VMWARE PROTECTION USING VBA WITH NETWORKER 8.1
Complete Deployment and Implementation procedure

Abstract
This technical note describes the integration of EMC® NetWorker® with VMware vCenter® using VBA. It also includes the complete deployment and implementation procedure of VBA with EMC Networker ® for data protection of VMware environments.

April 2014
Copyright © 2014 EMC Corporation. All Rights Reserved.

EMC believes the information in this publication is accurate as of its publication date. The information is subject to change without notice.

The information in this publication is provided “as is.” EMC Corporation makes no representations or warranties of any kind with respect to the information in this publication, and specifically disclaims implied warranties of merchantability or fitness for a particular purpose.

Use, copying, and distribution of any EMC software described in this publication requires an applicable software license.

For the most up-to-date listing of EMC product names, see EMC Corporation Trademarks on EMC.com.

VMware® and vCenter® are registered trademarks of VMware, Inc. in the United States and/or other jurisdictions. All other trademarks used herein are the property of their respective owners.

Part Number H13101
Table of Contents

Introduction to NetWorker VMware Protection ................................................................. 4
What is VBA? .......................................................................................................................... 4
VBA installation components ............................................................................................... 5
Pre-installation Requirements ............................................................................................ 5
DNS Configuration ............................................................................................................... 5
To create the user account: ................................................................................................. 7
To customize a role with the required privileges: .............................................................. 7
Install VMware Backup Appliance (VBA) ........................................................................ 10
Conclusion .......................................................................................................................... 20
References ......................................................................................................................... 20
Introduction to NetWorker VMware Protection

NetWorker VMware Protection is a NetWorker-integrated VMware backup and monitoring solution introduced with NetWorker 8.1. This solution allows you to create backup and cloning policies for a VMware Backup appliance using NMC. You can then assign those policies to VMs using the EMC Backup and Recovery plug-in user interface in the vSphere Web Client.

This solution becomes available when you deploy an EMC Backup and Recovery appliance in the vSphere server and register the appliance with NetWorker and vCenter. After performing VM backups, you can then perform full recoveries of these backups from the vSphere Web Client, or file-level recoveries from the EMC Data Protection Restore Client user interface.

What is VBA?

The VBA is a software appliance providing scalability, enhanced administration, vCenter integration, and deduplication with EMC Data Domain Boost®, which provides automatic client side deduplication for every VMware backup operation. The primary backup target for the VBA is a Data Domain system.

NetWorker adds value to the business by providing role based administration, thereby empowering the administrators of VMware, applications and NetWorker to take control of their environments while eliminating the need to learn new administrative interfaces. This concept brings benefits to those customers that use traditional methods of managing data centers as well as those moving to an IT service provider model.
VBA installation components:

- NetWorker Server installation (Must).
- NetWorker Storage Node (Optional) - If you need a separate storage node other than NetWorker server.
- NetWorker Management Console (NMC)
- Deploy VMware Backup Appliance (VBA) in the vCenter (Must). VBA comes with 8 internal proxies, which means each proxy can do one backup or recover at a time. You can deploy multiple VBAs as per the need.
- Deploy External Proxy (Optional). You can deploy multiple proxies as per the need.

**Note:** EMC Backup and Recovery (EBR) terminology is used in the context of vCenter. VMware Backup Appliance (VBA) terminology is used in the context of NetWorker.

Pre-installation Requirements:

**DNS Configuration**

You must add an entry to the DNS Server for the appliance IP address and Fully Qualified Domain Names (FQDNs). The DNS server must support both forward and reverse lookup.

**IMPORTANT:** Failure to setup DNS properly can cause many configuration issues.

To confirm DNS configuration, open a command prompt and run the following commands from the vCenter Server:

1. To verify DNS configuration, type:
   
   ```
   nslookup EMC_Backup_and_Recovery_appliance_IP_address DNS_IP_address
   ```
   
   The `nslookup` command returns the FQDN of the EMC Backup and Recovery appliance.

2. To verify that the FQDN of the EMC Backup and Recovery appliance resolves to the correct IP address, type:
   
   ```
   nslookup FQDN_of_EMC_Backup_and_Recovery_Appliance DNS_IP_address
   ```
   
   Ensure this is the same IP as the previous command.

3. To verify that the FQDN of the vCenter Server resolves to the correct IP address, type:
   
   ```
   nslookup FQDN_of_vCenter DNS_IP_address
   ```
   
   If the `nslookup` commands return the proper information, then close the command prompt; if not, correct the DNS configuration. If you configure short names for the DNS entries then perform additional lookups for the short names.
NTP Configuration

The EMC Backup and Recovery appliance leverages VMware Tools to synchronize time through NTP. All ESXi hosts and the vCenter Server should have NTP configured properly. The EMC Backup and Recovery appliance obtains the correct time through VMware Tools and should not be configured with NTP.

The EMC Backup and Recovery appliance enables the **Sync guest OS time with host** option, by default.

Note: If you configure NTP directly on the **EMC Backup and Recovery plug-in** user interface, then time synchronization errors occur.

The ESXi and vCenter Server documentation provides more information about configuring NTP.

Port requirements

The NetWorker VMware Protection solution requires the ports outlined in Table below:

<table>
<thead>
<tr>
<th>Source host</th>
<th>Destination host</th>
<th>Protocol</th>
<th>Ports to open on the firewall to reach the destination host</th>
</tr>
</thead>
<tbody>
<tr>
<td>NetWorker server</td>
<td>vCenter server</td>
<td>TCP</td>
<td>443</td>
</tr>
<tr>
<td>NetWorker server</td>
<td>EMC Backup and Recovery</td>
<td>TCP</td>
<td>8543</td>
</tr>
<tr>
<td>EMC Backup and Recovery</td>
<td>NetWorker server</td>
<td></td>
<td>8060</td>
</tr>
</tbody>
</table>

All NetWorker daemons are assigned a port number within the range **7937-9936**. All NetWorker clients, EMC Backup and Recovery appliances, and proxies connect to one of the ports in the range.

Create dedicated vCenter user account and EMC Backup and Recovery role

EMC strongly recommends that you set up a separate vCenter user account that is strictly dedicated for use with EMC Backup and Recovery. Use of a generic user account such as “Administrator” might make future troubleshooting efforts difficult as it might not be clear which “Administrator” actions are actually interfacing, or communicating, with the NetWorker server. Using a separate vCenter user account ensures maximum clarity if it becomes necessary to examine vCenter logs.
Create vCenter user account

To create the user account:

1. From a web browser, connect to the vSphere Web Client:
   
   https://<IP_address_vCenter_Server>:9443/vSphere-client/

2. Navigate to Home > Administration > SSO Users and Groups.

3. In the Users tab, click on the Green +. The New User window appears.

4. In the Username field, specify a username (for example, EMC Backup and Recovery).

5. In the Password and Confirm Password fields, specify a password. You can leave the First name, last name and password fields blank.

6. In the Permissions field, select Administrator User.

7. Click OK.

Create a customized role

To customize a role with the required privileges:

1. In the vSphere Web Client, go to Administration > Role Manager and click on the green +. The Create Role dialog displays.

2. Type the name of this role (for example, Admin1).

3. Select all the privileges listed in Table below and click OK. This vCenter user account must have these privileges at a minimum.
<table>
<thead>
<tr>
<th>Setting</th>
<th>vCenter 5.1 required privileges</th>
<th>vCenter 5.0 required privileges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarms</td>
<td>• Create alarm</td>
<td>• Create alarm</td>
</tr>
<tr>
<td></td>
<td>• Allocate space</td>
<td>• Allocate space</td>
</tr>
<tr>
<td></td>
<td>• Browse datastore</td>
<td>• Browse datastore</td>
</tr>
<tr>
<td></td>
<td>• Low level file operations</td>
<td>• Low level file operations</td>
</tr>
<tr>
<td></td>
<td>• Move datastore</td>
<td>• Move datastore</td>
</tr>
<tr>
<td></td>
<td>• Remove datastore</td>
<td>• Remove datastore</td>
</tr>
<tr>
<td></td>
<td>• Remove file</td>
<td>• Remove file</td>
</tr>
<tr>
<td></td>
<td>• Rename datastore</td>
<td>• Rename datastore</td>
</tr>
<tr>
<td>Datastore</td>
<td>• Register extension</td>
<td>• Register extension</td>
</tr>
<tr>
<td></td>
<td>• Unregister extension</td>
<td>• Unregister extension</td>
</tr>
<tr>
<td></td>
<td>• Update extension</td>
<td>• Update extension</td>
</tr>
<tr>
<td></td>
<td>• Create folder</td>
<td>• Create folder</td>
</tr>
<tr>
<td></td>
<td>• Cancel task</td>
<td>• Cancel task</td>
</tr>
<tr>
<td></td>
<td>• Disable method</td>
<td>• Disable method</td>
</tr>
<tr>
<td></td>
<td>• Enable method</td>
<td>• Enable method</td>
</tr>
<tr>
<td></td>
<td>• Licenses</td>
<td>• Licenses</td>
</tr>
<tr>
<td></td>
<td>• Log event</td>
<td>• Log event</td>
</tr>
<tr>
<td></td>
<td>• Manage custom attributes</td>
<td>• Manage custom attributes</td>
</tr>
<tr>
<td></td>
<td>• Settings</td>
<td>• Settings</td>
</tr>
<tr>
<td></td>
<td>• Assign network</td>
<td>• Assign network</td>
</tr>
<tr>
<td></td>
<td>• Configure</td>
<td>• Configure</td>
</tr>
<tr>
<td></td>
<td>• Assign virtual machine to resource pool</td>
<td>• Assign virtual machine to resource pool</td>
</tr>
<tr>
<td></td>
<td>• Validate session</td>
<td>• Validate session</td>
</tr>
<tr>
<td></td>
<td>• Create task</td>
<td>• Create task</td>
</tr>
<tr>
<td></td>
<td>• Update task</td>
<td>• Update task</td>
</tr>
<tr>
<td></td>
<td>• Export</td>
<td>• Export</td>
</tr>
<tr>
<td></td>
<td>• vApp application configuration</td>
<td>• vApp application configuration</td>
</tr>
<tr>
<td>Virtual machine</td>
<td>Configuration</td>
<td>Guest Operations</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Configuration</td>
<td>• Add existing disk&lt;br&gt;• Add new disk&lt;br&gt;• Add or remove device&lt;br&gt;• Advanced&lt;br&gt;• Change CPU count&lt;br&gt;• Change resource&lt;br&gt;• Disk change tracking&lt;br&gt;• Disk Lease&lt;br&gt;• Host USB device&lt;br&gt;• Memory&lt;br&gt;• Modify device setting&lt;br&gt;• Raw device&lt;br&gt;• Reload from path&lt;br&gt;• Remove disk&lt;br&gt;• Rename&lt;br&gt;• Reset guest information&lt;br&gt;• Settings&lt;br&gt;• Swapfile placement&lt;br&gt;• Upgrade virtual hardware&lt;br&gt;• Extend virtual disk</td>
<td>• Add existing disk&lt;br&gt;• Add new disk&lt;br&gt;• Add or remove device&lt;br&gt;• Advanced&lt;br&gt;• Change CPU count&lt;br&gt;• Change resource&lt;br&gt;• Disk change tracking&lt;br&gt;• Disk Lease&lt;br&gt;• Host USB device&lt;br&gt;• Memory&lt;br&gt;• Modify device setting&lt;br&gt;• Raw device&lt;br&gt;• Reload from path&lt;br&gt;• Remove disk&lt;br&gt;• Rename&lt;br&gt;• Reset guest information&lt;br&gt;• Settings&lt;br&gt;• Swapfile placement&lt;br&gt;• Upgrade virtual hardware&lt;br&gt;• Extend virtual disk</td>
</tr>
<tr>
<td>Guest Operations</td>
<td>• Guest operation modifications&lt;br&gt;• Guest operation program execution&lt;br&gt;• Guest operation queries</td>
<td>• Guest operation modifications&lt;br&gt;• Guest operation program execution&lt;br&gt;• Guest operation queries</td>
</tr>
</tbody>
</table>
**Install VMware Backup Appliance (VBA)**

I. Download - Download the OVA for installing VMware Backup Appliance.

II. Deploy - Go to vCenter and deploy this OVA and supply network information correctly (provide static IP, gateway, DNS and subnet mask). Please note entering right network information is really vital for this appliance to work correctly. Turn on the 'power-on after deployment option.'

III. Configure - Once VBA is powered on and booted, after few minutes, you should see a blue screen with instructions.
a. Open the internet browser and type the URL on the VBA appliance's blue screen. The URL will be something like - http://<VBA-IP>:8580/ebr-configure. If you are unable to connect to it, check the network configuration - ipaddress, DNS, etc. If any of the network information was incorrectly entered, then you need re-deploy it from the scratch.

b. Log in with userid root and default password **8RttoTriz**. Change the password during the configuration process.
c. Click Next at the Welcome screen.
d. Verify the Network Settings & IP configuration. (Should be good or you wouldn't get this far).

![Network Settings](image)

- IP4 static address: 192.168.1.10
- Netmask: 255.255.255.0
- Gateway: 192.168.1.1
- Primary DNS: 192.168.1.10
- Secondary DNS: 
- Host name: vba
- Domain: emc.edu

Click Next.

e. Set the time zone to match that of the vCenter appliance. It is good to have same time as vCenter otherwise you may have trouble connecting with VBA from vCenter.

![Time Zone](image)

- Choose the time zone: America/New_York
f. Set the new password for EBR appliance.

g. Enter the details need to connect to the vCenter appliance and test the connection (you can't proceed with successfully testing). Use the FQDN of the vCenter server for the SSO.
h. Enter the details of connecting to the NetWorker Web Server.

i. Username = **VMUser** (default works)

ii. Password = **changeme** (default works)

iii. Port = **8080** (default works)

iv. Test the connection. You cannot proceed without successfully testing.

**Note:** Please use the default credentials supplied in the UI. If you need to use a different userid or change passwd, please change it in NetWorker server and come back here. NetWorker Web Server settings are stored in the "NSR" resource. The attributes are: VMWS port, VMWS user name, and VMWS user password. You can change them through nsradmin, but they are not visible in NMC. When changing the settings (port, userid, or passwd), you need to restart nsrmwsd manually: nsrd will signal nsrmwsd to reload its configuration automatically.
Changing the userid and password in Networker Server through NMC: (Optional)

In the NMC configuration tab, right click Networker Server ---->Properties ---->Miscellaneous Tab

IV. Click the finish button - VBA will be rebooted. Close the browser.

V. Once reboots completes... it takes approx. 30 to 45 mins. You will get the same blue screen again as above, which means it is ready for use.
**Note:** VBA and vCenter needs to be time synced. General recommendation is - in a NetWorker data zone; all clients including vCenter should synchronize the time.

**Test VBA:**

1. Once all above steps are completed then go to NMC and
   a. Configuration -> VMware Backup Appliance: - you must see your VBA registered here.
   
   ![Configuration -> VMware Backup Appliance](image)

   b. Configuration -> VMware Protection Policies: - You must see a Default policy here

   ![Configuration -> VMware Protection Policies](image)
2. To go to the VBA machine GUI to see the health and all, use the link - **https://<VBA address>:8543/ebr-configure/**

3. Login to vCenter webclient - **https://vcenter-name**
   i. Go to EMC Backup and Recovery (you should see EMC Backup and Recovery if a VBA/EBR is successfully deployed in this vCenter)
   ii. Connect to your VBA (You can connect to only one EBR at a time)

   iii. You must see one Default policy which was pushed by Networker to it.
4. Policy and VMs

   a. For each policy created in NMC and when a VBA is assigned to it, this policy gets pushed into the VBA so that it is available for vCenter admin to assign VMs to a policy. To check whether a policy is pushed to the VBA successfully, go to NMC->configuration->VMware Backup Appliances. This queries the VBA and lists Policies configured in addition to VBA's health.

   b. Edit the policy to add VMs to it.

   c. Manually start the backup from vCenter - click on ‘Run the “Backup Now”. This will start the backup. You should be able to see Backup session in NMC too. Otherwise, NW will run the policy as per the policy schedule.

   d. Note - Policies are created in NW and VMs are assigned to it using vCenter web client EBR UI.

5. Restore - Click on Restore tab and follow the instructions to restore a VM

6. FLR(File Level Restore from a VM) - bring up the internet browser and type the URL - http://VBA-host:8580/flr

   a. Mount a restore point, start browsing the files and select some files and restore.

**Adding external proxies**

1. VBA has 8 internal proxies. A proxy can only do one backup or restore at a time.
2. If you need more proxies, then deploy an external proxy OVA.
Point existing VBA to new NW Server

a) Delete the existing policies using Avamar MCUI - Policies, Datasets, Schedules and Retention Policies
b) Edit NW Server hostname in VBA - /usr/local/vdr/etc/vcenterinfo.cfg
c) Re-register VBA with new NW server - emwebapp.sh --restart
d) Verify the settings have been applied by logging into - https://VC_IP:8543/ebrcConfigure/
e) Verify the new Default Policy is pushed to VC by logging into - https://VC_IP:9443/vsphere-client and connect to the EBR appliance.
f) Create a new policy and ensure the policy is pushed onto VC.

Conclusion
This document provides step by step procedure of deployment of VBA in vCenter, registration with Networker Server v8.1 and configuration of VMware protection policies. This helps as quick reference guide for VBA implementation.

References
EMC® NetWorker 8.1 SP1 Administration Guide - P/N 302-000-421
EMC® NetWorker and VMware 8.1 Integration Guide - P/N 302-000-561