cgl@ns1:/$ echo "Install DNS server software"
Install DNS server software

cgl@ns1:/$
cgl@ns1:/$ sudo apt-get install bind9
cgl@ns1:/$ echo "Configure DNS server to be authoritative for my domain"
Configure DNS server to be authoritative for my domain
cgl@ns1:/$
cgl@ns1:/$ sudo emacs -nw -q /etc/bind/named.conf.local
// Do any local configuration here

// Consider adding the 1918 zones here, if they are not used in your organization
#include "/etc/bind/zones.rfc1918";
//
// Do any local configuration here
//

zone "dsutux.us" {
    type master;
    file "/etc/bind/db.dsutux.us";
    allow-transfer { 144.38.214.131; localhost; };
    notify yes;
    allow-query { any; };
};

// Consider adding the 1918 zones here, if they are not used in your organization
//include "/etc/bind/zones.rfc1918";
cgl@ns1:/$ echo "Now create the zone file for my domain."
Now create the zone file for my domain.
cgl@ns1:/$
cgl@ns1:/$ sudo emacs /etc/bind/db.dsutux.us
FYI

3600 seconds = 1 hour
86400 seconds = 1 day
604800 seconds = 1 week
31449600 seconds = 52 weeks

This TTL (time to live) is for all RR (resource records) that do not have TTL otherwise specified. The value is in seconds. If the TTL is too large, then it takes a long time to get changes into the caching lookup servers. If it is too small, then the name server will be overworked.

$TTL 3600

There must be one SOA for every zone.

SOA (Start of Authority) record:
Serial - Unique number of version of the zone file data. It must increase every time the file contents are changed.
Refresh - How often the secondary (slave) name servers should check
; There must be one SOA for every zone

; SOA (Start of Authority) record.
; Serial  - Unique number of version of the zone file data. It must
;          increase every time the file contents are changed.
; Refresh - How often the secondary (slave) name servers should check
;          for updated information.
; Retry   - How often the secondary (slave) name servers should retry
;          the refresh, if the refresh is unsuccessful.
; Expire  - How long secondary (slave) name servers should keep and serve
;          this zone information before it is discarded.
; Minimum/TTL - How long negative hits should be stored. This is for caching
;              lookup servers that ask our authoritative server for
;              for non-existent RR. This tells how long to cache the
;              negative response.

@     IN  SOA  ns1.dsutux.us.  root.ns1.dsutux.us.  (2014091601  ; Serial
          3600  ; Refresh
          300   ; Retry
          241920 ; Expire
          60   ) ; Negative cache TTL
60  ); Negative cache TTL

; NS (Name Server) records
; @    IN    NS    ns1.dsutux.us.
@    IN    NS    ns2.dsutux.us.

; A (Address) records
ns1    IN    A    144.38.214.130
ns2    IN    A    144.38.214.131
mail   IN    A    144.38.214.132
www    IN    A    144.38.214.133
cgl@ns1:/$ echo "Now, restart the DNS service so that the new configuration will be used."
Now, restart the DNS service so that the new configuration will be used.
cgl@ns1:/$
cgl@ns1:/$ sudo service bind9 restart
  * Stopping domain name service... bind9
  waiting for pid 2453 to die

  * Starting domain name service... bind9

cgl@ns1:/$
cgl@ns1:/$ echo "Don't trust the output of the restart command. If there are errors, they will show up in the log file."
Don't trust the output of the restart command. If there are errors, they will show up in the log file.
cgl@ns1:/$
cgl@ns1:/$ less /var/log/syslog
Sep 16 23:25:20 ns1 named[3509]: available at https://www.isc.org/support
Sep 16 23:25:20 ns1 named[3509]: ---------------------------------------------------------------------
Sep 16 23:25:20 ns1 named[3509]: adjusted limit on open files from 4096 to 1048576
Sep 16 23:25:20 ns1 named[3509]: found 1 CPU, using 1 worker thread
Sep 16 23:25:20 ns1 named[3509]: using 1 UDP listener per interface
Sep 16 23:25:20 ns1 named[3509]: using up to 4096 sockets
Sep 16 23:25:20 ns1 named[3509]: loading configuration from '/etc/bind/named.conf'
Sep 16 23:25:20 ns1 named[3509]: reading built-in trusted keys from file '/etc/bind/bind.keys'
Sep 16 23:25:20 ns1 named[3509]: using default UDP/IPv4 port range: [1024, 65535]
Sep 16 23:25:20 ns1 named[3509]: using default UDP/IPv6 port range: [1024, 65535]
Sep 16 23:25:20 ns1 named[3509]: listening on IPv6 interfaces, port 53
Sep 16 23:25:20 ns1 named[3509]: listening on IPv4 interface lo, 127.0.0.1#53
Sep 16 23:25:20 ns1 named[3509]: listening on IPv4 interface eth0, 144.38.214.130#53
Sep 16 23:25:20 ns1 named[3509]: generating session key for dynamic DNS
Sep 16 23:25:20 ns1 named[3509]: sizing zone task pool based on 6 zones
Pattern not found (press RETURN)
Sep 16 23:25:20 ns1 named[3509]: automatic empty zone: 100.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.IP6.ARPA
Sep 16 23:25:20 ns1 named[3509]: automatic empty zone: D.F.IP6.ARPA
Sep 16 23:25:20 ns1 named[3509]: automatic empty zone: A.E.F.IP6.ARPA
Sep 16 23:25:20 ns1 named[3509]: automatic empty zone: 8.B.D.0.1.0.1.0.2.IP6.ARPA
Sep 16 23:25:20 ns1 named[3509]: command channel listening on 127.0.0.1#953
Sep 16 23:25:20 ns1 named[3509]: command channel listening on ::1#953
Sep 16 23:25:20 ns1 named[3509]: managed-keys-zone: journal file is out of date: removing journal file
Sep 16 23:25:20 ns1 named[3509]: managed-keys-zone: loaded serial 2
Sep 16 23:25:20 ns1 named[3509]: zone 0.in-addr.arpa/IN: loaded serial 1
Sep 16 23:25:20 ns1 named[3509]: zone 127.in-addr.arpa/IN: loaded serial 1
Sep 16 23:25:20 ns1 named[3509]: zone dsutux.us/IN: loaded serial 2014091601
Sep 16 23:25:20 ns1 named[3509]: zone 255.in-addr.arpa/IN: loaded serial 1
Sep 16 23:25:20 ns1 named[3509]: zone localhost/IN: loaded serial 2
Sep 16 23:25:20 ns1 named[3509]: all zones loaded
Sep 16 23:25:20 ns1 named[3509]: running
Sep 16 23:25:20 ns1 named[3509]: zone dsutux.us/IN: sending notifies (serial 2014091601)
cgl@ns1:/$ echo "name.conf (and named.conf.local) loaded fine."
name.conf (and named.conf.local) loaded fine.
cgl@ns1:/$ echo "The zone file (db.dsutux.us) did as well."
The zone file (db.dsutux.us) did as well.
cgl@ns1:/$ echo "Errors in those files would show up as messages in syslog."
Errors in those files would show up as messages in syslog.
cgl@ns1:/$
cgl@ns1:/$ echo "Now, we want to test actual functionality."
Now, we want to test actual functionality.
cgl@ns1:/$ echo "We'll use the dig command to do this."
We'll use the dig command to do this.
cgl@ns1:/$
cgl@ns1:/$ dig @144.38.214.130 mail.dsutux.us A
cgl@ns1:/$ dig @144.38.214.130 mail.dsutux.us A

;; DiG 9.9.5-3-Ubuntu @144.38.214.130 mail.dsutux.us A
;; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 59830
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;mail.dsutux.us. IN A

;; ANSWER SECTION:
mail.dsutux.us. 3600 IN A 144.38.214.132

;; AUTHORITY SECTION:
dsutux.us. 3600 IN NS ns1.dsutux.us.
dsutux.us. 3600 IN NS ns2.dsutux.us.

;; ADDITIONAL SECTION:
ns1.dsutux.us. 3600 IN A 144.38.214.130
ns2.dsutux.us. 3600 IN A 144.38.214.131
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;mail.dsutux.us. IN A

;; ANSWER SECTION:
mail.dsutux.us. 3600 IN A 144.38.214.132

;; AUTHORITY SECTION:
dsutux.us. 3600 IN NS ns1.dsutux.us.
dsutux.us. 3600 IN NS ns2.dsutux.us.

;; ADDITIONAL SECTION:
ns1.dsutux.us. 3600 IN A 144.38.214.130
ns2.dsutux.us. 3600 IN A 144.38.214.131

;; Query time: 5 msec
;; SERVER: 144.38.214.130#53(144.38.214.130)
;; WHEN: Tue Sep 16 23:37:31 MDT 2014
;; MSG SIZE  rcvd: 127

cgl@ns1/$
cgl@ns1:/$ echo "To be more complete, you should do queries on all of the A records to be sure they are translated correctly."
To be more complete, you should do queries on all of the A records to be sure they are translated correctly.
cgl@ns1:/$
cgl@ns1:/$ echo "You can also ask for other records, like SOA and NS"
You can also ask for other records, like SOA and NS
cgl@ns1:/$
cgl@ns1:/$ dig @144.38.214.130 dsutux.us SOA

; <<< DiG 9.9.5-3-Ubuntu <<< @144.38.214.130 dsutux.us SOA
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 4683
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
dsutux.us. IN SOA

;; ANSWER SECTION:
dsutux.us. 3600 IN SOA ns1.dsutux.us. root.ns1.dsutux.us. 2014091601 3600 300 241920 60

;; AUTHORITY SECTION:
dsutux.us. 3600 IN NS ns1.dsutux.us.
dsutux.us. 3600 IN NS ns2.dsutux.us.

;; ADDITIONAL SECTION:
ns1.dsutux.us. 3600 IN A 144.38.214.130
cgl@ns1:/$ dig @144.38.214.130 dsutux.us NS

; <<< DiG 9.9.5-3-Ubuntu <<< @144.38.214.130 dsutux.us NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>>HEADER<<< opcode: QUERY, status: NOERROR, id: 4108
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 0, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
dsutux.us. IN NS

;; ANSWER SECTION:
dsutux.us. 3600 IN NS ns2.dsutux.us.
dsutux.us. 3600 IN NS ns1.dsutux.us.

;; ADDITIONAL SECTION:
ns1.dsutux.us. 3600 IN A 144.38.214.130
ns2.dsutux.us. 3600 IN A 144.38.214.131

;; Query time: 5 msec
;; SERVER: 144.38.214.130#53(144.38.214.130)
cgl@ns1:/$ echo "If there are any errors in syslog, then you must edit the file with the problem: named.conf.local or the zone file."
If there are any errors in syslog, then you must edit the file with the problem: named.conf.local or the zone file.
cgl@ns1:/$
cgl@ns1:/$ echo "If there are any errors in syslog, then you must edit the file with the problem: named.conf.local or the zone file."
If there are any errors in syslog, then you must edit the file with the problem: named.conf.local or the zone file.
cgl@ns1:/$ echo "All edits of the zone file should include an increase in the serial number of the SOA"
All edits of the zone file should include an increase in the serial number of the SOA
cgl@ns1:/$ echo "All edits of configuration must be followed with a service restart."
All edits of configuration must be followed with a service restart.
cgl@ns1:/$ echo "All service restarts should be followed with inspection of syslog and dig commands to verify changes are working as expected."
All service restarts should be followed with inspection of syslog and dig commands to verify changes are working as expected.
cgl@ns1:/$