

TRANCLASS

Solving Cascade Failures in a Mainframe Transaction Engine with XCF

A production war story from a homegrown z/OS transaction manager

XCF

HLASM

SELF-HEALING

Vini and Pedro | Itau Unibanco | Technical Session | Share – Pittsburgh PA 2026

THE SOLUTION: TRANCLASS

Automatic. Distributed. Proactive.
No human intervention.



PHASE 1 – DETECTION

Transaction arrives, finds no free TCB in the class pool. Class is "topped". Marked locally.



PHASE 2 – COMMUNICATION

XCF broadcast to all instances: "My PIX class is full. Stop sending PIX to me."



PHASE 3 – DIVERSION

Other instances receive the message. PIX destined to the stuck instance is rejected immediately. Fail fast.



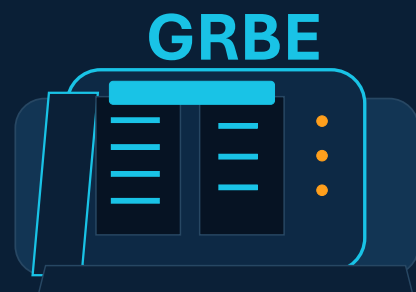
PHASE 4 – RECOVERY

Health monitor detects normalization. Broadcast: "I'm back. Resume normal routing."

Result: The impacted class can be isolated without affecting other workloads or customers. The environment stays healthy.

We built the engine, so we own the hard problems

GRBE is a homegrown TP monitor written in Assembler and tailored to core banking.



z/OS mainframe

- Custom transaction manager
- Multitasking TCB architecture
- Direct DB2 and VSAM integration
- Dispatcher to communication layer
- Customized every day

**Freedom creates leverage.
It also makes every failure mode ours
to solve.**

GRBE processes all core banking transaction lines: account openings, balance inquiries, statements, wire transfers, loans, credit and debit card operations, and more.

PIX is one of many workloads. One overloaded workload can starve all the others.

23 instance pairs. 4 LPARs. One routing mesh.

Each account is owned by the GRBE instance that serves its branch pool.



Gateway distributes requests round-robin across the 23 GRBE instances. The selected instance inspects the payload and branch, then routes the transaction to the branch-owner GRBE where the account VSAM file resides.

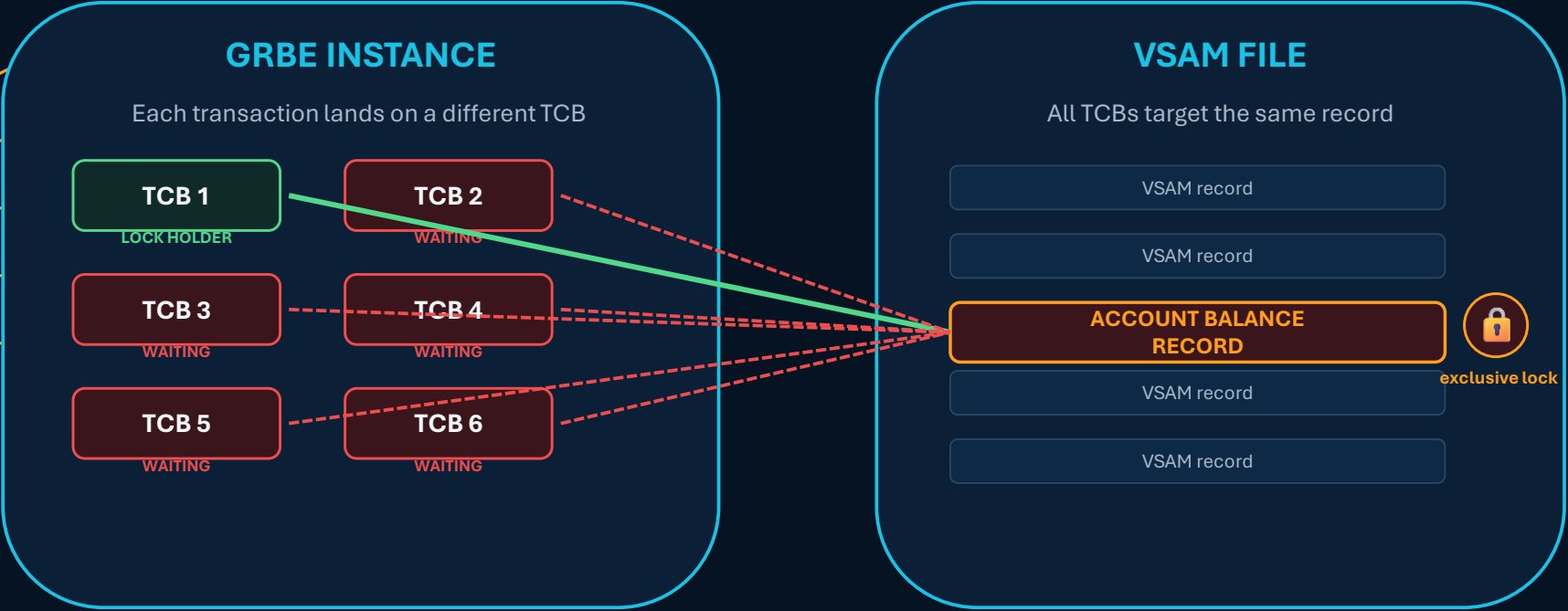
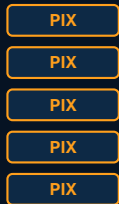
TRANCLASS acts here: before routing to the branch-owner GRBE

PIX turned isolated record locks into systemic risk

PIX can generate many concurrent postings against the same account balance record.

**Hundreds of PIX
per second**

same account receiving
concurrent postings



Only one TCB holds the VSAM record lock

The remaining TCBs wait, consuming execution capacity

The danger is not the lock itself. The danger is occupying the GRBE TCB pool while waiting for the same account balance record.



When one instance stops responding, the mesh starts waiting

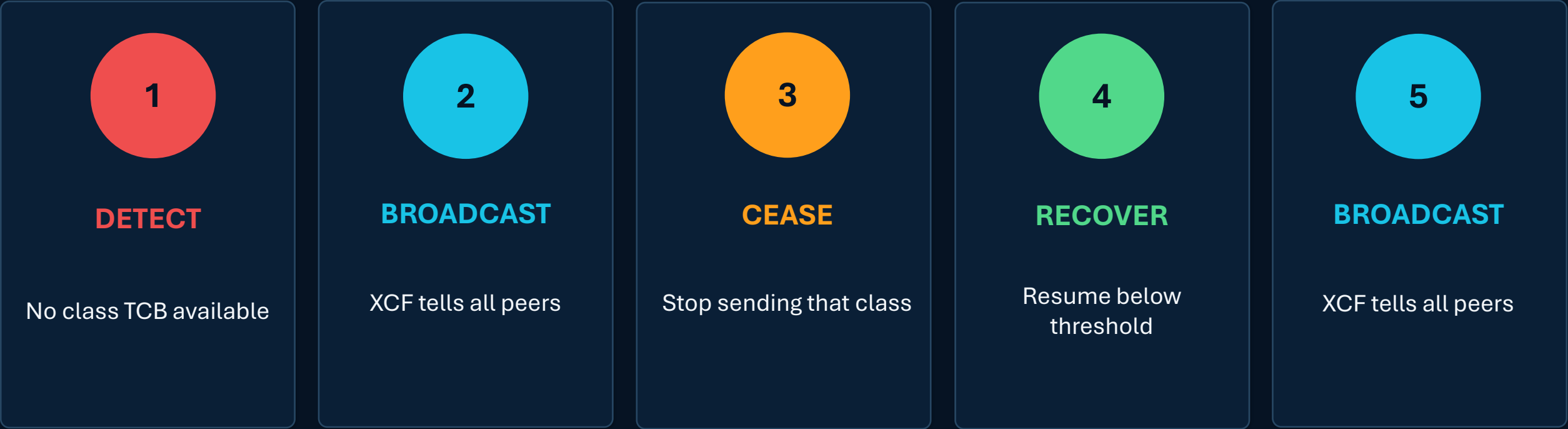
The problem is not limited to the owner GRBE. Other instances keep routing work to it and their own TCBs start piling up in wait.



KEY MESSAGE: with 23 GRBE instances across 4 LPARs, one high-volume account can progressively degrade the entire complex and impact unrelated branches.

Five phases. Distributed. Automatic.

Contain the event, fail fast, and resume routing when capacity returns.



SECONDS, NOT MINUTES



TCP/IP cannot report the failure when its own TCBs are stuck

The notification path must be independent of the transaction path.

TCP/IP via transaction TCBs

- Same workers process business and notify peers
- Workers are waiting on VSAM
- No free execution path for the alert
- Operational deadlock

XCF via dedicated TCB

- Never processes business transactions
- WAIT state when idle
- Wakes on POST
- Always available during saturation

The mechanism that says “I am stuck” cannot depend on the resources that are stuck.

Native Sysplex signaling is the lifeline

One group broadcast, automatic membership, no polling, and an isolated execution path.

Already used before in GRBE

Macros:

- **IXCJOIN** - Join group + register exits

Exits:

- **GRPEXIT** - Member join/leave notice

Implemented features

Macros:

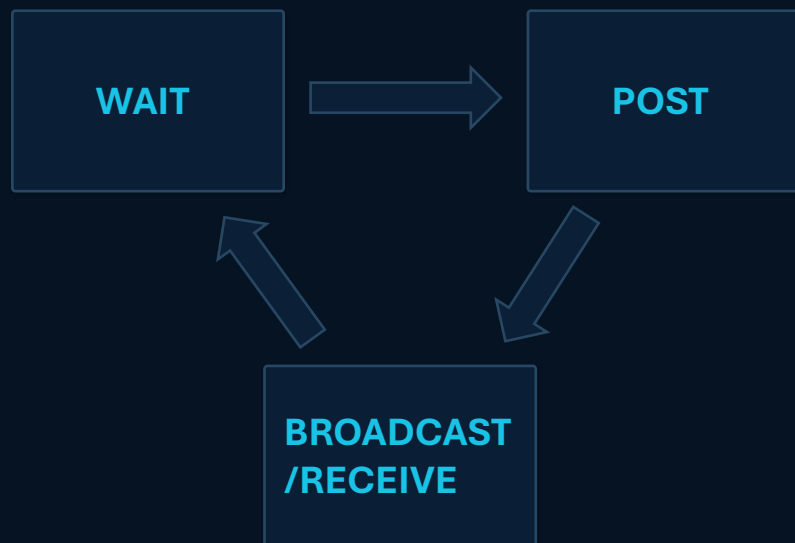
- **IXCMGGOX** - Send Message
- **IXCMGIX** - Receive Message

Exits:

- **MSGEXIT** - Receive routine

Isolate and conquer

A tiny, isolated lifecycle breaks the circular dependency.



Always available

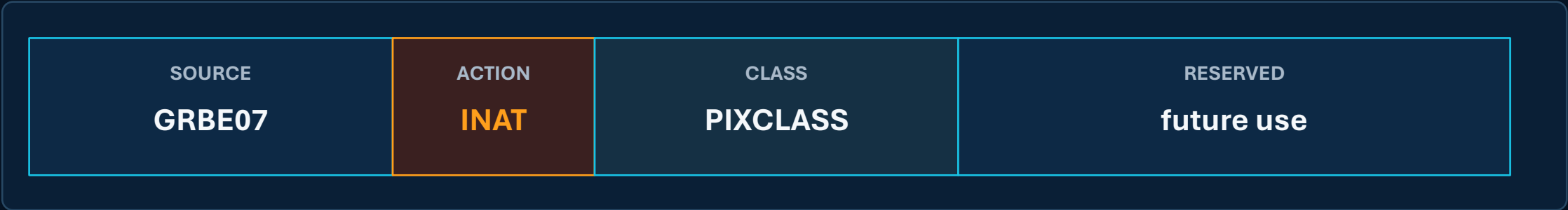
- Created during GRBE initialization
- Joins global and local XCF groups
- Consumes no CPU while in WAIT
- Wakes on a single ECB POST
- Returns to WAIT after handling

Isolation, not raw speed, is the decisive property.



256 bytes. No ceremony.

A compact control message is enough to block or release one class on one instance.



INAT → stop routing this class

ATIV → resume normal routing

Raw bytes through native Sysplex signaling. No XML. No JSON. No protocol overhead.



Incidents? Don't know what this is anymore

There's no longer any need to go to the war room because of those guys.

Number of incidents caused by PIX transactions

WITHOUT TRANCLASS	May	2025	69
WITHOUT TRANCLASS	June	2025	38
WITHOUT TRANCLASS	July	2025	80
WITHOUT TRANCLASS	August	2025	10
WITHOUT TRANCLASS	September	2025	10
WITH TRANCLASS	October	2025	3
WITH TRANCLASS	November	2025	0
WITH TRANCLASS	December	2025	0
WITH TRANCLASS	January	2026	0
WITH TRANCLASS	February	2026	0



Sometimes the best solution is the one the platform already provides.

TRANCLASS

Protecting the complex automatically, 24/7.

Q&A

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