Dell Wyse Management Suite

Version 1.4 High Availability Guide



Notes, cautions, and warnings

- () NOTE: A NOTE indicates important information that helps you make better use of your product.
- △ CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.
- Marning: A WARNING indicates a potential for property damage, personal injury, or death.

© 2019 Dell Inc. or its subsidiaries. All rights reserved. Dell, EMC, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be trademarks of their respective owners.

2019 - 05

Contents

1 Introduction	4
High availability overview	4
2 High availability architecture	5
System requirements for high availability	5
3 High availability on Windows Server 2012/2016	7
Creating clustered roles	7
4 Achieve high availability on Windows Server 2012/2016	
Add failover cluster feature on Windows Server 2012/2016	
Create file share witness	
Configure cluster quorum settings	
Creating clustered roles	20
5 Achieve high availability for MySQL InnoDB	24
High availability with MySQL InnoDB	
Install MySQL InnoDB database	24
Check MySQL InnoDB server instances	
Create a cluster instance for MySQL InnoDB	
Add server instance to MySQL InnoDB cluster	
Configure MySQL Router	
Create database and users on MySQL InnoDB server	58
6 Achieve high availability on MongoDB	59
Install MongoDB	
Create replica servers for MongoDB database	
Create database user	
Create DBadmin user for MongoDB	
Edit mongod.cfg file	
Initiate replication on the servers	61
7 Achieve high availability for Teradici devices	65
Install and configure HAProxy	
Install Wyse Management Suite server	67
8 Install Wyse Management Suite on Windows Server 2012/2016	
9 Upgrade Wyse Management Suite version 1.3 to 1.4	
10 Post installation checks	77
11 Troubleshooting	

Introduction

Wyse Management Suite version 1.4 is the next generation management solution and enables you to configure, monitor, manage, and optimize your Dell Wyse thin clients. This helps you to deploy and manage thin clients on a high availability set-up with improved performance.

It offers advanced feature options such as cloud versus on-premises deployment, manage-from-anywhere by using a mobile application, and enhanced security such as BIOS configuration and port lockdown. Other features include device discovery and registration, asset and inventory management, configuration management, operating system and applications deployment, real-time commands, monitoring, alerts, reports, and troubleshooting of endpoints.

Wyse Management Suite version 1.4 supports high availability and significantly minimizes the system downtime. The solution also protects the system from unplanned downtime and helps you to achieve the required availability to meet the business goals.

This guide describes the solution architecture and explains how to set up, configure, and maintain high availability clusters at the application and database level.

High availability overview

About this task

The high availability solution for Wyse Management Suite version 1.4 includes the following tasks:

Steps

- 1 Review the high availability requirements—see System requirements to set up high availability.
- 2 Deploy high availability on Microsoft Windows Server 2012/2016—see Deploy high availability on Windows Server 2012/2016.
- 3 Deploy high availability on MySQL InnoDB servers—see Deploy high availability on MySQL InnoDB.
- 4 Deploy high availability on MongoDB—see Deploy high availability on MongoDB.
- 5 Configure high availability proxy (for Teradici devices)—see Deploy high availability for Teradici servers.
- 6 Install Wyse Management version on Windows Server 2012/2016—see Install Wyse Management Suite on Windows Server 2012/2016.
- 7 Review the post installation checks—see Post installation checks.
- 8 Troubleshooting issues with workaround—see Troubleshooting.

High availability architecture

The Dell Wyse Management Suite architecture consists of Windows Server 2012/2016 with failover cluster enabled. The Windows cluster contains a main computer that supports other applications and ensures minimum downtime by harnessing the redundant. This is used for application failover for Tomcat, Memcache, MQTT services. MongoDB database cluster helps in the event of primary database failure the secondary database will take over. MySQL InnoDB database cluster has an inbuilt database clustering mechanism and secondary database will take over in case of primary read write database fail. Linux Server with HA Proxy is a load balancer and high availability server for EMSDK (Teradici) server. Local repository is created as part of the shared path that contains the applications, images, packages, and will not be part of the cluster set up.

() NOTE: The high availability system requirements may change depending on the infrastructure at your work site.



Figure 1. High availability architecture

System requirements for high availability

The table lists the minimum hardware and software requirement and supports up to 10,000 devices. Each instance of EMSDK can support a maximum of 5,000 devices. The deployment can be on individual servers or on a hypervisor environment, depending on the requirement.

The hardware and software requirements to set up high availability for Wyse Management Suite version 1.4 are:

Table 1. System requirements

Product	Port	Protocol	Description
Microsoft Windows Server 2012/2016 R2	 Network communication ports: UDP:3343 TCP:3342 UDP:137 	 Minimum disk space—40 GB Minimum number of systems—2 Minimum memory (RAM)—8 GB Minimum CPU requirements—4 	Server where Wyse Management Suite is hosted. Supports English, French, Italian, German, and Spanish languages.
MySQL Cluster	 Network communication port— TCP:3306 	 Minimum disk space—40 GB Minimum number of systems—3 Minimum memory (RAM)—8 GB Minimum CPU requirements—4 	Server in the high availability setup.
MySQL Router	 Network communication ports: 6446 6447 	 Minimum disk space—40 GB Minimum number of systems—2 Minimum memory (RAM)—8 GB Minimum CPU requirements—4 	Establishes communication in the high availability setup.
MongoDB	Network communication port— TCP: 27017	 Minimum disk space—40 GB Minimum number of systems—3 Minimum memory (RAM)—8 GB Minimum CPU requirements—4 	Database
EMSDK	Network communication port— TCP: 5172 TCP 49159	 Minimum disk space—40 GB Minimum number of systems—2 Minimum memory (RAM)—8 GB Minimum CPU requirements—4 	Enterprise SDK server
HAProxy	Network communication port— TCP: 5172	 Minimum disk space—40 GB Minimum number of systems—1 Minimum memory (RAM)—4 GB Minimum CPU requirements—2 	Load balancer in the high availability setup. Ubuntu version 12.04 and later.

() NOTE: Ensure that you add the TCP ports 443, 8080 and 1883 to the firewall exception list during high availability setup.

High availability on Windows Server 2012/2016

A failover cluster is a group of independent systems that increases the availability and scalability of clustered roles. This feature supports multiple workloads running clusters on hardware or on virtual machines.

A failover cluster is a group of systems that are independent and increases the availability and scalability of clustered roles. The clustered servers are the nodes that are connected to one another as a network. If one or more of the cluster nodes fail, other nodes become active and prevents failover of the systems in the network. The clustered roles that are created during cluster setup monitor to verify that the systems are working in the clustered network. If any of the systems are not working, they are restarted or moved to another node.

The failover cluster network for high availability on Windows Server 2012/2016 contains two nodes, Node 1 and Node 2 that are configured on systems running Windows Server 2012/2016. In the failover cluster network, if Node 1 that is working as the primary node fails, Node 2 starts working automatically as the primary node. After Node 1 becomes active, it automatically becomes the secondary node. The systems have a shared storage space that is connected in a network.



(i) NOTE: The IP address of the systems in the image is an example and varies for each system at your work place.

Figure 2. Failover cluster setup

Creating clustered roles

Prerequisite

After you create the failover cluster, you can create clustered roles to host cluster workloads. Ensure that Wyse Management Suite is installed on the servers and point to the remote database before you create clustered roles.

About this task

To create a clustered role, do the following:

Steps

- 1 In Microsoft Windows Server 2012, right-click the **Start** menu and then select **Server Manager** to launch the Server Manager dashboard
- 2 Click Failover Cluster Manager to launch the cluster manager.
- 3 Right-click **Roles** and then select **Configure Role** to display the **High Availability Wizard** screen.

80	High Availability Wiz	ard	x
Select R	ole		
Before You Begin Select Role Select Service Client Access Point Select Storage Replicate Registry Settings Confirmation Configure High Availability Summary	Select the role that you want to configure for high ava DFS Namespace Server DHCP Server Distributed Transaction Coordinator (DTC) File Server Generic Application Generic Script File Server Hyper-V Replica Broker FiSCSI Target Server	alability:	Description: You can configure high availability for some services that were not originally designed to run on a cluster. For more information, see <u>Configuring Generic</u> <u>Applications, Scripts, and Services</u> .
		< <u>P</u> re	evious <u>N</u> ext > Cancel

Figure 3. High availability wizard

4 Select Generic Service and then click Next to view the Select Service screen.

Select Service	Select the service you want to use from the list:		
Confirmation	Name	Description	4
Service	Data Sharing Sanua	Provides data brokaring between applications	
	Data Sharing Service	The DCP (Data Collection and Publishing) send	l
uninary	DCOM Server Process Launcher	The DCOMI ALINCH service launches COM an	1
	Dell WMS: Tomcat Service	Apache Tomcat 9.0.13 Server - https://tomcat	Ľ
	Device Association Service	Enables pairing between the system and wired	•
	Device Install Service	Enables a computer to recognize and adapt to	
	Device Management Enrollment Service	Performs Device Enrollment Activities for Devic	
	Device Setup Manager	Enables the detection, download and installatio	
	DevQuery Background Discovery Broker	Enables anns to discover devices with a backo	

Figure 4. Select service

5 Select **Dell WMS: Tomcat Service** and then click **Next**.

(i) NOTE: You can add the Wyse Management Suite version 1.4 related services to the cluster only after you install Wyse Management Suite version 1.4.

The **High Availability Wizard** screen is displayed where you need to create the client access point and establish connectivity between the Windows server 2012 and Wyse Management Suite.

6 Type a network name in the **Name** field and then click **Next**. The **Confirmation** screen is displayed with the network name and IP address details of the server.

刻	Hi	gh Availability Wizard	x
tonfirma	tion		
Before You Begin Select Role	You are ready to configure	high availability for a Generic Service.	
Select Service Client Access Point	Service: Network Name:	Dell WMS: memcached (memcached) WMS132AP	^
Select Storage	OU:	CN=Computers,DC=AD132,DC=COM	
Replicate Registry Settings	IP Address: Parameters:	10.150.132.51 -d runservice -p 11211	
Confirmation			
Configure High Availability			
Summary			*
	To continue, click Next.		
		< <u>P</u> revious <u>N</u> ext >	Cancel

Figure 5. Confirmation

- 7 Click **Next** to complete the process.
- 8 To add other Wyse Management Suite services as part of the cluster, launch **Failover Cluster Manager**, and then go to **ActionsRoles** to display the network name that you have created.
- 9 Click on the network name, and go to Add ResourceGeneric Service.
- 10 Select the following services from the **New Resource Wizard** screen that needs to be added as part of the cluster:
 - a Dell WMS: MQTT Broker
 - b Dell WMS: memcached
- 11 Click **Next** to complete the task.

The Wyse Management Suite services that have been added as part of the cluster are displayed with the status Running.

Achieve high availability on Windows Server 2012/2016

The following are the steps to achieve high availability on Windows Server 2012/2016:

- 1 Add failover cluster feature on Windows Server 2012/2016—see Adding failover cluster feature on Windows Server 2012/2016.
- 2 Create file share witness—see Create file share witness.
- 3 Configure cluster Quorum—see Configure cluster Quorum.
- 4 Create clustered roles—see Create cluster roles.

Add failover cluster feature on Windows Server 2012/2016

About this task

To add the failover clustering feature on the Windows server 2012, do the following:

Steps

- 1 In Microsoft Windows Server 2012/2016, click **Start** to open the **Start** screen and then click **Server Manager** to launch the **Server Manager** dashboard.
 - (1) NOTE: Server Manager is a management console in Windows Server 2012/2016 that enables you to add server roles/ features, manage, and deploy servers.
- 2 Click Add roles and features and select an option to configure the server based on your requirement from the Add Roles and Feature Wizard screen.

i.	Add Roles and Features Wizard
Before You Begin Installation Type Server Selection Server Roles Features Confirmation Results	Add Roles and Features Wizard DESTINATION SERVER No servers are selected. Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD). Role-based or feature-based installation Configure a single server by adding roles, role services, and features. Remote Desktop Services installation Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.
	< Previous Next > Install Cancel

Figure 6. Role based selection

3 Click Installation Type and select Role-based or Feature-based installation and then click Next to view the list of servers in the Select destination server screen.

lect destination	on server			No servers are selected
efore You Begin	Select a server or a virtual h	ard disk on which to insta	all roles and features.	
nstallation Type	Select a server from the	server pool		
erver Selection	 Select a virtual hard disk 	:		
	Server Pool			
	Filter:			
	Name	IP Address	Operating System	
	TMSRV002.ADSRV119.C TMSRV001.ADSRV119.C	10.150.145.102,10.15 10.150.145.100,169.2	Microsoft Windows Sen Microsoft Windows Sen	ver 2012 R2 Standard ver 2012 R2 Standard
	2 Computer(s) found This page shows servers tha Add Servers command in Se collection is still incomplete	t are running Windows S rver Manager. Offline ser are not shown.	erver 2012, and that have vers and newly-added se	been added by using th rvers from which data

Figure 7. Select server destination

- 4 Select the server where you want to enable the failover cluster feature and then click Next.
- 5 Select Failover Clustering on the Features screen, and then click Next. After you enable the failover cluster on the servers, open the Failover Cluster Manager on the server at Node 1.
- 6 Click **Yes** to confirm installation, and enable the failover cluster feature on the selected server.
- 7 In the Failover Cluster Manager screen, click Validate Configuration to view the Validate a Configuration Wizard add the required servers or nodes to cluster.



Figure 8. Failover cluster manager

- 8 Click Select servers or cluster and then click Browse to configure the servers.
- 9 ClickNext and select Run all tests from the Testing Options screen.

N	Validate a Configuration Wizard
Testing	Options
Before You Begin Select Servers or a Cluster Testing Options Confirmation Validating Summary	Choose between running all tests or running selected tests. The tests examine the Cluster Configuration, Hyper-V Configuration, Inventory, Network, Storage, and System Configuration. Microsoft supports a cluster solution only if the complete configuration (servers, network, and storage) can pass all tests in this wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2012." Run all tests (recommended) Run only tests I select More about cluster validation tests
	< Previous Next > Cancel

Figure 9. Testing options

10 Click **Next**. The **Confirmation** screen is displayed with the list of selected servers.



Figure 10. Confirmation

11 Click **Next**. The **Summary** screen is displayed with the failover cluster validation report.



Figure 11. Test summary details

12 Click **View Report** to check the report. If the status is **Passed**, you can proceed with the next step. If the status is **Failed**, you must fix the errors before you proceed with the next step.

I NOTE: The Create Cluster Wizard screen is displayed if there are no validation errors.

- 13 Click Next and type a name for the cluster in the Cluster Name field and then select the IP address of the system.
- 14 Click Next and the Confirmation screen is displayed.
- 15 Click Next to create the cluster on all the selected clustered nodes and then click View Report to view the warning messages.
- 16 Click **Finish** to create the failover cluster.

Create file share witness

A file share witness is a basic file share that the cluster computer has read/write access. The file share must be on a separate Windows Server 2012 in the same domain where the cluster resides.

About this task

To create a file share witness, do the following:

Steps

- 1 In Microsoft Windows Server 2012, Right-click the **Start** Menu and then select **Server Manager** to launch the Server Manager dashboard
- 2 Click the Server Manager icon to access the server manager.
- 3 Go to Files and Storage ServicesShares and then click Tasks.
- 4 Click New Share. The New Share Wizard is displayed.
- 5 Click Select Profile to create a file share and then click Next.
- 6 On the Share location screen, select the server and share location for the file share and then click Next.
- 7 On the Share Name screen, type a name in the Share name field and then click Next until the Confirmation screen is displayed.

- 8 Click **Create** to create the file share and the **View results** screen is displayed with the status as **Completed** which indicates that the file share witness is created without any errors.
- 9 Click **Close** to exit.

Configure cluster quorum settings

The cluster configuration database, also called the quorum, contains details as to which server should be active at any given time in a cluster set-up.

About this task

To configure the cluster quorum settings, do the following:

Steps

- 1 In Microsoft Windows Server 2012, click **Start** to open the **Start** screen and then click **Server Manager** to launch the Server Manager dashboard.
- 2 Click the Server Manager icon to access the server manager and then click Failover Cluster Manager to launch the cluster manager.
- 3 Right-click the cluster node, and go to **More ActionsConfigure Cluster Quorum Settings** to display the **Configure Cluster Quorum Wizard** screen.
- 4 Click Next. Select Select the quorum witness from the Select Quorum Configuration Option screen.

指置	Configure Cluster Quorum Wizard	x
Select Q	uorum Configuration Option	
Before You Begin Select Quorum Configuration Option Witness Confirmation Configure Cluster Quorum Settings Summary	Select a quorum configuration for your cluster. Use default quorum configuration The cluster determines quorum management options, including the quorum witness. Select the quorum witness You can add or change the quorum witness. The cluster determines the other quorum management options. Advanced quorum configuration You determine the quorum management options, including the quorum witness. Failover Cluster Quorum and Witness Configuration Options Next > Cancel	

Figure 12. Quorum cluster wizard

5 Click Next. Select All Nodes from the Select Voting Configuration screen.

巃	Configure Cluster Quorum Wizard	×
Select Vo	oting Configuration	
Before You Begin Select Quorum Configuration Option	Assign or remove node votes in your cluster. By explicitly removing a node's vote, y quorum of votes required for the cluster to continue running. All Nodes	vou can adjust the
Select Voting Configuration	O Select Nodes	
Select Quorum Witness	Name Status Value Status Image: Status Image: Status Image: Status Image: Status	
Configure File Share Witness	22wms02 (🕑 Up	Select All
Confirmation		Clear All
Configure Cluster Quorum Settings Summary	 No Nodes You must configure a quorum disk witness. The cluster will stop running if the di <u>Configuring and Managing Quorum Votes</u> 	isk witness fails.
	< Previous Next	> Cancel

Figure 13. Select voting configuration

- 6 Click Next . Select Configure a file share witness from the Select Quorum Witness screen.
- 7 Click **Next** and then type the share path in the **File Share Path** field from the **Configure a file share witness** screen.

む	Configure Cluster Quorum Wizard	x
Configure	e File Share Witness	
Before You Begin Select Quorum Configuration Option	Please select a file share that will be used by the file share witness resource. This file share must not be hosted by this cluster. It can be made more available by hosting it on another cluster.	
Select Voting Configuration	File Share Path:	
Select Quorum Witness	\\10.150.132.29\wms132ha Browse	
Configure File Share Witness		
Confirmation		
Configure Cluster Quorum Settings		
Summary		
	< Previous Next > Cancel	

Figure 14. Configure file share witness

8 Click **Next**. The**Summary** screen is displayed with the configured quorum settings.

稽	Configure	e Cluster Quorum Wizard		x
Summary				
Before You Begin Select Quorum Configuration Option	You have successfully	configured the quorum settings for the cluster.		
Select Voting Configuration	Configure	Cluster Ouorum Se	ettinas	~
Select Quorum Witness	Genigare	Querum es	Jeingo	
Configure File Share Witness	Witness Type: Witness Resource:	File Share Witness \\10.150.132.29\wms132ha		
Confirmation	Cluster Managed Voting:	Enabled		
Configure Cluster Quorum Settings				
Summary			`	~
	I To view the report created by t To close this wizard, click Finis	the wizard, click View Report. sh.	View Report	
			Finish	

Figure 15. Summary of the quorum settings

9 Click **Finish** to complete the quorum settings.

Creating clustered roles

Prerequisite

After you create the failover cluster, you can create clustered roles to host cluster workloads. Ensure that Wyse Management Suite is installed on the servers and point to the remote database before you create clustered roles.

About this task

To create a clustered role, do the following:

Steps

- 1 In Microsoft Windows Server 2012, right-click the **Start** menu and then select **Server Manager** to launch the Server Manager dashboard
- 2 Click Failover Cluster Manager to launch the cluster manager.
- 3 Right-click Roles and then select Configure Role to display the High Availability Wizard screen.

89	High Availability Wiz	ard	x
Select Re	ole		
Before You Begin Select Role Select Service Client Access Point Select Storage Replicate Registry Settings Confirmation Configure High Availability Summary	Select the role that you want to configure for high available.	ailability:	Description: You can configure high availability for some services that were not originally designed to run on a cluster. For more information, see <u>Confuguring Generic</u> <u>Applications, Scripts, and Services</u> .
		< <u>P</u> re	evious <u>N</u> ext > Cancel

Figure 16. High availability wizard

4 Select Generic Service and then click Next to view the Select Service screen.

Select Service	Select the service you want to use from the list:		
Confirmation	Name	Description	1
Service	Data Sharing Service	Provides data brokering between applications	
Summary	DataCollectionPublishingService	The DCP (Data Collection and Publishing) servi	
	DCOM Server Process Launcher	The DCOMLAUNCH service launches COM an	
	Dell WMS: Tomcat Service	Apache Tomcat 9.0.13 Server - https://tomcat	ſ
	Device Association Service	Enables pairing between the system and wired	1
	Device Install Service	Enables a computer to recognize and adapt to	
	Device Management Enrollment Service	Performs Device Enrollment Activities for Devic	
	Device Setup Manager	Enables the detection, download and installatio	
	DevQuery Background Discovery Broker	Enables anns to discover devices with a backo	

Figure 17. Select service

5 Select **Dell WMS: Tomcat Service** and then click **Next**.

(i) NOTE: You can add the Wyse Management Suite version 1.4 related services to the cluster only after you install Wyse Management Suite version 1.4.

The **High Availability Wizard** screen is displayed where you need to create the client access point and establish connectivity between the Windows server 2012 and Wyse Management Suite.

6 Type a network name in the **Name** field and then click **Next**. The **Confirmation** screen is displayed with the network name and IP address details of the server.

刻	Hi	gh Availability Wizard	×
Confirma	tion		
Before You Begin Select Role	You are ready to configure	high availability for a Generic Service.	
Select Service Client Access Point	Service:	Dell WMS: memcached (memcached)	~
Select Storage	OU:	CN=Computers,DC=AD132,DC=COM	
Replicate Registry Settings	IP Address: Parameters:	10.150.132.51 -d runservice -p 11211	
Confirmation			
Configure High Availability			
Summary			Ť.
	To continue, click Next.		
		< <u>P</u> revious <u>N</u> ext >	Cancel

Figure 18. Confirmation

- 7 Click **Next** to complete the process.
- 8 To add other Wyse Management Suite services as part of the cluster, launch **Failover Cluster Manager**, and then go to **ActionsRoles** to display the network name that you have created.
- 9 Click on the network name, and go to Add ResourceGeneric Service.
- 10 Select the following services from the **New Resource Wizard** screen that needs to be added as part of the cluster:
 - a Dell WMS: MQTT Broker
 - b Dell WMS: memcached
- 11 Click **Next** to complete the task.

The Wyse Management Suite services that have been added as part of the cluster are displayed with the status Running.

Achieve high availability for MySQL InnoDB

About this task

The following steps explain how to achieve high availability for MySQL InnoDB:

Steps

- 1 Check MySQL InnoDB server instance—see Create MySQL InnoDB cluster.
- 2 Add server or node to MySQL InnoDB—see Adding server or node to MySQL InnoDB cluster.
- 3 Create MySQL Router—see Creating MySQL Router

High availability with MySQL InnoDB

The MySQL InnoDB cluster provides a complete high availability solution for MySQL. The client application is connected to the primary node by using the MySQL router. If the primary node fails, a secondary node is automatically promoted to the role of primary node, and the MySQL router routes the requests to the new primary node.

The components of the MySQL InnoDB cluster are:

- · MySQL server
- · MySQL router

Install MySQL InnoDB database

About this task

To install MySQL InnoDB database, do the following:

Steps

- 1 Double-click the MySQL installer.
 - The MySQL Installer window is displayed.
- 2 On the License Agreement screen, read the license agreement, and click Next.
- 3 On the **Choosing a Setup Type** screen, click the **Custom** radio button, and click **Next**.



Figure 19. Setup type

4 On the Select Products and Features screen, select the MySQL Server, workbench, and shell components, and click Next.



Figure 20. Products and features

5 On the **Check Requirements** screen, select the components, and click **Execute**.

	MySQL Installer
MySQL. Installer Adding Community	Check Requirements The following products have failing requirements. MySQL Installer will attempt to resolve some of this automatically. Requirements marked as manual cannot be resolved automatically. Click on those items to try and resolve them manually.
License Agreement	For Product Requirement Status
Choosing a Setup Type	MySQL Server 5.7.22 Microsoft Visual C++ 2013 Redistrib
Select Products and Features	O MySQL Shell 8.0.11 Microsoft Visual C++ 2015 Redistrib
Check Requirements	MySQL Workbench 6.3.10 Microsoft Visual C++ 2015 Redistrib
Installation	
Product Configuration	
Installation Complete	Requirement Details MySQL Installer is trying to automatically resolve this requirement. There is nothing you need to do. Requirement: Microsoft Visual C++ 2013 Redistributable Package (x64) is not installed Status:
	< Back Execute Next > Cancel

Figure 21. Requirements

6 Install the required components, and click **Next**.



Figure 22. Components installation

	MySQL Installer	×
MySQL. Installer Adding Community	Check Requirements The following products have failing requirements. MySQL Installer will attemp some of this automatically. Requirements marked as manual cannot be resolv automatically. Click on those items to try and resolve them manually.	it to resolve red
License Agreement		
Choosing a Setup Type	For Product Requirement	Status
	Microsoft Visual C++ 2013 Redistrib	INSTL DONE
Select Products and Features	Microsoft Visual C++ 2015 Redistrib Microsoft Visual C++ 2015 Redistrib	INSTL DONE
Check Requirements	Wild Soft Wild Street Constant	INSTE DONE
Installation		
Product Configuration		
Installation Complete	Requirement Details MySQL Installer is trying to automatically resolve this requirement. There is not need to do. Requirement: Microsoft Visual C++ 2013 Redistributable Package (x64) is no Status:	thing you ot installed
	< Back Next >	Cancel

Figure 23. Requirements

7 On the **Installation** screen, click **Execute**.

	MySQL Installer				x
MySQL. Installer Adding Community	Installation				
	Press Execute to upgrade the following pro	ducts.			
	Product	Status	Progress	Notes	_
License Agreement	MySQL Server 5.7.22	Ready to Install			
Choosing a Setup Type	MySQL Shell 8.0.11	Ready to Install			
Salard David and an of Factorian	MySQL Workbench 6.3.10	Ready to Install			
Select Products and Features	Ц				4
Check Requirements					
Installation					
Product Configuration					
Installation Complete					
	Click [Execute] to install or update the follow	ving packages			
		< Back	Execute	Cance	I

Figure 24. Installation

The MySQL server, workbench, and shell components are upgraded.

8 Click Next.

	MySQL Installer	_ D X
MySQL. Installer Adding Community	Installation Press Execute to upgrade the following products.	
License Agreement Choosing a Setup Type Select Products and Features Check Requirements Installation Product Configuration Installation Complete	Product Status Image: Status Image: Status	e e e
	< <u>B</u> ack	<u>N</u> ext > <u>C</u> ancel

Figure 25. Installation

9 On the **Product Configuration** screen, the MySQL server component is displayed.



Figure 26. Product configuration

- 10 Click **Next** to configure the MySQL server component.
- 11 On the Group Replication screen, click the Standalone MySQL Server / Classic MySQL Replication radio button, and click Next.



Figure 27. Group replication

12 On the Type and Networking screen, select the Dedicated Computer option from the Config Type drop-down list.



Figure 28. Type and networking

- 13 Select and configure the options in the **Connectivity** section, and click **Next**.
- 14 In the Accounts and Roles screen, enter the MySQL root password.
- 15 Click Add User.

	MySQI	Installer	_ 🗆 X		
MySQL. Installer MySQL Server 5.7.22	Accounts and Roles Root Account Password Enter the password for the root account. Please remember to store this password in a secure place.				
Group Replication	MySQL Root Password:	•••••			
Type and Networking	Repeat Password:	Password strength: Medium			
Accounts and Roles			1		
Windows Service					
Plugins and Extensions	MySQL	User Details	C		
Apply Configuration	Apply Configuration Please specify the username, password, and database role.				
	Username Host Role Authentication Password Confirm Password	root <all (%)="" hosts=""> DB Admin MySQL •••••••</all>	Add User Edit User Delete		
		Password Strength: Medium	Nut > Court		
		OK Cancel			

Figure 29. Add user

The **MySQL User Details** window is displayed.

16 Enter the credentials and click **Ok**.

The newly added user account is displayed in the **MySQL User Accounts** section.



Figure 30. Accounts and roles

17 Click Next.

18 On the Windows Service screen, enter the MySQL Windows service name, and click Next.
	MySQL Installer
MySQL. Installer MySQL Server 5.7.22	Windows Service ☑ Configure MySQL Server as a Windows Service
Group Replication Type and Networking	Windows Service Details Please specify a Windows Service name to be used for this MySQL Server instance. A unique name is required for each instance. Windows Service Name: MySQL57
Accounts and Roles	✓ Start the MySQL Server at System Startup
Windows Service	
Plugins and Extensions Apply Configuration	 Run Windows Service as The MySQL Server needs to run under a given user account. Based on the security requirements of your system you need to pick one of the options below. Standard System Account Recommended for most scenarios. Custom User An existing user account can be selected for advanced scenarios.
	< <u>B</u> ack <u>Next</u> > <u>C</u> ancel

Figure 31. Windows service

19 On the **Plugins and Extensions** screen, click **Next**.



Figure 32. Plugins and extensions

20 On the Apply Configuration screen, click Execute. The configurations are applied to the MySQL component.



Figure 33. Apply configurations

21 Click Finish.



Figure 34. Apply configurations

22 On the **Product Configuration** screen, click **Next**.



Figure 35. Product configuration

23 On the **Installation Complete** screen, click **Finish**.



Figure 36. Installation complete

Next step

Follow the procedure to install and configure MySQL server in all the three servers of the MySQL cluster.

(i) NOTE: To set up the environment as per the high availability setup, see dev.mysql.com.

Check MySQL InnoDB server instances

Before you add MySQL InnoDB to the cluster setup, verify that MySQL InnoDB is created as per the cluster requirements. You must login as **root** user to run the commands and restart the system each time you run a set of commands.

Run the following commands to verify that the MySQL InnoDB server instance meets the configured cluster requirements:

NOTE: The IP Address is different for each system that is used at your work place and the following commands are used only as an example.

- To check that the MySQL InnoDB is created as per the requirements, run the following commands at the command prompt:
- mysql-js> dba.checkInstanceConfiguration('root@IP Address1')
- . mysql-js> dba.checkInstanceConfiguration('root@IP Address2')
- mysql-js> dba.checkInstanceConfiguration('root@IP Address3')

N	C:\Prog	ram Files\MySQ	QL\MySQL Shell 8.0\bin\mysqlsh.exe	
ySQL Shell 8.0.11				
opyright (c) 2016, 2018, Oracle an	d/or its affiliates. All	l rights reser	erved.	
racle is a registered trademark of ffiliates. Other names may be trad wners.	Oracle Corporation and lemarks of their respecti	'or its ive		
ype '\help' or '\?' for help; '\qu	it' to exit.			
ySQL JS> dba.configureLocalInstanc lease provide the password for 'ro onfiguring local MySQL instance li his instance reports its own addre lients and other cluster members v le should be changed. ome configuration options need to	e('root010.150.132.23:33 ot010.150.132.23:3306': stening at port 3306 for ess as 23MYSQL01 vill communicate with it be fixed:	906') *********** use in an In through this	nnoDB cluster address by default. If this is not correct, the report_host MySQL system	m vari
Variable	Current Value Requir	ed Value No	lote	
binlog_checksum enforce_gtid_consistency gtid_node log_bin log_slave_updates master_info_repository relay_log_info_repository transaction_write_set_extraction	CRC32 NONE OFF ON OFF ON Ø 1 Ø 0 FILE TABLE FILE TABLE OFF XXHASH	Uj Uj Uj Uj Uj Uj Uj 64 Uj	pdate the server variable pdate read-only variable and restart the server pdate read-only variable and restart the server	

following variable needs to be changed, but cannot be done dynamically: 'log_bin'

Detecting the configuration file... Found configuration file at standard location: C:\ProgramData\MySQL\MySQL Server 5.7\my.ini Do you want to modify this file? [y/N]: y Do you want to perform the required configuration changes? [y/n]: y Configuring instance... The instance '10.150.132.23:3306' was configured for cluster usage. MySQL server needs to be restarted for configuration changes to take effect.

19SQL JS> _

Figure 37. MySQL command prompt

To check that the MySQL InnoDB is created on all the three cluster nodes, run the following commands at the command prompt:

- mysql-js> dba.checkInstanceConfiguration('root@IPAddress1:3306')
- mysql-js> dba.checkInstanceConfiguration('root@IPAddress2:3306')
- mysql-js> dba.checkInstanceConfiguration('root@IPAddress3:3306')

The instance "IPAddress:3306" is valid for InnoDB cluster usage; 'Status': 'ok' message is displayed.

Create a cluster instance for MySQL InnoDB

Prerequisite

After you have installed MySQL InnoDB instance on the servers, create a cluster instance.

About this task

To create a cluster for MySQL InnoDB, do the following:

Steps

1 Login as administrator user from the command prompt. This user account should have administrative privileges. For example, DBadmin. The following screen shows an example of logging in as root user.

	C:\Program Files\MySQL\MySQL Shell 8.0\bin\mysqlsh.exe		
"status": "ok"			
MySQL JS> \connect root@10.150.132.23:3306 Creating a session to 'root@10.150.132.23:3306' Enter password: ********* Petching schema names for autocompletion Press ^ Your MySQL connection id is ? Server version: 5.7.22-log MySQL Community Server (No default schema selected: type \use <schema> to s;</schema>	C to stop. GPL> et one.		

Figure 38. Login prompt

2 Run the following command to create a cluster with a unique name. For example, MySQLCluster.

MySql JS> var cluster = dba.createCluster('MySQLCluster')

Run the following command to check the status of the cluster. 3

MySql JS>Cluster.status()

The status of the created cluster is displayed as **ONLINE** which indicates that the cluster is created successfully.



Figure 39. Confirmation screen

Add server instance to MySQL InnoDB cluster

Prerequisite

- Before you add servers or nodes to the clusters, change the server id to either 2 or 3 in the **my.conf** file in the secondary MySQL servers at **C:\ProgramData\MySQL\MySQL Server 5.7**.
- Only the primary MySQL server must have server ID as 1.

About this task

You must add server instance to the MySQL InnoDB cluster as primary or secondary. Do the following to add a server instance to the MySQL InnoDB cluster:

- 1 Log in as **DB Admin** user from the command prompt.
- 2 Run the following command to add a server instance to the MySQL InnoDB cluster:

cluster.addInstance('root@IPAddress2:3306')

cluster.addInstance('root@IPAddress3:3306')

(i) NOTE: The IP address and the port numbers are only examples and varies based on the system that you are using at your work place.

3 Run the following command to check the status of the server instance:

```
cluster.status()
```

() NOTE:

- If the server IDs are same in all the nodes, and if you try to add instances in the Cluster, the error message Server_ID is already in used by the peer node, Result<Runtime Error> is displayed.
- All the nodes should display the status as ONLINE which indicates that the nodes have been added successfully to the MySQL InnoDB cluster setup.



Figure 40. Cluster status

Configure MySQL Router

Prerequisite

MySQL Router establishes communication network between Wyse Management Suite and MySQL InnoDB.

About this task

To install MySQL Router, do the following:

Steps

- 1 Log in to the Windows Server 2012/2016 to install MySQL Router. For more information, see MySQL Router Installation
- 2 Select MySQL Router from the Select Products and Features screen and then click Next .



Figure 41. Select products and features

3 On the **Check Requirements** screen, click **Execute**.

	MySQL Installer			
MySQL. Installer Adding Community	Check Requirements The following products have failing requirements. MySQL Installer will attempt to resolve some of this automatically. Requirements marked as manual cannot be resolved automatically. Click on those items to try and resolve them manually.			
License Agreement Choosing a Setup Type Select Products and Features	For Product Requirement Status MySQL Router 8.0.11 Microsoft Visual C++ 2015 Redistrib			
Check Requirements				
Installation				
Product Configuration				
Installation Complete	Requirement Details MySQL Installer is trying to automatically resolve this requirement. There is nothing you need to do. Requirement: Microsoft Visual C++ 2015 Redistributable Package (x64) is not installed Status:			
	< Back Execute Next > Cancel			

Figure 42. Check requirements

4 Install the required components, and click **Next**.



```
Figure 43. Components install
```

	MySQL Installer			
MySQL. Installer Adding Community License Agreement	Check Requirements The following products have failing requirements. MySQL Installer will attempt to resolve some of this automatically. Requirements marked as manual cannot be resolved automatically. Click on those items to try and resolve them manually.			
Choosing a Setup Type	For Product Requirement Status			
Select Droducts and Features	MySQL Router 8.0.11 Microsoft Visual C++ 2015 Redistrib INSTL DONE			
Check Requirements Installation Product Configuration Installation Complete	Requirement Details MySQL Installer is trying to automatically resolve this requirement. There is nothing you need to do. Requirement: Microsoft Visual C++ 2015 Redistributable Package (x64) is not installed Status:			
	< Back Next > Cancel			

Figure 44. Check requirements

5 On the **Installation** screen, click **Execute**.

	MySQL Installer	- • ×
MySQL. Installer Adding Community	Installation Press Execute to upgrade the following products.	
License Agreement Choosing a Setup Type Select Products and Features Check Requirements Installation Product Configuration Installation Complete	Product Status Progress MySQL Router 8.0.11 Ready to Install	Notes
	< <u>B</u> ack E <u>x</u> ecute	Cancel

Figure 45. Installation

MySQL router component is upgraded.

6 Click Next.

2	MySQL Installer			_ □	x
MySQL. Installer Adding Community	Installation Press Execute to upgrade the following	products.			
	Product	Status	Progress	Notes	
Choosing a Setup Type	MySQL Router 8.0.11	Complete			
Select Products and Features					
Check Requirements					
Installation					
Product Configuration					
Installation Complete					
	Show Details >				
		< <u>B</u> ack	<u>N</u> ext >	<u>C</u> ancel	

Figure 46. Installation

7 On the **Product Configuration** screen, the MySQL router component is displayed.



Figure 47. Product configuration

- 8 Click **Next** to configure the MySQL router component.
- 9 On the MySQL Router Configuration screen, enter the hostname, port number, management user, and password.

	MySQL Installer
MySQL. Installer MySQL Router 8.0.11 MySQL Router Configuration	MySQL Router Configuration Configure MySQL Router for InnoDB cluster. This wizard can bootstrap the MySQL Router to route traffic between MySQL applications and a MySQL InnoDB cluster. Applications that connect to the router will be automatically directed to an available R/W or R/O member of the cluster. Please provide a connection to the InnoDB cluster below. In order to register the MySQL Router for monitoring use the current Read/Avite instance of the cluster.
Apply Configuration	Hostname: 10.150.132.24 Port: 3306 Management User: root Password:
	Next > Cancel

Figure 48. MySQL Router Configuration

10 On the **Apply Configuration** screen, click **Execute**.

	MySQL Installer		x
MySQL. Installer MySQL Router 8.0.11	Apply Configuration Press [Execute] to apply the changes Configuration Steps Log		
MySQL Router Configuration Apply Configuration	 Removing MySQL Router Windows service Creating MySQL Router configuration files Installing MySQL Router Windows service 		
	< Back Execute	Cance	:

Figure 49. Apply configuration

11 Click **Finish**.

	MySQL Installer			x
MySQL. Installer MySQL Router 8.0.11	Apply Configuration The configuration operation has finished. Configuration Steps Log			_
MySQL Router Configuration	 Removing MySQL Router Windows service Creating MySQL Router configuration files 			
Apply Configuration				
	The configuration for MySQL Router 8.0.11 was successful. Click on Finish to continue.			
		Ei	nish	

Figure 50. Apply configurations

12 On the **Product Configuration** screen, click **Next**.



Figure 51. Product configuration

The Installation Complete message is displayed.

N	MySQL Installer
MySQL. Installer Adding Community	Installation Complete The installation procedure has been completed.
Choosing a Setup Type Select Products and Features Installation Broduct Configuration	Copy Log to Clipboard
Installation Complete	
	Finish

Figure 52. Installation complete

- 13 Click **Finish**.
- 14 Browse to **\ProgramData\MySQL\MySQL Router** directory, and open the file **mysqlrouter.conf** to check that the bootstrap property with all the configured MySQL servers are part of cluster setup.

mysqlrouter - Notepad	Ŀ	. 🗆		×
File Edit Format View Help				
<pre># File automatically generated during MySQL Router bootstrap [DEFAULT] logging_folder=C:/ProgramData/MySQL/MySQL Router/log runtime_folder=C:/ProgramData/MySQL/MySQL Router/run data_folder=C:/ProgramData/MySQL/MySQL Router/data keyring_path=C:/ProgramData/MySQL/MySQL Router/data/keyring master_key_path=C:/ProgramData/MySQL/MySQL Router/mysqlrouter.key connect_timeout=30 read_timeout=30 [logger] level = INFO</pre>				
<pre>[metadata_cache:MySQLCluster] router id=2 bootstrap_server_addresses=mysql://10.150.132.23:3306,mysql://10.150.132.24:3306,mysql://10.150.132.25:3306 user=mysql_router2_oqybiazm2w3p metadata_cluster=MySQLCluster ttl=5</pre>	2			
<pre>[routing:MySQLCluster_default_rw] bind_address=0.0.0.0 bind_port=6446 destinations=metadata-cache://MySQLCluster/default?role=PRIMARY</pre>			>	•

Figure 53. Bootstrap server address

Create database and users on MySQL InnoDB server

You must create the database and user accounts with administrator privileges on MySQL InnoDB server. To create database on MySQL InnoDB server, run the following SQL commands:

```
Create Database stratus DEFAULT CHARACTER SET utf8 DEFAULT COLLATE utf8_unicode_ci;

CREATE USER 'STRATUS'@'LOCALHOST';

CREATE USER 'STRATUS'@'IP ADDRESS';

SET PASSWORD FOR 'STRATUS'@'LOCALHOST' = PASSWORD <db_password>;

SET PASSWORD FOR 'STRATUS'@ <IP_Address> = PASSWORD <db_password>;

GRANT ALL PRIVILEGES ON *.* TO 'STRATUS'@<IP_Address> IDENTIFIED BY <db_password> WITH GRANT

OPTION;

GRANT ALL PRIVILEGES ON *.* TO 'STRATUS'@'LOCALHOST' IDENTIFIED BY <db_password> WITH GRANT

OPTION;

GRANT ALL PRIVILEGES ON *.* TO 'STRATUS'@'LOCALHOST' IDENTIFIED BY <db_password> WITH GRANT

OPTION;
```

() NOTE: Instead of IP Address, you can type the Wildcard for Network /Subnet or Multiple Single host entry where Wyse Management Suite application server will be installed.

6

Achieve high availability on MongoDB

About this task

The following steps explain how to achieve high availability on MongoDB:

Steps

- 1 Install MongoDB—see Installing MongoDB.
- 2 Create replica servers—see Creating Replica servers.
- 3 Create Stratus users—see Creating Stratus user account.
- 4 Create root user—see Creating root user for MongoDB.
- 5 Edit MongoDB configuration file—see Editing MongoDB configuration file.

Install MongoDB

About this task

To install MongoDB on all the three nodes, do the following:

() NOTE: For information on installing MongoDB see—Install MongoDB

Steps

- 1 Copy the MongoDB installation files on a system.
- 2 Create two folders Data\log and data\db on a secondary drive other than Drive C.

File Home Share View
€
Favorites Name Date modified Type Siz
Desktop
Downloads 🔒 log 20-04-2017 16:05 File folder
📃 Recent places

Figure 54. Data files

3 Go to the folder where you have copied the MongoDB installation files, and create a file **mongod.cfg** from the command prompt.

🔊 🕞 🗊 = I			3.4	
File Home Share	View			
🔆 Favorites	Name	Date modified	Туре	Size
📃 Desktop	퉬 bin	26-04-2017 13:27	File folder	
鷆 Downloads	GNU-AGPL-3.0	01-02-2017 20:50	0 File	35 KB
🔛 Recent places	mongod.cfg	20-04-2017 15:52	CFG File	0 KB
	MPL-2	01-02-2017 20:50	File	17 KB
👰 This PC	README	01-02-2017 20:50	File	2 KB
🙀 Network	THIRD-PARTY-NOTICES	01-02-2017 20:50	File	56 KB

Figure 55. mongod.cfg file

- 4 Open the mongod.cfg file in a text editor, and add the following entries:
 - a SystemLog:destination: file
 - b path: c:\data\log\mongod.log
 - c Storage: dbpath: c:\data\db
- 5 Save the file.
- 6 Open command prompt.
- 7 Run the following command to start the MongoDB service:
 - a C:\MongoDB\bin>.\mongod.exe --config c:\Mongodb\mongod.cfg --install
 - b C:\MongoDB\bin>net start mongodb

The message MongoDB service is starting is displayed.

- 8 Change the working directory to \MongoDB\bin.
- 9 Run Mongo.exe at the command prompt to complete the MongoDB installation.

Create replica servers for MongoDB database

You must create replica servers to avoid any system failures. The replica servers should have the capacity to store multiple distributed read operations.

For more information to create replica servers, see Deploy a Replica Server Set at docs.mongodb.com/manual.

Create database user

Create an user, for example, DBUser using the Wyse Management Suite to access MongoDB.

() NOTE: The database user and password are examples and can be created using a different name and password at your work place.

Run the following command to create the DBUser:

```
db.createUser( {
  user: "DBUser",
  pwd: <db_password>,
  roles: [ { role: "userAdminAnyDatabase", db: "admin" },
  { role: "dbAdminAnyDatabase", db: "admin" },
  { role: "readWriteAnyDatabase", db: "admin" },
  { role: "dbOwner", db: "DBUser" } ]
})
```

Create DBadmin user for MongoDB

Login to the MongoDB using the user account created in the previous section. The DBadmin user is created with the administrative privileges.

Run the following command to create the DBadmin user:

```
mongo -uDBUser -pPassword admin
use admin
db.createUser( {
user: "DBadmin",
pwd: <DBadmin user password>,
roles: [ { role: "DBadmin", db: "admin" } ]
})
```

Edit mongod.cfg file

You must edit the mongod.cfg file to enable the security for the MongoDB database.

- 1 Login to MongoDB as root user that you have already created and run the following command: mongo -uroot -<root password> admin
- 2 Go to \data\bin\mongod.cfg directory, and open mongod.cfg file in a text editor.
- 3 Edit mongod.cfg file as shown in the following command:

```
mongod - Notepad
File Edit Format View Help
systemLog:
    destination: file
    path: c:\data\log\mongod.log
storage:
    dbPath: c:\data\db
net:
    port: 27017
security:
    authorization: enabled
```

Figure 56. Edit mongod.cfg

```
systemLog:
destination: file
path: c:\data\log\mongod.log
storage:
dbPath: c:\data\db\Mongo
net:
port: 27017
security:
authorization: enabled
```

INOTE: The port numbers will change depending on the system at the work place.

4 Save mongod.cfg and exit.

Initiate replication on the servers

Ensure that you disable firewall on Windows and stop Tomcat servers if they are running.

1 Login to MongoDB as root user that you have already created and run the following command: mongo -uroot -<root password> admin

- 2 Go to \data\bin\mongod.cfg directory, and open mongod.cfg file in a text editor.
- 3 Add the following three lines in the **mongod.cfg** file:

```
keyFile: c:\data\log\mongod.key.txt
```

```
replication:
```

replSetName: wms

```
File Edit Format View Help

systemLog:
    destination: file
    path: c:\data\log\mongod.log
storage:
    dbPath: c:\data\db
net:
    port: 27017
security:
    authorization: enabled
    keyFile: c:\data\log\mongod.key.txt
replication:
    replSetName: wms
```

Figure 57. Enabling security

4 Create **mongod.key.txt** file and copy on all the three servers.

() NOTE: Ensure that the mongod.key.txt file content or key is the same in all the three servers.

l 💽 🛄 = I		log		_
File Home Share	View			
😔 💿 ד 🛉 🎴 🕨 Т	his PC → Local Disk (C:) → Data → log		✓ Ċ Searc	:h log
☆ Favorites	Name	Date modified	Туре	Size
E Desktop	mongod.key	03-04-2018 00:57	Text Document	1 KB
🚺 Downloads	mongod	06-08-2018 12:56	Text Document	8 KB
Recent places	mongod.log.2018-08-06T06-28-34	06-08-2018 11:58	2018-08-06T06-28	. 1 KB
🌉 This PC				
🙀 Network				

Figure 58. Copy the mongod key file

5 After you copy the file, stop the mongod service by running the following command:

net stop mongodb

6 Start the mongod service by running the following command:

net start mongodb

- 7 Repeat the steps from 1 to 6 in all the tree nodes of MongoDB servers.
- 8 Initiate replication on the primary node of the MongoDB cluster logging in using DBadmin user and then run the following command:

rs.initiate();

9 Check the replication status by running the following command:

```
rs.status();
```



Figure 59. Replication status

10 Start mongod service and add the secondary nodes to the second and third nodes in the MongoDB cluster:

rs.add("IPAddress2:27017")

```
rs.add("IPAddress3:27017")
```

(i) NOTE: The port numbers will differ based on the systems at your network and systems.

11 After you add the nodes in the MongoDB cluster, check the replication status by running the following commands for the primary and secondary nodes:

rs.status();



Figure 60. Status in primary server



Figure 61. Secondary server status

Achieve high availability for Teradici devices

Wyse Management Suite uses the HAProxy hosted on the Ubuntu server 16.04.1 LTS to perform load balancing between the EMSDK servers. HAProxy is a load balancer proxy that can also provide high availability based on how it is configured. It is a popular open source software for TCP/HTTP Load Balancer, and proxy solution which runs on Linux operating system. The most common use is to improve the performance and reliability of a server environment by distributing the workload across multiple servers. The following points explains how to achieve high availability for Teradici devices using HAProxy on Linux operating system:

- There will be only one instance of Teradici server as part of high availability with Wyse Management Suite.
- Teradici device support requires installation of EMSDK. EMSDK is a software component provided by Teradici that is integrated into Wyse Management Suite. Wyse Management Suite Installer installs EMSDK can be installed on Wyse Management Suite server or on a separate server. You need minimum of two instances of EMSDK to support more than 5000 devices, and all EMSDK servers should be on remote servers.
- · Only one instance of EMSDK can be installer per server.
- · Teradici Device support requires a PRO license.
- · High availability of Teradici will be provided through HAProxy.
- If Teradici server goes down, device will reconnect automatically to the next available EMSDK server.

Install and configure HAProxy

HAProxy which is the load balancer for ThreadX 5x devices is configured on Ubuntu Linux version 16.04.1 with HAproxy version 1.6. Do the following to install and configure HAProxy on Ubuntu Linux system:

- 1 Log in to Ubuntu system using the user credentials used during the installation of Ubuntu operating system.
- 2 Run the following commands to install HAProxy

sudo apt-get install software-properties-common

sudo add-apt-repository ppa:vbernat/haproxy-1.6

sudo apt-get update

sudo apt-get install haproxy

3 Run the following command to take backup of the original configuration:

sudo cp /etc/haproxy/haproxy.cfg /etc/haproxy/ haproxy.cfg.original

4 Edit the HAProxy configuration file in a suitable text editor by running the following commands:

sudo nano /etc/haproxy/haproxy.cfg

Add the following entries in the configuration file:

Global section: Maxconn <maximum number of connections>

Frontend tcp-in: bind :5172

Back end servers: server :5172

maxconn <maximum number of connections per Teradici device proxy server>

(i) NOTE: Administrator must add additional back end servers beyond the total number of client's capacity to have seamless failover.

5 Save the changes to the **haproxy.cfg** file by typing CTRL+O.

The following text is a sample HAProxy configuration file:

```
qlobal
        log /dev/log
                         localO
                        local1 notice
        log /dev/log
        chroot /var/lib/haproxy
        daemon
        #maxconn is maximum allowed connections
        maxconn 60000
defaults
                qlobal
        loq
        mode
              tcp
        timeout connect 5000ms
        timeout client
                         50000ms
        timeout server 50000ms
        errorfile 400 /etc/haproxy/errors/400.http
        errorfile 403 /etc/haproxy/errors/403.http
        errorfile 408 /etc/haproxy/errors/408.http
        errorfile 500 /etc/haproxy/errors/500.http
        errorfile 502 /etc/haproxy/errors/502.http
        errorfile 503 /etc/haproxy/errors/503.http
        errorfile 504 /etc/haproxy/errors/504.http
frontend fe_teradici_5172
  bind :5172
  mode tcp
  backlog 4096
  maxconn 70000
  default backend be teradici 5172
backend be teradici 5172
  mode tcp
  option log-health-checks
  option tcplog
  balance leastconn
  server emsdk1 :5172 check server emsdk2 5172 check : timeout queue 5s timeout server
86400s
  option srvtcpka
#frontend fe teradici 5172
#replace IP \overline{\mathrm{w}} ith IP of your Linux proxy machine bind Eg: 10.150.105.119:5172
#default backend servers
#backend servers
#Add your multiple back end windows machine ip with 5172 as port
# maxconn represents number of connection- replace 10 with limit #(below 20000)
# "server1" "server2" are just names and not keywords
#server server1 10.150.105.121:5172 maxconn 20000 check
#server server2 10.150.105.124:5172 maxconn 20000 check
Validate the HAProxy configuration by running the following command:
sudo haproxy -f /etc/haproxy/haproxy.cfg -c
If the confiration is valid, the message Configuration is Valid is displayed.
Restart HAProxy servce by running the following command:
Sudo service haproxy restart
Stop HAProxy by running the following command:
```

```
serviceSudo service haproxy stop
```

6

7

8

Install Wyse Management Suite server

Ensure that the following components are configured before you install Wyse Management Suite server:

- · Windows Failover Cluster on two Nodes
- MongoDB Server is running with replica set
- MySQL InnoDB Cluster set-up is running
- MySQL Router isinstalled on the two Nodes

Do the following to install Wyse Management Suite server:

- 1 Launch the Wyse Management Suite installer screen.
- 2 Select Custom Type and Teradici EMSDK and then click Next.
- 3 Select the External MongoDB option (MongoDB Cluster with Replica set that you have created. For example, wms. Type the Remote Primary Mongo DB server information, Port number, and MongoDB Username and password in the respective fields and then click Next.
- 4 Select the **External MariaDB** option for MySQL. Use MySQL router address (Local Host if it is installed on Wyse Management Suite server node).

INOTE: Ensure that the Stratus user account is created on MySQL server.

- 5 Type MySQL Router information in the **External Maria DB Server** fields with the port number. Type the MySQL database user account information that you have created initially. The **Port Selection** screen is displayed with the port details. This port is used by MySQL Router. The default port is 6466. However, you can also change the port number.
- 6 Type the user name that has administrative privileges and e-mail address with the Teradici EMSDK port number and CIFS user account information.
- 7 Type the Destination Installation folder path and Shared UNC path for the local repository and then click **Next**. The message **The installation was successful** is displayed.
 - (i) NOTE: The shared UNC path should be kept out of both the Windows Server where Wyse Management Suite application is installed.
 - INOTE: Before you install Wyse Management Suite application on Node 2, make sure to delete the 'Data' folder present in the Wyse Management Suite Local Repository; which was created during installation on Node 1. After 'Data' folder is deleted from the shared UNC WMS Local Repository path, you can install Wyse Management Suite Application in the Node 2 of the Windows Cluster.

Install Wyse Management Suite on Windows Server 2012/2016

About this task

To install the Wyse Management Suite on a private cloud, do the following:

Steps

- 1 Double-click the installer package.
- 2 On the Welcome screen, read the license agreement, and click Next.
- 3 Select the Setup Type you want to install, and click Next. The available options are:
 - Typical—Requires minimum user interaction and installs embedded databases.
 - · Custom—Requires maximum user interactions and is recommended for advanced users.
- 4 Select the Setup Type as Custom, and click Next.
 - The Mongo Database Server page is displayed.
- 5 Select the External Mongo DB option. Enter user name, password, database server details, and the port details.

() NOTE: The port field populates the default port which can be changed.

- 6 Enter the administrator credentials and email address information.
- 7 Enter the Teradici EM SDK port information and CIFS user account information.
- 8 Enter the destination folder path and shared UNC path for Local repository
- 9 Click Next.
- 10 Click Next until the message The Installation was Successful is displayed.
 - (i) NOTE: Before you install Wyse Management Suite on server or node 2, make sure to delete the \Data folder from the local repository which is created during installation on server or node 1.

Upgrade Wyse Management Suite version 1.3 to 1.4

Prerequisites

Ensure that the mongodb.seedList value in the bootstrap.properties file includes backslash character (\) in the list of Mongo database servers. The bootstrap.properties file is at Tomcat-8\webapps\ccm-web\WEB-INF\classes, mongodb.seedList = MongoDBServer1_IP\:27017, MongoDBServer2_IP\:27017, MongoDBServer3_IP\:27017.

	Date modified	Туре	Size		
com	15-03-2019 11:23	File folder			
org	15-03-2019 11:23	File folder			
appqueue.properties	08-10-2018 15:22	PROPERTIES File	3 KB	_	
bootstrap.properties	15-03-2019 11:25	PROPERTIES File	2 KB		
<pre>immongodb.authenticat build.number=40983 dbcpTestOnBorrow-tr mongodb.write.optio dbcpInitialSize=16 mongodb.socketKeepA dbcpMinEvictableId1 public.cloud.url.us mongodb.seedList=10</pre>	ionDatabaseName-admin n=1 live=true eTimeMillis=1800000 =https\://us1.wyseman .150.132.46\:27017,10	agementsuite.com, .150.132.47\:270:	/ccm-web 17,10.150.13	2.48\:27017	
jpa.connection.driv sessionTimeZone=+0\ jpa.connection.pass	er_class=org.mariadb. :00 word=oadCZJ0Z9H+Y/Hs/ =https\://eu1.wyseman	jdbc.Driver 73B3Wg\=\= agementsuite.com,	/ccm-web		

Figure 62. Prerequisite

• Ensure that the primary (active) Mongo database server with read and write access is the first entry in the mongodb.seedList. This is because the installer uses only the first entry as the primary server in the MongoDB cluster.

About this task

To upgrade Wyse Management Suite from version 1.3 to 1.4, do the following:

Steps

- 1 Double-click the Wyse Management Suite 1.4 installer package.
- 2 On the **Welcome** screen, read the license agreement and click **Next**.

9

Dell Wyse Management Suite 1.4

😡 Wyse Managem	ient Suite Installer — 🗙
Welcome	Welcome to Dell Wyse Management Suite
Upgrade	This wizard guides you to upgrade your setup to Dell Wyse Management Suite 1.4 on your system.
	By installing or using this product, you agree to the following: Dell End User License Agreement
	Important Notice Please see the Dell Wyse Management Suite Quick Start Guide to make sure that your thin client devices have the correct version of the Wyse Device Agent to communicate with the WMS Cloud.
	Next

Figure 63. Welcome screen

3 On the **Upgrade** page, click **Next** to upgrade Wyse Management Suite .

Dell Wyse Management Suite 1.4	1	
www. Wyse Managem	ent Suite Installer	
 Welcome Upgrade 	Upgrade	
	Dell Wyse Management Suite 1.3 will be upgraded to 1.4.	
	Please make sure WMS console is closed for ensuring a smooth upgrade.	
	Back	

Figure 64. Upgrade

Dell Wyse Management Suite 1.4

www. Wyse Managem	ent Suite Installer
✓ Welcome	Status
Upgrade	Stopping Dell WMS: Tomcat service

Figure 65. Upgrade

4 Click Launch to open the Wyse Management Suite web console.


Figure 66. Launch

Next steps

- Ensure that Tomcat-8 folder and subfolders are deleted, and Tomcat-9 folder and subfolders are created. Also, do the following:
 - Ensure that Tomcat-9\webapps\ccm-web\WEB-INF\classes folders and subfolders are created.
 - Ensure that Tomcat-9 service is added, and Tomcat-9 service is running.
 - Ensure that the bootstrap.properties file is copied from Tomcat-8\ webapps\ccm-web\WEB-INF\classes folder to Tomcat-9\webapps\ccm-web\WEB-INF\classes folder.
 - Ensure that the mongodb.seedList value in the bootstrap.properties file includes backslash character (\) in the list of Mongo database servers. The bootstrap.properties file is at Tomcat-8\webapps\ccm-web\WEB-INF\classes, mongodb.seedList = MongoDBServer1_IP\:27017, MongoDBServer2_IP\:27017, MongoDBServer3_IP\:27017.
 - Ensure that the primary and secondary MongoDB servers entries are present in the mongodb.seedList.
- In the Windows Fail-over Cluster, if the status of the access point is down due to the unavailability of the Tomcat 8 service, do the following:
 - a Go to Failover Cluster Manager > Cluster > Roles > Access Point.
 - b Check the status of the Wyse management Suite related services, roles and access point.

ver Cluster Manager IMS1314HA.AD132.COM Roles Nodes Storage Networks	Roles (1) Suppl			Dell WMS: Tomcat Service Properties		× ors					
	Name Status Type			Owner Node 42W/MS02	Peorty Medium	Information		Advanced Policies Repitry Replication General Dependencies Policies			Configure Role Virtual Machines
ents								Тура	Genetic Service		View
	23	2						Refresh			
	* 😡 WHS1314A	<i>p</i> .						Commenter	17		Help
	Name			Status	Information			Server name.	//RS//Transit®		WMS: Tomcat Service
	E Del WMS: meno	ceched T Bioker		Online Online				Use Network Nam	e for computer name		J Bong Online Take Offline
	Del WMS: Tomast Service			S Faled	Failed to bring th	a bring the resource 'Dell'In/MS: Tomcat Service' on		•		Show Critical Events	
	Tendo SCK Service			() Online	Failed to brin		Failed to bring the re	e resource 'Dell WMS: Torricat Service' online. For more data, see Informatio			ion Details', ktions
	Marker WWS1314AP			(Onlese		4.1. 1 . 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.				Remove	
											Properties
								11 Total -	OK Darced	here	Help

Figure 67. Access point

- c Check the version of the Tomcat service. If the version of the Tomcat service is 8, you must manually remove Tomcat-8 and add Tomcat-9 service into the Access Point. This is because, when you upgrade Wyse Management Suite 1.3 to WMS 1.4, Tomcat-8 service is replaced with Tomcat-9.
- d Right-click the Tomcat-8 service, and then click **Remove**.

Failover Cluster Manager WindS1314HA.AD132.COM Roles Nodes Storage Networks District Events	Roles (1)									
	Search							P Queries 🕶 🔛 🔻 😒		
	Name	Status Status Failed	Type Generic Service	Owner Node 42WM502	Pilonty Medium	Information				
	v 😘 WMS1314AP Prefe									
	Name		Status	Information						
	Rolea									
	Del WMS mencache		Online							
	Del WMS MOTT BO		(e) Online	Exiled to being 1	the resources 'Ball 1986'. Teacent Canadra' not					
	Teradici SDK Service	Bring O	nine Tine	() Online	Pales to bring t	ne resorce des rando, romas derrice un				
	Marne: WM51314AP	informa Show C	ition Details ritical Events	() Online						
		Mone A	ctions +							
		× Remove	e	1						
		Propert	ies							
				10						

Figure 68. Tomcat service removal

e Add the Tomcat-9 service to the access point.



Figure 69. Tomcat-9 service



Figure 70. Tomcat 9 service

f Bind the FQDN adress of the access point of High Availability to the Memcached registry on both nodes of the High Availability setup using the command

```
Registry Path: HKLM\SYSTEM\CurrentControlSet\Services\Memcached\
"ImagePath" = "C:\Program Files\DELL\WMS\memcached\memcached.exe" -d runservice -p -I
11211 WMS1314AP.AD132.COM -U 0"
```

memcached > - mb4_bus	^	Name (Default) Description DisplayName ErrorControl	Type REG_SZ REG_SZ REG_SZ REG_DWORD	Data (value not set) memcached 1.4.4-14-g9c660c0 is a high-performa. Dell WMS: memcached 0x00000001 (1)	
Value name:					
InagePath	1	e ImagePath	REG_EXPAND_SZ	"C:\Program Files\DELL\WMS\memcached\mem-	
Value data: sd'unemcached.exe" -d runservice -p 11211 4 11WMS61140132450M -U 0 OK Cancel		ObjectName Start WOW64	REG_SZ REG_DWORD REG_DWORD REG_DWORD	LocalSystem 0x0000003 (3) 0x0000010 (16) 0x0000001 (1)	
mosmb20 > MaBridge > MSDTC Bridge 4.0.0					

- 0

Figure 71. Memcached data

Post installation checks

Do the following to check the high availability for Wyse Management Suite version 1.4:

- Launch the Wyse Management Suite administrator portal and check whether you can log in using the web interface.
- Edit the bootstrap.properties file in the Tomcat server under the \Dell\WMS\Tomcat-9\webapps\ccm-web\WEB-INF\classes folder for MongoDB as follows:

```
mongodb.seedList = MongoDBServer1_IP\:27017, MongoDBServer2_IP\:27017, MongoDBServer3_IP\:
27017
```

 Log in to MongoDB and update bootstrapProperties table with Windows Cluster Virtual IP/Hostname of Access Point values for the following attributes:

```
Stratusapp.server.url
Stratus.external.mqtt.url
Memcached. Servers
Mqtt.server.url
```

Do the following to make changes in the MongoDB and MySQL DB tables:

- 1 Log in to Mongo DB using Robo 3T and update Windows Cluster Virtual IP/Hostname of Access Point values in the bootstrapProperties table with the following attributes:
 - · Stratusapp.server.url
 - · Stratus.external.mqtt.url
 - Memcached. Servers
 - Mqtt.server.url
- 2 Update the MySQL tables and restart the Tomcat on both the nodes. Manually update **mysql** database table to retain the **ServerIp** in the **ServersInCluster** table to be active by running the following command:

Update serversInCluster set ServerIp = '<VIP address of Windows Cluster>';

```
(i) NOTE: Ensure that there is only one record in serversInCluster table and if there are more than one record, delete the excess records.
```

Update queuelock set IpInLock = '<VIP address of Windows Cluster>';

- 3 Connect the FQDN address of the access point to the **Memcached** registry on both nodes of the high availability setup using the following paths:
 - Registry path—HKLM\SYSTEM\CurrentControlSet\Services\Memcached\
 - Image path—C:\Program Files\DELL\WMS\memcached\memcached.exe -d runservice -p 11211-I <FQDN of Access Point> -U 0

Troubleshooting

This section provides troubleshooting information for Wyse Management Suite version 1.x for the cluster set up.

- Problem: Where is the Wyse Management Suite log file located to check server installation issues.
 Workaround: The log file is in the %temp% WMSInstall.logfolder.
- Problem: Where is the Tomcat service related log file located to check the application related issues.

Workaround: If any of the node/server in the cluster does not work and fails to be part of the MySQL cluster do the following:

- a Reboot the cluster node and run the command var cluster = dba.rebootClusterFromCompleteOutage(); in the shell prompt.
- b Reconfigure the local instance using the command dba.configureLocalInstance('root@ Server_IPAddress:3306').
- c Add the instruce back to the cluster using the command cluster.addInstance('root@Server_IPAddress:3306').
- Problem: If any of the server or node in the cluster stops working and is not part of the MySQL InnoDB cluster.

Workaround: Perform the following steps at the command prompt:

var cluster = dba.rebootClusterFromCompleteOutage(); #Reboot the cluster instance dba.configureLocalInstance('root@Server_IPAddress:3306') #Reconfigure the local instance cluster.addInstance('root@Server_IPAddress:3306')#Add the cluster instance back to the network My-SQL JS> cluster.rejoinInstance("root@Server_IPAddress")

Problem: If the server IDs are same in all the nodes, and if we try adding instances in the Cluster, an error message **ERROR: Error** joining instance to cluster is displayed.

1		C:\Program Files\	MySQL\My	SQL Shell 8.0\bin\mysqlsh.exe		
Some active options on server '1 Please configure the instance fo The server_id 1 is already used The server_id must be different Option name	0.150.132.24:3306 or InnoDB Cluster by peer '23MYSQL0 fron the ones in Required Value	' are incompatible usage and try aga 1:3306' use by the members Current Value	s with Gro in. s of the (Result	oup Replication. GR group.		
server_id	<unique id=""></unique>	1	FAIL (R	untimeError)		
MySQL [10.150.132.23] JS> cluste A new instance will be added to data on the cluster this might t	r.addInstance('ro the InnoDB cluste ake fron a few se	ot@10.150.132.24: r. Depending on t conds to several 1	3306') he anount hours.	of		
Please provide the password for Adding instance to the cluster .	'root@10.150.132.	24:3306': ******	6-00 (C			
Validating instance at 10.150.13	2.24:3306					
This instance reports its own ad	ldress as 24MYSQL0	12				
Instance configuration is suital Cluster.addInstance: WARNING: Th ERROR: Error joining instance to Some active options on server '1 Please configure the instance fo The server_id 1 is already used The server_id must be different Option name	ele. ie given '10.150.1 c cluster: The ope 0.150.132.24:3306 ir InnoDB Cluster by peer '23MYSQL0 from the ones in Required Value	32.24:3306' and t ration could not of ' are incompatible usage and try aga: H:3306' use by the member Current Value	he peer '2 continue d e with Gro in. s of the Q Result	23MYSQL01:3306' have duplicated due to the following requirement oup Replication. GR group.	server_id 1 ts not heing met:	
server_id	<unique id=""></unique>	1	FAIL (R	untimeError)		
MySQL [10.150.132.23] JS> cluste A new instance will be added to data on the cluster this might t Please provide the password for Adding instance to the cluster.	r.addInstance('ro the InnoDB cluste ake fron a few se 'root@10.150.132.	ot010.150.132.25: r. Depending on t conds to several 1 25:3306': *******	3306') he anount hours.	of		
Validating instance at 10.150.13	2.25:3386					
This instance reports its own ad	Idress as 25MYSQL0	13				
Instance configuration is suital Cluster.addInstance: WARNING: TJ ERROR: Error joining instance to Some active options on server 'I Please configure the instance fo The server_id 1 is already used The server_id must be different Option name	le. le given '10.150.1 cluster: The ope 0.150.132.25:3306 r InnoBE Cluster by peer '23MYSQL0 from the ones in Required Value	32.25:3306' and t ration could not of ' are incompatible usage and try aga 1:3306' use by the member Current Value	he peer '2 sontinue o e with Gro in. s of the (Result	23MYSQL01:3306' have duplicated due to the following requiremen oup Replication. GR group.	server_id 1 ts not being met:	
server_id	<unique id=""></unique>	1	FAIL (R	untimeError)	Activate	Win
		1.0	Contraction of the local division of the loc	and the second se		

Figure 72. Error message

Workaround: Change the server ID entries in the my.conf file located in the \ProgramData\MySQL\MySQL Server 5.7 directory.



Figure 73. change server ID