3 network configuration options for deploying hybrid proxies
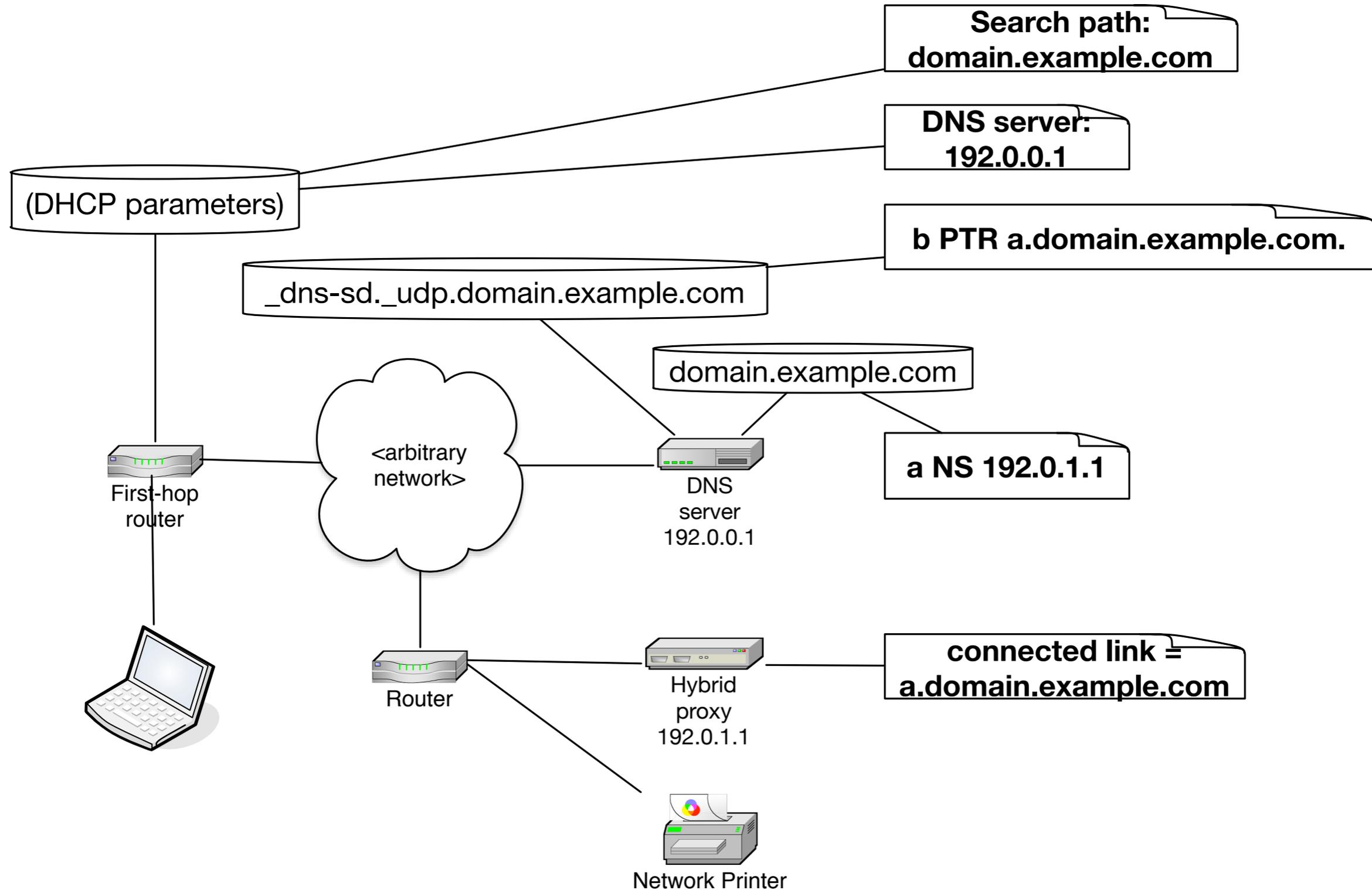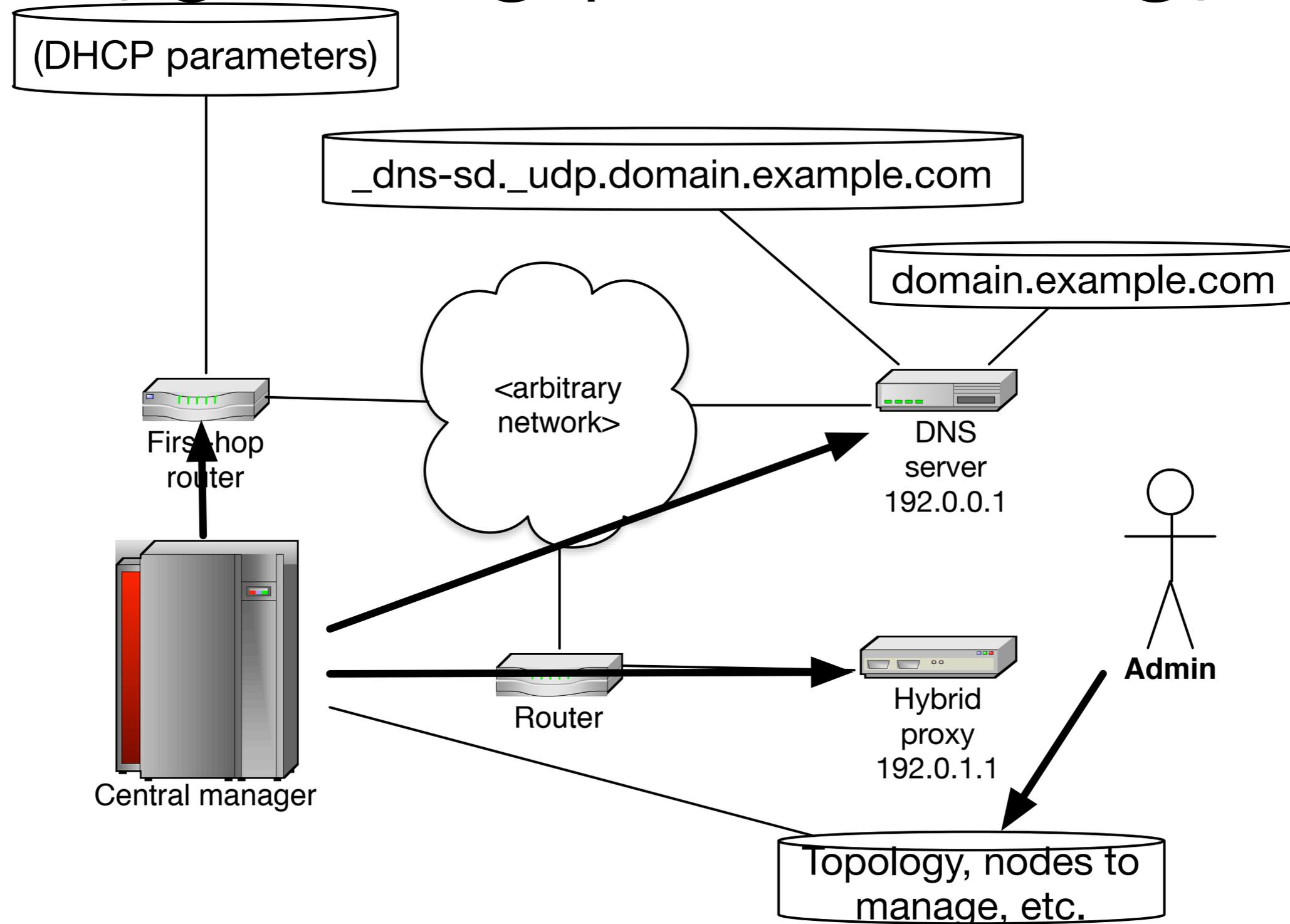
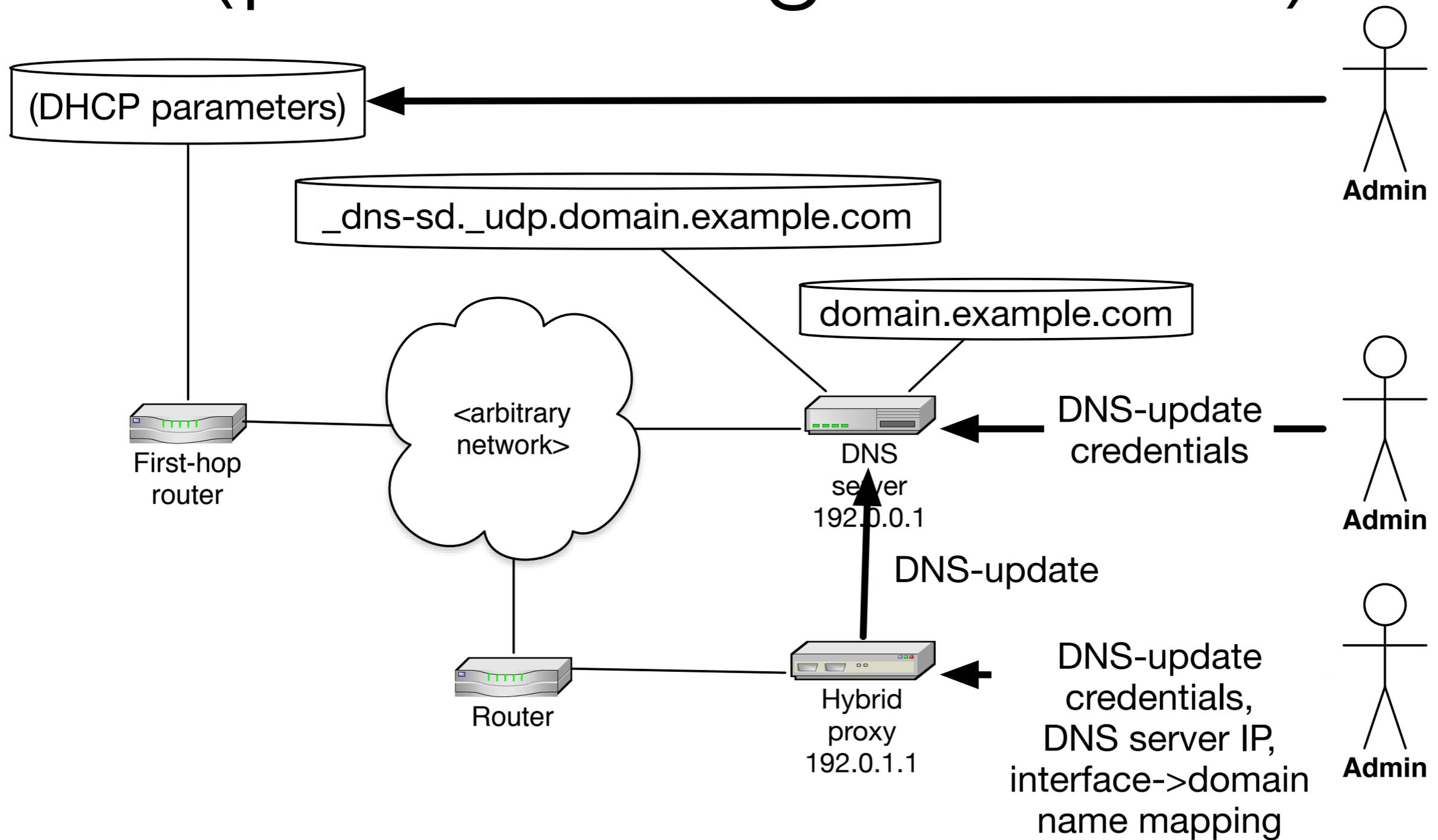Markus Stenberg <fingon+ietf92@iki.fi>

What network configuration does hybrid proxy require to be useful?

Search path:
domain.example.com

DNS server:
192.0.0.1

(DHCP parameters)

b PTR a.domain.example.com.

_dns-sd._udp.domain.example.com

domain.example.com

First-hop
router

<arbitrary
network>

DNS
server
192.0.0.1

a NS 192.0.1.1

Router

Hybrid
proxy
192.0.1.1

connected link =
a.domain.example.com

Network Printer

Option 1: God node (ignoring provisioning)

(DHCP parameters)

_dns-sd._udp.domain.example.com

domain.example.com

<arbitrary network>

First hop router

DNS server
192.0.0.1

Central manager

Router

Hybrid proxy
192.0.1.1

Admin

Topology, nodes to manage, etc.

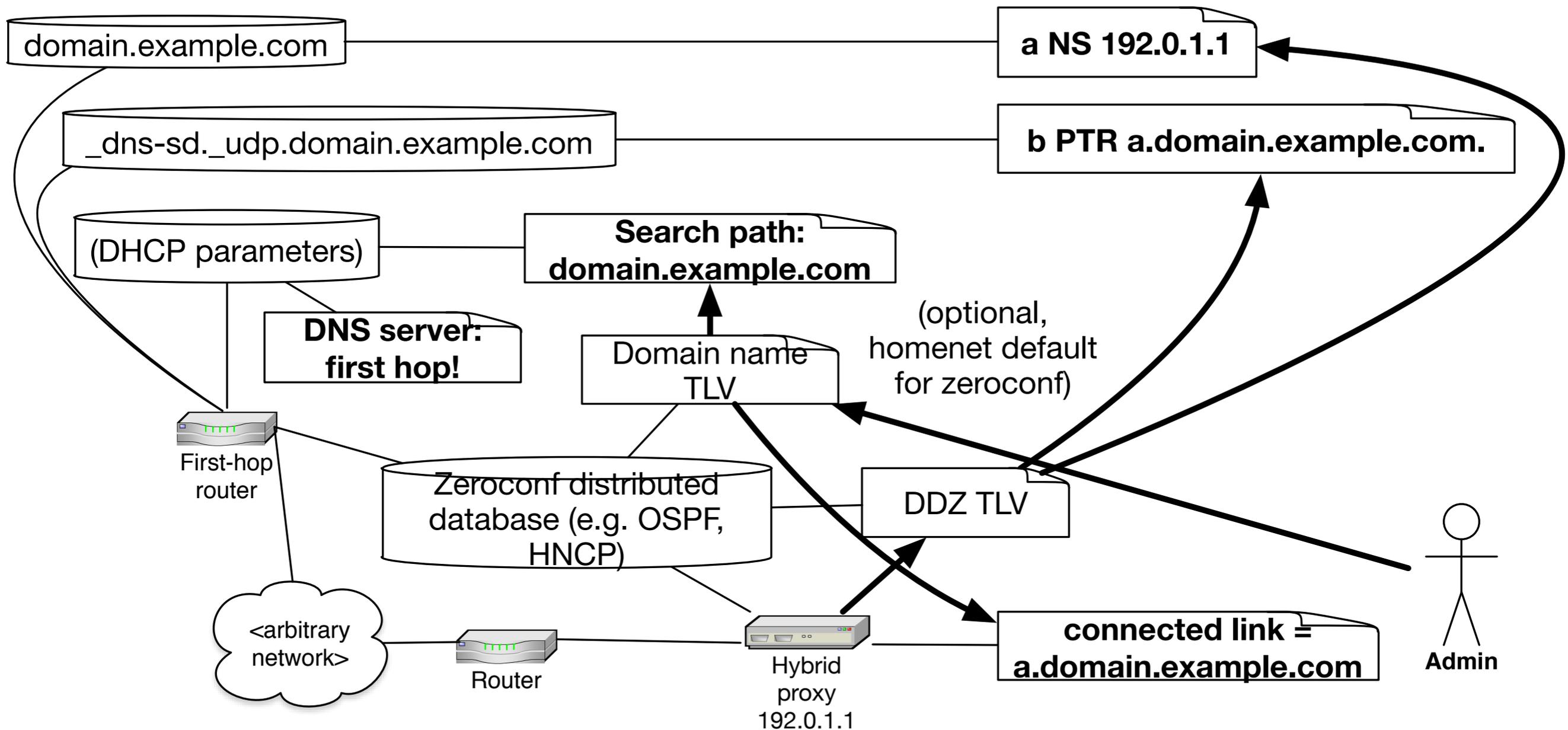# Option 2: DNS update (provisioning included)

Issues in options 1 and 2

- Option 1 (god node) issues:

  - Requires centralized management infrastructure

  - Requires essentially same admin domain for all nodes on the network involved (e.g. DNS server <> hybrid proxy <> first-hop routers)

- Option 2 (DNS-update) issues:

  - In practice, painful to bootstrap (per-hybrid proxy auth credentials for DNS-update, strict ACLs on what can be updated)

  - Also painful to maintain - staleness may be an issue (TTLs or synchronized admin operations may fix this)

- Neither option is zero-configuration (or I would argue, even little-configuration)

Option 3:
draft-ietf-homenet-hybrid-proxy-zeroconf-00
(in homenet WG but the draft itself is generic)

domain.example.com

a NS 192.0.1.1

_dns-sd._udp.domain.example.com

b PTR a.domain.example.com.

(DHCP parameters)

**Search path:
domain.example.com**

**DNS server:
first hop!**

Domain name
TLV

(optional,
homenet default
for zeroconf)

First-hop
router

Zeroconf distributed
database (e.g. OSPF,
HNCP)

DDZ TLV

<arbitrary
network>

Router

Hybrid
proxy
192.0.1.1

**connected link =
a.domain.example.com**

Admin

Some notes on draft-ietf-homenet-hybrid-proxy-zeroconf-00 (1/2)

- There are multiple ways to generate the sub-zone names; the one in the example is the simplest one, that is, link.domain

  - Another, more complex one is link.owning-node.domain format

    - Once node names are unique, there is no need for link conflict resolution (and node name portion may be useful as e.g. wlan-42.domain.example.com may be hard to track down)

- There is conflict resolution mechanism in place due to which the sub-zone names are unique domain-wide regardless of how they are generated

- No issues with state staleness

- However, all nodes are expected to be "trusted"

- Requires some work to integrate the DNS server and the hybrid proxy to use the distributed database

Some notes on draft-ietf-homenet-hybrid-proxy-zeroconf-00 (2/2)

- Two implementations

  - Historic one based on OSPFv3 auto-configuration LSA and slightly different looking TLVs

  - Current one based on HNCP TLVs available at http://www.homewrt.org/ (http://github.com/sbyx/hnetd/)

- Finally.. Please advance draft-ietf-dnssd-hybrid ASAP, this depends on it! :)

Questions?