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SymmetricDS Synchronization Concepts

SymmetricDS is a change data capture, replication solution that can be used to synchronize databases in near real time. Synchronization can be bi-directional, scale to a very large number of databases, work across low bandwidth connections, and withstand periods of network outage. It is a general purpose tool that can be deployed and configured in many different ways to solve a wide variety of synchronization concerns.

In order to get the solution up and running it is important to understand some base terminology. We'll use a simple retail business scenario that synchronizes data (information about pricing, inventory, transactions, etc.) between a central office database and multiple store databases to help explain the terms.

Term	Description
Node	A single installed and running instance of SymmetricDS that is attached to, and has responsibility for, keeping a database instance in synch. In the example below, #1, #2, and #3 are all examples of nodes in a SymmetricDS implementation
Root Node	The master or primary Node in the SymmetricDS implementation that is responsible for storing and coordinating all configuration (metadata) information about the synchronization scenario. The root node is also responsible for hosting the SymmetricDS web management console that allows you to configure, manage and monitor your solution. In the example below, #1 is the root node.
Node Group	A logical grouping of Nodes used in defining your synchronization configuration. A Node Group can be a single node, or it can be thousands of nodes. Node Groups are based on which Nodes share common synchronization configuration or rules. For example, all stores need to get pricing information from, and send transaction information to the Central Office. We don't want to define that configuration for each store (Node), but instead want to be able to define it for the group of stores as a whole (Node Group). Each Node must be contained within a Node Group. In our example below, we have two Node Groups defined, "Corp" which is #4 and "Stores" which is #5. The Stores node group includes each Node for every store, and the Corp includes the single instance that is the Root Node.
Root Database	The jdbc compliant database attached to the Root Node. This database usually contains both data you want synchronized, as well as all of the SymmetricDS configuration data for your synchronization solution. In the example below, #6 is the Root Database
Client Database	The jdbc compliant database attached to one of the other SymmetricDS nodes. This database contains data you want synchronized as well as SymmetricDS configuration data sent to it by the Rood Node from the Root Database. In the example below, #7 is a Client Database





Installing the Root Node

To begin installation of the root node:	Installer for SymmetricDS-Pro
• Verify that you have the 1.5 x Java Runtime	Symmetric DS Information Step 1 of 14
 Verify that you have the 1.5.X Java Runtine Environment (JRE) installed on the Root Node computer. Verify that the 1.5.x JRE bin directory is in your path (windows) or <what do="" for<br="" here="" i="" need="" put="" to="">Mac, Linux or Unix></what> Run the SymmetricDS installer by double clicking the symmetric-pro-2.4.x-install.jar Click "Next" after reading the Welcome screen. 	Welcome to SymmetricDS Pro 2.3.0! Overview SymmetricDS is the leading open source solution for Data Replication, Change Data Capture, and Data Transformation in a heterogeneous enterprise environment. Performance and scalability allow it to replicate thousands of databases asynchronously in near real time. With flexible configuration and powerful scripting and programming interfaces, SymmetricDS can be extended to meet a range of requirements. About JumpMind is an open source software company specializing in data replication and other software packages for the enterprise. Our mission is to build software that is creative, practical, elegant, and easy to use. We provide consulting, services, and support for all of our products. JumpMind, Inc. (http://www.jumpmind.com/)
Review and accept the license agreement	Installer for SymmetricDS-Pro
1 0	Licensing Agreements Step 2 of 14
	Please read the following license agreement carefully:
	SymmetricDS Pro License Agreement PLEASE READ THIS END USER LICENSE AGREEMENT ("EULA") CAREFULLY BEFORE USING SOFTWARE FROM JUMPMIND, INC. BY USING THE SYMMETRICDS PRO SOFTWARE, YOU ACKNOWLEDGE YOUR AGREEMENT TO AND ACCEPTANCE OF THIS END USER LICENSE AGREEMENT AND ACKNOWLEDGE YOU HAVE READ AND UNDERSTAND THE TERMS. AN INDIVIDUAL ACTING ON BEHALF OF AN ENTITY REPRESENTS THAT HE OR SHE HAS THE AUTHORITY TO ENTER INTO THIS END USER LICENSE AGREEMENT NOT BRHALF OF THAT ENTITY. IF YOU DO NOT ACCEPT THE TERMS OF THIS AGREEMENT, THEN YOU MUST NOT USE THE SOFTWARE. THIS END USER LICENSE AGREEMENT NOT PROVIDE ANY RICHTS TO SERVICES SUCH AS SOFTWARE MAINTENANCE, UPGRADES OR SUPPORT, PLEASE REVIEW YOUR SERVICE
Select the installation directory where the	Installer for SymmetricDS-Pro
SymmetricDS application should be installed	Symmetric DS Step 3 of 14
	Select the installation path: c:\dev\sym2 Browse
	JumpMind, Inc. (http://www.jumpmind.com/)







SymmetricDS can be started manually from a Program Shortcut or as a Windows Service. Select one of the two options and click "Next."	Installer for SymmetricDS-Pro User Data Step 8 of 14 Service Setup The SymmetricDS server can be started automatically by installing it as a Windows service or run manually from a Program Shortcut. Run automatically as a Windows Service Run manually from a Program Shortcut
	JumpMind. Inc. (http://www.jumpmind.com/)
The Summary Configuration screen allows you to review your installation choices. Review and click "Next"	Installer for SymmetricDS-Pro Sum mary Configuration Data Step 9 of 14 Installation will proceed with the following settings. Press Next to continue. Target Path C: devisym2 Select Installation Packages Main Installation Server Libraries Samples Documentation
Once the application files have been copied to the installation directory, click the "Next" button.	Installer for SymmetricDS-Pro



The Setup Shortcuts screen allows you to specify where you would like shortcuts created for the Root SymmetricDS instance. Select a group and click the "Next" button.	Installer for SymmetricDS-Pro Setup Shortcuts Step 11 of 14 Create shortcuts in the Start-Menu Select a Program Group for the Shortcuts: Accessories Administrative Tools Google Chrome Google Tak JumpMind Mantenance MySQL Startup SymmetricDS-Pro Default JumpMind, Inc. (http://www.jumpmind.com/) Previous
Installation of the Root Node is now complete. Click the "Done" button.	Installer for SymmetricDS-Pro Installation Finished Step 14 of 14 JumpMind, Inc. (http://www.jumpmind.com/)
To start the SymmetricDS Pro Software, either start the service (if you selected to run as a service), or start manually from the start menu.	 SpringSource Startup SymmetricDS-Pro Management Console Quick Start Guide Run Demo Server Run Demo Server Run Demo Server Back Search programs and files Shut down



Once you have started the Root Node, open a web browser and go to the following url, replacing machine_name with the name of the computer on which the Root Node is installed <u>http://<machine_name>:31415</machine_name></u> The first thing the Root Node will do is let you know that it found the Root Database you specified during installation. Click the Continue button.	SymmetricDS Database Found! The database settings have been modified and we have successfully connected to a database. Are these settings correct? PARAMETER VALUE db.driver com.mysql.jdbc.Driver db.user root Continue
SymmetricDS Pro has the concept of pre-configured synchronization profiles. These profiles are out of the box synchronization configurations for off the shelf software programs. To set up a sample synchronization from scratch, select "No Thanks, I'll configure things myself."	SymmetricDS Do you want to perform a quick configuration? Simple 2 Tier Configuration No thanks. Til configure things myself or advanced users. Do not insert any pre- defined configuration or override the node group id.
Next, you must specify a user id and password for the administrative console. Select a userid, password, and click the Save button.	SymmetricDS User Information There are no users configured yet. Please setup an administrator user. User id* admin Password*



After entering your user id and password, the console will make you log in with your credentials before proceeding further.

Usernam	3		
admin			
Password	l		
•••••	••••		
Login			

The next screen (shown below) is the main screen and dashboard for SymmetricDS Pro. From this screen we can configure, manage and explore our synchronization scenario. The Configure menu allows us to set up our scenario. The Manage menu allows us to manage the day to day operations of that scenario, and the Explore menu allows us to look at data flowing through the system. We'll start with the Configure menu option and configuring your scenario, but first, let's talk about some additional concepts.

Node		Performance	Auto I Cellesii 🥔
Node Id Group Id Status Instances Version Client Nodes Outgoing Errors Incoming Errors	root root 1 Started 0 2.3.0 0 0 0	By Channel • Routed • 2 hou	
System			
Hostname IP Address Last Restart Java Version	gwilmer-laptop 192.168.1.103 8:09 PM 1.6.0_21	-0.5	
Database		-1.0	100 100
Database Version Database User Connections In Pool Connections In Use Connections Idle	MySQL 5.5 root 40 0 2	6-15 6-25 6-35 6-35 6-35 6-35 7-95 7-15 7-15 7-35 7-35 7-35 7-35 7-35 7-35 7-35 7-3	²⁰⁹ ^{6,1} 6 k.



SymmetricDS Configuration Concepts

We've already talked about Nodes and Node Groups. Now we'll define terms that are needed to configure the data that is captured, how that data is logically grouped, and where the data should be sent.

Term	Description
Node Group	A logical grouping of Nodes used in defining your synchronization configuration. See SymmetricDS
	Synchronization Concepts section earlier in this document for additional details.
Node Group	A Node Group Link defines how data flows between each of the Node Groups in your
Link	synchronization scenario. Each Node Group Link allows you to define a Source Node Group,
	a Target Node Group, and whether data is pulled or pushed between those Node Groups.
	SymmetricDS supports the concept of Channels of data. Data synchronization is defined at the
Channel	table (or table subset) level, and each managed table can be assigned to a <i>channel</i> that helps
	control the flow of data. A channel is a category of data that can be enabled, prioritized and
	synchronized independently of other channels. For example, in a retail environment, users may
	be waiting for inventory documents to update while a promotional sale event updates a large
	number of items. If processed in order, the item updates would delay the inventory updates
	even though the data is unrelated. By assigning changes to the item tables to an <i>item</i> channel
	and inventory tables' changes to an <i>inventory</i> channel, the changes are processed
	independently so inventory can get through despite the large amount of item data.
Trigger	SymmetricDS uses triggers to capture changes that need to be routed to other Nodes. SymmetricDS
	Triggers are standard database triggers supported by your database platform that are automatically
	created based on your configuration data.
Router	Routers are responsible for taking changes that are captured by Triggers and determining to which
	Node Groups those changes are delivered.



Configuring The Synchronization Solution

Node Groups - The first step in configuring your synchronization scenario is to set up your Node Groups (see Node Groups from the Synchronization Concepts page. The Root Node Group has already been set up for you based on the information you supplied to the installer when installing the Root Node. To create additional Node Groups, click the "New" button, fill in the Group Id (unique Id that identifies the Node Group) and a description and click "Save." You must have at least two Node Groups to continue the configuration of your scenario.

Node Group Links - The next step in configuration is setting up Node Group Links. The purpose of the links is to describe how data flows between the Node Groups. They define a source Node Group, a target Node Group, and a link type, namely whether the data changes are *pushed* or *pulled*. The push method causes the source Node Group to connect to the target Node Group and push data changes to it, while the pull method causes the source Node group to wait for the target Node Group to connect to it and pull the data changes that have been recorded on the source.

When you save a new "Node Group Link" you will be asked if you want to create a default router for the link. We'll describe this in more detail in the Router section, but for now, click "Yes" to create the Router.

Groups	*								
Group Links	GROUP I	D		DES	CRIPTIO	N		•	
Triggers	corp								
Parameters	Edit Gr	roup							
Export	Group I	d* com							
import	Group	u corp							
Console Users	Descripti	on						<u></u>	
License Key								-	
	Save	Dele	te Ner	w					
SymmetricDS	Configure	Manage	Explore	Help	W	elcome, Ad	ministrator	n Logou	t
SymmetricDS	Configure	Manage	Explore	Help	W	elcome, Ad	ministrator	2 Logou	t
SymmetricDS Synchronization Channels	Configure Config	Manage ure Gro i	Explore up Links	Help	W	elcome, Ad	ministrator	n Logou	t
SymmetricDS Synchronization Channels Groups	Configure Config	Manage ure Gro i	Explore up Links	Help	w	elcome, Ad	ministrator	n Logou	t
SymmetricDS Synchronization Channels Groups Group Links Ponters	Configure Config main source	Manage ure Grou group	Explore up Links	Help	W	elcome, Ad	ministrator	S. Logou	t
SymmetricDS Synchronization Channels Groups Group Links Routers Triggers	Configure Config m source Edit Gr	Manage ure Groo gRoup oup Lin	Explore up Links	Help	W	elcome, Ad TARGET GR	ministrator OUP	Si Logou	t
SymmetricDS Synchronization Channels Groups Group Links Routers Triggers Parameters	Configure Config and source Edit Gr	Manage ure Grou group oup Lin	Explore up Links	Неір	W	elcome, Ad TARGET GR	ministrator	n Logou	t
SymmetricDS Synchronization Channels Group Links Routers Triggers Parameters Export	Configure Config #	Manage ure Grou GROUP oup Lin roup *	Explore up Links	Неір	w	elcome, Ad TARGET GR	ministrator OUP	المعالم المعالم المعالم المعالم	t
SymmetricDS Synchronization Channels Group Links Routers Triggers Parameters Export Import	Configure Config M Source Edit Gr Source G	Manage ure Groo group oup Lin roup *	Explore up Links k	Help	• •	elcome, Ad	ministrator	n Logou	t
SymmetricDS Synchronization Channels Group Links Routers Triggers Parameters Export Import Console	Configure Config main source Edit Gr Source Go Target G	Manage ure Groo oup Lin roup * Link * roup *	Explore up Links k	Help		elcome, Ad	ministrator	n Logou	ť
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SymmetricDS Synchronization Channels Group Links Routers Triggers Parameters Export Import Console Users License Key	Configure Config source Edit Gr Source G Target G	Manage ure Grou GROUP oup Lin roup * Link * roup *	Explore up Links k ishes to te New	Help	v v	elcome, Ad	ministrator	ILOGOU	t



Data Channels - The next step is to configure Data Channels. In a nutshell, Data Channels allo you to logically group data that is being synchronized within your scenario. When SymmetricDS captures data changes in the database, the changes are captured in the order in which they occur. In addition, that order is preserved when synchronizing the data to other nodes. Frequently, however, you will have cases where you have different "types" of data with differing priorities. Some data might, for example, need priority for synchronization despite the normal order of events. For example, in a retail environment, users may be waiting for inventory documents to update while a promotional sale event updates a large number of items. SymmetricDS supports this by allowing tables being synchronized to be grouped together into Channels. A number of controls to the synchronization behavior of SymmetricDS are controlled at the Channel level. For example, Channels provide a processing order when synchronizing, a limit on the amount of data that will be batched together, and isolation from errors in other channels.

Synchronization Channels	Configure C	Channels									
Groups	ä										
Group Links	CHANNEL ID	ENABLED	PROCESSING ORDER	BATCH ALGORITHM	MAX BATCH 💌						
Triagoro	config	true	0	default	100						
Recompeters	reload	true	1	default	1						
Export	•	III			4						
Import	Edit Channe	el									
import											
Console	Channe	I Id* config									
Users		🔽 Ena	bled								
LICENSE KEY	Processing Or	dor* 0									
	1 Tocessing Of										
	Batching Algor	ithm defaul	t •)								
	Max Batch S	ize* 100									
		10 400									
	Max Batch To Se	end* 100									
	Max Data To Ro	ute* 10000									
		V Use	Old Data To Route								
			Row Data To Routo								
		W 036									
		Use Use	e Pk Data To Route								
		🔲 Tab	les Contain Big Lobs								
	Save	Delete N	ew								

Symmetric DS

Triggers - SymmetricDS uses database triggers as the capture mechanism to record changes to be synchronized to other nodes. Based on the configuration you provide, SymmetricDS creates the needed database triggers automatically for you. Each trigger you define is for a particular table that needs to be synchronized. There is a great deal of flexibility in terms of defining the exact conditions under which a data change is captured by the trigger. For each trigger you can also specify:

- Whether to install a trigger for updates, inserts, and/or deletes
- · Conditions on which an insert, update, and/or delete fires
- A list of columns that should not be synchronized from this table
- A SQL select statement that can be used to hold data needed for routing (known as External Data)

You can create triggers one at a time by clicking the "New" button, filling in the appropriate details for the trigger, and clicking the "Save" button, or you can "Auto Create" them. The "Auto Create" button is a feature that allows you to browse your database table definitions and select tables for which you would like triggers created. You can select multiple tables, and then simply click the "Apply" button which will automatically create triggers for each table selected. Once triggers have been created with the "Auto Create" mechanism you can update each trigger's attributes indivdually by selecting them from the list, editing them, and saving them.

Channels Groups Group Links Routers	Configure Tri Triggers are a repi generated unless	ggers esentation the node b	of tables for w elongs to a no	vhich data i de group tł	s captured to nat is the sou	b be routed to anoth Irce of data for a cor	er system. Actual d nfigured router.	latabase triggers will not b	e
Triggers	TRIGGER ID	TABLE	CHANNEL	SYNC ON	INSERT	SYNC ON UPDATE	SYNC ON DELETE	SYNC ON INCOMING	•
Parameters Export	Edit Trigger				Linked F	Routers			
Import					SELECTED	ROUTER ID	LOAD ORDER	LOAD SQL	
Console Users License Key	Trigger Id* Source Catalog Source Schema Source Table Channel*	✓ Sync Or✓ Sync Or	n Insert n Update	•					
	Save De	Sync Or	n Delete n Incoming lew Auto	o Create]				



Routers - The triggers that have been defined in the previous section only define *when* data changes are to be captured for synchronization. They do not define *where* the data changes are to be sent. Routers, plus a mapping between Triggers and Routers (Trigger/Router), define the process for determining which Nodes receive the data changes.

When you created your Node Group Links, a default Router for each Node Group Link was automatically created for you. This Router defines the data route between your Node Groups (i.e. Node Group 1 pushes data to Node Group 2). All that is remaining to do is to define which triggers are associated with which Router. You can complete this mapping between Triggers and Routers on either the Routers page or the Triggers page. From the Triggers page, simply select a Trigger from the list, and check the "Linked Router" box to have that trigger's captured data be routed by the given router. From the Routers page, select a Router from the list, and then select all of the "Linked Triggers" that you want routed via that Router.

Channels Groups	Routers are a defini available for routing	tion of how node:	s or node groups	s will be chosen i	vhen data from	a linked trigger	table has been cap	otured and is	
Group Links	# a								
Routers	ROUTER ID NO	DE GROUP LINK	ROUTER TYPE	SYNC ON INS	ERT SYNC	ON UPDATE	SYNC ON DELETE		
Parameters									
Export	Edit Router			Linked Trig	gers				
Import				SELECTED	TABLE NAME	LOAD ORDER	LOAD SQL	•	
	Router Id*			Select All Sele	<u>ct None</u>				
LISERS	Group Link*		*						
License Kev	Poutor Typo *	dofault							
	Router Type	uelauli		_					=
									-
	Router Expression								
		🔽 Sync On Upo	date						40
		V Sync On Ins	ert						
		🔽 Sync On Del	ete						
	Target Catalog								
	TorretOrborne								
	Target Schema								
	Target Table								

After your Triggers and Routers have been configured, and the association between the two are mapped, you have completed your initial synchronization configuration.



Client Node Concepts

Now that we have our root instance installed and our synchronization scenario configured, the next steps are to install our client instance. The following are some terms that will help in understanding setting up the client.

Term	Description
Client Node	A SymmetricDS instance (other than the Rood Node) that is participating in the
	synchronization scenario
Node	For a Node to participate in the synchronization it needs to ask for permission from the
Registration	Registration Server. Node registration is the process of a Client Node requesting to be added
	to the synchronization scenario.
Registration	The Node (the Root Node) that is responsible for accepting Node Registration requests
Server	
Registration	The URL of the Root Node which is acting as the Registration Server. The URL includes the
URL	Name (or IP Address) and port that the SymmetricDS instance is running on
Initial Load	An initial load is the process of loading an initial set of data on a Client Node from the Root
	Node



Installing the Client Node(s)

The steps for installing Client Nodes start exactly the same as installing the Root Node.	Installer for Symmetric DS-Pro
 Verify that you have the 1.5.x Java Runtime Environment (JRE) installed on the Root Node computer. Verify that the 1.5.x JRE bin directory is in your path (windows) or <what do="" for<br="" here="" i="" need="" put="" to="">Mac, Linux or Unix></what> Run the SymmetricDS installer by double clicking the symmetric-pro-2.4.x-install.jar 	Step 1 of 14 Welcome to SymmetricDS Pro 2.3.0! Overview SymmetricDS is the leading open source solution for Data Replication, Change Data Capture, and Data Transformation in a heterogeneous enterprise environment. Performance and scalability allow it to replicate thousands of databases asynchronously in near real time. With flexible configuration and powerful scripting and programming interfaces, SymmetricDS can be extended to meet a range of requirements. About JumpMind is an open source software company specializing in data replication and other software packages for the enterprise. Our mission is to build software that is creative, practical, elegant, and easy to use. We provide consulting, services, and support for all of our products. JumpMind, Inc. (http://www.jumpmind.com/)
Review and accept the license agreement	Tinstaller for SymmetricDS-Pro Licensing Agreements Step 2 of 14 These part the following large agreement profile
	SymmetricDS Pro License Agreement PLEASE READ THIS END USER LICENSE AGREEMENT ("EULA") CAREFULLY BEFORE USING SOFTWARE FROM JUMPAIND, INC. BY USING THE SYMMETRICDS PRO SOFTWARE, YOU ACKNOWLEDGE YOUR AGREEMENT TO AND ACCEPTANCE OF THIS END USER LICENSE AGREEMENT AND ACKNOWLEDGE YOU HAVE READ AND UNDERSTAND THE TERMS. AN INDIVIDUAL ACTING ON BEHALF OF AN ENTITY REPRESENTS THAT HE OR SHE HAS THE AUTHORITY TO ENTER INTO THIS END USER LICENSE AGREEMENT, THEN YOU MUST NOT USE THE SOFTWARE. THIS END USER LICENSE AGREEMENT, ND PROVIDE ANY RIGHTS TO SERVICES SUCH AS SOFTWARE MAINTENANCE, UPGRADES OR SUPPORT. PLEASE REVIEW YOUR SERVICE I do not accept the terms of this kense agreement. JumpMind. Inc. (http://www.jumpmind.com/)
Select the installation directory where the SymmetricDS application should be installed	Installer for Symmetric DS-Pro Symmetric DS Step 3 of 14
	Select the installation path: c:\dev\sym2 Browse
	JumpMind, Inc. (http://www.jumpmind.com/)







 The next screen allows you to specify the connection information for the Client Database. JDBC Driver – The class name for your JDBC driver for your Root Database JDBC URL – The URL for your Root Database User Id – The user id for your Root Database. This Id will need Create, Read, Update, Delete (CRUD) privileges for tables Password – Associated password for the User ID for the Root Database Verify – Verification of the password 	Installer for SymmetricDS-Pro
SymmetricDS can be started manually from a Program Shortcut or as a Windows Service. Select one of the two options and click "Next."	Installer for SymmetricDS-Pro User Data Step 8 of 14 Service Setup The SymmetricDS server can be started automatically by installing it as a Windows service or run manually from a Program Shortcut. Run automatically as a Windows Service Run manually from a Program Shortcut JumpMind, Inc. (http://www.jumpmind.com/)
The Summary Configuration screen allows you to review your installation choices. Review and click "Next"	Installer for SymmetricDS-Pro SymmetricDS: Summary Configuration Data Step 9 of 14 Installation will proceed with the following settings, Press Next to continue. Target Path c:devi sym2 Select Installation Packages Main Installation Server Libraries Required Libraries Samples Documentation JumpMind, Inc. (http://www.jumpmind.com/) Imprevious Imprevi



Once the application files have been copied to the installation directory, click the "Next" button.	Installer for SymmetricDS-Pro
The Setup Shortcuts screen allows you to specify where you would like shortcuts created for the Client SymmetricDS instance. Select a group and click the "Next" button.	Installer for SymmetricDS-Pro
Installation of the Client Node is now complete. Click the "Done" button.	Installer for SymmetricDS-Pro Installation Finished Step 14 of 14 JumpMind, Inc. (http://www.jumpmind.com/)



To start Client, either start the service (if you selected to run as a service), or start manually from the start menu.

Management Console	
Quick Start Guide	
Run Demo Server	
Run Server	
Unin-all	•
4 Back	

Registering the Client Node and Completing an Initial Load

Once the client has been started, it will automatically request registration from the registration server that you specified during the client install. With the default settings, permission to participate in the synchronization must be granted to the Client Node. Go to the Root Node web management console (<u>http://<server_name>:<port</u>>). Once logged into the console, click on the "Manage" tab.

Nodes	Manag	Manage Nodes									
Jobs	The following are a list of nodes that push, pull either directly or indirectly (through a tier) to 00000.										
	A node is considered offline if it hasn't checked in within that past 120 minutes.										
	Filter:	Filter:									
	S Open Registration										
	NODE ID	D	EXT	D G	ROUP ID	STATUS	SYNC URL	DEPLOYMENT TYPE	LAST HEARTI		
	?		00001	С	LIENT	Unregistered			3:13 PM	Allow	
	0000	00	00000	Q	ORP	Local	http://gwilmer-laptop:31415/sync	professional	3:09 PM	<u>Manage</u>	

Node to participate in the synchronization, click the "Allow" link on the Client Node row.



After clicking the "Allow" link, a dialog box will be displayed that asks you to confirm the registration request for the Client Node. You will see the Node Group (CLIENT) and the External ID (00001) for the Node that is requesting permission to register.

There is also an "Initial Load?" checkbox that allows you to determine whether this Client Node should get an initial load of data from the Root. By checking this box, any data captured by triggers since the install of SymmetricDS Pro on the Root Node and Root Database will be synchronized to the Client Node.

it hasn't checked in within	Open Registration	×
Please select the group registration will be open	and the external id of the node t ed for.	that
Group		
CLIENT	•	
External Id* 00001		
✓ Initial Load?		
	Apply	Cancel

Once the Client Node has been successfully registered, the "Manage Nodes" screen will look as follows:

Manage	Manage Nodes									
Nodes										
Jobs	A node is considered offline if it hasn't checked in within that past 120 minutes.									
Filter: Open Registration										
	NODE ID	EXTERNAL ID	GROUP ID	STATUS	SYNC URL	DEPLOYMENT TYPE	LAST HEART	I		
	▼00000	00000	CORP	Local	http://gwilmer-laptop:31415/sync	professional	3:24 PM	Man		
	00001	00001	CLIENT	Online	http://gwilmer-laptop:31415/sync		3:37 PM	Mar		
	4 III +									



Common Questions

- Installing JDBC Drivers SymmetricDS Pro ships with most JDBC drivers included in the install program. The Oracle JDBC driver is NOT included with the SymmetricDS Pro distribution. If you want to use Oracle as your Root or Client database, you must install the Oracle JDBC driver manually by copying the ojdbc<version>.jar file to the lib directory of your SymmetricDS Pro install directory.
- Running Root and Client on the Same Computer For trial purposes, you may want to run both a Root Node and Client Node on the same computer. There are a couple of different ways to accomplish this. The first is to actually install the SymmetricDS Pro software twice, in two separate directories (one for the root, and one for the client). In this case, you will need to adjust the port number on either the Root Node or the Client Node as both can't be running at the same time on the same machine. In addition, if you install twice, only one shortcut will be created in your start menu, and it will reference the directory of the last install. SymmetricDS Pro can be run from the command line and started with different port numbers as follows:

From the conf directory of the Root Node: ..\bin\sym.bat –p symmetric.properties –server

From the conf directory of the Client Node: ..\bin\sym.bat –p symmetric.properties –P 31417 –server

The –p argument specifies the properties file, and the –P property specifies the port number. Ensure that your properties file specifies the same port number that used when starting up the Nodes.

The second option for running Root and Client on the same computer is to install once, and then create two separate properties files, one for the Root and another for the Client. When using this method, you can start the first instance from the start menu, but the second will need to be started from the command line or via a manually created option in the start menu. Creation of the Client Node properties file can be completed by copying the Root Properties file and making changes to the following configuration lines:

group.id external.id registration.url sync.url db.driver db.url db.user db.password

Remember to specify a different port on the Client Node.

• Foreign Keys on Initial Loads – For databases with complex relationships between tables, you need to ensure that tables that depend on each other are both in the same channel as well as are ordered properly such that data will be



inserted correctly such that key constraints are not violated. For example, if you have a header and line item table, you need to ensure that the header rows get inserted before the line items. This can be accomplished by specifying the proper initial load order on the "Configure", "Triggers" page for each table / trigger.