

S27

Using ETO with SQs and VGR

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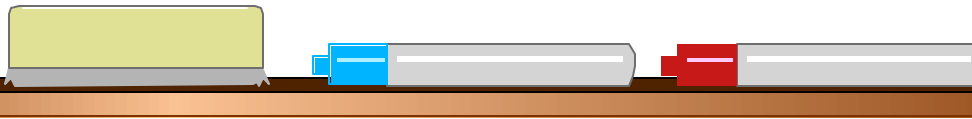
Part A11

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: Basics of SQ and VGR**
- **Part B: Synonym Lterms**
 - ▶ Multiple SIGN-ONs
- **Part C: Significant Status**
 - ▶ Conversations
- **Part D: Printers and Autologon**
 - ▶ Practical Solutions
- **Summary and Recommendations**

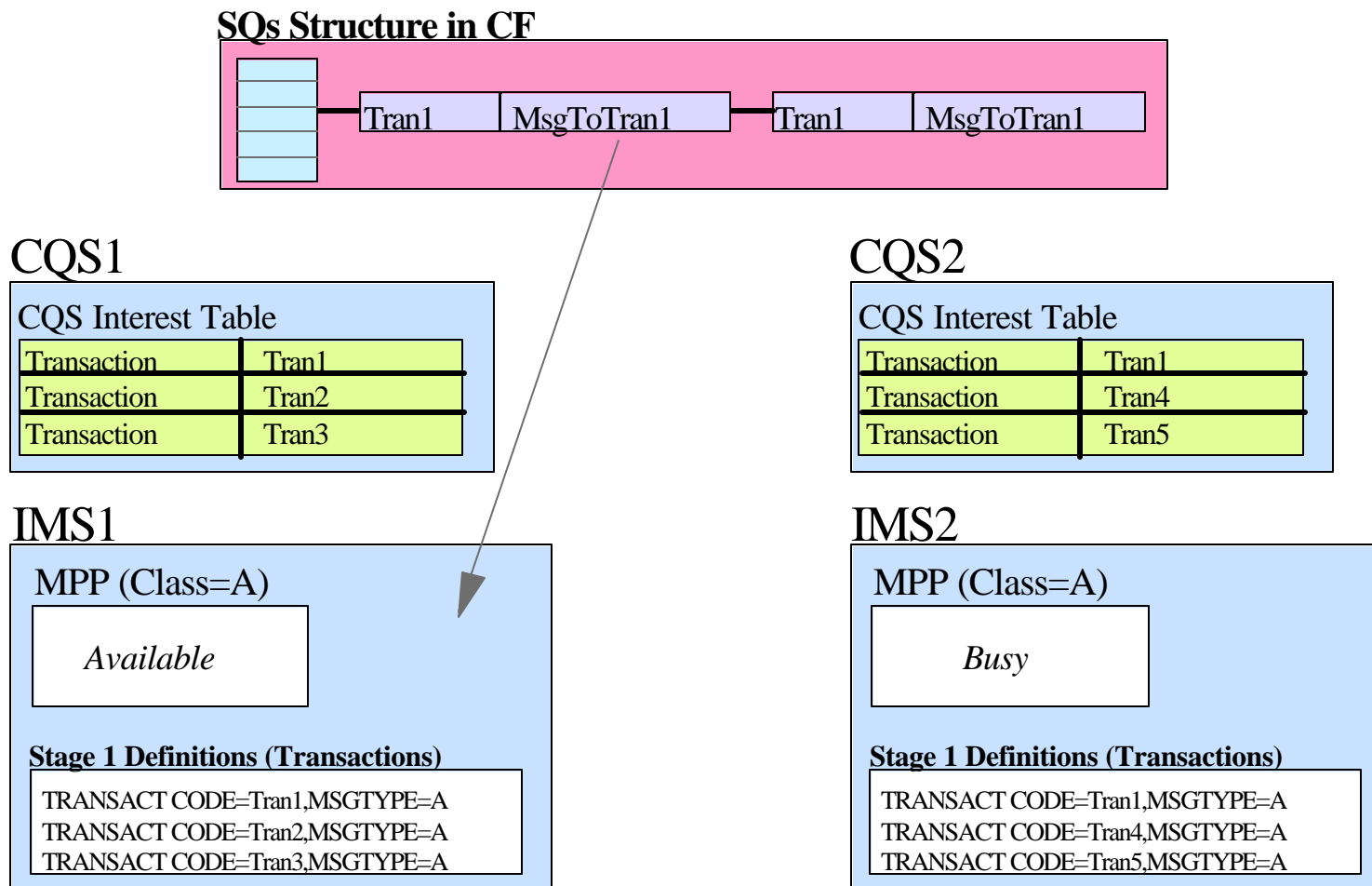


Part A

- **The Basics of**
 - ▶ Shared Queues
 - ▶ VTAM Generic Resources

Interest Registration

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

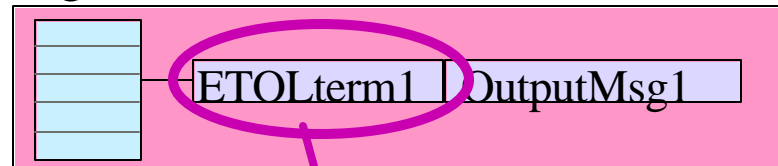


.... and

Interest Registration (cont.)

- Terminals = LTERMs

SQs Structure in CF

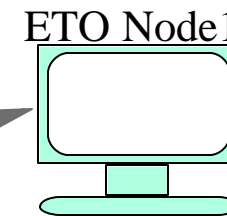
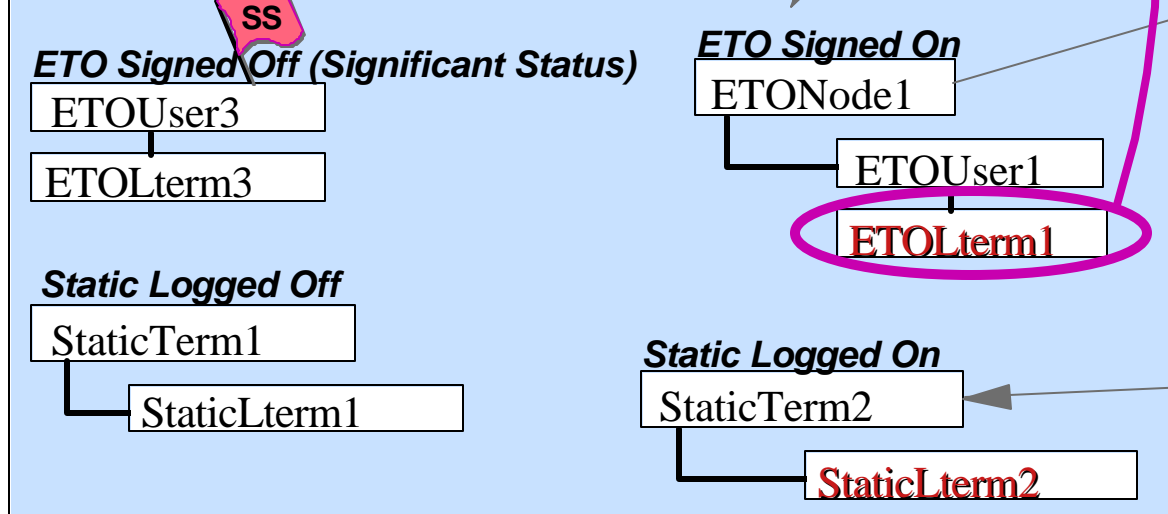


CQS1

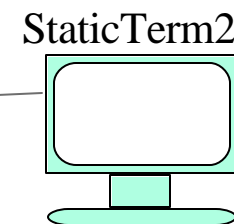
COS Interest Table

Lterm	ETOLterm1
Lterm	StaticLterm2
Transaction	Tran1

IMS1

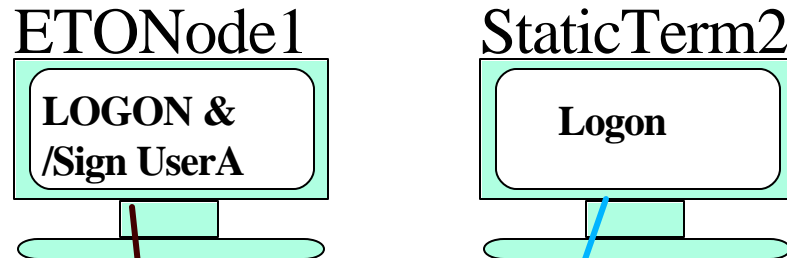


For users of Fastpath EMH, FP Registration takes place at first EMH transaction input (or signon/logon with output (or input) in process)



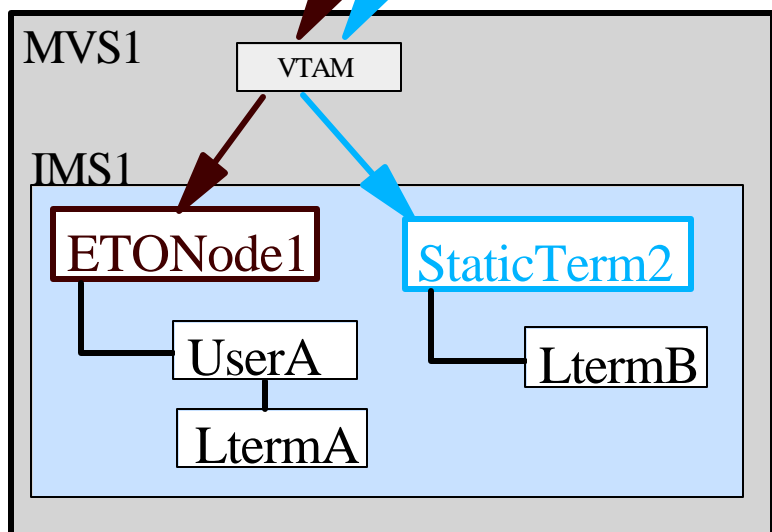
VTAM Generic Resources

◆ LOGON
 ■ and SIGNON



VGR Structure in CF

ISTGENERIC		
Generic Resource name	Member LU name	
IMS	IMS1 IMS2 IMS3	
LU Name	Generic Resource name	Member LU name
ETONode1	IMS	IMS1
StaticTerm2	IMS	IMS1



Terminal Affinity can be owned by IMS

- ▶ GRAFFIN=IMS (default)

or by VTAM

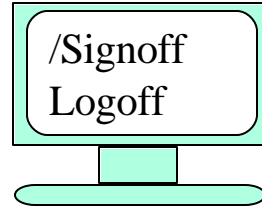
- ▶ GRAFFIN=VTAM



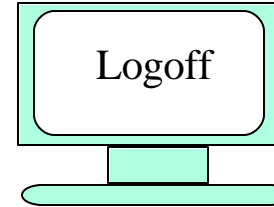
VTAM Generic Resources (cont.)

◆ LOGOFF
 ■ and SIGNOFF

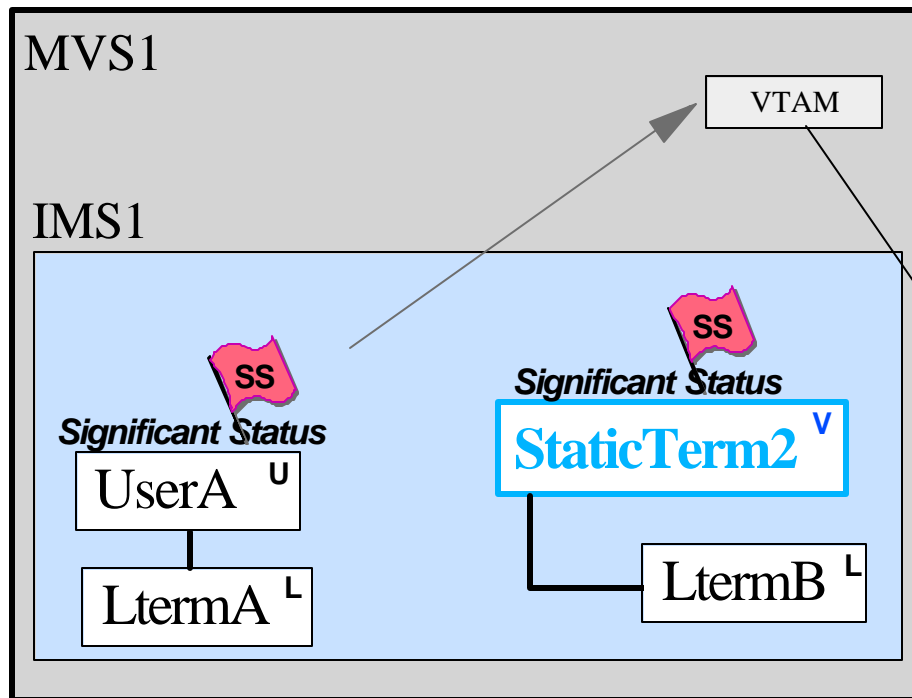
ETONode1



StaticTerm2



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



VGR Structure in CF

ISTGENERIC		
Generic Resource name	Member LU name	
IMS	IMS1 IMS2 IMS3	
LU Name	Generic Resource name	Member LU name
<i>ETONode1 is removed</i>		
StaticTerm2	IMS	IMS1

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

Part B

- Synonym LTERMs
 - ▶ Multiple Sign-ons with same Userid

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

Multiple Sign-Ons w/ Same Userid

Static Terminals

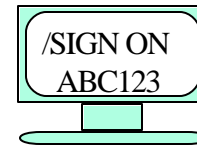
Node1/Lterm1



Node3/Lterm3



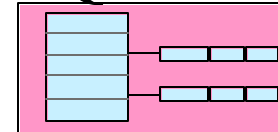
Node2/Lterm2



Node4/Lterm4



SQs



CQS1

CQS Interest Table	
Lterm	Lterm1
Lterm	Lterm3

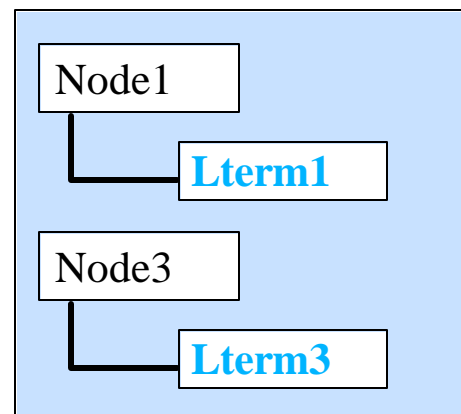
CQS2

CQS Interest Table	
Lterm	Lterm2
Lterm	Lterm4

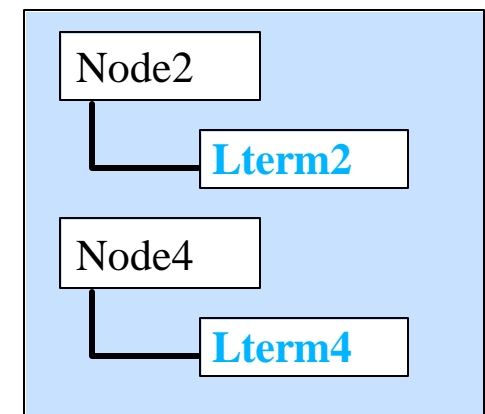
No problems, assuming sensible use of cloned systems

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

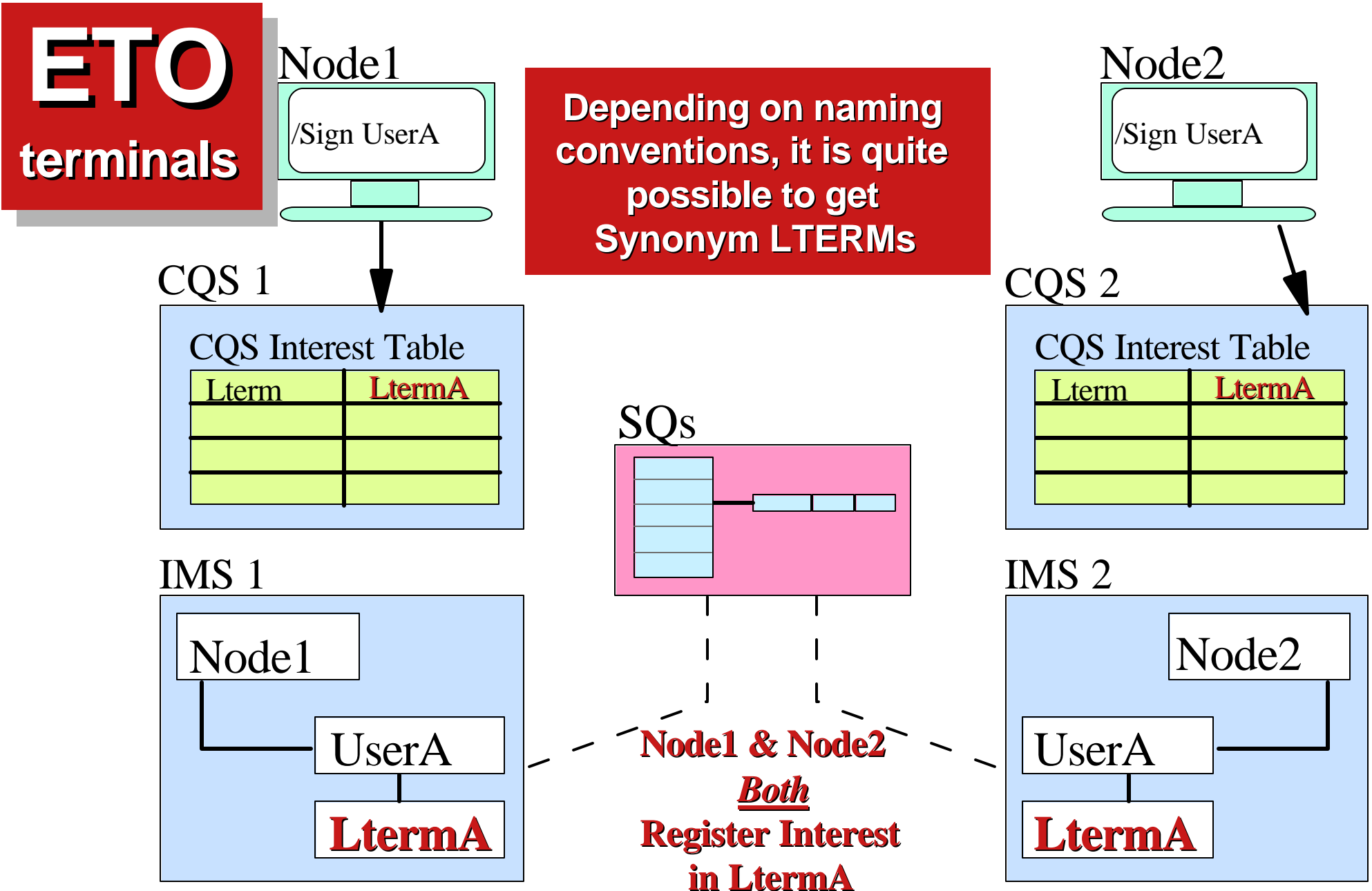
IMSFE1



IMSFE2



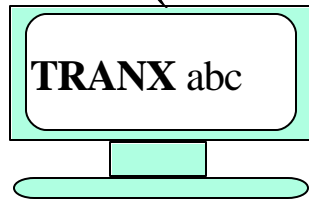
ETO Mult Sign-Ons (cont.)



ETO Mult Sign-Ons (Cont.)

◆ Each system processes a transaction from “LTERM A”

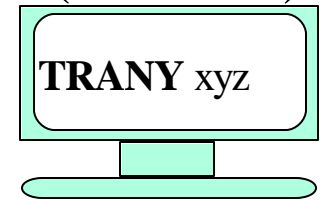
Node1 (USERA)



LtermA

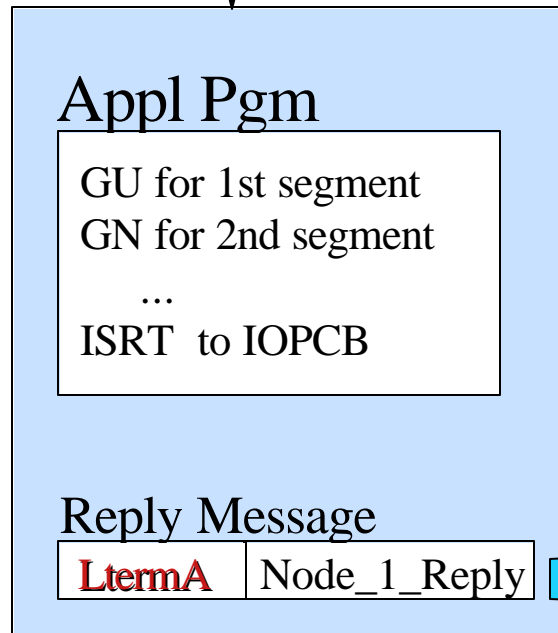
- Both replies are queued to “LtermA”
- Each IMS with registered interest will be notified
- Each IMS will respond

Node2 (USERA)

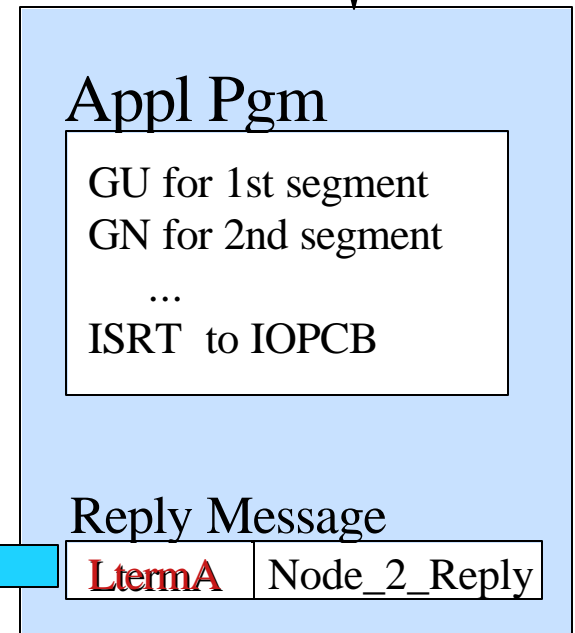


LtermA

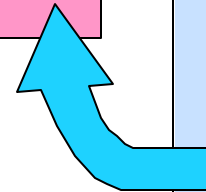
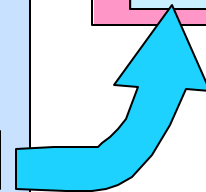
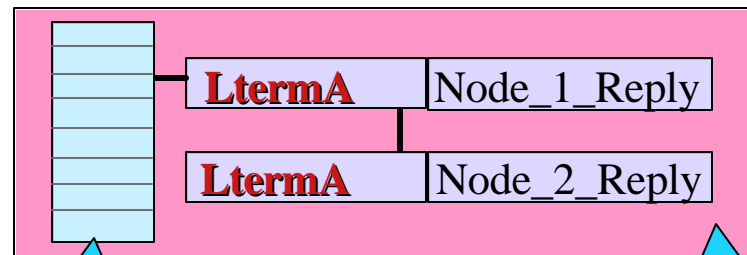
IMS 1



IMS 2



SQs Structure in CF



ETO Mult Sign-Ons (Cont.)

◆ Assume IMS2 responds first

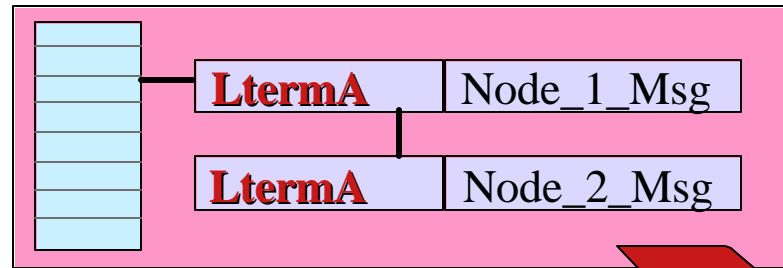
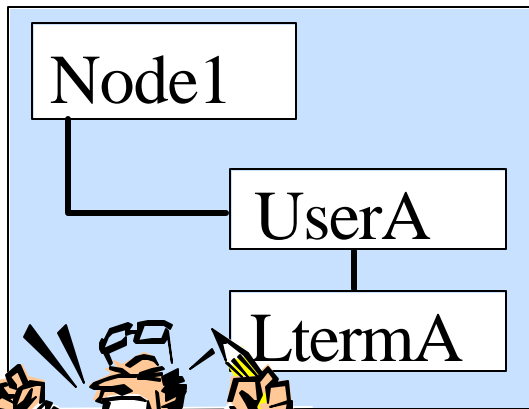
CQS 1

CQS Interest Table	
Lterm	LtermA

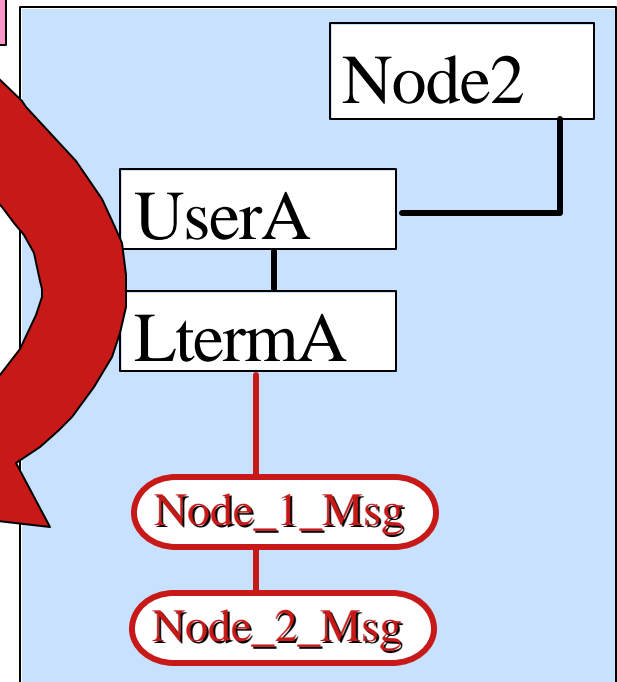
CQS 2

CQS Interest Table	
Lterm	LtermA

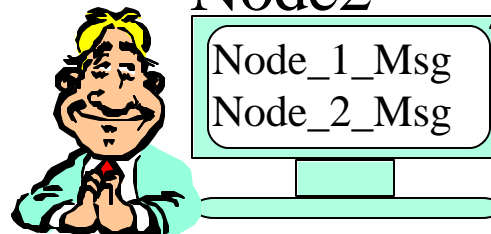
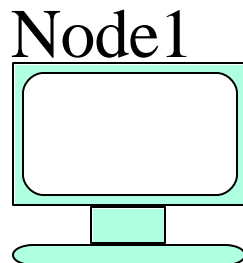
IMS 1



IMS 2



Node2 might receive both Node1 & Node2 messages



Solutions Overview

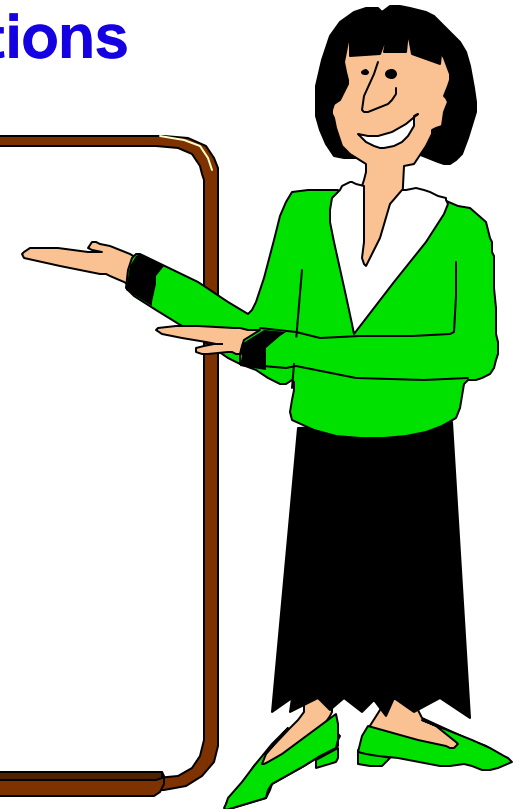
Avoiding Problems with Synonym LTERMs

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

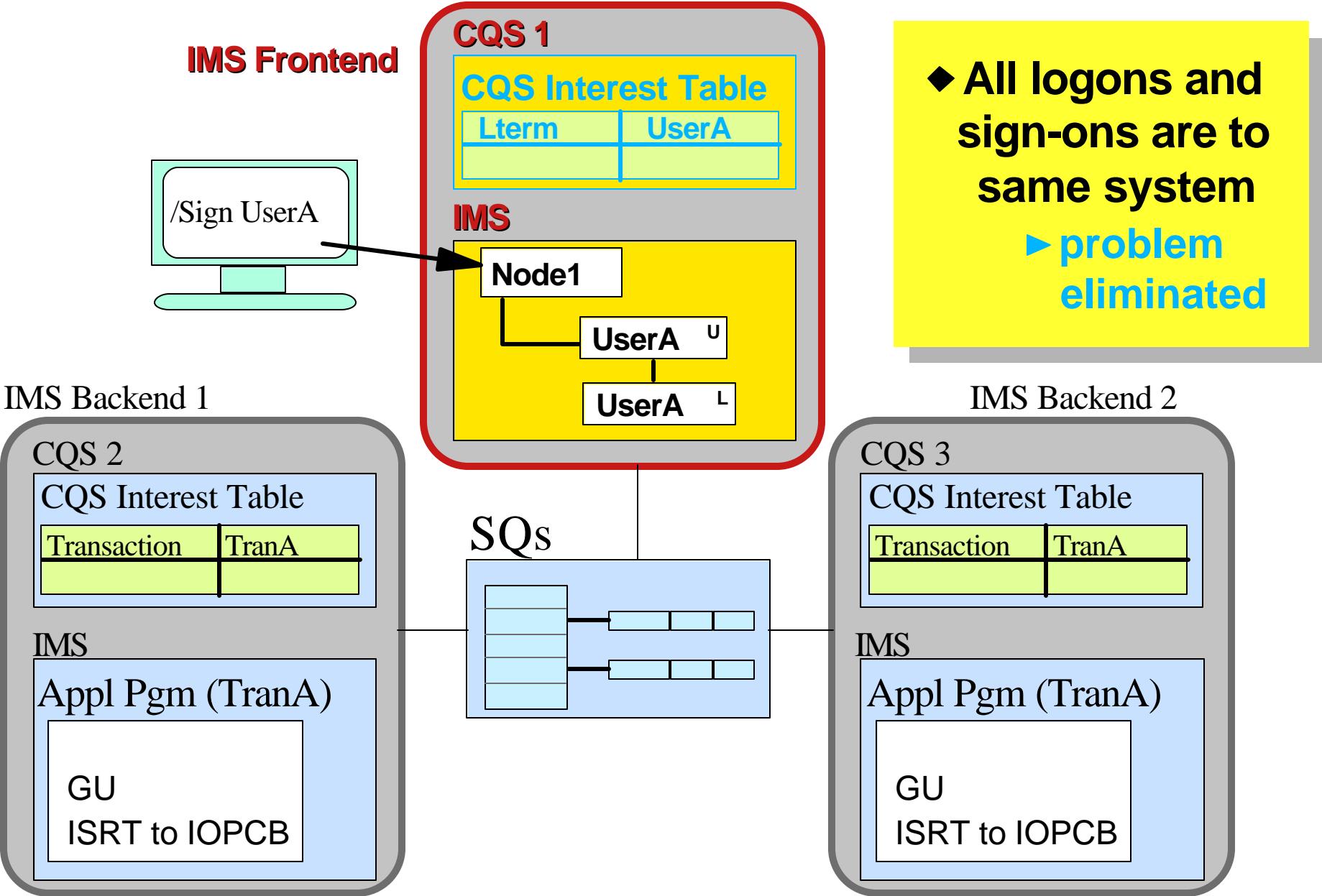


System Solutions

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



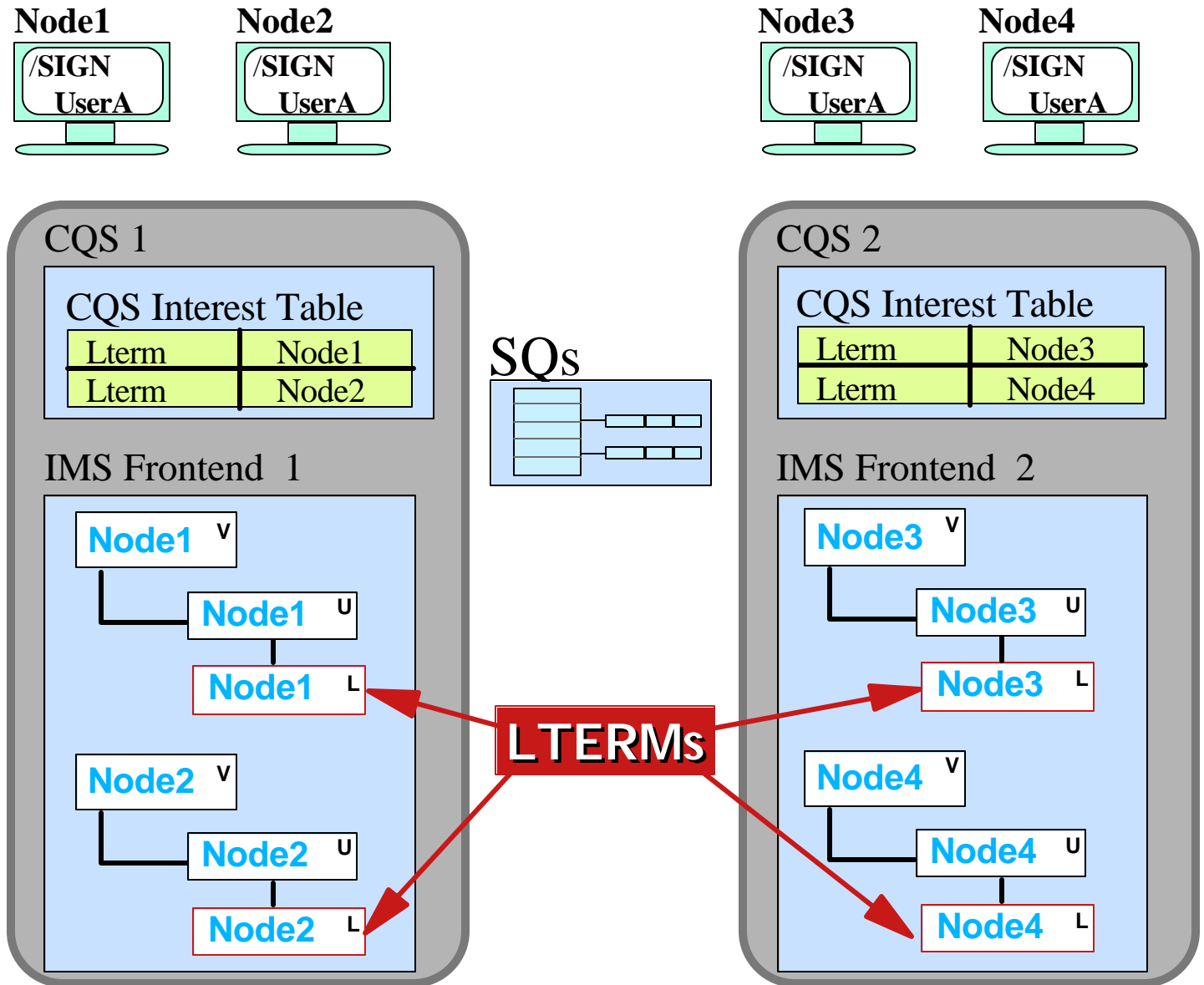
Solution 1: Single Frontend



Solution 2: ETO Compat Mode

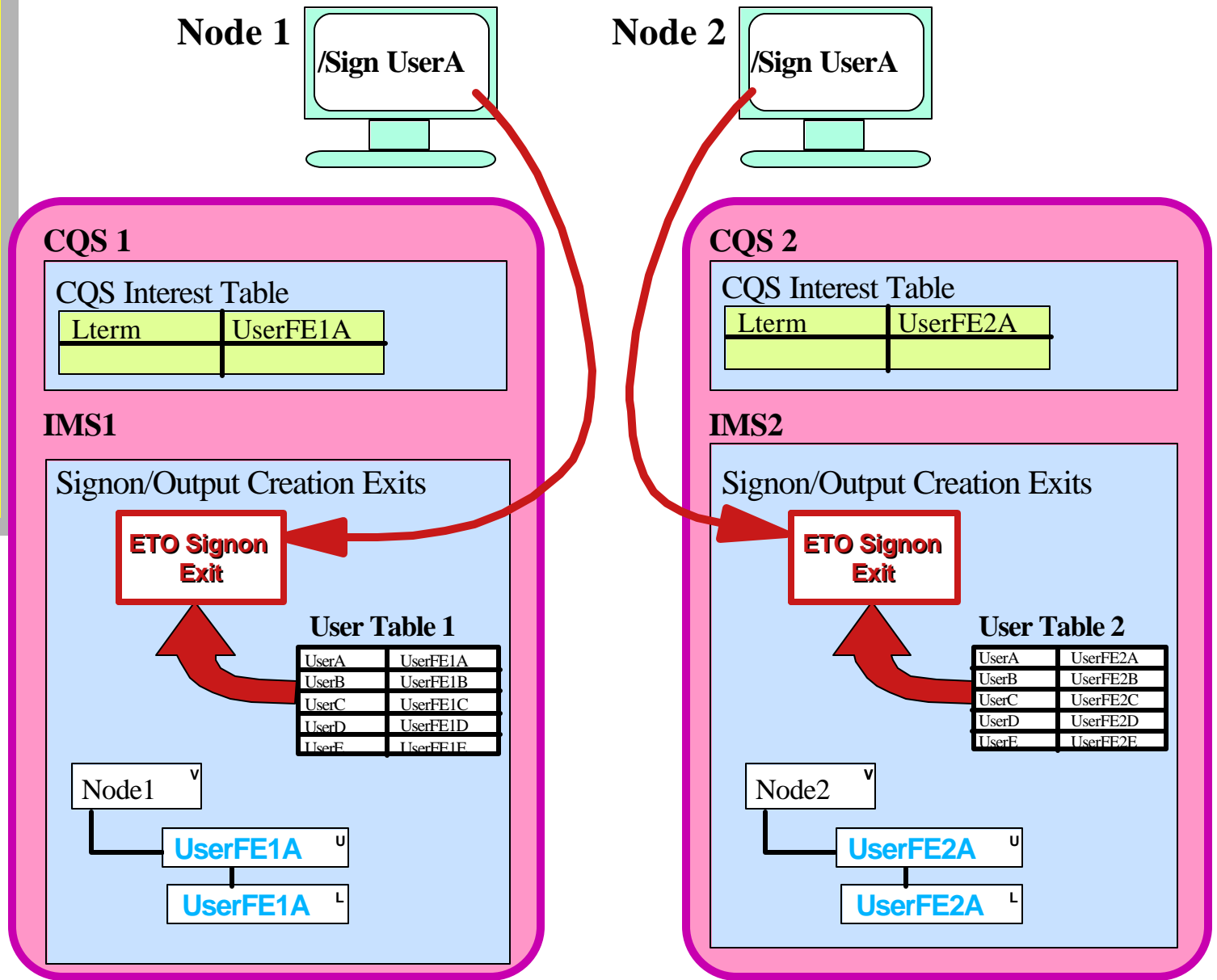
- Nodenames are always unique
- And so LTERM names will also be unique

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



Solution 3: Smart ETO Exits

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

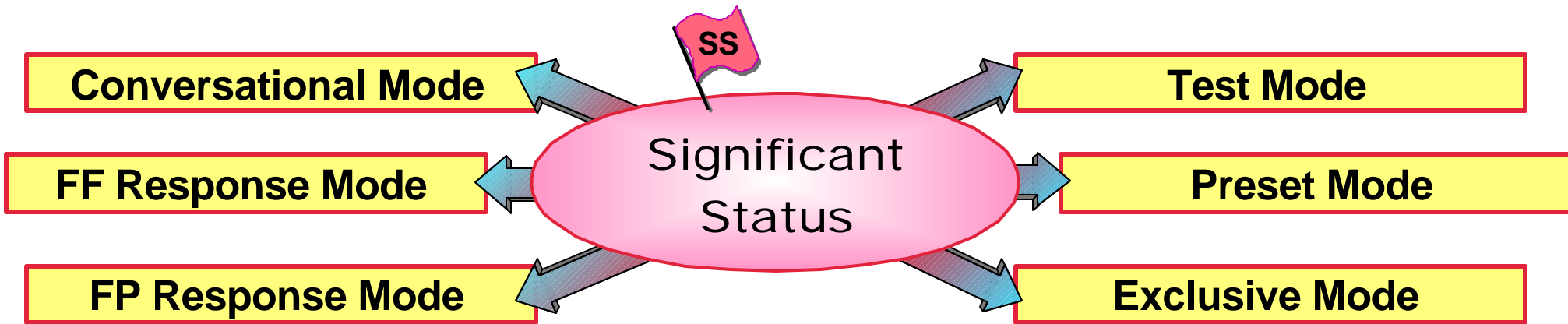


Part C

Significant Status with ETO

- ▶ Reminder of Basics
- ▶ “Messages on Queue” at Sign-On
- ▶ Conversations

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-STS terminal)
 - ▶ 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

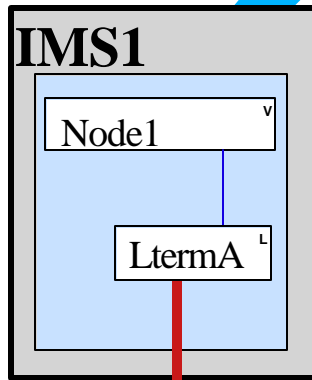
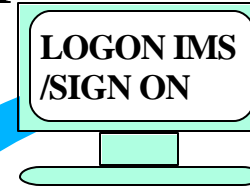
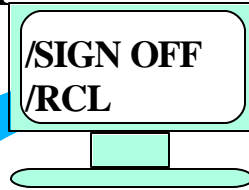
- **VGR maintains TERMINAL Affinity**
- **ETO maintains USER "Affinity"**
 - ▶ ie. significant status

Static Term Logoff (msgs on SQ)

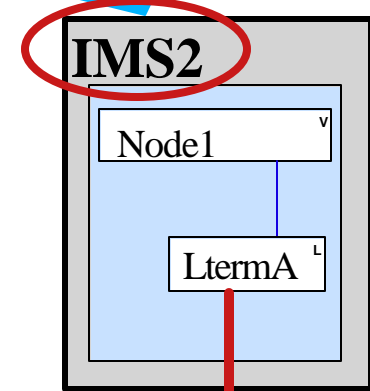
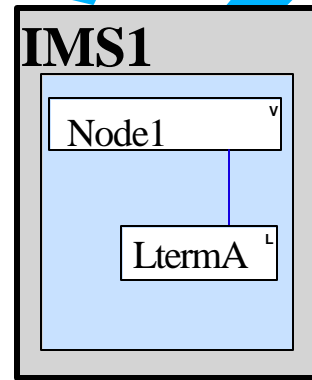
Static

Node1

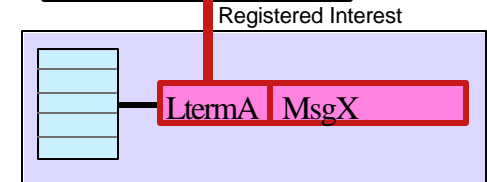
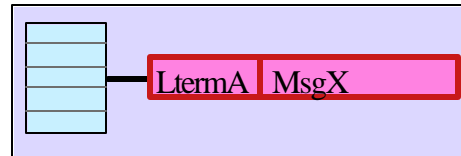
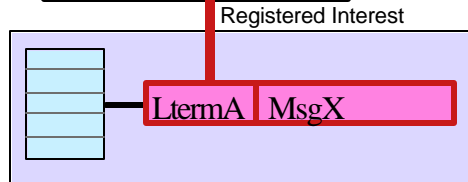
Node1



Assuming No Significant Status



SQs in CF

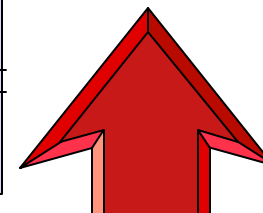


VGR Structure in CF

ISTGENERIC		
Generic Resource name		Member LU name
IMS		IMS1 IMS2 IMS3
LU Name	Generic Resource name	Member LU name
Node1	IMS	IMS1

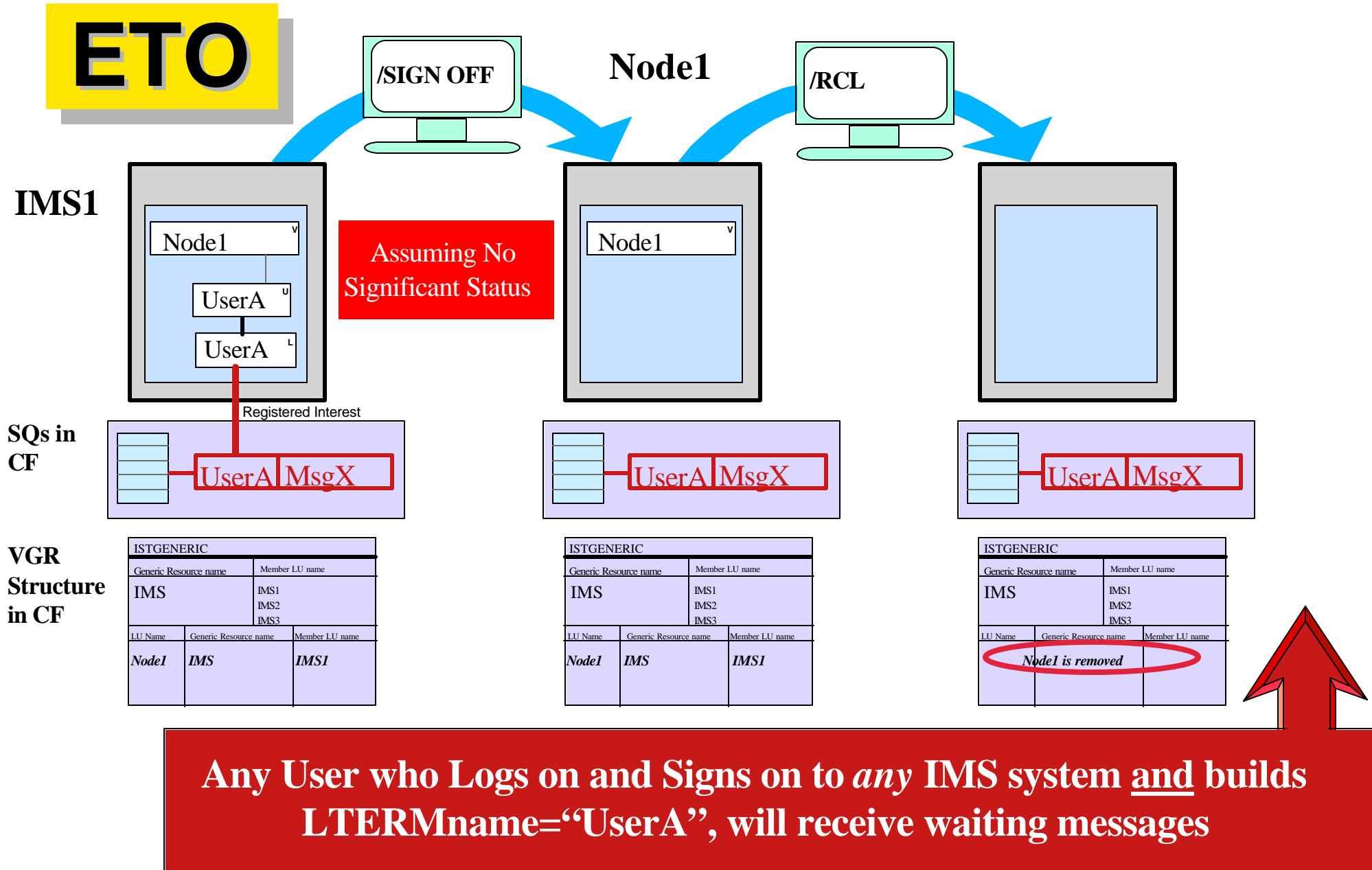
ISTGENERIC		
Generic Resource name		Member LU name
IMS		IMS1 IMS2 IMS3
LU Name	Generic Resource name	Member LU name
Node1 is removed		

ISTGENERIC		
Generic Resource name		Member LU name
IMS		IMS1 IMS2 IMS3
LU Name	Generic Resource name	Member LU name
Node1	IMS	IMS2



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

ETO User Sign-Off (msgs on SQ)



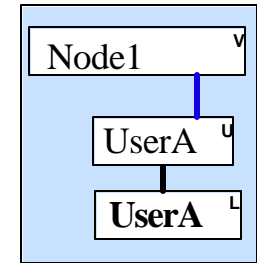
ISTGENERIC		
Generic Resource name		Member LU name
IMS		IMS1 IMS2 IMS3
LU Name	Generic Resource name	Member LU name
Node1	IMS	IMS1

ISTGENERIC		
Generic Resource name		Member LU name
IMS		IMS1 IMS2 IMS3
LU Name	Generic Resource name	Member LU name
Node1	IMS	IMS1

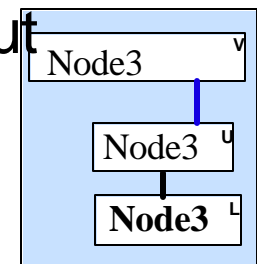
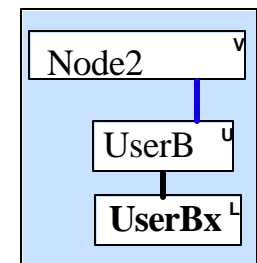
ISTGENERIC		
Generic Resource name		Member LU name
IMS		IMS1 IMS2 IMS3
LU Name	Generic Resource name	Member LU name
		<i>Node1 is removed</i>

ETO Sign-Off (Msgs 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
- 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



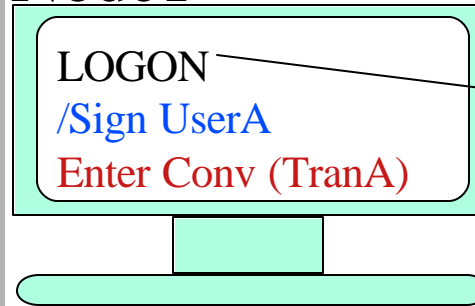
IMSx



Conversational Mode (1)

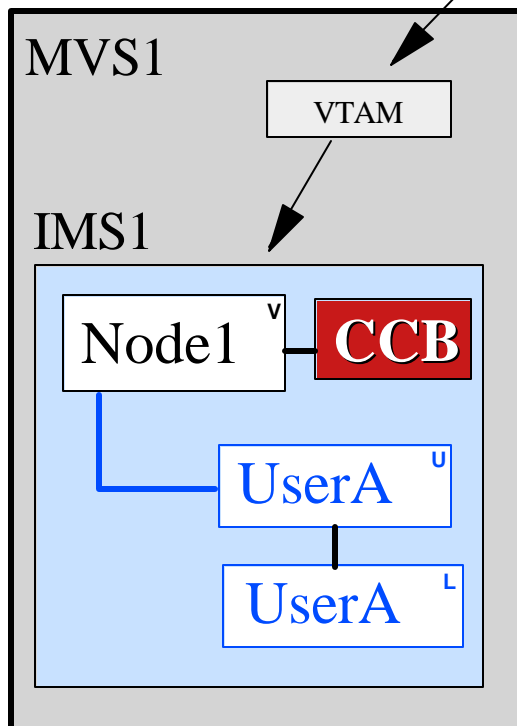
- LOGON
- SIGNON
- Start Conversation

Node1

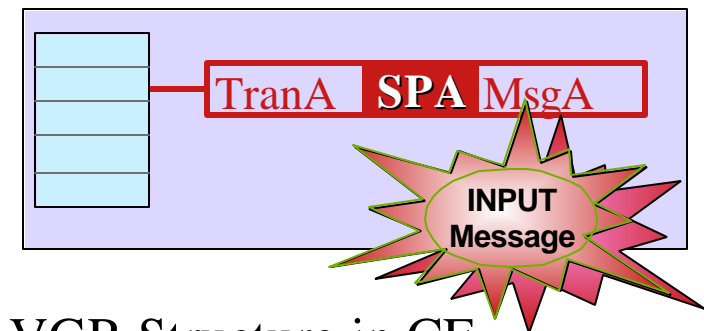


VTAM in Network Node

Logon APPLID = IMS



SQs Structure in CF



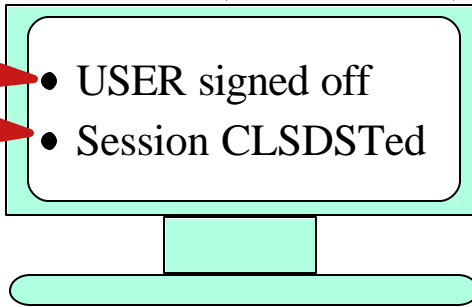
VGR Structure in CF

ISTGENERIC		
Generic Resource name	Member LU name	
IMS	IMS1 IMS2 IMS3	
LU Name	Generic Resource name	Member LU name
Node1	IMS	IMS1

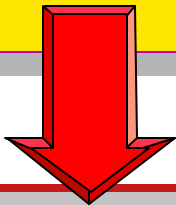
Conversational Mode (2)

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

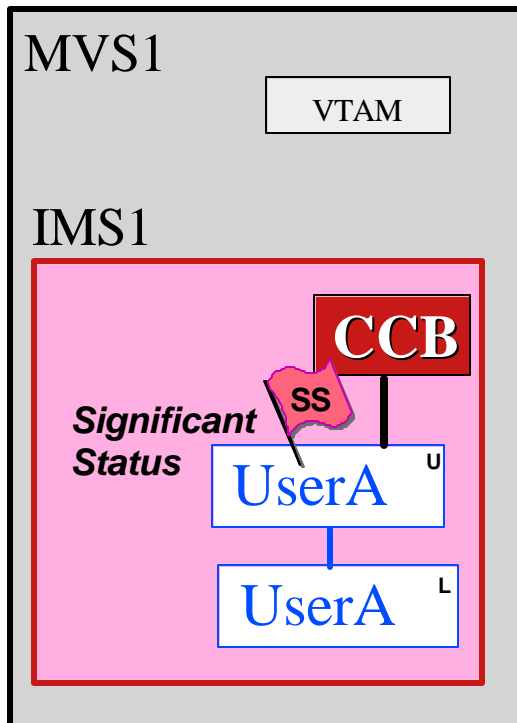
Node1 (non-STSN)



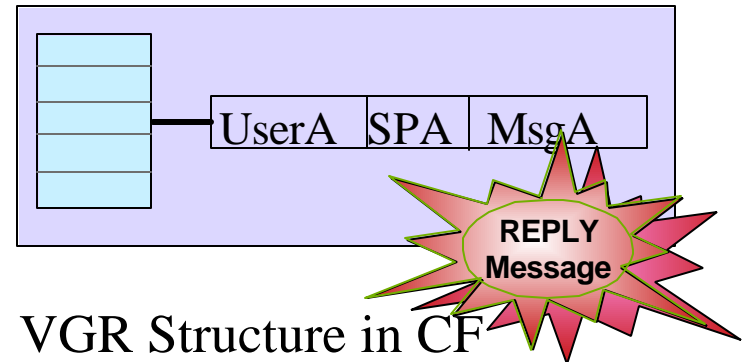
Assumes
GRAFFIN=IMS



- ▶ 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
<i>Node1 is removed if ETO</i>		

The Potential Problem

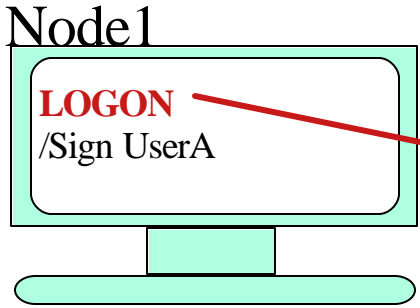
- With VTAM Generic Resources (VGR)
 - ▶ if the User has significant status
 - ▶ but there is no Terminal Affinity (due to using ETO), then
 - there is the potential for VTAM to reconnect the terminal to a different system from the one that has the “significant status”



Static Term Restart in Conv

Static Terminal

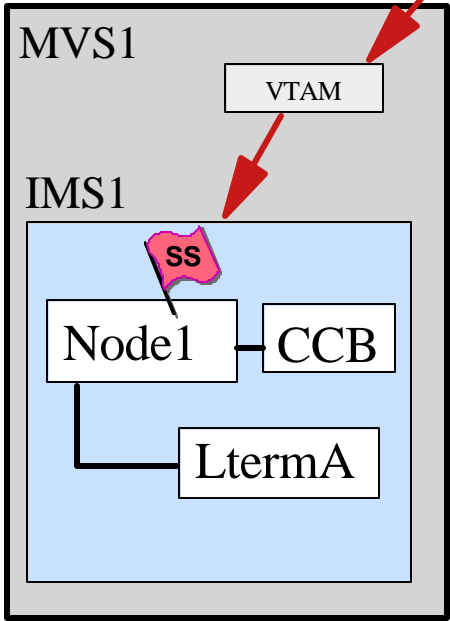
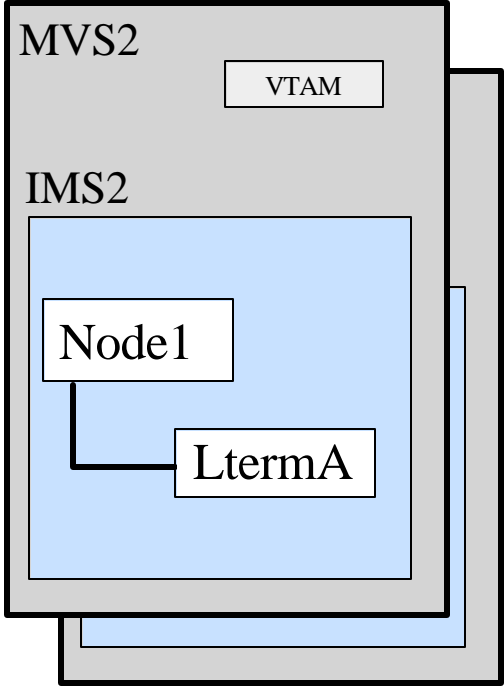
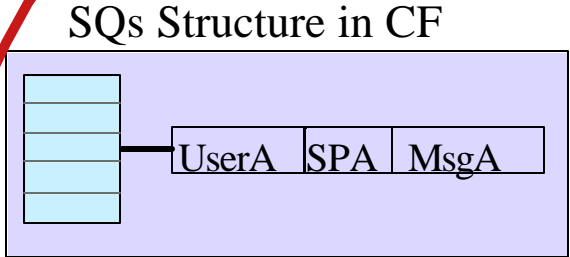
- ▶ Terminal Affinity will have been retained
- ▶ Will logon to correct IMS



Assumes
GRAFFIN=IMS

VTAM in Network Node

Logon APPLID = IMS



VGR Structure in CF

ISTGENERIC		
Generic Resource name	Member LU name	
IMS	IMS1	
	IMS2	
	IMS3	
LU Name	Generic Resource name	Member LU name
Node1	IMS	IMS1

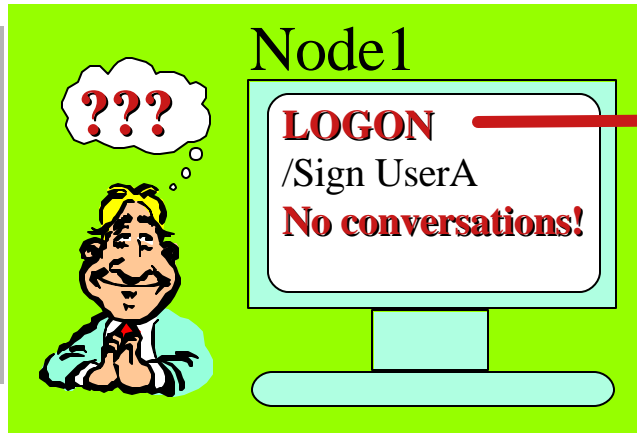
NB. If using SQ but not VGR, an attempt to logon to "wrong IMS" will be treated the same as with ETO (see later)

ETO Term Restart in Conv

► VGR but with DASD Queues

Assumes
GRAFFIN=IMS

VGR can
choose
“wrong”
IMS system

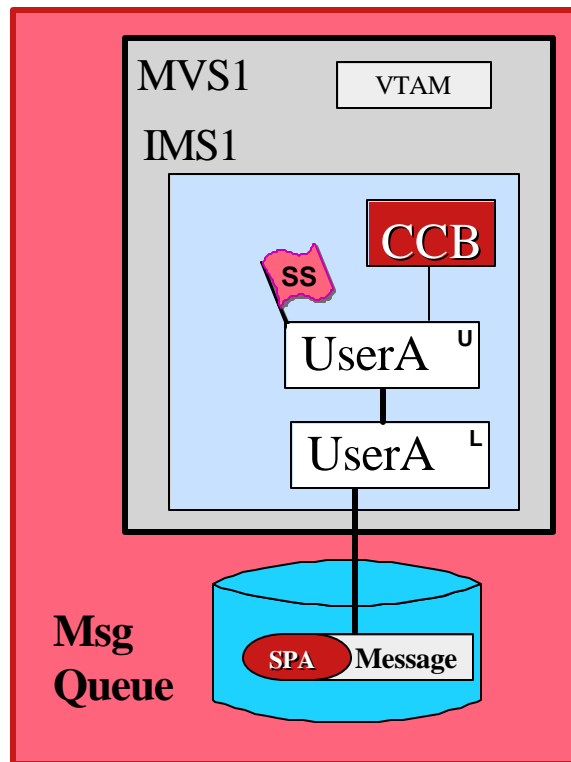


VTAM in Network Node

Logon APPLID = IMS

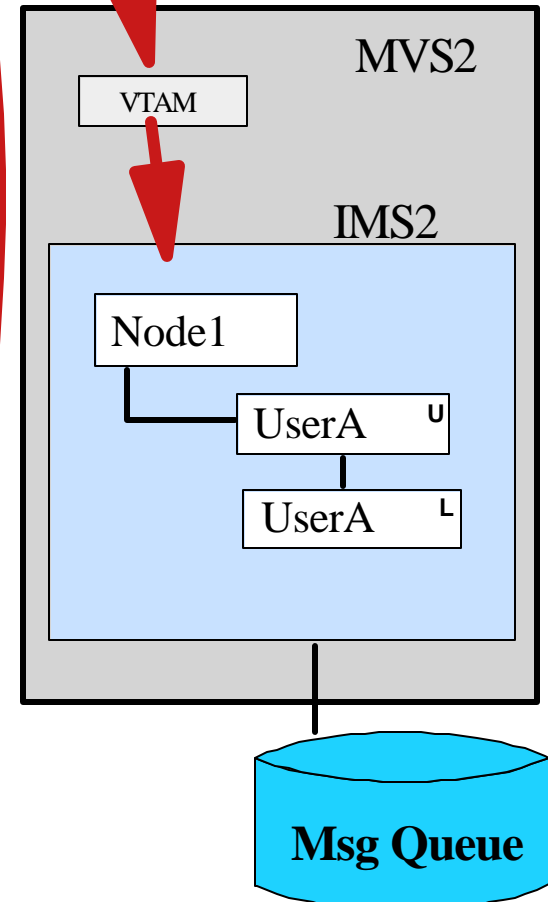
No
terminal
affinity at
LOGON

Original
IMS
System



VGR Structure in CF

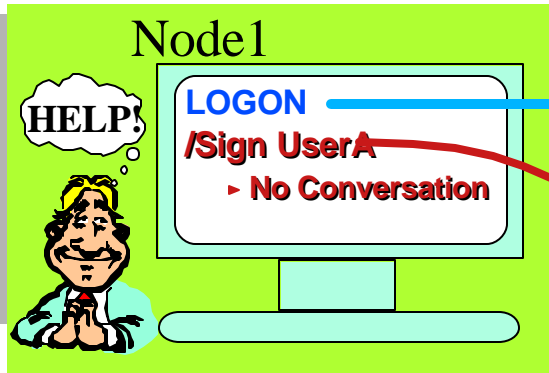
ISTGENERIC		
Generic Resource name	Member LU name	
IMS	IMS1	
	IMS2	
	IMS3	
LU Name	Generic Resource name	Member LU name
Node1	IMS	IMS2



ETO Term Restart in Conv

► Using Shared Queues (w/wout VGR)

User/VGR chooses "wrong" IMS system



VTAM in Network Node

Logon APPLID = IMS

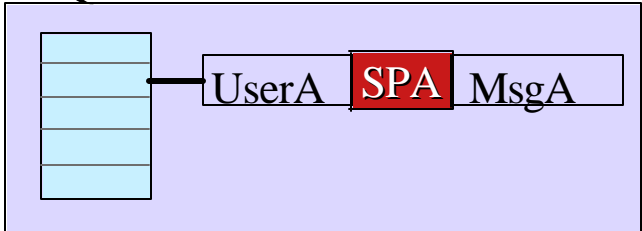
Assumes GRAFFIN=IMS

No terminal affinity at LOGON

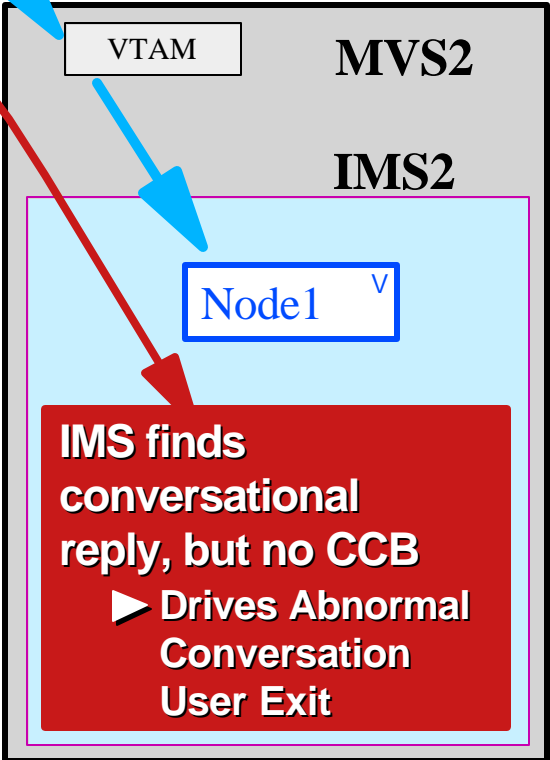
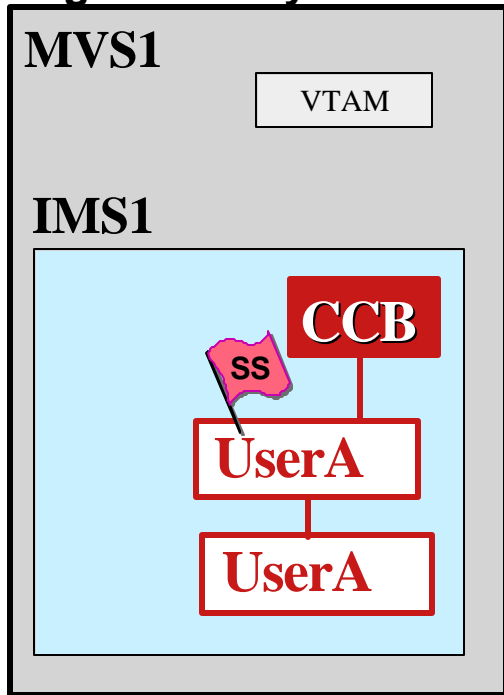
VGR Structure in CF

ISTGENERIC		
Generic Resource name	Member LU name	
IMS	IMS1 IMS2 IMS3	
LU Name	Generic Resource name	Member LU name
Node1	IMS	IMS2

SQs Structure in CF



Original IMS System



Next Logon/Signon to "right" IMS system needs /EXIT !



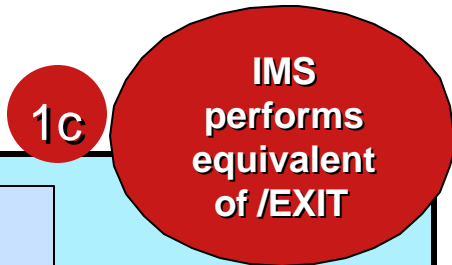
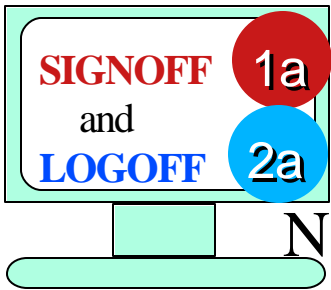
ETO Term Restart in Conv

► The Solution = Delete Significant Status!

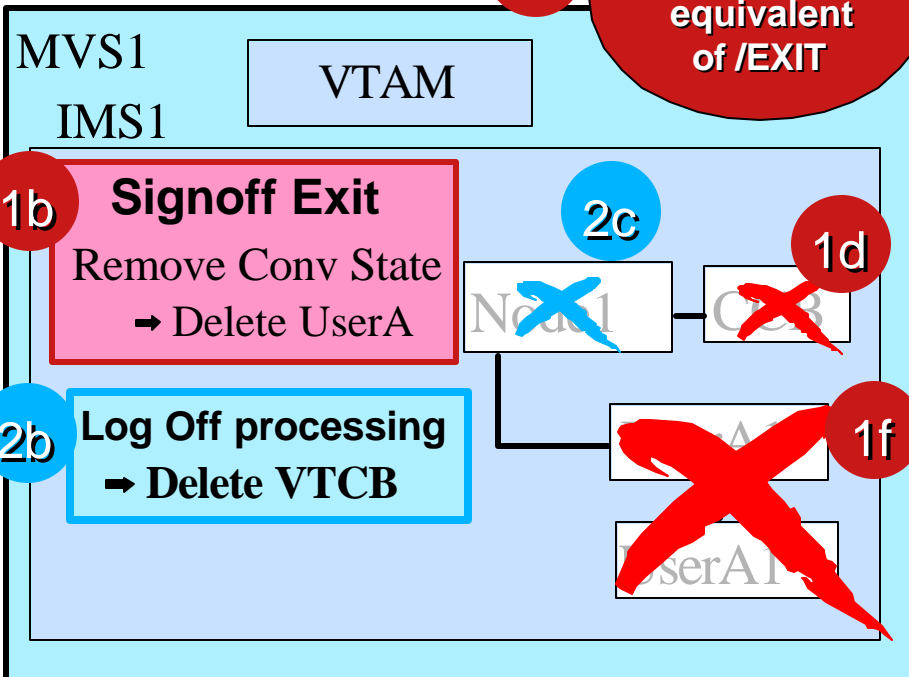
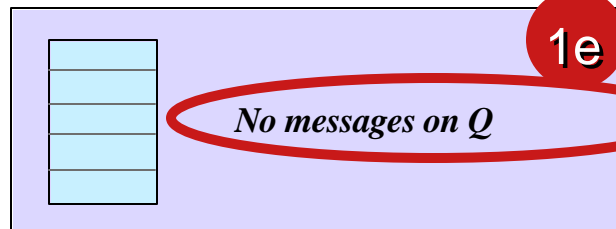
Technique 1

✦ Use ETO SignOff Exit

- Exit receives significant status vector
- can reset status by changing vector
→ eg. cancel conversational status



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		

RESULT

Old conversations never exist at sign-on

- Some users have this as a requirement

ETO Term Restart in Conv

► 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

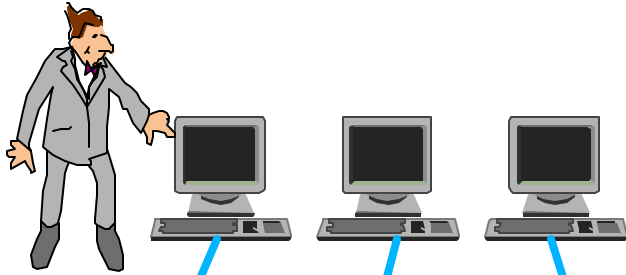
NB. GRAFFIN option is system-wide for all non-ISC terminals using VGR

Part D

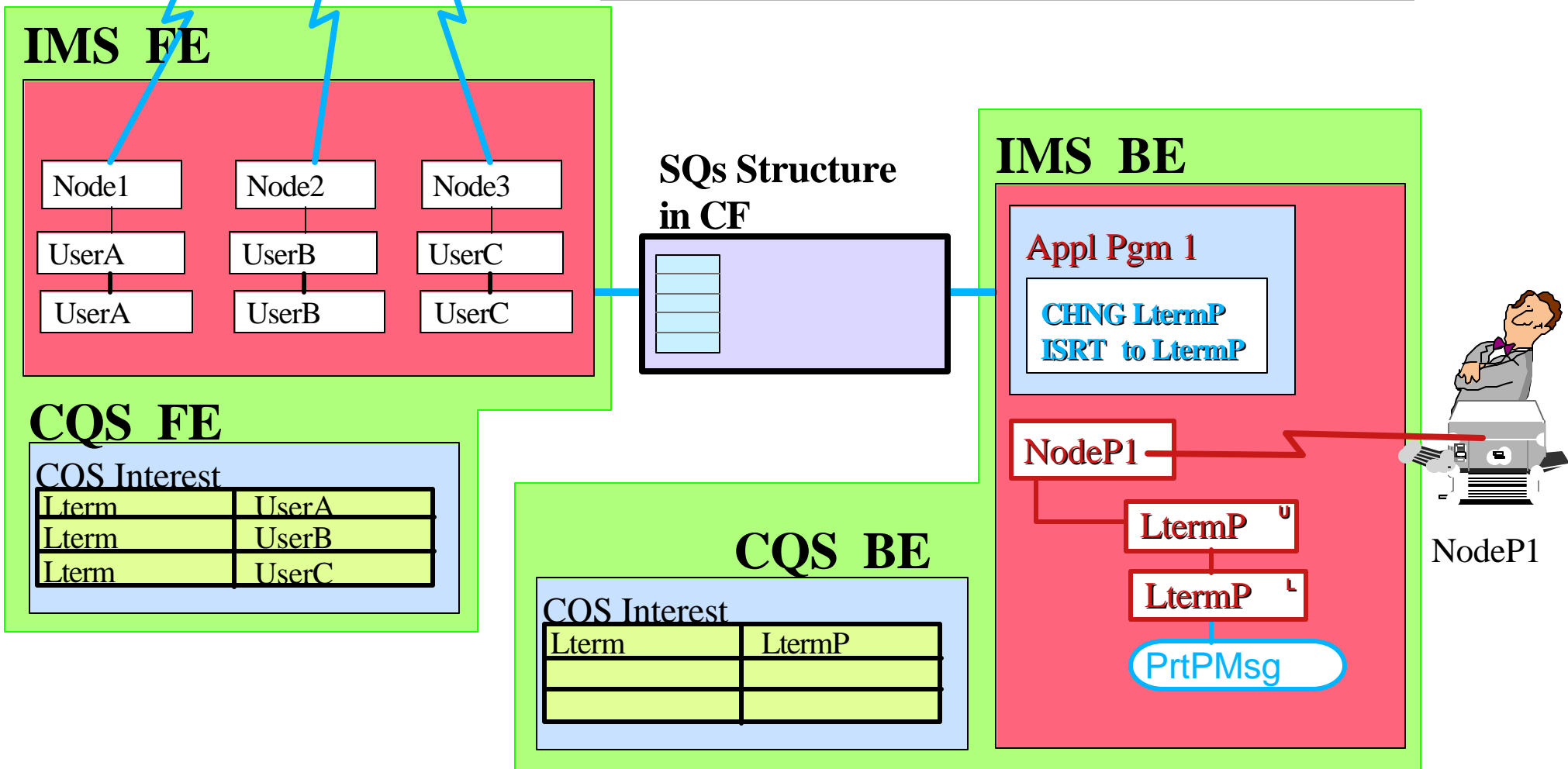
AUTOLOGON

- ▶ 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 Environment



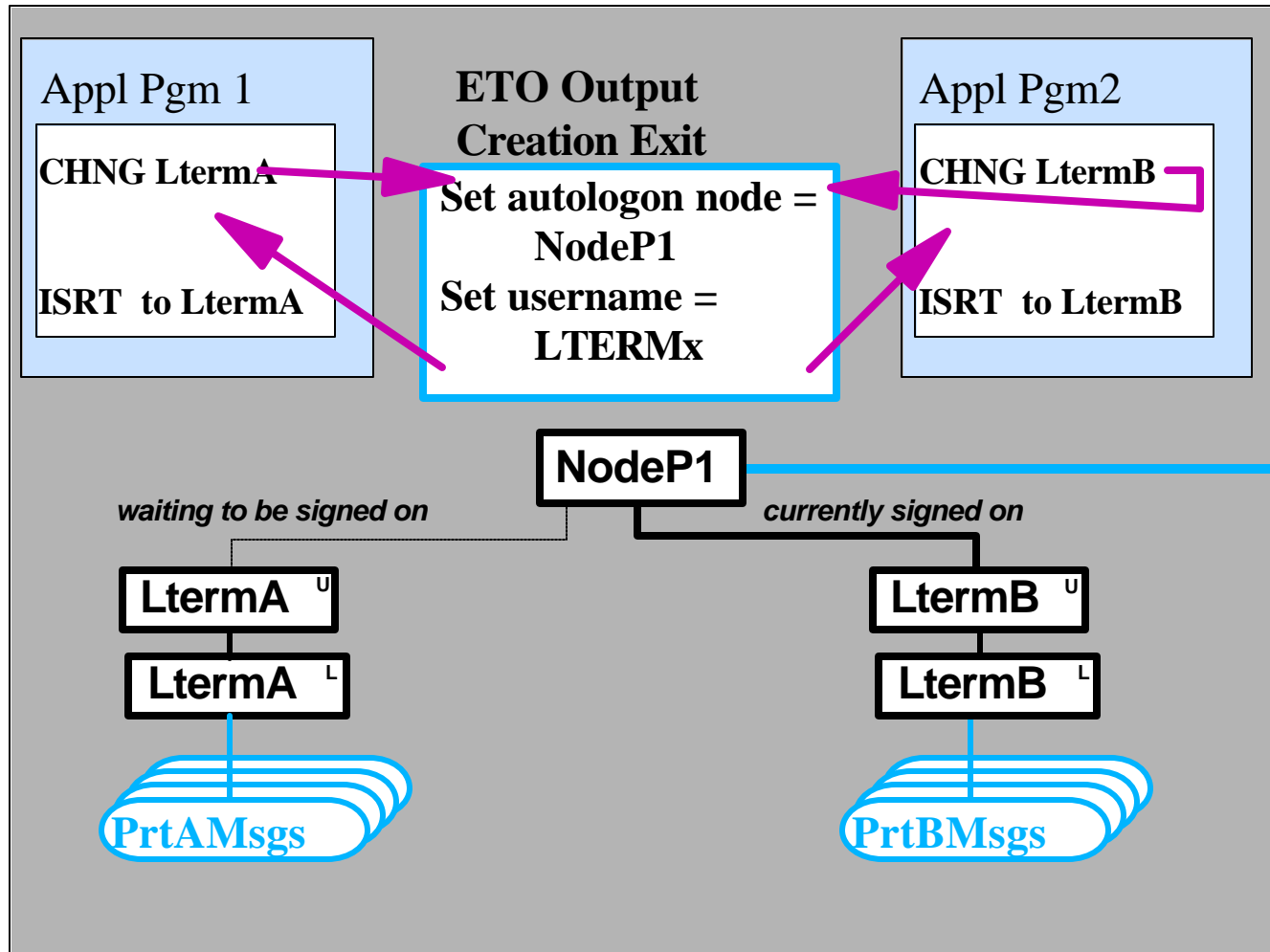
IMS FE is intended to own all Nodes
 ▶ but autologon Nodes will be on IMS BE



Autologon with Single IMS

One Possible Implementation

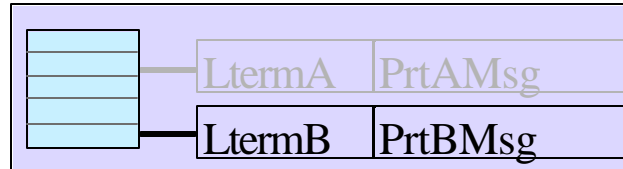
IMS1



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

Autologon w/ SQs and Two IMSs

SQs Structure in CF



CQS1

CQS Interest Table

Lterm	LtermA

CQS2

CQS Interest Table

IMS1

Appl Pgm 1

CHNG LtermA
ISRT to LtermA

Output Creation Exit

**Set autologon
node = NodeP1**

NodeP1

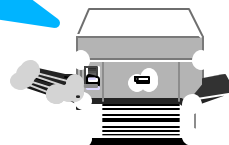
LtermA^U

LtermA^L

PrtAMsg

**NodeP1 is
switched
between
IMS1, IMS2**

NodeP1



IMS2

Appl Pgm 1

CHNG LtermB
ISRT to LtermB

Output Creation Exit

**Set autologon
node = NodeP1**

NodeP1 User Waiting Queue

LtermB

Autolog Node = NodeP1

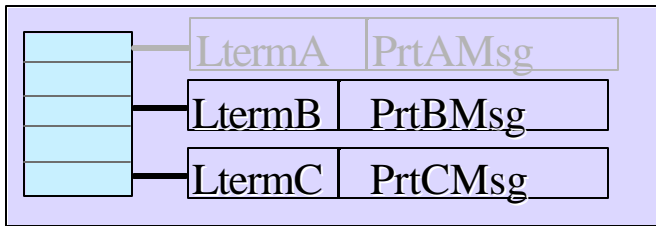
LtermB

LtermB^U

LtermB^L

Potential Problem with Mult IMSs

SQs Structure in CF

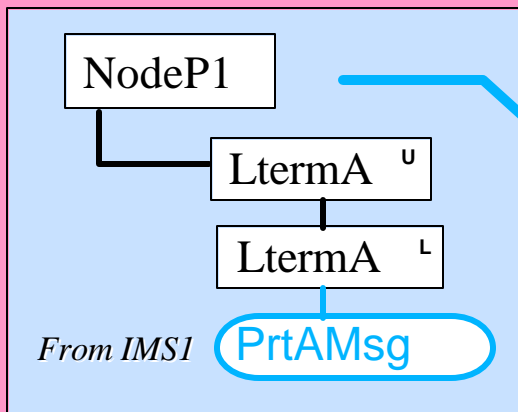


CQS1

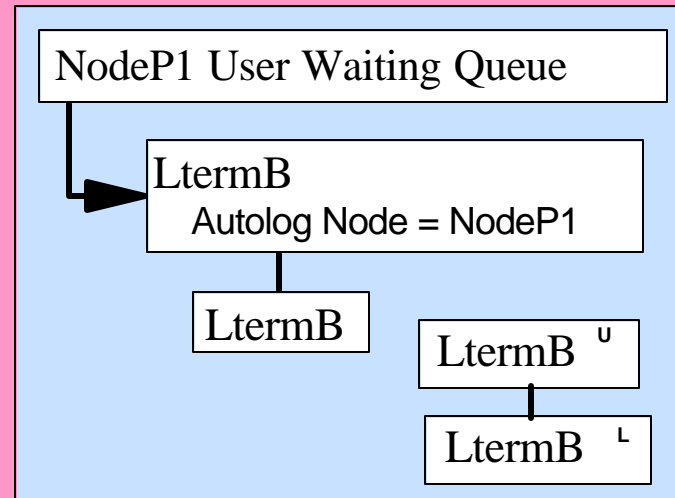
CQS Interest Table

Lterm	LtermA

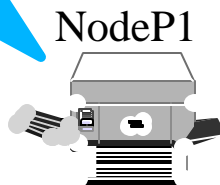
IMS1



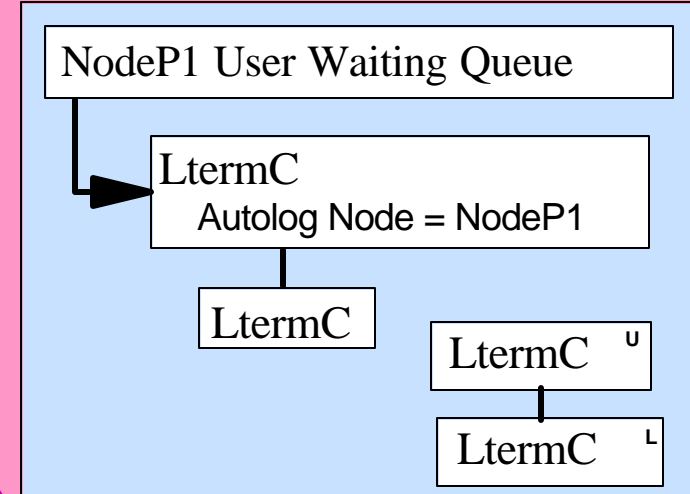
IMS2



NodeP1 is constantly switched between IMS1, IMS2, IMS3



IMS3



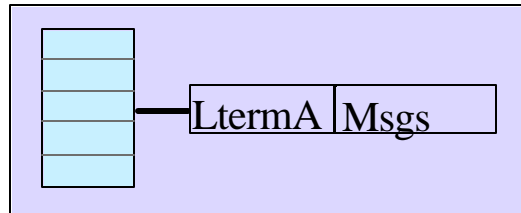
Result

Cost of continual Logoff/Logon may be excessive

Solution (1)

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

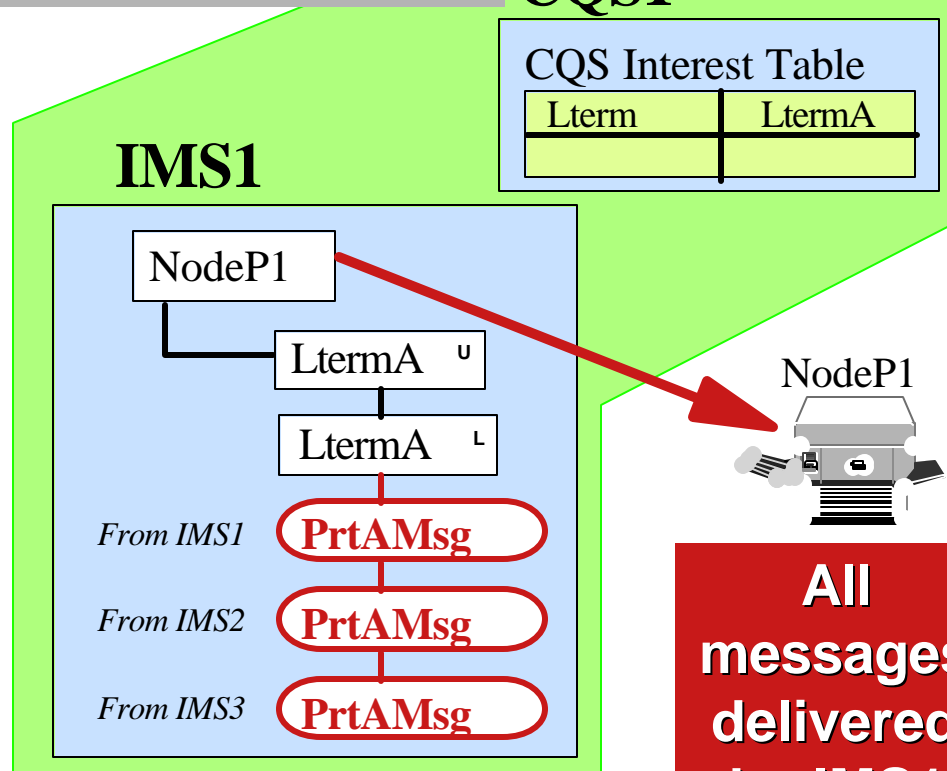
SQs Structure in CF



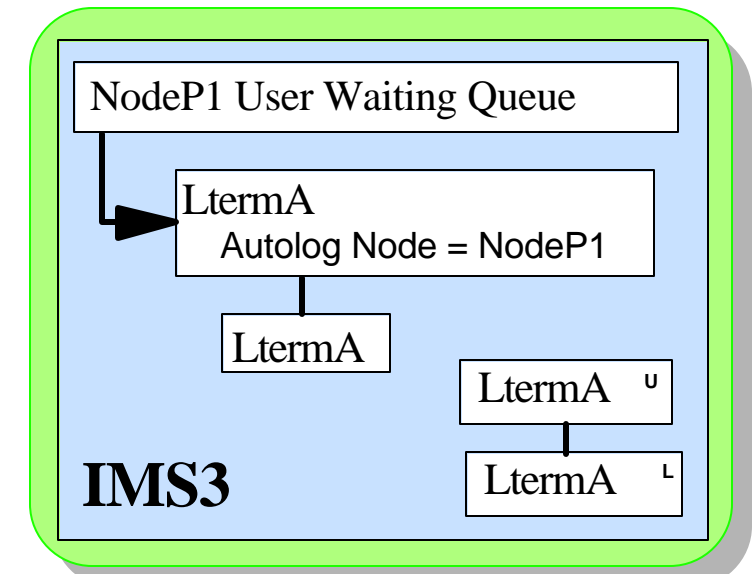
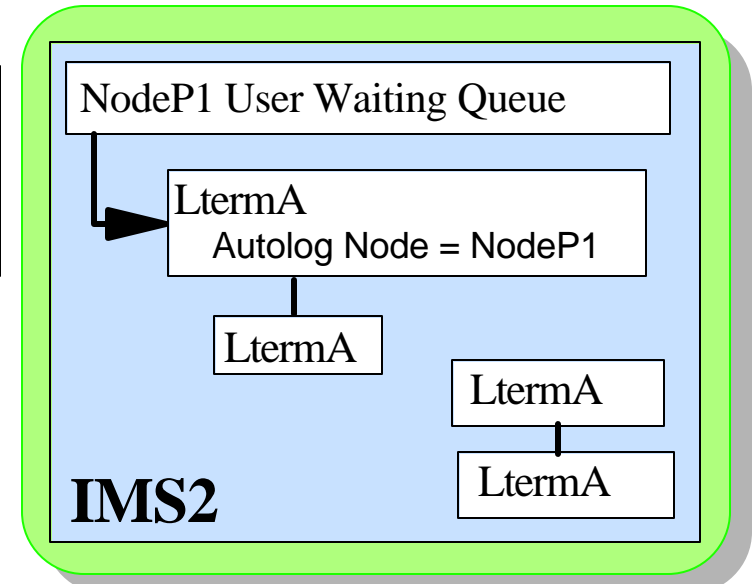
CQS1

CQS Interest Table

Lterm	LtermA



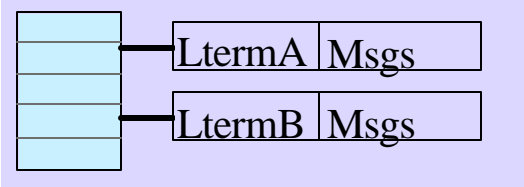
All messages delivered by IMS1



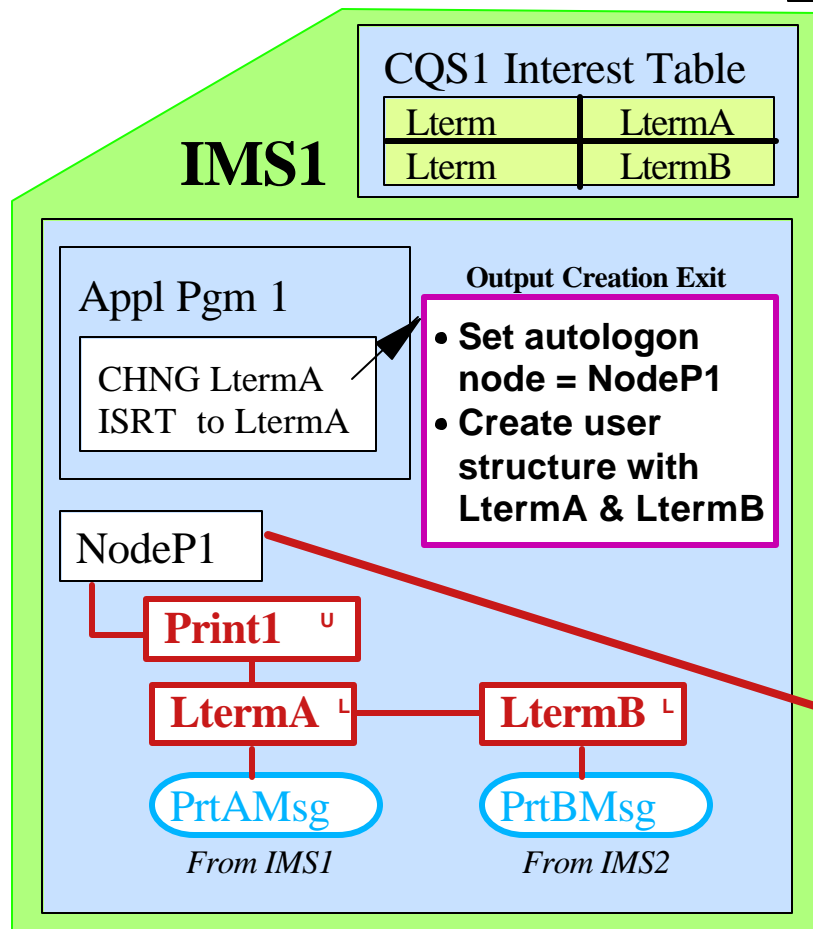
Solution (2)

Alternatively, use **same set of Lterms** on every system

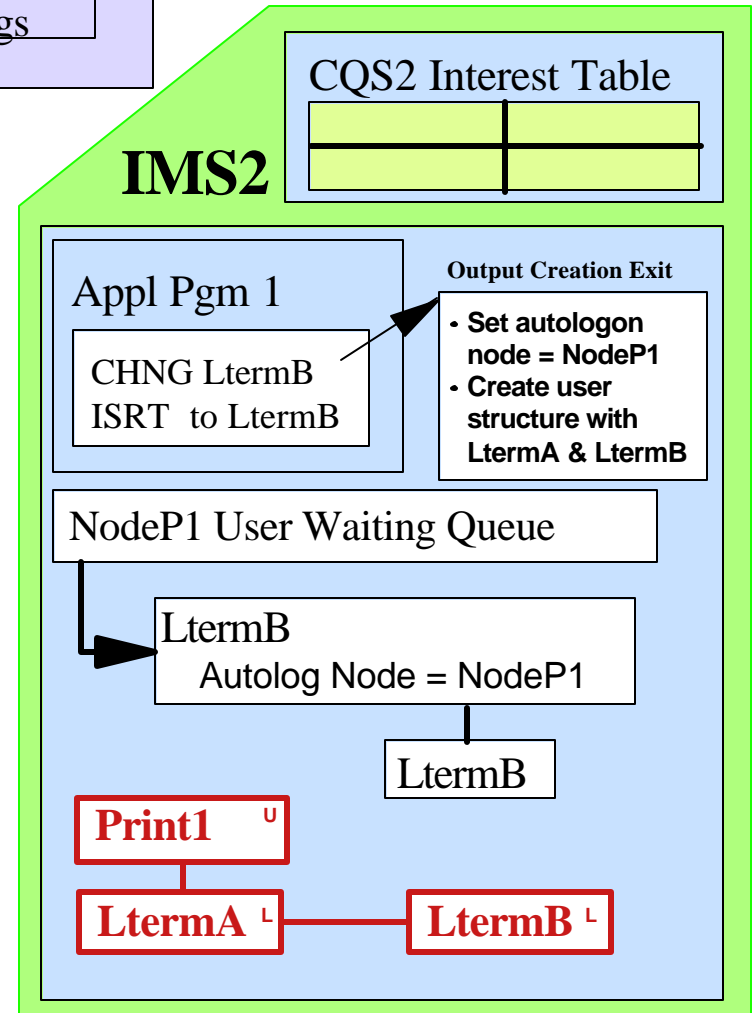
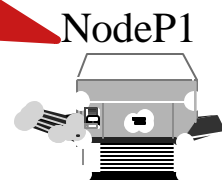
SOs Structure in CF



Still requires use of **NORELRQ**

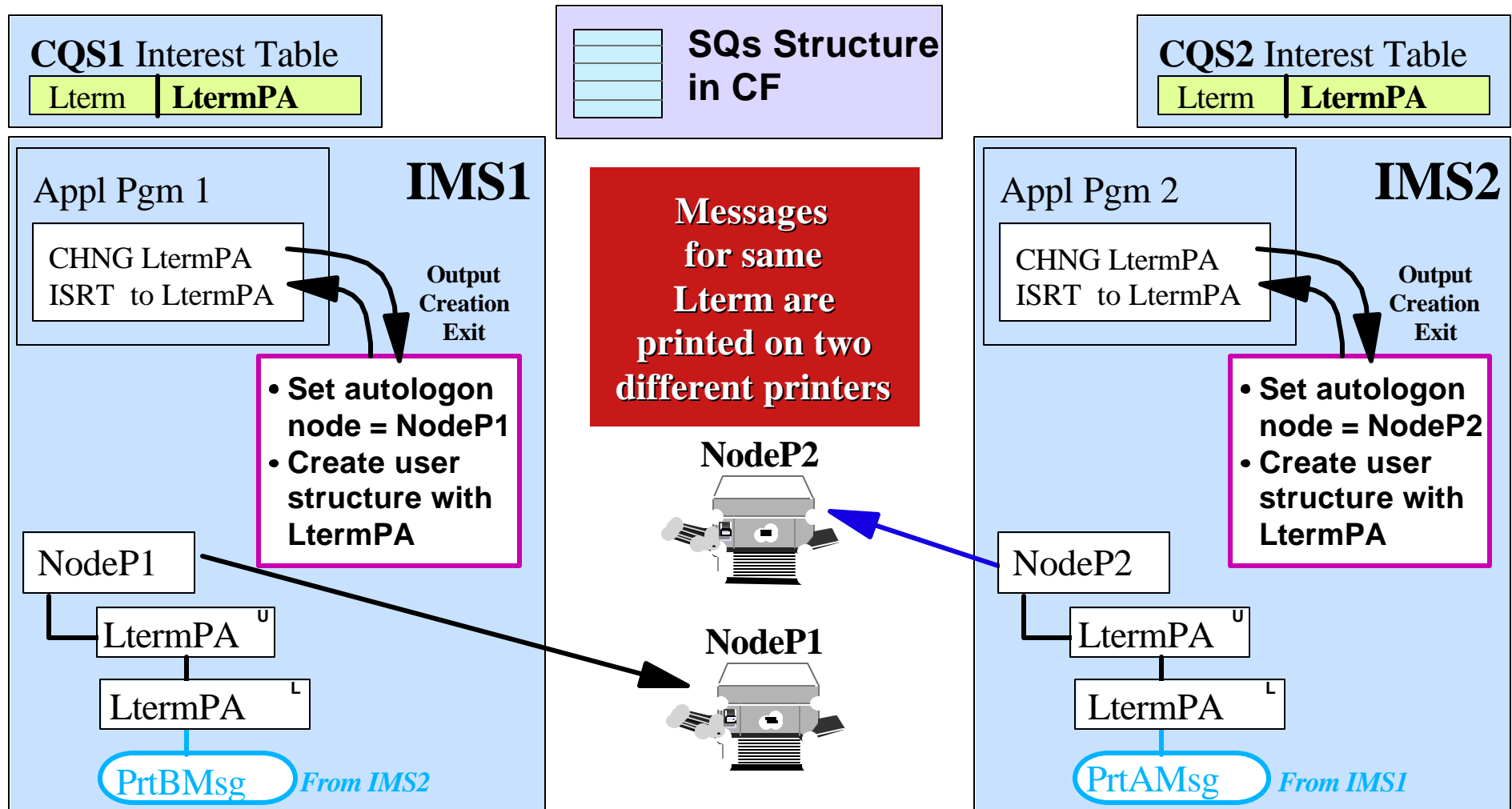


All messages delivered on **IMS1**



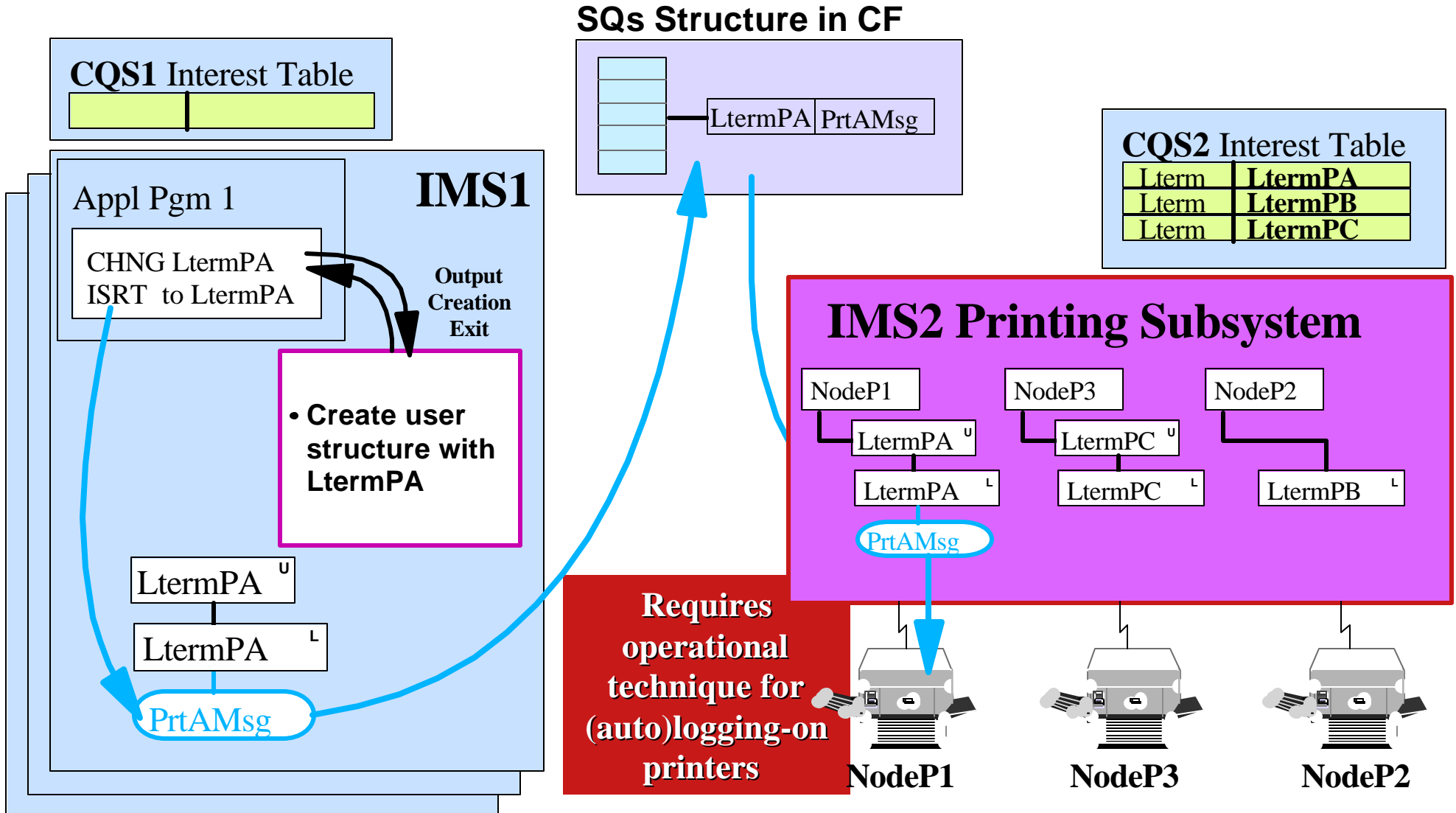
Solution (3)

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.



Solution (4)

One IMS (possibly a separate IMS) manages all Printers



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