DELL EMC ECS

AN EDGENEXUS ADC DEPLOYMENT GUIDE

EDGE NEXUS

Contents

Document Properties

Document Number: 2.0.6.24.21.12.06

Document Creation Date: April 30, 2021

Document Last Edited: June 24, 2021

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Document Last Edited by: Jay Savoor

Document Referral: EdgeADC - Version All

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Introduction

The Dell-EMC Elastic Cloud Storage (ECS) is a highly flexible solution based on object storage technology fully managed using HTTPS and a web-based management interface. The ECS product has been very successful and is the leading platform for customers requiring an easily managed storage solution.

The Edgenexus EdgeADC (ADC) is fully compliant with the ECS and can load balance using S3, Atmos, SWIFT, NFS protocols, and the ECS Management engine.

Document Intention

This document is aimed at administrators who wish to load-balance their ECS storage platform efficiently while still retaining ease of configuration. Although you can utilize the Dell-ECS-JETPACK to auto-populate the ADC's configuration, the guide will explain the process step-by-step using images and text.

The content within this guide is a reference point and has never been intended to be the exact configuration for your particular deployment of ECS. The ECS Jetpack available from the AppStore is easily installed and will create the VIP and sub-protocols required for ECS, and you will need to use the ones you need and delete the superfluous ones.

There are two load-balancing approaches when it comes to supporting ECS.

Layer 4 Load Balancing

Layer 4 is used when there is no need to use SSL offloading or bridging. In this mode, the traffic is passed through without inspection or intervention.

Requests are aimed at the Virtual IP (VIP) that you will define, and these requests are sent to the ECS server set. Return traffic is sent by the ECS server that served the request to the originator via the ADC.

Layer 7 Load Balancing

Although we can load balance ECS using Layer 7, we advise that you load-balance the solution using Layer 4 TCP for speed. Every action upon the data can result in latency, no matter how small, and we see no real need to load balance using L7 unless required.

Dell-EMC ECS Ports and Services

The ECS, or Elastic Cloud Storage concept from Dell-EMC, uses what is referred to as software-defined object storage and is usually deployed as a Dell-EMC storage appliance or on 3rd party hardware compliant with its requirements.

Several specialist modules comprise the fabric of the ECS system.

- ECS Portal and Provisioning Services
- ECS Data Services
- ECS Storage Engine
- RCS Fabric
- ECS Infrastructure
- The hardware hosting ECS

When load balancing ECS, you are required to create a VIP and its sub-protocol services that handle the various usage protocols, each of which utilizes its particular port.

ECS PROTOCOL	TRANSPORT PROTOCOL/SERVICE	PORT
S3	HTTP	9020
	HTTPS	9021
ATMOS	HTTP	9022
	HTTPS	9023
SWIFT	HTTP	9024
	HTTPS	9025
NFS	PORTMAP	111
	MOUNTD / NFSD	2049
	LOCKD	10000

Using Layer 4 Load Balancing

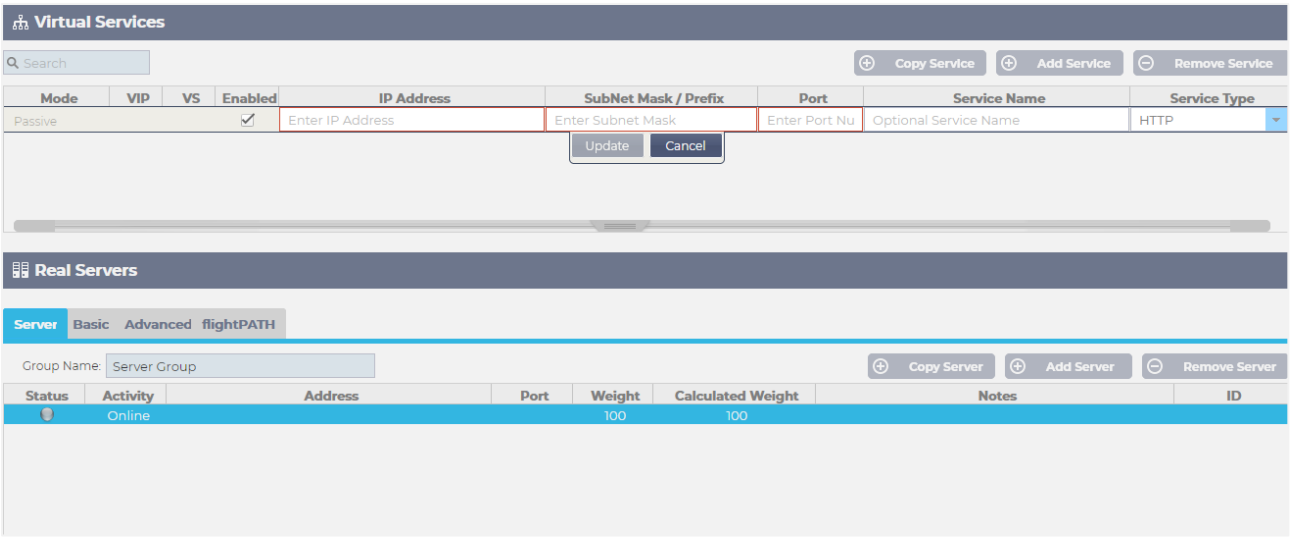
The simple and easy step-by-step guide below provides all the instructions you will need to create a Layer 4 load balancing solution.

Creating the Virtual IP Service (VIP)

Please follow the instructions below to create a working Layer 4 load balancing configuration that uses secured (SSL). This process comprises the main Virtual IP (VIP) and its associated Virtual Services (VS).

ECS Management Service

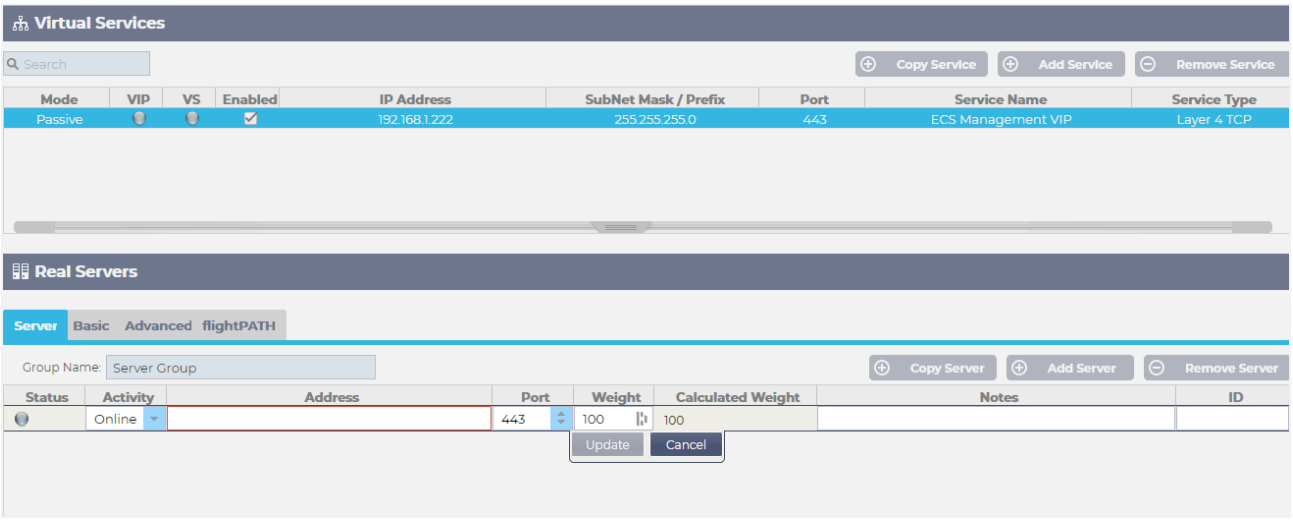
1. First, we will create the main VIP using the Add Service button.
2. This action will create an empty VIP, as shown in the image below



3. Enter the details as per the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.35	255.255.255.0	443	ECS Management Service	Layer 4 TCP

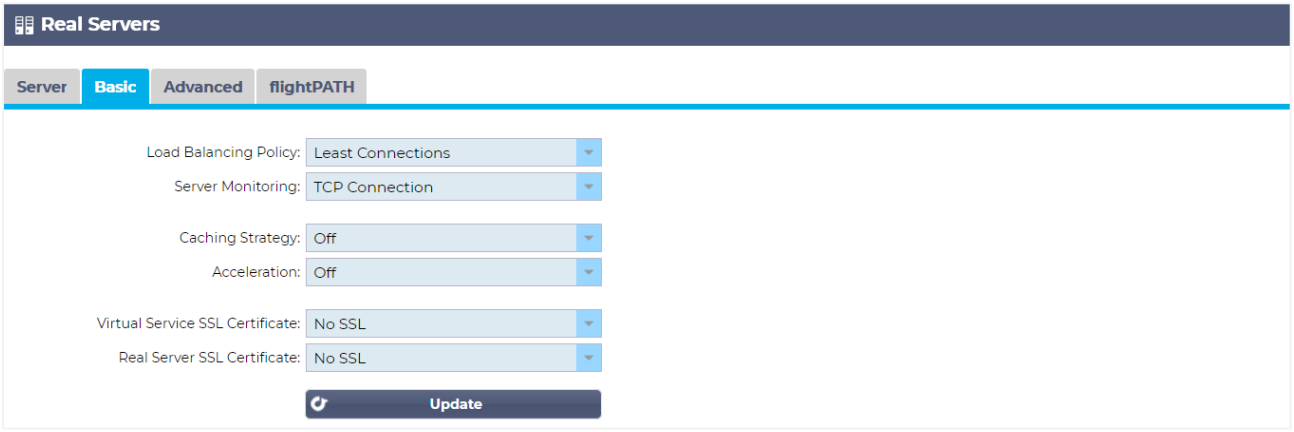
4. When you have done this, click Update.
5. It will look like the example below.



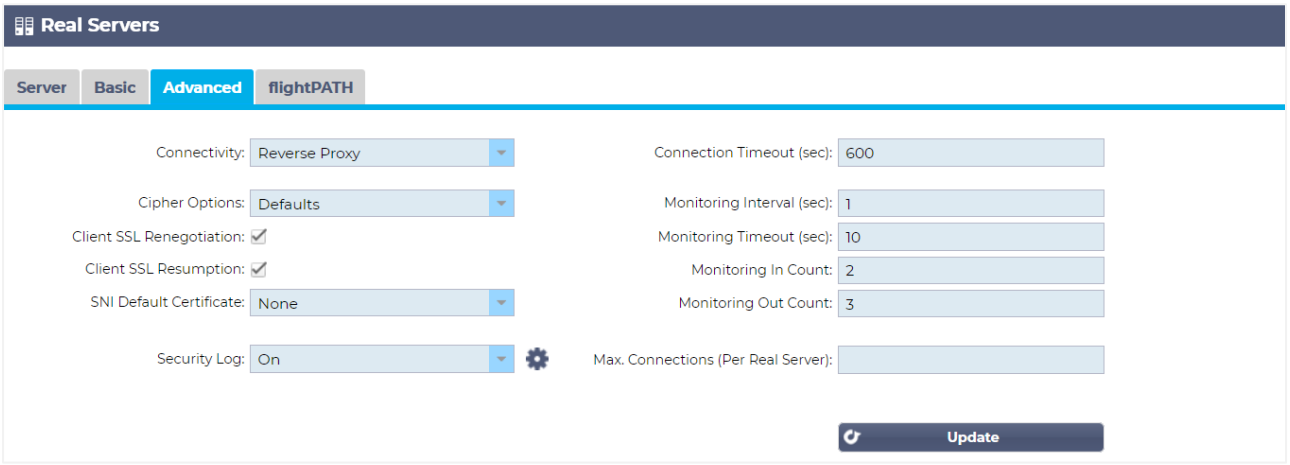
6. Enter the details for the Real Servers in the bottom section as per the table below.

Address	Subnet Mask/Prefix	Port	Notes	ID
10.53.3.31	255.255.255.0	443	ECS Management Service	*Leave blank*

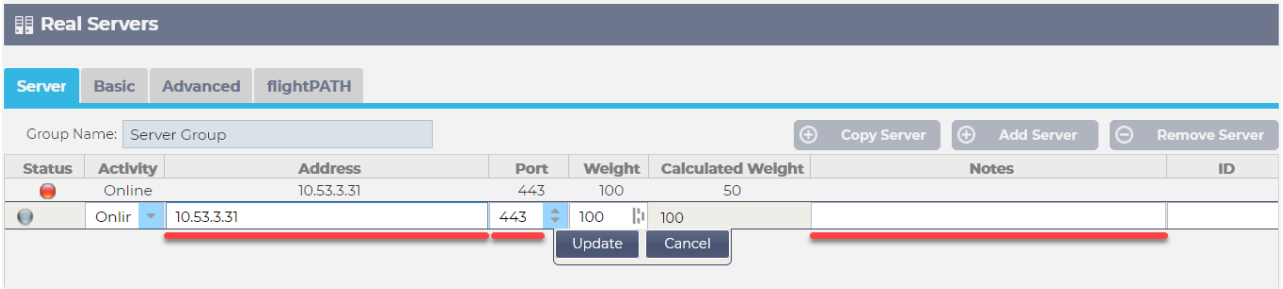
7. You will need to create additional lines for the other ECS nodes, but leave this until you have configured the Basic and Advanced tabs.
8. Click on the Basic tab and complete it as shown below.



9. Press the Update button once done.
10. Next on the list is the Advanced tab. Complete again as shown below.



11. Since we are using a Layer 4 TCP configuration, we cannot use flightPATH.
12. The basic first level is now complete, and we need to configure and add the remaining ECS nodes.
13. Click on the Services tab.
14. The first Real Server we configured will be highlighted. Click on the Copy Server button.
15. The server will be copied, and a new line created, with the text fields ready for filling in. See the image below.



16. Fill in the field for the IP address that corresponds to the next node to be included in the load-balanced set. Note that we have copied the IP address, and you are left with editing it.

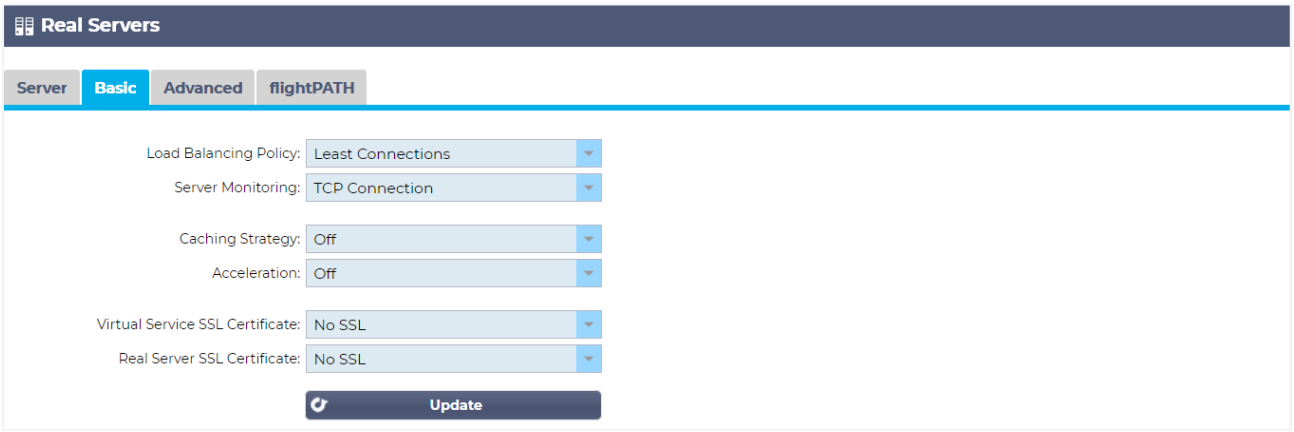
17. Repeat this process until you have added all the nodes.
18. The first and foremost VIP entry, ECS Management Service entry, is now complete. We now have to create the entries under the main VIP that correspond to the remaining services of ECS. We will only be editing the BASIC tab for each subsequent Virtual Services as all other settings in the Real Server section remain untouched.

S3 API HTTP Service

1. Click on the primary VIP/VS you created in the previous example.
2. Click the Copy Service button
3. The service you earlier created is copied to a new line with field values intact and ready to be edited.
4. Enter the details highlighted in RED in the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.35	255.255.255.0	**9021**	**S3 API HTTPS SERVICE**	Layer 4 TCP

5. When you have done this, click Update.
6. You will find that the Real Servers have been duplicated since you copied the VIP, so you do not need to re-enter them.
7. You will find that the system has highlighted the PORT field for the first Real Server line. You will need to enter the value used in the table above into the Port field.
8. This step must be replicated for each Real Server.
9. Click on the Basic tab and complete it as shown below.



10. Press the Update button once done.
11. The S3 API HTTPS Service is now added, and if everything is OK, the status indicators for the VS and Real Server lines will be green.

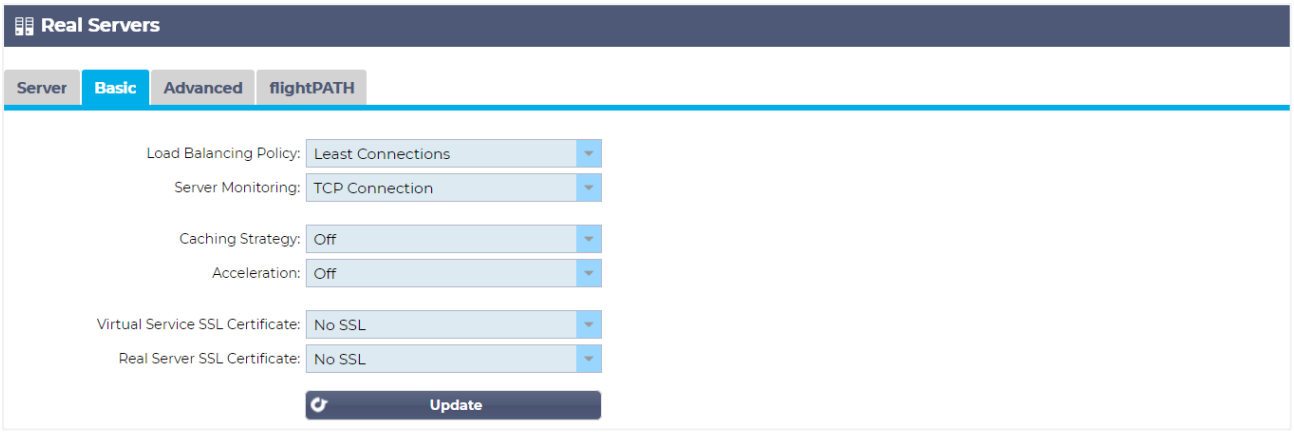
ATMOS API HTTPS SERVICE

1. Click on the primary VIP/VS you created in the previous example.
2. Click the Copy Service button
3. The service you earlier created is copied to a new line with field values intact and ready to be edited.
4. Enter the details highlighted in RED in the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.35	255.255.255.0	**9023**	**ATMOS API HTTPS SERVICE**	Layer 4 TCP

5. When you have done this, click Update.

6. You will find that the Real Servers have been duplicated since you copied the VIP, so you do not need to re-enter them.
7. You will find that the system has highlighted the PORT field for the first Real Server line. You will need to enter the value used in the table above into the Port field.
8. This step must be replicated for each Real Server.
9. Click on the Basic tab and complete it as shown below.



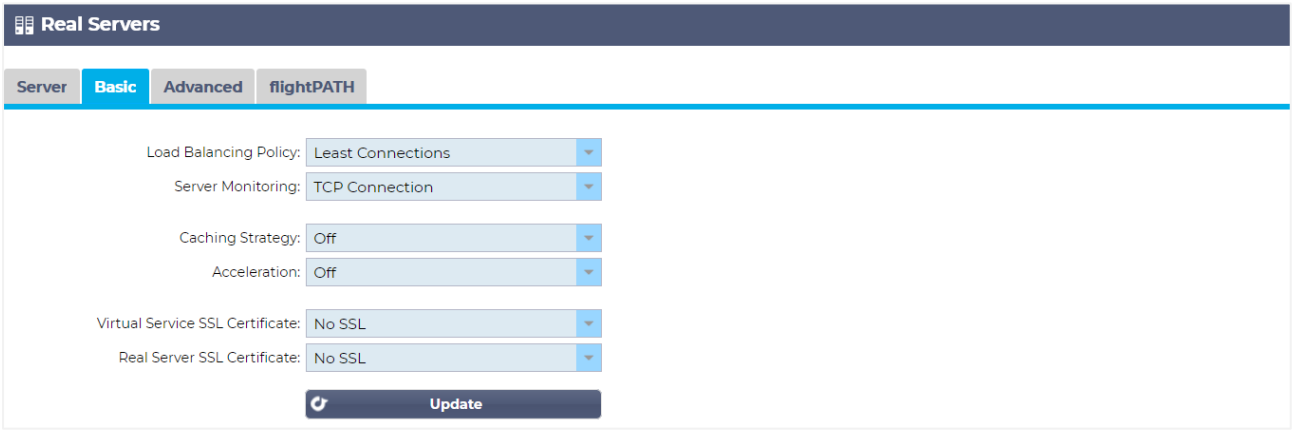
10. Press the Update button once done.
11. The ATMOS API HTTPS Service is now added, and if everything is OK, the status indicators for the VS and Real Server lines will be green.

SWIFT API HTTPS SERVICE

1. Click on the primary VIP/VS you created in the previous example.
2. Click the Copy Service button
3. The service you earlier created is copied to a new line with field values intact and ready to be edited.
4. Enter the details shown in RED as per the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.35	255.255.255.0	**9025**	**SWIFT API HTTPS SERVICE**	Layer 4 TCP

5. When you have done this, click Update.
6. You will find that the Real Servers have been duplicated since you copied the VIP, so you do not need to re-enter them.
7. You will find that the system has highlighted the PORT field for the first Real Server line. You will need to enter the value used in the table above into the Port field.
8. This step must be replicated for each Real Server.
9. Click on the Basic tab and complete it as shown below.



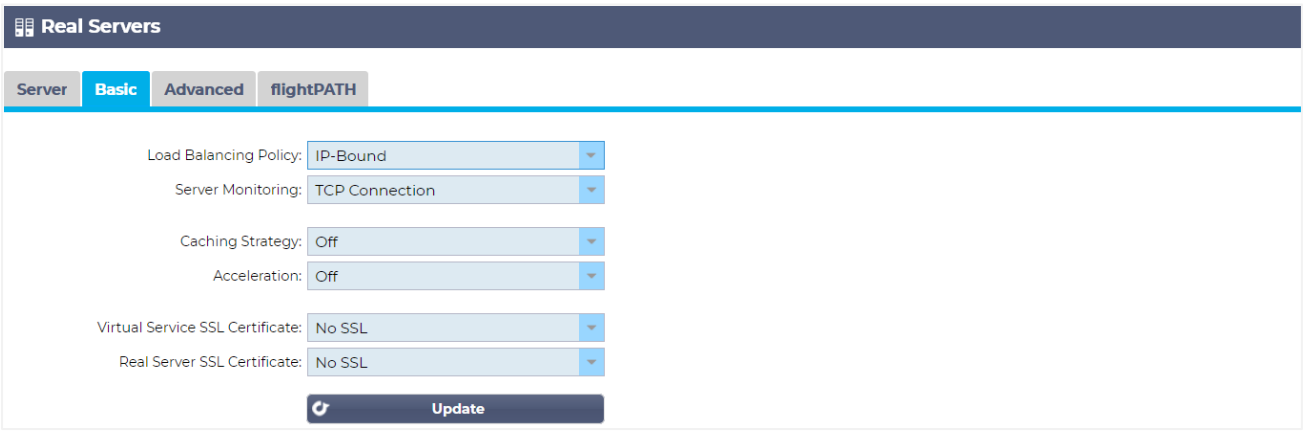
10. Press the Update button once done.
11. The SWIFT API HTTPS Service is now added, and if everything is OK, the status indicators for the VS and Real Server lines will be green.

NFS PORTMAP SERVICE

1. Click on the primary VIP/VS you created in the previous example.
2. Click the Copy Service button
3. The service you earlier created is copied to a new line with field values intact and ready to be edited.
4. Enter the details shown in RED as per the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.35	255.255.255.0	111	NFS PORTMAP SERVICE	Layer 4 TCP

5. When you have done this, click Update.
6. You will find that the Real Servers have been duplicated since you copied the VIP, so you do not need to re-enter them.
7. You will find that the system has highlighted the PORT field for the first Real Server line. You will need to enter the value used in the table above into the Port field.
8. This step must be replicated for each Real Server.
9. Click on the Basic tab and complete it as shown below.
   Note that the Load Balancing Policy is IP-Bound



10. Press the Update button once done.
11. The NFS PORTMAP Service is now added, and if everything is OK, the status indicators for the VS and Real Server lines will be green.

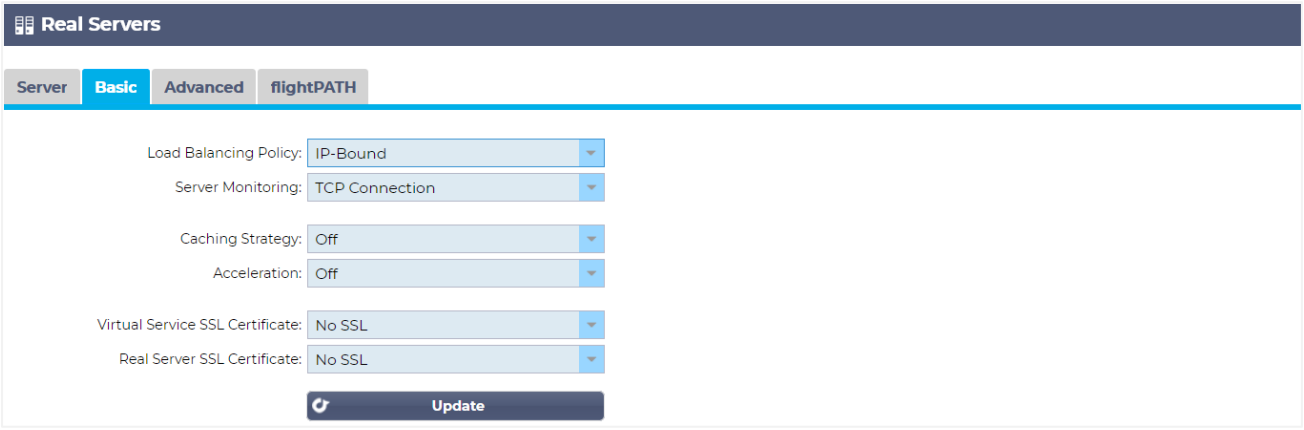
NFS MOUNTD/NFSD SERVICE

1. Click on the primary VIP/VS you created in the previous example.
2. Click the Copy Service button
3. The service you earlier created is copied to a new line with field values intact and ready to be edited.
4. Enter the details shown in RED as per the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.35	255.255.255.0	2049	NFS MOUNTD-NFSD SERVICE	Layer 4 TCP

5. When you have done this, click Update.
6. You will find that the Real Servers have been duplicated since you copied the VIP, so you do not need to re-enter them.

7. You will find that the system has highlighted the PORT field for the first Real Server line. You will need to enter the value used in the table above into the Port field.
8. This step must be replicated for each Real Server.
9. Click on the Basic tab and complete it as shown below.
   Note that the Load Balancing Policy is IP-Bound



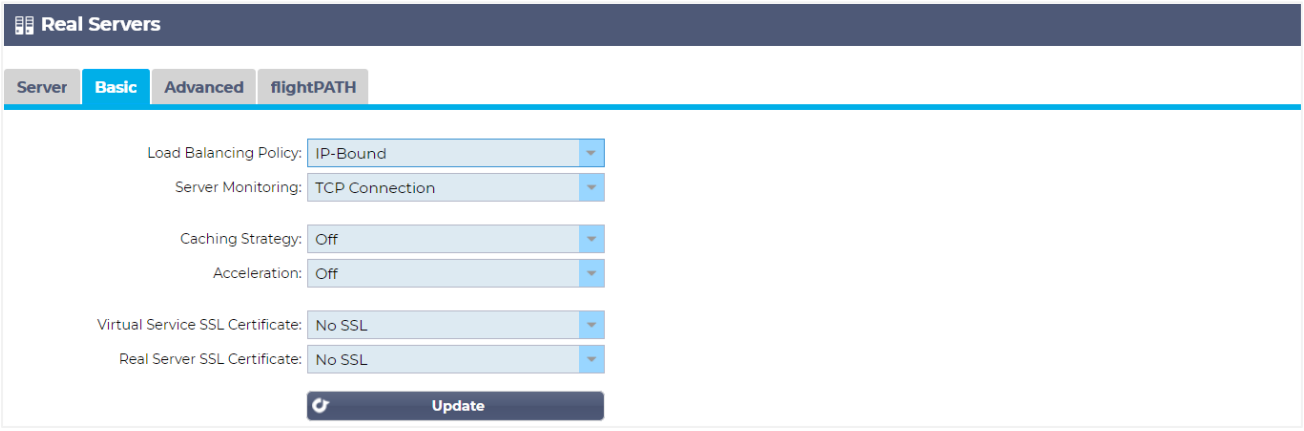
10. Press the Update button once done.
11. The NFS MOUNTD/NFSD Service is now added, and if everything is OK, the status indicators for the VS and Real Server lines will be green.

NFS LOCKD SERVICE

1. Click on the primary VIP/VS you created in the previous example.
2. Click the Copy Service button
3. The service you earlier created is copied to a new line with field values intact and ready to be edited.
4. Enter the details shown in RED as per the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.35	255.255.255.0	**10000**	**NFS LOCKD SERVICE**	Layer 4 TCP

5. When you have done this, click Update.
6. You will find that the Real Servers have been duplicated since you copied the VIP, so you do not need to re-enter them.
7. You will find that the system has highlighted the PORT field for the first Real Server line. You will need to enter the value used in the table above into the Port field.
8. This step must be replicated for each Real Server.
9. Click on the Basic tab and complete it as shown below.
   Note that the Load Balancing Policy is IP-Bound



10. Press the Update button once done.
11. The NFS LOCKD Service is now added, and if everything is OK, the status indicators for the VS and Real Server lines will be green.

The ECS REST API

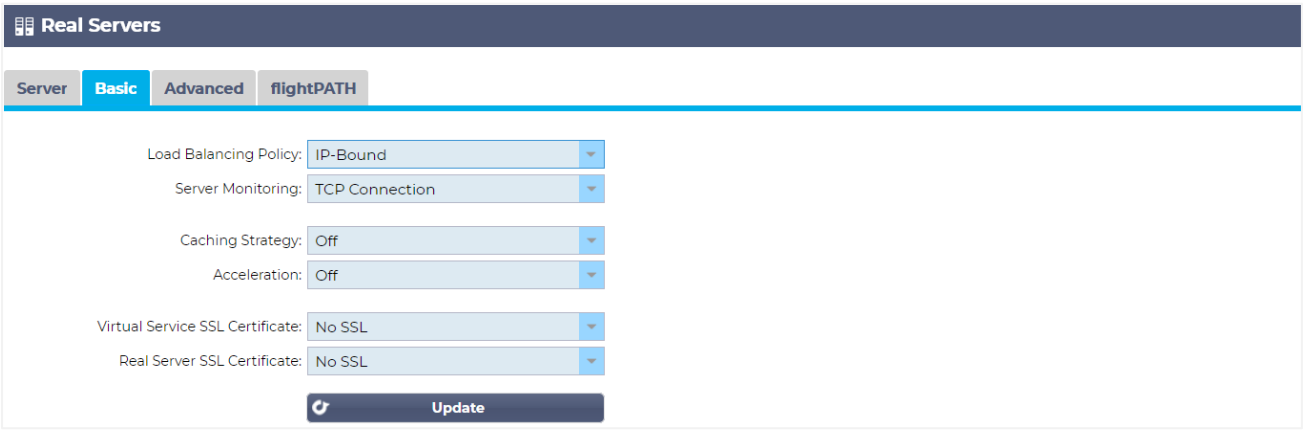
The final stage is to create a second VIP to host the ECS REST API. For security reasons, we suggest that use a separate VIP to make use of the REST API.

ECS REST API VIP/VS 4443

1. Click on the primary service we created in the step for ECS Management Service
2. Click the Copy Service button
3. This action will copy the service to a new line, but unlike the sub-services we created for the various protocols, we need to re-enter the details required for the REST API. This process creates an entirely new VIP.
4. Enter the details shown in RED as per the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.134	255.255.255.0	**4443**	**ECS REST API**	Layer 4 TCP

5. When you have done this, click Update.
6. You will find that the Real Servers have been duplicated since you copied the VIP, so you do not need to re-enter them.
7. You will find that the system has highlighted the PORT field for the first Real Server line. You will need to enter the value used in the table above into the Port field.
8. This step must be replicated for each Real Server.
9. Click on the Basic tab and complete it as shown below.
   Note that the Load Balancing Policy is IP-Bound



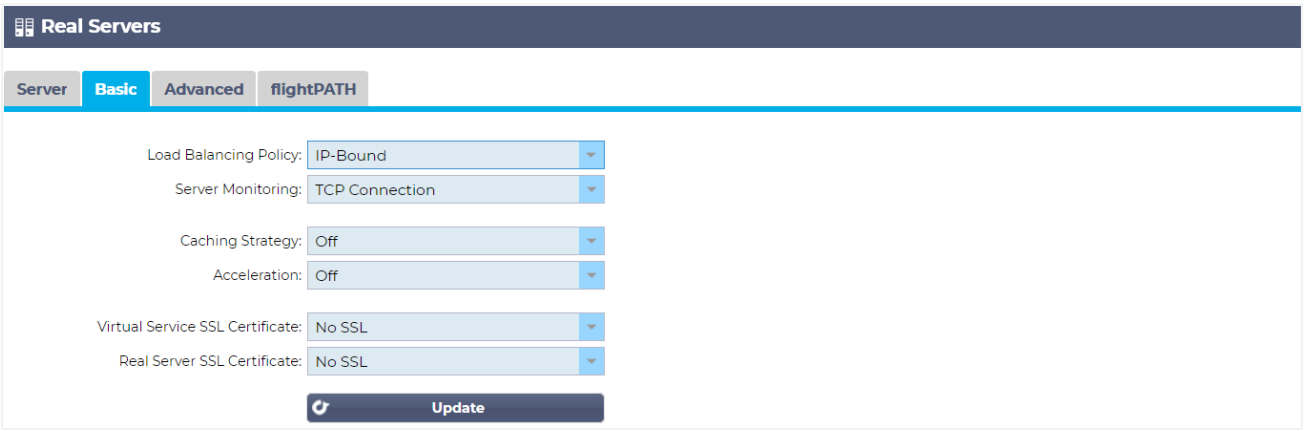
10. Press the Update button once done.
11. The ECS REST API Service is now added, and if everything is OK, the status indicators for the VS and Real Server lines will be green.

ECS REST API VIP/VS 7871-7874

1. Click on the primary service we created in the step for ECS REST API VIP/VS 4443
2. Click the Copy Service button
3. This action will copy the service to a new line, but unlike the sub-services we created for the various protocols, we need to re-enter the details required for the REST API. This process creates an entirely new VIP.
4. Enter the details shown in RED as per the table below (these are only examples):

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.134	255.255.255.0	7871-7874	ECS REST API (7871-7874)	Layer 4 TCP

5. When you have done this, click Update.
6. You will find that the Real Servers have been duplicated since you copied the VIP, so you do not need to re-enter them.
7. You will find that the system has highlighted the PORT field for the first Real Server line. You will need to enter the value used in the table above into the Port field.
8. This step must be replicated for each Real Server.
9. Click on the Basic tab and complete it as shown below.
   Note that the Load Balancing Policy is IP-Bound



10. Press the Update button once done.
11. The secondary ECS REST API Service is now added, and if everything is OK, the status indicators for the VS and Real Server lines will be green.

The Dell-EMC ECS load balancing configuration using Layer 4 load-balancing is now complete.

Restricting Access to Services

Providing access to the Management Service interface is always a security nightmare to the IT security officers.

To accommodate their concerns, you should consider moving the Management Service VS and REST API Service VS to use HTTP rather than using Layer 4.

This change involves altering the entries, as indicated in the examples below.

ECS Management Service

In the earlier section ECS Management Service shown within Creating the Virtual IP Service (VIP), the table below shows the change highlighted in RED.

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.35	255.255.255.0	443	ECS Management Service	**HTTP**

Once this change has been made, traffic management rules can be defined using the flightPATH system. flightPATH rules can be configured to only allow access from specific networks, for example.

For details on how to do this, please examine the administration guide.

ECS REST API

As in the previous example, the REST API also needs to be protected from unwanted access, and the Layer 4 configuration should be moved to HTTP.

The table below shows the change highlighted in RED for settings in the earlier sections, ECS REST API VIP/VS 4443 and ECS REST API VIP/VS 7871-7874 within The ECS REST API.

ECS REST API VIP/VS 4443

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.134	255.255.255.0	**4443**	**ECS REST API**	Layer 4 TCP

ECS REST API VIP/VS 7871-7874

IP	Subnet Mask/Prefix	Port	Service Name	Service Type
10.53.3.134	255.255.255.0	**7871-7874**	**ECS REST API (7871-7874)**	Layer 4 TCP

Once this change has been made, traffic management rules can be defined using the flightPATH system. flightPATH rules can be configured to only allow access from specific networks, for example.

For details on how to do this, please examine the administration guide.

Help and Support

Help and support are always available from Edgenexus.

Should you require technical support, please email support@edgenexus.io, and one of our support engineers will get back to you.