配置OMPROUTE以在大型機上運行

目錄

簡介

本文檔概述了在大型機上運行OMPROUTE過程以與其他TCP/IP網路交換路由更新的主機和路由器配置示例。OMPROUTE通常與虛擬IP地址(VIPA)結合使用，它允許在客戶端中配置的大型機IP地址獨立於任何一個通道介面。這為通道提供了冗餘。最初，IBM的大型機TCP/IP實施僅支援路由資訊協定(RIP)作為路由協定，使用OROUTED過程。較新的OMPROUTE支援RIP V1或V2和開放最短路徑優先(OSPF)。IBM建議使用OMPROUTE而不是OROUTE，並且IBM最終將取消對OROUTE的支援。

必要條件

需求

本文件沒有特定需求。

採用元件

用於此組態的Cisco IOS®軟體版本為12.1(3a)T2（xCPA微碼27-9），這是測試此配置時的最新版本。但是，如果您使用的是CLAW，則它應該適用於任何版本的Cisco IOS軟體。CMPC+至少需要Cisco IOS軟體版本12.1T。

該路由器是帶xCPA埠介面卡的Cisco 7206。或者，如本文檔稍後所述，帶有CIP卡的Cisco 7500路由器可用於對配置進行細微更改。

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

慣例

如需文件慣例的詳細資訊，請參閱思科技術提示慣例。

組態

大型機配置 — OMPROUTE檔案

大型機上的OMPROUTE配置與OROUTE的配置非常相似。OMPROUTE還至少使用兩個配置檔案。您必須使用以下兩個環境變數指向這些配置檔案在OMVS地址空間中的位置：

- `export resolver_conf=/etc/resolv.conf`
- `export omproute_file=/etc/omproute.conf`

以下是resolver_conf內容的範例：

```
TCPJobName TCPIP
DomainOrigin cisco.com
domain cisco.com
Datasetprefix TCPIP
HostName P390
Messagecase mixed
```

comproute_file將取決於是使用RIP還是OSPF。以下是RIP的配置示例：

```
;
Originate_RIP_Default Condition=Always Cost=1
;
RIP_Interface IP_Address=10.64.3.34
Name=LDIPTG
Subnet_Mask=255.255.255.240
Receive_Dynamic_Nets=YES
Receive_Dynamic_Subnets=YES
MTU=1470
Destination_Addr=10.64.3.33
;
RIP_Interface IP_Address=10.64.3.17
Name=VIPALINK
Subnet_Mask=255.255.255.240
MTU=1470
;
```

對於OSPF，有更多配置選項可用，其中包括使大型機充當末節區域的功能。當許多邏輯分割槽(LPAR)通過同一通道進行連線時，這可以顯著減少通道上的負載路由更新。範例如下：

```
Area Area_Number=0.0.0.0 Authentication_Type=None Stub_Area=NO
;
Comparison=Type2
;
AS_Boundary_Routing Import_Subnet_Routes=YES
Import_Direct_Routes=YES
;
OSPF_Interface IP_Address=10.64.3.34
```

```
Name=LDIPTG
Subnet_Mask=255.255.255.240
Attaches_To_Area=0.0.0.0
MTU=1470
Destination_Addr=10.64.3.33
Hello_Interval=30
Dead_Router_Interval=120
;
OSPF_Interface IP_Address=10.64.3.17
Name=VIPALINK
Subnet_Mask=255.255.255.240
```

大型機配置 — TCP/IP堆疊

TCP/IP配置檔案資料集不需要OMPROUTE的任何特殊配置，除了必須註釋掉所有靜態和預設路由配置以及BSDROUTINGPARMS部分（僅由OROUTED使用）之外。 此解壓僅顯示必須註釋掉的內容以及OMPROUTE配置檔案引用的引數：

```
TCPIP Profile dataset
---------------------
 ------------------------------------------------------------------------
; Hardware definitions:
 ------------------------------------------------------------------------
; NOTE: To use these device and link statements, update the statements
; to reflect your installation configuration and remove the semicolon
;
DEVICE DIPTG MPCPTP
LINK LDIPTG MPCPTP DIPTG
DEVICE VIPADEV VIRTUAL 0
LINK VIPALINK VIRTUAL 0 VIPADEV
;
;
; ------------------------------------------------------------------------
;
; HOME Internet (IP) addresses of each link in the host.
;
; NOTE: To use this home statement, update the ipaddress and linknames
; to reflect your installation configuration and remove the semicolon
;
HOME
10.64.3.17    VIPALINK
10.64.3.34    LDIPTG
; ------------------------------------------------------------------------
;
; IP routing information for the host.All static IP routes should
; be added here.
;
; NOTE: To use this GATEWAY statement, update the addresses and links
; to reflect your installation configuration and remove the semicolon
;
; GATEWAY
;
; Direct Routes - Routes that are directly connected to my interfaces.
;
; Network  First Hop  Link Name Packet Size  Subnet Mask  Subnet Value
; 10           =       CIS1      1500       0.255.255.0    0.101.1
; 10           =       LDIPTG    1500       0.255.255.240  0.64.3.32
; 9            =       LIS1      1500       0.255.255.0    0.117.56.0
; 130.50       =       TR1       2000       0.0.255.0      0.0.10.0
; 193.5.2      =       ETH1      1500       0
; 9            =       FDDI1     4000       0.255.255.0    0.67.43.0
; 193.7.2.2    =       SNA1      2000       HOST
```

```
;
; Indirect Routes - Routes that are reachable through routers on my
;    network.
;
; Network     First Hop   Link Name Packet Size  Subnet Mask  Subnet Value
; DEFAULTNET  10.64.3.33  LDIPTG    DEFAULTSIZE  0
; 193.12.2    130.50.10.1 TR1       2000         0
; 10.5.6.4    193.5.2.10  ETH1      1500         HOST
;
; Default Route - All packets to an unknown destination are routed
;  through this route.
;
; Network     First Hop   Link Name Packet Size  Subnet Mask  Subnet Value
; DEFAULTNET  9.67.43.1   FDDI1     DEFAULTSIZE  0
;
; ----------------------------------------------------------------------
;
; orouted Routing Information
;
; if you are using orouted, comment out the GATEWAY statement and
; update the BSDROUTINGPARMS statement to reflect your installation
; configuration and remove the semicolon
;
;    Link     Maxmtu   Metric   Subnet Mask     Dest Addr
; BSDROUTINGPARMS false
; LDIPTG       1500       0     255.255.255.240 10.64.3.33
; VIPALINK     1500       0     255.255.255.240 0
;    TR1       2000       0     255.255.255.0   0
;    ETH1      1500       0     255.255.255.0   0
;    FDDI1  DEFAULTSIZE   0     255.255.255.0   0
; ENDBSDROUTINGPARMS
!--- Note that all of the last two sections have been commented out.
```

大型機配置 — VTAM定義和啟動TCP/IP

路由更新可以通過CLAW或CMPC+連線交換。如果使用CLAW ，則不需要在大型機上執行其他配置。此範例使用CMPC，它需要VTAM傳輸資源清單(TRL)專案。以下是VTAM成員：

```
DIPTGTRL VBUILD TYPE=TRL
*
*
DIPTG TRLE  LNCTL=MPC,MAXBFRU=16,READ=(E24),WRITE=(E25)
*
```

TRL必須在啟動TCPIP啟動任務之前啟用。例如：

```
V NET,ACT,ID=DIPTRL1,UPDATE=ALL
IST097I VARY ACCEPTED
ISTTRL ACTIVE
```

然後使用S TCPIP MVS控制檯命令啟用TCP/IP啟動任務。運行TCP/IP啟動任務後，OMPROUTE過程即可啟動，或者使用作業控制語言(JCL)作為啟動任務，或者從OMVS地址空間內啟動。要在OMVS中啟動，請發出以下命令：

```
cd /usr/lpp/tcpip/sbin

omproute &
```

要檢查OMPROUTE是否正在運行，請發出以下控制檯命令，其中p390是啟動OMPROUTE守護程式的使用者ID:

```
d omvs,u=p390
```

路由器配置

必須將CLAW和CMPC專門配置為使用broadcast關鍵字通過通道傳送廣播。例如，對於CLAW:

```
claw 0100 20 10.101.1.10 P390D C7000D TCPIP TCPIP broadcast
```

在本例中，CMPC+正在使用中，因此以下是路由器配置的相關部分：

```
!
interface Channel2/0
 ip address 10.64.3.33 255.255.255.240
 ip ospf network point-to-multipoint
 no keepalive
 cmpc 0100 24 DIPTG READ
 cmpc 0100 25 DIPTG WRITE
 tg DIPTG    ip 10.64.3.34 10.64.3.33 broadcast
 router ospf 1
  network 10.0.0.0 0.255.255.255 area 0
!
```

如果這是一台帶有CIP卡的Cisco 7500路由器，而不是帶有xCPA埠介面卡的7200路由器，則應該在/2tg語句。請注意ip ospf network point-to-multipoint命令，OSPF正常運行需要該命令。通道介面被視為多點介面，與幀中繼非常相似。如果您不希望在整個網路中運行OSPF，則只能在通道介面本身運行它，並使用其他路由協定之間的重分發。例如：

```
!
router eigrp 1
 redistribute ospf 1
 passive-interface Channel2/0
 network 10.0.0.0
 no eigrp log-neighbor-changes
!
router ospf 1
 log-adjacency-changes
 redistribute eigrp 1
 network 10.64.3.33 0.0.0.0 area 0
!
```

顯示在路由器上

```
diplodocus# show extended channel 2/0 status

Path: 0100  -- ESTABLISHED
       Command    Selective   System     Device    CU
Dev    Connects    Retries    Cancels    Reset    Reset    Errors    Busy
24        30         21          1         0        0        0        0
25        29         0           1         0        0        0        0
```

```
Blocks          Bytes          Dropped Blk          Memd
Dev-Lnk    Read    Write    Read    Write    Read    Write    wait    Con
24-00       29       6      3484     789      0        0       0       Y
25-00        9      29       801    3920      0        0       0       Y
Path 0100
Total:      38      35      4285    4709      0        0       0
Last statistics 0 seconds old, next in 10 seconds

diplodocus# show extended channel 2/0 cmpc

Path    Dv    TGName    Dir    Bfrs     Status
CMPC   0100     24     DIPTG  READ  16  Active+
CMPC   0100     25     DIPTG  WRITE 16  Active+

diplodocus# show ip ospf i

Channel2/0 is up, line protocol is up
Internet Address 10.64.3.33/28, Area 0
Process ID 1, Router ID 200.100.100.9, Network Type POINT_TO_MULTIPOINT,
Cost: 4
Transmit Delay is 1 sec, State POINT_TO_MULTIPOINT,
Timer intervals configured, Hello 30, Dead 120, Wait 120, Retransmit 5
Hello due in 00:00:10
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 10.64.3.17
Suppress hello for 0 neighbor(s)

diplodocus# show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address       Interface
10.64.3.17       1    FULL/  -        00:01:35
Neighbor is up for 00:04:01           10.64.3.34  Channel2/0

diplodocus# show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is 10.64.3.1 to network 0.0.0.0
1.0.0.0/27 is subnetted, 1 subnets
C1.1.1.0 is directly connected, Loopback1
200.100.100.0/29 is subnetted, 1 subnets
C200.100.100.8 is directly connected, Loopback0
10.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D10.0.0.0/8 is a summary, 00:06:40, Null0
C10.64.3.0/28 is directly connected, Ethernet6/0
O E210.64.3.17/32 [110/1] via 10.64.3.34, 00:03:57, Channel2/0
O10.64.3.16/28 [110/5] via 10.64.3.34, 00:03:57, Channel2/0
C10.64.3.32/28 is directly connected, Channel2/0
S10.64.3.34/32 [1/0] via 10.64.3.34, Channel2/0
S10.64.3.37/32 [1/0] via 10.64.3.37, Channel2/0
C10.64.3.48/28 is directly connected, Serial1/3.1
C10.64.3.128/28 is directly connected, Serial1/3.2
S*   0.0.0.0/0 [1/0] via 10.64.3.1
```

在大型機上顯示

VTAM顯示在系統控制檯上

D NET,TRL

```
IST097I DISPLAY ACCEPTED
ST350I DISPLAY TYPE = TRL 042
IST1314I TRLE = DIPTG  STATUS = ACTIV       CONTROL = MPC
IST1454I 1 TRLE(S) DISPLAYED
IST314I END
```

D NET,TRL,TRLE=DIPTG

```
IST097I DISPLAY ACCEPTED
IST075I NAME = DIPTG, TYPE = TRLE 045
IST486I STATUS= ACTIV, DESIRED STATE= ACTIV
IST087I TYPE = LEASED  , CONTROL = MPC , HPDT = YES
IST1715I MPCLEVEL = HPDT       MPCUSAGE = SHARE
IST1577I HEADER SIZE = 4092 DATA SIZE = 60 STORAGE = ***NA***
IST1221I WRITE DEV = 0E25 STATUS = ACTIVE     STATE = ONLINE
IST1577I HEADER SIZE = 4092 DATA SIZE = 60 STORAGE = DATASPACE
IST1221I READ  DEV = 0E24 STATUS = ACTIVE     STATE = ONLINE
IST314I END
```

路由資訊顯示在netstat命令的TSO下

netstat route顯示路由表。例如：

===> **netstat route**

```
EZZ2350I MVS TCP/IP NETSTAT CS V2R7       TCPIP NAME: TCPIP       15:56:33
EZZ2755I Destination       Gateway       Flags  Refcnt  Interface
EZZ2756I -----------       -------       -----  ------  ---------
EZZ2757I 10.0.0.0          10.64.3.33    UG     000000  LDIPTG
EZZ2757I 10.64.3.32        0.0.0.0       U      000000  LDIPTG
EZZ2757I 10.64.3.33        0.0.0.0       UH     000000  LDIPTG
```

netstat設備顯示所有連線的裝置或鏈路的狀態等。例如：

===> **netstat device**

```
EZZ2350I MVS TCP/IP NETSTAT CS V2R7  TCPIP NAME: TCPIP   15:58:04
EZZ2760I DevName: LOOPBACK    DevType: LOOPBACK  DevNum: 0000
EZZ2761I   LnkName: LOOPBACK      LnkType: LOOPBACK    Status: Ready
EZZ2762I     NetNum: 0 QueSize: 0   ByteIn: 0000004278   ByteOut: 0000004278
EZZ2768I   BSD Routing Parameters:
EZZ2769I     MTU Size: 00000 Metric: 00
EZZ2770I     DestAddr: 0.0.0.0 SubnetMask: 0.0.0.0
EZZ2810I   Multicast Specific:
EZZ2811I     Multicast Capability: No
EZZ2760I DevName: DIPTG     DevType: MPC       DevNum: 0000
EZZ2761I   LnkName: LDIPTG      LnkType: MPC   Status: Ready
EZZ2762I     NetNum: 0 QueSize: 0   ByteIn: 0000001848   ByteOut: 0000001936
EZZ2768I   BSD Routing Parameters:
EZZ2769I     MTU Size: 01470 Metric: 01
EZZ2770I     DestAddr: 0.0.0.0 SubnetMask: 255.255.255.240
EZZ2810I   Multicast Specific:
EZZ2811I     Multicast Capability: Yes
EZZ2812I     Group            RefCnt
```

```
EZZ2813I     -----            ------
EZZ2814I     224.0.0.5        0000000001
EZZ2814I     224.0.0.1        0000000001
EZZ2760I DevName: VIPADEV    DevType: VIPA      DevNum: 0000
EZZ2761I   LnkName: VIPALINK      LnkType: VIPA   Status: Ready
EZZ2762I     NetNum: 0 QueSize: 0   ByteIn: 0000000000   ByteOut: 0000000000
EZZ2768I   BSD Routing Parameters:
EZZ2769I     MTU Size: 01470 Metric: 01
EZZ2770I     DestAddr: 0.0.0.0 SubnetMask: 255.255.255.240
EZZ2810I   Multicast Specific:
EZZ2811I     Multicast Capability: No
```

netstat還有許多可用選項。您可以發出**netstat ?**命令顯示全部內容。

相關資訊

- IBM技術支援
- 技術支援與文件 - Cisco Systems