

Version 7.0

Impairment Emulator Software for IP Networks (IPv4 & IPv6)

NetDisturb Client - Impairment Tool for IP Networks - v6.0.WSX

File Edit Actions Working Modes Statistics Help « Hide Aggregates

Flows to impair using filters

View TCP 5001 Run #01 w/Log

View TCP 5002 + #02 w/Log

View TCP 5003 Run #03 w/Log

View TCP 5004 Run #04 w/Log

View TCP 5005 + #05 w/Log

View TCP 5006 Run #06 w/Log

View TCP 5007 Run #07 w/Log

View TCP 5008 + #08 w/Log

View TCP 5009 + #09 w/Log

View TCP 5010 Run #10 w/Log

View TCP 5011 Run #11 w/Log

View TCP 5012 Run #12 w/Log

View TCP 5013 + #13 w/Log

View TCP 5014 Run #14 w/Log

View TCP 5015 Run #15 w/Log

View TCP 5016 + #16 w/Log

Unfiltered - Flows, Frames & Packets

View All Run w/Log

Automatically Start with filtered Flow(s)

View Per-Flow Statistics

Run All Stop All

Dashboard

Alarms: View Alarms ...

CPU Usage: 6 %

Unfiltered - Flows, Frames & Packets (All)

ENHANCED EDITION

Impairments to apply on packets going from A to B

Loss & Duplication Delay & Jitter Content Impairment

Constant Loss Constant Delay 1 Packet out of 10

To Lose 12 Packets Define Constant Delay Define 1 Packet out of N Define

Incoming on A

Packets 0

Packets/s 0 p/s

Throughput 0.00 b/s

Application Rules

Impairments on A to B

Lost/Duplic. Pkts 0 [0.0%]

Delayed Pkts 0 [0.0%]

Modified Pkts 0 [0.0%]

Outgoing on B

Packets 0

Packets/s 0 p/s

Throughput 0.00 b/s

A Interface B Interface

Outgoing on A

Packets 0

Packets/s 0 p/s

Throughput 0.00 b/s

Application Rules

Impairments on B to A

Lost/Duplic. Pkts 0 [0.0%]

Delayed Pkts 0 [0.0%]

Modified Pkts 0 [0.0%]

Incoming on B

Packets 0

Packets/s 0 p/s

Throughput 0.00 b/s

Impairments to apply on packets going from B to A

Loss & Duplication Delay & Jitter Content Impairment

% of Loss & Time Throughput, Jitter, Time Uniform Law Impairment

Loss: Percentage & Duration Define Throughput and max. Jitter with Duration from File Define Uniform Law Define

Cumulative Statistics of the Interfaces (based on Network Interface Cards level)

	Throughput Reception	Received Pkts	Filtered Pkts	Sent Pkts	Throughput Transmission
From A to B	0.00 b/s	0 p/s	0 p	0 p	0.00 b/s
From B to A	0.00 b/s	0 p/s	0 p	0 p	0.00 b/s

Aggregates Panel

#01

#02

(None) #03

#04

(None) #05

#06

(None) #07

#08

(None) #09

#10

(None) #11

#12

(None) #13

#14

(None) #15

#16

(None) Other

Configure Aggregates

Help

The aggregate is a consecutive set of Flows sharing the same Delay & Jitter laws. All Flows of an aggregate share only one aggregate's Delay & Jitter law. There is one aggregate Delay & Jitter law per direction.

Read Me First

Table of contents

PART 0	PREFACE	4
0.1	ORGANIZATION OF THIS MANUAL.....	4
0.2	MINIMUM SYSTEM REQUIREMENTS.....	5
0.3	TECHNICAL SUPPORT.....	5
PART 1	NETDISTURB OVERVIEW	6
1.1	PRODUCT REQUIREMENTS.....	6
1.2	TYPICAL APPLICATIONS	7
1.3	KEY FEATURES.....	7
1.4	COMPARISON BETWEEN STANDARD AND ENHANCED EDITIONS	9
1.5	EXAMPLES OF USE.....	10
PART 2	WHAT'S NEW IN NETDISTURB VERSION 7?	11
PART 3	INSTALL NETDISTURB	12
3.1	FOREWORDS BEFORE UPGRADING FROM VERSIONS 4, 5 AND 6 TO VERSION 7	12
3.2	FOREWORDS BEFORE UPGRADING FROM VERSIONS 4.2 UP TO VERSION 4.8	12
3.3	FOREWORDS BEFORE UPGRADING FROM VERSIONS 4.1 AND UNDER	12
3.4	HOW TO INSTALL THE SOFTWARE DOWNLOADED FROM THE INTERNET	12
3.5	HOW TO INSTALL THE SOFTWARE FROM THE CD-ROM.....	12
3.6	HOW TO INSTALL THE NETDISTURB CLIENT ONLY (FROM THE CD-ROM).....	13
3.7	DURING THE INSTALLATION.....	13
3.7.1	NetDisturb packages in a few words.....	13
3.7.2	Which package should I install?.....	14
3.7.2.1	I want to evaluate NetDisturb	14
3.7.2.2	I already use NetDisturb.....	14
3.7.2.3	I just bought NetDisturb.....	14
3.8	WHAT HAS BEEN INSTALLED ON MY COMPUTER?	14
3.9	HOW TO REINSTALL ANOTHER PACKAGE?	15
3.10	HOW TO TRANSFER THE SOFTWARE TO ANOTHER COMPUTER?	15
PART 4	HOW TO HANDLE YOUR LICENSE?	16
4.1	NETDISTURB TRIAL.....	16
4.1.1	NetDisturb Server License Information window	16
4.1.2	End of the fifteen-day trial period	16
4.2	NETDISTURB & USB SOFTWARE PROTECTION KEY.....	17
PART 5	UNINSTALL NETDISTURB	17
PART 6	RUN NETDISTURB.....	18
6.1	NETDISTURB AND NIC CARDS	18
6.2	NETDISTURB AND WI-FI NIC	18

6.3 LAUNCH NETDISTURB19

6.4 FIRST RUN.....19

6.4.1 The NetDisturb Server startup 19

6.4.2 NetDisturb Client startup 20

6.4.2.1 NetDisturb Client startup in Automatic Mode 20

6.4.2.2 NetDisturb Client startup in Manual Mode 26

6.5 DETAILED DESCRIPTION OF THE SERVER AND CLIENT STARTUP32

6.5.1 The NetDisturb Server Startup Modes 32

6.5.2 The NetDisturb Client Startup Options..... 32

Part 0 Preface

0.1 Organization of this manual

This document is aimed at helping you to discover and use **NetDisturb**. It is organized as follows:

- **Part 1:** Product Overview

Part 1 briefly describes the key features of the **NetDisturb** software.

- **Part 2:** What's new in **NetDisturb** version 7

Part 2 is a general overview of new features, main improvements provided with **NetDisturb** version 7.

- **Part 3:** Install **NetDisturb**

Part 3 presents the product requirements, how to install the software downloaded from the Internet or from the CD-ROM, provides important information to upgrade from previous versions and explains how to choose the most suitable **NetDisturb** package.

- **Part 4:** How to handle your license?

Part 4 describes how to proceed for the license transfer

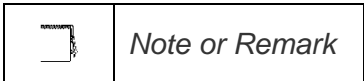
- **Part 5:** Uninstall **NetDisturb**

Part 5 describes how to uninstall the software.

- **Part 6:** Run **NetDisturb**

Part 6 describes how to run the **NetDisturb** Server and **NetDisturb** Client.

In this document, you will find the following symbols: They mean:



0.2 Minimum System Requirements

To appropriately operate **NetDisturb** you need the following minimum system requirements:

- 64-bit version of Windows Seven, 8, 10, 11 or Server 2008R2 and upper
- 3 GB memory at least
- Two identical Ethernet NICs are recommended: Ethernet, Fast Ethernet, or Gigabit Ethernet network interface card.
- 1024 x 768 display, DPI setting = Normal size (96 DPI) / 100% and Font size = Normal
- 75 MB free hard disk space



*Acrobat Reader is needed to display the **NetDisturb** Help. If Acrobat reader hasn't been installed, a warning message is displayed to inform that the help file can't be opened.*

0.3 Technical Support

ZTI Communications Technical Support can assist you with all your technical problems from installation to troubleshooting.

Before contacting our Technical Support, please read the relevant sections of the product documentation and the “Read Me First” file.

Before contacting our technical support, make sure you record the following information:

- Product name and version.
- Trial License or unlimited licensed product.
- System configuration.
- Problem details: settings, error messages...
- If the problem is persistent, give the details of how to create the problem.

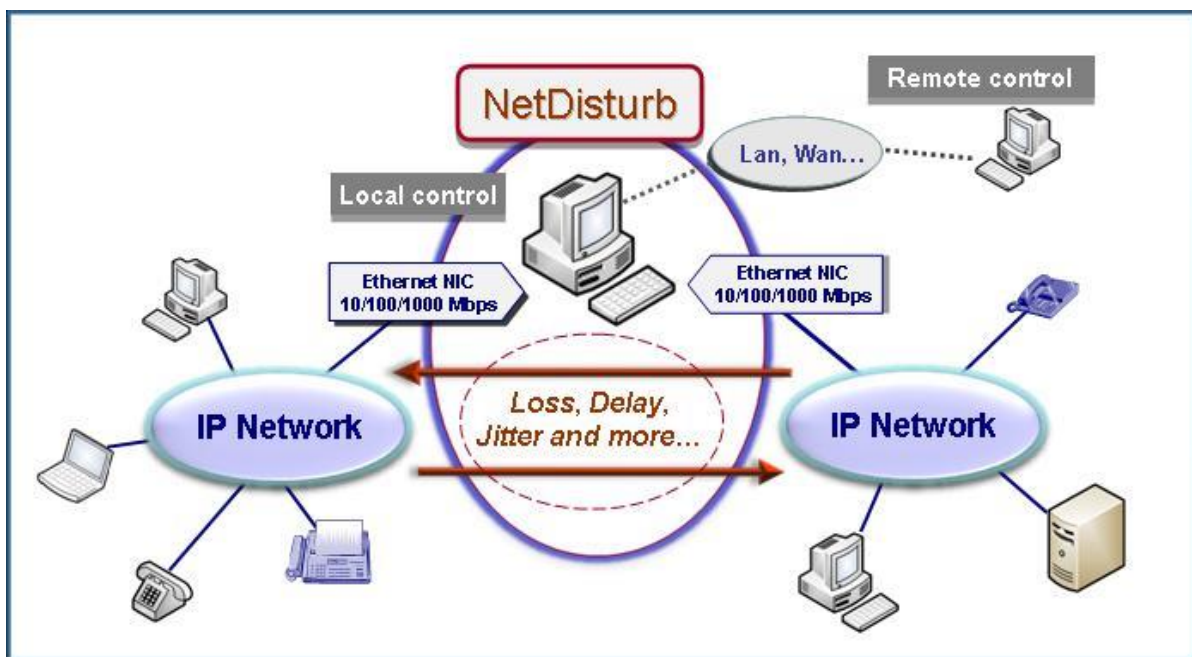
You can contact Technical Support by:

Email	Send as many details as possible to support@zti-communications.com
Telephone	Telephone support is available from 09:00 am to 05:00 pm (Central European Time), Monday to Friday. Call on +33 2 5104 8984

Part 1 NetDisturb Overview

NetDisturb is an IP network emulator software that can generate impairments over IP networks (IPv4 and IPv6) such as: latency, delay, jitter, bandwidth limitation, loss, duplication and modification of the packets. **NetDisturb** allows you to disturb flows over an IP network helping to study the behavior of applications, devices or services in a disturbed network environment.

NetDisturb is inserted between two Ethernet segments acting as a bridge and operates bi-directional packet transfer on Ethernet, Fast Ethernet and Gigabit network interface cards.



1.1 Product Requirements

- * Platform: 64-bit version of Windows Seven, 8, 10, 11 or Server 2008R2 and upper with at least 3 GB Ram. 75 MB free hard disk space.
- * Hyper-threading, multi core and PC multiprocessors are also supported.
- * Two Identical Network Interfaces Cards (NIC) are recommended: Ethernet, Fast Ethernet, or Gigabit Ethernet.
- * Display resolution: at least 1024 x 768 (more readable: 1152 x 768 and sup.), DPI setting = Normal size (96 DPI) / 100% and Font size = Normal.

1.2 Typical Applications

No need to buy expensive hardware, use **NetDisturb** software as hundreds of customers around the world!

- *Development assistance and debug of automations for IP equipment:* particularly on Set-Top Boxes operating in cable or telecom environments.
- *Performance & Acceptance Tests:* Qualify and evaluate the behavior of IP equipment (phone, fax, gateway, set-top box, IMS core, call server, application server, residential gateway, ADSL wireless router, and more...) and applications (audio and video streaming) on IP networks.
- *Configuration and control of IP Equipment for product verification and test:* Define different QoS levels in an Intranet or the Internet environment to configure terminals, gateways and routers.
- *Test Laboratories:* **NetDisturb** provides repeatable QoS on different flows using configuration mode and values (loss, duplicate, delay, packet content impairment) defined by the user, and so re-create real world problems in the lab.
- *Applications test:* **NetDisturb** allows you to test applications such as Voice over IP, Fax over IP, streaming audio and video, IPTV, VoD, real time applications and services, and other distributed applications.
- *Emulation of symmetric or asymmetric network conditions found on the Internet and enterprise networks (LAN, MAN, WAN):* latency, jitter, packet loss, bandwidth limitations, and more... to test IP applications (VoIP, streaming audio & video, etc.), services and products sensitive to various real conditions.

1.3 Key Features

Two software editions are available: **Standard** and **Enhanced**. What are the major features of **NetDisturb** version 7?

Common Key features for Standard and Enhanced Editions

- 64-bit Windows operating systems –Seven, 8, 10, 11 or Server 2008R2 and upper.
- Simultaneous support of **IPv4** and **IPv6**
- Client-Server Architecture based on the SOAP mechanism which uses the HTTP protocol and the XML format for the exchanges between the client and the server.
- **NetDisturb** is an **Ethernet Bridge** to avoid any network configuration.
- **NetDisturb** is an IP Router for Wi-Fi NICs
- Use of standard Ethernet Network Interface Cards up to **1 Gbps** or Wi-Fi card to make impairment.
- **Automatic start mode for new users with a set of predefined contexts (PING, TCP, UDP, HTTP, Video, etc.)**
- **Automatic discovery and configuration the NICs to use with NetDisturb.**
- Symmetric or Asymmetric **Bandwidth limitation** with Throughput Limitation laws.
- Very easy to use and intuitive Graphical User Interface
- 16 configurable flows per direction
- **Aggregates** of flows can be defined (set of flows sharing the same Delay & Jitter Law)
- User-defined rules for disturbances: pattern trigger, starting time after delay or number of packets received, stop impairments after number of received packets or elapsed time, loops, and more...
- Predefined filter parameters based on the main protocol header fields (MAC, MPLS, VLAN, IP, TCP and UDP headers) and user-defined pattern filter
- Ethernet-type filter
- Enhanced RTP detection for Audio and Video SDP flows
- PTPv1 and PTPv2 (IEEE 1588) impairment at UDP and MAC layers
- **Unidirectional** or **bi-directional** packet impairments
- Impairments: Latency, Loss, Duplication, bandwidth limitation, Delay and Jitter, Content Impairment (mathematical laws and user-defined files)



- Change the impairment law **on-the-fly** for a flow
- Change of law parameters **on the fly** for a given flow (Percentage laws, Uniform Law parameters, etc.).
- Ability to **impair the remaining network traffic** that could be either only the IP packets or all the Ethernet frames.
- **Connections per flow**: impairments are applied to the flow or to each connection of the flow
- Ethernet / Internet modes (Out-of-Sequence packets)
- Command Line Interface (CLI) to use NetDisturb in test beds
- Ability to handle Ethernet Jumbo frames (payload up to 17976 bytes)
- Statistics display and export detailed statistics into a file
- Accuracy = **1 millisecond resolution**

Specific Key features for the Enhanced Edition

- Impairments based on protocol primitives:
 - ARP (ARP Operation Code)
 - PTPv1 and PTPv2 (PTP Message Type)
 - DHCP (DHCP Message Type)
 - DNS (DNS Message Type, DNS message Operation)
 - FTP (FTP Command, FTP Returned Status)
 - FTP-DATA
 - HTTP (HTTP Method, HTTP Returned Status)
 - NTP
 - RTP (Audio Payload Type, Video Payload Type, DTMF)
 - SIP (SIP Method, SIP From, SIP To, SIP Returned status)
- RTP and FTP data flow automatic discovery.
- MOS impairment laws
- Detailed event log window per flow viewing the events and application of the impairments according to the user-defined rules.

1.4 Comparison between Standard and Enhanced Editions

The table below summarizes the main differences between NetDisturb Standard edition and NetDisturb Enhanced edition.

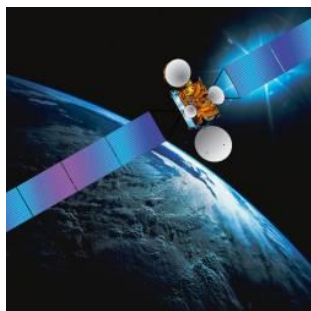
Features		
Impairment of IPv4 and IPv6 packets, ARP and Ethernet frames	Yes	Yes
Automatic NIC configuration and Automatic Sample start mode	Yes	Yes
Filter parameters to define a flow: <ul style="list-style-type: none"> Activity rules: <ul style="list-style-type: none"> Start/Stop after a time limit or a packet counter or a pattern trigger Loop to reapply the rule with delay between each iteration Packet filters: Ethernet-type, Ethernet length, source address, destination address, source port, destination port, protocol, DSCP DiffServ (ToS), MPLS, VLAN, MAC address... User-defined pattern filter based on Ethernet packet content 	Yes	Yes
16 user-defined flows to impair using filters and 'Unfiltered Flows, Frames, Packets, etc.' to impair without using filters	Yes	Yes
Dynamically modify impairments on-the-fly per flow in each direction when running	Yes	Yes
Aggregates of flows (set of flows sharing the same delay and/or jitter laws)	Yes	Yes
View Per-Flow statistics and NICs statistics	Yes	Yes
Accuracy = 1 millisecond	Yes	Yes
Standard impairments: drop/loss, duplicate, delay (latency), jitter, bandwidth limiting, congestion, packet error, bit error, reorder, burst errors	Yes	Yes
Delay from 1 millisecond up to 100 seconds in each direction		
Emulate bandwidth up to 1Gbps		
Impairments by using the IP protocol field	Yes	Yes
Definition of flows to disturb based on protocol primitives:		
• ARP (ARP Operation Code)	No	Yes
• PTPv1 and PTPv2 (PTP Message Type)	No	Yes
• DHCP (DHCP Message Type)	No	Yes
• DNS (DNS Message Type, DNS Message Operation)	No	Yes
• FTP (FTP Command, FTP Returned Status)	No	Yes
• FTP-DATA	No	Yes
• HTTP (HTTP Method, HTTP Returned Status,)	No	Yes
• NTP	No	Yes
• RTP (Audio Payload Type, Video Payload Type, DTMF)	No	Yes
• SIP (SIP Method, SIP From, SIP To, SIP Returned Status)	No	Yes
• MOS impairment	No	Yes
Detailed events log per flow	No	Yes

1.5 Examples of Use

The following examples illustrate a subset of use cases implemented in various projects.

Simulation of packet loss rate for a corporate network

The modeling of packet loss rate of a banking network has generated a loss rate file with 1.3 million values. Before the deployment of new applications on the network, **NetDisturb** Standard Edition simulates the network to test these applications by using this external file containing loss rates to recreate the actual conditions of exploitation.

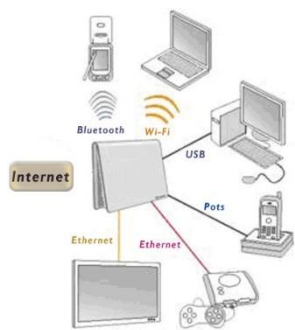
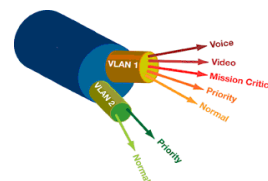


Simulation of a satellite link (with a 2 Mbps downlink and a 512 Kbps uplink throughput) for workstations of a branch office that generate TCP and UDP flows.

NetDisturb Standard Edition simulates the satellite link with limited uplink and downlink bandwidth. An aggregate is defined to submit all TCP and UDP flows to a function of delay - to reflect the delay of several hundreds of milliseconds introduced with the satellite link.

Application of disturbances on VLANs encapsulated over MPLS frames.

NetDisturb Standard Edition generates losses and delays of packets for specific VLANs implemented in a very large MPLS core network.



Tests of robustness for application protocols used in Triple Play Set-Top Box over DSL with NetDisturb Enhanced Edition

VoIP use case: for example, verify that the SIP REGISTER or the SIP INVITE message is retransmitted in case of no answer and then apply a loss and delay for RTP packets of the SIP session.

DHCP use case: for example, check that the OFFER message is lost following a transmitted DISCOVER message to validate automatic DHCP retransmission.



Test Video over IP using RTP with NetDisturb Enhanced Edition

NetDisturb generates impairments (loss, delay, duplication, modification of packets...) for the testing of codecs integrated in gateways, servers, STB and more...

Part 2 What's new in NetDisturb version 7?

This part is a general overview of new features and improvements provided with **NetDisturb** version 7 and important information to upgrade from previous versions.

More details regarding features and improvements included in the different versions of **NetDisturb** can be found in the version.txt file located in the installation directory (default settings: C:\Program Files\NetDisturbv7.0).

The new features and improvements provided with **NetDisturb** v7 are listed below:

- ⇒ Support Windows Driver
- ⇒ Remove 32bit support
- ⇒ Setup procedure allows testing NetDisturb v7 without removing a previous installed version.



The contexts created with versions 4.x, 5.0 and 6.x are reused automatically. When saved, they get the new NetDisturb version 7 file format.

Part 3 Install NetDisturb

NetDisturb installation procedure is a standard installation program for Windows.



** To run **NetDisturb** your computer's screen resolution must be at least 1024x768 (more readable: 1152 x 768 and sup.), the DPI setting should be set up with the "Normal size (96 DPI)" value and the Font size should be set up with the "Normal" value.*

** To install **NetDisturb**, you must log on with Administrator rights.*

3.1 Forewords before upgrading from versions 4, 5 and 6 to version 7



*When upgrading from a previous version of **NetDisturb** and if you don't have the USB license dongle, do not uninstall the previous version to keep your existing license.*

When upgrading from **NetDisturb** version 4.9 to version 6.0, the installation procedure of **NetDisturb** version 7 keeps the previous version to allow you to use **NetDisturb** 7 or the previous version installed.

3.2 Forewords before upgrading from versions 4.2 up to version 4.8



*When upgrading from a previous version of **NetDisturb** and if you don't have the USB license dongle, do not uninstall the previous version to keep your existing license.*

When upgrading from an older **NetDisturb** version, the installation procedure of **NetDisturb** moves the user's files and the context files, located in the previous default **NetDisturb Server** directory, into **NetDisturb Client** directory. All files related to a context (defined using the extension .txt and .wsx) are copied, but the files installed with **NetDisturb** version 7 will overwrite those files.

3.3 Forewords before upgrading from versions 4.1 and under

You don't need to uninstall the previous version of **NetDisturb** to keep your license scheme. However, this license will not enable you to use **NetDisturb** version 7, because the license date of version 4.1 and under is too old. You should contact ZTI Communications (contact@zti-communications.com) to get back a new unlimited license when upgrading to version 7.

3.4 How to install the software downloaded from the Internet

The installation procedure is a standard installation program.

- If you have downloaded the **NetDisturb_Standard.zip** or **NetDisturb_Enhanced.zip** file from the website, you must first unzip this file in a temporary directory. It contains the **setup file** "[Setup_NetDisturb_Standard_Edition-v7.0.exe](#)" or "[Setup_NetDisturb_Enhanced_Edition-v7.0.exe](#)" file and the related documentation.
- Then run the **setup file** from the temporary directory to launch the setup procedure.



***NetDisturb** is made of two parts: **NetDisturb Client** and **NetDisturb Server**. This setup will install both Client and Server parts on the same system.*

3.5 How to install the software from the CD-ROM

The installation procedure is a standard installation program. On the CD-ROM, you will find the "[Setup_NetDisturb_Standard_Edition-v7.0.exe](#)" or "[Setup_NetDisturb_Enhanced_Edition-v7.0.exe](#)" file.



NetDisturb is made of two parts: **NetDisturb Client** and **NetDisturb Server**. This setup will install both Client and Server parts on the same system.

3.6 How to install the NetDisturb Client only (from the CD-ROM)

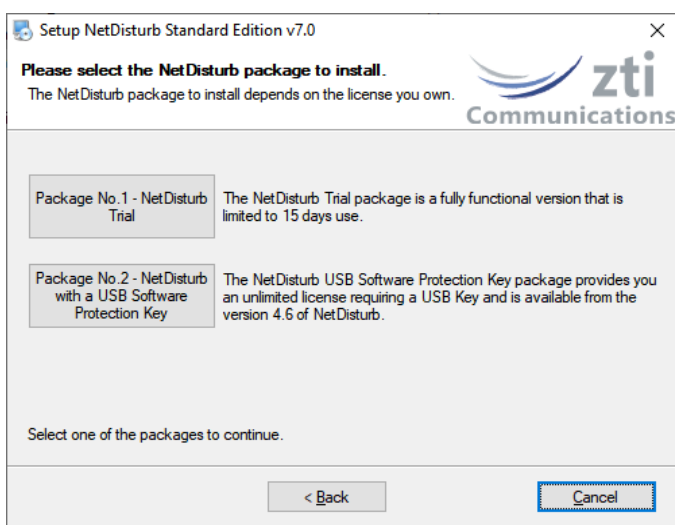
On the CD-ROM, a second setup allows you to install the **NetDisturb** Client on a machine. This is useful when you need to install the **NetDisturb** Server and the **NetDisturb** Client on two different machines.

To install the **NetDisturb** Client, run the **setup** file and follow the setup instructions to proceed with the installation.

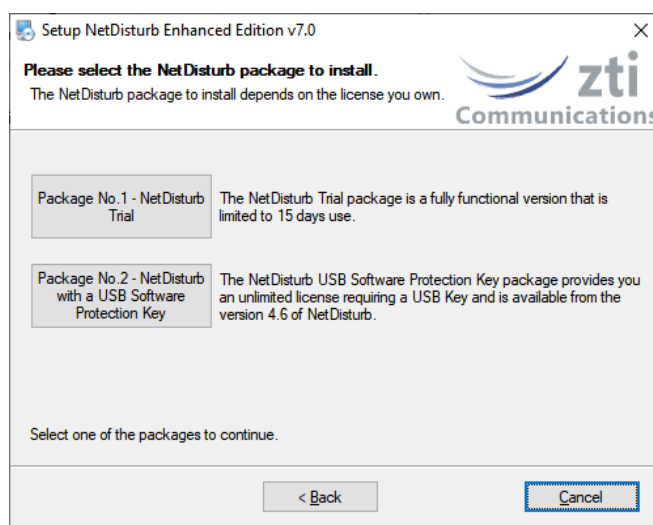
3.7 During the installation

Follow the instructions until reaching the **NetDisturb** package selection window.

NetDisturb Standard Edition



NetDisturb Enhanced Edition



3.7.1 NetDisturb packages in a few words

To use the **NetDisturb** software, there are 2 license schemes:

Package No.1 - NetDisturb Trial: the Trial package allows you to use **NetDisturb** during 15 days after the first run. When the trial period has expired, the license should be purchased.

Package No.2 - NetDisturb with a USB Software Protection Key: this package requires a USB dongle containing the **NetDisturb** license. The USB Software Protection Key is provided with **NetDisturb** from version 4.6. This package allows you to install **NetDisturb** on several PCs but the only PC able to run **NetDisturb** is the one having the USB dongle plugged in.



As previous user, you may be interested to move to a USB Software Protection Key: please contact your distributor or ZTI Communications to get more details about the license migration program (see paragraph 4.2 NetDisturb & USB Software Protection Key for more details).



This software is licensed on a per workstation basis. This means that you will need to get a separate license for each machine you will run it on. The license may be a software license key or the USB Software Protection key.



The USB Software Protection key contains only the license information.
The **NetDisturb** software is available on a separate CD-ROM.

3.7.2 Which package should I install?

Depending on your needs, please find here below the package most suitable for you.

3.7.2.1 I want to evaluate NetDisturb

In that case, choose the Package No.1 "**NetDisturb Trial**".
You will be able to use **NetDisturb** for 15 days only.

3.7.2.2 I already use NetDisturb...



*This paragraph is dedicated to the users owning a previous version of **NetDisturb**.*

... and I want to upgrade and use the USB Software Protection Key I bought

In that case, choose the Package No.2 "**NetDisturb with a USB Software Protection Key**". Plug the USB dongle before launching **NetDisturb**.

3.7.2.3 I just bought NetDisturb...



*This paragraph is related to the users purchasing **NetDisturb version 7***

... and I received the CD-ROM & USB Software Protection Key

In that case, choose the Package No.2 "**NetDisturb with a USB Software Protection Key**". Plug the USB dongle before running **NetDisturb**.

... and I will receive CD-ROM & USB Software Protection Key in a few days

In that case, choose the Package No.1 "**NetDisturb Trial**". You will get a fully functional but time-limited Software Protection Key.

3.8 What has been installed on my computer?

The default settings install **NetDisturb** software components in the following directory:

C:\Program Files**NetDisturbv7.0** with the following subdirectories:
C:\Program Files**NetDisturbv7.0**\Client
C:\Program Files**NetDisturbv7.0**\Driver
C:\Program Files**NetDisturbv7.0**\Server

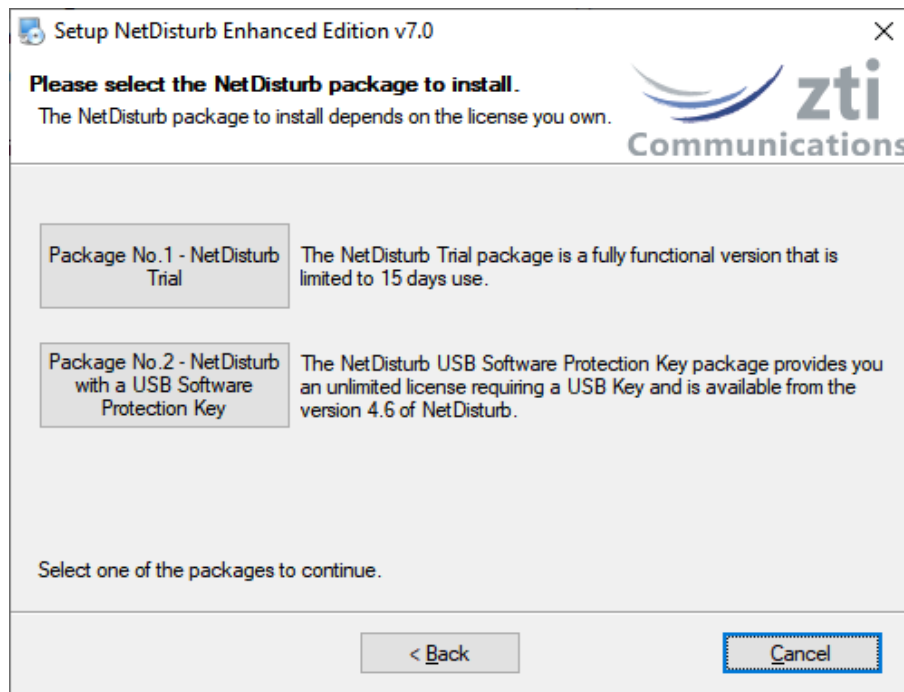
And the following Shortcuts are created:

Start ► All Programs ► **NetDisturb v7.0**

- **NetDisturb** (start both Server and Client)
- **NetDisturb Client Only**
- **NetDisturb Server Only**
- **Read Me First**
- **Uninstall NetDisturb**
- **User Guide**
- **USB Key Viewer** (USB Software Protection Key version only)

3.9 How to reinstall another package?

If you already have installed one of the **NetDisturb V7** packages, click [Setup_NetDisturb_Standard_Edition-v7.0.exe](#) or [Setup_NetDisturb_Enhanced_Edition-v7.0.exe](#) and select, in the window below, the new package you want to install.



(Example NetDisturb Enhanced edition)

3.10 How to transfer the software to another computer?

For the users having the NetDisturb USB dongle, install the software on the target machine by using the Package No.2 ("NetDisturb with a USB Software Protection Key"), and then plug the USB dongle before running the software on this machine.

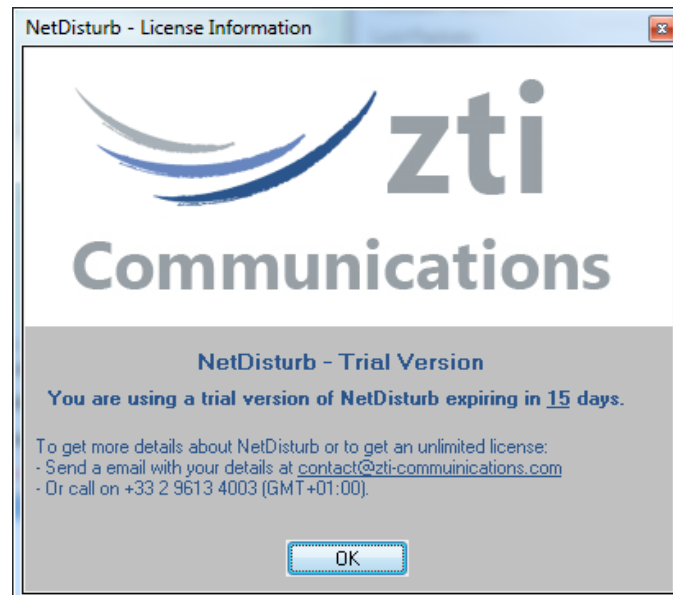
Part 4 How to handle your license?

4.1 NetDisturb Trial

You don't need any license to install the **NetDisturb Trial package**. After the first run of **NetDisturb Server**, the **NetDisturb Trial package** can be used for 15 days.

4.1.1 NetDisturb Server License Information window

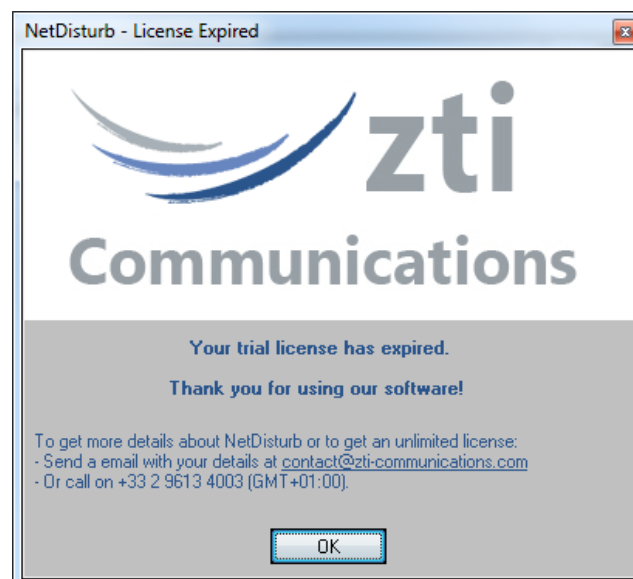
When you run **NetDisturb Server**, the information about your trial license is displayed, as shown below.



You are now able to use **NetDisturb** during the next 15 days.

4.1.2 End of the fifteen-day trial period

Once the trial period is over, you can't use **NetDisturb** anymore, see below:



When you press the **OK** button, **NetDisturb** will stop running.

To continue to use **NetDisturb** please contact your local distributor or **ZTI Communications** to get an unlimited license.

4.2 NetDisturb & USB Software Protection Key

The USB Software Protection Key is the most flexible way to transfer your license to any other PC. Plug it in the computer you want to use **NetDisturb** on.

If you are a user of a previous version of **NetDisturb (version 4.5 and under)** and if you are interested with the USB Software Protection Key, please contact ZTI Communications Sales Offices (Email: sales@zti-communications.com).

Part 5 Uninstall NetDisturb

To uninstall **NetDisturb**, please select “Uninstall NetDisturb v7.0” by using the shortcut:

Start ► All Programs ► NetDisturb v7.0

All installed components of **NetDisturb** will be removed including the **NetDisturb** driver.

Part 6 Run NetDisturb

6.1 NetDisturb and NIC cards

With **NetDisturb** version 7, the NIC configuration is done transparently. **NetDisturb** configures the two selected NICs to handle the Ethernet traffic without the noise of the other installed protocols. When NetDisturb stops, the previous protocols are reselected.

6.2 NetDisturb and Wi-Fi NIC

The Wi-Fi NICs change the way **NetDisturb** version 7 handles the frames. When a Wi-Fi NIC is selected as an Interface to be used by **NetDisturb** version 7, **NetDisturb** runs like an IP router to exchange the frames from the Wi-Fi. From your devices expecting to use the **NetDisturb** Wi-Fi Interface, you should route your IP flows to this Wi-Fi NIC manually i.e. you create a route that uses the **NetDisturb** Wi-Fi NIC as the gateway for the flow.

Example: when the IP address of Wi-Fi NIC used by **NetDisturb** is **192.168.0.156**, the route command for traffic to the target **192.168.0.26** through the **NetDisturb** Wi-Fi NIC is:
route add 192.168.0.26 mask 255.255.255.255 192.168.0.156

The list of routes can be checked via the route print command. Here is an example of the resulting routes:

```
C:\NetDisturb v7\>route print
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...00 11 43 4c 62 90 ... Intel(R) PRO/100 VE Network Connection - Packet Scheduler Miniport
0x3 ...00 12 f0 19 5d 60 .. Intel(R) PRO/Wireless 2200BG Network Connection - Packet Scheduler Miniport
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          192.168.0.1      192.168.0.177    25
0.0.0.0                    0.0.0.0          192.168.0.1      192.168.0.147    20
127.0.0.0                  255.0.0.0        127.0.0.1        127.0.0.1        1
192.168.0.0                255.255.255.0    192.168.0.147    192.168.0.147    20
192.168.0.0                255.255.255.0    192.168.0.177    192.168.0.177    25
192.168.0.26              255.255.255.255  192.168.0.156    192.168.0.147    1
192.168.0.147             255.255.255.255  127.0.0.1        127.0.0.1        20
192.168.0.177             255.255.255.255  127.0.0.1        127.0.0.1        25
192.168.0.255             255.255.255.255  192.168.0.147    192.168.0.147    20
192.168.0.255             255.255.255.255  192.168.0.177    192.168.0.177    25
192.168.1.0               255.255.255.0    192.168.1.147    192.168.0.147    20
192.168.1.147             255.255.255.255  127.0.0.1        127.0.0.1        20
192.168.1.255             255.255.255.255  192.168.1.147    192.168.0.147    20
224.0.0.0                 240.0.0.0        192.168.0.147    192.168.0.147    20
224.0.0.0                 240.0.0.0        192.168.0.177    192.168.0.177    25
255.255.255.255           255.255.255.255  192.168.0.147    192.168.0.147    1
255.255.255.255           255.255.255.255  192.168.0.177    192.168.0.177    1
Default Gateway:          192.168.0.1
=====
Persistent Routes:
None
```

When you don't need **NetDisturb**, you may delete the route as following:

route delete 192.168.0.26

6.3 Launch NetDisturb

As **NetDisturb** is made of 2 parts (**NetDisturb** Server and **NetDisturb** Client), you need to run these two programs in the following order:

- 1. **NetDisturb Server**
- 2. **NetDisturb Client**

To run the software in this order, click on:

Start ► All Programs ► **NetDisturb v7.0** ► **NetDisturb** (start both Server and Client)

6.4 First Run

6.4.1 The NetDisturb Server startup

NetDisturb Server is started automatically when using the **NetDisturb** shortcut (start both Server and Client).

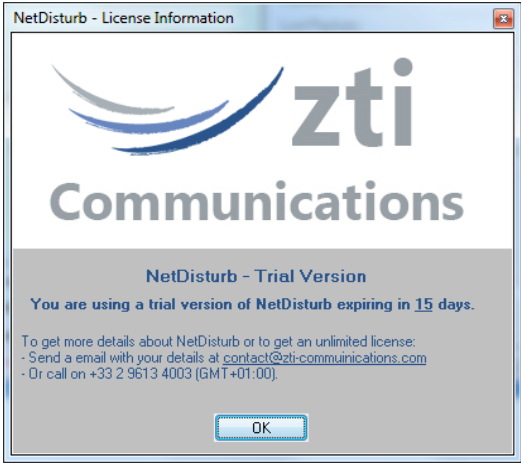


You may also start the server independently, for instance when you are using a remote configuration where **NetDisturb Server** doesn't run on the same PC as **NetDisturb Client**.

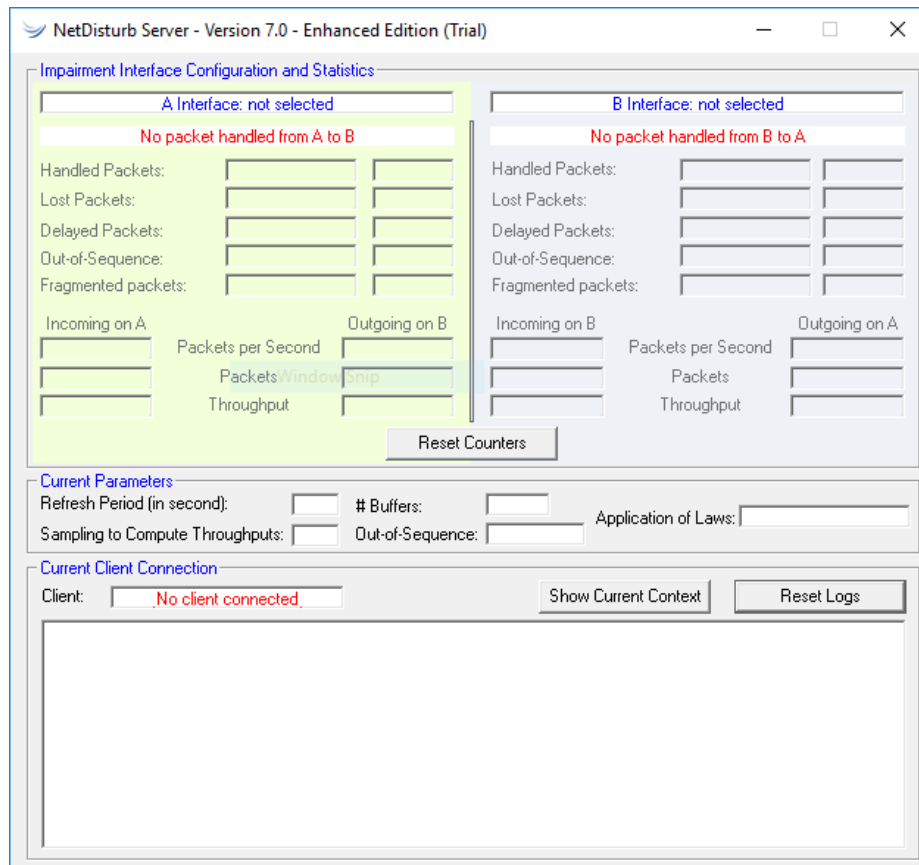
To start the **NetDisturb Server** alone, use the Windows start menu:

Start ► All Programs ► **NetDisturb v7.0** ► **NetDisturb Server**

After a few seconds and depending on your license, you will get one of the following license windows:

15-day trial version license	USB Software Protection key
	<p>When you use a USB Software Protection key, there is no window displayed!</p>

The next window displayed is **NetDisturb Server**



We recommend closing **NetDisturb Server** and then to configure the NICs usable by **NetDisturb** as described in paragraph [6.1](#) if you didn't configure the NICs before.

6.4.2 NetDisturb Client startup

NetDisturb Client is started automatically when using the **NetDisturb** shortcut.

There are 2 modes to start **NetDisturb Client**:

- **NetDisturb Client** Automatic Sample mode (default installation):

The **NetDisturb Client** Automatic Sample mode is the new starting mode introduced in **NetDisturb** version 7. It is designed for simplify the **NetDisturb** usage for new users. **NetDisturb Client** Automatic Sample mode presents a list of predefined context files. The user selects one of this file, selects the 2 NICs to use and **NetDisturb Client** automatically starts the impairments based on the laws defined in the samples. The user should generate the traffic to see the impairments from **NetDisturb**.

- **NetDisturb Client** Manual mode:

The **NetDisturb Client** manual mode is designed for users with knowledge of **NetDisturb**. At startup, **NetDisturb Client** loads the most recent context file. The user may be required to select the 2 NICs. Then it is able to start the impairments, to handle context files, filters and laws, aggregate, etc. The Manual mode was the only mode available in previous versions of **NetDisturb**.

To switch from Automatic Mode to Manual Mode at startup, the user presses the button 'Cancel' from the Automatic Mode dialog box: more details are shown in next 2 paragraphs.

6.4.2.1 NetDisturb Client startup in Automatic Mode

The default connection parameters used to exchange between **NetDisturb Client** and **NetDisturb Server** are:

- **NetDisturb Server IP address or Host Name = 127.0.0.1**
(127.0.0.1 = default local IP address if the **NetDisturb Server** and the **NetDisturb Client** are installed on the same machine).
- **HTTP Port Number = 8080**

You may also start the **NetDisturb Client's** part alone, to connect to a remote **NetDisturb Server**.



To start the **NetDisturb Client** alone, use the Windows start menu:

Start ► **All Programs** ► **NetDisturbv7.0** ► **NetDisturb Client**

When **NetDisturb Client** starts, it will ask you to enter the parameters to connect to the **NetDisturb Server** machine:

NetDisturb Client - Connection to NetDisturb Server

NetDisturb Server Information

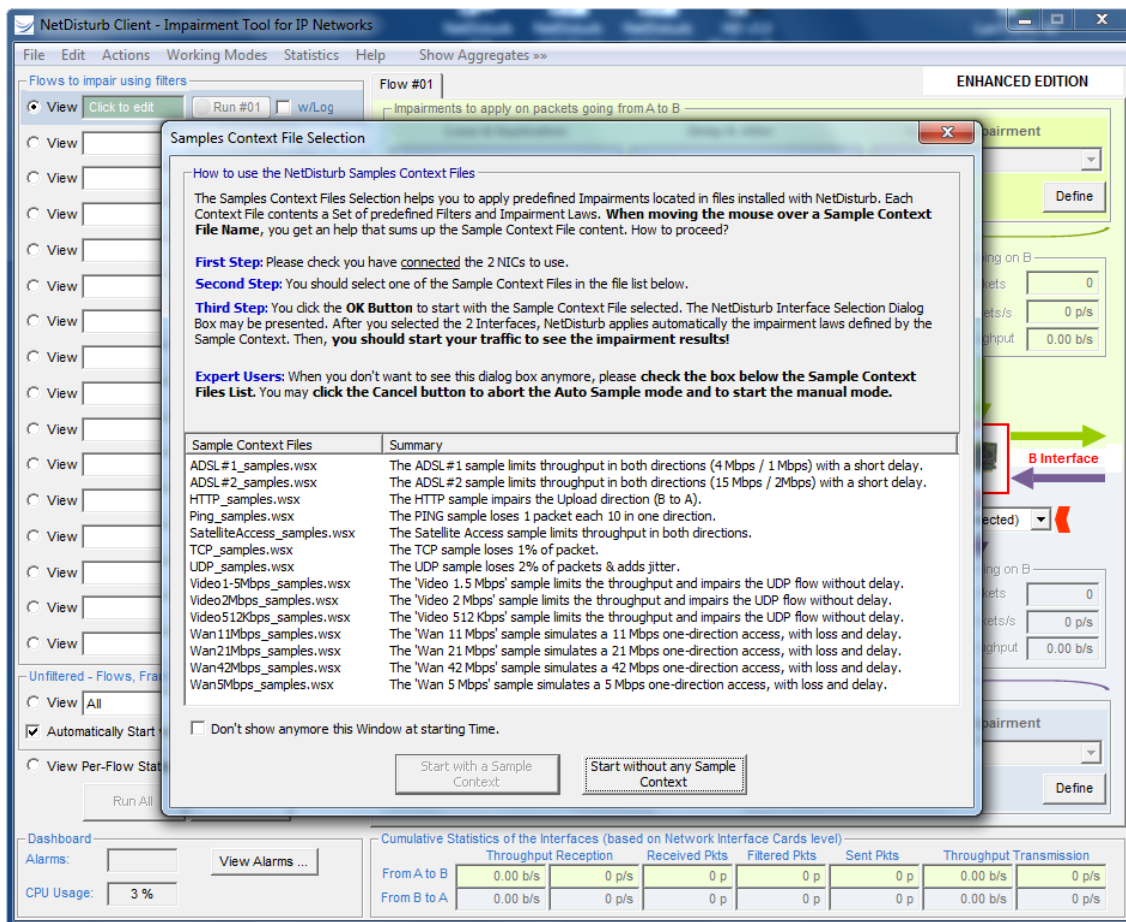
The dialog with the NetDisturb Server is based on SOAP which is using HTTP protocol. To connect to the NetDisturb Server proceed as follows:

- First, specify the IP address or Host Name of the NetDisturb Server.
- Then, ensure that the HTTP port entered is correct (the default port number is 8080).

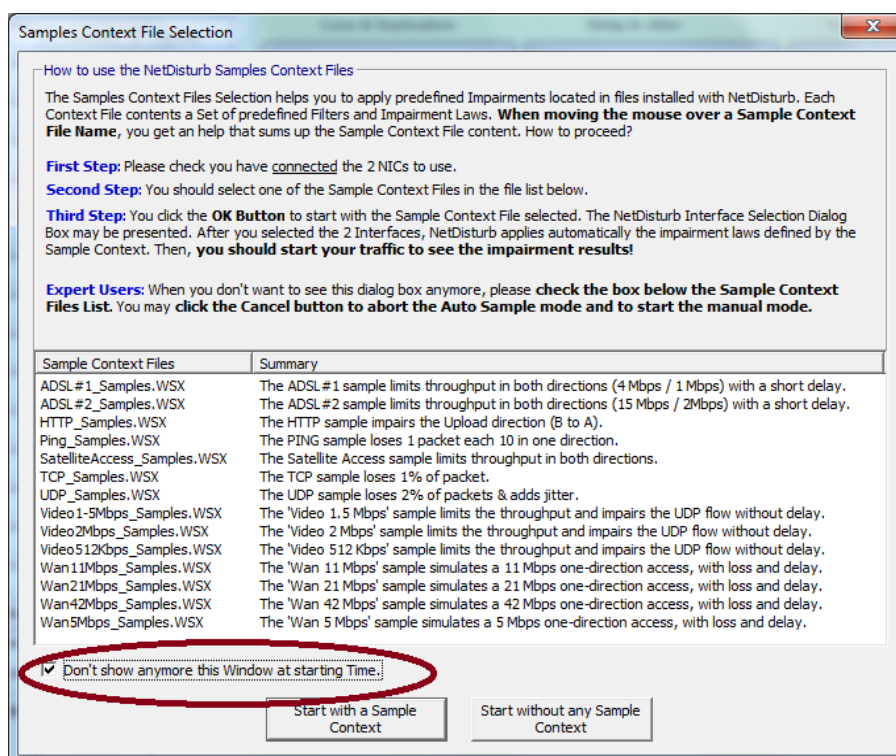
IP address or host name:

HTTP port number:

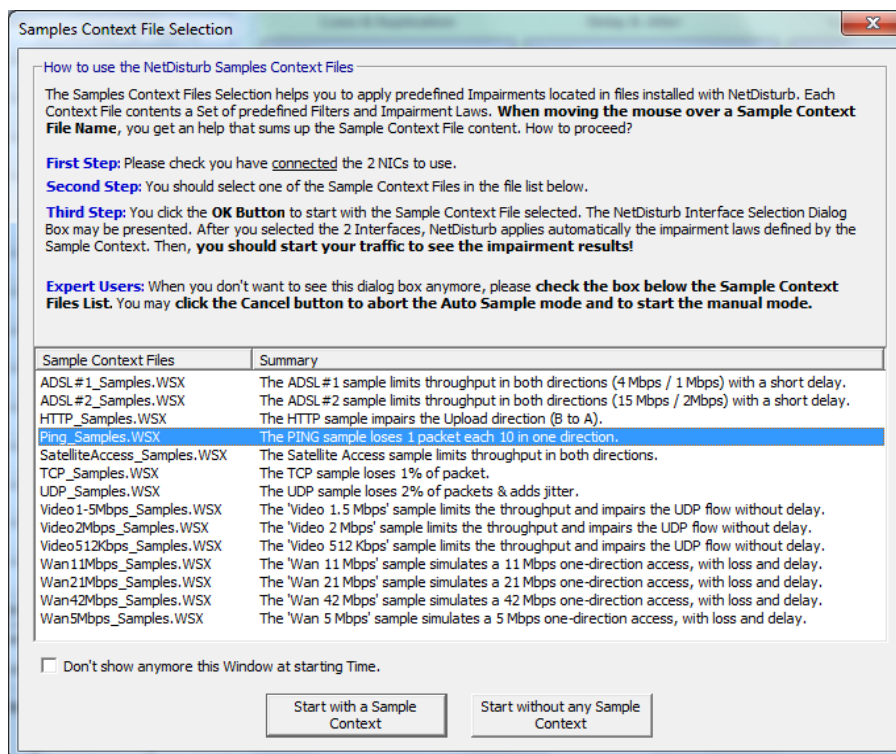
Click “OK” and the **NetDisturb Client** Automatic Sample mode main window will appear:



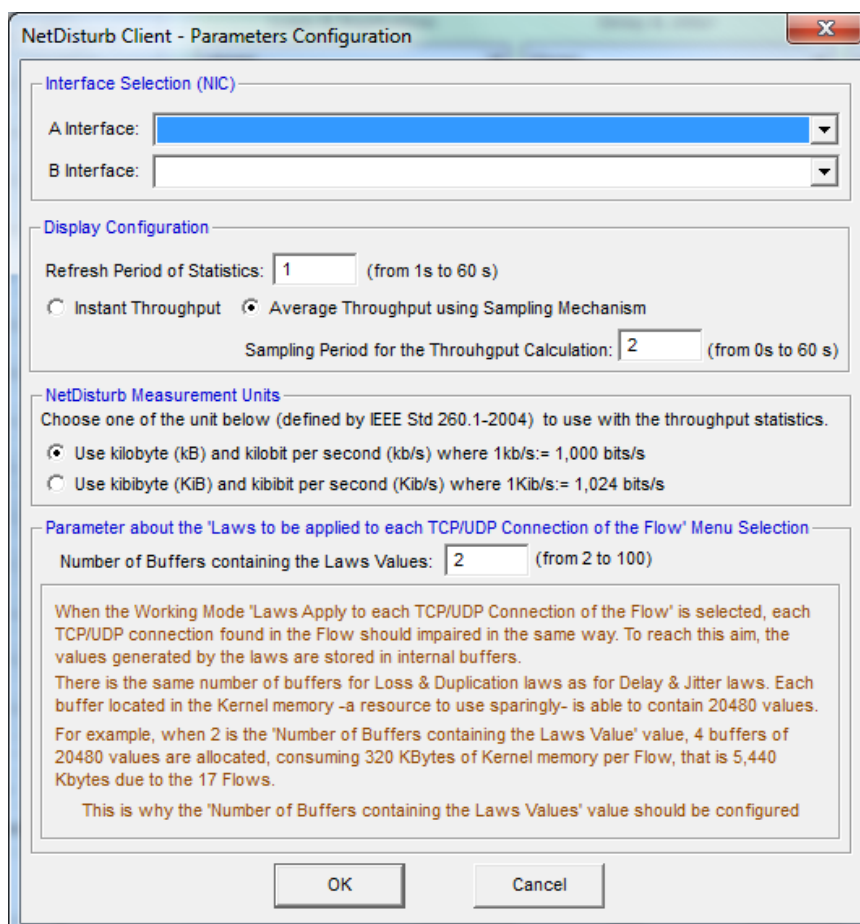
For **NetDisturb Expert Users**: to avoid the Automatic Sample mode dialog at startup, select the box on the bottom of the window and click ‘Cancel’.



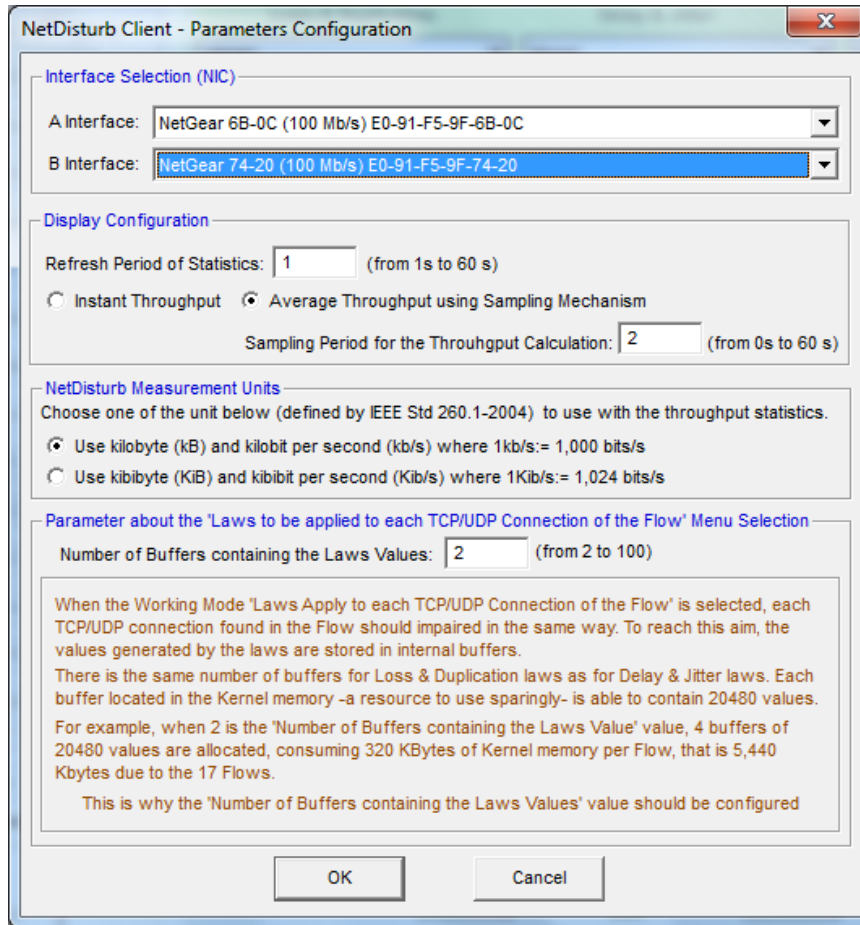
Select the sample context file that fulfills your traffic. For first time users, it is recommended to select the Ping Samples.



Click 'Start with a Sample Context' to access the NIC selection:



Select the 2 NICs to use:



The image shows a Windows-style dialog box titled "NetDisturb Client - Parameters Configuration". It contains several sections for configuring network measurement parameters.

Interface Selection (NIC)

A Interface: NetGear 6B-0C (100 Mb/s) E0-91-F5-9F-6B-0C

B Interface: NetGear 74-20 (100 Mb/s) E0-91-F5-9F-74-20

Display Configuration

Refresh Period of Statistics: 1 (from 1s to 60 s)

☐ Instant Throughput ☒ Average Throughput using Sampling Mechanism

Sampling Period for the Throughput Calculation: 2 (from 0s to 60 s)

NetDisturb Measurement Units

Choose one of the unit below (defined by IEEE Std 260.1-2004) to use with the throughput statistics.

☒ Use kilobyte (kB) and kilobit per second (kb/s) where 1kb/s:= 1,000 bits/s

☐ Use kibibyte (KiB) and kibibit per second (Kib/s) where 1Kib/s:= 1,024 bits/s

Parameter about the 'Laws to be applied to each TCP/UDP Connection of the Flow' Menu Selection

Number of Buffers containing the Laws Values: 2 (from 2 to 100)

When the Working Mode 'Laws Apply to each TCP/UDP Connection of the Flow' is selected, each TCP/UDP connection found in the Flow should impaired in the same way. To reach this aim, the values generated by the laws are stored in internal buffers.

There is the same number of buffers for Loss & Duplication laws as for Delay & Jitter laws. Each buffer located in the Kernel memory -a resource to use sparingly- is able to contain 20480 values.

For example, when 2 is the 'Number of Buffers containing the Laws Value' value, 4 buffers of 20480 values are allocated, consuming 320 KBytes of Kernel memory per Flow, that is 5,440 Kbytes due to the 17 Flows.

This is why the 'Number of Buffers containing the Laws Values' value should be configured

OK Cancel

Click OK to start the impairment:

NetDisturb Client - Impairment Tool for IP Networks - Ping_samples.wsx

File Edit Actions Working Modes Statistics Help Show Aggregates >>

Flows to impair using filters

View ICMP Stop #01 w/Log

View Run #02 w/Log

View Run #03 w/Log

View Run #04 w/Log

View Run #05 w/Log

View Run #06 w/Log

View Run #07 w/Log

View Run #08 w/Log

View Run #09 w/Log

View Run #10 w/Log

View Run #11 w/Log

View Run #12 w/Log

View Run #13 w/Log

View Run #14 w/Log

View Run #15 w/Log

View Run #16 w/Log

Unfiltered - Flows, Frames & Packets

View All Stop w/Log

Automatically Start with filtered Flow(s)

View Per-Flow Statistics

Run All Stop All

Dashboard

Alarms: View Alarms ...

CPU Usage: 8 %

Flow #01: ICMP

Impairments to apply on packets going from A to B

Loss & Duplication Delay & Jitter Content Impairment

Loose 1 Packet out of 10 (None) (None)

Loss: 1 Packet out of N Change (None) Define (None) Define

Incoming on A

Packets 5

Packets/s 1 p/s

Throughput 584 b/s

ICMP Filter

Application Rules - Applying impairments

Impairments on A to B

Lost/Duplic. Pkts 0 [0.0%]

Delayed Pkts 0 [0.0%]

Modified Pkts 0 [0.0%]

Outgoing on B

Packets 5

Packets/s 1 p/s

Throughput 584 b/s

A Interface B Interface

Configure Filter

Application Rules - Applying impairments

Impairments on B to A

Lost/Duplic. Pkts 0 [0.0%]

Delayed Pkts 5 [100%]

Modified Pkts 0 [0.0%]

Outgoing on A

Packets 5

Packets/s 1 p/s

Throughput 584 b/s

ICMP Filter

Impairments to apply on packets going from B to A

Loss & Duplication Delay & Jitter Content Impairment

(None) Delay 10ms to 50ms (Uniform) (None)

(None) Define Constant Delay & Uniform Jitter Change (None) Define

Cumulative Statistics of the Interfaces (based on Network Interface Cards level)

	Throughput Reception	Received Pkts	Filtered Pkts	Sent Pkts	Throughput Transmission
From A to B	584 b/s	1 p/s	6 p	6 p	584 b/s
From B to A	944 b/s	2 p/s	7 p	7 p	944 b/s

6.4.2.2 NetDisturb Client startup in Manual Mode

The default connection parameters used to exchange between **NetDisturb Client** and **NetDisturb Server** are:

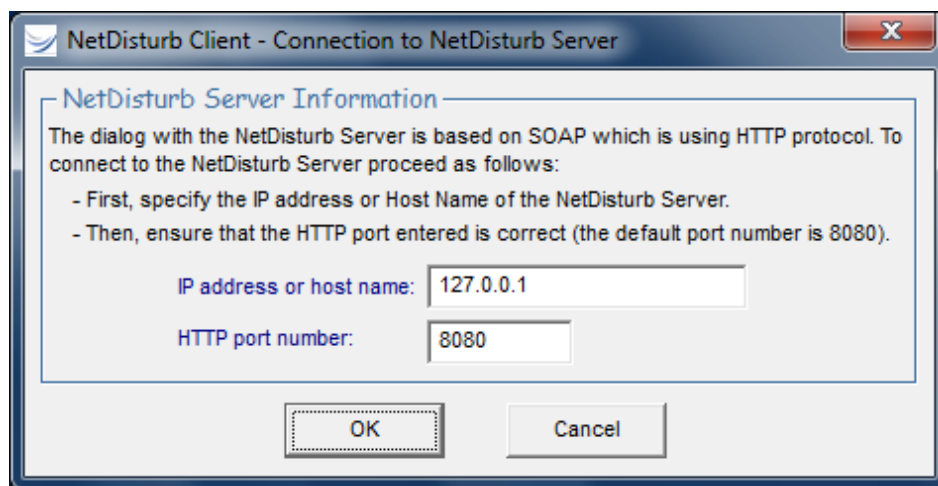
- **NetDisturb Server IP address or Host Name = 127.0.0.1**
(127.0.0.1 = default local IP address if the **NetDisturb Server** and the **NetDisturb Client** are installed on the same machine).
- **HTTP Port Number = 8080**

*You may also start the **NetDisturb Client's** part alone, to connect to a remote **NetDisturb Server**.*

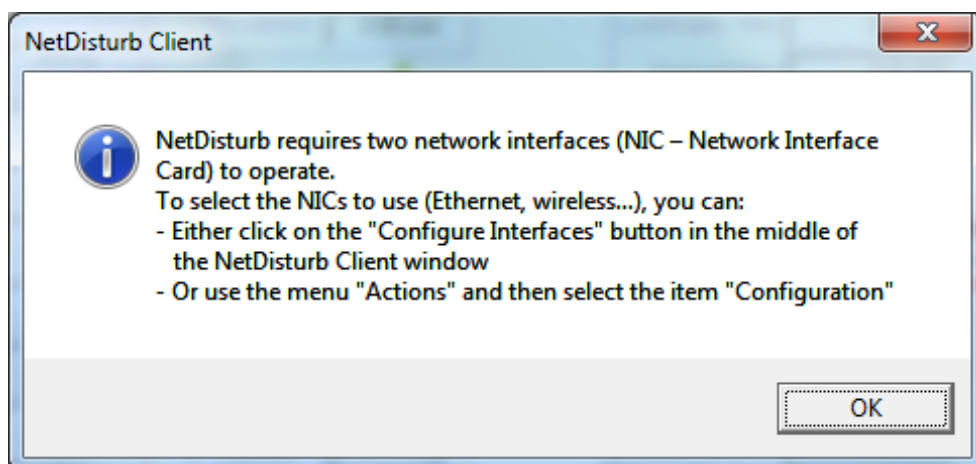
*To start the **NetDisturb Client** alone, use the Windows start menu:*

Start ► All Programs ► NetDisturbv7.0 ► NetDisturb Client

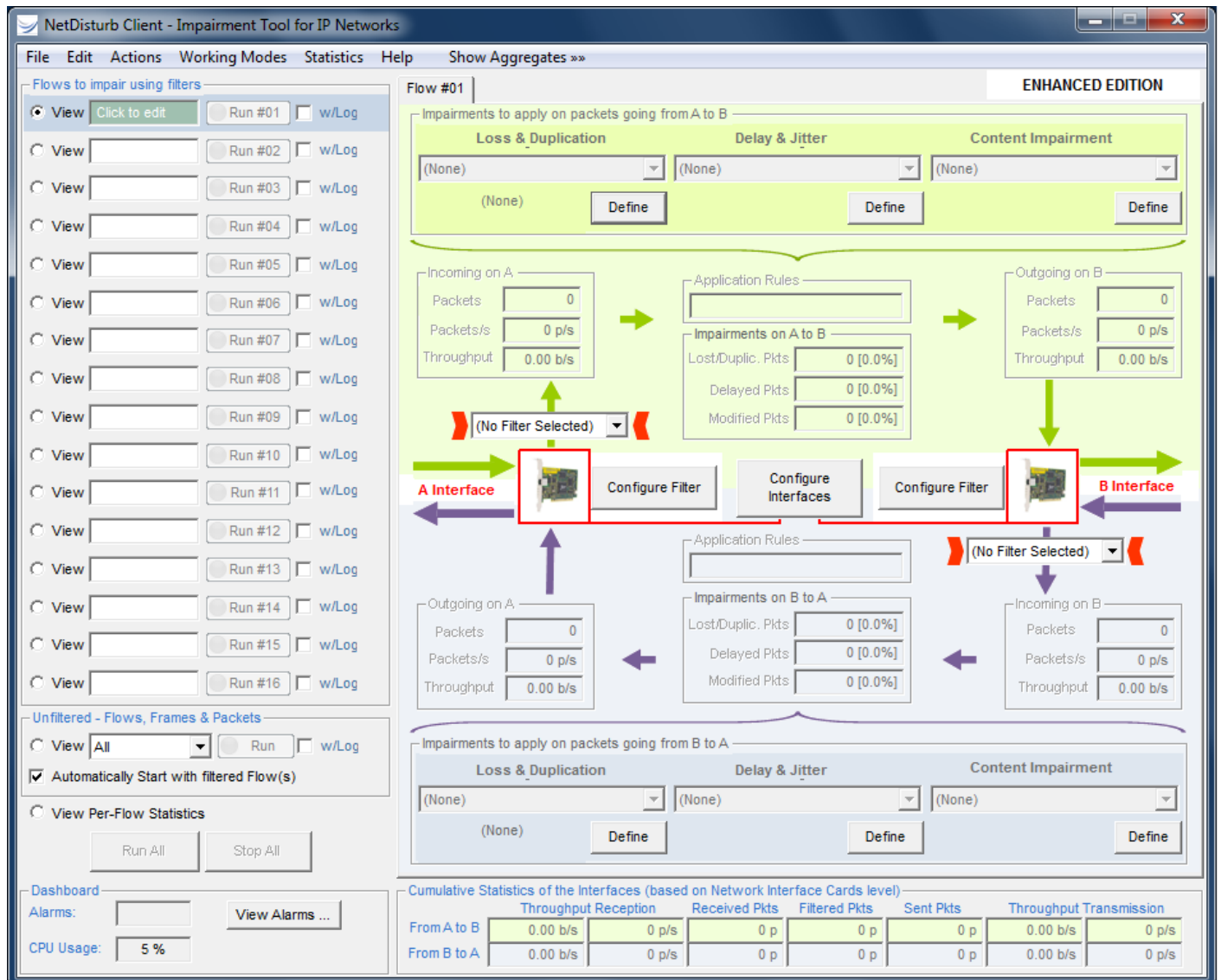
*When **NetDisturb Client** starts, it will ask you to enter the parameters to connect to the **NetDisturb Server** machine:*



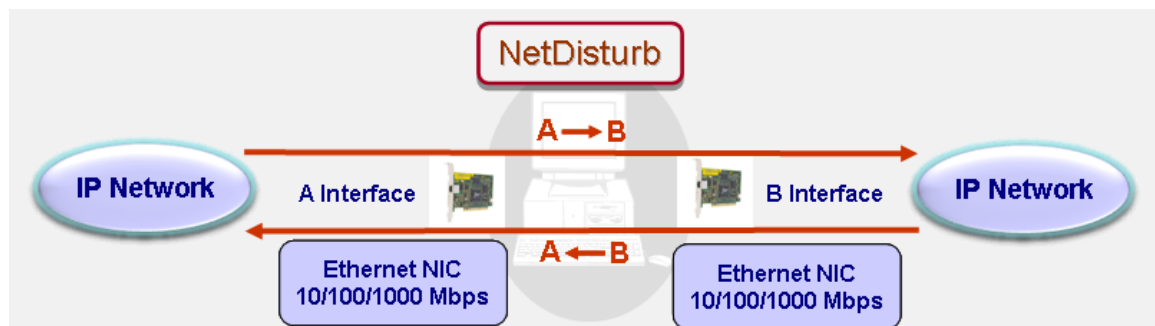
*On the first run, there is no Interface defined. **NetDisturb Client** will tell you how to configure those 2 interfaces.*



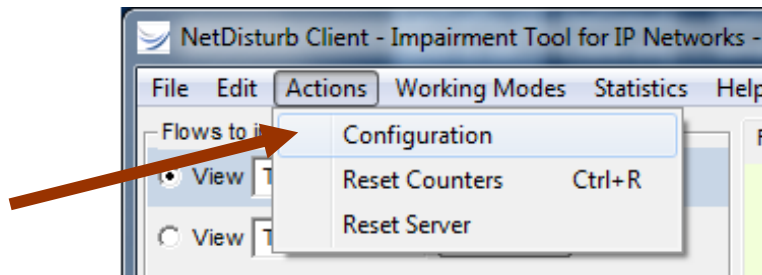
Click “OK” and the **NetDisturb Client** main window will appear:



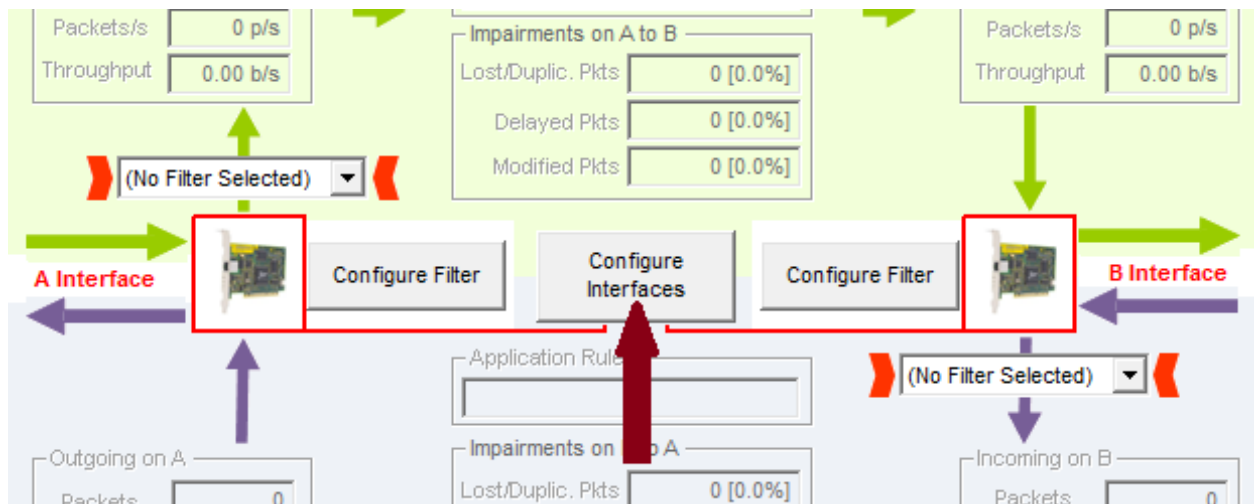
Then, you need to select the NICs (interface A and interface B) that the **NetDisturb** Server is going to use.



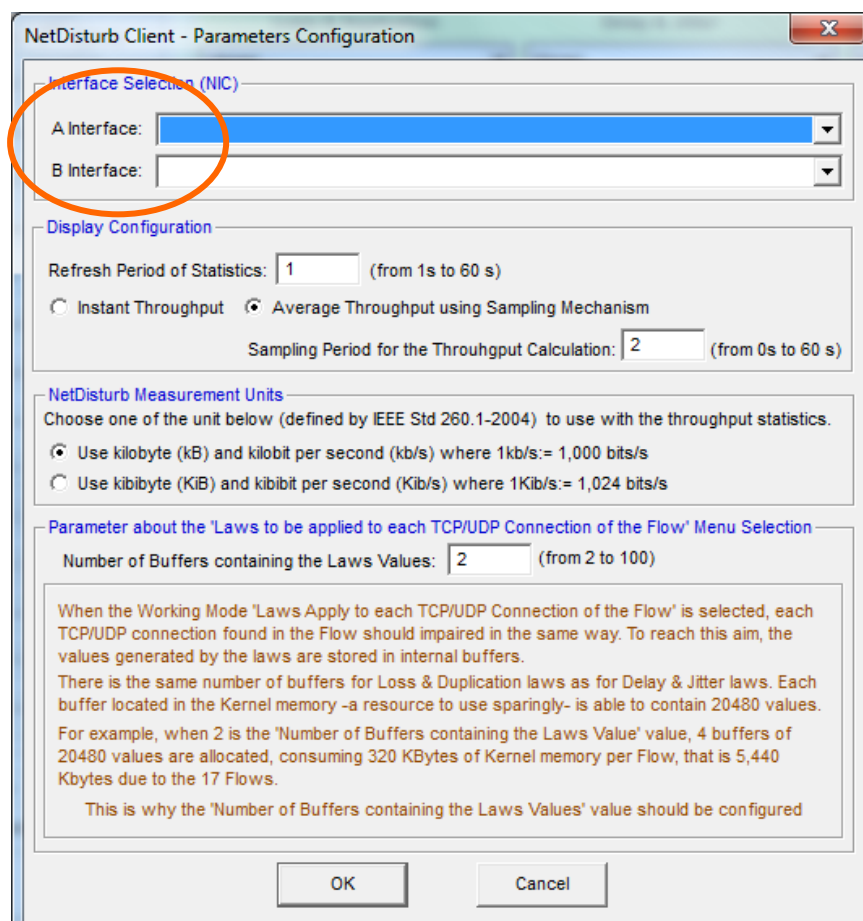
Select "Configuration" in the Actions menu:



or click on the "Configure Interfaces" button located in the main window:



Then the parameters configuration window is displayed:



At the bottom of this window in the "Interface Selection" part, select one NIC for Interface A and another NIC for the Interface B, and then confirm with "OK".

You should see in the combo-box (Interface A or Interface B) all available and operational NICs. If you don't see any NICs, please follow the steps below:

- Verify that your NICs are installed and operational.
- Enable the needed NICs.
- Stop the **NetDisturb Client**.
- Stop the **NetDisturb Server**.
- Reboot your system if necessary.
- Start the **NetDisturb Server**.
- Start the **NetDisturb Client**.

Then you should see your installed NICs in the Interface A and B combo-boxes (see the example below):

NetDisturb Client - Parameters Configuration

Interface Selection (NIC)

A Interface: Ethernet 2 (4294 Mb/s) 00-15-5D-02-1E-2F

B Interface: Ethernet 3 (4294 Mb/s) 00-15-5D-02-1E-2E

Display Configuration

Refresh Period of Statistics: 1 (from 1s to 60 s)

☐ Instant Throughput ☒ Average Throughput using Sampling Mechanism

Sampling Period for the Throughput Calculation: 2 (from 0s to 60 s)

NetDisturb Measurement Units

Choose one of the unit below (defined by IEEE Std 260.1-2004) to use with the throughput statistics.

☒ Use kilobyte (kB) and kilobit per second (kb/s) where 1kb/s:= 1,000 bits/s

☐ Use kibibyte (KiB) and kibibit per second (Kib/s) where 1Kib/s:= 1,024 bits/s

Parameter about the 'Laws to be applied to each TCP/UDP Connection of the Flow' Menu Selection

Number of Buffers containing the Laws Values: 2 (from 2 to 100)

When the Working Mode 'Laws Apply to each TCP/UDP Connection of the Flow' is selected, each TCP/UDP connection found in the Flow should impaired in the same way. To reach this aim, the values generated by the laws are stored in internal buffers.

There is the same number of buffers for Loss & Duplication laws as for Delay & Jitter laws. Each buffer located in the Kernel memory -a resource to use sparingly- is able to contain 20480 values.

For example, when 2 is the 'Number of Buffers containing the Laws Value' value, 4 buffers of 20480 values are allocated, consuming 320 KBytes of Kernel memory per Flow, that is 5,440 Kbytes due to the 17 Flows.

This is why the 'Number of Buffers containing the Laws Values' value should be configured

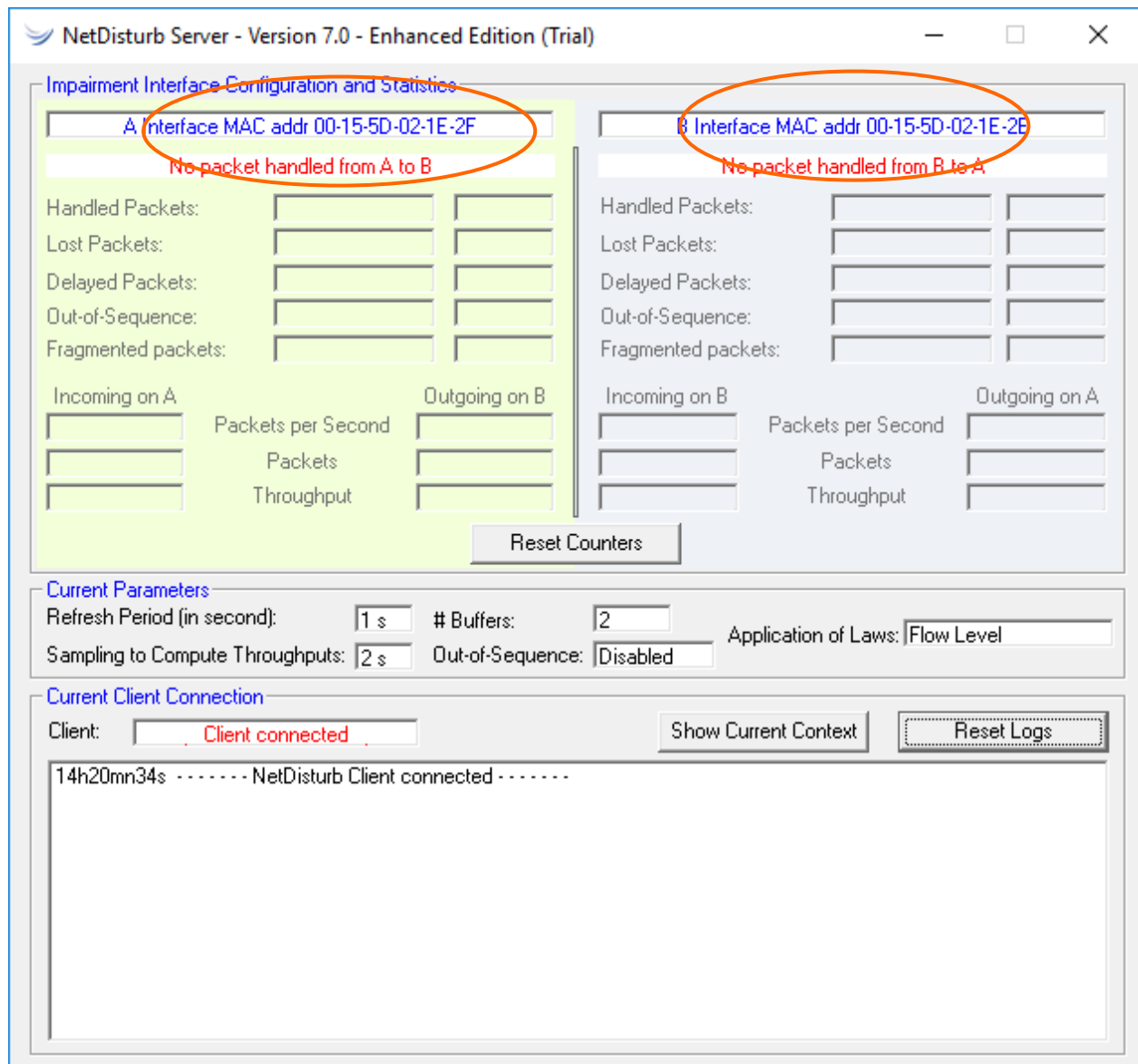
Default Directory for the Context and User-defined Files

Directory : Browse...


(This directory is used for User context and data files. Leave it empty to use the NetDisturb Client installation directory)

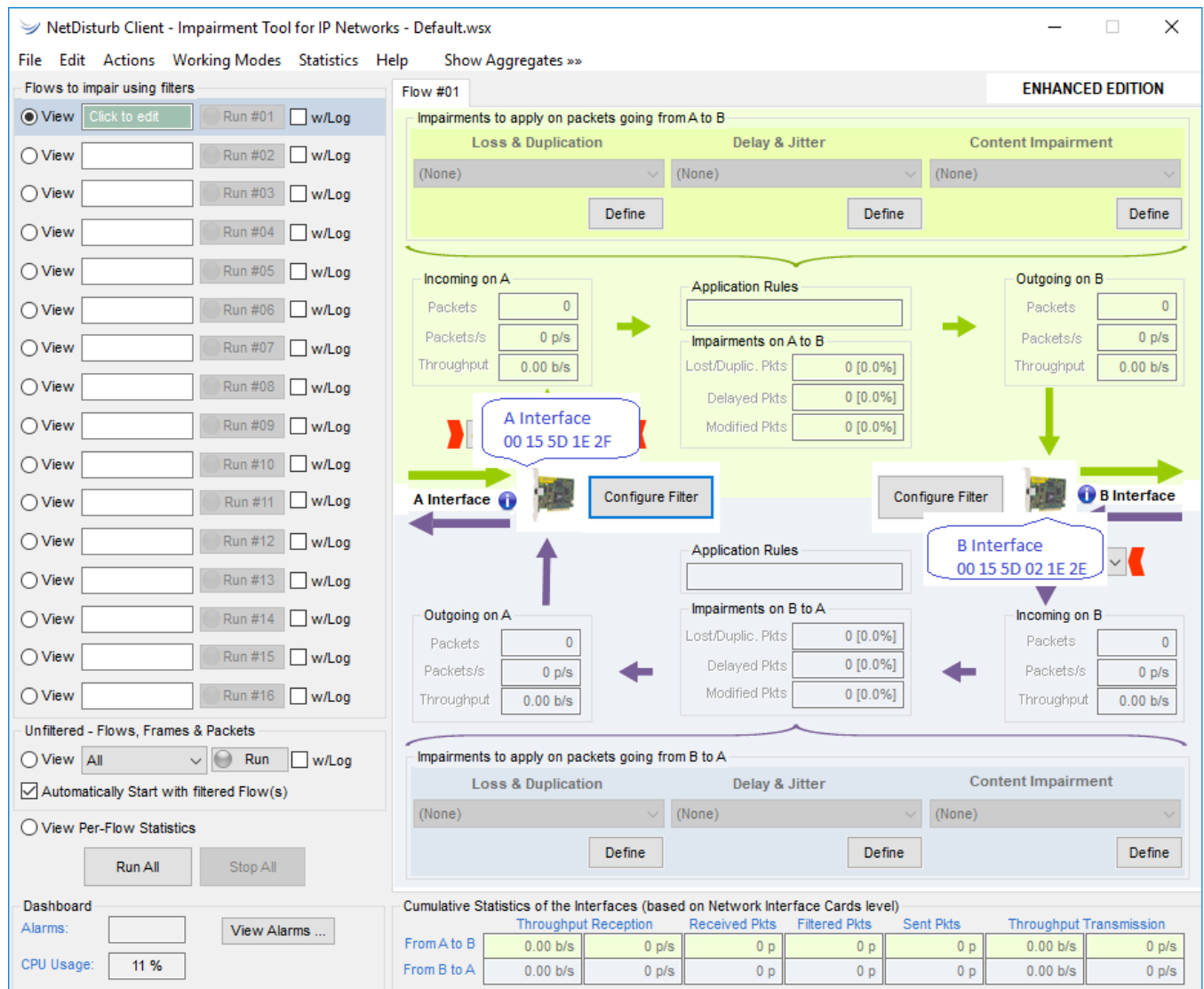
OK Cancel

As soon as the configuration is done, the **NetDisturb** Server recognizes “Interface A” and “Interface B” as shown below.



NetDisturb Server configured with two Ethernet NICs (A and B)

The MAC Addresses of the selected interfaces are also displayed in the **NetDisturb Client** window by clicking on the  symbol of each interface:



NetDisturb Client - Impairment Tool for IP Networks - Default.wsx

File Edit Actions Working Modes Statistics Help Show Aggregates »»

Flows to impair using filters

Flow #01 **ENHANCED EDITION**

Impairments to apply on packets going from A to B

Loss & Duplication: (None) Define

Delay & Jitter: (None) Define


Content Impairment: (None) Define


Incoming on A: Packets: 0, Packets/s: 0 p/s, Throughput: 0.00 b/s

Application Rules

Impairments on A to B: Lost/Duplic. Pkts: 0 [0.0%], Delayed Pkts: 0 [0.0%], Modified Pkts: 0 [0.0%]

Outgoing on B: Packets: 0, Packets/s: 0 p/s, Throughput: 0.00 b/s

A Interface  **00 15 5D 1E 2F**

B Interface  **00 15 5D 02 1E 2E**

Configure Filter

Outgoing on A: Packets: 0, Packets/s: 0 p/s, Throughput: 0.00 b/s

Application Rules

Impairments on B to A: Lost/Duplic. Pkts: 0 [0.0%], Delayed Pkts: 0 [0.0%], Modified Pkts: 0 [0.0%]

Incoming on B: Packets: 0, Packets/s: 0 p/s, Throughput: 0.00 b/s

Impairments to apply on packets going from B to A

Loss & Duplication: (None) Define

Delay & Jitter: (None) Define

Content Impairment: (None) Define

Unfiltered - Flows, Frames & Packets

View: All Run w/Log

☒ Automatically Start with filtered Flow(s)

View Per-Flow Statistics

Run All Stop All

Dashboard

Alarms: View Alarms ...

CPU Usage: 11 %

Cumulative Statistics of the Interfaces (based on Network Interface Cards level)

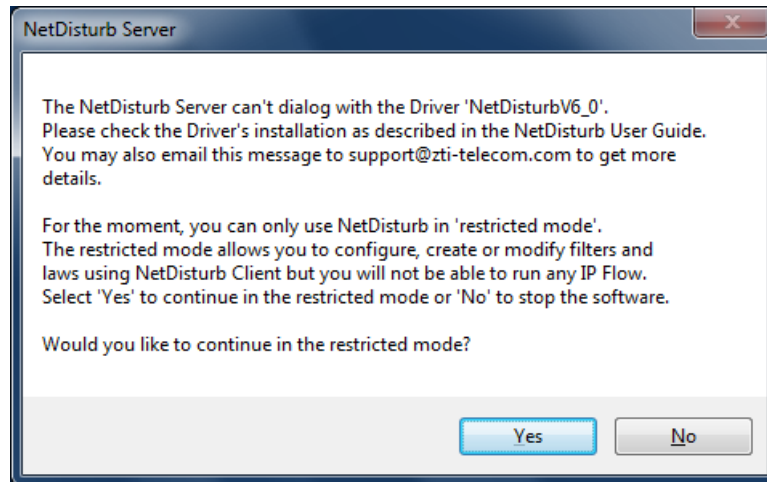
	Throughput Reception	Received Pkts	Filtered Pkts	Sent Pkts	Throughput Transmission
From A to B	0.00 b/s	0 p/s	0 p	0 p	0.00 b/s
From B to A	0.00 b/s	0 p/s	0 p	0 p	0.00 b/s

NetDisturb Client with two Ethernet NICs configured

6.5 Detailed Description of the Server and Client Startup

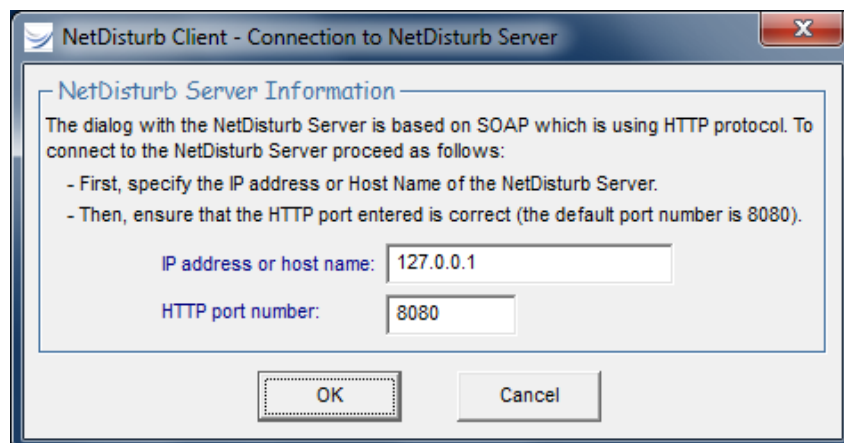
6.5.1 The NetDisturb Server Startup Modes

The level of provided functionalities depends on the availability or not of the **NetDisturb** driver. If the **NetDisturb** driver is lacking, a message warns the user. In that case it is possible to continue in the “restricted mode” where only a few functions are available.



6.5.2 The NetDisturb Client Startup Options

When starting the **NetDisturb Client**, the Connection to Server parameters window is displayed.



This parameters window is made of two sections:

The **NetDisturb** Client needs the following information in order to connect to the **NetDisturb** Server:

- The **NetDisturb** Server IP address
- The **NetDisturb** Server HTTP port number

In case of a connection failure (if one of the parameters is invalid), an error window pops up. To go back to the identification window, just click on the OK button.

