OFTP2 kurs

Odette File Transfer Protocol 2

Björn Lantz

Thursday 27th of October 2016,
Scandic Europa hotel

Version 16

Agenda

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09.00	**Introduktion**
09.15	**Communication services for B2B Data Exchange (EDI)**
	The OFTP-protocol and alternatives - Introduction
	The OSI-model
	Security
	Introduction to PKI ■ CA-function and certificate administration ■ PKI ■ How to use the certificate ■ Signatures and encryption/decrypting
	Introduction to TSL and SSL ■ Odette SCX ■ OFTP2 – Certificate administration
10.30	**Coffee**

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10.45	**Detailed walkthrough of SCX and OFTP protocol and codes**
	Odette security Certificate Exchange ■ Role and responsibility ■ PKI ■ How to use the certificate ■ Signing, encryption
11.30	**OFTP2 and the exchange of security** ■ The security policy of Odette (Odette SCX) ■ OFTP2 and the certificate administration
	Implementation issues
12.15	**Lunch**

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Introduction to this day, presentation of lecturers and participants

Björn Lantz

- Software developer at Encode Networks Svenska AB since 1999
- Experience in EDI and Auto ID since 1987
- Involved in international OFTP2 experts group

Training course objectives

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- Basic understanding of communications services and their usage in B2B Data Exchange (EDI)
- Basic understanding of how to use Internet for EDI and how to build trust between trading partners
- Understanding the OFTP2, information flow, OFTP components etc.
- How to identify errors on protocol and network level, including reading of OFTP and communications tracing and logging information
- The understanding of OFTP2 related specifications
- Share implementation experience

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Communications services for B2B Data Exchange (EDI)

EDI supports complex logistics processes

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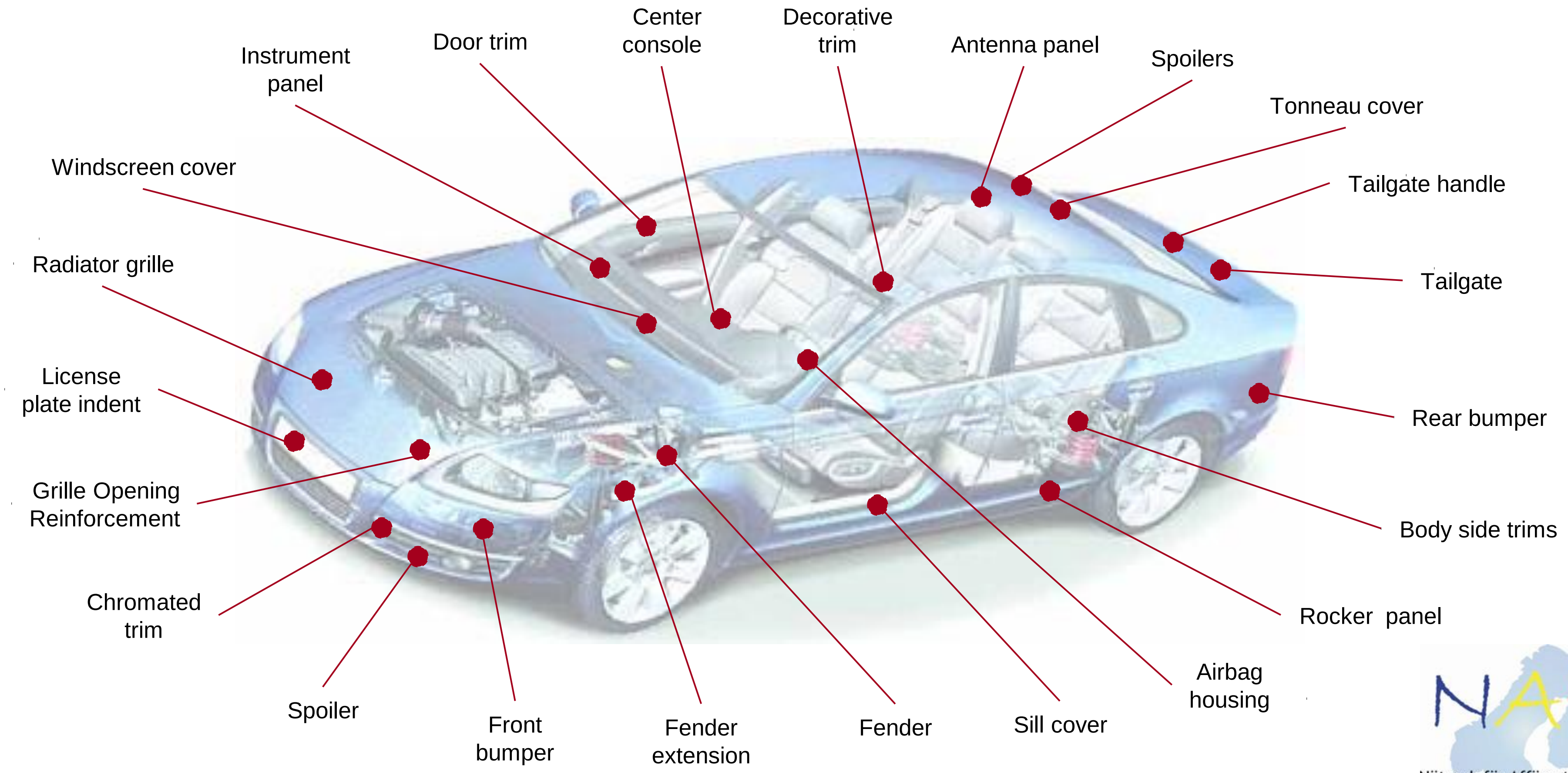
Many parts from a large number of trading partners



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EDI supports complex logistics processes

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Ordering of individual components/sub-assemblies for sequenced deliveries

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ACRONYMS used in the training course

The world of EDI is full of acronyms, some of the most commonly used are:

AS2	Applicability Statement 2
B2B	Business to Business
CA	Certification authority
DMZ	DeMilitarized Zone
ebXML	Electronic Business using eXtensible Markup Language
ERP	Enterprise Resource Planning
FTP	File Transfer Protocol
IETF	Internet Engineering Task Force
IPSEC	Internet Protocol Security
ISDN	Integrated Services Digital Network
MITM	Man-in-the-middle
OEM	Major (Automotive) Customer
OSCAR	Odette System for Coding And registration

ACRONYMS used in the training course

The world of EDI is full of acronyms, some of the most commonly used are:

OSI	Open Systems Interconnection
PKI	Public Key Infrastructure
SCX	Odette Security Certificate Exchange project
SFTP	SSH File Transfer Protocol
SLA	Service Level Agreement
SSL	Secure Sockets Layer
TCP/IP	Transmission Control Protocol/Internet Protocol
Tier1	Tier 1 or primary supplier
TSL	Trust Service Status List
VAN	Value Added Network
VPN	Virtual Private Network
XML	EXtensible Mark-Up language

See also the Glossary in the end of the presentation

Examples of the usage of OFTP

Business Sector

Automotive Industry
Other Manufacturing
Customs
Finance
Retail (Often trough VAN: s)
Transports
Engineering Centres

Application fields

Purchasing and Logistics
Suppliers processes
VAN-services
Public services
Banking
Third Party Logistics Services
Product Data CAD/PDM

State of the Industry usage of EDI and OFTP

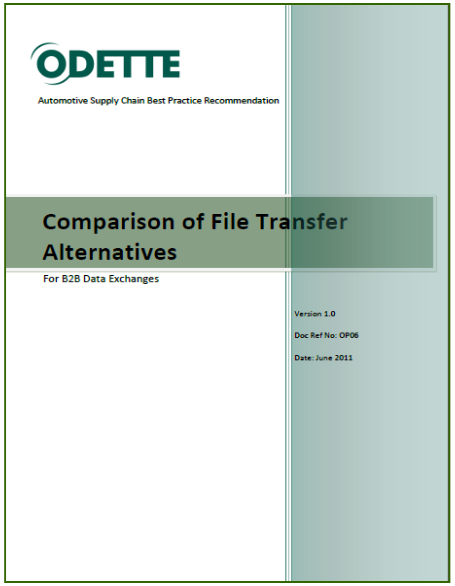
- EDI is widely used in Europe among OEM:s and 1st, 2nd and 3rd Tier suppliers, based on European and/or global automotive recommendations (mainly EDIFACT based)

- The preferred solution is direct data exchange using the OFTP protocol (version 2).

- OFTP2 is accepted by most actors in the European automotive industry for logistics as well as for engineering data (*BMW, Daimler, Ford, GM Europe, MAN, Peugeot Citroën, Scania, Volvo Group, Volvo Cars, VW Group. ….*)

- There is also some usage outside Europe. One example is VW who established connections in Brazil, US, China, India, Russia

OFTP2 compared to other options



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Automotive Supply Chain Best Practice Recommendation

Comparison of File Transfer Alternatives

For B2B Data Exchanges

Version 1.0

Doc Ref No: OP06

Date: June 2011

Odette has published a report on File Transfer Alternatives:

- Listed the main aspect to compare
- Investigated specific automotive requirements
- Identified the main alternatives for file transfer

Today´s main alternatives in automotive are:

- OFTP1 /VPN/ENX (decreasing)
- OFTP2 (increasing)
- Web Portals (increasing)
- (AS2)

For the next 10 years probably the main options will be:

- OFTP2
- Web Portals
- Web Services

OFTP2 compared to other options

Web Portals

- Since long seen as a growing problem, could be replaced by EDI based on EDIFACT or XML with OFTP2 or Web Services

Web Services

- Suitable for certain applications but not well standardised, only applicable within specifically defined environments
- Could not generally replace OFTP2
- No automated certificate handling

AS2

- Is lacking key functionality needed by the automotive industry
- No automated certificate handling

Alternative communications protocols

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- Secure protocol has been required for some time
- Other protocols have been allowed to creep in
- Suppliers have to meet demands of customers

Protocol	Date
SMTP	1982
X.400	1984
FTP	1985
OFTP	1986
SFTP	2000
AS2	2000
OFTP2	2005

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Comparison

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	OFTP 2	AS2	SFTP
TCP/IP	Yes	Yes	Yes
X.25	Yes	No	No
ISDN	Yes	No	No
File restart	Yes	No	No
Availability	Global	Global	Global
MITM secure	Yes	No	No
File size and type acceptance	Yes	No	No
Technical Acknow-ledgement	Yes	No	No
Compression	Yes	No	No

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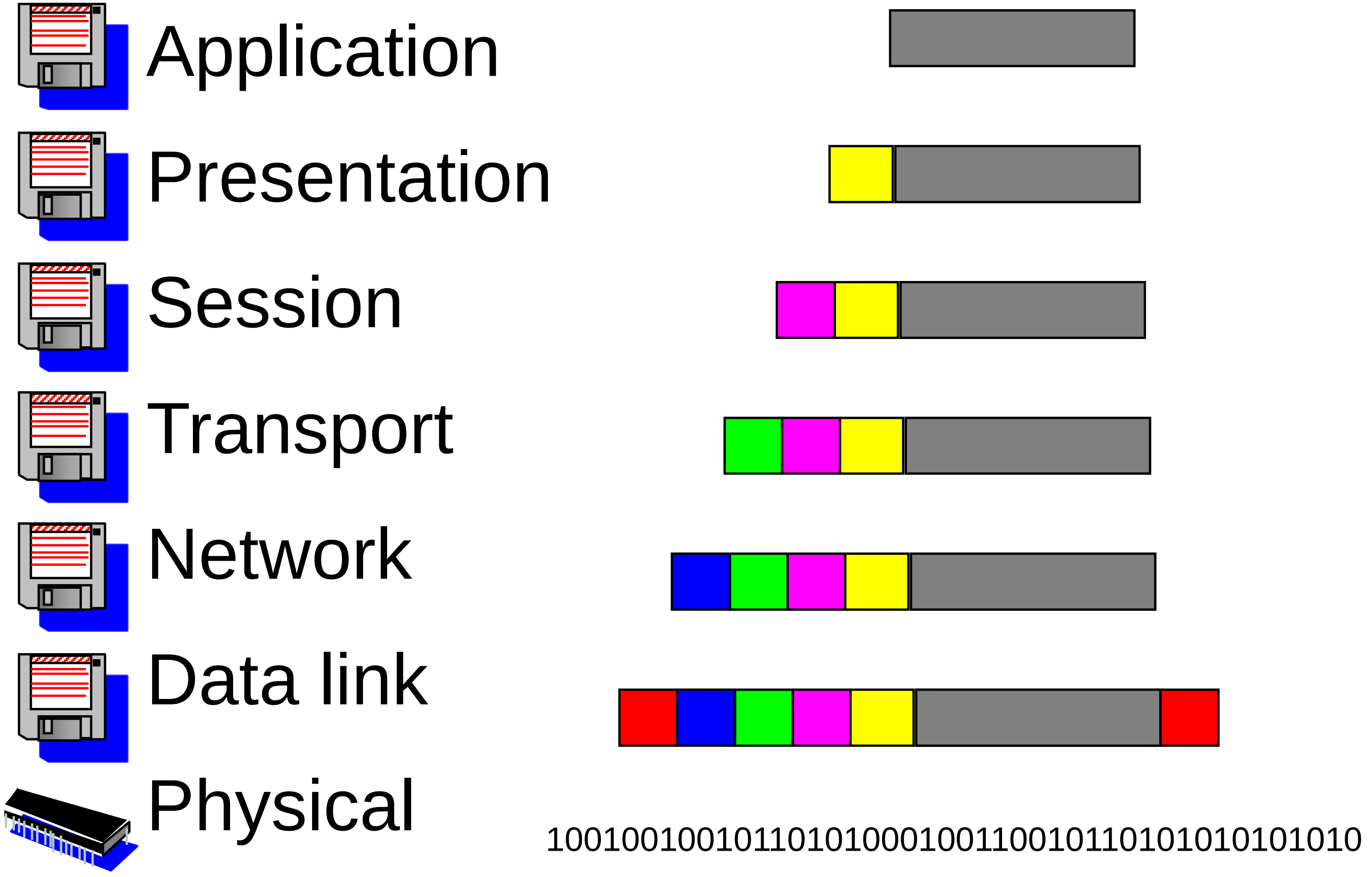
The OSI model

Open Systems Interconnection



Application

Presentation

Session

Transport

Network

Data link

Physical

100100100101101010001001100101101010101010

The OSI model (1)

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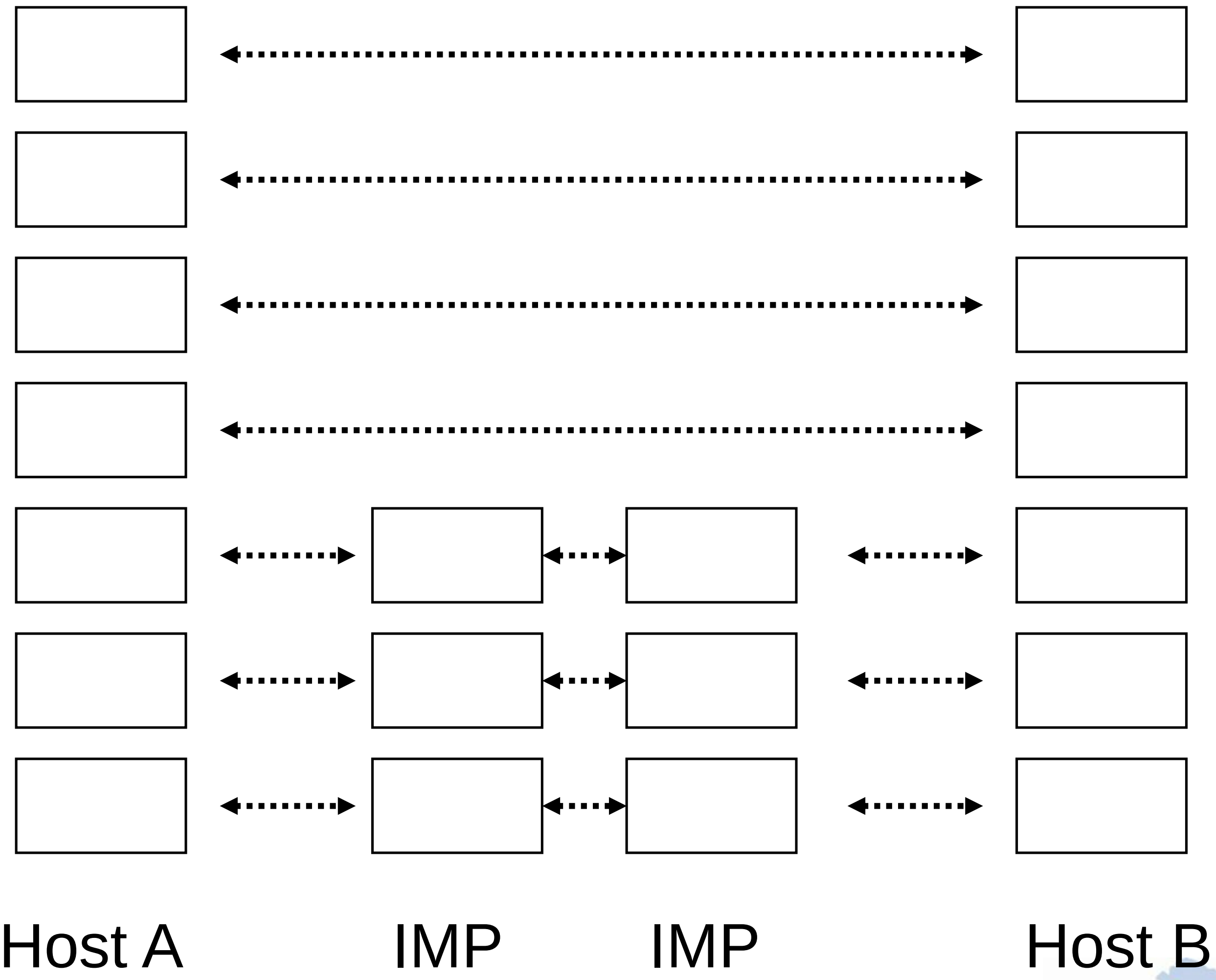
7. Application	OFTP
6. Presentation	OFTP
5. Session	OFTP
4. Transport	OFTP
3. Network	X.25
2. Data link	X.25
1. Physical	X.25



Host A IMP IMP Host B

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Security

Today's needs

- More speed, less cost and world wide
- Go to TCP/IP (Internet, ENX, ...)
- Security: Authentication, Confidentialness, Integrity, Non Repudiation Mandatory over Internet
- Basic components : Keys & Certificates.

SECURITY is based on TRUST

Trust : In which Layer?

Trust at **Network** level:

- Private point to point links
- VPN: Based on IPSEC or SSL
- ENX: A global VPN

Trust at **Software** level:

- Security is inboard, in the application

Trust at Software Level

Security targets:

- Peer **authentication** (not only the site, but the server)
- Traffic **protection** against overseer
- End to end **file services**

Advantages:

- Advanced **file** services features : end to end **encryption**, **signature** and **integrity**, **non repudiation**
- **Same software**: just some configuration items more
- **Autonomy**: no operator and even no IT team dependency

Disadvantages:

- Applications become more **complicated**
- **Internet** connection must be **seriously secured** (DMZ, **Relays**…)

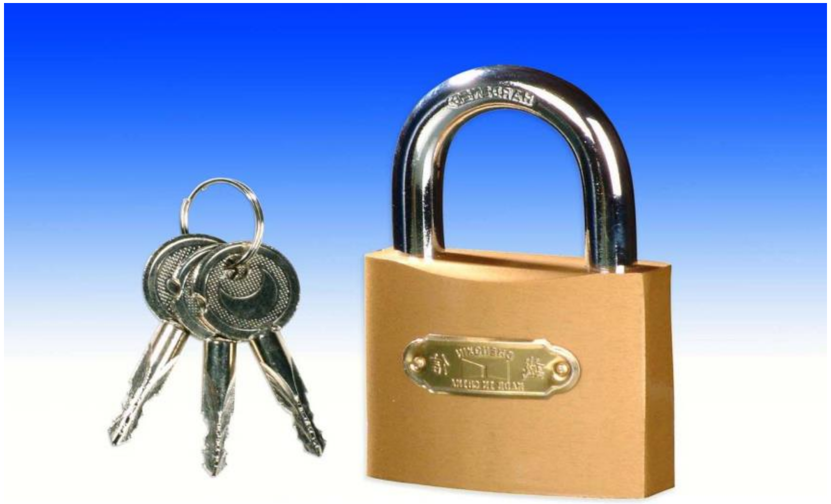
Introduction to PKI

PKI and the handling of certificates

Four basic aspects of security:

- Integrity which guarantees that *data was not altered* during transmission.
- Authenticity which *verifies the identities* of the parties involved in an electronic transmission.
- Non-repudiation of origin which ensures that no party involved in an electronic transaction *can deny their involvement* in the transaction.
- Confidentiality that ensures that only those *who are entitled can access* the transmitted data

Public Key Crypto Systems



- Public and private keys
- Speed
- Attacks
- Key length

Public and private key

Symmetric crypto - encrypt and decrypt with same crypto key

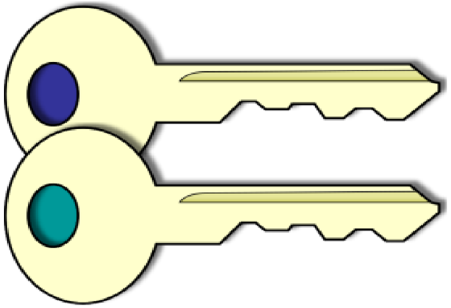
Asymmetric crypto – two different but interdependent keys, encrypt with one and decrypt with the other one, and vice versa

Using Asymmetric crypto for Public and Private Key

- Receive Public Key encrypted messages from many
- Distribute Private Key encrypted messages to many

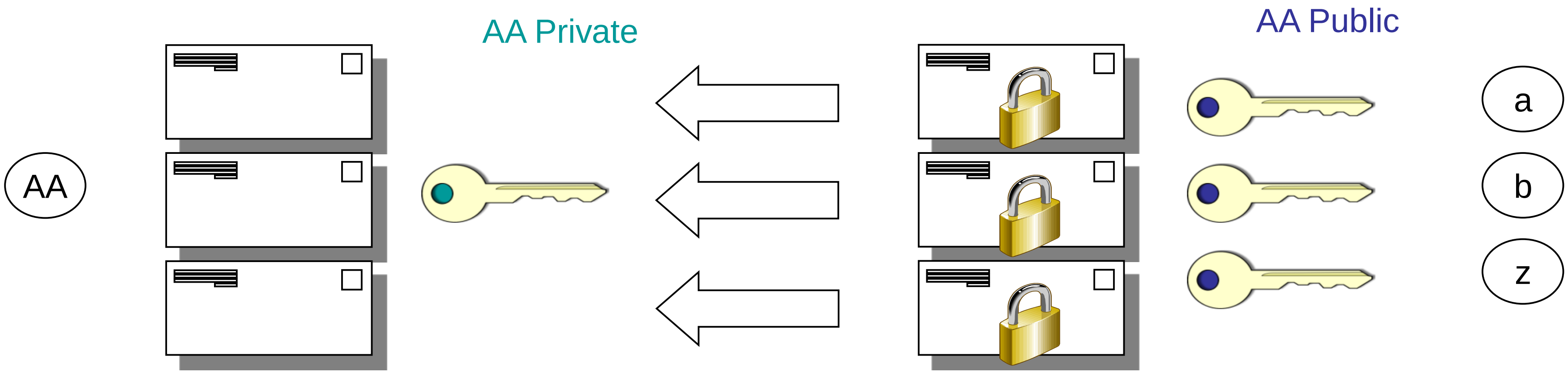
Using Private and Public Key

- Signing
- Protection
- Identification

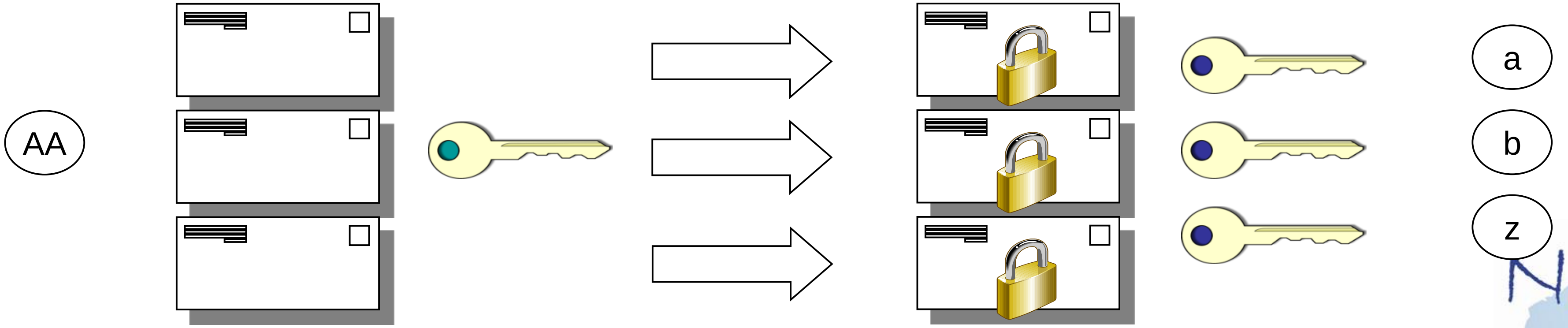


Private and Public key usage, illustration

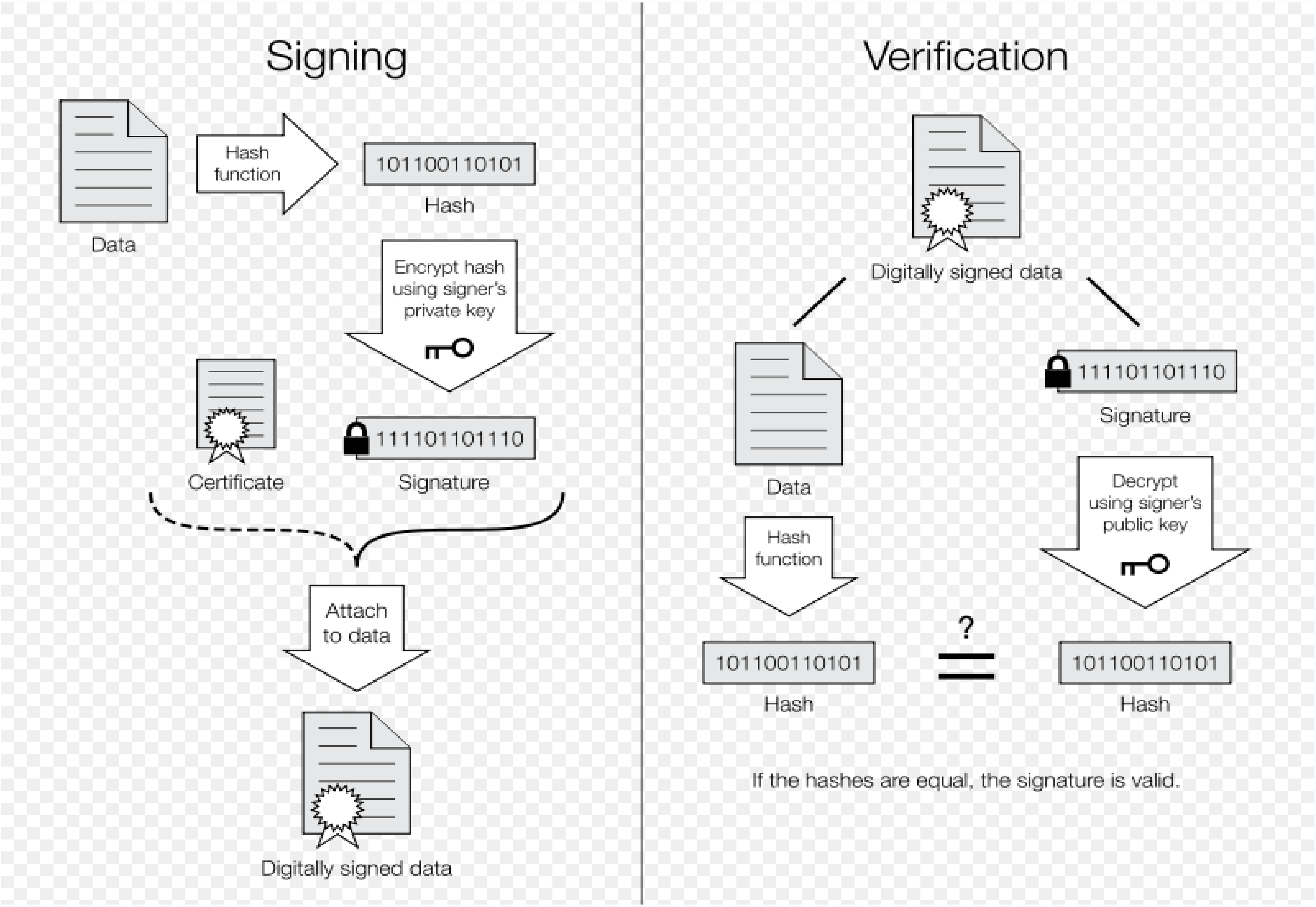
Message to AA encrypted with AA public key



Message from AA encrypted with AA private key

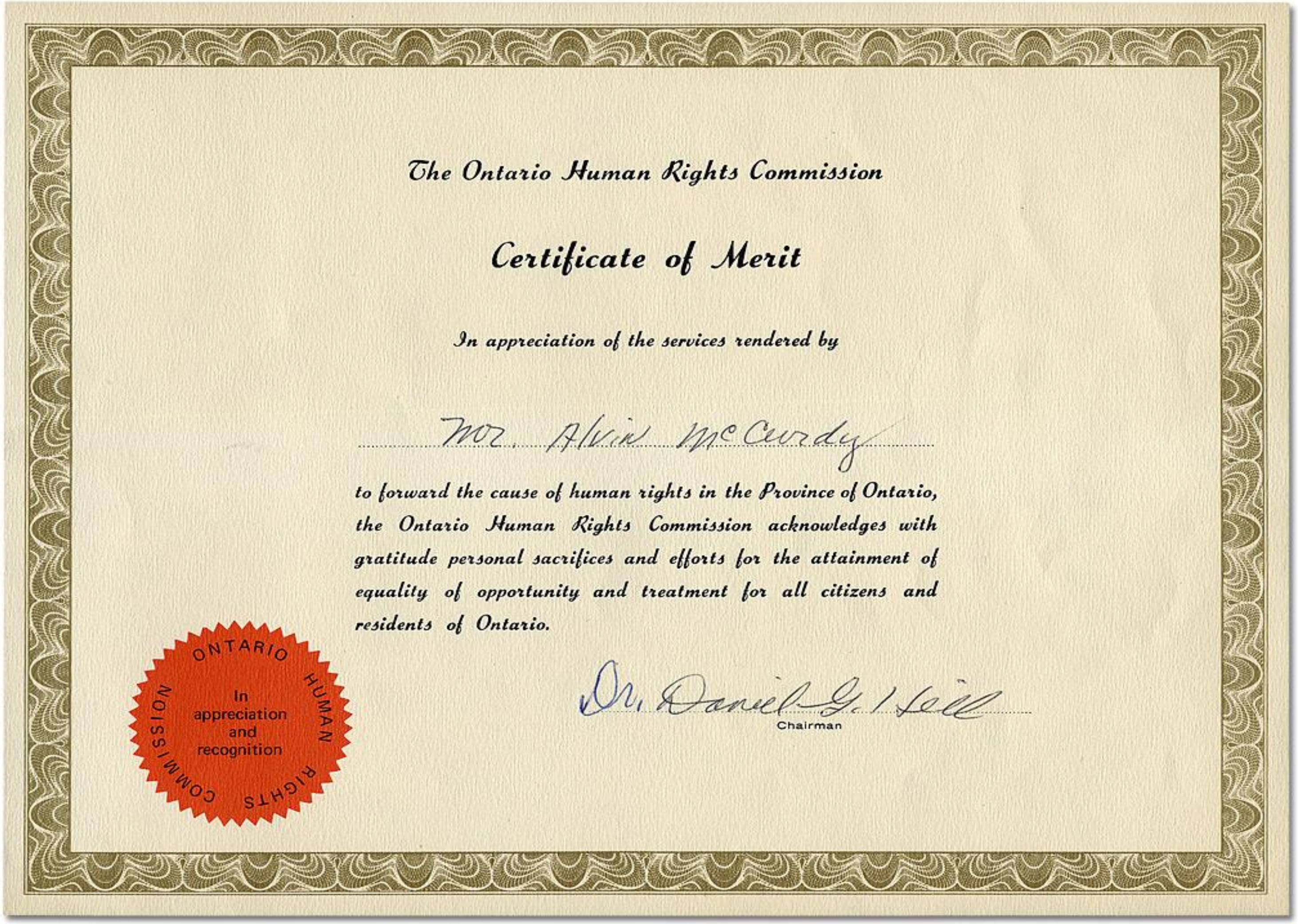


Digital signature, example



http://en.wikipedia.org/wiki/File:Digital_Signature_diagram.svg

Certificates



The Ontario Human Rights Commission

Certificate of Merit

In appreciation of the services rendered by

Mr. Alvin McCurdy

to forward the cause of human rights in the Province of Ontario, the Ontario Human Rights Commission acknowledges with gratitude personal sacrifices and efforts for the attainment of equality of opportunity and treatment for all citizens and residents of Ontario.

ONTARIO HUMAN RIGHTS COMMISSION

In appreciation and recognition

Dr. Daniel G. Hill

Chairman

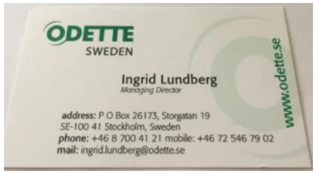
The Challenge of Trust

- Technically, (nearly) all certificates implement the same standard technology

- Whether you trust them, depends on the issuing CA and how trustable the CA is

- With hundreds of CA‘s the assessment of trustability of each of them becomes a nightmare

KÖRKORT SVERIGE
1. LUNDBERG
2. INGRID
3. 14.11.1955 -
4a. 27.08.2015 4c. Transportstyrelsen
4b. 27.08.2025 4d. 642522323
5. 551114-2688
7.
9. AM/B



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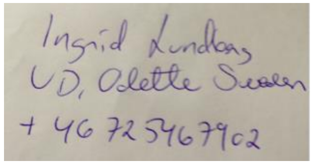
www.odette.se



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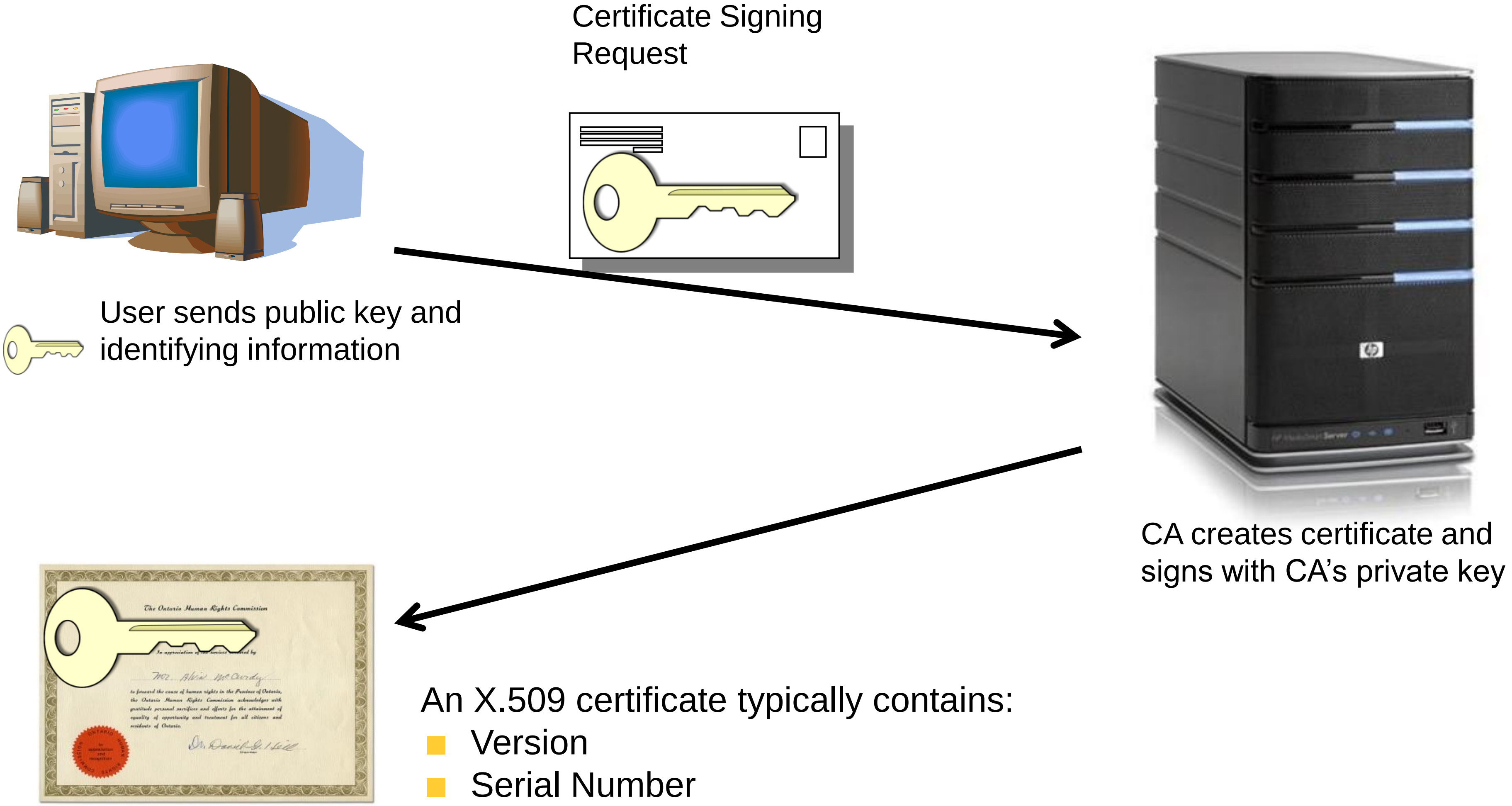
Certificate Authorities



Certificate Signing Request

User sends public key and identifying information

CA creates certificate and signs with CA's private key

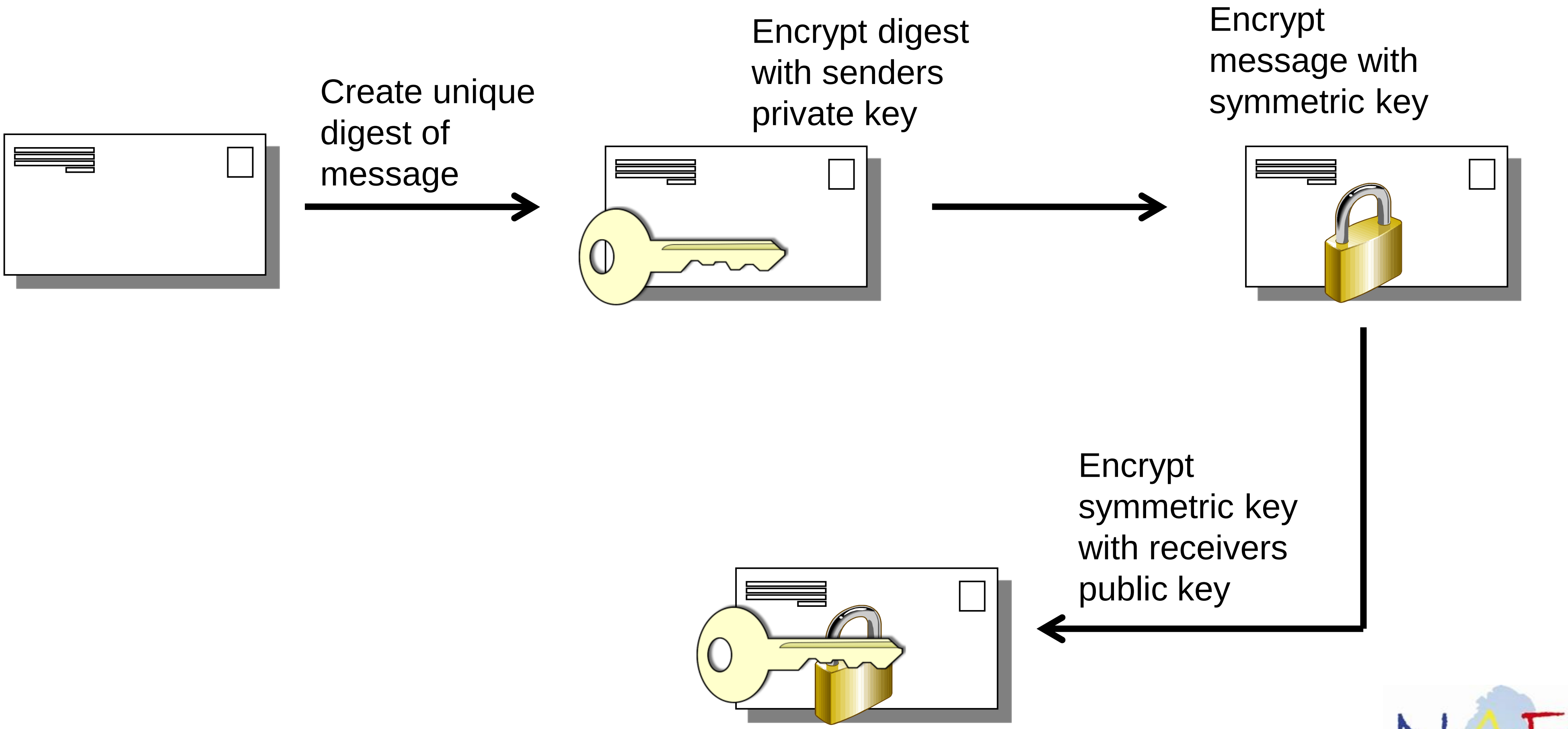
An X.509 certificate typically contains:

- Version
- Serial Number
- Signature
- Issuer name
- The validity time window
- A subject containing the owners identifying details
- Usage attributes

Digital Signatures

- Integrity
- Authenticity
- Non-repudiation of origin

Signing and Sending



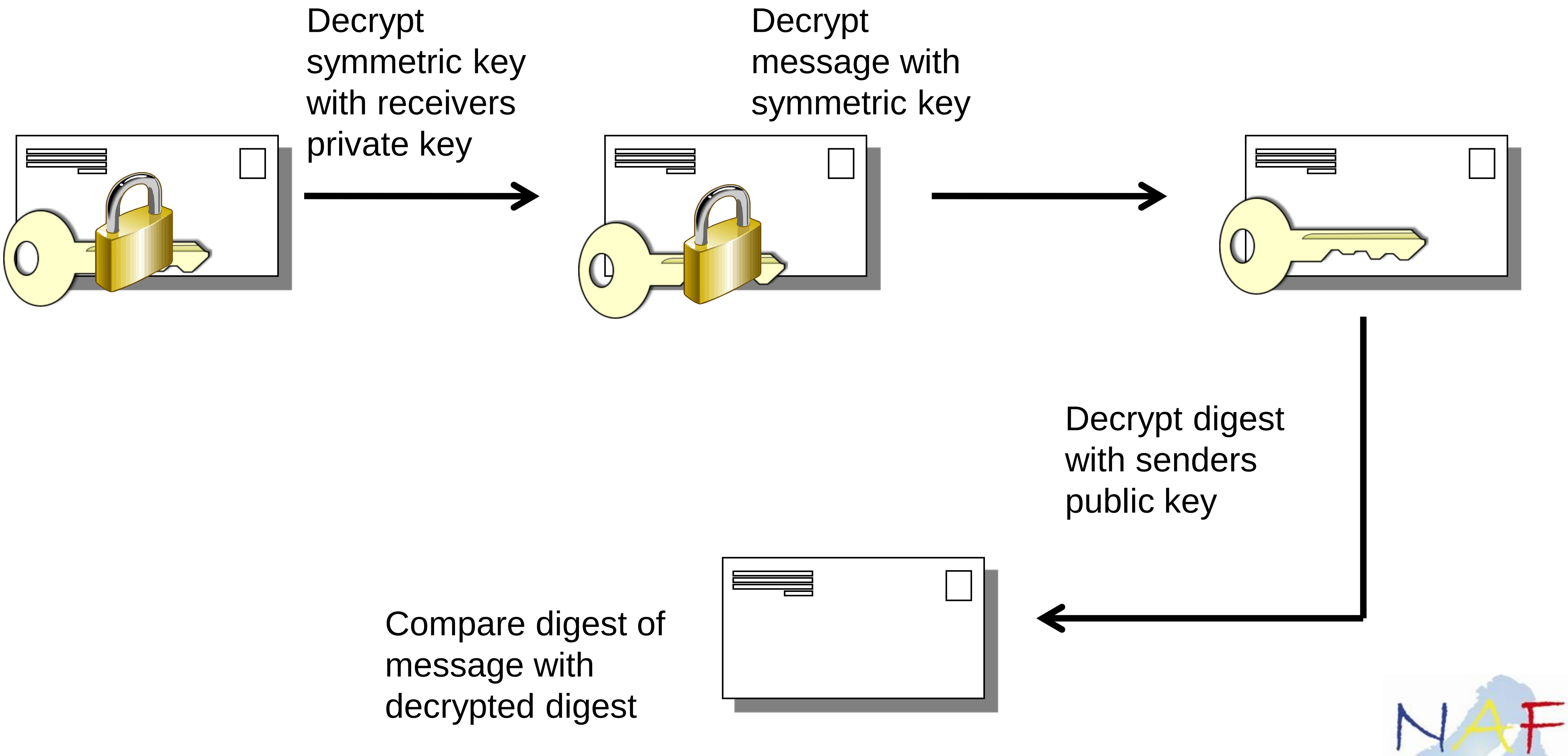
Create unique digest of message

Encrypt digest with senders private key

Encrypt message with symmetric key

Encrypt symmetric key with receivers public key

Decrypting and Verifying



Decrypt symmetric key with receivers private key

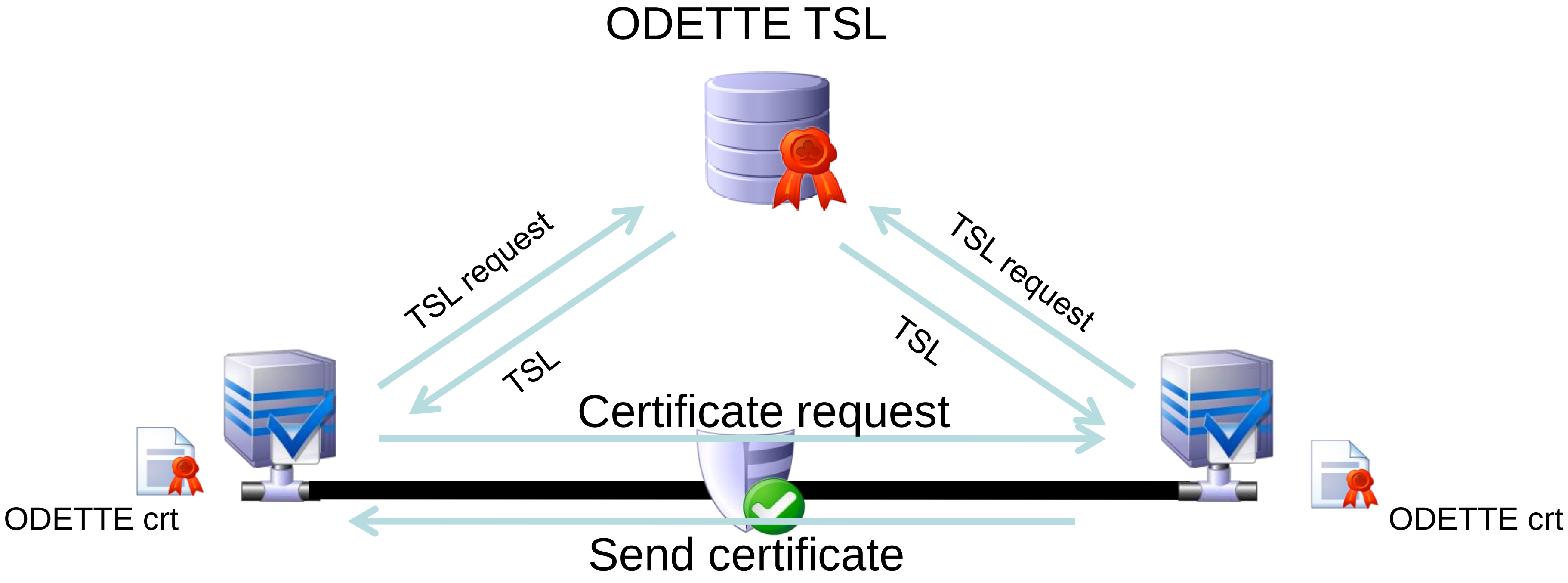
Decrypt message with symmetric key

Decrypt digest with senders public key

Compare digest of message with decrypted digest

Introduction to TSL and SSL

Odette – Trust Status signed List –TSL Administration



It needs to underline that this is an automated certificate administration procedure running in real-time. All approved certificates would have to be published as a TSL, else it will not work

The Odette SCX recommendation

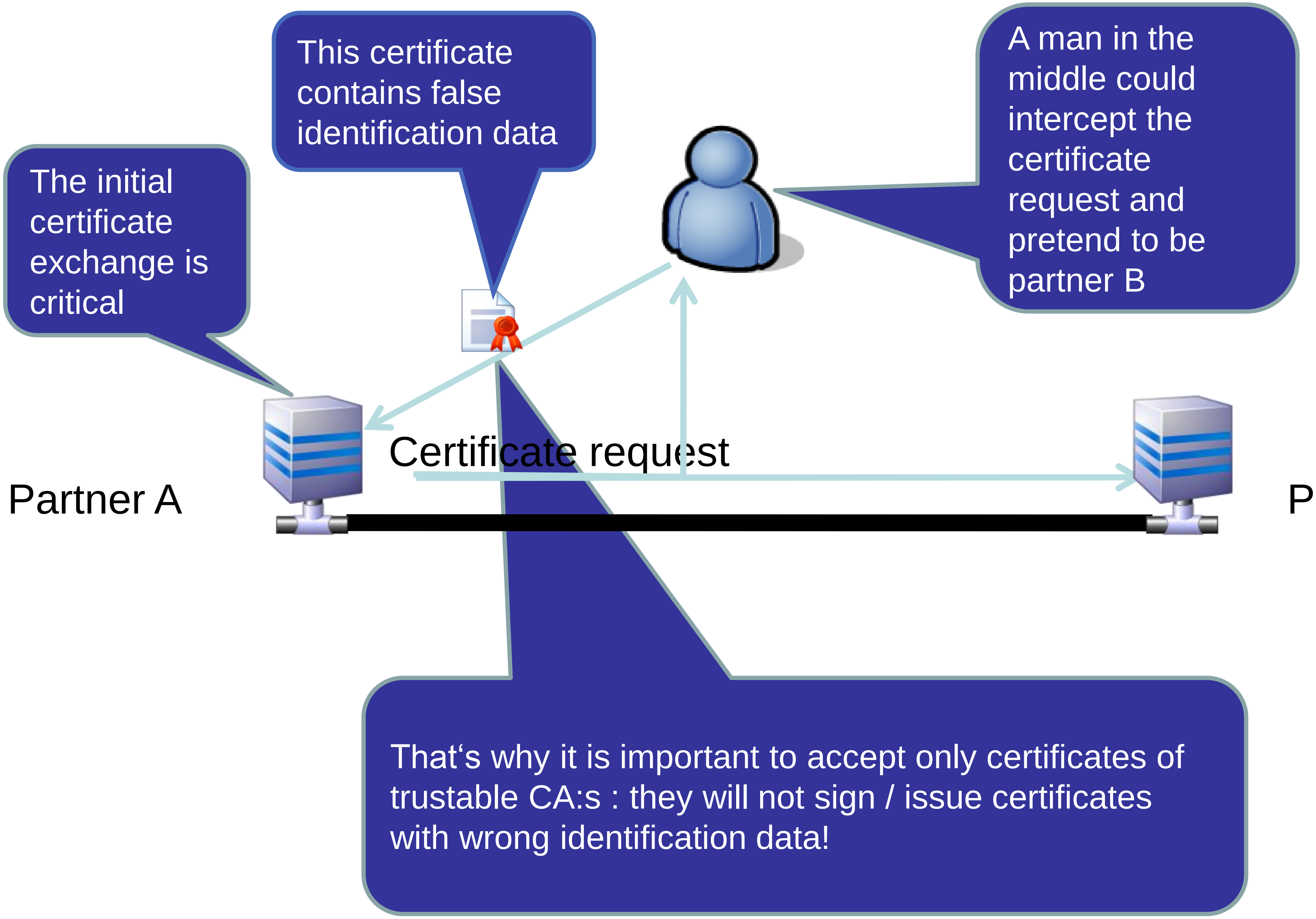
What is a TSL?

Trust Service Status Lists

- An ETSI standard using XML formatting
- Contains the list of the CA:s certificates recognised as "Trusty", according to an agreed policy.
- The list is signed by a trusted authority (Odette)
- This list is used by the software to trust or reject automatically CA signed certificates

Several lists for different applications will be managed by Odette

TSL helps to prevent Man-in-the-middle Attacks



This certificate contains false identification data

The initial certificate exchange is critical

A man in the middle could intercept the certificate request and pretend to be partner B

That‘s why it is important to accept only certificates of trustable CA:s : they will not sign / issue certificates with wrong identification data!

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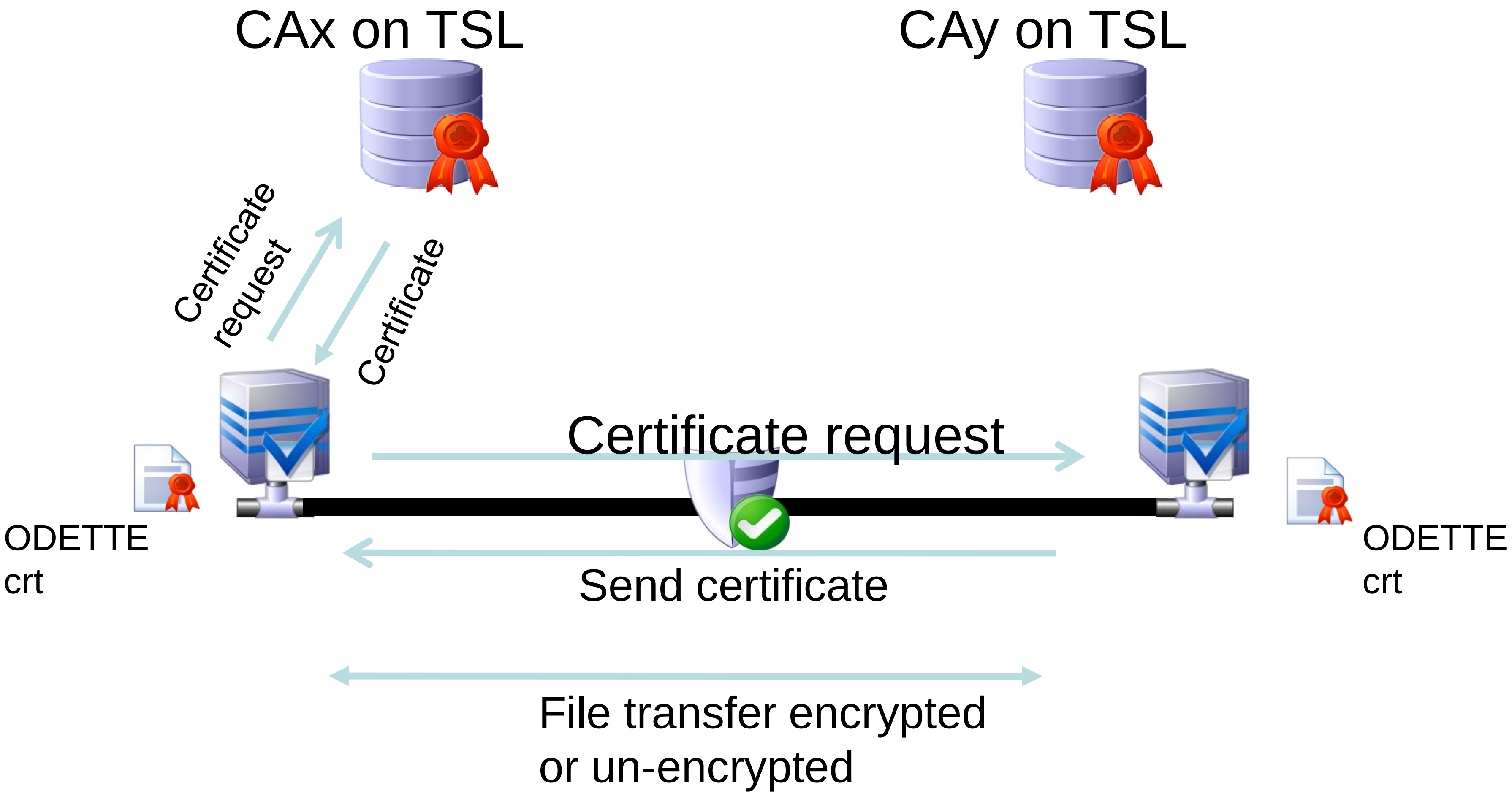
Odette Recommendations and Services for Security

- Odette Security policy (Odette SCX)
- OFTP2 and handling of certificates
- Odette Services for handling of Security Certificate Exchange
- Ordering, installing and maintaining certificates
- Q & A

OFTP 2 – Certificate administration



Finally – a secure, trusted connection!

Managing Security by OFTP2 Experts Group

- Security certificates provide proof of identity of the partners, allow encryption / decryption / integrity-check of files and ensure non-repudiation of the data exchange.
- Trust Service Status Lists (TSL) will be established by Odette
- Odette is the trust guardian and provides this service to the automotive industry community
- TSL contains details of the trustable Security Certificate providers (CA:s)
- TSL is being published and updated on Internet and can be accessed by OFTP2 software easily

Odettes Security Certificate Exchange (Odette SCX)

Secure Communications

Odette File Transfer Protocol Version 2

- Session security
- Secure authentication
- File encryption
- File signing

OFTP2 Certificate Policy Version 1.0

Certificate Usage:

OFTP2 application usage for encryption, authentication and integrity.

Certificate Requirements:

Types of certificates

- TLS:
  - One for session authentication and encryption

- OFTP protocol:
  - One for OFTP authentication (challenge encryption),
  - One for EERP signing

- File security service (CMS):
  - One for file signature
  - One for file encryption

Large scale deployment of certificates

Issues of scale:

- Several applications
  - **OFTP2**, e-mail, File encryption and signature, secure access to web server, AS2…
- All of them use **certificates**
- **Thousands** of partners’ certificates
- Signed by **dozen's of CA:s**

- **A mess of various CA:s and certificate in use**

The Challenge of Trust

- Technically, (nearly) all certificates implement the same standard technology

- Whether you trust them, depends on the issuing CA and how trustable the CA is

- With hundreds of CA‘s the assessment of trustability of each of them becomes a nightmare

The Odette SCX recommendation

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What’s a TSL?

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- An ETSI standard using XML syntax
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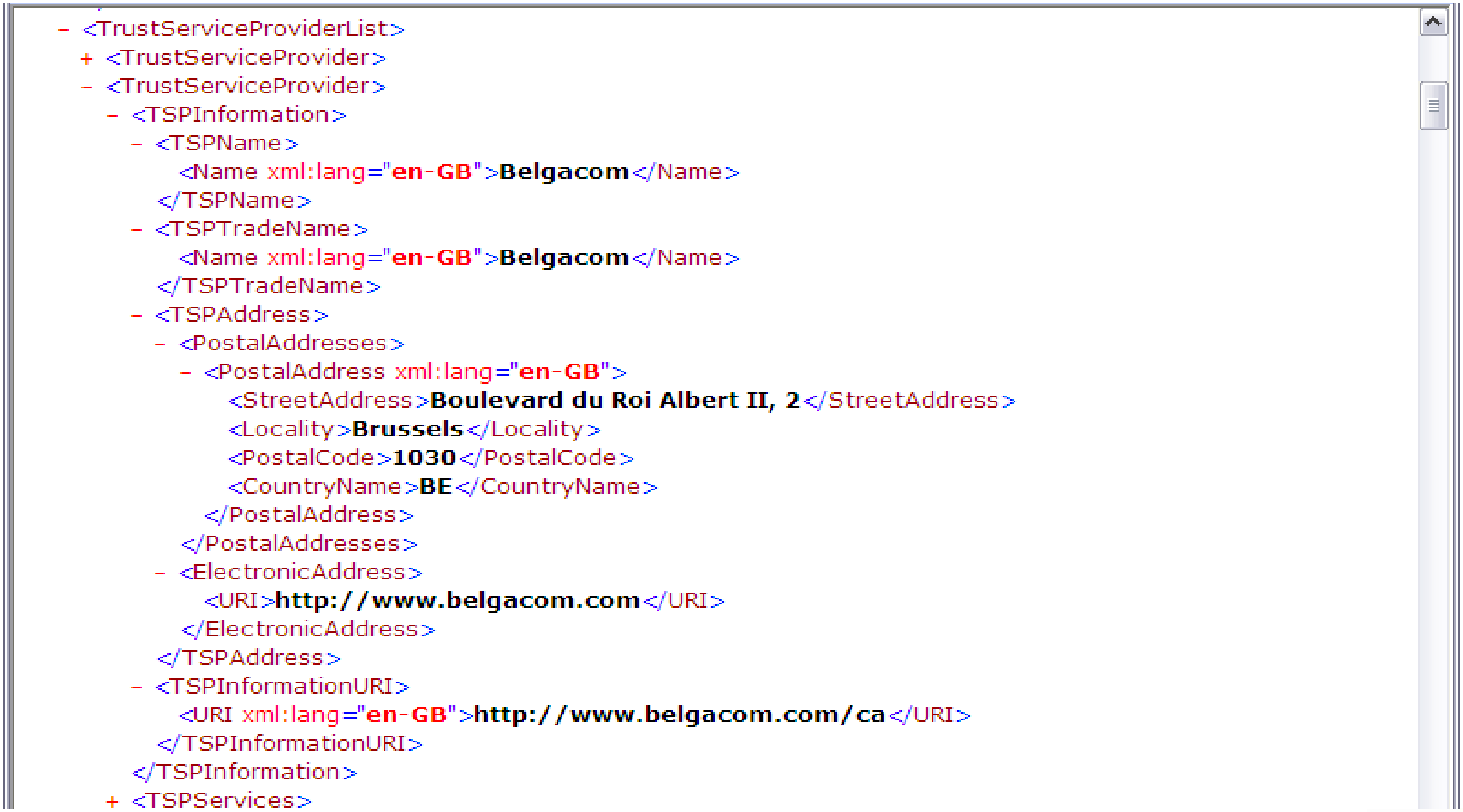
TSL Snippet



```
- <TrustServiceProviderList>
  + <TrustServiceProvider>
  - <TrustServiceProvider>
    - <TSPInformation>
      - <TSPName>
          <Name xml:lang="en-GB">Belgacom</Name>
        </TSPName>
      - <TSPTradeName>
          <Name xml:lang="en-GB">Belgacom</Name>
        </TSPTradeName>
      - <TSPAddress>
        - <PostalAddresses>
          - <PostalAddress xml:lang="en-GB">
              <StreetAddress>Boulevard du Roi Albert II, 2</StreetAddress>
              <Locality>Brussels</Locality>
              <PostalCode>1030</PostalCode>
              <CountryName>BE</CountryName>
            </PostalAddress>
          </PostalAddresses>
        - <ElectronicAddress>
            <URI>http://www.belgacom.com</URI>
          </ElectronicAddress>
        </TSPAddress>
      - <TSPInformationURI>
          <URI xml:lang="en-GB">http://www.belgacom.com/ca</URI>
        </TSPInformationURI>
      </TSPInformation>
    + <TSPServices>
```

Current Types of Trust Service-status Lists (TSL)

BASIC

- Odette performs an identity check of the CA owner for all CA:s on TSL Basic

OFTP2

- Additional restrictions apply: only CA:s that issue certificates usable for OFTP2 data exchange are listed (i.e. they comply to a certificate policy)
- Pre-requisit: CA:s must be registered on TSL Basic

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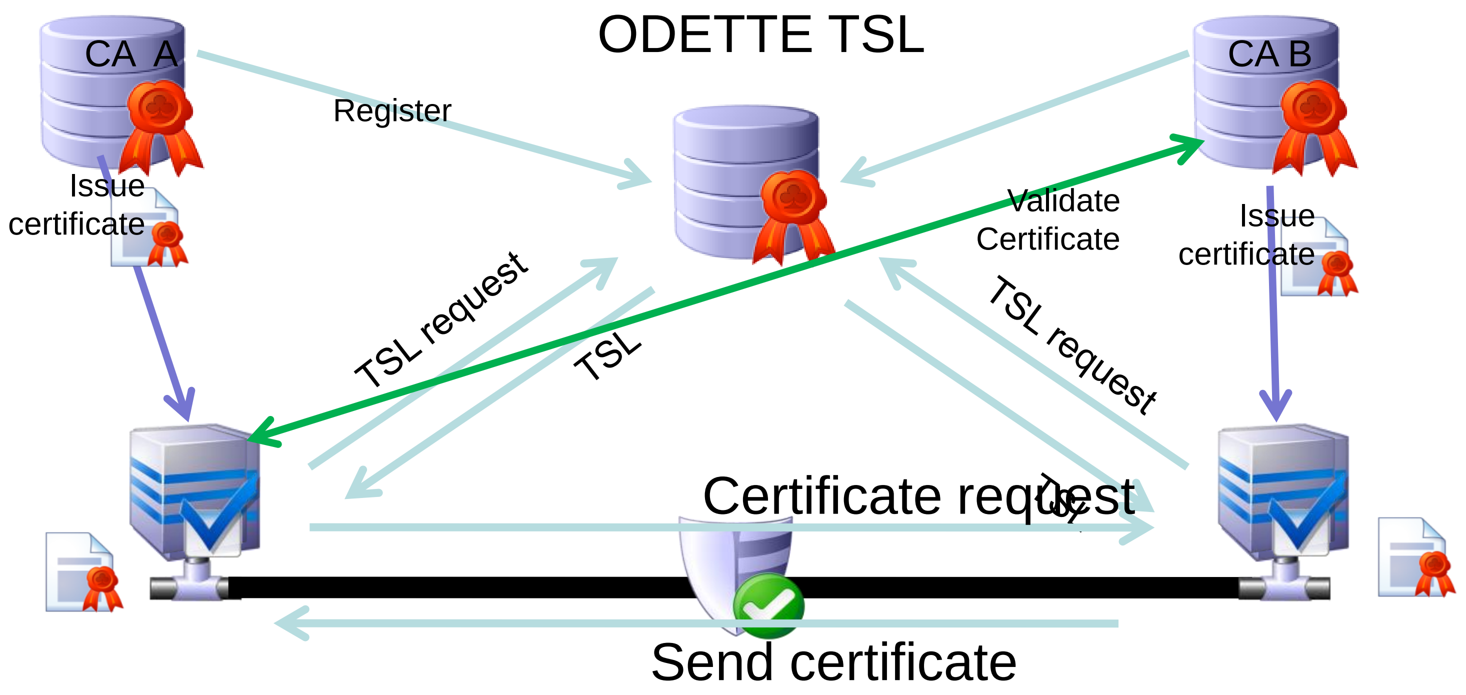
Odette – Trust Status Service List –TSL Administration



Finally – a secure, trusted connection!

OFTP2 and the exchange of security certificates

Odette Services

The role of Odette as a Trust Centre

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- This function is realised by the Odette community, i.e the Central Office and the National Organisations
- Odette has close links to the industry in our countries and can make sure the system is facilitated and maintained to fit exactly to the needs of the automotive supply chain.
- Odette is a non-profit organisation and provides the service to members free of charge

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The role of Odette

- Distribute the certificate policy associated with the TSL to CA organisations

- Collect their commitment

- Build the TSL with the certificates of those who accept the policy

- Verification:
  - The commitment of a CA is made on a volunteer basis, by self-assessment
  - If a CA’s policy becomes incompatible with the TSL policy, this CA will finally be discarded.

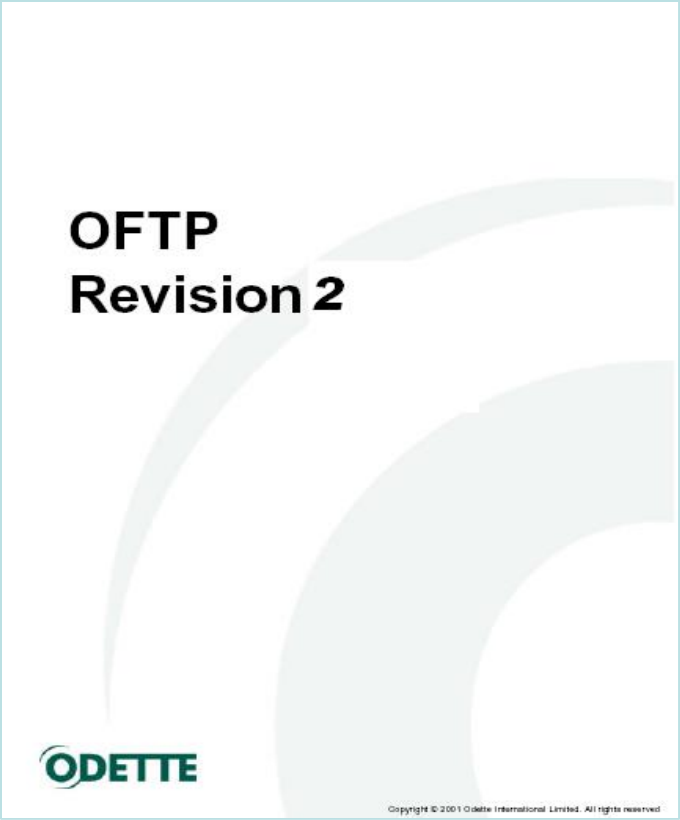
OFTP2 documents review - SCX recommendations

Prerequisites to add a CA to the ODETTE TSL

- Odette must check that the CA exists as a legal entity – e.g. by requiring a copy of the company registration form
- A responsible person of that company must sign a document stating that she/he is responsible for the PKI of that company or branch
- The PKI system belongs to the identified legal entity
- The company adheres to the requirements stated in the policy document
- The company accepts the terms and conditions of the TSL service provided by Odette International

Terms & Conditions exclude claims and warranties for ODETTE and the CA

Overview of OFTP



OFTP
Revision 2

ODETTE

Start session components

Initiator/Responder

The entity that took initiative to establish the network connection becomes the INITIATOR. The other is called the RESPONDER.

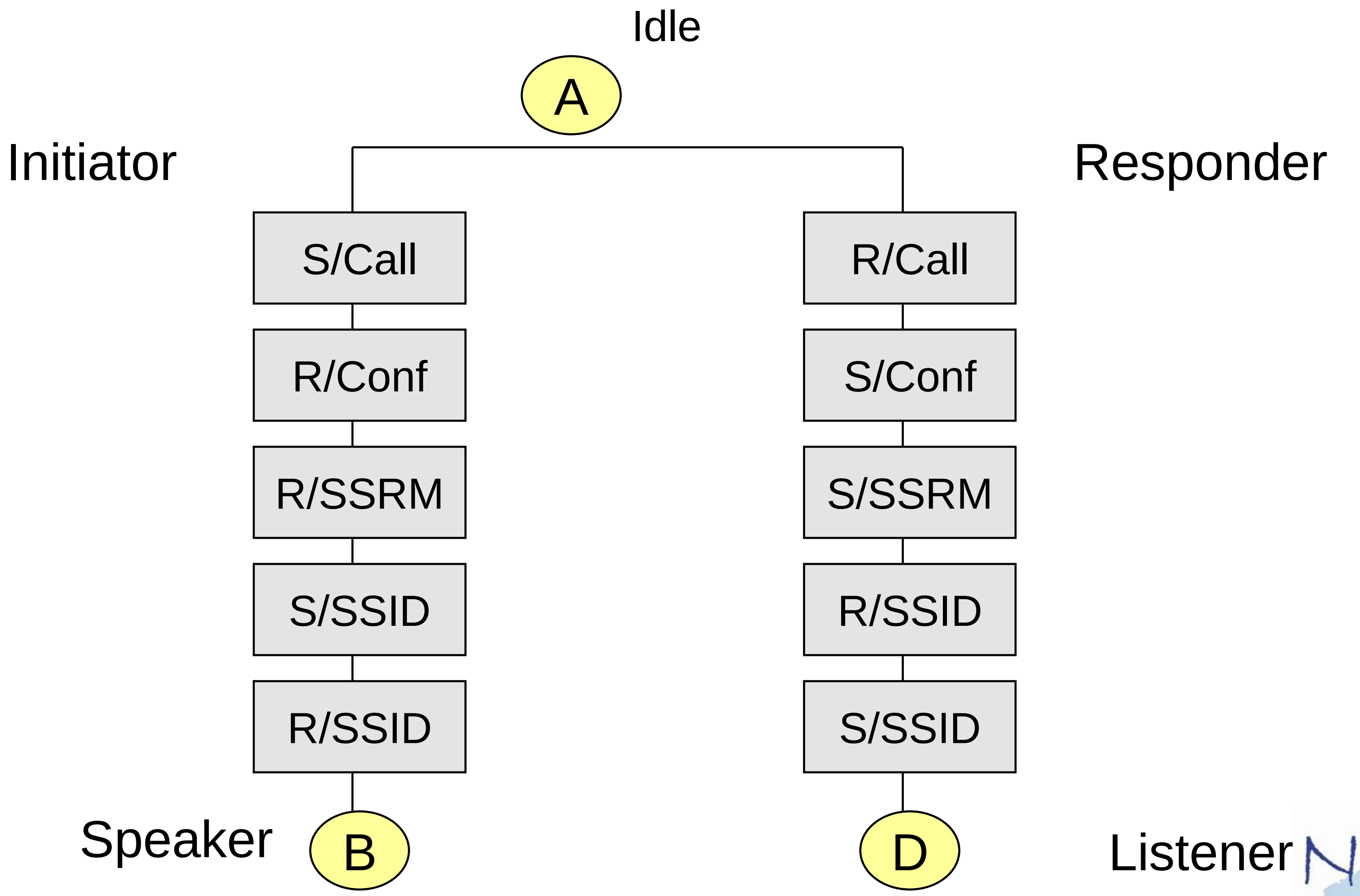
Speaker/Listener

The entity of SPEAKER or LISTENER is the result of the Start Session phase, where the INITIATOR becomes the first SPEAKER or as a result of a change direction request./listener

Protocol

After the Start File phase, data will flow from speaker (sender) to listener (receiver). The speaker has not the right to send data unless he has the permission of the listener. Sending more data than allowed (by the listener) will result in protocol error and leads to an abort.

Initiator and Responder diagram



OFTP commands

Commands and data are not mixed in the DATA EXCHANGE BUFFER.

A command start at the beginning of the buffer.

Command identifier: The command identifier is a single octet (see hereafter).

Parameter(s): There may be as many parameters as needed, but:

- predefined order (sequence as they are specified in the TABLE hereafter)
- positional
- required (no default value)

Initiator:

X	SSID	Identification Password & Profile

Responder:

I	SSRM	Ready message
X	SSID	Identification Password & Profile

Speaker:

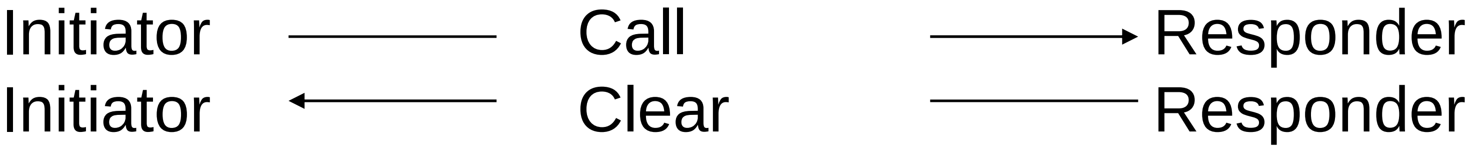
F	ESID	End of Session (normal)
H	SFID	Send File Information
T	EFID	End of File Information
E	EERP	End to End Response
N	NERP	Negative End to End Response
R	CD	Change direction
D	DATA	Data

Listener:

F	ESID	End of Session (error)
2	SFPA	Send File Positive Answer
3	SFNA	Send File Negative Answer
4	EFPA	End of File Positive Answer
5	EFNA	End of File Negative Answer
C	CDT	Set Credit
P	RTR	Ready to Receive

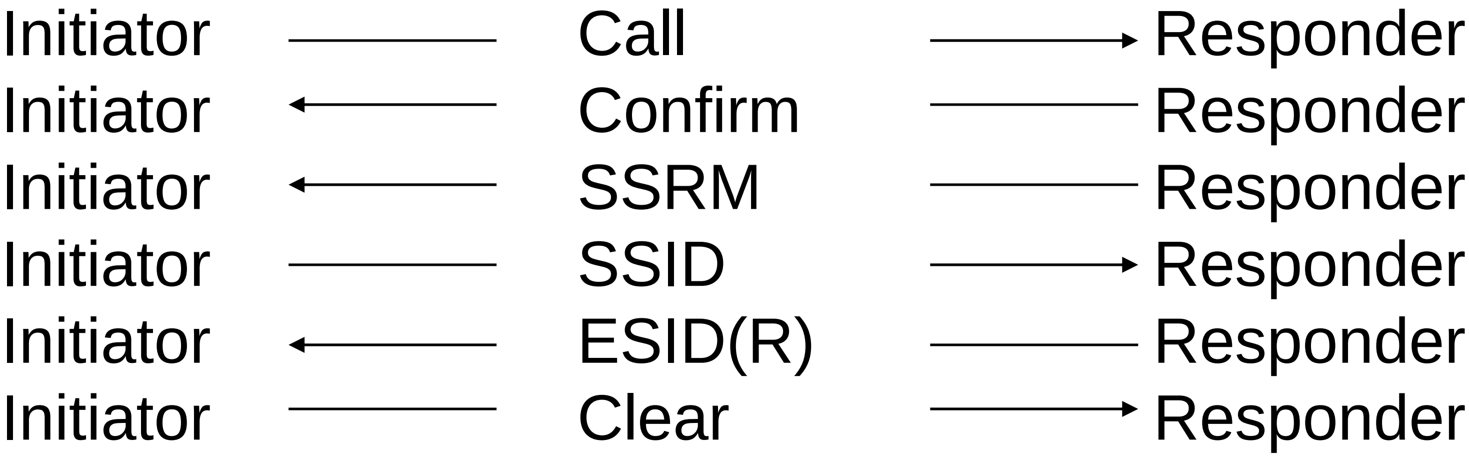
Session Control: Start session

Start session (alt 1):



Initiator	——	Call	——→	Responder
Initiator	←——	Clear	——	Responder

Start session (alt 2):



Initiator	——	Call	——→	Responder
Initiator	←——	Confirm	——	Responder
Initiator	←——	SSRM	——	Responder
Initiator	——	SSID	——→	Responder
Initiator	←——	ESID(R)	——	Responder
Initiator	——	Clear	——→	Responder

Start session (alt 3):

Initiator	———	Call	——→	Responder
Initiator	←——	Confirm	———	Responder
Initiator	←——	SSRM	———	Responder
Initiator	———	SSID	——→	Responder
Initiator	←——	SSID	———	Responder
Initiator	———	ESID(R)	——→	Responder
Initiator	←——	Clear	———	Responder

Start session (alt 4 V 1.4):

Initiator	———	Call	——→	Responder
Initiator	←——	Confirm	———	Responder
Initiator	←——	SSRM	———	Responder
Initiator	———	SSID	——→	Responder
Initiator	←——	SSID	———	Responder

New

Start session (alt 5 V 2.0):

Initiator	———	Call	——→	Responder
Initiator	←——	Confirm	———	Responder
Initiator	←——	SSRM	———	Responder
Initiator	———	SSID	——→	Responder
Initiator	←——	SSID	———	Responder
Initiator	———	SECD	——→	Responder
Initiator	←——	AUCH	———	Responder
Initiator	———	AURP	——→	Responder
Initiator	←——	SECD	———	Responder
Initiator	———	AUCH	——→	Responder
Initiator	←——	AURP	———	Responder

Session Control: Session established

Initiator remains Speaker
Responder remains Listener

Speaker could send either of the following:

SFID	Send file identification
EERP	End to End response
CD	Change Direction
NERP	Negative end response
AUCH	Authentication Challange
SECD	Security Change Direction
AURP	Authentication Respons

SSRM Ready Message

Command	I
Message	ODETTE FTP READY Carriage Return

SSID Identification & Password

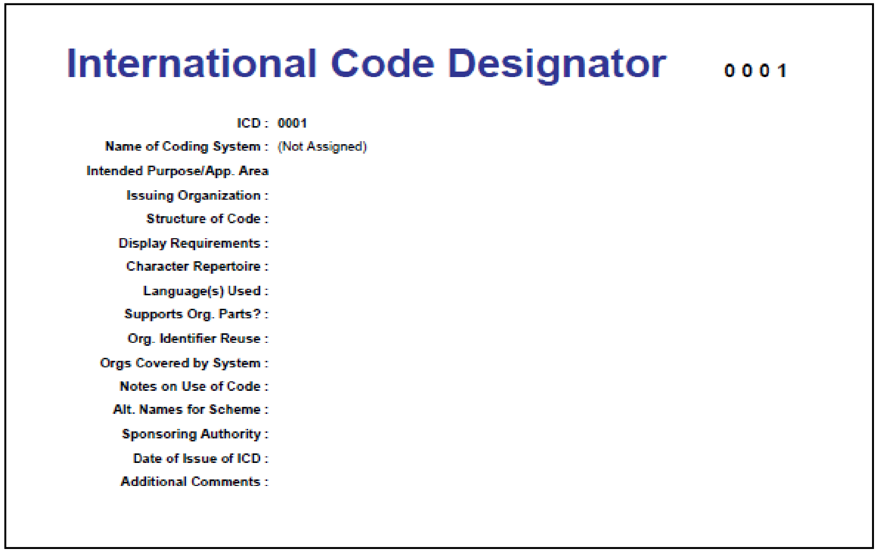
Command	X
Version	Protocol (version) release level (1, 2,4,5)
Code	OFTP code
Password	
Buffer Size	min 128 characters
Snd/Rcv	(S)end only, (R)eceive only, (B)oth
Compression	Y/N
Restart	Y/N
Special logic	Y/N (Not used in V 2.0)
Buffer credit	min 1
Secure Authentication (Y/N)	
User data	
Carriage Return	

OFTP code: Unique identification of an OFTP-system

It identifies in a unique way the Initiator (sender) and the Responder (receiver)

Odette identifier	1	O
ICD	4	International Code Designator, ISO, identifies the coding system
Organisation	14	Organisation Identifier, identifies the owner
Sub-Address	6	Owners system under responsibility of the company

ICD coding scheme



International Code Designator 0001

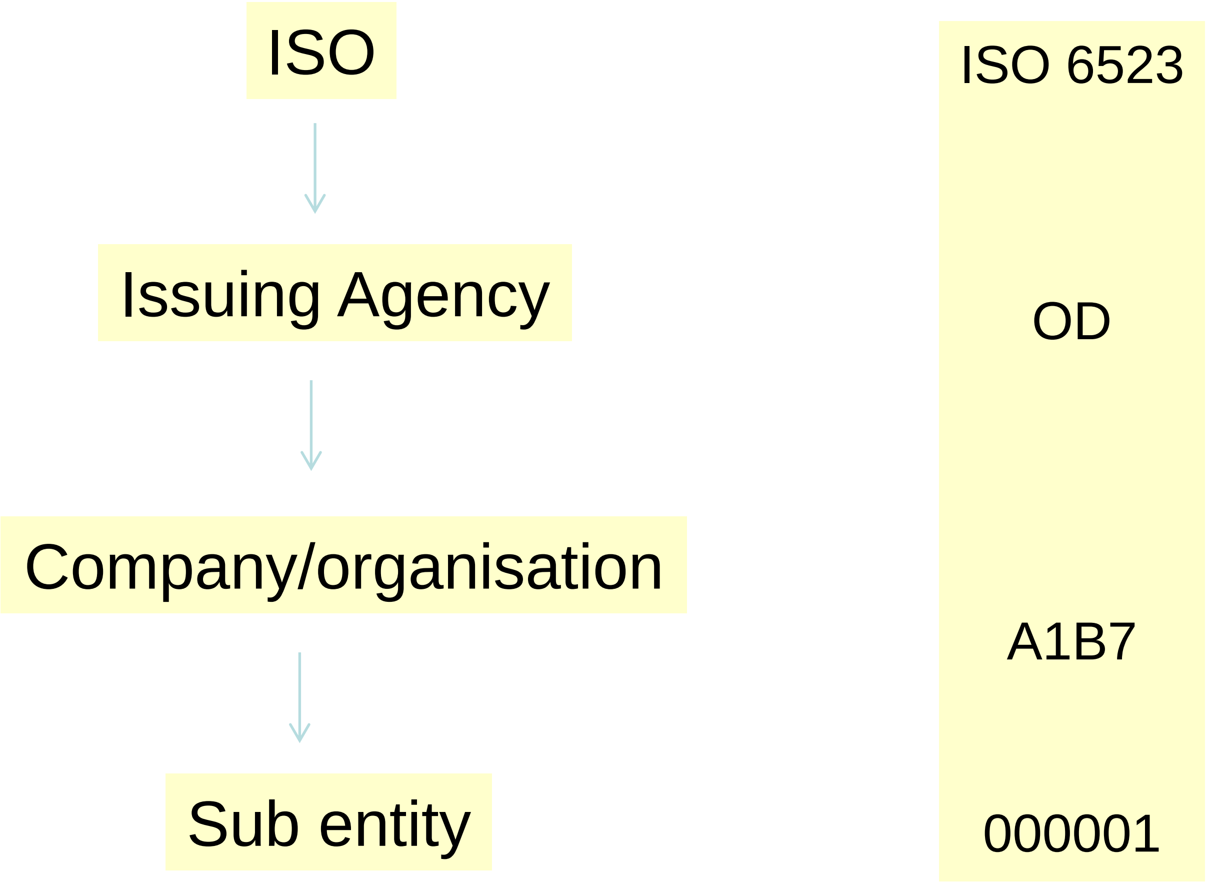
ICD :	0001
Name of Coding System :	(Not Assigned)
Intended Purpose/App. Area	
Issuing Organization :	
Structure of Code :	
Display Requirements :	
Character Repertoire :	
Language(s) Used :	
Supports Org. Parts? :	
Org. Identifier Reuse :	
Orgs Covered by System :	
Notes on Use of Code :	
Alt. Names for Scheme :	
Sponsoring Authority :	
Date of Issue of ICD :	
Additional Comments :	

Registration Authority
c/o RA
British Standards Institution
389 Chiswick High Road
GB-London W4 4AL
United Kingdom
Tel: +44 20 89 96 71 65
Fax: +44 20 89 96 71 98
E-mail: telecoms@bsigroup.com

The codification rules recommended in ODDC020 are based on the ISO standard 6523 : Data Interchange - Structure for the identification of Organisations.

This unique identification of a party codification system is named **ICD** (International code designator) and is allocated by the BSI on behalf of ISO.

ICD coding scheme – basic principles



ISO

Issuing Agency

Company/organisation

Sub entity

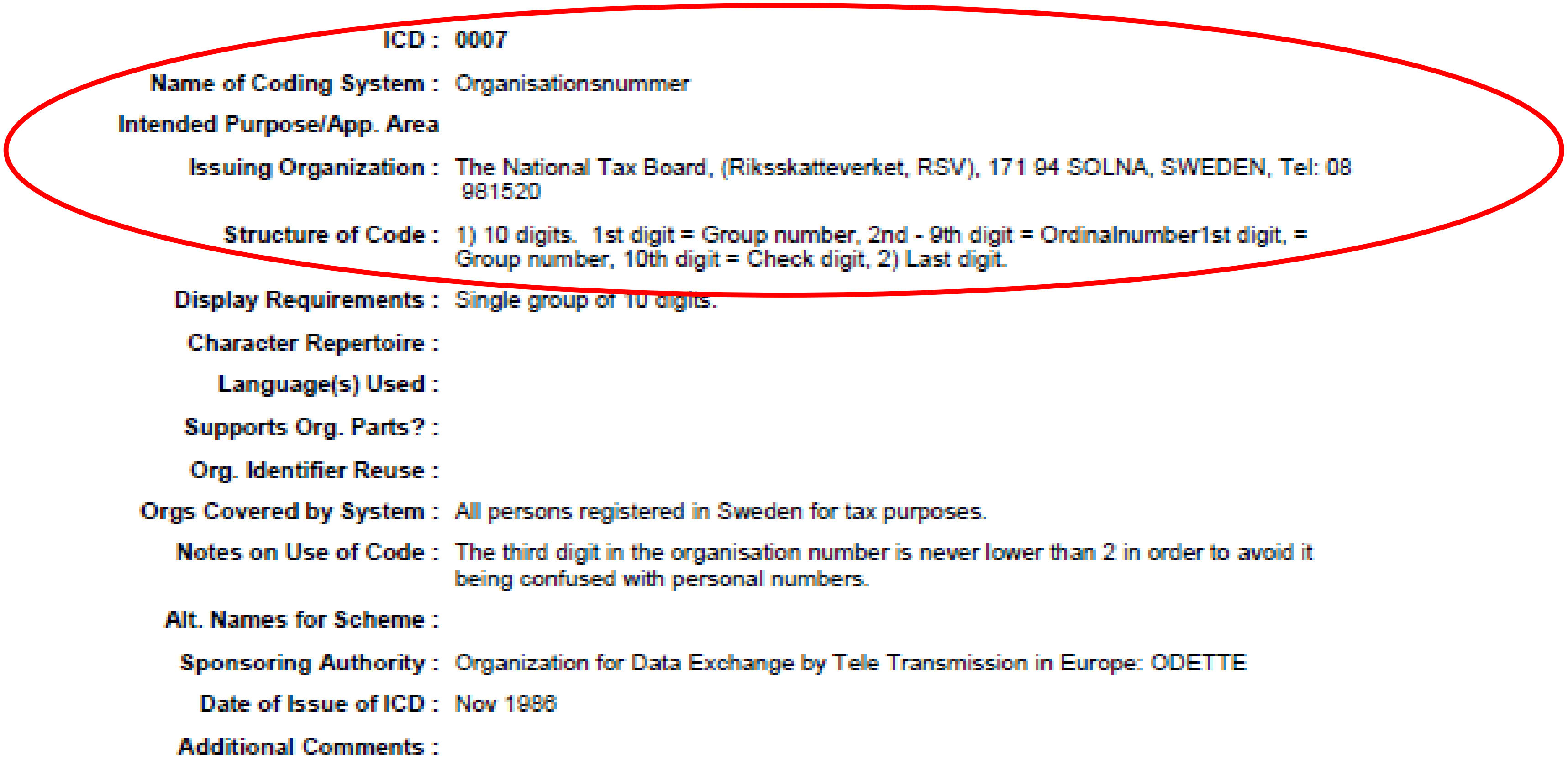
ISO 6523

OD

A1B7

000001

International Code Designator 0007



ICD :	0007
Name of Coding System :	Organisationsnummer
Intended Purpose/App. Area	
Issuing Organization :	The National Tax Board, (Riksskatteverket, RSV), 171 94 SOLNA, SWEDEN, Tel: 08 981520
Structure of Code :	1) 10 digits. 1st digit = Group number, 2nd - 9th digit = Ordinalnumber1st digit, = Group number, 10th digit = Check digit, 2) Last digit.
Display Requirements :	Single group of 10 digits.
Character Repertoire :	
Language(s) Used :	
Supports Org. Parts? :	
Org. Identifier Reuse :	
Orgs Covered by System :	All persons registered in Sweden for tax purposes.
Notes on Use of Code :	The third digit in the organisation number is never lower than 2 in order to avoid it being confused with personal numbers.
Alt. Names for Scheme :	
Sponsoring Authority :	Organization for Data Exchange by Tele Transmission in Europe: ODETTE
Date of Issue of ICD :	Nov 1986
Additional Comments :	

ICD coding scheme: code examples

0942	Svenskt organisationsnummer
0060	Dun & Bradstreet
0177	Odette International (OSCAR)

OFTP code: Example

O 0942 0000 4203075710 000RVD

0942	Code identifying the Swedish National Tax Board
0000	Non-significant characters
420375710	”Organisationsnummer”, Company registration and VAT nr
000RVD	In-house code
0177	Odette (next slide)

Other European examples:

O001300005560GERMANY
O09310000918234455251551
O093200000000341001AND001

The Possible Use of OSCAR Codes

OFTP (25 characters)																								
O	0	1	7	7	0	0	0	0	0	0	0	0	0	0	7	5	1	1	V	E	G	A	0	1
For OFTP (1)	ICD (4)				main OFTP code from Odette register (14)														sub-address (6)					

EDI (variable)																		
	0	1	7	7	0	0	0	0	0	7	5	1	1	V	E	G	A	1
	ICD (4)				Code from Odette register (9)									sub-address (5)				

PID (19 char)																						
	0	1	7	7	0	0	0	0	0	7	5	1	1	V	E	G	A	1	9			
	ICD (4)				Code from Odette register (9)									sub-address (5)					Origin Code (1)			

Nätverk för Affärsutveckling
i Försörjningskedjan

SECD Security Change Direction
Command J

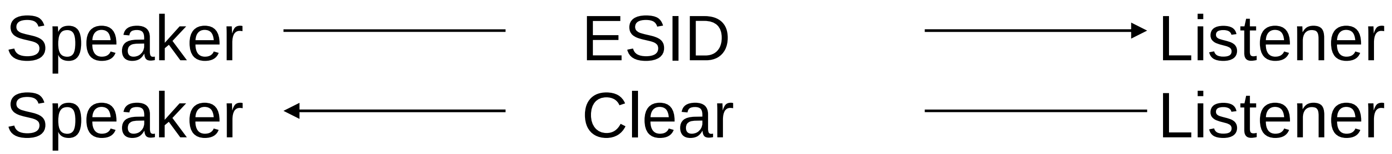
AUCH Authentication Challenge
Command A
Challenge A 20 Byte random no uniquely Generated
each time an AUCH is sent.

AURP Authentication Response
Command S
Signed Challenge The length of the signed challenge
Signed Challenge The Challenge from AUCH signed with the
Private key encoded into a CMS message.

After negotiation

Version	Lowest
Buffer size	Lowest
Buffer credit	Lowest
Send/Receive	Could be incompatible
Compression	If one location = N no compressed data
Restart	If one location = N no restart
Secure Authent	No negotiation is allowed

Session termination



Speaker ESID Listener

Speaker Clear Listener

ESID End of Session

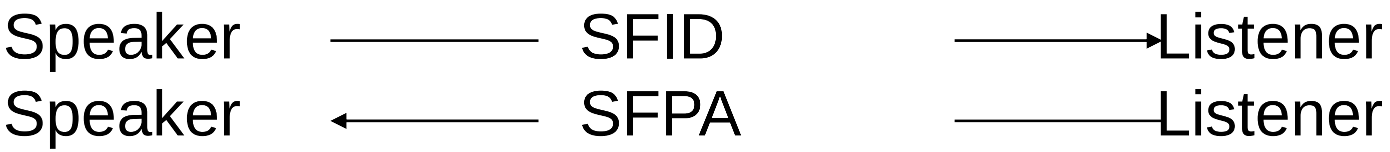
Command	F
Reason code	Reason code nr
Reason text Length	Max 999
Reason text	UTF-8
	(Carriage Return)

ESID Reason codes

00	Normal termination
01	Command not recognised
02	Protocol violation
03	User code not known
04	Invalid password
05	Local site emergency closedown
06	Command contained invalid data
07	NSDU size error
08	Resources not available
09	Time out
10	Mode or capabilities incompatible
11	**Invalid Challenge response**
12	**Secure Authentication incompatible**
99	Unspecified abort code

File Control

File transfer initiation (alt 1):



Speaker — SFID → Listener

Speaker ← SFPA — Listener

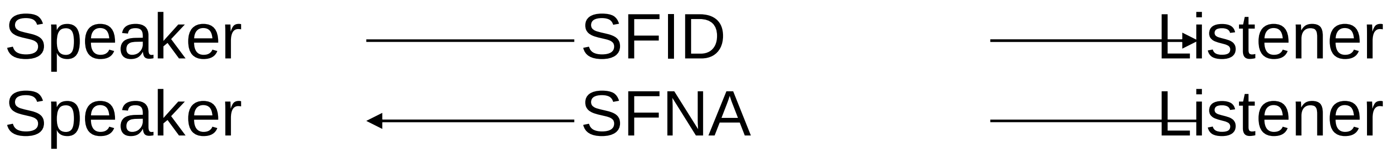
Speaker could send either of:

EFID

DATA

File Control

File transfer initiation (alt 2):


Speaker SFID Listener

Speaker SFNA Listener

Speaker could send anyone of :

SFID (not the same file!)

EERP

CD

SFID Send File

Command	H
Filename	Bilateral agreement
Date	YYMMDD
Timestamp	*See next slide*
User data	Not used
Destination	OFTP code
Origin	OFTP code
File format	F/V/U/T
Max rec. size	Specifies the max record File format = T/U (0)
File size	Amount of space at the origin. for the virtual file
Restart pos	Before compression
Original file size	Before compression max 9,3 PB (9 300 000 000 000 000 byte)
Security Level	00=No security Values 00,01,02,03
Cipher suite	00=No
Compression	0=No , 1 = Comp with ZLIB
File Envelope	0=No , 1 Enveloping using CMS
Signed EERP	N,Y
VFN descr Len	Virtual File description length 0 = no Description
VFN Description	Plain text in UTF-8

Timestamp

This is the time when a file is made available for transmission at the sender's location. The DATE and TIME stamps are assigned by the file originator and have only local significance. They should not be changed by any clearing centre.

REFERENCE: ISO 3307.
The first 2 digits (starting from the left) define the hours.
The 2nd 2 digits represent the minutes.
The 3rd 2 digits define the seconds.
The last 4 digits is a counter (0001-9999), which gives higher resolution.

SFPA Send File Positive

Command	2
Answer count	Restart
	Lower or equal to SFID restart

SFNA Send File Negative

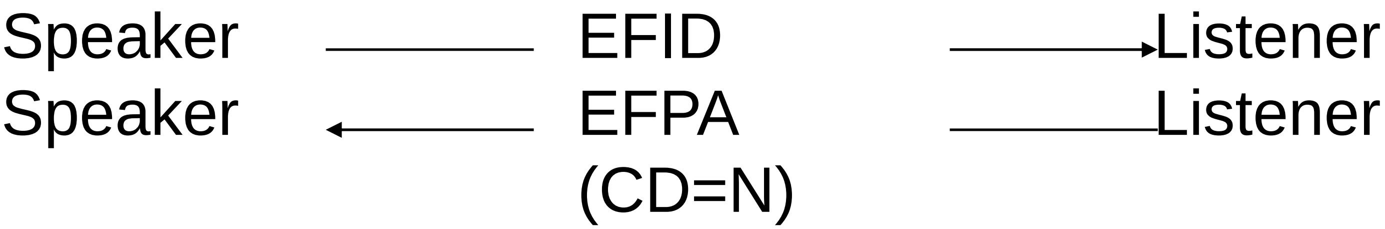
Command	3
Answer reason	As in list of arguments
Retry	Y/N
	Y retry later
	N the file should not be sent
Answer reason	Answer reason text length
Answer reason	Answer reason text

SFNA/EFNA Answer reasons

01	Invalid filename
02	Invalid destination
03	Invalid origin
04	Storage record format not supported
05	Maximum record length not supported
06	File size too big
10	Invalid record count
11	Invalid byte count
12	Access method failure
13	Duplicate file
14	File direction refused
15	Cipher suite not supported
16	Encrypted file not allowed
17	Unencrypted file not allowed
18	Compression not allowed
19	Signed file not allowed
20	Unsigned file not allowed
99	Unspecified reason

File transfer termination

File transfer termination (alt 1):



Speaker EFID → Listener

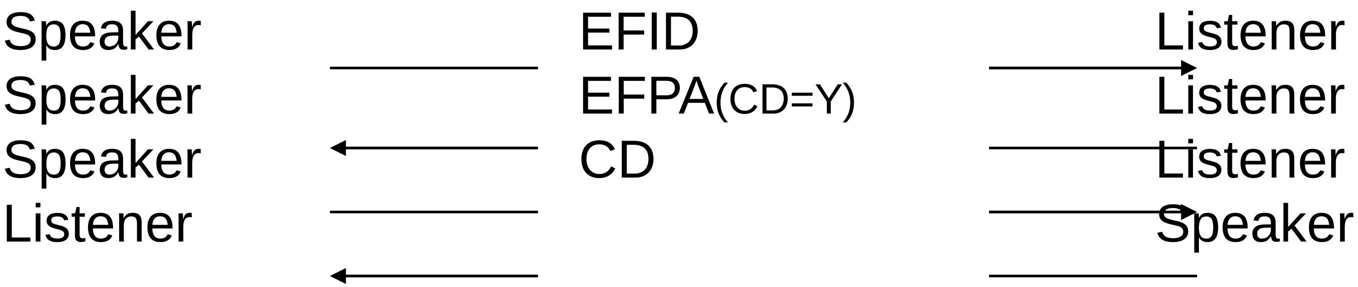
Speaker ← EFPA (CD=N) Listener

Speaker could send any of:

SFID
NERP
EERP
CD

File transfer termination

File transfer termination (alt 2):



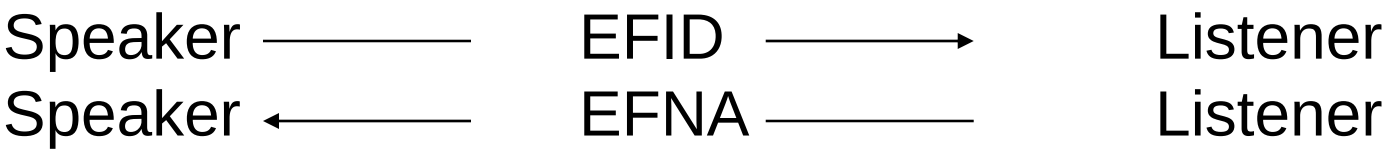
Speaker EFID Listener
Speaker EFPA(CD=Y) Listener
Speaker CD Listener
Listener Speaker

Speaker could send:

SFID
NERP
EERP
CD might not be sent in this alternative!

File transfer termination

File transfer termination (alt 3):


Speaker EFID Listener

Speaker EFNA Listener

Speaker could send any of:

SFID
NERP
EERP
CD

EFID End of File

Command	T
Record count	F/V or 0
Byte count	F/V/U/T Before compression
Unit count	No of octets sent

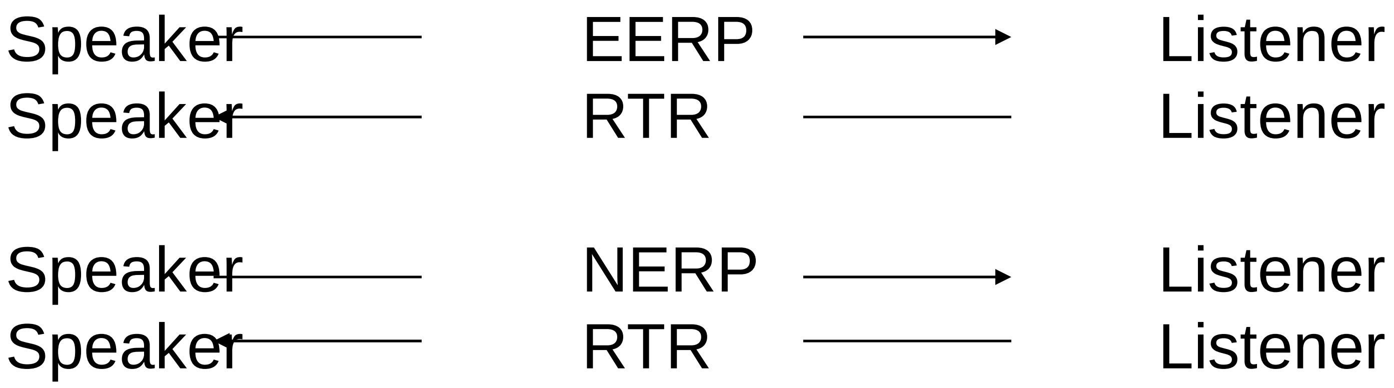
EFPA End of File Positive

Command	4
Change direct.	Y/N Request to become speaker

EFNA End of File Negative

Command	5
Answer reason	As in list of arguments

End to End Control


Speaker EERP Listener
Speaker RTR Listener

Speaker NERP Listener
Speaker RTR Listener

Speaker could send any of:

SFID
NERP
EERP
CD

NERP*	Negative End Response
Command	N
Filename	Bilateral agreement
Date	YYMMDD
Timestamp	Se slide ”Timestamp”
User data	Not used
Destination	OFTP code
Origin	OFTP code
Creator of NERP	
Reason code	See ESID/EFNA Code
Reason text length	max 999
Reason text	Text UTF-8
VF Hash Len	Virtual file hash length
VF Hash	Virtual file hash
NERP Len	NERP Signature length
NERP Sign	NERP signature

* New from version 1.4

EERP	End to End Response
Command	E
Filename	Bilateral agreement
Date	YYMMDD
Timestamp	Se slide ”Timestamp”
User data	Not used
Destination	OFTP code
Origin	OFTP code
Reason code	See ESID/EFNA Code
Reason text length	max 999
Reason text	Text UTF-8
VF Hash Len	Virtual file hash length
VF Hash	Virtual file hash
EERP Len	EERP Signature length
EERP Sign	EERP signature

RTR	Ready to Receive
Command	P

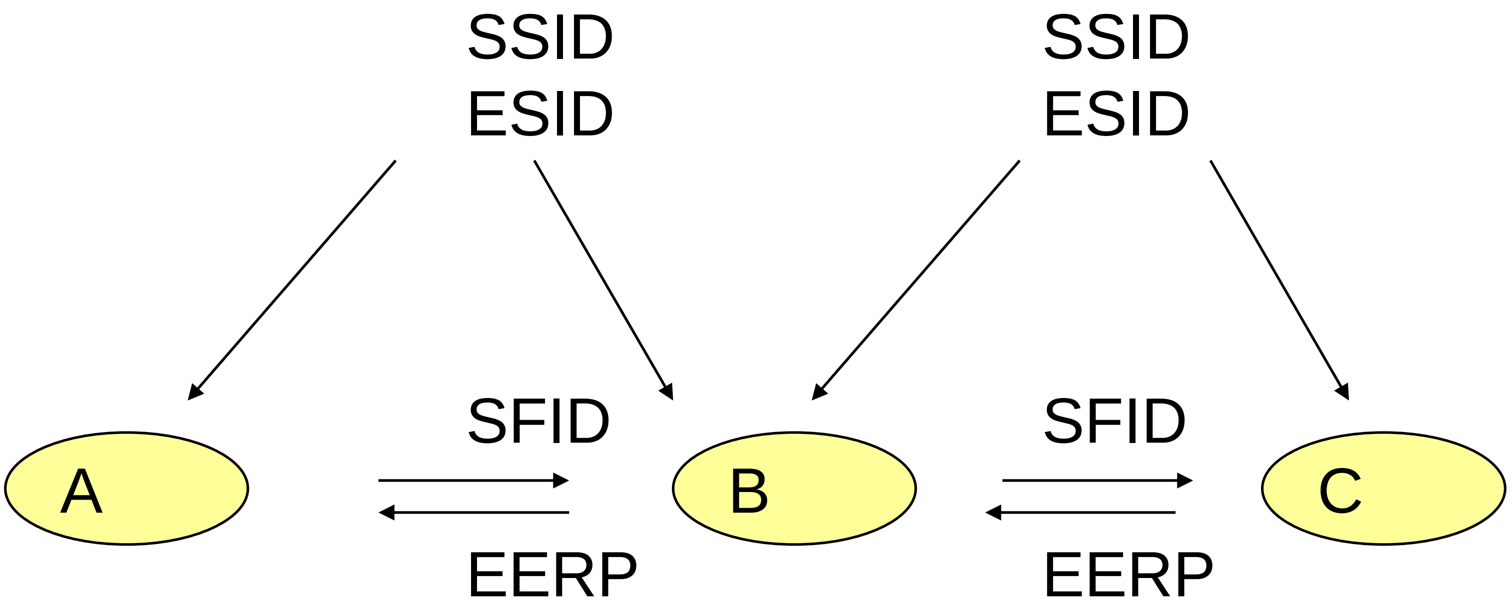
EERP/NERP

EERP/NERP is a ”mirror” of SFID

Is used to control a route and is normally interpreted as a handover confirmation

RTR is used solely to prevent from an uncontrolled flow of EERP

Routing



Origin	A	Origin	A	Origin	A
Destination	C	Destination	C	Destination	C
Filename		Filename		Filename	
Date		Date		Date	
Time		Time		Time	

Virtual File

File organization : Sequential

File identity: File name + date/timestamp identifies uniquely

Record format:

F (Fixed): Each record in the file has the same length.
V (Variable): The records in the file can have a different length.
U (Unstructured) Character stream of data, no structure
T (Text File): A sequence of ASCII characters, no transparent data

Data Exchange Buffer

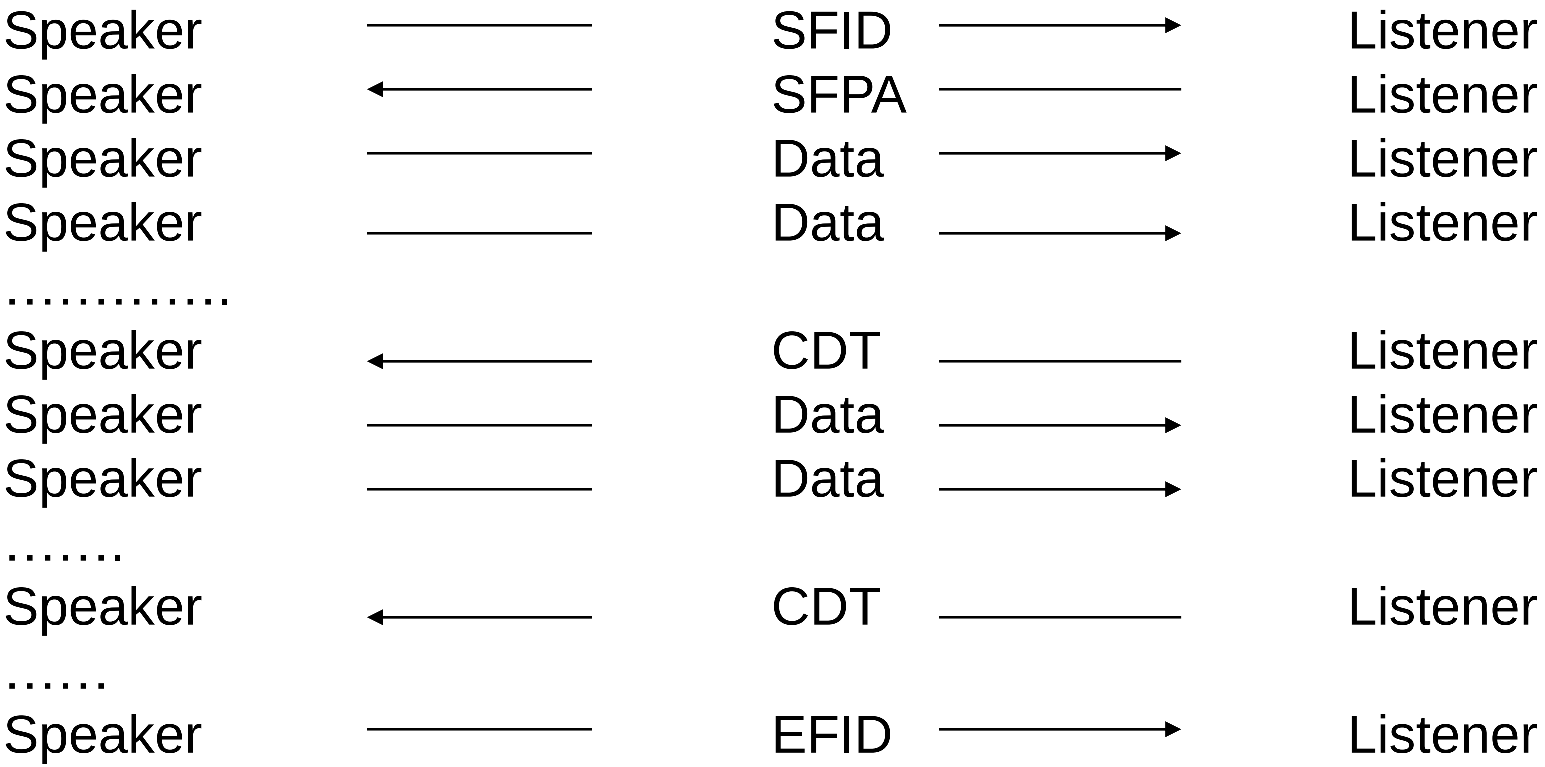
Number of bytes in each packet
It will effect the communication speed

Higher value equals higher speed

The max limit is 65 K for OFTP2

Volvo Group increased performance by 25 % by changing buffer to size to maximum value

Data flow control



Speaker → SFID → Listener
Speaker ← SFPA ← Listener
Speaker → Data → Listener
Speaker → Data → Listener
………….
Speaker ← CDT ← Listener
Speaker → Data → Listener
Speaker → Data → Listener
…….
Speaker ← CDT ← Listener
……
Speaker → EFID → Listener

Listener could send any of:

EFPA
EFNA

Data Flow

DATA	Data Flow
Command Data	D Data
CDT	Set Credit
Command	C

The number of Data Exchange Buffers that the speaker is allowed to send is negotiated in the Start Session phase

The Listener gives the Speaker permission to send more data (or EFID) by sending CDT.

Terminology: Communications Agreement

Term	Definition
SSID	EDI Code Sender/Receiver
Physical Adress	EDI Code Sender/Receiver
EDI Code	EDI Code Sender/Receiver
Network adress	DNS-adress (from Network Service Order)
NUA	DNS-adress (from Network Service Order)
Password	Password from/to Partner
Port	Assign logical port according to choice of communication channel
Certificate	TLS management

Terminology: Applications Agreement

Term	Definition
Logical address	UNB code in message UNB.0004/0010
Qualifier	Define UNB code usage
Sub-address	Internal address at sender/receiver
Code representation	Character set, eg ascii,ebcdic
Message version *	Version of message
Message type	Type of message
File format	Format of the file, eg F/80 unspecified file length
Virtual file name	Name of the file during the file transfer
Authentication	Certificate for identification
Confidentiality	Certificate for encryption of file

* Next slide

Identification of message versions (profiles) in DE 0057

Character 1: G (Global Automotive EDI message)
Character 2: X (Regional Automotive organisation)
Characters 3 - 4: XX (Regional Subset/Profile identifier)
Character 5: X (Regional Subset/Profile Version number)
Character 6: X (Regional Subset/Profile Release number)
Initial Code Values for Character 2:

JAI	A
Odette International	B
AIAG	C
JAMA	D
SASIG	G

Identification of message versions (profiles) in DE 0057

Odette Sweden Subsets/Profiles = S1 – S9, SA – SZ, examples:

SMSI General Invoice	GBS112
SMSI Freight Invoice	GBS212
SMSI Service Invoice	GBS311
Scania Global DESADV for Sequence Deliveries	GBSA11
Scania Global DESADV for Batch Deliveries	GBSB11
Nordic eBuilding Version 1	NEB01
Nordic eBuilding Version 2	NEB02
Volvo Group DELFOR D04A (2006 version)	GBSC11
Volvo Group DELFOR D04A (2014 version)	GBSD11
Volvo Group DELJIT D04B (2013 version)	GBSE11
Volvo Group DESADV D00A (2006 version)	GBSF11
Volvo Group DESADV D07A Batch (2014 version)	GBSG11
Volvo Group DESADV D07A Sequence (2014 version)	GBSH11
Volvo Group INVOIC D07A AP (2014 version)	GBSI11
Volvo Group PRODAT D03A	GBSJ11
Volvo Group INVOIC D07A NAP (2014 version)	GBSK11

What you need to communicate

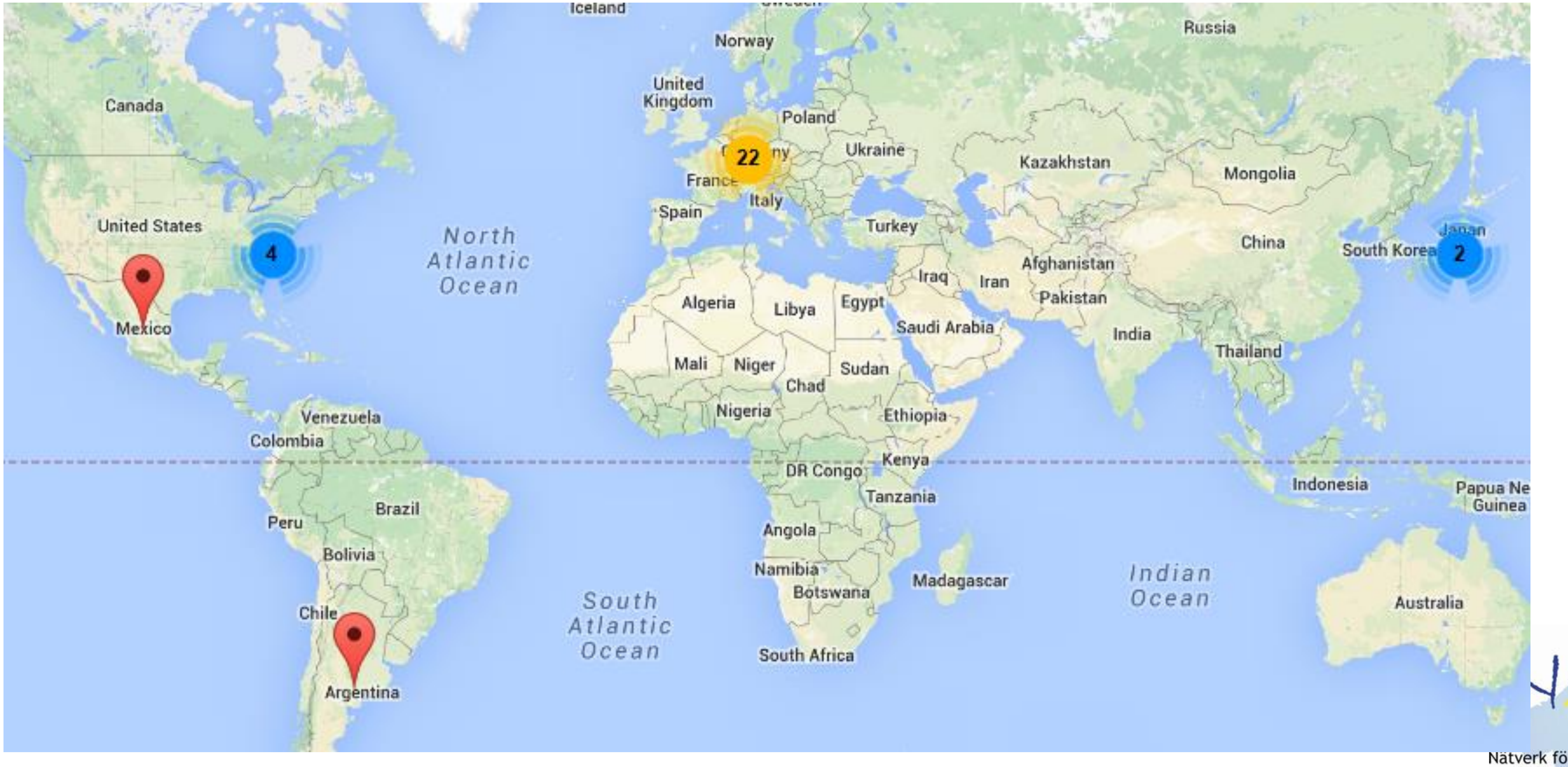
- OFTP2 software
- Network service
- Application agreement/specification with trading partner
- Communications agreement/specification with trading partner
- Security Certificate

Examples of OFTP-system vendors

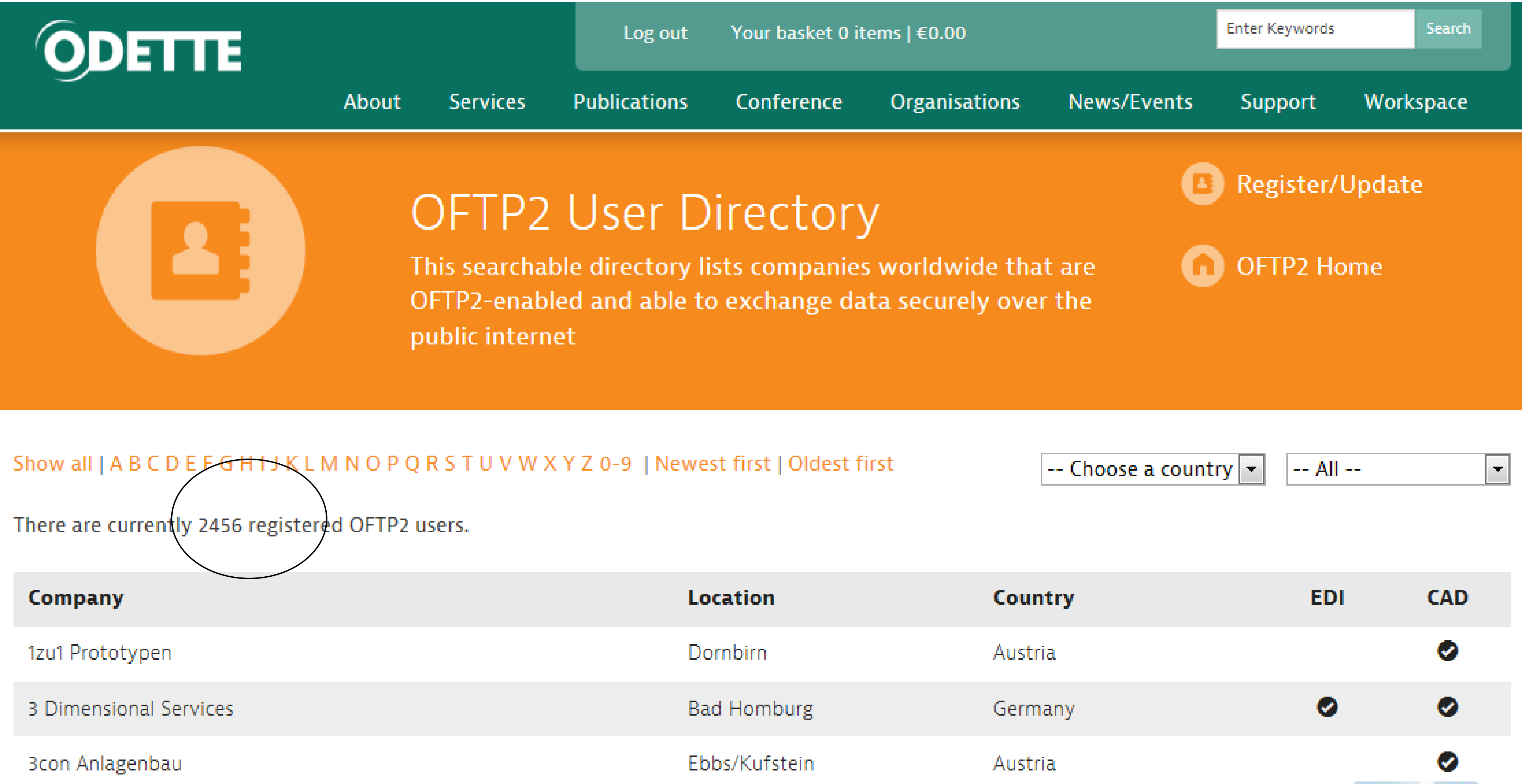
- **Freeware**
  Mendelson
- **For small entities (5 000 - 30 000 kr)**
  Encode (RedOftp) , Xware (xWare), Data Interchange (Odex Enterprise)
- **Medium and larger entities (+ 30 000 kr)**
  Seeburger(BIS),Data Interchange (Epic),Axway,Hungsberg,Numlog,T-Systems

http://www.odette.org/services/oftp2/software

- List of Certified OFTP2 SW Providers
- Find your OFTP2 SW Provider



http://www.odette.org/services/oftp2-directory/users



OFTP2 User Directory

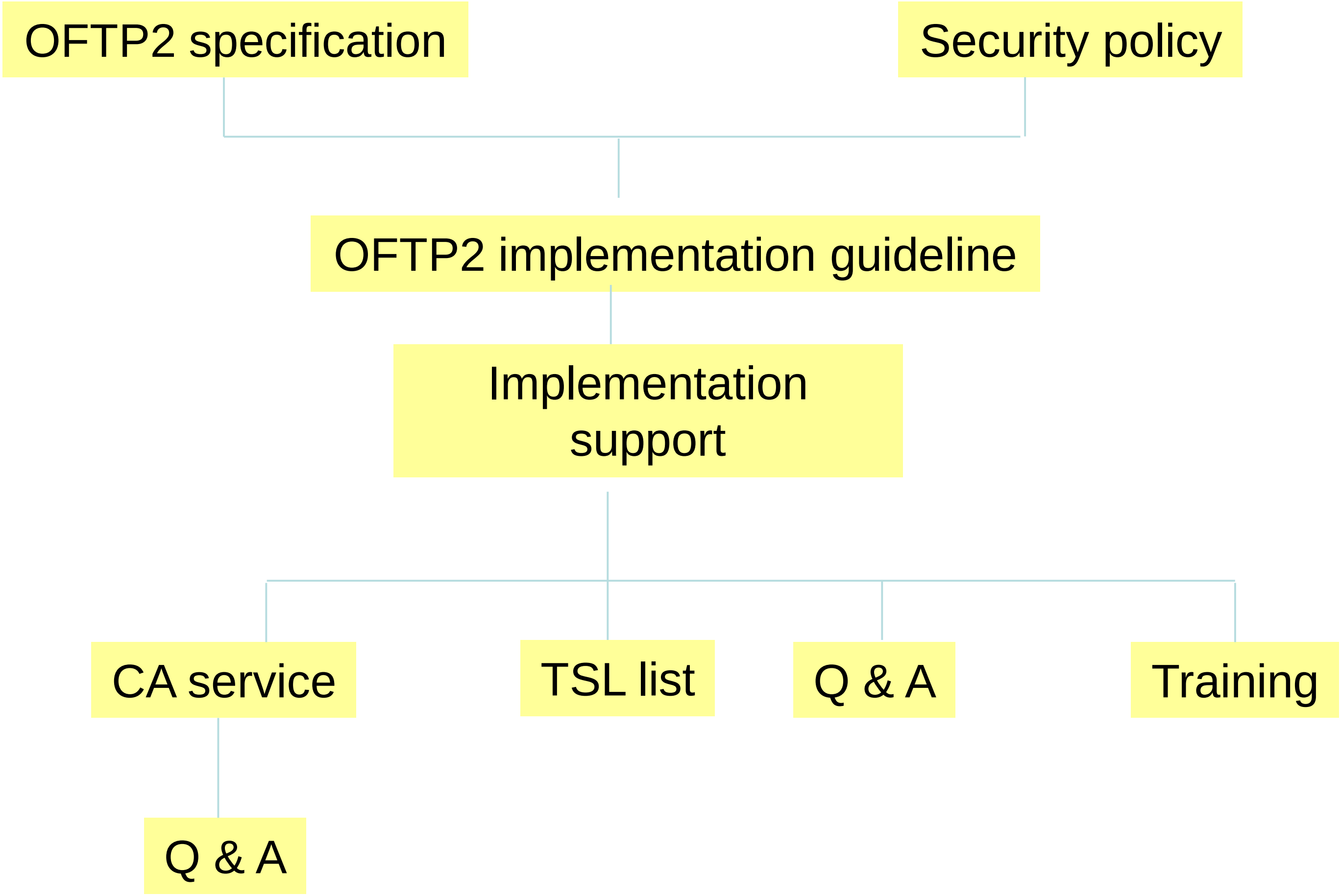
This searchable directory lists companies worldwide that are OFTP2-enabled and able to exchange data securely over the public internet

There are currently 2456 registered OFTP2 users.

Company	Location	Country	EDI	CAD
1zu1 Prototypen	Dornbirn	Austria		✓
3 Dimensional Services	Bad Homburg	Germany	✓	✓
3con Anlagenbau	Ebbs/Kufstein	Austria		✓

Implementation issues

The role of Odette in OFTP2



OFTP2 specification

Security policy

OFTP2 implementation guideline

Implementation support

CA service

TSL list

Q & A

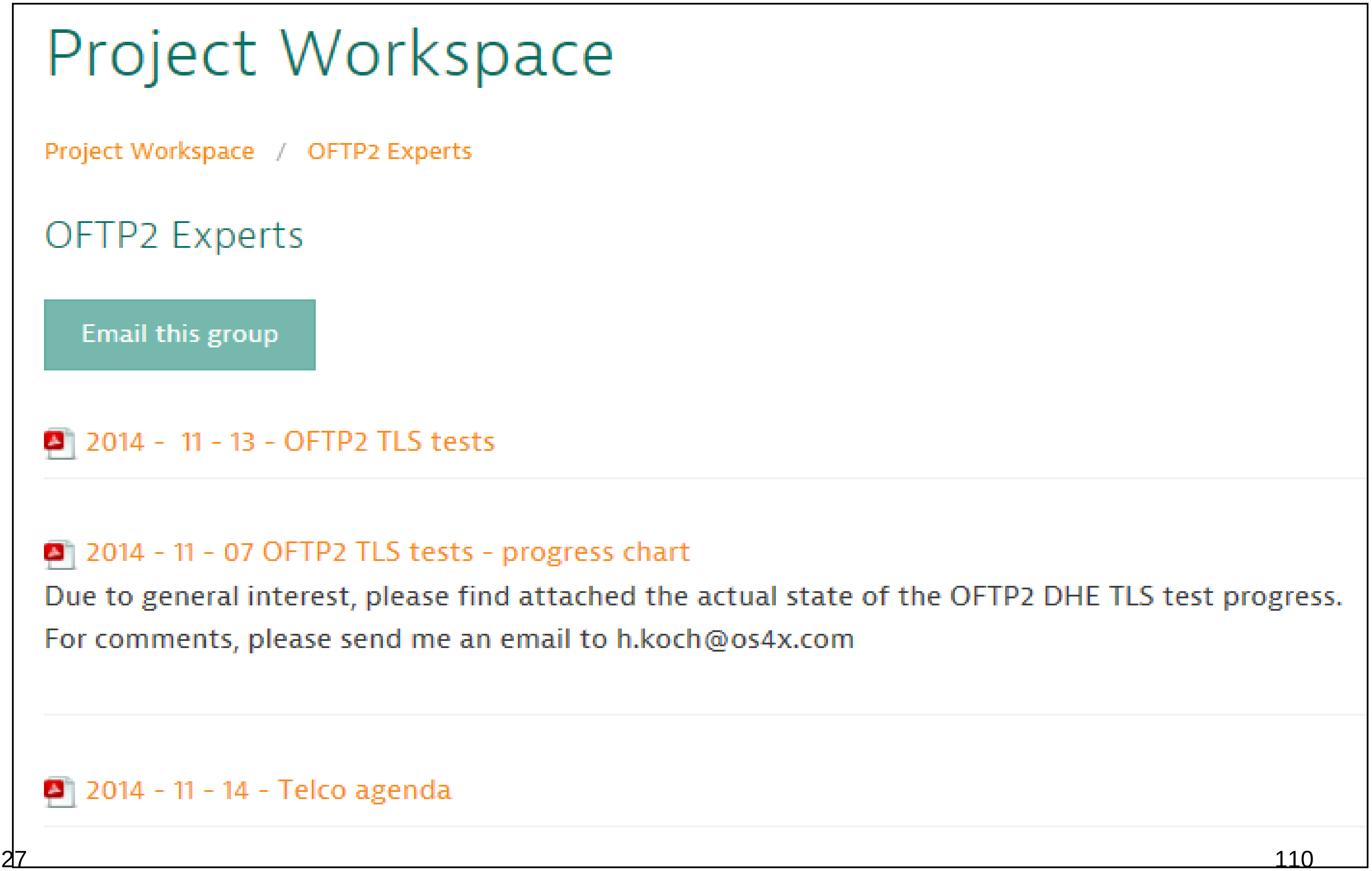
Training

Q & A

Odette OFTP2 Experts Group

ODETTE SWEDEN

Odette International is running an OFTP2 Experts Group where any kind of implementation issues could be raised. There is participation from Odette Sweden member companies in the group



Project Workspace

Project Workspace / OFTP2 Experts

OFTP2 Experts

2014 - 11 - 13 - OFTP2 TLS tests

2014 - 11 - 07 OFTP2 TLS tests - progress chart

Due to general interest, please find attached the actual state of the OFTP2 DHE TLS test progress. For comments, please send me an email to h.koch@os4x.com

2014 - 11 - 14 - Telco agenda

NAF Nätverk för Affärsutveckling i Försörjningskedjan

Implementation issues

ODETTE SWEDEN

- Prepare yourself
- Practical implementation issues
- Certificate
- TSL
- ICD codes
- Oscar codes – identification – authentication - how to request from Odette
  - Form for acquiring Oscar
  - Form for acquiring Certifikate
  - Ordering TSL
  - CA who wish to qualify for the TSL
- Questions and answer

NAF Nätverk för Affärsutveckling i Försörjningskedjan

Implementation issues

- Partners using software from NUMLOG have to remember that you can not use communications for more than one DNS connected to one SSID
- Remember when you are connected to VAN services certain delays can appear
- Remember that secure communication to a VAN Service does not mean you have a secure connection to a supplier

Implementation issues

From experience we know that certain steps are necessary for a successful implementation:

Information gathering

- Obtain documentation through your Odette National Organisation (NO)
- If possible take part in training courses organised by your NO or by IT Providers
- Discuss OFTP2 implementation with your communication software provider. They should have the necessary knowledge about security and certificates.

Migration planning and/or new implementation

- If there is a need to upgrade your software, ask in-house and ask your trading partners
- If there is a demand to upgrade, make a timetable together with your trading partners, your communication software provider and your IT Provider.
- Collect information to clarify when older network services could be phased out

Implementation issues

Security Solution (Certificate)

- It is important to clarify Trading Partner requirements for the security solution:

  - Security Certificate and CA Service - how to reduce the number of options
  - Trading Partner security policy (session encryption, file encryption, signing, signed acknowledgement of receipt)

Odette CA

- Established to provide all items necessary for a reliable data exchange in the automotive industry manged by the Odette organisation
- Easy to use
- State of the art certificates, may even include the Odette ID of the station
- „One stop shop“ principle

How to get security certificates for OFTP2

- Security Certificates for OFTP2 must come from CA:s listed on the Odette TSL (Trust Service Status Lists)

- Therefore the first step is to check this list

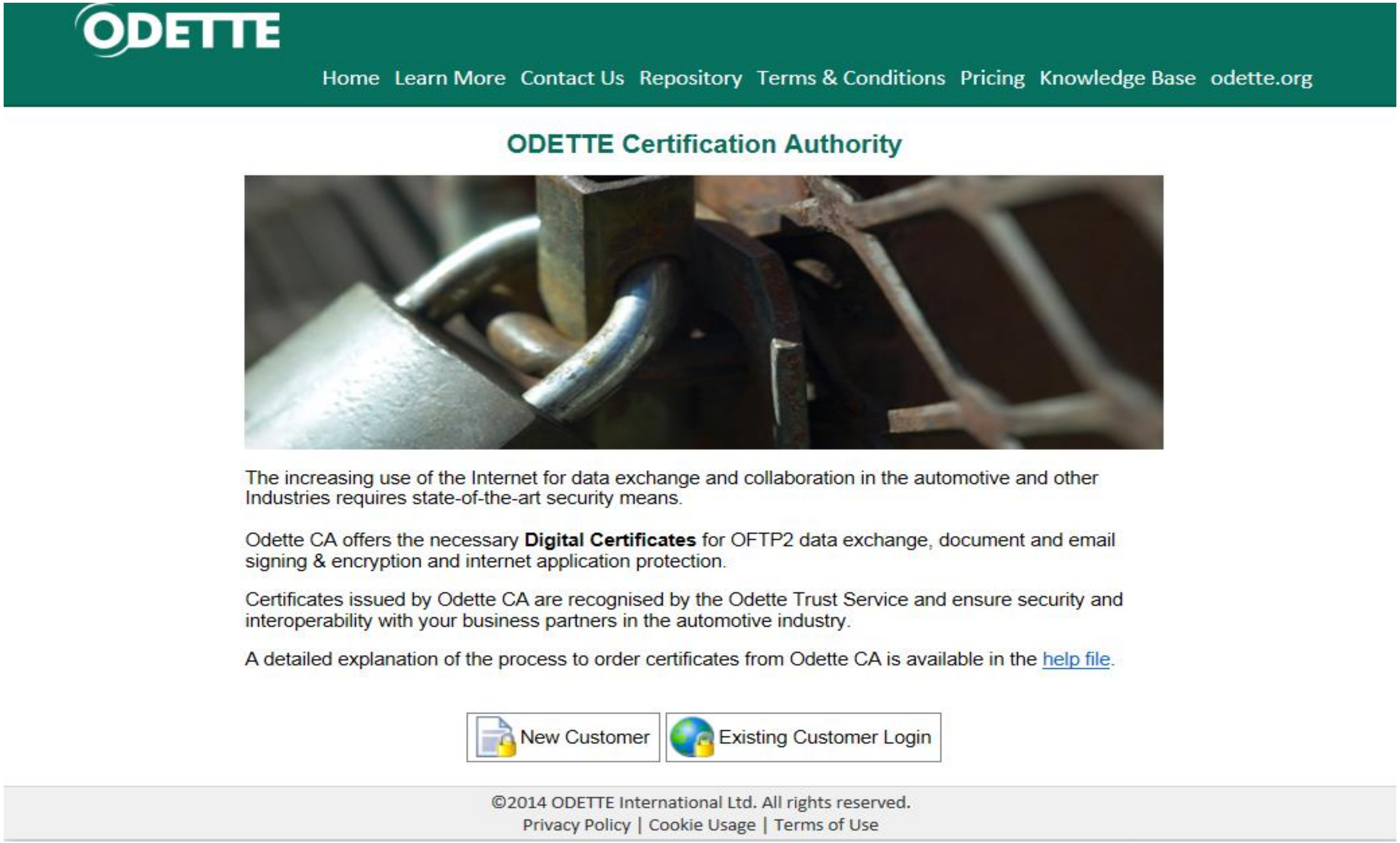
- The second step is to see if your company already has obtained certificates that could be used also for OFTP2 (beside other use such as secure websites)

- If you have a preferred CA services provider which is not listed on the Odette TSL you can suggest your CA to apply for being listed

- Another potential providers of security certificates is the Odette CA, or possibly your OFTP2 software provider or a major customer (OEM)

Nätverk för Affärsutveckling
i Försörjningskedjan

https://www.odetteca.com/



ODETTE Certification Authority

The increasing use of the Internet for data exchange and collaboration in the automotive and other Industries requires state-of-the-art security means.

Odette CA offers the necessary **Digital Certificates** for OFTP2 data exchange, document and email signing & encryption and internet application protection.

Certificates issued by Odette CA are recognised by the Odette Trust Service and ensure security and interoperability with your business partners in the automotive industry.

A detailed explanation of the process to order certificates from Odette CA is available in the help file.

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Privacy Policy | Cookie Usage | Terms of Use

There is also information available in Swedish on the Odette Sweden website about how to register

ODETTE CA
www.odetteca.com

11 November 2009

Sten gör om

ODETTE
SWEDEN

Certificate Registration and Authorisation Data Sheet

Order Number: xxxxxx

Order Date: xxxxx

Certificate Details

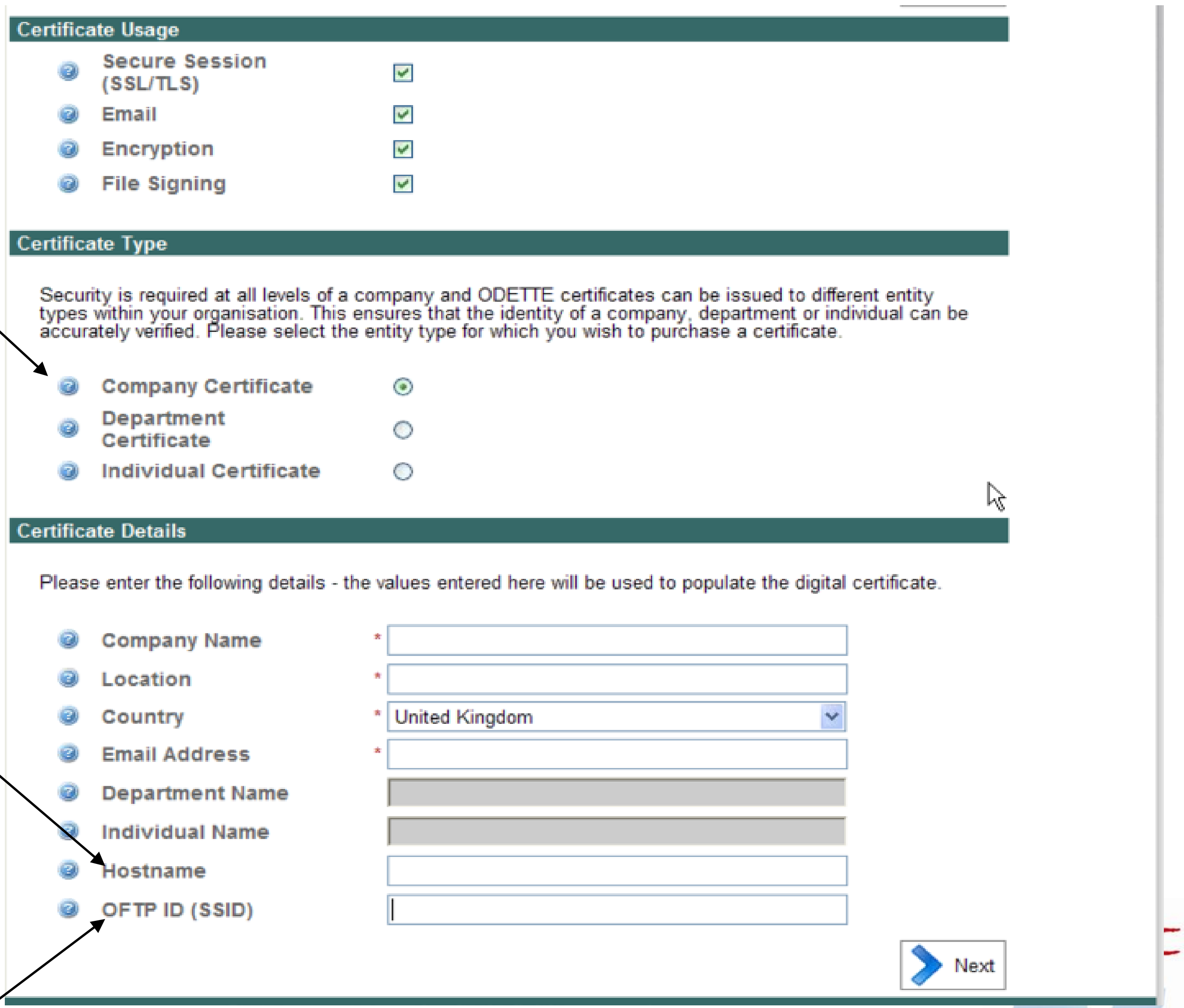
Certificate type	Company	
Email		
Location		
Country		
Organisation		
Department		
Name		
Domain / IP Address	“Host name” in the web form – mandatory for AB Volvo	
OFTP ID		
Validity		Year(s)

NAF
Nätverk för Affärsutveckling
i Försörjningskedjan

Sten gör om

Recommended to use the actual OFTP2 server for ordering and installation

Standard (but not the only) option is “company”



Certificate Usage

Secure Session (SSL/TLS)	☑
Email	☑
Encryption	☑
File Signing	☑

Certificate Type

Security is required at all levels of a company and ODETTE certificates can be issued to different entity types within your organisation. This ensures that the identity of a company, department or individual can be accurately verified. Please select the entity type for which you wish to purchase a certificate.

Company Certificate	●
Department Certificate	○
Individual Certificate	○

Certificate Details

Please enter the following details - the values entered here will be used to populate the digital certificate.

Company Name	*	
Location	*	
Country	*	United Kingdom
Email Address	*	
Department Name		
Individual Name		
Hostname		
OFTP ID (SSID)		

Host name
Not mandatory, but required for AB Volvo, should be DNS or IP address as called by Volvo

OFTP ID: Not mandatory

Sten gör om

Not same person

ODETTE
SWEDEN

Technical Contact Details

Name	
Company	
Position	
Email	
Address Line 1	
Address Line 2	
City	
Postcode	
Country	
Telephone	

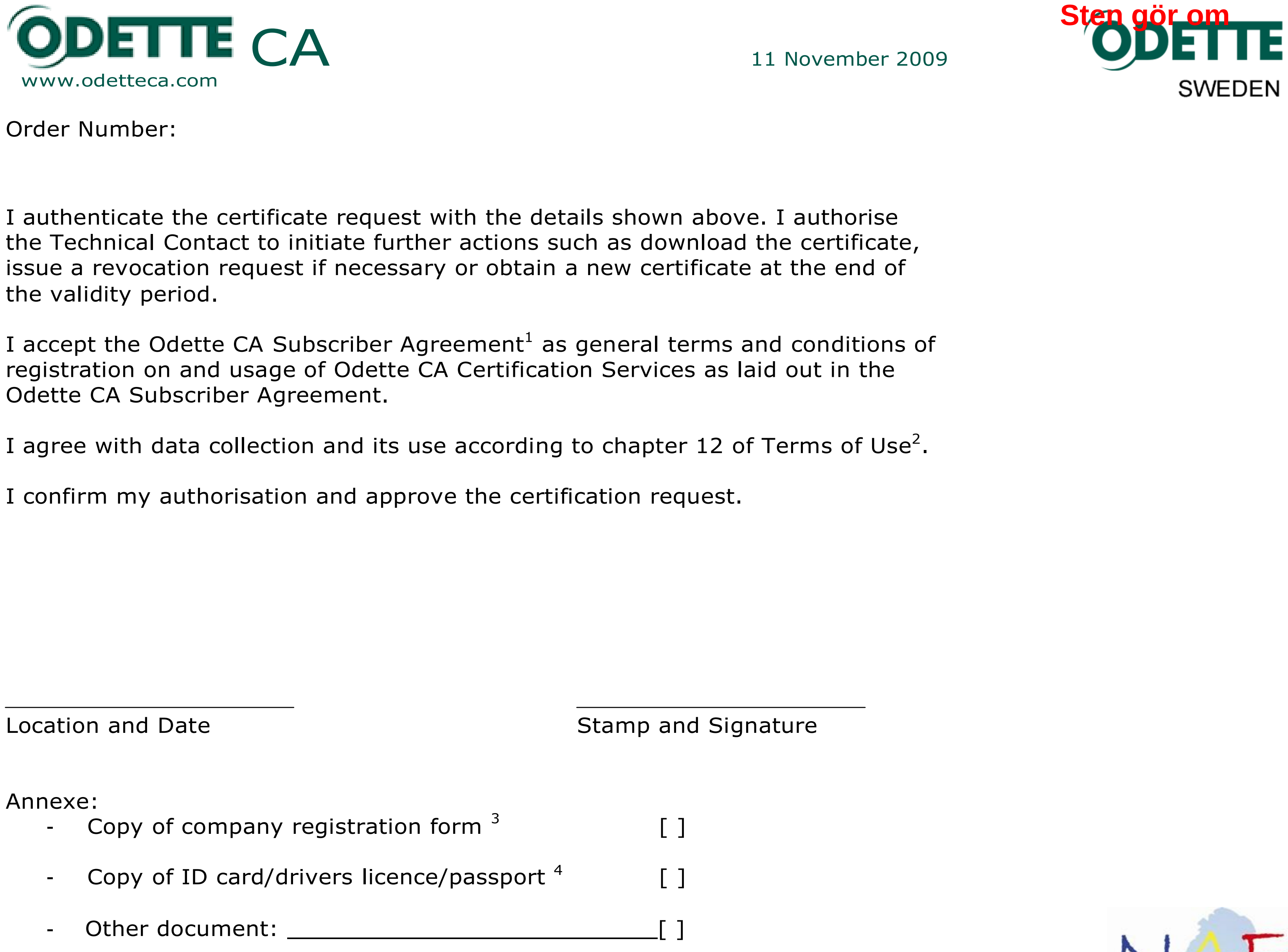
Authentication Contact Details

Name	
Company	
Position	
Email	
Address Line 1	
Address Line 2	
City	
Postcode	

The person that would sign this document

NAF
Nätverk för Affärsutveckling
i Försörjningskedjan

Sten gör om



ODETTE CA
www.odetteca.com

11 November 2009

ODETTE
SWEDEN

Order Number:

I authenticate the certificate request with the details shown above. I authorise the Technical Contact to initiate further actions such as download the certificate, issue a revocation request if necessary or obtain a new certificate at the end of the validity period.

I accept the Odette CA Subscriber Agreement[1] as general terms and conditions of registration on and usage of Odette CA Certification Services as laid out in the Odette CA Subscriber Agreement.

I agree with data collection and its use according to chapter 12 of Terms of Use[2].

I confirm my authorisation and approve the certification request.

__________________________ __________________________
Location and Date Stamp and Signature

Annexe:

- Copy of company registration form [3] [ ]
- Copy of ID card/drivers licence/passport [4] [ ]
- Other document: ________________________________[ ]

SCX Implementation

- The work to build the TSLs is carried out by Odette CO supervised by a permanent Odette committee
- TSLs and their associated policies are published on the Odette Web:
  - http://www.odette.org/TSL/POL_BASIC.txt
  - http://www.odette.org/TSL/POL_OFTP2.txt
- Enabled software will download it according to a special policy in order to avoid bottleneck
- The software is able of automatically trust or distrust a certificate, basing its decision on the trusted CA list
- **OFTP2** was the first application to benefit of these features
- Other applications will have their own TSL according to their own need in mater of certificate policy (e.g. secure email).

Practical implementation issues

There are some aspects that individually might not be so complicated to handle, but could still cause certain issues. It is therefore recommended that you discuss the following items with your IT support and with your IT provider:

Firewall

- The firewall will have to be adapted for OFTP2, Port 3305 (OFTP) plus 6619 (TLS). Ports must be open in both directions in order to enable dialling out and dialling in.

DNS address (fixed) or IP address

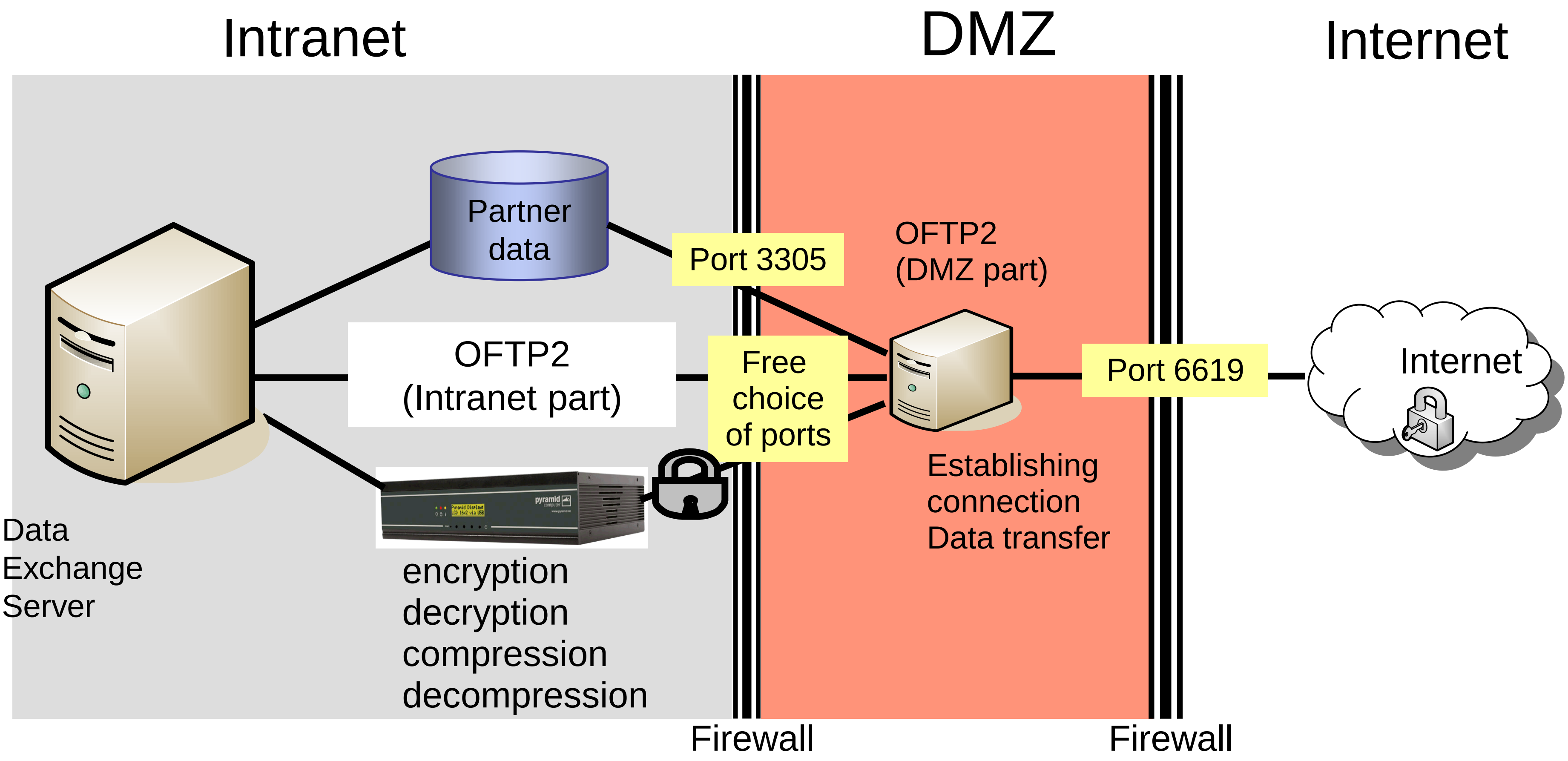
- We recommend choosing a fixed IP address together with a DNS name (e.g. oftp.supplier.com) instead of IP address.
- This would minimise the risk for problems when changing ISP (Internet Service Provider).
- We do not recommend using dynamic DNS Services since this would make you dependant on a third party.
- Some free services can be closed down after 30 days of inactivity, for example if an IP address has not been changed.

Practical implementation issues

Public IP address and the link to certificates

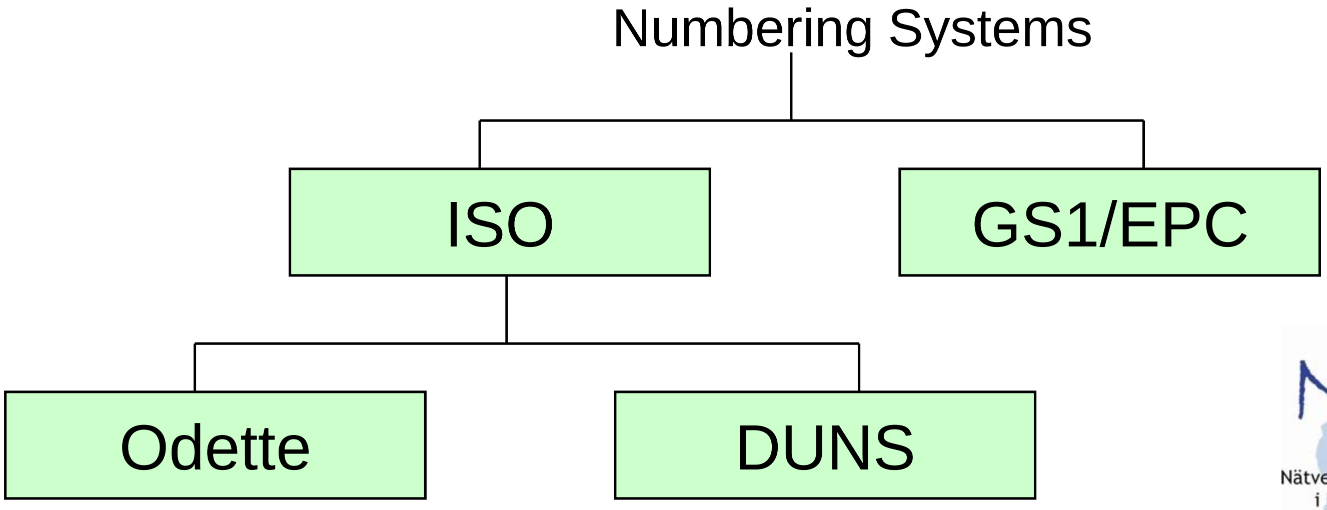
- The DNS name should be listed in the certificate.
- Tests
- Select a suitable business partner for testing, certificate handling and others.

Example of secure OFTP2 configuration by Swedish OEM



OSCAR:
Odette System for Coding And Registration

- The Oscar system provides:
  - An issuing service (issuing codes)
  - An information service (a user can query information on the registered entity)
- ISO compliant



Usage of OSCAR Codes

SWEDEN

Organisation codes:
Trading partners
Locations, business functions and departments within a company
Logistics handling units
Company Assets
Individual parts/components
Computer network addresses
Engineering changes

AutoID

- Consignment ID (Licence Plate)
- Asset ID (e.g. Containers)
- Product ID (Parts Marking)

EDI messaging

- Technical Partner ID (Sender/Receiver)
- Business process related Party ID (NAD ID)

File transfer station identification (OFTP)

ISO ID					OFTP code from the OSCAR System														Sub address					
0	0	1	7	7	0	0	0	0	0	0	0	0	0	0	X	0	0	A	0	0	0	0	0	0

Maintain Business Entity Datasets

Provide Business Entity Datasets for use in Partner Databases

Nätverk för Affärsutveckling i Försörjningskedjan

Sten gör om

OSCAR code for OFTP only:
175 EUR per OFTP code, no maintenance fee
Entitles to get 1 Odette Certificate for one year for free.

Full OSCAR Code (for All Purposes)
MBE Code 180 EUR each
SBE Codes (can be generated by Users free of charge)
Annual Maintenance: 96 EUR per MBE Code

Odette Certificate for OFTP2 (but also usable for other purposes):
Certificate 180 EUR
Annual Renewal 180 EUR

Adresses

www.odette.se
https://oscar.odette.org/
https://forum.odette.org/service/oscar/oscar-explained
www.odetteca.com

Questions and answers

Sten gör om

Documentation and websites

Documentation

Training course slides
OFTPV2 specifications
OFTPV2 Implementation Guidelines
Security Certificate Exchange (SCX)
OFTP2 Explanatory paper (in Swedish)
CA Help document

Where to find

Go to http://www.odette.se/web/Seminarier_o_kurser.aspx

Select Endast tillgänglig för kursmedlemmar

User name:	odettekurs
Password:	kurssamverkan

Glossary

Term/ abbreviation	Meaning	Definition
AIAG	Automotive Industry Action Group	North American Automotive EDI Association
APS	Advanced Planning System	A business system with advanced MRP capability
AS2	Applicability Statement 2	Internet standard for file transfer communications, mainly used in retail and trading
ASN	Advanced Shipping Note	Electronic Despatch Note, equal to DESADV message
Bill of lading		A document which evidences a contract of carriage by sea
Call-off	Call-off/Call-in/Daily Shipping instruction	Short horizon order/requirement document
Carrier	Transporter	Party undertaking transport of goods from one point to another
CMR note	Convention relative au contrat de transport international de Marchandises par route	A document which evidences a contract of carriage by road
Consignee		Party to which goods is to be shipped to
Consignment		Load of one or more shipments to one consignee
Consignment note		A document which evidences a contract of carriage by any means
Consignor	Despatch party	Party sending goods
Consolidation Point	Consignment point/Grouping center	Location where consolidation of consignments takes place.
Data Element		Lowest level of data occurrence
Data Element Separator		The special character used to separate data elements in a data format.
DI	Data identifier	Character(s) to qualify a meaning of data for Auto ID
DM	Data model	Information model connecting data to business process
DELFOR	Delivery forecast/Delivery Instruction	Electronic order/requirement document

Glossary

Term/ abbreviation	Meaning	Definition
Delivery party		Sub-contractor/hub/LSP/supplier
DESADV	Despatch advise	Electronic despatch/delivery note (ASN)
EDI	Electronic Data Interchange	Means to electronically transmit structured data
EDIFACT	Electronic data interchange for administration, commerce and transport	Framework for EDI Exchange, developed by UNECE
ERP	Enterprise resource planning (system)	
(S)FTP	(Secure) File transfer protocol	Commonly used file transfer protocol over Internet
Forwarder	Carrier, transporter	Party arranging the carriage of goods
Freight		Goods in transit
Freight invoice		Invoice issued by carrier for transport cost
FCL		Full container load
FTL		Full trailer load
Hub	Hub/cross docking	Central collection point of goods for further distribution
HRI	Human readable interpretation	Characters readable to the human eye
Incoterms coded		Code specifying terms of delivery and/or transport
Packaging item	Package/kolli	Package identified by unique label number
Intermodal transport		Load of goods forwarded by more than one mode of transport
INVOIC		Commercial invoice message
Invoicee		Party to which invoice is addressed
JAMA		Japan Automobile Manufacturers Association
Kanban		A pull replenishment system, with Kanban card indicating minimum stock.

Glossary

Term/ abbreviation	Meaning	Definition
Kanban number	Card number	Unique identifier for a pull signal from buyer
License Plate		Unique transport unit identifier
Linear symbol		One dimensional bar code symbol
LSP	Logistic service provider	Party taking consignment responsibility for other party
Master Load	Master load/transport carrier	Unit that hold inner packages with same items.
Material release	DELFOR/CALLOFF/ORDER	An order against a blanket order for a requirement
Message		A continuous stream of data elements
Message envelope		Message header and trailer surrounding message
Message Function Coded		A code specifying function (purpose) of message
Message Header		Group of characters defining start of message
Message trailer		Group of characters defining end of message
Message Type Code		Code specifying type of message
Message version		Code specifying version of message
Mixed load	Mixed load (G pallet)	A transport carrier with inner packages with different items
ODETTE	Organisation for Data Exchange by TeleTransmission in Europe	Organization for EDI and Auto-ID in the European Automotive Industry
OEM	Original equipment manufacturer	Commonly used to describe actors in top of value chain
OFTP/OFTP2	Odette file transfer protocol (2)	
Packaging instruction	Package instruction	Agreed packaging instruction for an item, equipment or module

Glossary

Term/ abbreviation	Meaning	Definition
Packaging type code		A code to specify a packaging type
Packing list		Document specifying individual packages and content
Payee		A party to which payments are made
Place of delivery	Place of delivery/discharge	Place of delivery according to terms of transport
Place of despatch		Place where goods is taken over for carriage
Proforma Invoice		Invoice document with same info as conventional invoice. Mostly used for customs declarations
Proof of delivery		Signed copy of delivery receipt (reception receipt)
Pull method		Order based on static stock and replenishment order is immediate upon consumption
Push method		Order based on specified due dates and est transport lead time.
Quiet zone		Blank space surrounding a bar code
Reader		Equipment to read and decode bar codes
RECADV	Reception advise	Reception advise from buyer to supplier on received goods (corresponding with DESADV)
RFID	Radio Frequency identity	Wireless electromagnetic method for data transfer
SBI	Self billing invoice	Invoice (monetary transfer) document from buyer to supplier
Shikyu process	Shikyu process	Shipment of components to a supplier for assembly to a larger component ready for final assembly
Ship-from	Ship-from (Consignor)	Shipping party

Glossary

Term/ abbreviation	Meaning	Definition
Ship-to	Ship-to (Consignee)	Receiving party
Shipment		Load of one or multiple transport carriers shipped from one consignee to one consignor
Shipper	Shipper (Consignor)	Party sending goods
Subset	Subset/application of framework	Framework (business rules) within larger framework
Symbology		Framework for bar codes standard
Syntax	Data grammar	Data grammar, data sequence framework
TOD	Terms of delivery	Conditions agreed between buyer and seller on delivery
TOF	Terms of freight	Conditions agreed between buyer of transport and carrier
TOT	Terms of transport	Conditions agreed as above for physical transport of goods
Tracing	Tracing (traceability)	Function to trace goods, items, consignments and so on
Tracking		Function to maintain trace of goods, items, consignments and so on
Transshipment		Transition from one means of transport to another
THU	Transport handling unit	One separately identifiable transport unit (eg pallet)
Transport instruction		Generic term document with details to arrange transport
Tier	Tier 1, Tier 2 …	Level in supply/value chain
VAN	Value added network	Communication hub with features added
VDA	Verband Der Automobilinustrie	German Automobile Manufacturers Association
Web-EDI	Web-EDI	Web accessible EDI system (via Portal)

Glossary

ODETTE
SWEDEN

Term/ abbreviation	Meaning	Definition
Ultimate consignee		Final place of discharge (consumption place)
UML	Unified modeling language	Set of diagrams communication requirements of a business process
UN/CEFACT		United Nations Centre for Trade Facilitation and Electronic Business
Waybill	Consignment note	A document which evidences a contract of carriage by any means
XML	Extensible markup language	Data format
X.12		American EDI framework for EDI
X.25	X.25	Datapak, older analog communication network
X.400	X.400	Older but still existing communication network

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i Försörjningskedjan