Day 3
Practical data streaming

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Outline

I. Demonstration of RabbitMQ 💻
II. A cluster of brokers 💻

I. Demonstration of RabbitMQ 💻

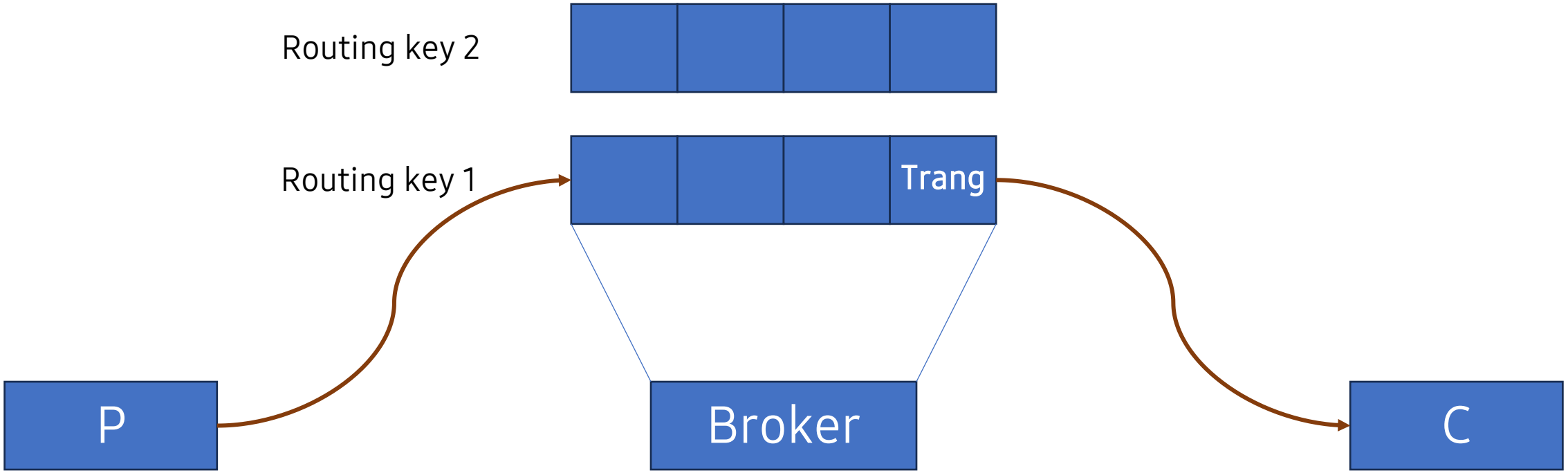
- Ubuntu/Linux dist. Desktop or server (headless)
- Python3 (pre-installed)
- RabbitMQ

Works

1. 1P -> 1 message queue -> 1C
2. 1P -> 1 work queue -> 2C (workers)
3. 1P -> 1X -> n direct msg queues -> nC
4. 1P -> 1X -> n topic msg queues -> nC
5. 1 client -> procedure queue -> 1 server -> reply queue -> 1 client

https://www.rabbitmq.com/getstarted.html

1P -> 1 message queue -> 1C



Program

Set-up

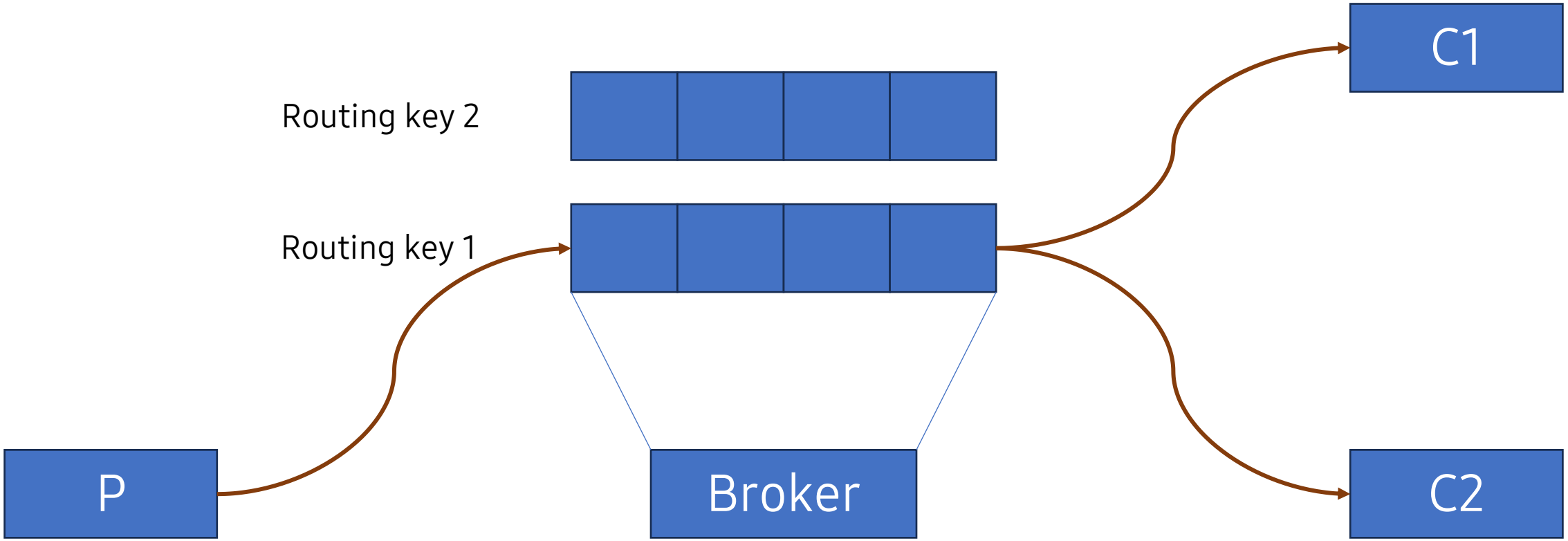
Program

https://www.rabbitmq.com/tutorials/tutorial-one-python.html

Questions

1. Which port(s) does RabbitMQ use?
2. Which transport layer protocol(s) does RabbitMQ use?

1P -> 1 work queue -> 2C (workers)



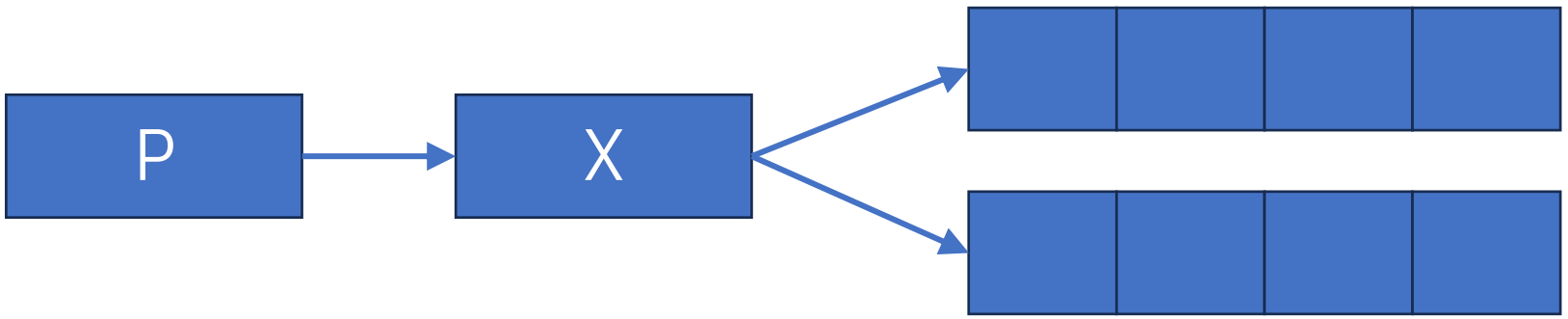
Program Set-up Programs

https://www.rabbitmq.com/tutorials/tutorial-two-python.html

Questions

3. Not all works are equal, how RabbitMQ's **fair dispatch** fixes that?
4. For message durability, why do we need both "durable" and "delivery_mode" parameters?

1P -> 1X -> n direct msg queues -> nC



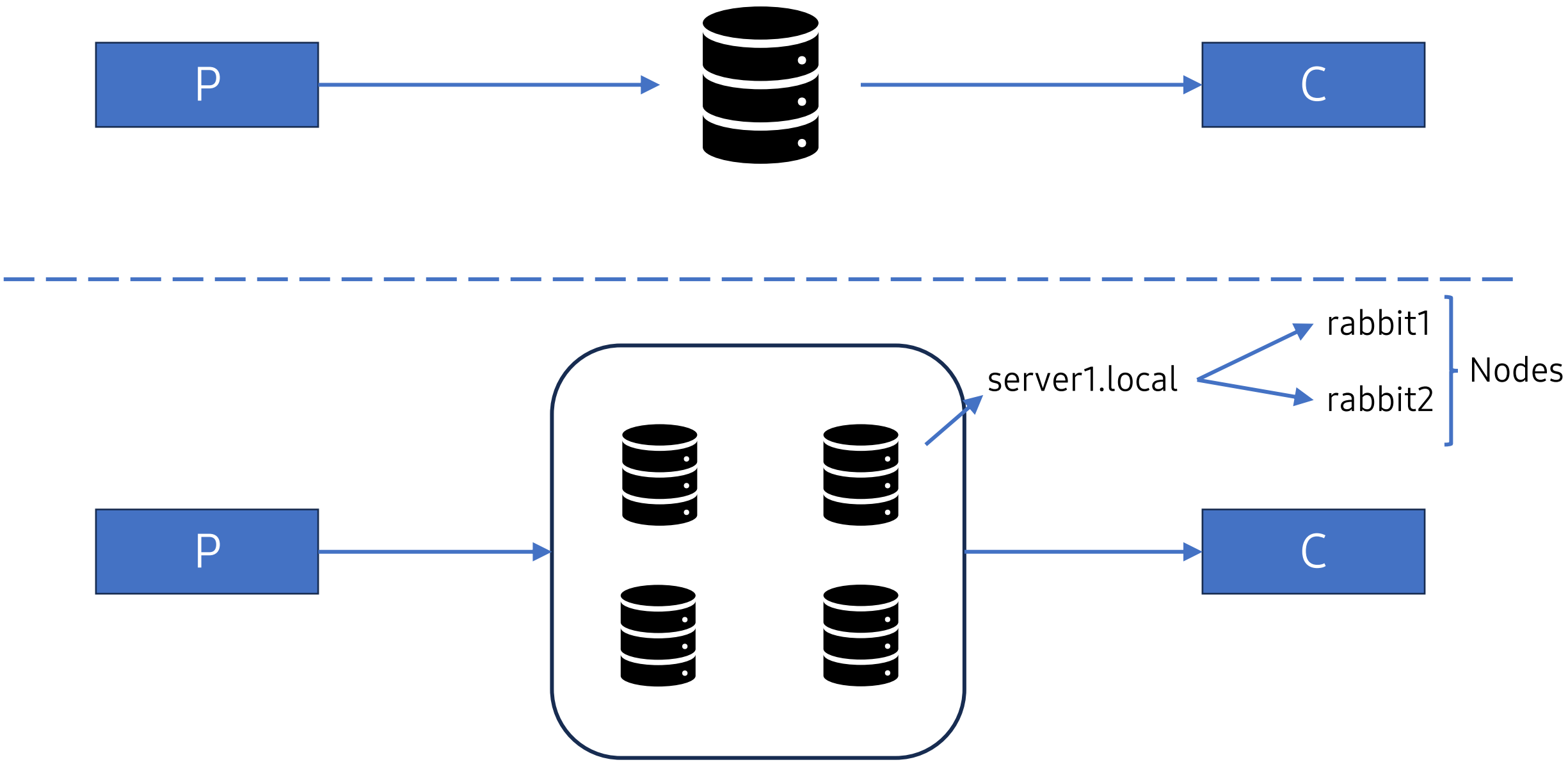
Fanout exchange type

Questions

5. Can we have multiple exchanges in one server?
6. Does an exchange have its' name?
7. What must be done to create a queue that is generated and deleted before and after usage?
8. What is the connection between an exchange and a queue?
9. What will happen if the consumer does not declare exchange?

III. A cluster of brokers

- A broker is just a server.
- It becomes slow if there are too many messages.
- Low durability when the only node dies.
- Can we fix the problems?


P
C
server1.local
rabbit1
rabbit2
Nodes
P
C

Cluster can be formed by…

- Defining cluster nodes in config file
2 • DNS service discovery
- AWS EC2 instance discovery (plugin)
- Kubernetes discovery (plugin)
- Consul-based discovery (plugin)
- Etcd-based discovery (plugin)
1 • Rabbitmqctl command (manually)

https://www.rabbitmq.com/clustering.html

Our 1st goal

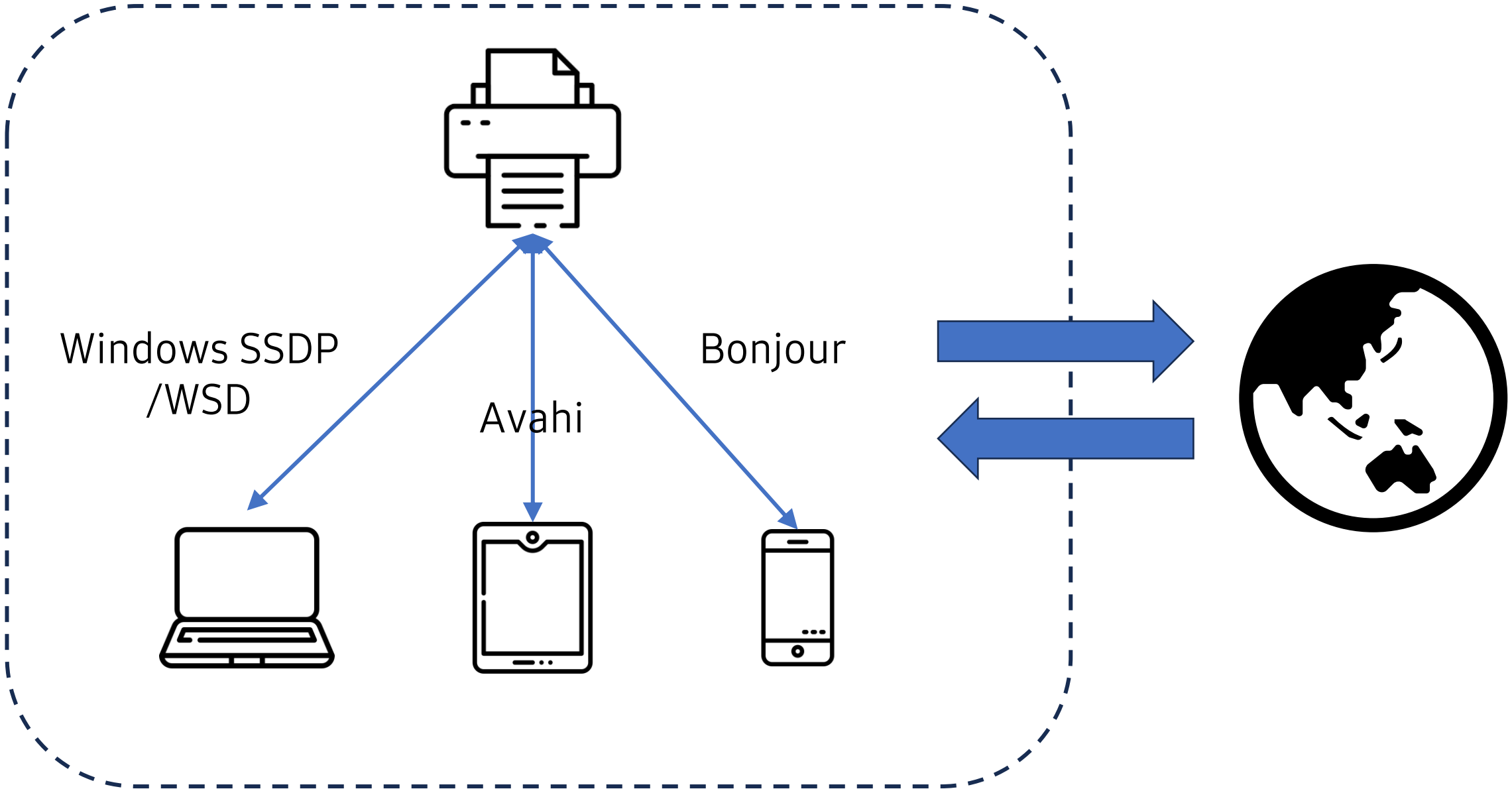
1. Create 2 clusters in 1 machines.
   - 2 instances of RabbitMQ running at different ports.
2. Join 2 clusters.

- *https://www.rabbitmq.com/clustering.html#single-machine*
- *https://www.rabbitmq.com/configure.html#config-location*

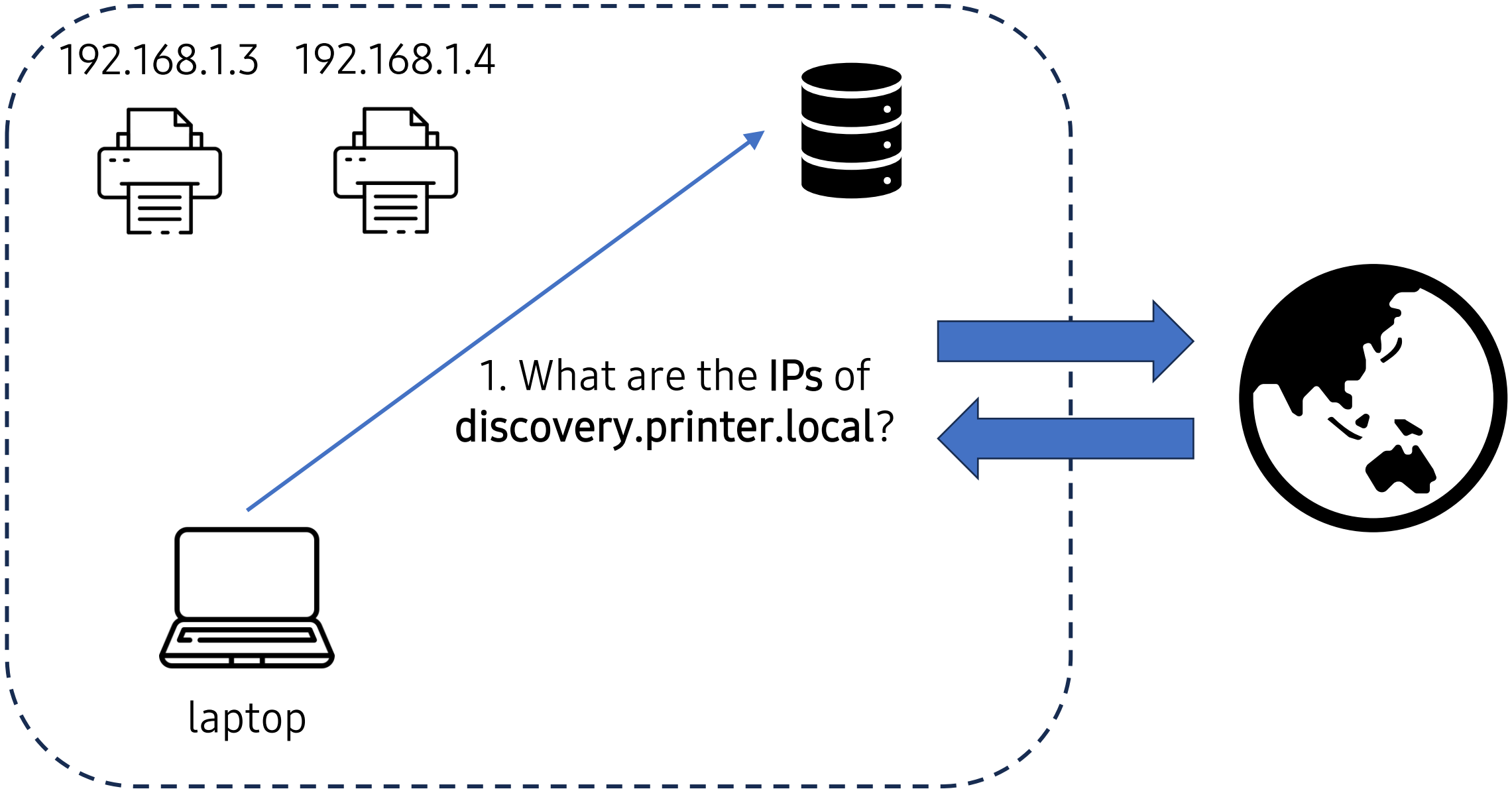
More about clusters

- All data/state is replicated across all nodes.
- All nodes are equal.
- If cluster A requests to join cluster B, the final cluster is named B.

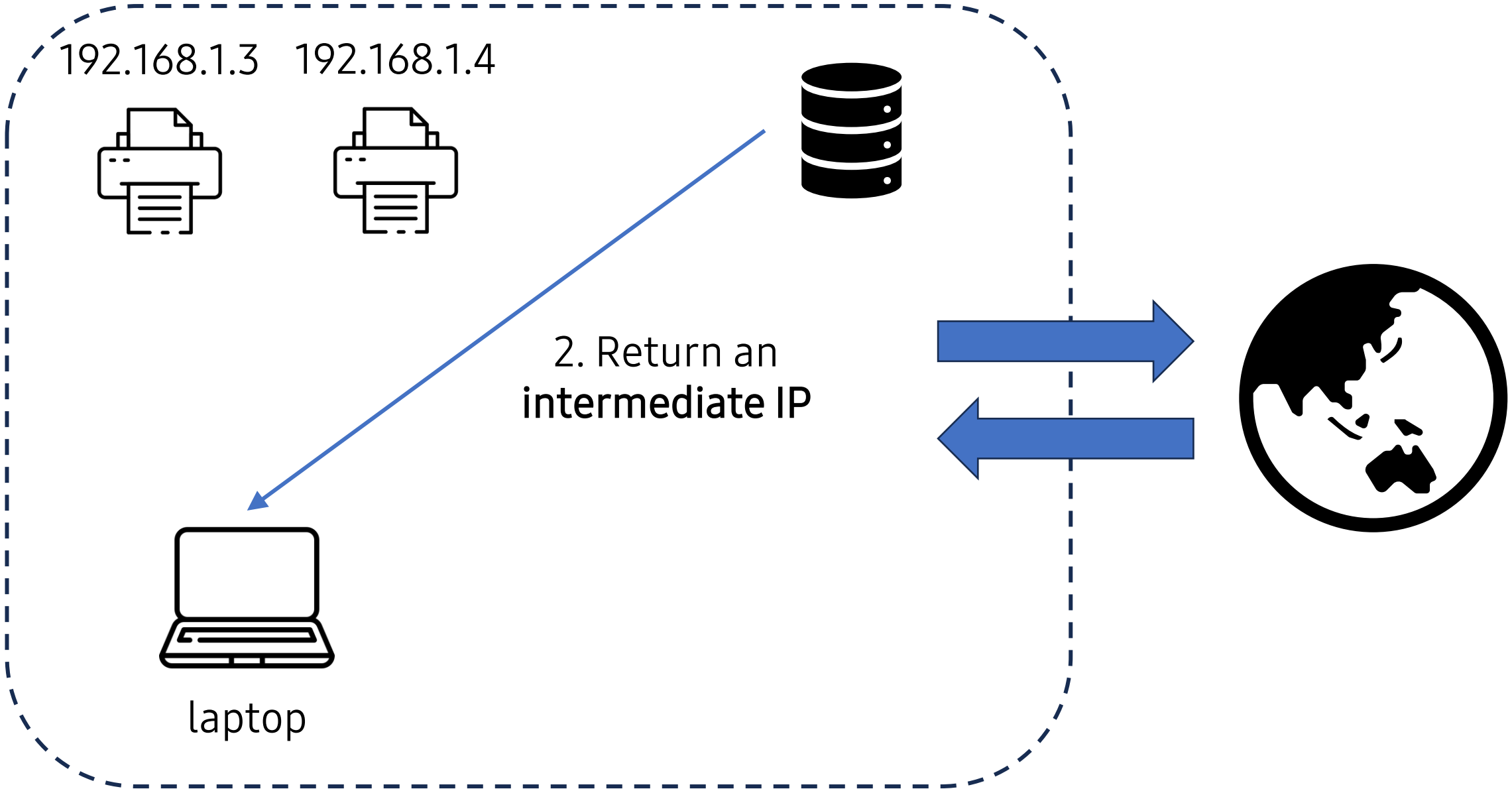
Zero-configuration networking



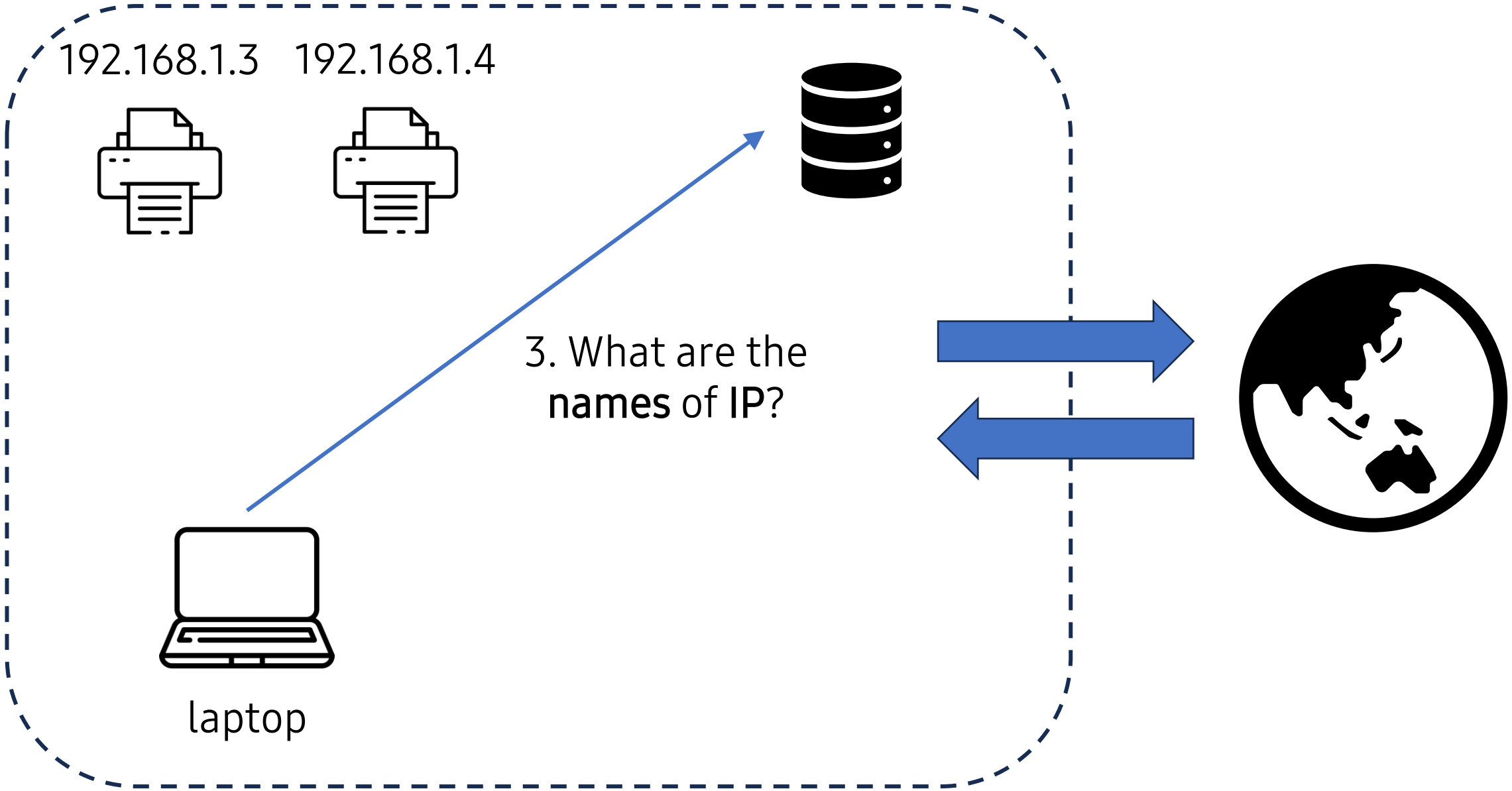
DNS-based discovery



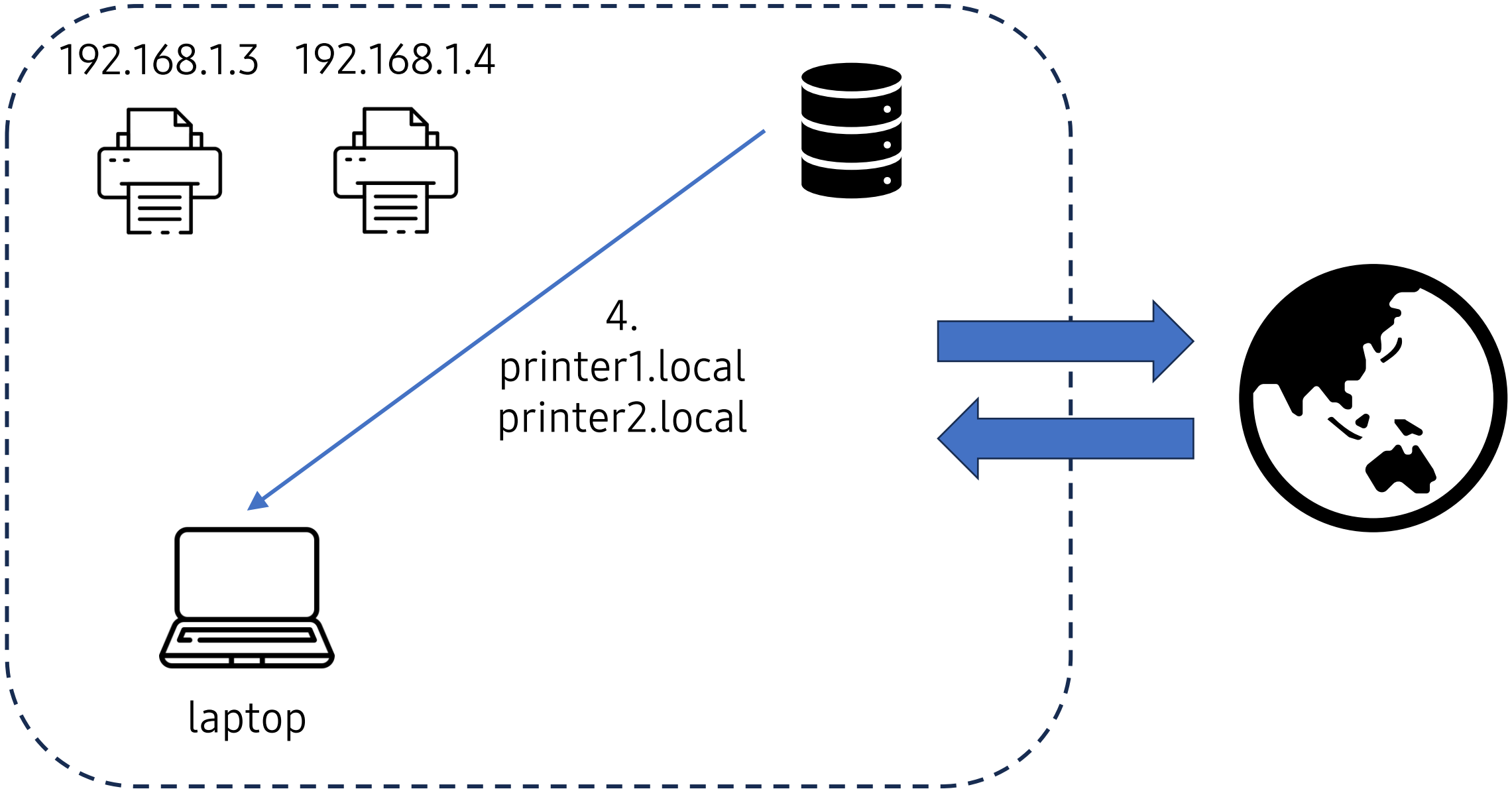
DNS-based discovery



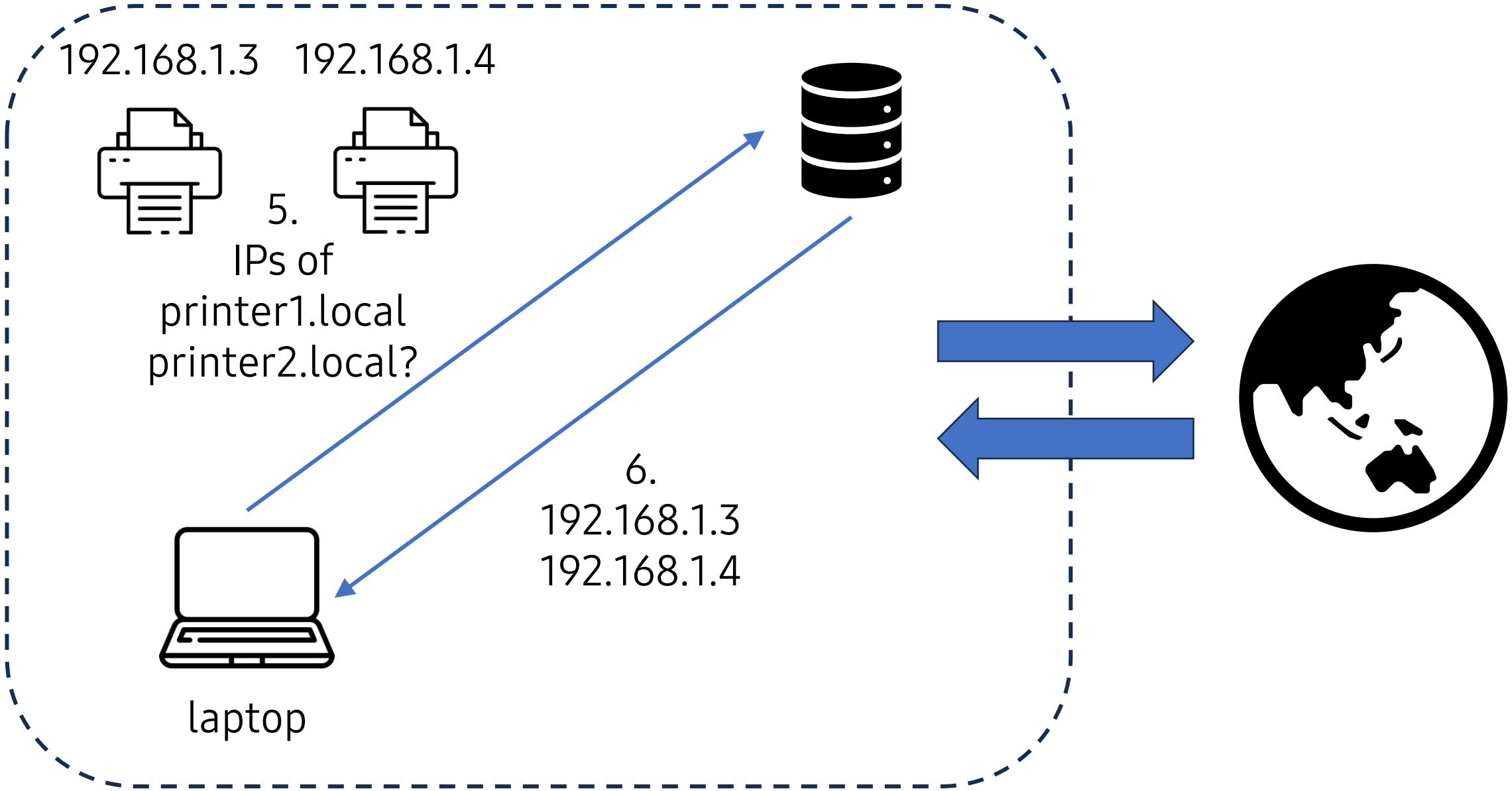
DNS-based discovery

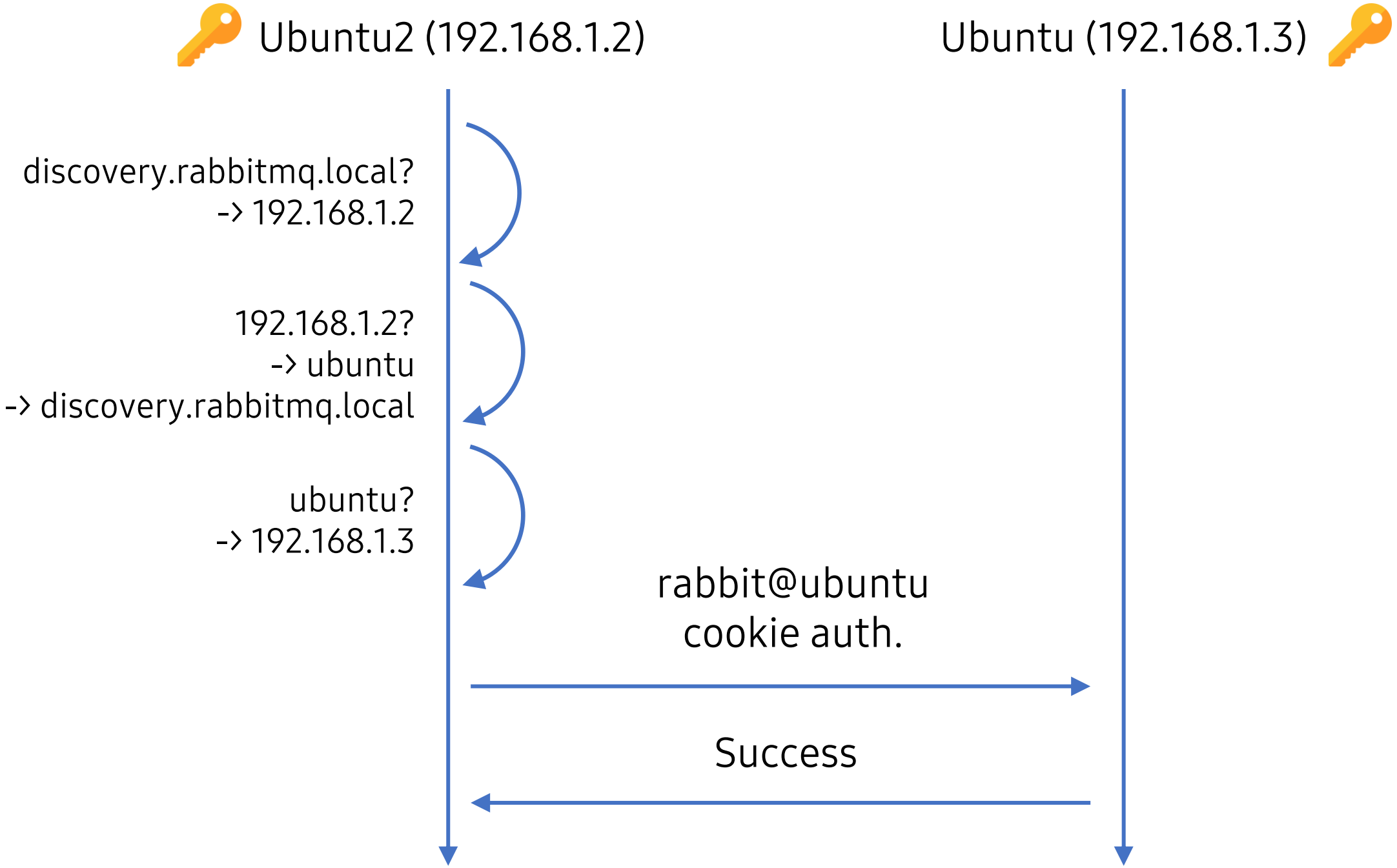


DNS-based discovery



DNS-based discovery




Ubuntu2 (192.168.1.2)
Ubuntu (192.168.1.3)
discovery.rabbitmq.local?
-> 192.168.1.2
192.168.1.2?
-> ubuntu
-> discovery.rabbitmq.local
ubuntu?
-> 192.168.1.3
rabbit@ubuntu
cookie auth.
Success

1. Update /etc/hosts file.
2. Stop RabbitMQ server.
3. Copy cookie from ubuntu to ubuntu2.
4. Start RabbitMQ server.
5. Stop, reset, and start ubuntu2 RabbitMQ app.

- *https://www.rabbitmq.com/cluster-formation.html*
- *https://www.rabbitmq.com/configure.html#config-location*

Homework (group)

- Answer all 9 questions.

Notes: Submit the zip file as “Student ID – Student name.zip”