Advanced Network Management: Intelligent Correlation and Performance Management

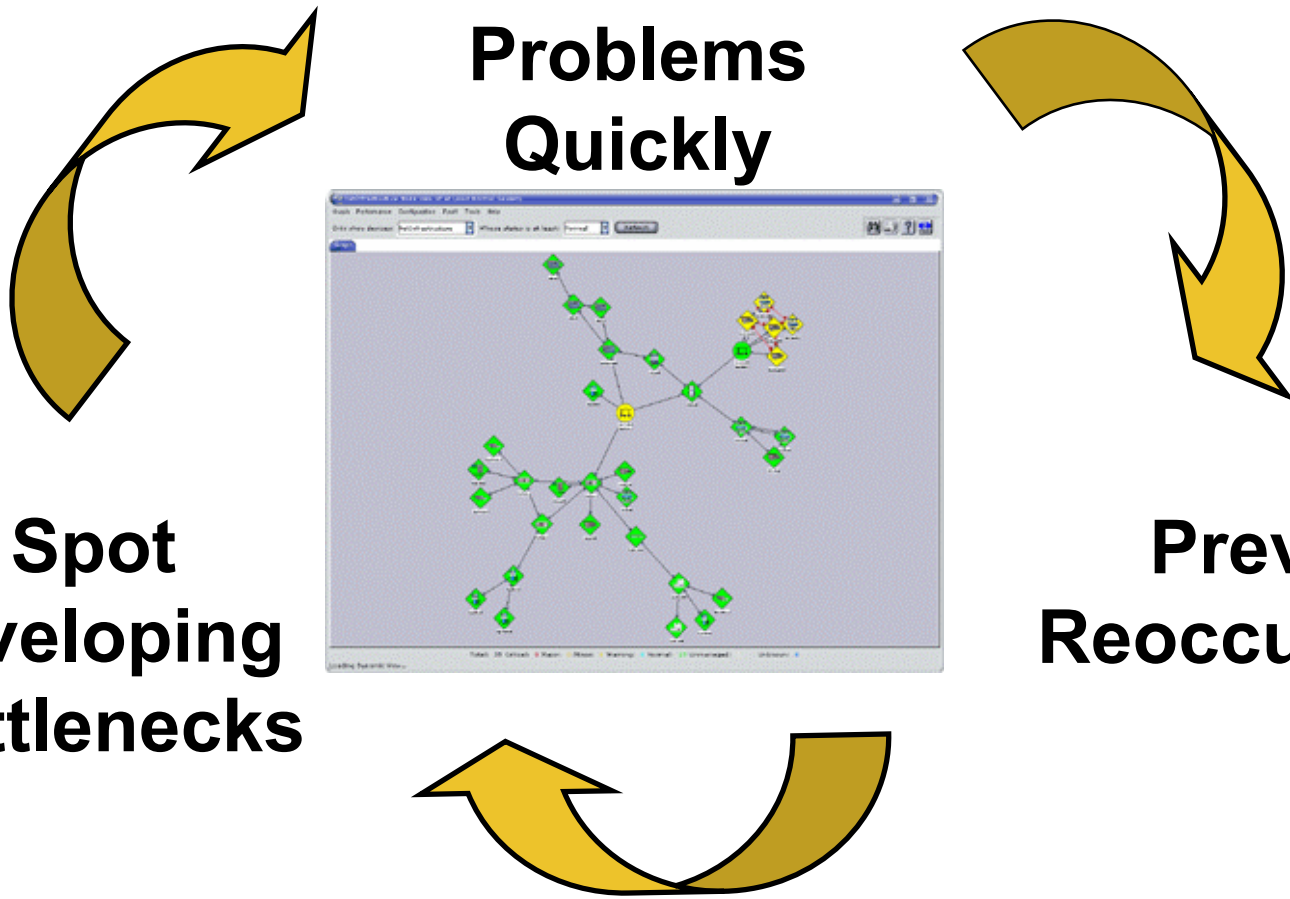
Gloria Canales – Network Services Management Manger

Dan Roggenbuch – Technical Marketing

Hewlett-Packard

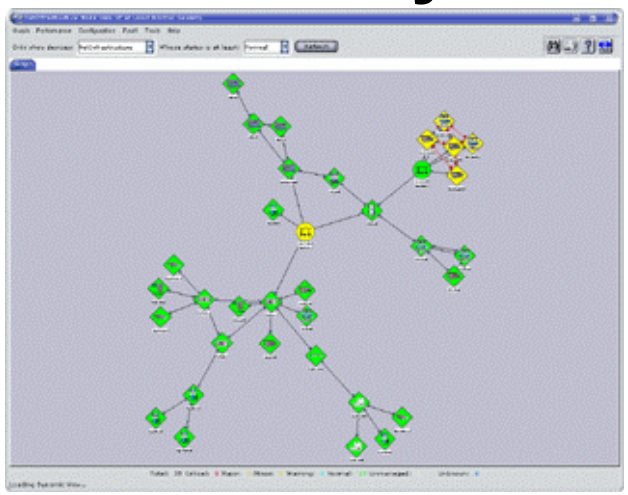
HP WORLD 2003
Solutions and Technology Conference & Expo

Keeping Networks Healthy



Keeping Networks Healthy

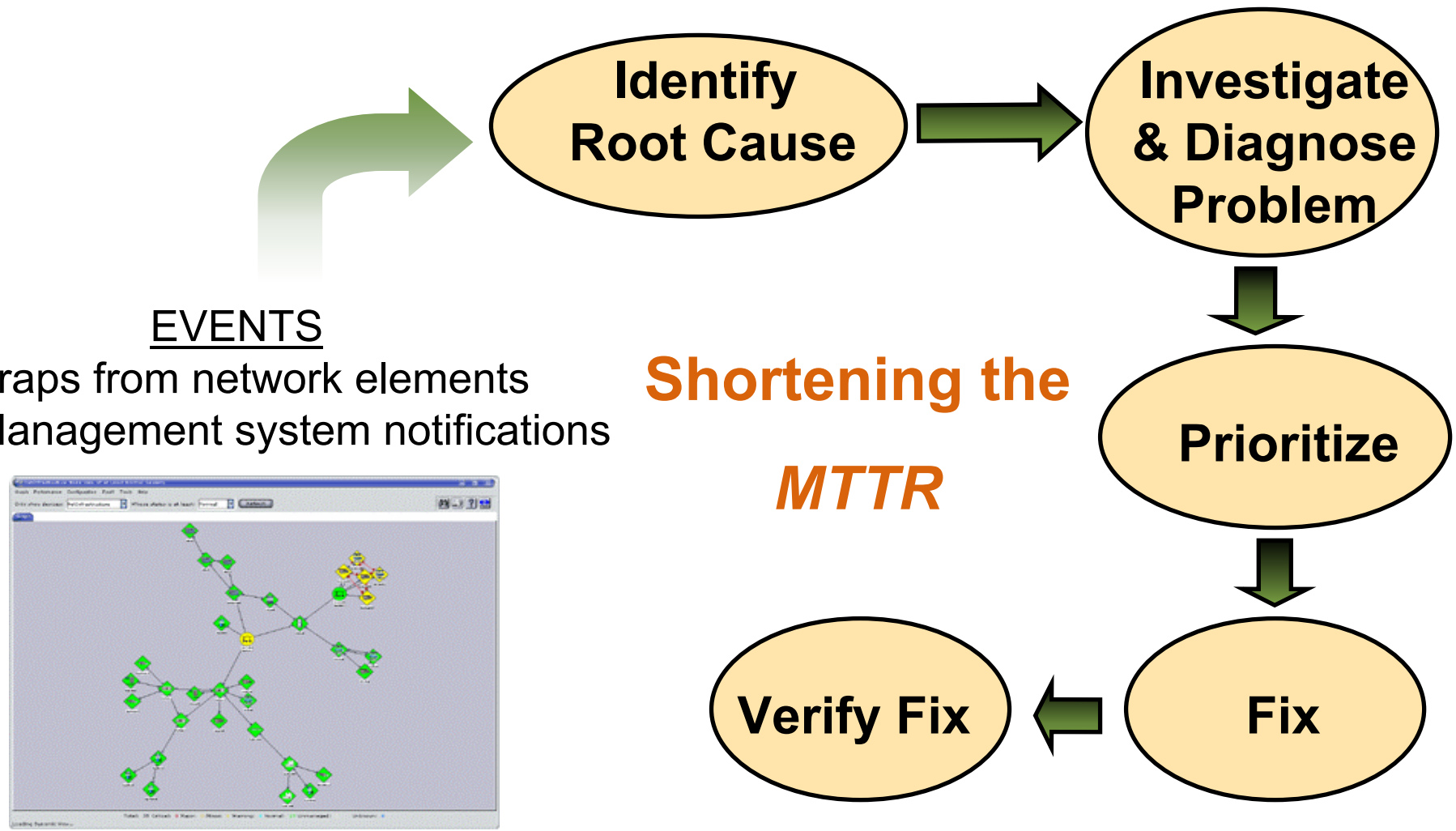
Resolve Problems Quickly



Spot Developing Bottlenecks

Prevent Reoccurrence

Problem Resolution Process

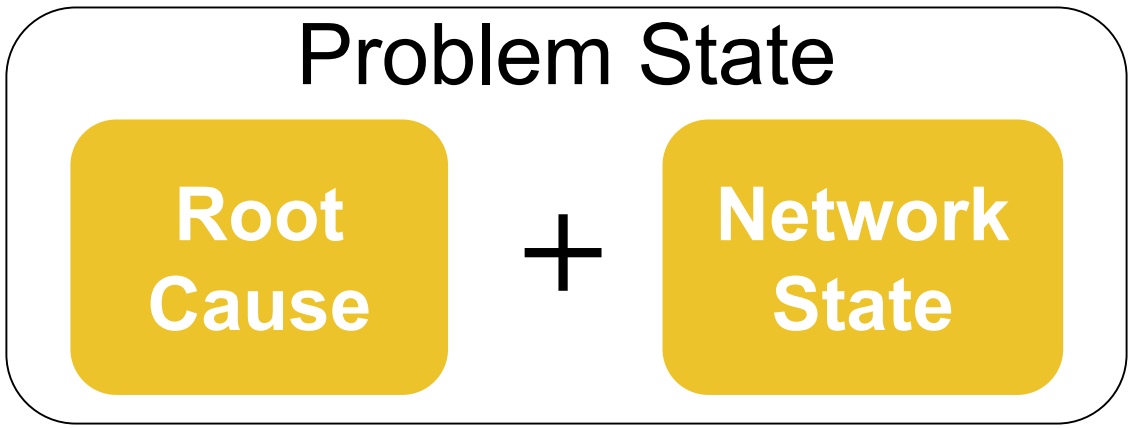


The Challanges

- **Too many events**
  - 1000s per day in a large network
  - Symptomatic events
- **Network Complexity**
  - HSRP
  - VLANs
  - OSPF
  - Meshed Topologies
  - Frame Relay
  - MPLS
- **Events don’t tell the whole story**
  - Must know network STATE after a failure

Problem State

- The diagnostic process must determine:



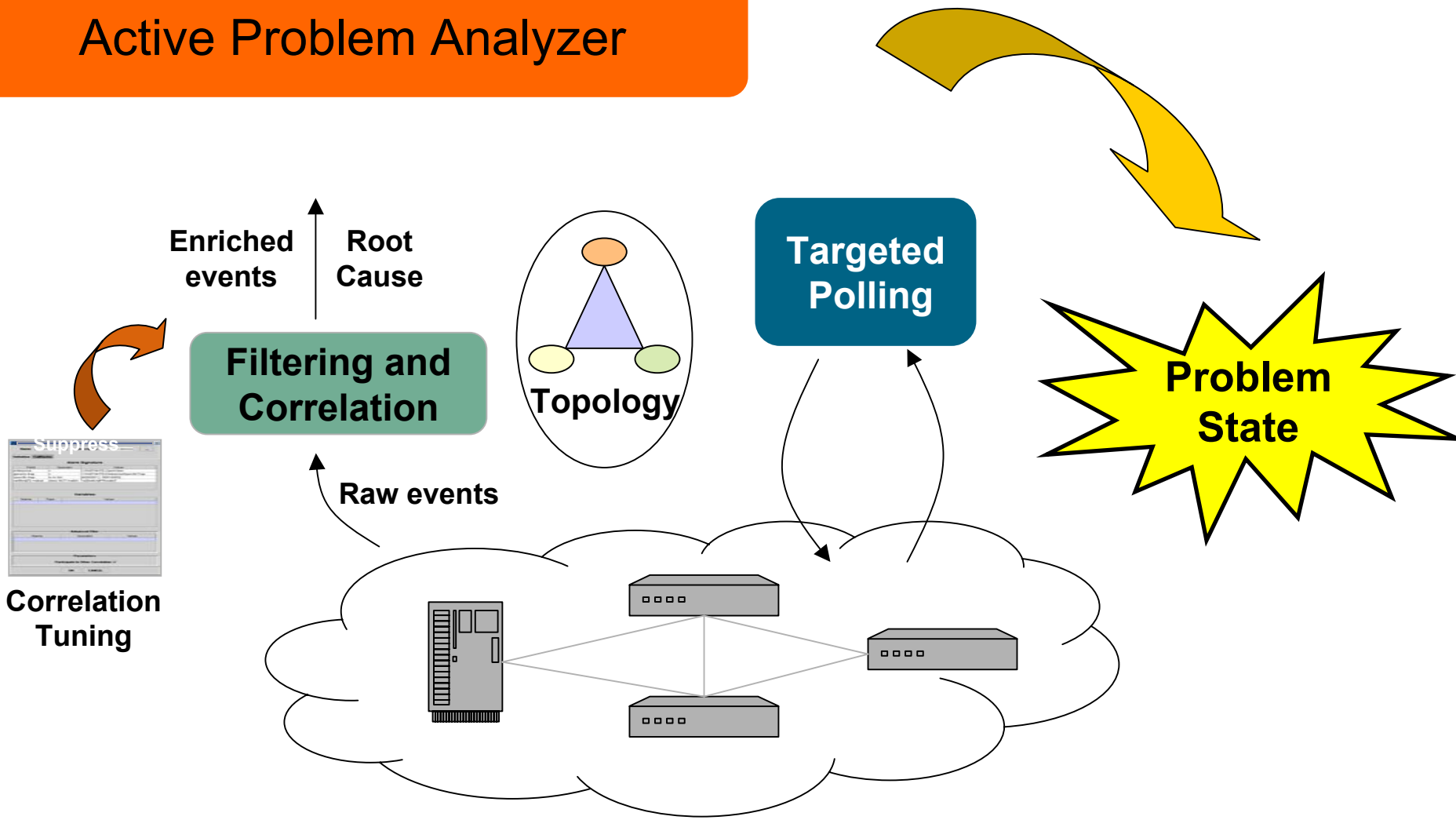
The key to preventing follow-on outages.

A Management System Should

1. Analyze the event stream to determine the most likely root cause
2. Perform active analysis and polling to confirm the root cause and determine the s*tate* of the network following the failure.
3. Provide the views and tools needed for further investigation.
4. Help assess services and customers impacted.
5. Link easily to other tools to correct problems.

Intelligent Diagnostics for Networks

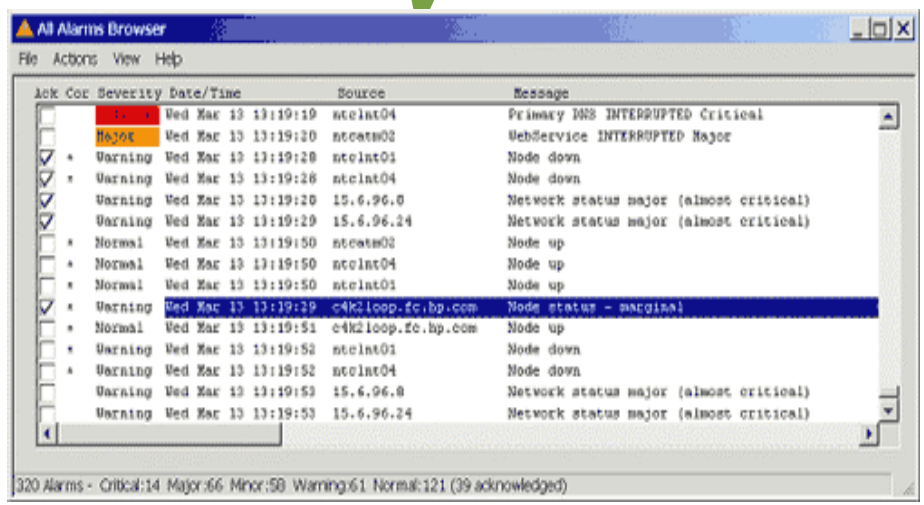
Active Problem Analyzer



Filtering and Correlation

- Filters out unimportant events
- Eliminates duplicates
- Understands event relationships
- Determines most likely root cause
- Provides more meaningful messages

dramatically fewer but intelligent events !



** *Topology Smart* **

Built-in Correlators

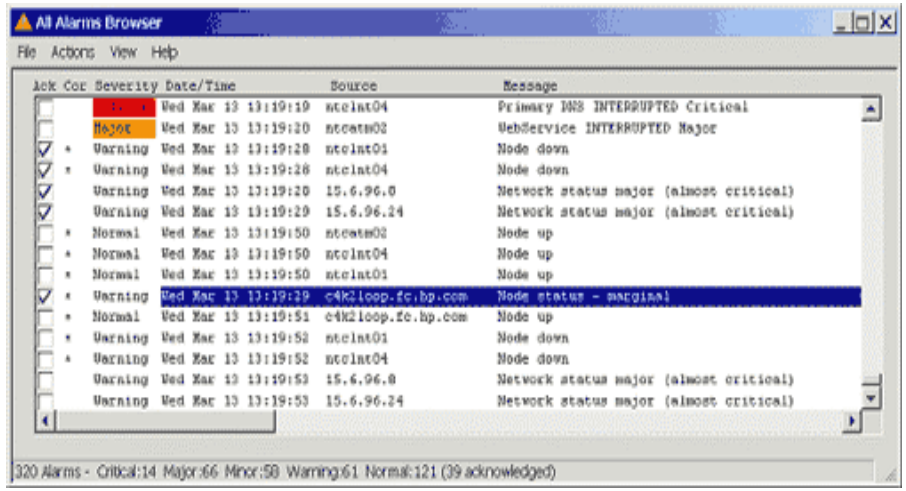
- Adjacent Node Failure
- Frame Relay Correlator
- Hot Standby Router Protocol
- Intermittent Interface
- Chassis Enclosure
- Event Noise Reduction
  - See next slide

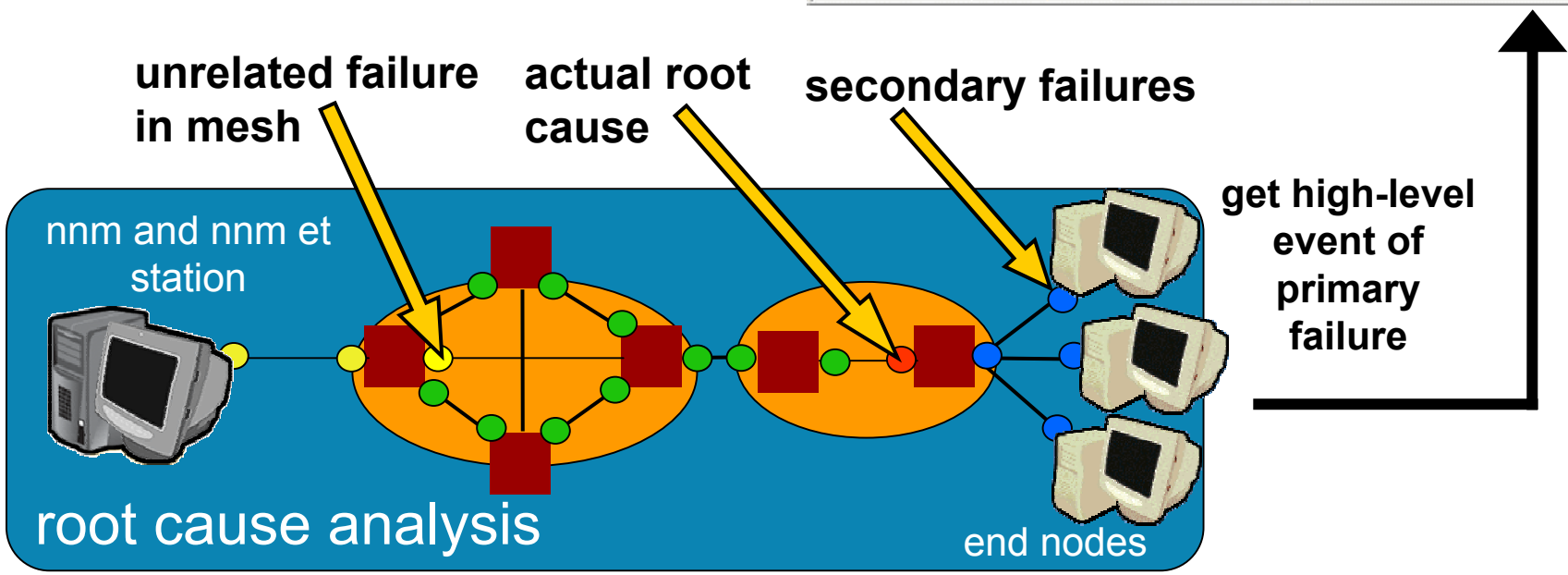
Event Noise Reduction

- Event classifier
- Pair-wise events
- Node interface
- Multiple reboot
- De-duplication
- Physical address mismatch
- Authentication failure
- Connector down
  (Advanced Edition only)
- Scheduled maintenance

Topology Smart

- Based on accurate layer 2 and layer 3 path analysis (including meshed networks)
- example: NNM AE understands the mesh, therefore knows precisely why the end nodes are down





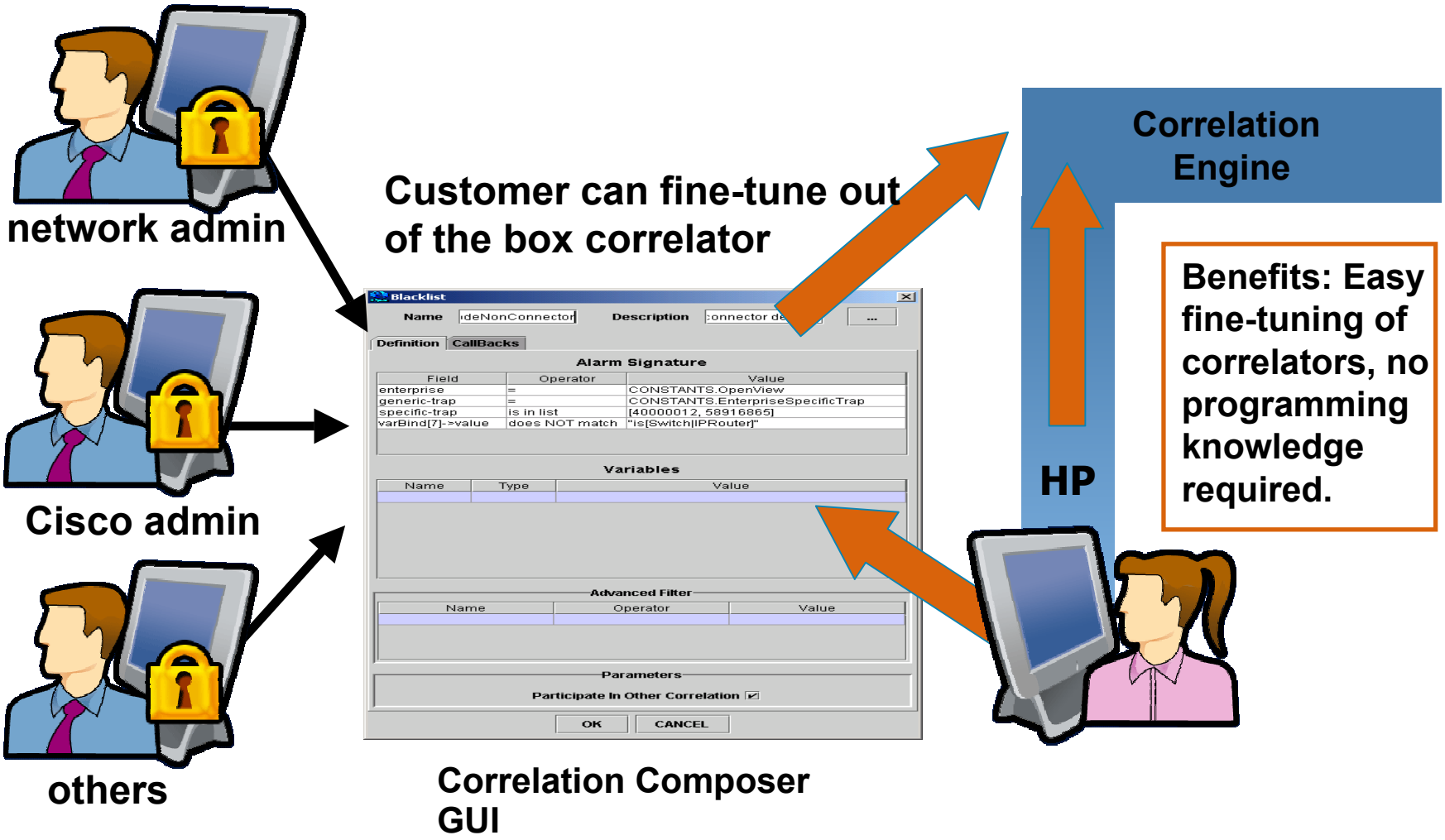
Frame Relay Correlation

Frame Relay

- Detects and reports problems with virtual connections
- Distinguishes between failures within the provider network and failures within the local network

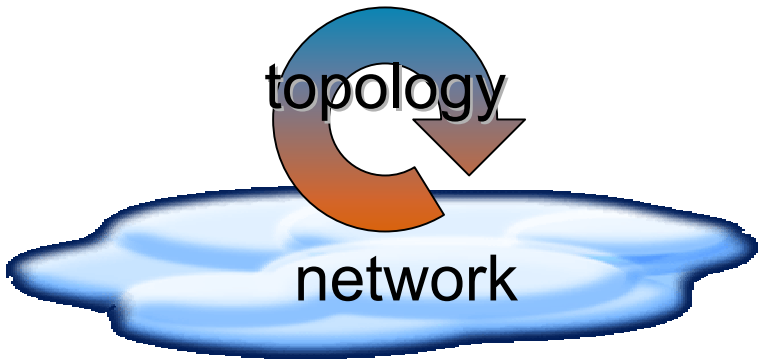
Correlation Composer

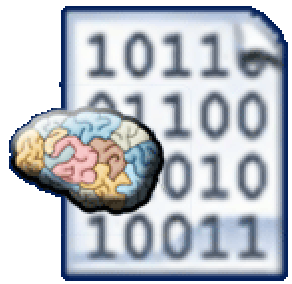
Immediate customer value….with a custom fit



Active Problem Analyzer Starts the diagnostic process

Built-in Scenario Intelligence





Targeted Polling
- Situation aware
- Uses accurate and complete topology
- Collects additional information

State determination
- Situation aware
- Determines Problem State
- HSRP (requires NNM SPI for advanced routing)
- Adjacent node failures

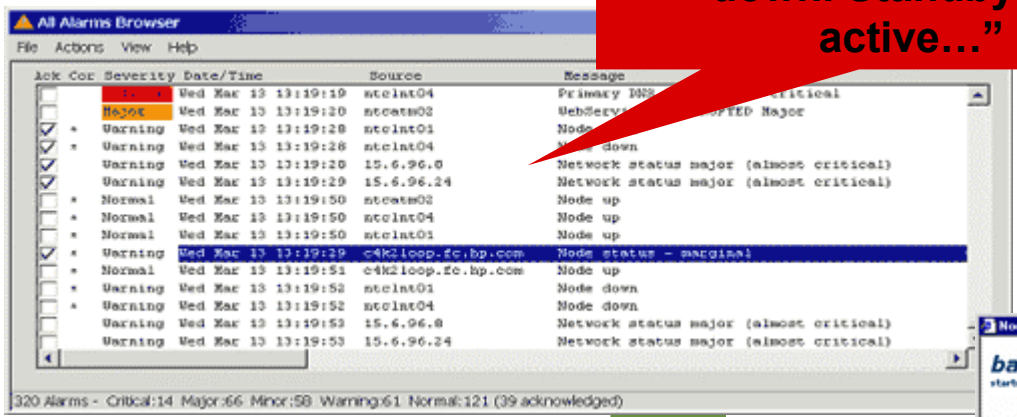
For example: Cisco HSRP

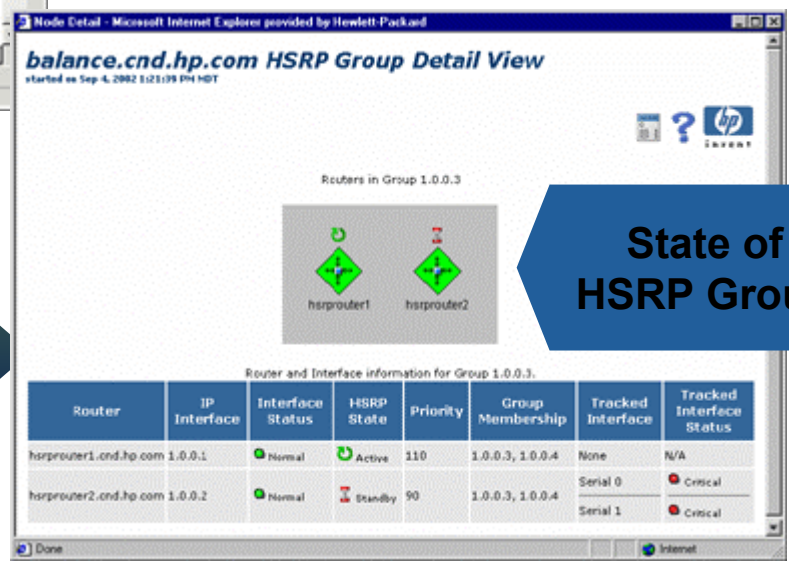
Root cause HSRP events

Benefits:

- **intelligent messages to operator**
- **understand the state of your service**

"Warning: HSRP Router down. Standby now active…"



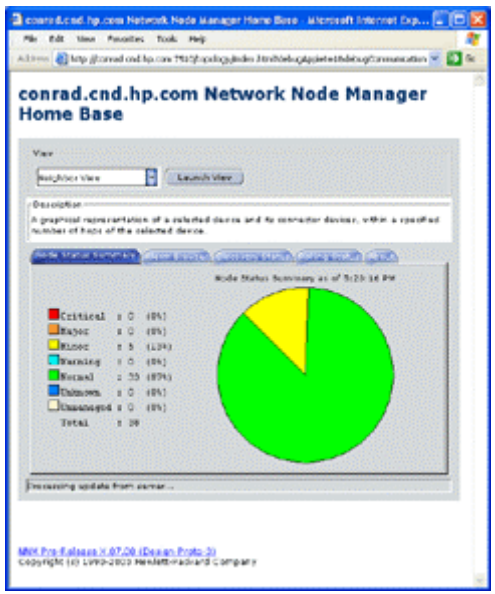


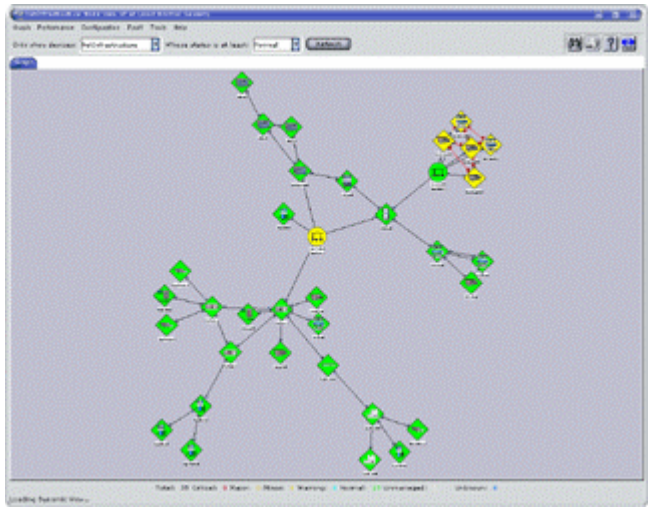
State of HSRP Group

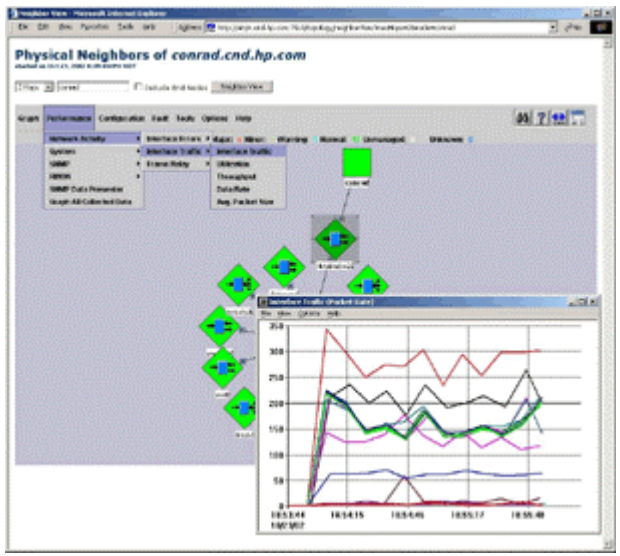
contextual launch of detail view

- **Is it ok/critical?**
- **What's the risk of future failure?**

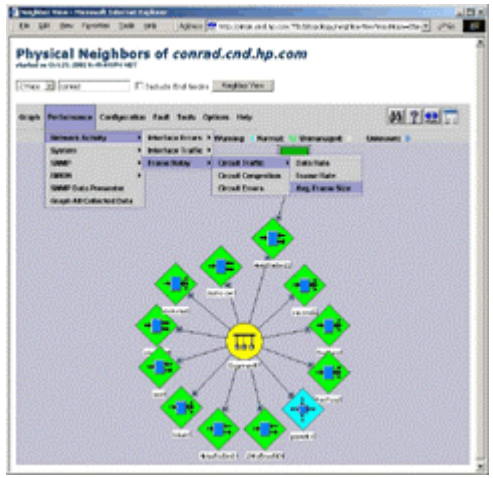
Views – get to the heart of your problem fast



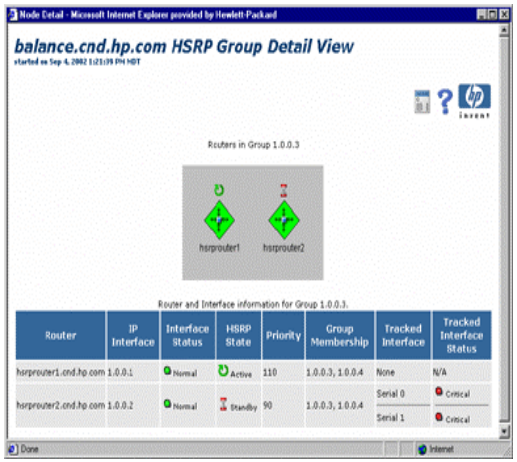




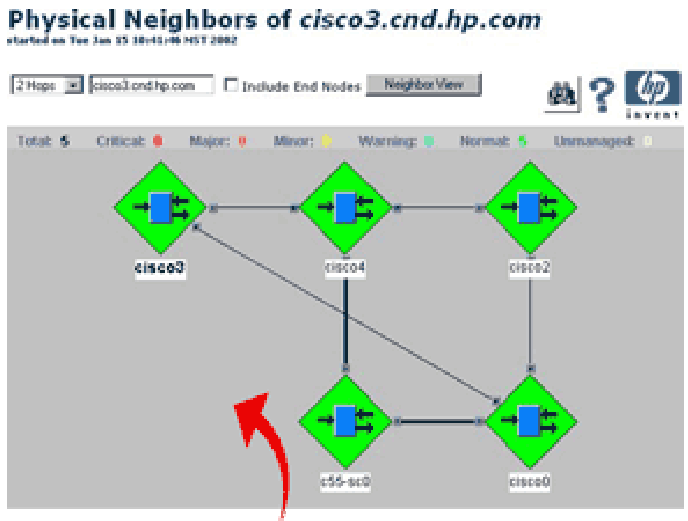
Benefits: Fast troubleshooting

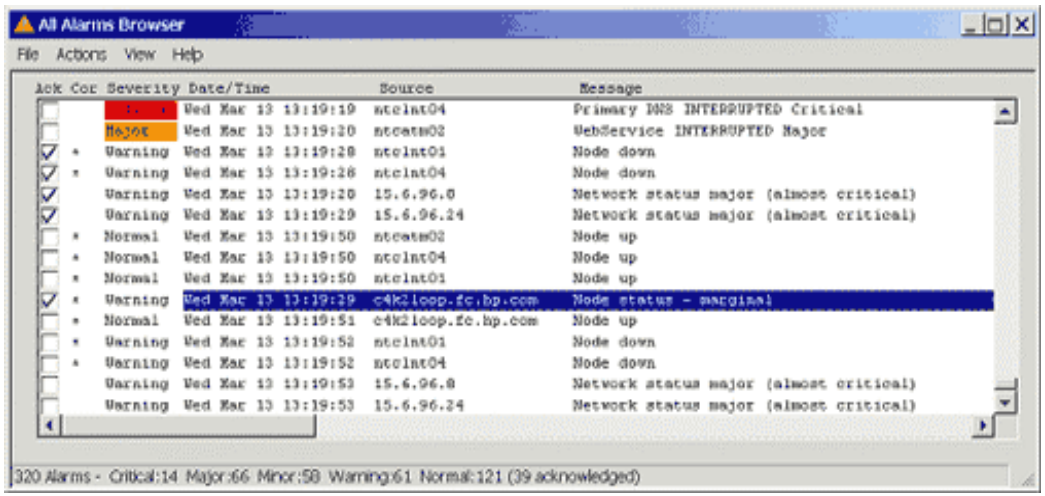


Support the diagnosis process



launch a view from Problem State display

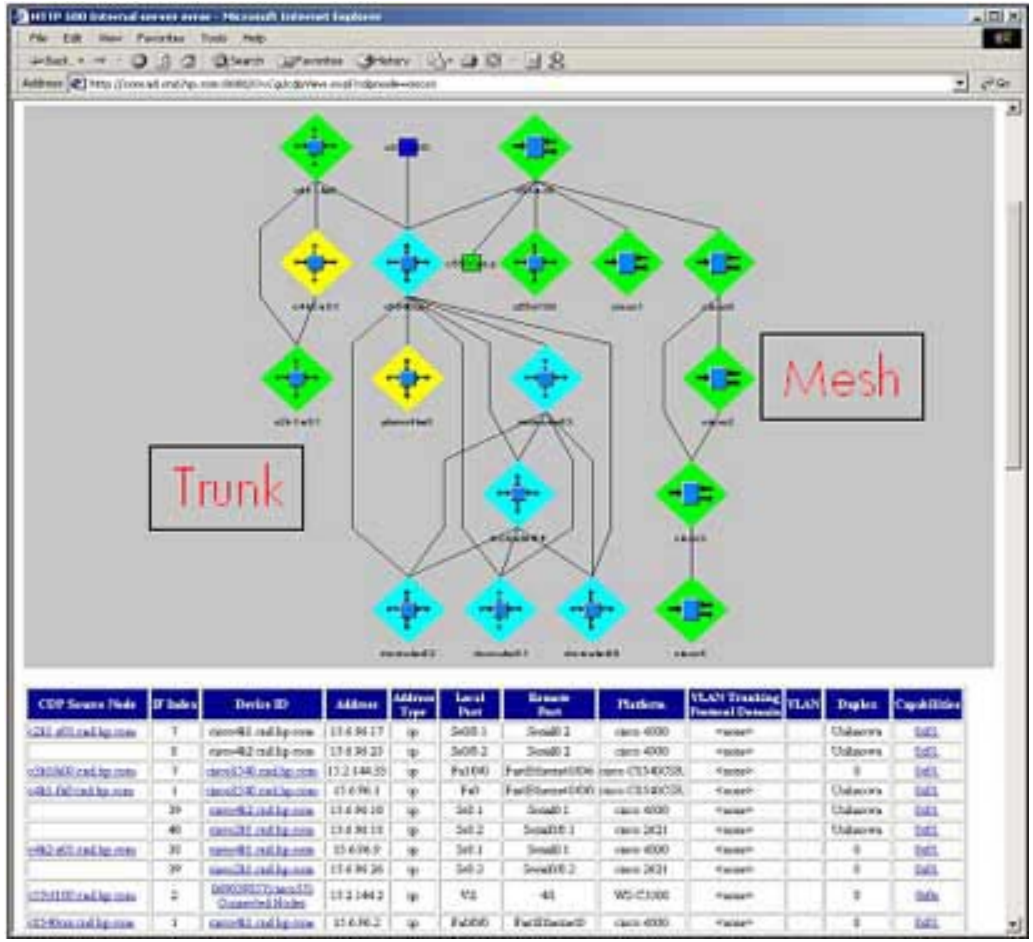




launch a view from event browser

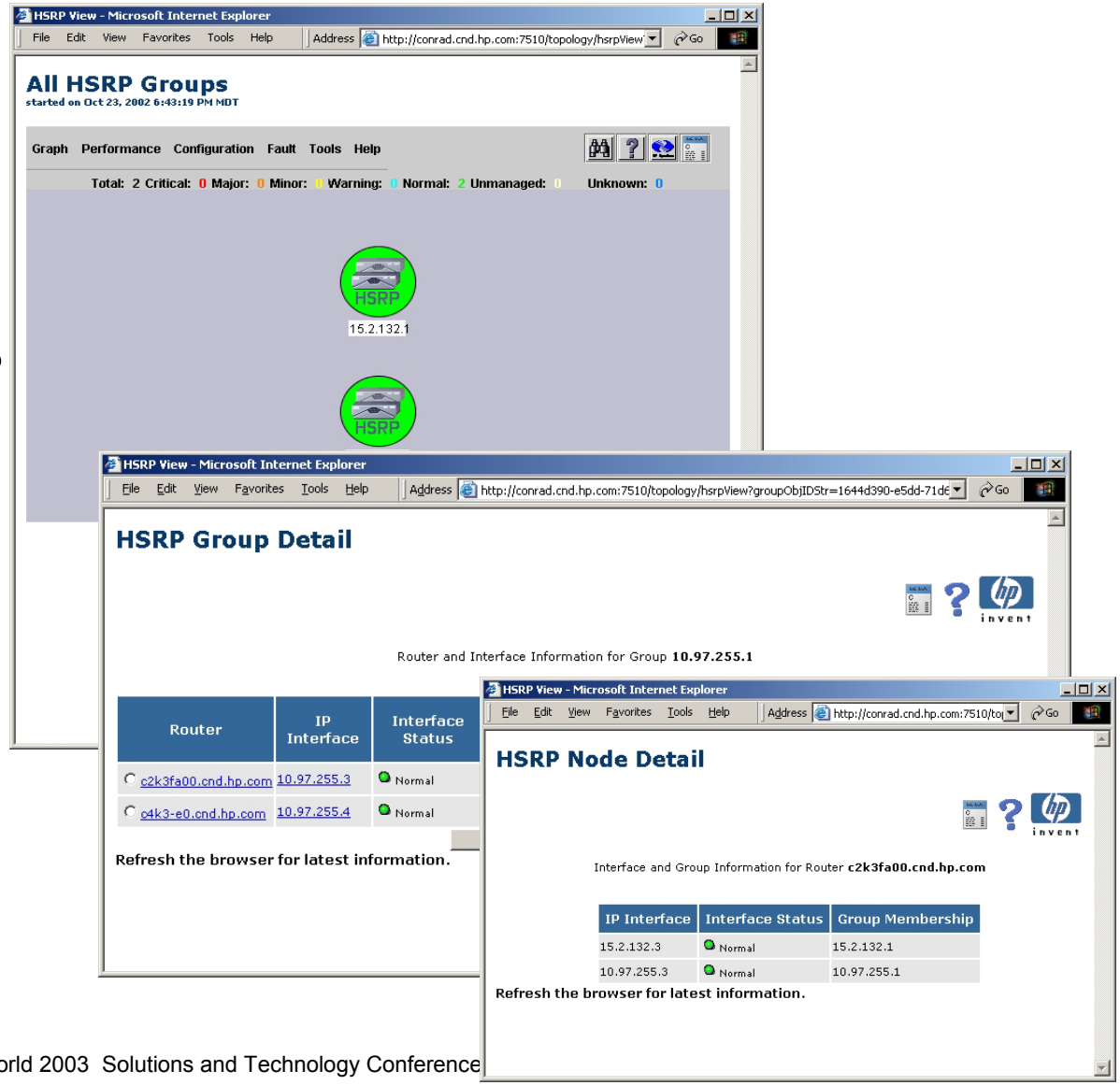
Neighbor View

- heterogeneous L2 view
- meshed networks
- trunked networks



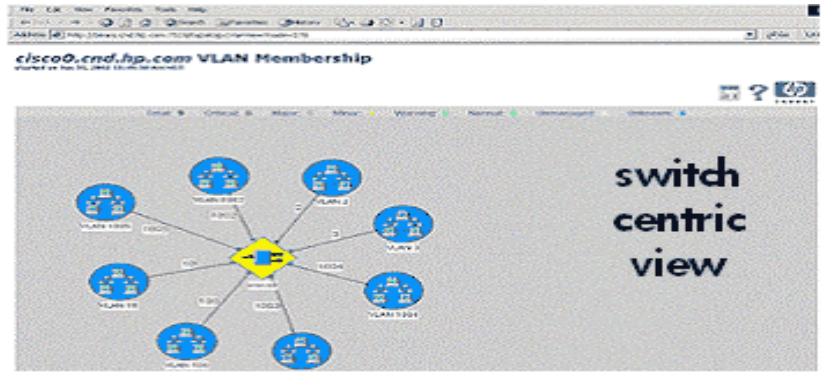
HSRP View

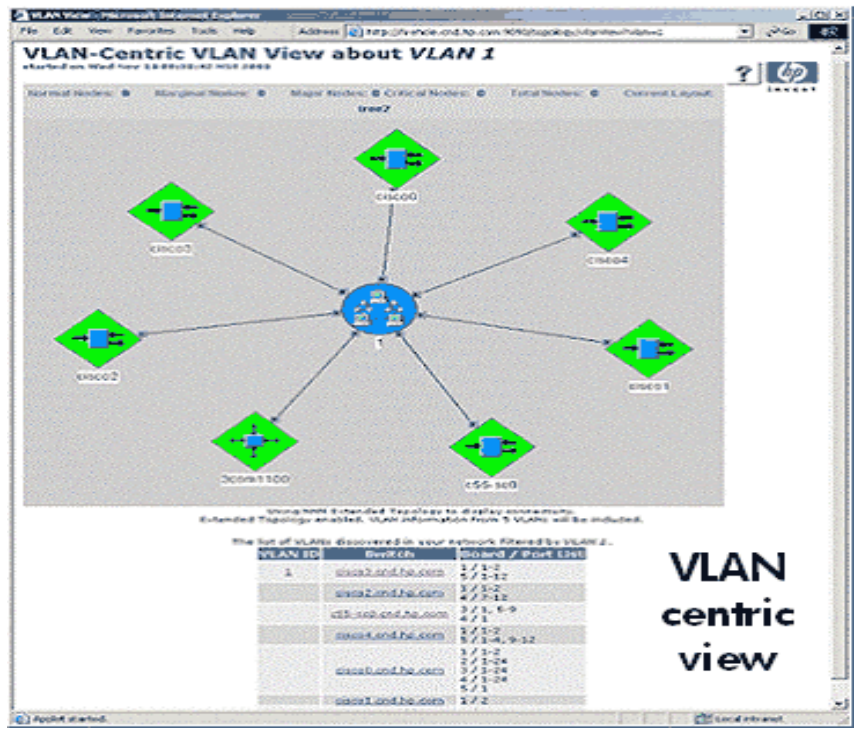
- HSRP groups
- router interfaces
- group states (active/standby)



VLAN View

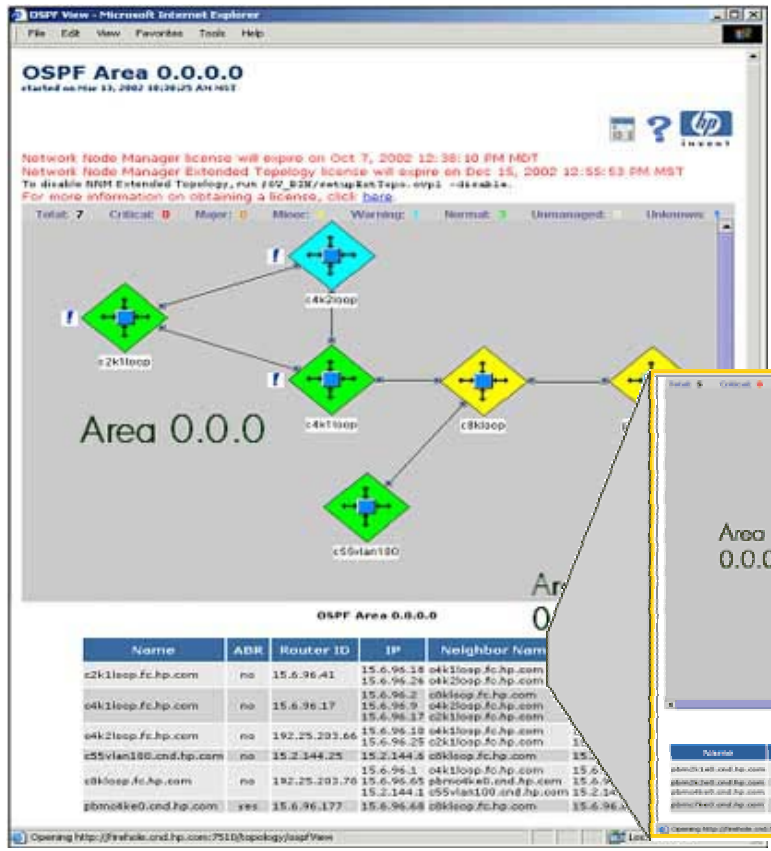
- table of all VLANs
  - •which switches, interfaces, and ports participate in which VLAN
- know which VLANs are affected when problem on a switch
- troubleshoot a VLAN problem by seeing which switches participate in VLAN



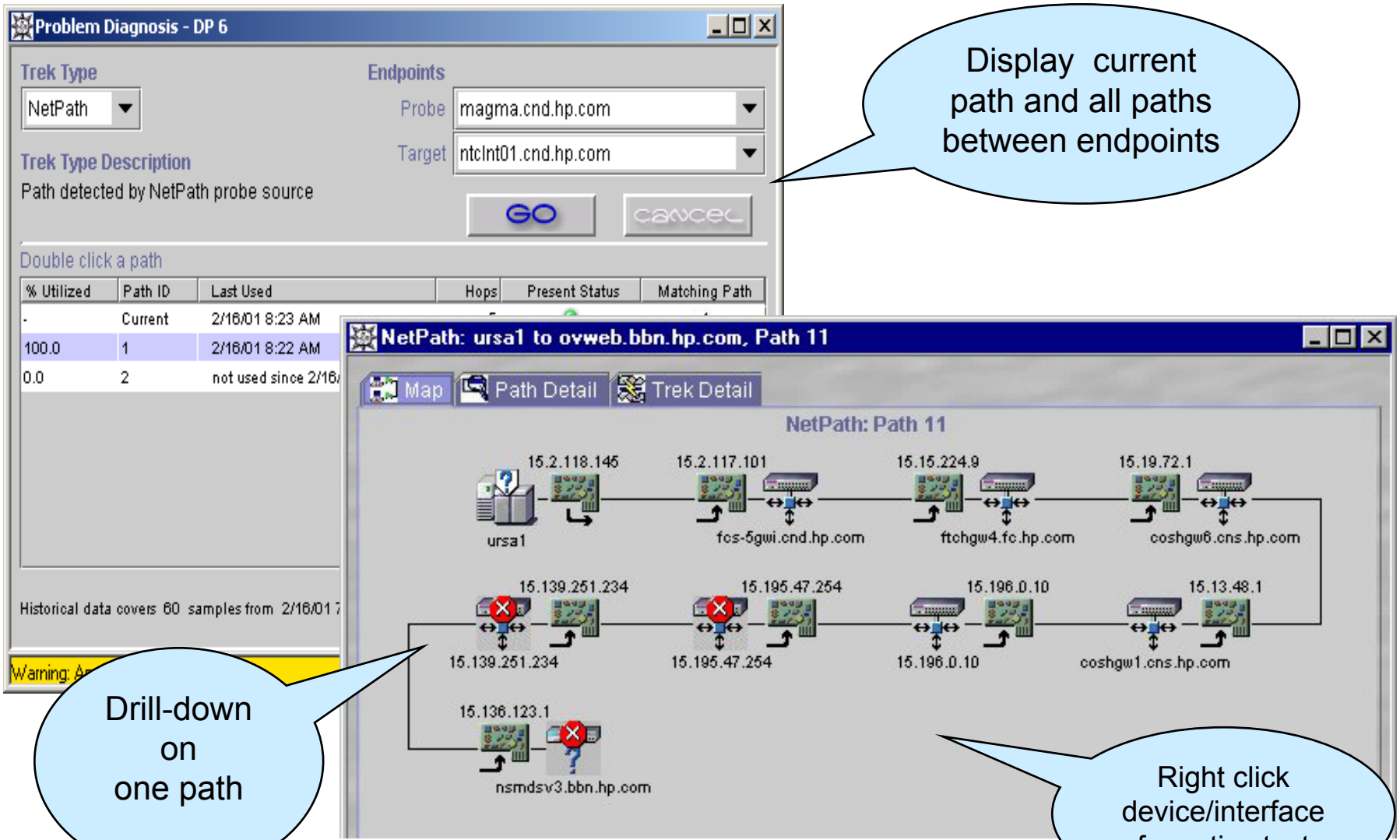


OSPF View

- graphical representation of an OSPF area
- table of routers, filtered by area, with router ID, IP addresses, and neighbors
- figure illustrates a pop-up of node details (status, uptime, description, etc.)



Path Views

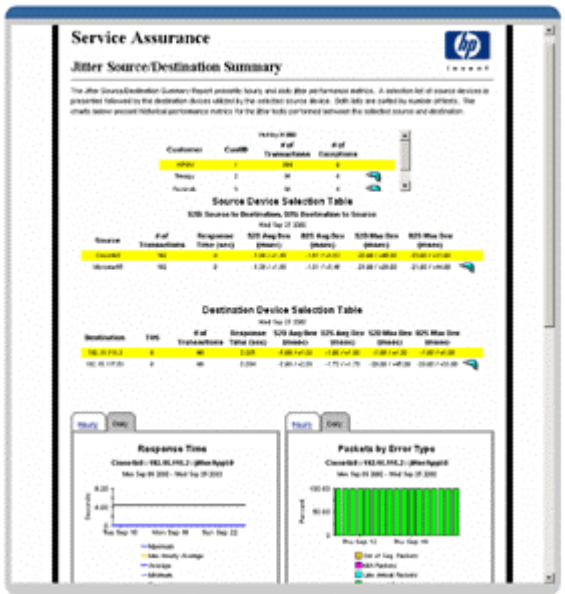

Problem Diagnosis - DP 6
Trek Type
NetPath
Endpoints
Probe
magma.cnd.hp.com
Target
ntcInt01.cnd.hp.com
Trek Type Description
Path detected by NetPath probe source
GO
cancel
Double click a path
% Utilized
Path ID
Last Used
Hops
Present Status
Matching Path
- Current 2/16/01 8:23 AM
100.0 1 2/16/01 8:22 AM
0.0 2 not used since 2/16/
Historical data covers 60 samples from 2/16/01 7
Warning: A
Display current path and all paths between endpoints
NetPath: ursa1 to ovweb.bbn.hp.com, Path 11
Map
Path Detail
Trek Detail
NetPath: Path 11
15.2.118.145
15.2.117.101
15.15.224.9
15.19.72.1
ursa1
fcs-5gwi.cnd.hp.com
ftchgw4.fc.hp.com
coshgw6.cns.hp.com
15.139.251.234
15.195.47.254
15.196.0.10
15.13.48.1
15.139.251.234
15.195.47.254
15.196.0.10
coshgw1.cns.hp.com
15.136.123.1
nsmdsv3.bbn.hp.com
Drill-down on one path
Right click device/interface for active test menu

Path Analysis

Integrated fault & performance

Advanced Edition

Performance Insight for Networks

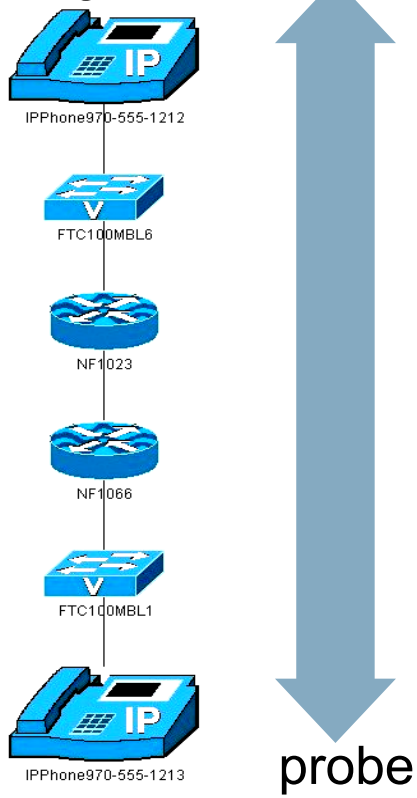


Views shows layer 2 for more complete path analysis

OVPI:

- Improved Ease-of-Use
- Base-lining
- IP QoS
- Cisco CAR
- IPF

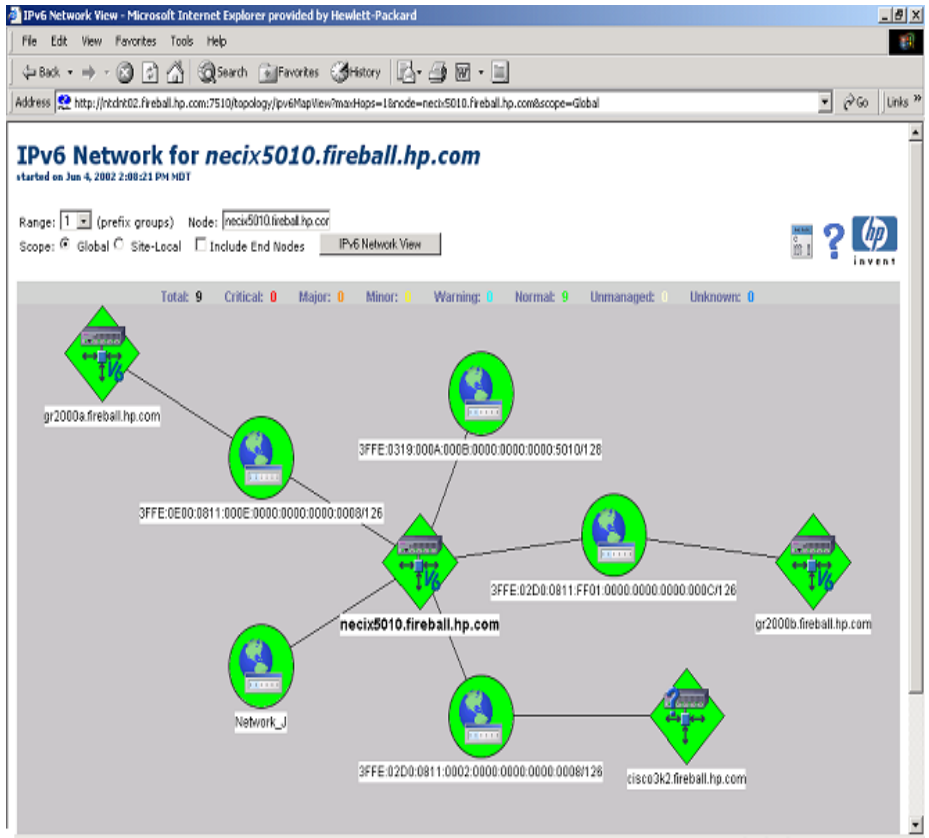
Problem Diagnosis



Benefits: Isolating performance problems in complex networks.

IPV6 View

- IPv6 devices discovered and polled (via ICMPv6 ping)
- IPv6 dynamic view shows layer 3 connectivity
- Hitachi, NEC, Juniper, & Cisco equipment supported
- Only dual-stacked (IPV4 & IPV6) routers supported



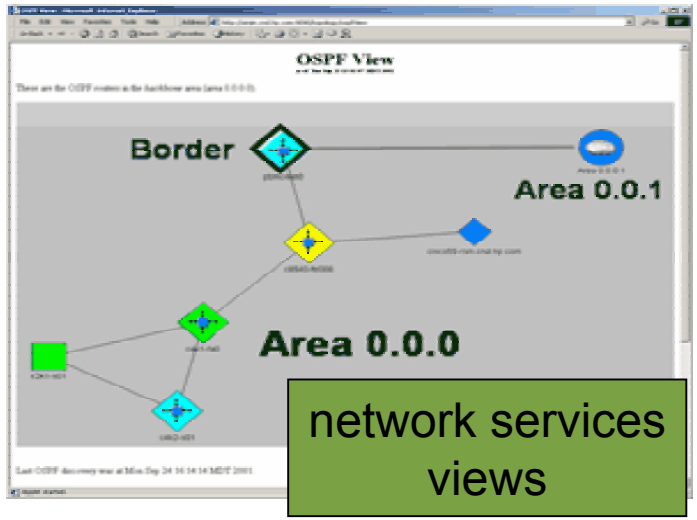
Dynamic Views

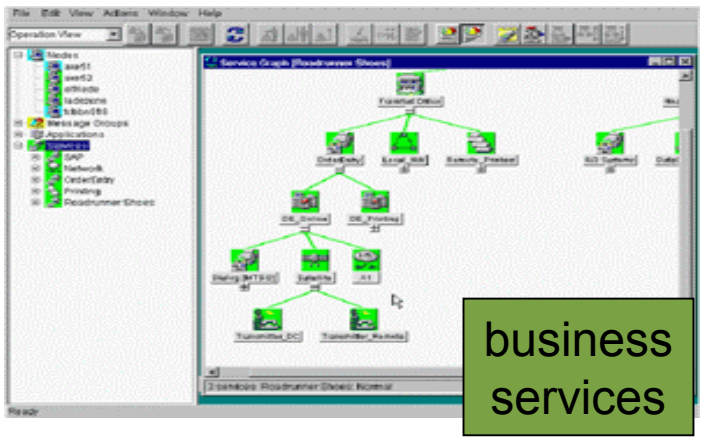
- Need a custom view?
- Create dynamic views as needed
- Based on
  - Device types
  - Device attributes

Prioritize the Problem

Operator understands network impact

- **what's the health of network service: (VLAN, OSPF, HSRP)**
- **redundant networks paths still working?**
- **trunks, meshes, OSPF areas, HSRP standby routers…**





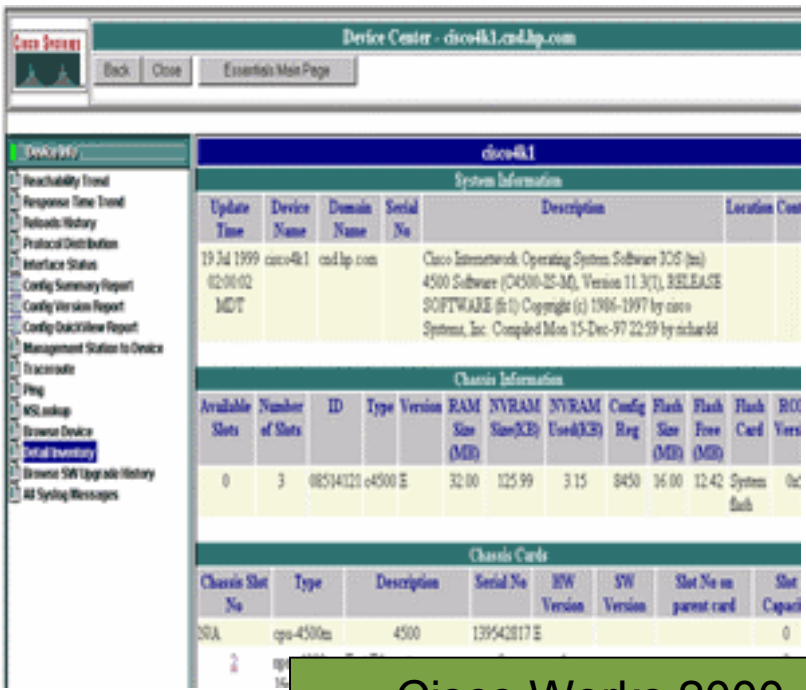
hp OpenView service navigator

Operator understands business impact

- **what systems & applications depend on these network paths**
- **what business services and customers are affected?**

Take Action

fix and verify

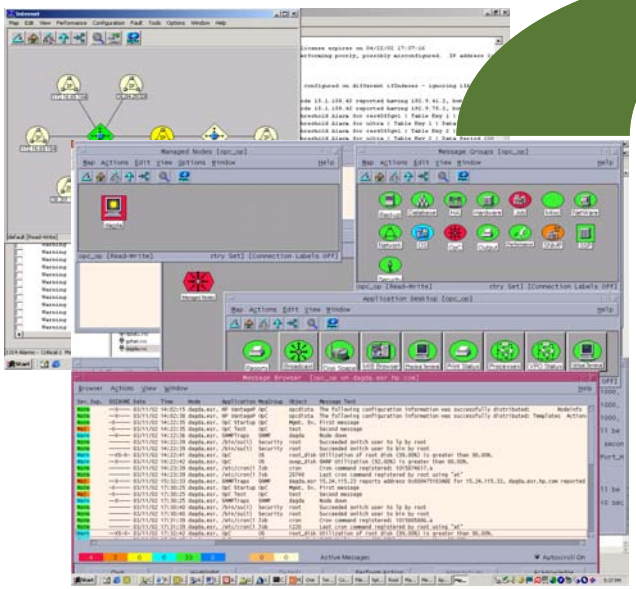


Cisco Works 2000 integration shipped w/nnm

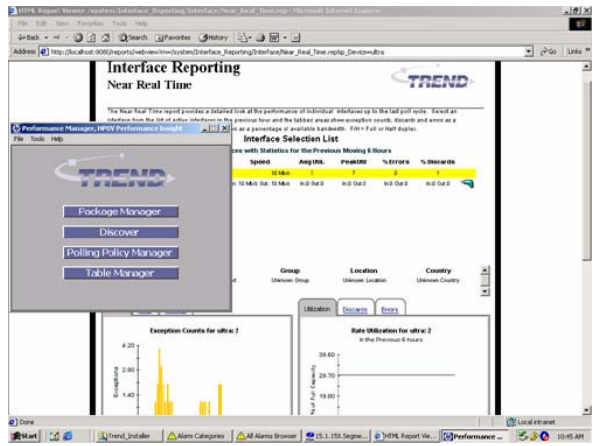
- launch device **element manager** for further investigation & corrective actions
- NNM & HP OpenView Operations ***automated actions***
- Service Desk for **fix control & documentation**
- **check** NNM views – configuration changes happened?
  - missing PC added to VLAN?
  - new router added to OSPF area 0?

Integration with NNM OVPI Integration

node list synchronization



threshold traps

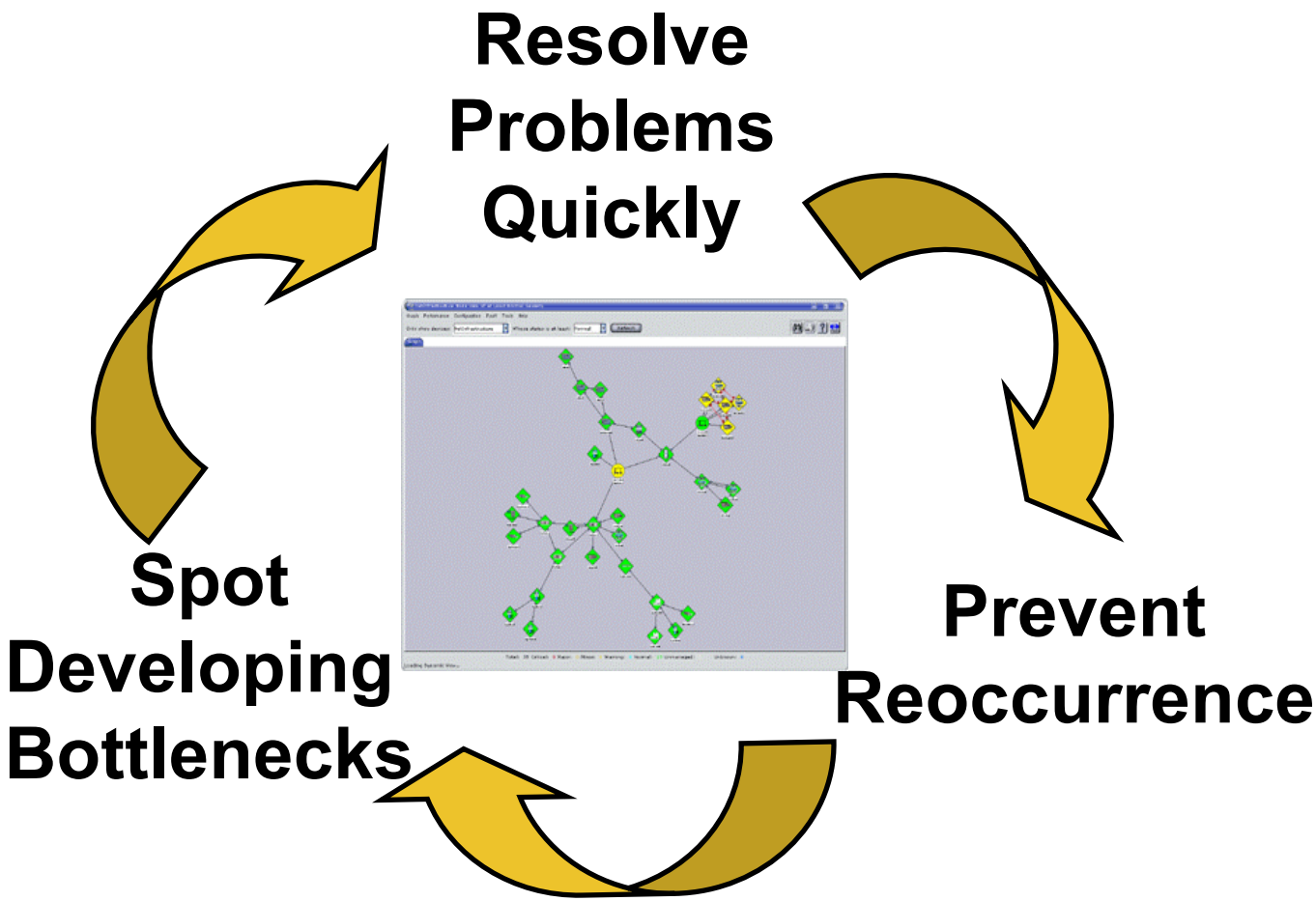


HP OpenView NNM/
HP OpenView Operations

HP OpenView PI

context based PI
report launching

Keeping Networks Healthy



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