

## 6. Future Research Perspectives

### 6.1 ARM CPU Support

VMware, the recognized leader in x86 virtualization, is now closely following developments in ARM's technology ecosystem and has a team dedicated to porting the VMware ESXi™ hypervisor to the ARM8 architecture. There is currently insufficient server market demand to justify releasing this as part of a product portfolio, however, VMware is very interested in exploring new market opportunities with customers and partners in the embedded space to help shape strategy moving forward. There are use cases in the area of providing high availability and fault tolerance for systems related to automated/driverless driving, and in providing a flexible way to use the compute power of head units by securely separating applications through virtualization.

### 6.2 Vision: The Software-Defined Car

VMware has shown that the software-defined approach has many advantages for data centers as differentiating intelligence has moved from dedicated hardware to software run on less task-specific hardware. VMware introduced compute virtualization many years ago and virtualization has since become mainstream, dramatically increasing server utilization while maintaining consistent response time. VMware is now able to virtualize networks as well. VMware helps the telecommunication industry to virtualize functions that up until now have been provided by highly specialized appliances. This is called network function virtualization, or NFV. However, VMware takes this a step further and virtualizes every function of IP networks using VMware NSX™. This approach radically simplifies the network across the entire data center and provides unprecedented security by easily microsegmenting the various virtual components.

VMware can apply the same principles to automobile electronic components. The VMware approach is to virtualize the functions, which today reside in specialized ECUs, the same way network functions for the telecom industry were virtualized—the software from the ECU is virtualized, thus becoming a virtualized control unit (VCU).

Figure 7. From ECUs to VCUs

#### Vision – The Software-Defined Car

