CICS Transaction Server Performance & Tuning

This course is designed to take systems programmers through the main components of CICS, explaining how various parameters, design concepts, CICS facilities, operating system facilities and network facilities affect the performance of CICS systems. Attendees are encouraged to bring statistics and resources definitions from their own systems to gain added value from the course.

Objectives

On successful completion of this course, attendees will be able to:

• explain how performance is effected by parameters and design concepts
• manipulate CICS facilities to optimise performance
• describe the impact of MVS facilities on CICS performance
• explain the impact of network features on performance

Who Should Attend
Systems Programmers.

Prerequisites
CICS systems programming experience.

Duration
4 days

Contents

Introduction
Performance objectives; What are your tuning objectives?; Response times; Types of transactions; Types of waits; Resource load; Why tune?; Poor response time; Increased workload; Hardware considerations; Methodology; Successful tuning requires; Understanding; CICS and the applications; Preliminaries; Measurement tools; Collecting tool; Benchmarking tools; What resources to tune; Storage; CPU; I/O; Terminal I/O; Checklist for tuning; Understand serialization; Making a change; Processor cycle (CPU) checklist; Virtual storage checklist; Real storage checklist; I/O tuning checklist.

z/OS interface
Introduction; Resource hierarchy; CPU; Storage; I/O; Central storage; Auxiliary storage; Address space; Operating system; CICS private area; CICS region layout; Data spaces; Checking the z/OS storage; Coupling facility; VSAM record level sharing; Coupling facility data tables; TS datasharing concepts; TCBS prior to CICS/TS; CICS environment TCBS; TCBS at CICS/TS 1.3; Open transaction environment; CICS/TS 1.3; MAXOPENTCBS; FORCEQR={NO|YES}; CICS/TS 2.2/2.3; MAXOPENTCB changes; OPENTCBS V2.2 & V2.3; CICS utilization; CICS & real storage; Other OS areas; Recommendations.

Dispatching
CICS dispatching; Kernel task; CICS task; CICS transaction; CICS dispatching; Dispatcher chains; Double chains; Use of TCBS; Mode switching; MXT; Purpose; Recommendations; Statistics; Transaction CLASS (TCLASS); V4.1 and above TRANCCLASS; Group; MAXACTIVE; PURGETHRESH; Task priority & PRTYAGE (SIT); Transaction priority; Formula; Empiric evidence; Transaction priority (PRTYAGE);
Recommendations; Region exit interval ICV; ICV; Runaway task time ICVR; DTIMOUT; SIT parameters; Limit conditions; Reliability features; Trace; Monitor; Other conditions; Other transaction definitions; Storage clear; Transaction dump; Transaction isolation; Dispatcher statistics; End of day statistics; Output from stat transaction.

Storage management
Problems with storage; Virtual storage constraint; 31bit storage; MVS/ESA nucleus and extended nucleus; Prefixed Save Area (PSA); System Queue Area and extended SQA; Link Pack Area and extended LPA; z/OS common service area; Private and extended private area; Region size; RMF; RMF monitor III common storage; Common areas; The CICS private area; High private area; LSQA; Scheduler work area; Subpool 229 230; The CICS region; z/OS storage above the CICS region; z/OS storage within the CICS region; CICS kernel storage; Static tasks; Dynamic tasks; Kernel changes; Kernel stacks; DSAS CICS V3; Subsystem storage protection; Additional administration; DSAS CICS V410 onwards; Improved storage management; DSA limits; DSALIM; EDSALIM; DSA extent sizes; Fragmentation; DSA parameters; Storage fragmentation; DFHSMUTL; Storage fragmentation; CICS PAM examples; Solutions to DSA problems; CICS JVM execution environment; CICS LE/370; CICS LE/370 CEEROPT; CLER transaction.

Loader
Loader domain; Events proceeding SOS; Events when SOS; CICS program compression; New philosophy; Target calculation; Introduction; Compression trace; Virtual Lookaside Facility (VLF); Library LookAside (LLA); Loader statistics.

Network
Network performance; Introduction; Network components; Data flow sequence; HPO; RAPOOL; Statistics; Receivesize/sendsize; IOAREALEN; MSGINTEG; ICV; SIT parameter; Autoinstall; AIQMAX, AIDELAY, AIRDELAY, AIEXIT; Autoinstall statistics; CATA/CATD transactions; Problems with shutdown; Data compression; Unsolicited statistics; XSTOUT; Network review.
MRO/ISC
Introduction; MRO sessions; ISC sessions; System entries; Workload management; Dynamic routing; The dynamic routing program, DFHDYP; Generic resource names; MRO long running mirrors; MROLRM=YES; Mirror priorities; MROBTCH.

TCP/IP services
Accessing CICS from the web; 3270 bridge; CWS overview; The listener transaction (CSOL); CWXN - web attach processing; Alias transaction; Performance study; CWS RDO; CWS Secure Sockets Layer; SSL enablement; SSL SIT parameters; Encryption; SSLDELAY; SSLTCBS; FULL SSL handshake; DOCTEMPLATE.

VSAM
File structures; KSDS; ESDS; RRDS; Alternate Index; VRRDS; LDS; VSAM basics; Control Area; VSAM myths and legends; Obsolete parameters; IMBED/REPLICATE are obsolete; Keyranges not supported; VSAM KSDS; FREESPACE; CI lock; Disk space utilization; VSAM LISTCAT; Important LISTCAT fields; Premature Control Area splits; N.S.R.; Default buffering; Eliminating index I/O; Additional data buffers; Local shared resources; Data tables; CICS maintained; User maintained; Shared data tables; Performance benefits; VSAM RLS; RLSACCESS (NO|YES); Coupling Facility Data TAbles (CFDTs).

MVS Logger
Introduction; CICS/ESA V4.1; Known problems with CICS/ESA; CICS SIT parameters; CICS V4 AKPFREQ considerations; Log manager concepts; Coupling facility; Primary storage; DASD-only logging; Secondary storage; Offload process; For all log streams; For the CICS system log only; Statistics available; CICS/TS activity keypointing; Journal models; Coupling facility example; DASD model example; Logger statistics; SMF 88 record fields.

Transient data
Introduction; Extra partition; Intrapartition queues; Recovery serialization; Sample statistics; Buffers and strings.

Temporary storage
Introduction; Temporary storge; Main vs aux
CICS DB2 interface
Resource Control Table (RCT); CICS / DB2 connection; Defining DB2 connections with CEDA; CICS/TS TCB allocation; Defining DB2 entries with CEDA; CICS/TS 2.2; Example TRACE FORCEQR=YES; Example Trace Program
Concurrency(THREADSAFE); Performance; OTE exploitation; THREADSAFE code; THREADSAFE CICS commands; CICS API & SPI; Load module summary report; Detail report; Example DFHEISUP; Summary; Detail; Accounting pre CICS/TS 2.2; Accounting CICS/TS 2.2; DB2CONN; TCBLIMIT; Wait types; CICS/TS 2.3 migration; Statistics.

CICS DBCTL
Local DL/1; Old DL/1 interface; DBCTL; Database resource adapter; DBCTL TCB support; DBCTL virtual storage planning; Statistics.