Oracle FLEXCUBE Investor Servicing Adapter for Blockchain Mutual Fund Transactions
Release 14.7.2.0.0
[May] [2023]

ORACLE®
FINANCIAL SERVICES

ORACLE®

Table of Contents

ORACLE®

1. Preface

1.1 Introduction

This document helps you to get acquainted with the information on inter-connecting any version of Oracle FLEXCUBE Investor Servicing with Blockchain systems. Oracle FLEXCUBE Blockchain adapter enables easy transformation of information between Oracle FLEXCUBE and Blockchain datasets.

1.2 Audience

This manual is intended for the following User/ User Roles:

Role	Function
Back office data entry Clerks	Input functions for maintenance related to the interface
Implementation Teams	For setting up integration

1.3 Documentation Accessibility

For information about Oracle's commitment to accessibility, visit Oracle Accessibility Program website at: http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc

1.4 Organization

This chapter is organized into following chapters:

Chapter	Description
Chapter 1	*Preface* gives information on the intended audience. It also lists the various chapters covered in this User Manual
Chapter 2	*Blockchain Adapter for Mutual Fund Transactions* gives information on interface between Oracle FLEXCUBE Investor Servicing and Blockchain Adapter

ORACLE

1.5   <u>Acronyms and Abbreviations</u>

Abbreviation	Description
System	Unless and otherwise specified, it always refers to Oracle FLEXCUBE Investor Servicing
FCIS	Oracle FLEXCUBE Investor Servicing

1.6   <u>Related Information Sources</u>

Along with this user manual you may also refer the following related resources:

- Oracle FLEXCUBE Investor Servicing Installation Manual

ORACLE®

2. Blockchain Adapter for Mutual Fund Transactions

Oracle FLEXCUBE Blockchain Adapter enables Oracle FLEXCUBE to interface to blockchain systems facilitating easy transformation of information between traditional applications and blockchain datasets. You can use this adapter with any version of Oracle FLEXCUBE. Blockchain transactions, generated from the system, can be queried and viewed from Oracle FLEXCUBE itself. The adapter allows transformation and processing of information between Oracle FLEXCUBE and blockchain systems, with minimal human intervention thereby improving process efficiency, reducing risks and enhancing straight through processing. The adapter can be used not only to interface Oracle FLEXCUBE to blockchain systems but also any other similar third party applications to interface to blockchain systems.

A blockchain is an append only distributed data store/ log, in a peer to peer network, where un-trusted parties come to a consensus on the order of data sets (financial or non-financial data), based on previously agreed upon rules. Block chains can be classified, as public or private and permissioned or unpermissioned, based on the read and write access respectively allowed to the participating entities. Block chains allow an immutable record of transaction log, when multiple parties need shared control of data, without the need to depend on a central trusted authority. Smart contracts allow business logic to be triggered and processed based on pre-defined events mutually agreed upon by the contracting parties.

2.1 Scope

Oracle FCIS Blockchain Adapter for Mutual Fund Transactions allows you to:

- Transmit real time data across smart contracts allowing simplified and efficient auditing process
- Reduce SWIFT message cost

2.2 Prerequisites

The following are the prerequisites for the interface:

- Set up Oracle FLEXCUBE Investor Servicing
- Set up Blockchain Adapter for Mutual Fund Transactions
- Set up WebLogic server to deploy FCIS Blockchain adaptor

ORACLE

2.3 Integration Architecture

The following diagram provides information on technical architecture for Oracle's Blockchain based solution:
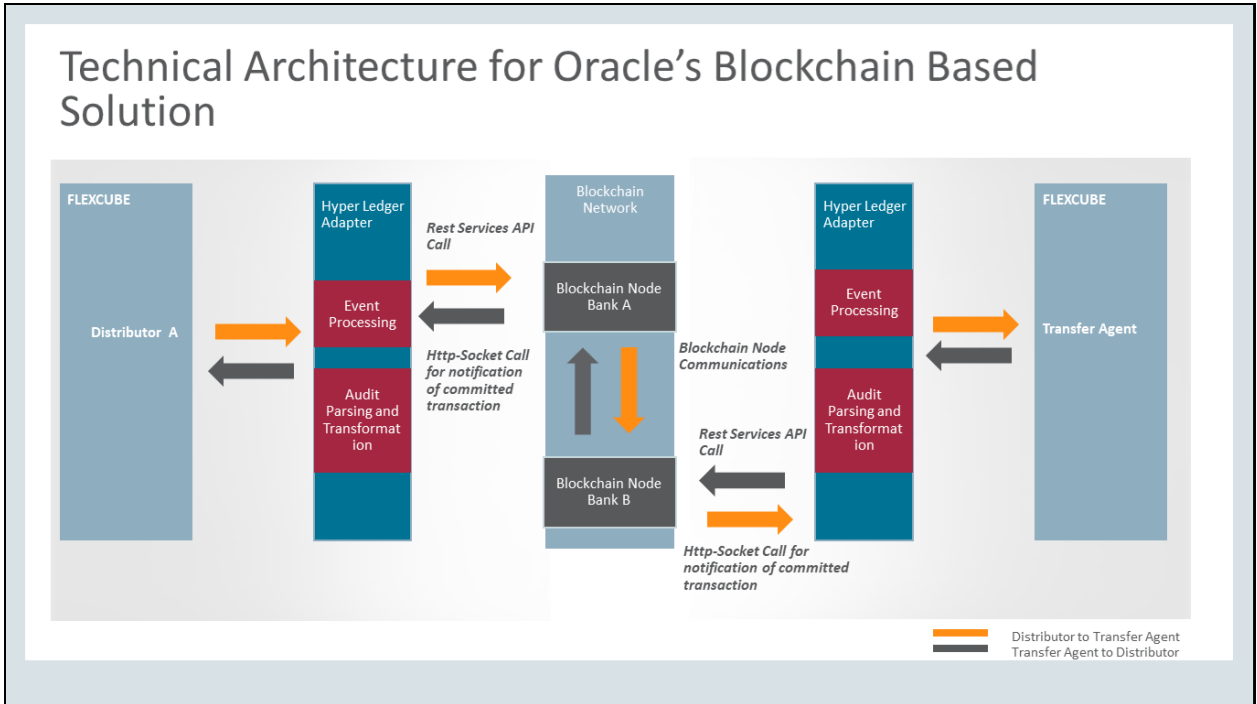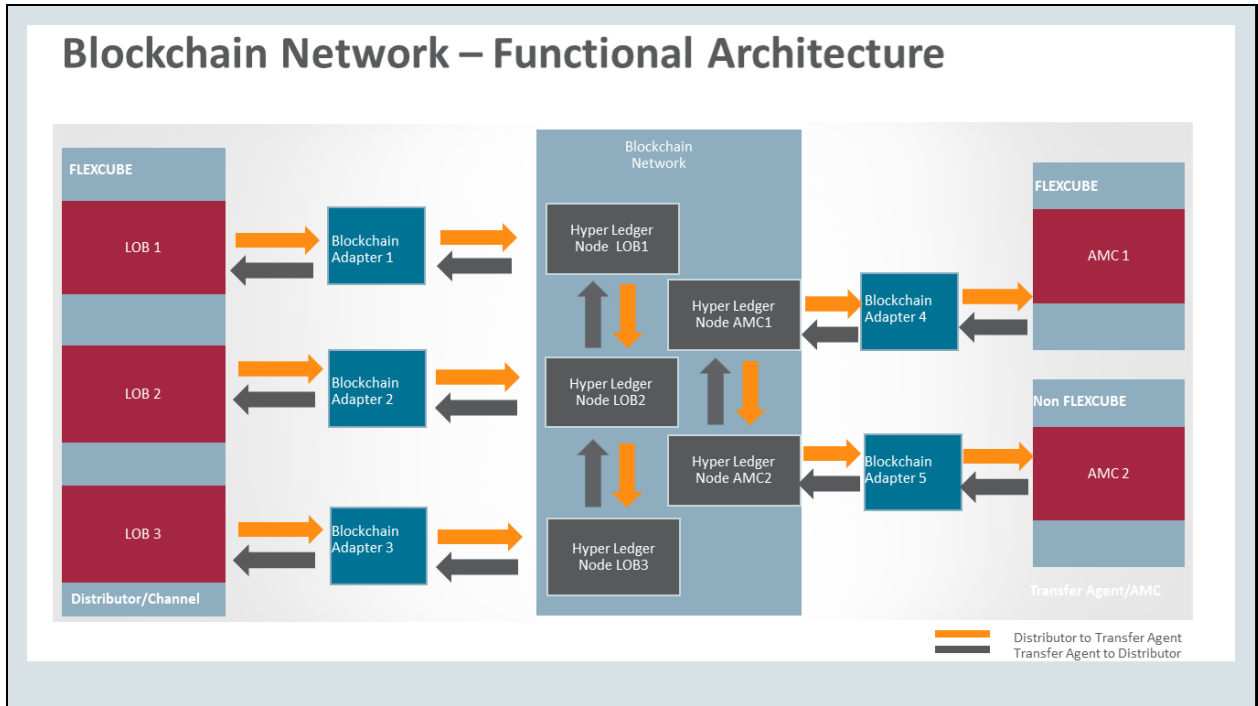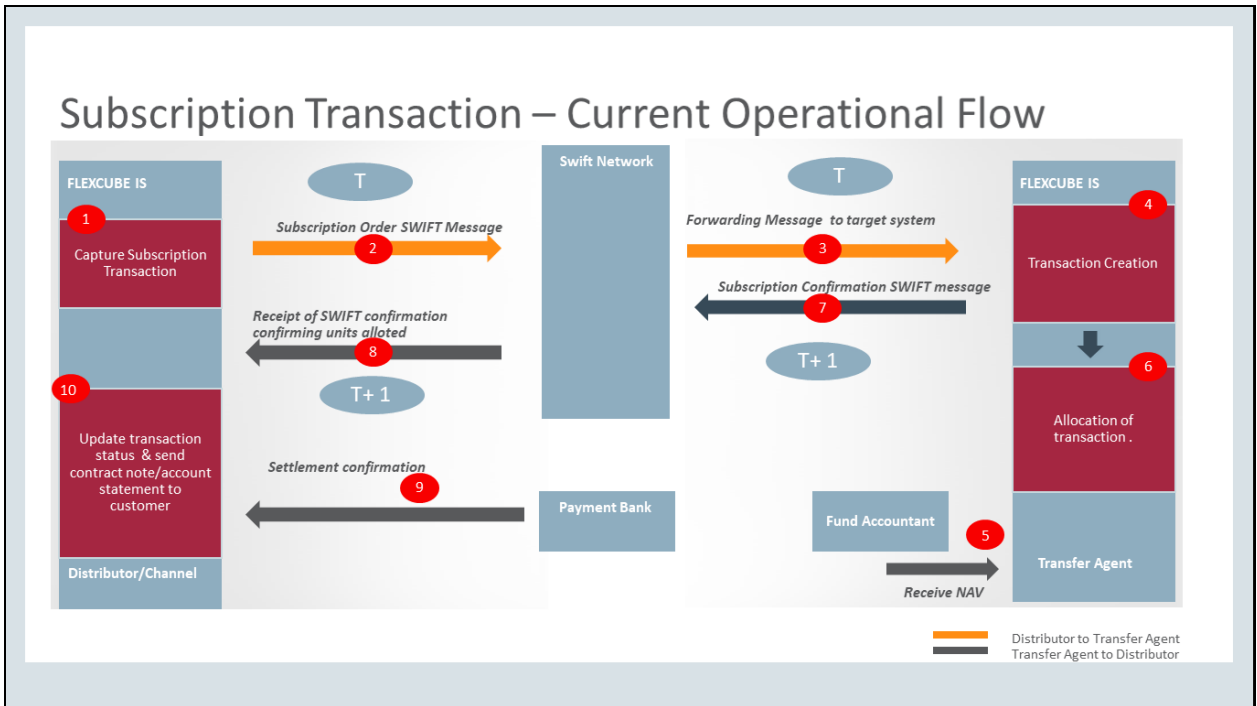
2.4 Integration Process

This section describes Oracle FCIS Blockchain technology.

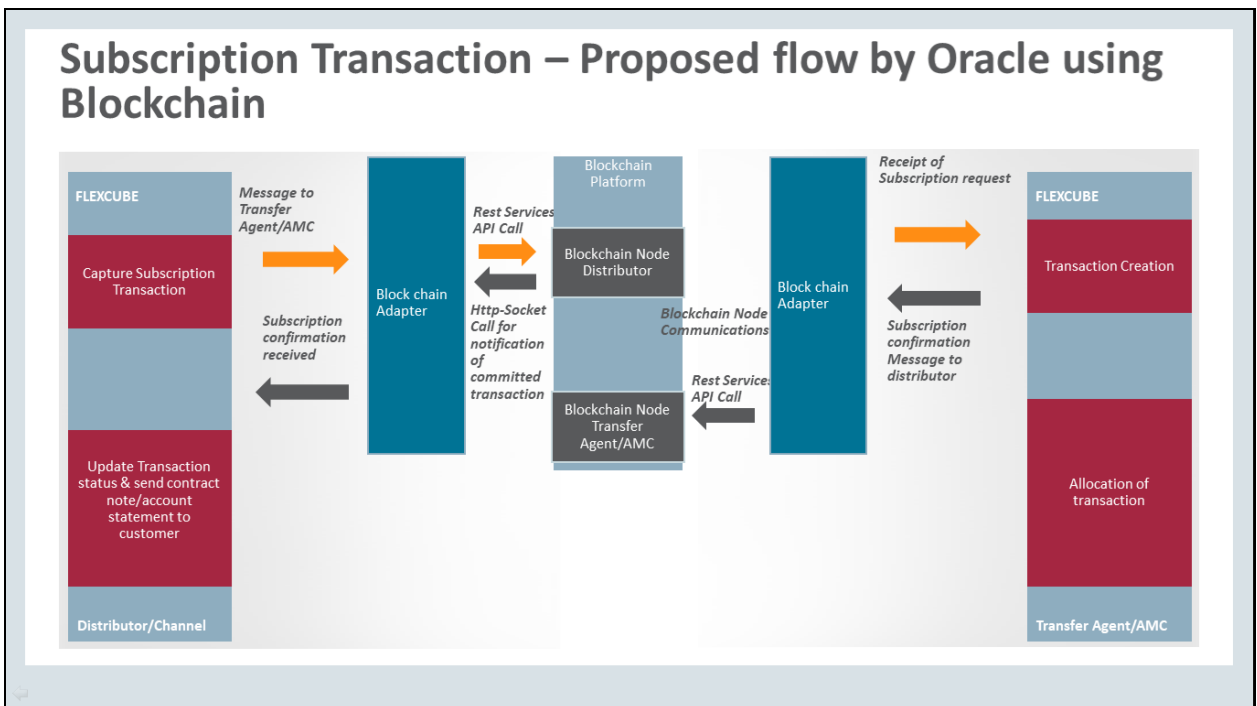### 2.4.1 Business Process Workflow for FCIS Transaction

The following image represents the overall functional flow using blockchain for the transaction.

ORACLE

The following image represents the current Transaction flow:

The following image represents the proposed Transaction flow:

2.4.2 Detailed Use Case for FCIS Transaction using Blockchain

This section describes the Transaction Use case.

2.4.2.1 TA - Transactions

Transactions captured in the TA will be handed over to the AMC using block chain adapter.

The following transaction attributes will be shared to AMC via network. The assumption is TA and AMC will be having same FUNDID.

- FCISTRANSACTIONNUMBER
- TRANSACTIONDATE
- FUNDID
- UNITHOLDERIDTYPE
- UNITHOLDERIDNUMBER
- TOFUNDID
- TOUNITHOLDERIDTYPE
- TOUNITHOLDERIDNUMBER
- TRANSACTIONCCY
- TRANSACTIONMODE
- TRANSACTIONVALUE
- GROSSORNET

Unitholder ID Type which is maintainable in the TA side can be either 'U' –Unitholder ID or 'C' – Cash Nominee

- Unitholder ID Number will be either Unitholder ID or Cash Nominee ID which will be maintained in the AMC
- Unitholder ID Type will be used as 'C' – Cash nominee for Subscription, Redemption and Switch Transactions. Transfer transaction will not be posted if the Unitholder ID Type is 'C'.
- For transfer transaction ID type will be 'U' – Unitholder for both From and To unitholders.

2.4.2.2 Authorization of a Transaction

The following actions will be performed by default if transaction gets authorized:

- The data will be passed to blockchain network for validation and creation of Smart Contract
- The smart contract will be notified to AMC by the blockchain network. The receiver will be identified based on the Destination Entity.
- The smart contract will have a status to identify current status of the transaction

2.4.2.3 Receiving Data at AMC

AMC is notified about the smart contract by the blockchain adapter. When the notification is received:

- A new transaction will be created automatically
- Below are the status which will be updated in Smart Contract

Status	Transaction Status
1	Transaction Initiated
2	Transaction Acknowledged
3	Transaction Confirmed by AMC
4	Transaction Completed
5	Transaction Failed

The Transaction status will be notified to the TA using Block Chain Adapter.

2.4.2.4 Smart Contract Summary

- At AMC/ TA, a facility is required to see the list of transactions which are posted along with the status
  A Summary screen is provided to view the details of the transaction. The smart contract capture status in TA screen is displayed as follows:

Smart Contract Capture Status in TA

Distributed Ledger Transaction Summary

Save   Refresh   Reset   Clear All   Records per page   15

> Search Criteria (Search Is Case Sensitive)

Search Results   Lock Columns   0

	Transaction Number	Fund ID	Transaction Date	Transaction Mode	Transaction Value	Net Asset Value	Units Allotted	Transaction Currency	Status
☐	0220150050001108	AGLDA	01/06/2015	AMOUNT	2001	1673.4304	0	HKD	Transaction Confirmed
☑	0220150050001110	AGLDA	01/06/2015	AMOUNT	25000	0	0	HKD	Transaction Initiated

Page 1 of 1 |<   ◄ 1 ► >|

Exit

The smart contract capture status update by AMC screen is displayed as follows:

Smart Contract Status Updated by AMC

Distributed Ledger Transaction Summary

Save   Refresh   Reset   Clear All   Records per page 15

> Search Criteria (Search Is Case Sensitive)

Search Results   Lock Columns 0 ▼

	Transaction Number ⌄	Fund ID ⌄	Transaction Date ⌄	Transaction Mode ⌄	Transaction Value ⌄	Net Asset Value ⌄	Units Allotted ⌄	Transaction Currency ⌄	Status ⌄
☐	0220150050001108	AGLDA	01/06/2015	AMOUNT	2001	1673.4304	0	HKD	Transaction Confirmed by
☑	0220150050001110	AGLDA	01/06/2015	AMOUNT	25000	0	0	HKD	Transaction Acknowledged

Page 1 of 1 |< ◀ 1 ▶ >|

Exit

The smart contract capture status in AMC screen is displayed as follows:

Smart Contract Status in AMC

Distributed Ledger Transaction Summary

Save   Refresh   Reset   Clear All   Records per page 15

> Search Criteria (Search Is Case Sensitive)

Search Results   Lock Columns 0 ▼

	Transaction Number ⌄	Fund ID ⌄	Transaction Date ⌄	Transaction Mode ⌄	Transaction Value ⌄	Net Asset Value ⌄	Units Allotted ⌄	Transaction Currency ⌄	Status ⌄
☑	0220150050001108	AGLDA	01/06/2015	AMOUNT	2001	1673.4304	1.1957	HKD	Transaction Confirmed
☐	0220150050001110	AGLDA	01/06/2015	AMOUNT	25000	0	14.9393	HKD	Transaction Failed
☐	022015005000040	AGLDA	01/06/2015	AMOUNT	2002	1673.4304	0	HKD	Transaction Failed

Page 1 of 1 |< ◀ 1 ▶ >|

Exit

ORACLE®

The smart contract unit allocation status screen is displayed as follows:

Smart Contract Unit Allocation Status

Distributed Ledger Transaction Summary

Save   Refresh   Reset   Clear All   Records per page   15

> Search Criteria (Search Is Case Sensitive)

Search Results   Lock Columns   0

☐	Transaction Number	Fund ID	Transaction Date	Transaction Mode	Transaction Value	Net Asset Value	Units Allotted	Transaction Currency	Status
☐	0220150050001108	AGLDA	01/06/2015	AMOUNT	2001	1673.4304	1.1957	HKD	Transaction Confirmed
☑	0220150050001110	AGLDA	01/06/2015	AMOUNT	25000	1673.4304	14.9393	HKD	Transacton Confirmed by

Page 1 of 1 |< ◀ 1 ▶ >|

Exit

ORACLE

ORACLE®

Blockchain Adapter for Transactions
[May] [2023]
Version 14.7.2.0.0

Oracle Financial Services Software Limited
Oracle Park
Off Western Express Highway
Goregaon (East)
Mumbai, Maharashtra 400 063
India

Worldwide Inquiries:
Phone: +91 22 6718 3000
Fax:+91 22 6718 3001
www.oracle.com/financialservices/

ORACLE®