

Troubleshoot "OS-SHMWIN-2-ERROR_ENCOUNTERED" Error Message

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Introduction

This document describes how to troubleshoot the "OS-SHMWIN-2-ERROR_ENCOUNTERED" error on a Cisco IOS® XR router.

The Error Message

Examples of the error message are:

```
"%OS-SHMWIN-2-ERROR_ENCOUNTERED"
```

```
LC/0/0/CPU0:Dec 16 09:45:58 : fib_mgr[260]: %OS-SHMWIN-2-ERROR_ENCOUNTERED : SHMWIN: Error encountered:
```

```
LC/0/0/CPU0:Dec 16 09:45:39 : 12fib[328]: %OS-SHMWIN-2-ERROR_ENCOUNTERED : SHMWIN: Error encountered: S
```

```
RP/0/RSP0/CPU0:Aug 11 21:15:47.174 IST: show_ip_interface[65961]: %OS-SHMWIN-2-ERROR_ENCOUNTERED : SHMW
```

The error indicates that the system's memory state is severe. Specifically, the shared memory, which stores the dynamic data between multiple processes, has an issue.

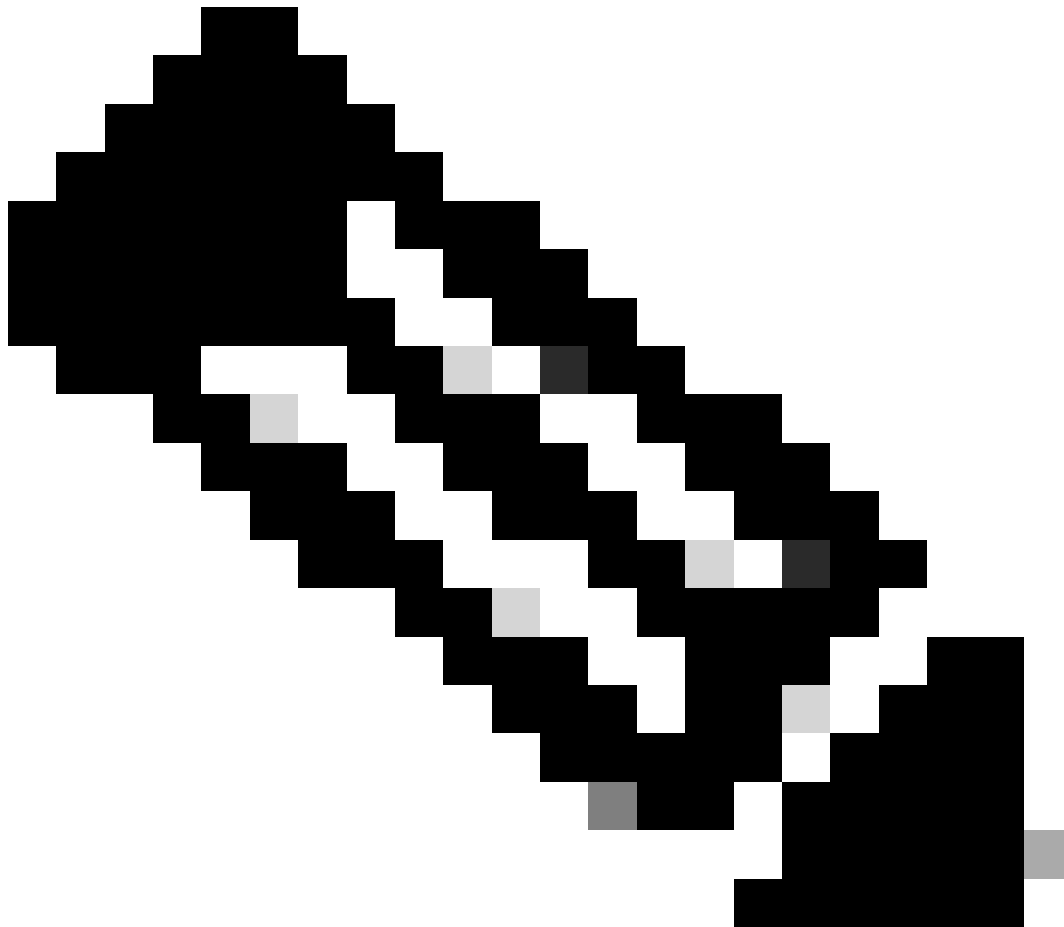
Troubleshoot

Start by identifying the linecard (or RP/RSP) and the top memory consumers.

The error message can have a process or even a command embedded. However, if the memory condition is low, anything can fail if there is not enough memory available. You need to identify what causes the available memory to go low.

The linecard is indicated in the error message itself. Try to find the top consumers of the memory.

```
show memory location 0/x/CPUx
show memory summary location 0/x/CPUx
show watchdog memory-state location 0/x/CPUx
show processes memory location 0/x/CPUx
```



Note: There could be other error messages possibly indicating what the culprit processes are.

For example:

```
<#root>
```

```
RP/0/RSP0/CPU0:Apr 24 11:34:33.599 EST: wdsysmon[450]: %HA-HA_WD-4-MEMORY_ALARM : Memory threshold cross
RP/0/RSP0/CPU0:Apr 24 13:23:12.947 EST: wdsysmon[450]: %HA-HA_WD-4-MEMORY_ALARM : Memory threshold cross
RP/0/RSP0/CPU0:Apr 24 14:32:10.086 EST: wdsysmon[450]: %HA-HA_WD-4-MEMORY_STATE_CHANGE : New memory sta
RP/0/RSP0/CPU0:Apr 24 14:32:10.086 EST: wdsysmon[450]: %HA-HA_WD-4-TOP_MEMORY_USERS_WARNING :
```

Top 5 consumers of system memory

(671084 Kbytes free):

```
RP/0/RSP0/CPU0:Apr 24 14:32:10.086 EST: wdsysmon[450]: %HA-HA_WD-4-TOP_MEMORY_USER_WARNING : 0: Process
RP/0/RSP0/CPU0:Apr 24 14:32:10.086 EST: wdsysmon[450]: %HA-HA_WD-4-TOP_MEMORY_USER_WARNING : 1: Process
RP/0/RSP0/CPU0:Apr 24 14:32:10.087 EST: wdsysmon[450]: %HA-HA_WD-4-TOP_MEMORY_USER_WARNING : 2: Process
RP/0/RSP0/CPU0:Apr 24 14:32:10.087 EST: wdsysmon[450]: %HA-HA_WD-4-TOP_MEMORY_USER_WARNING : 3: Process
RP/0/RSP0/CPU0:Apr 24 14:32:10.087 EST: wdsysmon[450]: %HA-HA_WD-4-TOP_MEMORY_USER_WARNING : 4: Process
```

If the process is BGP or any other routing protocol, verify you did not make any changes in the network that contributed to this.

Use these commands to get an overview of the memory used and to identify the top processes taking the memory.

0/x/CPUx is the specific linecard in the error.

```
show memory summary location 0/x/CPUx
show memory summary location 0/x/CPUx
show shared-memory location 0/x/CPUx
show memory-top-consumers location 0/x/CPUx
show shmwin summary location 0/x/CPUx
```

Examples:

<#root>

RP/0/RSP1/CPU0:R1#

```
show memory summary location 0/RSP0/CPU0
```

```
node:      node0_RSP0_CPU0
Physical Memory: 6144M total-----
Application Memory : 5738M (2795M available)
Image: 117M (bootram: 117M)
Reserved: 224M, IOMem: 0, flashfsys: 0
Total shared window: 76M
```

<#root>

RP/0/RSP1/CPU0:R1#

```
show memory summary location 0/RSP0/CPU0
```

```
node:      node0_RSP0_CPU0
Physical Memory: 6144M total-----
Application Memory : 5738M (2797M available)
Image: 117M (bootram: 117M)
Reserved: 224M, IOMem: 0, flashfsys: 0
Total shared window: 76M
```

<#root>

RP/0/RSP1/CPU0:R1#

show shared-memory location 0/0/cpu0

Total Shared memory: 1527M

ShmWin: 236M

Image: 703M

LTrace: 353M

AIPC: 33M

SLD: 3M

SubDB: 1M

CERRNO: 144K

GSP-CBP: 64M

EEM: 0

XOS: 4M

CHKPT: 2M

CDM: 4M

XIPC: 594K

DLL: 64K

SysLog: 0

Miscellaneous: 119M

LTrace usage details:

Used: 353M, Max: 2075M

Current: default(dynamic)

Configured: dynamic with scale-factor: 8 (changes take effect after reload)

<#root>

RP/0/RP0/CPU0:R1#

show memory-top-consumers location 0/RP0/CPU0

Execute 'show memory-snapshots process <> location <>' to check memory usage trend.

#####

Top memory consumers on 0/RP0/CPU0 (at 2023/Nov/8/15:41:42)

#####

PID	Process	Total(MB)	Heap(MB)	Shared(MB)
7366	mibd_interface	233.2	192.64	37.7
2552	spp	228.2	9.71	222.1
49132	bgp	225.9	83.62	165.9
4844	l2rib	211.8	21.12	190.1
2787	gsp	137.9	24.64	113.1
3869	mpls_lsd	122.8	12.85	107.8
3804	fib_mgr	121.0	13.43	108.7
2975	parser_server	116.7	66.39	44.6
6685	l2vpn_mgr	116.5	43.77	82.3
3310	dpa_port_mapper	114.8	2.96	110.2

<#root>

RP/0/RSP1/CPU0:R1#

show shmwin summary location 0/0/cpu0

 Shared memory window summary information

Data for Window "subdb_sco_tbl":

 Virtual Memory size : 1536 MBytes
 Virtual Memory Range : 0x7c000000 - 0xdc000000
 Virtual Memory Group 2 size : 352 MBytes
 Virtual Memory Group 2 Range : 0x66000000 - 0x7c000000

Window Name	ID	GRP	#Usrs	#Wrtrs	Ownr	Usage(KB)	Peak(KB)	Peak Timestamp
subdb_sco_tbl	70	1	1	1	158	3	0	--/--/----- --:---:--

Data for Window "ptp":

ptp	131	P	1	1	0	35	35	10/18/2023 11:56:31
-----	-----	---	---	---	---	----	----	---------------------

Data for Window "cfmd-sla":

cfmd-sla	53	1	1	1	0	99	99	10/18/2023 11:56:20
----------	----	---	---	---	---	----	----	---------------------

Data for Window "cfmd":

cfmd	36	1	1	1	0	99	99	10/18/2023 11:56:30
------	----	---	---	---	---	----	----	---------------------

Data for Window "vkg_pbr_ea":

vkg_pbr_ea	83	1	1	1	0	147	147	10/18/2023 11:56:27
------------	----	---	---	---	---	-----	-----	---------------------

Data for Window "span_ea_pd":

span_ea_pd	40	1	1	1	362	34	34	10/18/2023 11:56:13
------------	----	---	---	---	-----	----	----	---------------------

Data for Window "vkg_l2fib_vqi":

vkg_l2fib_vqi	97	1	2	2	0	3	0	--/--/----- --:---:--
---------------	----	---	---	---	---	---	---	-----------------------

Data for Window "statsd_db":

statsd_db	60	1	1	1	0	3	0	--/--/----- --:---:--
-----------	----	---	---	---	---	---	---	-----------------------

Data for Window "statsd_db_l":

statsd_db_l	130	P	1	1	0	1131	1131	10/18/2023 11:56:17
-------------	-----	---	---	---	---	------	------	---------------------

Data for Window "arp":

arp	20	1	1	1	0	227	227	10/18/2023 11:56:37
-----	----	---	---	---	---	-----	-----	---------------------

Data for Window "bm_lacp_tx":

bm_lacp_tx	54	1	1	1	132	1	0	--/--/----- --:---:--
------------	----	---	---	---	-----	---	---	-----------------------

Data for Window "ether_ea_shm":

ether_ea_shm	26	1	4	4	406	227	227	10/18/2023 11:56:27
--------------	----	---	---	---	-----	-----	-----	---------------------

Data for Window "vkg_l2fib_evpn":

vkg_l2fib_evpn	100	1	3	3	0	3	0	--/--/----- --:---:--
----------------	-----	---	---	---	---	---	---	-----------------------

Data for Window "l2fib":

l2fib	14	1	10	10	262	45265	45265	11/08/2023 15:03:18
-------	----	---	----	----	-----	-------	-------	---------------------

Data for Window "ether_ea_tcam":

ether_ea_tcam	58	1	5	5	313	595	595	10/18/2023 11:55:55
---------------	----	---	---	---	-----	-----	-----	---------------------

Data for Window "vkg_vpls_mac":

vkg_vpls_mac	35	1	3	3	0	6291	6291	10/25/2023 13:15:04
--------------	----	---	---	---	---	------	------	---------------------

Data for Window "prm_stats_svr":

prm_stats_svr	24	1	21	21	0	12419	12419	10/18/2023 11:56:24
---------------	----	---	----	----	---	-------	-------	---------------------

Data for Window "prm_srh_main":

prm_srh_main 66 1 31 31 0 60163 60163 10/18/2023 11:56:31
Data for Window "prm_tcam_mm_svr":

prm_tcam_mm_svr 23 1 1 1 0 22067 22163 10/18/2023 12:04:59
Data for Window "prm_ss_lm_svr":

prm_ss_lm_svr 65 1 1 1 0 3233 3233 10/18/2023 11:56:33
Data for Window "prm_ss_mm_svr":

prm_ss_mm_svr 22 1 5 5 0 3867 3867 10/18/2023 11:55:52
Data for Window "vkg_gre_tcam":

vkg_gre_tcam 63 1 2 2 388 35 35 10/18/2023 11:55:54
Data for Window "tunl_gre":

tunl_gre 62 1 2 2 388 39 39 10/18/2023 11:55:38
Data for Window "pd_fib_cd11":

pd_fib_cd11 28 1 1 1 0 35 35 10/18/2023 11:55:36
Data for Window "SMW_TEST_2":

SMW_TEST_2 86 1 1 1 0 1067 1067 10/18/2023 11:55:35
Data for Window "ifc-mp1s":

ifc-mp1s 13 1 18 18 188 7161 9057 11/02/2023 18:32:41
Data for Window "ifc-ipv6":

ifc-ipv6 17 1 18 18 188 25249 25665 11/02/2023 18:33:13
Data for Window "ifc-ipv4":

ifc-ipv4 16 1 18 18 188 24205 24893 10/31/2023 18:12:27
Data for Window "ifc-protomax":

ifc-protomax 18 1 18 18 188 6057 6297 10/18/2023 11:56:06
Data for Window "bfd_offload_shm":

bfd_offload_shm 94 1 1 1 0 2 0 --/--/---- -:---
Data for Window "netio_fwd":

netio_fwd 34 1 1 1 0 0 0 --/--/---- -:---
Data for Window "mfwd_info":

mfwd_info 1 1 2 2 254 1373 1373 10/18/2023 11:56:24
Data for Window "mfwdv6":

mfwdv6 15 1 1 1 258 737 737 10/18/2023 11:55:57
Data for Window "vkg_bmp_adj":

vkg_bmp_adj 30 1 2 2 129 235 235 10/18/2023 11:55:55
Data for Window "rewrite-db":

rewrite-db 101 1 3 3 0 4115 4115 10/18/2023 11:55:32
Data for Window "inline_svc":

inline_svc 88 1 1 1 0 755 755 10/18/2023 11:55:33
Data for Window "im_rd":

im_rd 33 1 75 75 217 1131 1131 10/18/2023 11:55:32
Data for Window "ipv6_pmtu":

```

ipv6_pmtu      98 1 1 1 256 3 0 --/--/---- -:---
Data for Window "im_db_private":
-----
im_db_private  129 P 1 1 0 1131 1131 10/18/2023 11:55:34
Data for Window "infra_ital":
-----
infra_ital     19 1 3 3 340 387 387 10/18/2023 11:55:41
Data for Window "infra_statsd":
-----
infra_statsd   8 1 5 5 370 3 0 --/--/---- -:---
Data for Window "ipv6_nd_pkt":
-----
ipv6_nd_pkt    128 P 1 1 0 107 107 10/18/2023 11:55:30
Data for Window "aib":
-----
aib            2 1 10 10 114 2675 2675 10/18/2023 11:56:42
Data for Window "vkg_pm":
-----
vkg_pm         5 1 34 1 313 307 307 11/03/2023 11:25:06
Data for Window "subdb_fai_tbl":
-----
subdb_fai_tbl  75 2 11 1 0 51 51 10/18/2023 11:55:26
Data for Window "subdb_ifh_tbl":
-----
subdb_ifh_tbl  74 2 2 1 0 35 35 10/18/2023 11:55:26
Data for Window "subdb_ao_tbl":
-----
subdb_ao_tbl   72 2 1 1 0 43 43 10/18/2023 11:55:26
Data for Window "subdb_do_tbl":
-----
subdb_do_tbl   73 2 11 1 0 35 35 10/18/2023 11:55:26
Data for Window "subdb_co_tbl":
-----
subdb_co_tbl   71 2 11 1 0 4107 4107 10/18/2023 11:55:26
Data for Window "rspp_ma":
-----
rspp_ma        3 1 14 14 0 3 0 --/--/---- -:---
Data for Window "cluster_dlm":
-----
cluster_dlm    61 1 26 26 0 3 0 --/--/---- -:---
Data for Window "pfm_node":
-----
pfm_node       29 1 1 1 0 195 195 10/18/2023 11:56:11
Data for Window "im_rules":
-----
im_rules       31 1 85 85 217 453 453 10/18/2023 11:55:32
Data for Window "im_db":
-----
im_db          32 1 85 1 0 2065 2065 10/18/2023 11:56:26
Data for Window "spp":
-----
spp            27 1 51 51 88 1403 1403 10/18/2023 11:56:29
Data for Window "qad":
-----
qad            6 1 1 1 0 134 134 01/01/1970 02:00:08
Data for Window "pcie-server":
-----
pcie-server    39 1 1 1 0 39 39 01/01/1970 02:00:07
-----

```

Total SHMWIN memory usage : 235 MBytes

Memory Leak

Identify there is no memory leak for any process:

You can take a 'memory compare'. This process shows you the increase or decrease over a period of time - that you specify - of memory per process. This is an example; note the 'difference' column.

```
<#root>
```

```
RP/0/RSP0/CPU0:R1#
```

```
show memory compare start
```

```
Successfully stored memory snapshot /harddisk:/malloc_dump/memcmp_start.out
```

```
RP/0/RSP0/CPU0:R1#
```

```
show memory compare end
```

```
Successfully stored memory snapshot /harddisk:/malloc_dump/memcmp_end.out
```

```
RP/0/RSP0/CPU0:R1#
```

```
show memory compare report
```

JID	name	mem before	mem after	difference	mallocs	restart/exit/new
---	----	-----	-----	-----	-----	-----
376	parser_server	32069512	32070976	1464	1	
463	sysdb_svr_local	10064204	10065084	880	20	
459	sysdb_shared_nc	4103104	4103560	456	12	
66013	exec	209964	210052	88	3	
1241	xtc_agent	4796436	4796432	-4	0	
1087	bgp	51646552	51646120	-432	-3	
457	sysdb_mc	5094852	5094188	-664	-8	
358	netio	19185724	19183804	-1920	-45	
334	lpts_pa	76234948	76228484	-6464	-97	
1031	ospf	9107084	9098232	-8852	-1	
476	tcp	5725148	5708444	-16704	-8	
254	gsp	9473460	9424452	-49008	14	
1153	mdtd	25206084	24750076	-456008	-25	

You are now free to remove snapshot memcmp_start.out and memcmp_end.out under /harddisk:/malloc_dump

Ltrace

If ltrace is the process that takes a lot of memory and is one of the top memory consumers, consider lowering the amount of memory it uses.

This is how you can configure ltrace to take less memory: [Configure ltrace Scale Factors on ASR9K Route Processors and Line Cards for Efficient Memory Management](#)

Provide Output

If you did not find the solution to the problem in this document, provide this output:

0/x/CPUx is the specific linecard in the error. The Job ID (JID) of the process can be found with the command `show processes`.

```
show tech-support
show hw-module fpd
show memory location 0/x/CPUx
show memory summary location all
show watchdog memory-state location all
show watchdog trace location all
show processes memory location all
show shmwin all header location 0/x/CPUx
show shmwin all bands location 0/x/CPUx
show shmwin all banks location 0/x/CPUx
show shmwin all list all location 0/x/CPUx
show shmwin all malloc-stats location 0/x/CPUx
show shmwin all mutexlocation 0/x/CPUx
show shmwin all participants all-stats location 0/x/CPUx
show shmwin all pool all-pools location
show shmwin trace all location all
show memory <job id process> location 0/x/CPUx
```