readme.md for @push.rocks/smartsocket

Easy and secure WebSocket communication with native WebSocket support □□

Features

- □□ **Native WebSocket** - Uses native WebSocket API (browser) and `ws` library (Node.js)
- □□ **Auto Reconnection** - Exponential backoff with configurable retry limits
- □□ **RPC-style Function Calls** - Define and call functions across server/client
- □□ **Connection Tagging** - Tag connections for easy identification and routing
- □□ **Smartserve Integration** - Works seamlessly with `@push.rocks/smartserve`
- □□ **Secure Communication** - WSS support for encrypted connections

Issue Reporting and Security

For reporting bugs, issues, or security vulnerabilities, please visit community.foss.global/. This is the central community hub for all issue reporting. Developers who sign and comply with our contribution agreement and go through identification can also get a code.foss.global/ account to submit Pull Requests directly.

Install

```
npm install @push.rocks/smartsocket --save
```

or with pnpm:

```
pnpm add @push.rocks/smartsocket
```

Usage

Quick Start - Server

```
import { Smartsocket, SocketFunction } from '@push.rocks/smartsocket';

// Create server
const server = new Smartsocket({
  alias: 'myServer',
  port: 3000
});

// Define a function that clients can call
const greetFunction = new SocketFunction({
  funcName: 'greet',
  funcDef: async (data, socketConnection) => {
    console.log(`Received greeting from ${data.name}`);
    return { message: `Hello, ${data.name}!` };
  }
});

server.addSocketFunction(greetFunction);

// Start the server
await server.start();
console.log('WebSocket server running on port 3000');
```

Quick Start - Client

```
import { SmartsocketClient } from '@push.rocks/smartsocket';

// Create client
const client = new SmartsocketClient({
  url: 'http://localhost',
  port: 3000,
  alias: 'myClient',
```

```
  autoReconnect: true
});

// Connect to server
await client.connect();

// Call server function
const response = await client.serverCall('greet', { name: 'Alice' });
console.log(response.message); // "Hello, Alice!"
```

Connection Options

The `SmartsocketClient` supports several configuration options:

```
const client = new SmartsocketClient({
  url: 'http://localhost',           // Server URL (http/https)
  port: 3000,                         // Server port
  alias: 'myClient',                  // Client identifier
  autoReconnect: true,                // Auto-reconnect on disconnect
  maxRetries: 100,                    // Max reconnection attempts (default: 100)
  initialBackoffDelay: 1000,          // Initial backoff in ms (default: 1000)
  maxBackoffDelay: 60000              // Max backoff in ms (default: 60000)
});
```

Two-Way Function Calls

Both server and client can define and call functions on each other:

```
// Server calling client
const clientFunction = new SocketFunction({
  funcName: 'clientTask',
  funcDef: async (data) => {
    return { result: 'Task completed' };
  }
});

// On client
client.addSocketFunction(clientFunction);
```

```
// On server - call the client
const socketConnection = server.socketConnections.findSync(conn => conn.alias === 'myClient');
const result = await server.clientCall('clientTask', { task: 'doSomething' },
socketConnection);
```

Connection Tagging

Tag connections to identify and group them:

```
// On client
await client.addTag({
  id: 'role',
  payload: 'admin'
});

// On server - find tagged connections
const adminConnections = server.socketConnections.getArray().filter(async conn => {
  const tag = await conn.getTagById('role');
  return tag?.payload === 'admin';
});

// Server can also tag connections
await socketConnection.addTag({
  id: 'verified',
  payload: true
});
```

Integration with Smartserve

Use smartsocket with `@push.rocks/smartserve` for advanced HTTP/WebSocket handling:

```
import { SmartServe } from '@push.rocks/smartserve';
import { Smartsocket } from '@push.rocks/smartsocket';

// Create smartsocket without a port (hooks mode)
const smartsocket = new Smartsocket({ alias: 'myServer' });
```

```
// Get WebSocket hooks and pass them to SmartServe
const wsHooks = smartsocket.getSmartserveWebSocketHooks();
const smartserve = new SmartServe({
  port: 3000,
  websocket: wsHooks
});

// Add socket functions as usual
smartsocket.addSocketFunction(myFunction);

// Start smartserve (smartsocket hooks mode doesn't need start())
await smartserve.start();
```

Handling Disconnections

The client automatically handles reconnection with exponential backoff:

```
const client = new SmartsocketClient({
  url: 'http://localhost',
  port: 3000,
  alias: 'myClient',
  autoReconnect: true,
  maxRetries: 10,
  initialBackoffDelay: 500,
  maxBackoffDelay: 5000
});

// Listen for connection status changes
client.eventSubject.subscribe(status => {
  console.log('Connection status:', status);
  // Status can be: 'new', 'connecting', 'connected', 'disconnecting', 'timedOut'
});

await client.connect();

// Manually disconnect without auto-reconnect
await client.disconnect();

// Stop the client completely (disables auto-reconnect)
```

```
await client.stop();
```

Secure Connections (WSS)

For secure WebSocket connections, use HTTPS URLs:

```
const client = new SmartsocketClient({
  url: 'https://secure.example.com',  // HTTPS triggers WSS
  port: 443,
  alias: 'secureClient'
});
```

TypedRequest Integration

For strongly-typed RPC calls, define interfaces:

```
interface IGreetRequest {
  method: 'greet';
  request: { name: string };
  response: { message: string };
}

// Type-safe server call
const response = await client.serverCall<IGreetRequest>('greet', { name: 'Bob' });
// response is typed as { message: string }
```

API Reference

Smartsocket (Server)

Method	Description
`start()`	Start the WebSocket server (not needed in hooks mode)
`stop()`	Stop the server and close all connections
`addSocketFunction(fn)`	Register a function that clients can call

Method	Description
`clientCall(funcName, data, connection)`	Call a function on a specific client
`getSmartserveWebSocketHooks()`	Get hooks for smartserve integration

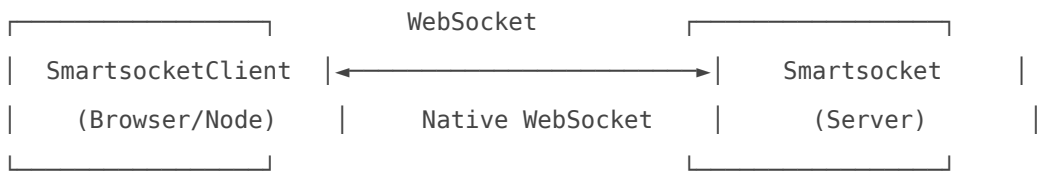
SmartsocketClient

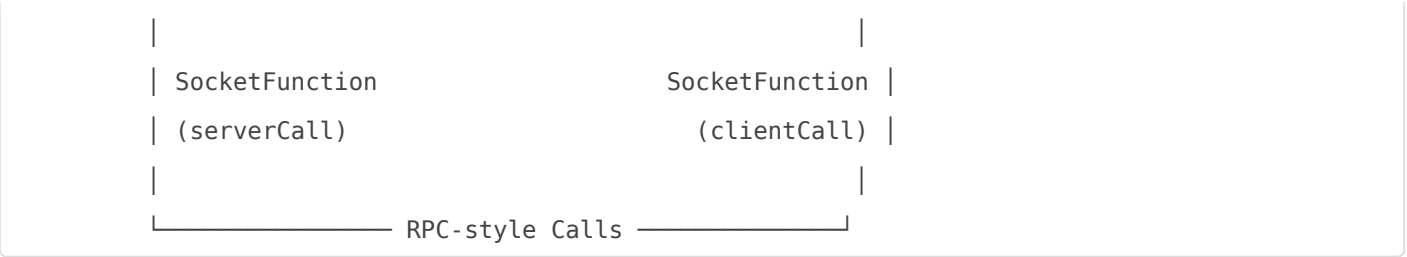
Method	Description
`connect()`	Connect to the server
`disconnect()`	Disconnect from the server
`stop()`	Disconnect and disable auto-reconnect
`serverCall(funcName, data)`	Call a function on the server
`addSocketFunction(fn)`	Register a function the server can call
`addTag(tag)`	Add a tag to the connection
`getTagById(id)`	Get a tag by its ID
`removeTagById(id)`	Remove a tag by its ID

SocketFunction

```
const fn = new SocketFunction({
  funcName: 'myFunction',
  funcDef: async (data, socketConnection) => {
    // data: the request payload
    // socketConnection: the calling connection
    return { result: 'response' };
  }
});
```

Architecture





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