Subject: Re: Custom vs. commodity networks
Posted by Alexander Mann on Tue, 01 Jun 2004 08:30:53 GMT
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To start the discussion, I have just collected some arguments pro and against the two network classes:

commodity networks:

(Ethernet, ATM, SCI, HIPPI, ...) everything one can simply buy.

+ No major hardware development needed. Chips are widely used and well tested.
+ Low price because of high quantities.
+ Components are available within short time. No expensive stock-keeping for spare parts.
+ Switches or interface cards come fully tested from the manufacturer. We do not have to worry about making them work or about repairing them.
+ Configuration by protocol software, so changes are easy to apply.

- Our problem might not perfectly fit in the existing network technologies, so we have to oversize the network system.
- High bitrate / bandwidth components still are quite expensive.

custom networks:

+ We can optimize the network implementation to our specific needs.
+ High usable bitrate, due to low protocol overhead.
+ Additional features (like time and clock distribution) can be implemented.

- All hard- and software design work has to be done by ourselves.
- If chips are not tested well, design changes might become very expensive.
- If the network requirements change, the custom implementation might become obsolete and a new implementation might be necessary.

Some other interesting questions are:

How shall the network behave in error conditions (defective computing / routing node or link). Should the network find a way to work around the error, or should there be a supervisor which determines the entire network routing?
How is the performance affected by these two implementations?
What error detection or correction is needed?
Can our network requirements be mapped on existing network hardware or do we need something completely different?

Regards,

Alexander Mann