Maximum Number of Interfaces and Subinterfaces for Cisco IOS Software Platforms: IDB Limits

Contents

Introduction

This document explains the Interface Descriptor Block (IDB) limit, and provides the limits for the different Cisco IOS® software-supported platforms and Cisco IOS software releases.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on the software and hardware releases that the IDB Limits Per Platform section lists.

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.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Background Information

An Interface Descriptor Block (IDB) is a special control structure internal to the Cisco IOS software that contains information such as the IP address, interface state, and packet statistics. Cisco IOS software maintains one IDB for each interface present on a platform and one IDB for each subinterface.

There are two main types of IDBs:

- Hardware IDBs (HWIDBs)
- Software IDBs (SWIDBs)

A HWIDB represents a physical interface, which includes physical ports and channelized interface definitions. A SWIDB represents a logical sub-interface (Permanent Virtual Circuit (PVC) or virtual LAN (VLAN)), or a Layer 2 encapsulation (Point-to-Point Protocol (PPP), High-Level Data Link Control (HDLC), and so forth).

Each physical interface on the router consumes a minimum of two IDBs:

- One HWIDB for the physical port
- One SWIDB for the Layer 2 encapsulation

A channelized port consumes N+1 HWIDBs, where N is the number of channels within the physical port, plus a minimum of N SWIDBs (Level 2 encapsulation per channel). Any sub-interfaces that you define each add another SWIDB.

Each tunnel interface definition, such as Universal Transport Interface (UTI), Generic Routing Encapsulation (GRE), Multiprotocol Label Switching Traffic Engineering (MPLS TE), or Any Transport over MPLS (AToM) consumes an HWIDB plus one SWIDB per tunnel, plus an additional SWIDB for each additional sub-interface, for example, a Frame Relay PVC, that is tunneled. The tunnel IDBs are in addition to the original interface(s) that are tunneled.

Layer 2 Tunnel Protocol Version 3 (L2TPv3), which replaces UTI in Cisco IOS Software Release 12.0(23)S, does not consume IDBs, because L2TPv3 is a session-based pseudo-wire implementation rather than a defined tunnel interface such as UTI.

The maximum number of interfaces (physical, subinterface, or virtual) a router can handle depends on the maximum number of SWIDBs that the router can use. This limit used to be set to 300 for all platforms, but with the emergence of features such as frame-relay subinterfaces, multilink Point-to-Point Protocol (PPP), and virtual private dial-up network (VPDN) that uses virtual interfaces, this value has proven to be insufficient on some platforms.

Cisco has performed extensive work to scale Cisco IOS software to these new requirements. From Cisco IOS Software Release 11.3T and later, the IDB limit depends on the platform and the Cisco IOS software release. The IDB limit now indicates the maximum number of interfaces a router can handle, if you assume that other resources, such as memory, CPU, and so forth, are available.

In order to see the maximum number of IDBs, and the number of IDBs currently in use, along with their memory consumption, use the **show idb** IOS command. This command is available in Cisco IOS Software Releases 12.1(9), 12.1(9)E, 12.1(9)EC, 12.0(18)S/ST, 12.2(x), 12.2(x)T, and 12.2(2)B.

If you monitor the number of IDBs currently in use, you can re-configure or add capacity as the IDB limit is approached for dial and aggregation purposes.

The output of the **show idb** command looks similar to this:

```
Router#show idb

Maximum number of IDBs 4096

42 SW IDBs allocated (2440 bytes each)

40 HW IDBs allocated (5760 bytes each)
HWIDB#1   1   SRP0/0 (HW IFINDEX, SRP)
HWIDB#2   2   POS1/0 (HW IFINDEX, SONET, Serial)
HWIDB#3   7   FastEthernet3/0 (HW IFINDEX, Ether)
HWIDB#4   8   FastEthernet3/1 (HW IFINDEX, Ether)
HWIDB#5   9   FastEthernet3/2 (HW IFINDEX, Ether)
HWIDB#6   10  FastEthernet3/3 (HW IFINDEX, Ether)
HWIDB#7   11  FastEthernet3/4 (HW IFINDEX, Ether)
HWIDB#8   12  FastEthernet3/5 (HW IFINDEX, Ether)
HWIDB#9   13  FastEthernet3/6 (HW IFINDEX, Ether)
HWIDB#10  14  FastEthernet3/7 (HW IFINDEX, Ether)
HWIDB#11  15  POS4/0 (HW IFINDEX, SONET, Serial)
HWIDB#12  16  POS4/1 (HW IFINDEX, SONET, Serial)
HWIDB#13  17  POS4/2 (HW IFINDEX, SONET, Serial)
HWIDB#14  18  POS4/3 (HW IFINDEX, SONET, Serial)
HWIDB#15  19  GigabitEthernet6/0 (HW IFINDEX, Ether)
HWIDB#16  21  POS10/0 (HW IFINDEX, SONET, Serial)
```

```
HWIDB#17  22  POS11/0 (HW IFINDEX, SONET, Serial)
HWIDB#18  23  Loopback0 (HW IFINDEX)
HWIDB#19  24  Loopback1 (HW IFINDEX)
HWIDB#20  25  Tunnel100 (HW IFINDEX)
HWIDB#21  26  Tunnel909 (HW IFINDEX)
HWIDB#22  27  Ethernet0 (HW IFINDEX, Ether)
```

Maximum Number of Interfaces

Every interface uses an IDB. Therefore, the IDB limit indicates the maximum number of interfaces a router can handle.

The IDB limit is, therefore, the answer to the common question "How many (sub)interfaces can be configured on this platform?"

Maximum Number of VLANs

Each Virtual LAN (VLAN) requires one IDB. Any Cisco IOS software release can support up to 4096 VLANs (0-4095, where the number range is 1 to 4094 and in which 0, 4095 are reserved), if the platform supports at least 4000 IDBs

There is a limitation of 256 bridge groups in the Cisco IOS software release if you use VLAN bridging.

IDB Limits Per Platform

Table 1 lists the IDB limit for the different Cisco IOS software-supported platforms and Cisco IOS Software Releases 11.3T and later:

Table 1 IDB Limits

Platform/IOS	Cisco IOS Software Release 11.3T	Cisco IOS Software Release 11.3AA	Cisco IOS Software Release 12.0	Cisco IOS Software Release 12.0S	Cisco IOS Software Release 12.0T	Cisco IOS Software Release 12.1	Cisco IOS Software Release 12.1T	Cisco IOS Software Release 12.2	Cisco IOS Software Release 12.2T	Cisco IOS Software Release 12.3	Cisco IOS Software Release 12.3T
as5200	300	300	300	n/a	300	300	300	300	300	n/a	n/a
as5300	700	700	700	n/a	**800**	800	800	800	800	800	800
as5400	n/a	n/a	n/a	n/a	n/a	n/a	2000	**3000**	3000	3000	3000
as5800	n/a	2048	2048	n/a	2048	2048	2048	2048	2048	2048	2048
800	n/a	n/a	n/a	n/a	300	300	300	300	300	300	300
ubr900	n/a	n/a	n/a	n/a	300	300	300	300	300	300	300
1000	300	300	300	n/a	300	300	300	300	300	n/a	n/a
1700/c1600	300	300	n/a	n/a	300	300	300	300	300	300	300
2500	300	300	300	n/a	300	300	300	300	300	300	300
2600/2600XM	300	300	300	n/a	300	300	300	300	800	800	800
3600	800	800	800	n/a	800	800	800	800	800	800	800
3660	n/a	n/a	n/a	n/a	1400	1400	1400	1400	1400	1400	1400
3725	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	800	800	800
3745	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1400	1400	1400
3800	300	300	300	n/a	300	300	300	300	300	n/a	n/a
mc3810	n/a	n/a	300	n/a	300	300	300	300	300	300	300
4000	300	300	300	n/a	300	300	300	300	300	n/a	300
4500/4700	300	300	300	n/a	300	300	300	300	300	300	300

7100	300	300	**3000**	3000	3000	3000	**10000**	10000	10000	**20000**	20000
7200	300	300	**3000**	3000	3000	3000	**10000**	10000	10000	**20000**	20000
MSFC	n/a	n/a	n/a	n/a	3000	3000	3000	3000	3000	n/a	n/a
ls1010	300	300	300	n/a	300	300	300	300	300	n/a	n/a
6400 (nrp)	n/a	n/a	n/a	n/a	3000	**4500**	4500	4500	4500	4500	4500
7500 (rsp/vip)	300	**1000**	1000	**2048**	2048	2048	2048	2048	2048	2048	2048
12000 (grp/lc)	n/a	n/a	n/a	**4096**	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Note:

- Limits in **bold** denote value changes.
- The numbers in this table are nominal values. Real values might vary. Consult your Cisco Sales Engineer (SE) for details.

Table 2 ESR 10000 and ESR 10700 IDB Limits and the Supported Cisco IOS Software Releases

Platform/ IOS	Cisco IOS Software Release 12.0.28.S	Cisco IOS Software Release 12.2	Cisco IOS Software Release 12.3(7)X12
ESR 10000	Yes (Can have up to16383)	Yes	Yes (Can have up to 65530)
ESR 10700	Yes (12.0SP)	No	No

Additional IDB Limits for All Platforms

Table 3 indicates the IDB limit for the different Cisco IOS software-supported platforms and Cisco IOS software releases (earlier than 11.3T):

Table 3 IDB Limit for Cisco IOS Software-Supported Platforms and Releases (11.3T and Earlier)

Platform/IOS	Cisco IOS Software Release 11.3	Cisco IOS Software Release 11.2	Cisco IOS Software Release 11.2P	Cisco IOS Software Release 11.1	Cisco IOS Software Release 11.1CC	Cisco IOS Software Release 11.1CA	Cisco IOS Software Release 11.0
All platforms	300	300	300	300	1024	1024	256

IDB limits for various ISR platforms

Table 4 IDB Limits

Platform/IOS	Cisco IOS Software Release 12.3T
1841	700
2801	800
2811	800
2821	900
2851	1000
3825	1200
3845	1400

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