis engines to applications to identify patterns, trends, and actionable insights that help to make better decisions |
| **Conversation**
Automate interaction with end users by adding natural language interface to application | | **Text to Speech**
Convert text to speech | **Tradeoff Analytics (Unsupported Japanese)**
Support to make better choices when faced with multiple |
| **Personality Insights**
Estimate an individual’s characteristics from text |  |  | |
HTTP Functions, JSON_TABLE, & Watson Services
For the Developer...

HTTP Functions

IBM Watson Services & APIs

Language Translator
For the Developer...

JSON_TABLE, XMLTABLE, or direct consumption
**Watson’s Language Translator**

Visit this site for complete pricing details:

https://www.ibm.com/watson/developercloud/language-translator.html#pricing-block

<table>
<thead>
<tr>
<th>PRICING</th>
<th>Standard Plan</th>
<th>Advanced Plan</th>
<th>Premium</th>
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</thead>
<tbody>
<tr>
<td><strong>Standard Plan</strong></td>
<td>250,000 characters FREE for standard translations*</td>
<td>$0.02/thousand characters for standard translations**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$0.02/thousand characters after the first 250,000</td>
<td>Custom Model Translations</td>
<td>Let’s talk</td>
</tr>
<tr>
<td></td>
<td>Includes News, Conversational, and Patent models</td>
<td>- $0.10/thousand characters</td>
<td></td>
</tr>
<tr>
<td><strong>Premium</strong></td>
<td><strong>Let’s talk</strong></td>
<td>Custom Model Maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Watson Premium plans offer a higher level of security and isolation to help customers with sensitive data requirements.</td>
<td>- $15.00/model/month, pro-rated daily</td>
<td>Click here to find out more</td>
</tr>
</tbody>
</table>
OMNI Conference @ IBM Schaumburg

- www.gpsvisualizer.com/geocode
  (or choose your fave)

- With the geocode, we can query Bluemix’s Weather Channel using SQL
-- Return almanac detail...
SELECT * FROM JSON_TABLE(
  SYSTOOLS.HTTPGETCLOB('https://' || WeatherCo.username || ':' || WeatherCo.password || '@twcservice.mybluemix.net/api/weather/v1/geocode/' || WeatherCo.latitude || '/' || WeatherCo.longitude || '/almanac/daily.json?start=0918&end=0920&units=e',''),
  '$' COLUMNS( NESTED PATH '$."almanac_summaries"[*]' COLUMNS(
    "almanac_dt" VARCHAR(4), "avg_hi" DECIMAL(4,1), "avg_lo" DECIMAL(4,1), "record_lo" DECIMAL(4,1) ))) AS X ;

<table>
<thead>
<tr>
<th>almanac_dt</th>
<th>avg_hi</th>
<th>avg_lo</th>
<th>record_lo</th>
<th>avg_precip</th>
<th>avg_snow</th>
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</thead>
<tbody>
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<td>0.10</td>
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<td>0.11</td>
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<td>52.0</td>
<td>36.0</td>
<td>0.11</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Large User Group – January 2018 meeting

• Contrast the CEC event with the LUG event

• January in Minnesota is an “interesting” time for weather

• Change the Geocode global variables & start and end dates
-- Return almanac detail... LUG event in Rochester, MN USA
SELECT * FROM JSON_TABLE(
    SYSTOOLS.HTTPGETCLOB('https://'concat weatherCo.username concat 
    ':' concat weatherCo.password concat '@' concat 
    'twcservice.mybluemix.net/api/weather/v1/geocode/' concat 
    weatherCo.latitude concat '/' concat weatherCo.longitude concat 
    '/almanac/daily.json?start=0121&end=0126&units=e',''),
    '$' COLUMNS( NESTED PATH '$."almanac_summaries"[*]' COLUMNS( 
        "almanac_dt" VARCHAR(4), "avg_hi" DECIMAL(4,1), 
        "avg_lo" DECIMAL(4,1), "record_lo" DECIMAL(4,1) ))) AS X ;

<table>
<thead>
<tr>
<th>almanac_dt</th>
<th>avg_hi</th>
<th>avg_lo</th>
<th>record_lo</th>
<th>avg_precip</th>
<th>avg_snow</th>
</tr>
</thead>
<tbody>
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<td>-39.0</td>
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</table>
Wrap up and demo
Watson Resources

• “How to” Redbooks on Watson
• Some are “hot” off the presses

IBM i Driveway to Watson

- Pilot event held September 6 & 7, 2017
- 30+ Attendees
- Technical details for using BlueMix and Watson with IBM i
- Mix of Education and Workshop style
- We expect this event to be repeated
- [http://www.common.org/events/ibm-i-driveway-watson/](http://www.common.org/events/ibm-i-driveway-watson/)
Thank You
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Revised September 26, 2006
OMNI – September, 2017

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