ZoneControl

User Guide

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Release 1.6.1

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CHAPTER

ONE

FIRST STEPS WITH ZONECONTROL

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

1.1 Main window

After logging in, the main screen is presented.

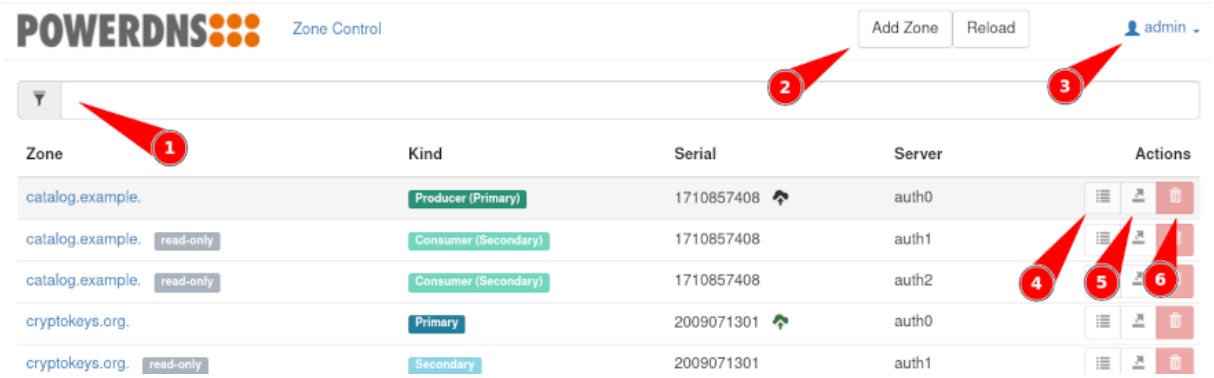

Fig. 1.1: The main window of ZoneControl.

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 "primary", "secondary", "native", "producer" or "consumer" (the last two only when catalog zone support has been enabled). A "secondary" or "consumer" zone cannot be modified, as its data is retrieved from a primary server. A "primary" or "producer" zone can be edited and is generally distributed to other DNS servers that serve as secondaries or consumers. 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 "secondary" servers to check if their copy of the DNS data is still up to date. On "primary" zones – and "secondary" 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 "primary" on one, and as a "secondary" 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. *(only shown when the user does not have RRSet limits)*
- **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 backward, 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 primary zones, fill in the *NS records* for this zone (with trailing dots).

Note:

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

For a secondary zone, fill in the IP address(es) of the primary 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 secondary zone will be retrieved from its primary, and a primary zone will send out notifications to its (potential) secondary servers.

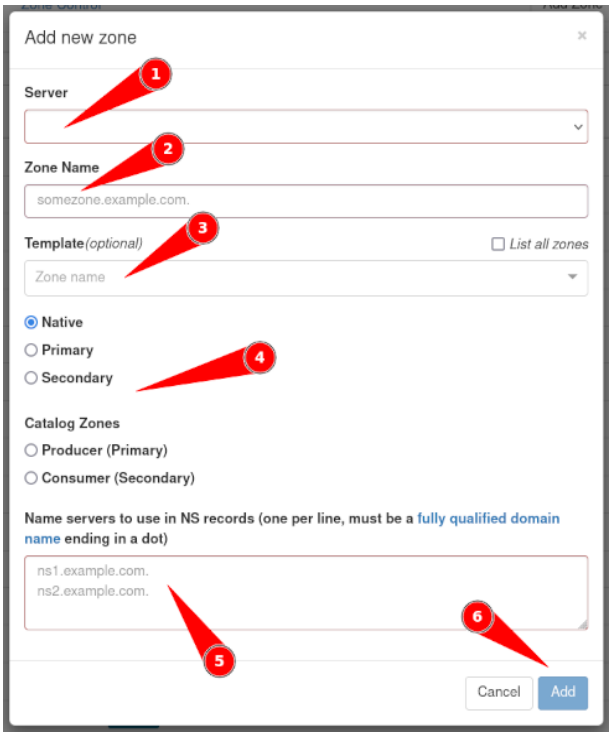

Fig. 1.2: The "Add zone" dialog window.

CHAPTER

TWO

EDITING ZONES

Editing zone contents is done in the zone details page, which is openend by clicking on the name of a zone in the *main window*.

2.1 Zone details page

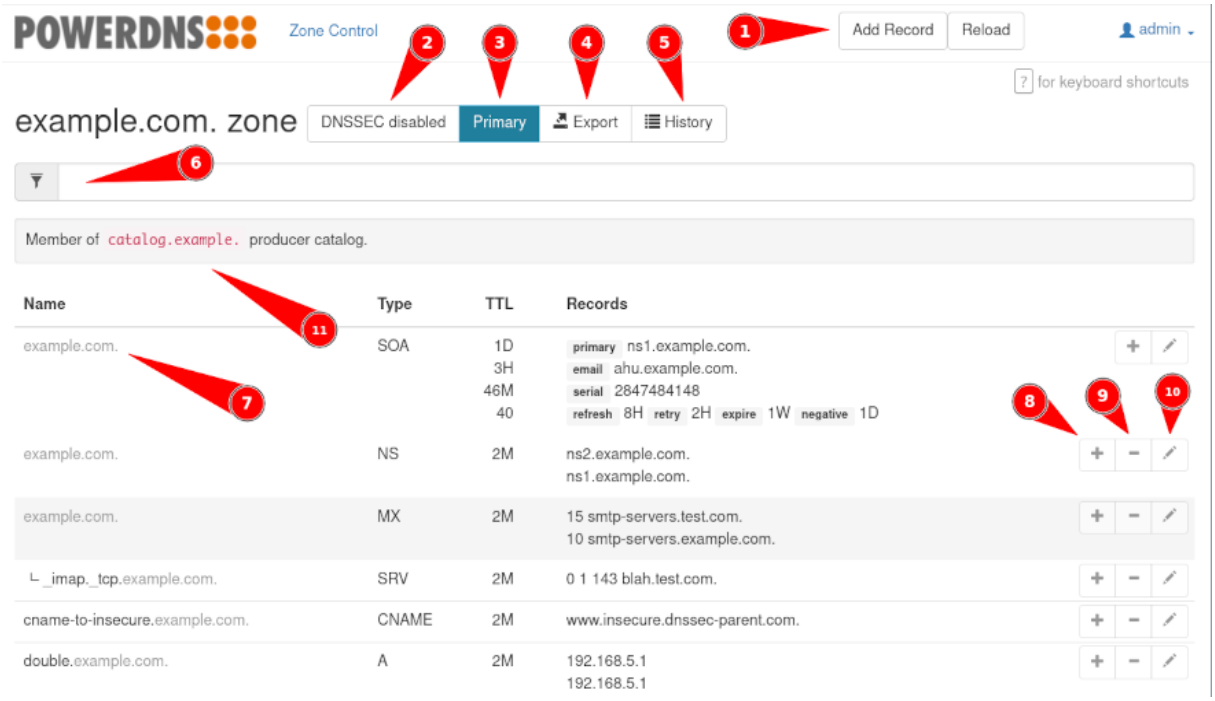

Fig. 2.1: The zone details screen of ZoneControl.

This page lists all the DNS records in the zone in a table.

11 shows which catalog ("Producer") this zone is part of. If the zone is not part of a catalog this element will not be shown.

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 secondary 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 Secondary zone buttons. The Primary zone button is not shown here.

The zone kind button (**3**) shows what kind of the zone this is. This is one of *primary*, *secondary* 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. *(this button is **not shown** when the user has RRSet limits)** 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.

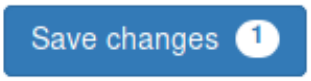

Fig. 2.4: The Save changes button.

Any changes made to the zone in this window are not directy 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.

2.1.1 Catalog Zones

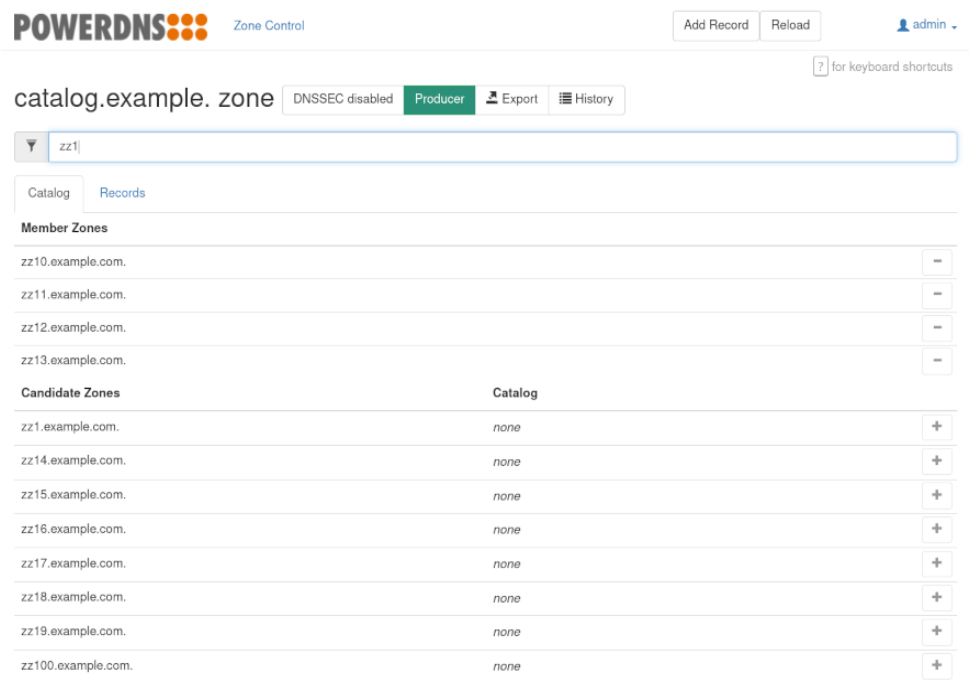

Fig. 2.5: The catalog editing section of a Producer zone.

The zone page of a Producer zone has one extra element compared to other zone kinds: the "Catalog" tab. Inside this element zones can be added and removed from the Producer's catalog. The `[+]` button will add a candidate zone to the catalog and the `[-]` button will remove a member zone from the catalog.

The "Records" tab shows the zone's records similar to other zone kinds.

Both the "Member Zones" and the "Candidate Zones" lists support pagination and filtering.

The "Candidate Zones" also has a "Catalog" column showing whether a candidate is already part of another catalog. *A zone can only be part of a single catalog.*

Not shown here but member zone screens have a little extra element showing which catalog zone they are part of.

2.2 Adding a new record

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.

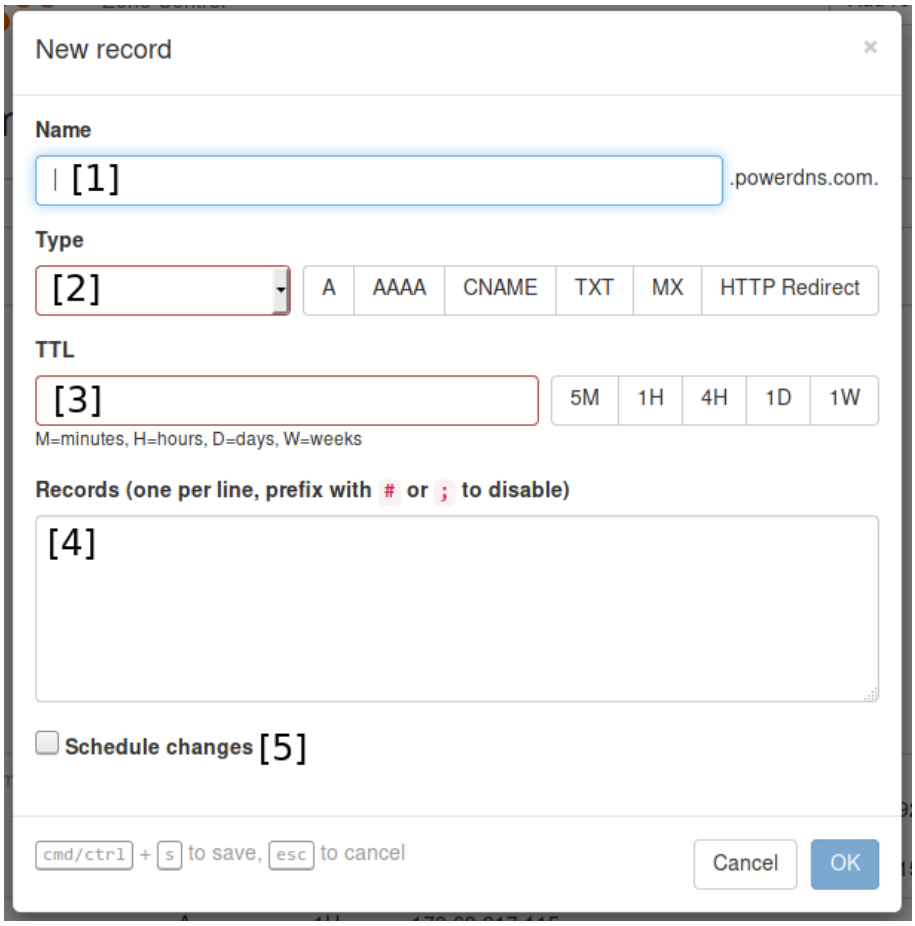

Fig. 2.6: The New Record dialog window.

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 server 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.

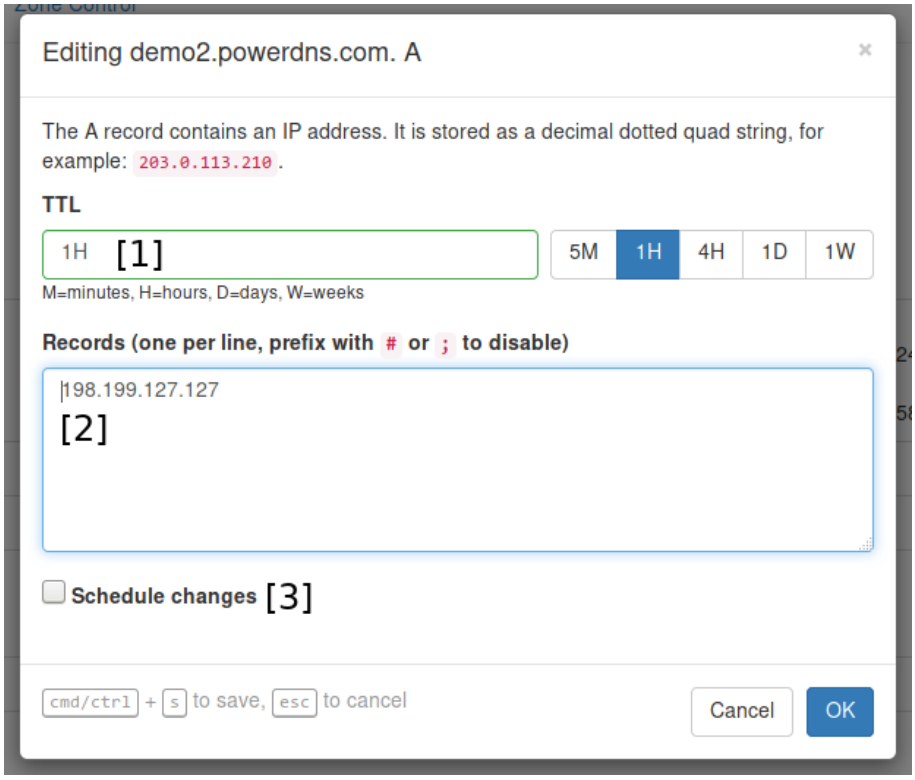

Fig. 2.7: The Edit record dialog window.

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.

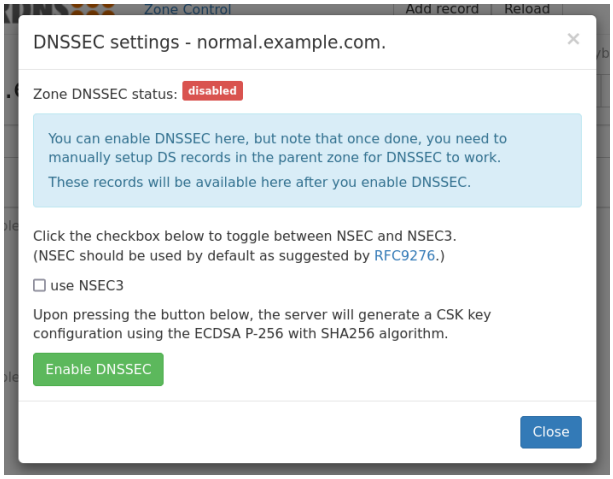

Fig. 2.8: The DNSSEC dialog for an unsecured zone.

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

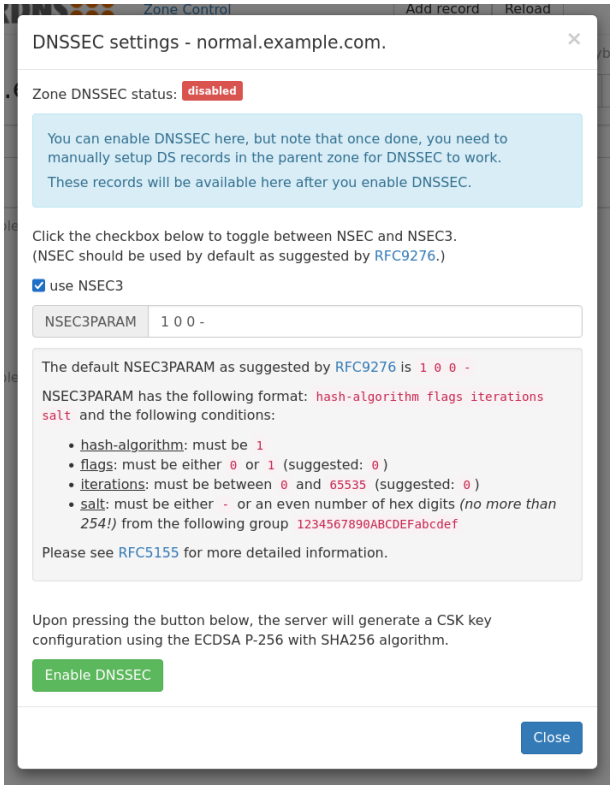

Fig. 2.9: The DNSSEC dialog for an unsecured zone with expanded NSEC3 settings.

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. 2.10 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.

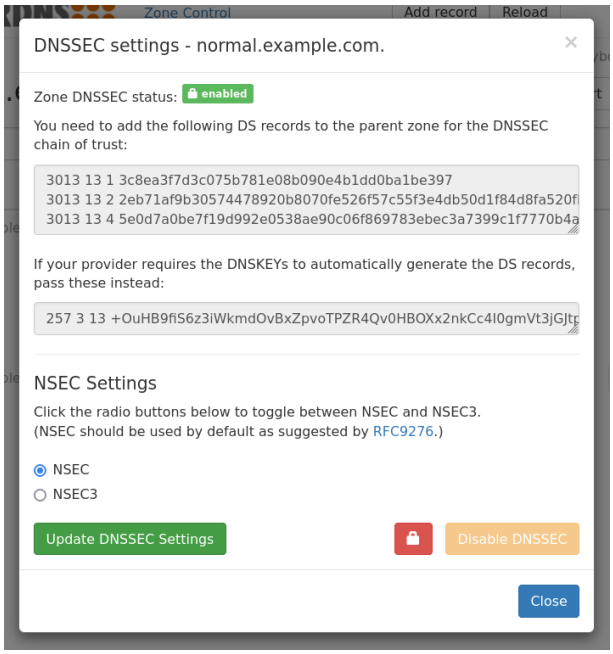

Fig. 2.10: The DNSSEC dialog for a secured zone.

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. 2.9.

It is possible to disable DNSSEC here but be very careful with this (as shown in Fig. 2.11) 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.

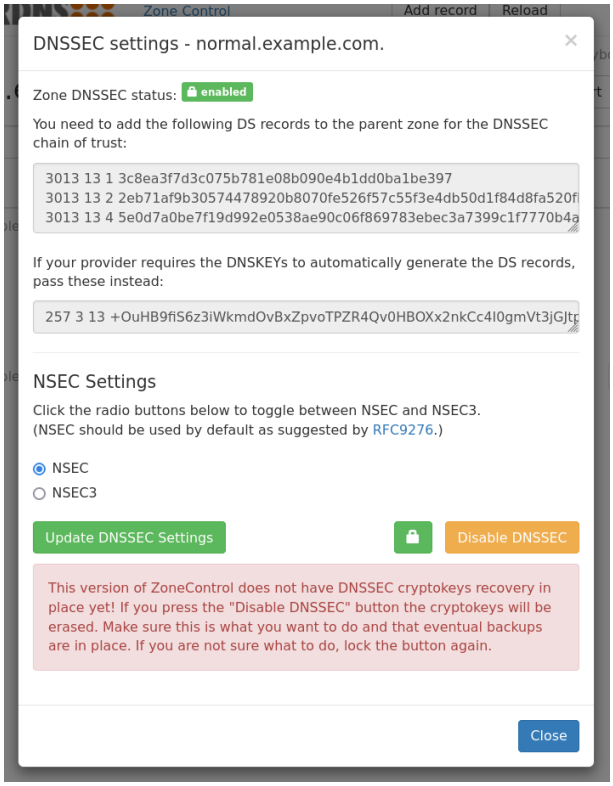

Fig. 2.11: The DNSSEC dialog with an unlocked “Disable DNSSEC” button

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.

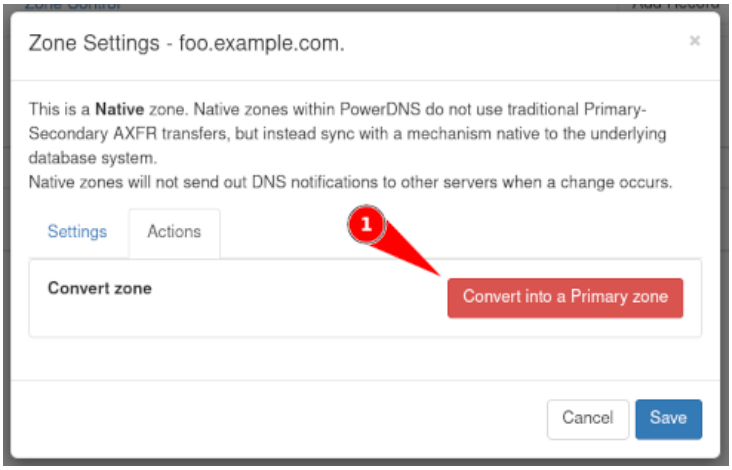

Fig. 2.12: The Zone settings dialog window for a native zone with an active Actions tab.

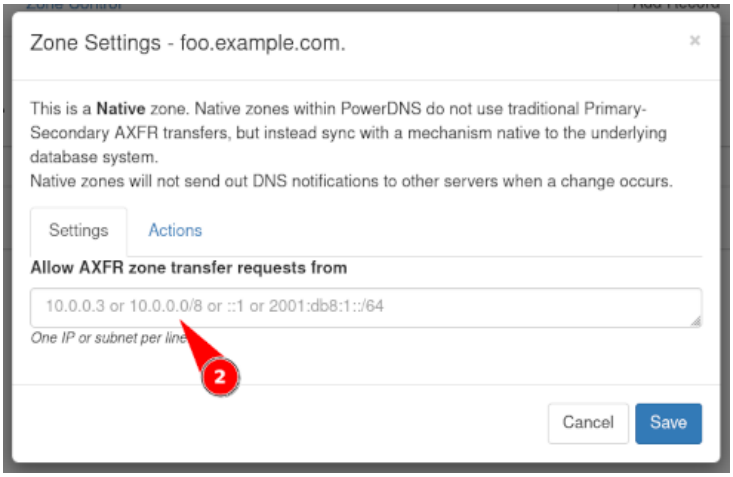

Fig. 2.13: The Zone settings dialog window for a native zone with an active Settings tab.

The button at **1** converts the zone from a *native* zone to a *primary* zone. (Zone conversion to a Producer zone is not available.)

Note: Changing from a native zone to a primary zone might require extra configuration in the PowerDNS Authoritative Server. For instance, the primary 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 Primary zones

For *primary* zones, the dialog in Fig. 2.14 is displayed:

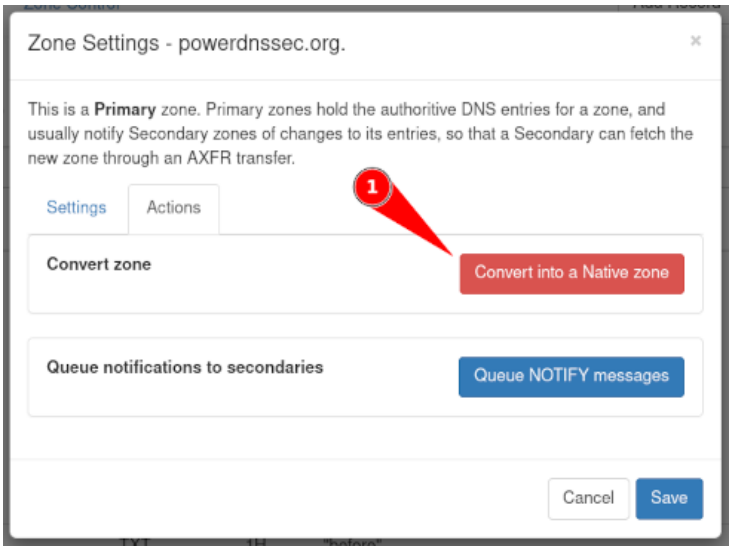

Fig. 2.14: The Zone settings dialog window for a primary zone with an active Actions tab.

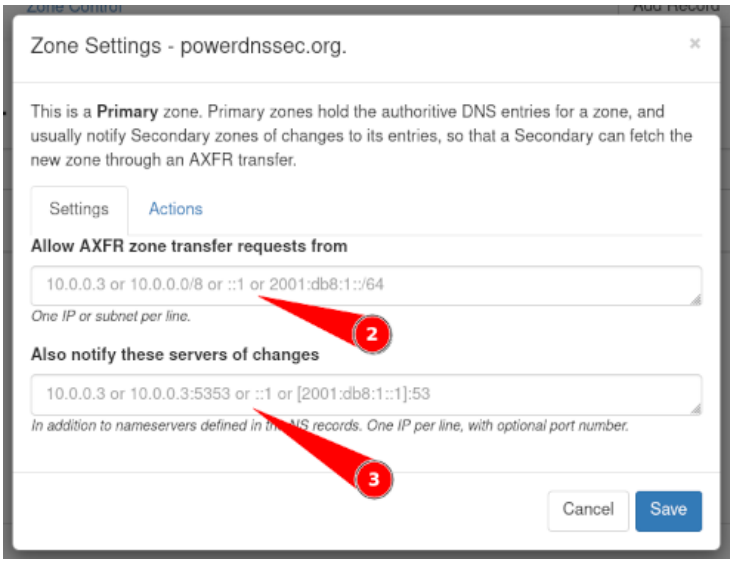

Fig. 2.15: The Zone settings dialog window for a primary zone with an active Settings tab.

The button at **1** converts the zone into a *native* zone. (Zone conversion is not available for Producer zones.)

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 adresses 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.

2.6.3 Secondary zones

The *secondary* zone dialog is show in Fig. 2.16.

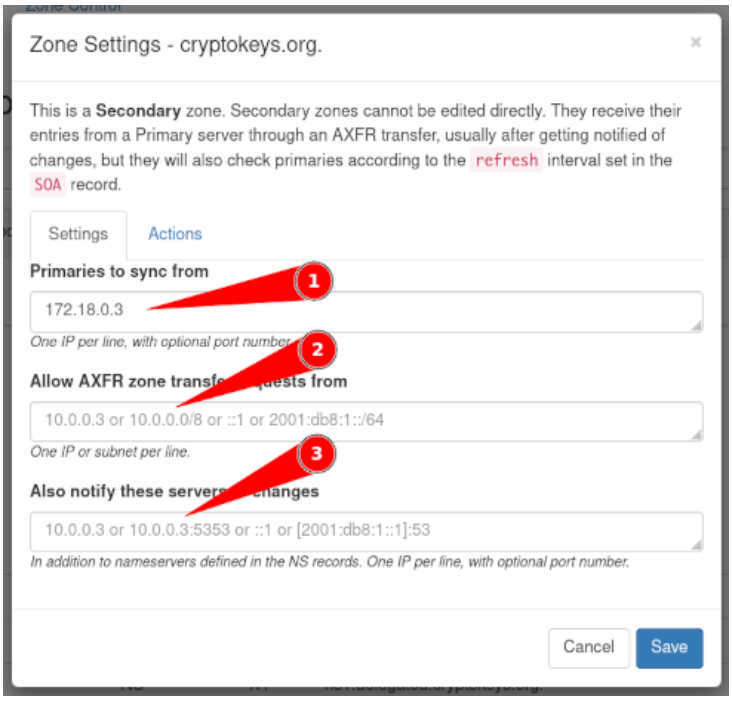

Fig. 2.16: The Zone Settings dialog window for a secondary zone.

The field at **1** is used specify the IP addresses of the primary(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 primary for other secondaries, 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 adresses 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

CHAPTER

FOUR

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.

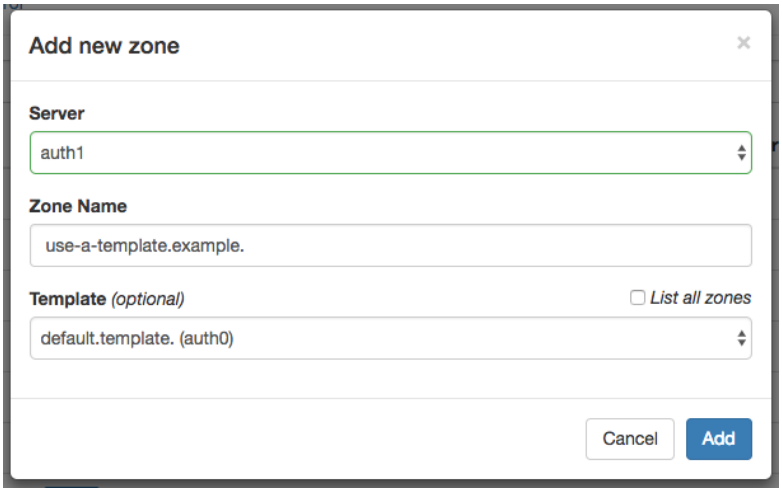

Fig. 4.1: The "Add new zone" dialog showing template zones.

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.

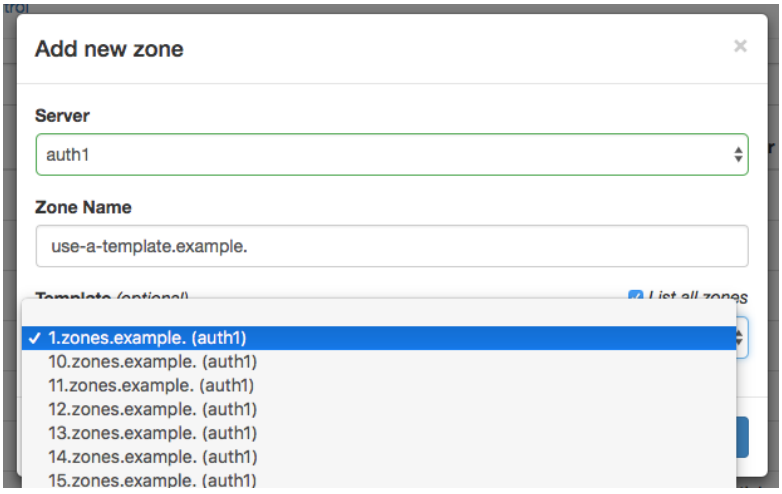

Fig. 4.2: The "Add new zone" dialog showing all zones as template candidates.

CHAPTER

FIVE

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.

primary
primary server
: A "primary" zone (or server) acts as a source of truth for a zone. *secondary* servers will check at the primary server if their zones are still up to date.

native
: A "native" zone does not used 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 organization operate the *TLDs*. For .nl this is SIDN and for .com this Verisign

secondary
secondary zone
: A "secondary" zone (or server) retrieves its zone data from a *primary* 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 Doman
: A Top-Level Domain is a 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/{commen`
??

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