The New Web Switch

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President & CEO

September 13, 2001

CROSSBEAM SYSTEMS
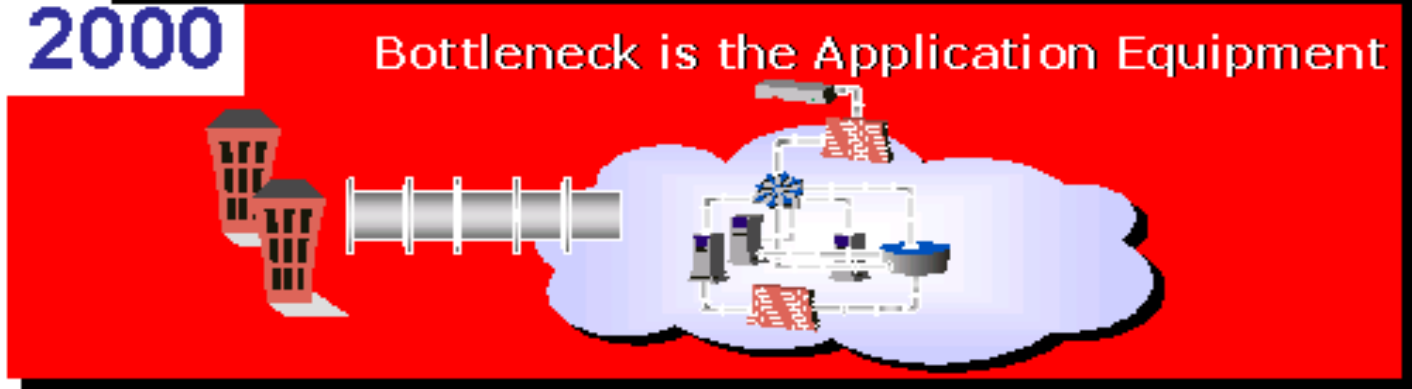
Vision: Ubiquitous Application Services

2002 — Carrier-class Application Service Delivery via Overlay

2000 — Bottleneck is the Application Equipment

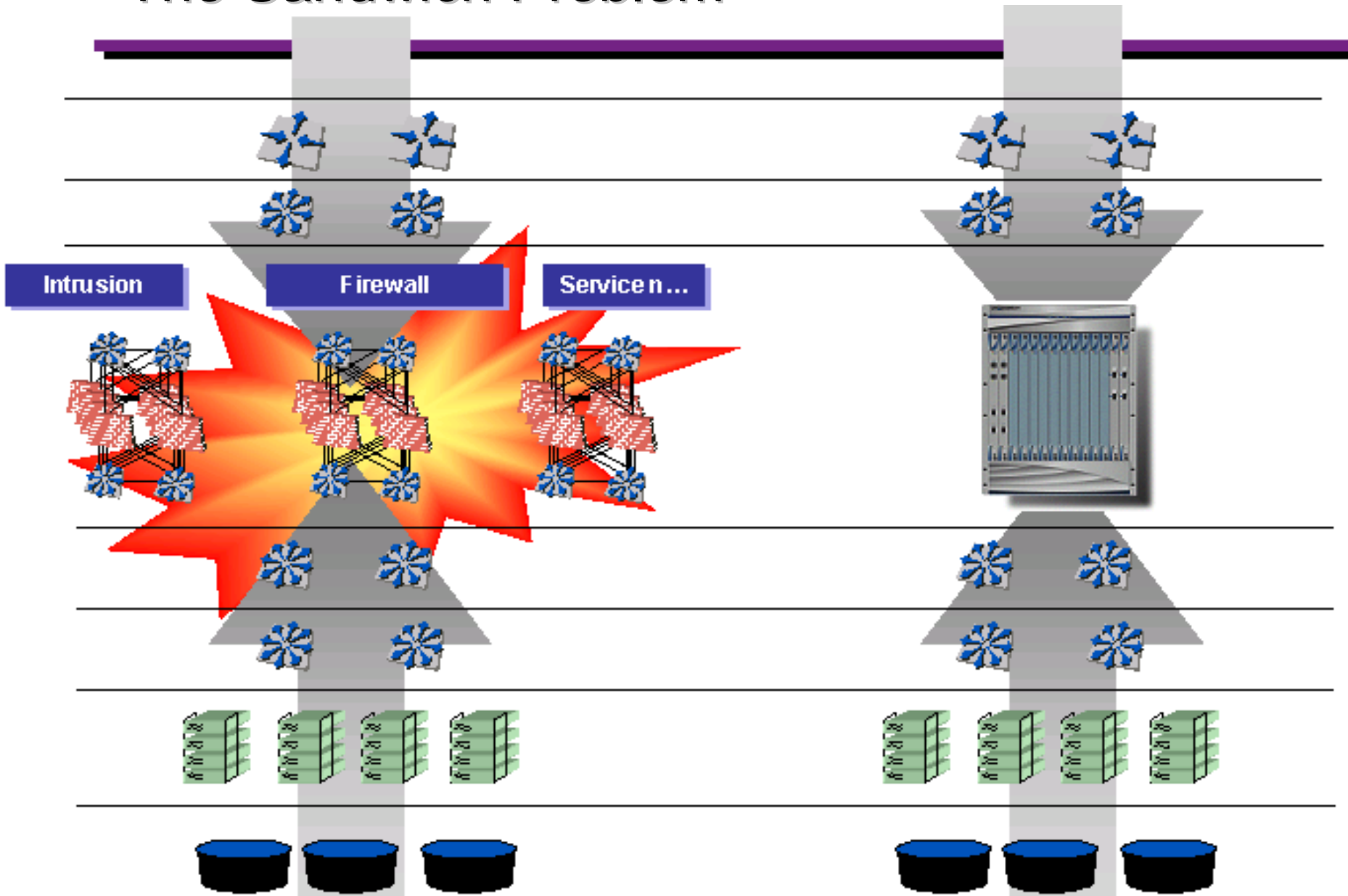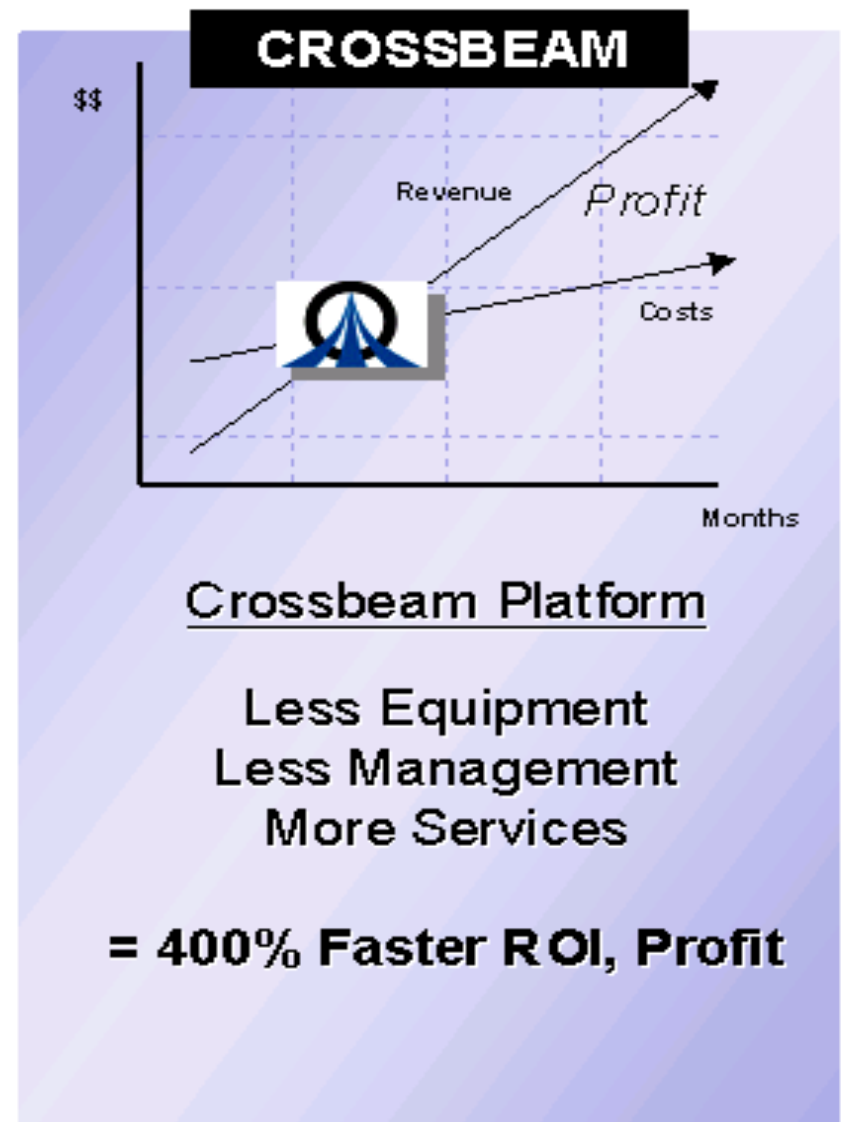**1990** — Bottleneck is the Wide Area Network

The Sandwich Problem

Intrusion   **Firewall**   **Service n…**

Chicken and Egg Economics

EXISTING

$$

Costs

Revenue

Years

Existing Platforms

Initial Outlay Too Great
Management Costs Too High
No Subsequent Leverage

= Slow ROI, Lagging Profit

CROSSBEAM

$$

Revenue   *Profit*

Costs

Months

Crossbeam Platform

Less Equipment
Less Management
More Services

= 400% Faster ROI, Profit
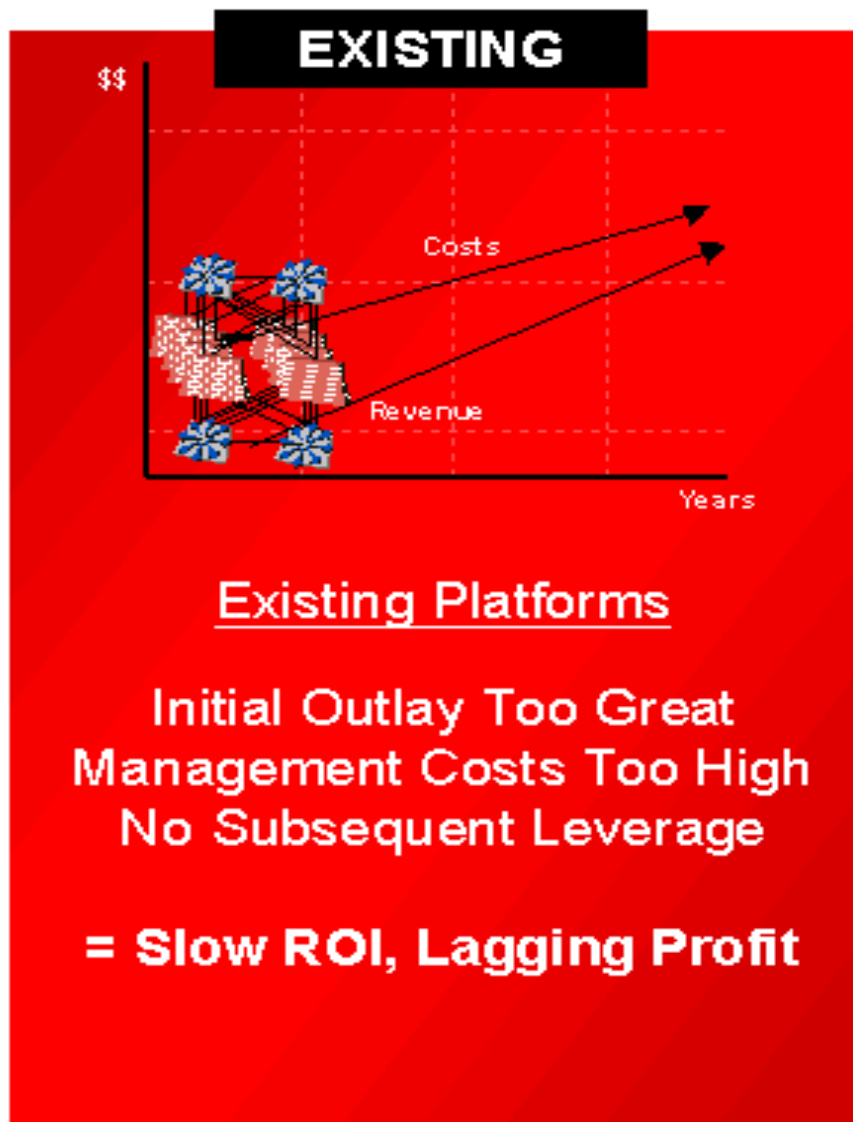
Cost Reduction Via Integration

Load Balancing Flow Switches

Purpose-built Computing Elements
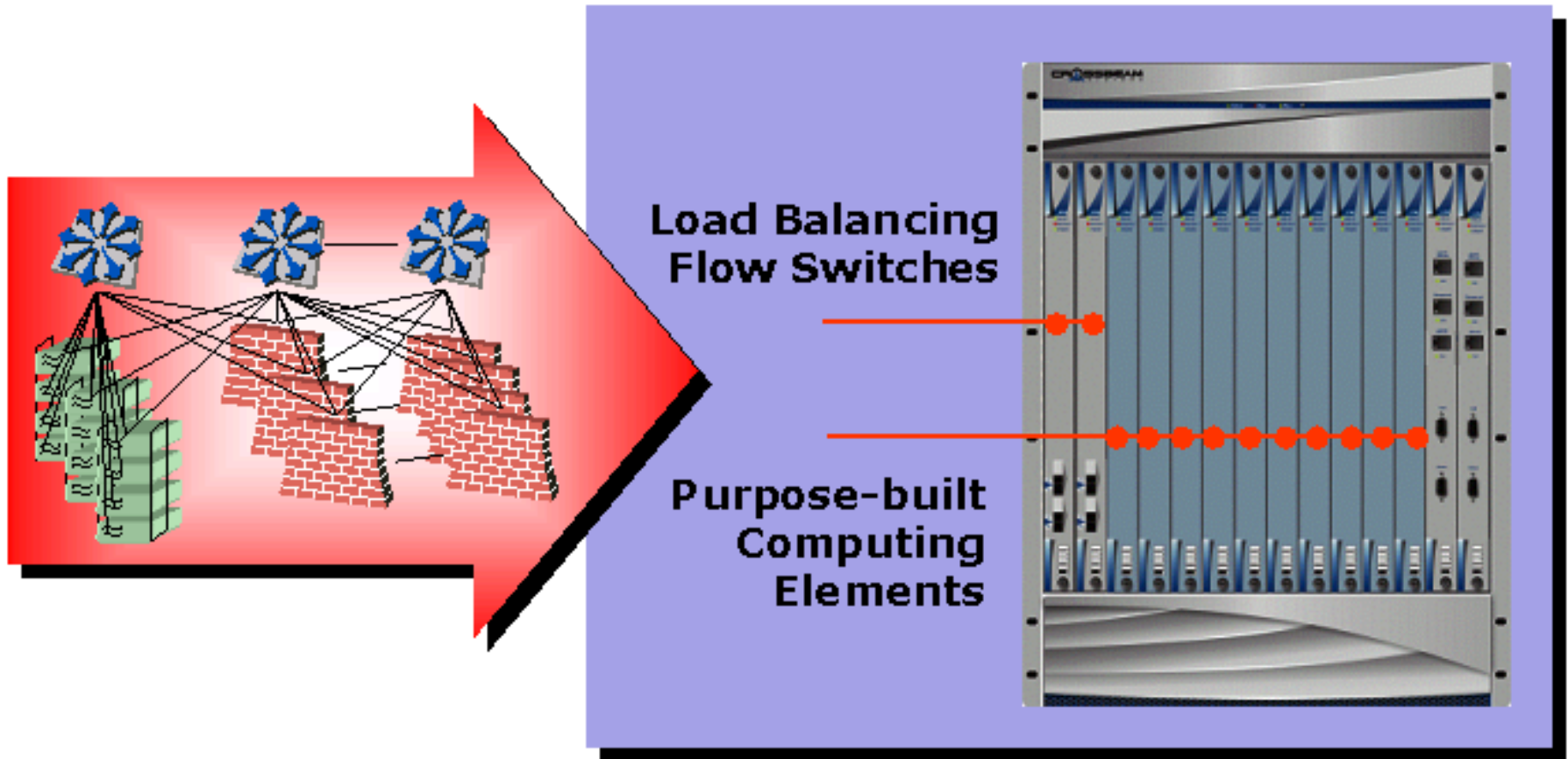
Extend 99.999% Availability to Application Services Cost Effectively

Maximizing Application Service Value

Customers and Applications Drive Platform Hardware and Software Evolution

Best in Class
Third Party Applications

Binary Compatibility Layer

Virtualization Layer

Packet Processing Processing
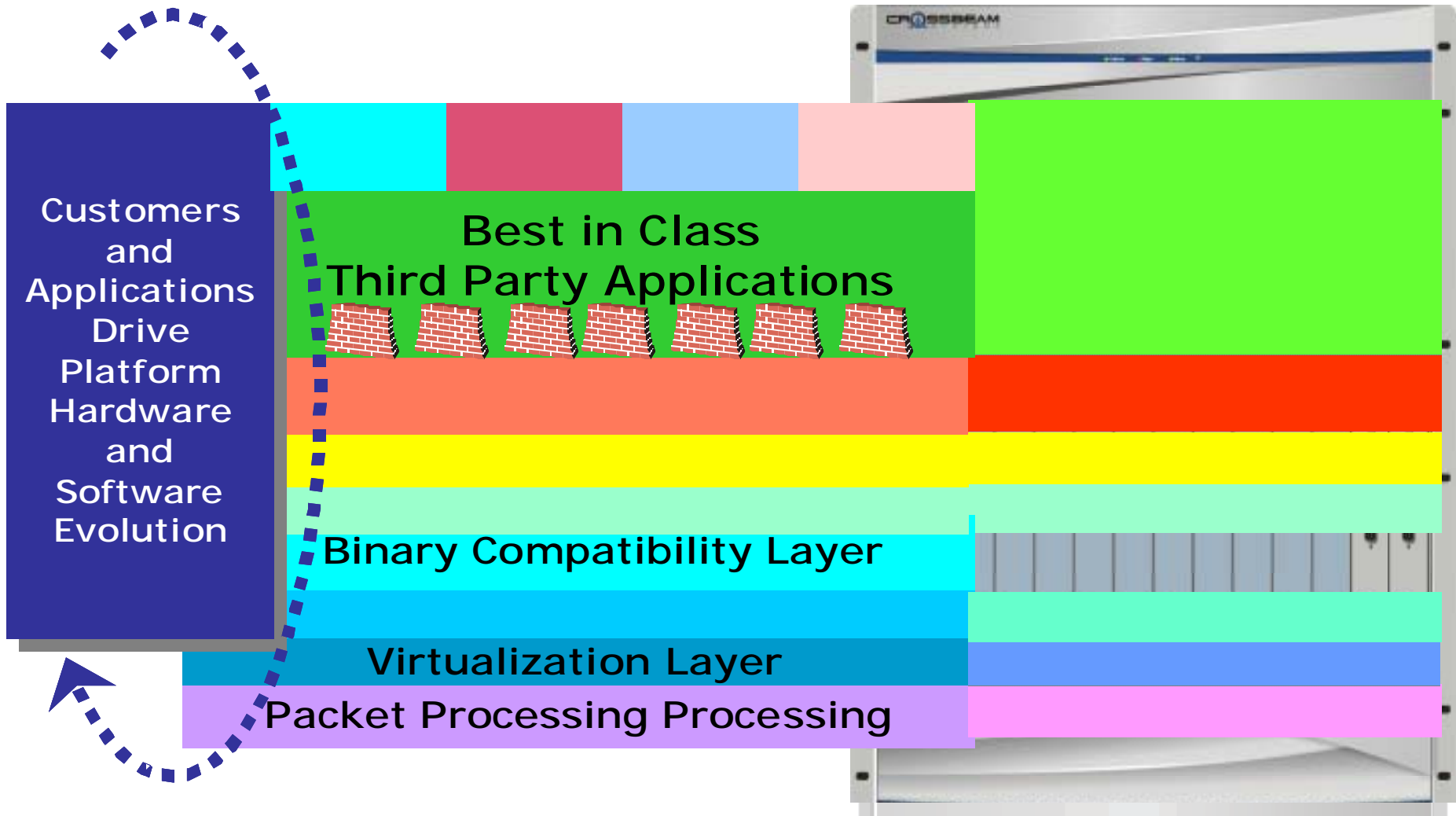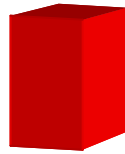
Standard Software subsystems migrate into hardware

Optimizing For Application Services
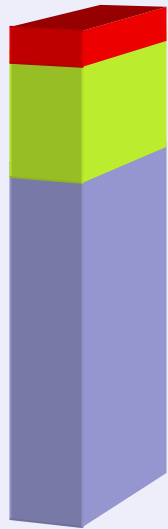
Platform Cost Components
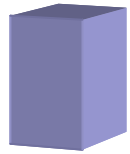
Transport Services

Flow Processing and Management
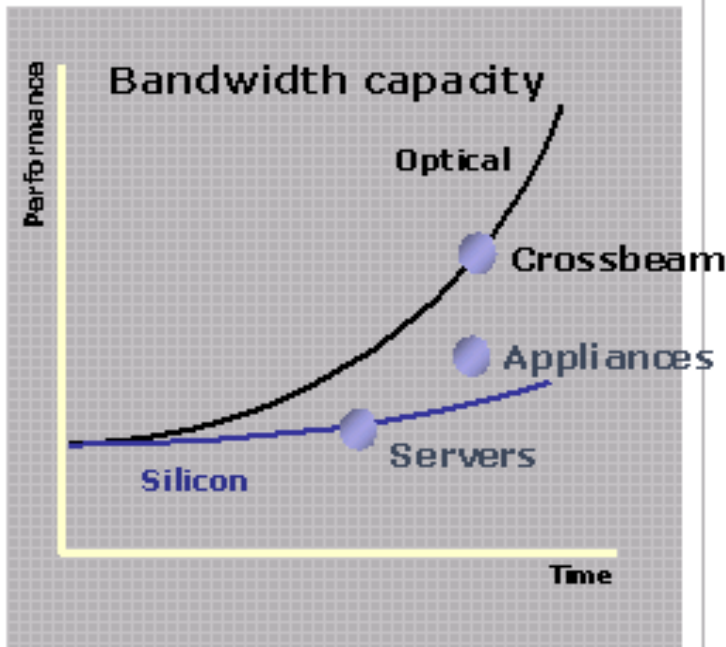
Value Added Services & Applications

Network Equipment

Servers

Crossbeam

Technology Challenge

Only Crossbeam 'X'
Architecture Matches
Stateful Application Service
Performance to Optical
Connections

Bandwidth capacity

Performance

Optical

Crossbeam

Appliances

Servers

Silicon

Time

Transport Layer   Application Layer

Bits arriving   Bits processed

Copper-based Transport

- -
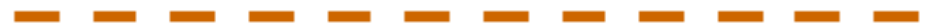
Optical-Based Transport

Optical Performance doubles   NOT PROCESSED!

Optical Performance doubles again   NOT PROCESSED!   FULLY PROCESSED
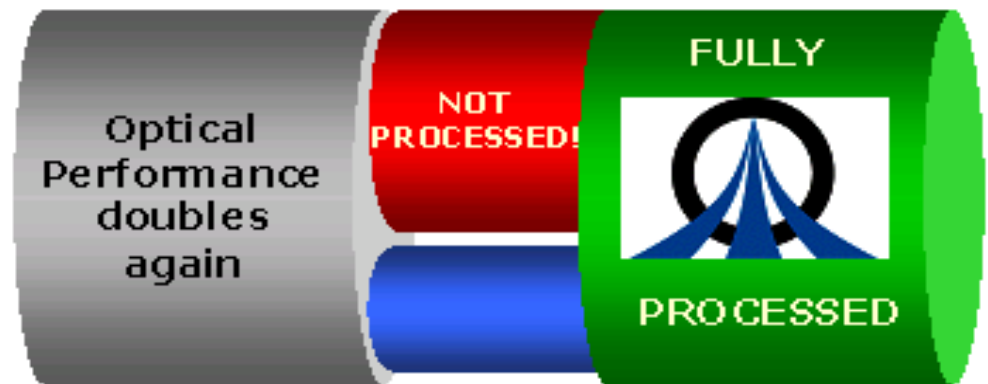
Architectural Subsystems

CPMs
- System control
- Common disks
- Management

Carrier-Class Patent Pending Architecture

Secure, Gigabit Mgt, I/O Interfaces

APMs
- Flow processing
- Applications
- Services
- Policies
- Configurations

Multiple Gigabit Network Interfaces

NPMs
- Flow classification
- Flow switching
- Load balancing
- Network interfaces
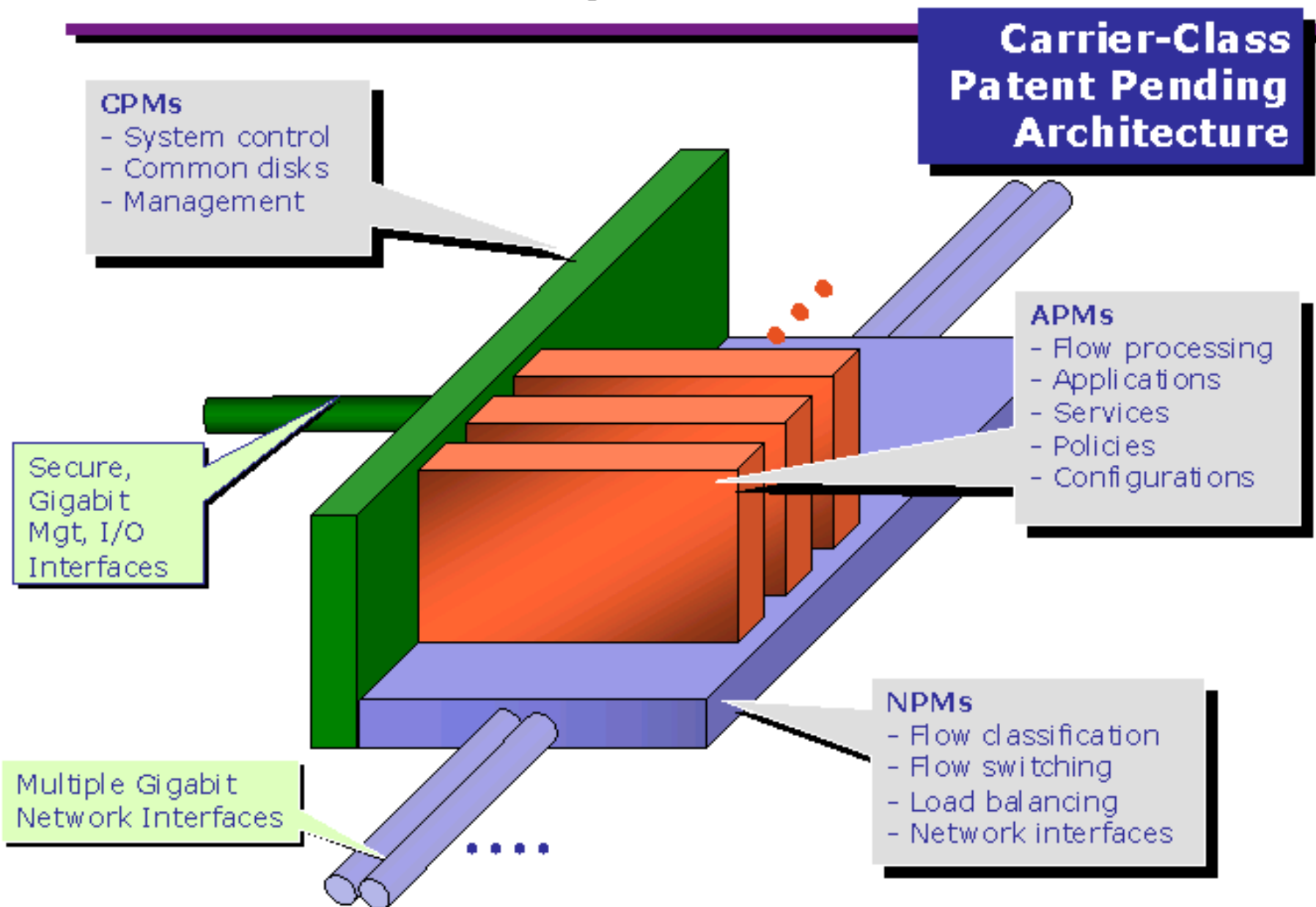
Tighter Integration Enables Better Resource Utilization

Scheduling vector

CPM gets metrics from APM and computes scheduling vector for NPM

CPM

NPM uses the Vector to schedule new flows to APMs

NPM

User flows

Load metrics

APMs

APMs generate load metrics and send updates to CPM