

Nameserver check – New release 2005

Version 1.0 – 4 Aug. 2005

A Functional description

1) Obligatory requirements in the template

- Exactly all nameservers configured for a zone in the DNS must also be specified in the template. This means:
All nameservers entered in the template must be configured in the zone, and all nameservers configured in the zone must be specified in the template.
- At least two different hostnames must be specified in the template.
- The specification of up to eight `nserver:-/remarks:-` line pairs is possible.
→ Note: Up to now, a maximum of five line pairs has been possible. This old restriction still exists in the registrar web.
- The `nserver:-` and `remarks:-` lines must be completed correspondingly, i.e. the first `nserver:-` entry belongs to the first `remarks:-` line etc. If additional IP-addresses are to be assigned to a hostname, it can be realised by adding a second hostname entry. – Example:

```
nserver: ns1.example.at
remarks: 192.0.2.44
nserver: ns2.example.at
remarks: 192.0.2.55
nserver: ns2.example.at
remarks: 192.0.2.66
```
- The IPv4-addresses specified in the template must represent a subset of the address records within the real DNS. This means that not all IP-addresses assigned to a hostname must actually be specified in the template.
→ Note: Up to now, all addresses have had to be entered in the template as soon as at least one address was specified.
- If a `remarks:-` line is completed, there must be a corresponding `remarks:-` line for *each* `nserver:-` line. – Examples:
correct:

```
nserver: ns1.example.at
remarks: 192.0.2.44
nserver: ns2.example.at
remarks: 192.0.2.55
```


or:

```
nserver: ns1.example.at
nserver: ns2.example.at
remarks: 192.0.2.44
```

```
remarks: 192.0.2.55
```

Or:

```
nserver: ns1.example.at  
remarks:  
nserver: ns2.example.at  
remarks:
```

not correct:

```
nserver: ns1.example.at  
remarks: 192.0.2.44  
nserver: ns2.example.at  
remarks:
```

- If at least one `remarks: -line` with an IP-address is specified, there must be exactly one corresponding `remarks: -line` with an IP-address for *each* `nserver: -line` in the template. – Example:

correct:

```
nserver: ns1.example.at  
nserver: ns2.example.at
```

not correct:

```
nserver: ns1.example.at  
remarks: 192.0.2.44  
nserver: ns2.example.at
```

- Hostnames¹ and IPv4-addresses² must be specified using the correct format.
- Hostnames¹ and IPv6-addresses³ must be specified using the correct format.
- If IPv6-addresses are specified, they must be syntactically correct. In addition, only Unicast IPv6-addresses within 2000::4. Thus, a specification of Loopback (::1/128), the Unspecified Address (::/128), Link Local (FE80::- In case of hostnames that require glue-records, all IPv4-addresses entered in the DNS must appear in the template.
- The specification and use of an IPv6-only host which requires glue-records, is not possible unless the IPv6-address is specified in the template.

¹ A hostname consists of labels linked with dots. A label is a character string consisting of 1 to 63 characters including the 26 letters ("a ... z") without umlauts and ß and without regarding case sensitivity, the 10 numbers ("0 ... 9") and the hyphen ("-"). The latter must not be placed at the beginning or at the end of the label. The maximum number allowed for the hostname is 255 characters.

² An IPv4 address consists of four one- to three-digit number strings separated by dots, whereas RFC1918 addresses [10.0.0.0 - 10.255.255.255 (10/8 prefix) | 172.16.0.0 - 172.31.255.255 (172.16/12 prefix) | 192.168.0.0 - 192.168.255.255 (192.168/16 prefix)] and local addresses [127.0.0.0 - 127.255.255.255 (127/8 local prefix)] are not allowed.

³ An IPv6-address consists of up to eight max. four-digit number strings separated by a colon. An abbreviated form is possible, like 2001:62a:4:1::25:2001 instead of the complete form 2001:062a:0004:0001:0000:0000:0025:2001.

⁴ Please find further details in RFC2374 and in RFC1700 on page 4.

2) Obligatory requirements of the nameserver check

- At least two separate IPv4-nameservers must be configured for the zone in the DNS.
- All specified nameservers must answer on Port 53 via TCP and UDP at all IP-addresses.
- If IP-addresses are specified with a hostname, all IPv4-addresses of all specified hosts (except glue-records) are checked for their correctness by querying a local, recursive nameserver whose cache is emptied after each query. Please also refer to the information about glue-records below.
- Exactly all IPv4-addresses must be specified in the template for nameservers whose hostname is within the zone (glue-records). The specified addresses must exactly match the A-records entered for the hostname in the zone. This means: According to an identification via A-RR query in the DNS, IP-addresses of the nameserver-hostnames that require a glue-record must exactly match the glue-records from the template.
If the nameserver-hostname is directly within the zone, the specified addresses are checked for their correctness on all authoritative servers. This check is performed directly on the specified addresses, if the hostname of the servers is within the zone.
- All nameservers identified in the DNS are checked on all IPv4-addresses that are identified via recursive DNS-query. This check is performed directly on these IP-addresses, if hostnames that require the specification of glue-records are used.
- For the following queries require correct replies signed with aa-Flag (authoritative answer) :
 - Exactly all nameserver hosts must be returned on a NS-query for the domain name to the authoritative host.
 - The SOA-record for the zone must be returned on a query.
- The MNAME in the returned SOA-RRs must be a syntactically correct hostname. This check only produces warnings, but no rejection is made.
→ Note: Up to now, the MNAME has had to be reachable and configured exactly as all nameservers specified.

The RNAME in the returned SOA-RRs must be a syntactically correct transcription of a e-mail address, whereas the @-sign is replaced by a "." (dot). This check only produces warnings, but no rejection is made.
- No CNAME-record must exist for a NS-hostname.
→ Note: Up to now, a NS-hostname has required a A-RR.
- At least one A- or AAAA-record must exist for all hostnames in the DNS.
→ Note: Up to now, a hostname has required a A-RR.

- An A-record must not refer to RFC1918-addresses:
The following cases produce an error:

Address Block	Present Use	Reference
10.0.0.0/8	Private-Use Networks	[RFC1918]
127.0.0.0/8	Loopback	[RFC1700, page 5]
169.254.0.0/16	Link Local	[RFC3330]
172.16.0.0/12	Private-Use Networks	[RFC1918]
192.0.2.0/24	Test-Net	[RFC3330]
192.168.0.0/16	Private-Use Networks	[RFC1918]
240.0.0.0/4	Reserved for Future Use	[RFC1700, page 4]

Eine Warnung wird ausgegeben, ohne dass eine Ablehnung erfolgt, bei:

Address Block	Present Use	Reference
224.0.0.0/4	Multicast	[RFC3171]

→ Note: Up to now, not all these preconditions were checked.

3) **Additions regarding IPv6 – optional guidelines**

- In addition to the two `nserver: -/remarks: -` lines including the obligatory IPv4-addresses, IPv6-addresses can be entered in the `remarks: -` lines.
- Saving involves a normalisation to the compressed format.
- Reserved addresses can not be specified – only the use of Unicast-addresses is allowed.

If IPv6-addresses are specified, there is a check whether they represent a subset of the addresses identified via DNS AAAA-record query.
This check only produces warnings, but no rejection is made.

If IPv6-addresses are specified as glue-records, there is a check whether all IPv6-addresses identified via DNS AAAA-/NS record query on the authoritative nameserver are specified.
This check only produces warnings, but no rejection is made.

When a DNS AAAA-record query is made, there is a check whether there is a Unicast-address and not a Site Local or Link Local address.
This check only produces warnings, but no rejection is made.

B Error codes

1. obsolete codes

The error codes **NS0001 - NS0051** have become obsolete and are no longer used.

2. new codes

NS0052 - NC03052

Adresse %ADDR% wurde fuer Nameserver "%NS%" mehrfach angegeben.
Address %ADDR% specified more than once for nameserver "%NS%".

NS0053 - NC03053

IPv4-Adresse %ADDR% wurde fuer Nameserver "%NS%" mehrfach angegeben.
IPv4-address %ADDR% specified more than once for nameserver "%NS%".

NS0054 - NC03054

IPv6-Adresse %ADDR% wurde fuer Nameserver "%NS%" mehrfach angegeben.
IPv6-address %ADDR% specified more than once for nameserver "%NS%".

NS0055 - NC03055

Server %SERVER% liefert fuer die Domain "%Q%" den Nameserver "%ENTRY%"
mehrfach zurueck.
Server %SERVER% returned nameserver "%ENTRY%" more than once for domain
"%Q%".

NS0056 - NC03056

Server %SERVER% liefert fuer die Abfrage [%Q%, %T%] eine Adresse der falschen
Version: "%ADDR%".
Server %SERVER% returned wrong address version for query [%Q%, %T%]:
"%ADDR%".

NS0057 - NC03057

Die fuer Nameserver "%NS%" angegebene Adresse "%ADDR%" ist ungueltig.
Invalid address "%ADDR%" specified for nameserver "%NS%".

NS0058 - NC03058

Der angegebene NS-Hostname "%NAME%" ist ungueltig.
Invalid NS-hostname "%NAME%" specified.

NS0059 - NC03059

Die fuer Nameserver "%NS%" angegebene IPv4-Adresse %ADDR% ist ungueltig.
Invalid IPv4-address %ADDR% specified for nameserver "%NS%".

NS0060 - NC03060

Die fuer Nameserver "%NS%" angegebene IPv6-Adresse %ADDR% ist ungueltig.
Invalid IPv6-address %ADDR% specified for nameserver "%NS%".

NS0061 - NC03061

Server %SERVER% liefert fuer die Domain "%Q%" den ungueltigen NS-Hostnamen "%NAME%" zurueck.
Server %SERVER% returned invalid NS-hostname "%NAME%" for domain "%Q%".

NS0062 - NC03062

Server %SERVER% liefert im SOA-RR den ungueltigen MNAME "%MNAME%" zurueck.
Server %SERVER% returned SOA-record with invalid MNAME "%MNAME%".

NS0063 - NC03063

Server %SERVER% liefert im SOA-RR den ungueltigen RNAME "%RNAME%" zurueck.
Server %SERVER% returned SOA-record with invalid RNAME "%RNAME%".

NS0064 - NC03064

Server %SERVER% liefert eine unzuessaessige IPv4-Adresse "%ADDR%" fuer Nameserver "%Q%", der einen Glue-Record benoetigt.
Server %SERVER% returned forbidden IPv4-address "%ADDR%" for nameserver "%Q%" which requires a glue record.

NS0065 - NC03065

Server %SERVER% liefert eine unzuessaessige IPv6-Adresse "%ADDR%" fuer Nameserver "%Q%", der einen Glue-Record benoetigt.
Server %SERVER% returned forbidden IPv6-address "%ADDR%" for nameserver "%Q%" which requires a glue record.

NS0066 - NC03066

Der angegebene Zonenname "%ZONE%" ist ungueltig.
Invalid zone name "%ZONE%".

NS0067 - NC03067

Server %SERVER% liefert fuer Nameserver "%Q%" die Adresse "%ADDR%" nicht zurueck, die im Template als Glue-Record fuer "%Q%" angegeben wurde.
Server %SERVER% did not return address "%ADDR%" specified as glue record for nameserver "%Q%".

NS0068 - NC03068

Server %SERVER% liefert fuer die Domain "%Q%" den angegebenen Nameserver "%NS%" nicht zurueck.
Server %SERVER% did not return alleged nameserver "%NS%" for domain "%Q%".

NS0069 - NC03069

Server %SERVER% liefert fuer Nameserver "%Q%" die IPv4-Adresse "%ADDR%" nicht zurueck, die im Template als Glue-Record fuer "%Q%" angegeben wurde.
Server %SERVER% did not return IPv4-address "%ADDR%" specified as glue record for nameserver "%Q%".

NS0070 - NC03070

Server %SERVER% liefert fuer Nameserver "%Q%" die IPv6-Adresse "%ADDR%" nicht zurueck, die im Template als Glue-Record fuer "%Q%" angegeben wurde.
Server %SERVER% did not return IPv6-address "%ADDR%" specified as glue record for nameserver "%Q%".

NS0071 - NC03071

Nur ein Nameserver angegeben. Es sind mindestens zwei Angaben im Template erforderlich.

Only one nameserver specified. At least two nameservers are required.

NS0072 - NC03072

Die erforderlichen zwei Nameserver mit jeweils einer distinkten IPv4-Adresse sind nicht angegeben.

Two nameservers are mandatory, each with at least one distinct IPv4-address.

NS0073 - NC03073

Fuer Nameserver "%NS%" wurde kein Glue-Record angegeben.

No glue record specified for nameserver "%NS%".

NS0074 - NC03074

Fuer den von Server %SERVER% gelieferten, unbekanntem Nameserver "%NS%", der innerhalb der Zone liegt, wurden vom Server keine Adress-Records zurueckgeliefert.

Server %SERVER% returned unknown nameserver "%NS%" located within the zone, but did not return any address records for that nameserver.

NS0075 - NC03075

Server %SERVER% liefert fuer die Domain "%Q%" keine NS-Records.

Server %SERVER% : no NS-records returned for domain "%Q%".

NS0076 - NC03076⁵

Keine Antwort von Server %SERVER% fuer die Abfrage [%Q%, %T%].

No response from server %SERVER% for query [%Q%, %T%].

NS0077 - NC03077

Server %SERVER% liefert fuer die Domain "%Q%" keinen SOA-Record zurueck.

Server %SERVER% : no SOA-record returned for domain "%Q%".

NS0078 - NC03078⁵

Server %SERVER% liefert bei der Frage nach [%Q%, %T%] keine autoritative Antwort.

Server %SERVER% : non-authoritative answer for query [%Q%, %T%].

NS0079 - NC03079

Eine rekursive Abfrage liefert fuer den angegebenen NS-Hostnamen "%NS%" einen CNAME-Record: "%CNAME%".

CNAME-record "%CNAME%" returned by recursive query for alleged NS-hostname "%NS%".

NS0080 - NC03080⁵

Eine rekursive Abfrage liefert fuer die Abfrage [%Q%, %T%] eine Adresse der falschen Version: "%ADDR%".

Wrong address version "%ADDR%" returned by recursive query for [%Q%, %T%].

⁵ Correct replies signed with aa-Flag (authoritative answer) must be returned: Exactly all nameserver hostnames must be returned on a NS-query for the domain name to the authoritative host, as well as the SOA-records for the zone.

NS0081 - NC03081

Eine rekursive Abfrage liefert fuer Nameserver "%Q%" die ungueltige Adresse "%ADDR%".

Invalid address "%ADDR%" returned by recursive query for nameserver "%Q%".

NS0082 - NC03082

Eine rekursive Abfrage liefert fuer Nameserver "%Q%" die ungueltige IPv4-Adresse "%ADDR%" zurueck.

Invalid IPv4-address "%ADDR%" returned by recursive query for nameserver "%Q%".

NS0083 - NC03083

Eine rekursive Abfrage liefert fuer Nameserver "%Q%" die ungueltige IPv6-Adresse "%ADDR%" zurueck.

Invalid IPv6-address "%ADDR%" returned by recursive query for nameserver "%Q%".

NS0084 - NC03084

Eine rekursive Abfrage liefert fuer Nameserver "%NS%" die angegebene Adresse "%ADDR%" nicht zurueck.

Alleged address "%ADDR%" not returned by recursive query for nameserver "%NS%".

NS0085 - NC03085

Eine rekursive Abfrage liefert fuer Nameserver "%NS%" die angegebene IPv4-Adresse %ADDR% nicht zurueck.

Alleged IPv4-address "%ADDR%" not returned by recursive query for nameserver "%NS%".

NS0086 - NC03086

Eine rekursive Abfrage liefert fuer Nameserver "%NS%" die angegebene IPv6-Adresse %ADDR% nicht zurueck.

Alleged IPv6-address "%ADDR%" not returned by recursive query for nameserver "%NS%".

NS0087 - NC03087

Eine rekursive Abfrage liefert fuer Nameserver "%NS%" weder A-Records noch AAAA-Records zurueck.

Neither A records nor AAAA records returned by recursive query for nameserver "%NS%".

NS0088 - NC03088⁶

Lokaler rekursiver Nameserver antwortet nicht. Abfrage nach [%Q%, %T%] fehlgeschlagen.

Local recursive nameserver did not respond. Query for [%Q%, %T%] failed.

NS0089 - NC03089

Eine rekursive Abfrage liefert fuer Nameserver "%NS%" die unbekante Adresse "%ADDR%" zurueck.

Unknown address "%ADDR%" returned by recursive query for nameserver "%NS%".

NS0090 - NC03090

⁶ This error can only appear in the Stand-alone package.

Eine rekursive Abfrage liefert fuer Nameserver "%NS%" die unbekannte IPv4-Adresse %ADDR% zurueck.
Unknown IPv4-address %ADDR% returned by recursive query for nameserver "%NS%".

NS0091 - NC03091

Eine rekursive Abfrage liefert fuer Nameserver "%NS%" die unbekannte IPv6-Adresse %ADDR% zurueck.
Unknown IPv6-address %ADDR% returned by recursive query for nameserver "%NS%".

NS0092 - NC03092

Server %SERVER% liefert fuer Nameserver "%Q%", der innerhalb der Zone liegt, die nicht angegebene Adresse "%ADDR%" zurueck.
Server %SERVER% returned address "%ADDR%" which was not specified for nameserver "%Q%" located within the zone.

NS0093 - NC03093

Server %SERVER% liefert fuer Domain "%Q%" einen im Template nicht angegebenen Nameserver "%NS%" zurueck.
Server %SERVER% returned unspecified nameserver "%NS%" for domain "%Q%".

NS0094 - NC03094

Server %SERVER% liefert fuer Nameserver "%Q%", der innerhalb der Zone liegt, die nicht angegebene IPv4-Adresse "%ADDR%" zurueck.
Server %SERVER% returned IPv4-address "%ADDR%" which was not specified for nameserver "%Q%" located within the zone.

NS0095 - NC03095

Server %SERVER% liefert fuer Nameserver "%Q%", der innerhalb der Zone liegt, die nicht angegebene IPv6-Adresse "%ADDR%" zurueck.
Server %SERVER% returned IPv6-address "%ADDR%" which was not specified for nameserver "%Q%" located within the zone.

NS0096 - NC03096

Server %SERVER% : TCP-Abfrage fehlgeschlagen.
Server %SERVER% : query over TCP failed.

NS0097 - NC03097

Server %SERVER% liefert fuer Nameserver "%NS%", der innerhalb der Zone liegt, den CNAME-Record "%CNAME%" zurueck.
Server %SERVER% returned CNAME record "%CNAME%" by query for nameserver "%NS%" located within the zone.