Hierarchical Subnet ID Autoconfiguration
<draft-ohira-multi6-multilink-auto-prefix-assign-00.txt>

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Motivation

- Many multi-address model multihoming solutions are proposed in this wg, but...
  - How to assign those addresses to a host?
  - How to interact an address assignment with the routing system in a site?

- We propose an address assignment protocol.
  - Features:
    - Hierarchical address block assignment
    - Recursive assignment

Concept

- For multi-link multi-exit-router sites, source address based routing is the most scalable

  – Draft-ohira-assign-select-e2e-multihome-02.txt

- This protocol gives specific rules of:

  – Hierarchical address assignment in a site

  – Distributing source address based routing information in a site
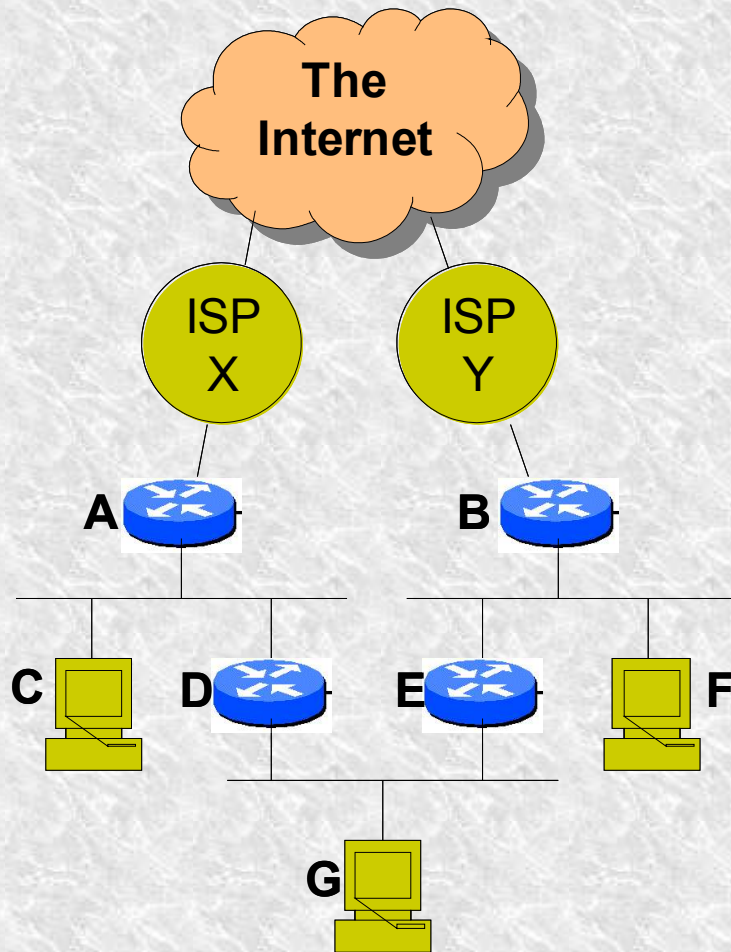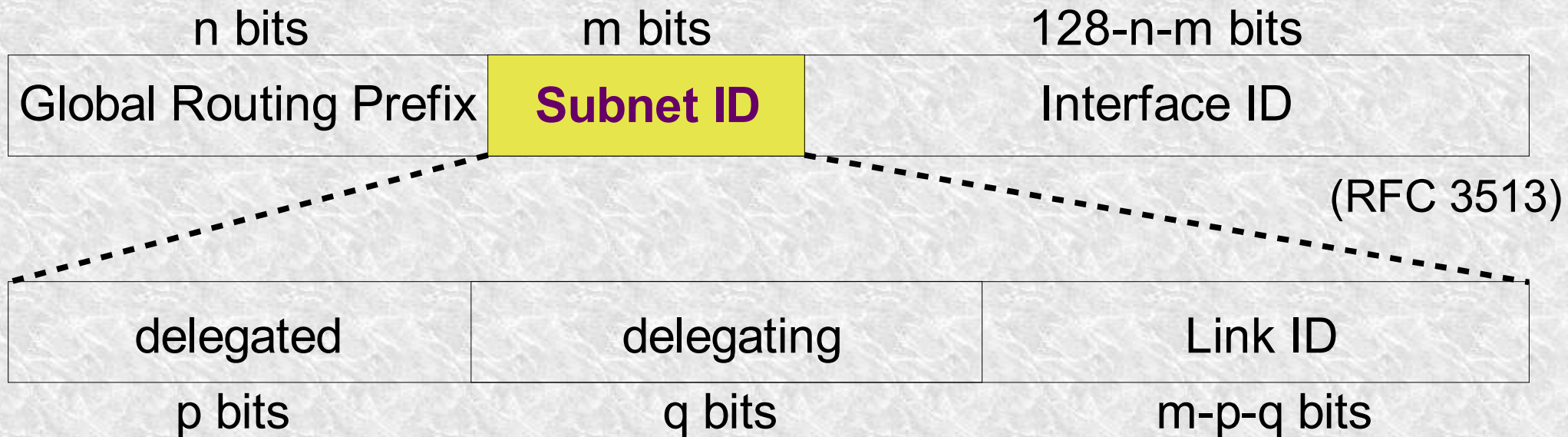
Scheme

- Role
  - Assign Subnet IDs to each link
  - Transport survivability is out of scope
    - Should be used with multiple addresses aware ULPs
- Implementation
  - DHCPv6 (RFC 3315)
    - Prefix Options (RFC 3633)

Usage of an IPv6 Address

n bits	m bits	128-n-m bits
Global Routing Prefix	**Subnet ID**	Interface ID

(RFC 3513)

delegated	delegating	Link ID
p bits	q bits	m-p-q bits

- Focused on the "Subnet ID" field

- Divide the "Subnet ID" field into 3 sub-fields

Hierarchical Address Assignment

ISP X delegates X::/48

ISP X

A

__X__:**0000**::**/48** (p=0)

__X__:**0000**::**/64**

C

D

__X__:**1000**::**/52** (p=4)

__X__:**1000**::**/64**

E

G

__X__:**1100**::**/56** (p=8)

__X__:**1100**::**/64**

B

F
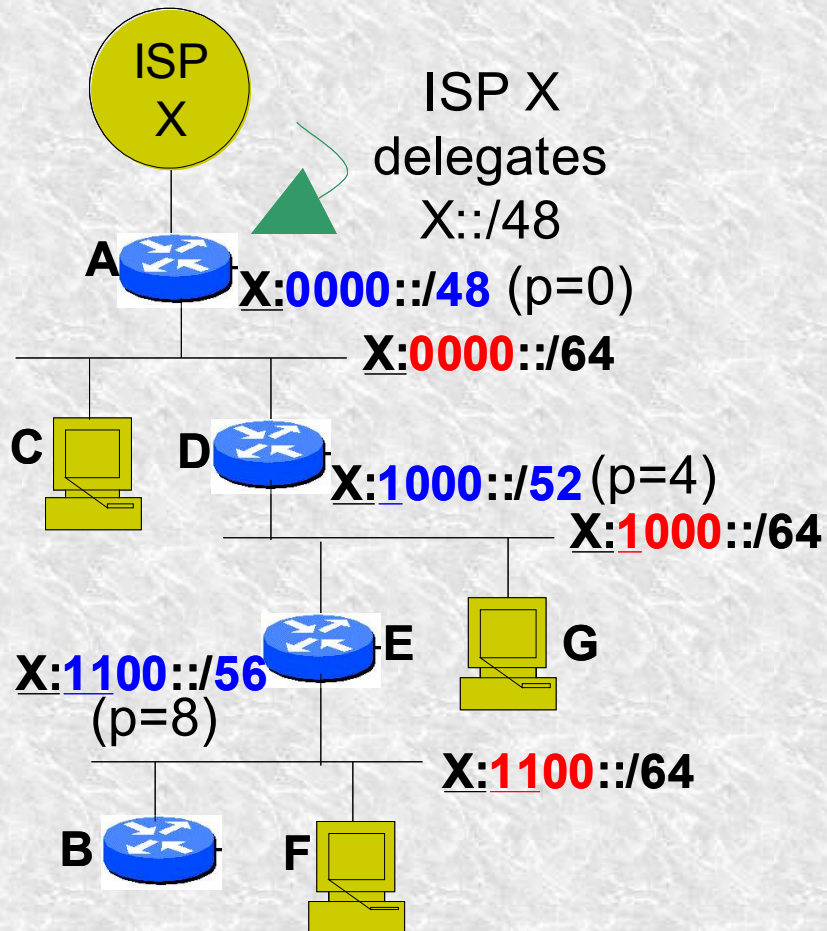
- An example of:
  - 48 bits Global Prefix (n=48)
  - 16 bits Subnet ID (m=16)
  - Each router delegates 1/16 of delegated address block (q=4)

- Delegation is start at each exit router

- Delegating router owes to avoid assignment loop

RFC 3582 Assessment

Redundancy	Depends on an ULP
Load sharing	Depends on an ULP
Performance	No problem
Policy	Seems difficult except packet filtering
Simplicity	Very easy
L4 survivability	Depends on an ULP
Impact on DNS	No impact
Packet filtering	No impact
Scalability	Very scalable
Impact on routers	SABR is recommended
Impact on hosts	SABR is recommended
Host & Routing Interaction	Needed but automatically done
Operation & management	No cooperation with upstream needed
Cooperation between ISPs	Not necessary
Multiple solutions	Co-exist with other layer solutions