# Hyper-Star Graph: A New Interconnection

the network cost, defined by degree £ diameter, is introduced as a measure for interconnection networks [4, 5, 7].

An *n*

**Theorem 1.** *A hyper-star graph $HS(n,k)$ is isomorphic to a hyper-star graph $HS(n,n-k)$.*

Since $HS(n,k)$ is isomorphic to $HS(n,n-k)$, throughout the paper, we assume that $k \leq \frac{n}{2}$ unless explicitly mansion.

## 2.2 Connectivity

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For two nodes $S = s_1 s_2 \ldots s_n$ and $D = d_1 d_2 \ldots d_n$, denote by $R = r_1 r_2 \ldots r_n$ the bit string obtained by applying *Exclusive-OR* operation between $S$ and $D$. We use © to represent the Exclusive-OR operator. Each $i$-dimensional edge,

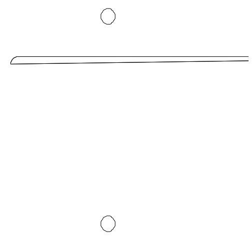

Fig. 3. $FHS(4, 2)$ graph

the hypercube and its other variations such as folded hypercube[6], multiply-twisted cube[4], and hierarchical cubic networks(HCN) [8]. Basic parameters such as the size, degree, diameter and the network cost of folded hyper-star graph, hypercube and its other variations are shown in Table 1.

Table 1. Network cost of the hypercube and its variations

| Network Model |
| --- |

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Shortest_path_2(S; D; P_s)
begin
    k = 0;
    if (S = D) then
        return P_s;
    obtain R = r_1 r_2 ... r_i ... r_2n, where r
```