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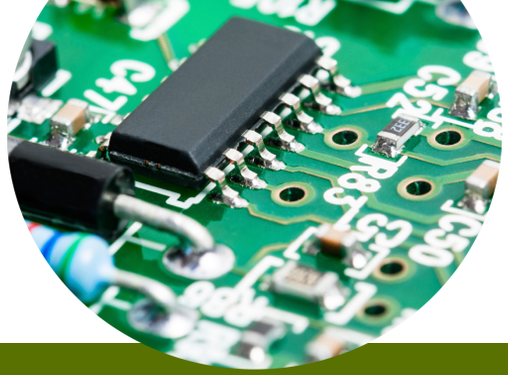

Fault-Tolerant Routing

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Dear Colleagues,

Networked computers and Internet formed the biggest working machine ever made by human. Applications for this machine are enormous and amount of them growing.

Regretfully, vast majority, if not all of them, is about to make our life more convenient, comfortable, easier, and not making human better, healthier or safer. I have a feeling that we all do “what we can” instead of “what we have to…”

The latter ones require substantially different properties of this machine: using networked computers for real time monitoring of nuclear reactor, air-traffic control, health monitoring, other real-time and safety critical missions requires serious reshuffle of the whole world of connected computers (CC).

Thus making shift to real-time safety critical use of CC we have to redo our system software toward real-time fault tolerant functioning, our links to make more reliable and resilient, our computers, especially serving for communication ones - routers to be fault tolerant and available at order of magnitude higher than today. What can we do to make it shift??

Threesome answer is proposed:

Routing algorithms should be analyzed and redone where necessary to be able to operate with hardware degradation with minimum or no losses of availability for CC system as a whole

Router hardware has to be redesigned with performance-, reliability- and energy-wise (PRE) properties for CC systems

Protocols known and future ones should be re-designed or designed from scratch addressing mentioned properties of the whole system and its main elements.

Primarily, we have to achieve extreme availability of backbones of CC world – routers, making them fault tolerant, with no degradation in performance or overheads in power consumption.

Clear, it is easier to say that to do. Clear, all actions and solutions proposed to address bullet points above should be accompanied by analysis of gains in PRE properties.

Dr. Igor Schagaev

Guest Editor

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