# Methodology for creating the IP table

## Sources

From the ARIN website (<https://whois.arin.net/rest/asn/AS14593>), we know that the Autonomous System (AS) number of SpaceX is AS14593, so that we can base our research on the IPv4 and IPv6 address belonging to this AS. Here are the two different sources from which data were taken:

* <https://whois.ipip.net/AS14593>
* <https://ipinfo.io/AS14593>

For each range present in this database, once you click on it, you have access to various information, including a whois record. Usually, most information is available from this record (NetName, Continent, Country…), but sometimes it can be obtained otherwise. Analyzing the NetName can give information mainly on the location, and you can use the map on whois.ipip.net, which indicates the location of a specific range of IPs (however, the source of this information is unknown.

## Creation of the table

To create this table, we start by looking at the list of each IP address. For each IP address range in the sources, we click on it and access the whois record. Here is a sample of the first few lines of the table, for which we will describe the utility

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IPv4 | | | | | |
| City | Country | Continent | Address | NetName | Range utility |
| Frankfurt | Germany | Europe | 169.155.224.0/21 | STARLINK\_10795\_FRNTDEU1\_IPV4 |  |
| Olso | Norway | Europe | 91.102.182.0/23 | STARLINK\_9704\_FRNTDEU1\_IPV4 |  |
| Zurich | Switzerland | Europe | 169.155.232.0/21 | STARLINK\_10803\_FRNTDEU1\_IPV4 |  |
| Brussels | Belgium | Europe | 169.155.240.0/22 | STARLINK\_10811\_FRNTDEU1\_IPV4 |  |
|  | Virgin Islands | North America | 98.97.76.0/25 | STARLINK-6110-VI-ATLAGAX1-IPV4 |  |
| Lagos | Nigeria | Africa | 102.215.56.0/23 | STARLINK\_10449\_LGOSNGA1\_IPV4 |  |
| Tokyo | Japan | Asia | 170.203.83.0/25 | STARLINK-8544-XX-TKYOJPN1-IPV4 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dallas | USA | North America | 2605:59C8:4000::/40 | STARLINK-6735-US-DLLSTXX1-IPV6 |  |

First, we look at the NetName, an identifier for each IP range. It usually starts with “STARLINK-“ followed by a four or five-number ID unique to every IP range. After that, in most cases, we have the two-letter identifier of the country for the issued range, but you can also have the presence of POP (Point of Presence), XX (maybe inter-continental link), or MC (Multi-Carrier). Then there is an identification code for every city in which Starlink has a POP/Gateway; for example, London becomes LNDNGBR, New York NWYYNYX, … Here are a few examples to understand various types of NetNames:

* STARLINK-6110-VI-ATLAGAX1-IPV4: Virgin Island IP address, closest to the POP of Atlanta in Georgia
* STARLINK-6735-US-DLLSTXX1-IPV6: Dallas, Texas, USA in IPv6
* STARLINK\_10449\_LGOSNGA1\_IPV4: Lagos, Nigeria in Africa
* STARLINK-8544-XX-TKYOJPN1-IPV4: Tokyo, Japan in Asia

Second, we added the address range, as indicated in the whois record, using the “/” IPv4/v6.

Third, we filled the City/Country/Continent column. The city was indicated in two ways, either from the NetName (such as LNDN for London) or from the map in whois.ipip.net, which shows a somewhat precise location for a particular IP range. The Continent was derived from the country, as this is easy to guess. A record without a city means that we were not sure which country it was based in by just having the country and no indication on the map. If the country code was set to XX, then the country wasn’t filled. If the NetName had MC or POP instead of the country code, the continent wasn’t specified, but the country was set to the one in the whois record.

To clarify, we’ve classified (colored) entries in the table based on their NetNames (and other fields) property. Here is the classification that can be seen in the table:

* Green: These are for the direct range of the PoP
* Blue: These are a range that has been assigned to another geographical area while still having their closest PoP in NetNames
* Yellow: These are for the range having “XX” set as country
* Orange: These are for the range distributed by the PoP around his geographical area.
* Pink: These are for the range having the multi-carrier tag in their NetNames

An example could be the Belgian case, 169.155.240.0/23 is the IP with a NetName corresponding to “STARLINK\_10811\_FRNTDEU1\_IPV4”. It could be guessed that it belongs to the PoP in Frankfurt; however, in the whois, the country is set as “BE” (for Belgium), and if we look at the location on the map, the range belongs to Brussels.

We can then guess that the range utility content hasn’t been set yet but will be used in the future for noting comments on certain ranges and what could be their specific purpose if they have one.

Analyzing the record was repeated for every range as there are particular cases. IPv6 was also modeled, even though it contains way fewer ranges since those are much bigger. Some ranges have not been added since the whois record didn’t hold any relevant information that could help identify a range.

## Future improvement

An improvement to this table could be to fill every column, but that would require additional information on every range and its utility. That is expected to come as I move forward in my research.

It is also possible (case seen for IPv6 address in Australia) that some ranges are absent in the sources, which will be added as time progresses and as I make more discoveries.

The expected output is a comprehensive table that indicates the location, utility, and NetName for a specific IP range.