

x86 시대, RISC Migration ?

Scalable platform for business-critical and mission-critical apps

2014. 03.13

홍 윤기

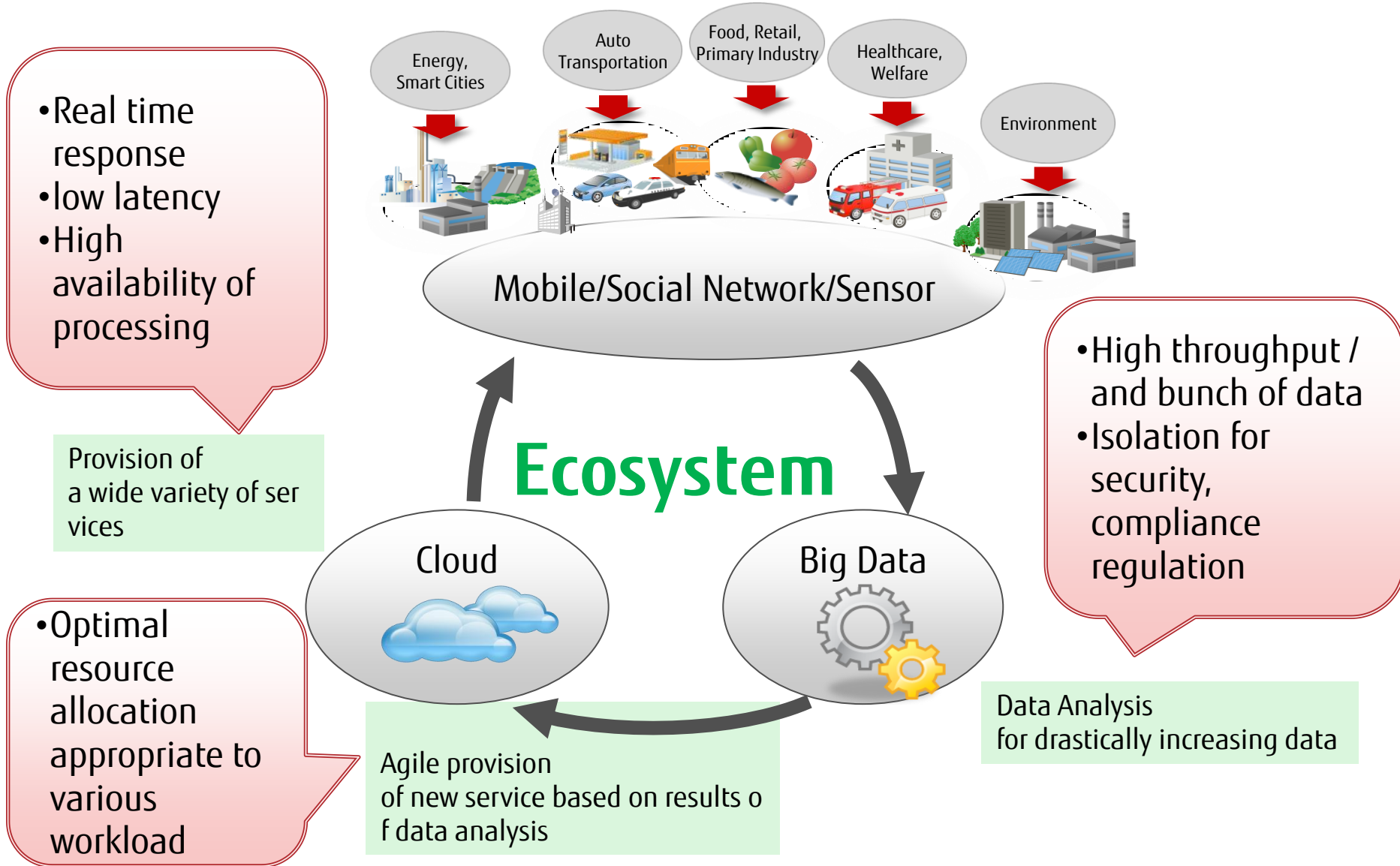
Fujitsu Korea Limited

Contents

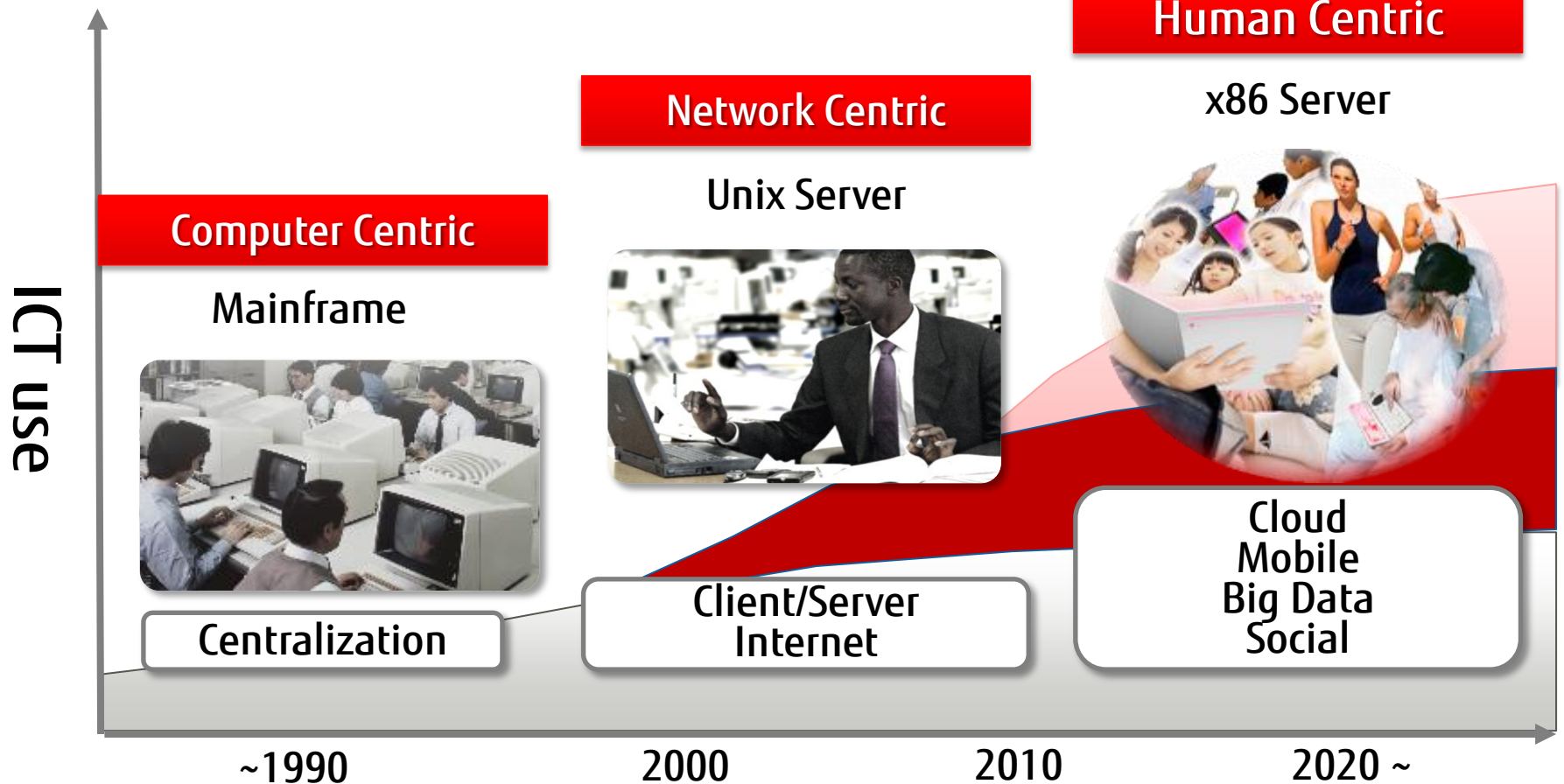
- I. x86 Generation (IT Trend)**
- II. RISC Migration**
- III. Fujitsu PRIMEQUEST**

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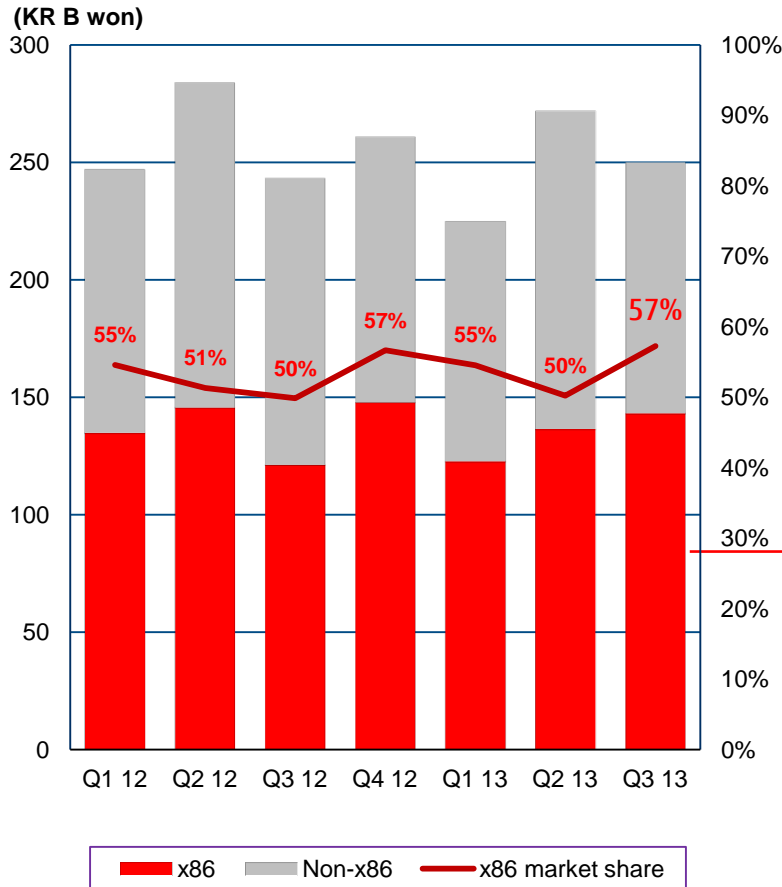


Platform History



Korea Total Server Market, 2013

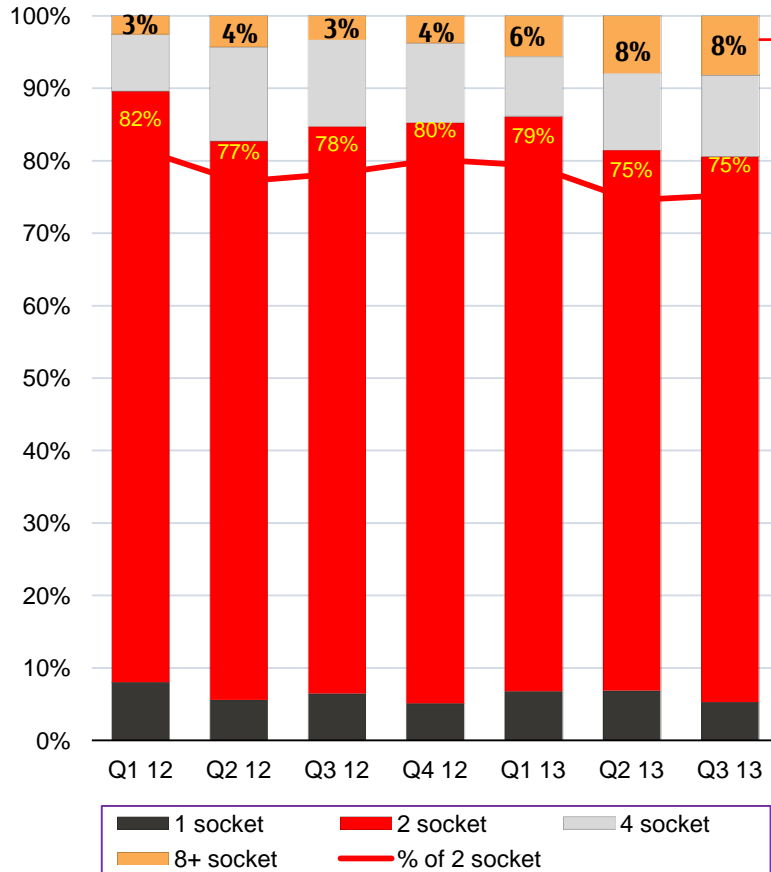
Total server revenue by server type



Non-x86 server revenue declines of **-12.4%** respectively in 2013(3Q13).
 On a year-over-year basis, x86 server systems experienced revenue growth, achieved **57.2%** factory revenue share.

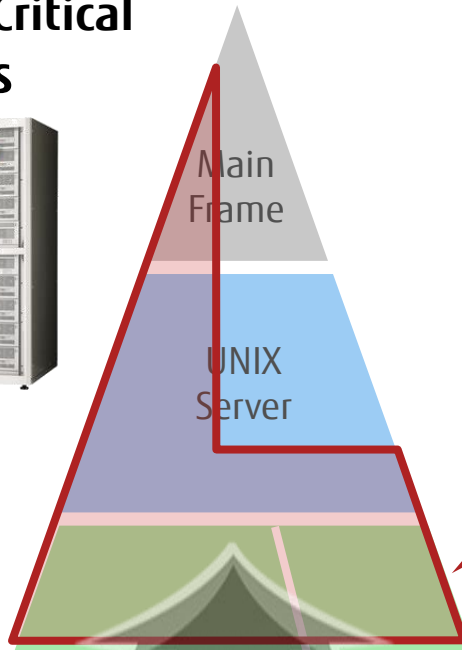
Korea x86 Server Market Share by Socket, 2013

x86 server revenue share by socket



Two-socket servers remain the dominant socket capability with **75%** revenue share. Eight-socket servers continued to grow in the third quarter of the year, recording year-on-year revenue increases of **64.6%** respectively.

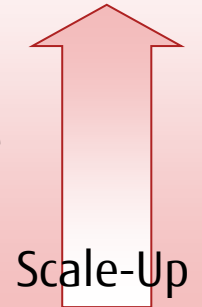
Mission-Critical Business



Mainframe/Unix Server



- High Reliability · Availability
- Mass Data DB, DB+AP Appliance
- Scale Up System



Volume Business



Windows Server

Linux Server

X86 Server

x86 Server

- Flexible . Integrity, Cost Down
- Web/Application, General DB
- Scale Out System



Mission-Critical Business Goals

- Increase enterprise growth
- Provide operational results
- Optimize cost structure
- Be attractive for new customers
- Reduced risks



Applications must deliver the RIGHT

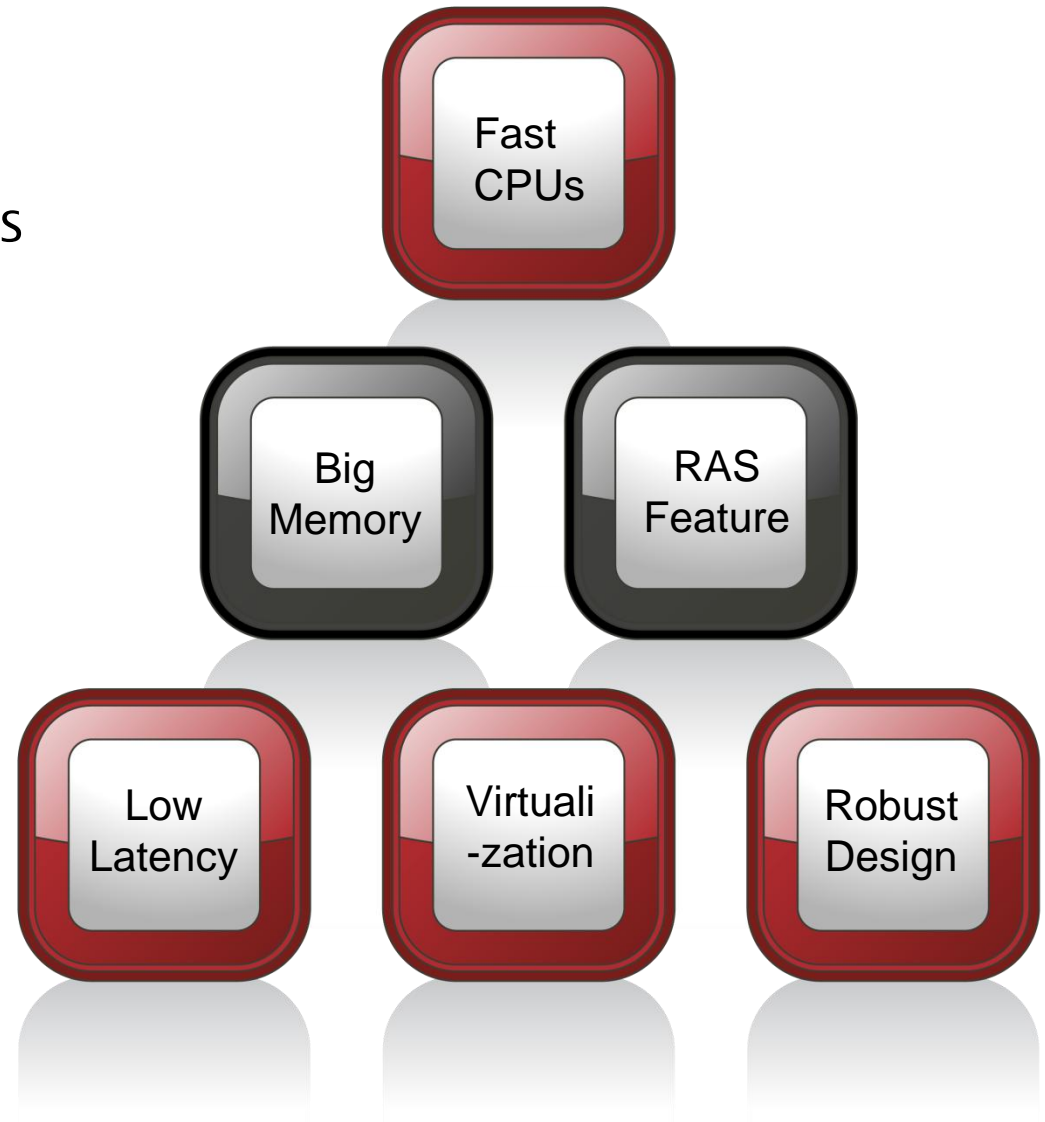


The right INFORMATION

To the right PEOPLE

At the right TIME

- Accelerate processing
- Handle massive amounts of data
- Deliver near-real-time response
- Flex to meet dynamic business priorities
- Support rapid growth



Computing Technology

- Industry Standard
- **Mission Critical**
- Mainframe



Computing Solutions & Reference Architectures

- Infrastructure
- Application-specific
- Branch-specific



Computing Consumption Options

- Outsourcing
- as-a-Service
- Managed
- Co-Location
- Maintenance



Project and Consulting Services

Assess, Design, Build, Deploy

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Analysis

As-Is & To-Be Business , The Possibility of Migration

Analysis

(1) Business & Data

- Business Rule
- Data Flow
- Database Structure
- Specified Business

Classification

(2) Reuse & Rebuild

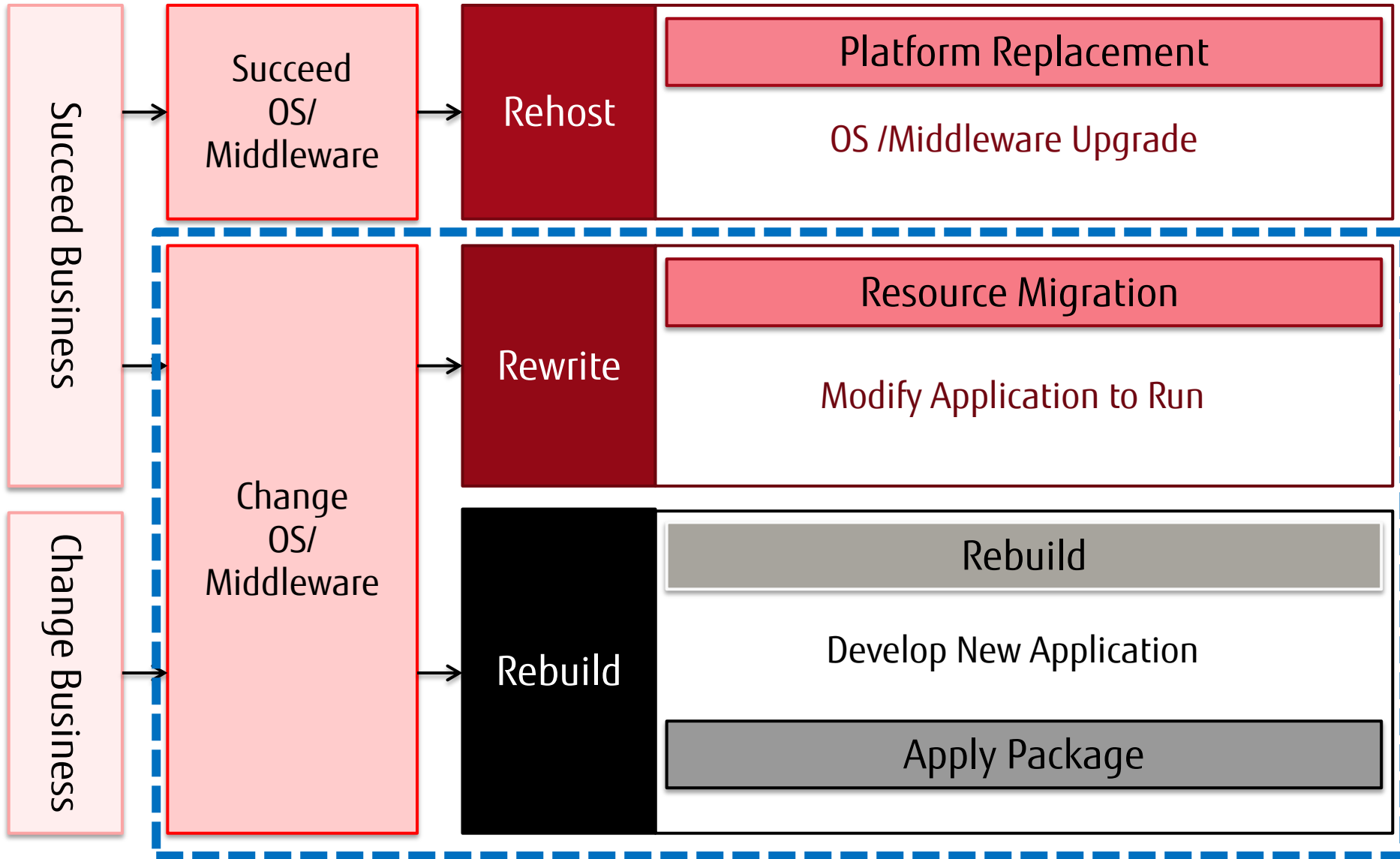
- Specified To-Be's Goal
- Estimate Cost
- Classification

Verification

(3) Proof of Concept

- Resource Sizing
- Technology
- Method
- Equipment
- Personnel & Cost

Migration Pattern



Pattern Comparison

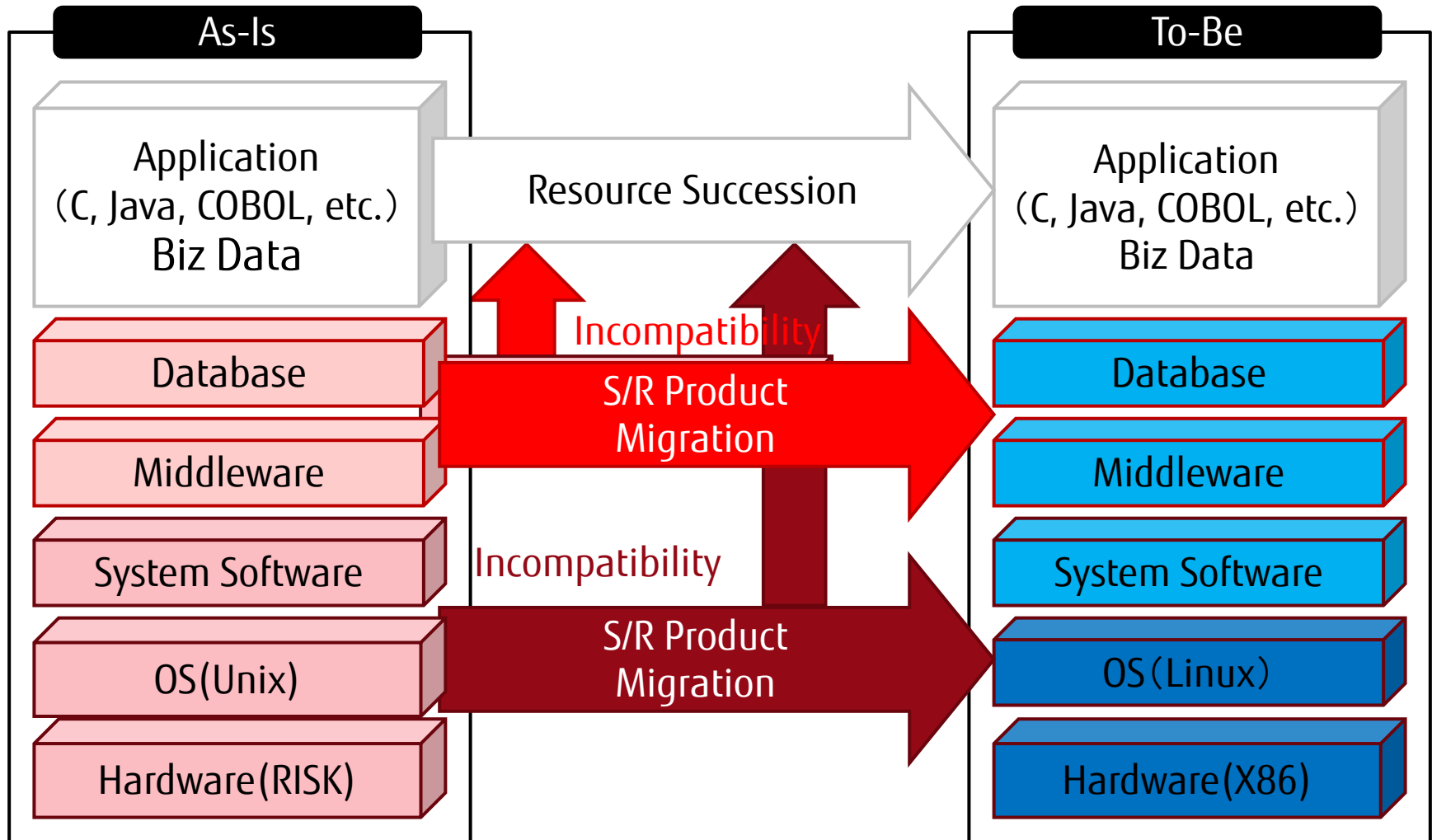
	Rehost	Rewrite	Rewrite + Rebuild	Rebuild
Migration Cost	VG	G	N	NG
Operation Cost	NG	G OSS	G OSS	G OSS
Maintenance	NG	N	G	VG
Skill / Know How	N	G	N	N

VG : Very Good, G : Good, N : Normal, NG : No Good



The review of total system

■ Total System



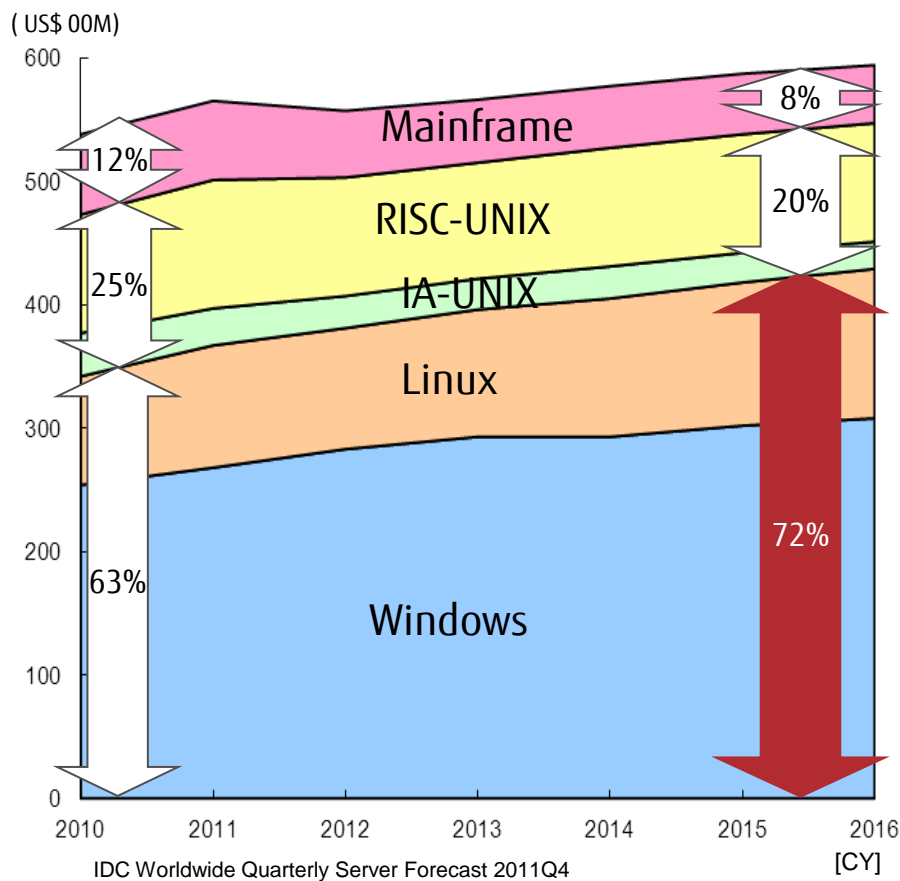
The review of total system

Item	Point
H/W	<ul style="list-style-type: none">▪ IA Architecture System Replacement (System Sizing, RAS Feature, Clustering , Virtualization)▪ Peripheral device (Storage/Network/Print) Review
OS	<ul style="list-style-type: none">▪ OS Compatibility (C Language Program SHEE SCRIPT ...)
Middleware	<ul style="list-style-type: none">▪ Check for New H/W and OS, Upgrade, Replacement
Application/ Data	<ul style="list-style-type: none">▪ Apply for New Platform
Operation /People	<ul style="list-style-type: none">▪ Operational Rule▪ Development of Human resource

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Mainframe/UNIX Market is declining, while Linux and Windows market is growing worldwide.



Gartner says that...

2014~2015

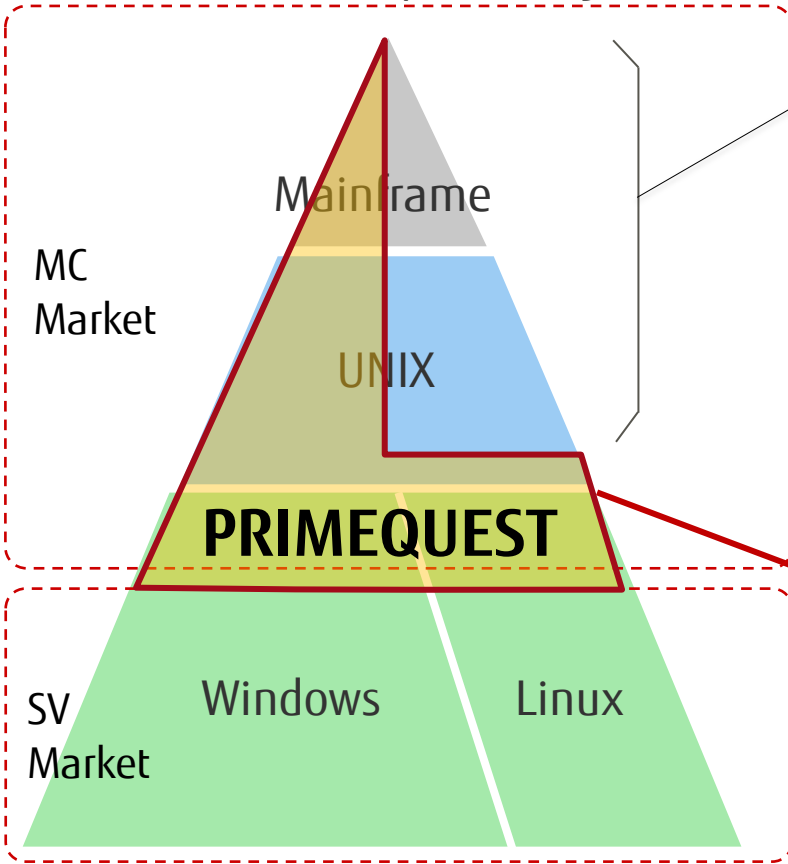
- Migration from HP-UX/Itanium will be steepest.

~2017

- **65%** of applications running on UNIX in 2012 will have been migrated to x86

Fujitsu PRIMEQUEST is targeted to Mainframe/UNIX customers' mission critical systems and x86 customers' highly reliable platform for server consolidation

PRIMEQUEST positioning



PRIMEQUEST offers Mainframe/ UNIX equivalent RAS features

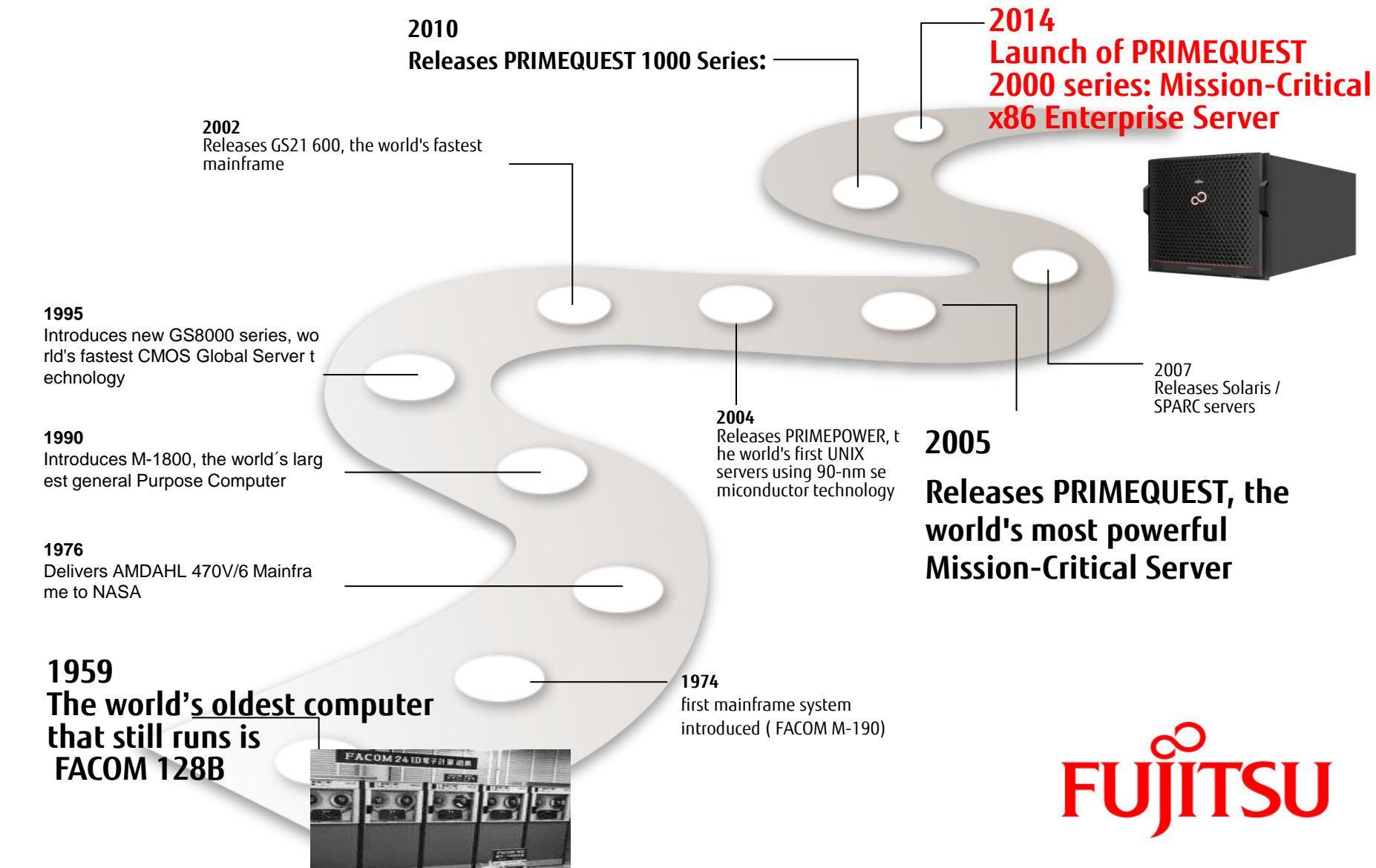


PRIMEQUEST Target

- | ■ Industry | ■ Workloads |
|--------------------|----------------------|
| Banking/Securities | Database |
| Telecom | ERP |
| Government | Server Consolidation |
| Manufacturing | |

MC: Mission Critical, SHV: Standard Volume

Long track record in mission-critical computing



Mission-Critical IA Server New PRIMEQUEST 2000 Series

■ Highest availability value in the x86 platform

- Almost everything is redundant
- Flexible I/O + Reserved SB

■ Open Standard technology

- Intel® Xeon® processor
- Red Hat® Enterprise Linux
- Microsoft® Windows Server®

- Intel New Xeon E7 v2 Processor

- Max 12TB Mass Memory

- Mainframe RAS
- Physical Partitioning
- Dynamic Reconfiguration

Installation in 28* countries around 3,000 units

Mission Critical Databases

- TIS (Linux)
- Nikken Gakuin/
Kenchiku Shiryo Kenkyusha Co., Ltd (Windows)
- Shibaura Institute of Technology (Windows)
- Daiwa Securities Co. Ltd (Linux)
- Daiwa Next Bank (Linux)
- To Solutions Co., Ltd. (Windows)
- Nagoya University Hospital (Linux)
- The Banshu Shinkin Bank (Windows)
- Tsu Municipal Office (Windows)
- Yamazaki Baking Co., Ltd. (Windows)
- Yamato System Development (Linux)
- Inje University Paik Hospital (Korea) (Windows)
- Sejoong Namu Tour (Korea) (Linux/Windows)
- Seoul National University (Korea) (Linux)
- Sung-Ae Hospital (Korea) (Windows)
- Severance Hospital (Korea) (Windows)
- Lotte World (Korea) (Windows)
- Jiangyin Software Park (China) (Linux)
- YTO (China) (Linux)
- Baoji High-tech Development Zone People's Hospital
(China) (Linux)
- Eastern Asia Commercial Bank (Vietnam) (Linux)
- Banco Popular (Spain) (Windows)
- Coput (Spain/ Bureau of transportation) (Linux)
- Portugal Telecom (Portugal) (Linux)
- Meditel (Morocco) (Linux)

- The Anthony Marano Company (USA) (Windows)
- Fulton County, Georgia (USA) (Linux)
- SICOOB (Brazil) (Windows)
- Vivo (Brazil) (Linux)

UNIX Migration

- NTT Data Corporation (Linux)
- TKC Corporation (Windows)
- Gunma Bank (Linux)
- Shiga Bank (Linux)
- Shizuoka Bank (Linux)
- Shizuoka City (XSP)
- Tokyo Stock Exchange (Linux)
- Nogata City (Fukuoka) City Hall (XSP)
- Ministry of Justice (Linux)

MC Consolidation

- Ohita Prefectural government (VMware)
- Kansai University (VMware/Windows)
- Doshisha University (VMware)
- Toshima Ward Office (VMware)
- Board of Education of Nara City (VMware)
- Ziarre Limited (Hong Kong) (Linux)

MC ERP

- KONICA MINOLT HOLDINGS, INC. (Windows)
- Daiichi Sankyo, Inc. (Windows)
- Toray Engineering Co., Ltd. (Windows)
- Naganoken Kyodo Densan Co., Ltd. (Windows)
- JAPAN VILENE COMPANY, LTD. (Windows)
- KDN (Germany) Linux

HPC

- Institute for Cosmic Ray Research, University of Tokyo (Linux)
- National Institute of Occupational Safety and Health (Linux)

As of September 2013 (PRIMEQUEST 1000/500A/500/400)

Fujitsu Server PRIMEQUEST 2000 series

based on Intel® Xeon® processors



Fujitsu's Mission Critical portfolio of services and tools

PRIMEQUEST 2400E & 2800E
Unity of x86 efficiency & flexibility
with mission-critical features



PRIMEQUEST 2800B

Advanced x86 platform with enhanced RAS features



Outstanding platform reliability: Reserved SB built-in mission critical features for error preventions / corrections

Non-stop flexible:
Dynamic Reconfiguration
enables HW re-partitioning without downtimes

Unprecedented performance: up to 158% more performance

Support of large scale solutions and applications by offering up to 12TB RAM on x86 platform

**Deliver the right information
for decision-making**

**Ensure availability of mission-critical information
and business processes**

Fujitsu Server PRIMEQUEST 2000 series based on Intel® Xeon® processors



**World Record
8-socket result¹**

**Sales and distribution ERP
Two-Tier SAP SD**

47,500 benchmark users



**World Record
8-socket result²**

**Enterprise computing
SPECint*_rate_base2006**

4570 baseline result



**World Record
8-socket result³**

**Technical computing
SPECfp*_rate_base2006**

3240 baseline result

Unprecedented performance – Intel confirms new benchmark records

For more information, please visit

<http://www.intel.com/content/www/us/en/benchmarks/server/xeon-e7-summary.html>

1 Record claim as of Feb 18, 2014. Fujitsu PRIMEQUEST 2800E, 47500 benchmark users, SAP EHP 5 for SAP ERP 6.0, SQL Server 2012, Windows Server 2012, 8 processors / 120 cores / 240 threads, certification 2014003. Further information at www.sap.com/benchmark.
2 Competitive benchmark results stated above reflect results published on <http://www.spec.org> as of February 19, 2014. Score of 4570 SPECint*_rate_base2006 published by Fujitsu on the PRIMEQUEST 2800E, see: <http://docs.ts.fujitsu.com/dl.aspx?id=c39e20bc-034f-4204-b7e4-095e20cc8ccb>. 3 Competitive benchmark results stated above reflect results published on <http://www.spec.org> as of February 19, 2014. Score of 3240 SPECfp*_rate_base2006 published by Fujitsu on the PRIMEQUEST 2800E, see: <http://docs.ts.fujitsu.com/dl.aspx?id=7dc037e0-46b0-4b5b-aa20-053d51e114f0>. SPEC and SPEC cpu are trademarks or registered trademarks of Standard Performance Evaluation Corporation (SPEC).

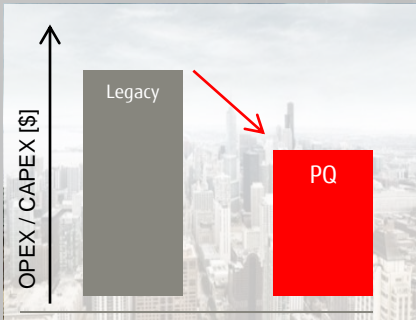
Enterprise Version: Built-in Mission-Critical



Dynamic platform for demanding workloads



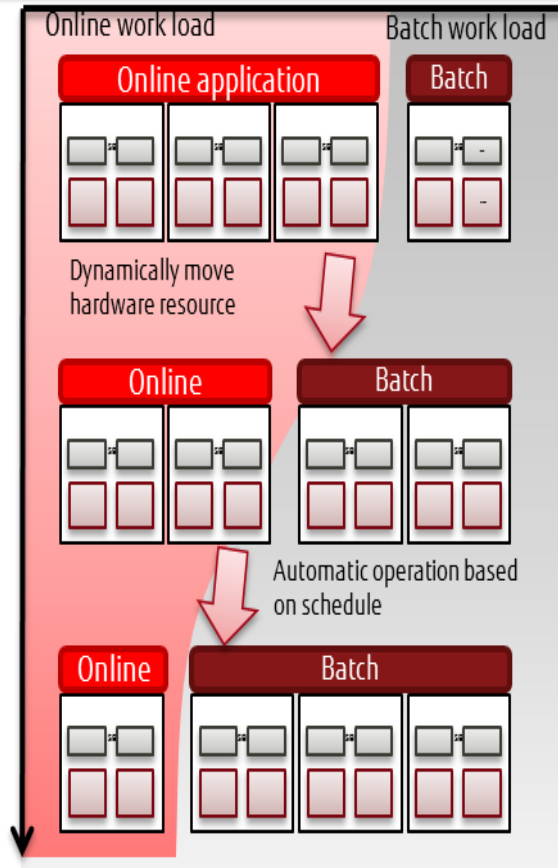
Ensure business continuity



Operational efficiency with mission-critical uptime



Dynamic Reconfiguration

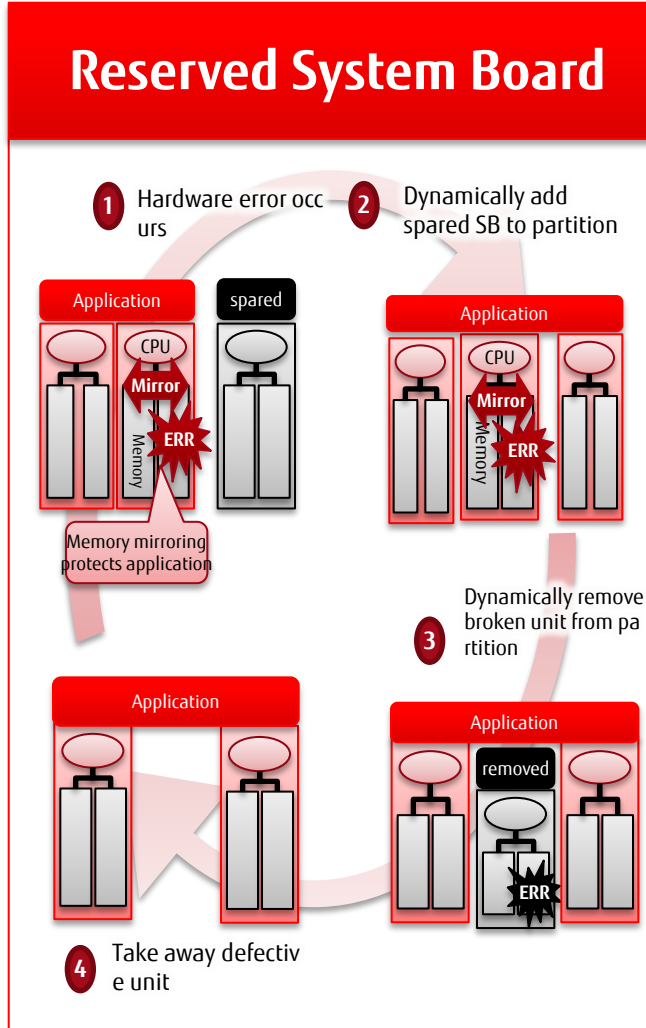


Dynamic Reconfiguration enables

- Dynamic resource balancing without stopping application
- Hardware resources are moved dynamically between partitions
- Adjust partition configuration to meet various workloads by moving hardware resources without stopping applications.

Benefits

- Efficient usage of available resources
- No downtime
- Simplify resource management

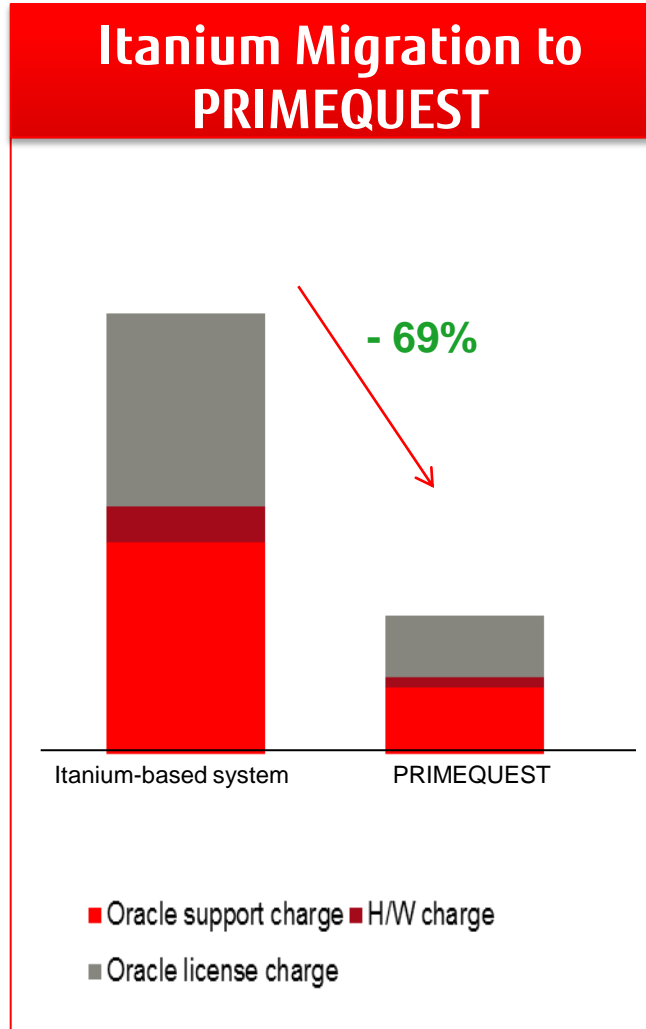
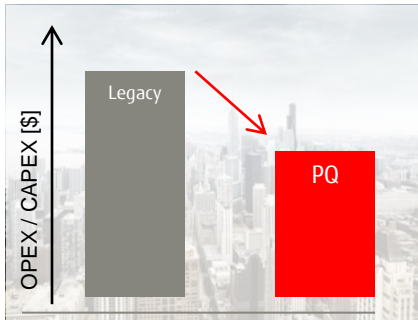


Mission-critical features

- Replace defective hardware unit without stopping applications
- Enable maintenance "on-the-fly"
- Reserved SB can be used for other workloads (training / tests)
- Isolated hardware partitions: Failures in a partition do not affect other partitions

Benefits

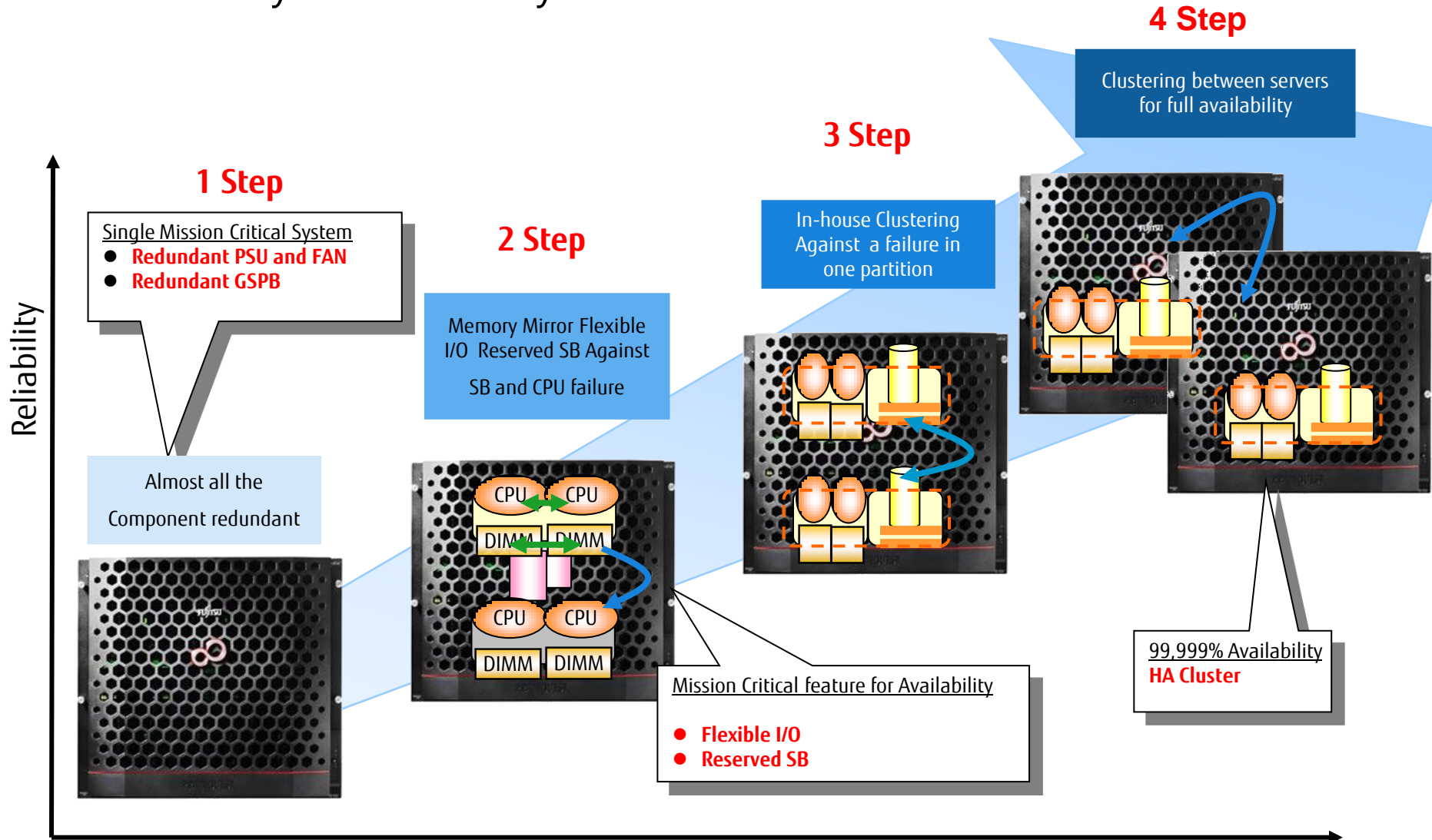
- Outstanding platform reliability
- Automatic recovery of resources, applications & services
- System maintenance without downtime



- If using Itanium, customers have to pay twice the DB license and maintenance costs
 - Oracle core factor for Itanium2 increases to 1.0 from 0.5
- Customers choices
 - PRIMEQUEST 2400E (40 cores) 20 licenses
 - Itanium-based server (64 cores) 64 licenses
- Migration to PRIMEQUEST 2400E offer huge cost reduction amount of up to 69% in a typical case

Price and maintenance are based on Fujitsu's estimation

■ Redundancy and reliability

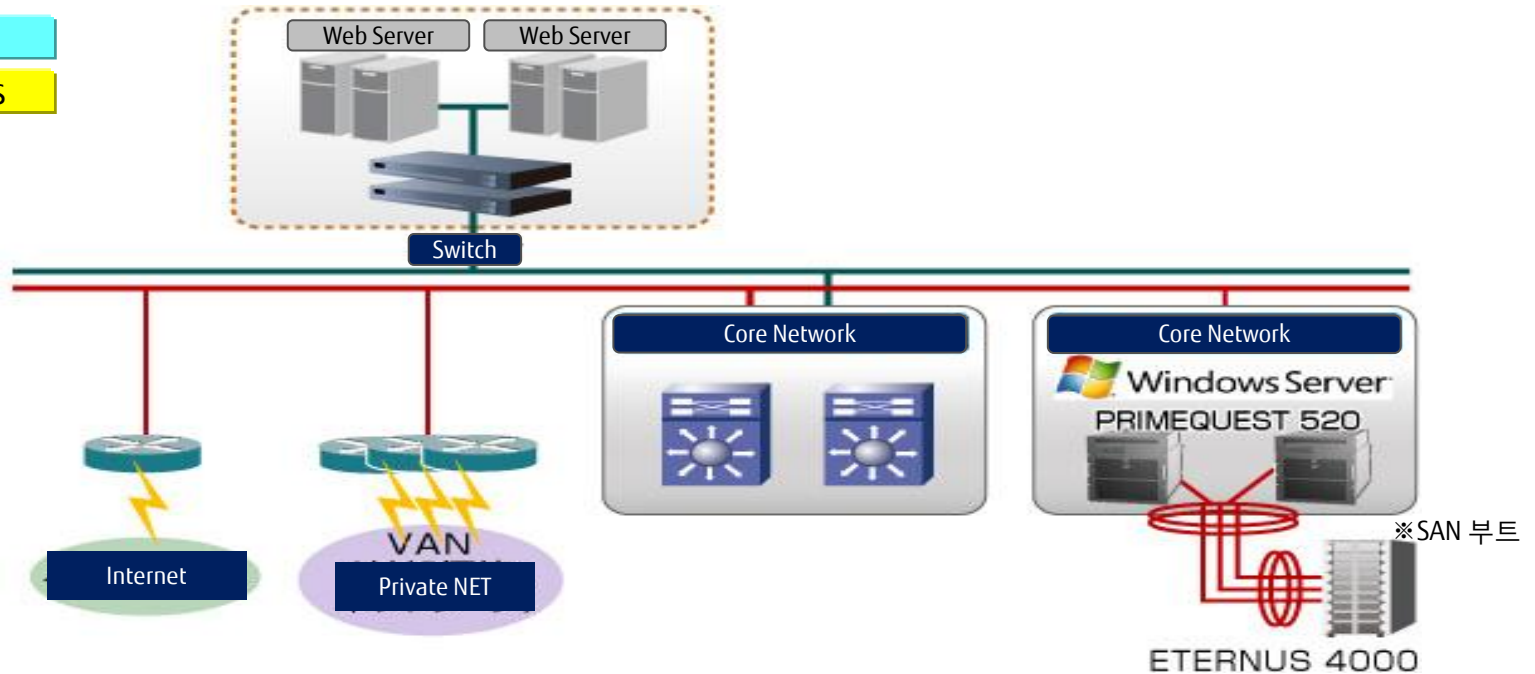


Case study

국내 A유통사의 기간계 DB서버

- 발권, 레스토랑, 선물Shop, 스포츠 시설 등의 확장에 의한 처리 능력 부족 및 피크시 장애 건수 증가
- 확장성, 안정성, 보수성, 기존 자산 (Windows)의 계승 등을 위하여 PRIMEQUEST를 도입
- 서버의 SAN 부트와 클러스터 구성으로 24시간 365일 연속 운전의 신뢰성을 확보

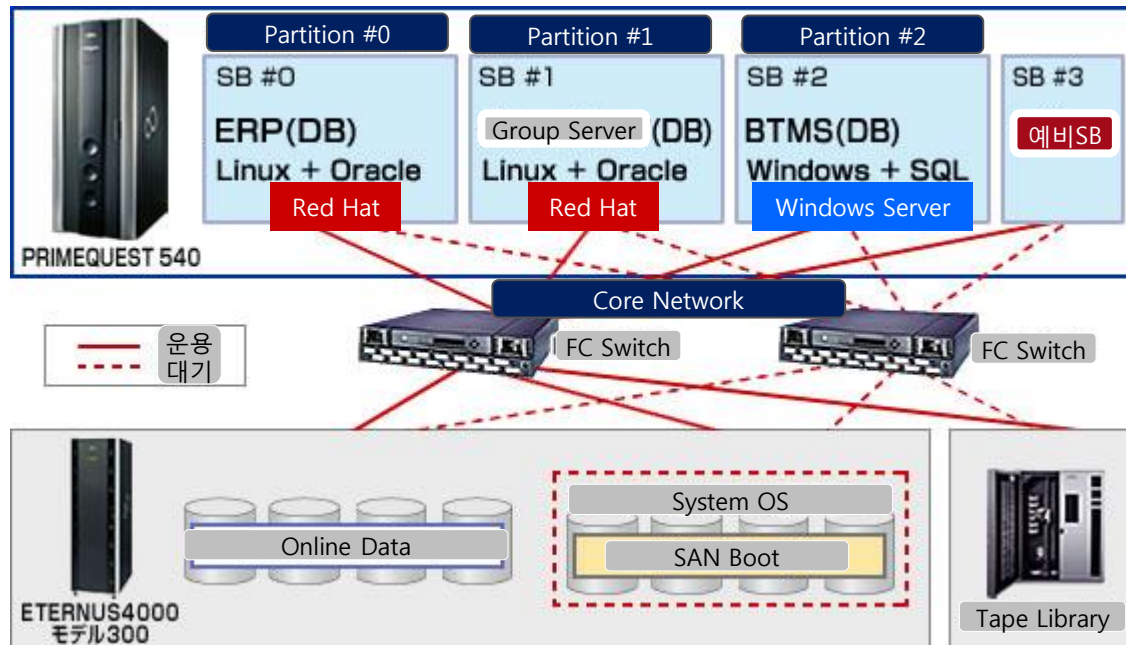
DB서버
Windows



국내 B관광사의 통합 DB서버

- 이전 UNIX 서버 (노후화), PC서버 (I/O처리 증대)로 성능 저하의 문제점으로 서버 통합 추진
- 복수의 OS (Linux/Windows), DBMS (Oracle/SQL)가 동작하는 서버로서 PRIMEQUEST를 도입 ※이전 UNIX는 Linux에 이행
- Flexible I/O + 예비 시스템 보드에 의한 시스템의 가용성 향상

DB서버
Linux Win



- Red Hat Enterprise Linux AS v.4
- Oracle Database 10g
- Windows Server 2003
- SQL Server 2005

국내 B사(관광) 통합 DB서버

- 2 millisecond의 주문 응답 시간, 3 millisecond의 정보 전달 Speed를 실현
<이전의 시스템의 1,000 배 이상의 고속성>
- 글로벌 도쿄 증권시장을 지탱하는 높은 신뢰성
<오픈 서버로 Mainframe과 동등의 가용성>
- 손쉽고 빠른 확장성을 실현
<2배 이상의 Capacity, 1주일 이내의 확장>



기간 재구축

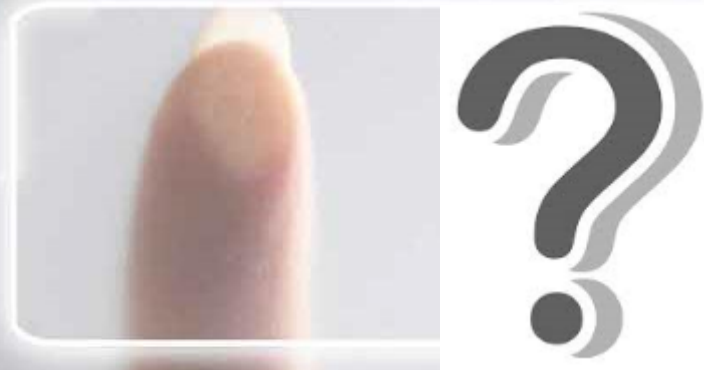
Linux

차세대 주식매매 시스템
「arrowhead」
고신뢰 데이터베이스

초고속 데이터 관리 소프트웨어


PRIMEQUEST





For more information, go to :

- > <http://www.fujitsu.com/kr/products/server/>
- > <http://www.fujitsu.com/kr/products/storage/>



FUJITSU

shaping tomorrow with you