# C:\Users\stefano.maggi.CONBIPELSPA\Desktop\prom38.png

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**Procedure:** Active Directory - How do I formulate LDAP queries and filters?

**Source:** [**LINK**](http://www.tek-tips.com/faqs.cfm?fid=5667)

**Permalink:** [**LINK**](http://heelpbook.altervista.org/2012/active-directory-how-do-i-formulate-ldap-queries-and-filters/)

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# **Active Directory – How do I formulate LDAP queries and filters?**

**CONVENTIONS AND DEFINITIONS**

* ()
  + Parenthesis encapsulate filters and separate them into sections
* {}
  + Braces (or curly brackets) encapsulate my notes about the contents of the filter
* **CAPITAL LETTERS**
  + Plain English title
* **mIxEd cAsE**
  + Attribute name in AD
* **Bit Value**
  + Decimal value of a binary number (ie. 001000010 bin=34 dec). If you want to examine multiple bit values, simply add them up (ie. 2+65536=65538). Use the "**Bitwise AND**" or "**Bitwise OR**" filters for searches based on these values.
* **Attribute**
  + Attributes are the properties of an **Object** in AD.
* **Value**
  + Values are data related to the attributes with which they are associated. They may be "**present**" or "**not present**" (blank). Data may be in plain text, hex, numeric, or other formats.
* **Class**
  + Objects in **AD** are categorized into **Classes**. This document only discusses 3 classes: **Users**, **Computers**, and **Groups**.
* **Integer8 Date**
  + The value represents the number of **100-nanosecond** intervals since 12:00 AM January 1, 1601.
  + At the bottom of this document you can find the text of a **VBScript** that will convert normal dates to **Integer8** dates so that you can use them in searches. Simply cut and paste the VB into a text file with a **.vbs** extension and use it from a command prompt.
  + **NOTE**: Remember, the lower this number is the further back in time it is. Use <= for "on or before" queries.

**WHERE TO GET INFORMATION**

* Microsoft's MSDN website
* Google
* ADSI Edit
  + \*\*USE EXTREME CAUTION WHEN USING THIS UTILITY. DO NOT MANUALLY CHANGE ANY VALUES WHILE USING THIS UTILITY.\*\*
  + This utility allows you to see the actual attribute names and the values they use so that you can perform searches. This utility is included with the **Windows 2000 Server** or **Windows Server 2003** support pack.

**FILTERS**

\*\*\*\*\*\*BASE FILTERS\*\*\*\*\*\*   
WILDCARD...........................\*   
PRESENCE...........................(attribute=\*)   
EQUALITY...........................(attribute=value)   
PARTIAL MATCH......................(attribute={partial value}\*)   
PARTIAL MATCH......................(attribute=\*{partial value})   
PARTIAL MATCH......................(attribute=\*{partial value}\*)   
PARTIAL MATCH......................(attribute=\*{partial value 1}\*{partial value 2}\*)   
GREATER THAN or EQUAL..............(attribute>=value)   
LESS THAN or EQUAL.................(attribute<=value)   
APPROXIMATELY EQUAL................(attribute~=value)

\*\*\*\*\*\*BOOLEAN FILTERS\*\*\*\*\*\*   
AND................................(&(filter1)(filter2))   
AND................................(&(filter1)(filter2)(filter3))   
OR.................................(|(filter1)(filter2))   
OR.................................(|(filter1)(filter2)(filter3))   
NOT................................(!(filter1))   
BITWISE AND........................(attribute:1.2.840.113556.1.4.803:={bitvalue in decimal})   
BITWISE OR.........................(attribute:1.2.840.113556.1.4.804:={bitvalue in decimal})

\*\*\*\*\*\*SPECIAL CHARACTERS IN "VALUE" FIELDS\*\*\*\*\*\*   
(..................................\28   
)..................................\29   
\*..................................\2A   
\..................................\5C

\*\*\*\*\*\*CORRELARY FILTERs\*\*\*\*\*\*   
NOT PRESENT (BLANK FIELD)..........(!(attribute=\*))

**COMMON OBJECT CLASSES AND ATTRIBUTES**

\*\*\*\*\*\*USER ACCOUNT\*\*\*\*\*\*   
CLASS..............................objectCategory=person AND objectClass=user   
ACCOUNT DISABLED...................userAccountControl={contains bit value of 2}   
PASSWORD NOT REQUIRED..............userAccountControl={contains bit value of 32}   
PASSWORD NEVER EXPIRES.............userAccountControl={contains bit value of 65536}   
SMARTCARD REQUIRED.................userAccountControl={contains bit value of 262144}   
ACCOUNT TRUSTED FOR DELEGATION.....userAccountControl={contains bit value of 524288}   
ACCOUNT CANNOT BE DELEGATED........userAccountControl={contains bit value of 1048576}   
USE DES ENCRYPTION.................userAccountControl={contains bit value of 2097152}   
DON'T REQUIRE KERBEROS PRE-AUTH....userAccountControl={contains bit value of 4194304}   
PREVIOUS PASSWORD CHANGE...........pwdLastSet {Integer8 Date, use .vbs to convert conventional dates, use "<=" for all dates before or ">=" for all dates after}   
LAST LOGON.........................lastLogon {Integer8 Date as above, value of 0 or blank means NEVER}   
REQUIRE P/W CHANGE AT NEXT LOGON...pwdLastSet {Value of 0, any other value is previous p/w change date}   
GROUP MEMBERSHIP...................memberOf {Specify exact DN of group, no wildcards allowed}   
EXCHANGE USER......................msExchHomeServerName {wildcard, or complete or partial servername}   
EXCHANGE USER (OPTIONAL)...........homeMDB {wildcard, or complete or partial database name}   
DESCRIPTION........................description {wildcard, or complete or partial text}   
FIRST NAME.........................givenName {wildcard, or complete or partial text}   
LAST NAME..........................sn {wildcard, or complete or partial text}   
EMPLOYEE TYPE......................employeeType {wildcard, or complete or partial text}   
EMPLOYEE NUMBER....................employeeID {wildcard, or complete or partial text}   
DEPARTMENT NUMBER..................department {wildcard, or complete or partial text}   
LOGON NAME.........................sAMAccountName {wildcard, or complete or partial text}   
USER PRINCIPAL NAME (UPN)..........userPrincipalName {wildcard, or complete or partial text}

\*\*\*\*\*\*COMPUTER ACCOUNT\*\*\*\*\*\*   
CLASS..............................objectClass=computer   
OS NAME............................operatingSystem {ie. Windows 2000 Professional, use "PARTIAL" filter}   
OS SERVICE PACK....................operatingSystemServicePack {ie. Service Pack 4, use "PARTIAL" filter}   
OS VERSION.........................operatingSystemVersion {ie. 5.0 (2195), use "PARTIAL" filter}   
DOMAIN CONTROLLER..................userAccountControl={contains bit value of 8192}   
ACCOUNT TRUSTED FOR DELEGATION.....userAccountControl={contains bit value of 524288}   
DESCRIPTION........................description {wildcard, or complete or partial text}

\*\*\*\*\*\*GROUP OBJECTS\*\*\*\*\*\*   
CLASS..............................objectClass=group   
DESCRIPTION........................description {wildcard, or complete or partial text}   
NAME...............................CN {wildcard, or complete or partial text}   
SECURITY GROUP.....................groupType {contains bit value of 2147483648}   
GLOBAL GROUP.......................groupType {contains bit value of 2}   
DOMAIN LOCAL GROUP.................groupType {contains bit value of 4}   
UNIVERSAL GROUP....................groupType {contains bit value of 8}

**SAMPLE QUERY SEGMENTS**

* Object is a user
  + (&(objectCategory=person)(objectClass=user))
* Account is not disabled
  + (!(userAccountControl:1.2.840.113556.1.4.803:=2))
* Object is an Enabled User
  + (&(objectCategory=person)(objectClass=user)(!(userAccountControl:1.2.840.113556.1.4.803:=2)))
* Account is assigned an Exchange Mailbox
  + (|(homeMDB=\*)(msExchHomeServerName=\*))
* User is member of group (Specify exact DN of Group. Use ADSIEdit to determine if unsure.)
  + (memberOf=CN=your group name,OU=your ou,DC=yourdomain,DC=tld)
* Account Password Never Expires not set
  + (!(userAccountControl:1.2.840.113556.1.4.803:=65536))
* Password set on or before 8/9/2004 (Specify Integer8 Date, Use VB script to determine)
  + (pwdLastSet<=127365120000000000)
* Change Password at next logon flag
  + (pwdLastSet=0)
* Account has never logged on
  + (|(lastLogon=0)(!(lastLogon=\*)))

**SAMPLE FULL QUERIES** (NOTE: If you cut and paste from this document, remove any extra carriage returns)

* [Object is an Enabled User Account] and [Has an Exchange mailbox] and [Not members of the All Mail Users D/L]
  + (&(&(&(objectCategory=person)(objectClass=user)(!(userAccountControl:1.2.840.113556.1.4.803:=2)))(|(homeMDB=\*)(msExchHomeServerName=\*)))(!(memberOf=CN=your group name,OU=your ou,DC=yourdomain,DC=tld)))
* [Object is a User Account] and [P/W never expires flag is not set and not disabled] and [P/W changed on or before 8/9/04] and [Password change flag is not set]
  + (&(&(&(&(objectCategory=person)(objectClass=user))(!(userAccountControl:1.2.840.113556.1.4.804:=65538)))(pwdLastSet<=127365120000000000))(!(pwdLastSet=0)))
* [Object is an Enabled User Account] and [P/W changed on or before 8/9/04] or [Password change flag is set and Last Logon is never] or [Last Logon is >90 days]
  + (&(&(objectCategory=person)(objectClass=user)(!(userAccountControl:1.2.840.113556.1.4.803:=2)))(|(&(pwdLastSet=0)(|(lastLogon=0)(!(lastLogon=\*))))(lastLogon<=127439424000000000)(&(pwdLastSet<=127365120000000000)(!(userAccountControl:1.2.840.113556.1.4.803:=65536)))))
* [Object is a Group] and [type of Global and Security]
  + (&(objectClass=group)(groupType:1.2.840.113556.1.4.803:=2147483650))
* [Object is a Computer] and [P/W changed on or before 8/9/04]
  + (&(objectClass=computer)(pwdLastSet<=127365120000000000))
* [Object is a Computer] and [Is a Domain Controller] and [Is running Windows NT 4]
  + (&(&(objectClass=computer)(userAccountControl:1.2.840.113556.1.4.803:=8192))(operatingSystemVersion=4\*))