Integrated Data Exchange

Wim de Olde - GTS

What are “Web Services”?

- ***Implementation technology for SOA application development***

> The term "Web Services" can be confusing. It is, unfortunately, often used in many different ways. Often the cause of this confusion is the term "services" that has a different meaning than the term "Web Services." **The term Web Services refers to the technologies that allow for making connections. Services are what you connect together using Web Services.** The combination of services—internal and external to an organization—make up a service-oriented architecture.

- ***Collection of specifications from W3C and OASIS***

> W3C: SOAP, WSDL etc.

> OASIS: UDDI, WS-Security, WS-Federation, WS-Trust, WS-Reliability etc.

> XML is used in the wrapper, e.g. WSDL, headers, meta-data, etc.; but can also be the payload

- ***Implementation***

> Mix and match specifications to suit one’s need

> WSDL (WS definition), UDDI (WS directory) not mandatory

> Security and availability, measures must be taken to implement authentication, defence against misuse, etc.

Example: Transparency

- ***COMMISSION DECISION of 10 November 2010 amending Chapter 3 of Annex I to Regulation (EC) No 715/2009 of the European Parliament (2010/685/EU)***
- ***3.1.1. Form of publication***
- ***Transmission system operators (TSOs) shall provide all information referred to under paragraph 3.1.2 and paragraph 3.3(1) to 3.3(5) in the following manner:***

> on a website accessible to the public, free of charge and without any need to register or otherwise sign on with the transmission system operator;

> on a regular/rolling basis; the frequency shall be according to the changes that take place and the duration of the service;

> in a user-friendly manner;

> in a clear, quantifiable, easily accessible way and on a non-discriminatory basis;

> in downloadable format that allows for quantitative analyses;

> in consistent units, in particular kWh (with a combustion reference temperature of 298,15 K) shall be the unit for energy content and m3 (at 273,15 K and 1,01325 bar) shall be the unit for volume. The constant conversion factor to energy content shall be provided. In addition to the format above, publication in other units is also possible;

> in the official language(s) of the Member State and in English.

- ***This Decision shall enter into force on the 20th day following its publication in the Official Journal of the European Union. It shall apply from 3 March 2011. Done at Brussels, 10 November 2010.***

Example: Transparency

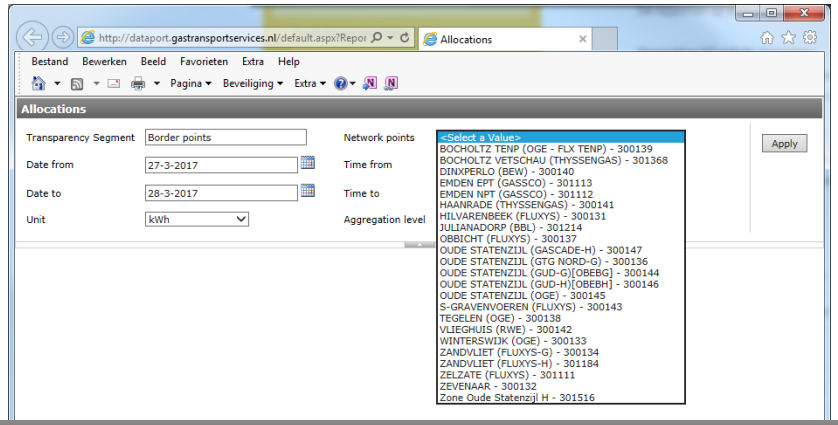
- ***Characteristics for the service***

> on a website accessible to the public, free of charge; (Note: it would be recommended if the source website is identifiable)
> on a regular/rolling basis;
> in a user-friendly manner;
> in a clear, quantifiable, easily accessible way and on a non-discriminatory basis;
> in downloadable format that allows for quantitative analyses.

- ***Information to disclose:***

Information		Requirements												
Transparency information group	Information	F	I	BH	TN	TX	NWP Segm	Segm. Aggr	Three Minus Rule	Publ. Level	Update Freq.	History	Future	Remark
Capacity	Available capacity	X	X	X	X	X	-	-	-	day	Weekly	3 y	5 y	Border points
	Booked capacity	X	X	X	X	X	-	-	X	day	Weekly	3 y	5 y	Border points
	Total capacity	X	X	X	X	X	-	-	X	day	Weekly	3 y	5 y	Border points
	Longterm available capacity	X	X	X	X	X	-	-	-	year	Monthly	-	10 y	Border points
Nominations	Nominations and Re-nominations	X	X	X	X	X	-	-	X	hour	2x day	-	5 d	Border points
	Confirmations	X	X	X	X	X	-	-	X	hour	2x day	-	5 d	Border points
Metering	Real time flow + Hs	-	-	-	-	-	-	-	X	hour	Hourly	1 m	-	Industry, Storage, Import Export
Interruptions	Booked capacity	X	X	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Total capacity	X	X	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Nominated quantity	X	X	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Confirmed quantity	X	X	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Allocated quantity	X	X	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Initial interrupted quantity	-	-	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Initial interruptible quantity	-	-	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Initial nominated quantity	-	-	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Interrupted quantity of last nomination	-	-	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Interruptible quantity of last nomination	-	-	-	X	X	-	-	X	hour	Daily	3 y	-	Border points
Allocations	Allocations	X	X	X	X	X	-	-	X	hour	Daily	3 y	-	Border points
	Provisional allocations	X	X	X	X	X	-	-	X	hour	Daily	3 y	-	Border points

GTS example



Allocations

Transparency Segment: Border points
Network points: OUDE STATENZIJL (OGE) - 300145
Date from: 1-3-2017
Time from: 06:00
Date to: 28-3-2017
Time to: 06:00
Unit: kWh
Aggregation level: Hour

1 of 14

Report name	Allocations
Data provider	Gas Transport Services
Transparency segment	Border points
Network points	OUDE STATENZIJL (OGE) - 300145
Date from	01-03-2017
Time from	06:00
Date to	28-03-2017
Time to	06:00
Time zone	LET
Unit of measure	kWh
Aggregation level	Hour
Creation date time	28-03-2017 11:47

NWP Code	NWP Description	Date	Allocated Entry	Allocated Firm Entry	Allocated Interruptible Entry	Allocated Exit	Allocated Firm Exit	Allocated Interruptible Exit	Allocated Backhaul	Allocated Provisional Entry	Allocated Provisional Firm Entry	Allocated Provisional Interruptible Entry	Allocated Provisional Exit	Allocated Provisional Firm Exit	Allocated Provisional Interruptible Exit	Allocated Provisional Backhaul
300145	OUDE STATENZIJL (OGE)	01-03-2017 07:00								5549722	5549722		62856	62856		
300145	OUDE STATENZIJL (OGE)	01-03-2017 08:00								5549724	5549724		780770	780770		
300145	OUDE STATENZIJL (OGE)	01-03-2017 09:00								5549377	5549377		780769	780769		
300145	OUDE STATENZIJL (OGE)	01-03-2017 10:00								5549377	5549377		780769	780769		
300145	OUDE STATENZIJL (OGE)	01-03-2017 11:00								5549377	5549377		780769	780769		

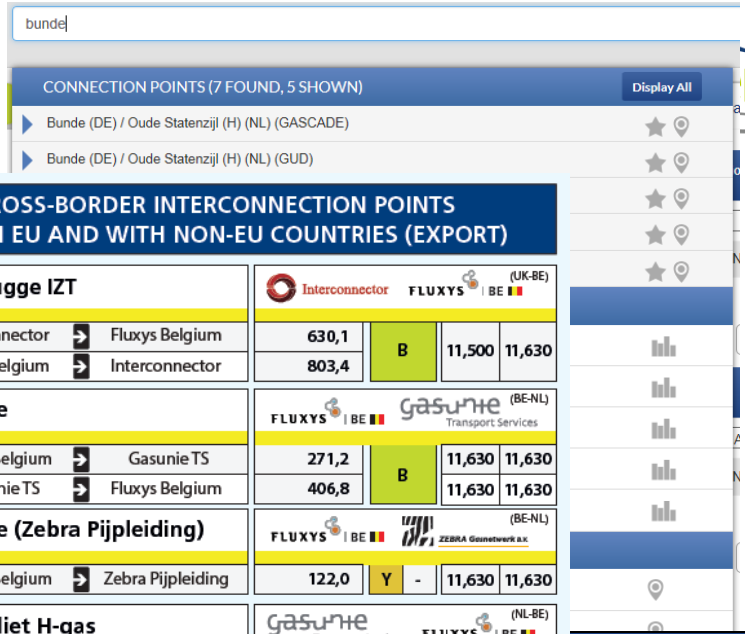
ENTSOG example

- ***What do we mean? (transparency platform)***

> Is it Bunde?

> Is it Oude Statenzijl?

> Is it 21Z000000000078I?



CROSS-BORDER INTERCONNECTION POINTS WITHIN EU AND WITH NON-EU COUNTRIES (EXPORT)

001	**Zeebrugge IZT**						
	Interconnector	Fluxys Belgium	630,1	B		11,500	11,630
	Fluxys Belgium	Interconnector	803,4				
002	**Zelzate**						
	Fluxys Belgium	Gasunie TS	271,2	B		11,630	11,630
	Gasunie TS	Fluxys Belgium	406,8			11,630	11,630
	Zelzate (Zebra Pijpleiding)						
	Fluxys Belgium	Zebra Pijpleiding	122,0	Y	-	11,630	11,630
003	**Zandvliet H-gas**						
	Gasunie TS	Fluxys Belgium	47,5	Y		11,630	11,630
004	**Poppel (BE) // Hilvarenbeek / Zandvliet-L (NL)**						
	Gasunie TS	Fluxys Belgium	644,8	Y		9,770	9,770
005	**'s Gravenvoeren Dilsen (BE) / 's Gravenvoeren / Obbicht (NL)**						
	Gasunie TS	Fluxys Belgium	343,6	Y		11,630	11,630
006	**Eynatten 1 (BE) // Lichtenbusch / Raeren (DE)**						
	Fluxys Belgium	GASCADE	129,5	B		11,630	11,630
	GASCADE	Fluxys Belgium	173,9				
	Eynatten 2 (BE) // Lichtenbusch / Raeren (DE)						
	Fluxys Belgium	Fluxys TENP	183,6	B		11,200	11,630
	Fluxys Belgium	Open Grid Europe		B		11,630	11,630
	Fluxys Belgium	Thyssengas		B	Y	10,600	11,700
	Fluxys TENP	Fluxys Belgium	178,3	B		11,200	11,630
	Open Grid Europe	Fluxys Belgium		B		11,630	11,630
	Thyssengas	Fluxys Belgium		Y	B	10,600	11,700

Number		Point	Arc	Technical physical capacity (GWh/d)
Cross-border IP within EU and with non-EU (export)				
1		Zeebrugge IZT	>IB-BEhz	630,1
			IB-BEhz>	803,4
2		Zelzate	BEh>NL	271,2
			NL>BEh	406,8
		Zelzate (Zebra Pijpleiding)	BEh>NL	122,0
3		Zandvliet H-gas	NL>BEh	47,5
4	V	Poppel (BE) // Hilvarenbeek/Zandvliet-L (NL)	NL>BEl	664,8
5	V	's Gravenvoeren Dilsen (BE) // 's Gravenvoeren/Obbicht (NL)	NL>BEh	343,6
6		Eynatten 1 (BE) // Lichtenbusch / Raeren (DE)	BEh>DEg	129,5
			DEg>BEh	173,9
		Eynatten 2 (BE) // Lichtenbusch / Raeren (DE)	BEh>DEn	183,6
			DEn>BEh	178,3

To CC	To BZ	Available Flow Directions		Min GCV	Max GCV
BE	BeLux	B	B	11,500	11,630
UK	IUK	B	B	11,500	11,630
NL	Netherlands	B	B	11,630	11,630
BE	BeLux	B	B	11,630	11,630
NL	Netherlands	Y	-	11,630	11,630
BE	BeLux	Y	Y	11,630	11,630
BE	L-Zone	Y	Y	9,770	9,770
BE	BeLux	Y	Y	11,630	11,630
DE	GASPOOL	B	B	11,630	11,630
BE	BeLux	B	B	11,630	11,630
DE	NCG	B	B	11,630	11,630
DE	NCG	B	Y	10,600	11,700
DE	NCG	B	B	11,200	11,630
BE	BeLux	B	B	11,630	11,630
BE	BeLux	Y	B	10,600	11,700
BE	BeLux	B	B	11,200	11,630

Important! Definitions

- ***When a web service is published, the information model behind it is important***

> **Definitions** of the terms used, e.g.

  - **(Border) Point**: A by regulation defined relevant point. The physical representation is used.
  - **ConnectionPoint:** By regulation marked as relevant point, part of a network and administrative required (non-physical), for entering and exiting a balancing zone.

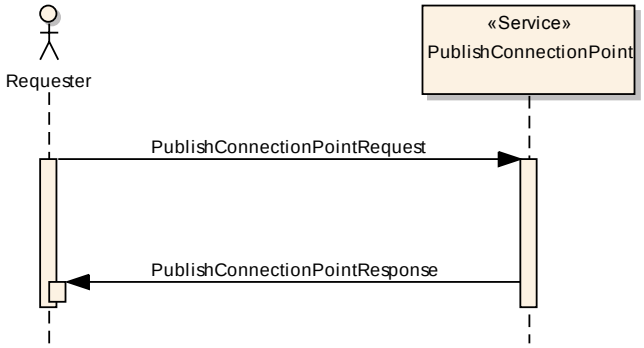
> Public published **information model**

- ***The WSDL and/or XSD's must be published***

- ***Caution: Don't make the service too big!***

> Keep the service restricted for a specific information purpose, e.g. transparency

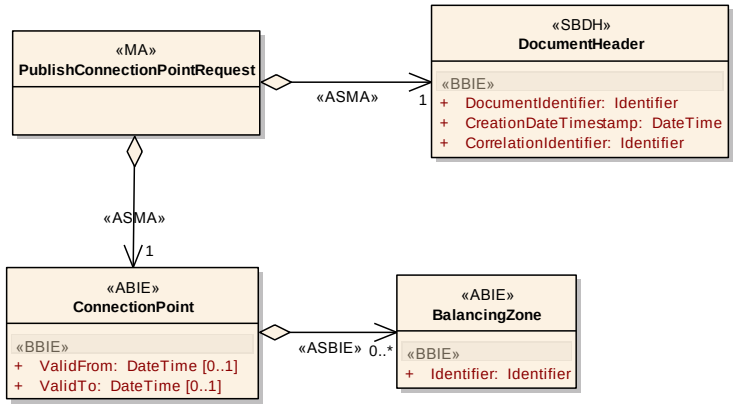
Transparency: Example Publish ConnectionPoint



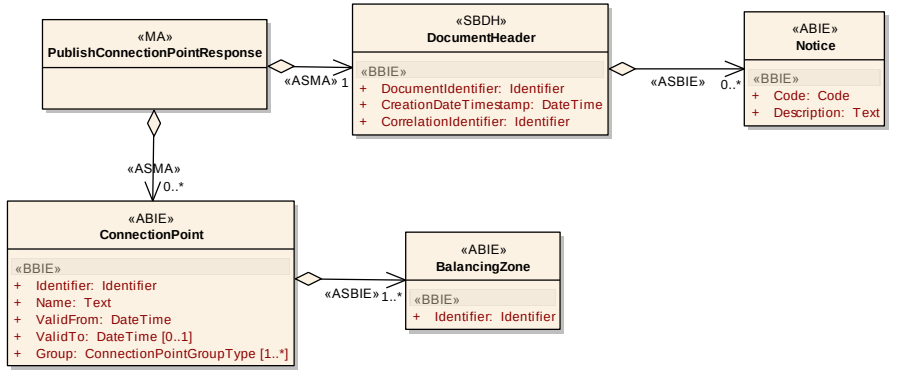
Service Definition	
Description	Publishes a list of available ConnectionPoints
Parameters	ValidFrom, ValidTo, BalancingZone (Optional)
Normalized Name	PublishConnectionPoint

Constraints

- Valid Period is 18 month ahead and 60 months back (starting from 1-1-2011)
- When no ValidFrom and/or ValidTo is specified the minimum ValidFrom and/or maximum ValidTo will be used by the service provider.
- For aggregated Balancingzones only the ConnectionPoints on the border of the aggregated BalancingZone will be related to the aggregated BalancingZone.

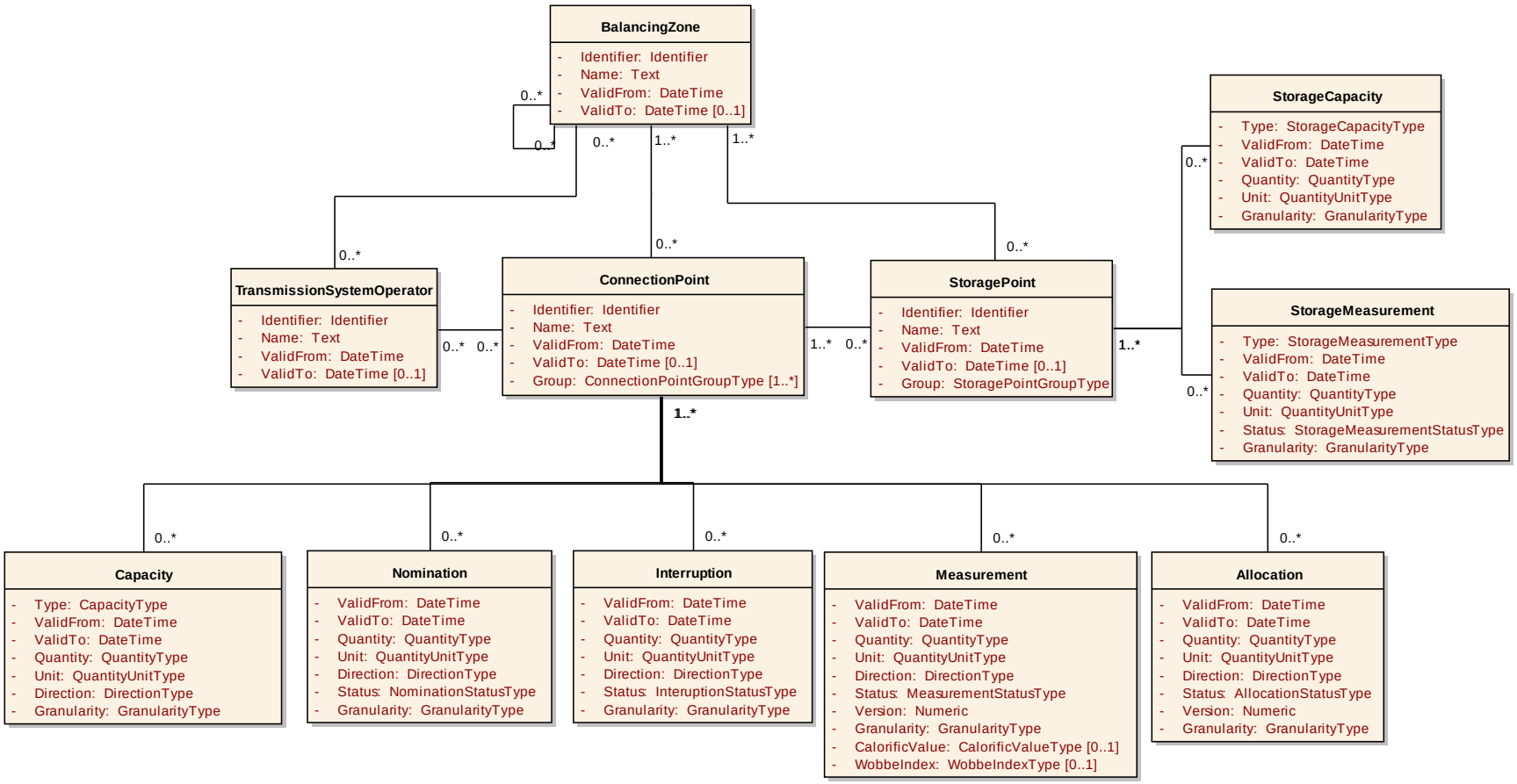


inbound



outbound

Transparency: Example Information model



Interoperability

- ***Defining HTTP/S-SOAP is not enough to make a web service interoperable***
- ***Since there is not one definition of a "web service", additional specifications must be made between parties or communities***
- ***The interface to a SOAP web service is captured in a WSDL (this could be seen as a web service API)***

> Payload is always XML, wrapped in a SOAP envelope, also XML

> Code can be generated (XSD elements/types to Java/C#... Classes)

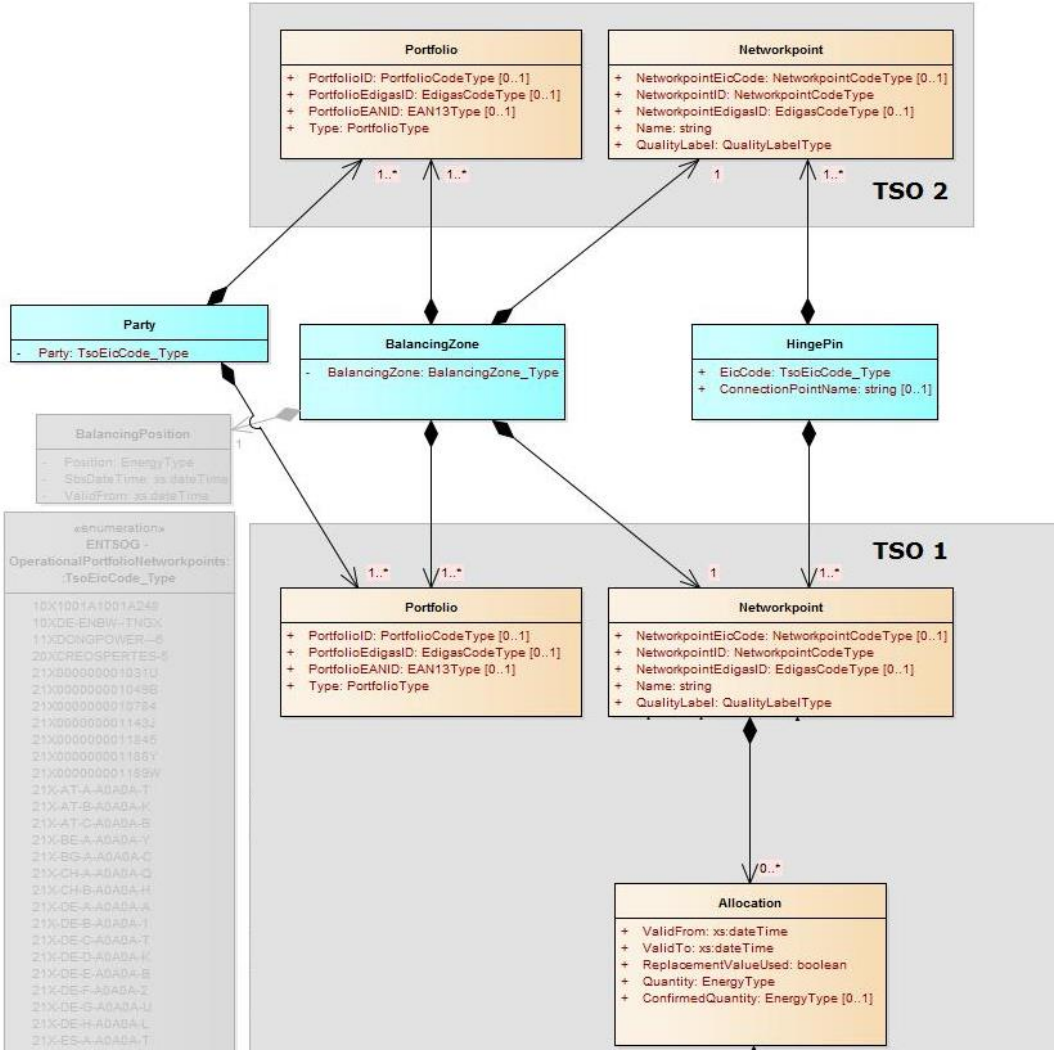
> When the response on a request is a "well formed" XML, it can easily be further processed

> It is even possible to query a web service within Microsoft Excel

> Authentication must be implemented in a separate way: username/password, certificates

Interop: EU information model?

- ***Generic, high level information model***
- ***Connecting information models (hinge pin)***
- ***Standardised way entering a web service***



GTS

- ***Gasport: Interactive, B2B: Integrated***

> B2B is 24-hour service based.

> Gasport is only serviced by GTS during office hours.

- ***Contracting, Allocating, Measuring, Balancing***

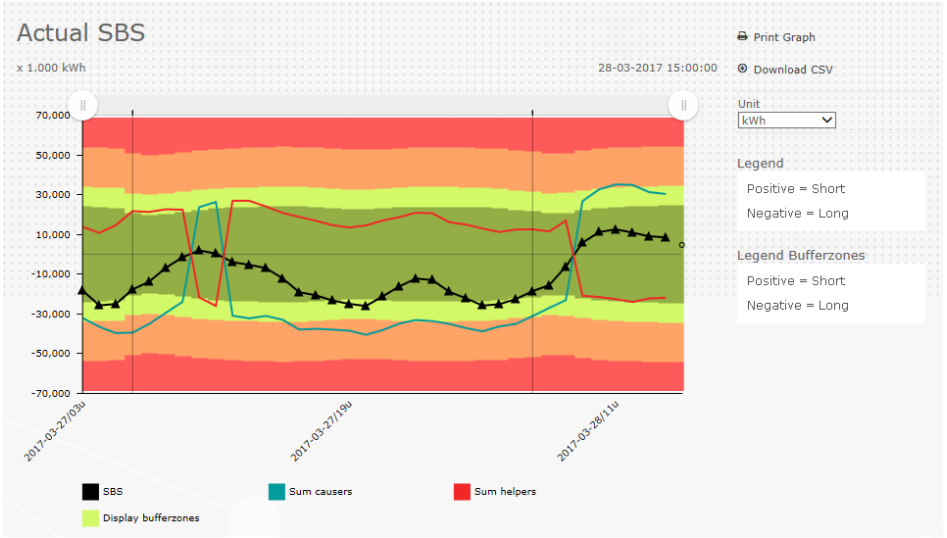
> **Standardised** and centrally published in the Netherlands

> https://www.gasunietransportservices.nl/en/gasport-b2b-certification/gasport-and-b2b

- ***Public: Interactive***

> System Balance Signal

> Portfolio Imbalance Signals



Conclusion

- ***SOAP web services can be used for public available information, minimal security***
- ***SOAP web services can be used in conjunction with authentication to provide specific content for a party***

> Most parties use their own certificates to authorise users, username/password is not advisable to use

- ***Standardised information model & terms***
- ***SOAP web services should be standardised which makes it more efficient to use it within the gas market (to consume web services)***
- ***Web service descriptions & WSDL's must be made available***
- ***BRS-es must clearly state which data exchange solution(s) is or are applicable***
- ***ENTSOG profiles must be in line with the business requirements***

Questions and Answers