
MAS V3.4 PTF02 Function Reference

Introduction and Operational Notes

The following functions are being shipped on the 2216 in MAS V3.4 PTF02, so they are available in that level and in all subsequent maintenance levels of MAS V3.4. This document contains the 2216 publications updates for these new functions. For information about installing this PTF, refer to the "Introduction and General Download Instructions" document available on the 2216 Operational Code web page.

Note: If you install this PTF or any subsequent MAS V3.4 PTF, you need to upgrade your V3.4 Configuration Program to PTF NP01102 or later. The V3.4 Configuration program is available on the 2216 Configuration Program web page.

These functions include:

- Dynamic Reconfiguration for Dial Circuits
- Additional BRS Filters and Configurable Queue Depths
- Configurable TCP
- DLUS Names at the Port Level
- DLUR Path Switch SAW Data
- Web Server Cache Updates

Refer to www.networking.ibm.com/support for a copy of this Function Reference as well as the 2216 base publications.

Dynamic Reconfiguration for Dial Circuits

With this PTF, the dial circuit parameter, *Destination Address*, can now be dynamically updated without requiring the 221x router to be restarted.

Additional BRS Filters and Configurable Queue Depths on Each Traffic Class

With this PTF, the number of UDP/TCP filters supported by BRS has been increased from 5 to 16. These new filters are valid for PPP interfaces, the FR default circuit definition, and for FR PVCs and SVCs.

Additionally, the maximum and minimum queue size can now be configured for each BRS traffic class. Valid values range from 3–255. If the queue size is not specified, default sizes are taken from the interface level for PPP and from the circuit level for FR. Note that PPP interface level or the FR circuit level, valid values for the queues sizes still range from 3–100.

Configurable TCP

With this PTF, you can use the IP configuration command to configure the following TCP parameters:

- Retransmission and Session Control
 - KeepAlive Interval (also referred to as *Idle Time*)
 - Minimum Retransmission Interval

- Maximum Retransmission Interval
- Timeout
- TCP Performance
 - Hash Table Size
 - Memory (I/O) Block Size
 - Connection Limit
- Application Layer
 - TelnetServer Port

TCP Configuration Commands

To access the TCP configuration environment, enter the following command at the IP config> prompt:

```
IP config> TCP
TCP config>
```

Table 1. TCP Configuration Commands Summary

Command	Function
List	Displays TCP configuration items.
Set	Defines certain TCP configuration parameters that affect retransmission and session controls, performance, and TelnetServer ports.

List

Use the **list** command to display the TCP configuration data.

Syntax:

list all

all Displays all the configurable TCP port parameters.

Example: list all

TCP Parameters

0 tells router to use default
see Console (talk 5) for runtime values

```
Telnet server port.....: 23 Timeout (seconds).....: 300
Min retransmit (.01sec): 25 Max retransmit (.01sec): 6400
Connection limit.....: 0 Hash table size.....: 500
Keepalive interval (sec.): 90 Memory block size.....: 756
```

Set

Use the **set** command to set certain values (intervals, sizes, limits) within your TCP configuration.

Syntax:

set connection-limit
hash-table-size
keepalive-interval
maxrx-interval
memory-block-size
minrx-interval

telnet-port

timeout

connection-limit

Specifies the maximum number of TCP connections supported by this router. A change in this value takes effect when the router is restarted or a Talk5 **reset TCP** command is issued.

Valid Values

- 100–65535

Default Value: Varies depending on the amount of memory installed in the router. To use the default setting, select the "default" pushbutton in the configuration tool or specify zero (0) from the router console.

Example:

```
TCP config> set connection-limit 500
```

hash-table-size

Specifies the size of the TCP hash table. The size of the table is defined as the number of 'buckets', with each bucket requiring four bytes. A change in this value takes effect when the router is restarted.

Valid Values

- 1–65535

Default Value: Varies between 64 and 10 275, depending on the amount of memory installed in the router. To use the default setting, select the "default" pushbutton in the configuration tool or specify zero (0) from the router console.

Example:

```
TCP config> set hash-table-size 100
```

keepalive-interval

Specifies the number of seconds that a TCP connection can remain idle before a keep-alive packet is sent. A change in this value takes effect when the router is restarted or a Talk5 **reset TCP** command is issued.

Valid Values

- 1–65535

Default Value: Varies depending on the amount of memory installed in the router. To use the default setting, select the "default" pushbutton in the configuration tool or specify zero (0) from the router console.

Example:

```
TCP config> set keepalive-interval 2500
```

maxrx-interval

Specifies the maximum amount of time in hundredths of a second (1/100 seconds) that a TCP connection will wait for an acknowledgment before retransmitting data. Increasing this value allows additional time for acknowledgments to be received. Decreasing this value results in an increased number of retransmissions within a specified timeout period. A change in this value takes effect when the router is restarted or a Talk5 **reset TCP** command is issued.

Valid Values

- 200–6400 (in units of 1/100 second)

Default Value: 6400 (64 seconds). To use the default setting, select the "default" pushbutton in the configuration tool or specify zero (0) from the router console.

Example:

```
TCP config> set maxrx-interval 300
```

This example sets the maximum retransmit value to 3 seconds.

memory-block-size

Specifies size of the transmit and receive data blocks. This parameter is useful in specific applications when traffic consists of many small blocks of data. In these environments, using a smaller block size than the default 756 bytes can save memory space. A change in this value takes effect when the router is restarted.

Valid Values

- 24–65535

Default Value: 756 bytes. To use the default setting, select the "default" pushbutton in the configuration tool or specify zero (0) from the router console.

Example:

```
TCP config> set memory-block-size 50
```

minrx-interval

Specifies the minimum amount of time in hundredths of a second (1/100 seconds) that a TCP connection will wait for an acknowledgment before retransmitting data. Increasing this value allows additional time for acknowledgments to be received. Decreasing this value results in an increased number of retransmissions within a specified timeout period. A change in this value takes effect when the router is restarted or a Talk5 **reset TCP** command is issued.

Valid Values

- 25–6400 (in units of 1/100 second)

Default Value: 25 (.25 seconds). To use the default setting, select the "default" pushbutton in the configuration tool or specify zero (0) from the router console.

Example:

```
TCP config> set minrx-interval 50
```

This example sets the minimum retransmit value to .5 seconds.

telnet-port

Allows you to change the router's Telnet server port from the usual address of 23. A change in this value takes effect when the router is restarted or a Talk5 **reset TCP** command is issued.

Valid Values

- 1–65535

Default Value: 23. To use the default setting, select the "default" pushbutton in the configuration tool or specify zero (0) from the router console.

Example:

```
TCP config> set telnet-port 10023
```

timeout

Specifies the number of seconds that TCP will wait for an acknowledgment (ACK) before the session is ended. A change in this value takes effect when the router is restarted or a Talk5 **reset TCP** command is issued.

Valid Values

- 10–65535

Default Value: 180 seconds (3 minutes). To use the default setting, select the *default* button in the configuration tool or specify zero (0) from the router console.

Example:

```
TCP config> set timeout 250
```

DLUS Names at the Port Level

With this PTF, you can now specify the DLUS name at the node, port, and linkstation level. If a DLUS name is not specified, then the node level DLUS name is used by the ports and linkstations. However if a DLUS name is specified at the node and port levels, then the port level DLUS name is used for traffic in and out of that particular port. Similarly, if a DLUS name is specified at the linkstation level, then the linkstation DLUS name is used to for traffic in and out of that particular linkstation.

Note: In order to specify DLUS names at the port level, DLUS/DLUR must be enabled at the node level.

Example 1 shows configuring a DLUS name at the port level. In this case, you specify both a primary and a backup DLUS.

Example 1:

```
APPN config> add port
```

```
APPN Port
```

```
Link Type: (P)PP, (FR)AME RELAY, (E)THERNET, (T)OKEN RING,  
(S)DLC, (X)25, (FD)DI, (D)LSw, (A)TM, (I)P [ ]? T
```

```
Interface number(Default 0): [0]?
```

```
Port name (Max 8 characters) [T00000]?
```

```
WARNING!! You are changing an existing record.
```

```
Enable APPN on this port (Y)es (N)o [Y]?
```

```
Port Definition
```

```
Support multiple PU (Y)es (N)o [Y]?
```

```
All active port names will be of the form
```

```
Service any node: (Y)es (N)o [Y]?
```

```
Treat non-configured callers as LEN nodes: (Y)es (N)o [N]?
```

```
High performance routing: (Y)es (N)o [Y]?
```

```
Maximum BTU size (768-17745) [2048]?
```

```
Maximum number of link stations (1-65535) [65535]?
```

```
Percent of link stations reserved for incoming calls (0-100) [0]?
```

```
Percent of link stations reserved for outgoing calls (0-100) [0]?
```

```
Local SAP address (04-EC) [4]?
```

```
Local HPR SAP address (04-EC) [C8]?
```

```

Edit TG Characteristics: (Y)es (N)o [N]?
Edit LLC Characteristics: (Y)es (N)o [N]?
Edit HPR defaults: (Y)es (N)o [N]?
Edit Dependent LU Server: (Y)es (N)o [N]? Y
    Fully-qualified CP name of primary DLUS []? STFNET.MVS1
    Fully-qualified CP name of backup DLUS []? STFNET.MVS2
Write this record? [Y]?
The record has been written.

```

Example 2 shows changing the specified DLUS name at the port level to the default value.

Example 2:

```

APPN config> add port
APPN Port
Link Type: (P)PP, (FR)AME RELAY, (E)THERNET, (T)OKEN RING,
(S)DLC, (X)25, (FD)DI, (D)LSw, (A)TM, (I)P [ ]? T
Interface number(Default 0): [0]?
Port name (Max 8 characters) [T00000]?

WARNING!! You are changing an existing record.
Enable APPN on this port (Y)es (N)o [Y]?
Port Definition
    Support multiple PU (Y)es (N)o [Y]?
All active port names will be of the form <port name sap>
    Service any node: (Y)es (N)o [Y]?
    Treat non-configured callers as LEN nodes: (Y)es (N)o [N]?
    High performance routing: (Y)es (N)o [Y]?
    Maximum BTU size (768-17745) [2048]?
    Maximum number of link stations (1-65535) [65535]?
    Percent of link stations reserved for incoming calls (0-100) [0]?
    Percent of link stations reserved for outgoing calls (0-100) [0]?
    Local SAP address (04-EC) [4]?
    Local HPR SAP address (04-EC) [C8]?
Edit TG Characteristics: (Y)es (N)o [N]?
Edit LLC Characteristics: (Y)es (N)o [N]?
Edit HPR defaults: (Y)es (N)o [N]?
Edit Dependent LU Server: (Y)es (N)o [N]? Y
    Fully-qualified CP name of primary DLUS [STFNET.MVS1]? <DEFLT>
Write this record? [Y]?
The record has been written.

```

Example 3 shows using the DLUS values specified at the node level. An explicit DLUS name is not configured at the port level.

Example 3:

```

APPN config> add port
APPN Port
Link Type: (P)PP, (FR)AME RELAY, (E)THERNET, (T)OKEN RING,
(S)DLC, (X)25, (FD)DI, (D)LSw, (A)TM, (I)P [ ]? T
Interface number(Default 0): [0]?
Port name (Max 8 characters) [T00000]?

WARNING!! You are changing an existing record.
Enable APPN on this port (Y)es (N)o [Y]?
Port Definition
    Support multiple PU (Y)es (N)o [Y]?
All active port names will be of the form <port name sap>
    Service any node: (Y)es (N)o [Y]?
    Treat non-configured callers as LEN nodes: (Y)es (N)o [N]?
    High performance routing: (Y)es (N)o [Y]?
    Maximum BTU size (768-17745) [2048]?
    Maximum number of link stations (1-65535) [65535]?
    Percent of link stations reserved for incoming calls (0-100) [0]?

```

```

Percent of link stations reserved for outgoing calls (0-100) [0]?
Local SAP address (04-EC) [4]?
Local HPR SAP address (04-EC) [C8]?
Edit TG Characteristics: (Y)es (N)o [N]?
Edit LLC Characteristics: (Y)es (N)o [N]?
Edit HPR defaults: (Y)es (N)o [N]?
Edit Dependent LU Server: (Y)es (N)o [N]? Y
Fully-qualified CP name of primary DLUS [<DEFLT>]?
Write this record? [Y]?
The record has been written.

```

Example 4 shows configuring a primary DLUS name at the port level, but not specifying a backup DLUS name. If you do not specify a backup DLUS, this overrides the previously specified node and there will be no backup DLUS

Example 4:

```

APPN config> add port
APPN Port
Link Type: (P)PP, (FR)AME RELAY, (E)THERNET, (T)OKEN RING,
(S)DLC, (X)25, (FD)DI, (D)LSw, (A)TM, (I)P [ ]?
Illegal link type
APPN config>add port
APPN Port
Link Type: (P)PP, (FR)AME RELAY, (E)THERNET, (T)OKEN RING,
(S)DLC, (X)25, (FD)DI, (D)LSw, (A)TM, (I)P [ ]? T
Interface number(Default 0): [0]?
Port name (Max 8 characters) [T00000]?

WARNING!! You are changing an existing record.
Enable APPN on this port (Y)es (N)o [Y]?
Port Definition
Support multiple PU (Y)es (N)o [Y]?
All active port names will be of the form
Service any node: (Y)es (N)o [Y]?
Treat non-configured callers as LEN nodes: (Y)es (N)o [N]?
High performance routing: (Y)es (N)o [Y]?
Maximum BTU size (768-17745) [2048]?
Maximum number of link stations (1-65535) [65535]?
Percent of link stations reserved for incoming calls (0-100) [0]?
Percent of link stations reserved for outgoing calls (0-100) [0]?
Local SAP address (04-EC) [4]?
Local HPR SAP address (04-EC) [C8]?
Edit TG Characteristics: (Y)es (N)o [N]?
Edit LLC Characteristics: (Y)es (N)o [N]?
Edit HPR defaults: (Y)es (N)o [N]?
Edit Dependent LU Server: (Y)es (N)o [N]? Y
Fully-qualified CP name of primary DLUS [<DEFLT>]? STFNET.MVS3
Fully-qualified CP name of backup DLUS [ ]?
Write this record? [Y]?
The record has been written.

```

DLUR Path Switch SAW Data

This PTF allows a router acting as a DLUR node to provide additional route information to its DLUS for the LU-LU sessions served by that DLUS. Before this PTF, when a session is brought up, the DLUR provides the serving DLUS with session awareness (SAW) information. This information does not currently include the LU-LU session route (RSCV) for the dependent LU-LU session. With this PTF, the LU-LU session RSCV is included in the SAW data sent to the DLUS upon session activation. This RSCV is sent regardless of the level of the DLUS, since most levels of VTAM can save and display this RSCV (those which cannot save it will just ignore it). Refer to the SAVERSCV start option in the VTAM publications.

In addition, this PTF includes a function which causes the DLUR to collect information about the HPR route over which the LU-LU session flows, and include this in the SAW data sent to the DLUS upon session activation. If the HPR route undergoes path switch, the DLUR then sends the new HPR route information to the DLUS. This allows the DLUS to update its copy of the LU-LU session route for all the LU-LU sessions which use that HPR route, so the network operator always has an accurate record of the current route for each dependent LU-LU session.

Support for this HPR route information is negotiated between the DLUS and DLUR during CPSVRMGR pipe session activation. If either does not support the function, the HPR route information is not included in the SAW data for dependent LU-LU sessions. This function can be enabled or disabled in the router, via a new configuration option. If the function is enabled on the DLUR, the DLUR saves the HPR route information for the duration of the underlying LU-LU sessions, even if the DLUS does not support receipt of the information. This allows the router to send the HPR route information to a backup DLUS which does support the function, in case of DLUR giveback and takeover. If no DLUS in the network supports the new HPR SAW data, the function should be disabled in the DLUR, thereby saving memory.

```
Config> protocol APPN
APPN config>set dlur
Support DLUR HPR session awareness (y/n) [N] y
Fully-qualified CP name of primary DLUS [] xxx.xx1
Fully-qualified CP name of backup DLUS [] xxx.xx2
Perform retries to restore disrupted pipe [Y]?
Take down the dependent link when there is no session [N]?
Support DLUR HPR session awareness support (y/n) [N]?
Write this record [Y]?
```

Web Server Cache Updates

Cache Hit and Miss Byte Counters Expanded

With this PTF, the counters for Cache Hit Bytes Served and the Cache Missed Bytes Served have been expanded from 32 bits to 64 bits. In Talk 5, each of these 64-bit counters will be displayed in decimal as two 32-bit values.

```
WEBC>list partition 0
Cache Partition 0      Status: Enabled
    Cluster address: 113.16.3.11, Port 80
    Cluster address: 114.16.3.11, Port 80
Partition size: Current - 0 bytes Highest - 133120 bytes Maximum - Unlimited
Number of objects: Current - 0 Highest - 15 Maximum - Unlimited
Maximum object size: Unlimited
Cache purge interval: 10 minute(s)
Hit ratio: 29%
Total number of hits: 103
Cache Hit 4GBytes Served: 0
+Cache Hit Bytes Served: 1036361
Breakdown of responses for the Cache Hits
(note: this is based on whether the HTTP Proxy considered it a hit.
  So these count may not add up to the hit count above)
  Response 200(OK):          103
  Response 203(Non-Authoriative): 0
  Response 206(Partial Content): 0
  Response 300(Multiple Choices): 0
  Response 301(Moved Permanently): 0
  Response 304(Not Modified): 0
  Response 410(Gone):        0
Total number of misses: 249
Cache Miss 4GBytes Served: 0
+Cache Miss Bytes Served: 532549
Breakdown of responses for the Cache Misses
```


(note: this is based on whether the HTTP Proxy got the response back through it. In the case of multiple boxes working together as a big cache these counts will not add up to the total misses if a handoff was done)

```

Response 100 Range(Information):          0
Response 200(OK):                          72
Response 200 Range(Successful-not 200):    0
Response 304(Not Modified):                0
Response 300 Range(Redirection-not 304):   0
Response 400 Range(Client Error):          0
Response 500 Range(Server Error):          176
Response other (not in the above):         0
Object Excluded (Object too large):        0
      (Object expired):                    0
      (DONT CACHE header):                 0
      (URL Mask excluded):                 0
      (Image excluded):                    0
      (Static object excluded):            0
      (Dynamic object excluded):           0
      (Cache disabled):                    0
Objects explicitly Included: 0
Total number of purged objects: 36
Purged objects (Cache full): 0
      (Object stale): 21
      (Purged by user): 15
      (Invalidation): 0
      (via ECC delete): 0
Total number of objects added via ECCM Interface: 0
Total number of objects not added via ECCM Interface but was attempted: 0
Total number of objects replaced via ECCM Interface: 0
WEBC>

```

Using SNMP

You can also use SNMP to access each 64-bit hit and miss counters. The high order 32 bits of each counter have been added at the end of an OID tree structure as follows:

```

1.3.6.1.4.1.2.6.119.4.8.2.1.1.x.y where y = cache partition number and
x = 54 for ibmcacheserverPartitionHitByteCount
    55 for ibmcacheserverPartitionMissByteCount
    56 for ibmcacheserverPartitionHitByteCountHi
    57 for ibmcacheserverPartitionMissByteCountHi

```

The following TCP-related parameters are also added to the Web Server Cache MIB:

```

1.3.6.1.4.1.2.6.119.4.8.1.x where
x = 4 for webcacheCoreTCPcurconn (current count of TCP connections)
    5 for webcacheCoreTCPmaxconn (maximum count of TCP connections)
    6 for webcacheCoreSOcurconn (current count of SOX connections)
    7 for webcacheCoreSOmaxconn (maximum count of SOX connections)

```

ECCM Authentication

Additionally, by using the Talk 6 patch command, you can disable ECCM authentication (enabled is the default). To disable ECCM authentication, use the patch command to change the variable *ecc-auth-disable* to any non-zero value as follows:

```

Config>patch
Variable to patch ?[] ecc-auth-disable
New Value [0]? 1
Variable patched successfully
Config>

```

To re-enable ECCM authentication, use the patch command to change the variable back to zero:

```
Config>patch
Variable to patch ?[] ecc-auth-disable
New Value [1]? 0
Variable patched successfully
Config>
```