

Oracle FLEXCUBE Investor Servicing Adapter for
Blockchain Mutual Fund Transactions

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

1.5 Acronyms and Abbreviations

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

1.6 Related Information Sources

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

- Oracle FLEXCUBE Investor Servicing Installation Manual

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

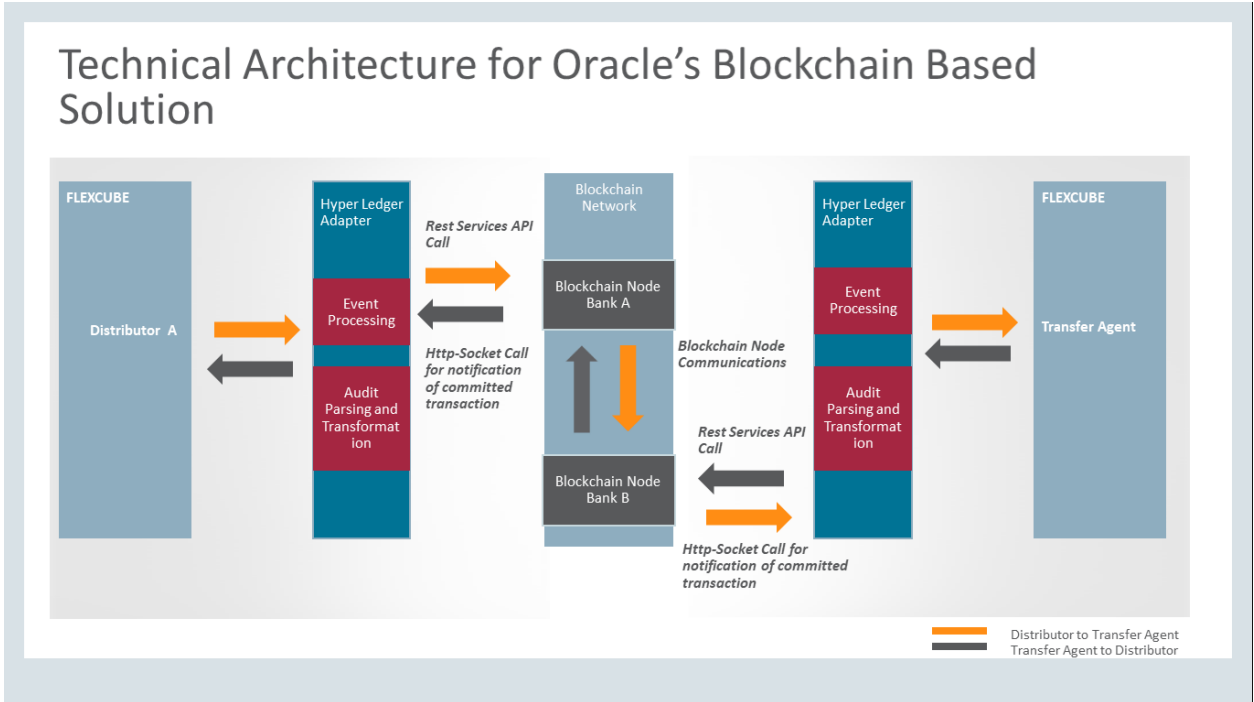
2.2 Prerequisites

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

2.3 Integration Architecture

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

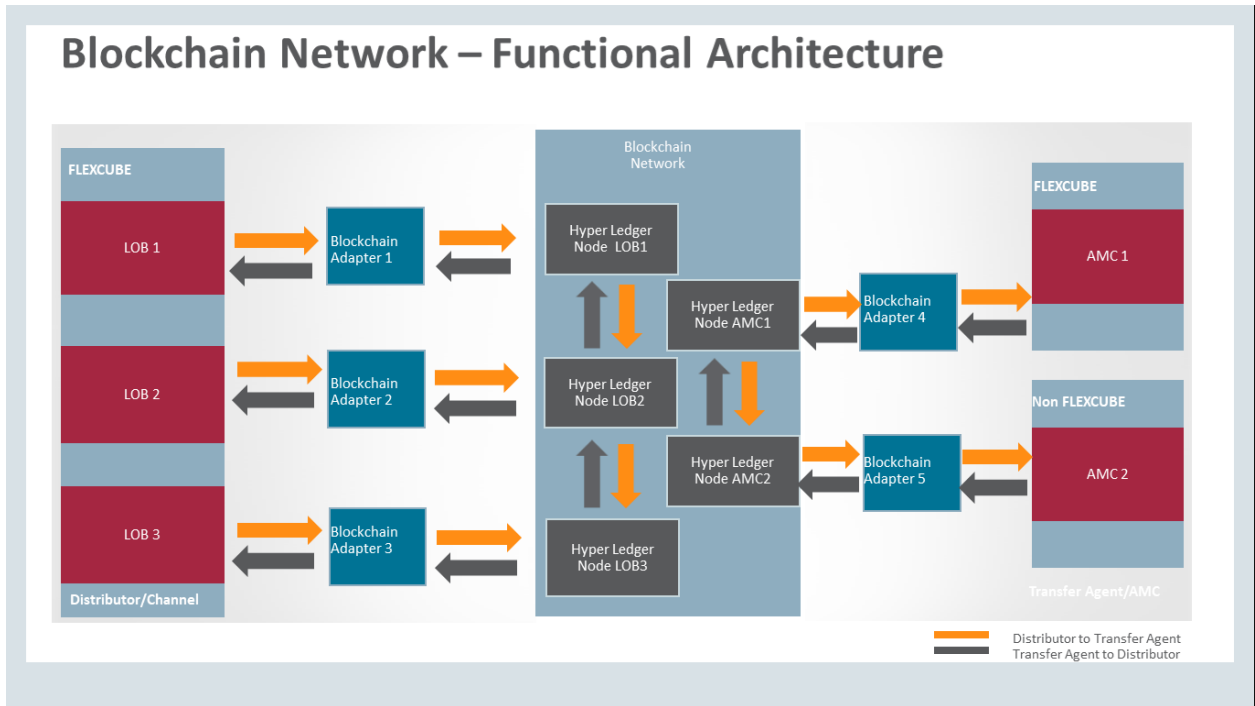


2.4 Integration Process

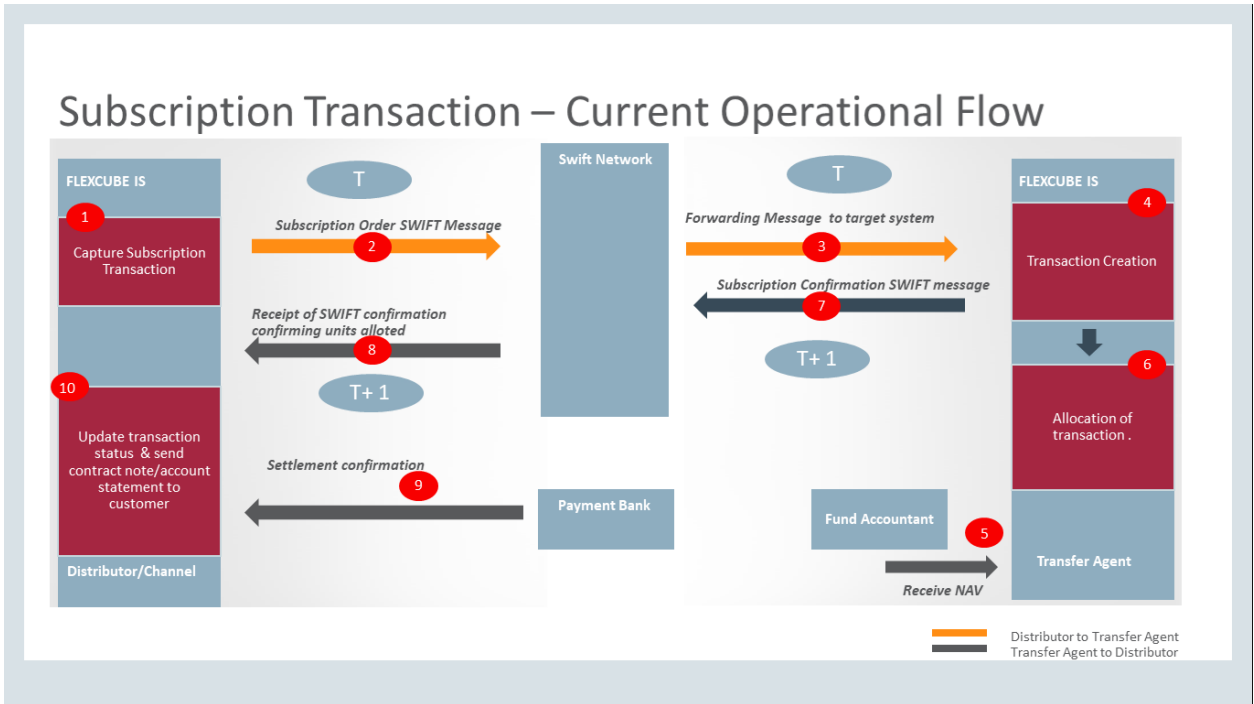
This section describes Oracle FCIS Blockchain technology.

2.4.1 Business Process Workflow for FCIS Transaction

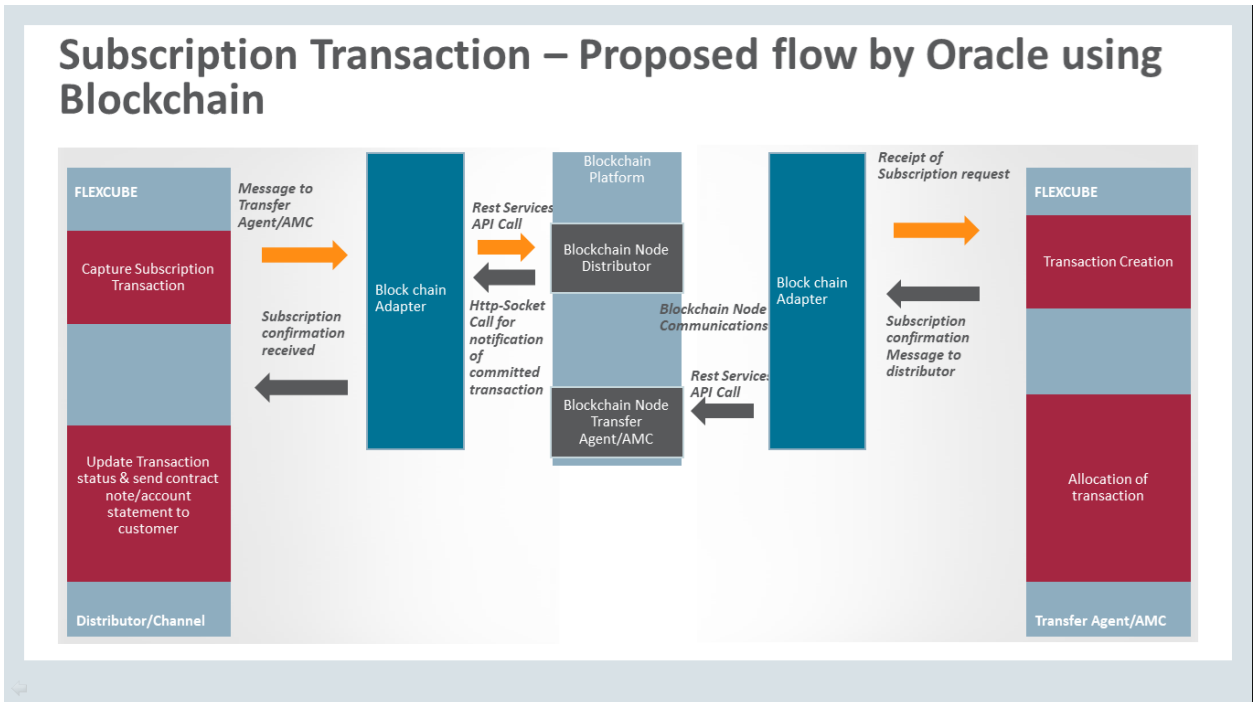
The following image represents the overall functional flow using blockchain for the transaction.



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

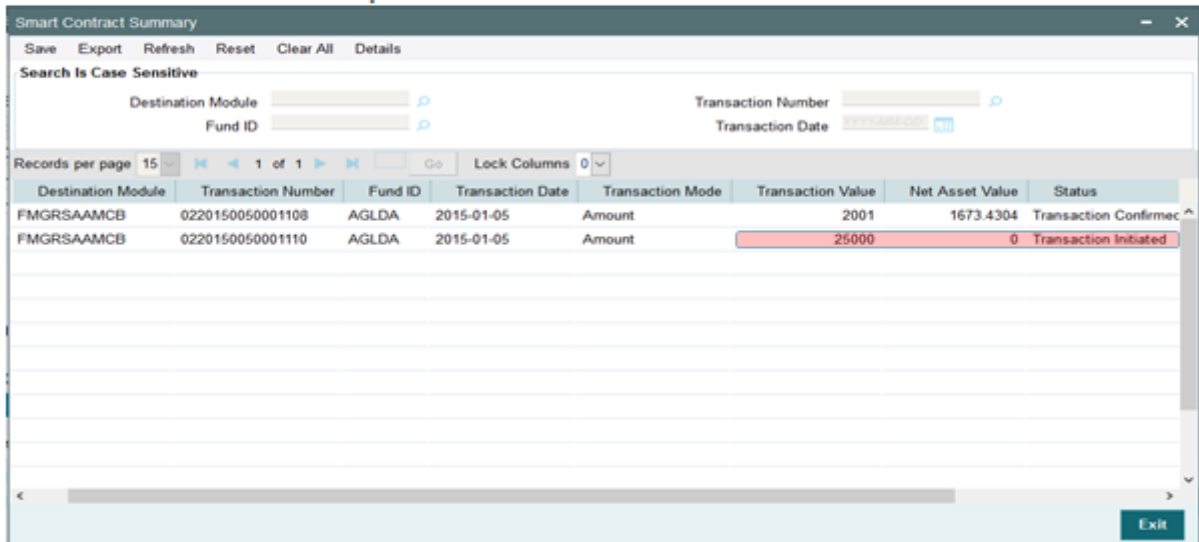
Status	Transaction Status
1	Transaction Initiated
2	Transaction Acknowledged
3	Transaction Confirmed by AMC
4	Transaction Completed
5	Transaction Failed

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



The screenshot shows a web application window titled "Smart Contract Summary". It features a search bar with fields for "Destination Module", "Fund ID", "Transaction Number", and "Transaction Date". Below the search bar, there are navigation controls including "Records per page" (set to 15), "1 of 1" pages, and "Lock Columns" (set to 0). The main content is a table with the following columns: Destination Module, Transaction Number, Fund ID, Transaction Date, Transaction Mode, Transaction Value, Net Asset Value, and Status. Two rows of data are visible:

Destination Module	Transaction Number	Fund ID	Transaction Date	Transaction Mode	Transaction Value	Net Asset Value	Status
FMGRSAAMCB	0220150050001108	AGLDA	2015-01-05	Amount	2001	1673.4304	Transaction Confirmed
FMGRSAAMCB	0220150050001110	AGLDA	2015-01-05	Amount	25000	0	Transaction Initiated

An "Exit" button is located at the bottom right corner of the window.

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

Smart Contract Status Update by AMC

Smart Contract Summary

Save Export Refresh Reset Clear All Details

Search Is Case Sensitive

Destination Module Transaction Number

Fund ID Transaction Date

Records per page 15 1 of 1 Lock Columns 0

Destination Module	Transaction Number	Fund ID	Transaction Date	Transaction Mode	Transaction Value	Net Asset Value	Status
AMCB	0220150050001108	AGLDA	2015-01-05	Amount	2001	1673.4304	Transaction Confirmed by AMC
AMCB	0220150050001110	AGLDA	2015-01-05	Amount	25000	0	Transaction Acknowledged

Exit

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

Smart Contract Status in AMC

Smart Contract Summary

Save Export Refresh Reset Clear All Details

Search Is Case Sensitive

Destination Module Transaction Number

Fund ID Transaction Date

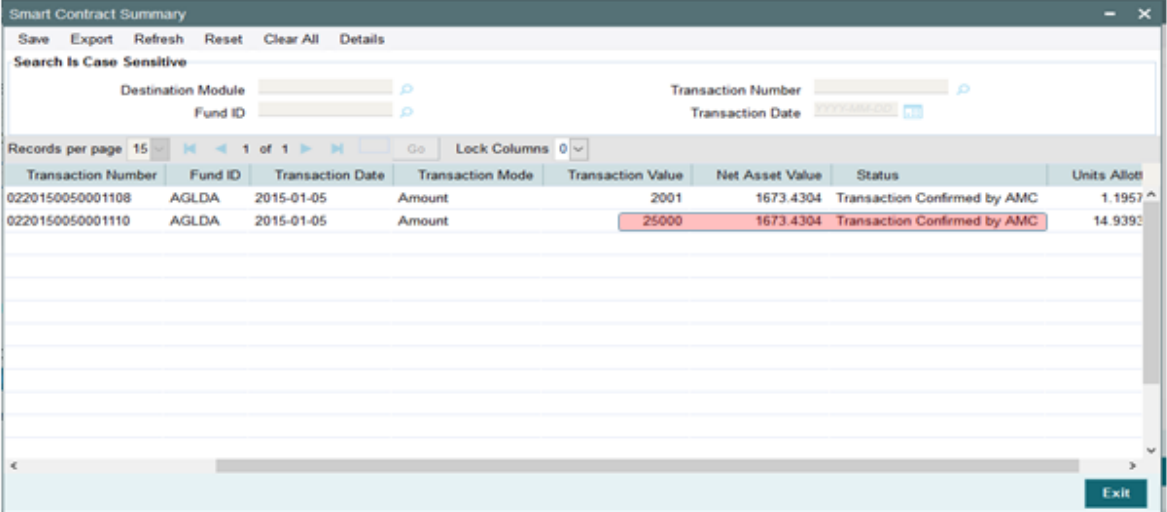
Records per page 15 1 of 1 Lock Columns 0

Destination Module	Transaction Number	Fund ID	Transaction Date	Transaction Mode	Transaction Value	Net Asset Value	Status	U
FMGRSADISTB	0220150050001110	AGLDA	0005-01-15	Amount	25000	0	Transaction Generated	
FMGRSADISTB	0220150050001108	AGLDA	0005-01-15	Amount	2001	1673.4304	Transaction Allocated	
FMGHKGDISTE	0220150050000404	AGLDA	0005-01-15	Amount	2002	1673.4304	Transaction Allocated	

Exit

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

Smart Contract Unit Allocation Status



The screenshot shows a web application window titled "Smart Contract Summary". At the top, there are menu items: Save, Export, Refresh, Reset, Clear All, and Details. Below this is a search section with the text "Search is Case Sensitive". There are input fields for "Destination Module", "Fund ID", "Transaction Number", and "Transaction Date". The "Transaction Date" field contains the value "2015-01-05".

Below the search fields, there is a table with the following columns: Transaction Number, Fund ID, Transaction Date, Transaction Mode, Transaction Value, Net Asset Value, Status, and Units Allot. The table contains two rows of data. The first row has Transaction Number "0220150050001108", Fund ID "AGLDA", Transaction Date "2015-01-05", Transaction Mode "Amount", Transaction Value "2001", Net Asset Value "1673.4304", Status "Transaction Confirmed by AMC", and Units Allot "1.1957". The second row has Transaction Number "0220150050001110", Fund ID "AGLDA", Transaction Date "2015-01-05", Transaction Mode "Amount", Transaction Value "25000", Net Asset Value "1673.4304", Status "Transaction Confirmed by AMC", and Units Allot "14.939".

At the bottom right of the window, there is an "Exit" button.

Transaction Number	Fund ID	Transaction Date	Transaction Mode	Transaction Value	Net Asset Value	Status	Units Allot
0220150050001108	AGLDA	2015-01-05	Amount	2001	1673.4304	Transaction Confirmed by AMC	1.1957
0220150050001110	AGLDA	2015-01-05	Amount	25000	1673.4304	Transaction Confirmed by AMC	14.939



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