

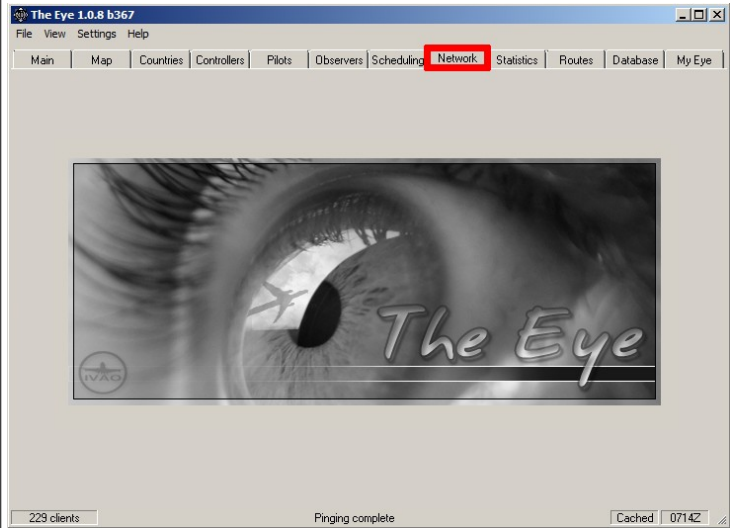
Chapter 5 – Testing the PC to IVAO network connection.

5.1 – Determining the technical layout of the IVAO network.

In order to understand how you can have “a perfect IVAO online experience”, you first need to know the architecture of the IVAO network is build up and how you can gain access to the various IVAO servers. For that purpose we first need to find technical-related information about the IVAO network.

5.1.1 - Getting IVAO technical network information the old way – “The Eye”.

If you (still) have the IVAO “The Eye” tool installed on your computer, you can get this information from here:

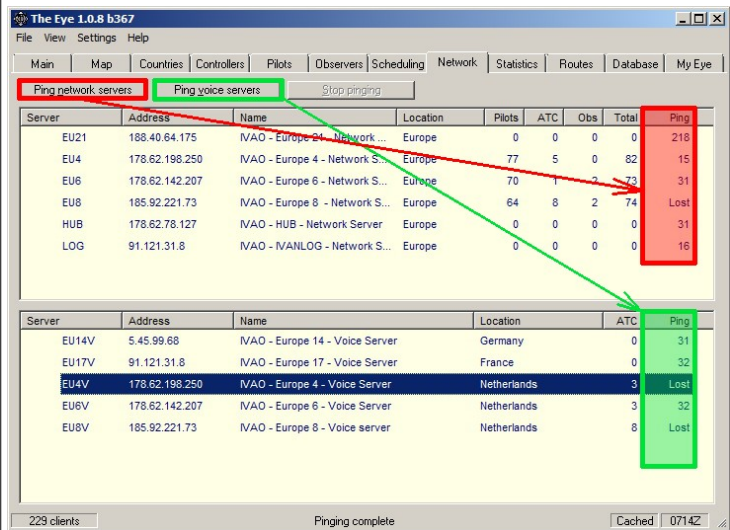


Start up “The Eye”.  
Click on the [Network Tab].

This tab shows you some technical information about the IVAO network infrastructure like:

- Sernvernames (IvAp, IvAc Teamspeak)
- Their IP-addresses and Domain Name Server names.
- Physical location of the servers.
- Number of pilots connected to any server at that time.
- Number of atc-ers connected to any server at that time.
- Ping-time from The Eye to that server at that time.

1 - The Eye – Opening screen



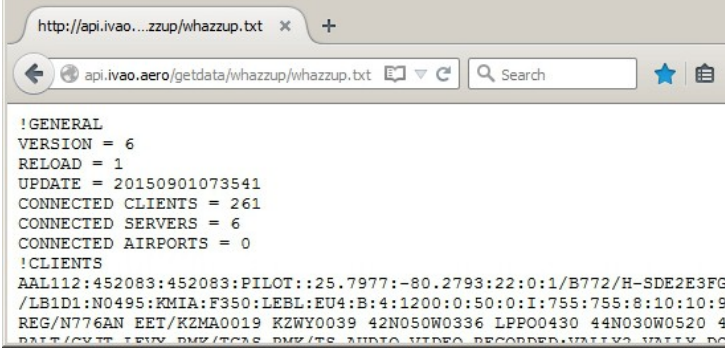
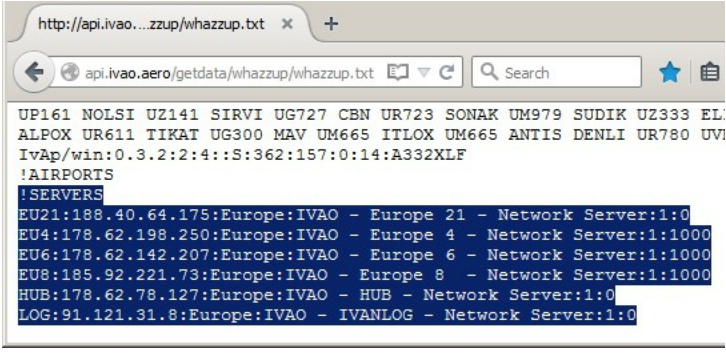
Click on the [Ping network servers] button:  
.. to measure the ping-time to the IVAO network servers. This results in the ping-numbers inside the Red column.

Click on the [Ping voice servers] button:  
..to measure the ping-time to the IVAO network voice servers. This results in the numbers inside the Green column.

The ping(time) number is an important factor that can tell you much about the quality of your internet connection to that specific IVAO network server.

2 - The Eye – Network Tab

5.1.2 - Getting IVAO technical network information, the new way – IVAO API's “Whazzup file”.

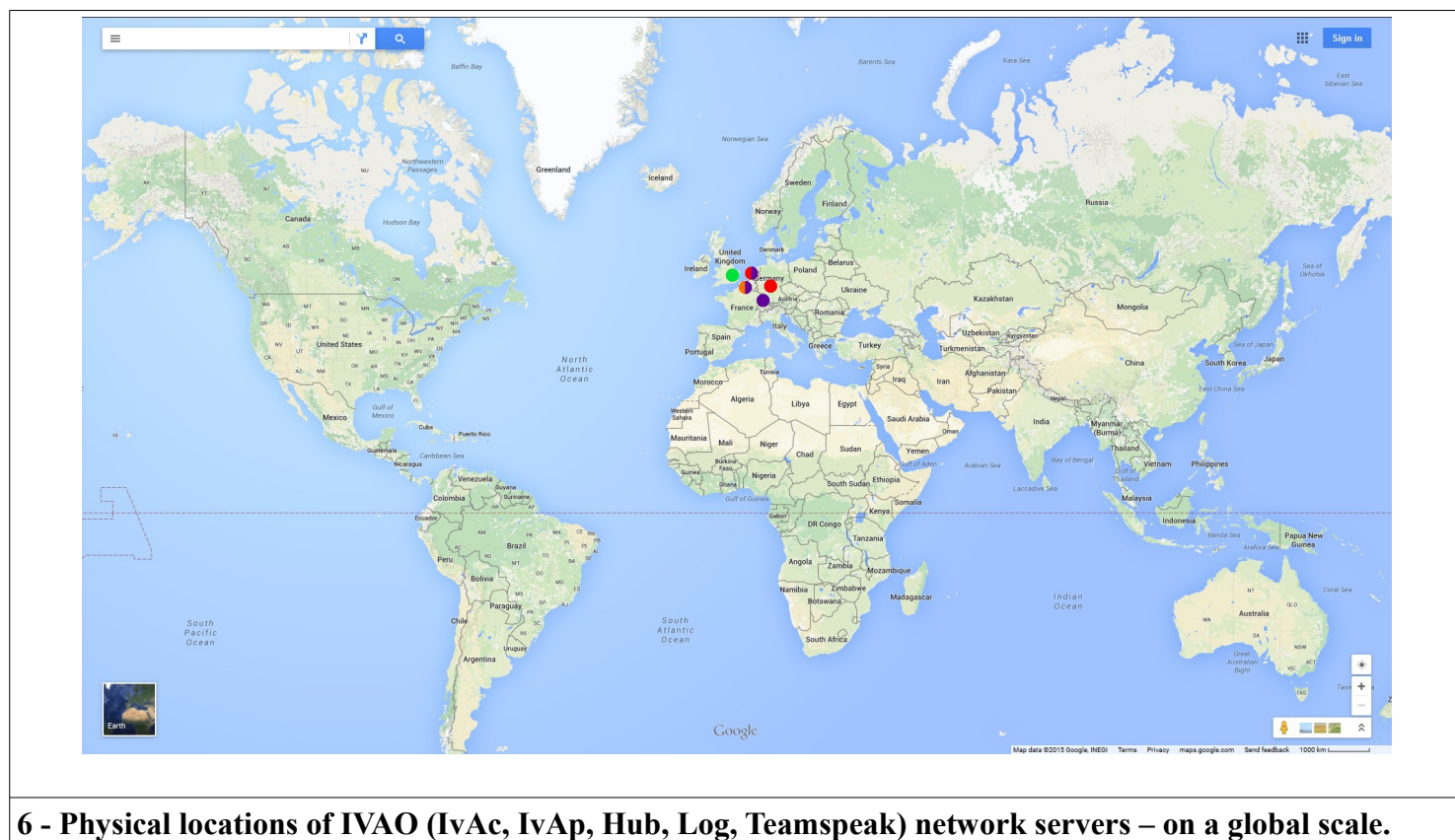
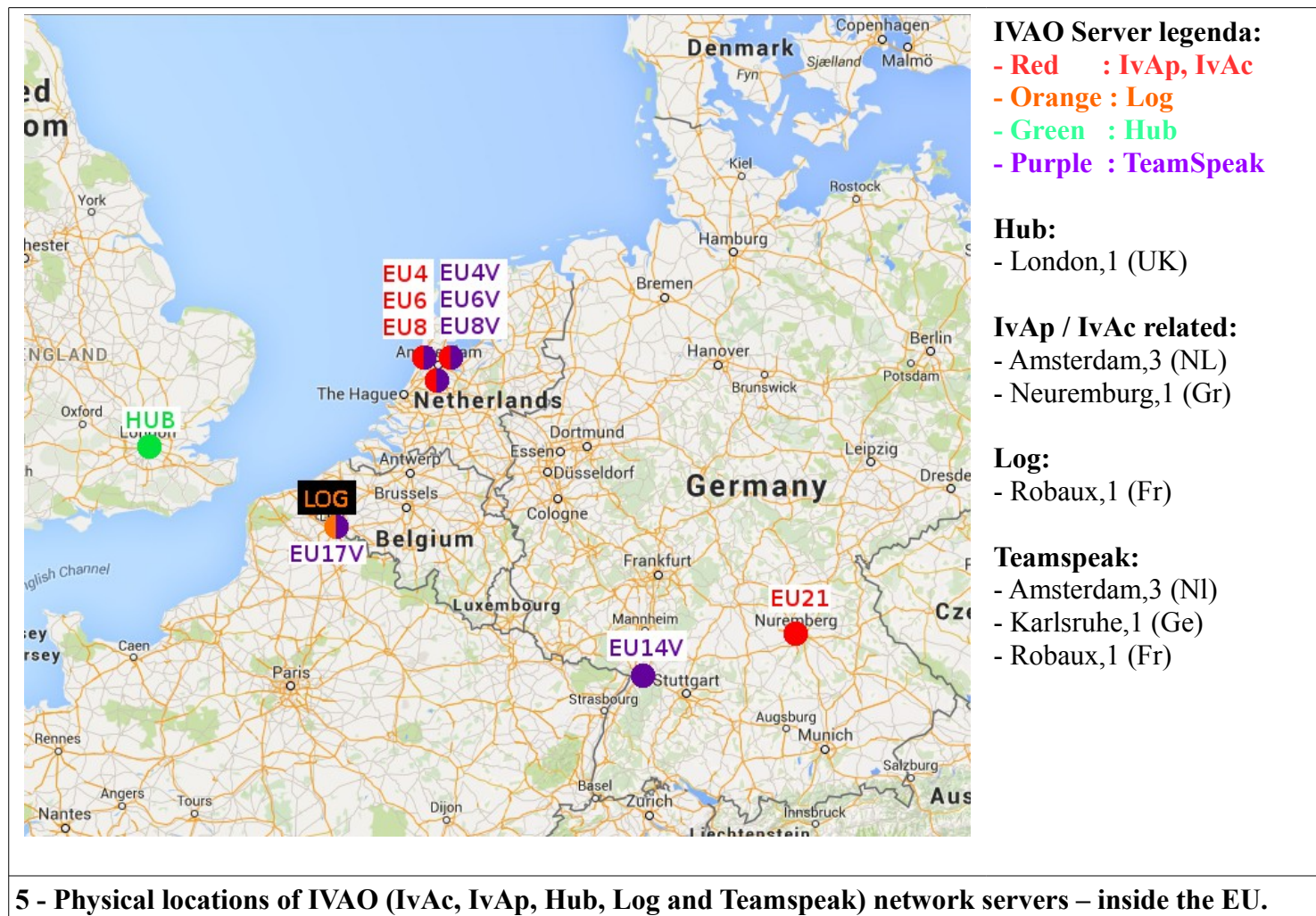
	<p>Start your internet browser. Enter the following url into your browser: <a href="http://api.iviao.aero/getdata/whazzup/whazzup.txt">http://api.iviao.aero/getdata/whazzup/whazzup.txt</a></p> <p>&gt;&gt; The browser downloads Whazzup file on your pc. &gt;&gt; The browser displays the Whazzup file on screen.</p>
<p>3 - Whazzup file – top of the file's contents.</p> 	<p>Scroll all the way down to the end of the file.</p> <p>Here you will find the information about <i>the currently! active!</i> IVAO network servers in the !SERVERS section of the Whazzup file. This can vary from time to time.</p> <p><b>This is the Whazzup Line format:</b> Servername: ip-address: location descr. config data</p>
<p>4 - Whazzup file – !SERVER section at the bottom.</p>	

In the figure above you can see that there are currently: (date 1 September 2015, 11:58 GMT+1)

- 4 IVAO network servers up-and-running, to which IvAp can connect (EU4, EU6, EU8 and EU21)
- 2 other type-of-network servers are up-and-running. (HUB, LOG)
- Their ip-addresses (vvv.xxx.yyy.zzz)
- Other location and configuration data that is not relevant for this guide purpose.

This is the technical information I have used to create the following map of the IVAO network infrastructure.

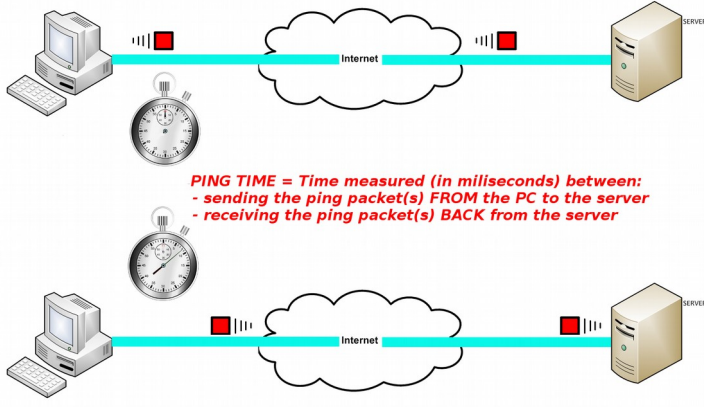


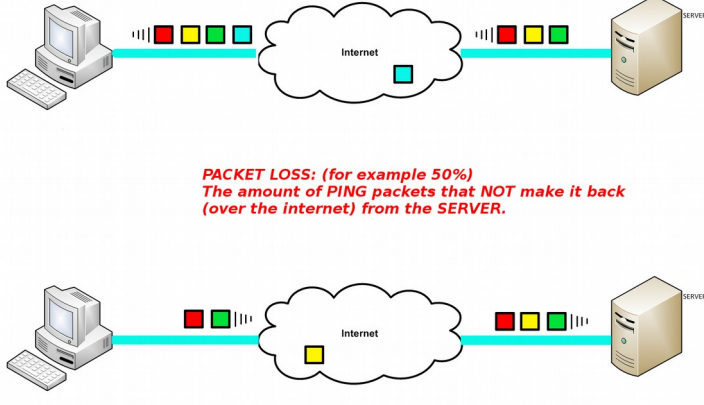


As you can see clearly, all IVAO related servers are physically located *on the European continent*.

5.1.3 – Why do I need to know this IVAO network infrastructure map?

In order to “get the picture”, “to be able to visualize your connectivity to the IVAO network” when you are trouble shooting IvAp connectivity issues later on. This map will help you clearly understand many reasons behind the most common IVAO network errors. I will explain more to you later on in this document.

<p>5.2 - What is “ping-time”, What is “packet loss” and what do they tell me about my Internet connection?</p>  <p>7 - Ping-time graphic</p>	<p>The ping program on the pc:</p> <ul style="list-style-type: none"><li>- sends a ping-packet to any given ip-address.</li><li>- measures the time between sending and receiving it.</li></ul> <p>The “pinged” computer/server reacts to an incoming ping-packet by bouncing it back to its original sender.</p> <p>← This figure shows you a single ping-packet, travelling over an Internet connection, being sent by the pc and then getting bounced back by the server and received again by the “pinging” pc.</p>
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 <p>8 - Packet-loss graphic</p>	<p>The ping program on the pc:</p> <ul style="list-style-type: none"><li>- sends (by default) a series of 4 ping-packets to any given ip-address.</li><li>- measures the number of sent ping-packets that are being bouncing back by the other computer/server and received again by the pc.</li></ul> <p>← This figure shows you an (bad) Internet connection that has 50% packet-loss since 2 from the 4 ping-packets <i>do not make it back</i> to the “pinging” pc.</p>
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Conclusions:

The greater *the physical distance* between the pc and the other computer / IVAO server is:

- the higher the ping-time will become,
- the bigger *the chance* on packet-loss will become.

Signs of a BAD Internet connection:

- High ping-time,
- Great % of packet-loss.

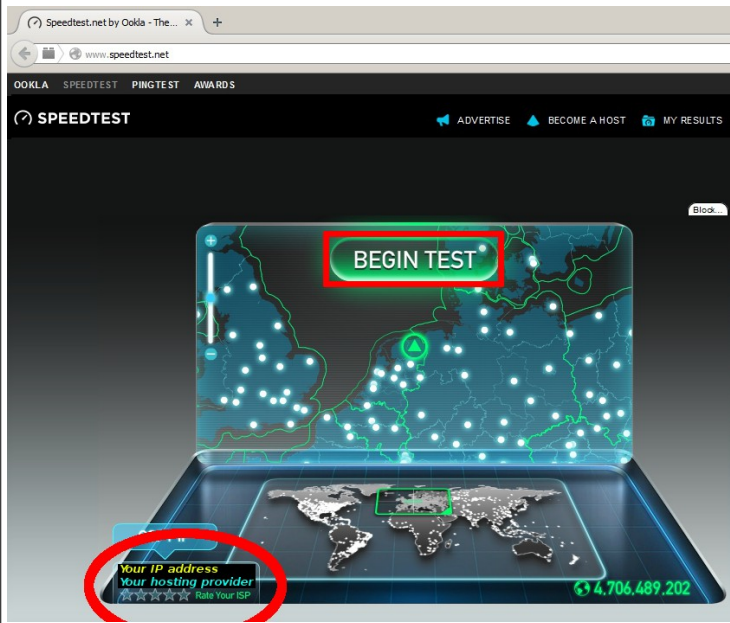
Signs of a GOOD Internet connection:

- Low pingtime,
- 0% packet-loss.



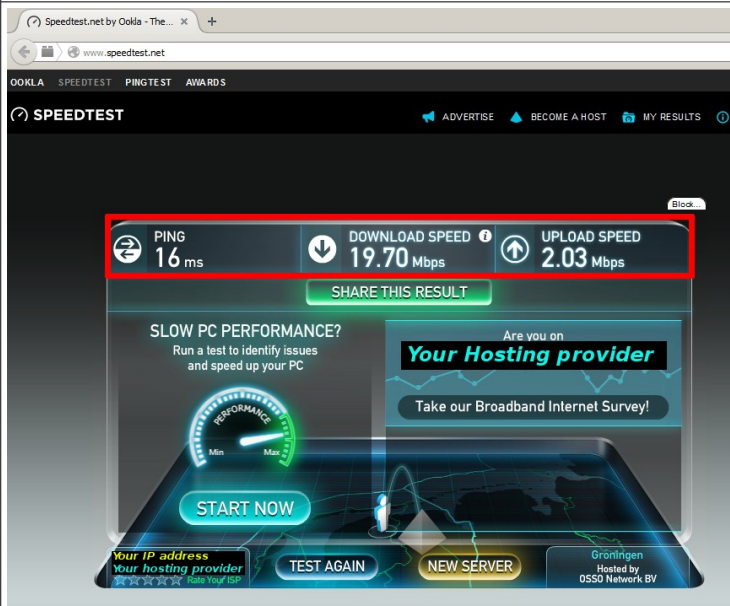
5.3 – Testing your Internet connection:

5.3.1 – Testing your Internet connection (upload, download speed in general)



Start your Internet browser.  
Surf to <http://www.speedtest.net>  
>> Internet speed test tool appears on screen.  
>> In the lower left corner you can see: (red ellipse)  
>> - your own (external) ip-address.  
>> - your own internet service provider.  
  
Click on the green [BEGIN TEST] button.  
>> A file downloads on your pc from a Speedtest host.  
>> Same file uploads from your pc to a Speedtest host.  
>> The results are shown on your screen.

9 - Speedtest – Begin test screen



Speedtest results screen:

This tells you your current:

- Ping-time, (from and to the Speedtest host!)
- Download speed, (from the Speedtest host!)
- Upload speed, (to the same Speedtest host!)

to the automatically selected Speedtest hosting server.

**and not to any IVAO network server!**

10 - Speedtest – End results screen

These numbers are only a good/general indication about your current (local) internet connection speed, between your pc and the nearest Speedtest host server.

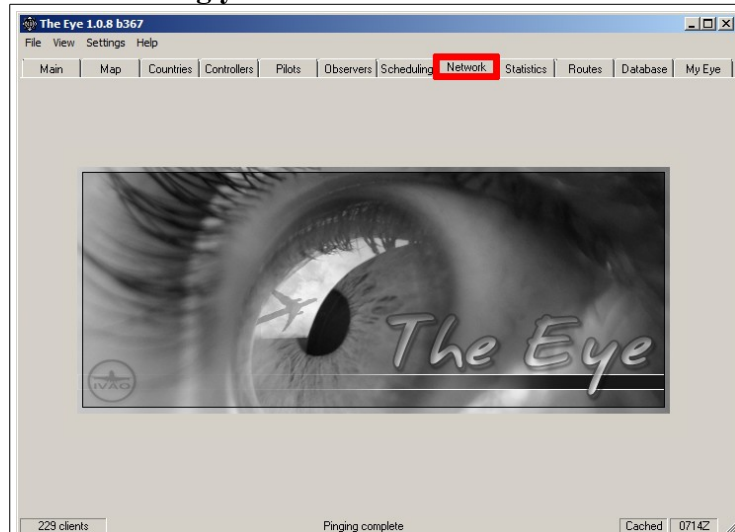
### 5.4 – Testing your Internet connection to the IVAO servers.

We can do this in multiple ways,

- via IVAO's tool called “The Eye”,
- via the Windows *ping.exe* command on the console.

I will show you both methods.

#### 5.4.1 – Testing your Internet connection to the IVAO servers with “The Eye”.



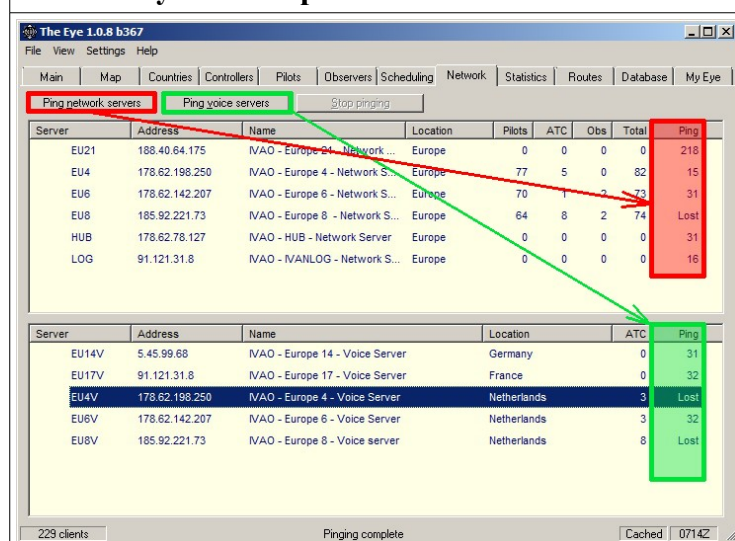
Start up “The Eye”:

>> Opening screen shows.

Click on the **[Network Tab]**:

>> Network Tab contents appear.

### 11 - The Eye - Startup screen.



Click on the **[Ping network servers]** button:

.. to measure the ping-time from your pc to the IVAO network servers. This will result in the numbers inside the Red column.

Click on the **[Ping voice servers]** button:

.. to measure the ping-time from your pc to the IVAO network voice (TeamSpeak) servers. This will result in the numbers inside the Green column.

### 12 - The Eye – Network Tab.

The ping(time) number is an important fact that tells you much about *the quality of your internet connection* to the IVAO network servers.



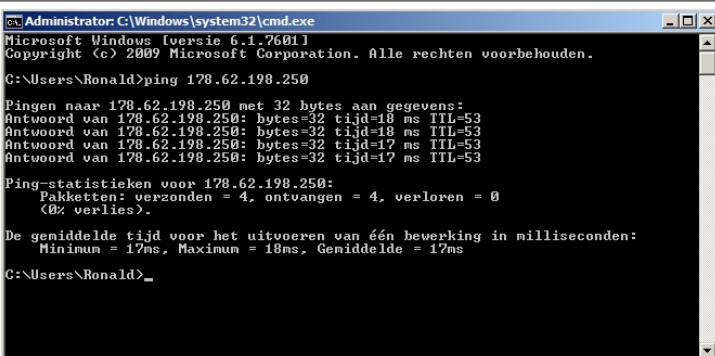
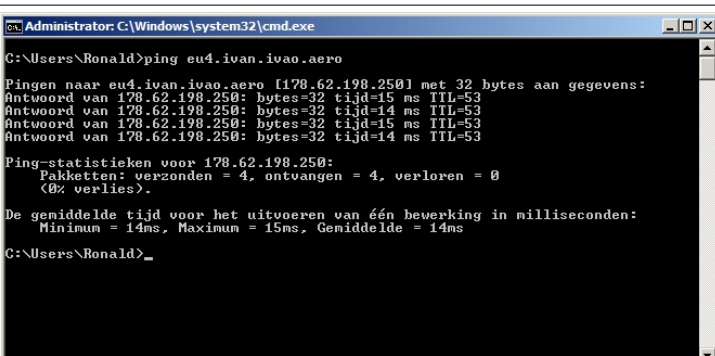
When a connection shows **[Lost]** in the Red - or Green column, that is a clear indication that:

- The Eye can not make a (good) connection to that IVAO server at all!
- The Internet connection to the IVAO server suffers heavy %packet-loss.
- The IVAO server is too busy (handling its IvAp-airtraffic load) to answer to the ping request from The Eye.
- The IVAO server is offline (simply switched off).

#### TIP:

If any IVAO server continues to show **[Lost]** you should NOT connect to it with IvAp when going online.

## 5.4.2 – Testing your Internet connection to the IVAO servers on the Windows command-line.

	<p>Go to the Windows Desktop, Click on <b>[Start],[Run]</b> &gt;&gt; Dialog box opens</p> <p>Enter the following command: - <b>“cmd.exe&lt;enter&gt;”</b></p> <p>Press the <b>[OK]</b> button.</p>
<h3>13 - Opening a command-line / console window.</h3> 	<p>&gt;&gt; A black “DOS-style” window opens.</p> <p>You are now on the Windows command-line / console. From here you can “ping” any IVAO server with the following ping command:</p> <p><i>Example : IVAO's EU4 server: Ip-address: 178.62.198.250 DNS name: eu4.ivan.ivao.aero</i></p>
<h3>14 - The Windows command-line / console</h3> 	<p>Pinging <i>directly</i> to the servers ip-address: Enter: <b>ping 178.62.198.250&lt;enter&gt;</b> &gt;&gt; 4 ping-packets sent. &gt;&gt; 4 ping-packets received back.</p> <p>&gt;&gt; Statistics show: &gt;&gt; → 4 send, 4 received : <b>non lost!</b> &gt;&gt; → Average ping-time : <b>17 ms</b></p>
<h3>15 - Ping IVAO server – via IP Address</h3> 	<p>Pinging <i>indirectly</i> via a server dns name: Enter: <b>ping eu4.ivan.ivao.aero&lt;enter&gt;</b> &gt;&gt; Translation from DNS-name to ip-address &gt;&gt; → Translation went correct!</p> <p>&gt;&gt; 4 ping-packets sent. &gt;&gt; 4 ping-packets received back.</p> <p>&gt;&gt; Statistics show: &gt;&gt; → 4 send, 4 received: <b>non lost!</b> &gt;&gt; → Average time : <b>14 ms</b></p>
<h3>16 - Ping IVAO server – via DNS name.</h3>	

## Conclusion:

This is a *good and stable internet connection* from this pc to this IVAO network server.

### 5.5 - Most common causes of Internet connectivity trouble:

So far I have shown you the “perfect scenario” in which everything is working smoothly. But.. browsing through IVAO's Support forum postings, I must come to the conclusion that this is not always the case by every IVAO user. That is why i'm going to show you the most common causes of internet connection errors, so you check them for yourself, and see what might be the cause on your own computer.



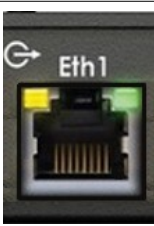

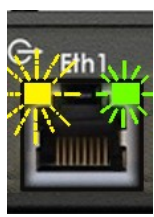
### 5.5.1 – Rotten/ disconnected Internet cable (from and to your physical Internet router):

Your computer needs to be physically connected to your Internet router. (in case of a local area network).

From the back of your computer to your Internet router, you need to see a cable, connecting them both.

	
<b>17 - Pc Ethernet cable connector.</b>	<b>18 - Internet router (with 4 “Ethernet” LAN ports).</b>

#### 5.5.1.1 - How can I check if the Ethernet port and Internet cable are working correctly?

	<p>At the back of your computer, you can see the connector as shown at the left. It has:</p> <ul style="list-style-type: none"> <li>- a big hole, in which you can put the Internet cable.</li> <li>- 2 little leds above the big hole (yellow, green).</li> </ul> <p>This is technically called an “Ethernet port”.</p>
	<p>When you insert the Internet cable from your router into the pc-connector, the Green LED-light start to burn continuously if your router is powered ON.</p> <p>This tells you that the Internet cable is <i>electrically connected</i> to the router and functions well.</p>
	<p>When your computer starts “to speak TCP-IP” over the Internet cable to your router (or other connected devices), the Yellow LED-light starts to flicker.</p> <p>This tells you that your computer and your router (or other device) are speaking TCP-IP to each other.</p>
<b>19 – Ethernet port - connection indicator lights</b>	

These LED lights can tell – at any time – if your PC is firmly connected to your internet router and working.

**NOTE: Never ever connect / disconnect any cable with THE ELECTRICAL POWER ON! Never!**  
Always shut down all connected computer device, when you are working with cables and/or powercords.

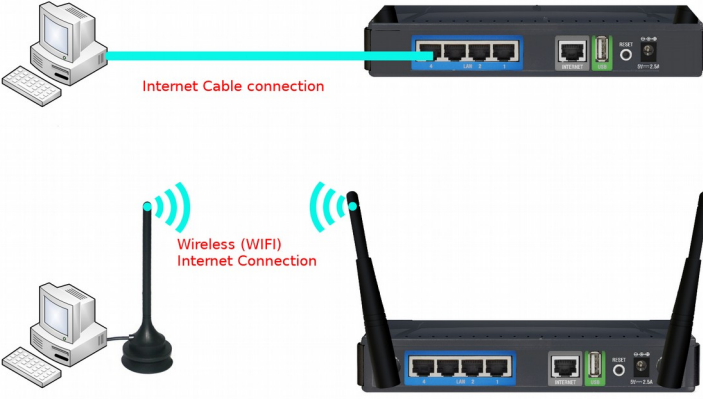
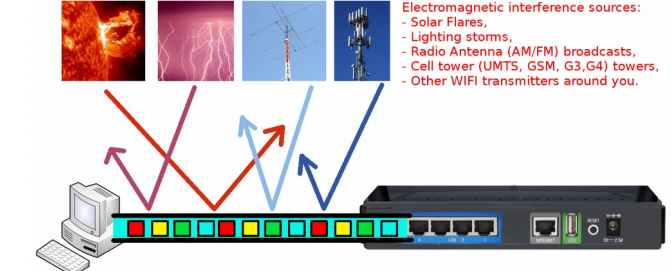
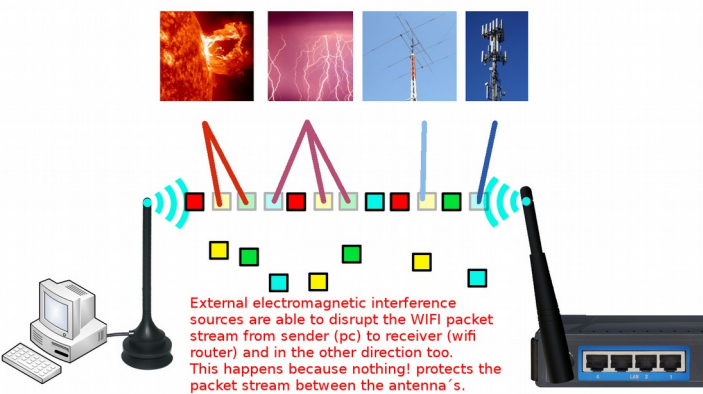
Why? This can trigger *static-electricity discharges* from your physical body/hands directly into your PC motherboard and/or Router's hardware and fully DESTROY IT!

## 5.5.2 - Rotten WIFI connection:

Let me kick in the door at right away at the start:

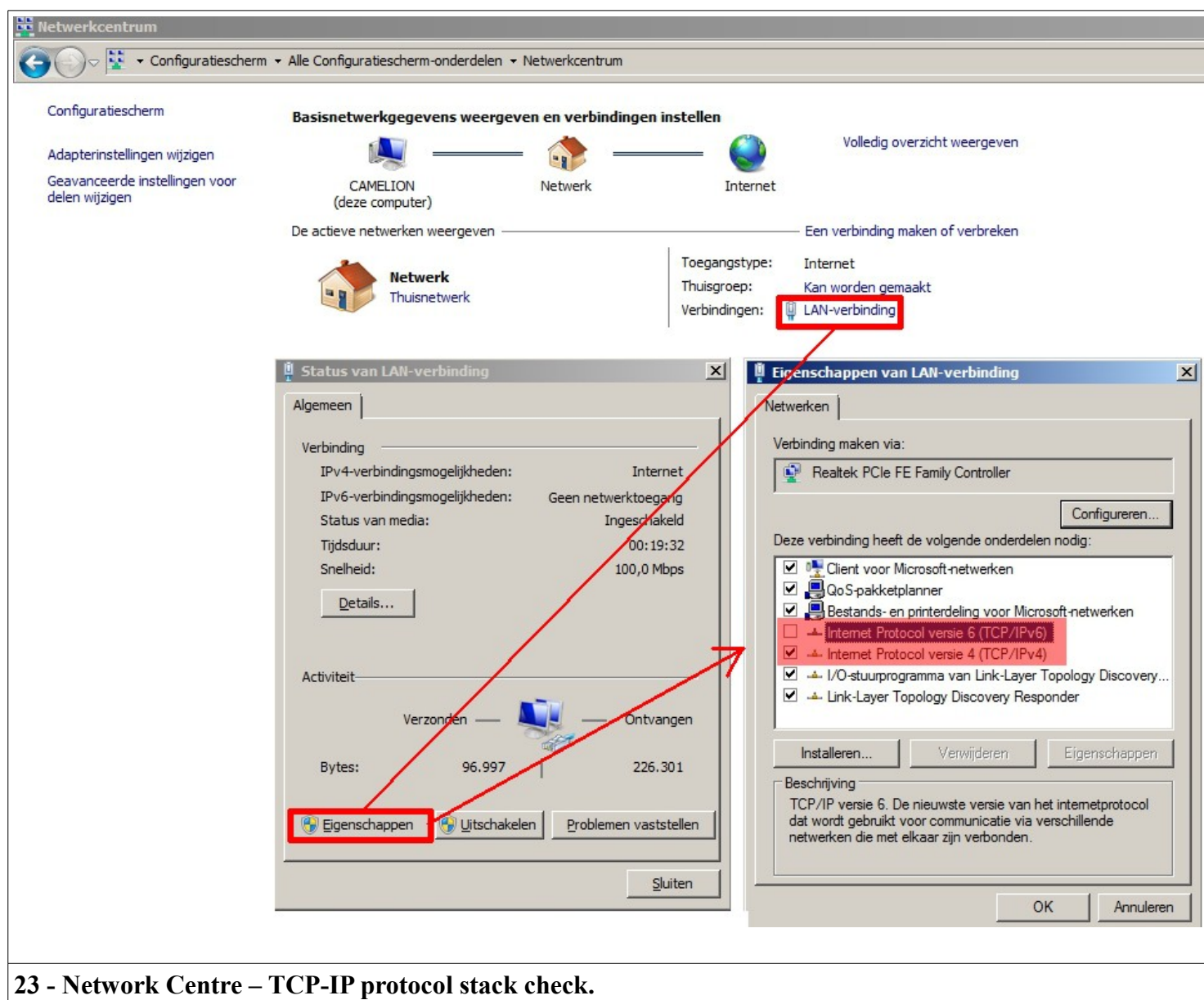
**WIFI and other forms of wire-less (like satellite) internet connections *Suck! Big! Time!* as a trustworthy, secure, serious, stable and reliable Internet connection medium PERIOD. End of discussion.**

If you choose to use this (wireless) medium to connect to the Internet anyway, you set yourself up for a lot of connectivity trouble by design and default, so it is your choice and your choice alone. In order for you to be fully able to understand it, I have created some crystal clear graphics below.

 <p>Internet Cable connection</p> <p>Wireless (WIFI) Internet Connection</p>	<p>Here you see the difference between an Internet connection over a (copper/fiber)wire/“cable”.</p> <p>This type of internet connection includes:</p> <ul style="list-style-type: none"> <li>- Modem / Dial-up internet.</li> <li>- A.D.S.L. internet.</li> <li>- (TV) cable internet.</li> <li>- Fiber optical internet.</li> </ul> <p>← Internet connection via a wire-less connection like:</p> <ul style="list-style-type: none"> <li>- Mobile phone (GSM, UMTS, G3, G4) internet.</li> <li>- WiFi internet.</li> <li>- Satellite based internet.</li> </ul>
<p><b>20 - Cable and Wifi connection.</b></p>  <p>Electromagnetic interference sources:</p> <ul style="list-style-type: none"> <li>- Solar Flares,</li> <li>- Lightning storms,</li> <li>- Radio Antenna (AM/FM) broadcasts,</li> <li>- Cell tower (UMTS, GSM, G3,G4) towers,</li> <li>- Other WIFI transmitters around you.</li> </ul>	<p>Copper cables are shielded at the outside. This shielding enables the copper cables to deflect interference from other external electromagnetic radiation sources like, Solar flares, Lightning storms, all kind of radio (AM/FM) towers and Cellphone towers.</p> <p>This shielding also helps to keep the (Red, Yellow, Green, Blue) packet-stream intact, and thereby guaranteeing a good, stable internet connection and speed.</p> <p>Glasfiber cables are – by design - immune for outside electromagnetic interference!</p>
<p><b>21 - Cable connection vrs external interference.</b></p>  <p>External electromagnetic interference sources are able to disrupt the WIFI packet stream from sender (pc) to receiver (wifi router) and in the other direction too. This happens because nothing! protects the packet stream between the antenna's.</p>	<p>In a WIRE-less connection (hence shield-less connection), the connecting itself made from an electromagnetic carrier wave (aka “radio wave”). This open carrier radio-wave itself is not able to shield the data-packets that are being transmitted between the WIFI antenna's</p> <p>← So every external (other) “radio-wave form” is able to corrupt the Wifi's own carrier wave, and thereby is able to cause massive packet loss.</p>
<p><b>22 - Wifi connection vrs external interference.</b></p>	

### 5.5.3 - No TCP-IP protocol stack installed on your computer:

In order for your computer to connect to (anything on the Internet) it first needs to speak “TCP-IP.”  
You can check if your computer speaks TCP-IP in the following way:



### 23 - Network Centre – TCP-IP protocol stack check.

Go to [Start],[Configuration],[Network Centre]

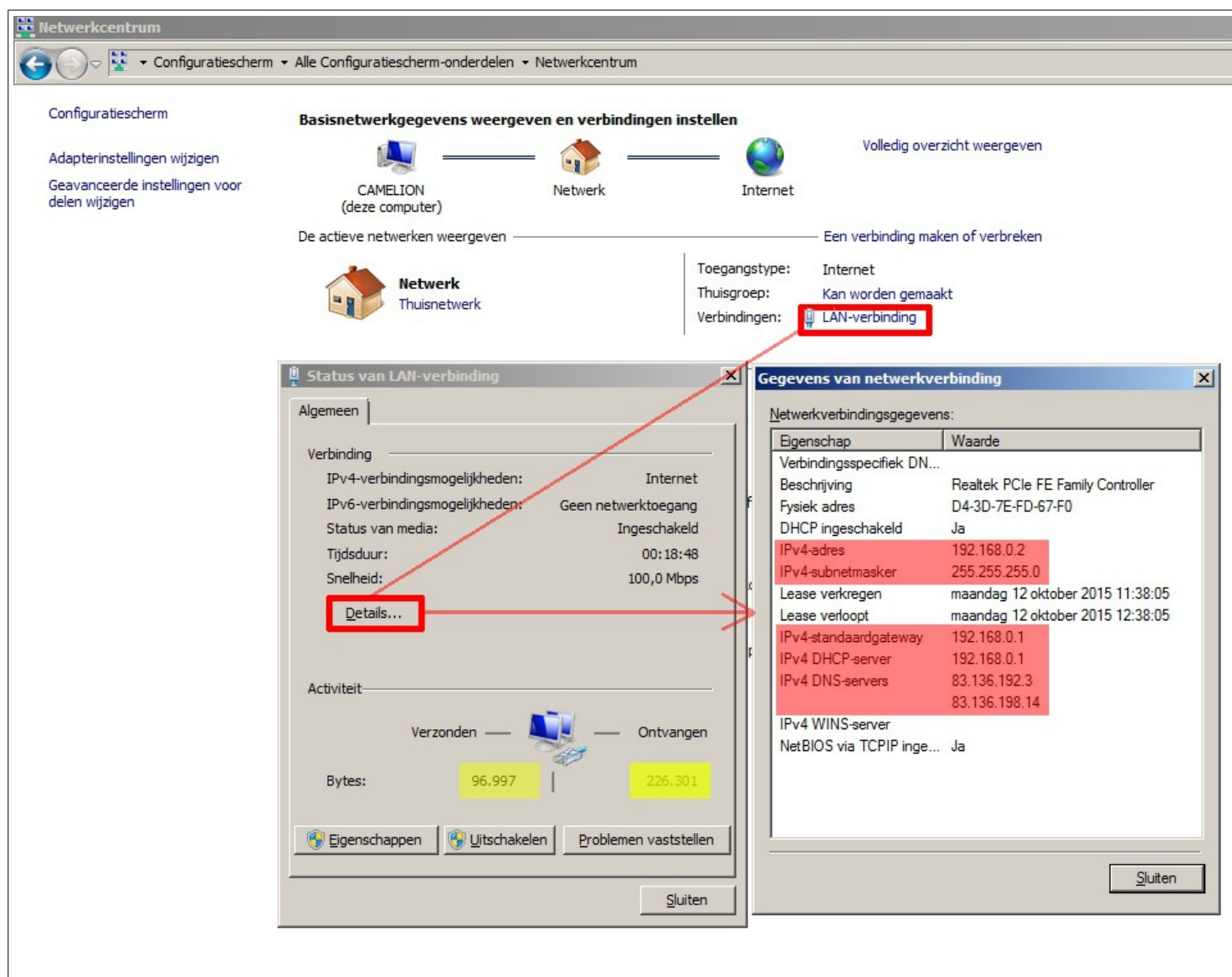
Click [Lan connection],

Click [Properties]

Here you can check if your computer has the [Internet Protocol version 4/6 (TCP/IPV4, V6)] installed on it.  
This is a must so your computer is able to talk “TCP-IP” to other computers on the Internet.

## The Unofficial IVAO Network Connection Troubleshooting Guide – Chapter 5

Now that we have checked that your computer has TCP/IP installed, we need to control if it works correctly. You can control this at the following place inside your Windows Operating system.



### 24 - Network Centre – TCP-IP protocol stack check.

Go to [Start],[Configuration],[Network Centre]

Click [Lan connection]

Here you see 2 counters (yellow squares), that tell you the number of packets that have been:

- transmitted by your computer.
- received by your computer.

If these counters are incrementing in value TCP-IP is installed ok and working correctly on your computer.

Click [Details]

Here you can see (red squares)

- your own IP address
- your IP subnet mask


>>


- your DNS server's IP address

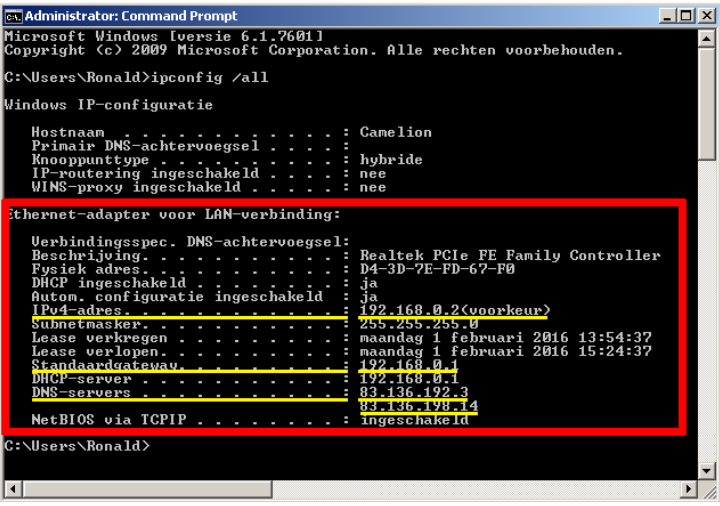
Now that you have confirmed that everything TCP-IP-wise is working on your pc, you are ready to test the rest of the internet connection to the IVAO servers, from the Windows command-line.



5.6 - Testing the correct TCP/IP installation from the Windows command-line:

	<p>Go to the Windows Desktop, Click on <b>[Start],[Run]</b> &gt;&gt; Dialog box opens</p> <p>Enter the following command: - <b>“cmd.exe&lt;enter&gt;”</b></p> <p>Press the <b>[OK]</b> button.</p>
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<p><b>25 – Opening a command-line window.</b></p> 	<p>&gt;&gt; A black “DOS-style” window opens. Your are now on the Windows command-line / console.</p> <p>Type:“<b>ipconfig /all&lt;enter&gt;</b>”</p>
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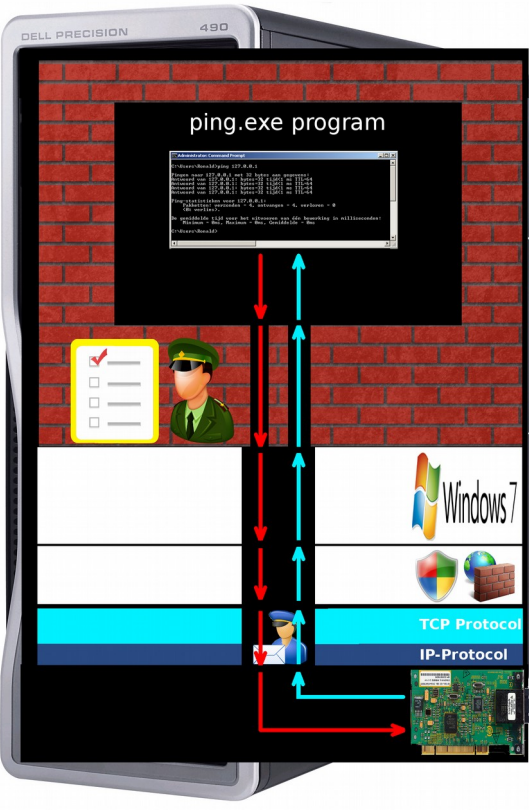
<p><b>26 – Windows 7 command-line.</b></p> 	<p>&gt;&gt; The computer shows this TCP-IP configuration:</p> <ul style="list-style-type: none"><li>- IPv4-Address : 192.168.0.2</li><li>- Default gateway : 192.168.0.1</li><li>- DNS server 1 .....: 83.136.192.3</li><li>- DNS server 2 .....: 83.136.192.14</li></ul> <p>With these data, we can now thoroughly check if your pc is able to speak “TCP-IP” properly and if your computer is able to reach other computers on the Internet.</p> <p>We are going to use the “ping.exe” command for that.</p>
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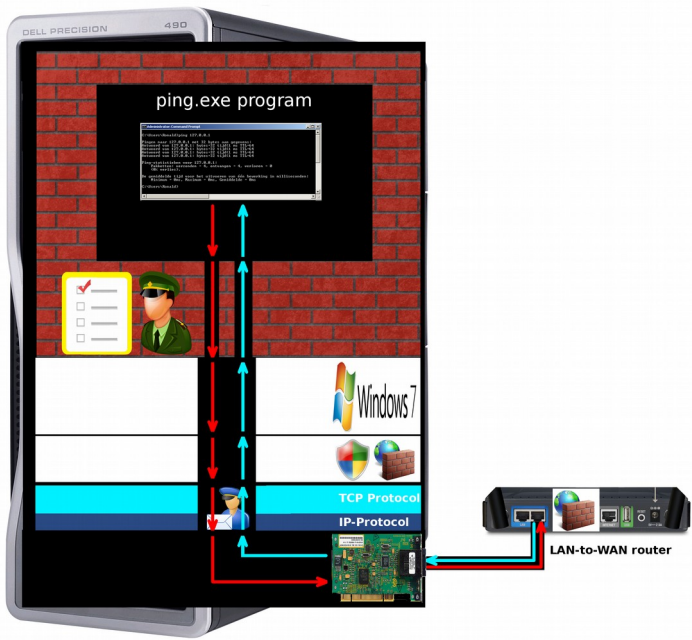
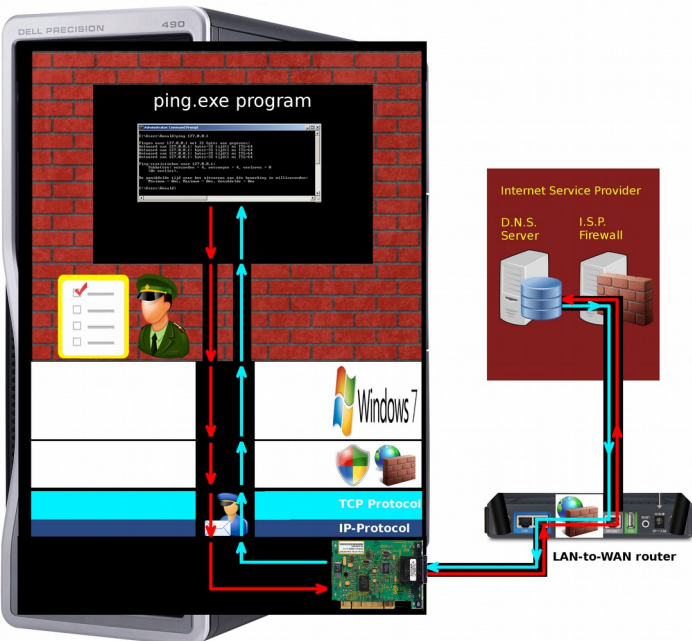
27 – All TCP-IP relevant data.

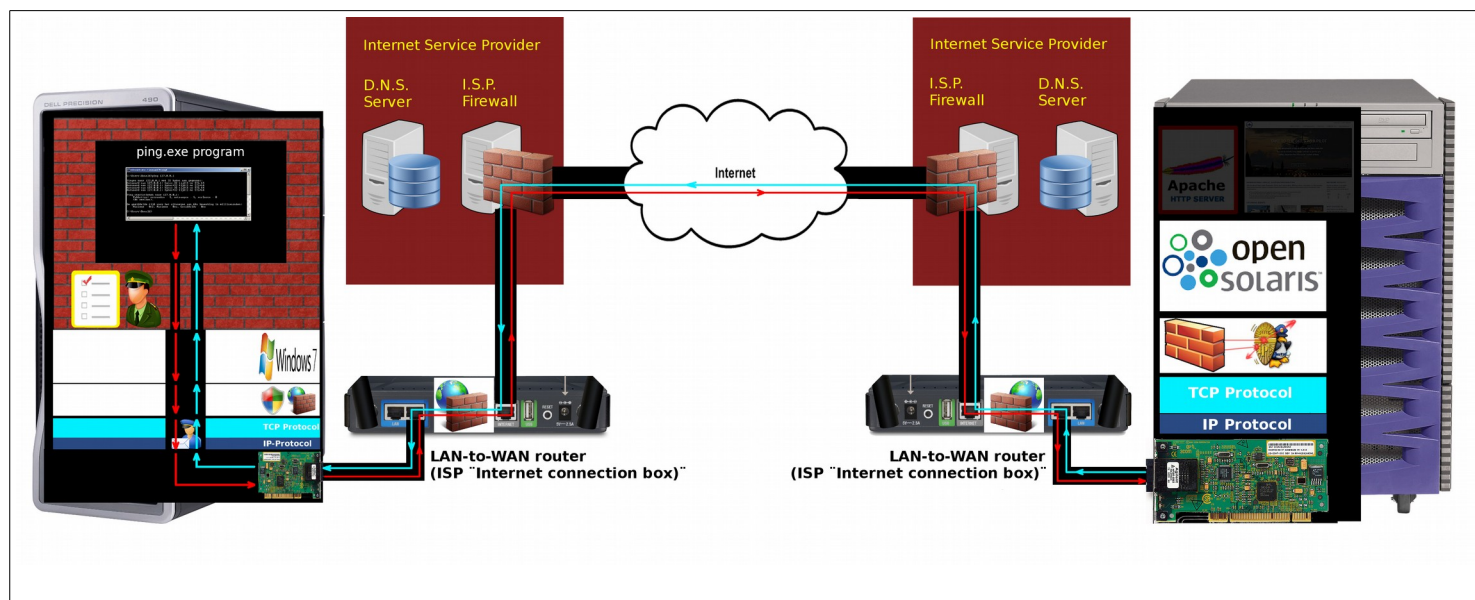
As you can see in the above figure, you can (double)check the TCP-ip data on the Windows command-line.

5.7 - Testing the rest of the Internet connection to the IVAO servers.

The illustrations in the next section will show you exactly what happens, when we are going to test the pc and the connections to other equipment (Application Level Firewall, Network Level Firewall, Lan-to-Wan router, DNS server, IVAO's website server) on the Internet.

	<p><b>Ping the pc on ip-address &lt;127.0.0.1&gt;</b></p> <p><b>When it works, you can draw these conclusions</b></p> <ol style="list-style-type: none"><li>1 - The pc's operating system is working,</li><li>2 - Application Level Firewall allows ping.exe to start</li><li>3 - Ping.exe program is working correct.</li><li>4 - Application Level Firewall allows network connections.</li><li>5 - Network firewall allows ping-packets to pass through.</li><li>6 - Tcp-Ip protocol-stack is installed and working.</li><li>7 - Pc network card is working correctly.</li></ol>
<p><b>28 – Ping-ing the network card via 127.0.0.1</b></p>	
	<p><b>Ping the pc on ip-address &lt;own ip-address&gt;</b></p> <p><b>When it works, you can draw these conclusions:</b></p> <ol style="list-style-type: none"><li>1 - The pc's operating system is working.</li><li>2 - Application Level Firewall allows ping.exe to start.</li><li>3 - Ping.exe program is working correct.</li><li>4 - Application Level Firewall allows network connections.</li><li>5 - Network Level Firewall allows ping-packets to pass through.</li><li>6 - Tcp-Ip protocol-stack is installed and working.</li><li>7 - Pc network card is working correctly.</li></ol>
<p><b>29 – Ping-ing the network card via the IP-address.</b></p>	
	<p><b>Ping router via the &lt;"default gateway" ip-address&gt;</b></p> <p><b>When it works, you can draw this conclusion:</b></p>

 <p>The diagram shows a Dell Precision 480 PC with a red brick wall background. A 'ping.exe program' window is open at the top. Below it, a checklist with a green soldier icon is visible. The network stack is represented by a vertical column of boxes: Windows 7, TCP Protocol, and IP-Protocol. A LAN-to-WAN router is connected to the PC's network card. Red and blue arrows indicate the flow of data between the PC and the router.</p>	<ul style="list-style-type: none"><li>1 - The pc's operating system is working.</li><li>2 - Application Level Firewall allows ping.exe to start.</li><li>3 - Ping.exe program is working correct.</li><li>4 - Application Level Firewall allows network connections.</li><li>5 - Network Level Firewall allows ping-packets to pass through.</li><li>6 - Tcp-Ip protocol-stack is installed and working.</li><li>7 - Pc network card is working correctly.</li><li>&gt;&gt;</li><li>8 - Pc is electrical connected to the router.</li><li>9 - Router is switched ON and working.</li></ul>
<p><b>30 – Ping-ing the router via the IP-address.</b></p>  <p>The diagram is similar to the previous one, but includes an 'Internet Service Provider' box above the router. This box contains a 'D.N.S. Server' and an 'I.S.P. Firewall'. Red and blue arrows show the path of data from the PC, through the network stack, to the router, and then to the ISP's DNS server.</p>	<p><b>Ping your local isp's dns via the &lt;dns ip-address&gt;</b></p> <p><b>When it works, you can draw this conclusion:</b></p> <ul style="list-style-type: none"><li>1 - The pc's operating system is working,</li><li>2 - Application Level Firewall allows ping.exe to start.</li><li>3 - Ping.exe program is working correct.</li><li>4 - Application Level Firewall allows network connections.</li><li>5 - Network firewall allows ping-packets to pass through.</li><li>6 - Tcp-Ip protocol-stack is installed and working</li><li>7 - Pc network card is working correctly.</li><li>&gt;&gt;</li><li>8 - Pc is electrical connected to the router.</li><li>9 - Router is switched ON and working.</li><li>&gt;&gt;</li><li>10 - Router forwards ping-packets to your ISP DNS</li><li>11 - Router connection to your ISP works fine.</li><li>12 - ISP's DNS server is up and running.</li></ul>
<p><b>31 – Ping-ing the ISP's DNS via the IP-address.</b></p>	



## 32 – Ping-ing IVAO's Webserver computer via the domain-name “www.iviao.aero”.

**When it works, you can draw this conclusion:**

- 1 - The pc's operating system is working,
- 2 - Application Level Firewall allows ping.exe to start up.
- 3 - Ping.exe program is working correct.
- 4 - Application Level Firewall allows network connections.
- 5 - Network Level firewall allows ping to pass through.
- 6 - Tcp-Ip protocol-stack is installed and working.
- 7 - Pc network card is working correctly.
- >>
- 8 - Pc is electrical connected to the router.
- 9 - Router is switched ON and working.
- >>
- 10 - Router forwards ping-packets to your ISP DNS
- 11 - Router connection to your ISP works fine.
- 12 - ISP's DNS server is up and running.
- 13 - Router forwards DNS request to I.S.P DNS server.
- 14 - DNS server found the ip-address for [www.iviao.aero](http://www.iviao.aero).
- 15 - DNS server answers the ip-address for [www.iviao.aero](http://www.iviao.aero) back to the pc.
- 16 - Router forwards DNS answer back to the pc.
- 17 - Network Level Firewall allows incoming DNS answers.
- >>
- 18 - Ping.exe now sends a ping-packet to IVAO's web-server computer.
- >>
- 19 - Your local ISP firewall is allowing ping-packets to pass through, on to the Internet.
- 20 - The remote ISP firewall is allowing ping-packets to pass through to IVAO's router.
- 21 - The remote IVAO Router is allowing ping-packets to pass through to IVAO's web-server computer.
- 22 - IVAO's webserver computer is turned ON and works fine.
- 23 - IVAO's webserver computer replies the ping-packets all the way back to the ping.exe program on the pc.
- >>

**The complete connection from PC to IVAO's webserver is now checked with ping.exe and works fine!.**



### 5.8 – Internet connection testing conclusions:

**After each (ping/test) step you can come a certain conclusion about:**

- Every piece of ICT-equipment that has been part of that tested connection.
- The configuration of all participating parts-of-the-internet connect (cables, network cards, firewalls, routers)

**“PING-ing” is a very basic but oh so efficient test-strategy to investigate a TCP-IP connection between:**

- Your own PC.
- Any given other computer / server on the Local Area Network(LAN) / The Internet.

**IF your ping-packets DO COME BACK at your pc, then you can see:**

- The *ping-time* between your pc and the other computer online.
- The % *packet-loss* of the tested connection between your pc and the other computer online.

These 2 vital parameters (pingtime / %packet-loss) can tell you almost anything about:

- the SPEED of end-to-end Internet connection.
- the QUALITY of end-to-end Internet connection.

**WHEN your ping-packets DO NOT COME BACK back at your pc, then you can come (one of) to these conclusions:**

- A physical connection has gone broke like:
  - Damaged LAN/WAN connector-chips due to static electricity / lighting strikes.
  - Broken off connectors inside your computer (on the motherboard).
  - Broken cable connectors or wires inside the cable.
  - Damaged UTP cable shielding.
- A piece of ICT-equipment is misconfigured like:
  - Not allowing certain:
    - Ports \ Connections to be forwarded to a certain other LAN\WAN port inside the router.
    - Incoming and/or outgoing connections to a certain destination on the network\ Internet.
- A piece of ICT-equipment is physically turned OFF (and hence not able to respond it the ping-packets)
- Your (local/remote) Internet Service Provider BLOCKS/ FLITERS out internet traffic  
This can be the case in countries around the world with an oppressive government (like China).
- The OTHER computer is turned OFF (and hence not able to respond it the ping-packets)

**GOLDEN TIPS:**

**A - The fastest way to check any (TCI-IP) internet connection, is to directly ping “the other computer.”**  
Either on its own IP- Address or (if it has one) by its own domain-name.

**B - If “Tip A” does not work... Always start with your own pc first!**  
and then systematically ping just 1 piece of ICT-equipment further up in the connection.

**C – Always check “up-stream” starting with your own PC, in the following order:**

- ☐ **PC - Power supply.**
- ☐ **PC - Hardware, Network-card.**
- ☐ **PC - Operating system, TCP-IP configuration.**
- ☐ **PC - Internal application level firewall, permission-list.**
- ☐ **PC - Internal network level firewall, access-list.**
- ☐ **PC to Router: Connectors and Cables**
- ☐ **Router - Internal (router and tcp-ip) configuration.**
- ☐ **Router - LAN connection.**
- ☐ **Router - Build-in firewall, access-list, port-forwarding, parental-control-url-blockinglist**
- ☐ **Router - WAN connection.**
- ☐ **Router to local ISP: Connectors and Cables**
- ☐ **Local Internet Service Provider(ISP) - Internal to-the-customer connection firewall.**
- ☐ **Local Internet Service Provider(ISP) - DNS server.**
- ☐ **Local Internet Service Provider(ISP) - External to-the-Internet connection firewall.**
- ☐ **Internet - Learn your (local) Internet topology (in your own country, in the other computer's country).**
- ☐ **Internet - Find out if there are major internet (backbone) connection disruptions due to:**
- ☐ **Internet → “Natural” cause disasters like:**
- ☐ **Internet →→ Solar Flares**
- ☐ **Internet →→ Earthquakes**
- ☐ **Internet → “Man made” causes disruptions like:**
- ☐ **Internet →→ Local digging, ground work.**
- ☐ **Internet →→ Government censorship / web-page content filtering.**
- ☐ **Internet →→ Corporate (ISP) filtering of internet traffic.**
- ☐ **Internet →→ Corporate (ISP) internet connection bandwidth filtering**
- ☐ **Remote Internet Service Provider(ISP) - External to-the-Internet connection firewall.**
- ☐ **Remote Internet Service Provider(ISP) - Internal to-the-customer connection firewall.**
- ☐ **Remote Internet Service Provider(ISP) to Other Router - Connectors and Cables**
- ☐ **Other Router - Internal (router and tcp-ip) configuration.**
- ☐ **Other Router - WAN connection.**
- ☐ **Other Router - Build-in firewall.**
- ☐ **Other Router - LAN connection.**
- ☐ **Other Router to Other PC - Connectors and Cables**
- ☐ **OTHER PC - Power supply**
- ☐ **OTHER PC - Hardware, Network-card.**
- ☐ **OTHER PC - Operating system, TCP-IP configuration.**
- ☐ **OTHER PC - Internal application level firewall, permission-list.**
- ☐ **OTHER PC - Internal network level firewall, access-list.**

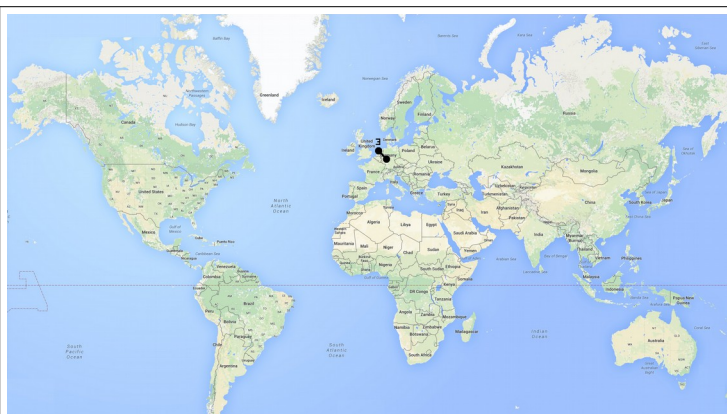
This way of testing enables you to find out exactly where “the rotten (physical / logical) connection link” is located inside the “chain-of-ict-equipment” between your Pc and “the other computer” connected somewhere to the Internet.

### 5.9 – Technical topics to consider for the future of the IVAO network infrastructure.

If you look at these global-network-topology-maps below, you see that the VATSIM network has more servers and VATSIM also has her servers more equally distributed over the entire globe, while IVAO has all her servers on the European continent.



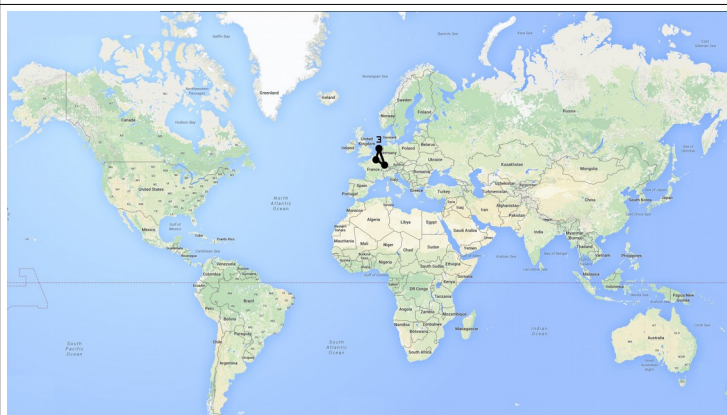
**33 - VATSIM – FSD (FsInn) server locations.**



**34 - IVAO – FSD (IvAp/IvAc) server locations.**



**35 - VATSIM – TeamSpeak server location map.**



**36 - IVAO – TeamSpeak server location map.**

Despite the fact that IVAO and VATSIM came from the same mother-organisation (called “SATCO”) and:

- IVAO has her historical roots in Europe, Belgium,
- VATSIM has her historical roots in the USA,

there still is a great difference in *the geographical network infrastructure* between IVAO and VATSIM.

To my opinion the VATSIM organisation has done a better job at building a *true global network infrastructure*:

- VATSIM has more FSD servers (for their pilot clients) and Teamspeak server (for voice support) then IVAO.
- VATSIM has her FSD and Teamspeak servers geographically spread out *over the entire globe*.

These proven IVAO geographical network infrastructure facts mean that:

**The further away you live from:**

- Germany.....(1 FSD server, Neuremburg)
- The Netherlands..(3 FSD servers together at 1 place, Amsterdam)

**the worse your “Internet-connection-to-the-IVAO-server” quality and speed will be by design and default!**

Appendix A – Technical network data from VATSIM and IVAO

The data below was used to build the network infrastructure maps. (Date:Friday 05-02-2016)

VATTASTIC => Your looking glass into the world of Vatsim - Mozilla Firefox

www.vattastic.com

Pa Raised: \$351.00 \$1,650.00 USD goal for 2016

Development Blog FAQ Feedback Teamspeak Register Log in

Map Aircraft ATC Airports Servers Events

Identifier	Host	Location	Name
ASIA	106.186.24.200	Tokyo, JAPAN	ASIA
BRAZL	181.41.210.178	Brazil	Brazil
EUROPE-CC	5.9.155.43	Europe	Center Europe Server
EUROPE-CE	212.67.73.150	Czech Republic	CenterEast Europe Server - sponsor...
EUROPE-N	176.124.148.55	Sweden	EUROPE North
OCEANIA	180.200.247.40	AUSTRALIA	OCEANIA
SINGAPORE	128.199.91.34	Singapore	SINGAPORE
UAE	185.93.245.200	Dubai, U.A.E.	United Arab Emirates
UK1	178.79.154.95	London, UK	UK1
USA-C	198.58.118.229	Dallas, USA	USA Central
USA-E	97.107.135.245	New Jersey, USA	USA East
USA-W	50.116.3.203	San Francisco, USA	USA West

Name	Location	Host
LiveATC-Asia	Asia, Japan	rw-asia.liveatc.net
Liveatc	North America, USA, California	rw.liveatc.net
Singapore	Singapore	singapore.voice.vatsim.net
Sponsored by AirCharts.org	North America, USA, MO, Kansas City	voice.aircharts.org
Sponsored by Houston ZHU-A...	North America, USA, Houston	voice.zhuaircc.net
Sponsored by NY ARTCC	North America, USA, NYC	voice.nyartcc.org
Sponsored by Salt Lake ZLC-A...	North America, USA, Salt Lake	voice.zlcartcc.com
Sponsored by VATRUS	Europe, Russia, Saint-Petersburg	voice.vatrus.info
Sponsored by Vattastic.com	North America, USA, FL, Tampa	voice.vattastic.com
Sponsored by vroute	Europe, France – Strasbourg	voice.vroute.net
Sweden	Sweden	sweden.voice.vatsim.net
VATPAC	Oceania, Australia	rw1.vatpac.org
VATSIM Germany ACC (Server 1)	Europe, Germany	voice1.vatsim-germany.org
VATSIM Hong Kong	Asia, Hong Kong	rw.vatsim.hk
VATSIM Scandinavia	Oslo - Norway - Europe	voice.vatsim-scandinavia.org
VATSIM United Kingdom	London, UK	uk.voice.vatsim.net
Vatstim Spain Server	Europe, Spain	sspain.voice.vatsim.net

Friends Teamspeak (3) Who's On

Vattastic

Lobby

Break Room

Pilot and Controller Lounges

Lounge 1

Daniels

Luis Jose Valdes MDSD

Lounge 2

Lounge 3

Lounge 4

Group Flights

Flight 1

Flight 2

Flight 3

Flight 4

Flight 5

Flight 6

Flight 7

Flight 8

Flight 9

Search

cham

Execute Help

Callsign

Name

Vattastic would like to thank all of it's supporters for 2015! It is appreciated more than you know. New features upcoming! Stay Tuned!

17:07:39 GMT Vattastic: Rodolfo Sanchez has logged in

Type your message here and press [Enter] or click "Shout"

Shout Options

Clients: 506

About Vattastic 17:20:25 GMT

The Eye 1.0.8 b367

File View Settings Help

Main Map Countries Controllers Pilots Observers Scheduling Network Statistics Routes Database My Eye

Ping network servers Ping voice servers Stop pinging

Server	Address	Name	Location	Pilots	ATC	Obs	Total	Ping
EU2	185.34.216.31	IVAO - Europe 2 - Network S...	Europe	231	21	7	259	15
EU21	188.40.64.175	IVAO - Europe 21 - Network ...	Europe	0	0	0	0	31
EU3	31.220.31.13	IVAO - Europe 3 - Network S...	Europe	77	5	1	83	15
EU4	178.62.198.250	IVAO - Europe 4 - Network S...	Europe	234	22	11	267	15
EU6	178.62.142.207	IVAO - Europe 6 - Network S...	Europe	234	28	9	271	31
HUB	178.62.78.127	IVAO - HUB - Network Server	Europe	0	0	0	0	32
LOG	91.121.31.8	IVAO - IVANLOG - Network S...	Europe	0	0	0	0	16

Server	Address	Name	Location	ATC	Ping
EU16V	5.135.66.181	IVAO - Europe 16 - Voice server	France	0	16
EU17V	91.121.31.8	IVAO - Europe 17 - Voice Server	France	0	15
EU2V	185.34.216.31			4	15
EU3V	31.220.31.13			2	62
EU4V	178.62.198.250	IVAO - Europe 4 - Voice Server	Netherlands	17	32
EU6V	178.62.142.207	IVAO - Europe 6 - Voice Server	Netherlands	21	16

881 clients Pinging complete 1707Z 1708Z

37 – VATSIM -VatSpy – network & voice servers

39 – IVAO – The Eye – network & voice servers



### Appendix B - About the Author- Ronald Vermeij

Ronald Vermeij (1964) has always had a passion for aviation, computers and knowledge transfer. He started “computing” since he had his hands-on-keyboard of a friends Tandy TRS-80 back in the 1980's. He bought his own Texas-TI44a home computer and learn himself everything he wanted to know about it. He's a self-learner in almost every aspect of ICT-technology (and life itself) and has a “hacker”-mindset.

Ronald holds has a Bachelor of Science degree in Engineering and Industrial/Process Automation since 1992. His business career took him along (almost) all possible ICT-functions in the ICT industry in just 9 years.

- Installation of physical computer networks (coax, ibm, utp, ethernet)
- Computer hardware assembler, configurator and installer at various companies.
- Local Area Network manager on Novell, Microstaf and Banyan networks at various companies.
- Wide Area Network manager for Unisource Business Networks.
- 1<sup>st</sup>, 2<sup>nd</sup> 3<sup>rd</sup> lines technical troubleshooter everywhere he went.
- Trainer in computer hardware, software and network management courses.
- E-commerce Website designer / content manager.
- Internet consultant at various companies
- Directory consultant at Banyan

In his private life, Ronald has been:

- Flying civil flight-simulators since Microsoft Flightsimulator version 1 (Pilot in Command B767)
- Flying countless military jet and helicopter flight-simulators (including Falcon 4)
- A proud member of the best Dutch Flightsimclub called the “D.F.S.O.”
- Pilot and Webmaster for Eurostar VA.
- Website and community manager for the 1<sup>st</sup> Dutch flightsim magazine called “FsMagazine”.
- Programming in Visual Basic (6) and Java
- Sharing his ideas for the flightsimulation community.

Ronald has flown online since the year 2003 on the VATSIM, Flight Project International, IVAO and FsOpen online flight-simulation networks and is enjoying all of them to the fullest.

Ronald loves to “hack”, investigate, teach and to help and stimulate others around him to evolve and grow to their own fullest potential. He spreads his knowledge by writing and sharing tutorials for the flightsim community:

You can find more of Ronald's Dutch-language works over here:

- <http://www.dutchfs.com/downloads/other/files/handleidingen/>
- NDB navigation,
- VOR navigation,
- IFR autopilot flight with an ILS landing,
- How to make a perfect landing every time.

You can find more of Ronald's English-language work over here:

- [www.flightsim.com](http://www.flightsim.com) , [www.avsim.com](http://www.avsim.com) / [www.hovercontrol.com](http://www.hovercontrol.com)
- FSX.CFG parameter overview
- FSX.CFG Hacking project
- FSX Helicopter Auto Pilot tutorial

Ronald chooses to live by the following motto's:

			
<p><b>Become the change <i>you</i> want to see in this world.</b></p>	<p><b>Lead-By-Good example, and be willing to do what ever it takes.</b></p>	<p><b>Actions speak louder then Words.</b></p>	<p><b>Friends fly better together.</b></p>

When present on the IVAO network, you can find Ronald (all over the forum :-P and) in the “Special Operation” hanger, and/or on WebEye under Callsign “POLLYxx” “- the fighting parrot of the RNLAF 322nd Squadron based at “NATO's Fightertown, Home of the Frysian Flag Exercise” - EHLW - Leeuwarden Airbase.

He loves to fly anything: from Cessna 172's to Antonov AN225, but especially *Military Planes and Jets*. (since I can always become an Air- a-to-b-bus driver later :-P )









C.U. soon in Virtual IVAO skies, fellow airman!



Ronald Vermeij  
(VID145185)

## Appendix C – Credits

This guide would not have been possible without the following free tools: (except Windows 7 ;-)

I would like thank each programmer(s-team) who have created these wonderful piece of software!