Network Test Tools
for
Voice and Video

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What Do You Do When…

The traditional NMS fails to meet your needs?

A. Tell your boss that it isn't possible.

B. Call your NMS vendor and complain.

C. Ask your friends and search the web.

D. Run around in circles, screaming and pulling your hair out.

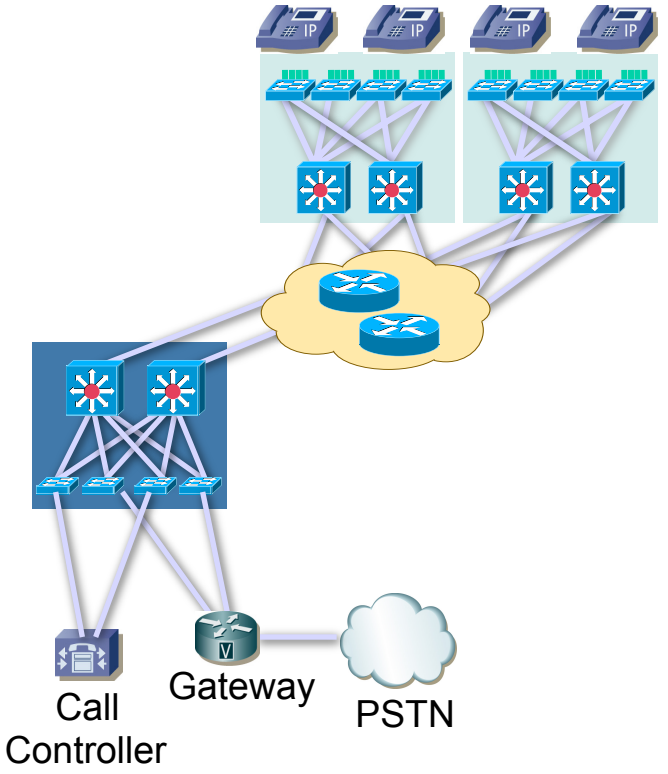
E. All of the above.

Traditional NMS

- Element management (devices & interfaces)
- Event logging and processing (syslog and SNMP Trap)
- Primarily device and link performance
- Poor visibility into QoE for apps, including voice/video
- Good things, but not sufficient for voice/video

Voice/Video Monitoring

- **Problem detection**
  - When did it occur?
  - Where in the path did the problem occur?
  - Characterize the problem
    - Calls don't connect
    - Poor audio/video quality
    - Calls drop
    - Conference calls don't work
- **Problem isolation**
  - What subsystem is failing?
  - Where in the path should I look?

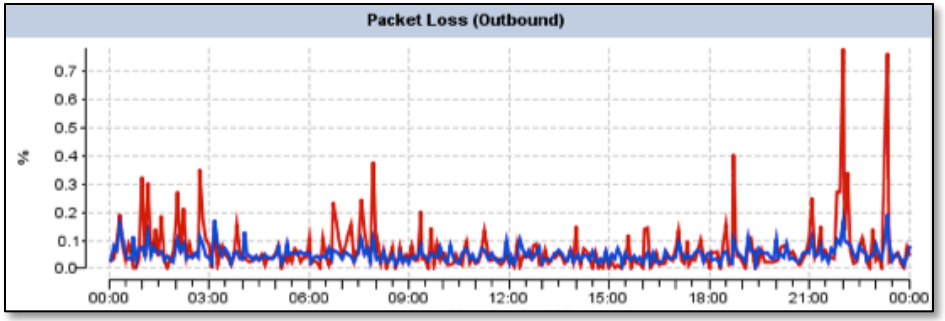


What to Test and Monitor

- **Signaling: call setup and termination**
- **Bearer traffic characteristics: delay, jitter, and packet loss**
  - **Many things influence these factors**
  - **Identifying the source of problems can be difficult**
- **Monitoring QoE**
  - **Use simulated calls**
  - **Monitor real user calls**
  - **Both?**
- **Provide *Information*, not *Data***
  - **Don't overwhelm the network manager**

Tool Requirements

- **Identification of voice/video problems**
  - Dashboard and reporting (what to tell the boss)
  - Thresholds and alerting
- **The type of problem**
  - call connect
  - poor quality
  - call drop



- **The time and duration of the problem**
- **Historical records with trending**
- **Network segments to investigate**
- **Drill-down to more detailed information**
- **Troubleshooting tools**
  - Real-time monitoring tools

Tool Categories

- **Active**
  - Generate synthetic traffic – simulate call traffic
  - Interact with the signaling systems
  - Can find problems before customers use the system
  - Also useful for troubleshooting and diagnosis
  - Place probes where endpoints are located
  - May initiate other tests to isolate problem location
- **Passive**
  - Watch real user traffic
  - Identifies actual problems between endpoints
  - Can measure QoE
  - May require switch SPAN port to see call traffic
  - Some monitor call controller operations

Cost of Ownership

- How much does it cost? Compare with the loaded cost of a staff member
- What is the maintenance cost and burden?
- How many devices are needed and what are the installation requirements?
- What's the learning curve like?
  - Can it be effectively used after periods of minimal use?
- Compare with the cost of having part of the voice/video system down or underperforming

Panelists

Tool Types and voice/video management and monitoring:

Paul Barrett, Netscout

Matt Stevens, AppNeta

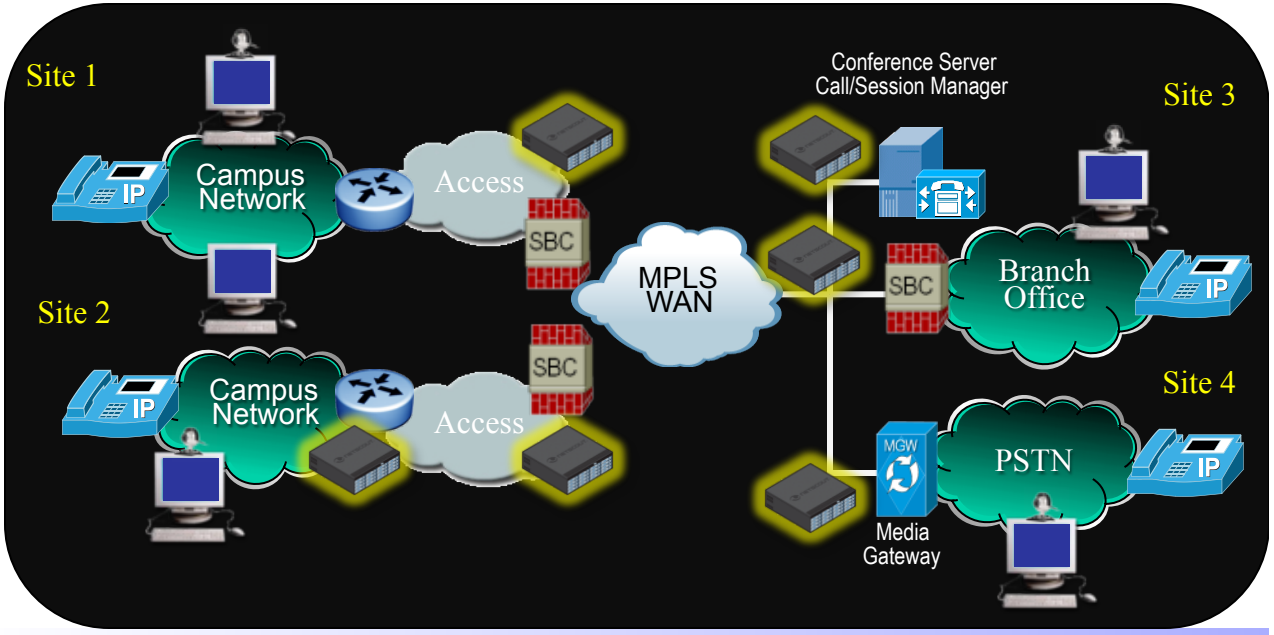
John Dunne, Integrated Research

Passive Tool: Packet Capture

- Identify problems in bearer traffic
- SPAN or Tap to capture packets
- Common stats: Delay, Jitter, Loss
- Deep packet analysis: Echo, Noise, Distortion
- Install at network choke points

- NetScout,

  Telchemy



Active Tool: Endpoint Monitors

- Identify endpoint problems
- Monitor all endpoints
  - Call controllers, Phones, Gateways, SBCs, etc
  - Multi-vendor
- Resource utilization: Trunks, DSP pools, VM storage, dial plan
- System-wide views
  - Groups of endpoints with problems
  - Call controller health
- Good for overall system health monitoring
  - Essential for multi-vendor systems
- Integrated Research: Prognosis

Active Tool: Active Path Testing

- Simulate voice or video
  - Delay, Jitter, Loss
  - Available Bandwidth, QoS consistency
- Heisenberg Uncertainty Principle
  - Minimize impact to the system being measured
  - Determine the path and operational characteristics
- ICMP and UDP probe packets
  - Multiple sizes – measures latency and link capacity
  - Traceroute-like functionality
- Scaling to many tests
  - Alerts only on failed tests
  - API to configure test endpoints
- AppNeta: PathView