

**NATIONAL  
SETTLEMENT  
DEPOSITORY**  
MOSCOW EXCHANGE GROUP

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# **ELECTRONIC COMMUNICATION IN SECURITIES MARKET**

# IT SOLUTIONS IN NSD

## Outsourcing

Management of the distributed team up to 400 people

## Release

6 major and 6 minor software releases. Up to 7500 functional requirements per release.

## Agile

Maintaining tasks and projects, prototyping of solutions

## CMMI tier 3

The first non IT company in Russia to have received this status

## SWIFT Service Bureau

The first SWIFT Service Bureau in Russia and Eastern Europe with the PREMIER highest level of reliability and security

**More than 70 clients**

## Blockchain

Member of Hyperledger architectural committee

Carrying out transactions in commercial operation

## Robotization

Optimization of operating activities

## Infrastructure

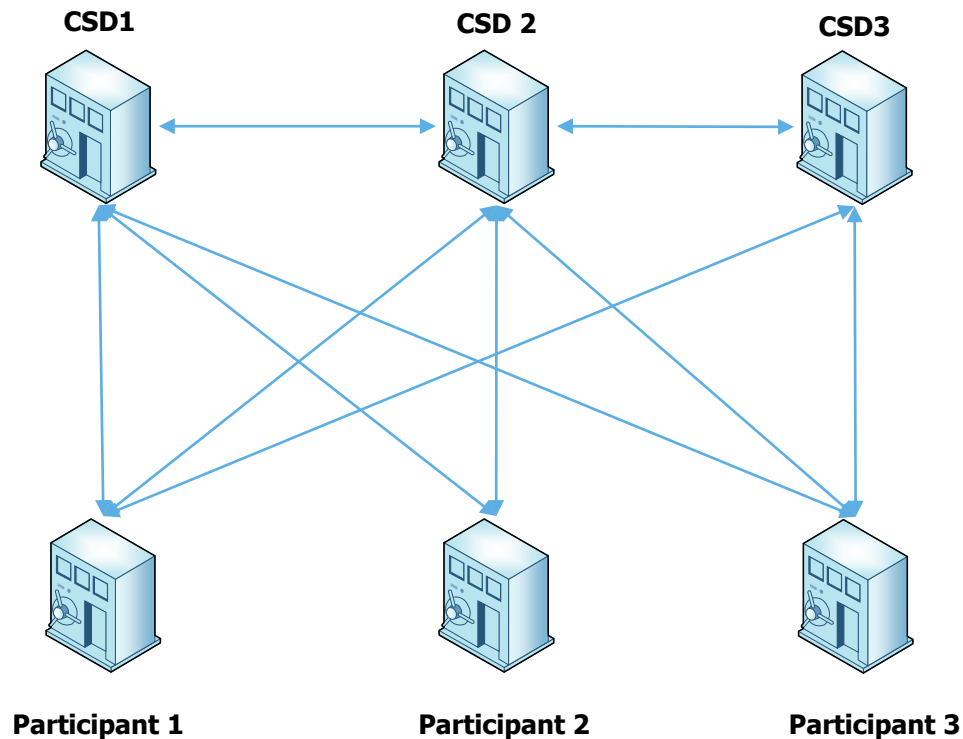
3 sites, main DPC – Tier 3  
E-workflow network – geographically divided cluster

## Technologies

Microservices – are brought into commercial operation

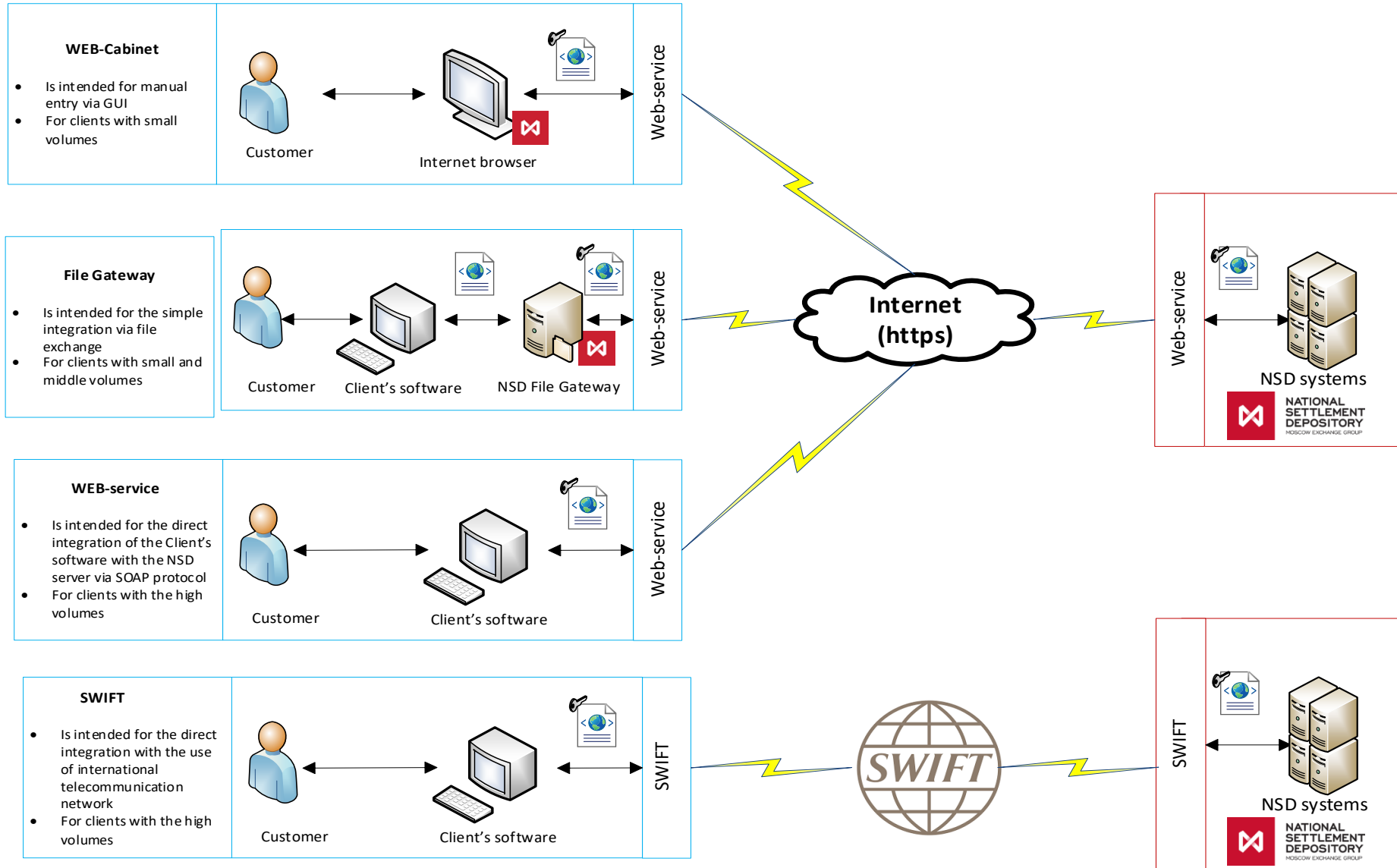
DevOps – automation of the process of solution integration and installation on stands

# CURRENT STATUS AND THE MAIN TREND LINES



- CSD are forced to support a set of channels and formats of messages
- SWIFT – is an optimal way of interaction between CSD
- There is no universal way of communication between the participants
- The leading CSD are migrating to ISO 20022 international standard
- Electronic channels pass from IT to business

# CONNECTION TYPES BY MEANS OF THE EXAMPLE OF NSD



# CONNECTION TYPES BY MEANS OF THE EXAMPLE OF EUROCLEAR, T2S

## Your connectivity options explained

Screen based	EasyWay	EasyWay is a web-based tool that simplifies the way you connect to and use our services. EasyWay offers you a real-time view of your Euroclear activity.
	EUCLID PC	for low- to medium-volume users to access to Euroclear Bank core services
	EUCLID Server	for high-volume users to operate their accounts; synchronised with our real-time process
	Service specific options	FundSettle browser for access to FundSettle services
	Triweb	for information on triparty activity
Computer-to-computer	EUCLID Server	gives high-volume users a continuous exchange of information synched with Euroclear Bank's real-time process
	EUCLID file transfer	batch-oriented file exchange over a secure IP network
	SWIFT messaging	real-time message based solution using ISO 15022 or ISO 20022 compliant formats
	Service specific option	FundSettle file transfer batch-oriented file exchange over a secure IP network

Source: <https://www.euroclear.com/dam/PDFs/Corporate/MA3023-Becoming-a-client-Euroclear-Bank.pdf>



## General approach



- The Eurosystem maintains the view that:
  - Competition is the preferred way to ensure low connectivity costs for Directly Connected T2S Actors (DiCoAs);
  - Choice is the preferred way to ensure that DiCoAs can connect to T2S in a way that supports their individual business case.
- The number of connectivity solutions has to be limited in order to allow a sound technical and operational management of the solutions, in particular from a business continuity perspective.
- The Eurosystem will offer two connectivity options to Directly Connected T2S Actors (DiCoAs):
  - Via a Value-Added Network (VAN)
  - Via a Dedicated Link (DL)

2

# SWIFT HOW EFFECTIVELY TO USE SWIFT CHANNEL

1. To use SWIFT with the participants as much as possible (reduction of costs for own channels maintenance)
2. To rate SWIFT channel correctly (reverse billing or re-invoicing to clients)
3. To create SWIFT service bureau (assessment of the market and expenses for business case is required)



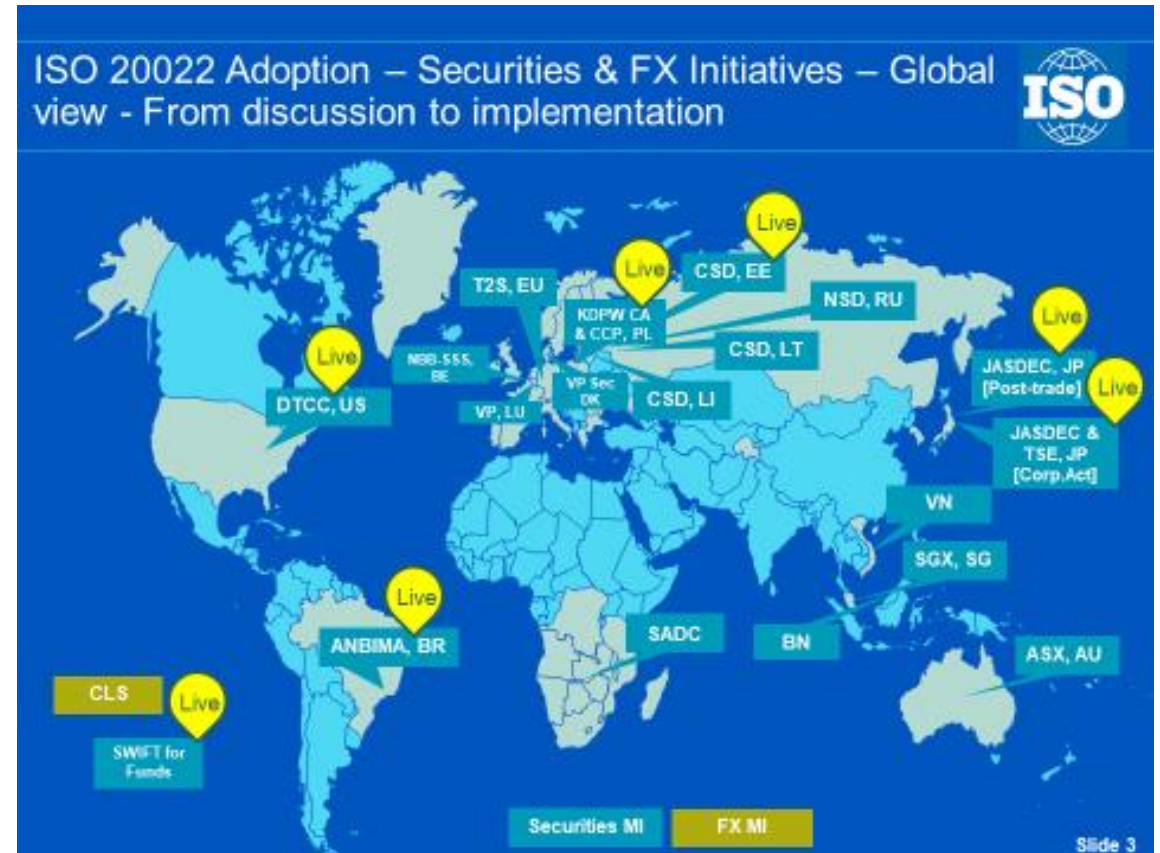
# ISO 2022 IS THE PERSPECTIVE STANDARD IN THE MARKET OF THE CENTRAL BANK

## Benefits

- Unified international standard
- Scalable
- Not tied to network

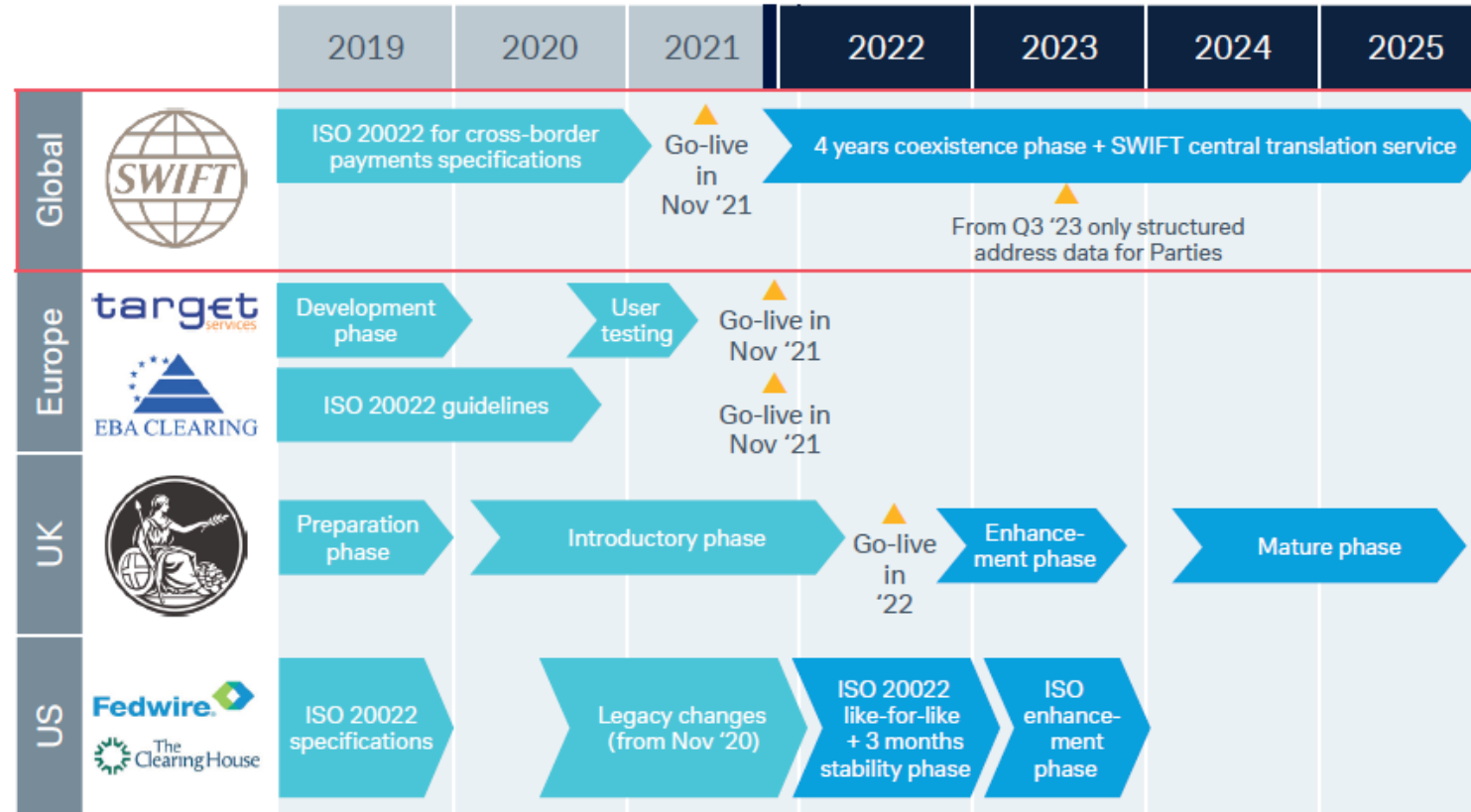
## Limitations

- Implementation costs
- Market participants training
- Maintenance (version control)



Source: <https://www.iso2022.org/adoption.page>

# ISO 2022 IS THE PERSPECTIVE STANDARD IN THE MARKET OF THE CENTRAL BANK



Source: Deutsche Bank

# CRYPTOGRAPHY ISSUES

## National standards:

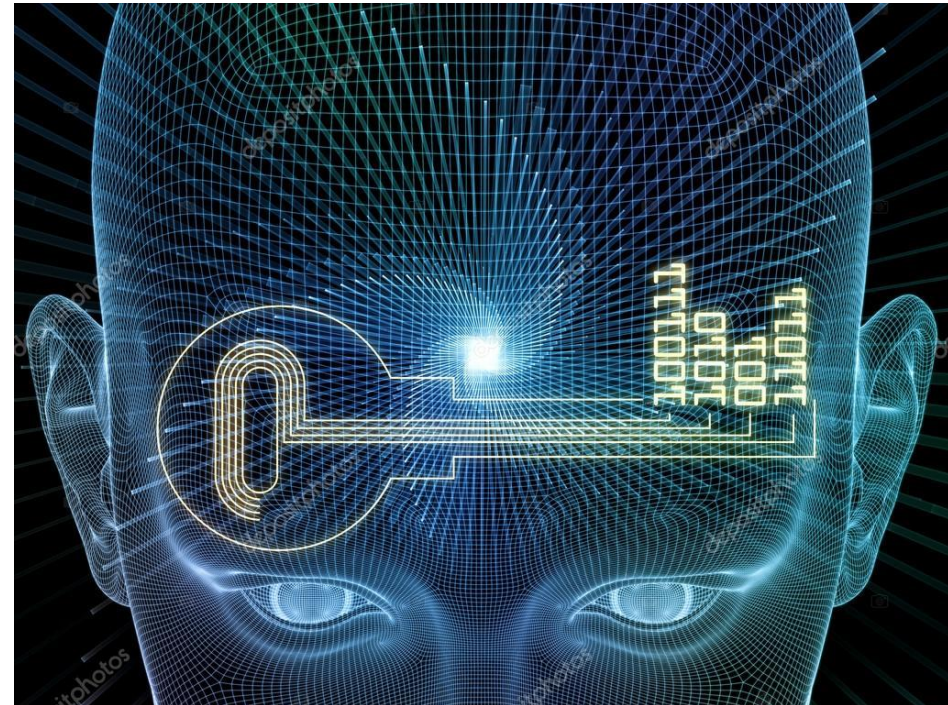
- State standard 34.10-2012

## International standards:

- DSS – the federal standard of the USA digital signature
- RSA, ECDSA – international standard

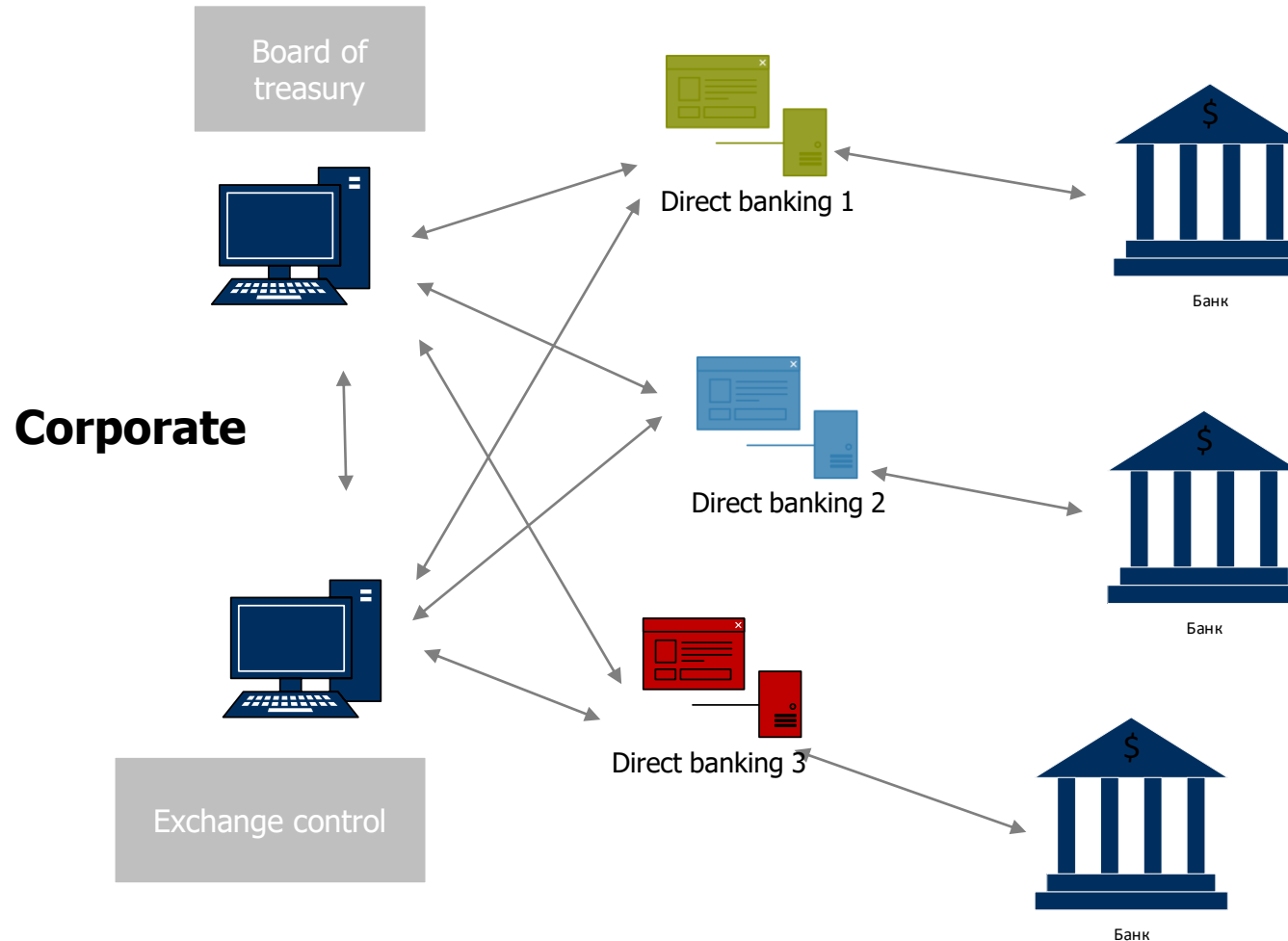
## Main problems:

- Import permit
- Permission to use
- Export permit



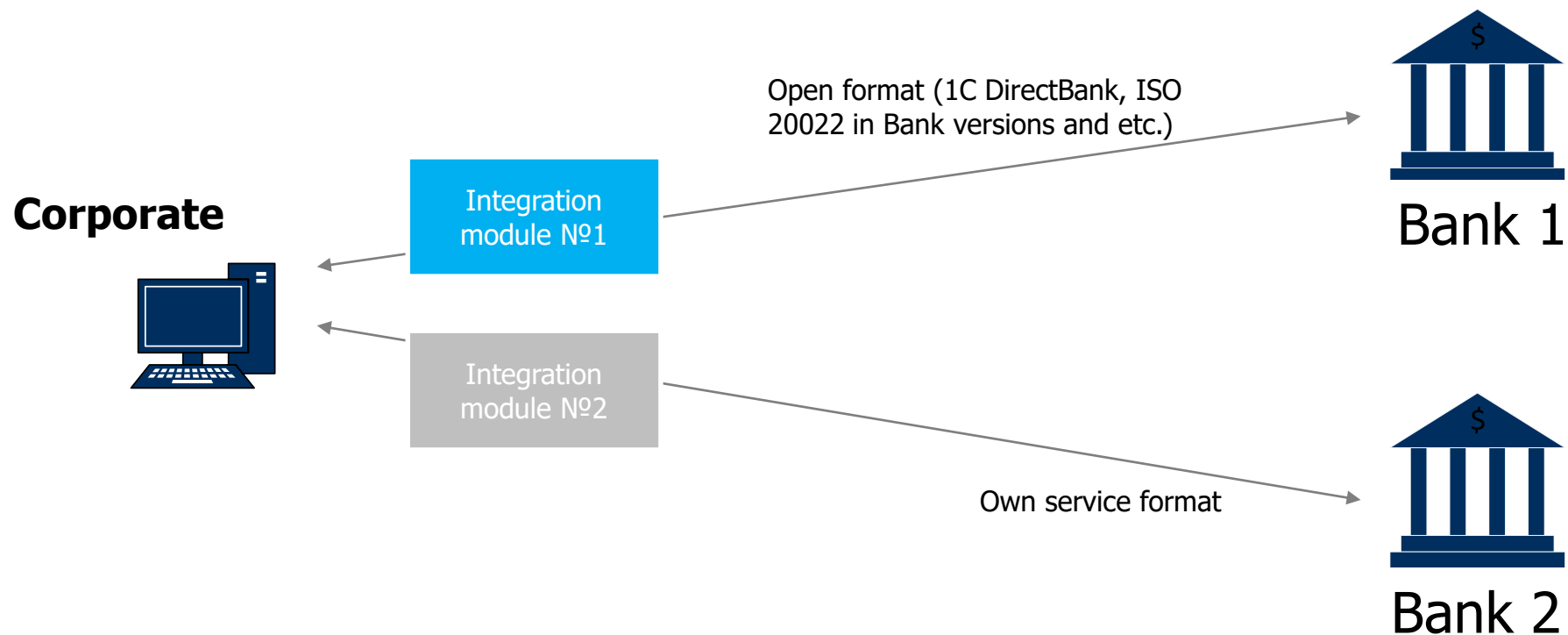
# CASE 1: TRANSIT 2.0

# CORPORATE-BANK INTERACTION «AS IS» FINANCIAL MESSAGING



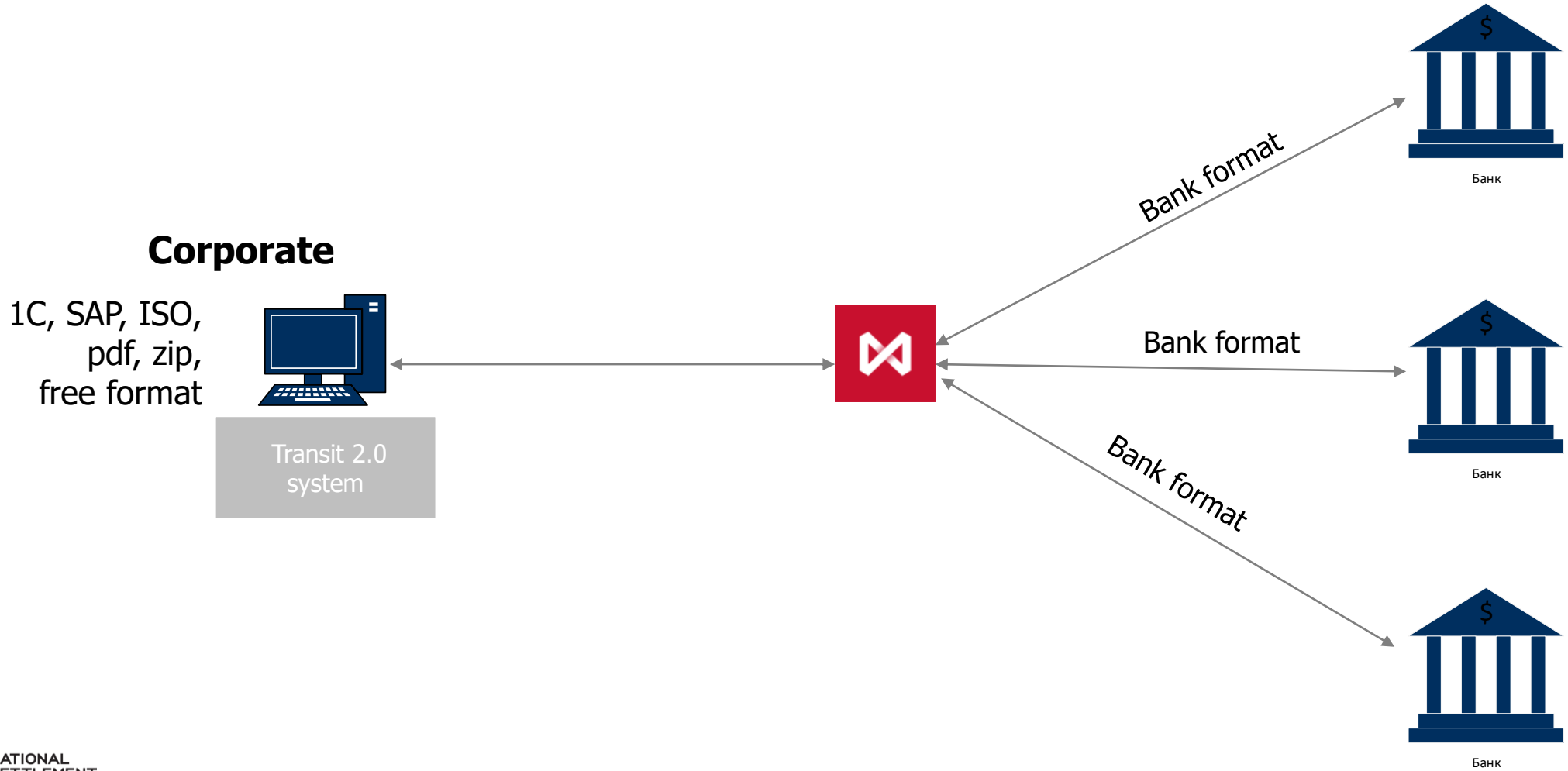
# SOLUTION OPTION: DIRECT INTEGRATION OF THE CORPORATE ACCOUNTING SYSTEM AND BANK SYSTEM

## USE OF HOST-TO-HOST SOLUTION



- ! Significant investments on implementation and support
- ! Lack of the single control interface
- ! Differences in the exchange formats

# CORPORATE-BANK INTERACTION «TO BE» USE OF THE CENTRALIZED PROVIDER



# **CASE 2: SWIFT SERVICE BUREAU**

# INFORMATION ABOUT SWIFT

## CONNECTION TYPES



SWIFT provides a **safe** and **reliable** transmission of financial messages all over the world and forms unified standards since **1973**

**6+**  
**mln**

Messages  
per day

**200+**

Countries

**11+**  
**thousand**

Institutions

**400+**

Banks in Russia

### Advantages of using SWIFT:

- SWIFT is financially responsible for an accurate, complete and timely delivery of messages.
- No one except the Sender and the Receiver has the opportunity to read or modify the message during its transfer between the Parties.
- SWIFT international formats and standards allow to automate the message exchange between participants.

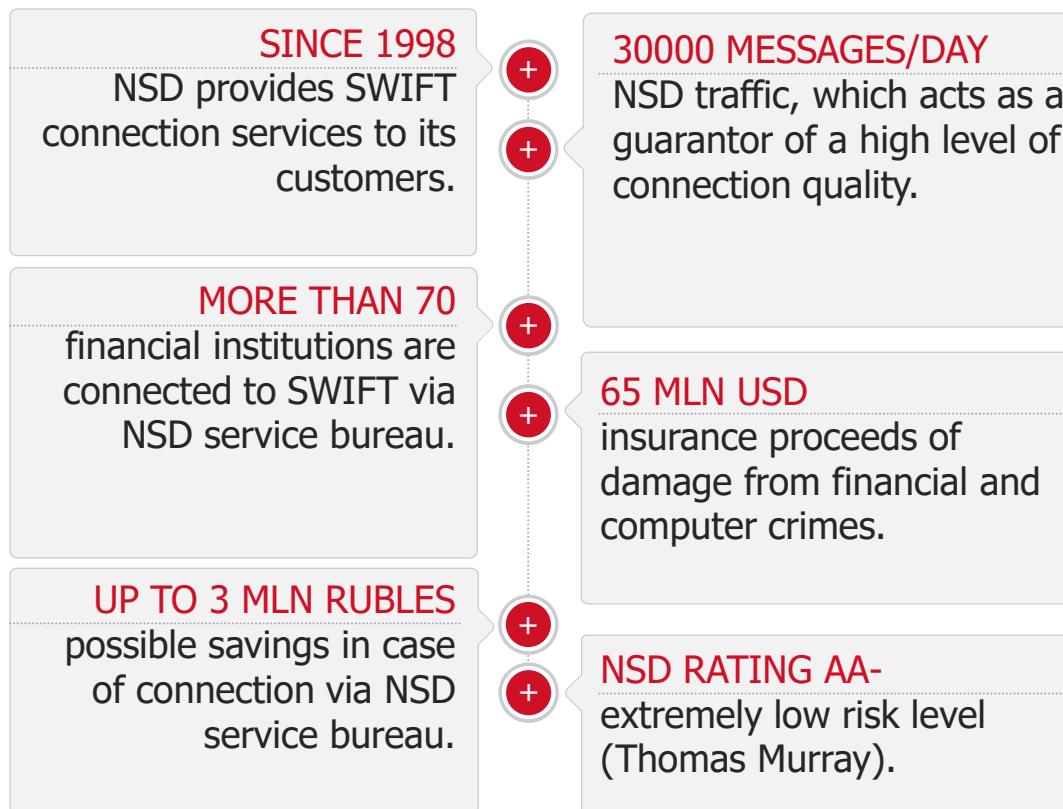
### Connection types:

- **30%** are connected directly – independently solve technical issues, acquire licenses, equipment and software.
- **70%** are connected via service bureaux - there is an opportunity to reduce operating costs and risks, and:
  - there is no need to organize and pay for the specialized SWIFT communication channels.
  - there is an opportunity to migrate for the private infrastructure without loss of investments.

# NSD – MORE THAN SERVICE BUREAU

## BENEFITS OF CONNECTION VIA NSD

### NSD — AN INFRASTRUCTURE INSTITUTION FOR FINANCIAL MARKET OF THE RUSSIAN FEDERATION



### SERVICE BUREAU PREMIER



NSD is the only holder of the highest status of service bureau's certification – **Premier** – in Russia and Eastern Europe.

**Premier** compliance allows to guarantee the highest level of security and reliability as at the private infrastructure level.

# MAINTAINANCE OF THE CONTINUOUS OPERATION



The complex is deployed on 3 territorially remote places for main and back-up data centers with a full set of equipment for access to SWIFT, communication channels and customer service offices.

## **CONSTANT AVAILABILITY**

of independent gateways  
SWIFT Alliance Gateway,  
on different sites  
for customer access  
with its own interface.

3 SWIFT Alliance Access  
servers locate on different  
sites.

Using the solution of IBM  
Tivoli for comprehensive  
on-line monitoring  
of the complex.

## **SECURED SYNCHRONIZATION**

Synchronization of data  
between two sites in real-  
time mode.

Synchronization of data  
with the third site  
with a delay of not more than  
40 seconds.

Using clusters of VPN-boxes  
channel encoders and  
clusters of HSM-boxes.

## **DUPLICATION OF COMMUNICATION CHANNELS**

**Gold Connectivity** –  
on two sites:  
with 2 independent SWIFT  
leased line channels of  
different providers.

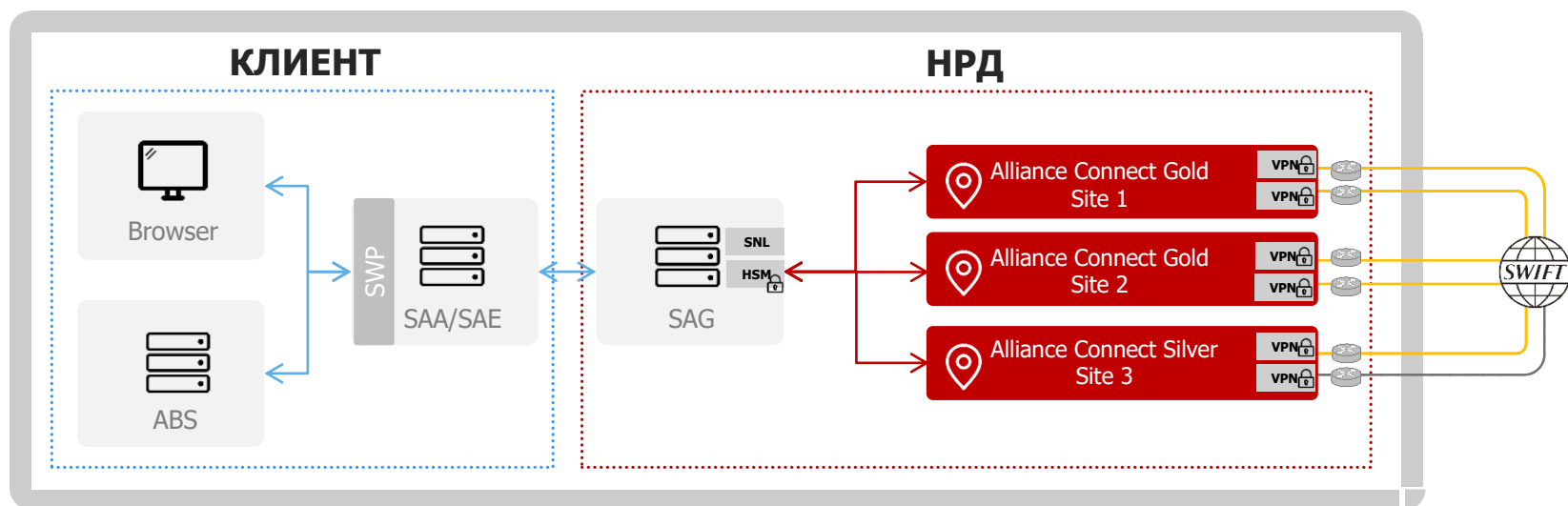
**Silver Connectivity** –  
at the third site: a SWIFT  
leased line channel and the  
Internet channel.



# CONNECTION TYPES

## SHARED CONNECTIVITY

The partial outsourcing of SWIFT infrastructure, the server with SAA/SAE is located on the customer's premises. Reduction of expenses is reached due to outsourcing of SAG, SNL, HSM and VPN.



**SAA** – SWIFT Alliance Access  
**SAE** – SWIFT Alliance Entry  
**SWP** – SWIFT Web Platform  
**SAG** – SWIFT Alliance Gateway

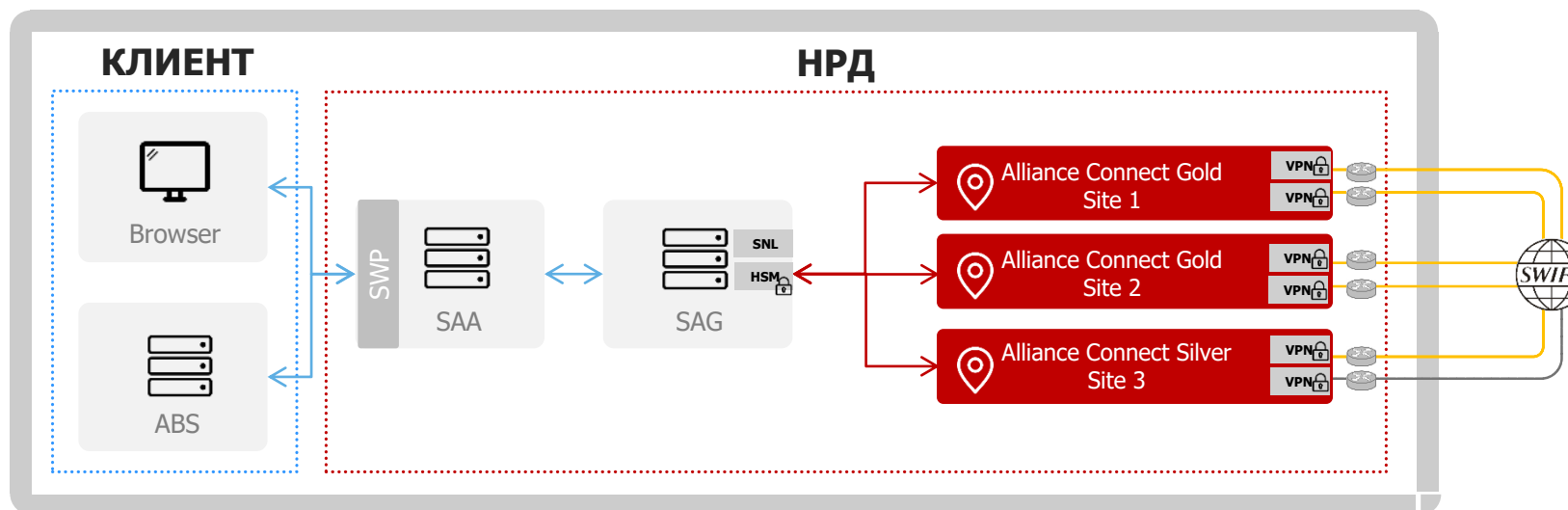
**ABS** – Automated banking system  
**SNL** – SWIFTNet Link  
**VPN** – Virtual Private Network  
**HSM** – Hardware Security Module

— SWIFT Leased Line  
 - - - Internet channel

# CONNECTION TYPES

## SHARED CONNECTION

The full outsourcing of SWIFT infrastructure, maximum savings, a high reliability and safety.



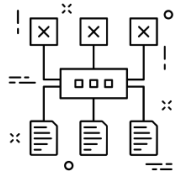
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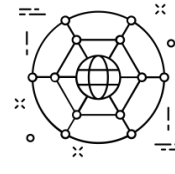
# ADDITIONAL CLIENT SERVICES

**WORKING WITH NSD, THE CLIENT GETS THE RELIABLE BUSINESS PARTNER:**



## BACK-UP CONNECTION

The guarantee of uninterrupted and continuous operation in case the main connection becomes unavailable.



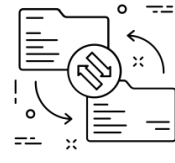
## ISO 20022

Consultation on migration to the new financial standards, development and localization of electronic messages.



## INTEGRATION SOLUTIONS

File exchange and printing (FEP) –  
The automatic file transmission and messages printing.



## CONVERSION

Development of message converters of different financial standards (ISO 15022 <> ISO 20022).



## FILTERING PAYMENTS

The centralized solution for verification of financial transactions on sanctions lists.



## SUPPORT

Services to support and maintain the SWIFT complex by qualified specialists.

**THANK YOU!**



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