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UW-Madison IPv6 Allocation Guidelines

Explanation of IPv6 address space allocation guidelines for the UW-Madison campus network.

The UW-Madison campus has been allocated the IPv6 range 2607:f388::/32. The IPv6 addressing format gives the ability to allocate each campus network entity their own appropriately sized range of IPv6 addresses.

The goals of the allocation plan include:

- Using the campus /32 range efficiently, yet generously.
- Allowing each network administrator the ability to manage their own allocation plan.
- Network size planning with at least a 20 year service life goal.
- A single allocation made once, without needing to request more anytime soon.
- The ability to express a network entity as one aggregated range.
- Reserving room for future growth and unknowns.

Central Allocation size guidelines

Allocation size	Reservation Size	Number of Subnets	Allocation Guidelines	Example
/44	/40	1,048,576	College, School, or Large campus entity	Med School
/48	/47	65,536	Typical department/unit	Waisman Center
/52		4,096	*Not allocated centrally*	
/56		256	*Not allocated centrally*	
/60		16	*Not allocated centrally*	
/64		1	An individual end-user subnet.	

There may be special circumstances to use larger or smaller allocations, but these should be extremely rare. Network Engineering will work with each requester to make sure the appropriate size is determined.

Tips for Network Administrators

- Consider making sub-allocations based on security zones or other administrative boundaries to make managing firewall rules easier.
- Do not zealously over-aggregate. Keep the plan simple, high-level, and well documented.
- When possible, assign subnet numbering sequentially.
- Avoid bit-boundaries that are unfriendly to humans. (ex /53 - /55, /57 - /59, etc.)
- Leave room for growth in all planning, considering 20 or more years.
- Be wary of aggregation on geographical boundaries, as groups will move locations over time.
- Do not encode vlan numbers into IPv6 allocations. Vlan numbers may change over time.
- Do not encode IPv4 numbers into IPv6 allocations. The two protocols operate autonomously and this can lead to confusion if changes are made to IPv4 use on campus.

End-User Subnet size

As shown in the table above, all end-user subnets are to be of size /64. This is a recognized standard subnet size that allows for a nearly limitless number of hosts, optional host autoconfiguration, and maximum compatibility.

In special circumstances, it may be useful to use /112 for point-to-point links or for private, unique application uses such as cluster heart-beat links. The /112 size is not officially standardized, but is somewhat recognized to be used for these situations. You should check beforehand to make sure it will work for your specific application.

Reserve allocations

In the interest of sustaining long-term growth, as each allocation is made a corresponding allocation will be held in reserve. In the event that an existing allocation is too small, the reserve space may be used to accommodate growth.

- For /48 allocations, the adjacent /47 is held in reserve.
- For /44 allocations, the adjacent /40 is held in reserve.

Requesting an allocation

Contact the DoIT helpdesk to request an IPv6 allocation.

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