DNS ActiveX Control for Microsoft® Windows™

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1 DNS Overview

1.1 Introduction

The Magneto Software DNS (Domain Name Service) ActiveX control (skdns.ocx) allows developers to integrate the DNS protocol message sending capability into their 32-Bit or 64-Bit applications.

The Magneto Software DNS custom control takes care of sending the DNS message to the desired name server. Reply sent from the name server is decoded and necessary information is passed to the application.

All functionality is taken care of by setting properties and by handling events.

Properties can be changed at run time. Events occur to inform the application of errors and changes in the connection status and to deliver the incoming data.

Additional information about Domain Name Service (DNS) can be found at these locations:

[RFC 1034 - DOMAIN NAMES - CONCEPTS AND FACILITIES](#)
[RFC 1035 - DOMAIN NAMES - IMPLEMENTATION AND SPECIFICATION](#)

1.2 Usage

Skdns ActiveX Control can retrieve information about the host/domain by performing a general DNS lookup, or to list addresses in specified domain by performing an AFXR (special zone transfer) lookup.

It is capable of performing multiple general DNS lookups and/or AFXR requests simultaneously.

1.3 Property Summary

optAppendDefaultDomainName
Append default domain name to each query.
optDefaultDomainName
Specify default domain.
optDefaultNameServerIpAddress
Specify IP address of the default name server.
optDefaultNameServerName
Specify domain name of the default name server.
optPortNumber
Specify port number to send query on.
optQueryClass
Specify query class as one of: IN (Internet), CHAOS, HESIOD or ANY.
optQueryType
Specify query type as one of: A, ANY, CNAME, HINFO, MX, PX, NS, PTR, SOA, TXT, WKS, SRV, NAPTR, etc.
optRecurse
Ask for recursive answer to query.
optRetry
Specify number of retries.
optRoot
Set current default server to the root
optSearch
Use search list
optSearchList
Specify search list in the format NAME1/NAME2, etc and set default domain name to NAME1.
optTimeout
Specify initial time-out interval in seconds.
optVirtualCircuit
Always use a virtual circuit (send query over TCP protocol).

1.4 Event Summary

DNSListHostsCompleted
Indicate that skdns.ocx has stopped processing replies to AFXR (transfer zone of authority) queries.
DNSListHostsFoundResourceRecord
Indicate that skdns.ocx has retrieved a resource record in the reply to AFXR query.
DNSListHostsQueryCompleted
Indicate that skdns.ocx has stopped processing replies to a single AFXR query.
DNSLookupHostCompleted
Indicate that skdns.ocx has stopped processing replies to general DNS queries.
DNSLookupHostFoundResourceRecord
Indicate that skdns.ocx has retrieved a resource record in the reply to a general DNS query.
DNSLookupHostQueryCompleted
Indicate that skdns.ocx has stopped processing replies to a single general DNS query.

1.5 Method Summary

AboutBox
Display a dialog box with SkDNS ActiveX Control license and version information.
DNSListHosts
Send an AFXR (transfer zone of authority) query.
DNSListHostsGetResourceRecord
Retrieves resource records when AFXR query is sent.
DNSListHostsReset
Stop AFXR messages (general DNS messages will not be affected).

DNSLookupHost
Send a general DNS query.
DNSLookupHostWithServer
Send a general DNS query to the specified name server.
DNSLookupHostGetResourceRecord
Retrieves resource records when general DNS query is sent.
DNSLookupHostReset
Stop general DNS messages (AFXR messages will not be affected).
ResetDNSSettings
Reset all DNS settings back to default values.

1.6 Error codes

The following provides a complete listing of error codes returned by SkDNS ActiveX Control.
typedef enum __ns_rcode
{

```
          ns_r_noerror          = 0,              // No error occurred.

          ns_r_response         = -5,             // the server didn't respond.
          ns_r_non_auth         = -4,             // the server didn't have the desired info but
                                          // returned the name(s) of some servers who should.
          ns_r_generic_error    = -3,             //  one of the following types of errors:
                                                  // socket operation failed, etc.
          ns_r_no_info          = -2,             // the server didn't find any info about the host.
          ns_r_timeout          = -1,             // a socket connection timed out.

          ns_r_formerr          = 1,              // Format error..
          ns_r_servfail         = 2,              // Server failure.
          ns_r_nxdomain         = 3,              // Name error.
          ns_r_notimpl          = 4,              // Unimplemented.
          ns_r_refused          = 5,              // Operation refused.
          ns_r_yxdomain         = 6,              // Name exists
          ns_r_yxrrset          = 7,              // RRset exists
          ns_r_nxrrset          = 8,              // RRset does not exist
          ns_r_notauth          = 9,              // Not authoritative for zone
          ns_r_notzone          = 10,             // Zone of record different from zone section
          ns_r_max              = 11,

          /* The following are TSIG (RFC 2845) extended errors */

          ns_r_badsig           = 16,             // bad signature
          ns_r_badkey           = 17,             // bad key
          ns_r_badtime          = 18              // bad time
} ns_rcode;
```

1.7 Query Types and Resource Records Types

The following provides a complete listing of resource types and query types supported by SkDNS ActiveX Control.
typedef enum __ns_type {

```
          ns_t_invalid          = 0,              // Cookie.
          ns_t_a                = 1,              // Host address.
          ns_t_ns               = 2,              // Authoritative server.
          ns_t_md               = 3,              // Mail destination.
          ns_t_mf               = 4,              // Mail forwarder.
          ns_t_cname            = 5,              // Canonical name.
          ns_t_soa              = 6,              // Start of authority zone.
          ns_t_mb               = 7,              // Mailbox domain name.
```

```
        ns_t_mg                = 8,              // Mail group member.
        ns_t_mr                = 9,              // Mail rename name.
        ns_t_null              = 10,             // Null resource record.
        ns_t_wks               = 11,             // Well known service.
        ns_t_ptr               = 12,             // Domain name pointer.
        ns_t_hinfo             = 13,             // Host information.
        ns_t_minfo             = 14,             // Mailbox information.
        ns_t_mx                = 15,             // Mail routing information.
        ns_t_txt               = 16,             // Text strings.
        ns_t_rp                = 17,             // Responsible person.
        ns_t_afsdb             = 18,             // AFS cell database.
        ns_t_x25               = 19,             // X_25 calling address.
        ns_t_isdn              = 20,             // ISDN calling address.
        ns_t_rt                = 21,             // Router.
        ns_t_nsap              = 22,             // NSAP address.
        ns_t_nsap_ptr          = 23,             // Reverse NSAP lookup (deprecated).
        ns_t_sig               = 24,             // Security signature.
        ns_t_key               = 25,             // Security key.
        ns_t_px                = 26,             // X.400 mail mapping.
        ns_t_gpos              = 27,             // Geographical position (withdrawn).
        ns_t_aaaa              = 28,             // Ip6 Address.
        ns_t_loc               = 29,             // Location Information.
        ns_t_nxt               = 30,             // Next domain (security).
        ns_t_eid               = 31,             // Endpoint identifier.
        ns_t_nimloc            = 32,             // Nimrod Locator.
        ns_t_srv               = 33,             // Server Selection.
        ns_t_atma              = 34,             // ATM Address
        ns_t_naptr             = 35,             // Naming Authority Pointer
        ns_t_kx                = 36,             // Key Exchange
        ns_t_cert              = 37,             // Certification record
        ns_t_a6                = 38,             // IPv6 address (deprecates AAAA)
        ns_t_dname             = 39,             // Non-terminal DNAME (for IPv6)
        ns_t_sink              = 40,             // Kitchen sink (experimental)
        ns_t_opt               = 41,             // EDNS0 option (meta-RR)
        ns_t_tkey              = 249,            // Transaction key
        ns_t_tsig              = 250,            // Transaction signature.
        ns_t_ixfr              = 251,            // Incremental zone transfer.
        ns_t_axfr              = 252,            // Transfer zone of authority.
        ns_t_mailb             = 253,            // Transfer mailbox records.
        ns_t_maila             = 254,            // Transfer mail agent records.
        ns_t_any               = 255,            // Wildcard match.
        ns_t_zxfr              = 256,            // BIND-specific, nonstandard.
        ns_t_max               = 65536
} ns_type;
```

Note that ns_t_any is a query type but not a record type. (You can ask for records of type ns_t_any, but you can't have any records of that type in the database.

1.8 Query Classes and Resource Records Classes

The following provides a complete listing of query classes supported by SkDNS ActiveX Control .

```
typedef enum __ns_class {
        ns_c_invalid           = 0,             // Cookie.
        ns_c_in                = 1,             // Internet.
        ns_c_2                 = 2,             // Unallocated/unsupported.
        ns_c_chaos             = 3,             // MIT Chaos-net.
```

```
        ns_c_hs                         = 4,                    // MIT Hesiod.
        // Query class values which do not appear in resource records
        ns_c_none                       = 254,                  // For prereq. sections in update requests
        ns_c_any                        = 255,                  // Wildcard match.
        ns_c_max                        = 65536
} ns_class;
```

2 Properties

2.1 optAppendDefaultDomainName

Summary
Append default domain name to each query.
Description
This property specifies whether domain name will be added to the specified host name in format "HostName.DomainName".
This property is of type short.
Default value for this property is 0.
VB Example
SKDNS.optAppendDefaultDomainName = 0

2.2 optDefaultDomainName

Summary
Default domain name.
Description
This property specifies the default domain name.
This property is of type BSTR.
VB Example
Dim DomainName As String
DomainName = "magnetosoft.com"
SKDNS.optDefaultDomainName = DomainName

2.3 optDefaultNameServerIpAddress

Summary

Specify IP address of the default name server.

Description

This property specifies IP address of the default name server.

This property is of type BSTR.

The name server default value is retrieved from the local TCP/IP stack configuration.

VB Example

Dim NameServer As String

NameServer = "127.0.0.1"

SKIDNS.optDefaultNameServerIpAddress = NameServer

2.4 optDefaultNameServerName

Summary
Specify domain name of the default name server.

Description
This property specifies a domain name of the default name server.

If the default name server doesn't have a fully qualified domain name, the returned value will be IP address of the name server in square brackets, i.e. "[1.2.3.4]". In this case property *optDefaultNameServerIpAddress* can be used to retrieve IP address of the default name server

This property is of type BSTR.

The name server default value is retrieved from the local TCP/IP stack configuration.

VB Example
Dim NameServer As String
NameServer = SKDNS.optDefaultNameServerName

2.5 optPortNumber

Summary
Specify port number to send query on.
Description
This property specifies the port to send a DNS query on.
This property is of type short.
Default value for this property is 53.
VB Example
Dim Port As Integer
Port= 53
SKDNS.optPortNumber = Port

2.6 optQueryClass

Summary
Specify query class as one of: IN (Internet), CHAOS, HESIOD or ANY.
Description
Specify a DNS query class (a value that identifies a protocol family or instance of a protocol).
See section 1.8 Query Classes and Resource Records Classes for the complete list of supported query classes.
This property is of type short.
Default value for this property is 1 (Internet).
VB Example
Dim QueryClass As Integer
QueryClass = 1
SKDNS.optQueryClass = QueryClass

2.7 optQueryType

Summary
Specify query type as one of: A, ANY, CNAME, HINFO, MX, PX, NS, PTR, SOA, TXT, WKS, SRV, NAPTR, etc.
Description
Specify a DNS query type (a value that specifies the specific type of information).
See section 1.7 Query Types and Resource Records Types for the complete list of supported query types.
This property is of type short.
Default value for this property is 1 (Host address).
VB Example
Dim QueryType As Integer
QueryType = 1
SKDNS.optQueryType = QueryType

2.8 optRecurse

Summary
Ask for recursive answer to query.
Description
This property is of type short.
Default value for this property is 1 (recursive mode).
VB Example
Dim Recursive As Integer
Recursive = 1
SKDNS.optRecursive = Recursive

2.9 optRetry

Summary
Specify number of retries.
Description
This property specifies the number of times that you want to resend your requests if it times out.
This property is of type short.
Default value for this property is 2.
VB Example
Dim Retry As Integer
Retry = 2
SKDNS.optRetry = Retry

2.10 optRoot

Summary
Set current default name server to the domain name space root

Description
This property is of type BSTR.

Default value for this property is set to "f root-servers.net.".

VB Example
Dim Root As String
Root = "f root-servers.net."
SKDNS.optRoot = Root

2.11 optSearch

Summary
Use search list
Description
This property is of type short.
Default value for this property is 0.
VB Example
Dim Search As Integer
Search = 1
SKDNS.optSearch = Search

2.12 optSearchList

Summary
Specify search list in the format NAME1/NAME2, etc and set default domain name to NAME1.
Description
This property is of type BSTR.
Default value for this property will show default domain name if available.
VB Example
Dim SearchList As String
SearchList = "magnetosoft.com/magnetosoft.net"
SKDNS.optSearchList = SearchList

2.13 optTimeout

Summary
Specify initial time-out interval in seconds.
Description
This property is of type short.
Default value for this property is 5.
VB Example
Dim Timeout As Integer
Timeout = 5
SKDNS.optTimeout = Timeout

2.14 optVirtualCircuit

Summary
Always use a virtual circuit (send query over TCP protocol).

Description
Some systems may wish to use UDP datagrams for queries and responses, and only establish virtual circuits (TCP streams) for transactions that need the reliability (e.g., database updates, long transactions); other systems will use virtual circuits exclusively.

This property is of type short.

Default value for this property is 0 (use UDP datagrams for queries).

VB Example
Dim VirtualCircuit As Integer
VirtualCircuit = 0
SKDNS.opt VirtualCircuit = VirtualCircuit.

3 Events

3.1 DNSListHostsCompleted

Summary
Indicate that skdns.ocx has stopped processing replies to AFXR (transfer zone of authority) queries.
Syntax
DNSListHostsCompleted ();
Description
skdns.ocx allows for processing of multiple AFXR queries and multiple general DNS queries by the same program simultaneously. This event can have a high importance for the application presentation logic, like "Start" / "Stop" buttons and other.

3.2 DNSListHostsFoundResourceRecord

Summary

Indicate that skdns.ocx has retrieved a resource record in the reply to AFXR query.

Syntax

DNSListHostsFoundResourceRecord(long *lQueryId*, BSTR *strDomainName*, BSTR *strOrigin*,
                                    short *nType*, short *nClass*, long *lTTL*, BSTR *strRecord*);

Description

The DNSListHostsFoundResourceRecord event occurs whenever a skdns.ocx has extracted a valid resource record from the reply to AFXR query.

Parameters

lQueryId is the query identifier,

strDomainName is the queried domain name.

strOrigin is a relative name taken relative to a well-known origin.

nType is the record type. See section 1.7 Query Types and Resource Records Types for the complete list of supported record types.

nClass is the record class. See section 1.8 Query Classes and Resource Records Classes for the complete   list of supported resource records classes.

lTTL is the time to live of the resource record in seconds. This value can be used by an application when   they cache resource records.. The TTL describes how long a resource record can be cached before   it should be discarded.

strRecord is the resource record.

3.3 DNSListHostsQueryCompleted

Summary

Indicate that skdns.ocx has stopped processing replies to a single AFXR query.

Syntax

DNSListHostsQueryCompleted(long *lQueryId*, BSTR *strDomainName*, long *lAnswers*, long *lRecords*,
    long *lError*);

Description

The DNSListHostsFoundResourceRecord event occurs whenever a skdns.ocx has finished processing a single AFXR query.

Parameters

lQueryId is the query identifier,

strDomainName is the queried domain name.

lAnswers is the number of answers.

lRecords is the number of resource records.

lError is the error code. See section 1.6 Error Codes the complete list of supported error codes.

3.4 DNSLookupHostCompleted

Summary

Indicate that skdns.ocx has stopped processing replies to general DNS queries.

Syntax

DNSLookupHostCompleted ();

Description

skdns.ocx allows for processing of multiple AFXR queries and multiple general DNS queries by the same program simultaneously. This event can have a high importance for the application presentation logic, like "Start" / "Stop" buttons and other.

3.5 DNSLookupHostFoundResourceRecord

Summary
Indicate that skdns.ocx has retrieved a resource record in the reply to general DNS query.

Syntax
DNSLookupHostFoundResourceRecord(long *lQueryId*, BSTR *strHostName*, short *nType*, short *nClass*, long *lTTL*, short *nCategory*, BSTR *strRecord*);

Description
The DNSListHostsFoundResourceRecord event occurs whenever a skdns.ocx has extracted a valid resource record from the reply to AFXR query.

Parameters
lQueryId is the query identifier,
strHostName is the queried host name.
nType is the record type. See section 1.7 Query Types and Resource Records Types for the complete list   of supported record types.
nClass is the record class. See section 1.8 Query Classes and Resource Records Classes for the complete   list of supported resource records classes.
lTTL is the time to live of the resource record in seconds. This value can be used by an application when   they cache resource records.. The TTL describes how long a resource record can be cached before   it should be discarded.
nCategory is the resource record category. It can be on of the following values:
          0 (Answer), 1 (Authority), or 2 (Resource).
strRecord is the resource record.

3.6 DNSLookupHostQueryCompleted

Summary
Indicate that skdns.ocx has stopped processing replies to a single general DNS query.

Syntax
DNSLookupHostQueryCompleted(long *lQueryId*, BSTR *strHostName*, long *lQuestionEntries*, long
lAnswerEntries, long *lAuthorityEntries*, long *lResourceEntries*, long *lError*);

Description
The DNSListHostsFoundResourceRecord event occurs whenever a skdns.ocx has finished processing a single general DNS query.

Parameters
lQueryId is the query identifier,
strHostName is the queried host name.
lQuestionEntries is the number of questions in the DNS query.
lAnswerEntries is the number of answer entries in the name server reply.
lAuthorityEntries is the number of authority entries in the name server reply.
lResourceEntries is the number of resource entries in the name server reply.
lError is the error code. See section 1.6 Error Codes the complete list of supported error codes.

4 Methods

4.1 AboutBox

Summary
Display a dialog box with SkDNS control license and version information.
Syntax
void AboutBox();
Description
This method could be used to display version license information or to register skdns.ocx control.
Parameters
None.

4.2 DNSListHosts

Summary
Send an AFXR (transfer zone of authority) query.

Syntax
long DNSListHosts(BSTR *strDomainName*, short *nResourceRecordType*);

Description
Send an AFXR (transfer zone of authority) query.
The AXFR may cause an error, such as refused, but normally is answered by a
sequence of response messages. The first and last messages must contain the data for the top authoritative node of the zone. Intermediate messages carry all of the other resource records from the zone, including both authoritative and non-authoritative Resource records. The stream of messages allows constructing a copy of the zone. Because accuracy is essential, some name servers may require TCP protocol be used for AXFR requests.

Parameters
strDomainName is the queried domain name.
nResourceRecordType is the record type selector. See section 1.7 Query Types and Resource Records Types for the complete list of supported record types.

Return value
This method is asynchronous. If successful, it returns 0 (ERROR_SUCCESS).
The value from the actual AFXR query will be returned by event DNSListHostsQueryCompleted.

4.3 DNSListHostsGetResourceRecord

Summary

Retrieves resource records when AFXR query is sent.

Note that this method should be used only when SkDNS control is used as a COM server, not an ActiveX control, for instance, when SkDNS is instantiated from ASP page or Windows Scripting Host.

When SkDNS is used as regular ActiveX control, notification event DNSListHostsFoundResourceRecord should be used instead.

Syntax

long DNSListHostsGetResourceRecord(VARIANT* *pvarQueryId*, VARIANT* *pvarDomainName*, VARIANT* *pvarOrigin*, VARIANT* *pvarType*, VARIANT* *pvarClass*, VARIANT* *pvarTTL*, VARIANT* *pvarRecord*, VARIANT* *pvarQueryCompleted*, VARIANT* *pvarError*)

Parameters

pvarQueryId is the query identifier,

pvarDomainName is the queried domain name.

pvarOrigin is a relative name taken relative to a well-known origin.

pvarType is the record type. See section 1.7 Query Types and Resource Records Types for the complete list of supported record types.

pvarClass is the record class. See section 1.8 Query Classes and Resource Records Classes for the complete list of supported resource records classes.

pvarTTL is the time to live of the resource record in seconds. This value can be used by an application when they cache resource records.. The TTL describes how long a resource record can be cached   before it should be discarded.

pvarRecord is the resource record.

pvarQueryCompleted indicates that query is completed. If *pvarQueryCompleted* is 1 then *pvarError* has the return code from DNS query.

pvarError contains the error code. See section 1.6 Error Codes the complete list of supported error codes.

Return value

Return value indicates current state.

Possible values:

997 (ERROR_IO_PENDING), control is still processing AXFR request.

234 (ERROR_MORE_DATA), a resource record is retrieved.

259 (ERROR_NO_MORE_ITEMS), there is no more data to retrieve.

4.4 DNSListHostsReset

Summary
Stop AFXR messages (general DNS messages will not be affected).
Syntax
void DNSListHostsReset (void)
Description
The DNSListHostsReset method terminates any pending AFXR queries.
Parameters
None.

4.5 DNSLookupHost

Summary
Send a general DNS query.
Syntax
long DNSLookupHost(BSTR *strHostName*);
Description
Send a general DNS query.
Parameters
strHostName is the queried host name.   It can be IP address or domain name of the host.
Return value
This method is asynchronous. If successful, it returns 0 (ERROR_SUCCESS).
The value from the actual general DNS query will be returned by event DNSLookupHostQueryCompleted.

4.6 DNSLookupHostWithServer

Summary
Send a general DNS query to the specified name server.
Syntax
long DNSLookupHostWithServer(BSTR *strHostName*, BSTR *strNameServer*);
Description
Send a general DNS query to the specified name server.
Parameters
strHostName is the queried host name.   It can be IP address or domain name of the host.
strNameServer is the specified name server.   It can be IP address or domain name of the host.
Return value
This method is asynchronous. If successful, it returns 0 (ERROR_SUCCESS).
The value from the actual general DNS query will be returned by event DNSLookupHostQueryCompleted.

4.7 DNSLookupHostGetResourceRecord

Summary

Retrieves resource records when general DNS query is sent.

Note that this method should be used only when SkDNS control is used as a COM server, not an ActiveX control, for instance, when SkDNS is instantiated from ASP page or Windows Scripting Host.

When SkDNS is used as regular ActiveX control, notification event DNSLookupHostFoundResourceRecord should be used instead.

Syntax

long DNSLookupHostGetResourceRecord(VARIANT* *pvarQueryId*, VARIANT* *pvarHostName*, VARIANT* *pvarType*, VARIANT* *pvarClass*, VARIANT* *pvarTTL*, VARIANT* *pvarCategory*, VARIANT* *pvarRecord*, VARIANT* *pvarQueryCompleted*, VARIANT* *pvarError*)

Parameters

pvarQueryId is the query identifier,

pvarHostName is the queried host name.

pvarType is the record type. See section 1.7 Query Types and Resource Records Types for the complete   list of supported record types.

pvarClass is the record class. See section 1.8 Query Classes and Resource Records Classes for the   complete list of supported resource records classes.

pvarTTL is the time to live of the resource record in seconds. This value can be used by an application   when they cache resource records.. The TTL describes how long a resource record can be cached   before it should be discarded.

pvarCategory is the resource record category. It can be on of the following values:

      0 (Answer), 1 (Authority), or 2 (Resource).

pvarRecord is the resource record.

pvarQueryCompleted indicates that query is completed. If *pvarQueryCompleted* is 1 then *pvarError* has   the return code from DNS query.

pvarError contains the error code. See section 1.6 Error Codes the complete list of supported error codes.

Return value

Return value indicates current state.

Possible values:

997 (ERROR_IO_PENDING), control is still processing AXFR request.

234 (ERROR_MORE_DATA), a resource record is retrieved.

259 (ERROR_NO_MORE_ITEMS), there is no more data to retrieve.

4.8 DNSLookupHostReset

Summary
Stop general DNS messages (AFXR messages will not be affected).
Syntax
void DNSLookupHostReset (void);
Description
The DNSListHostsReset method terminates any pending general DNS queries.
Parameters
None.

4.9 ResetDNSSettings

Summary
Reset all DNS settings back to default values.
Syntax
void ResetDNSSettings(void);
Description
All DNS related settings would be reset to defaults.
The destination address list will remain intact.
Parameters
None.