INTERNET PROTOCOL t1 and t2 ADDRESS SPACE

Status of this Memo

Conventions

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Abstract

Abstract

This paper Defines the 'IPtX Protocol Specification', and provides a
visualization of the lack of IP Address Control, a Blunder, which may
be excused partly because of the impossibility of Predicting the
Current, as well as the Future use and growth of the Internet.
However, this requires an investigation, or Analysis for the Current
use of the HD-Ratio in the IPv4 and IPv6 IP Specifications. Moreover,
while the IPv4 IP Specification, is indeed the primary focus of this
investigation. To provide a fair comparison however, this Analysis
requires, if not mandates, the use of the IPt1 and IPt2 specifications
as well. The reasoning here nevertheless, is the difference in the
respective Addressing Schematics. Where by, the Addressing Scheme of the
former focuses primarily on the HOST IP Address (Assignment), while the
focus of the latter emphasizes only the Network IP Address. Nevertheless,
it shall be concluded, the Addressing Methods used in the Schematic also
affects the Efficiency; 'the RATIO of Total Number of Nodes that can be
attached to Service the Global Networking Community, and the Number of
available IP Addresses used for the Connection'.

In other words, this 'Analysis is Argument', whose focus upon the
'HD-Ratio' and the 'CIDR Notation' establishes the foundation defining
the 'INTERNET PROTOCOL t1 and t2 ADDRESS SPACE' for the IPt1 and IPt2
Protocol Specifications. Which moreover, exceeds the Mandate Defining a
New IP Addressing System specified as the Requirements outlined in
RFC1550.

"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: Analysis and Impact of the IPv4 Internet Protocol
            Address Space, which Questions the Current Use of
            and Application of the 'CIDR Notation'

    The mathematical learning curve regarding an understanding of such
    concepts as 'Bit Mapping' the 'Network Portion of an IP Address' can
    be long and arduous. And this is seen especially true, when trying to
    grasp the 'How-To's' and functional purpose of 'CIDR'. And while, I
    have read the works from only a few authors whose approach makes a
    distinction, as would be a noted difference in the interpretation of
    the definition of 'CIDR'. I have noted moreover, their approach is not
    a pronounced separation, as would be an unquestionable distinction used
    in the 'Water and Oil' analogy from Chemistry. However, the beginner,
    would understand quite clearly the difference between the 'Front-End'
    and 'Back-End' approaches used in "Supernetting of an IP Address".
    Where by the 'Bit Mapping' of the 'Network Portion', would represent
    the 'Front-End' approach, and the 'Bit Mapping' of the 'Host Portion'
    would represent the 'Back-End' approach, in what is defined, or called
    the "Supernetting of an IP Address", or 'CIDR'. Nevertheless, while the
    mathematical operation involved in either the 'Front-End' or 'Back-End'
    usage of 'CIDR' is not, by themselves, confusing or conflicting
    operations. Still, a lot remains the Wishful Dream, or on the 'Wish List'
    of the hopeful, regarding a greater Specificity in the definition and
    distinction of the functional 'Parameters' associated with the conventions
    used in the 'CIDR' notation representing a Network IP Address. Needless
    to say, this becomes even more evident when trying to understand the
    "INTERNET PROTOCOL V4 ADDRESS SPACE", which was developed and used by
    IANA as a guide, or scheme, Denoting some Method used to determine IP
    Address Availability, Special Assignment, and Allocation.

    In other words, TABLE 1, the "IPv4 Internet Protocol Address Space",
    according to the current standards and definition of 'CIDR', one would
    conclude that there is a great number of IP Addresses wasted on HOST
    Assignments. And this is apparent from the 'Bit Map' definition assigned
    to the notation "/8". Where in any 32 Bit IP Addressing format, this
    'Bit Mapping' notation accounts for (Class A = 126 x 254^3) 2,064,770,064
    IP Addresses under the current IPv4 specification, that is, without using
    the 'Front-End' indicator from Class A. And then, when it is used, it
    would it would account, (again using the current definitions of 'CIDR')
    an assignment, or allocation of more than 16 Million IP Address
    (1 X 245^3). Which, to say the very least, amounts to IP Address waste,
    because this has the effect of providing a Host with Network Status. 'Not
    to mention that most of the companies, who has such an arrangement are
    not "IPS's".

Nevertheless, the Mathematical Problem(s) encompassing these definitions far out weight the problems associated with IP Address Waste. In other words, the Current Methods and Definitions of 'CIDR', regarding it use in 'Bit Mapping' an IP Address, is Mathematically Incorrect. Or just plain Wrong! In other words, an '8 Bit Mapping' Designation under the Current '32 Bit IP Specification', can only account for '255' IP Addresses (And NO more than that!). To be more specific however, what this means Mathematically, is that, there is only '1' of the '4' '8 Bit Quadrants' being used, which sets the Parameters for the Total Number of IP Addresses Assigned. Moreover, the use of only '1' Quadrant, as a means for specification regarding the total number of IP Addresses assigned, is an Error. Which can not be used to Account for the 'Diversity in Number', regarding the Total Number Combinations Derived from the Calculation of the Total Number of IP Addresses Contained in the IP Address Class.

Unfortunately however, the above argument leads to a mathematical Proof, which revives an Old Argument regarding the Method of Enumeration using the Binary Numbering System. In other words, the Total, or Inclusive Count, which would represent the '8 Bit Mapping' notation, '/8', would not yield the Binary Number '255'. It would in fact represent '256', because Zero, under the Current Binary Specification, is indeed a Binary Number (0000). Furthermore, it should be understood, that this does serve not only the explanation for the ongoing argument, but the Current Definition of the Modern Binary System as well. Which is to say, under the Current, or Modern Binary System, {11111111} = '8 Bits' = '255', does not follow from the Definition of '2', representing Base, in what is clearly (And has been Defined as Being) an Exponential, represented by the equation, 2^N (Where N = some Positive Integer). In which case, the the Total, or Inclusive Count for an '8 Bit' translation of a Binary Number representing an Integer, would be given by the equation, '$2^8 = 256$'. This moreover, Mathematically implies the equation, $8^{32} = 256^4$, which would be interpreted as meaning; 'There are '32' Bits used to represent the '4,294,967,296' Integers, which represents the Total Number of IP Addresses contained in the IPv4 Addressing Specification. Nevertheless, while the counting methods used in the Binary System remain in Dispute, an adequate representation for the 'CIDR' Notation can be determined using the Current Binary Methods for Enumeration. That is, given by TABLE 2, we have:

```
                      TABLE 1

            IPv4 Internet Protocol Address Space



Address Block     Registry - Purpose                    Date
--------------- ------------------------------------- ------
000/8           IANA - Reserved                       Sep 81
001/8           IANA - Reserved                       Sep 81
002/8           IANA - Reserved                       Sep 81
003/8           General Electric Company              May 94
004/8           Bolt Beranek and Newman Inc.          Dec 92
005/8           IANA - Reserved                       Jul 95
006/8           Army Information Systems Center        Feb 94
007/8           IANA - Reserved                       Apr 95
008/8           Bolt Beranek and Newman Inc.          Dec 92
009/8           IBM                                   Aug 92
010/8           IANA - Private Use                    Jun 95
011/8           DoD Intel Information Systems         May 93
012/8           AT&T Bell Laboratories                Jun 95
013/8           Xerox Corporation                     Sep 91
014/8           IANA - Public Data Network            Jun 91
015/8           Hewlett-Packard Company               Jul 94
016/8           Digital Equipment Corporation         Nov 94
017/8           Apple Computer Inc.                   Jul 92
018/8           MIT                                   Jan 94
019/8           Ford Motor Company                    May 95
020/8           Computer Sciences Corporation         Oct 94
021/8           DDN-RVN                               Jul 91
022/8           Defense Information Systems Agency     May 93
023/8           IANA - Reserved                       Jul 95
024/8           ARIN - Cable Block                    May 01
                   (Formerly IANA - Jul 95)
025/8           Royal Signals and Radar Establishment Jan 95
026/8           Defense Information Systems Agency     May 95
027/8           IANA - Reserved                       Apr 95
028/8           DSI-North                             Jul 92
029/8           Defense Information Systems Agency     Jul 91
030/8           Defense Information Systems Agency     Jul 91
031/8           IANA - Reserved                       Apr 99
032/8           Norsk Informasjonsteknologi           Jun 94
033/8           DLA Systems Automation Center         Jan 91
034/8           Halliburton Company                   Mar 93
035/8           MERIT Computer Network                Apr 94
036/8           IANA - Reserved                       Jul 00
                   (Formerly Stanford University - Apr 93)
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037/8         IANA - Reserved                          Apr 95
038/8         Performance Systems International         Sep 94
039/8         IANA - Reserved                          Apr 95
040/8         Eli Lily and Company                     Jun 94
041/8         IANA - Reserved                          May 95
042/8         IANA - Reserved                          Jul 95
043/8         Japan Inet                               Jan 91
044/8         Amateur Radio Digital Communications     Jul 92
045/8         Interop Show Network                     Jan 95
046/8         Bolt Beranek and Newman Inc.             Dec 92
047/8         Bell-Northern Research                   Jan 91
048/8         Prudential Securities Inc.               May 95
049/8         Joint Technical Command                  May 94
              Returned to IANA                         Mar 98
050/8         Joint Technical Command                  May 94
              Returned to IANA                         Mar 98
051/8         Deparment of Social Security of UK       Aug 94
052/8         E.I. duPont de Nemours and Co., Inc.     Dec 91
053/8         Cap Debis CCS                            Oct 93
054/8         Merck and Co., Inc.                      Mar 92
055/8         Boeing Computer Services                 Apr 95
056/8         U.S. Postal Service                      Jun 94
057/8         SITA                                     May 95
058/8         IANA - Reserved                          Sep 81
059/8         IANA - Reserved                          Sep 81
060/8         IANA - Reserved                          Sep 81
061/8         APNIC - Pacific Rim                      Apr 97
062/8         RIPE NCC - Europe                        Apr 97
063/8         ARIN                                     Apr 97
064/8         ARIN                                     Jul 99
065/8         ARIN                                     Jul 00
066/8         ARIN                                     Jul 00
067/8         ARIN                                     May 01
068/8         ARIN                                     Jun 01
069-079/8     IANA - Reserved                          Sep 81
080/8         RIPE NCC                                 Apr 01
081/8         RIPE NCC                                 Apr 01
082-095/8     IANA - Reserved                          Sep 81
096-126/8     IANA - Reserved                          Sep 81
127/8         IANA - Reserved                          Sep 81
128-191/8     Various Registries                       May 93
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192/8        Various Registries - MultiRegional        May 93
193/8        RIPE NCC - Europe                          May 93
194/8        RIPE NCC - Europe                          May 93
195/8        RIPE NCC - Europe                          May 93
196/8        Various Registries                         May 93
197/8        IANA - Reserved                            May 93
198/8        Various Registries                         May 93
199/8        ARIN - North America                       May 93
200/8        ARIN - Central and South America           May 93
201/8        Reserved - Central and South America       May 93
202/8        APNIC - Pacific Rim                        May 93
203/8        APNIC - Pacific Rim                        May 93
204/8        ARIN - North America                       Mar 94
205/8        ARIN - North America                       Mar 94
206/8        ARIN - North America                       Apr 95
207/8        ARIN - North America                       Nov 95
208/8        ARIN - North America                       Apr 96
209/8        ARIN - North America                       Jun 96
210/8        APNIC - Pacific Rim                        Jun 96
211/8        APNIC - Pacific Rim                        Jun 96
212/8        IPE NCC - Europe                           Oct 97
213/8        RIPE NCC - Europe                          Mar 99
214/8        US-DOD                                     Mar 98
215/8        US-DOD                                     Mar 98
216/8        ARIN - North America                       Apr 98
217/8        RIPE NCC - Europe                          Jun 00
218/8            APNIC - Pacific Rim                     Dec 00
219/8            APNIC                                   Sep 01
220/8            APNIC                                   Dec 01
221-223/8        IANA - Reserved                         Sep 81
224-239/8    IANA - Multicast                            Sep 81
240-255/8    IANA - Reserved                             Sep 81
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                              TABLE 2

                IPv4 'Bit Mapped' IP Address Distribution
               Derived from the Modern Method for Binary Enumeration
                       Using the 'CIDR' Notation

            1                      2              3             4

      Network IP Address      Number of IP    Exponential    Total
        Class Range          Addresses Issued   equation    Number of
        /Starting            /for the Octet    yielding    IP Addresses
         Network             Representing      Total Number   Issued
         Prefix:             the IP Address   IP Addresses
       Number of Bits         Class Range       Issued
            |                     |               |             |
            V                     V               V             V
       "/New 'CIDR'
         Notation"


                              CLASS A


       0-126/00:8     =        0/8       =       2^0    =        1

       0-126/00:8     =        1/8       =       2^1    =        2

       0-126/00:8     =        2/8       =       2^2    =        4
                                |                 |              |
                                V                 V              V
       0-126/00:8     =        6/8       =       2^6    =        64
                                |                 |              |
                                V                 V              V
       0-126/00:8     =        X/8       =       2^X    =        126



       ----------------------------------------------------------

                              CLASS B


       128-191/10:16    =     0/16       =        2^0    =        1

       128-191/10:16    =     1/16       =        2^1    =        2
                                |                  |              |
                                V                  V              V
       128-191/10:16    =     X/16       =        2^X    =      16,256

       ---------------------------------------------------------
```

```
                         CLASS C

       192-223/110:24   =    0/24    =      2^0  =      1

       192-223/110:24   =    1/24    =      2^1  =      2
                             |              |           |
                             V              V           V
       192-223/110:24   =    X/24    =      2^X  =  2,064,512
```

Nevertheless, while Table 2 provides a better description and use of the
'CIDR' notation, it falls extricably short from the full exploitation, and
the actual representation regarding the True Value of 'CIDR'. In other
words, the real Value for the use of 'CIDR', would be seen to take
advantage of the Total Number of IP Addresses contained in the IPv4
specification, and not just the limited number of IP Addresses contained
in 'Class C'. Where by, it should be very clear, that while Table 1 does
provide an easily discernable explanation of the IP Addresses Allocated.
Now. It also shows the IP Address waste, because it does nothing to change,
nor fix the Loss of more than 16 Million IP Addresses, for every IP Address
issued, which represents the Number IP Addresses wasted on HOST Address
assignment. Nonetheless, Re-Defining the CIDR' Notation as depicting the
'Network Prefix' and the 'Bit Range it Uses', as used in Table 2, under
column '1', does indeed provide the necessary foundation for its full
exploitation, and establishes a smooth Transition, which is represented
in the 'IPt1 IP Addressing Specification' (See Chapter II). Needless to
say, this method clearly follows from the definition of 'CIDR', and builds
upon the existing foundation, which was logically derived.

Chapter I: Analysis IPv4, IPt1, and IPt2 address space using
          the HD-Ratio

    As shown in RFC1715, and RFC3194, the HD-ratio proved to be a Dismal
    Failure for use as an indicator to determine IP Address use and
    Distribution Efficiencies. In fact, it can easily be concluded that the
    IPt1 and IPt2 IP Specification are the only Addressing Protocols which
    meet the All of the Requirements outlined in RFC1550, especially since,
    they were Logically Derived from the IPv4 IP Specification. In other
    words, the IPt1 and IPt2 Protocol Specifications not only meet the
    Transitional requirements, as would be viewed as meeting all of the
    Engineering considerations required under RFC1550, but it also offers
    a more Gradual, and yet Infinite Expansion Possibilities, to meet the
    challenge that only the Colonization of the Universe could provide.

    Needless to say, when examining the benefits of using the HD-Ratio, one
    would discover, that is has absolutely No application regarding the
    determination of the Efficiency Rating for the IPt1 and IPt2 Addressing
    Protocol Specification, because these protocols makes use of more than
    99.999+% of the IP Addresses contained in this Addressing System. And
    while, some of the additional protocol definitions and specifications,
    which increased the benefits of the IPv4 foundation, has been remarked,
    or viewed as being unnecessary Growing Pains. These remarks should not be
    considered as being anything but unintelligent babblings. As an example,
    the use of 'CIDR', while not fully exploited, followed logically the
    foundation of the IPv4 Specification, and paved the way for the
    Mathematical and Logical derivation of a 2 New IP Addressing Systems,
    which Completely exploited the Solid Foundation provided by the IPv4
    Specification. In other words, at best, the HD-Ratio, like the H-Ratio,
    is a Beguilement, whose only purpose is to deceive, because surely the
    Logarithmic Equation described in RFC1715 could not serve any vital
    purpose. In which case, the author would have been better off using the
    elementary method for calculating the actual Efficiency Rating (see
    Eq. 1). Because taking the Log to the Base 10, using this equation, would
    not have derived any practical meaning, at least not one which could be
    translated into some actuate determination for some Efficiency Rating
    regarding the IP Addressing Systems. And this becomes even more apparent,
    when it is realized that the Number of Bits used to represent an IP
    Address does not account for the Total Number of IP Addresses available
    in the IP Addressing System.

Eq. 1

                        log (number of objects)
                  H = -----------------------
                            available bits

   Furthermore, while RFC3194 provides a more actuate Logarithmic Equation,
   for Efficiency Determination, its usage would be more applicable in a
   Current Use scenario (See Eq. 2). This becomes even more apparent when it
   is realized that the 'Numerator' used in the equation 'can' represent a
   'Constant', or Specific Value, and not the result derived from some
   'Sampling Related to a Statistical Analyses of the World's Population
   Growth, or Decline Patterns.

                              Eq. 2

                      log(number of allocated objects)
                 HD = ---
                      log(maximum number of allocatable objects)

   Even still, suppose for a moment that Eq. 2 were a valid representation
   for the determination of the Efficiency Rating for an IP Addressing System.
   And suppose even further, that a test was needed to determine the value of
   the IPt1 Addressing Specification, then the results from the Calculations
   using this equation would be 'Startling', because the 'HD-Ratio' would
   approach NEARLY a VALUE of '1'. This is because all of the available IP
   Addresses, which are available in this IP Addressing Specification are
   used for Network Assignment, the point of 'Demarcation', that excludes
   the use of a viable Network IP Address for Host Address Assignment. And
   if you would note Table 3, and the Currently Acceptable IP Network
   Addressing Practices, then it would be realized, that the Entire World
   could Actually be Networked using only Section 'A-1' from Class A of IPt1
   IP Addressing Specification.

   Furthermore, since the Prefixes used in the IPt2 IP Protocol Specification
   can not be used in any calculation, which would be required for the
   Determination of the Efficiency Rating regarding the use of the Total
   Number of IP Address. Then their use within the IPt2 Protocol
   Specification is indeed an Enhancement, which can only be viewed as a
   Magnification Freebie. That is, without question, IPt2 allows a more
   Gradual Growth that can quite easily be Expanded to Infinity (See Tables
   4 and 5). In which case, Population Growth really does not matter, because
   it is now a Variable that has been removed from the Equation.

Nevertheless, while there was some mention of a comparison to other
Addressing Systems, there was No mention regarding the way these Numbering
Systems were used or even Allocated (i.e. The telephony System). In other
words, their mention was pointless, because no clear foundation, that
could be viewed as having establish the Point upon which an Argument
could be based was ever mentioned or shown to exist. In a word; 'I
actually did not understand the point, nor purpose of either RFC1715 nor
RFC3194, because it seems that these RFCs were focused more upon the
Logarithmic Equation, rather than the reported objective regarding the
Efficiency Rating, and the Determination of the most efficient IP
Addressing scheme that should be used. Furthermore, while I have read
some mention regarding the 'Address Space Allocation Table(s), it was
never pointed out, that the 'Address Allocation Table' (Or "INTERNET
PROTOCOL ADDRESS SPACE") could quite literally invalidate any calculation
regarding efficiency, because such a TABLE can also be INEFFICIENT.

```
                          Table 3

      "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 4

                   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

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Table 5

  "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

$$= 254 \times 254 \times 32 \times 254^3$$
$$= 254 \times 254 \times 524,386,048$$
$$= 3.383129 \times 10^{13}$$

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

$$= 254 \times 32 \times 256^3$$
$$= 254 \times 524,386,048$$
$$= 1.331941 \times 10^{11}$$

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

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

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

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

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

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

$$= 254 \times 254 \times 16 \times 254^3$$
$$= 254 \times 254 \times 262,193,024$$
$$= 1.691558 \times 10^{13}$$

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

$$= 254 \times 16 \times 254^3$$
$$= 254 \times 262,193,024$$
$$= 6.659677 \times 10^{10}$$

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

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

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

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

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

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

$$= 254 \times 254 \times 15 \times 254^3$$
$$= 254 \times 254 \times 245,805,960$$
$$= 1.585842 \times 10^{13}$$

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

$$= 254 \times 15 \times 254^3$$
$$= 254 \times 245,805,960$$
$$= 6.243471 \times 10^{10}$$

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

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

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

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

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

Chapter II: Suggestion for the IPt1 and IPt2 Internet Protocol Address
         Space, Supernetting and the New 'CIDR' Notation

    The "Internet Protocol v4 Address Space" allocation Table, as noted in
    'Table 1' above, can retain the same IP Address Allocation, in the 'IPt1
    IP Protocol Specification'. In fact, the only guide lines that would be
    different, and appropriated, are those governing the 'Host' Address
    Allocation, whose derivation is Defined by 'The Laws of the Octet'.
    Furthermore, noting Table 2, it should be understood that it represents
    an 'IP Address Allocation / Translation Guide', which would be used to
    determine the total Number of Available IP Addresses when converting from
    the IPv4 to the IPt1 Addressing Specifications. This Table represents
    the IP Address conversion, which should be viewed as extremely important,
    because the IPt1 Specification makes use of nearly all of the total number
    of IP Addresses for use as the Network IP Address. And while there are
    Host Addresses Assigned, there are No Viable network IP Addresses wasted
    or used for this purpose (See The Laws of the Octet.).

    Nevertheless, the description shown in Table 6 provides an Example, which
    describes the 'Supernetting of an IP Address' when using the 'IPt1'
    specification, which also uses the New Notation for 'CIDR'. However, this
    is a Practice, 'Supernetting of an IP Address', that can only be used
    BEHIND the 'Point of Demarcation' (The 'VIABLE Network IP Address'), for
    the purpose of Subnet creation, because to do so otherwise would not only
    be in violation of 'The Laws of the Octet', but it would create an
    Addressing Conflict within the IP Addressing Scheme itself. Even still,
    is should nevertheless be very clear, that the 'CIDR' Notation represents
    the 'Bit Mapped Displacement' of the Network IP Address, and nothing more.

    Moreover, since the IPt1 specification uses the same IP Addressing methods
    for enumeration, as that used in IPv4. It can quite easily be employed, and
    replace, in every scenario now occupied and used by the IPv4 Specification.
    There is an exception however, which translates into recovery of wasted IP
    Addresses that can be recovered from the "Internet Protocol v4 Address
    Space". In other words, as previously mentioned, the primary difference
    between these IP Specifications, beyond the Schematic itself, is the way
    they each use and assign 'Host IP Addresses'. Where by, the assignment
    of '1' IP Address, is just that, because there are No 16 Million Host IP
    Addresses that will accompany this assignment under the IPt1 specification
    (See Appendix I). And while this may be viewed as a problem with the IPt1
    specification, it certainly does not become a consideration for the
    implementation of the IPt2 Addressing Specification. In fact, the IPt2
    Addressing Specification not only provides foundation for the possibility
    for Unlimited IP Addresses, it simplifies the "Internet Protocol Address
    Space" Table, (See Table 7) while reducing the Management Burden
    associated with the Allocation of IP Addresses.

```
                              TABLE 6


               IPt1 'Bit Mapped' IP Address Distribution
            Derived from the Modern Method for Binary Enumeration
                      Using the 'CIDR' Notation

            1                       2              3               4

   Network IP Address         Number of       Exponential      Total
      Class Range               BITS            equation      Number of
     /Starting Point                            yielding        HOST
    of the Network                          Total Number IP Addresses
        Prefix:                                  HOST
    Number of Bits                            IP Addresses
          |                       |              |               |
          V                       V              V               V
   "/New 'CIDR'
     Notation"


                            CLASS A



                          Class A-1



    0-126/00:8     =          8/8        =       2^X   =  8,129,016



    ----------------------------------------------------------



                          Class A-2



    0-126/00:16    =         16/8        =       2^X   =   32,004



    ----------------------------------------------------------
```

```
                        Class A-3


    0-126/00:24    =      24/8       =      2^X  =      126



    -------------------------------------------------------


                        Class A-4


    0-126/00:25    =      25/8       =      2^7  =      128
                          |                 |           |
                          V                 V           V
    0-126/00:30    =      30/8       =      2^2  =      4


    0-126/00:31    =      31/8       =      2^1  =      2


    0-126/00:32    =      32/8       =      2^0  =      0




                        CLASS B


                        Class B-1


    0-126/10:8    =       8/16       =      2^X  = 4,129,024



    -------------------------------------------------------
```

Class B-2

   128-191/10:16   =   16/16   =   2^X =   16,256

                        Class B-3

   128-191/10:24   =   24/16   =   2^X =   32

                        Class B-4

   128-191/10:25   =   25/16   =   2^7 =   128
                          | | |
                          V   V   V
   128-191/10:30   =   30/16   =   2^4 =   4

   128-191/10:31   =   31/16   =   2^1 =   2

   128-191/10:32   =   32/16   =   2^0 =   0

CLASS C

                        Class C-1

   192-223/110:8   =   8/24   =   2^X = 2,064,512

                        Class C-2

   192-223/110:16   =   16/24   =   2^X =   8,128

                        Class C-3

   192-223/110:24   =   24/24   =   2^X = 32

```
                    Class C-4


    0-126/110:25    =      25/24      =      2^7 =      128
                    |                        |          |
                    V                        V          V
    0-126/110:30    =      30/24      =      2^2 =      4


    0-126/110:31    =      31/24      =      2^1 =      2


    0-126/110:32    =      32/24      =      2^0 =      0




                     CLASS D



                    Class D-1



     224-239/1110:8    =      8/28      =      2^X  =  1,032,256



    --------------------------------------------------------



                    Class D-2



     224-239/1110:16    =      16/28      =      2^X =   4,064



    --------------------------------------------------------
```

```
                        Class D-3


  224-239/1110:24  =      24/28       =       2^X  =      16


         --------------------------------------------------------


                        Class D-4


  224-239/1110:25   =    25/28      =       2^7  =    128
                         |                  |           |
                         V                  V           V
  224-239/1110:30   =    30/28      =       2^2  =     4


  224-239/1110:31   =    31/28      =       2^1  =     2


  224-239/1110:32   =    32/28      =       2^0  =     0




                        CLASS E


                        Class E-1


  240-254/1111:8   =     8/~29      =       2^X  = 967,740



         --------------------------------------------------------
```

```
                          Class E-2



        240-254/1111:16    =   16/~29     =       2^X  =  3,810



        ---------------------------------------------------------



                          Class E-3



        240-254/1110:24    =   24/~29     =       2^X  =    15



        ---------------------------------------------------------



                          Class E-4

        240-254/1111:25    =   25/~29     =     2^7  =     128
                               |                   |          |
                               V                   V          V
        240-254/1111:30    =   30/~29     =     2^2  =      4


        240-254/1111:31    =   31/~29     =     2^1  =      2


        240-254/1111:32    =   32/~29     =     2^0  =      0
```

```
                             Table 7

               INTERNET PROTOCOL t2 (64 Bit) ADDRESS SPACE


               IPt2 IP Address Prefix    IPt1 Address   Distribution   Date
               /        |        \       /Schematic\    /Purpose\      /    \
    Reserved   CIDR   Zone IP   IP Area   IP Address        |           |
      BITS    Network    |       Code     Assignment        |           |
     /    \   Descriptor V         |          |             V           V
    ----+----+--------+-------+---------+----------------+-------------+------
     8  | 8  |  None    000:      000:   000.000.000.000      None      4/2002
     8  | 8  |  All     001:      All:   XXX.XXX.XXX.XXX      NA        4/2002
     8  | 8  |  All     002:      All:   XXX.XXX.XXX.XXX      SA        4/2002
     8  | 8  |  All     003:      All:   XXX.XXX.XXX.XXX      EU        4/2002
     8  | 8  |  All     004:      All:   XXX.XXX.XXX.XXX      OS        4/2002
     8  | 8  |  All     005:      All:   XXX.XXX.XXX.XXX      AU        4/2002
     8  | 8  |  All     006:      All:   XXX.XXX.XXX.XXX      AF        4/2002
     8  | 8  |  All   007-254:    All:   XXX.XXX.XXX.XXX  IANA/RESERVED  4/2002
     8  | 8  |  All   001-254:  000-254: 000.000.000.000  IANA/EMERGENCY 4/2002
     8  | 8  | /00:8    255:      255:   127.000.000.000  IANA/LoopBack  4/2002
```


```
                    IPt2 64 Bit Mapped Address Space

   Prefix Address <---> (Or Trunk Identifier)                   CIDR
          /    |         |        \          32 Bit IPt1     Network
   | 8 Bits | 8 Bits |  8 Bits | 8 Bits     | Address Space  |Descriptor
   +---------+---------+----------------------+--------------------------+
   |Reserved:|Reserved:| Zone IP:|IP Area Code:| XXX.XXX.XXX.XXX | /XXXX:XX |
   +---------+---------+----------------------+--------------------------+
```

CONTIENTS /ZONE IP\	COUNTRIES / \	IP AREA CODE DISTRIBUTION / \	DATE / \	COMMENTS / \
'NA' NORTH AMERICA 001:	'3' UNITED	'60'	4/2002	NONE
	STATES	'001 – 050:'	4/2002	NONE
IP AREA CODE	MEXICO	'051 – 054:'	4/2002	NONE
CONTIENT SURPLUS '194'	CANADA	'055 – 060:'	4/2002	NONE
'SA' SOUTH AMERICA 002:	'38'	'88'	4/2002	NONE
	Brazil	'001 – 050:'	4/2002	NONE
IP AREA CODE CONTIENT	Antigua and Barbuda	'051 – 052:'	4/2002	NONE
SURPLUS '166'	Aruba	'053:'	4/2002	NONE
	Bahamas	'054:'	4/2002	NONE
	Barbados	'055:'	4/2002	NONE
	Cayman Islands	'056:'	4/2002	NONE
	Cuba	'057:'	4/2002	NONE
	Dominica	'058:'	4/2002	NONE
	Dominican Republic	'059:'	4/2002	NONE
	Grenada	'060:'	4/2002	NONE
	Guadeloupe	'061:'	4/2002	NONE
	Jamaica	'062:'	4/2002	NONE
	Haiti	'063:'	4/2002	NONE
	Martinique	'064:'	4/2002	NONE

```
          |
          |   Puerto Rico      '065:'              4/2002   NONE
          |
          |   Saint Kitts      '066:'              4/2002   NONE
          |    and Nevis
          |
          |   Saint Lucia      '067:'              4/2002   NONE
          |
          |   Trinidad         '068:'              4/2002   NONE
          |   and Tobago
          |
          |   Virgin Islands   '069:'              4/2002   NONE
          |
          |   Belize           '070:'              4/2002   NONE
          |
          |   Costa Rica       '071:'              4/2002   NONE
          |
          |   El Salvador      '072:'              4/2002   NONE
          |
          |   Guatemala        '073:'              4/2002   NONE
          |
          |   Honduras         '074:'              4/2002   NONE
          |
          |   Nicaragua        '075:'              4/2002   NONE
          |
          |   Panama           '076:'              4/2002   NONE
          |
          |   Argentina        '077:'              4/2002   NONE
          |
          |   Bolivia          '078:'              4/2002   NONE
          |
          |   Chile            '079:'              4/2002   NONE
          |
          |   Colombia         '080:'              4/2002   NONE
          |
          |   Ecuador          '081:'              4/2002   NONE
          |
          |   French Guiana    '082:'              4/2002   NONE
          |
          |   Guyana           '083:'              4/2002   NONE
          |
          |   Paraguay         '084:'              4/2002   NONE
```

	Peru	'085:'	4/2002	NONE
	Suriname	'086:'	4/2002	NONE
	Uruguay	'087:'	4/2002	NONE
	Venezuela	'088:'	4/2002	NONE
'EU' EUROPE 003:	'45'	'74'	4/2002	NONE
	Belarus	'001'	4/2002	NONE
IP AREA CODE CONTIENT SURPLUS '180'	Russian Federation	'002 – 031:'	4/2002	NONE
	Bulgaria	'032:'	4/2002	NONE
	Czech Republic	'033:'	4/2002	NONE
	Hungary	'034:'	4/2002	NONE
	Moldova	'035:'	4/2002	NONE
	Poland	'036:'	4/2002	NONE
	Romania	'037:'	4/2002	NONE
	Slovakia	'038:'	4/2002	NONE
	Ukraine	'039:'	4/2002	NONE
	Denmark	'040:'	4/2002	NONE
	Estonia	'041:'	4/2002	NONE
	Faeroe Islands	'042:'	4/2002	NONE
	Finland	'043:'	4/2002	NONE
	Iceland	'044:'	4/2002	NONE
	Ireland	'045:'	4/2002	NONE

Latvia	'046:'	4/2002	NONE
Lithuania	'047:'	4/2002	NONE
Norway	'048:'	4/2002	NONE
Sweden	'049:'	4/2002	NONE
United Kingdom	'050:'	4/2002	NONE
Albania	'051:'	4/2002	NONE
Andorra	'052:'	4/2002	NONE
Bosnia and Herzegowina	'053:'	4/2002	NONE
Croatia (Hrvatska)	'054:'	4/2002	NONE
Gibraltar	'055:'	4/2002	NONE
Greece	'056:'	4/2002	NONE
Vatican City State	'057:'	4/2002	NONE
Italy	'058:'	4/2002	NONE
Macedonia	'059:'	4/2002	NONE
Malta	'060:'	4/2002	NONE
Portugal	'061:'	4/2002	NONE
San Marino	'062:'	4/2002	NONE
Slovenia	'063:'	4/2002	NONE
Spain	'064:'	4/2002	NONE
Yugoslavia	'065:'	4/2002	NONE
Austria	'066:'	4/2002	NONE
Belgium	'067:'	4/2002	NONE
France	'068:'	4/2002	NONE

```
                 |
                 |  Germany             '069:'                4/2002   NONE
                 |
                 |  Liechtenstein       '070:'                4/2002   NONE
                 |
                 |  Luxembourg          '071:'                4/2002   NONE
                 |
                 |  Monaco              '072:'                4/2002   NONE
                 |
                 |  Netherlands         '073:'                4/2002   NONE
                 |
                 |  Switzerland         '074:'                4/2002   NONE
                 |
                 |
                 |
    ------------+-----------+--------------------------+-------+---------
      'OS'       |   '23'          '23'                    4/2002   NONE
    OCEANIA      |
    STATES       |  Australia          '001:'                4/2002   NONE
     004:        |
                 |  Wallis             '002:'                4/2002   NONE
 IP AREA CODE    |  and Futuna Islands
   CONTIENT      |
    SURPLUS      |  New Zealand        '003:'                4/2002   NONE
     '231'       |
                 |  Fiji               '004:'                4/2002   NONE
                 |
                 |  Papua New Guinea   '005:'                4/2002   NONE
                 |
                 |  New Caledonia      '006:'                4/2002   NONE
                 |
                 |  Solomon Islands    '007:'                4/2002   NONE
                 |
                 |  Vanuatu            '008:'                4/2002   NONE
                 |
                 |  Guam               '009:'                4/2002   NONE
                 |
                 |  Kiribati           '010:'                4/2002   NONE
                 |
                 |  Marshall Islands   '011:'                4/2002   NONE
                 |
                 |  Micronesia         '012:'                4/2002   NONE
                 |
                 |  Nauru              '013:'                4/2002   NONE
                 |
                 |  Palau              '014:'                4/2002   NONE
```

```
                |
                | American Samoa      '015:'                      4/2002   NONE
                |
                | Northern Mariana    '016:'                      4/2002   NONE
                |   Islands
                |
                | Cook Islands        '017:'                      4/2002   NONE
                |
                | French Polynesia    '018:'                      4/2002   NONE
                |  (Tahiti)
                |
                | Niue                '019:'                      4/2002   NONE
                |
                | Pitcairn            '020:'                      4/2002   NONE
                |
                | Samoa               '021:'                      4/2002   NONE
                |
                | Tonga               '022:'                      4/2002   NONE
                |
                | Tuvalu              '023:'                      4/2002   NONE
                |
                |
  -----------+-----------+---------------------------+-------+---------
    'AU'      |  '55'          '55'                            4/2002   NONE
   AFRICAN    |
    UNION     | Burundi             '001'                      4/2002   NONE
    005:      |
              | Democratic          '002:'                     4/2002   NONE
 IP AREA CODE | Republic of the Congo
   CONTIENT   |
    SURPLUS   | Djibouti            '003:'                      4/2002   NONE
    '199'     |
              | Eritrea             '004:'                      4/2002   NONE
              |
              | Ethiopia            '005:'                      4/2002   NONE
              |
              | Kenya               '006:'                      4/2002   NONE
              |
              | Madagascar          '007:'                      4/2002   NONE
              |
              | Malawi              '008:'                      4/2002   NONE
              |
              | Mauritania          '009:'                      4/2002   NONE
              |
              | Mozambique          '010:'                      4/2002   NONE
```

```
          |
          | Réunion            '011:'                    4/2002   NONE
          |
          | Rwanda             '012:'                    4/2002   NONE
          |
          | Seychelles         '013:'                    4/2002   NONE
          |
          | Somalia            '014:'                    4/2002   NONE
          |
          | Tanzania           '015:'                    4/2002   NONE
          |
          | Uganda             '016:'                    4/2002   NONE
          |
          | Zambia             '017:'                    4/2002   NONE
          |
          | Zimbabwe           '018:'                    4/2002   NONE
          |
          | Angola             '019:'                    4/2002   NONE
          |
          | Cameroon           '020:'                    4/2002   NONE
          |
          | Chad               '021:'                    4/2002   NONE
          |
          | Congo              '022:'                    4/2002   NONE
          |
          | Equatorial Guinea  '023:'                    4/2002   NONE
          |
          | Central African    '024:'                    4/2002   NONE
          | Republic
          |
          | Gabon              '025:'                    4/2002   NONE
          |
          | Sao Tome           '026:'                    4/2002   NONE
          | and Principe
          |
          | Algeria            '027:'                    4/2002   NONE
          |
          | Egypt              '028:'                    4/2002   NONE
          |
          | Libyan Arab        '029:'                    4/2002   NONE
          | Jamahiriya
          |
          | Morocco            '030:'                    4/2002   NONE
          |
          | Sudan              '031:'                    4/2002   NONE
          |
          | Tunisia            '032:'                    4/2002   NONE
```

```
|
| Western Sahara     '033:'                    4/2002   NONE
|
| Botswana           '034:'                    4/2002   NONE
|
| Lesotho            '035:'                    4/2002   NONE
|
| Namibia            '036:'                    4/2002   NONE
|
| South Africa       '037:'                    4/2002   NONE
|
| Swaziland          '038:'                    4/2002   NONE
|
| Benin              '039:'                    4/2002   NONE
|
| Burkina Faso       '040:'                    4/2002   NONE
|
| Cape Verde         '041:'                    4/2002   NONE
|
| Côte d'Ivoire      '042:'                    4/2002   NONE
|
| Gambia, The        '043:'                    4/2002   NONE
|
| Ghana              '044:'                    4/2002   NONE
|
| Guinea             '045:'                    4/2002   NONE
|
| Guinea-Bissau      '046:'                    4/2002   NONE
|
| Liberia            '047:'                    4/2002   NONE
|
| Mali               '048:'                    4/2002   NONE
|
| Mauritania         '049:'                    4/2002   NONE
|
| Niger              '050:'                    4/2002   NONE
|
| Nigeria            '051:'                    4/2002   NONE
|
| Saint Helena       '052:'                    4/2002   NONE
|
| Senegal            '053:'                    4/2002   NONE
|
| Sierra Leone       '054:'                    4/2002   NONE
|
| Togo               '055:'                    4/2002   NONE
```

```
           |
           |
           |
  -----------+-----------+--------------------------+-------+---------
     'AF'    |   '55'        '151'                    4/2002   NONE
    ASIAN    |
  FEDERATION |   China       '001-051'                4/2002   NONE
    006:     |
           |   Japan       '052:'                   4/2002   NONE
 IP AREA CODE |
   CONTIENT  |   Korea (North)   '053:'             4/2002   NONE
   SURPLUS   |
    '103'    |   Korea (South)   '054:'             4/2002   NONE
           |
           |   Macau       '055:'                   4/2002   NONE
           |
           |   Mongolia    '056:'                   4/2002   NONE
           |
           |   Taiwan      '057:'                   4/2002   NONE
           |
           |   Afghanistan '058:'                   4/2002   NONE
           |
           |   Bangladesh  '059:'                   4/2002   NONE
           |
           |   Bhutan      '060:'                   4/2002   NONE
           |
           |   India       '061-111'                4/2002   NONE
           |
           |   Iran        '112:'                   4/2002   NONE
           |
           |   Kazakhstan  '113:'                   4/2002   NONE
           |
           |   Kyrgyzstan  '114:'                   4/2002   NONE
           |
           |   Maldives    '115:'                   4/2002   NONE
           |
           |   Nepal       '116:'                   4/2002   NONE
           |
           |   Pakistan    '117:'                   4/2002   NONE
           |
           |   Sri Lanka   '118:'                   4/2002   NONE
           |
           |   Tajikistan  '119:'                   4/2002   NONE
           |
           |   Turkmenistan '120:'                  4/2002   NONE
           |
```

```
        │  Uzbekistan         '121:'                4/2002   NONE
        │
        │  Brunei Darussalam  '122:'                4/2002   NONE
        │
        │  Cambodia           '123:'                4/2002   NONE
        │
        │  East Timor         '124:'                4/2002   NONE
        │
        │  Indonesia          '125:'                4/2002   NONE
        │
        │  Laos               '126:'                4/2002   NONE
        │
        │  Malaysia           '127:'                4/2002   NONE
        │
        │  Myanmar (Burma)    '128:'                4/2002   NONE
        │
        │  Philippines        '129:'                4/2002   NONE
        │
        │  Singapore          '130:'                4/2002   NONE
        │
        │  Thailand           '131:'                4/2002   NONE
        │
        │  Viet Nam           '132:'                4/2002   NONE
        │
        │  Armenia            '133:'                4/2002   NONE
        │
        │  Azerbaijan         '134:'                4/2002   NONE
        │
        │  Bahrain            '135:'                4/2002   NONE
        │
        │  Cyprus             '136:'                4/2002   NONE
        │
        │  Georgia            '137:'                4/2002   NONE
        │
        │  Iraq               '138:'                4/2002   NONE
        │
        │  Israel             '139:'                4/2002   NONE
        │
        │  Jordan             '140:'                4/2002   NONE
        │
        │  Kuwait             '141:'                4/2002   NONE
        │
        │  Lebanon            '142:'                4/2002   NONE
        │
        │  Gambia, The        '143:'                4/2002   NONE
```

```
           |
           |  Oman               '144:'              4/2002   NONE
           |
           |  Qatar              '145:'              4/2002   NONE
           |
           |  Palestine          '146:'              4/2002   NONE
           |
           |  Saudi Arabia       '147:'              4/2002   NONE
           |
           |  Syria              '148:'              4/2002   NONE
           |
           |  Turkey             '149:'              4/2002   NONE
           |
           |  United Arab        '150:'              4/2002   NONE
           |  Emirates
           |
           |  Yemen              '151:'              4/2002   NONE
           |
   -----------+-----------+----------------------------+-------+---------
```

   Nevertheless, any careful examination and study of Table 7, the "INTERNET
   PROTOCOL t2 ADDRESS SPACE", and its INDEX. Anyone would readily conclude;
   'It does not matter if the World's Population Doubled or Tripled in 5, 10,
   or 15 years from now, because the number of IP Addresses contained in the
   Surplus of IP Area Code Addresses, for each Continent, would presently
   sustain a 20 Billion total World Population, and this says nothing about
   the Reserve IP Addresses allocation to IANA. In fact, if there is an
   agreement (which it will be) regarding the New Binary System, it will not
   pose any difficulties for IANA, because these IP Specifications were
   derived and first discovered, using the New Method of Enumeration, as
   defined by the New Binary System. In other words, the IPt1 and IPt2 IP
   Protocol Specifications overwhelmingly surpasses every Requirement
   Specified in RFC1550.

Chapter III: IPt1 and IPt2; The APRA and IN-ADD.APRA Addresses

   It has been mention that the IPt1 IP Specification differs only in 2
   primary areas from that of the IPv4 IP Addressing system. And these
   differences account for the use of more than 99.999...+ % of the total
   number of available IP Addresses contained in this System of Addressing,
   and the way Host IP Addresses are allocated. Needless to say, other than
   the Schematic itself, that's it. In other words, the use of 'APRA and
   IN-ADD.APRA functions the same in the IPt1 IP Specification, and except
   for the 'SIGHT' of the Prefixes used in the IPt2 Specification, their use
   functions the same under this IP Specification as well. In other words,
   the Prefixes used in the IPt2 IP Specification, serve only the provisions
   regarding stability, control, management, and increase the Number of IP
   Addresses (And nothing more!). Because other than these benefits, the
   Prefixes used in the IPt2 IP Specification does absolutely nothing to
   effect, nor change any other the practices or procedures used in the
   IPv4 Protocol. Furthermore, while I do not advocate the used of the
   Primary IP Protocol in Networking Household Appliances, (behind the
   demarcation). It should be clearly understood, not only is the IPt2 IP
   Specification well suited for this application, but there is absolutely No
   Protocol Requirement, or Demand, it is not suited to address...And it goes
   without saying, it does indeed, maintain a sufficient supply of IP
   Addresses, regardless (The 'IPtX' IP Specification: See Table 8, and
   Appendix II).

                          Table 8

                   'IPtX IP Specification'

              IPt1   =   32 Bit

              IPt2   =   64 Bit

              IPt3   =   96 Bit

              IPt4   =   128 Bit

              IPt5   =   160 Bit
               :   :   :
              IPt100   =   3,200 Bit
               :   :   :
              IPt5000   =   160,000 Bit
               :   :   :
              IPtX   =   Infinity

This document, whose only objective was the explanation for the
method(s) used in the Efficiency Determination of an IP Addressing
Specification, and the development of a possible (Suggestion) "INTERNET
PROTOCOL ADDRESS SPACE" for the 'IPt1 and IPt2 IP Addressing
Specifications', which actually did not directly raise any security
issues. Hence, there are no issues raised that warrant Security
Considerations.

Figure 1; Visualizing the 'Zone IP' and 'IP Area Code' Addresses

Figure 2: 'NA' Continent; Zone IP Address = '001'

Figure 3: Different 'IP Area Code' Address for each State

Appendix I: IPt1 Internet Protocol Address Space

                        TABLE 9

                 Internet Protocol t1 Address Space

                 Compatibility / Conversion with the
                 Internet Protocol v4 Address Space

Address Block | Registry - Purpose | Date

Number of IP | Note: Host IP Addresses are Not, and |
Addresses | Can not Be Used for a Direct |
Issued - | Active Connection. They can |
                  | only be Used in conjunction |
IPaddNum/ | with a Requestor / Server, as |
CIDRNetDescrip | a Client having a Subordinate |
                  V   function, which defines a Host V
---------------   --------------------------------------   ------
All 000/00:8   IANA - Reserved   Sep 81
  1 001/00:8   IANA - Reserved   Sep 81
  1 002/00:8   IANA - Reserved   Sep 81
  1 003/00:8   General Electric Company   May 94
  1 004/00:8   Bolt Beranek and Newman Inc.   Dec 92
  1 005/00:8   IANA - Reserved   Jul 95
  1 006/00:8   Army Information Systems Center   Feb 94
  1 007/00:8   IANA - Reserved   Apr 95
  1 008/00:8   Bolt Beranek and Newman Inc.   Dec 92
  1 009/00:8   IBM   Aug 92
  1 010/00:8   IANA - Private Use   Jun 95
  1 011/00:8   DoD Intel Information Systems   May 93
  1 012/00:8   AT&T Bell Laboratories   Jun 95
  1 013/00:8   Xerox Corporation   Sep 91
  1 014/00:8   IANA - Public Data Network   Jun 91
  1 015/00:8   Hewlett-Packard Company   Jul 94
  1 016/00:8   Digital Equipment Corporation   Nov 94
  1 017/00:8   Apple Computer Inc.   Jul 92
  1 018/00:8   MIT   Jan 94
  1 019/00:8   Ford Motor Company   May 95
  1 020/00:8   Computer Sciences Corporation   Oct 94
  1 021/00:8   DDN-RVN   Jul 91
  1 022/00:8   Defense Information Systems Agency   May 93
  1 023/00:8   IANA - Reserved   Jul 95
  1 024/00:8   ARIN - Cable Block   May 01
                   (Formerly IANA - Jul 95)
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IPt1 and IPt2 ADDRESS SPACE   October 15, 2002

```
1  025/00:8        Royal Signals and Radar Establishment  Jan 95
1  026/00:8        Defense Information Systems Agency      May 95
1  027/00:8        IANA - Reserved                         Apr 95
1  028/00:8        DSI-North                               Jul 92
1  029/00:8        Defense Information Systems Agency      Jul 91
1  030/00:8        Defense Information Systems Agency      Jul 91
1  031/00:8        IANA - Reserved                         Apr 99
1  032/00:8        Norsk Informasjonsteknologi             Jun 94
1  033/00:8        DLA Systems Automation Center           Jan 91
1  034/00:8        Halliburton Company                     Mar 93
1  035/00:8        MERIT Computer Network                  Apr 94
1  036/00:8        IANA - Reserved                         Jul 00
                   (Formerly Stanford University - Apr 93)
1  037/00:8        IANA - Reserved                         Apr 95
1  038/00:8        Performance Systems International       Sep 94
1  039/00:8        IANA - Reserved                         Apr 95
1  040/00:8        Eli Lily and Company                    Jun 94
1  041/00:8        IANA - Reserved                         May 95
1  042/00:8        IANA - Reserved                         Jul 95
1  043/00:8        Japan Inet                              Jan 91
1  044/00:8        Amateur Radio Digital Communications    Jul 92
1  045/00:8        Interop Show Network                    Jan 95
1  046/00:8        Bolt Beranek and Newman Inc.            Dec 92
1  047/00:8        Bell-Northern Research                  Jan 91
1  048/00:8        Prudential Securities Inc.              May 95
1  049/00:8        Joint Technical Command                 May 94
                   Returned to IANA                        Mar 98
1  050/00:8        Joint Technical Command                 May 94
                   Returned to IANA                        Mar 98
1  051/00:8        Department of Social Security of UK     Aug 94
1  052/00:8        E.I. duPont de Nemours and Co., Inc.    Dec 91
1  053/00:8        Cap Debis CCS                           Oct 93
1  054/00:8        Merck and Co., Inc.                     Mar 92
1  055/00:8        Boeing Computer Services                Apr 95
1  056/00:8        U.S. Postal Service                     Jun 94
1  057/00:8        SITA                                    May 95
1  058/00:8        IANA - Reserved                         Sep 81
1  059/00:8        IANA - Reserved                         Sep 81
1  060/00:8        IANA - Reserved                         Sep 81
1  061/00:8        APNIC - Pacific Rim                     Apr 97
1  062/00:8        RIPE NCC - Europe                       Apr 97
1  063/00:8        ARIN                                    Apr 97
1  064/00:8        ARIN                                    Jul 99
1  065/00:8        ARIN                                    Jul 00
1  066/00:8        ARIN                                    Jul 00
1  067/00:8        ARIN                                    May 01
1  068/00:8        ARIN                                    Jun 01
```

```
10  069-079/00:8  IANA - Reserved                      Sep 81
 1  080/00:8       RIPE NCC                             Apr 01
 1  081/00:8       RIPE NCC                             Apr 01
14  082-095/00:8  IANA - Reserved                       Sep 81
31  096-126/00:8  IANA - Reserved                       Sep 81
 1  127/00:8       IANA - Reserved                      Sep 81
64  128-191/00:8  Various Registries                    May 93
 1  192/00:8       Various Registries - MultiRegional   May 93
 1  193/00:8       RIPE NCC - Europe                    May 93
 1  194/00:8       RIPE NCC - Europe                    May 93
 1  195/00:8       RIPE NCC - Europe                    May 93
 1  196/00:8       Various Registries                   May 93
 1  197/00:8       IANA - Reserved                      May 93
 1  198/00:8       Various Registries                   May 93
 1  199/00:8       ARIN - North America                 May 93
 1  200/00:8       ARIN - Central and South America     May 93
 1  201/00:8       Reserved - Central and South America May 93
 1  202/00:8       APNIC - Pacific Rim                  May 93
 1  203/00:8       APNIC - Pacific Rim                  May 93
 1  204/00:8       ARIN - North America                 Mar 94
 1  205/00:8       ARIN - North America                 Mar 94
 1  206/00:8       ARIN - North America                 Apr 95
 1  207/00:8       ARIN - North America                 Nov 95
 1  208/00:8       ARIN - North America                 Apr 96
 1  209/00:8       ARIN - North America                 Jun 96
 1  210/00:8       APNIC - Pacific Rim                  Jun 96
 1  211/00:8       APNIC - Pacific Rim                  Jun 96
 1  212/00:8       IPE NCC - Europe                     Oct 97
 1  213/00:8       RIPE NCC - Europe                    Mar 99
 1  214/00:8       US-DOD                               Mar 98
 1  215/00:8       US-DOD                               Mar 98
 1  216/00:8       ARIN - North America                 Apr 98
 1  217/00:8       RIPE NCC - Europe                    Jun 00
 1  218/00:8       APNIC - Pacific Rim                  Dec 00
 1  219/00:8       APNIC                                Sep 01
 1  220/00:8       APNIC                                Dec 01
 3  221-223/00:8  IANA - Reserved                       Sep 81
16  224-239/00:8  IANA - Multicast                      Sep 81
16  240-255/00:8  IANA - Reserved                       Sep 81
-----------------------------------------------------------------|
Note: Host IP Addresses are determined by the 'IPt1' Addressing
      Schematic, and can Not Be Used for / to Establish A Direct
      Internet Connection (Connection Outside of its Network Domain)
-----------------------------------------------------------------|
```

```
                        TABLE 10


          Internet Protocol t1 Address Space INDEX


                IPaddNum  =  Network IP Address

           CIDRNetDescrip  = CIDR Network Descriptor

          Current Number of IP Network Addresses Issued
              Accounts for  =  253 IP Network Addresses

                                                CDIR
                                              Network
                            Class A          Descriptor

       A-1: Issued = 127 , Remaining = 1,040,513,921   /00:8

       A-2: Issued = None, Remaining = 516,160,512     /00:16

       A-3: Issued = None, Remaining = 256,048,128     /00:24

       A-4: Issued = None, Remaining = 252,047,376     /00:32




                           Class B

        B-1: Issued = 64  , Remaining = 784,514,496     /10:8

        B-2: Issued = None, Remaining = 197,672,960     /10:16

        B-3: Issued = None, Remaining = 49,807,360      /10:24

        B-4: Issued = None, Remaining = 16,777,216      /10:32




                           Class C

        C-1: Issued = 32  , Remaining = 458,321,632     /110:8

        C-2: Issued = None, Remaining = 57,741,312      /110:16

        C-3: Issued = None, Remaining = 7,274,496       /110:24

        C-4: Issued = None, Remaining = 1,048,576       /110:32
```

Class D

     D-1: Issued = 16   , Remaining = 245,676,912   /1110:8

     D-2: Issued = None, Remaining = 15,475,712   /1110:16

     D-3: Issued = None, Remaining = 974,848   /1110:24

     D-4: Issued = None, Remaining = 65,536   /1110:32

                              Class E

     E-1: Issued = 15   , Remaining = 231,289,845   /1111:8

     E-2: Issued = None, Remaining = 13,658,850   /1111:16

     E-3: Issued = None, Remaining = 806,625   /1111:24

     E-4: Issued = None, Remaining = 50,625   /1111:32

Appendix II: Mathematical Analysis of the Structure, and the Definition
            of the IPtX Protocol(s) Addressing System. (Part1)

   The 'IPtX' is a System of Addressing Protocol Specifications; An 'Internet
   Protocol 't'ele-communications Specification having an Unlimited 'IP Bit'
   Mapped Address Size Numbering Capacity, which is used to Establish
   Communications between Networked Computers. This Protocol Specification
   represents a Mathematical Series of a Class of Protocols, a Numbering
   System that Increases in 32 Bit Increments, or Some Multiple of 32, which
   is represented by the Number Specified, and Replaced in the 'X' notation
   used in the name; 'IPtX'. Furthermore, this is Protocol Addressing
   System that represents a Class of Addressing Specifications, which are
   completely Backward Compatible, in nearly every respect, with the IPv4
   Addressing Specification (See Tables 8 and 11).

   Nevertheless, while the 'IPt1' is the only Protocol, the first addressing
   protocol in this specification, which has complete compatibility with the
   IPv4 specification. The difference between the IPv4 Protocol and the other
   protocols derived from the 'IPtX Specification', is their Addressing
   Schematic, which requires a Different 'Application Program Interface' that
   would allow Network Cards (NIC) to Bind to the Prefixes used in the format
   describing these Addressing Specifications (See Table 11). Needless to say,
   my suggestion would be, the Development of an Application (GUI), which
   allows the User to direct their communications via Continent (Zone IP) and
   the respective Country / State / Province (IP Area Code) of the Recipient.

```
                        TABLE 11


                 IPt1 32 Bit Mapped Address Space


                                     CIDR
                    32 Bit IPt1     Network
                   | Address Space  |Descriptor|
                   +--------------------------+
                   | XXX.XXX.XXX.XXX | /XXXX:XX |
                   +--------------------------+




                 IPt2 64 Bit Mapped Address Space


      Prefix Address <---> (Or Trunk Identifier)                 CIDR
       /      |    /     |    \        \        32 Bit IPt1    Network
    | 8 Bits | 8 Bits |  8 Bits | 8 Bits    | Address Space  |Descriptor
    +---------+---------+--------------------+--------------------------+
    |Reserved:|Reserved:| Zone IP:|IP Area Code:| XXX.XXX.XXX.XXX | /XXXX:XX |
    +---------+---------+--------------------+--------------------------+




                 IPt3 96 Bit Mapped Address Space


   Prefix Address Bit Count (Or Trunk Identifier)              CIDR
      /    |         |           \        32 Bit IPt1    Network
    | 8| 8|8 |8 |8 |8 |  8 Bits | 8 Bits     | Address Space |Descriptor
    +--+--+--+--+--+--+---------+------------+----------------+----------+
    |R:|R:|R:|R:|R:|R:| Zone IP:|IP Area Code:| XXX.XXX.XXX.XXX | /XXXX:XX |
    +--+--+--+--+--+--+---------+------------+----------------+----------+




                 IPt4 128 Bit Mapped Address Space


      Prefix Address Bit Count (Or Trunk Identifier)        IPt1     CIDR
       /     |           |          \          Address   Network
    | 8| 8|8 |8 | 8| 8|8 |8 |8 |8 |  8 Bits | 8 Bits   | Space |Descriptor
    +--+--+--+--+--+--+--+--+--+--+---------+-----------+-----------------+
    |R:|R:|R:|R:|R:|R:|R:|R:|R:|R:| Zone IP:|IP Area Code:| 32 Bit| /XXXX:XX |
    +--+--+--+--+--+--+--+--+--+--+---------+-----------+-----------------+
```

The Future; which Suggest a Different Reality regarding the Internet and
Networking, using the IPtX Protocol Specification. (Part2)

   The Future of the Internet promises an Always On, for everyone, in a
   Always Connected World. In fact, it will become a necessity for many,
   because there are many devices, using the current technology, which
   would be Medically vital, to sustain life.

   1. Bluetooth Wireless; Transmitting Biorhythms, read from a Biorhythm
      Watch, that would monitor a 'Heart Patient', and that could Dispatch
      an Ambulance during an Emergency.

   2. Personal Email, operated from Trunk or Backbone Server, transmitted to
      the Personal Email Server assigned to every Personal Intranet-Network.
      This however, would require a New Email Naming Convention, which would
      allow everyone to always have an email address to match their place of
      residence; e.g.: 'john.doe@ip area code.zone ip/XXXX:XX', which
      translates to, 'john.doe@255.255/00:8'. Where the DNS values could be
      equivalent to (Or actually, would not be necessary, because as long as
      the First and Last Names are Unique the Email would find its'
      Destination);

                   Last Name = Network Address, and
                   First Name = host Address

   3. Internet Television and the elimination of the 'Tuner', while having
      Graphics Superior to 'HDTV', and total Interactive Control. And while,
      the 'Internet TV' would see the elimination of the Turner Hardware
      Device, it would still exist in principle. Because instead of changing
      Channels in Hardware, a person would be Changing IP Addresses, which are
      using Video Streaming to Broadcast almost the same (except for the
      advantages regarding total Interactive Control) TV Broadcasted via some
      Radio Spectrum Frequency. In other words, Changing the Tuner to an IP
      Address Channel could be Free, when broadcasted using only a 32 Bit IP
      Address, and Pay, when using Zone IP and IP Area Code Addresses:
      e.g.; Channel '7' could be 234.44.123.007 for normal Broadcast...And Pay
      Broadcast could be delivered from anywhere in the world, because all
      that would be needed to represent the Channel is the
      'Zone IP: IP Area Code: Network IP Address'.

4. IP Telephoning could use the same Billing Type Structure, which would
      mean either Packaging everything, having only 1 cost, or a substantial
      reduction in the Monthly Phone Bill for the average Consumer.

   Nevertheless, while these were only examples, they exist as Real World
   Possibilities, because most of the required technology is currently on
   the shelf. Even still, with the implementation of these Protocol
   Specifications, the possibility for living the future, during my life,
   is indeed a possibility today.

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