Configure Secure Web Appliance to Improve Upload and Download Speed

Contents

Introduction

This document describes how to configure network tune settings for Secure Web Appliance (WSA) to improve the upload and download speed of file (s).

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- WSA Installed
- Secure Shell (SSH) client
- Transmission Control Protocol (TCP) window scale

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

The WSA is designed to handle thousands of client snd server connections in parallel.

The default size of the send and receive buffers are configured to deliver optimal performance, and the maximum number of short-lived connections.

Problem

Default size for send and receive buffers can introduce upload or download speed degradation. Especially for an environment where large file downloads or uploads contribute to large amount of the daily traffic.

Solution

The Network settings of the WSA control send and receive buffer size. Which improves the upload and download speed for large files.

Calculate WSA Maximum Send and Receive Buffer Size

This section explains how to calculate the right WSA network settings to be used in the configuration section.

The formula used to calculate the right network values:

MBUF_CLUSTER_COUNT = 98304*(X/Y)

MBUF_CLUSTER_COUNT: The maximum amount of memory buffer clusters can be used for this WSA.

X: The current Random Access Memory (RAM)

Y: Fixed value equals to 4 Giga Bytes (GB)

> **Note**: Example: WSA S390 with 32G RAM fomula: MBUF_CLUSTER_COUNT = 98304*(32/4) =786,432

Verify WSA RAM Size

This section describes how to verify WSA RAM size through the command **ipcheck.**

1. Access the WSA Command Line Interface (CLI) through admin credentials.
2. Enter the command **ipcheck.**
3. Check the value of **RAM Total** in the output if WSA is physical appliance, or value of **Memory** if Virtual Appliance is used. as shown in these two images.

Figure 1. Physical WSA **ipcheck** output

```
WSA> ipcheck
  Ipcheck Rev          1
  Date                 Wed Jul 28 01:17:35 2021
  Model                S390
  Platform             [REDACTED] (UCSC-[REDACTED])
  WSA Version          Version: [REDACTED]
  Build Date           [REDACTED]
  Install Date         [REDACTED] 51
  Burn-in Date         Unknown
  Serial No.           [REDACTED]N
  BIOS Version         [REDACTED]BIOS
  RAID Version         [REDACTED]200
  RAID Status          Optimal
  RAID Type            10
  RAID Chunk           Unknown
  BMC Version          2.00
  Disk 2               557GB     SEAGATE ST600MM0006     0001Z0M02D8E
  Disk 3               557GB     SEAGATE ST600MM0006     0001Z0M02DF8
  Disk 4               557GB     SEAGATE ST600MM0006     0001Z0M02GJ2
  Disk 5               557GB     SEAGATE ST600MM0006     0001Z0M02G04
  Disk 6               557GB     SEAGATE ST600MM0006     0001Z0M02H3Y
  Disk 7               557GB     SEAGATE ST600MM0006     0001Z0M02ENE
  Disk 8               557GB     SEAGATE ST600MM0006     0001Z0M02H50
  Disk 9               557GB     SEAGATE ST600MM0006     0001Z0M02F7V
  Disk Total           4456GB
  Root                 2GB 92%
  Nextroot             2GB 92%
  Var                  400MB 7%
  Log                  1633GB 3%
  DB                   2GB 0%
  Swap                 8GB
  Proxy Cache          400GB
  RAM 1 A              4096M ECC 1600MHz
  RAM 1 B              4096M ECC 1600MHz
  RAM 1 C              4096M ECC 1600MHz
  RAM 1 D              4096M ECC 1600MHz
  RAM 1 E              4096M ECC 1600MHz
  RAM 1 F              4096M ECC 1600MHz
  RAM 1 G              4096M ECC 1600MHz
  RAM 1 H              4096M ECC 1600MHz
  RAM Total            32G
```

Figure 1: Physical WSA ipcheck output

Figure 2. Virtual WSA **ipcheck** output

```
WSA> version
Current Version
===============
Product: Cisco S100V Web Security Virtual Appliance
Model: S100V
Version: 12.5.1-035
Build Date: 2020-11-24
Install Date: 2021-06-29 20:43:24
Serial #: [REDACTED]
BIOS: 6.00
CPUs: 3 expected, 2 allocated
Memory: 8192 MB expected, 8192 MB allocated
Hard disk: 200 GB, or 250 GB expected; 200 GB allocated
RAID: NA
RAID Status: Unknown
RAID Type: NA
BMC: NA
Cisco DVS Engine: 1.0 (Never Updated)
Cisco DVS Malware User Agent Rules: 0.554 (Never Updated)
Cisco DVS Object Type Rules: 0.554 (Never Updated)
Cisco Trusted Root Certificate Bundle: 1.9 (Tue Jun 29 20:46:39 2021)
Cisco Certificate Blocked List: 1.3 (Tue Jun 29 20:46:39 2021)
```

Figure 2: Virtual WSA ipcheck output

Configure WSA Network Settings

This section explains how to configure the network settings of the WSA and increase the send and

receive buffers to get better upload and download speed.

Step 1. Configure send and receive buffer on network level.

1. Access the WSA Command Line Interface (CLI) with admin credentials.
2. Enter **networktuning** command to access buffers options, as shown in this snippit.

```
WSA> networktuning
Choose the operation you want to perform:
- SENDSPACE - TCP sendspace (8192-262144) default 32768
- RECVSPACE - TCP recvspace (8192-262144) default 65536
- SEND_AUTO - TCP send autotuning (ON=1/OFF=0) default OFF
- RECV_AUTO - TCP receive autotuning (ON=1/OFF=0) default OFF
- MBUF_CLUSTER_COUNT - number of mbuf clusters (98304,147100) Default 98304
- SENDBUF_MAX - Maximum send buf, size(131072 - 262144) default, 256K=262144
- RECVBUF_MAX - Maximum recv buf, size(131072 - 262144) default, 256K=262144
- CLEAN_FIB_1 - Remove all M1/M2 entries from Data routing table
[]>
```

Note: Check the **MBUF_CLUSTER_COUNT** formula explained in the previous section.

3. Use this table to enter the new values for each option.

Option	Value	Description
SENDSPACE	Increased up to **262144** (32 times the default value)	Send buffer size for TCP connections
RECVSPACE	Increased up to **262144** (32 times the default value)	Receive buffer size for TCP connections
SEND_AUTO	Set to **1**	1. Allows the WSA to automatically update the send buffer on network level 0. Allows the WSA to automatically update the send buffer on proxy level
RECV_AUTO	Set to **1**	1. Allows the WSA to automatically update the receive buffer on network level 0. Allows the WSA to automatically

MBUF_CLUSTER_COUNT	Use The formula	update the receive buffer on proxy level Number of Memory buffer clusters to be used for WSA
SENDBUF_MAX	No Changes, set to maximum by default	Maximum send buffer size
RECVBUF_MAX	No Changes, set to maximum by default	Maximum receive buffer size
CLEAN_FIB_1	none	FIB1 means the Data routing table. This option removes data routes entries for M1 and M2 interfaces

4. Use the **Enter Key** to go back to the main **CLI** prompt.

> **Note**: Complete **Step 2.** on the same **CLI** session.

Step 2. Configure send and receive buffer on proxy level.

In order to enable network level receive and send buffers, the proxy level options must be disabled:

1. Enter the command **advancedproxyconfig.**
2. Enter the option **miscellaneous.**
3. Use the **Enter** key to move to next option.
4. Repeat previous step to reach the option **"Would you like proxy to perform dynamic adjustment of TCP receive window size?"** and set to **NO.**
5. Use the **Enter** key to move to next option **"Would you like proxy to perform dynamic adjustment of TCP send window size?"** and set to **NO.**
6. Use the **Enter** key until you are back to the main CLI prompt.
7. Enter the command **commit** and save a backup of WSA configuration.

> **Note**: **Reboot** is required for the settings to have impact.

Related Information

- **WSA End User Guide**
- **Upload and Download Speed Troubleshooting**
- **Technical Support & Documentation - Cisco Systems**