LETTER TO THE EDITOR

Comments on "Three-Stage Multiconnection Networks Which Are Nonblocking in the Wide Sense," by F. K. Hwang*

Two theorems presented in this paper are incorrect. Theorem 2 stated by Hwang can be reformulated as follows.

Theorem 2: $\nu(m, n_1, r_1, n_2, r_2)$ *is nonblocking as a* (q_1, q_2) *multiconnection network under Strategy 2, for* $r_1 \geq q_1q_2n_1$ *and* $r_2 \geq q_1q_2n_2$, *if and only if*

$$m \geq q_1q_2(n_2 - 1) + q_1 + n_1 - 1.$$

Proof: Sufficiency. Consider the connection of the pair (x, Y). The input switch that contains x can be connected already to at most $n_1 - 1$ distinct middle switches under Strategy 2. Each output switch in Y can be connected already to at most $n_2q_1 - 1$ distinct middle switches under Strategy 2. Since $|Y| \leq q_2$, we need q_2 sets of $n_2q_1 - 1$ distinct middle switches, if the sets are disjoint. However, under Strategy 2 these sets are not disjoint and the number of middle switches must be replaced by

$$q_2(n_2q_1 - 1) - (q_1 - 1)(q_2 - 1).$$

Then the total number of middle switches, including one switch that must be available to connect the pair (x, Y), is

$$(n_1 - 1) + q_2(n_2q_1 - 1) - (q_1 - 1)(q_2 - 1) + 1.$$

After rearrangement we obtain

$$m \geq q_1q_2(n_2 - 1) + q_1 + n_1 - 1.$$

The necessity can be proved with ease by presenting the network with

$$m < q_1q_2(n_2 - 1) + q_1 + n_1 - 1,$$

in which a new call is blocked.

Similarly, Theorem 3 can be reformulated as follows.

Theorem 3: $\nu(m, n_1, r_1, n_2, r_2)$ *is nonblocking as a* (q_1, q_2) *multiconnec-*

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tion network under Strategy 3, *for* $r_1 \geq q_1q_2n_1$ *and* $r_2 \geq q_1q_2n_2$, *if and only if*

$$m \geq q_1q_2(n_1 - 1) + q_2 + n_2 - 1.$$

Proof: Analogous to the proof of Theorem 2.

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