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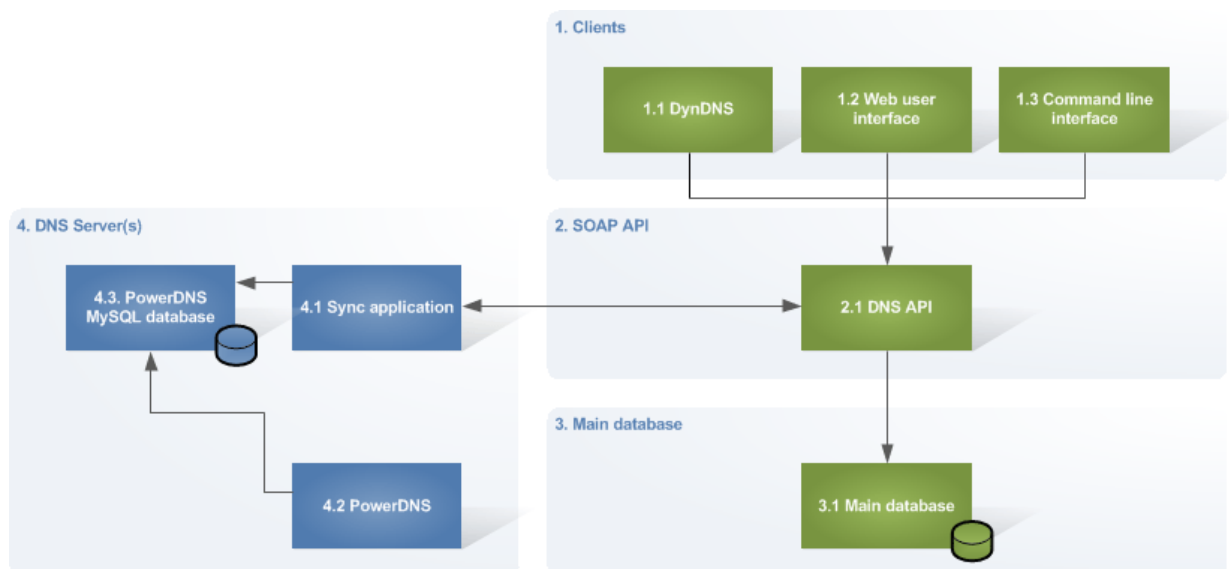# 1. Atomia DNS Overview

1.1. What is Atomia DNS

Atomia DNS is a system to provision and improve administration of DNS settings across several DNS-servers. DNS-servers can be geographically spread and are optimized to handle large amounts of DNS-data by using a local database instead of zone files.

The local databases of individual DNS-servers are updated from a main database which contains data for all servers.

Atomia DNS provides a API which lets applications update DNS-data in a very simple way.

1.2. System overview

Atomia DNS is a DNS system which enables easy management of DNS zones through a programmatic SOAP interface. The system consists of several parts which are described below.

1. **Clients**

   a. **DynDNS:** RFC2136 Dynamic DNS update daemon proxying updates to the API.

   b. **Web user interface:** Web interface to make changes using the API.

   c. **Command line interface:** CLI tool to make changes using the API.

2. **Atomia DNS API:** Part of Atomia DNS Master server

   a. **Atomia DNS API:** The API is used by clients to make changes in the DNS settings as well as for communicating with different DNS servers. The two logical APIs (SyncSOAP and DNS SOAP API) are both provided by the same SOAP Server, installed using the atomiadns-api package.

3. **Atomia DNS database:** Part of Atomia DNS Master server.

   a. **Atomia DNS database:** The main database is by default setup on the SOAP Server, but can be set up on an external machine as well if necessary for policy reasons, as shown in the image above.

4. **Atomia DNS PowerDNS Nameserver:** One or more nameservers controlled by the system.

   a. **Sync application:** Synchronizes data between the Atomia DNS database and the local DNS database on the nameserver. The sync application on the nameserver nodes is provided by the package atomiadns-powerdnssync. The sync application will write data to the local MySQL database.

   b. **PowerDNS:** The nameserver software used, can be found at http://powerdnssec.org/downloads/packages/.

5. **Atomia DNS Bind-DLZ Nameserver:** One or more nameservers controlled by the system.

   We no longer recommend the Bind-DLZ sync agent, the PowerDNS integration is more actively developed and is a requirement for DNSSEC support
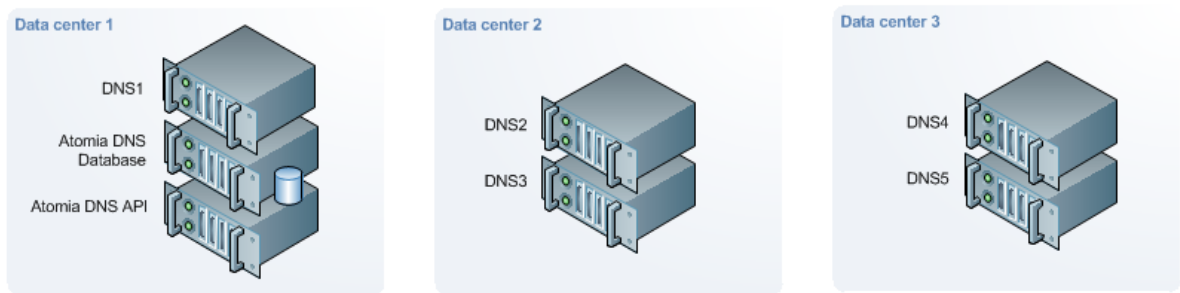
   a. **Sync application:** Synchronizes data between the Atomia DNS database and the local DNS database on the nameserver. All software on the nameserver nodes is provided by the package atomiadns-nameserver. The sync application will write data to the local database. In the case where the nameserver should get slave zones the sync application will write configurations for BIND.

   b. **BIND9:** Nameserver software compiled using database support for quick reload of zone data.

   c. **BindDLZ/BDBHPT:** Stores zone data.

   d. **Zone files:** Zone files are only used for slave zones where data is loaded from another DNS master server according to the DNS protocol.

2. Atomia DNS Features

2.1. Features

The main features of Atomia DNS are:

- **Programmatic interface:** you can integrate Atomia DNS with your application by using the SOAP interface of Atomia DNS.

- **Scalability:** you can scale the DNS system up by adding more servers.

- **Realtime updates:** Support for massive amounts of zones without reconfiguration downtime

- **Always valid DNS-data:** it is impossible to add bad zone-data to the database

- **Several data centers:** administrate DNS servers in different data centers

This is a example infrastructure setup where DNS servers are placed in different data centers. The Atomia DNS API and Atomia DNS database can either be installed on the same machine (default) or on separate machines.

2.2. Atomia DNS functionality

The Atomia DNS system consists of:

1. **Atomia DNS Master server** : The master server includes the Atomia DNS API that is used for communicating with nameservers and also used by external applications to provision DNS-data. Also on the master server is the Atomia DNS database which contains DNS-settings for all nameservers. It's possible to install the Atomia DNS API and Atomia DNS database on different machines.

2. **Atomia DNS PowerDNS Nameserver** : The nameserver includes the popular PowerDNS nameserver configured to use a local MySQL database for zone data. All nameservers will also have the Atomia DNS PowerDNS Sync application installed which provisions changes to the local database and also settings and keys needed for DNSSEC.

3. **Optional Atomia DNS Bind-DLZ Nameserver** : The nameserver includes the popular BIND nameserver configured to use a local database instead of zone files. All nameservers will also have the Atomia DNS Sync application installed which provisions changes to the local database and also settings for BIND from the data in the Atomia DNS database.

    We no longer recommend the Bind-DLZ sync agent, the PowerDNS integration is more actively developed and is a requirement for DNSSEC support

3. Usage

- Atomia DNS Master server
- Atomia DNS Bind-DLZ Nameserver
- Atomia DNS PowerDNS Nameserver
- Atomia DNS DynDNS

3.1. Atomia DNS Master server

3.1.1. What is the Atomia DNS Master server?

The master server includes the Atomia DNS API that is used for communicating with the nameservers and also used by external applications to provision DNS data. Also on the master server is the Atomia DNS database which contains DNS settings for all nameservers. It is possible to install the Atomia DNS API and Atomia DNS database on different machines.

3.1.2. Atomia DNS Master server documentation

Please locate the desired information in one of the following sections:

- Atomia DNS Master server installation
- Atomia DNS Master server configuration

- Atomia DNS Master server updates

- Atomia DNS Master server usage

- Atomia DNS Master server technical information

3.1.3. Atomia DNS Master server installation

3.1.3.1. Installation

The Atomia DNS Master server consists of two different parts, the Atomia DNS database and the Atomia DNS API. It is possible to install the Atomia DNS Master server either with the database and the API on the same machine or on different machines. The default and recommended way is to install both on the same machine. In addition, if you want to use DNSSEC, it consists of an optional step where you add the initial DNSSEC keyset.

3.1.3.1.1. Default installation

The default installation will install both the Atomia DNS database and the Atomia DNS API.

See Atomia DNS Master server default installation for instructions.

3.1.3.1.2. Manual installation

Using the manual installation guide you can install separate packages and have the Atomia DNS database and the Atomia DNS API on separate machines.

See Atomia DNS Master server manual installation for instructions.

3.1.3.1.3. Creating the initial DNSSEC keyset

For using DNSSEC you need to create the initial keys used to sign your zones.

See Creating the initial DNSSEC keyset for instructions.

3.1.3.2. The database schema

The package will create a database called *zonedata* if it doesn't exist, and create the schema there.

If the database already exists, there are two cases:

1. The schema is already installed correctly and the installer proceeds.

2. The database contains something which is not a version of the Atomia DNS schema and the installer fails.

To be able to install the product if you already have a database called *zonedata* you need to remove or rename that database, or manually install the latest version of the schema to the database, then rerun the installer.

3.1.3.3. Software used by Atomia DNS Master server

On the Atomia DNS Master server the following software is needed (in the recommended installation with Atomia DNS API and Atomia DNS database on the same machine):

- *Atomia::DNS::Server*

- *Apache2 with mod_perl2*

- *Postgresql 8.3 or later*

- *DBD::Pg 2.11.7 or later*

- *SOAP::Lite 0.810.08 or later*

- *Moose*

- *Config::General*

All needed software, including prerequisites, is installed by the provided package, *atomiadns-masterserver* .

3.1.3.4. Atomia DNS Master server default installation

- Introduction

- Installation on Ubuntu 10.04 LTS

- Installation on FreeBSD

- Installation on Redhat Enterprise Linux 4

- Installation on Redhat Enterprise Linux 5

- Installation on Redhat Enterprise Linux 6

- Installation troubleshooting

3.1.3.4.1. Introduction

This guide will install the Atomia DNS Master server using a default installation. This means that both the Atomia DNS database and Atomia DNS API will be installed.

3.1.3.4.2. Installation on Ubuntu 10.04 LTS

1. Do a standard installation of Ubuntu 10.04 LTS.

2. Add the Atomia APT Repository to the server using:

   ```
   wget --q --O -- http://public.apt.atomia.com/setup.sh.shtml -| sed s/%distcode/
   `lsb_release --c -| awk -'{ print $2 -}'`/g -| sh
   ```

3. Update all packages:

   ```
   apt-get update
   ```

4. Install the Atomia DNS Master:

   ```
   apt-get install atomiadns-masterserver
   ```

5. Add the initial DNSSEC keyset (optional):

   See Creating the initial DNSSEC keyset for instructions.

3.1.3.4.3. Installation on FreeBSD

1. Do a standard installation of FreeBSD. The instructions where tested with FreeBSD 10.0-RELEASE, but should work on other versions as well.

2. Make sure you have an up-to-date ports collection, as described in the FreeBSD handbook [http:// www.freebsd.org/doc/en_US.ISO8859-1/books/handbook/updating-upgrading-portsnap.html].

3.   This step is only neccessary as long as the Atomia DNS ports are not in the main ports collection

   ```
   cd -/usr/ports/dns -; fetch --q --o -- http://atomiadns.com/tarballs/bleeding.tar.gz -|
   tar xvfpz -- ---strip-components 2 -"*/freebsd"
   ```

4. Install PostgreSQL:

   ```
   cd -/usr/ports/databases/postgresql91-server
   make BATCH=yes install
   ```

```
    echo -'postgresql_enable="YES"' >> -/etc/rc.conf
    /usr/local/etc/rc.d/postgresql initdb
    /usr/local/etc/rc.d/postgresql start
```

5. Install Atomia DNS:

   Make sure that your hostname exists in DNS or in /etc/hosts, otherwise the install might fail
   due to Apache complaining.

```
    cd -/usr/ports/dns/atomiadns-database
    make BATCH=yes install
    test x"$SHELL" = x"/bin/bash" && hash --r -; echo -"$SHELL" -| grep csh > -/dev/null
&& rehash
    atomiadns-sync-database
    cd -/usr/ports/dns/atomiadns-api
    echo -"DEFAULT_VERSIONS+=apache=2.2" >> -/etc/make.conf
    make BATCH=yes install
    cd -/usr/ports/dns/atomiadns-client
    make BATCH=yes install
    echo -'apache22_enable="YES"' >> -/etc/rc.conf
```

6. Optionally password protect the Atomia DNS installation (very much recommended):

```
                    cat > -/usr/local/etc/apache22/Includes/
atomiadns_password_protect.conf <<EOF
                    <Location -/>
     AuthUserFile -/usr/local/etc/apache22/atomiadns.htpasswd
     AuthName -"Atomia DNS"
     AuthType Basic
     require valid-user
    </Location>
                    EOF
                    # Remember the password that you enter, it is used in the next step,
and later when you add nameservers.
                    htpasswd --c -/usr/local/etc/apache22/atomiadns.htpasswd atomiadns
                    apachectl graceful
```

7. Test the installation by creating your first (and often only) nameserver group:

```
 echo -'soap_username=YOUR_OPTIONAL_BUT_OBVIOUSLY_HIGHLY_RECOMMENDED_API_SERVER_USERNAME'
>> -/etc/atomiadns.conf

 echo -'soap_password=YOUR_OPTIONAL_BUT_OBVIOUSLY_HIGHLY_RECOMMENDED_API_SERVER_PASSWORD'
>> -/etc/atomiadns.conf
                    atomiadnsclient ---method AddNameserverGroup ---arg default
```

8. Add the initial DNSSEC keyset (optional):

   See Creating the initial DNSSEC keyset for instructions.

3.1.3.4.4. Installation on Redhat Enterprise Linux 4

   We no longer recommend Redhat Enterprise Linux 4, latest version supported is Redhat
   Enterprise Linux 6

1. First setup the needed repositories.

```
rpm --Uhv http://apt.sw.be/redhat/el4/en/i386/rpmforge/RPMS/rpmforge-
release-0.3.6-1.el4.rf.i386.rpm
rpm --Uhv http://yum.pgsqlrpms.org/reporpms/8.4/pgdg-redhat-8.4-1.noarch.rpm
rpm --Uhv http://rpm.atomia.com/rhel4/atomia-repository-setup-1.0-1.noarch.rpm
```

2. Next install the Atomia DNS master server

```
up2date --i atomiadns-masterserver
```

3. Allow md5 authentication instead of ident for connections to 127.0.0.1/32 in /var/lib/pgsql/data/ pg_hba.conf, example row:

```
host    all       all       127.0.0.1/32        md5
```

4. Restart postgresql:

```
service postgresql restart
```

3.1.3.4.5. Installation on Redhat Enterprise Linux 5

We no longer recommend Redhat Enterprise Linux 5, latest version supported is Redhat Enterprise Linux 6

1. First setup the needed repositories.

```
rpm --Uhv http://apt.sw.be/redhat/el5/en/i386/rpmforge/RPMS/rpmforge-
release-0.3.6-1.el5.rf.i386.rpm
rpm --Uhv http://yum.pgsqlrpms.org/reporpms/8.4/pgdg-redhat-8.4-1.noarch.rpm
rpm --Uhv http://rpm.atomia.com/rhel5/atomia-repository-setup-1.0-1.noarch.rpm
```

2. Next install the Atomia DNS master server

```
yum install atomiadns-masterserver
```

3. Allow md5 authentication instead of ident for connections to 127.0.0.1/32 in /var/lib/pgsql/data/ pg_hba.conf, example row:

```
host    all       all       127.0.0.1/32        md5
```

4. Restart postgresql:

```
service postgresql restart
```

3.1.3.4.6. Installation on Redhat Enterprise Linux 6

1. First setup the needed repositories.

```
rpm --Uhv http://apt.sw.be/redhat/el6/en/i386/rpmforge/RPMS/rpmforge-
release-0.5.2-2.el6.rf.i686.rpm
rpm --Uhv http://yum.pgsqlrpms.org/reporpms/8.4/pgdg-redhat-8.4-1.noarch.rpm
rpm --Uhv http://public.rpm.atomia.com/rhel6/atomia-public-repository-
setup-1.0-1.el6.noarch.rpm
```

2. Next install the Atomia DNS master server

```
yum install atomiadns-masterserver
```

3. Allow md5 authentication instead of ident for connections to 127.0.0.1/32 in /var/lib/pgsql/data/ pg_hba.conf, example row:

```
host    all       all       127.0.0.1/32        md5
```

4. Restart postgresql:

```
service postgresql restart
```

3.1.3.4.7. Installation troubleshooting

3.1.3.5. Atomia DNS Master server manual installation

This guide will install the Atomia DNS Master server with the Atomia DNS database on a separate server from the Atomia DNS API.

3.1.3.5.1. Installation on Ubuntu 10.04 LTS

1. Do a standard installation of Ubuntu 10.04 LTS on two servers.

2. On both servers:

    a. Add the Atomia APT Repository to the server using:

    ```
    wget --q --O -- http://public.apt.atomia.com/setup.sh.shtml -| sed s/%distcode/
    `lsb_release --c -| awk -'{ print $2 -}'`/g -| sh
    ```

    b. Update all packages:

    ```
    apt-get update
    ```

3. Assign one of the servers to be Atomia DNS database server, on that server execute the following steps:

    a. Install the Atomia DNS database:

    ```
    apt-get install atomiadns-database
    ```

4. Assign one of the servers to be Atomia DNS API server, on that server execute the following steps:

    a. Install the Atomia DNS API:

    ```
    apt-get install atomiadns-api
    ```

3.1.3.6. Creating the initial DNSSEC keyset

If you want all zones to be signed, then after the Atomia DNS API server is installed you need to create the initial DNSSEC key set. In addition you will need to use a nameserver synchronization agent that supports DNSSEC; at the moment this means the PowerDNS agent.

The DNSSEC setup is completed by executing the following steps:

1. Install the command line client:

    ```
    apt-get install atomiadns-client
    ```

2. Add the active key signing key:

    ```
    atomiadnsclient ---method AddDNSSECKey ---arg RSASHA256 ---arg 2048 ---arg KSK ---arg 1
    ```

3. Add the active zone signing key:

    ```
    atomiadnsclient ---method AddDNSSECKey ---arg RSASHA256 ---arg 1024 ---arg ZSK ---arg 1
    ```

4. Add the inactive zone signing key:

    ```
    atomiadnsclient ---method AddDNSSECKey ---arg RSASHA256 ---arg 1024 ---arg ZSK ---arg 0
    ```

    Warning: The suggested workaround for random number generation in virtual machines will produce easily predictable and insecure DNSSEC keys. For production purposes, please solve it in a secure way. You have been warned.

    Adding DNSSEC keys on a virtual machine where you can't use keyboard input to generate entropy requires an additional step.

Install rng-tools using `apt-get install rng-tools`, then open `/etc/default/rng-tools` and add the following line, or better something equivalent but secure:

```
# WARNING: This setup is insecure, you should make sure that you have an adequate setup
# for generating cryptographically strong random numbers instead.
HRNGDEVICE = -/dev/urandom
```

Now, they key creation should be instant. Notice though that this setup is really insecure. You should instead configure rng-tools to provide sufficient amounts of random numbers in a secure way, e.g. by having better hardware for generating entropy.

3.1.4. Atomia DNS Master server configuration

If you use the recommended setup for the Atomia DNS Master server you don't need to edit the config file. A password is generated when creating the non-existing schema when the package is installed.

3.1.4.1. Configuration file

The config file used by Atomia DNS API is placed at `/etc/atomiadns.conf` and contains the following settings:

Parameter	Example	Description
db_name	zonedata	The name of the database.
db_hostname	localhost	The hostname where the database is running.
db_username	atomiadns	Username of the database.
db_password	password_for_the_username	Password for the database.

Default config file:

```
db_name = zonedata
db_hostname = localhost
db_username = atomiadns
db_password = autogeneratedpassword
```

3.1.5. Atomia DNS Master server updates

- Introduction

- Updates on Ubuntu 10.04 LTS

  - Where to get updates?

- Updates on Redhat Enterprise Linux

  - Where to get updates?

3.1.5.1. Introduction

Updates are done by installing the latest version of the installed packages.

Any change in the dependencies will be handled appropriately by the installation package, upgrading or installing them as needed.

If the database schema has changed, the schema on the Atomia DNS Master server will be automatically updated. If you have chosen to have the database on a separate server, you will have to update the atomiadns-database package on that server as well. All schema changes are noted in the release notes for the new version.

3.1.5.2. Updates on Ubuntu 10.04 LTS

To install an update, complete the following steps:

1. Update all packages:

```
apt-get update
```

2. Note the version number of the package currently installed.

3. Install updates using:

```
apt-get install atomiadns-masterserver
```

If you for some reason want to rollback to the previous version, then run:

```
apt-get install atomiadns-masterserver=version-number-noted
```

3.1.5.2.1. Where to get updates?

Updates are distributed using the Atomia APT repository. If not done, then add the Atomia APT Repository to the server using:

```
wget --q --O -- http://public.apt.atomia.com/setup.sh.shtml -| sed s/%distcode/
`lsb_release --c -| awk -'{ print $2 -}'`/g -| sh
```

3.1.5.3. Updates on Redhat Enterprise Liux

To install an update, complete the following steps:

1. Clean the cache so that you are sure that you get the latest:

```
yum clean expire-cache ---disablerepo -"*" ---enablerepo atomia
```

2. Upgrade the package:

```
yum install atomiadns-masterserver
```

3.1.5.3.1. Where to get updates?

Updates are distributed using the Atomia RPM repository.

3.1.6. Atomia DNS Master server usage

3.1.6.1. Atomia DNS API

The Atomia DNS Master server is administrated using an API which you can use to create a web interface or other applications. For information on how the API works and how to use it see Atomia DNS API .

3.1.6.2. Atomia DNS DynDNS

The Atomia DNS DynDNS client is used to handle DynDNS updates according to the DNS protocol. The client acts as a regular nameserver but only has support for DynDNS updates. For information on how DynDNS works and how to use it see Atomia DNS DynDNS .

3.1.7. Master database

The schema for the Atomia DNS database can be found on the Atomia DNS Master server in `/usr/share/atomiadns/schema` .

It contains the following tables:

Table	Description
allowed_type	Ccontains a list of allowed DNS types together with regular expressions for validating data.
updates_disabled	Always contains a single row stating if updates to the nameservers are disabled or enabled.
nameserver	Contains one row of all nameservers subscribing to this data set.
change	Contains one row for every changed zone per nameserver that hasn't propagated the change yet.
zone	Contains the zone name and a primary key.
label	Contains the label name, a foreign key mapping the label to a zone and a primary key.
record	Contains the record data, a foreign key mapping the record to a label and a primary key.

It also contains a number of triggers for validating data and one stored procedure for every method in the Atomia DNS API .

3.2. Atomia DNS Bind-DLZ Nameserver

3.2.1. What is the Atomia DNS Bind-DLZ Nameserver?

We no longer recommend the Bind-DLZ sync agent, the PowerDNS integration is more actively developed and is a requirement for DNSSEC support

The nameserver includes the popular BIND nameserver configured to use a local database instead of zone files. All nameservers will also have the Atomia DNS Sync application installed which provisions changes to the local database and also settings for BIND from the data in the Atomia DNS database.

3.2.2. Atomia DNS Bind-DLZ Nameserver documentation

Please locate the desired information in one of the following sections:

- Atomia DNS Bind-DLZ Nameserver installation

- Atomia DNS Bind-DLZ Nameserver configuration

- Atomia DNS Bind-DLZ Nameserver updates

- Atomia DNS Bind-DLZ Nameserver usage

- Atomia DNS Bind-DLZ Nameserver technical information

3.2.3. Atomia DNS Bind-DLZ Nameserver installation

- Introduction

- Installation on Ubuntu LTS

- Installation on Redhat Enterprise Linux 4

- Software used by Atomia DNS Bind-DLZ Nameserver

- Installation troubleshooting

3.2.3.1. Introduction

This guide will install the Atomia DNS Bind-DLZ Nameserver.

3.2.3.2. Installation on Ubuntu LTS

1. Install the latest Ubuntu LTS relase.

2. Add the Atomia APT Repository to the server using:

```
wget --q --O -- http://public.apt.atomia.com/setup.sh.shtml -| sed s/%distcode/
`lsb_release --c -| awk -'{ print $2 -}'`/g -| sh
```

3. Install the Bind-DLZ package we provide:

```
apt-get install bind9-dlz-bdbhpt
```

4. Install the Atomia DNS Bind-DLZ Nameserver:

```
apt-get install atomiadns-nameserver
```

5. Install the Atomia DNS Client utility:

```
apt-get install atomiadns-client
```

6. Edit the configuration file:

```
edit -/etc/atomiadns.conf
```

   a. Change the soap_uri row to contain the hostname of your Atomia DNS Master server

   b. Add a row looking like 'server_name = hostname of this node'

   c. Example configuration:

```
servername = your.name.server
soap_uri = https://your.atomia.dns.master.server.com/atomiadns
soap_cacert = -/etc/atomiadns_soap_cert.crt
soap_username = atomia
soap_password = XXXXXX
bdb_environment_path = -/var/lib/bind/atomiadns_bdb
bdb_filename = dns_data.db
rndc_path = -/usr/sbin/rndc
slavezones_config = -/etc/bind/slave/named-slavezones.conf.local
slavezones_dir = -/etc/bind/slave/zones
```

7. If this is the first server in it's nameserver group, then add the group (substitute groupname):

```
atomiadnsclient ---method AddNameserverGroup ---arg groupname
```

8. Add the nameserver as a subscriber of the zones in the configured Atomia DNS Master server (substitute groupname):

```
atomiadnssync add_server groupname
```

9. Start the daemon that fetches updates and replicates those to the local zone database:

```
/etc/init.d/atomiadns-nameserver start
```

10. Initiate a full reload of all zones in the Atomia DNS Master sever (all nameservers are reloaded):

```
atomiadnssync full_reload_online
```

11. Start BIND:

```
/etc/init.d/bind9-dlz-bdbhpt start
```

3.2.3.3. Installation on Redhat Enterprise Linux 4

1. First setup GPG-keys for the needed repositories.

```
rpm --Uhv http://apt.sw.be/redhat/el4/en/i386/rpmforge/RPMS/rpmforge-
release-0.3.6-1.el4.rf.i386.rpm
rpm --Uhv http://rpm.atomia.com/rhel4/atomia-repository-setup-1.0-1.noarch.rpm
```

2. Then configure up2date to use them, by adding to /etc/sysconfig/rhn/sources:

```
yum atomia http://rpm.atomia.com/rhel4
yum dag http://apt.sw.be/redhat/el4/en/$ARCH/dag
```

3. Install the Atomia DNS master server:

```
up2date --i atomiadns-nameserver
```

4. Install the Atomia DNS Client utility:

```
up2date --i atomiadns-client
```

5. Edit the configuration file:

```
edit -/etc/atomiadns.conf
```

   a. Change the soap_uri row to contain the hostname of your Atomia DNS Master server

   b. Add a row looking like 'server_name = hostname of this node'

   c. Example configuration:

```
servername = your.name.server
soap_uri = https://your.atomia.dns.master.server.com/atomiadns
soap_cacert = -/etc/atomiadns_soap_cert.crt
soap_username = atomia
soap_password = XXXXXX
bdb_environment_path = -/var/lib/bind/atomiadns_bdb
bdb_filename = dns_data.db
rndc_path = -/usr/sbin/rndc
slavezones_config = -/etc/bind/slave/named-slavezones.conf.local
slavezones_dir = -/etc/bind/slave/zones
```

6. If this is the first server in it's nameserver group, then add the group (substitute groupname):

```
atomiadnsclient ---method AddNameserverGroup ---arg groupname
```

7. Add the nameserver as a subscriber of the zones in the configured Atomia DNS Master server (substitute groupname):

```
atomiadnssync add_server groupname
```

8. Start the daemon that fetches updates and replicates those to the local zone database:

```
service atomiadnssync start
```

9. Initiate a full reload of all zones in the Atomia DNS Master sever (all nameservers are reloaded):

```
atomiadnssync full_reload_online
```

10 Start BIND:

```
service bind start
```

3.2.3.4. Software used by Atomia DNS Bind-DLZ Nameserver

On the nameservers the following software is needed:

- *Config::General*

- *SOAP::Lite*

- *Moose*

- *BerkeleyDB*

- *Bind9 compiled with DLZ and the bdbhpt driver linked to the same bdb-version as the BerkeleyDB module*

All needed software, including prerequisites are installed by the provided package, *atomiadns-nameserver* .

3.2.3.5. Installation troubleshooting

3.2.4. Atomia DNS Bind-DLZ Nameserver configuration

You have to configure the Atomia DNS Bind-DLZ Nameserver to fit your environment.

3.2.4.1. Configuration file

The config file used by Atomia DNS Bind-DLZ Nameserver is placed in `/etc/atomiadns.conf` and contains the following settings:

Parameter	Example	Description
bdb_environment_path	/var/lib/bind/atomiadns_bdb	Path where the database should be stored.
soap_uri	http:// hostname.of.your.soap.server/ atomiadns	URI of the Atomia DNS API.
bdb_filename	dns_data.db	Filename of the database.
servername	ns1.yourhost.com	Hostname of the nameserver.

soap_uri and servername always needs to be changed. For the other two parameters, the default settings will work.

Default config file:

```
bdb_environment_path = ~/var/lib/bind/atomiadns_bdb
soap_uri = http://your.atomia.dns.master.server.com/atomiadns
bdb_filename = dns_data.db
servername = your.name.server
slavezones_config = ~/etc/bind/slave/named-slavezones.conf.local
slavezones_dir = ~/etc/bind/slave/zones
```

3.2.4.2. Scripts and commands

For more information on how to use the Atomia DNS Sync application see Atomia DNS Bind-DLZ Nameserver usage .

3.2.5. Atomia DNS Bind-DLZ Nameserver updates

To install an update, complete the following steps:

1. Update all packages:

```
apt-get update
```

2. Note the version number of the package currently installed.

3. Install updates using:

```
apt-get install atomiadns-nameserver
/etc/init.d/atomiadns-nameserver restart
```

If you for some reason want to rollback to the previous version, then run:

```
apt-get install atomiadns-nameserver=version-number-noted
```

Any changes in the dependencies will be handled appropriately by the installation package, upgrading or installing them as needed.

3.2.5.1. Where to get updates?

Updates are distributed using the Atomia APT repository. If not done, then add the Atomia APT Repository to the server using:

```
wget --q --O -- http://public.apt.atomia.com/setup.sh.shtml -| sed s/%distcode/
`lsb_release --c -| awk -'{ print $2 -}''`/g -| sh
```

3.2.5.2. Atomia DNS Building new Bind-DLZ RPMS

3.2.5.2.1. Instructions

To build new RPMS for Bind-DLZ whenever an important new release is made we use the following steps:

1. Login to build machine for the OS release in question (e.g. RHEL5, RHEL4 etc).

2. Download   bind9_rhel5_rpm.patch   [https://raw.github.com/atomia/atomiadns/develop/syncer/bind9_rhel5_rpm.patch] and place it in /usr/src/redhat

3. Checkout redhat package sources:

```
cvs --d -":pserver:anonymous@cvs.fedoraproject.org:/cvs/pkgs" co rpms/bind
```

4. Use the latest non-devel version of the spec:

```
cd rpms/bind/F-12
```

5. Patch the package sources to include the things we need:

```
patch --p1 < -/usr/src/redhat/bind9_rhel_rpm.atomia.patch
```

6. Build the SRPM:

```
rm *rpm -; make srpm
```

7. Install the sources and SPEC-file:

```
rpm --i *rpm
```

8. Build it:

```
cd -/usr/src/redhat/SPECS && rpmbuild --bb ---sign bind.spec
```

3.2.6. Atomia DNS Bind-DLZ Nameserver usage

3.2.6.1. Sync application

The sync application is called atomiadnssync. You can view its manual page here or by running:

```
man atomiadnssync
```

3.2.6.2. Atomia DNS Sync manual

3.2.6.2.1. NAME

atomiadnssync - An application for synchronizing a local BDB database with the master zone database using SOAP.

3.2.6.2.2. SYNOPSIS

```
atomiadnssync full_reload_offline SERIAL DESTINATION
atomiadnssync OPTION
```

3.2.6.2.3. DESCRIPTION

atomiadnssync is an application for synchronizing a local BDB database with the master zone database using SOAP.

It contains options for both doing a full reload of all zones in the master database, and for just fetching the zones changed since the last update and reloading those.

In addition you can use this tool for adding or removing the subscription of updates for a nameserver, and for enabling and disabling propagation of updates globally across all nameservers.

3.2.6.2.4. OPTIONS

```
full_reload_offline SERIAL DESTINATION
```

- Propagates all zones to a fresh BDB environment stored in the destination folder (should be empty before running). All zones get the serial specified in their SOA-record. This command should always be run with the same user BIND is running as.

```
full_reload_online
```

- Marks all zones as changed so that the update-process propagates them on all nameservers.

```
full_reload_slavezones
```

- Marks all slave zones as changed so that the update-process propagates them on all nameservers.

```
updated
```

- Fetches a list of changed zones and adds/removes them from the local BDB database. This option is used by the daemon started at boot-time by /etc/init.d/atomiadns-nameserver. You should never run this manually.

```
add_server
```

- Adds this server (configured using servername in /etc/atomiadns.conf) as a subscriber of the data set on the configured SOAP server.

```
remove_server
```

- Remove the subscription of the data set on the configured SOAP server for this server (configured using servername in /etc/atomiadns.conf).

```
disable_updates
```

- Disable propagation of changes to the nameservers.

`enable_updates`

- Enable propagation of changes to the nameservers

3.2.6.2.5. CONFIGURATION

The application is configured using a config file stored at /etc/atomiadns.conf. All options are required.

The following options exist:

`bdb_environment_path`

- Specifies the path of the local BDB environment. The default is /var/lib/bind/atomiadns_bdb, and does probably not need to change.

`bdb_filename`

- Specifies the filename (relative to bdb_environment_path) of the local BDB database. The default is dns_data.db, and does probably not need to change.

`soap_uri`

- Specifies the URI of the SOAP Server to fetch changes from.

`servername`

- Specifies the filename which contain a list of the configured slave zones.

`slavezones_config`

- Specifies the hostname used when subscribing and checking for changes.

`slavezones_dir`

- Specifies the directory where zone files for the slave zones are stored.

3.2.6.2.6. EXAMPLES

To do a full reload to a new folder without missing any updates (assuming the default bdb_environment_path), do:

1. atomiadnssync disable_updates

2. Verify manually that no pending changes exist.

3. Write down the output (unix timestamp) of `date +%s`

4. Run `atomiadnssync full_reload_offline the_timestamp /var/lib/bind/atomiadns_bdb_new

5. rm -rf /var/lib/bind/atomiadns_bdb_old ; mv /var/lib/bind/atomiadns_bdb /var/lib/bind/atomiadns_bdb_old ; mv /var/lib/bind/atomiadns_bdb_new /var/lib/bind/atomiadns_bdb

6. rndc reload

7. atomiadnssync enable_updates

Or to accomplish the same thing using the online reload feature (much better and the preferred way):

atomiadnssync full_reload_online

To add the server as a subscriber:

atomiadnssync add_server

3.2.6.2.7. AUTHOR

Atomia DNS was developed by Atomia AB. For support, please see http://www.atomiadns.com/.

3.2.7. BDB databases on the nameservers

On the nameservers the location of the BDB databases is configured in `/etc/atomiadns` using `bdb_environment_path` and `bdb_filename` .

You can use the regular BDB utilities to do things like hot backup and crash recovery.

More information can be found in the BDB documentation, for example: http://www.oracle.com/technology/documentation/berkeley-db/db/ref/transapp/archival.html http://www.oracle.com/technology/documentation/berkeley-db/db/ref/transapp/recovery.html

If the BDB databases were to become corrupt, the recommended solution would be to do a full resync of the BDB databases from the master. This is done using the atomiadnssync tool .

3.3. Atomia DNS PowerDNS Nameserver

3.3.1. What is the Atomia DNS PowerDNS Nameserver?

The nameserver includes the popular PowerDNS nameserver configured to use a local MySQL database instead of zone files. All PowerDNS nameservers will also have the Atomia DNS PowerDNS Sync application installed which provisions changes to the local database from the data in the Atomia DNS database.

3.3.2. Atomia DNS PowerDNS Nameserver documentation

Please locate the desired information in one of the following sections:

- Atomia DNS PowerDNS Nameserver installation

3.3.3. Atomia DNS PowerDNS Nameserver installation

- Introduction

- Installation on Ubuntu LTS

- Installation on FreeBSD

- Software used by Atomia DNS PowerDNS Nameserver

3.3.3.1. Introduction

This guide will install the Atomia DNS PowerDNS Nameserver.

3.3.3.2. Installation on Ubuntu LTS

1. Install the latest Ubuntu LTS relase.

2. Add the Atomia APT Repository to the server using:

```
wget --q --O -- http://public.apt.atomia.com/setup.sh.shtml -| sed s/%distcode/
`lsb_release --c -| awk -'{ print $2 -}'`/g -| sh
```

3. Install the database schema (will also install MySQL):

```
apt-get install atomiadns-powerdns-database
```

4. To configure the nameserver to get zones from your Atomia DNS installation, add soap_uri, soap_cacert, soap_username and soap_password to /etc/atomiadns.conf

```
soap_uri = https://some.server.example.com/atomiadns
soap_cacert = -/path/to/CA_cert_that_signed_SSL_cert
```

```
soap_username = someuser
soap_password = somepass
```

5. Also to /etc/atomiadns.conf add the subscriber name for this nameserver:

```
servername = powerdns1
```

6. Install the PowerDNS sync agent:

```
apt-get install atomiadns-powerdnssync
```

7. Add the nameserver as subscriber of the zones (replace default with whatever server group it is to be member of):

```
atomiapowerdnssync add_server default
```

8. Start the daemon:

```
start atomiadns-powerdnssync
```

9. Sync all zones:

```
atomiapowerdnssync full_reload_online
```

10. Go to http://powerdnssec.org/downloads/packages/ and download the latest .deb package

11. Install it using (replace filename):

```
dpkg --i pdns-static_3.0-rc1-1_amd64.deb
```

   a. When it asks if you want to replace /etc/powerdns/pdns.conf, just press enter to keep the version that atomiadns-powerdns-database preconfigured for you.

3.3.3.3. Installation on FreeBSD

1. Do a standard installation of FreeBSD. The instructions where tested with FreeBSD 10.0-RELEASE, but should work on other versions as well.

2. Make sure you have an up-to-date ports collection, as described in the FreeBSD handbook [http://www.freebsd.org/doc/en_US.ISO8859-1/books/handbook/updating-upgrading-portsnap.html].

3. This step is only neccessary as long as the Atomia DNS ports are not in the main ports collection

```
cd -/usr/ports/dns -; fetch --q --o -- http://atomiadns.com/tarballs/bleeding.tar.gz -|
tar xvfpz -- ---strip-components 2 -"*/freebsd"
```

4. Install MySQL and create the database:

```
    cd -/usr/ports/databases/mysql55-server
    make BATCH=yes install
    echo -'mysql_enable="YES"' >> -/etc/rc.conf
    /usr/local/etc/rc.d/mysql-server start
    mysql --u root mysql --e -"drop database test; delete from db; delete from user where
user = -''; delete from user where host << -'localhost'; flush privileges"
    mysqladmin create powerdns
    set powerdns_pw=`sh --c -'dd if=/dev/urandom bs=1024 count=1 2> -/dev/null -| sha1'`
    mysql --u root --e -"grant all on powerdns.* to -'powerdns'@'localhost' identified
by -'$powerdns_pw'"
    cat > -/root/pdns.conf.tmp <<EOF
    launch=gmysql
    gmysql-host=localhost
    gmysql-user=powerdns
    gmysql-dbname=powerdns
```

```
gmysql-password=$powerdns_pw
gmysql-dnssec=yes
EOF
```

5. Install PowerDNS:

```
cd ~/usr/ports/dns/powerdns
make BATCH=yes WITH_MYSQL=YES WITHOUT_PGSQL=YES install
echo -'pdns_enable="YES"' >> ~/etc/rc.conf
echo -'pdns_flags="--daemon ---guardian=yes"' >> ~/etc/rc.conf
mv ~/root/pdns.conf.tmp ~/usr/local/etc/pdns/pdns.conf
```

6. Install atomiadns-powerdnssync:

```
cd ~/usr/ports/dns/atomiadns-powerdnssync
make BATCH=yes install
atomiadns-sync-powerdns-database ~/usr/local/etc/pdns/pdns.conf
echo -"servername = `hostname`" >> ~/etc/atomiadns.conf
echo -'soap_uri=http://INSERT_IP_OF_API_SERVER/atomiadns' >> ~/etc/atomiadns.conf

 echo -'soap_username=YOUR_OPTIONAL_BUT_OBVIOUSLY_HIGHLY_RECOMMENDED_API_SERVER_USERNAME'
>> ~/etc/atomiadns.conf

 echo -'soap_password=YOUR_OPTIONAL_BUT_OBVIOUSLY_HIGHLY_RECOMMENDED_API_SERVER_PASSWORD'
>> ~/etc/atomiadns.conf
echo -'atomiapowerdnssync_enable="YES"' >> ~/etc/rc.conf
atomiapowerdnssync add_server default
/usr/local/etc/rc.d/atomiapowerdnssync start
atomiapowerdnssync full_reload_online
```

7. Start PowerDNS:

```
/usr/local/etc/rc.d/pdns start
```

3.3.3.4. Software used by Atomia DNS PowerDNS Nameserver

On the nameservers the following software is needed:

- PowerDNS

- MySQL

- Atomia DNS PowerDNS sync

3.4. Atomia DNS DynDNS

3.4.1. What is the Atomia DNS DynDNS server?

Atomia DNS DynDNS provides a DynDNS server supporting standard DNS update requests, performing the updates using an Atomia DNS Master server installation.

When using Atomia DNS DynDNS any standard DynDNS client can be used. Examples include:

1. nsupdate

2. dhcpd

3. Windows DHCP client service

3.4.2. Atomia DNS DynDNS server documentation

Please locate the desired information in one of the following sections:

- Atomia DNS DynDNS configuration
- Atomia DNS DynDNS installation
- Atomia DNS DynDNS technical information
- Atomia DNS DynDNS updates
- Atomia DNS DynDNS usage

3.4.3. Atomia DNS DynDNS configuration

You have to configure the Atomia DNS DynDNS server to fit your environment.

3.4.3.1. Configuration file

The config file used by Atomia DNS DynDNS is placed in `/etc/atomiadns.conf` and contains the following settings:

Parameter	Example	Description
soap_uri	http://hostname.of.your.soap.server/atomiadns	URI of the Atomia DNS API.
tsig_keyname	atomia-dns-key	The name of the shared key that all authorized DDNS clients needs to use.
tsig_key	ZXhhbXBsZQ==	The base64-encoded shared key used to authorize DDNS updates.

soap_uri and tsig_key always needs to be changed. For the other parameter, the default settings will work if used at the clients as well.

Default config file:

```
soap_uri = http://your.atomia.dns.master.server.com/atomiadns
tsig_keyname = atomia-dns-key
#tsig_key = ZXhhbXBsZQ==
```

3.4.3.2. Scripts and commands

For more information on how to use the Atomia DNS DynDNS server see Atomia DNS DynDNS usage .

3.4.4. Atomia DNS DynDNS installation

3.4.4.1. Installing Atomia DNS DynDNS server

1. Do a standard installation of Ubuntu 10.04 LTS.

2. Add the Atomia APT Repository to the server using:

```
wget --q --O -- http://public.apt.atomia.com/setup.sh.shtml -| sed s/%distcode/
`lsb_release --c -| awk -'{ print $2 -}'`/g -| sh
```

3. Update all packages:

```
apt-get update
```

4. Install the Atomia DNS DynDNS server:

```
apt-get install atomia-dyndns
```

5. Edit the configuration file:

```
edit -/etc/atomiadns.conf
```

a. Change the soap_uri row to contain the hostname of your Atomia DNS Master server

b. Add a row looking like 'tsig_key = SomeBase64_encoded_value '

c. Example configuration:

```
soap_uri = http://your.atomia.dns.master.server.com/atomiadns
tsig_keyname = atomia-dns-key
tsig_key = kT6ulFA6Dg0qyRZv9vRrkA==
ver
```

6. Start the DynDNS server:

```
/etc/init.d/atomia-dyndns start
```

3.4.4.2. Software used by Atomia DNS DynDNS

On the DynDNS server the following software is needed:

- *Config::General*

- *SOAP::Lite*

- *Net::DNS*

All needed software, including prerequisites are installed by the provided package, *atomia-dyndns* .

3.4.5. Architecture

Atomia DNS DynDNS accepts DNS update requests on port 5353, authenticates them using a key shared with authorized clients and then connects to the Atomia DNS Master server to perform the needed prerequisite checks and/or updates.

3.4.6. Atomia DNS DynDNS updates

To install an update, complete the following steps:

1. Update all packages:

```
apt-get update
```

2. Note the version number of the package currently installed.

3. Install updates using:

```
apt-get install atomia-dyndns
/etc/init.d/atomia-dyndns restart
```

If you for some reason want to rollback to the previous version, then run:

```
apt-get install atomia-dyndns=version-number-noted
```

Any changes in the dependencies will be handled appropriately by the installation package, upgrading or installing them as needed.

3.4.6.1. Where to get updates?

Updates are distributed using the Atomia APT repository. If not done, then add the Atomia APT Repository to the server using:

```
wget --q --O -- http://public.apt.atomia.com/setup.sh.shtml -| sed s/%distcode/
`lsb_release --c -| awk -'{ print $2 -}'`/g -| sh
```

3.4.7. Client applications

The Atomia DNS DynDNS application only comes with the DDNS server. To update zones using the server all standard DDNS clients, like nsupdate, can be used.

The server listens on port 5353 to distinguish it from authorative nameservers (it only handles the UPDATE opcode, not other queries against the handled zones).

Example using nsupdate (which is included with Bind):

```
cat <<EOF -| nsupdate
server your.dyndns.server 5353
zone some.zone.com
key atomia-dns-key ZXhhbXBsZQ==
prereq yxrrset somehost.some.zone.com A
update delete somehost.some.zone.com A
update add somehost.some.zone.com 300 A 127.0.0.1
send
EOF
```

4. FAQ

- What hardware is required for the Atomia DNS system?

- What software is required for the Atomia DNS system?

- How many queries can Atomia DNS handle?

- How well does Atomia DNS scale?

- How do I administrate zones in Atomia DNS?

- The database on my Atomia DNS Bind-DLZ Nameserver has been corrupted. How do I fix it?

4.1. What hardware is required for the Atomia DNS system?

The absolute minimum requirement is one machine, but this would require the Atomia DNS Master server and Atomia DNS Bind-DLZ Nameserver to be installed on the same machine which is not recommended.

A more likely scenario would be:

1. Server running Atomia DNS Master.

2. Backup replica of the Atomia DNS Master database.

3. Two or more servers running Atomia DNS Bind-DLZ Nameserver.

For larger installations it is also possible to install Atomia DNS API and Atomia DNS database on separate machines.

4.2. What software is required for the Atomia DNS system?

The software requirements for the Atomia DNS Master are listed in the Atomia DNS Master server installation instructions and the software requirements for Atomia DNS Bind-DLZ Nameserver are listed in the Atomia DNS Bind-DLZ Nameserver installation instructions.

4.3. How many queries can Atomia DNS handle?

The Atomia DNS Bind-DLZ Nameserver has been tested using dnsperf (http://www.nominum.com/services/measurement_tools.php) on a modest system to see its performance.

With dnsperf running on the same machine as the nameserver, this modest system managed to handle 8609 queries per second.

4.4. How well does Atomia DNS scale?

Atomia DNS can scale to handle large DNS infrastructures both on the back end and in terms of nameservers. To be able to scale and handle many DNS queries you only need to add more nameservers into the system. The load will then be spread across all nameservers.

The Atomia DNS Master doesn't usually have a high load since it is only used to provision changes to the nameservers. To scale the Atomia DNS Master server, the Atomia DNS API and Atomia DNS Database can be installed on separate servers. For higher requirements it is also possible to load balance the API using several servers.

4.5. How do I administrate zones in Atomia DNS?

Atomia DNS comes with an API containing functions for administrating DNS settings.

4.6. The database on my Atomia DNS Bind-DLZ Nameserver has been corrupted. How do I fix it?

The recommended way is to do a full resync using Atomia DNS Sync. More information about this can be found in the Atomia DNS Sync manual .
<xi:include></xi:include>