D

D_1  D_2  D_3  D_4  D_5
vote 1  2  3  4  5

T_0: No partition

T_1: D_1  D_2  |  D_3  D_4  D_5
     ↑R  |     ↑W
     C_1  |     C_2

T_2: D_1  D_2  |  D_3  D_4  D_5
     ↑R  |     ↑W
     C_1  |     C_2  C_3
\[ \sum V = 15 \]

\[ R = 1 \quad W = 15 \]

\[ T_1: \quad C_1 \rightarrow R \quad \checkmark \]
\[ C_2 \rightarrow W \quad X \]

\[ T_2: \quad C_1 \rightarrow R \quad \checkmark \]
\[ C_2 \rightarrow W \quad X \]
\[ C_3 \rightarrow W \quad X \]

\[ R = 8 \quad W = 8 \]

\[ T_1: \quad C_1 \rightarrow R \quad X \]
\[ C_2 \rightarrow W \quad \checkmark \]

\[ T_2: \quad C_1 \rightarrow R \quad X \]
\[ C_2 \rightarrow W \quad X \]
\[ C_3 \rightarrow X \]
Hierarchical voting

level 1

Data items:

# children of a node at level i = \(2^{l_{i+1}}\)

# nodes at level i = \(2^{i-1}\) = \(l^{(same)}\)

level 1

level 2

level 3

level 4 (data)

Depth = m (A ui the above example)

# rounds of voting = m-1

Read quorum = \(r_i\) (at level i) = r (same)

Write quorum = \(w_i\) (at level i) = w (same)

Successfully m-1

# data replicas I have to contact for reading = \(\&\ r^{m-1}\)

# Writing = w
Total n data replicas
Fixed branching factor = b
Depth of tree \( m = \log_2 n + 1 \)

# votes for read = \( 2^{m-1} \) (read quorum = 2)

\[ m = \log_2 b \cdot 2 \cdot n + 1 \]

\[ n = 5 \]
\[ b = 3 \]

Possible combinations:

R+W possible
\[ X \quad X \quad X \]
\[ ++ \]

R+W not possible
\[ X \quad X \]
\[ o \]
\[ ++ \]