

REACT JS



# WEBSOCKETS USING REACT



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# WHAT ARE WEBSOCKETS?

WebSockets are a protocol used for real-time, interactive communication between a client (like a web browser) and a server. Unlike HTTP, a one-way request-response model, WebSockets use a bidirectional, full-duplex connection. This means that once a WebSocket connection is established, the client and the server can send messages to each other at any time, without repeatedly requesting information or polling the server.

Here's a brief rundown:

- **Initiation:** Starts with a handshake using ws:/ or wss:/ in the URL.
- **Communication:** The connection stays open for continuous, two-way data exchange, more efficient than HTTP.
- **Lifecycle:** Remains active until either side closes it; both are notified when it terminates.



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# SETTING UP A WEBSOCKET SERVER IN NODE

```
server.ts

import WebSocket, { WebSocketServer } from 'ws'; ✖

const wss = new WebSocketServer({ port: 8080 });

wss.on('connection', (ws: WebSocket) => {
  console.log('New client connected');

  ws.on('message', (message: string) => {
    console.log(`Received message: ${message}`);
    ws.send(`Echo: ${message}`);
  });

  ws.on('close', () => {
    console.log('Client disconnected');
  });
});
```



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## Explanation:

- WebSocketServer creates a WebSocket server on port 8080.
- WebSocket is a type for the socket.
- connection event triggers when a client connects.
- message event handles incoming messages and sends an echo back to the client.
- close event handles disconnections.



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WebSocketComponent.tsx

```
import React, { useEffect, useState } from 'react';

const WebSocketComponent: React.FC = () => {
  const [message, setMessage] = useState<string>('');
  const [ws, setWs] = useState<WebSocket | null>(null);

  useEffect(() => {
    const socket = new WebSocket('ws://localhost:8080');
    setWs(socket);

    socket.onmessage = (event) => {
      setMessage(event.data);
    };

    return () => {
      socket.close();
    };
  }, []);

  const sendMessage = () => {
    if (ws) {
      ws.send('Hello Server!');
    }
  };

  return (
    <div>
      <button onClick={sendMessage}>Send Message</button>
      <p>Message from server: {message}</p>
    </div>
  );
};

export default WebSocketComponent;
```

**Explanation:**

- `useEffect` sets up the WebSocket connection when the component mounts.
- `ws.onmessage` handles incoming messages.
- `sendMessage` function sends a message to the server.
- Cleanup: WebSocket is closed when the component unmounts, return in `useEffect` is run when a component unmounts.



```
WebSocketComponent.tsx

import React, { useEffect, useState } from 'react';

const WebSocketComponent: React.FC = () => {
  const [message, setMessage] = useState<string>('');
  const [ws, setWs] = useState<WebSocket | null>(null);
  const [error, setError] = useState<string>('');

  useEffect(() => {
    const connect = () => {
      const socket = new WebSocket('ws://localhost:8080');
      setWs(socket);

      socket.onmessage = (event) => {
        setMessage(event.data);
      };

      socket.onerror = (event) => {
        setError('WebSocket error');
      };

      socket.onclose = () => {
        setError('WebSocket closed, trying to reconnect...');
        setTimeout(connect, 3000); // Reconnect after 3 seconds
      };
    };

    connect();

    return () => {
      if (ws) {
        ws.close();
      }
    };
  }, [ws]);

  const sendMessage = () => {
    if (ws) {
      ws.send('Hello Server!');
    }
  };

  return (
    <div>
      <button onClick={sendMessage}>Send Message</button>
      <p>Message from server: {message}</p>
      <p>Error: {error}</p>
    </div>
  );
};

export default WebSocketComponent;
```

### Explanation:

- Error Handling: `socket.onerror` captures WebSocket errors.
- Reconnection: `socket.onclose` triggers reconnection logic after a short delay.



# THANK YOU FOR READING

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