**Intellectual Property Protection with Blockchain:**

The *IPRegistry* Solidity smart contract offers a decentralized solution for registering and managing intellectual property (IP) such as patents, designs, and creative works on the Ethereum blockchain.

**Admin Role:** The deployer becomes the admin with special privileges (e.g. revocation).

**IPAsset Struct:** Stores metadata about an IP asset (title, hash, owner, timestamp, active status).

**Mappings:**

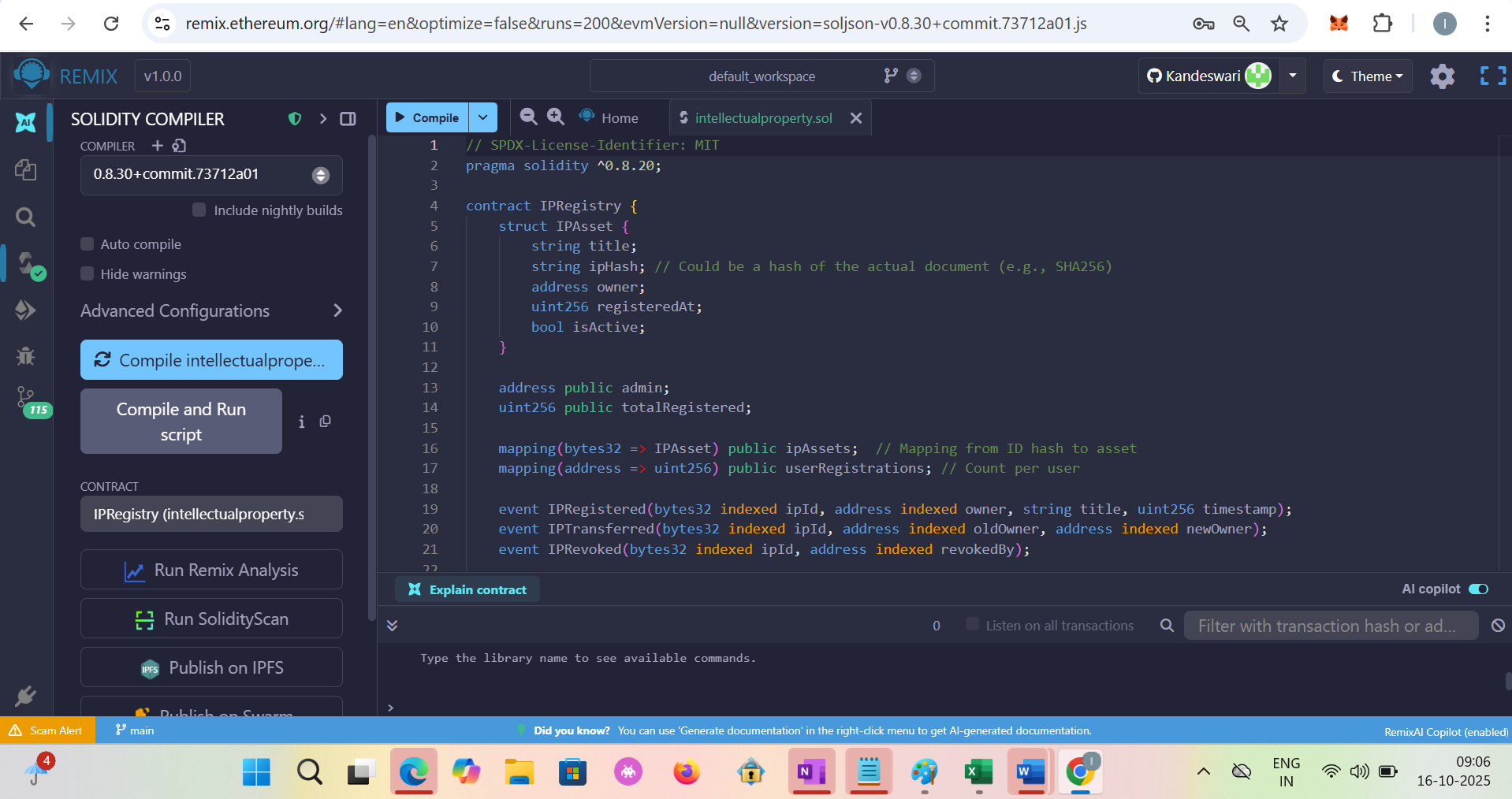
* ipAssets: Stores registered IPs using a unique ID.
* userRegistrations: Tracks how many IPs a user registered.

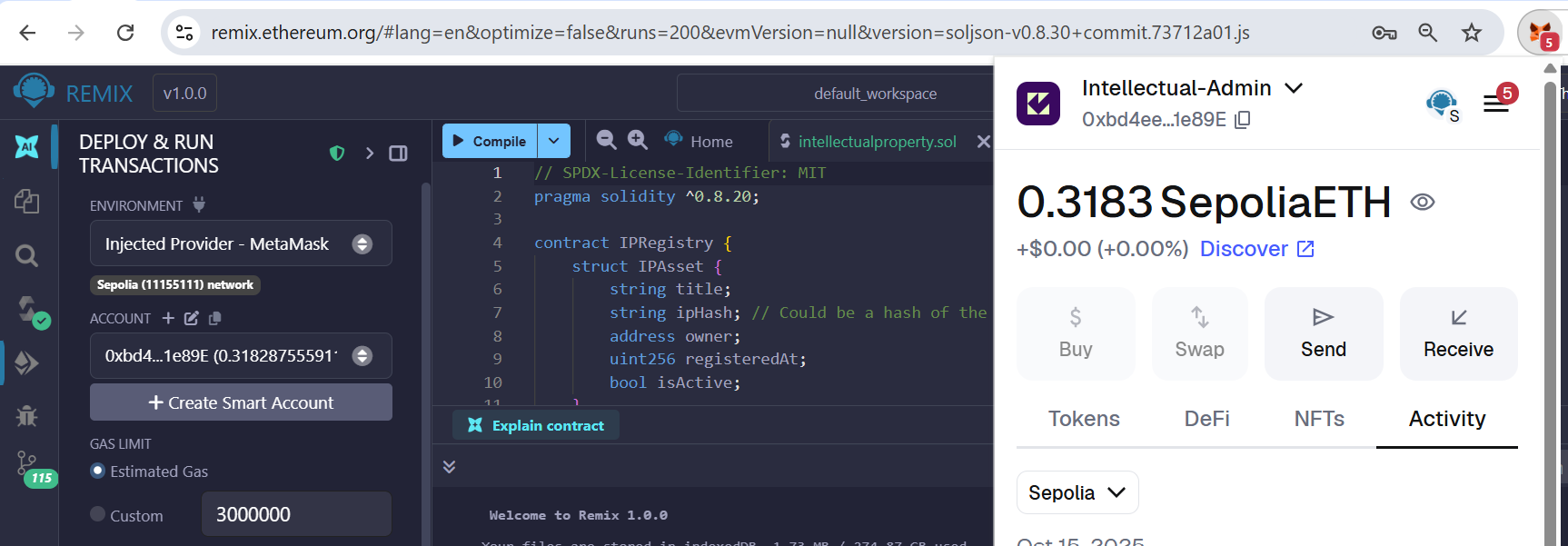
**Events:** Emit logs on registration, transfer, and revocation.

**Key Functions:**

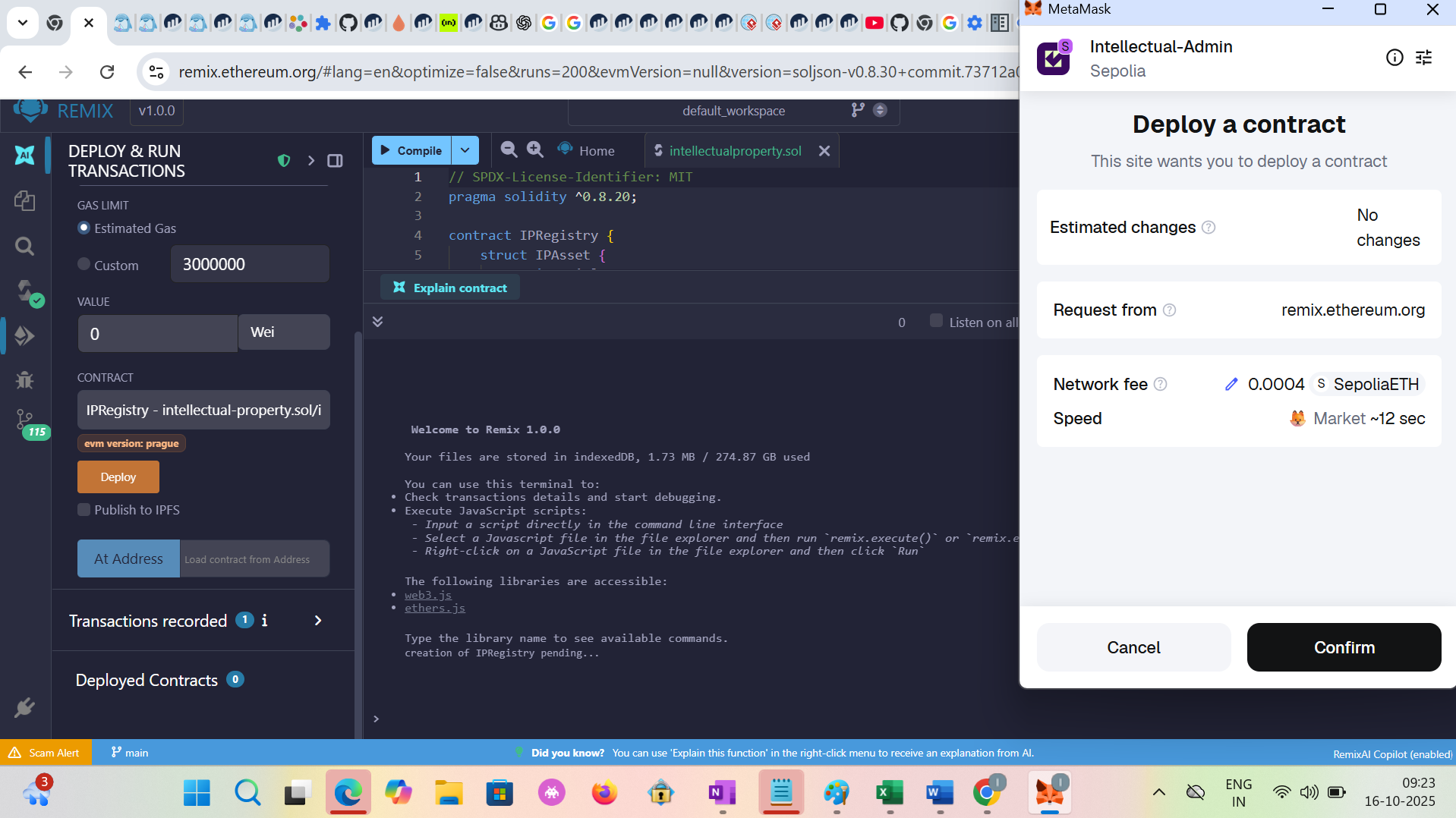
* registerIP: Registers a new IP with a generated ID.
* transferOwnership: Allows current owner to transfer ownership.
* revokeIP: Allows admin to deactivate an IP.
* getIPDetails: Public getter for all metadata.
* isIPActive: Public boolean checker for IP status.

Step by step: Environment has been loaded with Intellectual Admin and compile the contract on remix IDE.

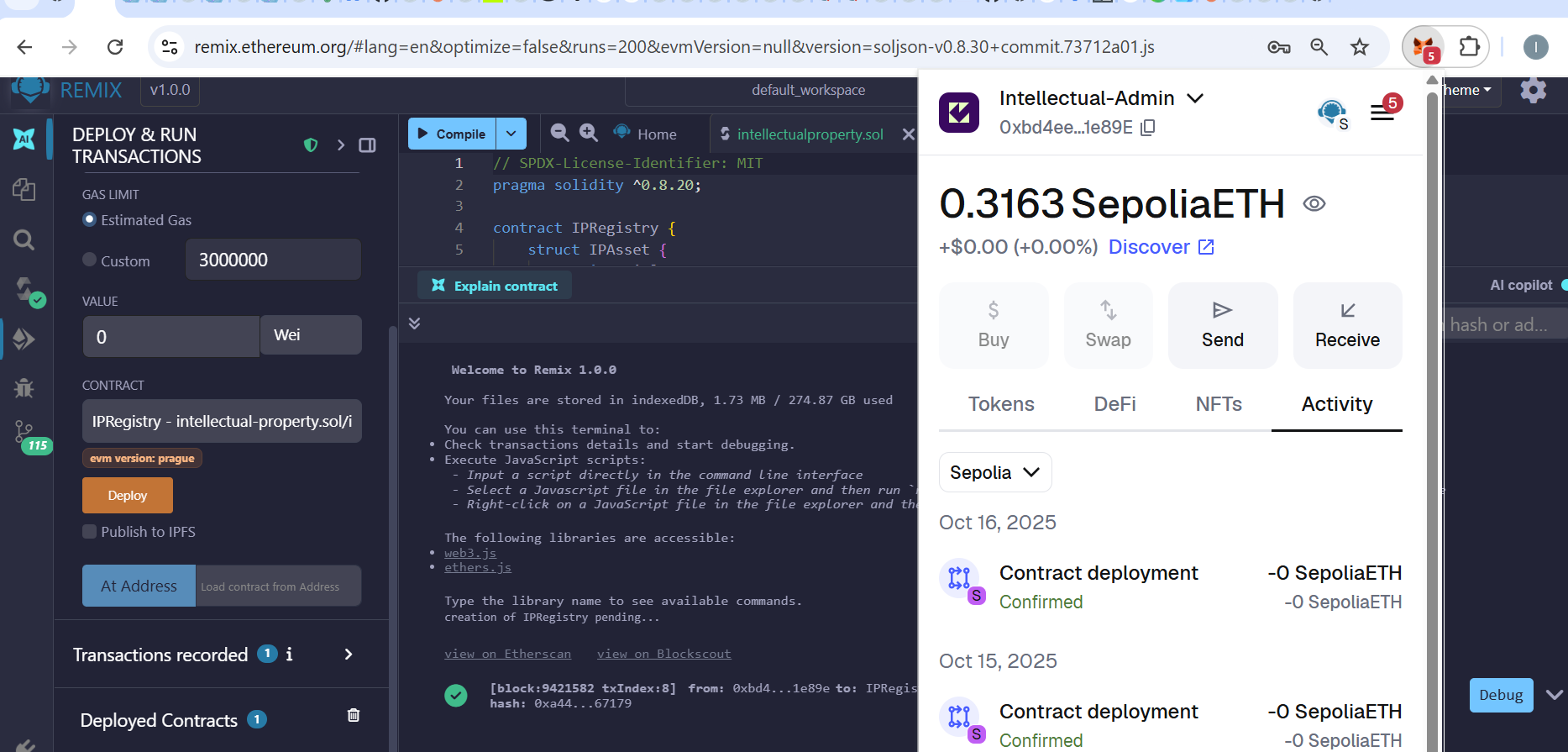




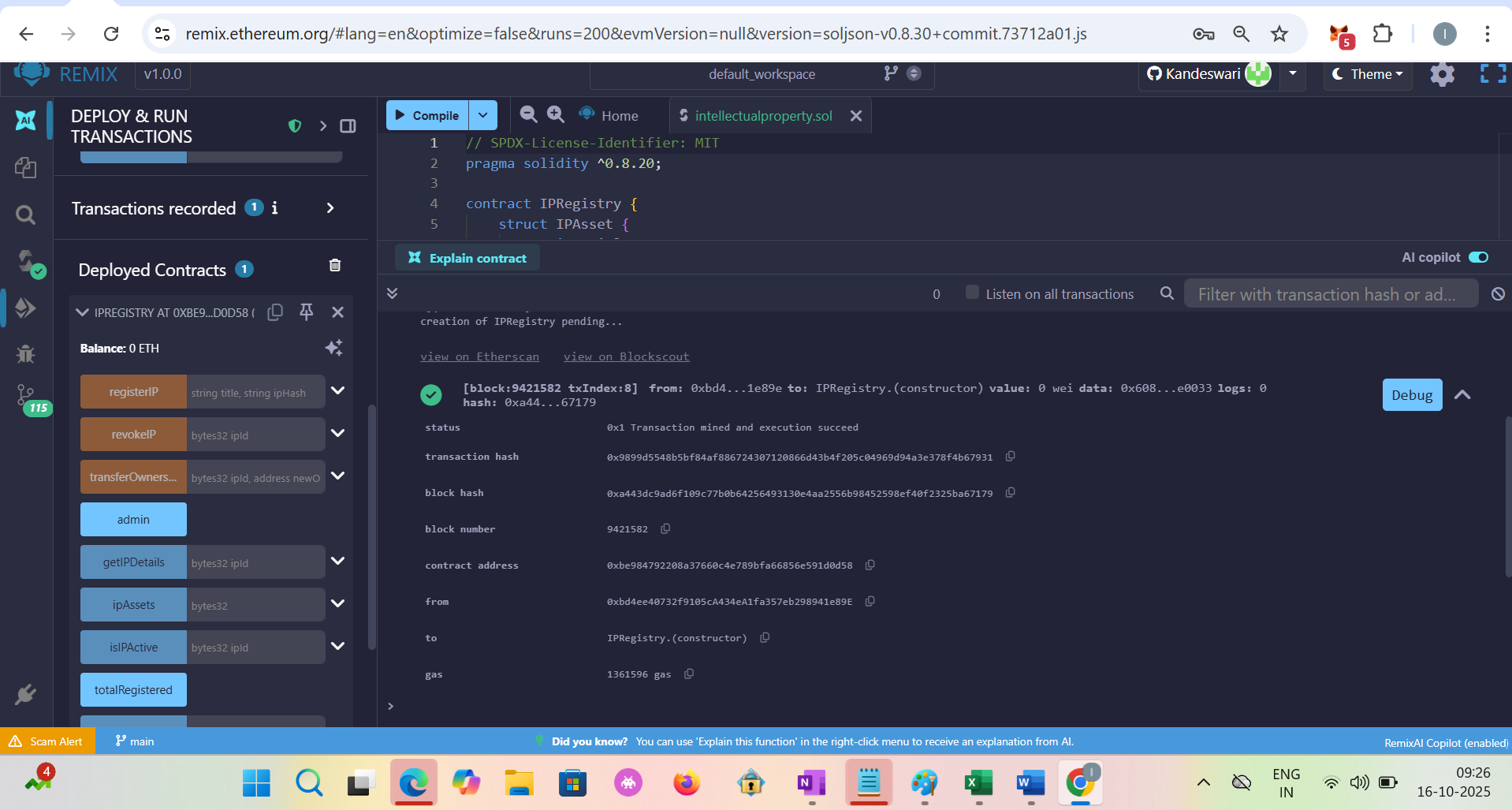
Deploy

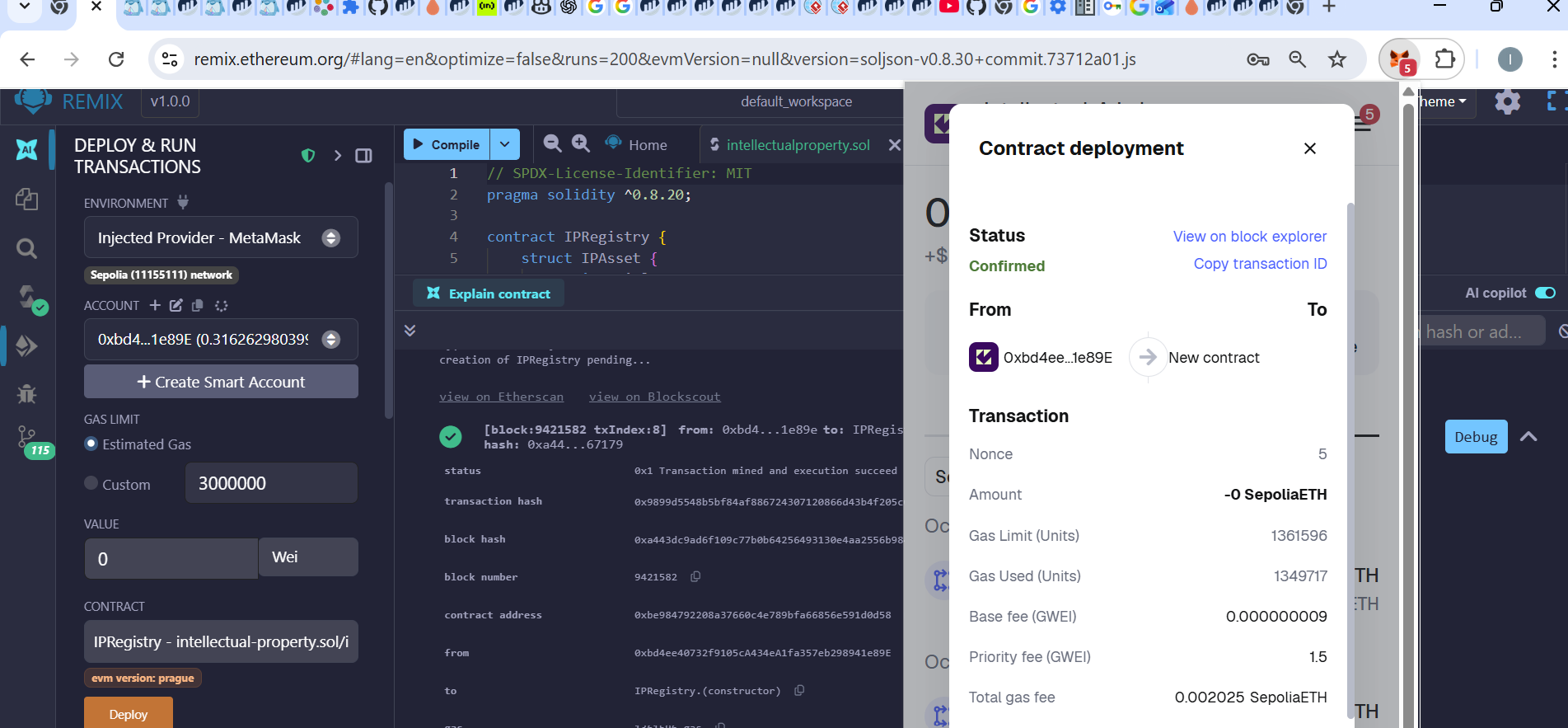


Deployment confirmed



[view on Etherscan](https://sepolia.etherscan.io/tx/0x9899d5548b5bf84af886724307120866d43b4f205c04969d94a3e378f4b67931) [view on Blockscout](https://eth-sepolia.blockscout.com/tx/0x9899d5548b5bf84af886724307120866d43b4f205c04969d94a3e378f4b67931)

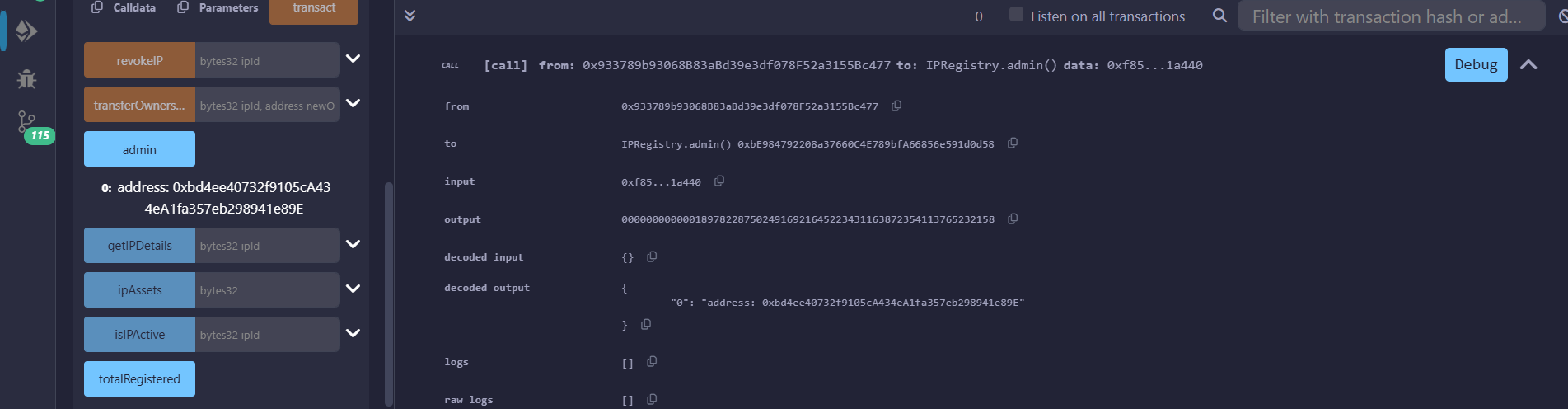


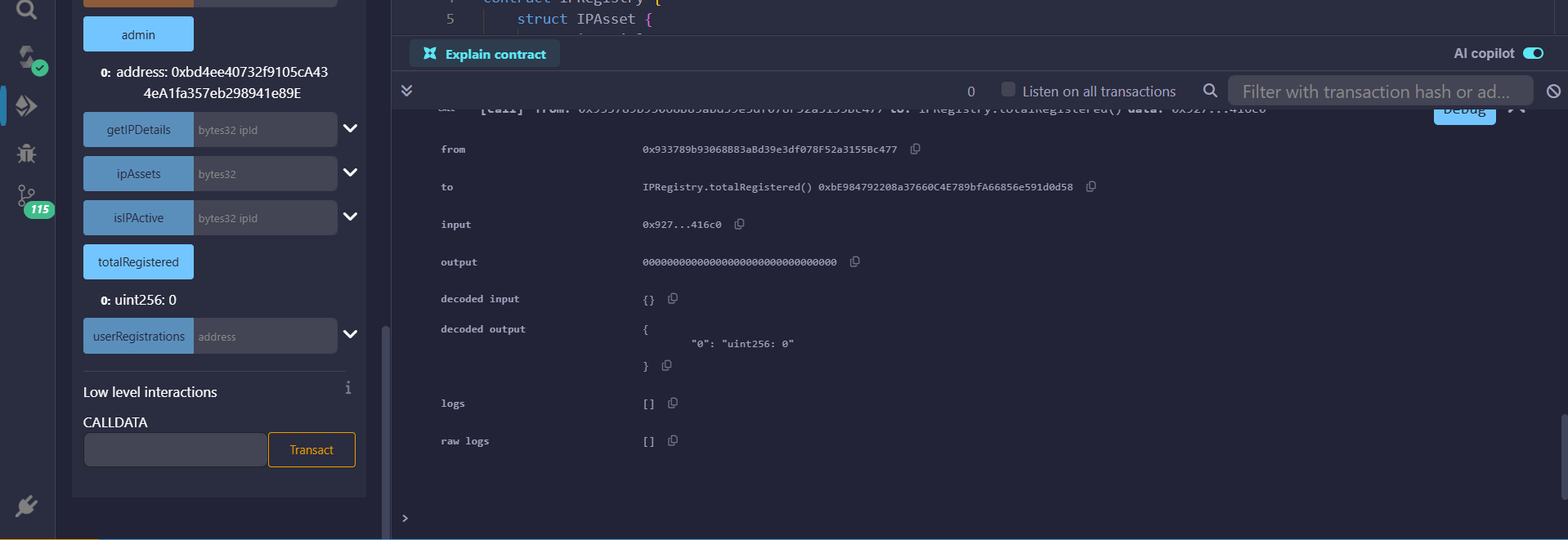


<https://sepolia.etherscan.io/tx/0x9899d5548b5bf84af886724307120866d43b4f205c04969d94a3e378f4b67931>

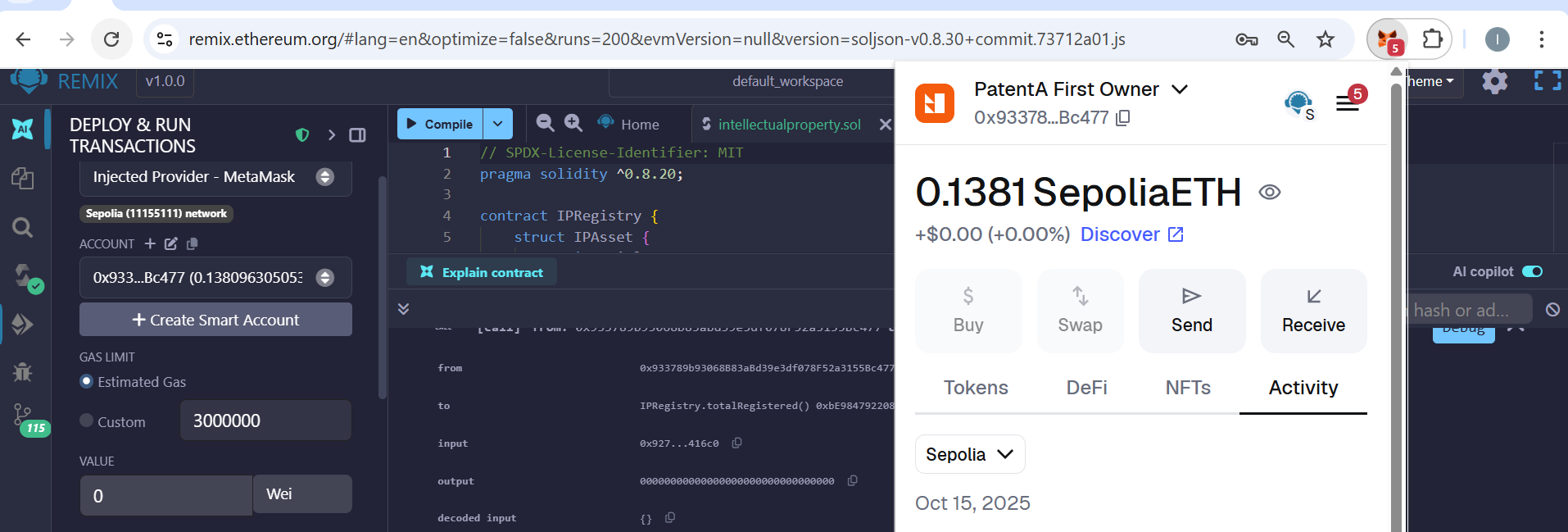


Transaction ID : 0x9899d5548b5bf84af886724307120866d43b4f205c04969d94a3e378f4b67931Admin has deployed the contract and initially no registrations



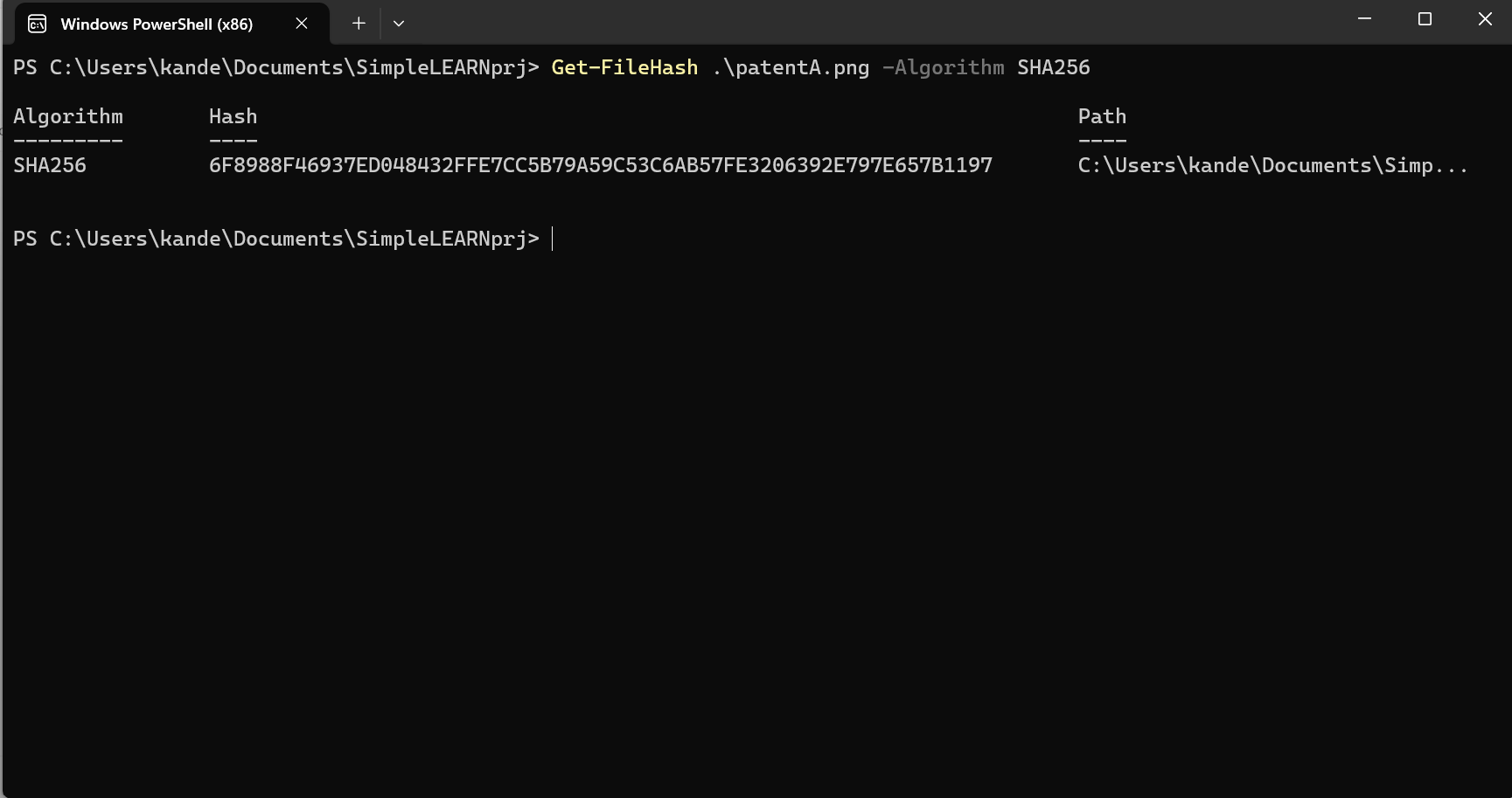


**RegisterIP:** Environment and MetaMask has been Loaded with first owner address



Consider patentA.png as a document.

Create hash for patentA.png



Use this as our input to register IP

registerIP("PatentA", " 6F8988F46937ED048432FFE7CC5B79A59C53C6AB57FE3206392E797E657B1197");

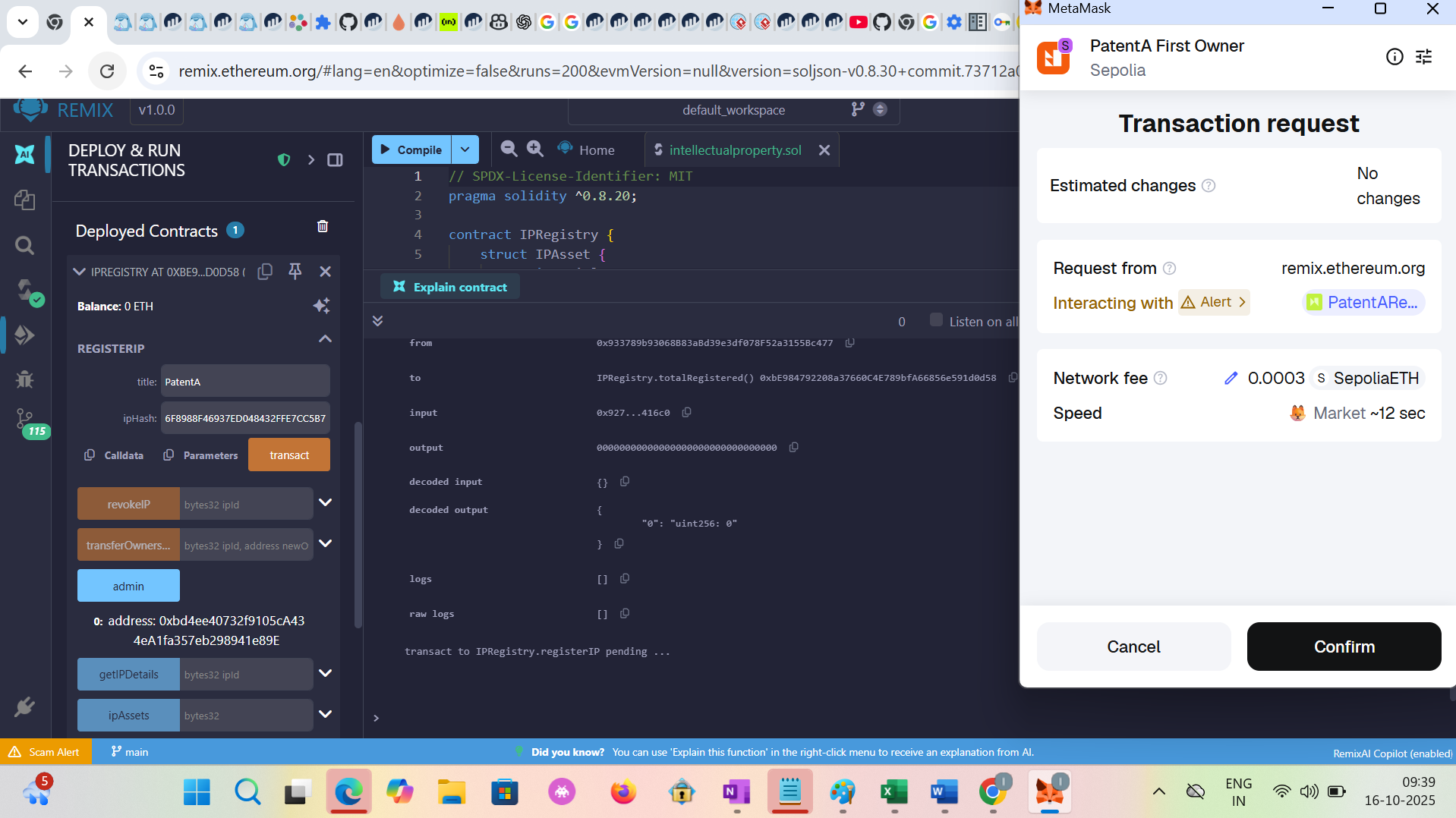
1. registerIP (string title, string ipHash)

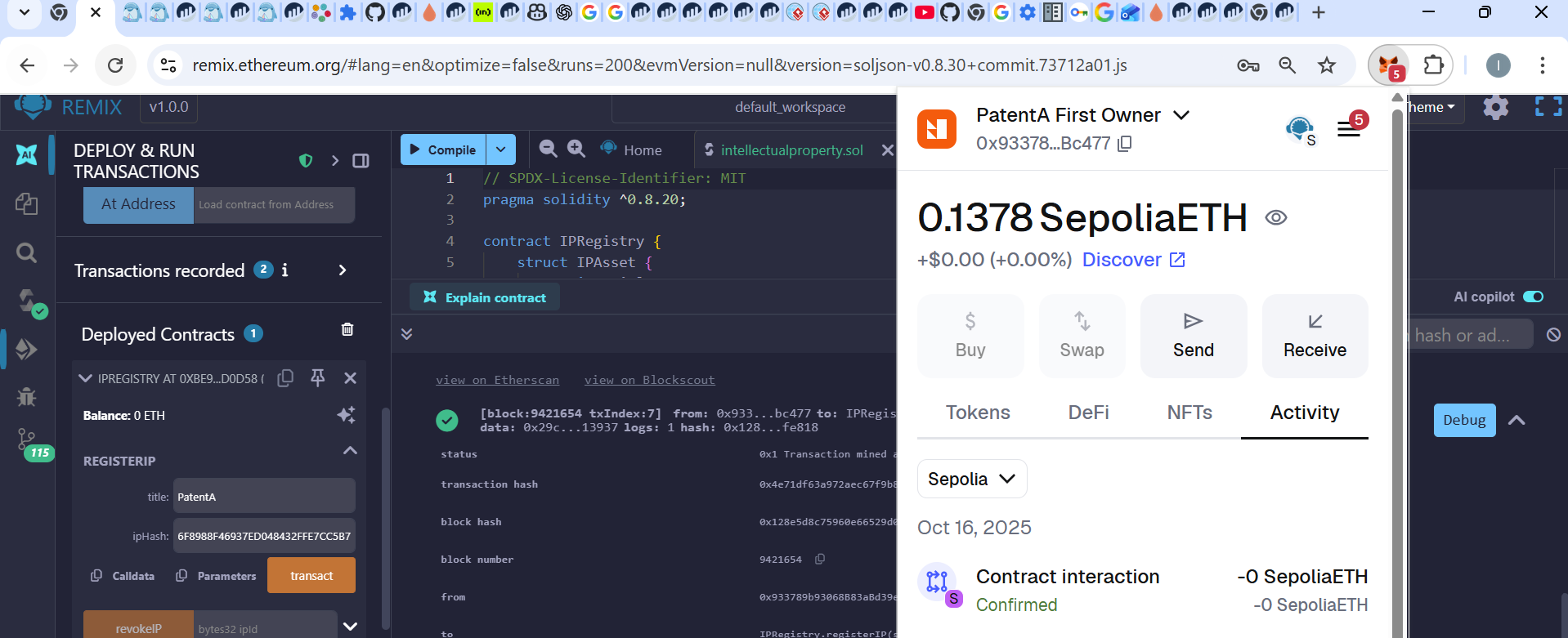
input :

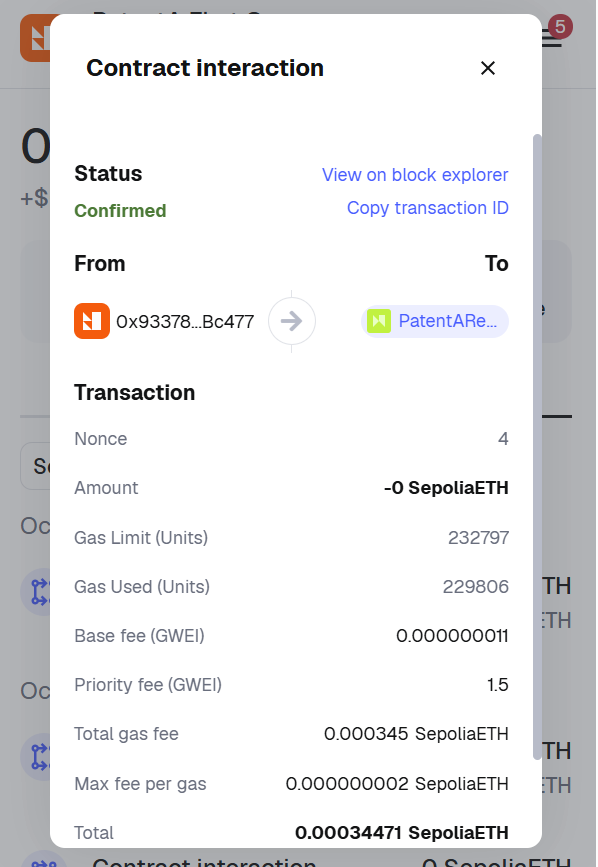
title: "Patent A"

ipHash: "6F8988F46937ED048432FFE7CC5B79A59C53C6AB57FE3206392E797E657B1197"

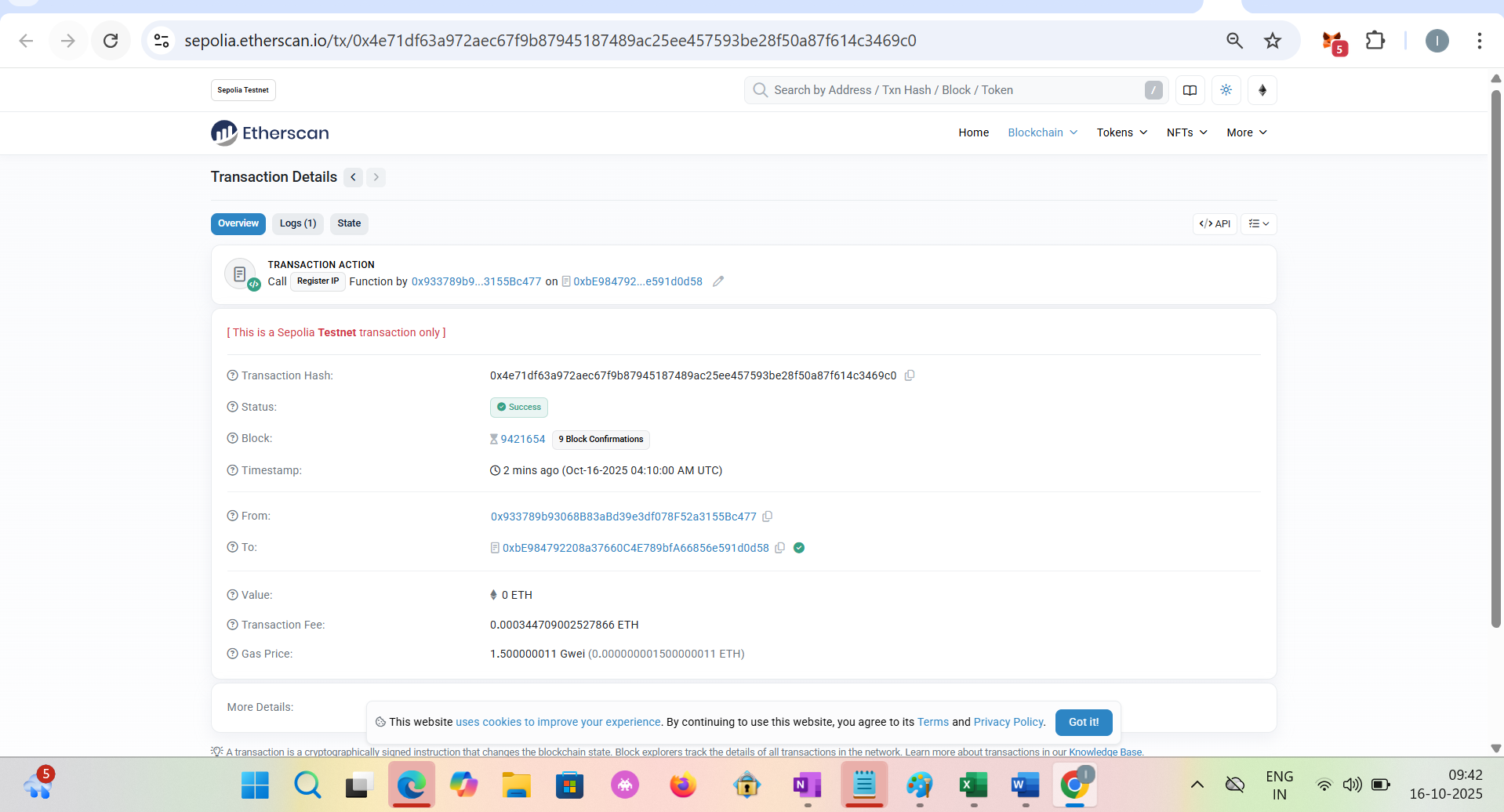
Click registerIP and confirm the transaction.







<https://sepolia.etherscan.io/tx/0x4e71df63a972aec67f9b87945187489ac25ee457593be28f50a87f614c3469c0>



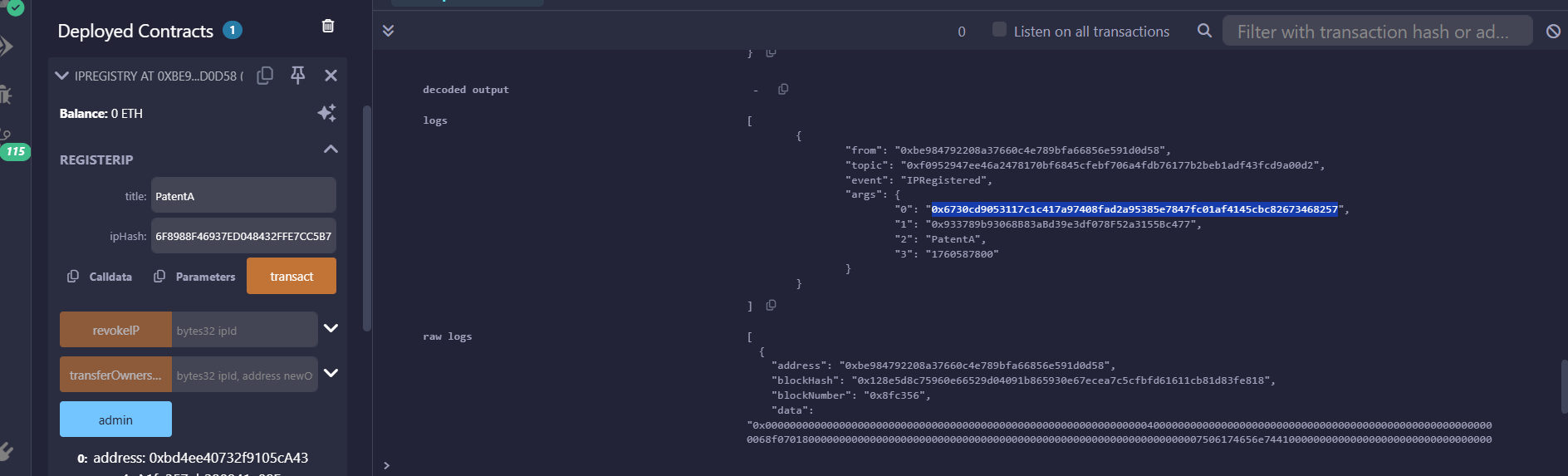
Transaction ID : 0x4e71df63a972aec67f9b87945187489ac25ee457593be28f50a87f614c3469c0

[view on Etherscan](https://sepolia.etherscan.io/tx/0x4e71df63a972aec67f9b87945187489ac25ee457593be28f50a87f614c3469c0) [view on Blockscout](https://eth-sepolia.blockscout.com/tx/0x4e71df63a972aec67f9b87945187489ac25ee457593be28f50a87f614c3469c0)

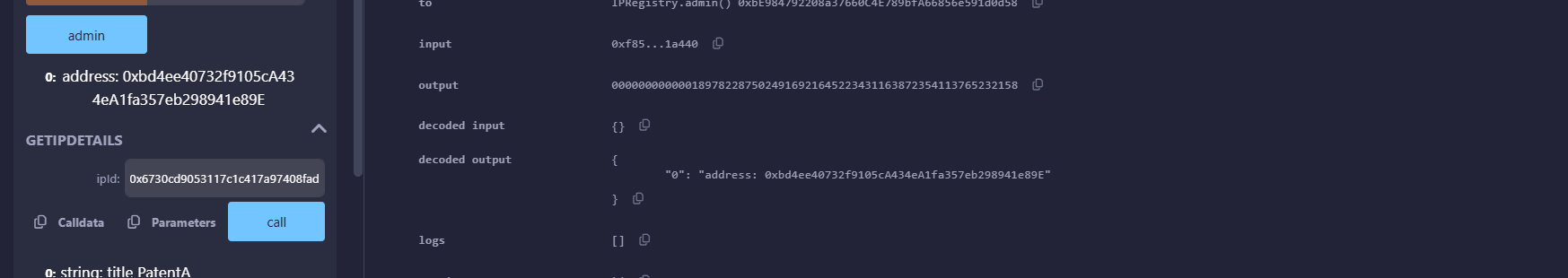
|  |  |
| --- | --- |
| **status** | 0x1 Transaction mined and execution succeed |
| **transaction hash** | 0x4e71df63a972aec67f9b87945187489ac25ee457593be28f50a87f614c3469c0 |
| **block hash** | 0x128e5d8c75960e66529d04091b865930e67ecea7c5cfbfd61611cb81d83fe818 |
| **block number** | 9421654 |
| **from** | 0x933789b93068B83aBd39e3df078F52a3155Bc477 |
| **to** | IPRegistry.registerIP(string,string) 0xbe984792208a37660c4e789bfa66856e591d0d58 |
| **gas** | 232797 gas |
| **transaction cost** | 229806 gas |
| **input** | 0x29c...13937 |
| **decoded input** | { "string title": "PatentA", "string ipHash": "6F8988F46937ED048432FFE7CC5B79A59C53C6AB57FE3206392E797E657B1197" } |
| **decoded output** | - |
| **logs** | [ { "from": "0xbe984792208a37660c4e789bfa66856e591d0d58", "topic": "0xf0952947ee46a2478170bf6845cfebf706a4fdb76177b2beb1adf43fcd9a00d2", "event": "IPRegistered", "args": { "0": "0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257", "1": "0x933789b93068B83aBd39e3df078F52a3155Bc477", "2": "PatentA", "3": "1760587800" } } ] |
| **raw logs** | [ { "address": "0xbe984792208a37660c4e789bfa66856e591d0d58", "blockHash": "0x128e5d8c75960e66529d04091b865930e67ecea7c5cfbfd61611cb81d83fe818", "blockNumber": "0x8fc356", "data": "0x00000000000000000000000000000000000000000000000000000000000000400000000000000000000000000000000000000000000000000000000068f070180000000000000000000000000000000000000000000000000000000000000007506174656e744100000000000000000000000000000000000000000000000000", "logIndex": "0xc", "removed": false, "topics": [ "0xf0952947ee46a2478170bf6845cfebf706a4fdb76177b2beb1adf43fcd9a00d2", "0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257", "0x000000000000000000000000933789b93068b83abd39e3df078f52a3155bc477" ], "transactionHash": "0x4e71df63a972aec67f9b87945187489ac25ee457593be28f50a87f614c3469c0", "transactionIndex": "0x7" } ] |

Generates a **unique ID** for the IP using the sender’s address, the hash, and the current time.

keccak256 is a hashing function used to create a unique identifier.

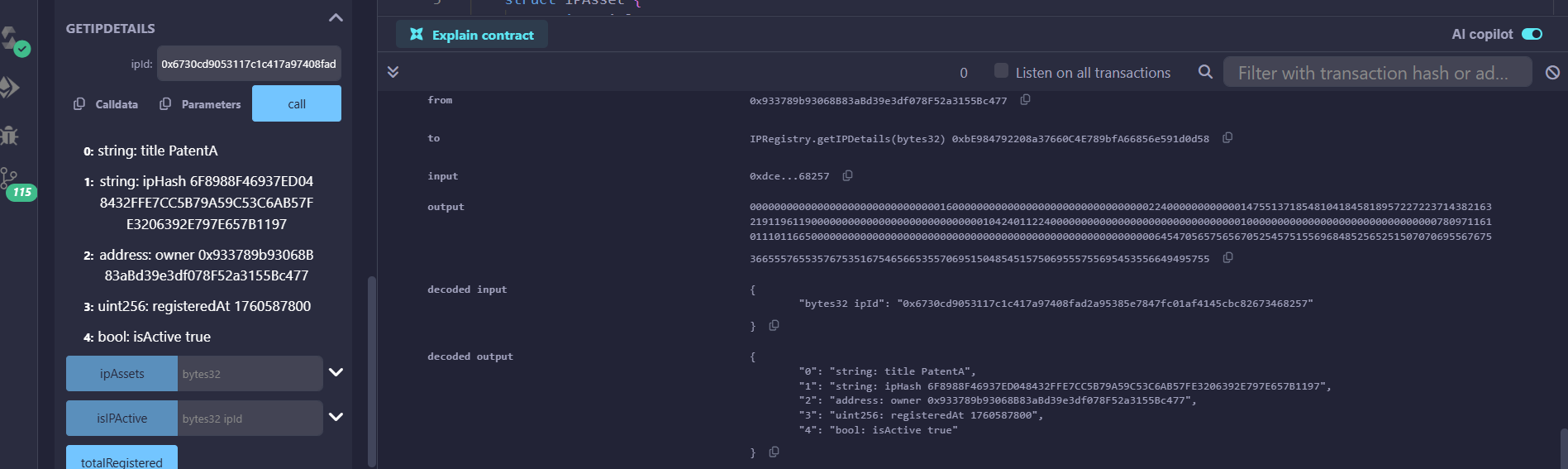


2.Call Admin it would display the address of admin.

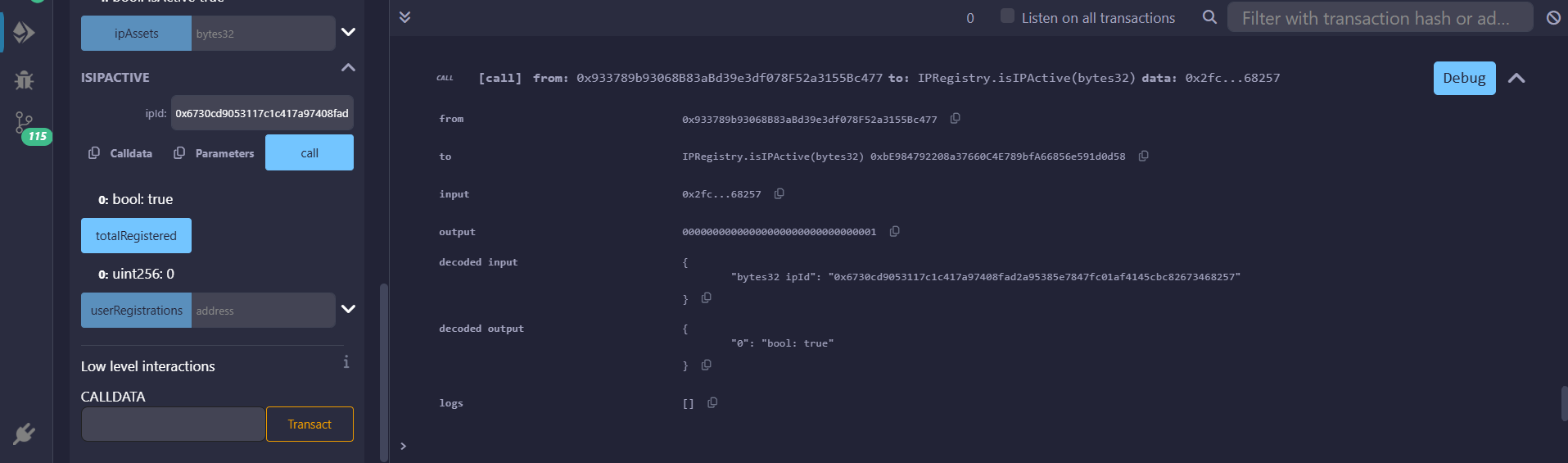


3.Take IPid from registerip event 0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257

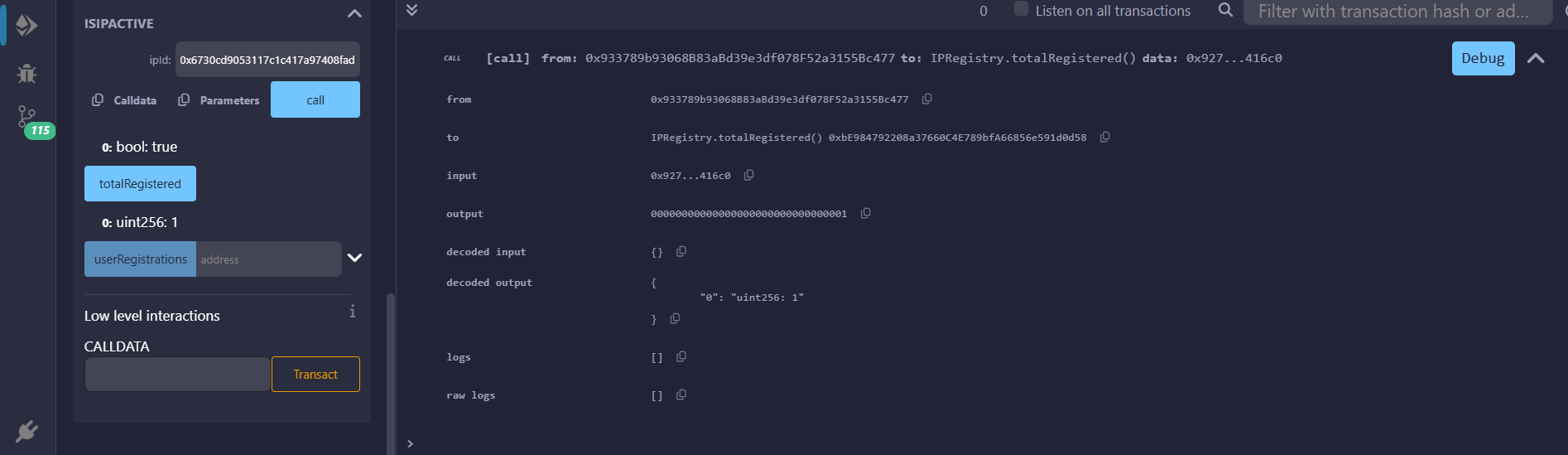
4.**GetIp Details**



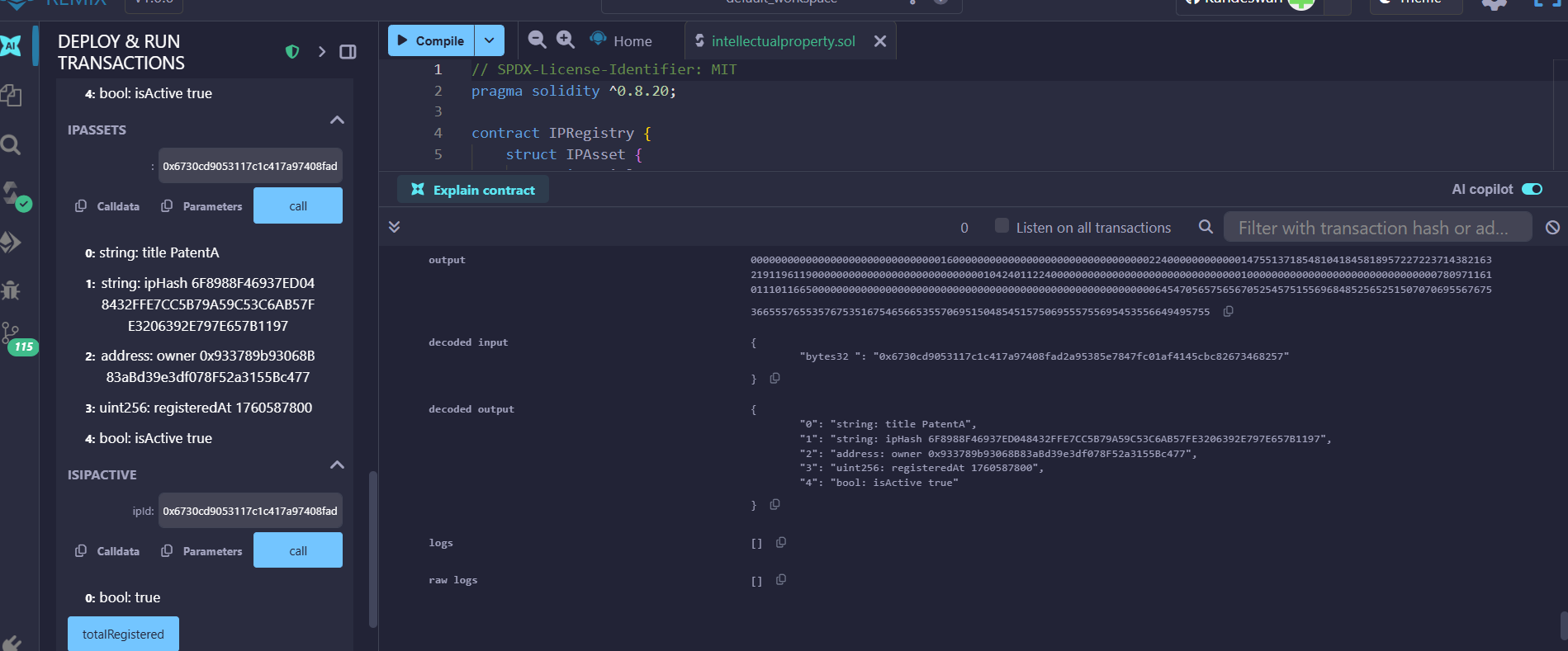
5.**ISIPAcctive**



6.**Total register after registerIP execution**:



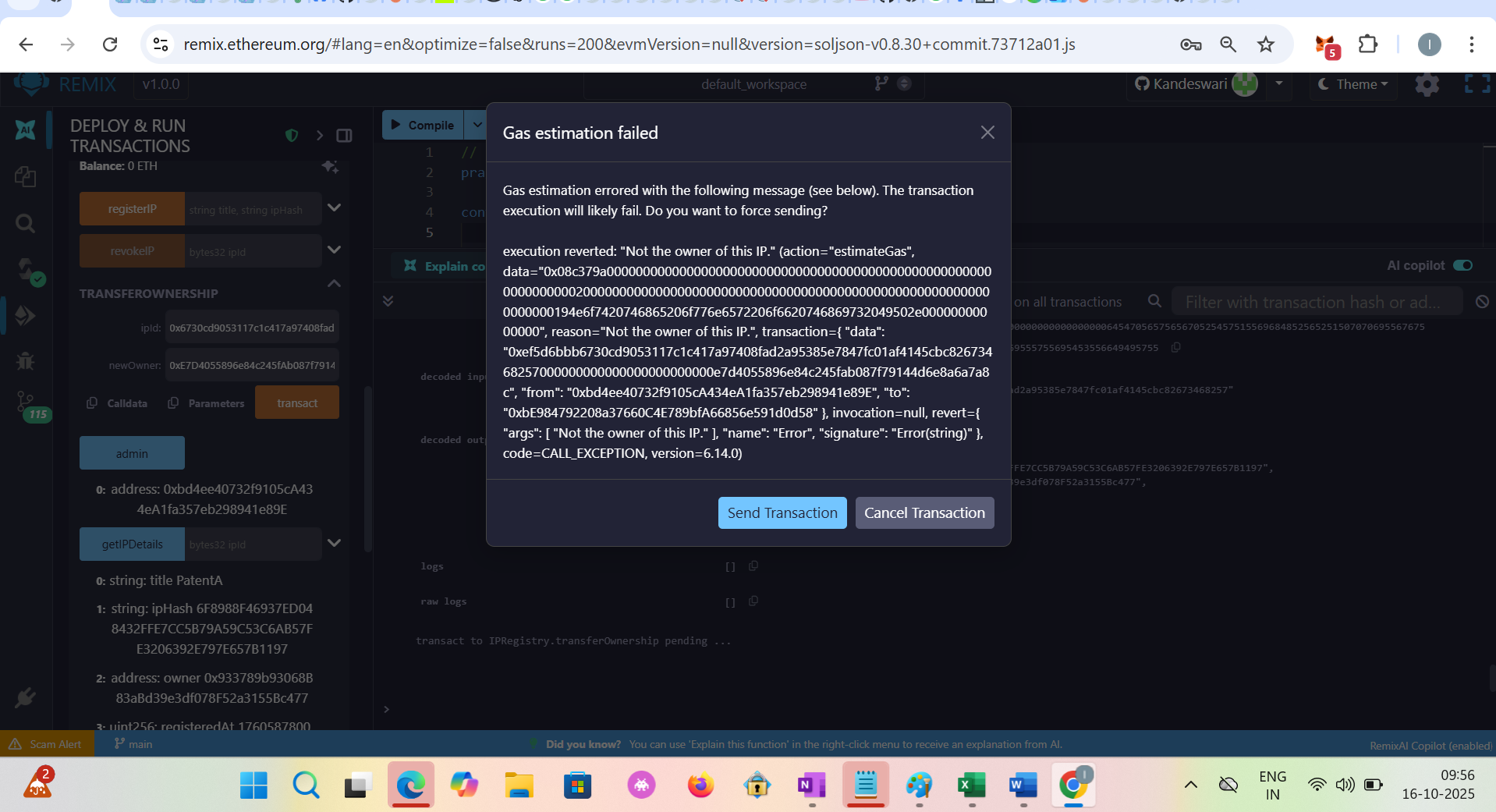
7.**IPAsset Details:**

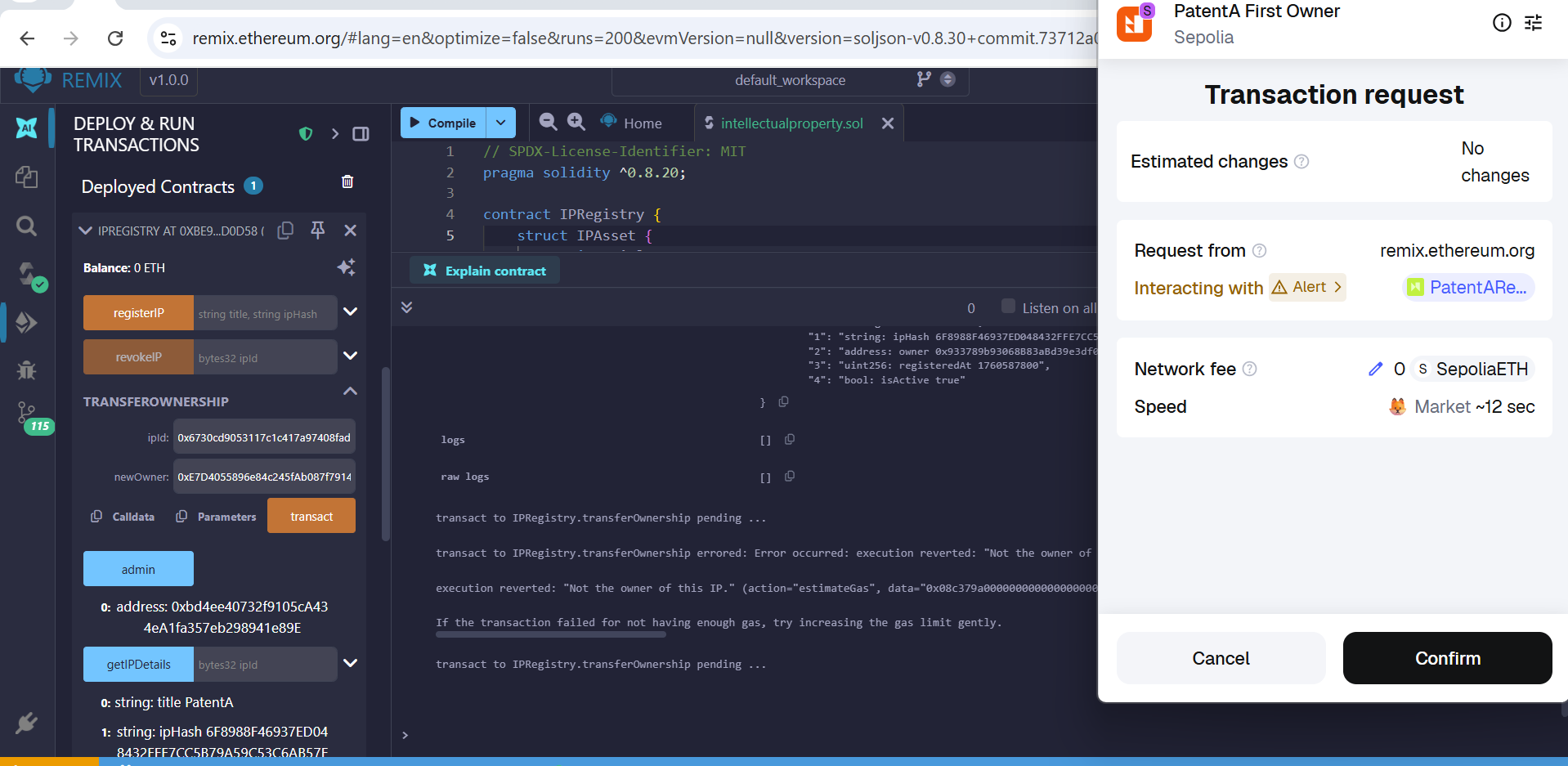


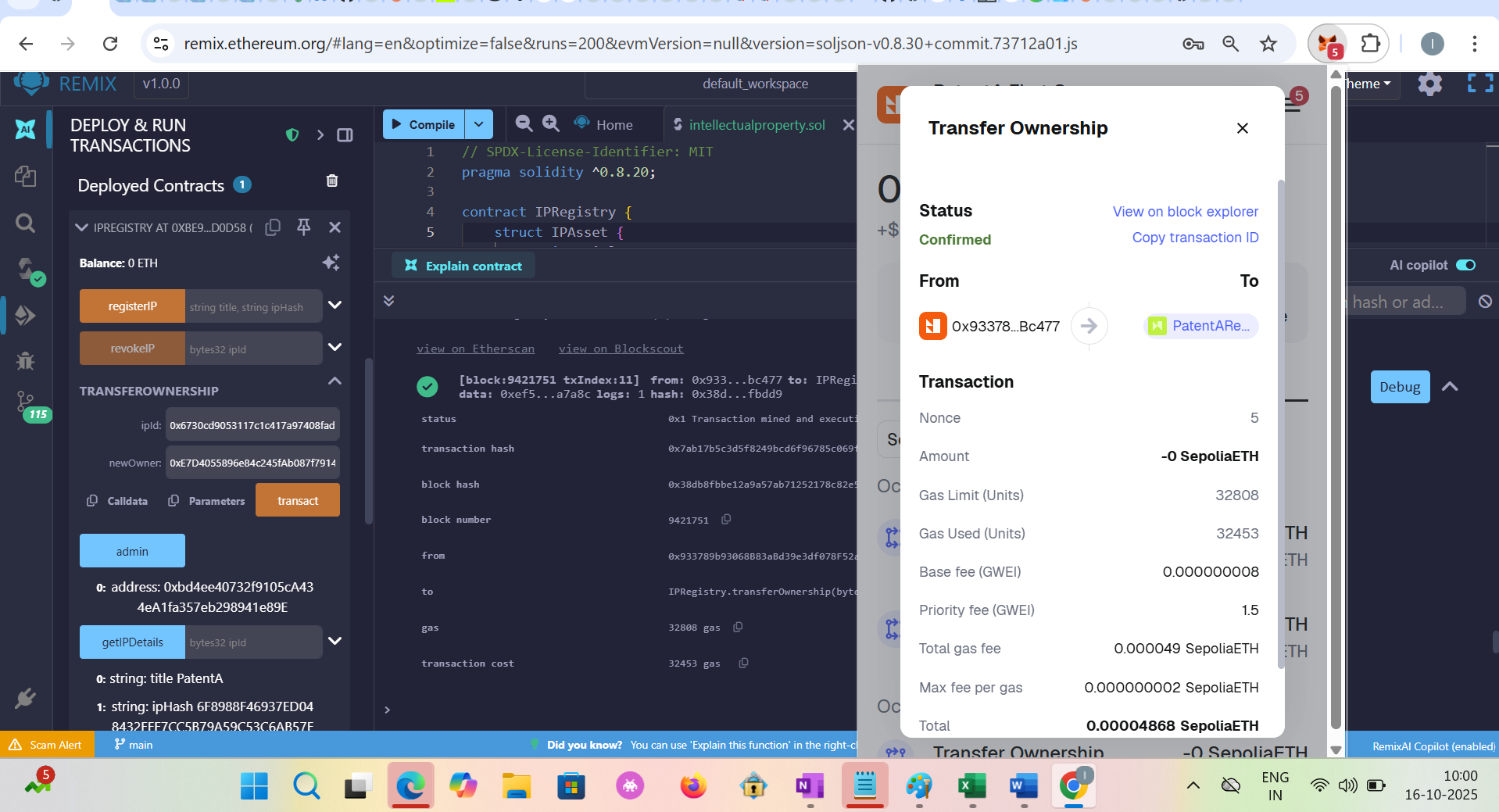
* string: title PatentA
* 1:string: ipHash 6F8988F46937ED048432FFE7CC5B79A59C53C6AB57FE3206392E797E657B1197
* 2:address: owner 0x933789b93068B83aBd39e3df078F52a3155Bc477
* 3:uint256: registeredAt 1760587800
* 4:bool: isActive true

8.**Transferownership**

Asset owner only can transfer .







<https://sepolia.etherscan.io/tx/0x7ab17b5c3d5f8249bcd6f96785c069ff4f6119f83d8a6512eed1871d5f61c97b>

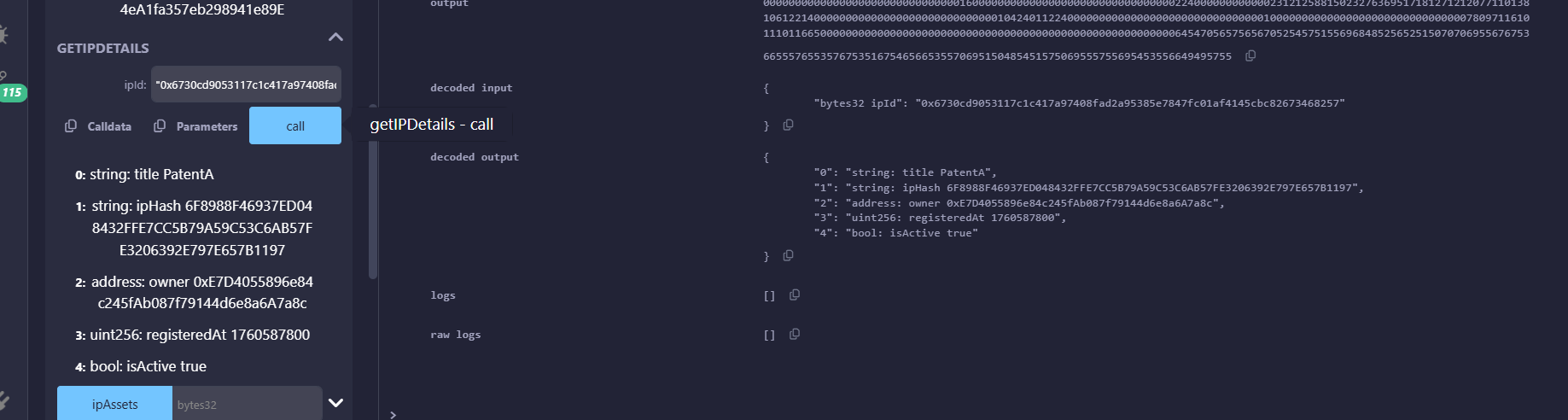


Transaction ID : 0x7ab17b5c3d5f8249bcd6f96785c069ff4f6119f83d8a6512eed1871d5f61c97b

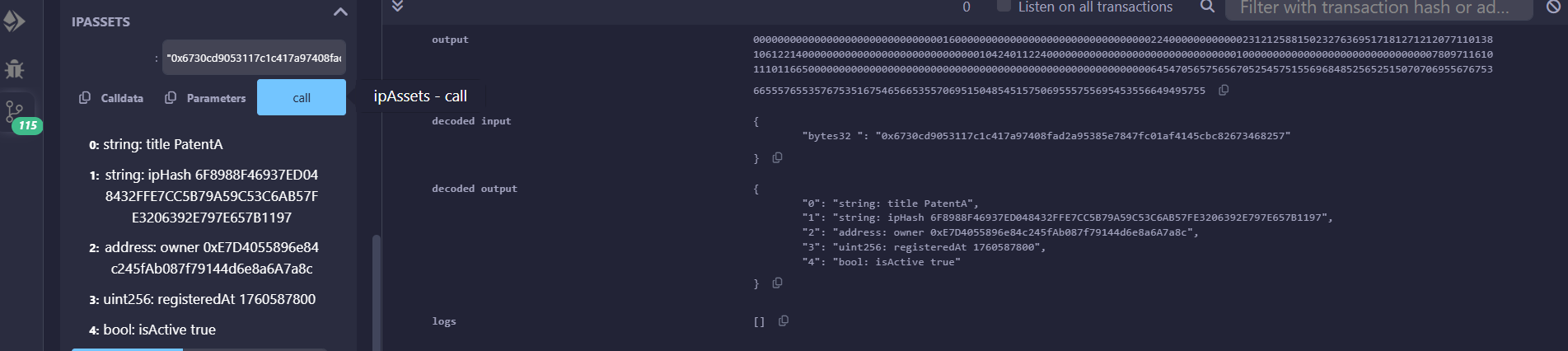
[view on Etherscan](https://sepolia.etherscan.io/tx/0x7ab17b5c3d5f8249bcd6f96785c069ff4f6119f83d8a6512eed1871d5f61c97b) [view on Blockscout](https://eth-sepolia.blockscout.com/tx/0x7ab17b5c3d5f8249bcd6f96785c069ff4f6119f83d8a6512eed1871d5f61c97b)

|  |  |
| --- | --- |
| **status** | 0x1 Transaction mined and execution succeed |
| **transaction hash** | 0x7ab17b5c3d5f8249bcd6f96785c069ff4f6119f83d8a6512eed1871d5f61c97b |
| **block hash** | 0x38db8fbbe12a9a57ab71252178c82e5caa4070f313f35829dbc55cfa9fbfbdd9 |
| **block number** | 9421751 |
| **from** | 0x933789b93068B83aBd39e3df078F52a3155Bc477 |
| **to** | IPRegistry.transferOwnership(bytes32,address) 0xbe984792208a37660c4e789bfa66856e591d0d58 |
| **gas** | 32808 gas |
| **transaction cost** | 32453 gas |
| **input** | 0xef5...a7a8c |
| **decoded input** | { "bytes32 ipId": "0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257", "address newOwner": "0xE7D4055896e84c245fAb087f79144d6e8a6A7a8c" } |
| **decoded output** | - |
| **logs** | [ { "from": "0xbe984792208a37660c4e789bfa66856e591d0d58", "topic": "0x47fd5e9be4733c2ce3963fa824369b7cfa16a6b31284d9a48608e23ac90e6149", "event": "IPTransferred", "args": { "0": "0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257", "1": "0x933789b93068B83aBd39e3df078F52a3155Bc477", "2": "0xE7D4055896e84c245fAb087f79144d6e8a6A7a8c" } } ] |
| **raw logs** | [ { "address": "0xbe984792208a37660c4e789bfa66856e591d0d58", "blockHash": "0x38db8fbbe12a9a57ab71252178c82e5caa4070f313f35829dbc55cfa9fbfbdd9", "blockNumber": "0x8fc3b7", "data": "0x", "logIndex": "0xa", "removed": false, "topics": [ "0x47fd5e9be4733c2ce3963fa824369b7cfa16a6b31284d9a48608e23ac90e6149", "0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257", "0x000000000000000000000000933789b93068b83abd39e3df078f52a3155bc477", "0x000000000000000000000000e7d4055896e84c245fab087f79144d6e8a6a7a8c" ], "transactionHash": "0x7ab17b5c3d5f8249bcd6f96785c069ff4f6119f83d8a6512eed1871d5f61c97b", "transactionIndex": "0xb" } ] |

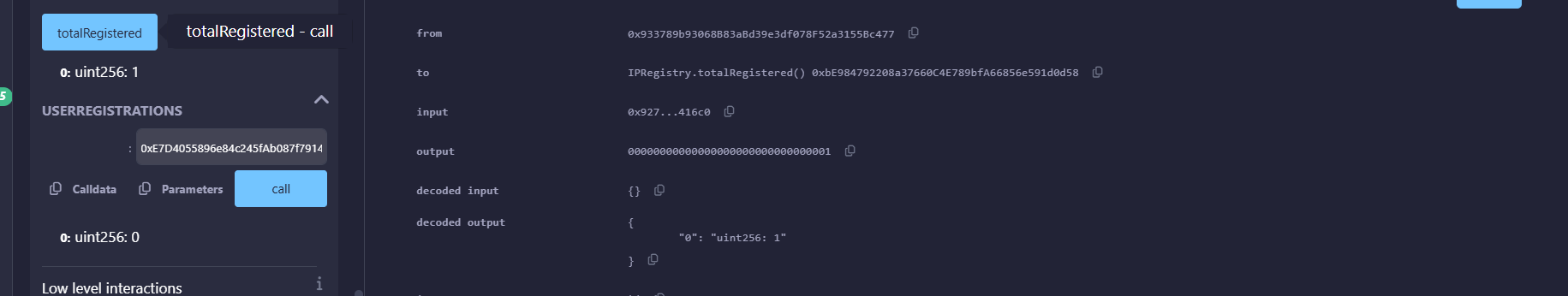
Patent A Transferd to new owner  0xE7D4055896e84c245fAb087f79144d6e8a6A7a8c



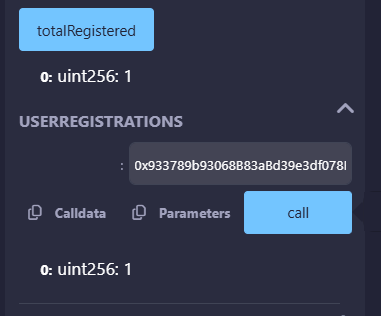
* string: title PatentA
* 1:string: ipHash 6F8988F46937ED048432FFE7CC5B79A59C53C6AB57FE3206392E797E657B1197
* 2:address: owner 0xE7D4055896e84c245fAb087f79144d6e8a6A7a8c
* 3:uint256: registeredAt 1760587800
* 4:bool: isActive true



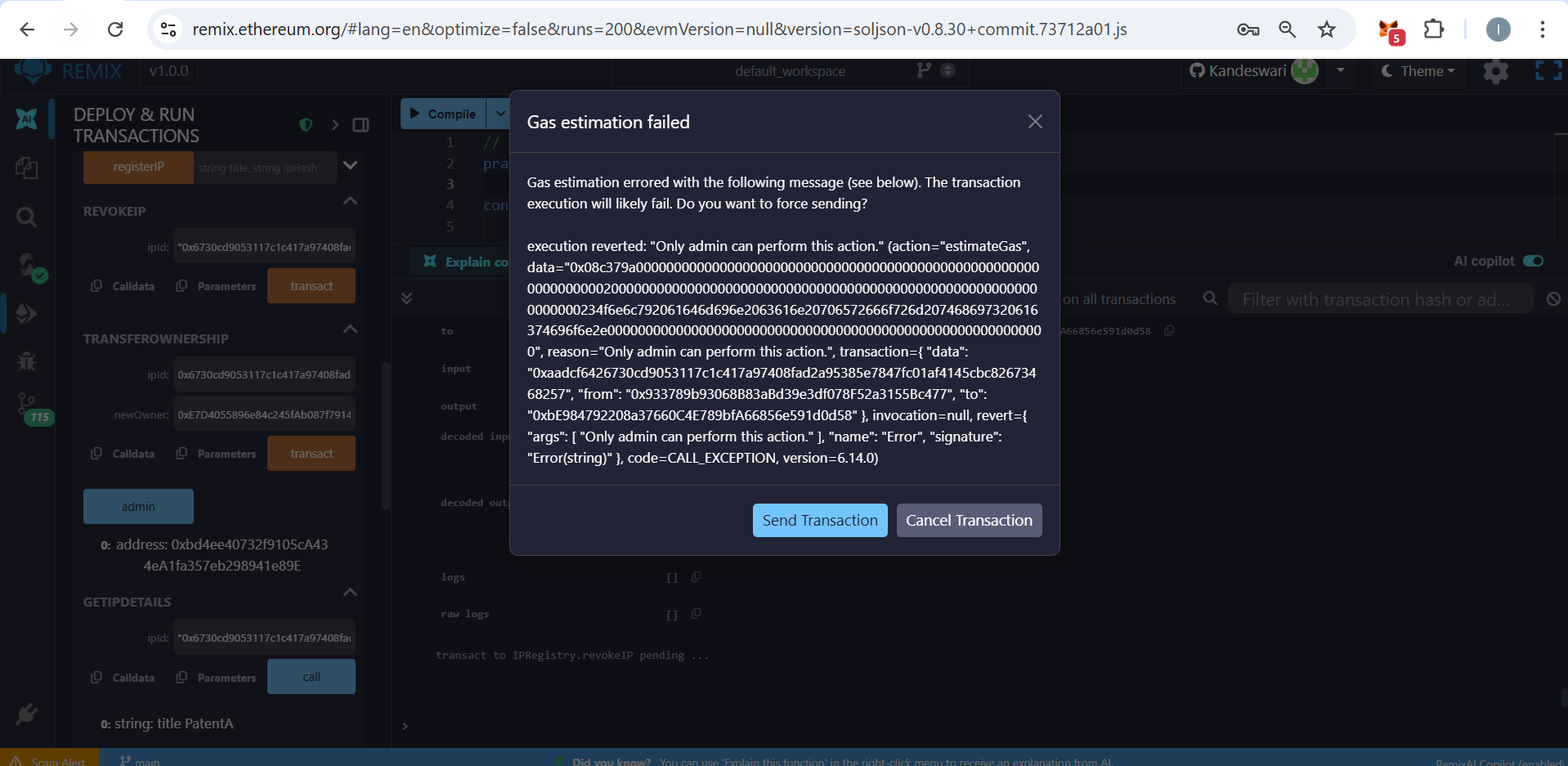
Total Registered :

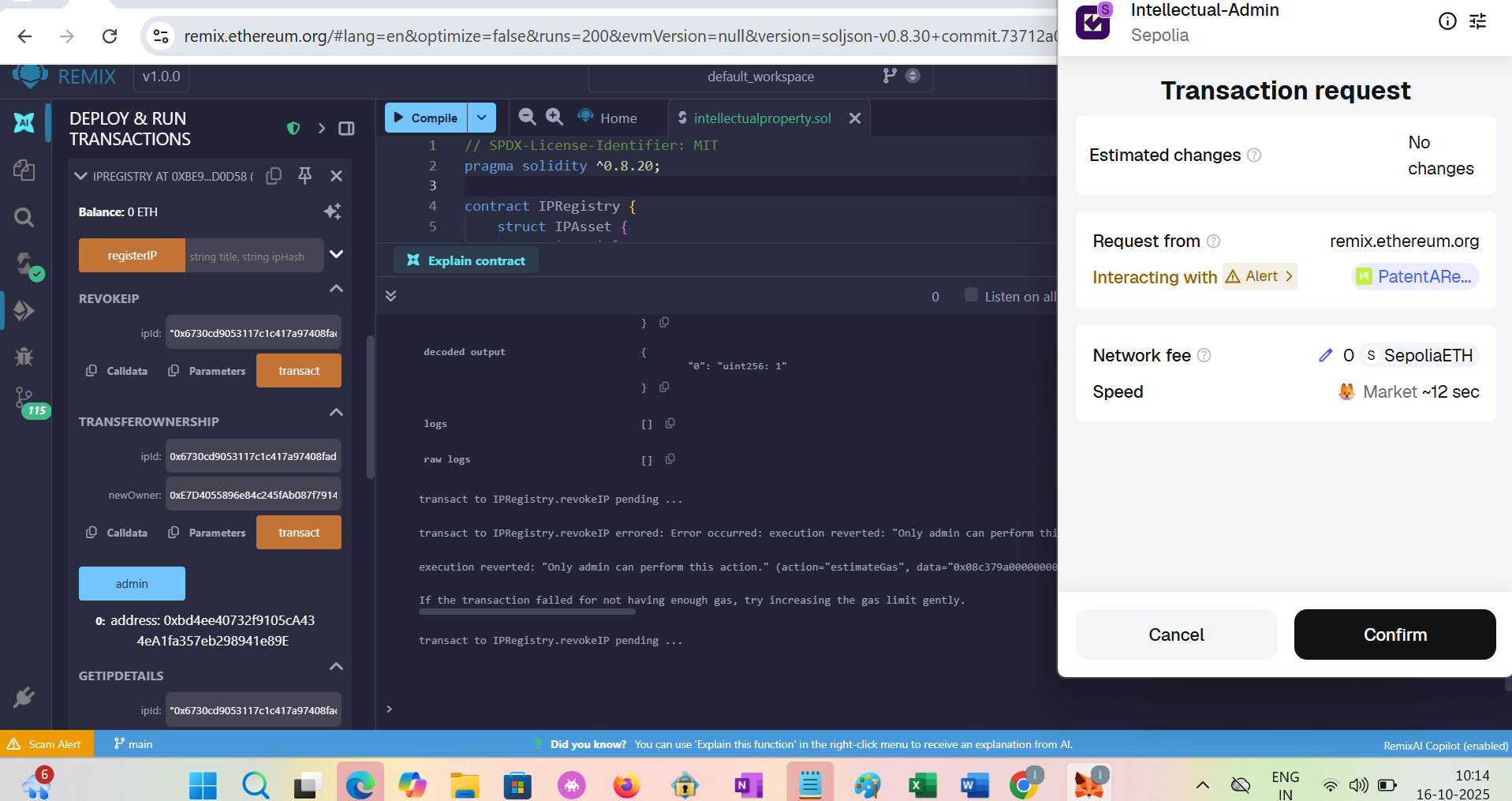


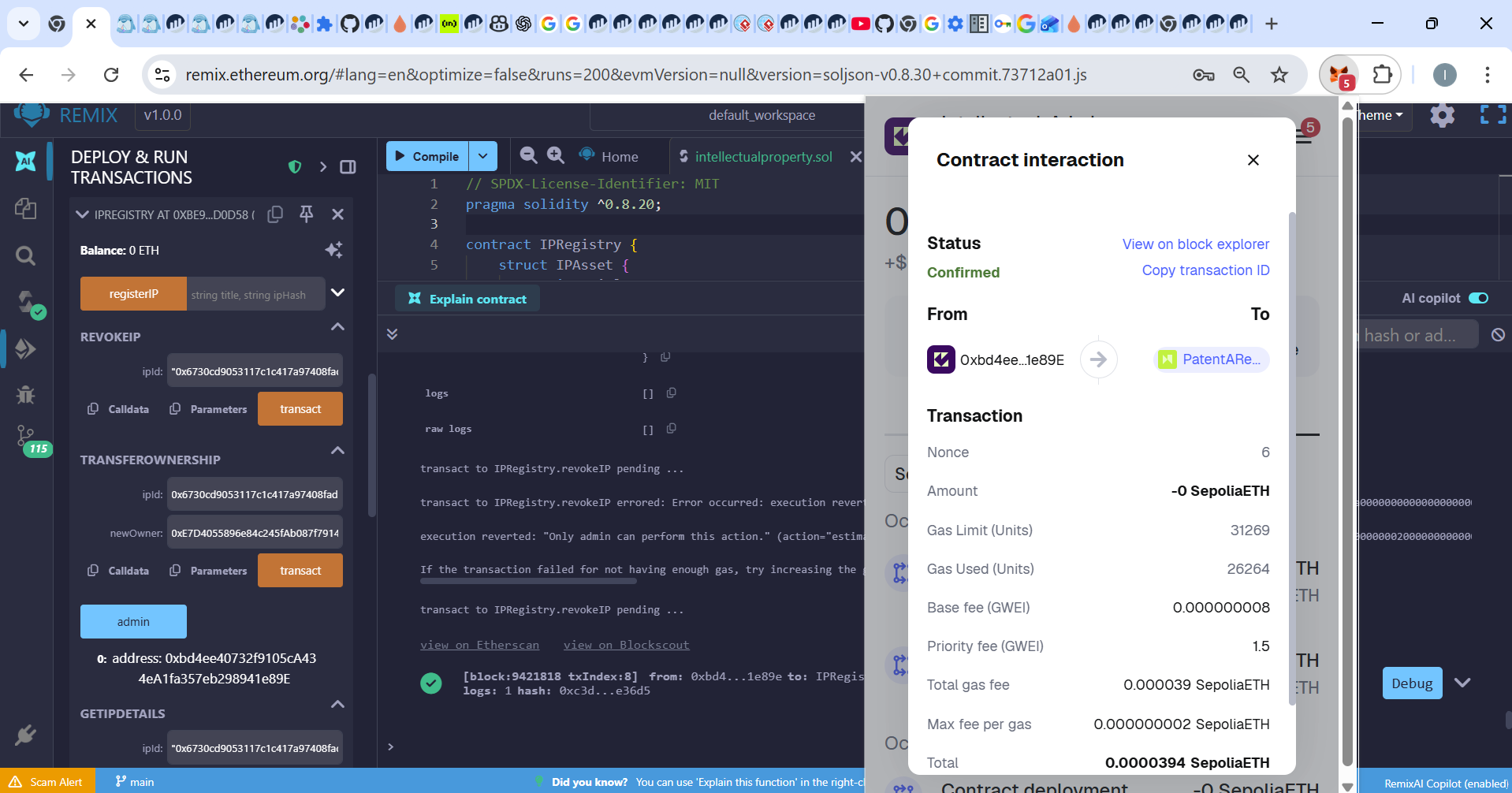
User Registrations : First owner has register the IP



**9.RevokeIp** : Admin only can revokeIP



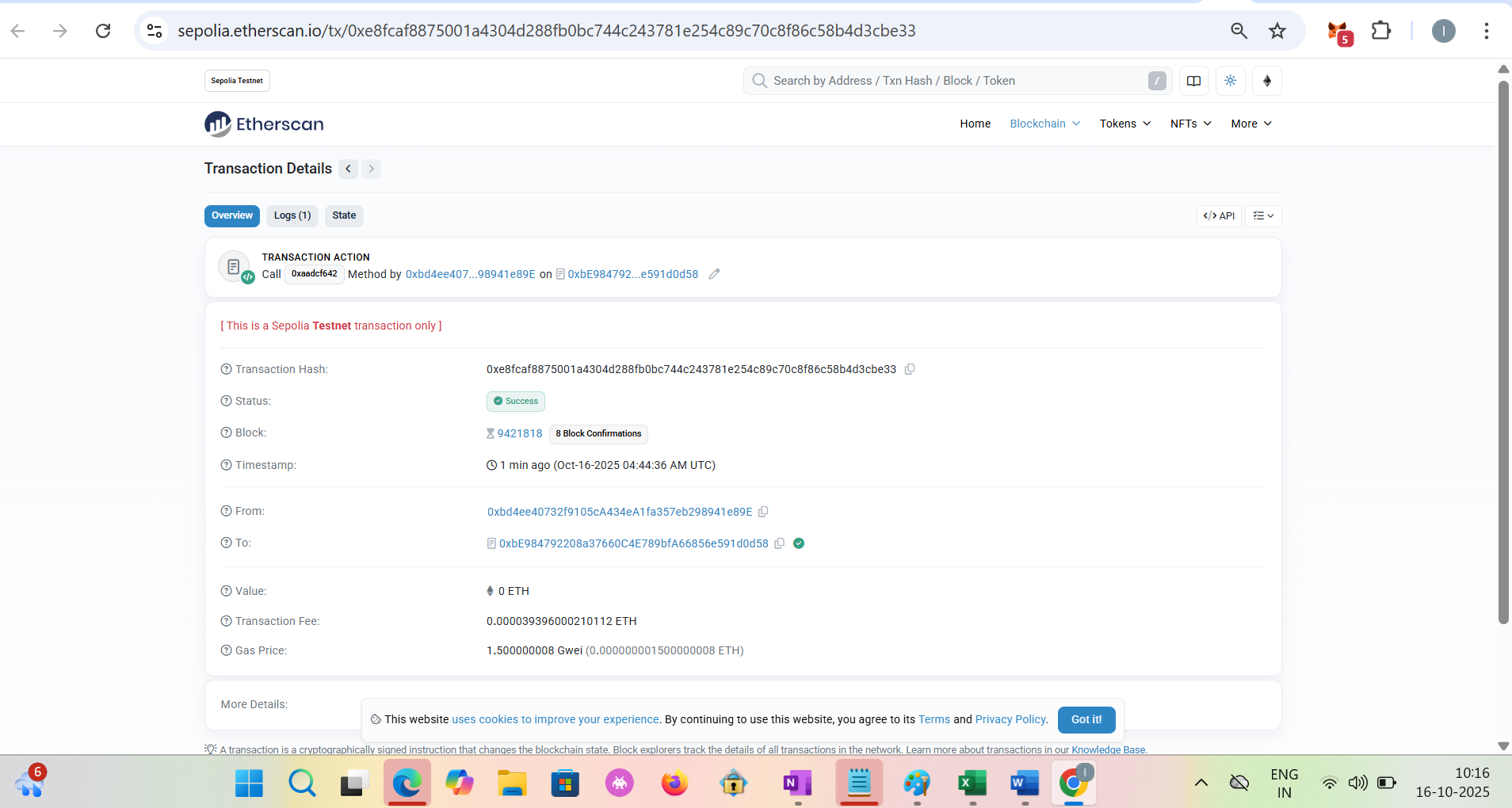




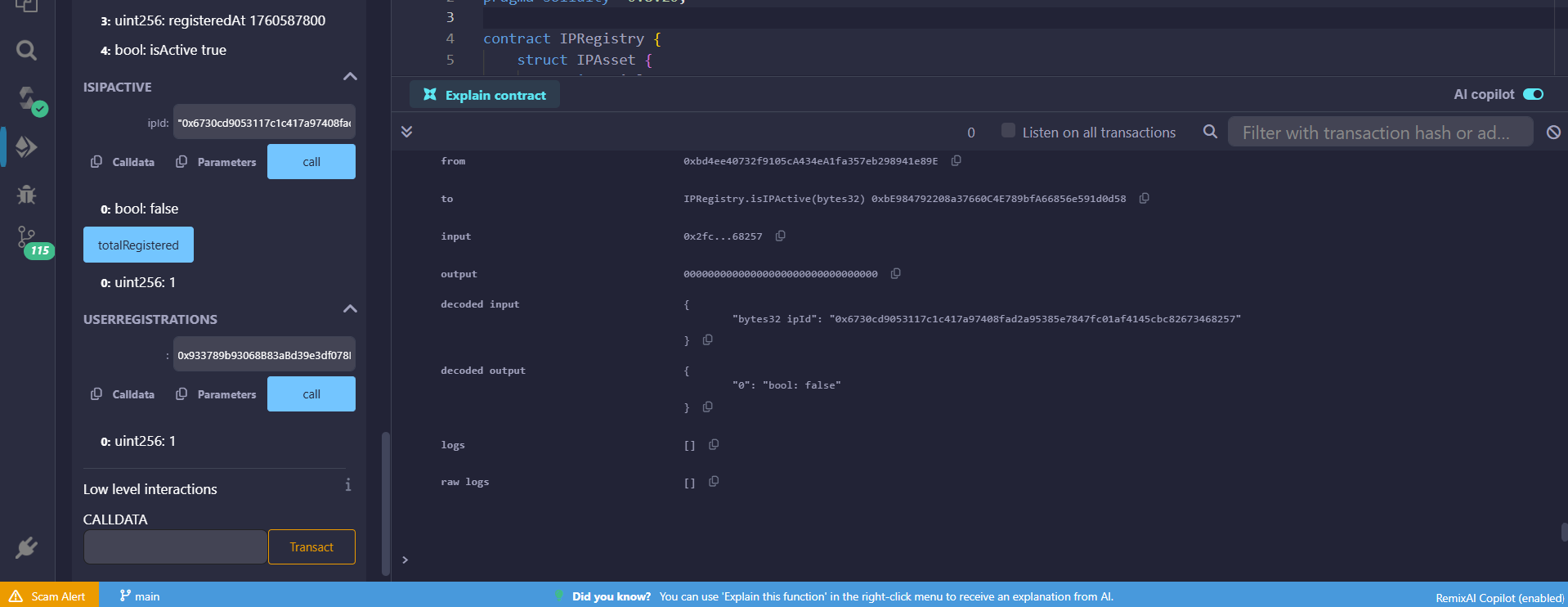
[view on Etherscan](https://sepolia.etherscan.io/tx/0xe8fcaf8875001a4304d288fb0bc744c243781e254c89c70c8f86c58b4d3cbe33) [view on Blockscout](https://eth-sepolia.blockscout.com/tx/0xe8fcaf8875001a4304d288fb0bc744c243781e254c89c70c8f86c58b4d3cbe33)

|  |  |
| --- | --- |
| **status** | 0x1 Transaction mined and execution succeed |
| **transaction hash** | 0xe8fcaf8875001a4304d288fb0bc744c243781e254c89c70c8f86c58b4d3cbe33 |
| **block hash** | 0xc3dcf449b8b85fb3dd8d2da6e3faf1269159570478de77c9918ec3416e3e36d5 |
| **block number** | 9421818 |
| **from** | 0xbd4ee40732f9105cA434eA1fa357eb298941e89E |
| **to** | IPRegistry.revokeIP(bytes32) 0xbe984792208a37660c4e789bfa66856e591d0d58 |
| **gas** | 31269 gas |
| **transaction cost** | 26264 gas |
| **input** | 0xaad...68257 |
| **decoded input** | { "bytes32 ipId": "0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257" } |
| **decoded output** | - |
| **logs** | [ { "from": "0xbe984792208a37660c4e789bfa66856e591d0d58", "topic": "0xe20e585e95cf94bdece8263e4de9868cf870b85898f5518cccc83c7547abd411", "event": "IPRevoked", "args": { "0": "0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257", "1": "0xbd4ee40732f9105cA434eA1fa357eb298941e89E" } } ] |
| **raw logs** | [ { "address": "0xbe984792208a37660c4e789bfa66856e591d0d58", "blockHash": "0xc3dcf449b8b85fb3dd8d2da6e3faf1269159570478de77c9918ec3416e3e36d5", "blockNumber": "0x8fc3fa", "data": "0x", "logIndex": "0xe", "removed": false, "topics": [ "0xe20e585e95cf94bdece8263e4de9868cf870b85898f5518cccc83c7547abd411", "0x6730cd9053117c1c417a97408fad2a95385e7847fc01af4145cbc82673468257", "0x000000000000000000000000bd4ee40732f9105ca434ea1fa357eb298941e89e" ], "transactionHash": "0xe8fcaf8875001a4304d288fb0bc744c243781e254c89c70c8f86c58b4d3cbe33", "transactionIndex": "0x8" } ] |

<https://sepolia.etherscan.io/tx/0xe8fcaf8875001a4304d288fb0bc744c243781e254c89c70c8f86c58b4d3cbe33>



Transaction ID : 0xe8fcaf8875001a4304d288fb0bc744c243781e254c89c70c8f86c58b4d3cbe33



IP has revoked by admin and set to false.

IPRegistry is a simple, secure, and functional smart contract for managing IP ownership on-chain, with room for small improvements in flexibility and ID generation.