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# NEC

**EXPRESSCLUSTER X for Microsoft Windows Server 2012 R2 Standard.  
Quick Start Guide for Milestone XProtect VMS Products 2018 R2.  
Version 1**



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**NEC EXPRESSCLUSTER X 3.3 for Milestone XProtect VMS Products 2018 R2  
Quick Start Guide**

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## About this Guide

### Using this guide

This guide provides a hands-on “Quick Start” set of instructions for the EXPRESSCLUSTER X (ECX) for Windows. The guide assumes its readers to have Windows system administration knowledge and skills with experience in installation and configuration of Microsoft Windows operating systems, networks, and Milestone XProtect VMS Products 2018 R2. The guide includes step-by-step instructions to install and configure EXPRESSCLUSTER X with Milestone XProtect VMS Products 2018 R2.

This guide covers the following topics:

**Chapter 1:** [Overview](#) – describes the general steps of setup procedure.

**Chapter 2:** [System Requirements and Planning](#) – describes the overall system and network requirements and includes a set of tables for planning the installation and configuration.

**Chapter 3:** [System](#) – describes the configurations required for each system before installing target application.

**Chapter 4:** [Milestone XProtect VMS Products 2018 R2 Installation](#) – describes the installation of Milestone XProtect VMS Products 2018 R2 on the Primary and Standby Servers.

**Chapter 5:** [EXPRESSCLUSTER X Server Installation](#)– describes the installation of EXPRESSCLUSTER X on the Primary and Standby Servers.

**Chapter 6:** [Base Cluster Setup](#)– describes required configuration to enable full cluster functionality.

**Chapter 7:** [Configure DB of Milestone XProtect VMS Products 2018 R2](#)– describes required configuration to enable full cluster functionality.

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## Where to go for more information

Refer to additional documentation under the “documentation” directory on the EXPRESSCLUSTER X distribution CD or archive file.

For any further information, please visit Express Cluster web-site at <http://www.nec.com/EXPRESSCLUSTER>

We have the following guides for instant support:

- **GettingStartedGuide.pdf** – This guide explains general cluster concepts and overview of EXPRESSCLUSTER functionality.
- **InstallationGuide.pdf** – This guide explains EXPRESSCLUSTER X installation and configuration procedures in detail.
- **ReferenceGuide.pdf** – This is a reference of commands that can be put in EXPRESSCLUSTER X scripts and maintenance commands that can be executed from the server command prompt.

The above stated guides can also be found at <http://www.nec.com/global/prod/EXPRESSCLUSTER/en/support/manuals.html>

You can also contact the Express Cluster team via the following E-mail address: [info@EXPRESSCLUSTER.jp.nec.com](mailto:info@EXPRESSCLUSTER.jp.nec.com)

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## 1 Overview

The general procedure of MILESTONE XPROTECT VMS PRODUCTS 2018 R2 with NEC EXPRESSCLUSTER X on two server machines (Primary and Standby) for high availability consists of the following major steps:

1. Perform system planning to determine requirements and specify configuration settings prior to start of actual system installation and configuration.
2. Prepare the Primary and Standby Servers including OS installation and configuration if necessary.
3. Install, configure, and verify MILESTONE XPROTECT VMS PRODUCTS 2018 R2 on the Primary and Standby Servers respectively. If an existing production MILESTONE XPROTECT VMS PRODUCTS 2018 R2 system exists already then it could be use as the Primary Server without reinstallation of MILESTONE XPROTECT VMS PRODUCTS 2018 R2.
4. Install and configure NEC EXPRESSCLUSTER Server on the Primary and Standby Servers.
5. Create and configure NEC EXPRESSCLUSTER failover group to enable continuous protection and automatic recovery for MILESTONE XPROTECT VMS PRODUCTS 2018 R2.
6. Upload the configuration file on the server and start the cluster to complete the deployment.

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## 2 System Requirements and Planning

### 2.1 Milestone XProtect VMS Products 2018 R2 requirements

- .Net Framework 3.5

#### System Requirements

VM 1: Primary Server

VM 2: Standby Server

VM 3: Test Client Machine

	<b>VM 1 Primary Server</b>	<b>VM 2 Standby Server</b>	<b>VM 3 Test Machine</b>
<b>CPU</b>	Xeon – 2.10 GHz or better		Xeon – 2.10 GHz or better
<b>Memory</b>	8 GB or more		4 GB or more
<b>Disk</b>	OS partition: 20 GB or more space available. Data partition: 40 GB or as per requirement space to store data MILESTONE XPROTECT VMS PRODUCTS 2018 R2.		OS partition: 5 GB or more space available.
<b>OS</b>	Windows Server 2012 (Standard or Enterprise) with SP1 or later		Windows 7 or later
<b>Software</b>	Java 1.5(or later) enabled web browser		Java 1.5(or later) enabled web browser
<b>Network</b>	2 100Mbit or faster Ethernet network interface cards		1 100Mbit or faster Ethernet network interface card

### 2.2 System Planning

Review the requirements from last section and then fill out the tables of the worksheet below. Use for reference in the following sections of this guide. See [Appendix B](#) for an example worksheet.

Machine 1 Primary Server

Machine 2 Standby Server

Machine 3 Test Client Machine

**Table 1: System Network Configuration**

Machine	Host name	Network Connection	IP Address	Subnet Mask	Default Gateway	Preferred DNS Server
1		Public: Interconnect:				
2		Public: Interconnect:				
3						

**Floating IP (FIP) addresses:**

Web Management Console FIP: (1) \_\_\_\_\_

**Table 2: System OS and Disk Configuration**

Machine	OS	Disk 0 (OS Disk)	Disk 1 (Data Disk)
1		<b>Boot Partition:</b> Drive Letter: Size:	<b>Cluster Partition:</b> Drive Letter: Size (>17MB) :
2		<b>Boot Partition:</b> Drive Letter: Size:	<b>*Data Partition:</b> Drive Letter: Size:
3			

\* The size must be large enough to store all data files for Milestone XProtect VMS Products 2018 R2 to meet current and expected future needs.

**Table 3: System Logins and Passwords**

	Login	Password
<b>Machine 1 Administrator</b>		
<b>Machine 2 Administrator</b>		
<b>Machine 3 Administrator</b>		

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## 3 System Preparation

### 3.1 Setup the Primary Server (Machine 1)

1. If necessary, install required hardware components and a supported OS including any required service pack as specified in [Section 2](#)
2. Verify basic system boot and administrator login functionality and availability of required hardware components as specified in [Section 2](#).
3. Configure network interface names
  - Rename the network interface to be used for network communication with client systems to **Public**.
  - Rename the network interface to be used for internal EXPRESSCLUSTER X management and network communication between servers to **Interconnect**.
4. Configure network interface TCP/IP Settings:
  - In the Network Connections window, right-click Public and then click on Properties.
  - In the Properties dialog box, double-click Internet Protocol (TCP/IP).
  - Click the Use the following IP address: option button.
  - Type the IP address, Subnet mask, and Default gateway values (Refer [Section 2](#)).
  - Click the Use the following DNS server addresses: option button and enter the Preferred DNS server address (Refer [Section 2](#)).
  - Click the Advanced button. Click the DNS tab. Click to clear the Register this connection's addresses in DNS check box. Click OK. Click OK.
  - Go back to the Network Connections window. Right-click Interconnect and then click Properties.
  - In the Properties dialog box, double-click Internet Protocol (TCP/IP).
  - Click the Use the following IP address: option button.
  - Type the IP address and Subnet mask values (Refer [Section 2.2](#)). Click OK. Click OK.
5. Configure network interface binding order:
  - In the Network Connections window, click on the advanced menu tab, and click Advanced Settings.
  - On the Adapters and Bindings tab, under Connections: use the up and down arrow buttons to move Public to the first (top) position. Click OK.
  - Close the Network Connections window.
6. Connect the network interfaces:
  - Connect the network interface Interconnect to the Cluster Interconnect Network and verify a healthy physical link status.
  - Connect the network interface Public to the Public Network and verify a healthy physical link status and connectivity to the Management Console/Test Client (Machine 3).
7. Configure the Data Disk:

Make sure the disk device or LUN is initialized as a Windows Basic disk device

- 
- Create a data partition on the share disk with specified size in Table 2. Assign drive letter specified in Table 2: System OS and Disk Configuration to the partition and format it as NTFS file system.
  - Verify the share disk cluster and data partitions are visible in Windows Explorer under their respective assigned drive letters.

### **3.2 Setup the Standby Server (Machine 2)**

Perform all steps from 1-7 mentioned in [Section 3.1](#) on the Standby Server

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## 4 Milestone XProtect VMS Products 2018 R2 Installation

Follow standard procedure to install Milestone XProtect VMS Products 2018 R2 in primary and standby server. For more details please refer Milestone manuals.

## 5 EXPRESSCLUSTER X Server Installation

### 5.1 Install EXPRESSCLUSTER X on the Primary Server (Machine 1)

1. Insert the EXPRESSCLUSTER X CD-ROM into a CD-ROM drive on the server.
2. On the License Agreement screen, click **I Agree**.
3. On the pop up window select NEC EXPRESSCLUSTER for Windows.
4. Now, click on NEC EXPRESSCLUSTER X 3.x for Windows
5. On the Welcome screen click Next
6. On the Choose Destination Location screen, click **Next**.
7. On the next screen, click **Install**.
8. On the Port Number screen, if you t to use any port numbers that are different from the default numbers listed, change on this screen. Click **Next**.
9. On the Filter Settings of Shared Disk screen, click **Next**.
10. On the Confirmation screen, click **Yes**.
11. On the License Manager screen, click **Register**.
12. On the next screen, click **Register with License File**.
13. Select an EXPRESSCLUSTER license file and click **Open**. (Example: ECX-.key).
14. On the License Registration screen, click **OK**.
15. On the License Manager screen, click **Register**.
16. On the next screen, click **Register with License File**.
17. Select an EXPRESSCLUSTER X Replicator license file and click **Open**.
18. On the license registration screen, click **OK**.
19. On the next screen, click **Finish**.
20. On the Install Shield Wizard Complete screen, click the **No, I will restart my computer later** option button and then click **Finish**.
21. On the next screen, click **Finish**.

### 5.2 Install EXPRESSCLUSTER X on the Standby Server (Machine 2)

Perform the steps 1-21 in [Section 5.1](#) on the Standby Server (Machine 2).

### 5.3 Restart the Primary and Standby Servers (Machines 1 & 2)

First restart the Primary Server and then restart the Standby Server.

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## 6 Base Cluster Setup

This section describes the steps to create a cluster using EXPRESSCLUSTER Manager running on the Management Console/Test Client (Machine 3).

### 6.1 Install Java Runtime Environment (JRE)

Verify JRE v.1.5.0.6 or newer is installed on the Management Console/Test Client (Machine 3). If necessary, install JRE by performing the following steps:

1. Run **jre-1\_5\_0 <build and platform version>.exe** (a compatible JRE distribution can be found in the **jre** folder on the EXPRESSCLUSTER CD).
2. On the License Agreement screen, verify the default **typical setup** option button is selected. Click **Accept**.
3. On the Installation Completed screen, click **Finish**.

### 6.2 Start the cluster manager

The cluster manager is started by accessing port 29003 from the web browser of any of the nodes (Machine1 or Machine 2). Example: <http://localhost:29003>.

### 6.3 Create a cluster

To create the cluster Follow all of the steps below and refer to Table 1 for IP addresses and Server names.

1. When the cluster manager is open for the first time, we will see a pop up which has three options. Click on "**Start cluster generation wizard**".
2. A new window opens where you can specify the name of the cluster
3. Provide a cluster name. Example: cluster
4. Provide the Management IP address and click on **Next**.
5. In the next window, one server is already added (this is the server which is being accessed for cluster creation) .Click on **Add** to add another server to this cluster.
6. Provide the hostname or the IP address of the second server and click **OK**.
7. Now both servers appear in the list. Click on **Next**.
8. EXPRESSCLUSTER X automatically detects the IP addresses of the added servers. Select Kernel mode for the network the network that you would like to use as Heartbeat path as Kernel Mode. Click on **Next**.
9. For this guide, the NP resolutions resources are not configured. So click on **Next**.

### 6.4 Create a failover group

For all of the steps below, refer to Table 1 for the IP addresses and Server Names.

1. Now in the groups section, click on **Add** to add a group.

- 
2. In the new pop-up window, select the type of the group as **Failover** and give this group a name (eg: Milestone\_cluster),click **Next** and then click **Next again**.
  3. Group attributes can be set from this screen if required, set these or else click **Next**

## 6.5 Create floating IP and share disk resources

1. Now in the **Group resources** section of the Cluster generation wizard.
2. Click on **Add** to add a resource.
3. In the next window, to add a Floating IP Resource (FIP) select “**floating ip resource**” from the drop down list. Click **Next**.
4. By default, the FIP resource is not dependent on any other resources. Follow the default dependency and click **Next**.
5. For default options click **Next**.
6. Provide a floating IP address<sup>1</sup>. Click **Finish**.
7. To Add disk resource click on **Add**
8. In the next window, select “Disk resource” from the drop down list to add a Disk Resource (SD). Click **Next**
9. Again, follow the default dependency. Click **Next**.
10. For default options click **Next**.
11. Now, add both the servers one by one. Click “**Add**” to add the first server. In the pop-up window click on the **Connect** button to refresh the partition information. Select the data partition and click **OK**.
12. Repeat step 11 for second server as well.
13. Click Finish.
14. To add a Virtual Computer Name click on **Add**.
15. In the next window, select “Virtual Computer Name resource” from the drop down list. Click **Next**.
16. Define a virtual computer name, like in this case “**milestone**” and select FIP that was created in previous section as Target FIP. Click **Finish** and again click **Finish** Click **Next**.
17. All the monitors for the added resources are added automatically. Click **Finish** to accept the defaults for the monitors.
18. To apply this configuration, click on **File** menu and then click on **Apply the Configuration File**.  
The message window pops-up stating the configuration has been successfully applied click **ok** and change to **operations mode** in web manager console to start the base cluster.

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<sup>1</sup> Floating IP address is a free IP address belonging to the same Network subnet as the servers. It should not have been allocated to any device on same network.

The screenshot displays a web console interface for a functional cluster. The left-hand navigation pane shows a tree structure under 'Milestone\_cluster' with sub-items for 'Servers' (milestone1, milestone2), 'Groups' (Milestone\_failover, MSSQL\_service, Milestone\_Data\_service, Milestone\_Event\_service, Milestone\_Management\_service, fip, sd1), and 'Monitors' (fipw1, sdw1, servicew1, servicew4, servicew5, servicew6, userw). The main content area is titled 'Disk: sd1' and shows a table of properties:

Properties	Value
Comment	
Drive Letter	E:
Status	Online
Started Server	milestone1

At the bottom, a log table provides a detailed view of system events:

Type	Received Time	Time	Server Name	Module Name	Event ID	Message
Info	2018/11/13 12:12:35.343	2018/11/14 12:11:25.405	milestone2	rm	1501	Monitor sdw1 has been started.
Info	2018/11/13 12:12:35.343	2018/11/14 12:11:25.404	milestone2	rm	1501	Monitor userw has been started.
Info	2018/11/13 12:12:33.291	2018/11/14 12:11:24.401	milestone2	icns	3551	The trial version is valid till 2019/04/01. Product name EXPRESSCLUSTER X 3.3 for Windows
Info	2018/11/13 12:12:31.289	2018/11/14 12:11:22.145	milestone2	pm	534	There was a request to resume cluster service from the command prompt.
Info	2018/11/13 12:12:31.257	2018/11/14 12:11:22.100	milestone2	pm	501	Cluster service has been started properly.
Info	2018/11/13 12:12:19.234	2018/11/14 12:11:09.217	milestone2	pm	502	Cluster service is shutting down.
Info	2018/11/13 12:12:13.232	2018/11/14 12:11:04.099	milestone2	rm	1502	Monitor userw has been stopped.

Figure 1 Web Console showing functional cluster

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## 7 Configure DB of Milestone XProtect VMS Products 2018 R2 for Cluster Setup

Perform the following functions on the primary server:

1. Create a new directory on the shared disk: **[your drive letter:] \MSSQL**
2. Inside MSSQL create another new directory: **[your drive letter:] \MSSQL\DATA**

### 7.1 Moving the Master and Resource Database to Disk on Primary Server

Follow the following steps

1. From the **Start** Menu, point to apps, point to Microsoft SQL Server 2016 and then click **SQL Server Configuration Manager**.
2. In the SQL Server Services node, right-click on SQL SERVER (MSSQLSERVER) and click on Properties.
3. In the **SQL Server(MSSQLSERVER) Properties** dialog box, click **Startup Parameters** tab.
4. Edit the **Startup Parameters** values to point to planned location for the master database data and log files, and click **OK**. (Moving the error log file is optional.)

The parameter value for the data file must following the `-d` parameter and the value for the log file must follow the `-l` parameter. The following example shows the parameter values for the default location of the master data and log files.

```
-dC:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\DATA \master.mdf;  
-eC:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\LOG\ERRORLOG;  
-lC:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\DATA \mastlog.ldf
```

If the planned relocation for the master data and log files is on the shared disk: [your drive letter:] \MSSQL\DATA, the parameter values would be changed as follows:

```
-d[your drive letter:] \MSSQL\DATA\master.mdf;  
-eC:\ProgramFiles\MicrosoftSQLServer\MSSQL10.MSSQLSERVER\MSSQL\LOG\ERRORLOG;  
-l: [your drive letter:] \MSSQL\DATA\mastlog.ldf
```

5. Move the **master.mdf** and **mastlog.ldf** files to shared disk by using copy and paste
6. Set all Microsoft SQL services to Manual and make sure that they are stopped.

### 7.2 Configure DB of Milestone XProtect VMS Products 2018 R2 on the Secondary Server

1. Move the cluster to the secondary server.

- 
2. Perform all of the steps (except step 5) mentioned in [section 7.2](#) on the Standby Server.
  3. Now, move the cluster back to the primary server.

### 7.3 Set the DB and application Server Services to Manual

After the SQL Server setup is completed on both servers, set all Milestone Services to manual as well, and make sure that they are stopped along with the MSSQL Server services as mentioned in section 7.1 and 7.2.

### 7.4 Cluster Services Setup

1. From **Config Mode** on EXPRESSCLUSTER X web manager console, right click on **failover** and click **Add Resource** in builder window.
2. Select **service resource**.
3. Provide a name for this resource (Ex: **MSSQLSERVER**) and add optional comments if required.
4. Click **Next**
5. Click on Connect and select the service **MSSQLSERVER** from the drop down.
6. Click **OK**
7. Click **Next** (for default values) Click **Next**.
8. Click **Finish**.
9. Right click on **failover** and click **Add Resource** in builder window.
10. Select **service resource**.
11. Provide name to this resource (Ex: **Milestone Data service**) and add optional comments if required.
12. Click **Next**
13. Click on Connect and select the service **Milestone XProtect Data Collector Server** from the drop down list.
14. Click **OK**
15. Click **Next** (for default values) Click **Next**.
16. Click **Finish**.
17. Right click on **failover** and click **Add Resource** in builder window.
18. Select **service resource**.
19. Provide a name to this resource (Ex: **Milestone XProtect Management Server**) and add optional comments if required.
20. Click **Next**
21. Click on Connect and select the service **Milestone XProtect Management Server** from the drop down list.
22. Click **OK**
23. Click **Next** (for default values) Click **Next**.
24. Click **Finish**.
25. Right click on **failover** and click **Add Resource** in builder window.
26. Select **service resource**.
27. Provide a name to this resource (Ex: **Milestone XProtect Event Server**) and add optional comments if required.

- 
28. Click **Next**
  29. Click on Connect and select the service **Milestone XProtect Event Server** from the drop down.
  30. Click **OK**
  31. Click **Next** (for default values) Click **Next**.
  32. Click **Finish**.
  33. Select **File** and then **Upload the Configuration File**.
  34. A message window appears confirming the Successful upload of Cluster configuration
  35. Click **OK**, then Navigate back to cluster manager operation mode
  36. Right click on the cluster name and then select **Start Cluster**

## 8 Appendix A: Example System Planning Worksheet

VM 1 Primary Server

VM 2 Standby Server

VM 3 Test client Machine

**Table 1: System Network Interfaces**

Machine	Host name	Network Connection	IP Address	Subnet Mask	Default Gateway	Preferred DNS Server
1	Primary	Public	10.1.1.1	255.255.255.0	10.1.1.3	10.1.1.3
		Interconnect	192.168.1.1	255.255.255.0	-----	-----
2	Standby	Public	10.1.1.2	255.255.255.0	10.1.1.3	10.1.1.3
		Interconnect	192.168.1.2	255.255.255.0	-----	-----

**Table 2: System OS and Disks**

Machine	OS	Disk 0 (OS Disk)	Disk 1 (Data Disk)
1	Win Server 2012 R2 Std. Ed. or later	<b>Boot Partition:</b> Drive Letter: C Size: 40 GB	<b>Data Partition:</b> Drive Letter: E Size: 40GB
2	Win Server 2012 R2 Std. Ed. or later	<b>Boot Partition:</b> Drive Letter: C Size: 40 GB	
3	Win 7	C: 40 GB	

\* Must be a raw partition and larger than 17MB.

### Floating IP (FIP) addresses:

Web Management Console FIP: (1) 10.0.0.222

**Table 3: System Logins and Passwords**

	Login	Password
Machine Administrator 1	Administrator	admin123
Machine Administrator 2	Administrator	admin123