

CiB Initial Walkthrough Guide

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Supermicro Storage Group

Supermicro CiB

Windows® Server 2012 R2 on Supermicro Cluster-in-a-Box Walkthrough Guide

Summary

This document is designed to allow the user to initially setup and configure the Supermicro CiB product. The system is delivered with the software pre-installed and all that remains is for the user to integrate the system into their own environment.

Scope

This document is specifically aimed at installing and configuring the Supermicro CiB system. It does not cover Administrative details such as setting up DHCP servers, Domain and Active Directory configuration and assigning user permissions. Please refer to the appropriate Microsoft[®] documentation for this information.



Best practices and tips are highlighted in bold text with a "note icon" throughout the document!



Helpful information about setting up a Microsoft Cluster can be found <u>here</u> at <u>http://technet.microsoft.com/en-us/library/hh831579.aspx</u>

Disclaimer

The intent of this document is to provide a quick start guide for the user deploying the Supermicro CiB product. The appropriate software vendor should be treated as the definitive resource for Software/Operating System setup. Information contained herein is provided with the best intent, however Supermicro cannot be held responsible for errors or omissions contained in this document.

Feedback is greatly encouraged.

All Trademarks respected and acknowledged.

Contents

1.	Cluster Setup Walkthrough	1
	Network cabling	1
	First Boot	1
2.	APPENDIX – Troubleshooting	. 13

Figures

Windows Server 2012 R2 on Supermicro Cluster-in-a-Box Walkthrough Guide



1. Cluster Setup Walkthrough

Network cabling

Connect the private heartbeat cable to the ports on the right of each bay. This is used for inter node communication and is factory configured for static IP addresses.

Figure 1 Connecting the heartbeat cable

Connect Port-1 Ethernet ports together using a single cable



Default Static IP Addresses on LAN #2 are: Node A: 10.10.10.1 Node B: 10.10.10.2

Ethernet cables are not provided with CIB

First Boot

For the Initial Setup, it will need to be done either at the system with a monitor, keyboard, and mouse connected, or through IPMI. Remote Desktop will not be an option at this point. It will be noted when Remote Desktop can be used.

When you first boot up the system, you should see a screen similar to Figure 2 on both nodes

- 1. Power on the system (make sure both nodes are fully inserted and powered on).
- 2. The clustering setup is performed from a single node (configuration of the second node is performed through remote access, therefore switching between nodes is unnecessary). Choose which node you will be working from (for example node1) and proceed through the Out-Of-Box-Experience (OOBE) setup, where the user is asked to configure region settings, enter the COA product key, and accept the EULA.
- 3. At this point connect **only** the heartbeat cables as shown above.

Note if any issues are encountered at this point please refer to the workaround as listed on page **Error!** Bookmark not defined.



Figure 2 Initial screen

	Setting	S	
	Country or region	United States	~
	App language	English (United States)	~
	Keyboard layout	US	~
ዮ			Next

From the screen above select <Next> to proceed to the product key screen as shown in Figure 3.

Figure 3 Entering the Product Key

G	Settings
	Type your product key below. When you connect to the Internet, the product key will be sent to Microsoft to activate Windows.
	It looks similar to this: X0000-X0000-X0000-X00000
	Product key
÷	Next Skip



The product keys are located at the top of the chassis.

Refer to the Quick Reference Guide for the location of the keys if needed.

Figure	4	Accepting	the	License	Terms
--------	---	-----------	-----	---------	-------

€	Settings
	Please read the license terms.
	MICROSOFT SOFTWARE LICENSE TERMS
	MICROSOFT WINDOWS STORAGE SERVER 2012 R2 STANDARD
	These license terms are an agreement between you and:
	the server manufacturer that distributes the software with the server; or
	the software installer that distributes the software with the server.
	Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft:
	+ updates,
	 supplements,
	Internet-based services, and
	support services
	for this software, unless other terms accompany those items. If so, those terms apply. If you obtain updates or supplements directly from Microsoft, Microsoft, and not the manufacturer or installer, licenses those to you. Printed paper license terms, which may come with the software, take the place of any on-screen license terms.
	By using the software, you accept these terms. If you do not accept them, do not use the software. Instand, contact the manufacturer or installer to determine its return nolicy for a refund or credit
Գ	laccept

4. After accepting the EULA, the node will automatically log in with the Administrator account and display the Initial Configuration Tasks (ICT) menu after approximately 20 seconds. Under the "View Connection Status" section of the ICT menu, the Connection Status should be "Connected."



Figure 5 Performing Initial Configuration Tasks

	Initial Configuration 1	asks	- 0 X
Perform the following configuration tasks			Windows Storage Server 2092 R
View Connection Status			6
Sonnext to remate nodes	Connection Status	Connected	
Configure Networking			
Configure Settings			0
Tattine zone	Time Zone	(UTC-08.00) Pacific Time (US & Canada)	
Rouide cluster name and domain	Cluster Name Domain	Not configured Not configured	
Strable Windows Brior Reporting	Windows Error Reporting	он	
🗿 Enable Customer Espanence Improvement Program	Customer Experience Improvement Program	Not participating	
Provision Cluster Storage			
Deploy the Cluster			6
 Validate and create the cluster (i) To enable this task, log in as a domain user that is a member of the local Administrator group. 	Cluster Status	Not created	
Cluster-Aware Updating			
Use Cluster-Aware Updating to help keep this cluster secure and up-to- date and then open freevall parts to enable updating	Automatic Updating:	Waiting for duster	

Do not show this window at the next logon.	Close
	Place 25 to refrech the window

5. **(Required)** Set up Static IPs for the public domain connection (named "IPMI_DATA") on **both** nodes. By default, this connection is set to receive an IP address via DHCP. Click on the "Configure Networking" heading in the ICT menu to expand the section. Use both options to configure IP settings for the "IPMI_DATA" network adaptor appropriate for your network infrastructure.

Figure 6 Setting the IP Addresses

1	Initial Con	figuration Tasks	- 0 X
Perform the following configuration tasks			Windows Storage Server 2012 R2
View Connection Status			6
Connect to remote nodes	Connection Status	Connected	
Configure Networking			
Configure networking for node 1 (local)	IPMI_DATA	IPv4 address assigned by DHCP, IPv6 enabled	
and the second s	Ouster_Heartbeat	10.10.10.1, iPr6 enabled	
Configure networking for Node 2 (10.10.10.2)	IPMI_DATA	IPv4 address assigned by CHCP, IPv6 erabled	
100 m	Ouster_Heartbeat	10.10.10.2, IPv6 enabled	
Configure Settings			6



Connecting to the remote node will introduce a short delay as the local node negotiates a remote access connection, but no credentials are necessary provided the Administrator account passwords have not been changed from the expected default.

At this point connect the port 1 DHCP enabled cables as show below:

Figure 7 Connecting the DHCP cables



- 6. Under the "Configure Settings" section of the ICT menu, change the Time Zone settings if necessary.
- 7. The next step in Cluster Configuration is to select the "Provide cluster name and domain" option.

Figure 8 Setting the Cluster Name and Domai	Figure	8 Setting	the	Cluster	Name	and	Domai
---	--------	-----------	-----	---------	------	-----	-------

Configure Settings			
The set time zone	Time Zone	(UTC-08.00) Pacific Time (US & Canada)	
Provide cluster name and domain	Claster Name	Not configured	
	Domain	Not configured	
V Inable Windows Error Reporting	Windows Error Reporting	0#	
Brable Cultomer Experience Improvement Program	Customer Experience Improvement Program	Not participating	



Note ensure that the correct user permissions are configured for the IT administrator performing this step.

This brings up the "Configure Domain and Cluster Settings" wizard, which will guide you through the process of:



- 1. Joining your Domain network
- 2. Choosing a Cluster Management name¹
- 3. Configuring Administrative access groups
- 4. Changing the Local Administrator password (which will be applied to both nodes).

Figure 9 Issuing Domain Credentials

18	Configure Domain and Cluster Settings
Specify the Ac	tive Directory Domain and User Credentials
Steps: Specify the Active Directory Domain and User Credentials 1 Specify the Cluster Management Name 2 Add Accounts to the Local 3	Specify the domain that the nodes will join. Domain: Specify the domain credentials to create the cluster.
Administrators Group Change the Local Administrator 4 Password Review Settings and Create Domain Controller Confirmation	Domain\User name:
	< Previous Next > Cancel

 $^{^{1}}$ Note: If the Clustername already exists please refer to the section c of the appendix on page 13.



Figure 10 Completing the Domain and Cluster Settings

1	Configure Domain and Cluster Se	ttings	-	•	x
Confirmation Steps: Specify the Active Directory Domain and User Credentials	Configure Domain and Ouster Settings Wizard ha must restart all nodes after closing the wizard.	s successfully completed. You			
Specify the Cluster Management Name Add Accounts to the Local Administrators Group Change the Local Administrator Password Review Settings and Create Domain Controller Confirmation	Tasks Image: Solution of the series	Status Success Success Success Success Success Success Success Success		Cose	

After successfully configuring the settings, the wizard will ask to restart both nodes. Click "OK" to reboot (the remote node will reboot automatically; you do not need to switch to it).



Figure 11 Restarting the System

M	Configure Domai	n and Cluster Settin	ngs	-		x
Confirmation						
Steps:						
Specify the Active Directory Domain and User Credentials	Configure Domain and Clus must restart all nodes after	ster Settings Wizard has su closing the wizard.	uccessfully completed. You			
Specify the Cluster Management Name	Tasks Errore					
Add Accounts to the Local Administrators Group	Task	S	tatus		7	
Change the Local Adm	Restar	t All Nodes	X			
Review Settings and C Domain Controller	All nodes are waiting for a re	start. Confirm that you	want to restart all			
Confirmation	nodes now.					
			ОК			
				2		
				(Jose	

8. Sign into the node with a domain account using Administrative privileges to proceed with the cluster setup. If you are not signed in with a domain account, the ICT menu will instruct you to log in with a domain account. If you see the following screen/message within the ICT menu you are in the backup node and you need to log onto the primary node.

A Please logon to the first node to complete the configuration.

9. Open the "Provision Cluster Storage" section of the ICT menu. The "CIB Storage Pool" and "QuorumWitness" disk volume should already be created on your behalf in order to facilitate the cluster setup. Verify that these two objects exist and are properly detected as shown below. (Note: the QuorumWitness disk may need to be turned online in Microsoft's Storage Spaces. See Appendix D.)



Figure 12 Provisioning Storage

Provision Cluster Storage			
Configure (SCSI initiator for node 1 (local)			
Configure GESI Initiator for Node 2 (OBCLuster-N2)			
Creater a storage pool	Available Disks:	None	
	Storage Pools:	CI8 Storage Fool, 29.1 TB, 29.1 TB free, Storage Spaces	
The Create disks and volumes	Volumes:	QuorumWintess (Q), 1.97 G8, 1.92 G8 free	
Create volumes			



Note: No further actions are necessary at this point in time. (It is <u>STRONGLY RECOMMENDED that you</u> <u>DO NOT</u> create additional disks and volumes prior to finalizing cluster creation as they may interfere with the cluster validation tests.) Provisioning storage for clustered services should be done after the cluster setup is completed (not covered in this document).

10. Under the "Deploy the Cluster" section of the ICT menu, select the "Validate and create the cluster" link. This brings up the Cluster Validation and Setup Wizard. Click on the Validate button to begin the automated cluster validation tests.

Figure 13 Validating the Cluster

	Cluster Validation and Setup Wizard
Validate Failove	er Cluster Configuration
eps:	
slidate Failover Cluster	validation resung must be performed to verify that the failover cluster hodes and attached storage are configured correctly. Failover clustering is supported only if the configuration passes all validation testing. Validation testing may run for an extended period of time.
uster Management Name	
ghly Available File Server	Validation testing will be performed on the following nodes:
eview Settings and Create allover Cluster	Node 1 (local) A Node 2 (CIBOluster-N2)
pnfimation	Validate N
	Validation testing details:
	<u>^</u>
	×



After approximately 10-15 minutes, the validation tests should complete. Review the Validation Testing Report and ensure that there are no errors or warnings before proceeding. (Cluster support is available only on fully validated configurations.)



NOTE: It is **<u>HIGHLY RECOMMENDED</u>** that you incrementally re-run the cluster validation tests when you add clustered storage and services.

Figure 15 Completing the Cluster Validation

8 <u>8</u>	Cluster Validation and Setup Wizard
Validate Fai	lover Cluster Configuration
Steps: Validate Failover Cluster Configuration Cluster Management Name Review Settings and Create Failover Cluster Confirmation	Validation testing must be performed to verify that the failover cluster nodes and attached storage are configured correctly. Failover clustering is supported only if the configuration passes all validation testing. Validation testing may run for an extended period of time. Validation testing will be performed on the following nodes: Node 1 (local) Node 2 (CIBCluster-N2) Validation testing details: Cluster validation has started.
	Quster validation testing has completed successfully. View validation testing report < Previous

At the next window, you will be asked to assign an IPv4 address to the cluster if your network's DHCP server does not automatically assign one. Review the settings and proceed to create the cluster.



Figure 16 Final Cluster Validation screen

槛	Cluster Validation and Setup Wizard	_		x
Confirmation				
Steps:				
Validate Failover Cluster Configuration	You have successfully completed the Cluster Validation and Setup Wizard.			
Cluster Management Name				
Review Settings and Create Failover Cluster	Tasks Errors			
Confirmation	Create cluster Success Save machine pool Success			
	Fallover cluster configuration settings can be changed using the Fallover Cluster Manager snap-in	R.	Close	

- 11. Congratulations! You have successfully created your failover cluster via the OEM Cluster Setup process; you can view more information regarding Microsoft Failover Clusters at <u>http://technet.microsoft.com/en-us/library/hh831579.aspx</u>.
 - a. The configuration of clustered storage disks and cluster services is beyond the scope of this document; please study additional documentation and tutorials online as well as Supermicro's CiB Best Practices Guide.



b. REMINDER: Please remember to activate Windows on the second node.

Note: We have seen an issue with the Initial Configuration Tasks screen where it states to go to the main node to continue with the setup even though it has completed successfully. This can be verified by one of two ways documented below:

• Go to the main node and where it shows *Validate and create the cluster* the option is greyed out since the cluster has already been created.



Figure 17 Checking that the cluster has been deployed

Deploy the Cluster

Validate and create the cluster

• Alternatively go to the Failover Cluster Manager screen to check if the cluster is connected

Figure 18 Verifying cluster connection

电			Failover Cluster Manager		_ 0			
File Action View Help								
(+ +) 🖄 🖬 📓 🖬								
🍓 Failover Cluster Manager	Cluster TS-NODE.ClusterNetwork.com				Actions			
▲ W TS-NODE.ClusterNetwork.c					TS-NODE.ClusterNetwork.com			
Nodes	Summary of Cluster 1S-NODE	🍇 Configure Role						
þ 📇 Storage	Name: TS-NODE ClusterNetwork com		Networke: Cluster Network 1 Clu	tar Natwork 2. Clivetar Natwork 3	Validate Cluster			
Networks	Current Host Server: TS-Node-N2		Subnets: 2 IPv4 and 1 IPv6	ter netholic 2, clater netholic 5	View Validation Report			
Iluster Events	Recent Cluster Events: None in the last 24 hours				P Add Node			
	Witness: Disk (Cluster Disk 1)		Close Connection					
	Configure							
					More Actions			
	Configure high availability for a specific clustered role, add one or mo	ire servers (nodes), or c	opy roles from a cluster running Windows Server	2012 R2, Windows Server 2012, or Windows Server 2008 R2.	View			
	Wikidate Custer	G Refresh						
	Add Node	Properties						
	I Conv Cluster Polen	1 Help						
	Custar Awara Undation							
	 Navigate 							
	Roles Roles	Terrage	R Networks	Custer Events				
	Cluster Core Dessures:							
	Name	Status	Information					
	T B Chaster Dials 1	(Online						
	S. Cluster Pool 1	Online						
	Server Name	(or or and						
	Mame: TS-NODE	() Online						
		-						
< III >								



2. APPENDIX – Troubleshooting

A. Issues during OOBE / Remote node connection:

 The default Administrator account password is *Admin_123*. The Cluster OEM Setup expects this password to be unchanged in order to maintain a more convenient flow. (You will be asked to change this password later in the cluster setup process.)

B. Network Configuration

- 1) Consult your IT / Network / Domain Administrator for the proper configuration of Static IPs.
- 2) It is possible to change the "Cluster_Heartbeat" IP addresses from the default settings, but doing so will cause the ICT menu to become unresponsive. To resolve the unresponsive issue, close the ICT menu and then restart the menu with the C:\Windows\system32\oemoobe\OemOOBE.exe application.

C. Joining a Domain Network

- 1) If you receive a Domain Network "is not accessible" error, please check with your IT/ Network / Domain Administrator that the Domain Network is available.
- 2) If you receive an error that your cluster management name or Node Name "is already in use", consult your IT / Network / Domain Administrator to check whether stale Active Directory objects and/or DNS records exist on the Domain Controller.

Note: After the records have been cleaned return to the previous section as described on step 1 of page 6 and select the previous screen to ensure that the changes are reflected.



Figure 19 Domain Name Issues

3	Configure Domain and Cluster Settings	-		x
Specify the C	luster Management Name			
Steps: Specify the Active Directory Domain and User Credentials Specify the Cluster Management Name	Specify the cluster management name and change node names as needed. Cluster management name: CIBCluster			
Add Accounts to the Local Administrators Group Change the Local Adm	Configure Domain and Cluster Settings			
Password Review Settings and C Domain Controller Confirmation	The cluster management name "CIBCluster" is already in use. Enter a unique name.			
	< Previous Next >		Cancel	

D. Existing Storage Pool and QuorumWitness

 On occasion the QuorumWitness volume may not display properly in the ICT menu while still existing. Go to Server Manager → File and Storage Services → Volumes → Disks to check whether the QuorumWitness Virtual Disk exists. Note: It is ok if its status is "Offline"; the cluster creation process will attach it correctly provided there are no unexpected errors.



Figure 20 Quorum issues

Servers	All storage pools 1 tol	a					TASKS
Volumes	Fitter	Q	· ·				9
Storage Pools	A Name	Туре	Managed by	Available to	Read-Write Server	Capacity Tree Space	Percent Allocated 5
iSCSI	 Storage Spaces (1) CB Storage Post 	Storage Pool	NoteA	Nodel	NodeA	20178 20178	_
Work Folders	Verify 1			Contraction of Contra			
	()	2.4.1.1.0.01.4					
	Call Performance and State of Per-	THE PAR					
	VIRTUAL DISKE				BUVEICAL DIEVE		
	CIB Storage Pool on NodeA			TASKS 🗢	Cill Storage Pool on NodeA		T#5K5
	Faur	P	(i) • (ii) •	0	Filter	P (i) + (ii)	-
	1		Marca Marca				
	A Name	Leyout Pro	nusioning Capacity Alloci	rted Volume OF	Z Slot Name	Status Capac	ity Bus Usage; C
	CB Quorum Disk	Party In	ed 2.00 G8 2.00 C		10 NewcalDisk2 (Node/	N 3.64 T	1 SAS Automation
	Varify 2				8 PhysicaDone Code	A) 3647 3647	8 545 Automatic S
					15 PhysicalDisk? (NodeA	A) 154 T	8 SAS Automatic S
					13 PhysicalOisk5 (NodeA	4) 3647	B SAS Automatic S
					9 PhysicaDisk1 (Node)	3.64 7	SAS Automatic S
					11 PhysicalDiss and del	3.64.7	8 SAS Adonate S
					12 Photoki (Nodel	4) 3.64.7	8 SAS Automatic
					the compositio	on of physical disks depen	ds on your
					configuration e	choice	

2) If the CIB Storage Pool and QuorumWitness disk/volume do not already exist, then this is an indication that the Cluster OEM Setup was not prepared correctly. Consult the Microsoft documentation regarding Storage Spaces at <u>http://technet.microsoft.com/en-us/library/hh831739.aspx</u> to manually create a storage pool and quorum disk.

E. Cluster Validation and Creation

 Provided that you have followed the customer walkthrough guide above, the initial cluster validation test should pass without any warnings or errors. Within the validation test report it is easy to find the sections that require your attention; see <u>http://technet.microsoft.com/en-us/library/jj134244.aspx</u> for more information about the cluster validation tests. One of the more common warnings is if you attempt to create additional disks and volumes (beyond the pre-created CIB Storage Pool and QuorumWitness disk) prior to creating the cluster itself; please cancel the cluster setup wizard, delete the additional disks and volumes, and re-run the validation tests again.





2) It is <u>HIGHLY RECOMMENDED</u> that you incrementally re-run the cluster validation tests as you add clustered storage and services in later steps. You can do so by opening the Failover Cluster Manager, selecting the cluster from the left panel, then selecting "Validate Cluster.." from the right panel.

F. Removing an Existing Cluster

- 1) In case you are unsatisfied with your cluster configuration, you may choose to destroy the cluster so that you can start over.
 - i. Open the Failover Cluster Manager and select the target cluster from the left panel. In the right panel, click on "More Actions → Destroy Cluster" and confirm your choice in the following window.
 - ii. Consult your IT / domain administrator for additional cleanup of stale active directory objects and DNS records that exist on the domain controller.

G. Error Communicating with Other Node During Initial Setup

1) In this case, press ALT+TAB to get to the *Set Up Windows* window, use TAB or LEFT ARROW or RIGHT ARROW to highlight *Cancel*, and press ENTER

Figure 21 Node communication error

	Set Up Windows
8	The following error(s) occurred: Unable to access the node with IP address 169.254.214.103. The network path was not found. Cannot establish communication with all remote nodes. Automated setup cannot proceed until all remote nodes are accessible. Ensure all remote nodes are powered on and connected to the network. As applicable, refer to the OEM product documentation for information on available connection options. After all remote nodes are turned on and connected, it may take several minutes before Setup can resume.
	<u>R</u> etry Cancel

The following window will appear:



Figure 22 Node communication error workaround screen 1

	Set Up Windows X
?	Do you want to ignore all remote nodes? If so, you must run the wizard manually later to configure all remote nodes.
	<u>Y</u> es <u>N</u> o

2. Select *Yes* and press ENTER. Repeat for NodeB. When you see the following window on both Nodes . Go to node B and select <Connect to remote nodes>. The window shown in **Error! Reference source not found.** should appear.

Figure 23 Node communication error workaround screen 2

3	_ 0 ×		
Perform the following configuration tasks			Windows Server 2012 R2
View Connection Status			
Connect to remote nodes Unable to discover all remote nodes. Unable to discover any remote node. The IP address of the current node is 169.254.214.103. Please logon to each remote node to identify the IP address displayee in the corresponding message area. Then return to the first node and click the Connect to the remote nodes task and enter the IP	Connection Status	Failed to discover remote nodes.	
Configure Networking	ķ		
Configure Settings			
Set time zone	Time Zone	(UTC-08:00) Pacific Time (US & Canada)	
Karate virtual switches for Hyper-V	Virtual Switch Status	Not configured	
Provide cluster name and domain	Cluster Name Domain		=
Y Enable Windows Error Reporting	Windows Error Reporting	Off	
Trable Customer Experience Improvement Program	Customer Experience Improvement Program	Not participating	
Provision Cluster Storage			
Deploy the Cluster			۲
Validate and create the cluster	Cluster Status	Not created	
To enable this task, log in as a domain user that is a member of the local Administrator group.			
Cluster-Aware Updating			0
Use Cluster-Aware Updating to help keep this cluster secure and up-to-	- Automatic Updating:	Waiting for cluster	~
Do not show this window at the next logon.			Close
			Refresh is in progress



Figure 24 Node communication error workaround screen 3

١	Connect to remote nodes 🗕 🗖 🗙						
	The expected number of remote nodes is 1. Please logon to each remote node and determine the IP address for each remote node. This is usually displayed in the associated message area of the same task in Initial Configuration Tasks. Afterwards, return to this node and enter 1 comma-separated IP addresses in the text box below.						
	Apply Cancel						

Enter the IP address of NodeA (it should be 10.10.10.1, and NodeB should be 10.10.10.2) and click Apply. NodeB (which is now the main) should have the Initial Configurations Tasks looking like this, note the highlighted area!

Figure 25 Node communication error workaround screen 4

li in the second se	Initi	ial Configuration Tasks	_ 0 ×
Perform the following configuration tasks			Windows Server 2012 R2
View Connection Status			۲
Connect to remote nodes	Connection Status	Connected	
Configure Networking			۲

NodeA (now the backup) should have the following, basically saying log into the first node to complete the configuration.

Figure 26	6 Node	communication	error	workaround	screen 5
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Initial Configuration Tasks			_ 0 ×
	Perform the following configuration tasks		Windows Server 2012 R2
		A Please logon to the first node to complete the configuration.	

Now return to where you left off in the main walkthrough.