AS4 & EDIGQS

DESCRIPTION OF THE MESSAGE TRANSFER SOLUTION
BACKGROUND / OVERALL DESCRIPTION

• This document describes the technical solution and acts as a reference document for setting up the AS4 connections to TSO FI system

• Edig@s XML messages are used, like described in standard
  ▪ https://www.edigas.org

• AS4 is used as transport protocol
  ▪ OASIS standard for secure WebServices
WHAT IS AS4?

AS4 defines a standardized, secure and reliable exchange of messages, containing one or multiple payloads.

These are the key features of the messaging standard:

• **Interoperable**: AS4 is defined as an OASIS standard. It is built on top of existing standards, which have proven interoperability in the past: MIME, SOAP and WS-Security.

• **Secure**: AS4 uses a subset of the WS-Security features in order to assure message non repudiation and data confidentiality.

• **Reliable**: AS4 guarantees once-and-only-once delivery, via the exchange of acknowledgements and additional requirements on both send and receive side.

• **Payload agnostic**: AS4 can exchange any kind of payloads (XML, JSON, HL7, EDI, binary …) and it supports also multiple payloads being sent in one AS4 message.

SOURCE: HTTPS://WWW.CODIT.EU/BLOG/AS4-FOR-DUMMIES-PART-I-INTRODUCTION/?COUNTRY_SEL=BE
WHAT IS EDIG@S?

- A standard way of transmitting operational data related to gas business
- Recommendation from EASEE-gas/Edig@s workgroup
- At the end of 1996 first release of standard, based on EDIFACT
- Since version 4 also XML syntax supported, now in version 5.1
- Only XML messages are used in TSO FI connections
- [https://www.edigas.org](https://www.edigas.org)
• AS4 defines how systems connect to each other and how data is sent
  ▪ Message Service Handler (MSH) doesn’t have to have understanding of the payload
  ▪ Processing is based on SOAP header information
    • EIC codes are used to identify parties

• Edig@s defines the payload
  ▪ Translating the data produced by Message Consumer/Producer (eg. an ERP) to/from the Edig@s format can be done in MSH system
  ▪ Acknowledgements are sent after processing the message
    • Deflate, decrypt and validate
Message Consumer/Producer
Eg. ERP of some kind

Message Service Handler
Middleware software
Eg. Axway

Message Service Handler
Middleware software
Eg. Tibco

Message Consumer/Producer
Eg. ERP of some kind

Implementation specific

AS4 channel

Implementation specific

SIGNAL MESSAGE

NOMINT

ACKNOW
EDIG@S MESSAGES

- Usage of EDIG@S XML 5.1 messages in Finland is described in document
  - Edig@s XML 5.1 guideline for Finland 13_09_2019.docx
- In nomination process following messages are used
  - NOMINT
    - Nominations and renominations from shippers to TSO
  - NOMRES
    - After NOMINT is processed and matched a NOMRES is sent from TSO to shipper
  - ACKNOW
    - After receiving any messages a ACKNOW is sent to the original sender of the message. This applies to both shippers and TSO.
Shipper

NOMINT
Nomination or renomination

ACKNOW
Expected to be received in 10 min after sending NOMINT

NOMRES

ACKNOW

Shipper MSH

NOMINT

ACKNOW

NOMRES

ACKNOW

TSO FI MSH

NOMINT

ACKNOW

NOMRES

ACKNOW

TSO FI

NOMINT

ACKNOW

NOMRES

ACKNOW

Expected to be received in 10 min after sending NOMRES

After nomination is processed
NOMINATION - NOMINT MESSAGE

• Validity period must cover at least one whole gas day
  ▪ Message can contain several days
  ▪ No partial days, always whole gas days

• Nomination message is always sent containing quantity for each hour of gas day
  ▪ 07.00 – 07.00 EET
  ▪ A <Period> aggregate for each hour

<Period>
  <timeInterval>2019-09-10T04:00Z/2019-09-10T05:00Z</timeInterval>
  <direction.code>Z02</direction.code>
  <quantity.amount>4000</quantity.amount>
</Period>
Example of NOMINT message

<Nomination_Document xmlns="urn:easeegas.eu:edigas:nominationandmatching:nominationanddocument:5:1" release="3">
  <identification>NOMINT20190621T21Z000000000059M</identification>
  <version>1</version>
  <creationDateTime>2019-09-10T12:37:22Z</creationDateTime>
  <validityPeriod>2019-09-10T04:00Z/2019-09-11T04:00Z</validityPeriod>
  <contractReference>TEST-TSO-FIXX</contractReference>
  <issuer_MarketParticipant.identification codingScheme="305">21X-FI-A-SHIPPER</issuer_MarketParticipant.identification>
  <issuer_MarketParticipant.marketRole.code>ZSH</issuer_MarketParticipant.marketRole.code>
  <recipient_MarketParticipant.identification codingScheme="305">21X000000001393X</recipient_MarketParticipant.identification>
  <recipient_MarketParticipant.marketRole.code>ZSO</recipient_MarketParticipant.marketRole.code>

  <ConnectionPoint>
    <identification codingScheme="305">21Z000000000059M</identification>
    <measureUnit.code>KW1</measureUnit.code>
    <NominationType type="A02">
      <Account>
        <internalAccount codingScheme="ZSO">TEST-TSO-FIXX</internalAccount>
        <externalAccount codingScheme="ZSO">GAZPROSHP</externalAccount>
      </Account>
      <Period>
        <timeInterval>2019-09-10T04:00Z/2019-09-10T05:00Z</timeInterval>
        <direction.code>Z02</direction.code>
        <quantity.amount>4000</quantity.amount>
      </Period>
      <Period>aggregate repeats to cover the whole <validityPeriod></Period>
    </Account>
    <NominationType>
    </ConnectionPoint>
  </Nomination_Document>
Example of ACKNOW Message

<?xml version="1.0"?><Acknowledgement_Document xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" release="3"
xmllns="urn:easeegas.eu:edigas:general:acknowledgementdocument:5:1">
<identification>ACKNOW20190409B131992684018365574</identification>
.VERSION>1</version>
<type>294</type>
<creationDateTime>2019-09-10T12:40:29Z</creationDateTime>
<validityPeriod>2019-09-10T04:00Z/2019-09-11T04:00Z</validityPeriod>
<contractReference>TEST-TSO-FIX</contractReference>
<issuer_MarketParticipant.identification codingScheme="305">21X00000001393X</issuer_MarketParticipant.identification>
<issuer_MarketParticipant.marketRole.code>ZSO</issuer_MarketParticipant.marketRole.code>
<recipient_MarketParticipant.identification codingScheme="305">21X-FI-A-SHIPPER</recipient_MarketParticipant.identification>
<recipient_MarketParticipant.marketRole.code>ZSH</recipient_MarketParticipant.marketRole.code>
<receiving_Document.identification>REMNINT20190621T21Z00000000059M</receiving_Document.identification>
<receiving_Document.version>1</receiving_Document.version>
<Reason>
<code>01G</code>
</Reason>
</Acknowledgement_Document>

Reason / Code is 01G for positive acknowledgements. Errors according to the Edig@s ReasonCode code list, which is found online. For example 50G for duplicate messages.
AS4 COMMUNICATION

• Based on ENTSOG AS4 profile version 3.6

• Messaging is technically SOAP 1.2 with attachments
  ▪ SOAP header with Messaging extension headers

• Profile defines for example the packaging, compression and security in different levels

• Using one-way/push pattern

• No duplicates
AS4 MESSAGE STRUCTURE

- SOAP header is defined in ENTSOG profile definition
- SOAP header is UTF-8 encoded
- Payloads are in separate MIME parts
  - Payloads are
    - Compressed
    - Signed
    - Encrypted
AS4 SECURITY

• Security at two communication layers
  ▪ the transport layer
    • HTTPS communication, at least TLS 1.2
    • TLS 1.0, TLS 1.1, SSL 2.0 and SSL 3.0 not supported
  ▪ the message layer
    • Web Services Security SOAP Message Security [WSSSMS]
    • Web Services Security X.509 Certificate Token Profile [WSSX509]
      • X.509 tokens for message signing and encryption
      • Web Services Security SOAP Message with Attachments (SwA) Profile [WSSSSWA]

• No self signed certificates
IMPLEMENTATION STEP-BY-STEP

1. Register as a shipper or trader according to prior instructions from TSO
2. Contact info@kaasumarkkina.fi to indicate readiness for testing
3. Collect and distribute own communication parameters to the TSO using the provided excel sheet
4. Create connections from own test-system to TSO’s test-system
5. Execute connectivity test
   - In coordination with TSO FI specialist
   - MSH connectivity
6. Create needed functionality for EDIG@S XML messages and acknowledgements
7. Execute integration test
   - Testing the data integrity, acks and error handling according to the test plan (provided by TSO)
8. After successful tests create connection to TSO production environment
9. Execute connectivity test
   - In coordination with TSO FI specialist
10. Production launch
    - Timetable agreed together with TSO
CONTACT INFO

• Ville Rahkonen
  ▪ Edig@s, nomination Baltic Connector and Imatra
  ▪ +358407199831, ville.rahkonen@gasum.fi

• Tero Kinnunen
  ▪ Technical issues and AS4
  ▪ +358407013562, tero.kinnunen@gasum.fi

• Tiina Niinimäki
  ▪ +358405927042

• In all issues please contact info@kaasumarkkina.fi
MSH PLATFORMS

- ARCESB (EARLIER RSSBUS)
  - https://www.arcesb.com
- AXWAY
- IBM
- ORACLE
- PONTON
- SEEBUGER AG
  - http://www.seebuger.com/home.html
- TIBCO
- FUJITSU
- GBST
- IQGROUP
- OBAN
- SOFTWARE AG
XML Type

```xml
<Nomination_Document xmlns="urn:easeegas.eu:edigas:nominationandmatching:nominationdocument:5:1" release="3">

  <identification>
    <M>1</M>  
    <length>0.35</length>  
    <type>string</type>  
    <example>NOMINT20190621T21Z00000000059M</example>  
    <Remarks>First document starts with version '1'. Subsequent nomination documents must be incremented. <version>1</version> Earlier versions than already received will be rejected.</Remarks>
  </identification>

  <version>
    <M>1</M>  
    <length>0.35</length>  
    <type>integer</type>  
    <example>1</example>  
    <Remarks>Nomination type must always be 01G</Remarks>
  </version>

  <creationDateTime>
    <M>1</M>  
    <length>6</length>  
    <type>dateTime</type>  
    <example>2019-09-10T12:37:22Z</example>  
    <Remarks>UTC date time format is used for all date and time fields.</Remarks>
  </creationDateTime>

  <validityPeriod>
    <M>1</M>  
    <length>0.35</length>  
    <type>string</type>  
    <example>2019-09-10T04:00Z/2019-09-11T04:00Z</example>  
    <Remarks>Validity period must contain the same time interval as the sum of the time intervals (from the first hour to and the last hour).</Remarks>
  </validityPeriod>

  <contractReference>
    <M>1</M>  
    <length>0.35</length>  
    <type>string</type>  
    <example>TEST-TSO-GASGRIDXX</example>  
    <Remarks>Contract reference must be the TSO’s EIC code.</Remarks>
  </contractReference>

  <recipient_MarketParticipant.identification>
    <M>1</M>  
    <length>0.35</length>  
    <type>string</type>  
    <example>21X00000001393X</example>  
    <Remarks>EIC code</Remarks>
  </recipient_MarketParticipant.identification>

  <issuer_MarketParticipant.marketRole.code>
    <M>1</M>  
    <length>0.35</length>  
    <type>NMTOKEN</type>  
    <example>ZSH</example>  
    <Remarks>ZSH=Shipper</Remarks>
  </issuer_MarketParticipant.marketRole.code>

  <recipient_MarketParticipant.marketRole.code>
    <M>1</M>  
    <length>0.35</length>  
    <type>NMTOKEN</type>  
    <example>ZSO</example>  
    <Remarks>ZSO=TSO</Remarks>
  </recipient_MarketParticipant.marketRole.code>

  <ConnectionPoint>
    <M>1</M>  
    <length>0.35</length>  
    <type>string</type>  
    <example>TEST-TSO-GASGRIDXX</example>  
    <Remarks>Location Connection point EIC Coding scheme Nomination rule Balticconnector 21Z00000000004952 305 Mandatory Imatra 21Z000000000059M 305 Mandatory Imatra 21Z000000000059M 305 Mandatory Balticconnector 21Z00000000004952 305 Mandatory for bilateral trades Location Connection point EIC Coding scheme Nomination rule Balticconnector 21Z00000000004952 305 Mandatory Imatra 21Z000000000059M 305 Mandatory Imatra 21Z000000000059M 305 Mandatory Balticconnector 21Z00000000004952 305 Mandatory for bilateral trades</Remarks>
  </ConnectionPoint>

  <type>
    <M>A01, A02</M>  
    <length>0.35</length>  
    <type>NMTOKEN</type>  
    <example>A01</example>  
    <Remarks>A01 = single sided A02 = double sided</Remarks>
  </type>

  <Account>
    <M>1</M>  
    <length>0.35</length>  
    <type>string</type>  
    <example>TEST-TSO-GASGRIDXX</example>  
    <Remarks>Internal account is always the TSO: TEST-TSO-GASGRIDXX</Remarks>
  </Account>

  <internalAccount>
    <M>1</M>  
    <length>0.35</length>  
    <type>string</type>  
    <example>TEST-TSO-GASGRIDXX</example>  
    <Remarks>External account is the TSO of the adjacent system in Balticconnector, if Balticconnector is the connection point. External account is the EIC code of the counterparty shipper or trader, if the connection point is VTP. Otherwise there needs to be no external account.</Remarks>
  </internalAccount>

  <externalAccount>
    <M>1</M>  
    <length>0.35</length>  
    <type>string</type>  
    <example>GAZPROSHP</example>  
    <Remarks>Repeat to cover the whole validityPeriod. Remark: Amount of repetitions differ when changing to and from daylight saving time.</Remarks>
  </externalAccount>

  <Period>
    <M>*</M>  
    <length>6</length>  
    <type>string</type>  
    <example>2019-09-10T04:00Z/2019-09-10T05:00Z</example>  
    <Remarks>Times in UTC Z02: ENTRY TSO Z03: EXIT TSO The nominating shipper must send a nomination direction as seen from the Finnish system point of view Buying and selling at VTP or gas exchange must comply with the following: Z02: ENTRY TSO, market party buying gas from counterparty or at a gas exchange Z03: EXIT TSO, market party selling gas to counterparty or at a gas exchange</Remarks>
  </Period>

  <timeInterval>
    <M>*</M>  
    <length>6</length>  
    <type>string</type>  
    <example>2019-09-10T04:00Z/2019-09-10T05:00Z</example>  
    <Remarks>Times in UTC Z02: ENTRY TSO Z03: EXIT TSO The nominating shipper must send a nomination direction as seen from the Finnish system point of view Buying and selling at VTP or gas exchange must comply with the following: Z02: ENTRY TSO, market party buying gas from counterparty or at a gas exchange Z03: EXIT TSO, market party selling gas to counterparty or at a gas exchange</Remarks>
  </timeInterval>

  <direction.code>
    <M>Z02, Z03</M>  
    <length>0.35</length>  
    <type>NMTOKEN</type>  
    <example>Z02</example>  
    <Remarks>Negative values are not allowed. Note that matching is done hourly therefore counterparts need to nominate</Remarks>
  </direction.code>

</Nomination_Document>
```
QUESTIONS?