This chapter emphasizes the need to adopt a systemic approach to the engineering of modern computing

and communication systems. Such an approach is critical to the future of large-scale systems such as

clouds. A systemic approach is also critical to the development of other complex systems such as

cyberphysical and sociotechnical systems, which are increasingly important in the modern computing

landscape, along with computer clouds.

Complex systems exhibit different patterns of behavior than traditional systems and require new

design principles based on a deeper understanding of the physical properties of their components and

of the manner in which they interact with one another and with the environment. The new thinking in

complex system design has to be an ab-initio concern rather than an afterthought.