

# UEN IP Address Allocation Policy

Version: 1.0  
January 2008

## Abstract

This policy details the allocation of all UEN managed IPv4 and IPv6 address space. It also outlines recommendations entities can use to conserve IP address space for the benefit of the Internet community.

## Table of Contents

1. Introduction.....	2
1.1. SURIN Role in IP Address Management .....	2
1.2. UEN Role in IP Address Management .....	2
1.3. UEN Managed IP Address Space .....	2
1.4. UEN Obligations as an ARIN Member .....	2
2. General Principles .....	2
2.1. Conservation .....	2
2.2. Validity .....	2
2.3. Invalidation .....	3
2.4. Recall .....	3
2.5. Determination of IP Address Allocation Size.....	3
2.6. CIDR Bit Boundaries .....	3
2.7. IP Address Availability.....	3
2.8. Routing UEN IP Address Blocks.....	3
2.9. IP Allocation Audit .....	3
3. Allocation to Customers .....	4
3.1. Written Request for IP Space Allocation.....	4
3.2. Efficient Utilization of Current Allocations .....	4
3.3. Renumber and Return .....	4
3.3.1. UEN Requested Renumber and Return .....	4
3.4. UEN Response Time.....	5
3.5. Right to Appeal .....	5
4. IPv4 Address Conservation.....	5
4.1. Classless Inter-Domain Routing (CIDR) .....	5
4.2. Network Address Translation (NAT) .....	5
4.3. DHCP Address Sharing .....	5
4.4. RFC 1918 Address Space .....	5
5. IPv6 Address Guidelines.....	6
5.1. IPv6 Initial Allocations .....	6
5.2. Additional Customer IPv6 Allocations.....	6
5.3. IPv6 Reserve Pool.....	6

## **1. Introduction**

This policy governs the distribution of UEN managed IP address space. The goal of this document is to provide fair and equitable IPv4 and IPv6 allocations to all UEN customers and ensure adequate IP address space for all those requiring it in the future.

### **1.1. SURIN Role in IP Address Management**

SURIN's role is to set and modify IP address management policy that UEN is to follow concerning new and existing IP allocations.

### **1.2. UEN Role in IP Address Management**

UEN's role is to follow the policies set by SURIN included in this document. UEN will also perform daily management of IP addressing including allocating, routing, subnetting, and recording all IP address allocations.

### **1.3. UEN Managed IP Address Space**

UEN managed IP address space is defined as any IP block that lists UEN as the holder according to the public ARIN (American Registry for Internet Numbers) whois servers. UEN routes many IP blocks for both Higher Ed and Public Ed that are owned and managed by those entities according to the ARIN whois server. This policy manual only applies to IP address space managed by UEN.

### **1.4. UEN Obligations as an ARIN Member**

Under ARIN definitions UEN is an Internet Service Provider (ISP) for its customers. According to the ARIN Number Resource Policy Manual (ANRPM) as an ISP UEN is required to make its downstream customers adhere to ARIN policy (ANRPM 4.2.3.4). More specifically UEN is required to make its customers adhere to utilization requirements and other policies as pertaining to IP address management. As UEN is obligated to follow ARIN IP addressing guidelines the UEN IP Address Allocation Policy will be based upon the ARIN Number Resource Policy Manual and RFC 2050.

## **2. General Principles**

The following are the general principles that this policy is built around.

### **2.1. Conservation**

SURIN seeks the fair distribution of IP address space according to the operational needs of the end-users operating networks using this address space. SURIN also seeks the prevention of stockpiling addresses. Conservation is critical to maximize the lifetime of the available IPv4 Internet address space.

### **2.2. Validity**

IP address allocations are valid as long as the utilization and other relevant criteria continue to be met. Only IP addresses currently routed to the customer are considered as valid. All valid IP address allocations are listed in IP Control. IP

addresses not routed to the customer and/or listed in IP Control are part of the UEN free pool and may be assigned for use.

### **2.3. Invalidation**

SURIN may invalidate any IP allocation if it determines that the requirement for the IP address space no longer exists. UEN does not have the authority to invalidate any IP allocations.

### **2.4. Recall**

In the event of an IP address recall/invalidation, SURIN will provide a 45 day written notification to the customer informing them the IP addresses are being returned to the UEN free pool.

### **2.5. Determination of IP Address Allocation Size**

Determination of IP address allocation size is the responsibility of UEN. Customer allocation size will be based upon specific project needs or projected 3-month growth with CIDR bit boundaries taken into consideration.

### **2.6. CIDR Bit Boundaries**

In an effort to ensure that Classless Inter-Domain Routing (CIDR) is implemented and utilized as efficiently as possible, UEN will issue blocks of addresses on appropriate "CIDR-supported" bit boundaries.

### **2.7. IP Address Availability**

UEN is committed to always have IPv4 and IPv6 address space available for customers connecting to the UEN Network. For this reason customers do not need to hold more than three months of IP address allocations in reserve.

### **2.8. Routing UEN IP Address Blocks**

UEN IP address blocks are only available to be routed on the UEN AS210 network and are not available to be ported or routed from any other ISPs. This includes customers multi-homing to other ISPs or the sale/lease/transfer of UEN managed IP address space to another entity.

### **2.9. IP Allocation Audit**

UEN reserves the right to request written utilization information, network diagrams, and/or a network audit to determine current utilization percentage.

### **3. Allocation to Customers**

This section details how IP allocations are made to customers including requests, UEN response, and customer rights to appeal.

#### **3.1. Written Request for IP Space Allocation**

Customers will provide UEN with a written (e-mail or web) request for an allocation based on documented project needs or projected three-month growth. Customers should document in detail how and where this new allocation is to be used and are encouraged to include network diagrams. Customers are entitled to request allocations at any time and are not required to wait any time period before requesting new IP allocations.

#### **3.2. Efficient Utilization of Current Allocations**

Customers should be prepared to demonstrate efficient (approx. 80%) utilization of current IP address allocations at the time of request. This should include written documentation and network diagrams. UEN may request additional information including and up to a network audit to obtain accurate and up-to-date information.

#### **3.3. Renumber and Return**

Customers may request, from UEN, an IP allocation to renumber out of their previously allocated space for the purpose of route aggregation or another requirement. The new allocation size granted will be a CIDR block comparable in size to all their current allocations combined. If this request is approved the customer must renumber out of their previously assigned IP addresses for return to the UEN free pool within 90 days.

##### **3.3.1. UEN Requested Renumber and Return**

UEN may approach a customer to renumber and return either a portion or all of their IP addressing allocations for the purpose of route aggregation or another requirement. If there is an organization that represents SURIN members located within an area, UEN may direct this recommendation first to that organization. If no such organization exists, UEN may direct its recommendation to the group of all members located within a particular area, so that those members may collectively take action to aggregate these unused blocks. If a return and renumbering is requested UEN will provide the customer with a CIDR allocation, which will meet the customer requirements for renumbering their network. Any return and renumbering must seek to minimize any change in routed addressing at a SURIN member organization as its highest priority. The timelines will be worked out between the customer and UEN, but the customer or group of customers may request up to six months to renumber and return IP addresses. The customer has the right to refuse UENs request. In the event the customer refuses this request UEN has the right to bring this request to the SURIN board for further action.

### **3.4. UEN Response Time**

Once all necessary documentation is received, UEN will respond to the requestor within five (5) business days with a decision. If an allocation is granted it will be routed to the customer within this timeframe.

### **3.5. Right to Appeal**

Customers may appeal any UEN IP allocation decision for any reason. A three step appeals process should proceed in the following order until resolved: 1) UEN Network Engineering and Operations Managers 2) UEN Technical Services Director 3) SURIN Board. No action can be taken while the appeal is in process.

## **4. IPv4 Address Conservation**

UEN recommends customers investigate the following methods/technologies which will allow them to better utilize current IPv4 allocations for the benefit of the Internet community. UEN Recognizes these methods may not work for everyone but encourages customers to use them where appropriate.

### **4.1. Classless Inter-Domain Routing (CIDR)**

CIDR allows for a more efficient utilization of IP addresses on both network gear and LANs. Customer should verify networks use a network subnet (/27, /28, etc.) that matches the requirements for the LAN. Example, a LAN with 25 host computers should use a subnet size /27 instead of a /24 (a savings of 87%).

### **4.2. Network Address Translation (NAT)**

Where appropriate customers may benefit from placing LANs behind a NAT appliance or device. NAT allows an entire LAN to use only one (1) valid IP address through address translation. The majority of network devices support NAT, which will result in significant address savings. UEN recognizes that NAT will not work for certain requirements such as Video, VOIP, Servers, etc.

### **4.3. DHCP Address Sharing**

DHCP address sharing utilizes shorter leases to time out DHCP assigned addresses to hosts. This can be used in environments such as labs and wireless LANs where many computers come and go but still retain IP addresses. Shortening the lease times will allow the addresses to be used over and over again instead of being held by computers not in use.

### **4.4. RFC 1918 Address Space**

RFC 1918 specifies private IP address space that can be used for network devices that do not require communication with the Internet. Customers with network nodes that only need to communicate within a district or campus environment can assign private IP address space instead of globally routed IP addresses.

## **5. IPv6 Address Guidelines**

This section outlines how UEN's IPv6 allocation is to be managed.

### **5.1. IPv6 Initial Allocations**

The initial UEN customer IPv6 allocations are detailed in the *UEN IPv6 Address Allocation Plan* document. This document specifies how the first two /36 address blocks from an initial /32 address allocation are to be managed. This document assigns IPv6 address space to the majority of UEN customers while leaving a substantial amount of address space available for additional customer allocations and network growth.

### **5.2. Additional Customer IPv6 Allocations**

Customer requests for additional IPv6 allocations, beyond the initial, should follow the process outlined in section three of this document.

### **5.3. IPv6 Reserve Pool**

The majority (87.5% or 14 - /36) of the IPv6 address block UEN has received from ARIN will be held in a reserve pool. This reserve pool should be held for future growth only after the initial 2 - /36 allocations have been substantially used. Additional /36 address blocks should be opened for customer allocations only under authorization from SURIN. Once UEN has received approval from SURIN the new /36's will be used for customer allocation following the process in section three of this document.