Use Case Scenario for the P2P File Sharing System

The **P2P File Sharing System** allows authenticated users to securely transfer files while maintaining a log of transfers. Below are the key use cases and their scenarios:

1. User Authentication

Actor: User
Precondition: The user has an account.
Scenario:

1. The user enters login credentials.

2. The system verifies the credentials using JWT authentication.

3. Upon success, the user is granted access to the system.

4. If authentication fails, an error message is displayed.
   Postcondition: The user is logged in and can access the file-sharing features.

2. File Transfer

Actor: User
Precondition: Both sender and receiver are online.
Scenario:

1. The sender selects a file to transfer.

2. The system establishes a **P2P WebRTC connection** between sender and receiver.

3. The file transfer process begins.

4. The recipient receives a notification and confirms the transfer.

5. The system logs the transfer details (file name, size, timestamp).
   Postcondition: The file is successfully transferred and recorded in the system logs.

3. Transfer History Logging

Actor: System
Precondition: A file transfer must have occurred.
Scenario:

1. The system automatically logs each file transfer.

2. The log includes file name, size, sender, receiver, and timestamp.
   Postcondition: Transfer details are stored for future reference.

4. View Transfer History

Actor: User
Precondition: The user has completed at least one file transfer.
Scenario:

1. The user navigates to the "Transfer History" section.

2. The system retrieves and displays a list of past transfers.

3. The user can view details like file name, date, and recipient.
   Postcondition: The user can see past transfers.

5. Search Transfer Logs

Actor: User
Precondition: The user has completed at least one file transfer.
Scenario:

1. The user enters a search query (e.g., file name, date, recipient).

2. The system filters and displays matching logs.
   Postcondition: The user finds specific transfer records.

6. Download Confirmation

Actor: User
Precondition: The sender has shared a file.
Scenario:

1. The recipient receives a file transfer request.

2. The system prompts the recipient to confirm the download.

3. If confirmed, the file is received.
   Postcondition: The recipient successfully downloads the file.

7. Drag-and-Drop Upload

Actor: User
Precondition: The user is logged in and, on the file-sharing interface.
Scenario:

1. The user drags and drops a file into the upload section.

2. The system detects and processes the file for transfer.
   Postcondition: The file is ready to be sent.

8. File Preview

Actor: User
Precondition: The user has selected a file to send.
Scenario:

1. The user previews the file before sending.

2. The system displays a preview (e.g., image or text snippet).

3. The user confirms and proceeds with the transfer.
   Postcondition: The user is assured of the correct file before transfer.

9. Session Persistence

Actor: System
Precondition: The user is logged in, and a file transfer is ongoing.
Scenario:

1. The system continuously monitors the session state.

2. If a connection is lost, the system attempts to resume the transfer.
   Postcondition: The user experiences a seamless transfer despite connection issues.

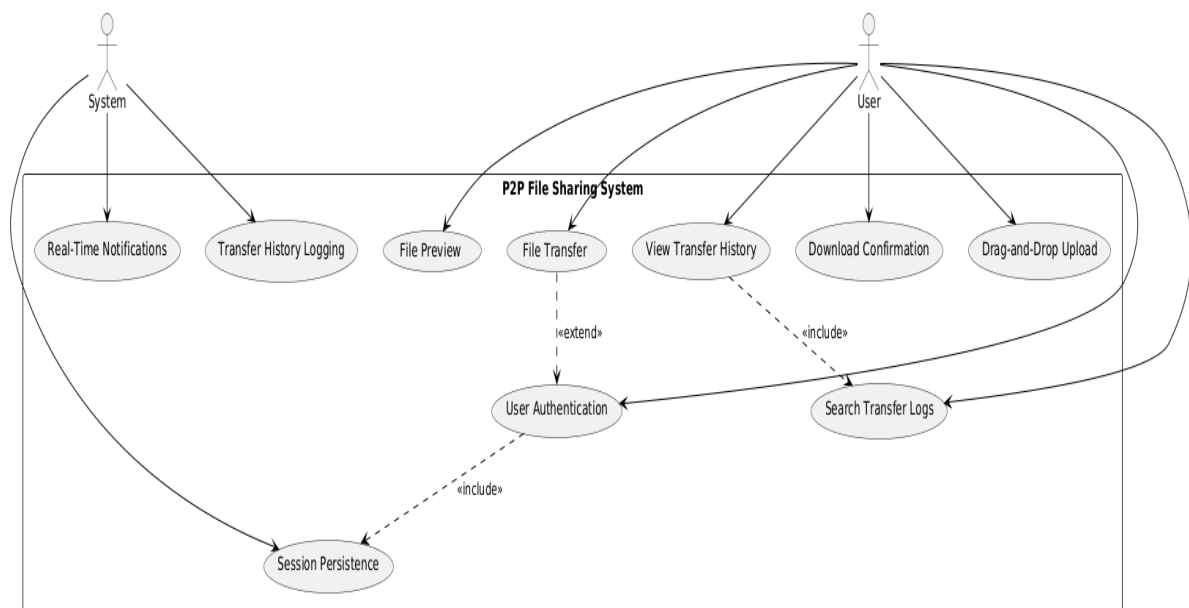## 10. Real-Time Notifications

Actor: System
Precondition: A file transfer event occurs.
Scenario:

1. The system sends a **real-time notification** for transfer status (e.g., "Transfer Started," "Transfer Completed").

2. The user receives pop-up or in-app alerts.
   Postcondition: Users stay informed about transfer progress.

Use Case Diagram

Tabular Representation of Actors and Use Cases

Actor	Use Case	Description
User	User Authentication	Logs in to the system using credentials.
User	File Transfer	Sends and receives files over a P2P connection.
System	Transfer History Logging	Automatically logs file transfer details.
User	View Transfer History	Views a list of previously transferred files.
User	Search Transfer Logs	Searches specific file transfer records.
User	Download Confirmation	Confirms and downloads a received file.
User	Drag-and-Drop Upload	Uploads files by dragging and dropping.
User	File Preview	Previews files before sending.
System	Session Persistence	Maintains session state for active users.
System	Real-Time Notifications	Sends notifications for file transfer updates.

Conclusion:

This **Use Case Scenario** covers user interactions with the **P2P File Sharing System**, ensuring smooth authentication, file transfers, history tracking, and session management.