Johannesburg Stock Exchange

Post-trade Services

JSE Services Documentation
Volume PT05 – Post-trade Failure and Recovery

Document Version	1.0
Release Date	5 October 2018
Number of Pages	8 (Including Cover Page)

1 DOCUMENT CONTROL

1.1 Table of Contents

1.2 Document Information

Drafted By	Post-trade Services
Status	FINAL
Version	1.0
Release Date	6 October 2018

1.3 Revision History

Date	Version	Description
5 October 2018	1.0	Initial draft created.

1.4 About this Document

The purpose of this document is to serve as guidance to the EMAPI protocol when implementing EMAPI client applications or backend systems to integrate with the JSE's real-time clearing (RTC) system.

This document is intended to provide the required information to JSE Clients on the behaviour of the services when there is a failure and the recovery guidelines to resume to normal operations.

Software components, machines and network hardware can fail while the JSE System is in operation. The System deployed for the JSE will have fault resilience built into it which prevents a "single point of failure". This ensures that if a server, software component or network equipment fails, the JSE System will be able to continue operating without service degradation. Note that there may be degradation in the performance (increase of latency, reduction of throughput) depending on the type of failure.

High Availability is achieved through each component having a Mirror component which can take over from a Primary component failure. Details of both Primary and Mirror services for the software components of the JSE System for, the Gateways used by JSE Clients are outlined in this document. JSE Clients are requested to use the guidelines given in this document in conjunction with the respective interface specification documentation for each service.

In the event of a catastrophic failure of the JSE‟s Primary Data Centre, the JSE System will also have the capability to fail over to the JSE‟s Remote Disaster Recovery (DR) Site. In case of a total failure in the entire System in the JSE‟s Primary Data Centre site, the System will be started in the JSE‟s Remote DR Site. This document also details guidelines for JSE Client Recovery following a site failover.

1.5 Intended Audience

The information in this document is intended for software developers writing EMAPI interfaces to RTC.

1.6 Contact Details

JSE Limited One Exchange Square Gwen Lane, Sandown South Africa Tel: +27 11 520 7000 **www.jse.co.za**	**Post Trade Services** ITAC Queries **Email: CustomerSupport@jse.co.za**
Clearing specifications disclaimer **Disclaimer: All rights in this document vests in the JSE Limited ("JSE") and Cinnober Financial Technology AB (publ) ("Cinnober"). Please note that this document contains confidential and sensitive information of the JSE and Cinnober and as such should be treated as strictly confidential and proprietary and with the same degree of care with which you protect your own confidential information of like importance. This document must only be used by you for the purpose for which it is disclosed. Neither this document nor its contents may be disclosed to a third party, nor may it be copied, without the JSE's prior written consent. The JSE endeavours to ensure that the information in this document is correct and complete but do not, whether expressly, tacitly or implicitly, represent, warrant or in any way guarantee the accuracy or completeness of the information. The JSE, its officers and/or employees accept no liability for (or in respect of) any direct, indirect, incidental or consequential loss or damage of any kind or nature, howsoever arising, from the use of, or reliance on, this information.**	

1.7 Definitions, Acronyms and Abbreviations

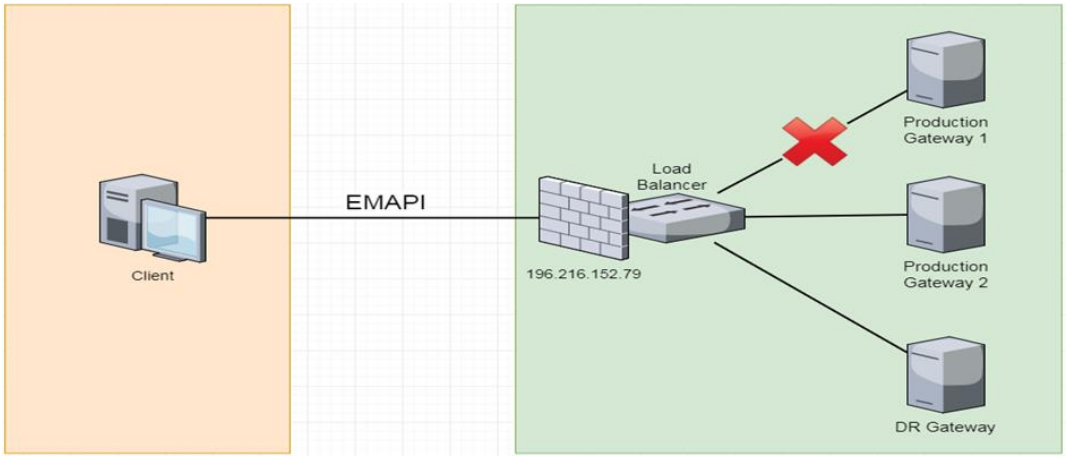
EMAPI	External Messaging API. EMAPI is the API used to integrate a client application or backend system with the RTC Clearing System.
Client	A client that connects to RTC Servers using the EMAPI protocol.
RTC	Real-time Clearing. The JSE implementation of Cinnober TradeExpress™ clearing system.
Server	RTC server that supports the EMAPI protocol. For example, the TAX (Trading Application Multiplexer) Server.

2 REAL-TIME CLEARING SYSTEM GATEWAY FAILURE

During a normal operational day, a member will log into the Real-Time Clearing (RTC) system using the EMAPI Gateway interface.

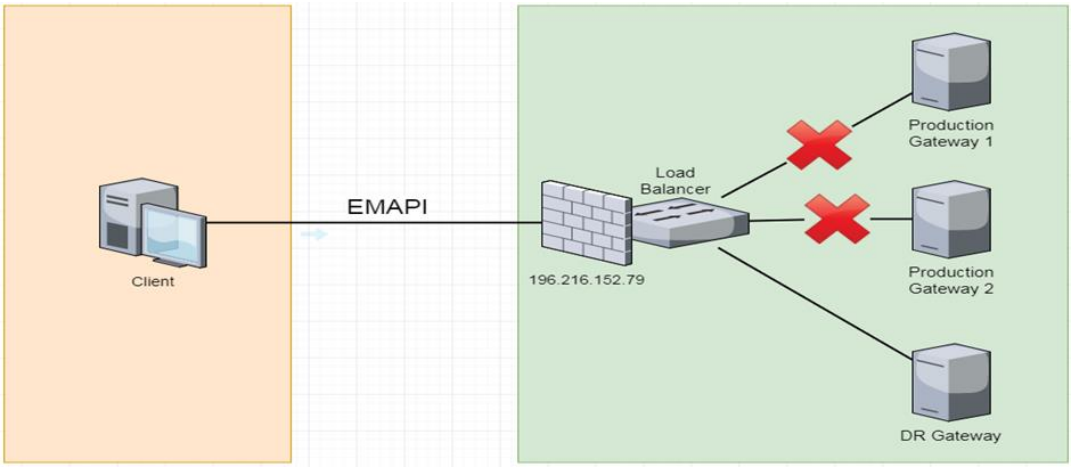
2.1 Loss of the a Production Gateway

In the case of an unexpected disconnection from the Gateway, JSE Clients should attempt to re-connect to the Gateway. RTC production has two Gateways (1 and 2). The third Gateway is standby for Disaster Recovery site. All the members are load balanced between Production Gateway 1 and 2. Should one of the Production Gateways fail, members connected to the affected Gateway will be disconnected. When the member initiates a connection to the EMAPI interface post the failure, a connection will be made to the available Production Gateway, as shown below.



2.2 Loss of both Gateway 1 and 2

In the event that both the Production Gateways fail, clients connected to the Production Gateways will be disconnected. JSE Clients should attempt to re-connect to the Gateway when the member initiates a connection to the EMAPI interface post this failure, they will be routed to the Disaster Recovery Gateway.



2.3 Recovery after both Gateway 1 and 2 failure

The RTC system is designed in such a way that there should be seamless failover between all the Gateways. It is important to note that the RTC system runs in an ACTIVE ACTIVE configuration i.e Both the Production and Disaster Recovery sites are always active. There should be little or no client impact during the failover. All that needs to happen from JSE client side is to try and reconnect.