Thesis Summary Sheet: Monitoring and measuring server availability

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Background
The Internet today consists of various services namely web servers, mail servers, domain name servers etc. With these services, it is crucial to monitor and measure the availability of these servers to ensure that they’re always assessable by end-users. There are numerous problems that can cause server unavailability such as client errors, server errors or network errors. This thesis aims to monitor the availability of these servers through measurement of important metrics and to inform users so that they can choose highly available services, and to inform providers so they can measure and improve their availability.

Web Server (HTTP)
HTTP is the most important protocol in the World Wide Web today and is responsible for downloading web pages from the Internet. Due to the rising requests the server needs to handle, web server occasionally becomes unavailable causing loss of customer time.

Domain Name Server (DNS)
DNS is responsible in mapping host name to IP address. Without this server, almost all Internet services won’t be able to function. Thus, unavailability in DNS would cause significant downtime in network services.

Mail Servers (SMTP, POP)
SMTP is the most widely used Internet Mail protocol and is responsible for transferring mail over the Internet. POP is a protocol used to retrieve email. The availability of these protocols will determine dependability on email thus monitoring and measuring mechanisms is needed.

Implementation Approach
- Use adaptive probing rate technique to monitor servers
- Monitor server TCP connection to check unavailability
- Analyze status codes/response time to determine partial availability
- Implementation of data logger

Possible Challenges
- Ability of tool to handle monitoring of multiple servers
- Ability to deal with multiple IP per server domain.
- Tool accurately measure important availability/performance metrics
- Provide end-user perspective data

Useful Tools/Software/Libraries/Docs
- Editors, gcc and Linux
- Ethereal, Telnet
- Packet capture library (pcap.h)
- SMTP/POP/HTTP/DNS RFC