# Telecommunications @ Crossroads

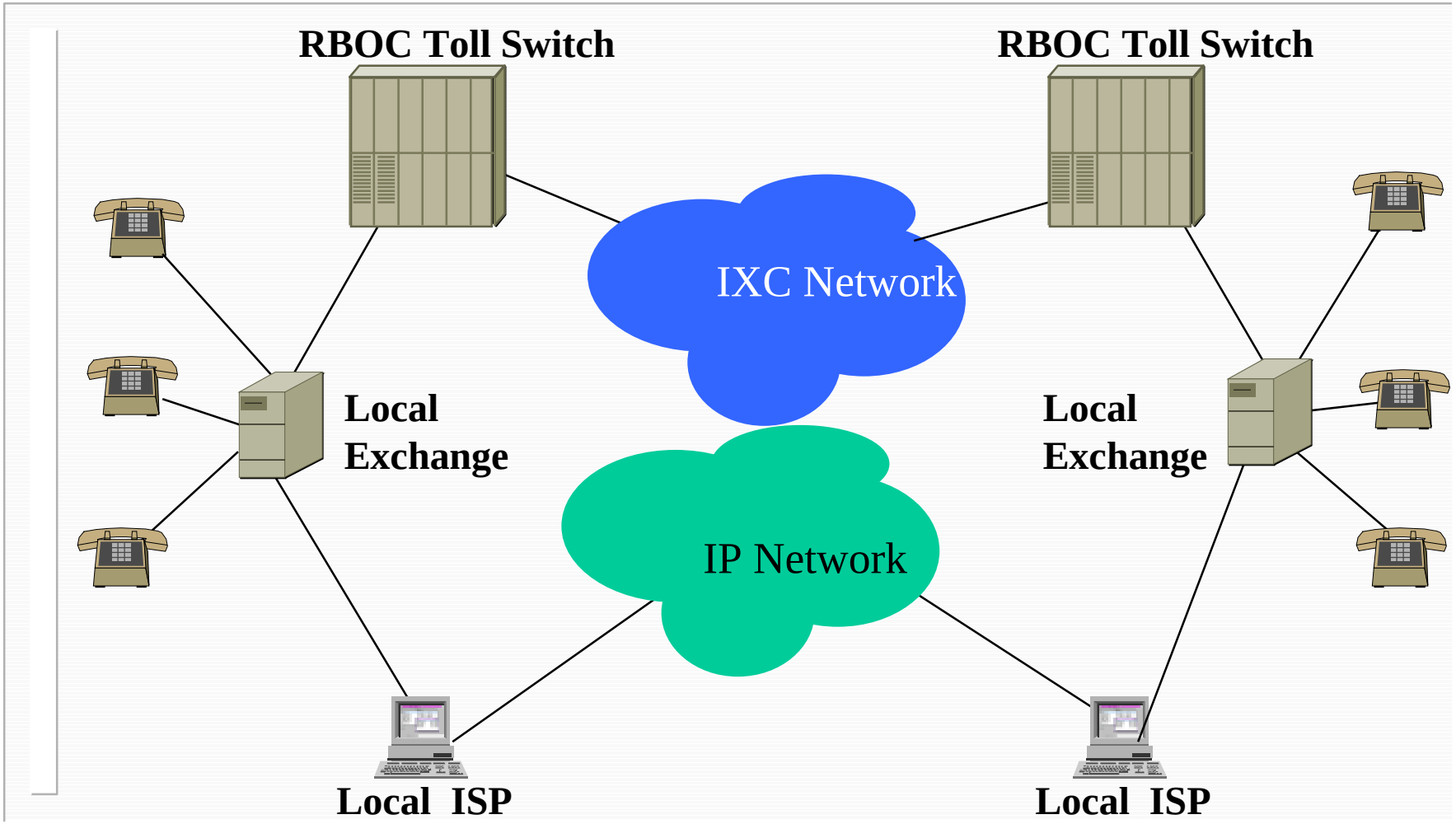
Philip K. Mutooni

President

IP.Phusion Technologies, Inc.

IP Phusion™

# Current Network Infrastructure



# The Traffic Transition Model

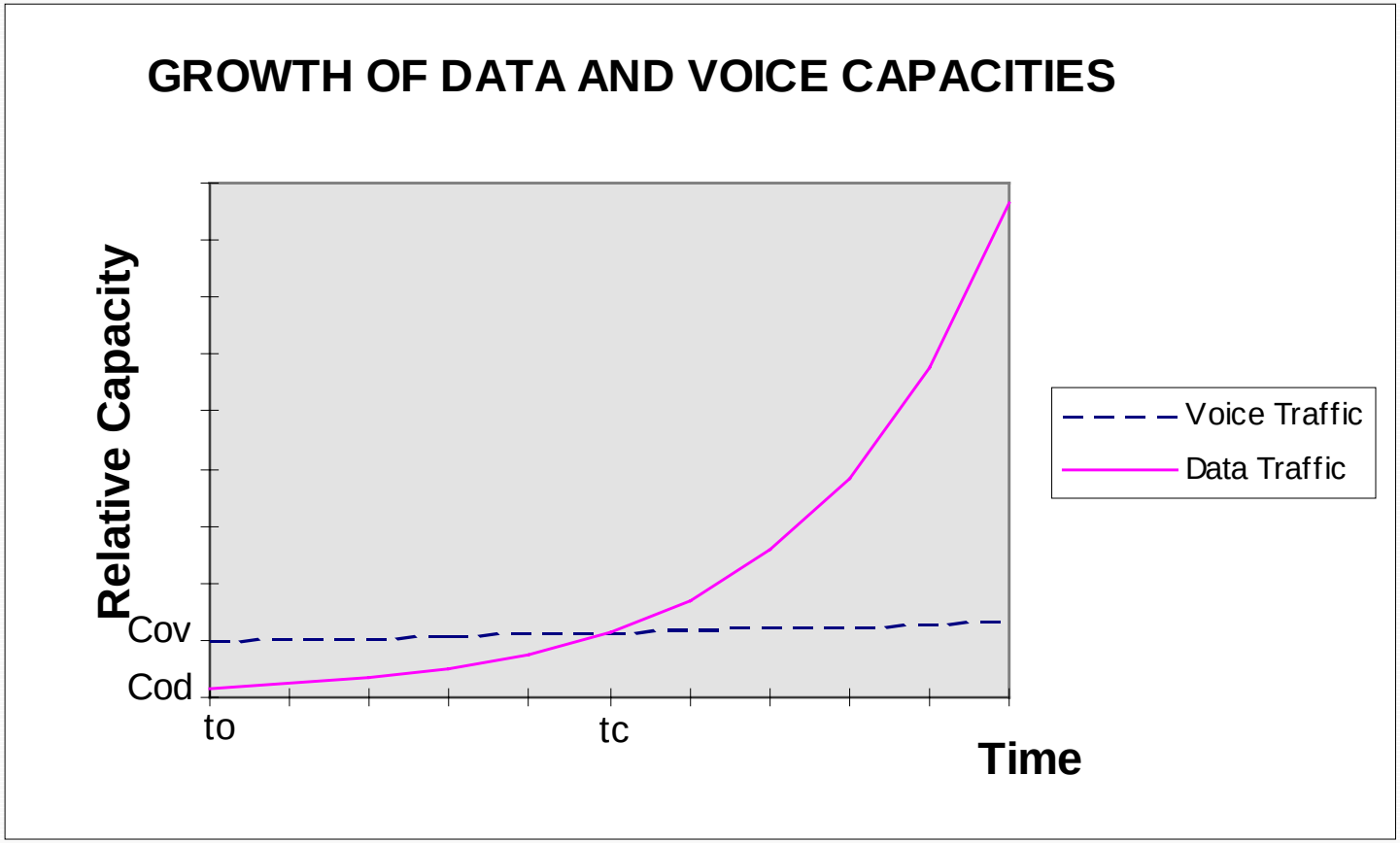
- Assumptions:
  - Installed Capacity closely matched with peak traffic
  - Capacity growing at constant compounded rate
- Formulation:
  - $C(\tau)=C_o(1+r_x)^{\tau}$

where $C_o$ is a base capacity, $r_x$ is a voice or data growth rate, and $\tau$ is a time duration

  - $C_{ov}=\alpha C_{od}$

where $\alpha$ is a constant determined during the model's calibration

# Model Formulation




* The general function used to plot these graphs was $k(1+x)^t$. A different value of x was used in both the voice and data cases with x(voice) < x(data).

# Desired Model Results

- Five quantities of interest:
  1. $t_l$ or the lead-user point:

  Defn - The point at which packet-data traffic required 10% of the total capacity

  2. $t_c$ or the crossover point:

  Defn - The point where both types of service require the same capacity

  3. $t_e$ or the eclipse point:

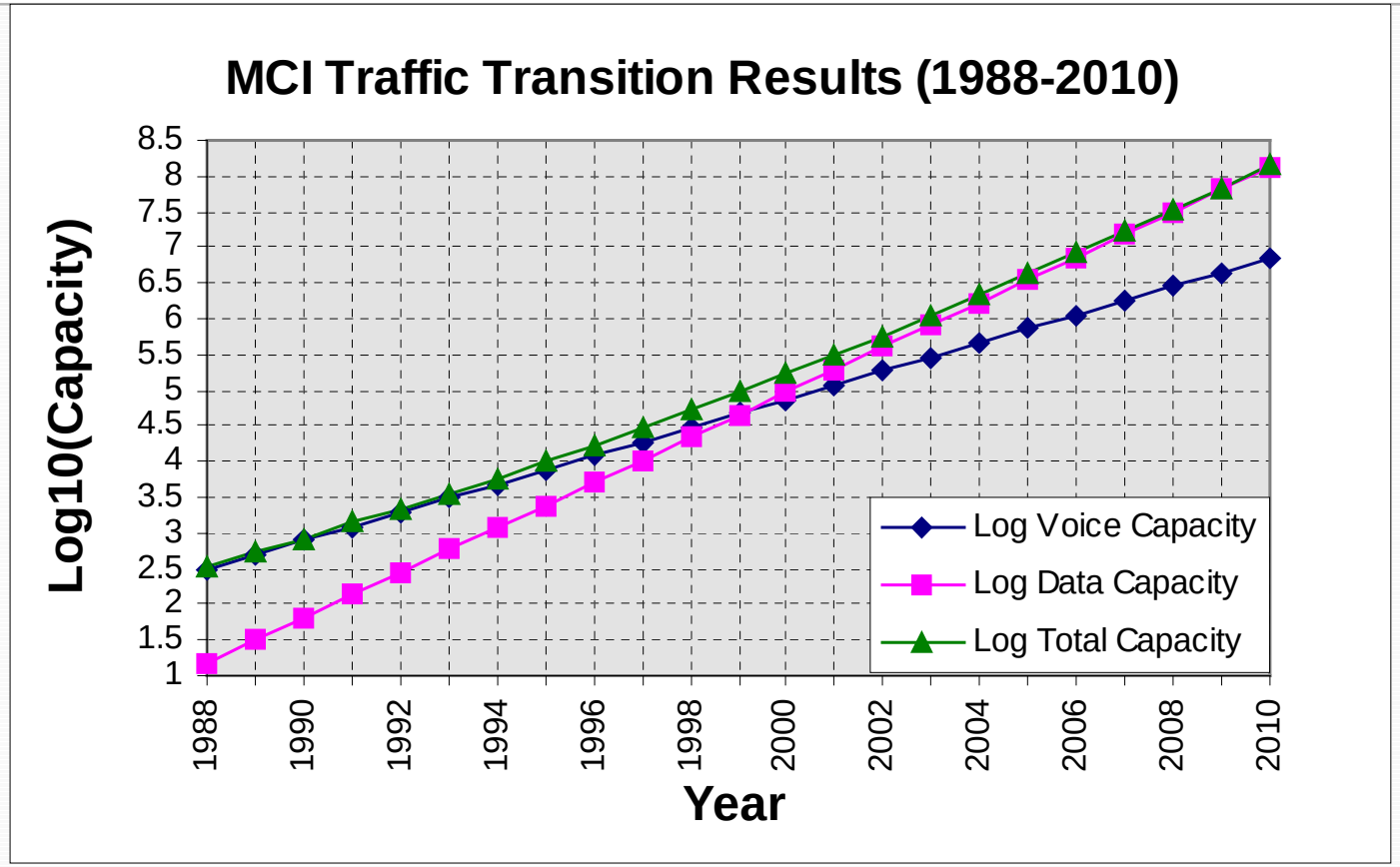
  Defn - The point where packet-data traffic consumes 90% of overall backbone capacity

  4. The time interval $t_c$-$t_l$
  5. The time interval $t_e$-$t_c$

# Calibrating the Traffic Transition Model

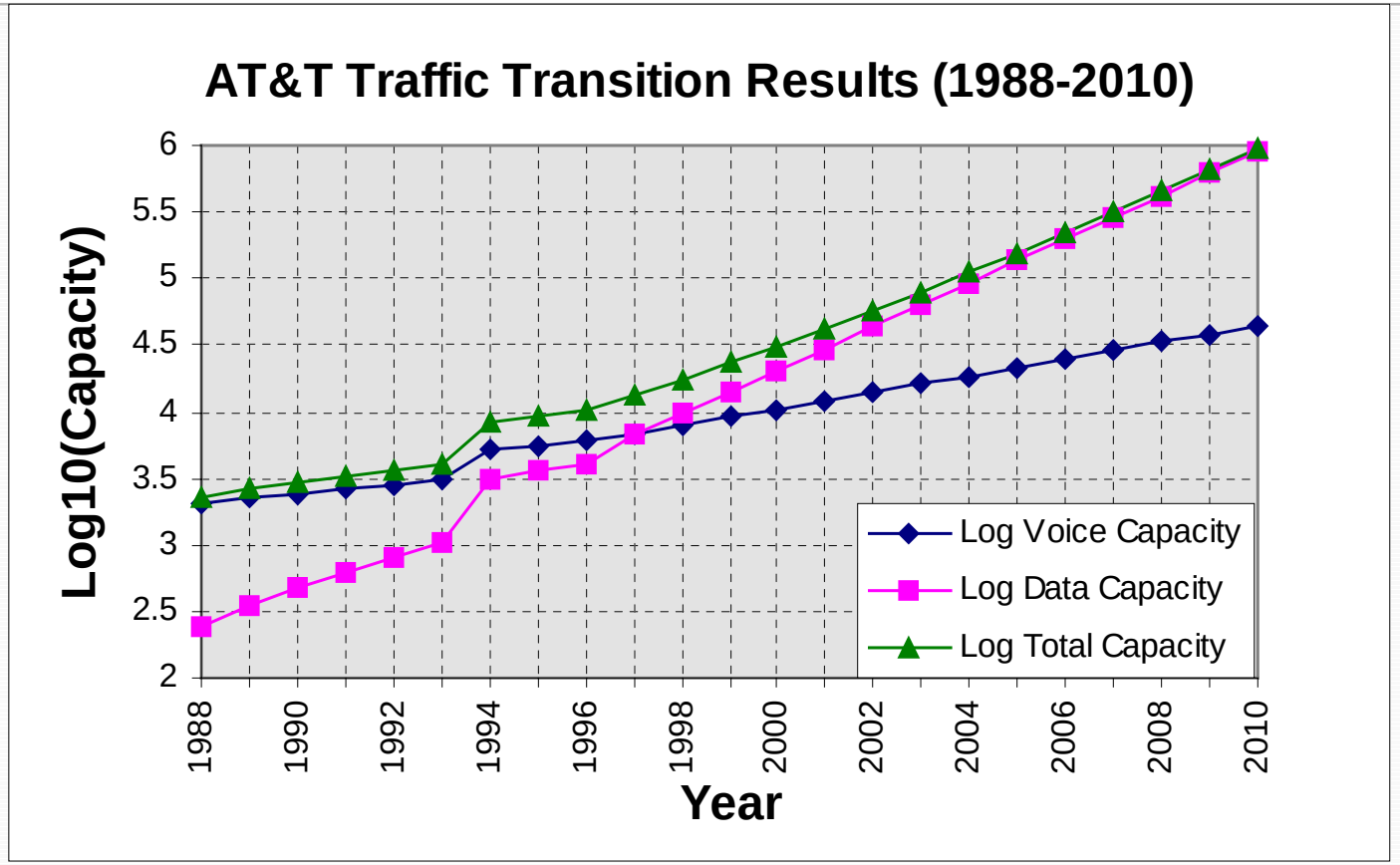
- Four Step Process:
  1. Obtain Overall Capacity $C_{total}$ at known points
  2. Decompose $C_{total}$ into $C_{voice}$ and $C_{data}$ components
  3. Determine growth rates $r_v$, $r_d$, and $r_{total}$
  4. Determine $t_l$, $t_c$, $t_e$
- Process applied to two data sets:
  - For a selected MCI POP
  - For a selected ATT POP

# Model Results - MCI Case



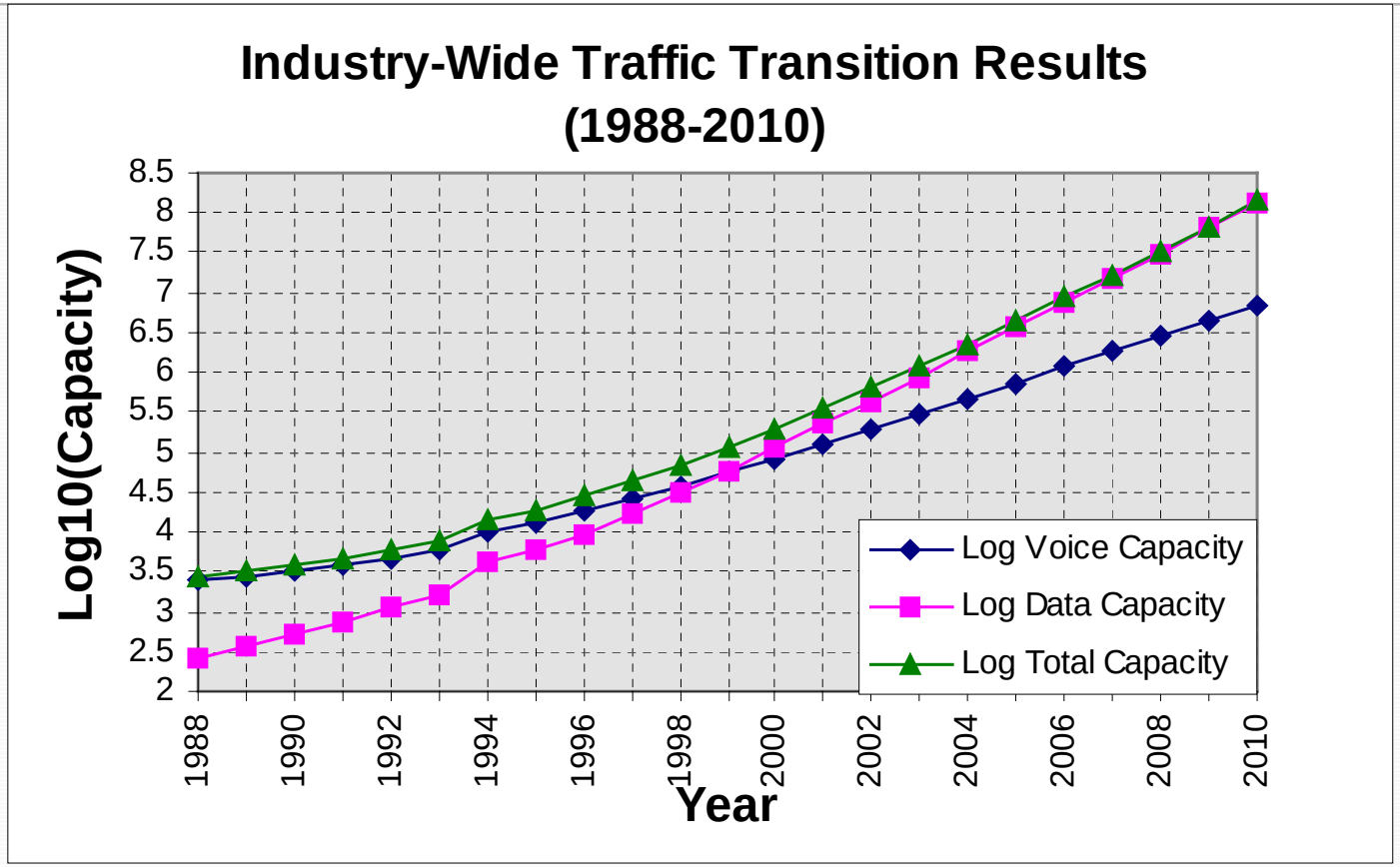

| $t_l$ | $t_c$ | $t_e$ | $t_c - t_l$ | $t_e - t_c$ |
|---|---|---|---|---|
| 1991 | Jan 1999 | 2007 | 8 yrs | 8 yrs |

# Model Results - ATT Case




| $t_l$ | $t_c$ | $t_e$ | $t_c - t_l$ | $t_e - t_c$ |
|---|---|---|---|---|
| 1988 | Apr 1997 | 2006 | 9 yrs | 9 yrs |

# Model Results - Industry-wide




| $t_l$ | $t_c$ | $t_e$ | $t_c$-$t_l$ | $t_e$-$t_c$ |
|---|---|---|---|---|
| 1988 | Nov 1998 | 2007 | 10 years | 9 years |

# Key Findings - General

- Window in which data traffic increases to contribute 90% of overall traffic is 10 years from 1997.
- Crossover point in 1998.
- Suddenness of the change, as opposed to change itself, is key in determining post “crossover” industry structure.

# Key Findings - IP Telephony

- Due to short transition interval, growth of IP telephony will be very sudden and very significant
- Potential of infrastructure sharing is key driver of IP telephony, not bandwidth savings

# IP.Phusion Technologies, Inc

- Mission: To be the premier provider of Open and Cross-Platform Support Systems for IP Telephony
  - "Shrink-wrap" Software: Billing and NMS
  - Customized Software: Billing/CDR Interfaces
  - Solutions: Consulting, System Integration, and Network roll-outs for Service Providers.
- Founded: By Researchers from ITC and LCS
- Contact Info: www.ipphusion.com
  info@ipphusion.com