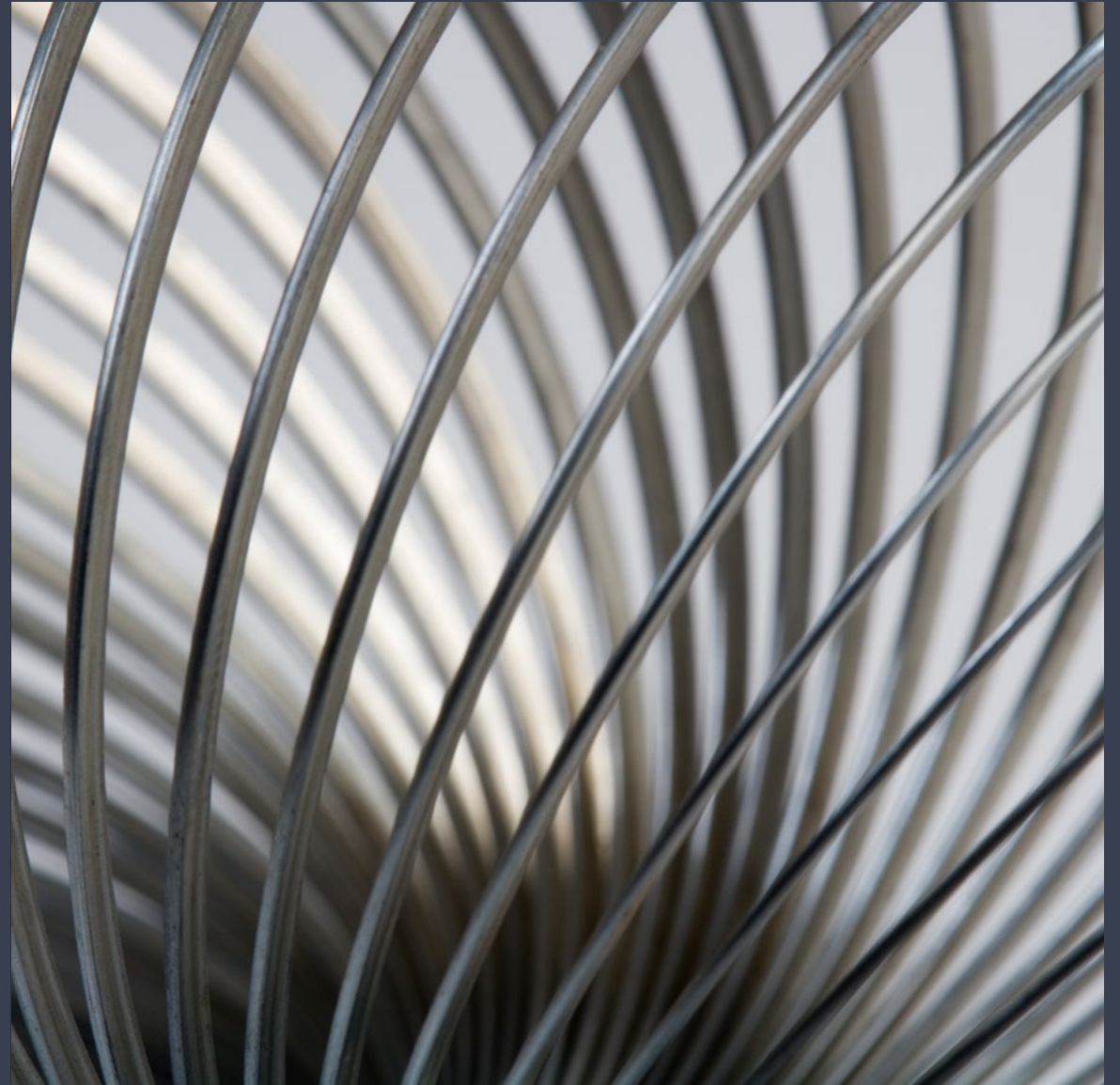


NUGM 2024

MANAGE 2000 AS A  
REST CONSUMER

Peter Newby, Epicor



# AGENDA

The End Game

REST Fundamental Concepts

Manage 2000 REST.SERVICES

REST.NEWS and REST.MSO

A PWS function as a front-end to REST Services



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# THE END GAME

ERP System Integrated with the  
World



# POSSIBLE REST SERVICE INTEGRATIONS

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- Third Party Logistics (3PL)
  - FEDEX, UPS, USPS, Aggregators
    - Tracking, Rate Quotes, Times in Transit, Regulatory Documents and Advisories, Trade Documents Upload
- Cloud Talk
  - AWS
  - Azure
  - Shopify
  - Adobe Acrobat Sign
- Internal Integrations
  - Power BI, Excel
  - MES
  - Parent company systems



# THIRD PARTY LOGISTICS INSIDE MANAGE 2000

The screenshot shows a web browser window displaying the Epicor Manage 2000 News Reader. The browser's address bar shows the URL: <https://vm-mps-m2kwin11.americas.epicor.net/Peter/MT/Ne...>. The page header includes navigation links: ShortCuts, IntraNet Access, Manage 2000 Portals, My Account, Web Development, and Epicor. The main content area features a 'Channel Selector' dropdown menu set to 'UPS News'. Below this, the heading 'UPS News' is followed by a sub-heading: 'So Nbr 5029 Tracking Info from UPS Cust Nbr 1024'. A table displays tracking information:

Tracking Nbr	Delivery Date	Delivery Time	
1Z1442YY7229014688	20220126	163000	
Status	Delivery Date	Delivery Time	City
DELIVERED	20220126	163000	PARAMUS
Shipper created a label, UPS has not received the package yet.	20220126	151641	

The footer of the page includes the user information: 'PETER ( Facility: 01 User: pmn )', a 'View in Mobile Style' link, and a welcome message: 'Welcome, Peter Newby'. At the bottom, there are links for 'Epicor Software Company', 'Terms of use', 'Privacy Policy', and 'Contact Us'.



# PWS FUNCTION WITH FEDEX BACKEND

The screenshot displays a software application window titled "hp4 - pmn:PETER - Manage 2000 - Peter Newby". The main window is in "ADD" Mode and shows shipping rate data entry fields:

- 01 From Postal Code: 55441
- 02 To Postal Code: 65802
- 03 Pickup Type: USE\_SCHEDULED\_PICKUP
- 04 Service Type: FEDEX\_2\_DAY
- 05 Packaging Type: FEDEX\_LARGE\_BOX
- 06 Request Type: .01) ACCOUNT, .02) LIST, .03) [blank]
- Entries: 2
- 07 Unit of Measure: LB
- 08 Weight: 15

At the bottom of the main window, it says "Change Which Field, END, TOP, \P ....." and "User pmn:PETER, PID 0060 on hp4".

An overlaid window titled "PWS Viewer - [Live Rate Data from FEDEX REST API (pmn:PETER)]" displays the following information:

Live Rate Data from FEDEX REST API  
Transaction ID: APIF\_SV\_RATC\_TxID0bcd9b90-6c61-4cd3-9efa-97e5284b597f

NOTE This is a Virtual Response.  
NOTE The origin state/province code has been changed.  
NOTE The destination state/province code has been changed.

Customer Message  
Rate does not include duties & taxes, clearance entry fees or other import fees. The payor of duties/taxes/fees will be responsible for any applicable Clearance Entry Fees.

Type	Base Charge	Net Charge	Vat Charge	FEDEX Net	Net w/Duties and Taxes
ACCOUNT	66.20	88.50	15.90	72.50	88.50
LIST	66.20	87.00	14.50	72.50	87.00



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# REST CONCEPTS



# REST CONCEPTS

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1. URL Based Resource - https... to some URL endpoint
2. HTTP Methods **POST** and **GET**
  1. Less used in JSON APIs - PUT, PATCH, DELETE, CONNECT, OPTIONS, TRACE
3. Security Versions SSL 3.0 TLS v1.1, **TLS v1.2**, TLS v1.3
4. Authentication Schemes
  1. Unauthenticated
  2. Authenticated
    1. Form Variable
    2. HTTP Header Variable - Basic Authentication, Bearer Token (JWT) ...
5. Parameter Passing
  1. Querystring (GET)
  2. Form Variable (POST)
  3. Route Path Variable (GET, POST)
  4. HTTP Header (GET, POST)
  5. HTTP Body JSON package (POST)
6. Result – HTTP Body JSON package, maybe plain text, maybe HTML, maybe BLOB





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# REST.SERVICES



# PUBLIC IP EXAMPLE

File Edit Commands Scripts Attachments Tools ProcessOpts Help

Maintain REST Service Configuration Table (328) "CHG" Mode

Service ID  02 Custom Flag

03 Description

04 Protocol  05 Security Ver

06 HTTP Version  07 HTTP Method

08 Timeout  09 Content Type

10 Endpoint

11 Auth Token

12 Add Header .01)

Entries 0 .02)

13 Body .01)

.02)

.03)

.04)

Entries 0 .05)

	14 Parameter Name	15 Parameter Value	16 Parameter Type
.01)	<input type="text"/>	<input type="text"/>	<input type="text"/>
.02)	<input type="text"/>	<input type="text"/>	<input type="text"/>
.03)	<input type="text"/>	<input type="text"/>	<input type="text"/>

Entries 0

Change Which Field, END, TOP, \P, TC .....  
Mail: 1

- Simple GET with no parameter and no authentication



# NATIONAL WEATHER SERVICE EXAMPLE

hp4 - pmn:PETER - Manage 2000 - Peter Newby

File Edit Commands Scripts Attachments Tools ProcessOpts Help Debug

Attachments Add Attachment Add Note Notes Note Summary

Maintain REST Service Configuration Table (328) "CHG" Mode

Service ID  02 Custom Flag

03 Description

04 Protocol  05 Security Ver

06 HTTP Version  07 HTTP Method

08 Timeout  09 Content Type

10 Endpoint

11 Auth Token

12 Add Header .01)

Entries 0 .02)

13 Body .01)

.02)

.03)

.04)

Entries 0 .05)

14 Parameter Name	15 Parameter Value	16 Parameter Type
.01) <input type="text" value="LOC"/>	<input type="text" value="OHX/62,43"/>	<input type="text" value="ROUTE"/>
.02) <input type="text"/>	<input type="text"/>	<input type="text"/>
.03) <input type="text"/>	<input type="text"/>	<input type="text"/>

Entries 1

Test Connection

Change Which Field, END, TOP, \P, TC .....

✓ ✕ \* User pmn:PETER, PID 0030 on hp4 0 Ins

- GET with route parameter and no authentication



# FEDEX AUTHENTICATION EXAMPLE

hp4 - pmn:PETER - Manage 2000 - Peter Newby

File Edit Commands Scripts Attachments Tools ProcessOpts Help Debug

Attachments Add Attachment Add Note Notes Note Summary

Maintain REST Service Configuration Table (328) "CHG" Mode

Service ID  02 Custom Flag

03 Description

04 Protocol  05 Security Ver

06 HTTP Version  07 HTTP Method

08 Timeout  09 Content Type

10 Endpoint

11 Auth Token

12 Add Header .01)

Entries 0 .02)

13 Body .01)

.02)

.03)

.04)

Entries 0 .05)

14 Parameter Name	15 Parameter Value	16 Parameter Type
.01) <input type="text" value="grant_type"/>	<input type="text" value="client_credentials"/>	<input type="text"/>
.02) <input type="text" value="client_id"/>	<input type="text" value="1782291f85cd5843c4a061ace1d4dd"/>	<input type="text"/>
.03) <input type="text" value="client_secret"/>	<input type="text" value="REDACTED"/>	<input type="text"/>

Entries 3

Test Connection

Change Which Field, END, TOP, \P, TC .....

User pmn:PETER, PID 0030 on hp4 0 Ins

- POST with text/plain Form Variables



# FEDEX RATE REQUEST

hp4 - pmn:PETER - Manage 2000 - Peter Newby

File Edit Commands Scripts Attachments Tools ProcessOpts Help Debug

Attachments Add Attachment Add Note Notes Note Summary

Maintain REST Service Configuration Table (328) "CHG" Mode

Service ID  02 Custom Flag

03 Description

04 Protocol  05 Security Ver

06 HTTP Version  07 HTTP Method

08 Timeout  09 Content Type

10 Endpoint

11 Auth Token

12 Add Header .01)   
Entries 2 .02)

13 Body .01)   
.02)   
.03)   
.04)   
Entries 30 .05)

14 Parameter Name	15 Parameter Value	16 Parameter Type
.01) <input type="text" value="AUTH"/>	<input type="text" value="CALL GetAuthToken(Value,FX1,\$."/>	<input type="text" value="ROUTE"/>
.02) <input type="text" value="ENDPOINT"/>	<input type="text" value="rates/quotes"/>	<input type="text" value="ROUTE"/>
.03) <input type="text" value="ACCT.NBR"/>	<input type="text" value="XXXXX7364"/>	<input type="text" value="ROUTE"/>

Entries 11

Change Which Field, END, TOP, \P, TC .....

Test Connection

User pmn:PETER, PID 0030 on hp4 0 Ins

- POST with HTTP Header OAUTH Bearer Token (JWT) Authentication and with ROUTE variable and JSON HTTP Body Request, supporting many complex input variables
- Auth token retrieval delegated to REST.SERVICE FX1 by using a call to GetAuthToken



# HTTP BODY JSON PARAMETER PASSING

The screenshot displays a REST client interface with two main panes. The left pane, titled 'Maintain REST Service Config', shows a list of configuration entries for a service with ID 'FX4'. The right pane, titled 'REST.SERVICES Body, TOP', shows the JSON body of the service, which is parameterized with values from the configuration.

Service ID	Description
FX4	

Parameter Name	Entries
AUTH	.01)
ENDPOINT	.02)
ACCT.NBR	.03)
Entries	11

```
{
  "accountNumber": {
    "value": "&ACCT.NBR&"
  },
  "requestedShipment": {
    "shipper": {
      "address": {
        "postalCode": "&FROM.ZIP&",
        "countryCode": "US"
      }
    },
    "recipient": {
      "address": {
        "postalCode": "&TO.ZIP&",
        "countryCode": "US"
      }
    },
    "pickupType": "&PICKUP.TYPE&",
    "serviceType": "&SERVICE.TYPE&",
    "packagingType": "&PACKAGING.TYPE&",
    "rateRequestType": [
      "&RATE.REQUEST.TYPES&"
    ],
    "requestedPackageLineItems": [
      {
        "weight": { "units": "&UOM&", "value": "&WEIGHT&" }
      }
    ]
  }
}
```

- Values in the Body can be parameterized allowing applications to make complex requests
- Default values can be codified in the REST.SERVICES record and only overridden as needed



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INCORPORATING  
REST INTO  
MANAGE 2000



# APPROACHES TO USING REST IN MANAGE 2000

---

- Create news articles incorporating REST content
- Create Manage 2000 Software Objects (MSO) with REST Content
- Create custom REST processes using the tools subroutine REST.SERVICE
- Create Manage 2000 functions based on REST functionality





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REST.NEWS



# NEWS.ARTICLE REST NEWS SOURCE

hp4 - pmn:PETER - Manage 2000 - Peter Newby

File Edit Commands Scripts Attachments Tools ProcessOpts Help Debug

Attachments Add Attachment Add Note Notes Note Summary

News Article Maintenance "CHG" Mode

Id	000054	02 News Source	REST
07 Desc	National Weather Service	03 ECA Id	
08 Title	National Weather Service	04 Monitor	
09 Category	SYS System Administration	05 MSO Id	
		06 REST Id	NWS National Weather

10 Summary (HTML) Entries 28

.01)	<h3>Customer &LK CM& &LK CM&{CM.Name} &LK CM&{CM.City}</h3>	Edit
.02)	<table><tr><th>NWS Office</th><td>&LOC&</td></tr>	
.03)	<tr><th>Updated At</th><th>Units</th><th>Forecast Generator</th><	
.04)	<tr>	

Drill Back

11 Function	
12 Document	/ROIPortals/WelcomePortal/WelcomePortal.aspx

13 Feeds	Entries	1	14 Code Behind		
.01)	000019 Customer News and Weather		REST.NEWS		
.02)			15 Parameters	Entries	2
.03)			.01)	NWS	
.04)			.02)	LOC=&LK CM&{CM.Nws_Loc}	

16 Publish on [ ] 17 Retire on [ ]

Change Which Field, END, TOP, \P .....

User pmn:PETER, PID 0200 on hp4 0 Ins



# NEWS.ARTICLE FROM OUT THERE

ShortCuts IntraNet Access Manage 2000 Portals My Account Web Development Epicor

**EPICOR**  
Manage 2000

## News Reader

Welcome SeeAlso IntraNet Access

Channel Selector REST results in Manage 2000

### REST results in Manage 2000

**National Weather Service**

Customer 1024 Sears Systems, Inc MINNEAPOLIS

NWS Office	MPX/108,73				
Updated At	Units	Forecast Generator			
2023-09-19T20:32:07+00:00	us	BaselineForecastGenerator			
Day	Temperature	Dew Point	Humidity	Wind	Desc
This Afternoon	80 F	16.7 wmoUnit:degC	56	10 mph SE	Mostly Sunny
Tonight	61 F	16.7 wmoUnit:degC	90	5 to 10 mph SE	Mostly Clear
Wednesday	85 F	18.3 wmoUnit:degC	93	5 to 10 mph SSE	Mostly Sunny
Wednesday Night	61 F	17.8 wmoUnit:degC	93	5 to 10 mph SSE	Slight Chance Showers And Thunderstorms
Thursday	81 F	16.1 wmoUnit:degC	97	5 to 15 mph SSE	Mostly Sunny
Thursday Night	62 F	15.6 wmoUnit:degC	79	10 to 15 mph SSE	Partly Cloudy then Slight Chance Rain Showers

PETER ( Facility: 01 User: pmn ) View in Mobile Style Welcome, Peter Newby



---

REST.MSO



# M.SO.BUILD REST NEWS SOURCE

hp4 - pmn:PETER - Manage 2000 - Peter Newby

File Edit Commands Scripts Attachments Tools ProcessOpts Help Debug

Attachments  Add Attachment  Add Note  Notes  Note Summary

**M.SO.BUILD.1 - Main Software Object Information**

Object ID	<input type="text" value="2335C"/>	02 Extended Description
	.01)	Fedex Availability Transit Times
	.02)	Example call to FEDEX REST API to get transit times
Object Type	<input type="text" value="B"/>	04 Object Command
	.01)	REST.MSO
	.02)	ServiceID = FX5
	.03)	Parameter1 = FromZip=55441
	.04)	Parameter2 = ToZip=&LK SOH&{SOH.Cust_Zip}
	.05)	Parameter3 = Weight=6
05 Windows Caption	<input type="text" value="FEDEX Transit Time Infomation"/>	
06 Category Group	<input type="text" value="UTIL System Utilitie"/>	
07 Sub-Category	<input type="text" value="CM Customer Number"/>	

Change Which Field, DELETE, END, TOP, \P .....

✓ ✕ \* User pmn:PETER, PID 0460 on hp4

PWS Viewer - [FEDEX Transit Time Infomation (pmn:PETER)]

File Edit Window Help

```

Transittimedetails
-----
serviceType          FEDEX_GROUND
serviceName          FedEx Ground
dayOfWeek            Wed
time                 23:59
day                  Apr-19-2023
minimumTransitTime  ONE_DAY
description          1 Business Day
countryCode          US
stateOrProvinceCode TN
postalCode           55401
locationNumber       380
airportId            MEM

Customermessages
-----
code                 2036
message              End of Day
    
```



---

# WRITING A REST APPLICATION



# SCREEN.BUILD A UI

hp4 - pmn:PETER - Manage 2000 - Peter Newby

File Edit Commands Scripts Attachments Tools Help Debug

Attachments Add Attachment Add Note Notes Note Summary

FEDX Shipping Rates Live from FEDX Last Update: pmn 12-07-23

01 From Postal Code  
02 To Postal Code  
03 Pickup Type  
04 Service Type  
05 Packaging Type  
06 Request Type .01)  
.02)  
Entries .03)  
07 Unit of Measure  
08 Weight

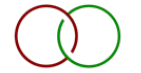
(FEDX.RATES\_PMN) FEDX Shipping Rates Live from FEDX

File Edit Help

Pmt	Prompt Description	Xdata 1	Xdata 2
1	01 From Postal Code	&FROM.ZIP&	
2	02 To Postal Code	&TO.ZIP&	
3	03 Pickup Type	&PICKUP.TYPE&	
4	04 Service Type	&SERVICE.TYPE&	
5	05 Packaging Type	&PACKAGING.TYPE&	
6		&REQUEST.TYPE&	
7	07 Unit of Measure	&UOM&	
8	08 Weight	&WEIGHT&	

OK Select All More Info Delete Show Filter Cancel Help

User pmn:PETER, PID 0060 on hp4 8 items



# WRITE THE APPLICATION CODE

---

Create a new program with PGM.BUILD and add code to:

1. Call SUB.MT500 to run the screen
2. Overlay the variables from the screen to the REST common
3. Call REST.SERVICE
4. Parse the result with JPATH
5. Present the results to user, perhaps in the PWS Viewer using SUB.TEXT.OUTPUT





# PWS FUNCTION WITH FEDEX BACKEND

The image shows two overlapping terminal windows. The background window is titled "hp4 - pmncPETER - Manage 2000 - Peter Newby" and displays a shipping rate configuration form. The foreground window is titled "PWS Viewer - [Live Rate Data from FEDEX REST API (pmncPETER)]" and displays the results of a live rate query.

**Shipping Rate Configuration (Background Window):**

FEDX Shipping Rates Live from FEDX "ADD" Mode

01 From Postal Code: 55441  
02 To Postal Code: 65802  
03 Pickup Type: USE\_SCHEDULED\_PICKUP  
04 Service Type: FEDEX\_2\_DAY  
05 Packaging Type: FEDEX\_LARGE\_BOX

06 Request Type: .01) ACCOUNT  
.02) LIST  
Entries: 2 .03) [ ]

07 Unit of Measure: LB  
08 Weight: 15

Change Which Field, END, TOP, \P .....

User pmnc.PETER, PID 0060 on hp4

**Live Rate Data (Foreground Window):**

Live Rate Data from FEDEX REST API  
Transaction ID: APIF\_SV\_RATC\_TxID0bcdfb90-6c61-4cd3-9efa-97e5284b597f

NOTE This is a Virtual Response.  
NOTE The origin state/province code has been changed.  
NOTE The destination state/province code has been changed.  
Customer Message  
Rate does not include duties & taxes, clearance entry fees or other import fees. The payor of duties/taxes/fees will be responsible for any applicable Clearance Entry Fees.

Type	Base Charge	Net Charge	Vat Charge	FEDEX Net	Net w/Duties and Taxes
ACCOUNT	66.20	88.50	15.90	72.50	88.50
LIST	66.20	87.00	14.50	72.50	87.00



---

# CONCLUSION



# USING MANAGE 2000 8.1 SP6 REST.SERVICES

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- Make information and services from across the Internet available within Manage 2000 ERP functions.
- Have Manage 2000 functions reach across the Internet accessing services, initiating processes, and incorporating information from other systems and organizations.
- Automate collaboration.
- Request Treasure # 40672 and 40673 to support delegated authentication and provide more flexible REST.SERVICES entry screen.



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# QUESTIONS AND ANSWERS



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THANK YOU

