Causal Consistency in an Active-Active Database

When you enable Causal Consistency in Active-Active databases, the order of operations on a specific key are maintained across all Active-Active database instances.

For instance, if operations A and B were applied on the same key and the effect of A was observed by the instance that initiated B before B was applied to the key, then all instances of an Active-Active databases would observe the effect of A before observing the effect of B. This way, any causal relationship between operations on the same key is also observed and maintained by every replica.

Causal consistency side effects

When the Causal Consistency option is enabled, each instance maintains the order of operations it received from another instance and relays that information to all other N-2 instances, where N represents the number of instances used by the Active-Active database.

As a result, network traffic is increased by a factor of (N-2). The memory consumed by each instance and overall performance are also impacted when Causal Consistency is activated.

Enabling causal consistency

When you create an Active-Active database, Causal Consistency is set as:
Once enabled, additional operations to enable or disable can only be performed using the REST API or the crdb-cli tool. In this case, the updated Active-Active database behavior happens only for commands and operations received after the change.

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