

# Qualifying Ethernet Cards for Cisco Agent Desktop Monitoring

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## Introduction

This document describes how to qualify Ethernet cards for use in a Cisco Agent Desktop environment.

## Prerequisites

### Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco Agent Desktop
- Cisco Unified Contact Center Enterprise
- Cisco Unified Contact Center Express
- Sniffer Pro, or similar software

### Components Used

The information in this document is based on these software and hardware versions:

- Cisco Agent Desktop
- Cisco Unified Contact Center Enterprise version 4.6(0)
- Cisco Unified Contact Center Express version 6.1(1)
- Sniffer Pro, or similar software

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.

## Description

On a site where you deploy IP Telephony (or plan to deploy in the future), the Cisco CallManager and the IP phones typically use a Virtual Local Area Network (VLAN) in order to logically separate voice from data. Although both traffic types are carried on the same physical channel, they are transmitted on two different VLANs, one for voice and one for data. This configuration allows voice to be transmitted with higher priority than data.

In a contact center that uses silent monitor, you must ensure that the agent desktop system is connected to the PC port on the back of the IP phone. This enables the silent monitor subsystem to collect voice packets that reach the phone, and to forward the voice packets to the supervisor workstation. The agent desktop system uses one single physical channel to interact with two different VLANs.

The agent desktop accesses the physical channel with the help of an Ethernet Network Interface Controller (NIC). The NIC watches the channel and collects Ethernet frames addressed to the agent computer. Then it runs a pre-processing step to extract IP packets from the Ethernet frames and deliver them to the TCP/IP stack.

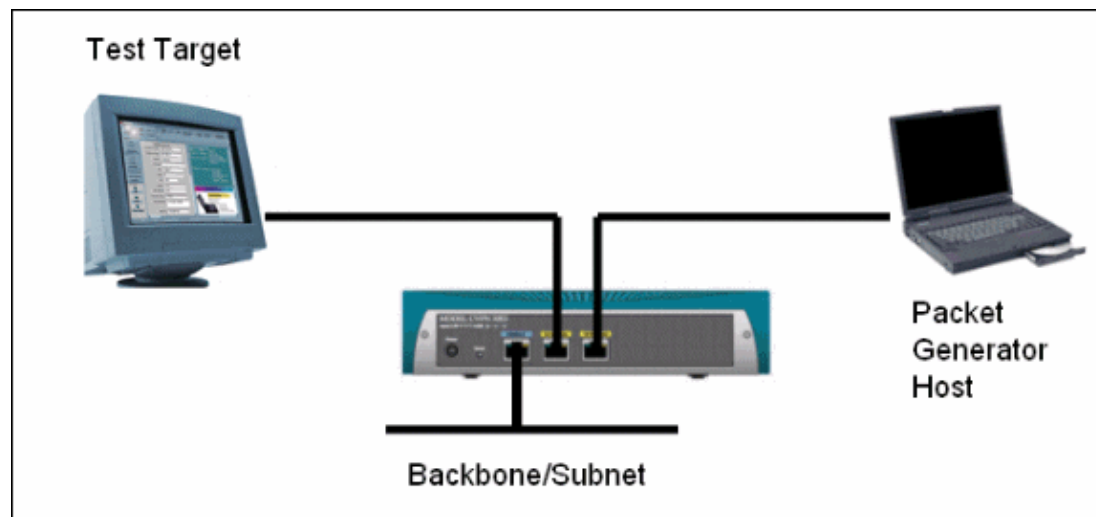
During extensive internal testing Cisco identified that some Ethernet NIC card drivers available are not capable of pre-processing Ethernet frames that have an IP packet encapsulated in a VLAN frame. The NIC card driver discards the Ethernet frame altogether if the IP packet is encapsulated in an 802.1Q frame. Some vendors can provide a configuration setting that allows their NIC card driver to forward VLAN traffic to the TCP/IP stack. See table 1.

If an agent desktop NIC card driver discards VLAN traffic, the silent monitor subsystem on that desktop is not able to collect and forward voice packets to the supervisor workstation and silent monitor does not function properly. Cisco has developed a procedure to determine whether a particular Ethernet NIC card driver works with CTI OS Silent Monitor. The procedure is described in the Test Procedure section.

## Test Procedure

In this test, you send sample VLAN packets to a Test Target NIC card, and ensure that the pre-processing step does not discard the packets, but passes the packets on to the TCP/IP stack on the operating system to the computer that hosts the NIC card. Figure 1 represents the setup you require for this test.

**Figure 1 The Test Setup**



The Test Target NIC is connected to one port of a simple Hub. The Hub is connected to the network backbone or subnet. You also need a Packet Generator Host that has the ability to generate Ethernet traffic. The Packet Generator Host is connected to another port on the Hub.

The Packet Generator Host equipment can be either a dedicated packet analyzer, or a computer with a software-based packet analyzer with capabilities to generate Ethernet traffic.

There are a good number of software packet analyzers available that can be used for this purpose. For a comprehensive list of reliable analyzers visit the Cooperative Association for Internet Data Analysis web site.

## Prepare the Test Target

When the environment is set up, load the software tools on the Test Target and Packet Generator Host. Complete these steps:

1. Download WinPcap .
2. Run the Install program for WinPcap.
3. Create a directory on the Test Target computer, and name it "VLANTest".
4. Download WinDump.exe .
5. Copy the file to the directory you created in step 3.
6. Open a console window, go to the directory where you copied WinDump.exe.
7. Determine the MAC address of the Test Target NIC. To do so, execute **ipconfig /all** at the command prompt.
8. Write down the number that appears for the Physical Address, as shown in figure 2:

**Figure 2 The ipconfig /all Command Output**

```
Select C:\WINNT\system32\cmd.exe
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . : cisco.com

Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix  . : cisco.com
    Description . . . . .           : Cisco Systems 350 Series PCMCIA Wir
    Physical Address. . . . .       : 00-09-43-74-55-94
    DHCP Enabled. . . . .          : Yes
    Autoconfiguration Enabled . . . : Yes
    IP Address. . . . .             : 10.86.165.239
    Subnet Mask . . . . .           : 255.255.254.0
    Default Gateway . . . . .       : 10.86.164.1
    DHCP Server . . . . .           : 161.44.124.23
    DNS Servers . . . . .           : 161.44.124.122
                                     64.102.6.247
                                     171.68.226.120
    Primary WINS Server . . . . .   : 161.44.122.10
    Secondary WINS Server . . . . . : 64.102.2.51
    Lease Obtained. . . . .         : Friday, August 08, 2003 5:39:41 PM
    Lease Expires . . . . .         : Saturday, August 09, 2003 1:39:41 P

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : cisco.com
    Description . . . . .           : Intel(R) PRO/100 UE Network Connect
    Physical Address. . . . .       : 00-D0-59-D8-F7-D9
    DHCP Enabled. . . . .          : Yes
    Autoconfiguration Enabled . . . : Yes
    IP Address. . . . .             : 10.86.139.153
    Subnet Mask . . . . .           : 255.255.255.128
    Default Gateway . . . . .       : 10.86.139.129
```

For example, notice the Intel Pro/100 NIC card, the MAC address is **00D059d8f7d9**.

9. Determine the device interface number of the Test Target NIC. Execute **windump D**.
10. Write down the number of the test NIC (see figure 3).

**Figure 3 The Test NIC Number**

```
C:\WINNT\system32\cmd.exe
D:\Development\ULAN Testing\WinDump>windump -D
1.\Device\NPF_{5E18F3A4-4257-46C3-9ADB-A33EBC591C3C} <Intel(R) PRO/100 UE Netwo
2.\Device\NPF_{9908F2F0-99CE-4183-AE6E-C9A38A9F14D2} <Cisco 350 series Wireless
D:\Development\ULAN Testing\WinDump>
```

Notice the interface number 1 that corresponds to the Intel Pro/100 NIC card in figure 3.

**Note:** If you are not sure which number to pick, repeat the test for each card until the test succeeds for one (sufficient pass) or fails for all cards.

11. Start **WinDump** to monitor the Test Target NIC for incoming VLAN packets. Execute **windump i <device\_number> vlan**. As shown in figure 4, the device\_number is **1**.

**Figure 4 The Device Number is 1**

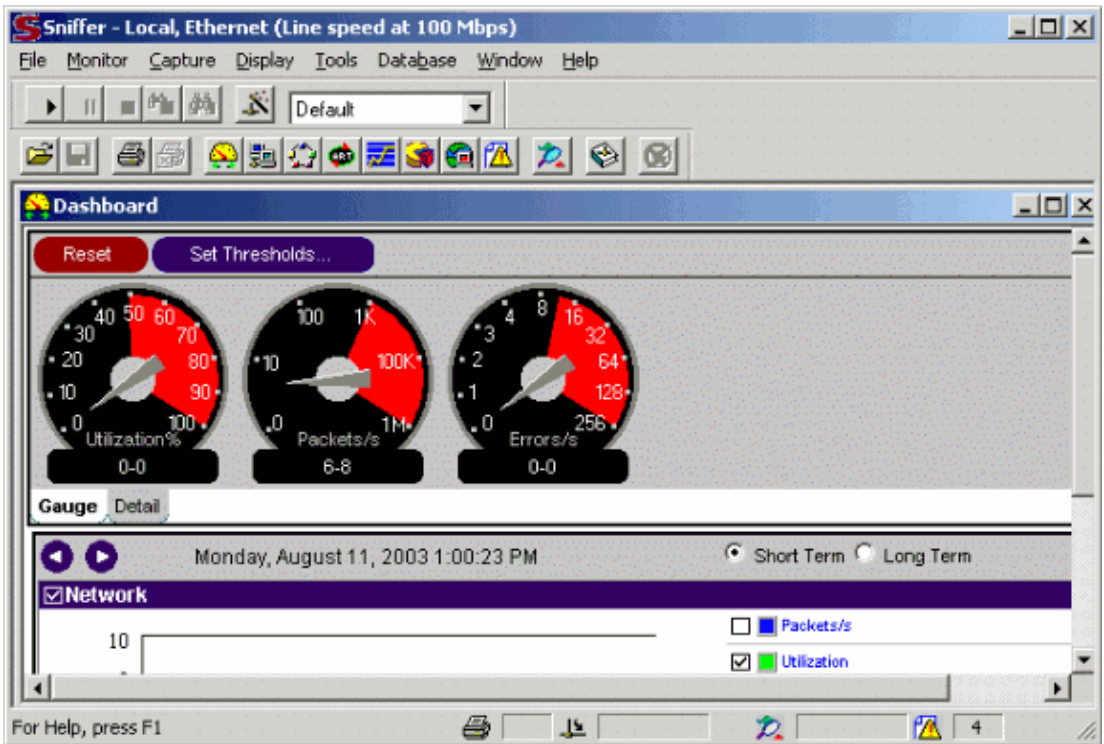
```
C:\WINNT\system32\cmd.exe - windump -i 1 vlan
D:\Development\ULAN Testing\WinDump>windump -i 1 vlan
windump: listening on \Device\NPF_{5E18F3A4-4257-46C3-9ADB-A33EBC591C3C}
```

## Prepare the Packet Generator Host

Complete these steps in order to prepare the packet generator host:

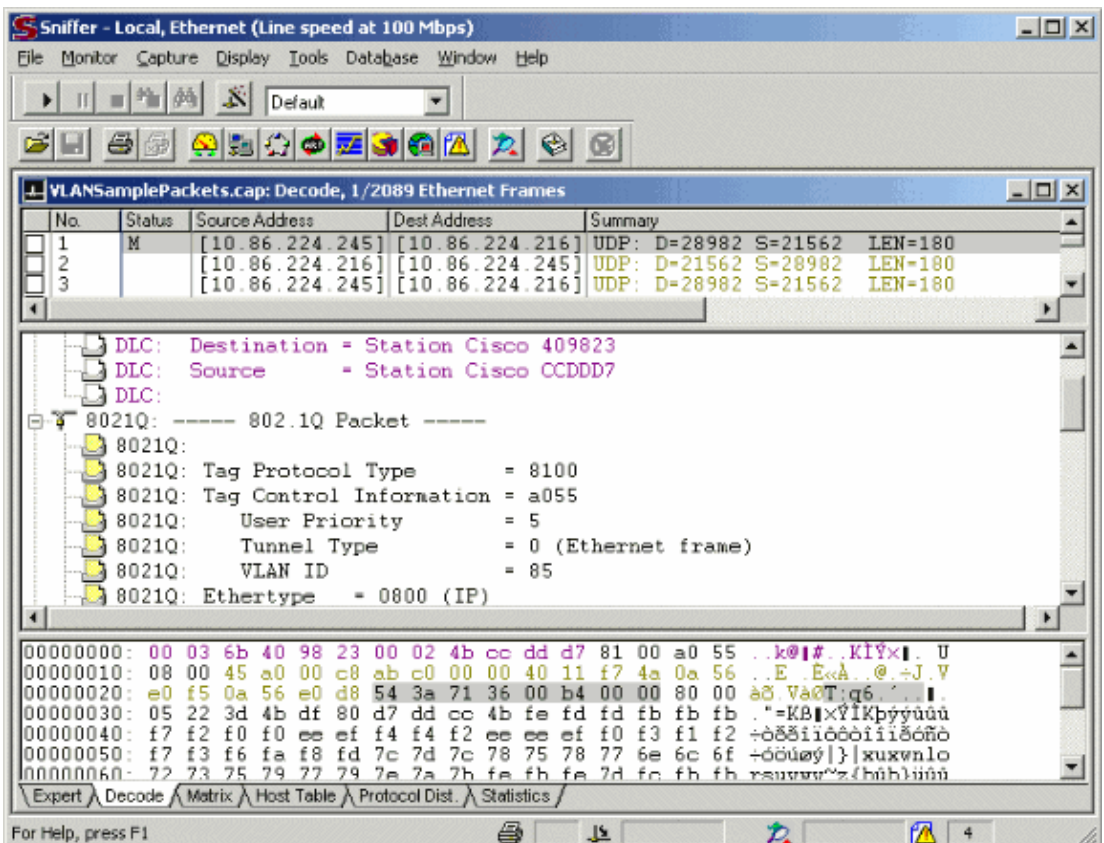
1. Obtain a packet analyzer, for example Sniffer Pro.
2. Load the packet analyzer software onto the Packet Generator Host. Figure 5 shows Sniffer Pro.

**Figure 5 Sniffer Pro**



3. Obtain the sample capture file **VLANSamplePackets.cap**, and save the file to an accessible directory.
4. Load the sample capture file into the packet analyzer, such as Sniffer Pro. **VLANSamplePackets.cap** is generated in a format that majority of the dedicated and software packet analyzers can load. Figure 6 displays the opened file in Sniffer Pro.

**Figure 6 The File Opened in Sniffer Pro**



## Execute the Test

In this test, you send sample VLAN packets to a Test Target NIC card, and ensure that the pre-processing step does not discard the packets, but passes the packets on to the TCP/IP stack on the computer that hosts the NIC card.

Here is the test case to determine whether or not the Test Target NIC is qualified to work with CTI OS Silent Monitor and Cisco Agent Desktop monitoring:

- PA – Packet Analyzer
- WD – WinDump

### SMNIC – 1 Send Sample VLAN Packets to Test Target NIC Card

#### Objective

To verify whether the Test Target NIC is able to pre-process VLAN packets and forward them to the TCP/IP stack on the Test Target host.

#### Steps

##### Party

##### Action

1

PA

Select one of the loaded sample VLAN packets.

2

PA

Select the option, "Send the Current Frame".

3

PA

Modify the destination MAC address to use the MAC address of the Test Target NIC (see figure 7).

4

PA

Send five times the new frame to the Test Target NIC.

5

WD

Confirm that there is activity reported on the Test Target NIC.

## Expected Result

The Test Target computer "windump" displays five packets for VLAN ID=85 (see figure 8). If the test fails, no packets are displayed.

Figure 7 Modify the Destination MAC Address

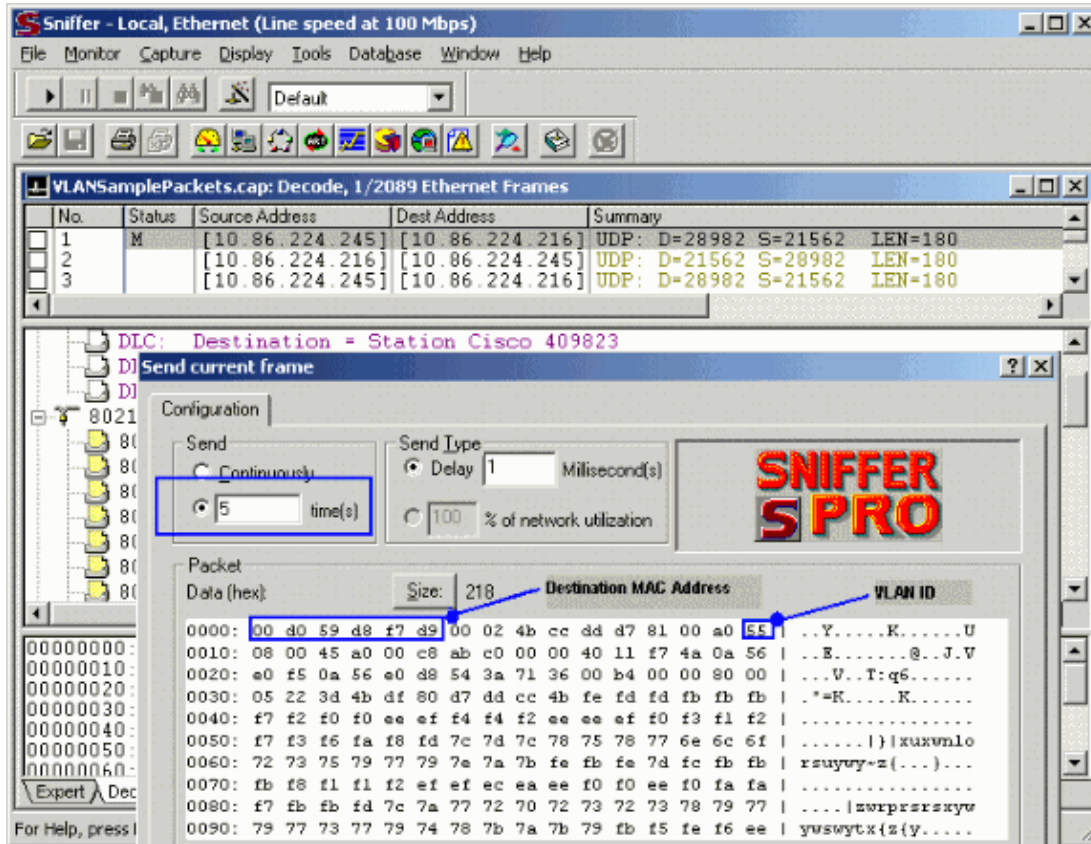
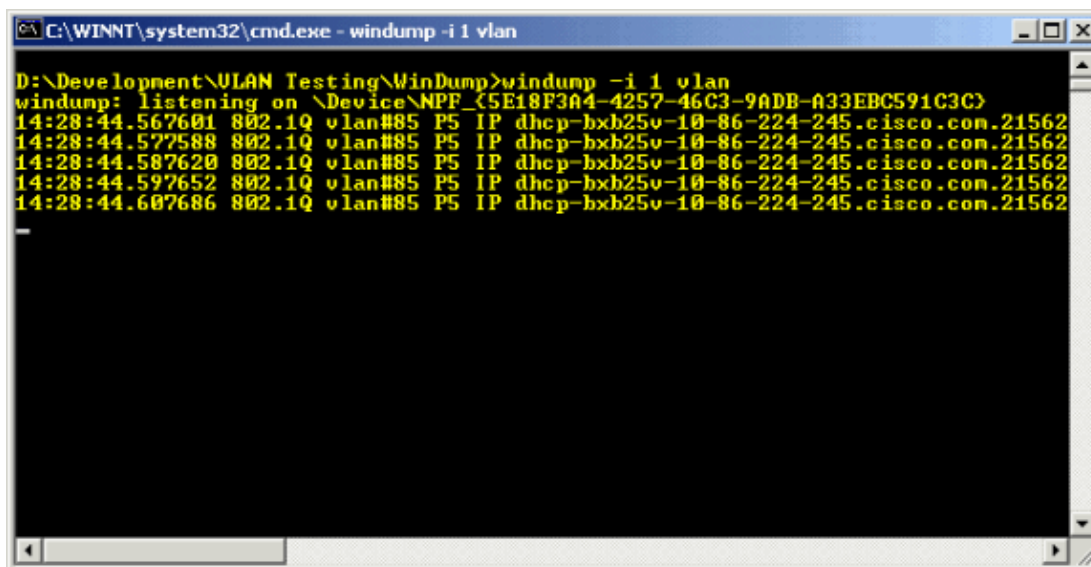


Figure 8 Five Packets Displayed for VLAN ID=85



If the outcome of this test is successful, your Test Target NIC works with CTI OS Silent Monitor and Cisco Agent Desktop monitoring. If the test is not successful, contact your NIC card provider and ask for the settings necessary to allow the NIC card driver to forward all packets including VLAN packets to the TCP/IP

stack on the computer so the packet analyzer tool can capture and display them.

Apply the appropriate adjustments and re-run this test procedure.

**Manufacturer**

**Card**

**Driver Versions Tested**

**OS Tested**

**Result**

Intel

8255x-based PCI Ethernet Adapter

5.067.0 (8/5/2000)

Windows 2000

Does not work

5.40.17.0(4/12/2001)

Windows 2000

Does not work

Intel

Intel Pro/1000

According to Intel currently no supported but on the roadmap for 2004

Does not work

Intel

Pro/100 VE (see below)

7.0.26.0 (3/4/2003)

6.1.3.0 (2/25/2002)

Windows 2000 and Windows XP

Works with a workaround

## Note on Intel Pro/100 VE Cards

While the Intel Pro/100 cards tested did not work in their default configuration, there is a configuration setting (registry key), which enables Intel Pro/100 cards to work with CTIOS Silent Monitor. For more information please visit the Intel web site.

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## Related Information

- [Cooperative Association for Internet Data Analysis](#)
  - [WinPcap: the Free Packet Capture Architecture for Windows](#)
  - [WinDump: tcpdump for Windows](#)
  - [My Sniffer\\* is Not Seeing VLAN or QoS Tags When I Take the Trace on the PC](#)
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