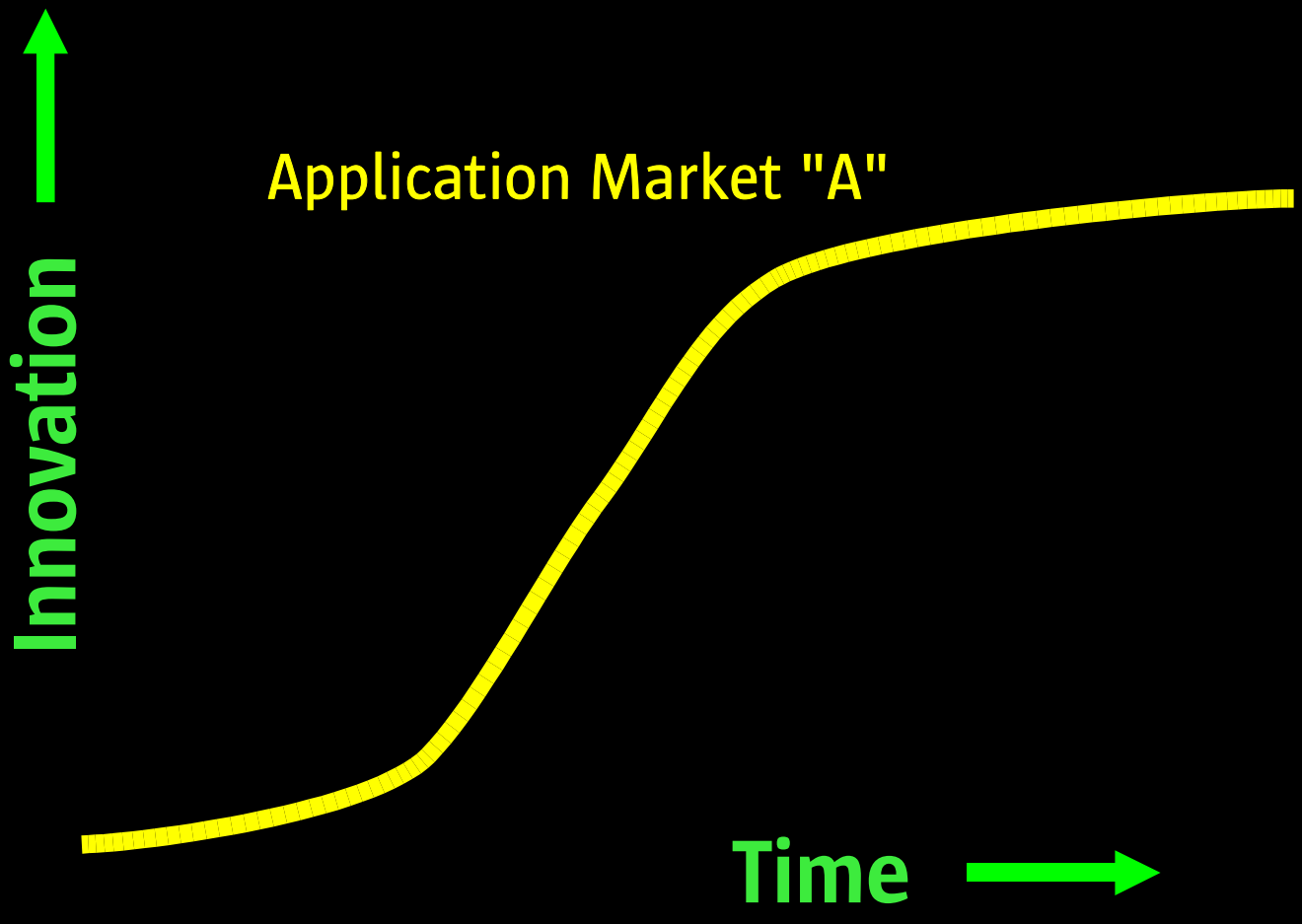


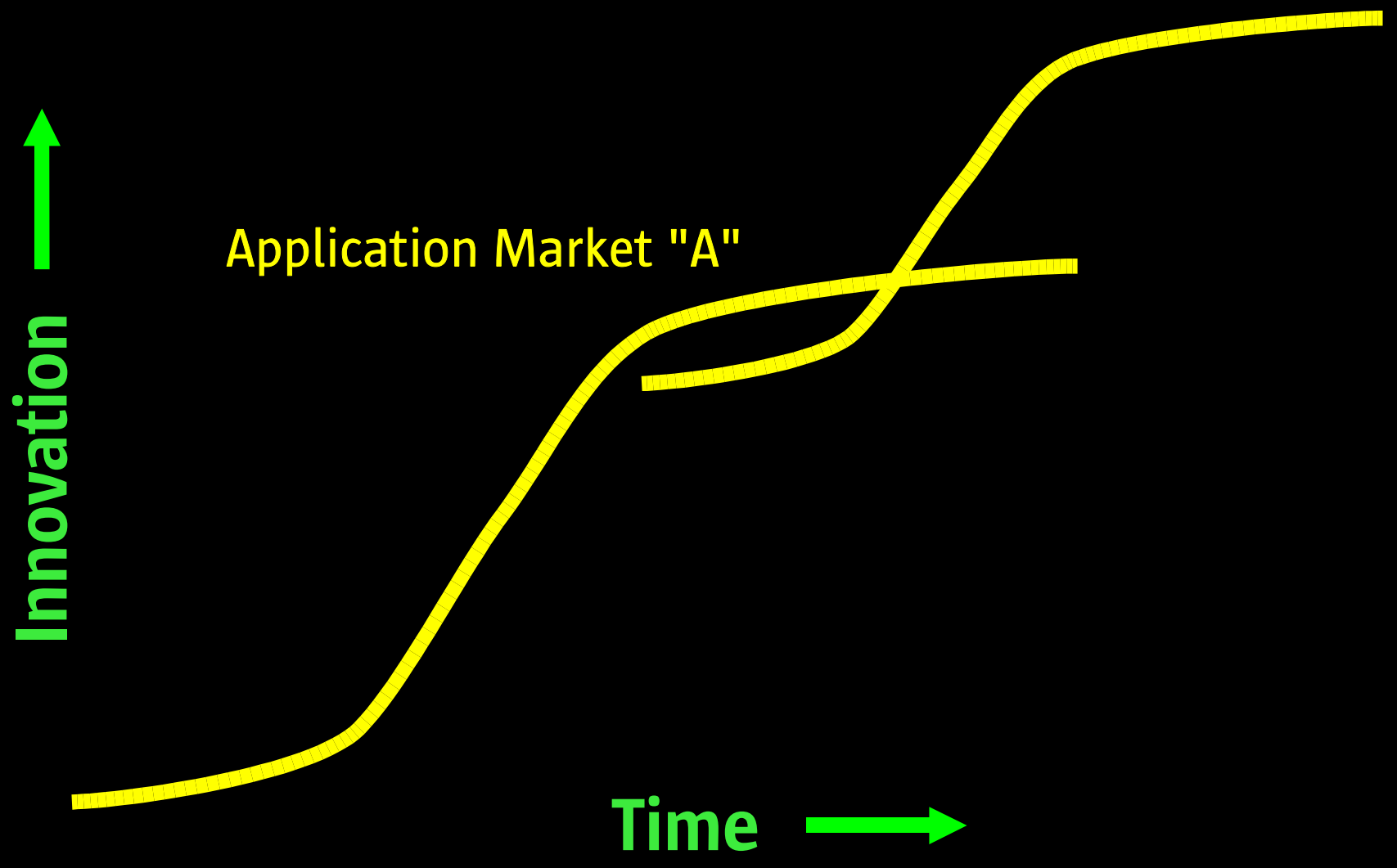
Software-as-a-Service

Greg Papadopoulos
VP & CTO
Sun Microsystems, Inc

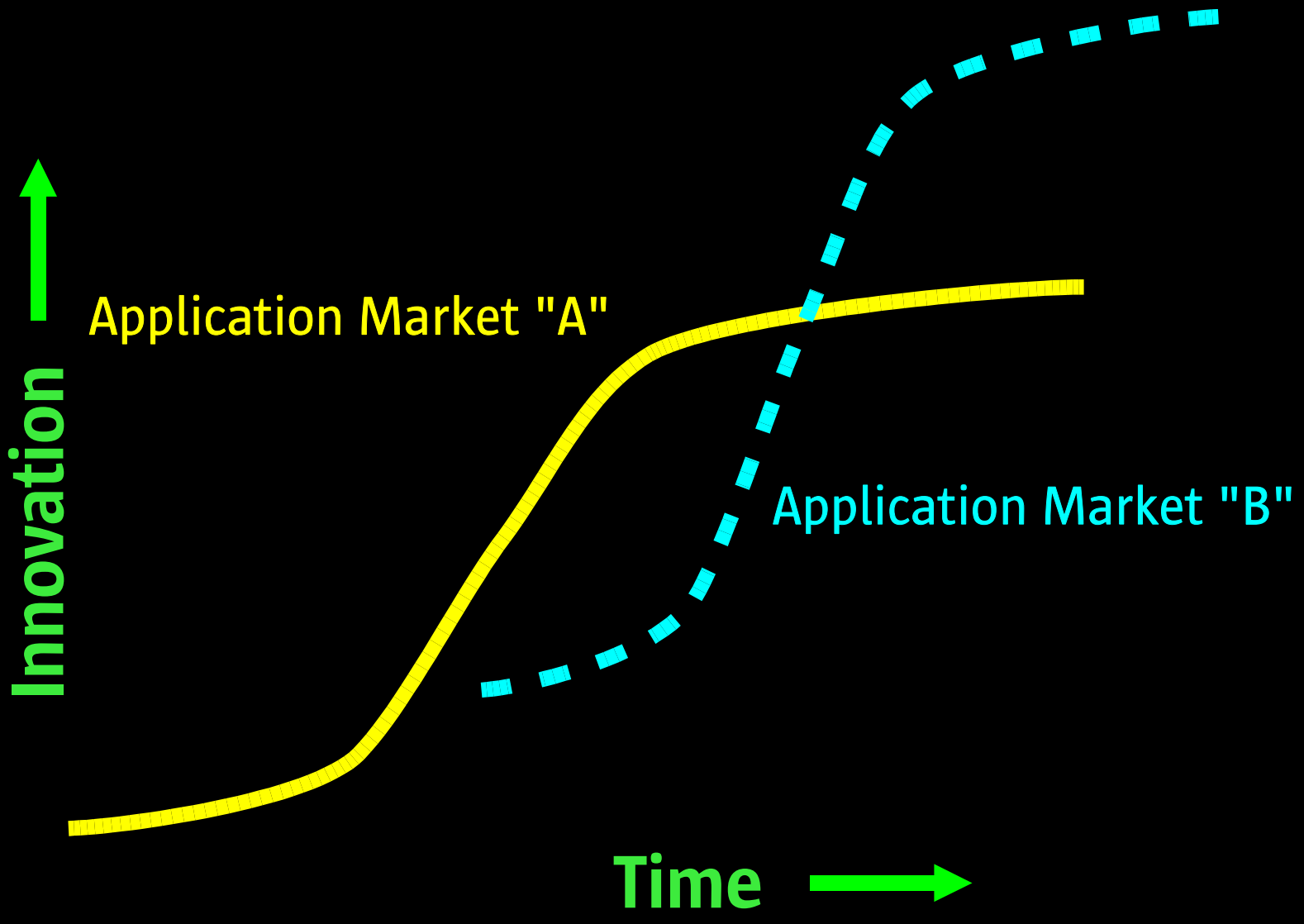
Tech S-curves (Christensen)



Tech S-curves (Christensen)



Disruptive Technologies



Early Indicators

- **Incumbent technology increasingly focused on the needs of the more advanced customer:**
  More performance, function & complexity
- **Disruptive technology viewed as:**
  Less capable, too simple & not "good enough"

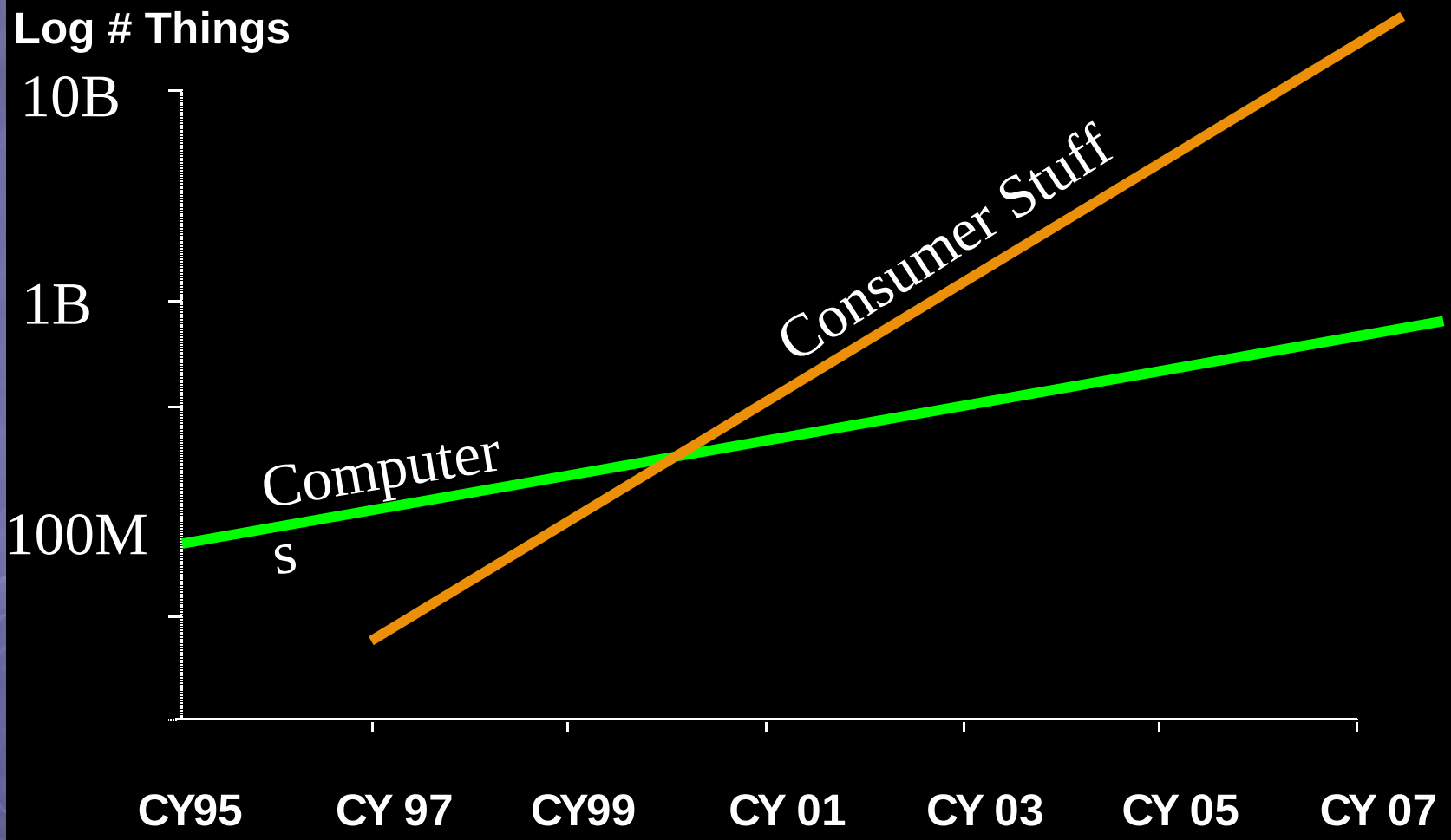
Examples

- The Microprocessor
- The Workstation and PC
- The Web
- The Optical Network

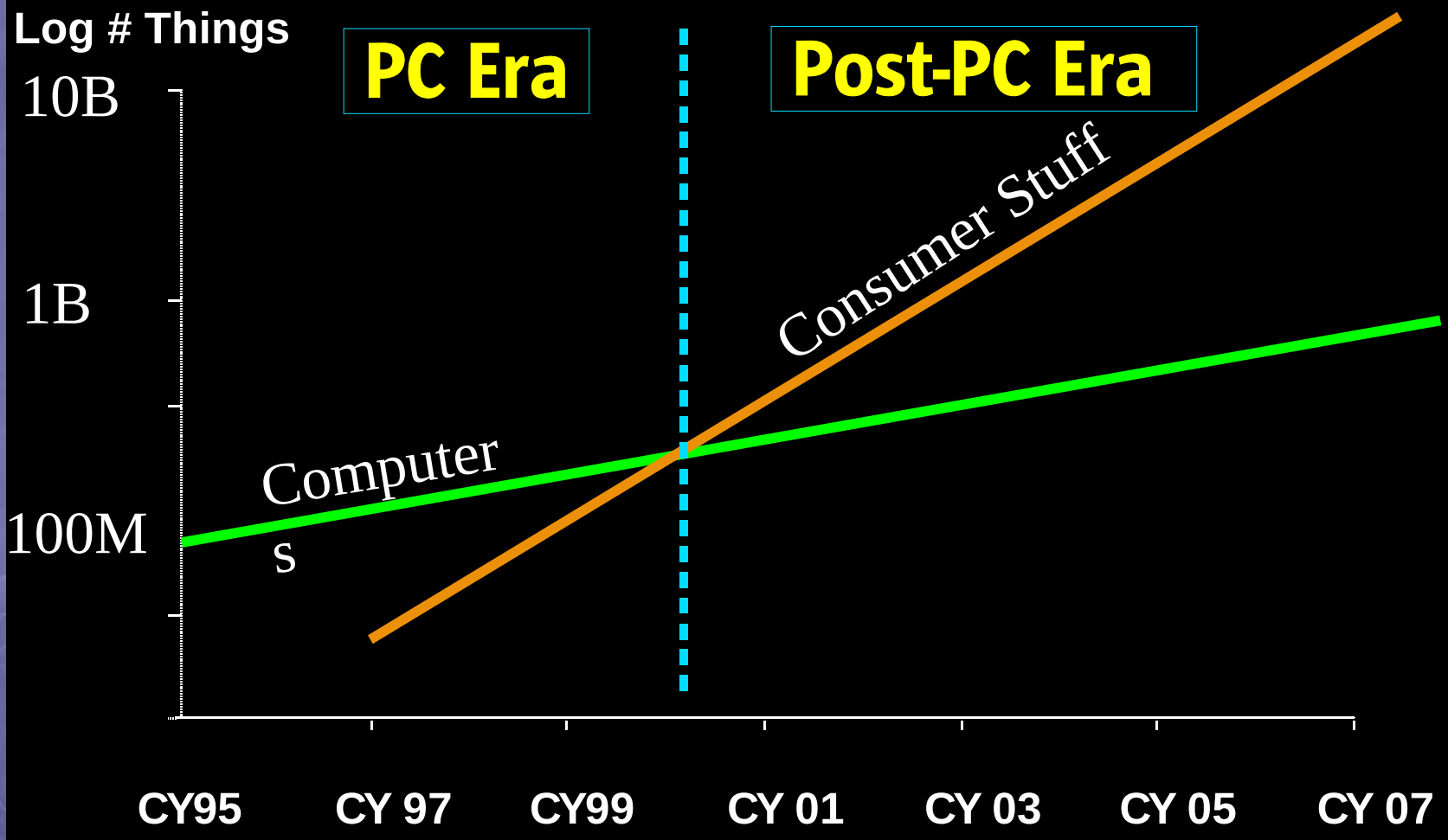
Examples

- The Microprocessor
- The Workstation and PC
- The Web
- The Optical Network
- Java / Jini / XML
- Information Appliances

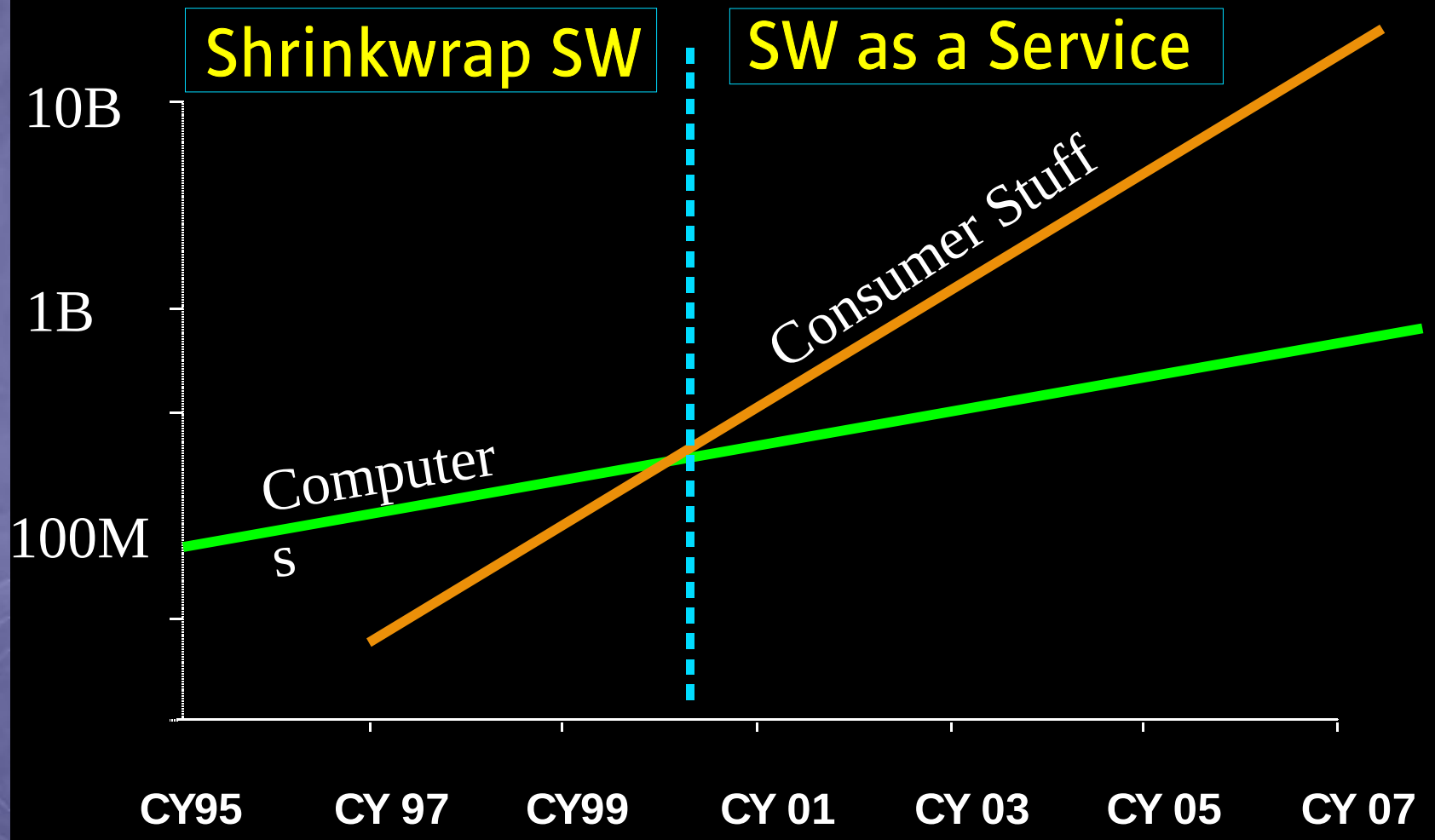
Things Networked



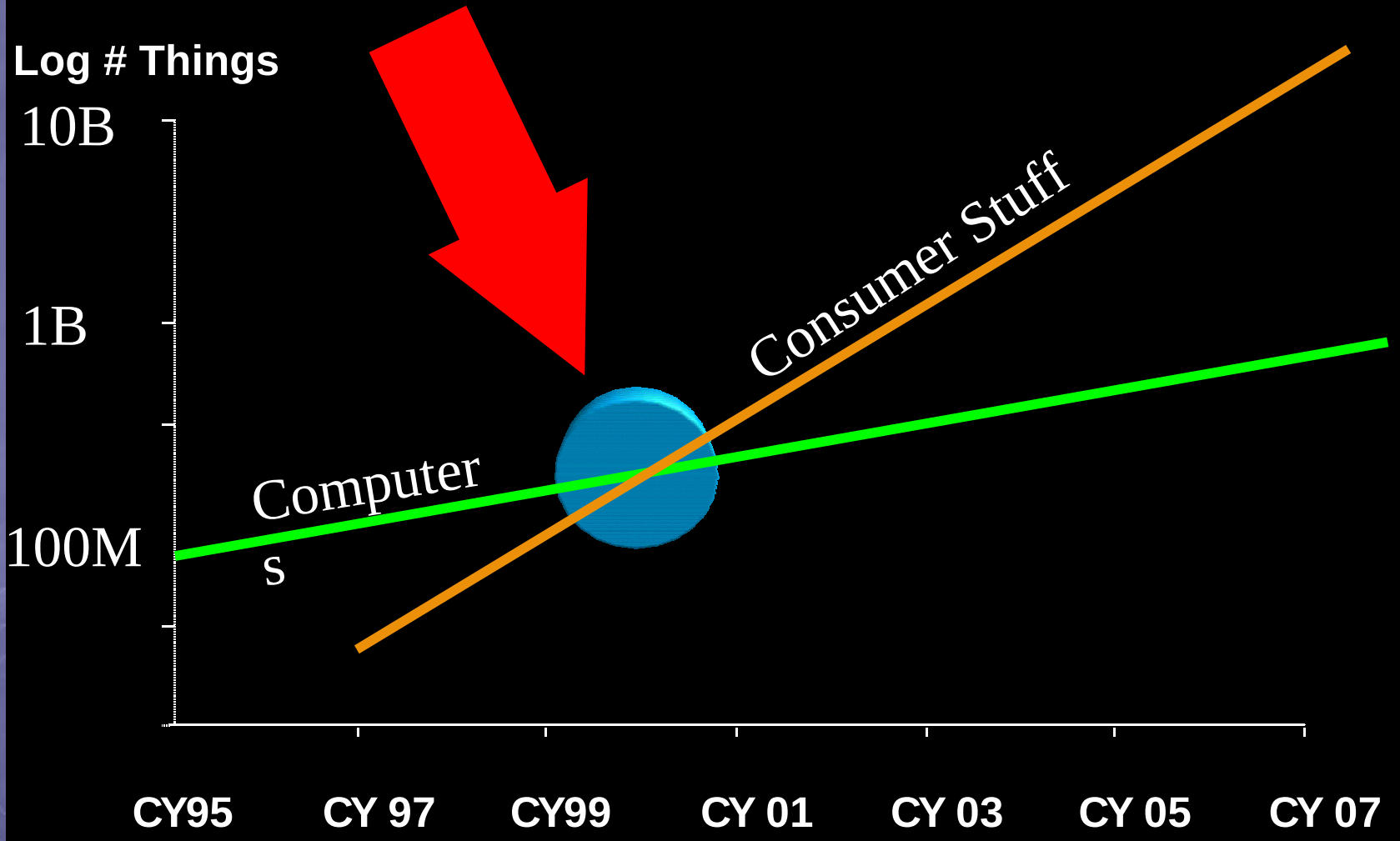
Things Networked



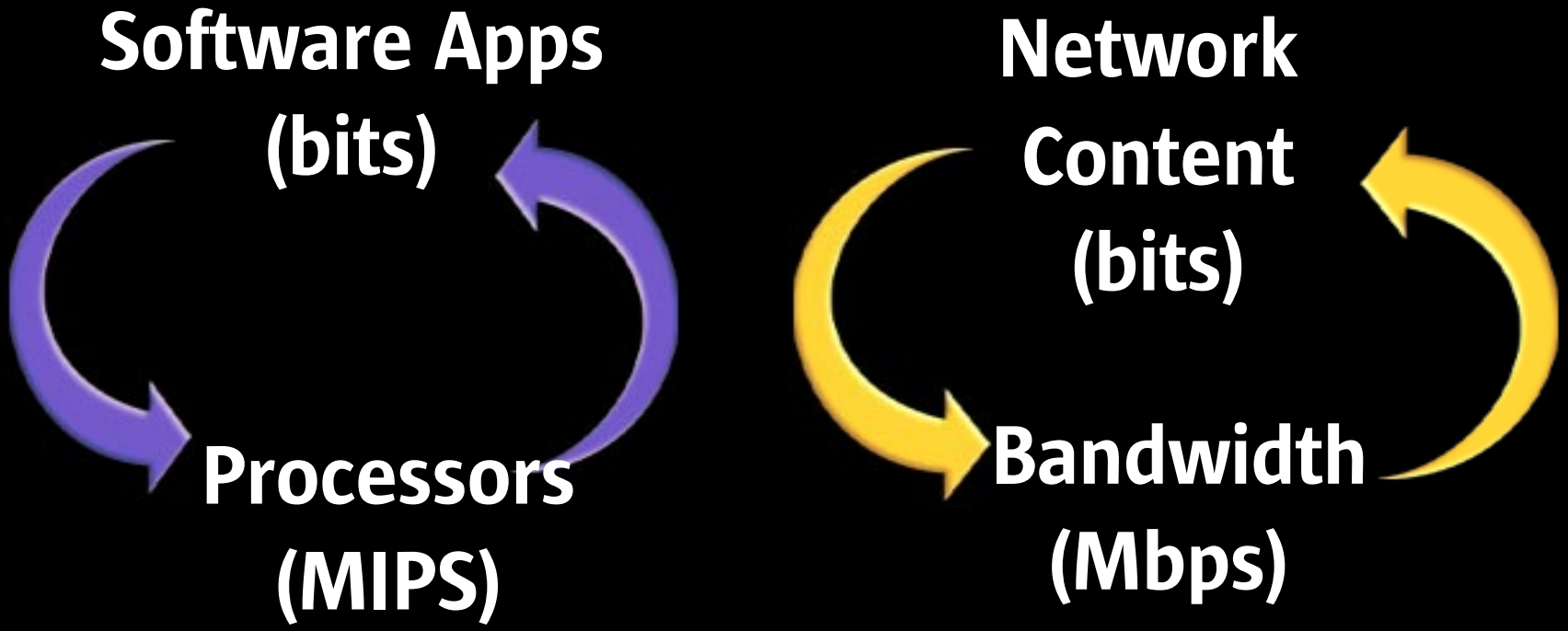
Things Networked



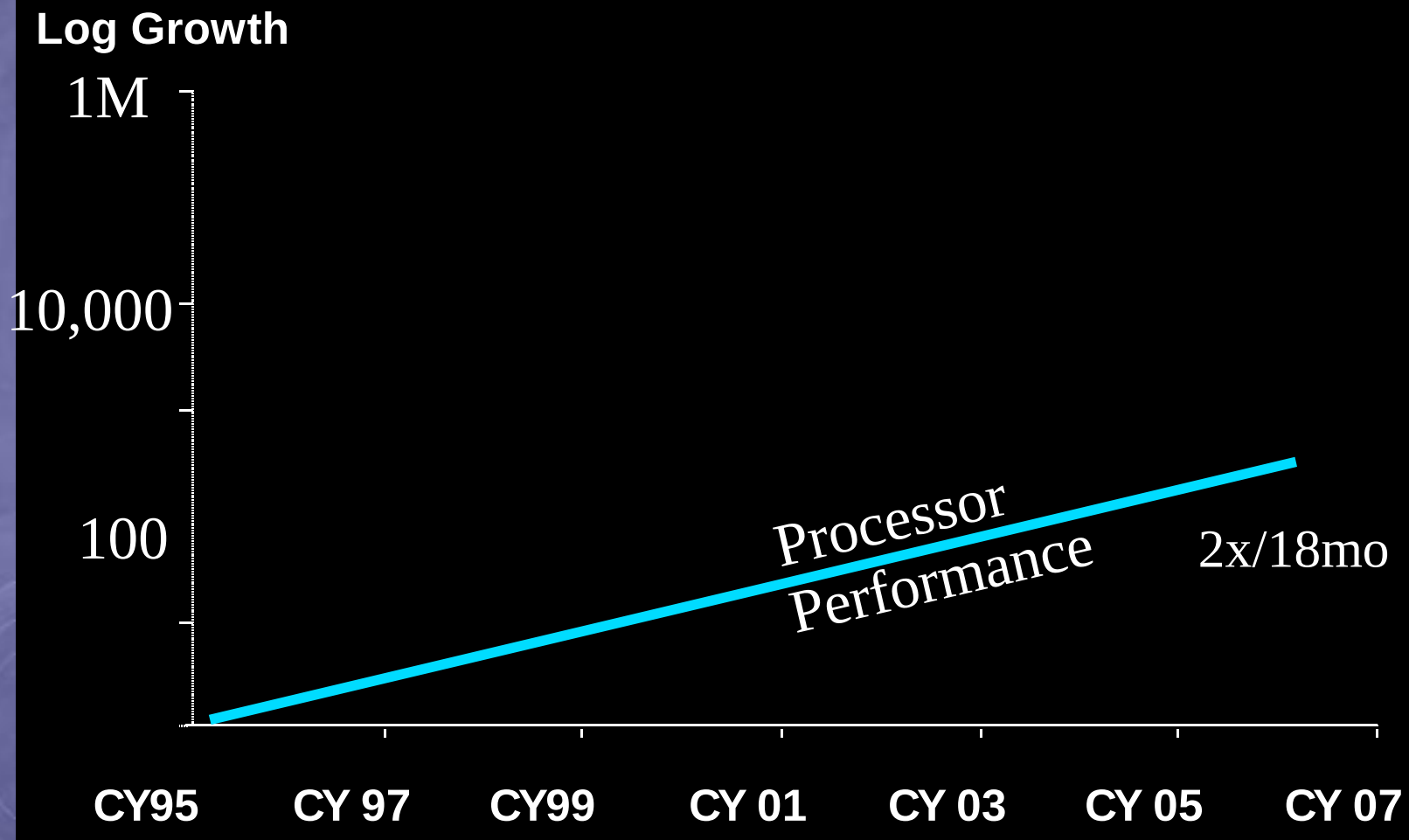
We are Here!


Log # Things
10B
1B
100M
Computer
s
Consumer Stuff
CY95
CY 97
CY99
CY 01
CY 03
CY 05
CY 07

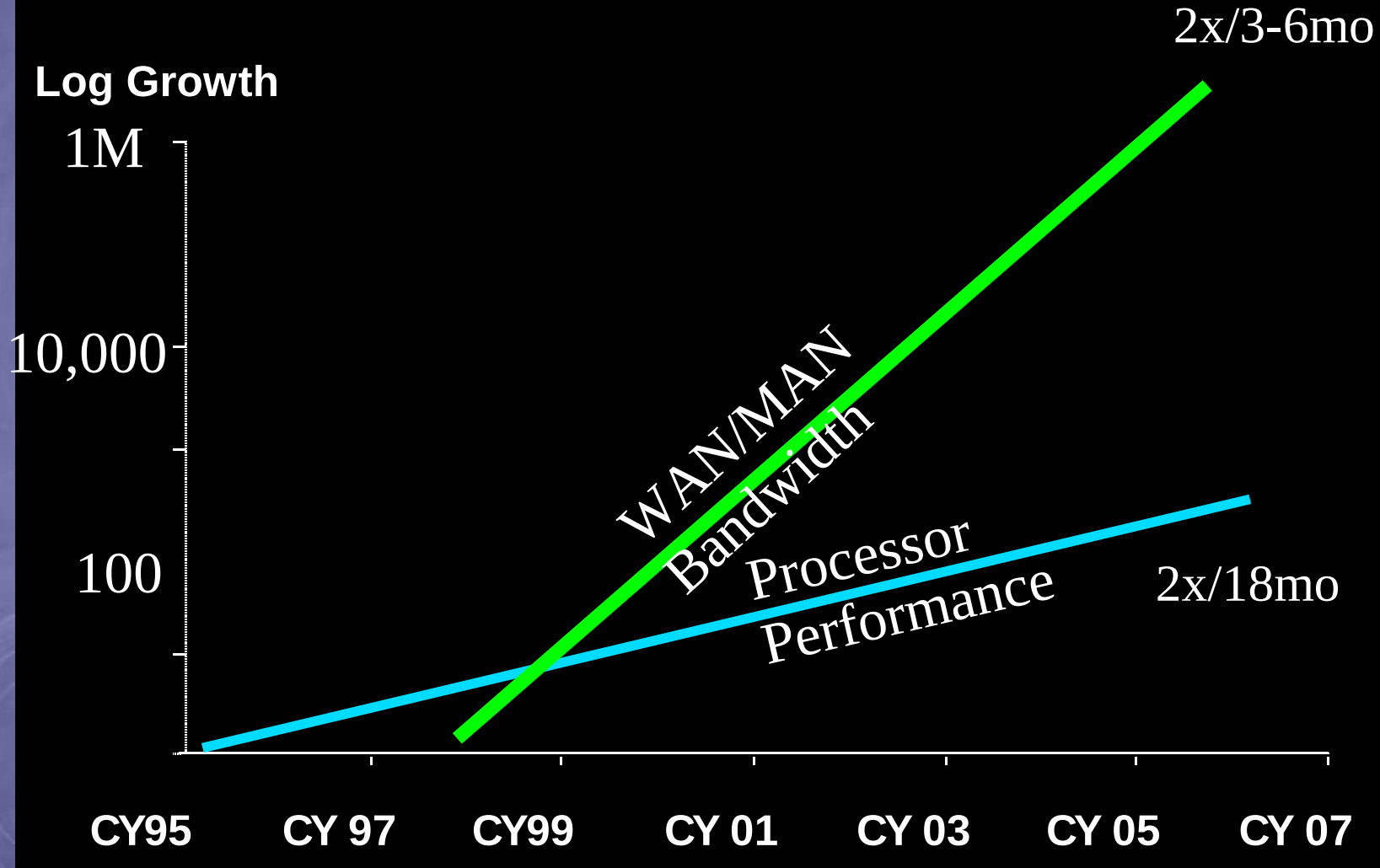
The BW Feedback Loop



Gilder's vs. Moore's Law



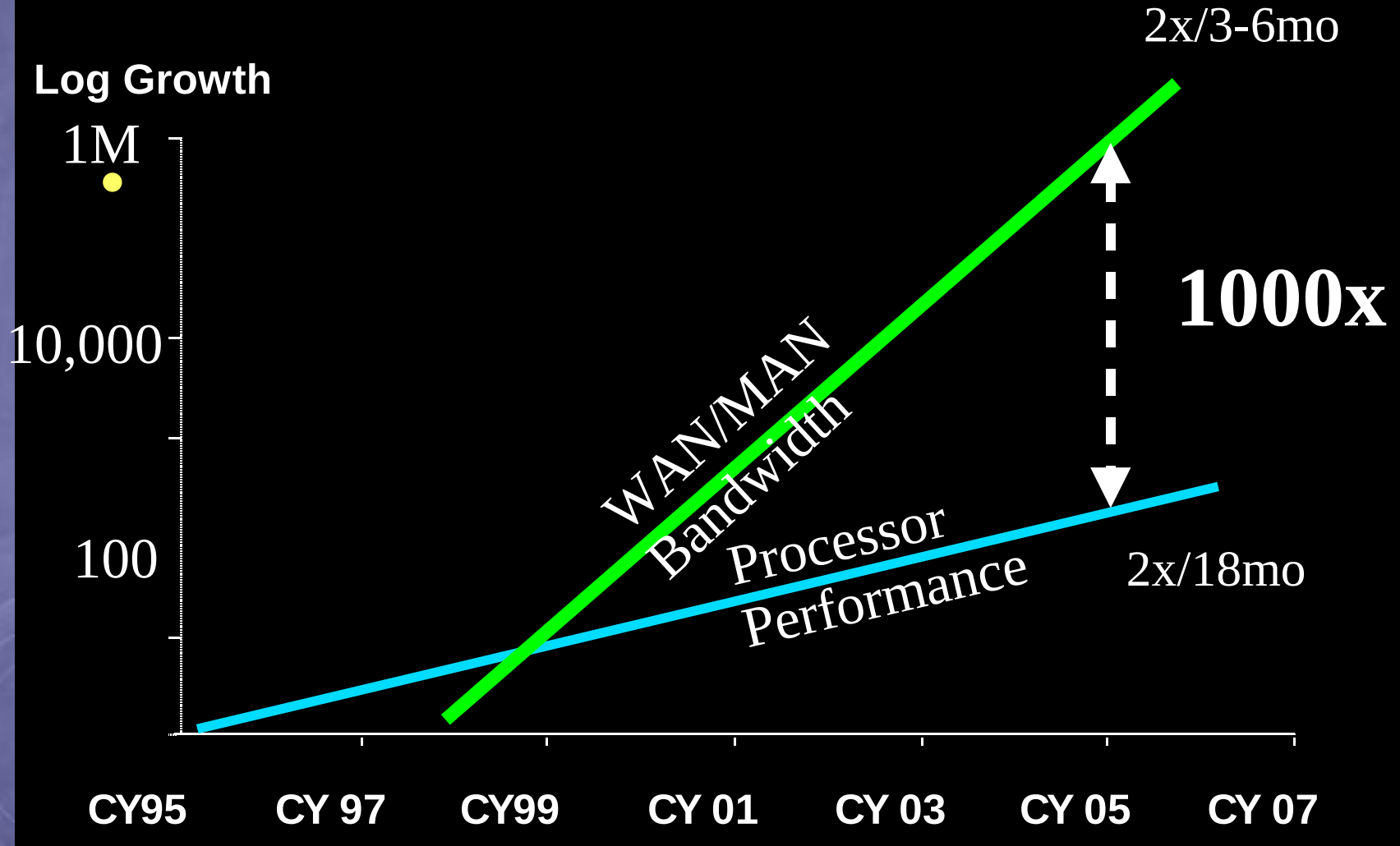
Gilder's vs. Moore's Law



Big Rule

NEVER
Bet Against
Bandwidth

Gilder's vs. Moore's Law



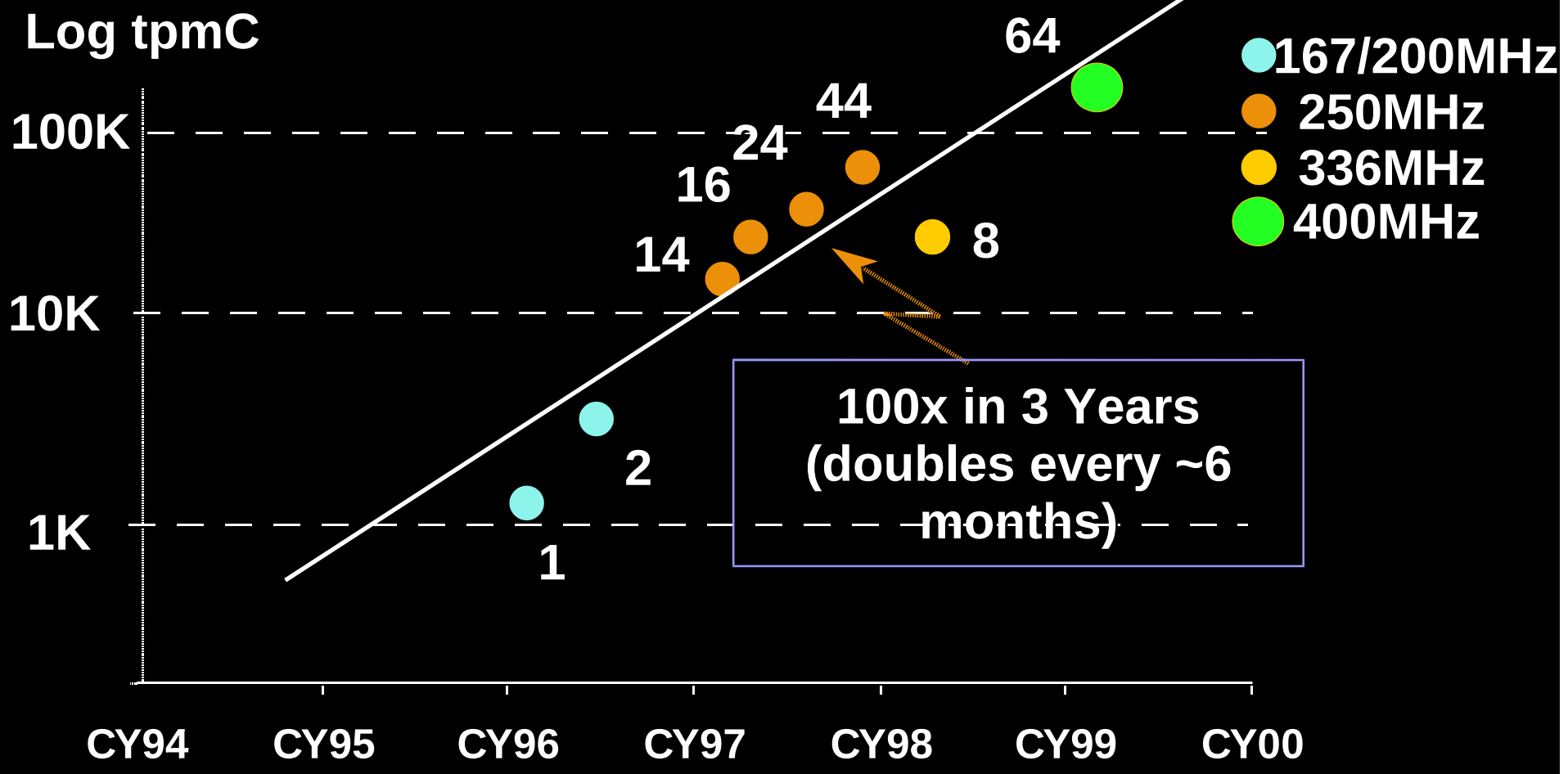
Without a lot of Imagination - 2005

- 10,000 CPU “plexes”
- 10's Millions of simultaneous users
- Multi-terabit network feeds
- 1 Terabyte RAM < $50K

  => 10’s of Terabytes commonplace
- 1 Terabyte DISK < $5K

  => 10’s of Petabytes commonplace

Processor x Scale: *TPC-C*

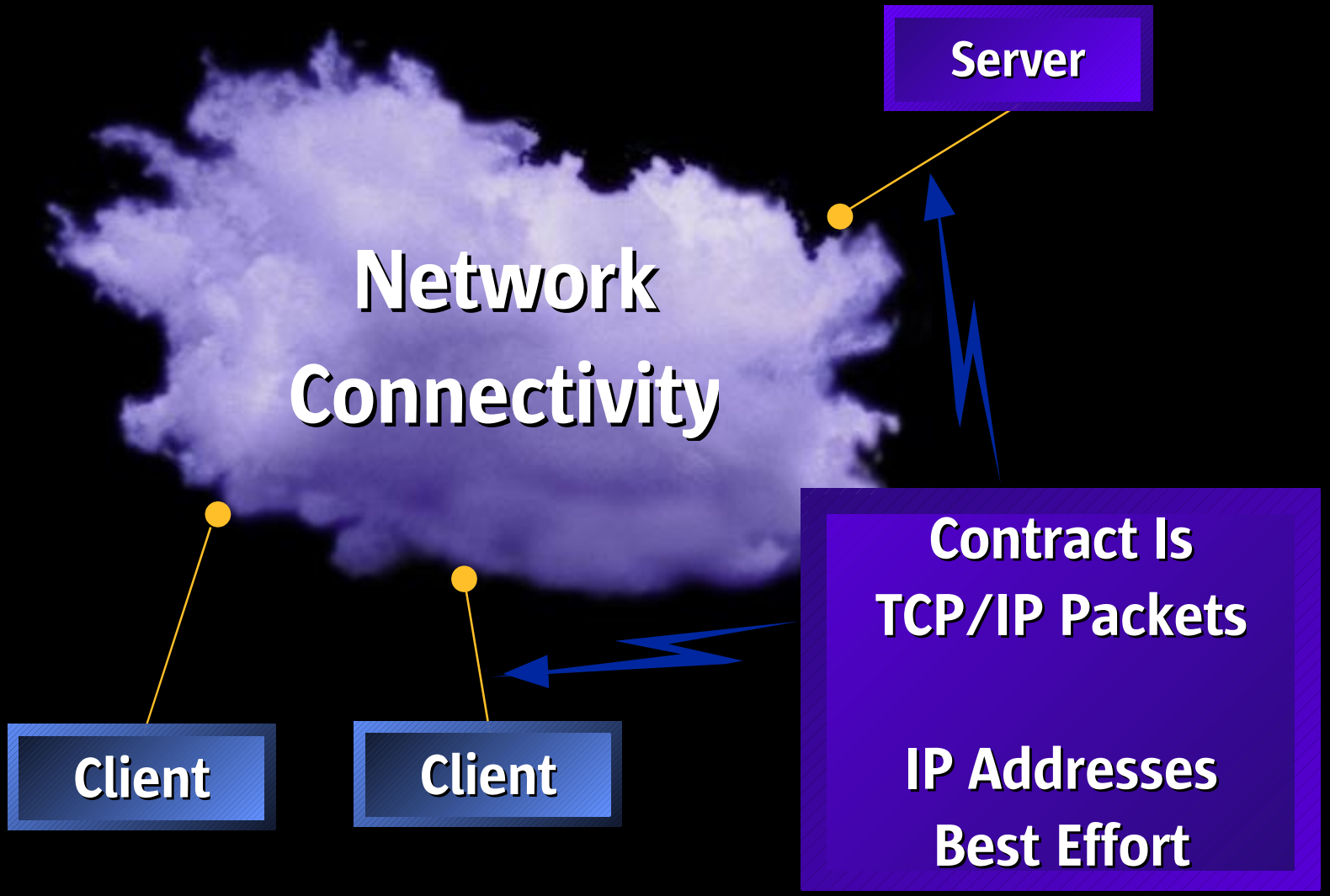




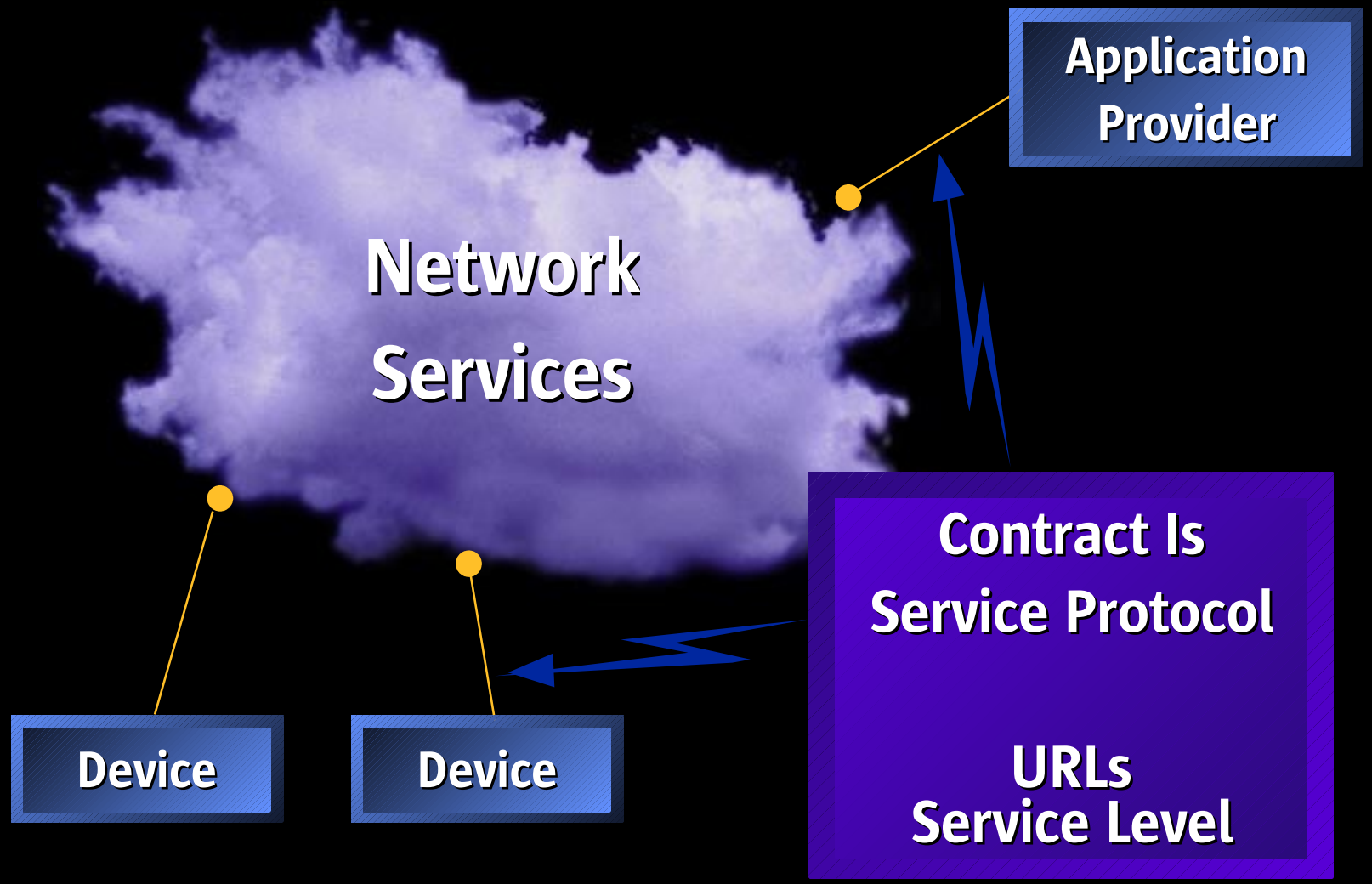
The Challenge

Billions of devices
interacting with
Millions of services,
Predictably,
Securely,
Globally.

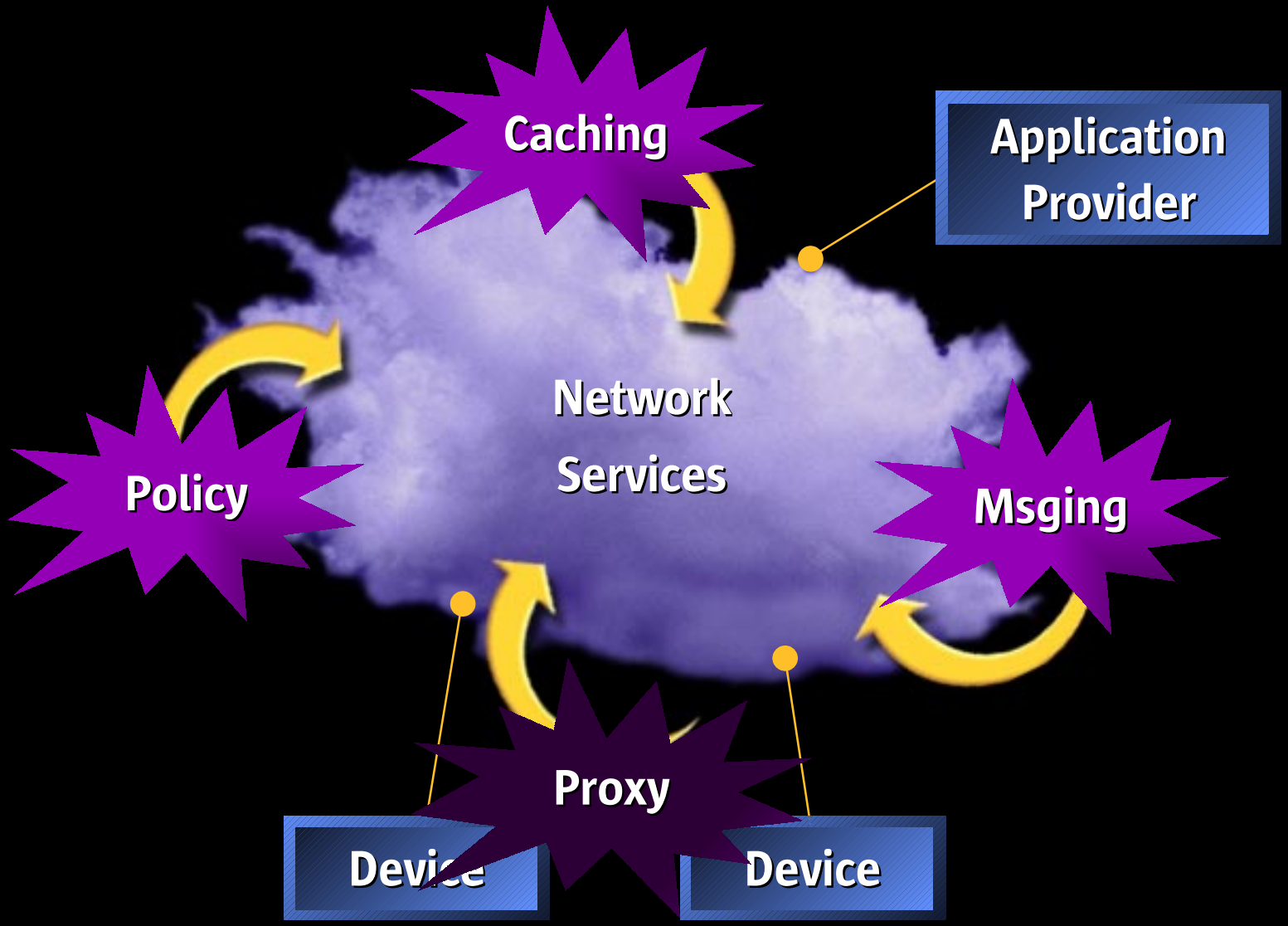
Old Think


Server
Network
Connectivity
Contract Is
TCP/IP Packets
IP Addresses
Best Effort
Client
Client

New Think


Application Provider
Network Services
Contract Is Service Protocol
URLs Service Level
Device
Device

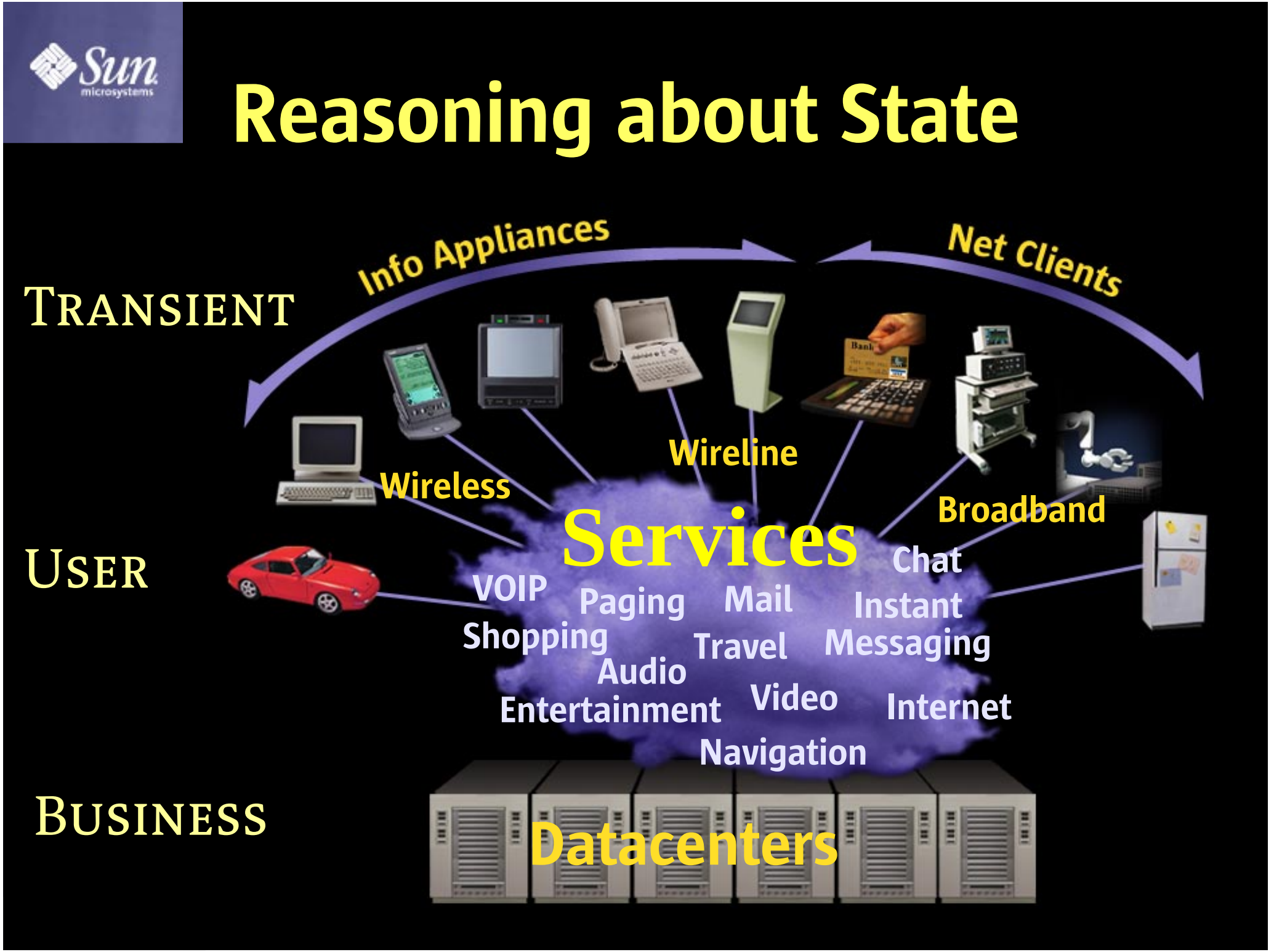
Lots of Computing In the Network



The Emerging Big Picture



Reasoning about State



Best Practices / Expectations





Qualities Demanded

- Reactive Scalability
- 5 & 6 9's Availability
- Wirespeed Performance
- Extreme Trust
- Rational Scaling of Management



3 Basic Technologies

Java

Jini

XML



Different Objectives

New, tightly-coupled services

Rapid Integration of existing services

New, distributed services

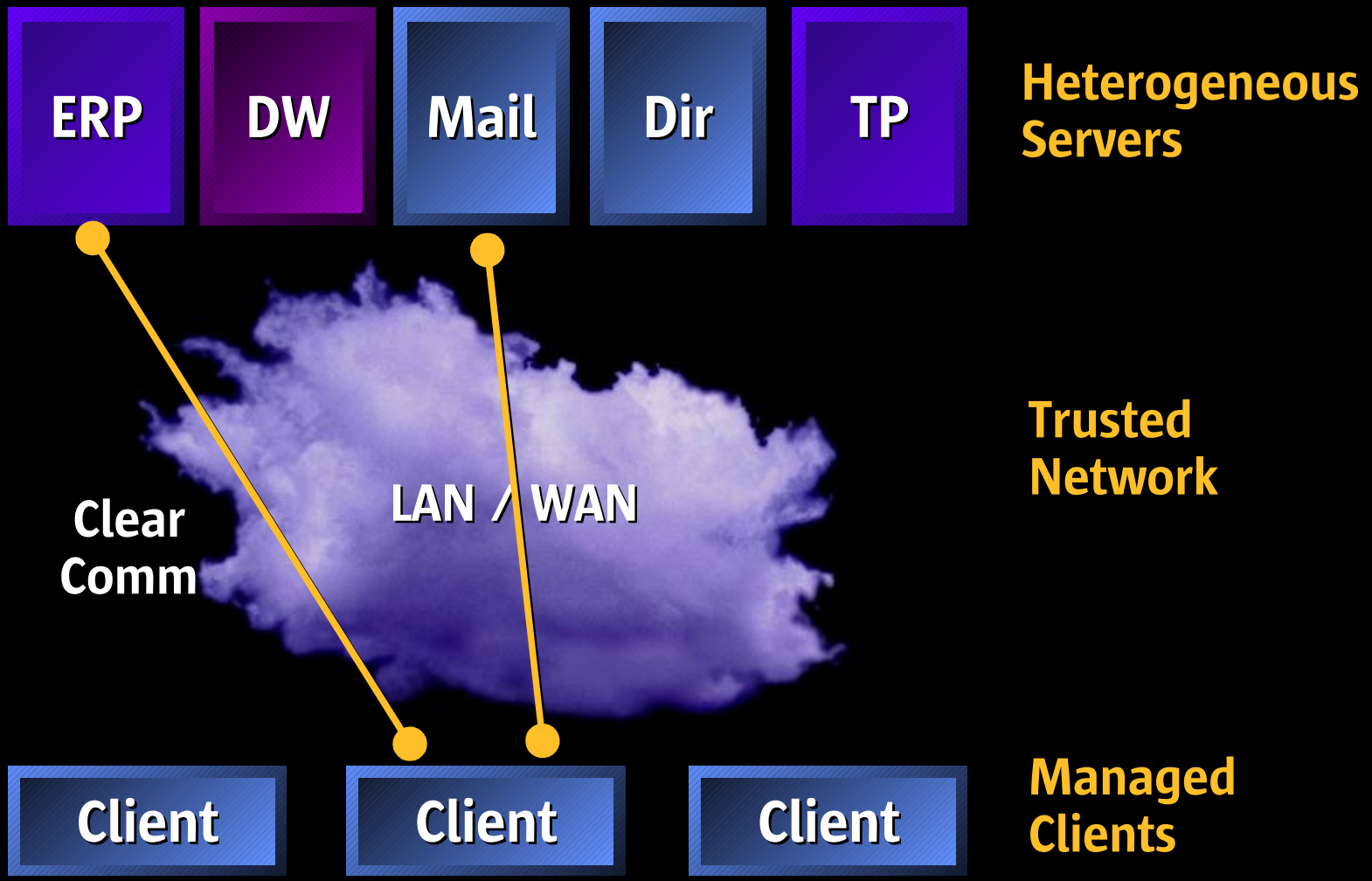
Interaction among services for commerce



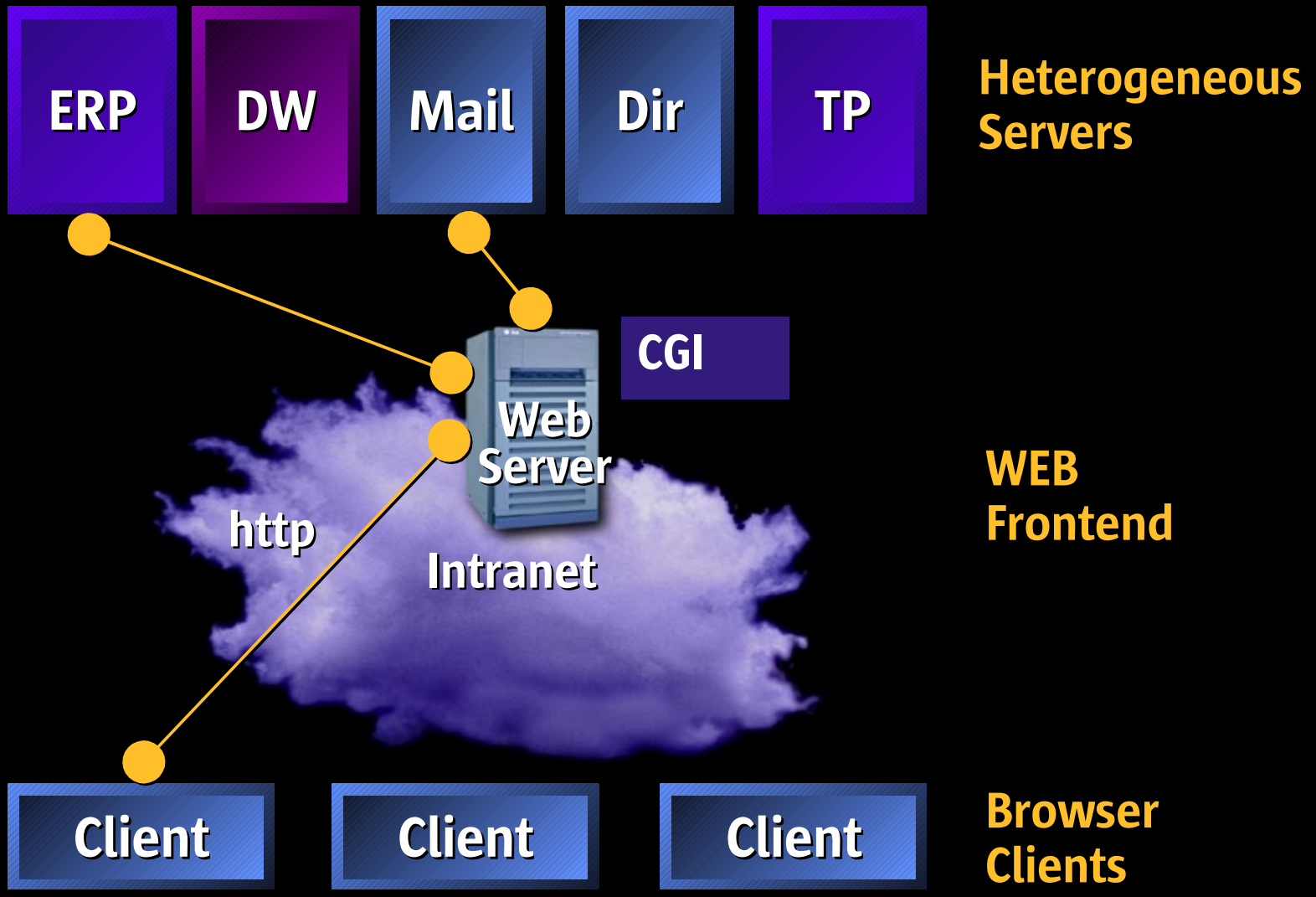
Big Question

What is the new application architecture?

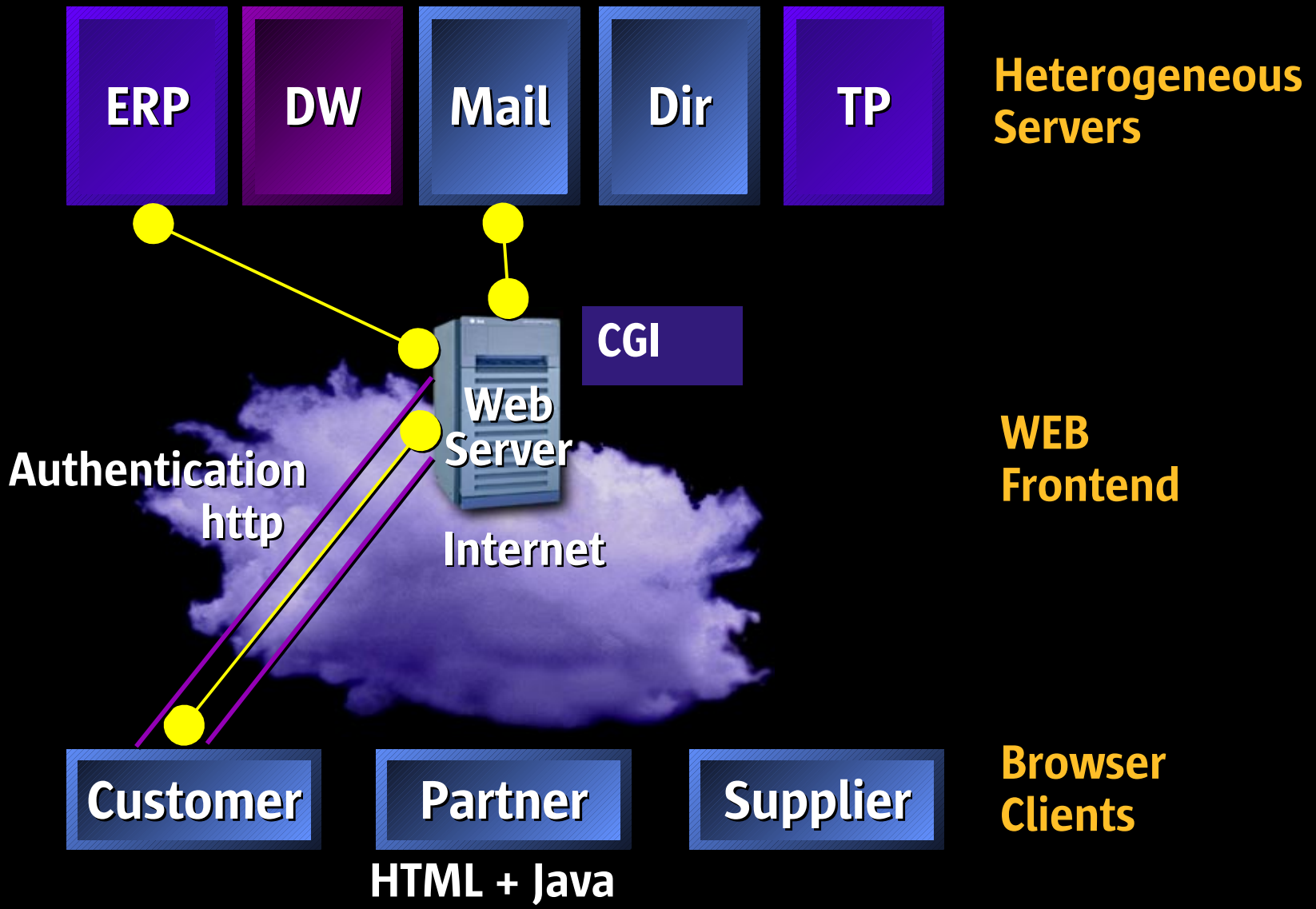
“Old” Client/Server



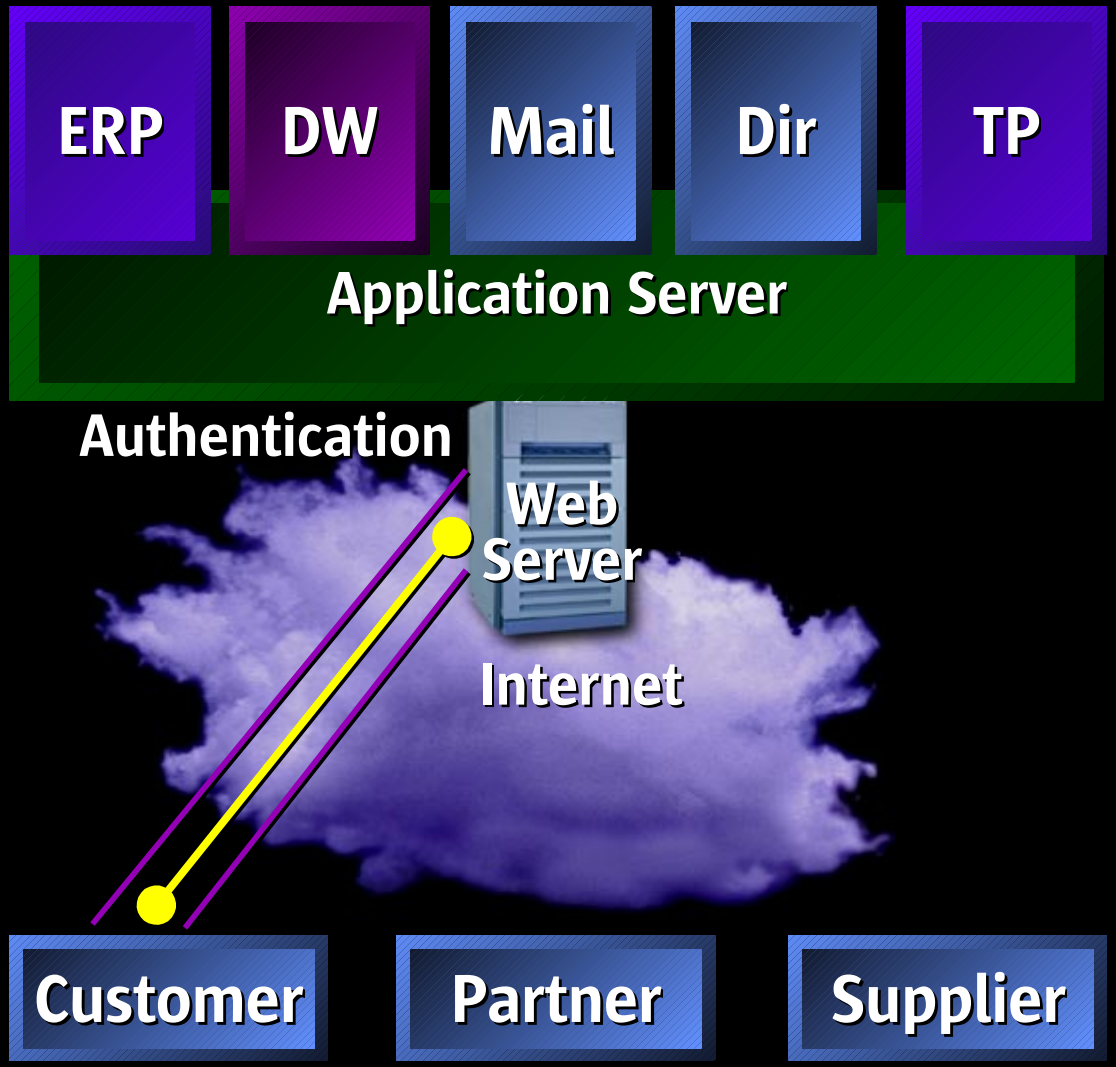
Transitional



Transitional



App Server-Centric



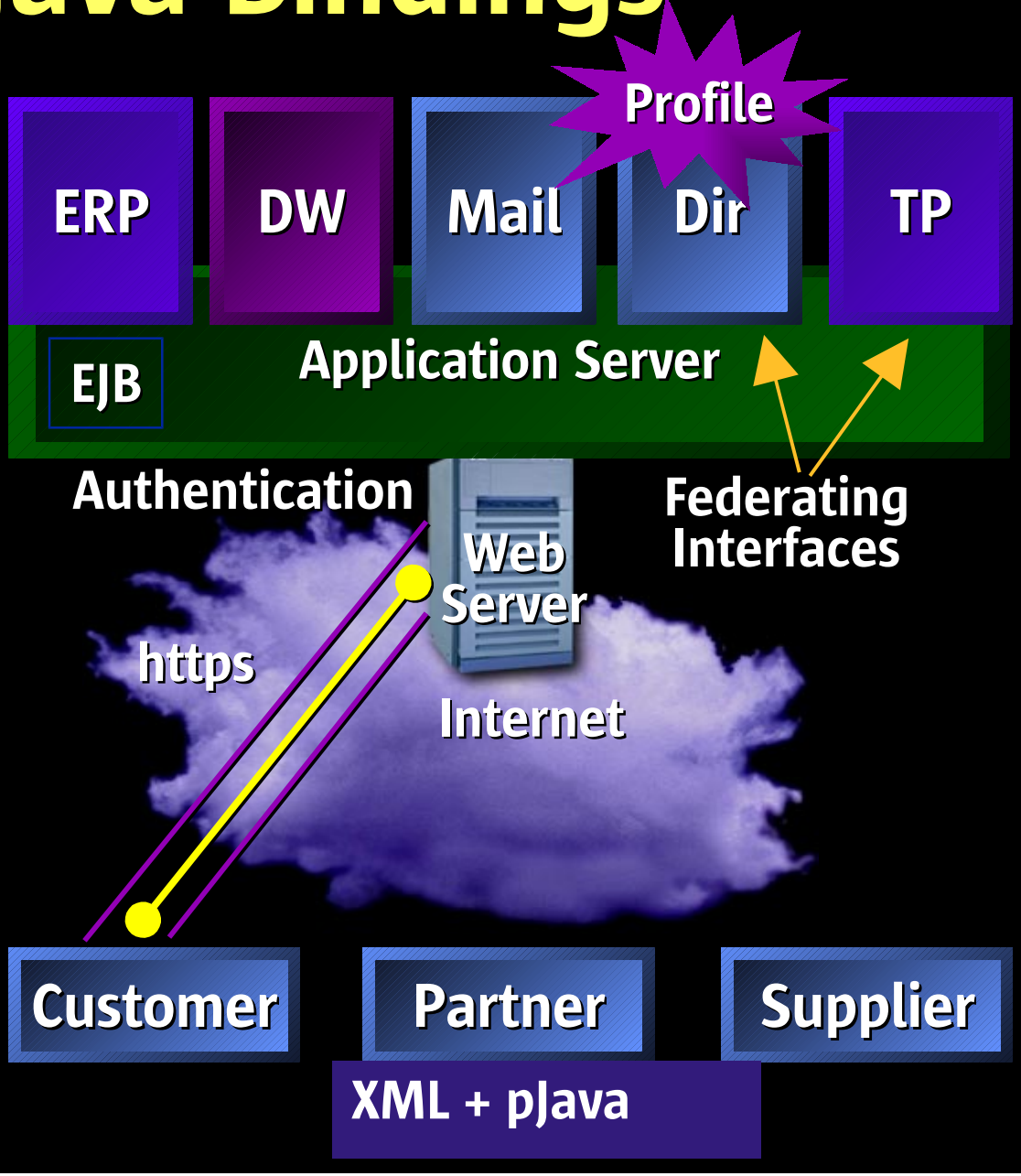
Heterogeneous Servers

Distributed Apps

WEB Frontend

Uncontrolled Clients

Java Bindings



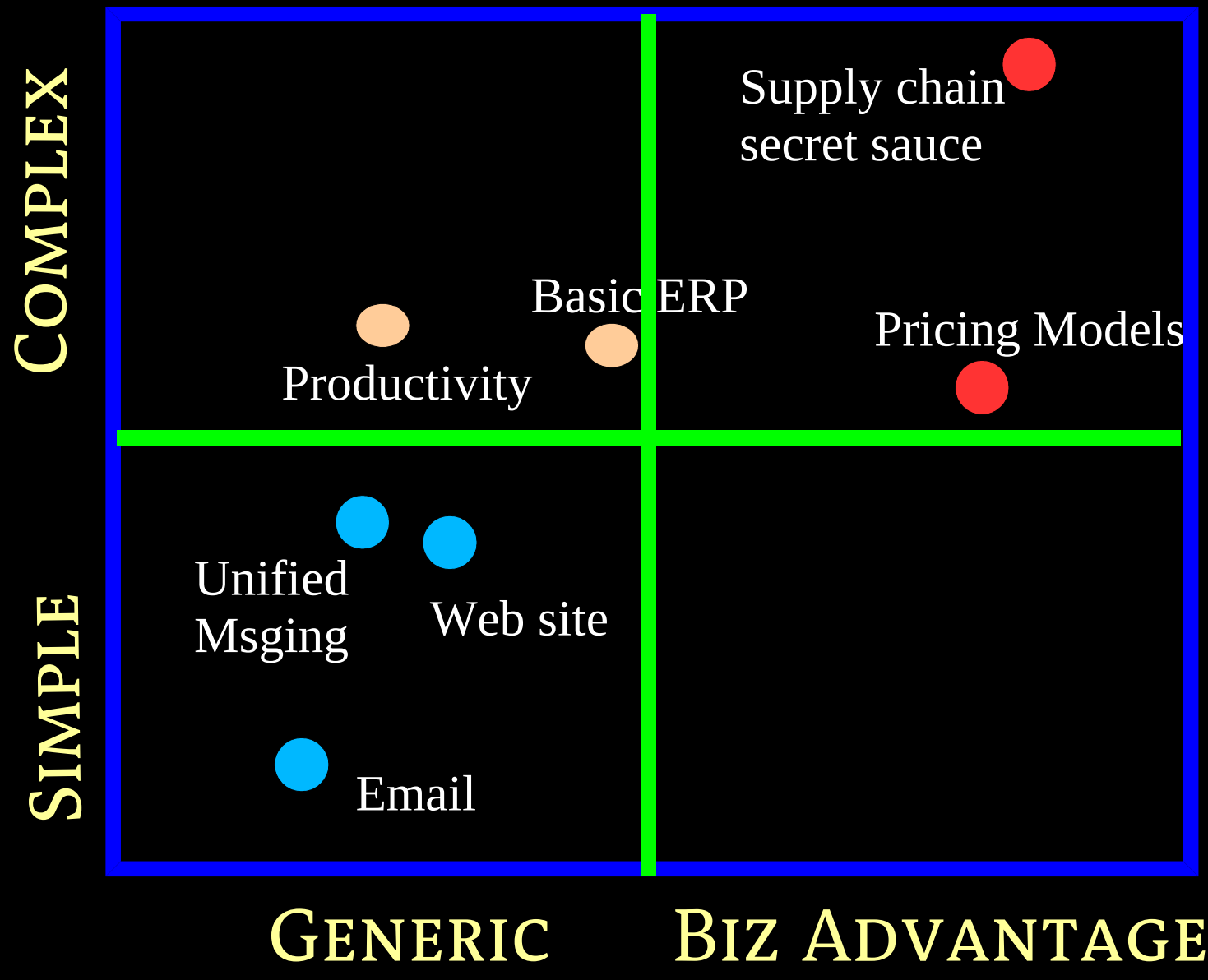
Heterogeneous Servers

Distributed Apps

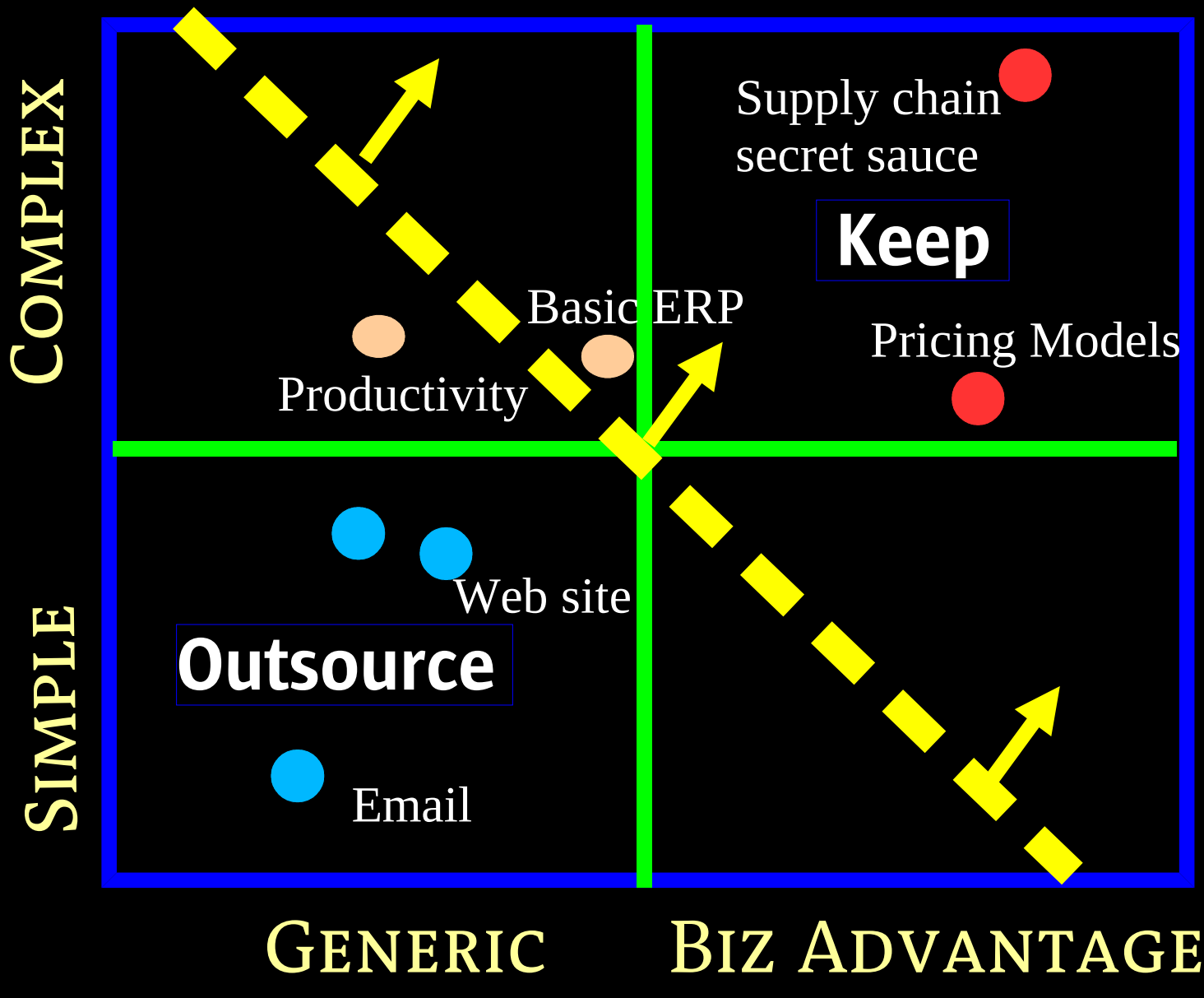
WEB Frontend

Uncontrolled Clients

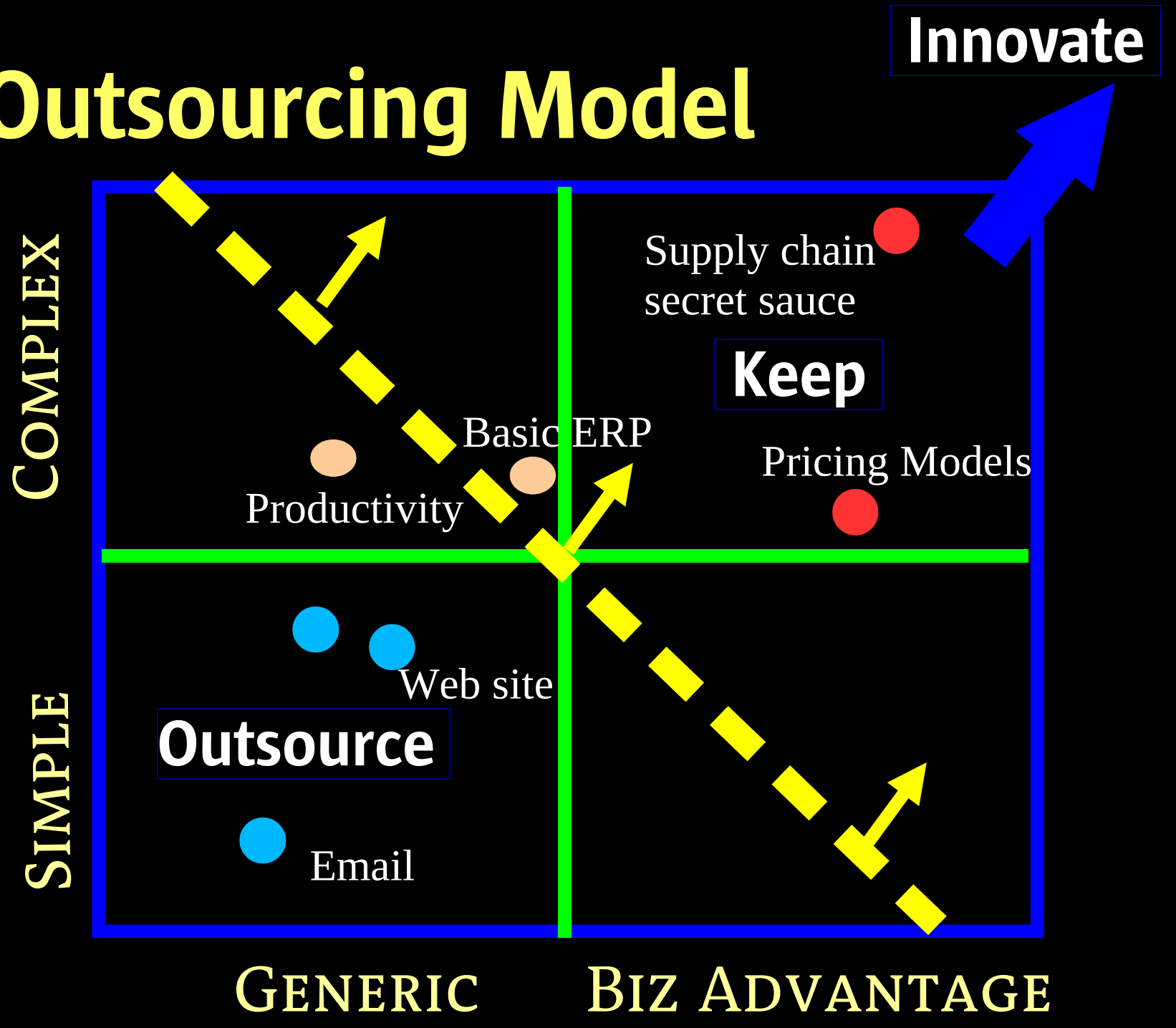
Outsourcing Model



Outsourcing Model



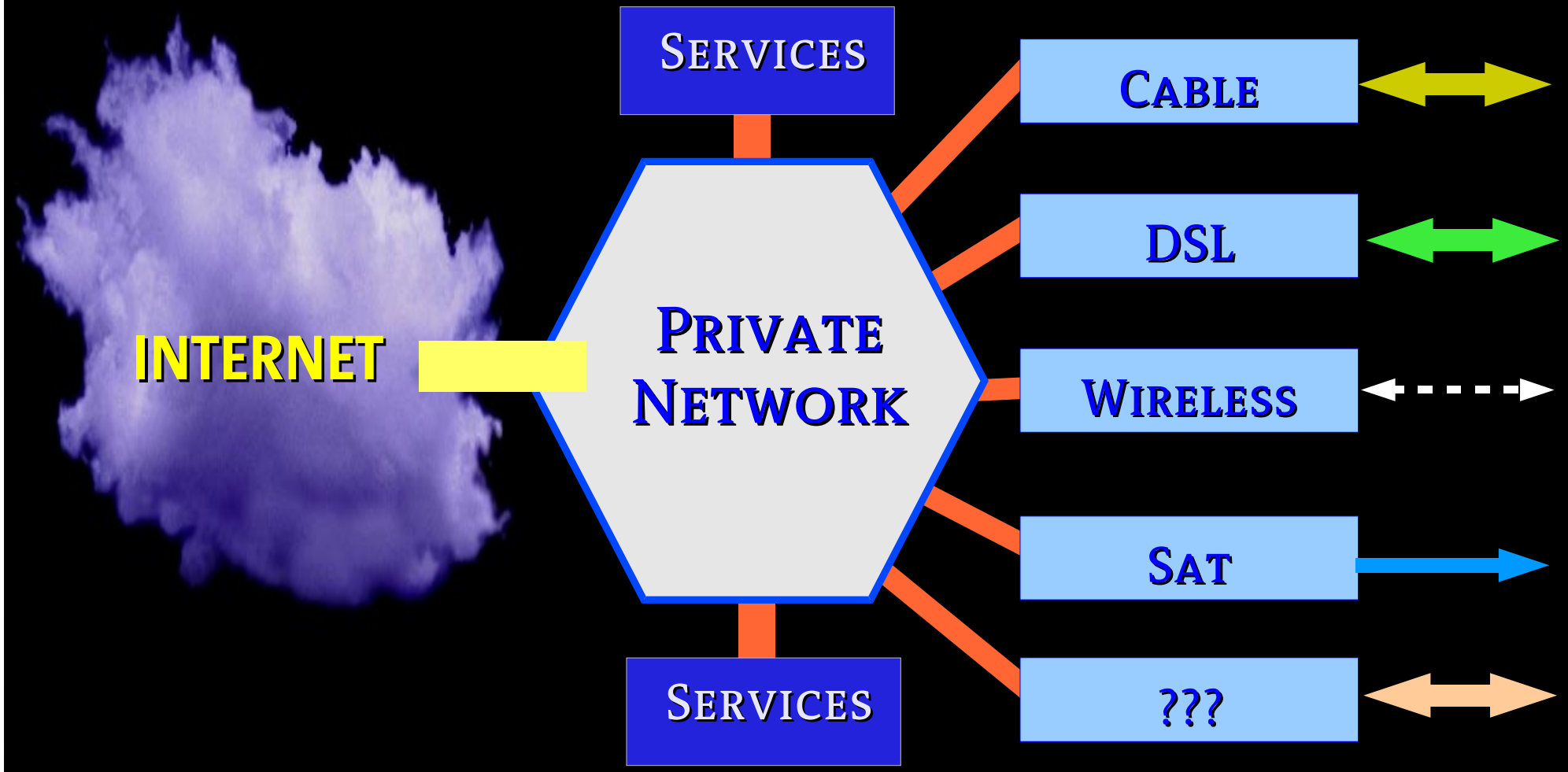
Outsourcing Model



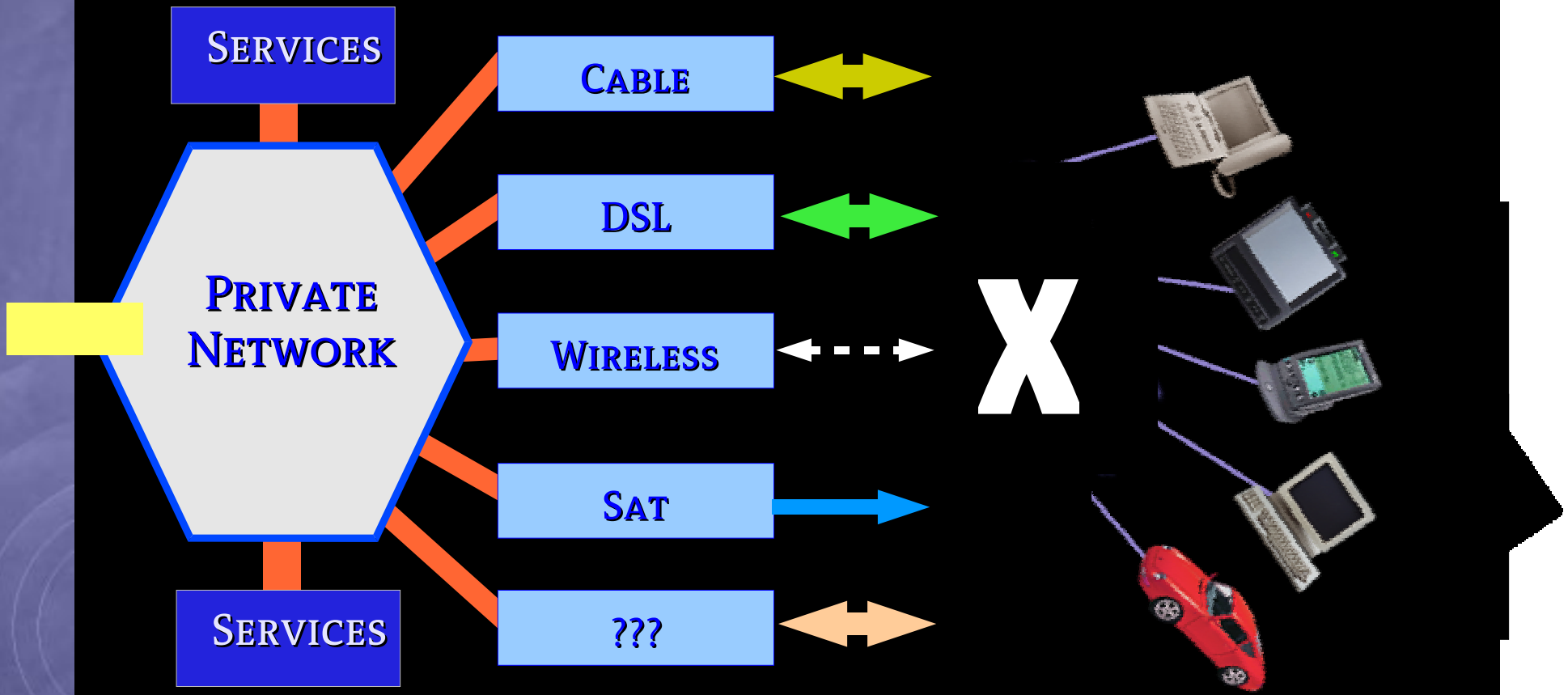
The Emerging Structure



The Emerging Structure



Any Device, Any Network



Control Points / Differentiators

- Service Level (QoS -> CoS)
- Trust
- Mobility
- Completeness:
  My community of devices
- New & Cool
- Sublinear Cost Scaling(!)

Overlay Trend

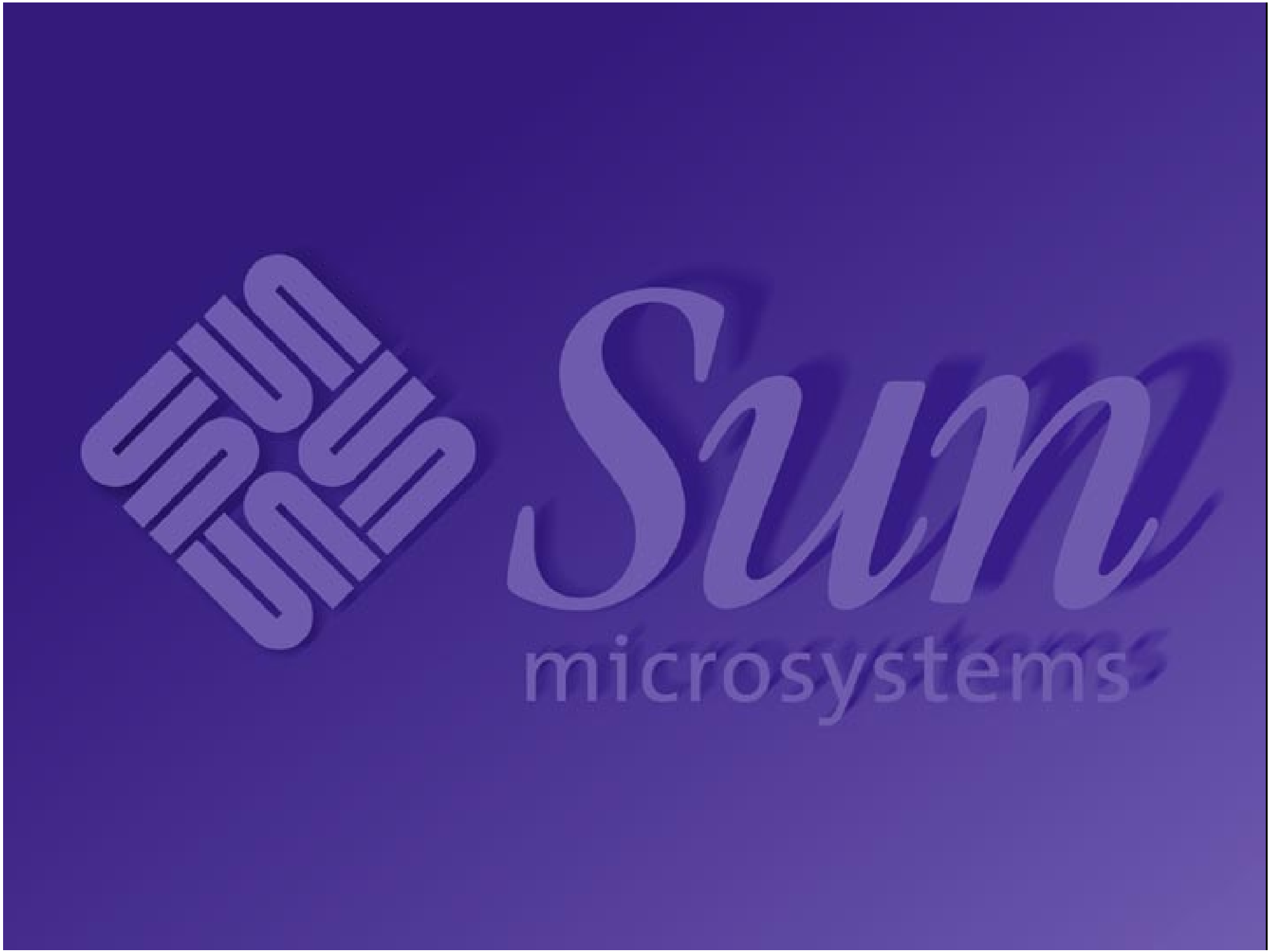
Home
=
Office
=
Consumer



Final message

Before someone else does it to you...

Disrupt Thyself


Sun
microsystems