A Framework for MetaNet Pages

I propose a draft of a framework for MetaNet Pages (or Sites). It includes four protocols M protocol, S protocol, N protocol and P protocol. M protocol allows MetaNet pages to be updated. S protocol provides a simple database protocol and allows MetaNet pages to be updated dynamically. N protocol allows us to access a MetaNet site by a short name. P protocol tells M browsers the IPs of MetaNet sites' servers. All information is stored on the blockchain.

1 . M Protocol for MetaNet Pages

In this framework, pages of a site are stored in OP_Returns of transactions that their first outputs point to an address representing the site. A page of the site is stored in op_return with its site name and page name. A latest and validated M protocol op_return with the site name and the page name is used to update the page.

The M protocol format is shown as follows.

[M Protocol Identifier][site name][page name][source code][other information][time stamp][signature]

M Protocol Identifier(MPI)=1MSTTsMZkKKGVyUD82MfzCn8cWEr392ea7

site name is the name of a site. It can be mapped to an address by N protocol. The site name can be replaced by an address directly.

page name is the name of the page. For example, "articles/article1".

source code is the source code of the page.

other information. Leave it empty if no other info. Do not remove the bracket.

time stamp is unique and increased for [site name][page name]. Time stamps should be different for any two M protocol op_returns with the same [site name][page name]. If two or more M protocol op_returns are the same, the first verified one is valid.

signature is the signature of [1MSTTsMZkKKGVyUD82MfzCn8cWEr392ea7][site name][page name][source code][other information][time stamp] by the secret key of the address mapped by the [site name]. The public key of the address must be known. The signature is used to validate updates of pages.

The [site name][page name] identify a page. The blockchain stores historical versions of the page. The site server returns the latest version of the page for a request. The page can be updated by sending a transaction to the address mapped by the site name with the M protocol Op_return.

2 . S Protocol for Simple Storage

S protocol is a simple storage protocol that can be used to provide a simple database for the MetaNet pages.

The S protocol format is shown as follows.

[S Protocol Identifier][database name][object name][object value][data type][other information][time stamp][signature]

S Protocol Identifier(SPI)=1FRXAKsemxyTsS1bHe5A7rwvHuUQcAThkz

database name is the name of a database. It can be mapped to an address by N protocol. The database name can be replaced by an address directly.

object name is the name of an object. For example, "article1/title".

object value is the value of the object.

data type is the data type of the object value.

other information. Leave it empty if no other info. Do not remove the bracket.

time stamp is unique and increased for [database name][object name]. The time stamps should be different for any two S protocol op_returns with the same [database name][object name]. If two or more S protocol op_returns are the same, the first verified one is valid.

signature is the signature of [1FRXAKsemxyTsS1bHe5A7rwvHuUQcAThkz][database name][object name][object value][data type][other information][time stamp] by the secret key of the address mapped by the [database name]. The public key of the address must be known. The signature is used to validate updates of objects in databases.

The [database name][object name] identify an object. The blockchain stores historical values of the object. The database server returns the latest value of the object for a request. The object value can be updated by sending a transaction to the address mapped by the database name with the S protocol Op_return. Object values can be easily embedded into MetaNet pages. Therefore, it is easy to build dynamic MetaNet pages.

3 . N protocol for Short Name

The full name of N protocol is Transferable Identifier-Address Mapping Protocol. But I like call it Name Protocol, shortly N Protocol. N protocol maps a name to an address. Anyone can register a name to an address. If a name is registered, others cannot register it validly. A registered name can be deleted by deletion op_return. A registered name can be transferred to another address by transfer op_return.

3.1 . Registration Format of N protocol

The registration format of N protocol is used to register a name-address mapping. Its format is shown as follows.

[N Protocol Identifier][name][mapped address][other information][time stamp][signature]

N Protocol Identifier(NPI)=1NXhhVE88Fp5SoTV1v5Hhb9WBP14NKa9Zy

name is a registered name.

mapped address is the address mapped by the name.

other information. Leave it empty if no other info. Do not remove the bracket.

time stamp is unique and increased for [name][mapped address]. Any two N protocol op_returns with the same [name][mapped address], their time stamps should be different. If two or more N protocol op_returns are the same, the first verified one without expired is valid. Note that the time stamp is not the registration time. Registration time is the block time.

signature is the signature of [1NXhhVE88Fp5SoTV1v5Hhb9WBP14NKa9Zy][name][mapped address][other information][time stamp] by the secret key of the mapped address. The public key of the mapped address must be known. The signature is used to verify the registration.

Registration valid period is one year. Re-registers the name before its expiration if its owner wants own it for another year. An owner of a name is the one who owns the secrete key of the mapped address. **Registration time is the block time** contains the registration op_return. If a name is registered to two or more addresses, the first one is the valid registration. Multiple names can be mapped to one address. One address can be mapped to only one name validly.

1NXhhVE88Fp5SoTV1v5Hhb9WBP14NKa9Zy is used as a **N Protocol Registration Address(NPRA)** at present. Sending a transaction with registration Op_return to NPRA makes a registration. A name server only needs to monitor NPRA to maintain valid name-address mappings. Registration transactions would generate many UTXOs. **If the UTXOs of the NPRA are not consumed after one years after their generations, stop using the current NPRA and appoint a new NPRA instead.** NPI and NPRA are different. NPI is fixed, NPRA can be changed.

3.2 . Deletion Format of N Protocol

The deletion format of N protocol is used to cancel a mapping relationship between a name and an address. Its format is as follows.

[NPI][name][mapped address][other information][delete][time stamp][signature]

NPI, name, mapped address, other information and **time stamp** are the same with the registration format.

delete denotes the name-address mapping is deleted and then invalid.

signature is the signature of [1NXhhVE88Fp5SoTV1v5Hhb9WBP14NKa9Zy][name][mapped address][other information][delete][time stamp] by the secret key of the mapped address. The public key of the mapped address must be known. The signature is used to verify the deletion operation.

Sending a transaction with the deletion op_return to the NPRA deletes a name-address mapping.

3.3 . Transfer Format of N Protocol

Transfer format of N protocol is used to transfer a name to a new address. Its format is as follows.

[NPI][name][current mapped address][new mapped address][other information][time stamp][signature by current mapped address][signature by new mapped address]

NPI, name, other information and **time stamp** are the same with the registration format.

current mapped address is the address mapped by the name validly.

new mapped address is the address that the name will map to.

signature by current mapped address is the signature of [1NXhhVE88Fp5SoTV1v5Hhb9WBP14NKa9Zy][name][current mapped address][new mapped address][other information][time stamp] by the secret key of the current mapped address.

signature by new mapped address is the signature of [1NXhhVE88Fp5SoTV1v5Hhb9WBP14NKa9Zy][name][current mapped address][new mapped address][other information][time stamp] by the secret key of the new mapped address. The public keys of the current and the new mapped addresses must be known.

Sending a transaction with the transfer op_return to NPRA transfers a name to a new address. The old name-address mapping becomes invalid, and the new name-address mapping becomes valid after the transaction. If there are two transfer transactions that transfer the same name to different addresses, the first verified one without expired is valid.

The valid period after transfer is one year. Re-registers the name before its expiration if its owner wants own it for another year.

4 . P Protocol for Address-IP Mapping

P protocol allows MetaNet browsers to find servers' IPs of MetaNet sites or databases. It includes two operations, registration and deletion.

4.1 . Registration format of P protocol

Registration format of P protocol is used to register an address-IP mapping. Its format is as follows.

[P Protocol Identifier][address][IP][other information][time stamp][signature]

P Protocol Identifier(PPI)=1PiKH641J5WQgUm91qLoiLac4ekHJc6WML

address is a bitcoin address mapped by the IP.

IP is an Internet Protocol Address.

other information. Leave it empty if no other info. Do not remove the bracket.

time stamp is unique and increased for [address][IP]. Any two P protocol op_returns with the same [address][IP], their time stamps should be different. If two or more N protocol op_returns

are the same, the first verified one without expired is valid. Note that the time stamp is not the registration time. Registration time is the block time.

signature is the signature of [1PiKH641J5WQgUm91qLoiLac4ekHJc6WML][address][IP][other information][time stamp] by the secret key of the address. The public key of the address must be known. The signature is used to verify the registration.

Registration valid period is one year. Re-registers the address-IP pair to keep the mapping valid for another year before its expiration. **Registration time is the block time** contains the registration op_return. One address can be mapped to multiple IPs. One IP can be mapped to multiple addresses.

4.2 . Deletion Format of P Protocol

Deletion format of P protocol is used to cancel a mapping relationship between an address and an IP. Its format is as follows.

[PPI][address][IP][other information][delete][time stamp][signature]

PPI, address, IP, other information and **time stamp** are the same with the registration format.

delete denotes the address-IP mapping is deleted and then invalid.

signature is the signature of [1PiKH641J5WQgUm91qLoiLac4ekHJc6WML][address][IP][other information][delete][time stamp] by the secret key of the address. The public key of the address must be known.

1PiKH641J5WQgUm91qLoiLac4ekHJc6WML is used as a **P Protocol Registration Address(PPRA)** at present. Sending a transaction with registration Op_return to PPRA makes a registration. An address-IP server only needs to monitor PPRA to maintain valid address-IP mappings. Registration transactions would generate many UTXOs. **If the UTXOs of the PPRA are not consumed after one years after their generations, stop using the current PPRA and appoint a new PPRA instead.** PPI and PPRA are different. PPI is fixed, PPRA can be changed.