Sysplex Distributor support for IBM z/OS Control Plane Appliances

Documentation changes for APAR PH49323

z/OS 2.5

Contents

New Function Summary

Sysplex Distributor support for IBM z/OS Control Plane Appliances

With z/OS 2.5, z/OS Communications Server is enhanced with APAR PH49323 to support z/OS Sysplex Distributor for non-z/OS targets that run co-located with a z/OS TCP/IP stack in a sysplex. For example, Sysplex Distributor can be used to provide highly available Kubernetes clusters on z/OS with multiple z/OS Control Plane Appliances. For more information about the IBM z/OS Control Plane Appliance (IBM zCPA) and Kubernetes, see IBM z/OS Container Platform.

Dependencies:

APARs PH39613 and OA63289 for z/OS 2.5 are required for base network support for IBM z/OS Container Platform.

Using Sysplex Distributor support for IBM z/OS Control Plane Appliances

To use Sysplex Distributor support for IBM z/OS Control Plane Appliances, complete the appropriate tasks in the following table.

Table. Task topics to enable Sysplex Distributor support for IBM z/OS Control Plane Appliances

Task	Reference
Review documentation on Kubernetes control plane nodes and running in an HA environment	IBM z/OS Container Platform
Configure the VIPADISTRIBUTE statement with the new EXTTARG keyword and specify one or more external target addresses on the DESTIP keyword.	• VIPADYNAMIC - VIPADISTRIBUTE statement • VIPADYNAMIC - VIPARANGE statement
Issue the Netstat VIPADCFG/-F report to display the dynamic VIPA configuration for a local host.	Netstat VIPADCFG/-F report
Use the z/OSMF workflows to configure the z/OS Control Plane Appliance with the Distributor dynamic VIPA address.	Provisioning IBM z/OS Control Plane Appliance instances in IBM z/OS Container Platform
Issue the Netstat VDPT/-O report to view the dynamic VIPA destination port table information and confirm you have at least one ready target for distribution.	Netstat VDPT/-O report

Communications Server IP interface changes

PROFILE.TCPIP configuration file

PROFILE.TCPIP statement and parameter changes

The following table lists the new and updated Communications Server PROFILE.TCPIP configuration statements and parameters.

Table. New and changed Communications Server PROFILE.TCPIP configuration statements and parameters for z/OS 2.5

Statement	Description	Reason for change
EXTTARG keyword on the VIPADISTRIBUTE statement	This keyword indicates that the distributed DVIPA address configured on the same VIPADISTRIBUTE statement is to be used for external target distribution.	Sysplex Distributor support for IBM z/OS Control Plane Appliances

Operator commands

Netstat operator commands (DISPLAY TCPIP,,NETSTAT)

The following table lists the new and updated Communications Server IP Netstat operator command DISPLAY TCPIP,,NETSTAT.

Table. New and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) for z/OS 2.5

Report option	Description	Reason for change
OPERATOR VIPADCFG TSO VIPADCFG UNIX -F	This display shows a flag (EXT for long format or X for short) for the new EXTTARG keyword on the VIPADISTRIBUTE configuration statement related to external target distribution.	Sysplex Distributor support for IBM z/OS Control Plane Appliances
OPERATOR VDPT TSO VDPT	This display shows a new flag for the new Sysplex Distributor support for external targets (EXT for long format or X for short).	Sysplex Distributor support for IBM z/OS Control Plane Appliances

UNIX -O		

Application programming interfaces and network management interfaces

TCP/IP callable NMI (EZBNMIFR)

The following table lists the updates to the Communications Server TCP/IP callable NMI.

Table. New Communications Server TCP/IP callable NMI (EZBNMIFR) for z/OS 2.5

Request	Parameter/output	Description	Reason for change
NWMPROFILETYPE	NMTP_DDVSFlags	A new flag, NMTP_DDVSEXTTARG, is added. If set, the DVIPA is used to distribute requests to non-z/OS (external) targets.	Sysplex Distributor support for IBM z/OS Control Plane Appliances

IPCS subcommands

TCPIPCS subcommands

This topic describes the Communications Server TCPIPCS subcommand option changes for z/OS 2.5.

The following table lists the TCPIPCS subcommand options.

The TCPIPCS command contains the OPTLOCAL specification in some displays.

Table. New and changed Communications Server TCPIPCS subcommand options for z/OS 2.5

Subcommand	Description	Reason for change
TCPIPCS PROFILE	Indicate EXTTARG when configured in the TCP/IP profile. Indicate EXTTARG for dynamically created SRCIP when using external target distribution with local targets.	Sysplex Distributor support for IBM z/OS Control Plane Appliances

TCPIPCS XCF	Display DVIPA port hash table information for external target distribution.	Sysplex Distributor support for IBM z/OS Control Plane Appliances

IP Configuration Reference

TCP/IP profile (PROFILE.TCPIP) and configuration statements

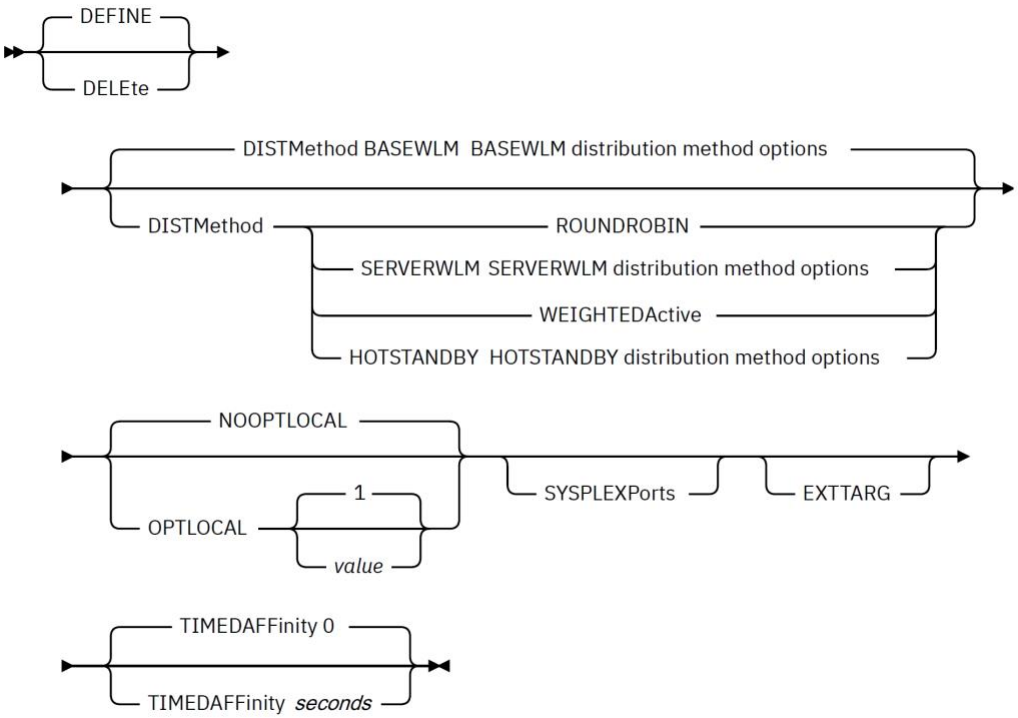
VIPADYNAMIC - VIPADISTRIBUTE statement

Enables (VIPADISTRIBUTE DEFINE) or disables (VIPADISTRIBUTE DELETE) the sysplex distributor function for a dynamic VIPA (defined on the same stack by a VIPADEFINE or VIPABACKUP statement) for which new connection requests can be distributed to other stacks in the sysplex. If you want to distribute FTP traffic, specify port 21 (or another designation according to which ports you are using for FTP) on the PORT parameter.

Syntax

Rule: Specify the parameters in the order shown here, except for the optional parameters preceding the IPv4 address or IPv6 interface name, which can be specified in any order.

Base Options (These can be specified in any order)



Parameters

EXTTARG

Specifies that this distributed DVIPA is used for external target distribution. This value is not specified by default. The only valid distribution method for a VIPADISTRIBUTE statement with the EXTTARG keyword is ROUNDROBIN.

Note: If the EXTTARG keyword is configured without the DISTMETHOD parameter, ROUNDROBIN will be set automatically.

EXTTARG must be specified on the first VIPADISTRIBUTE statement for a DVIPA. It cannot be enabled after a DVIPA has been marked for distribution. If enabled, it cannot be disabled until all distribution has been deleted for the DVIPA.

Guideline:

SRCIP DESTINATION statements will be created autonomically for EXTTARG DVIPAs if they are not manually configured. The autonomic SRCIP DESTINATION statements will use the IPCONFIG DYNAMICXCF IP address as the source IP address. This ensures local client

applications will not use the distributed VIPA as the source IP address when connecting to a target with the distributed DVIPA.

For more information about source IP selection, see z/OS Communications Server: IP Configuration Guide.

For more information about the SRCIP statement, see SRCIP statement.

Rules:

- The following options are supported for VIPADISTRIBUTE statements with the EXTTARG keyword:
  - DISTMETHOD ROUNDROBIN
- The OPTLOCAL base option is ignored with the EXTTARG keyword
- The TIMEDAFFINITY base option is ignored with the EXTTARG keyword
- The following options cannot be specified with the EXTTARG keyword and will cause the VIPADISTRIBUTE statement to be rejected:
  - DESTIP ALL
    - DESTIP ALL is only rejected in combination with a VIPADISTRIBUTE DEFINE. It is accepted with a VIPADISTRIBUTE DELETE
  - DISTMETHOD other than ROUNDROBIN
  - IPv6 interface names
  - SYSPLEXPORTS
  - TIER1 or TIER2 parameters
  - PORT
  - PAUSE

DESTIP *dynxcfip*

Specifies the dynamic XCF address (IPCONFIG DYNAMICXCF) of the TCP/IP stacks in the sysplex that are to be target stacks for the dynamic VIPA. The target stacks are candidates for receiving new incoming connection requests. See the PORT keyword for an explanation of how a candidate target stack becomes eligible to receive connection requests. If the VIPAROUTE statement specifies a target IP address for dynxcfip, but no route exists from the distributor to the target stack, that target stack is not considered for distribution, and the distributor treats this as it does when the dynamic XCF interface becomes inactive.

A maximum of 32 destination (target) dynamic XCF addresses can be specified.

Rules:

- If an IPv4 address is specified for this VIPADISTRIBUTE statement, then all of the addresses specified by the dynxcfip value must also be IPv4 addresses.
- If an IPv6 interface name is specified for this VIPADISTRIBUTE statement, then all of the addresses specified by the dynxcfip value must also be IPv6 addresses.

- If the EXTTARG keyword is configured for this VIPADISTRIBUTE statement, then all of the addresses specified by the dynxcfip value must be the IP addresses assigned to the external targets.

SRCIP statement

Steps for modifying

Guidelines:

- While the SRCIP-ENDSRCIP statement allows the specification of real IP addresses that are associated with physical interfaces, use static or dynamic VIPA interfaces. Because static and dynamic VIPA interfaces are not associated with a specific physical interface, they provide higher availability attributes in cases where specific network interfaces fail or where connectivity is lost in specific parts of the network. In cases where a real IP address must be specified as a source IP address on the SRCIP-ENDSRCIP block statement, there are several considerations that should be carefully evaluated:
    - The IP address specified affects only the source IP address that is used for all packets associated with an outbound TCP connection for the specified jobs or destinations; it does not influence the physical network interface selected by TCP/IP for any outbound packets associated with the TCP connection. TCP/IP determines the outbound interface by consulting its routing table and determining the best route to the destination IP address for the connection. As a result, the source IP address that is selected might not be associated with the outbound physical interface selected by TCP/IP. The network routing topology must allow for any inbound packets for this connection to be routed back to this TCP/IP host regardless of the network interface that was used for any outbound traffic associated with this connection.
    - If the physical network interface associated with a specified IP address fails or is deactivated, any incoming packets destined to this IP address might not be able to reach this TCP/IP host. This could disrupt traffic for both existing TCP connections and new TCP connections that use this source IP address.
- For JOBNAME entries, if the same VIPA source IP address is used on more than one z/OS TCP/IP stack, then the job-specific source IP address should be a distributed DVIPA with the SYSPLEXPORTS parameter enabled.
- SRCIP DESTINATION statements will be created autonomically for VIPADISTribute dynamic VIPAs configured with the EXTTARG parameter (distributed DVIPA) if they are not manually configured. The autonomic SRCIP DESTINATION statements will use the IPCONFIG DYNAMICXCF IP address as the source IP address. This ensures local client applications will not use the distributed VIPA as the source IP address when connecting to a target with the distributed DVIPA.

For more information about the EXTTARG parameter, see VIPADISTRIBUTE statement.

IP System Administrator's Commands

Netstat VDPT/-O report

This report displays the dynamic VIPA destination port table information. The command displays information about distribution to TCP/IP stacks; this section of the report applies to Base targets, tier 1 targets and tier 2 targets. The destination port tables exist only on distributing stacks, which are stacks on which a VIPADISTRIBUTE DEFINE keyword was specified.

Report examples

The following examples are generated using the TSO NETSTAT command. Using the z/OS UNIX netstat command displays the data in the same format as the TSO NETSTAT command.

Not IPv6 enabled (SHORT format)

NETSTAT VDPT

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           15:35:26
Dynamic VIPA Destination Port Table for TCP/IP Stacks:
Dest IPaddr     DPort DestXCF Addr    Rdy TotalConn  WLM TSR  Flg
-----------     ----- ------------    --- ---------  --- ---  ---
201.2.10.9      08888 201.1.10.13     001 0000152960 00  100  X
201.2.10.11     00021 201.1.10.15     001 0000310485 01  075  DI
201.2.10.13     00243 201.3.10.16     001 0000256794 03  085
201.2.10.14     00244 201.3.10.16     000 0000000000 15  100  1
201.2.10.15     05000 201.3.10.15     001 0000034011 10  100
201.2.10.18     04040 201.3.10.16     001 0000063421 30  100  2
201.2.10.18     04040 201.3.10.15     001 0000019011 07  100  2
201.4.10.15     07000 201.3.10.16     001 0000094011 10  100  V
201.4.10.15     07000 201.3.10.17     001 0000000000 10  100  K
```

NETSTAT VDPT DETAIL

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           15:35:26
Dynamic VIPA Distribution Port Table for TCP/IP Stacks:
Dest IPaddr     DPort DestXCF Addr    Rdy TotalConn  WLM TSR  Flg
-----------     ----- ------------    --- ---------  --- ---  ---
201.2.10.9      08888 201.1.10.13     001 0000152960 00  100  X
  DistMethod: Roundrobin
  TCSR: 100  CER: 100 SEF: 100
  ActConn:    0000000042
201.2.10.11     00021 201.1.10.15     001 0000310485 01  075  DI
  DistMethod: Roundrobin
  TCSR: 100  CER: 075 SEF: 075
  ActConn:    0000000042
201.2.10.13     00243 201.3.10.16     001 0000256794 03  090
  DistMethod: BaseWLM
  TCSR: 100  CER: 095 SEF: 090
  Weight: 12
    Raw          CP: 13 zAAP: 00 zIIP: 10
    Proportional CP: 08 zAAP: 00 zIIP: 04
```

```
  ActConn:    0000000091
  QosPlcAct:  *DEFAULT*                                        W/Q: 01
201.2.10.14     00244 201.3.10.16     000 0000000000 15  090  1
  DistMethod: ServerWLM
  TCSR: 100  CER: 095  SEF: 090
  Weight: 60
    Raw          CP: 60 zAAP: 00 zIIP: 60
    Proportional CP: 06 zAAP: 00 zIIP: 54
  Abnorm: 0000         Health: 100
  ActConn:    0000000000
  QosPlcAct:  *DEFAULT*                                        W/Q: 01
201.2.10.15     05000 201.3.10.15     001 0000034011 10  100  A
  DistMethod: WeightedActive
  TCSR: 100  CER: 100  SEF: 100
  Abnorm: 0000         Health: 100
  ActConn:    0000003011
201.2.10.18     04040 201.3.10.16     001 0000063421 30  100  2
  DistMethod: ServerWLM
  TCSR: 100 CER: 100 SEF: 100
  Abnorm: 0000       Health: 100
  ActConn:    0000006006
201.2.10.18     04040 201.3.10.15     001 0000019011 07  100  2
  DistMethod: ServerWLM
  TCSR: 100 CER: 100 SEF: 100
  Abnorm: 0000       Health: 100
  ActConn:    0000003006
201.4.10.15     07000 201.3.10.16     001 0000094011 10  100  V
  DistMethod: HotStandby              SrvType: Preferred
  TCSR: 100  CER: 100  SEF: 100
  Abnorm: 0000         Health: 100
  ActConn:    0000001011
201.4.10.15     07000 201.3.10.17     001 0000000000 10  100  K
  DistMethod: HotStandby              SrvType: Backup
  TCSR: 100  CER: 100  SEF: 100
  Abnorm: 0000         Health: 100
  ActConn:    0000000000
```

IPv6 enabled or request for LONG format

NETSTAT VDPT

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           15:37:51
Dynamic VIPA Destination Port Table for TCP/IP Stacks:
Dest:        201.2.10.9..8888
  DestXCF:   201.1.10.13
  TotalConn: 0000152960  Rdy: 001  WLM: 00 TSR: 100
  DistMethod: Roundrobin
  Flg: EXT
Dest:        201.2.10.11..21
  DestXCF:   201.1.10.15
  TotalConn: 0000000000  Rdy: 001  WLM: 01 TSR: 075
  DistMethod: Roundrobin
  Flg: Dynamic, Inactive
```

```
Dest:        201.2.10.13..243
  DestXCF:   201.3.10.16
  TotalConn: 0000000000  Rdy: 001  WLM: 08 TSR: 085
  DistMethod: BaseWLM
  Flg:
Dest:        201.2.10.14..244
  DestXCF:   201.3.10.16
  TotalConn: 0000000000  Rdy: 001  WLM: 15 TSR: 090
  DistMethod: ServerWLM
  Flg: Tier1
Dest:        201.2.10.15..5000
  DestXCF:   201.3.10.15
  TotalConn: 0000034011  Rdy: 001  WLM: 10 TSR: 100
  DistMethod: WeightedActive
  Flg:
Dest:        201.2.10.18..4040
  DestXCF:   201.3.10.16
  TotalConn: 0000063421  Rdy: 001  WLM: 30 TSR: 100
  DistMethod: ServerWLM
  Flg: Tier2
Dest:        201.2.10.18..4040
  DestXCF:   201.3.10.15
  TotalConn: 0000019011  Rdy: 001  WLM: 07 TSR: 100
  DistMethod: ServerWLM
  Flg: Tier2
Dest:        201.4.10.15..7000
  DestXCF:   201.3.10.16
  TotalConn: 0000094011  Rdy: 001  WLM: 10 TSR: 100
  DistMethod: HotStandby           SrvType: Preferred
  Flg: Active
Dest:        201.4.10.15..7000
  DestXCF:   201.3.10.17
  TotalConn: 0000000000  Rdy: 001  WLM: 10 TSR: 100
  DistMethod: HotStandby           SrvType: Backup
  Flg: Backup
DestIntf:
  Dest:        2001:0db8::522:f103..20
    DestXCF:   2001:0db8::943:f003
    TotalConn: 0000000000  Rdy: 001  WLM: 01 TSR: 094
    DistMethod: BaseWLM
    Flg:
DestIntf:
  Dest:        2001:0db8::522:f103..21
    DestXCF:   2001:0db8::943:f003
    TotalConn: 0000000000  Rdy: 001  WLM: 15 TSR: 100
    DistMethod: ServerWLM
    Flg:
```

NETSTAT VDPT DETAIL

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS          15:37:51
Dynamic VIPA Destination Port Table for TCP/IP Stacks:
Dest:        201.2.10.9..8888
  DestXCF:   201.1.10.13
  TotalConn: 0000152960  Rdy: 001  WLM: 00 TSR: 100
  DistMethod: Roundrobin
```

```
  Flg: EXT
  TCSR: 100  CER: 100 SEF: 100
  ActConn:   0000000042
Dest:        201.2.10.11..21
  DestXCF:   201.1.10.15
  TotalConn: 0000000000  Rdy: 001  WLM: 01 TSR: 075
  DistMethod: Roundrobin
  Flg: Dynamic, Inactive
  TCSR: 100  CER: 075 SEF: 100
  ActConn:   0000000000
Dest:        201.2.10.13..243
  DestXCF:   201.3.10.16
  TotalConn: 0000000000  Rdy: 001  WLM: 01 TSR: 090
  DistMethod: BaseWLM
  Flg:
  TCSR: 100  CER: 095 SEF: 090
  Weight: 12
    Raw          CP: 13 zAAP: 00 zIIP: 10
    Proportional CP: 08 zAAP: 00 zIIP: 04
  ActConn:   0000000000
  QosPlcAct: *DEFAULT*
    W/Q: 01
Dest: 201.2.10.14..244
  DestXCF: 201.3.10.16
  TotalConn: 0000000000 Rdy: 001 WLM: 15 TSR: 090
  DistMethod: ServerWLM
  Flg: Tier1
  TCSR: 100  CER: 095 SEF: 090
  Weight: 60
    Raw          CP: 50 zAAP: 00 zIIP: 61
    Proportional CP: 05 zAAP: 00 zIIP: 55
  Abnorm: 0000        Health: 100
  ActConn:   00000000
  QosPlcAct: *DEFAULT*
    W/Q: 15
Dest: 201.2.10.15..5000
  DestXCF: 201.3.10.15
  TotalConn: 0000034011 Rdy: 001 WLM: 10 TSR: 100
  DistMethod: WeightedActive
  Flg:
  TCSR: 100 CER: 100 SEF: 100
  Abnorm: 0000       Health: 100
  ActConn:      00003011
Dest:        201.2.10.18..4040
  DestXCF:   201.3.10.16
  TotalConn: 0000063421  Rdy: 001  WLM: 15 TSR: 100
  DistMethod: ServerWLM
  Flg: Tier2
  TCSR: 100 CER: 100 SEF: 100
  Weight: 60
    Raw          CP: 60 zAAP: 00 zIIP: 00
    Proportional CP: 60 zAAP: 00 zIIP: 00
  Abnorm: 0000       Health: 100
  ActConn:   00006006
  QosPlcAct: *DEFAULT*
    W/Q: 15
Dest:        201.2.10.18..4040
```

```
  DestXCF:   201.3.10.15
  TotalConn: 0000055421  Rdy: 001  WLM: 07 TSR: 100
  DistMethod: ServerWLM
  Flg: Tier2
  TCSR: 100 CER: 100 SEF: 100
  Weight: 60
    Raw          CP: 60 zAAP: 00 zIIP: 00
    Proportional CP: 60 zAAP: 00 zIIP: 00
  Abnorm: 0000       Health: 100
  ActConn:   0000003006
  QosPlcAct: *DEFAULT*
    W/Q: 07
Dest:        201.4.10.15..7000
  DestXCF:   201.3.10.16
  TotalConn: 0000094011  Rdy: 001  WLM: 10 TSR: 100
  DistMethod: HotStandby           SrvType: Preferred
  Flg: Active
  TCSR: 100  CER: 100  SEF: 100
  Abnorm: 0000         Health: 100
  ActConn:    0000001011
Dest:        201.4.10.15..7000
  DestXCF:   201.3.10.17
  TotalConn: 0000000000  Rdy: 001  WLM: 10 TSR: 100
  DistMethod: HotStandby           SrvType: Backup
  Flg: Backup
  TCSR: 100  CER: 100  SEF: 100
  Abnorm: 0000         Health: 100
  ActConn:    0000000000
DestIntf:
  Dest:        2001:0db8::522:f103..20
    DestXCF:   2001:0db8::943:f003
    TotalConn: 0000000000  Rdy: 001  WLM: 01 TSR: 100
    DistMethod: BaseWLM
    Flg:
    TCSR: 100  CER: 100 SEF: 100
    Weight: 16
      Raw          CP: 24 zAAP: 00 zIIP: 08
      Proportional CP: 12 zAAP: 00 zIIP: 04
    ActConn:   0000000000
    QosPlcAct: *DEFAULT*
      W/Q: 00
DestIntf:
  Dest:        2001:0db8::522:f103..21
    DestXCF:   2001:0db8::943:f003
    TotalConn: 0000000000  Rdy: 001  WLM: 15 TSR: 100
    DistMethod: ServerWLM
    Flg:
    TCSR: 100  CER: 100 SEF: 100
    Weight: 50
      Raw          CP: 60 zAAP: 00 zIIP: 49
      Proportional CP: 06 zAAP: 00 zIIP: 44
    Abnorm:0000         Health: 100
    ActConn:   0000000000
    QosPlcAct: *DEFAULT*
      W/Q: 15
```

Report field descriptions for the Dynamic VIPA Destination Port Table for TCP/IP Stacks

Displays information about distribution to TCP/IP stacks, including base targets and z/OS® tier 1 and tier 2 targets.

For a SHORT format report

Flg

Flags; depending on the VIPADISTRIBUTE configuration parameters, the state of the target, and the path to the target, flags can have the following values:

1
Indicates that this is a tier 1 DVIPA address.

2
Indicates that this is a tier 2 DVIPA address.

D
Indicates a dynamically assigned destination/port entry.

I
Indicates that the data path to the target stack is inactive.

K
Indicates that this is currently a backup (hot standby) server.

L
Indicates that the target stack specified by the DestXCF Addr value is currently processing outbound connections that originated on the target stack for this destination and port pair locally.

V
Indicates that this is currently the active server.

X
Indicates that this DVIPA is used to distribute requests to non-z/OS (external) targets.

For a LONG format report

Flg

Flags; depending on the VIPADISTRIBUTE configuration parameters, the state of the target, and the path to the target, flags can have the following values:

Active
Indicates that this is currently the active server.

Backup
Indicates that this is currently a backup (hot standby) server.

Dynamic
Indicates a dynamically assigned destination/port entry.

EXT
Indicates that this DVIPA is used to distribute requests to non-z/OS (external) targets.

Inactive

Indicates that the datapath to the XCF target is inactive.

Local

Indicates that the target stack specified by the DestXCF Addr value is currently processing outbound connections for this destination and port pair locally.

Tier1

Indicates that this is a tier 1 DVIPA address.

Tier2

Indicates that this is a tier 2 DVIPA address.

Netstat VCRT/-V report

Displays the dynamic VIPA Connection Routing Table used for sysplex distributor and moveable dynamic VIPA support. On a sysplex distributor routing stack, it displays all connections being routed through the distributor. On a stack taking over a dynamic VIPA, it displays every connection to the dynamic VIPA. On a sysplex distributor target stack or a stack that is in the process of giving up a dynamic VIPA, the report displays every connection for which the stack is an endpoint.

Report examples

The following examples are generated by using TSO NETSTAT command. Using the z/OS® UNIX netstat command displays the data in the same format as the TSO NETSTAT command.

Not IPv6 enabled (SHORT format)

NETSTAT VCRT

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           18:17:26
Dynamic VIPA Connection Routing Table:
Dest IPaddr      DPort  Src IPaddr       SPort  DestXCF Addr
-----------      -----  ----------       -----  ------------
201.2.10.11      00021  193.9.200.1      00000  193.1.1.18
201.2.10.11      00021  193.9.200.1      01025  193.1.1.18
201.2.10.11      00021  201.1.10.85      01026  201.1.10.10
203.1.10.18      08000  193.10.1.1.118   01080  193.1.1.108
```

NETSTAT VCRT DETAIL

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           14:16:16
Dynamic VIPA Connection Routing Table:
Dest IPaddr      DPort  Src IPaddr       SPort  DestXCF Addr
-----------      -----  ----------       -----  ------------
201.2.10.11      00021  201.1.10.85      00000  201.1.10.10
  CfgTimAff: 0200  TimAffCnt: 0000000002  TimAffLft: 0000
201.2.10.11      00021  201.1.10.85      01026  201.1.10.10
  PolicyRule:    *NONE*
  PolicyAction:  *NONE*
  Intf:  CTC1
    VipaRoute: Yes      Gw: 0.0.0.0
  Accelerator: No
```

```
201.2.10.11      00021  201.1.10.85      01027  201.1.10.10
  PolicyRule:    *NONE*
  PolicyAction:  *NONE*
  Intf:   OSAQDIOLINK
    VipaRoute: Yes      Gw: 199.100.1.1
  Accelerator: yes
203.1.10.18      08000  193.10.1.118     01080  193.1.1.108
  PolicyRule:    PRule-TCP-High
  PolicyAction:  PAction-TCP-High
  Intf:   EZAXCFC7
    VipaRoute: No       Gw: 0.0.0.0
  Accelerator: No
203.1.10.19      09000  193.10.1.119     01081  193.1.1.109
  PolicyRule:    PRule-TCP-High
  PolicyAction:  PAction-TCP-High
  Intf:   EZAXCFC6
    VipaRoute: Unavail  Gw: 0.0.0.0
  Accelerator: No
```

IPv6 enabled or request for LONG format

NETSTAT VCRT

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           20:04:04
Dynamic VIPA Connection Routing Table:
Dest:      201.2.10.11..21
  Source:  193.9.200.1..0
  DestXCF: 193.1.1.18
Dest:      201.2.10.11..21
  Source:  193.9.200.1..1025
  DestXCF: 193.1.1.18
Dest:      201.2.10.11..21
  Source:  201.1.10.85..1026
  DestXCF: 201.1.10.10
Dest:      203.1.10.18..8000
  Source:  193.9.200.1..1080
  DestXCF: 193.1.1.108

Dest:      2001:0db8::0522:f103..21
  Source:  2001:0db8::0524:f104..1026
  DestXCF: 2001:0db8::0943:f003
```

NETSTAT VCRT DETAIL

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           20:04:04
Dynamic VIPA Connection Routing Table:
Dest:      201.2.10.11..21
  Source:  201.1.10.85..0
  DestXCF: 201.1.10.10
    CfgTimAff: 0200  TimAffCnt: 0000000002  TimAffLft: 0000
Dest:      201.2.10.11..21
  Source:  201.1.10.85..1026
  DestXCF: 201.1.10.10
    PolicyRule:    *NONE*
```

```
    PolicyAction:  *NONE*
    Intf:   CTC1
      VipaRoute: Yes      Gw: 0.0.0.0
  Accelerator: No
Dest:      201.2.10.11..21
  Source:  201.1.10.85..1027
  DestXCF: 201.1.10.10
    PolicyRule:    *NONE*
    PolicyAction:  *NONE*
    Intf:   OSAQDIOLINK
      VipaRoute: Yes      Gw: 199.100.1.1
  Accelerator: No
Dest:      203.1.10.18..8000
  Source:  193.9.200.1..1080
  DestXCF: 193.1.1.108
    PolicyRule:    PRule-TCP-High
    PolicyAction:  PAction-TCP-High
    Intf:   EZAXCFC7
      VipaRoute: No       Gw: 0.0.0.0
  Accelerator: No
Dest:      203.1.10.19..9000
  Source:  193.9.10.119..1081
  DestXCF: 193.1.1.109
    PolicyRule:    PRule-TCP-High
    PolicyAction:  PAction-TCP-High
    Intf:   EZAXCFC6
      VipaRoute: Unavail  Gw: 0.0.0.0
  Accelerator: No
 Dest:     2ec0::0522:f103..21
  Source:  2ec0::0524:f104..1026
  DestXCF: 2ec0::0943:f003
    PolicyRule:    PRule-TCP-High
    PolicyAction:  PAction-TCP-High
    Intf:   OSAQDIO46
      VipaRoute: Yes      Gw:  2ec0::206:2aff:fe71:4400
```

Netstat VIPADCFG/-F report

Displays the dynamic VIPA configuration for a local host.

Report examples

Not IPv6 enabled (SHORT format)

```
NETSTAT VIPADCFG
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           19:47:49
Dynamic VIPA Information:

 VIPA Range:
   AddressMask      IP Address       Moveable  SAF Name Flg
   -----------      ----------       --------  -------- ---
   255.255.255.192  201.2.10.192     NonDisr   RANGE1
   255.255.255.192  201.2.20.192     Disrupt
```

```
   255.255.255.0    201.3.10.1       Disrupt   ZCXRANGE C

 VIPA Distribute:
   IP Address       Port   DestXCF          SysPt  TimAff  Flg
   ----------       ----   -----------      -----  ------  ----
   201.2.10.9       n/a    201.1.10.13      n/a    No      X
   201.2.10.11      n/a    ALL              Yes    200
   201.2.10.13      243    ALL              No     No      O
   201.2.10.14      244    ALL              No     No      1
   201.2.10.15      5000   201.3.10.15      No     No      A
   201.2.10.17      8080   200.1.10.10      No     Yes     1
   201.2.10.18      4040   201.3.10.16      No     Yes     2
   201.2.10.18      4040   201.3.10.15      No     Yes     2
   201.4.10.15      7000   201.3.10.16      No     No
   201.4.10.15      7000   201.3.10.17      No     No


 VIPA Route:
   XCF Address     TargetIp
   -----------     --------
   201.10.10.1     201.20.20.1
   201.10.10.2     201.20.20.2
   201.10.10.3     201.20.20.3
Deactivated Dynamic VIPA Information:

 VIPA Backup:
   IP Address       Rank    Address Mask     Moveable  Flg
   ----------       ----    ------------     --------  ---
   201.2.10.40      100     255.255.255.192  Immediate

 VIPA Define:
   IP Address       AddressMask      Moveable  Flg
   ----------       -----------      --------  ---
   201.2.10.20      255.255.255.192  Immediate

 VIPA Distribute:
   IP Address       Port   XCF Address      SysPt  TimAff  Flg
   ----------       ----   -----------      -----  ------  ----
   201.2.10.20      5000    ALL              No     No      B
```

NETSTAT VIPADCFG DETAIL

```
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           19:47:49
Dynamic VIPA Information:

VIPA Backup:
   IP Address       Rank    Address Mask     Moveable  Flg
   ----------       ----    ------------     --------  ---
   201.2.10.29      025     255.255.255.192  WhenIdle
   201.2.10.30      100     255.255.255.192  Immediate
   201.2.10.32      040
   201.2.10.40      010     255.255.255.192  Immediate 1
   201.2.10.45      020     255.255.255.192  Immediate 2
   201.2.10.54      010     255.255.255.192  Immediate C

 VIPA Define:
   IP Address       AddressMask      Moveable  Flg
   ----------       -----------      --------  ---
```

```
   201.2.10.11      255.255.255.192  WhenIdle
   201.2.10.12      255.255.255.192  Immediate
   201.2.10.13      255.255.255.192  Immediate
   201.2.10.17      255.255.255.192  Immediate 1
   201.2.10.18      255.255.255.192  Immediate 2C
   201.2.10.19      255.255.255.192  Immediate C
   201.2.10.31      255.255.255.192  Immediate 1


 VIPA Range:
   AddressMask      IP Address       Moveable  SAF Name   Flg
   -----------      ----------       --------  --------   ---
   255.255.255.192  201.2.10.192     NonDisr   RANGE1
   255.255.255.192  201.2.20.192     Disrupt
   255.255.255.0    201.3.10.1       Disrupt   ZCXRANGE   C

  VIPA Distribute:

   IP Address       Port   DestXCF          SysPt  TimAff  Flg
   ----------       ----   -----------      -----  ------  ----
   201.2.10.9       n/a    201.1.10.13      n/a    No      X
     DistMethod: Roundrobin
     OptLoc: n/a
   201.2.10.11      n/a    ALL              Yes    200     R
     DistMethod: Roundrobin
     OptLoc: No
   201.2.10.13      243    ALL              No     No      O
     DistMethod: BaseWLM
     OptLoc: 1
     ProcType:
       CP: 60  zAAP: 00  zIIP: 40
   201.2.10.14      243    ALL              No     No      1
     DistMethod: ServerWLM
     OptLoc: No
     ProcXCost:
       zAAP: 003  zIIP: 001
     ILWeighting: 1
   201.2.10.18      4040   201.3.10.16      No     Yes     2
     DistMethod: ServerWLM
     OptLoc: No
     GrpName: CICSGROUP
     ProcXCost:
       zAAP: 003  zIIP: 001
     ILWeighting: 1
   201.2.10.18      4040   201.3.10.15      No     Yes     2
     DistMethod: ServerWLM
     OptLoc: No
     GrpName: FTPGROUP
   201.4.10.15      7000   201.3.10.16      No     No
     DistMethod: HotStandby      SrvType: Preferred
     AutoSwitchBack: Yes         HealthSwitch: Yes
     OptLoc: No
   201.4.10.15      7000   201.3.10.17      No     No
     DistMethod: HotStandby      SrvType: Backup  Rank: 001
     AutoSwitchBack: Yes         HealthSwitch: Yes
     OptLoc: No
```

```
 VIPA Route:
   XCF Address     TargetIp
   -----------     --------
   201.10.10.1     201.20.20.1
   201.10.10.2     201.20.20.2
   201.10.10.3     201.20.20.3

Deactivated Dynamic VIPA Information:

 VIPA Backup:
   IP Address       Rank    Address Mask     Moveable  SrvMgr Flg
   ----------       ----    ------------     --------  ------ ---
   201.2.10.40      100     255.255.255.192  Immediate No

 VIPA Define:
   IP Address       AddressMask      Moveable  SrvMgr Flg
   ----------       -----------      --------  ------ ---
   201.2.10.20      255.255.255.192  Immediate No

 VIPA Distribute:
   IP Address       Port   XCF Address      SysPt  TimAff  Flg
   ----------       ----   -----------      -----  ------  ----
   201.2.10.20      5000    ALL              No     No      B
```

IPv6 enabled or request for LONG format

```
NETSTAT VIPADCFG
MVS TCP/IP NETSTAT CS V2R5       TCPIP Name: TCPCS           19:49:12
Dynamic VIPA Information:

  VIPA Backup:
    IpAddr/PrefixLen: 201.2.10.29/26
      Rank: 025  Moveable: WhenIdle   Flg:
    IpAddr/PrefixLen: 201.2.10.30/26
      Rank: 025  Moveable: Immediate  Flg:
    IpAddr/PrefixLen: 201.2.10.32
      Rank: 040  Moveable:            Flg:
    IpAddr/PrefixLen: 201.2.10.40
      Rank: 010  Moveable: Immediate  Flg: 1
    IpAddr/PrefixLen: 201.2.10.45
      Rank: 020  Moveable: Immediate  Flg: 2
    IpAddr/PrefixLen: 201.2.10.54
      Rank: 010  Moveable: Immediate  Flg: C
    IntfName: INTFNAM5
      IpAddr: 2001:db8::526:f604/64
        Rank: 050  Moveable: Immediate  Flg: 2C
    IntfName: INTFNAM4
      IpAddr: 2001:db8::526:f606/64
        Rank: 025  Moveable: WhenIdle   Flg: C
    IntfName: INTFNAM6
      IpAddr: 2001:db8::526:f603
```

```
        Rank: 050  Moveable:           Flg:

  VIPA Define:
    IpAddr/PrefixLen: 201.2.10.11/26
      Moveable: WhenIdle   Flg:
    IpAddr/PrefixLen: 201.2.10.12/26
      Moveable: Immediate  Flg:
    IpAddr/PrefixLen: 201.2.10.13/26
      Moveable: Immediate  Flg:
    IpAddr/PrefixLen: 201.2.10.14/26
      Moveable: Immediate Flg:
    IpAddr/PrefixLen: 201.2.10.17/26
      Moveable: Immediate Flg: 1
    IpAddr/PrefixLen: 201.2.10.18/26
      Moveable: Immediate Flg: 2C
    IpAddr/PrefixLen: 201.2.10.19/26
      Moveable: Immediate Flg: C
    IpAddr/PrefixLen: 201.2.10.31/26
      Moveable: Immediate Flg: 1
    IntfName: INTFNAM1
      IpAddr: 2001:0db8::522:f103
        Moveable: Immediate  Flg:
    IntfName: INTFNAM2
      IpAddr: 2001:0db8::522:f203
        Moveable: Immediate  Flg:
    IntfName: INTFNAMB
      IpAddr: 2001:0db8::522:f222/64
        Moveable: Immediate  Flg: 1
    IntfName: INTFNAMC
      IpAddr: 2001:0db8::522:f333/64
        Moveable: Immediate  Flg: 2C
    IntfName:  INTFNAMD
      IpAddr: 2001:0db8::22:f334/64
        Moveable: Immediate  Flg: C


  VIPA Range:
    IpAddr/PrefixLen: 201.2.10.192/26
      Moveable: NonDisr   SAFName: RANGE1   FLG:
    IpAddr/PrefixLen: 201.2.20.192/26
      Moveable: Disrupt                     FLG:
    IpAddr/PrefixLen: 201.3.10.1/24
      Moveable: Disrupt   SAFName: ZCXRANGE FLG: C
    IntfName: INTFNAM3
      IpAddr/PrefixLen: 2001:0db8::522:f303/24
        Moveable: NonDisr   SAFName: RANGE2

VIPA Distribute:
   Dest:       201.1.10.9..n/a
     DestXCF:    201.2.10.13
     DistMethod: Roundrobin
     SysPt:   n/a  TimAff: No    Flg: EXT
    Dest:        201.2.10.11..n/a
      DestXCF:   ALL
      DistMethod: Roundrobin
      SysPt:   Yes  TimAff: 200  Flg: Roundrobin
    Dest:        201.2.10.13..243
```

```
      DestXCF:   ALL
      DistMethod: BaseWLM
      SysPt:   No   TimAff: No   Flg: OptLocal
    Dest:        201.2.10.14..244
      DestXCF:   ALL
      DistMethod: ServerWLM
      SysPt:   No   TimAff: No   Flg: Tier1
    Dest:        201.2.10.17..8080
      DestXCF:   200.1.10.10
      SysPt:   No   TimAff: Yes  Flg: Tier1
    Dest:        201.2.10.18..4040
      DestXCF:   201.3.10.15
      DistMethod: ServerWLM
      SysPt:   No   TimAff: Yes  Flg: Tier2
    Dest:        201.2.10.18..4040
      DestXCF:   201.3.10.16
      DistMethod: ServerWLM
      SysPt:   No   TimAff: Yes  Flg: Tier2
    Dest:        201.4.10.15..7000
      DestXCF:   201.3.10.16
      DistMethod: HotStandby       SrvType: Preferred
      SysPt:   No   TimAff: Yes  Flg:
    Dest:        201.4.10.15..7000
      DestXCF:   201.3.10.17
      DistMethod: HotStandby       SrvType: Backup  Rank: 001
      SysPt:   No   TimAff: Yes  Flg:
    DestIntf:    INTFNAM1
      Dest:      2001:0db8::522:f103..20
        DestXCF: ALL
        DistMethod: ServerWLM
        SysPt: No   TimAff: No    Flg:
    DestIntf:    INTFNAM1
      Dest:      2001:0db8::522:f103..21
        DestXCF: ALL
        DistMethod: ServerWLM
        SysPt: Yes  TimAff: 10    Flg:


VIPA Route:
    DestXCF:     201.10.10.1
      TargetIp:  201.20.20.1
    DestXCF:     201.10.10.2
      TargetIp:  201.20.20.2
    DestXCF:     2eco::500:f103
      TargetIp:  2eco::100:f103

Deactivated Dynamic VIPA Information:
VIPA Backup:
    IpAddr/PrefixLen: 201.2.10.40/26
      Rank: 025  Moveable: Immediate  Flg:

  VIPA Define:
     IpAddr/PrefixLen: 201.2.10.20/26
      Moveable: Immediate  Flg:


VIPA Distribute:
```

```
    Dest:        201.2.10.20..5000
      DestXCF:   ALL
        SysPt:   No   TimAff: No   Flg: BaseWLM


NETSTAT VIPADCFG DETAIL
MVS TCP/IP NETSTAT CS V2R5      TCPIP Name: TCPCS           19:49:12

Dynamic VIPA Information:

  VIPA Backup:
    IpAddr/PrefixLen: 201.2.10.29/26
      Rank: 025  Moveable: WhenIdle   Flg:
    IpAddr/PrefixLen: 201.2.10.30/26
      Rank: 025  Moveable: Immediate  Flg:
    IpAddr/PrefixLen: 201.2.10.32
      Rank: 040  Moveable:            Flg:
    IpAddr/PrefixLen: 201.2.10.40
      Rank: 010  Moveable: Immediate  Flg: 1
    IpAddr/PrefixLen: 201.2.10.45
      Rank: 020  Moveable: Immediate  Flg: 2
    IpAddr/PrefixLen: 201.2.10.54
      Rank: 010  Moveable: Immediate  Flg: C
    IntfName: INTFNAM5
      IpAddr: 2001:db8::526:f604/64
        Rank: 050  Moveable: Immediate  Flg: 2C
    IntfName: INTFNAM4
      IpAddr: 2001:db8::526:f606/64
        Rank: 025  Moveable: WhenIdle   Flg: C
    IntfName: INTFNAM6
      IpAddr: 2001:db8::526:f603
        Rank: 050  Moveable:            Flg:

  VIPA Define:
    IpAddr/PrefixLen: 201.2.10.11/26
      Moveable: WhenIdle   Flg:
    IpAddr/PrefixLen: 201.2.10.12/26
      Moveable: Immediate  Flg:
    IpAddr/PrefixLen: 201.2.10.13/26
      Moveable: Immediate  Flg:
    IpAddr/PrefixLen: 201.2.10.17/26
      Moveable: Immediate Flg: 1
    IpAddr/PrefixLen: 201.2.10.18/26
      Moveable: Immediate Flg: 2C
    IpAddr/PrefixLen: 201.2.10.19/26
      Moveable: Immediate Flg: C
    IpAddr/PrefixLen: 201.2.10.31/26
      Moveable: Immediate Flg: 1
    IntfName: INTFNAM1
      IpAddr: 2001:db8::522:f103
        Moveable: Immediate  Flg:
    IntfName: INTFNAM2
      IpAddr: 2001:db8::522:f203
        Moveable: Immediate  Flg:
    IntfName: INTFNAMB
      IpAddr: 2001:0db8::522:f222/64
        Moveable: Immediate Flg: 1
```

```
    IntfName: INTFNAMC
      IpAddr: 2001:0db8::522:f333/64
        Moveable: Immediate Flg: 2C
    IntfName: INTFNAMD
      IpAddr: 2001:0db8::22:f334/64
        Moveable: Immediate Flg: C

  VIPA Range:
    IpAddr/PrefixLen: 201.3.10.1/24
     Moveable: Disrupt SAFName: ZCXRANGE FLG: C
    IpAddr/PrefixLen: 201.2.10.192/26
      Moveable: NonDisr   SAFName: RANGE1
    IpAddr/PrefixLen: 201.2.20.192/26
      Moveable: Disrupt
    IntfName: INTFNAM3
      IpAddr/PrefixLen: 2001:db8::522:f303/24
        Moveable: NonDisr   SAFName: RANGE2

  VIPA Distribute:
    Dest:        201.1.10.9..n/a
      DestXCF:   201.2.10.13
      DistMethod: Roundrobin
      SysPt:   n/a  TimAff: No Flg: EXT
      OptLoc:  n/a
    Dest:        201.2.10.11..n/a
      DestXCF:   ALL
      DistMethod: Roundrobin
      SysPt:   Yes  TimAff: 200 Flg: Roundrobin
      OptLoc:  No
    Dest:        201.2.10.13..243
      DestXCF:   ALL
      DistMethod: BaseWLM
      SysPt:   No   TimAff: No  Flg: OptLocal
      OptLoc:  1
    Dest:        201.2.10.14..244
      DestXCF:   ALL
      DistMethod: ServerWLM
      SysPt:   No   TimAff: No  Flg: Tier1
      OptLoc:  No
   Dest:        201.2.10.18..4040
      DestXCF:   201.3.10.15
      DistMethod: ServerWLM
      SysPt:   No   TimAff: Yes  Flg: Tier2
      OptLoc:  No
      ProcXCost:
        zAAP: 001  zIIP: 001
      ILWeighting: 0
      GrpName: CICSGROUP
    Dest:        201.2.10.18..4040
      DestXCF:   201.3.10.16
      DistMethod: ServerWLM
      SysPt:   No   TimAff: Yes  Flg: Tier2
      OptLoc:  No
      ProcXCost:
        zAAP: 001  zIIP: 001
      ILWeighting: 0
      GrpName: CICSGROUP
```

```
    Dest:        201.4.10.15..7000
      DestXCF:   201.3.10.16
      DistMethod: HotStandby      SrvType: Preferred
      AutoSwitchBack: Yes         HealthSwitch: Yes
      SysPt:   No   TimAff: Yes   Flg:
      OptLoc:  No
    Dest:        201.4.10.15..7000
      DestXCF:   201.3.10.17
      DistMethod: HotStandby      SrvType: Backup  Rank: 001
      AutoSwitchBack: Yes         HealthSwitch: Yes
      SysPt:   No   TimAff: Yes   Flg:
      OptLoc:  No
    DestIntf:    INTFNAM1
      Dest:      2001:db8::522:f103..20
        DestXCF: ALL
        DistMethod: ServerWLM
        SysPt:   No   TimAff: No  Flg:
        OptLoc:  No
        ProcXCost:
          zAAP: 001  zIIP: 001
        ILWeighting: 0
    DestIntf:    INTFNAM1
      Dest:      2001:db8::522:f103..21
        DestXCF: ALL
        DistMethod: ServerWLM
        SysPt:   Yes  TimAff: 10  Flg:
        OptLoc:  No
        ProcXCost:
          zAAP: 001  zIIP: 001
        ILWeighting: 0


  VIPA Route:
    DestXCF:     201.10.10.1
      TargetIp:  201.20.20.1
    DestXCF:     201.10.10.2
      TargetIp:  201.20.20.2
    DestXCF:     2eco::500:f103
      TargetIp:  2eco::100:f103

Deactivated Dynamic VIPA Information:
VIPA Backup:
    IpAddr/PrefixLen: 201.2.10.40/26
      Rank: 025  Moveable: Immediate  Flg:

  VIPA Define:
    IpAddr/PrefixLen: 201.2.10.20/26
      Moveable: Immediate  Flg:


VIPA Distribute:
    Dest:        201.2.10.20..5000
      DestXCF:   ALL
        SysPt:   No   TimAff: No   Flg: BaseWLM
```

Report field descriptions

VIPA Distribute

Displays the configured dynamic VIPA define information.

For a SHORT format report:

IP Address

The specific IP address for which incoming connections are to be distributed.

Port

The specific port for which incoming connections are to be distributed. A port value of n/a indicates that the PORT parameter was not specified on the VIPADISTRIBUTE profile statement.

Result: If multiple ports were specified individually or in a range on a VIPADISTRIBUTE statement, one entry is displayed for each address and port combination.

XCF Address

The dynamic XCF address (IPCONFIG DYNAMICXCF) of a target stack for incoming connections to the DVIPA and port.

Weight

The configured distribution method is WEIGHTEDActive. This is the configured active connection weight that is used when incoming connections are distributed to this target stack.

Flg

Flags including the following values:

1

Indicates that the DVIPA is used to distribute incoming requests to tier 1 targets.

2

Indicates that the DVIPA is used to distribute incoming requests from tier 1 targets to a group of tier 2 server applications.

O

Indicates that the OPTLOCAL keyword was defined on the VIPADISTRIBUTE profile statement. To see the OPTLOCAL value currently in effect, issue the Netstat VIPADCFG/-F command with the DETAIL keyword.

X

Indicates that this DVIPA is used to distribute requests to non-z/OS (external) targets.

For a LONG format report:

DestIntf

The name of this IPv6 interface.

Dest

The specific IP address and port for which incoming connections are to be distributed. A port value of n/a indicates that the PORT parameter was not specified on the VIPADISTRIBUTE profile statement.

Result: If multiple ports were specified individually or in a range on a VIPADISTRIBUTE statement, one entry is displayed for each address and port combination.

DestXCF
The dynamic XCF address (IPCONFIG6 DYNAMICXCF) of a target stack for incoming connections to the DVIPA and port.

Flg
Flags including the following values:

EXT
Indicates that this DVIPA is used to distribute requests to non-z/OS (external) targets.

OptLocal
Indicates that the OPTLOCAL keyword was defined on the VIPADISTRIBUTE profile statement. To see the OPTLOCAL value currently in effect, issue the Netstat VIPADCFG/-F command with the DETAIL keyword.

Tier1
Indicates that the DVIPA is used to distribute incoming requests to tier 1 targets.

Tier2
Indicates that the DVIPA is used to distribute incoming requests from tier 1 targets to a group of tier 2 server applications.

VARY TCPIP,,SYSPLEX

Use the VARY TCPIP,,SYSPLEX command to change the sysplex configuration of the TCP/IP stack.

Parameters

QUIesce
Requests that the specified application, or all applications on a particular TCP/IP stack, be quiesced from DVIPA sysplex distributor workload balancing. After the command is issued, sysplex distributor will no longer route new TCP connection requests to the specified applications. Existing connections to these applications are not affected. This command must be issued on the local system where the applications are to be quiesced. This command can be useful in scenarios where you would like to temporarily divert new TCP connection requests away from a specific application or target system. One such scenario is when a particular application or system is to be shutdown (for example, in order to apply maintenance). Issuing this command prior to the shutdown can allow applications to gracefully complete any existing

workload requests. PORT, JOBNAME or TARGET parameters must be specified following the QUIESCE keyword.

POrt=*portnum*

The port number parameter is an integer in the range 1 – 65 535 and is optional. Applications bound to this port number are excluded from DVIPA sysplex distributor workload balancing (they do not receive new TCP connection requests from sysplex distributor). If the *portnum* value specifies a port that has more than one instance of an application bound to it with either a different *jobname* or *asid* value, then either the JOBNAME value or the JOBNAME and ASID values must be specified to identify a unique specific application instance to be quiesced. PORT or TARGET parameters must be specified following the QUIESCE keyword.

JOBNAME=*jobname*

The *jobname* value specifies the MVS™ job name of the application with which the Quiesce command is associated.

- If the JOBNAME parameter is specified without the PORT keyword, then all applications with this *jobname* or *asid* value are quiesced regardless of the port they are bound to.
- If the *jobname* value specifies a job name that has more than one instance of an application with that job name but that has a different *asid* value, then the ASID parameter must also be specified and all application instances that have a matching job name are quiesced, regardless of the port they are using.
- The environment in which the application runs determines the job name that is to be associated with a particular client or server application.
- The *jobname* value can be up to 8 characters in length and is optional.

Guidelines:

- Applications submitted as batch jobs use the batch job name.
- Job names associated with applications started from the MVS operator console using the START command are determined as follows:
    - If the START command is issued with the name of a member in a cataloged procedure library (for example, S APP1), the job name is the member name (for example, APP1).
    - If the member name on the START command is qualified by a started task identifier (for example, S APP1.ABC), the job name is the started task identifier (for example, ABC).
    - The JOBNAME parameter can also be used on the START command to identify the job name (for example, S APP1,JOBNAME=XYZ).
    - The JOBNAME parameter can also be included on the JOB card.
- Applications run from a TSO user ID use the TSO user ID as the job name.
- Applications run from the z/OS® shell normally have a job name that is the logged on user ID plus a one-character suffix.
- Authorized users can run applications from the z/OS shell and use the _BPX_JOBNAME environment variable to set the job name. In this case, the value specified for the environment variable is the job name.
- z/OS UNIX applications started by INETD typically use the job name of the INETD server plus a one-character suffix.

ASID=*asid*

The *asid* value is optional and specifies the hexadecimal address space ID associated with the application to be quiesced. If the *portnum* value specifies a port that has more than one instance of that application bound to it and the *jobname* value is not unique, then you can specify an *asid* value to quiesce all application instances that match this port, job name, and *asid* value.

Guidelines:

- This command must be issued on the system and the TCP/IP stack where the application instance is running.
- This command applies to a single TCP/IP stack's application instance. If the server needs to be quiesced over multiple stacks in a CINET environment, the command would need to be issued on each stack.
- Any sysplex distributor timed affinities will be terminated. Existing connections are not affected.
- The quiesce state is associated with the application's active listening socket. If the application is recycled or if the application closes and opens a new listening socket on the specified port, the socket will no longer be in a quiesced state.
- If the application is bound to the unspecified address, it can continue to receive connection requests that are not using a distributed DVIPA as the destination IP address.
- Applications quiesced with the PORT= option can be resumed by issuing a RESUME command.

Rule: When applications are quiesced using the PORT= or JOBNAME= option followed by a quiesce TARGET option for the stack on which those applications reside, you can no longer resume individual applications using the PORT= or JOBNAME= option. Instead, you must resume the entire TCP/IP stack using the TARGET option.

Tips:

- The Netstat ALL command can be issued as follows to determine which applications have been quiesced: QUIESCED DEST|NO.
- When an application is quiesced, the ready count (Rdy) field that appears on the Netstat VDPT display (issued on the sysplex distributor routing stack) is decremented. If no other applications are listening on this port on this target TCP/IP stack, the count is zero.

TARGET

Requests that all applications on this TCP/IP stack be quiesced from DVIPA sysplex distributor workload balancing. Existing connections are not affected.

Guidelines:

- This command must be issued on the system and the TCP/IP stack that is being quiesced.
- This command applies to a single TCP/IP stack. If an entire system with multiple TCP/IP stacks in the CINET environment needs to be quiesced, then a command needs to be issued for each TCP/IP stack on the system.
- Any sysplex distributor timer-based affinities are terminated. Existing connections are not affected.

- While sysplex distributor will no longer route new distributed DVIPA TCP connection requests to this TCP/IP stack, any TCP connections that do not specify a distributed DVIPA address as the destination IP address continue to be serviced by this TCP/IP stack.
- The QUIESCE state for a TARGET persists for all applications (existing and new) running on this TCP/IP stack, until the TCP/IP stack is recycled or a V TCPIP,,RESUME,TARGET command is issued.
- When an entire TCP/IP stack is quiesced using the TARGET option, you cannot resume individual applications for workload distribution. You can, however, resume distribution for the entire TCP/IP stack using the V TCPIP,,RESUME,TARGET command.
- When an entire TCP/IP stack is quiesced using the TARGET option, a quiesce for an individual application on that target stack is ignored.
- Applications that are targets of a VIPADISTRIBUTE DVIPA with the EXTTARG keyword are not affected by this command and cannot be quiesced.

Tips:

- The Netstat ALL command can be issued to determine which applications have been quiesced: QUIESCED DEST|NO
- When a TCP/IP stack is quiesced, the ready count (Rdy) field that appears on the Netstat VDPT display (issued on the sysplex distributor routing stack) will be zero for all entries associated with this target TCP/IP stack.

This section provides information about distributed TCP connection processing for dynamic VIPA (DVIPA) interfaces. This information is configured on the VIPADYNAMIC VIPADISTRIBUTE profile statement. There can be multiple sections in the record. Each section represents one distributed dynamic VIPA, per one distributed port, per one destination to a target TCP/IP stack.

If requested configuration changes for this section were cancelled, then the following occurs:

- Only one section is provided in the record.
- Flag NMTP_DDVSChgCancelled is set. If this flag is set, no other information is provided in the section.

The following table shows the Distributed dynamic VIPA section.

Table. TCP/IP profile record Distributed dynamic VIPA (DVIPA) section

Offset	Name	Length	Format	Description
4(X'4')	NMTP_DDVSFlags	2	Binary	Distributed DVIPA flags: **X'8000', NMTP_DDVSChgCancelled:** If set, pending configuration changes for this section were cancelled because the stack is not currently joined to the sysplex group. If this flag is set, no other information is provided in this section. **X'4000', NMTP_DDVSIPv6:** If set, this is an IPv6 entry; otherwise, it is an Ipv4 entry. **X'2000', NMTP_DDVSPort:** If set, the PORT parameter was specified and field NMTP_DDVSDistPortNum contains the distributed port number. **X'1000', NMTP_DDVSDestipAll:** If set, connections to the DVIPA address can be distributed to all stacks connected to this stack by way of a dynamic XCF interface of the same protocol type (Ipv4 or Ipv6) as the DVIPA address. If flag NMTP_DDVSTier2 is set, connections can be distributed only to targets on the same CPC as the Tier2 distributor. **X'0800', NMTP_DDVSOptLocal:**

				If set, target stacks should normally process new connection requests locally instead of sending them to the sysplex distributor stack, depending on the OPTLOCAL value in field NMTP_DDVSOptLocalValue. **X'0400', NMTP_DDVSSysplexPorts:** If set, coordinated sysplex-wide ephemeral port assignment is activated for the distributed DVIPA on all stacks where the DVIPA is defined. **X'0200', NMTP_DDVSTier1:** If this parameter is set, incoming connection requests to the distributed DVIPA are distributed to z/OS® targets. **X'0100', NMTP_DDVSTier1Gre:** Deprecated in V2R5, value is 0. **X'0080', NMTP_DDVSTier2:** If set, the DVIPA is used to distribute incoming requests from tier 1 targets to server applications. The NMTP_DDVSTierGroupName field contains the TIER2 group name. **X'0040', NMTP_DDVSDeactivated:** If set, the associated distributed DVIPA is currently deactivated. DVIPA distribution can be deactivated by using the VARY TCPIP,,SYSPLEX,DEACTIVATE command to deactivate the corresponding DVIPA address. **X'0020', NMTP_DDVSSrvTypePreferred:** When the value of NMTP_DDVSDistMethod is HotStandby, this flag is set if the server type is Preferred: **1** This is the preferred server. **0** This is not the preferred server. **X'0010', NMTP_DDVSSrvTypeBackup:** When the value of NMTP_DDVSDistMethod is HotStandby, this flag is set if the server type is Backup: **1** This is a backup server. **0** This is not a backup server. **X'0008', NMTP_DDVSAutoSwitchBack:**

				When the value of NMTP_DDVSDistMethod is HotStandby, this flag is the AUTOSWITCHBACK setting: **1** AUTOSWITCHBACK is configured. **0** NOAUTOSWITCHBACK is configured **X'0004', NMTP_DDVSHealthSwitch:** When the value of NMTP_DDVSDistMethod is HotStandby, this flag is the HEALTHSWITCH setting: **1** HEALTHSWITCH is configured. **0** NOHEALTHSWITCH is configured. **X'0002', NMTP_DDVSEXTTARG:** If set, the DVIPA is used to distribute requests to non-z/OS (external) targets.

EZD2071E *target_type* AT DVIPA *ip_address* UNRESPONSIVE, SYSPLEX DISTRIBUTION STOPPED FOR THIS TARGET

Explanation

Message EZD2071E is issued because an unexpected failure occurred between the TCP/IP stack and the external target with the given DVIPA due to an issue with the target. The sysplex distributor will not forward connections to this target until the issue is resolved.

In the message text:

target_type

The type of appliance associated with the external target DVIPA that has become unresponsive. The possible value is ZCPA.

ip_address

The IP address of the dynamic VIPA associated with the unresponsive external target.

System action

TCP/IP continues but distribution to the IP address specified in the message has stopped. TCP/IP will periodically try to reestablish the control connection with the external appliance and the message will remain until a new connection is established.

Operator response

The operator should save the z/OS system log and the appliance job log and contact the system programmer.

System programmer response

Check the z/OS system log and appliance job log for any error messages. Check the FFDC directory associated with the appliance for a recent dump or issue the kubeadmz getDump command to obtain one. Refer to *Troubleshooting IBM z/OS Containers* of IBM z/OS Container Platform library to gather additional relevant diagnostic information.

Contact IBM support once diagnostic information is obtained.

User response

Not applicable.

Problem determination

See the system programmer response.

Module

EZBXFSUB

Routing code

2, 8

Descriptor code

2

Automation

This message will go to the console and syslog. You could potentially implement automation to detect that the control connection with an external target has been severed unexpectedly and can take the appropriate actions to restore the connection or resolve the issue. Potential risk to incorrect responses can be a decrease in distributed connection throughput and server availability.

Example

```
EZD2071E ZCPA AT DVIPA 9.55.220.250 UNRESPONSIVE, SYSPLEX DISTRIBUTION STOPPED FOR
THIS TARGET
```

EZD2072I CONTROL CONNECTION TO *target_type* DESTIP *ip_address* RESET - DISTRIBUTED DVIPA MISMATCH

Explanation

Message EZD2072I is issued when the distributed DVIPA configured on the TCP/IP stack with the EXTTARG keyword does not match the distributed DVIPA configured in the external target. The connection between the TCP/IP stack and the external target is reset.

In the message text:

ip_address

The IP address of the dynamic VIPA associated with the external non-z/OS target that is configured for sysplex distribution.

target_type

The type of appliance associated with the external non-z/OS target that is configured for sysplex distribution. The possible value is ZCPA.

System action

TCP/IP continues but the external target control connection between the TCP/IP stack and the external non-z/OS target will be reset. Connections will not be distributed to the target DVIPA address specified in the message.

Operator response

Save the system log and contact the system programmer to update the TCP/IP profile or appliance configuration.

System programmer response

Compare the distributed DVIPA configured on the VIPADISTRIBUTE statement with the EXTTARG keyword and the distributed DVIPA configured in the external appliance. If these addresses do not match, take one of the following actions:

- Follow the reconfiguration workflow to update the distributed DVIPA configured on the external appliance.
- Update the corresponding VIPADISTRIBUTE statement in the TCP/IP profile.

For more information about the reconfiguration workflow, see *Managing IBM z/OS Control Plane Appliance workflows* of IBM z/OS Container Platform library. For more information on how to reconfigure the distributed DVIPA on the VIPADISTRIBUTE statement of the TCP/IP, see TCP/IP profile (PROFILE.TCPIP) and configuration statements in z/OS Communications Server: IP Configuration Reference.

User response

Not applicable.

Problem determination

See the system programmer response.

Module

EZBTCUTL

Routing code

2, 8

Descriptor code

12

Automation

Not applicable for automation.

Example

```
EZD2072I CONTROL CONNECTION TO ZCPA DESTIP 9.56.218.235 RESET - DISTRIBUTED DVIPA
MISMATCH
```

EZD2073I AT LEAST ONE ACTIVE SERVER WAS FOUND ON AN EXTERNAL TARGET

Explanation

This message is additional information for message EZZ8471I.

The VIPADISTRIBUTE DELETE statement with the given DESTIP address is rejected because the target DESTIP has at least one active listener. When specifying one or more destination IP addresses, or the keyword ALL on the VIPADISTRIBUTE delete statement, only target addresses with no active listeners are deleted.

System action

TCP/IP continues. The VIPADISTRIBUTE DELETE statement was not processed for the destination IP address indicated in message EZZ8471I and it will remain as target for distribution.

Operator response

Issue the Netstat VDPT/-O report to check the server ready count for the distributed DVIPA and targets specified by EZZ8471I to ensure that there are no active listeners bound to the destination IP addresses that are configured for deletion on the VIPADISTRIBUTE DELETE TCP/IP profile statement.

Refer to EZZ8471I to determine which target type is preventing deletion of the VIPADISTRIBUTE statement. In the case of z/OS Control Plane Appliance (zCPA), stop the zCPA and retry. You may need to contact the Kubernetes administrator to reset or drain the appliance before it is stopped.

System programmer response

See the operator response.

User response

Not applicable.

Problem determination

See the operator response.

Module

EZBXFDV2

Routing code

11

Descriptor code

6

Automation

Not applicable for automation.

Example

```
EZZ8471I VIPADIST DEL 10.91.1.1 00080 9.56.218.235 REJECTED

EZD2073I AT LEAST ONE ACTIVE SERVER WAS FOUND ON AN EXTERNAL TARGET
```

EZZ0326I *keyword* conflicts with *statement* value *value* used on line *lineno*

Explanation

The *keyword* is incorrect. *keyword* and *value* are not supported in combination with each other.

System action

If processing an initial profile or a VARY TCPIP,,OBEYFILE command, profile processing continues, but the statement is ignored.

This message is also displayed as part of VARY TCPIP,,SYNTAXCHECK processing when the VARY TCPIP,,SYNTAXCHECK command detects this error in a profile data set. No changes are applied to the active configuration by VARY TCPIP,,SYNTAXCHECK processing.

Operator response

Contact the system programmer.

System programmer response

Correct the statement and rerun the profile. For more information about the statement, see the z/OS Communications Server: IP Configuration Reference.

Module

EZACFATM, EZACFMS1, EZACFPPT

Automation

This message is directed to the console. You can use automation to detect and respond to TCP/IP profile errors reported during initial profile and VARY TCPIP,,OBEYFILE processing.

This message can also be displayed during VARY TCPIP,,SYNTAXCHECK processing. Because the VARY TCPIP,,SYNTAXCHECK command does not affect the active configuration, you might want to adjust your automation to ignore the configuration messages that are displayed after EZZ0061I and before EZZ0065I.

Procedure name

parseFile

Examples

```
EZZ0326I NOAUTOLOG CONFLICTS WITH PORT VALUE RESERVED USED ON LINE 54

EZZ0326I EXTTARG CONFLICTS WITH VIPADISTRIBUTE VALUE SYSPLEXPORTS USED ON LINE 10
```

EZZ2397I DROP connection process not allowed for internal connections

Explanation

An attempt was made to drop an internally created TCP connection. These connections are created for specific purposes by the TCP/IP stack and cannot be dropped. An example of an internal TCP connection is the connection from the TCP/IP stack to an external non-z/OS target when the EXTTARG keyword is configured on a VIPADISTRIBUTE statement.

Operator response

Ensure that the connection to be dropped is a connection associated with an application.

System programmer response

No action is needed.

User response

None.

Problem determination

Not applicable.

Module

EZACDNE6 EZACDNE0

Routing code

Not applicable.

Descriptor code

Not applicable.

Automation

Not applicable for automation.

Examples

Not applicable.

z/OS Release Upgrade Reference Summary

New and changed System Management Facilities (SMF) records

This topic lists the System Management Facilities (SMF) records for z/OS elements and features that are new or changed.

Table. New and changed System Management Facilities (SMF) records

SMF record	z/OS element or feature	Description
Type 119, TCP/IP profile event record (subtype 4)	Communications Server	New flag NMTP_DDVSEXTTARG indicates that the DVIPA is used to distribute requests to non-z/OS (external) targets. **Reason for change:** Sysplex Distributor support for IBM z/OS Control Plane Appliances

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