vFabric Application Director® Marketplace

Nanotrader Blueprint

1.0.0

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vmware®

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Author	Version	Review	Comments
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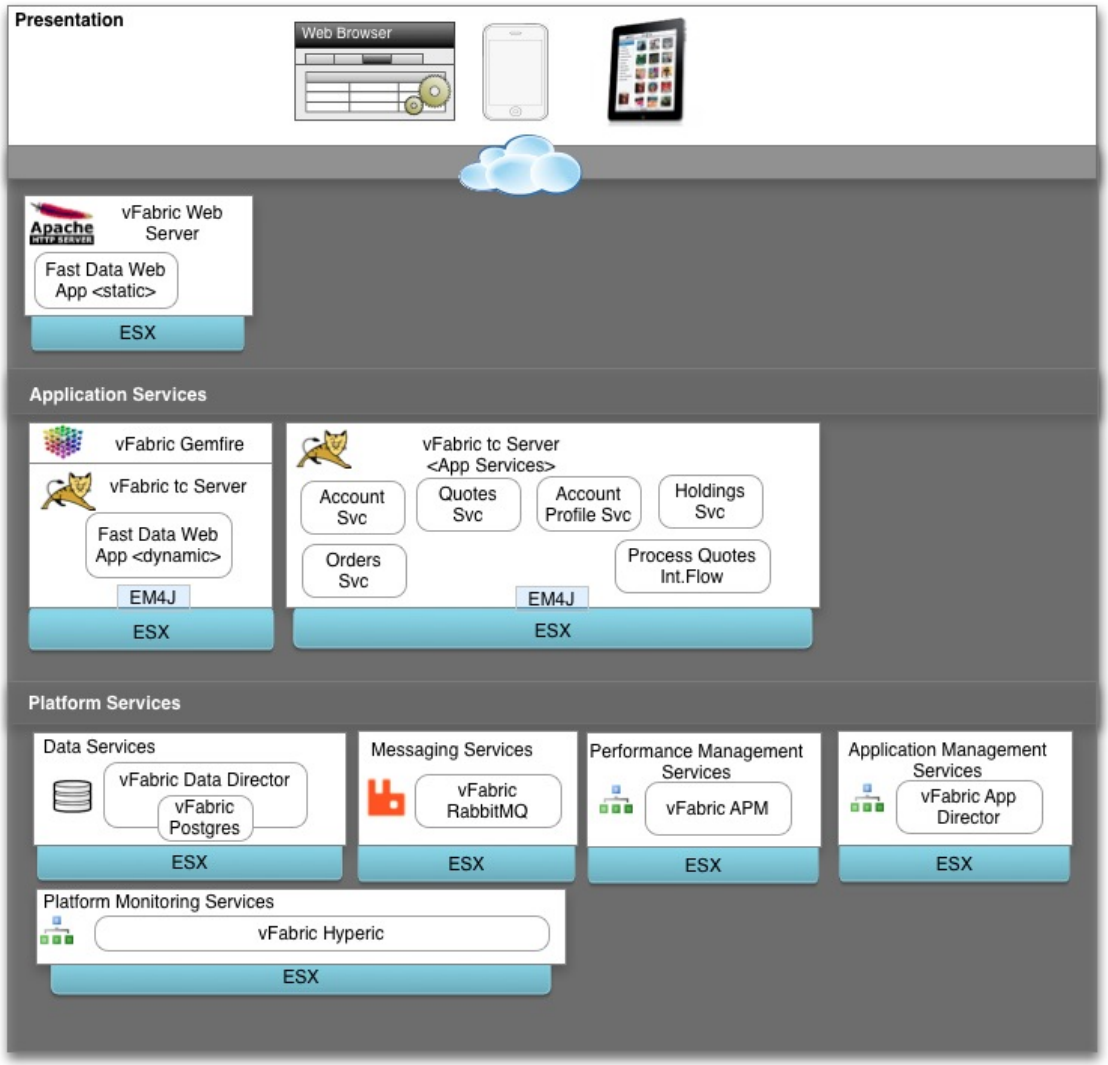
1. Introduction

Nanotrader application is written entirely using vFabric suite of products to show case the best of the breed solution for application development. It demonstrates:

- the best practices in coding in Spring and vFabric components,
- build high performing applications
- build highly scalable applications
- build applications for Platform-as-a-Service (PaaS)

Here is an overview of the Nanotrader architecture.

Figure 1 Nanotrader Architecture



Note: Performance management and monitoring is not part in this release of application blueprint, even though the Nanotrader application has support.

2. Pre-Requisites

To create Nanotrader blueprint into your Application Director setup, there are few pre-requisites that are needed:

- A working vCloud Director environment
- An Organization, an Organization Virtual Datacenter, and an Org Admin account
- Direct-connect or Routed Organization networks. Note that Isolated and vApp networks will not work, since the VMs cannot reach vFabric Application Director server.
- Application Director appliance installed and configured
- A web server to host the Nanotrader WARs, tcServer template for Nanotrader (tar) and sample data generator scripts (zip)
- A RedHat/CentOS x64bit VM with Application Director Agent and VMware JRE installed. This VM needs to be stored in the Catalog as a vApp template in the aforementioned Organization
- Install Groovy in the template. Groovy scripts are used to schema and generate sample data for backend SQLFire.
- Access to Internet, specifically access to http://repo.vmware.com. If the setup is behind the web proxy, then proxy server and proxy port are required. If the proxy requires a password, adjust the 'rpm' command to include the password
- Download the accompanying text file which has the Bash scripts for the Nanotrader catalog services
- Download the accompanying WAR files for the Nanotrader application
- Download the accompanying tcServer template for Nanotrader application
- Host the downloaded files in HTTP server that is accessible from the deployed VMs
- The Nanotrader blueprint is compatible with both vFabric Application Director v1.0 and v5.x versions

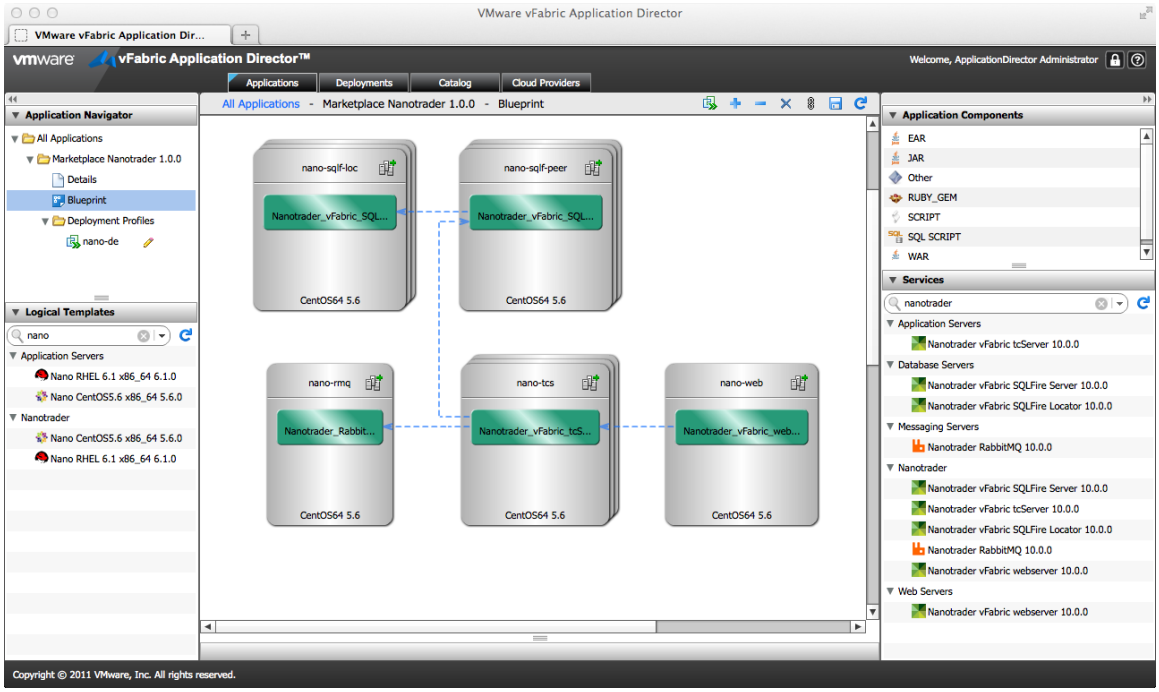
There is more information in Reference section.

3. Nanotrader Setup

To setup Nanotrader in your vFabric Application Director appliance, first make sure that pre-requisites are met, and then we create catalog services, and finally build the application blueprint for deployment.

Figure 2 shows the lay out of the Nanotrader application blueprint in Application Director. The templates and services are filtered by 'nano' and 'nanotrader' respectively to show only the necessary components. The final application blueprint should be similar to the following screenshot.

Figure 2 Nanotrader Application



3.1 Catalog Services

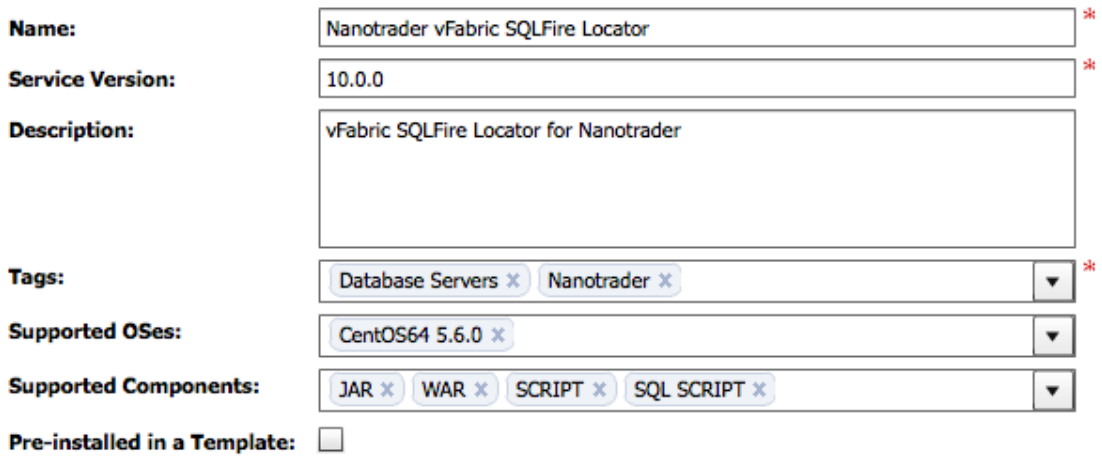
Catalog services are building block of the application blueprint. They contain the necessary information in the form of properties and scripts to create a component of application. The properties allow for customization of the scripts at run-time. In the example, the scripts are in Bash.

There are several services which are available out-of-the-box in vFabric Application Director. But in our case, we are using customized scripts to create all the services.

3.1.1 SQLFire Locator Service

To start with, we will show how to create SQLfire locator service from scratch. In the Catalog tab → Services tab, click on the image to begin. Enter the values as shown in the Figure 3

Figure 3 Create Catalog Service



Then click on “Properties” tab. You can copy and paste the name/value pair from Table 1

Figure 4 shows the properties for the locator service. Note: These properties are passed to the Bash scripts, so they are case sensitive. Also, use variable names that are valid in Bash shell.

Figure 4 SQLFire Locator Properties

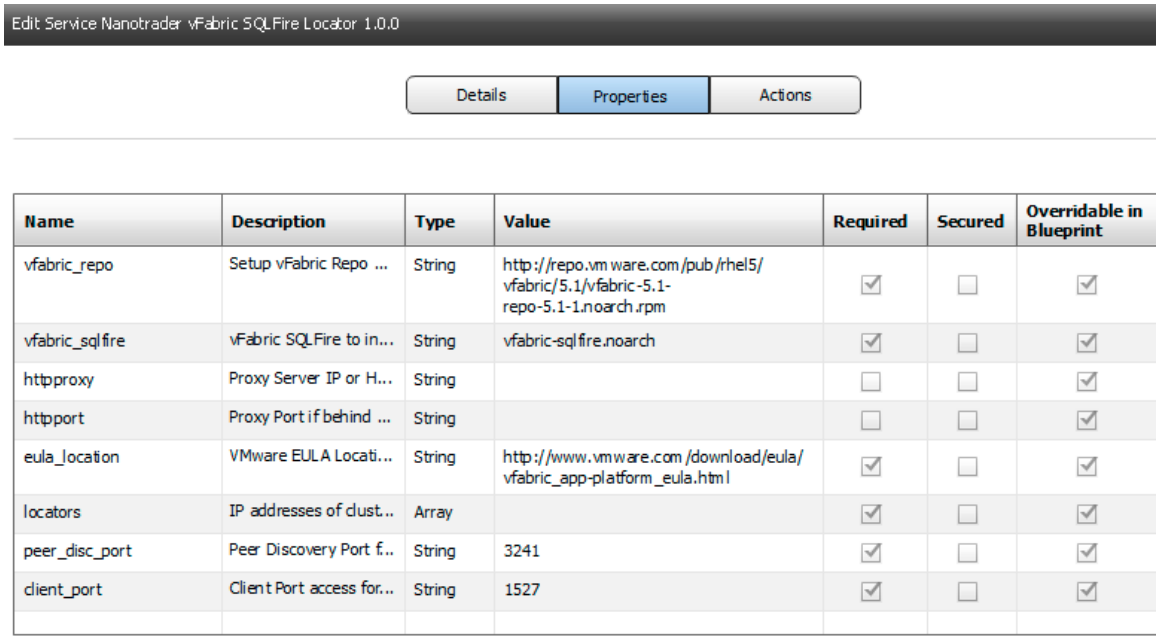
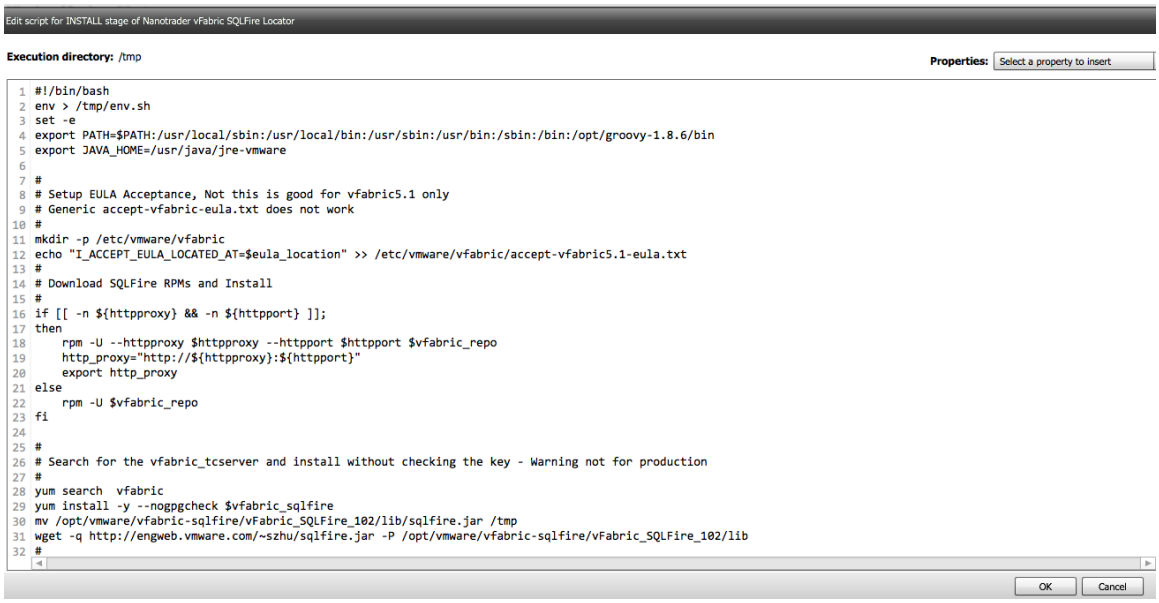


Table 1 SQLFire Locator Property

Name	Value
httpproxy	
vfabric_sqlfire	vfabric-sqlfire.noarch
vfabric_repo	http://repo.vmware.com/pub/rhel5/vfabric/5.1/vfabric-5.1-repo-5.1-1.noarch.rpm
httpport	
eula_location	http://www.vmware.com/download/eula/vfabric_app-platform_eula.html
locators	
peer_disc_port	3241
client_port	1527

Click on the “Actions” tab, then “INSTALL” to create an action script. Copy and paste this script from the text file that you downloaded as shown in Figure 5

Figure 5 Action Script



3.1.2 SQLFire Server

In this section, we will create SQLFire Server service for Nanotrader. Enter the values as shown in Figure 6. SQLFire server requires the properties as shown in Figure 7.

Figure 6 SQLFire Server service

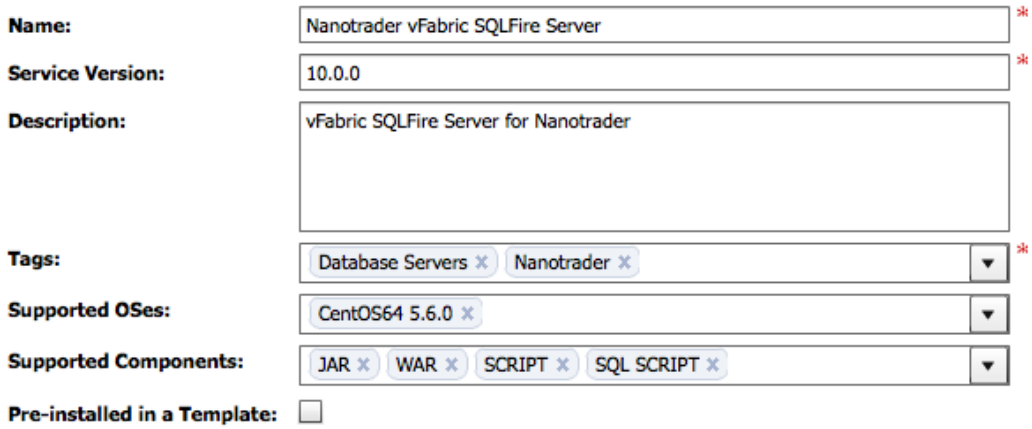
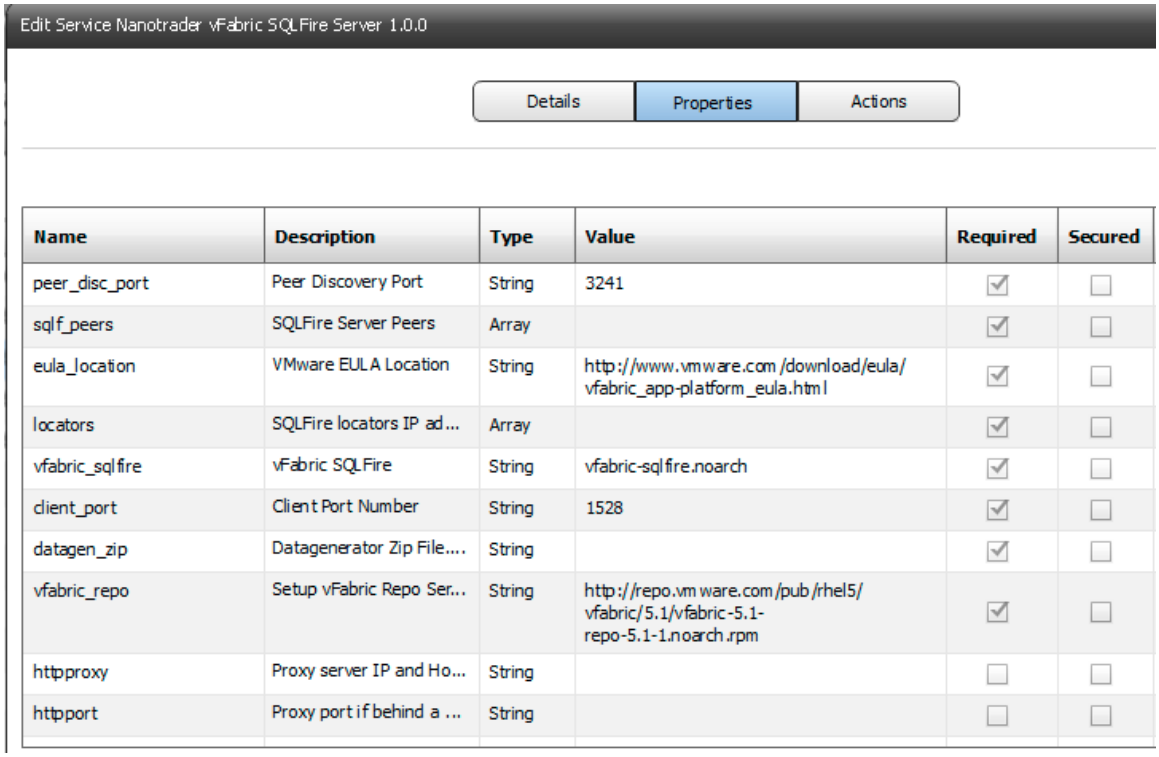
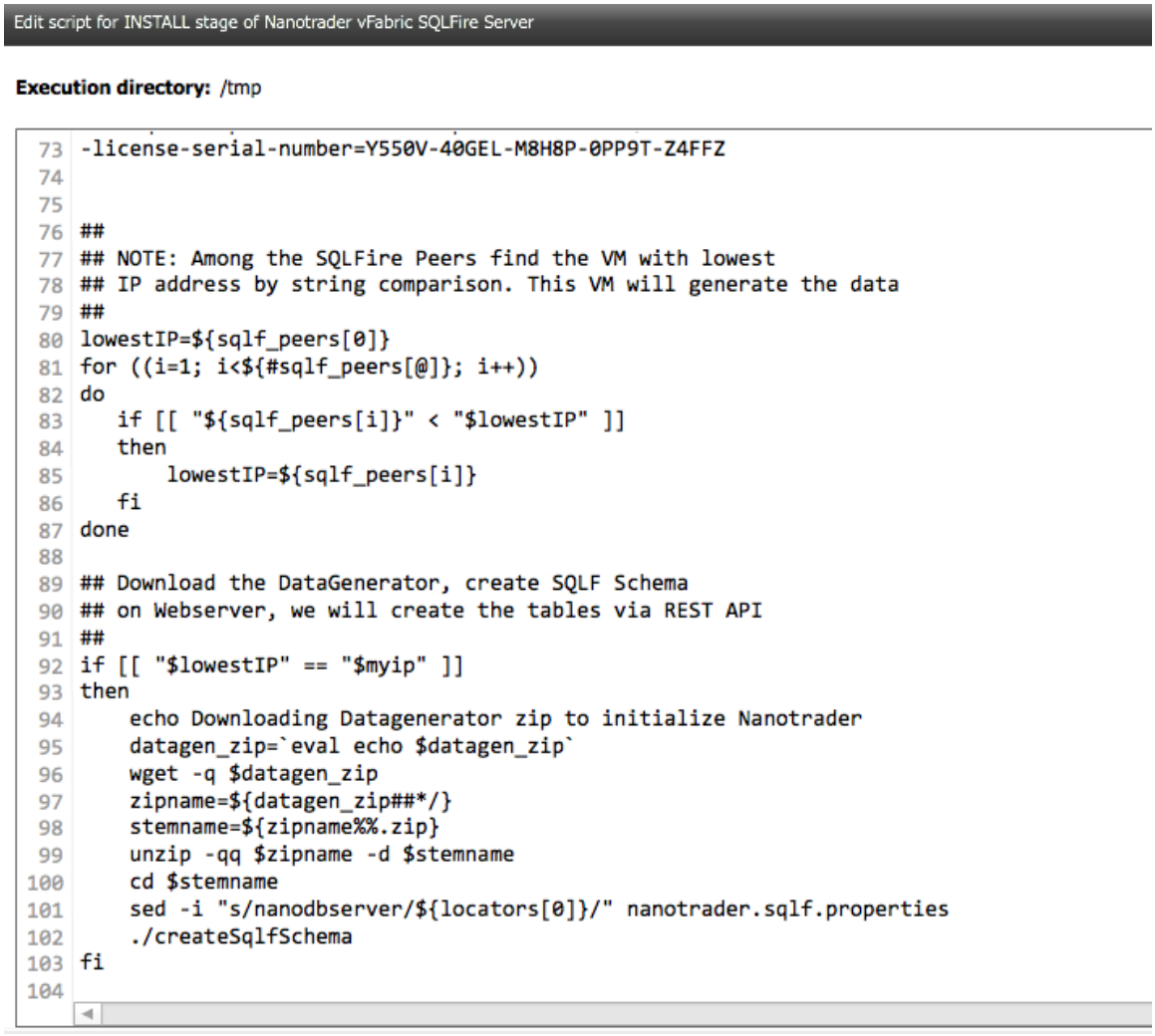


Figure 7 SQLFire Server Properties



Name	Description	Type	Value	Required	Secured
peer_disc_port	Peer Discovery Port	String	3241	☑	☐
sqlf_peers	SQLFire Server Peers	Array		☑	☐
eula_location	VMware EULA Location	String	http://www.vmware.com/download/eula/vfabric_app-platform_eula.html	☑	☐
locators	SQLFire locators IP ad...	Array		☑	☐
vfabric_sqlfire	vFabric SQLFire	String	vfabric-sqlfire.noarch	☑	☐
client_port	Client Port Number	String	1528	☑	☐
datagen_zip	Datagenerator Zip File....	String		☑	☐
vfabric_repo	Setup vFabric Repo Ser...	String	http://repo.vmware.com/pub/rhel5/vfabric/5.1/vfabric-5.1-repo-5.1-1.noarch.rpm	☑	☐
httpproxy	Proxy server IP and Ho...	String		☐	☐
httpport	Proxy port if behind a ...	String		☐	☐

Figure 8 SQLFire Server Script



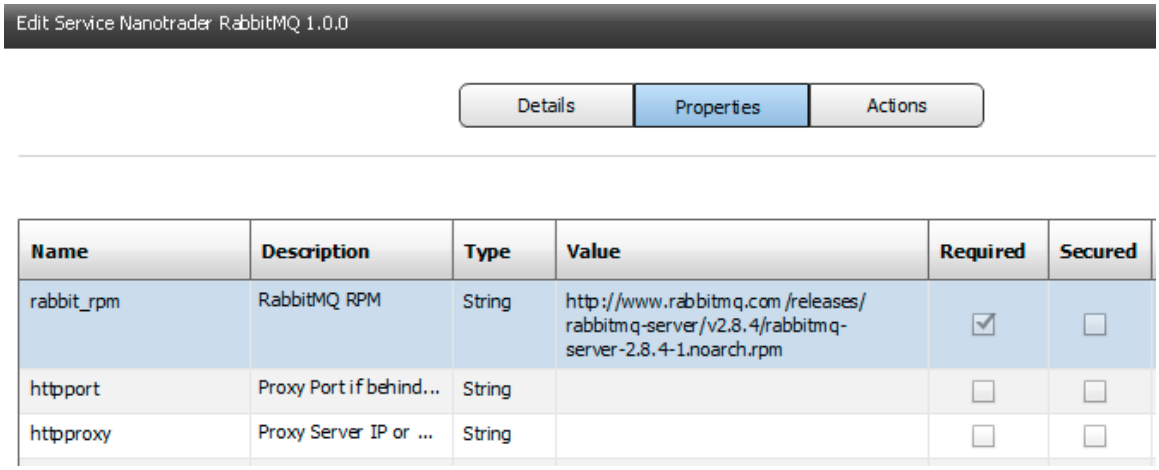
Copy and paste the action script for the SQLFire server from the text file.

If there is more than one SQLFire server, we pick the one with lowest IP address in string comparison, and run **createSqlfSchema** script. This script creates Nanotrader schema. Since this script is shared across all SQLFire servers, we want to run this script once, we we pick the one with the lowest IP address. This is shown in Figure 8

3.1.3 RabbitMQ server

Use similar procedure to create services for RabbitMQ.

Figure 9 RabbitMQ Properties

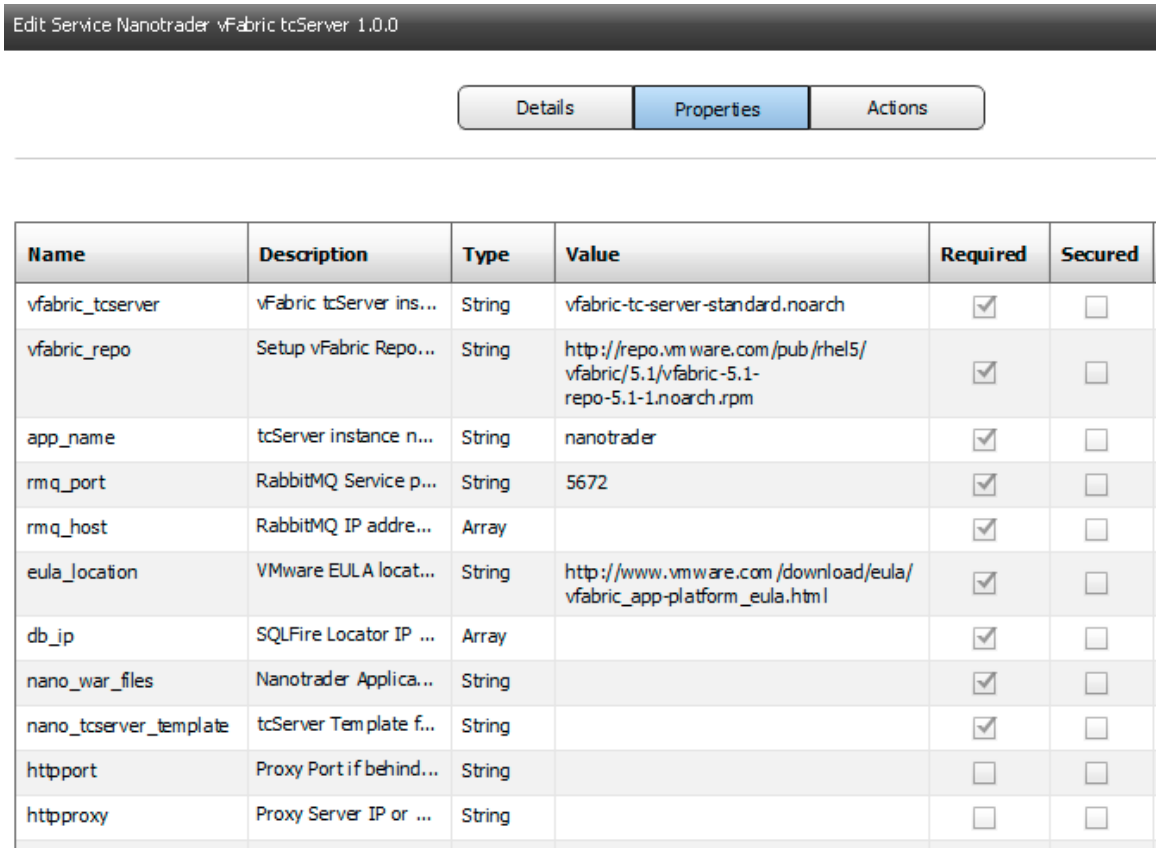


Copy the action script for RabbitMQ from the text file downloaded from the Marketplace.

3.1.4 vFabric tcServer

Properties for vFabric tcServer shown in Figure 10. Copy and paste property value from Table 1 as needed.

Figure 10 vFabric tcServer

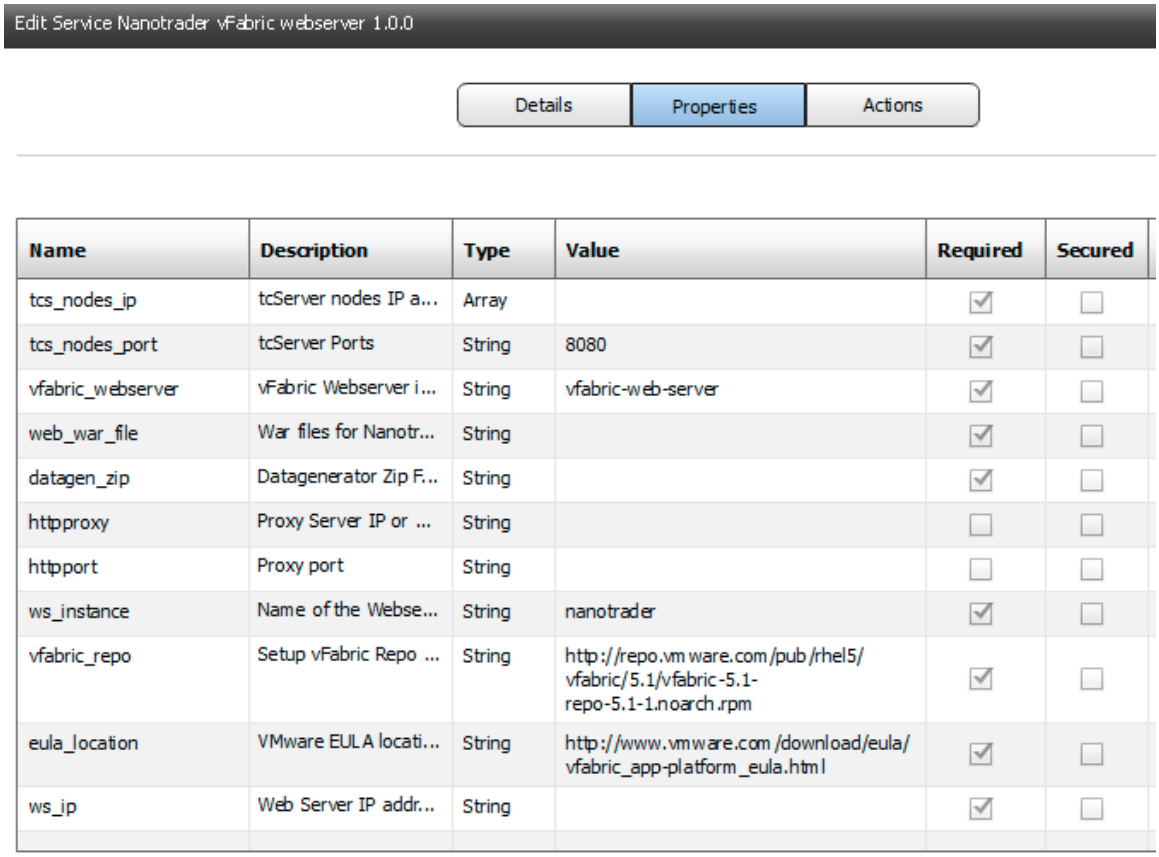


Name	Description	Type	Value	Required	Secured
vfabric_tcserver	vFabric tcServer ins...	String	vfabric-tc-server-standard.noarch	☑	☐
vfabric_repo	Setup vFabric Repo...	String	http://repo.vmware.com/pub/rhel5/vfabric/5.1/vfabric-5.1-repo-5.1-1.noarch.rpm	☑	☐
app_name	tcServer instance n...	String	nanotrader	☑	☐
rmq_port	RabbitMQ Service p...	String	5672	☑	☐
rmq_host	RabbitMQ IP addre...	Array		☑	☐
eula_location	VMware EULA locat...	String	http://www.vmware.com/download/eula/vfabric_app-platform_eula.html	☑	☐
db_ip	SQLFire Locator IP ...	Array		☑	☐
nano_war_files	Nanotrader Applica...	String		☑	☐
nano_tcserver_template	tcServer Template f...	String		☑	☐
httpport	Proxy Port if behind...	String		☐	☐
httpproxy	Proxy Server IP or ...	String		☐	☐

3.1.5 vFabric web server

Create the vFabric web server with properties as shown in Figure 11.

Figure 11 vFabric Webserver Properties



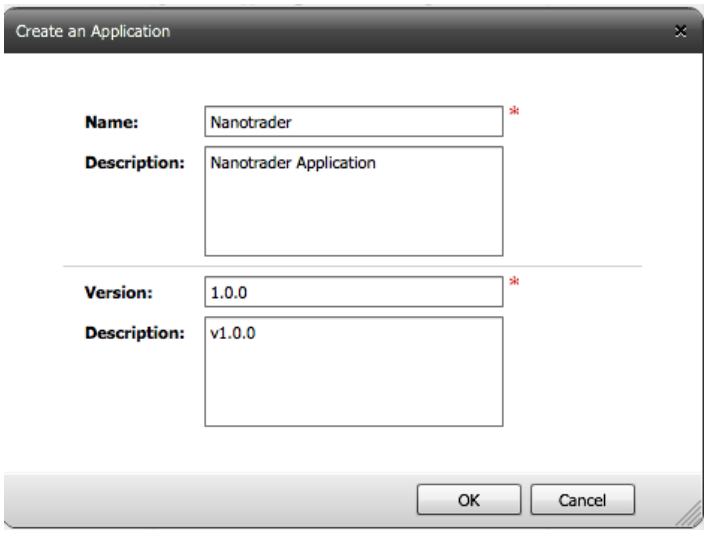
Name	Description	Type	Value	Required	Secured
tcs_nodes_ip	tcServer nodes IP a...	Array		☑	☐
tcs_nodes_port	tcServer Ports	String	8080	☑	☐
vfabric_webserver	vFabric Webserver i...	String	vfabric-web-server	☑	☐
web_war_file	War files for Nanotr...	String		☑	☐
datagen_zip	Datagenerator Zip F...	String		☑	☐
httpproxy	Proxy Server IP or ...	String		☐	☐
httpport	Proxy port	String		☐	☐
ws_instance	Name of the Webse...	String	nanotrader	☑	☐
vfabric_repo	Setup vFabric Repo ...	String	http://repo.vmware.com/pub/rhel5/vfabric/5.1/vfabric-5.1-repo-5.1-1.noarch.rpm	☑	☐
eula_location	VMware EULA locati...	String	http://www.vmware.com/download/eula/vfabric_app-platform_eula.html	☑	☐
ws_ip	Web Server IP addr...	String		☑	☐

3.2 Application Blueprint

Now we are ready to create Nanotrader Application blueprint. It is important that the nodes are named and used consistently, since we use those nodes names in the Bash scripts.

To create an application, click on “Applications” tab and ✚ icon, enter the fields in the text area and click OK.

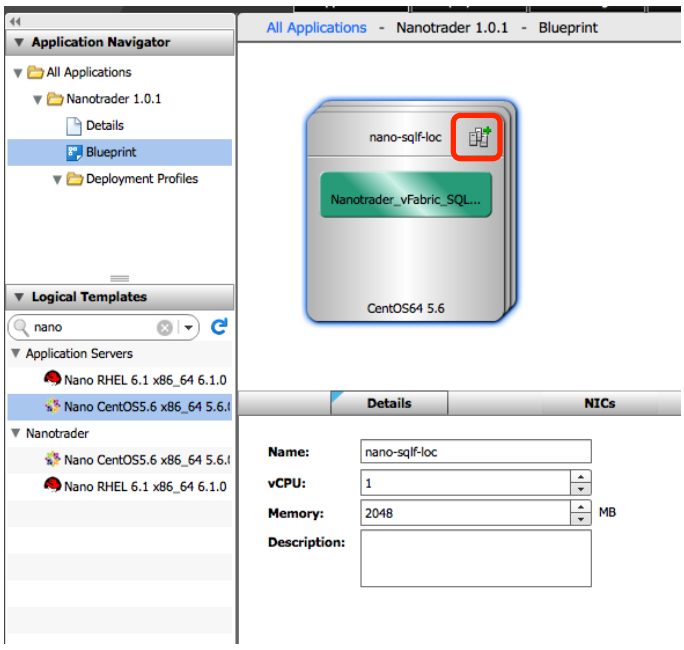
Figure 12 Create Application Blueprint



Now drag and drop guest VM template from the “Logical Templates”. This must be the logical template that is mapped to the vApp template in vCloud Director catalog.

Next drag and drop SQLFire Locator service on to the node as shown in Figure 13

Figure 13 Create SQLFire locator node



Modify the node name in “Details”, Click on “Convert to Node Array” and enter 2 for the size of the cluster. Now when the blueprint is instantiated, two SQLFire locator nodes will be deployed. Default is one.

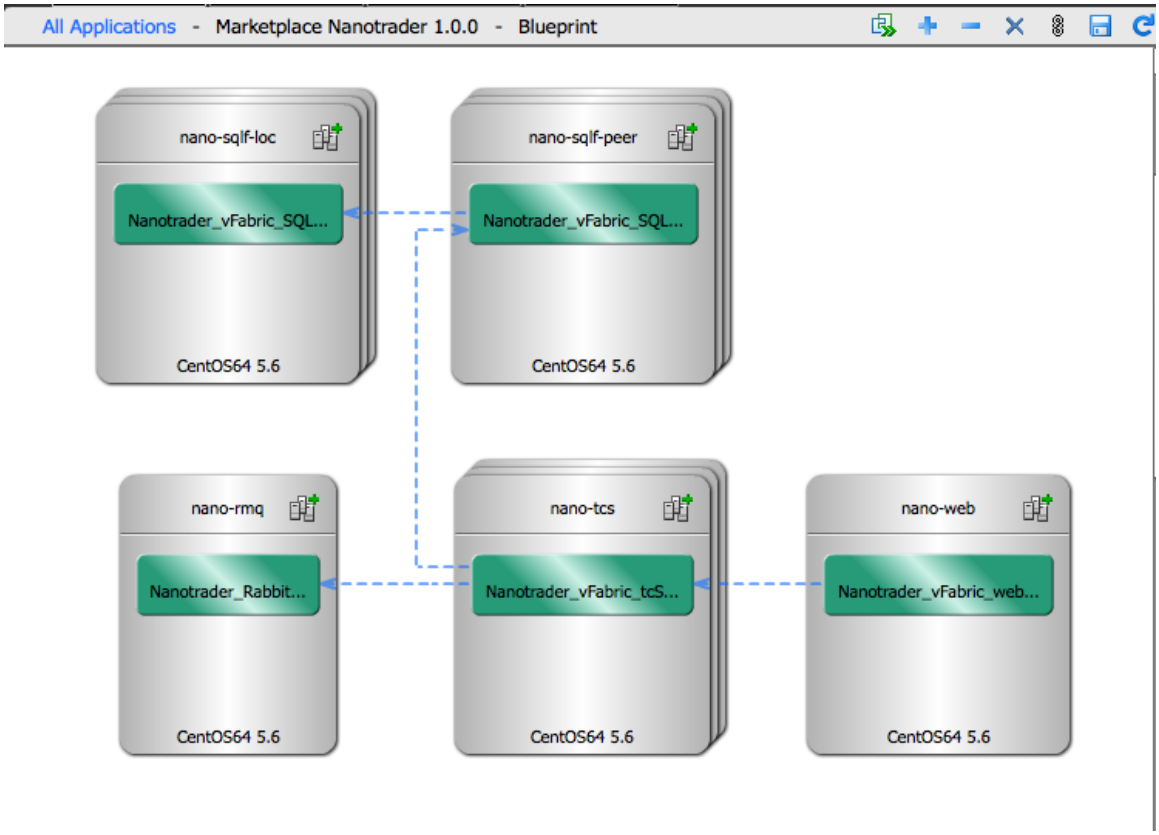
Complete rest of the application as shown in Figure 14. Make sure that node names match the screen shot, SQLFire nodes and tcServer cluster sizes are set to two or more.

In the Figure 14, we also show the dependencies of the server nodes. In this example, RabbitMQ and SQLFire Locator servers are installed and configured first, since they are no dependencies for them. The vFabric webserver is installed last as it depends on vFabric tcServer, which in turn depends on SQLFire server and RabbitMQ.

Setting up the dependencies are important because of configurations need to be done in the right order. For example, we can create schemas and populate the tables with sample data only after the database is installed and configured.

To create this application we need to create catalog services first. In section 3.1 Catalog Services on page 8, we show how to create the services.

Figure 14 Nanotrader Blueprint Detail



There are 5 services that are requirement to set up this blueprint. These are:

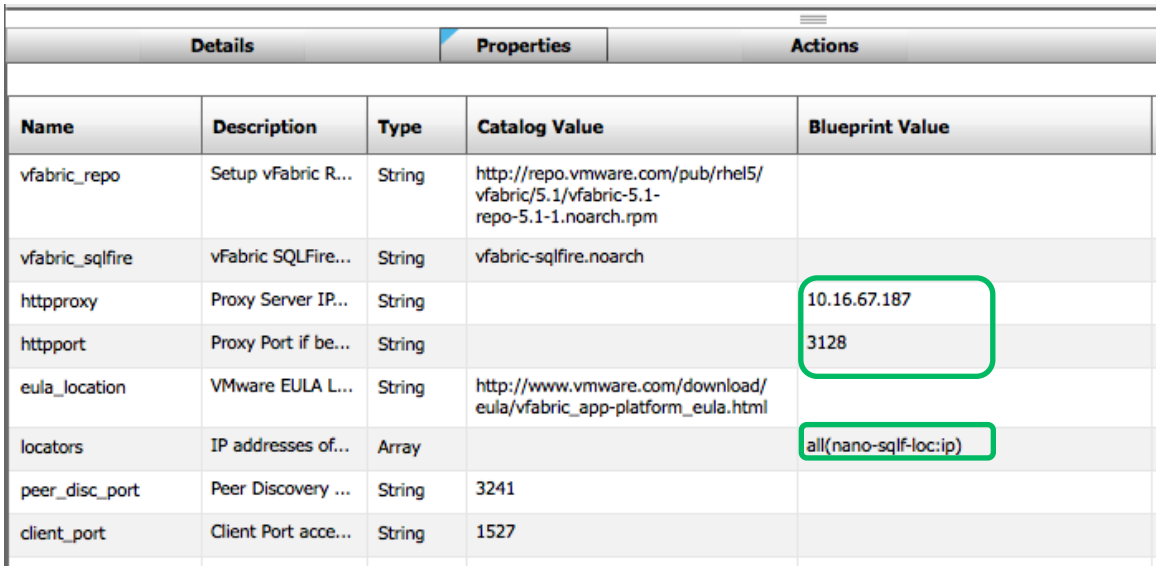
- SQLFire Locator Service
- SQLFire Server
- RabbitMQ server
- vFabric tcServer
- vFabric web server

Let us look at the run-time properties set for each of the services. Click on each service and enter the properties as shown in the following screenshots.

Binding of the properties is required at run-time. This is because when we created the blueprint, we did not have all the information necessary to instantiate it. For example, the IP addresses of the nodes are not known until the blueprint is instantiated and nodes are deployed as VMs. Similarly, proxy settings may differ for different environments.

Modify the path of the WAR, TAR and ZIP file to match your Depot/Repository server as mentioned in section 2 Pre-Requisites on page 7.

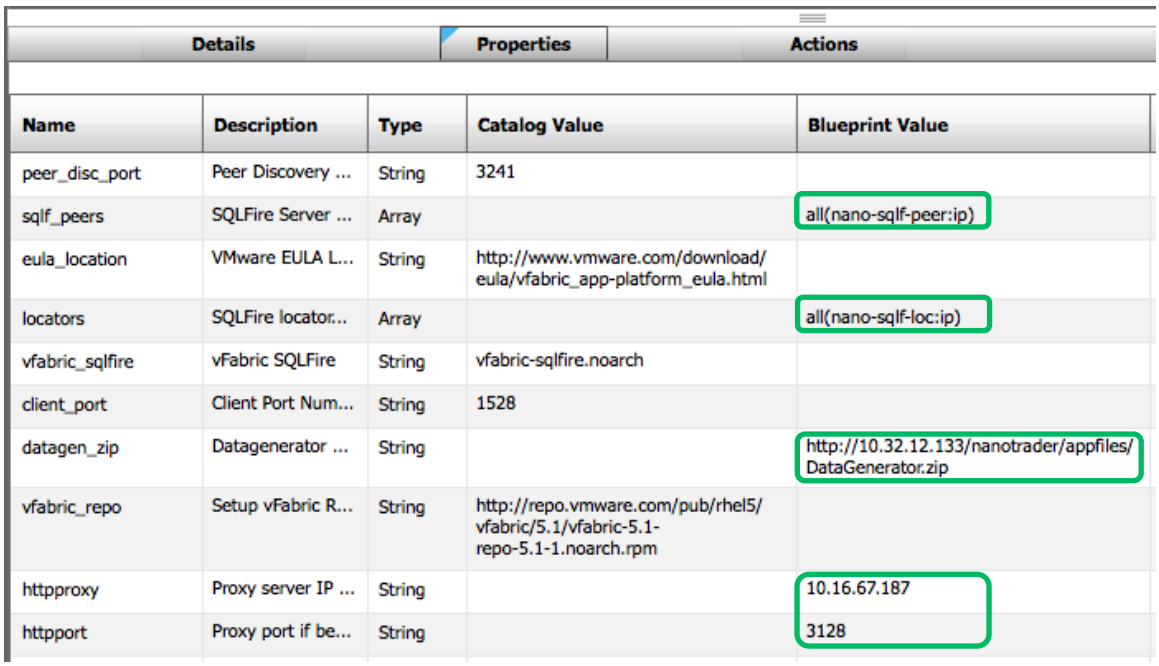
Figure 15 SQLFire Locator run-time binding



Details | Properties | Actions

Name	Description	Type	Catalog Value	Blueprint Value
vfabric_repo	Setup vFabric R...	String	http://repo.vmware.com/pub/rhel5/vfabric/5.1/vfabric-5.1-repo-5.1-1.noarch.rpm	
vfabric_sqlfire	vFabric SQLFire...	String	vfabric-sqlfire.noarch	
httpproxy	Proxy Server IP...	String		10.16.67.187
httpport	Proxy Port if be...	String		3128
eula_location	VMware EULA L...	String	http://www.vmware.com/download/eula/vfabric_app-platform_eula.html	
locators	IP addresses of...	Array		all(nano-sqlf-loc:ip)
peer_disc_port	Peer Discovery ...	String	3241	
client_port	Client Port acce...	String	1527	

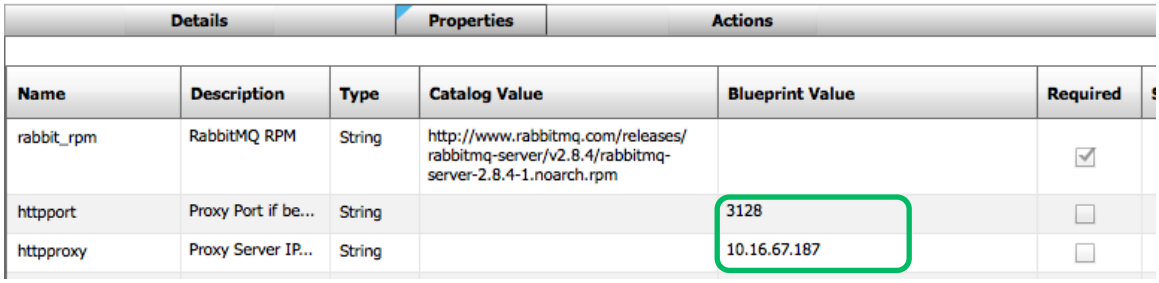
Figure 16 SQLFire Server run-time binding



Details | Properties | Actions

Name	Description	Type	Catalog Value	Blueprint Value
peer_disc_port	Peer Discovery ...	String	3241	
sqlf_peers	SQLFire Server ...	Array		all(nano-sqlf-peer:ip)
eula_location	VMware EULA L...	String	http://www.vmware.com/download/eula/vfabric_app-platform_eula.html	
locators	SQLFire locator...	Array		all(nano-sqlf-loc:ip)
vfabric_sqlfire	vFabric SQLFire	String	vfabric-sqlfire.noarch	
client_port	Client Port Num...	String	1528	
datagen_zip	Datagenerator ...	String		http://10.32.12.133/nanotrader/appfiles/DataGenerator.zip
vfabric_repo	Setup vFabric R...	String	http://repo.vmware.com/pub/rhel5/vfabric/5.1/vfabric-5.1-repo-5.1-1.noarch.rpm	
httpproxy	Proxy server IP ...	String		10.16.67.187
httpport	Proxy port if be...	String		3128

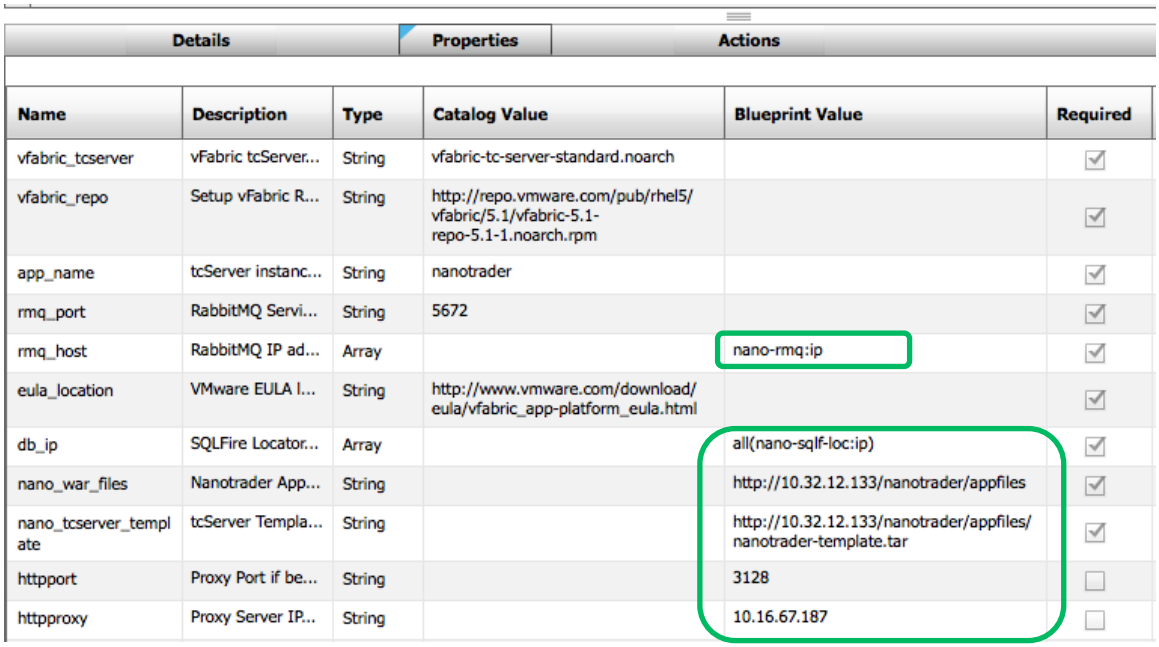
Figure 17 RabbitMQ run-time binding



Details | Properties | Actions

Name	Description	Type	Catalog Value	Blueprint Value	Required
rabbit_rpm	RabbitMQ RPM	String	http://www.rabbitmq.com/releases/rabbitmq-server/v2.8.4/rabbitmq-server-2.8.4-1.noarch.rpm		☑
httpport	Proxy Port if be...	String		3128	☐
httpproxy	Proxy Server IP...	String		10.16.67.187	☐

Figure 18 vFabric tcServer run-time binding



Details | Properties | Actions

Name	Description	Type	Catalog Value	Blueprint Value	Required
vfabric_tcserver	vFabric tcServer...	String	vfabric-tc-server-standard.noarch		☑
vfabric_repo	Setup vFabric R...	String	http://repo.vmware.com/pub/rhel5/vfabric/5.1/vfabric-5.1-repo-5.1-1.noarch.rpm		☑
app_name	tcServer instanc...	String	nanotrader		☑
rmq_port	RabbitMQ Servi...	String	5672		☑
rmq_host	RabbitMQ IP ad...	Array		nano-rmq:ip	☑
eula_location	VMware EULA l...	String	http://www.vmware.com/download/eula/vfabric_app-platform_eula.html		☑
db_ip	SQLFire Locator...	Array		all(nano-sqlf-loc:ip)	☑
nano_war_files	Nanotrader App...	String		http://10.32.12.133/nanotrader/appfiles	☑
nano_tcserver_template	tcServer Templa...	String		http://10.32.12.133/nanotrader/appfiles/nanotrader-template.tar	☑
httpport	Proxy Port if be...	String		3128	☐
httpproxy	Proxy Server IP...	String		10.16.67.187	☐

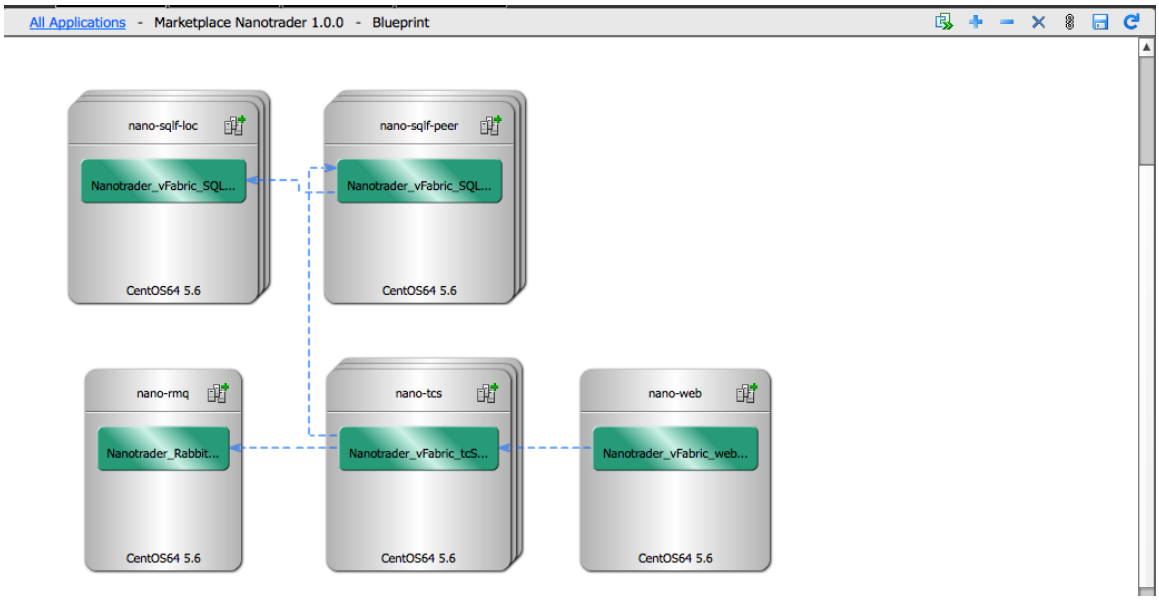
Figure 19 vFabric webserver run-time binding

Details | Properties | Actions

Name	Description	Type	Catalog Value	Blueprint Value	Required
tcs_nodes_ip	tcServer nodes ...	Array		all(nano-tcs:ip)	☑
tcs_nodes_port	tcServer Ports	String	8080		☑
vfabric_webserver	vFabric Webser...	String	vfabric-web-server		☑
web_war_file	War files for Na...	String		http://10.32.12.133/nanotrader/appfiles/spring-nanotrader-web-0.0.1.BUILD-SNAPSHOT.war	☑
datagen_zip	Datagenerator ...	String		http://10.32.12.133/nanotrader/appfiles/DataGenerator.zip	☑
httpproxy	Proxy Server IP...	String		10.16.67.187	☐
httpport	Proxy port	String		3128	☐
ws_instance	Name of the W...	String	nanotrader		☑
vfabric_repo	Setup vFabric R...	String	http://repo.vmware.com/pub/rhel5/vfabric/5.1/vfabric-5.1-repo-5.1-1.noarch.rpm		☑
eula_location	VMware EULA l...	String	http://www.vmware.com/download/eula/vfabric_app-platform_eula.html		☑
ws_ip	Web Server IP ...	String		self:ip	☑

To deploy this application to the cloud, click on “Deploy” icon in Figure 20 Deploy Application. You will be prompted to create a new deployment profile, enter “Nanotrader Dev Profile” and Click OK. Click “Next” and modify the fields if needed, finally click “Deploy” button.

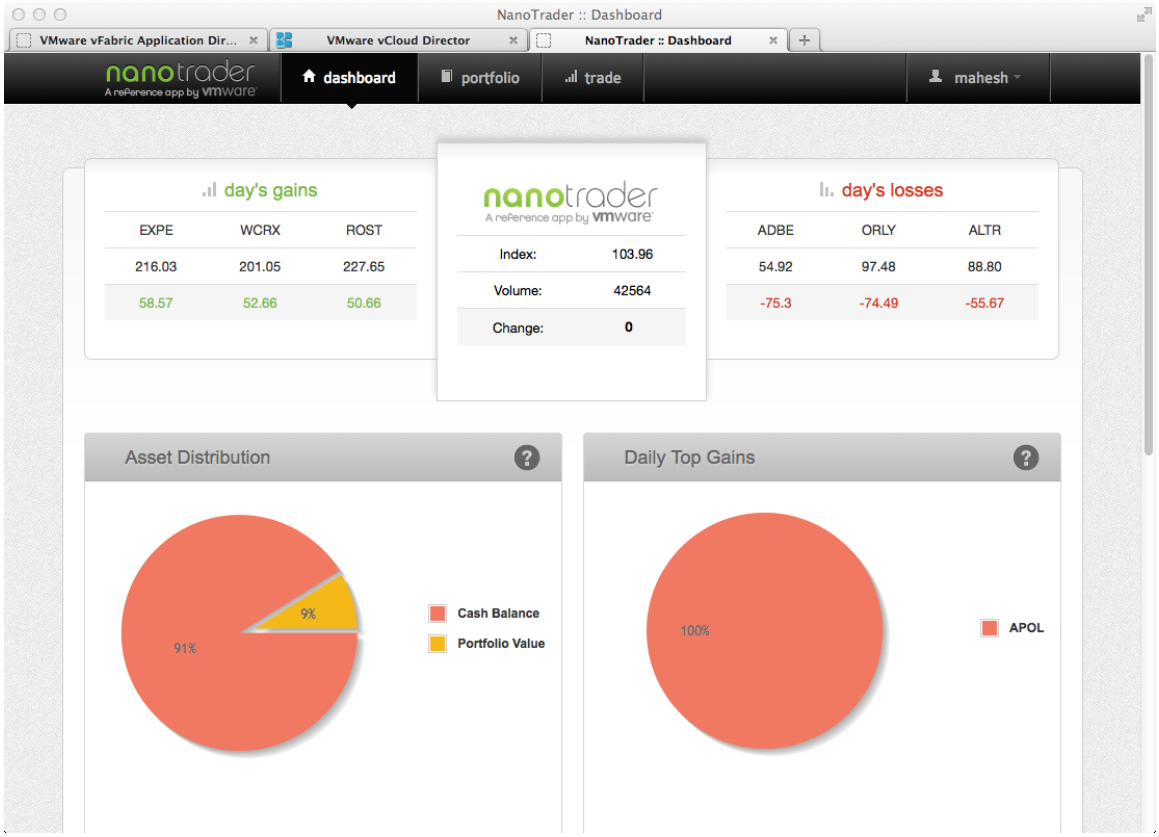
Figure 20 Deploy Application



Review the status of the deployment by refreshing the page, by clicking on the refresh icon. After you see the message “Deployed Successfully”, click on the VM Console to find the web server’s IP address.

Open a browser and enter the web server IP address. You should see the application deployed in Figure 21

Figure 21 Nanotrader Front Page



4. References

- vFabric Application Director Documentation
  https://www.vmware.com/support/pubs/appdirector-pubs.html
- VMware Repository for vFabric suite
  http://repo.vmware.com/pub/
- RabbitMQ Install and Documentation
  http://www.rabbitmq.com/install-rpm.html