PROMISE®
TECHNOLOGY, INC.

Vess A2000 Series

NVR Storage Appliance

Best Practices

Version 1.0

Contents

INTRODUCTION

This document describes how to setup the Vess A2000 NVR Storage Appliance with Milestone XProtect to achieve the best performance. There are three example topologies described and step-by-step setup instructions that guide you through the entire configuration process. Which topology is used depends on the equipment available for your surveillance layout. Two of the topologies use a single RAID 5 array in one Vess A2000. The third topology creates separate RAID 5 arrays, one array per subsystem (Vess A2600, Vess R2600, Vess J2600).

This document does not describe any hardware connections or hardware setup. Please refer to your user documents for hardware related instructions and information.

Before you start

First determine which of the two topologies you will use for your XProtect/Vess A2000 surveillance setup. If you plan to use external storage in the form of one or more Vess R2000 and Vess J2000 subsystems, it is best to setup the storage and software configuration to create one RAID 5 array and one volume per subsystem.

If you are using the Vess A2000 without additional external storage, use one or two volumes on one RAID 5 setup according to the guidelines in “Topology” on page 2.

PROMISE and Milestone have tested these topologies and determined that they are the best arrangement for efficiency and performance. To view the Milestone report (PDF file) online, click below.

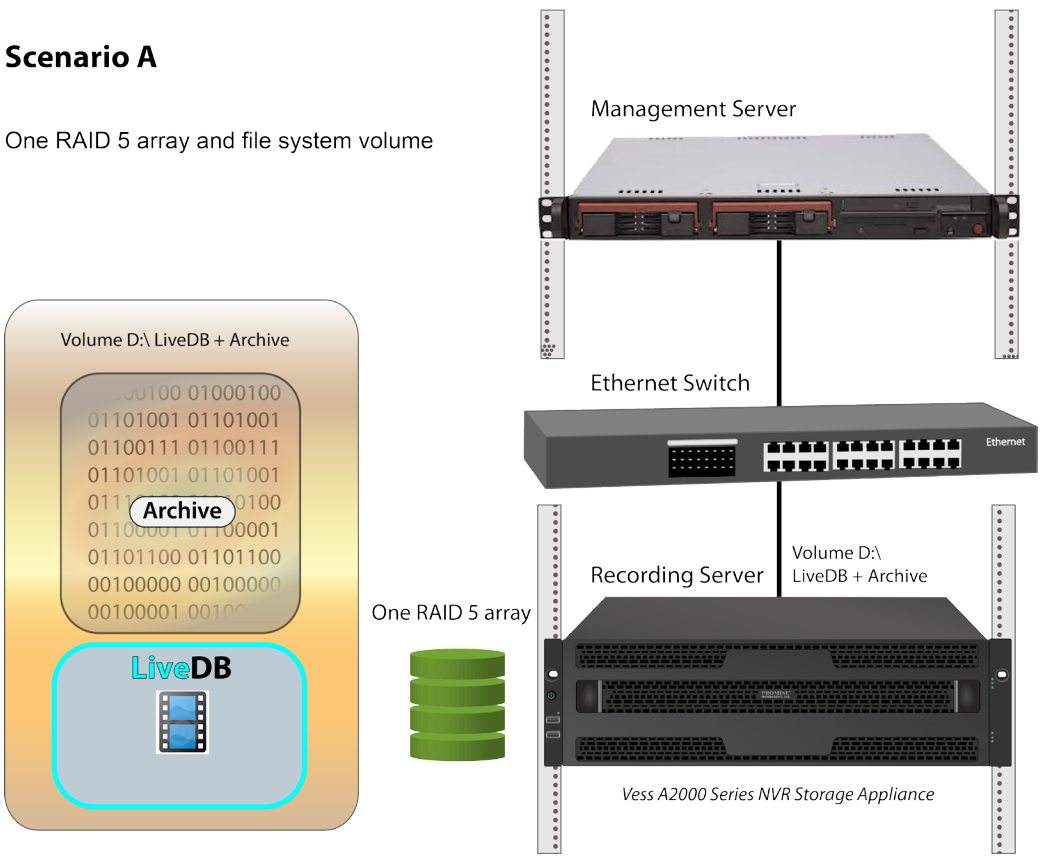
TOPOLOGY

For purposes of illustration, three scenarios are presented here. Which scenario is used depends on the number of subsystems employed and whether or not the NVR and storage system(s) are using an Uninterruptible Power Supply (UPS). If the NVR system is not using a UPS, and archiving is performed once a day, the two volume setup is also recommended. For the two volume setup, one volume is used for the LiveDB, the other is used for the Archive. This is done in order to reduce the time needed to check the file system when an unexpected power down occurs.

Single volume setup with one Vess A2000

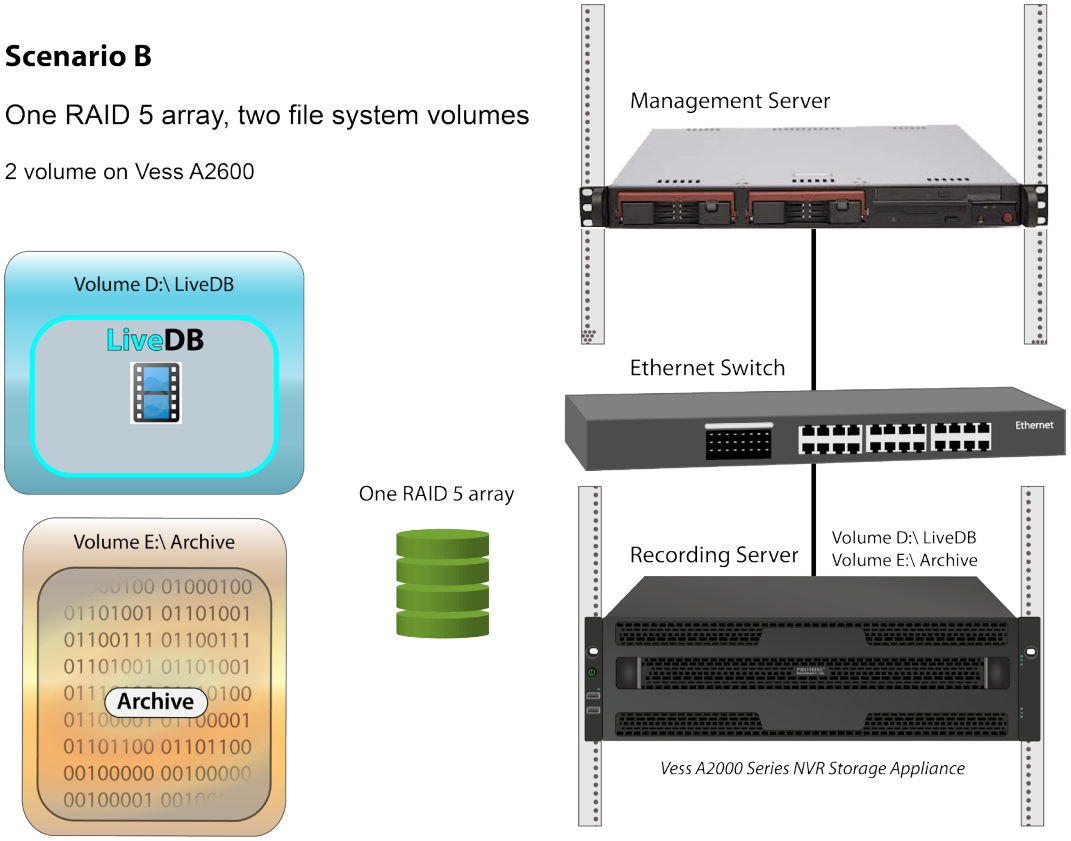
Scenario A

One RAID 5 array and file system volume



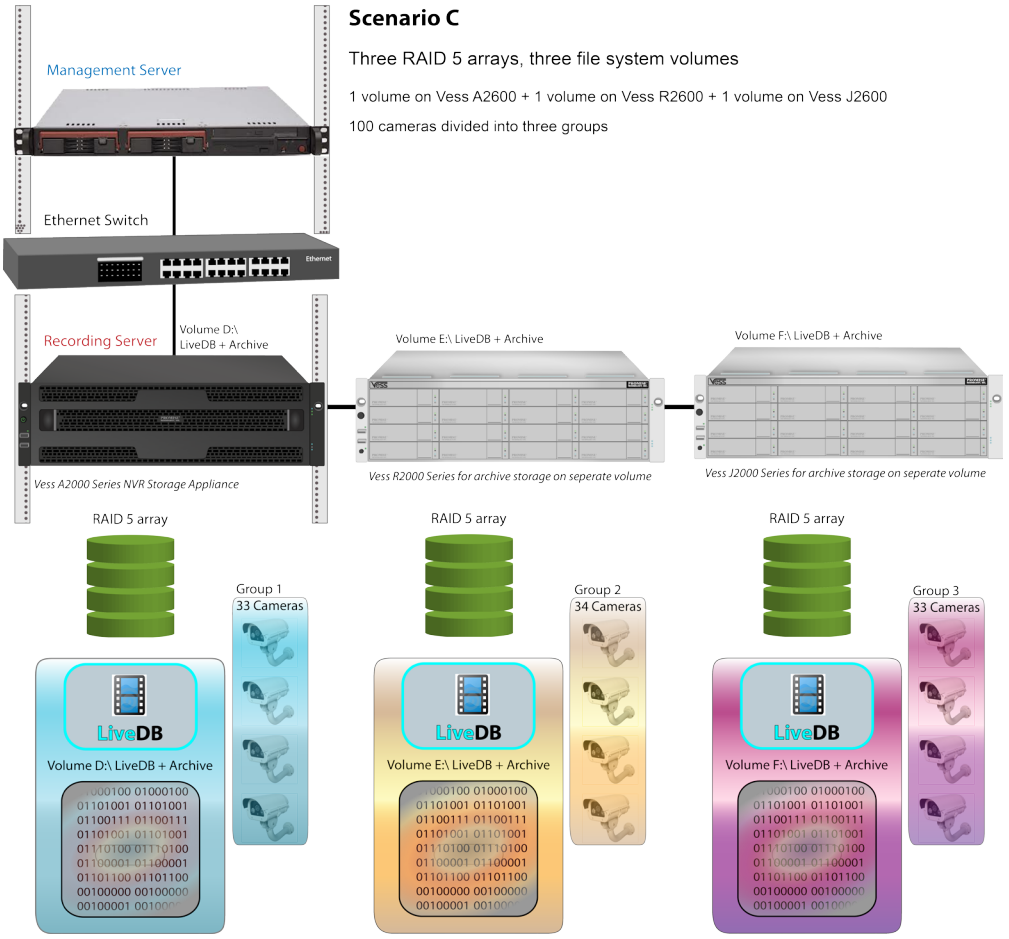
Scenario A can be used if UPS support is available for the Vess A2000. Create one file system volume for the LiveDB and Archive.

Two volume setup with one Vess A2000



For setups using one Vess A2000 without UPS support, two volumes are recommended. One volume for the Live DB, and another for the Archive.

Multivolume large scale topology on multiple subsystems



For larger scale deployments using two or more subsystems, create a RAID 5 array and a single volume for each subsystem. It will be necessary to calculate the capacity for each volume before partitioning in Windows. In addition, it is best to divide the cameras about evenly among the different volumes. This is done in the Milestone management software. Please consult the Milestone documentation for more information.

Scenario C volumes and size

Subsystem	Volume and Size
Vess A2600 15 HDD total capacity = 30 TB	[System drive] C:/ (Windows OS, RAID Engine, Milestone VMS)
	D:/ 28 TB (LiveDB and Archive)
Vess R2600 15 HDD total capacity = 30 TB	E:/ 28 TB (LiveDB and Archive)
Vess J2600 15 HDD total capacity = 30 TB	F:/ 28 TB (LiveDB and Archive)

Determining volume size

If you are using a single volume setup like the illustrated example in Scenario A on page 2, just use all available capacity for Disk 1 in Windows Disk Manager to create the volume.

If you are using a single volume setup like the illustrated example in Scenario B on page 3, determine how large the LiveDB must be then use that value for the first volume. Use he remaining capacity for the second volume. Consult your Milestone VMS to determine the size of the LiveDB that is suitable for your circumstance.

For implementations such as that illustrated in Scenario C on page 4, it is necessary to calculate the size of each volume before using Windows Disk Manager to partition and initialize the volumes. In that example it is assumed that all subsystems are fully populated with 2 TB HDDs. Since we have a single RAID 5, this works out to about 28 TB per volume.

VESS A2000

Follow the instructions here to prepare the Vess A2000 for operation of XProtect software. The instructions are different depending on whether or not the Vess A2000 unit has Hard Disk Drives (HDD) installed. First follow the instructions for either the Vess A2000 shipped with HDD (see below) or shipped without HDD (go to page 8), then proceed to create the file system and install the Milestone software.

Vess A2000 shipped with HDD

For Vess A2000 with HDD installed, first check the array and LD configuration.

1. Enter CLI mode (click **START** and type **clitest** in the search field)
2. Use **administrator** and **password** to login
3. Type **array –v** to view the array configuration.

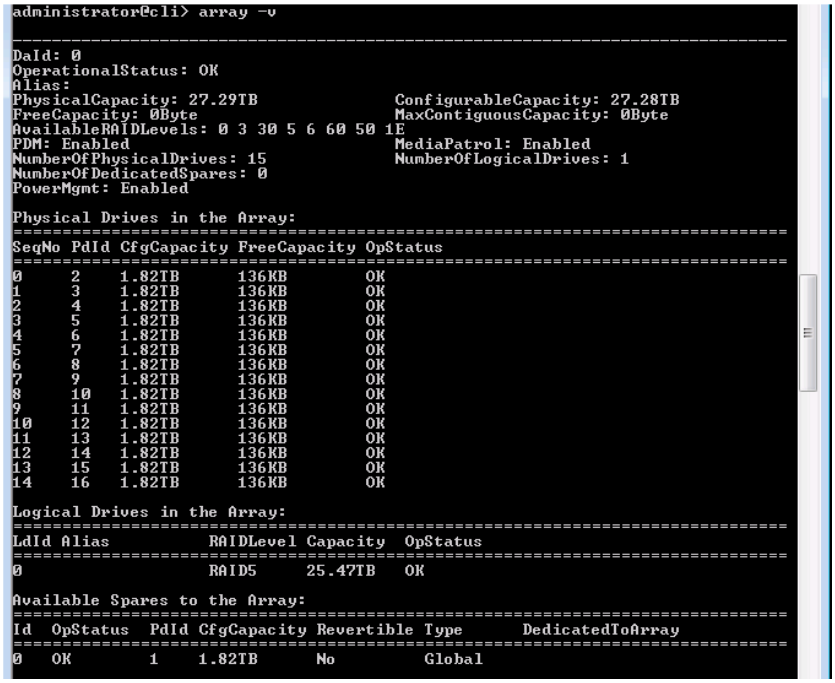
For Vess A2600, default configuration uses a single RAID 5 Logical Drive of 15 HDD.

For Vess A2200, default configuration uses a single RAID 5 Logical Drive of 6 HDD.

Important

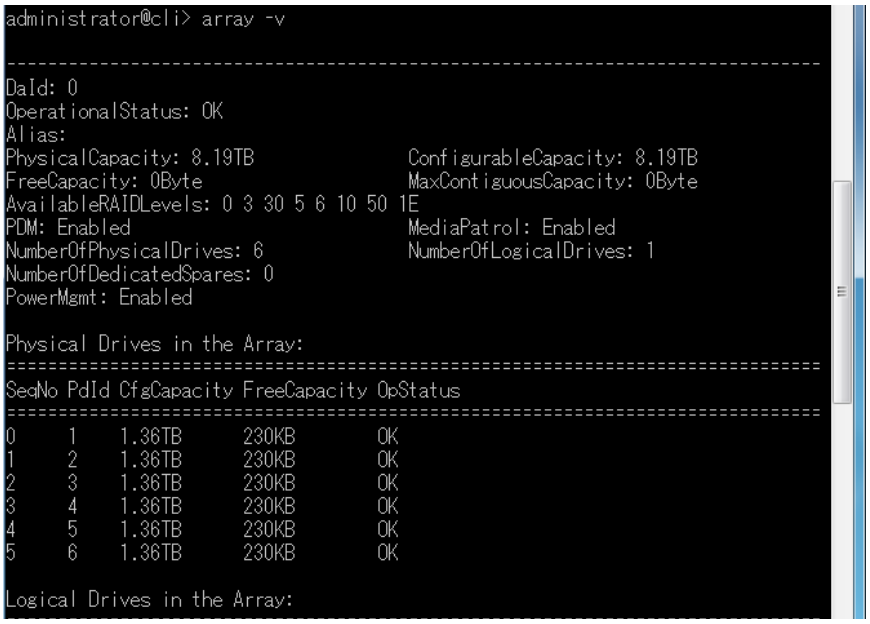
If the existing array has data stored on it, make sure it is backed up to another storage system.

Example of single RAID 5 array status for Vess A2600



```
administrator@cli> array -v

------------------------------------------------------------------------------
DaId: 0
OperationalStatus: OK
Alias:
PhysicalCapacity: 27.29TB              ConfigurableCapacity: 27.28TB
FreeCapacity: 0Byte                    MaxContiguousCapacity: 0Byte
AvailableRAIDLevels: 0 3 30 5 6 60 50 1E
PDM: Enabled                           MediaPatrol: Enabled
NumberOfPhysicalDrives: 15             NumberOfLogicalDrives: 1
NumberOfDedicatedSpares: 0
PowerMgmt: Enabled

Physical Drives in the Array:
==============================================================================
SeqNo PdId CfgCapacity FreeCapacity OpStatus
==============================================================================
0     2    1.82TB      136KB        OK
1     3    1.82TB      136KB        OK
2     4    1.82TB      136KB        OK
3     5    1.82TB      136KB        OK
4     6    1.82TB      136KB        OK
5     7    1.82TB      136KB        OK
6     8    1.82TB      136KB        OK
7     9    1.82TB      136KB        OK
8     10   1.82TB      136KB        OK
9     11   1.82TB      136KB        OK
10    12   1.82TB      136KB        OK
11    13   1.82TB      136KB        OK
12    14   1.82TB      136KB        OK
13    15   1.82TB      136KB        OK
14    16   1.82TB      136KB        OK

Logical Drives in the Array:
==============================================================================
LdId Alias          RAIDLevel Capacity  OpStatus
==============================================================================
0                   RAID5     25.47TB   OK

Available Spares to the Array:
==============================================================================
Id  OpStatus  PdId CfgCapacity Revertible Type      DedicatedToArray
==============================================================================
0   OK        1    1.82TB      No         Global
```

Example of single RAID 5 array status for Vess A2200



```
administrator@cli> array -v

------------------------------------------------------------------------------
DaId: 0
OperationalStatus: OK
Alias:
PhysicalCapacity: 8.19TB               ConfigurableCapacity: 8.19TB
FreeCapacity: 0Byte                    MaxContiguousCapacity: 0Byte
AvailableRAIDLevels: 0 3 30 5 6 10 50 1E
PDM: Enabled                           MediaPatrol: Enabled
NumberOfPhysicalDrives: 6              NumberOfLogicalDrives: 1
NumberOfDedicatedSpares: 0
PowerMgmt: Enabled

Physical Drives in the Array:
==============================================================================
SeqNo PdId CfgCapacity FreeCapacity OpStatus
==============================================================================
0     1    1.36TB      230KB        OK
1     2    1.36TB      230KB        OK
2     3    1.36TB      230KB        OK
3     4    1.36TB      230KB        OK
4     5    1.36TB      230KB        OK
5     6    1.36TB      230KB        OK

Logical Drives in the Array:
```

Continue to “Create RAID array(s)” on page 8.

Vess A2000 shipped without HDD

First follow the instructions in the Product Manual to install HDD (*6 HDD for Vess A2200 and 16 HDD for Vess A2600*), then follow the steps below to create a single array with single RAID5 Logical Drive.

Important

Make sure that any data on the array is backed up to another storage system before deleting the array configuration.

Create RAID array(s)

Create a single RAID 5 array on the Vess A2200, or a RAID 5 array plus a spare on the Vess A2600. If you are also using a Vess R2000 or Vess J2000, you need to also extend the RAID 5 array to them as well.

Use these CLI commands to create the arrays:

1. Delete array configuration if any.

   array –a del –d0

2. Create Logical Drive(s)
   a. RAID 5 Logical Drive in Vess A2200

      array –a add –p1~6 –l “raid=5”

   b. RAID 5 Logical Drive and spare in Vess A2600

      array –a add –p1~15 –l “raid=5”

      spare –a add –p16 –ry

If all HDD are not all the same size, use the drive with the largest capacity for the spare.

c. RAID 5 Logical Drive and spare in Vess R2000

array –a add –p1~15 –l “raid=5”

spare –a add –p16 –ry

If all HDD are not all the same size, use the drive with the largest capacity for the spare.

d. RAID 5 Logical Drive and spare in JBOD

array –a add –p16~31 –l “raid=5”

spare –a add –p32 –ry

array –a add –p33~47 –l “raid=5”

spare –a add –p48 –ry

array –a add –p49~63 –l “raid=5”

spare –a add –p64 –ry

array –a add –p65~79 –l “raid=5”

spare –a add –p80 –ry

array –a add –p81~95 –l “raid=5”

spare –a add –p96 –ry

If all HDD are not all the same size, use the drive with the largest capacity for the spare.

Setup system for XProtect

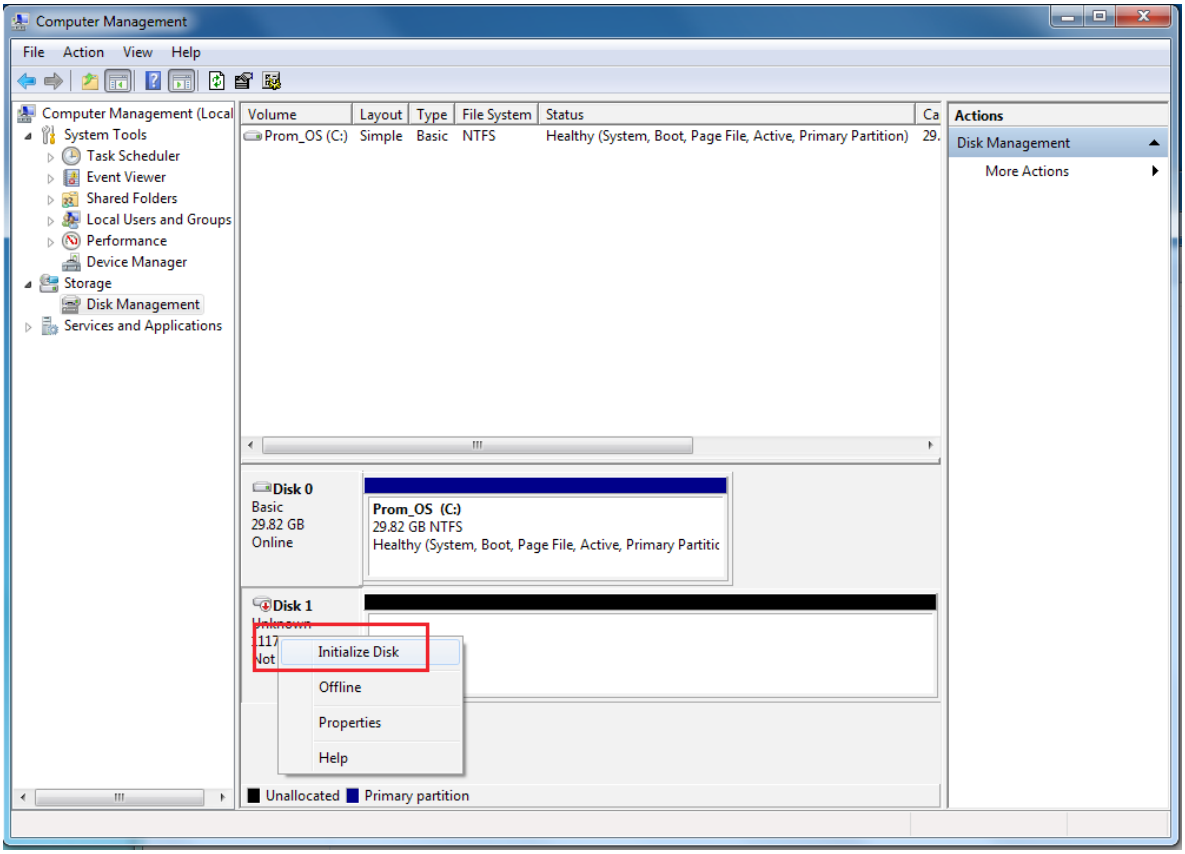
Now that the Vess A2000 unit has a HDD and a Logical Drive, it is necessary to use the Windows Disk Manager to create one or two file system volumes on the newly created RAID array. After creating the volume(s), install the XProtect Recording Server software and configure the storage accordingly to designate the LiveDB and Archive.

Create file system volumes

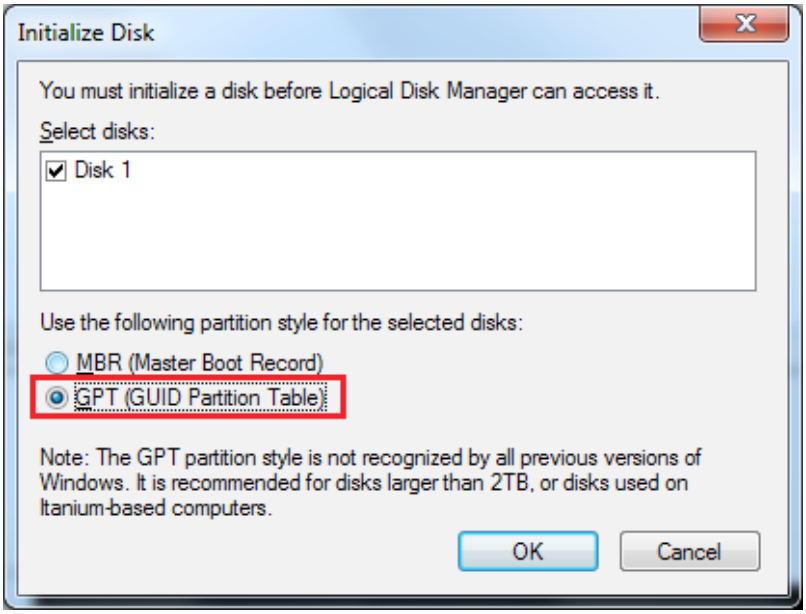
First create one or more file system volumes in the Windows Disk Management menu.

Use Windows Disk Manager following these steps:

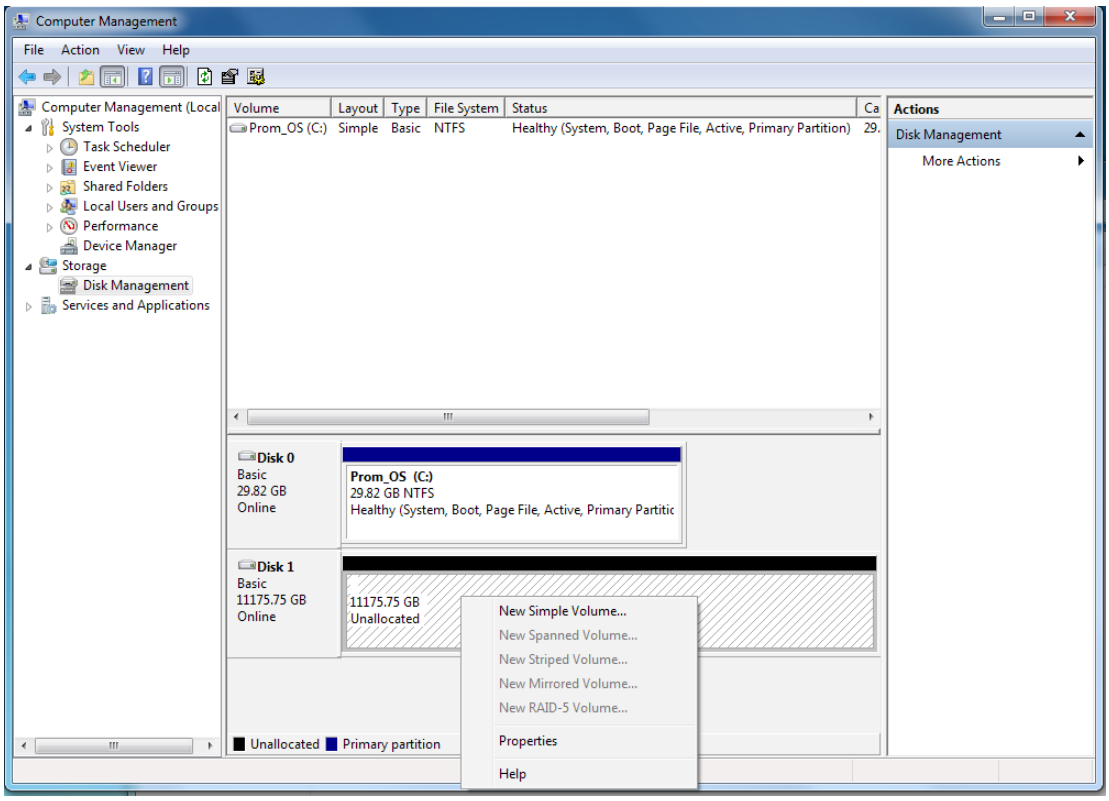
1. Open Windows Disk Manager. On the desktop, right-click on **My Computer** and choose the *Manage* option.
2. In the **Computer Management** menu, look under **Storage** and choose **Disk Management**.
3. Notice that there are two disks detected. *Disk 0* is the C drive. This contains the Windows operating system and Milestone XProtect software. Check to make sure the status of the Disk 0 is *Healthy*. If the disk is healthy, continue to the next step. If the Disk 0 status does not indicate it is healthy, this will need to be fixed before continuing. Please contact Technical Support. If Disk 0 is healthy, continue to the next step.
4. Disk 1 is the entire RAID 5 array created previously. If you are creating multiple volumes, you will partition the disk into the number of volumes you have planned. Right-click on Disk 1 and choose *Initialize Disk*.



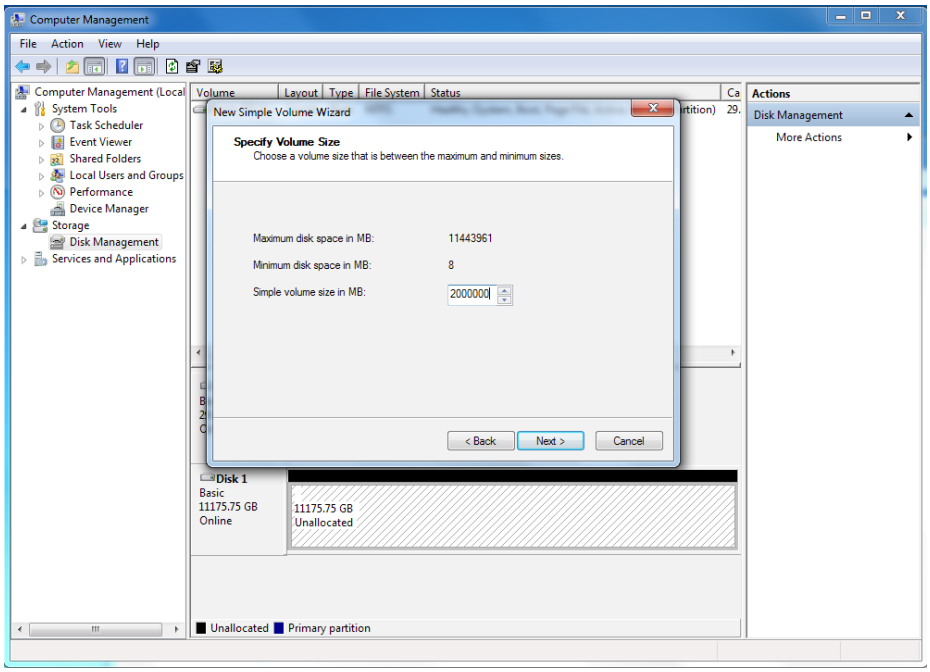
5. The **Initialize Disk** menu appears. Disk 1 should be selected. Choose **GPT (GUID Partition Table)** as the partition style, and click **OK**.



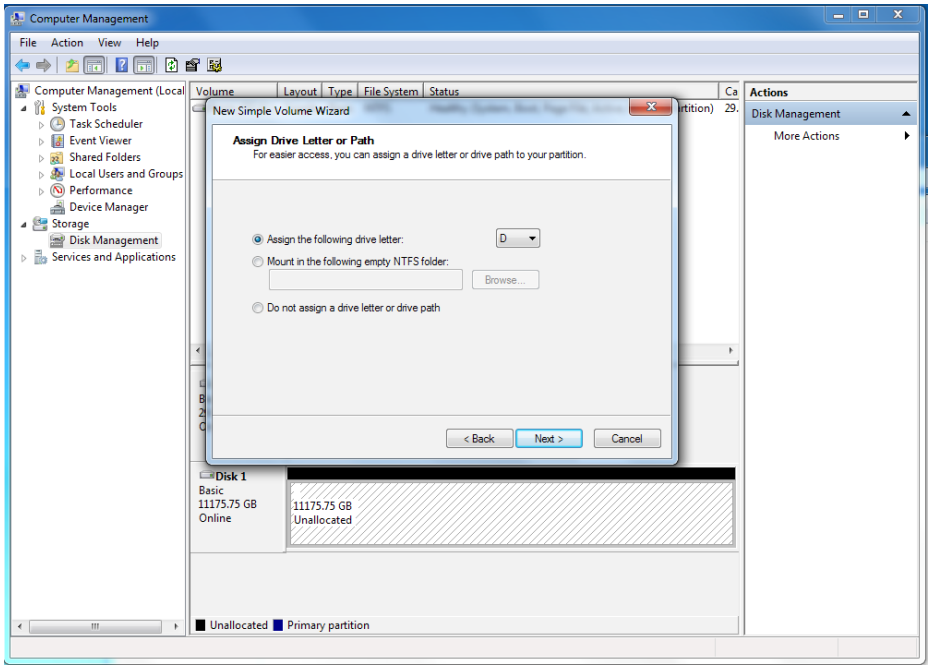
6. Back in the Disk Management menu, Disk 1 appears as an unallocated disk. Right-click on it and choose the *New Simple Volume* option. This launches the Simple Volume Wizard.



7. Click **Next** in the first **Simple Volume Wizard** menu.
8. For multiple volume setups, enter the size for the first volume as previously determined. See “Determining volume size” on page 5. If you are creating one volume, use the entire disk capacity. Click **Next** to continue.

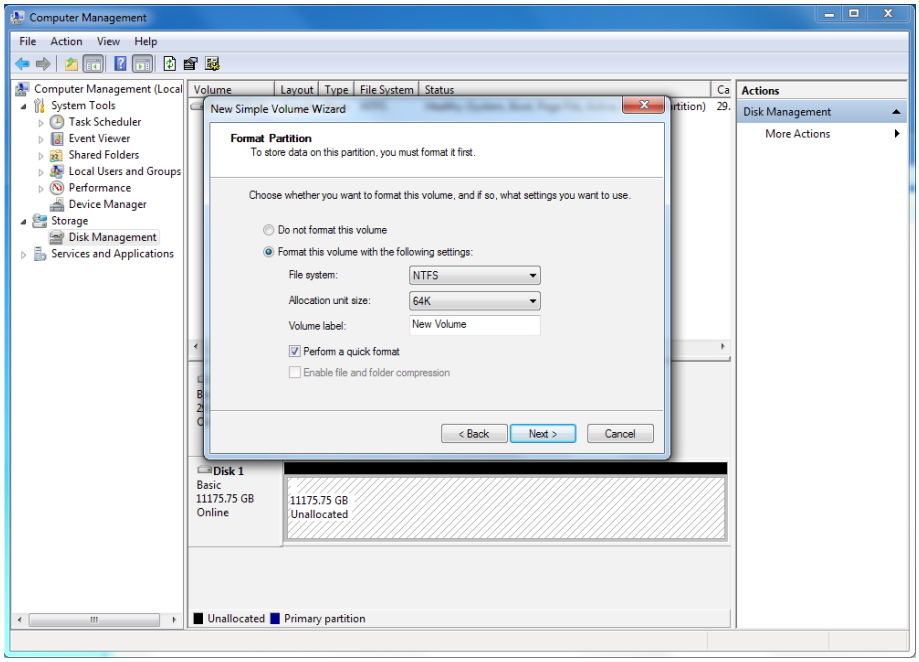


9. Choose the volume letter. Click **Next** to continue.



10. Configure format settings. Use *NTFS* **file system** and *64K* **Allocation size**.

    Click **Next** to continue.



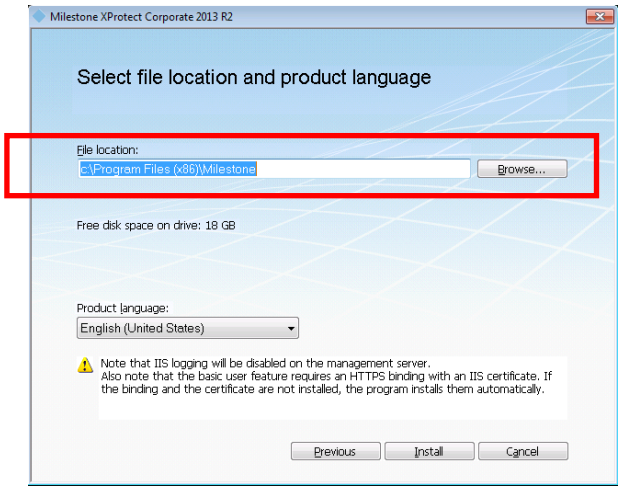
11. When the formatting is completed, a summary screen is displayed. Click **Finish**.
12. For multiple volume setups, repeat the procedure as needed until you have the desired number of volumes and have used the remaining capacity of Disk 0.

This concludes the preparation of the Vess A2000 and the installation of the software. Now it is time to assign a size and location for the LiveDB and the Archive. This task is performed using the Milestone XProtect Recording Server software you just installed.

Installation notes for Milestone VMS

Follow the instructions included with the Milestone XProtect software. However some points that need to be stressed about the installation procedure:

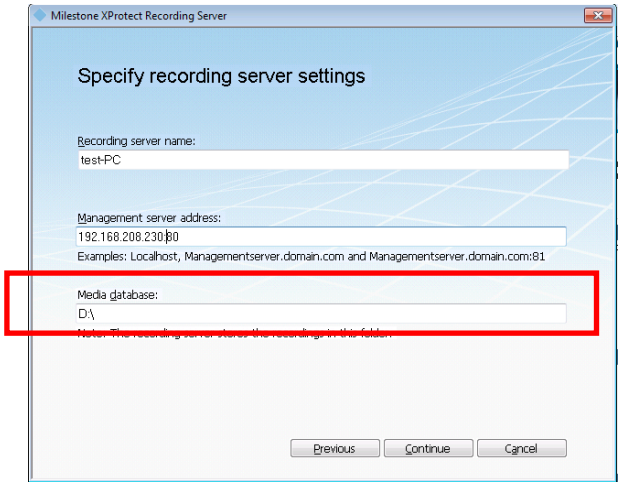
- Be sure to **install the program software on the C drive,** that is, the drive that contains the operating system as well as the PROMISE RAID engine.



Milestone software goes on system drive

- **Setup additional volumes (D drive, E drive, etc.) according to the planned topology.** All video data goes on the RAID disk assigned to the volume, or volumes as planned. Please consult the Milestone user documentation for details on how to do this.

- Also, the **Management server address is the IP address of the management server**, NOT the recording server (i.e. not the Vess A2000).

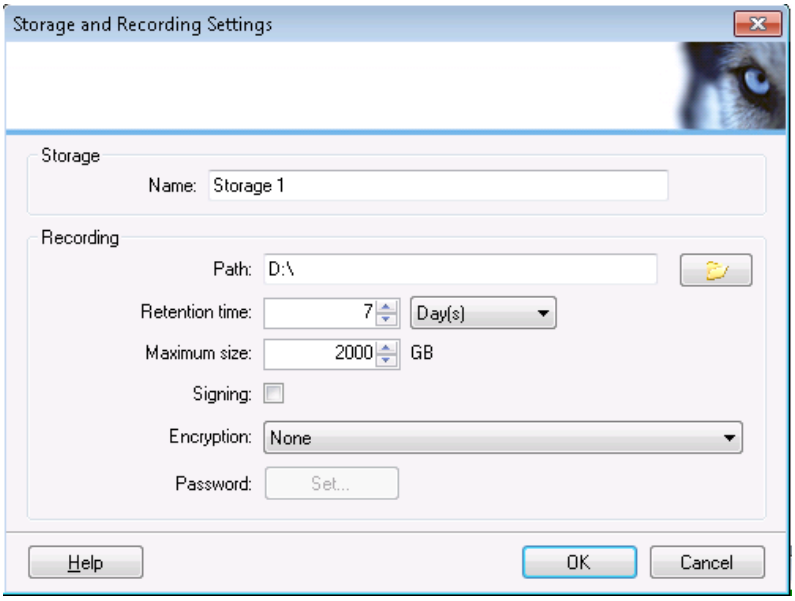


Data goes on other volumes, D drive, E drive, etc.

MILESTONE XPROTECT

1. LiveDB: Determine the size of the LiveDB according to guidelines in the Milestone documentation. Then assign the LiveDB to one of the following depending on the topology used:

    - A single volume (D drive shared with Archive)
    - A single volume (D drive, separate from the Archive volume)
    - Multiple volumes (LiveDB is placed on each volume, D drive, E drive, etc., shared with Archive)



2. Edit this file in **C:\ProgramData\Milestone\XProtect Recording Server\RecorderConfig.xml**

    Stop recording service, then change the two parameters below:

```
<low_priority_archive_thread_pool_size>2</low_priority_archive_thread_pool_size>
<maxframesinqueue>100</maxframesinqueue>
```

    Start recording service.

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