One of the key procedures necessary to validate your DR/BC plan is testing the plan in a controlled environment to ensure that in the event of a real disaster the failovers of critical virtual machines and their applications will be successful.

Zerto provides documentation outlining how to test your DR/BC plan using various strategies, dependent on the level of testing you require. For details, refer to Live DR Testing (vSphere) or Live DR Testing (Hyper-V).

After an initial test has been successfully run, you need to repeat this testing on a regular basis to ensure that changes to the protected virtual machines and the environment have not adversely affected the ability to failover.

Zerto provides an automated testing tool so that the periodic tests are performed when and how you want them, with minimal manual intervention.

The Zerto *Orchestrator* is a pre-packaged Debian Linux virtual machine that contains the Jenkins build scheduling system and Python scripts that communicate with the Zerto Virtual Manager and vCenter Server using public APIs.

Using Jenkins to schedule tests instead of builds, the Zerto *Orchestrator* is tailored to automatically perform scheduled failover tests in Zerto Virtual Replication, verifying success for each test. The test results can be audited and the administrator notified if a test fails.

Because the Zerto *Orchestrator* uses open-source tools, you can customize it to your specific testing requirements.

The Zerto *Orchestrator* can be used on any version of Zerto Virtual Manager from version 3.5.

See the following sections:
- "Installation and Initial Setup of the Zerto Orchestrator", on page 1
- "Configuring Zerto Orchestrator", on page 3

Installation and Initial Setup of the Zerto Orchestrator

Install the Zerto *Orchestrator* in vCenter Server. Setting up the Zerto *Orchestrator* is done within Jenkins in a browser.

To install Zerto Orchestrator:

1. Download the zerto_orchestrator zip and extract the contents.
2. Deploy the *zerto_orchestrator* OVF, zerto_orchestrator.ovf, in vCenter Server, using the defaults.

   The *zerto_orchestrator* virtual machine is a Linux machine, created using DHCP, with VMTools installed.
3. In the vSphere Web Client or Client console, check the IP address of the *zerto_orchestrator* virtual machine in the *Summary* tab.

   Note: If you want to change this IP to a static IP, log in to the virtual machine with the root user using `zerto` as the password, and change the networking configuration by editing the */etc/network/interfaces* file, for example by setting up `eth0`, the first network interface card, with the IP address 192.168.1.5 and the gateway to 192.168.1.254:

   ```
   iface eth0 inet static
   address 192.168.1.5
   netmask 255.255.255.0
   gateway 192.168.1.254
   ```

   You can also change the password, using the `passwd` command in the root directory.

To set up Zerto Orchestrator:

1. In a browser, log on to the Jenkins console dashboard using `http://<ip>:8080` where `<ip>` is the IP address of the *zerto_orchestrator* virtual machine, from step 3, above.

   A browser window similar to the following is displayed.
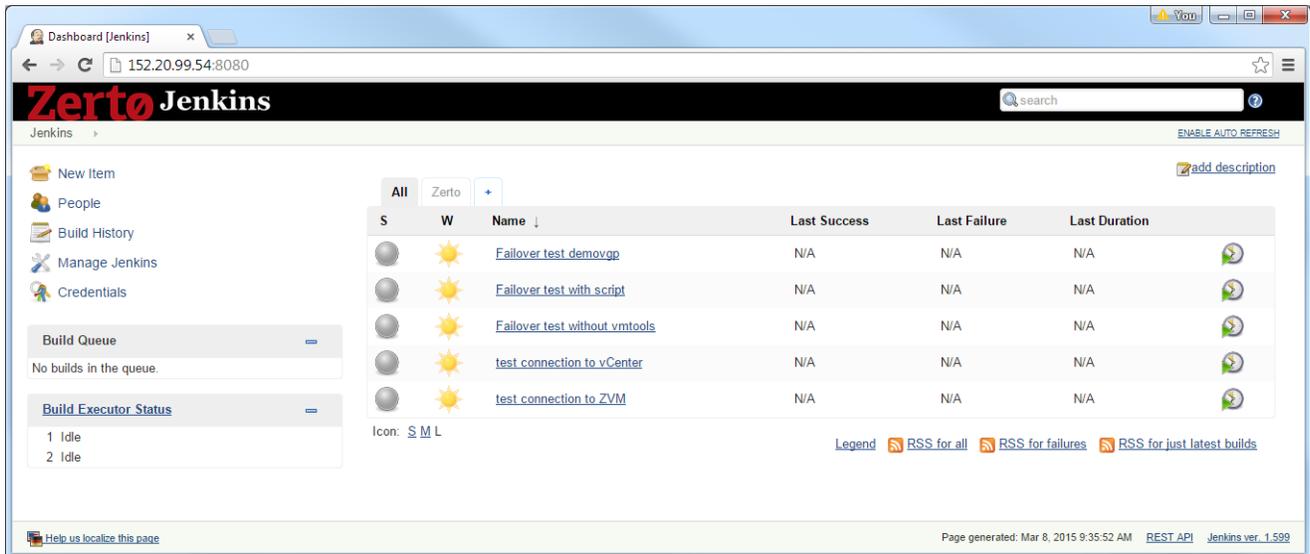
2. Optionally, configure security settings to Jenkins.
   a) Choose *Manage Jenkins > Configure Global Security*.
   b) Check *Enable security* and specify any security settings you want.

3. Optionally, configure access settings to Jenkins.
   a) Choose *Credentials*.
   b) Set up access credentials. The default password is `zerto`.

4. Verify that the time is correct. The time is displayed in the browser status bar and is updated whenever you refresh the page. This time is synchronized with the ESXi host under which the *zerto_orchestrator* virtual machine is deployed using EST as the default timezone.

   Note: You can change the time by logging in to the *zerto_orchestrator* virtual machine and altering the `/etc/timezone` file and then rebooting the virtual machine.

Configuring Zerto Orchestrator

The *zerto_orchestrator* virtual machine is configured as follows:

- To access the vCenter Servers and Zerto Virtual Managers where failover tests will be performed. See "Connecting the Zerto Orchestrator to Zerto Virtual Managers", on page 3.
- To configure email notifications. See "Configuring Email Notifications", on page 4.
- To configure and schedule the VPG tests. See "Specifying the VPG to Test and Scheduling the Test", on page 5.

Connecting the Zerto Orchestrator to Zerto Virtual Managers

The *zerto_orchestrator* virtual machine must be configured to access the vCenter Servers and Zerto Virtual Managers where failover tests will be performed.

To configure connections to vCenter Server and Zerto Virtual Manager sites:

1. In the Jenkins console dashboard, choose *Manage Jenkins > Configure System*.
2. Scroll down to *Global properties* and set the connection parameters for each Zerto Virtual Manager.

3. For each site, set the following:
    - The vCenter Server name and IP address.
    - The vCenter Server user and the user name.
    - The Zerto Virtual Manager name and IP address.

    Initial dummy values have been entered for `vcenter1_ip`, `vcenter1_user` and `zvm1_ip`.

    In *Global properties*, you can also set a global timeout value, in seconds.
4. Scroll down to *Mask Passwords - Global name/password pairs* and set the passwords for each vCenter Server.
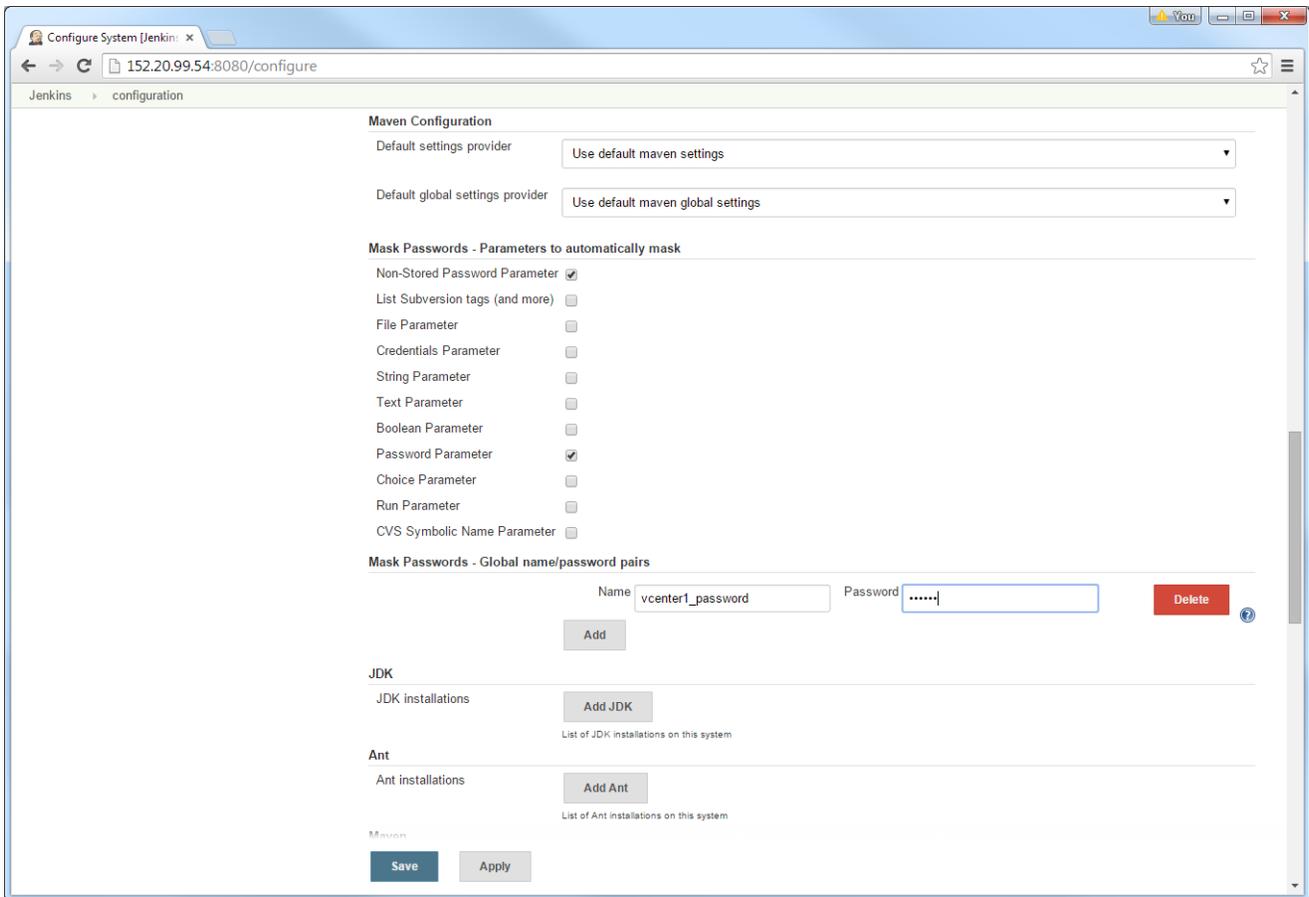
An initial dummy value has been entered for `vcenter1_password`.

The Zerto Virtual Managers are authenticated using the vCenter Server credentials.

5. Repeat steps 3-4 for each site with a Zerto Virtual Manager.

6. Click *Save*.

7. Test the connection.

    Zerto has provided a number of preconfigured jobs, viewable from the Jenkins console dashboard in the Zerto tab. Run both of the following jobs to test the connectivity.

    ■   *test connection to vCenter*
    ■   *test connection to ZVM*

    a) Click the test and then *Build Now*.
    b) Click the test, under *Permalinks* or *Build History*, and then click *Console Output* to see the results.

Configuring Email Notifications

The *zerto_orchestrator* virtual machine must be configured to access the vCenter Servers and Zerto Virtual Managers where failover tests will be performed.

To email notifications:

1. In the Jenkins console dashboard, choose *Manage Jenkins > Configure System*.

2. Scroll down to *E-mail Notification*.

3. Specify the following:

   SMTP server – The SMTP mail server address. Leave this value empty to use the default server, which is normally the one running on localhost.

   Default user e-mail suffix – The suffix for email addresses, such as `@example.com`.

4. Check *Test configuration by sending test e-mail* and click *Apply* to test the notification.

5. Click *Save*.

Specifying the VPG to Test and Scheduling the Test

Zerto has included a number of test jobs to use as templates for your testing requirements:

Failover test demovpg – A fully automated test that checks virtual machines in a VPG that are being failover tested for the existence of VMTools. Customize this job by changing the name of the VPG from `demovpg`.

Failover test with script – Enables running a script inside the VPG virtual machines after they have been powered on and VMTools is running during a failover test, to verify the virtual machines.

Failover test without vmtools – Enables running a script inside the VPG virtual machines after they have been powered on but the virtual machine does not have VMTools running, to verify the virtual machines. Note that the script cannot run inside the virtual machines without VMTools.

To set up a failover test schedule for a VPG:

1. In the Jenkins console dashboard, choose *New Item*.
2. Specify a name for the new item and the name of the job to be copied in the *Copy from* field.
3. Click *OK*.
4. Scroll down to *Build* and change the name of the VPG from `demovpg` to the actual VPG name.
5. Add or delete build steps as appropriate.
6. Set the schedule for the test by scrolling up to *Build Triggers* and specifying the schedule. For example, to specify that the test is run periodically, check `Build periodically`, and use a variation of cron syntax to specify the date for each run.

   Note: Use the help provided by Jenkins for the exact syntax. The help is accessed by clicking the help symbol to the right of the field.
7. Click *Save*.