Stay ahead.

Innovate2013

The IBM Technical Summit

開發者大會

最安全、更可靠，大型主機夯應用

温德賢 / Derek Wen
台灣 IBM公司 資訊科技服務事業群
資深資訊工程顧問

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The IBM Technical Summit
開發者大會

Stay ahead.

Topic

- **夯應用在主機的特性及優勢**

- **大型主機的夯應用在台灣**

- **Stay Ahead ，先馳得點 的主機應用服務**

使用量持續成長的 IBM 主機

- **"I predict that the last mainframe will be unplugged on March 15, 1996"**

  – Stewart Alsop, former InfoWorld columnist (and Fortune Magazine), March, 1991

- 自1992年以來，主機的MIPS的年成長量超過**30%**

- 自1996 年以來，主機的營收超過**$30B** 以上 (從最後一部主機應該要被拆下的時間算起…)
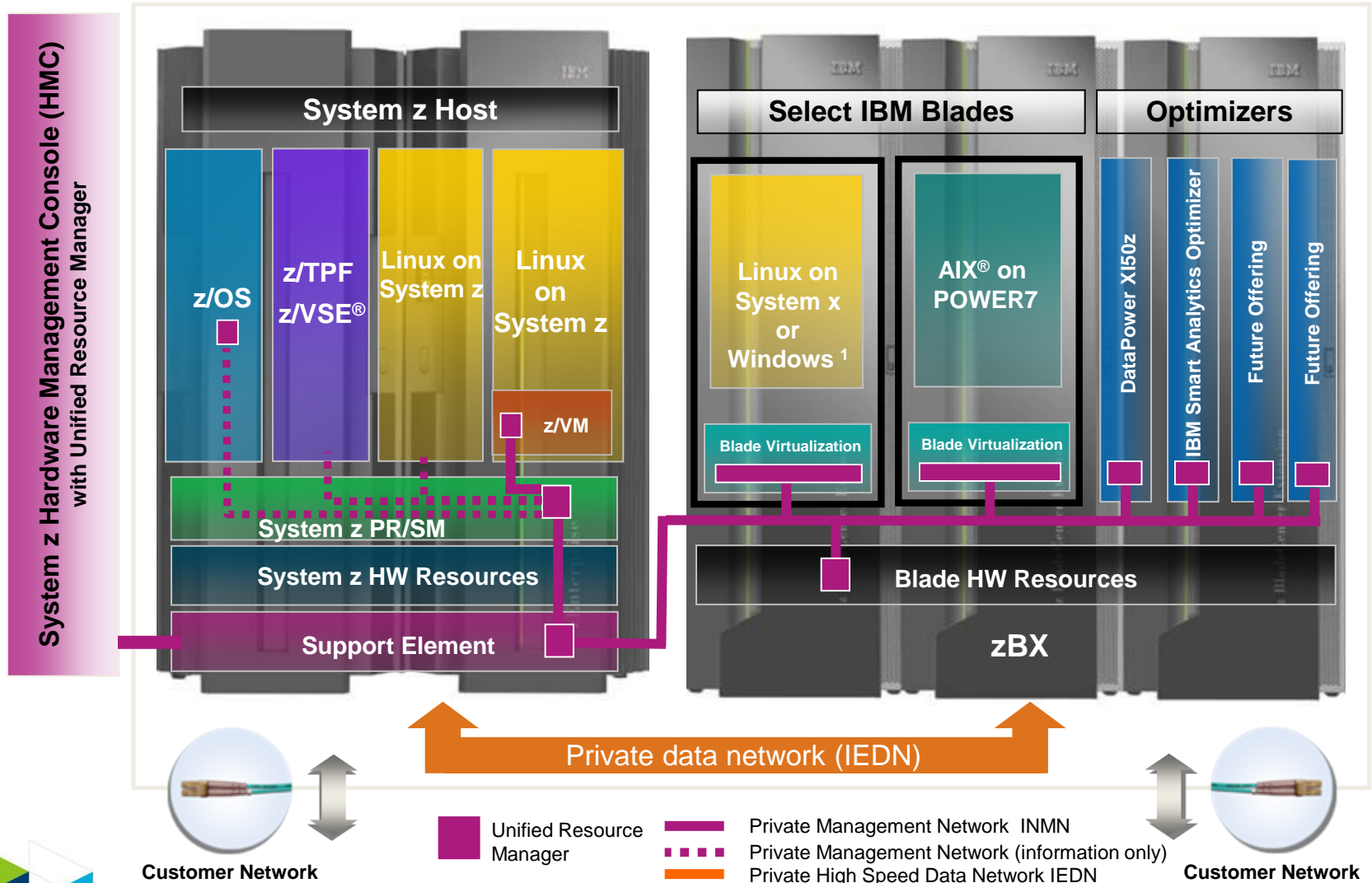
- 但自1991年以來，主機有許多的改變!

IBM 主機客戶現況

- 從一份主機使用者的調查
  - **60**個全球性的銀行有**59**個使用主機
  - **20**個全球性的保險公司有**18**個使用主機
  - **9** 個全球性的醫療保健公司有**7**個使用主機
  - **9** 個全球性的零售商公司有**7**個使用主機
  - 全美的財訊前**500大**人壽，資產管理，意外保險公司

  - 平均主機容量**15,000 MIPS** 持續成長中
  - 營收的成長**兩倍**於在主機的花費的成長
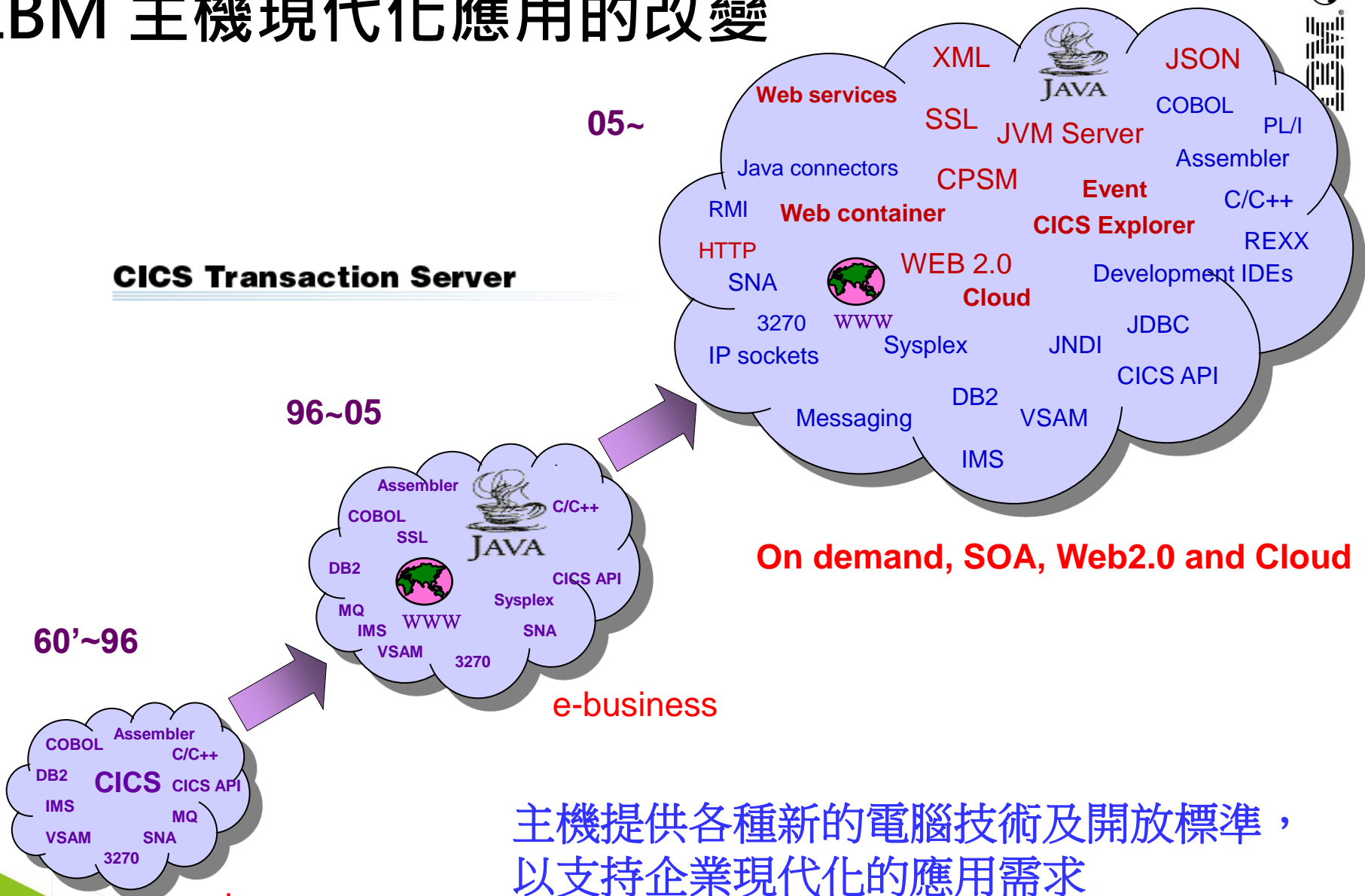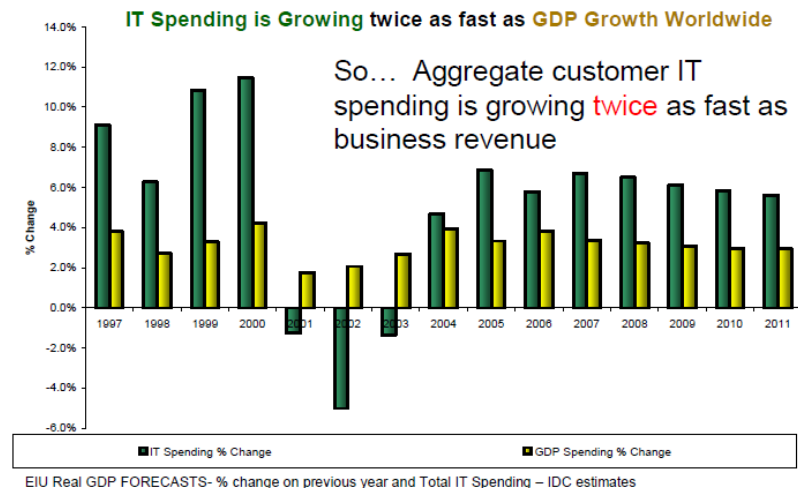   - Compared with "IT Spending is Growing twice as fast as GDP Growth Worldwide"

新一代的全能主機

System z Hardware Management Console (HMC) with Unified Resource Manager

System z Host

| z/OS | z/TPF z/VSE® | Linux on System z | Linux on System z |

z/VM

System z PR/SM

System z HW Resources

Support Element

Select IBM Blades

Linux on System x or Windows [1]

AIX® on POWER7

Blade Virtualization

Blade Virtualization

Blade HW Resources

zBX

Optimizers

DataPower XI50z

IBM Smart Analytics Optimizer

Future Offering

Future Offering

Private data network (IEDN)

Customer Network

Customer Network

Unified Resource Manager

Private Management Network INMN

Private Management Network (information only)

Private High Speed Data Network IEDN

[1] All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

IBM 主機現代化應用的改變

05~

XML   JSON

Web services

SSL   JVM Server   COBOL   PL/I

Java connectors   CPSM   Assembler

RMI   **Web container**   **Event**   C/C++

HTTP   **CICS Explorer**   REXX

SNA   WEB 2.0   Development IDEs

3270   **Cloud**   WWW

IP sockets   Sysplex   JNDI   JDBC

DB2   CICS API

Messaging   VSAM

IMS

CICS Transaction Server

96~05

Assembler   C/C++

COBOL

SSL   **JAVA**

DB2   CICS API

MQ   Sysplex

IMS   WWW   SNA

VSAM   3270

e-business

60'~96

COBOL   Assembler   C/C++

DB2   **CICS**   CICS API

IMS   MQ

VSAM   SNA

3270

On demand, SOA, Web2.0 and Cloud

主機提供各種新的電腦技術及開放標準，
以支持企業現代化的應用需求

投資主機符合經濟效益

- 對**585**個大型或成長中主機客戶進行的調查:
  - 平均營收成長 **14.6%**
  - 平均營利成長 21.3%
  - 平均MIPS成長 23.5%
  - 平均主機HW and SW 花費成長 **6.4%**
- 客戶延用原有主機服務來提供新的服務，控制資訊花費成長只有營收成長的一半
- 但依據IDC調查，企業平均資訊花費成長是營收成長的二倍

IT Spending is Growing twice as fast as GDP Growth Worldwide

So… Aggregate customer IT spending is growing twice as fast as business revenue

IT Spending % Change
GDP Spending % Change

EIU Real GDP FORECASTS- % change on previous year and Total IT Spending – IDC estimates

8

整合在主機的效能提昇

- ## When Application and Data are in the same z/OS
  - Up to 34% overall CPU savings
  - 52% more throughput
  - DB2 z/OS: JDBC Local (Type 2) now yields 28%-38% better results
  - CICS Transaction Gateway (CTG) Local is 18% more efficient

The best connector is no connector!

Avg CPU time per trx (ms)
11.73

Amount of data xfrd per trx (KB)
54.4

Avg CPU time per trx (ms)
2.64

Amount of data xfrd per trx (KB)
0.5
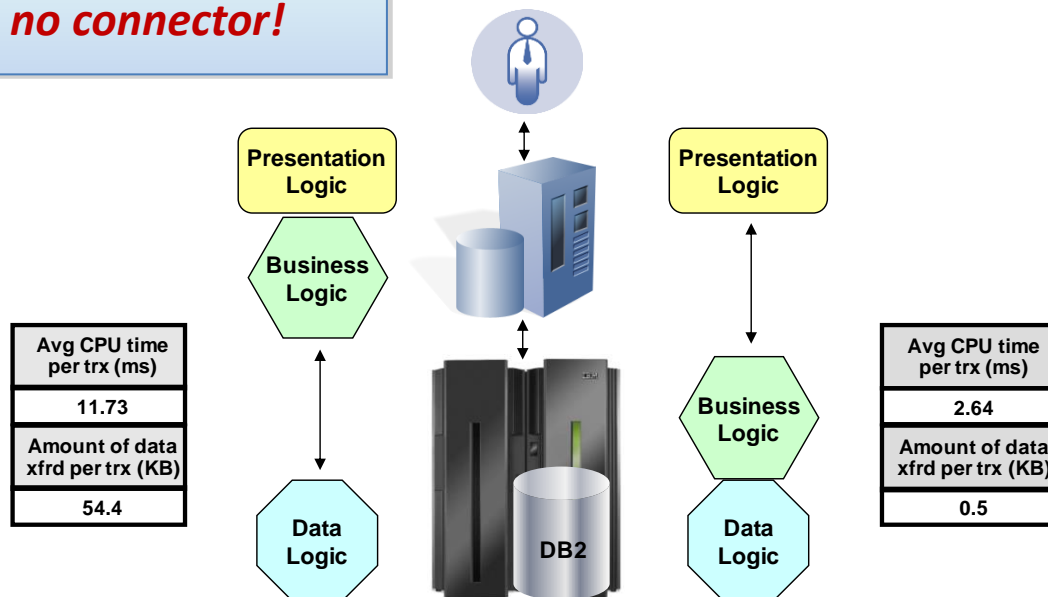
More information
WPS z/OS performance report: in the performance library
WebSphere z/OS co-location paper: in the techdocs library

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新一代主機的特性及優勢

- **Plays a central role in the daily operations of the world's largest organizations – and the daily lives of most people.**

- **Is known for its reliability, security, and enormous processing capabilities.**

- **Is designed for processing large scale workloads and serving thousands of users and transactions concurrently.**

- **Is managed by highly skilled technical support staff.**

- **Runs a variety of operating systems.**

核心 大量 可靠 安全 即時 多樣 經濟

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IMS 平行處理及負載平衡

主機
夯應用

CICSplex 平行處理及負載平衡

主機
夯應用

logon applid(CICSTOR)

SNA

VTAM GR

Dynamic Trans Routing

TOR   TOR

CF

AOR AOR   TS Queues   AOR AOR

DBMS   DBMS

IMS/DB DB2 VSAM   DB
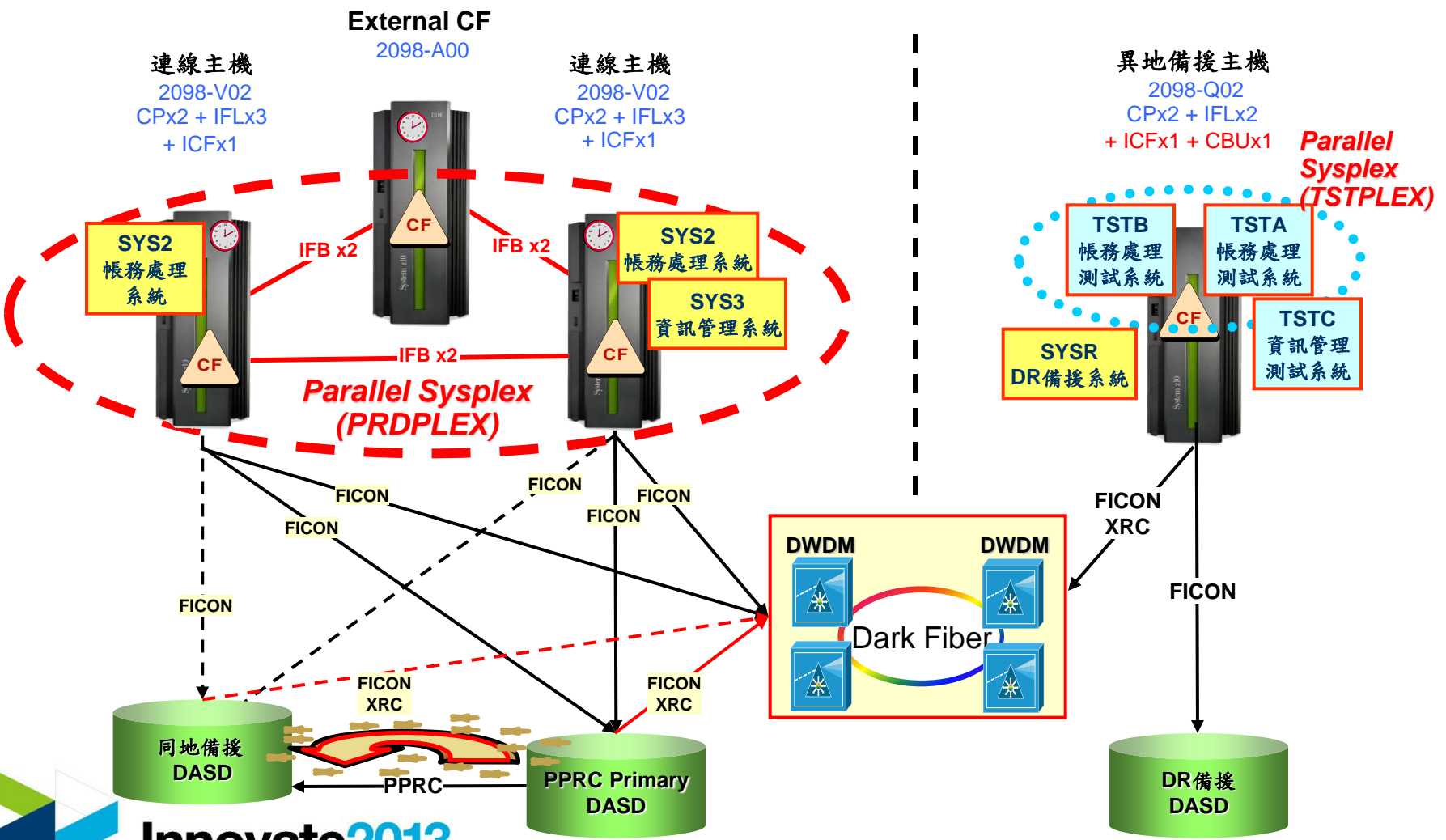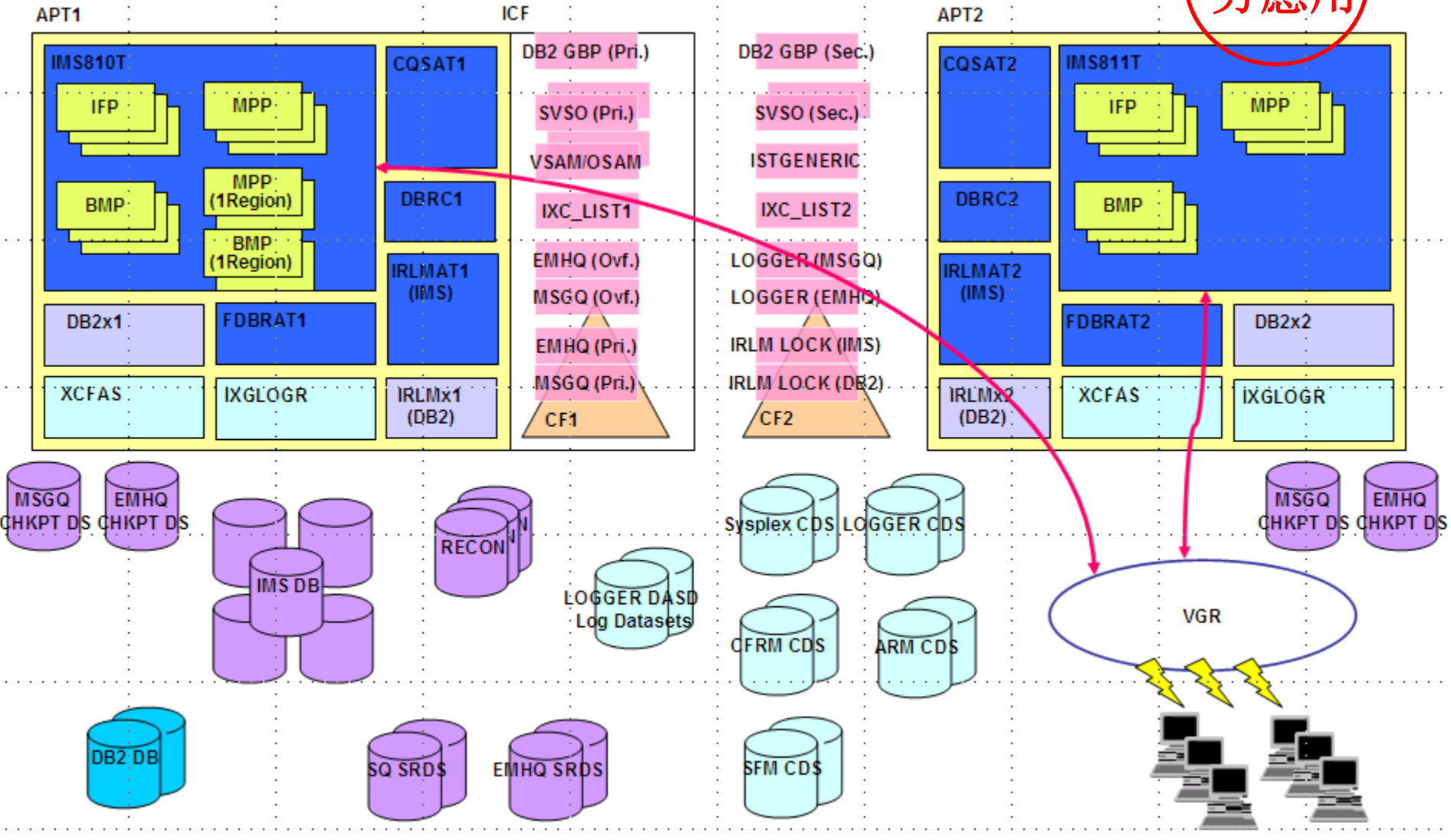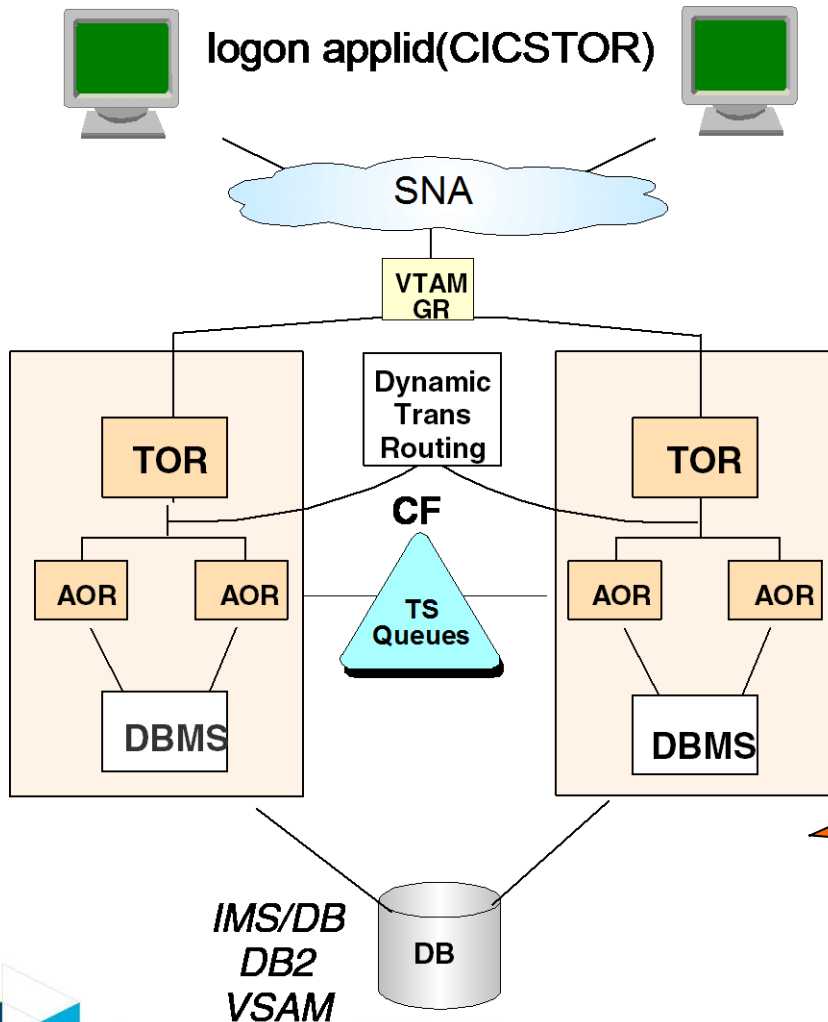
Dynamic session balancing across TORs using VTAM Generic Resource

Dynamic transaction routing across AORs using CICSPlex SM

File system sharing via DB2 group attach, VSAM RLS or CICS function shipping

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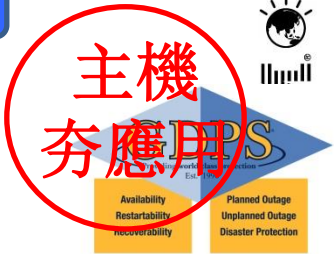
GDPS 高可用度與異地備援自動化服務

主機夯應用

15 years and still going strong

Manage & Automate

- **Central Point of Control**
  - System z and Distributed Servers
  - Remote Copy Infrastructure
- **Real-time Monitoring & Alert Mgt.**
- **Automated Recovery**
  - Planned & Unplanned Outages
- **Site Management**
  - Single or Multiple Sites
- **Automated Provisioning**
  - System z CBU

Solutions

GDPS/PPRC HM	**PPRC HyperSwap Manager**
GDPS/PPRC	**PPRC (Metro Mirror)**
GDPS/XRC	**XRC (z/OS Global Mirror)**
GDPS/GM	**Global Mirror**
GDPS/MzGM	**z/OS Metro Global Mirror**
GDPS/MGM	**Metro Global Mirror**
GDPS/A-A	**Active-Active**
VTS GRID	**VTS Remote Mirroring**

GDPS

A → B

zE   zBX

C
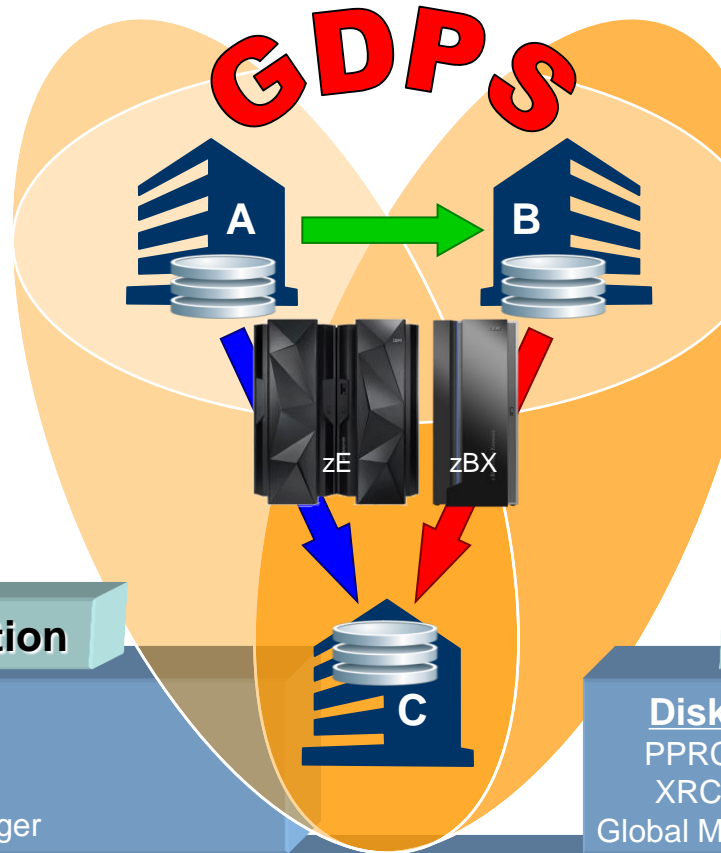
System Automation

SA for z/OS
NetView for z/OS
SA Multi-Platform
SA Application Manager

Replication

Disk	**Tape**	**Software**
PPRC	VTS GRID	InfoSphere for DB2
XRC	Mirroring	InfoSphere for IMS
Global Mirror		

Technology

First GDPS installation 1998, now more than 665 in 42 countries

主機 TCP/IP 防護機制

主機
夯應用

◆ 在系統層面上保護資料 ：
- System Availability
  - Protect system against unwanted access and denial of service (DoS) attacks from network
- Identification and Authentication
  - Verify identity of users
- Access Control
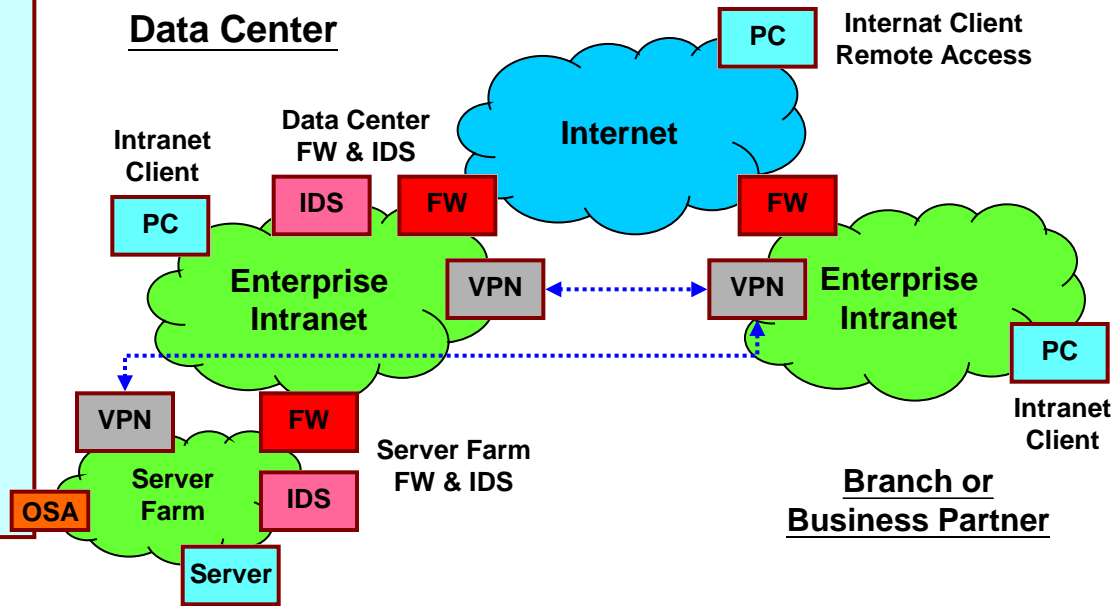 - Protect data and other system resources from unauthorized access

◆ 保護在網路上傳送的資料 ：
- Data Origin Authentication
  - Verify that data was originated by claimed sender
- Message Integrity
  - Verify contents were unchanged in transit
- Data Privacy
  - Conceals clear text using encryption

z/OS Communication Server IP Security
System & Resource Protection:
✓IP Filtering
✓Intrusion Detection Service (IDS)
✓TN3270 LU Mapping
✓TCP/IP Resource Protection
✓Operations and Administration Security
Network Security:
✓Transparent Application Security
✓IPSecurity (IPSec & VPN)
✓Built-in Application Security
✓TN3270 SSL/TLS Support
✓FTP TLS Support
✓Secure Network Services
✓SNMPv3 Authentication
✓OSPF Authentication
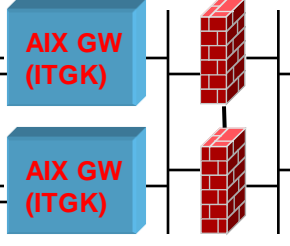✓Quality of Services (QoS)
✓Policy-based Routing
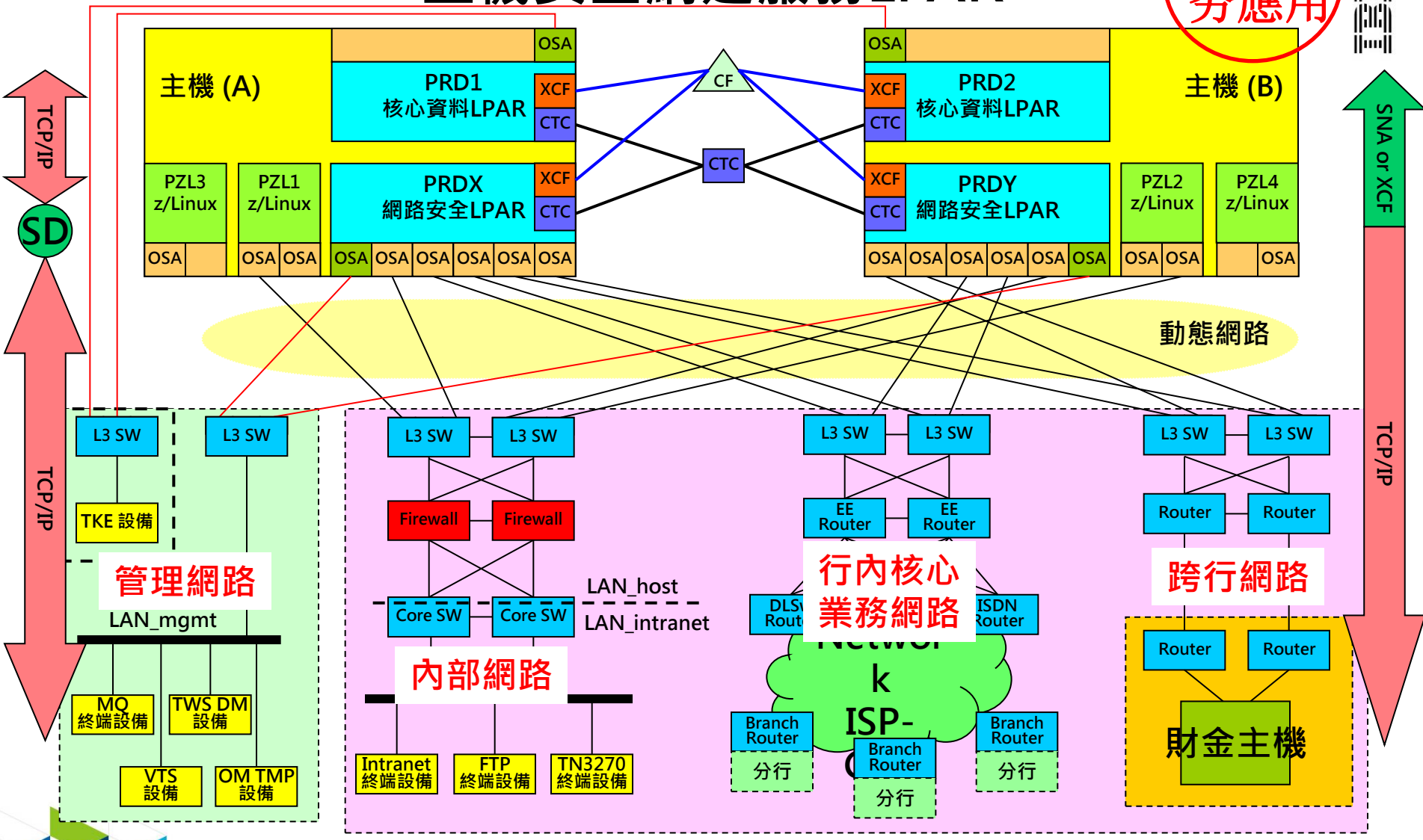
Data Center

Internet

Internat Client
Remote Access

Intranet Client — PC

Data Center FW & IDS — IDS, FW

Enterprise Intranet — VPN ↔ VPN — Enterprise Intranet

Server Farm FW & IDS — VPN, FW, IDS

OSA, Server Farm, Server

Intranet Client — PC

Branch or Business Partner

主機安全網通服務LPAR

IMS Connect 財金跨行連線
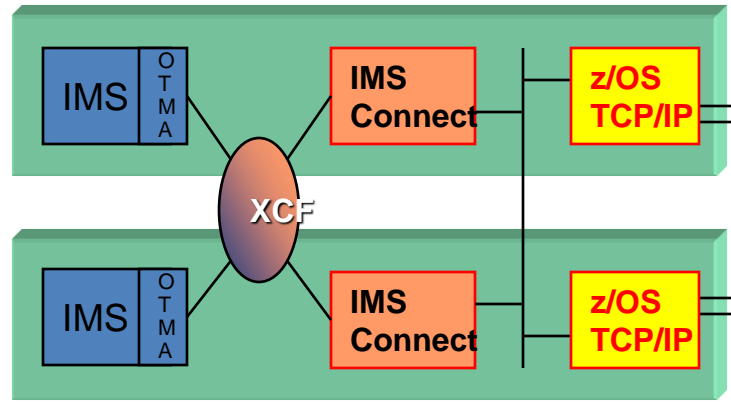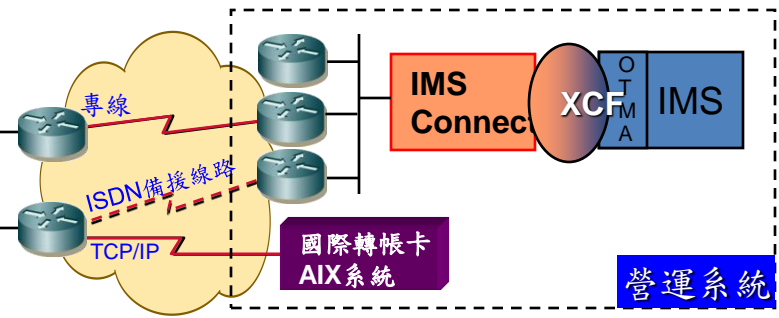
TCPIP ATM 管理系統 on zLinux

核心　大量　可靠　安全　即時　多樣　經濟

主機
夯應用
L86P

Member Bank
Applications Subsystem (SOR)

Socket
元件
3001埠
ATM
/
補摺

Socket
元件
3002埠
ATM
/
補摺

Socket
元件
3001埠
ATM
/
補摺

Socket
元件
3002埠
ATM
/
補摺

Socket
元件
3001埠
ATM
/
補摺

Socket
元件
3002埠
ATM
/
補摺

Socket
元件
3001埠
ATM
/
補摺

Socket
元件
3002埠
ATM
/
補摺

ITGK Framework
Java JDK 5 SR6 Kernel/Dispatcher

ATM狀態
(Port:4202)

L86P訊息
(Port:4000)

監控程式

Port: 4202

Port: 9080

CICSICON
Channel

XML
設定檔

SOAP
伺服器
元件

管理
工作站

Socket
Server
元件
32101埠
ATM
/
補摺

ATM
狀態紀錄

ipatm
Channel

交易流程
控制元件

日誌處理
元件

系統
Logs

交易資料
Logs

ATM ATM ATM ATM ATM ATM ATM ATM ATM ATM ATM ATM
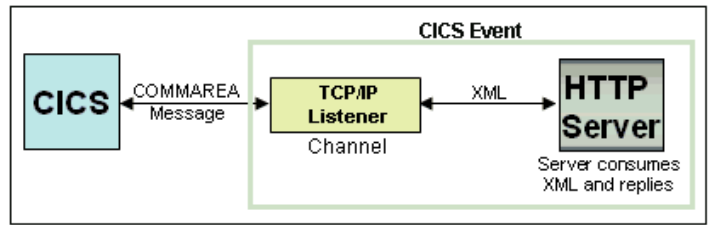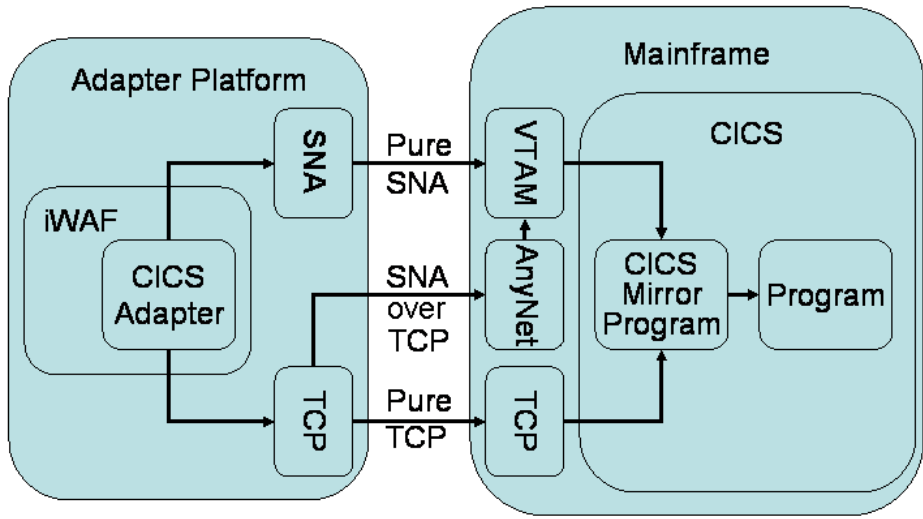
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個人網路銀行 on zWAS

CICS 整合SAP作業

主機
夯應用
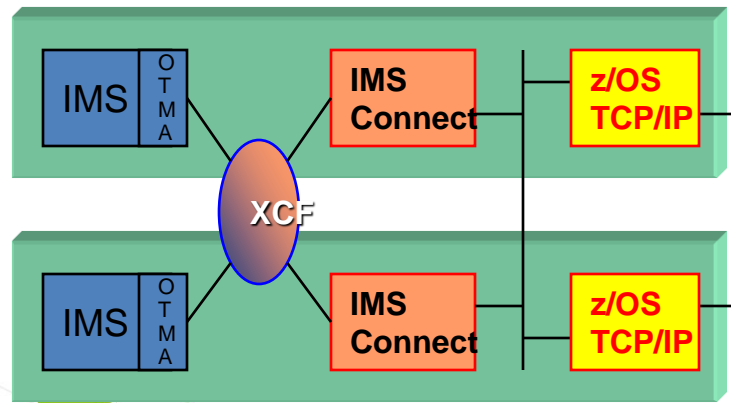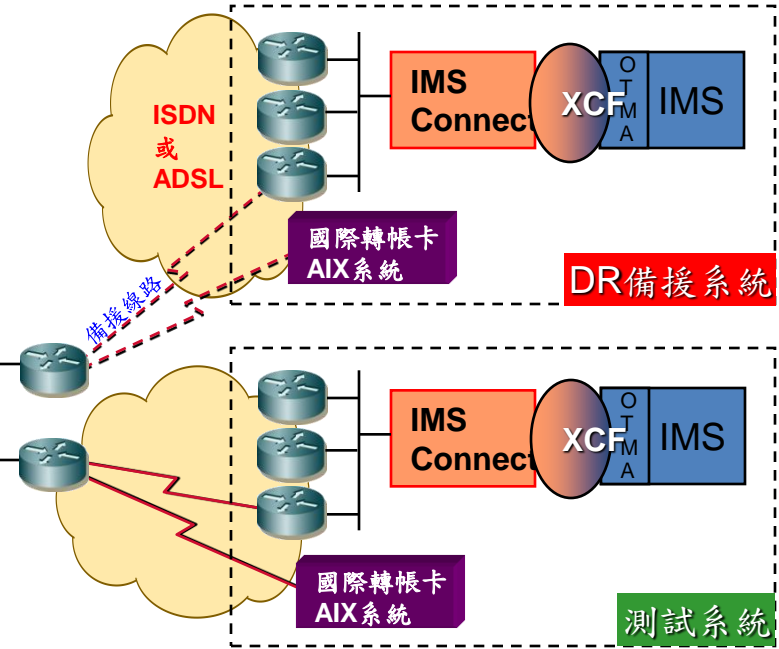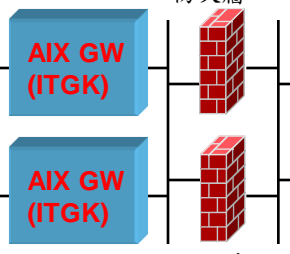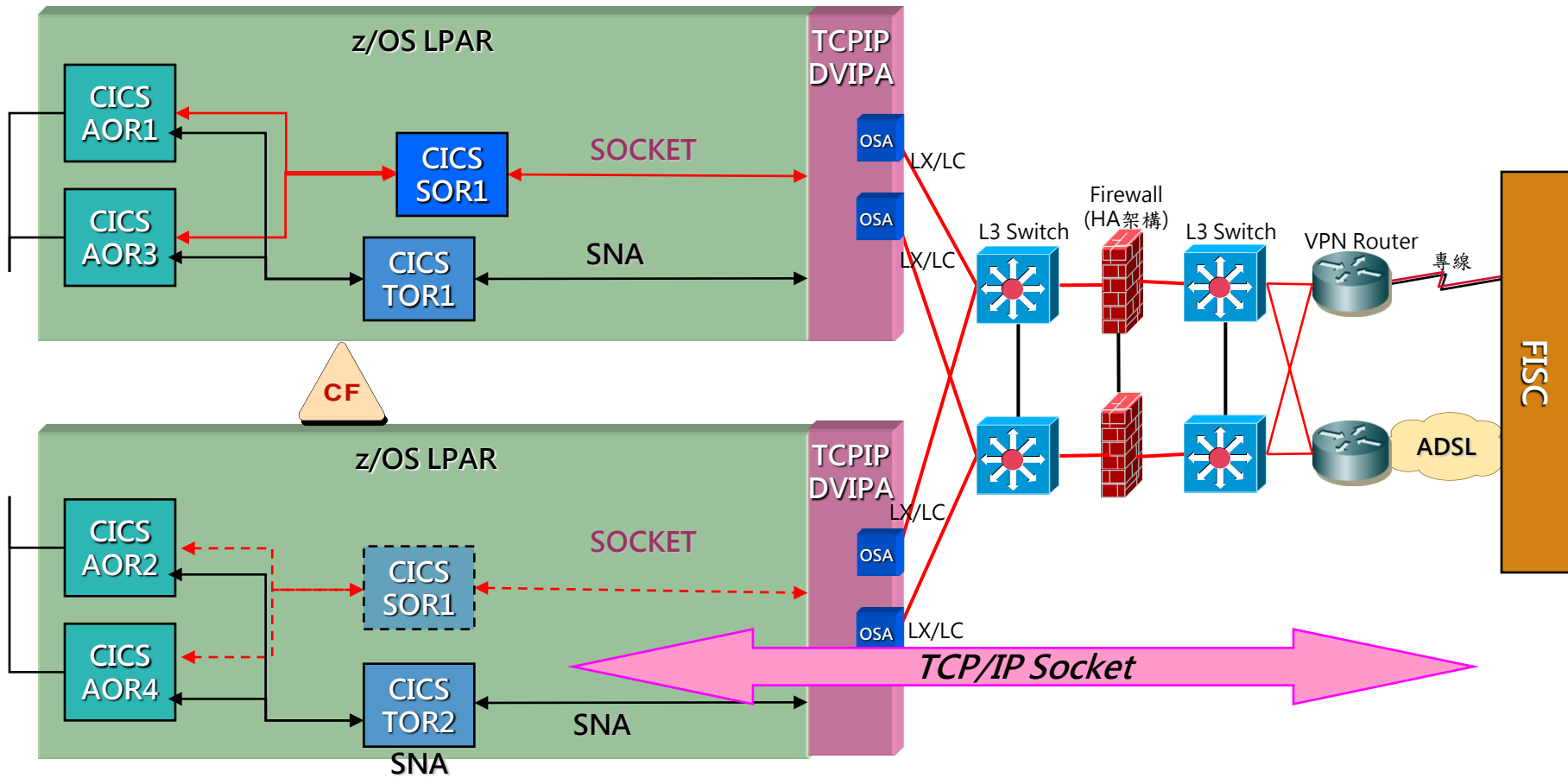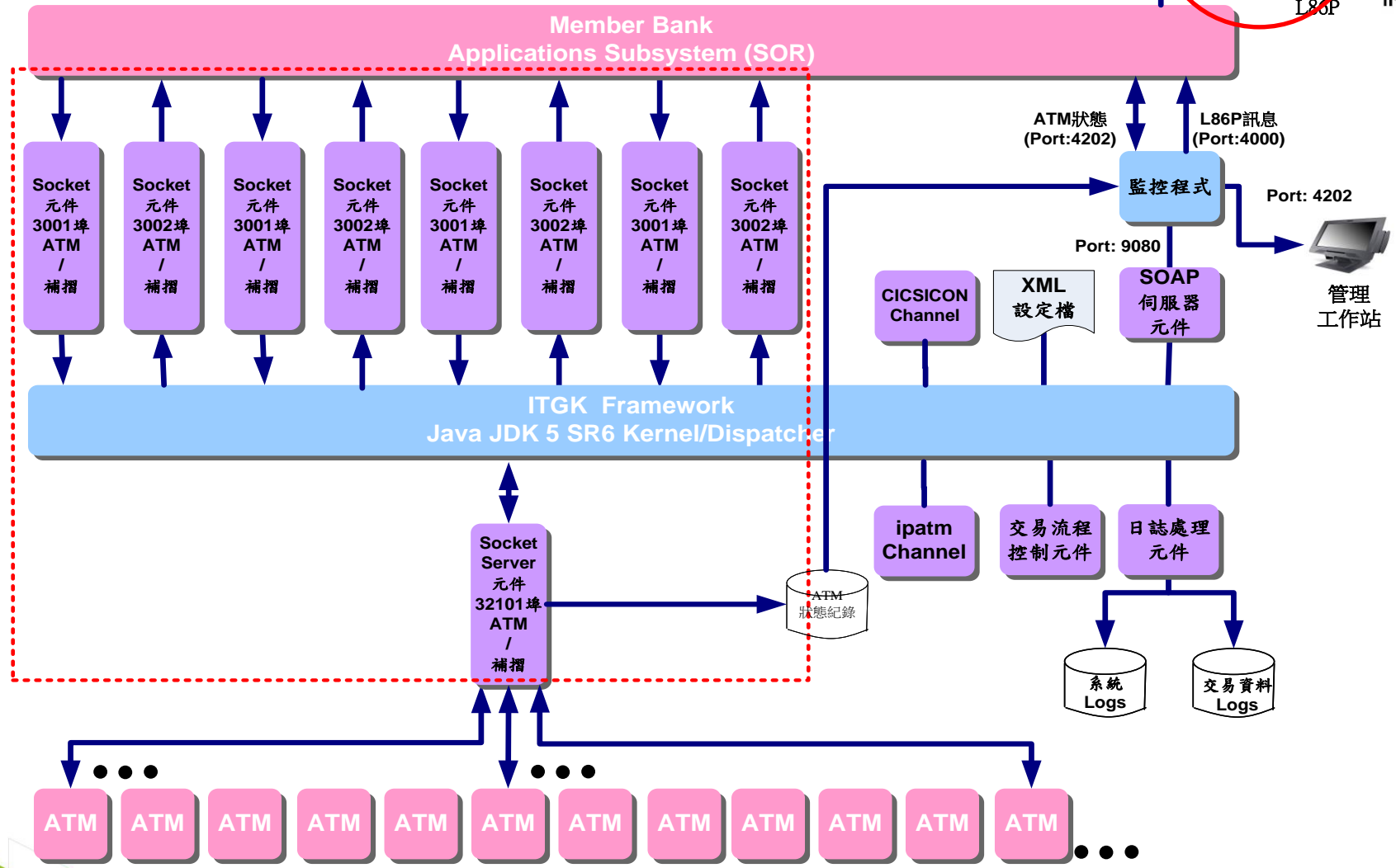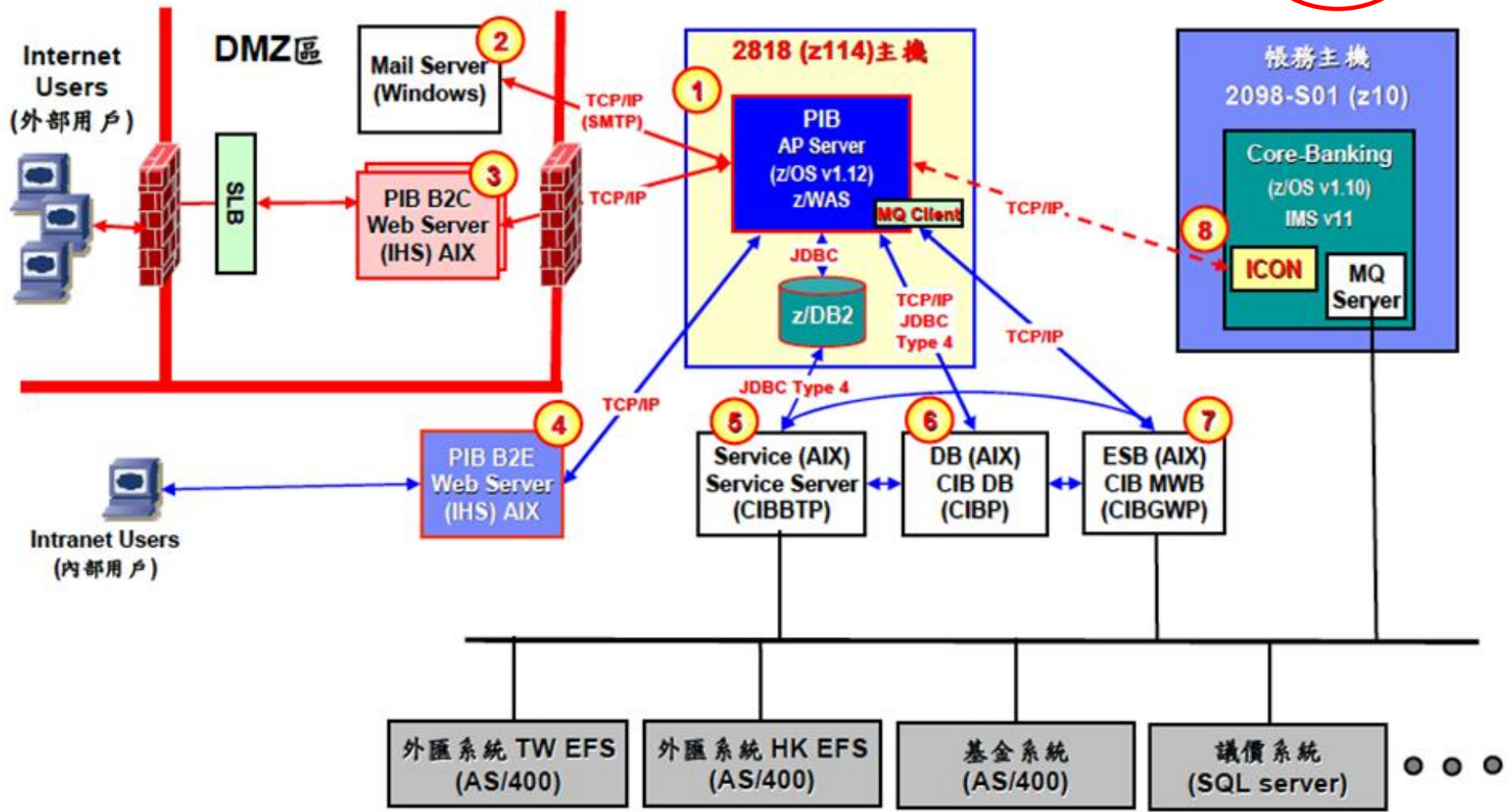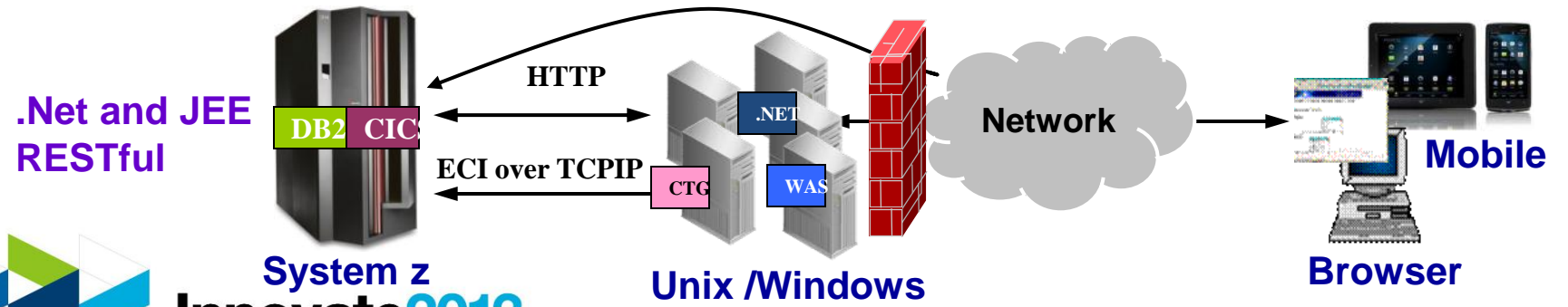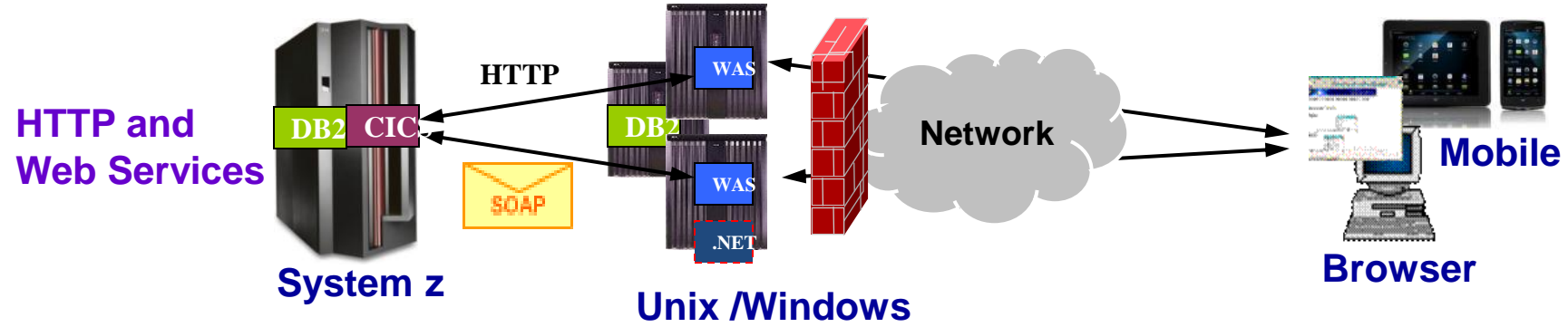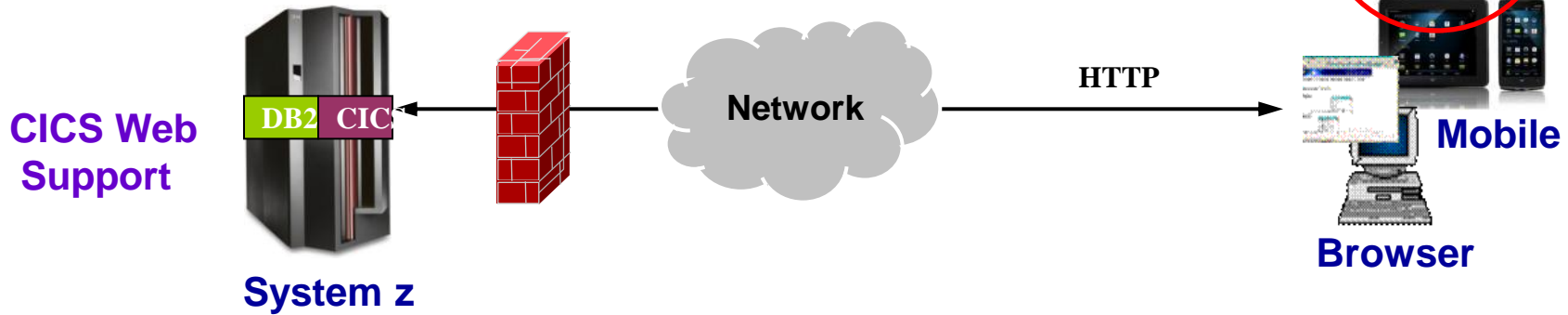
- The adapter enables the following functions:
  - –Connecting to CICS.
  - –Executing **COMMAREA** programs.
  - –Mapping **XML messages** to and from CICS data structures.
  - –Listening for events triggered in CICS.

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核心　大量　可靠　安全　即時　多樣　經濟

主機中文轉碼整合解決方案

主機夯應用

- 主機Unicode技術支援
- 造字不用造字檔 (PC/平板/手機)
- 造字區不敷使用
- 簡繁中文轉換
- 多國語支援問題

UNICODE

EBCDIC

z/OS Unicode Services

Java bean
.NET Class

Javascript

WAS

DB2　CIC
DB　TM

WAS

.NET

Network

Mobile

Browser

System z

Unix /Windows

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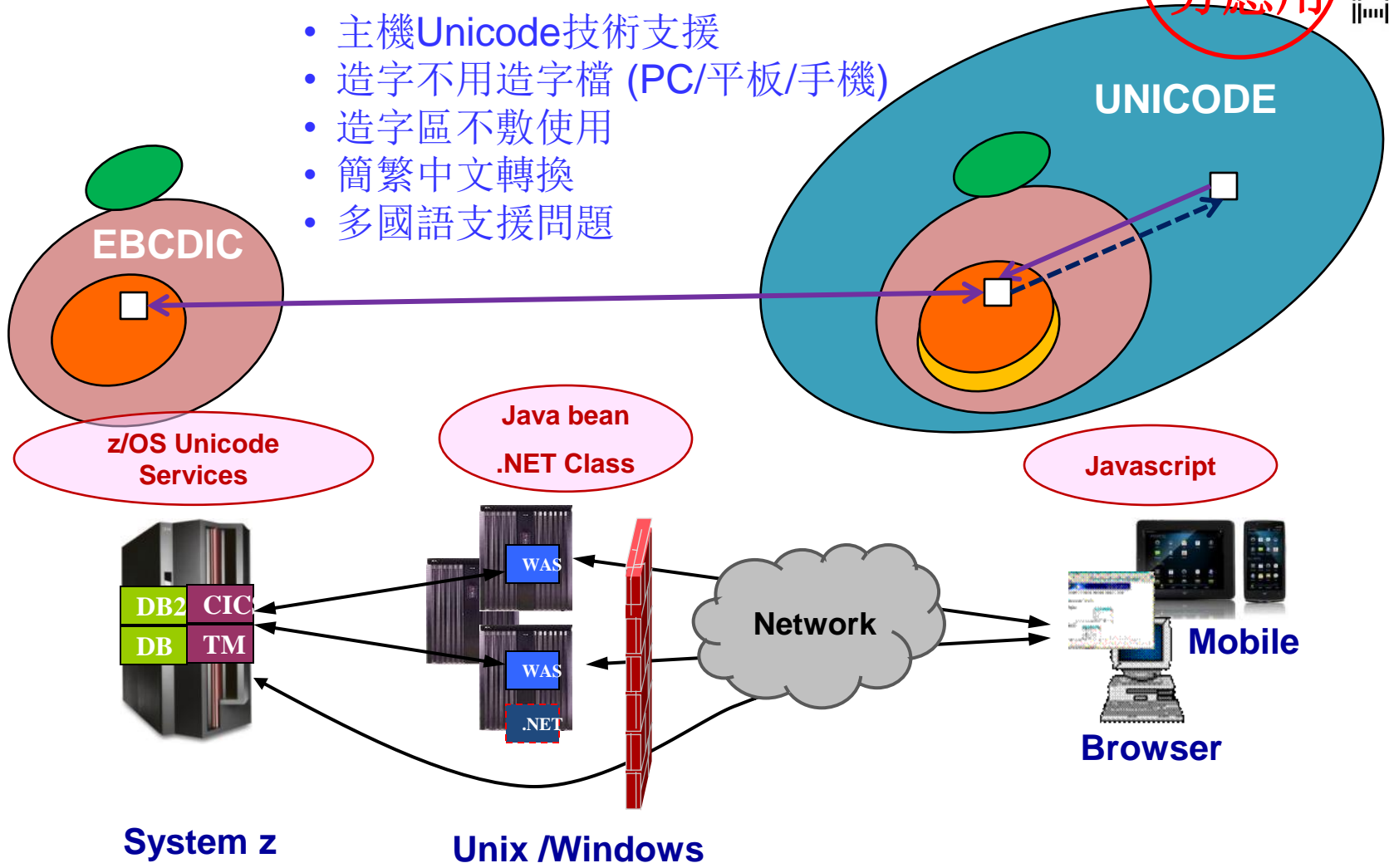
即時，不間斷的資料庫監控

主機
夯應用

InfoSphere Guardium

1. Prevent data breaches 防止數據洩露
   - Protect against cybercriminals & rogue insiders

2. Assure data governance 保證數據治理
   - Prevent unauthorized changes to sensitive data by privileged users

3. Reduce cost of compliance 降低合規成本
   - Automated & centralized controls across:
     - ✓ DBMS platforms (Oracle, DB2, SQL Server, …)
     - ✓ Enterprise applications (ERP, CRM, HR, analytics, …)
     - ✓ Compliance initiatives (SOX, PCI, data privacy)
     - ✓ Business units & distributed data centers
   - Minimal performance impact
   - No changes to databases or applications

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zNALC – 優惠計價方案

System z New Application License Charges (zNALC) for z/OS

- *Attractive pricing* for z/OS operating system for *qualified new workloads* on the System z platform
- Customers looking to add new applications to System z as well as existing NALC and z/OS.e customers will be interested in zNALC.

zNALC provides:
- **Single Qualified New Workload** pricing metric across System z product line
- LPAR-level granularity
    - Sub-capacity announced and supported – no need for full machine dedicated to new workload
- zNALC 'Qualified New Workload' Criteria replaces NALC Fixed Application List
    - A wider choice of workloads
- Improved z/OS pricing
    - Incremental Price/Performance improvements including Parallel Sysplex® Aggregation
- No separate z/OS product or product number

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zNALC – 更多符合 New Workload 應用

- zNALC can provide more choice of qualifying applications*
- zNALC provides a definition of Qualified Applications:
  - Qualifies a range of commercially available UNIX and Microsoft Windows applications
  - Qualifies a range of enterprise application data serving workloads
  - Qualifies a range of Java™ language business applications running under WebSphere Application Server and CICS Transaction Server
  - See the zNALC announcement letter for terms, conditions, and details
- NALC was applicable only to a short list of select applications
- z/OS.e disables or disallows certain products, applications, and workloads
  - * zNALC is available only on LPARs dedicated to a qualified new workload application. In general, qualified applications are those that IBM considers 'new workload', such as Java language business applications running under WebSphere Application Server, Lotus® Domino™, SAP, PeopleSoft, and Siebel among others.

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VUE

CICS TS Value Unit Edition – 僅適用 於新的 *Java* 應用及服務

超值優惠 - 回應客戶對於軟體計價的要求

新的 *Java* 應用*	快速提供服務*	協同現有應用作業
使用最新的 64-bit, Java 7, multithreaded JVMSERVER 架構, 提供高可擴充性。	使用最新的 CICS Java 支援功能, 快速的整合現有的CICS 應用, 提供現代化的服務	不需提昇現有後台作業系統, 即可使用CICS TS V5.1 提供的新功能, 開發新的應用服務

CICS TS V5 VUE (OTC)

CICS liberty profile 提供新的現代化網頁作業*

IBM Business Rules for z/OS 提供新的動態開發模型*

zNALC LPAR (特別計價 z/OS)

DPL

CICS TS V5, V4 or V3 (MLC)

現有 CICS COBOL, PL1, C/C++, ASM 核心應用系統

一般 **LPAR (**正常計價 **z/OS)**

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*所有 zNALC 的應用，都需向IBM提出申請

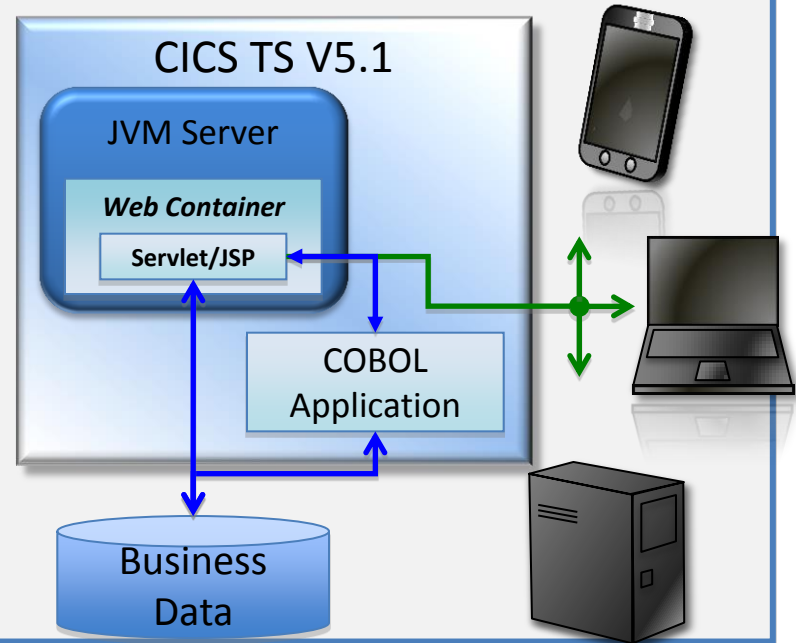# *CICS Transaction Service V5.1 Web Container*

Build rich web experiences for critical applications

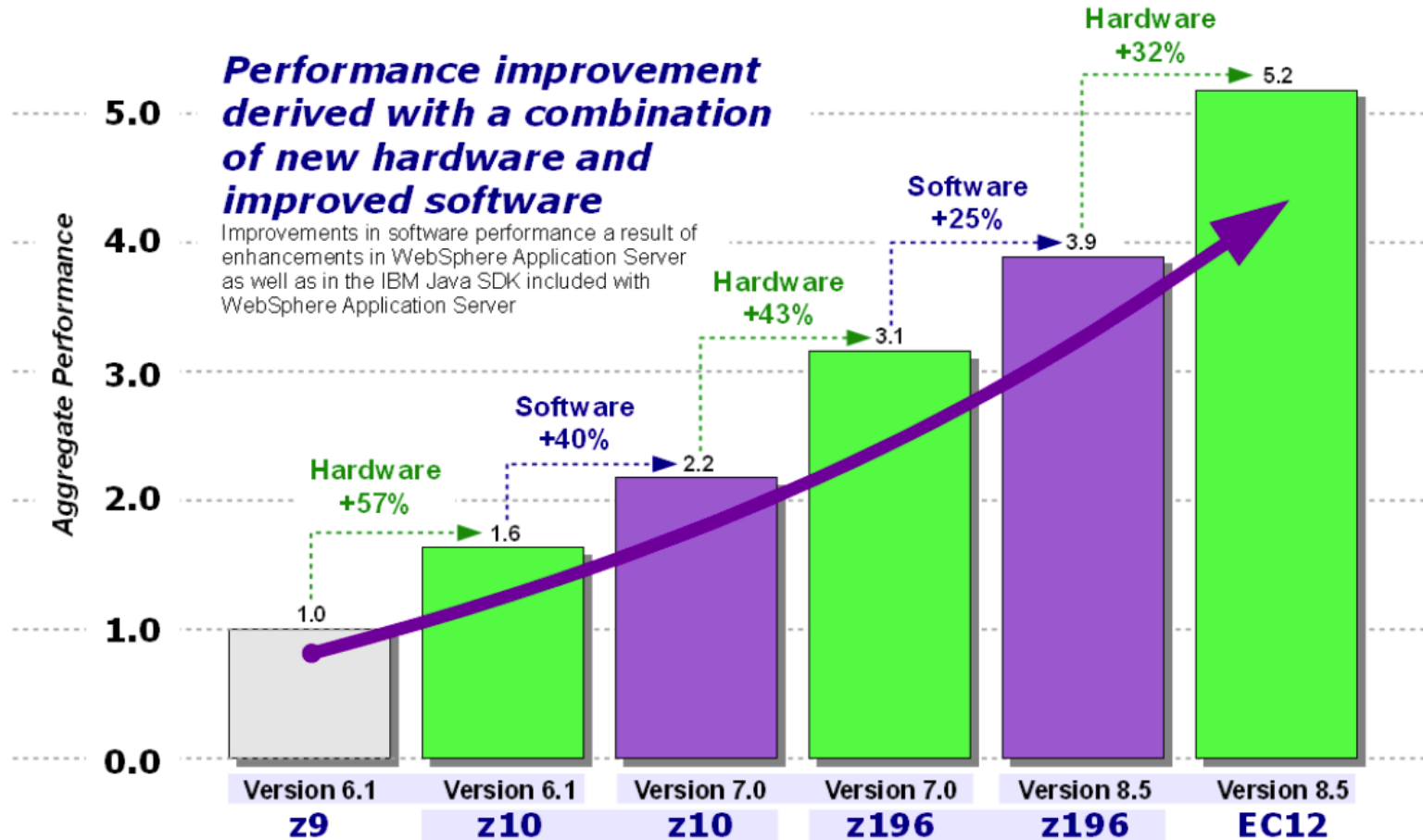### *The web container enables…*

- A **production-ready web container** with CICS qualities of service

- Deployment of lightweight **Java servlets** and **Java Server Pages (JSP)**

- Improved performance through local access to CICS applications and data

- Rapid roll-out of interface updates through OSGi-packaged deployments

- Full integration with first-class applications and platforms

- Technology built on the WebSphere Application Server **Liberty profile** for compatibility

The best connector is no connector!

CICS TS V5.1

JVM Server

Web Container

Servlet/JSP

COBOL Application

Business Data

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主機Java的效能

IBM持續的創新承諾，大幅提昇主機Java的運行效率

Performance improvement derived with a combination of new hardware and improved software

Improvements in software performance a result of enhancements in WebSphere Application Server as well as in the IBM Java SDK included with WebSphere Application Server
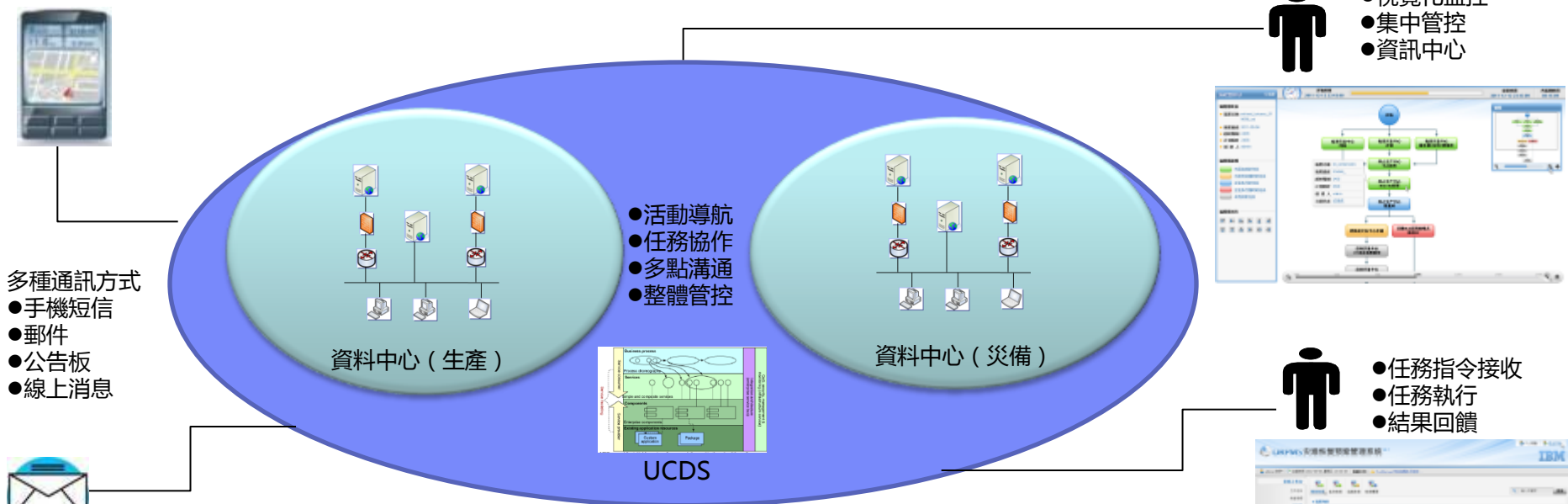
Performance measurement conducted in a controlled environment under specific conditions. Your results may vary based on many factors that influence overall system performance. Results here are not a promise of similar results. Results here are for traditional WebSphere Application Server z/OS and not the new Liberty Profile server. Test measured maximum achievable throughput transactions per second with overall CPU held near 100%. Version 8 not shown here because Version 8 and Version 8.5 are roughly equivalent in performance profile. Workload based on "DayTrader" benchmark sample. Details on the DayTrader application may be found at this URL: https://cwiki.apache.org/GMOxDOC20/daytrader.html

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計價方案參考資訊

- System z Software pricing Web site
  - **ibm.com**/zseries/swprice
- Parallel Sysplex Aggregation
  - **ibm.com**/zseries/swprice/sysplex
- zNALC web site
  - **ibm.com**/zseries/swprice/znalc.html
- Announcement Letters
  - System z New Application License Charges
  - US: 207-006   EMEA/LA: ZA07-0102
  - AP: AP07-0006   Canada: A07-0035

- SCRT page
  - **ibm.com**/zseries/swprice/scrt/
- Sub-capacity Corner web site
  - **ibm.com**/zseries/swprice/subcap
- NALC
  - **ibm.com**/zseries/swprice/znalc.html

UCDS 災備統一智能指揮平台

UCDS整體功能描述

●視覺化監控
●集中管控
●資訊中心

多種通訊方式
●手機短信
●郵件
●公告板
●線上消息

●活動導航
●任務協作
●多點溝通
●整體管控

資料中心（生產）　　　資料中心（災備）

UCDS

●任務指令接收
●任務執行
●結果回饋

➤視覺化管控視圖，為領導決策提供服務

➤通過自動化手段實現任務協作

➤統一的多形式溝通平臺

➤對組織、人員、流程等進行管理與版本控制

➤自動生成事件總結報告

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CICS TS Feature Pack for Mobile Extensions

Mobile extensions – simplified integration with mobile devices

Scalable platform	*Service enablement*	*Agile integration*
CICS TS V5.1's advanced scalability makes it the ideal platform for managing mobile workloads	*COBOL, C/C++, PL/I and Java programs can be RESTful service providers*	*JSON data and RESTful interface makes integration with mobile devices simple and efficient*

Available on CICS TS V4.2 & V5.1

Via Worklight Server

Worklight Server

COBOL, PL/I, C/C++, and Java Services

Direct to CICS

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New Announcement on April 23, 2013

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IMS SOA Integration Suite

IMS Enterprise Suite

IMS TM

| COBOL | PL/I | C | Java | MFS |

IMS DB

| DLI Data | XML Data |

IMS Explorer

IMS Catalog

IMS DLIModel Utility

IMS SOAP Gateway

IMS Connect API

WebSphere DataPower

IMS TM Resource Adapter

IMS MFS Web Solutions

IMS Web 2.0 Solutions

IMS Universal DB Resource Adapter

IMS Open DB And Universal JDBC Drivers

IMS XQuery

WebSphere
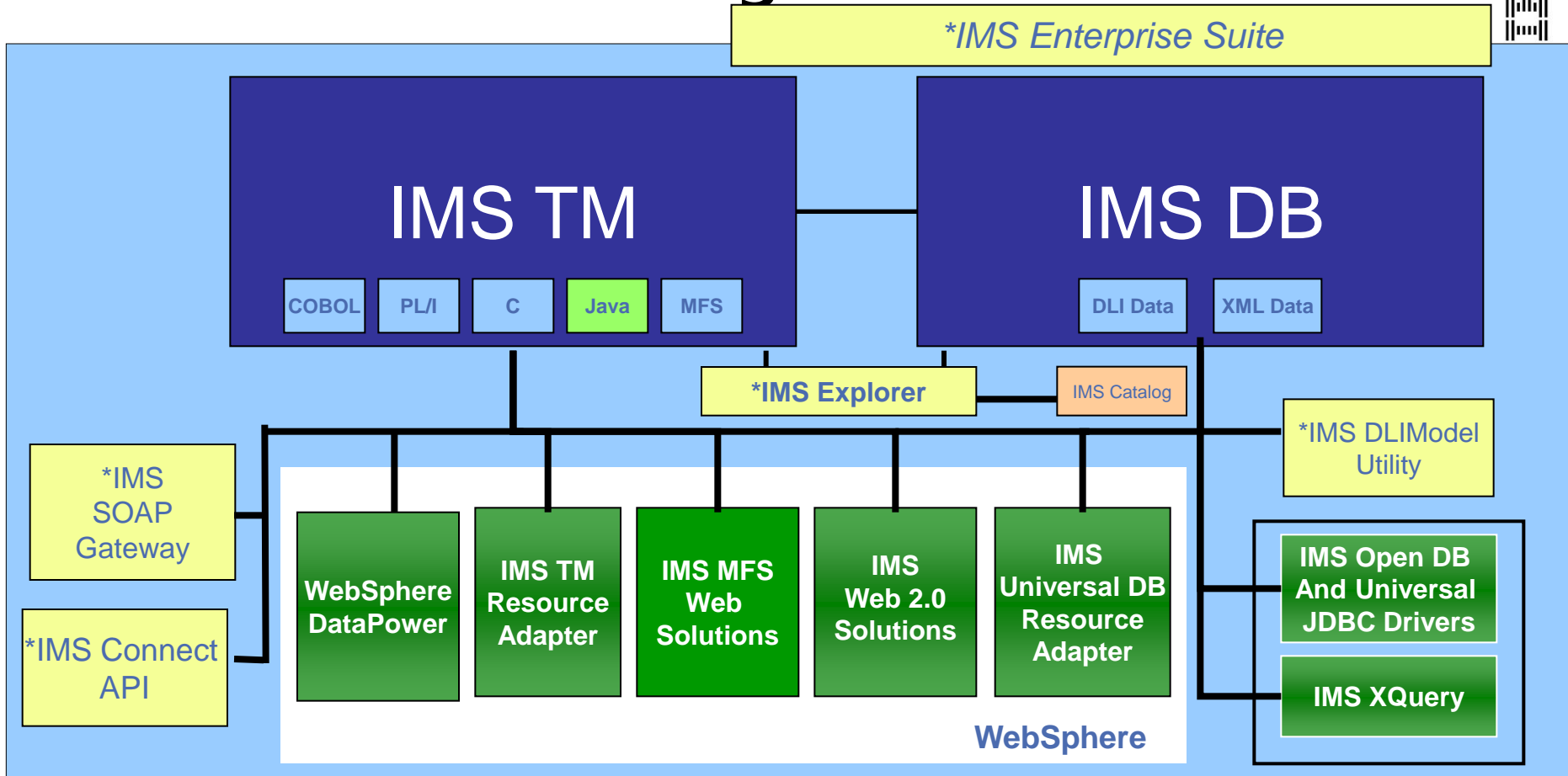
Service Oriented Architecture (SOA)
Web Services, SOAP, XML, Java, SCA/SDO, XQuery, Web 2.0

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* - Denotes upcoming functions

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IBM Explorer for z/OS Tools

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