

# **Certain Investigation on Internet work Protocol Using Network Machine Learning Model**

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## ***Abstract***

The most famous global network is the Internet, which is a collection of networks that act as a network. The main communication channel of the Internet is a series of networks to link the supercomputers of major research laboratories. This channel is called the reference network (backbone). The structure of the initial support network, with access limited to a limited number of specialized users, the Internet has grown into a network covering the entire world, providing access to millions of ordinary users. Information is divided by the TCP/IP protocol into the required number of packets for transmission over the Internet. They pass through various networks at different levels en route to destination packages. In this paper the certain investigation of internetwork protocol by using network machine learning model. Depending on the

routing scheme used, individual packets are sent through different routes over the Internet and then assembled in an initial order to reach the destination. In the process of moving packets from the source, they may pass through multiple local networks, regional networks, routers, relays, hubs, bridges, and gateways. Regional networks are networks that can exchange information without connecting to the Internet.

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## **1. Introduction**

IP address consists of network address and node address. A network address identifies the entire network, and a node address is an individual node on this network: a router, server, or workstation [1]. Local networks are divided into 3 classes: A, B, C. The network is determined by the network portion of the IP address. Network Larger networks have an assigned set of addresses. For the network part of the address, the first 8 bits (left) are used, and for the node address - the last 24 bits of the IP address [2-3]. The first (highest) bit of the first octet of a network address is 0, and the remaining 7 bits can be any combination. Accordingly, IP addresses of class 001.x.x.x occupy a range [4]. Address range 1 27.x.x.x is reserved for testing network computers. Some of these addresses are test the internet reference network. Address 127.0.0.1 is assigned to test the local bus tire [5].

- Class B addresses is assigned to medium-sized networks. The value of the first two octets is in the numeric range of 128.x.x.x - 191.254.0.0. It allows addressing up to 16384 different networks, each of which can have 65,534 nodes [6].
- Class C addresses are used for networks where the number of nodes is relatively small. The network part of the address is represented by the first three octets, and the network address is the last. The value of the first three octets defining the network address can be in the range 192.x.x.x - 223.254.254.0. Thus, Class C addresses allow addressing of approximately 2 million networks, each with up to 254 nodes [7].

The functioning of the World Wide Web is based on the TCP/IP protocol set. But these terms alone are complicated at first glance. In fact, the TCP / IP protocol stack is a simple set of communication rules, and although you probably don't think about it, it's actually well known [8-9]. Through a systematic jar of patterns for solving routine tasks such training is futile. Usually when changing the version of office software, you had to look at the complete assistant of the accountant - with a slight change in the sequence of mouse clicks required to perform the usual operation [10]. Or a person who fell into a stupor when changing the desktop interface should see. By understanding the essence of problems, phenomena, and patterns are developing a system of principles through understanding [11-12]. In this case, the possession of knowledge does not play a big role - the missing information is easy to find. The key is to know what to look for. This does not require formal knowledge of the subject, but an understanding of the essence [13-14].

Remember how our regular mail works. First you write a letter on a piece of paper, then put it in the envelope, on the back of the envelope, write the address of the sender and recipient, then look for the nearest post office [15]. Next, the letter travels through a chain of post offices to the recipient's nearest post office, where it is forwarded to the postman's desired post and delivered inside his mailbox or personally [16]. All, the letter reached the recipient. When the recipient of the letter wants to reply to you, he will change the address of the recipient and the sender in his reply, with the same chain as the letter to you, but in the opposite direction [17]. Each computer (ie: a node, a host) on the Internet has a unique address called an IP address (Internet Protocol address) [18], for example: 195.34.32.116. An IP address consists of four decimal numbers (0 to 255) separated by a dot. But the IP address of the computer alone is not enough, because ultimately the transaction information is not themselves, but the applications running on them. And many applications can work simultaneously on the computer (for example, mail server, web server, etc.) [19]. To issue a regular paper letter, it is not enough to know the home address - you need to know the apartment number. Also, each program has a similar number called the application port number [20]. There are standard rooms for most server applications, for example: the postal service is connected to the number 25 (still says: "port" is "listed"), the Internet service is bound to port 80, FTP - port 21 then.

## 2. Literature Review

Sends a request (packaged with a query) to retrieve a page. Port 80 matches the web server. In the address bar of the browser, the 80th sector is usually not written, because it is used by default, but it can be explicitly indicated after a colon [21]. Having received a request from us, the web server

processes it and sends us a page in HTML language - the text markup language that the browser understands - in several packages. Our browser gets the page and displays it. As a result, we see the main page of this site on the screen [22]. Consider the strange behavior of your computer - incomprehensible network activity, brakes, etc. What should I do? Open the console (press the "Start" button - "Run" - type CMD - "OK"). In the console, type the command `net stat -an`. and `zhmem`. This application will display the list of connections established between our computer and remote nodes' sockets [23].

If we see any other IP addresses in the "External Address" column, through the double 25th port, what does it mean? (Remember that the 25th field is related to the mail server) This means that your computer has established a connection with some mail servers (servers) and is sending some mail [24]. If your e-mail client (for example, for example) is not started at this time, but there are many connections to the 25th port, the virus on your computer is sent from your computer or forwards the number of your credit cards with password attackers [25]. Also, an understanding of Internet policies is essential to properly configure a firewall (just put a firewall :)). This program is designed to filter out "them" and "enemy" - packages (often delivered by viruses). I miss my own, strangers don't care [26]. For example, your firewall tells you which port on your computer it wants to make a connection to. The most important thing is that this knowledge is very useful when communicating with technical support [27].

### 3. Proposed Model

Rectification prevents signal attenuation, and amplifies transmits the following information. Hubs connect computers in a network segment, allowing them to communicate with each other. Bridges connect different networks, allowing you to firewall data [28]. A special type of bridge, called a gateway, exchanges messages between different types of networks. Internet access to individual users and networks is provided by Internet Service Providers (ISP, Internet Service Provider). These companies own blocks of Internet addresses to which their customers can be assigned. When a user connects to an Internet service provider, he connects to its server, which in turn connects to the Internet through devices that connect to the website. A router receives network packets from network nodes and determines the best route to their destination address on the Internet and delivers the packet to this address. Rounding is done on the basis of known channels in the Internet and traffic volume in various segments. After that, the router sends a packet to a network access

point[29-30]. The services provided by the Internet Service Provider to its customers include the following shown in fig 1:

- The meaning of an internet identity in the form of an IP address;
- email services via POP3 and SMTP servers;
- message services through USENET servers;
- Routing through DNS servers

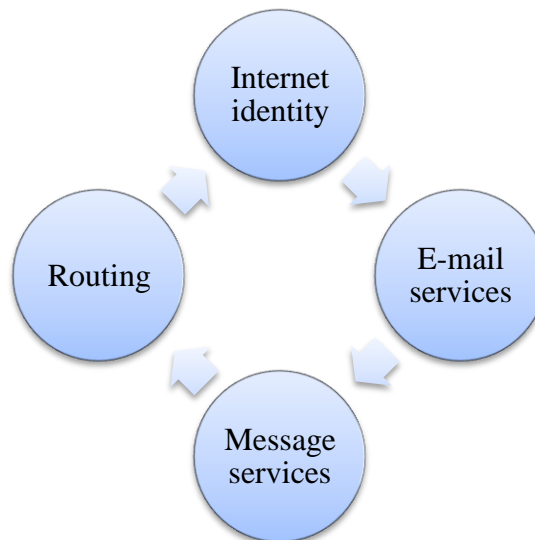


Fig 1: Activities of Internet Service Provider

### 3.1. IP Address management

Internet service providers provide their customers with addresses for Internet access, called IP protocol addresses or IP addresses. An IP address allows access to personal information, identifying a user on the Internet. Two versions of Internet addressing are now used: the IPv4 protocol and the IPv6 protocol. the prevailing version was the IPv4 version. In this version of the IP protocol, each node in the network is assigned a numeric address in the form of XXX.Yy.ZZZ.AAA, each group a three-digit number in decimal form (or 8-bit binary). This format with points (dotted decimal notation) is called a decimal notation, and the group itself is an octet. The decimal numbers of each octet are hardware operated from binary numbers. For example, 10000111. 10000111. 01001001. 01001001. 001010110 001010110 address 135. 139. 073. 073. 073. 054.

### 3.2. Subnet management

To create a subnet, the network portion of the IP address contains the mask, the mask that you want to add to this subnet. In this regard, data movement is limited by subnet nodes, since these nodes

can disguise and recognize addresses within the range. There are three main reasons for creating a subnet was shown in fig 2.

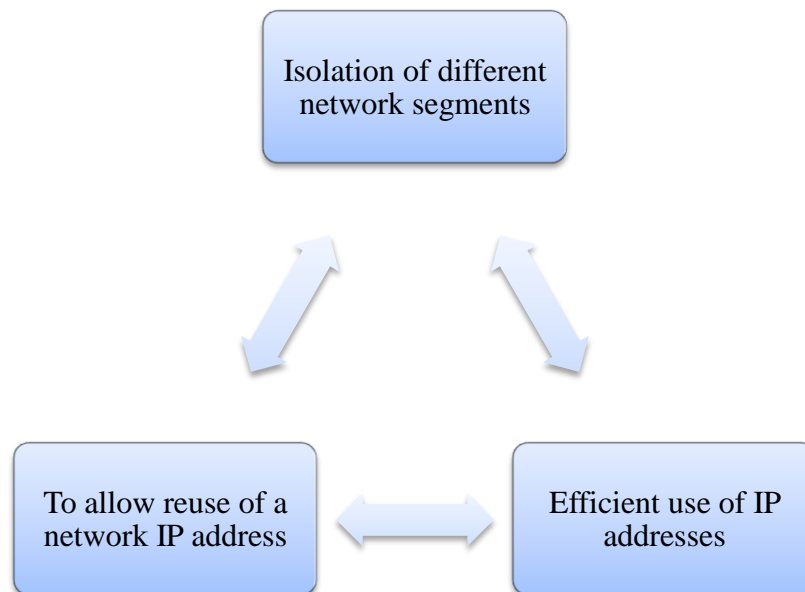


Fig 2: Subnet Management

- Isolation of different network segments from each other. For example, take a network of 1,000 computers. Without the use of segmentation, data from these 1,000 computers would pass through all other computers. Imagine a load on the communication channel. Additionally, each network user has access to all other members.
- Efficient use of IP addresses. The use of a 32-bit representation of an IP address allows for a limited number of addresses. 126 networks, each with 17 million nodes, this number of addresses may seem like a large number of global network size.
- to allow reuse of a network IP address. For example, the separation of class C addresses between two subnets located in different places allows you to choose half of the available addresses for each subnet. Therefore, two subnets can use one class C network address.

To create a subnet, you need to block any or all bits of the os-code of an IP-address. For example, a mask with a value of 255 blocks total octets, and a value of 254 blocks everything but an octet address. For class A networks, a mask of 255 is commonly used. 0. 0, class V-mask 255.255.0 .0 .0 .0 .0, and class C-mask 255. 255. 255. 255. 255. 255. 255. Network, you logical "AND" with IP address and mask. To perform a batch operation in Windows 2000 / XP, the default mask is entered automatically when entering an IP address. Thus, there is an almost perfect analogy with our regular postal address: "home address", "computer", "computer number", "port number". In computer

networks working on TCP / IP protocols, an envelope is the analogue of a paper letter. It actually contains the transfer data and address information - sender address and receiver address, for example: Sender Address (Source Address): IP: 82.146.49.55 Port: 2049. Receiver Address (Destination Address): IP: 195.34.32.116 Port: 53. Package Data: Of course, the packages contain official information, but it is not necessary to understand the essence.

### 3.3. Port management

As a rule, communication is carried out according to the client-server scheme: the "client" requests any information (for example, a site page), the server accepts the request, processes it and sends the result. Server application port numbers are well known, for example: Mail SMTP Server "Listens" on port 25, POP3 server that sends mail from your mailboxes on port 110, web server - on port 80, etc. Most programs on the home computer are clients - for example, the Outlook email client, IE, Firefox web browsers, etc. Client port numbers are not fixed on the server, but are dynamically assigned by the operating system. Standard server ports are usually up to 1024 (but there are exceptions), and the client starts after 1024. IP is the address of a computer (node, host) on a network, the number of a specific application that can run on this computer. Folders, Printers - These ports are used by windows to access shared resources of the computer. Do not open these ports outside, i.e. For district local network and internet. They should be covered by a firewall. Also, if you do not see anything in the network environment or see yourself on the local network, it may be due to the fact that the firewall blocks these ports. Thus, for the local network, these ports must be opened, and the Internet is closed. This was shown in fig 3

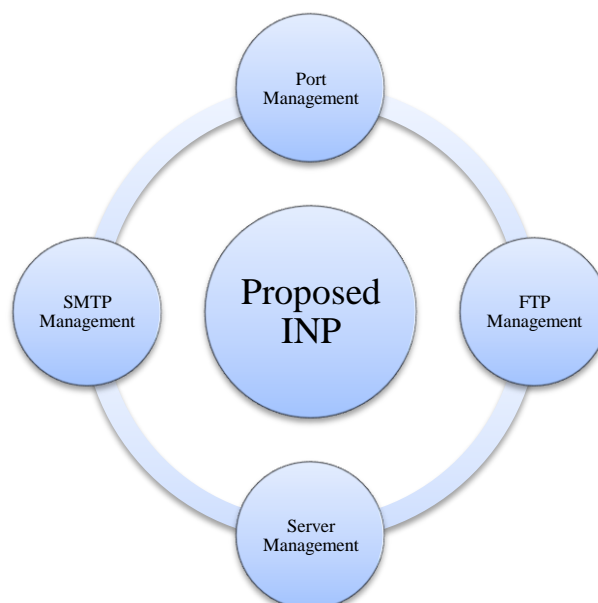


Fig 3: Proposed INP

- Port Management
- FTP Management
- Server Management
- SMTP Management

With it, your email client sends letters. The IP address of the SMTP server and its sector must be specified in the settings of your mail client. Your email client retrieves letters from your mailbox. The POP3 IP address of the server and its port must be specified in the settings of your mail client.

### **3.4. Routing management**

With a package with information, not "lost" on the road, it is in the moving Internet nodes, because of its so-called hosting tables, electronic databases containing instructions to send these or those packages if he follows to such an address. Navigation tables are sent centrally to the terminals, periodically changed and supplemented. Servers of routing nodes are called routers, or routers. Routing rules are described in ICMP (Internet Control Message Protocol), RIP (ROUTING INTERNATEPROTORCOLOCOL) and OSPF (First Shortest Path First). router knows, which direction should you send in which direction should you send? Yes, from you from you. No need to specify destination address only when sending messages with carrier pigeons. Unfortunately, the Internet does not use Pigeon Mail, so in order to send a message somewhere on the network, you must specify where.

### **3.5. Internet address system**

Every person living on earth has an address that can be discussed if needed. I think, no one will be surprised that every internet running machine has its own private address. Addresses on the Internet are different from direct mail. it is absolutely useless to write information about the ship in the network. But if you specify a computer as an address like 195.85.102.14, the car will understand you. It is a TCP/IP standard that represents records of addresses connected to Internet computers. This post is called an IP address. An IP address can be seen as consisting of four decimal identifiers, or octets, separated by a dot. The left octet indicates the type of local intranet in which the required computer is located. As part of this standard, several subdivisions of domestics are distinguished, determined by the value of the first octet. This value specifies the maximum number of subnets and nodes that such a network includes the value of the first swing of the IP address.



## 4. Results and discussion

The proposed network machine learning model (NMLM) was compared with the existing Routing Algorithm of Data in Networks (RADN), Hemoglobin Binding Algorithm (HBA), N-Ary Huffman Coding (NAHC) and deep learning mobile edge model (DLMEM)

### 4.1. Management of IP

The IPv6 IP version of the IP protocol was designed to address the anticipated problems of the lack of addresses supported by the IPv4 version. The destination and source addresses in IPv6 are 128 bits or 16 bytes long, which allows a large number of IP addresses to be maintained. The IPv6 protocol provides authentication of the packet sender, as well as encryption of the contents of the packet. IPv6 support is built into Windows 7 and many Linux distributions; In recent years, this protocol has been used more frequently. The IPv6 protocol provides support for mobile phones, car on-board computers, and a wide range of other Internet-connected personal devices. 2001: 0DB8: 0051: 4DC1: 635B: 0000: 0000: 2ffe. Zero groups are double colons. But the address cannot contain two consecutive oceans. For convenience, leading zeros may be omitted. When using a URL address, the IPv6 address must be enclosed in square brackets. This was shown in table 1,

Table 1: Management of IP

No of Inputs	RADN	HBA	NAHC	DLMEM	NMLM
100	86.92	86.71	62.88	85.41	94.61
200	85.43	84.74	60.46	83.21	92.62
300	84.63	83.61	60.05	82.41	91.42
400	83.37	81.92	58.30	80.68	89.69
500	82.23	80.37	56.89	79.18	88.10
600	81.08	78.82	55.47	77.68	86.50
700	79.94	77.27	54.06	76.18	84.90

### 4.2. Management of Subnet

Networks of network segments can be connected into subnets over a common IP address range. These groups are called intrinsic. Each wide section should play the role of a safety gate entry point and section exit. Usually the gateway role is played by a device called a router. A router is an intelligent device that forwards the received data to the recipient's IP address. In some networks, a

network screen is used as an external gateway or, differently, a firewall (firewall). A typical firewall is a combination of hardware and software components that create a security barrier between networks with different levels of security. The administrator can configure the firewall so that data is excluded on specific IP addresses and ports. This was shown in table 2,

Table 2: Management of subnet

No of Inputs	RADN	HBA	NAHC	DLMEM	NMLM
100	82.22	80.37	56.88	79.18	88.10
200	81.08	78.82	55.47	77.68	86.50
300	79.93	77.27	54.05	76.18	84.91
400	78.79	75.72	52.64	74.68	83.31
500	77.64	74.17	51.22	73.18	81.72
600	76.50	72.62	49.81	71.68	80.12
700	75.35	71.07	48.39	70.18	78.53

### 4.3. DNS Management

it is difficult for a person to remember digital IP addresses - it is more convenient to work with letter name names. After all, words are much easier to remember than a set of numbers. So done it any digital IP address can be associated with an alphanumeric name. As a result, for example, instead of 82.146.49.55, you can use the name and engage in the domain name change domain name service to a digital IP address. The provider either explicitly (a piece of paper, manual connection configuration) or implicitly (through automatic connection configuration) assigns a name server (DNS) IP address. On a computer with this IP address, an application (name server) runs, which knows all domain names and corresponding digital IP addresses on the Internet. The DNS server "listens" on port 53 for requests and issues responses. This was shown in table 3,

Table 3: Management of DNS

No of Inputs	RADN	HBA	NAHC	DLMEM	NMLM
100	82.33	82.48	58.45	81.74	90.94
200	81.29	82.03	56.13	80.31	89.51
300	80.25	81.58	53.81	78.88	88.08
400	79.21	81.13	51.49	77.45	86.65

500	78.17	80.68	49.17	76.02	85.22
600	77.13	80.23	46.85	74.59	83.79
700	76.09	79.78	44.53	73.16	82.36

#### 4.4. TCP Management

When sending information packets, the TCP protocol requires a receiving computer to confirm the reception of the information. When it receives, it is organized by creating temporary delays—time-outs or anticipations. Meanwhile, the sender continues to send data. A certain amount of data has already been sent, but not yet confirmed. In other words, TCP arranges two-way exchange of information, which provides high speed of its transmission. When connecting two computers, their TCP blocks are monitored in the connection state. At the same time, the connection automatically transfers data, called a virtual channel. This was shown in table 4,

Table 4: Management of TCP

No of Inputs	RADN	HBA	NAHC	DLMEM	NMLM
100	80.65	80.58	61.88	79.22	91.35
200	79.99	80.10	59.15	78.74	89.58
300	79.33	79.62	56.42	78.26	87.81
400	78.67	79.14	53.69	77.78	86.04
500	78.01	78.66	50.96	77.30	84.27
600	77.35	78.18	48.23	76.82	82.50
700	76.69	77.70	45.50	76.34	80.73

#### 4.5. Open Systems Interconnection Management

The current data transfer scheme on the Internet is a multi-layered structure consisting of several levels. This system is called the ISO OSI reference model (Open Systems Interconnection). For the general understanding of Internet principles, I will not reveal the essence of this project in detail, it is simply not necessary. Those who have a keen need to read this summary system in detail can use any technical reference book or use information from the world of the world search server query window the word "Internet" or "ISOC" in the search server window. This was shown in table 5,

Table 5: Management of OSI

No of Inputs	RADN	HBA	NAHC	DLMEM	NMLM
100	76.12	72.17	70.36	81.88	87.74
200	76.23	72.67	70.36	82.97	88.00
300	76.29	73.42	71.19	84.11	88.57
400	76.34	73.42	70.46	83.75	87.43
500	76.42	74.04	70.87	84.86	87.84
600	76.50	74.49	70.99	85.54	87.81
700	76.57	74.94	71.10	86.21	87.77

#### 4.6. Routing Management

The data transfer from your computer to any remote computer. In fact, your employees, by default, do not broadcast information directly to the recipient's computer (of course, it is not the server that connects to the website). Data falls from the computer that connects you to the global network to another computer that this computer is connected to, and at the first node. Next, there is a direction in which the end receiver is located, i.e. the path of information packets. The packet is then forwarded to the next node where its further path is determined. This process is called routing. This was shown in table 6,

Table 6: Management of Routing

No of Inputs	RADN	HBA	NAHC	DLMEM	NMLM
100	76.38	72.37	69.35	82.22	86.41
200	76.41	72.09	68.95	81.58	86.17
300	76.43	72.81	69.52	82.16	86.82
400	76.46	72.86	69.44	81.93	86.88
500	76.48	73.08	69.53	81.90	87.08
600	76.51	73.30	69.61	81.87	87.29
700	76.53	73.52	69.70	81.84	87.49

#### 5. Conclusion

Internet provider is usually called a company, a company or a company or a company that provides communication services and a company that connects the network. Simply put, such organizations simply "sell the Internet" to consumers. All the companies around the world have a clear division

that says label as Tier 1, 2, 3. We can say that the Internet providers of the entire global network level have their own optics located under the seas and oceans. Such global operators, as a rule, do not work with end users and do not sell traffic to small companies. There are many companies that are engaged only in transit traffic and help organize a multichannel network. The largest number of cases involves the end user in cases with providers involved in providing local networks and subscriber connection services. Of course, such a plan slightly increases the cost of the Internet for consumers, because it introduces the concept of permanent payment, but here it is important to understand that it entails all obligations to organize a service, repair and repair networks, and conduct direct technical communication with customers.

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