This thesis investigates the deployment modeling in the scope of Progress, a research vision that aims to tackle the increasing complexity of embedded software systems by adopting a software-component approach. The rst phase of the Progress deployment process, which is in the focus of this thesis, de nes virtual nodes architecture as an abstraction of target platform devices where components are allocated. Based on the Progress development process analysis, the thesis identi es concerns that need to be addressed by the ProCom component model to support the concepts of virtual nodes and allocation, proposes the extension of the ProCom meta-model and the design of allocation in general. The thesis also provides an implementation of a tool support incorporated into the Eclipse application that forms the basis of the Progress IDE. The implementation, whose main goals are to prove the correctness of the ideas and alleviate the deployment in the IDE, integrates rich graphical editors that support the modeling of virtual platform and allocation of components.