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

> Alan Baugher CA Sr. Principal Architect 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

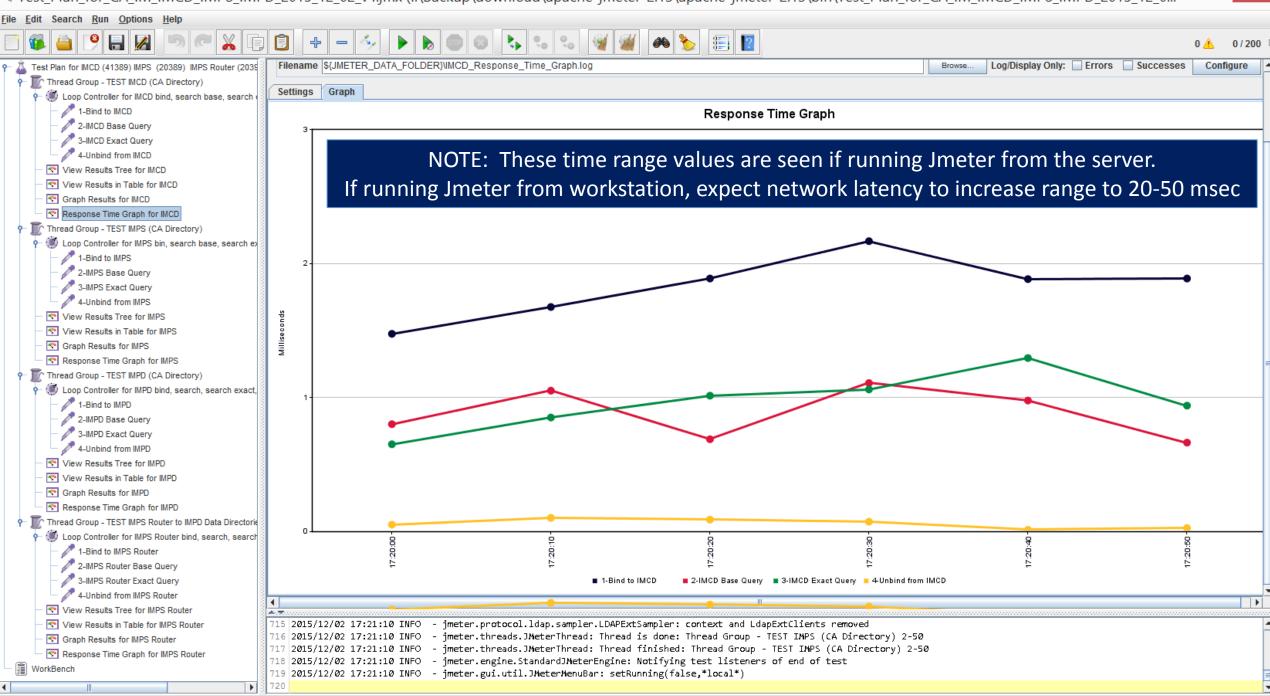
Background

- 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 / Idapsearch (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.
 - \circ $\,$ 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
 - o 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.

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Thread Group - TEST IMCD (CA Directory)

+ 🗑 Loop Controller for IMCD bind, search base, search exact, unbind

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

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 exact GUI, unbind

/ 1-Bind to IMPS

🖉 2-IMPS Base Query

3-IMPS Exact Query

- 🥒 4-Unbind from IMPS

View Results Tree for IMPS

S 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, unbind

1-Bind to IMPD

🧪 2-IMPD Base Query

- 🧪 3-IMPD Exact Query

— 🥒 4-Unbind from IMPD

View Results Tree for IMPD

S View Results in Table for IMPD

S 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

I-Bind to IMPS Router
 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

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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

Delete

Clear

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...

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71	5 2015/12/02 17:21:10 INFO - jmeter.protocol.ldap.sampler.LDAPExtSampler: context and LdapExtClients removed
71	16 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50
71	17 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50
71	8 2015/12/02 17:21:10 INFO - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test
71	9 2015/12/02 17:21:10 INFO - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*)

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1	Thread Group - TEST IMCD (CA Directory)	Thread Group	MPS (20389) MPS Pointer (2024
	🛉 🕑 Loop Controller for IMCD bind, search base, search (Name: Thread Group - TEST IMCD (CA Directory)	MCD (CA Directory) Add
	- 🥕 1-Bind to IMCD	Comments:Number of threads (users) =50 and ramp up over 1 min & repeat; set to continue	- IMCD bind, search base, search Paste Ctrl-V Test Fragment SetUp Thread Group (2)
	- 🌽 2-IMCD Base Query	Action to be taken after a Sampler error	
	- 🥂 3-IMCD Exact Query	Continue Start Next Thread Loop Stop Thread Stop Test	C Step Teet New
	- 🧖 4-Unbind from IMCD	Continue Start Next Thread Loop Stop Thread Stop Test	Stop rest now
	View Results Tree for IMCD	Thread Properties	
	 View Results in Table for IMCD 	Number of Threads (users): 50	
	- 🔄 Graph Results for IMCD		
	Response Time Graph for IMCD	Ramp-Up Period (in seconds): 60	
	Thread Group - TEST IMPS (CA Directory)	Loop Count: Forever 10	
	- Doop Controller for IMPS bin, search base, search ex		
	- Z 1-Bind to IMPS	Delay Thread creation until needed	
	2-IMPS Base Query	Scheduler	
	- Z 3-IMPS Exact Query		
	4-Unbind from IMPS		
	View Results Tree for IMPS	Define # of users (threads)	& ramp up time
	View Results in Table for IMPS		
	Craph Results for IMPS		
	Response Time Graph for IMPS		
	Thread Group - TEST IMPD (CA Directory)		
	Ecop Controller for IMPD bind, search, search exact, A picture autop A		
	- / 1-Bind to IMPD		
	2-IMPD Base Query	Start with # of threads = 50, after success	stul initial testing
	- 3-IMPD Exact Query		Ũ
	4-Unbind from IMPD	jump this value to 10x or higher	
	View Results Tree for IMPD		
	View Results in Table for IMPD		
	Graph Results for IMPD Response Time Graph for IMPD		
	Response Time Graph for IMPD Thread Group - TEST IMPS Router to IMPD Data Directorie		
'	Goop Controller for IMPS Router bind, search, search		
	- 2 1-Bind to IMPS Router		
	- 2-IMPS Router Base Query		
	- 2 3-IMPS Router Exact Query		
	- 2 4-Unbind from IMPS Router		
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3		719 2015/12/02 17:28:57 INFO - jmeter.services.FileServer: Set new base='C:\temp\jmeter' 720	
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🛝 Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039 Loop Controller Thread Group - TEST IMCD (CA Directory) Loop Controller for IMCD bind, search base, search Name: Loop Controller for IMCD bind, search base, search exact, unbind 1-Bind to IMCD Comments: 2-IMCD Base Query Loop Count: Forever 1 🥒 3-IMCD Exact Query 🥒 4-Unbind from IMCD View Results Tree for IMCD View Results in Table for IMCD S 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 S Graph Results for IMPS Router Response Time Graph for IMPS Router

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Define Loop Controller (Container Object)

	1915					
		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'
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2-IMCD Base Query		p	Cut Cat-X	Pre Processors	-
- 2 3-IMCD Exact Query	Test Configuration	MCD	Copy Ctri-C Paste Ctri-V	Post Processors > AJP/1.3 Sampler	
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Thread Group - TEST IMPS (CA Directory)	Servername : \${IMCD_HostName}	MPS Directory)	Save Node As Image Ctri-G	JSR223 Sampler	
Coop Controller for IMPS bin, search base, search ex	Port: 41389	nd, search, search	enable	JUnit Request LDAP Extended Request	
- 2 1-Bind to IMPS	DN	L	Disable	LDAP Request	
2-IMPS Base Query					
- 2-IMPS Exact Query	Username \${IMCD_Bind_DN}				
4-Unbind from IMPS	Password •••••••				
View Results Tree for IMPS	Connection timeout (in milliseconds)				
View Results in Table for IMPS					
Graph Results for IMPS	Use Secure LDAP Protocol?	ro			
Response Time Graph for IMPS	Use Secure LDAP Protocol? Initial BIND is always requi		. U.		
Controller for IMPD bind, search, search exact, to provide the two points of two points of the two points of two points					
- / 1-Bind to IMPD	the second because the ((DNI) field block to excit the start the following				
2-IMPD Base Query	However, leave the "DN" field blank; to avoid impacting the followin	ig A(ctions da	ase DN.	
- 3-IMPD Exact Query	The Astional hase DN is "velotive" to this DIND DN year locator desure			these is	
4-Unbind from IMPD	The Actions' base DN is "relative" to this BIND DN per Jmeter docum	ient	ation. It	there is	
View Results Tree for IMPD					
View Results in Table for IMPD	an overlap, error message return for an action may state "Object No	t fo	una		
Graph Results for IMPD					
Response Time Graph for IMPD					
P Thread Group - TEST IMPS Router to IMPD Data Directorie					
- 🥑 Loop Controller for IMPS Router bind, search, search					
- Z 1-Bind to IMPS Router					
- Z-IMPS Router Base Query					
- Z 3-IMPS Router Exact Query					
4-Unbind from IMPS Router					
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- 🧪 3-IMCD Exact Query	Test configuration	MCD	Paste CH-V		AJP/1.3 Sampler Bean Shell Sampler	
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 View Results in Table for IMCD 			Redo		HTTP Request Java Request	
- 🔄 Graph Results for IMCD	○ Add test ○ Deletion test ◎ Search test ○ Compare ○ Modification test	s	Merge		JDBC Request JMS Point-to-Point	
Response Time Graph for IMCD		MPS	Save Selection As Save as Test Fragment		JMS Publisher JMS Subscriber	
- Thread Group - TEST IMPS (CA Directory)	Search base ou=cam,o=ca	MPS Directory)	Save Node As Image Ctrl-G Save Screen As Image Ctrl+Shift-G		JSR223 Sampler JUnit Request	
두 🛞 Loop Controller for IMPS bin, search base, search ex	Search Filter (objectClass=*)	nd, search, search	Enable		LDAP Extended Request	
- 🥒 1-Bind to IMPS			Disable		LDAP Request	J
- 🥒 2-IMPS Base Query	Scope Perform baseobject search					
- 🥒 3-IMPS Exact Query	Size limit 1000					
- 2 4-Unbind from IMPS						
View Results Tree for IMPS						
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- 🔄 Graph Results for IMPS	Return object					
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WorkBench	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*)					
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4-Unbind from IMCD	○ Thread Bind ○ Thread Unbind ○ Single bind/unbind ○ Rename entry MCD Duplicate Assertions Uster Uster	 BeanShell Sampler BSF Sampler 	
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 View Results in Table for IMCD 	Redo	HTTP Request Java Request	
- 🔄 Graph Results for IMCD	O Add test ○ Deletion test	JDBC Request JMS Point-to-Point	
Response Time Graph for IMCD	Search base ou=serviceaccount,ou=cam,o=ca	JMS Publisher	
Thread Group - TEST IMPS (CA Directory)	Save Node As Image CM-9	JSR223 Sampler	
- Coop Controller for IMPS bin, search base, search ex	Search Filter (&(objectClass=person)(cn=diradmin))	LDAP Extended Reques	
- 🥂 1-Bind to IMPS	Scope Perform subtree search	LDAP Request	
- 🧖 2-IMPS Base Query			
- Z-IMPS Exact Query	Size limit		
4-Unbind from IMPS			
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Graph Results for IMPS	Return object		
Response Time Graph for IMPS	Dereference aliases		
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4-Unbind from IMPD			
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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*)

Response Time Graph for IMPS Router

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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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Thread Group - TEST IMCD (CA Directory)

1-Bind to IMCD

2-IMCD Base Querv

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)

> 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

> 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

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

WorkBench

Response Time Graph for IMPS Router

Thread Group - TEST IMPD (CA Directory)

Loop Controller for IMCD bind, search base, search

Loop Controller for IMPS bin, search base, search ex

Loop Controller for IMPD bind, search, search exact.

Thread Group - TEST IMPS Router to IMPD Data Directorie Loop Controller for IMPS Router bind, search, search

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Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039 LDAP Extended Request

Name: 4-l

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	Directory)	Loop con			
Jnbind from IMCD	nd, search base, sea	sh Name: Loop			se, search exact, unbind
	_	Add		Logic Controller	
		Insert Parent		Config Element	
		Change Controller	· · · ·	Timer I	·
	D	Cut	OH-X	Pre Processors	
figuration		Сору	Ctrl-C		Access Log Sampler
		Paste	Ctrl-V		AJP/1.3 Sampler
Thread Bind Thread Unbind Single bind/unbind Rename entry		Duplicate	Ctrl+Shift-C		Bean Shell Sampler
○ Thread Bind Thread Onbind Single bind/unbind Rename entry	Directory)	Reset Gui		Listener I	BSF Sampler
	n, search base, searc	Remove	Delete		Debug Sampler
		Undo			FTP Request
		Redo			HTTP Request
Add test O Deletion test O Search test O Compare O Modification test		Open			Java Request
		Merge			JDBC Request
		Save Selection As			JMS Point-to-Point
		Save as Test Fragm	ent		JMS Publisher
		Save Node As Image		-	JMS Subscriber
	Directory	Save Screen As Image			JSR223 Sampler
	nd, search, search ex	Save Screen AS Inte	ge ouronno	-	JUnit Request
		Enable			I DAP Extended Request

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 - immeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50 717 2015/12/02 17:21:10 INFO 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*)

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LDAP Request

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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a 🇞 🔚 👔 8 🎯 😔 🔖 🗞 🗞 👹 🎬 Ē ÷ Z., -0 🔥 0 / 200 🗆 Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039 View Results Tree Thread Group - TEST IMCD (CA Directory) • Icop Controller for IMCD bind, search base, search Name: View Results Tree for IMCD 1-Bind to IMCD Comments: 2-IMCD Base Query Write results to file / Read from file 3-IMCD Exact Query Filename \${JMETER_DATA_FOLDER}\IMCD_Results_Tree.log Log/Display Only: Errors Successes Configure Browse. 4-Unbind from IMCD View Results Tree for IMCD Sampler result | Request | Response data Text T View Results in Table for IMCD 🔬 1-Bind to IMCD Graph Results for IMCD Thread Name: Thread Group - TEST IMCD (CA Directory) 1-1 🔬 2-IMCD Base Query Response Time Graph for IMCD Sample Start: 2015-12-02 17:20:01 CST 🔬 3-IMCD Exact Query Load time: 2 Thread Group - TEST IMPS (CA Directory) 🔬 4-Unbind from IMCD Connect Time: 0 Loop Controller for IMPS bin, search base, search ex A 1-Bind to IMCD Latency: 0 1-Bind to IMPS A 2-IMCD Base Query Size in bytes: 236 🔬 3-IMCD Exact Query 🥒 2-IMPS Base Query Headers size in bytes: 0 \land 4-Unbind from IMCD 3-IMPS Exact Query Body size in bytes: 236 A 1-Bind to IMCD Sample Count: 1 🧷 4-Unbind from IMPS A 2-IMCD Base Query Error Count: 0 View Results Tree for IMPS A 3-IMCD Exact Query Example of Results Tree Response code: 0 View Results in Table for IMPS \land 4-Unbind from IMCD Response messag A 1-Bind to IMCD Graph Results for IMPS A 2-IMCD Base Query Response Time Graph for IMPS Response headers 🔬 3-IMCD Exact Query Thread Group - TEST IMPD (CA Directory) 🔬 4-Unbind from IMCD Loop Controller for IMPD bind, search, search exact, A 1-Bind to IMCD SampleResult fields: 1-Bind to IMPD A 2-IMCD Base Query ContentType: text/xml A 3-IMCD Exact Query 🥒 2-IMPD Base Query DataEncoding: windows-1252 A-Unbind from IMCD 3-IMPD Exact Query 💩 1-Bind to IMCD 🥒 4-Unbind from IMPD A 2-IMCD Base Query View Results Tree for IMPD Very Useful report. A 3-IMCD Exact Query View Results in Table for IMPD A-Unbind from IMCD A 1-Bind to IMCD Graph Results for IMPD 🔬 2-IMCD Base Query Response Time Graph for IMPD A 3-IMCD Exact Query Thread Group - TEST IMPS Router to IMPD Data Directorie Response Data Tab can show LDAP query results if selected on prior 🔬 4-Unbind from IMCD Loop Controller for IMPS Router bind, search, search 🔬 1-Bind to IMCD 1-Bind to IMPS Router actions to return attribute values. 🔬 2-IMCD Base Query 2-IMPS Router Base Query A 3-IMCD Exact Query A-Unbind from IMCD 3-IMPS Router Exact Query Raw Parsed Scroll automatically? 4-Unbind from IMPS Router View Results Tree for IMPS Router - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50 View Results in Table for IMPS Router 715 2015/12/02 17:21:10 INFO 716 2015/12/02 17:21:10 INFO - imeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50 Graph Results for IMPS Router 717 2015/12/02 17:21:10 INFO - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test Response Time Graph for IMPS Router 718 2015/12/02 17:21:10 INFO - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*) WorkBench 719 2015/12/02 17:28:57 INFO - jmeter.services.FileServer: Set new base= C:\temp\jmeter 720 F Ŧ

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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ዮ 🚨 Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039	View Results in Table										
Thread Group - TEST IMCD (CA Directory)	view Results in Ta	bie									
- 🕑 Loop Controller for IMCD bind, search base, search	Name: View Results in T	able for IMCD									
- 🥂 1-Bind to IMCD	Comments:										
- Z-IMCD Base Query	Write results to file / Re	ad from file									
- 3-IMCD Exact Query	Filename \${JMETER_DA		sults. Table csv				Browse Log/Displa	ay Only: 🗌 Errors 📄	Successes Configure		
4-Unbind from IMCD			0000_100000				Logioloph		ouccouce comigure		
View Results Tree for IMCD	Oamala #	Otart Times	Thread Name	Label	Querrala Time (ma)	Otatua	Dites	Latanay	Ocean est Time (ma)		
View Results in Table for IMCD Graph Results for IMCD	Sample #	Start Time	Thread Name Thread Group - TEST I	Label	Sample Time(ms)	Status	Bytes 23	Latency	Connect Time(ms)	0	
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Response Time Graph for IMCD	3		Thread Group - TEST I			0 🕅	38	-	0	0	
Thread Group - TEST IMPS (CA Directory)	4		Thread Group - TEST I			0 👗	17		0	0	
🕈 🖤 Loop Controller for IMPS bin, search base, search ex	5	17:20:01.364	Thread Group - TEST I	1-Bind to IMCD		1 🔬	23	6	0	0	
- Z 1-Bind to IMPS	6		Thread Group - TEST I			1 🔬	35	-	0	0	
- 🖉 2-IMPS Base Query	7		Thread Group - TEST I			1 🔬	38		0	0	
- Z-IMPS Exact Query	8		Thread Group - TEST I	4-Unbind from IMCD		0 🔬	173		0	0	
- Z 4-Unbind from IMPS	10	17:20:01.374 17:20:01.380					23		0	0	
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 View Results in Table for IMPS 	12	17:20:01:388	Thread Gro	ample	כן דט נ	anie v			0	0	
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Response Time Graph for IMPS	14	17:20:01.398	Thread Gro				35		0	0	
- Thread Group - TEST IMPD (CA Directory)	15		2 Thread Group - TEST I			2 🔬	38		0	0	
- Doop Controller for IMPD bind, search, search exact,	16		Thread Group - TEST I			0 🔬	173		0	0	
- I-Bind to IMPD	17		Thread Group - TEST I			3	23		0	0	
- Z-IMPD Base Query	18		Thread Group - TEST I Thread Group - TEST I			1 🐴	33.		0		
- Z 3-IMPD Exact Query	20		Thread Group - TEST I				17	-	0	0	
- 2 4-Unbind from IMPD	21) Thread Group - TEST I			1 👗	23		0	0	
View Results Tree for IMPD	22				•	•••				0	
View Results in Table for IMPD	2	Useful for	quick checl	k to validate	no issues	with any A	ction via the	Status Col	lumn	0	
Graph Results for IMPD	24		Thread Group - TEST I			1	23		0	0	
Response Time Graph for IMPD	25		Thread Group - TEST I				35	-	0		
Thread Group - TEST IMPS Router to IMPD Data Directorie	20		Thread Group - TEST I			1 🕅	38	-	0	o l	
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- 2 1-Bind to IMPS Router	29	17:20:01.475	Thread Group - TEST I	1-Bind to IMCD		2 🔬	23	6	0	0	
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- 2-IMPS Router Base Query - 2 3-IMPS Router Exact Query	31	17:20:01.484	Thread Group - TEST I	3-IMCD Exact Query		0	38		0	0 🖵	
4-Unbind from IMPS Router	Scroll automatically?	Child samples?		No of Samples	2000 Lata	st Sample 0	Average 0 Deviat	tion 1			
		chilu samples :		No or samples	Z000 Late		Average 0 Devia				
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View Results in Table for IMPS Router		2		Thread is done: Thread		· · · · · · · · · · · · · · · · · · ·					
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Seponse Time Graph for IMPS Router				<pre>ir: setRunning(false,*)</pre>							
WorkBench		57 INFO - jmeter.s	ervices.FileServer:	Set new base="C:\temp"	jmeter					=	
	720									-	



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3 R 8 Ê ÷ - 4 **N** 0,0,0 a 🇞 1 191 0 / 200 Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039 **Graph Results** Thread Group - TEST IMCD (CA Directory) - Doop Controller for IMCD bind, search base, search Name: Graph Results for IMCD 1-Bind to IMCD Comments: 🥒 2-IMCD Base Querv Write results to file / Read from file 🥒 3-IMCD Exact Query Filename \${JMETER DATA FOLDER}\MCD Graph Results.log Log/Display Only: Errors Successes Browse.. Configure 4-Unbind from IMCD View Results Tree for IMCD Graphs to Display V Data V Average V Median V Deviation V Throughput View Results in Table for IMCD Graph Results for IMCD 2 ms 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 Example of Graph View 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 Limited value. 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 0 ms 3-IMPS Router Exact Query No of Samples 2000 Latest Sample 0 Average 0 🥭 4-Unbind from IMPS Router Deviation Throughput 2,013.693/minute Median 1 View Results Tree for IMPS Router - jmeter.threads.JMeterThread: Thread is done: Thread Group - TEST IMPS (CA Directory) 2-50 View Results in Table for IMPS Router 715 2015/12/02 17:21:10 INFO - jmeter.threads.JMeterThread: Thread finished: Thread Group - TEST IMPS (CA Directory) 2-50 716 2015/12/02 17:21:10 INFO Graph Results for IMPS Router 717 2015/12/02 17:21:10 INFO - jmeter.engine.StandardJMeterEngine: Notifying test listeners of end of test Response Time Graph for IMPS Router 718 2015/12/02 17:21:10 INFO - jmeter.gui.util.JMeterMenuBar: setRunning(false,*local*) WorkBench 719 2015/12/02 17:28:57 INFO - imeter.services.FileServer: Set new base='C:\temp\imeter' 720) I

Run Options Help

Test Plan for IMCD (41389) IMPS (20389) IMPS Router (2039

- Doop Controller for IMCD bind, search base, search

Loop Controller for IMPS bin, search base, search ex

Loop Controller for IMPD bind, search, search exact,

Settings Graph

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Thread Group - TEST IMCD (CA Directory)

1-Bind to IMCD

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)

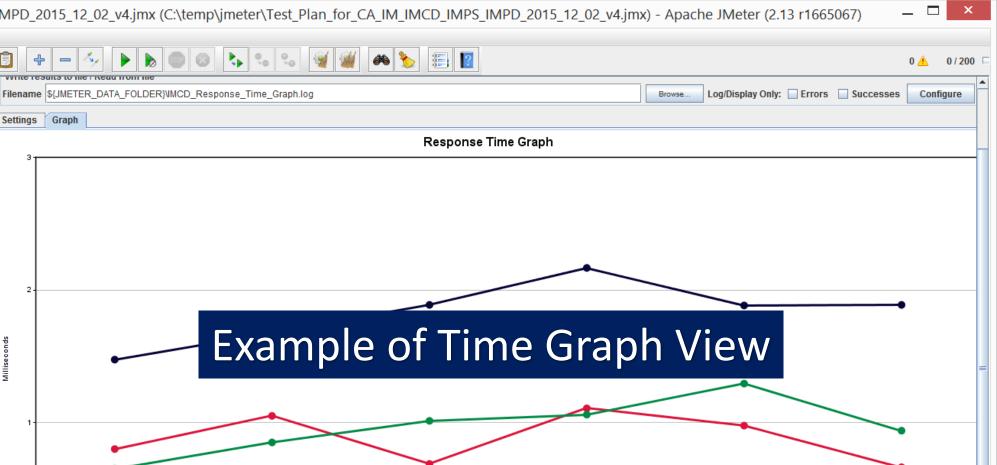
View Results in Table for IMPD

1-Bind to IMPD 2-IMPD Base Query 3-IMPD Exact Query 🥒 4-Unbind from IMPD View Results Tree for IMPD

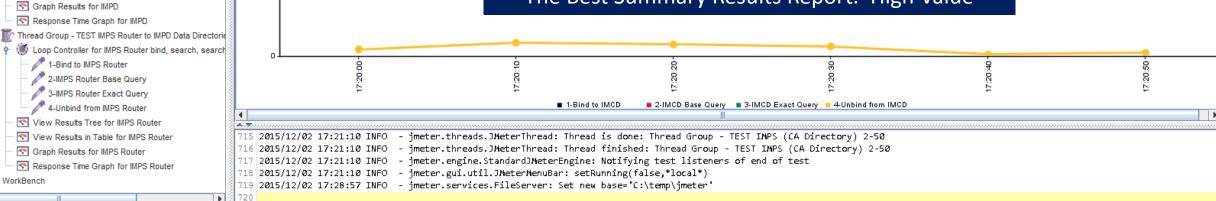
🥒 2-IMCD Base Query 3-IMCD Exact Query 4-Unbind from IMCD View Results Tree for IMCD View Results in Table for IMCD Graph Results for IMCD Response Time Graph for IMCD Thread Group - TEST IMPS (CA Directory)

Edit

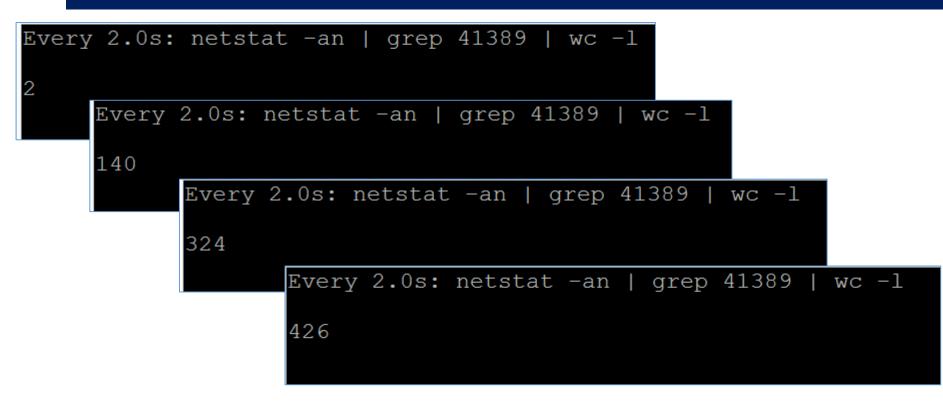
Search



The Best Summary Results Report. High Value



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. <u>http://jmeter.apache.org/</u> (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



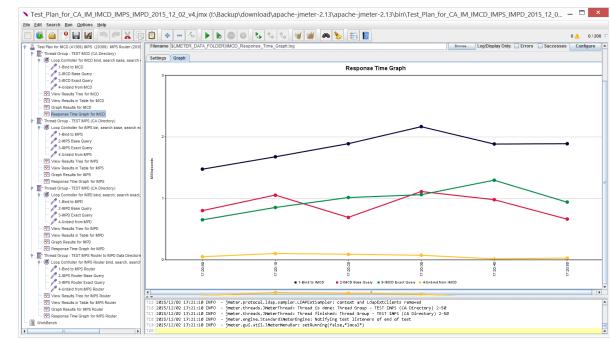
jmx



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



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_minic-netscape-for-siteminder_command.htm https://support.ca.com/cadocs/0/CA%20Directory%2012%20SP13-ENU/Bookshelf_Files/HTML/idocs/index.htm?toc.htm?set_ignore-name-bindings_command.htm https://support.ca.com/cadocs/0/CA%20Directory%2012%20SP13-ENU/Bookshelf_Files/HTML/idocs/index.htm?toc.htm?set_ignore-name-bindings_command.htm https://wiki.ca.com/display/CAD1214/Name+Bindings https://support.ca.com/cadocs/0/CA%20Directory%2012%20SP13-ENU/Bookshelf_Files/HTML/idocs/index.htm?toc.htm?pruning_and_replacing_object_classes.htm