E16

Using ETO with Shared Queues and VGR

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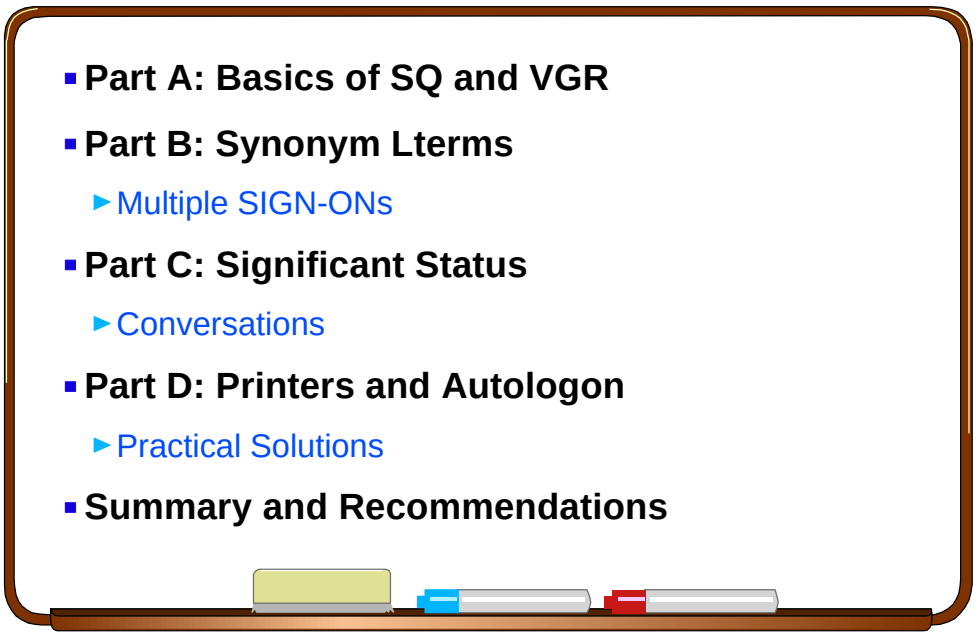
Part E16

Using ETO with Shared Queues and VGR

ETO was initially designed to provide dynamic terminal support for a single IMS system. WIth IMS Version 6, it is now possible to use ETO with multiple IMS systems, working in a parallel sysplex, to provide a single IMS transaction processing entity. This presentation considers the issues arising when using ETO within an IMS sysplex with Shared Queues and VTAM Generic Resources, and offers advice for achieving a successful ETO implementation in these environments.

Agenda

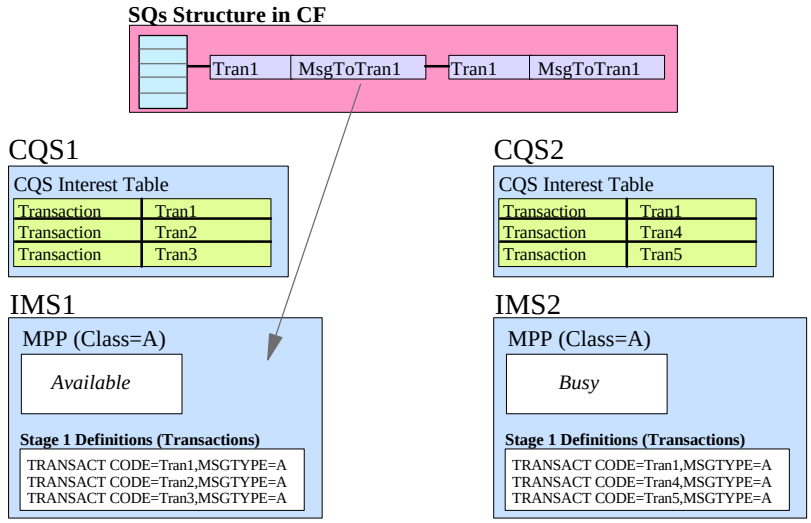


Part A

- The Basics of
  - Shared Queues
  - VTAM Generic Resources

Interest Registration

- IMS Systems register interest in the CF for
  - Transactions ...



.... and .....

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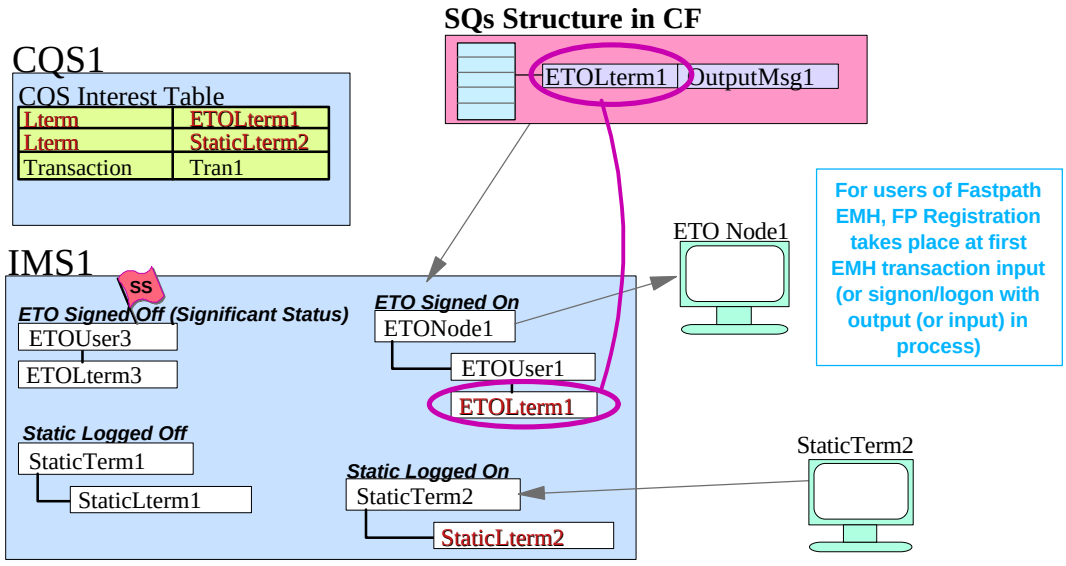
Interest Registration (cont.)

- Terminals = LTERMs



For users of Fastpath EMH, FP Registration takes place at first EMH transaction input (or signon/logon with output (or input) in process)

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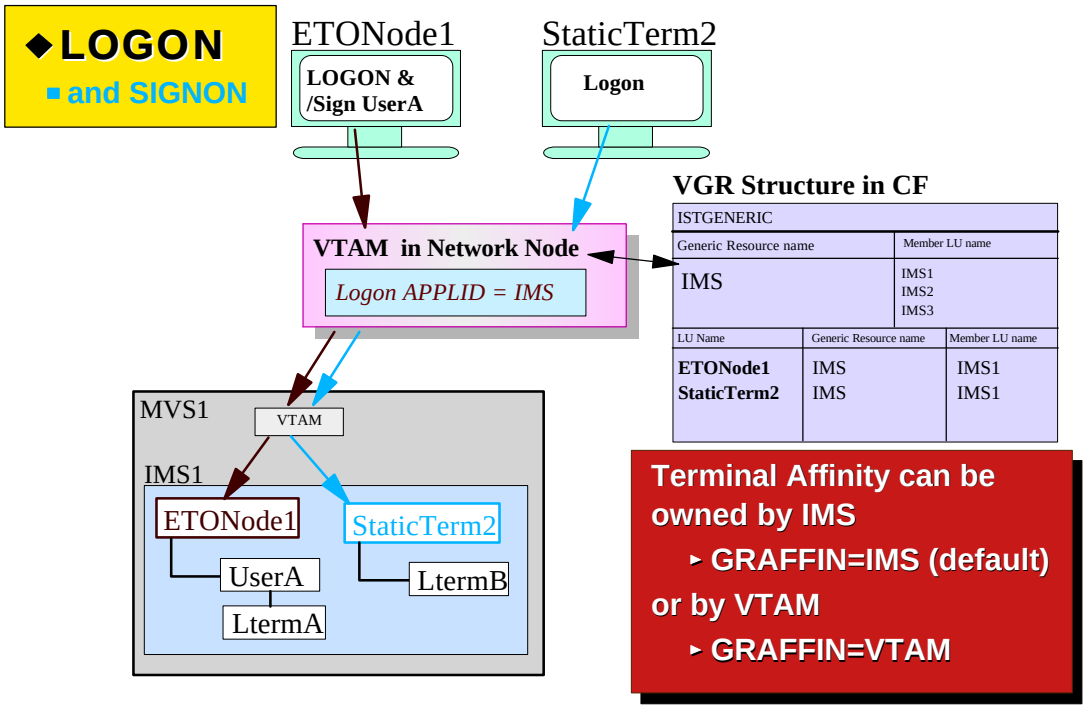
VTAM Generic Resources

- **LOGON**
  - and SIGNON

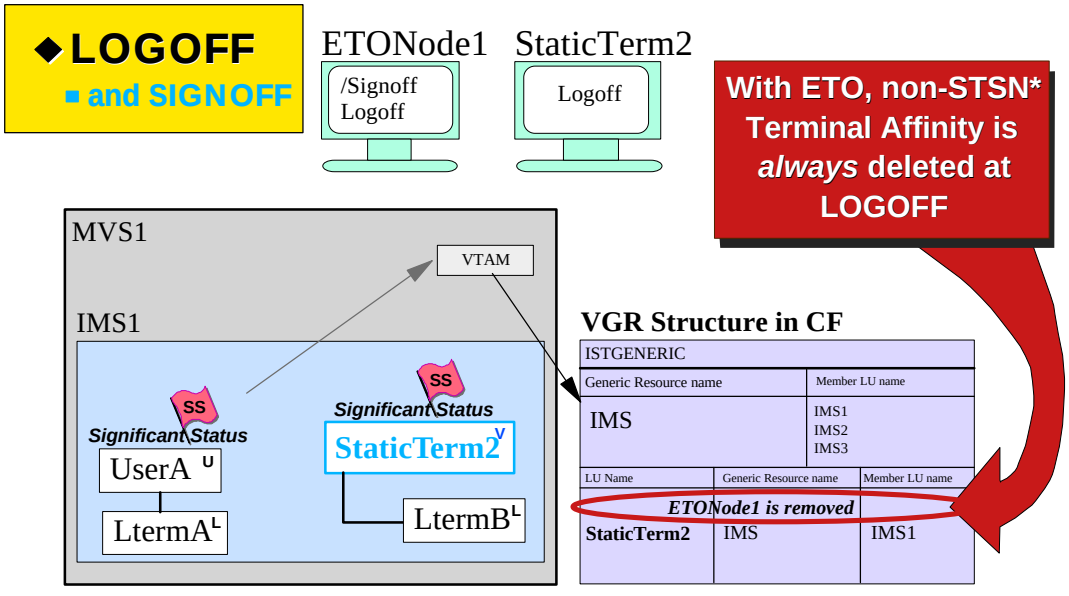


Terminal Affinity can be owned by IMS
- ▸ GRAFFIN=IMS (default)

or by VTAM
- ▸ GRAFFIN=VTAM

VTAM Generic Resources (cont.)

- **LOGOFF**
  - and SIGNOFF



With ETO, non-STSN* Terminal Affinity is *always* deleted at LOGOFF

* STSN (set & test sequence number) terminals include SLUP, FINANCE, ISC

Part B

- Synonym LTERMs
  - Multiple Sign-ons with same Userid

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Synonym LTERMs

- In a single IMS system, each LTERM has a unique name
- But in an IMSplex, the same LTERM name can exist ***and be active*** in multiple systems

  ➡ **Synonym LTERMs**

  For example -
  - ETO user logs and signs on multiple times with same userid
    - ➡ each logon is to a different IMS system
  - Applications in multiple systems issue CHNG call to same LTERM with AUTOLOGON
- One particular potential cause is the use of a Session Manager
- Synonym LTERMs can be a good thing if used for printers, but are otherwise a problem to be avoided

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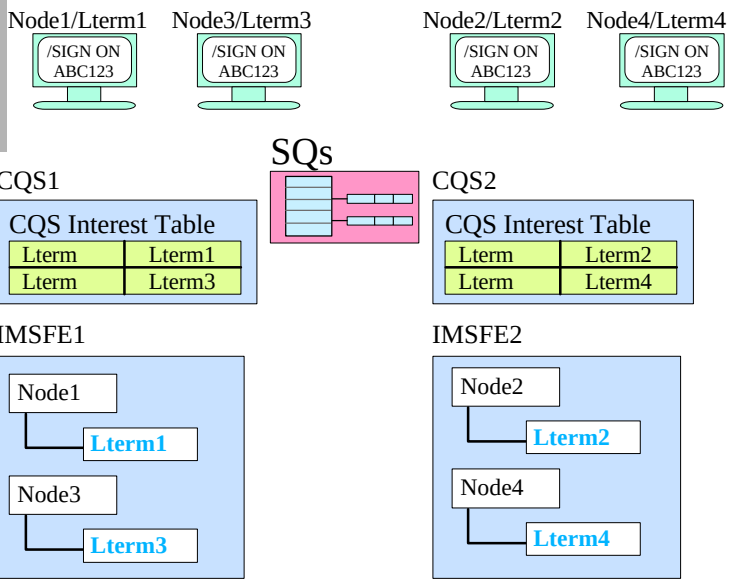
Multiple SIGN-ONs with Same USERID

Static Terminals



No problems, assuming sensible use of cloned systems

- since a node (and its LTERM) can only be logged on to a single system at any point in time

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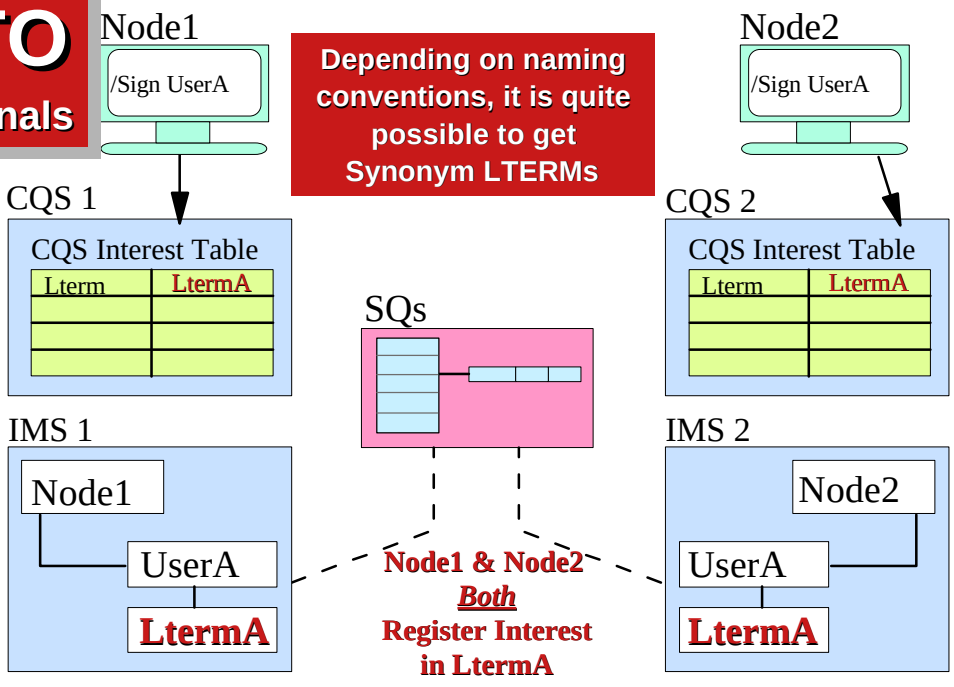
Multiple ETO SIGN-ONs with Same Userid

ETO terminals

Depending on naming conventions, it is quite possible to get Synonym LTERMs



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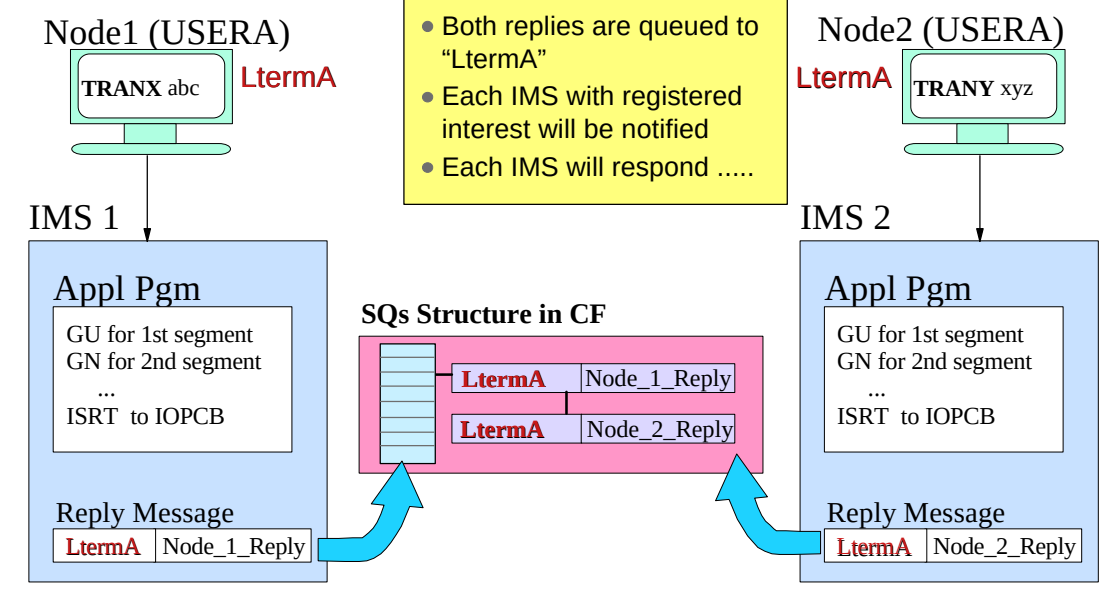
ETO Multiple SIGN-ONs (cont.)

◆ **Each system processes a transaction from "LTERM A"**

- Both replies are queued to "LtermA"
- Each IMS with registered interest will be notified
- Each IMS will respond .....



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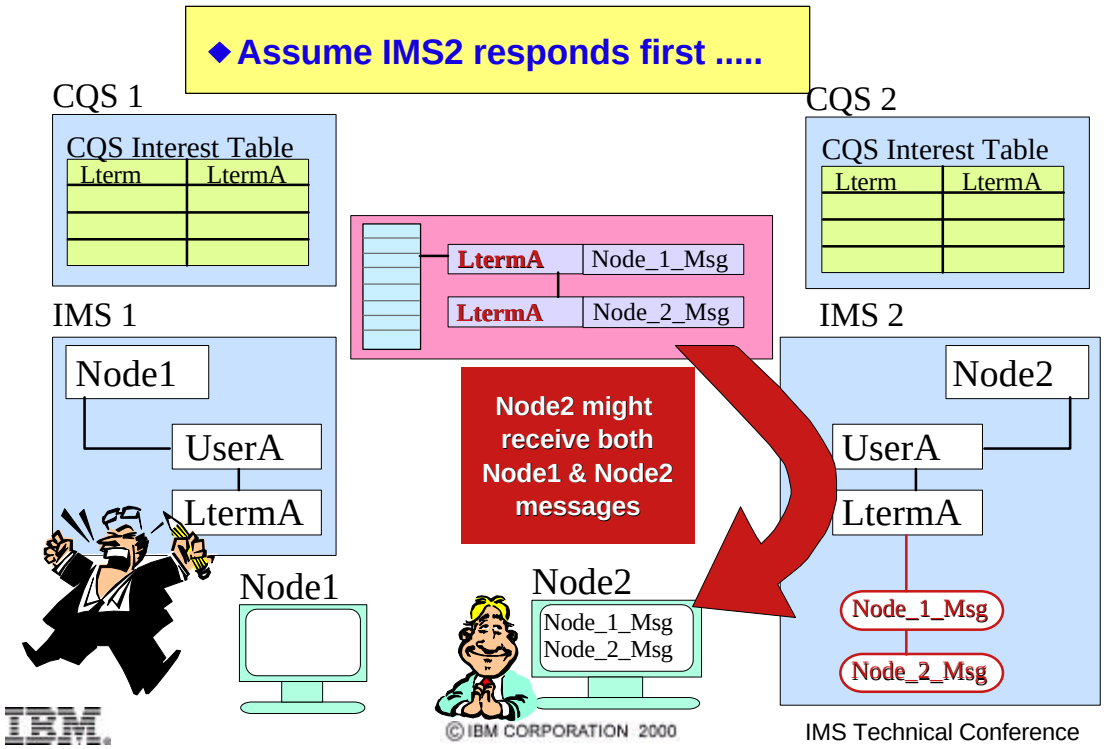
ETO Multiple SIGN-ONs (cont.)

◆ **Assume IMS2 responds first .....**



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Solutions Overview

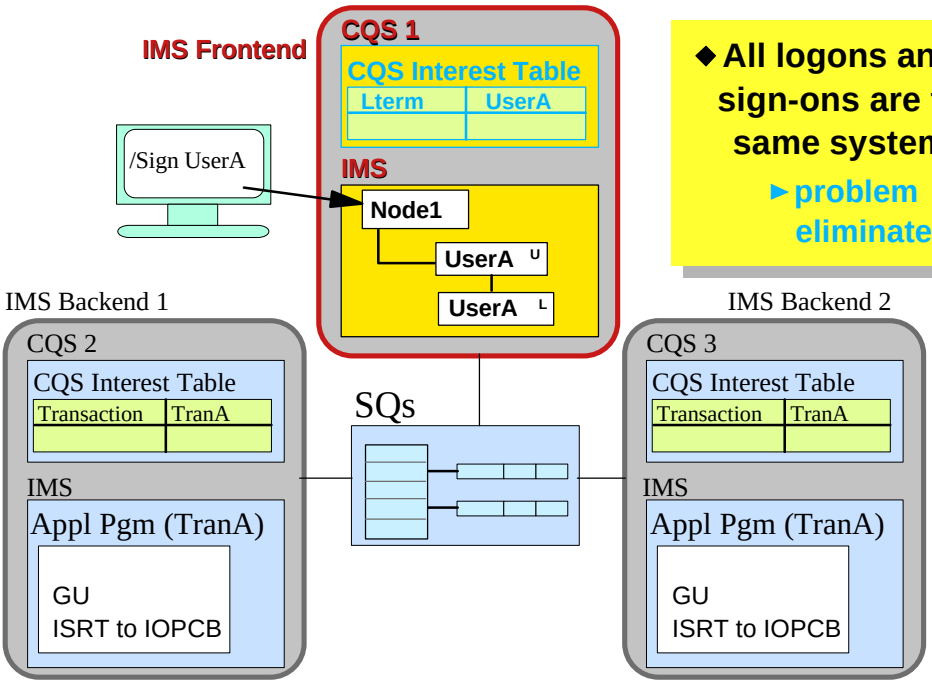
Avoiding Problems with Synonym LTERMs

- The end users can take responsibility for not signing on multiple times
  - ➡ or else suffer the consequences
- Alternatively, there are system solutions

System Solutions

1. Single Frontend IMS
2. Compatibility Mode
3. Smart ETO SIGNON Exit

Solution 1. Single Frontend IMS

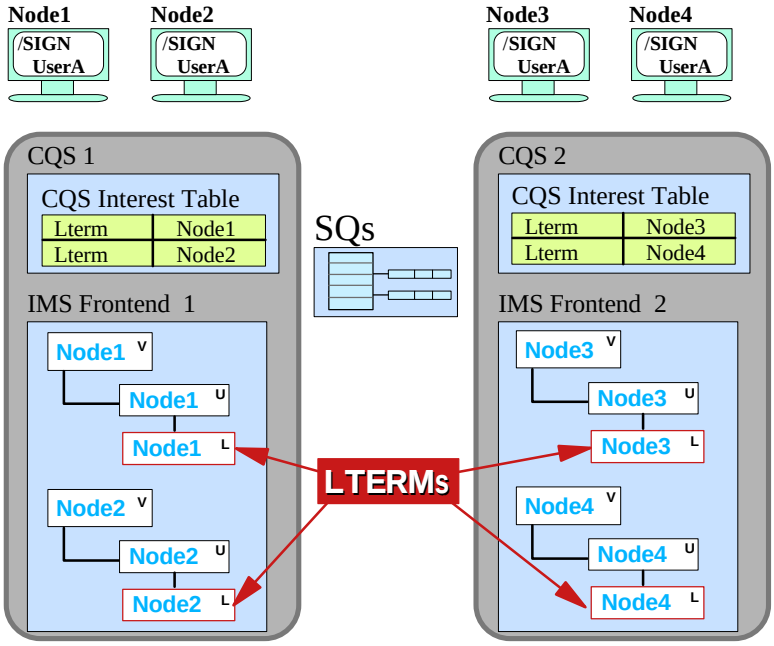


- ◆ All logons and sign-ons are to same system
  - ► problem eliminated

Solution 2. ETO Compatibility* Mode

- Nodenames are always unique
- And so LTERM names will also be unique

*Compatibility Mode is where LTERMname = USERname = NODEname. This is normally set by using the SIGNON Exit.



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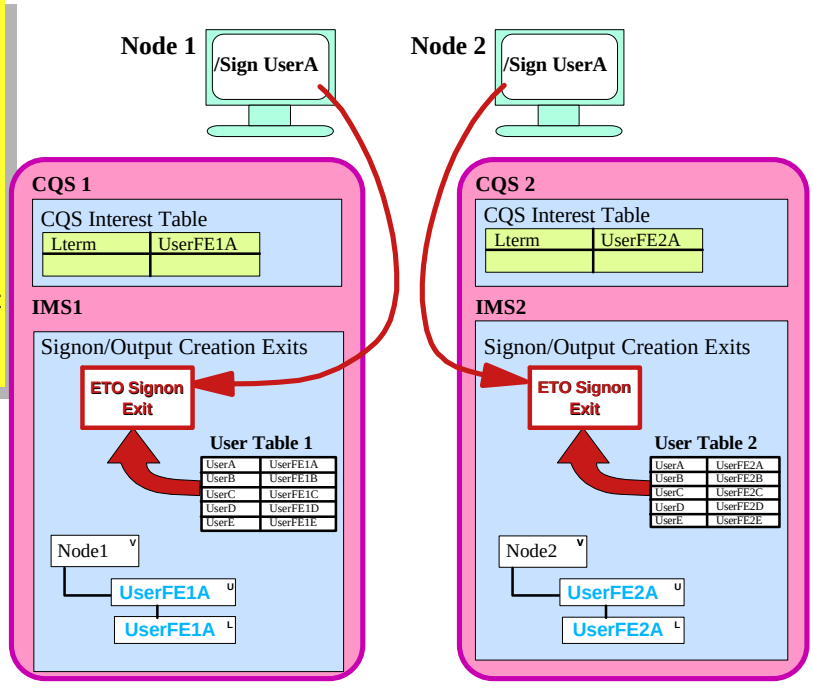
Solution 3. Smart ETO Sign-on Exit

- UserA signs-on twice
- ETO Sign-on Exit sets unique USER/LTERM names
  - referencing system-dependent user table
  - using sysid



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Part C

Significant Status with ETO

- Reminder of Basics
- "Messages on Queue" at Sign-On
- Conversations

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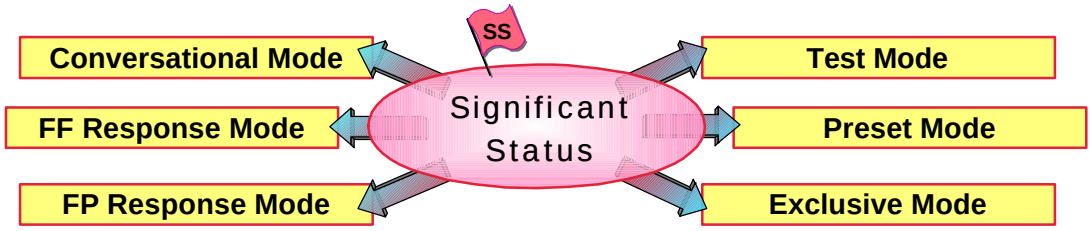
Reminder of the Basics



- With ETO and SQ
  - Messages waiting on LTERM Queue at SIGNOFF do not represent significant status (User Structure can be deleted)
- With ETO and VGR (for Non-STSN terminals)
  - Significant Status is transferred to USER at SIGN OFF
    - but may be deleted if using GRAFFIN=VTAM
  - Terminal Affinity always deleted for ETO at LOGOFF
    - (For static terminals with, GRAFFIN option determines action)

Fundamental Problem

- VGR maintains TERMINAL Affinity
- ETO maintains USER "Affinity"
  - ie. significant status

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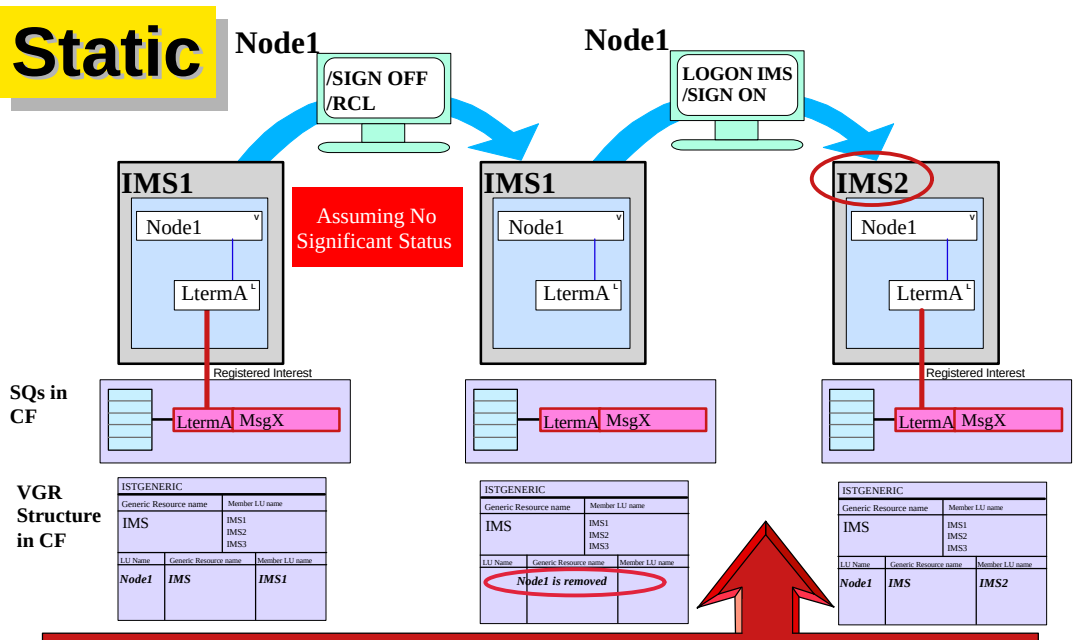
Static Terminal Logoff with Messages on SQ



User can Logon/Signon at *same terminal* to *any* cloned IMS system (assuming no VTAM Affinity) and receive waiting messages

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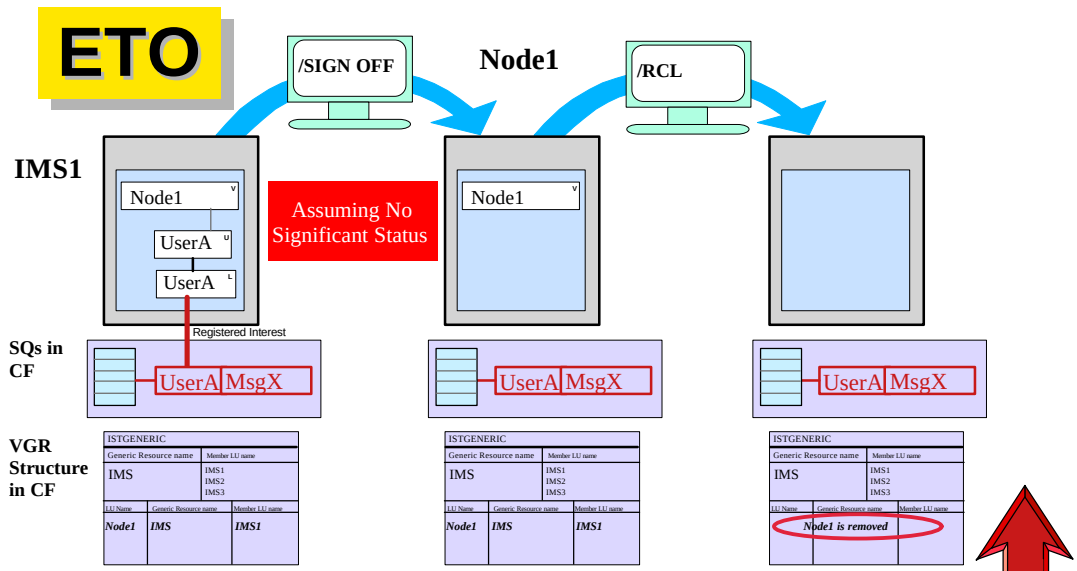
ETO Sign-Off with Messages on SQ



Any User who Logs on and Signs on to *any* IMS system <u>and</u> builds LTERMname="UserA", will receive waiting messages

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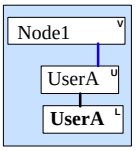
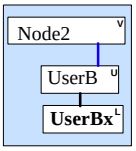
ETO Sign-On with Messages on SQ

- When LTERM name derived from USERID alone
  - User can get messages from previous session
  - But there is danger of getting Synonym Lterms
    - Users must be responsible for not doing multiple sign-ons

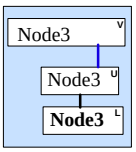


- When LTERM name derived from USERID and System Information
  - User can only get messages created on “this system”
  - But avoids Synonym Lterms

IMSx



- When using ETO Compatibility Mode
  - User can always get messages from previous session but **only at same terminal**
    - same as for Static Terminals
    - No danger of Synonym Lterms



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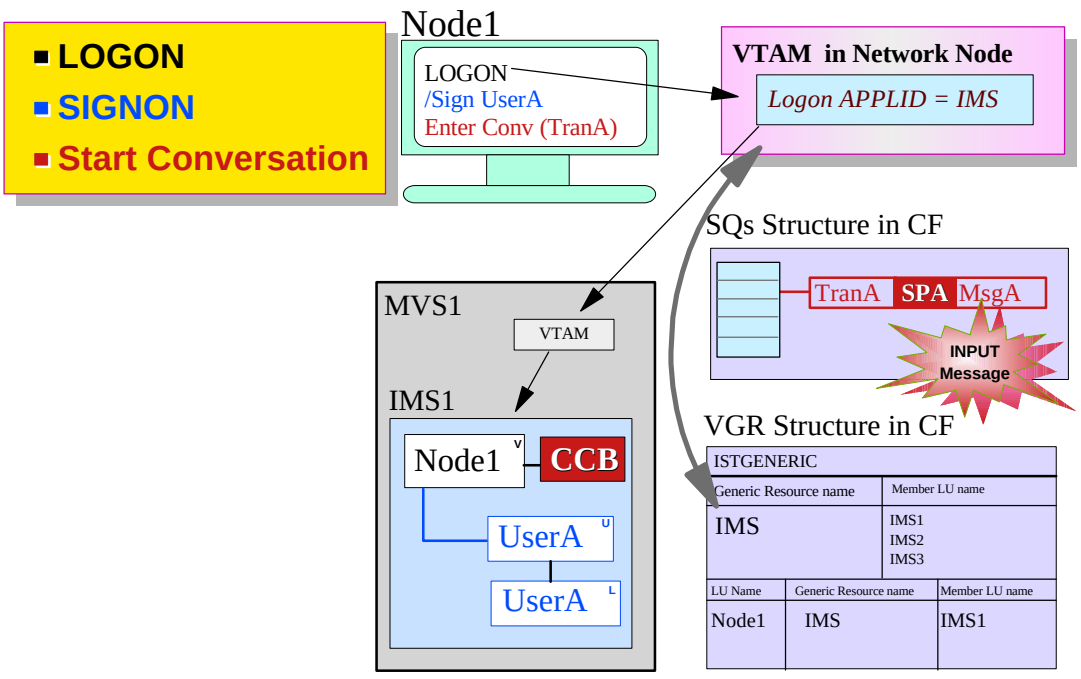
Conversational Mode (1)

- **LOGON**
- **SIGNON**
- **Start Conversation**



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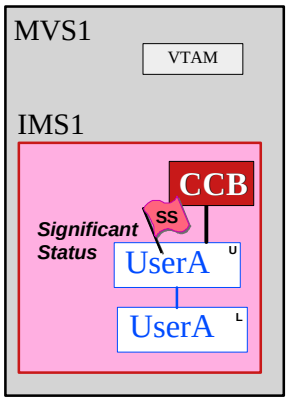
Conversational Mode (2)

- Transaction runs
- Session breaks
  - for example, due to ETO timeout

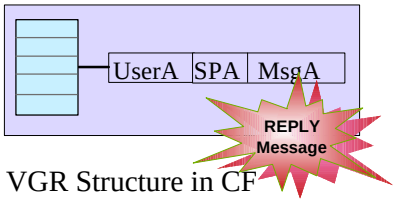
Node1 (non-STSN)
- USER signed off
- Session CLSDSTed

Assumes GRAFFIN=IMS

- User Structure retained with "Conversational Status" (at sign-off)
- For ETO, terminal affinity deleted by IMS (at logoff)



SQs Structure in CF



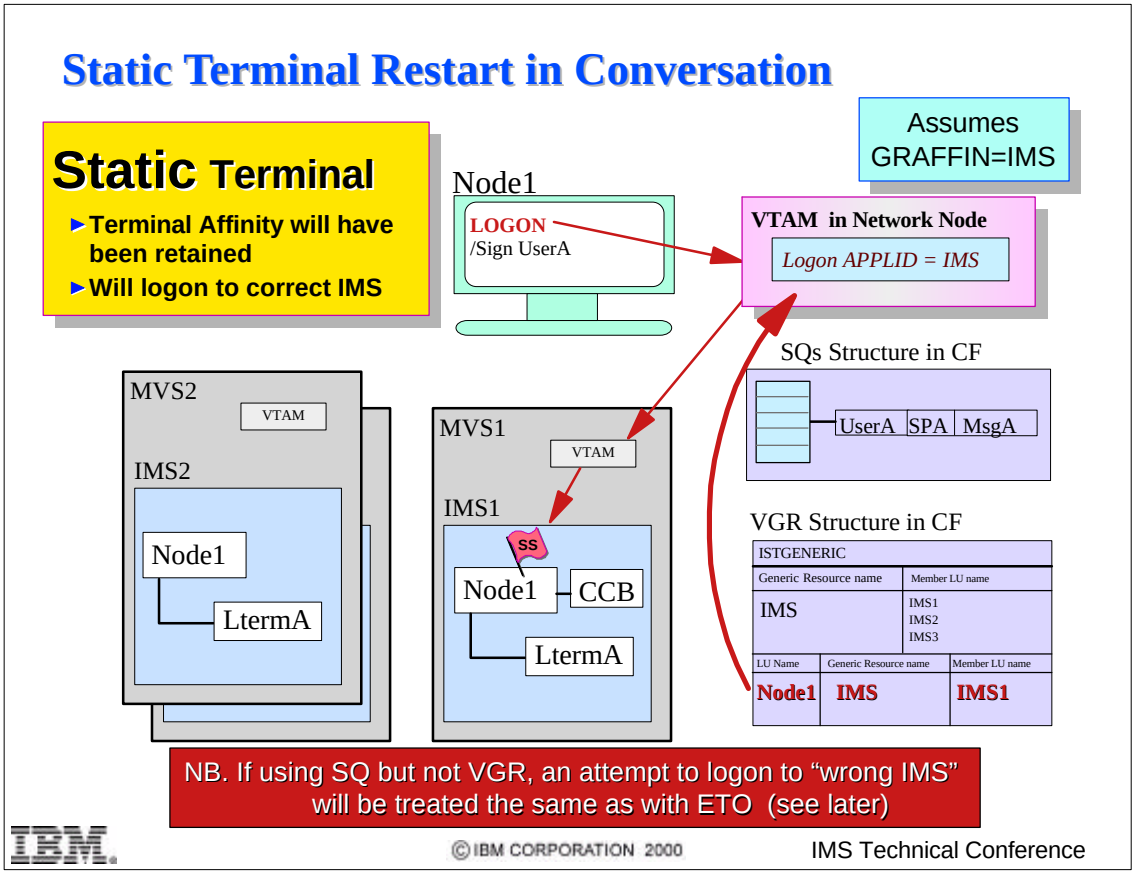
VGR Structure in CF

ISTGENERIC	
Generic Resource name	Member LU name
IMS	IMS1 IMS2 IMS3
LU Name	Generic Resource name / Member LU name
Node1 is removed if ETO	

The Potential Problem

- With VTAM Generic Resources (VGR)
  - if the User has significant status
  - but there is no Terminal Affinity (due to using ETO), then
    - there is the potential for VTAM to reconnect the terminal to a different system from the one that has the "significant status"

Static Terminal Restart in Conversation



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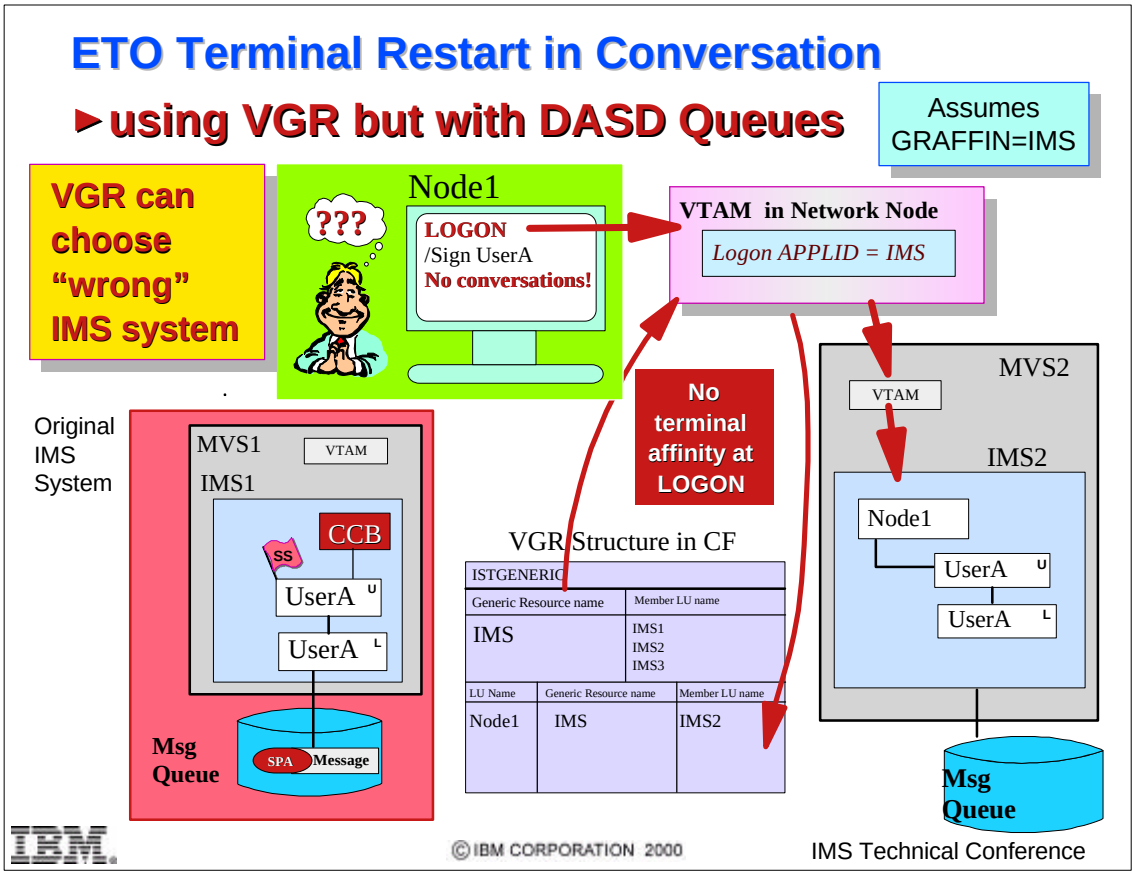
ETO Terminal Restart in Conversation

using VGR but with DASD Queues



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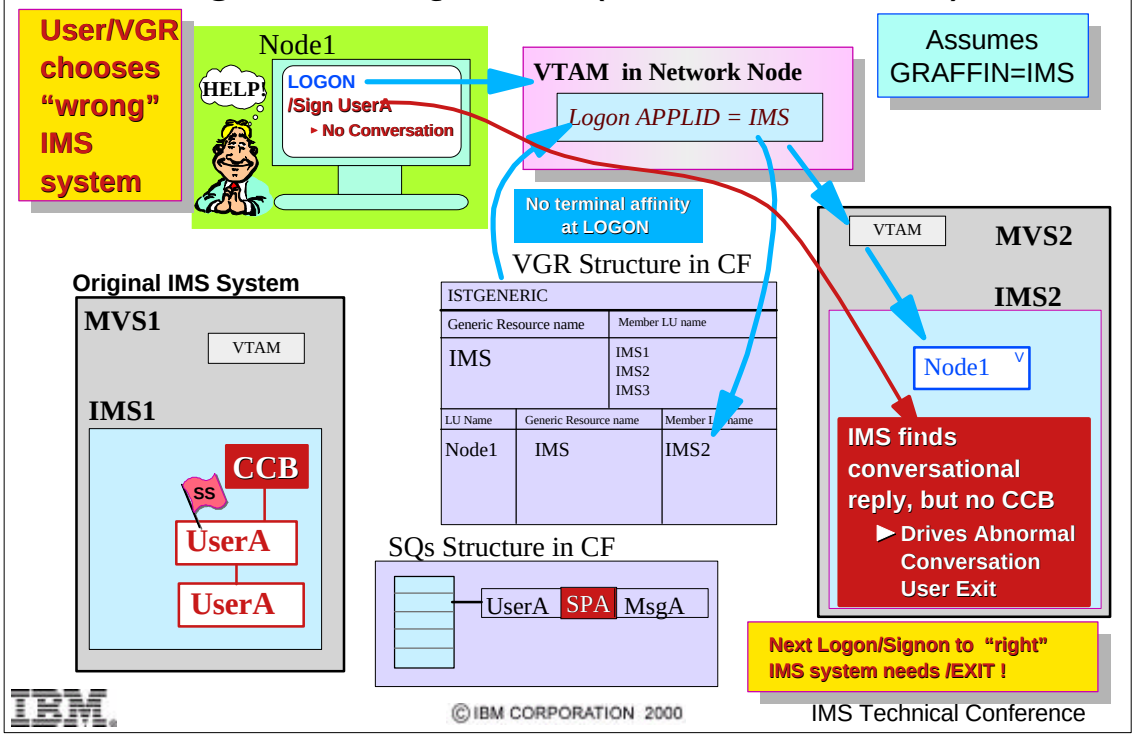
ETO Terminal Restart in Conversation

►Using Shared Queues (with/without VGR)



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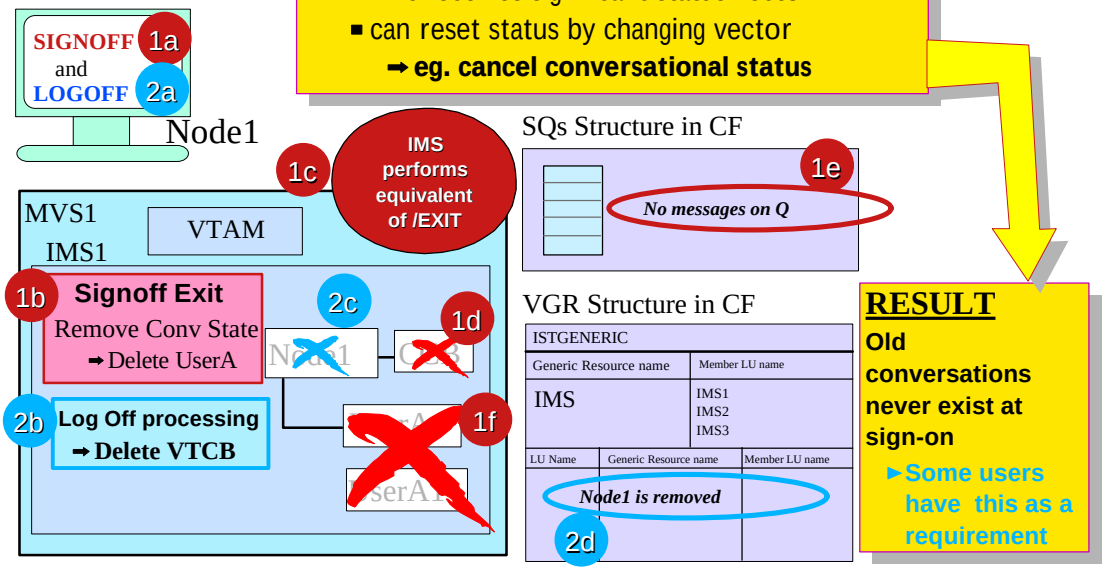
ETO Terminal Restart in Conversation

►the Solution = Delete Significant Status!

Technique 1

Use ETO SignOff Exit
- Exit receives significant status vector
- can reset status by changing vector
  - ➡ **eg. cancel conversational status**



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ETO Terminal Restart in Conversation

►the Solution = Delete Significant Status!

Technique 2

"Generic Resource Affinity" option in DFSDCxxx

GRAFFIN=IMS|VTAM

Introduced by **PQ18590**

USE

GRAFFIN=IMS ➔ **IMS manages the VGR affinities** (the default)

GRAFFIN=VTAM ➔ VTAM manages the generic resource affinities
(except for ISC sessions)

- **VTAM deletes affinity at terminal logoff** (not ISC, but including SLUP/FINANCE)
- **For terminals which logged on using Generic IMS Name,**
  - ►IMS deletes all significant status (before signoff/logoff exits, if appropriate)
  - ►For SLUP/FINANCE terminals, sequence numbers are reset to zero
- **Performed at any Signoff/Logoff (exceptionally, done before logon/signon to a failed and restarted IMS - eg. following a CPU power failure)**

GRAFFIN=VTAM enables a non-ISC terminal using VGR to immediately logon after a session or IMS failure

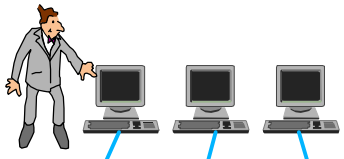
NB. GRAFFIN option is system-wide for all non-ISC terminals using VGR

Part D

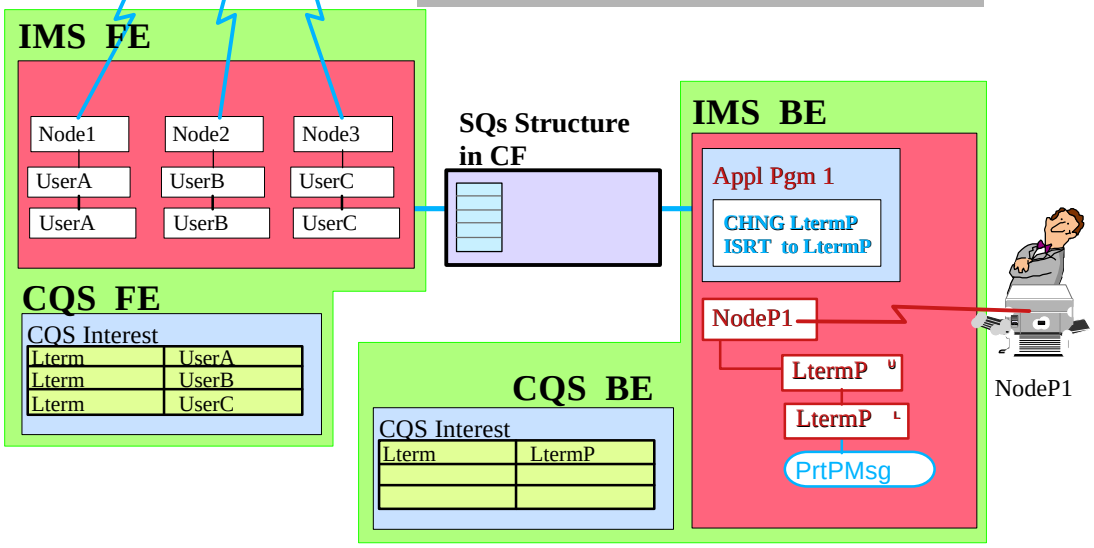
AUTOLOGON

- ►Autologon applies to any terminal type
  - – but most often used for printers
- ►This section considers printer autologon
  - – in a FE/BE implementation
  - – in a single IMS system (reminder)
  - – in an multiple IMS environment
    - potential problem of excessive printer logons
    - solutions

Autologon in FE/BE Implementation



IMS FE is intended to own all Nodes
- ►but autologon Nodes will be on IMS BE



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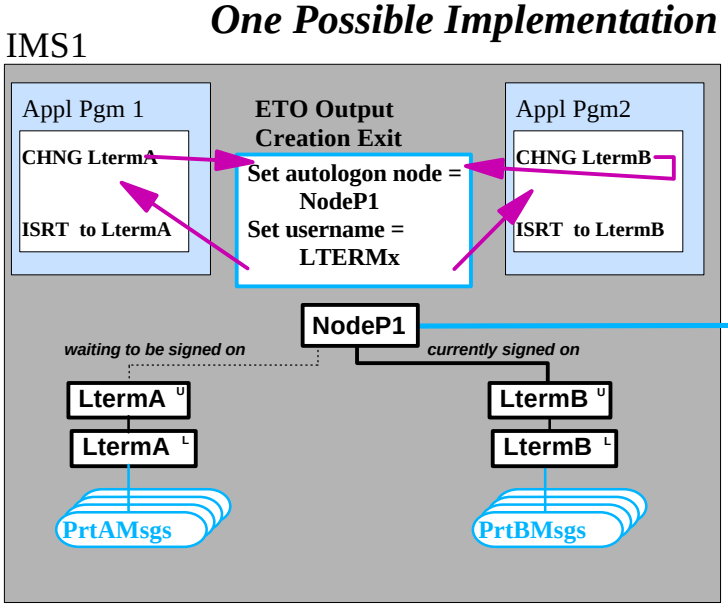
Autologon with a Single IMS (Reminder)

One Possible Implementation



- **Lterms A and B are both associated with NodeP1**
- **When Queue for LtermB is empty, IMS will**
  - ►signoff LtermB and
  - ►signon LtermA

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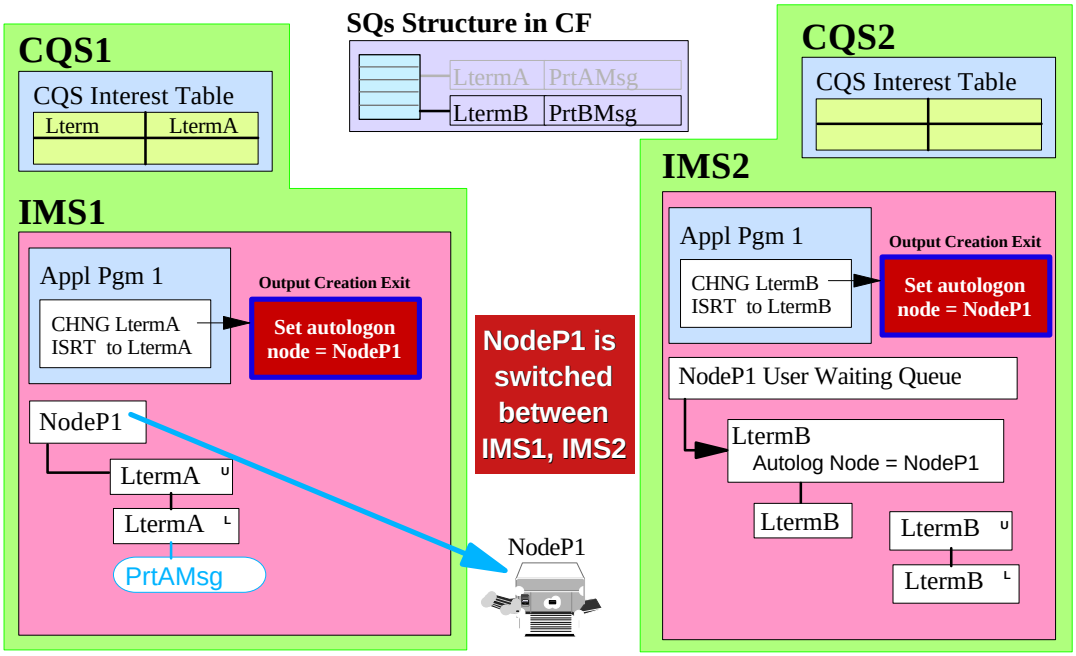
Autologon With SQs and Duplex IMS



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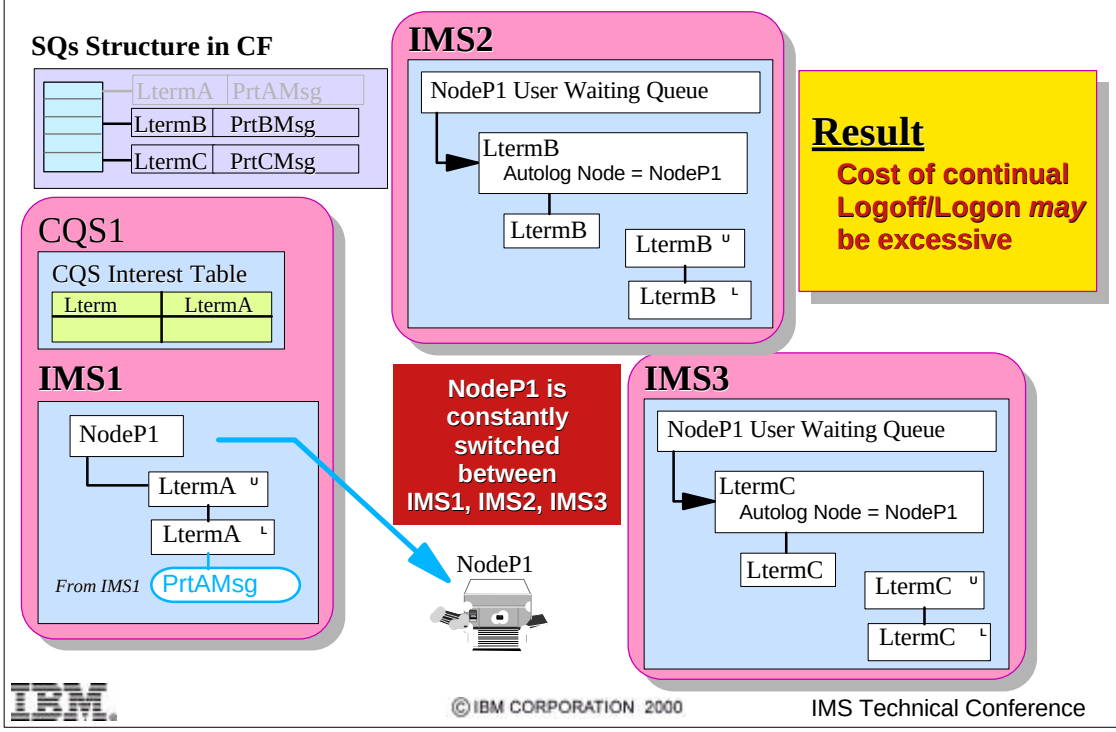
Potential Problem with Multiple IMSs



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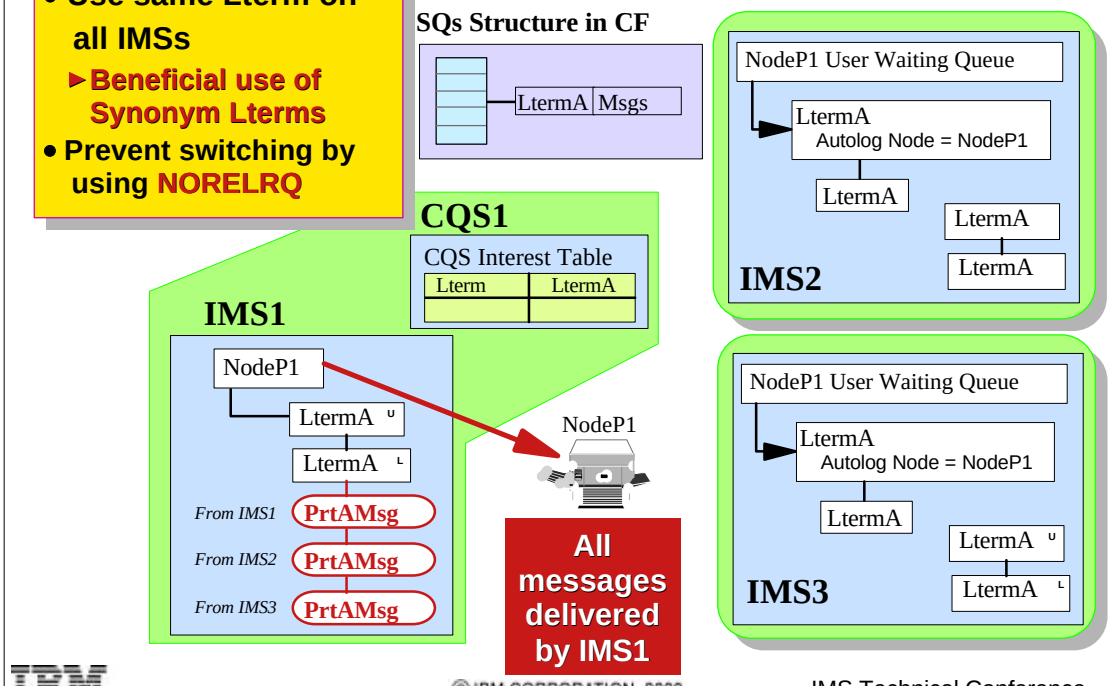
Solution (1)

- Use same Lterm on all IMSs
  - ►Beneficial use of Synonym Lterms
- Prevent switching by using NORELRQ



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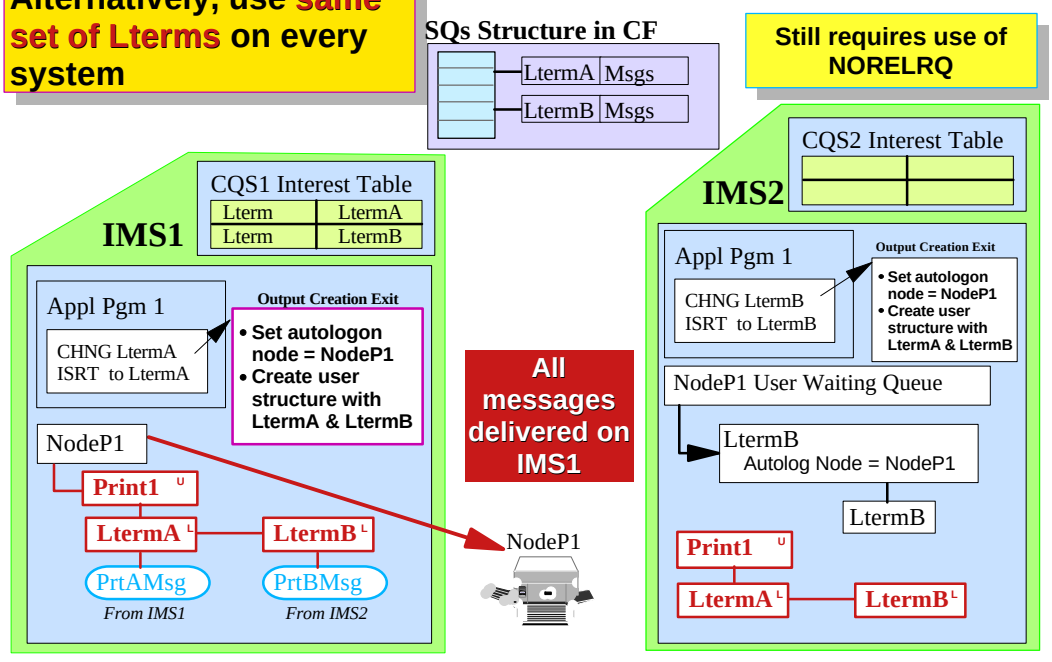
Solution (2)

Alternatively, use same set of Lterms on every system



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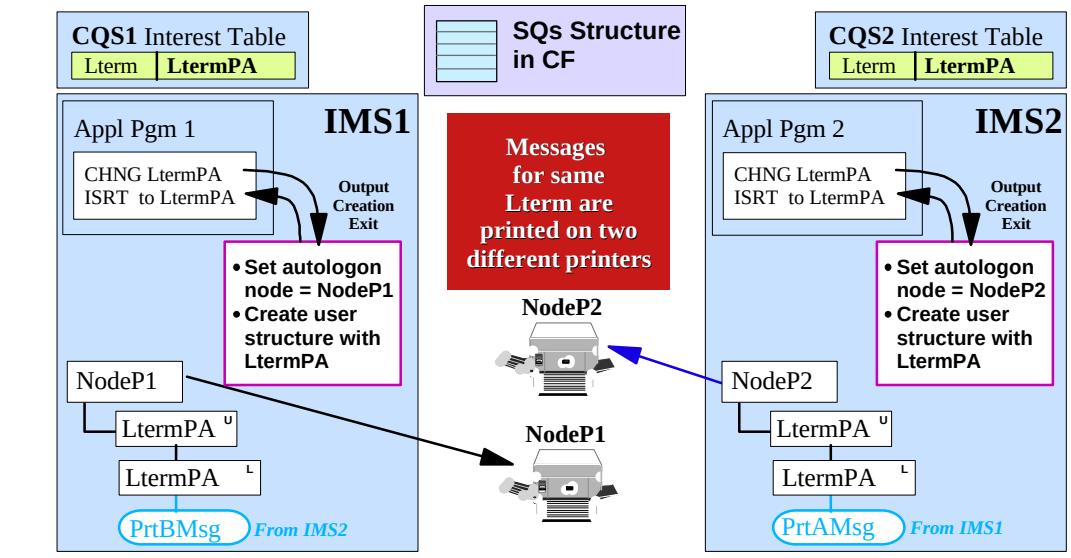
Solution (3)

This allows two printers to be used as a single resource.
Messages from both IMSs will be intermixed on both printers.
It requires a Smart Output Creation exit.



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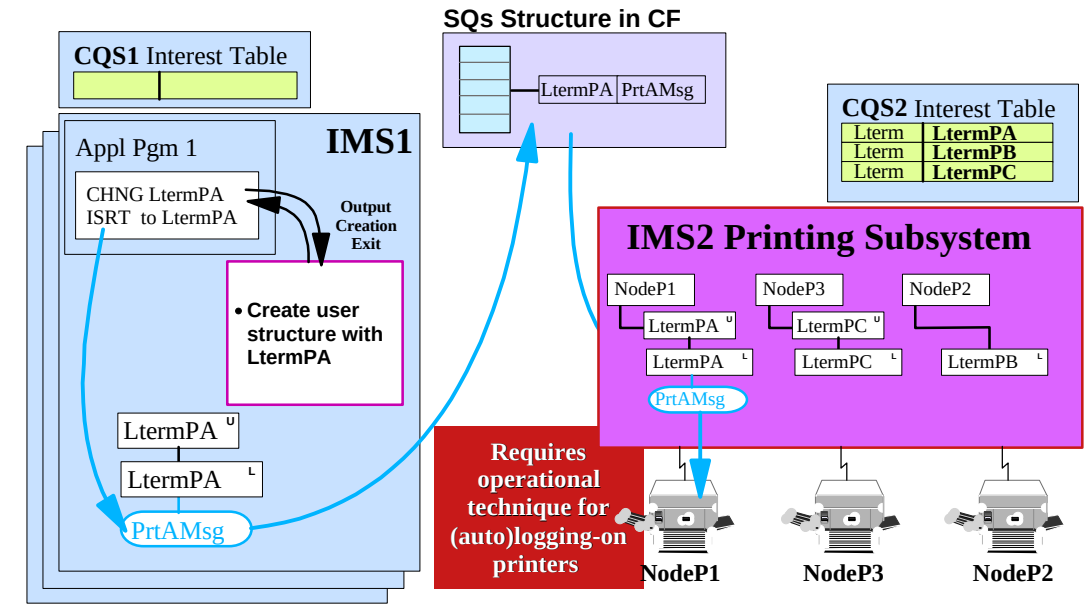
Solution (4)

One IMS (possibly a separate IMS) manages all Printers



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Summary

- Synonym LTERMs active in a sysplex may be good or bad
  - For printers, it may be a good solution
  - For end-users, it is almost certainly a problem, especially when using Session managers
    - Get end-users to cooperate
    - or use a single front end
    - or use Compatibility Mode
    - or ensure unique names with a smart Signon Exit
- ETO Logoff with Significant Status has strange effects
  - Delete Status in ETO Signoff exit
  - or use GRAFFIN=VTAM
    - Also resets SLUP/FINANCE
- ETO Printers
  - Remember autologon occurs on Transaction Processing system
  - Beware of printer switching (logoff/logon) between multiple IMS systems

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