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A feasibility study for a voucher management system (VOMS) as part of intelligent network (IN) architecture for telecommunications operations in a changing customer service market

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APPENDIX A

Cisco Load Balancer configuration used to create the new VOMS system.

Chapter 3 showed the Cisco Ace Load Balancer that was used for the design of the new VOMS system.

The configuration that followed was used in the setup of the new VOMS system. The emulations that we executed were done using these parameters.

The configuration listed was added to the running configuration of the Load Balancer. These parameters were required to setup the environment of the system that the Load Balancer would be utilised within. The IP addresses of the front end servers had to be declared as well as those of the backend servers.

- The system configuration was required to up the command line environment as well as the parameters required for the logs that would be generated
- The access lists had been setup to allow all IP addresses to access the front end servers
- The health probes were essential in the automatic failover of a dying or dead server, whether it be a front end or backend server
- The real servers were those IP addresses of the front end and back end servers
- The serverfarms defines the front end group and the back end group and the real servers found within them
- The sticky serverfarms define static routes within the Load Balancer
- The class maps were required to link the access list to the defined name for the front end and back end servers as well as defining the allowed port ranges that would access the front end or back end
- The policy maps were setup to define the serverfarms for the front end and the back end of the Load Balancer
- The policy maps multi match was the trigger to activate the Virtual IP address as well as the parameters defined for the serverfarms for the front end and back end
- The interfaces exist on the switches, specifically the VLANS, here the Load Balancer defines which VLAN belongs to which front end or back end

- The routes were required as they defined the range of IP addresses that are routed through the Load Balancer
- The user credentials defined were the users who were allowed on the Load Balancer
- The SNMP servers were the passwords that were defined so that external machines may interrogate the Load Balancer
- The SNMP configurations were setup so that the Load Balancer would send statistics about itself to another machine to analyse its performance and health

 # System Configuration

logging enable

logging standby

logging timestamp

logging trap 5

logging buffered 5

logging device-id context-name

logging host 10.113.135.175 udp/514 format emblem

logging message 106023 level 6

 # Access Lists

access-list LinuxVOMS_BE_NAT_ACL line 8 extended permit tcp any host 10.115.251.4 eq 3306

access-list LinuxVOMS_FE_NAT_ACL line 8 extended permit tcp any host 10.115.251.3 eq 10080

access-list any line 8 extended permit tcp any any

 # Active Health Probes

probe tcp 3306

port 3306

interval 10

faildetect 2

passdetect interval 10

passdetect count 2

probe tcp 8080

port 8080

interval 60

faildetect 2

passdetect interval 10

passdetect count 2

probe icmp ICMP

interval 10

faildetect 1

passdetect interval 10

probe http http_LinuxVOMS

port 10080

interval 10

faildetect 2

passdetect interval 10

request method get url /VOMS/index.jsp

expect status 200 200

connection term forced

 # Defining Real Servers IP Addresses

rserver host ppbepoc01

ip address 10.115.244.174

inservice

rserver host ppbepoc02

ip address 10.115.244.175

inservice

rserver host VOMSpoc01

ip address 10.115.244.172

inservice

rserver host VOMSpoc02

ip address 10.115.244.173

inservice

 # Defining the Serverfarms

serverfarm host be_serverfarm *(Backend Server farm)*

probe 3306

rserver ppbepoc01

inservice

rserver ppbepoc02

inservice

serverfarm host fe_serverfarm *(Frontend Server farm)*

probe http_LinuxVOMS

rserver VOMSpoc01

inservice

rserver VOMSpoc02

inservice

#Creating Sticky Server farms

sticky ip-netmask 255.255.255.255 address source sticky_fe_serverfarm

timeout 5

serverfarm fe_serverfarm

sticky ip-netmask 255.255.255.255 address source sticky_be_serverfarm

timeout 5

serverfarm be_serverfarm

#Defining Class Maps

class-map match-any LinuxVOMS_BE_NAT_Class

2 match access-list LinuxVOMS_BE_NAT_ACL

class-map match-any LinuxVOMS_BE_VIP_Class

2 match virtual-address 10.115.251.4 tcp eq 3306

class-map match-any LinuxVOMS_FE_NAT_Class

2 match access-list LinuxVOMS_FE_NAT_ACL

class-map match-any LinuxVOMS_FE_VIP_Class

2 match virtual-address 10.115.251.3 tcp eq 10080

class-map type management match-any Mgt_Class

2 match protocol http source-address 10.0.0.0 255.0.0.0

3 match protocol https source-address 10.0.0.0 255.0.0.0

4 match protocol icmp source-address 10.0.0.0 255.0.0.0

5 match protocol snmp source-address 10.0.0.0 255.0.0.0

6 match protocol ssh source-address 10.0.0.0 255.0.0.0

7 match protocol telnet source-address 10.0.0.0 255.0.0.0

#Defining Policy Maps

policy-map type management first-match Mgt_Policy

class Mgt_Class

permit

policy-map type loadbalance first-match LinuxVOMS_BE_L7_Policy

class class-default

sticky-serverfarm sticky_be_serverfarm

policy-map type loadbalance first-match LinuxVOMS_FE_L7_Policy

class class-default

serverfarm fe_serverfarm

#Defining Policy Maps Multi Match

policy-map multi-match LinuxVOMS_BE_LB_Policy

class LinuxVOMS_BE_VIP_Class

loadbalance vip inservice

loadbalance policy LinuxVOMS_BE_L7_Policy

loadbalance vip icmp-reply active

loadbalance vip advertise active

policy-map multi-match LinuxVOMS_BE_NAT_Policy

class LinuxVOMS_BE_NAT_Class

nat dynamic 2 vlan 458

policy-map multi-match LinuxVOMS_FE_LB_Policy

class LinuxVOMS_FE_VIP_Class

loadbalance vip inservice

loadbalance policy LinuxVOMS_FE_L7_Policy

loadbalance vip icmp-reply active

loadbalance vip advertise active

policy-map multi-match LinuxVOMS_FE_NAT_Policy

class LinuxVOMS_FE_NAT_Class

nat dynamic 1 vlan 458

#Defining the Interfaces

interface vlan 457

description LinuxVOMS Front End Vlan

ip address 10.115.251.2 255.255.255.240

access-group input any

service-policy input Mgt_Policy

service-policy input LinuxVOMS_FE_LB_Policy

service-policy input LinuxVOMS_FE_NAT_Policy

service-policy input LinuxVOMS_BE_LB_Policy

service-policy input LinuxVOMS_BE_NAT_Policy

no shutdown

interface vlan 458

description LinuxVOMS Back End Vlan

ip address 10.115.251.18 255.255.255.240

access-group input any

nat-pool 2 10.115.251.20 10.115.251.20 netmask 255.255.255.255 pat

nat-pool 1 10.115.251.19 10.115.251.19 netmask 255.255.255.255 pat

service-policy input Mgt_Policy

no shutdown

#Defining The Routes

ip route 0.0.0.0 0.0.0.0 10.115.251.1

ip route 10.115.244.0 255.255.255.0 10.115.251.17

#Defining the Users Credentials

username LinuxVOMS password 5 1htQQTFGb$Q2.Tvd0iSxnljivrzl/rF1 role Server-Maintenance domain default-domain

#Creating SNMP Servers

snmp-server community network group Network-Monitor

snmp-server community public group Network-Monitor

#SNMP Configuration

snmp-server host 10.113.184.7 traps version 2c network

snmp-server enable traps slb vserver

snmp-server enable traps slb real

snmp-server enable traps syslog

snmp-server enable traps snmp authentication

snmp-server enable traps snmp linkup

snmp-server enable traps snmp linkdown