

# CA IDMS currency: an overview for database applications

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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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## 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**

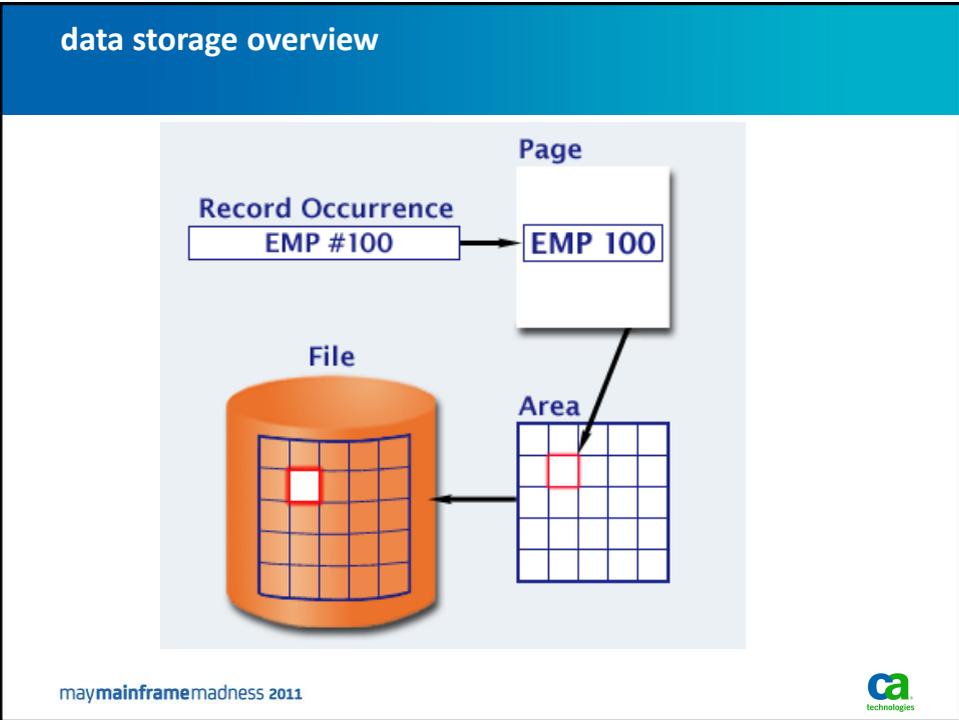
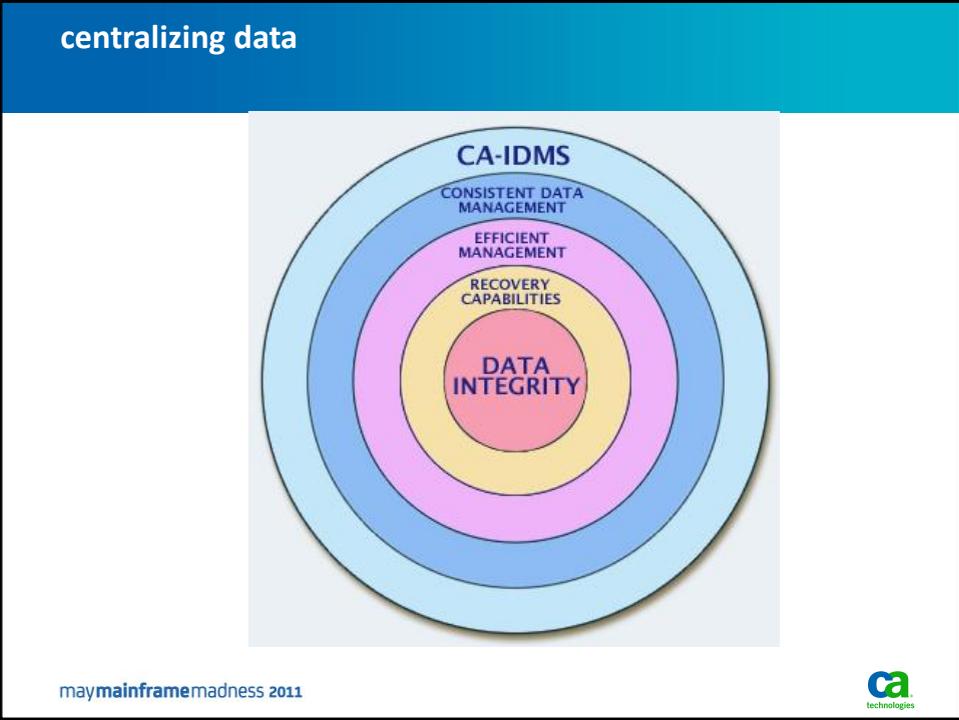
With CA Technologies, **IT powers business agility**

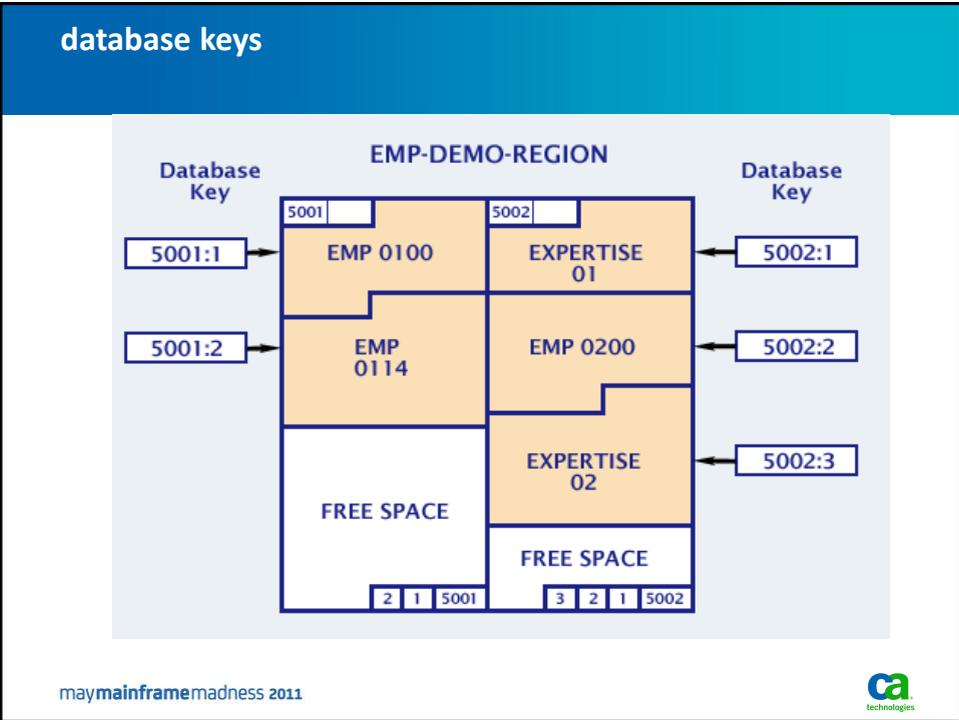
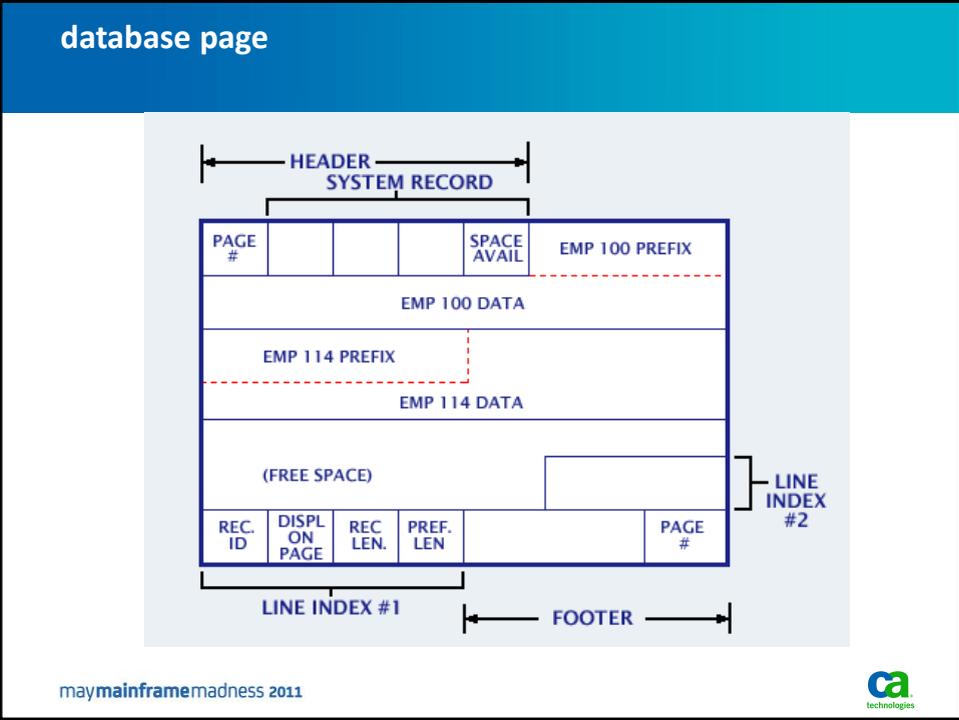
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# basic principles of operation

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## 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

```

graph TD
    JOB[JOB] -- "JOB-EMPOSITION  
NPO OM NEXT" --> EMPPOSITION[EMPPOSITION]
    EMPLOYEE[EMPLOYEE] -- "EMP-EMPOSITION  
NPO MA FIRST" --> EMPPOSITION
    
```

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

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

**EMPPOSITION**  
 EMP-EMPOSITION  
 EMP-DEMO-REGION

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

**EMPLOYEE**  
 EMP-ID-0415  
 EMP-DEMO-REGION

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

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### tracking currency changes

(continued)

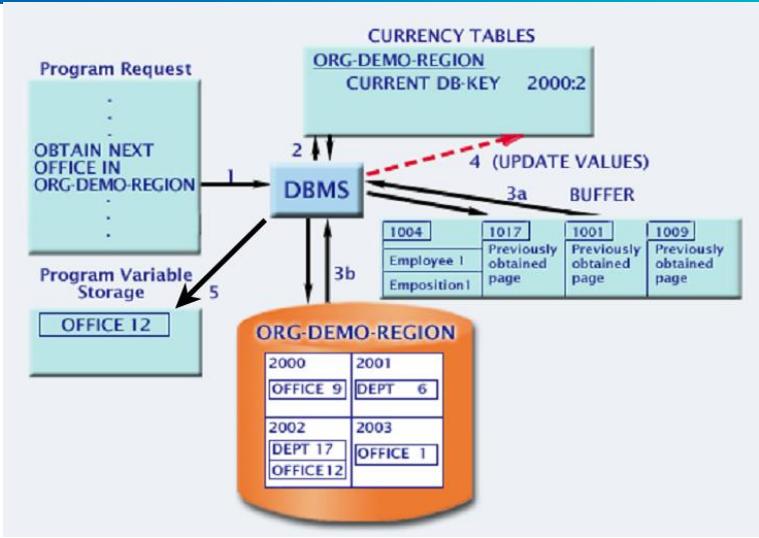
DB REQUEST	Currency Used	Currency Following Successful Execution													
		Records				Sets								Areas	
		RUN UNIT	JOB	EMPOSITION	EMPLOYEE	EMP-EMPOSITION				JOB-EMPOSITION				ORG-DEMO-REGION	EMP-DEMO-REGION
				CURR	NEXT	PRIOR	OWNER	CURR	NEXT	PRIOR	OWNER				
1 Retrieve Employee #33 by CALC key.	None	33	—	—	33	33	#1	#3	33	—	—	—	—	—	33
2 Retrieve first EMPOSITION in EMP-EMPOSITION	Current of set EMP-EMPOSITION	#1	—	#1	33	#1	#2	33	33	#1	#83	#8	SR PGMR	—	#1
3 Retrieve owner in JOB-EMPOSITION	Current of set JOB-EMPOSITION	SR PGMR	SR PGMR	#1	33	#1	#2	33	33	SR PGMR	#8	#83	SR PGMR	SR PGMR	#1

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## how currency is used

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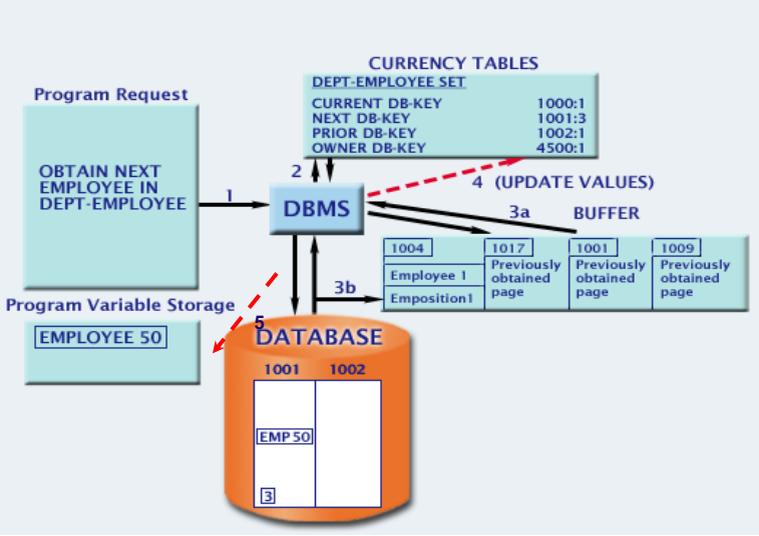
## how the dbms uses currency to sweep an area



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## how the dbms uses currency to walk a set



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## 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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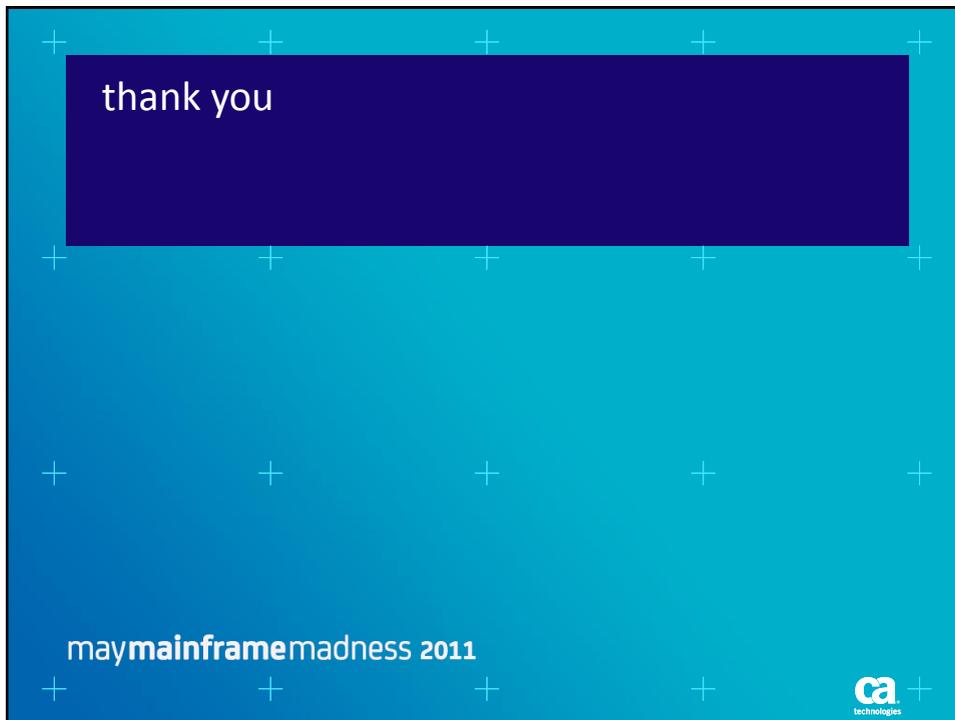


## programming techniques to consider

- 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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reference slides

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### how DML verbs use and update currency

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

*continued*

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## how DML verbs use and update currency

(continued)

DML verb	Currency used in command Execution				Page Group	Currency updated by Successful execution
	Run unit	Record	Set	Area		
STORE			X <sup>6</sup>			ALL
MODIFY	X					NONE <sup>+</sup>
ERASE	X <sup>7</sup>					Nullifies currencies of all record types and sets involved
CONNECT		X		X		Run unit, set
DISCONNECT		X <sup>7</sup>				Nullifies currency of object set; updates current of run unit and area
KEEP <sup>1</sup>	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

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## how DML verbs use and update currency

(continued)

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

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