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Internet Draft
Category: Proposed Standard
Document: draft-terrell-schem-desgn-ipt1-ipt2-cmput-tel-numb-01.txt
Expires September 22, 2002

The Reality of the Schematic Design of the IPt1 and IPt2 Protocol Specifications: 'It is Just the Computer's Telephone Number'

Status of this Memo

Conventions

Please note, the Mathematics used to Derive the IPt1 and IPt2 IP Protocol Specifications, is Based upon the conclusions from the Logic of Quantification, which resulted in a New System of Enumeration for the Binary System. However, Appendix II, Tables A-I, A-II, and A-III, depicts the IPt1 and IPt2 Protocol Specifications using the Modern Binary System, which is used in 'IPv4'. And still, there is a noticeable increase in efficiency, which is indeed, the hallmark of the Schematic these IP Protocol Specifications represent.

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Note: The '^' sign is the Mathematical Symbol used to represent the Exponential Operation. Where '2^2 = 4', is the same equation represented by '2 * 2 = 4', which is the Multiplicative equivalent.

Abstract

This paper focuses upon the simplification of the presentation for Defining the New Schematic of what was called the IPv7 and IPv8 IP Protocol Specifications. Which is accomplished by first, Renaming these Protocols to 'IPt1' and 'IPt2', where the "t" represents 'Tele-Communications-Specification'. And second, by eliminating either all, or most of the extraneous information, which is not essential (at least not anymore) for understanding the overall Schematic Structure, nor the benefits, these Protocol Specifications actually represent. Which is further emphasized with a comparison, that uses The New and the Modern Binary Systems. Where is it shown that an increase in efficiency still exist, while the Number of IP Addresses remains Astronomically Large in both cases.

In other words, the 'IPt1' and 'IPt2' IP Specifications represents a format, which is nothing more than a 'Telephone Number Implementation' that can be used as the primary IP Addressing format in any Telecommunications System, regardless of the choice for the Method in Binary Enumeration. Which means, in essence, this a Telecommunications Protocol that is essentially the 'Computer's Telephone Number'.

"This work is Dedicated to my first and only child, 'Yahnay', who is; the Mover of Dreams, the Maker of Reality, and the 'Princess of the New Universe'. (E.T.)"

Introduction: Re-Viewing the Design Structure of the IPv4 Protocol

Either by accident, or actual intent, clearly the IPv4 IP Addressing Specification is a marvel of ingenuity, because it represents a solid foundation, which is built upon the spirit of simplicity, without sacrificing any of the functionally prescribed for it’s' use. In other words, the IPv4 IP specification uses a Simple Natural Numbering System, designed specifically as the standard IP Addressing specification. Whose added purpose, was the elimination of having to remember some Naming convention, or the Name representing the Host, for addressing, to establish communication. (Compare the Telephone Number used today with the Telephone Number used, say, 50 years ago!)

To be more specific, the IPv4 specification is a 12 numbered IP Addressing System, which is divided into 4 sections separated by periods, called Octets. Each section, or Octet, can contain up to 3 numbers, which have been specifically defined to provide the IP Address Location of any Network, or the Host, located within the Network itself. However, given the explosive growth of the Computer Industry, which supply the ever growing demands of the 'Consumer User' This demand, and a 6 Billion World population total, seem to dwarf the Supply of the current number of available IP Addresses in the IPv4 Addressing Scheme. And while, I feel hard Pressed to accept the belief, or the claim, for the existence of an IP Addressing shortage. I do believe however, that the reality of the so called IP Address shortage, is really a Statement, which Acknowledges IP Address waste And this seems especially true, when observing Table 1-A, and knowing that there are IP Addresses which are excluded from the IP Address Allocation pool. (Noting specifically IP Address Classes 'D' and 'E'.)

Furthermore, while this makes no mention of Corporate Greed, or IP Address Hoarding, as some of the additional ways to account for the need, or loss, of IP Addresses. There is a way, that has been Proven Mathematically, to construct a System for IP Addressing which is logically derived from the IPv4 Addressing format. This system would provide inherently, the necessary regulations, while eliminating any of the other possible problems that have been associated with this dilemma. Again, personal beliefs notwithstanding, while admitting to the possibility for Production Miracles...Still, having 3 Billion functional Computers all vying for a Global Network Connection, is indeed, a serious stretch in the belief for the Technology of Today, not to mention the overall intellectual development of Mankind in general.

Table 1-A

Structure Decimal of the IPv4 Representation IP Class System

1. Class A: 1 - 126, Default Subnet Mask 255.x.x.x:
   126 Networks and 16,387,064 Hosts: 0

2. Class B: 128- 191, Default Subnet Mask 255.255.x.x:
   16,256 Networks and 64,516 Hosts: 10

3. Class C: 192 - 223, Default Subnet Mask 255.255.255.x:
   2,064,512 Networks and 254 Hosts: 110

4. Class D: 224 - 239; Used for Multicasting, No Host: 1110
   16 x 254^3 = 262,192,024 IP Addresses available

5. Class E: 240 - 254; Denoting Experimental, No Host: 11110
   15 x 254^3 = 245,805,960 IP Addresses available

Chapter I: The Computer's First Telephone Number, the IPt1 Design Using the New Method of Enumeration for the Binary System

The development of a new protocol specification whose foundation is based upon the Mathematics of Quantification, which was logically derived from the IPv4 specification, was not Mathematical Black Magic. In other words, while providing an additional 133 Million IP Addresses, the IPt1 IP Protocol reinforces the significance of the solid foundation, which was the essence of the IPv4 protocol specification. Now, just for a moment, take notice of Table 2-A, which is the IP Addressing Schematic that represents the IPt1 IP Protocol Specification.

Table 2-A

"The Logically derived Structure of the 'Synthetic' Decimal
Representation of the IPt1 Class System"

CLASS A

1. Class A-1, 1 - 128, Subnet Identifier 256.Y.X.X:
   Class A-2, 1 - 128, Subnet Identifier 256.256.Y.X:
   Class A-3, 1 - 128, Subnet Identifier 256.256.256.Y:
   Class A-4, 1 - 128, Subnet Identifier 256.256.256.256:

2^7 Networks and 256^3 Hosts: 0
Total Number of IP Addresses Available:
128 x 16,777,216 = 2,147,483,648

CLASS B

2. Class B-1, 129 - 192, Subnet Identifier 256.Y.X.X:
   Class B-2, 129 - 192, Subnet Identifier 256.256.Y.X:
   Class B-3, 129 - 192, Subnet Identifier 256.256.256.Y:
   Class B-4, 129 - 192, Subnet Identifier 256.256.256.256:

2^6 Networks and 256^3 Hosts: 10
Total Number of IP Addresses Available:
64 x 16,777,216 = 1,073,741,824

CLASS C

3. Class C-1, 193 - 224, Subnet Identifier 256.Y.X.X:
   Class C-2, 193 - 224, Subnet Identifier 256.256.Y.X:
   Class C-3, 193 - 224, Subnet Identifier 256.256.256.Y:
   Class C-4, 193 - 224, Subnet Identifier 256.256.256.256:

2^5 Networks and 256^3 Hosts: 110
Total Number of IP Addresses Available:
32 x 16,777,216 = 536,870,912

CLASS D

4. Class D-1, 225 - 240, Subnet Identifier 256.Y.X.X:
   Class D-2, 225 - 240, Subnet Identifier 256.256.Y.X:
   Class D-3, 225 - 240, Subnet Identifier 256.256.256.Y:
   Class D-4, 225 - 240, Subnet Identifier 256.256.256.256:

2^4 Networks and 256^3 Hosts: 1110
Total Number of IP Addresses Available:
16 x 16,777,216 = 268,435,456

CLASS E

5. Class E-1, 241 - 255, Subnet Identifier 256.Y.X.X:
   Class E-2, 241 - 255, Subnet Identifier 256.256.Y.X:
   Class E-3, 241 - 255, Subnet Identifier 256.256.256.Y:
   Class E-4, 241 - 255, Subnet Identifier 256.256.256.256:

15 Networks and 256^3 Hosts: 1111
Total Number of IP Addresses Available:
15 x 16,777,216 = 251,658,240

First you should notice, that this is a Logically derived Structure of the 'Synthetic' Decimal Representation for IPt1. Next, you will probably observe that it retains the same Classification Structure, with the added twist, in which each IP Addressing Class has been further Sub-Divided into '4' additional Sub-Sections within each of the IP Address Class. And upon the third inspection, you should notice the 'Default Addressing Structure', which is also different than that in the IPv4 Specification. However, the final inspection reveals the difference in the respective numberings for the 'Default IP Subnet Mask', which is called the 'Default Subnet Mask' for the IPv4 specification, and it is called the 'Subnet Identifier' in the IPt1 specification.

Nevertheless, these comparisons are not without an accompanying logical justification. Where by, the 'Default IP Subnet Mask' specification, specifies the Limit in Binary Notation, which deals with size of the Set that represents the Total Number of IP Addresses contained in the 'IP Address Class Range'. In which case, in the IPv4 specification, the number '255', is an Integer that represents the Modern Binary Number '11111111', and the Integer '256', in the IPt1 specification, represents the new Binary Representation for the Binary Number '11111111'. Moreover, since both of these IP Addressing Specifications, has a Default IP Addressing Structure that contains '4' Octets, then the respective equation which represents the Total Number of Available IP Addresses contained in each of the Sets representing these specification, is given respectively as; 255^4, and 256^4.

Furthermore, the difference in the Naming Convention regarding the 'Default IP Subnet Mask', was meant to emphasize the efficiency of the mathematically derived technique, of Subnetting the IP Address Pool for each of the '5' IP Addresses Classes, which prevents the loss of IP Addresses for use in the assignment of the Host IP Address. And this process was noticed, when viewing the 'Default IP Address Structure', and is represented by the 'Y' in the IPt1 specification, which also resulted in a further Sub-Division of each of the '5' IP Address Classes. That is, given by the 'Laws for The Octet', as depicted in Table 1-B, we have: 'Where N = Number of Octet, and if 'Y' equals the Address Range '129 - 256', and 1 - 128 is not included in the Address Range, then 'Y' is Represented by the equation 'Y = 256 - 128'.'

Table 1-B

{" The Laws of the Octet "}

'If the "Subnet Identifier specifies the value for the Variable Y", then the "Subnet Identifier" is said to Define the value of every Octet, for All Address Classes, in which the 'Y' variable is assign': Hence;

1. By definition, there exist 4 distinct Sections or Divisions for every IP Address Class. However, the number of Sections or Divisions that any IP Address Class can maintain is Mathematically derived, which is related to, and dependent upon, the IP Bit Address Number and the Total Number of IP Addresses defined for the IP Address Classes.

2. The Sections or Divisions of the IP Address Class are defined as: Primary, Secondary, Ternary, etc...And are labeled according to their respective Class Location (e.g.: Class A would be Class A-1, Class A-2, Class A-3, and continued as would be necessary to distinguish every Division(s) of the Class, and the respective Divisions of the remaining IP Address Classes; i.e. Address Classes B - E).

3. The Subnet Identifier assigns to the First Octet within each Section or Division of every IP Address Class, when it is not use as the Default Subnet Mask, only the value of the numbers available in the IP Address Range assigned to the IP Address Class.

4. Every OCTET, in every Address Class, which is not defined by the Subnet Identifier, can be assigned any value defined by the range given by; '1 - 256' (which excludes the use of All Integer '0's'). That is, provided that there is no succeeding Section or Division within the same Address Class, whose reference would be the same OCTET Number, which is Defined by the Subnet Identifier. (In other words, if there is such an OCTET in the succeeding Section or Division, then neither, can be defined by the Subnet Identifier and use All of the Numbers in the Integer Range specified above.)

5. For every OCTET within each Section or Division of every IP Address Class, that is defined by the Subnet Identifier, and it is preceded by a Section or Division within the same Address Class, whose reference is the preceding Octet Number. Then, the Octet of the preceding Section or Division must be defined by the Subnet Identifier. (Because with the exception of the First Octet, the Octet of the preceding Section, or Division, must be defined by 'Y', and can NOT be assigned the value denoted by the Integer Range, which DEFINES the IP Address Range assigned to that IP Address Class.)

In addition, any further comparison between these Protocol Specifications, which actually represents the Network and the Host IP Address assignments for the '5' IP Address Classes contained within these protocol specifications, as shown in Tables '3-A', and '4-A', respectively. Which not only reveal the efficiency gains of the IPt1 Protocol in the total number of available IP Addresses, but the benefits from the provisions of the inherent regulation that controls the issuances of the IP Addresses based upon the number the Host IP Address assignment required.

Table 3-A

"The IPv4 IP Addressing Schematic, and the Total
Number of available IP Addresses, which equals;'4.145 x 10^9'"

Class A, 1 - 126, Default Subnet Mask 255.x.x.x:
126 Networks and 16,387,064 Hosts: 0
Total Number of IP Addresses Available:
126 x 16,387,064 = 2,064,770,064

Class B, 128- 191, Default Subnet Mask 255.x.x.x:
16,256 Networks and 64,516 Hosts: 10
Total Number of IP Addresses Available:
64 x 16,387,064 = 1,048,772,096

Class C, 192 - 223, Default Subnet Mask 255.x.x.x:
2,064,512 Networks and 254 Hosts: 110
Total Number of IP Addresses Available:
32 x 16,387,064 = 524,386,048

Class D, 224 - 239, Default Subnet Mask 255.x.x.x:
16 x 254^3 Networks and 'No' Hosts: 1110
Total Number of IP Addresses Available:
16 x 16,387,064 = 262,193,024

Class E, 240 - 254, Default Subnet Mask 255.x.x.x:
15 x 254^3 Networks and 'No' Hosts: 1111
Total Number of IP Addresses Available:
15 x 16,387,064 = 245,805,960

Table 4-A

"Reality of the Mathematically Derived Addressing Schematic using the New Binary System as the Representation for the 'IPt1' Class System." (Where the Value for the variable 'Y' is given by the Laws of the Octet, which yields 4.278 x 10^9 Addresses: And '128 + 64 + 32 + 16 + 15 = 255, which Yields 255 x 256^3 IP Addresses'.)

1. Total IP Addresses for Class A = 128 x 256^3 = 2,147,483,648
   Total available IP Addresses for Class A = 128 x 256^3
   Total available IP Host Addresses Equals 128 x 255^N
   (Where N = Number of Octet, and 'Y' equals the Address Range '129 - 256', 1 - 128 is not included in the Address Range Represented by the equation 'Y = 256 - 128'.)

   Class A-1, 1 - 128, Subnet Identifier 256.y.x.x:
   1,073,741,824 Networks and 8,323,200 Hosts: 0

   Class A-2, 1 - 128, Subnet Identifier 256.256.y.x:
   536,870,912 Networks and 32,640 Hosts

   Class A-3, 1 - 128, Subnet Identifier 256.256.256.y:
   268,435,456 Networks and 128 Hosts

   Class A-4, 1 - 128, Subnet Identifier 256.256.256.256:
   268,435,456 Network / MultiCast IP Addresses / AnyCast

2. Total IP Addresses for Class B = 64 x 256^3 = 1,073,741,824
   Total available IP Addresses for Class B = 64 x 256^3
   Total available IP Host Addresses Equals 64 x 255^N
   (Where N = Number of Octet, and 'Y' equals the Address Range '256 - Q'; 129 - 192 is not included in the Address Range Represented by the equation 'Y = 256 - 64'.)

   Class B-1, 129 - 192, Subnet Identifier 256.y.x.x:
   805,306,368 Networks and 4,161,600 Hosts: 10

   Class B-2, 129 - 192, Subnet Identifier 256.256.y.x:
   201,326,592 Networks and 16,320 Hosts

   Class B-3, 129 - 192, Subnet Identifier 256.256.256.y:
   50,331,648 Networks and 64 Hosts

   Class B-4, 129 - 192, Subnet Identifier 256.256.256.256:
   16,777,216 Network / MultiCast IP Addresses / AnyCast

3. Total IP Addresses for Class C = 32 x 256^3 = 536,870,912
Total available IP Addresses for Class C = 32 x 256^3
Total available IP Host Addresses Equals 32 x 255^N
(Where N = Number of Octet, and 'Y' equals the Address Range '256 - Q'; 193 - 224 is not included in the Address Range Represented by the equation 'Y = 256 - 32.)

Class C-1, 193 - 224, Subnet Identifier 256.y.x.x:

469,762,048 Networks and 2,080,800 Hosts: 110

Class C-2, 193 - 224, Subnet Identifier 256.256.y.x:
58,720,256 Networks and 8,160 Hosts

Class C-3, 193 - 224, Subnet Identifier 256.256.256.y:
7,340,032 Networks and 32 Hosts

Class C-4, 193 - 224, Subnet Identifier 256.256.256.256:
1,048,576 Network / MultiCast IP Addresses / AnyCast

4. Total IP Addresses for Class D = 16 x 256^3 = 268,435,456
Total available IP Addresses for Class D = 16 x 256^3
Total available IP Host Addresses Equals 16 x 255^N
(Where N = Number of Octet, and 'Y' equals the Address Range '256 - Q'; 225 - 240 is not included in the Address Range Represented by the equation 'Y = 256 - 16'.)

Class D-1, 225 - 240, Subnet Identifier 256.y.x.x:
251,658,240 Networks and 1,040,400 Hosts: 1110

Class D-2, 225 - 240, Subnet Identifier 256.256.y.x:
15,728,640 Networks and 4,080 Hosts

Class D-3, 225 - 240, Subnet Identifier 256.256.256.y:
983,040 Networks and 16 Hosts

Class D-4, 225 - 240, Subnet Identifier 256.256.256.256:
65,536 Network / MultiCast IP Addresses / AnyCast

5. Total IP Addresses for Class E = 15 x 256^3 = 251,658,240
   Total available IP Addresses for Class E = 15 x 256^3
   Total available IP Host Addresses Equals 15 x 255^N
   (Where N = Number of Octet, and 'Y' equals the Address
    Range '256 - Q'; 241 - 255 is not included in the
    Address Range Represented by the equation
           'Y = 256 - 15'.)

   Class E-1, 241 - 255, Subnet Identifier 256.y.x.x:
   236,912,640 Networks and 975,375 Hosts: 1111

   Class E-2, 241 - 255, Subnet Identifier 256.256.y.x:
   13,881,600 Networks and 3,825 Hosts

   Class E-3, 241 - 255, Subnet Identifier 256.256.256.y:
   813,375 Networks and 15 Hosts

   Class E-4, 241 - 255, Subnet Identifier 256.256.256.256:
   50,625 Network / MultiCast IP Addresses / AnyCast

The IP Addressing Scheme of IPt1 can serve the Global Internetworking Community now. Its implementation offers the most significant improvements ever conceived, well beyond any planed replacement system, or those presently in use. However, while there is a learning curve, it would actually impose no challenge for the seasoned professional. In fact, there are 'SEVEN' reasons that support its implementation and the reality of it being the logical replacement for IPv4.

1. It maintains the Identical methods of enumeration for IP Addressing, as in IPv4, with a guarded respect for error correction(s).

2. Its Header does not change from that used in IPv4, which means the version number can remain the same.

3. It is only a 'Transparent Overlay' of the present Addressing System, which provides an increase of more than 133 million additional IP Addresses.

4. It is a Logical Derivative of the IPv4 Addressing System, which eliminates all of the 'PREDEPLOYMENT' testing required of a New System, all while providing a flawless transition for its expansion, IPt2. Which makes the implementation of IPt1 and IPt2 cost effective.

5. It Increases the Efficiency in the use of IP Addresses, because there are Absolutely No IP Addresses wasted on Host assignments in any of the Divisions or Sections of the respective IP Address Classes. But! Any Mathematical Analysis however, would clearly show that the Difference between the IP Address Loss of (16,777,216), and total Number of Host IP Addresses (16,581,375), represents a further reduction of the Total Number of reported IP Address Losses in the IPt1 IP Specification, to approximately 195,841 Addresses. In other words, the number of available Hosts IP Addresses determined by 'Laws of the Octet', is always a 'Constant', which provides an unquestionable Efficiency in the use of the Total Number of Available IP Addresses for the IPt1 IP Specification*.

6. There is no Mandate Requiring Any Change to The Current Structure of the Private Networking Domains, nor to their Existing IP Addressing System or Format, which would extend beyond providing the Users with an additional convenience. In other words, asides from the Requirement for Changing the numbering and Naming of 'Default IP Subnet Mask' used in the DNS Server, and DHCP Servers, implementing these changes, which results from the change in the Binary System, would be all that is needed. Especially since, other than the Operating System itself, these changes would provide all the consideration as would be needed by the Applications the individual systems might contain.

7. The existence of the Use of the Integer '0', except for the use in EMERGENECY BROADCAST COMMUNICATION. Which means, the Integer '0' would be excluded from any use involving any Normal IP Addressing Format. Thus, barring it from the use in any Octet of the IP Address, except in an Emergency. However, this is a special case, and an important function of the Integer '0', which is beyond the limits imposed that Bars its (ALL Integer 0's) use in the 'Zone IP', 'IP Area Code', and the Octet(s) Defined by the 'Subnet Identifier'. In other words, this requirement prohibits All Network Administrators, Except those Responsible for Administrating the EMERGENECY BROADCAST COMMUNICATION Network, from the use or assignment of All Integer '0' to any Octet within an IP Address. And this does not effect nor alter the number of available of IP Addresses for use in the IPt1 and IPt2 IP Addressing Specification, nor its use in defining the 'Default Subnet Mask'.

Furthermore, these protocols could represent the END of the DHCP Server, because other than considerations for IP Address mapping to a 'Name', or the facilitation it provides in making IP Address assignment an automatic process, there would be No need for assigning a temporary IP Address. Which does ultimately suggest, Re-Defining the functions for a DHCP Server. Where by, the New specification would provide the complete Specifications and Capabilities for Sub-Net Creation, that would allow Variable Sizing. It must also be capable of Suggesting, or Specifying the Number of IP Addresses Allocated for creating the Sub-Net, which would use the 'Gateway Router's Permanente IP Address' as the 'Point of Demarcation' to Assign an IP Address from the 'Sub-Net Pool' to every Device which is attached to the Sub-Net. In addition to Sizing and Maintaining the Reserve (Surplus) IP Address Pool, and also maintaining a Permanente Server IP Address Assignment. The New definition for the 'DHCP Server' would also incorporate all of the functions, which would be necessary to allow any person to Design and implement a Network of any Size. Moreover, this specification must also included 'IP PBX' suffixing Capabilities. That is, the specification for Enabling the Trailing Numbers ('1 - 999') ':X.X.X', which are attached to the End of an IP Address, that would provide the Services for 'VVoIP' (Video & Voice Over IP: See 'Ex. 1'), using only the Router to Direct the Communications to the Right Sub-Components in a 'Session Initialization Protocol' Environment. And to complete the set-up for Network Operations, the 'DHCP Server' must also establish, and verify, the final LAN, WAN, or MAN (etc...) Connections.

Ex. 1

'Example of an IP PBX Telephone Number'

```
Zone IP: IP Area Code: IP Network Address :IP PBX Extension
    \        \                 |                   /
    256:     256:       256.256.000.000       :X.X.X
```

Chapter II: Developing the Country Code, and the Sub-Country code Designations: The Design of the IPt2 Protocol

The advantages of IPt2 however, surmount far beyond any 32 Bit IP Addressing System now employed, or any IP Addressing System ever conceived, which was derived from a designed that mimics the format of the Typical Telephone Number, having a 'Country Code' and a 'Area Code' Prefix (See Figure 2-B, and Figure 3-B). Nevertheless, while retaining the ease of use and implementation of IPv4 / IPt1, IPt2 provides an additional number of available IP Addresses that's staggering, to say the very least. In other words, the comparable analogy would be, IPt1 can provide an individual IP Address to 'nearly' every person in the world today. While IPt2 presently, using only 48 Bits of this 64 Bit IP Addressing System, can sustain the inhabitants of more than '46 Thousand Planets'. And if the total Address Range of this 64 Bit System is used, then IPt2 can provide an individual IP Address to the inhabitants of more than '3 Billion Planets', with each planet having a population equal to the population total of the world today. Which is to say, if IPt2 were expanded to the same Address Space as IPv6, which is a 128 Bit IP Address. Then the total number of available IP Addresses would be greater than 3.402 x 10^38. Which is greater than the available IP Address offering of IPv6. In other words, what this means in the terms of the foregoing scenario, is that: 'The people of planet Earth can, when using the 128 Bit IP Addressing format of IPt2, colonize more than 5.36 x 10^28 Planets, with each Planet having a population total equal to the existing count, and still have reserve IP Addresses'.

Figure 2-B

Typical Structure of a Telephone
Number with COUNTRY CODE and AREA CODE

```
|COUNTRY CODE| AREA CODE|TELEPHONE NUMBER
++++++++++++++++++++++++++++++++++++++++++++
|  88        |  510     | 645-4721
```

Figure 3-B

```
                  Reality of the Structure of the
              Addressing Schematic Design for the IPt2
        Protocol Specification Using The New Binary System
                  Which yields a Combined Total
                   of 2.78 x 10^14 IP Addresses


            '255'       '255'          One Copy Of
            Total    IP Area Code   'IPt1' Addressing
           Zone IP    Addresses         Schematic
          Addresses      per        per 'IP Area Code'
           |    |     'Zone IP'        255 x 256^3
           v    v      Address        IP  Addresses

         | Zone IP | IP Area Code |   IP Address
         ++++++++++++++++++++++++++++++++++++++++++++
        ... 256    :    256      :  256.000.000.000
              |           |                 |
              V           V                 V
      <-Global-Net |  InterNet    |    IntraNet
```

In other words, IPt2 represents 255^2 (65,025) copies of the IPt1 IP Addressing Schematic, in which there is only one copy assigned per IP Area Code Address. And there is a total of 255 Zone IP Addresses that uses only 48 Bits of this 64 Bit Addressing System, which has '255 IP Area Codes' per 'Zone IP Address. It amounts to a total availability of 255 x 256^3 IP Addresses, which forms the Base, or IPt1 is the Base Addressing Schematic for the IPt2 IP Specification, that yields a total availability of 2.78 x 10^14 IP Addresses, using only the Prefix Designations, specified as the 'Zone IP', and the 'IP Area Code'. And while, the reality of the IPt2 Addressing Schematic, is somewhat miss leading, as depicted in Table 5-A , it still represents an accurate total of the number of available IP Addresses contained in this Protocol Specification. However, the reality of the Schematic is still IPt1, which is Prefixed using the 'Zone IP' and the 'IP Area Code', to generate this extremely large pool of available IP Addresses.

Table 5-A

"Reality of the Structure of the Decimal Representation for the IPt2 Class System using the New Binary System."(Where the Value for the variable 'Y' is given by the Laws of the Octet, which yields 2.78 x 10^14 IP Addresses.)*

1. Total IP Addresses for 'Class A' having '255' 'Zone IP' Addresses

= 255 x 255 x 128 x 256^3
= 255 x 255 x 2,147,483,648
= 1.39640 x 10^14

Total of 255 IP of 'IP Area Code' Addresses per 'Zone IP' Address

= 255 x 128 x 256^3
= 255 x 2,147,483,648
= 5.47608 x 10^11

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class A-1, 1 - 128, Subnet Identifier 256:256:256.y.x.x:
2.73804 x 10^11 Networks and 8,257,536 Hosts: 0

Class A-2, 1 - 128, Subnet Identifier 256:256:256.256.y.x:
1.36902 x 10^11 Networks and 32,256 Hosts

Class A-3, 1 - 128, Subnet Identifier 256:256:256.256.256.y:
6.84510 x 10^10 Networks and 128 Hosts

Class A-4, 1 - 128, Subnet Identifier 256:256:256.256.256.256:
6.84510 x 10^10 Network / MultiCast IP Addresses / AnyCast

2. Total IP Addresses for 'Class B' having '255' 'Zone IP' Addresses

= 255 x 255 x 64 x 256^3
= 255 x 255 x 1,073,741,824
= 6.98201 x 10^13

Total of 255 IP 'IP Area Code' Addresses per 'Zone IP' Address

= 255 x 64 x 256^3
= 255 x 1,073,741,824
= 2.73804 x 10^11

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class B-1, 129 - 192, Subnet Identifier 256:256:256.y.x.x:
2.20046 x 10^11 Networks and 4,194,304 Hosts: 10

Class B-2, 129 - 192, Subnet Identifier 256:256:256.256.y.x:
5.13383 x 10^10 Networks and 16,384 Hosts

Class B-3, 129 - 192, Subnet Identifier 256:256:256.256.256.y:
1.28346 x 10^10 Networks and 64 Hosts

Class B-4, 129 - 192, Subnet Identifier 256:256:256.256.256.256:
4.27819 x 10^9 Network / MultiCast IP Addresses / AnyCast

3. Total IP Addresses for 'Class C' having '255' 'Zone IP' Addresses

= 255 x 255 x 32 x 256^3
= 255 x 255 x 536,870,912
= 3.49100 x 10^13

Total of 255 IP 'IP Area Code' Addresses per 'Zone IP' Address

= 255 x 32 x 256^3
= 255 x 536,870,912
= 1.36902 x 10^11

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class C-1, 193 - 224, Subnet Identifier 256:256:256.y.x.x:
1.19789 x 10^11 Networks and 2,097,152 Hosts: 110

Class C-2, 193 - 224, Subnet Identifier 256:256:256.256.y.x:
1.49737 x 10^10 Networks and 8,192 Hosts

Class C-3, 193 - 224, Subnet Identifier 256:256:256.256.256.y:
1.872 x 10^9 Networks and 32 Hosts

Class C-4, 193 - 224, Subnet Identifier 256:256:256.256.256.256:
2.6738 x 10^8 Network / MultiCast IP Addresses / AnyCast

4. Total IP Addresses for 'Class D' having '255' 'Zone IP' Addresses

= 255 x 255 x 16 x 256^3
= 255 x 255 x 268,435,456
= 1.74550 x 10^13

Total of 255 IP 'IP Area Code' Addresses per 'Zone IP' Address

= 255 x 16 x 256^3
= 255 x 268,435,456
= 6.84510 x 10^10

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class D-1, 225 - 240, Subnet Identifier 256:256:256.y.x.x:
6.41729 x 10^10 Networks and 1,048,576 Hosts: 1110

Class D-2, 225 - 240, Subnet Identifier 256:256:256.256.y.x:
4.01080 x 10^9 Networks and 4,096 Hosts

Class D-3, 225 - 240, Subnet Identifier 256:256:256.256.256.y:
2.50675 x 10^8 Networks and 16 Hosts

Class D-4, 225 - 240, Subnet Identifier 256:256:256.256.256.256:
1.6712 x 10^7 Network / MultiCast IP Addresses / AnyCast

5. Total IP Addresses for 'Class E' having '255' 'Zone IP' Addresses

```
                                  = 255 x 255 x 15 x 256^3
                                  = 255 x 255 x 251,658,240
                                  = 1.63641 x 10^13
```

Total of 255 IP 'IP Area Code' Addresses per 'Zone IP' Address

```
                                  = 255 x 15 x 256^3
                                  = 255 x 251,658,240
                                  = 6.41729 x 10^10
```

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class E-1, 241 - 255, Subnet Identifier 256:256:256.y.x.x:
6.04127 x 10^10 Networks and 967,740 Hosts: 1111

Class E-2, 241 - 255, Subnet Identifier 256:256:256.256.y.x:
3.5398 x 10^9 Networks and 3,810 Hosts

Class E-3, 241 - 255, Subnet Identifier 256:256:256.256.256.y:
2.0741 x 10^8 Networks and 15 Hosts

Class E-4, 241 - 255, Subnet Identifier 256:256:256.256.256.256:
1.2903 x 10^7 Network / MultiCast IP Addresses / AnyCast

And finally, the added feature of the IPt2 Protocol, is that, everyone, everywhere, can be assigned their own personal, Home Use, IP Address. In other words, the supply pool is so large, that the IP Addresses can be free for everyone. Additionally, the regulation is built into the IPt2 IP Addressing Structure. In fact, it is made for Distribution by Continents, using the 'Zone IP' prefix, and depending upon the Population of the Countries contained within the each of these Continents, each Country can be assigned '1' or 'More' 'IP Area Code' Addresses, because there are '255' of these IP Area Code Addresses for every 'Zone IP' Address. Which means, with each 'IP Area Code' Address issued, the Recipient Country would get exactly '1' copy of the 'IPt1' IP Addressing Schematic, that contains more than 4 Billion IP Addresses. Take for example, the United States, Canada, and Mexico, which are all part of the same Continent. They in turn, would share the same 'ZONE IP' Address, which contains "255 IP AREA CODE" Addresses. In which case, the distribution could be '1' IP Area Code' Address package assigned to every 'State' or 'Province', which is located within the Countries contained in the Continent. But, if you will note, this would amount to the distribution approximation represented by: ('50 IP Area Code' Addresses) = United States, ('6 IP Area Code' Addresses) = Canada, and ('4 IP Area Code' Addresses) = Mexico. And the sum of the Distribution equals '60' IP Area Code Addresses, which leaves the Continent with a surplus of '195' IP Area Code Addresses, containing more than 4 Billion IP Addresses each.

However, this was only an example of one possible solution for assigning the 'Zone IP' Addresses. Because just as easily, one can see that an entire 'Galaxy', or Star System, could be assigned to one 'GSSZone IP' Address, in a '64' IP Addressing System using only a '56' Bit IP Addressing format. And the 'Solar Systems' within this Galaxy could be assigned one 'Zone IP' Address, in which the related 'Planets' would be assigned one 'IP Area Code' from the 'Zone IP' Address of their respective 'Solar Systems'.

Still, even this, does not depict the actual Mathematical efficiency defined in the IPt1 and IPt2 IP Specifications, because in reality, while the '99.999...+ %' efficiency rating, in overall use, is true. However, this 'Rating' says nothing about the overall number of viable 'Network Addresses', which Increases by a factor greater than '17.3'. Nor does this 'Rating' reflect the increase in the number of 'Host Addresses'. That is, when depicting a one-to-one comparison with IPv4, this represents an increase which is greater than 50%, and a Network-to-Host distribution percentage, that would surpass even this amount.

In other words, one copy of the 'IPt1' Schematic would suffice to meet the needs of the entire 'Planet', today, and there would still be a Surplus of IP Addresses. What this actually means Mathematically, is that, the 'IPt2 Header' could always be used, even in the choice for the actual 'Bit Range' of the IP Address, because the IP Address Range in this IP Specification is indeed a variable. And for now at least, this can be within the range of '32 to 64' Bits, which is incremented in '8 Bit' Segments when the IP Address is beyond the '32 Bit format specified in 'IPt1'. Furthermore, it should clearly be understood, this is a Mathematical System that can quite easily be expanded to an 'IPt8 Format' (And Beyond!), which is an IP Addressing System that uses '256 Bit IP Addresses*'. Nevertheless, in all cases, a Surplus of available IP Addresses would always exist, which means that the allocation of these IP Addresses should be determined by actual usage or needs, and not waste. Needless to say, whatever the final decision may be, IP Address Availability, Clearly, is no longer an issue.

In a word, the future is Now! Because everything, which is, or can be represented as an Electrical Signal for Telecommunications, can use the Global Network (Global-Net) as the only Thoroughfare, which would Unite the Lives and Livelihoods of Everyone, Everywhere, for the benefit of all Mankind.

Chapter III: Security Considerations

This document, whose only objective was the simplification of a very serious theoretical work, does not directly raise any security issues. Hence, there are no issues raised that warrant Security Considerations.

Appendix I : Graphical Depiction of the Headers for the IPt1 and IPt2
Protocol Specifications

Figure 1-C

IP Header for IPv4 and IPt1

```
0                   1                   2                   3

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
| VER  |  IHL  | TYPE OF SERVICE |  TOTAL LENGHT                |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
| IDENTIFICATION                |FLA|    FRAGMENT OFFSET        |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|  TIME TO LIVE  |  PROTOCOL    |      CHECK SUM HEADER         |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|                          SOURCE ADDRESS                       |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|                   DESTINATION   ADDRESS                       |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|                             OPTIONS                           |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|                             DATA                              |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|---------------------------------------------------------------|
```

IP Header for IPt2

```
0                   2                   4                   6
0 2 4 6 8 0 2 4 6 8 0 2 4 6 8 0 2 4 6 8 0 2 4 6 8 0 2 4 6 8 0 2
| VER  |  IHL  | TOS & NEXT HEADER |   TL & DIRECTION BIT     |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
| IDENTIFICATION & SECURITY BIT  |FLA|    FRAGMENT OFFSET     |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
| TTL & HOP LIMIT | PROTOCOL |:IP PBX Ext. | CHECK SUM HEADER |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
| S1 RESERVED: | S2 RESERVED:| S  ZONE IP:   | S IP AREA CODE:|
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|                          SOURCE ADDRESS                     |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
| D1 RESERVED: | D2 RESERVED:| D  ZONE IP:   | D IP AREA CODE:|
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|                   DESTINATION   ADDRESS                     |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|                             OPTIONS                         |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|                             DATA                            |
|+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +|
|-------------------------------------------------------------|
```

This is a Proposal, an example notwithstanding, whose graphical depiction is indeed functional. Where by, the TTL and Hop Limit are program functions related to the Router's Table. And the Security Bit is a 2 Bit representation of some combination of 01, and 00. Where a '01' in the first bit tells the Router to route as a Direct Connection, and a '01' in the second Bit tells the Router that the transmission is Encrypted. While Type Of Service remains unchanged and Next Header is a '1' Bit indicator, being either a '01' or a '00'. And the Total Length remain the same, but the Direction Bit of either a '01' or '00' tells the Router if the Packet is an InterCom or OuterCom communication, which would assist the FireWall in Blocking Illegal Attempts to Access Private Domains. Which also could include the ability to write a 'IP PBX Extension' for VVoIP Transmissions.

Nevertheless, figure 2-C outlines the Mathematically Derived 'Default IP Address Structure' that is used in IPt2, which employs IPt1's Addressing Schematic as its Default, or Base Addressing Format. Which is also Prefixed by the Zone IP and the IP Area Code IP Addresses, and designated by the Subnet Identifier, that follows the format presented in figure '3-B'.

FIGURE 2-C

1. Source Addressing Structure: S1-Reserved = (X.X.X):

2. Source Addressing Structure: S2-Reserved = (X.X.X):

3. Source Addressing Structure: 256:256:256.256.256.000

4. Destination Addressing Structure: D1-Reserved = (X.X.X):

5. Destination Addressing Structure: D2-Reserved = (X.X.X):

6. Destination Addressing Structure: 256:256:256.256.000.000

FIGURE 3-C

‘Reality of the IP Addressing Format in the 64 Bit Header’
'Whose Reserved Addresses would not be apart of the Software
Program representing the Header'

1. Source Address Structure: (X.X.X):(X.X.X):256:256:256.256.000.000

2. Destination Address Structure: (X.X.X):(X.X.X):256:256:256.256.000.000

Note*: While the expansion of the IP Address within the Header, is incremented in '8 Bit' Segments. The increase in the Total Size of the IP Address beyond the Current Header Specifications, is accomplished using '32 Bit' increments, which increases the overall size of the Header itself. This is, as it should be, because it reflects the size of the 'Base IP Addressing Schematic'; 'IPt1'. Thus, preserving the Logic and Mathematical Continuity, which is the actual integrity of the System's Foundation, that was logically derived from the Mathematics of Quantification.

Appendix II: Using the Modern Binary System to Depict the IPt1 and IPt2 IP Protocol Specifications

Before beginning a comparison, I would suggest that you review the 'Laws of the Octet' to fully understand the Logic and the Mathematics, which is the Hallmark denoting the difference between Tables '3-A' and '4-A'. That is, while noting that Table '4-A' uses the New Method derived for Binary Enumeration, it's expansion focuses upon the Schematic, the foundation established by the 'Laws of the Octet', which was derived from the Logic of the Mathematics of Quantification. These Laws provided the foundation, the Schematic, which is what makes the IPt1 and IPt2 IP Specifications so powerful. In other words, after a consideration of the overall increase of the 133 Million IP Addresses provided by 'IPt1', and the results from 'IPt2', which can be explained using the Planet scenario demonstrated above (i.e. 44 or 46 Thousand Planets in a 48 Bit System, and 2.87 or 3 Billion Planets in a 64 Bit System: this respectively reflects the different Methods of Counting used in the Binary Systems). It would then be realize, that the actual difference between the Numbers presented in each of these Tables, reflects only one part of the Logical Justification. Which represents the distinction in counting that differs in each of these Binary Systems. However, the Schematic, which is the second part of the Logical justification, maintains a significance that can only be viewed when each of these Systems are represented in the Tables using the same Methods for Binary Enumeration.

That is, when comparing the 'IPt1' and 'IPv4' specifications, which are both using the Modern Methods for Enumerating in Binary Notation, as shown in Tables '3-A' and 'A-I', where there is No actual increase in the Total Number of available IP Address. Then the benefit however, is clearly established by the Schematic, which shows the Efficiency and Superiority that the IPt1 IP Addressing Specification maintains over IPv4, and which certainly surpasses that of IPv6. Furthermore, when accepting both parts of the Logical Justification, any further comparison between the Systems represented by Tables 4-A, 5-A, A-I, and A-III, which signifies the importance of the Logical Foundation provided by the Schematic. The conclusions, as resulting from the Mathematics of Quantification, remains valid for all Addressing Specifications represented in the Tables noted above, regardless of the choice of the Method for Binary Enumeration.

Nevertheless, while it was Mathematically proven, using the Mathematics of Quantification, that the New Binary System represented the Logical, and Mathematically correct System. It is doubtful nonetheless, especially without the foundation offered by my next work, that an agreement could ever be reached, regarding which System, being correct, is the system that should be used. Even still, any comparison between the Tables which represents each of these Binary Systems. Clearly shows, that the Mathematics of Quantification established the Logic and Mathematical foundation, rationalized the choice, whose conclusions Defined the Binary System. Hence, the IPt1 and IPt2 IP Addressing Specifications results from a Schematic whose Logical Derivation from the Mathematics of Quantification remains unquestionably valid, regardless of the choice in the Method for Binary Enumeration.

Table A-I

"Reality of the Mathematical Addressing Schematic for the 'IPt1' Addressing System Using the Modern Binary System." (Where the Value for the variable 'Y' is given by the Laws of the Octet, and the System contains 4.145 x 10^9 Addresses.)

1. Total IP Addresses for Class A = 126 x 254^3 = 2,064,770,064
   Total available IP Addresses for Class A = 126 x 254^3
   Total available IP Host Addresses Equals 126 x 254^N
   (Where N = Number of Octet, and 'Y' equals the Address Range '128 - 254', 1 - 126 is not included in the Address Range Represented by the equation 'Y = 254 - 126'.)

Class A-1, 1 - 126, Default Subnet Mask 255.y.x.x:
1,040,514,048 Networks and 8,129,016 Hosts: 0

Class A-2, 1 - 126, Default Subnet Mask 255.255.y.x:
516,160,512 Networks and 32,004 Hosts

Class A-3, 1 - 126, Default Subnet Mask 255.255.255.y:
256,048,128 Networks and 126 Hosts

Class A-4, 1 - 126, Default Subnet Mask 255.255.255.255:
252,047,376 Network / MultiCast IP Addresses / AnyCast

2. Total IP Addresses for Class B = 64 x 254^3 = 1,048,772,096
   Total available IP Addresses for Class B = 64 x 254^3
   Total available IP Host Addresses Equals 64 x 254^N
   (Where N = Number of Octet, and 'Y' equals the Address
    Range '254 - Q'; 128 - 191 is not included in the
    Address Range Represented by the equation
           'Y = 254 - 64'.)

Class B-1, 128 - 191, Default Subnet Mask 255.y.x.x:
784,514,560 Networks and 4,129,024 Hosts: 10

Class B-2, 128 - 191, Default Subnet Mask 255.255.y.x:
197,672,960 Networks and 16,256 Hosts

Class B-3, 128 - 191, Default Subnet Mask 255.255.255.y:
49,807,360 Networks and 64 Hosts

Class B-4, 128 - 191, Default Subnet Mask 255.255.255.255:
16,777,216 Network / MultiCast IP Addresses / AnyCast

3. Total IP Addresses for Class C = 32 x 254^3 = 524,386,048
   Total available IP Addresses for Class C = 32 x 254^3
   Total available IP Host Addresses Equals 32 x 254^N
   (Where N = Number of Octet, and 'Y' equals the Address
    Range '254 - Q'; 192 - 223 is not included in the
    Address Range Represented by the equation
           'Y = 254 - 32.)

Class C-1, 192 - 223, Default Subnet Mask 255.y.x.x:
458,321,664 Networks and 2,064,512 Hosts: 110

Class C-2, 192 - 223, Default Subnet Mask 255.255.y.x:
57,741,312 Networks and 8,128 Hosts

Class C-3, 192 - 223, Default Subnet Mask 255.255.255.y:
7,274,496 Networks and 32 Hosts

Class C-4, 192 - 223, Default Subnet Mask 255.255.255.255:
1,048,576 Network / MultiCast IP Addresses / AnyCast

4. Total IP Addresses for Class D = 16 x 254^3 = 262,193,024
   Total available IP Addresses for Class D = 16 x 254^3
   Total available IP Host Addresses Equals 16 x 254^N
   (Where N = Number of Octet, and 'Y' equals the Address
    Range '254 - Q'; 224 - 239 is not included in the
    Address Range Represented by the equation
            'Y = 254 - 16'.)

   Class D-1, 224 - 239, Default Subnet Mask 255.y.x.x:
   245,676,928 Networks and 1,032,256 Hosts: 1110

   Class D-2, 224 - 239, Default Subnet Mask 255.255.y.x:
   15,475,712 Networks and 4,064 Hosts

   Class D-3, 224 - 239, Default Subnet Mask 255.255.255.y:
   974,848 Networks and 16 Hosts

   Class D-4, 224 - 239, Default Subnet Mask 255.255.255.255:
   65,536 Network / MultiCast IP Addresses / AnyCast

5. Total IP Addresses for Class E = 15 x 254^3 = 245,805,960
   Total available IP Addresses for Class E = 15 x 254^3
   Total available IP Host Addresses Equals 15 x 254^N
   (Where N = Number of Octet, and 'Y' equals the Address
    Range '254 - Q'; 240 - 254 is not included in the
    Address Range Represented by the equation
           'Y = 254 - 15'.)

   Class E-1, 240 - 254, Default Subnet Mask 255.y.x.x:
   231,289,860 Networks and 967,740 Hosts: 1111

   Class E-2, 240 - 254, Default Subnet Mask 255.255.y.x:
   13,658,850 Networks and 3,810 Hosts

   Class E-3, 240 - 254, Default Subnet Mask 255.255.255.y:
   806,625 Networks and 15 Hosts

   Class E-4, 240 - 254, Default Subnet Mask 255.255.255.255:
   50,625 Network / MultiCast IP Addresses / AnyCast

Table A-II

Reality of the Structure of the
Addressing Schematic Design for the IPt2
Protocol Specification Using The Modern Binary System
Which yields a Combined Total
of 2.67 x 10^14 IP Addresses

```
          '254'       '254'          One Copy Of
          Total    IP Area Code   'IPt1' Addressing
         Zone IP    Addresses         Schematic
        Addresses      per        per 'IP Area Code'
         |    |     'Zone IP'        253 x 254^3
         v    v      Address         IP Addresses

       | Zone IP | IP Area Code |   IP Address
       ++++++++++++++++++++++++++++++++++++++++++++
      ... 255    :    255       :  255.000.000.000
            |           |                  |
            V           V                  V
    <-Global-Net |  InterNet    |    IntraNet
```

Table A-III

"Reality of the Structure of the Schematic for the 'IPt2' IP Specification Using the Modern Binary System."(Where the Value for the variable 'Y' is given by the Laws of the Octet, and Total Number of Available IP Addresses Equals 2.67 x 10^14.)

1. Total IP Addresses for 'Class A' having '254' 'Zone IP' Addresses

= 254 x 254 x 126 x 254^3
= 254 x 254 x 2,064,770,064
= 1.332107 x 10^14

Total of 254 IP 'IP Area Code' Addresses per 'Zone IP' Address

= 254 x 126 x 254^3
= 254 x 2,064,770,064
= 5.244516 x 10^11

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class A-1, 1 - 126, Default Subnet Mask 255.y.x.x:
2.642906 x 10^11 Networks and 8,129,016 Hosts: 0

Class A-2, 1 - 126, Default Subnet Mask 255.255.y.x:
1.311048 x 10^11 Networks and 32,004 Hosts

Class A-3, 1 - 126, Default Subnet Mask 255.255.255.y:
6.503622 x 10^10 Networks and 126 Hosts

Class A-4, 1 - 126, Default Subnet Mask 255.255.255.255:
6.4020034 x 10^10 Network / MultiCast IP Addresses / AnyCast

2. Total IP Addresses for 'Class B' having '254' 'Zone IP' Addresses

```
                                  = 254 x 254 x 64 x 254^3
                                  = 254 x 254 x 1,048,772,096
                                  = 6.766258 x 10^13
```

Total of 254 IP 'IP Area Code' Addresses per 'Zone IP' Address

```
                                  = 254 x 64 x 254^3
                                  = 254 x 1,048,772,096
                                  = 2.663881 x 10^11
```

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class B-1, 128 - 191, Default Subnet Mask 255.y.x.x:
1.992667 x 10^11 Networks and 4,129,024 Hosts: 10

Class B-2, 128 - 191, Default Subnet Mask 255.255.y.x:
5.0208932 x 10^10 Networks and 16,256 Hosts

Class B-3, 128 - 191, Default Subnet Mask 255.255.255.y:
1.2651069 x 10^10 Networks and 64 Hosts

Class B-4, 128 - 191, Default Subnet Mask 255.255.255.255:
4.2614129 x 10^9 Network / MultiCast IP Addresses / AnyCast

3. Total IP Addresses for 'Class C' having '254' 'Zone IP' Addresses

= 254 x 254 x 32 x 254^3
= 254 x 254 x 524,386,048
= 3.383129 x 10^13

Total of 254 IP 'IP Area Code' Addresses per 'Zone IP' Address

= 254 x 32 x 256^3
= 254 x 524,386,048
= 1.331941 x 10^11

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class C-1, 192 - 223, Default Subnet Mask 255.y.x.x:
1.164137 x 10^11 Networks and 2,064,512 Hosts: 110

Class C-2, 192 - 223, Default Subnet Mask 255.255.y.x:
1.466629 x 10^10 Networks and 8,128 Hosts

Class C-3, 192 - 223, Default Subnet Mask 255.255.255.y:
1.8477220 x 10^9 Networks and 32 Hosts

Class C-4, 192 - 223, Default Subnet Mask 255.255.255.255:
2.663383 x 10^8 Network / MultiCast IP Addresses / AnyCast

4. Total IP Addresses for 'Class D' having '254' 'Zone IP' Addresses

= 254 x 254 x 16 x 254^3
= 254 x 254 x 262,193,024
= 1.691558 x 10^13

Total of 254 IP 'IP Area Code' Addresses per 'Zone IP' Address

= 254 x 16 x 254^3
= 254 x 262,193,024
= 6.659677 x 10^10

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class D-1, 224 - 239, Default Subnet Mask 255.y.x.x:
6.240194 x 10^10 Networks and 1,032,256 Hosts: 1110

Class D-2, 224 - 239, Default Subnet Mask 255.255.y.x:
3.930831 x 10^9 Networks and 4,064 Hosts

Class D-3, 224 - 239, Default Subnet Mask 255.255.255.y:
2.476114 x 10^8 Networks and 16 Hosts

Class D-4, 224 - 239, Default Subnet Mask 255.255.255.255:
1.6646144 x 10^7 Network / MultiCast IP Addresses / AnyCast

5. Total IP Addresses for 'Class E' having '254' 'Zone IP' Addresses

= 254 x 254 x 15 x 254^3
= 254 x 254 x 245,805,960
= 1.585842 x 10^13

Total of 254 IP 'IP Area Code' Addresses per 'Zone IP' Address

= 254 x 15 x 254^3
= 254 x 245,805,960
= 6.243471 x 10^10

Distribution per 'Zone IP' Address yielding the 'IP Area Code' Addresses

Class E-1, 240 - 254, Default Subnet Mask 255.y.x.x:
5.874762 x 10^10 Networks and 967,740 Hosts: 1111

Class E-2, 240 - 254, Default Subnet Mask 255.255.y.x:
3.4693479 x 10^9 Networks and 3,810 Hosts

Class E-3, 240 - 254, Default Subnet Mask 255.255.255.y:
2.0488275 x 10^8 Networks and 15 Hosts

Class E-4, 240 - 254, Default Subnet Mask 255.255.255.255:
1.285875 x 10^7 Network / MultiCast IP Addresses / AnyCast

Appendix III: Implications of Using 'A IP PBX Telephone Number'

The implications of having the ability of assigning a Telephone Suffix to an IP Address, provides Telephony capabilities, with Video, to every Computer User. However, simply providing a IP PBX Extension would not be sufficient. That is, while one would have the number, to receive a call would still require a IP PBX server, or suffering prohibitive costs. And while there exist an offering of several IP PBX Servers on the Consumer's Market. They might not cover all of the issues, which would allow Global-Net Telephony to become a practical reality. However, it's construction or Program Implementation might be, as a Suggestion:

1. The Design of a IP PBX Server having an integrated IP PBX DNS Server Option:

2. The significance of a IP PBX DNS Server, is that, it would provide a Straddle for normal IP traffic and IP telephone traffic. This facility is a vital necessity for IP Telephony to work, because it would establish Telephone Network Connections or Services, allow communications with a Normal DNS Server, and provide the DataBase for the Directory Services, as would be needed to establish Party Connections, Privacy and Searches. In other words, the incorporation of the DNS Server functions into a IP PBX Server would allow reverse Lookups, or the Translation of an IP Telephone Address Number, which would have the effect of 'Prioritizing' the Extension. Thus, providing the Extension with Direct Access, and the ability to Control, or Direct (Session) Communication (See Ex. A-V).

3. The ability to Assign, or Define the Extensions; e.g. having the numbers 1 - 299 represent Residential Housing, 300 – 599 Businesses, 600 - 799 Governmental, 800 - 899 Informational, and 900 – 999 Emergency / Fire / Police / Hospitals...etc.

Ex. A-IV

'Example of an IP PBX Telephone Number'

```
Zone IP: IP Area Code: IP Network Address :IP PBX Extension
    \        \               |                   /
    255:     255:       255.255.000.000       :A.B.C
```

Ex. A-V

Example of an IP PBX Telephone Number 'IP PBX in-add.arpa'

```
Zone IP: IP Area Code: IP PBX Extension  :IP Network Address
    \        \               |                   /
    255:     255:           A.B.C        :000.000.255.255
```

References

1. E. Terrell (not published, notarized 1979) " The Proof of Fermat's Last Theorem: The Revolution in Mathematical Thought" Outlines the significance of the need for a thorough understanding of the Concept of Quantification and the Concept of the Common Coefficient. These principles, as well many others, were found to maintain an unyielding importance in the Logical Analysis of Exponential Equations in Number Theory.

2. E. Terrell (not published, notarized 1983) " The Rudiments of Finite Algebra: The Results of Quantification " Demonstrates the use of the Exponent in Logical Analysis, not only of the Pure Arithmetic Functions of Number Theory, but Pure Logic as well. Where the Exponent was utilized in the Logical Expansion of the underlying concepts of Set Theory and the Field Postulates. The results yield; another Distributive Property (i.e. Distributive Law for Exponential Functions) and emphasized the possibility of an Alternate View of the Entire Mathematical field.

'It is said; "The Unsung Hero has No song, because it is only the Craven who writes the Lyrics, that Counterfeits the Reality of the World, which is made only for those who can Pretend."
e.t.'

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