Session N1
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Do Web Measurements Measure Up?

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KEYNOTE
The Internet Performance Authority

Why Measure?

- To enforce Service Level Agreements
- To find and fix problems quickly
- To improve site revenue and load capacity
- To provide research data

... to enforce Service Level Agreements

- **Often has financial and career implications!**
- **Must be:**
  - **Representative**
    - Location (geo, backbone, access type, time of day)
  - **Accurately measured**
    - Avoid inaccurate emulations; e.g. of dial-up
    - Delete erroneous measurements, but not inconvenient measurements
- **Must use appropriate statistical treatments**
  - **NO arithmetic means and standard deviations!**
  - **Confidence interval calculation difficulties!**

... to find and fix problems quickly

- First goal is to get the correct staff involved, not to diagnose
  - Correct staff will have access to special tools and data
- Wide distribution of measurement agents
  - see patterns without doing complex diagnosis
  - *But*: are you responsible for the last dial-up mile of each of your end users?
  - *Or* do you just want to capture the effects of caching and other architectural characteristics of the major access providers?
- Specialized tools to fix individual user's problems

... to improve site revenue and load capacity

- **Workload characteristics to improve site flow and to prepare for load testing**
  - **frequent paths through site**
  - **exit or abandonment points and frequencies**
    - Affected by page, user class; session duration;... Correlation with performance measurements
    - Abandonment rates are critical for Web load testing, but abandonment is difficult to detect.
- **Reliable counts for advertising revenue**
- **Correlation among different techniques for measuring workload**

... to provide research data

- Improve methods for calculating confidence intervals and for obtaining a desired confidence interval (possibly by adaptive measurement)
- Measure overall health of the Web for government agencies and the press
- Locate bottlenecks in the Web and calculate the ROI for improving them
- But... without violating privacy or collecting data that could be used to violate privacy
- *See Keynote's White Papers!*

Questions

- **We can provide end-user performance measures from major nodal points on major ISPs in major metropolitan areas to evaluate performance**
  - **For SLAs and diagnosis, uncongested access links ensure that any problems are due to backbone or peering issues**
  - **How can we drive these measure to the leaves of the tree with statistical reliability in a cost-effective and privacy-sensitive manner?**
    - What are we actually measuring?
    - What will we do with the measurements?
- **Reliable abandonment and site path data?**
  - **Measurement panel bias *vs*. privacy problems**
- **Dollar value of performance problems?**
- **Adaptive measurement to get a desired level of accuracy / confidence interval / diagnostic precision quickly?**