



POLITECNICO
MILANO 1863

Peer to peer Exercises

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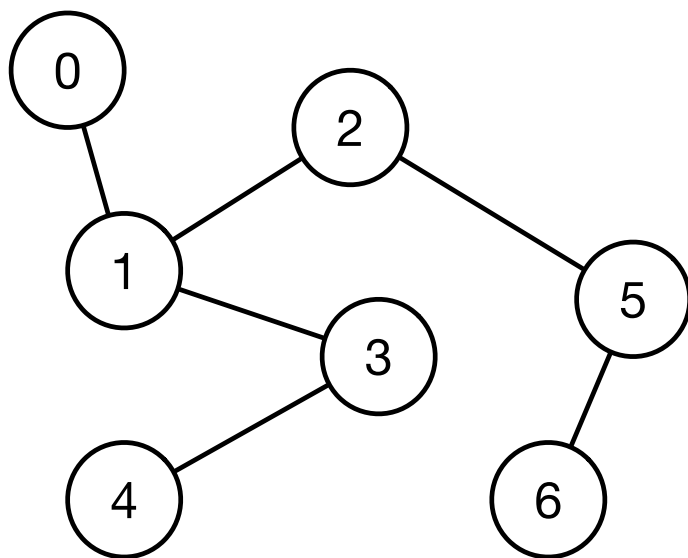
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Exercise 1

- Consider the P2P overlay network in the figure below. Node 3 searches for item A, which is stored both at Node 0 and at Node 6.
- Describe the exchange of messages between peers, assuming they use the query flooding search mechanism (as in Gnutella) and that the field “hops to live” in search messages is 3.

Exercise 1

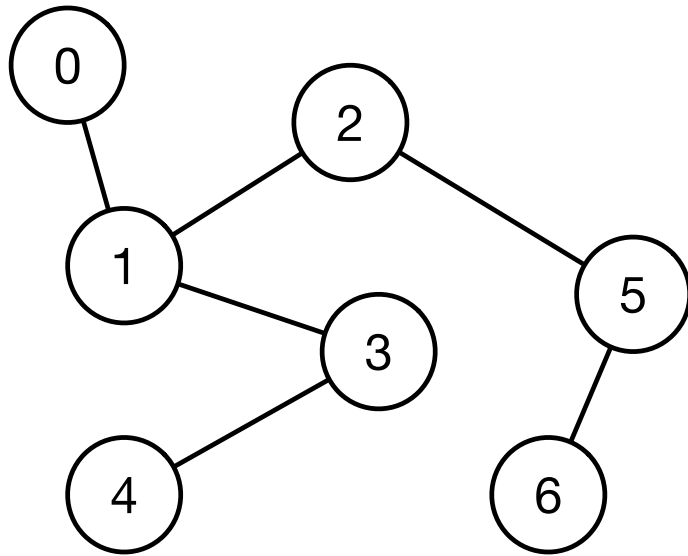


Node 3 searches for A

Node 0 and 6 have A

Hops to live = 3

Exercise 1



Node 3 searches for A
Node 0 and 6 have A
Hops to live = 3

Search messages:

- 3 → 4
- 3 → 1
- 1 → 0
- 1 → 2
- 2 → 5

Reply messages:

- 0 → 1
- 1 → 3

Exercise 2

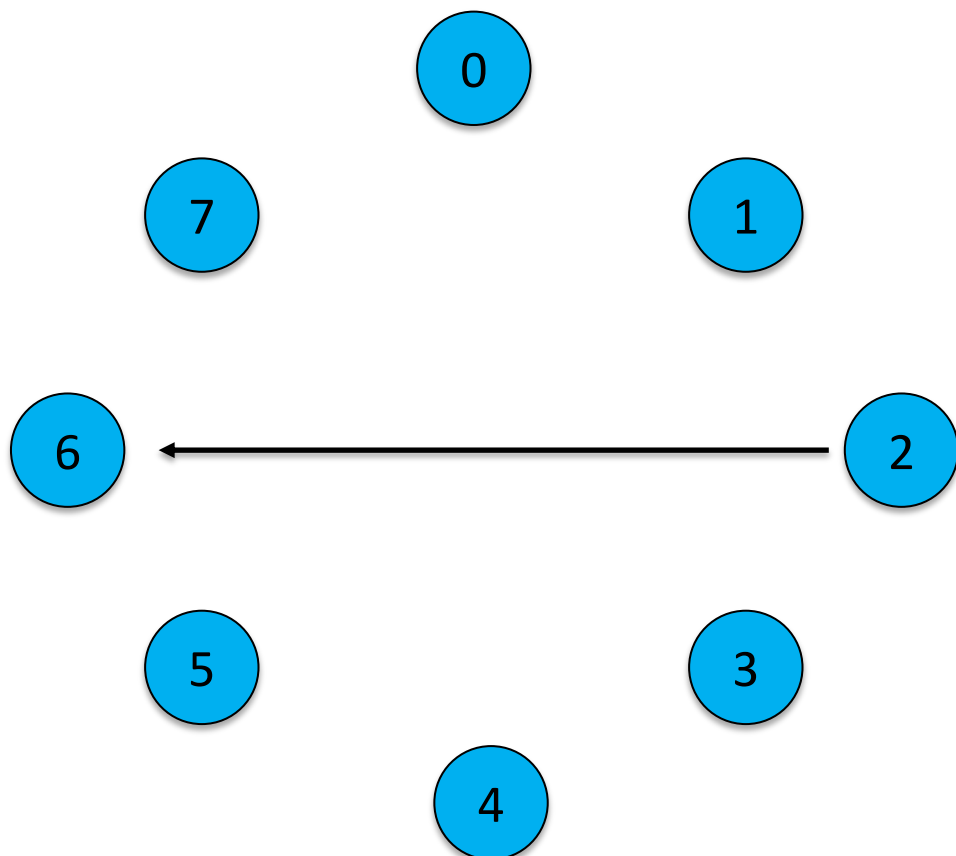
Eight peers ($ID = 0, \dots, 7$) participate in a circular DHT with finger tables.

Assume that the DHT uses 3-bits to represent the node IDs and the Keys.

Peer 2 wants to retrieve the Value of an object having Key 1.

Show the exchange of messages required to perform the searching and retrieve the desired value.

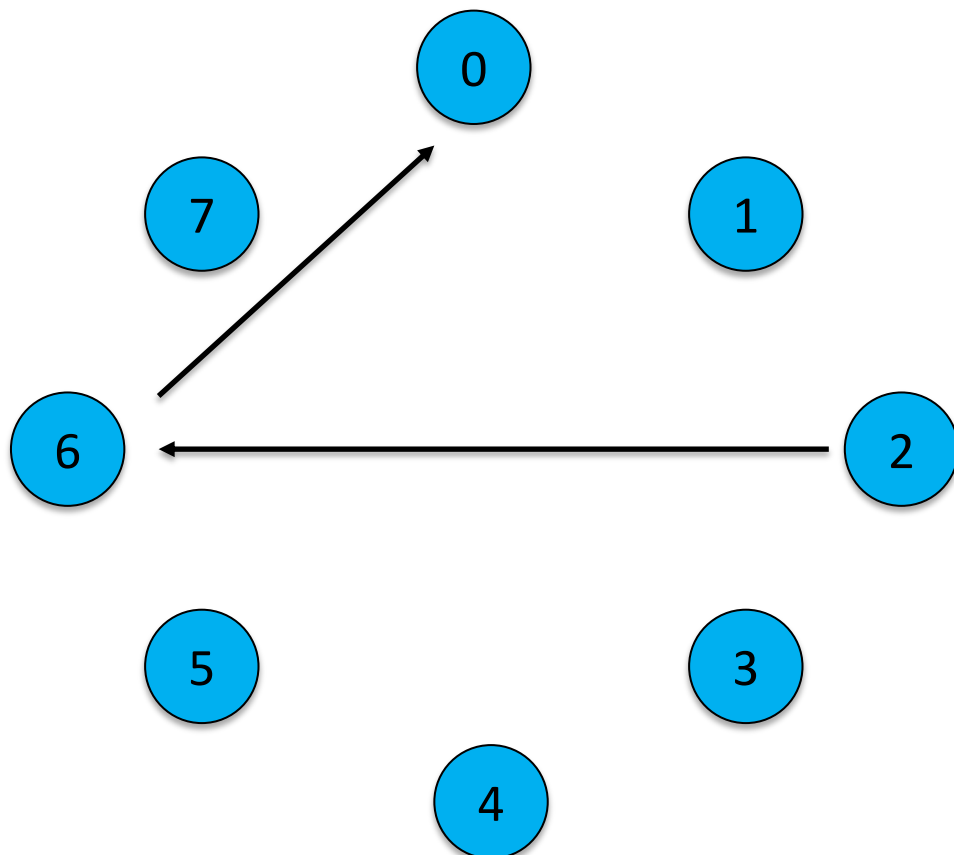
Exercise 2



Node 2

i	2^i	$Id + 2^i$	succ
0	1	3	3
1	2	4	4
2	4	6	6

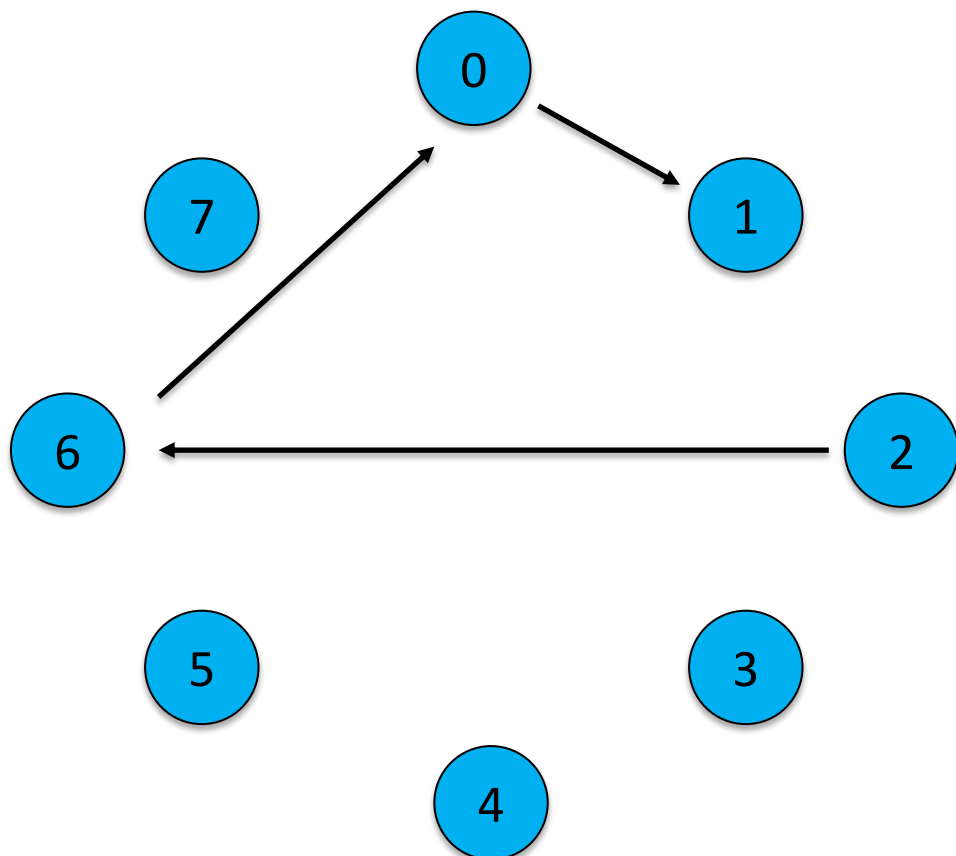
Exercise 2



Node 6

i	2^i	$\text{Id} + 2^i$	succ
0	1	7	7
1	2	0	0
2	4	2	2

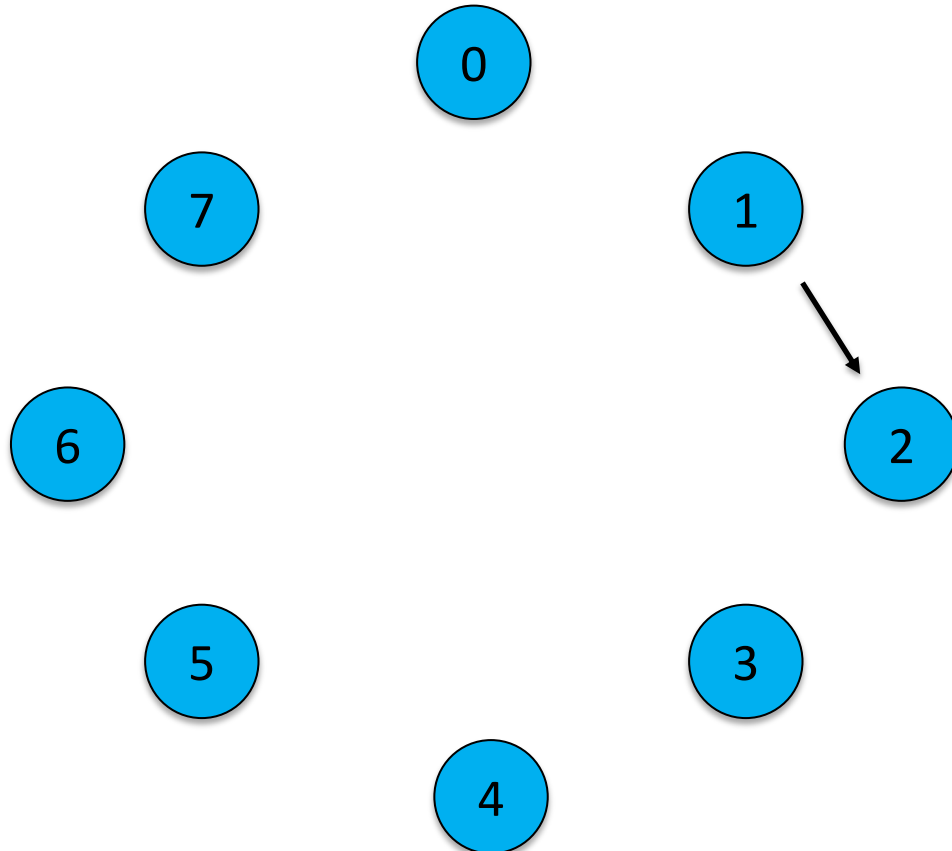
Exercise 2



Node 0

i	2^i	$\text{Id} + 2^i$	succ
0	1	1	1
1	2	2	2
2	4	4	4

Exercise 2



Exercise 3

Three peers ($ID = 0, 1, 4$) participate in a circular DHT with finger tables.

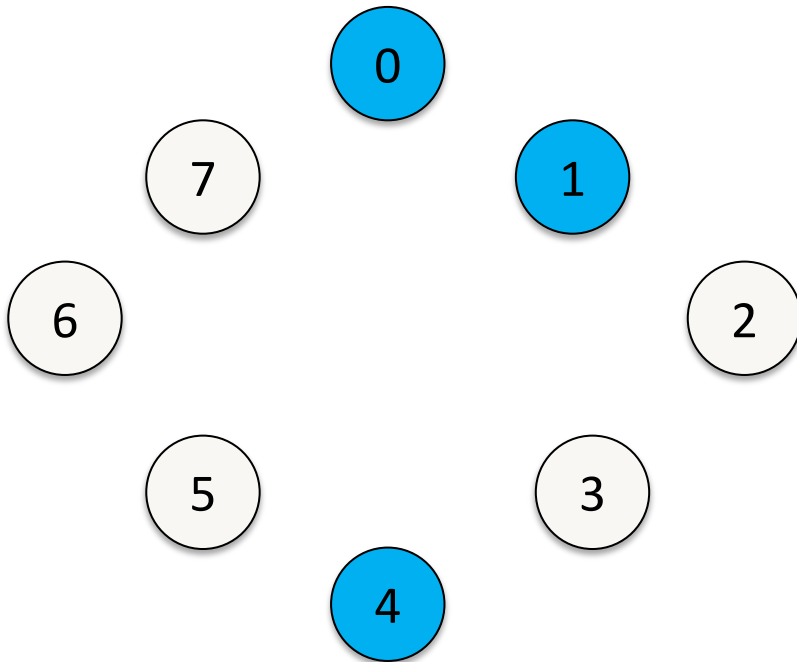
Assume that the DHT uses 3-bits to represent the node IDs and the Keys.

Show the routing tables of the three peers

Peer 4 wants to retrieve the value of an object having key 1.

Show the exchange of messages required to search the desired value.

Exercise 3a



Node 0

i	2^i	$Id + 2^i$	succ
0	1	1	1
1	2	2	4
2	4	4	4

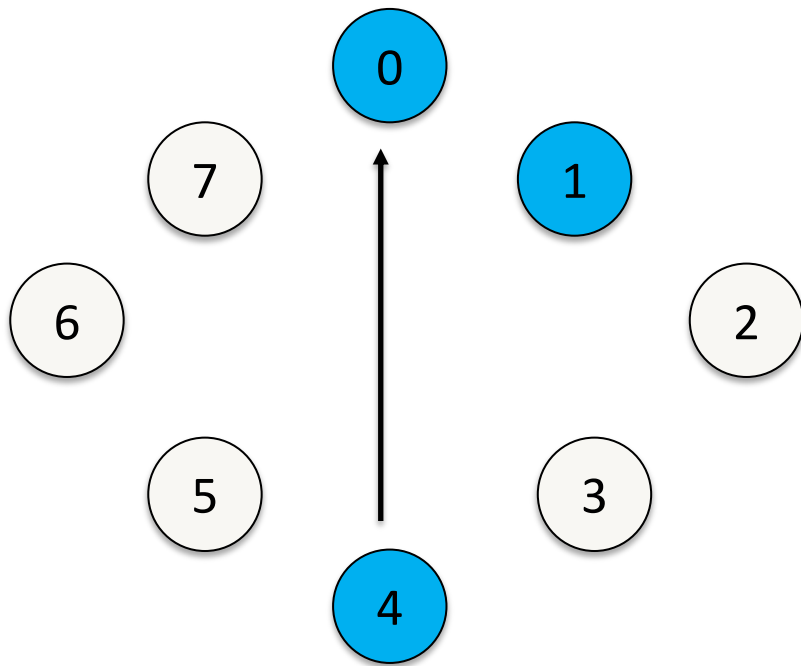
Node 1

i	2^i	$Id + 2^i$	succ
0	1	2	4
1	2	3	4
2	4	5	0

Node 4

i	2^i	$Id + 2^i$	succ
0	1	5	0
1	2	6	0
2	4	0	0

Exercise 3b



Node 0

i	2^i	$Id + 2^i$	succ
0	1	1	1
1	2	2	4
2	4	4	4

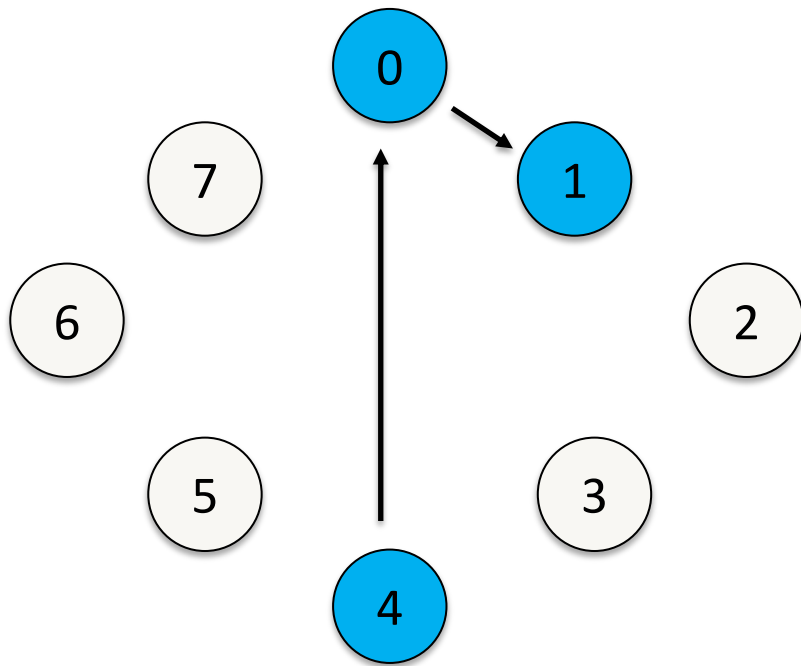
Node 1

i	2^i	$Id + 2^i$	succ
0	1	2	4
1	2	3	4
2	4	5	0

Node 4

i	2^i	$Id + 2^i$	succ
0	1	5	0
1	2	6	0
2	4	0	0

Exercise 3b



Node 0

i	2^i	$Id + 2^i$	succ
0	1	1	1
1	2	2	4
2	4	4	4

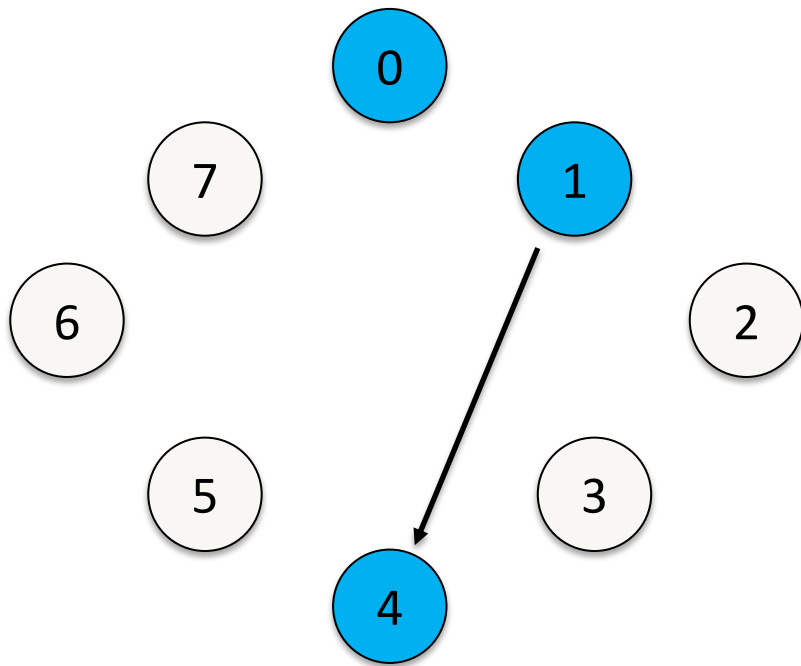
Node 1

i	2^i	$Id + 2^i$	succ
0	1	2	4
1	2	3	4
2	4	5	0

Node 4

i	2^i	$Id + 2^i$	succ
0	1	5	0
1	2	6	0
2	4	0	0

Exercise 3b



Node 0

i	2^i	$Id + 2^i$	succ
0	1	1	1
1	2	2	4
2	4	4	4

Node 1

i	2^i	$Id + 2^i$	succ
0	1	2	4
1	2	3	4
2	4	5	0

Node 4

i	2^i	$Id + 2^i$	succ
0	1	5	0
1	2	6	0
2	4	0	0