Jmeter – Testing the IMCD, IMPS, IMPD, IMPS Router, & Endpoints for CA Identity Manager

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Jan 2016

References:
http://jmeter.apache.org/
http://jmeter.apache.org/usermanual/build-ldapext-test-plan.html
http://people.apache.org/~mkostrze/jmeter-docs/docs/usermanual/build-ldapext-test-plan.html

Background

- Challenge:
  - Low cost, available performance testing tools for the IM solution are usually limited to the low end spectrum of functionality
    - CLI (Command Line)
      - Bulk Loader Client (blc) for top tier (Web Application) testing of create, modify, delete user objects only.
      - etautil / ldapsearch (imps version) for the mid-tier (Provisioning Server) testing of create, modify, reset passwords, delete, to the GU and endpoint accounts.
  - High cost performance testing tools for project, required customers to own or purchase HP Loadrunner or similar vendor tools.
    - Usually owned and executed by specialized business units at customer site
    - Required future scheduling to occur. Limited ad-hoc testing
    - No proactive testing available or limited.
- The use of Apache Jmeter is an amazing mid-spectrum solution that provide non-invasive performance testing
  - Benefits:
    - Open Source License
    - No install required; just extract and run from workstation/desktop
    - Low learning curve [less than 2 hours to learn & use]
    - No agents required to be deployed for majority of test plans
      - May use the included “PerfMon” Server Agent to view disk I/O CPU, Network utilization
    - Easy to share test plans
    - Use of a built-in HTTP proxy recorder to auto-build test plans
- This deck focus on the use of Jmeter and LDAP(S) protocol used by the mid-tier & data tier component of IM.
  - Mid-Tier: Provisioning Server & its Connector Servers (JCS/CCS); Data Tier: IMCD (IM Corporate User Store/Directory) & IMPD (Prov. Directory)
  - Only the query operation is defined in the example labs. This single operation will quickly define where bottlenecks may exist with a configuration settings for a Connector, or perhaps load-balancing operations, and if there are issues with the endpoints.

Goals

- Use Apache Jmeter as independent testing / validation tool for a “performance feedback” process & proactively identify any provisioning bottle-neck challenges for a production “Go-Live”
- Pre-create definitions to the four (4) primary X500/LDAP instances for the CA Identity Management solution.
  - Only one (1) of the four (4) IMPD DSA are represented.
  - IMCD = IM Corporate Directory/Userstore
    - The primary IM userstore, used by the top tier of the solution, for user profiles & IM group objects.
    - May be CA Directory or other LDAP/X.500 vendor
    - May be Flat or Hierarchal, typically InetOrg schema [Open for customization] with one (1) structural class [minimal] & one (1) auxiliary class [optional]
  - IMPS = IM Provisioning Server
    - This userstore is the IM mid-tier component / service for normalizing user data and providing a connector framework to manage various endpoint userstores.
    - May use either the IMPS Manager GUI, Jxplorer, IMPS_HOME\bin\etautil, and IMPS_HOME\bin\ldapsearch to manage.
  - IMPD = IM Provisioning Directory
    - The supporting CA Directory (x500) for IMPS. Has predefined schema to support various endpoint userstores; and custom userstores.
    - Referential integrity is maintained by the IMPS Service. Do not make any changes to this directory via Jxplorer or any other tool to avoid data corruption. Queries are fine.
  - IMPS Router = IM Provisioning Server Router DSA
    - A component of CA Directory that provides software routing, load-balancing, and failover to the IMPD tier.
- Four (4) examples of Jmeter output reports or results have been pre-defined.
- A fifth definition has been added to directly query endpoint accounts that have been previously explored.
  - Note1: The IMPS connectors will redirect any explored account from the Provisioning Server to the actual endpoint, if the account exists & the “pointer object” has been created from a prior IMPS explore operation.
  - Note2: The IMPS explore operation may per OU or per endpoint account. To focus on a single endpoint account, use the IMPS\bin\ldapsearch.exe binary to ensure that the search criteria is focus on the single account.

Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (I:\Backup\download\apache-jmeter-2.13\apache-jmeter-2.13\bin\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_0...

File Edit Search Run Options Help

0 0 / 200

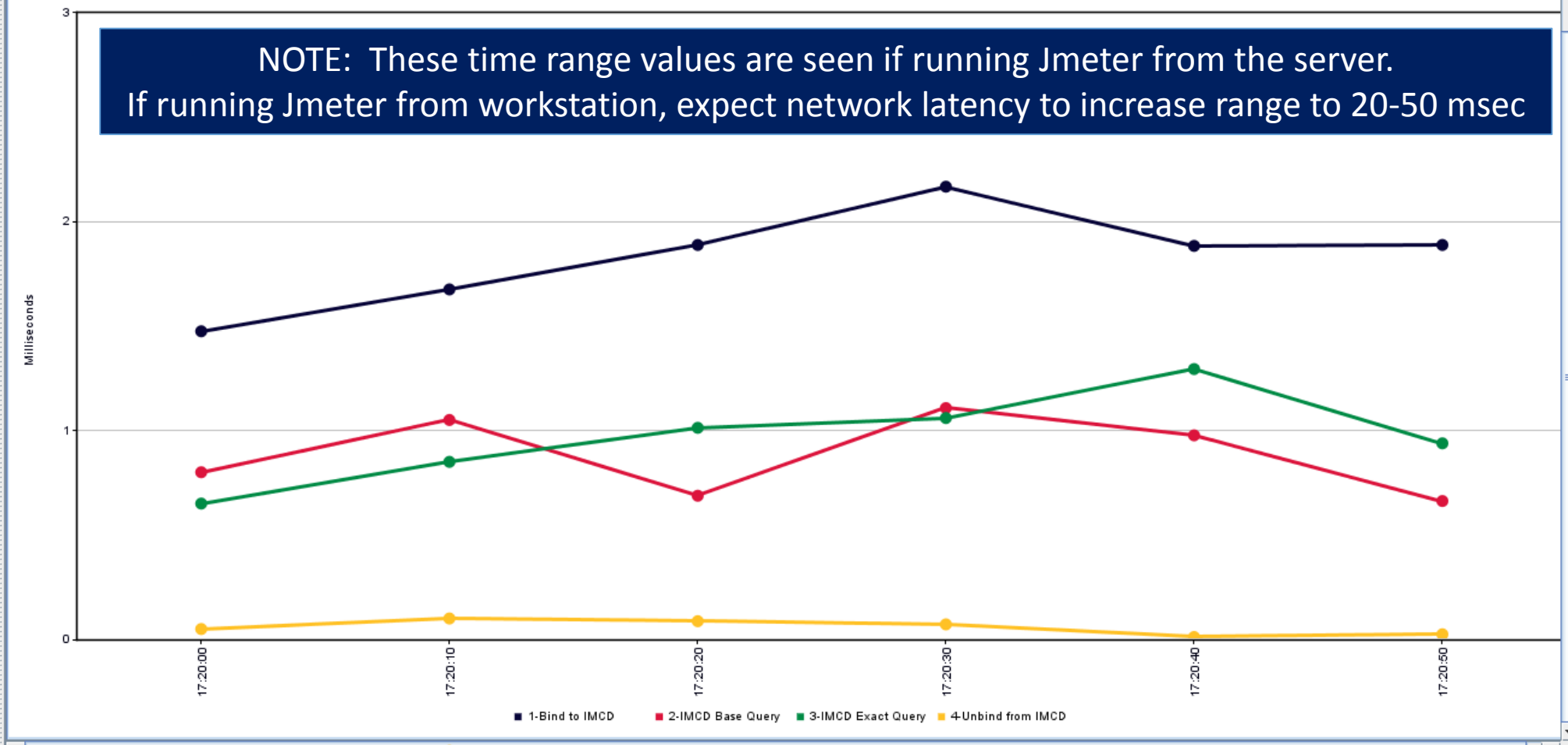
- Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039
  - Thread Group - TEST IMCD (CA Directory)
    - Loop Controller for IMCD bind, search base, search
      - 1-Bind to IMCD
      - 2-IMCD Base Query
      - 3-IMCD Exact Query
      - 4-Unbind from IMCD
    - View Results Tree for IMCD
    - View Results in Table for IMCD
    - Graph Results for IMCD
    - Response Time Graph for IMCD
  - Thread Group - TEST IMPS (CA Directory)
    - Loop Controller for IMPS bin, search base, search ex
      - 1-Bind to IMPS
      - 2-IMPS Base Query
      - 3-IMPS Exact Query
      - 4-Unbind from IMPS
    - View Results Tree for IMPS
    - View Results in Table for IMPS
    - Graph Results for IMPS
    - Response Time Graph for IMPS
  - Thread Group - TEST IMPD (CA Directory)
    - Loop Controller for IMPD bind, search, search exact,
      - 1-Bind to IMPD
      - 2-IMPD Base Query
      - 3-IMPD Exact Query
      - 4-Unbind from IMPD
    - View Results Tree for IMPD
    - View Results in Table for IMPD
    - Graph Results for IMPD
    - Response Time Graph for IMPD
  - Thread Group - TEST IMPS Router to IMPD Data Directorie
    - Loop Controller for IMPS Router bind, search, search
      - 1-Bind to IMPS Router
      - 2-IMPS Router Base Query
      - 3-IMPS Router Exact Query
      - 4-Unbind from IMPS Router
    - View Results Tree for IMPS Router
    - View Results in Table for IMPS Router
    - Graph Results for IMPS Router
    - Response Time Graph for IMPS Router
- WorkBench

Filename ${JMETER_DATA_FOLDER}\IMCD_Response_Time_Graph.log Browse... Log/Display Only: Errors Successes Configure

Settings Graph

Response Time Graph

NOTE: These time range values are seen if running Jmeter from the server.
If running Jmeter from workstation, expect network latency to increase range to 20-50 msec




```
715 2015/12/02 17:21:10 INFO  - jmeter.protocol.ldap.sampler.LDAPExtSampler: context and LdapExtClients removed
716 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
717 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
718 2015/12/02 17:21:10 INFO  - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
719 2015/12/02 17:21:10 INFO  - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)
720
```

Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (I:\Backup\download\apache-jmeter-2.13\apache-jmeter-2.13\bin\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_0...

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    - Loop Controller for IMPD bind, search, search exact, unbind
      - 1-Bind to IMPD
      - 2-IMPD Base Query
      - 3-IMPD Exact Query
      - 4-Unbind from IMPD
    - View Results Tree for IMPD
    - View Results in Table for IMPD
    - Graph Results for IMPD
    - Response Time Graph for IMPD
  - Thread Group - TEST IMPS Router to IMPD Data Directories (CA Directory)
    - Loop Controller for IMPS Router bind, search, search exact, unbind
      - 1-Bind to IMPS Router
      - 2-IMPS Router Base Query
      - 3-IMPS Router Exact Query
      - 4-Unbind from IMPS Router
    - View Results Tree for IMPS Router
    - View Results in Table for IMPS Router
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    - Response Time Graph for IMPS Router
  - WorkBench

Test Plan

Name: Test Plan for IMCD (41389) IMPS (20389) IMPS Router (20391) and IMPD (20394) with no SSL

Comments: Run all in parallel or change selection to run each "Thread Group" one at a time. AB 2015-12-02

User Defined Variables

Name:	Value
IMCD_HostName	192.168.92.129
IMCD_Bind_DN	cn=diradmin,ou=serviceaccount,ou=cam,o=ca
IMPS_HostName	192.168.92.129
IMPS_Bind_DN	eTGlobalUserName=idmadmin,eTGlobalUserUserContainerName=Global User,eTNamespaceName=CommonObjects,dc=im,dc=eta
IMPD_HostName	192.168.92.129
IMPD_Bind_DN	eTDSAContainerName=DSAs,eTNamespaceName=CommonObjects,dc=etadb
JMETER_DATA_FOLDER	C:\TEMP\JMETER

Define useful variables here

Hostnames & Bind DN & the Data Folder for any Output are useful

Detail Add Add from Clipboard Delete Up Down

☐ Run Thread Groups consecutively (i.e. run groups one at a time)

☑ Run tearDown Thread Groups after shutdown of main threads

☐ Functional Test Mode (i.e. save Response Data and Sampler Data)

Selecting Functional Test Mode may adversely affect performance.

Add directory or jar to classpath Browse... Delete Clear

Library

```
715 2015/12/02 17:21:10 INFO  - jmeter.protocol.ldap.sampler.LDAPExtSampler: context and LdapExtClients removed
716 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
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File Edit Search Run Options Help

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  - Thread Group - TEST IMPD (CA Directory)
    - Loop Controller for IMPD bind, search, search exact,
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      - 2-IMPD Base Query
      - 3-IMPD Exact Query
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      - 4-Unbind from IMPS Router
    - View Results Tree for IMPS Router
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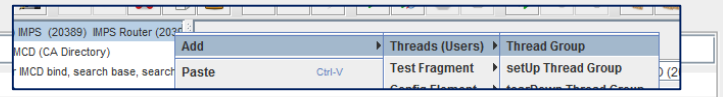
- WorkBench

Thread Group

Name: Thread Group - TEST IMCD (CA Directory)

Comments: Number of threads (users) =50 and ramp up over 1 min & repeat; set to continue



Action to be taken after a Sampler error

(•) Continue ( ) Start Next Thread Loop ( ) Stop Thread ( ) Stop Test ( ) Stop Test Now

Thread Properties

Number of Threads (users): 50

Ramp-Up Period (in seconds): 60

Loop Count: [ ] Forever 10

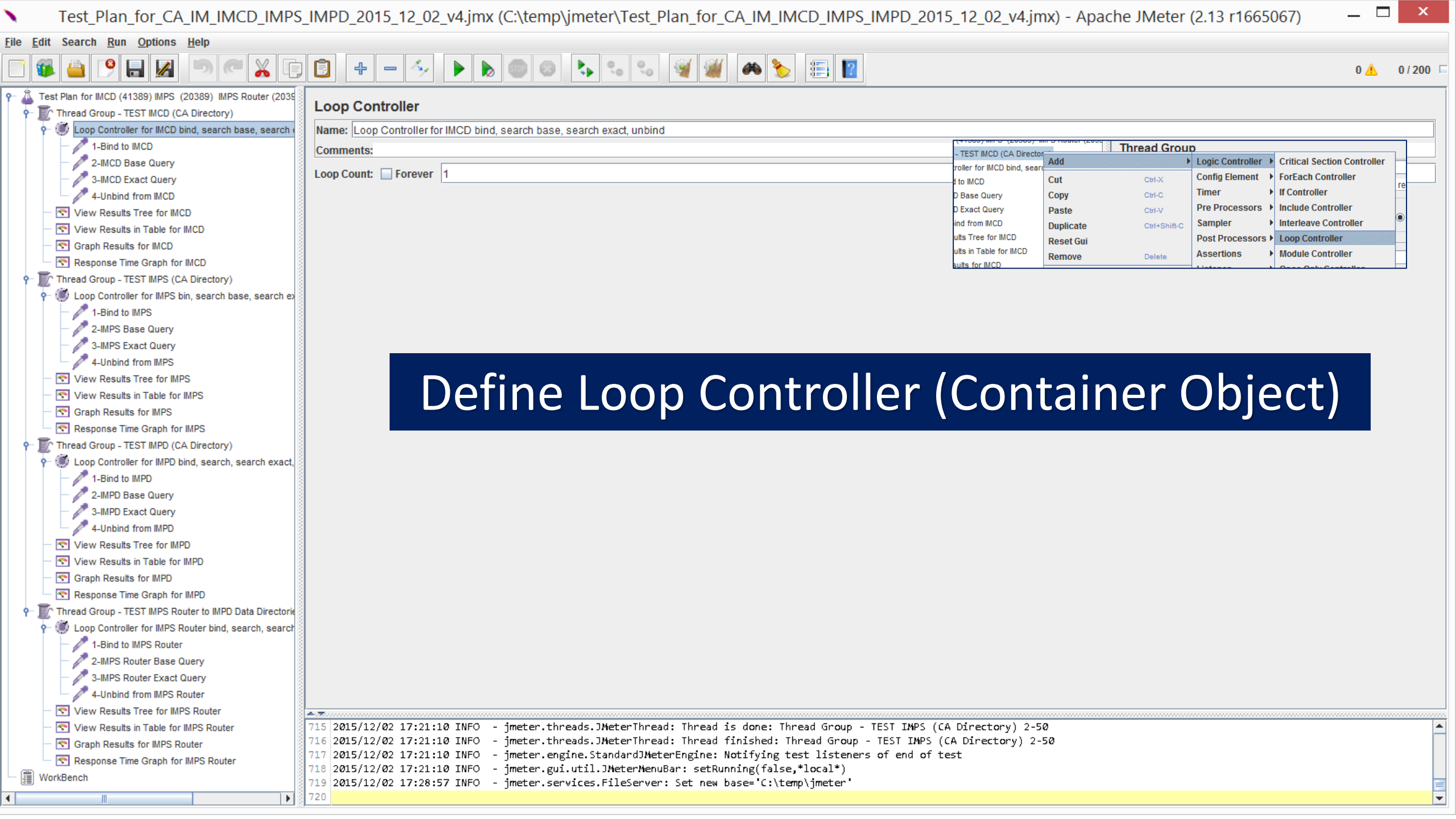
[ ] Delay Thread creation until needed

[ ] Scheduler

Define # of users (threads) & ramp up time

Start with # of threads = 50, after successful initial testing
jump this value to 10x or higher

```
715 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
716 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
717 2015/12/02 17:21:10 INFO  - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
718 2015/12/02 17:21:10 INFO  - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)
719 2015/12/02 17:28:57 INFO  - jmeter.services.FileServer: Set new base='C:\temp\jmeter'
720
```


Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (C:\temp\jmeter\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx) - Apache JMeter (2.13 r1665067)
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Response Time Graph for IMPS
Thread Group - TEST IMPD (CA Directory)
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Thread Group - TEST IMPS Router to IMPD Data Directorie
Loop Controller for IMPS Router bind, search, search
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3-IMPS Router Exact Query
4-Unbind from IMPS Router
View Results Tree for IMPS Router
View Results in Table for IMPS Router
Graph Results for IMPS Router
Response Time Graph for IMPS Router
WorkBench
Loop Controller
Name: Loop Controller for IMCD bind, search base, search exact, unbind
Comments:
Loop Count: Forever 1
Thread Group
Add
Cut Ctrl-X
Copy Ctrl-C
Paste Ctrl-V
Duplicate Ctrl+Shift-C
Reset Gui
Remove Delete
Logic Controller
Config Element
Timer
Pre Processors
Sampler
Post Processors
Assertions
Critical Section Controller
ForEach Controller
If Controller
Include Controller
Interleave Controller
Loop Controller
Module Controller
Define Loop Controller (Container Object)
715 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
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719 2015/12/02 17:28:57 INFO - jmeter.services.FileServer: Set new base='C:\temp\jmeter'
720

Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (I:\Backup\download\apache-jmeter-2.13\apache-jmeter-2.13\bin\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_0...

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    - View Results in Table for IMPS Router
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    - Response Time Graph for IMPS Router
  - WorkBench

LDAP Extended Request

Name: 1-Bind to IMCD

Comments: Leave BASE DN empty to avoid impacting the RELATIVE BASE DN in the other queries

Test Configuration

(•) Thread Bind ( ) Thread Unbind ( ) Single bind/unbind ( ) Rename entry

Test

( ) Add test ( ) Deletion test ( ) Search test ( ) Compare ( ) Modification test

Servername : ${IMCD_HostName}

Port: 41389

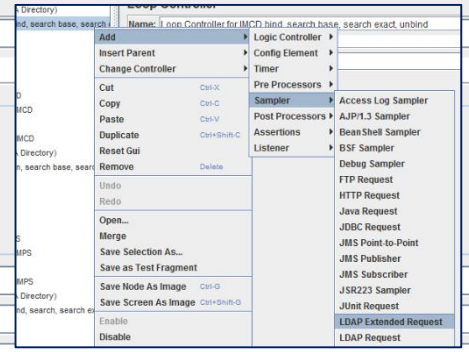
DN:

Username ${IMCD_Bind_DN}

Password ••••••••••

Connection timeout (in milliseconds)

[ ] Use Secure LDAP Protocol ?



Initial BIND is always required.

However, leave the “DN” field blank; to avoid impacting the following Actions’ base DN. The Actions’ base DN is “relative” to this BIND DN per Jmeter documentation. If there is an overlap, error message return for an action may state “Object Not Found”

```
715 2015/12/02 17:21:10 INFO  - jmeter.protocol.ldap.sampler.LDAPExtSampler: context and LdapExtClients removed
716 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
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LDAP Extended Request

Name: 2-IMCD Base Query

Comments:

Test Configuration

Test

Thread Bind | Thread Unbind | Single bind/unbind | Rename entry

Add test | Deletion test | Search test | Compare | Modification test

Search base: ou=cam,o=ca

Search Filter: (objectClass=*)

Scope: Perform baseobject search

Size limit: 1000

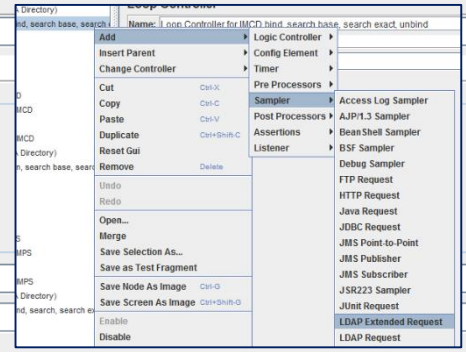
Time limit:

Attributes:

Return object

Dereference aliases

Parse the search results ?



Validate Base Query

```
715 2015/12/02 17:21:10 INFO  - jmeter.protocol.ldap.sampler.LDAPExtSampler: context and LdapExtClients removed
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  - Thread Group - TEST IMPS Router to IMPD Data Directorie
    - Loop Controller for IMPS Router bind, search, search
      - 1-Bind to IMPS Router
      - 2-IMPS Router Base Query
      - 3-IMPS Router Exact Query
      - 4-Unbind from IMPS Router
    - View Results Tree for IMPS Router
    - View Results in Table for IMPS Router
    - Graph Results for IMPS Router
    - Response Time Graph for IMPS Router
  - WorkBench

LDAP Extended Request

Name: 3-IMCD Exact Query

Comments: Test without Return Object & Parse Then retest with to see any deltas

Test Configuration

Thread Bind | Thread Unbind | Single bind/unbind | Rename entry

Test

Add test | Deletion test | Search test | Compare | Modification test

Search base: ou=serviceaccount,ou=cam,o=ca

Search Filter: (&(objectClass=person)(cn=diradmin))

Scope: Perform subtree search

Size limit

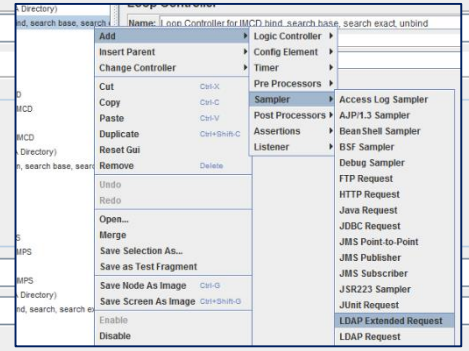
Time limit

Attributes

Return object

Dereference aliases

Parse the search results ?



Validate Exact Search Query

```
715 2015/12/02 17:21:10 INFO  - jmeter.protocol.ldap.sampler.LDAPExtSampler: context and LdapExtClients removed
716 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
717 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
718 2015/12/02 17:21:10 INFO  - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
719 2015/12/02 17:21:10 INFO  - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)
720
```

Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (I:\Backup\download\apache-jmeter-2.13\apache-jmeter-2.13\bin\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_0...

File Edit Search Run Options Help

0 0 / 200

- Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039
  - Thread Group - TEST IMCD (CA Directory)
    - Loop Controller for IMCD bind, search base, search (
      - 1-Bind to IMCD
      - 2-IMCD Base Query
      - 3-IMCD Exact Query
      - 4-Unbind from IMCD
    - View Results Tree for IMCD
    - View Results in Table for IMCD
    - Graph Results for IMCD
    - Response Time Graph for IMCD
  - Thread Group - TEST IMPS (CA Directory)
    - Loop Controller for IMPS bin, search base, search ex
      - 1-Bind to IMPS
      - 2-IMPS Base Query
      - 3-IMPS Exact Query
      - 4-Unbind from IMPS
    - View Results Tree for IMPS
    - View Results in Table for IMPS
    - Graph Results for IMPS
    - Response Time Graph for IMPS
  - Thread Group - TEST IMPD (CA Directory)
    - Loop Controller for IMPD bind, search, search exact,
      - 1-Bind to IMPD
      - 2-IMPD Base Query
      - 3-IMPD Exact Query
      - 4-Unbind from IMPD
    - View Results Tree for IMPD
    - View Results in Table for IMPD
    - Graph Results for IMPD
    - Response Time Graph for IMPD
  - Thread Group - TEST IMPS Router to IMPD Data Directorie
    - Loop Controller for IMPS Router bind, search, search
      - 1-Bind to IMPS Router
      - 2-IMPS Router Base Query
      - 3-IMPS Router Exact Query
      - 4-Unbind from IMPS Router
    - View Results Tree for IMPS Router
    - View Results in Table for IMPS Router
    - Graph Results for IMPS Router
    - Response Time Graph for IMPS Router
  - WorkBench

LDAP Extended Request

Name: 4-Unbind from IMCD

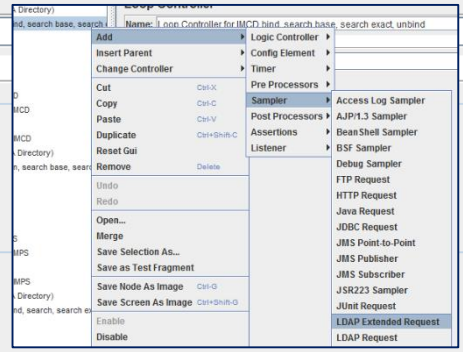
Comments:

Test Configuration

Thread Bind (•) Thread Unbind ( ) Single bind/unbind ( ) Rename entry

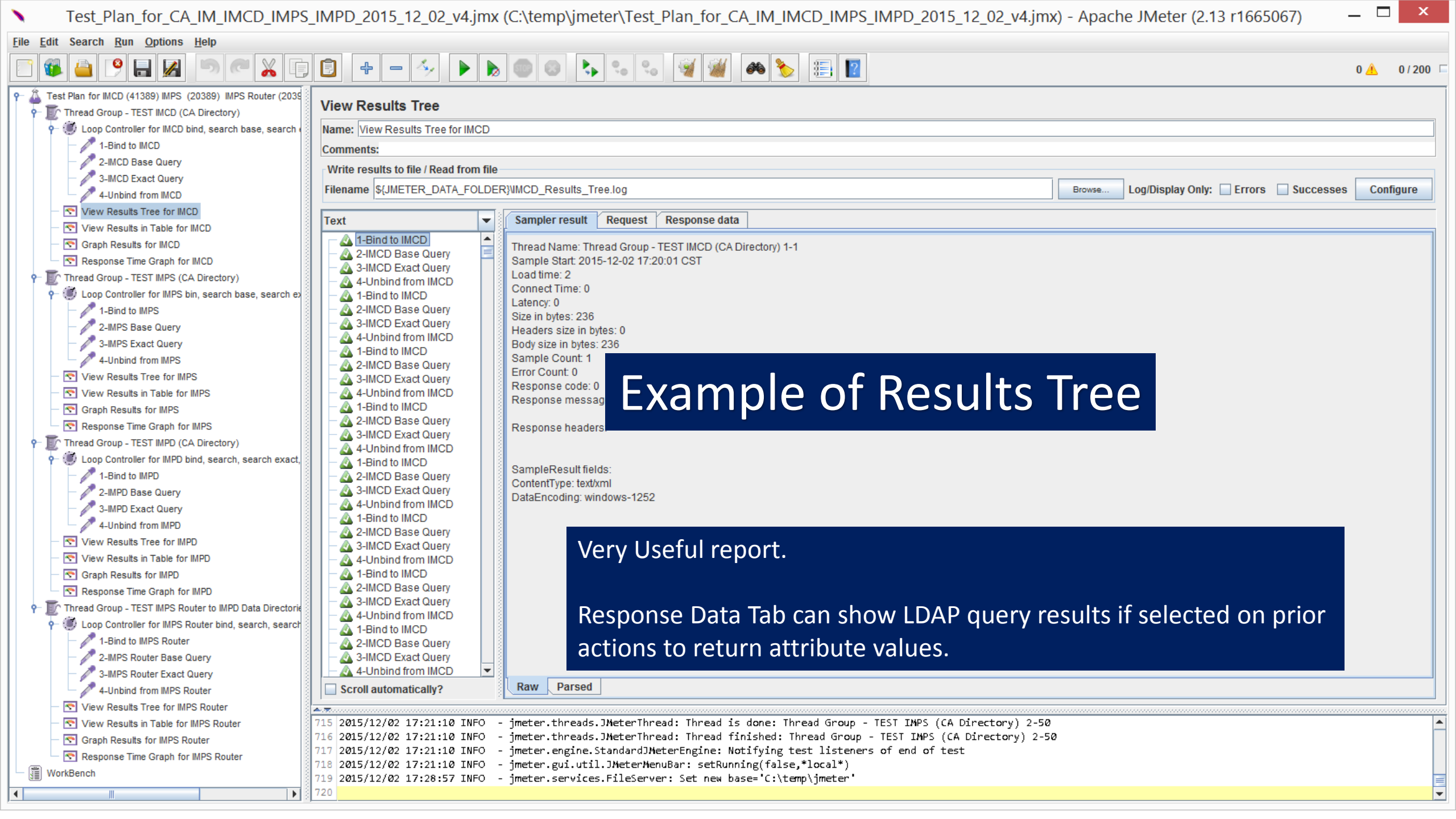
Test

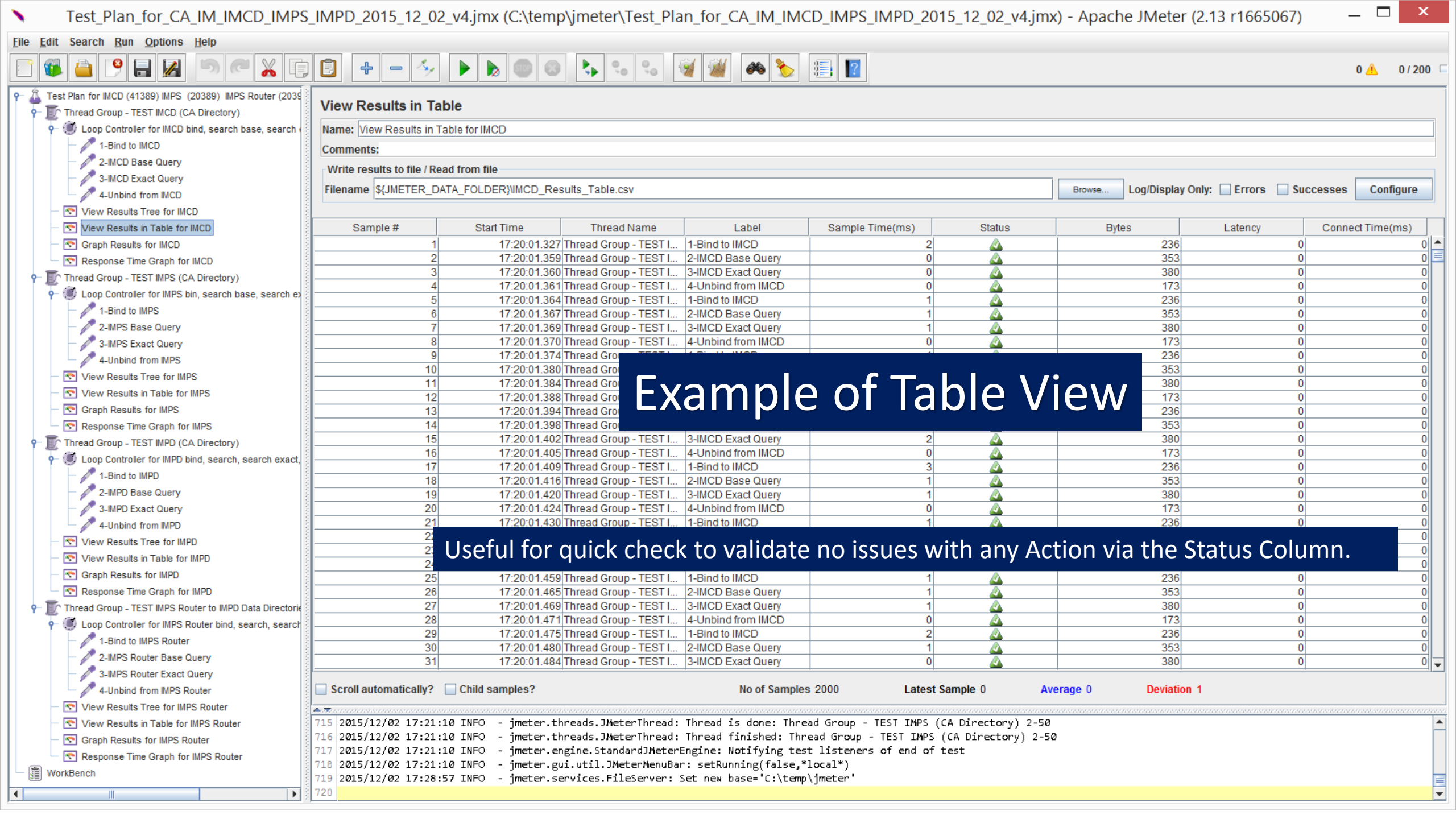
( ) Add test ( ) Deletion test ( ) Search test ( ) Compare ( ) Modification test

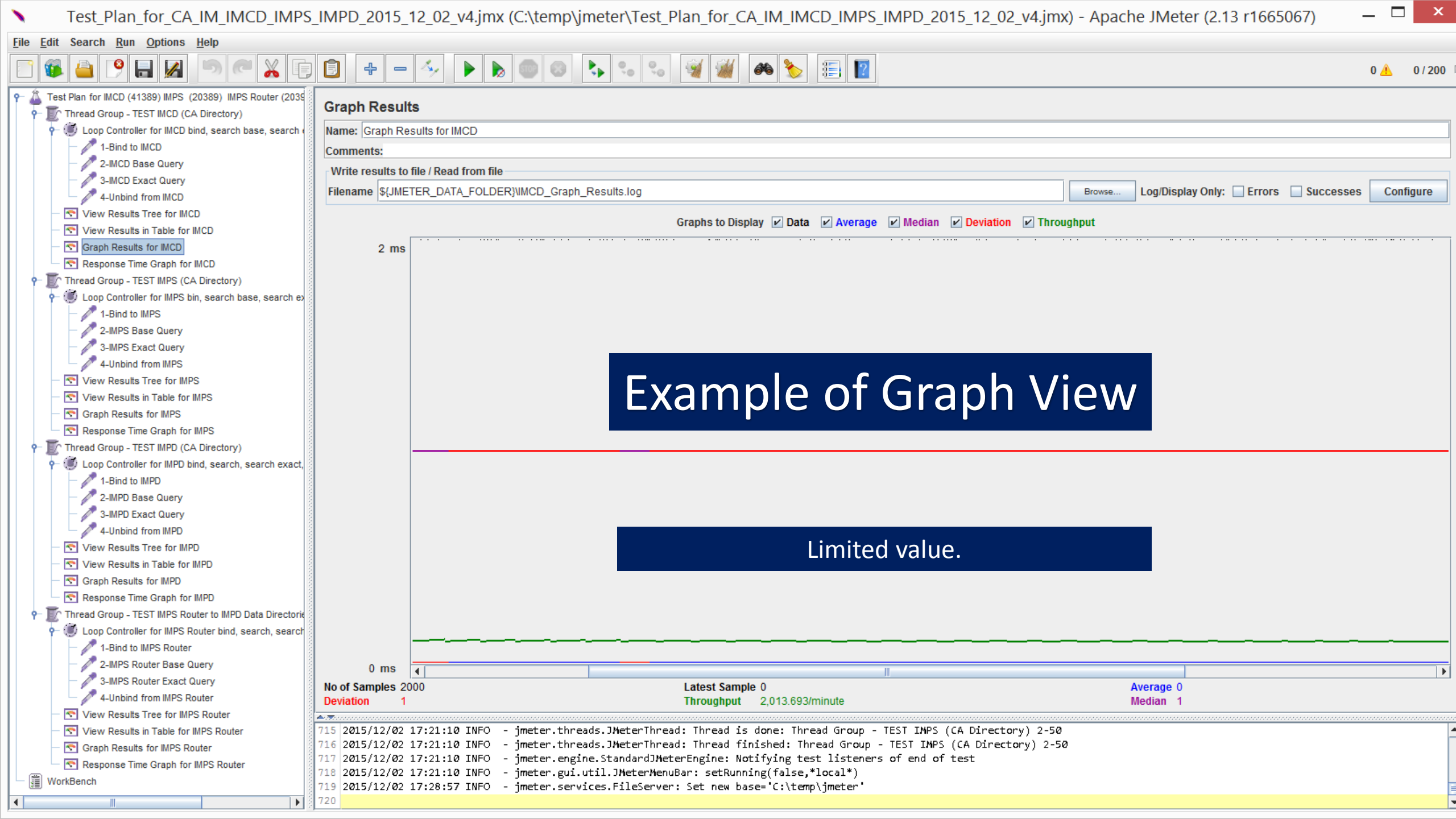


Un-BIND to reset to initial conditions.
Required to ensure connections are closed for proper test conditions.

```
715 2015/12/02 17:21:10 INFO  - jmeter.protocol.ldap.sampler.LDAPExtSampler: context and LdapExtClients removed
716 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
717 2015/12/02 17:21:10 INFO  - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
718 2015/12/02 17:21:10 INFO  - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
719 2015/12/02 17:21:10 INFO  - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)
720
```


Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (C:\temp\jmeter\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx) - Apache JMeter (2.13 r1665067)
File Edit Search Run Options Help
Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039
Thread Group - TEST IMCD (CA Directory)
Loop Controller for IMCD bind, search base, search
1-Bind to IMCD
2-IMCD Base Query
3-IMCD Exact Query
4-Unbind from IMCD
View Results Tree for IMCD
View Results in Table for IMCD
Graph Results for IMCD
Response Time Graph for IMCD
Thread Group - TEST IMPS (CA Directory)
Loop Controller for IMPS bin, search base, search ex
1-Bind to IMPS
2-IMPS Base Query
3-IMPS Exact Query
4-Unbind from IMPS
View Results Tree for IMPS
View Results in Table for IMPS
Graph Results for IMPS
Response Time Graph for IMPS
Thread Group - TEST IMPD (CA Directory)
Loop Controller for IMPD bind, search, search exact,
1-Bind to IMPD
2-IMPD Base Query
3-IMPD Exact Query
4-Unbind from IMPD
View Results Tree for IMPD
View Results in Table for IMPD
Graph Results for IMPD
Response Time Graph for IMPD
Thread Group - TEST IMPS Router to IMPD Data Directorie
Loop Controller for IMPS Router bind, search, search
1-Bind to IMPS Router
2-IMPS Router Base Query
3-IMPS Router Exact Query
4-Unbind from IMPS Router
View Results Tree for IMPS Router
View Results in Table for IMPS Router
Graph Results for IMPS Router
Response Time Graph for IMPS Router
WorkBench
0 0 / 200
View Results Tree
Name: View Results Tree for IMCD
Comments:
Write results to file / Read from file
Filename ${JMETER_DATA_FOLDER}\IMCD_Results_Tree.log
Browse... Log/Display Only: Errors Successes Configure
Text
1-Bind to IMCD
2-IMCD Base Query
3-IMCD Exact Query
4-Unbind from IMCD
Scroll automatically?
Sampler result Request Response data
Thread Name: Thread Group - TEST IMCD (CA Directory) 1-1
Sample Start: 2015-12-02 17:20:01 CST
Load time: 2
Connect Time: 0
Latency: 0
Size in bytes: 236
Headers size in bytes: 0
Body size in bytes: 236
Sample Count: 1
Error Count: 0
Response code: 0
Response messag
Response headers
SampleResult fields:
ContentType: text/xml
DataEncoding: windows-1252
Raw Parsed
Example of Results Tree
Very Useful report.
Response Data Tab can show LDAP query results if selected on prior actions to return attribute values.
715 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
716 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
717 2015/12/02 17:21:10 INFO - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
718 2015/12/02 17:21:10 INFO - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)
719 2015/12/02 17:28:57 INFO - jmeter.services.FileServer: Set new base='C:\temp\jmeter'
720


Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (C:\temp\jmeter\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx) - Apache JMeter (2.13 r1665067)
File Edit Search Run Options Help
Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039
Thread Group - TEST IMCD (CA Directory)
Loop Controller for IMCD bind, search base, search
1-Bind to IMCD
2-IMCD Base Query
3-IMCD Exact Query
4-Unbind from IMCD
View Results Tree for IMCD
View Results in Table for IMCD
Graph Results for IMCD
Response Time Graph for IMCD
Thread Group - TEST IMPS (CA Directory)
Loop Controller for IMPS bin, search base, search ex
1-Bind to IMPS
2-IMPS Base Query
3-IMPS Exact Query
4-Unbind from IMPS
View Results Tree for IMPS
View Results in Table for IMPS
Graph Results for IMPS
Response Time Graph for IMPS
Thread Group - TEST IMPD (CA Directory)
Loop Controller for IMPD bind, search, search exact,
1-Bind to IMPD
2-IMPD Base Query
3-IMPD Exact Query
4-Unbind from IMPD
View Results Tree for IMPD
View Results in Table for IMPD
Graph Results for IMPD
Response Time Graph for IMPD
Thread Group - TEST IMPS Router to IMPD Data Directorie
Loop Controller for IMPS Router bind, search, search
1-Bind to IMPS Router
2-IMPS Router Base Query
3-IMPS Router Exact Query
4-Unbind from IMPS Router
View Results Tree for IMPS Router
View Results in Table for IMPS Router
Graph Results for IMPS Router
Response Time Graph for IMPS Router
WorkBench
0 0 / 200
View Results in Table
Name: View Results in Table for IMCD
Comments:
Write results to file / Read from file
Filename ${JMETER_DATA_FOLDER}\IMCD_Results_Table.csv
Browse... Log/Display Only: Errors Successes Configure
Sample # Start Time Thread Name Label Sample Time(ms) Status Bytes Latency Connect Time(ms)
1 17:20:01.327 Thread Group - TEST I... 1-Bind to IMCD 2 236 0 0
2 17:20:01.359 Thread Group - TEST I... 2-IMCD Base Query 0 353 0 0
3 17:20:01.360 Thread Group - TEST I... 3-IMCD Exact Query 0 380 0 0
4 17:20:01.361 Thread Group - TEST I... 4-Unbind from IMCD 0 173 0 0
5 17:20:01.364 Thread Group - TEST I... 1-Bind to IMCD 1 236 0 0
6 17:20:01.367 Thread Group - TEST I... 2-IMCD Base Query 1 353 0 0
7 17:20:01.369 Thread Group - TEST I... 3-IMCD Exact Query 1 380 0 0
8 17:20:01.370 Thread Group - TEST I... 4-Unbind from IMCD 0 173 0 0
9 17:20:01.374 Thread Gro 236 0 0
10 17:20:01.380 Thread Gro 353 0 0
11 17:20:01.384 Thread Gro 380 0 0
12 17:20:01.388 Thread Gro 173 0 0
13 17:20:01.394 Thread Gro 236 0 0
14 17:20:01.398 Thread Gro 353 0 0
15 17:20:01.402 Thread Group - TEST I... 3-IMCD Exact Query 2 380 0 0
16 17:20:01.405 Thread Group - TEST I... 4-Unbind from IMCD 0 173 0 0
17 17:20:01.409 Thread Group - TEST I... 1-Bind to IMCD 3 236 0 0
18 17:20:01.416 Thread Group - TEST I... 2-IMCD Base Query 1 353 0 0
19 17:20:01.420 Thread Group - TEST I... 3-IMCD Exact Query 1 380 0 0
20 17:20:01.424 Thread Group - TEST I... 4-Unbind from IMCD 0 173 0 0
21 17:20:01.430 Thread Group - TEST I... 1-Bind to IMCD 1 236 0
25 17:20:01.459 Thread Group - TEST I... 1-Bind to IMCD 1 236 0 0
26 17:20:01.465 Thread Group - TEST I... 2-IMCD Base Query 1 353 0 0
27 17:20:01.469 Thread Group - TEST I... 3-IMCD Exact Query 1 380 0 0
28 17:20:01.471 Thread Group - TEST I... 4-Unbind from IMCD 0 173 0 0
29 17:20:01.475 Thread Group - TEST I... 1-Bind to IMCD 2 236 0 0
30 17:20:01.480 Thread Group - TEST I... 2-IMCD Base Query 1 353 0 0
31 17:20:01.484 Thread Group - TEST I... 3-IMCD Exact Query 0 380 0 0
Example of Table View
Useful for quick check to validate no issues with any Action via the Status Column.
Scroll automatically? Child samples? No of Samples 2000 Latest Sample 0 Average 0 Deviation 1
715 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
716 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
717 2015/12/02 17:21:10 INFO - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
718 2015/12/02 17:21:10 INFO - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)
719 2015/12/02 17:28:57 INFO - jmeter.services.FileServer: Set new base='C:\temp\jmeter'
720


Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (C:\temp\jmeter\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx) - Apache JMeter (2.13 r1665067)
File Edit Search Run Options Help
Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039
Thread Group - TEST IMCD (CA Directory)
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1-Bind to IMCD
2-IMCD Base Query
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4-Unbind from IMCD
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View Results in Table for IMCD
Graph Results for IMCD
Response Time Graph for IMCD
Thread Group - TEST IMPS (CA Directory)
Loop Controller for IMPS bin, search base, search ex
1-Bind to IMPS
2-IMPS Base Query
3-IMPS Exact Query
4-Unbind from IMPS
View Results Tree for IMPS
View Results in Table for IMPS
Graph Results for IMPS
Response Time Graph for IMPS
Thread Group - TEST IMPD (CA Directory)
Loop Controller for IMPD bind, search, search exact,
1-Bind to IMPD
2-IMPD Base Query
3-IMPD Exact Query
4-Unbind from IMPD
View Results Tree for IMPD
View Results in Table for IMPD
Graph Results for IMPD
Response Time Graph for IMPD
Thread Group - TEST IMPS Router to IMPD Data Directorie
Loop Controller for IMPS Router bind, search, search
1-Bind to IMPS Router
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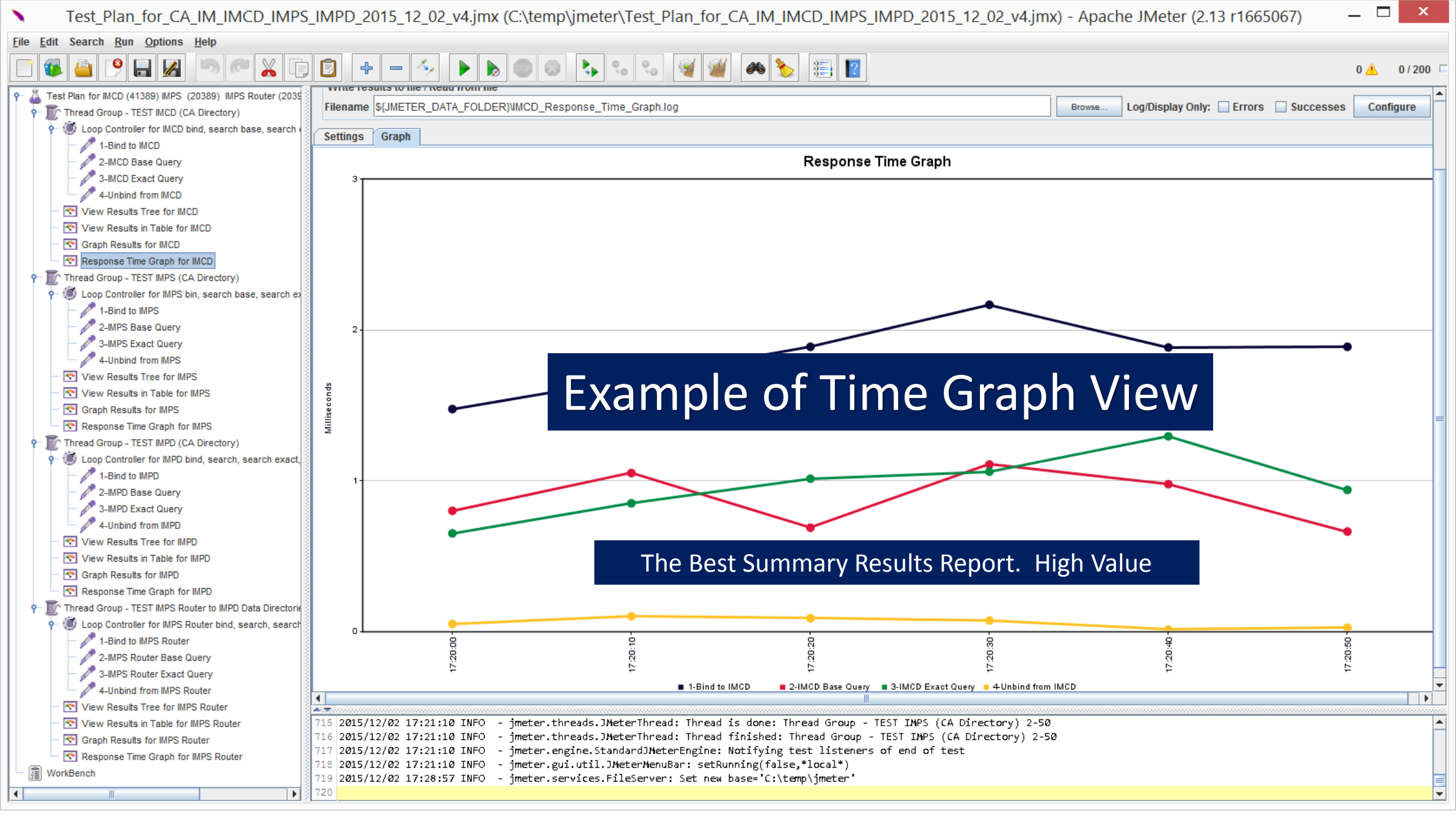
3-IMPS Router Exact Query
4-Unbind from IMPS Router
View Results Tree for IMPS Router
View Results in Table for IMPS Router
Graph Results for IMPS Router
Response Time Graph for IMPS Router
WorkBench
0 0 / 200
Graph Results
Name: Graph Results for IMCD
Comments:
Write results to file / Read from file
Filename ${JMETER_DATA_FOLDER}\IMCD_Graph_Results.log
Browse... Log/Display Only: Errors Successes Configure
Graphs to Display Data Average Median Deviation Throughput
2 ms
0 ms
Example of Graph View
Limited value.
No of Samples 2000
Latest Sample 0
Average 0
Deviation 1
Throughput 2,013.693/minute
Median 1
715 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
716 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
717 2015/12/02 17:21:10 INFO - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
718 2015/12/02 17:21:10 INFO - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)
719 2015/12/02 17:28:57 INFO - jmeter.services.FileServer: Set new base='C:\temp\jmeter'
720


Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx (C:\temp\jmeter\Test_Plan_for_CA_IM_IMCD_IMPS_IMPD_2015_12_02_v4.jmx) - Apache JMeter (2.13 r1665067)
File Edit Search Run Options Help
Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039
Thread Group - TEST IMCD (CA Directory)
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3-IMPS Exact Query
4-Unbind from IMPS
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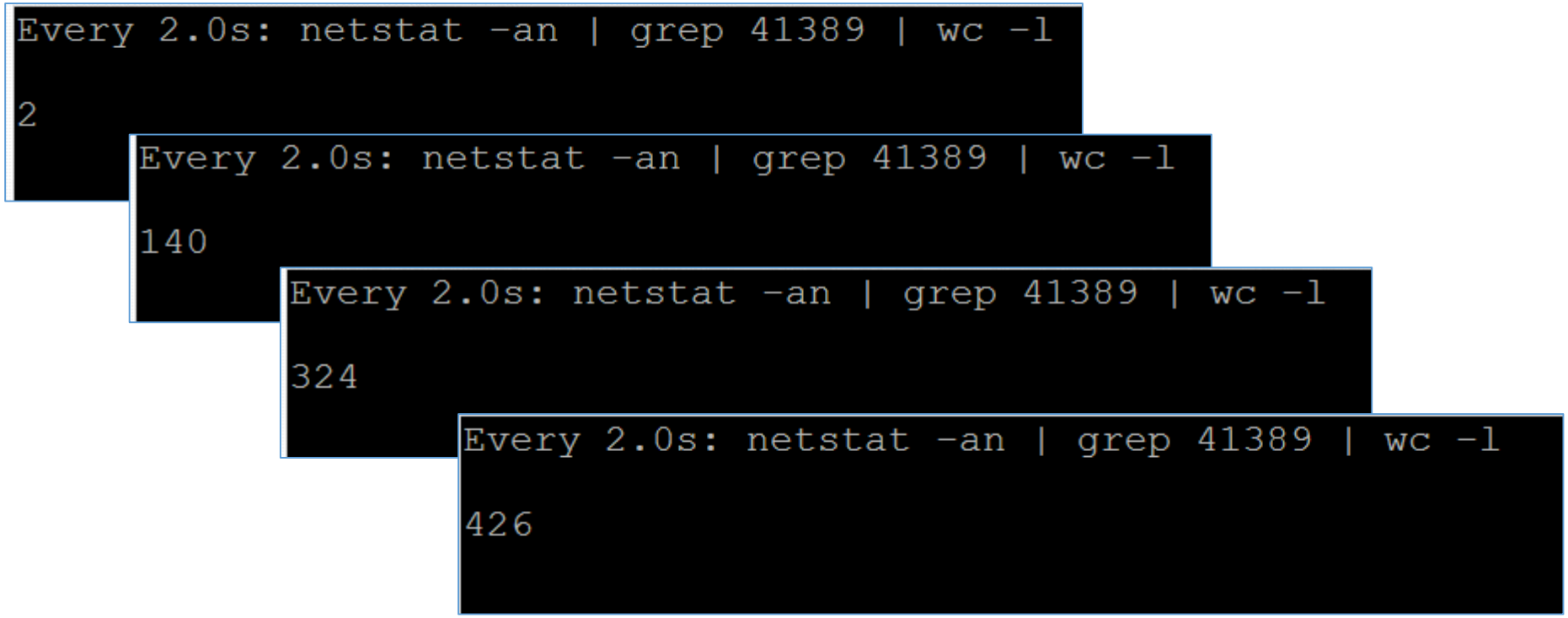
View Results in Table for IMPS
Graph Results for IMPS
Response Time Graph for IMPS
Thread Group - TEST IMPD (CA Directory)
Loop Controller for IMPD bind, search, search exact,
1-Bind to IMPD
2-IMPD Base Query
3-IMPD Exact Query
4-Unbind from IMPD
View Results Tree for IMPD
View Results in Table for IMPD
Graph Results for IMPD
Response Time Graph for IMPD
Thread Group - TEST IMPS Router to IMPD Data Directorie
Loop Controller for IMPS Router bind, search, search
1-Bind to IMPS Router
2-IMPS Router Base Query
3-IMPS Router Exact Query
4-Unbind from IMPS Router
View Results Tree for IMPS Router
View Results in Table for IMPS Router
Graph Results for IMPS Router
Response Time Graph for IMPS Router
WorkBench
0 0 / 200
Filename ${JMETER_DATA_FOLDER}\IMCD_Response_Time_Graph.log
Browse... Log/Display Only: Errors Successes Configure
Settings Graph
Response Time Graph
Milliseconds
3
2
1
0
17:20:00
17:20:10
17:20:20
17:20:30
17:20:40
17:20:50
1-Bind to IMCD
2-IMCD Base Query
3-IMCD Exact Query
4-Unbind from IMCD
Example of Time Graph View
The Best Summary Results Report. High Value
715 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
716 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
717 2015/12/02 17:21:10 INFO - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
718 2015/12/02 17:21:10 INFO - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)
719 2015/12/02 17:28:57 INFO - jmeter.services.FileServer: Set new base='C:\temp\jmeter'
720

Monitor network connections with netstat to the Directory Servers from workstation/desktop



Example where # of threads are set to 500 over 60 seconds ramp up time.

Note: Always run Jmeter test suite from a desktop/workstation to ensure network latency is captured.
If Jmeter is run directly on the server (IMPS), then results will be lower and may skew expectations during remote connection performance.

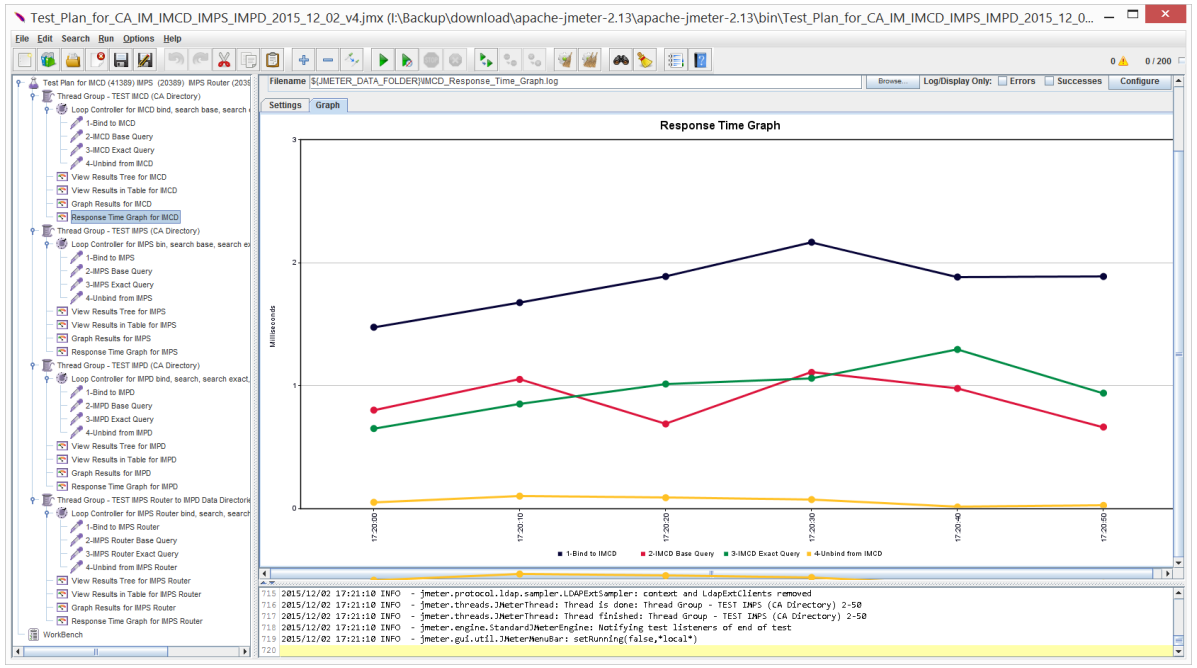
Export of the IM Jmeter Test Lab

1. Save to disk (XML file with jmx extension)
2. Open / Load with Latest Jmeter
   a. http://jmeter.apache.org/ (Require Java 1.6+)
3. Update the configuration entry with variables & ports for your servers.
4. Test with current settings
5. Review and adjust settings for other tests
6. Add to for delete/modify/creation operations

jmx

Scalability Validation: Use Jmeter for testing Password Resets

1. Install Apache Jmeter & Jxplorer on the IMPS (Provisioning Server)
2. Use Jxplorer to connect to the IMPS 20389 and select the DN attribute of an "Explored" Endpoint Account (EA)
   a. This "pointer object" will ONLY be created after an initial Explore operation to the endpoint. When this object is select (via IMPS 20389), the IMPS services will query the CCS/JCS connector for the endpoint; and pull back or update the endpoint account.
3. Open Apache Jmeter & Create a Test Plan with two (2) sections
   a. SECTION ONE: Password Reset via IMPS & Connectors to managed endpoints
      a. Step 01: Bind to IMPS Service (IMPS Host + 20389/20390) with Admin Account (etaadmin/idmadmin)
      b. Step 02: Exact LDAP query : Query EA [Copy from Jxplorer]
         i. eTADSAccountName=BugsBunny,eTADSContainerName=Users,eTADSDirectoryName=TEST,eTNamespaceName=ActiveDirectory,dc=im,dc=eta
            a) Format: eTXXXAccountName where XXX = ADS, ACC, AS4, DB2, DBZ, ETC, FND, KRB, LND, N16, NIS, ORA, PLS, RAC, RSA, SAP Exceptions: EIAM and DYN (all CX connectors)
            b) Other exceptions: eTACFLid=BugsBunny,eTLIDContainerName= [alternative format: eTACFLid, eTTSSAcid, eTSBLUser, eTSQLLogin, eTPPSUser]
         ii. eTDYNAccount=BugsBunny,eTDYNContainerName= {all CX connectors}
      c. Step 03: Exact Account LDAP update: Update userPassword [Copy from Jxplorer]
      d. Step 04: Unbind from IMPS Service
   b. SECTION TWO: Password Reset directly to userstores
4. Ramp up testing from 1-50 users over 60 seconds.
5. Monitor Output
   a. Create four (4) reports



May also use other tools, e.g. HP Load Runner, for same performance/ scalability validation

To view all endpoint objects Names/Classes without installing or using Jxplorer: **IMPS_HOME\bin\dumpptt.exe –f –of c:\temp\imps-dumppt.txt**

Example of User Store Tuning for IMPD

Measure user store search performance [Use Apache Jmeter, CA Directory DxSoak CLI, or other performance monitoring tools]

For optimum performance, CA Identity Manager policy evaluation searches should complete within **10-20 milliseconds.**
To ensure that CA Identity Manager can consistently complete these searches in the recommended time, consider testing search performance under multiple load conditions.
You can also use this measurement to determine when a user store reaches its physical limits and additional servers are required for load balancing.

Index attributes

Index each attribute that is used in a role policy or identity policy. Indexing attributes can provide significant performance improvements.
Note: For information about indexing attributes, see the documentation for the LDAP directory or relational database that contains the user store.

Within the CA Directory solution: DXHOME\dxserver\config\servers\hostname-{main,co,inc,notify)-impd.dxi files [validate these entries exist in ALL four (4) DSAs]

```
set cache-index = all-attributes;
set lookup-cache = true;
```

Cache LDAP Binds

In CA Identity Manager, all directory LDAP binds are executed by the proxy user defined on the CA Identity Manager Directory object. For each connection, the same LDAP bind occurs for this same user repeatedly. If you are using an LDAP directory as a user store, configure the directory to cache LDAP binds (or sessions), if the directory supports it.

Within the CA Directory solution: DXHOME\dxserver\config\settings\impd.dxc [append to end to end of single file, referenced by all four (4) IMPD DSAs]

```
set password-storage = sha-512;
set prune-oc-parents = true;          {Removes redundant superior object classes when new entries are created.}

### IMPD Performance Tokens ###
### set mimic-netscape-for-siteminder = true;
set concurrent-bind-user = <dc etadb><eTNamespaceName CommonObjects><eTDSAContainerName DSAs>;
```

Enable user store caches

When CA Identity Manager evaluates the policy decisions for a user, that information is stored in an authorization cache. When the cached information expires, CA Identity Manager evaluates all policies for that user again. To improve performance of user store searches in subsequent policy rule evaluations, enable the user store to cache searched data, if your user store supports it.

Within the CA Directory solution: DXHOME\dxserver\config\servers\hostname-{main,co,inc,notify}-impd.dxi files [validate these entries exist in ALL four (4) DSAs]

```
set cache-index = all-attributes;
set lookup-cache = true;
```

https://support.ca.com/cadocs/0/CA%20Identity%20Manager%2012%206%205-ENU/Bookshelf_Files/HTML/idocs/index.htm?toc.htm?599187.html
https://support.ca.com/cadocs/0/CA%20Directory%2012%20SP13-ENU/Bookshelf_Files/HTML/idocs/index.htm?toc.htm?process_concurrent_binds_from_siteminder.htm
https://support.ca.com/cadocs/0/CA%20Directory%2012%20SP13-ENU/Bookshelf_Files/HTML/idocs/index.htm?toc.htm?set_concurrent-bind-user_command.htm
https://support.ca.com/cadocs/0/CA%20Directory%2012%20SP13-ENU/Bookshelf_Files/HTML/idocs/index.htm?toc.htm?set_mimic-netscape-for-siteminder_command.htm
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