Developing an Address Plan

(or IPv6 Subnetting in the Real World)

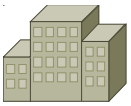
There is no one right way for developing an IPv6 addressing plan, but the recommended general guidelines include the following:

Step 1: Decide how you are going to divide your network:

a. by location
b. by user groups

Administration
Users Include:
Administration
Staff

Academic
Users Include:
Staff
Students



Dormitory
Users Include:
Staff
Students

Subnetting by Location:
To divide by location you would need four subnets. One for each building and one for the overall network infrastructure needs. You also need to hold several extra subnets in reserve for later growth.

Advantages:
This allows you to optimize your routing tables. All the networks within each location will aggregate to a single route.

Subnetting by User Groups:
To subnet the network by user groups you would need four subnets. One for Administration, Staff, and Students, plus one for overall network infrastructure needs. You also need to hold several extra subnets in reserve for later growth.

Advantages:
Subnetting by user groups makes it much easier to implement a security policy. Grouping by usage also helps track addresses for allocation and management.

Best Practice:
Subnetting by either location or user is acceptable. However, with the emphasis on network security, most networks are better served by subnetting user groups. It makes it much easier to maintain a higher level of security.

Step 2: Determine how many primary and secondary subnets your Site will need.

a. Create the primary subnets first.
b. Then create secondary subnets.

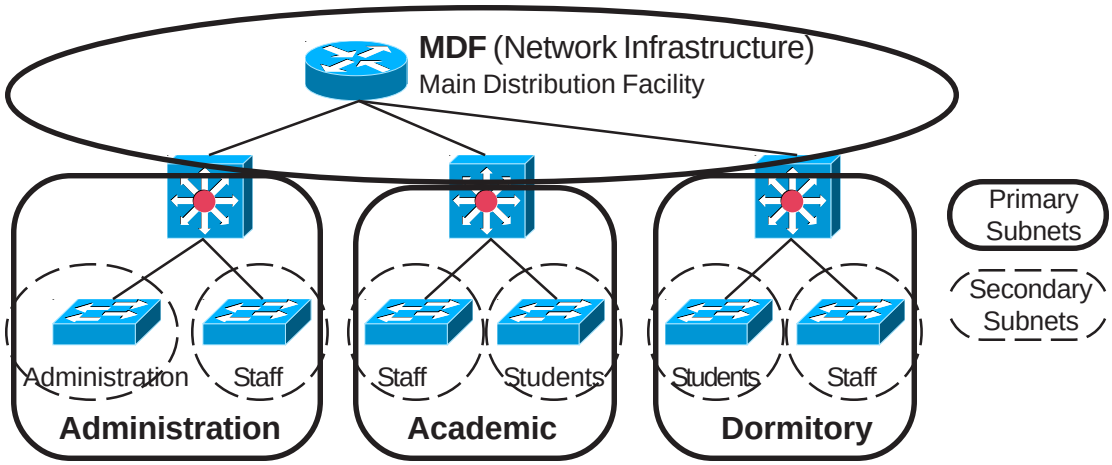
Subnetting by Location:

Primary Subnets: Quantity 4

With three buildings you will need four primary subnets. One for each building and one for the overall infrastructure needs.

Secondary Subnets: Quantity 6

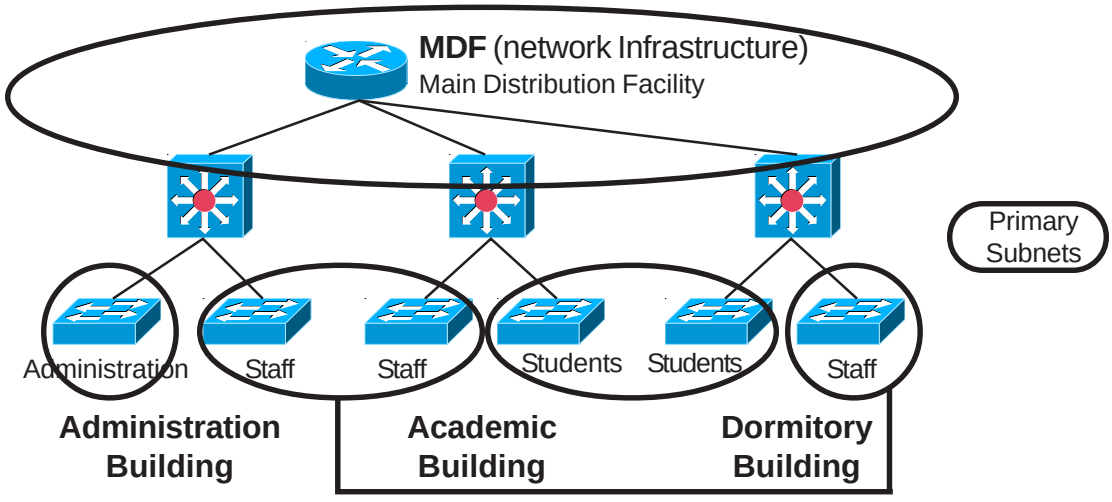
Administration will need two secondary subnets: Administration and Staff.
Academic will need two secondary subnets: Staff and Students.
Dormitory will need two secondary subnets: Staff and Students.



Subnetting by User Groups:

Primary Subnets: Quantity 4

With three user groups you will need four subnets. One for each group and one for the overall infrastructure needs.



Step 3: Based on the number of primary and secondary subnets needed assign the address ranges. The ISP has assigned you 2001:ACAD:1234::/48.

Subnetting Options:

/48 No Nibbles	/52 1 Nibble	/56 2 Nibbles	/60 3 Nibbles	/64 4 Nibbles
/48 - 1 Subnet				
/52 - 16 Subnets	/52 - 1 Subnet			
/56 - 256 Subnets	/56 - 16 Subnets	/56 - 1 Subnets		
/60 - 4096 Subnets	/60 - 256 Subnets	/60 - 16 Subnets	/60 - 1 Subnets	
/64 - 65,536 Subnets	/64 - 4096 Subnets	/64 - 256 Subnets	/64 - 16 Subnets	/64 - 1 Subnet

Subnetting by Location:

Primary Subnets: Quantity 4

With three buildings you will need four primary subnets. One for each building and one for the overall infrastructure needs.

Secondary Subnets: Quantity 6

Administration will need two secondary subnets: Administration and Staff.
Academic will need two secondary subnets: Staff and Students.
Dormitory will need two secondary subnets: Staff and Students.

Take the addresses assigned to you by the ISP use one nibble and subnet it into 16 subnets using a /52 Subnet Prefix. This will give you the 4 primary subnets required with several to spare for future growth.

2001:ACAD:1234::/48 becomes:

- 2001:ACAD:1234::/52 Site ID for over all infrastructure needs.
- 2001:ACAD:1234:**1**000::/52 Site ID for the Administration Building.
- 2001:ACAD:1234:**2**000::/52 Site ID for the Academic Building.
- 2001:ACAD:1234:**3**000::/52 Site ID for the Dormitory.
- 2001:ACAD:1234:**4**000::/52
  (Subnets omitted for space.)
- 2001:ACAD:1234:**F**000::/52

Site IDs and Sub-Site IDs will be the addresses found in the routing tables.

Take the second, third, and forth ranges and subnet them again by using the next Nibble with a /56 Subnet Prefix. This will create 16 subnets for each location.

Administration Building Site ID 2001:ACAD:1234:**1**000::/52 becomes:

- 2001:ACAD:1234:**1**000::/52 Administration Building Site ID
  - 2001:ACAD:1234:**10**00::/56 Sub-Site ID for infrastructure needs.
  - 2001:ACAD:1234:**11**00::/56 Sub-Site ID for Administration
  - 2001:ACAD:1234:**12**00::/56 Sub-Site ID for Staff

Academic Building Site ID 2001:ACAD:1234:**2**000::/52 becomes:

- 2001:ACAD:1234:**2**000::/52 Academic Building Site ID
  - 2001:ACAD:1234:**20**00::/56 Sub-Site ID for infrastructure needs.
  - 2001:ACAD:1234:**21**00::/56 Sub-Site ID for Students
  - 2001:ACAD:1234:**22**00::/56 Sub-Site ID for Staff

Dormitory Building Site ID 2001:ACAD:1234:**3**000::/52 becomes:

- 2001:ACAD:1234:**3**000::/52 Dormitory Building Site ID
  - 2001:ACAD:1234:**30**00::/56 Sub-Site ID for infrastructure needs.
  - 2001:ACAD:1234:**31**00::/56 Sub-Site ID for Students
  - 2001:ACAD:1234:**32**00::/56 Sub-Site ID for Staff

Subnetting by User Group:

Primary Subnets: Quantity 4

With three user groups you will need four primary subnets. One for each group and one for the overall infrastructure needs. In this example no secondary subnets are required.

Take the address assigned to you by the ISP use one nibble and subnet it into 16 subnets using a /52 Subnet Prefix. This will give you the 4 primary subnets required with several to spare for future growth.

2001:ACAD:1234::/48 becomes:

- 2001:ACAD:1234::/52 Site ID for over all infrastructure needs.
- 2001:ACAD:1234:**1**000::/52 Site ID for the Administration employees.
- 2001:ACAD:1234:**2**000::/52 Site ID for the Staff.
- 2001:ACAD:1234:**3**000::/52 Site ID for the Students.
- 2001:ACAD:1234:**4**000::/52

(Subnets omitted for space.)

- 2001:ACAD:1234:**F**000::/52