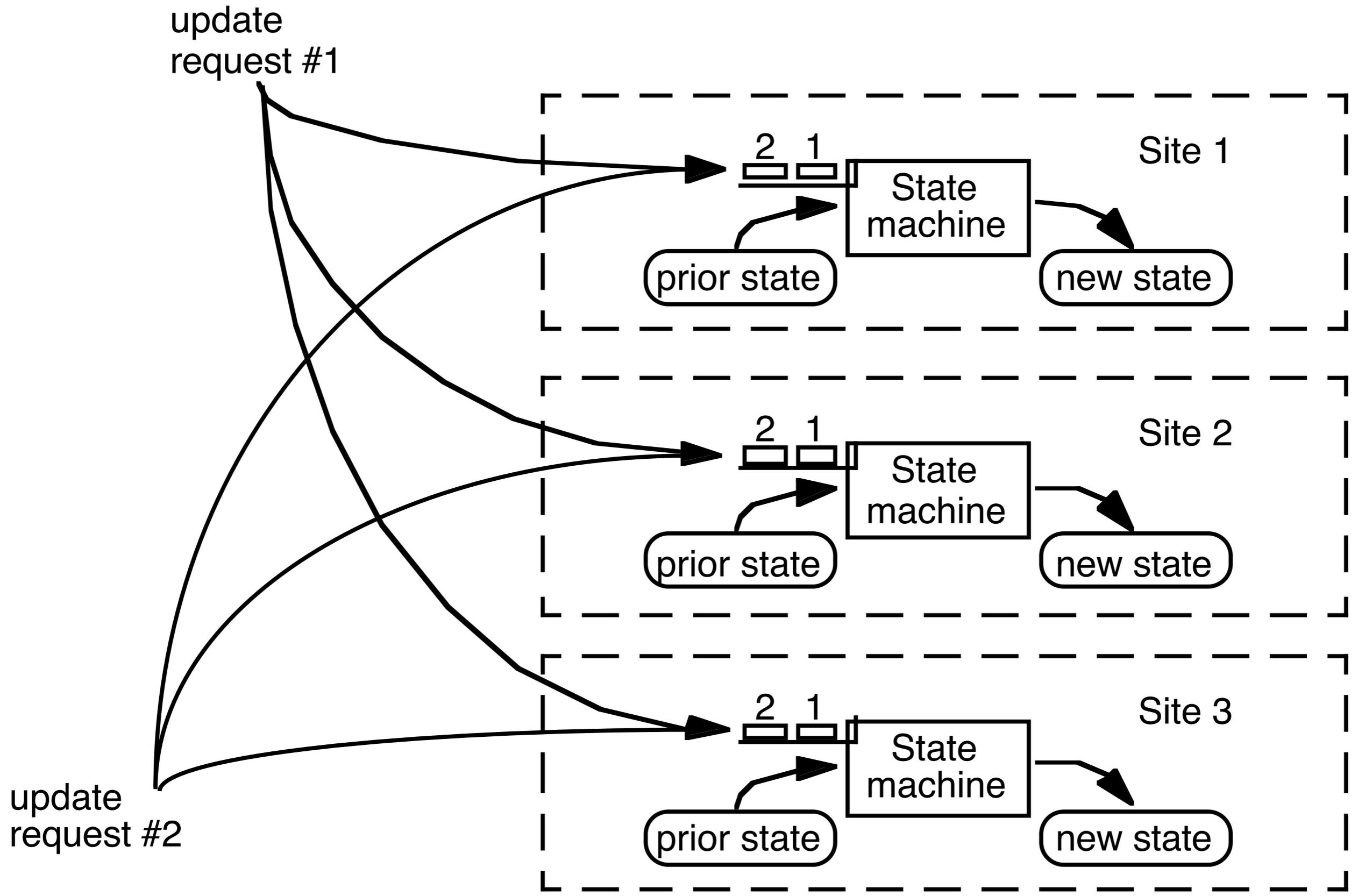


The durability mantra

Multiple copies, widely separated and independently administered...
Multiple copies, widely separated and independently administered...



```
procedure RECONCILE (reference left, reference right,  
                    reference last_reconcile_time)  
  quiesce all activity on left and right // Shut down all file-using applications  
  ALL_OR_NOTHING_GET (last_reconcile_time, reconcile_time_sector)  
  left_list ← enumerate(left)  
  right_list ← enumerate(right)  
  common_list ← intersect(left_list, right_list)  
  left_only_list ← remove members of common_list from left_list  
  right_only_list ← remove members of common_list from right_list  
  conflict_list ← nil
```

```
for each named_file in common_list do // Reconcile files found both sides
  left_new ← (MODIFICATION_TIME (left.named_file) > last_reconcile_time)
  right_new ← (MODIFICATION_TIME (right.named_file) > last_reconcile_time)
  if left_new and right_new then
    add named_file to conflict_list
  else if left_new then
    copy named_file from left to right
  else if right_new then
    copy named_file from right to left
  else if MODIFICATION_TIME (left.named_file) ≠
    (MODIFICATION_TIME (right.named_file)
  then TERMINATE ("Something awful has happened.")
```

```

for each named_file in left_only_list do // Reconcile files found one side
    if MODIFICATION_TIME (left.named_file) > last_reconcile_time then
        copy named_file from left to right
    else
        delete left.named_file
for each named_file in right_only_list do
    if MODIFICATION_TIME (right.named_file) > last_reconcile_time then
        copy named_file from right to left
    else
        delete right.named_file

for each named_file in conflict_list do // Handle conflicts
    MANUALLY_RESOLVE (right.named_file, left.named_file)
last_reconcile_time ← NOW ()
ALL_OR_NOTHING_PUT (last_reconcile_time, reconcile_time_sector)
Allow activity to resume on left and right

```

