Create your own local domain and DHCP with dnsmasq

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Back in 2007, Bernat explained how to set up our own domain name using ISC BIND and ISC DHCP. You can't go wrong with those servers but maybe you prefer something more straightforward. I present here a simpler alternative built on top of `dnsmasq` which is an integrated DNS and DHCP.

What we are going to do is to configure our a forwarding DNS (so it will forward queries to other DNS servers), it will provide us a DNS *zone* `.mydomain` and also DHCP.

The following example assumes that your LAN gateway is in `192.168.1.1` and we will call it `router.mydomain`. Your DNS server is in `192.168.1.2` and we will call it `dns.mydomain`. Install `dnsmasq` in `dns.mydomain` (check your Linux distribution on how to do this). `dnsmasq` settings are commonly found in `/etc/dnsmasq.conf`.

> Make sure you disable the DHCP of your LAN router if it is providing this service. Otherwise you will run into unpleasant conflicts with DHCP (only one DHCP server can be running in a LAN at a time). Also you may want to disable its DNS forwarding service as you're not going to need it.

/etc/dnsmasq.conf

```
# Never forward plain names (without a dot or domain part)
domain-needed
# Never forward addresses in the non-routed address spaces
bogus-priv
# Don't read /etc/resolv.conf or any other
# file to get the forwarding files.
no-resolv
# Add other name servers here, with domain specs if they are for
# non-public domains.
server=8.8.8.8
server=8.8.4.4
# Add local-only domains here, queries in these domains are answered
# from /etc/hosts or DHCP only.
```

```
14 local=/mydomain/
15 # It does the following things.
16 # 1) Allows DHCP hosts to have fully qualified domain names, as long
17 #     as the domain part matches this setting.
18 # 2) Sets the "domain" DHCP option thereby potentially setting the
19 #    domain of all systems configured by DHCP
20 # 3) Provides the domain part for "expand-hosts"
21 domain=mydomain
22 # Uncomment this to enable the integrated DHCP server, you need
23 # to supply the range of addresses available for lease and optionally
24 # a lease time. If you have more than one network, you will need to
25 # repeat this for each network on which you want to supply DHCP
26 # service.
27 dhcp-range=192.168.1.32,192.168.1.250,24h
28 # Always give the host with Ethernet address 11:22:33:44:55:66
29 # the name fred and IP address 192.168.1.60 and lease time 45 minutes
30 # dhcp-host=11:22:33:44:55:66,fred,192.168.1.60,45m
31 dhcp-host=11:22:33:44:55:66,uber,192.168.1.3
32 dhcp-host=21:22:33:44:55:67,dad,192.168.1.4
33 dhcp-host=31:22:33:44:55:68,xbox360,192.168.1.5
34 # Override the default route supplied by dnsmasq, which assumes the
35 # router is the same machine as the one running dnsmasq.
36 dhcp-option=option:router,192.168.1.1
```

Option `domain-needed` in line 2 is to make sure we don't forward to DNS servers plain names without a domain separator. So we will forward things like `xbox360.com` or `xbox360.foo` but not `xbox360`. Also option `bogus-priv` avoids us forwarding names like `3.1.168.192.in-addr.arpa`. This is a reverse DNS for an IP `192.168.1.3` which belongs to the non-routable space of `192.168.0.0/24`

Line 7 tells `dnsmasq.conf` that does not try to use `/etc/resolv.conf` to get the forwarder servers. We will specify them, for maximum control, in `dnsmasq.conf` itself. We do this in lines 10 and 11. Here we use the Google DNS servers, but feel free to use other servers such as OpenDNS or the one of your ISP.

Line 14, `local`, is a way to restrict the domains we're going to asnswer locally. Which we will enable in line 21, `domain`. Now the names registered in the DHCP will have a `.mydomain` suffix as part of their fully qualified domain name.

In line 27, `dhcp-range` we configure the range of IPs for which we will assign automatically DHCP addresses. In this example from 32 to 250, leaving us some room from `192.168.1.1` to `192.168.1.32` and `192.168.1.250` to `192.168.1.254`. The DHCP lease will last 24 hours.

Next in lines 31 to 33 we statically assign IPs (should be from the range not used by DHCP) to specific machines when they do a DHCP request. We match them using their MAC address (such as

`11:22:33:44:55:66`), use the right MAC addresses of your network devices here.

Finally in line 36 we make sure that when a node in our network requests IP, the gateway is correctly set to the IP of our LAN gateway (`192.168.1.1`).

A final note for devices with fully static IPs (i.e. those that will never get their IP via DHCP) such as `router.mydomain` an `dns.mydomain`. You can use `/etc/hosts` in `dns.mydomain` to set them up. In our example setup we would add the following lines. `dnsmasq` will use this file to register those names in its DNS database.

```
 /etc/hosts
192.168.1.1     router.mydomain router
192.168.1.2     dns.mydomain dns
```

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