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

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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
- 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 Techical Exchange (STE) Website:
  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
- 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

Part 4: Replication

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/uninst_ITDS6.3_Windows.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/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/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/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/Offlinebackup_using_WebAdministrationTool.avi
  - ftp://ftp.software.ibm.com/software/tivoli_support/misc/STE/OnlineBackup_with_idsxinst.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

Tivoli Directory Proxy Server

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 -I <*instance_name*>
2. Issue the command:
   - ddsetup –I proxy_inst -B “o=testdata” -I mydata.ldif

     - proxy_inst – The proxy instance

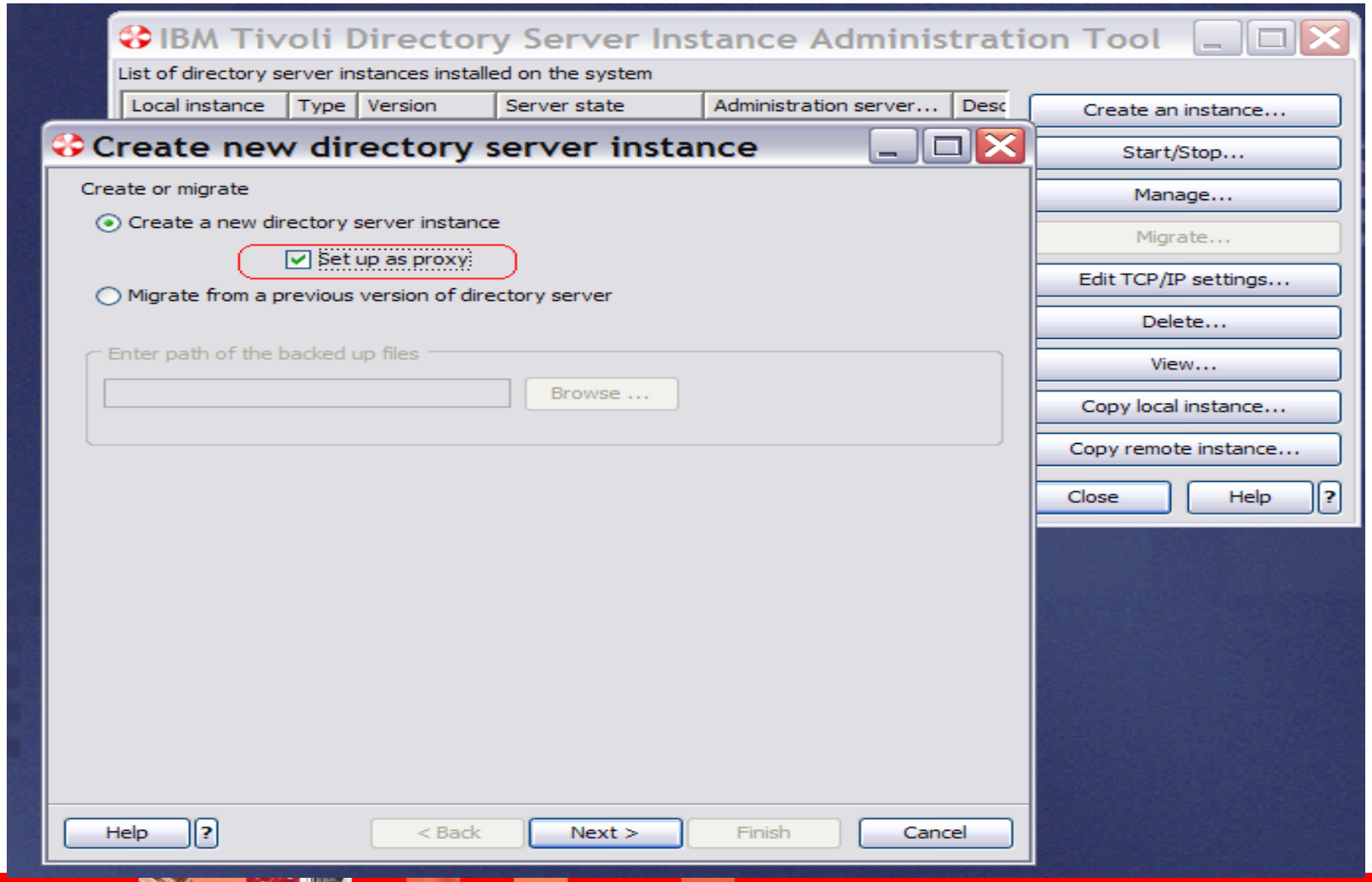
Important terms associated with proxy server

- **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.

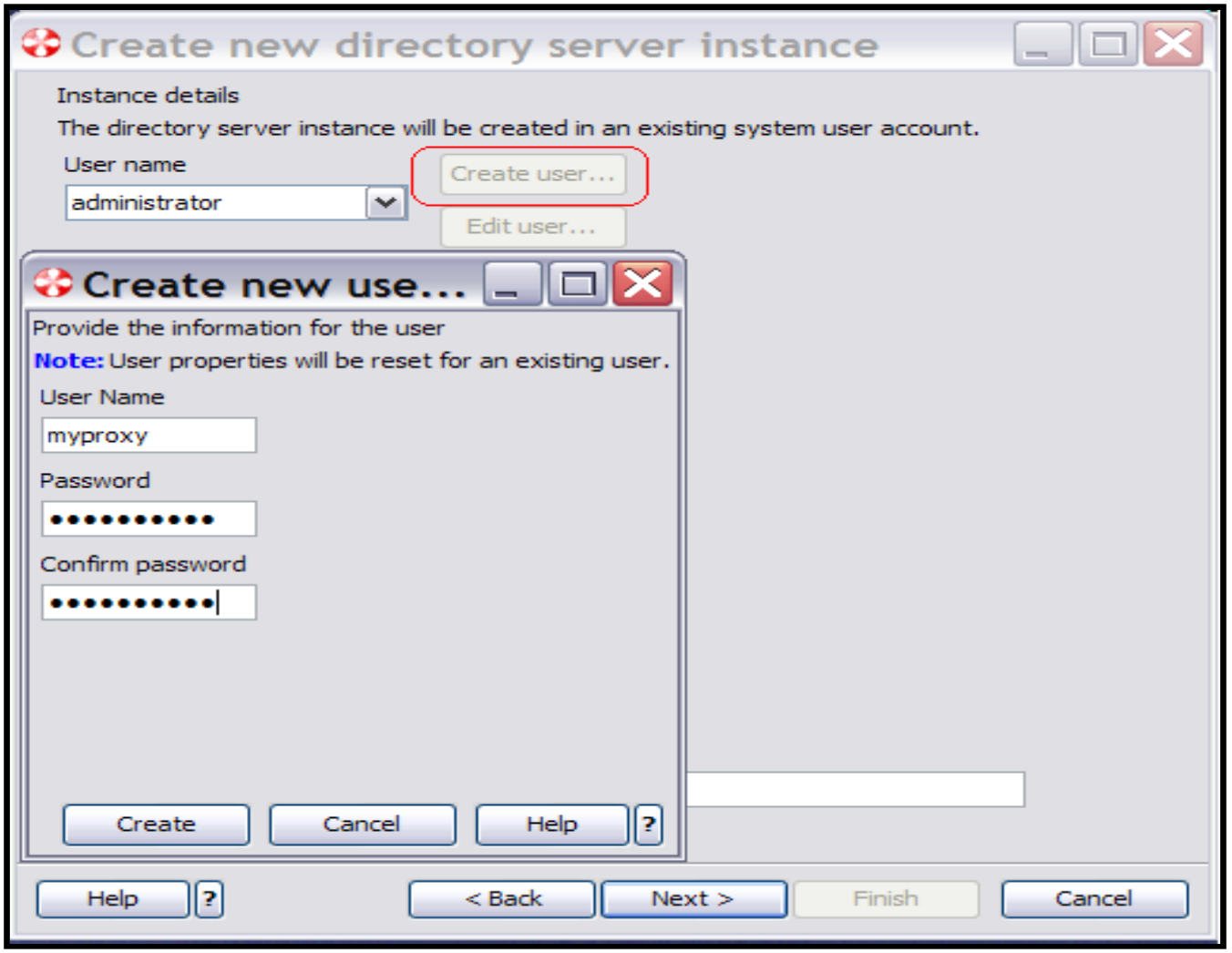
Important terms associated with proxy server

- **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.

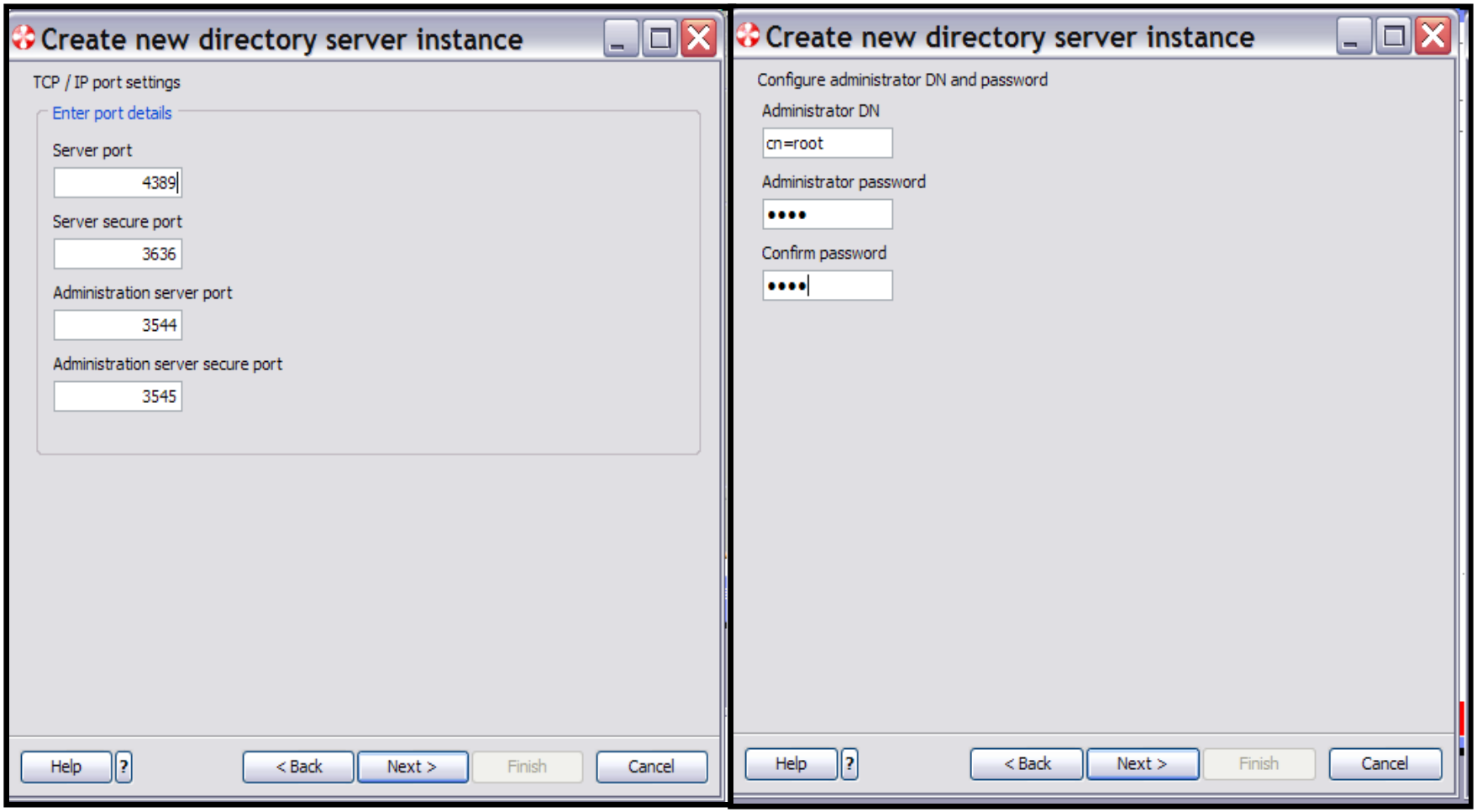
Proxy server configuration – Web Admin Tool Method



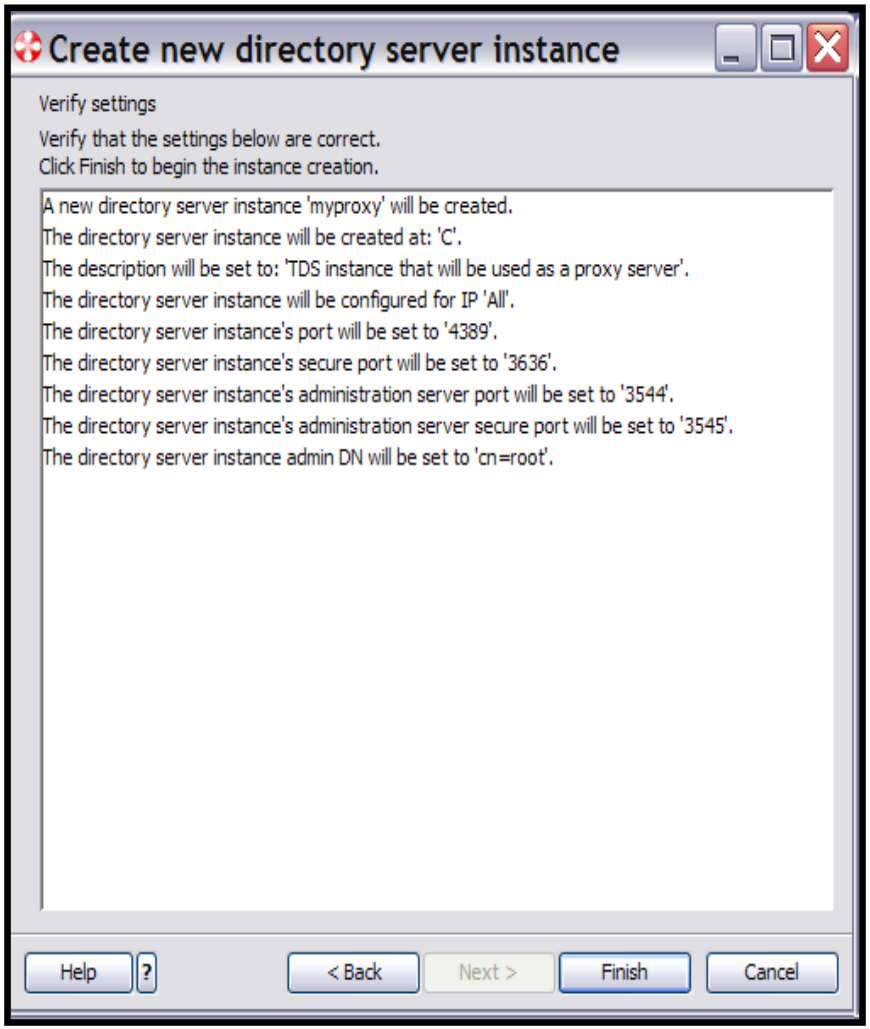
Create user for the proxy instance

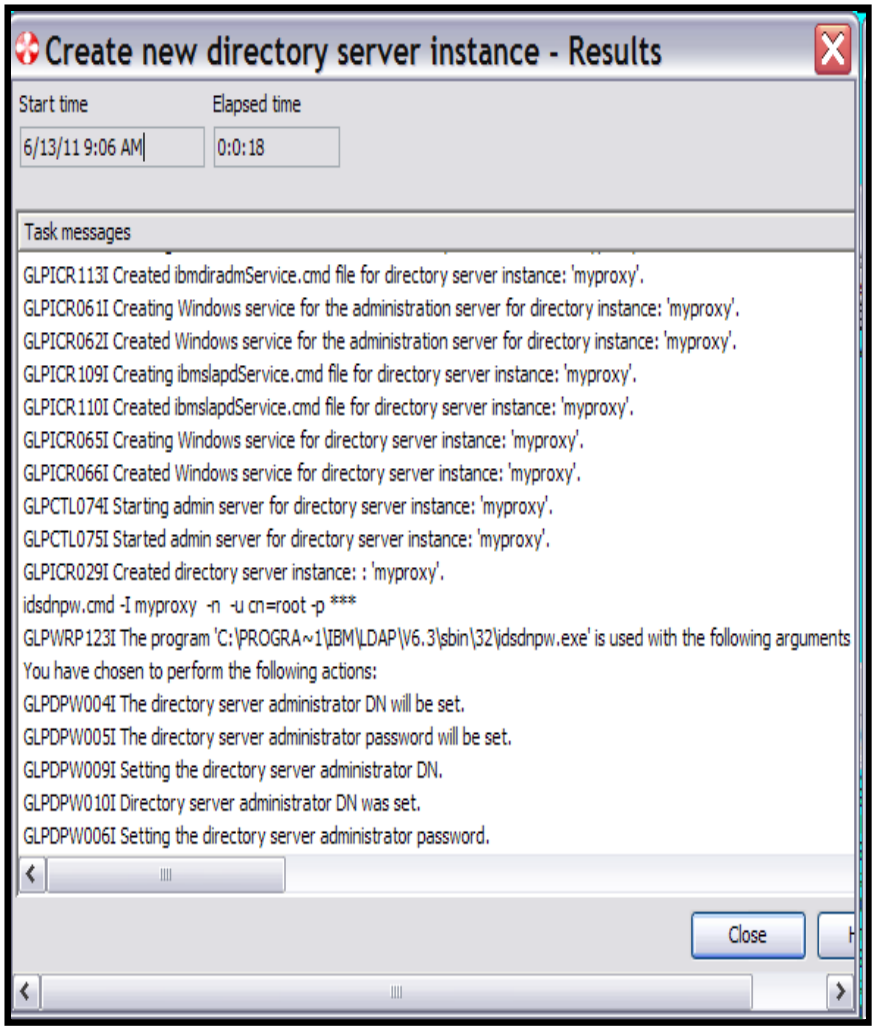


Instance creation contd..



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 fi
le.
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

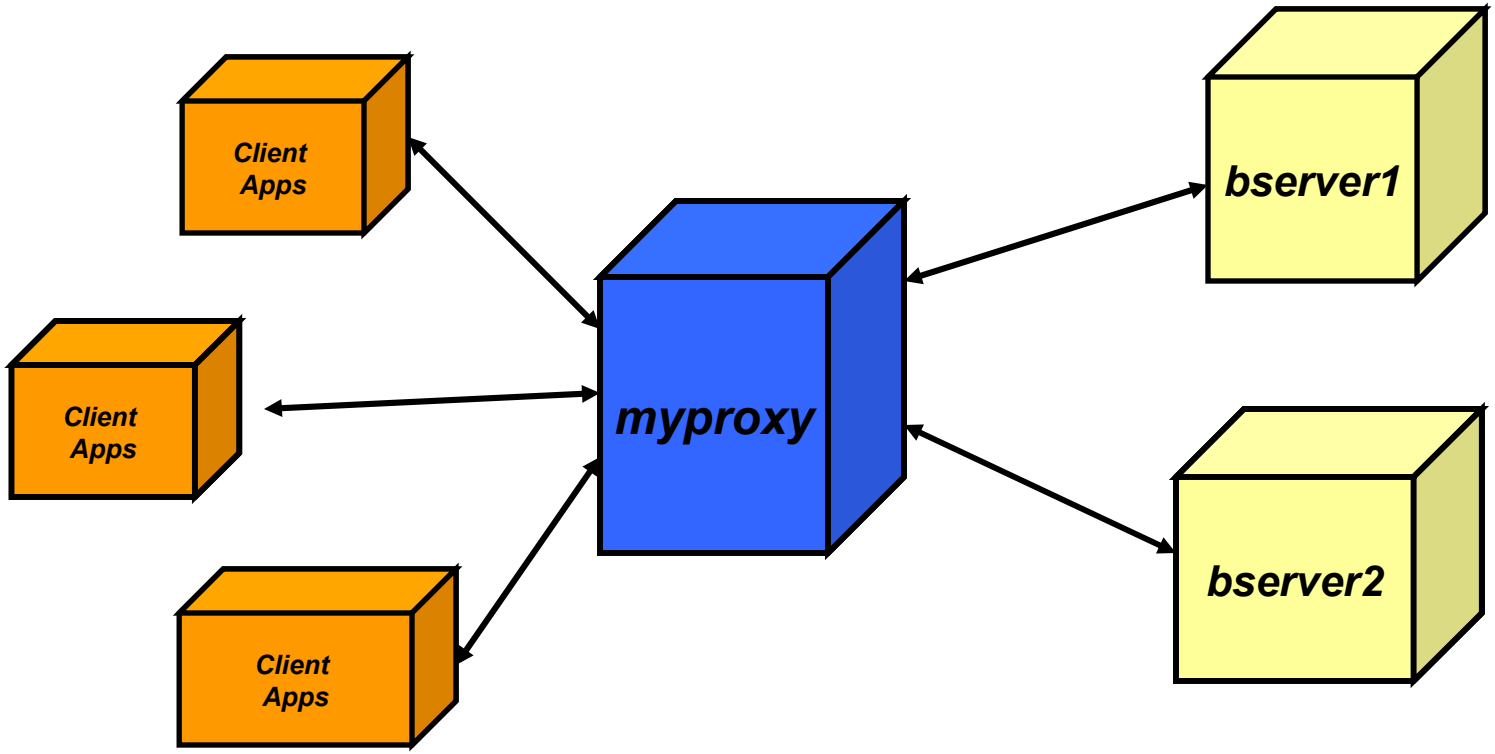
- idsilist –a

```
----------------------------------------
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



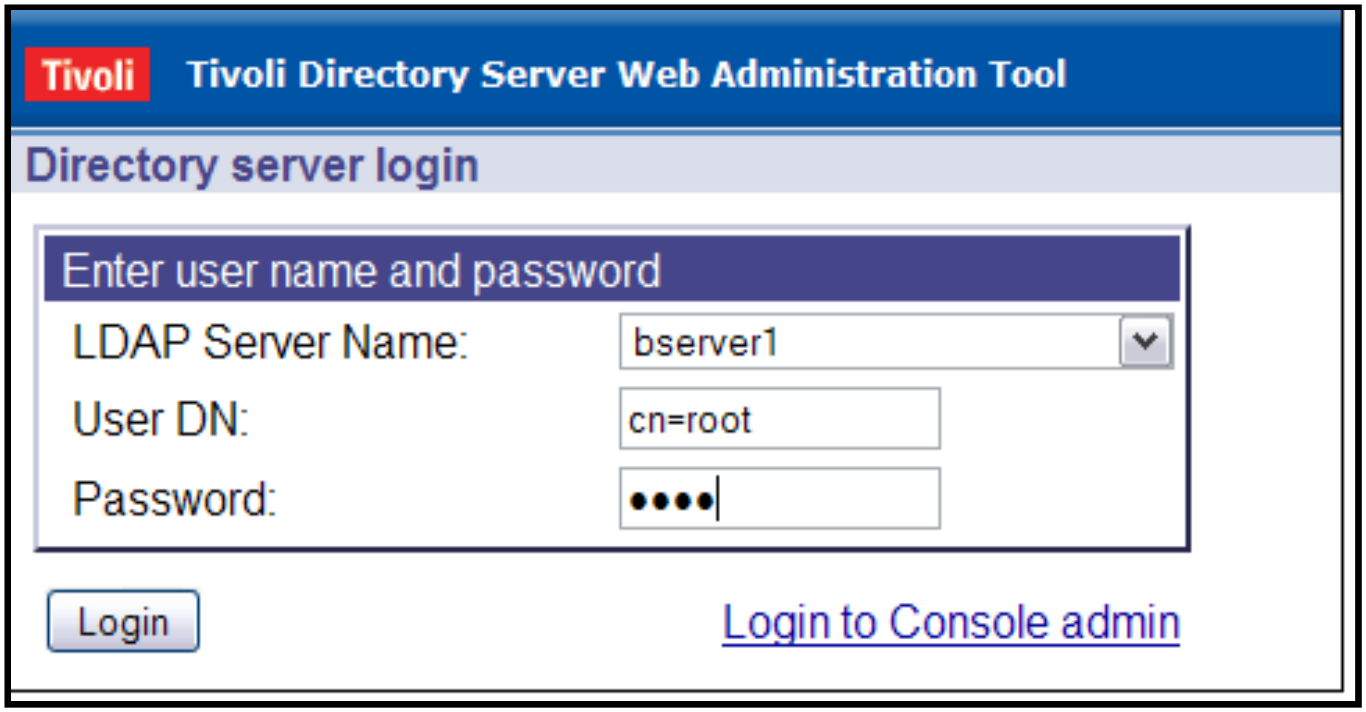
Tivoli Directory Proxy Server Configuration using web administration tool

Setting up the backend servers

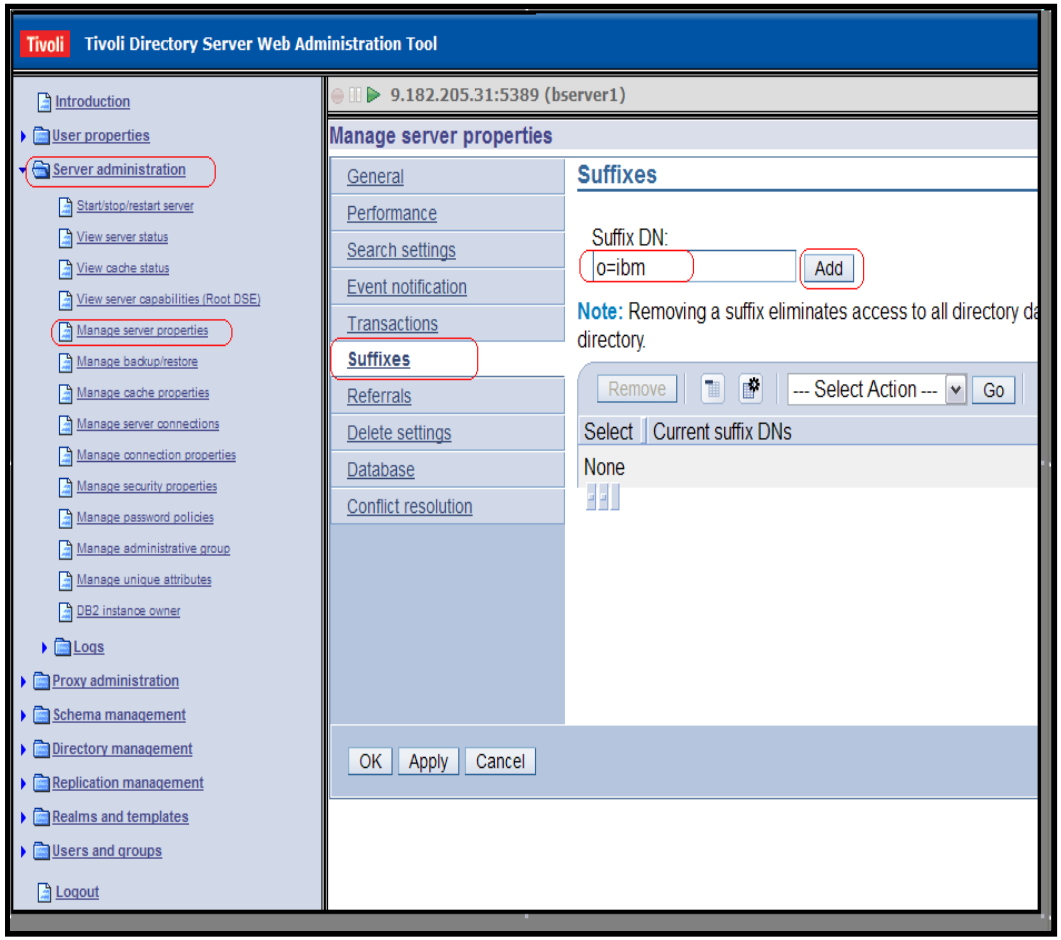
```
Instance 5:

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..

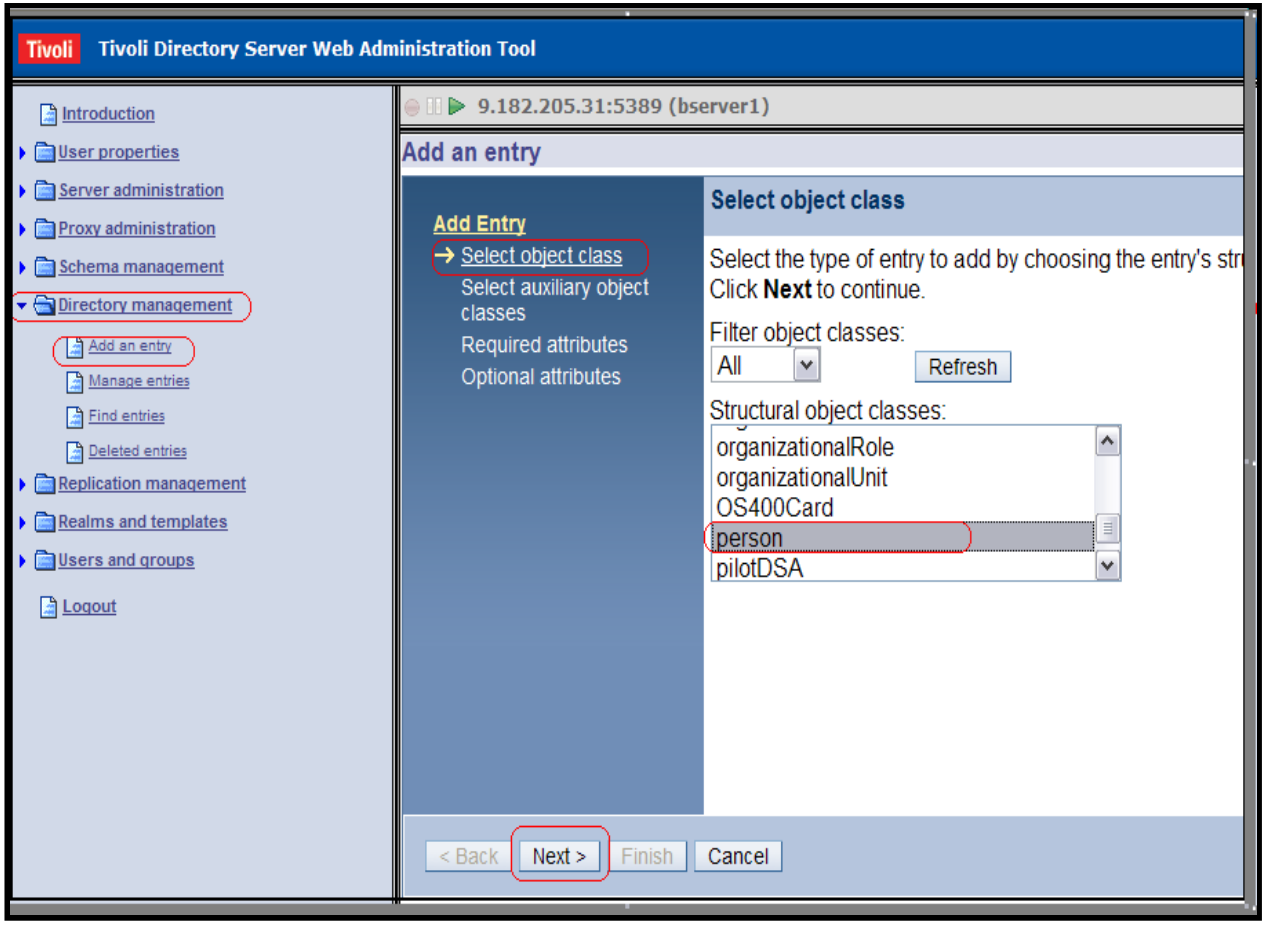
- Login to the admin server and create a suffix for it



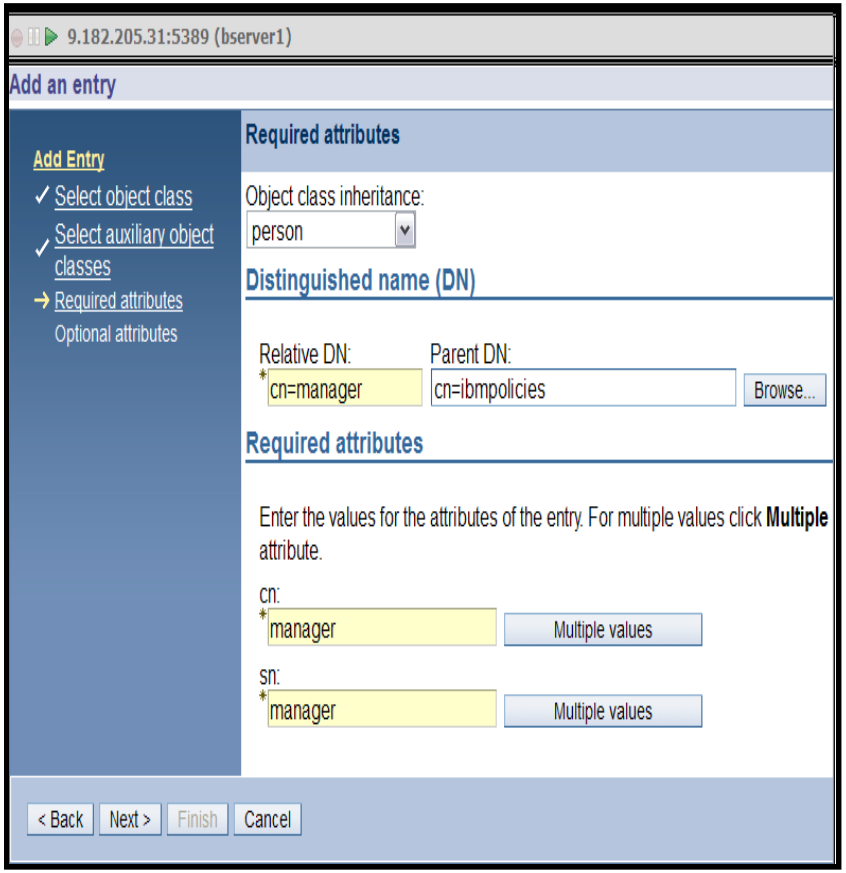
Proxy configuration contd..



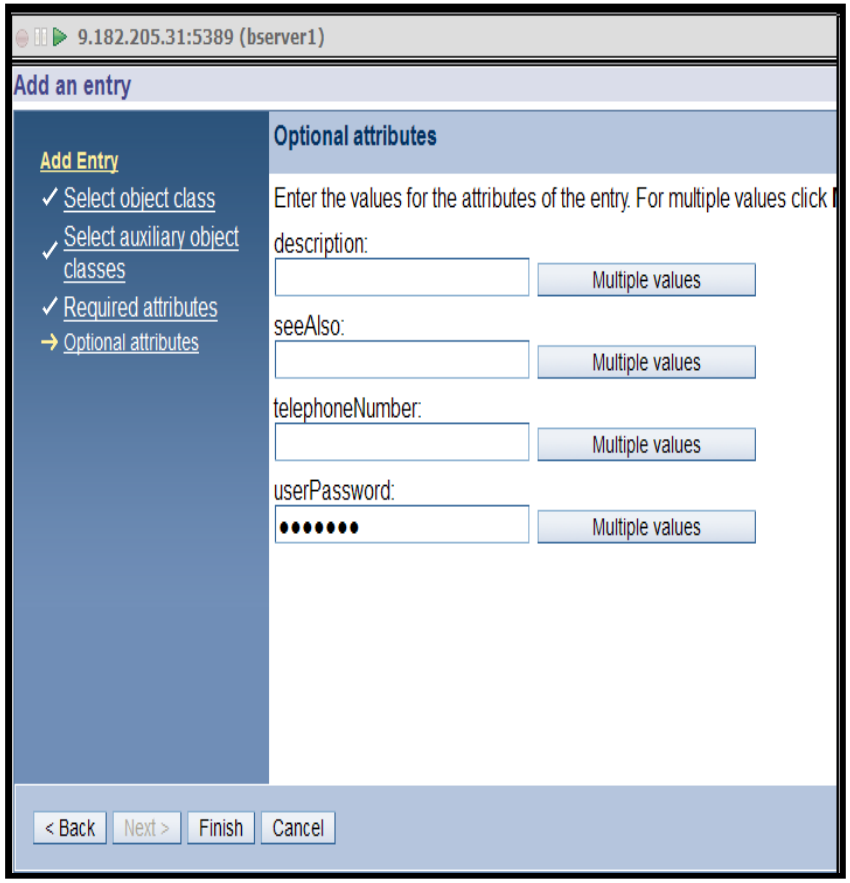
Proxy configuration contd..



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



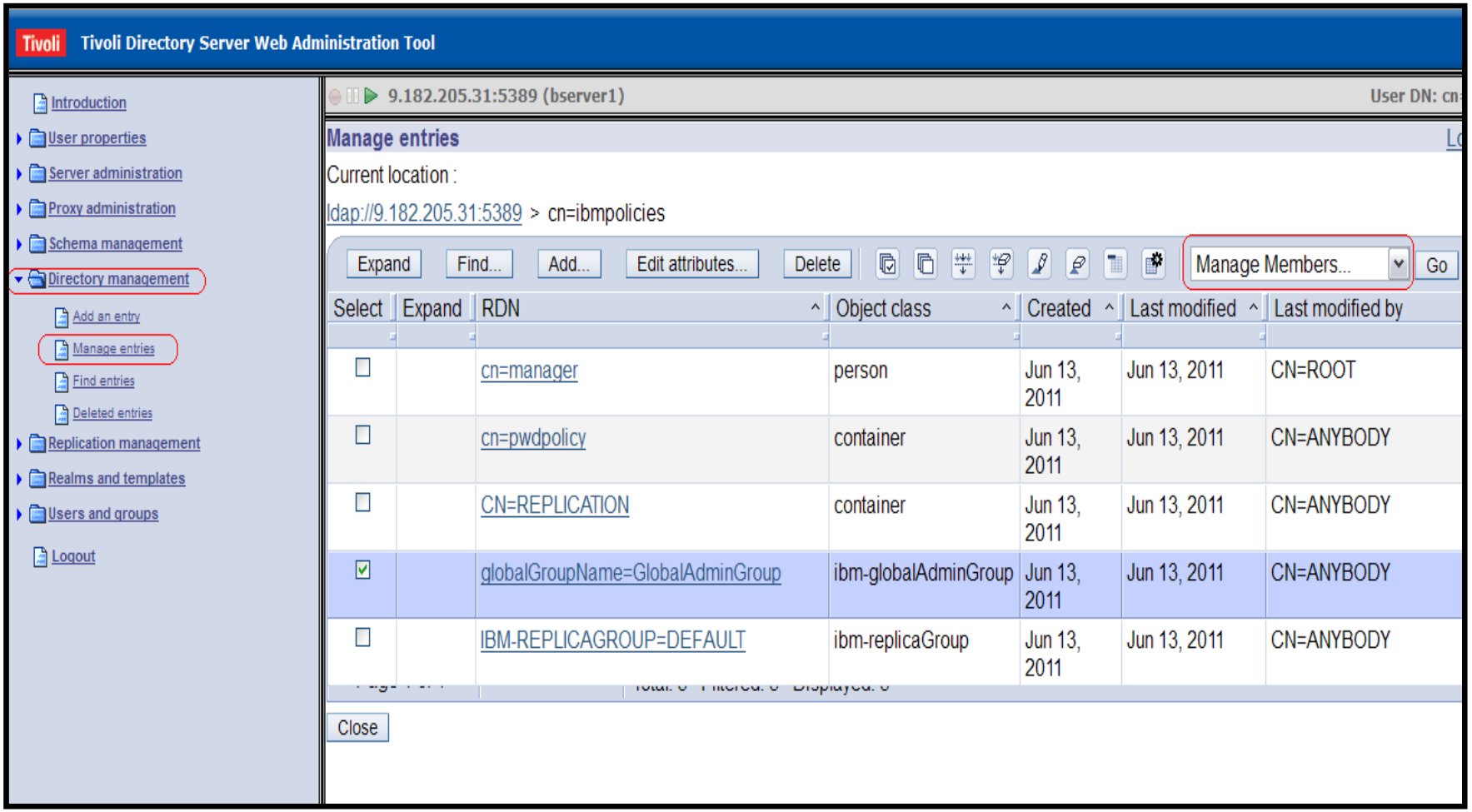
Add an entry to the BE Server and make it member of the GlobalAdmin group



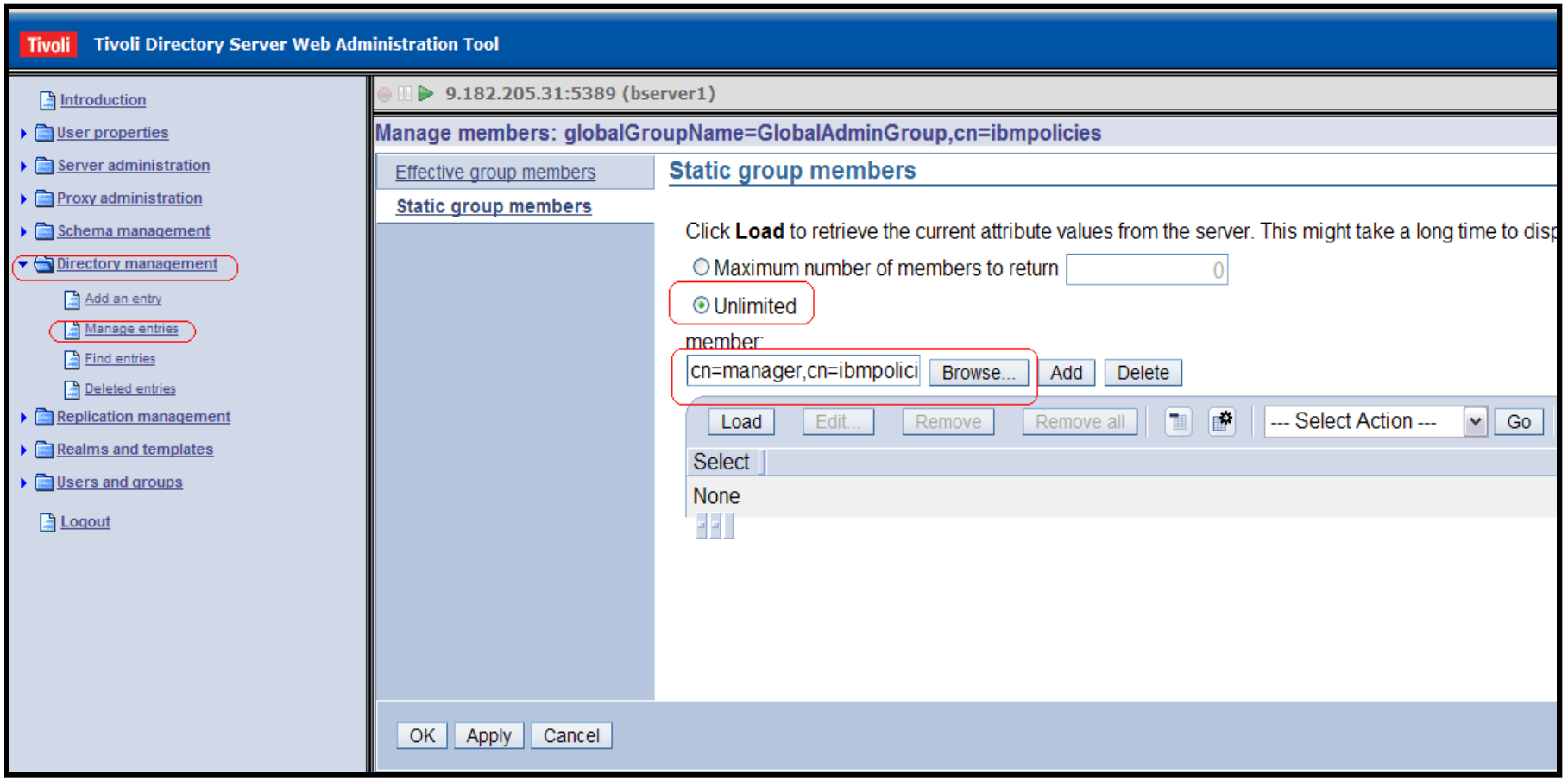
Add an entry to the BE Server and make it member of the GlobalAdmin group

- 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

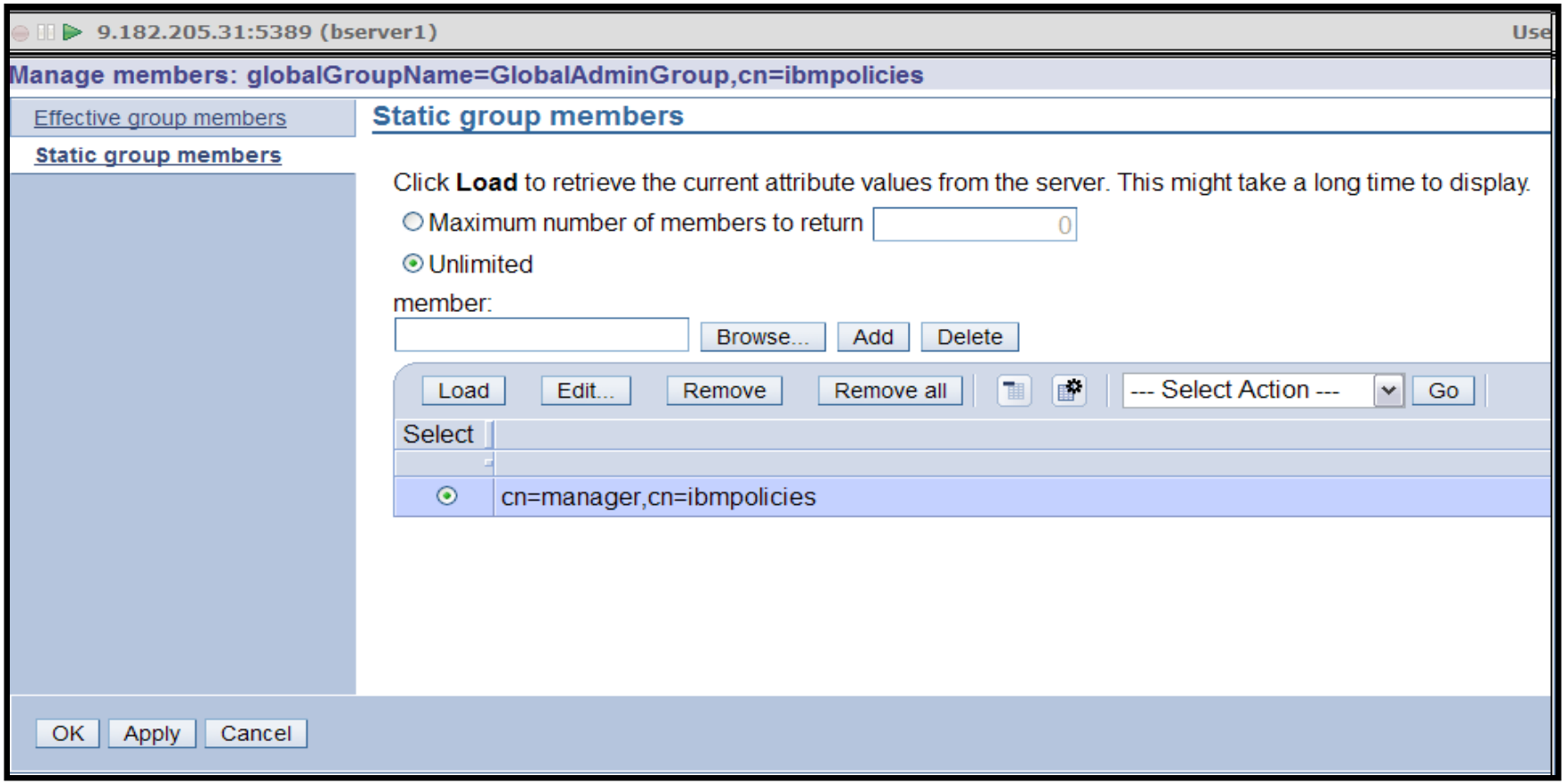
Add an entry to the BE Server and make it member of the GlobalAdmin group



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

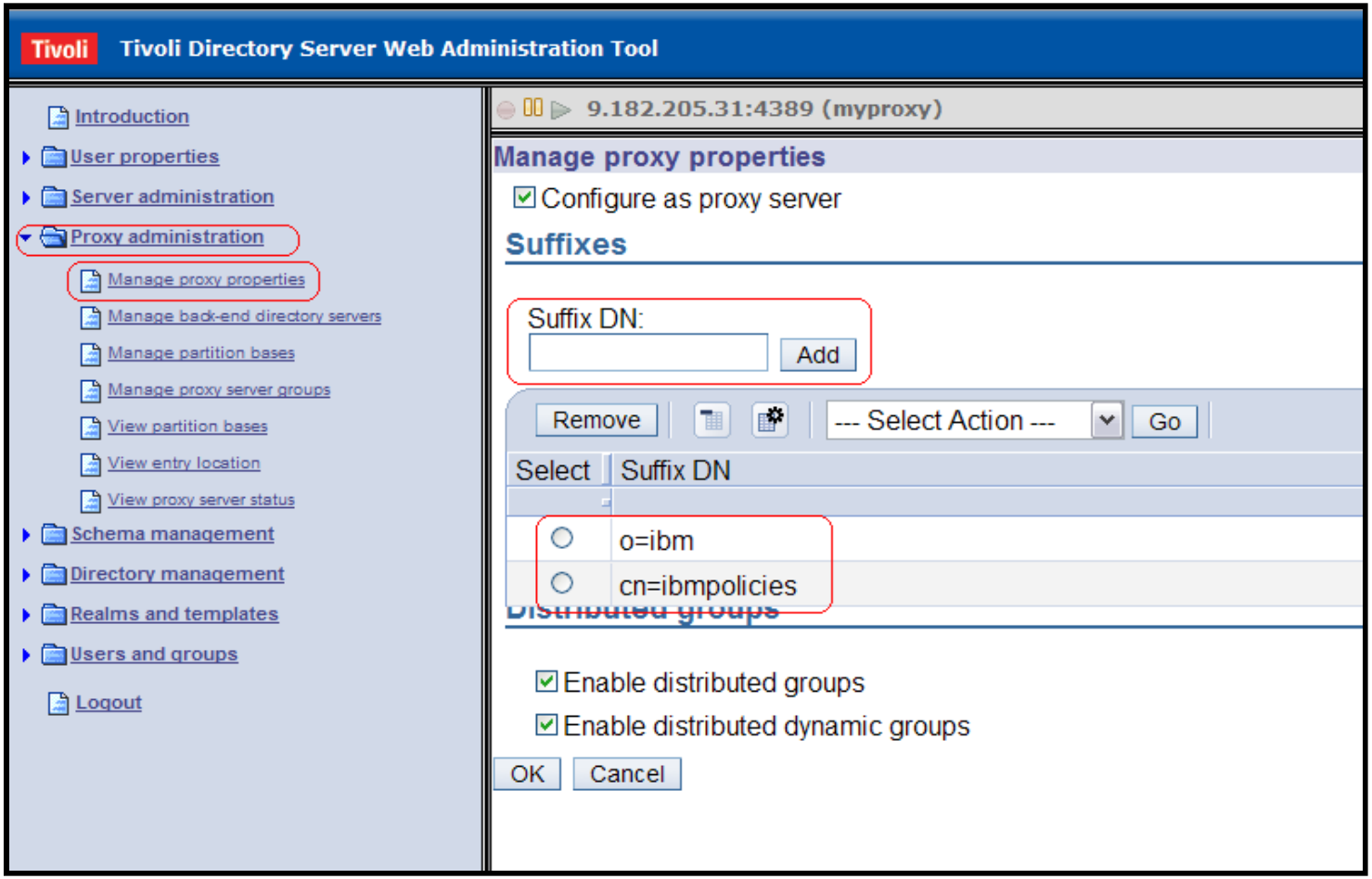


Add an entry to the BE Server and make it member of the GlobalAdmin group

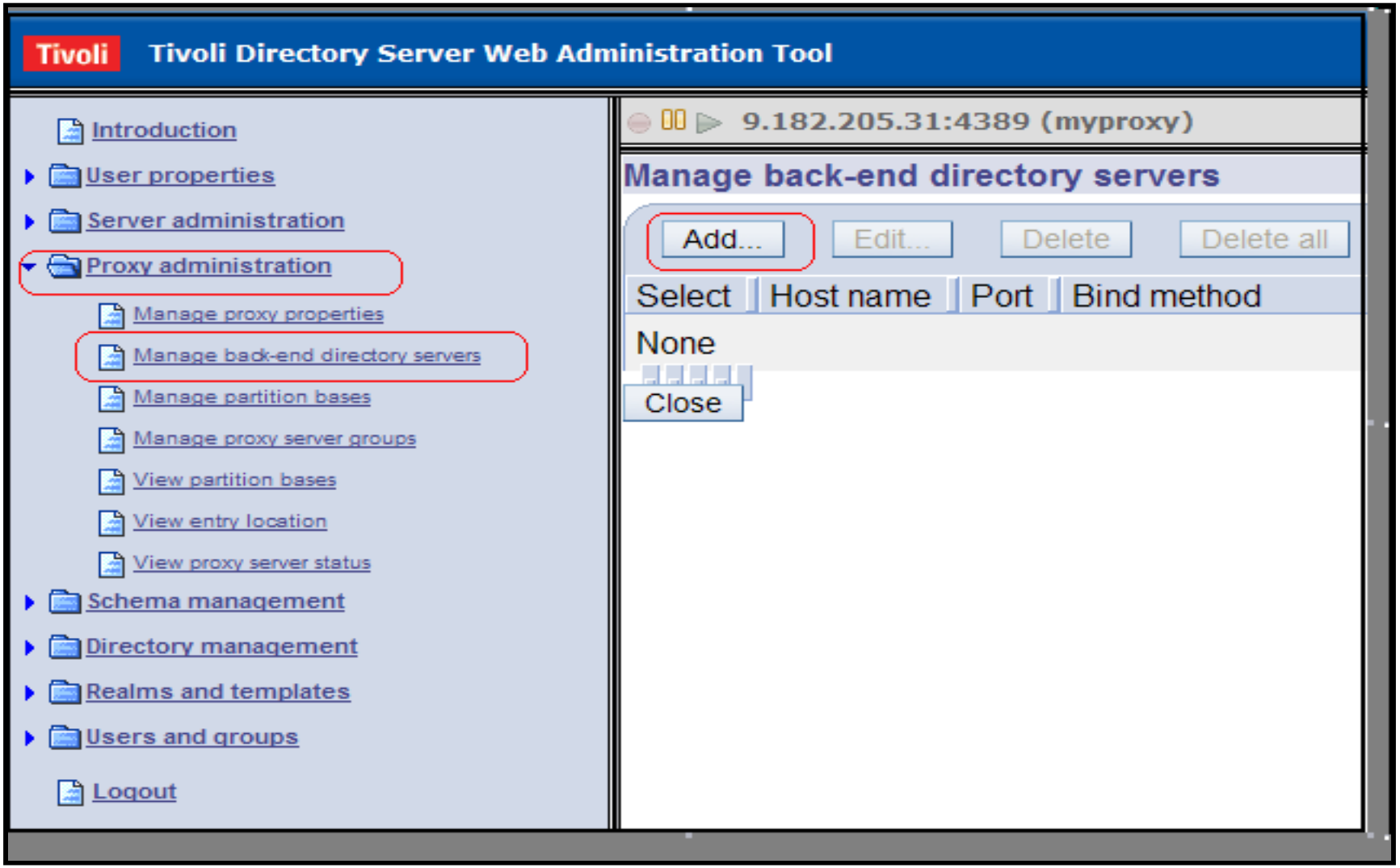


Adding the backend servers to proxy server

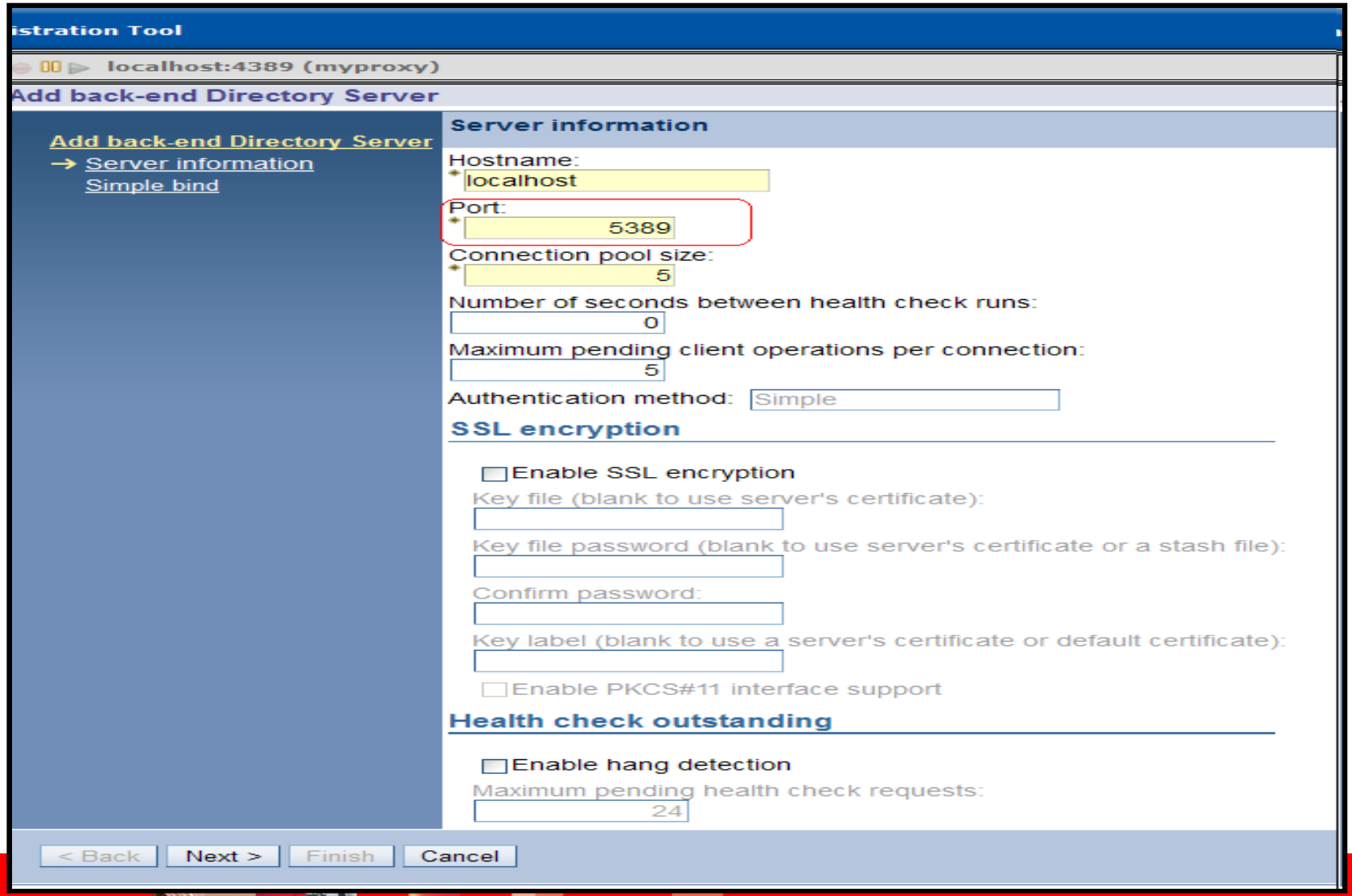
- Login to the proxy server and add the suffix o=ibm



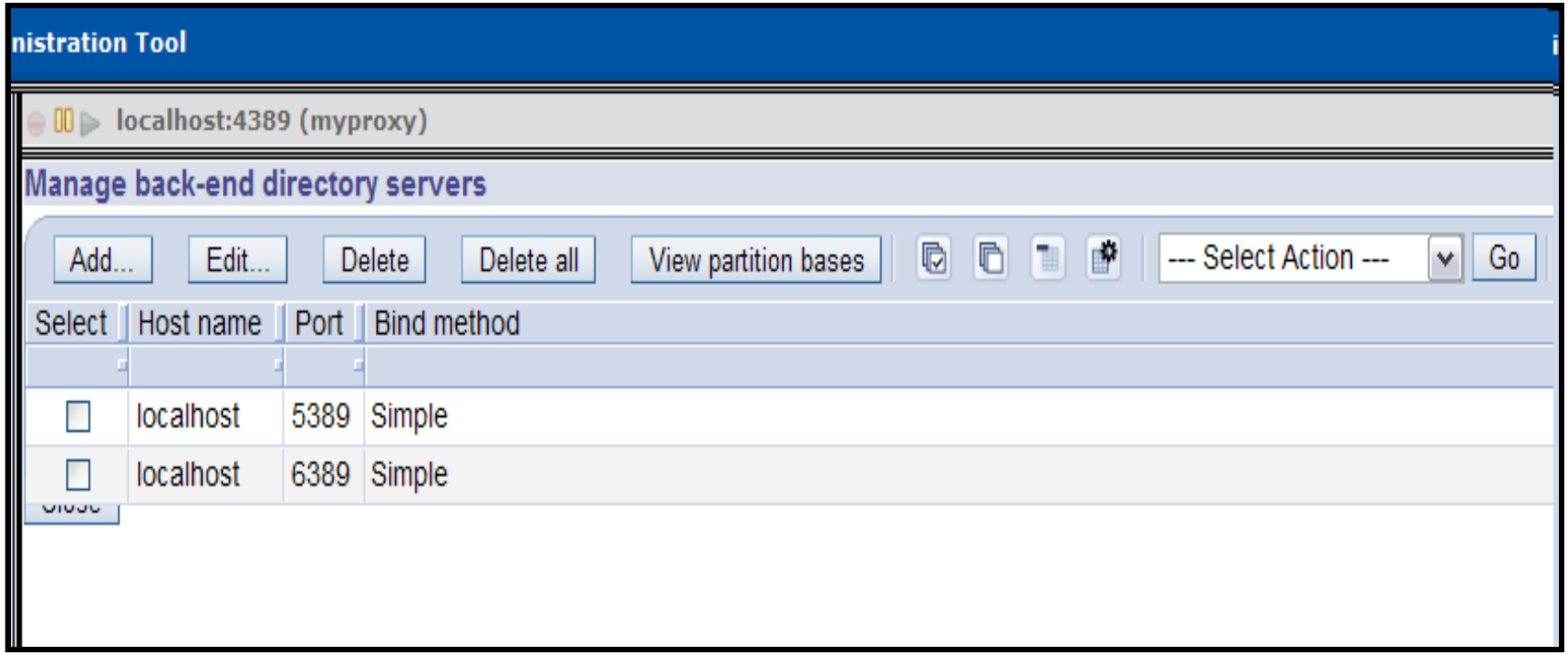
Adding the backend servers to proxy server



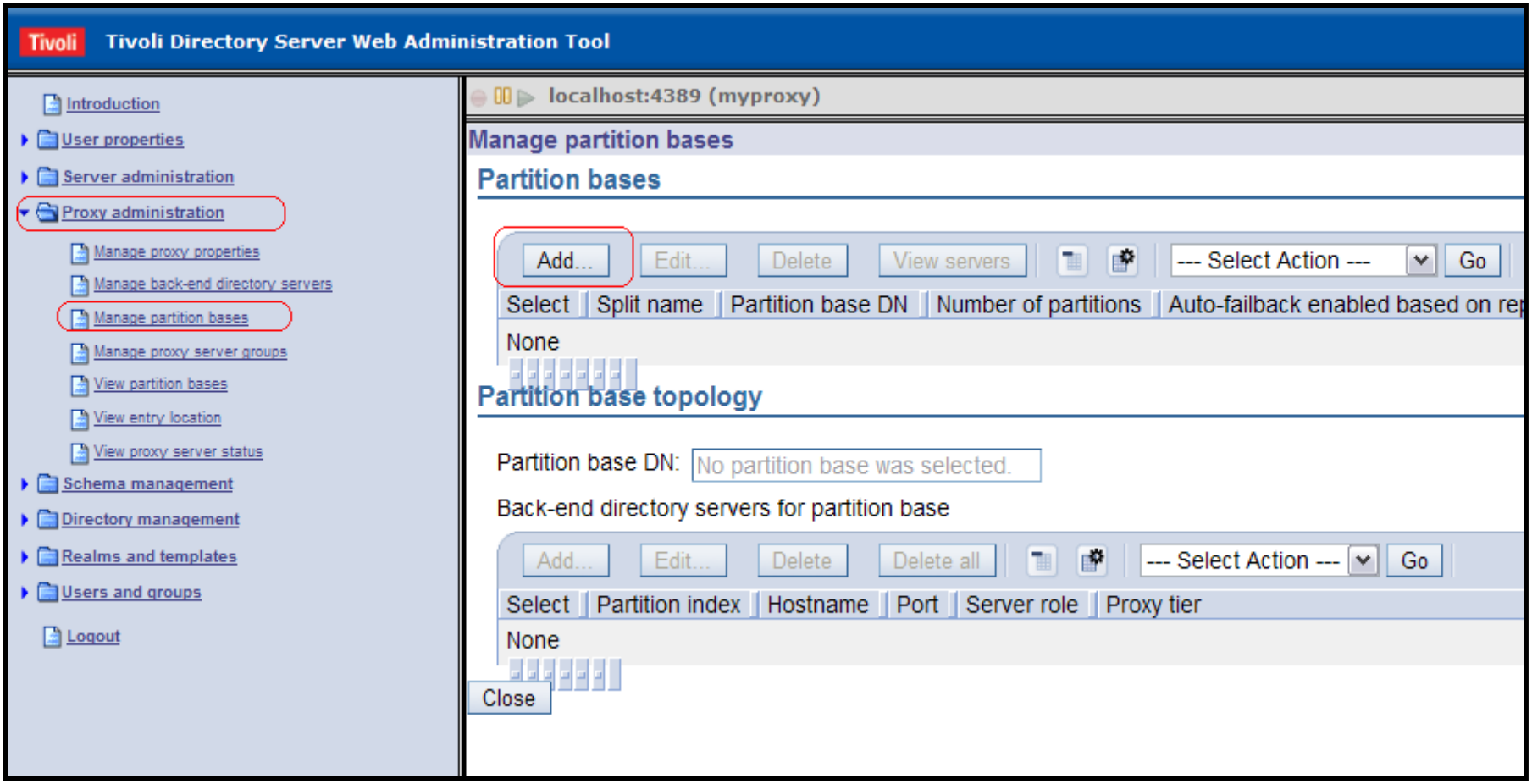
Adding the backend servers to proxy server



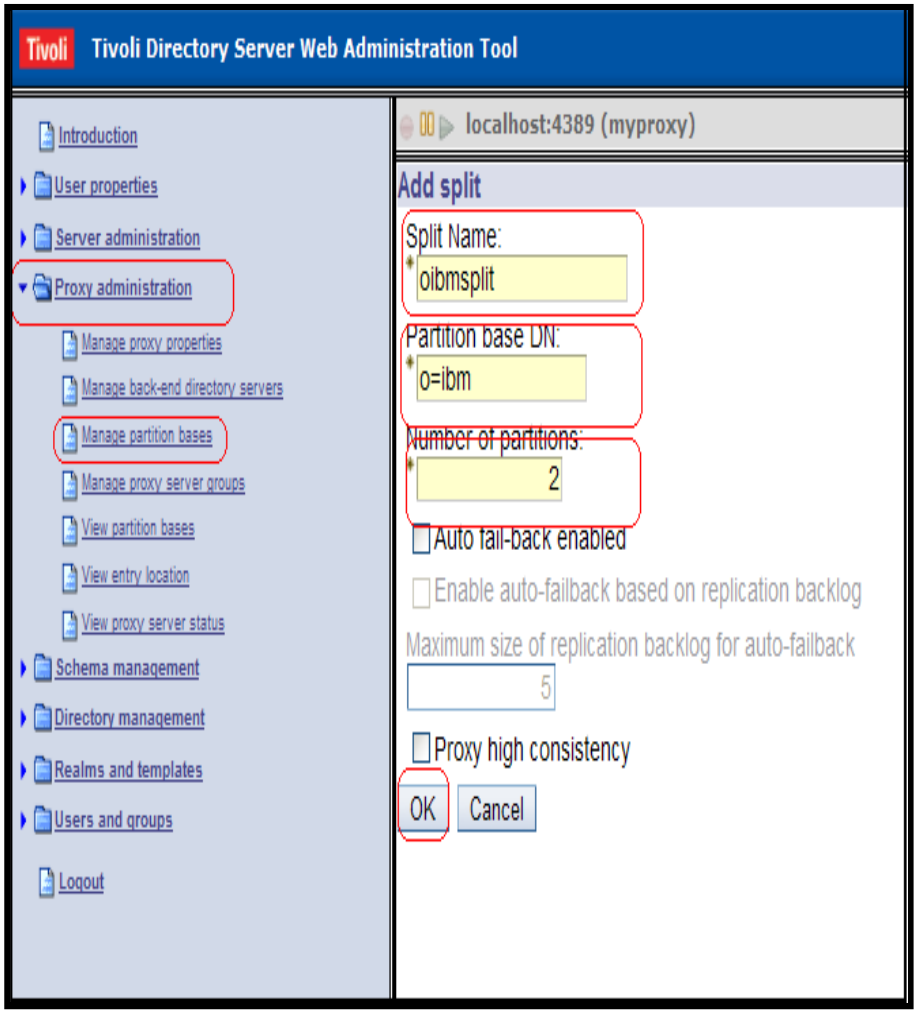
Added the backend servers



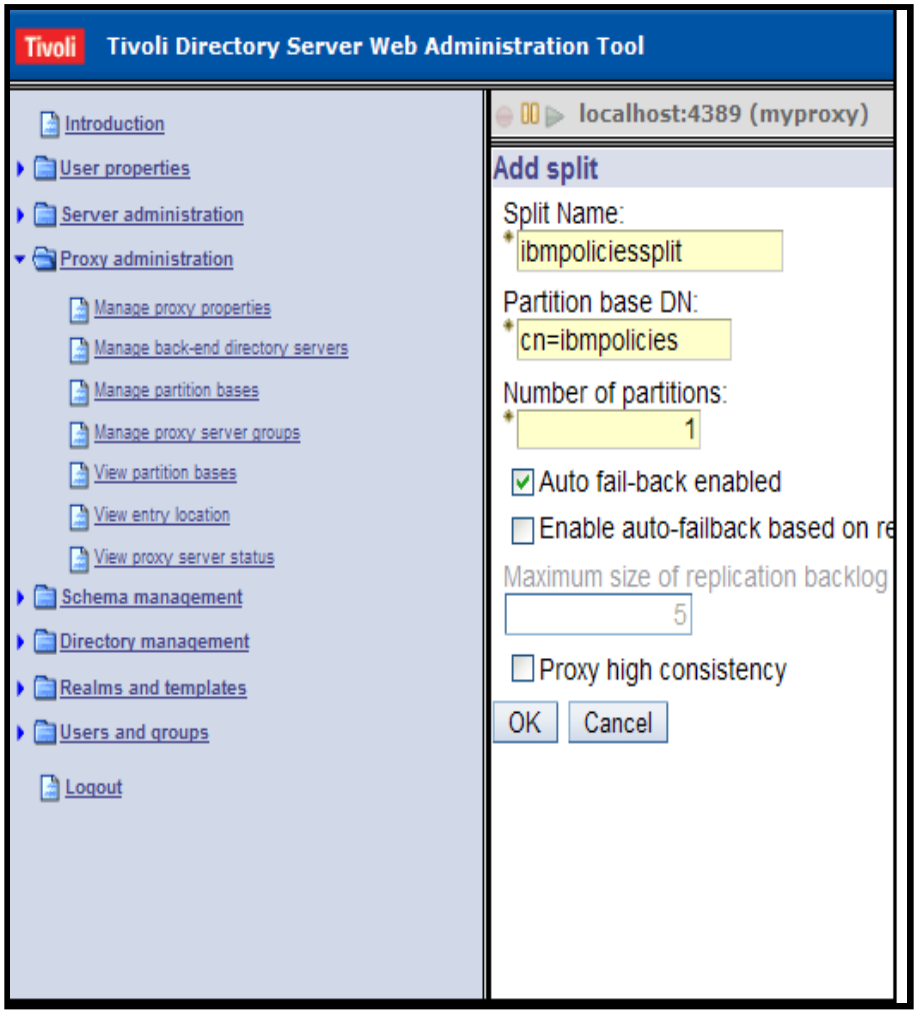
Manage partition bases



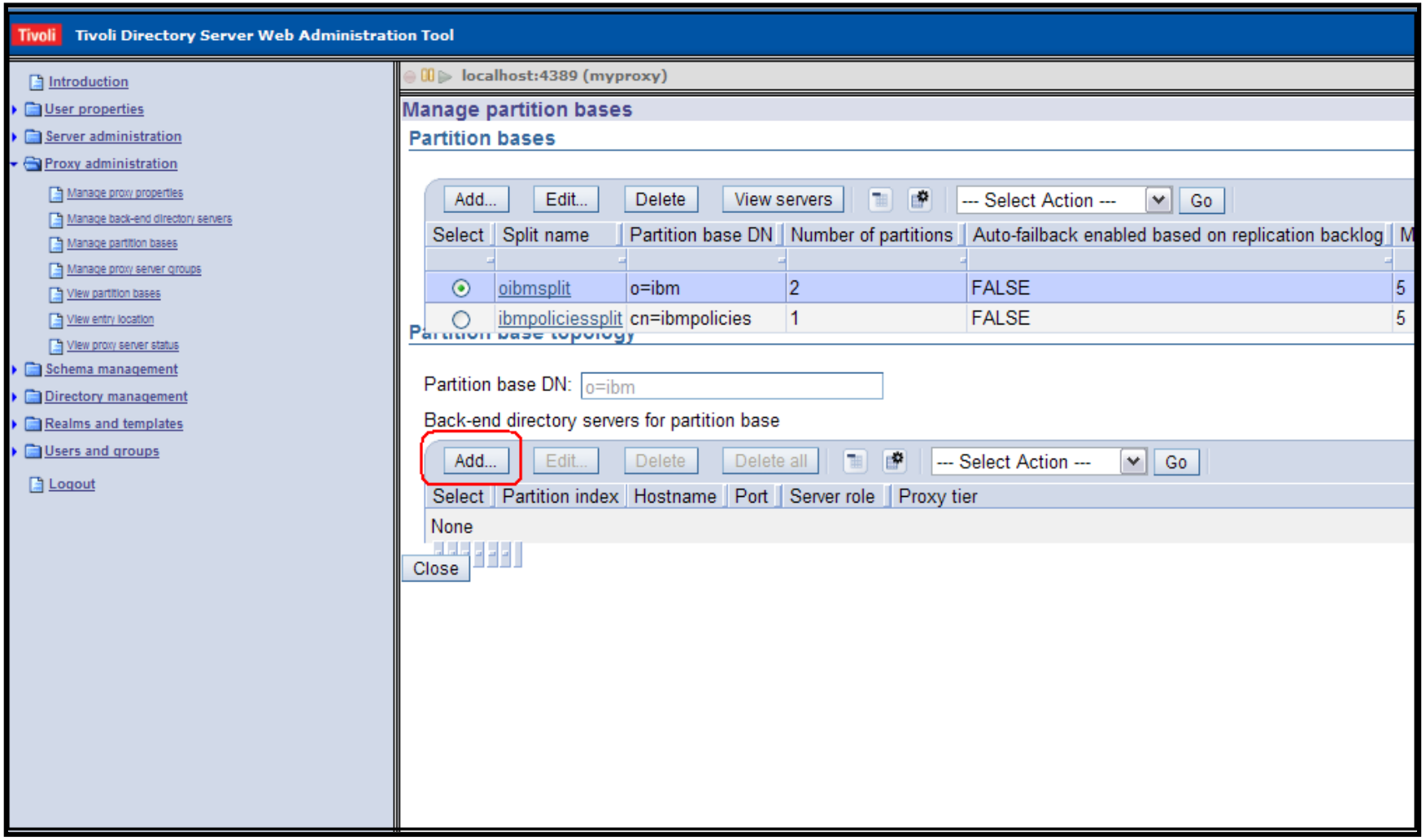
Manage partition bases contd..



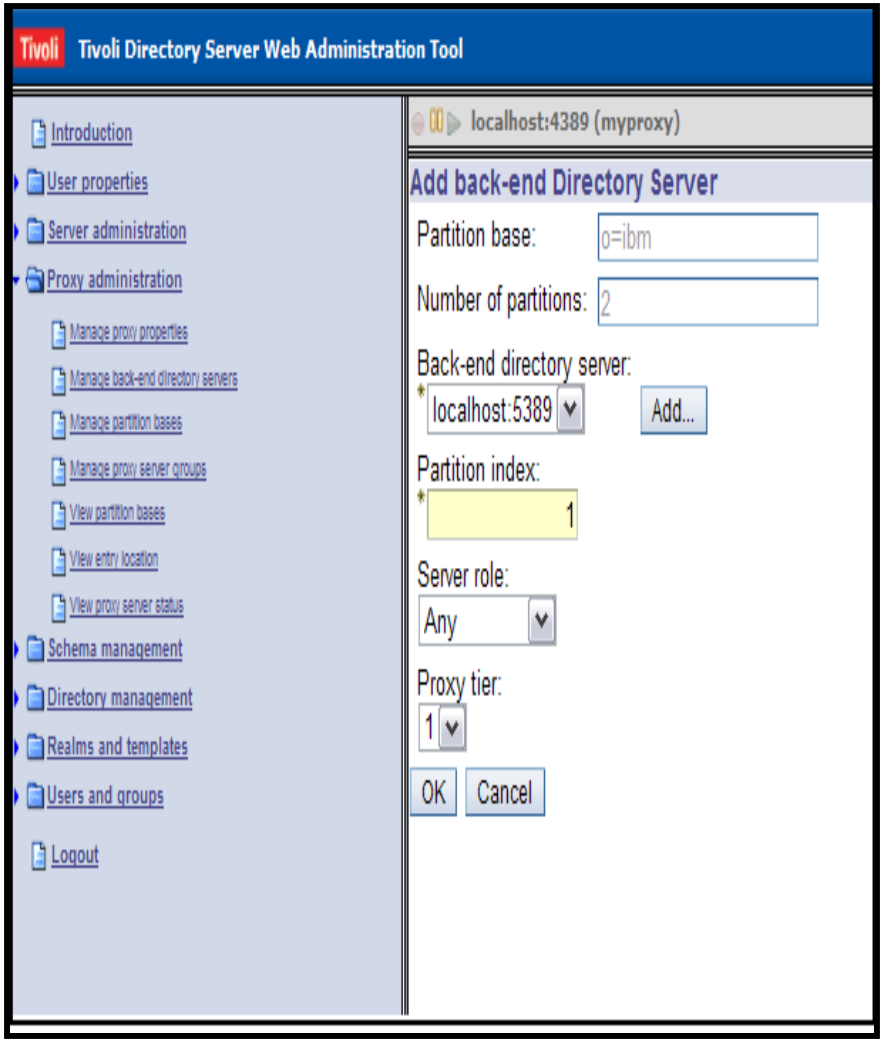
Manage partition bases contd..



Manage partition bases contd..



Add backend servers to the partition base



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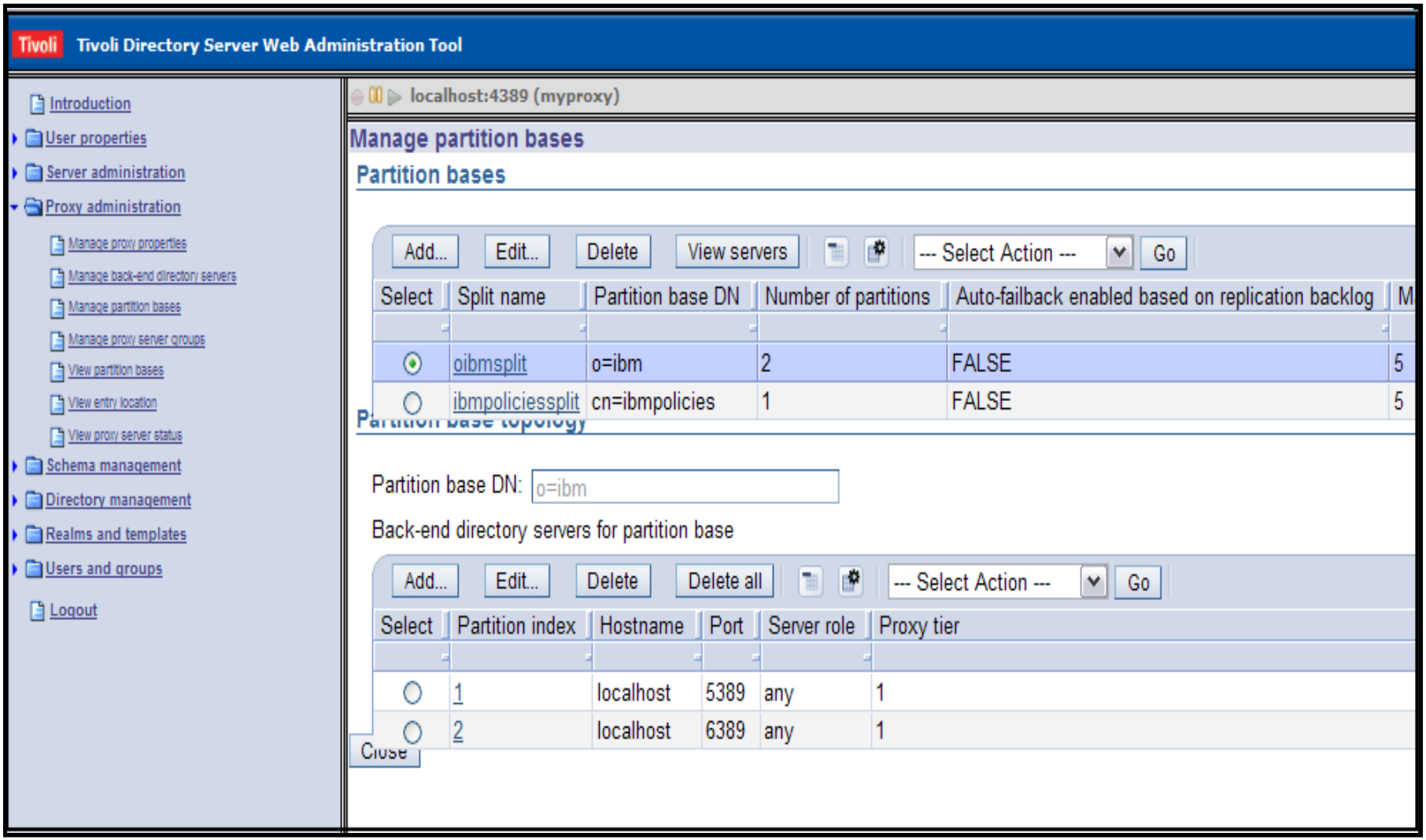
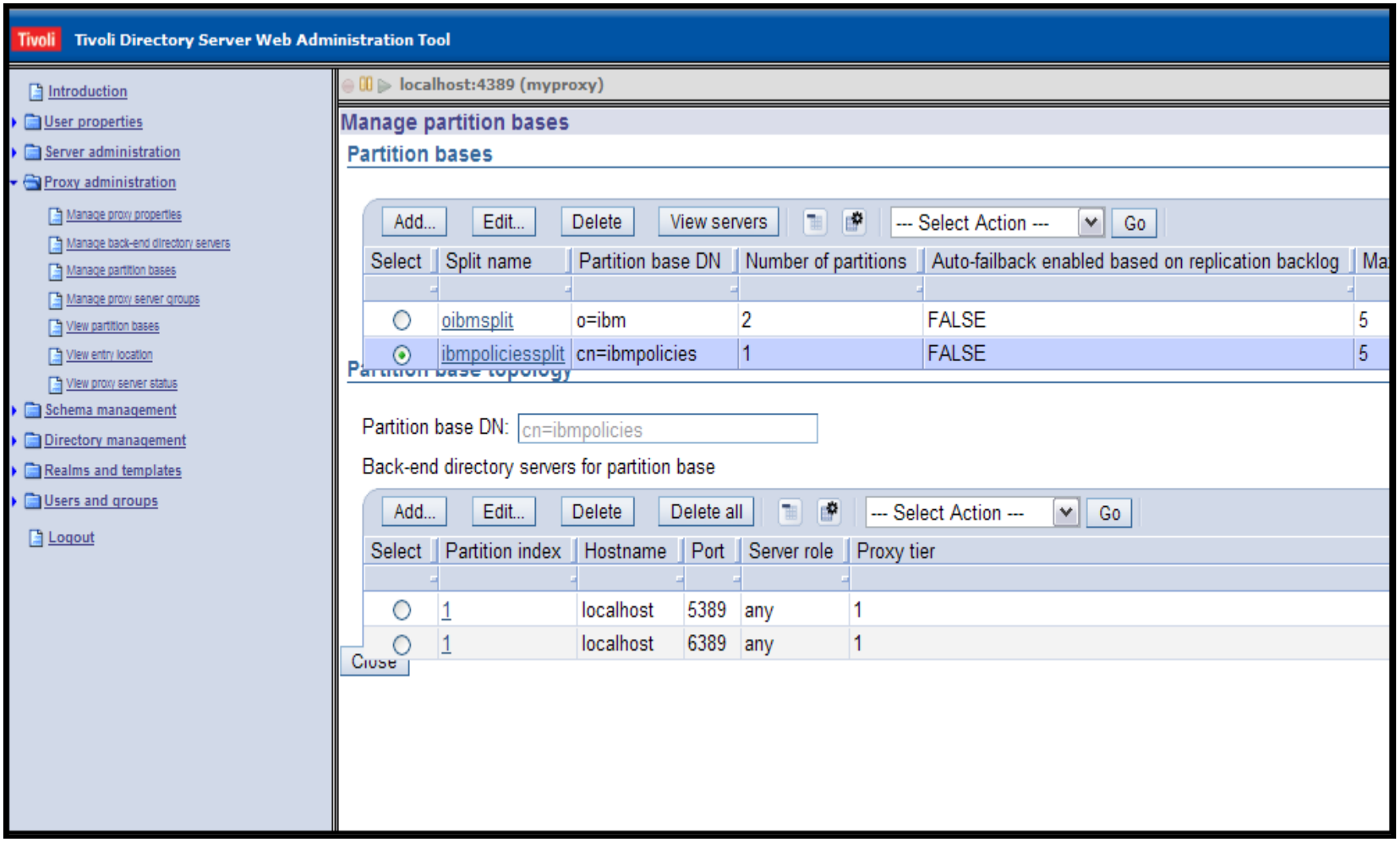
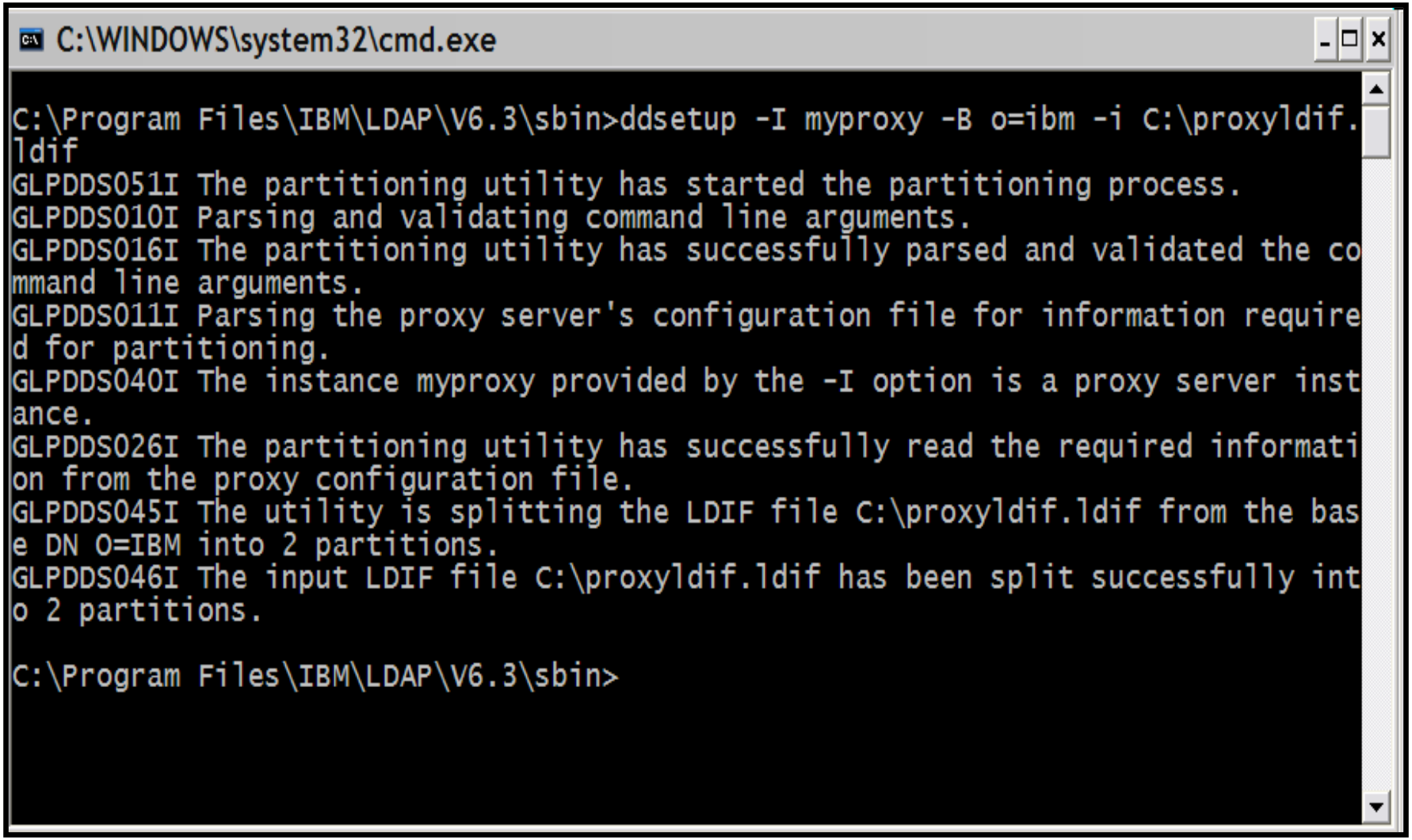


Add backend servers to the partition base

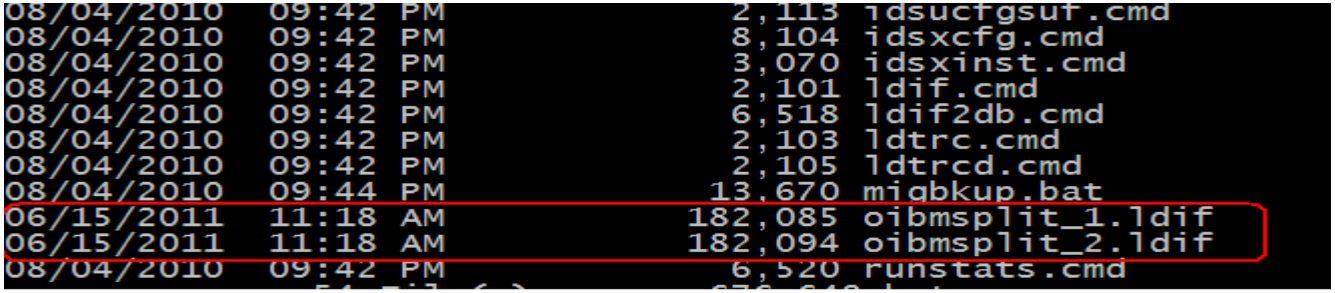


Splitting data into partitions with ddsetup tool



Importing data to the backend servers

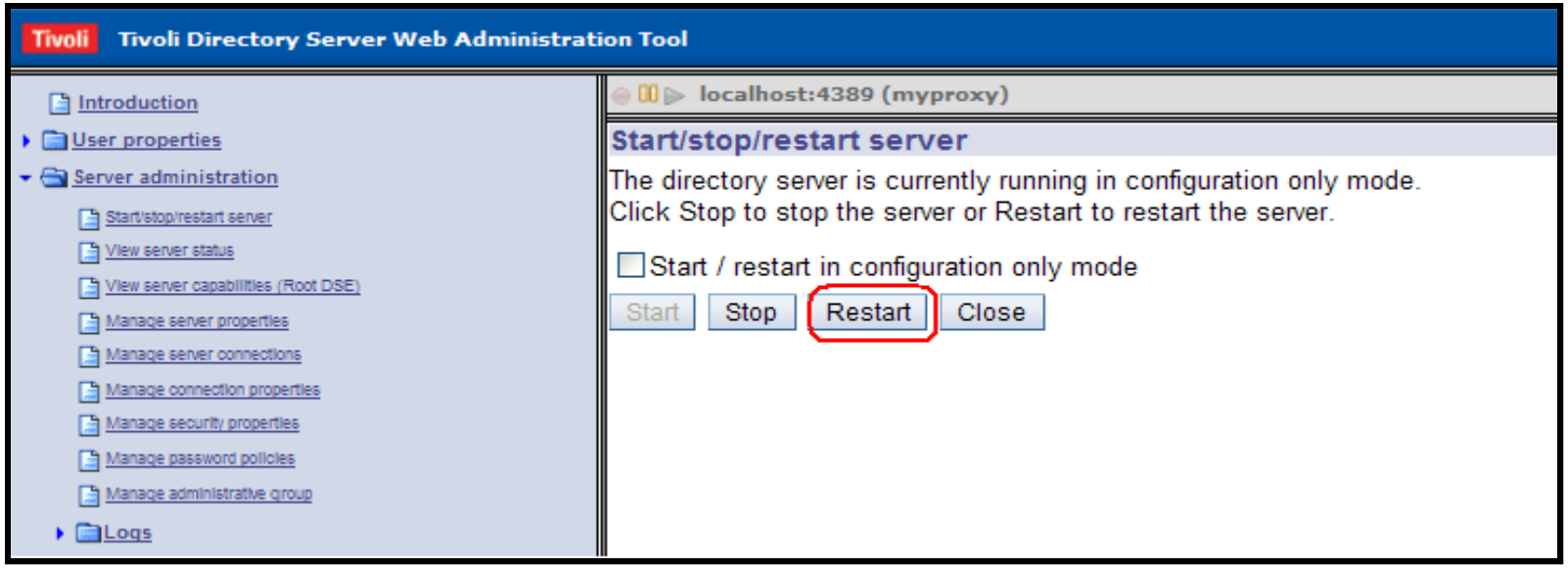
- After completing ddsetup, if you list the entries (ls/dir) then you can see files created with <splitname>_<no of partitions> there



- 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



Tivoli Directory Proxy Server Configuration using command line utilities

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 ldif 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

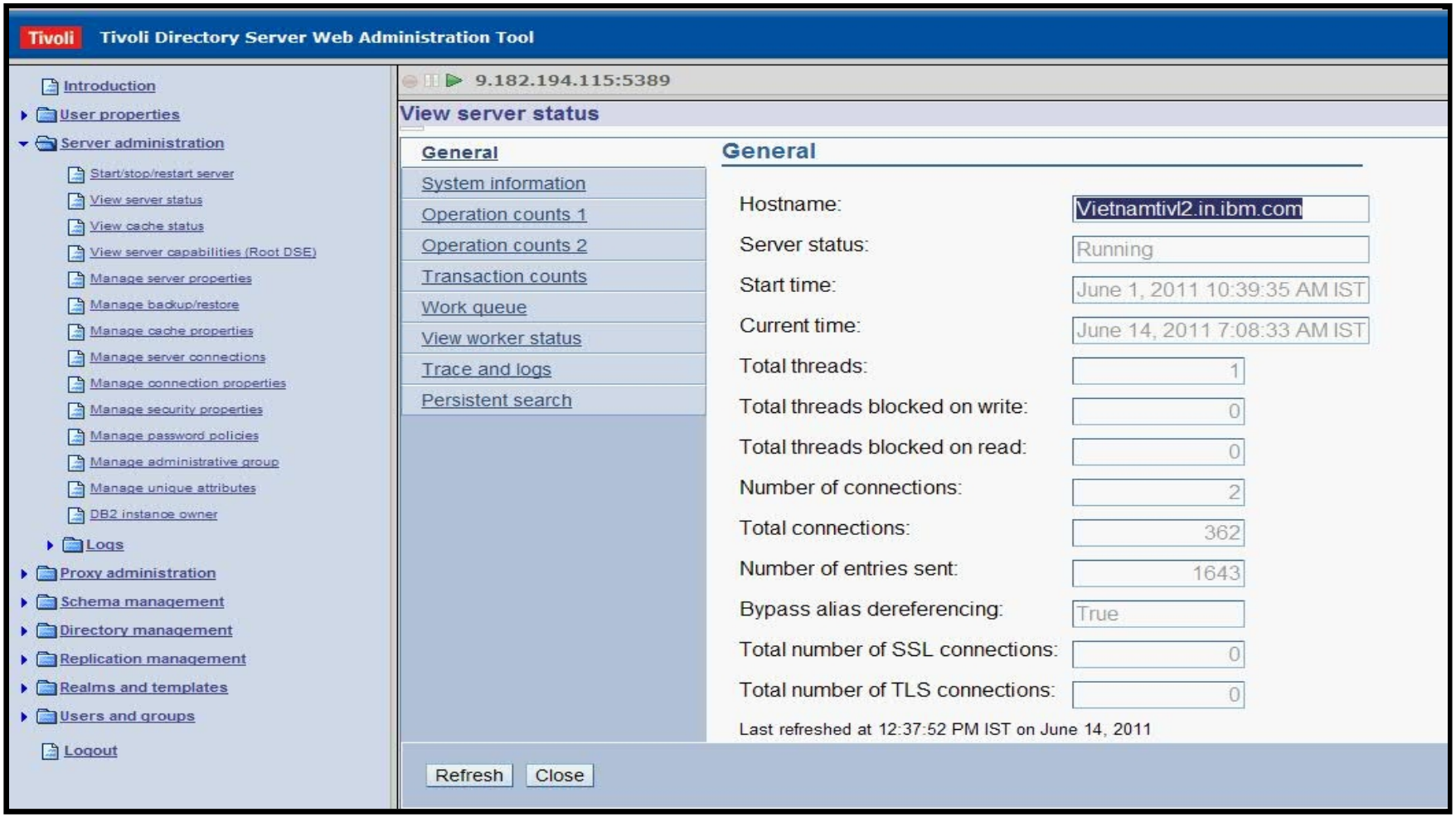
- The proxy server has a health check thread that runs to verify back-end availability.
- The proxy is configurable on a per-server basis.
- A setting of zero (0) disables health check for a server.
- Proxy does a root DSE search to determine health.
- Health check interval is not dynamic.
- You set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

Proxy server: Important notes

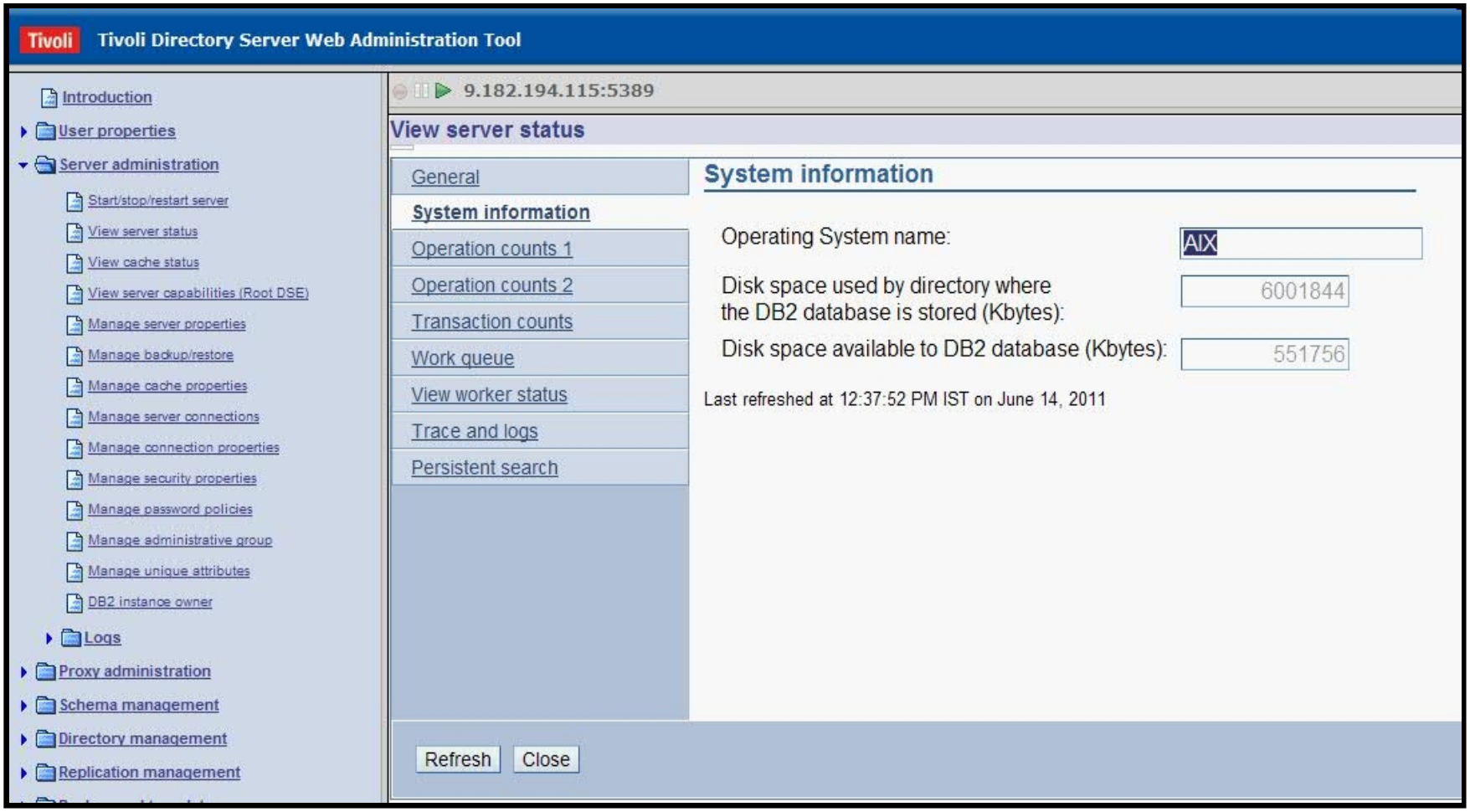
- To set up the initial proxy configuration, the proxy server *must* be in configuration-only mode.
- After configuring the server as a proxy in the Web Administration Tool, you must log out and then log back in to the Web Administration Tool to see all of the proxy options.
- For the proxy server to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

Performance Tuning

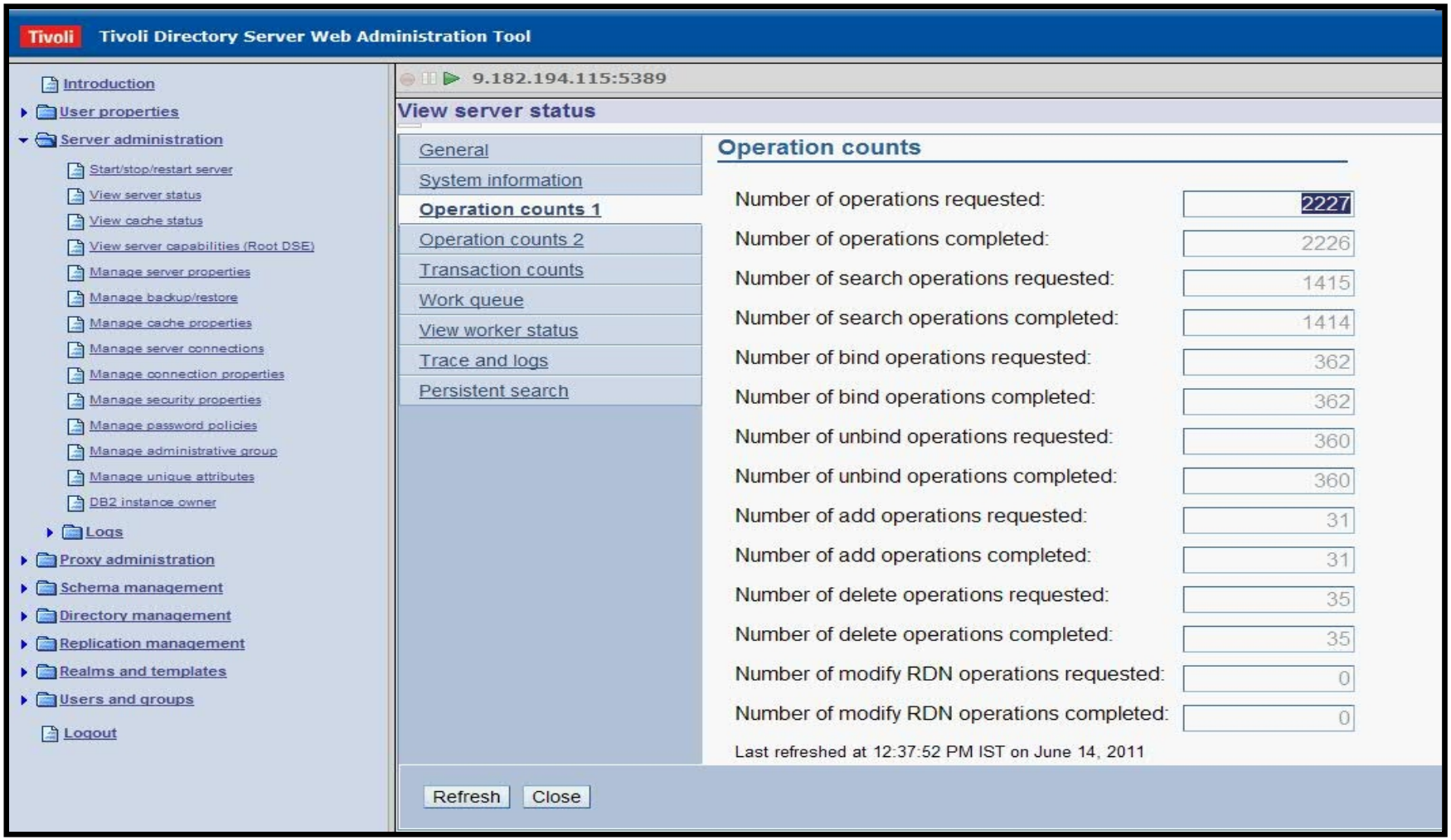
View Server Status-General



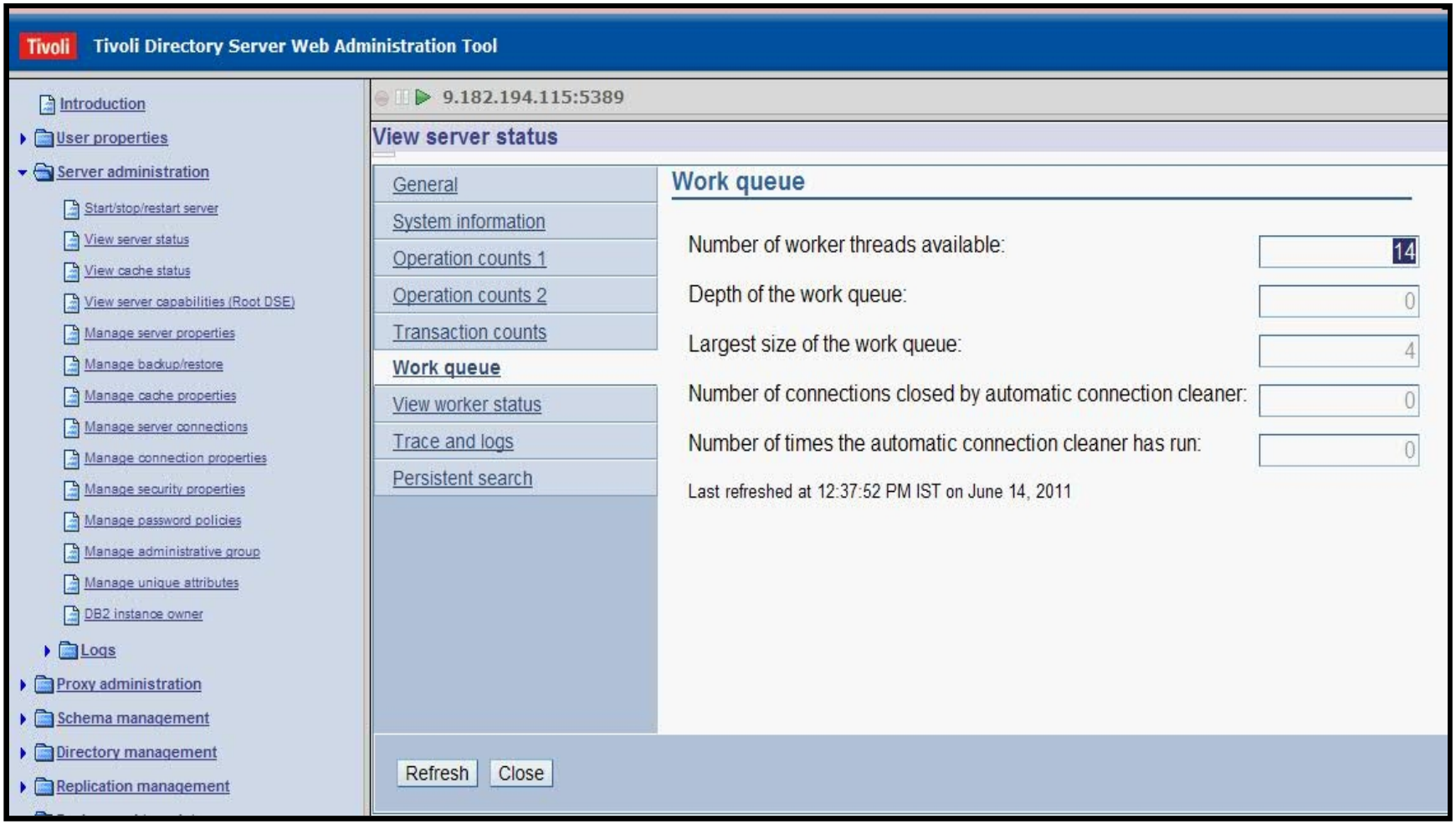
View Server Status-System Information



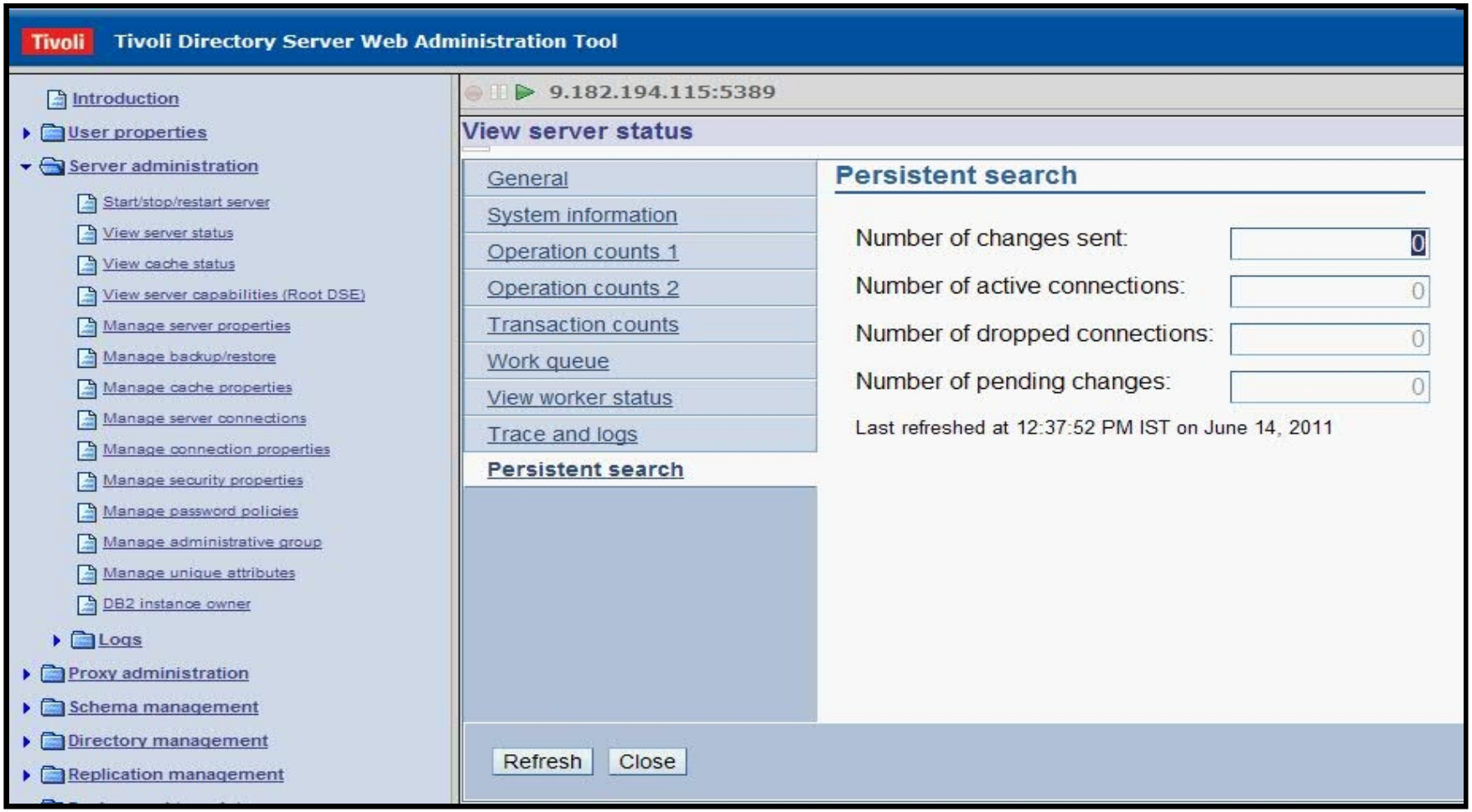
View Server Status- Operation Counts

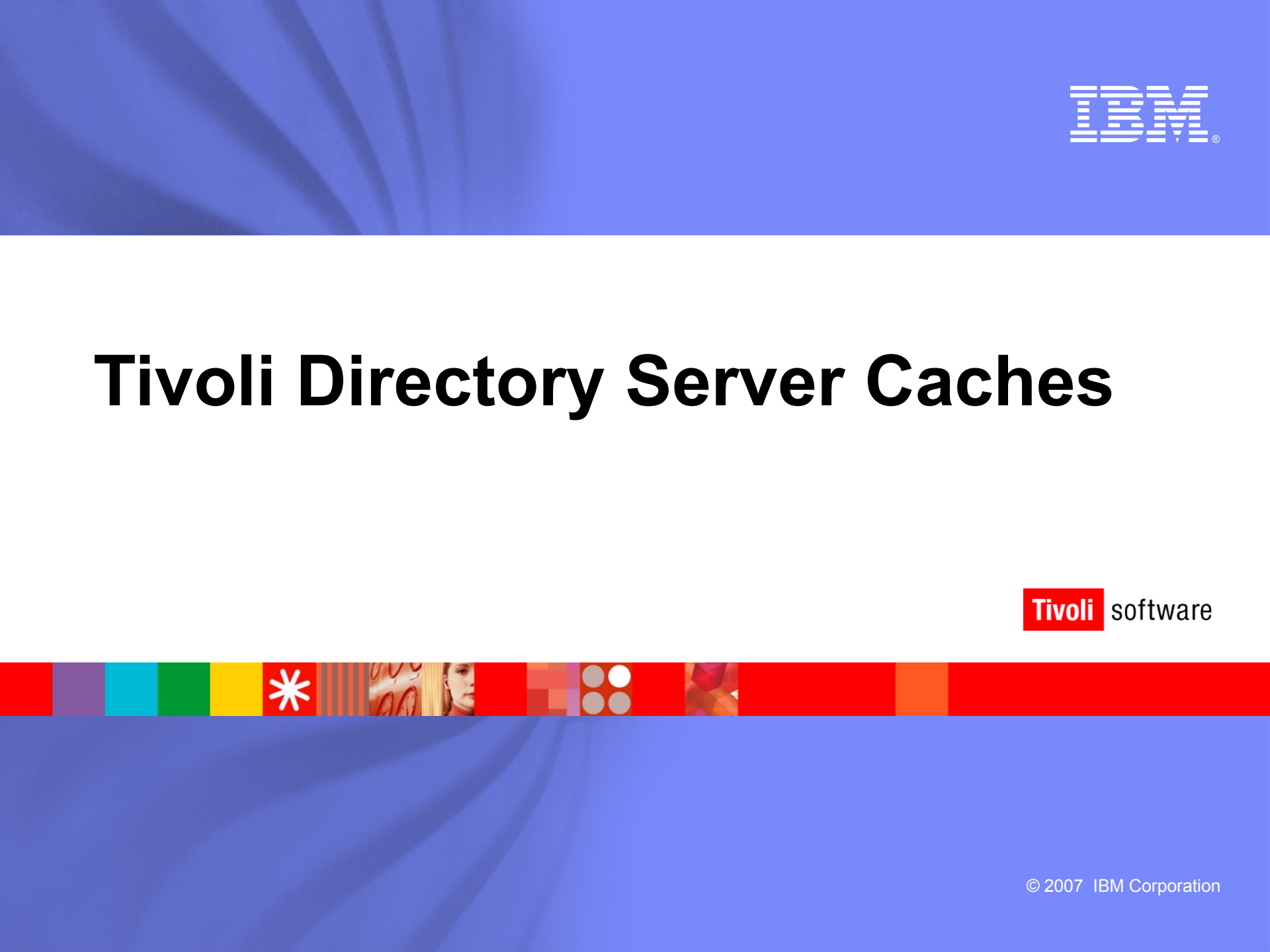


View Server Status- Work Queue



View Server Status- Persistent Search





Tivoli Directory Server Caches

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)

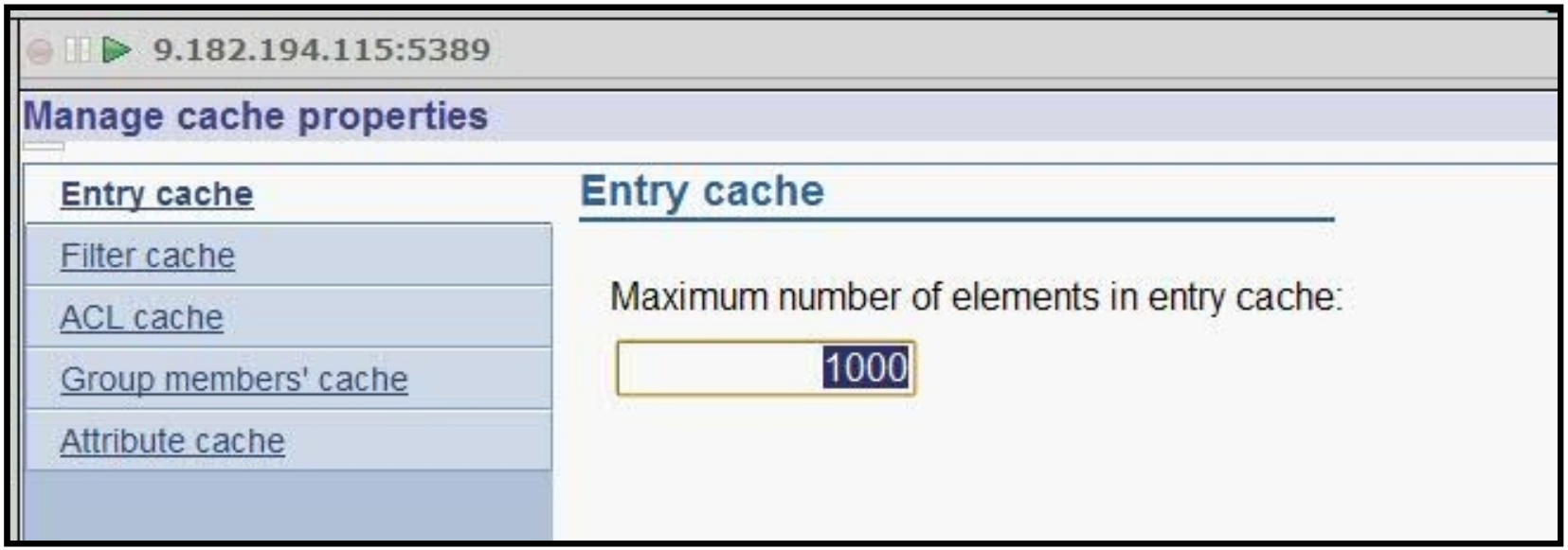
- An LDAP search that accesses the LDAP cache is much faster than one that requires a connection to DB2. This is true even if the information is stored in a cache in DB2.
- Entry cache.
  - Actual data of an entry is stored in the entry cache.
  - Entry IDs are sent to the entry cache to find the actual 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



Configuring Entry cache via command line.

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

  where <filename> contains:

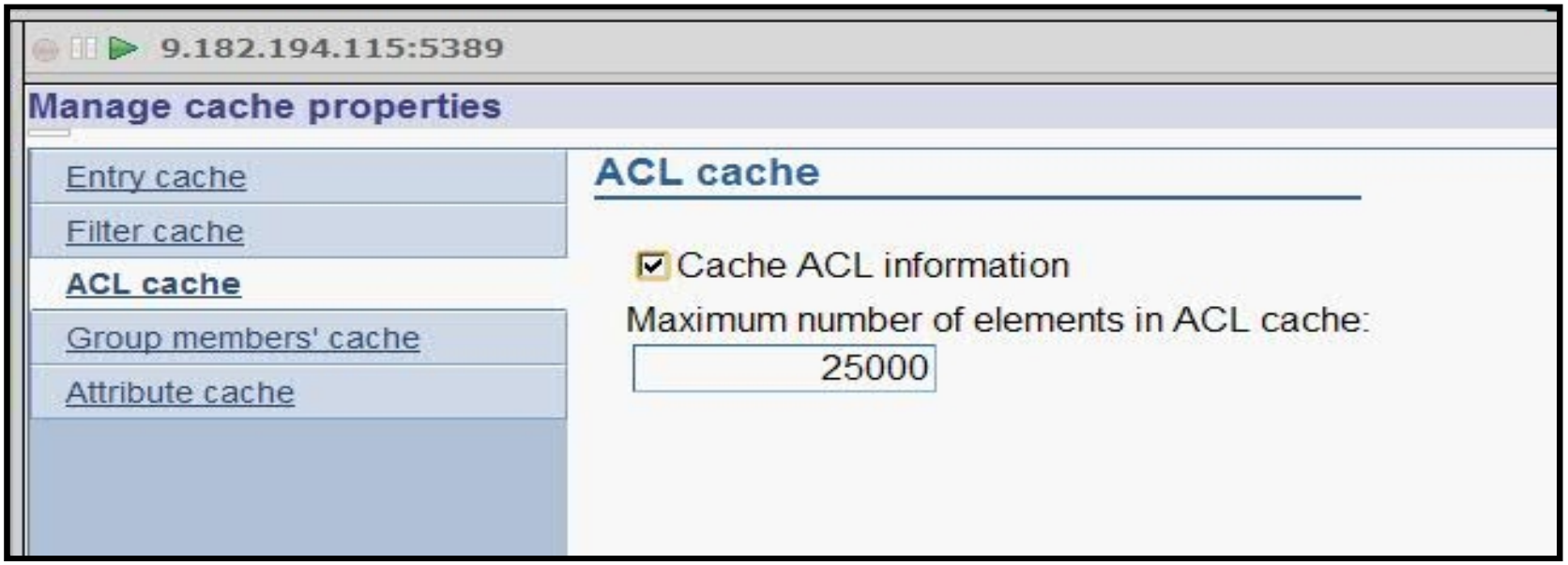
  dn: cn=Front End, cn=Configuration

  changetype: modify

  replace: ibm-slapdEntryCacheSize

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

Configuring ACL cache via Web Admin Tool



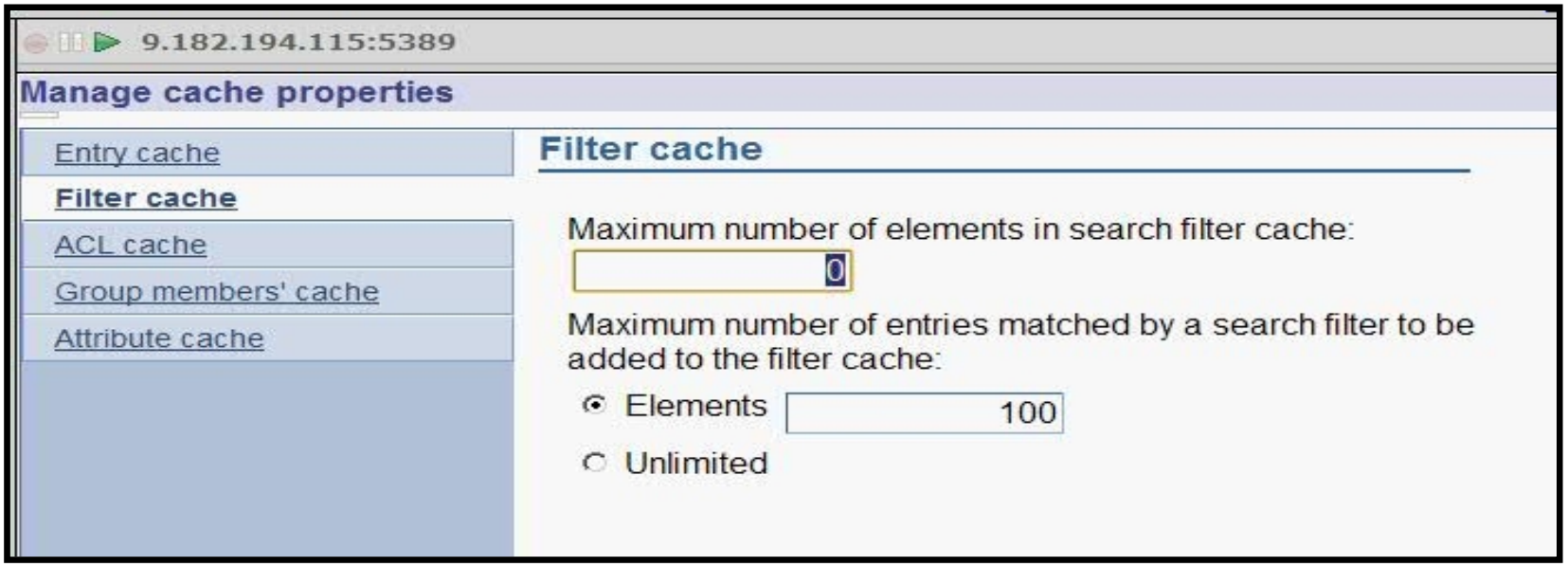
Configuring ACL cache via command line.

- 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



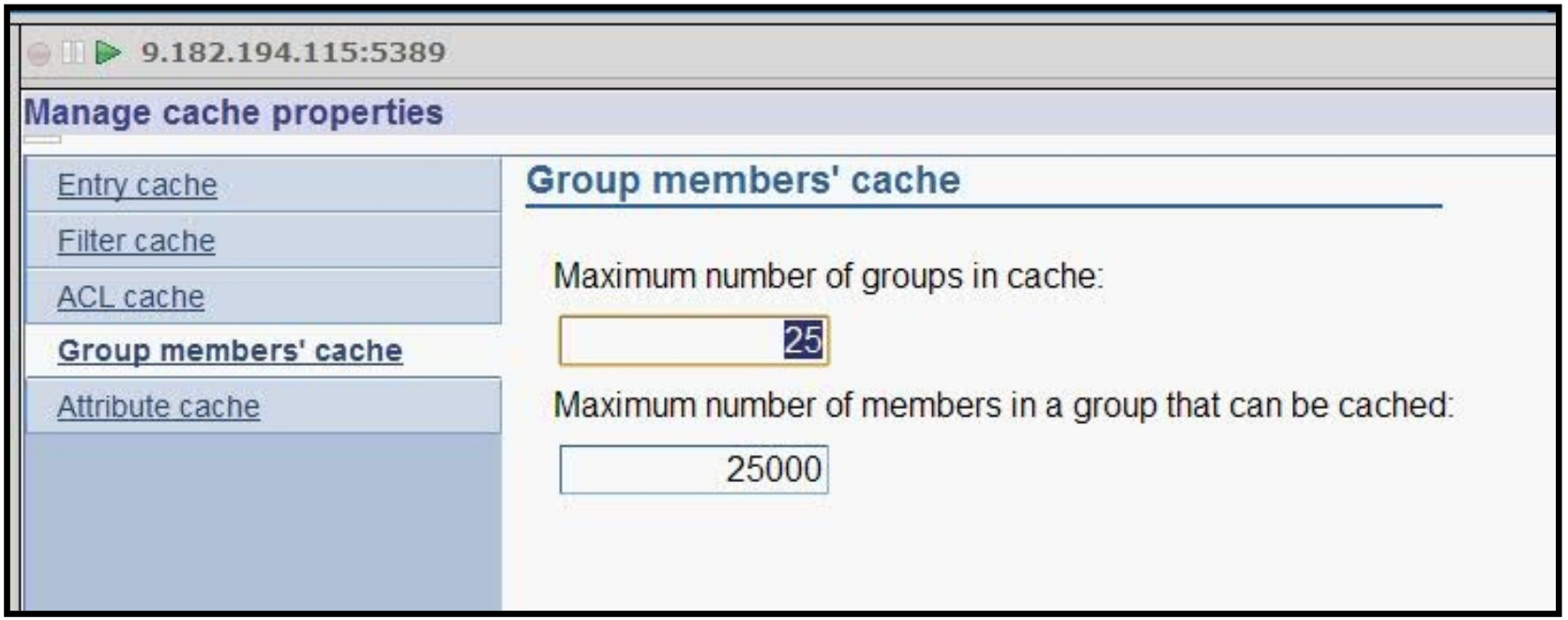
Configuring Filter Cache via Command line

- 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



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

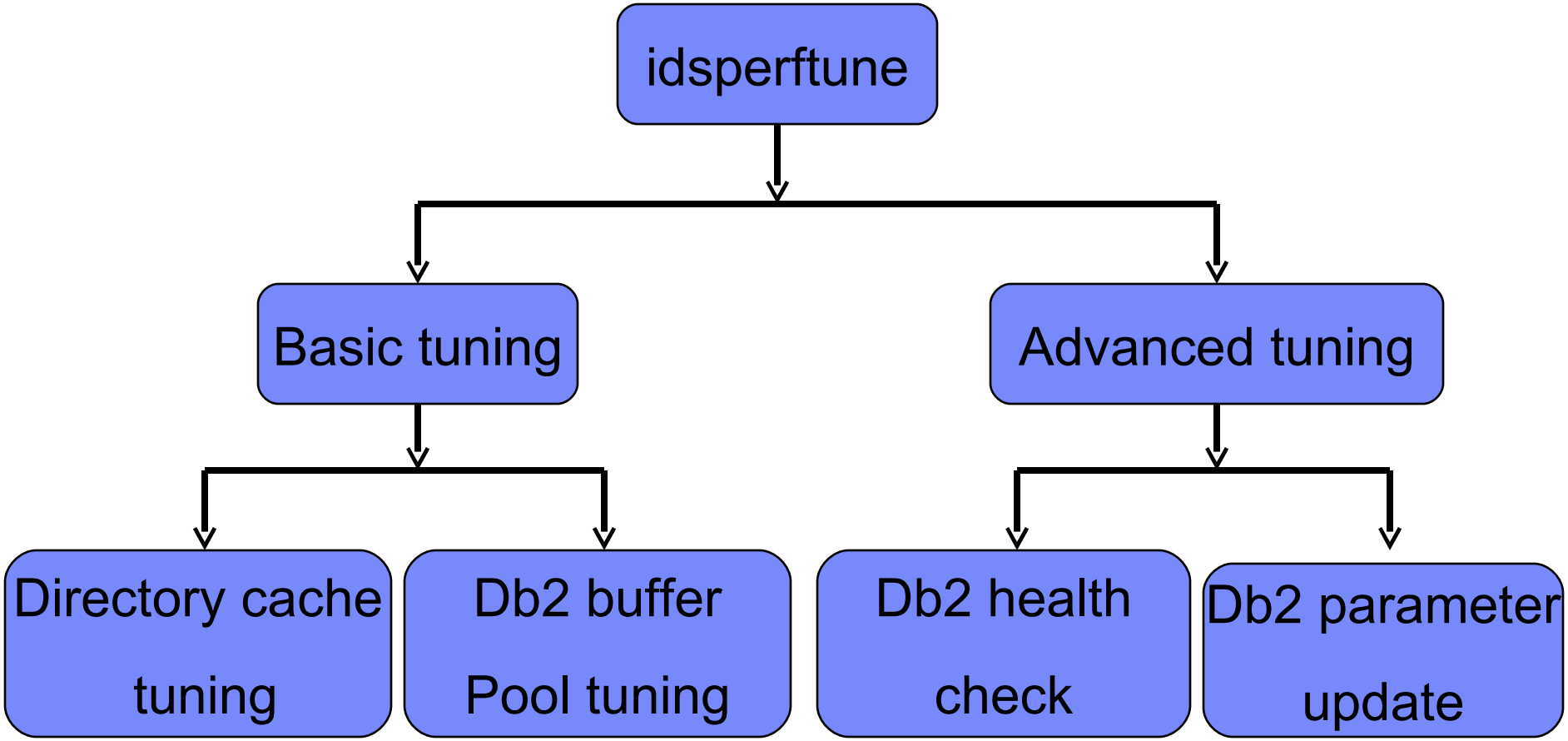
Performance tuning using idsperftune

- Available using the graphical user interface (GUI) **idsxcfg** and as a command-line utility.
- Can be used in a basic and advanced mode.

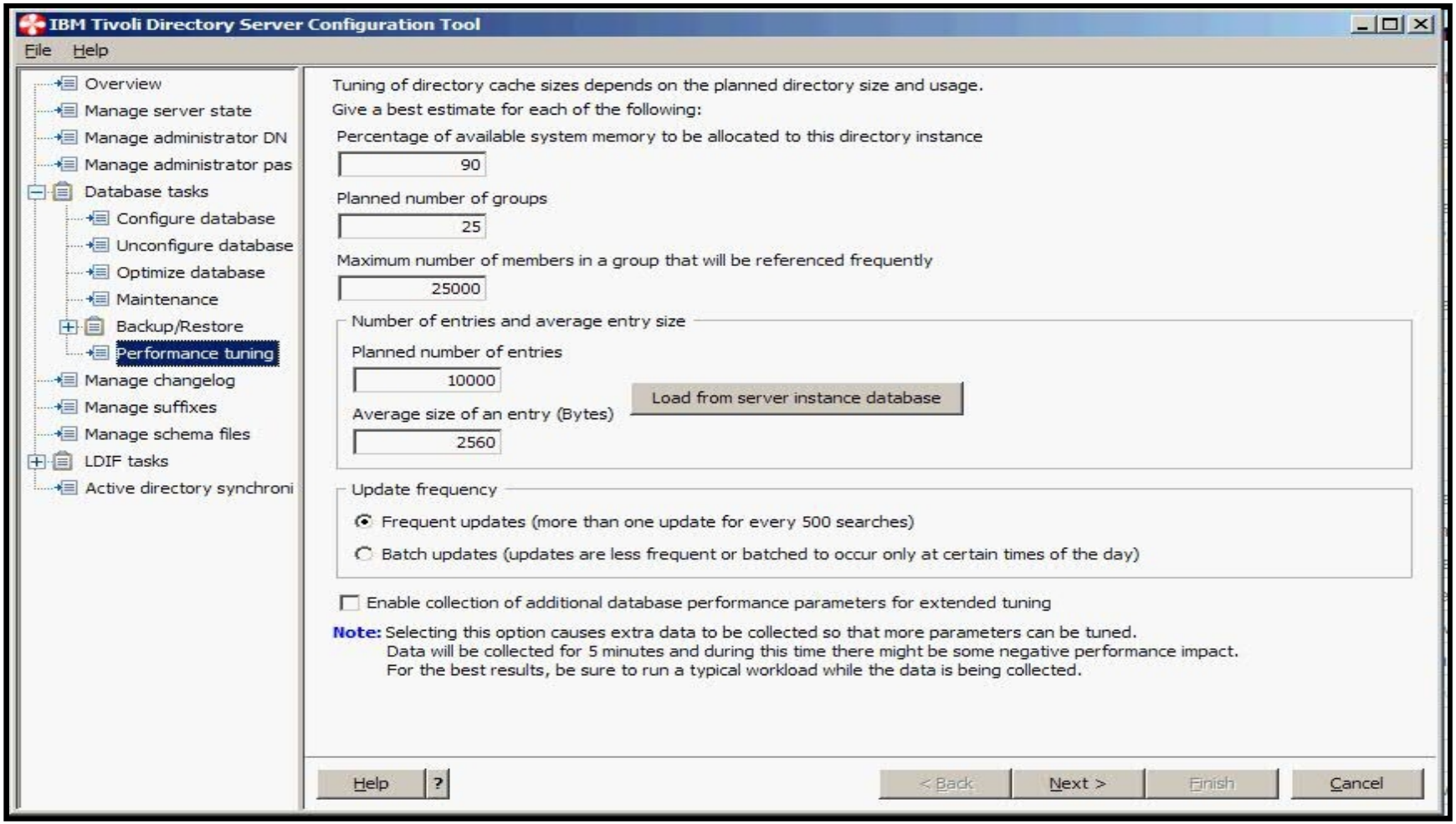
  Basic mode takes the best estimate of the administrator and some planned usage estimates. Determines and optionally sets the best cache and DB2 buffer pool settings.

  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**.

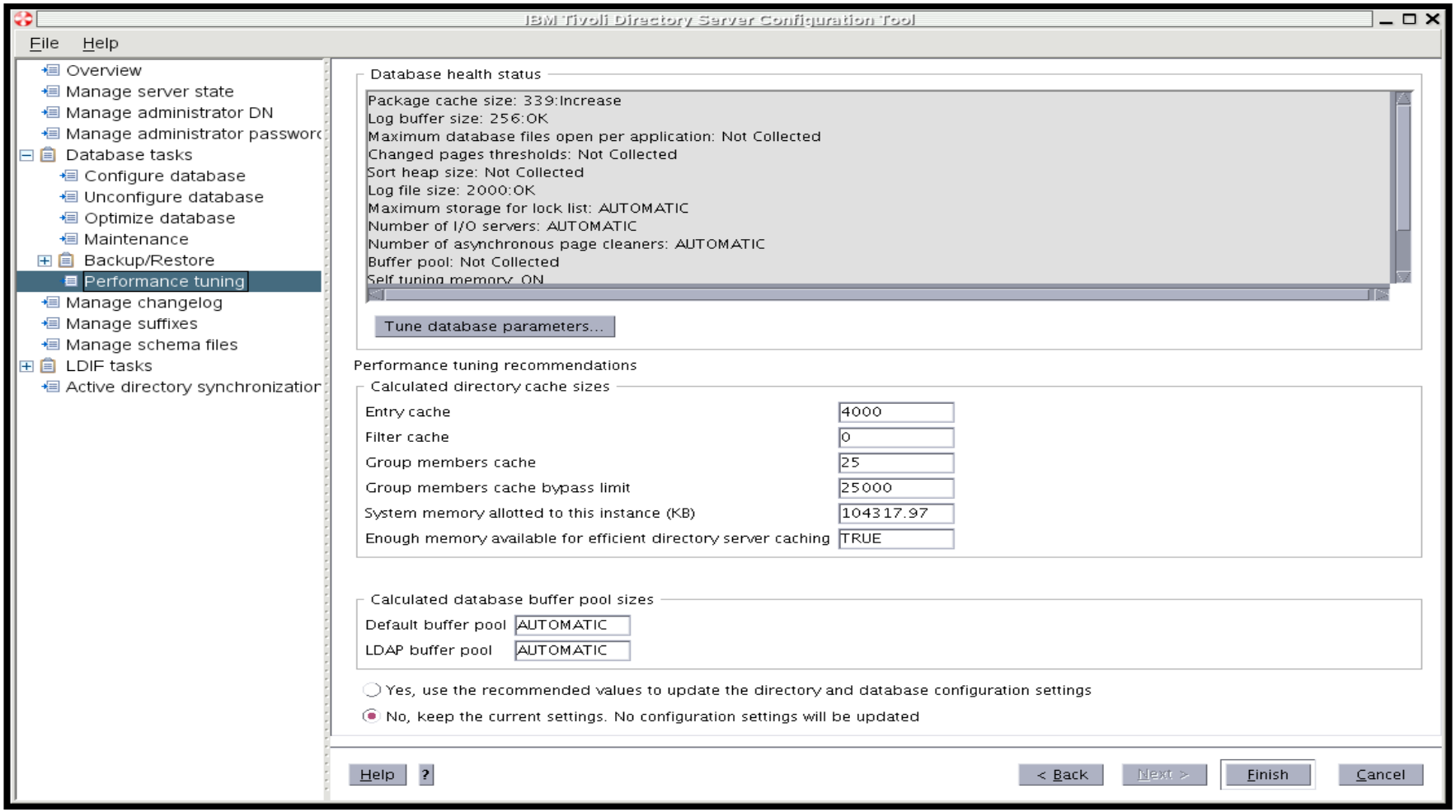
Performance Tuning Tool



Performance tuning using basic idsxcfg



Performance tuning using basic idsxcfg (Contd.)



Performance tuning using basic idsperftune

perftune_input.conf

```
#----------------------------------------------------------
#   Admin Input
#----------------------------------------------------------
# Amount of system memory (%) to be allotted to TDS instance
TDS_SYS_MEM=90

# Total number of entries that will reside in the directory
TDS_TOTAL_ENTRY=10000

# Average size of entry (Bytes)
TDS_AVG_ENTRY_SZ=2560

# Update Frequency
# 1. Frequent updates expected, or
# 2. Only Batch Updates  expected
TDS_UPDATE_FREQ=1

#Total number of Groups to be cached
TDS_GROUP_CACHE=25

# Maximum number of members in a group that will be referenced frequently
TDS_GROUP_MEMBER=25000

#----------------------------------------------------------
# DB2 PARAMETER INPUT
#----------------------------------------------------------

# NEWLOGPATH allows you to specify a string of up to 242 bytes to change the location where the log files are stored.
# eg, NEWLOGPATH="/home/idsldap" NOTE: A new directory NODE0000 will be created inside this path
NEWLOGPATH=None

# LOGFILSIZ defines the size of each primary and secondary log file. The size of these log files limits
# the number of log records that can be written to them before they become full and a new log file is required.
LOGFILSIZ=None

# DBHEAP determines the maximum memory used by the database heap.
DBHEAP=None

# MAXFILOP specifies the maximum number of file handles that can be open for each database agent.
MAXFILOP=None

# SORTHEAP defines the maximum number of private memory pages to be used for private sorts,
# or the maximum number of shared memory pages to be used for shared sorts.
SORTHEAP=None

# LOGBUFSZ allows you to specify the amount of the database heap (defined by the dbheap parameter)
# to use as a buffer for log records before writing these records to disk.
LOGBUFSZ=None

```

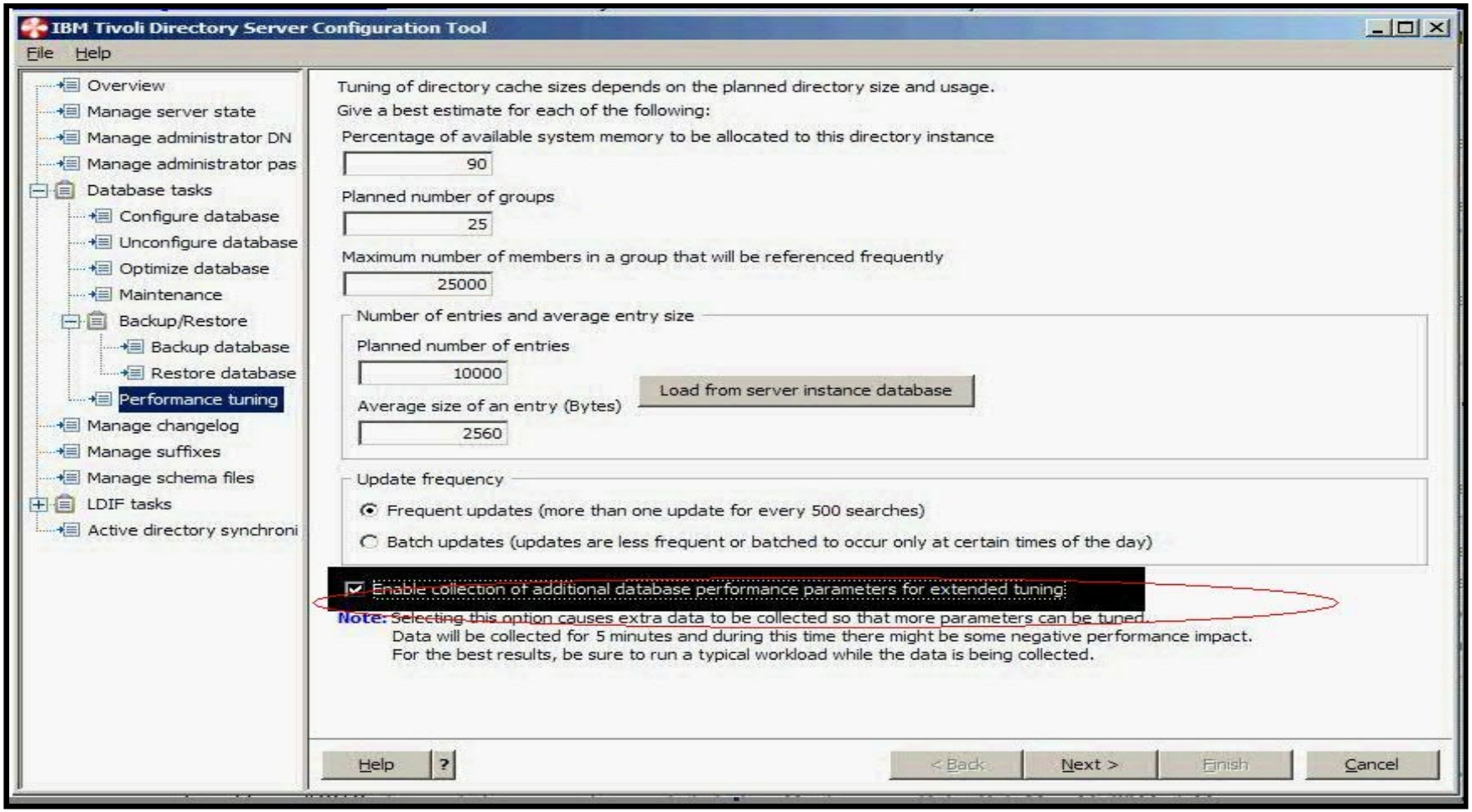
Performance tuning using basic idsperftune(Contd.)

```
bash-3.2# ./idsperftune -I master -s
GLPWRP123I The program '/opt/IBM/ldap/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 idsperftune(Contd.)

```
bash-3.2# ./idsperftune -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



Tivoli Directory Server Database Maintenance

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.

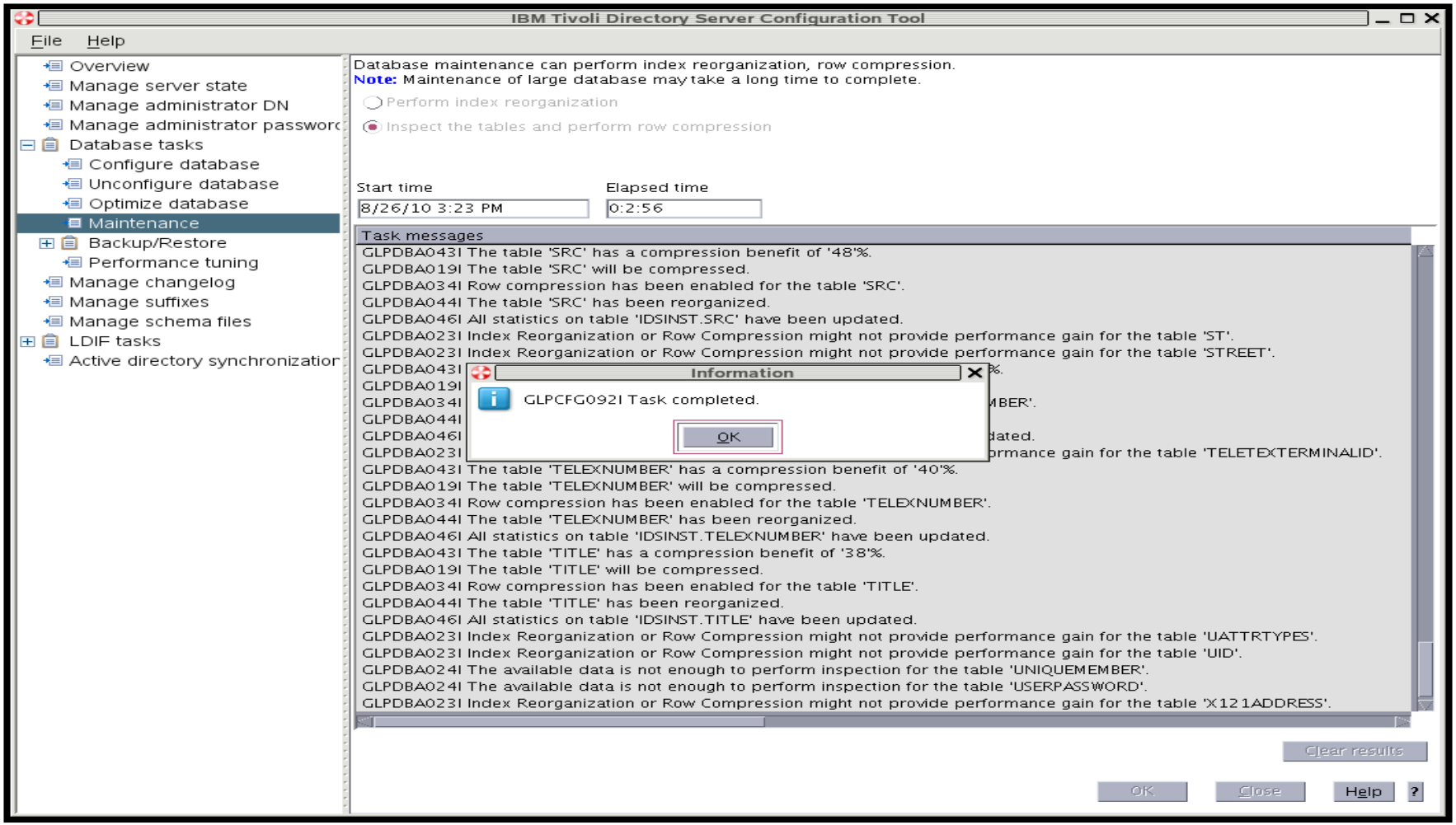
  Reorganizes the table.

  Updates the tables statistics.

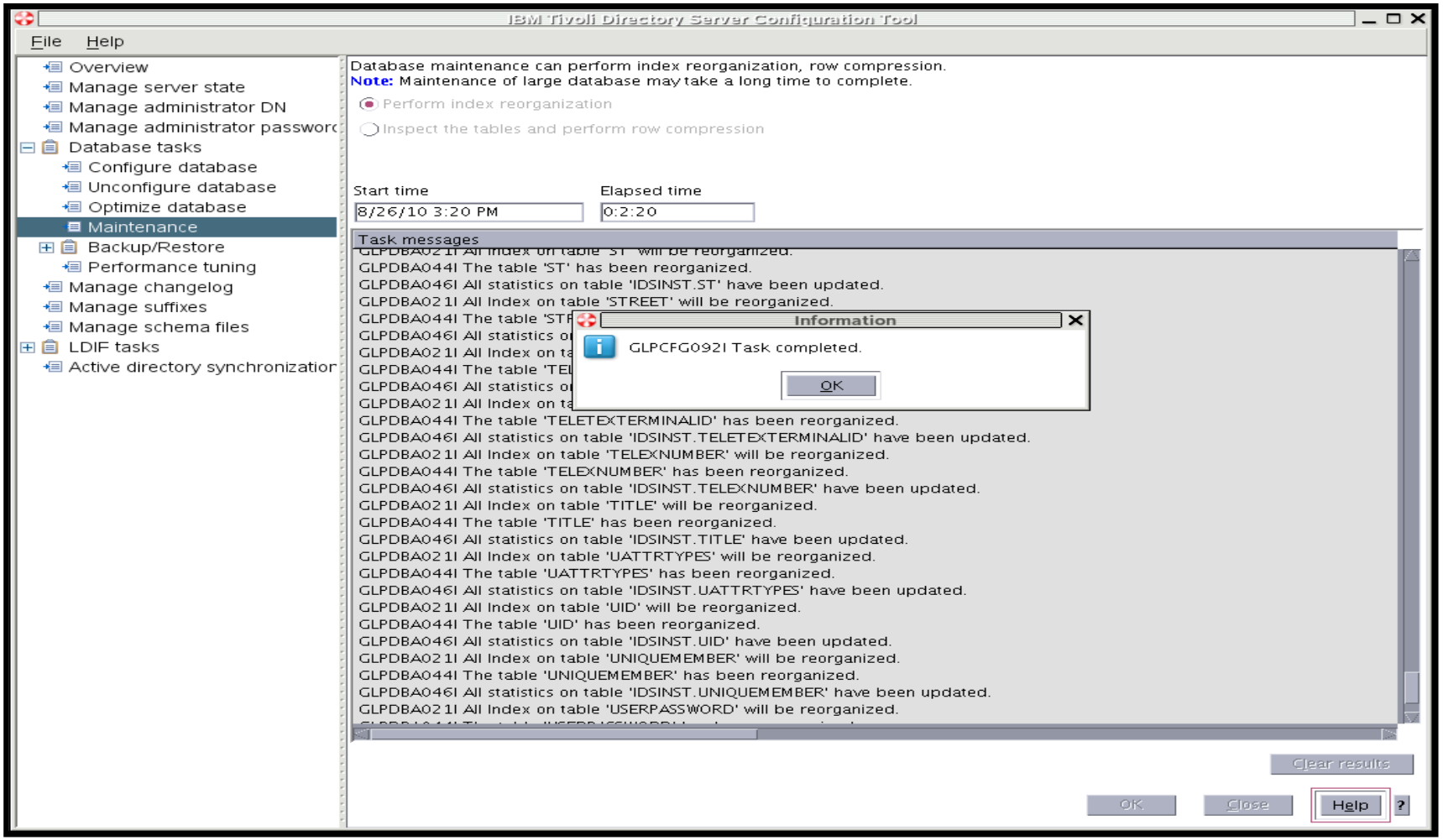
Converting DB2 tablespace types

- 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



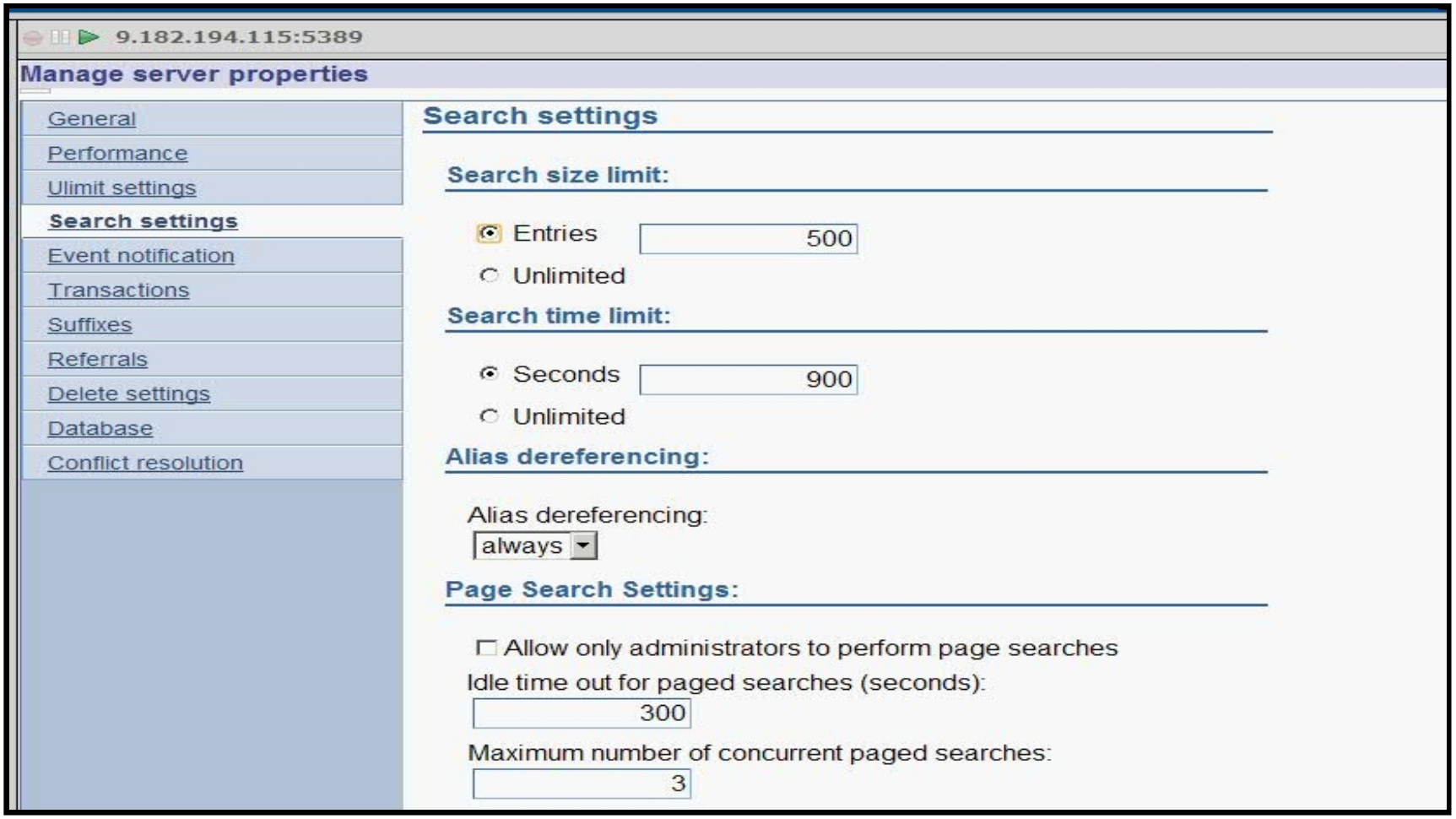
Database maintenance using idsxcfg(Contd.)



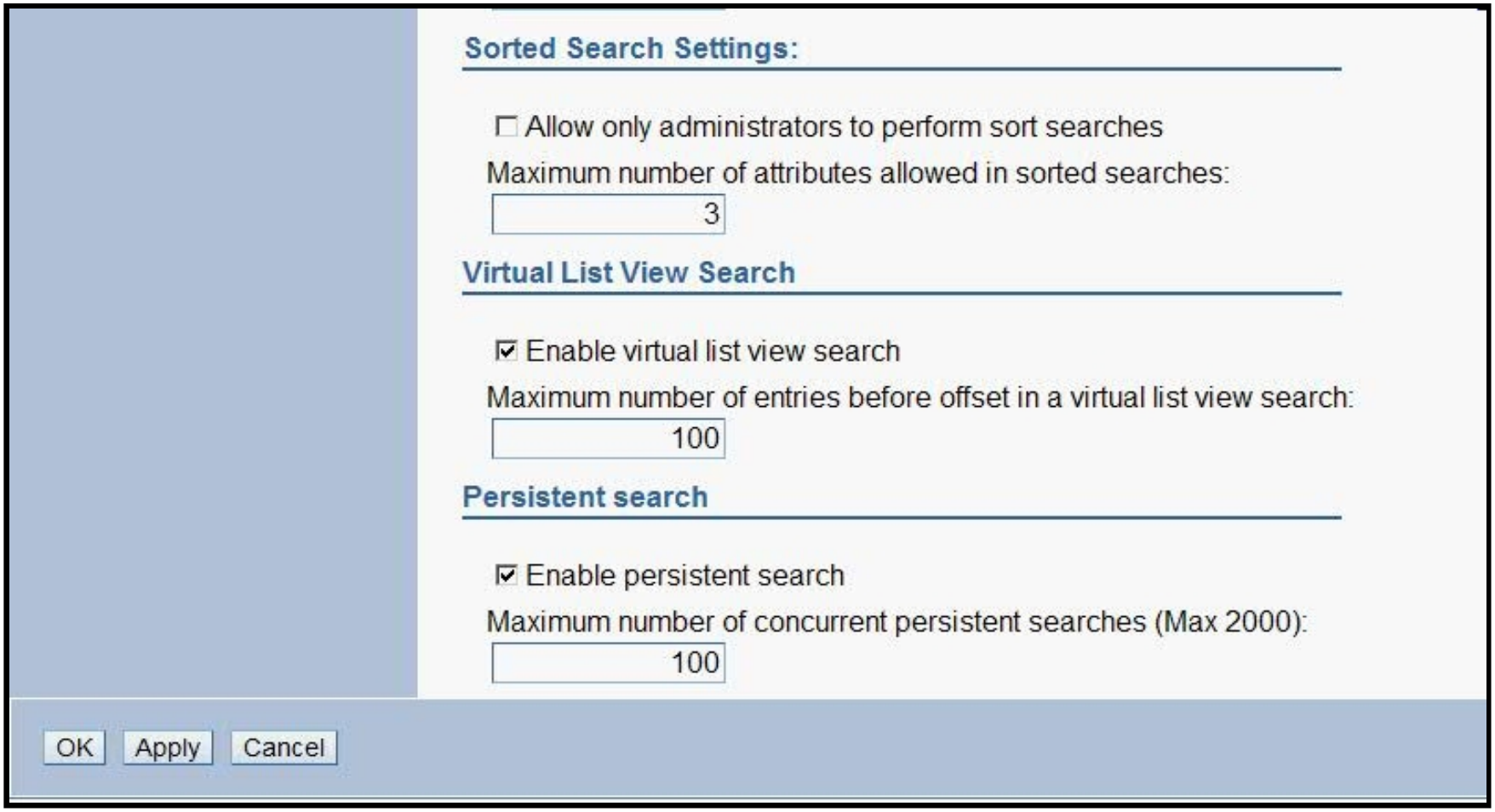
Control LDAP client functions

- 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.)



Control LDAP client functions (Contd.)



Runstats and Reorg

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

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>/idsslapd-<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

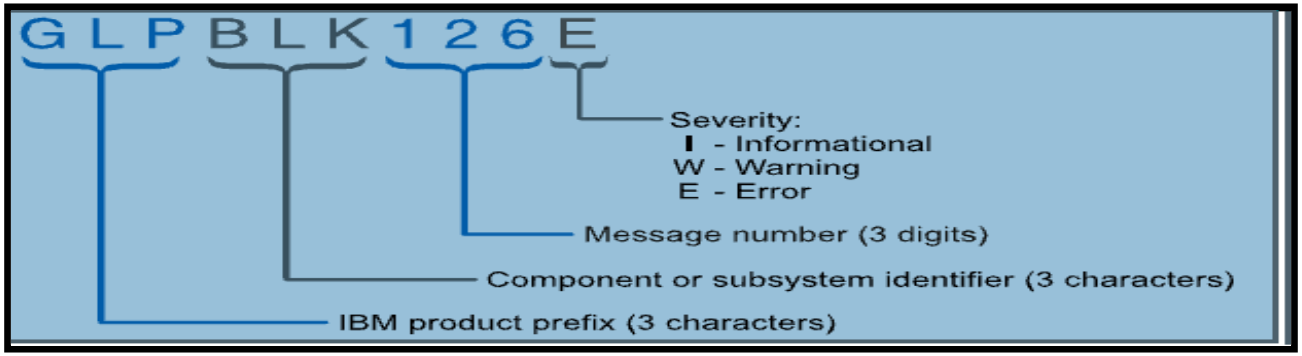
```
idsldapmodify -D <adminDN> -w <adminPW>
dn: cn=Front End, cn=configuration
changetype: modify
add: ibm-slapdSetEnv
ibm-slapdSetEnv: IBMSLAPD_PREOP_AUDIT=YES
```

- 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	**bulkload** utility
CAT	Catalog files
CCH	**idscfgchglg** utility
CDB	**idscfgdb** utility
CFG	**idsxcfg** and **idsxinst** utilities
COM	Common server libraries
CRY	Encryption seed and encryption salt
CSC	**idscfgsch** utility
CSF	**idscfgsuf** utility
CTL	Common configuration tools libraries
D2L	**db2ldif** utility
DBA	**idsdbmaint** utility
DBB	**dbback** utility
DBM	**idsdbmigr** utility
DBR	**dbrestore** 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
- 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