mobilefish.com

GETH COMMUNICATION

GETH COMMUNICATION

- In this video i will only focus on Geth.
  Geth is the **G**o implementation of the **Eth**ereum protocol.

- In this video Geth version 1.6.6 is used and is connected to the Rinkeby test network.

- There are several ways to communicate with Geth:

  ✴Console mode using the JavaScript Runtime Environment

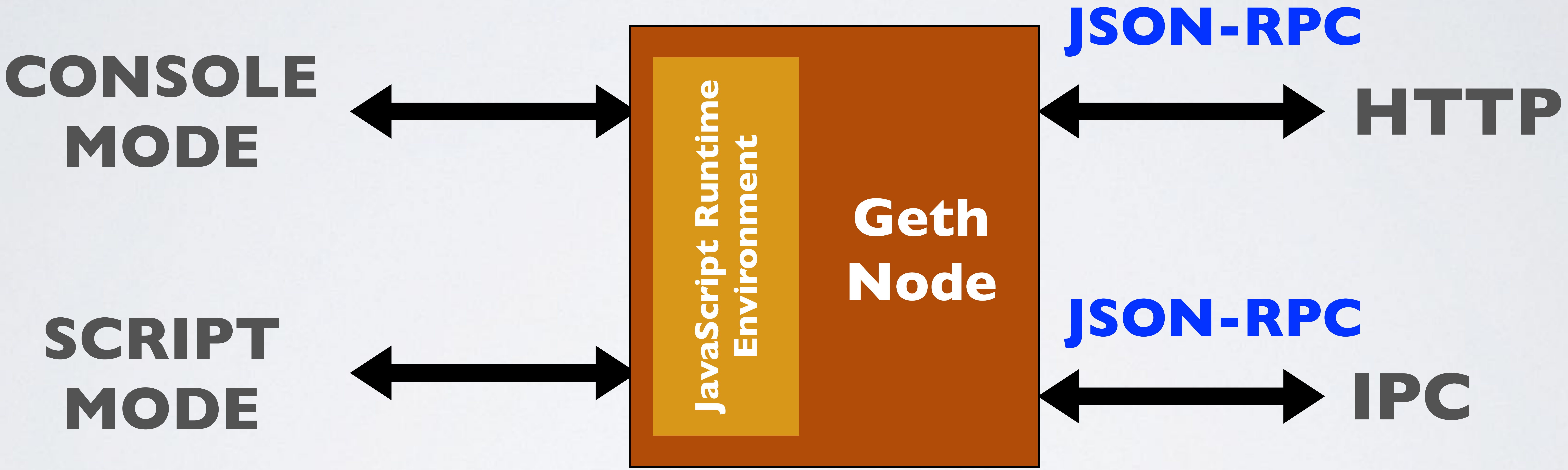
  ✴Script mode using the JavaScript Runtime Environment

  ✴HTTP = Hypertext Transfer Protocol

  ✴IPC = Inter Process Communication

CONSOLE AND SCRIPT MODE DEMONSTRATION

GETH COMMUNICATION



JAVASCRIPT RUNTIME ENVIRONMENT

- More information about the JavaScript Runtime Environment:
  https://github.com/ethereum/go-ethereum/wiki/JavaScript-Console

CONSOLE MODE EXAMPLES

- personal, personal.listAccounts, personal.newAccount(“mypassword”)
- eth, eth.accounts, eth.coinbase
- web3, web3.sha3(“hello”), web3.fromWei(1000000000000000000)
- admin, admin.datadir, admin.peers[1].network.localAddress
- debug
- miner, miner.stop(), miner.start()

CONSOLE MODE EXAMPLES

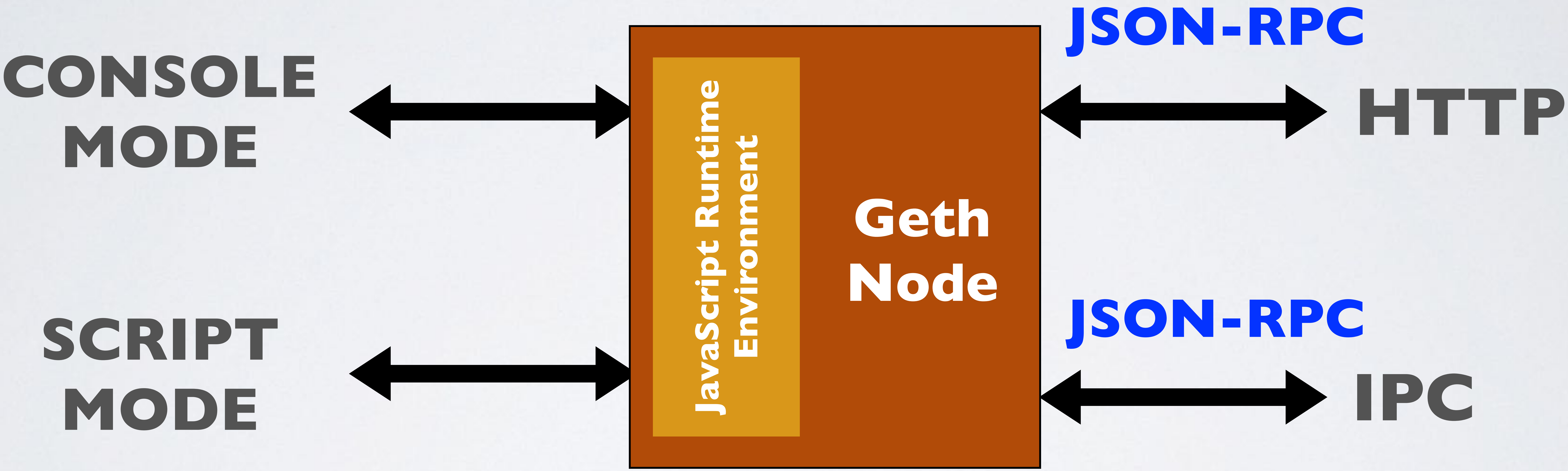
- net,   net.listening,   net.peerCount
- txpool
- rpc
- clique

SCRIPT MODE EXAMPLES

- To access the JavaScript Runtime Environment in Script mode, type:
- geth —exec “*command*” attach
- Examples:
  - geth —exec “admin.datadir” attach
  - geth —exec “personal.newAccount(‘mypassword’)” attach
- To change an account password, you can enter:
  - geth --datadir=/Users/robertlie/tools/ethereum_rinkeby_network/datadir account update 0x301d97ea3f92ea38c6d8d44f38a0a1a4b75f549f

JSON-RPC

GETH COMMUNICATION



JSON-RPC

- JSON-RPC is a stateless, light-weight remote procedure call (RPC) protocol.
- Example of a JSON-RPC message:
  {“**jsonrpc**’’:"2.0","**method**":"eth_coinbase","**params**":[],"**id**":1}
- **jsonrpc** property
  A string specifying the version of the JSON-RPC protocol. Must be "2.0".
- **method** property
  A string containing the name of the method to be invoked.

JSON-RPC

- **params** property
  Parameter values to be used during the invocation of the method.

- **id** property
  An identifier established by the client.
  If specified you let the server know you are expecting a response.
  If not specified the server assumes the message to be a notification.
  The id is also used to match responses to requests when using asynchronous or batch calls.

- More information about JSON-RPC: http://www.jsonrpc.org

JSON-RPC EXAMPLES

- '{"jsonrpc":"2.0","method":"rpc_modules","params":[],"id":1}'
- '{"jsonrpc":"2.0","method":"eth_coinbase","params":[],"id":1}'
- '{"jsonrpc":"2.0","method":"personal_listAccounts","params":[],"id":1}'
- '{"jsonrpc":"2.0","method":"personal_newAccount","params":["mypassword"],"id":1}'
- '{"jsonrpc":"2.0","method":"txpool_status","params":[],"id":1}'
- '{"jsonrpc":"2.0","method":"admin_nodeInfo","params":[],"id":1}'
- '{"jsonrpc":"2.0","method":"admin_peers","params":[],"id":1}'

JSON-RPC EXAMPLES

- '{"jsonrpc":"2.0","method":"eth_accounts","params":[],"id":1}'

- '{"jsonrpc":"2.0","method":"eth_getBalance","params":["0x2b417fe5d262443918358a92868c60922285eda1", "latest"],"id":1}'

- '{"jsonrpc":"2.0","method":"personal_unlockAccount","params":["0x2b417fe5d262443918358a92868c60922285eda1", "mypassword", 300],”id":1}'

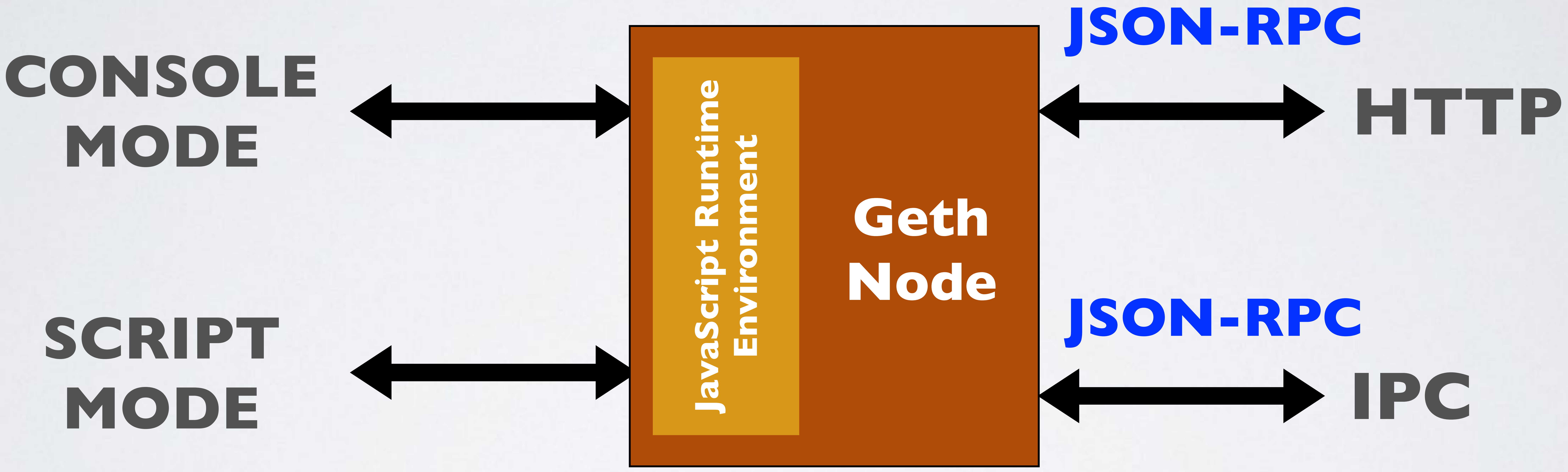
- WARNING:
  The last JSON message unlocks the account for 300 seconds. Unlocking an account gives hackers the opportunity to steal your ethers. Apply this command only for test accounts.

JSON-RPC

- JSON RPC API: https://github.com/ethereum/wiki/wiki/JSON-RPC
- Management APIs: https://github.com/ethereum/go-ethereum/wiki/Management-APIs

IPC
INTER PROCESS COMMUNICATION
DEMONSTRATION

GETH COMMUNICATION



IPC (INTER PROCESS COMMUNICATION)

- IPC service is by default enabled.

```
To disable IPC service: geth —ipcdisable
```

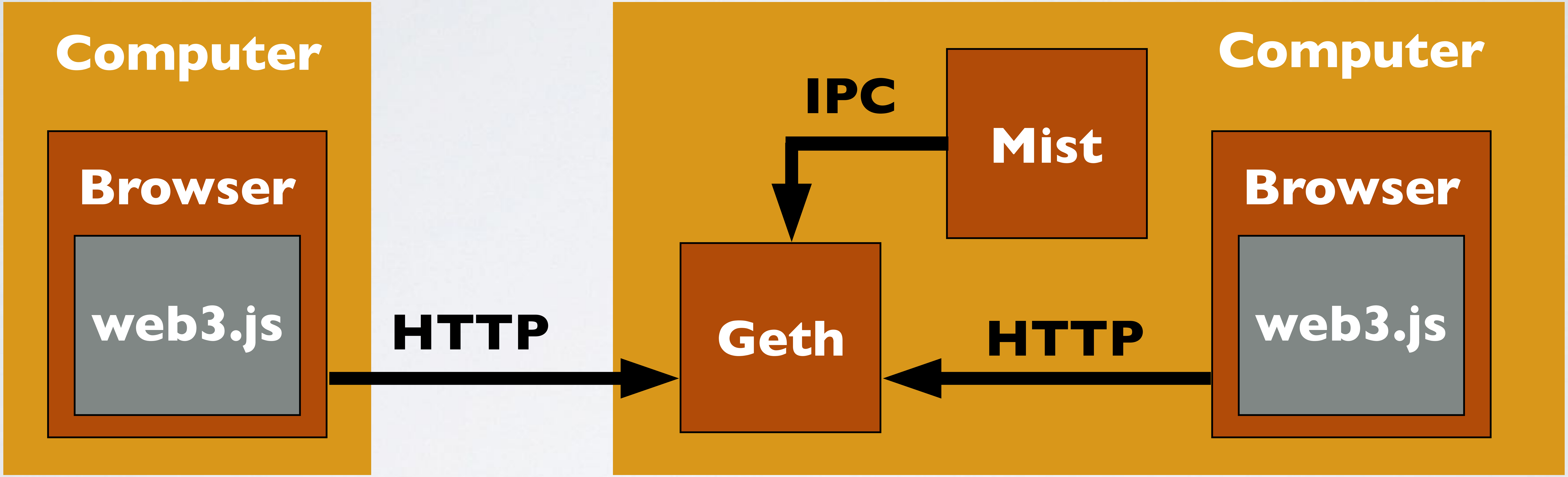
IPC (INTER PROCESS COMMUNICATION)

- Other applications on the same computer as the Geth node are using IPC communication.

- When Geth is running a geth.ipc file is created.This file is used by other applications such as Mist to create a bi-directional communication.

- The location of this file depends on your operating system:
  macOS: ~/Library/Ethereum/
  Linux: ~/.ethereum/
  Windows: ~/AppData/Roaming/Ethereum

IPC AND HTTP GETH COMMUNICATION



IPC (INTER PROCESS COMMUNICATION)

- You can manually communicate with Geth using the geth.ipc file.

- On macOS / Linux open a terminal and type:
  echo ‘*message*’ | nc -U /*path*/geth.ipc

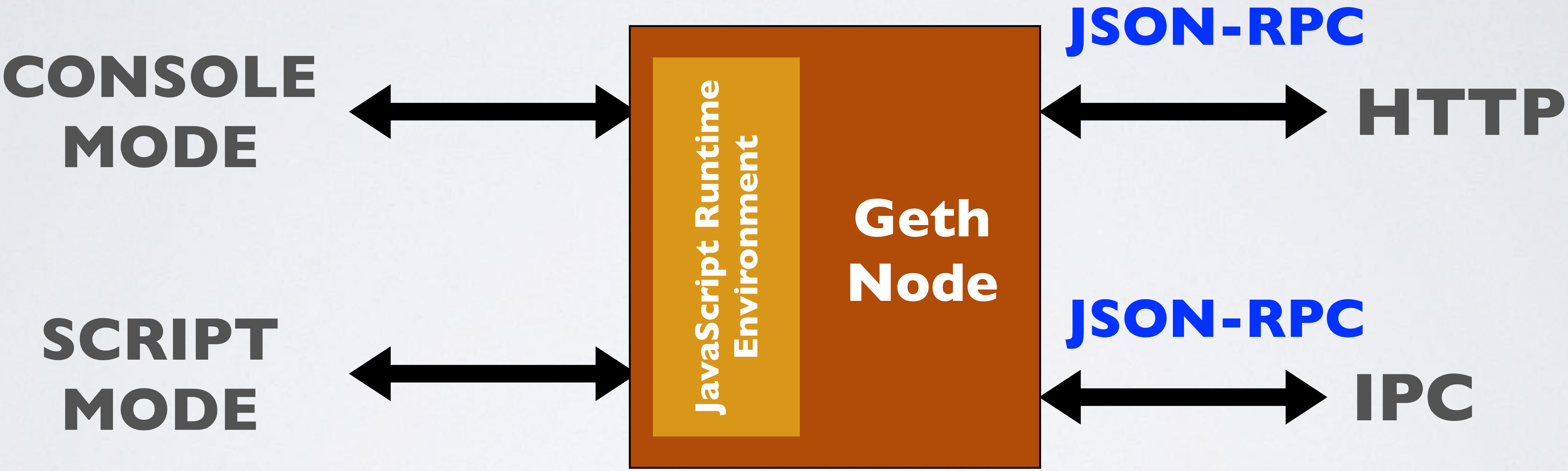
- nc (or netcat) is a networking utility which can be used for creating TCP/UDP connections.

- echo '{"jsonrpc":"2.0","method":"eth_coinbase","params":[],"id":1}' | nc -U $HOME/.ethereum/geth.ipc

- echo ‘{“jsonrpc”:”2.0”,"method":"eth_getBalance","params":["0x2b417fe5d262443918358a92868c60922285eda1",“latest”],”id":1}' | nc -U $HOME/.ethereum/geth.ipc

HTTP
HYPERTEXT TRANSFER PROTOCOL
DEMONSTRATION

GETH COMMUNICATION

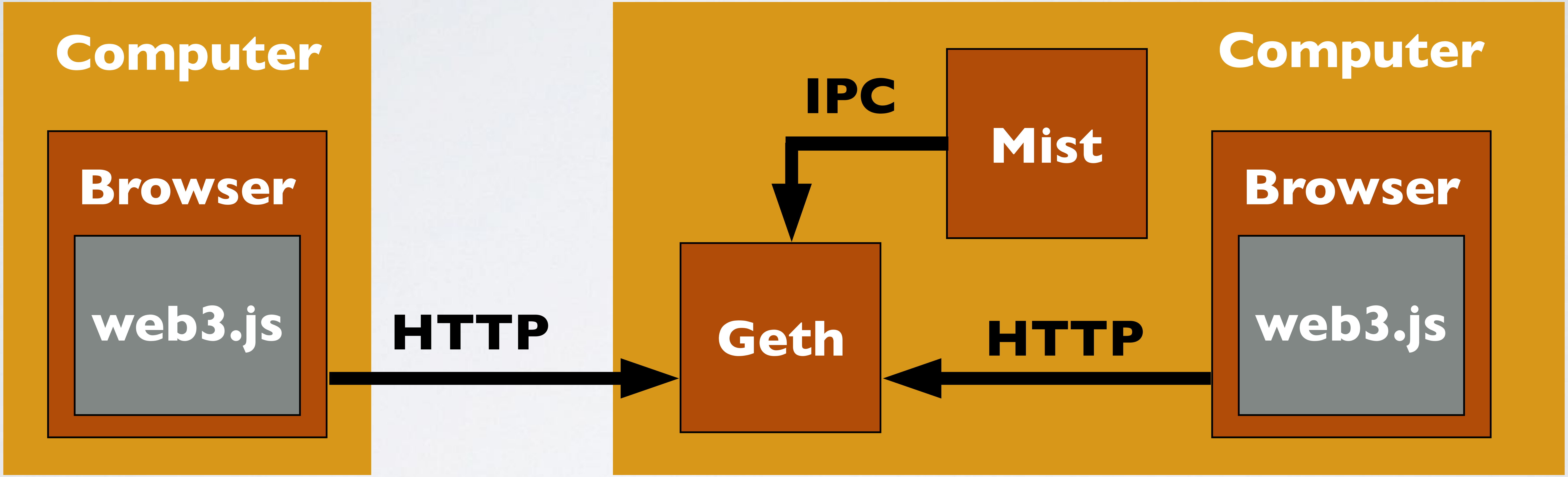


HTTP (HYPERTEXT TRANSFER PROTOCOL)

- HTTP service is disabled by default for security reasons.

```
To enable HTTP service: geth —rpc
```

IPC AND HTTP GETH COMMUNICATION



HTTP (HYPERTEXT TRANSFER PROTOCOL)

- To communicate with Geth over HTTP make sure the flag —rpcapi and —rpc**cors**domain are correctly set. Of course flag —rpc must be set.

- If the flag rpcapi is not set, by default the api *eth, net* and *web3* are allowed. This is the same as —rpcapi "eth,web3,net"

- Example:
  —rpcapi "personal,eth,web3,admin,debug,miner,net,txpool"
  —rpcapi "personal"

HTTP (HYPERTEXT TRANSFER PROTOCOL)

- CORS = Cross-Origin Resource Sharing.
  If Geth is accessed from a browser set the appropriate domain.

- Example:
  —rpccorsdomain "*"
  Web pages from all domains have access to your Geth node. High security risk!

  —rpccorsdomain "http://www.mobilefish.com"
  Only web pages from http://www.mobilefish.com have access to your Geth node.

  —rpccorsdomain "http://*.mobilefish.com"
  Only web pages from http://www.mobilefish.com or http://sand.mobilefish.com have access to your Geth node.

HTTP (HYPERTEXT TRANSFER PROTOCOL)

- To communicate with a Geth node from inside a Javascript application you can use the web3.js library.

- This web3.js library is making JSON-RPC calls under the hood.

- More information about Web3.js API: https://github.com/ethereum/wiki/wiki/JavaScript-API

HTTP (HYPERTEXT TRANSFER PROTOCOL)

- You can manually communicate with Geth using HTTP.

- curl --data '{"jsonrpc":"2.0","method":"eth_coinbase","params":[],"id":2}' http://127.0.0.1:8545

- curl --data '{"jsonrpc":"2.0","method":"eth_getBalance","params":["0x2b417fe5d262443918358a92868c60922285eda1", "latest"],"id":1}' http://127.0.0.1:8545