

Auto-IP Product Overview

Auto-IP provides an automated method to configure Ethernet devices without complex and product specific routines. To get an idea of the power this tool delivers, let's look at the following real world example.



Device failure without IntraVUE and Auto-IP

It's 3 AM and suddenly a failure to an I/O device shuts down the process. After twenty minutes you finally locate the failed device hidden in a remote electrical enclosure. You search for the device type and model number. This search may not be easy or quick because the device is a few years old.

Next, it's to the spares area hoping you have the correct information to locate the proper replacement. Reality check - you've already spent an hour on the replacement process. You find a backup unit and quickly return to the enclosure with the replacement. You look for the dipswitch to set an address to match the failed unit, but there isn't one. Because this is an Ethernet network, it clicks that you now need to find the IP address of the failed unit, but how? You see a number on the side of the unit but they are partially worn off. If you guess, you may just create even more problems. You think you may now have the number but now what? You search for the appropriate documentation to help configure the replacement device.

Oh No! The vendor requires the IP address be configured through BootP or their special serial cable and software. The line has now been down for three hours as you search for the cable. A little voice in the back of your head starts to tell you that a management meltdown is about to happen if you don't get things up and running.

Device failure with IntraVUE and Auto-IP

It's 3 AM and suddenly a failure to an I/O device prompts an email page from IntraVUE. You view the device on the IntraVUE screen and identify its location, model number, serial number and type. You go straight to the spares area, find a backup unit and quickly go to the enclosure with the replacement. You take out the failed unit, plug in the Ethernet cable to the replacement unit and then power-up the device. The Auto-IP feature of IntraVUE manages all devices and provides the correct IP address automatically on power-up. Everything is now back up. You return to the break room to finish your coffee, which is still hot!

Although this is not an actual event, it highlights the fact that this kind of situation is not unusual. The use of commercial technology reduces the cost of not only equipment but also deployment over more proprietary solutions. Industry trends continue to forecast growth in the application of Ethernet on the plant-floor for automation companies. The Industrial environment however is not an exact replication of the office environment and IntraVUE and Auto-IP were specifically developed to handle these unique requirements.

How does Auto-IP and IntraVUE work?

IntraVUE software determines the exact location of every device on the network. IntraVUE utilizes a process that extracts data from the switches and applies the data to a unique algorithm that automatically draws the network connections that include Hubs and unmanaged switches. The software then continually monitors the network, to determine exactly what has occurred and prompts the appropriate response.

Since fixed IP addresses are a major requirement in industrial applications, it is important that a replacement unit get the exact same address as the failed unit. In an office where the actual IP address is not important, a DHCP server picks an IP address from a pool that can be randomly used for network devices. A new device coming on the network can then be assigned any of the

addresses available from this pool. This is useful in an environment where most devices do not require fixed addresses because they operate as clients. On the plant floor where it is important to know who is sending what data, fixed addresses are a must as devices act as information servers. The challenge is to ensure the device obtains a specific IP address without a great deal of manual intervention.

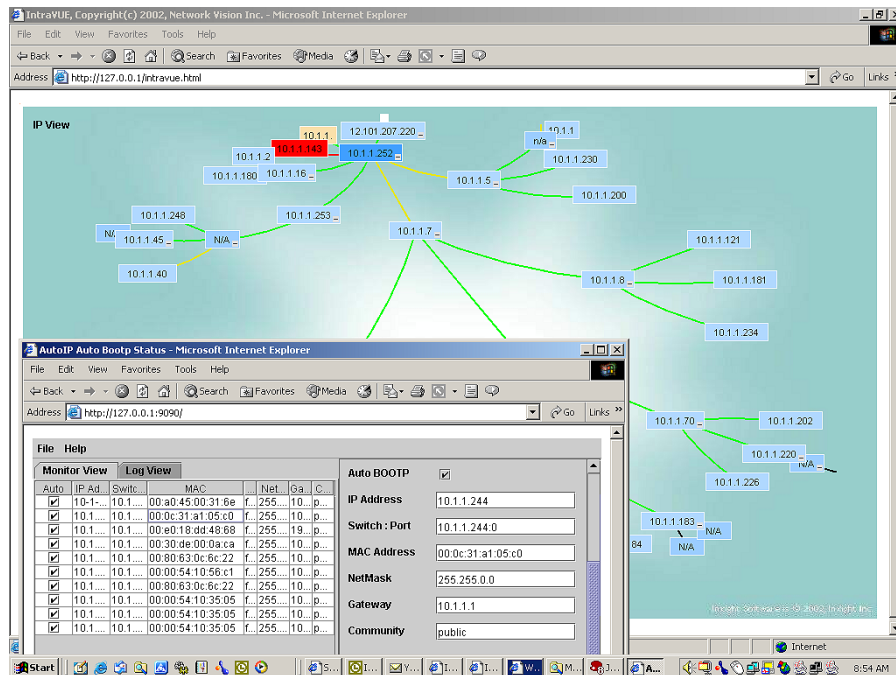
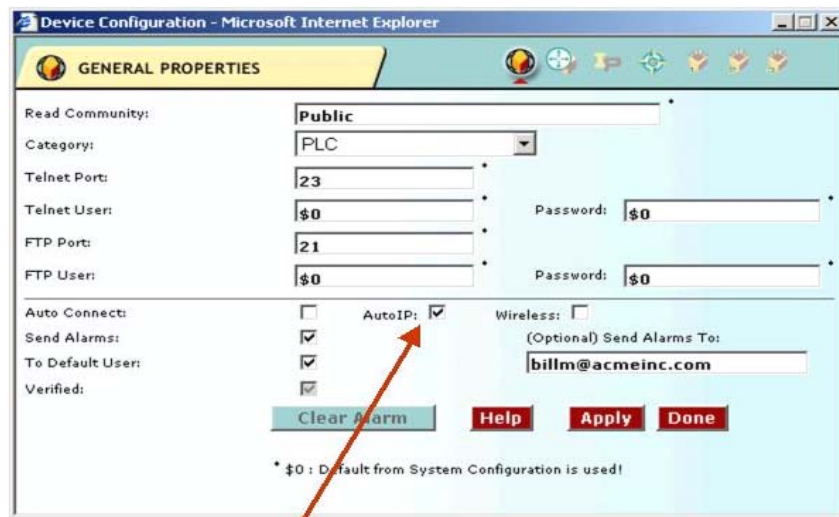


Figure 1. IntraVUE in the background with connection details of Auto-IP in front window

There are two ways Auto-IP software obtains specific information about a device it's location or connection. If the device is already connected and running on the network, the easiest method is to select the device on IntraVUE screen and then select the AUTO-IP Checkbox in General Properties. Once chosen, Auto-IP monitors the health of this device. If a device is not yet on the network the IP address can be pre-configured to a specific port on a selected switch. As seen in Figure 1. Auto-IP allows an administrator to assign an IP address to a port on any switch on the network. All the field technician has to do is connect up the network cable to the device before powering up the unit. Field installers do not have to worry about IP or MAC addresses just device types and port connections.



Auto-IP Selection

Figure. 2 Simple selection on the Auto-IP button registers the device on Auto-IP

Figure 2. shows the check boxes for the Auto-IP selection as well as Auto Connect. Auto Connect allows the user to select devices that can move freely around the network. If not selected, the device will be fixed to a specific connection. If the fixed device is accidentally moved from one port to another, or switched to another location on a network it will be alarmed. The original location will be highlighted in the IntraVUE graphical view with a red line and box indicating where the device was moved from and where it should be returned.

Many companies prefer devices not yet installed to have an automated method so that electricians can install them without having to set IP addresses. This is easily handled and can be set through the Auto-IP interface. All connections to the switches are listed and the ports are identified as a number followed by a colon (:). For example, port 5 on the switch with IP address 10.1.1.244 is represented as 10.1.1.244:5. Once the IP address is assigned to the port all the electrician does is plug in the network cable and power up the unit. In Figure 3, the IP address assigned to 10.1.1.244:5 is 10.1.1.15, which is the fourth entry from the top. Plugging into port 5 and then powering up the device will activate Auto-IP to assign 10.1.1.15 to this device.

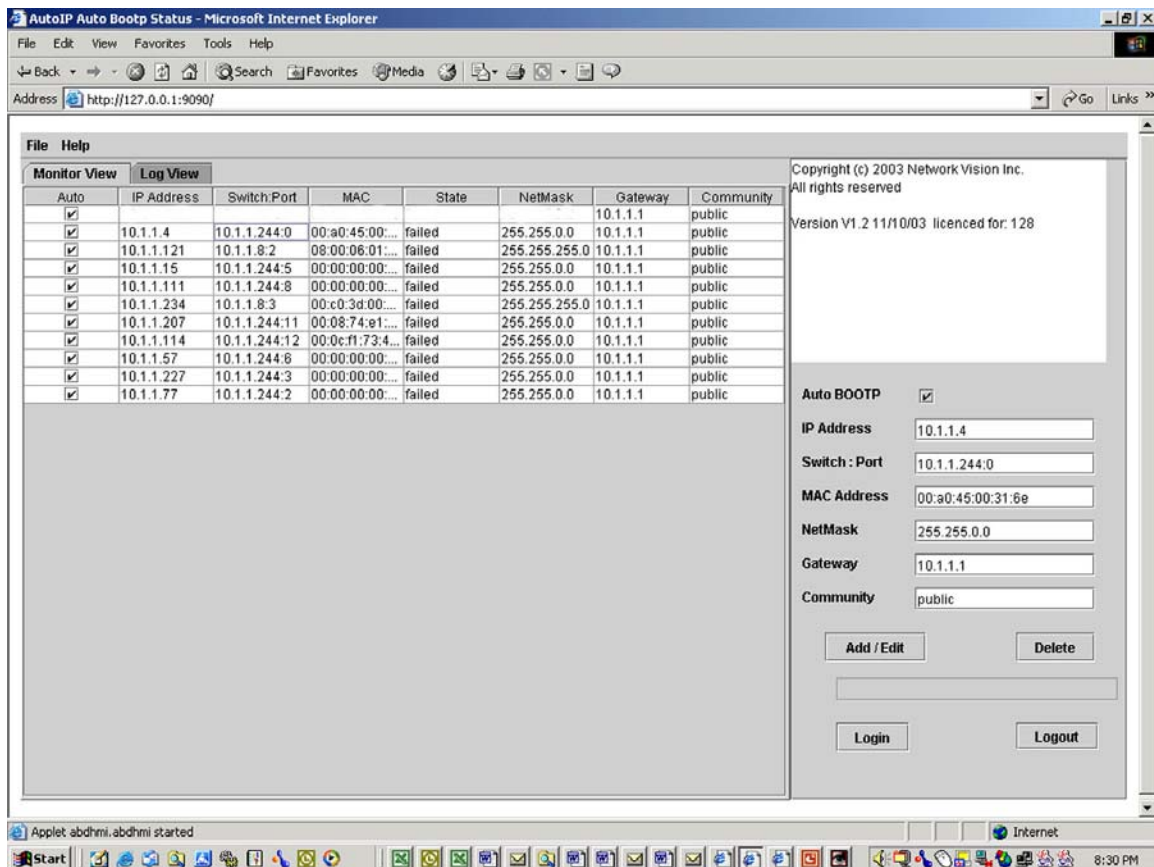


Fig 3. Auto-IP new product installation via remote access capability

The ability to configure an IP address to a port on the switch can be done remotely. This allows a control engineer who gets a call about assigning a device address to initiate this activity remotely and the electrician to merely physically connect the device. Auto-IP works for end devices including I/O and switches. It leverages standard Ethernet requests with common device support to provide a truly open solution that is not tied to a specific vendor or class of equipment. This is especially important to Industrial applications with large installed equipment investments.

When a device fails, the 24x7 monitoring feature of IntraVUE quickly identifies the fault and alarm. The alarm can be a signal sent to an operator display or an email message. The red line indicating loss of communication can quickly identify the device. With IntraVUE the technician can right click on the device highlighted in red and receive detailed information to help in the repair process. Figure 4 displays devices properties in IntraVUE with all the necessary details about the device retrieved.

The ability to have the accurate IP address is crucial because there may be no way to retrieve it from a failed device. Documentation sometimes is not always up to date and the potential for errors exists.

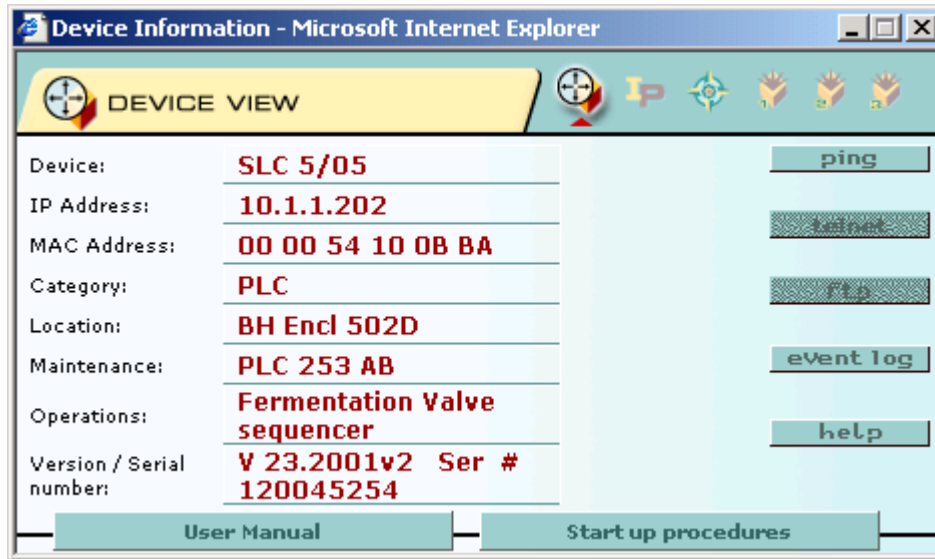


Figure 4. Detailed information on a failed device made easily accessible

In addition, IntraVUE provides web links to additional support material that includes user manuals and start-up procedures. This eliminates all potential confusion that the technician may encounter when servicing a device. If the device happens to come back on line, the technician can press the event log button to see if this problem has occurred before and/or how frequently this event is happening. This information could indicate an intermittent failure is occurring at the device or its connection. This may be a good reason to replace the unit even if it is back up and operational. Another option is to check connections to insure they are properly installed. Intermittent failures waste hundreds of hours of time as people search to find the root cause.

Once it is determined that a replacement is required, the technician simply unplugs the network cable from the failed unit and plugs it into the replacement. Next the replacement unit is powered up. At this point the device sends out a request for an address and Auto-IP compares the information that it has about the devices on the network, makes sure that the original device is not moved and still active. With all of the requirements met, Auto-IP answers the request with the appropriate IP address in a matter of seconds.

IntraVUE also monitors the replacement activity and places information in the event log for future reference. The detailed information about this activity is then logged. MAC addresses and IP addresses important to the IT group and Controls group are also available for review, but not immediately needed to keep the plant up and running.

For details, contact info@intravue.net
or visit our website, www.Auto-IP.com

IntraVUE™ is a product of Network Vision, Inc.
Newburyport, MA, USA
Tel: 1.978.499.7800

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