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# FIXEdge


## OVERVIEW

January 2025

# FIXEdge Description

FIXEdge Overview

January 2025

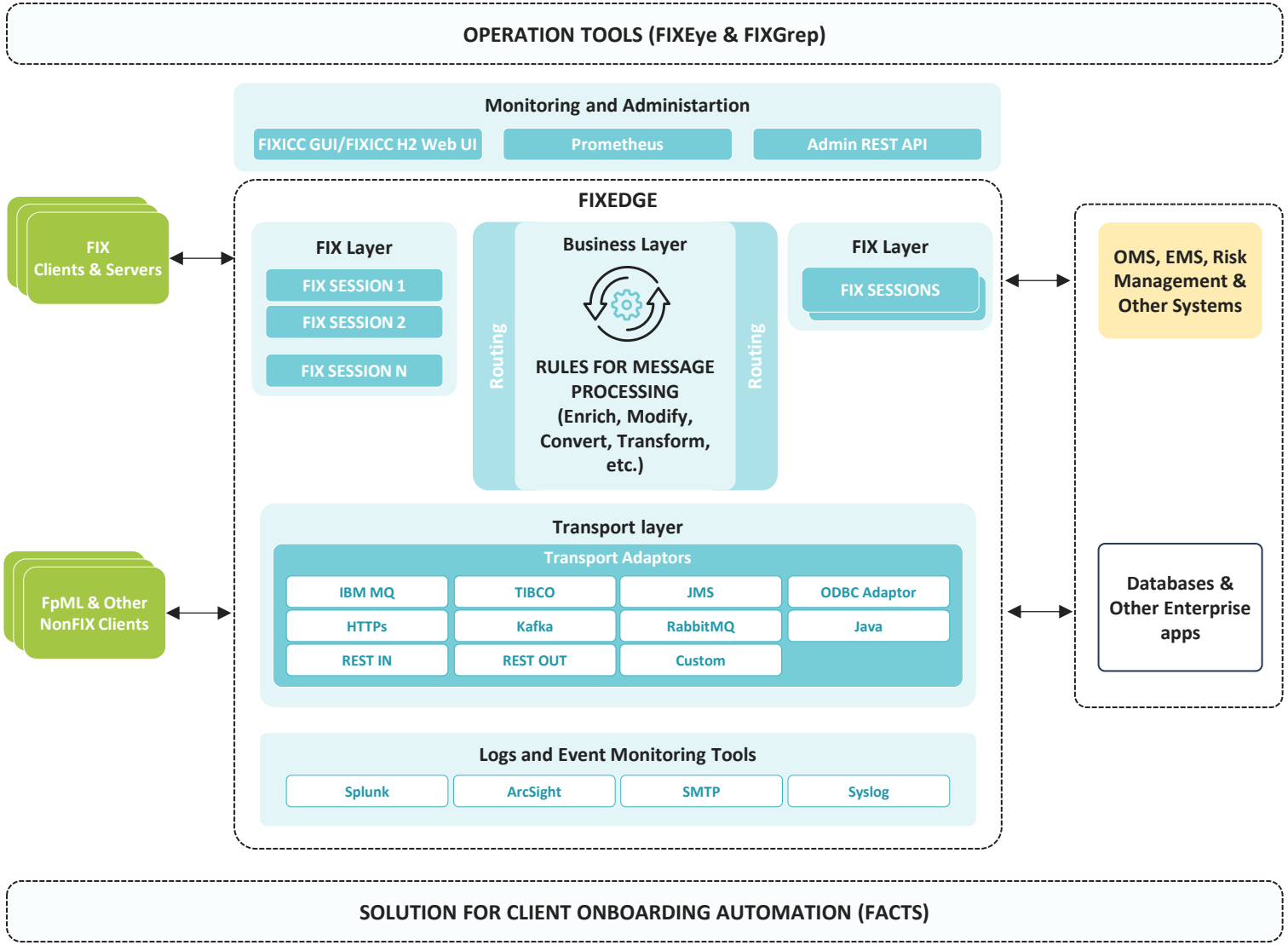
# FIXEdge Description

- FIXEdge® is an application server providing FIX connectivity to buy- and sell-side institutions, exchanges and clearing houses.
- It supports all workflows for all asset classes defined in the FIX protocol, including typical use cases such as:
- Capturing messages from clients. Serves as an Order Entry Gateway/router.
- Entering orders/quotes to markets. Can be combined with a check for pre-trade risk.
- Capturing messages from a venue and saving them to a DB/message queue/plain text file. Serves as a FIX aggregator.
- Fanning-out quotes/market data publishing. One FIX message can be distributed to many sessions (1-to-Many).
- Generic FIX message routing. Smart message router with configurable rules and message normalization/enrichment.

# FIXEdge Features

- 100% FIX standard compliance:
  - → FIX 4.0 - 5.0SP2 and FIXT 1.1 including Extension Packs
  - → FAST 1.1
- Guaranteed message delivery based on the store and forward routing pattern
- Capturing messages from a venue and saving them to a DB/message queue/plain text file
- Storing outgoing messages in a queue and releasing them at a specific time, according to an exchange schedule
- Integration with non-FIX transports: IBM MQ, RabbitMQ, HTTPs, Kafka, JMS, Rest IN, Rest OUT, Java, Custom
- CRON-like scheduler for major session events (start, connect, disconnect, terminate, days off, time zone)
- Work in a High Availability cluster
- ODBC-based direct access to databases for data integrity, storage, and management
- Built-in powerful rule engine to store, modify and route FIX messages
- JavaScript and XSLT scripting to smart routing customization and messages enrichment
- An open interface for plug-ins on the transport and business levels (C++ or Java SDK)
- Secure authentication: SSL/TLS/LDAP
- Multi-platform: Windows, Linux, Docker

# FIXEdge Description



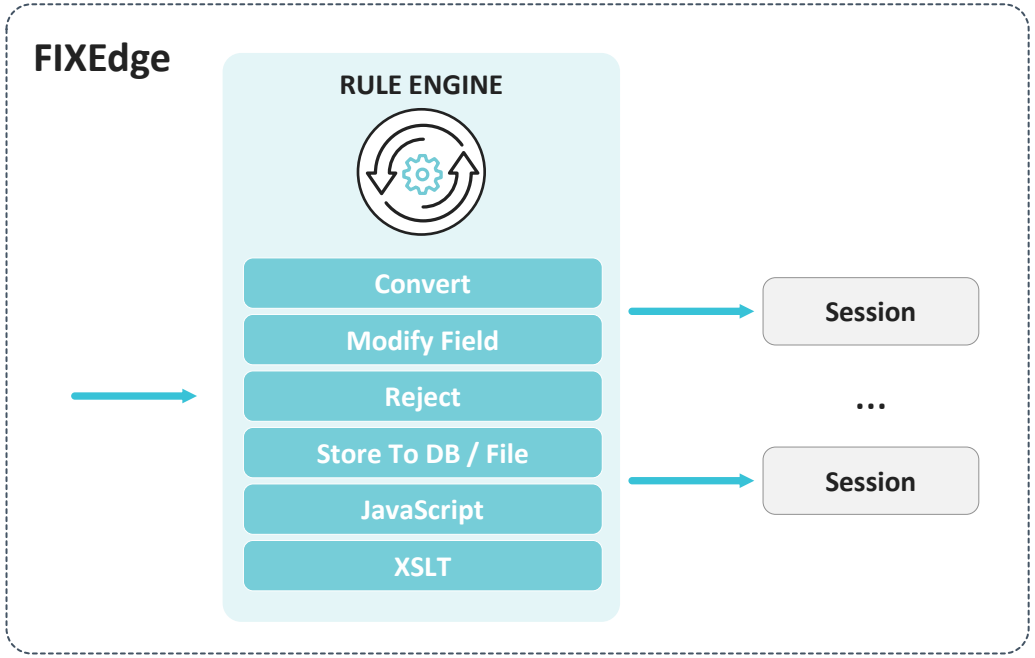

Client applications communicate with FIXEdge via one of multiple supported message protocols (e.g., JMS, IBM MQ,REST, Kafka) employing FIXEdge transport adaptors.

It is designed to be easy to install, configure, administer and monitor sessions and trading information flows.

FIXEdge adheres to the best information security practices defined in FIX security recommendations.

# FIXEdge Transformation and Routing

## FIXEdge rule engine



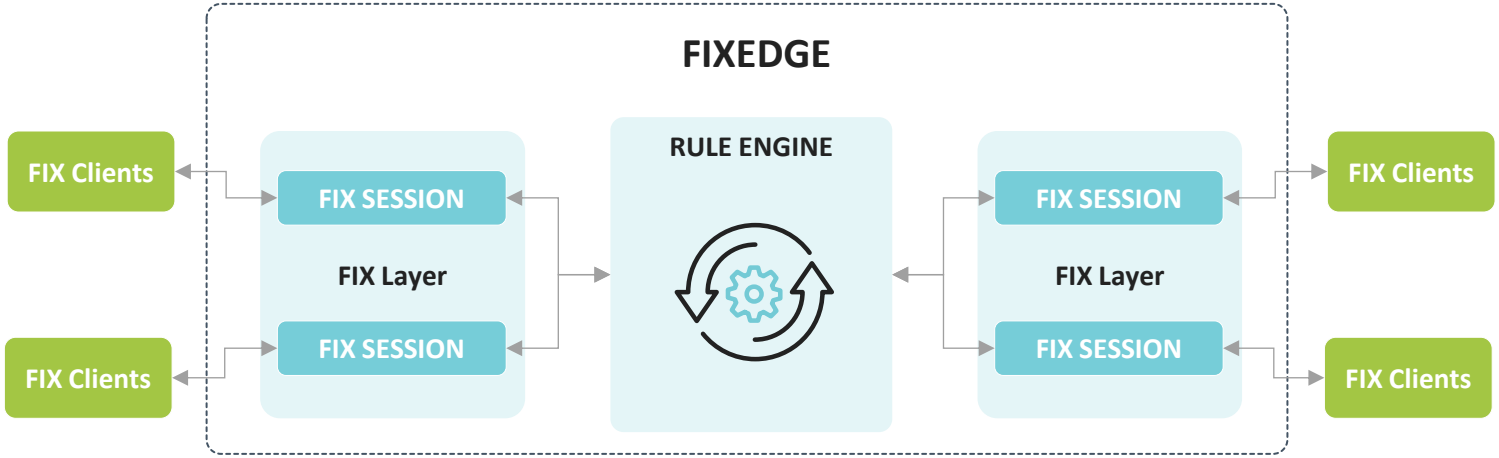

```
|-Rule
|       |-Source
|       |-Condition
|       |-Action
...
|-Rule
|       |-Source
|       |-Condition
|       |-Action
...
|-Default Rule
|
|-Events
```

For detailed information on the rules language, consult our FIXEdge Business Rules Guide.

- XML Rules
- Scripting languages
- Regular expressions
- Create custom rules for smart order routing
- Modify message (set/remove field)
- Convert message (FIX-to-FIX / FIX-to-FIX / FIX-to-JSON )
- Send to multiple sessions
- Change rules on the fly
- Split a message into several messages

# FIXEdge Transformation and Routing

## FIXEdge is a FIX router




FIXEdge is mostly used as a generic smart router and a common FIX connectivity service to delegate all FIX connectivity-related tasks in the enterprise architecture.

- One-to-one, many-to-many routing
- Context-based routing rules
- On the fly message conversion
- Multiple session management
- Conversion from/to FIX/FIXML
- FIX 4.0 - 5.0 SP2; FIXT1.1
- FIX Dialects
- FAST 1.1
- FIXML 4.0 - 5.0 SP2

See *kb.b2bits.com* for details

# FIXEdge Customization

## FIXEdge BL and TA customization

| Custom Business Layer Handler | Custom Transport Adaptor |
|---|---|
| • Write your library | • Write your library |
| • Implement the Handler interface | • Implement the TransportAdaptor interface |
| • Override: process method | • Override: sendToClient method |
| • Work with FIX messages using the B2BITS API | • Use an observer to upload incoming messages to FIXEdge |
| • Use MessageSender to queue a message for sending | • Implement Administrable and Monitorable to add the adaptor to the Control Center |
| • Describe your handler in the Rule Engine configuration | • Configure the Adaptor in FIXEdge.properties |
| • Call your handler from the Action section | |

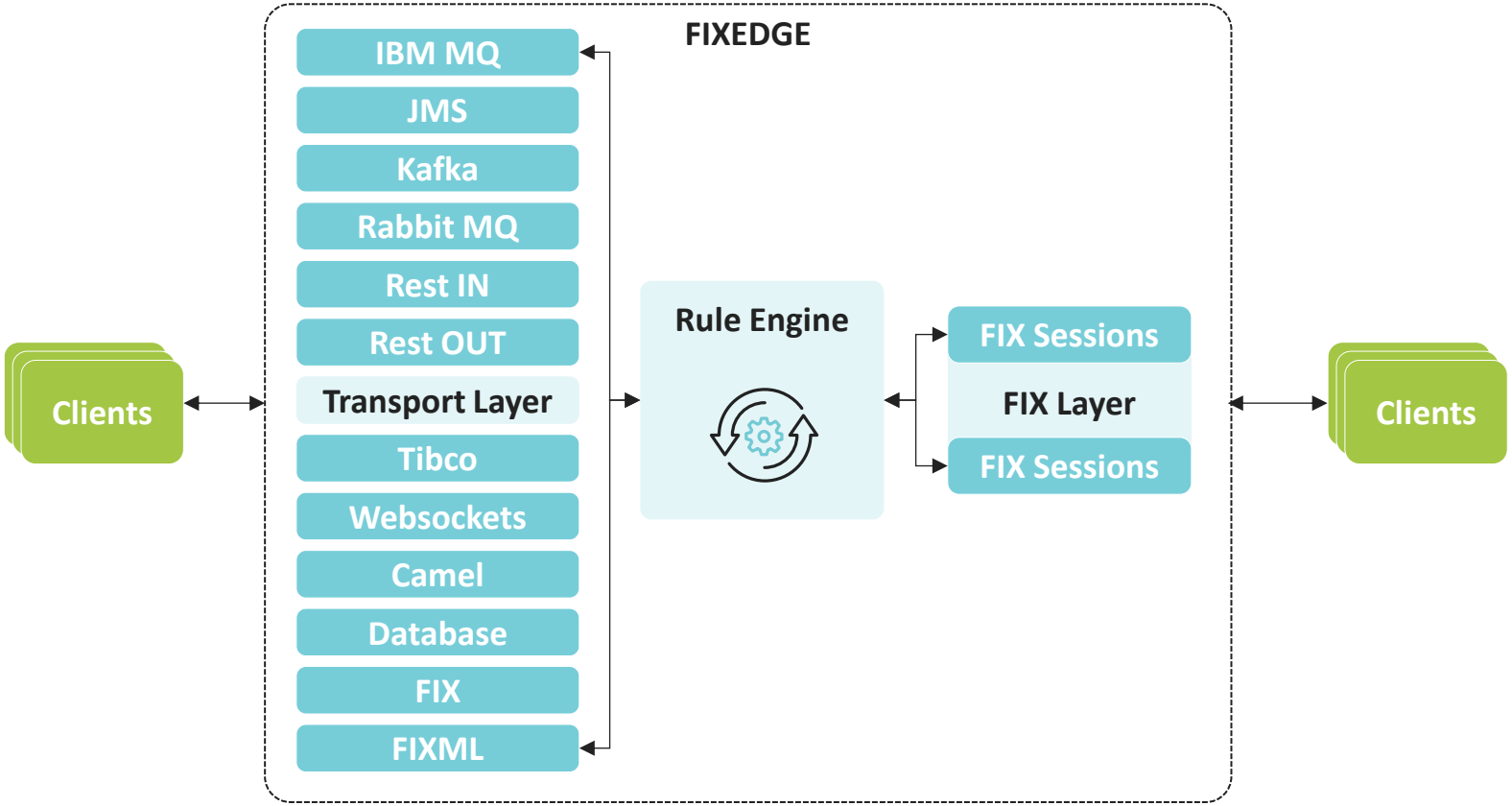
# FIXEdge Management

## MONITORING AND ADMINISTRATION

- Built-in remote monitoring and administrative interface for session monitoring and management
- Friendly, XML-based DSL for administrative instructions: easy to read, easy to extend
- Logging to plaintext files
- Logging with Log4cplus as system backend for writing logs to a log collector via TCP (See Log4Cplus Usage for details). e.g: option for logging to Splunk
- Ability to log important lifecycle events (i.e. application starting, application complete) in CEF format, e.g for ArcSight
- Admin REST API
- Email alerting and notifications on Business Layer
- Rich monitoring and administration GUI out of the box

# FIXEdge is a Connector

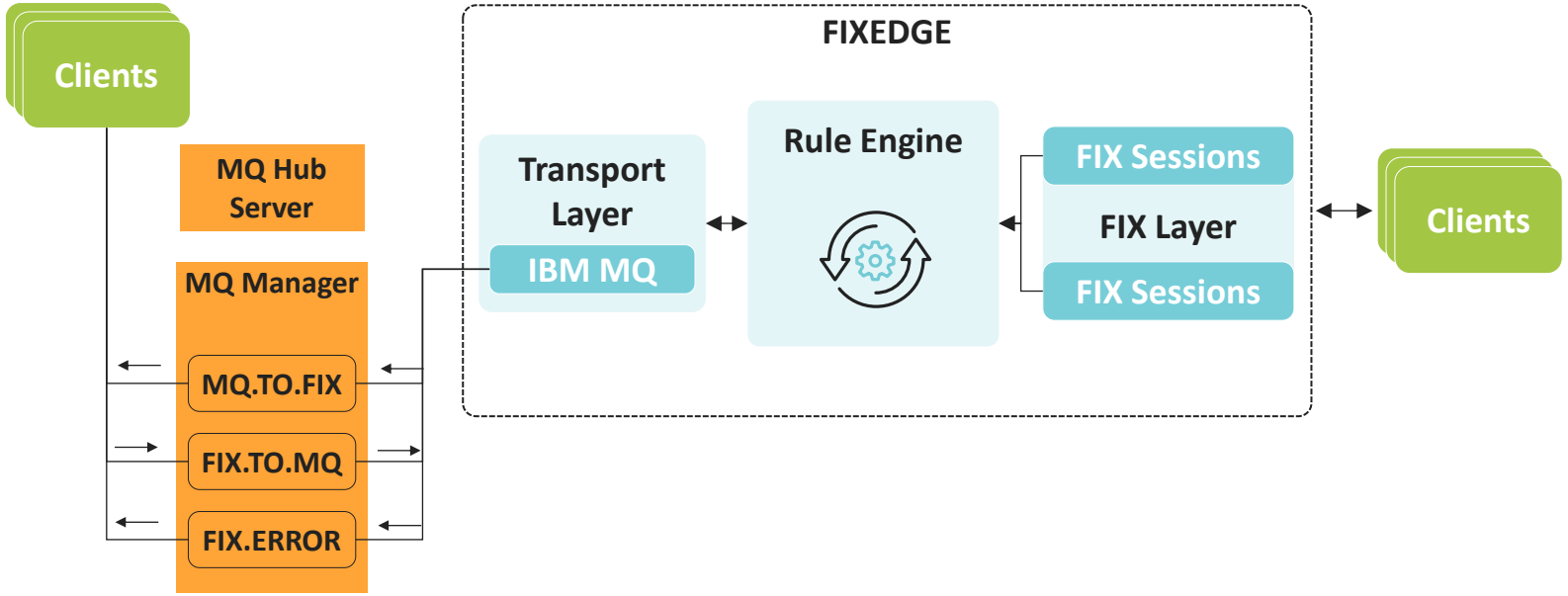
## FIXEdge Transports




- IBM MQ Series
- JMS
- Kafka
- RabbitMQ
- REST Initiator (REST IN)
- REST Acceptor (REST OUT)
- Tibco
- Websockets
- Camel
- Database (Oracle, MSSQL)
- FIX
- FIXML

# FIXEdge Transports

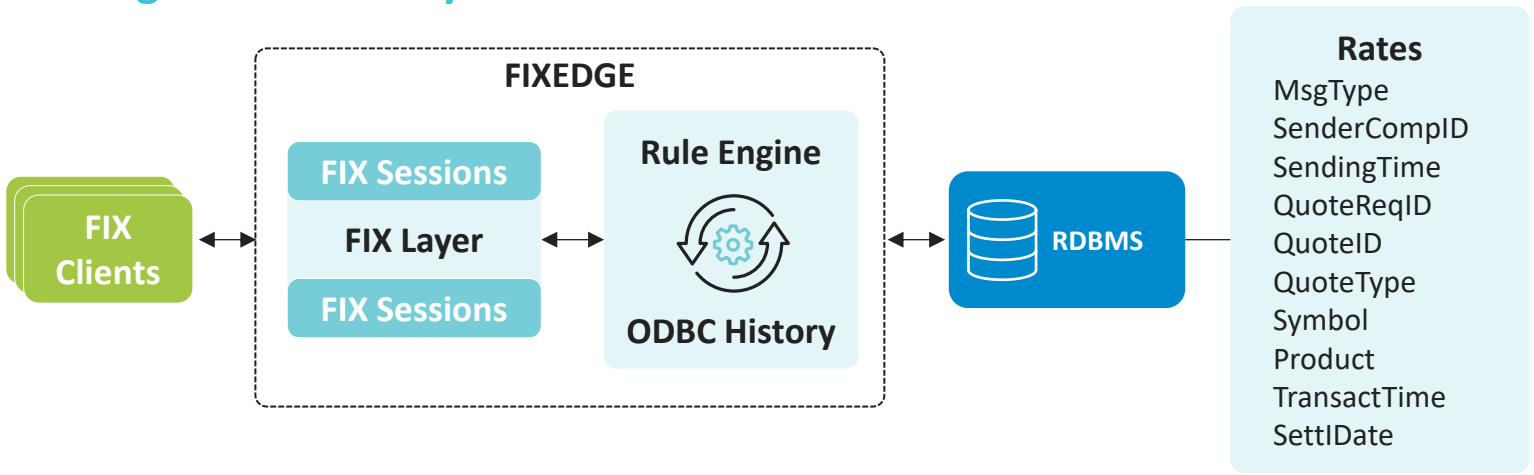
## FIXEdge And IBM MQ




IBM MQ Transport Adaptor is an add-in for FIXEdge that allows clients to communicate with FIXEdge over IBM MQSeries middleware.

# FIXEdge Features

## FIXEdge ODBC History




```
<History
                        Name="Quotes"
                        StorageType="ODBC"
                        ColumnSize="256"
                        TableName="Rates"
                        ConnectionString="DSN=Cmp;UID=cmp;PWD=cmp321;">
        <Field ColumnName="MsgType" ColumnSize="4">35</Field>
        <Field ColumnName="SenderCompID" ColumnSize="40">49</Field>
        <Field ColumnName="SendingTime" DataType="Datetime" ColumnSize="20">52</ Field>
        <Field ColumnName="QuoteReqID" ColumnSize="40">131</Field>
        <Field ColumnName="QuoteID" ColumnSize="64">117</Field>
        <Field ColumnName="QuoteType" DataType="Int" ColumnSize="10">537</Field>
        <Field ColumnName="Symbol" ColumnSize="12">55</Field>
        <Field ColumnName="Product" DataType="Int" ColumnSize="10">460</Field>
        <Field ColumnName="TransactTime" DataType="Datetime" ColumnSize="20">60</Field>
        <Field ColumnName="SettlDate" DataType="Date" ColumnSize="10">64</Field>
</History>
```

```
BL_Config.xml
<Rule Description="Save Quote to DB">
        <Source>
                <FixSession
SenderCompID="FIXEdge" TargetCompID="Client1"/>
        </Source>
        <Condition>
                <EqualField Field="35"
Value="S"/>
        </Condition>
        <Action>
                <SaveToHistory
Name="Quotes"/>
        </Action>
</Rule>
```

FIXEdge provides an option to store the row or enriched messages in database via ODBC.

# FIXEdge Platforms

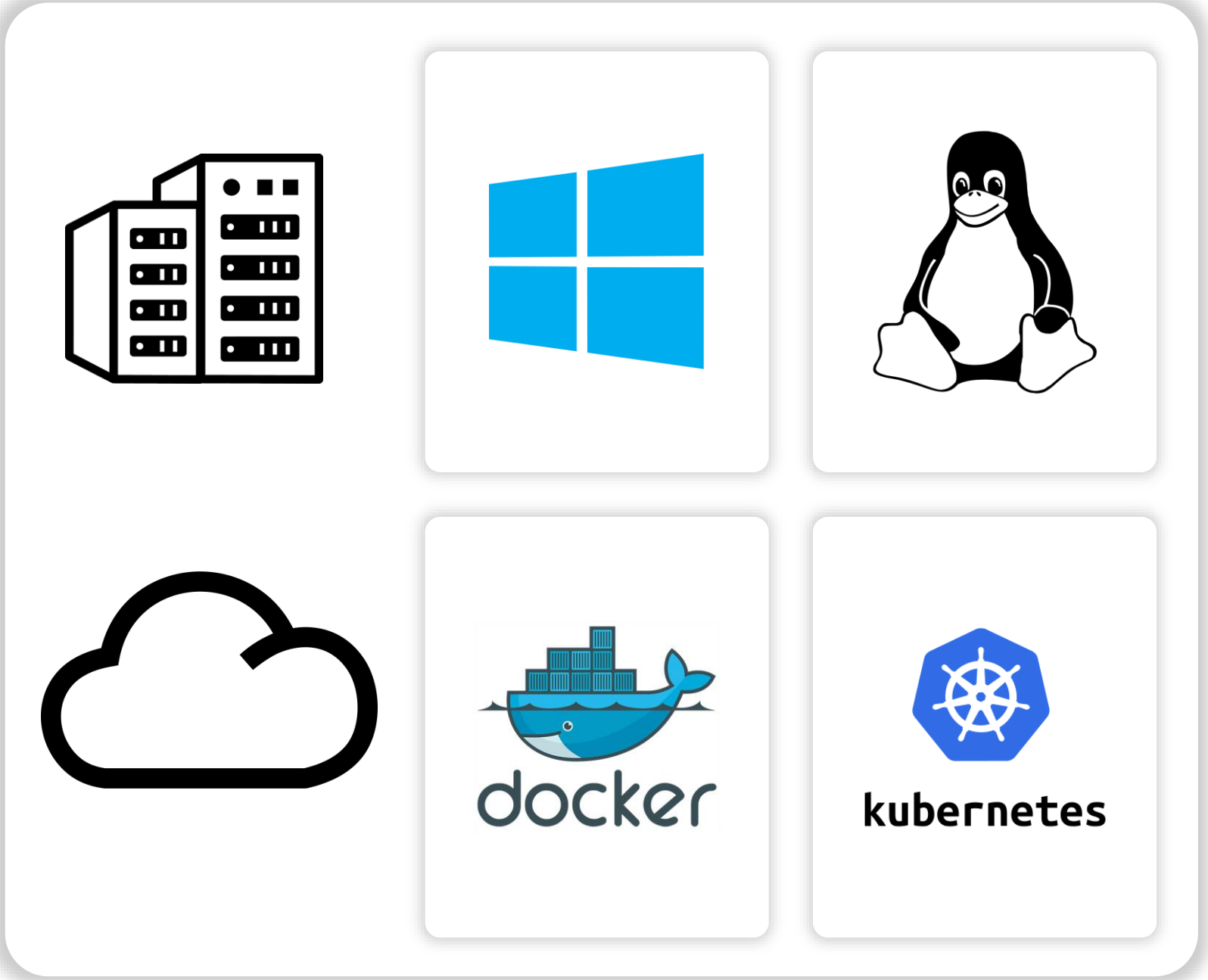
**CAN BE DEPLOYED ON:**

- On-premise datacenters
- Clouds (AWS, Azure, GCP)

**SUPPORTED PLATFORMS:**

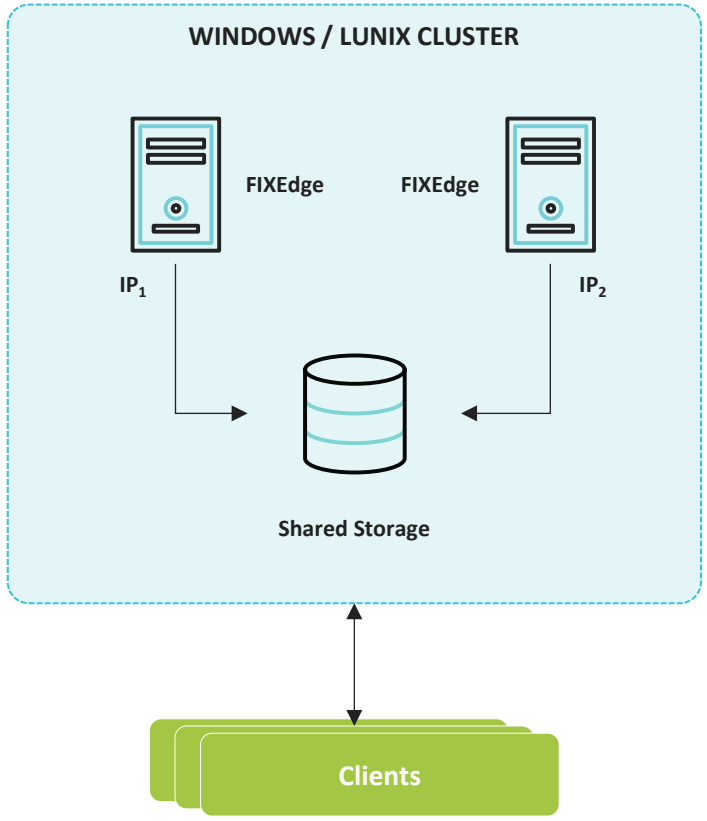
- Windows
- Linux RHEL/CentOS 7/8/9
- Docker
- K8s

*Support for other platforms is available on demand.*



# FIXEdge High Availability

## FIXEdge cluster




FIXEdge supports work in multiple node clusters with state replication, failover and recovery functionalities. FIXEdge clusters are based on the RedHat 7/8 pacemaker with corosync and are used in production in some of the most demanding environments in the world.

Major FIXEdge cluster features are:

File-based persistence

Automatic fast recovery state after failure

Leveraging OS clustering features such as: virtual IP, shared storage, cluster resource management

**Supports two storages scenarios:**

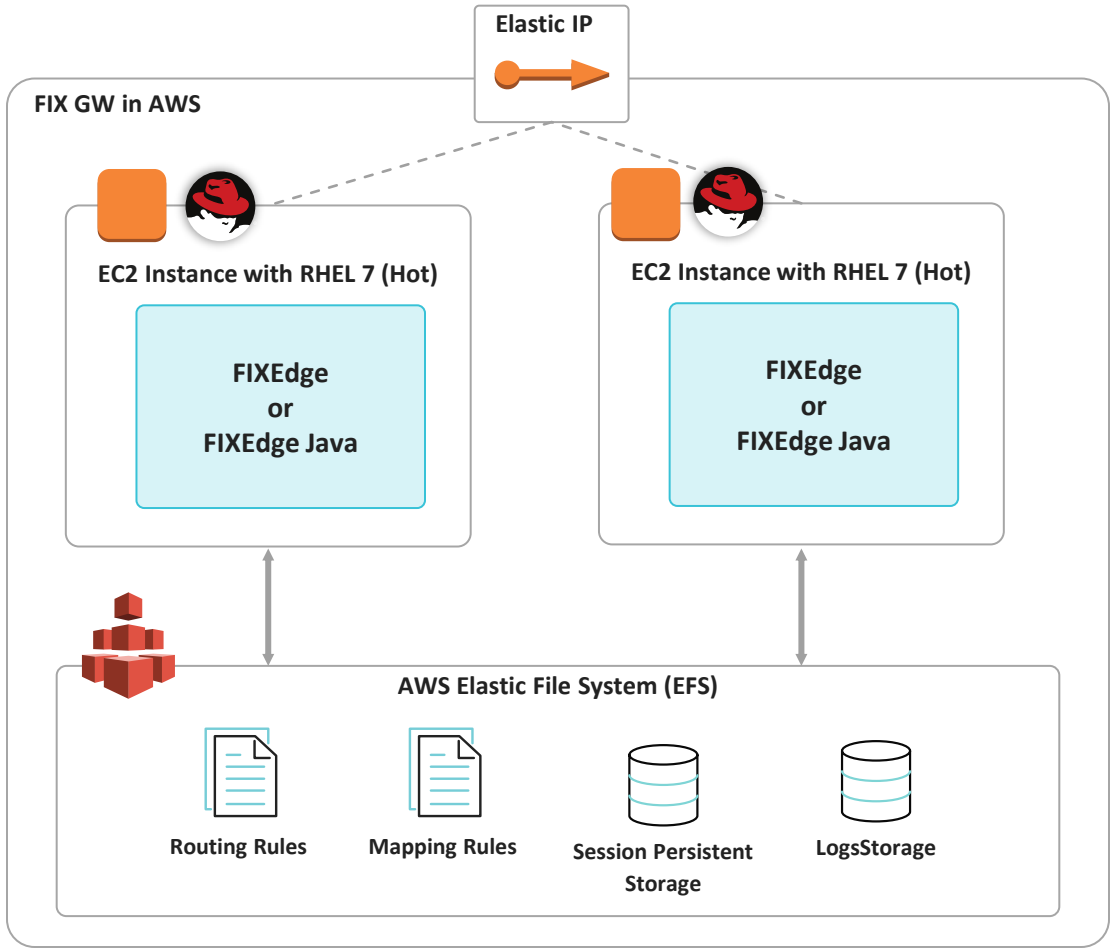
- Organizing shared storage utilizing third-party physical shared storage hardware or third-party shared storage software;
- Organizing persistence synchronization across nodes utilizing a Log Replicator, which provides continuous persistent storages synchronization across one master and one or more backup nodes;

A Logs Replication tool that can be used not only for persistence synchronization, but for organizing real-time backing as well

A comprehensive step-by-step installation guide describing the cluster setup

# FIXEdge Cloud Deployment

## FIXEdge cloud deployment options

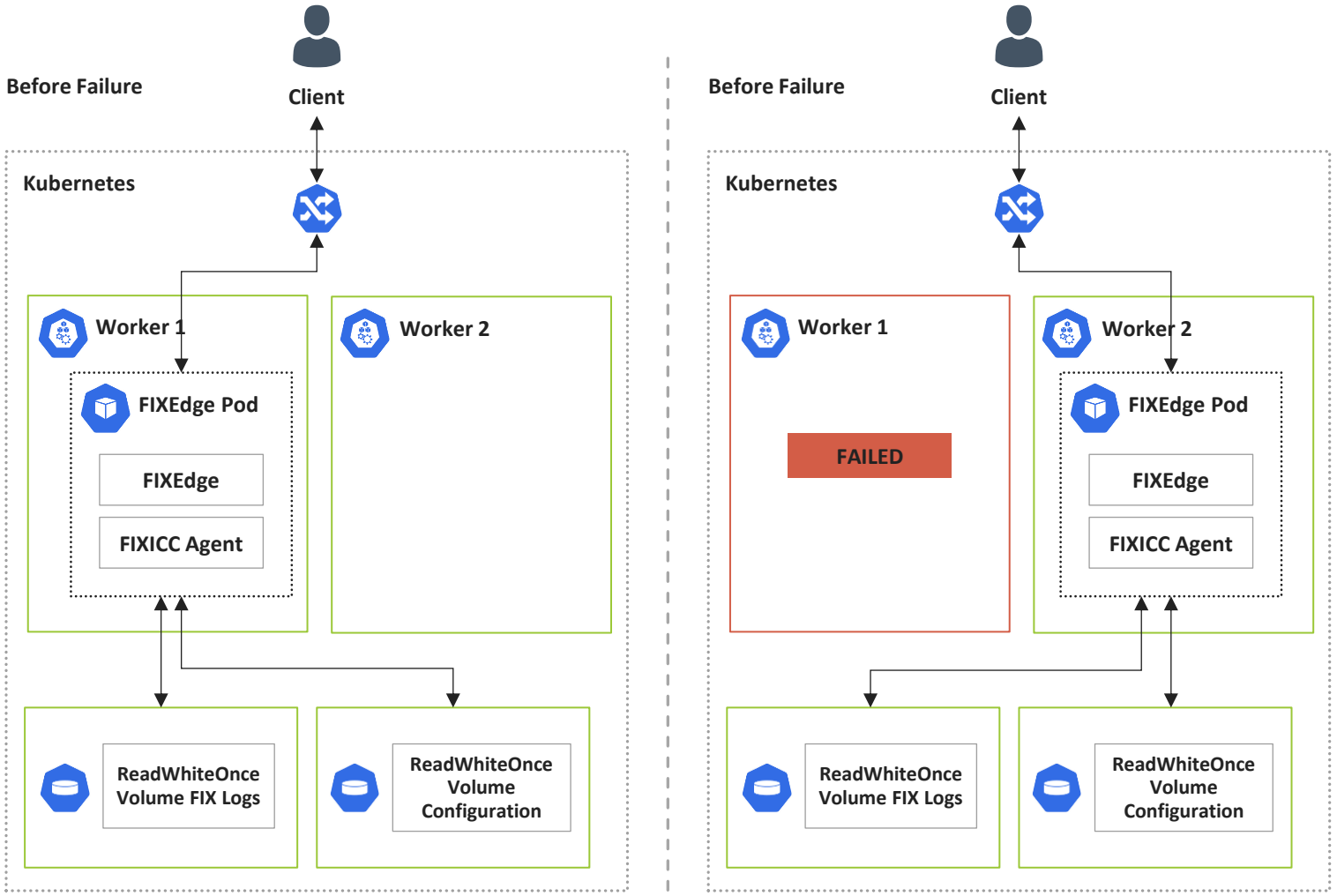



FIXEdge can be deployed on-premises as well as in the public cloud.

With the help of cloud infrastructure, you can setup a resilient FIX Gateway.

# FIXEdge Cloud Deployment

## FIXEdge Cloud Deployment Options



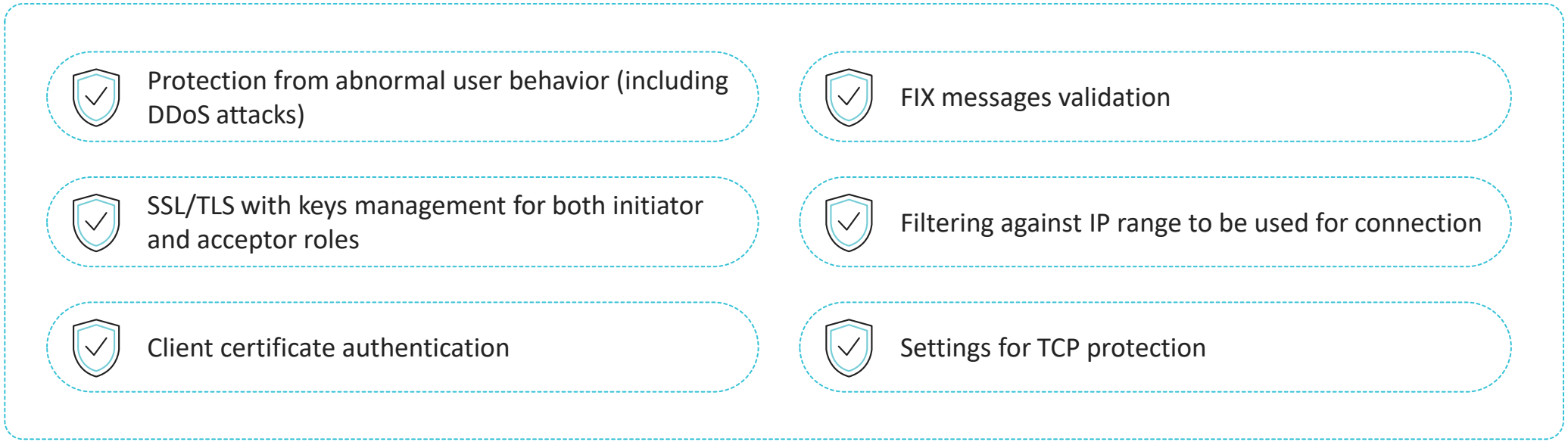

FIXEdge can be deployed in containerized environments like Kubernetes to leverage HA facilities and flexible workload distribution for multiple applications across servers.

# FIXEdge Security

## FIXEdge security compliance

FIXEdge follows the recommendations published by the FIX Trading Community to address all the current issues and challenges on the cybersecurity front, to satisfy best practices and all the crucial requirements of the industry.

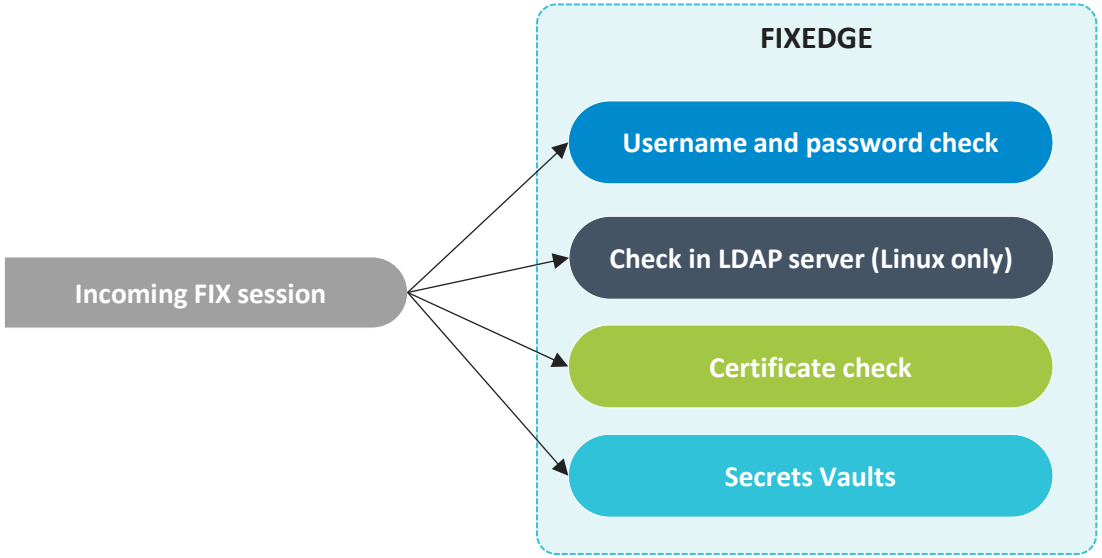
The following security features are supported in FIXEdge:



On page 18, maybe we should mention integration with Secrets Vaults?

# FIXEdge Security

## FIXEdge Authentication And Authorization

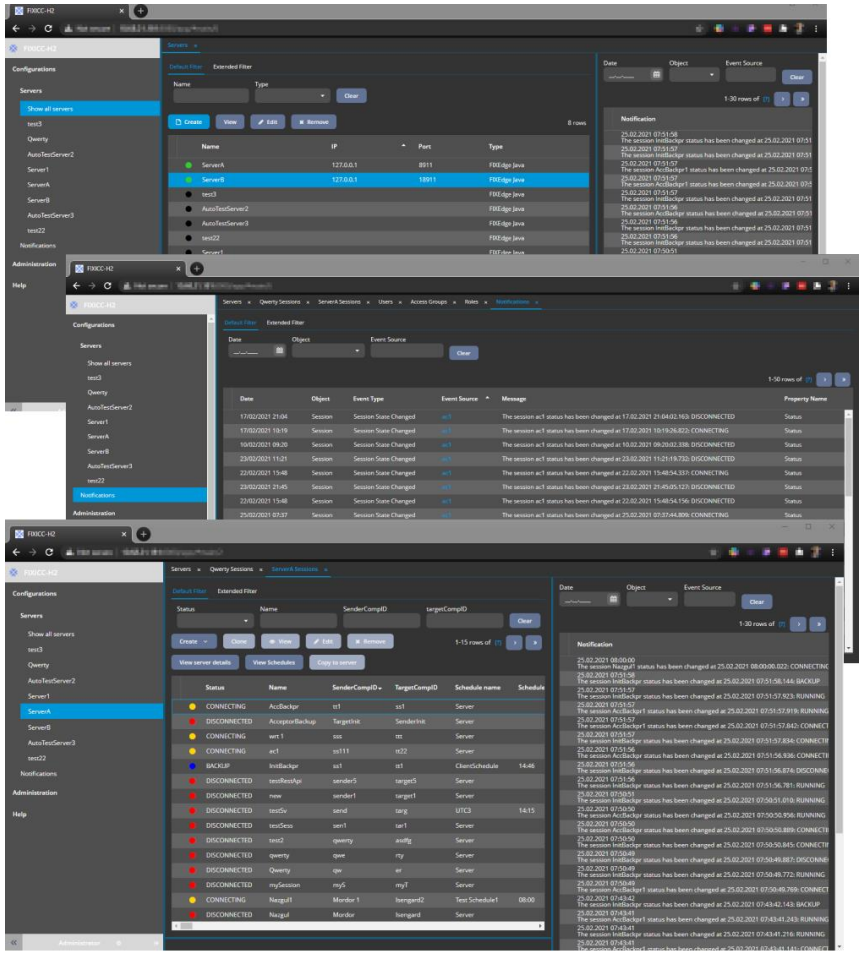



FIXEdge supports four kinds of incoming FIX session authentications:

- Checking the username and password against the configured ones
- Checking the provided certificate
- Checking the provided user in the LDAP (currently available in Linux only)
- Checking credentials against the stored in Secrets Vaults

# FIXEdge Administration

## FIXEdge Control Center H2

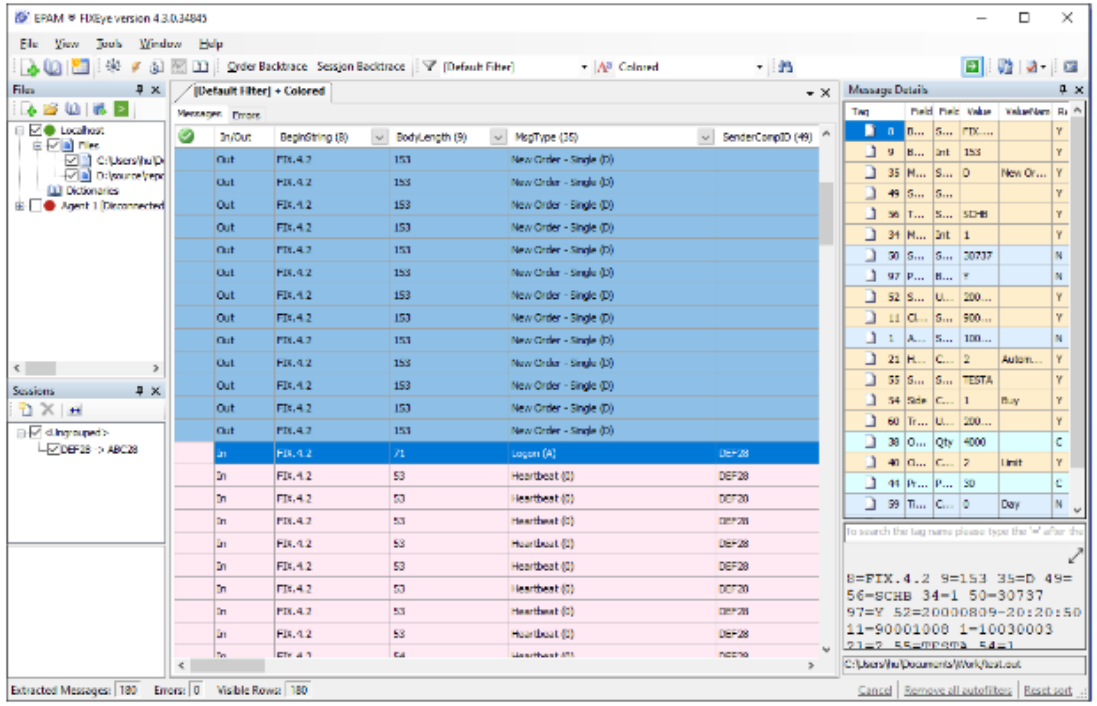


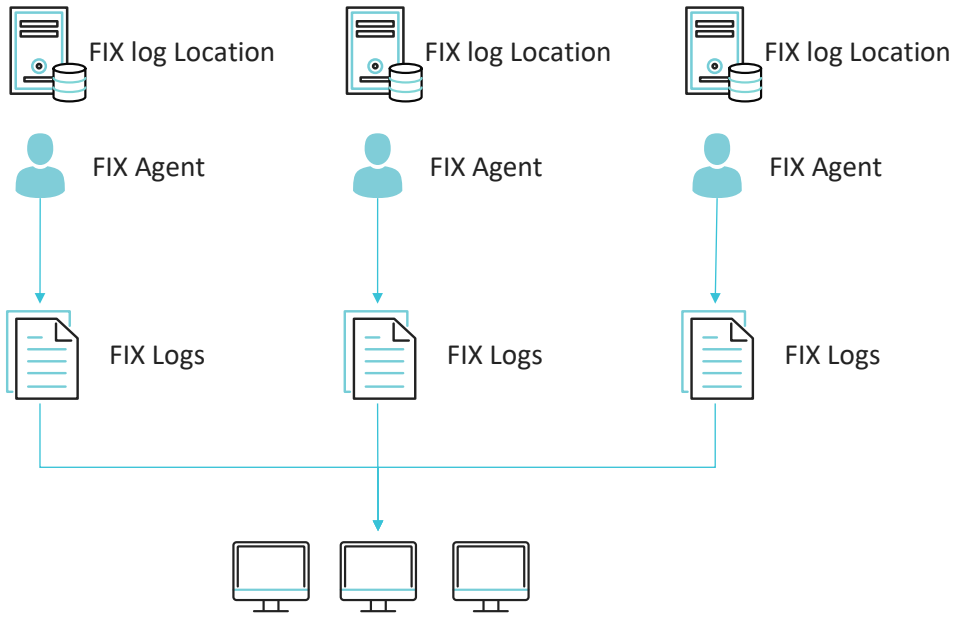
- FIXICC H2 is the web-based, next generation of the FIX Integrated Control Center (FIXICC).
- It is designed to administer, configure, and monitor the FIXEDGE line of products, including standalone FIX engines and clusters of FIX engines. It is the central source of FIX session configuration and schedules for FIX servers.
- Major FIXEdge functions:
- Start and Stop server
- Change server configuration
- Modify routing rules
- Reload routing rules (instruction to enact the latest changes if they are made while the server is running)
- Create and modify session schedules
- Export and import configuration
- Export logs
- FIXICC H2 is extendible and customizable:
- It supports various database management systems to store servers and session configurations;
- FIXICC H2 relies on a Service Discovery service to find and monitor servers and their health;
- FIXICC H2 has an informative UI, comprised of a master-detail section and notifications that are always visible.
- FIXICC H2 supports an authorization for session operation types (monitor, change, configure)

# FIXEdge Tools

## FIXEdge Log Analyzer

FIXEye is a powerful log analyzer that allows monitoring FIX Edge logs in both non-real-time and real-time (from either the machine where FIXEdge is deployed or a remote machine).

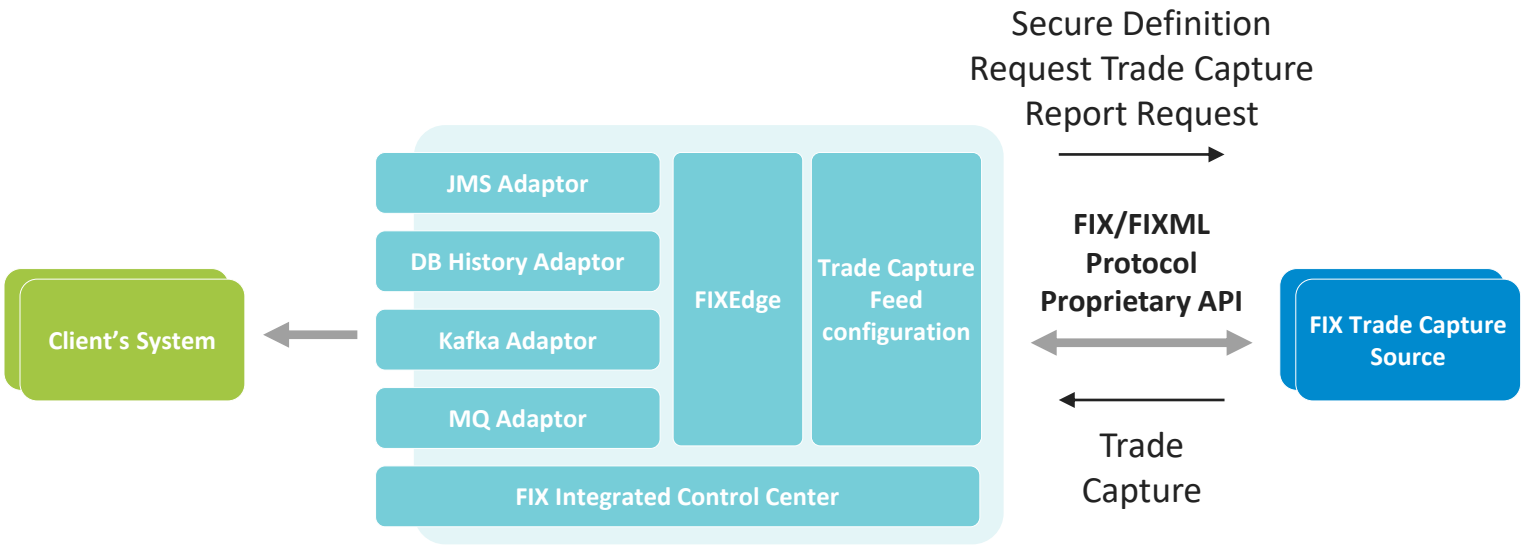





Workstation with FIXEye & FIXGrep

# FIXEdge Exchange Flows

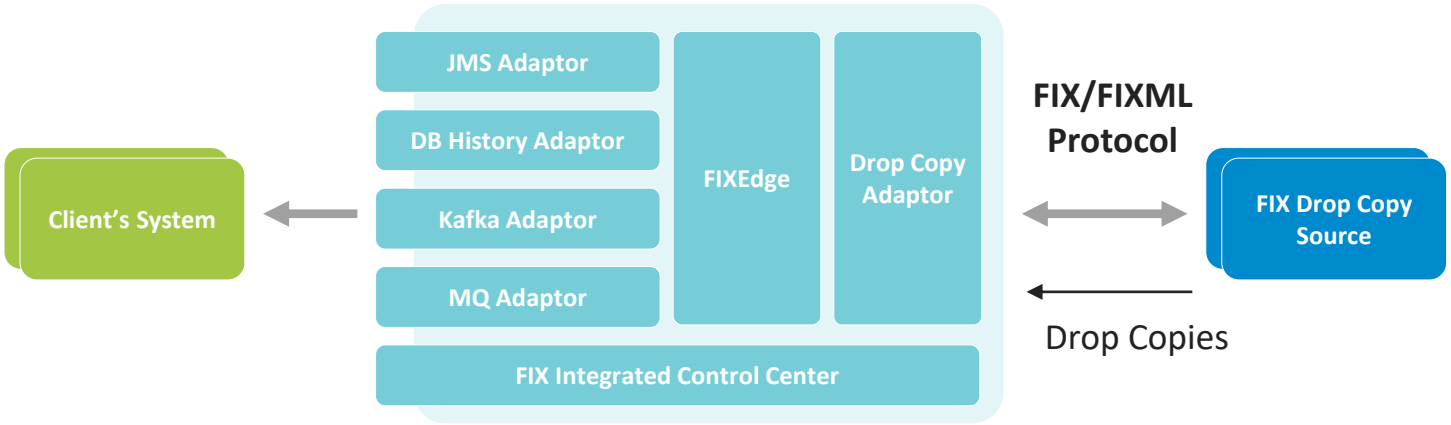
## FIXEdge for Trade Capture




The process of capturing trades and/or security definitions is fully automated, while all the connectivity specifics are completely encapsulated and hidden from the client.

# FIXEdge Exchange Flows

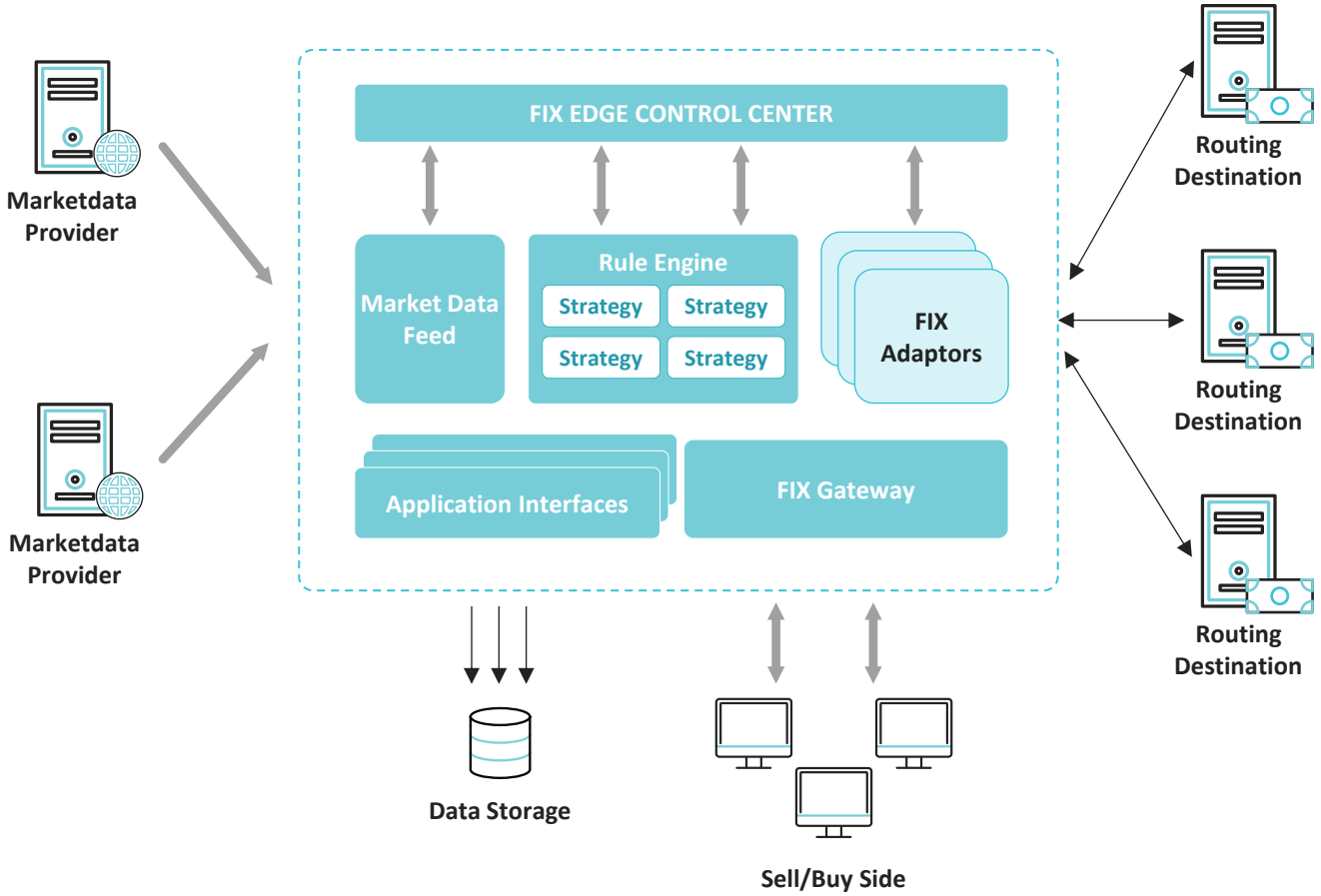
## FIXEdge For Drop Copies




The FIX Drop Copy Solution allows retrieving drop copies of trades from FIX-compliant drop copy sources and includes recovery tools that allow requesting missing data in case of failures. The process by which the server captures drop copies is fully automated.

# FIXEdge Exchange Flows

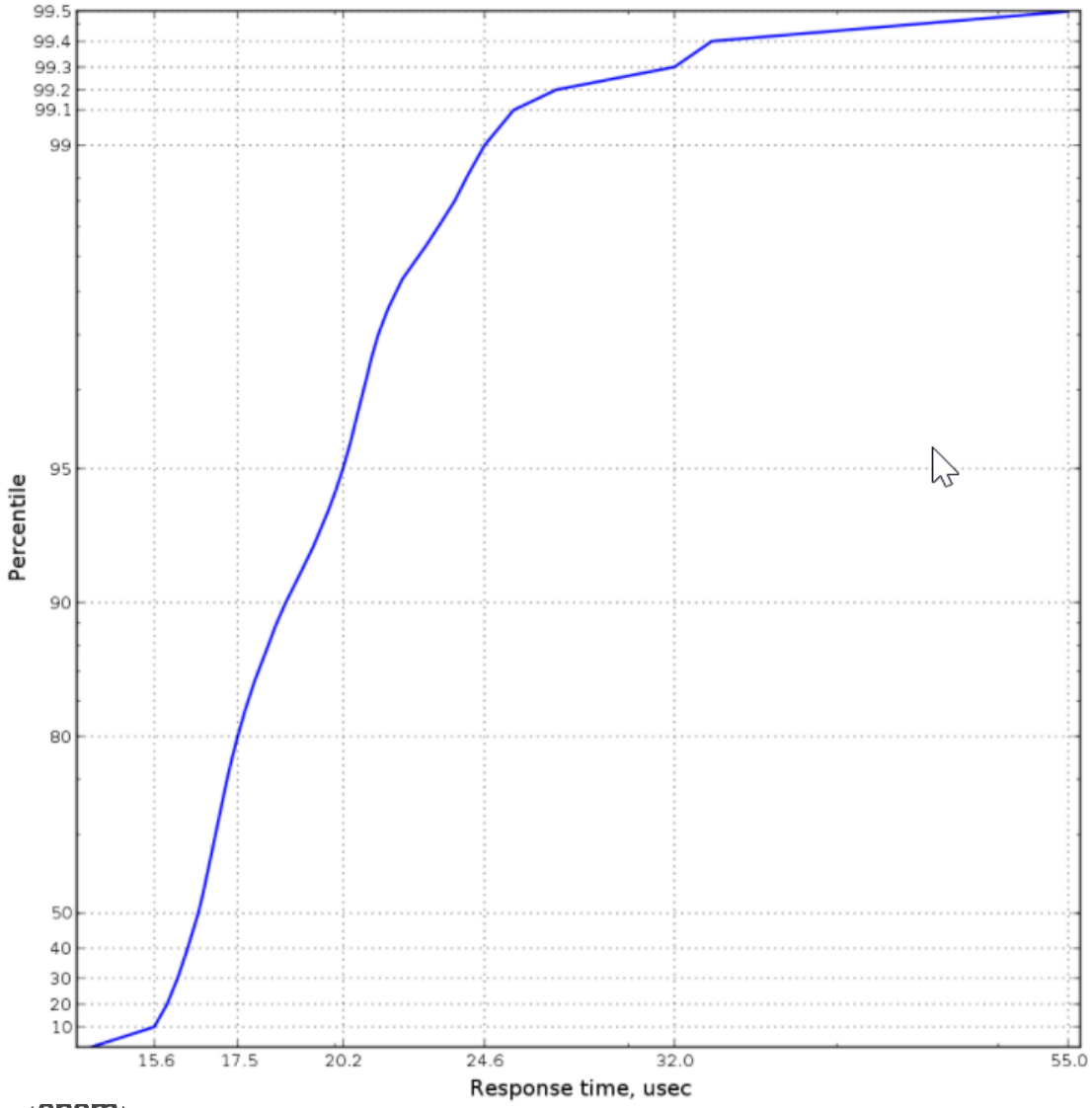
## FIXEdge For Smart Order Routing




The FIXEdge-based Smart Order Router allows receiving and routing orders according to predefined rules and market conditions, securities-based preferences, account-based preferences, and the ranking of preferred venues.

It allows connecting to as many destinations as are required for one or more asset classes

# FIXEdge Benchmarks




## SINGLE SESSION ECHO SCENARIO

- FIXEdge has one acceptor session configured.
- The client application has one initiator session configured.

**The overall process looks like:**

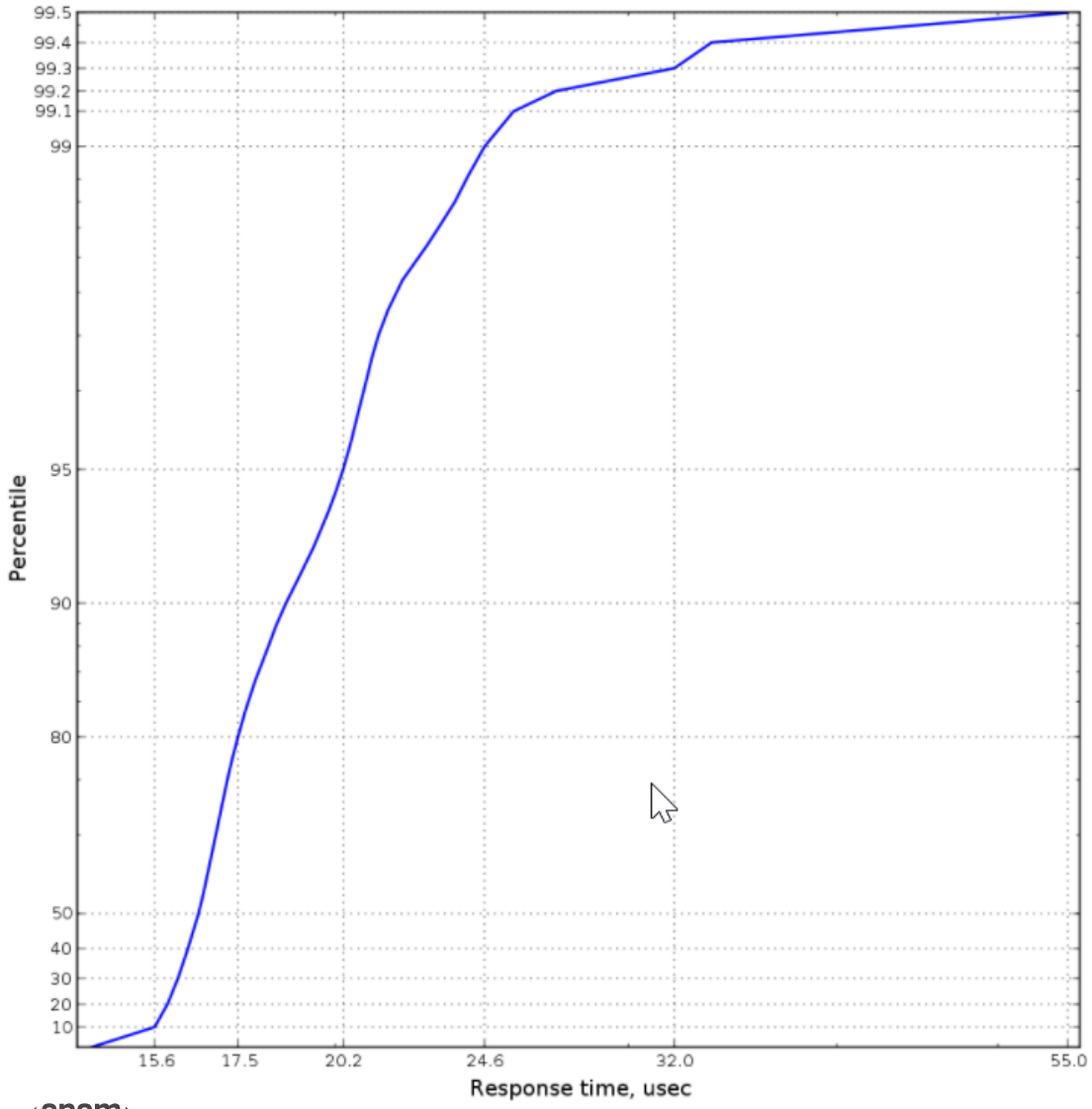
- Client application connects to the FIXEdge instance and sends 200000 FIX 4.2 messages with a rate of 2000 messages per second.
- FIXEdge receives the messages and matches them to the same session using business layer logic.
- FIXEdge responds to the client application with the same message via the same TCP/IP connection (the same session).

The response time measured by the client application is the difference between timestamps:

- t1 - timestamp taken before sending a message to the socket;
- t2 - timestamp taken after receiving the same message from the socket (from FIXEdge).

So the round-trip time formula is: RTT=t2-t1 and the measurement unit is microseconds.

# FIXEdge Benchmarks



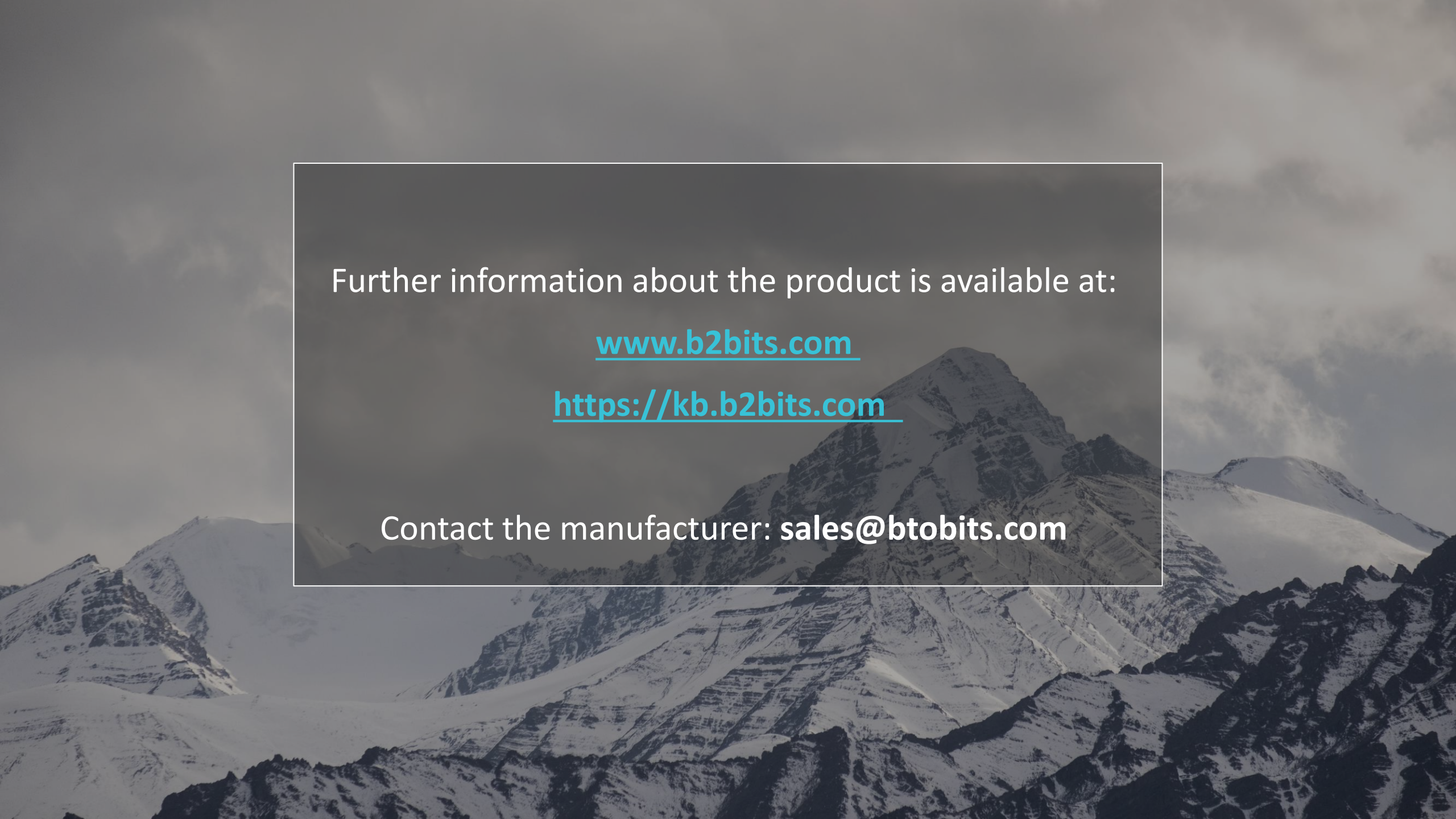

## TWO SESSIONS WITH CONVERSION SCENARIO

- FIXEdge has two acceptor sessions configured.
- The client application has two initiator sessions configured.
- The overall process looks like:
- Client application connects to the FIXEdge instance (establishes session №1) and sends 200000 FIX 4.2 messages with a rate of 2000 messages per second.
- Client application connects to the FIXEdge instance (establishes session №2) and starts to receive a message from another FIXEdge session.
- FIXEdge receives the messages sent to it from client application (session №1).
- FIXEdge uses business layer logic to route the message to another session and converts it from FIX 4.2 to FIX 4.4 protocol.
- FIXEdge responds to the client application with the converted message via another TCP/IP connection (session №2).

The round-trip time measured by benchmark is the difference between timestamps (just like in the previous test):

- t1 - timestamp is taken before sending a message to the socket;
- t2 - timestamp is taken after receiving the same message from the socket (from FIXEdge).

The round-trip time formula is: RTT=t2-t1 and the measurement unit is microseconds.



Further information about the product is available at:

www.b2bits.com

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Contact the manufacturer: **sales@btobits.com**