



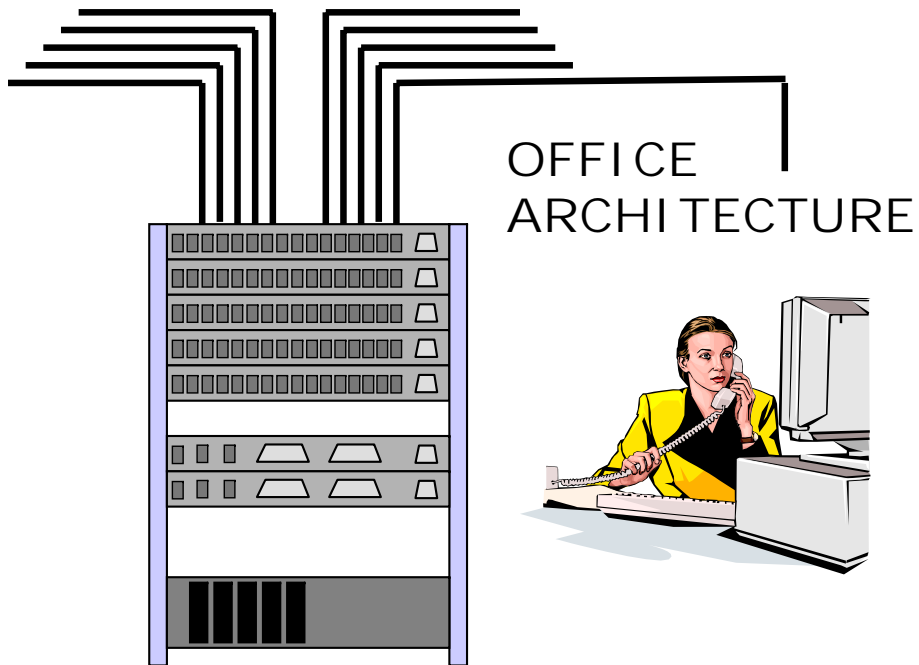
*THE MOST EFFECTIVE TOOL TO MANAGE
AND VISUALIZE YOUR INDUSTRIAL
ETHERNET NETWORK AND CONNECTED
DEVICES.*



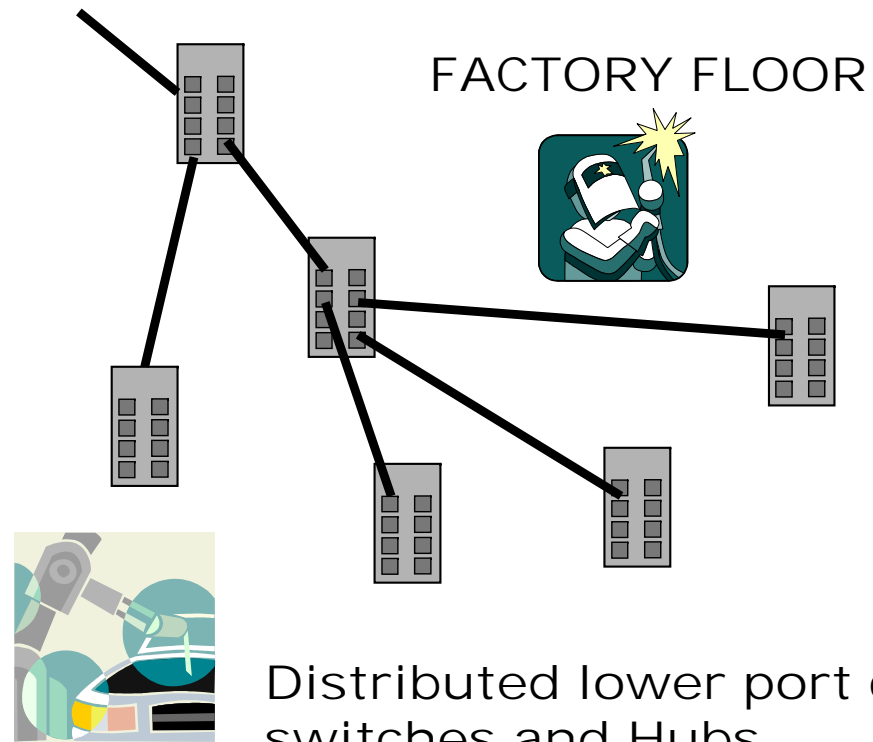
Industrial Automation Networks

- Ethernet deployment on the factory floor is expanding at an accelerating rate.
- Architectures of the factory floor Ethernet are vastly different than the office environment.
- First level support of these networks will need to be performed by plant floor personnel.
- Many of these Networks will require immediate and quick identification of problems and predictive methods for support.
- Embedded Web based applications will provide a method for device supervision as well as a scalable means to provide a front office interface.

Industrial networking differs from the office based on the more distributed nature of the network architecture

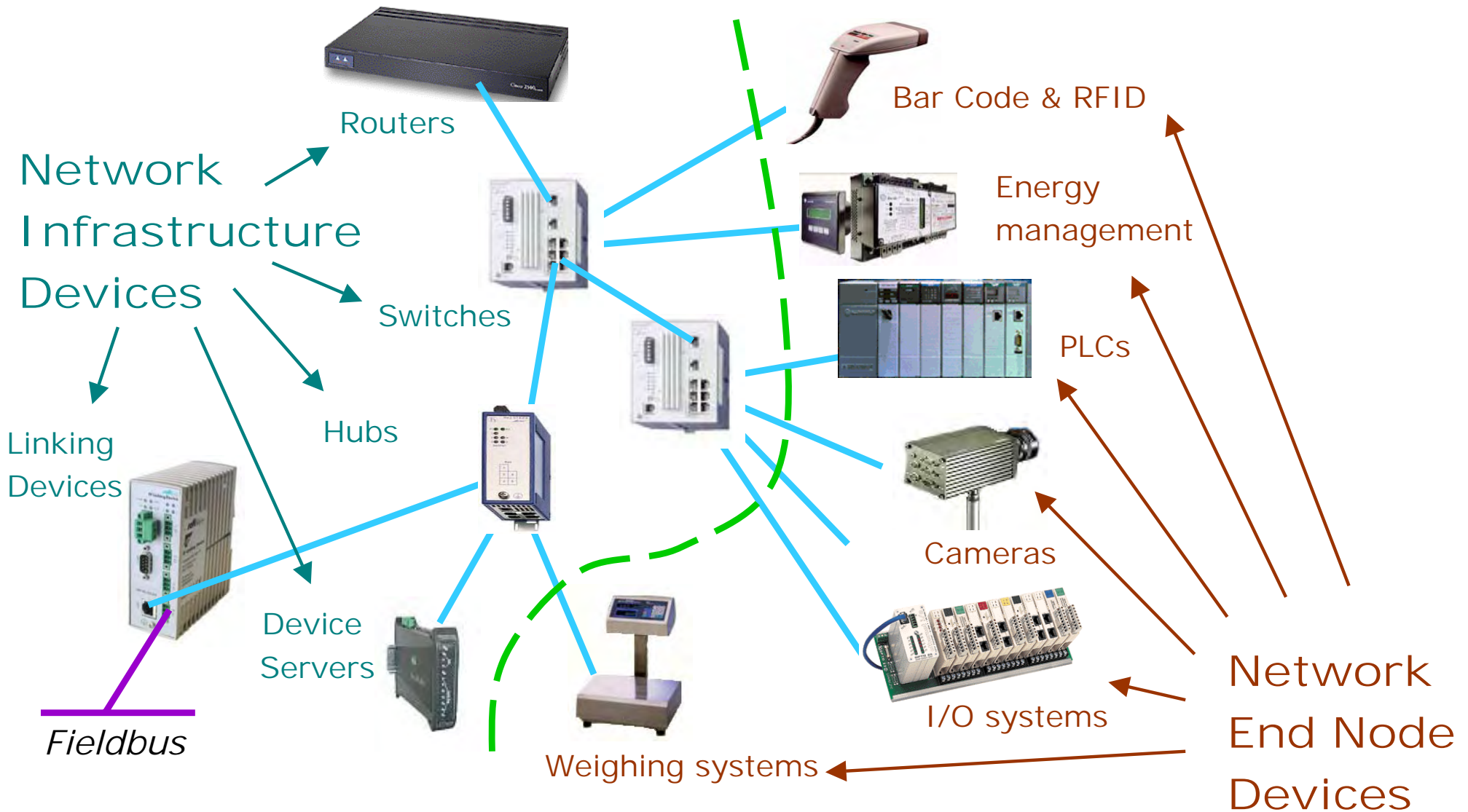


Centralized Racks & Switch Closets



Distributed lower port count switches and Hubs

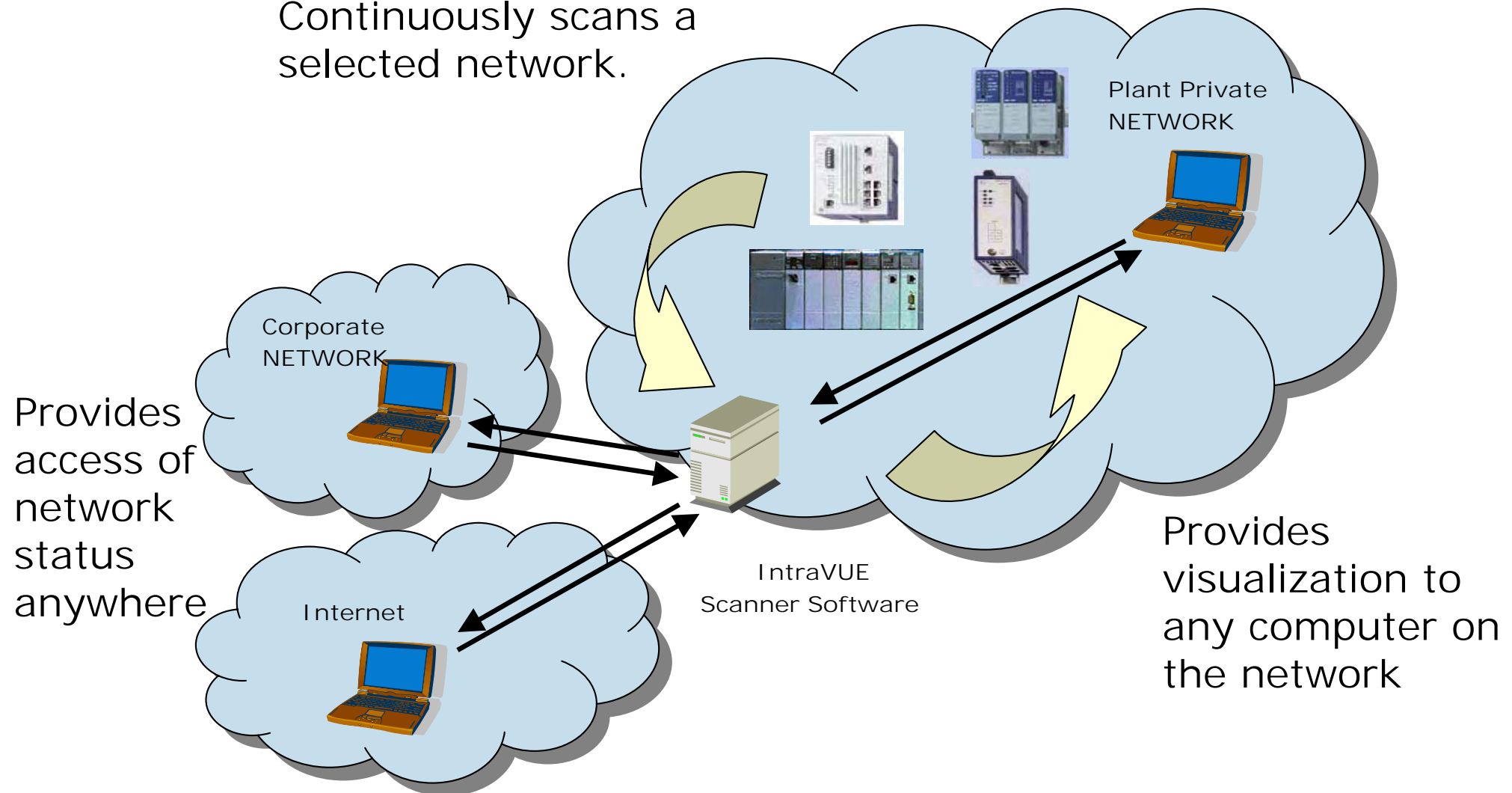
Two levels of Factory Floor Network and Devices



IntraVUE is a continuous monitoring package that provides a high level interface.



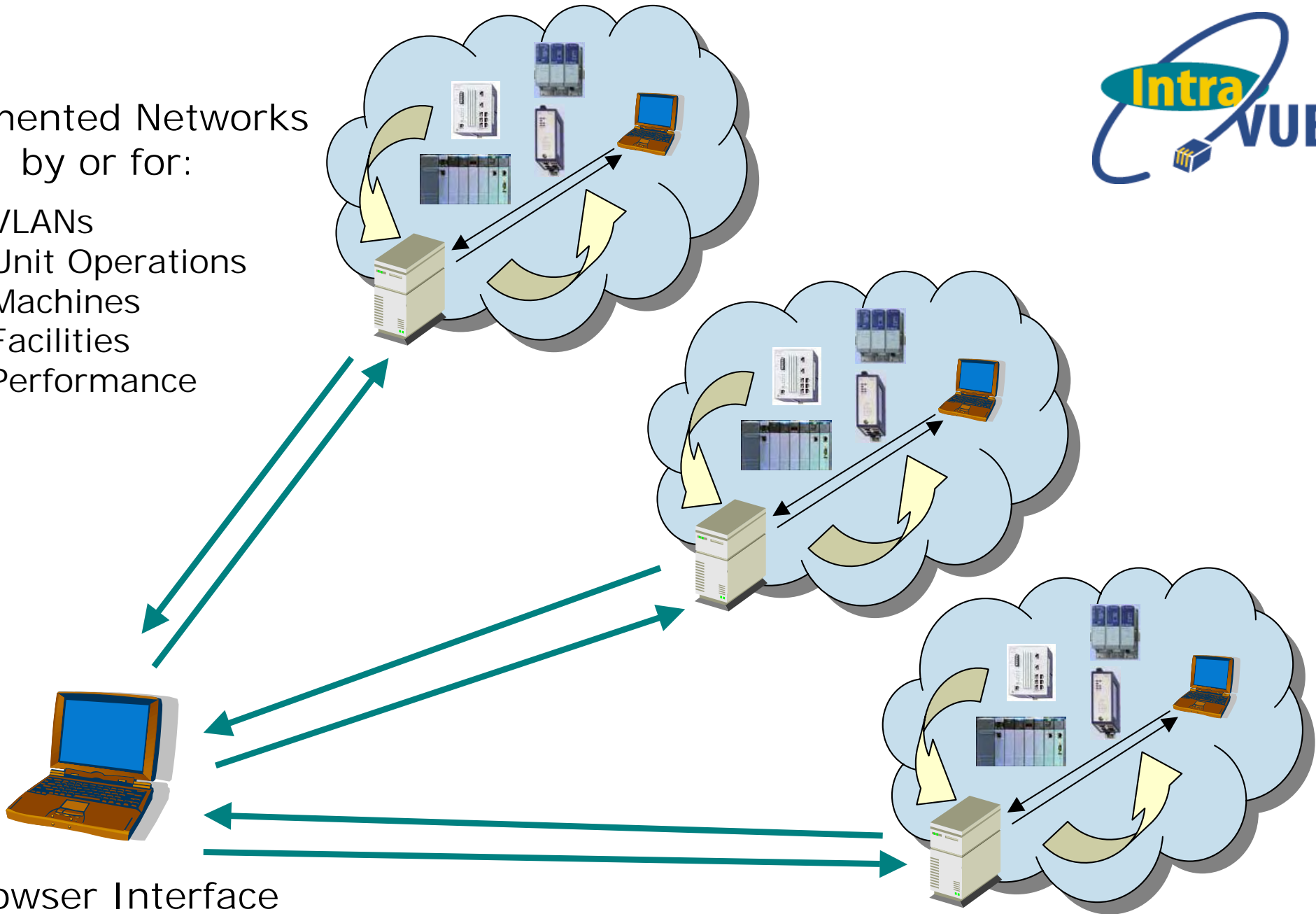
Continuously scans a selected network.





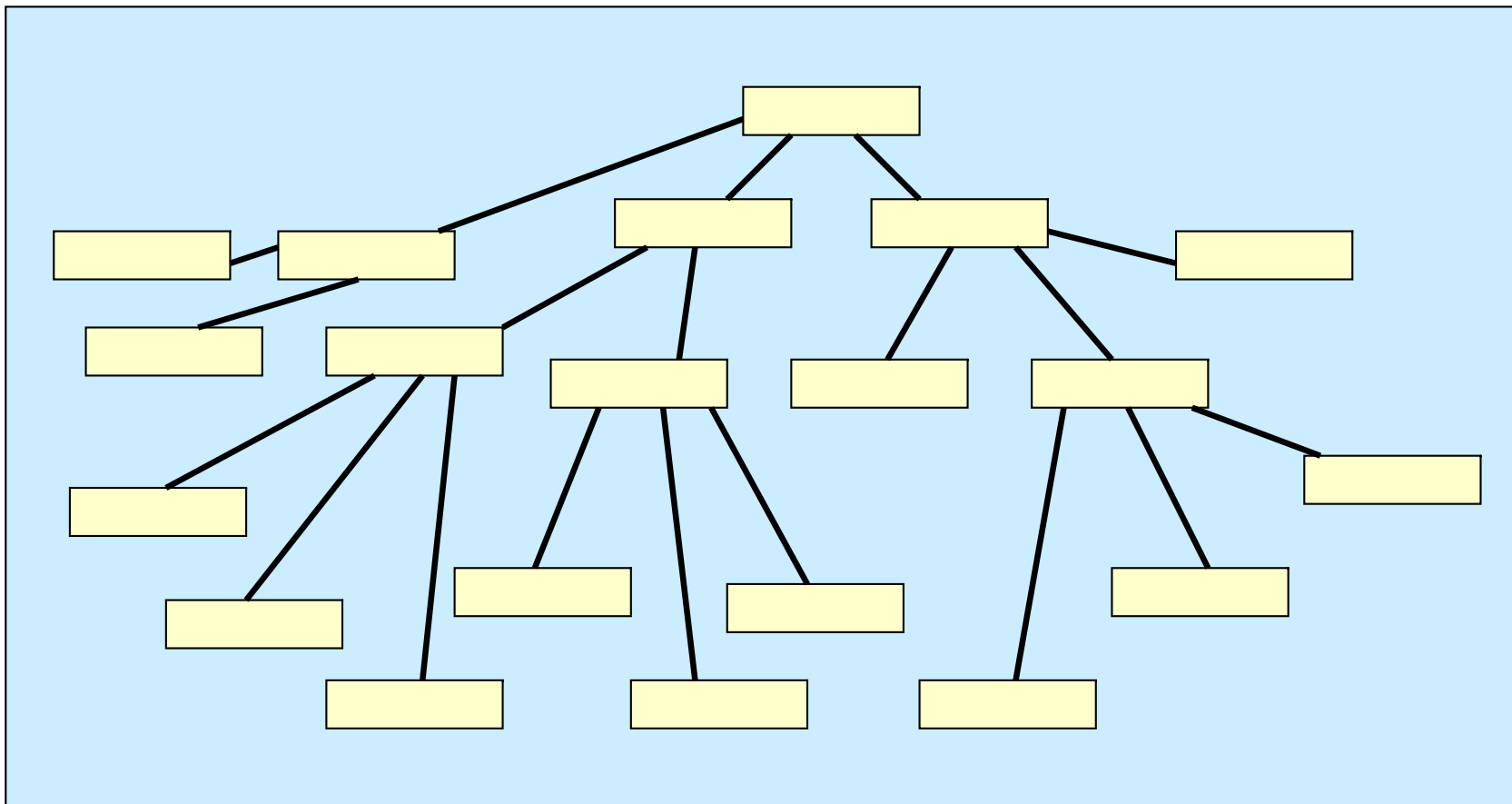
Segmented Networks by or for:

- VLANs
- Unit Operations
- Machines
- Facilities
- Performance

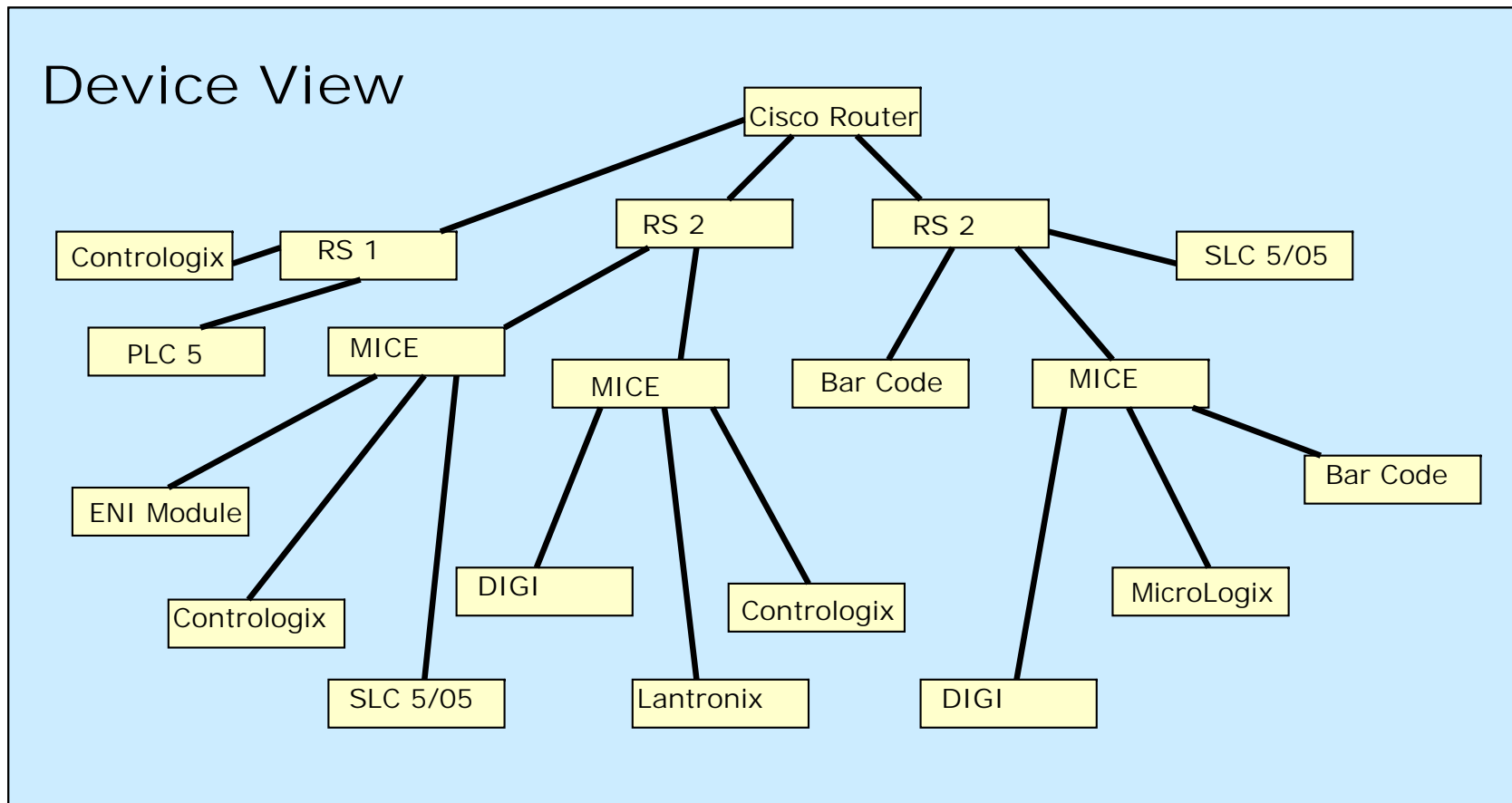


Browser Interface

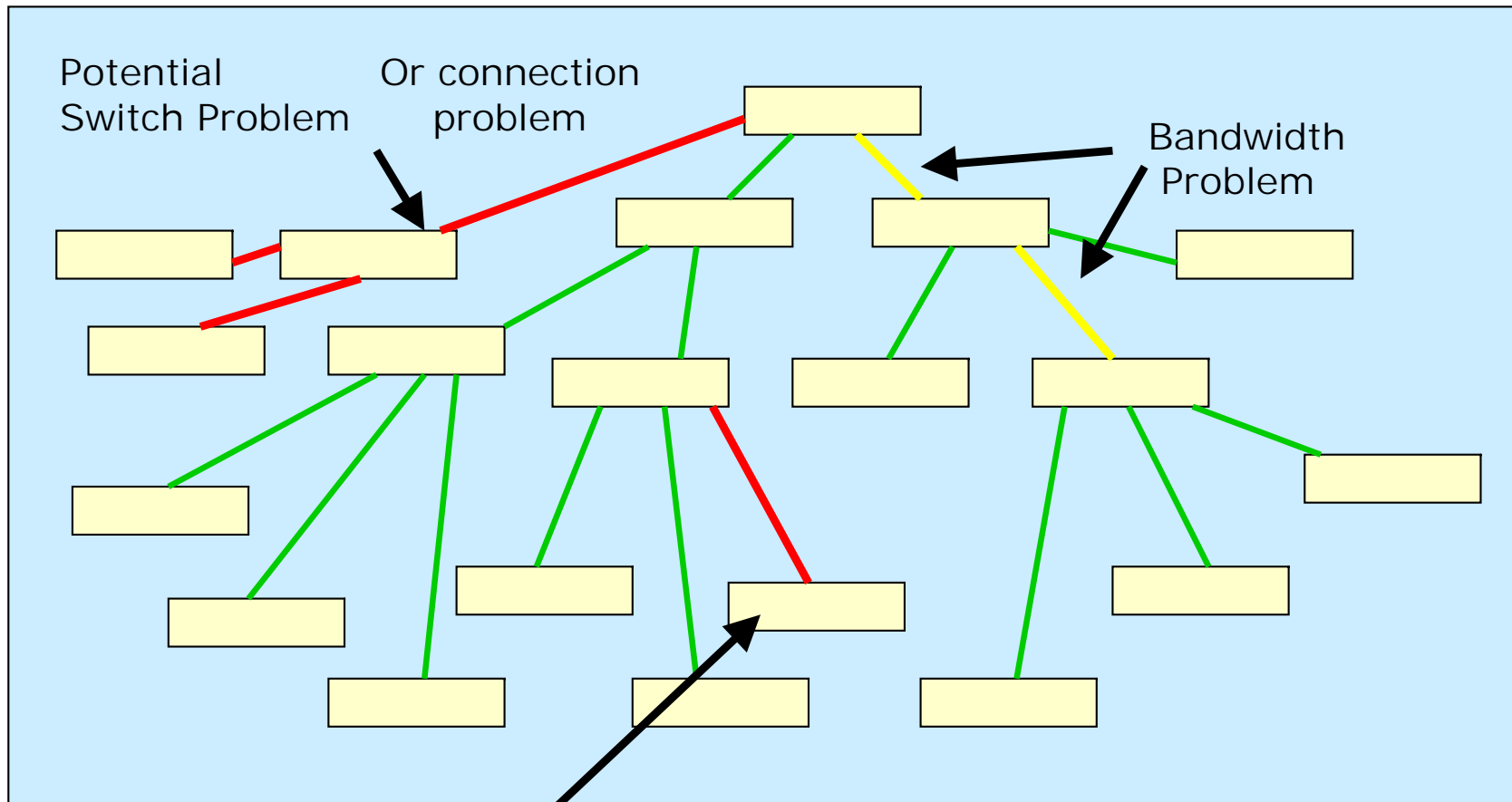
Automatically discovers and builds the actual interconnections of the Managed Ethernet Network



Provides Identification of Device by up to 6 different Views

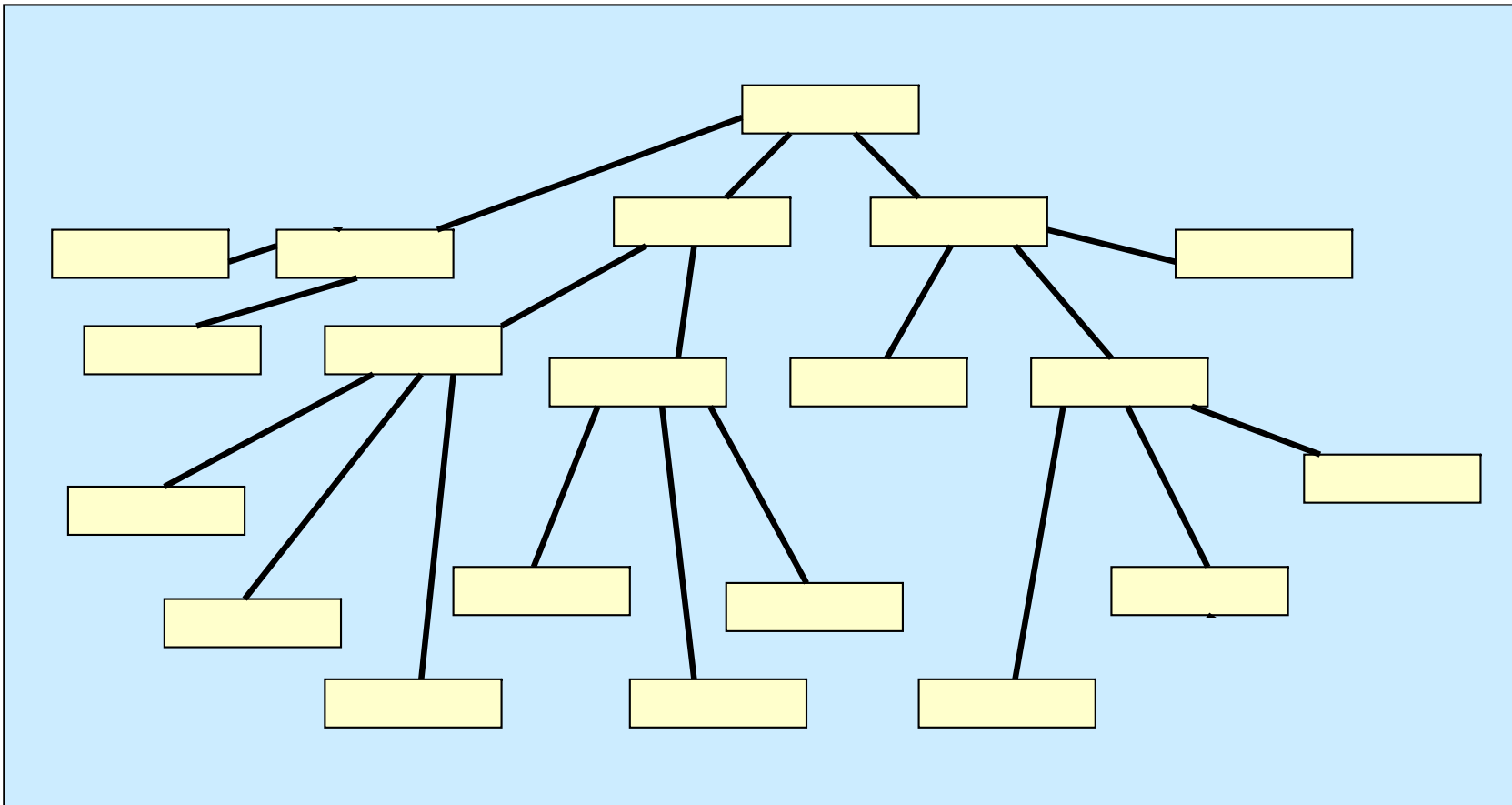


Graphically represents Network health and potential trouble spots



No communication
to an end device

Discovering New Devices connected to the Network



Event Logging

The screenshot displays the IntraVUE software interface. On the left, an 'IP View' network diagram shows various IP addresses (e.g., 10.1.1.254, 10.1.1.228, 10.1.1.227) connected to a central hub. On the right, an 'Event log - Microsoft Internet Explorer provided by America Online' window is open, showing a list of events. The events include device moves, disconnections, reconnections, and admin verifications.

ID	IP Address	Date/Time	Description	Count
71	10.1.1.234	09/04/2002 14:36:30	Device 10.1.1.234 moved	2
72	10.1.1.101	09/04/2002 17:05:39	Device 10.1.1.101 disconnected	2
73	10.1.1.101	09/04/2002 17:06:35	Device 10.1.1.101 reconnected	2
74	10.1.1.180	09/04/2002 17:07:28	Device 10.1.1.180 disconnected	2
75	10.1.1.180	09/04/2002 17:07:54	Device 10.1.1.180 reconnected	2
76	10.1.1.61	09/04/2002 17:20:56	Device 10.1.1.61 joined Network	2
77	10.1.1.61	09/04/2002 17:21:22	Device 10.1.1.61 disconnected	2
78	10.1.1.5	09/06/2002 16:16:30	Admin verified	1
79	10.1.1.4	09/11/2002 14:36:37	Admin verified	1
80	10.1.1.253	09/12/2002	Admin verified	1

Logs All:

- New Connections
- Device Moves
- Admin verifies
- Thresholds exceeded
- Lost Communication
- Devices Deleted
- Reconnection

Administrative Functions By individual Device

A screenshot of a web browser window titled "Device Configuration - Microsoft Internet Explorer provided by America O...". The page shows the "GENERAL PROPERTIES" section for a device configuration. The fields are as follows:

- Read Community: public
- Read/Write Community: private
- Category: P.L.C.s
- Telnet Port: 23
- Telnet User: Bill, Password: *****
- FTP Port: 21
- FTP User: Bill, Password: *****
- Auto Connect:
- Send Alarms:
- To Default User:
- Verified:
- Auto BootP:
- Wireless:
- Optional) Send Alarms To: [empty text box]

Buttons for "Apply" and "Done" are at the bottom right.

Individual Device Configuration

Wireless Identifier

Email Alarm Notification

Auto IP Addressing

Permission to be moved without Alarming

New Device Verify

Communication Detail



IntraVUE, Copyright(c) 2002, ICT Global - Microsoft Internet Explorer provided by America Online

Address <http://localhost:8080/intravue.html>

IP View

Thresholds - Microsoft Internet Explorer provided by America Online

THRESHOLDS

Connection From: **10.1.1.250**
 Connection To: **10.1.1.227**

Enable	Condition	Priority	High/Low	Threshold	Avg	Min	Max	Last
<input type="checkbox"/>	Transmitted	☺	☺	150	2	0	-467	29
<input type="checkbox"/>	Received	☺	☺	150	206	0	356	34
<input type="checkbox"/>	Collisions	☺	☺	50	0	0	0	0
<input checked="" type="checkbox"/>	Bandwidth	☺	☺	30.00	0.00	0.00	0.03	0.01

Reset Scan Period

Length of Avg. Time: 0
 Time Last Checked: 0

Done

10.1.1.201 Local intranet 1:44 PM



Properties of all Connected Devices

The screenshot displays the IntraVUE software interface within a Microsoft Internet Explorer browser window. The browser title is "IntraVUE, Copyright(c) 2002, ICT Global - Microsoft Internet Explorer provided by America Online". The address bar shows "http://localhost:8080/intravue.html".

The main window, titled "Device View", shows a network diagram with various devices connected. A central "Hirschmann RS2" device is connected to several other devices, including "Schneider PLC", "Netsage BootP Server", "ControlLogix", "SLC 505", "EtherPAD", "Digi Real Port", "EtherPAD", "FL IBS SCA-T", and "Schneider". A "Digi IA" device is also connected to the "Hirschmann RS2".

A "Device Information" window is open, displaying the following details for the "Digi IA" device:

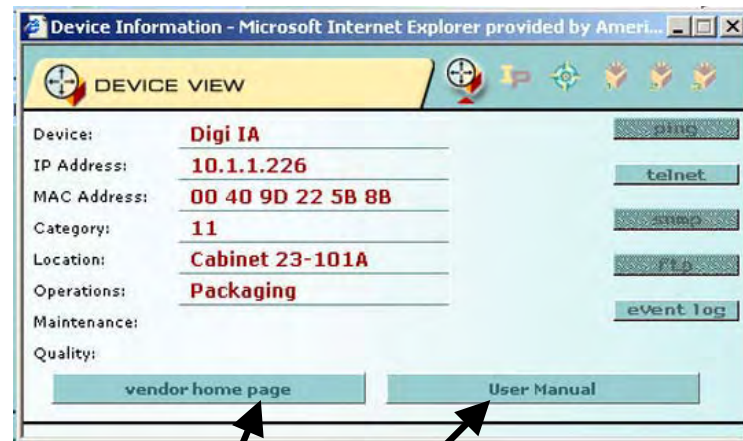
DEVICE VIEW	
Device:	Digi IA
IP Address:	10.1.1.226
MAC Address:	00 40 9D 22 5B 8B
Category:	11
Location:	Cabinet 23-101A
Operations:	Packaging
Maintenance:	
Quality:	

Additional buttons in the Device Information window include "telnet", "ping", "snmp", "ftp", "event log", "vendor home page", and "User Manual".

The bottom of the browser window shows the taskbar with the Start button, several application icons, and the system tray displaying "Local intranet" and the time "3:17 PM".

Device Properties Box Pop-Up Window at the selected Node

Device Attributes



Network Function Selection

Allows the viewer to perform basic Networking tasks from a button click

- ping
- telnet
- SNMP
- ftp

Primary and Secondary Web Page
(Embedded or Proxy for example)
Web Page triggers

Administration View

Setting up Links to trigger Management Tools

Device Configuration - Microsoft Internet Explorer provided by America O...

DEVICE PROPERTIES

Device Name:

Web Page:

Title:

Proxy Web Page:

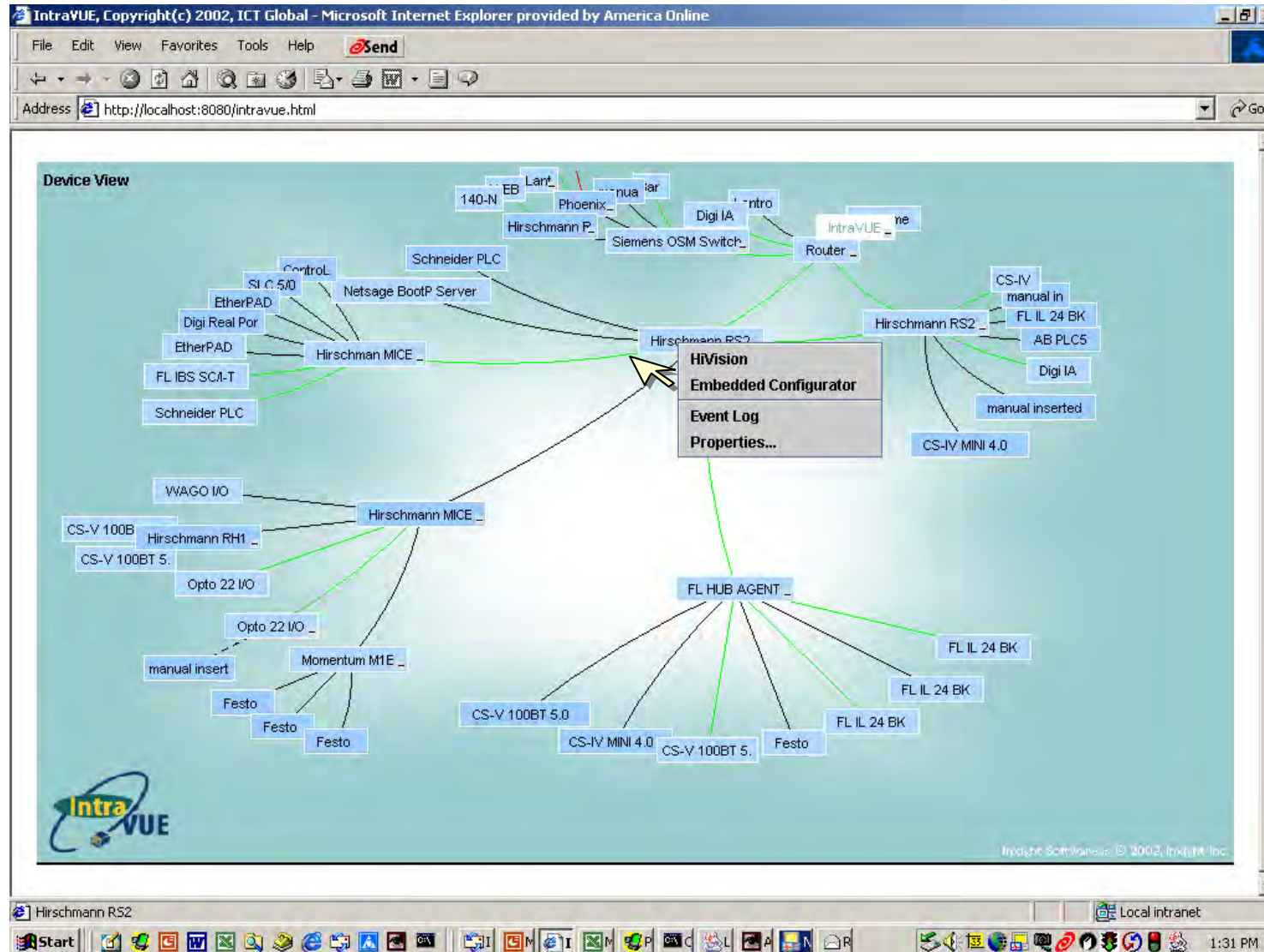
Title:

Icon:

Thumbnail Image:

User View

Link to trigger Management Tools



Other Views

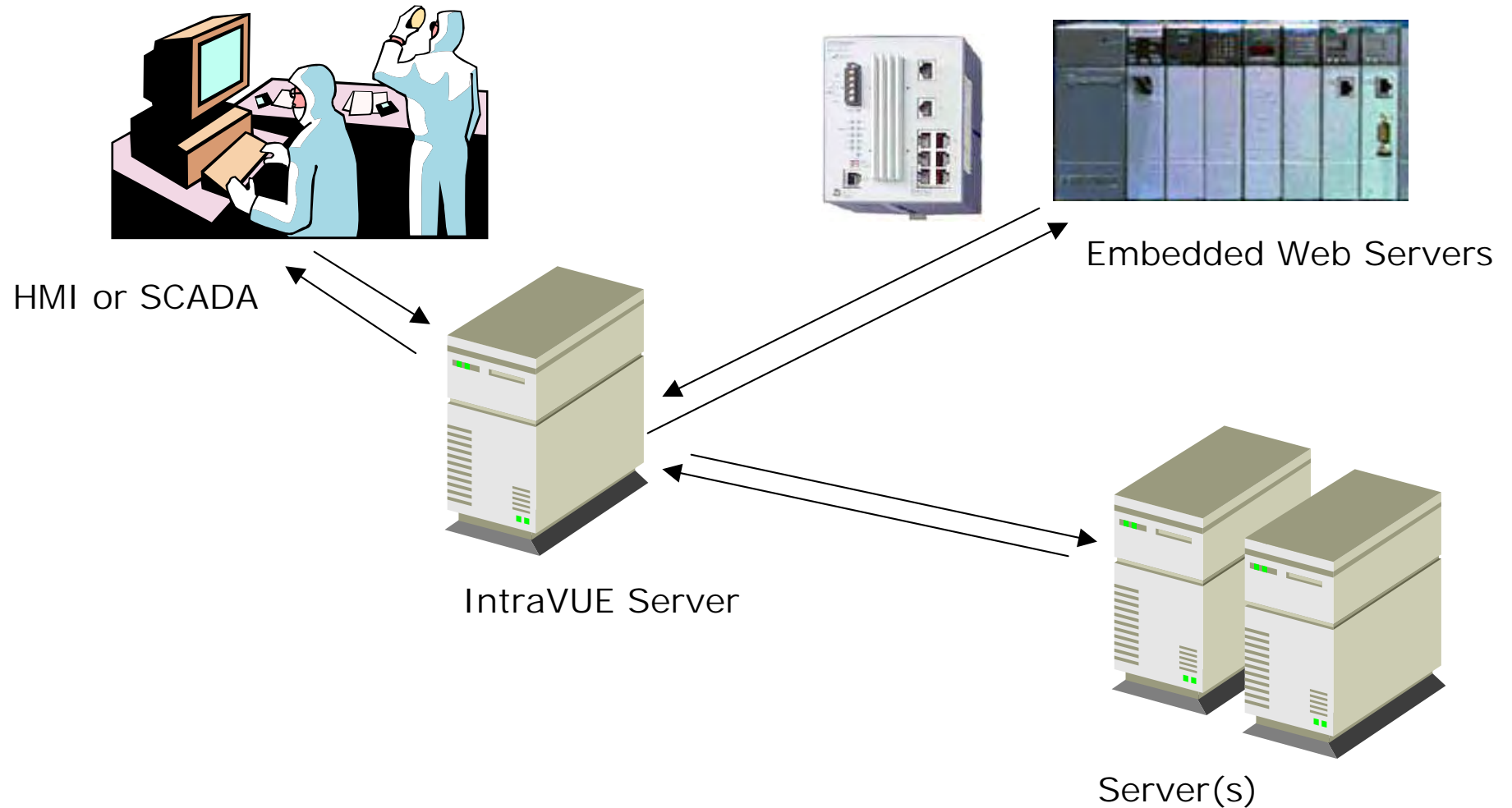
Two Links per View

The screenshot displays the IntraVUE software interface within a Microsoft Internet Explorer browser window. The browser's address bar shows the URL `http://localhost:8080/intravue.html`. The main content area is titled "Location View" and features a network diagram. The diagram consists of numerous nodes, many of which are labeled "no location". A central node is labeled "Cabinet 33-101". A context menu is open over this node, listing options: "Opening Instructions", "Service Log", "Event Log", and "Properties...". The interface includes a Microsoft Internet Explorer browser window at the top with the address "http://localhost:8080/intravue.html" and a Windows taskbar at the bottom showing the Start button and various application icons. The IntraVUE logo is visible in the bottom-left corner of the main window area.

Linking to Embedded and Proxy Web Services



Device can organize information via HTTP



Example: Maintenance Web Page

Machine #23 Stamping Press
Rockwell Automation SLC 5/05

Current Status

CPU	Running
Power	OK
Scan Time	53mS
Serial #	RA3498812
Version	V3.2

Support Documentation

- [Machine Theory of Operation](#)
- [User Manual](#)
- [Wiring Diagrams](#)
- [Manufactures online support](#)
- [Maintenance log](#)
- [Email Engineering](#)

Real Time
Data

Hypertext links that are organized in the PLC or IntraVUE Server and are pointed to. Links can also point to vendor online support or initiate a email form to the appropriate person where the content is filled out by the user.

Example: Operations Web Page

Cleveland Plant Building # 8
Machine #23 Stamping Press

Current Status

Press	Down awaiting parts
LOT #	128799-25
Units good	1276
Units Bad	14
Units required	2500
Efficiency	66.3%

Support Links

- [Production Schedule](#)
- [Quality six Sigma report](#)
- [Month to date Job Log](#)
- [Manufactures online support](#)
- [Maintenance log](#)
- [Email Engineering](#)

Real Time Data
Directly from
End Node or
via

Hypertext links that are organized in the PLC or IntraVUE Server and are pointed to. Links can also point to vendor online support or initiate a email form to the appropriate person where the content is filled out by the user.

Conclusion



IntraVUE is a Server based software tool that will provide an extremely powerful method to visualize the performance and represent the true physical structure of any Ethernet network.

IntraVUE also provides a method to organize and visualize web based content that is proliferating among devices. Allowing users from various departments in an organization to easily navigate the plant floor and retrieve valuable information.

IntraVUE is independent of the protocols (Modbus TCP, Ethernet IP, PROFINet, etc.) being carried over Ethernet TCP/IP. It provides the plant floor personnel with graphical and easy to use network management tools.