Origins of Timing Noise

• Everything adds noise
  • Reference, PFD, charge pump, supply voltage, ...
  • Look at jitter TF for each one
  • And actual cause of noise (jitter)

PFD Jitter

• Why does a PFD add jitter?
Estimating Jitter in “Digital” Gates

LF Noise

PFD Jitter TF

VCO Noise TF

CP Noise

Implications on PLL Design
Implications on PLL Design