

How to Configure Dynamic DNS on a Virtual Access Router



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1 About this document

This document describes how to configure a Virtual Access router's settings for Dynamic DNS.

1.1 Scope

This document explains how to:

- Configure the router for Dynamic DNS
- Utilise the diagnostic and trace analyzer tools in the router

1.2 Readership

This document is for engineers who have previous experience configuring and managing networks.

1.3 Terminology

SLA	Service Level Agreement
DNS	Domain Name Resolution
Dyn DNS	Dynamic Domain Name Resolution
DDNS	Dynamic Domain Name Resolution

2 Introduction

Dynamic DNS functionality on a Virtual Access router will dynamically perform DDNS updates to a server so it can associate an IP address with a correctly associated DNS name. Users can then contact a machine, router, device etc. with a DNS name rather than a dynamic IP address

2.1 How does the router implement Dynamic DNS?

2.1.1 Overview

An account is required with the provider, and one or more domain names are associated with that account. A dynamic DNS client on the router monitors the public IP address associated with an interface and whenever the IP address changes, the client notifies the DNS provider to update the corresponding domain name.

When the DNS provider responds to queries for the domain name, it sets a low lifetime, typically a minute or two at most, on the response so that it is not cached. Updates to the domain name are thus visible throughout the whole Internet with little delay.

Note: most providers impose restrictions on how updates are handled: updating when no change of address occurred is considered abusive and may result in an account being blocked. Sometimes, addresses must be refreshed periodically, for example, once a month, to show that they are still in active use.

2.1.2 Address updates

The DDNS client will support two types of address update:

- updating the public address associated with the default route, or
- updating the address bound to a particular interface.

The difference between these is best illustrated by example. Consider a router with an ADSL link configured on ppp-1 and a backup 3G link on ppp-2. When the ADSL link is offline, the backup link becomes active.

Now consider binding the DNS client to the default route. Only a single domain name is needed, let's say 'va1-test-provider.org'. When the default route points to ppp-1, the domain name is updated to reflect ppp-1's IP address. If ppp-1 goes down and the default route switches to ppp-2, the domain name is updated to reflect ppp-2's address. When ppp-1 becomes active again, the domain name changes back to ppp-1's address.

In this scenario, the single domain name 'va1-test-provider.org' will always route to the router, regardless of whether the main ADSL link or backup 3G link is in use. For most purposes, this will be the preferred behaviour.

For some applications, it may be preferable to distinguish between the two interfaces. For example, the 3G interface may be associated with a private network used purely for out-of-band management, while still being assigned a dynamic IP address when a connection is made.

In this case, we can assign separate DNS names to each interface. 'va1-test-adsl-provider.org' can be associated with either the default route or directly with interface ppp-1. 'va-test-3g-provider.org' can be associated with interface ppp-2.

If ppp-1 goes offline, no change is made to the DNS entry for 'va1-test-adsl-provider.org'; the associated IP address simply no longer works, since there is no route to the router

Whenever ppp-2 comes online, 'va1-test.3g.provider.org' is updated with the ppp-2 IP address. If ppp-2 is offline, then the domain name still exists but again will not be routable.

2.1.3 VRRP support

DDNS functionality on the router contains support for interacting with VRRP. This is provided by a configurable option. If the 'Update Only If VRRP Master' configuration option is set for a domain entry, then any event that normally causes that domain name to be updated will be ignored if the router is not a VRRP master, or if VRRP is disabled. If the router is a VRRP master, then domain name updates take place as usual.

In addition, whenever the router attains VRRP master status, including after a reload, any domain names configured in this way will perform a forced update to their IP address to reflect its current setting. Several routers participating in a VRRP group can each have a Dynamic DNS client active for the same domain name, and whenever the master status moves to a new router, the domain name is guaranteed to follow it.

3 Configuring the router

All Virtual Access routers contain an internal web server to configure it. Before you can access the internal web server and start configurations, you must ensure that your PC has the correct networking set up.

When your router is correctly connected to your PC, type `fast.start` into the URL line of your browser to display the start page.

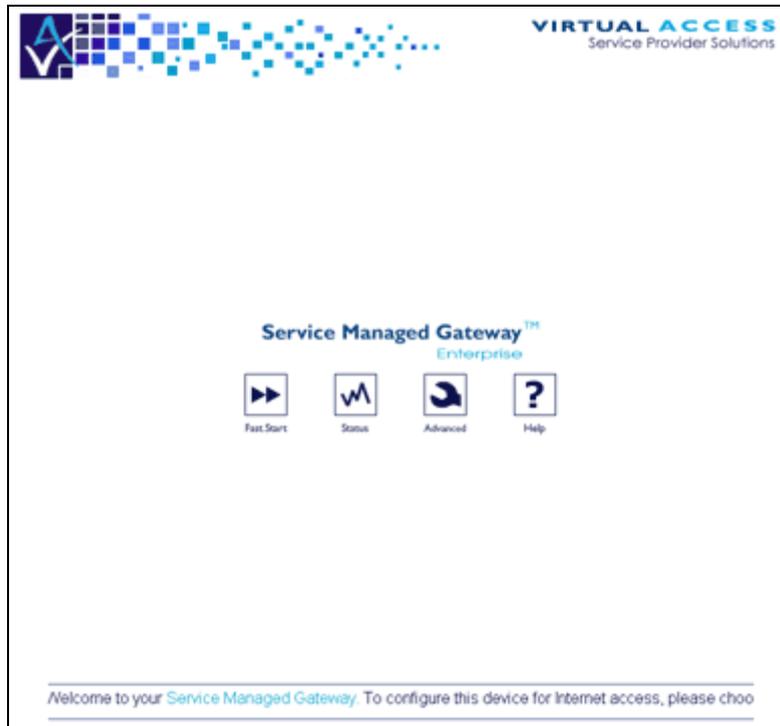


Figure 1: The start page

Access the Fast Start Wizard by clicking the Fast.Start icon on the start page of the embedded web.

The Fast Start Wizard will guide you through a series of forms that you must complete to configure your router.

3.1 Configuring Dynamic DNS on a Virtual Access router

To configure Dynamic DNS, click **Advanced** on the start page. The Advanced menu page appears.

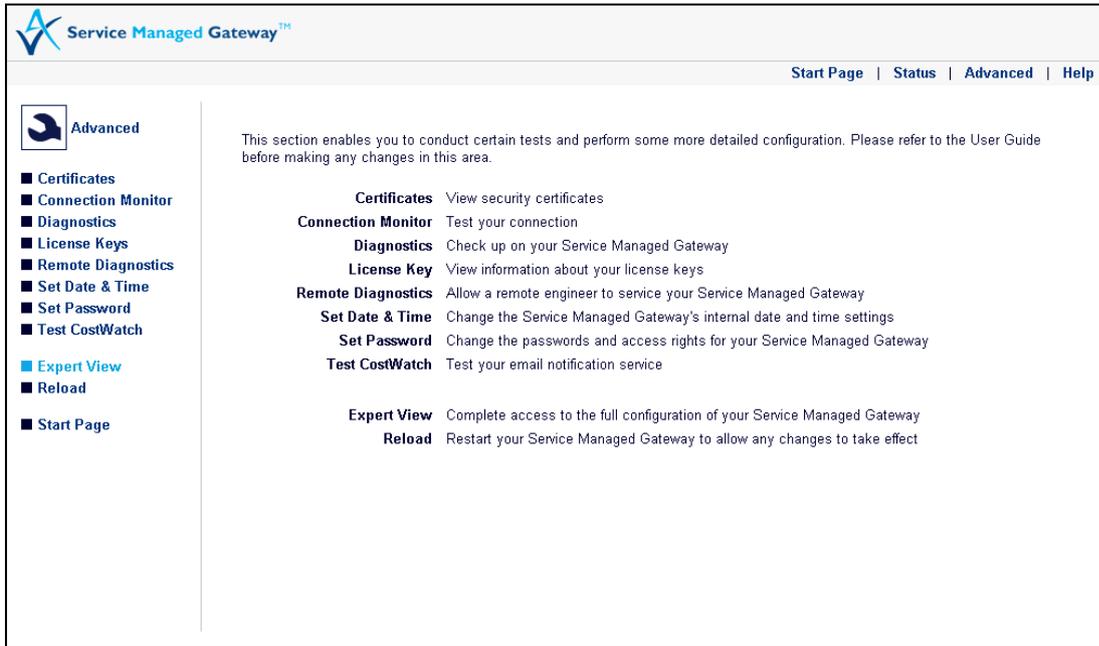


Figure 2: The Advanced menu showing expert view

In the left-hand menu, click **Expert View**.

3.1.1 Configure the Dynamic DNS system

In the Expert View menu, select **System -> local clients -> dyn dns -> system**. The Dynamic DNS page appears.

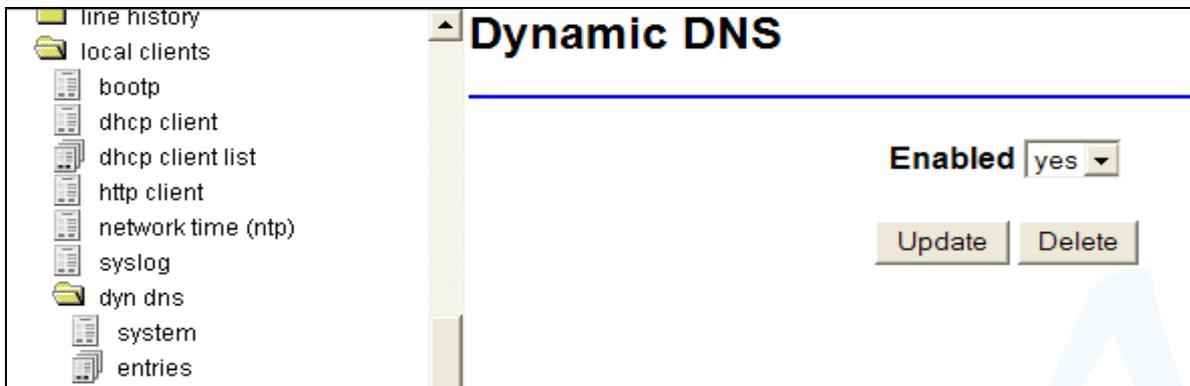


Figure 3: The Dynamic DNS system page

Field	Description	Command Line
Enabled	Enables or disables the IP address.	
	yes	Enables Dynamic DNS
	no	Disables Dynamic DNS
		Set DNS Dynamic client enabled,yes

Table 1: The dynamic DNS page field, description and command line

3.1.2 Configure Dynamic DNS entries

Up to 10 dynamic DNS client entries are supported, each corresponding to one domain name. Several domain names can be associated with the same interface if desired.

Since it is common to use a single provider to manage multiple domain names, the client allows the provider information for a particular entry to be inherited from the previous entry rather than having to be re-entered. This action is controlled by setting the "Provider Type" field to **Previous**. The provider address, username and password are then all inherited from the most recent configured preceding entry.

The special provider type 'Custom' uses the same update mechanism as DynDns.org, and is provided merely to make it more obvious that a custom update provider has been selected. It will not fill in a default URL, so failing to provide one will generate an error rather than an erroneous update to DynDns.com.

3.1.2.1 Configure a Dynamic DNS entry

In the Expert View menu, select **System -> local clients -> dyn dns -> entries**. The Dynamic DNS Entries list page appears.

Select **add** to add an entry.

Enabled	<input type="text" value="yes"/>
Domain Name	<input type="text" value="smgtest.dyndns-home.com"/>
Interface	<input type="text" value="default"/>
Refresh Rate	<input type="text" value="0"/> days
Update Only When VRRP Master	<input type="text" value="no"/>
Provider Type	<input type="text" value="dyn.com"/>
Update URL	<input type="text"/>
Update Parameters	<input type="text"/>
Check Response	<input type="text" value="yes"/>
Username	<input type="text"/>
Password	<input type="text"/>
Password Confirm	<input type="text"/>

Figure 4: The Dynamic entries list

Field	Description	Command Line								
Enabled	Indicates whether this dynamic DNS entry is configured or not. <table border="1"> <tr> <td>yes</td> <td>Enables an entry.</td> </tr> <tr> <td>no</td> <td>Disables an entry.</td> </tr> </table>	yes	Enables an entry.	no	Disables an entry.	Set DNS Dynamic client enabled,yes				
yes	Enables an entry.									
no	Disables an entry.									
Domain Name	The fully qualified domain name associated with this entry. This is the name to update with the new IP address as needed.	Set DNS Dynamic client entry Domain Name 1, a.b.c.d								
Interface	The interface to monitor for updates. <table border="1"> <tr> <td>default</td> <td>Monitor the interface associated with the current default route.</td> </tr> <tr> <td>interface-x</td> <td>Monitor the interface selected.</td> </tr> <tr> <td>none</td> <td>This entry is not associated with any interface. This entry can only be updated manually using the Update DDNS command; this may be appropriate for special scenarios where a script monitors some activity and triggers the update.</td> </tr> </table>	default	Monitor the interface associated with the current default route.	interface-x	Monitor the interface selected.	none	This entry is not associated with any interface. This entry can only be updated manually using the Update DDNS command; this may be appropriate for special scenarios where a script monitors some activity and triggers the update.	Set DNS Dynamic client entry interface 1		
default	Monitor the interface associated with the current default route.									
interface-x	Monitor the interface selected.									
none	This entry is not associated with any interface. This entry can only be updated manually using the Update DDNS command; this may be appropriate for special scenarios where a script monitors some activity and triggers the update.									
Refresh Rate	Determines how often to refresh this entry, in days, to prevent it expiring. This is no longer required by most providers. If configured to a non-zero value, an update will be forced for the entry after that number of days has expired, even if the IP address has not changed.	Set DNS Dynamic client entry Refresh Rate 1								
Update Only If VRRP Master	When set to yes , only update this entry if at least one Ethernet interface on the router is currently a VRRP master. <table border="1"> <tr> <td>yes</td> <td>Only update this entry if at least one Ethernet interface on the router is currently a VRRP master.</td> </tr> <tr> <td>no</td> <td>Always update this entry regardless of VRRP state.</td> </tr> </table>	yes	Only update this entry if at least one Ethernet interface on the router is currently a VRRP master.	no	Always update this entry regardless of VRRP state.	Set DNS Dynamic client entry update Only When VRRP Master 1				
yes	Only update this entry if at least one Ethernet interface on the router is currently a VRRP master.									
no	Always update this entry regardless of VRRP state.									
Provider Type	Governs how account authentication and name updating is carried out. Most DNS providers will conform to one of the provider types listed here. <table border="1"> <tr> <td>Previous</td> <td>This entry uses the same update mechanism as the most recent configured preceding entry.</td> </tr> <tr> <td>Dyn.com</td> <td>Uses Dyn.com update parameters.</td> </tr> <tr> <td>Dyn.com-NoSSL</td> <td>Uses HTTP instead of HTTPS for the update. This is less memory intensive, and makes it easier to view the update traffic with a network sniffer for debug purposes, however it is less secure.</td> </tr> <tr> <td>DynDns.org</td> <td>Uses Dyn.com update parameters.</td> </tr> </table>	Previous	This entry uses the same update mechanism as the most recent configured preceding entry.	Dyn.com	Uses Dyn.com update parameters.	Dyn.com-NoSSL	Uses HTTP instead of HTTPS for the update. This is less memory intensive, and makes it easier to view the update traffic with a network sniffer for debug purposes, however it is less secure.	DynDns.org	Uses Dyn.com update parameters.	Set DNS Dynamic client entry Provider type 1
Previous	This entry uses the same update mechanism as the most recent configured preceding entry.									
Dyn.com	Uses Dyn.com update parameters.									
Dyn.com-NoSSL	Uses HTTP instead of HTTPS for the update. This is less memory intensive, and makes it easier to view the update traffic with a network sniffer for debug purposes, however it is less secure.									
DynDns.org	Uses Dyn.com update parameters.									

	Custom	A special entry which has no associated default provider URL. In this case, an Update URL <i>must</i> be provided. Read section 3.1.3 for more information.	
Update URL	The fully qualified HTTP URL where you set update requests. If left empty, this is automatically inferred from the selected Provider Type. Only configure this when using a non-standard provider. The URL should begin with http or https and may include an optional port number after the domain name. Read section 3.1.3 for more information.		DNS Dynamic Client Entry Update URL 1
Update Parameters	The HTTP parameter string to be supplied to the given URL. Read section 3.1.3 for more information.		DNS Dynamic Client Entry Update Parameters 1
Check Response	yes	The response text must begin with good to indicate a successful update. nochg for an unnecessary update. Anything else will be treated as an error.	DNS Dynamic Client Entry Check Response
	no	A 200 response from the remote server is sufficient to indicate a successful update.	
Username	The user name to use for authenticating domain updates with the selected provider.		set DNS Dynamic Client Entry Username = 1,
Password	The password to use for authenticating domain name updates with the selected provider.		set DNS Dynamic Client Entry Encrypted Password = 1,

Table 2: The DNS entry page fields, descriptions and command lines

3.1.3 Defining a custom Dynamic DNS provider

If you need to update a DNS provider that is not natively supported by the DNS client on the router, you can use the advanced settings to directly configure such a client.

Typically, you configure the DNS Provider Type to 'Custom' and then define Provider URL and Provider Parameters setting specific to that provider. If you select a Provider Type other than Custom, for example, DynDns.org, you can leave either or both the Provider URL and Provider Parameters fields empty and they will inherit the default values from the selected provider. This is convenient if, for example, you want to update the default update URL for a particular provider, but keep the update parameters the same.

The update URL is defined as a fully qualified HTTP or HTTPS URL to the published update site for the provider, without any appended parameters. Do not include any embedded username or password information in the URL. Define the username and password using the Username and Password configuration options.

For example, the HTTP and HTTPS update URLs for DynDns.org are:

http://members.dyndns.org/nic/update

https://members.dyndns.org/nic/update

The URL may include an optional port number after the domain name. For example:

http://members.dyndns.org:8245/nic/update

The parameters field is appended to the update URL and contains the details of the domain name being updated, new IP address, etc. It can contain special variable names in braces which will be replaced by the corresponding value when performing the update:

{ip}	New IP address
{domain}	Domain name being updated
{username}	Username configured for this provider
{password}	Password configured for this provider

Warning: the password is entered in plain text

For example, the update parameter list for DynDns.org is:

```
hostname={domain}&myip={ip}&wildcard=NOCHG&mx=NOCHG&backmx=NOCHG
```

The update URL and parameters list are combined to make a full URL, any needed variable substitution is carried out, and then a HTTP GET is performed on the resulting URL to perform the update.

4 Diagnostics

Virtual Access routers support extensive remote diagnostics, status and SLA monitoring capabilities.

The status and diagnostics tools are provided as a series of Java applets.

4.1 Dynamic DNS statistics

To view Dynamic DNS statistics, from the start page, click **Advanced -> Expert View**.

In the top menu, click **Operations**.

In the Operations menu, click **troubleshooting -> advanced operations -> diagnostics -> dynamic DNS client** the dynamic DNS Stats page appears.

Dynamic DNS Client

Current status: smgtest.dyndns-home.com updated to 172.20.38.129 on 16-Feb 23:44:25

Display: Active entries

Entry: 1
 Domain: smgtest.dyndns-home.com
 Current IP: 172.20.38.129
 Published IP: 172.20.38.129
 Last updated: 16-Feb 23:44:25
 State: Okay
 Last error: None

Figure 5: The Dynamic DNS status page

These commands display the current metrics for the dynamic DNS client.

Command	Description	Hidden
Show DDNS	Displays a summary currently configured dynamic DNS client entries	No
Show DDNS ALL	Displays a detailed list of all currently configured dynamic DNS client entries	No
Show DDNS [1 - 10]	Displays a detailed view of a single dynamic DNS client entry (whether configured or not)	No
Show DDNS Providers	Lists all available DNS provider names, and their default update URLs	No
Show DDNS Status	Displays current status of the DDNS client (idle, updating entry x, most recent error)	No
Show DDNS Name [1-10]	Displays the domain name associated with entry X, or "unconfigured"	No

Table 3: Dynamic client commands

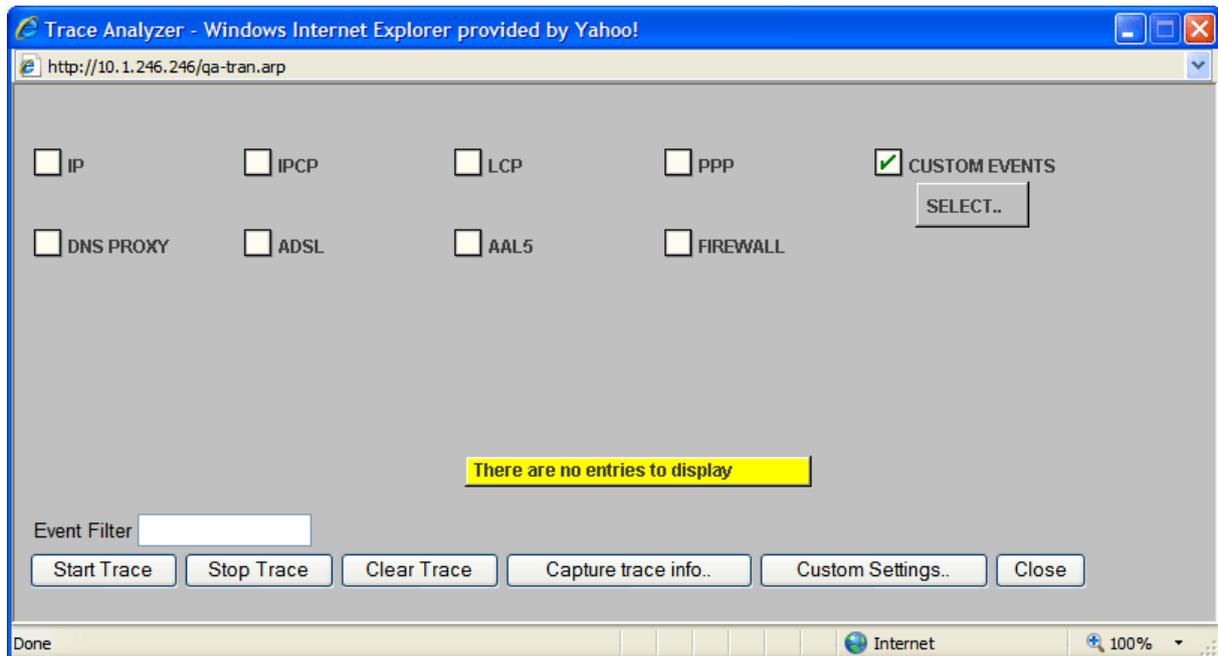
4.2 Trace analyzer

The Trace Analyzer provides a web interface to event tracing allowing you to quickly locate and analyze problems.

To view the Trace Analyzer, from the start page, click **Advanced**.

In the **Advanced** menu, click **Diagnostics**.

On the Diagnostics page, click **Trace Analyzer**. The Trace Analyzer pop-up window appears.



To view the Dynamic DNS traces check **Custom Events** and then click **Select**. The Select Events to Trace pop-up window appears.

In the Events Available window, scroll to the bottom of the list and select **DNSP**. DNSP appears in the Selected Events window. Click **ADD**.

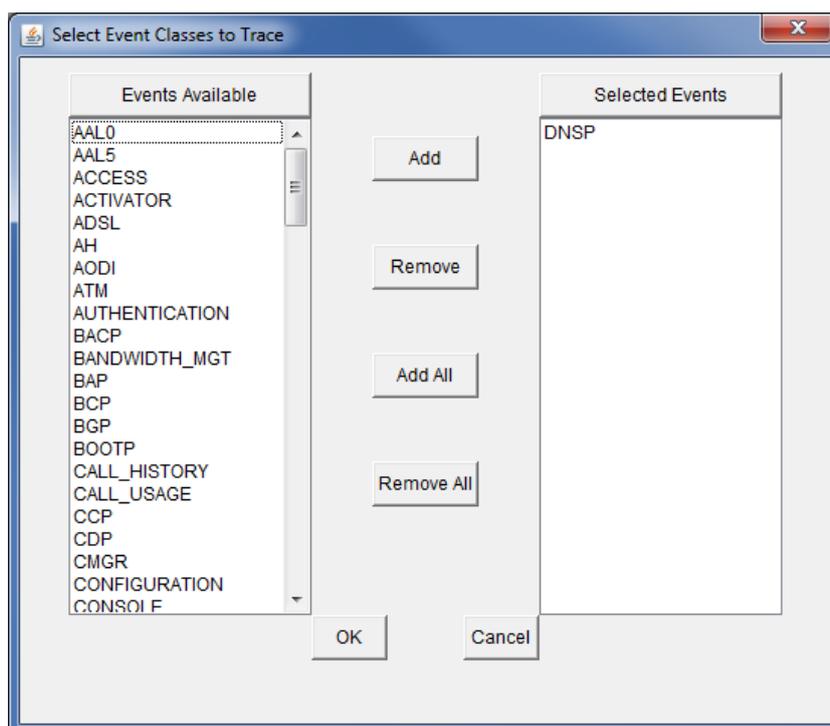


Figure 6: The select event classes to trace pop-up window

4.3 Tracing using the command line

For information on logging on to the command line interface, read the quick guide 'Using the CLI to Manage an SMG'

Tracing via the command line is more flexible than using the trace analyzer as you can specify the event severity and use the all class event to trace all event classes.

Command line tracing also allows you to trace to a log file for examining events over a protracted period of time.

If you enter no event severity, all event severities are displayed.

If you chose an event severity, all events of the chosen severity and greater are displayed.

4.3.1 Command line syntax

To stop tracing, entering - (minus) followed by the event class will stop tracing for this event class. Entering - (minus) on its own will stop all tracing.

Syntax	Description
++dnsp	Starts tracing DNS Proxy events (includes Dynamic DNS events)
-dnsp	Stops DNS Proxy tracing

Table 4: The command line tracing syntax and their descriptions

5 Interactive commands

5.1 Update Dynamic DNS

The command line **UPDATE** can be used to allow some or all of the entries associated with a dynamic DNS name to be updated immediately rather than whenever the interface IP address appears to have changed.

In each case, the optional **-f** parameter can be used to force an update, even if the IP address appears to have not changed since the last update. This may be considered abusive by the DNS provider, so should be used with caution.

Command	Description
Update DDNS [-f] ALL	Updates all currently configured dynamic DNS names.
Update DDNS [-f] portname	Updates all dynamic DNS entries associated with the given port name; if the default route currently routes out this port, then default entries are also included.
Update DDNS [-f] number	Updates the dynamic DNS entry associated with table entry 'number', which must be configured.
Update DDNS [-f] domainname	Invokes a dynamic DNS update for the DDNS entry with a Domain Name matching the given name. For example, Update DDNS va1-test.dyndns.org.

Table 5: Update Dynamic DNS commands and descriptions