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## Introduction

This document describes the configuration of Call Admission Control (CAC) for Point-to-Point Protocol (PPP)/Virtual Private Dial-up Network (VPDN) and the algorithm used by IOS to calculate the maximum value after which the router starts to drop the incoming session requests. CAC is a deterministic and informed decision that is made before a network session is established and is based on whether the required network resources are available to provide suitable service for a new session. The CAC function can be used as a best practice, especially on a router that terminates multiple sites.

## Prerequisites

### Requirements

Cisco recommends that you have knowledge of PPP/VPDN session establishment, that is the control plane packets exchanged to form a PPP/VPDN session.

### 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, make sure that you understand the potential impact of any command.

## Configure

Call Admission control is a method to restrict the number of control plane packets a router responds to, in a given timeframe. The restriction can be based on CPU utilization, Total session limit or Calls Per Second.

To enable CAC, **Call admission new-model** command must always be configured.

## CPU Utilization

In order to prevent high CPU load conditions, the router stops accepting new sessions when the router CPU utilization is above a specific value (in %).

This is set with **Call admission cpu-limit 80** command.

In this example, the cpu-limit of 80 means incoming calls will be dropped when the measured 5-second CPU utilization is 80% or higher which can be determined by the **show process cpu** or **show process cpu sorted** command.

## Session Limit

In order to set a cap for the maximum number of PPP/VPDN sessions that can be established with the router, you define the call admission session limit on the router, this can be set using **call admission session limit 10000** command.

After the numbers of PPP/VPDN sessions reach 10000, the incoming session requests will be dropped until the number of sessions reduces below 10000.

## Session Charge Limit

In order to set a cap for the number of session requests the router should respond to (per second) from various clients, the session charge is defined on the router through call admission control. The session charge limit is set by using **call admission limit 1000** command.

Along with the session charge limit, the session charge per time-frame (example: per second) for PPP/VPDN is also define. You might also define the session charge per time-frame for both PPP and VPDN simultaneously. The command used to define the session charge per time-frame is :

```
call admission pppoe 10 1
```

```
call admission vpdn 10 1
```

These values are used to calculate the call admission control attribute **Calls Per Second**.

## Calls Per Second Calculation

The formula takes these parameters:

```
call admission limit <A>
```

```
call admission pppoe/pppoa/vpdn <B> <C>
```

A: Total session charge the router will accept before dropping incoming control packets of PPPoE/PPPoA/VPDN.

B: session charge per time-frame (example in 1 second)

C: life-time Charge.

The Call rate is equal to: [ <A> / {<B> \* ( <C> + 1)}]

The "+1" is automatically added by the ASR1k to calculate the call rate. Hence if <C> = 1, then ASR will add 1 to <C>, making it 2.

For example:

```
call admission limit 1000
```

```
call admission pppoe 10 1
```

$CPS = [1000 / \{10 * (1 + 1)\}] = 50 \text{ CPS}$

## Related Outputs

### "Show call admission statistics detailed"

Important values to be checked:

1. Total calls rejected
2. Total calls accepted
3. Current hardware CAC status is

The command to show a brief of this command is **show call admission statistics**. Example of the command:

### Recommended values for ASR1000

RP1:

RP2:

## Verify

There is currently no verification procedure available for this configuration.

## Troubleshoot

There is currently no specific troubleshooting information available for this configuration.