Why is CICS Still Alive?

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Agenda

- Middleware – the hidden part of IT
- CICS (Customer Information Control System) track record as a middleware product
- The future environment for middleware
CICS Today

- **CICS Transaction Server V3.1** for zOS on IBM zSeries systems
  - Includes enhanced support for Web Services, application modernisation, and systems management

- **TXSeries V6.0** for AIX on IBM pSeries systems and other platforms including Windows
  - A fully functional CICS system with no dependencies

- **CICS Transaction Gateway V6.0** for ... many
  - Connects Web to older CICS systems

- One of the most successful s/w products ever
  - Most people in the developed world use it every day
Why? How?

- I thought mainframes died years ago ...?
- I never see adverts for CICS programmers ...?
- I don't recall the last time I heard about CICS ... so how can this be?
Did you do any of these today?

- Buy something in a supermarket?
- Use a mobile phone (or any phone)?
- Travel by public transport?
- Attend an entertainment event?
- Visit a hospital?
- Use electricity, gas or water?

- The chances are you used CICS ... 65% of transactions are processed on CICS mainframes ... or a competitor
Invisible Transactions

- A huge range of daily activities involve automated transactions which are performed on remote servers.
- The user interface is embedded in a supermarket checkout, mobile phone, ticketing machine etc. and is therefore invisible.
- The number and range of transaction applications will only continue to grow.
- And you can also do transactions on the Web!
So What's Different About Servers?

- We're all familiar with applications which run on personal systems, e.g. PCs, mobile phones, iPods
  - They offer instant access via low utilisation
- We tend to forget about server applications
  - Must offer instant access, but economics demand:
    - low cost per transaction, hence high utilisation
    - high scalability
    - continuous availability
  - So nearly always based on Middleware
What is Middleware?

- Software layer that sits between the operating system and the application programs
- Provides higher *level of abstraction* than operating system – makes application programming easier
- May provide greater *scalability*, reliability, and availability
# Middleware may Span Systems

<table>
<thead>
<tr>
<th>applications</th>
<th>applications</th>
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<tbody>
<tr>
<td>middleware</td>
<td>layer</td>
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<tr>
<td>operating system</td>
<td>operating system</td>
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<tr>
<td>server hardware</td>
<td>server hardware</td>
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- **Middleware layer:**
  - May be a class library/subroutine library
  - May exist on multiple physical systems
  - May exist on different operating systems – so may become a **virtual multi-system environment**
  - May enable portable applications
Common Middleware Services

- Program directory service
- Program scheduling service
- Program synchronisation service
- Time of day/time interval service
- Presentation services *(device class specific)*
- Reliable messaging
- High performance data management
- Transaction commitment service
- Journalling service
- Monitoring service
- Authentication service
- Authorisation service
- and more...
More on Middleware

- **Middleware** is a generic term which includes:
  - TP Monitors
  - Web Application Servers
  - Message Queue Managers
  - Remote Procedure Call
  - Various flavours of Web software

- Normally runs on servers or clusters of servers and requires *systems management*

- **CICS** is the *market leader* in middleware
How? Why?

- 3270 is dead, SNA is dead ...
- Does anyone still run COBOL applications ...?
- How did CICS get there?
Some Highlights from History

- 1968  CICS, IMS and GIS announced as IBM's first “unbundled” (i.e. priced) software products
- 1974  CICS development transferred to Hursley (in exchange for PL/I); expected to die but new command level API reverses the trend
- 1980  CICS 1.5 remote access to data and invocation of programs (ISC/MRO)
- 1990  CICS 3.1 large virtual storage via 31 bit addressing; enables very large networks
- 2005  CICS TS 3.1 supports “transactional Web”
Another Look at History

- 1968  CICS ~ 50 teletype terminals
- 1974  CICS ~ 500 3270 terminals
- 1980  CICS ~ 5000 3270 terminals
- 1990  CICS ~ 50,000 3270 terminals/emulators
- 2005  CICS ~ 500,000 browsers/emulators etc

*CICS systems handle ~ $10^{11}$ transactions with a financial value ~ $10^{13}$, per day*
Typical View of today's Enterprise Network

huge investments in applications based on CICS here
Some Lessons from History

- Look after your customers – protect the value of their past investments
- Enable technology change:
  - Increased processor speed, memory capacity
  - Hierarchical to relational database
  - SNA to TCP/IP and HTTP networking
  - 3270 terminals to Web browsers
- Embrace new application development styles:
  - Assembler, COBOL, C/C++, Java, Eclipse tools
- Watch the competition
How? Why?

- Well, OK, it looks good so far ... 
- ... but it can't last ... can it?
21st Century Market for TP

- Most networking is based on the **Internet**
- Growing number of **consumers** use traditional devices, web browsers, and pervasive devices to access services
- **IT substitutes** for labour - enables changed business processes*, leading to falling labour costs which provide the main source of increased productivity
- **Energy** becomes more **expensive** but usage must fall:
  - IT based communication substitutes for physical travel and reduces movement of goods
- Continued **growth** in transactions processed by a global IT infrastructure

* Harvard Business Review
Market Trends

- Consumers want unique products (i.e. “market of one”, *mass customisation*)
- Most enterprises must support *multi-channel service delivery* (browser, mobile phone, retail, etc.)
  - anytime, anyplace service
- Continued pressure for *cost reduction*
  - commoditisation of IT
  - on demand acquisition and pricing
  - utility computing
- Enterprises will continue to *consolidate & outsource*
  - Consolidation often involves migrating workloads or rehosting applications, to achieve economy of scale
The Transactional Web

- Enterprises will outsource by purchasing IT-based services ("B2B")
  - Using a Service Oriented Architecture
  - Enabled by standards for Web Services
  - A Service is an *encapsulated component application* – the supplier runs it as well as providing it (may also contain non-IT elements)
  - SOA enables dynamic, *loosely coupled integration* of services

- Enables a business to focus on its *core competency*, offered as a Web Service to other businesses
  - When there is an effective way of *charging* for Services
Where is the Business Value?

- Business value is created by *applications*
  - delivered as components or services

- Infrastructure is perceived as an *enabler*
  - deployed on clusters and networks
  - based on middleware architectures
  - invisible except at the point of delivery
  - cost must be defrayed by large scale use

- Middleware must *compete* for applications
  - Multiple languages and re-use of past investments
Summary

- CICS gained an early lead in TP applications
- Survived by adapting to changed technologies
- Continued to offer customer value
- Is well positioned for the future
- See www.ibm.com/cics/ for more information