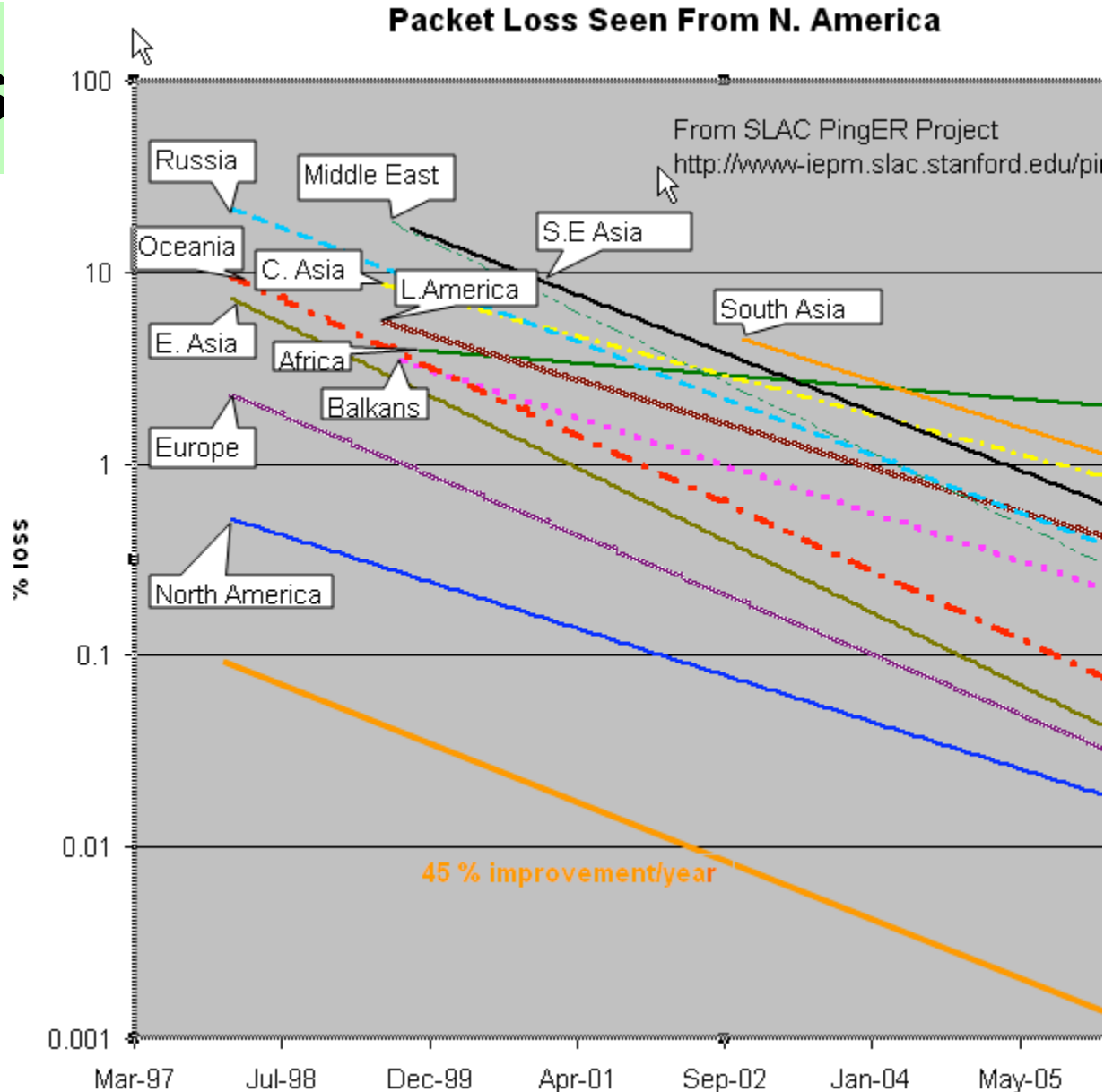


Trends: Losses

STANFORD LINEAR ACCELERATOR CENTER

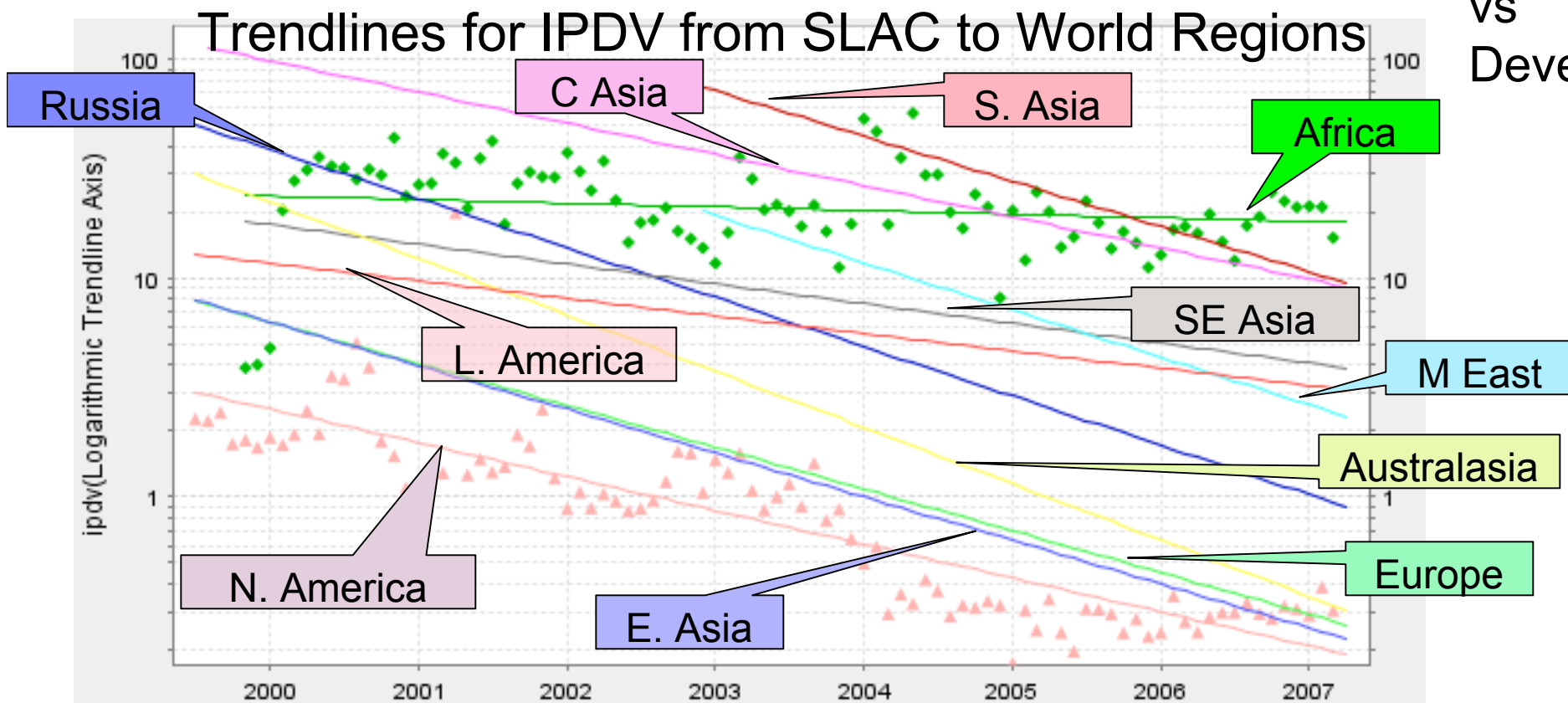
- Mainly distance independent
- Big impact on performance, time outs etc.
- Losses > 2.5 % have big impact on interactivity, VoIP etc.
- N. America, Europe, E. Asia, Oceania < 0.1%
- Underdeveloped 0.3- 2% loss, Africa worst.



Jitte

- ~ Distance independent
- Calculated as Inter Packet Delay Variation (IPDV)
 - $IPDV = Dr_i = R_i - R_{i-1}$
- Measures congestion
- Little impact on web, email
- Decides length of VoIP codec buffers, impacts streaming
- Impacts (with RTT and loss) the quality of VoIP

Usual
division
Develop
vs
Develop



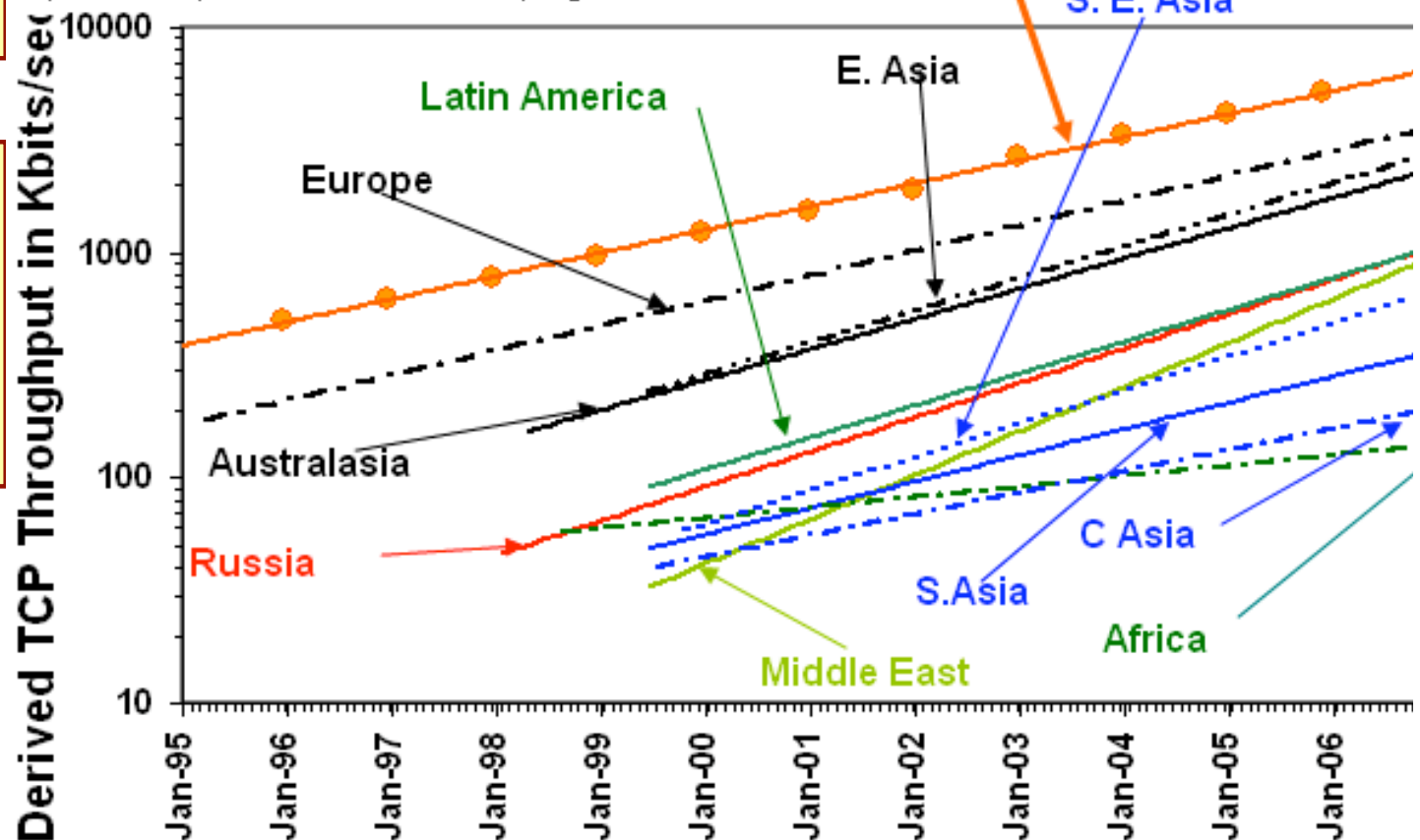


World throughput

Derived throughput $\sim 8 * 1460 / (RTT * \text{sqrt}(\text{loss}))$
Mathis et. al

TCP Throughput Measured From N. America to World Regions

From the PingER project, August 2007
<http://www-iepm.slac.stanford.edu/pinger/>



Behind Europe
 6 Yrs: Russia, Latin America
 7 Yrs: Mid-East, SE Asia
 10 Yrs: South Asia
 11 Yrs: Cent. Asia
 12 Yrs: Africa

South Asia, Central Asia, and Africa are in Danger of Falling Even Farther Behind