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The CIDR Network Descriptor expands the size of the IPtX Address Space beyond the IPv6 IP Addressing Specification

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Status of this Memo

Intellectual Property Rights (IPR) Statement

Conventions

Please note, some of the mathematical operators that cannot be represented in a 'txt' file format, such as the '^' Carrot sign for super-script, or 'v' for sub-script, that must be used to represent the Mathematical Operator involving an Exponential Operation.

This Internet-Draft will expire on October 27th, 2006.

Abstract

This document provides the final clarification of the conclusions resulting in the expansion of 'RFC 1518 and 1519', which redefines the 'CIDR' notation as the 'Network Descriptor', and proves that the IP Address Pool of the IPtX Specification is greater than IPv6. And more importantly, because these conclusions reveal the actual design of the Binary Communication System, the Revolutionary impact sustained, is an upheaval affecting the entire field of Computer Science. In other words, IPtX is a more powerful and cost effective IP Addressing Specification that when using the 'IPtX-MX Routing Protocol' {'2^X : 1' Compression Ratio}, the interface of the "Front-End" can mimic or simulate a 32 Bit-Mapped IP Address. And this, in conjunction with the IPtX Overlay, provides a 100% Backward Compatibility with the IPv4 Specification, in the Backbone environment approaching an unlimited size 'Bit-Map' Address Space.

Introduction

The "CIDR" Concepts, the 'Network Descriptor' and the 'Bit-Mapped' IP Address, provided the bases for the comparison between IPv4, IPv6, and the IPtX IP Addressing Specifications, which concluded that these are different expressions of equal definitions. That is, mathematically speaking, the IP Address Pools of the IPv4 and the IPv6 Specifications, mathematically defines the variable Coefficient of an Identical Base Pool of IP Addresses, or X(2^{32}); given that 'X' respectively equals '1' and '7.9228163 x 10^{28}'.

Where IPv4 = 1(2^{32}); and the 128 Bit IPv6 $\approx$ 7.9228163 x 10^{28} (2^{32}) = 2^{128} = $(2^{32})^4$.

However, the IP Address Pool for the IPtX Specification is mathematically defined by the equation:

$$\text{IPtX} = X(2^{32}) + 16{,}500{,}000.$$

Nevertheless, these additional IP Addresses, because only the "Network Descriptors" are different, (approximately 16.5 Million Shared) are Host or Client IP Addresses, which cannot be used to establish a direct Internet Connection because of the Logic problems, the decisional conflicts with the Routers. In other words, the expansion of the 'CIDR' concept(s), which mathematically defines the expression; 'X(2^32)', can only provide a Bit-Map that uniquely Identifies every IP Address within every Address Class, or the IP Address Range the expression defines, essentially availing the entire Range of IP Addresses to the Global-Net.

Table of Contents

1. The Classless Inter-Domain Routing Architecture, or CIDR

The Classless Inter-Domain Routing Architecture, or CIDR, was derived from the so called; "strategies for address assignment of the existing IP address space with a view to conserve the address space and stem the explosive growth of routing tables in default-route-free routers" [9]. It was in reality, an Expansion of the 'Default Addressing Structures' existing in the Address Class System. The popular claim nevertheless, boasted the elimination of the Address Class System. These Claims needless to say, were fashioned by the Authors, whose works represented their personal interpretation(s), because the works comprising RFC's 1517, 1518, and 1519 were never fully understood. The truth nonetheless, was clearly explained in RFC 1519, whose discourse dealt specifically with the way the Routers, and the Routing Protocols interpreted, or dealt with the IP Address, and not the elimination of the Address Class System per se. In other words, the Routers and the Routing Protocols were limited to using only the 'Default Addressing Formats', which represented Class A, Class B, and the Class C Addressing Specification. And to deal with the prospect, or the possibility of an IP Addressing Shortage, a plan was devised (RFC's 1517, 1518, and 1519), which actually involved not only the initial 'Default Addressing Formats', from Class A, B, and C, but the remaining fractional subcomponents from each of their respective Octets as well. In fact, while RFC 1519 specifically designed the CIDR Architecture to take advantage of Class C, it did not weaver in its mention of the same implementation for the Class A Specification. It could be said in other words, that the CIDR Architecture represents an Un-Finished version of the 'IPtX Protocol Family Specification'. However, because of the MISNOMER, 'CLASSLESS', the process of SUB-DIVIDING a Class (In particular; Class A, and Class C), was never fully understood. Hence, the CIDR Architecture is the Sub-division of a CLASS SYSTEM, or a Class Addressing System that has been SUB-DIVIDED, which represents the Class, or the Whole, having a Greater Number of Constituents.

In other words, the CIDR Architecture actually represents: The 'Inter-Domain IP Bit Mapped Address Routing Architecture'. Because this, in essence, is what is really happening to the IP Address, and this is the IP Addressing Format that the Router and the Routing Protocols are dealing with. Therefore, the Class Addressing System is a format that implements a Network IP Address using a specified number of BITs, and in this case, it is either '8', '16', '24', or '32' Bits. Needless to say, any further Sub-Division, or use of some Smaller Portion or Constituent, does not constitute a departure nor eliminate the Existence of the Address Class System. Hence, the CIDR Architecture actually reinforced the Class Concept and proved that, without changing the entire Addressing Architecture defining the 'IP Bit Mapped Address or the IP Bit Mapped Address Space', the Whole is indeed the Sum of its Parts.

2. The Interpretation of the conclusion's Expansion of 'CIDR'; Defining the "Network Descriptor"

When defining the New 'CIDR' Architecture as representing the collective Extension for RFC's 1517, 1518, and 1519, we must first list the functional components, or Highlights, noted as the objectives or purpose supporting each of these papers, individually. That is, there must be comparison between the definition or description of the functional purpose of the 'CIDR' Architecture as represented in each of these papers, compared with the New 'CIDR' Architecture this paper actually represents.

RFC 1517 (Maintained promoted a fear of IP Address Loss, and Astronomical growth in the size of the Routing Tables):

"- Exhaustion of the class-B network address space. One fundamental cause of this problem is the lack of a network class of a size that is appropriate for a mid-sized organization. Class-C, with a maximum of 254 host addresses, is too small, while class-B, which allows up to 65534 addresses, is too large to be densely populated. The result is inefficient utilization of class-B network numbers.

- Routing information overload. The size and rate of growth of the routing tables in Internet routers is beyond the ability of current software (and people) to effectively manage.

- Eventual exhaustion of IP network numbers."

Argument in Opposition (Justification of the New 'CIDR' Architecture):

Clearly, using the expanded 'CIDR' Architecture, when using the 'CIDR' Network Descriptor, the Reality of IP Address Exhaustion now defines a wasted use of IP Addresses. In other words, Viable IP Address that could have been use to establish an Internet Connection, Connecting the Network's Backbone-Domain to the Internet, were assigned for the Host IP Addresses. This is further clarified by a Comparison of the "Internet Protocol v4 Address Space, and the use of the CIDR Network Descriptor displayed in Table I:

TABLE I

IPtX - Internet Protocol tl Address Space INDEX

IPaddNum = Network IP Address
CIDRNetDescrip = CIDR Network Descriptor

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

Class A	CIDR Network Descriptor
A-1: Issued = 127 , Remaining = 1,040,513,921	/0000:08
A-2: Issued = None, Remaining = 516,160,512	/0000:16
A-3: Issued = None, Remaining = 256,048,128	/0000:24
A-4: Issued = None, Remaining = 252,047,376	/0000:32

TABLE I

Class B	CIDR Network Descriptor
B-1: Issued = 64 , Remaining = 784,514,496	/1000:08
B-2: Issued = None, Remaining = 197,672,960	/1000:16
B-3: Issued = None, Remaining = 49,807,360	/1000:24
B-4: Issued = None, Remaining = 16,777,216	/1000:32
Class C	
C-1: Issued = 32 , Remaining = 458,321,632	/1100:08
C-2: Issued = None, Remaining = 57,741,312	/1100:16
C-3: Issued = None, Remaining = 7,274,496	/1100:24
C-4: Issued = None, Remaining = 1,048,576	/1100:32

TABLE I	
Class D	CIDR Network Descriptor
D-1: Issued = 16 , Remaining = 245,676,912	/1110:08
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	/1111:08
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

RFC 1518 (Which deals more with the actual Structure of the Internet, or its Hierarchical Structure , and IP Address allocation and Routing, than the actual 'CIDR' Architecture) where by, the points are specified as:

There are two aspects of interest when discussing IP address allocation within the Internet. The first is the set of administrative requirements for obtaining and allocating IP addresses; the second is the technical aspect of such assignments, having largely to do with routing, both within a routing domain (intra-domain routing) and between routing domains (inter-domain routing). This paper focuses on the technical issues.

The architecture and recommendations in this paper are oriented primarily toward the large-scale division of IP address allocation in the Internet.

IP Addresses and Routing

Efficiency versus Decentralized Control

IP Address Administration and Routing in the Internet

Administration of IP addresses within a domain

Indirect Providers (Backbones)*

Continental aggregation*

Argument in Opposition (Justification of the New 'CIDR' Architecture):

While there is a lot that can be said regarding RFC 1518, especially since this is a proposal which advocates a great deal of dependency upon ISP's, whose entire existence is based upon the Economy, the Consumer, and a Volatile Market. This actually means, an ISP has no guaranteed Future, regarding either the use of the IP Address Base, or their Routers for a thoroughfare. In other words, while this RFC did mention some good points, which are indeed supported in the IPtX Specification. It nevertheless, maintained more the soundings of a White Paper Solicitation for a New System Overall, than an actual presentation representing 'CIDR' Architecture. Needless to say, some of the problems discussed, and emphasized repeatedly, addressed the need for a Internet Hierarchy, while dismissing the need to expand the number of Backbone connections, which is the main point of consideration when addressing the concept of an Internet Hierarchy.

RFC 1519 (While this RFC should be the replacement for RFC 1517, because it is clearly derived from RFC 1517, it claims to Obsoletes RFC 1338, which I have not read. And while this paper also disputes some of the proposals outlined in RFC 1518 {Noting Specifically the causes for a loss of aggregation efficiency; Organizations, which are multi-homed, and Organizations, which change, service provider but do not renumber.}. Nevertheless, one thing this RFC does, that the others so far do not, is that, it Mathematically Introduces the beginnings of Foundation for the 'CIDR' Architecture.)

Argument in Opposition (Justification of the New 'CIDR' Architecture):

Nonetheless, while this RFC introduces the basic Mathematical Foundation for the 'CIDR' Architecture, and sets the fundamentals for the hardware and software specifications for Networking in a Supernetted Environment, it actually does nothing to prevent IP Address wasted on Host Assignments. This is because the foundation of the 'CIDR' Architecture was derived from the IPv4 specification, which means there was no way, short of a New IP Addressing System, could this waste be avoided. However, this is not the problem with the IPt1 specification, because it De-Emphasizes the HOST IP Address, and gives it secondary functional value, which defines a dummy Host. Needless to say, this was the foundation that was needed to get the 'Ball Rolling'. Nevertheless, while RFC 1519 developed the Mathematical foundation for the 'CIDR' Architecture, it never fully Exploited the benefits this Architecture maintains.

Definitions

CIDR: Classless Inter-Domain Routing is an IP Address Resolution Technique that provides a way to resolve any Binary Number(s) into it's the Integer Translation to verify an IP Address, which is written in 'Dotted Notation', and defined by ' 4 ' 8 Bit Octets.

CIDR Network Descriptor: It is a 2 Part Number used to resolve, or discover the Integer representing the Binary Number defining the Network Address IP Bit-Mapped.

[Where by, the Digits to the Right of the Colon Represents the Starting Point for the IP Address Class Range in Binary Notation, or Network IP Address assigned to the Specified IP Address Class Range. And the Digits to the Left of the Colon represent the Count of Bit Mapped Displacement, or the Number of Binary Digits the Network IP Address uses. In which case, the '/XXXX:XX' notation would be used to Identify the Bit-Mapped Address Class and the Address Class Range of a Network IP Address.]

Nevertheless, the definitions noted above, concludes the argument by providing logical support for Re-Defining the 'CIDR' notation as the "Network Descriptor", which comprises a Switch, and a 2-part Number that defines the entire Range of every IP Address, including the Address Class Range mapping every Octet for the Network portion of the IP Address defines.

TABLE II

IPtX - Internet Protocol t1 Address Space INDEX

IPaddNum = Network IP Address (XXX.XXX.XXX.XXX)

CIDRNetDescrip = CIDR Network Descriptor (/XXXX:XX)

CIDRNetDesSwitch = CIDR Network Descriptor Switch (/)

CIDRNetDesClassID = A "4" place Binary Number (XXXX) Identifying the 'Front-End' of the Bit-Mapped Space of the Network Address in the Range of the Address Class.

CIDRNetDesDivider = Statement End-Start New Statement (:)

CIDROctDesNetID = A "2" place, or variable Number (XX) Identifying the enrire Bit-Mapped Range of an IP Address. (IPv6 has "3" places)

ZONEIPaddNum = Zone IP designates the Continent's location, and it is the First of a 2 Octet configuration defining the Prefix of a 32 Bit IP Address, which is 8 Bit Number Terminated by a Colon (XXX:)

IPAreaCodeaddNum = IP Area Code designates the second level of the Continent's Sub-Region, and defines the Second of the 2 8 Bit Octet configuration Prefixing a 32 Bit IP Address that is also Terminated by a Colon (XXX:)

GlobalIPaddNum = GlobalNet IP Address (XXX:XXX:XXX.XXX.XXX.XXX)

CIDRTrunkNetID = The combined use of the 'Zone IP'and the 'IP Area Code' to identify the "Trunk-Identifier", which is assigned to the 'TelCo-Xchge or Backbone Routers'

3. The IPtX and IPv4 IP Addressing Schemes –100% Compatibility

The IPtX IP Addressing Scheme is a logically derived 'Internet Protocol Addressing Family' that is founded upon the IPv4 IP Addressing Specification. In other words, because IPtX utilizes the same Bit-Mapped Binary Addressing Format, which does not require any deviation from the operational infrastructure of the IPv4 Address Space. It maintains a 100% Backward Compatibility with IPv4, which is retained throughout an expansion capability defining an Infinitely Bit-Mapped IP Address Space using only a 64 Bit Header. There is however, the one noted difference in the IPv4 and the IPtX Specifications, which defines a distinction between the respective "Subnet-Mask" and the "Subnet-Identifier" that allows the IPtX Address Pool to be greater than IPv4 and IPv6, when using the same Bit-Mapped IP Address Space. Needless to say, while this distinction might at first, appear to be a strong departure from the IPv4 Format. It's only a 'Binary Switch' that uses the elements from the Set, {X,Y} to provide the ability the Change ((between) or (Extend)) the 'Programmed Functions' or 'Operations' defining the "Subnet-Mask" and the "Subnet-Identifier". In any case, it should be clearly understood, the definition of the "Subnet-Identifier" extends the definition of the "Subnet-Mask" by providing the ability to Change the Range of the Subnet, which specifies the range of the Host IP Address. And this, it should be noted, is the Distinguishing Mathematical Hallmark that assigns every IP Address in the IPv4 Specification to the IP Address Pool, with the added benefit of the creation of a Host IP Address Pool. Now, if the Address Spaces were equal, the number of available IP Address in the IP Address Pool assigned to the IPv4 Specification, given that IPtX is defined as the extension of IPv4, exceeds the number of available IP Address in the IP Address Pool assigned to the IPv6 Specification. Nevertheless, the validity of the forgoing is supported by the conclusions from the mathematical analysis and comparison of Tables III, IV, and V.

TABLE III

Structure Decimal of the IPv4 Representation IP Class System
IPv4 IP Address Pool = 4.145 x 10^9 Addresses

1. **Class A: 1 - 126, Default Subnet Mask 255.X.X.X:**
   126 Networks and 16,387,064 Hosts: 0000

2. **Class B: 128- 191, Default Subnet Mask 255.255.X.X:**
   16,256 Networks and 64,516 Hosts: 1000

3. **Class C: 192   223, Default Subnet Mask 255.255.255.X:**
   2,064,512 Networks and 254 Hosts: 1100

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: 1111**
   15 x 254^3 = 245,805,960 IP Addresses available

TABLE IV

IPtX - 'Subnet-Identifier' = "Subnet-Mask" - 100% Backward Compatibility with IPv4
"IPtX Addressing System Using the Current Binary System."

[Note: The Law of the Octet defines the value, relative to Class, of the 'Y' variable in the IP Address Pool containing; 4,145,927,192 = 4.145 x 10^9 Addresses, which should be: 2^32 = 4,294,967,296]

1. Total IP Addresses for Class A = 126 x 254^3 = 2,064,770,064
   Total available IP Host Addresses Equals 126 x 254^N
   [Where N = Number of Octet(s), 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:
   126 Networks and 8,129,016 Hosts: /0000:08

   Class A-2, 1 - 126, Default Subnet-Mask 255.255.Y.X:
   15,876 Networks and 32,004 Hosts: /0000:16

   Class A-3, 1 - 126, Default Subnet-Mask 255.255.255.Y:
   2,000,376 Networks and 126 Hosts: /0000:24

   Class A-4, 1 - 126, Default Subnet-Mask 255.255.255.255:
   252,047,376 Network / MultiCast IP Addresses / AnyCast: /0000:32

TABLE IV - Continued

2. Total IP Addresses for Class B = 64 x 254^3 = 1,048,772,096
   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:
   64 Networks and 4,129,024 Hosts: /1000:08

   Class B-2, 128 - 191, Default Subnet Mask 255.255.Y.X:
   4,096 Networks and 48,260 Hosts: /1000:16

   Class B-3, 128 - 191, Default Subnet Mask 255.255.255.Y:
   262,144 Networks and 64 Hosts: /1000:24

   Class B-4, 128 - 191, Default Subnet Mask 255.255.255.255:
   16,777,216 Network / MultiCast IP Addresses / AnyCast: /1000:32

3. Total IP Addresses for Class C = 32 x 254^3 = 524,386,048
   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:
   32 Networks and 2,065,512 Hosts: /1100:08

   Class C-2, 192 - 223, Default Subnet Mask 255.255.Y.X:
   1,024 Networks and 8,128 Hosts: /1100:16

   Class C-3, 192 - 223, Default Subnet Mask 255.255.255.Y:
   32,768 Networks and 32 Hosts: /1100:24

   Class C-4, 192 - 223, Default Subnet Mask 255.255.255.255:
   1,048,576 Network / MultiCast IP Addresses / AnyCast: /1100:32

TABLE IV - Continued

4. Total IP Addresses for Class D = 16 x 254^3 = 262,193,024
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:
16 Networks and 1,032,256 Hosts: /1110:08

Class D-2, 224 - 239, Default Subnet Mask 255.255.Y.X:
256 Networks and 3,048 Hosts: /1110:16

Class D-3, 224 - 239, Default Subnet Mask 255.255.255.Y:
4,096 Networks and 16 Hosts: /1110:24

Class D-4, 224 - 239, Default Subnet Mask 255.255.255.255:
65,536 Network / MultiCast IP Addresses / AnyCast: /1110:32

5. Total IP Addresses for Class E = 15 x 254^3 = 245,805,960
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:
15 Networks and 967,740 Hosts: /1111:08

Class E-2, 240 - 254, Default Subnet Mask 255.255.Y.X:
225 Networks and 3,810 Hosts: /1111:16

Class E-3, 240 - 254, Default Subnet Mask 255.255.255.Y:
3,375 Networks and 15 Hosts: /1111:24

Class E-4, 240 - 254, Default Subnet Mask 255.255.255.255:
50,625 Network / MultiCast IP Addresses / AnyCast: /1111:32

The mathematical analysis of the result from Table III and Table IV reveals that when the "Subnet-Mask" is equal to the "Subnet-Identifier". The division of the Address Classes in the IPv4 Specification, is defined by the "Network Descriptor" as; the Logical Expansion of each of the Address Classes in the IPv4 Specification, through the use of the Network ID designation, "255", in remaining Octets. And because the requirement of the "Subnet-Mask" mandates that 'only a Number from the Range of the Address Class' can be assigned a Network ID, then every Octet specifies one of the '4 Sub-Division' created in the Range of every Address Class. In other words, because the "Subnet-Mask" specifies the uses of the "255" designation in conjunction with the 'Range of the Address Class', to identify the Address Class associated with the Network ID. The logical use of the Octets remaining in the Range of every Address Class in conjunction with the "Subnet-Mask", is the logical consequence of the conclusion derived from the expansion, or sub-division of the 'Address Class Range' that was outlined in RFC 1517, 1518, and 1519. Needless to say, since 'the Quantified Sum of the 'Product of the Network and Host IP Addresses' for every Address Class in Table IV, is equal to the Total Number of IP Address assigned to the Range of the Address Class defined by Table III, then the Addressing Specifications shown by these Tables are mathematically equal. In which case, mathematically speaking, is should be concluded that the IPtX Specification, by RFC 1517, 1518, and 1519, is the interpretation of the IPv4 Specification derived from the use of the "Subnet-Mask".

4. The Structural Comparison - IPv6 vs. IPtX

The handicaps from using an askew Binary System, the Loop-Back Address (127), and the Subnet-Mask (255), makes it impossible for the IPv4 Specification, even through the progressive expansion using 32 Bit additions for an equal Address Space, to match the IP Addresses available in the IP Address Pool of the IPv6 Specification. And clearly, the same fate, according to Figures 1 and 2, will befall the IPtX Specification. However, because the IPtX Specification maintains an expansion capability that defines an Infinitely Bit-Mapped IP Address Space, using only a 64 Bit Header. In which, the 'TelCo-Xchge or Backbone Routers' would be assigned a Network ID, which would absorb the Bit-String of the Address Space beyond the 32 Bit-Mapped IP Address Space defined by the IPt1 Specification. And since, the losses represented by Figures 1 and 2, at infinity, are not discernable. The IPtX Specification maintains an IP Address Pool Capacity, which is theoretically, infinitely larger than the IP Address Pool availability in the IPv6 Specification (See Figure 3).

IPv4 Specification

IPv4 = 32 Bit Address Space

IPv4 IP Address Pool = 253(254^3) = 4,145,927,192 = 4.145 x 10^9 Addresses
IPv4 IP Address Pool Specification = 4,294,967,296 = X(2^32)
This represents a loss: 4,294,967,296 - 4,145,927,192 = 149,040,104 IP Addresses

IPv6 Specification

IPv6 = 128 Bit Address Space

IPv6 IP Address Pool = (2^32) x (2^32) x (2^32) x (2^32) = 2^128 = X(2^32)
IPv4 IP Address Pool Specification =
340,282,366,920,938,463,463,374,607,431,768,211,456 IP Addresses = X(2^32)

IPtX Specification

IPt1 = 32 Bit Address Space

IPt1 IP Address Pool = (255^4) = 4,228,250,625 + 16,500,000 IP Addresses
IPt1 IP Address Pool Specification = X(2^32) + 16,500,000 IP Addresses
= 4,294,967,296 + 16,500,000 IP Addresses
This represents a loss: 4,294,967,296 - 4,228,250,625 = 66,716,671 IP Addresses

Figure 1

IPtX Specification

IPt2 = 64 Bit Address Space

IPt2 = 48 Bit IP Address = (255^2)(255^4) = X(2^32) + 16,500,000 IP Addresses
IPt2 IP Address Pool =(255^2)(255^4)= 65,025 X(2^32) + 16,500,000 IP Addresses
= 65,025(4,228,250,625) + 16,500,000
= 2.7494200 x10^14 + 16,500,000 IP Addresses

IPt2 IP Address Pool Specification = X(2^32) + 16,500,000 IP Addresses
=(256^2)(2^32) = 2.8147498 x 10^14
This represents a loss: 2.8147498 x 10^14 - 2.7494200 x 10^14
= 6.5329799 x 10^12 IP Addresses

IPt2 = 64 Bit IP Address = (255^4)(255^4) = X(2^32) + 16,500,000 IP Addresses
IPt2 IP Address Pool = (255^8) = 1.7878103 x 10^19 + 16,500,000 IP Addresses
= 1.7878103 x 10^19 + 16,500,000
= 1.7878103 x 10^19 + 16,500,000 IP Addresses

IPt2 IP Address Pool Specification = (256^4)(2^32) = 1.8446744 x 10^19
= X(2^32) + 16,500,000 IP Addresses
This represents a loss: 1.8446744 x 10^19 - 1.7878103 x 10^19
= 5.6864072 x 10^17 IP Addresses

Figure 2

'IPtX IP Specification'
(Topology of the Internet Backbone Hierarchy)

"Trunk-Identifier" Address Size Spec.		Zone IP and IP Area Code Address Spec.		IP Addressing Spec.		IP Header BITS Size Spec.		Bit-Mapped IP Address Space Spec.		Network IP Address Size Spec.
None	=	None	=	IPt1	=	32 Bit	=	32 Bit	=	32 Bit
32 Bit	=	16 Bit	=	IPt2	=	64 Bit	=	64 Bit	=	32 Bit
64 Bit	=	16 Bit	=	IPt3	=	64 Bit	=	96 Bit	=	32 Bit
96 Bit	=	16 Bit	=	IPT4	=	64 Bit	=	128 Bit	=	32 Bit
128 Bit	=	16 Bit	=	IPt5	=	64 Bit	=	160 Bit	=	32 Bit
:		:		:		:		:		:
3.168k Bit	=	16 Bit	=	IPt100	=	64 Bit	=	3,200 Bit	=	32 Bit
:		:		:		:		:		:
159,968 Bit	=	16 Bit	=	IPt5000	=	64 Bit	=	160,000 Bit	=	32 Bit
:		:		:		:		:		:
Infinity	=	16 Bit	=	IPtX	=	64 Bit	=	Infinity	=	32 Bit

The "Trunk-Identifier" Specification (Spec.) contains the Zone IP and IP Area Code. And given that Software can assign the Zone IP and IP Area Code to any location/destination. Eventually it will be necessary to know an 18 Digit IP Address: ZoneIP, IPAreaCode, Network IP Address.

Figure 3

INTERNET PROTOCOL t2 (64 Bit) ADDRESS SPACE

IPt2 IP Address Prefix

Reserved BITS		CIDR Network Descriptor	Zone IP	IP Area Code	IPt1 Address /Schematic\ IP Address Assignment	Distribution /Purpose\	Date
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	007-256:	All:	XXX.XXX.XXX.XXX	IANA/RESERVED	4/2002
8	8	All	001-256:	000-256:	000.000.000.000	IANA/EMERGENCY	4/2002
8	8	±/ 0000:00	256:	256:	127.000.000.000	IANA/LoopBack	4/2002

Note: SA = South American, NA = North America, EU = European Union, AU = African Union, OS = Oceania States, AF = Asian Federation.

Figure 4

Note: While noting that any Trunk-Id beyond 96 Bits might seem ridiculous, because of the inherent limitations of the design specifications for the "Network Descriptor", (+/0000:00). However, assigning a 'Router-ID' that requires Special Authentication between communicating Routers could easily absorb any Number of Bits beyond the IPt4 Specification.

Nevertheless, it should be clearly understood, that if the 'TelCo-Xchge or Backbone Routers' were assigned the "Trunk-Identifier", then there must be a way to verify, resolve, or confirm the "Zone IP and the IP Area Code" Address defining the "Trunk-Identifier". In other words, the IPtX Specification can maintain the "Subnet-Identifier", use the "Network Descriptor" to verify the "Trunk-Identifier", and exhaust, without loss, every available IP Address in the Address Pool defined by the equation 1 (eq-1):

$$\text{eq-1:} \quad \text{IPtX} = X(2^{32}) + 16{,}900{,}000 = \infty$$

$$\text{eq-2:} \quad \text{IPv6} = X(2^{32}) = (2^{128}) = (256^{16}) = 3.4028237 \times 10^{38}$$

The process of maximizing the Address Pool defined by equation 1, is a '3' Step procedure, in which the first step exhaust all of the available IP Addresses in the IPv4 Specification. The second step requires changing the Symbol used as the "Network Designator" for the "Subnet-Identifier" (255 or 256), and the third step requires expanding the function of the Switch for the "Network Descriptor". To achieve the first goal, multiply the Network and Host IP Addresses from Table IV, and use the product to represent the total number of Networks, leaving the Host total unchanged. And after the "Network Descriptor" and the "Subnet-Identifier" has been redefined, as provided in Table V. The adjusted results now reveals that the total number of available IP Addresses in the Address Pool for the IPtX Specification is equal the equation 1, and it exceeds the amount assigned to the IPv6 Specification, when the size of the Bit-Mapped Address Space is equal to both Addressing Specifications (See Table VI).

TABLE V - Definitions

"Network Descriptor": A method derived from the CIDR notation, which is used to resolve and identify every part of a Network IP Address. And when it defines the use of '2' State Switch, comprising a 'Statement End-Start' New Statement Command symbol' and a 2 Part numeral, it separates an IP Address into 2 components, which identifies the Network IP Address and the Trunk-Identifier.

CIDR Network Descriptor ' ±/0000:00 '

1) '2' State Switch: " ±/ " - CIDRNetDesSwitch
   a) "Network-Identifier" Switch: ' -/ ' - CIDRGetIPaddNum
   b) "Trunk-Identifier" Switch: ' +/ ' - CIDRTrunkIDNum

2) 'End-Start', Flip/Flop Command symbol: ' (:) ' - CIDRGetTrunkIDNum

3) 'Network ID': ' 0000 ' - CID RNetDesClassID

4) 'Octet Bit-Map': ' 00 ' - CIDROctDesNetID - Address Length

"Subnet-Identifier": Defines the Overllay that is used in conjunction with a "Network Designator" and the 'X' and 'Y' variables to resolve a Networks IP Address.

1) "Network Designator": The symbol for the Null Set, ' Ø ', which is used as the 'Place Holder', identifying the OCTET(s) that define the Network ID, or the Network portion of the 32 Bit IP Address.

2) "Octet using eitire Address Range: ' X '

3) "Octet not using "Network Designator" Addresses: ' Y '

Note: From Table V, the "Network Designator", which is symbolized as; ' Ø ', could just as easily, been assigned to defined any symbol, (e.g.; '257') except for ' 0 '(representing ' 00 ', the Binary equivalent of ' 1 ') and any assignment represented in the Range of the Addressing Specification. In any case, it should be clearly understood that when every available IP Address is used for IP Addressing. The IPtX Addressing Schematic, (where fig. 5 and fig. 6 respectively denotes IPt1 and IPt2 Specifications) becomes nothing more than an OVERLAY, which is used to facilitate the visualization of the Topology for the Structure of the Network Design. And this is an extremely important advantage when designing a Network containing hundreds (or thousands) of Servers and several thousand (or Million) Hosts assigned to Subnets. [It is important to note, ' Ø ' represents the 'NULL SET' or TRUE ZERO {the Traditional European Representation for True Zero}, and ' 0 ' is EQUAL to ' 00 ', which defines the Binary equivalence of ' 1 ': ' 00 ' = ' 0 ' = ' 1 '.]

TABLE VI : ' IPt4 ' 128 Bit-Mapped Space

"The Logically derived Structure of the 'Synthetic' Decimal Representation of the IPt4 IP Addressing Specification"
IPt4 Address Pool Size = 2^32(256^12) = 256^16
= 4,294,967,296(256^12) = 3.4028237 x 10^38

NOTE: IPt4, by FIGURE '5' contains;
'7.9228163 x 10^28' COPIES of the 'IPt1' Specification

CLASS A - 'Address Range 1 - 128'

A-1; Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.Y.X.X ±/0000:08
- Networks: 128 x (128 x 256^2)(256^12)
- Host: 128 x 256^2 = 8,388,608

A-2; Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.Y.X ±/0000:16
- Networks:(128^2)(128 x 256)(256^12)
- Host: 128 x 256 = 32, 768

A-3; Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.Y ±/0000:24
- Networks:(128^3) x 128(256^12)
- Host: 128 = 128

A-4; Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.ØØØ ±/0000:32
- Networks: 128^4(256^12)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks ID - 2^7 = (256^12)(128 x 16,777,216)
= 1.7014118 x 10^38
Hosts = (128 x 256^2) + (128 x 256) + 128 = 8,421,504

TABLE VI : ' IPt4 ' 128 Bit-Mapped Space - Continued

CLASS B - 'Address Range 129 - 192'

B-1, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.Y.X.X ±/1000:08
- Networks: 64(256 - 64)(256^2)(256^12)
- Host: 64 x 256^2 = 4,194,304

B-2, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.Y.X ±/1000:16
- Networks: (64^2)(256 - 64) x 256(256^12)
- Host: 64 x 256 = 16, 384

B-3, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.Y ±/1000:24
- Networks: 64^4(256^12)
- Host: 64 = 64

B-4, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.ØØØ ±/1000:32
- Networks: (256^12)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks ID - 2^6 = (256^12)(64 x 16,777,216)
= 8.5070592 x 10^37
Hosts = (64 x 256^2) + (64 x 256) + 64 = 4,210,752

TABLE VI : ' IPt4 ' 128 Bit-Mapped Space - Continued

CLASS C - 'Address Range 193 - 224'

C-1, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.Y.X.X ±/1100:08
- Networks: 32(256 - 32)(256^2)(256^12)
- Host: 32 x 256^2 = 2,097,152

C-2, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.Y.X ± /1100:16
- Networks: 32^2(256 - 32) x 256(256^12)
- Host: 32 x 256 = 5,888

C-3, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.Y ± /1100:24
- Networks: 32^3(256 - 32)(256^12)
- Host: 32 = 32

C-4, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.ØØØ ± /1100:32
- Networks: 32^4(256^12)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks ID - 2^5 = (256^12)(32 x 16,777,216)
= 4.2535296 x 10^37
Hosts = (32 x 256^2) + (32 x 256) + 32 = 2,105,376

TABLE VI : ' IPt4 ' 128 Bit-Mapped Space - Continued

CLASS D - 'Address Range 225 - 240'

D-1, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.Y.X.X ±/1110: 08
- Networks: 16(256 - 16)(256^2)(256^12)
- Host: 16 x 256^2 = 1,048,576

D-2, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.Y.X ± /1110:16
- Networks: 16^2(256 - 16) x 256(256^12)
- Host: 16 x 256 = 4,096

D-3, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.Y ± /1110:24
- Networks: 16^3(256 - 16)(256^12)
- Host: 16 = 16

D-4, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.ØØØ ± /1110:32
- Networks: 16^4(256^12)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks ID - 2^4 = (256^12)(16 x 16,777,216)
= 2.1267648 x 10^37
Hosts = (16 x 256^2) + (16 x 256) + 16 = 1,052,688

TABLE VI : ' IPt4 ' 128 Bit-Mapped Space - Continued

CLASS E - 'Address Range 241 - 256'

E-1, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.Y.X.X ±/1111:08
- Networks: 16(256 - 16)(256^2)(256^12)
- Host: 16 x 256^2 = 1,048,576

E-2, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.Y.X ± /1111:16
- Networks: 16^2(256 - 16) x 256(256^12)
- Host: 16 x 256 = 4,096

E-3, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.Y ± /1111:24
- Networks: 16^3(256 - 16)(256^12)
- Host: 16 = 16

E-4, Subnet Id - 256:256:256:256:256:256:256:256:256:256:256:256:ØØØ.ØØØ.ØØØ.ØØØ ±/1111:32
- Networks: 16^4(256^12)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks ID - 2^4 = (256^12)(16 x 16,777,216)
= 2.1267648 x 10^37
Hosts = (16 x 256^2) + (16 x 256) + 16 = 1,052,688

Note: Since, the "Subnet Id" = the "Subnet Identifier", the Shared Host IP Address Pool increases by a factor equal the number of available Network IP addresses assigned to every sub-division within the Overlay defining the Address Class Range, given that No Host Address is assigned a direct Internet Connection.

eq-1: $\text{IPtX} = X(2^{32}) + 16{,}900{,}000 = \infty$

eq-2: $\text{IPv6} = X(2^{32}) = (2^{128}) = (256^{16}) = 3.4028237 \times 10^{38}$

eq-3:
$$\begin{aligned}\text{IPt4} &= X(2^{32}) + 16{,}900{,}000\\ &= (2^{128}) + 16{,}900{,}000\\ &= (256^{16}) + 16{,}900{,}000\\ &= 3.4028237 \times 10^{38} + 16{,}900{,}000 \text{ Host Addresses}\end{aligned}$$

eq-4: $\text{IPv4} = X(2^{32})$; when $X = 1$.

FIGURE 5 : 'IPt1'

"The Logically derived Structure of the 'Synthetic' Decimal Representation of the IPt1 IP Addressing Specification"
'IPt1' Address Pool Size = 2^32 = 256^4
= 4,294,967,296 = 4.294967296 x 10^9

CLASS A

1. A-1, 1 - 128, Subnet Identifier ØØØ.Y.X.X -/0000:08
- Networks: 128 x (128 x 256^2)
- Host: 128 x 256^2

A-2, 1 - 128, Subnet Identifier ØØØ.ØØØ.Y.X -/0000:16
- Networks:(128^2)(128 x 256)
- Host: 128 x 256

A-3, 1 - 128, Subnet Identifier ØØØ.ØØØ.ØØØ.Y -/0000:24
- Networks:(128^3) x 128
- Host: 128

A-4, 1 - 128, Subnet Identifier ØØØ.ØØØ.ØØØ.ØØØ -/0000:32
- Networks: 128^4
- Host: 0

Total Number of Available Network and Host Addresses:
2^7 Networks = 128 x 16,777,216 = 2,147,483,648
Hosts = (128 x 256^2) + (128 x 256) + 128 = 8,421,504

FIGURE 5 : 'IPt1' - Continued

CLASS B

2. B-1, 129 - 192, Subnet Identifier ØØØ.Y.X.X -/1000:08
   - Networks: 64(256 - 64)(256^2)
   - Host: 64 x 256^2

   B-2, 129 - 192, Subnet Identifier ØØØ.ØØØ.Y.X -/1000:16
   - Networks:(64^2)(256 - 64) x 256
   - Host: 64 x 256

   B-3, 129 - 192, Subnet Identifier ØØØ.ØØØ.ØØØ.Y -/1000:24
   - Networks:64^3 (256 - 64)
   - Host: 64

   B-4, 129 - 192, Subnet Identifier ØØØ.ØØØ.ØØØ.ØØØ -/1000:32
   - Networks: 64^4
   - Host: 0

Total Number of Available Network and Host Addresses:
2^6 Networks = 64 x 16,777,216 = 1,073,741,824
Hosts = (64 x 256^2) + (64 x 256) + 64 = 4,210,752

FIGURE 5 : 'IPt1' - Continued

CLASS C

3. C-1, 193 - 224, Subnet Identifier ØØØ.Y.X.X -/1100:08
- **Networks: 32(256 - 32)(256^2)**
- **Host: 32 x 256^2**

C-2, 193 - 224, Subnet Identifier ØØØ.ØØØ.Y.X -/1100:16
- **Networks: 32^2(256 - 32) x 256**
- **Host: 32 x 256**

C-3, 193 - 224, Subnet Identifier ØØØ.ØØØ.ØØØ.Y -/1100:24
- **Networks: 32^3(256 - 32)**
- **Host: 32**

C-4, 193 - 224, Subnet Identifier ØØØ.ØØØ.ØØØ.ØØØ -/1100:32
- **Networks: 32^4**
- **Host: 0**

Total Number of Available Network and Host Addresses:
2^5 Networks = 32 x 16,777,216 = 536,870,912
Hosts = (32 x 256^2) + (32 x 256) + 32 = 2,105,376

FIGURE 5 : 'IPt1' – Continued

CLASS D

4. D-1, 225 - 240, Subnet Identifier ØØØ.Y.X.X -/1110:08
- **Networks: 16(256 - 16)(256^2)**
- **Host: 16 x 256^2**

D-2, 225 - 240, Subnet Identifier ØØØ.ØØØ.Y.X -/1110:16
- **Networks: 16^2(256 - 16) x 256**
- **Host: 16 x 256**

D-3, 225 - 240, Subnet Identifier ØØØ.ØØØ.ØØØ.Y -/1110:24
- **Networks: 16^3(256 - 16)**
- **Host: 16**

D-4, 225 - 240, Subnet Identifier ØØØ.ØØØ.ØØØ.ØØØ -/1110:32
- **Networks: 16^4**
- **Host: 0**

Total Number of Available Network and Host Addresses:
2^4 Networks = 16 x 16,777,216 = 268,435,456
Hosts = (16 x 256^2) + (16 x 256) + 16 = 1,052,688

FIGURE 5 : 'IPt1' - Continued

CLASS E

3. E-1, 241 - 256, Subnet Identifier ØØØ.Y.X.X -/1111:08
   - Networks: 16(256 - 16)(256^2)
   - Host: 16 x 256^2

E-2, 241 - 256, Subnet Identifier ØØØ.ØØØ.Y.X -/1111:16
   - Networks: 16^2(256 - 16) x 256
   - Host: 16 x 256

E-3, 241 - 256, Subnet Identifier ØØØ.ØØØ.ØØØ.Y -/1111:24
   - Networks: 16^3(256 - 16)
   - Host: 16

E-4, 241 - 256, Subnet Identifier ØØØ.ØØØ.ØØØ.ØØØ -/1111:32
   - Networks: 16^4
   - Host: 0

Total Number of Available Network and Host Addresses:
2^4 Networks = 16 x 16,777,216 = 268,435,456
Hosts = (16 x 256^2) + (16 x 256) + 16 = 1,052,688

Special Note: The simplification of the Network IP Addressing format into the 'Zone IP', the 'IP Area Code', and the 'Network IP Address', as provided by the IPtX Specification, could also REPLACE the format currently being used by the Telephone Systems all over the World. In other words, there is an EASY, 'Off-The-Shelf' procedure for DIALING any Telephone Number defined by the 18 Digit String from the 'IPtX' Specification:

1. Dial First - Key in the digits representing the 'ZONE IP'

2. Dial Next - Key in an Asterisk " * " the 'End-Start Statement'(:)'

3. Dial Second - Key in the digits representing the 'IP AREA CODE'

4. Dial Next - Key in an Asterisk " * " the 'End-Start Statement'(:)'

5. Dial Third - Key in the All '12' digits of the 'NETWORK IP ADDRESS'

eg. Direct Trunk-Identifier, and respective Local Dialing:

a. Dial Zone IP: '123:213:121.0.12.3' =
'123 * 213 * 121-000-012-003';

b. Dial IP Area Code: '123:213:121.0.12.3' =
' * 213 * 121-000-012-003';

c. Dial Local '123:213:121.0.12.3' = ' * * ' 121-000-012-003';

Where it is not possible to define the Zone IP,
IP Area Code, or Network IP Address with ' 0 '.

FIGURE 6 : 'IPt2'

"The Logically derived Structure of the 'Synthetic' Decimal Representation of the IPt2 IP Addressing Specification"
'IPt2' Address Pool Size = 2^32(256^2) = 256^6
= 4,294,967,296(256^2) = 2.814798 x 10^14

NOTE: IPt2, by FIGURE '5' contains;
' 256^2 ' COPIES of the 'IPt1' Specification

CLASS A

1. A-1, 1 - 128, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.Y.X.X ±/0000:08
- Networks: 128 x (128 x 256^2)(256^2)
- Host: 128 x 256^2

A-2, 1 - 128, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.Y.X ±/0000:16
- Networks:(128^2)(128 x 256)(256^2)
- Host: 128 x 256

A-3, 1 - 128, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.Y ±/0000:24
- Networks:(128^3) x 128(256^2)
- Host: 128

A-4, 1 - 128, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.ØØØ ±/0000:32
- Networks: 128^4(256^2)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks 2^7(256^3)(256^2) = (128 x 16,777,216)(256^2)
= 2,147,483,648(256^2)
Hosts = (128 x 256^2) + (128 x 256) + 128 = 8,421,504

FIGURE 6 : 'IPt2' - Continued

CLASS B

2. B-1, 129 - 192, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.Y.X.X ±/1000:08
- Networks: 64(256 - 64)(256^2)(256^2)
- Host: 64 x 256^2

B-2, 129 - 192, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.Y.X ±/1000:16
- Networks: (64^2)(256 - 64) x 256(256^2)
- Host: 64 x 256

B-3, 129 - 192, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.Y ±/1000:24
- Networks: 64^3(256 - 64)(256^2)
- Host: 64

B-4, 129 - 192, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.ØØØ ±/1000:32
- Networks: 64^4(256^2)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks 2^6(256^3)(256^2) = (64 x 16,777,216)(256^2)
= 1,073,741,824(256^2)
Hosts = (64 x 256^2) + (64 x 256) + 64 = 4,210,752

FIGURE 6 : 'IPt2' - Continued

CLASS C

3. C-1, 193 - 224, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.Y.X.X ± /1100:08
- Networks: 32(256 - 32)(256^2)(256^2)
- Host: 32 x 256^2

C-2, 193 - 224, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.Y.X ± /1100:16
- Networks: 32^2(256 - 32) x 256(256^2)
- Host: 32 x 256

C-3, 193 - 224, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.Y ± /1100:24
- Networks: 32^3(256 - 32)(256^2)
- Host: 32

C-4, 193 - 224, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.ØØØ ± /1100:32
- Networks: 32^4(256^2)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks 2^5(256^3)(256^2) = (32 x 16,777,216)(256^2)
= 536,870,912(256^2)
Hosts = (32 x 256^2) + (32 x 256) + 32 = 2,105,376

FIGURE 6 : 'IPt2' - Continued

CLASS D

4. D-1, 225 - 240, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.Y.X.X ± /1110:08
- Networks: 16(256 - 16)(256^2)(256^2)
- Host: 16 x 256^2

D-2, 225 - 240, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.Y.X ± /1110:16
- Networks: 16^2 (256 - 16) x 256(256^2)
- Host: 16 x 256

D-3, 225 - 240, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.Y ± /1110:24
- Networks: 16^3(256 - 16)(256^2)
- Host: 16

D-4, 225 - 240, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.ØØØ ± /1110:32
- Networks: 16^4(256^2)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks 2^4(256^3)(256^2) = (16 x 16,777,216)(256^2)
= 268,435,456(256^2)
Hosts = (16 x 256^2) + (16 x 256) + 16 = 1,052,688

FIGURE 6 : 'IPt2' - Continued

CLASS E

3. E-1, 241 - 256, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.Y.X.X ±/1111:08
- Networks: 16(256 - 16)(256^2)(256^2)
- Host: 16 x 256^2

E-2, 241 - 256, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.Y.X ±/1111:16
- Networks: 16^2 (256 - 16) x 256(256^2)
- Host: 16 x 256

E-3, 241 - 256, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.Y ±/1111:24
- Networks: 16^3(256 - 16)(256^2)
- Host: 16

E-4, 241 - 256, Subnet Id - 8 Bit Reserved:8 Bit Reserved:256:256:
ØØØ.ØØØ.ØØØ.ØØØ ±/1111:32
- Networks: 16^4(256^2)
- Host: 0

Total Number of Available Network and Host Addresses:
Networks 2^4(256^3)(256^2) = (16 x 16,777,216)(256^2)
= 268,435,456(256^2)
Hosts = (16 x 256^2) + (16 x 256) + 16 = 1,052,688

Special Note:

In the IPtX Specification any Contiguous String of ZERO(s) is not a mathematically viable IP Address, because the IP Address Pool equation, $X(X^{32})$, defines a sequence of counting by successive additions of '1'. That is, using Zero(s), while not a problem for the IPtX Specification, it is however, a problem for IPv6. In other words, the problems inherent in the IPv6 Specification pertain primarily to the difficulties arising from the 48 Digit Number used to represent the Default format of an IP Address. And while there are Rules which define the use of " :: " as the replacement for the Contiguous ZERO(s) String, because they are not mathematically viable, the problem is exacerbated. Furthermore, since I have not found any documentation that specifically defines how to distinguish between 2 or more Addresses defining a different number of ZERO(s) in the Contiguous String, which might occur in the Start, Middle, or Trailing portion of the Address. Clearly, the " :: " cannot be used as the solution for the size reduction of an IPv6 Address, the replacement for a Contiguous String of ZERO(s), at least, not without the necessary Rule(s) explaining its use. Nevertheless, these inadequacies are further compounded by defining the IP Addressing Format as having a variable length, which may be greater than 128 Bits, and the " :: " as a compressor of the leading and/or trailing zeros, or as the replacement for the multiple 16-bit Zero Groups with a specification that limits its use, number of occurrences, in an address. And this, needless to say, defines the gist of the mathematical failings of every supporting document, including RFC 2373, and more importantly, the reasons the Chinese developed the IPv9 Addressing Specification.

It should have been quite clear from documents expounding the development of the design for the 'IPtX' Specification that the "Network Descriptor" provided the means to identify the "Trunk-Identifier", which defines the IP Address assigned to the 'TelCo-Xchge or Backbone Routers'. In other words, from 'Table V - Definitions', the "Network Descriptor" allows for the resolution of the Trunk-Identifier ID and the resolution of the entire Length of the Network IP Address String. And while the "CIDR" notation was exploited even further during the creation of the IPv6 Specification; because the symbol, ' /128 ', specifies the length for the Bit-Mapped IP Address, which defines the size of the 128 Bit-Mapped IPv6 Address Space. The "Network Descriptor" provided the ability to separate, or distinguish between the addresses assigned to the 'TelCo-Xchge or Backbone Routers' and the 'Network IP Address'. And this specified the Length defining the Network IP Address as '32 Bits' in the IPtX Specification, even if the size of its Address Space was equal to or greater than the 128 Bit IPv6 Specification.

Nevertheless, this procedure allows the retention of the more familiar structure defining a Network IP Address, which is similar to the 'Telephone Number' and defined by the IPv4 Specification. And clearly, this mathematically clarifies the interpretation of the IPtX Specification (See Table VII), which is logically derived from IPv4, by proving that the number of available Addresses in its IP Address Pool is greater than the IPv6 Specification. Furthermore, since it was only in the configuration of the Router where "CIDR" was addressed, "CIDR", as with the "Network Descriptor" can be automatic, and remain only as the concerns for the Network Engineer, because its affect lies outside the boundary of the Network Domain. In other words, IPtX is a more powerful and cost effective IP Addressing Specification, which allows the interface of the "Front-End" to mimic or simulate the IPv4 Specification, a 32 Bit-Mapped IP Address, in the Backbone environment of an unlimited size IP Address Space.

Table VII

IPtX - "Network IP Address" Bit-Mapped Length Specification = 32 Bits

IPt2 - "Trunk-Identifier"	= 8 Bit Rsvd:8 Bit Rsvd:256:256:	
	= 16 Bit-Mapped Address String	
"Network Descriptor"	=+/ 0000:16; Range is '00 thru 16'	
IPt4 - "Trunk-Identifier"	= 256:256:256:256:256:256:256:256:256:256:256:256:	
	= 96 Bit-Mapped Address String	
"Network Descriptor"	=+/ 0000:96; Range is '00 thru 96'	

Given that the first '0000' defines the '8 Bit' String that identifies:

"Trunk-Identifier" : Class Range - A, B, C, D, E - using the '+/ ' Switch
"Network ID" : Address Class of Network IP Address - A, B, C, D, E - using the ' -/ ' Switch

5. Security Considerations

This document, whose only objective was the deliberation of the final explanation for the IPtX Specification, which resulted from the Mathematics of Quantification, does not directly raise any security issues. Hence, there are no issues that warrant Security Considerations.

6. IANA Considerations

<u>The complete Anatomy of a IPtX Address String</u>**

1. 'Router-ID + Trunk-Identifier + Network IP Address':**

Total Address Length - IANA Specifications

2. 'TelCo-Xchge or Backbone Routers' - Router-ID: 'DNS ZONE'

" ID + Trunk-Identifier + ZONE IP + IP AREA CODE "

Total Segment Address Length - IANA Specifications

3. 'Trunk-Identifier' - ID: 'DNS ZONE - Address Block Specification'

" ID + ZONE IP + IP AREA CODE "

a. - 'ZONE IP' - ID ' - Segment Address Length - IANA Specifications

b. - 'IP AREA CODE - ID ' - Segment Address Length - IANA Specifications

Total Segment Address Length - IANA Specifications

4. 'Network IP Address' - ID: Segment Address Length - IANA Specifications

6.1 Special IANA Consideration:

While the use of Router Authentication can include Address String verification, its application may prove even more vital for Security applications. However, Address resolution could be accomplished more easily using a '3 State CIDR Network Descriptor Switch' {0, -1, +1}:

a) **Router-ID: /0000:00 or /0000:00E00; ' 00E 00' = $00^{00 \text{ thru } 99}$**

{e.g. 96E99 = 96^{99} Bits ; or , $X^{99}(2^{32}) \approx (7.9228163 \times 10^{28})^{99}$ copies of 'IPt1' }

b) **Trunk-Identifier: +/0000:00 or +/0000:00E00; ' 00E 00' = $00^{00 \text{ thru } 99}$**

{e.g. 32E10 = 32^{10} Bits; or, $X^{10}(2^{32} \approx (4{,}294{,}967{,}296)^{10}$ copies of 'IPt1' }

c) **Network IP Address: -/0000:00 or -/0000:00E00; ' 00E 00' = $00^{00 \text{ thru } 99}$**

d) **'ANSI Trace Switch': Multi-Conditional Switch defining Additional Command Statements – ±//0000: |? and //0000:00|? {Where '|?' = HELP!}**

The above considerations represent the conclusions derived from the foundation of 'RFC(s) 1518 and 1519', which actually define 'Address Segment Routing'. Given that in the Binary System of counting, sums by the addition of '1's' are from the Right, and leading Zeros to the Left are insignificant. The conclusions clearly establish the above mathematical expressions as a viable representation of the Router's interpretation of an IPtX 'Bit-Mapped' IP Address. That is, the 'CIDR Network Descriptor' provides the Router's depiction of an IP Address, which only acknowledges the routing of the Network-ID according to the structure of the Network's IP Address defined by the Address Class Range: '±/0000:00E00 and /0000:00E00'. Hence, this is the gist of an extremely powerful method, 'Address Segment Routing', which provides the translation of the Network Address defined by the Schematic representing the IPtX IP Addressing Specification, and any length of one or more additional Address Segments defining the total length of the IPtX Bit-Mapped Address. In other words, the 'CIDR Network Descriptor', in addition to defining the mathematical expression of the routed Address, it also acts as the Address Mask, resolving the Integer, one Bit at a time, in a process that defines every Address defined in the Schematic of the IPtX Addressing Specification. And finally, these conclusions also confirm the necessity of resolving the 48 Bit-Mapped IP Address (18 Digits), as the required identification to specifically determine the exact location/destination of the communicating nodes.

In other words, the 'CIDR Network Descriptor', in addition to defining the mathematical expression of the routed Address, it also acts as the Address Mask, resolving the Integer, one Bit at a time, in a process that defines every Address defined by the Schematic of the IPtX Addressing Specification. And finally, these conclusions also confirm the necessity of the 48 Bit-Mapped IP Address (18 digits), as the required identification to specifically determine the exact location/destination of the communicating nodes.

Nevertheless, the method of Counting that is defined by '±/0000:00E00 and 000:00E00', defines a "One-to-One' Correspondence with the Unary Element, ' 1 ', which defines the Sum of the Elements contained in the Set defining the 'CIDR Network Descriptor, as the Cardinality representing the count of the number of elements the Set Contains. Thus, yielding the exact depiction, from the Sum of the number ' 1's ', which equals the Number representing the IPtX IP Address. In other words, the Sum of the Bit Count defined by the '00E00' String is equal to the Number representing the remaining portion of the IP Address that is not defined by the Address Class Range, which defines the 8 Bit '0000' Prefix of the IP Address defined by the Network Descriptor. However, allowing the '00E00.0000' String to be equal to the method defining 'Exponential Enumeration' would be easier, because an Exponential Equation could Mask and Un-Mask the Integer representing the IP Address(s); '±/0000:00E00.0000 and /0000:00E00.0000'. And this method would also represent an exact count of the Sum of the ' 1's ', because it equals the one-to-one relationship that assigns only one Number from the result of, '2^X', the 'Exponent', to one IP Address. Furthermore, it is also behooving to note, that since (±/)'0000:00E00.0000' and (/)'0000:00E00.0000' is Routable, its Function as the 'Network Descriptor' still remains useful, because it allows for Address Segment Routing, and retains the original definition of its Address String Length; '±/0000:00'. In other words, the expansion of the 'CIDR Network Descriptor' defines a Routable Mathematical Expression, defining a '2^X : 1' 'Exponential Compression Ratio', which can be used in either a Static or Dynamic Mode.

Note: The logical expansion of the 'CIDR Network Descriptor' defines a Routable 'Universal Expression', which is a Mathematical Expression defined by an Exponential Equation', expressing the value of the result that uniquely represents the value of the Quantified Sum of the Component Strings defining the numerical value of every IP Address defined by the IPtX Specification. And this, as it will be clearly realized, changes the calculation for the Bit/Data Transfer Rate.

In any case, it should by quite clear that the foregoing uniquely defines the IPtX Specification, a distinct difference from IPv4, that provides the exact rendering of Binary Enumeration, which is equal to the sequential incrementation resulting from the summation of the progressing using ' 1's '. In other words, since the Binary equivalent of the Unit displacement, given by eq-5, defines the 'Exponential Expression' derived from the Binary Equation defined by the Mathematics of Quantification, which defines an incremental progression using the result from the summation of ' 1's '. It defines the result, 2^Q, from the equation as representing the Quantified Sum of the Binary Expressions defining the Numerical Displacement of the 8 Bit Segment that defines the Octet represented in an IP Address {see eq-6 and eq-7}.

eq-5: 2^X = 1; respectively denoting the Binary and Unary Sets

eq-6: 2^X = 8 Bit String = " 1 thru 256 "

eq-7: $(2^X) + (2^X) + (2^X) + (2^X) = 2^Q$, given that { . } = { + }, then
Bit.8 Bit.8 Bit.8 Bit = 32 Bit = 2^Q,
XXX.XXX.XXX.XXX = 2^Q = 00E000.0000...,
2^Q now defines an incremental progression, using the summation from the additions of ' 1's ', which approaches a Bit displacement defining an infinite length; see eq-9.

And clearly, given that 2^Q = 00E000.0000..., where 2 = 00 and Q = E000.0000..., the Masking and Un-Masking procedure for protocol encapsulation is extremely elementary, because it is a comparison defined by the laws of addition and subtraction. In other words, the Sum of any number of the Binary Expressions equaling the value of the 8 Bit Address Segment defining an Octet of an IP Address, {where the 00E00.0000 = IPtX IP Address as the Sum of the Binary Expressions defining the Total Number of Octets the IP Address contains.) is equal to the value of the Integer defining an IPtX IP Address. Hence, if there is a difference between any of the values defining an Octet or their resulting Sum, 2^Q, it would be determined, confirmed, or verified by the Translation / Resolution of an IP Address from the Masking or Un-Masking of the 'Exponential Expression(s)'. And this uniquely defines, by eq-8, the 'IPtX Mathematical Expression' Routing Protocol, and the ability of IPtX Specification to define an Un-Limited IP Address Pool: see 'The Anatomy of the IPtX-MX Routing Protocol'.

eq-8: 0000:00E000.0000... ; $2^X + 2^X + 2^F + 2^F = 2^Q$
2^Q = IP Address value; or value of the Octets Sum.

The Anatomy of the IPtX-MX Routing Protocol

The Number of 8 Bit Address Segments - IANA Specifications

0000:00E000.0000... = 2^999.99987654321 IP Addresses = 2^Q
or: Theoretical Number of available IP Addresses =
(2^999.99987654321)^2 copies of IPt1 = [('/0000:00') x ('+/0000:00')]

1. ' 0000: ' ID: 8 Bit Address Segment - Address Class Range

Total Segment IP Address Length - IANA Specifications

2. ' 00 ' ID: 4 Bit Address Segment - The Base 2, in 2^Q

Total Segment Address Length - IANA Specifications

3. ' E ' ID: 4 Bit Address Segment - Binary Exponential Operator

Total Segment Address Length - IANA Specifications

4. ' 000.0000...' ID: 48 Bit Address Segment - 2 Part Exponent Q

a.' 000 ' ID: 3-4 Bit Address Segment - Integer Part of Exponent

Segment Length - IANA Specifications

b.'.0000...' ID: 36 Bit Address Segment - Decimal Part of Exponent

The Anatomy of the IPtX-MX Routing Protocol

5. 'Router-ID + Trunk-Identifier + Network IP Address*

0000:00E000.0000... + 0000:00E000.0000... + 0000:00E000.0000...

3(8 + 20 + 36) = 3(64) Bit Strings

a. 0000:00E000.0000... /0000:00 - Masked Routable Router-ID

b. 0000:00E000.0000... +/0000:00 - Masked Routable Trunk-Identifier

c. 0000:00E000.0000... -/0000:00 - Masked Routable Network IP Address

Total Address Length - IANA Specifications

eq-9: 0000:00E000.0000... ; The Reality of "2^X : 1" Compression Ratio of the IPtX-MX Protocol

a. (2^X)v1 + (2^X)v2 + (2^F)v3 + (2^X)v4 = 2^Q

b. (2^X)v1 + (2^X)v2 + (2^F)v3 + (2^X)v4 + (2^F)v5 + (2^F)v6 = 2^Q

c. (2^X)v1 + (2^X)v2 + . . . + (2^F)vN = 2^Q

Given that 2^X defines Binary Enumeration, as the result from an Exponential Equation that defines the Unary incremental progression of addition, or counting, using ' 1's '.

Note: The comparable analogy the Computing Power defining the payload capacity of the '00.E000.0000... String' is equivalent to having $2^{999.99987654321}$ 3-State Logical Transistor Switches in the Core of '1' CPU. And this, is should be duly noted, is equivalent to the ability of programming every Transistor, or allowing every Transistor to become the CPU. However, since every 4 Bit segment can equal any number in the range of '0 thru 16', the '00.E000.0000... String' Theoretical Number of available IP Addresses now equals:

$$[('/0000:00') \times ('+/0000:00')] = (16^{161,616})^2 = [(2^4)^{161,616}]^2 =$$

$$(2^{646,464})^2 = 2^X = 2^{1,292,928.99987654321} \text{ copies of IPt1}$$

In which case, this means; A 64 Bit Address String can define the Number or Data Stream that represents the Sum of the incremental progressions, using '1's ', which equals the count of a $2^{646,464}$ Bit-Mapped displacement. And if the Address total defined by IPt1; 4,294,967,296, equaled a book containing 67,108,864 64 Bit words, then the '00.E000.0000... ' 64 Bit Address Block defines a Bit-Mapped Address String equaling approximately $2^{646,464}$ Books; when a book contains approximately 50,000 pages.

[The Genetic Equation representing the Formula for Life? ...Yep.]
Encryption and Decryption - The Binary Enumeration Algorithm - 2^N

1) $X(2^X)$ - **Encryption and Decryption Key**

   a. X - Counts the Number of Octets - 00 thru 2^X
   b. (2^8) - Encodes and Decodes Bit-Map Octet String

2) **00.E000.0000... - Binary Enmeration Compression Algorithm**

   a. Encryption of the Integer defines a Unique value -
      e.g. - 123.123.123.123 = 123123123123 = 2^Q
   b. Every Integer has a Unique '00.E000.0000...' Translation

3) **' + ' and the ' . ' Symbols: "Put it Together & Take it Away"**

   a. String Assembler - ' + ' "Put it Together" -
      e.g. - '123 + 123' = '123.123' = '123123' = 2^Q
   b. String Delimiter - ' . ' "Take it Away" -
      e.g. - '123123' = '123.123' = 2^Q

In other words, Binary Enumeration, the method of incrementation using ' 1 ' that defines the ' 2^X : 1 ' Ratio, sustains a practical limit, which is defined by the current technology. However, with the current technology it might be easier if the Exponent of the ' 2^X : 1 ' Ratio defined a Payload Capacity of 256 Bits, or the equation, 2^{256}, which defines a Payload capacity equaling 256 copies of a 50,000 page Book. And this, it should be reasoned, with the appropriate upgrades would allow the Ratio defining the current Data Transmission Rates, and a host of related technological products, to obtain a performance increase by that might be greater than a ' 4 : 1 ' Ratio.

6.2 Special IANA Consideration - Closing Argument

The proof of the mathematical validity for the Ratio defining the ' 2^X : 1 ' relationship between Binary and Unary counting is given by:

- **Since; $2^0 = 1$, and $(2^0) + (2^0) = 1 + 1$ is True,**

- **then; If 1 + 1 = 2, 1 + 2 = 3, ..., and $1 + N = I_N$, is True,**

- **there is a relationship; defining every 'X', in '2^X',**

- **such that; for every value that the element 'Q' defines, also defines a unique element in I, the Set of Integers,**

- **then; '2^X' also defines an element of the Set of Integers,**

- **given that; for every '2^X' of the Set I, '$2^X = Q$',**

- **and; If 'X' defines an Element of the Set of Integers and an Element of the Set of Real Number,**

- **then; 'X' is Greater Than, or Equal To '$N_{N + 1}$' and '$N_{N + 1.000...NvN + 1}$'.**

- **Hence: The Binary Set defines an Equation, '2^X, that equals the count defining the Sum of the incremental progression resulting from the Addition of '1's', which is equal to the progressive counting sequence defined by the Unary Set.**

This concludes the design specification(s) for the IPtX Addressing Protocol Family, with the implementation of the logically derived 'Intelligent Quantum Worm', which mimics the 'Payload Carrying Capacity' of the 'Instruction Set' carried by a Cell of DNA. And this discovery, when the correct Mathematical interpretation of the encoding for the Binary System is used, defines the 64 Bit Address as the Mask of the 'Intelligent Quantum Worm', the 'IPtX-MX Universal Routing/Routed Protocol' Specification, which has a 'Theoretical Payload Carrying Capacity' (Data Stream 'Bit-Count' Capacity) equal to the Bit size specification defining a Backbone Environment having an unlimited size 'Bit-Mapped' Address Space.

Work(s) in Progress;

These drafts represent the twelve chapters of the Networking Bible, designing a Network IP Addressing Specification that maintains a 100 Percent backward compatibility with the IPv4 Specification. In other words, this is a design specification developed from the Theory of the Expansion of the IPv4 IP Addressing Specification, which allowed the representation of the Network for the entire World on paper, and the possibility of an Infinite IP Address Pool. Nevertheless, the Internet-Drafts listed below, "Cited as Work(s) in Progress', explain the design Specification for the development of the IPtX (IP Telecommunications Specification) Protocol Addressing System and the correction of the Mathematical Error in the Binary System.

Computer Science / Internet Technology:

http://www.ietf.org/internet-drafts/draft-terrell-logic-analy-bin-ip-spec-ipv7-ipv8-10.txt
(Foundational Theory for the New IPtX family IP Addressing Specification, and the Binary Enumeration error discovery after the correction.) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-simple-proof-support-logic-analy-bin-02.txt
(The 2nd proof for the existence of another Binary System, resulting from the Error Correction.) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-visual-change-redefining-role-ipv6-01.pdf
(Argument against the Machine dependant IPv6 deployment.) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-schem-desgn-ipt1-ipt2-cmput-tel-numb-02.pdf
(The foundation of the New IPtX Addressing Spec compared to the Telephone Numbering System.) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-internet-protocol-t1-t2-ad-sp-06.pdf
(The IPtX Addressing Specification Address Space / IP Address Allocation Table; establishes the visual perspective that actually represents Networking Schematic Networking the entire World on Paper.) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-iptx-spec-def-cidr-ach-net-descrip-01.pdf
(Re-Defines CIDR) {Classes Inter-Domain Routing Architecture} and introduces the Network Descriptor for the IPtX Addressing Standard.) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-math-quant-new-para-redefi-bin-math-04.pdf
(The 3rd Proof for the New Binary System, correcting the error in Binary Enumeration.) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-gwebs-vs-ieps-00.pdf
(Defining the GWEBS – The Global Wide Emergency Broadcast System) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-iptx-dhcp-req-iptx-ip-add-spec-00.pdf
(The development of the DHCP {Dynamic Host Configuration Protocol} for the IPTX IPSpec) - "Work(s) in Progress'

http://www.ietf.org/internet-drafts/draft-terrell-iptx-dns-req-iptx-ip-add-spec-03.pdf
(The development of the DNS {Domain Naming Specification} the for IPTX IPSpec)
- "Work(s) in Progress'

Note: **These Drafts has Expired at www.ietf.org Web Site. However, you can still find copies posted at Web Sites all over the World. {Suggestion; Perform Internet search using "Yahoo" or "Google", Key word: "ETT-R&D Publications"}.**

7. References:

Pure Mathematics:

1. The Proof of Fermat's Last Theorem; The Revolution in Mathematical Thought {Nov 1979}
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. The Rudiments of Finite Algebra; The Results of Quantification {July 1983}
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 underlining concepts of Set Theory and the Field Postulates. The results yield another Distributive Property that is Conditional, which supports the existence of a Finite Field (i.e. Distributive Law for Exponential Functions) and emphasized the possibility of an Alternate View of the Entire Mathematical field.

3. The Rudiments of Finite Geometry; The Results of Quantification {June 2003}
Building upon the preceding works from which the Mathematics of Quantification was derived. Where by it was logically concluded that there existed only 2 mathematical operations; Addition and Subtraction. In other words, the objectives this treatise maintained, which was derived from the foundation of the Mathematics of Quantification; involves not only the clarification of the misconceptions concerning Euclid's Fifth Postulate, and the logical foundation of his work, or the existence of 'Infinity in a Closed Bound Finite Space'. But, the logical derivation of the Foundational Principles that are consistence with the foundation presented by Euclid, which would establish the logical format for the Unification of all the Geometries presently existing.

4. The Rudiments of Finite Trigonometry; The Results of Quantification {July 2004}
The development of the concepts for Finite Trigonometry from the combined foundations derived from numbers 3 and 5, and the Mathematics of Quantification.

5. The Mathematics of Quantification and the Metamorphosis of $\pi : \tau$ { October 2004}
The logical derivation of the exact relationship between the Circumference and the Diameter of the Circle, which defines the measurement of the exact length of the Circle's Circumference,τ when the Radius is equal to '1'.

Physics:

1. **The Mathematics of Quantification & The Rudiments of Finite Physics**
   The Analysis of Newton's Laws of Motion…the Graviton' { December 2004}
   Through the use of Finite Algebra, Geometry, Trigonometry, and # 5, investigation of the Laws of Classical Physics were found to be erroneous. This allowed the presentation of the initial work, which correct the flaws in Classical Physics, and establishes the foundation upon which there exist the possibility of a Grand Unified Field Theory for the Natural Sciences.

Additional References

1. **G Boole (Dover publication, 1958) "An Investigation of The Laws of Thought" On which is founded The Mathematical Theories of Logic and Probabilities; and the Logic of Computer Mathematics.**

2. **R Carnap (University of Chicago Press, 1947 / 1958) "Meaning and Necessity" A study in Semantics and Modal Logic.**

3. **R Carnap (Dover Publications, 1958) " Introduction to Symbolic Logic and its Applications"**

4. **Regis Desmeules (Cisco Press, April 24, 2003) " Cisco Self-Study: Implementing Cisco IPv6 Networks "**

5. **Gary C. Kessler (Auerbach Press, August 1997) " Handbook on Local Area Networks "**

6. **R. Hinden (Nokia) and S. Deering (Cisco Systems) RFC 2373 - " IP Version 6 Addressing Architecture "**

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"This work is Dedicated to my first and only child, 'Princess Yahnay', because she is the gift of Dreams, the true treasure of my reality, and the 'Princess of the Universe'. (E.T. 2006)"

Application Note:

While it is not necessary to expound all of the possible applications of the 'IPtX-MX Routing Protocol', to mention a few however, it encompasses the ability to act as an Encryption Key; a Video, Voice, and Data Compression Protocol; to allow a Program to have a variable length defining a WORD in Assembler Language; change the measurement(s) defining the dimensions and Format Sector Size Specification resulting in the development of Hard Drives having an Astronomical Storage Capacity; as well as the Mathematical replacement for the notation representing Hex Enumeration. And just the impacts from this short listing is enough to describe the Revoluationary affects from using 'Quantum Worm Technology'.

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