# Lectures on the Internet and Mobile Computing

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*Ecole SIG at nouvelles Technogies en Democratic Republic Congo, 12-17 Septembre, Organisee par l’Universite de Kinshasa*

1. **The Internet Digital Divide: the emergence of Africa, see** [**http://www.slac.stanford.edu/grp/scs/net/talk11/kinshasa.pptx**](http://www.slac.stanford.edu/grp/scs/net/talk11/kinshasa.pptx)  
   Saturday 17 September
   * Why does Africa’s Internet performance matter?
   * How do we measure performance?
   * What do we find?
   * What is happening and the impact?
   * Next Steps?
   * Conclusions
2. **Internet History, trends and futures, see** [**http://www.slac.stanford.edu/grp/scs/net/talk11/internet-history.pptx**](http://www.slac.stanford.edu/grp/scs/net/talk11/internet-history.pptx)   
   Monday 12th September14:00-15:50
   * Brief history
   * Design goals
   * Growth & Success
   * Current challenges
   * Internet NG
   * What is driving the changes
   * What is enabling the improvements
3. **How is the Internet performing, see** [**http://www.slac.stanford.edu/grp/scs/net/talk11/perform.pptx**](http://www.slac.stanford.edu/grp/scs/net/talk11/perform.pptx)Tuesday September 13 11:00-12:30
   * Internet characteristics
   * Users, capacities, satellites, packet sizes, protocols, routing, flows
   * How is it used apps etc.
   * How the Internet worldwide is performing as seen by various measurements and metrics
   * Application requirements
   * Case studies
     + Digital Divide and Africa (some of this will be covered in the Grid Day presentation)
     + Cable cuts
     + Impact of TEIN3
     + Pakistan
     + 2011 Arab Spring
4. **Cell Phones, see** [**http://www.slac.stanford.edu/grp/scs/net/talk11/cellphone-work.pptx**](http://www.slac.stanford.edu/grp/scs/net/talk11/cellphone-work.pptx)  
   *Thursday September 15, 11:00-12;30*
   * Not covering Cordless phones, CB radios, pagers, car phones, Iridium etc.
   * How they work
   * History
   * Cell phone components
   * Power
   * Carriers
   * Coverage
   * Bars
   * Growth
   * Concerns
5. **Smart phones & other Mobile computing, see** [**http://www.slac.stanford.edu/grp/scs/net/talk11/smartphones.pptx**](http://www.slac.stanford.edu/grp/scs/net/talk11/smartphones.pptx)  
   Thursday September 15 14:00-15:30
   * Wireless
   * What is a smartphone and their growth
   * Why are they important
   * How are they used
   * What’s coming
   * Bandwidth impact
   * Not for everybody yet
   * Laptops & Netbooks
   * Smartbooks
   * Tablets
   * Security
   * WiFi
     + How it works
     + Protocols
     + WiFi and smartphones
6. **Diagnosing network problems for non-networkers, see** [**http://www.slac.stanford.edu/grp/scs/net/talk11/diagnosis.pptx**](http://www.slac.stanford.edu/grp/scs/net/talk11/diagnosis.pptx)  
   Friday September 16, 11:00-12:30
   * Goal: provide a practical guide to debugging common problems
   * Why is diagnosis difficult yet important?
   * Local host
   * Ping, Traceroute, PingRoute
   * Looking at time series
   * Where is a node
   * Who do you tell, what do you say?

### Others

Probably we will not cover the items below due to lack of time.

1. **Geolocation, see** [**http://www.slac.stanford.edu/grp/scs/net/talk10/geolocation.pptx**](http://www.slac.stanford.edu/grp/scs/net/talk10/geolocation.pptx)
   * Importance
   * How is it done
   * Dynamic method
     + RTT => distance
     + Geometrical methods of finding location from circles
   * Application
     + Management of landmarks
     + Tiering
   * Challenges
2. **How does the Internet work, see** [**http://www.slac.stanford.edu/grp/scs/net/talk09/ictp-tcpip.ppt**](http://www.slac.stanford.edu/grp/scs/net/talk09/ictp-tcpip.ppt)
3. **Network Measurements, see** [**http://www.slac.stanford.edu/grp/scs/net/talk10/internet-measure.pptx**](http://www.slac.stanford.edu/grp/scs/net/talk09/ictp-measure.ppt)
   * Why is measurement important?
   * LAN vs WAN
   * Passive
     + SNMP, Netflow
     + Effects of measurement interval
   * Active
   * Tools various
     + Ping, traceroute
     + Available bandwidth, achievable bandwidth
   * PingER
     + Motion metrics video (5 mins)