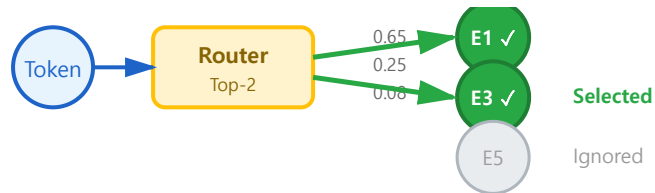


## Expert Routing Strategies & Selection Mechanisms

### Top-K Routing

★ Most Used



- Select K experts with highest scores
- Typical K=2 for efficiency
- Ensures sparse activation

### Soft Routing

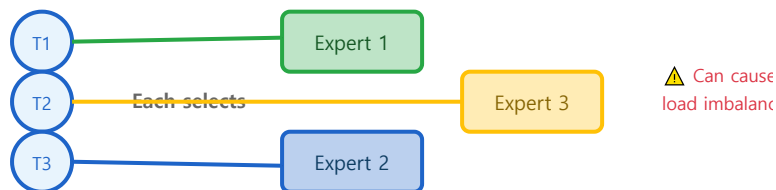
Smooth



- Weighted combination of all experts
- Smoother gradients during training
- Higher computational cost

### Token Choice

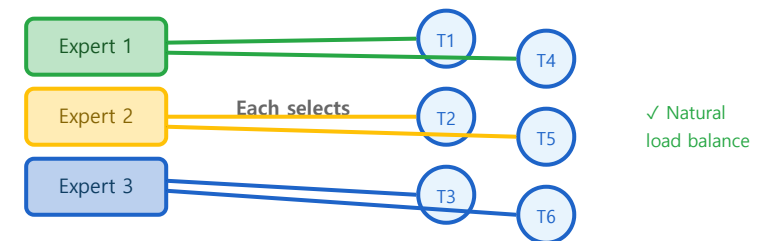
Specialized



- Each token selects its experts
- Better specialization

### Expert Choice

Balanced



- Experts select tokens to process
- Natural load balancing

- Can lead to load imbalance

- Used in Switch Transformer (Google)



### Routing Strategy Trade-offs

Different routing strategies balance between specialization quality, computational efficiency, and load balancing. Medical AI typically uses **Top-2 routing** for optimal performance with sparse activation.