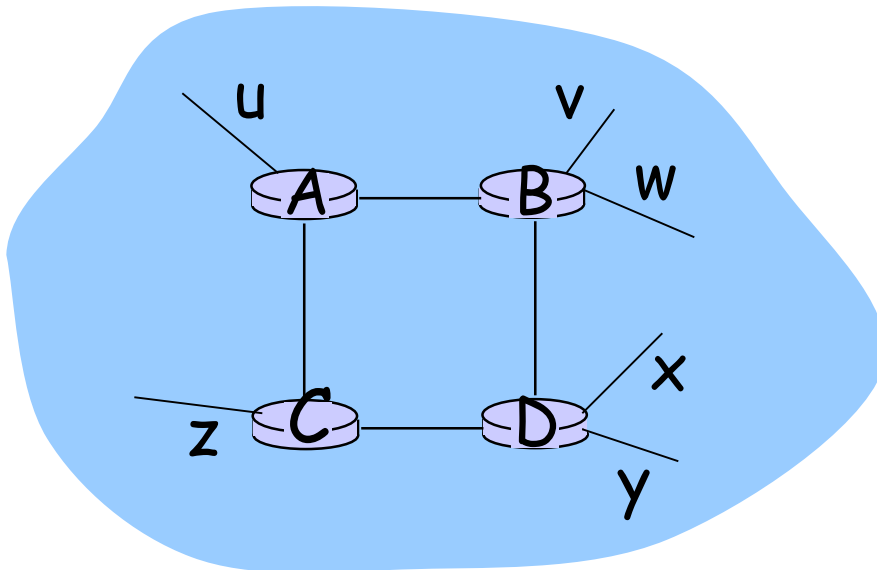


RIP (Routing Information Protocol)

RIP (Routing Information Protocol)

- ❑ Distance vector algorithm
- ❑ Included in BSD-UNIX Distribution in 1982
- ❑ Distance metric: # of hops (max = 15 hops)



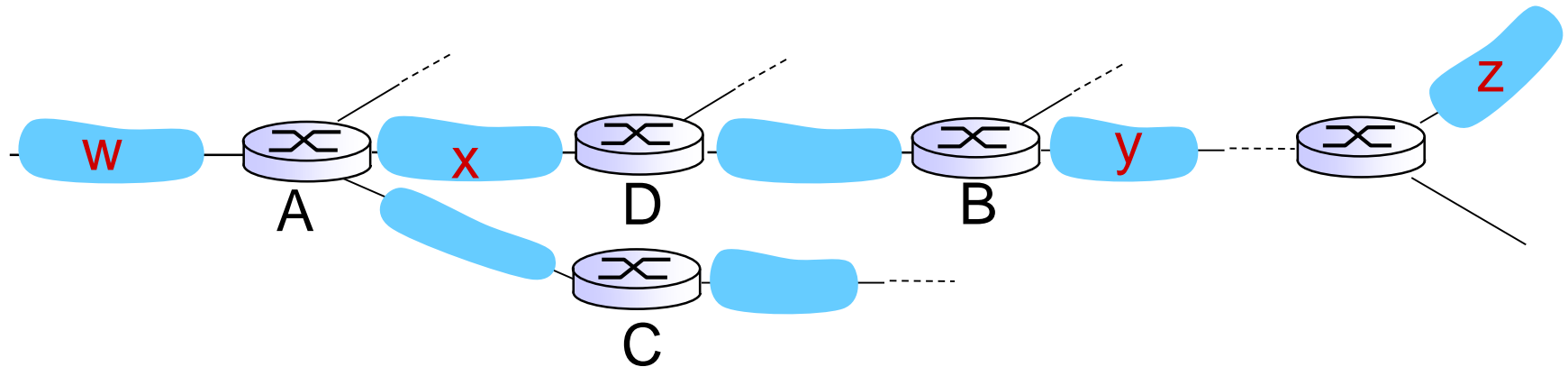
From router A to subsets:

<u>destination</u>	<u>hops</u>
u	1
v	2
w	2
x	3
y	3
z	2

RIP advertisements

- ❑ Distance vectors: exchanged among neighbors every 30 sec via Response Message (also called **advertisement**)
- ❑ Each advertisement: List of up to 25 destination nets within AS

RIP: example routing and forwarding table in node D



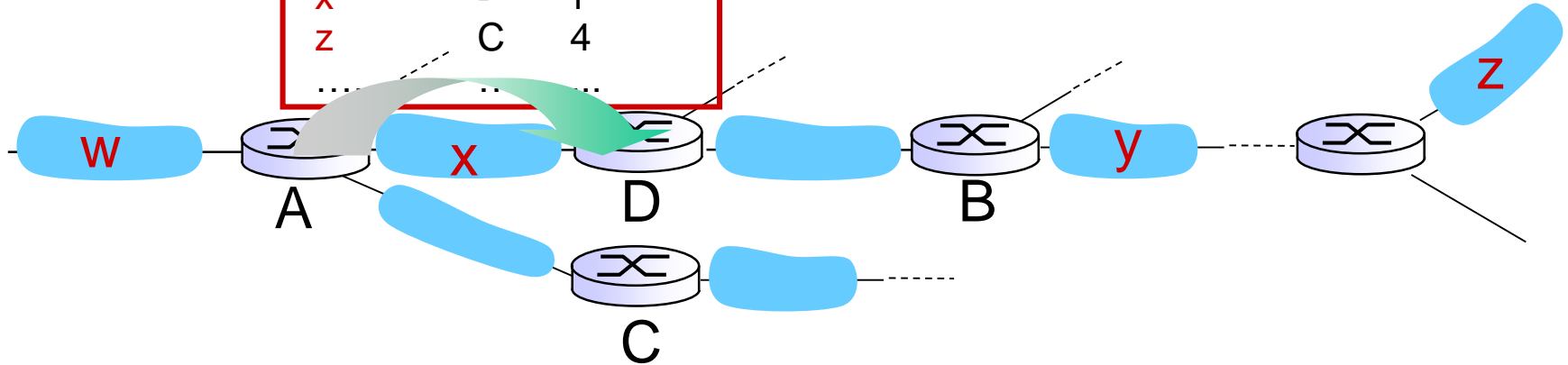
routing table in router D

destination subnet	next router	# hops to dest
W	A	2
y	B	2
Z	B	7
X	--	1
....

RIP: example

A-to-D advertisement

dest	next	hops
W	-	1
X	-	1
Z	C	4
.....



routing table in router D

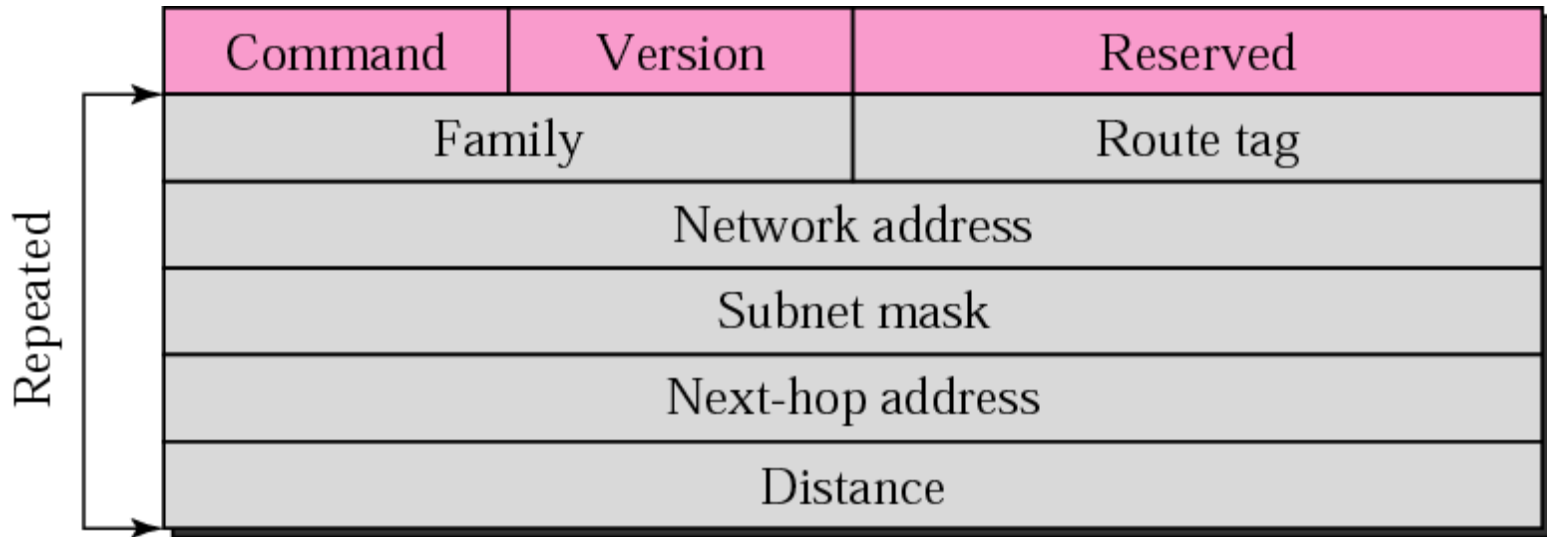
destination subnet	next	router	# hops to dest
W	A		2
y	B		2
Z	B → A		7 → 5
X	--		1
.....

RIP: Link failure and recovery

If no advertisement heard after 180 sec,
neighbor/link declared dead

- Routes via the neighbor are invalidated
- New advertisements sent to neighbors
- Neighbors in turn send out new advertisements (if their tables changed)
- Link failure info quickly propagates to entire net
- Poison reverse used to prevent ping-pong loops (infinite distance = 16 hops)
 - Advertise an infinite metric for a route on the interface over which it was received

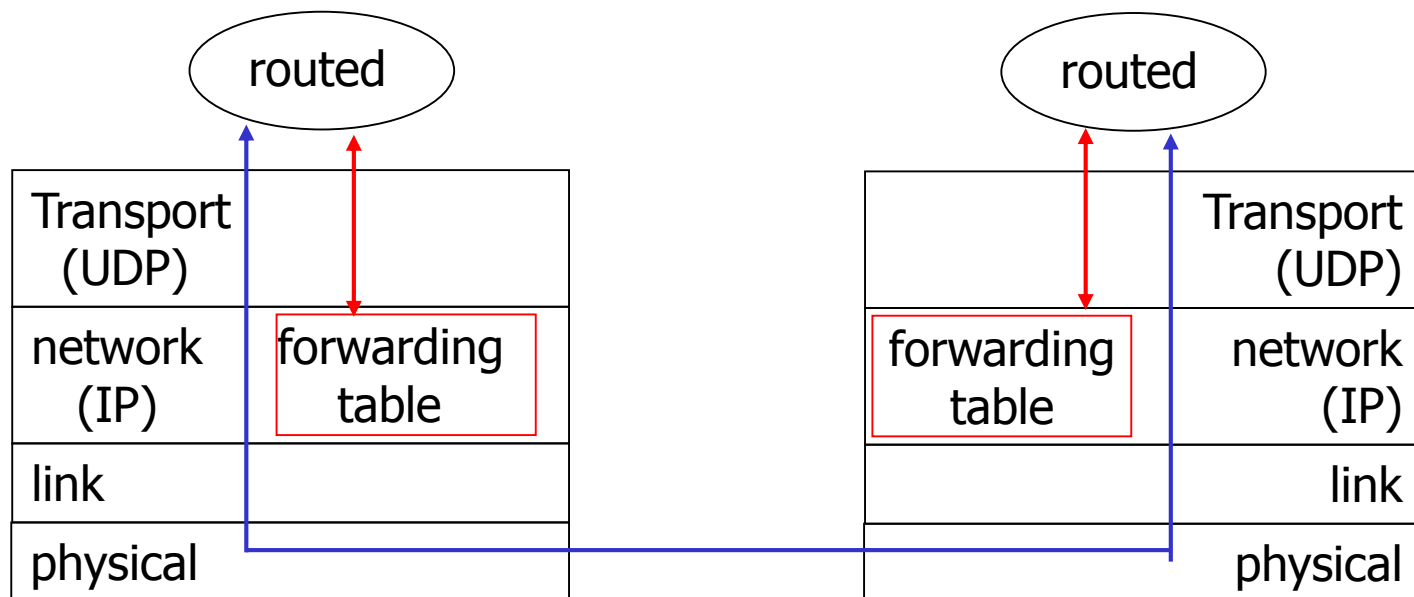
RIP-v2 Format



***RIP transported over UDP
on well-known port 520.***

RIP table processing

- ❑ RIP routing tables managed by an **application process** [Unix: route-d (daemon)]
- ❑ Advertisements encapsulated in UDP packets (no reliable delivery required)
- ❑ Advertisements are periodically repeated



RIP table example

Router: *giroflee.eurocom.fr*

Destination	Gateway	Flags	Ref	Use	Interface
127.0.0.1	127.0.0.1	UH	0	26492	lo0
192.168.2.	192.168.2.5	U	2	13	fa0
193.55.114.	193.55.114.6	U	3	58503	le0
192.168.3.	192.168.3.5	U	2	25	qaa0
224.0.0.0	193.55.114.6	U	3	0	le0
default	193.55.114.129	UG	0	143454	

- ❑ Three attached class C networks (LANs)
- ❑ Router only knows routes to attached LANs
- ❑ Default router used to “go up”
- ❑ Route multicast address: 224.0.0.0
- ❑ Loopback interface

How to avoid Count-to-Infinity

- ❑ Split Horizon
 - Don't advertise a route for an interface on which it was received
- ❑ Split Horizon with Poisoned Reverse
 - Put an infinite metric on routes out the interface on which is was received
- ❑ Triggered Updates
 - After metric change: Send update immediately
- ❑ Holddown Timer (Cisco)
 - After invalidation of route:
For some seconds ignore all updates for route

Summary: Routing tasks for RIP

- ❑ Neighbor?
 - Discovery
 - Maintenance
- ❑ Database?
 - Granularity
 - Maintenance – updates
 - Synchronization
- ❑ Routing table?
 - Metric
 - Calculation
 - Update