NEXT GENERATION DATA CENTER


Evolution

iPhone 1

One of the main features of the iPhone was its full-featured browser. The thing could actually visit normal webpages like those displayed on computers.

June 29, 2007

June 10, 2008

Jobs' original vision for the iPhone: No third-party native apps

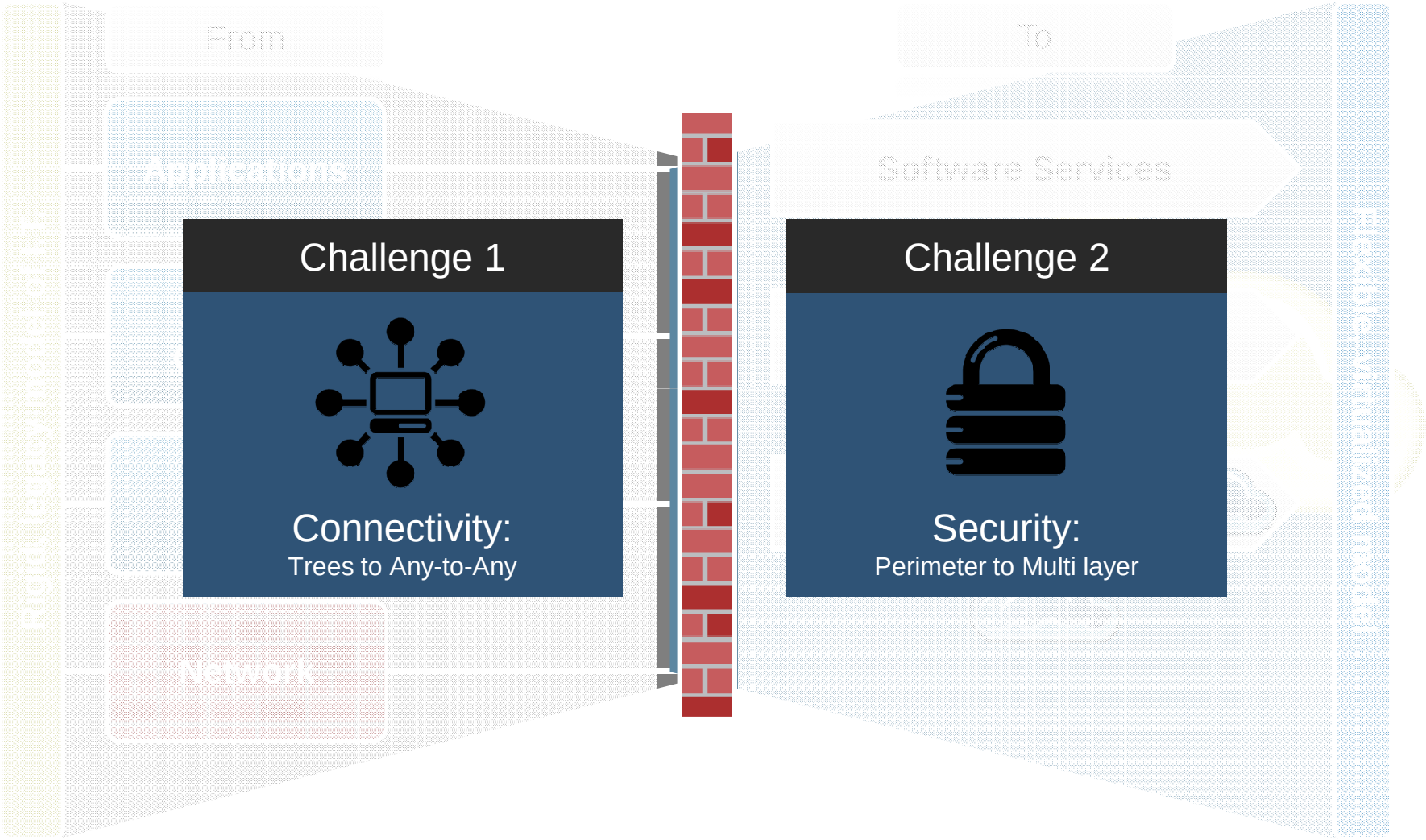
At the time, Jobs said:

" The full Safari engine is inside of iPhone. And so, you can write amazing Web 2.0 and Ajax apps that look exactly and behave exactly like apps on the iPhone. ……

And guess what? There's no SDK that you need!.....

So developers, we think we've got a very sweet story for you. You can begin building your iPhone apps today "

THE DATA CENTER HAS EVOLVED – BUT NOT THE NETWORK



UNDERSTANDING THE NEW DATACENTER REQUIREMENTS

Consolidation

§ Mega DCs; 400K sq ft

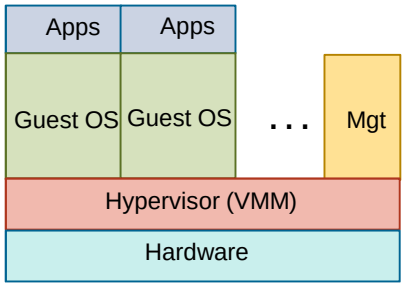
§ 4K racks, 200K servers

DC Scale

Server Trends

§ Multi-core (8->16 >32,….128,…)

§ Virtualization and VMs

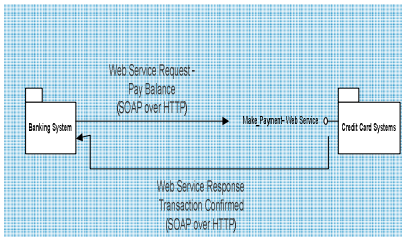


Want Low Oversubscription

Application Trends

§ SOA, Web 2.0

§ MapReduce, Hadoop, Grids

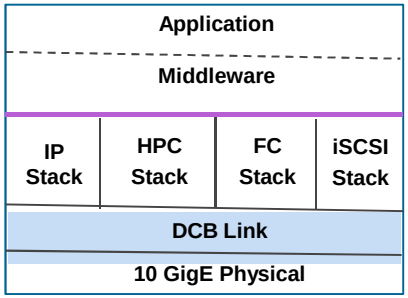


Increased East-West traffic

Interconnect Trends

§ Convergence to 10 GE

§ Enhancements to Ethernet

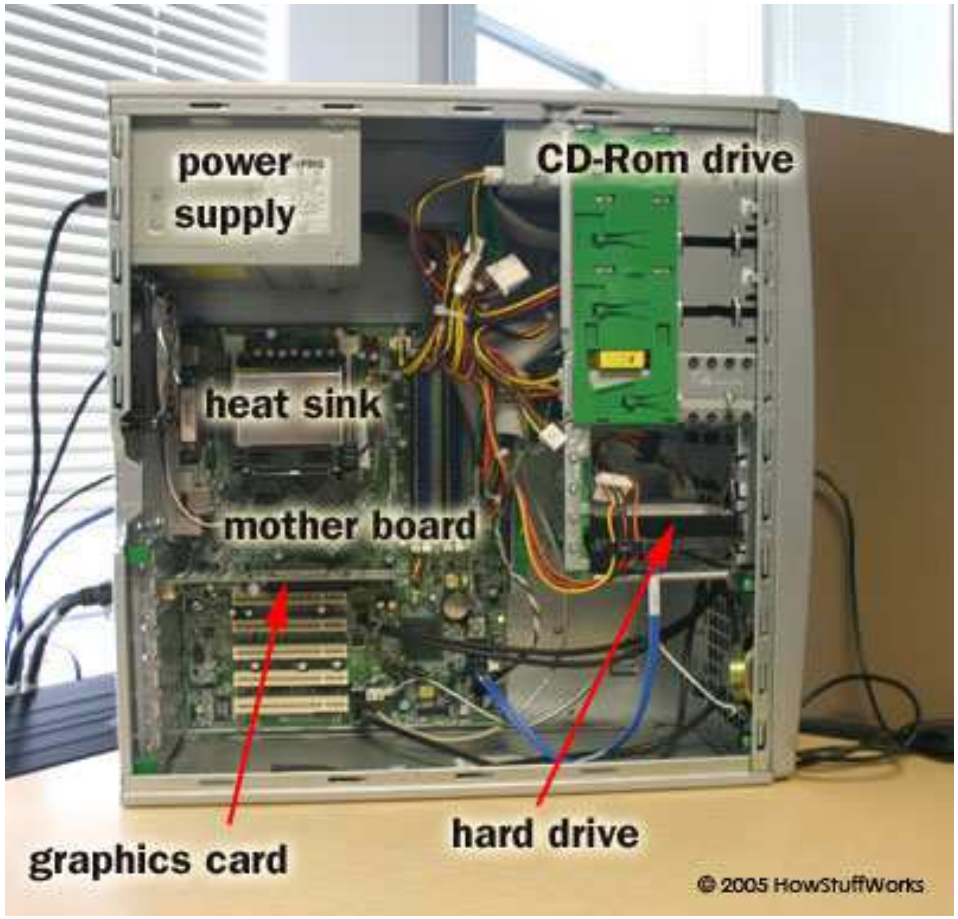


Large speed increases 10/40/100 GE

1. SERVER & STORAGE TRENDS

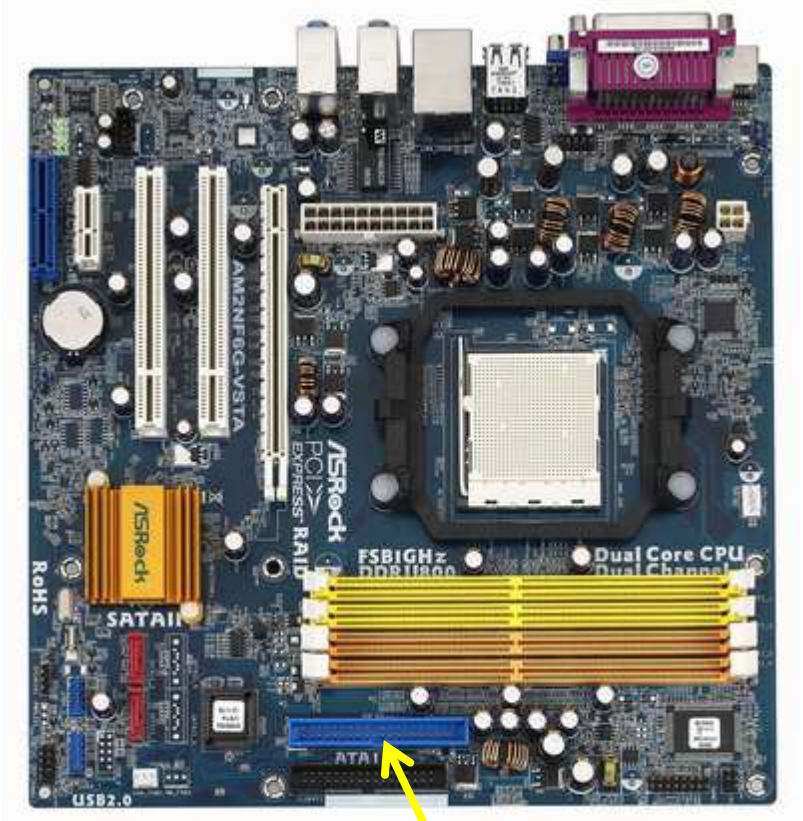

$3398
10MB
THE HARD DISK YOU'VE BEEN WAITING FOR
MORE SOFTWARE

STORAGE CONNECTIONS

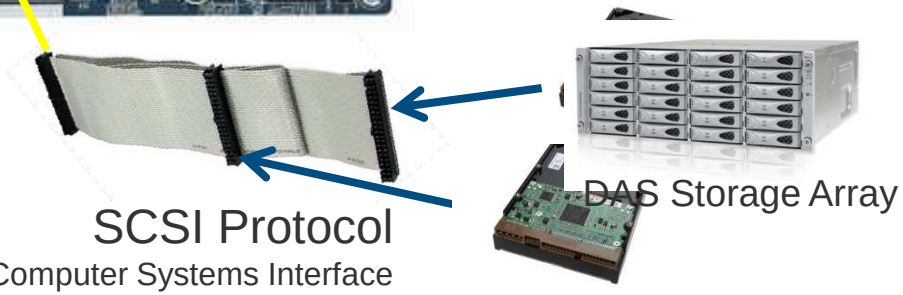


The Gray Cable ?

STORAGE CONNECTIONS : DIRECT ATTACHED STORAGE



- Direct Attached Storage (DAS)
  - Very fast
  - Limited capacity
  - Geographically limited
  - Limited resource sharing

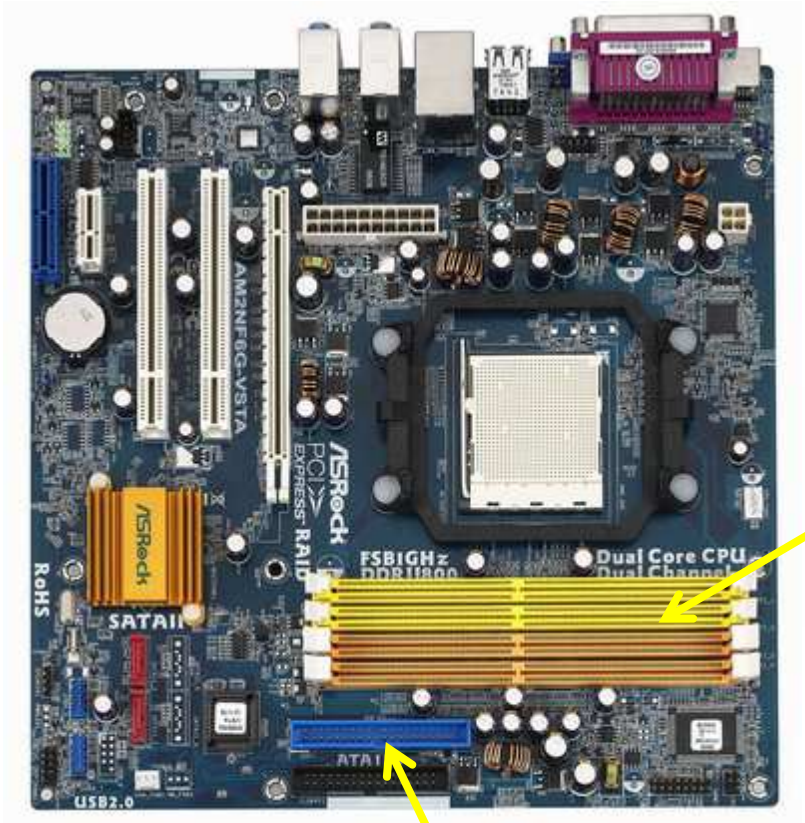


SCSI Protocol

Small Computer Systems Interface

DAS Storage Array

STORAGE CONNECTIONS : FIBRE CHANNEL SAN



Fibre Channel (FC)
Storage Area Network (SAN)

- Unlimited capacity
- Geographically diverse
- Unlimited resource sharing

Fibre Channel
Storage Array

FC Host Bus Adapter
(Fibre Channel NIC)

Fibre
Channel
Switch

Fibre Channel
Director

DAS Storage Array

SCSI Protocol
Small Computer Systems Interface

STORAGE CONNECTIONS : FIBRE CHANNEL OVER ETHERNET (FCOE)

Converged Network Adaptor

FCoE Storage Array

Ethernet Switch

Ethernet Switch

FCoE Gateway

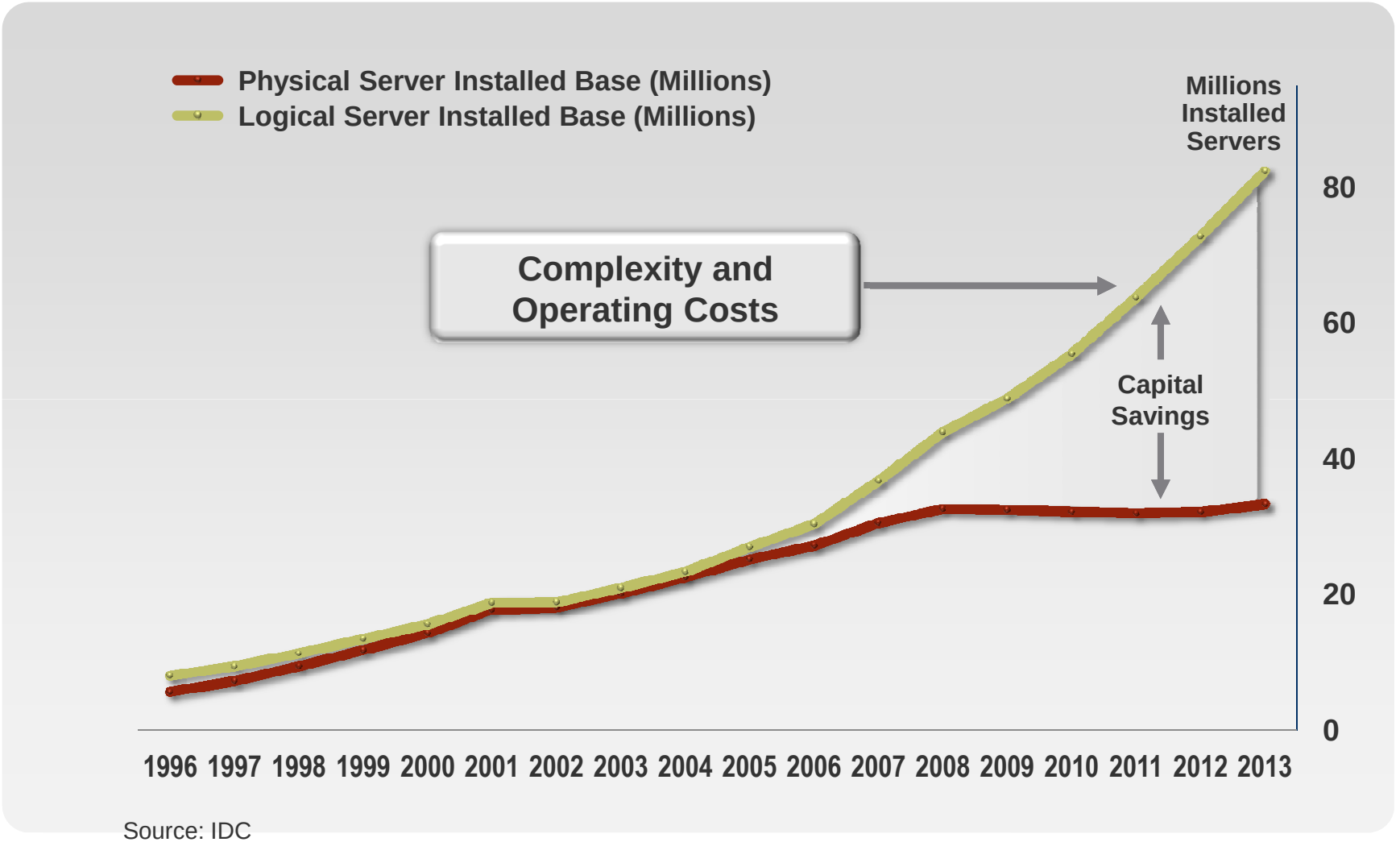
FC SAN

DAS Storage Array

SCSI Protocol

Small Computer Systems Interface

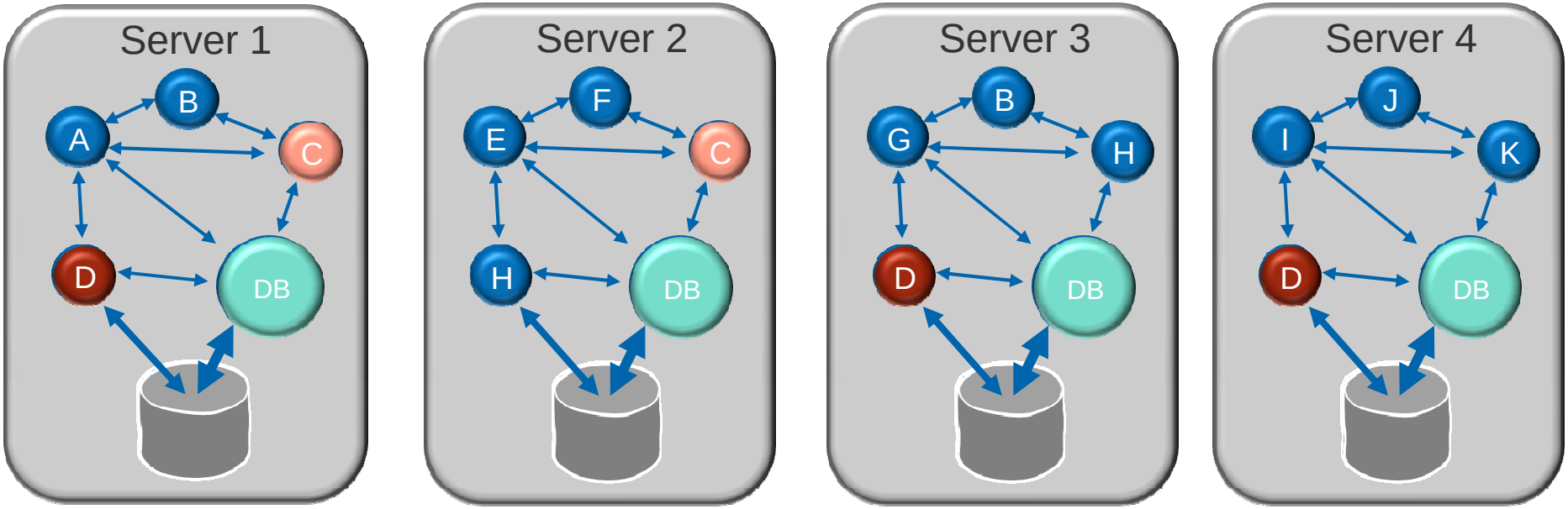
ECONOMICS OF THE VIRTUALISED DATA CENTER

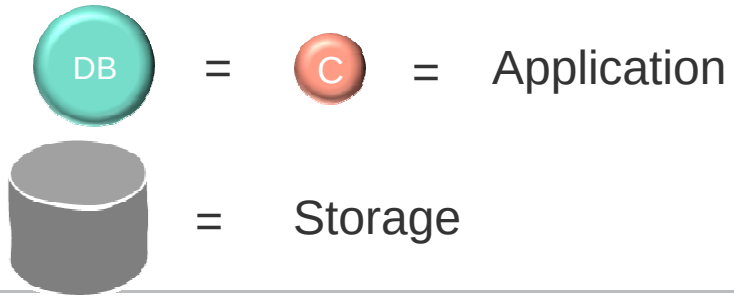


Source: IDC

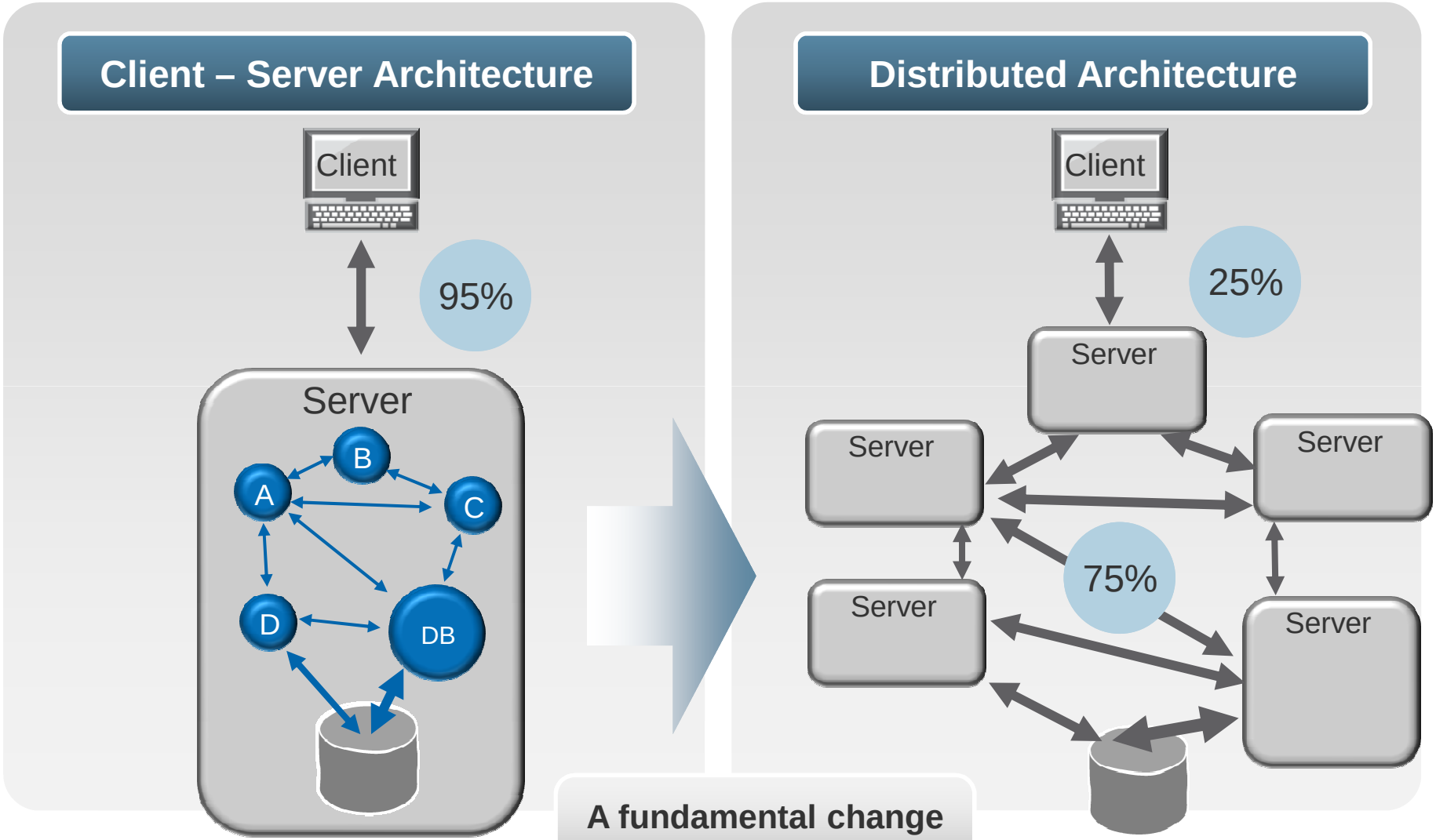
2. APPLICATION TRENDS

CLIENT SERVER APPLICATIONS



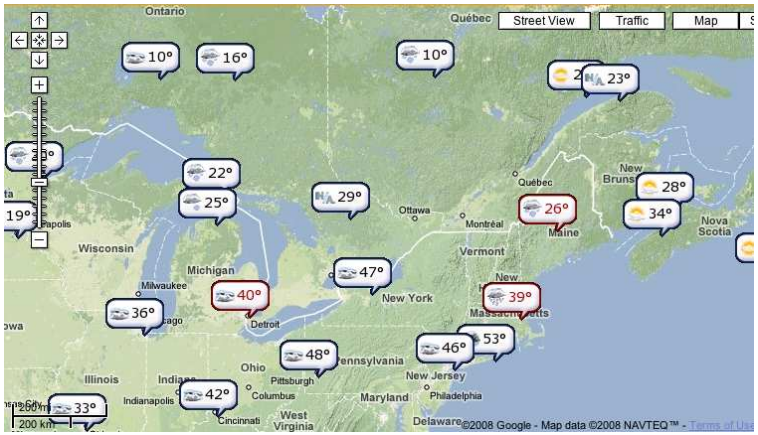


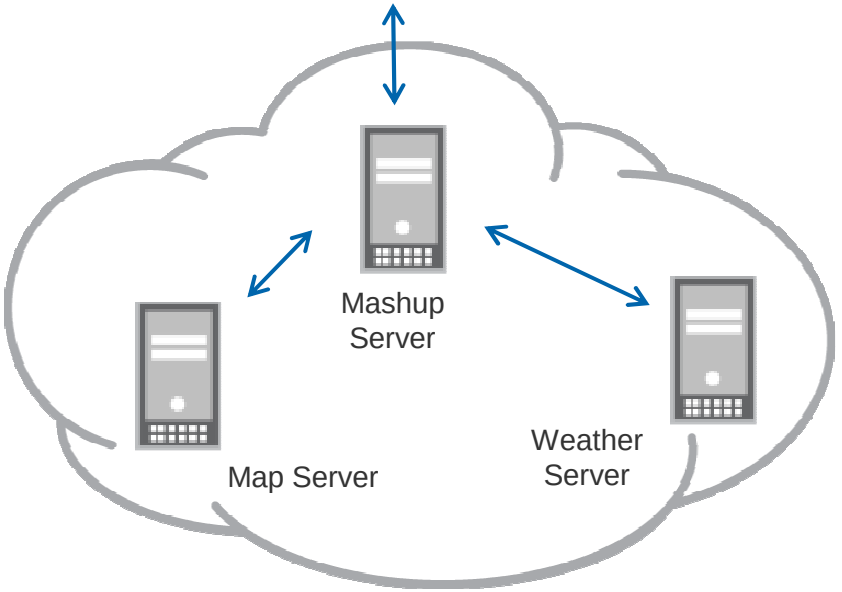
APPLICATION ARCHITECTURE EVOLVED



SOA AND MASHUPS –EXAMPLE

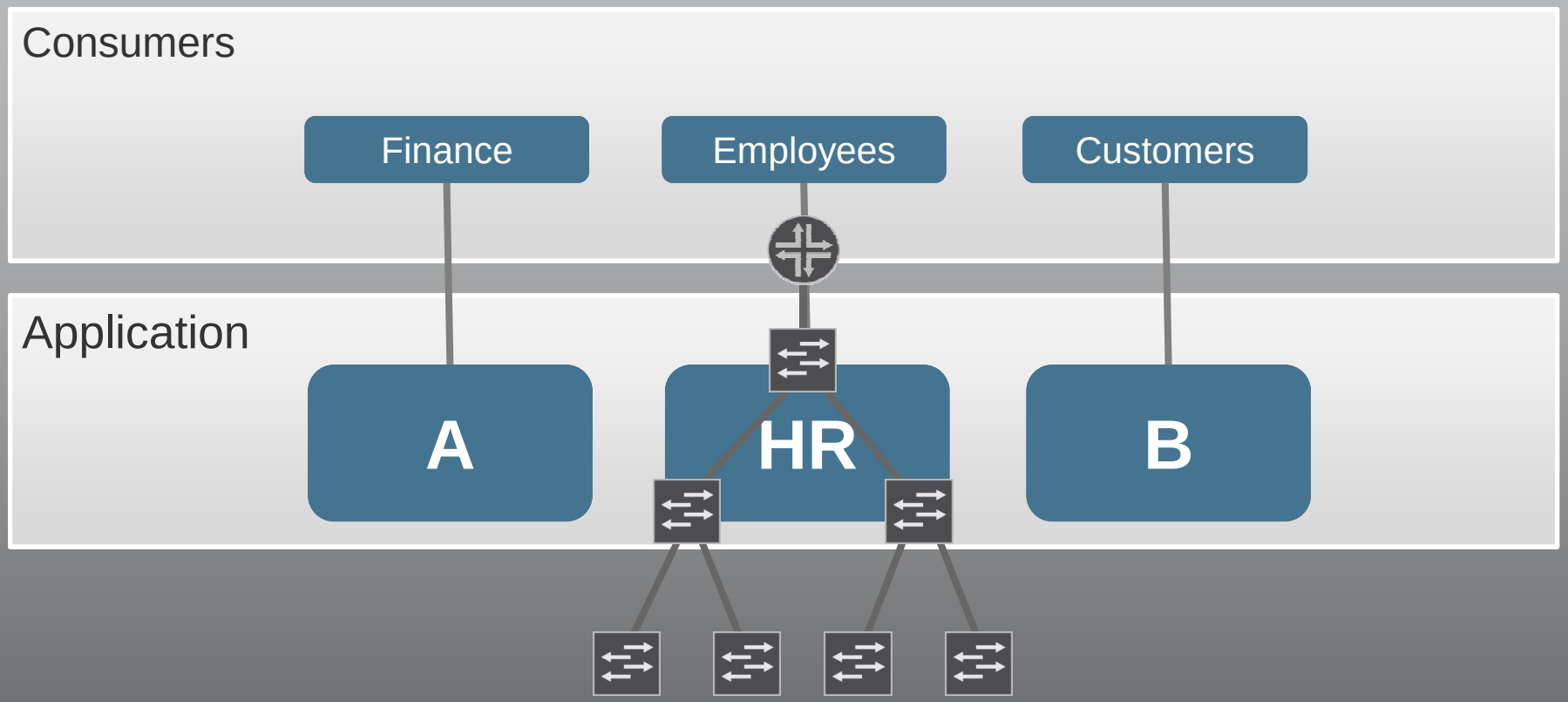
Service Oriented Architecture extends distributed architecture throughout the data center, across data centers and over the internet



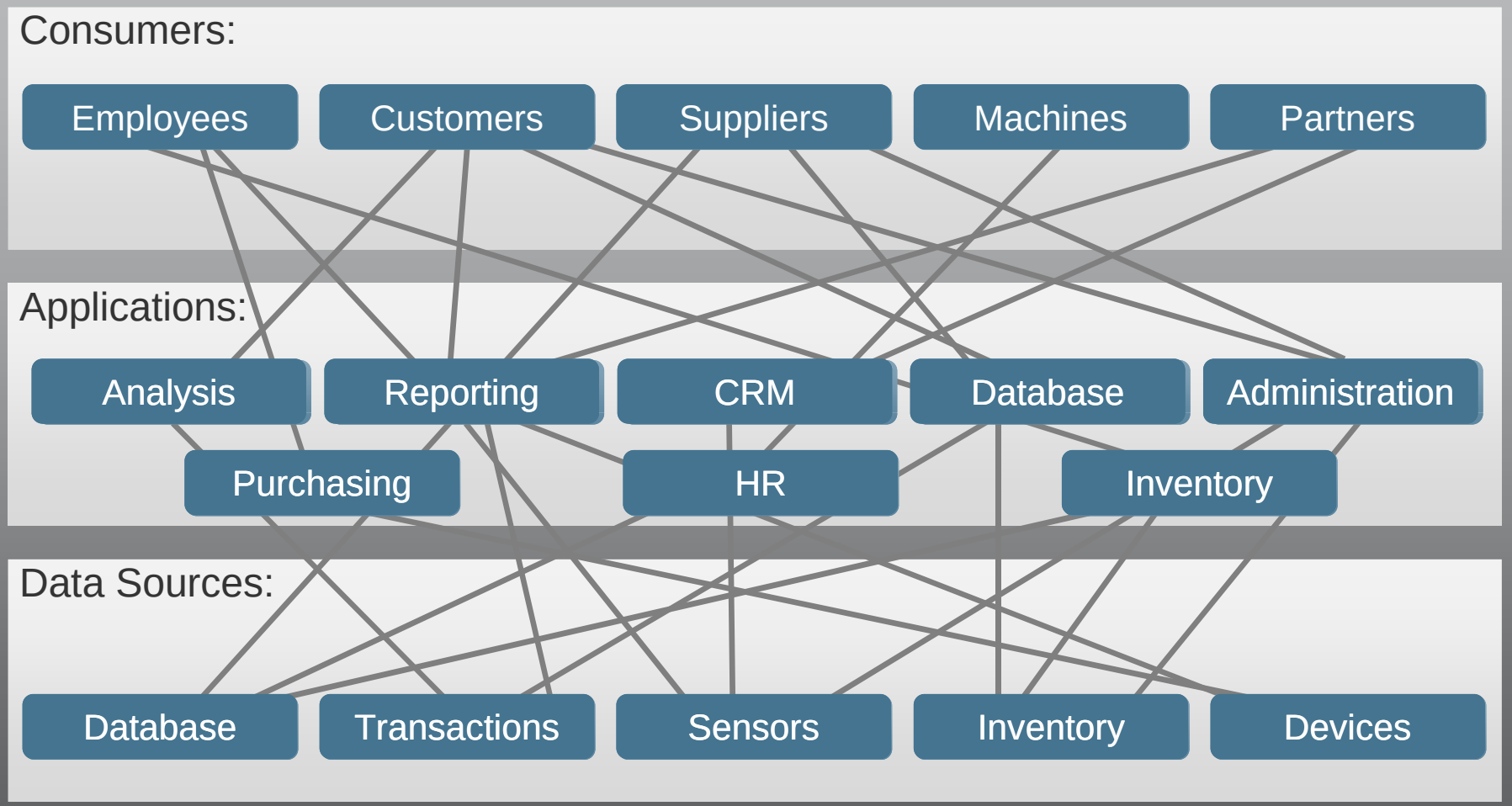


3. INTERCONNECT TRENDS
&
4. CONSOLIDATION TRENDS

TREES



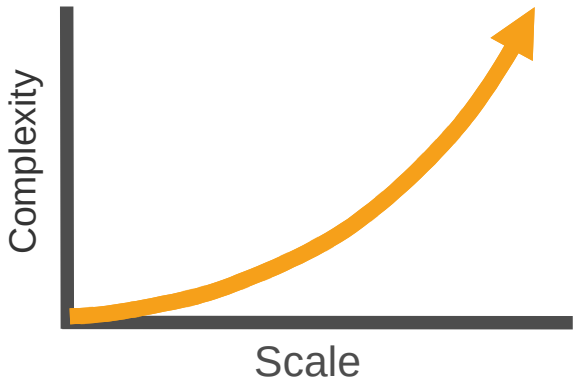
“ANY TO ANY” SERVICES



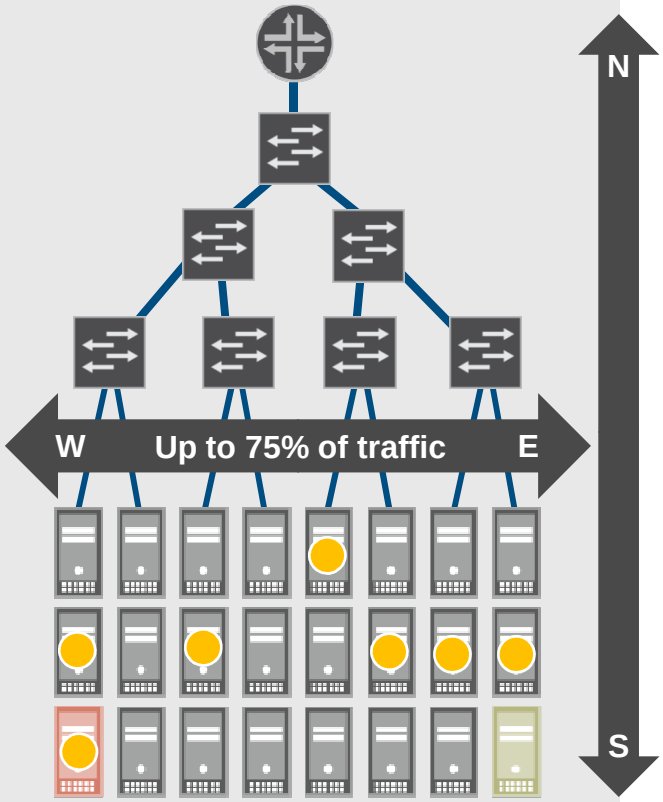
THE MULTI-TIER LEGACY NETWORK IS A BARRIER

The challenge

- Too slow
- Too complex
- Too expensive



Multi-tier legacy network



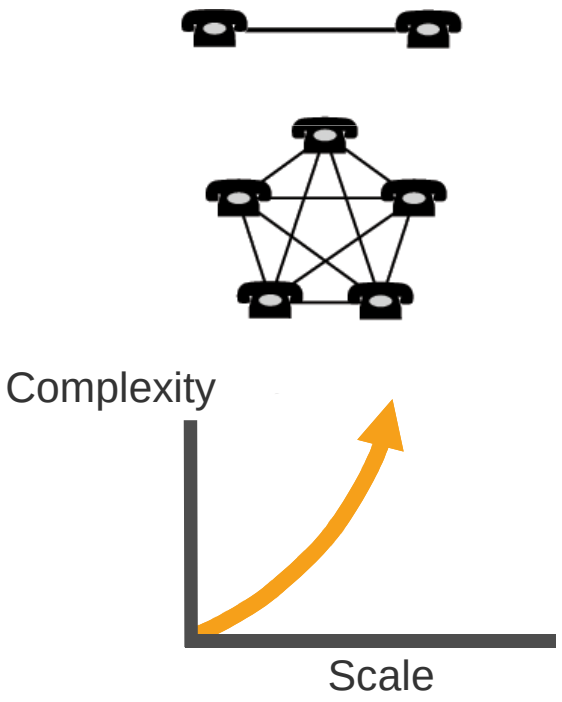
Unnecessary layers add hops and latency

Up to 50% of the ports interconnect switches, not servers or storage

Spanning Tree disables up to 50% of bandwidth

LARGER POOLS ARE MORE EFFICIENT BUT ALSO ADD COMPLEXITY

Two telephones can make only one connection, five can make 10 connections, and twelve can make 66 connections.

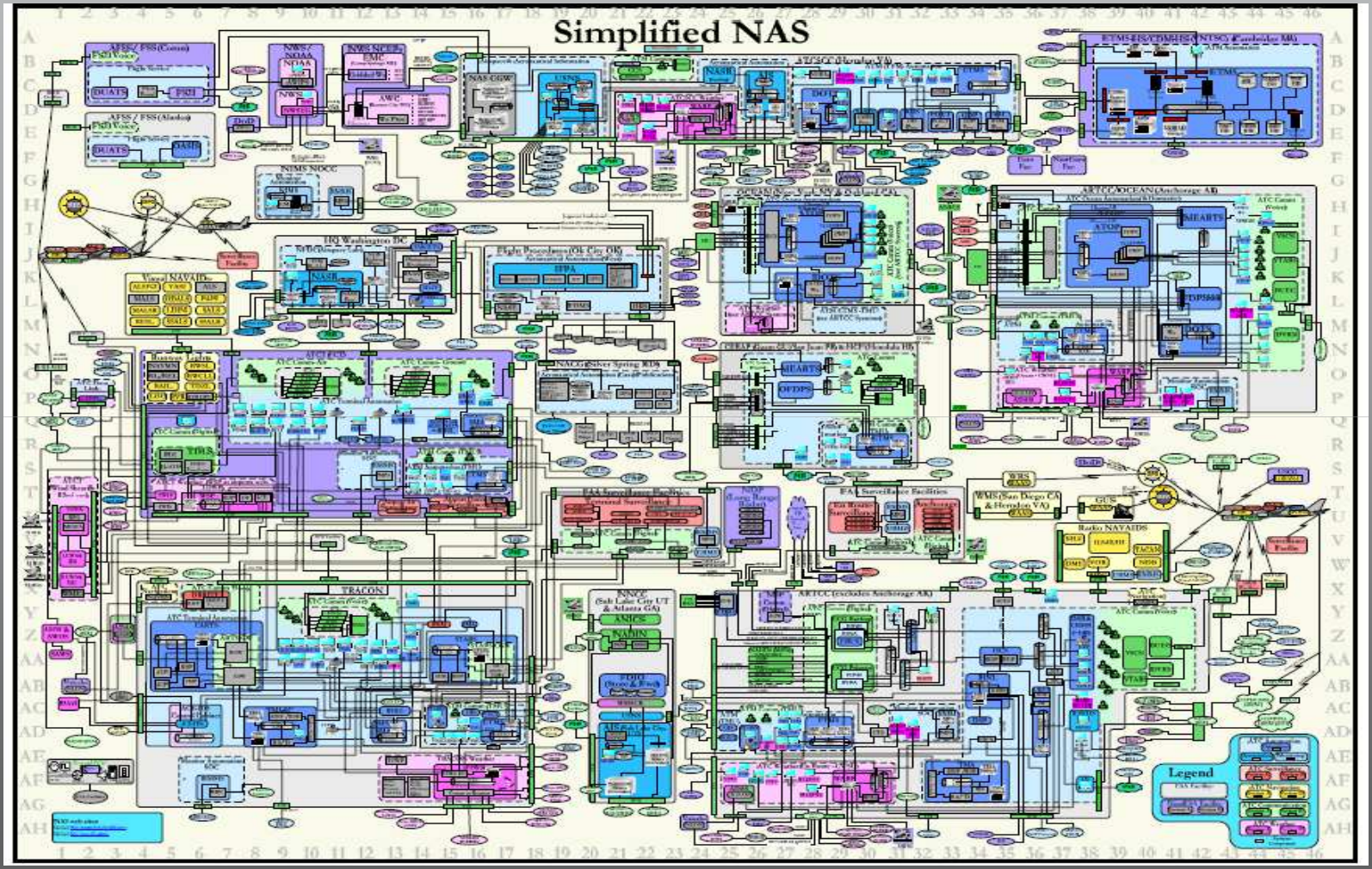


Complexity is a function of managed network devices and device interactions

$$\frac{n \times (n-1)}{2}$$

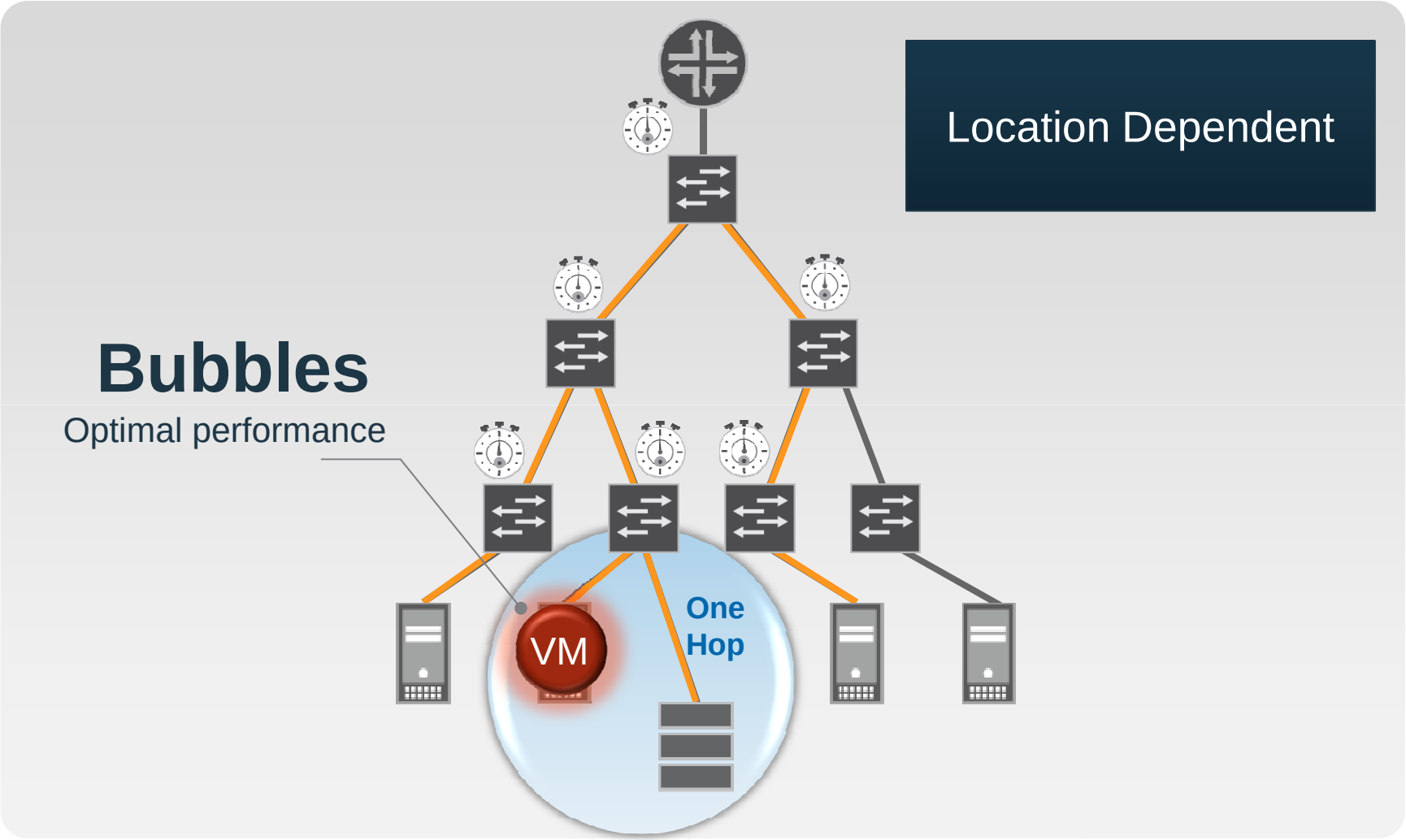
n = Number of managed network devices

WHAT MIXING APPLICATION COMPONENTS & MERGERS HAS BROUGHT:

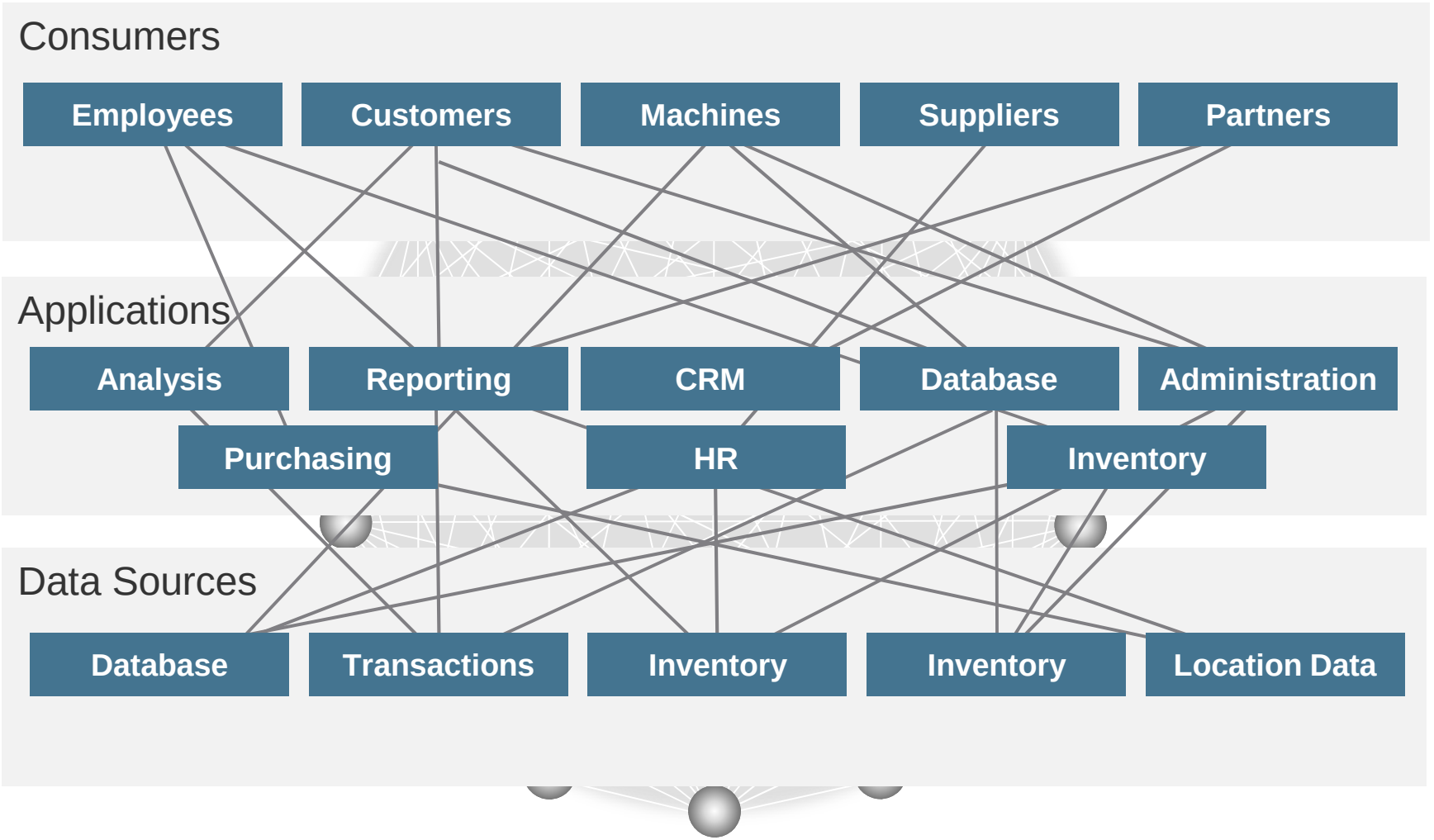


OF COURSE WHAT IT REALLY IT LOOKS LIKE IS THIS

WHERE DOES THIS MESS COME FROM?

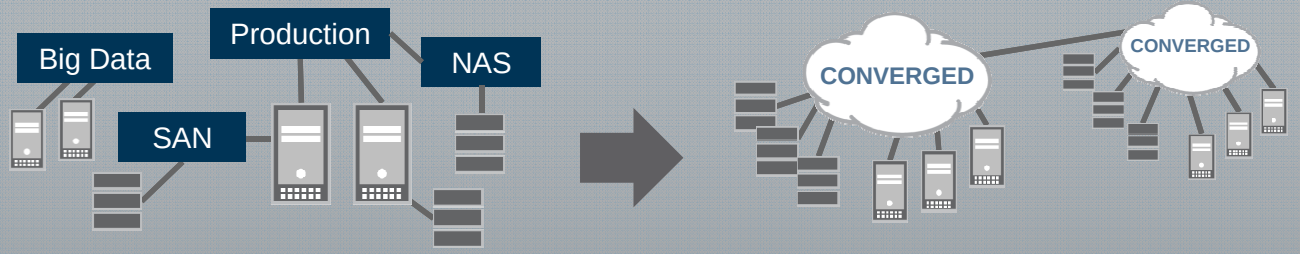


INFRASTRUCTURE MUST ENABLE “ANY TO ANY” APPS



CHALLENGE 1 - SIMPLIFYING CONNECTIVITY

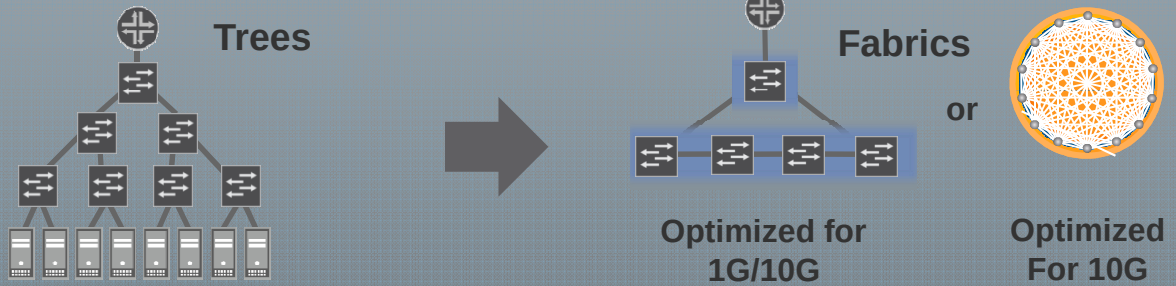
1. Multiple LANs and WANs



Many Networks
Landlocked Data

One Network
Data Available to All Apps

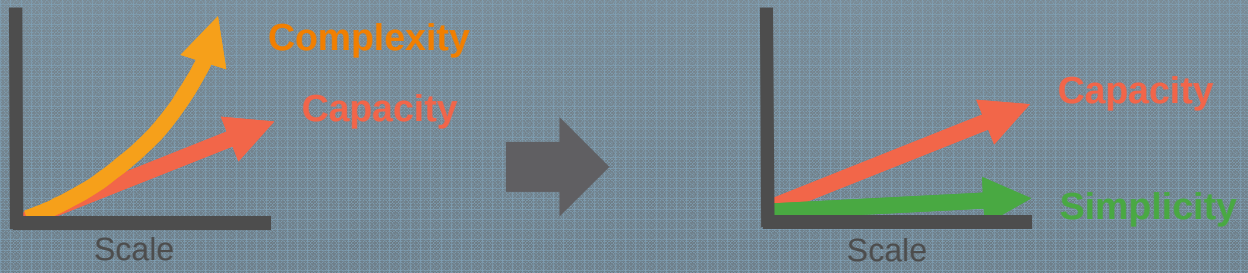
2. Tiered Networks



Optimized for 1G/10G

Optimized For 10G

3. Many Devices

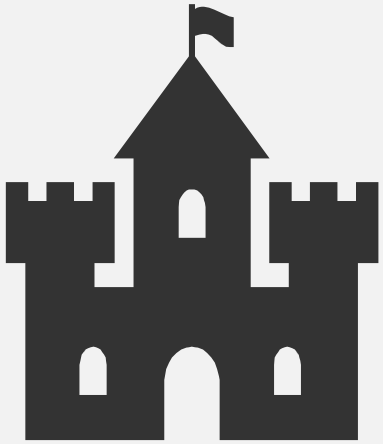


Many Separate Devices

One or Fewer Logical Devices

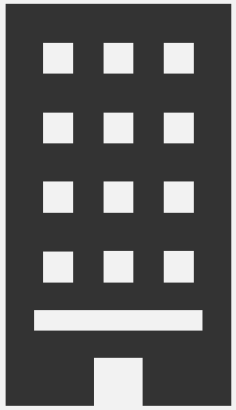
CHALLENGE 2 – NEW SECURITY MODEL

Castle Model



- Perimeter security
- Physical separation

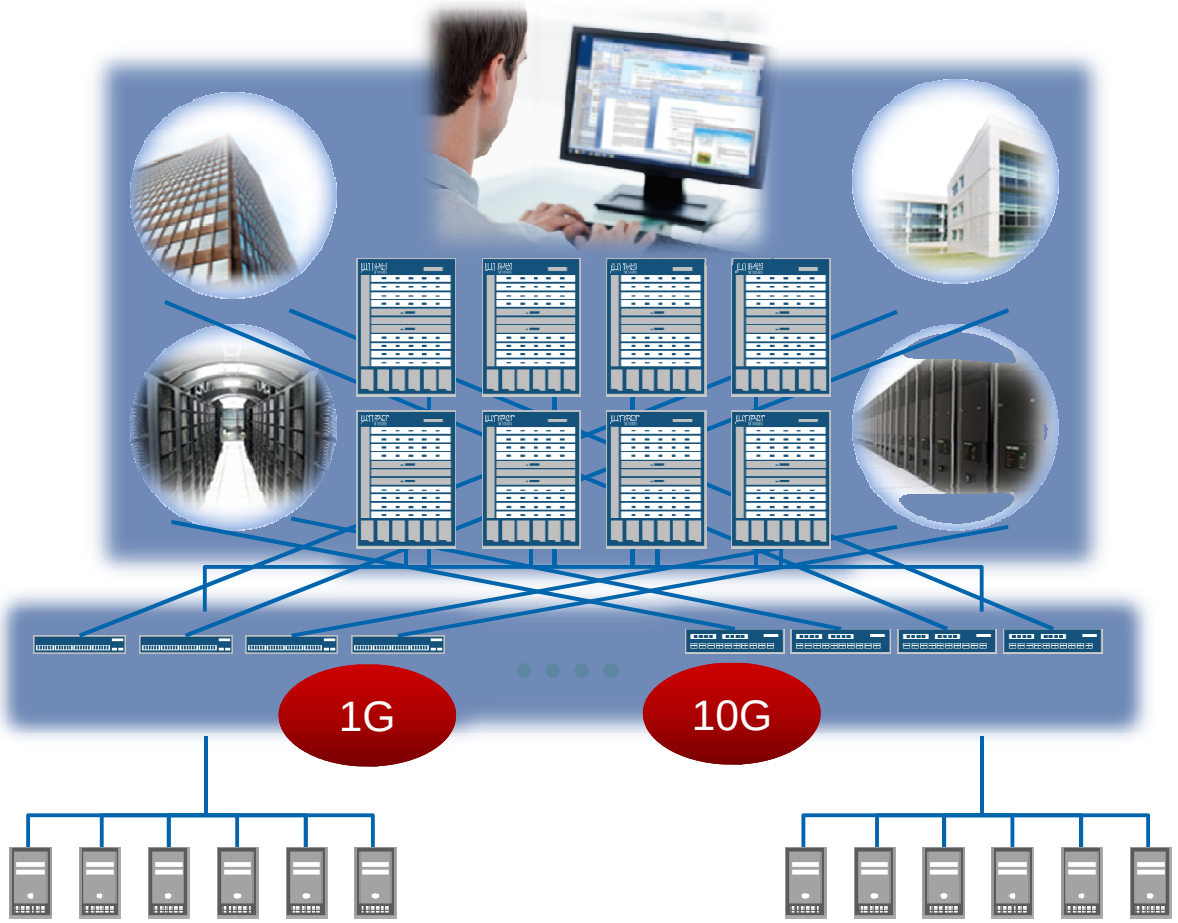
Hotel Model



- Multi-layer security
- Virtual separation

Solutions To Build Cloud-Ready Data Center

2-tier architecture



Inter-Site Connectivity

Up to 4 Data Centers 80kms apart managed as a single location

Industry-only

Unprecedented Core capacity

Up to 8 Core switches, 10.24Tbps throughput, 5000+ 10GE ports managed as 1 switch

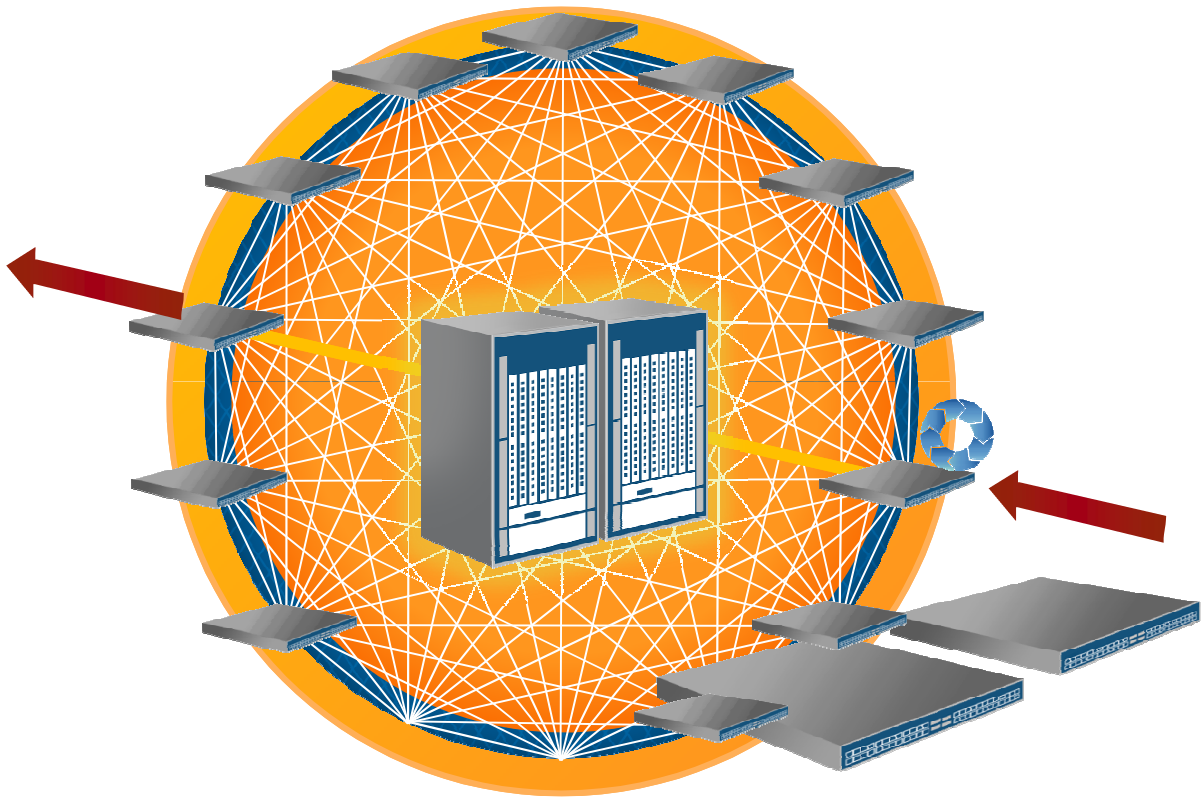
Industry-only

Seamless, plug-n-play migration from 1GE to 10GE servers

Any combination of up to 10 x 1GE/10GE switches managed as 1 switch

Industry-only

THE FABRIC SOLUTION

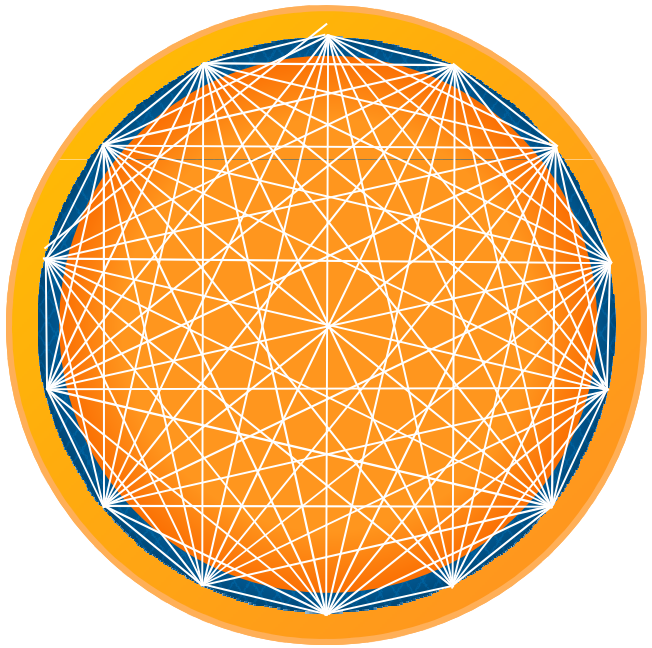


WHAT IS FABRIC SYSTEM?

A one very large distributed L2/L3 switch fabric for the entire data center that can be hard or soft partitioned

This ‘fabric’ sets new standards in

- Scale
- Performance
- Economics
- Convergence
- Services
- Reliability



Thank You !

everywhere