CA IDMS currency:
an overview for
database applications

Cal Domingue, Principal Support Engineer
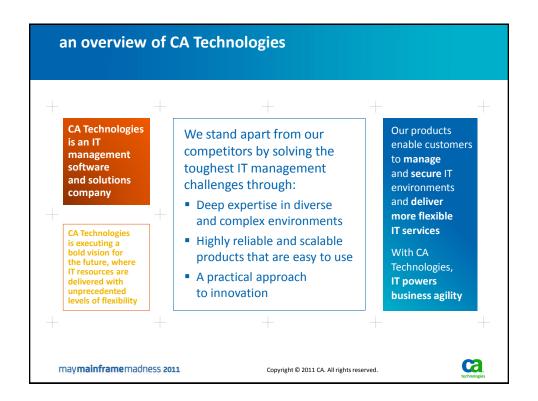May 2011

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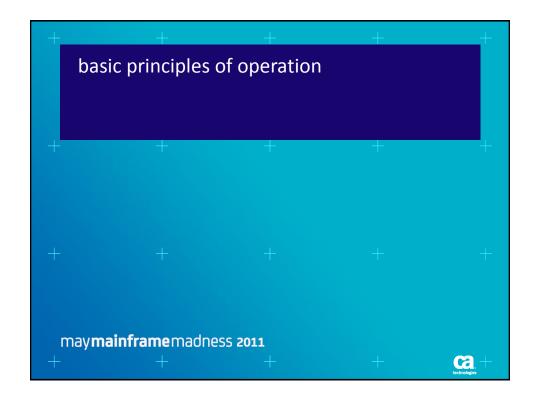technologies

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abstract

In this presentation, Principal Support Engineer Cal Domingue
takes us through an overview of CA IDMS currency. Currency
is a central critical concept in CA IDMS database applications
and operations for storing, managing and navigating your
database as well as maintaining integrity and avoiding
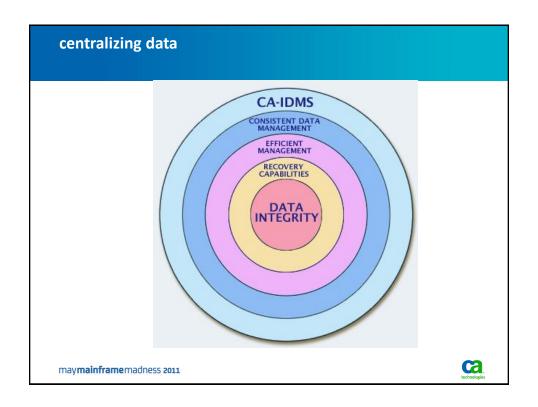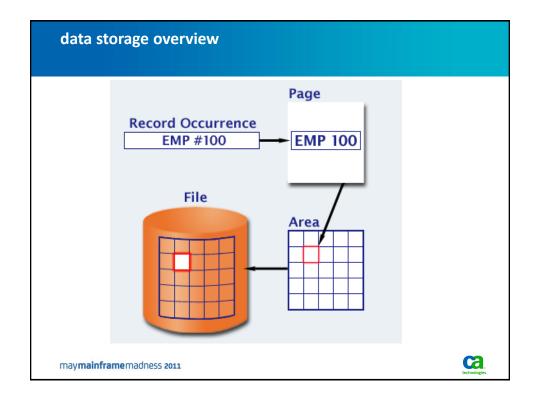deadlocks.

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technologies

an overview of CA Technologies

CA Technologies is an IT management software and solutions company

CA Technologies is executing a bold vision for the future, where IT resources are delivered with unprecedented levels of flexibility

We stand apart from our competitors by solving the toughest IT management challenges through:

- Deep expertise in diverse and complex environments
- Highly reliable and scalable products that are easy to use
- A practical approach to innovation

Our products enable customers to **manage** and **secure** IT environments and **deliver more flexible IT services**

With CA Technologies, **IT powers business agility**

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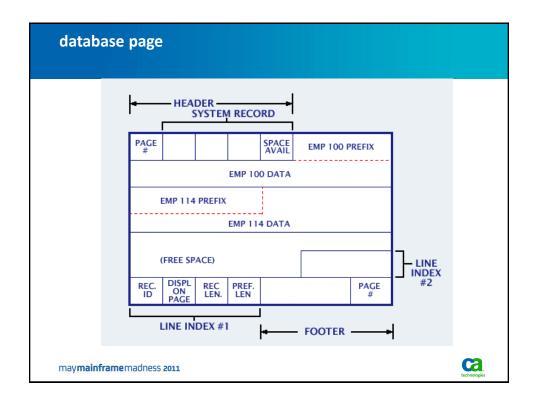# basic principles of operation

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centralizing data

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data storage overview
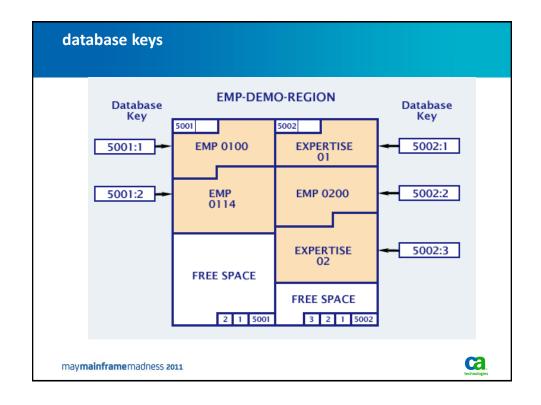
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database page

database page diagram showing HEADER, SYSTEM RECORD, PAGE #, SPACE AVAIL, EMP 100 PREFIX, EMP 100 DATA, EMP 114 PREFIX, EMP 114 DATA, (FREE SPACE), LINE INDEX #2, REC. ID, DISPL ON PAGE, REC LEN., PREF. LEN, PAGE #, LINE INDEX #1, FOOTER

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database keys

database keys diagram showing EMP-DEMO-REGION with Database Key 5001:1, 5001:2 and 5002:1, 5002:2, 5002:3; EMP 0100, EXPERTISE 01, EMP 0114, EMP 0200, EXPERTISE 02, FREE SPACE

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currency specifics

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types of currency

— Current of run unit

— Current of record type

— Current of set

— Current of area

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currency categories

```
RUN UNIT              1002:3

RECORD
     EMPLOYEE         1002:1
     DEPARTMENT       4001:4
     EXPERTISE        1002:3
          ....
SET
     DEPT-EMPLOYEE
          CURRENT     1002:1
          NEXT        1000:1
          PRIOR       1040:1
          OWNER       4001:4
     EMP-EXPERTISE
          CURRENT     1002:3
          NEXT        1002:5
          PRIOR       1002:1
          OWNER       1002:1
          ....
AREA
     EMP-DEMO-REGION  1002:3
     ORG-DEMO-REGION  4001:4
          .
          .
          .
```
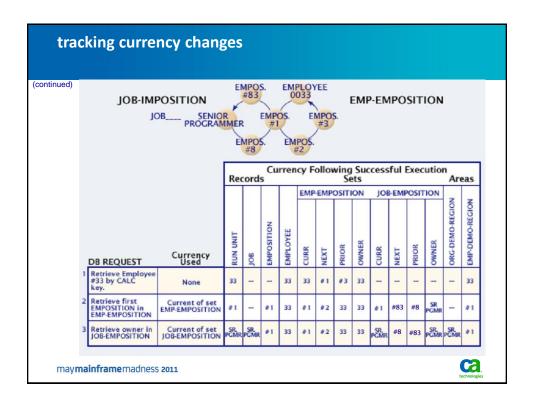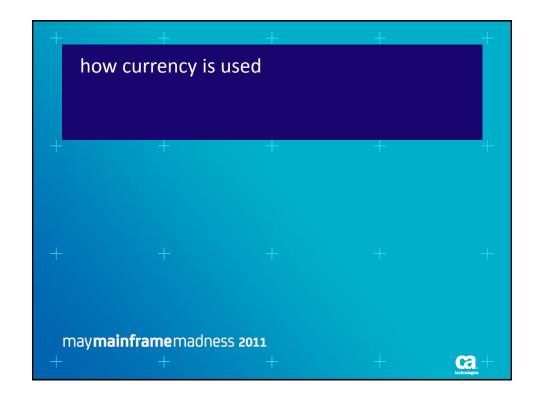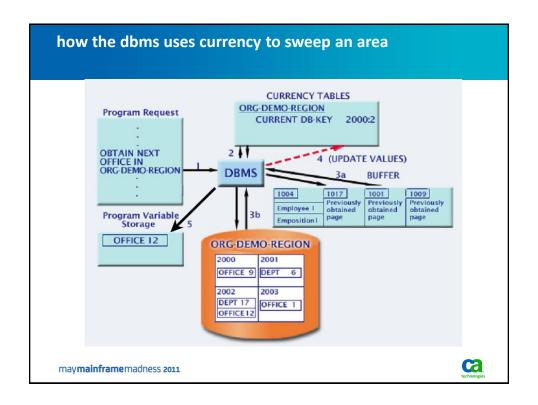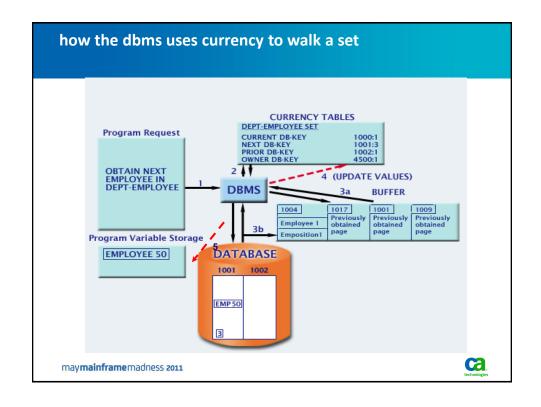
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tracking currency changes

JOB-TITLE-NDX
I OA
ASC JOB-TITLE-0440 DN

JOB			
440	FC	296	CALC
JOB-ID-0440			DN
ORG-DEMO-REGION			

JOB-EMPOSITION
NPO OM NEXT

EMPOSTION			
440	FC	28	VIA
EMP-EMPOSITION			
EMP-DEMO-REGION			

EMP-EMPOSITION
NPO MA FIRST

EMPLOYEE			
440	FC	118	CALC
EMP-ID-0415			DN
EMP-DEMO-REGION			

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tracking currency changes

how currency is used

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how the dbms uses currency to sweep an area

how the dbms uses currency to walk a set

common errors involving currency

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challenges

— Deadlocking

— Programs
  – Inefficient code
  – inaccurate code

— Database integrity problems
  – Procedural problem in manual recovery
  – Require manual analysis to correct
    ▪ IDMSDBAN to analyze status; PAGE FIX to correct
    ▪ Restore database and ROLLFORWARD / ROLLBACK
  – DB/Audit to detect & correct

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programming techniques to consider

— Manage Deadlocks
  – Within program, check for minor code 29
  – Re-bind run-unit
  – Re-establish currency
  – Resume program code

— "ACCEPT … dbkey into …. "   then "OBTAIN ..using DBKEY
  – Sometimes overused,
  – Use manual currency restore only when required
  – Unnecessary if the system currencies are already established
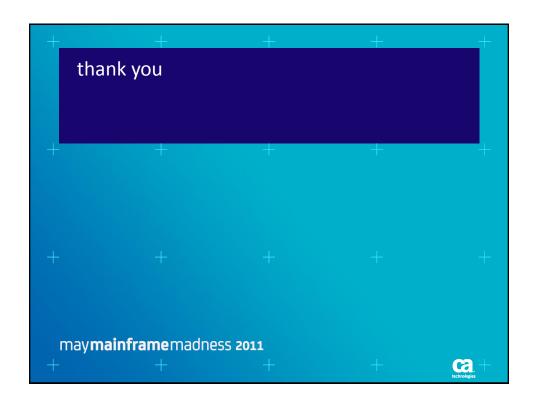 – Appropriate when Area Sweep will be interrupted then resumed

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programming techniques to consider

— Area sweep of an optional manual set members
  – Retrieving owner gets no error even if member not in set
  – Ensure record participates in set before getting owner
  – Use "IF <set-name> MEMBER"

— Use option RETRIEVAL NOLOCK or TRANSIENT RETRIEVAL
  – Avoids deadlocks and waits
  – Retrieval-only run-units
  – Where "dirty reads" are OK, reading uncommitted data
  – Use only when it's OK that data details may not be accurate, for trends etc.

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thank you

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how DML verbs use and update currency

DML verb	Currency used in command Execution Run unit	Record	Set	Area	Page Group	Currency updated by Succesfull execution
ACCEPT	X	X	X	X		NONE
IF	X		X			NONE
FIND OBTAIN DB-KEY					X [8]	ALL
FIND OBTAIN CURRENT	X	X	X	X		ALL
FIND OBTAIN WITHIN SET			X [2]			ALL
FIND OBTAIN WITHIN AREA				X [3]		ALL
FIND OBTAIN OWNER			X			ALL
FIND OBTAIN CALC						ALL
FIND OBTAIN DUPLICATE		X				ALL
FIND OBTAIN USING SORT KEY			X [4]			ALL
OBTAIN	X					NONE
RETURN			X [5]			SET

continued

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how DML verbs use and update currency

(continued)

continued DML verb	Currency used in command					Currency updated by Succesfull execution
	Execution Run unit	Record	Set	Area	Page Group	
STORE			X[6]			ALL
MODIFY	X					NONE +
ERASE	X[7]					Nullifies currencies of all record types and sets involved
CONNECT		X	X			Run unit, set
DISCONNECT		X[7]				Nullifies currency of object set; updates current of run unit and area
KEEP[1]	X	X	X	X		NONE
COMMIT						NONE
COMMIT ALL						Nullifies all currencies
ROLL BACK						Nullifies all currencies
ROLL BACK CONTINUE						Nullifies all currencies
FINISH						Nullifies all currencies

continued

how DML verbs use and update currency

(continued)

continued DML verb	Currency used in command					Currency updated by Succesfull execution
	Execution Run unit	Record	Set	Area	Page Group	
[1] Uses only one currency as determined by command format.						
[2] Currency not required if using FIRST, Nth, or LAST format to access a system-owned index						
[3] Required for NEXT and PRIOR formats only						
[4] Currency not required if accessing a system-owned index						
[5] Currency not required if using FIRST, LAST, or USING sort-key format						
[6] All in which record type participates as an automatic number						
[7] Currency set is nullified, but NPO of set are unchanged						
[8] Only used when MIXED PAGE GROUP is activated for the DBNAME and no record name is specified						
+ Except in the case of a sorted set						