# Protocol description for Fsync (Files Synchronization) project.

This document contains the protocol description for FSync project. At first we consider the transport layer. Then we describe the message formats and basic data types.

The Fsync is used for files synchronization in P2P network. The protocol is fully encrypted and utilises the SSL protocol as the transport. The two side certificate verification is used for nodes authentication purposes (see [[1](#_61wqf2or1npu)] for details).

The Fsync protocol is implemented over the SSL layer. The following basic types are used in Fsync protocol (Table 1).

##### Table 1 FSync basic types

|  |  |  |
| --- | --- | --- |
| **Type** | **Size (bytes)** | **Format** |
| UINT8 | 1 | Unsigned byte |
| UINT16 | 2 | Unsigned short |
| UINT32 | 4 | Unsigned integer |
| UINT64 | 8 | Unsigned 8 bytes integer |
| BOOL | 1 | true (0) or false (1) |
| UUID | 16 | 16 unsigned bytes |
| STRING | 4 bytes + string length | 4 bytes length +  N bytes string |

The FSync messages description are shown in table below (Table 2).

##### Table 2 FSync messages description

|  |  |  |
| --- | --- | --- |
| **Message** | **Description** | **Message format** |
| HELLO | Handshake. This message is used for node UUID and protocol version notification. | HELLO =  UUID  UINT32   * UUID - node ID * UINT32 - protocol version |
| NODE\_STATUS | Node status notification. Message is used for node status notification. | NODE\_STATUS =  UUID  UINT32   * UUID - node ID * uint32\_t - node status |
| SYNC\_FILES\_LIST | Files list notification. This message is used for files list exchange between different nodes. | SYNC\_FILES\_LIST=  UUID  BOOL  UINT8  { FILE\_INFO }   * UUID - node ID * BOOL - indicates the last part of the files list. The list of files is transmitted as the several SYNC\_FILES\_LIST messages. For last message this flag must be False. * UINT8 - files number in list. * Files list.   FILE\_INFO =  UINT32  STRING  { UINT8 }16  UINT64  BOOL   * UINT32 - unique file identifier for node. * STRING - File path. * { UINT8 }16 - MD5 digest. * UINT64 - file size * BOOL - flag indicates that the file exists. (True - file is exist, False - file isn’t exist) |
| FILE\_PART\_REQUEST | File part request. | FILE\_PART\_REQUEST =  UUID  UINT32  UINT32   * UUID - node ID * UINT32 - file id * UINT32 - file block number. Files are transferred in 4096-byte blocks. |
| FILE\_PART | File part. | FILE\_PART =  UUID  UINT32  UINT32  UINT16  { UINT8 }   * UUID - node ID * UINT32 - file id * UINT32 - file block number. * UINT16 - file block size (Maximum allowed value is 4096 bytes) * { UINT8 } - file content |

##### Messages sequence diagram.



# References

1. The Secure Sockets Layer (SSL) Protocol Version 3.0