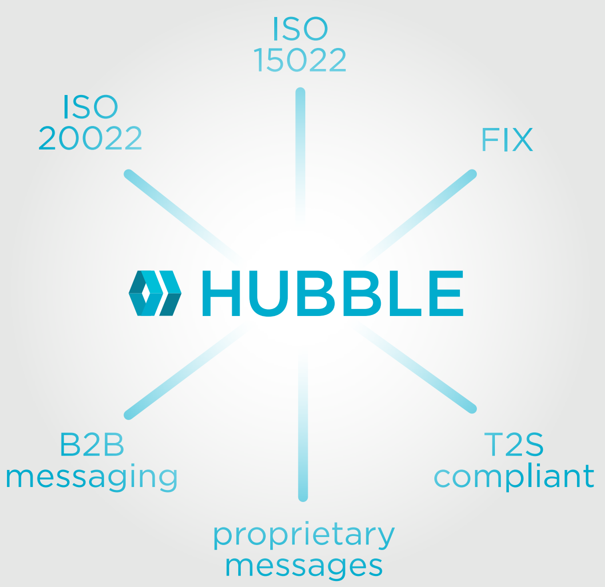
HUBBLE

PERCIVAL

HUBBLE – Enterprise Service Bus



ISO 15022

ISO 20022

FIX

HUBBLE

B2B messaging

T2S compliant

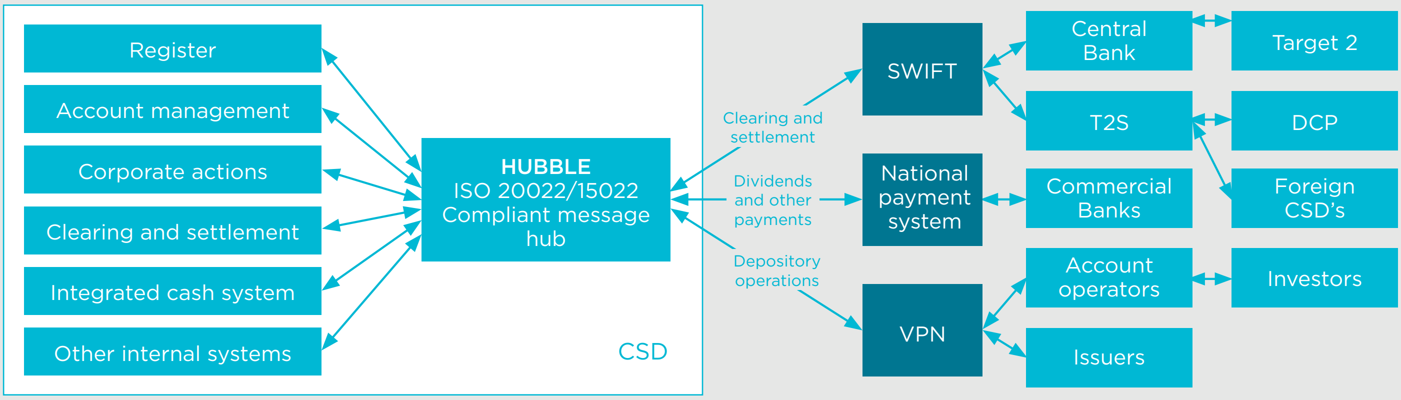
proprietary messages

HUBBLE is Percival’s integration tool that connects business solutions using a range of connectivity options.

Connections can be chosen from a wide range of standard methods including message exchange, direct API connections, web services, SQL and more.

HUBBLE is Percival’s preferred integration tool as there are ready-made configuration packages for our own products (DEPEND, REVENUE).

Sample **HUBBLE** based integration for T2S enabled markets



Register

Account management

Corporate actions

Clearing and settlement

Integrated cash system

Other internal systems

HUBBLE
ISO 20022/15022
Compliant message hub

CSD

Clearing and settlement

Dividends and other payments

Depository operations

SWIFT

National payment system

VPN

Central Bank

T2S

Commercial Banks

Account operators

Issuers

Target 2

DCP

Foreign CSD’s

Investors

HUBBLE is based on an ESB (Enterprise Service Bus) solution for routing and transforming messages between different information systems. **HUBBLE** is specifically designed to handle financial market messages defined by ISO standards **20022** and **15022**.

Our current configuration packages are based on **RabbitMQ** and **Java Spring** Integration components using SQL database for configuration.

IBM MQ and **REST** adapter components are available. Additionally, there is a file loader facility enabling file-based integrations, ie. with Swift Autoclient.

HUBBLE is highly configurable for business needs inside and outside depository business area.

HUBBLE

PERCIVAL

Main concepts and components are:

Queue – start and endpoint for messages exchanged between systems.

Channel – internal logical application communication link. There are several sub-applications inside HUBBLE that all have their own incoming channel to get tasks. Between each task there is an application called Message Flow Controller which decides, to whom pass on the results from previous step inside flow.

Flow Step – defines a channel (e.g. Message Transformer) where the current form of message should be sent.

Error Handler – uses configuration inside database to create error e-mails and insert both business and technical errors into database with help of **Error Logger**.

Incoming Message Validator – uses definition per each message queue, which incoming messages are accepted by **HUBBLE**.

Message Transformer – most commonly used sub-application inside HUBBLE. It can:

- Convert one XML message type into another using X-path
- Convert data format inside elements (date, integer, decimal)
- Convert data dynamically into another value, using values in other elements inside message
- Pick elements to put into XML according to values in message
- Create complex nested XML-files that contain several message types, like file header, business application header and business messages, according to defined templates
- Create more than one outgoing message from single incoming message
- Use XSD to apply correct sequence for elements inside outgoing message

Outgoing Message Validator – uses XSD to validate message before sending it to counterparty.

Flow Controller – uses (JMS) header elements like Correlation ID to continue business flow according to message received back from counterparty.

Message Router – there are several Routing Scenarios what to do with an incoming message. Correct scenario is picked out by Routing Criteria which base on content of the message.

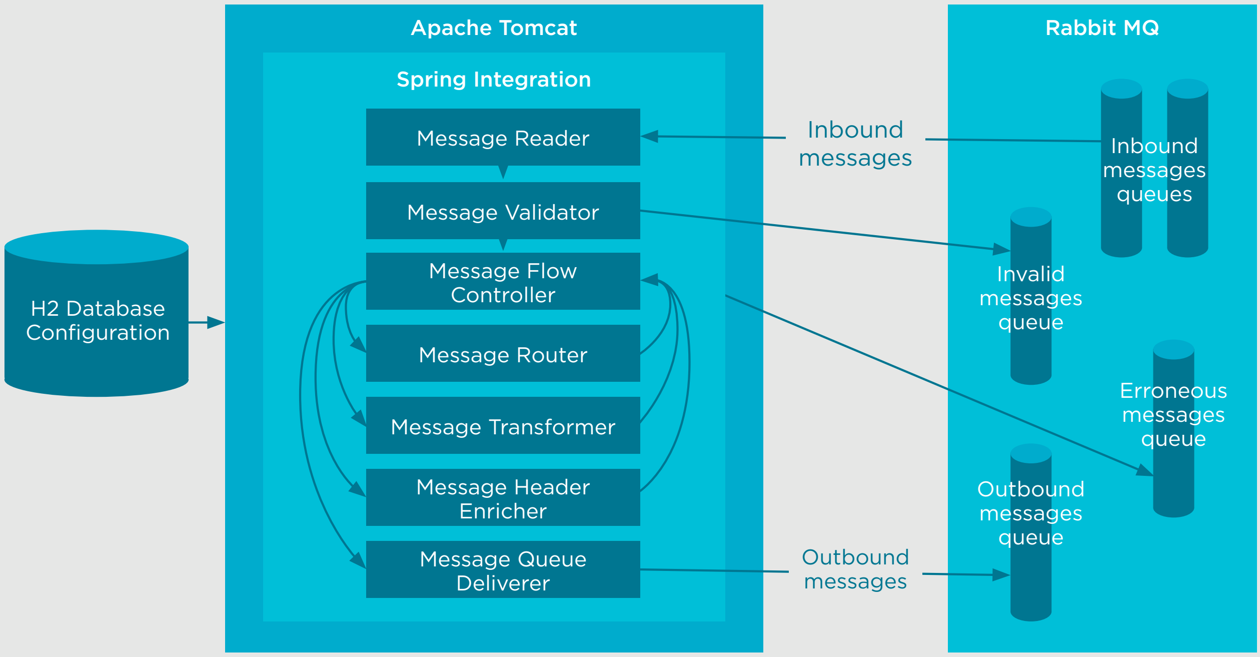
Message Logger – stores full information about a message before and after each step.

User Interface

Business Flow Definition – this interface enables user to click through entire flow definition, seeing decision points, route according to made decision and rules applicable for each step.

Message Flow – enables user to filter out specific (incoming) message and click through entire flow that has been used for this message.

Overview of **HUBBLE** architecture



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