



NMS Overview



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Agenda

- What is Network Management ?
- The CFO's view
- Configuration & Inventory
- Visibility
- Questions are welcome
- Mobile phone ringtones are not

What is Network Management ?

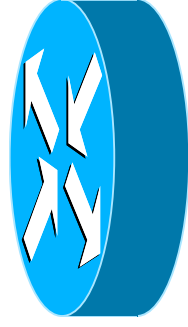
- Similar to a doctor treating a patient, similar to managing national health
- Because somebody wants to *achieve a goal*
- Steps:
 - 1) Observe or Monitor
 - 2) Interfere; i.e. change the behaviour
 - 3) Measure; similar to Monitor, but more precise data
 - 4) Report; produce intelligible info for others

The CFO's view



Why NMS ?

- Why Network Management **Systems** ?
- Enable owners of (Cisco) Kit to save on spending €€ while managing the kit



— €€€

Manual mgmt

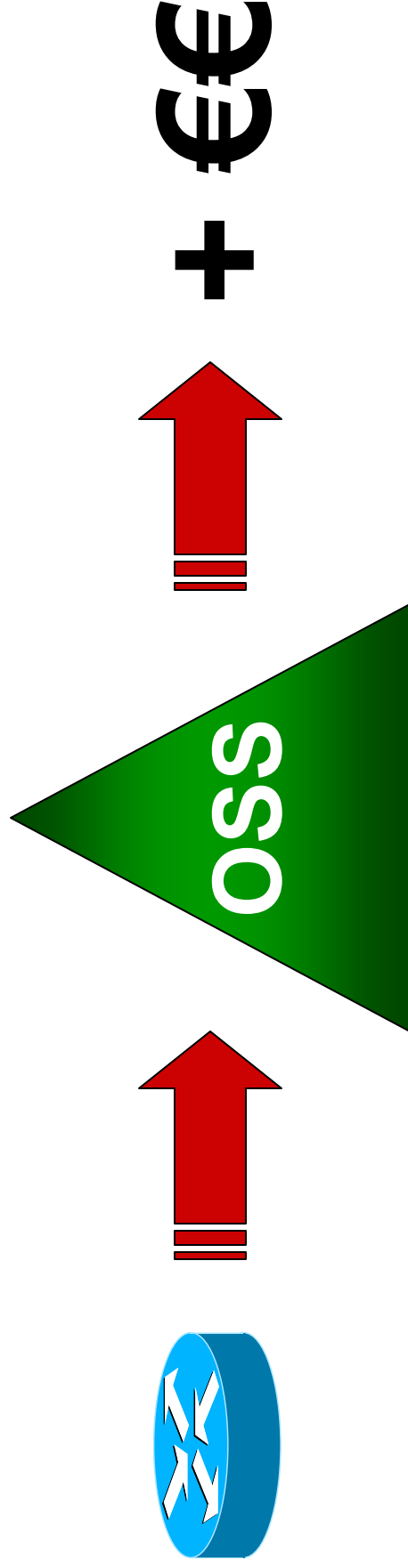


— €€€

IT assisted mgmt

About OSS

- Operations **S**upport **S**ystems help Service Providers to make €€ from (Cisco) Kit
- Some non-networking issues are taken care of also



Customer statement

“

"Cisco, Alcatel, it doesn't matter. What matters is how quickly you can offer new services. VPN, voice, you can only do it once the [OSS] systems are in place."

”



Hans Rietkerk, Managing Director BB-Ned

Configuration & Inventory



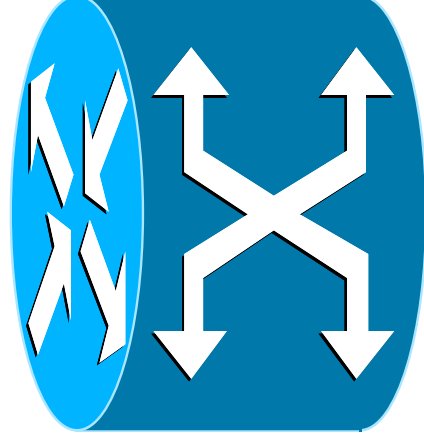
Infrastructure =

```
r1#sh run
...
router bgp 12
no synchronization
bgp log-neighbor-changes
network 137.1.200.0 mask 255.255.255.0
neighbor 137.1.200.2 remote-as 12
no auto-summary
```

...

+ **IOS 12.4(19)**

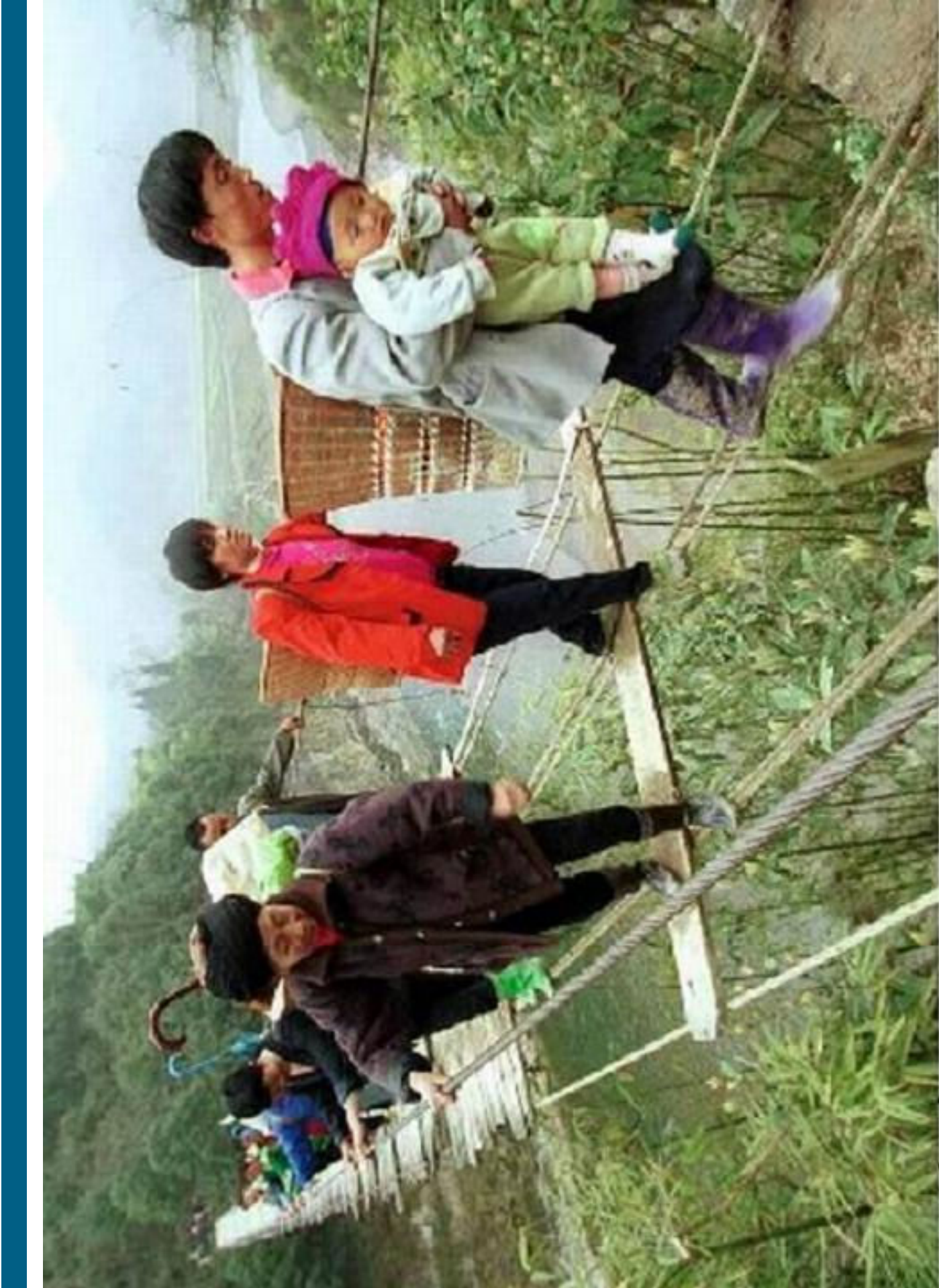
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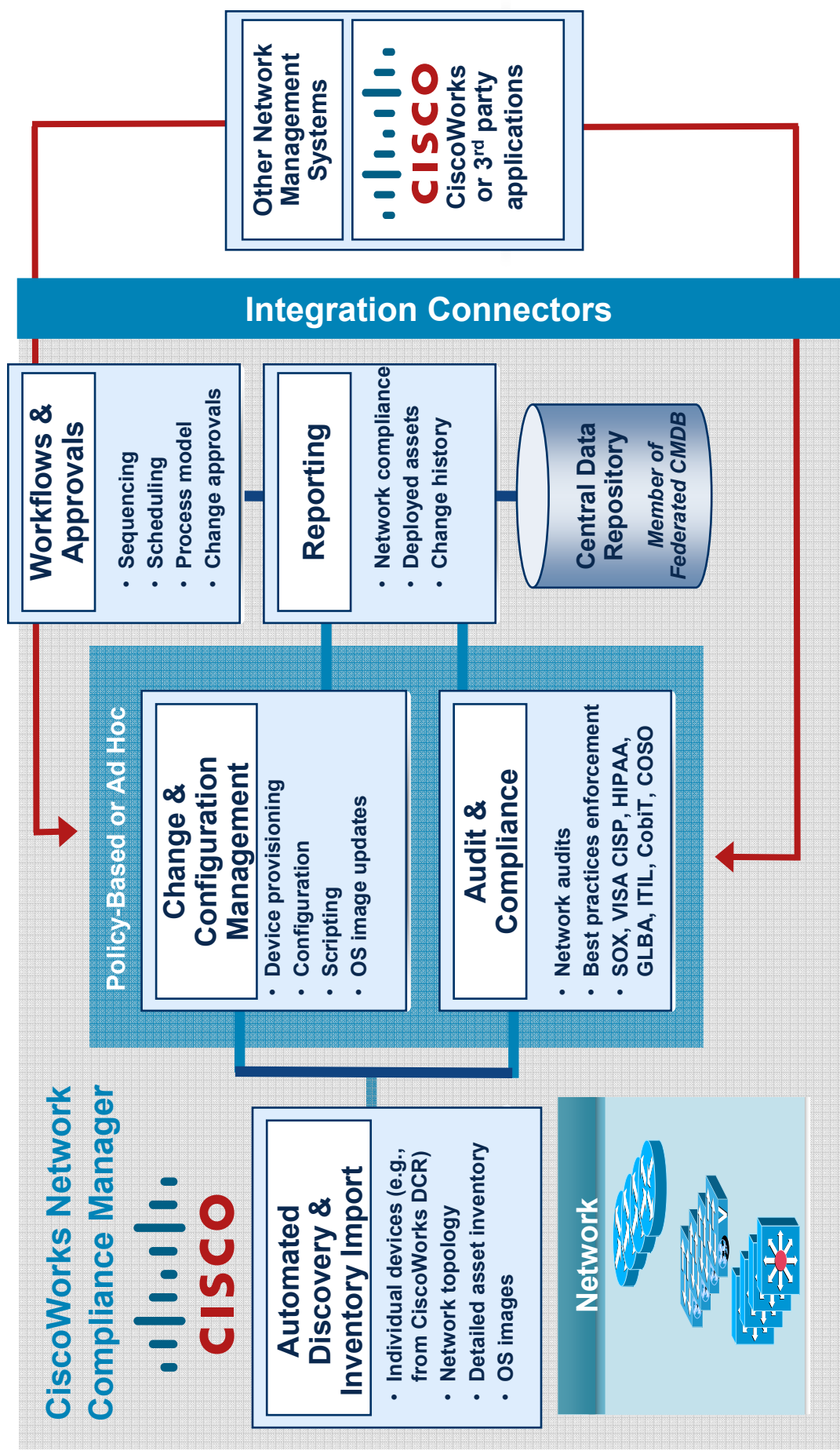


Stable Network Infrastructure =

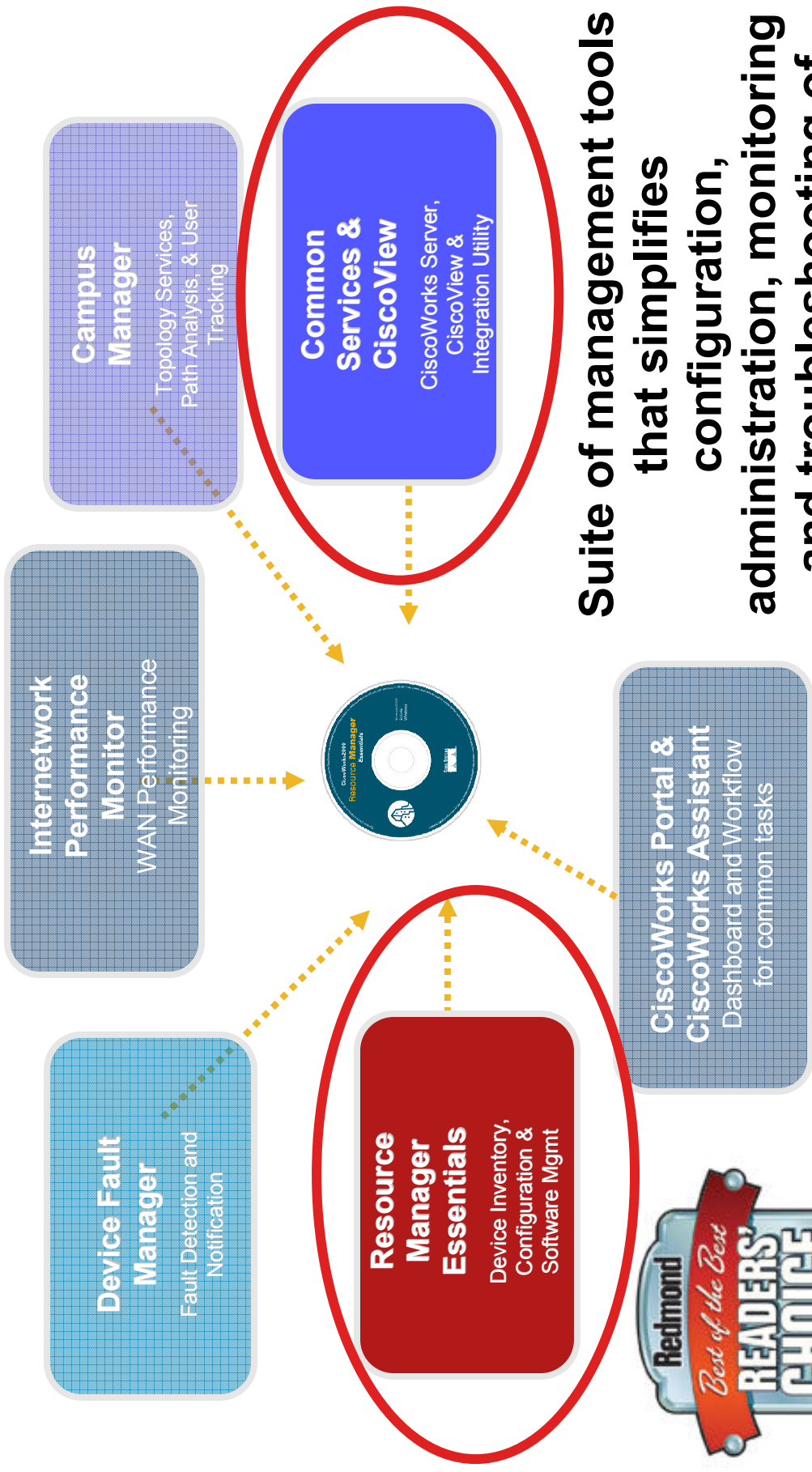
- Reliable hardware
- Reliable OS
- Well-known configuration
- Efficient processes



NCM Functional Overview



LAN Management Solution 3.0.1



Inventory in ANA Physical and Logical Inventory

Logical Inventory

The screenshot displays the ANA Logical Inventory interface. The top navigation bar includes: File, Edit, Configuration, Administration, Report, Tools, Window, Help. The main interface is divided into several panes:

- Object X Task Search:** Includes a search bar and a 'Clear Filter' button.
- Devices:** A tree view showing a hierarchy: MDF -> Routers -> 7 200 Series -> 7204 -> PE_South (4...).
- General Information:**
 - System Name: PE_South
 - Vendor: Cisco
 - Product: Router
 - Serial Number: 21293957
 - Contact:
 - VNE Name: PE_South
 - Element Type: Cisco 7204
 - IP Address: 80.80.80.63
 - Up Since: 20/02/06 - 17:13:49
 - Location: test
- Software Details:**
 - Software Version: 12.3(3)B1
 - System Description: Cisco Internetwork Operating System Software
 - TAC Support: http://www.cisco.com/tac
 - Copyright (c) 1986-2004 by Cisco Systems, Inc.
- Tickets Browser:** A table listing tickets with columns for Severity, Ticket, Short Description, Location, Last Modification, and Time.

Severity	Ticket	Short Description	Location	Last Modification	Time
Warning	49703	Port down	1#0:Ethernet0/	14/05/06 - 03:55:00	14/05/06 - 03:52:2
Error	49607	Link down	lorth#1:POS1 A...	14/05/06 - 03:42:07	14/05/06 - 03:39:3
Info	54317	Device reachable	_South	14/05/06 - 02:58:29	14/05/06 - 02:53:5
Error	49607	Link down	lorth#1:POS1 A...	14/05/06 - 03:42:07	14/05/06 - 03:39:3
Info	54317	Device reachable	_South	14/05/06 - 02:58:29	14/05/06 - 02:53:5
- Physical/Logical:** A tree view showing Logical Inventory categories: ATM Traffic Profiles, LSEs, MP BGP's, OSPF Networks, Pseudo Wire Tunnels (M), Routing Entities, Traffic Engineering Turnr..., and VRFs.
- Summary:** Shows 50 items and a 'Clear Filter' button.
- Memory:** Shows 9% memory usage.

Cisco IOS Management Instrumentation

Prepare
Plan

Design

Implement

Operate

Optimize

Management
Interfaces /
Infrastructure

NETCONF/ XML PI* / CLI/ WEB Services

SNMP/ Syslog/ NetFlow v9

Instrumentation
(Monitoring & Measurement)

MIB stats/ IP SLAs / NetFlow

Traps/ Syslog Msgs/ EEM/ ESM/ ERM
Svc Diagnostics/ GOLD/ OAM

Deployment
(Provisioning & Change Mgmt)

Zero Touch Deployment/ Image

Agent/ TR-69 *

Config Agent / Image Agent

Inventory Agent*

Note: * indicates Future capability

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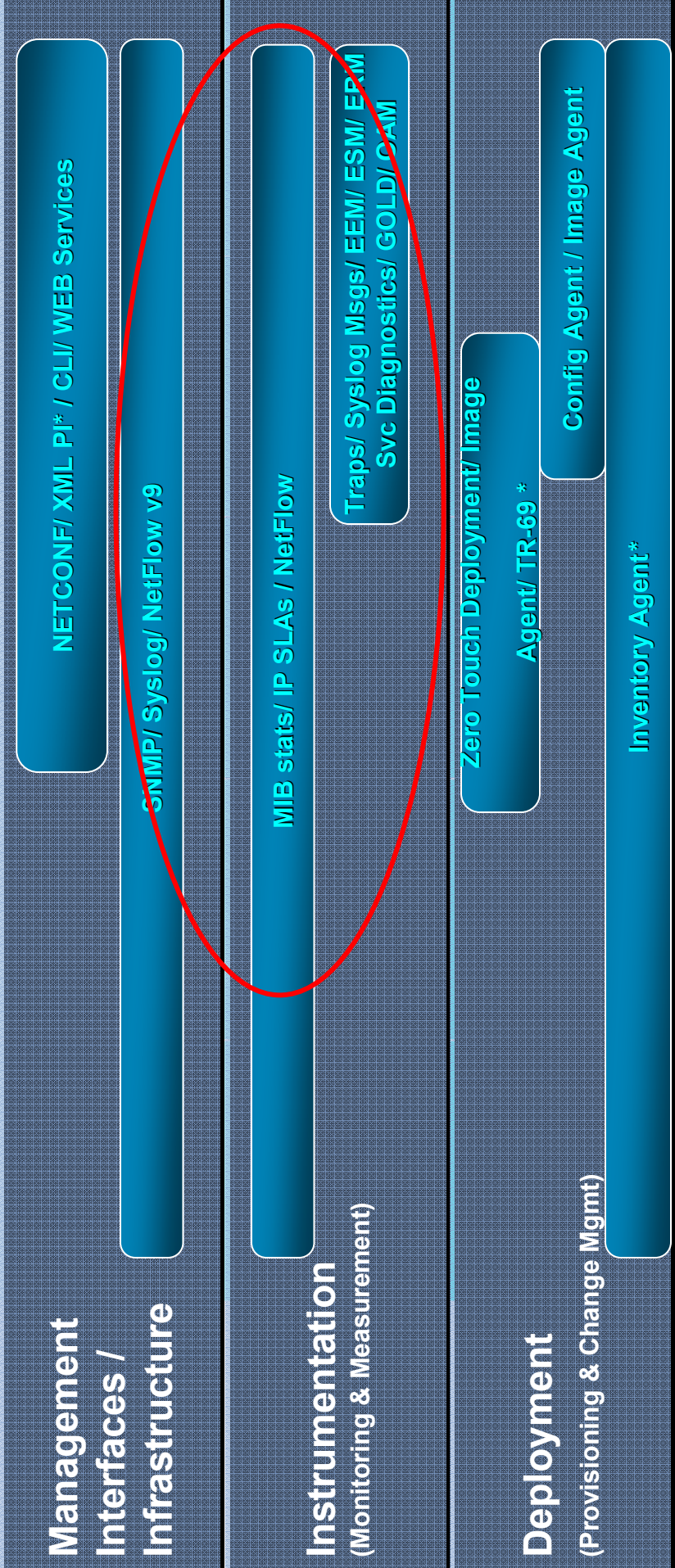
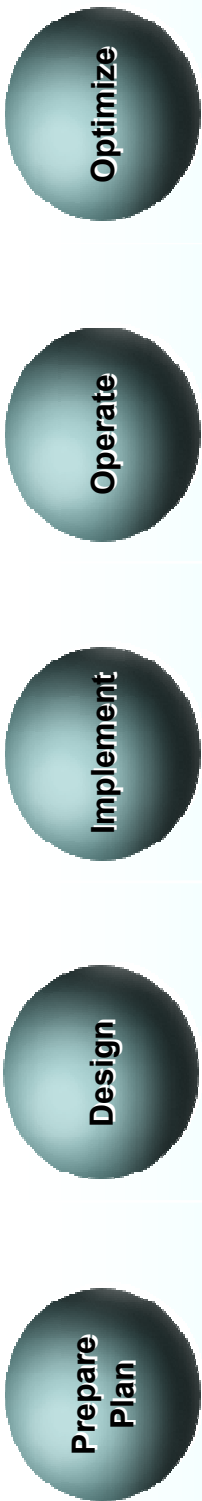
Cisco Confidential

Visibility



Cisco IOS Management Instrumentation

Summary View of Key Features



Note: * indicates Future capability

LAN Management Solution 3.0.1

Device Fault Manager
Fault Detection and Notification

Internetwork Performance Monitor
WAN Performance Monitoring

Campus Manager
Topology Services, Path Analysis, & User Tracking

Resource Manager Essentials
Device Inventory, Configuration & Software Mgmt



Common Services & CiscoView
CiscoWorks Server, CiscoView & Integration Utility



CiscoWorks Portal & CiscoWorks Assistant
Dashboard and Workflow for common tasks

Suite of management tools that simplifies configuration, administration, monitoring and troubleshooting of Cisco networks

PoE launch point

The screenshot displays the CiscoWorks interface for configuring PoE on Catalyst 3750-E series switches. The top navigation bar includes "CiscoWorks | Help | About". The main window is titled "CiscoView (CVTEST-DELL-PC1)" and shows a network diagram with two switches highlighted in yellow:

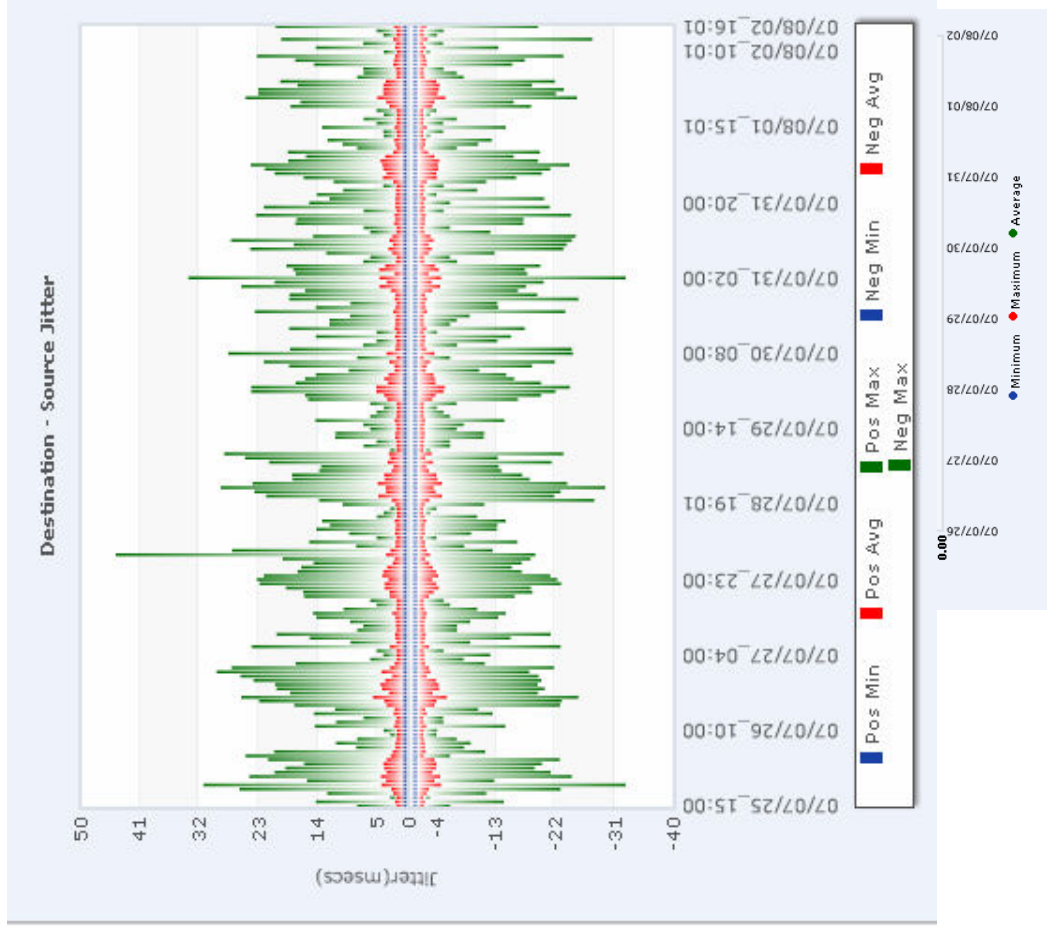
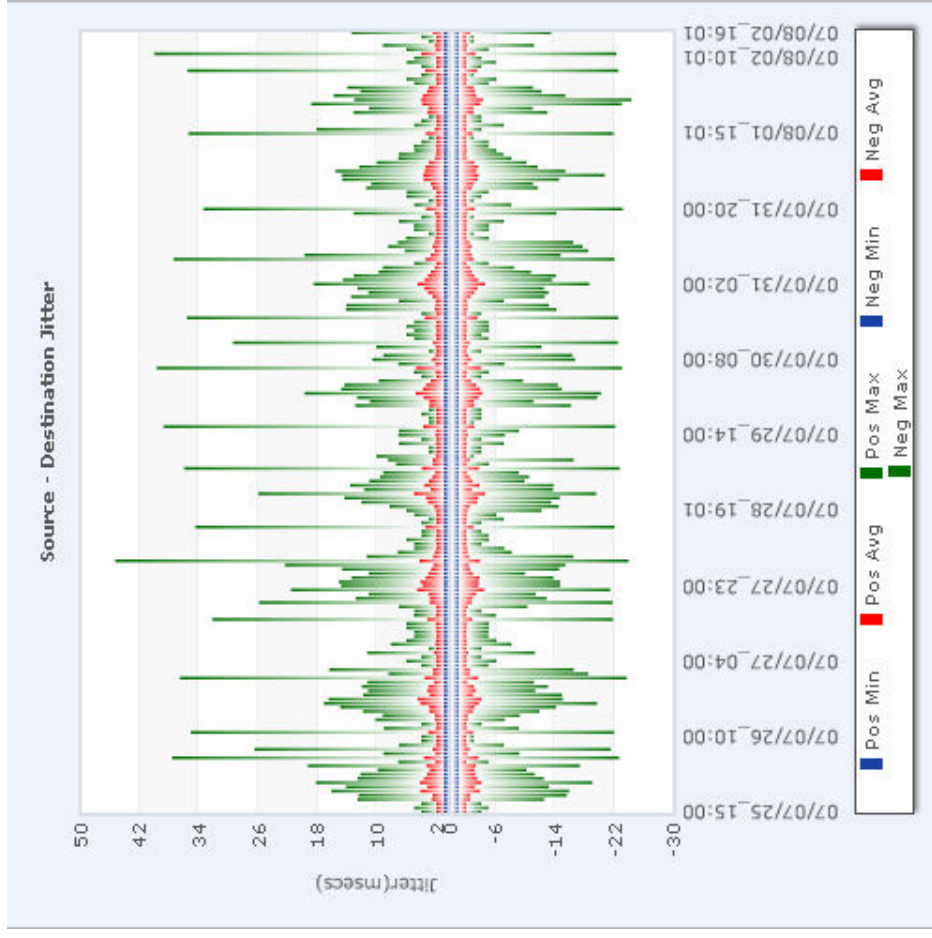
- Switch 1:** Catalyst 3750-E SERIES PoE 48. It has 48 ports, with ports 1-48 shown in a grid. A "Color Legend" and "Preferences" panel is visible on the left.
- Switch 2:** Catalyst 3750 SERIES PoE-24. It has 24 ports, with ports 1-24 shown in a grid.

Below the switch diagrams is a "DEVICE SELECTOR" section with a search input field containing "172.20.118.142". The search results show "All" selected, with "All Devices" and "Device Type Groups" options. A context menu is open over the PoE configuration area, listing the following options:

- Configure
- Monitor
- Resize
- Refresh
- System Info
- StackMaker
- Device Manager
- PoE

A yellow box on the right side of the interface contains the text "Right click device -> PoE".

IPM - Rich Graphs – Hourly Jitter Graphs



Alarm Tickets in ANA

Logical Inventory

The screenshot displays the Cisco ANA Logical Inventory interface. The top navigation bar includes: File, Edit, Configuration, Administration, Report, Tools, Window, Help. The main interface is divided into several panes:

- Logical Inventory (Left):** Shows a tree view of the network hierarchy: Logical Inventory > ATM Traffic Profiles > LSEs > MP BGP's > OSPF Networks > Pseudo Wire Tunnels (M... > Routing Entities > Traffic Engineering Turn... > VRFs. A 'Connected' status bar is visible at the bottom right of this pane.
- Devices (Middle-Left):** Shows a network diagram with a tree view: Select Group by MDF > Routers > 7 200 Series > 7204 > PE_South (4... > CE-Black-So... > ...
- General Information (Middle-Right):**

System Name : PE_South
 Vendor : Cisco
 Product : Router
 Serial Number : 21293957
 Contact :
 VNE Name : PE_South
 Element Type : Cisco 7204
 IP Address : 80.80.80.63
 Up Since : 20/02/06 - 17:13:49
 Location : test
- Software Details (Bottom-Middle-Right):**

Software Version : 12.3(3)B1 Sending Alarms:true
 System Description :
 Cisco Internetwork Operating System Software
 TAC Support: http://www.cisco.com/tac
 Copyright (c) 1986-2004 by Cisco Systems, Inc.
- Tickets Browser (Bottom-Right):**

Filter: Severity [dropdown] Go Clear Filter

Severity	Ticket	Short Description	Location	Last Modification	Time
🔴	49703	Port down	1#0:Ethernet0/	14/05/06 - 03:55:00	14/05/06 - 03:52:2
🔴	49607	Link down	lorth#1:POS1 A...	14/05/06 - 03:42:07	14/05/06 - 03:39:3
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🔴	49607	Link down	lorth#1:POS1 A...	14/05/06 - 03:42:07	14/05/06 - 03:39:3
🟢	54317	Device reachable	_South	14/05/06 - 02:58:29	14/05/06 - 02:53:5

50 items

Path Trace in ANA

The screenshot displays the Cisco ANA Path Trace interface. The main window shows a network diagram with a path highlighted in green. The path starts at an 'Edge Point' (cloud icon) on the left, goes to 'SYDpe01' (server icon), then to 'SYDCore' (server icon), then to 'MELcore' (server icon), then to 'MELpe01' (server icon), and finally to another 'Edge Point' (cloud icon) on the right. The path is labeled '1' in the top left corner.

The top status bar shows the date and time: 10/05/07 - 19:16:59.

The bottom right panel shows the 'Layer 3 Properties' for the selected device (MELpe01):

Layer 3 Properties	7.7.7.1, V45:TriplePlayDemo	7.7.7.5, V45:TriplePlayDemo
Name	FastEthernet0/0	FastEthernet0/0
IP Address	7.7.7.1	7.7.7.5
Mask	255.255.255.252	255.255.255.252
State	Up	Up
VRF Name	V45:TriplePlayDemo	V45:TriplePlayDemo
Sending Alarms	true	true

The bottom right panel also shows the 'Memory' usage: 8%.

Accounting

- Radius-based
- Connectivity (ISP, VPN...)
- Service-based (voice, video)

Take-away

- Network management \Leftrightarrow doctor treating patient
- Infrastructure = device + OS + Config
- What is your goal ?
- You can't manage what you can't observe

