



ZoneControl

User Guide

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FIRST STEPS WITH ZONECONTROL

ZoneControl is a web-based tool that facilitates the editing of DNS domains, known as “zones”. It also supports modifying slave notification settings, AXFR settings and enabling DNSSEC on these zones.

1.1 Main window

After logging in, the main screen is presented.



Fig. 1.1: The main window of ZoneControl.

This window lists all the zones on all the servers. Each zone line consists of the following elements:

Name shows the full name of the zone. An additional label indicates it is read-only.

Kind is one of “master”, “slave” or “native”. A “slave” zone cannot be modified, as its data is retrieved from a master server. A “master” zone can be edited and is generally distributed to other DNS servers that serve as slaves. The “native” zone kind indicates data replication is not done via DNS-based replication, but via another mechanism, like database level replication.

The **Serial** is the serial number in the SOA record of this zone. This number is used by “slave” servers to check if their copy of the DNS data is still up to date. On “master” zones – and “slave” zones that are configured to send notifications – a cloud shaped icon is shown. A blue icon indicates that the serial number for which a notification was sent does not match the current serial number. A notification will be sent at a later moment (the exact time depends on the DNS server configuration), at which point the icon will turn green.

In the **DNSSEC** field, a label is present if this zone is DNSSEC secured.

The **Server** field shows the server on which this zone resides. A zone with the same name can be on multiple servers, for instance as a “master” on one, and as a “slave” on many others.

The **Actions** field has several buttons for quick access to some actions for the zone. These buttons are:

- **4** History. Shows the history of all changes made to records in this zone.
- **5** Export. Exports the zone to a *zonefile* format.
- **6** Delete. Deletes the zone from the server.

When more than 25 records exists, the list is paginated. The page-controls are at the bottom of the list and the hotkeys *ctrl+f* and *ctrl+b* can be used to go a page forward or backbrad, respectively.

Above the list of zones, several other fields and buttons are visible.

Number **1** is the search field. This can be used to filter the list of zones.

Clicking on **2** shows a dialog to add a new zone. This dialog is explained in another chapter.

The username is displayed at **3**. Clicking the username will open a menu with several options, depending on the user's permissions. This menu also contains the logout button.

1.2 Adding a zone

When clicking on the "Add zone" button in the main screen of ZoneControl, the "[Add new zone](#)" dialog window is shown. This dialog window has all the fields required to add a new zone.

To add a zone, first select a server where this zone shall live (**1**). Then fill in the zone name at **2**, with a trailing dot. Select the kind of zone this is at **4**. Depending on the type of zone, one of two things will need to be filled in at **5**.

Instead of filling in the details above it is also possible to select a template at **3**. Please see [Zone Templates](#) for more information.

For native and master zones, fill in the [NS records](#) for this zone (with trailing dots).

Note: No corresponding slave zones are created on the specified servers, these need to be added manually.

For a slave zone, fill in the IP address(es) of the master server(s) for this zone.

After clicking the "Add" button (**6**), the data in this dialog is checked. If there are any input errors, they will be displayed in within this dialog. After the zone is added, the zone will appear in the [main window](#)'s zone list.

Once added, a slave zone will be retrieved from its master, and a master zone will send out notifications to its (potential) slave servers.

Fig. 1.2: The "Add zone" dialog window.

CHAPTER

TWO

EDITING ZONES

Editing zone contents is done in the zone details page, which is opened by clicking on the name of a zone in the [main window](#).

2.1 Zone details page

The screenshot shows the ZoneControl interface for editing the 'powerdns.com. zone'. The interface includes a header with the POWERDNS logo, a 'Zone Control' tab, and a user profile 'pieter'. Below the header, there's a section for 'powerdns.com. zone' with buttons for 'DNSSEC enabled', 'Master', 'Export', and 'History'. A search bar is present. The main content is a table of DNS records with columns: Name, Type, TTL, and Records. The table lists records for powerdns.com, including SOA, NS, MX, A, and AAAA records. Each record has a set of buttons for adding, deleting, and editing.

Name	Type	TTL	Records
powerdns.com. [7]	SOA	1H	primary pdns-public-ns1.powerdns.com. email pieter@lexis.powerdns.com. serial 2017120601 refresh 3H retry 1H expire 1W negative 1H
	NS	1H	pdns-public-ns2.powerdns.com. pdns-public-ns1.powerdns.com.
	MX	1H	75 download1.powerdns.com. 25 tmpmail.powerdns.com.
	A	1H	188.166.104.92
	AAAA	1H	2a03:b0c0:2:d0::4ab:8001

Fig. 2.1: The zone details screen of ZoneControl.

This page lists all the DNS records in the zone in a table. Each row has the following elements:

Name(**7) shows the exact name of this record. It is *fully qualified*, which means that it includes the parent zone's name.

The **Type** field shows the type of the record.

TTL: The Time to Live value of this record, shown in a shorthand if possible. Possible value suffixes for this shorthand are: 'H' for 'Hours', 'M' for 'Minutes', 'D' for 'Days' and 'W' for 'Weeks'. If no unit is present, the value is given in seconds.

The **Records** column shows the record's data for **Name** and **Type** and contains several buttons to manipulate this record. **8** is a shortcut for **1** and opens the [New record](#) dialog window with the current domain prefilled. Pressing **9** slates the record for deletion and **10** opens the [Edit record](#) dialog. When the logged-in user's permissions are insufficient, or when the zone cannot be edited (e.g. because it is a slave zone), these buttons are not visible.

When more than 200 records exists, the list is paginated. The page-controls are at the bottom of the records and the hotkeys *ctrl+f* and *ctrl+b* can be used to go a page forward or backbrad, respectively.




Fig. 2.2: The DNSSEC button when DNSSEC is disabled for this zone.

At the top of this window, next to the zone name, several buttons provide additional information about the zone. These buttons can be clicked to open a dialog window with relevant configuration items.

2 shows the DNSSEC state of the zone. It is green when DNSSEC is enabled and white when it is disabled. Clicking this button opens the *DNSSEC dialog* window.



Fig. 2.3: Native and Slave zone buttons. The red Master zone button is not shown here.

The zone kind button (**3**) shows what kind of the zone this is. This is one of *master*, *slave* or *native*. Clicking this button opens the *Zone kind dialog* window.

Clicking the Export button (**4**) generates an export of the zone in *zone file* format. Your browser will offer to download this file.

The History button opens the zone history window, where all the past changes to this zone are listed, with the latest changes on top. This view can also be used to restore a previous version of the zone if necessary.




Fig. 2.4: The Save changes button.

Any changes made to the zone in this window are not directly sent to the PowerDNS Authoritative Server, but kept within the browser. When there are pending changes, a button appears at the top of the window displaying the number of pending changes. Clicking this button opens the "Confirm Save" dialog.

Note: If you close the browser window without saving, your pending changes will be lost.

2.2 Adding a new record

Fig. 2.5: The New Record dialog window.

When adding a new record, several pieces of information need to be filled in.

Field **1** contains the name of the record. The name on the record must always be relative to the zone, as alluded to in the dialog. Leaving this field empty creates a record at the top of the zone.

The selector at **2** specifies the type of record that will be added. The buttons to the right of this field are shortcuts to frequently used DNS types.

The TTL field (**3**) sets the Time to Live for this record. This field accepts a number of seconds, or a shorthand notation like "10M" for a 10 minute (600 second) TTL. To the right you will find several shortcuts for frequently used TTLs.

Note: In DNS, the TTL applies to the *record set*, not to a single record.

The Records field at **4** is used to input the contents of the record(s), one item per line. You can prefix individual records with ; to disable them, in which case they will not be served by the DNS server.

Note: Disabled records will be validated on save, just like active records. You cannot use this for adding arbitrary comments.

When adding IPv4 and IPv6 addresses (A and AAAA records), the IP addresses can be suffixed with a * to indicate a PTR ("reverse") record should be created for this address.

Note: On save, the server will check if a zone exists to store the PTR. If none exists, the whole save transaction is aborted.

Check the box at **5** to schedule this change for the future. See the chapter on scheduled changes for more information.

Upon clicking the “OK” button, the new record is added to the pending changes.

2.3 Editing a record

After clicking the edit button (10 in Fig. 2.1), the Edit record dialog is opened.

Editing demo2.powerdns.com. A

The A record contains an IP address. It is stored as a decimal dotted quad string, for example: 203.0.113.210 .

TTL

1H [1] 5M 1H 4H 1D 1W

M=minutes, H=hours, D=days, W=weeks

Records (one per line, prefix with # or ; to disable)

198.199.127.127
[2]

☐ Schedule changes [3]

cmd/ctrl + s to save, esc to cancel

Cancel OK

Fig. 2.6: The Edit record dialog window.

This dialog is a stripped-down version of the [New record](#) dialog. The name and type of the record are fixed and shown in the header of the dialog.

The TTL field (1) sets the Time to Live for this record. The field accepts a number of seconds, or a shorthand notation like "10M" for a 10 minute (600 second) TTL. To the right you will find several shortcuts for frequently used TTLs.

Note: In DNS, the TTL is per [record set](#), not per single record.

The Records field at 2 is used to edit the contents of the record(s), one item per line.

Check the box at 3 to schedule this change for the future. See the chapter on scheduled changes for more information.

2.4 Saving pending changes

When editing, adding or deleting records, changes are not immediately saved to the DNS Server. Instead, these are 'staged' inside ZoneControl.

2.5 Changing DNSSEC settings

Pressing the DNSSEC button (2 in [Fig. 2.1](#) or [Fig. 2.2](#) when DNSSEC is disabled) opens the DNSSEC dialog.

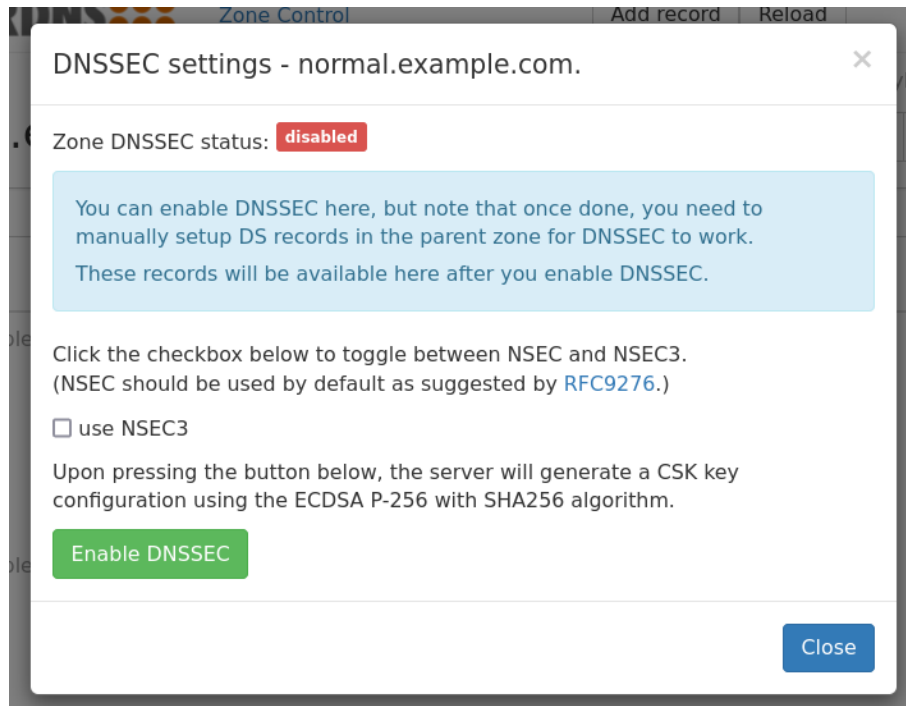


Fig. 2.7: The DNSSEC dialog for an unsecured zone.

By default NSEC will be used for DNSSEC. Checking the “use NSEC3” box will show an expanded dialog where one can edit the NSEC3PARAM.

Clicking the “Enable DNSSEC” button will enable DNSSEC for the zone. This adds cryptographic keys based on the settings of the PowerDNS Authoritative Server.

On a DNSSEC secured zone, the dialog displays the DNSSEC information that can be uploaded to the zone’s [registry](#) (see [Fig. 2.9](#) for an example).

Note: Both the DS records and DNSKEY record are shown. Which of these need to be uploaded depends on the domains’s [registry](#). Some registries require the DNSKEY to generate the DS records themselves.

This dialog can also be used to update the DNSSEC settings or to disable DNSSEC. As part of updating the DNSSEC settings it is possible to switch between NSEC and NSEC3 (the cryptokeys will be kept). Clicking the NSEC3 radio button will show the expanded NSEC3 settings similar to those in [Fig. 2.8](#).

It is possible to disable DNSSEC here but be very careful with this (as shown in [Fig. 2.10](#)) as we do not have backup functionality in place in this version of ZoneControl. The “Disable DNSSEC” button will be disabled until one enables it by pressing the red lock / unlock button.

The “Disable DNSSEC” button can be disabled again by pressing the, now green, lock button.

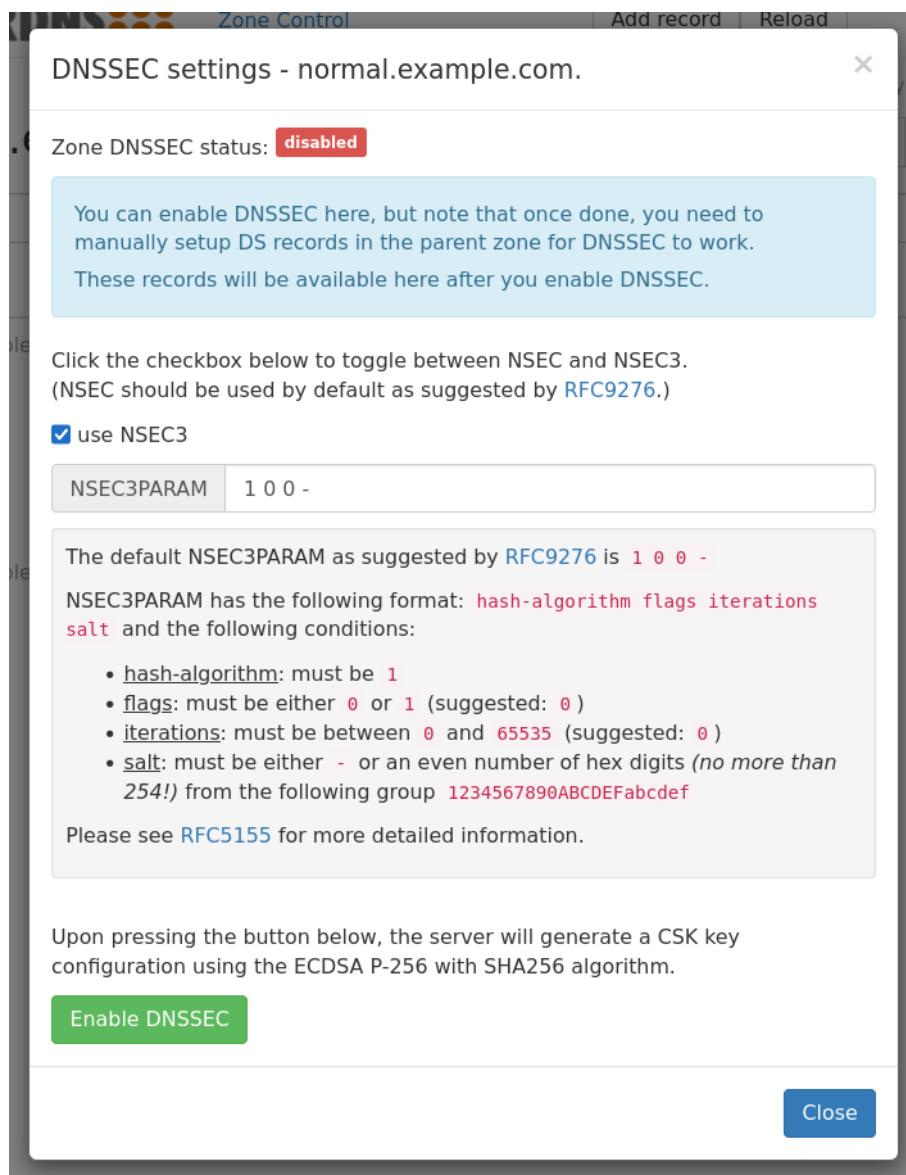


Fig. 2.8: The DNSSEC dialog for an unsecured zone with expanded NSEC3 settings.

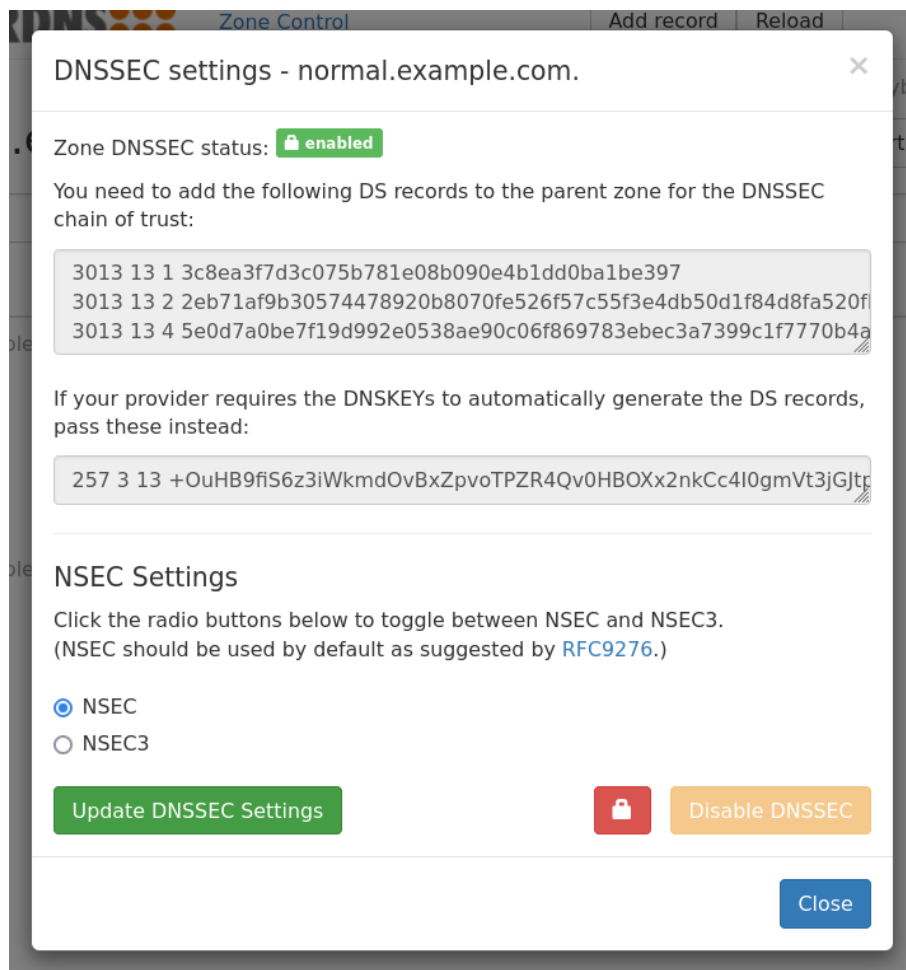


Fig. 2.9: The DNSSEC dialog for a secured zone.

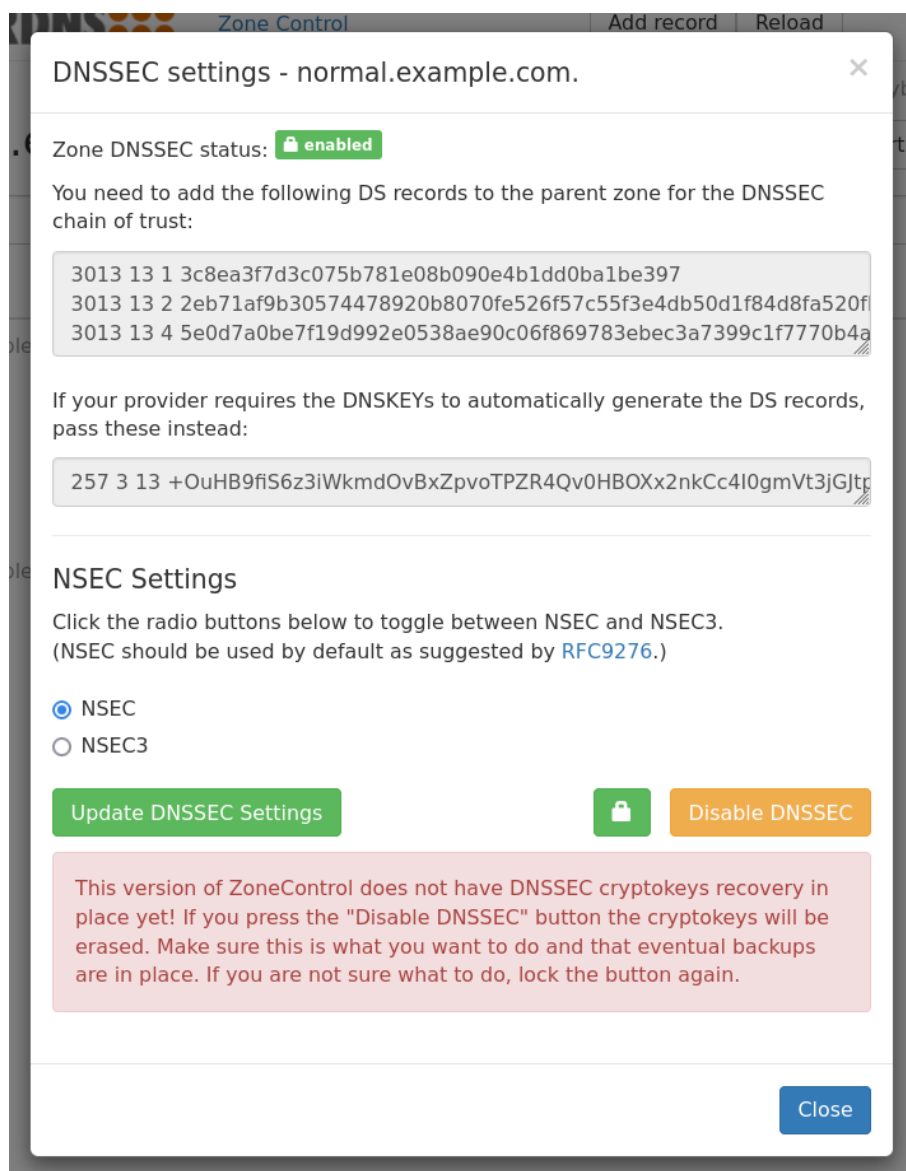


Fig. 2.10: The DNSSEC dialog with an unlocked "Disable DNSSEC" button

2.6 Zone settings

Clicking the Zone Kind button (3 in Fig. 2.1 or Fig. 2.3) opens the Zone Settings dialog window. The options available in this dialog depend on the zone kind.

2.6.1 Native zones

Native zones have the fewest settings, as there are no settings required for data replication.

Zone settings - zonecontrol.example.com. ✕

This is a **Native** zone. Native zones within PowerDNS do not use traditional Master-Slave AXFR transfers, but instead sync with a mechanism native to the underlying database system.
Native zones will not send out DNS notifications to other servers when a change occurs.

[1] Convert into a Master zone

Allow AXFR zone transfer requests from

[2] 10.0.0.3 or 10.0.0.0/8 or ::1 or 2001:db8:1::/64

One IP or subnet per line.

Cancel Save

Fig. 2.11: The Zone settings dialog window for a native zone.

The button at 1 converts the zone from a *native* zone to a *master* zone.

Note: Changing from a native zone to a master zone might require extra configuration in the PowerDNS Authoritative Server. For instance, the *master* configuration setting will need to be enabled before notifications are sent.

As it is possible for native zones to be replicated via *AXFR*, the field at 2 allows configuration of IP addresses that may transfer this zone.

2.6.2 Master zones

For *master* zones, the dialog in Fig. 2.12 is displayed:

The button at 1 converts the zone into a *native* zone.

Note: Converting into a native zone will make the PowerDNS Authoritative Server stop sending notifications for zone updates. It will still allow zone-transfers.

In field 2, IP addresses that are allowed to transfer the zone can be specified.

The IP addresses entered in the field at 3 will be notified when the zone has been changed, *in addition* to all the servers specified in the zone's NS records.

Zone settings - powerdns.com.

This is a **Master** zone. Master zones hold the authoritative DNS entries for a zone, and usually notify Slave zones of changes to its entries, so that a Slave can fetch the new zone through an AXFR transfer.

[1] [Convert into a Native zone](#)

Allow AXFR zone transfer requests from

[2] 10.0.3 or 10.0.0.0/8 or ::1 or 2001:db8:1::/64
One IP or subnet per line.

Also notify these servers of changes

[3] 10.0.3 or 10.0.0.3:5353 or ::1 or [2001:db8:1::1]:53
In addition to nameservers defined in the NS records. One IP per line, with optional port number.

Cancel Save

Fig. 2.12: The Zone settings dialog window for a master zone.

2.6.3 Slave zones

The *slave* zone dialog is show in Fig. 2.13.

Zone settings - dnsdist.org.

This is a **Slave** zone. Slave zones cannot be edited directly. They receive their entries from a Master server through an AXFR transfer, usually after getting notified of changes, but they will also check masters according to the **refresh** interval set in the **SOA** record.

Masters to sync from

[1] 10.0.2
One IP per line, with optional port number.

Allow AXFR zone transfer requests from

[2] 10.0.3 or 10.0.0.0/8 or ::1 or 2001:db8:1::/64
One IP or subnet per line.

Also notify these servers of changes

[3] 10.0.3 or 10.0.0.3:5353 or ::1 or [2001:db8:1::1]:53
In addition to nameservers defined in the NS records. One IP per line, with optional port number.

Cancel Save

Fig. 2.13: The Zone Settings dialog window for a slave zone.

The field at **1** is used specify the IP addresses of the master(s) of this zone. These addresses can be suffixed with a port, should be it different from the default of '53'.

Note: When adding a port to an IPv6 address, the address part must be wrapped in square brackets to disambiguate the address from the port:

```
[2001:0DB8:AA::1]:5300
```

If this server is also a master for other slaves, the other two fields can contain relevant settings.

In the field at **2**, IP addresses that are allowed to transfer the zone can be added.

The IP addresses entered in the field at **3** will additionally be notified when the zone has been changed. By default all servers in the zone's NS records are notified of changes.

CHAPTER

THREE

SCHEDULED TASKS

TBD

ZONE TEMPLATES

To simplify adding new zones it is possible to create “template zones”. These are zones whose zone contents and metadata are used for the newly created zone.

Note: DNSSEC settings are **not** copied.

A template zone is created just like any other zone except its name should end in `.template.` as shown in the “Template” input in [Fig. 4.1](#).

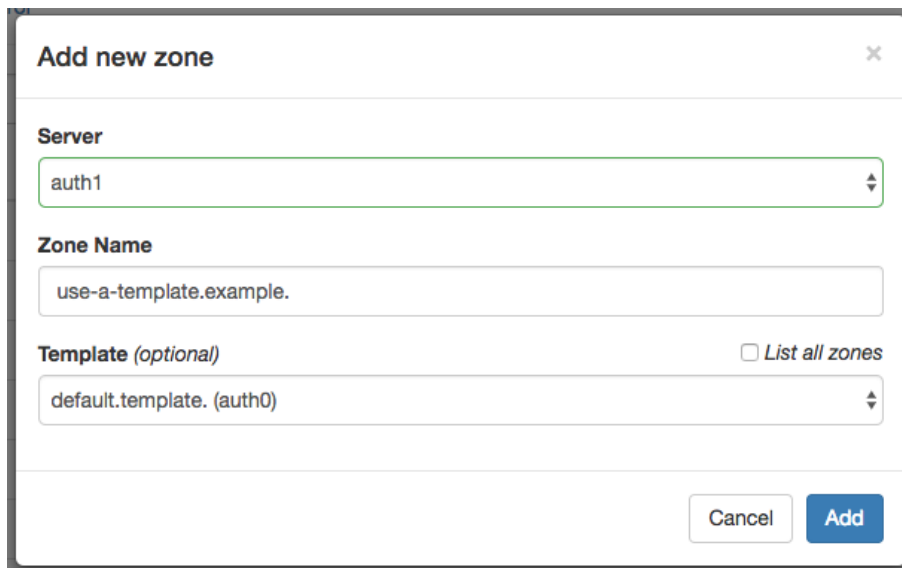


Fig. 4.1: The “Add new zone” dialog showing template zones.

It is also possible to use any existing (“real”) zone as template. When the “List all zones” box is checked all available zones will be shown to use as a template. See [Fig. 4.2](#).

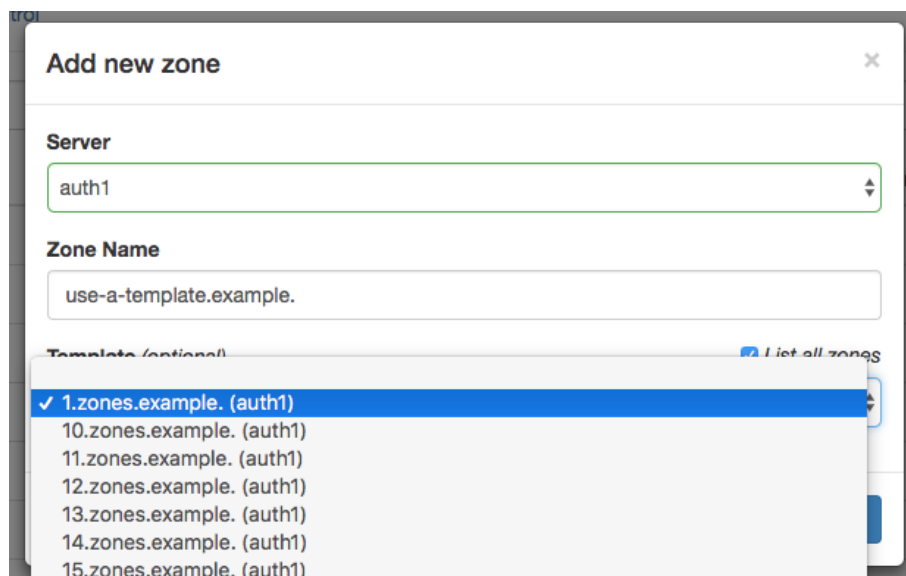


Fig. 4.2: The “Add new zone” dialog showing all zones as template candidates.

GLOSSARY

Many terms in this document are specific to the DNS. This glossary contains short explanations of these terms. For more information, [RFC 7719](#) (DNS Terminology) can be consulted.

AXFR

The query type used to request a full zone transfer. Commonly used to refer to the act of transferring a zone.

fqdn

A Fully Qualified Domain Name is a domain name that specifies its exact location in the DNS hierarchy.

master**master server**

A “master” zone (or server) acts as a source of truth for a zone. [slave](#) servers will check at the master server if their zones are still up to date.

native

A “native” zone does not use DNS-based data replication but for instance database replication.

NS record

NS records in a zone declare the name of the nameservers authoritative for that zone.

record set**RRSet**

A record set is the collection of DNS records with the same name, type and TTL.

registry

The organization that allows registration of names in the zone. These organizations operate the [TLDs](#). For .nl this is SIDN and for .com this is Verisign.

slave**slave zone**

A “slave” zone (or server) retrieves its zone data from a [master](#) server.

SOA record**SOA**

Only one “Start Of Authority” record exists in a zone. It indicates that this domain is indeed a zone.

TLD**Top Level Domain**

A Top-Level Domain is a zone that is one layer below the root, such as .nl and .com.

Zone file**Zonefile**

The de-facto storage format for DNS zones. This format is text-based and lists all records in a zone, one per line.

HTTP ROUTING TABLE

/api

GET /api/v1/servers/{server_id}/zones/{zone_id}/_history,

??

GET /api/v1/servers/{server_id}/zones/{zone_id}/_history/diff/{version_1}/{version_2},

??

GET /api/v1/servers/{server_id}/zones/{zone_id}/_history/diff/{version_2},

??

GET /api/v1/servers/{server_id}/zones/{zone_id}/_names/{name}/_comments/{rrtype},

??

GET /api/zonecontrol/info, ??

POST /api/v1/servers/{server_id}/zones/{zone_id}/_history/restore/{version},

??

POST /api/v1/servers/{server_id}/zones/{zone_id}/_names/{name}/_comments/{rrtype},

??

POST /api/zonecontrol/login, ??

DELETE /api/v1/servers/{server_id}/zones/{zone_id}/_names/{name}/_comments/{rrtype}/_comment/{comment_id},

??

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