Passing The Message Experiment

Graphical Representation

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Content

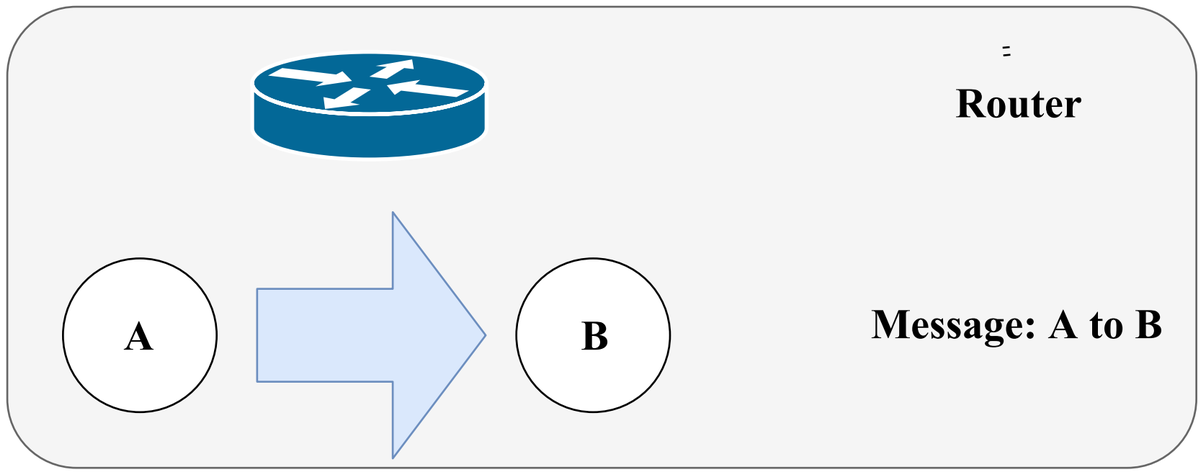
Apologies:

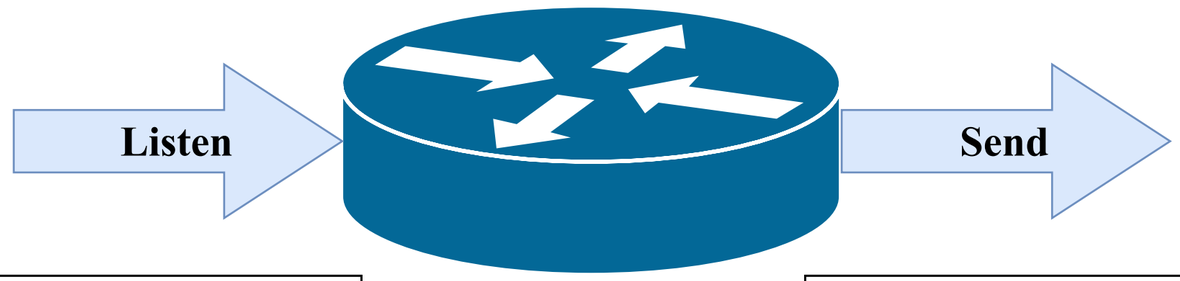
I'm using the Windows OS and struggling to import the SVG Images into my Word Office. Instead, I use the PDF format directly which is also the Vector Image, but I couldn't maintain a Content Index and a universal size for every image.

Router Entity

Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 3	10	False
Router 1	Router 2	5	False
...	...	...	...
Router x	Router y	Infinite	True



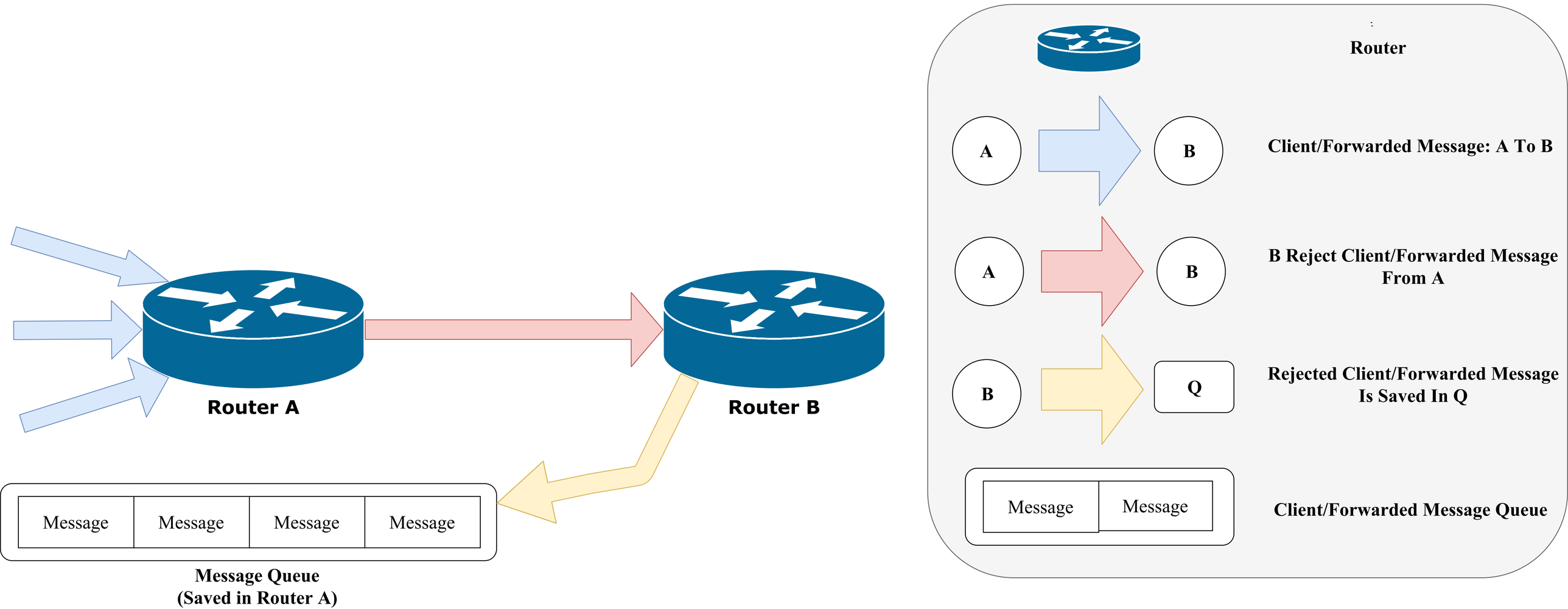


Listen List
Configuration
Client Messages
Shut Down Requirement

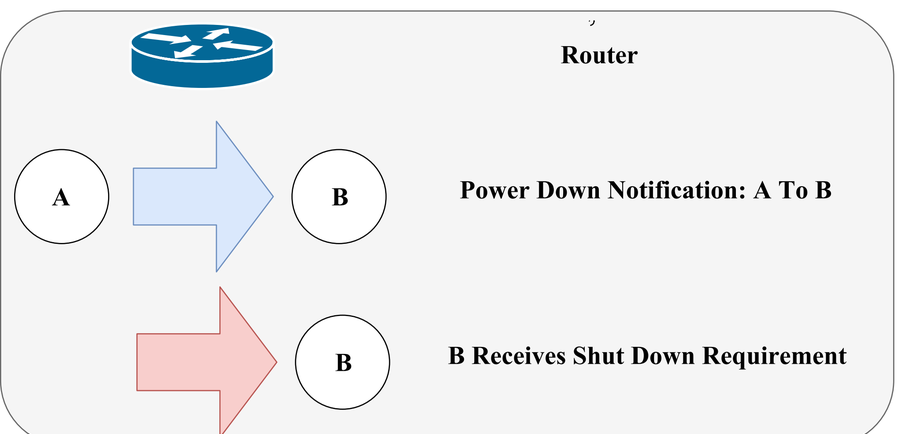
Distance Vector Messages
Power Down Notifications
Forwarded Messages

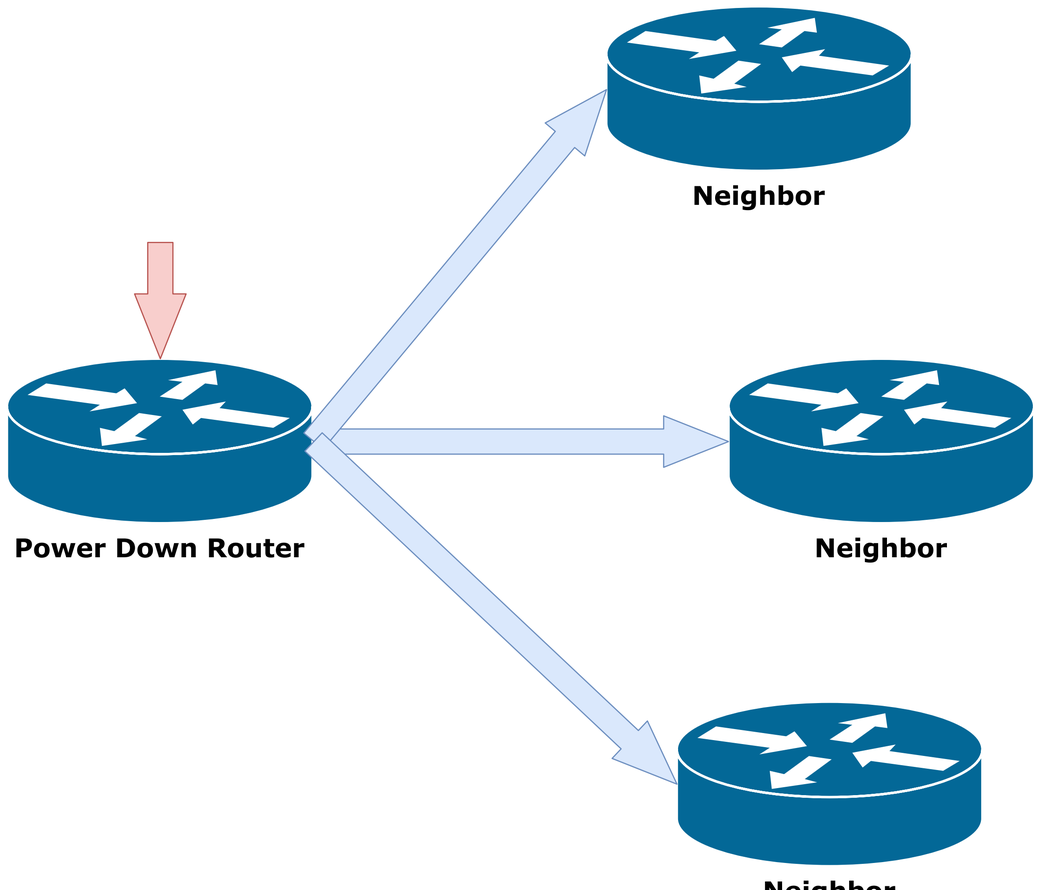
Send List
Forwarded Messages
Distance Vector Messages
Power Down Notifications
Forwarded Messages

Message Queue For Client_Forwarded Message



Power Down Notification





Neighbor Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 3	10	False
Router 1	Router 7	5	False
...	...	...	...
Power Down Router	Infinite	Infinite	True

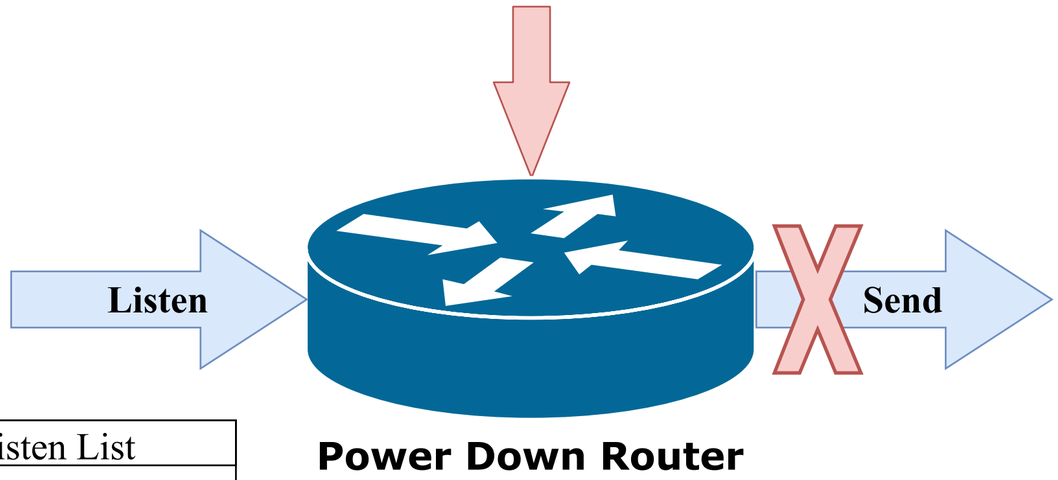
Neighbor Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 10	11	False
Router 1	Router 3	3	False
...	...	...	...
Power Down Router	Infinite	Infinite	True

Neighbor Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 10	10	False
Router 1	Router 6	20	False
...	...	...	...
Power Down Router	Infinite	Infinite	True

Graceful Degradation



Listen List
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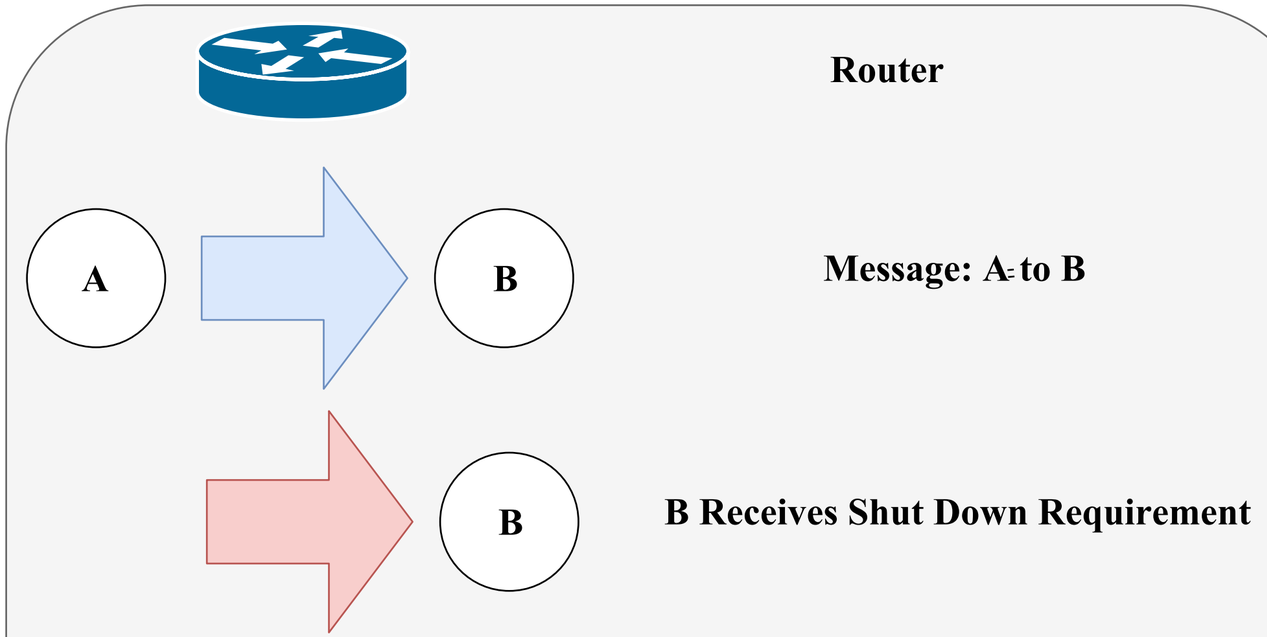
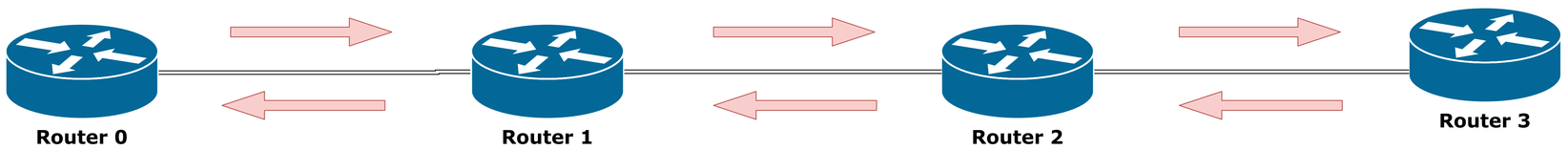
Distance Vector Messages
Power Down Notifications
Forwarded Messages



Graceful Degradation:

After receives the Shutdown Call, the router will keep listening until there isn't any potential call in the network but keep silence. That's to simulate the real world router, which already doesn't exist.

Distance Vector Algorithm(Global)



Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 0	0	False
Router 1	Router 1	1	False

Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 0	1	False
Router 1	Router 1	0	False
Router 2	Router 2	1	False

Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 1	Router 1	1	False
Router 2	Router 2	0	False
Router 3	Router 3	1	

Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 2	Router 2	1	False
Router 3	Router 3	0	False

Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 0	0	False
Router 1	Router 1	1	False
Router 2	Router 1	2	False

Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 0	0	False
Router 1	Router 1	1	False
Router 2	Router 2	1	False
Router 3	Router 2	2	False

Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 1	2	False
Router 1	Router 1	1	False
Router 2	Router 2	0	False
Router 3	Router 3	1	False

Routing Table

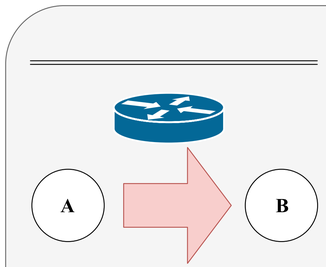
Destination	Next Hop	Distance	Power Down Check
Router 1	Router 2	2	False
Router 2	Router 2	1	False
Router 3	Router 3	0	False

Routing Table

Destination	Next Hop	Distance	Power Down Check
Router 0	Router 1	3	False
Router 1	Router 1	1	False
Router 2	Router 1	2	False
Router 3	Router 1	3	False

Routing Table

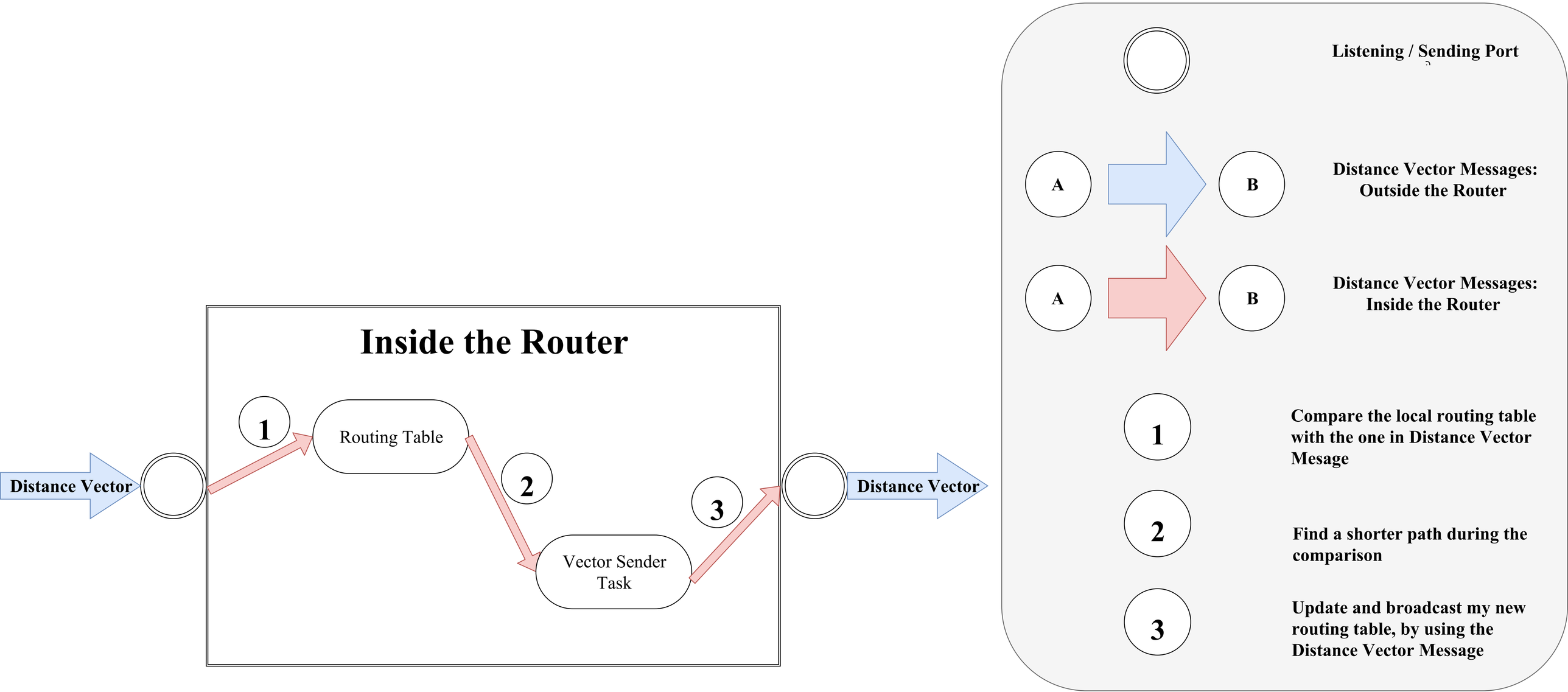
Destination	Next Hop	Distance	Power Down Check
Router 0	Router 0	3	False
Router 1	Router 1	2	False
Router 2	Router 2	1	False
Router 3	Router 3	0	False



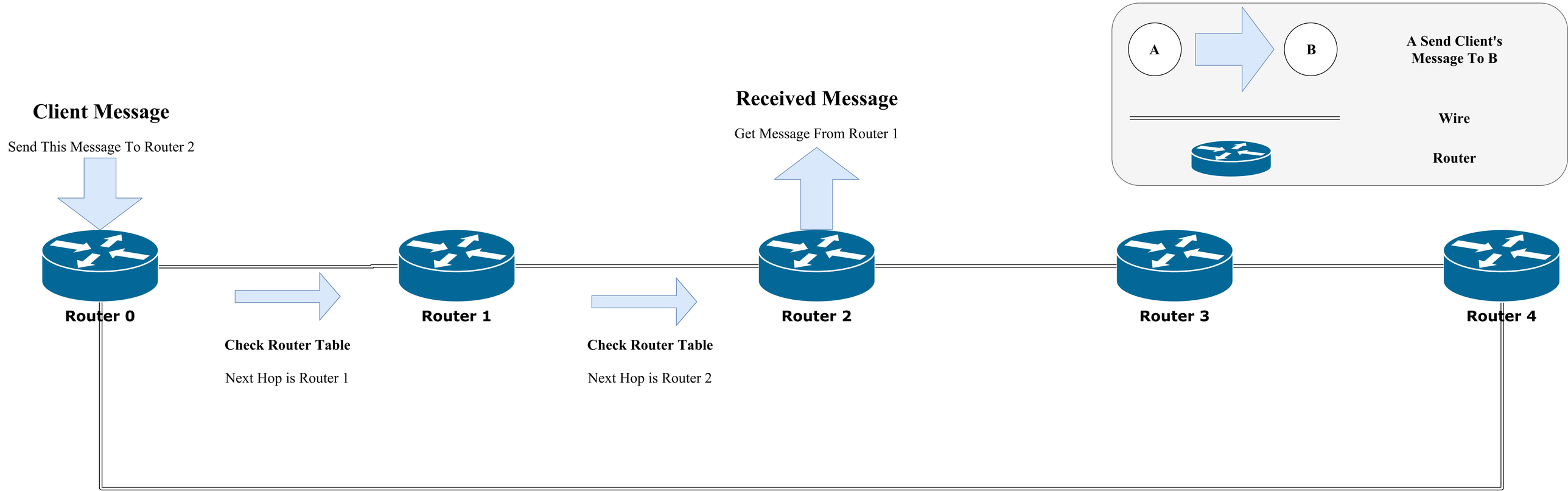
Distance Vector Algorithm:

Every time a router finds a shorter path, it will update its Routing Table and notify its neighbors.

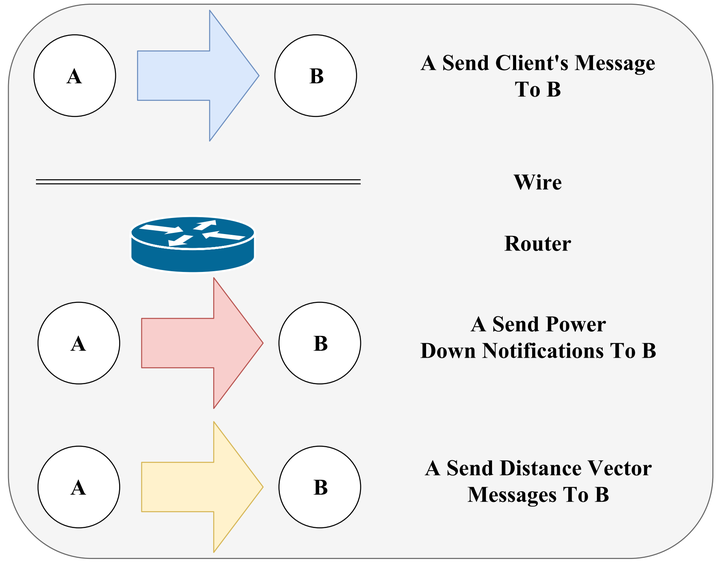
Distance Vector Algorithm(Individual)



Ideal Network Condition



With Routers Dropping Out



Client Message

Send This Message To Router 2

Received Message

Get Message From Router 1

R4: I Cannot Reach Router 2 As Well

R3: Don't Worry. I Have Another Path

Router 0

Router 1

Router 2

Router 3

Router 4

R4: Don't Worry. I Found Another Path Just Now

R1: I Cannot Reach Router 2 Anymore

Control Flow Graph