Issues in Design & Operations of Modern e-Business Systems

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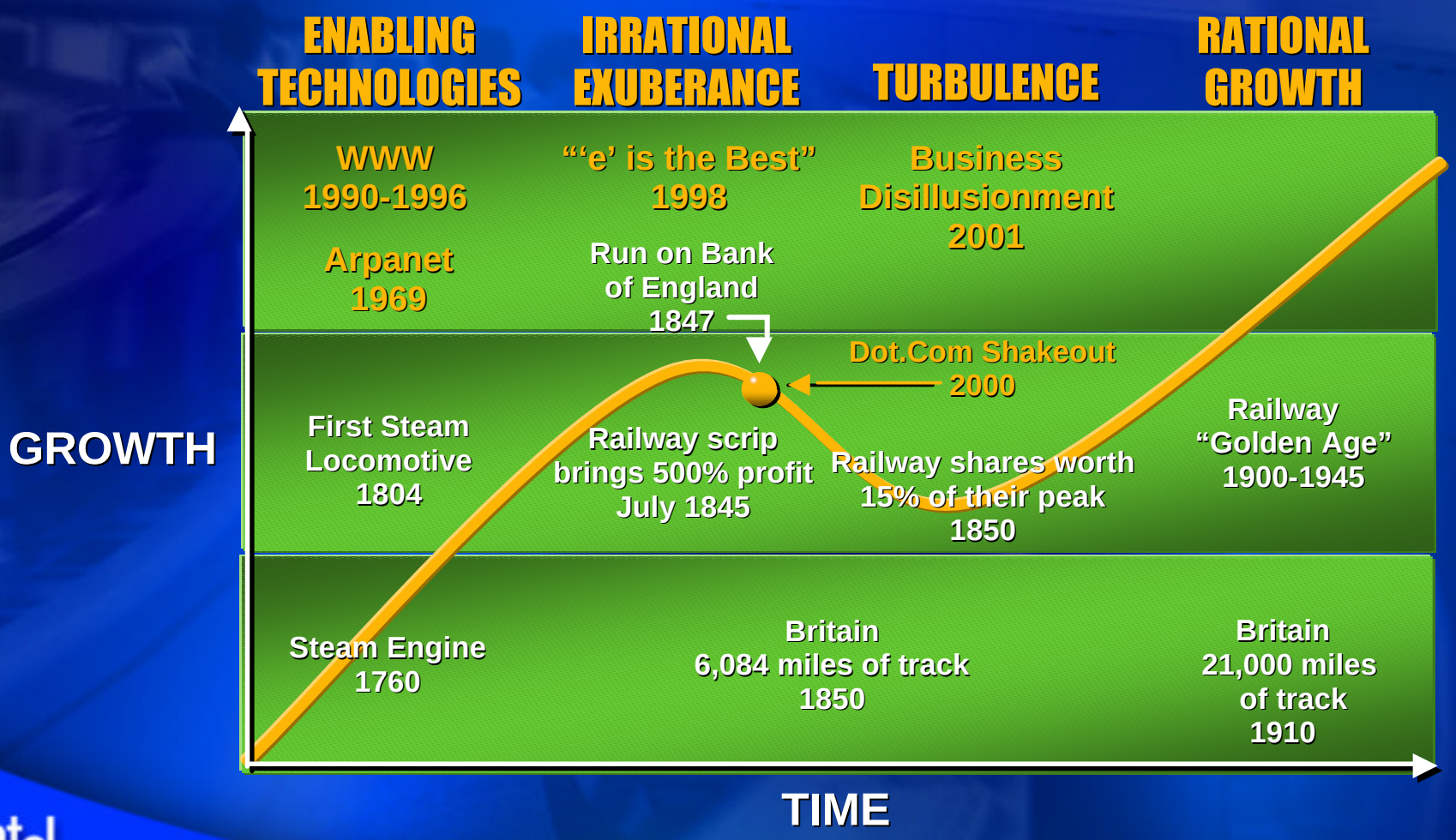
Technology Revolutions



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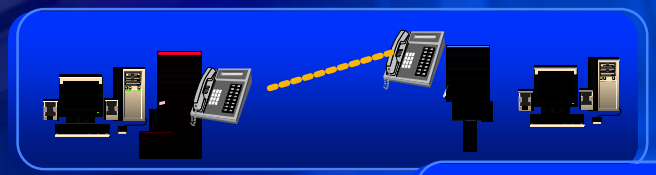
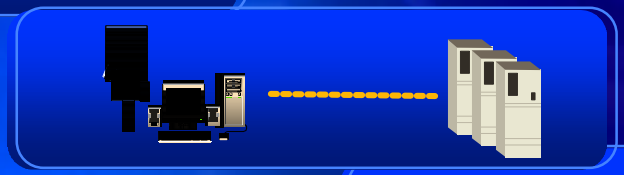
The Quest for Productivity

1960+	1970+	1980+	1990+	2000+
Data Processing	Information Reporting	Planning and Management Information	Electronic Commerce	Electronic Business

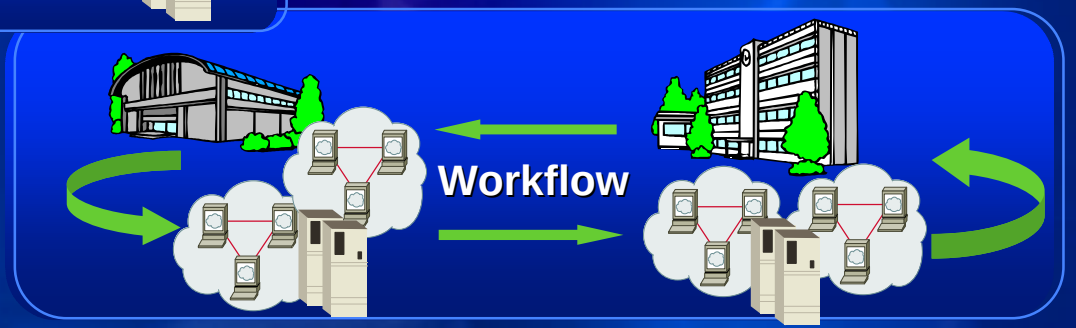
From person-to-person…



…via client-to-server(s)…



…to peer-to-peer



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e-Business Productivity Improvements

Errors reduced by 75%

Raw equipment inventory down some 67% from two years ago

Online sales per month doubled without adding staff

~26% of transactions after normal business hours

>75,000 resellers online

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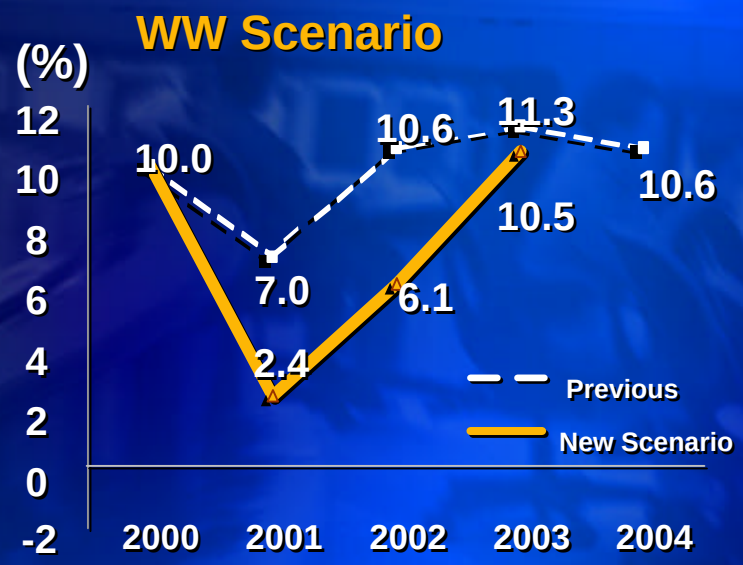
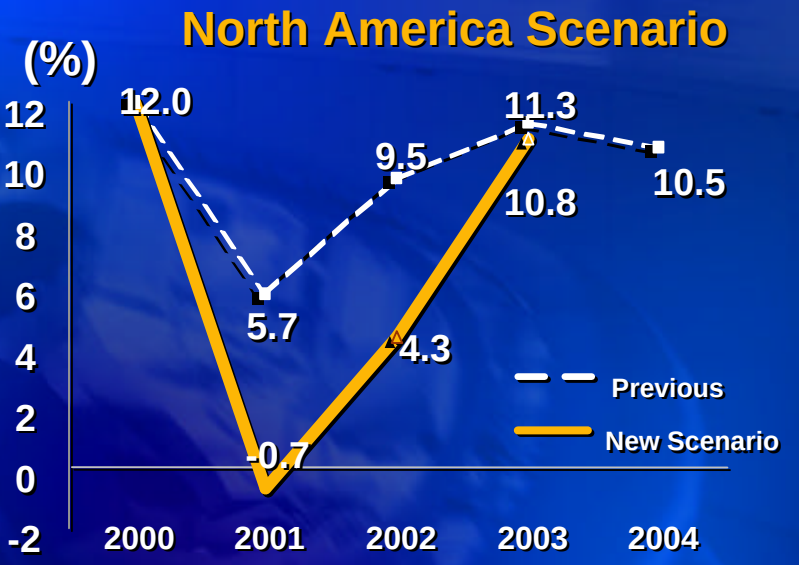
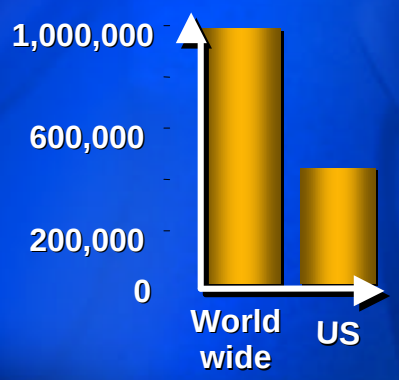
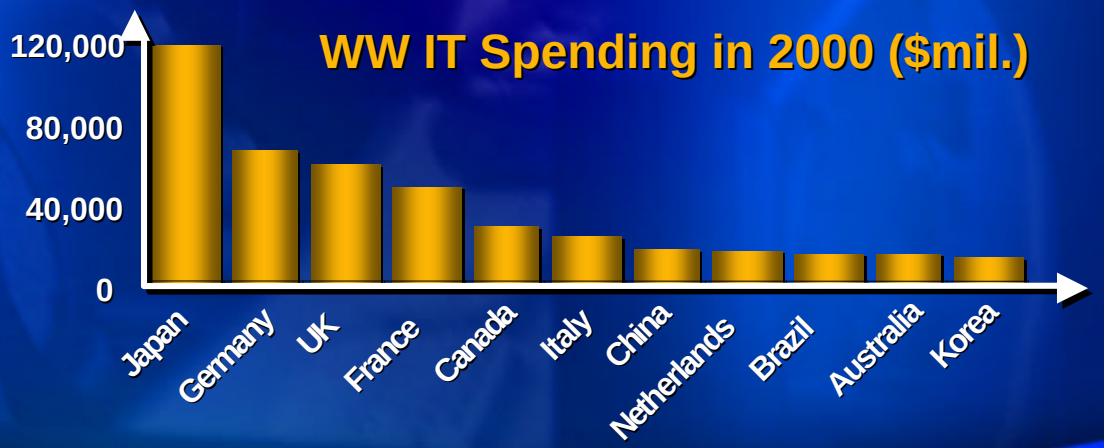
Source: Intel

A Challenged Economy
New IT Spending Growth









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Sources: IDC, October 2001, June 2001

RISK
It's Now Really Mission Critical

Industry	Business Operation	Average $ / Hour of Downtime
Financial	Brokerage Operations	$6,500,000
Financial	Credit Card / Sales Authorization	$2,600,000
Media	Pay-per-view Television	$1,100,000
Retail	Home Shopping (TV)	$113,000
Retail	Home Catalog Sales	$900,000
Transportation	Airline Reservations	$89,500

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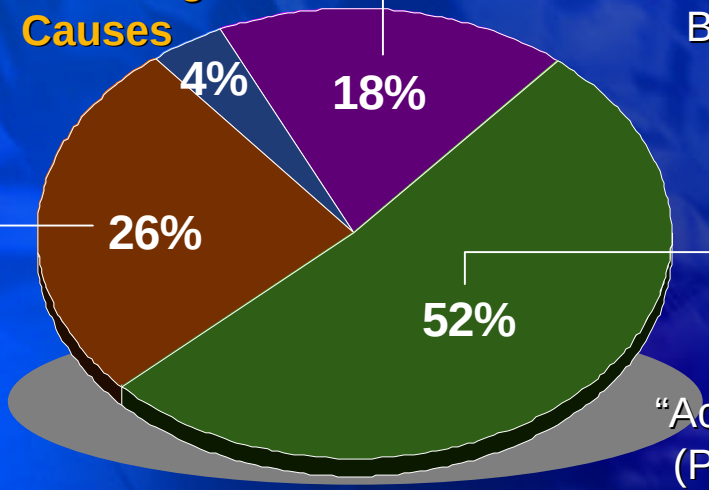
Source: IBM Global Services / High Availability Services

Typical Root Causes for Outages



Software Failure

Bug in OS or application

Misconfiguration / Human Error

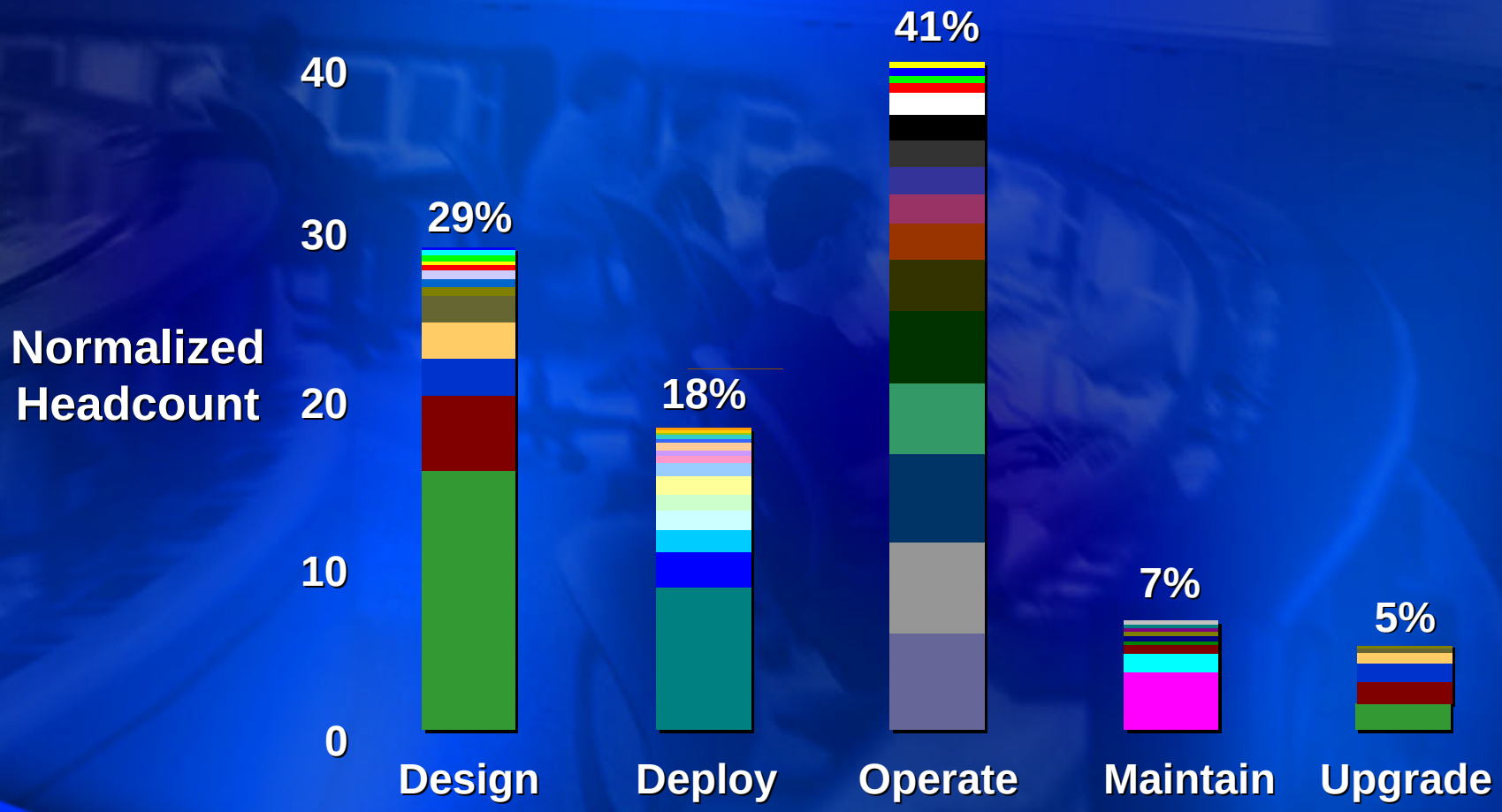
Human Error Was "Accidental" or "Procedural" (Procedure Not Followed)

Hardware Failure

Device Failure Due to a Component Defect or Mishandling

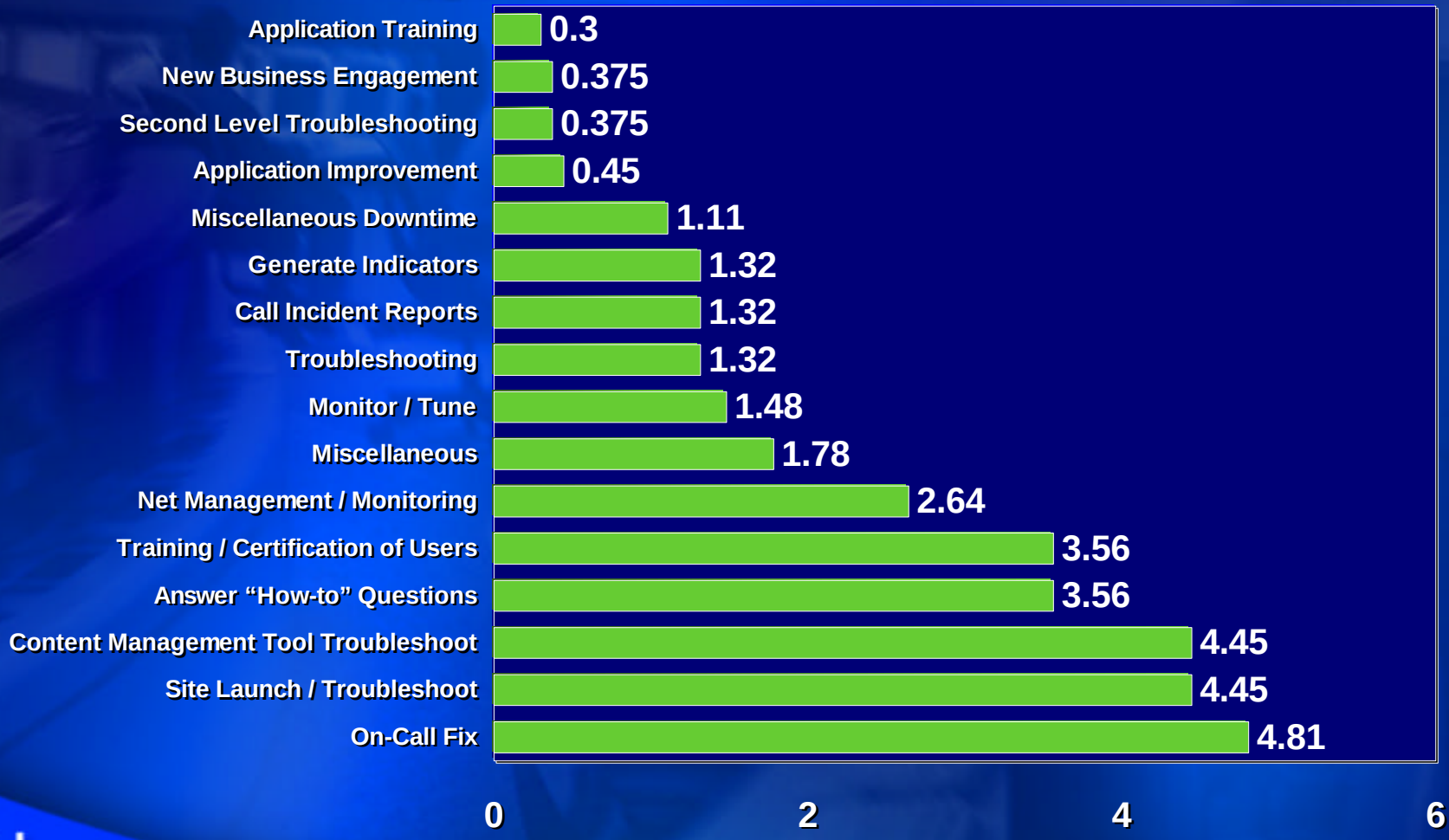
Must Comprehend Life Cycle Costs

Can't Manage What Hasn't Been Measured



Source: ATO study of Intel eBG

Operate Phase Distribution (41%)



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33.3 heads

Applying Lessons from History

Operators

A Switch

Automation leads to disruptive productivity growth and lower TCO

It results in improved reliability, scalability and quality of service

People move to higher value added work

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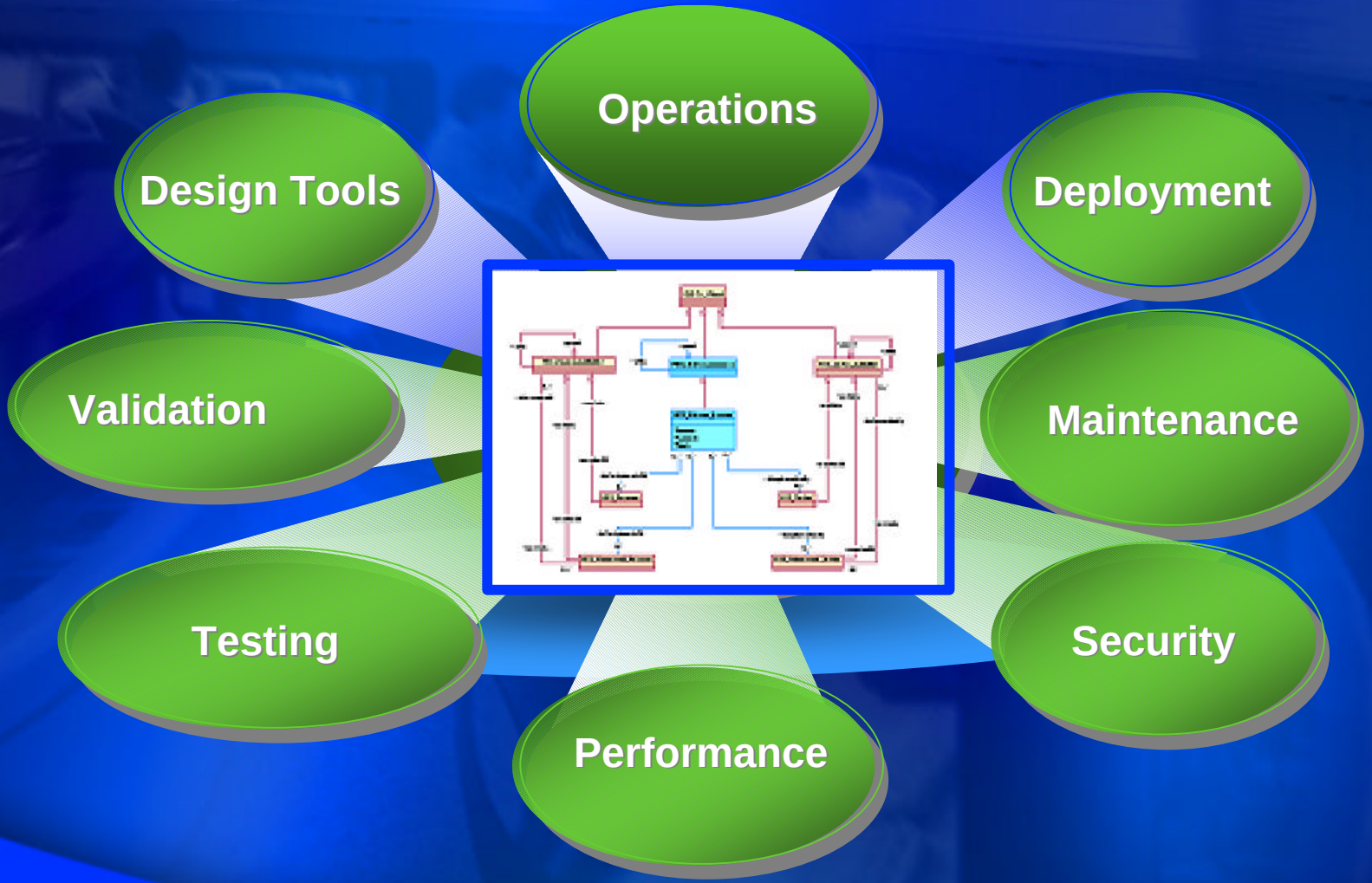
Open Control Model Enables Integrated Tool Ecosystem



Abstraction & Aggregation

Users

J.Doe

Roles/Groups

Administrators

Conn. Services

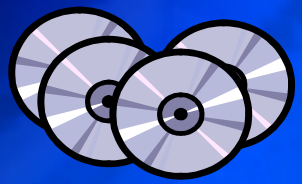
L/B service

Comp. Services

web service

Service Collections

E-commerce svcs.



Software Elements

W2K, Apache

Relationships

Pods

site

Comp. Resources

IA server

Conn. Resources

Firewall

Resource Collections

FE server group + L/B switch

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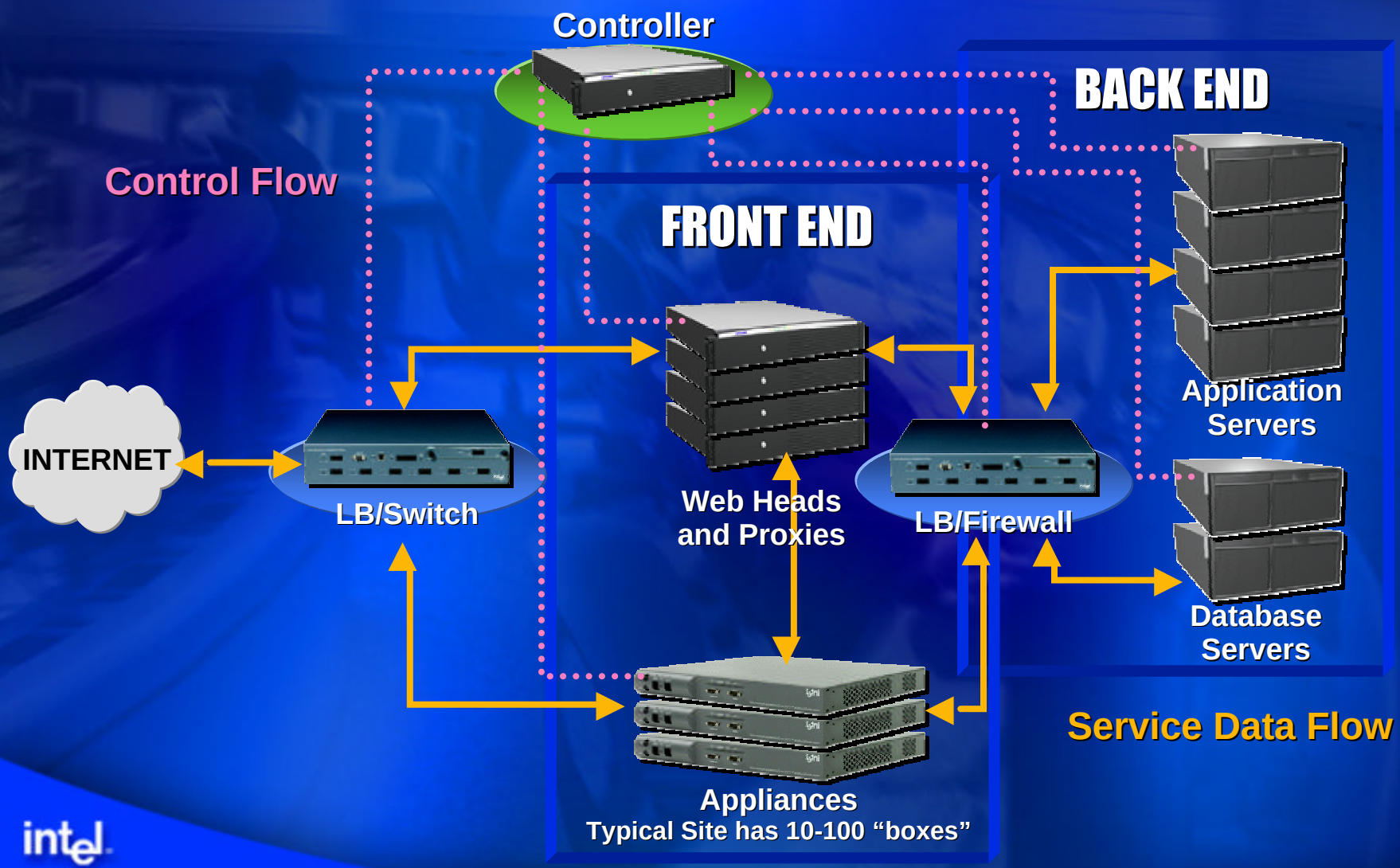
Our Implementation of e-Business Pod



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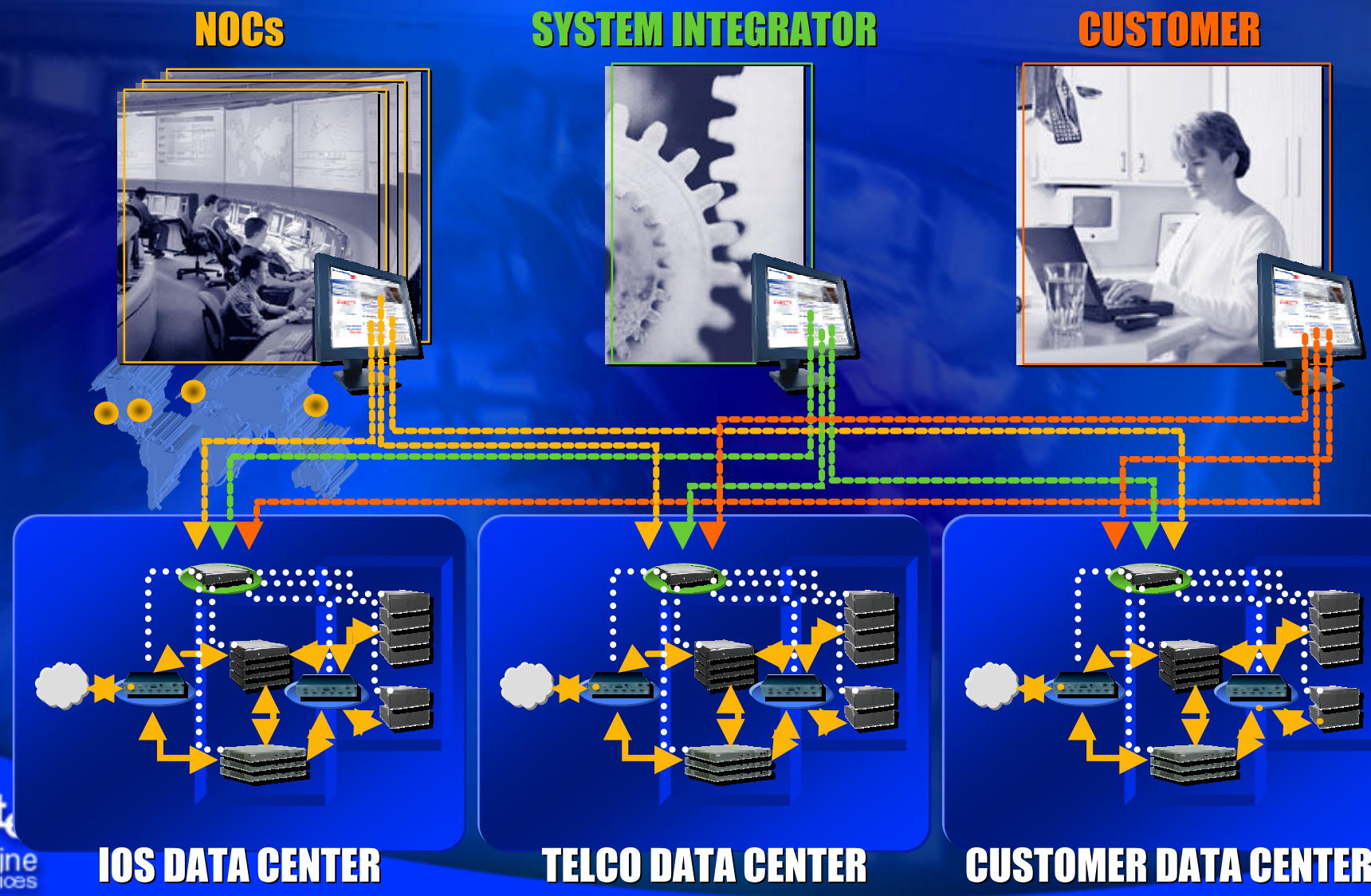
Operations everywhere service



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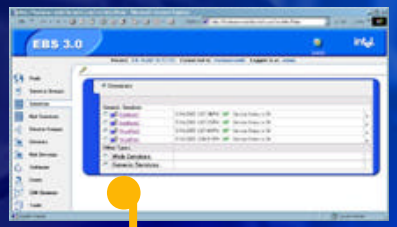
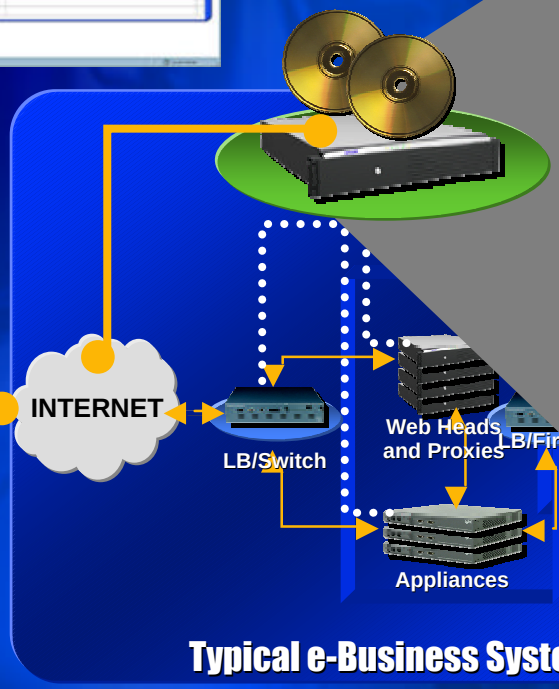
How Does Open Control Work

Controller is a model based "automation platform" which emulates operators

Browser Interface





Open CONTROLLER

WEB UI and AUTOMATION APPLICATIONS

AUTOMATION APPLICATION API

Open Control OBJECT MODEL

- Added abstractions for Services
- Added security, persistence…

PROVIDER SPI

PROVIDERS

Wrap existing management interfaces for Servers, Net Devices, OS, applications

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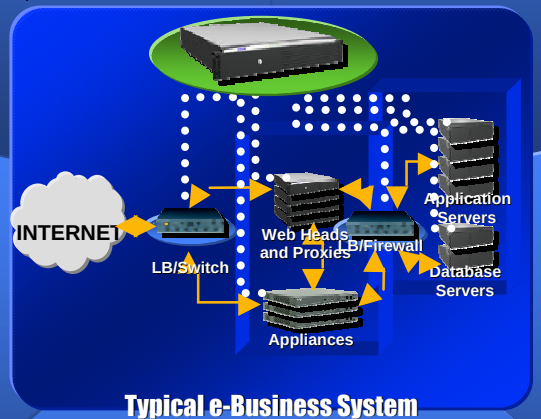
Open Control enabled e-Business Ecosystem

TOOL CHAIN

- Design capture, check, simulate
- Rules and troubleshooting, author automated runbook
- And IDE for e-Business Solution tools, based on Open Control, etc.

e-Business "MOTHERBOARDS"

- Data centers and pod-based OSS infrastructure
- Modular data center hosting environment
- e-Business OSS and Service components



Typical e-Business System

SERVICE COMPONENTS

- OS: Windows* 2000, Linux, Solaris
- Applications: Microsoft, Oracle, BEA, Sieble, Ariba

END-CUSTOMER SOLUTIONS

- CRM, SLM, …
- Web Services…

e-BUSINESS OSS and ISP/HSP SOLUTIONS

- Billing, TroubleTick, Configuration Management, Documentation Management
- Service Applications: Backup/Restore, Intrus Detect, Anit-Virus, Disaster Recovery, Content Management, …

PLATFORM COMPONENTS

- Servers, Network Gear, Load Balancers

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Intel® Open Control Technology

- Significantly improves productivity and system robustness
- Improves our flexibility when it comes to working with partners and customers (i.e., operations everywhere)
- Adding new systems and key alliances to prove and expand the technology
- Technology and automation are key to our differentiation

There Are Opportunities to Work Together to Our Mutual Benefit

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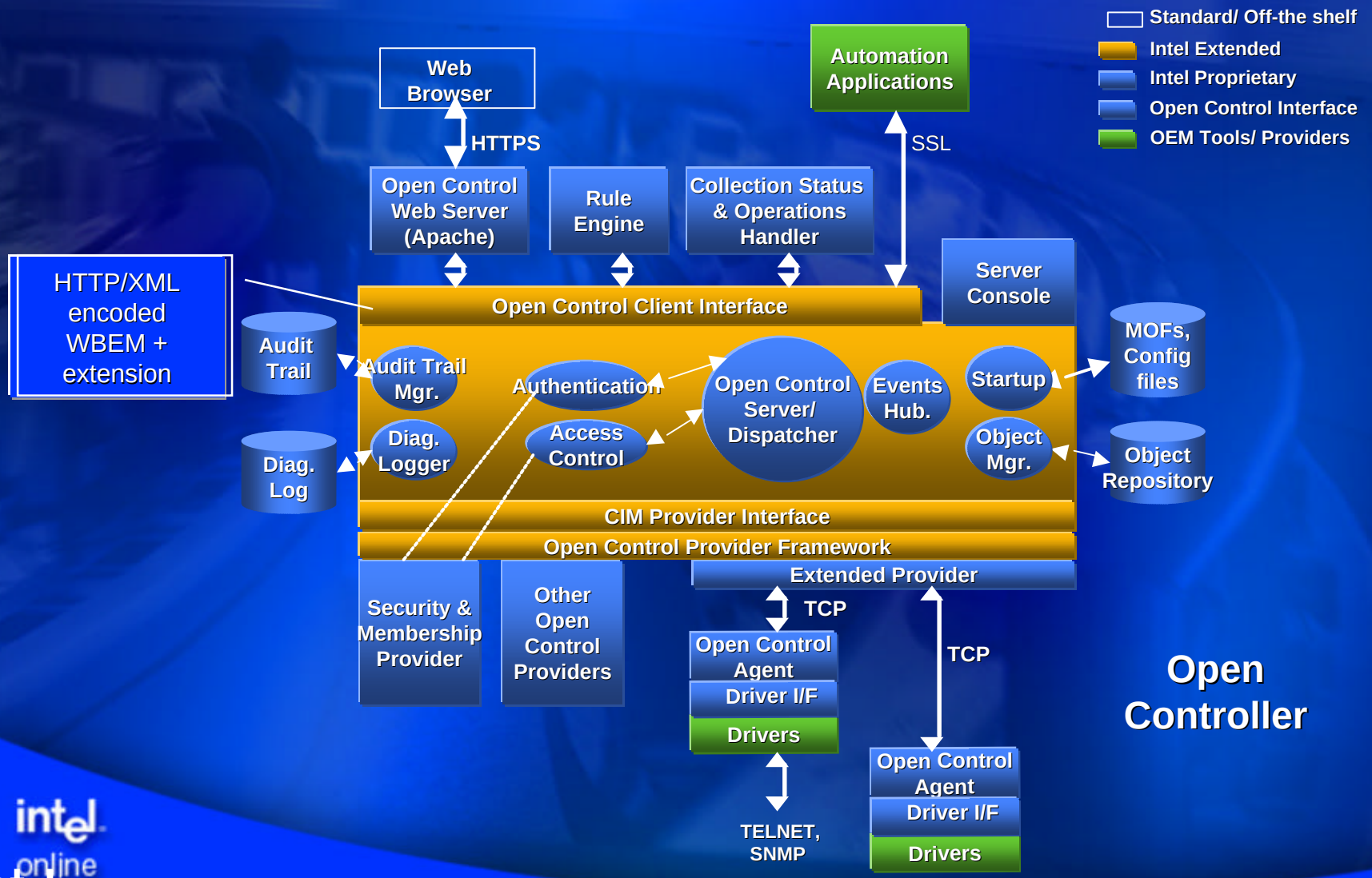
Intel® Online Services

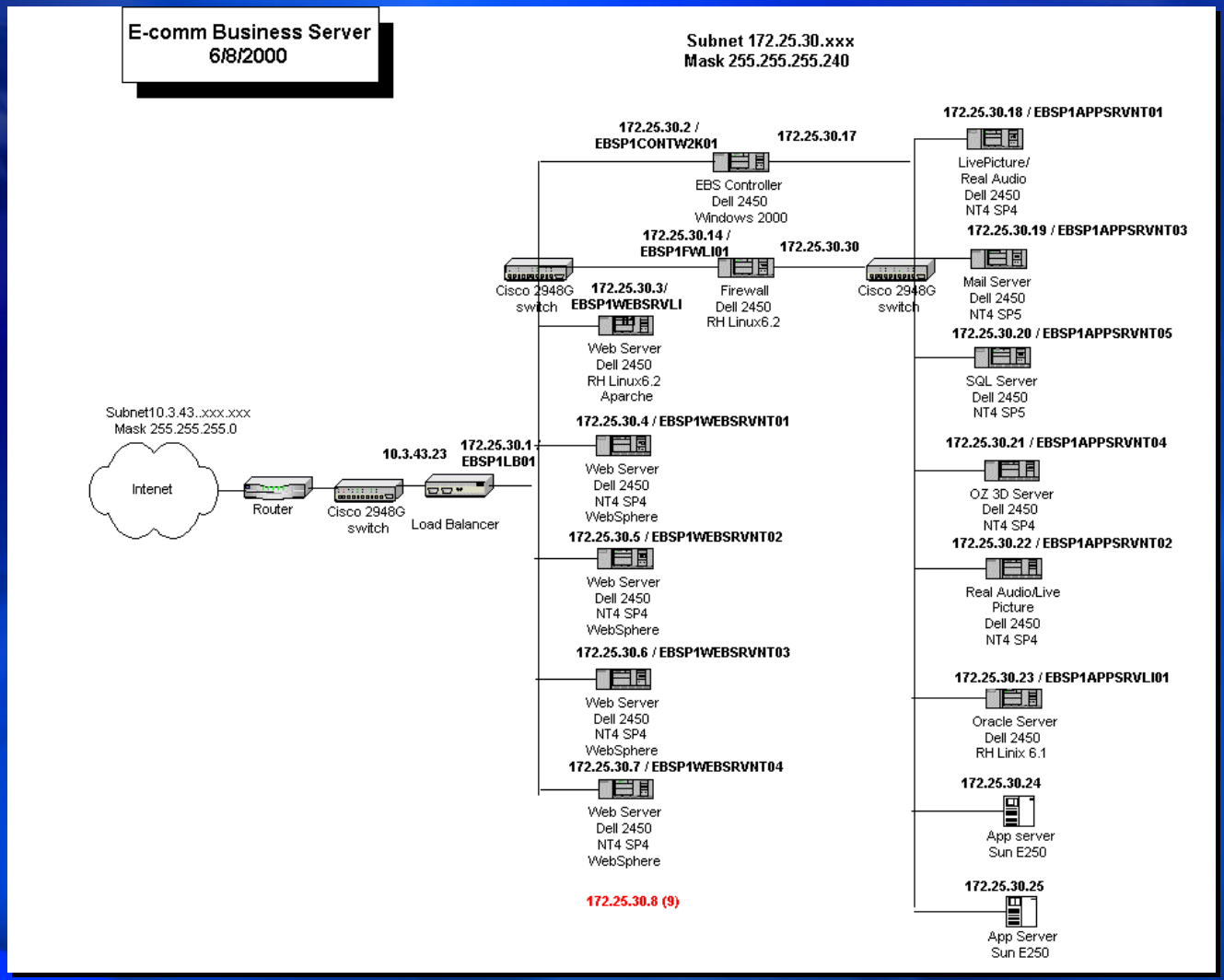
INTERNET OPERATIONS
management and flexible control of e-Business for the Global Enterprise

Open Controller Architecture



Managing a Solution with Open Control

ArtMuseum.Net – ATO integration project



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IOS AppChoice™ Platform Integrates
System Architectures into a Service System

Materials † Components † Systems

SYSTEM SOLUTIONS

Price / Performance

IA-32 PCA IXA IPF

Appliances

Computers

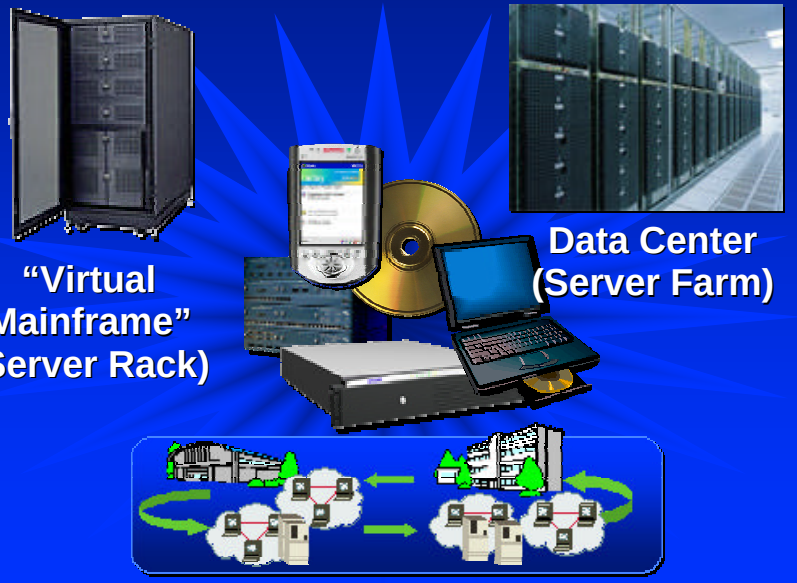
Switches

Components † Systems † Services

SERVICE SOLUTIONS

Total Cost of Ownership

Intel® Open Control Architecture



"Virtual Mainframe" (Server Rack)

Data Center (Server Farm)

Distributed (B2B, P2P)

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Design Phase Distribution (29%)

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24.05 heads

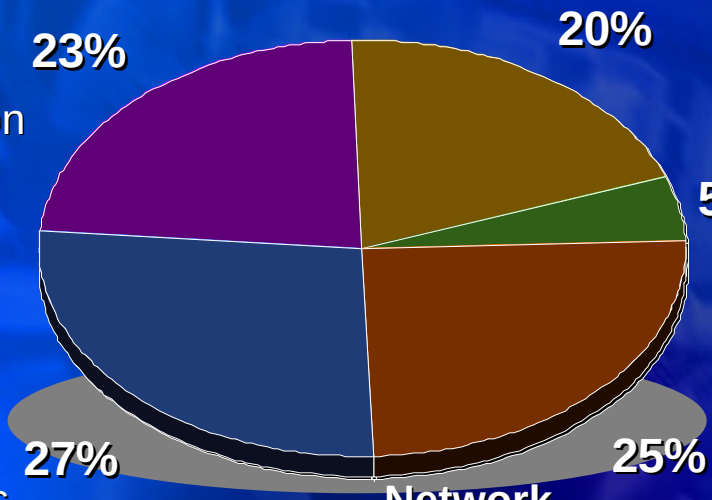
Deploy Phase Distribution (18%)

15.03 heads

Top 4 Web Site Performance Hot Spots

Web Server
- Improper server configuration
- Insufficient memory resources

Application Server
- Improper application configuration settings
- Poor cache and session management



Database
- Inefficient indexing
- Fragmented databases
- Out-of-data statistics
- Faulty application design

Network
- Insufficient network BW
- Improper tuning of firewall, routers, load balancers and gateways – hardware incompatibility and software misconfiguration

98% of Time Performance Problems Occur Simply Because the Infrastructure Components Were Not Tuned or Configured Properly

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Source: Mercury Interactive Study: Web site performance problems encountered during load testing, April 2001