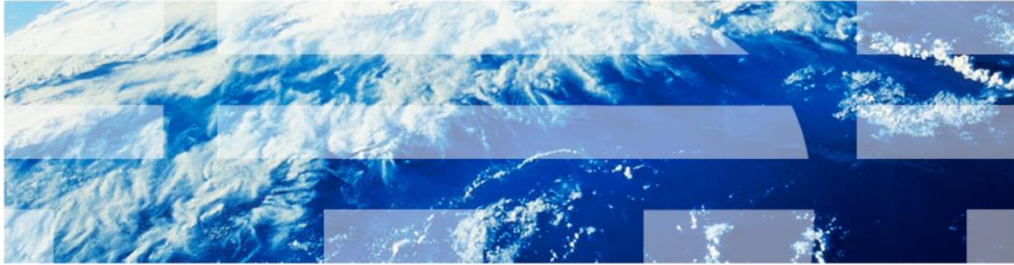


InfoSphere Information Server

Advanced LDAP filtering techniques to minimize the Information Server user list



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This presentation will discuss how to set up a user filter to minimize the number of users listed in the Information Server Web Console.

Objectives

- Why filter LDAP and Active Directory users
- View LDAP user attributes
- Create and test filter
- Configure filter

This presentation will discuss reasons for filtering your LDAP users, how to view your LDAP user attributes to determine what filter should be used and how to create and test your filter. This presentation will also discuss how to set your filter up in WebSphere® so that only the users you want are displayed in the Information Server Web Console.

The concepts of this presentation are for both LDAP and Active Directory. For simplicity, the term LDAP refers to both. This presentation will also assume that you already have LDAP configured and working with your version of Information Server and WebSphere. This presentation will not discuss how to configure Information Server to use LDAP.

Search filters

- Set under LDAP Entity Types (Federated) or Advanced LDAP Settings (Standalone LDAP)
- Limits number of users or groups or both
- Need to know what attributes are set for LDAP users
- Use LDAP browser to look at user attributes first
- Use filter in LDAP browser to test filters

Search filters will help limit the number of users or groups that are returned to WebSphere or Information Server when requesting a list of users or groups. This is especially important in cases where WebSphere is authenticating against multiple domains or one very large domain.

In order to create a filter, you must know what attributes are set up for the LDAP users. The easiest way to tell is with an LDAP browser. The LDAP browser will allow you to see the attributes for a user or group and it will also allow you to test your filters before adding them into WebSphere. Each time you add or change a filter in WebSphere, you need to stop and restart WebSphere for the changes to take effect. This can be very time consuming. It is much easier to test your filter in your LDAP browser and then update WebSphere once you have the filter correct.

Information Server Web Console default user list

- By default, all LDAP users are displayed
- LDAP servers may have thousands of users
- Only want to see Information Server users

IBM InfoSphere Information Server

Home Administration Glossary Information Services Catalog Reporting Repository Management

Navigation

- Contents
- Domain Management
- Session Management
- Users and Groups
 - Users
 - Groups
- Log Management
- Schedule Monitoring

Users

Select Users to Work With

User Name: Filter Clear Filter

Additional Filter Criteria

Item 1-25 out of 40

<input type="checkbox"/>	Last Name	First Name	User Name	Title
<input type="checkbox"/>			abalk	
<input type="checkbox"/>			brauch	
<input type="checkbox"/>	Administrator	DataStage	dsadm	
<input type="checkbox"/>	Administrator	DataStage	dsadm	
<input type="checkbox"/>			Hhelberg	
<input type="checkbox"/>			Idspowers	
<input type="checkbox"/>			Idsmith	
<input type="checkbox"/>	Titus	Aaron	Idathus	
<input type="checkbox"/>			Idbjalbert	
<input type="checkbox"/>	Brokaw	Scott	Idrokaw	
<input type="checkbox"/>			Idcooper	
<input type="checkbox"/>			Idcrommett	
<input type="checkbox"/>			Idfoster	
<input type="checkbox"/>			Idfowler	
<input type="checkbox"/>			Idfreund	
<input type="checkbox"/>			Idgesler	
<input type="checkbox"/>			Idsadmin	
<input type="checkbox"/>			Idmalaga	
<input type="checkbox"/>			Idmeyer	
<input type="checkbox"/>			Idmlisted	

4

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When you open the Information Server Web Console, by default, you will see all the LDAP users. When querying against multiple domains or a very large domain, the result of the search may yield thousands of users. These large searches can also take a long time to return and may result in an error if the result set is too large. It is much more manageable to see just a list of your Information Server users.

LDAP user attributes

- Use LDAP browser
- Look at user attributes
- Decide what to filter on
- `memberOf` commonly used with Active Directory

Name	Value	Type
<input type="checkbox"/> cn	Bernadette Rauch	Attribute
<input type="checkbox"/> gidNumber	100	Attribute
<input type="checkbox"/> givenName	Bernadette	Attribute
<input type="checkbox"/> homeDirectory	/home/brauch	Attribute
<input type="checkbox"/> loginShell	/bin/bash	Attribute
<input type="checkbox"/> objectClass	top	Attribute
<input type="checkbox"/> objectClass	posixAccount	Attribute
<input type="checkbox"/> objectClass	inetOrgPerson	Attribute
<input type="checkbox"/> sn	Rauch	Attribute
<input type="checkbox"/> uid	brauch	Attribute
<input type="checkbox"/> uidNumber	10030	Attribute
<input checked="" type="checkbox"/> departmentNumber	42	Attribute
<input checked="" type="checkbox"/> businessCategory	DataStageOper	Attribute
<input checked="" type="checkbox"/> businessCategory	InformationAnalyzer	Attribute

5

Active Directory: Managing Security and Access to Information Services

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The first step is to open an LDAP browser and look at the attributes of a user that you will want to include in your user list. When you set up a filter, you are basically telling the LDAP server what to search for. If you wanted to search for the user in the example on this slide, you can set the filter up to search for users where their department number equals 42. A very common attribute to use with Active Directory is `memberOf`. This attribute is set for each group the user is a member of.

Search filters – Example (1 of 4)

- Filters use standard LDAP filter syntax
- Example:
 - Use businessCategory and departmentNumber
 - Create filter with attributes
 - businessCategory = DataStageDev
 - departmentNumber = 42
 - Use “&” for “AND” operation
(&(departmentNumber=42)(businessCategory=DataStageDev))
- Test filter in LDAP browser

Search DN: dc=ipssupport,dc=ibm,dc=com

Filter: **(!(departmentNumber=42)(businessCategory=DataStageDev))**

Attributes: businessCategory, cn

Scope: One level Sub-tree level

Handle referrals Enable Paging

Page size: 1000

Name	Value	Parent DN	businessCategory	cn
uid	sparsons	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageDev	Sheldon Parsons
uid	ssussman	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageOper, DataStageDev	Stuart Sussman
uid	mayer	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageDev, DataStageOper	Raj Mayer
uid	lgalecki	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageDev	Leonard Galecki

6

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The syntax that WebSphere uses for filtering is the standard LDAP filter syntax. This example will use the user attributes businessCategory and departmentNumber. The filter will look for users where businessCategory is set to DataStageDev and departmentNumber is 42. The “&” tells the filter that both criteria must be met.

This particular filter is only returning four users which is too restrictive. The filter needs to be modified so that all of the Information Server users are returned.

Search filters – Example (2 of 4)

- Add businessCategory “DataStageOper” and “DataStageAdmin”
- Still need “departmentNumber=42” and “businessCategory=DataStageDev”
- “|” = OR
- (&(departmentNumber=42)((businessCategory=DataStageDev)(businessCategory=DataStageOper)(businessCategory=DataStageAdmin)))
- Filter reads
 - departmentNumber = 42 AND (businessCategory=DataStageDev OR businessCategory=DataStageOper OR businessCategory=DataStageAdmin)

The screenshot shows an LDAP search interface with the following fields:

- Search DN: dc=ipssupport,dc=ibm,dc=com
- Filter: (&(departmentNumber=42)((businessCategory=DataStageDev)(businessCategory=DataStageOper)(businessCategory=DataStageAdmin)))
- Attributes: businessCategory, cn
- Scope: One level, Sub-tree level
- Options: Handle referrals, Enable Paging
- Page size: 1000

The search results are displayed in a table:

Name	Value	Parent DN	businessCategory	cn
uid	sparsons	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageDev	Sheldon Parsons
uid	brauch	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageOper, InformationA...	Bernadette Ra...
uid	ssussman	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageOper, DataStageDev	Stuart Sussman
uid	mnyyar	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageDev, DataStageOper	Raj Nayyar
uid	hhelberg	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageOper	Howard Helberg
uid	lgalecki	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageDev	Leonard Galecki
uid	pmann	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageAdmin	Priya Mann
uid	pcuoco	ou=people,dc=ipssupport,dc=ibm,dc=com	DataStageAdmin	Penny Cuoco

In order to make the filter less restrictive and return more of the Information Server users, the filter will keep the departmentNumber at 42 and the businessCategory of dataStageDev and will add the businessCategory of DataStageOper and DataStageAdmin. This search will need to do both an “And” and an “OR” to yield the correct results. The pipe symbol is used for an OR operation. The search results of this filter is better because it correctly shows all of the DataStage users but it is missing the Information Analyzer users that do not have a DataStage businessCategory.

Search filters – Example (3 of 4)

- Filter missing Information Analyzer user
- User only has one businessCategory attribute
 - InformationAnalyzer
- (&(departmentNumber=42)((businessCategory=DataStageDev)(businessCategory=DataStageOper)(businessCategory=DataStageAdmin)(businessCategory=InformationAnalyzer)))
- Standalone LDAP - WebSphere Admin user **must be part of the result set**

The screenshot shows the IBM WebSphere Admin console's LDAP search interface. On the left, a tree view shows user attributes for 'Amy Bialk', with 'businessCategory' highlighted in red. On the right, the search configuration is shown with the following details:

- Search DN: dc=pssupport,dc=ibm,dc=com
- Filter: (&(departmentNumber=42)((businessCategory=DataStageDev)(businessCategory=DataStageOper)(businessCategory=DataStageAdmin)(businessCategory=InformationAnalyzer)))
- Attributes: businessCategory, cn
- Scope: Sub-tree level
- Options: Handle referrals, Enable Paging

The search results table is as follows:

Name	Value	Parent DN	businessCategory	cn
uid	spersons	ou=people,dc=pssupport,dc=ibm,dc=com	DataStageDev	Sheldon Parsons
uid	brauch	ou=people,dc=pssupport,dc=ibm,dc=com	DataStageOper, Informat...	Bernadette Rauch
uid	ssussman	ou=people,dc=pssupport,dc=ibm,dc=com	DataStageOper, DataStag...	Stuart Sussman
uid	abialik	ou=people,dc=pssupport,dc=ibm,dc=com	InformationAnalyzer	Amy Bialk
uid	rnayyar	ou=people,dc=pssupport,dc=ibm,dc=com	DataStageDev, DataStage...	Raj Nayyar
uid	hnelberg	ou=people,dc=pssupport,dc=ibm,dc=com	DataStageOper	Howard Helberg
uid	lgalecki	ou=people,dc=pssupport,dc=ibm,dc=com	DataStageDev	Leonard Galecki
uid	pmann	ou=people,dc=pssupport,dc=ibm,dc=com	DataStageAdmin	Priya Mann
uid	pucoco	ou=people,dc=pssupport,dc=ibm,dc=com	DataStageAdmin	Penny Cuoco

8

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In this example, user abialik is missing from the list because Amy is not a DataStage user but only an Information Analyzer user. In order to include this user as well, add one last addition to the filter of businessCategory=InformationAnalyzer. The list now contains all the users that you want to see in the user list in the Information Server Web Console. When configuring stand-alone LDAP, it is important to make sure this list includes your WebSphere admin user or the WebSphere admin user is not able to authenticate.

Search Filters – Example (4 of 4)

- LDAP syntax allows wild card – “*”

```
(&(departmentNumber=42)((businessCategory=DataStage*)(businessCategory=InformationAnalyzer)))
```

- Wild card may not be used with all attributes
 - Example: memberOf

The screenshot shows an LDAP search interface. The search filter is set to `(&(departmentNumber=42)((businessCategory=DataStage*)(businessCategory=InformationAnalyzer)))`. The attributes field is empty. The scope is set to "Sub-tree level". The "Handle referrals" checkbox is checked, and "Enable Paging" is unchecked. The page size is set to 1000. The results table shows the following data:

Name	Value	Parent DN
uid	sparsons	ou=people,dc=ipssupport,dc=ibm,dc=com
uid	brauch	ou=people,dc=ipssupport,dc=ibm,dc=com
uid	ssussman	ou=people,dc=ipssupport,dc=ibm,dc=com
uid	abialk	ou=people,dc=ipssupport,dc=ibm,dc=com
uid	mayyar	ou=people,dc=ipssupport,dc=ibm,dc=com
uid	hhelberg	ou=people,dc=ipssupport,dc=ibm,dc=com
uid	lgalecki	ou=people,dc=ipssupport,dc=ibm,dc=com
uid	pmann	ou=people,dc=ipssupport,dc=ibm,dc=com
uid	pcuoco	ou=people,dc=ipssupport,dc=ibm,dc=com

9

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LDAP syntax also allows for the use of an asterisk as a wild card in some instances. In this last example, the search filter from the previous slide was shortened by using the wild card syntax `businessCategory=DataStage*`. Not all attributes allow this, for example, this will not work with `memberOf` on Active Directory. At this point, you are ready to add the filter to WebSphere.

Setting up filters in WebSphere – Stand-alone LDAP (1 of 4)

- Open WebSphere administrative console
- Security => Global Security
- Configure LDAP settings

6.1 / 7.0

6.0

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The first example is setting up the filter in a stand-alone LDAP configuration. Begin by opening the WebSphere administrative console as your WebSphere admin user. For WebSphere 7.0 that ships with Information Server 8.5 and 8.7, make sure the Available realm definition is set to Standalone LDAP registry and click Configure. If you are using Information Server 8.0 or 8.1, which ships with WebSphere 6.0, click the LDAP link under User Registries.

Setting up filters in WebSphere – Stand-alone LDAP (2 of 4)

- Additional Properties => Advanced LDAP user registry settings

Global security > Standalone LDAP registry

Uses the Lightweight Directory Access Protocol (LDAP) user registry settings when users and groups reside in an external LDAP directory. When security is enabled and any of these properties are changed, go to Security > Global security panel. Click Apply or OK to validate the changes.

The screenshot shows the configuration page for the Standalone LDAP registry. It includes a 'Test connection' button at the top. Below it are two main sections: 'General Properties' and 'Additional Properties'. The 'General Properties' section contains a 'Primary administrative user name' field with the value 'ldwasadm', a 'Server user identity' section with radio buttons for 'Automatically generated server identity' (selected) and 'Server identity that is stored in the repository', and a 'Type of LDAP server' dropdown menu set to 'IBM Tivoli Directory Server'. The 'Additional Properties' section is circled in red and contains a link for 'Advanced Lightweight Directory Access Protocol (LDAP) user registry settings'. Below it is a 'Related Items' section with a link for 'Trusted authentication realms - inbound'. At the bottom, there is a 'Host' field and a footer with the page number '11', the text 'Advanced LDAP filtering techniques to minimize the Information Server user list', and the copyright notice '© 2012 IBM Corporation'.

Next, click Advanced LDAP user registry settings under Additional Properties. The WebSphere 6.0 screen will look slightly different than this screen capture displayed on this slide but will still contain the Advanced LDAP link in the same location on the right side of the screen.

Setting up filters in WebSphere – Stand-alone LDAP (3 of 4)

- User filter
(&(uid=%v)(objectclass=inetOrgPerson))
- Add new filter to current filter
- New filter must be current filter AND new filter

The screenshot shows the 'Global security' console window. The breadcrumb navigation is 'Global security > Standalone LDAP registry > Advanced Lightweight Directory Access Protocol (LDAP) user registry settings'. Below this, there is a descriptive paragraph: 'Specify advanced Lightweight Directory Access Protocol (LDAP) user registry settings when users and groups reside in an external LDAP directory. When security is enabled and any of these advanced settings are changed, go to the Security > Global security panel. Click Apply or OK to validate the changes.' The 'General Properties' section contains several fields: 'User filter' with the value '(&(uid=%v)(objectclass=inetOrgPerson))', 'Group Filter' with '(&(cn=%v)(objectclass=posixGroup))', 'User ID map' with 'inetOrgPerson:uid', 'Group ID map' with 'posixGroup:cn', and 'Group member ID map' with 'posixGroup:member'. There is a checkbox for 'Perform a nested group search' which is unchecked. Below these are fields for 'Kerberos user filter', 'Certificate map mode' (set to 'EXACT_DN'), and 'Certificate filter'. At the bottom are buttons for 'Apply', 'OK', 'Reset', and 'Cancel'.

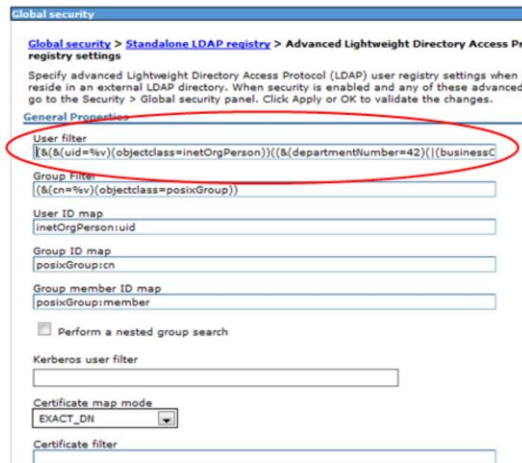
12

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Your screen will show the user and group filters that have been set up so far. The next step is to add the filter that was created using the LDAP browser to the user filter. Since the current filter does the user search, the new filter must be added to the current filter. It cannot replace the current filter.

Setting up filters in WebSphere – Stand-alone LDAP (4 of 4)

- User filter => Original user filter AND new user filter
 (&(&(uid=%v)(objectclass=inetOrgPerson))(&(departmentNumber=42)((businessCategory=DataStage*)(businessCategory=InformationAnalyzer))))
- Save and restart WebSphere



Global security

Global security > Standalone LDAP registry > Advanced Lightweight Directory Access Protocol (LDAP) user registry settings

Specify advanced Lightweight Directory Access Protocol (LDAP) user registry settings when users reside in an external LDAP directory. When security is enabled and any of these advanced settings are changed, go to the Security > Global security panel. Click Apply or OK to validate the changes.

General Properties

User filter
 (&(&(uid=%v)(objectclass=inetOrgPerson))(&(departmentNumber=42)((businessCategory=DataStage*)(businessCategory=InformationAnalyzer))))

Group Filter
 (&(cn=%v)(objectclass=posixGroup))

User ID map
 inetOrgPerson:uid

Group ID map
 posixGroup:cn

Group member ID map
 posixGroup:member

Perform a nested group search

Kerberos user filter

Certificate map mode
 EXACT_DN

Certificate filter

13

Advanced LDAP filtering technique

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The user filter now contains the original filter and the new filter that was created earlier wrapped with an “AND” clause. Save the settings and restart WebSphere.

Setting up filters in WebSphere – Federated repositories (1 of 4)

- Easier to add filters
- Available realm definition – Federated repositories
- Click Configure

Global security

Use this panel to configure administration and the default application security administrative functions and is used as a default security policy for user application policies for user applications.

[Security Configuration Wizard](#) [Security Configuration Report](#)

Administrative security

Enable administrative security [Administrative user roles](#)
[Administrative group roles](#)
[Administrative authentication](#)

Application security

Enable application security

Java 2 security

Use Java 2 security to restrict application access to local resources
 Warn if applications are granted custom permissions
 Restrict access to resource authentication data

User account repository

Current realm definition
Federated repositories

Available realm definitions
Federated repositories [Configure...](#) [Set as current](#)

[Apply](#) [Reset](#)

14

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The next example shows how to set up the same user filter under Federated repositories. WebSphere version 6.1 introduced federated repositories. Federated repositories makes setting up the user filters much easier than under stand-alone LDAP. If you are using Information Server 8.5 or 8.7 and have set WebSphere up to use federated repositories, you need to be sure the Available realm definition is set to Federated repositories and then click configure.

Setting up Filters in WebSphere – Federated Repositories (2 of 4)

- Click Repository Identifier
- Additional Properties => LDAP entity types

The image displays two screenshots from the WebSphere administration console, illustrating the steps to configure filters in federated repositories.

Left Screenshot: General Properties

- General Properties:**
 - Realm name: defaultWIMFileBasedRealm
 - Primary administrative user name: ldwasadm
 - Server user identity:
 - Automatically generated server identity (selected)
 - Server identity that is stored in the repository: ldwasadm
 - Ignore case for authorization:
- Repositories in the realm:**

Select	Base Entry	Repository Identifier
<input type="checkbox"/>	DC=newco.DC=com	NewcoAD
<input type="checkbox"/>	o=defaultWIMFileBasedRealm	InternalFileRepository
- Additional Properties:**
 - Property extension repository
 - Entry mapping repository
 - Supported entity types
 - Manage repositories
 - Trusted authenticator

Right Screenshot: Repository Identifier (NewcoAD)

- General Properties:**
 - Repository identifier: NewcoAD
 - LDAP server:
 - Directory type: Custom
 - Primary host name: NewcoAD.newco.com, Port: 389
 - Fallover server used when primary is not available: None
 - Support referrals to other LDAP servers: Ignore
- Additional Properties:**
 - LDAP entity types (circled in red)
 - Group structure definition

15

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Next, under the list of the Repositories in the realm, click the Repository identifier of the repository you want to add the filter to. On the next screen, go to the bottom of the screen under Additional Properties and click LDAP entity types.

Setting up Filters in WebSphere – Federated Repositories (3 of 4)

- Click PersonAccount



Entity Type	Object Classes
You can administer the following resources:	
Group	posixGroup
OrgContainer	organization;organizationalUnit;domain;container
PersonAccount	inetOrgPerson
Total 3	

Since the filter that was created is a filter for the user list, click PersonAccount.

Setting up Filters in WebSphere – Federated Repositories (4 of 4)

- Add new filter to Search Filter
- No need to append to a user filter as with stand-alone LDAP
- Save and restart WebSphere

Use this page to list entity types that are supported by the member repositories or to select an entity type to view or change its configuration properties.

General Properties

★ Entity type
PersonAccount

★ Object classes
inetOrgPerson

Search bases

Search filter
[&(departmentNumber=42)((businessCategory=DataStageDev)(businessCategory=

Apply OK Reset Cancel

17

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Next, add the filter that was created with the LDAP browser in the Search filter field. This value is the exact same value that was used in the LDAP browser. You do not have to append it to a user filter as you did with stand-alone LDAP.

Click apply, save and restart WebSphere.

Filtered user list in web console

- Information Server web console
 - Filtered users only
 - wasadmin user included
 - Internal federated repository user

The screenshot shows the IBM InfoSphere Information Server web console. The navigation pane on the left is expanded to 'Users and Groups' > 'Users'. The main content area displays a table of users with the following columns: Last Name, First Name, and User Name. The table contains 10 items, with the last item being 'wasadmin'.

Last Name	First Name	User Name
		abialk
		brauch
		hheberg
		lgalecki
		pcuoco
		pmann
		rnyyar
		sparsons
		ssussman
wasadmin	wasadmin	wasadmin

18

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Once WebSphere has been restarted, open the Information Server administrative console. Click Users and Groups and then Users. You will now see that the only users that appear are the ones displayed in the filter including the WebSphere admin user. This screen capture shows a list from federated repositories where the WebSphere admin user is an internal service account and not in LDAP.

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