

MQSeries Integrator LDAP Plug-In Version 1.4

5th November, 2001

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Fifth Edition, November 2001

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Acknowledgments

The author would like to acknowledge Arjan van Vught from IBM e-business Hosting Services who was very helpful at numerous times.

Summary of Amendments

Date	Changes
14 February 2001	Initial release
2 April 2001	AIX Support Both releases linked with IBM SecureWay Directory Version 3 Client (Arjan van Vught, avv@nl.ibm.com)
23 July 2001	Sun Solaris Support Linked with IBM eNetwork LDAP Directory Client Version 2.1. (Arjan van Vught, avv@nl.ibm.com)
26 September 2001	Linux (on Intel) support added Updated makefile for AIX and Sun Solaris.
19 October 2001	HP-UX support added

Preface

This document describes an MQSeries Integrator V2 plug-in node that takes parameters from the node properties and the input message, performs a Lightweight Directory Access Protocol (LDAP) search using those parameters, and constructs an output message which is a copy of the input message enriched with the LDAP search results.

This plug-in node offers an alternative for accessing a database to retrieve read-only data. It can be imagined that some information that the broker needs for formatting and/or routing of messages can be found in an LDAP directory instead of a database. The LDAP node gives access to such a directory from within an MQSeries Integrator V2 message flow.

Versions are supplied for use in the Microsoft Windows, AIX, Sun Solaris, Linux (on Intel) and HP-UX environments along with source code and documentation.

Bibliography

- *IBM MQSeries Integrator for Windows NT Version 2 Installation Guide*, IBM Corporation. SC34-5600.
- *IBM MQSeries Integrator for Sun Solaris Version 2 Installation Guide*, IBM Corporation. SC34-5842
- *IBM MQSeries Integrator for AIX Version 2 Installation Guide*, IBM Corporation. SC34-5841
- *IBM MQSeries Integrator for Linux Version 2 Installation Guide*, IBM Corporation. AA00-0000
- *IBM MQSeries Integrator for HP-UX Version 2 Installation Guide*, IBM Corporation. SC34-5907
- *IBM MQSeries Integrator Version 2 Using the Control Center*, IBM Corporation. SC34-5602
- *IBM MQSeries Integrator Version 2 Programming Guide*, IBM Corporation. SC34-5603

Installing the plug-in node

SupportPac contents

The supplied zip file should be unzipped in a temporary directory. The following files and sub-directories will be created:

/source

LdapPlugIn.c	
LdapPlugIn.h	
CrtDll.bat	<i>creates LdapPlugin.dll with debugging off</i>
CrtDebugDll.bat	<i>creates LdapPlugin.dll with debugging on</i>

/NT

LdapPlugIn.lil
LdapPlugIn
LdapPlugIn.wdp
LdapPlugInNode.properties

/AIX

LdapPlugIn.lil
makefile.ldap

/SUN

LdapPlugIn.lil
makefile.ldap

/Linux86

LdapPlugIn.lil
makefile.ldap

/HPUX

LdapPlugIn.lil
makefile.ldap

license2.txt

ia08.pdf

Prerequisites

This SupportPac provides a plug-in node to be used with the IBM MQSeries Integrator Version 2.0.1 and above. This node was tested using the IBM eNetwork LDAP Directory Server Version 2.1, but it should also work with other LDAP servers.

Required software:

- The products required by IBM MQSeries Integrator Version 2.0.1 and above.
- The SecureWay Directory Client V2.1 and above (NT, AIX, Sun Solaris and HP-UX)¹
- OpenLDAP V2.0 (Linux on Intel)

¹ The NT, AIX and HP-UX nodes were tested using the IBM SecureWay Directory Client V3. The Sun Solaris version was tested with IBM eNetwork LDAP Directory Client V2.1

If any changes are to be made to the plug-in node on NT, AIX, Sun Solaris and HP-UX, an appropriate C compiler is required together with the IBM SecureWay Directory Client SDK available at:

<http://www.ibm.com/software/network/directory>

If any changes are to be made to the plug-in node on Linux (on Intel), an appropriate C compiler is required together with the OpenLDAP Client SDK available at:

<http://www.openldap.org/software/download/> (Linux for Intel)

Supported Platforms

This SupportPac has been developed and tested in a Microsoft Windows NT, AIX and HP-UX environment with IBM SecureWay Directory Client V3. The Sun Solaris version has been developed and tested with IBM eNetwork LDAP Directory Client Version 2.1. The Linux (on Intel) has been developed and tested with OpenLDAP V2 (openldap-stable-20010524.tgz).

Installing the plug-in node on broker system

The plug-in 'lil' file can be installed by copying or moving the appropriate file to the following directory:

- <mqsi_root>\bin (Windows)
- <mqsi_root>/lil (AIX)
- <mqsi_root>/lil (Sun Solaris)
- <mqsi_root>/lil (Linux on Intel)
- <mqsi_root>/lil (HP-UX)

You must stop and restart the broker to enable it to detect the existence of the new 'lil'.

Integrating the plug-in node into the Windows Control Center

The necessary files for integrating the plug-in into the Windows Control Center are provided in the /NT directory.

Use the following table to copy the files to their correct location. These locations should already exist providing you have deployed at least one message flow. Append your <MQSI V2 root install path> to the **Copy to location** value.

Use the following to replace the placeholders:

<hostname> - TCP/IP hostname
 <CM QMName> - Configuration Manager's queue manager name

Filename	Copy to location
LdapPlugIn	\Tool\repository\private\<hostname>\<CM QMName>\MessageProcessingNodeType
LdapPlugIn.wdp	\Tool\repository\private\<hostname>\<CM QMName>\MessageProcessingNodeType
LdapPlugIn.properties	\Tool\com\ibm\lvm\mqitool\extensions

Defining the node to the configuration repository

When you have installed the files in the appropriate directories, as described in the previous section, you must make these definitions available to the Control Center.

1. Start the Control Center. The user ID you are using must be a member of the MQSeries Integrator group ***mqbrdevt***. You are recommended to use the superuser ***IBMMQSI2*** to complete this task². This causes your new node to be locked under the same user ID as all the supplied IBM primitive nodes. If you do not use this user ID, the definition files in the configuration repository might be accidentally locked, and therefore open to unauthorized update.
2. Select the Message Flows view.
3. Select an existing Message Flow Category, or create a new one.
4. Right-click the selected category, and select *Add->Message Flow*.

A list box is displayed showing all existing IBM-supplied primitive nodes and any defined message flows you have installed following the instructions provided.

5. Select the message flow (the node).

This node now appears within the message flow category you selected in the tree view in the left-hand pane.

6. Select your new node, and right-click. Select *Check In*.
7. Right-click again, and select Lock. Then right-click again and select Check In for a second time. After this check, the interface and ****.wdp*** definition files disappear from the local directory and go into the shared repository, where they are available to all users of the Control Center. However, user can only use this new node if they have installed the additional files (icons, properties files, and so on) on their own system.

² You must take care if you change logon IDs to complete this task. Changing logon IDs can effect the operation of the Configuration Manager's queue manager if it is on this system, but not running as a Windows NT service. See the *MQSeries Integrator Administration Guide* for more information about queue manager operation (Chapter 2) and the superuser ***IBMMQSI2*** (Chapter 4).

Using the plug-in node

Description

The plug-in node takes parameters from the node properties and the input message, performs an LDAP search using those parameters, and constructs an output message which is a copy of the input message enriched with the LDAP search results.

Plug-in node terminals

Terminal	Description
In	The input terminal that accepts a message for processing by the node
Out	The output terminal that outputs the new message with the LDAP search results
Failure	The output terminal which the message is routed if failure is detected during processing the message.

Plug-in node properties

These properties are displayed when you right click a LdapPlugIn node entry in the Message Flow Types pane, and click Properties. The values displayed are the default properties for this instance of the node. They cannot be edited when displayed from the Message Flow Types pane.

Server

Hostname or TCP/IP address of the LDAP server. This attribute is mandatory and it must be checked that a TCP/IP connection exists with this server.

Port

LDAP TCP/IP port. The default value is "389".

BindDN

The LDAP DN that will be used in the bind. If no DN is supplied no authentication is done.

Password

The LDAP password, corresponding to the DN, that will be used in the bind. Leave this blank if no DN is used.

SearchbaseElement

The name of the element in the input message tree that contains the value of the LDAP search base. The default value is "Root.LDAP.Searchbase".

FilterElement

The name of the element in the input message tree that contains the value of the LDAP filter. The default value is "Root.LDAP.Filter".

SearchResultsRoot

The name of the element in the output message tree that must act as the root of the subtree containing the LDAP search results. The default value is "Root.LDAP.Results".

Searchbase

The default value of the LDAP search base if no search base value can be found in the message.

Filter

The default value of the LDAP filter if no filter value can be found in the message. The default value for this attribute is "cn=*".

Resulting output message

The output message that will be produced by the LDAP plug-in node is a copy of the input message plus a subtree containing the LDAP search results. The root *SearchResultsRoot* of this tree is determined by the corresponding attribute of the node, as described above. For every LDAP entry an element *SearchResultsRoot*."Entry" is created. For every attribute of an entry with name *Attribute* an element *SearchResultsRoot*."Entry".*Attribute* is created. For every value of the attribute an element *SearchResultsRoot*."Entry".*Attribute*."Value" is created, which contains the actual value.

Compiling the plug-in node

Windows NT

To compile the source of the plug-in node, the following command can be used together with Microsoft Visual C++ V6.0.

```
cl /VERBOSE /LD /MT /I"C:\Program Files\IBM\LDAP\include" LdapPlugIn.c -link /DLL
imdbfplg.lib /LIBPATH:"c:\PROGRA~1\IBM\LDAP\lib" ldap.lib
```

Rename the dll file to a lil file after compiling.

If tracing of the node is required, the following command should be used instead.

```
cl /DDEBUG /VERBOSE /LD /MT /I"C:\Program Files\IBM\LDAP\include" LdapPlugIn.c -link
/DLL imdbfplg.lib /LIBPATH:"c:\PROGRA~1\IBM\LDAP\lib" ldap.lib
```

If tracing is enabled, trace information like the following will be written to the file "C:\temp\LdapDebug.txt" every time a message passes.

```
*****
*   Node "LdapPlugIn" for MQSeries Integrator V2.0 for Windows NT   *
*****
Node attributes:
  LdapServer      = "nlmqss03"
  LdapPort        = "389"
  LdapBindDN      = "cn=root, o=ibm_us, c=us"
  LdapPassword    = "root"
  LdapSearchbaseElement = "Root.XML.Message.LdapSearchbase"
  LdapFilterElement   = "Root.XML.Message.LdapFilter"
  LdapSearchResultsRoot = "Root.XML.Message.LdapResults"
  LdapSearchbase    = "o=ibm_us, c=us"
  LdapFilter        = "cn=*"
Start navigating to LdapSearchbaseElement
  NextElementName = XML
  NextElementName = Message
  NextElementName = LdapSearchbase
  Updated LdapSearchbase = "o=ibm_us, c=us"
Start navigating to LdapFilterElement
  NextElementName = XML
  NextElementName = Message
  NextElementName = LdapFilter
  Updated LdapFilter = "cn=Ro*"
Start navigating to LdapSearchResultsRoot
  NextElementName = XML
  NextElementName = Message
  NextElementName = LdapResults
Entry:
  AttributeName=<objectclass>
    AttributeValue=<organizationalPerson>
  AttributeName=<cn>
    AttributeValue=<Ron Edwards>
  AttributeName=<sn>
    AttributeValue=<Edwards>
  AttributeName=<telephonenumber>
    AttributeValue=<1-812-855-4021>
  AttributeName=<internationalisdnnumber>
    AttributeValue=<755-4021>
  AttributeName=<facsimiletelephonenumber>
    AttributeValue=<1-812-855-5454>
  AttributeName=<title>
    AttributeValue=<DEPT TECH>
  AttributeName=<seealso>
    AttributeValue=<cn=Cynthia Flowers, ou=Home Entertainment, ou=Austin, o=IBM_US,
c=US>
  AttributeName=<postalcode>
    AttributeValue=<4601>
  AttributeName=<telexnumber>
    AttributeValue=<1-812-474-3783>
Entry:
  AttributeName=<objectclass>
    AttributeValue=<organizationalPerson>
  AttributeName=<cn>
```

```
    AttributeValue=<Robert Dean>
  AttributeName=<sn>
    AttributeValue=<Dean>
  AttributeName=<telephonenumber>
    AttributeValue=<1-812-855-5703>
  AttributeName=<internationalisdnnumber>
    AttributeValue=<755-5703>
  AttributeName=<facsimiletelephonenumber>
    AttributeValue=<1-812-855-5704>
    AttributeValue=<755-5704>
  AttributeName=<postalcode>
    AttributeValue=<1701>
  AttributeName=<seealso>
    AttributeValue=<cn=Maria Garcia, ou=In Flight Systems, ou=Austin, o=IBM_US,
c=US>
Propagating to terminal "out"
```

AIX

To compile the source of the plug-in node, the following makefile can be used.

```
DEFINES      = -DAIX -qcpluscmt
CC           = xlc_r
MQSIROOT     = /home/mqmdvl/mqsiv2
LDAPROOT     = /home/mqmdvl/ldap

all:         LdapPlugIn.lil

LdapPlugIn.lil:      LdapPlugIn.o
                   $(CC) -bM:SRE -bexpall -bnoentry -o LdapPlugIn.lil -L
$(MQSIROOT)/lib -L $(LDAPROOT) -l ldap -l imbdfplg $(DEFINES) LdapPlugIn.o

LdapPlugIn.o:  LdapPlugIn.c LdapPlugIn.h
                   $(CC) -I $(LDAPROOT) -I $(MQSIROOT)/include -I
$(MQSIROOT)/include/plugin -c LdapPlugIn.c
```

Sun Solaris

To compile the source of the plug-in node, the following makefile can be used.

```
DEFINES      = -DSUN -xCC
CC           = cc
MQSIROOT     = /opt/mqsi
MQSISAMPLE   = $(MQSIROOT)/sample/plugin
MQSIINCLUDE  = -I$(MQSIROOT)/include -I$(MQSIROOT)/include/plugin -I$(MQSISAMPLE)
LDAPROOT     = /opt/IBMldapc

all:         LdapPlugIn.lil

LdapPlugIn.o:  LdapPlugIn.c LdapPlugIn.h
                   $(CC) -mt -I. $(MQSIINCLUDE) -c LdapPlugIn.c $(DEFINES)

BipSampPluginUtil.o:  $(MQSISAMPLE)/BipSampPluginUtil.c
$(MQSISAMPLE)/BipSampPluginUtil.h
                   $(CC) -mt -I. $(MQSIINCLUDE) -c
$(MQSISAMPLE)/BipSampPluginUtil.c $(DEFINES)

LdapPlugIn.lil:      LdapPlugIn.o BipSampPluginUtil.o
                   $(CC) -G -o LdapPlugIn.lil -L $(MQSIROOT)/lib -L $(LDAPROOT) -l ldap -l
imbdfplg LdapPlugIn.o BipSampPluginUtil.o
```

Linux (on Intel)

To compile the source of the plug-in node, the following makefile can be used.

```
DEFINES      = -DLINUX
CC           = gcc
MQSIROOT     = /opt/mqsi
MQSISAMPLE   = $(MQSIROOT)/sample/plugin
MQSIINCLUDE  = -I$(MQSIROOT)/include -I$(MQSIROOT)/include/plugin -I$(MQSISAMPLE)

all:         LdapPlugIn.lil

LdapPlugIn.o:  LdapPlugIn.c LdapPlugIn.h
                   $(CC) -I/usr/ldap/include -I. $(MQSIINCLUDE) -c LdapPlugIn.c $(DEFINES)

BipSampPluginUtil.o:  $(MQSISAMPLE)/BipSampPluginUtil.c
$(MQSISAMPLE)/BipSampPluginUtil.h
                   $(CC) -I. $(MQSIINCLUDE) -c $(MQSISAMPLE)/BipSampPluginUtil.c
$(DEFINES)

LdapPlugIn.lil:      LdapPlugIn.o BipSampPluginUtil.o
                   ld -shared -o LdapPlugIn.lil -l ldap -l lber -l resolv -L
$(MQSIROOT)/lib -l imbdfplg LdapPlugIn.o BipSampPluginUtil.o
```


HP-UX

To compile the source of the plug-in node, the following makefile can be used.

```

DEFINES      = -DHPUX +z
CC           = cc
MQSIROOT     = /opt/mqsi
MQSISAMPLE   = $(MQSIROOT)/sample/plugin
MQSIINCLUDE  = -I$(MQSIROOT)/include -I$(MQSIROOT)/include/plugin -I$(MQSISAMPLE)
LDAPROOT     = /Development/avv/ldap/ldapadt

all:    LdapPlugIn.lil

LdapPlugIn.o:      LdapPlugIn.c LdapPlugIn.h
                  $(CC) -I. -I$(LDAPROOT)/include -I$(MQSIROOT)/include -
I$(MQSIROOT)/include/plugin -c LdapPlugIn.c $(DEFINES)

BipSampPluginUtil.o: $(MQSISAMPLE)/BipSampPluginUtil.c
$(MQSISAMPLE)/BipSampPluginUtil.h
                  $(CC) -I. $(MQSIINCLUDE) -c $(MQSISAMPLE)/BipSampPluginUtil.c
$(DEFINES)

LdapPlugIn.lil:    LdapPlugIn.o BipSampPluginUtil.o
                  ld -b -o LdapPlugIn.lil -L $(MQSIROOT)/lib -L $(LDAPROOT)/lib -l
ldap -l imbdfplg LdapPlugIn.o BipSampPluginUtil.o

```

Example using the plug-in node

At the server with hostname “nlmqss03” an IBM eNetwork LDAP Directory Server Version 2.1 was installed and configured with default settings. Sample data was loaded into the directory.

An MQSI V2.0 sample flow was created with an MQInput, an LDAP and an MQOutput node. The LDAP node was configured with the following parameters.

Server	nlmqss03
Port	389
BindDN	cn=root, o=ibm_us, c=us
Password	root
SearchbaseElement	Root.XML.Message.LdapSearchbase
FilterElement	Root.XML.Message.LdapFilter
SearchResultsRoot	Root.XML.Message.LdapResults
Searchbase	o=ibm_us, c=us
Filter	cn=*

After deploying the following XML message was sent to the flow.

```
<Message>
  <LdapSearchbase>o=ibm_us, c=us</LdapSearchbase>
  <LdapFilter>cn=Ro*</LdapFilter>
</Message>
```

The XML output message was the following (extra spaces and end-of-lines are included to improve readability).

```
<Message>
  <LdapSearchbase>o=ibm_us, c=us</LdapSearchbase>
  <LdapFilter>cn=Ro*</LdapFilter>
  <LdapResults>
    <Entry>
      <objectclass>
        <Value>organizationalPerson</Value>
      </objectclass>
      <cn>
        <Value>Ron Edwards</Value>
      </cn>
      <sn>
        <Value>Edwards</Value>
      </sn>
      <telephonenumber>
        <Value>1-812-855-4021</Value>
      </telephonenumber>
      <internationalisdnnumber>
        <Value>755-4021</Value>
      </internationalisdnnumber>
      <facsimiletelephonenumber>
        <Value>1-812-855-5454</Value>
      </facsimiletelephonenumber>
      <title>
        <Value>DEPT TECH</Value>
      </title>
      <seealso>
        <Value>cn=Cynthia Flowers, ou=Home Entertainment, ou=Austin, o=IBM_US,
c=US</Value>
      </seealso>
      <postalcode>
        <Value>4601</Value>
      </postalcode>
      <telexnumber>
        <Value>1-812-474-3783</Value>
      </telexnumber>
    </Entry>
    <Entry>
      <objectclass>
        <Value>organizationalPerson</Value>
      </objectclass>
      <cn>
        <Value>Robert Dean</Value>
      </cn>
      <sn>
        <Value>Dean</Value>
      </sn>
      <telephonenumber>
        <Value>1-812-855-5703</Value>
      </telephonenumber>
      <internationalisdnnumber>
        <Value>755-5703</Value>
      </internationalisdnnumber>
      <facsimiletelephonenumber>
        <Value>1-812-855-5704</Value>
        <Value>755-5704</Value>
      </facsimiletelephonenumber>
      <postalcode>
        <Value>1701</Value>
      </postalcode>
      <seealso>
        <Value>cn=Maria Garcia, ou=In Flight Systems, ou=Austin, o=IBM_US,
c=US</Value>
      </seealso>
    </Entry>
  </LdapResults>
</Message>
```

----- End of Document -----