

# Using Jmeter to test CA Directory Query Performance with/without Directory Routers

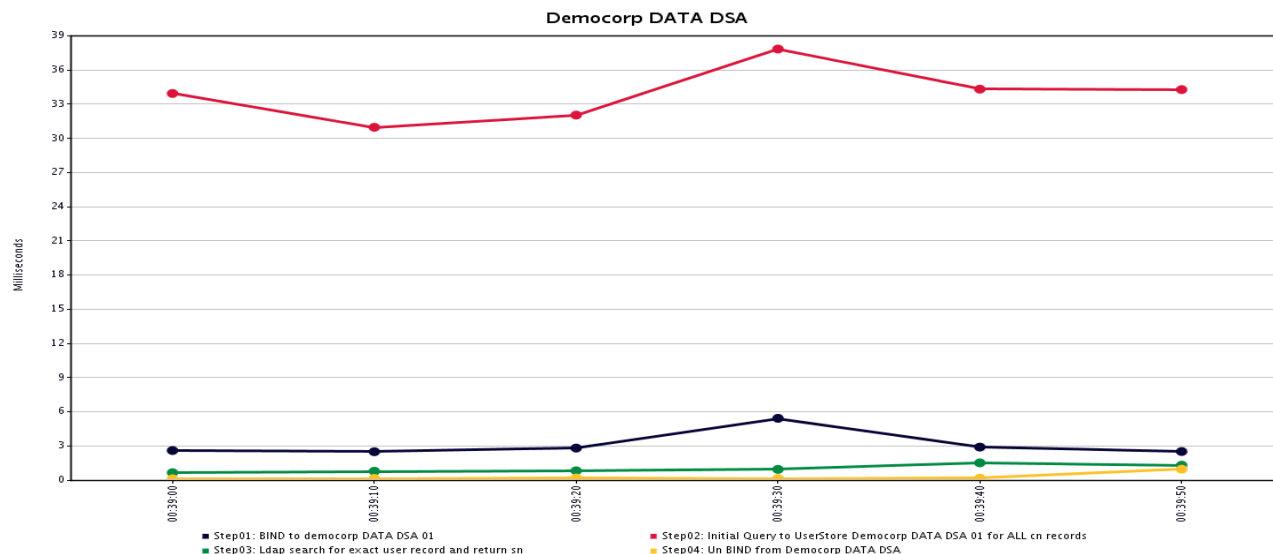
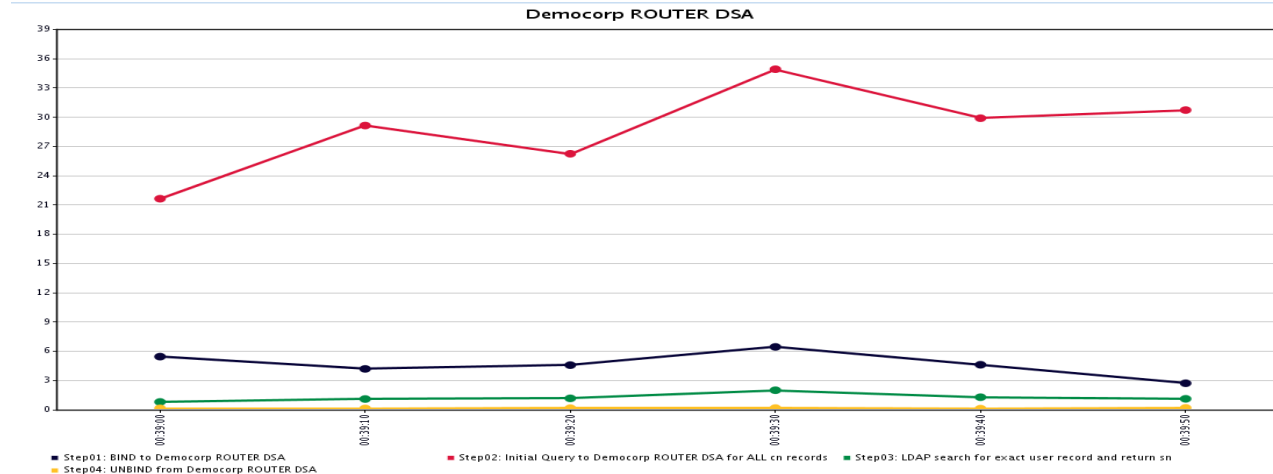
Alan Baugher

11/15/2013

# Jmeter (<http://jmeter.apache.org/>)

- Ability to load and performance test many different server/protocol types:
  - Web - HTTP, HTTPS
  - SOAP
  - FTP
  - Database via JDBC
  - **LDAP**
  - Message-oriented middleware (MOM) via JMS
  - Mail - SMTP(S), POP3(S) and IMAP(S)
  - Native commands or shell scripts
  - TCP
- Build LDAP TEST PLAN
  - <http://jmeter.apache.org/usermanual/build-ldap-test-plan.html>
- Quick reference: <http://rreddy.blogspot.com/2009/07/how-to-use-jmeter-to-do-ldapoid-load.html>

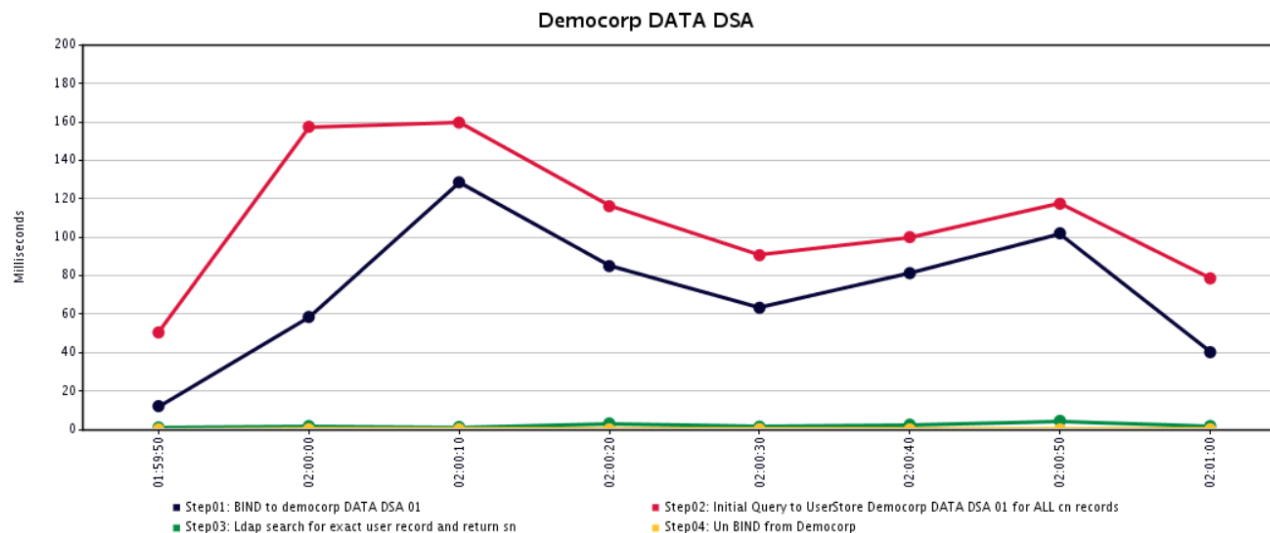
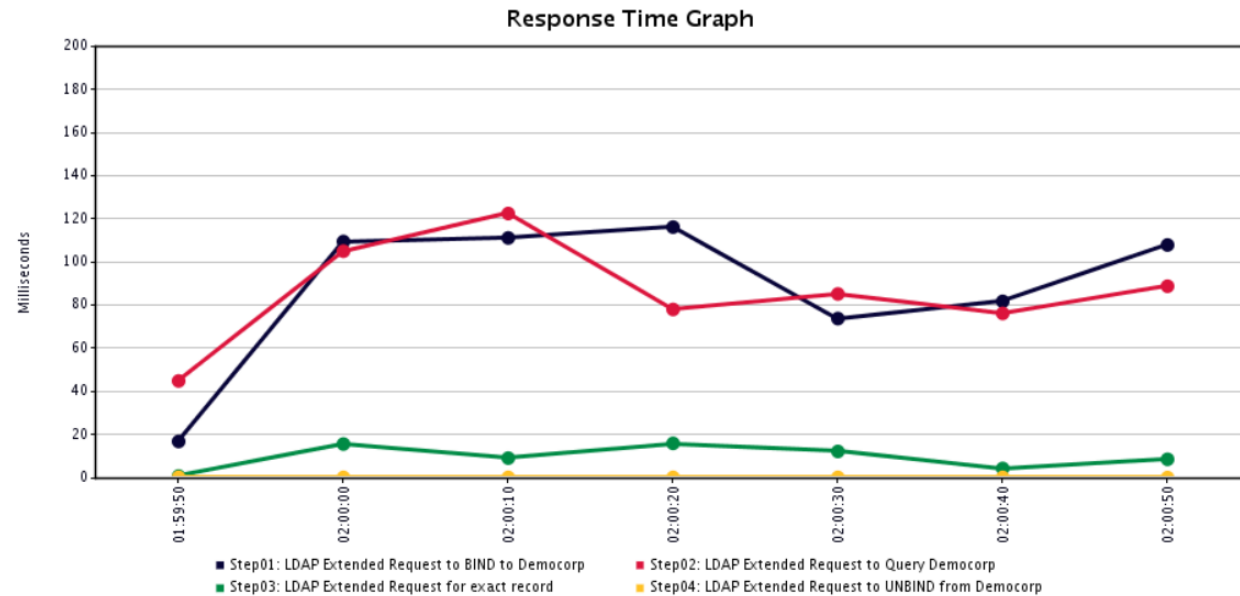
# 10 x FASTER Jmeter Results for CA Dir r12sp12



- ROUTER DSA (top graph) versus DATA DSA (bottom graph) for query responses
- Observation: If the system is NOT overloaded, then performance from Load Balancer is not much different from direct connection.
- CPU load was below 100% utilization.
- Current release is 10x faster than prior

```
root@smpls01:~  
top - 00:46:55 up 20:38, 3 users, load average: 0.91, 0.36, 0.33  
Tasks: 148 total, 1 running, 147 sleeping, 0 stopped, 0 zombie  
Cpu(s): 41.3%us, 12.7%sy, 0.0%ni, 44.7%id, 0.0%wa, 0.0%hi, 1.4%si, 0.0%st  
Mem: 1914680k total, 1836068k used, 78612k free, 41664k buffers  
Swap: 2031608k total, 228112k used, 1803496k free, 766780k cached  
  
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND  
31873 dsa 20 0 1877m 638m 12m S 75.5 34.1 3:02.17 java  
31420 dsa 20 0 625m 11m 2868 S 33.6 0.6 1:12.56 dxserver  
31200 dsa 20 0 552m 6396 2376 S 2.0 0.3 5:05.59 dxserver  
31484 dsa 20 0 561m 10m 2808 S 1.3 0.6 4:09.31 dxserver  
2099 smuser 20 0 545m 13m 7676 S 0.3 0.7 0:31.60 smpolicysrv  
31389 dsa 20 0 552m 4024 2372 S 0.3 0.2 0:00.14 dxserver  
1 root 20 0 19356 860 588 S 0.0 0.0 0:01.48 init  
2 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kthreadd  
3 root RT 0 0 0 0 S 0.0 0.0 0:00.56 migration/0  
4 root 20 0 0 0 0 S 0.0 0.0 0:00.44 ksoftirqd/0  
5 root RT 0 0 0 0 S 0.0 0.0 0:00.00 migration/0  
6 root RT 0 0 0 0 S 0.0 0.0 0:29.80 watchdog/0  
7 root RT 0 0 0 0 S 0.0 0.0 0:00.23 migration/1  
8 root RT 0 0 0 0 S 0.0 0.0 0:00.00 migration/1  
9 root 20 0 0 0 0 S 0.0 0.0 0:00.36 ksoftirqd/1  
10 root RT 0 0 0 0 S 0.0 0.0 0:00.12 watchdog/1  
11 root 20 0 0 0 0 S 0.0 0.0 0:44.82 events/0
```

# Jmeter Results for CA Dir r12sp11



- ROUTER DSA (top graph) versus DATA DSA (bottom graph) for query responses
- Observation: If the system is NOT overloaded, then performance from Load Balancer is not much different from direct connection.
- CPU load was below 100% utilization.

```
root@smpls01/tmp
top - 01:57:40 up 1 day, 15:02, 2 users, load average: 3.92, 1.13, 0.44
Tasks: 142 total, 5 running, 137 sleeping, 0 stopped, 0 zombie
Cpu(s): 92.0%us, 7.7%sy, 0.0%ni, 0.0%id, 0.0%wa, 0.0%hi, 0.3%si, 0.0%st
Mem: 1012540k total, 942028k used, 70512k free, 696k buffers
Swap: 2031608k total, 469452k used, 1562156k free, 94640k cached
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
11997	dsa	20	0	1496m	591m	5680	S	63.7	59.9	1:13.09	java
1935	dsa	20	0	561m	9400	1480	S	28.9	0.9	0:17.07	dxserver
1938	dsa	20	0	552m	5112	1016	R	4.0	0.5	535:42.92	dxserver
1941	dsa	20	0	561m	8092	1396	R	2.0	0.8	474:50.60	dxserver
2215	oracle	20	0	607m	12m	10m	S	0.3	1.3	1:31.00	oracle
2322	oracle	20	0	606m	3196	3128	S	0.3	0.3	2:18.10	oracle
1	root	20	0	19356	648	456	S	0.0	0.1	0:01.26	init
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	RT	0	0	0	0	S	0.0	0.0	0:00.00	migration/0

# JMETER CONFIGURATION FOR TESTING

- Democorp ROUTER DSA
- Democorp DATA DSA
- Delta between configurations is
  - TCP Ports defined.
  - Output Logs location/filename.

Library

☐ Scheduler



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER DSA

Step01: LDAP Extended Request to BIND to Democorp

Step02: LDAP Extended Request to Query Democorp

Step03: LDAP Extended Request for exact record

Step04: LDAP Extended Request to UNBIND from Democorp

Democorp DATA Thread Group

View Results Tree for Democorp DATA DSA

Response Time Graph for Democorp DATA DSA

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA 01

Step02: Initial Query to UserStore Democorp DATA DSA 01 for ALL cn re

Step03: Ldap search for exact user record and return sn

Step04: Un BIND from Democorp

rkBench

## View Results Tree

Name: View Results Tree for Democorp

Comments:

Write results to file / Read from file

Filename: /tmp/loadtesting.log

Browse...

Log/Display Only: ☐ Errors ☒ Success

- Step04: LDAP Extended Req
- Step01: LDAP Extended Req
- Step02: LDAP Extended Req
- Step01: LDAP Extended Req
- Step02: LDAP Extended Req
- Step03: LDAP Extended Req
- Step02: LDAP Extended Req
- Step03: LDAP Extended Req
- Step04: LDAP Extended Req
- Step03: LDAP Extended Req
- Step04: LDAP Extended Req
- Step04: LDAP Extended Req
- Step01: LDAP Extended Req
- Step01: LDAP Extended Req
- Step02: LDAP Extended Req
- Step02: LDAP Extended Req
- Step03: LDAP Extended Req
- Step03: LDAP Extended Req
- Step04: LDAP Extended Req
- Step04: LDAP Extended Req
- Step01: LDAP Extended Req
- Step02: LDAP Extended Req
- Step03: LDAP Extended Req
- Step04: LDAP Extended Req

Sampler result Request Response data

Thread Name: Democorp ThreadGroup 1-50

Sample Start: 2013-11-06 01:49:16 CST

Load time: 2

Latency: 0

Size in bytes: 245

Headers size in bytes: 0

Body size in bytes: 245

Sample Count: 1

Error Count: 0

Response code: 0

Response message: Success

Response headers:

SampleResult fields:

ContentType: text/xml

DataEncoding: UTF-8





Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

rkBench

Name: Response Time Graph for Democorp

Comments:

Write results to file / Read from file

Filename /tmp/loadtesting.log

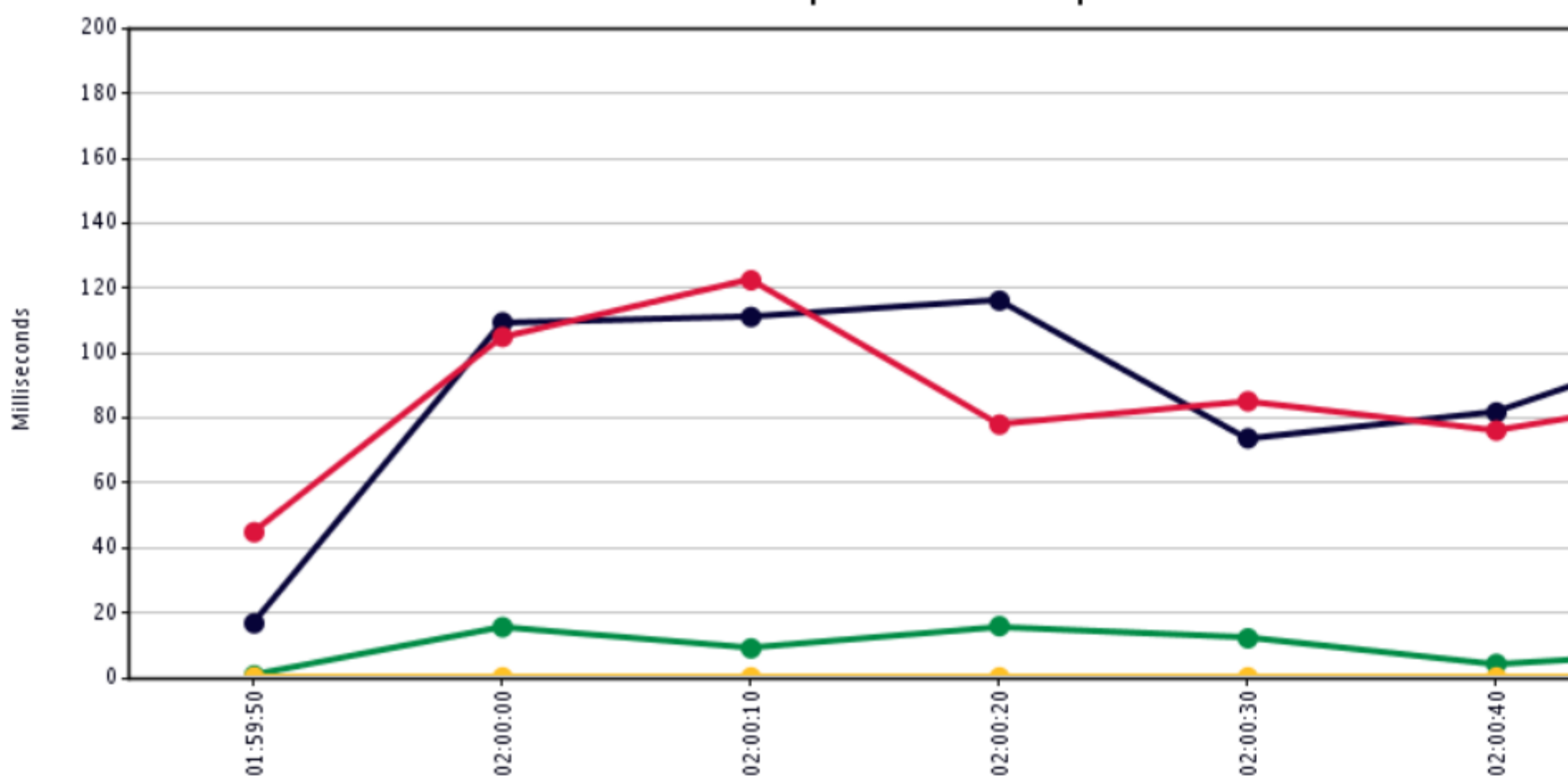
Browse...

Log/Display Only: ☐ Errors ☐ Success

Settings

Graph

Response Time Graph





Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER DSA

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DSA

Response Time Graph for Democorp DATA DSA

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

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## Loop Controller

Name: Loop Controller for Democorp ROUTER DSA

Comments:

Loop Count: ☐ Forever

1



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

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## LDAP Extended Request

**Name:** Step01: LDAP Extended Request to BIND to Democorp

**Comments:**

### Test Configuration

☒ Thread Bind ☐ Thread Unbind ☐ Single bind/unbind ☐ Rename entry

**Test**

☐ Add test ☐ Deletion test ☐ Search test ☐ Compare ☐ Modification test

**Servername :** smps01.im.dom

**Port:** 19359

**DN**

**Username** cn=diradmin,ou=Networks,ou=Support,o=DEMOCORP,c=AU

**Password** ●●●●●●●●

**Connection timeout (in milliseconds)**

☐ Use Secure LDAP Protocol ?



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

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## LDAP Extended Request

Name: Step02: LDAP Extended Request to Query Democorp

Comments:

### Test Configuration

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

Test

☐ Add test ☐ Deletion test ☒ Search test ☐ Compare ☐ Modification test

Search base o=DEMOCORP,c=AU

Search Filter (objectClass=\*)

Scope Perform subtree search ▼

Size limit

Time limit

Attributes cn

☒ Return object

☐ Dereference aliases

☐ Parse the search results ?



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

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## LDAP Extended Request

Name: Step03: LDAP Extended Request for exact record

Comments:

### Test Configuration

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

Test

☐ Add test ☐ Deletion test ☒ Search test ☐ Compare ☐ Modification test

Search base ou=Administration,ou=Corporate,o=DEMOCORP,c=AU

Search Filter (&(objectClass=inetOrgPerson)(cn=Craig LINK))

Scope Perform subtree search ▼

Size limit

Time limit

Attributes sn

☒ Return object

☐ Dereference aliases

☐ Parse the search results ?



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

rkBench

## LDAP Extended Request

**Name:** Step04: LDAP Extended Request to UNBIND from Democorp

**Comments:**

### Test Configuration

☐ Thread Bind ☒ Thread Unbind ☐ Single bind/unbind ☐ Rename entry

### Test

☐ Add test ☐ Deletion test ☐ Search test ☐ Compare ☐ Modification test



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

rkBench

## Thread Group

Name: Democorp DATA Thread Group

Comments:

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): 60

Ramp-Up Period (in seconds): 60

Loop Count: ☐ Forever 50

☐ Delay Thread creation until needed

☐ Scheduler





- Testing Democorp Router
- Democorp ROUTER ThreadGroup
    - View Results Tree for Democorp
    - Response Time Graph for Democorp
    - Loop Controller for Democorp ROUTER D
      - Step01: LDAP Extended Request to BIN
      - Step02: LDAP Extended Request to QU
      - Step03: LDAP Extended Request for ex
      - Step04: LDAP Extended Request to UN
  - Democorp DATA Thread Group
    - View Results Tree for Democorp DATA DSA
    - Response Time Graph for Democorp DAT
    - Loop Controller for Democorp DATA DSA
      - Step01: BIND to democorp DATA DSA
      - Step02: Initial Query to UserStore Dem
      - Step03: Ldap search for exact user re
      - Step04: Un BIND from Democorp
  - rkBench

## View Results Tree

Name: View Results Tree for Democorp DATA DSA

Comments:

Write results to file / Read from file

Filename

[Browse...](#)

Log/Display Only: ☐ Errors ☐ Success

- Step01: BIND to democorp
- Step02: Initial Query to U
- Step03: Ldap search for
- Step04: Un BIND from De
- Step01: BIND to democorp
- Step02: Initial Query to U
- Step03: Ldap search for
- Step04: Un BIND from De
- Step01: BIND to democorp
- Step02: Initial Query to U
- Step03: Ldap search for
- Step04: Un BIND from De
- Step01: BIND to democorp
- Step02: Initial Query to U
- Step03: Ldap search for
- Step04: Un BIND from De
- Step01: BIND to democorp
- Step02: Initial Query to U
- Step03: Ldap search for
- Step04: Un BIND from De

### Sampler result

Text





Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

rkBench

## Response Time Graph

Name: Response Time Graph for Democorp DATA DSA

Comments:

Write results to file / Read from file

Filename

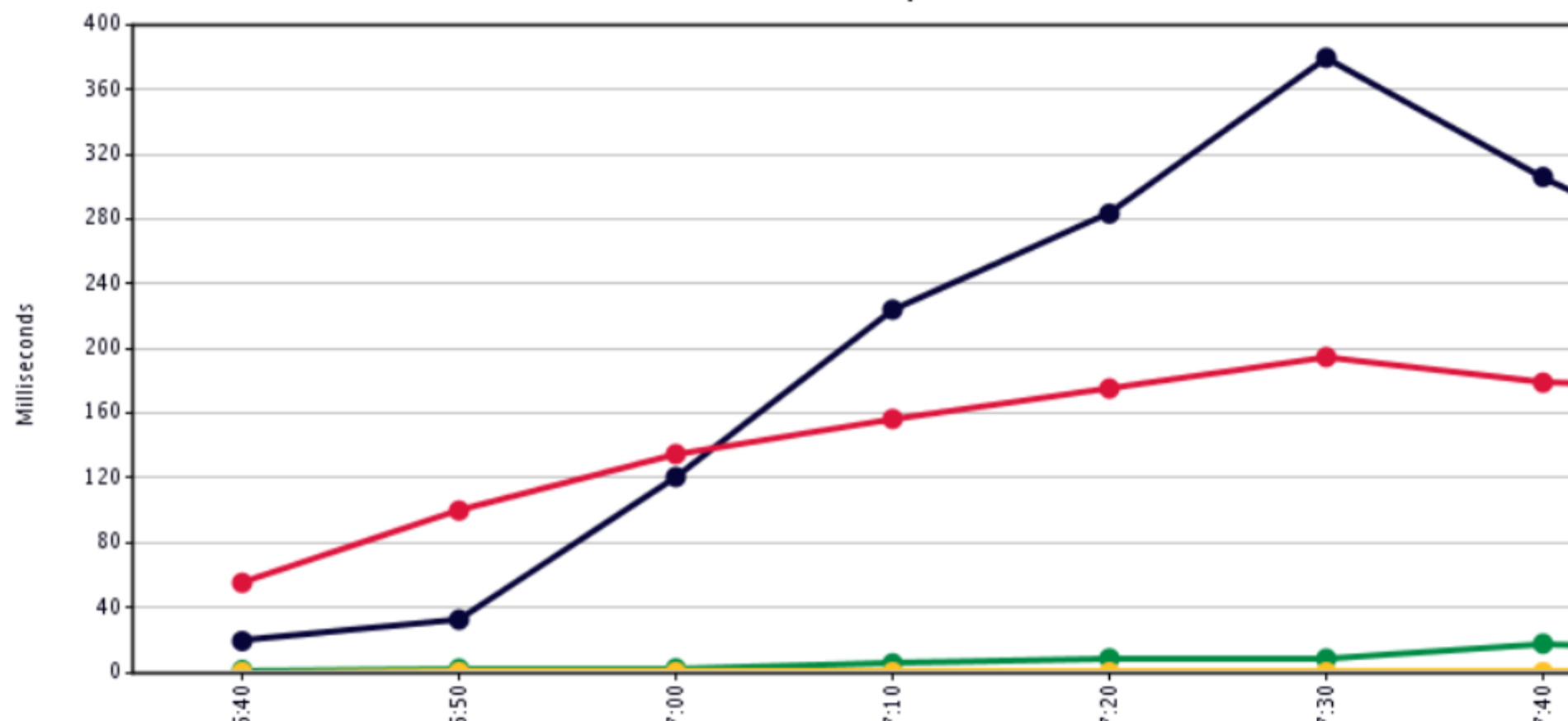
[Browse...](#)

Log/Display Only: ☐ Errors ☐ Success

Settings

Graph

### Democorp DATA DSA





Testing Democorp Router

Democorp ROUTER ThreadGroup

- View Results Tree for Democorp
- Response Time Graph for Democorp
- Loop Controller for Democorp ROUTER D
  - Step01: LDAP Extended Request to BIN
  - Step02: LDAP Extended Request to QU
  - Step03: LDAP Extended Request for ex
  - Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

- View Results Tree for Democorp DATA DS
- Response Time Graph for Democorp DAT
- Loop Controller for Democorp DATA DSA
  - Step01: BIND to democorp DATA DSA
  - Step02: Initial Query to UserStore Dem
  - Step03: Ldap search for exact user re
  - Step04: Un BIND from Democorp

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## Loop Controller

Name: Loop Controller for Democorp DATA DSA

Comments:

Loop Count: ☐ Forever

1



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

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## LDAP Extended Request

Name: Step01: BIND to democorp DATA DSA 01

Comments:

### Test Configuration

☒ Thread Bind ☐ Thread Unbind ☐ Single bind/unbind ☐ Rename entry

Test

☐ Add test ☐ Deletion test ☐ Search test ☐ Compare ☐ Modification test

Servername : smps01.im.dom

Port: 19369

DN

Username cn=diradmin,ou=Networks,ou=Support,o=DEMOCORP,c=AU

Password ●●●●●●●●

Connection timeout (in milliseconds)

☐ Use Secure LDAP Protocol ?



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

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## LDAP Extended Request

**Name:** Step02: Initial Query to UserStore Democorp DATA DSA 01 for ALL cn records

**Comments:**

### Test Configuration

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

**Test**

☐ Add test ☐ Deletion test ☒ Search test ☐ Compare ☐ Modification test

**Search base** o=DEMOCORP,c=AU

**Search Filter** (objectClass=\*)

**Scope** Perform subtree search ▼

**Size limit**

**Time limit**

**Attributes** cn

☒ Return object

☐ Dereference aliases

☐ Parse the search results ?



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

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## LDAP Extended Request

Name: Step03: Ldap search for exact user record and return sn

Comments:

### Test Configuration

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

Test

☐ Add test ☐ Deletion test ☒ Search test ☐ Compare ☐ Modification test

Search base ou=Administration,ou=Corporate,o=DEMOCORP,c=AU

Search Filter (&(objectClass=inetOrgPerson)(cn=Craig LINK))

Scope Perform subtree search ▼

Size limit

Time limit

Attributes sn

☒ Return object

☐ Dereference aliases

☐ Parse the search results ?



Testing Democorp Router

Democorp ROUTER ThreadGroup

View Results Tree for Democorp

Response Time Graph for Democorp

Loop Controller for Democorp ROUTER D

Step01: LDAP Extended Request to BIN

Step02: LDAP Extended Request to QU

Step03: LDAP Extended Request for ex

Step04: LDAP Extended Request to UN

Democorp DATA Thread Group

View Results Tree for Democorp DATA DS

Response Time Graph for Democorp DAT

Loop Controller for Democorp DATA DSA

Step01: BIND to democorp DATA DSA

Step02: Initial Query to UserStore Dem

Step03: Ldap search for exact user re

Step04: Un BIND from Democorp

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## LDAP Extended Request

Name: Step04: Un BIND from Democorp

Comments:

### Test Configuration

☐ Thread Bind ☒ Thread Unbind ☐ Single bind/unbind ☐ Rename entry

### Test

☐ Add test ☐ Deletion test ☐ Search test ☐ Compare ☐ Modification test