I2P support in Bitcoin Core

It is possible to run Bitcoin Core as an [I2P (Invisible Internet Project)](#) service and connect to such services.

This [glossary](#) may be useful to get started with I2P terminology.

Run Bitcoin Core with an I2P router (proxy)

A running I2P router (proxy) with [SAM](#) enabled is required. Options include:

- [i2prouter (I2P Router)](#), the official implementation in Java
- [i2pd (I2P Daemon)](#) ([documentation](#)), a lighter alternative in C++ (successfully tested with version 2.23 and up; version 2.36 or later recommended)
- [i2p-zero](#)
- [other alternatives](#)

Note the IP address and port the SAM proxy is listening to; usually, it is `127.0.0.1:7656`.

Once an I2P router with SAM enabled is up and running, use the following Bitcoin Core configuration options:

```
-i2psam=<ip:port>
     I2P SAM proxy to reach I2P peers and accept I2P connections (default:
     none)

-i2pacceptincoming
     If set and -i2psam is also set then incoming I2P connections are
     accepted via the SAM proxy. If this is not set but -i2psam is set
     then only outgoing connections will be made to the I2P network.
     Ignored if -i2psam is not set. Listening for incoming I2P
     connections is done through the SAM proxy, not by binding to a
     local address and port (default: 1)
```

In a typical situation, this suffices:

```
bitcoind -i2psam=127.0.0.1:7656
```

The first time Bitcoin Core connects to the I2P router, its I2P address (and corresponding private key) will be automatically generated and saved in a file named `i2p_private_key` in the Bitcoin Core data directory.

Additional configuration options related to I2P

```
-debug=i2p
```

Set the `debug=i2p` config logging option to see additional information in the debug log about your I2P configuration and connections. Run `bitcoin-cli help logging` for more information.

```
-onlynet=i2p
```

Make automatic outbound connections only to I2P addresses. Inbound and manual connections are not affected by this option. It can be specified multiple times to allow multiple networks, e.g. onlynet=onion, onlynet=i2p.

I2P support was added to Bitcoin Core in version 22.0 and there may be fewer I2P peers than Tor or IP ones. Therefore, using I2P alone without other networks may make a node more susceptible to [Sybil attacks](#). You can use `bitcoin-cli -addrinfo` to see the number of I2P addresses known to your node.

Another consideration with `onlynet=i2p` is that the initial blocks download phase when syncing up a new node can be very slow. This phase can be sped up by using other networks, for instance `onlynet=onion`, at the same time.

In general, a node can be run with both onion and I2P hidden services (or any/all of IPv4/IPv6/onion/I2P/CJDNS), which can provide a potential fallback if one of the networks has issues.

I2P-related information in Bitcoin Core

There are several ways to see your I2P address in Bitcoin Core:

- in the "Local addresses" output of CLI `-netinfo`
- in the "localaddresses" output of RPC `getnetworkinfo`
- in the debug log (grep for `AddLocal`; the I2P address ends in `.b32.i2p`)

To see which I2P peers your node is connected to, use `bitcoin-cli -netinfo 4` or the `getpeerinfo` RPC (e.g. `bitcoin-cli getpeerinfo`).

To see which I2P addresses your node knows, use the `getnodeaddresses 0 i2p` RPC.

Compatibility

Bitcoin Core uses the [SAM v3.1](#) protocol to connect to the I2P network. Any I2P router that supports it can be used.

Ports in I2P and Bitcoin Core

Bitcoin Core uses the [SAM v3.1](#) protocol. One particularity of SAM v3.1 is that it does not support ports, unlike newer versions of SAM (v3.2 and up) that do support them and default the port numbers to 0. From the point of view of peers that use newer versions of SAM or other protocols that support ports, a SAM v3.1 peer is connecting to them on port 0, from source port 0.

To allow future upgrades to newer versions of SAM, Bitcoin Core sets its listening port to 0 when listening for incoming I2P connections and advertises its own I2P address with port 0. Furthermore, it will not attempt to connect to I2P addresses with a non-zero port number because with SAM v3.1 the destination port (`TO_PORT`) is always set to 0 and is not in the control of Bitcoin Core.