Oracle Database 10*g* in your z/OS Mainframe Environment

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ORACLE

Oracle Background
On MVS, OS/390, z/OS

- A database and client applications on z/OS
- Oracle written in C / assembler and java
- EBCDIC based relational database on z/OS.
- Integrated with Oracle across all platforms
- Runs native as a subsystem.
- Developed in the USS environment.

- Released every major version since 1986
- Released simultaneously: 8.1.7, 9.0.1, 9.2.0
- Embarked on 10g architecture 10.1.0.x,10.2.0.x

Oracle for z/OS

Twenty+ Years of Commitment

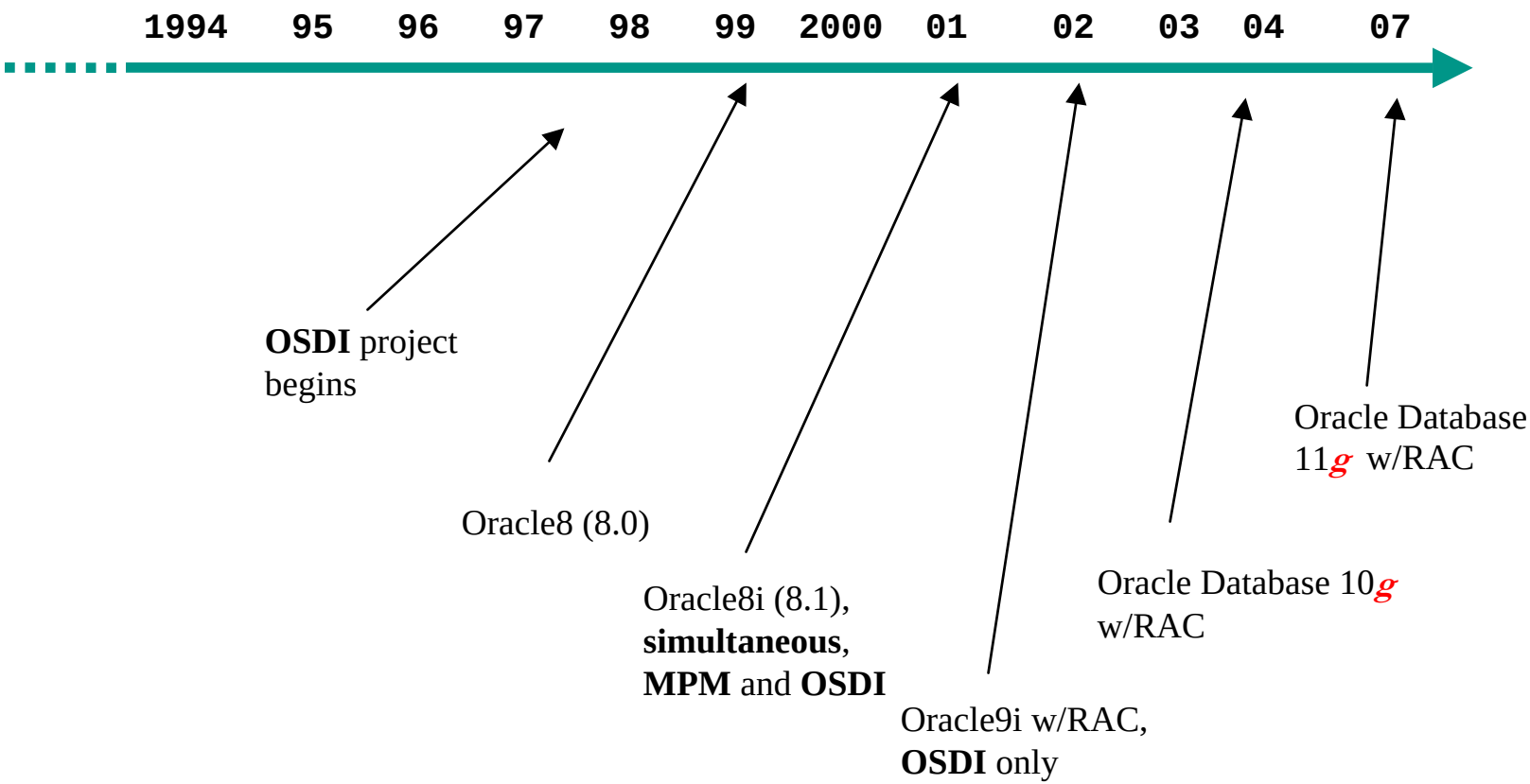
- 1986 – Oracle for MVS reaches GA
- 1988 – Oracle SQL connect gateways.
- 1990 – Oracle for MVS/XA 31-bit addressing
- 1995 – Oracle Parallel Server on MVS/ESA
- 1997 – Oracle Transparent Gateways.
- 2000 – Oracle's OS/390 re-architected
- 2001 – Real Application Clusters on OS/390
- 2002 – Oracle9iR2 for OS/390
- 2004 – Oracle Database 10*g* R1 for z/OS
- 2006 – Oracle Database 10*g* R2 for z/OS

Oracle for z/OS

Major Engineering Milestones

- Development transitioned to USS from VM
  - Adopt generic development and QA process
- Simultaneous release with Solaris, HP, etc.
  - Significant engineering effort
- Real Application Clusters (RAC)
- Oracle for z/OS re-architecture project - 2000
  - Rebuilt from the ground up
- Use IBM's LE environment for Oracle client
- Install using a common method across all platforms
- zIIP support.

Milestones


1994
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OSDI project begins
Oracle8 (8.0)
Oracle8i (8.1), **simultaneous**, **MPM** and **OSDI**
Oracle9i w/RAC, **OSDI** only
Oracle Database 10*g* w/RAC
Oracle Database 11*g* w/RAC

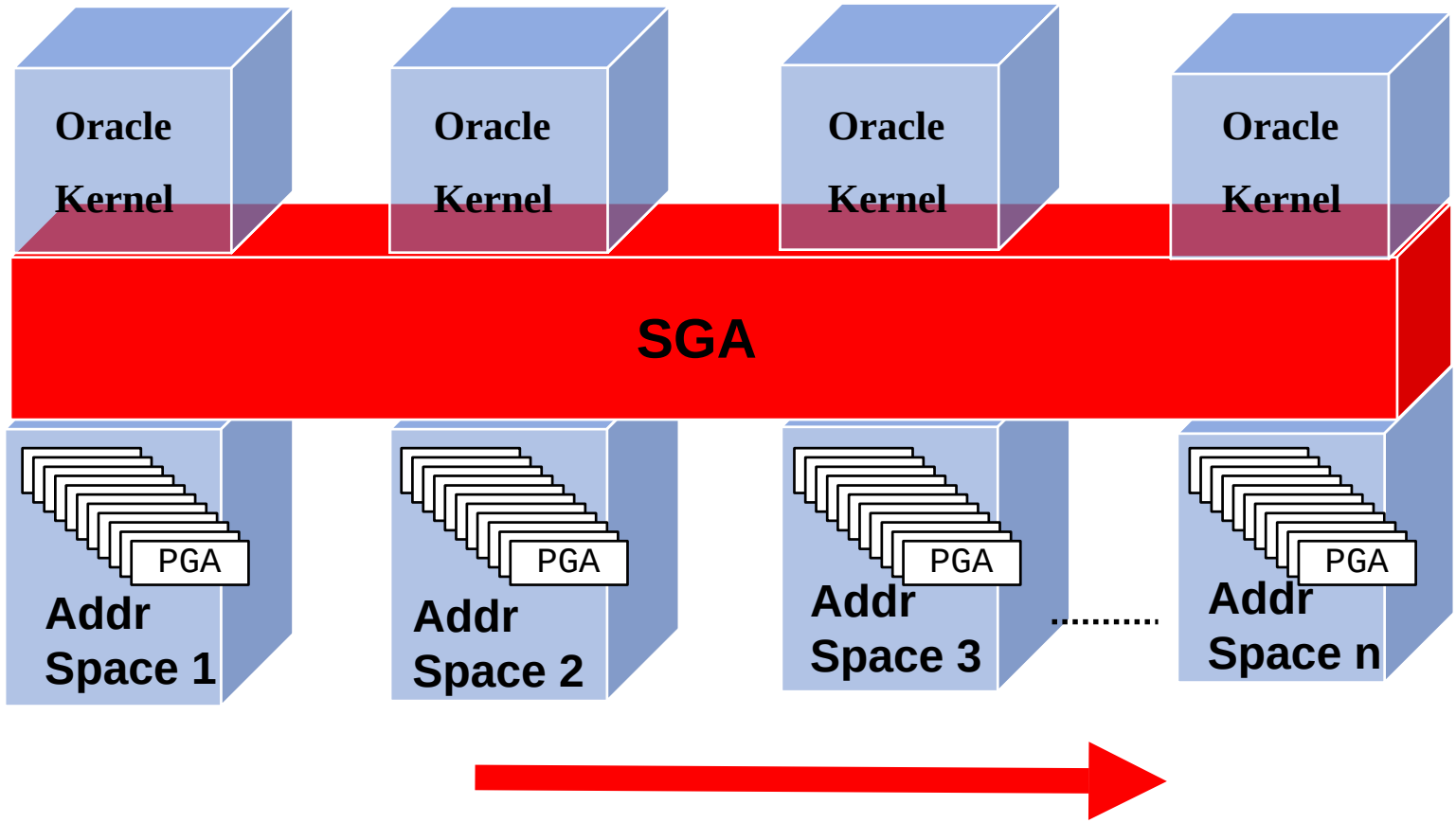
New Applications
Demand new Solutions

- Rise of Internet-based application structures
- Surge in user population
- Long-running transactions
- New requirements for security
- New open standards
- New OS/390 and z/OS facilities
- New S/390, zSeries hardware features
- 31-bit addressability limitations
- New applications using Java.

Architectural
Reengineering

- Exploit RDBMS session constraint using multiple address spaces
- Simplify product operation
- Improved performance and RAS
  - 10%-40% better performance and throughput
- Exploit newer OS/390, z/OS features
- Exploit zSeries 64-bit real memory support in z/OS
  - ESA-ME (>2G real memory) support
- Move to IBM-supported C runtime (~LE/370)
- Enable more timely porting/delivery

Oracle for z/OS
Current Design Of Oracle on z/OS

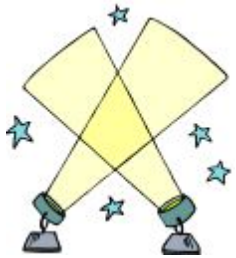


Oracle for z/OS
Architected for Tomorrow

- Up to **255** address spaces per instance
- SGA is private shared memory (`IARVSERV`)
- Sessions distributed across address spaces (virtual memory load balancing)
- Can add address spaces “on the fly”
- Large set of client sessions
  - Tested more than 31,000 active database threads
- All new z/OS OSD code, but no changes to Oracle base code

Oracle for z/OS
Workload Management

- Incoming client is classified via z/OS **Workload Manager** (WLM)
- Client sessions are distributed across instance address spaces (v/m load balancing)
- Enclave SRBs created for Network client requests – issues PC to enter Oracle server, may run on zIIP.
- Effective use of WLM goal mode (*e.g.* response time goal)
- Each client's transactions can be separately managed
  - The most important work gets the resources
  - Unsociable work can be segregated



Oracle Database 10*g*
Key Features

- Availability/Scalability
  - Real Application Clusters
- Availability/disaster recovery
  - Data Guard - Logical or physical standby database
- XML database features
- Information integration (Streams)
  - Event capture/propagate/apply
  - Advanced Queuing, Advanced Replication
- Installed / managed via OUI.
- Manageability
  - Enterprise Manager
  - User requested Server, net and subsystem version displays
- Security
  - LDAP client support

Oracle Database 10*g*
Key Features

- Data Management
  - Extend database files on demand
  - Extensive File management changes for usability under USS
  - Variable database block size
  - Disk cache interface
  - External tables
    - ZFS/HFS file access
  - Unicode support in the database
    - UTF-16 and UTF-8 on OS/390
- Workload manager (WLM)
- Full set of USS client tools
    - Oracle utilities run “native” (batch/TSO) and Unix-like (under USS)

Oracle Database 10*g*
Key Features

- Allow Non-Oracle z/OS applications running on z/OS to access Oracle on any platform
  - CICS / IMS / Batch applications.
  - Java applications!
  - Precompilers – Pro*C, Pro*Cobol, Pro*PLI and Pro*Fortran
- Server-side integration of 3rd party data stores with transparent gateways
    - DB2/390
    - UDB
    - Adabas / IDMS / VSAM
    - IMS
- 10.2 has a new “generic” listener which is closer to the architecture on other platforms.
- Oracle interMedia Audio, Video, Image and Locator
- OCCI / JDBC thick client limited support

Oracle Database 10*g*

Installing Oracle Database 10*g* for z/OS

- Installed using Oracle Universal Installer
- Java based X-windows application running in USS.
- Closely integrated with the rest of the Oracle product stack.
- Two methods of installation
  - GUI base interactive install
  - Silent command line driven install
- IBM Redbook: SG24-7055

  - Experiences Installing Oracle Database 10*g* for z/OS

Oracle Database 10*g* OUI.

Oracle for z/OS
Enterprise manager

- A tool use to remotely manage a database on any platform.
- Agent runs on z/OS to allow remote management of databases running on z/OS. Runs in uss
- Simple configuration
  - Run root.sh
  - Configure sysman/config/emd.properties
  - Configure sysman/emd/targets.xml
  - Start agent – emctl start agent
- Plan to integrate with Grid Control and provide additional performance data.

Oracle for z/OS
Looking Back and Whats next?

- 10.1.0.5 Released 03/2006
- 10.2.0.2 Released 05/2006
- 9.2.0.8 Released 08/2006
- 10.2.0.3 Released 12/2006
- Beta zIIP support Released 03/2007. Plan to provide zIIP and zIIP on CP time in SMFDTAI and SMFDTAO similar to SMFXMCPU
- A future version of ORASMFO will contain the names SMFZIIP and SMFZOCP.
- 11*g* Development progressing. z/OS 1.7 as requirement.
- Utilizes new IBM processors zIIP and other OS enhancements where possible.
- Feasibility of producing a 64 bit port. In research stage.
- Implement part of the CRS/CSS stack for RAC.

Questions !