

DATA LEAKAGE DETECTION

[DLD]

Ashutosh Singh (19) Swapnil Siddhartha (58) Umang raj (63)

Dr. Ambedkar Institute Of Technology For Handicapped, Kanpur, UP

Guided By Shrinath Dwivedi (HOD)



Agenda

- PROBLEM DEFINITION
- PROBLEM SETUP AND MATHEMATICAL NOTATION
- SYSTEM ARCHITECTURE DESIGN
- SOFTWARE AND HARDWARE REQUIREMENT
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PROBLEM DEFINITION

- In the course of doing business, sometimes sensitive data must be handed over to supposedly trusted third parties.
- **Our goal** is to detect when the distributor's sensitive data has been leaked by agents, through probability calculation using number of download for a particular agent.

PROBLEM SETUP AND NOTATION

Mathematical model

Title:-

DATA LEAKAGE DETECTION.

Problem statement: -

To build a application that helps in **Detecting the data** which has been leaked. Also it helps in finding **Guilty Agent** from the given set of agents which has leaked the data using **Probability Distribution through number of Downloads.**

Problem description:

Let,

DLD is the system such that $DLD = \{A, D, T, U, R, S, U^*, C, M, F\}$.

1. $\{A\}$ is the Administrator who controls entire operation's performed in the Software

2. **{D}** is the Distributor who will send data T to different agents U.
3. **T** is the set of data object that are supplied to agents.
T can be of any type and size, **e.g.**, they could be tuples in a relation, or relations in a database. $\mathbf{T} = \{t_1, t_2, t_3, \dots, t_n\}$
4. **U** is the set of Agents who will receive the data from the distributor A
 $\mathbf{U} = \{u_1, u_2, u_3, \dots, u_n\}$
5. **R** is the record set of Data objects which is sent to agents
 $\mathbf{R} = \{t_1, t_3, t_5, \dots, t_m\}$ **R is a Subset of T**

6

6. S is the record set of data objects which are leaked. $S = \{t_1, t_3, t_5 \dots t_m\}$

S is a Subset of T

7. U^* is the set of all agents which may have leaked the data

$$U^* = \{u_1, u_3, \dots, u_m\} \quad U^* \text{ is a subset of } U$$

8. C is the set of conditions which will be given by the agents to the distributor.

$$C = \{\text{cond}_1, \text{cond}_2, \text{cond}_3, \dots, \text{cond}_n\}$$

9. M is set of data objects to be send in Sample Data

$$\text{Request algorithm } M = \{m_1, m_2, m_3, \dots, m_n\}$$

ACTIVITY:

SAMPLE is a function for a data allocation for any m_i subset of records from T .
The transition can be shown as:

$$R_i = \text{SAMPLE}(T, m_i)$$

EXPLICIT is a function for a data allocation for which satisfies the condition.

$$R_i = \text{EXPLICIT}(T, \text{cond}_i)$$

SELECTAGENT is the function used in EXPLICIT algorithm for finding the agent .

SELECTAGENT(R1,R2....Rn)

SELECTOBJECT is the function used in SAMPLE algorithm for selecting the data Objects

SELECTOBJECT(i,Ri)

SIMPLE ENCRYPTO is the function used to ENCRYPT the file to be sent to the Agent

DATA STRUCTURES USED:

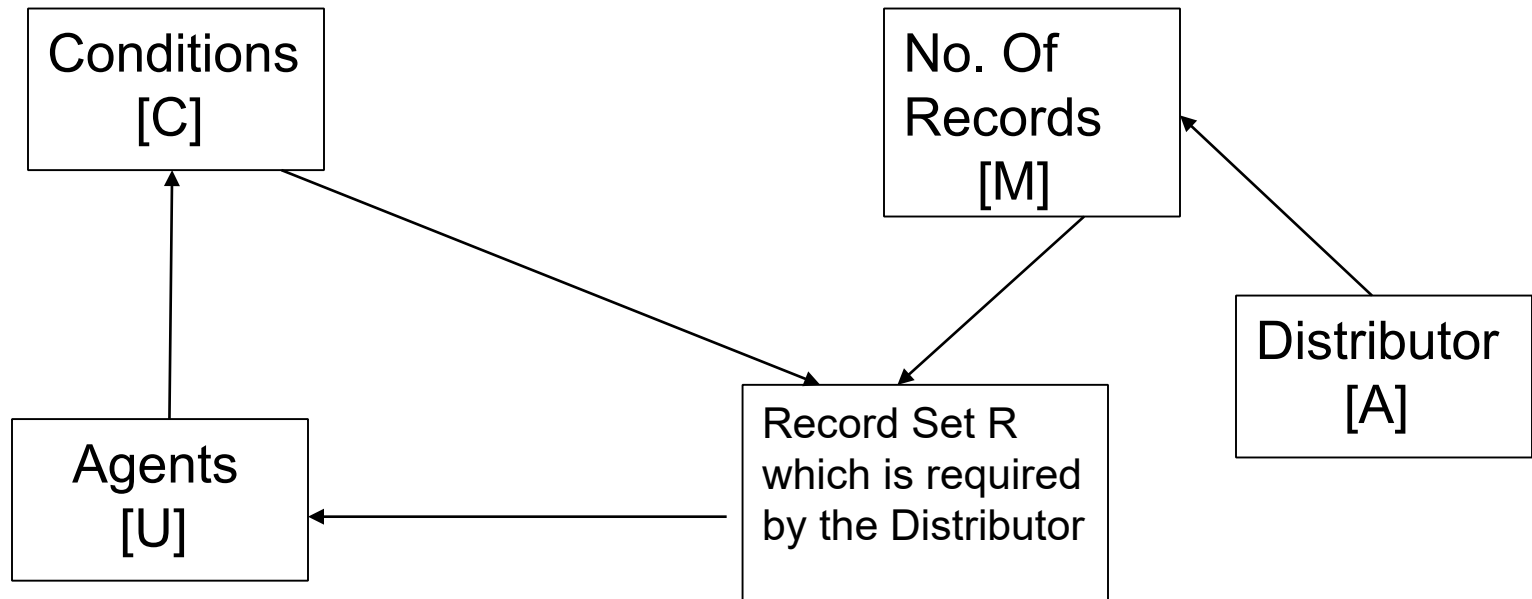
Array: To store the no of data objects T ,No of agents U , record set R and to display the particular output.

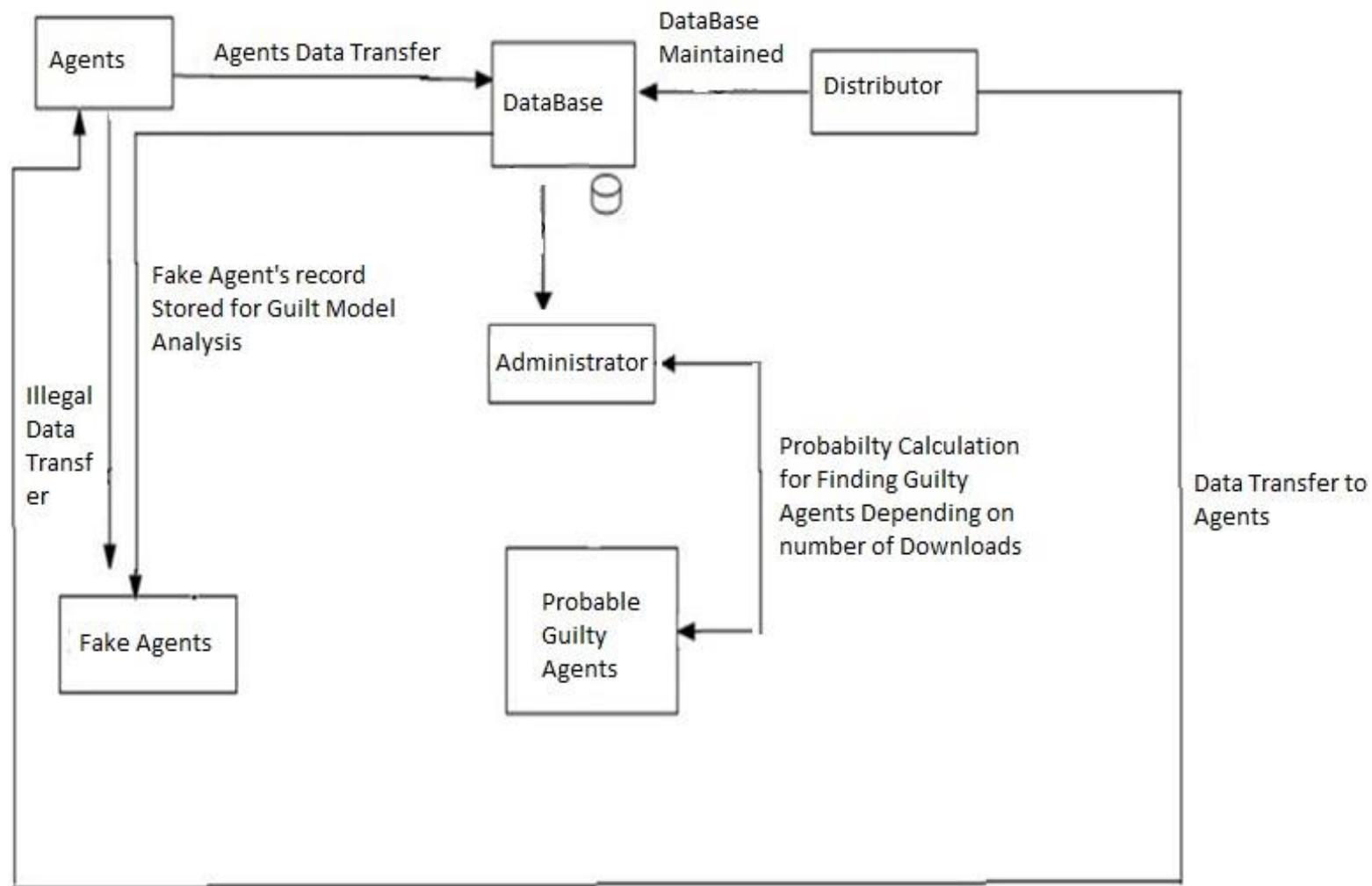
Execution of functions :

The functions will be executed on a daily basis for number of times whenever distributor wants to send the data to the agent and vice versa using C and M.

FUNCTIONAL DEPENDENCY DIAGRAM:

The functional dependency of the system depends upon the conditions which are given by the agent and no of records which distributor decides to send to the agents.





SYSTEM ARCHITECTURE DIAGRAM

SOFTWARE AND HARDWARE REQUIREMENT

Hardware Interfaces

- 2.4 GHZ, 80 GB HDD for installation.
- 512 MB memory.
- Users can use any PC based browser clients with IE 5.5 upwards.

Software Interfaces

- JDK 1.6
- Java Swing
- Net beans 6.5
- Socket programming
- Triple AES algorithm



SCREEN SHOTS



1.User Login

1.User Login



2. Agent Form(Request)

The screenshot shows a web application window titled "Data Leakage Detection". The window has a menu bar with "File", "Agent", "Change Password", and "Logout". Below the menu bar is a tab labeled "Data Leakage Detection". The main content area is titled "Sharing Details" and contains three input fields: "Data Request Descrip..." (a text box), "Select Region" (a dropdown menu with "Pune" selected), and "Select Distributor" (a dropdown menu with "Raj1 Agrawal1" selected). Below these fields is a "Send Request" button. At the bottom right of the window, there is a small "Data Leakage Detection" label.

Data Leakage Detection

File Agent Change Password Logout

Data Leakage Detection

Sharing Details

Data Request Descrip...

Select Region Pune

Select Distributor Raj1 Agrawal1

Send Request

Data Leakage Detection

3. Agent Form(Download Form)

Data Leakage Detection

File Agent Change Password Logout

Data Leakage Detection

Files For Agent

Sr. No	Uploaded By	Email Id	Phone No	File Description	Size	Date
1	Raj1 Agrawal1	mail.rajesh.agraw...	9860923474	ronal tp	6320	05-Jun-12 Tue
2	Raj1 Agrawal1	mail.rajesh.agraw...	9860923474	tp	6320	05-Jun-12 Tue
3	Raj1 Agrawal1	mail.rajesh.agraw...	9860923474	co	6320	05-Jun-12 Tue
4	rajesh agrawal	mail.rajesh.agraw...	9860923474	com	6320	05-Jun-12 Tue

Selected File Details

Upload...

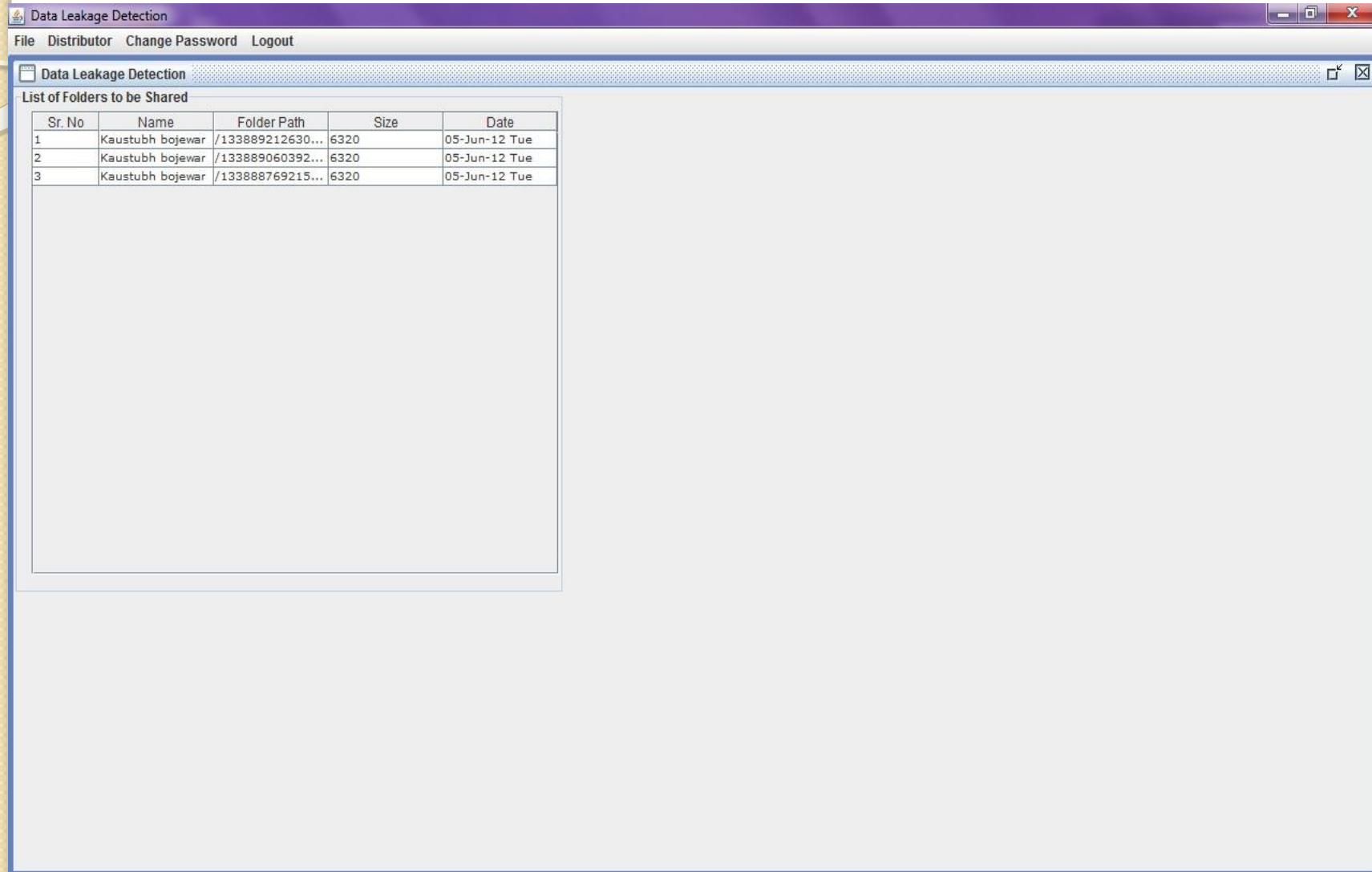
Shared...

Sharing Details

Encryption Key

File Content

4.Distributor(View shared files)



5.Distributor(Upload Files)

Data Leakage Detection

File Distributor Change Password Logout

Data Leakage Detection

File To Be Shared

List of Folders to be Shared

Sr. No	Folder Path	Size	Select

Sharing Details

Agent Requests


File Description

Encryption Key

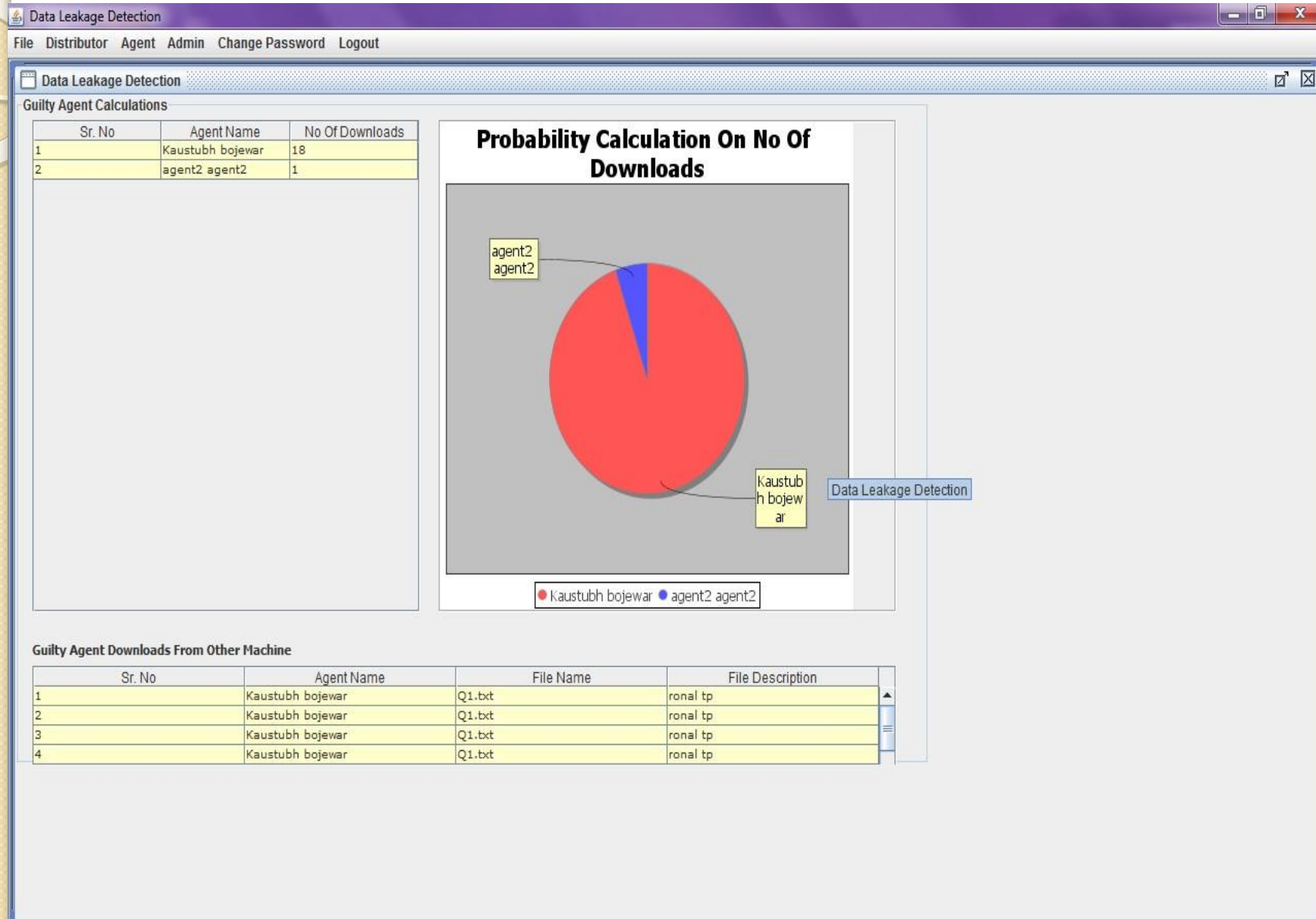
Share With

Shared Files By You

Sr. No	Name	Folder Path	Size	Date
1	Kaustubh bojewar	/1338892126306/Q1.dmp	6320	05-Jun-12 Tue
2	Kaustubh bojewar	/1338890603922/Q1.dmp	6320	05-Jun-12 Tue
3	Kaustubh bojewar	/1338887692155/Q1.dmp	6320	05-Jun-12 Tue



6. Administrator (Probability Calc)



7. Administrator (Manage Agents)

The screenshot displays the 'Data Leakage Detection' application window. The title bar includes the application name and standard window controls. The menu bar contains 'File', 'Distributor', 'Agent', 'Admin', 'Change Password', and 'Logout'. The main content area is titled 'Block Guilty Agent' and contains two form fields: 'Select Agent' with a dropdown menu showing 'Kaustubh bojewar', and 'Block Reason' with an empty text box. A 'Data Leakage Detection' button is positioned below the text box. At the bottom of the window is a 'Deactivate' button.

Data Leakage Detection

File Distributor Agent Admin Change Password Logout

Data Leakage Detection

Block Guilty Agent

Select Agent Kaustubh bojewar


Block Reason

Data Leakage Detection

Deactivate



UML DIAGRAMS

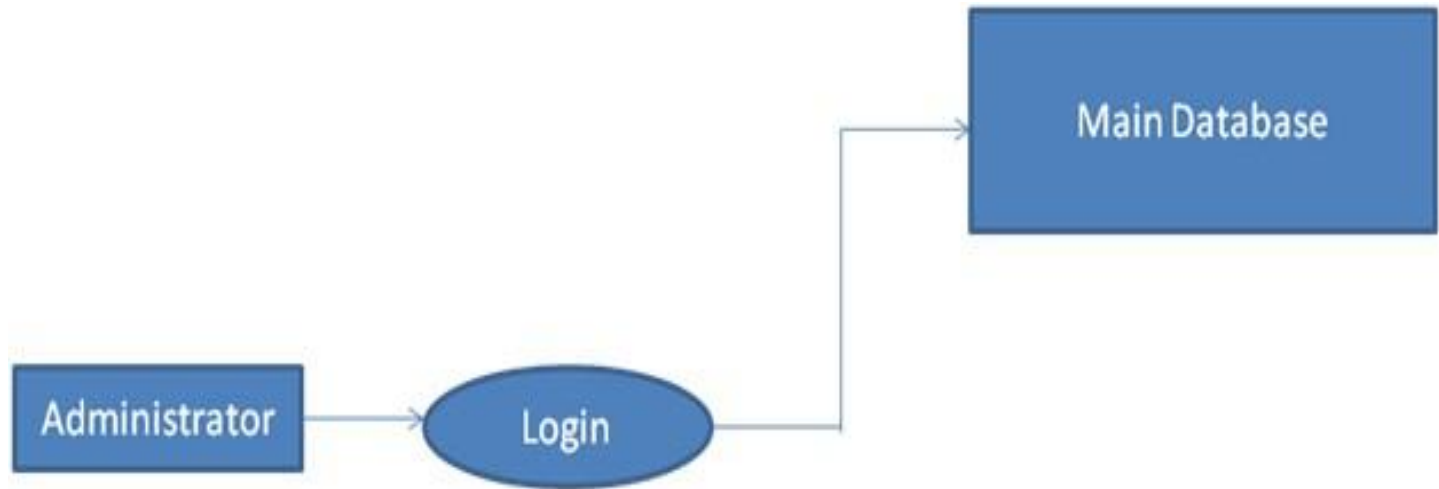
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- Data Flow Diagram
 - Use Case Diagram
 - Class Diagram
 - Sequence Diagram
 - Activity Diagram

DATA LEAKAGE DETECTION



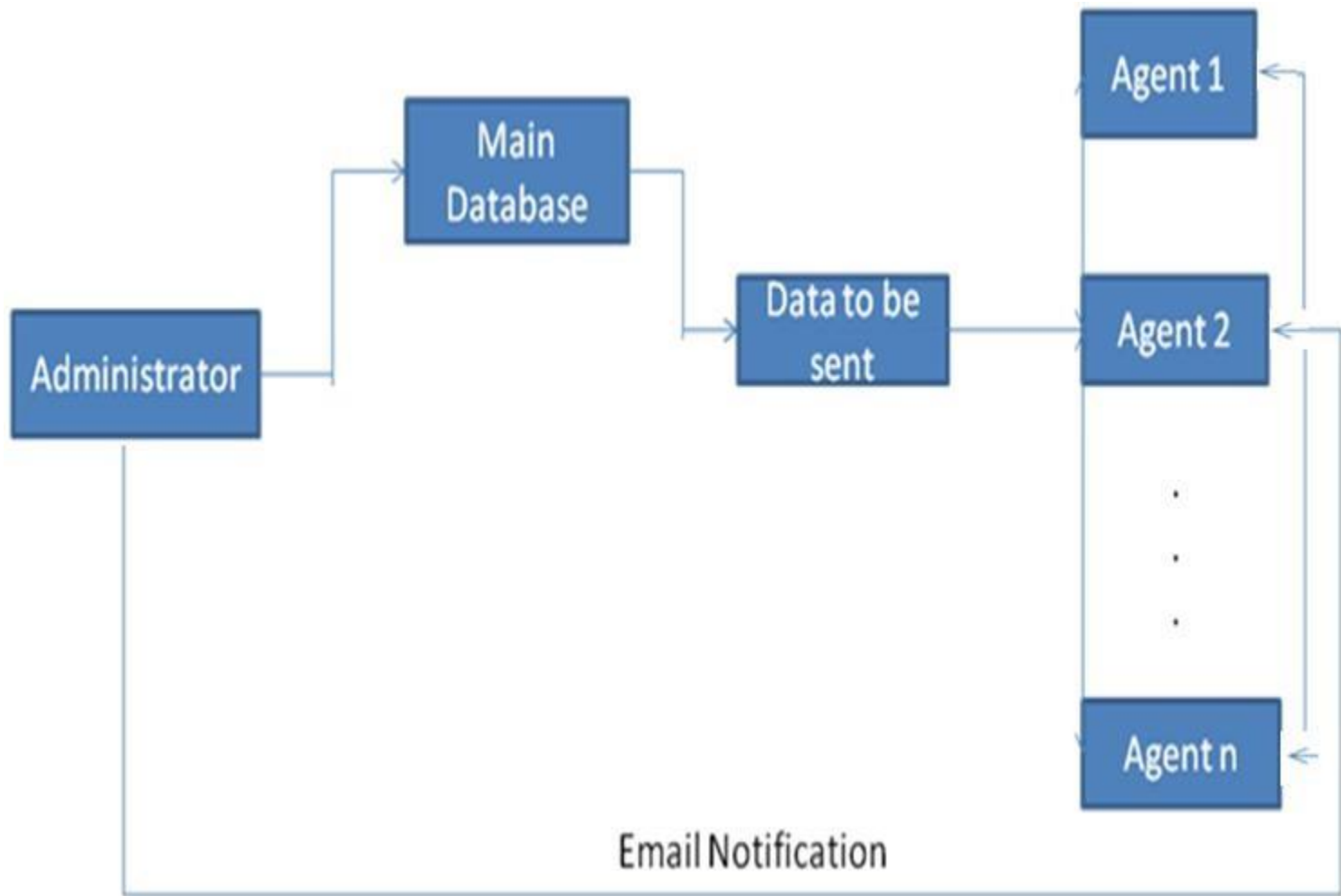
1. Data Flow Diagram

Level 0

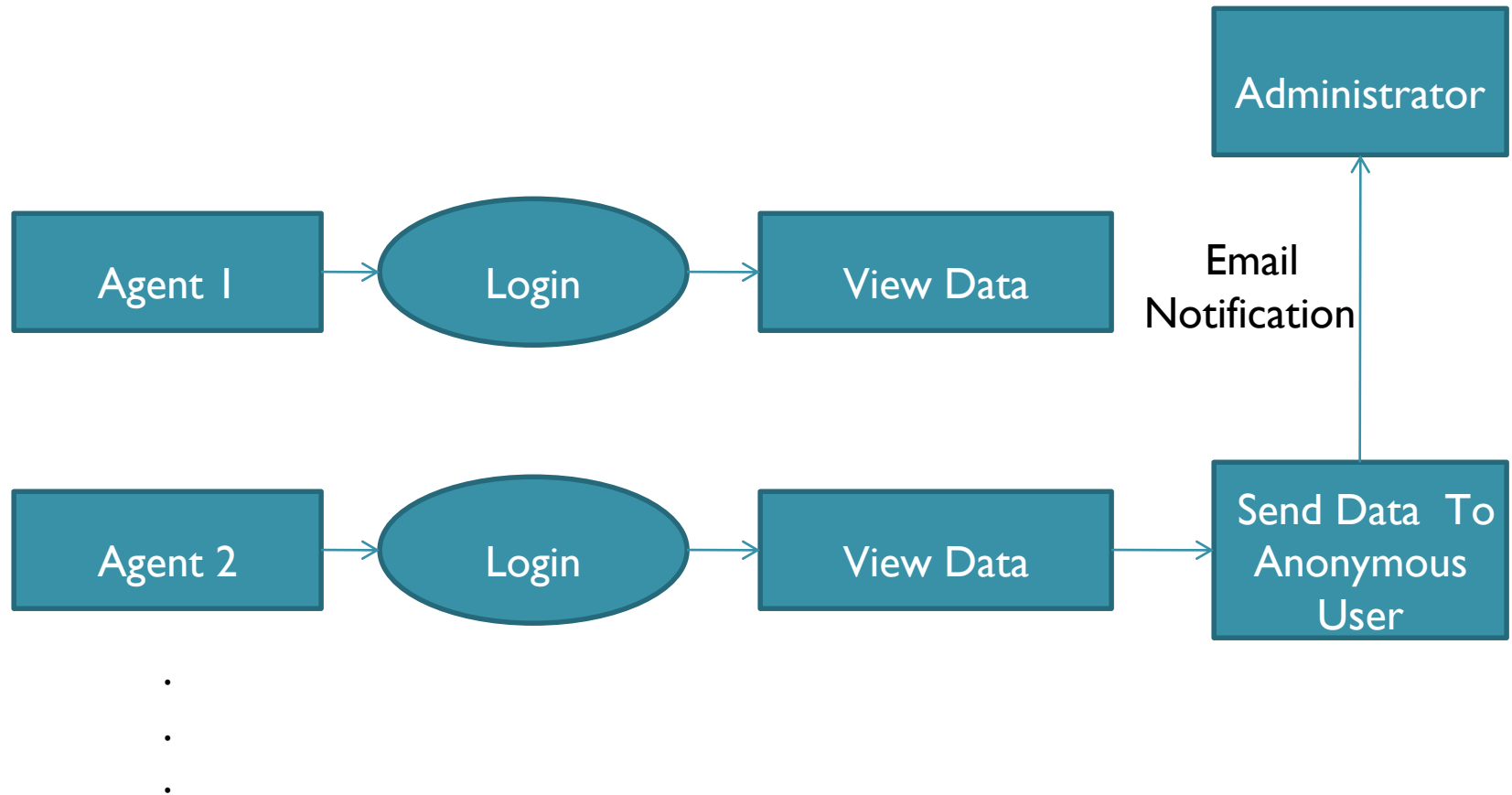




Level 1

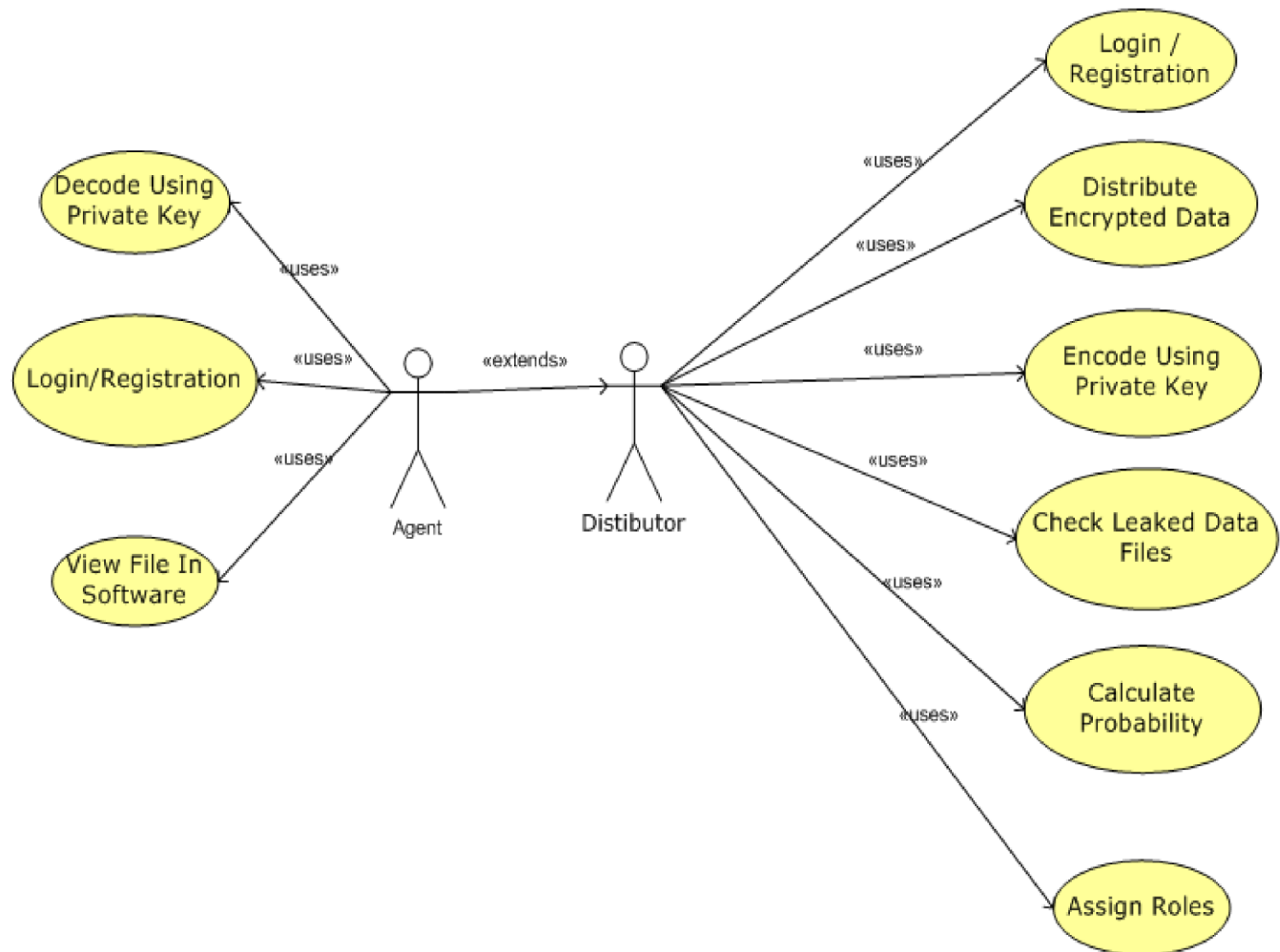


Level 2

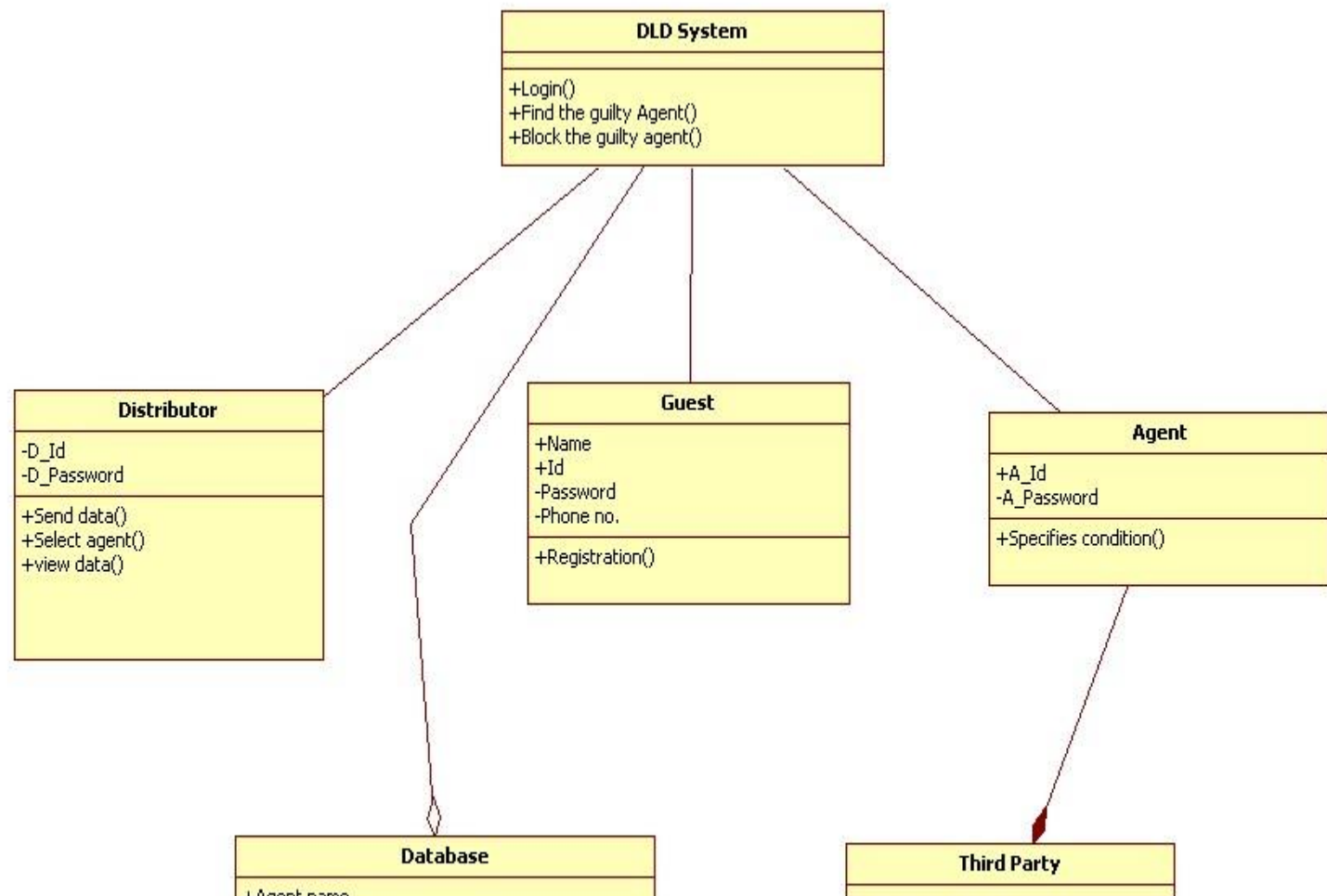




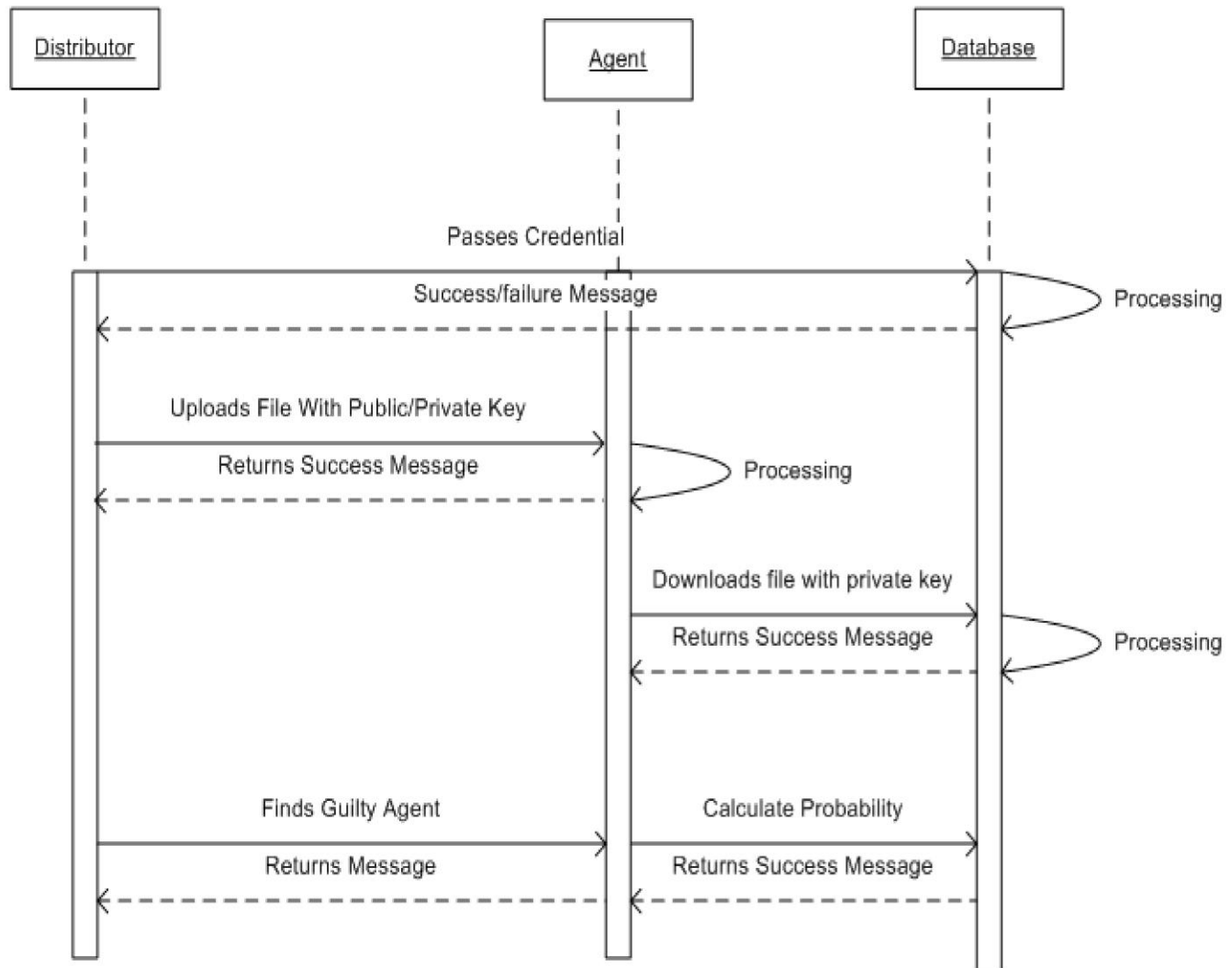
2. Use Case Diagram



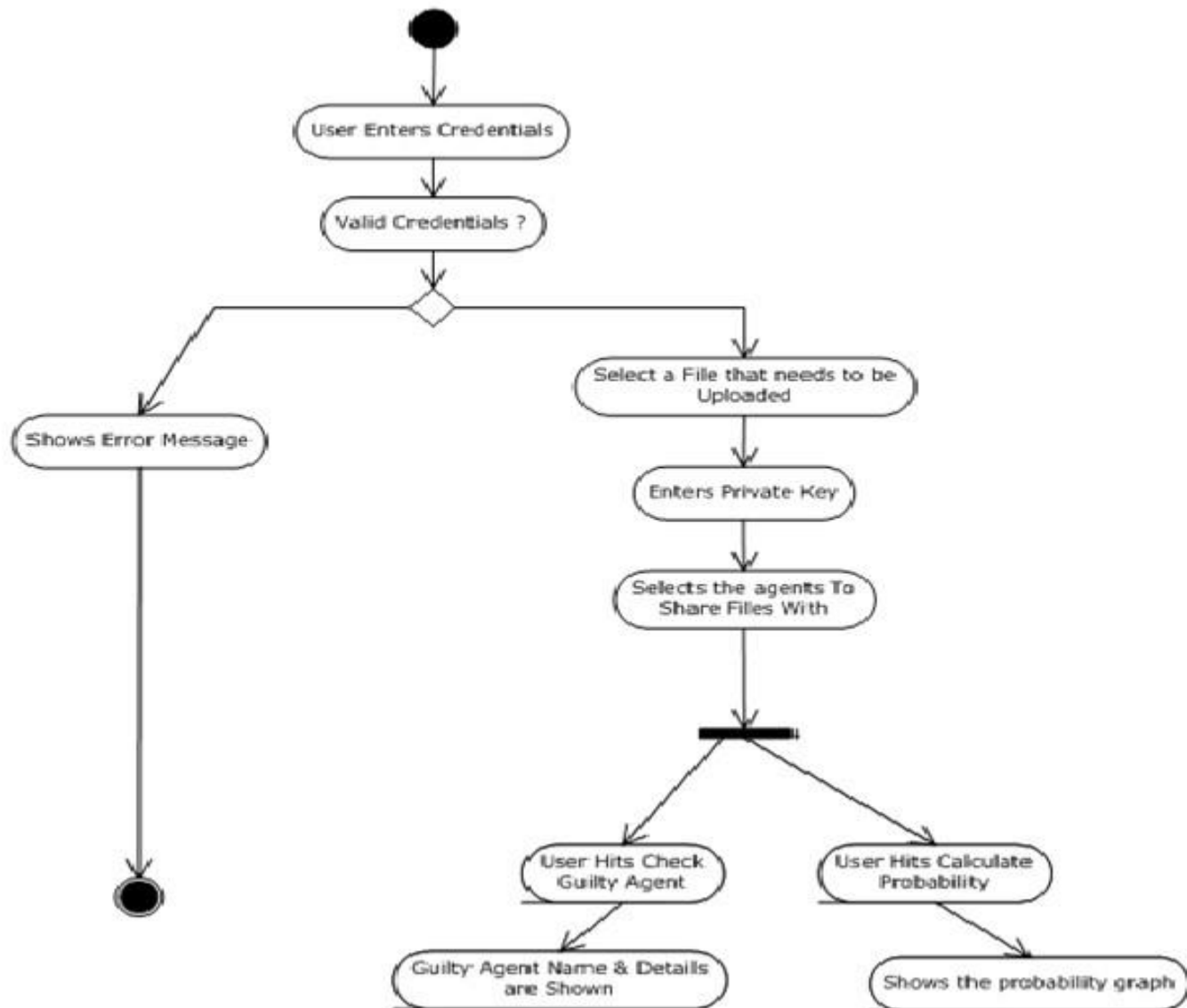
3.Class Diagram



4. Sequence Diagram



5. Activity Diagram






ADVANTAGES **ADVANTAGES**

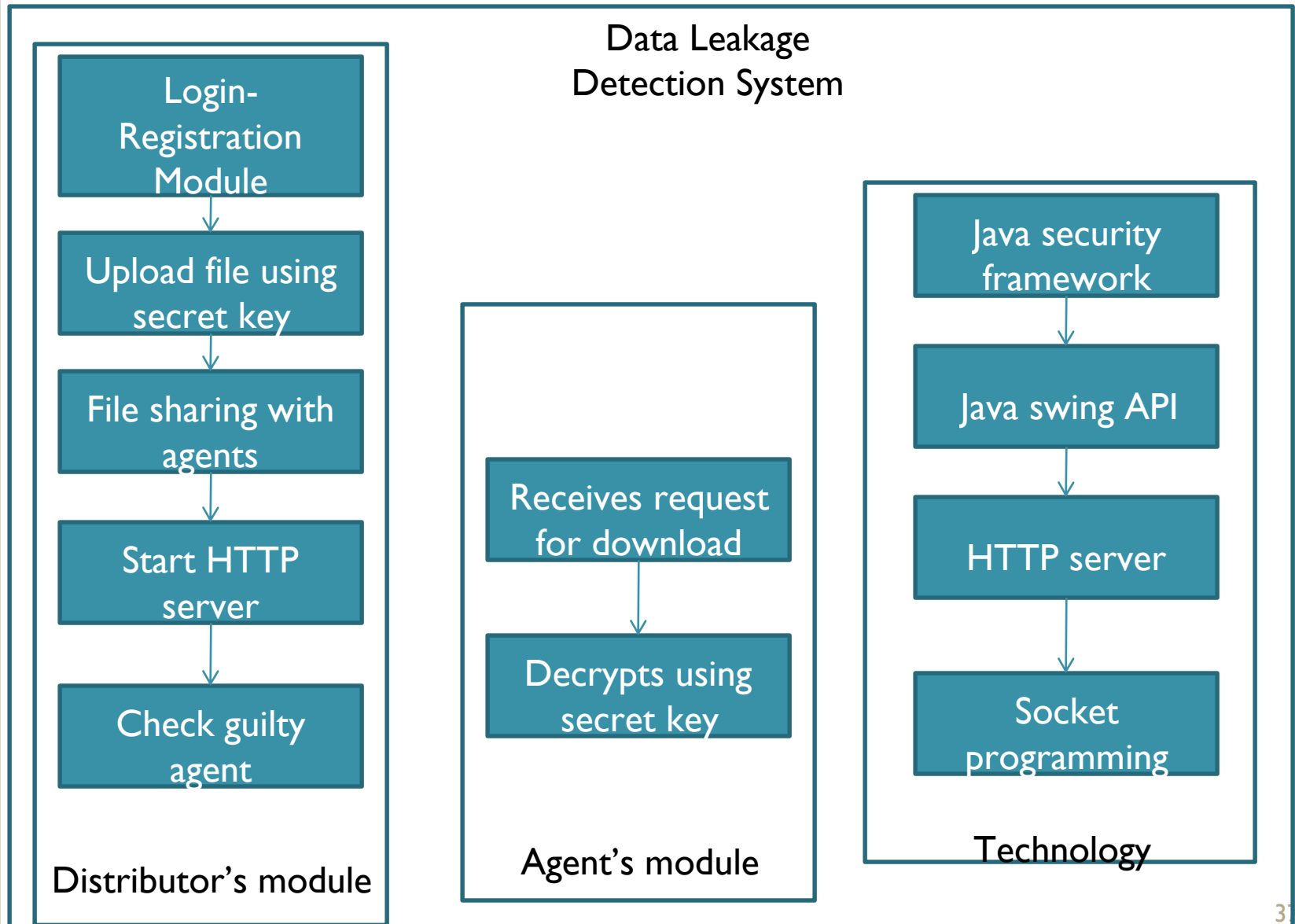
- This system includes the data hiding along with the provisional software with which only the data can be accessed.
- This system gives privileged access to the administrator (data distributor) as well as the agents registered by the distributors. Only registered agents can access the system. The user accounts can be activated as well as cancelled.
- The exported file will be accessed only by the system. The agent has given only the permission to access the software and view the data. If the data is leaked by the agent's system the path and agent information will be sent to the distributor thereby the identity of the leaked user can be traced.



FUTURE SCOPE **FUTURE SCOPE**

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- Currently, we are dealing with only text files in this project but in future we will try to deal with all types of files.
 - Recent research papers say that it is not possible to find the exact guilty agent who has leaked the data. Instead, we are finding out the probability of the agent being guilty or who has leaked the data through calculation of number of downloads.
 - For more security, we will also provide a verification code on the agent's mobile in future.

CONCLUSION





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THANK YOU...