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CONNECTING TO THE OUTSIDE WORLD: HOW TO GET THE BEST OUT OF WEB SERVICES

Arend-Jan Kauffmann, Mark Brummel
(Xperit Group / NAV Skills)

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WHERE WE ARE GOING WE DON'T NEED SOAP

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MONTH DAY YEAR PM HOUR MIN
OCT 26 1985 • 09 00

DESTINATION TIME

MONTH DAY YEAR PM HOUR MIN
OCT 21 2015 • 07 28

PRESENT TIME

MONTH DAY YEAR PM HOUR MIN
NOV 12 1955 • 06 38

LOWEST REAR REARATCH



AREND-JAN KAUFFMANN

Started as COBOL developer in 1988

Dynamics NAV since 2002

co-founder Xperit Group B.V.

Microsoft MVP Dynamics NAV since 2013

co-founder Dutch Dynamics Community

blogger

Microsoft Dynamics NAV Thoughts
<http://www.kauffmann.nl>



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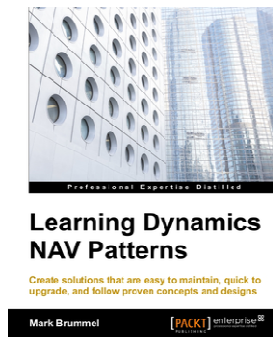


MARK BRUMMEL

Dynamics NAV (Navision) since 1997

MVP Since 2006

Freelance Engineer & Trainer



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AGENDA

Status Update
Web Services



Types of
Web Services



Consuming
Web Services

REST &
MANAGED API



Q & A



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A Decade of Web Services



WHY WEB SERVICES

Exchanging information in a **standardized** way



INTEGRATION

Web Services change the way we think about software development. They are like NAV Solutions on Steroids. Why would you build a solution in NAV to convert from Celcius to Fahrenheit if that is available as a Web Service.

Web Services are becoming more common and standardised. They are also better known by NAV Developers.

Microsoft Dynamics NAV however still has no solid framework to consume Web Services

When Web Services were introduced a lot of attention was given to exposing Pages as Web Services. Many partners discovered that this is generating confusing and too complex WSDLs. XML Ports are better

NAV Exposes SOAP and sends XML while the rest of the world is moving to REST and Json. How does this reflect to OData, which is REST based.

AGENDA

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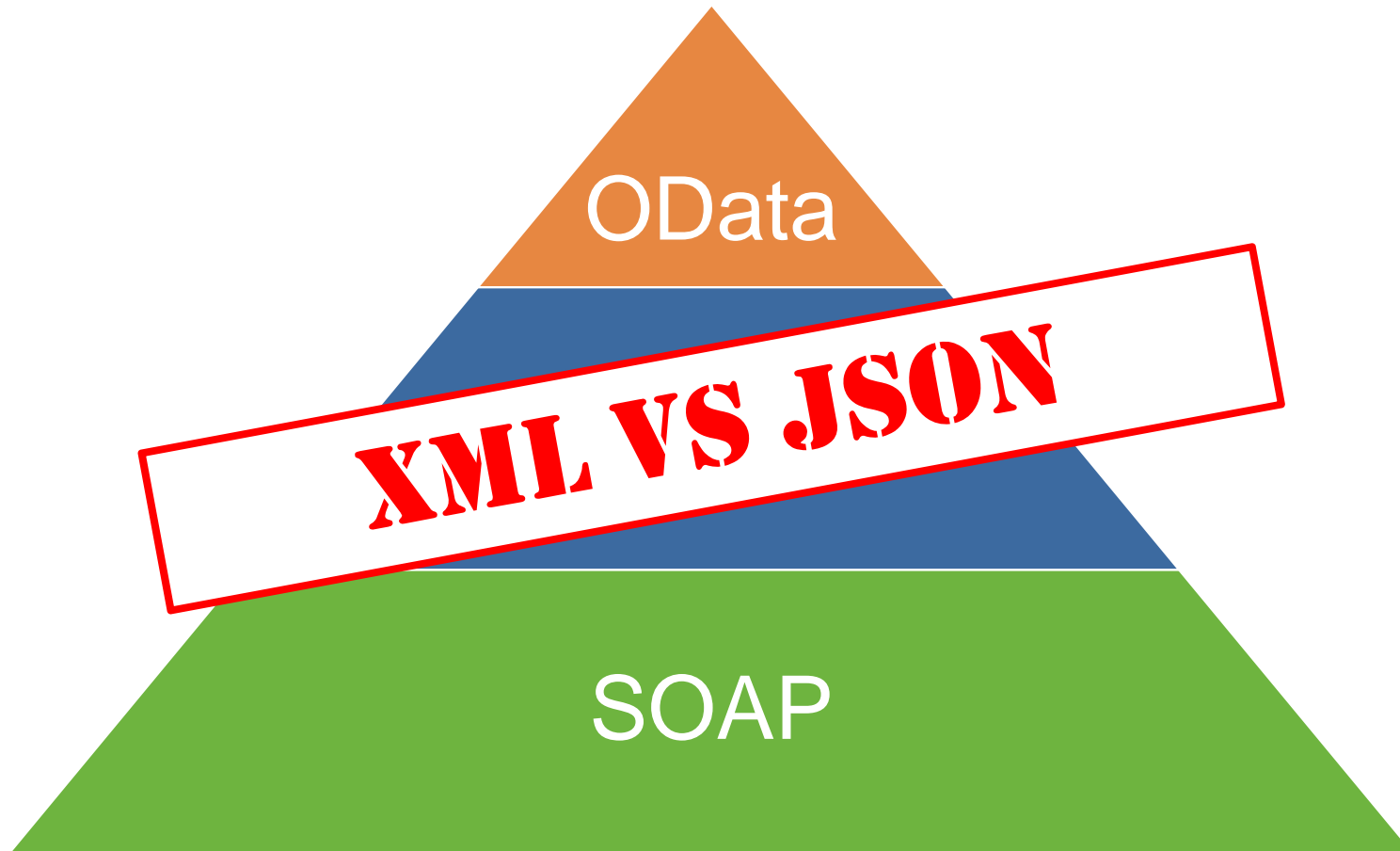
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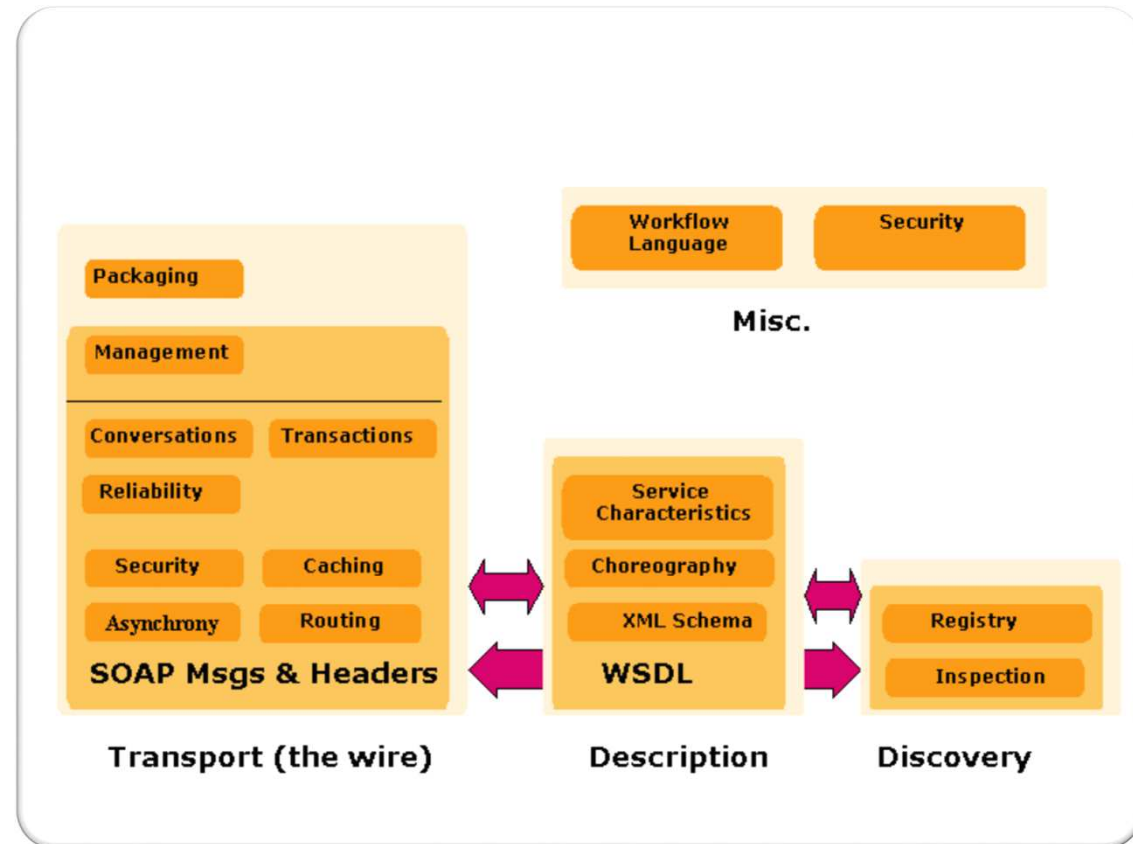
SOAP

Generic Object Model

Flexible

Supported by Dynamics NAV

WSDL - UDDI



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REST

Standardised (HTTP)

GET PUT POST DELETE

Not supported by NAV except...

OData is based on REST



ODATA

Based on REST

Includes Query language

Supported by NAV (Read/Write)

PATCH allows caching



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XML VS. JSON

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <companies>
- <company>
  <companyname>Stanford and
    Son</companyname>
  - <employee>
    <code>1</code>
    <name>Joe Jackson</name>
    <street>14th street</street>
    <housetno>1</housetno>
    <areacode>1050 DD</areacode>
    <place>NoWhere</place>
    <phone>0100 987654</phone>
  </employee>
  - <employee>
    <code>2</code>
    <name>Peter de Wit</name>
    <street>ChurchLane</street>
    <housetno>4a</housetno>
    <areacode>9876 AB</areacode>
    <place>Whereever</place>
    <phone>0100 987654</phone>
  </employee>
  - <employee>
    <code>3</code>
    <name>John Brown</name>
    <street>1st street</street>
    <housetno>243</housetno>
    <areacode>5558 ZZ</areacode>
    <place>Outside</place>
    <phone>0333 999888</phone>
  </employee>
</company>
</companies>
```



```
1 {
2   "data":
3   [
4     {
5       "id": 1,
6       "name": "Sequel Pro 0.8",
7       "version_string": "0.8",
8       "appcast_url": "http://www.sequelpro.com/appcast/app-releases.xml",
9       "build_no": 19,
10      "release_notes": "",
11      "download_link": "http://sequel-pro.googlecode.com/files/sequel-pro-0.8.dmg",
12      "release_type": "Stable",
13      "created": null,
14      "updated": 1296545735,
15      "release_date": 1207958400,
16      "archive": 0
17    },
18    {
19      "id": 2,
20      "name": "Sequel Pro 0.9",
21      "version_string": "0.9",
22      "appcast_url": "http://www.sequelpro.com/appcast/release_0.9.html",
23      "build_no": 30,
```

AGENDA

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Types of
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Q & A



SOAP vs REST

REST	SOAP
Exposes resources representing data	Exposes operations representing logic
Uses HTTP verbs - GET / POST / PUT / DELETE	Uses HTTP POST / SMTP / MSMQ
Emphasis on simple point-to-point communication over HTTP	Emphasis on loosely coupled distributed messaging
Stateless communication	Supports stateless and stateful operation
Multiple dataformats – Json / XML / Text	Supports only XML
Shorter learning path – easy consume without additional components	Requires more skills – hard to consume without additional components

REST

The URL is the command

Parameters are accepted:

- As part of the URL
- As body part of the HTTP request (HTTP POST)
- In the request header (most often used for authentication)

Request parameters and response data can be

- Just text
- Xml
- Json

```
{
  "readings": [
    {
      "name": "richard",
      "source": "home agent",
      "unitid": "129902",
      "reading": "20",
      "unit": "celsius",
      "timestamp": "2014-03-09T07:00:00"
    },
    {
      "name": "stephen",
      "source": "home agent",
      "unitid": "129918",
      "reading": "15",
      "unit": "celsius",
      "timestamp": "2014-03-09T07:10:00"
    },
    {
      "name": "kent",
      "source": "office agent",
      "unitid": "123001".
    }
  ]
}
```


SOAP vs REST – How to call them

REST

Without any external component:

- Do the message pumpling yourself
- Call the web service with .Net HttpWebRequest
- Handle HttpWebResponse
- No strong typing

See Codeunit 1294 / 1297 / 1299

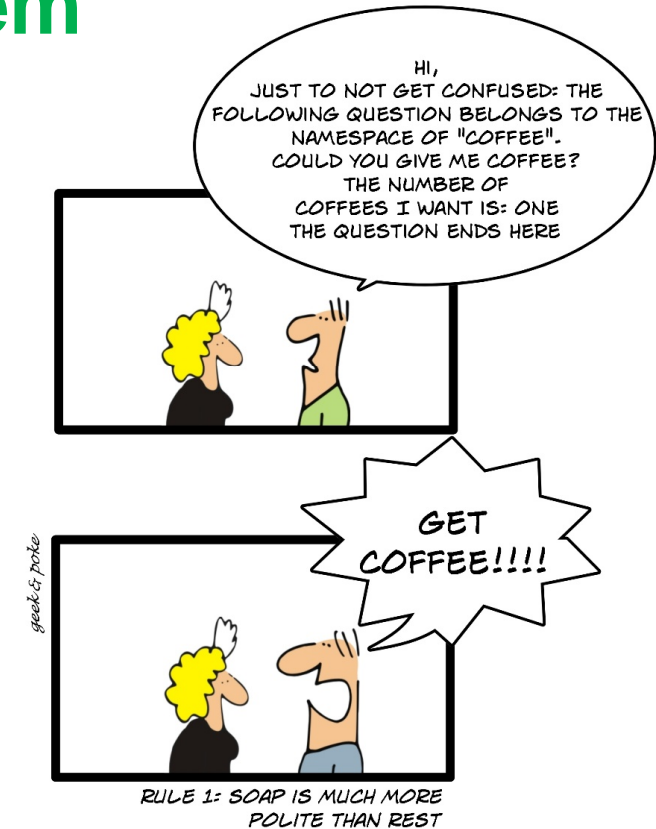
With external component

- Create strong type object with Visual Studio
- Use .Net HttpWebRequest / HttpWebResponse
- Better choice: HttpClient / HttpResponseMessage

SOAP

With external component

- Create web proxy dll with Visual Studio
- Strong typing
- Still need to use .Net Binding and Endpoint component



REST – Tip 1 – HttpClient

Supports GET / POST / PUT / DELETE methods

Designed as an easy to use alternative for HttpWebRequest

Available in .Net Framework 4.5

```
HttpClient := HttpClient.HttpClient();
HttpClient.BaseAddress := Uri.Uri(baseUrl);

CASE RestMethod OF
  'GET':
    HttpResponseMessage := HttpClient.GetAsync(method).Result;
  'POST':
    HttpResponseMessage := HttpClient.PostAsync(method,httpContent).Result;
  'PUT':
    HttpResponseMessage := HttpClient.PutAsync(method,httpContent).Result;
  'DELETE':
    HttpResponseMessage := HttpClient.DeleteAsync(method).Result;
END;

HttpResponseMessage.EnsureSuccessStatusCode(); // Throws an error when no success

result := HttpResponseMessage.Content.ReadAsStringAsync.Result;
```

REST – TIP 2 – Strong typing

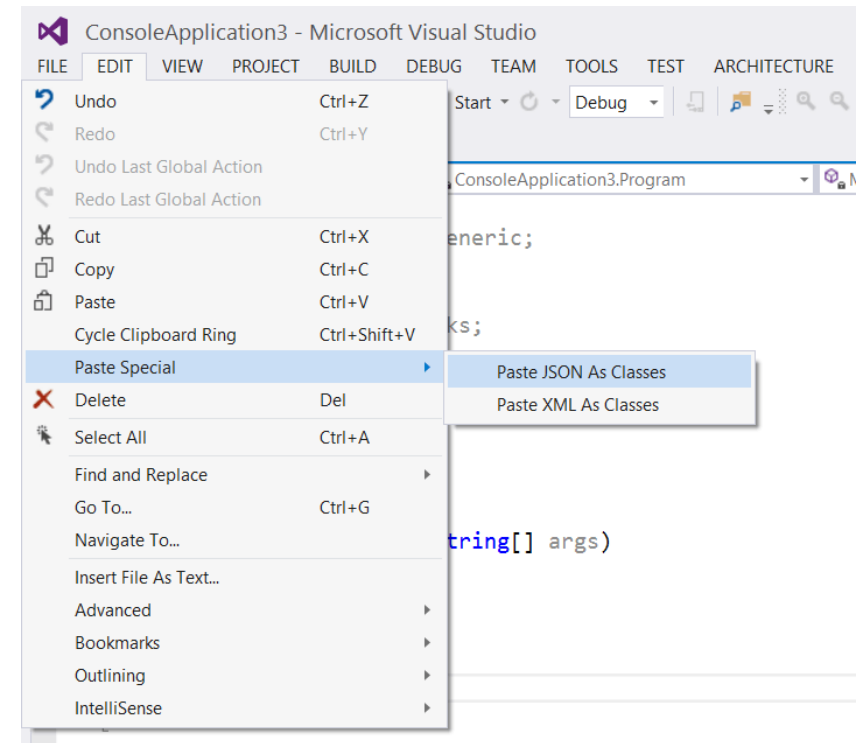
Let Visual Studio create your strong typed data object

Paste XML or JSON as class

Copy the dll to the Add-ins folder on the server

Use JsonConvert

(Copy Newtonsoft.Json.dll to Add-ins folder – only design-time)



Managed API

Hides the complexity

Library of types and operations build on top of a web service

Client code only need to use the API

The library performs the web service calls

Extremely useful with complex web services

Example 1: Verify e-mail address

Purpose	Verify if an e-mail address really exists
Homepage	http://www.email-validator.net/
Type	REST

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Example 2: Generate Bar Code

Purpose	Generate the bar code for an item
Homepage	http://www.barcodes4.me/
Type	REST

DEMO

Example 3: Send SMS

Purpose

Send SMS

Homepage

<http://www.bulksms.com/>

Type

REST

DEMO

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Example 4: DocuSign

Purpose

Digitally sign documents

Homepage

<http://www.docusign.com/>

Type

Managed API

DEMO

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Example 5: Office 365 Mail

Purpose

**Synchronize an Office 365 Inbox
Including attachments**

Homepage

<http://aka.ms/ews-managed-api-readme>

Type

Managed API

DEMO

Other Useful Web Services

Azure File Storage

<https://azure.microsoft.com/en-us/documentation/articles/storage-dotnet-how-to-use-files/>

EAN Search

<http://www.ean-search.org/>

Programmable Web

<http://www.programmableweb.com/apis/directory>

Call to action

Learn .Net Interoperability

Learn C#

Think simple

Don't try to reinvent the wheel



Any Questions?

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THANK YOU

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COFFEE BREAK

see you back in 30 min.

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