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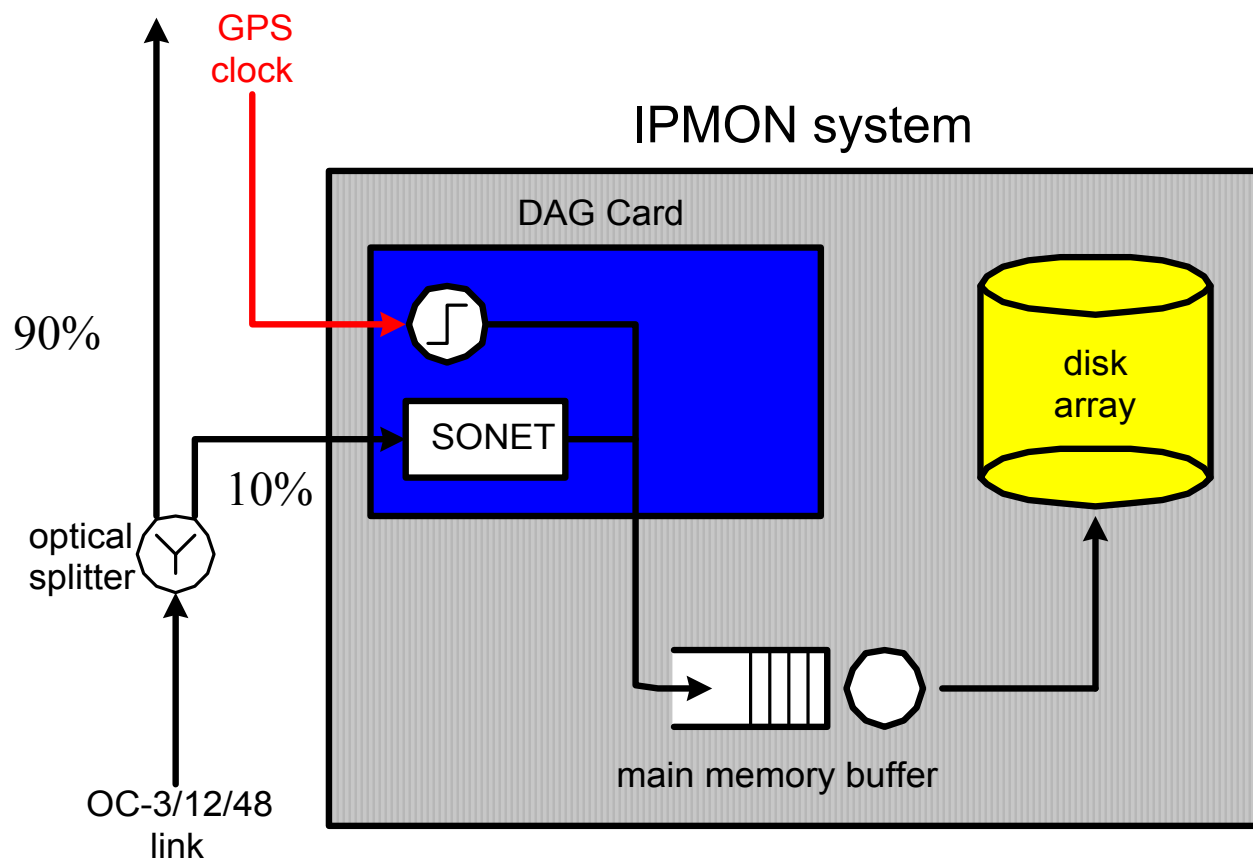
# *Monitoring: from research to operations*

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ipmon.sprintlabs.com

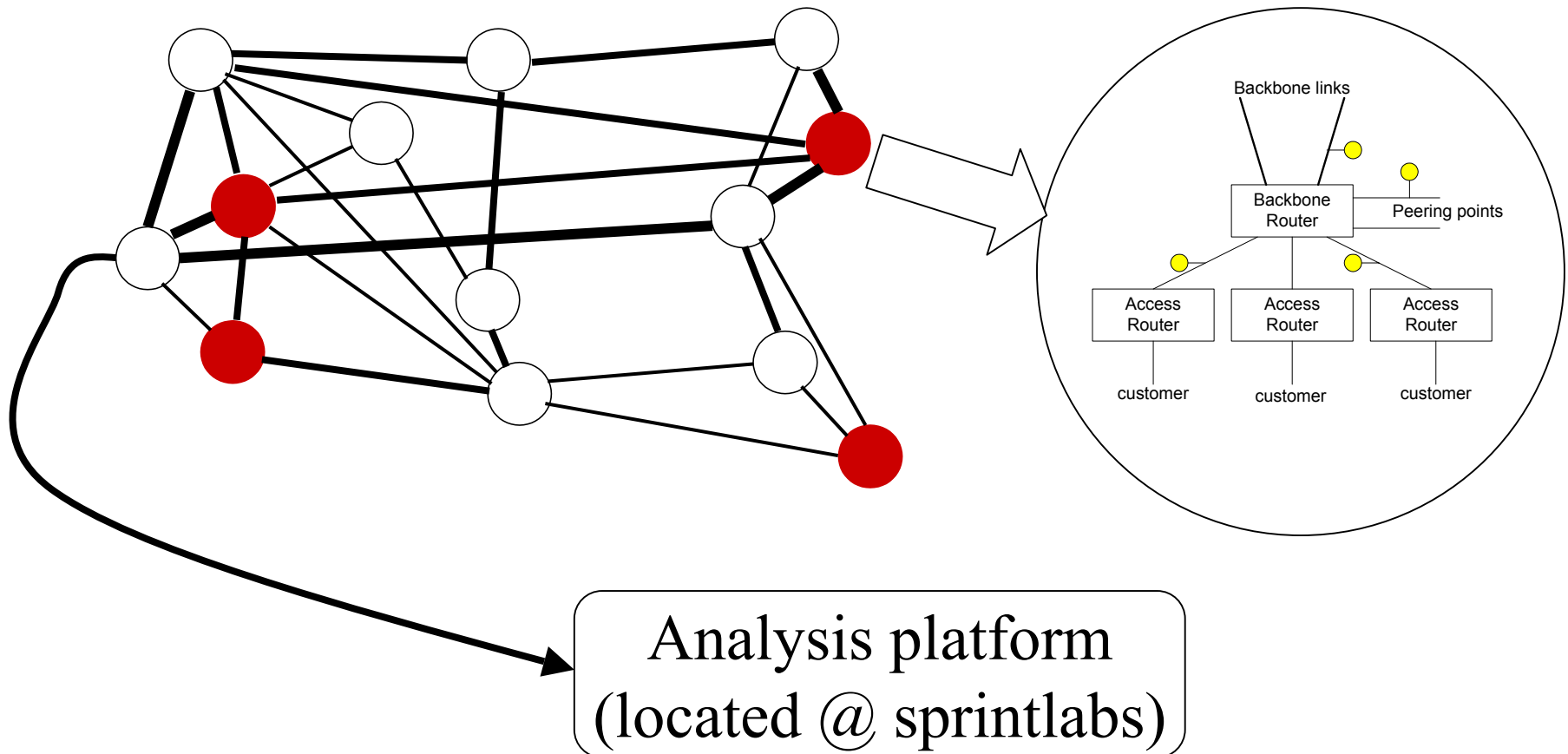


# Monitoring System Architecture



Linux PC with multiple PCI buses

# IPMON architecture



# *Needs for Monitoring*

- Management
  - configuration, traffic engineering
  - forecasting, provisioning, dimensioning
  - traffic matrices
- Diagnosis
  - detect and report problems
- Value-added services
  - feedback to customers



## *What information is needed*

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- Time-stamped IP headers
- IS-IS and BGP information
- Lower level alarms (if any)
- SNMP
- Router logs

## *Systematic approach*

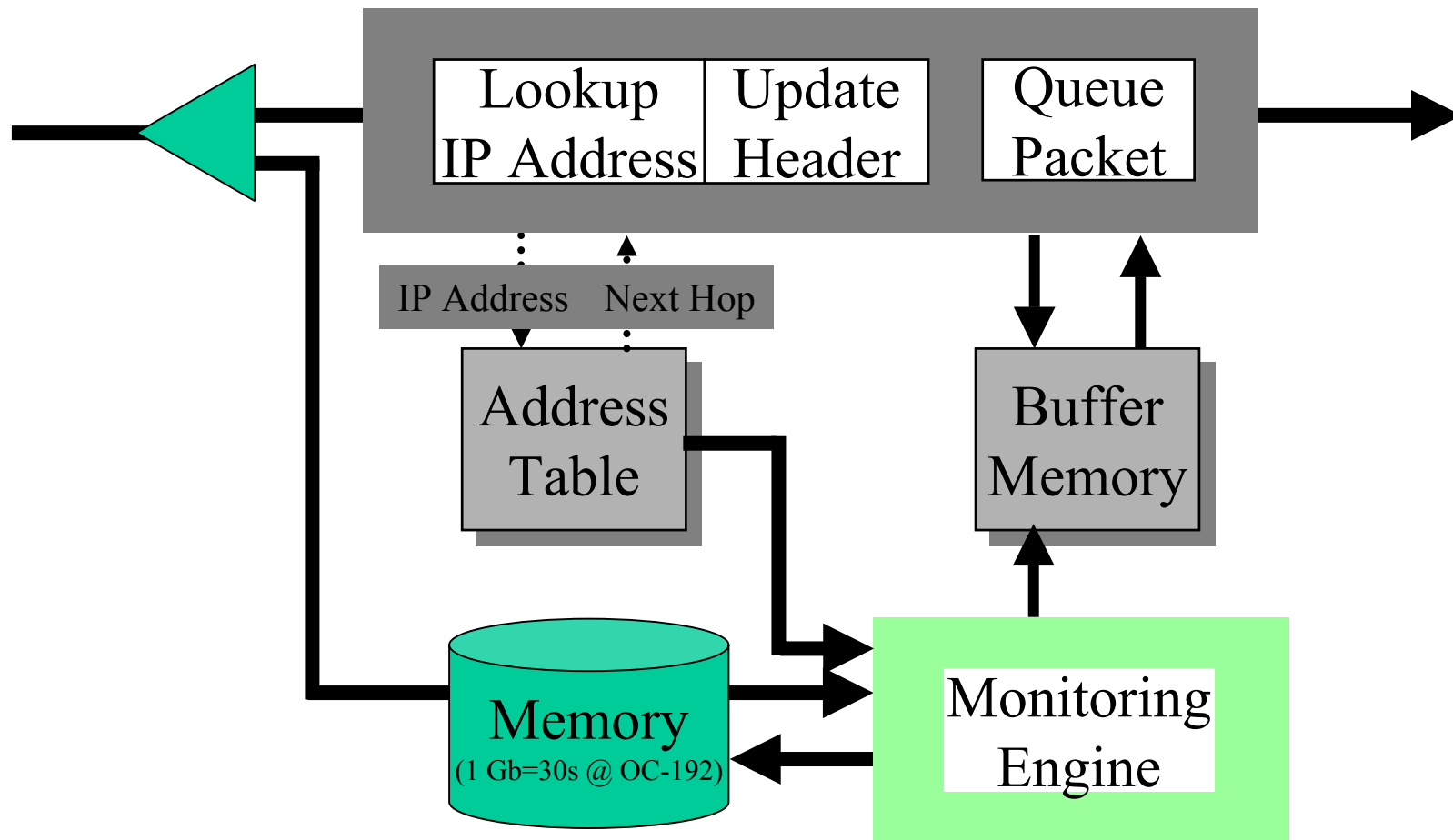
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- Continuously monitor each link
  - Compute and export a small set of statistics (volume, peak, flows, out-of-sequence)
  - Store packet traces for a limited amount of time
- Query when more is needed
  - SQL type queries
  - Match routing information to packet trace

## *How to implement*

- Active monitoring does not solve all problems
- OC-x MON approach is quite expensive and increases network complexity
- Line cards would be optimal
  - packet traces and routing information available
  - must not affect forwarding performance

# Implementation





## *Potential problems*

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- 5 clock cycles at OC-192 between two 40 bytes packets
- Query/Export might be heavy
- Complexity for line cards
- Memory
- Centralized management

# *ipmon.sprintlabs.com (under construction)*


IPMon Data Analysis - Netscape

File Edit View Go Communicator Help

Instant Message WebMail Radio People Yellow Pages Download Calendar Channels

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://ipmon.sprintlabs.com/paccess/ipmondataanalysis.php> What's Related

 **Sprint**

## IPMon Data Analysis

**Trace Analysis - Public Access**

[Packet Trace Analysis](#)  
Request/view a popular set of packet trace analysis results e.g. packet size distribution, pound trip time distribution and protocol break down etc.

[Routing Information](#)  
Some useful BGP Routing information.

[Delay Information](#)  
Some useful Delay information.

[IPMON Homepage](#)  
Find out more about the IPMon Project

**Latest System News & Updates**

(2002-04-17)  
Realtime Routing information added

(2002-01-19)  
Generating new site diagram by modifying previous copies of site diagram is now possible.  
New interface to modify existing site diagram is complete.

(2001-12-18)  
Link-layer topology discovery per PoP and US wide now available.

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Contact [Sprint ATL](#) with comments or questions.



## *To know more*

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- [ipmon.sprintlabs.com](http://ipmon.sprintlabs.com)
- Internet draft:  
    [draft-bhattacharyya-monitoring-sprint-00.txt](#)
- [cdiot@sprintlabs.com](mailto:cdiot@sprintlabs.com)

