



# Tivoli Directory Server v6.3 – Part05 of 06, Proxy Server, Performance monitoring and Troubleshooting

By : Nilesh Panhale, Shruti Maheshwari,  
Shital Patil & Nilesh Patel

**Tivoli** software



# Introduction

This STE will cover the proxy configuration via Web Admin Tool and command line and proxy failover and high availability.

Also, we will give a brief description on tuning directory servers to improve performance and some basic troubleshooting tips.



# Agenda

- Before we begin
  - Useful Links
  - Previous STEs
  - Upcoming STEs
- TDS Proxy Server
  - Introduction and benefits of the proxy server
  - Concept of partitions
  - Important terms associated with proxy
- Proxy server Configuration
  - By Web Admin Tool
  - By Command line
  - High availability and failover



## Agenda (Contd.)

- Obtain server status and statistical information to assess and improve directory server performance.
- Explain how LDAP caches improve directory server performance and configure LDAP caches using the Web Administration Tool.
- Use the Instance Administration Tool, **idsperftune**, and **idsdbmaint** for performance tuning.
- List the components that contribute to directory server performance.
- Explain how database indexes and database optimization improve directory server performance.



## Agenda (Contd.)

- Logging Facilities
- Understand Audit logs
- Configure PreAudit logs
- Understand ibmslapd.log
- More problem determination tools
- Troubleshooting installation ,uninstallation,instance creation and configuration .
- Troubleshooting DB2 and replication
- Gathering Problem Specific Information



# Useful Links

➤ **ITDS Support Portal:**

[http://www-947.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli\\_Directory\\_Server](http://www-947.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Directory_Server)

➤ **ITDS Online documentation:**

<http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/index.jsp?toc=/com.ibm.IBMDS.doc/toc.xml>

➤ **Tivoli Product Lifecycle Site:**

<http://www-306.ibm.com/software/sysmgmt/products/support/lifecycle/>

➤ **System Requirements:**

<http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/topic/com.ibm.IBMDS.doc/sysreq.htm>

➤ **Google group :**

<http://groups.google.com/group/ibm.software.ldap/topics?lnk=gschg&hl=en>



## Useful Links contd..

➤ Support Technical Exchange (STE) Website:

[http://www-01.ibm.com/software/sysmgmt/products/support/supp\\_tech\\_exch.html](http://www-01.ibm.com/software/sysmgmt/products/support/supp_tech_exch.html)

➤ Collecting Data For ITDS (Must Gather):

<http://www-01.ibm.com/support/docview.wss?rs=767&uid=swg21268035>

➤ Recommended Fixes for ITDS:

<http://www-01.ibm.com/support/docview.wss?rs=767&uid=swg27009778>

➤ Featured Documents:

<http://www-1.ibm.com/support/docview.wss?uid=swg27009603>



## Useful Links contd..

➤ Fixes by Version:

[http://www-01.ibm.com/support/docview.wss?  
rs=767&uid=swg21252238](http://www-01.ibm.com/support/docview.wss?rs=767&uid=swg21252238)

➤ Tivoli Software Global User Group Community

<http://www.tivoli-ug.org/>

➤ My Notifications:

<https://www-01.ibm.com/software/support/einfo.html>

➤ Download Link from passport advantage

<http://www.ibm.com/support/docview.wss?uid=swg24015906>





# Previous STEs

## Part 1: Installation and Configuration

<https://www-304.ibm.com/support/docview.wss?uid=swg27021610>

## Part 2: Web Admin Tool , ACL, SSL

<http://www-01.ibm.com/support/docview.wss?uid=swg27021610>

## Part 3: Backup and Restore

[http://www-01.ibm.com/software/sysmgmt/products/support/TE/techex\\_V980536A95841W35.html](http://www-01.ibm.com/software/sysmgmt/products/support/TE/techex_V980536A95841W35.html)

## Part 4: Replication

[http://www-01.ibm.com/software/sysmgmt/products/support/TE/techex\\_W517531B55309Q11.html](http://www-01.ibm.com/software/sysmgmt/products/support/TE/techex_W517531B55309Q11.html)



# Links to videos

## ➤ Installation and Un-installation

- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/DB2\\_install\\_4\\_tds.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/DB2_install_4_tds.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/uninst\\_ITDS6.3\\_Windows.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/uninst_ITDS6.3_Windows.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/IBM\\_Tivoli\\_Directory\\_Server\\_6.1.3\\_installation.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/IBM_Tivoli_Directory_Server_6.1.3_installation.avi)

## ➤ SSL / Web Admin Tool / Schema / Password Policy

- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/SSL.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/SSL.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/Schema.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/Schema.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/Web\\_Admin\\_Tool.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/Web_Admin_Tool.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/passwordpolicy.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/passwordpolicy.avi)



## Links to videos (Contd.)

### ➤ Online and offline Backup / Restore Videos

- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/backup\\_using\\_ldapexop.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/backup_using_ldapexop.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/Configuring\\_for\\_onlinebackup\\_using\\_Instance\\_Administration\\_Tool.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/Configuring_for_onlinebackup_using_Instance_Administration_Tool.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/ITDS\\_backup\\_using\\_idsdb2ldif.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/ITDS_backup_using_idsdb2ldif.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/Offlinebackup\\_using\\_WebAdministrationTool.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/Offlinebackup_using_WebAdministrationTool.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/OnlineBackup\\_with\\_idxinst.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/OnlineBackup_with_idxinst.avi)
- [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/STE/Unconfigure\\_onlinebackup.avi](ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/Unconfigure_onlinebackup.avi)



# Upcoming STE

## Part 6 : TDS Best practices , Ask the experts

[http://www-01.ibm.com/software/sysmgmt/products/support/TE/techex\\_A388755F84976D77.html](http://www-01.ibm.com/software/sysmgmt/products/support/TE/techex_A388755F84976D77.html)





# Tivoli Directory Proxy Server

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# Introduction to the proxy server

- The Proxy server is a special type of IBM Tivoli Directory Server that is configured with connection information of the backend servers and it provides a unified directory view to the clients like TAM/ WebSEAL and so on.
- Following features are provided by proxy server
  - Request Routing
  - Load Balancing
  - Fail Over
  - Distributed Authentication
  - Support for distributed/membership groups
  - Partitioning of containers



# Benefits of using a proxy server

- Huge data can be distributed and managed easily
- Request routing feature of TDS Proxy Server improves performance
- Scalability can be achieved using the Proxy Server
- Failover and load balancing
- High availability



# Proxy server configuration

- Extract all the data that you would like to partition into an LDIF file. After the server is configured as a proxy server you cannot access the data that is contained in its RDBM. If you need to access the data in its RDBM, you can either reconfigure the server so that it is not a proxy or create a new directory server instance that points to the RDBM as its database.
- The proxy server is configured with connection information to connect to each of the backend servers for which it is proxying
  - host address
  - port number
  - bind DN
  - credentials
  - connection pool size
  - Partition information





## Proxy server configuration contd..

- Each of the back-end servers is configured with the DN and credentials that the proxy server uses to connect to it.
- The DN must be a member of the global admin group, local admin group with dirData authority, or the primary administrator.
- The local DN for ex. cn=root does not have authority to access the proxy configuration
- The proxy server is configured with its own schema which is same as schema of the back-end servers for which it is proxying.
- Same config file <ibmslapd.conf> is used for the proxy server as well. Non supported features are automatically ignored



# Understanding the concept of partitions

- We use partitions to divide the data that can be distributed across the backend servers. Depending on the amount of data, we can decide the number of partitions to be made.
- Each server is assigned with the partition index that determines which partition does it belong to.
- The suffix `cn=ibmpolicies` is setup as a single partition. And we cannot have index more than 1 for it. This is necessary to enable you to synchronize the global policies on all of the servers.



# Partitions

- Data can be split and distributed across the directory servers with partitions
- The number of partitions and the partition level are determined when the proxy server is configured, and when the data is split. There is no way to expand or reduce the topology without repartitioning.
- ddsetup tool is used for creating partitions.
  1. Create the LDIF file containing all data at o=testdata
    - `idsdb2ldif -o mydata.ldif -s o=testdata -l <instance_name>`
  2. Issue the command:
    - `ddsetup -l proxy_inst -B "o=testdata" -l mydata.ldif`
      - proxy\_inst – The proxy instance



# Important terms associated with proxy server

- **Split:** A given namespace is partitioned into a set of partitions, each of which resides in an independent directory server instance. Each of these partitions is referred to as a split.
- **Partition Index:** Each partition/split for a given namespace is represented by an index known as the partition index.
- **ServerGroup:** ServerGroup is a means of specifying a set of servers, wherein if any of the servers is up, the proxy can mark the relevant partition as active, even if the rest of the servers in the group are down.
- **Global administrative group members:** Global administrative group members are users who have been assigned the administrative privileges for accessing entries in the backend server.

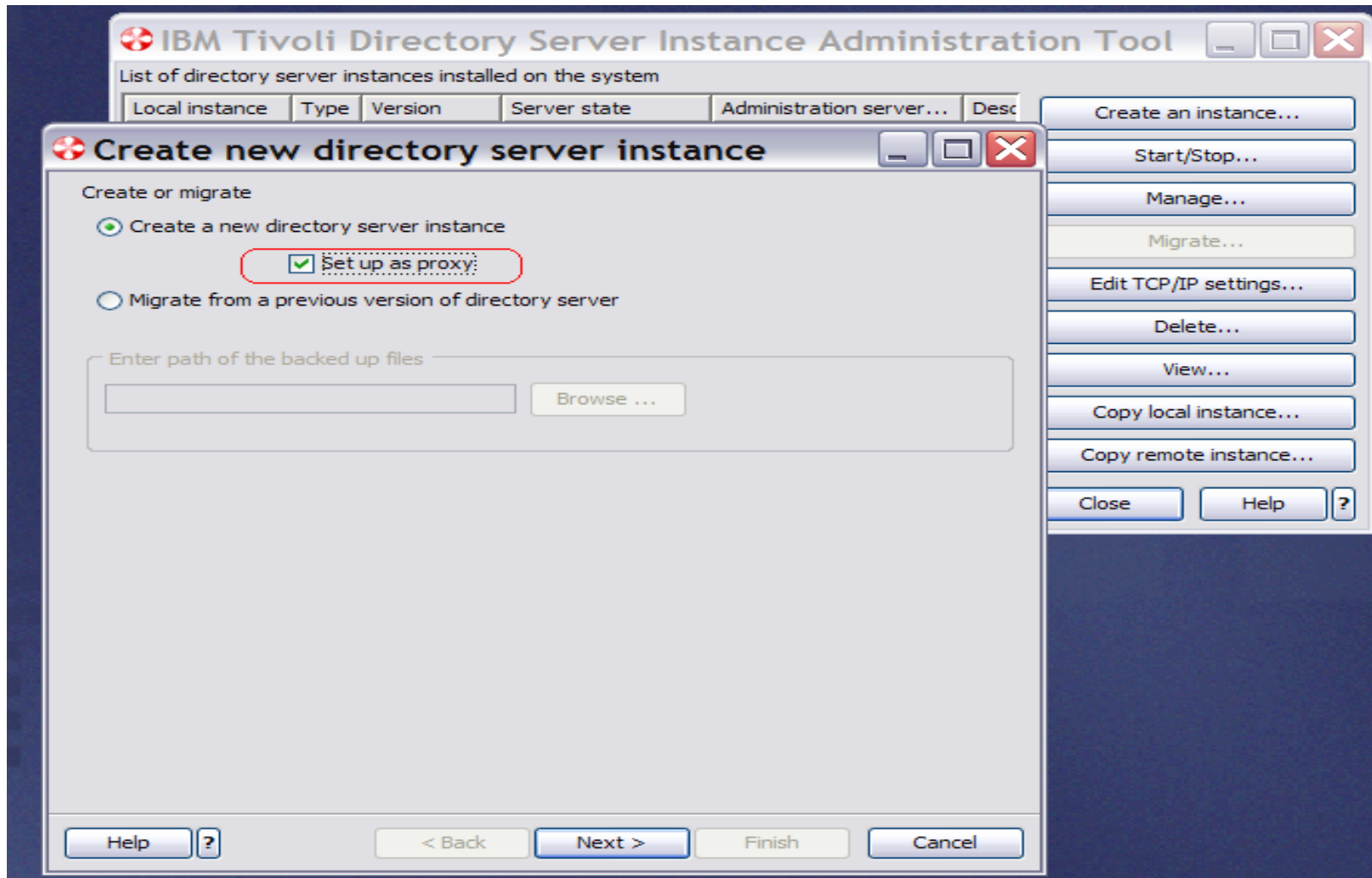


# Important terms associated with proxy server

- **Local administrative group members:** Local administrative group members are users who have been assigned a subset of administrative privileges.
- **Connection Pool Size (ibm-slapdProxyConnectionPoolSize):** Each proxy can be configured to talk to each of the back-end servers over a set of connections. These connections are in the form of a pool, whereby all the connections are established at the proxy start-up and used when required. This parameter is configurable and can be different for different back-end servers.
- **Proxy DN (ibm-slapdProxyDN):** This is the DN that a proxy server binds to the backend servers. This DN would basically proxy the user binding to the proxy server.
- **Proxy Target URL (ibm-slapdProxyTargetURL):** This attribute is used by the proxy server to specify the URL of the back-end server.



# Proxy server configuration – Web Admin Tool Method



# Create user for the proxy instance

The screenshot shows a two-step wizard for creating a new directory server instance. The main window, titled "Create new directory server instance", has a "User name" dropdown menu set to "administrator". A red box highlights a "Create user..." button next to it. Below this is an "Edit user..." button. An inset dialog box, titled "Create new use...", is open, prompting for user information. It includes a "Note" that user properties will be reset for existing users. The "User Name" field contains "myproxy", the "Password" field is masked with dots, and the "Confirm password" field is also masked. At the bottom of the dialog are "Create", "Cancel", "Help", and "?" buttons. The main window's bottom bar contains "Help", "?", "< Back", "Next >", "Finish", and "Cancel" buttons.

**Create new directory server instance**

Instance details  
The directory server instance will be created in an existing system user account.

User name  
administrator

Create user...  
Edit user...

**Create new use...**

Provide the information for the user  
**Note:** User properties will be reset for an existing user.

User Name  
myproxy

Password  
.....

Confirm password  
.....

Create Cancel Help ?

Help ? < Back Next > Finish Cancel

# Instance creation contd..

**Create new directory server instance**

TCP / IP port settings

[Enter port details](#)

Server port

Server secure port

Administration server port

Administration server secure port

Help ? < Back Next > Finish Cancel

**Create new directory server instance**

Configure administrator DN and password

Administrator DN

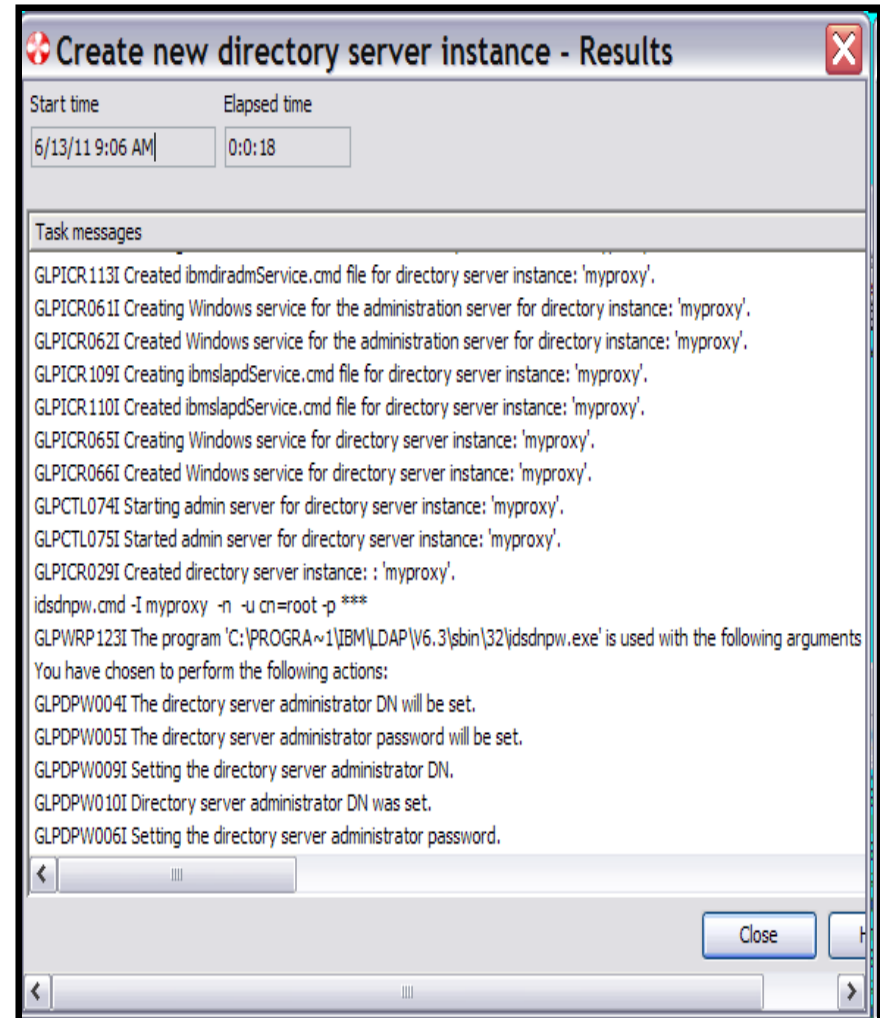
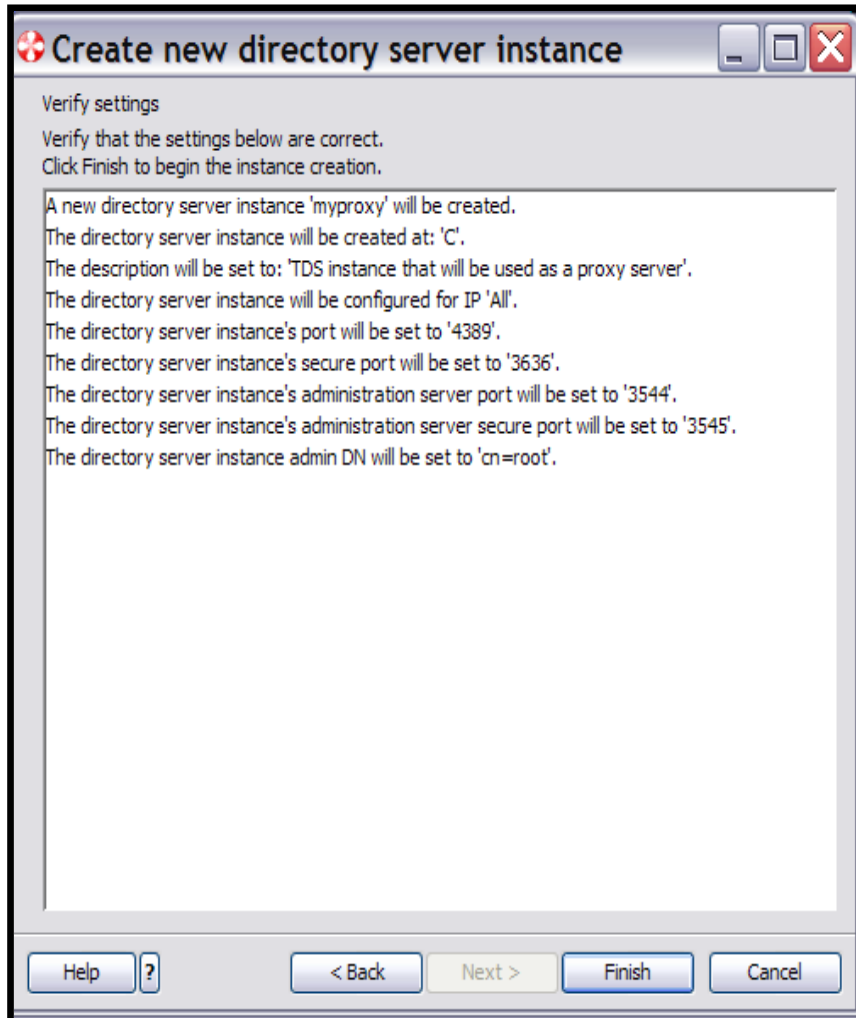
Administrator password

Confirm password

Help ? < Back Next > Finish Cancel



# Instance creation contd..



# Start the instance in config only mode

## ibmslapd -I myproxy -a

```
C:\Program Files\IBM\LDAP\V6.3\sbin>ibmslapd -I myproxy -a
GLPSRV034I Server starting in configuration only mode.
GLPSRV155I The DIGEST-MD5 SASL Bind mechanism is enabled in the configuration file.
GLPCOM021I The preoperation plugin is successfully loaded from libDigest.dll.
GLPCOM024I The extended Operation plugin is successfully loaded from libtranext.dll.
GLPCOM025I The audit plugin is successfully loaded from C:/PROGRA~1/IBM/LDAP/V6.3/lib/libldapaudit.dll.
GLPCOM022I The database plugin is successfully loaded from C:/PROGRA~1/IBM/LDAP/V6.3/lib/libback-config.dll.
GLPCOM024I The extended Operation plugin is successfully loaded from libloga.dll.
GLPCOM024I The extended Operation plugin is successfully loaded from libidsfget.dll.
GLPCOM003I Non-SSL port initialized to 4389.
GLPSRV009I 6.3.0.0 server started.
GLPSRV035I Server started in configuration only mode as requested.
GLPSRV048I Started 15 worker threads to handle client requests.
GLPSRV049I Started 10 handler threads to service established client connections.
```



# Verifying instance details

➤ `idsilist -a`

```
-----  
Instance 4:  
  
Name: myproxy  
Version: 6.3  
Location: C:  
Description: TDS instance that will be used as a proxy server  
IP Addresses: All available  
Port: 4389  
Secure Port: 3636  
Admin Server Port: 3544  
Admin Server Secure Port: 3545  
Type: Proxy Server
```

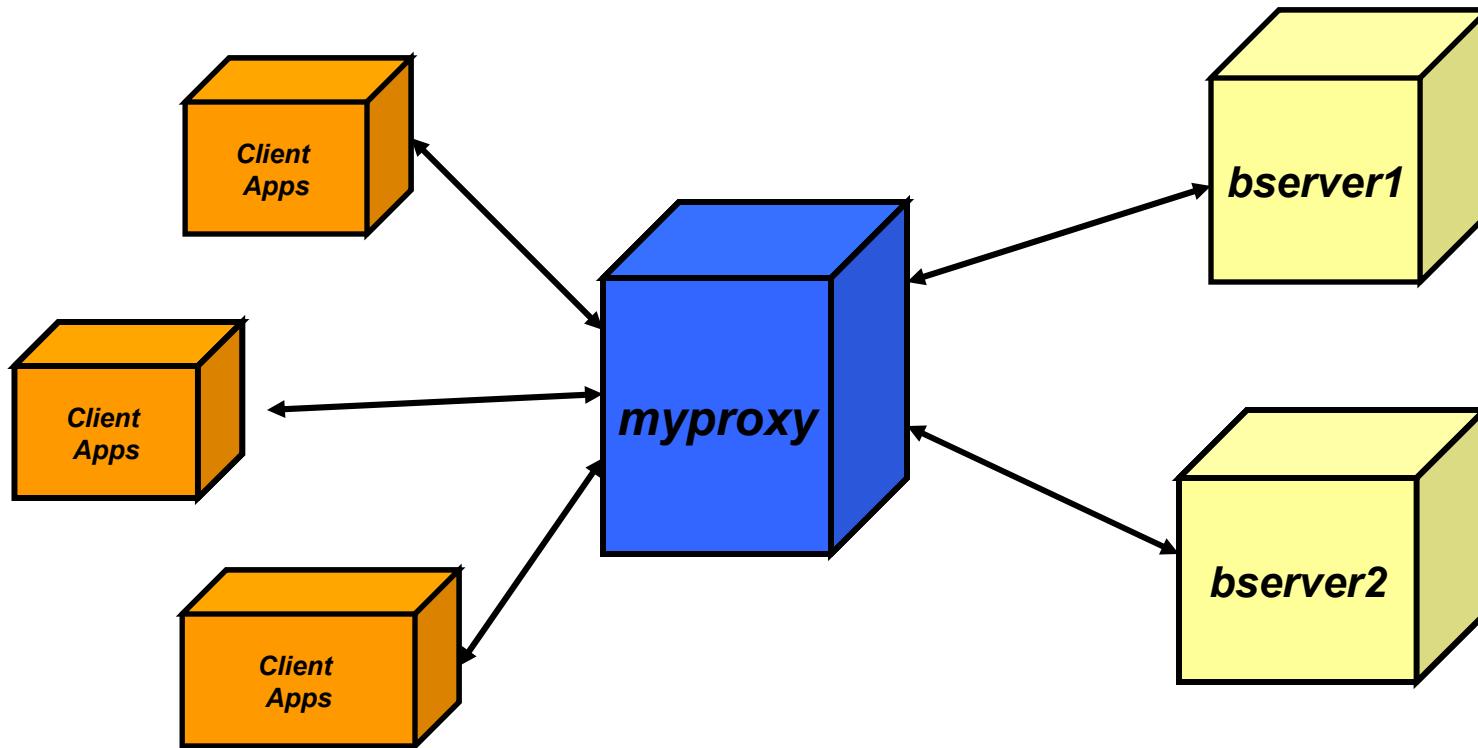


# Beginning with the configuration

- Proxy with two directory servers in backend
- Data distributed on RDN Hash
- o=ibm suffix with 100 entries split among four backend servers
- Synchronize schema among all servers including back-end servers and proxy server



# Simple Scenario to understand the proxy configuration





# Tivoli Directory Proxy Server Configuration using web administration tool

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# Setting up the backend servers

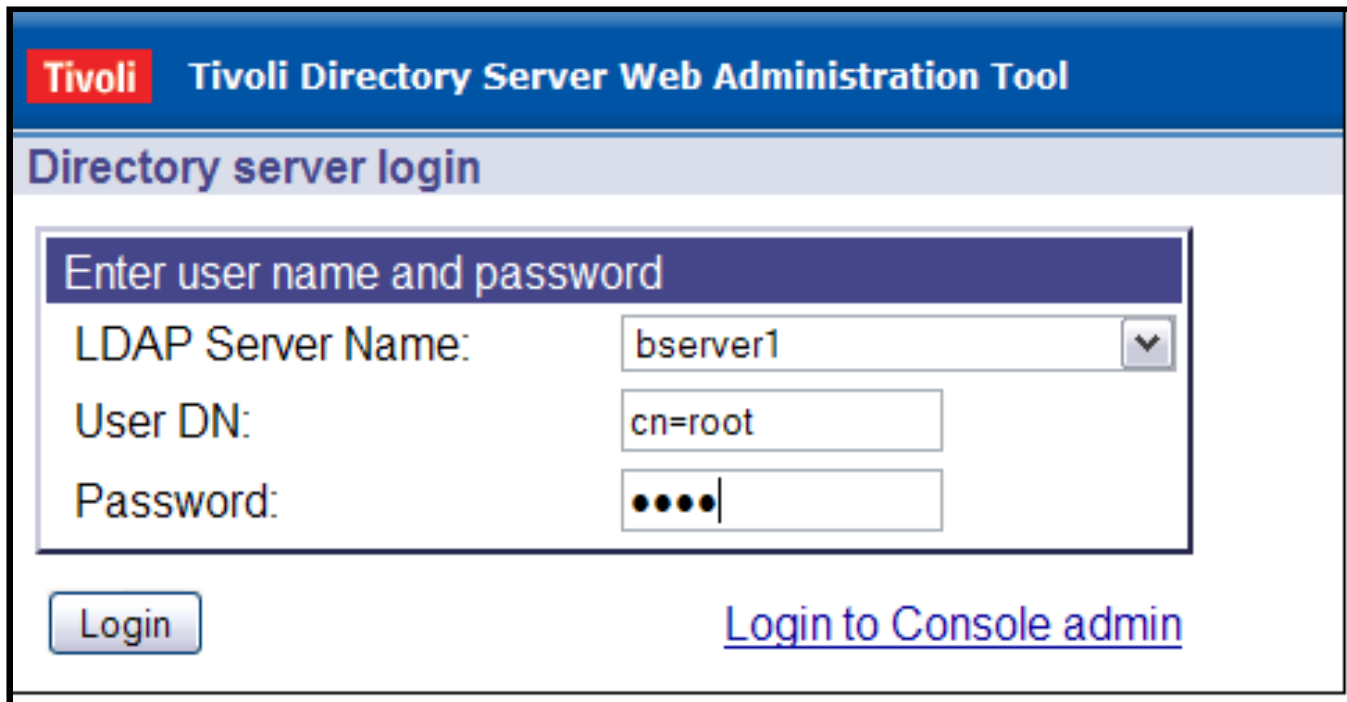
```
Instance 5:  
Name: bserver1  
Version: 6.3  
Location: C:  
Description: Back End Server for proxy configuration  
IP Addresses: All available  
Port: 5389  
Secure Port: 4636  
Admin Server Port: 3546  
Admin Server Secure Port: 3547  
Type: Directory Server
```

```
-----  
Instance 6:  
Name: bserver2  
Version: 6.3  
Location: C:  
Description: backend server for proxy  
IP Addresses: All available  
Port: 6389  
Secure Port: 5636  
Admin Server Port: 3548  
Admin Server Secure Port: 3549  
Type: Directory Server
```



# Proxy configuration contd..

- Login to the admin server and create a suffix for it



The screenshot shows the 'Tivoli Directory Server Web Administration Tool' interface. The main heading is 'Directory server login'. Below this, there is a section titled 'Enter user name and password' which contains three input fields: 'LDAP Server Name' with a dropdown menu showing 'bserver1', 'User DN' with the text 'cn=root', and 'Password' with four masked dots. At the bottom left is a 'Login' button, and at the bottom right is a blue hyperlink labeled 'Login to Console admin'.





# Proxy configuration contd..

**Tivoli Directory Server Web Administration Tool**

9.182.205.31:5389 (bserver1)

**Manage server properties**

General | Performance | Search settings | Event notification | Transactions | **Suffixes** | Referrals | Delete settings | Database | Conflict resolution

Suffix DN:

**Note:** Removing a suffix eliminates access to all directory data in that suffix.

Remove  --- Select Action ---

Select | Current suffix DNS

None
------

OK Apply Cancel



# Proxy configuration contd..

The screenshot displays the Tivoli Directory Server Web Administration Tool interface. The left-hand navigation pane shows a tree structure with 'Directory management' expanded, and 'Add an entry' selected. The main content area is titled 'Add an entry' and contains the following elements:

- Add Entry** section with a red box around the 'Select object class' link. Below it are links for 'Select auxiliary object classes', 'Required attributes', and 'Optional attributes'.
- Select object class** section with instructions: 'Select the type of entry to add by choosing the entry's structure. Click **Next** to continue.'
- Filter object classes:** A dropdown menu set to 'All' and a 'Refresh' button.
- Structural object classes:** A list box containing 'organizationalRole', 'organizationalUnit', 'OS400Card', 'person', and 'pilotDSA'. The 'person' class is highlighted with a red box.
- At the bottom, a navigation bar with buttons: '< Back', 'Next >' (highlighted with a red box), 'Finish', and 'Cancel'.



# Add an entry to the BE Server and make it member of the GlobalAdmin group

9.182.205.31:5389 (bserver1)

### Add an entry

**Add Entry**

- ✓ Select object class
- ✓ Select auxiliary object classes
- Required attributes
- Optional attributes

**Required attributes**

Object class inheritance:  
person

**Distinguished name (DN)**

Relative DN: \*cn=manager Parent DN: cn=ibmpolicies Browse...

**Required attributes**

Enter the values for the attributes of the entry. For multiple values click **Multiple** attribute.

cn:  
\*manager Multiple values

sn:  
\*manager Multiple values

< Back Next > Finish Cancel

# Add an entry to the BE Server and make it member of the GlobalAdmin group

9.182.205.31:5389 (bserver1)

### Add an entry

**Add Entry**

- ✓ [Select object class](#)
- ✓ [Select auxiliary object classes](#)
- ✓ [Required attributes](#)
- [Optional attributes](#)

#### Optional attributes

Enter the values for the attributes of the entry. For multiple values click

description:  [Multiple values](#)

seeAlso:  [Multiple values](#)

telephoneNumber:  [Multiple values](#)

userPassword:  [Multiple values](#)

< Back   Next >   Finish   Cancel

# Add an entry to the BE Server and make it member of the GlobalAdmin group

- On Back-end server(s) – create global admin group member
- Add this user to global admin group as a member
- Directory management -> Manage entries -> Expand cn=ibmpolicies
- Select globalGroupName=GlobalAdminGroup -> Manage Members -> Go



# Add an entry to the BE Server and make it member of the GlobalAdmin group

**Tivoli** Tivoli Directory Server Web Administration Tool

9.182.205.31:5389 (bserver1) User DN: cn=...

**Manage entries**

Current location :  
ldap://9.182.205.31:5389 > cn=ibmpolicies

Expand Find... Add... Edit attributes... Delete Manage Members... Go

Select	Expand	RDN	Object class	Created	Last modified	Last modified by
<input type="checkbox"/>		<a href="#">cn=manager</a>	person	Jun 13, 2011	Jun 13, 2011	CN=ROOT
<input type="checkbox"/>		<a href="#">cn=pwdpolicy</a>	container	Jun 13, 2011	Jun 13, 2011	CN=ANYBODY
<input type="checkbox"/>		<a href="#">CN=REPLICATION</a>	container	Jun 13, 2011	Jun 13, 2011	CN=ANYBODY
<input checked="" type="checkbox"/>		<a href="#">globalGroupName=GlobalAdminGroup</a>	ibm-globalAdminGroup	Jun 13, 2011	Jun 13, 2011	CN=ANYBODY
<input type="checkbox"/>		<a href="#">IBM-REPLICAGROUP=DEFAULT</a>	ibm-replicaGroup	Jun 13, 2011	Jun 13, 2011	CN=ANYBODY

Close

# Add an entry to the BE Server and make it member of the GlobalAdmin group

The screenshot displays the Tivoli Directory Server Web Administration Tool interface. The title bar reads "Tivoli Tivoli Directory Server Web Administration Tool". The main content area is titled "Manage members: globalGroupName=GlobalAdminGroup,cn=ibmpolicies".

On the left, a navigation pane shows "Directory management" selected, with "Add an entry" and "Manage entries" highlighted. The main area has two tabs: "Effective group members" and "Static group members". The "Static group members" tab is active, showing a "Static group members" section with a "Load" button and a "Click **Load** to retrieve the current attribute values from the server. This might take a long time to display" message.

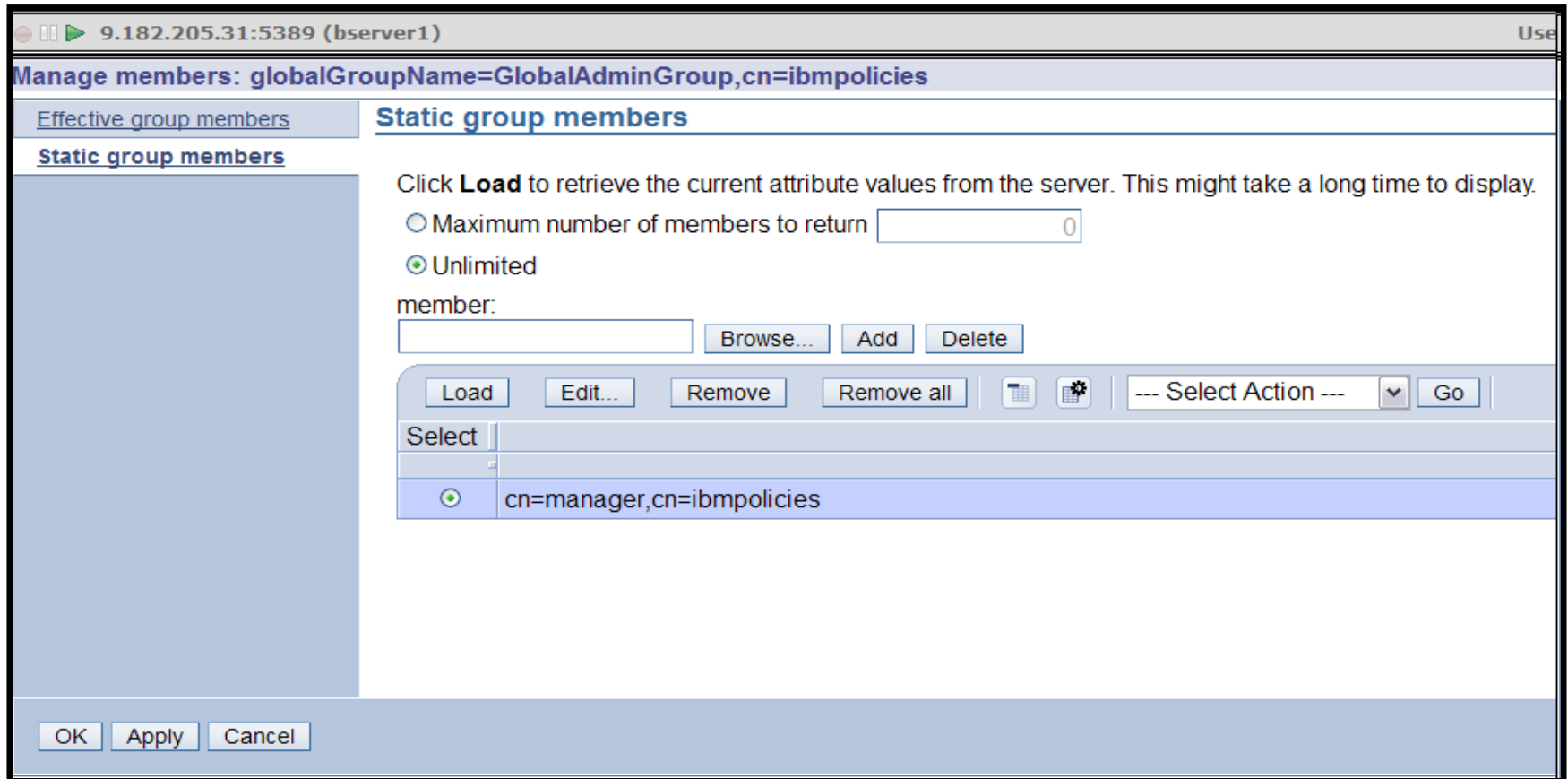
Below the "Load" button, there is a radio button for "Maximum number of members to return" set to "0", and a selected radio button for "Unlimited".

Under the "member:" label, there is a text input field containing "cn=manager,cn=ibmpolici", a "Browse..." button, and "Add" and "Delete" buttons.

At the bottom of the main area, there are buttons for "Load", "Edit...", "Remove", "Remove all", and a "Select Action" dropdown menu with a "Go" button.

At the bottom of the tool, there are "OK", "Apply", and "Cancel" buttons.

# Add an entry to the BE Server and make it member of the GlobalAdmin group





# Adding the backend servers to proxy server

- Login to the proxy server and add the suffix o=ibm

**Tivoli** Tivoli Directory Server Web Administration Tool

9.182.205.31:4389 (myproxy)

### Manage proxy properties

Configure as proxy server

### Suffixes

Suffix DN:

--- Select Action ---

Select	Suffix DN
<input checked="" type="radio"/>	o=ibm
<input type="radio"/>	cn=ibmpolicies

### Distributed groups

Enable distributed groups

Enable distributed dynamic groups

# Adding the backend servers to proxy server

The screenshot displays the Tivoli Directory Server Web Administration Tool interface. The left sidebar contains a navigation menu with the following items: Introduction, User properties, Server administration, Proxy administration (highlighted with a red box), Manage proxy properties, Manage back-end directory servers (highlighted with a red box), Manage partition bases, Manage proxy server groups, View partition bases, View entry location, View proxy server status, Schema management, Directory management, Realms and templates, Users and groups, and Logout.

The main content area shows the 'Manage back-end directory servers' page for the proxy server '9.182.205.31:4389 (myproxy)'. The page includes buttons for 'Add...', 'Edit...', 'Delete', and 'Delete all'. Below these buttons is a table with columns for 'Select', 'Host name', 'Port', and 'Bind method'. The table currently contains one row with the value 'None'. A 'Close' button is located at the bottom of the table.

Select	Host name	Port	Bind method
			None

# Adding the backend servers to proxy server

The screenshot shows the 'Administration Tool' window for 'localhost:4389 (myproxy)'. The main title is 'Add back-end Directory Server'. On the left, a navigation pane shows 'Add back-end Directory Server' with sub-items 'Server information' and 'Simple bind'. The 'Server information' section is active and contains the following fields:

- Hostname: localhost
- Port: 5389 (highlighted with a red box)
- Connection pool size: 5
- Number of seconds between health check runs: 0
- Maximum pending client operations per connection: 5
- Authentication method: Simple

The 'SSL encryption' section includes:

- Enable SSL encryption
- Key file (blank to use server's certificate):
- Key file password (blank to use server's certificate or a stash file):
- Confirm password:
- Key label (blank to use a server's certificate or default certificate):
- Enable PKCS#11 interface support

The 'Health check outstanding' section includes:

- Enable hang detection
- Maximum pending health check requests: 24

At the bottom, there are four buttons: '< Back', 'Next >', 'Finish', and 'Cancel'.

# Added the backend servers

Administration Tool

localhost:4389 (myproxy)

### Manage back-end directory servers

Add... Edit... Delete Delete all View partition bases --- Select Action --- Go

Select	Host name	Port	Bind method
<input type="checkbox"/>	localhost	5389	Simple
<input type="checkbox"/>	localhost	6389	Simple

Close

# Manage partition bases

**Tivoli** Tivoli Directory Server Web Administration Tool

localhost:4389 (myproxy)

## Manage partition bases

### Partition bases

Select	Split name	Partition base DN	Number of partitions	Auto-fallback enabled based on re
None				

### Partition base topology

Partition base DN:

Back-end directory servers for partition base

Select	Partition index	Hostname	Port	Server role	Proxy tier
None					



# Manage partition bases contd..

**Tivoli** Tivoli Directory Server Web Administration Tool

localhost:4389 (myproxy)

**Add split**

Split Name:  
\* oibmsplit

Partition base DN:  
\* o=ibm

Number of partitions:  
\* 2

Auto fail-back enabled

Enable auto-failback based on replication backlog

Maximum size of replication backlog for auto-failback  
5

Proxy high consistency

OK Cancel



# Manage partition bases contd..

The screenshot shows the Tivoli Directory Server Web Administration Tool interface. The left sidebar contains a navigation menu with the following items: Introduction, User properties, Server administration, Proxy administration (expanded), Schema management, Directory management, Realms and templates, Users and groups, and Logout. Under 'Proxy administration', the following sub-items are visible: Manage proxy properties, Manage back-end directory servers, Manage partition bases, Manage proxy server groups, View partition bases, View entry location, and View proxy server status. The main content area displays the 'Add split' dialog box for 'localhost:4389 (myproxy)'. The dialog contains the following fields and options:

- Split Name:**
- Partition base DN:**
- Number of partitions:**
- Auto fail-back enabled
- Enable auto-failback based on replication lag
- Maximum size of replication backlog:**
- Proxy high consistency

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

# Manage partition bases contd..

**Tivoli Directory Server Web Administration Tool**

localhost:4389 (myproxy)

### Manage partition bases

#### Partition bases

Select	Split name	Partition base DN	Number of partitions	Auto-failback enabled based on replication backlog	M
<input checked="" type="radio"/>	oibmsplit	o=ibm	2	FALSE	5
<input type="radio"/>	ibmpoliciesplit	cn=ibmpolicies	1	FALSE	5

**Partition base topology**

Partition base DN:

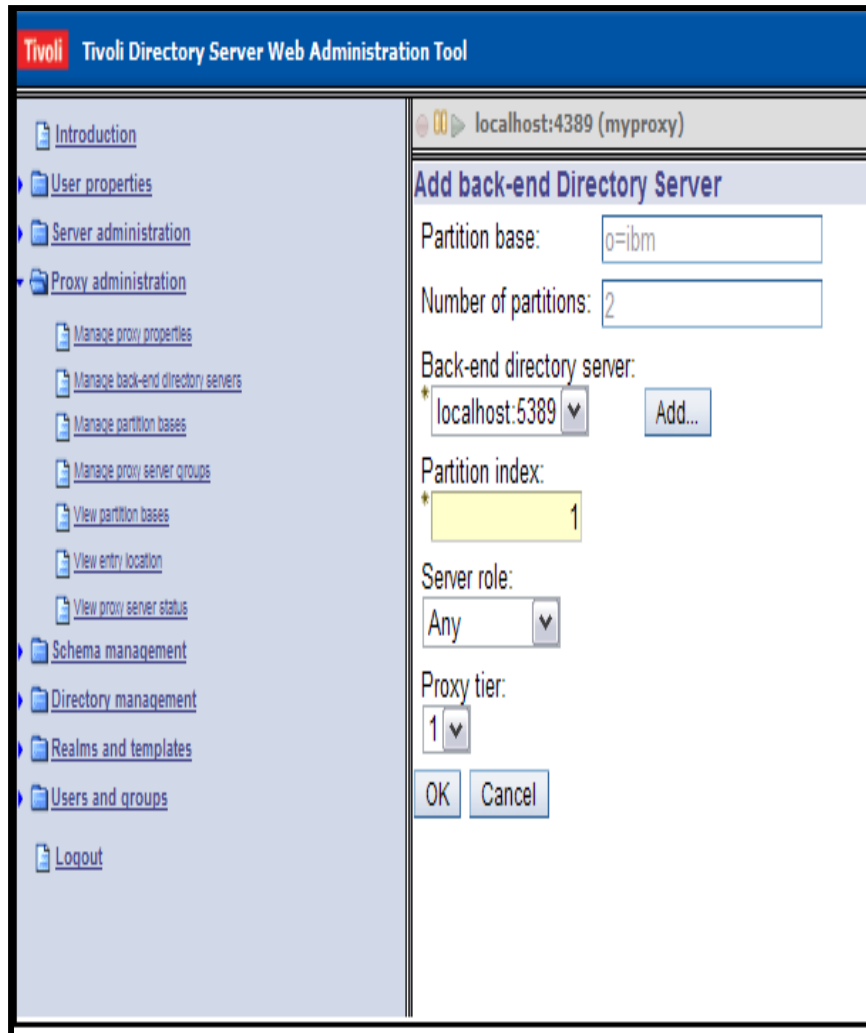
Back-end directory servers for partition base

Select	Partition index	Hostname	Port	Server role	Proxy tier
None					





# Add backend servers to the partition base



The screenshot displays the Tivoli Directory Server Web Administration Tool interface. The left sidebar contains a navigation menu with the following items: Introduction, User properties, Server administration, Proxy administration (selected), Manage proxy properties, Manage back-end directory servers, Manage partition bases, Manage proxy server groups, View partition bases, View entry location, View proxy server status, Schema management, Directory management, Realms and templates, Users and groups, and Logout. The main content area shows the 'Add back-end Directory Server' dialog box. The dialog box has a title bar with 'localhost:4389 (myproxy)'. The fields and controls are as follows: Partition base: o=ibm; Number of partitions: 2; Back-end directory server: localhost:5389 (with an 'Add...' button); Partition index: 1; Server role: Any; Proxy tier: 1; and 'OK' and 'Cancel' buttons at the bottom.

Tivoli Directory Server Web Administration Tool

localhost:4389 (myproxy)

### Add back-end Directory Server

Partition base:

Number of partitions:

Back-end directory server:  
\* localhost:5389

Partition index:  
\*

Server role:

Proxy tier:

# Add backend servers to the partition base

**Tivoli Directory Server Web Administration Tool**

localhost:4389 (myproxy)

### Manage partition bases

#### Partition bases

Select	Split name	Partition base DN	Number of partitions	Auto-failback enabled based on replication backlog	M
<input checked="" type="radio"/>	oibmsplit	o=ibm	2	FALSE	5
<input type="radio"/>	ibmpoliciesplit	cn=ibmpolicies	1	FALSE	5

#### Partition base topology

Partition base DN:

Back-end directory servers for partition base

Select	Partition index	Hostname	Port	Server role	Proxy tier
<input type="radio"/>	1	localhost	5389	any	1
<input type="radio"/>	2	localhost	6389	any	1



# Add backend servers to the partition base

**Tivoli Directory Server Web Administration Tool**

localhost:4389 (myproxy)

### Manage partition bases

#### Partition bases

Select	Split name	Partition base DN	Number of partitions	Auto-failback enabled based on replication backlog	Ma
<input type="radio"/>	oibmsplit	o=ibm	2	FALSE	5
<input checked="" type="radio"/>	ibmpoliciesplit	cn=ibmpolicies	1	FALSE	5

**Partition base topology**

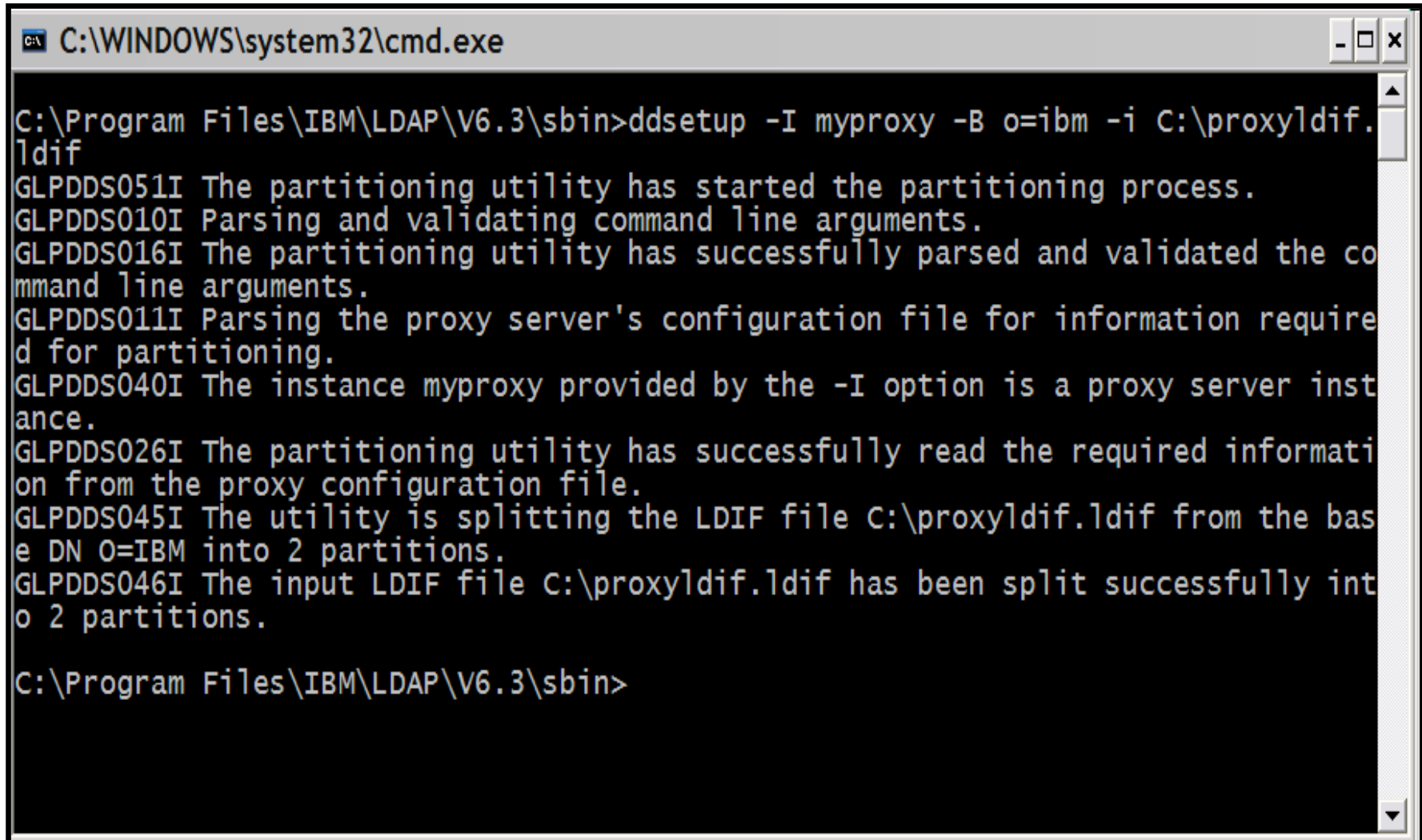
Partition base DN:

Back-end directory servers for partition base

Select	Partition index	Hostname	Port	Server role	Proxy tier
<input type="radio"/>	1	localhost	5389	any	1
<input type="radio"/>	1	localhost	6389	any	1



# Splitting data into partitions with ddsetup tool



```
C:\WINDOWS\system32\cmd.exe

C:\Program Files\IBM\LDAP\V6.3\sbin>ddsetup -I myproxy -B o=ibm -i C:\proxyldif.
ldif
GLPDDS051I The partitioning utility has started the partitioning process.
GLPDDS010I Parsing and validating command line arguments.
GLPDDS016I The partitioning utility has successfully parsed and validated the co
mmand line arguments.
GLPDDS011I Parsing the proxy server's configuration file for information require
d for partitioning.
GLPDDS040I The instance myproxy provided by the -I option is a proxy server inst
ance.
GLPDDS026I The partitioning utility has successfully read the required informati
on from the proxy configuration file.
GLPDDS045I The utility is splitting the LDIF file C:\proxyldif.ldif from the bas
e DN O=IBM into 2 partitions.
GLPDDS046I The input LDIF file C:\proxyldif.ldif has been split successfully int
o 2 partitions.

C:\Program Files\IBM\LDAP\V6.3\sbin>
```



# Importing data to the backend servers

- After completing ddsetup, if you list the entries (ls/dir) then you can see files created with <splitname>\_<no of partitions> there

```

08/04/2010 09:42 PM 2,113 idsuctgsut.cmd
08/04/2010 09:42 PM 8,104 idsxcfg.cmd
08/04/2010 09:42 PM 3,070 idsxinst.cmd
08/04/2010 09:42 PM 2,101 ldif.cmd
08/04/2010 09:42 PM 6,518 ldif2db.cmd
08/04/2010 09:42 PM 2,103 ldtrc.cmd
08/04/2010 09:42 PM 2,105 ldtrcd.cmd
08/04/2010 09:44 PM 13,670 migbkup.bat
06/15/2011 11:18 AM 182,085 oibmsplit_1.ldif
06/15/2011 11:18 AM 182,094 oibmsplit_2.ldif
08/04/2010 09:42 PM 6,520 runstats.cmd

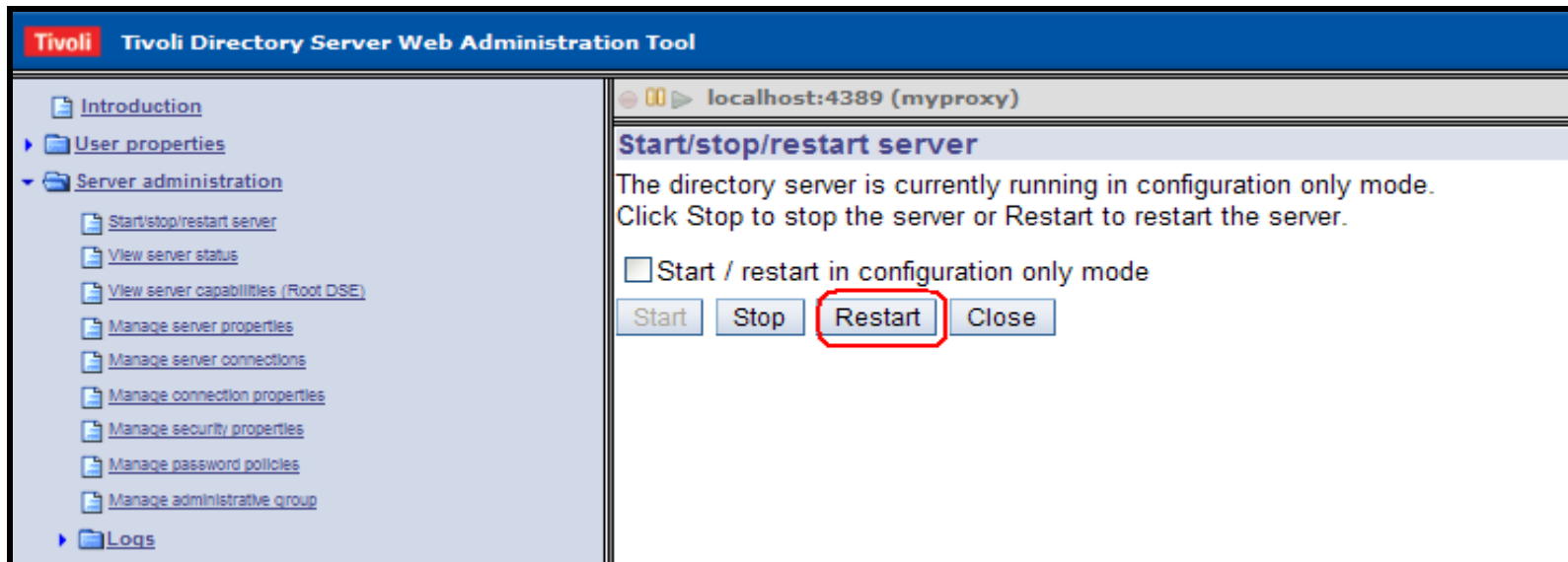
```

- Copy the files on backend servers => Stop the server => do bulkload / ldif2db
- On back-end server1:
  - # bulkload -I bserver1 -i oibmsplit\_1.ldif
- On back-end server2:
  - # bulkload -I ldapdb2 -i oibmsplit\_1\_2.ldif



# Restart Proxy server

- Restart the proxy server in normal mode, and you can verify the configuration from Directory management => Manage Entries



The screenshot displays the Tivoli Directory Server Web Administration Tool interface. The title bar reads "Tivoli Tivoli Directory Server Web Administration Tool". The left sidebar contains a navigation menu with the following items: Introduction, User properties, Server administration (expanded), Start/stop/restart server, View server status, View server capabilities (Root DSE), Manage server properties, Manage server connections, Manage connection properties, Manage security properties, Manage password policies, Manage administrative group, and Logs. The main content area shows the "Start/stop/restart server" page for "localhost:4389 (myproxy)". The page text states: "The directory server is currently running in configuration only mode. Click Stop to stop the server or Restart to restart the server." Below this text is a checkbox labeled "Start / restart in configuration only mode" which is currently unchecked. At the bottom of the page are four buttons: Start, Stop, Restart, and Close. The "Restart" button is highlighted with a red rectangular box.



# Tivoli Directory Proxy Server Configuration using command line utilities

**Tivoli** software



# Distributed Directory with Proxy server

➤ Add suffixes:

```
idscfgsuf -I myproxy -s "o=ibm" -n
```

```
idscfgsuf -I myproxy -s "cn=ibmpolicies" -n
```

➤ Start proxy ldap server in configuration only mode

```
ibmslapd -I myproxy -a
```

➤ Creating back-end server entries in proxy conf file





# Distributed Directory with Proxy server

- Create an Idif file with the two backend server entries:

```
dn: cn=bserver1, cn=ProxyDB, cn=Proxy Backends, cn=IB
  Directory, cn=Schemas, cn=Configuration
cn: bserver1
ibm-slapdProxyBindMethod: Simple
ibm-slapdProxyConnectionPoolSize: 5
ibm-slapdProxyDN: cn=manager, cn=ibmpolicies
ibm-slapdProxyPW: secret
ibm-slapdProxyTargetURL: ldap://bserver1:5389
objectClass: top
objectClass: ibm-slapdProxyBackendServer
objectClass: ibm-slapdConfigEntry
```



# Configuring proxy server ..... Contd

```
dn: cn=bserver2, cn=ProxyDB, cn=Proxy Backends, cn=IBM  
Directory, cn=Schemas, cn=Configuration
```

```
cn: bserver2
```

```
ibm-slapdProxyBindMethod: Simple
```

```
ibm-slapdProxyConnectionPoolSize: 5
```

```
ibm-slapdProxyDN: cn=manager,cn=ibmpolicies
```

```
ibm-slapdProxyPW: secret
```

```
ibm-slapdProxyTargetURL: ldap://bserver2:6389
```

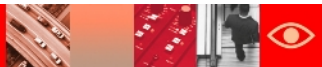
```
objectClass: top
```

```
objectClass: ibm-slapdProxyBackendServer
```

```
objectClass: ibm-slapdConfigEntry
```

- Add the ldif file contents using ldapadd command

```
idsldapadd -I myproxy -D cn=root -w secret -i ldiffile
```



# Configuring proxy server .... Contd

## Ldif file for configuring split for cn=ibmpolicies:

```
dn: cn=cn\=ibmpolicies split, cn=ProxyDB, cn=Proxy Backends, cn=IBM
Directory, cn=Schemas, cn=Configuration
```

```
cn: cn=ibmpolicies split
```

```
ibm-slapdProxyNumPartitions: 1
```

```
ibm-slapdProxyPartitionBase: cn=ibmpolicies
```

```
ibm-slapdProxySplitName: ibmpolicysplit
```

```
objectclass: top
```

```
objectclass: ibm-slapdConfigEntry
```

```
objectclass: ibm-slapdProxyBackendSplitContainer
```

```
dn: cn=split1, cn=cn\=ibmpolicies split, cn=ProxyDB, cn=Proxy Backends,
cn=IBM Directory, cn=Schemas, cn=Configuration
```

```
cn: split1
```

```
ibm-slapdProxyBackendServerDN: cn=bserver1, cn=ProxyDB, cn=Proxy Backends,
cn=IBM Directory, cn=Schemas, cn=Configuration
```

```
ibm-slapdProxyPartitionIndex: 1
```

```
ibm-slapdProxyBackendServerRole: any
```

```
objectclass: top
```

```
objectclass: ibm-slapdConfigEntry
```

```
objectclass: ibm-slapdProxyBackendSplit
```



# Configuring proxy server .....Contd

## Ldif file – second part, partition on o=ibm

```
dn: cn=o\=ibm split, cn=ProxyDB, cn=Proxy Backends, cn=IBM Directory,  
    cn=Schemas, cn=Configuration
```

```
cn: o=ibm split
```

```
ibm-slapdProxyNumPartitions: 2
```

```
ibm-slapdProxyPartitionBase: o=ibm
```

```
ibm-slapdProxySplitName: oibmsplit
```

```
objectclass: top
```

```
objectclass: ibm-slapdConfigEntry
```

```
objectclass: ibm-slapdProxyBackendSplitContainer
```

```
dn: cn=split1, cn=o\=ibm split, cn=ProxyDB, cn=Proxy Backends, cn=IBM  
    Directory, cn=Schemas, cn=Configuration
```

```
cn: split1
```

```
ibm-slapdProxyBackendServerDN: cn=bserver1, cn=ProxyDB, cn=Proxy  
    Backends, cn=IBM Directory, cn=Schemas, cn=Configuration
```

```
ibm-slapdProxyPartitionIndex: 1
```

```
ibm-slapdProxyBackendServerRole: any
```

```
objectclass: top
```

```
objectclass: ibm-slapdConfigEntry
```

```
objectclass: ibm-slapdProxyBackendSplit
```



# Configuring proxy server .....Contd

## ➤ Ldif file – final part, partition on o=ibm

```
dn: cn=split2, cn=o\=ibm split, cn=ProxyDB, cn=Proxy Backends,  
cn=IBM Directory, cn=Schemas, cn=Configuration
```

```
cn: split2
```

```
ibm-slapdProxyBackendServerDN: cn=bserver2, cn=ProxyDB, cn=Proxy  
Backends, cn=IBM Directory, cn=Schemas, cn=Configuration
```

```
ibm-slapdProxyPartitionIndex: 2
```

```
ibm-slapdProxyBackendServerRole: any
```

```
objectclass: top
```

```
objectclass: ibm-slapdConfigEntry
```

```
objectclass: ibm-slapdProxyBackendSplit
```

## ➤ Add the contents of Ldif file using ldapadd

```
idsldapadd -I myproxy -D cn=root -w secret -i ldiffile
```



## Command line setup of proxy server contd..

- Stop the proxy server and restart in normal mode:

```
ibmslapd -I myproxy -k  
ibmslapd -I myproxy
```

- Verify the proxy server is running in normal mode:

```
ldapsearch -h myproxy -D cn=root -w secret -s  
base -b " " objectclass=* ibm-  
slapdisconfigurationmode  
  
ibm-slapdisconfigurationmode=FALSE
```



# Proxy high availability

- Proxy Flow Control
  - Ensures high availability
  - Ensures that the proxy does not run out of memory when requests are received at a rate faster than the back-end servers can handle.
  - Requests are handled in the order that they are received.
- Failure detection
  - Proxy automatically detects if a server has failed.
  - Proxy switches to next available server if possible.
  - Proxy records that the server that failed is now inactive.
  - If no other servers can perform the operation requested, the proxy returns an operations error.
  - A configuration attribute is provided to enable the proxy server to detect when a back-end server is unresponsive.



# Proxy high availability: Fail-back

- Fail-back capabilities
  - If the failed server becomes available again, the proxy handles this according to the auto fail-back setting.
    - If auto fail-back is disabled, the server remains offline until the administrator issues a resume role command.
    - If auto fail-back is enabled, the server comes back online when it is available and the proxy notices it.
    - Auto fail-back is automatically enabled if all servers for a partition have become unavailable. The first server to become available is restored. If it is a read-only server, then the first writable server is also restored.
- Smart Fail-back
  - Enables a server that was down and has come back up to be restored to its role after replication is in sync.





# Health Check

- The proxy server has a health check thread that runs to verify back-end availability.
- The proxy is configurable on a per-server basis.
- A setting of zero (0) disables health check for a server.
- Proxy does a root DSE search to determine health.
- Health check interval is not dynamic.
- You set the number of failed health checks allowed by using the environment variable `PROXY_HEALTHCHECK_OLIMIT`.



## Proxy server: Important notes

- To set up the initial proxy configuration, the proxy server *must* be in configuration-only mode.
- After configuring the server as a proxy in the Web Administration Tool, you must log out and then log back in to the Web Administration Tool to see all of the proxy options.
- For the proxy server to start in normal mode, it must be able to contact all servers, unless server groups have been set up.





# Performance Tuning

**Tivoli** software



# View Server Status-General

Tivoli Tivoli Directory Server Web Administration Tool

- Introduction
- ▶ User properties
- ▶ Server administration
  - Start/stop/restart server
  - View server status
  - View cache status
  - View server capabilities (Root DSE)
  - Manage server properties
  - Manage backup/restore
  - Manage cache properties
  - Manage server connections
  - Manage connection properties
  - Manage security properties
  - Manage password policies
  - Manage administrative group
  - Manage unique attributes
  - DB2 instance owner
- ▶ Logs
- ▶ Proxy administration
- ▶ Schema management
- ▶ Directory management
- ▶ Replication management
- ▶ Realms and templates
- ▶ Users and groups
- Logout

9.182.194.115:5389

### View server status

**General**

- System information
- Operation counts 1
- Operation counts 2
- Transaction counts
- Work queue
- View worker status
- Trace and logs
- Persistent search

**General**

Hostname:	<input type="text" value="Vietnamtiv2.in.ibm.com"/>
Server status:	<input type="text" value="Running"/>
Start time:	<input type="text" value="June 1, 2011 10:39:35 AM IST"/>
Current time:	<input type="text" value="June 14, 2011 7:08:33 AM IST"/>
Total threads:	<input type="text" value="1"/>
Total threads blocked on write:	<input type="text" value="0"/>
Total threads blocked on read:	<input type="text" value="0"/>
Number of connections:	<input type="text" value="2"/>
Total connections:	<input type="text" value="362"/>
Number of entries sent:	<input type="text" value="1643"/>
Bypass alias dereferencing:	<input type="text" value="True"/>
Total number of SSL connections:	<input type="text" value="0"/>
Total number of TLS connections:	<input type="text" value="0"/>

Last refreshed at 12:37:52 PM IST on June 14, 2011

Refresh
Close

# View Server Status-System Information

Tivoli Tivoli Directory Server Web Administration Tool

9.182.194.115:5389

### View server status

General

**System information**

Operation counts 1

Operation counts 2

Transaction counts

Work queue

View worker status

Trace and logs

Persistent search

### System information

Operating System name:

Disk space used by directory where the DB2 database is stored (Kbytes):

Disk space available to DB2 database (Kbytes):

Last refreshed at 12:37:52 PM IST on June 14, 2011

- Introduction
- User properties
- Server administration
  - Start/stop/restart server
  - View server status
  - View cache status
  - View server capabilities (Root DSE)
  - Manage server properties
  - Manage backup/restore
  - Manage cache properties
  - Manage server connections
  - Manage connection properties
  - Manage security properties
  - Manage password policies
  - Manage administrative group
  - Manage unique attributes
  - DB2 instance owner
- Loqs
- Proxy administration
- Schema management
- Directory management
- Replication management

# View Server Status- Operation Counts

**Tivoli** Tivoli Directory Server Web Administration Tool

9.182.194.115:5389

**View server status**

- Introduction
- User properties
- Server administration
  - Start/stop/restart server
  - View server status
  - View cache status
  - View server capabilities (Root DSE)
  - Manage server properties
  - Manage backup/restore
  - Manage cache properties
  - Manage server connections
  - Manage connection properties
  - Manage security properties
  - Manage password policies
  - Manage administrative group
  - Manage unique attributes
  - DB2 instance owner
- Logs
- Proxy administration
- Schema management
- Directory management
- Replication management
- Realms and templates
- Users and groups
- Logout

Operation counts	
Number of operations requested:	2227
Number of operations completed:	2226
Number of search operations requested:	1415
Number of search operations completed:	1414
Number of bind operations requested:	362
Number of bind operations completed:	362
Number of unbind operations requested:	360
Number of unbind operations completed:	360
Number of add operations requested:	31
Number of add operations completed:	31
Number of delete operations requested:	35
Number of delete operations completed:	35
Number of modify RDN operations requested:	0
Number of modify RDN operations completed:	0

Last refreshed at 12:37:52 PM IST on June 14, 2011

# View Server Status- Work Queue

**Tivoli** Tivoli Directory Server Web Administration Tool

9.182.194.115:5389

**View server status**

- General
- System information
- Operation counts 1
- Operation counts 2
- Transaction counts
- Work queue**
- View worker status
- Trace and logs
- Persistent search

**Work queue**

Number of worker threads available:

Depth of the work queue:

Largest size of the work queue:

Number of connections closed by automatic connection cleaner:

Number of times the automatic connection cleaner has run:

Last refreshed at 12:37:52 PM IST on June 14, 2011



# View Server Status- Persistent Search

Tivoli Tivoli Directory Server Web Administration Tool

9.182.194.115:5389

### View server status

- [Introduction](#)
- ▶ [User properties](#)
- ▼ [Server administration](#)
  - [Start/stop/restart server](#)
  - [View server status](#)
  - [View cache status](#)
  - [View server capabilities \(Root DSE\)](#)
  - [Manage server properties](#)
  - [Manage backup/restore](#)
  - [Manage cache properties](#)
  - [Manage server connections](#)
  - [Manage connection properties](#)
  - [Manage security properties](#)
  - [Manage password policies](#)
  - [Manage administrative group](#)
  - [Manage unique attributes](#)
  - [DB2 instance owner](#)
- ▶ [Logs](#)
- ▶ [Proxy administration](#)
- ▶ [Schema management](#)
- ▶ [Directory management](#)
- ▶ [Replication management](#)

#### General

- [System information](#)
- [Operation counts 1](#)
- [Operation counts 2](#)
- [Transaction counts](#)
- [Work queue](#)
- [View worker status](#)
- [Trace and logs](#)

#### Persistent search

Number of changes sent:

Number of active connections:

Number of dropped connections:

Number of pending changes:

Last refreshed at 12:37:52 PM IST on June 14, 2011







# Tivoli Directory Server Caches

**Tivoli** software



# LDAP caches

## ➤ **Entry cache.**

Contains complete caches, entries, and entry IDs.

Size is in number of entries.

## ➤ **Cache of group members.**

Extension of the entry cache that contains member and uniquemember attribute values with their entries.

## ➤ **Attribute cache.**

Contains all values of an attribute.

Size is in bytes.

## ➤ **Access control list (ACL) cache.**

Contains information about the permissions of recent entries.

## ➤ **Filter cache.**

Contains all entries that match a filter.

Size is in entries.



## LDAP caches (continued)

- An LDAP search that accesses the LDAP cache is much faster than one that requires a connection to DB2. This is true even if the information is stored in a cache in DB2.
- Entry cache.
  - Actual data of an entry is stored in the entry cache.
  - Entry IDs are sent to the entry cache to find the actual entry after the search filter is resolved.
  - If the entry is found in the cache, it is sent to the client.
  - If the entry is not found in the cache, a request to DB2 is made.
- Attribute cache.
  - Configured attributes and their values are stored in the attribute cache.
  - When a search is performed using a filter that contains all cached attributes, it might be possible to resolve the search filter in memory.



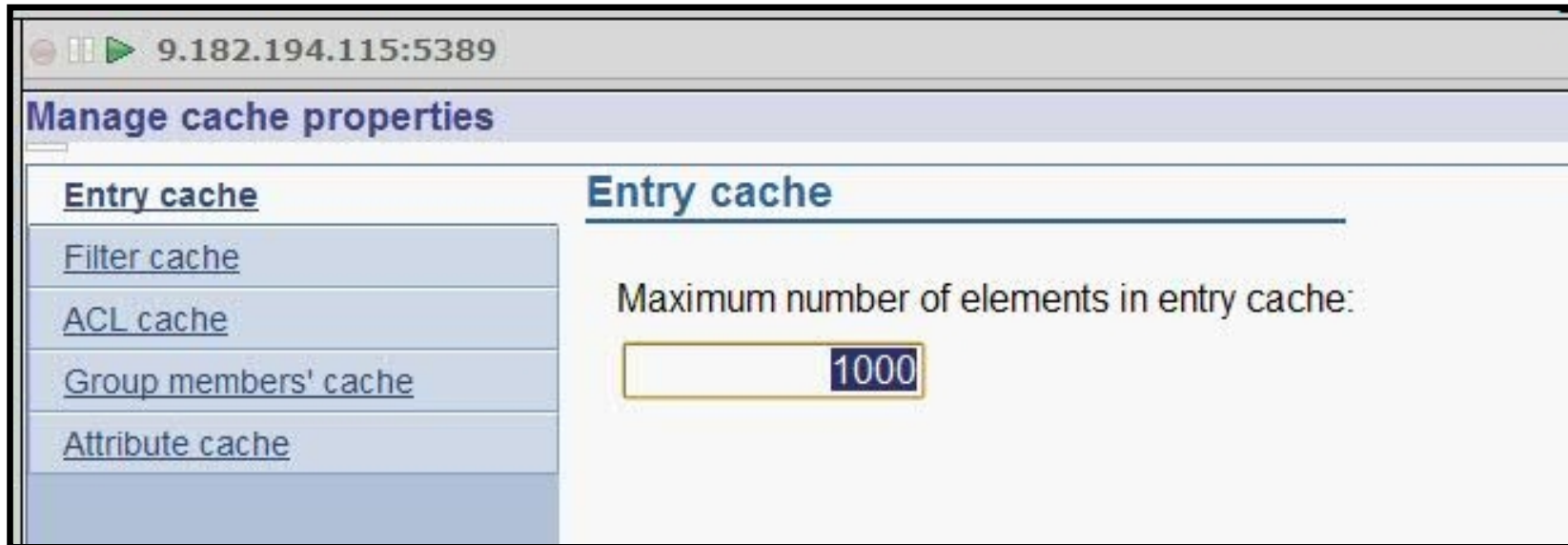
# How to set LDAP caches?

- There are various ways to set caches as below:
  - Web Administration Tool.
  - Command line using **idsldapmodify**.
  - Performance tuning option of **idsxcfg**.
  - Editing of the **ibmslapd.conf** file.
  - Performance tuning utility: **idsperftune**.
- All methods require the directory server to reload the cache settings.
  - For the graphical user interface (GUI) methods, this task is performed automatically.
  - For the command-line methods, use the following command:

```
idsldapexop -D admindn -w adminpw -h hostname  
-p port -op readconfig -scope entire
```



# Configuring Entry cache via Web Admin Tool



The screenshot shows a web browser window with the address bar displaying "9.182.194.115:5389". The main content area is titled "Manage cache properties". On the left side, there is a vertical menu with the following items: "Entry cache", "Filter cache", "ACL cache", "Group members' cache", and "Attribute cache". The "Entry cache" item is selected and highlighted. The main content area displays the configuration for the "Entry cache". It features a heading "Entry cache" followed by a horizontal line. Below this, the text "Maximum number of elements in entry cache:" is displayed. Underneath this text is a text input field containing the value "1000".



# Configuring Entry cache via command line.

➤ `idsldapmodify -D <adminDN> -w <adminPW> -i <filename>`

where <filename> contains:

`dn: cn=Front End, cn=Configuration`

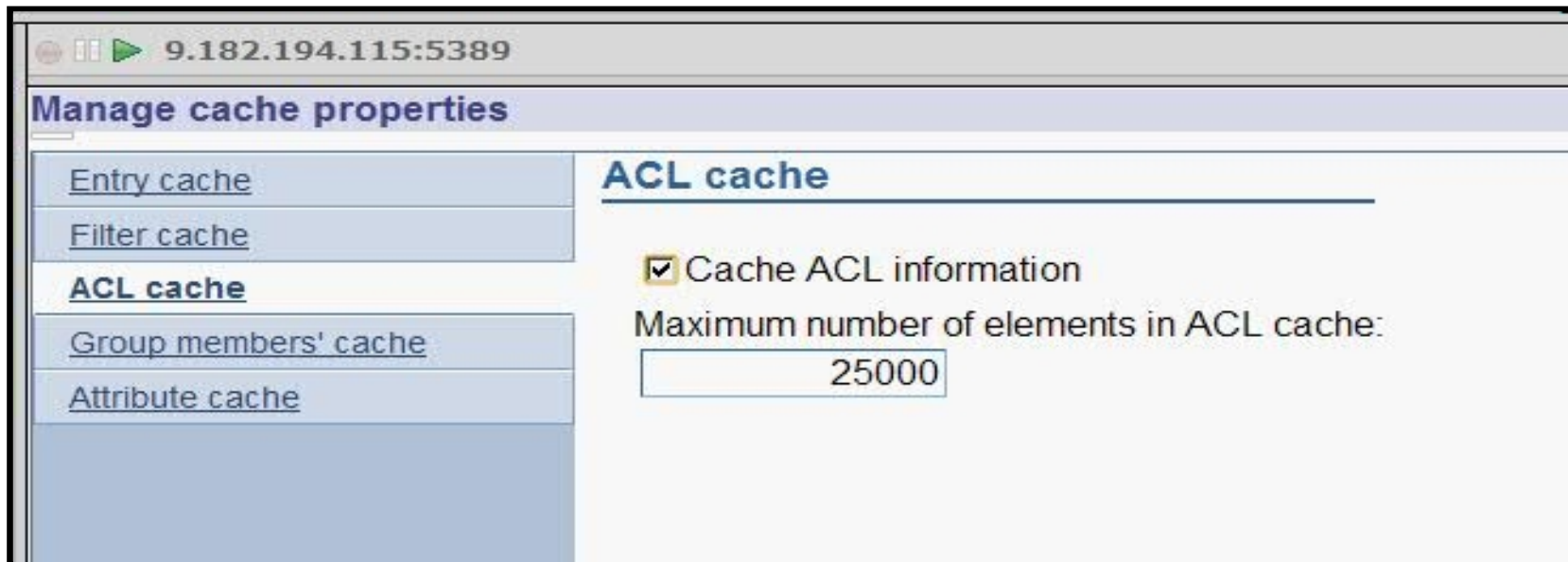
`changetype: modify`

`replace: ibm-slapdEntryCacheSize`

`ibm-slapdEntryCacheSize: <value to be set in numerals>`



# Configuring ACL cache via Web Admin Tool



# Configuring ACL cache via command line.

➤ `idsldapmodify -D <adminDN> -w <adminPW> -i <filename>`

where <filename> contains:

```
dn: cn=Front End, cn=Configuration
```

```
changetype: modify
```

```
replace: ibm-slapdACLCache
```

```
ibm-slapdACLCache: TRUE
```

```
-
```

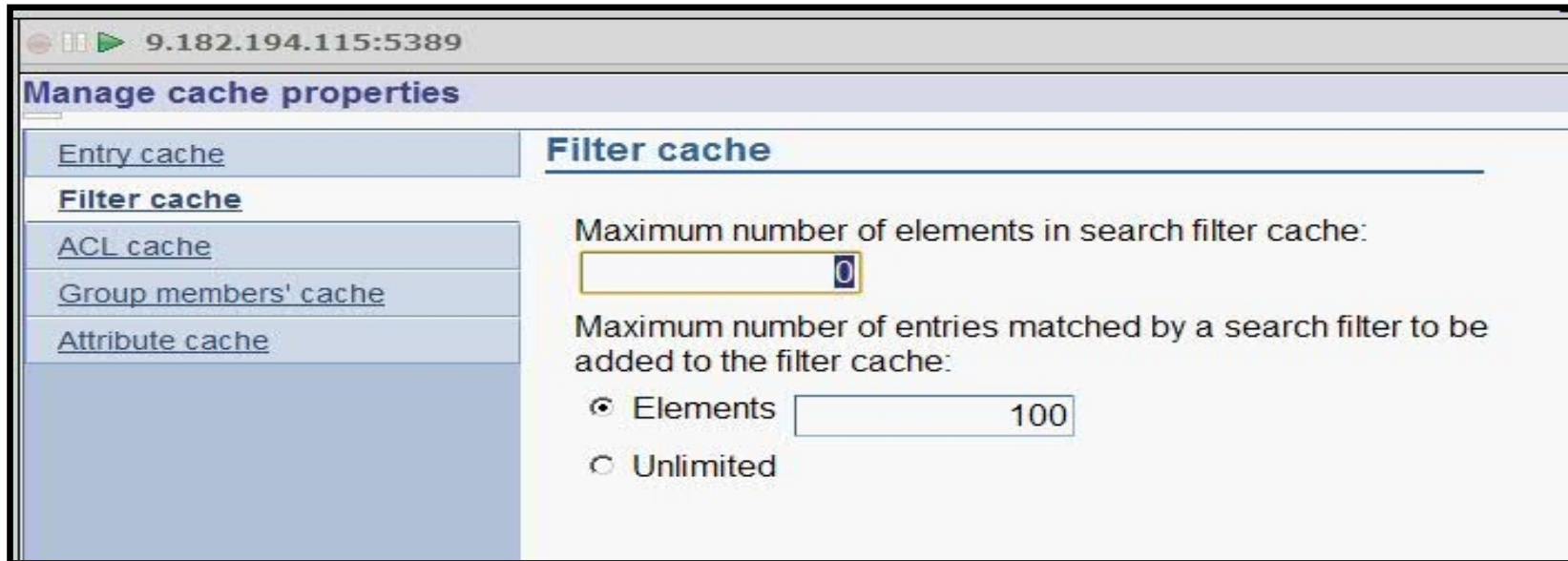
```
replace: ibm-slapdACLCacheSize
```

```
ibm-slapdACLCacheSize: <value to be set in  
numerals>
```





# Configuring Filter Cache via Web Admin Tool



The screenshot shows a web browser window with the address bar displaying "9.182.194.115:5389". The main content area is titled "Manage cache properties" and is divided into two sections: "Entry cache" and "Filter cache".

**Entry cache**

- Filter cache**
- ACL cache
- Group members' cache
- Attribute cache

**Filter cache**

Maximum number of elements in search filter cache:

Maximum number of entries matched by a search filter to be added to the filter cache:

- Elements
- Unlimited

# Configuring Filter Cache via Command line

➤ `idsldapmodify -D <adminDN> -w <adminPW> -i <filename>`

where <filename> contains:

```
dn: cn=Front End, cn=Configuration
```

```
changetype: modify
```

```
replace: ibm-slapdFilterCacheSize
```

```
ibm-slapdFilterCacheSize: <value to be set in numerals>
```

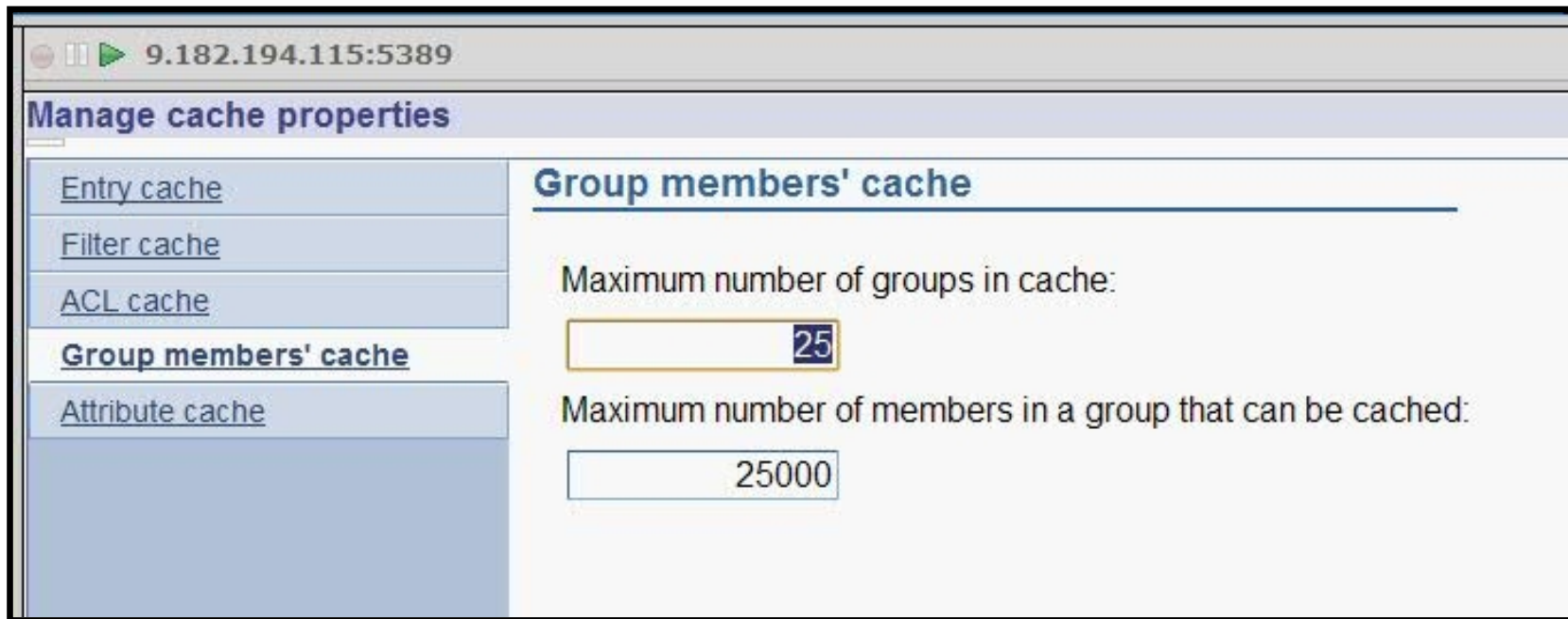
```
-
```

```
replace: ibm-slapdFilterCacheBypassLimit
```

```
ibm-slapdFilterCacheBypassLimit: <value to be set in numerals>
```



# Configure Group members cache via Web Admin tool



The screenshot shows a web browser window with the address bar displaying "9.182.194.115:5389". The page title is "Manage cache properties". On the left side, there is a navigation menu with the following items: "Entry cache", "Filter cache", "ACL cache", "Group members' cache" (which is highlighted), and "Attribute cache". The main content area is titled "Group members' cache" and contains two configuration fields:

- "Maximum number of groups in cache:" with a text input field containing the value "25".
- "Maximum number of members in a group that can be cached:" with a text input field containing the value "25000".



# Configure group members cache via command line

➤ `idsldapmodify -D <adminDN> -w <adminPW> -i <filename>`

where `<filename>` contains:

```
dn: cn=Directory, cn=RDBM Backends, cn=IBM
Directory, cn=Schemas, cn=Configuration
```

```
changetype: modify
```

```
replace: ibm-slapdGroupMembersCacheSize
```

```
ibm-slapdGroupMembersCacheSize:25
```

```
-
```

```
replace: ibm-slapdGroupMembersCacheBypassLimit
```

```
ibm-slapdGroupMembersCacheBypassLimit: 50
```





# Tivoli Directory Server Performance Tuning using idsperftune command

**Tivoli** software

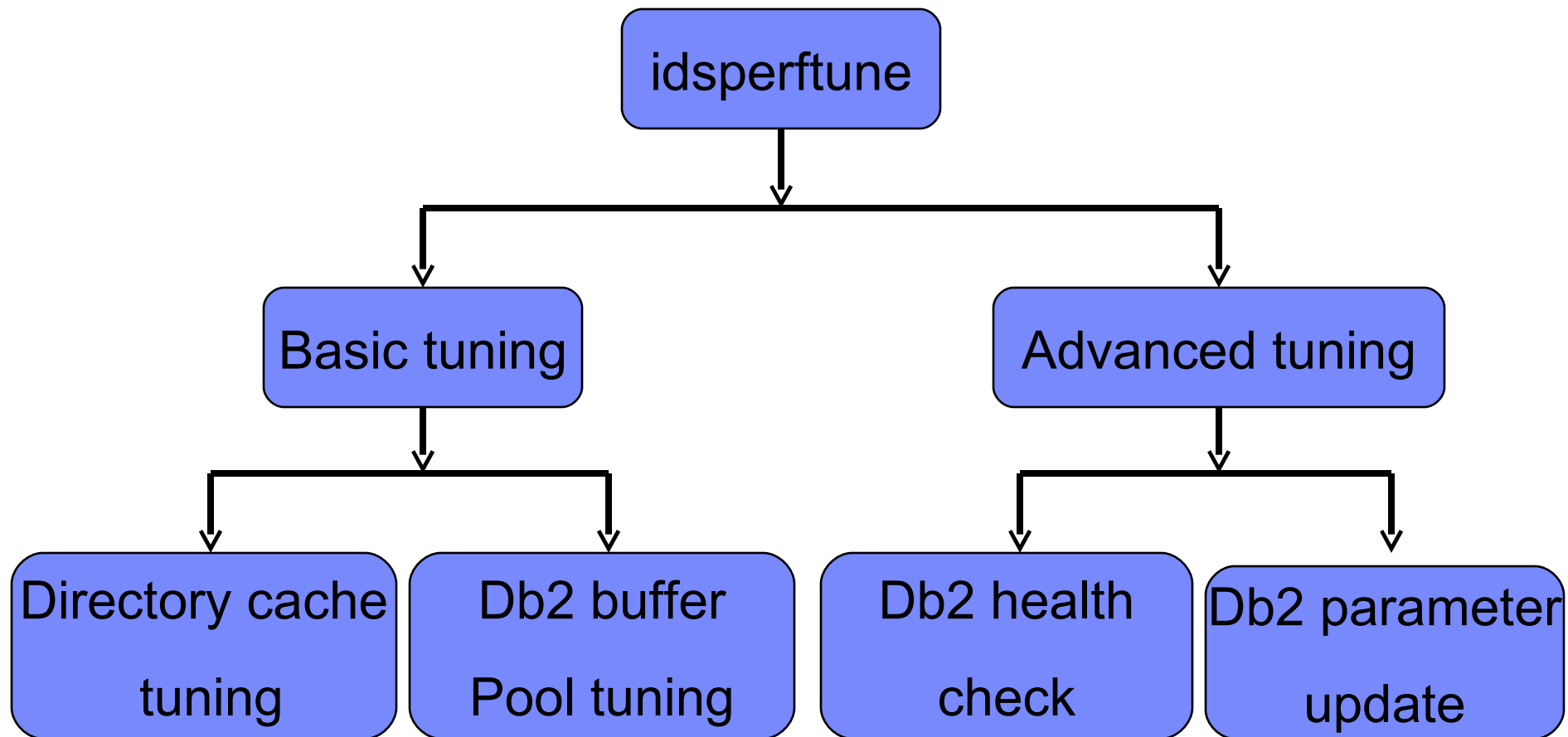


# Performance tuning using idisperftune

- Available using the graphical user interface (GUI) **idsxcfg** and as a command-line utility.
- Can be used in a basic and advanced mode.
  - Basic** mode takes the best estimate of the administrator and some planned usage estimates. Determines and optionally sets the best cache and DB2 buffer pool settings.
  - Advanced** mode starts with the same estimates as in basic mode. Enables DB2 health check and monitors system performance for 5 minutes. It then can make the same setting changes as in basic mode. It also advises on which DB2 database settings might need adjusting and which way to adjust them.
- Takes input from **perftune\_input.conf** file and writes output to **perftune\_stat.log** and optionally to **ibmslapd.conf**.



# Performance Tuning Tool



# Performance tuning using basic idsxcfg

The screenshot shows the 'Performance tuning' configuration window in the IBM Tivoli Directory Server Configuration Tool. The window title is 'IBM Tivoli Directory Server Configuration Tool'. The left-hand navigation pane lists various tasks, with 'Performance tuning' selected and highlighted in blue. The main content area contains the following settings:

- Tuning of directory cache sizes depends on the planned directory size and usage. Give a best estimate for each of the following:**
  - Percentage of available system memory to be allocated to this directory instance:
  - Planned number of groups:
  - Maximum number of members in a group that will be referenced frequently:
- Number of entries and average entry size**
  - Planned number of entries:
  - Average size of an entry (Bytes):
- Update frequency**
  - Frequent updates (more than one update for every 500 searches)
  - Batch updates (updates are less frequent or batched to occur only at certain times of the day)
- Enable collection of additional database performance parameters for extended tuning

**Note:** Selecting this option causes extra data to be collected so that more parameters can be tuned. Data will be collected for 5 minutes and during this time there might be some negative performance impact. For the best results, be sure to run a typical workload while the data is being collected.

At the bottom of the window, there are navigation buttons: 'Help ?', '< Back', 'Next >', 'Finish', and 'Cancel'.





# Performance tuning using basic idsxcfg (Contd.)

The screenshot shows the 'IBM Tivoli Directory Server Configuration Tool' window. The left-hand navigation pane is expanded to 'Performance tuning'. The main area displays 'Database health status' with a list of metrics and a 'Tune database parameters...' button. Below this, the 'Performance tuning recommendations' section is active, showing 'Calculated directory cache sizes' and 'Calculated database buffer pool sizes' with input fields for various parameters.

**Database health status**

- Package cache size: 339:Increase
- Log buffer size: 256:OK
- Maximum database files open per application: Not Collected
- Changed pages thresholds: Not Collected
- Sort heap size: Not Collected
- Log file size: 2000:OK
- Maximum storage for lock list: AUTOMATIC
- Number of I/O servers: AUTOMATIC
- Number of asynchronous page cleaners: AUTOMATIC
- Buffer pool: Not Collected
- Self tuning memory: ON

**Performance tuning recommendations**

**Calculated directory cache sizes**

Entry cache	4000
Filter cache	0
Group members cache	25
Group members cache bypass limit	25000
System memory allotted to this instance (KB)	104317.97
Enough memory available for efficient directory server caching	TRUE

**Calculated database buffer pool sizes**

Default buffer pool	AUTOMATIC
LDAP buffer pool	AUTOMATIC

Yes, use the recommended values to update the directory and database configuration settings  
 No, keep the current settings. No configuration settings will be updated

Buttons: Help, ? , < Back, Next >, Finish, Cancel

# Performance tuning using basic idsperftune

```
perftune_input.conf
1 #-----
2 #   Admin Input
3 #-----
4 # Amount of system memory (%) to be allotted to TDS instance
5 TDS_SYS_MEM=90
6
7 # Total number of entries that will reside in the directory
8 TDS_TOTAL_ENTRY=10000
9
10 # Average size of entry (Bytes)
11 TDS_AVG_ENTRY_S2=2560
12
13 # Update Frequency
14 # 1. Frequent updates expected, or
15 # 2. Only Batch Updates expected
16 TDS_UPDATE_FREQ=1
17
18 #Total number of Groups to be cached
19 TDS_GROUP_CACHE=25
20
21 # Maximum number of members in a group that will be referenced frequently
22 TDS_GROUP_MEMBER=25000
23
24 #-----
25 # DB2 PARAMETER INPUT
26 #-----
27
28 # NEWLOGPATH allows you to specify a string of up to 242 bytes to change the location where the log files are stored.
29 # eg, NEWLOGPATH="/home/idsldap" NOTE: A new directory NODE0000 will be created inside this path
30 NEWLOGPATH=None
31
32 # LOGFILSIZ defines the size of each primary and secondary log file. The size of these log files limits
33 # the number of log records that can be written to them before they become full and a new log file is required.
34 LOGFILSIZ=None
35
36 # DBHEAP determines the maximum memory used by the database heap.
37 DBHEAP=None
38
39 # MAXFILOP specifies the maximum number of file handles that can be open for each database agent.
40 MAXFILOP=None
41
42 # SORTHEAP defines the maximum number of private memory pages to be used for private sorts,
43 # or the maximum number of shared memory pages to be used for shared sorts.
44 SORTHEAP=None
45
46 # LOGBUFSZ allows you to specify the amount of the database heap (defined by the dbheap parameter)
47 # to use as a buffer for log records before writing these records to disk.
48 LOGBUFSZ=None
49
```

# Performance tuning using basic idspertune(Contd.)

```
bash-3.2# ./idspertune -I master -s
GLPWRP123I The program '/opt/IBM/dap/V6.3/sbin/64/perftune' is used with the fo
llowing arguments '-I master -s'.
GLPCTL113I Largest core file size creation limit for the process (in bytes): '-1
'(Soft limit) and '-1'(Hard limit).
GLPCTL121I Maximum Data Segment(Kbytes) soft ulimit for the process was 245759 a
nd it is modified to the prescribed minimum 262144.
GLPCTL119I Maximum File Size(512 bytes block) soft ulimit for the process is -1
and the prescribed minimum is 2097151.
GLPCTL122I Maximum Open Files soft ulimit for the process is 2000 and the prescr
ibed minimum is 500.
GLPCTL119I Maximum Physical Memory(Kbytes) soft ulimit for the process is -1 and
the prescribed minimum is 262144.
GLPCTL121I Maximum Stack Size(Kbytes) soft ulimit for the process was 32768 and
it is modified to the prescribed minimum 65536.
GLPCTL119I Maximum Virtual Memory(Kbytes) soft ulimit for the process is -1 and
the prescribed minimum is 1048576.
GLPSRV200I Initializing primary database and its connections.
GLPPFT009I Fetching the total number of entries and the average size of an entry
in the directory.
GLPPFT024I Updated the configuration file /home/master/idsslapd-master/etc/perft
une input conf.
GLPPFT030I The command completed successfully.
```



# Performance tuning using basic idspertune(Contd.)

```
bash-3.2# ./idspertune -I master -B -u -p 5389
GLPWRP123I The program '/opt/IBM/ldap/V6.3/sbin/64/perftune' is used with the
following arguments '-I master -B -u -p 5389'.
GLPCTL113I Largest core file size creation limit for the process (in bytes): '-1'(Soft
limit) and '-1'(Hard limit).
GLPCTL121I Maximum Data Segment(Kbytes) soft ulimit for the process was 245759
and it is modified to the prescribed minimum 262144.
GLPCTL119I Maximum File Size(512 bytes block) soft ulimit for the process is -1 and
the prescribed minimum is 2097151.
GLPCTL122I Maximum Open Files soft ulimit for the process is 2000 and the prescribed
minimum is 500.
GLPCTL119I Maximum Physical Memory(Kbytes) soft ulimit for the process is -1 and
the prescribed minimum is 262144.
GLPCTL121I Maximum Stack Size(Kbytes) soft ulimit for the process was 32768 and it
is modified to the prescribed minimum 65536.
GLPCTL119I Maximum Virtual Memory(Kbytes) soft ulimit for the process is -1 and the
prescribed minimum is 1048576.
GLPSRV200I Initializing primary database and its connections.
GLPPFT010I Performing basic tuning operation.
GLPPFT003I Parsing the input configuration file /home/master/idsslapd-
master/etc/perftune_input.conf.
GLPPFT017I Updated the status file /home/master/idsslapd-
master/logs/perftune_stat.log.
GLPPFT005I Successfully backed up the ibmslapd.conf file to /home/master/idsslapd-
master/logs/ibmslapd_log_save.
GLPPFT014I Updated directory cache and DB2 BUFFERPOOL.
GLPPFT017I Updated the status file /home/master/idsslapd-
master/logs/perftune_stat.log.
GLPPFT030I The command completed successfully.
```



# Performance tuning using advanced idsperftune

The screenshot shows the 'IBM Tivoli Directory Server Configuration Tool' window. The left-hand navigation pane is expanded to 'Performance tuning' under the 'Database tasks' category. The main area contains the following configuration options:

- Tuning of directory cache sizes depends on the planned directory size and usage. Give a best estimate for each of the following:
  - Percentage of available system memory to be allocated to this directory instance:
  - Planned number of groups:
  - Maximum number of members in a group that will be referenced frequently:
- Number of entries and average entry size:
  - Planned number of entries:
  - Average size of an entry (Bytes):
- Update frequency:
  - Frequent updates (more than one update for every 500 searches)
  - Batch updates (updates are less frequent or batched to occur only at certain times of the day)

A red circle highlights the checkbox for 'Enable collection of additional database performance parameters for extended tuning:'. Below this checkbox is a note:

**Note:** Selecting this option causes extra data to be collected so that more parameters can be tuned. Data will be collected for 5 minutes and during this time there might be some negative performance impact. For the best results, be sure to run a typical workload while the data is being collected.

At the bottom of the window, there are buttons for 'Help', '?', '< Back', 'Next >', 'Finish', and 'Cancel'.



# Tivoli Directory Server Database Maintenance

**Tivoli** software



# Database maintenance using idsdbmaint

- Available using the GUI idsxcfg and as a command-line utility.
- Directory server must be stopped.
- Perform DB2 index reorganization.
- Perform DB2 row compression.
- Convert DB2 tablespace types.

Tablespace conversion is only available using the command line.



# DB2 index reorganization

- Fetches all tables that have indexes defined.
- Performs index reorganization on all indexes.
- After index reorganization all table statistics are updated.





# DB2 row compression

- Uses a static dictionary-based compression algorithm.
- Reduces space required for the directory.
- Reduces I/O, which generally improves performance.
- The tool fetches all tables if the tables compression estimate is more than 30 percent.

Enables DB2 row compression.

Reorganizes the table.

Updates the tables statistics.



# Converting DB2 tablespace types

- IBM Tivoli Directory Server Version 6.2 and above supports both System Managed Space (SMS) and Database Managed Space (DMS) forms of tablespaces.
- SMS tablespaces are not preallocated and are easy to create.
- DMS tablespaces are more flexible and can be allocated by data type. They can also be located on different disks.
- `idsdbmaint` supports converting from SMS to DMS and from DMS to SMS.



# Database maintenance using idsxcfg

The screenshot displays the 'IBM Tivoli Directory Server Configuration Tool' interface. On the left, a navigation pane shows 'Maintenance' selected under 'Database tasks'. The main window contains the following elements:

- Database maintenance can perform index reorganization, row compression.**
- Note:** Maintenance of large database may take a long time to complete.
- Radio buttons for:
  - Perform index reorganization
  - Inspect the tables and perform row compression
- Start time: 8/26/10 3:23 PM
- Elapsed time: 0:2:56
- Task messages:**
  - GLPDBA043I The table 'SRC' has a compression benefit of '48%'.
  - GLPDBA019I The table 'SRC' will be compressed.
  - GLPDBA034I Row compression has been enabled for the table 'SRC'.
  - GLPDBA044I The table 'SRC' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.SRC' have been updated.
  - GLPDBA023I Index Reorganization or Row Compression might not provide performance gain for the table 'ST'.
  - GLPDBA023I Index Reorganization or Row Compression might not provide performance gain for the table 'STREET'.
  - GLPDBA043I The table 'TELEXNUMBER' has a compression benefit of '40%'.
  - GLPDBA019I The table 'TELEXNUMBER' will be compressed.
  - GLPDBA034I Row compression has been enabled for the table 'TELEXNUMBER'.
  - GLPDBA044I The table 'TELEXNUMBER' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.TELEXNUMBER' have been updated.
  - GLPDBA043I The table 'TITLE' has a compression benefit of '38%'.
  - GLPDBA019I The table 'TITLE' will be compressed.
  - GLPDBA034I Row compression has been enabled for the table 'TITLE'.
  - GLPDBA044I The table 'TITLE' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.TITLE' have been updated.
  - GLPDBA023I Index Reorganization or Row Compression might not provide performance gain for the table 'UATTRTYPES'.
  - GLPDBA023I Index Reorganization or Row Compression might not provide performance gain for the table 'UID'.
  - GLPDBA024I The available data is not enough to perform inspection for the table 'UNIQUEMEMBER'.
  - GLPDBA024I The available data is not enough to perform inspection for the table 'USERPASSWORD'.
  - GLPDBA023I Index Reorganization or Row Compression might not provide performance gain for the table 'X121ADDRESS'.

An 'Information' dialog box is overlaid on the task messages, displaying: 'GLPCFG092I Task completed.' with an 'OK' button.

# Database maintenance using idsxcfg(Contd.)

The screenshot shows the 'IBM Tivoli Directory Server Configuration Tool' window. The left-hand navigation pane is expanded to 'Maintenance'. The main window displays the following content:

- Database maintenance can perform index reorganization, row compression.**
- Note:** Maintenance of large database may take a long time to complete.
- Radio buttons for:
  - Perform index reorganization
  - Inspect the tables and perform row compression
- Start time: 8/26/10 3:20 PM
- Elapsed time: 0:2:20
- Task messages:**
  - GLPDBA021I All Index on table 'ST' will be reorganized.
  - GLPDBA044I The table 'ST' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.ST' have been updated.
  - GLPDBA021I All Index on table 'STREET' will be reorganized.
  - GLPDBA044I The table 'STREET' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.STREET' have been updated.
  - GLPDBA021I All Index on table 'TELETEXTERMINALID' will be reorganized.
  - GLPDBA044I The table 'TELETEXTERMINALID' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.TELETEXTERMINALID' have been updated.
  - GLPDBA021I All Index on table 'TELEXNUMBER' will be reorganized.
  - GLPDBA044I The table 'TELEXNUMBER' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.TELEXNUMBER' have been updated.
  - GLPDBA021I All Index on table 'TITLE' will be reorganized.
  - GLPDBA044I The table 'TITLE' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.TITLE' have been updated.
  - GLPDBA021I All Index on table 'UATTRTYPES' will be reorganized.
  - GLPDBA044I The table 'UATTRTYPES' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.UATTRTYPES' have been updated.
  - GLPDBA021I All Index on table 'UID' will be reorganized.
  - GLPDBA044I The table 'UID' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.UID' have been updated.
  - GLPDBA021I All Index on table 'UNIQUEMEMBER' will be reorganized.
  - GLPDBA044I The table 'UNIQUEMEMBER' has been reorganized.
  - GLPDBA046I All statistics on table 'IDSINST.UNIQUEMEMBER' have been updated.
  - GLPDBA021I All Index on table 'USERPASSWORD' will be reorganized.

An 'Information' dialog box is overlaid on the task messages, displaying the message: 'GLPCFG092I Task completed.' with an 'OK' button.

At the bottom of the main window, there are buttons for 'Clear results', 'OK', 'Close', and 'Help'.

# Control LDAP client functions

- Set server search settings.
- Put frequently searched attributes in attribute cache.
- Instruct clients to:
  - Search on indexed attributes only.
  - Open a connection once and reuse it for many operations.
  - Minimize the number of searches by retrieving multiple attribute values at one time.
  - Retrieve only the attributes needed.
  - Minimize and batch updates.
  - Minimize persistent query use.
  - Minimize virtual list usage.



# Control LDAP client functions (Contd.)

9.182.194.115:5389

## Manage server properties

- General
- Performance
- Ulimit settings
- Search settings**
- Event notification
- Transactions
- Suffixes
- Referrals
- Delete settings
- Database
- Conflict resolution

### Search settings

**Search size limit:**

Entries

Unlimited

**Search time limit:**

Seconds

Unlimited

**Alias dereferencing:**

Alias dereferencing:

**Page Search Settings:**

Allow only administrators to perform page searches

Idle time out for paged searches (seconds):

Maximum number of concurrent paged searches:

# Control LDAP client functions (Contd.)

## Sorted Search Settings:

---

Allow only administrators to perform sort searches

Maximum number of attributes allowed in sorted searches:

## Virtual List View Search

---

Enable virtual list view search

Maximum number of entries before offset in a virtual list view search:

## Persistent search

---

Enable persistent search

Maximum number of concurrent persistent searches (Max 2000):





# Runstats and Reorg

**Tivoli** software





# Runstats: Why do we need to run it?

- IBM Tivoli Directory Server creates a number of indexes for tables in the database. These indexes are used to minimize the data accessed in order to locate a particular row in a table.
- In a read-only environment, the distribution of the data changes very little. However, with the environment that has a large number of updates and additions to the database on a daily basis, it is common for the distribution of the data to change significantly.
- To remedy these situations, there is a script that can help optimize the access to data by updating the statistics and to reorganize the data within the tables of the database. The script is called *tune\_runstats.sh*.



# How to use tune\_runstats.sh?

- Update the DB2 statistics to improve runtime performance on *all* LDAP servers.

```
su - ldapdb2
```

```
$ ./tune_runstats.sh
```

```
exit
```

This keeps the updates current with DB2 and improves the database performance.

- Recycle the LDAP process each week on *all* LDAP servers, to update all indexes.

```
# Find the pid process for slapd and kill the process.
```

```
# Make sure the slapd process is not running.
```

```
su - ldapdb2
```

```
$ ./tune_runstats.sh
```

```
$ exit
```

```
# Start the slapd process back up
```



# REORG : When and how should we use this ?

- The **reorg** command, using the data generated by **tune\_runstats.sh**, reorganizes tablespaces to improve access performance and reorganizes indexes so that they are more efficiently clustered.
- After you have generated organizational information about the database using **tune\_runstats.sh** for reorganization, **reorg** finds the necessary tables and indexes and attempts to reorganize them.
- The above step is done if **tune\_runstats.sh** does not get the required results.



# Performing a reorg as required

- In general, reorganizing a table takes more time than updating statistics. You should update statistics first, and only perform reorgs on specific tables if the performance is still not as expected. Therefore, performance might be improved significantly by updating statistics first.
- If you notice that your performance is not improving after running `tune_runstats.sh` and you can trend this, then this is a good time to plan for doing some reorgs of tables and maybe some indexes as needed in a maintenance window. Then rerun the `tune_runstats.sh` after you finish your reorgs (this is a requirement to update the statistics and set the cardinality back that gets reset when you do a reorg).



# Reorg a table

To reorganize the tables with an asterisk in the last column, issue the DB2 command, as shown in the following steps:

- Find the pid process for slapd and kill the process.
- Make sure the slapd process is not running.
- Execute the following commands to reorg a table.

```
su - ldapdb2
```

```
db2 connect to ldapdb2
```

```
db2 reorg table <table_name>
```



## Reorg a table (Contd.)

- After all reorgs are done, run the following script (required):

```
su - ldapdb2
```

```
$ ./tune_runstats.sh
```

```
$ exit
```

- Start the slapd process back up.

```
$ ibmslapd
```



# Reorg an index

To reorganize database indexes with an asterisk in the last column, issue the following DB2 command:

- Find the pid process for slapd and kill the process.
- Make sure the slapd process is not running.
- Run the following commands to reorg a table.

```
su - ldapdb2
```

```
db2 connect to ldapdb2
```

```
db2 reorg table <table_name> index <index_name>
```



## Reorg an index (Contd.)

- After all reorgs are done, run the following script (required):

```
su - ldapdb2
```

```
$ ./tune_runstats.sh
```

```
$ exit
```

- Start the slapd process back up.

```
$ ibmslapd
```

- Remember that after you do all your reorgs of both tables and/or indexes, you *must* run the **tune\_runstats.sh** again before you restart your LDAP.







# Tivoli Directory Server v6.3 Troubleshooting

**Tivoli** software



# Logging Facilities

- Admin daemon error log.
  - **ibmdiradm.log.**
  - Errors encountered by the admin daemon.
  
- Admin daemon audit log.
  - **adminaudit.log.**
  - Activities performed by the admin daemon.
  
- Bulkload error log.
  - **bulkload.log.**
  - Status and errors related to performing bulkload operations.



# Logging Facilities Contd..

- Configuration tools log.
  - **ldstools.log.**
  - Status and errors related to the various IBM Tivoli Directory Server Configuration tools.
  
- DB2 error log.
  - **db2cli.log.**
  - Database errors that arise from LDAP operations.
  
- Installation logs.
  - **ldapinst.log, ldapuninst.log, and ldaplp\_inst.log.**
  - Status and errors related to installation.



# More Logging Facilities

- Lost and found log.
  - **lostandfound.log.**
  - Information to assist in resolving replication conflicts.
  
- Server error log.
  - **ibmslapd.log.**
  - Status and error messages related to the server.



## Default log paths

- The default log path for all logs is:

`<INSTANCE_HOME>/idsldapd-<instance name>/logs`

Where:

**INSTANCE\_HOME** directory is the home directory of the directory server instance



# Log File Management

- Log file size.
  - Size at which log file is archived.
  - Default value is 10 MB.
  - Unlimited means file is never archived.
- Maximum log archives.
  - Maximum number of archived logs.
  - Default value is 3.
  - No archive means that file is not saved when threshold is reached and contents of file are overwritten.
  - Unlimited means that there is no limit on the number of archived logs.



## Log File Management contd...

- Log archive path.
  - Directory to contain the archived logs.
  
- Configure using Web Administration Tool.
  - Log file management can be individually configured for each log file.



# Audit log

- ibm-audit: false
- ibm-auditAdd: false
- ibm-auditAttributesOnGroupEvalOp: false
- ibm-auditBind: true
- ibm-auditCompare: false
- ibm-auditDelete: false
- ibm-auditExtOp: false
- ibm-auditExtOPEvent: false





## Audit log contd..

- ibm-auditFailedOPonly: true
- ibm-auditGroupsOnGroupControl: false
- ibm-auditModify: false
- ibm-auditModifyDN: false
- ibm-auditPerformance: false
- ibm-auditPTABindInfo: true
- ibm-auditSearch: false
- ibm-auditUnbind: true



# Audit Record

- Header: LDAP connection information
  - Time stamp, version number, SSL flag, authentication flag, operation type, Bind DN, client IP address, connection ID, received time, transaction ID, and result
- LDAP control information
- Operation-specific information
  - **Bind**: Bind DN, authentication choice, authentication mechanism
  - **Search**: Base DN, scope, derefAliases flag, typesOnly flag, filter, attribute type list



## Audit Record contd..

- **Add:** Entry DN, attribute type list
- **Modify:** Object DN, operation:attribute type pair
- **Delete:** Entry DN
- **ModifyDN:** Entry DN, new rdn, deleteoldrdn flag, newSuperior



# Audit Entry Examples

```
AuditV3--2011-06-06-14:53:10.315+00:00--V3 unauthenticated
Bind--bindDN: cn=amit,o=ibm,c=in--client: 127.0.0.1:58788--
connectionID: 4--received: 2011-06-06-14:53:10.296+00:00--
Invalid credentials
controlType: 1.3.6.1.4.1.42.2.27.8.5.1
criticality: false
name: cn=amit,o=ibm,c=in
authenticationChoice: simple
```



# Audit Entry Examples

```
AuditV3--2011-03-11-00:04:15.191+01:00--V3 Add--bindDN:  
cn=repluser,cn=localhost--client: 10.192.198.184:63580--  
connectionID: 1--received: 2011-03-11-00:04:15.182+01:00--  
Success  
controlType: 2.16.840.1.113730.3.4.2  
criticality: true  
entry:uid=ERP001,ou=inet,dc=in  
attributes: inpdapUserType, uid, inpdapSSODisabledFlag,  
givenname, objectclass, inpdapPassDisp, sn, cn, ibm-  
entryuuid
```



# Configuring pre-op audit records

- Purpose is to audit operations before they complete
- How to enable it

```
idsldapmodify -D <adminDN> -w <adminPW>  
dn: cn=Front End, cn=configuration  
changetype: modify  
add: ibm-slapdSetEnv  
ibm-slapdSetEnv: IBMSLAPD_PREOP_AUDIT=YES
```

- Note:
  - The server must be restarted for the changes to take effect.
  - Pre-auditing must be used only for debugging purposes. It changes the format and breaks tools that parse the logs.

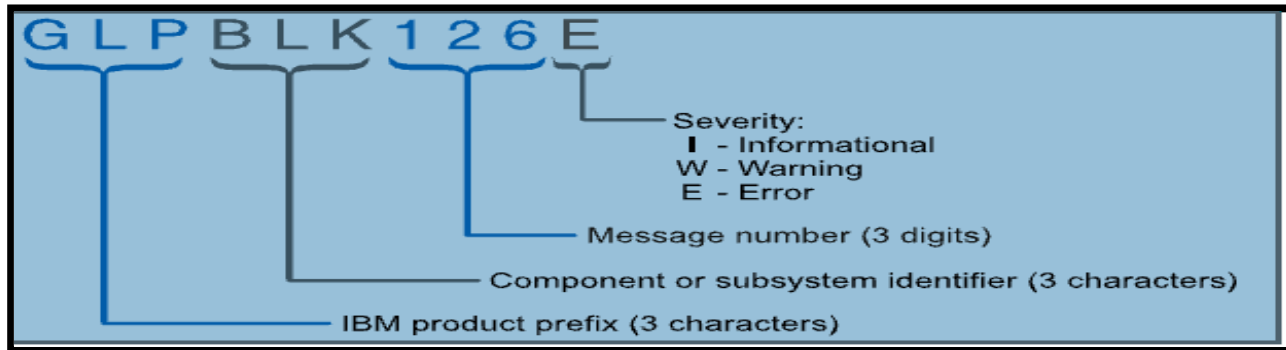


# ibmslapd.log

- One of the most important logs to check regularly even if you do not have any problems
- It logs informative messages, Warning logs and Errors
- A message ID in ibmslapd.log consists of 10 alphanumeric characters that uniquely identify the message.
- The message ID is composed of:
  - 3-character product identifier
  - 3-character component or subsystem identifier
  - 3-digit serial number
  - 1-character type code indicating the severity of the message



# Messages



Some valid message IDs are:

GLPCTL007W

GLPICR015I

GLPRDB002E

GLPSRV029E

GLPCCH001I

GLPSSL027E





# Component identifiers

Component identifier	Component
ADR	Active Directory synchronization runtime
BLK	<b>bulkload</b> utility
CAT	Catalog files
CCH	<b>idscfgchglg</b> utility
CDB	<b>idscfgdb</b> utility
CFG	<b>idsxcfg</b> and <b>idsxinst</b> utilities
COM	Common server libraries
CRY	Encryption seed and encryption salt
CSC	<b>idscfgsch</b> utility
CSF	<b>idscfgsuf</b> utility
CTL	Common configuration tools libraries
D2L	<b>db2ldif</b> utility
DBA	<b>idsdbmaint</b> utility
DBB	<b>dbback</b> utility
DBM	<b>idsdbmigr</b> utility
DBR	<b>dbrestore</b> utility



# More Problem Determination Tools

- Support tool.
  - **idssupport** program.
  - Gathers and packages logs and configuration information for IBM support.
  - The Support Tool then packages the information into a compressed file archive
  - Default location of saved logs is
    - `/var/idsldap/V6.0/idssupport/<timestamp>/` other than Windows
    - `<install_home>\var\idssupport\<timestamp>\idssupport.log` on Windows
  - Requires IBM Tivoli Directory Integrator and an IBM Tivoli Directory proxy server.



## More Problem Determination Tools contd..

### ➤ Server debug mode.

➤ Captures debugging information.

➤ Negatively impacts performance.

➤ Start the server instance at command line with appropriate debug mask (mask of 65535 turns on full debug output):

```
➤ idsslapd -I <instance_name> -h  
  <debug_mask>
```

### ➤ Generating core dumps.

➤ See Problem Determination Guide for information about how to enable core file generation for your operating system.



# Troubleshooting installation and uninstallation

- Make sure that you all prerequisite software installed
- To avoid failures while installing prerequisite softwares
  - If zip file has been downloaded then make sure that it is extracted a path that has no space in the name
  - If a tar file is being used then it has to be extracted into the same directory
  - The .iso file versions of the product are used to burn installation DVDs that can then be used in the installation process.



# Troubleshooting installation and uninstallation contd..

- If Installation still fails then check the installation logs which are stored in temporary location.

On Windows systems, the installation log file is usually stored in

```
C:\Documents and Settings\Administrator\Local  
Settings\Temp
```

On AIX, Linux, and Solaris systems, the installation log file is stored in the */tmp*



# Troubleshooting instance creation

- Common instance creation errors
  - Cannot create additional instance because of invalid IP address
  - On Windows 2003, instance creation might fail during the instance owner creation stage if the user password does not meet the operating system password requirements
  - On a 32-bit Windows 2008 operating system, which is installed on a 64-bit hardware, the Administration server might fail to start after the creation of a Tivoli Directory Proxy Server instance



# Troubleshoot instance Configuration

- Common errors
  - Interrupting Configuration Tool database tasks causes an incorrect status for the files
  - Failure when configuring an existing database instance and database
  - Error when starting the Configuration Tool on AIX
  - DB2 does not configure properly
  - Server does not start after making changes to configuration file attributes
  - Transaction log is full



# Troubleshooting DB2

## ➤ Common Errors

### ➤ DB2 license file expired

### ➤ Installing DB2 9.5 on Red Hat Enterprise Linux (RHEL) 5 64-bit or SuSE Linux Enterprise Server (SLES) 10 operating system for Intel Linux or zLinux

```
error while loading shared libraries: libstdc++.so.5
```

### ➤ An SQL0964C error, (transaction log full)

### ➤ A Tivoli Directory Server instance might start in config-only mode after applying DB2 fix pack





# Troubleshoot Replication

- Always check the replication status with `idsldapsearch`

```
idsldapsearch -h Node1_hostname -p <port #> -D  
cn=root -w password -s sub -b " " objectclass=* +  
+ibmrepl
```

- Check if server id's are correct in conf file and agreement

- If replicating large data that may take more that 60 seconds to replicate then set 'IBMSLAPD\_REPL\_UPDATE\_EXTRA\_SECS' to a value between 1 and 2147483647

- Eg.

```
idsldapmodify -p <port> -D <adminDN> -w <adminPW>  
dn: cn=Front End, cn=Configuration  
changetype: modify  
add: ibm-slapdSetenv  
ibm-slapdSetenv: IBMSLAPD_REPL_UPDATE_EXTRA_SECS=180
```



## Troubleshoot Replication contd..

- If replication context is not set then you may receive errors like these

```
08/13/04 15:32:34 For the replica group entry
ibm-replicaGroup=default,o=sample, the parent entry
must be an ibm-replicationContext entry.
```

```
08/13/04 15:32:34 Parent entry does not exist for entry
cn=urchin,ibm-replicaGroup=default,o=sample.
```

```
08/13/04 15:32:34 Entry cn=replication,cn=localhost already
exists.
```

```
08/13/04 15:32:35 Parent entry does not exist for entry
```



# Troubleshoot Replication contd..

- Peer to peer replication returns error "No such object occurred for replica"
  - One common cause of this error is that peer-to-peer replication, by design, does not allow for conflict resolution. To correct the error, export the missing entry from supplier and add it to consumer
- Replication topology extended operation returns result code 80
  - Check following
    - Replication context has objectclass `ibm-replicationContext`
    - Make sure each supplier has the proper credential object to bind with its consumers



## Troubleshoot Replication contd..

- One of the consumer servers is down or not reachable at that instance.
- The replication context is a non-suffix entry and the consumer does not have the parent entry of the context



## Troubleshoot Replication contd..

- Master server can become unstable or stop when serving to large number of replica servers
- To resolve this, you can set the Ulimits DN entry in the configuration file to the following:

```
dn: cn=Ulimits, cn=Configuration
cn: Ulimits
ibm-slapdUlimitDataSegment: -1
ibm-slapdUlimitDescription: Prescribed minimum
ulimit option values
ibm-slapdUlimitFileSize: 2097151
ibm-slapdUlimitNofile: 500
ibm-slapdUlimitRSS: -1
ibm-slapdUlimitStackSize: -1
ibm-slapdUlimitVirtualMemory: -1
objectclass: top
objectclass: ibm-slapdConfigUlimit
objectclass: ibm-slapdConfigEntry
```



# Troubleshoot Replication contd..

➤ And then configure the system ulimit values to:

```
core file size (blocks, -c) unlimited
data seg size (kbytes, -d) unlimited
file size (blocks, -f) unlimited
max memory size (kbytes, -m) unlimited
open files (-n) 30000
pipe size (512 bytes, -p) 64
stack size (kbytes, -s) unlimited
cpu time (seconds, -t) unlimited
max user processes (-u) 262144
virtual memory (kbytes, -v) unlimited
```



# Replication Good Practice

- Never stop multithreaded supplier abruptly before verifying that there no updates sent to consumers, you can suspend the agreement before stopping or restarting the supplier
- If you think that servers are out of sync then resync the servers with standard procedure as mentioned in previous STE in this series or you can also refer to this link

[http://www-01.ibm.com/support/docview.wss?  
uid=swg21396012](http://www-01.ibm.com/support/docview.wss?uid=swg21396012)

- Always make sure that all the write requests are going to only one master



# Different Types of Troubleshooting scenarios

- Server does not start or starts in config mode
  - Check logs for error, collect startup trace

Eg.

```
ibmslapd -h 65535 -p <port> -D <Bind DN>  
-w <password> -I <Instance name>
```

- Verify that you can connect to the database

Eg.

```
su - db2owner  
db2 connect to neil62
```





# Different Types of Troubleshooting scenarios contd..

## ➤ SSL communications returning errors

```
ldapsearch -Z -K <keyfile> -P <keyfilepw> -b suffix  
objectclass=*
```

Where

**keyfile** is the name of the SSL database file

**keyfilepw** is the SSL key database password

**suffix** is the suffix being searched; for example, -b o=sample



## Troubleshooting scenarios contd..

- Online backup and restore limitation
  - Restoration procedure will throw errors like as mentioned below when folder name (backup location) is changed to which online backup was initially configured

```
GLPCTL103E Failed to restore backup database  
rdsdb to configured database rdsdb.
```

```
GLPDBR004E Failed to restore directory  
server instance 'tdsadmin'.
```



## Troubleshooting scenarios contd..

- Verify the LOGARCHMETH1 variable for the corresponding database's configuration.

```
su - <instance_name>  
db2 list db directory  
db2 get db configuration for <databasename> |  
grep -i LOGARCHMETH1
```

- Note: Replace the <instance\_name> and <databasename> with the appropriate names.



# Gathering Problem Specific Information

➤ Please refer to the link for details

<https://www-304.ibm.com/support/docview.wss?uid=swg21268035>

We will discuss few topics here (AIX)

- Collect different types of traces
- Collect thread dumps/core dumps



# How to collect traces (AIX)

- Issue the follow commands to collect client traces :

```
export LDAP_DEBUG=<debug level>
export LDAP_DEBUG_FILE=/tmp/client_trace.out
```

Where debug level could be as follows..

Decimal	Value	Description
Debug levels		
1	LDAP_DEBUG_TRACE	Entry and exit from routines
2	LDAP_DEBUG_PACKETS	Packet activity
4	LDAP_DEBUG_ARGS	Data arguments from requests
8	LDAP_DEBUG_CONNS	Connection activity
16	LDAP_DEBUG_BER	Encoding and decoding of data
32	LDAP_DEBUG_FILTER	Search filters
64	LDAP_DEBUG_MESSAGE	Messaging subsystem activities and events
128	LDAP_DEBUG_ACL	Access Control List activities
256	LDAP_DEBUG_STATS	Operational statistics
512	LDAP_DEBUG_THREAD	Threading statistics
1024	LDAP_DEBUG_REPL	Replication statistics
2048	LDAP_DEBUG_PARSE	Parsing activities
4096	LDAP_DEBUG_PERFORMANCE	Relational backend performance statistics
8192	LDAP_DEBUG_RDBM	Relational backend activities (RDBM)
16384	LDAP_DEBUG_REFERRAL	Referral activities
32768	LDAP_DEBUG_ERROR	Error conditions
65535	LDAP_DEBUG_ANY	All levels of debug



# Collect GSKit trace

## ➤ On Unix issue:

```
export GSK_TRACE_FILE=filespec  
export GSKTRACE_NOBUFFERING=YES
```

## ➤ Recreate the problem

## ➤ Disable tracing

```
unset GSK_TRACE_FILE  
unset GSKTRACE_NOBUFFERING
```

## ➤ Provide the files



## Collecting an ascii server trace on startup.

- Stop the ITDS server, if running:
- Determine whether or not tracing is currently enabled  
`ldtrc info`
- Enable tracing if it is currently disabled.  
`ldtrc on`
- Start LDAP server in DEBUG mode and redirect output to a file  
`ibmslapd -I <instance name> -n -h 65535 2>&1  
| tee /tmp/slapd_trace.out`
- Recreate the Problem
- Disable Tracing:  
`ldtrc off`



# Collecting concurrent dynamic binary and ascii server traces on ITDS.

## ➤ Enable dynamic binary tracing

```
ldtrc on -t -l 5000000
```

## ➤ Enable dynamic ascii tracing

```
idsldaptrace -p <port> -a <admin port> -h  
<hostname> -D <adminDN> -w <adminpw> -l on  
-t start -m 65535 -o <output file>
```

## ➤ Recreate the Problem





# Collecting concurrent dynamic binary and ascii server traces on ITDS. Contd..

## ➤ Collect the trace records

```
ldtrc dump trace.raw
```

## ➤ Stop the Trace

```
idsldaptrace -p <port> -a <admin port>  
-h <hostname> -D <adminDN> -w  
<adminpw> -t stop
```

## ➤ Copy the trace.raw file into the <ITDS install home>/etc directory and cd to that directory



# Collecting concurrent dynamic binary and ascii server traces on ITDS contd...

## ➤ Execute commands

```
ldtrc fmt trace.raw trace.fmt
```

```
ldtrc flw trace.raw trace.flw
```

## ➤ Disable Tracing

```
idsldaptrace -p <port> -a <admin port>  
-h <hostname> -D <adminDN> -w  
<adminpw> -l off
```



# Collect thread dump in hang/core condition

## ➤ Requirement

- AIX with the bos.adt.debug (dbx) installed

```
ulimit -c unlimited
```

- The dumpthreads.sh script should be copied to the system and must have execute permission

## ➤ To get a thread dump from a hung server

- Find the process ID (PID) of the ibmslapd server

```
ps -ef | grep slapd
```

- Collect the thread dump

```
dumpthreads.sh PID > /tmp/threaddump.out
```



# Collect thread dump in hang/core condition Contd..

➤ To get a thread dump from a core file

```
dumpthreads.sh PROGRAM CORE >  
/tmp/threaddump.out
```

where PROGRAM is the fully qualified path to the ibmslapd executable or the executable which generated the core, and CORE is the generated core file.



Thank  
You

