

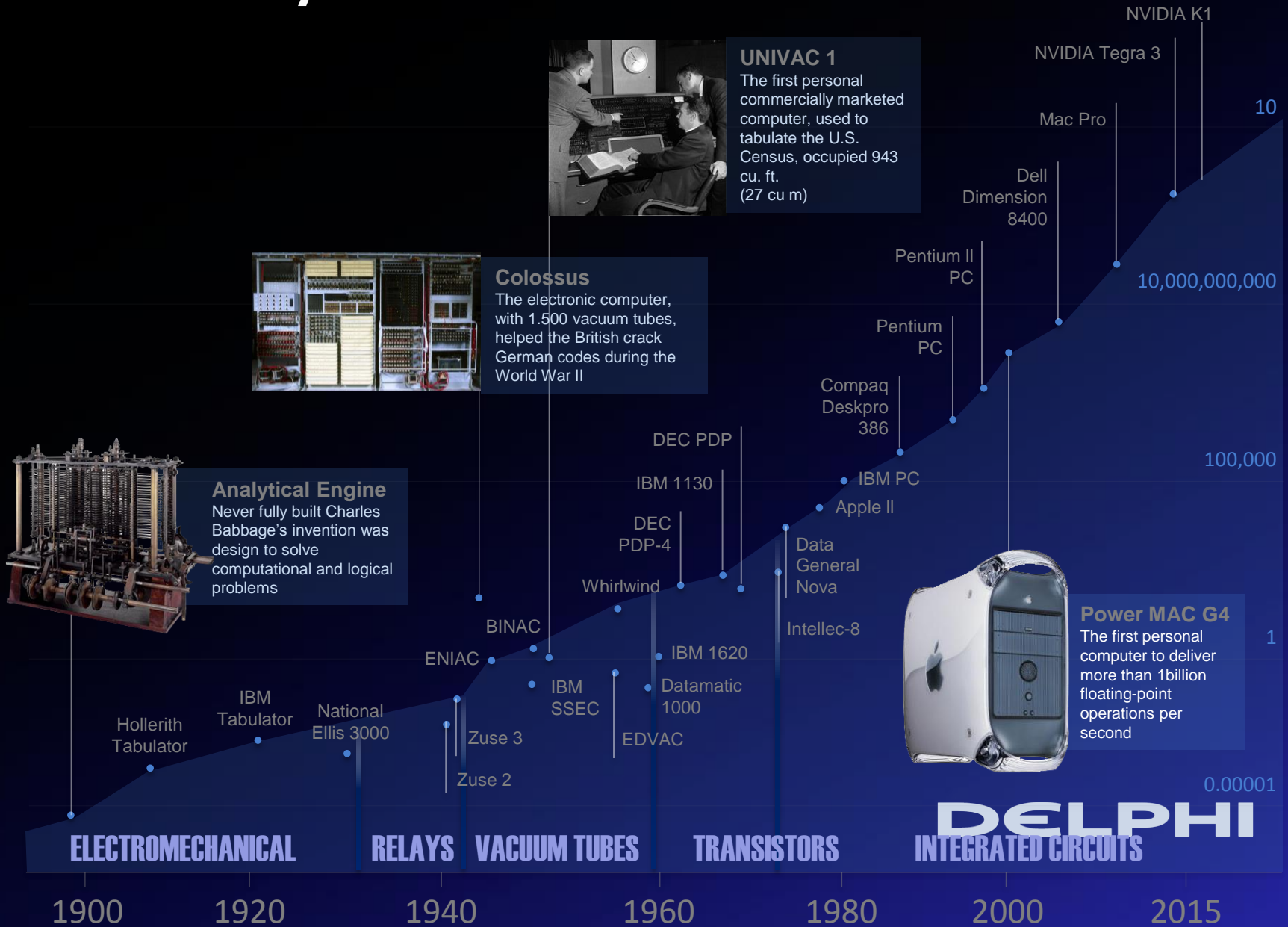
# Enabling Next-Gen Vehicle Architectures with Embedded Supercomputing

March 17, 2015

**Uday Pitambare**

Software Engineer, Delphi Labs @ Silicon Valley

# Computing Power has Evolved Dramatically and Made it's Way into Automotive



**Analytical Engine**  
 Never fully built Charles Babbage's invention was design to solve computational and logical problems

**Colossus**  
 The electronic computer, with 1,500 vacuum tubes, helped the British crack German codes during the World War II

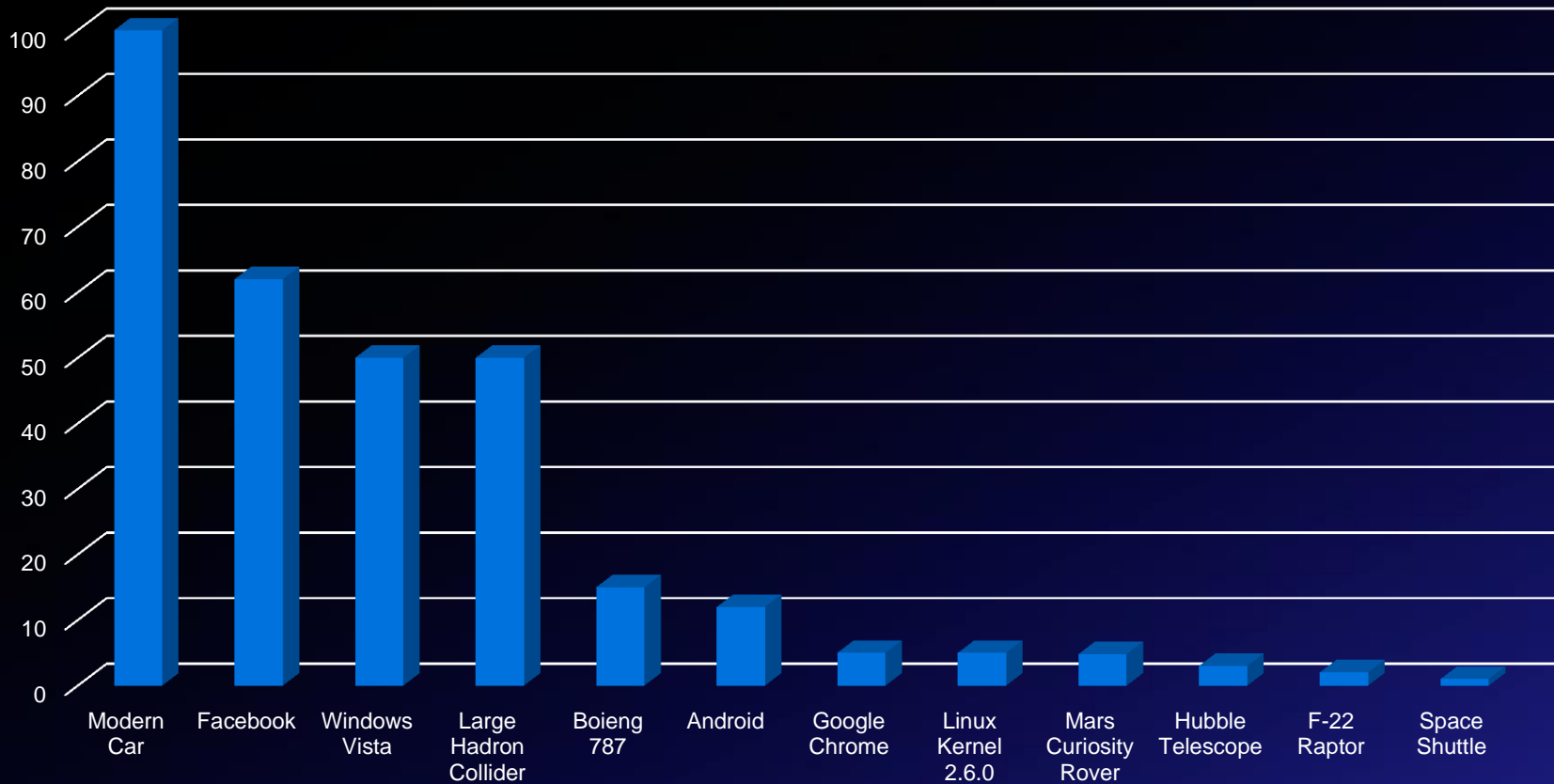
**UNIVAC 1**  
 The first personal commercially marketed computer, used to tabulate the U.S. Census, occupied 943 cu. ft. (27 cu m)

**Power MAC G4**  
 The first personal computer to deliver more than 1billion floating-point operations per second

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 INTEGRATED CIRCUITS

# Software

Software Size(Million Lines of Code)

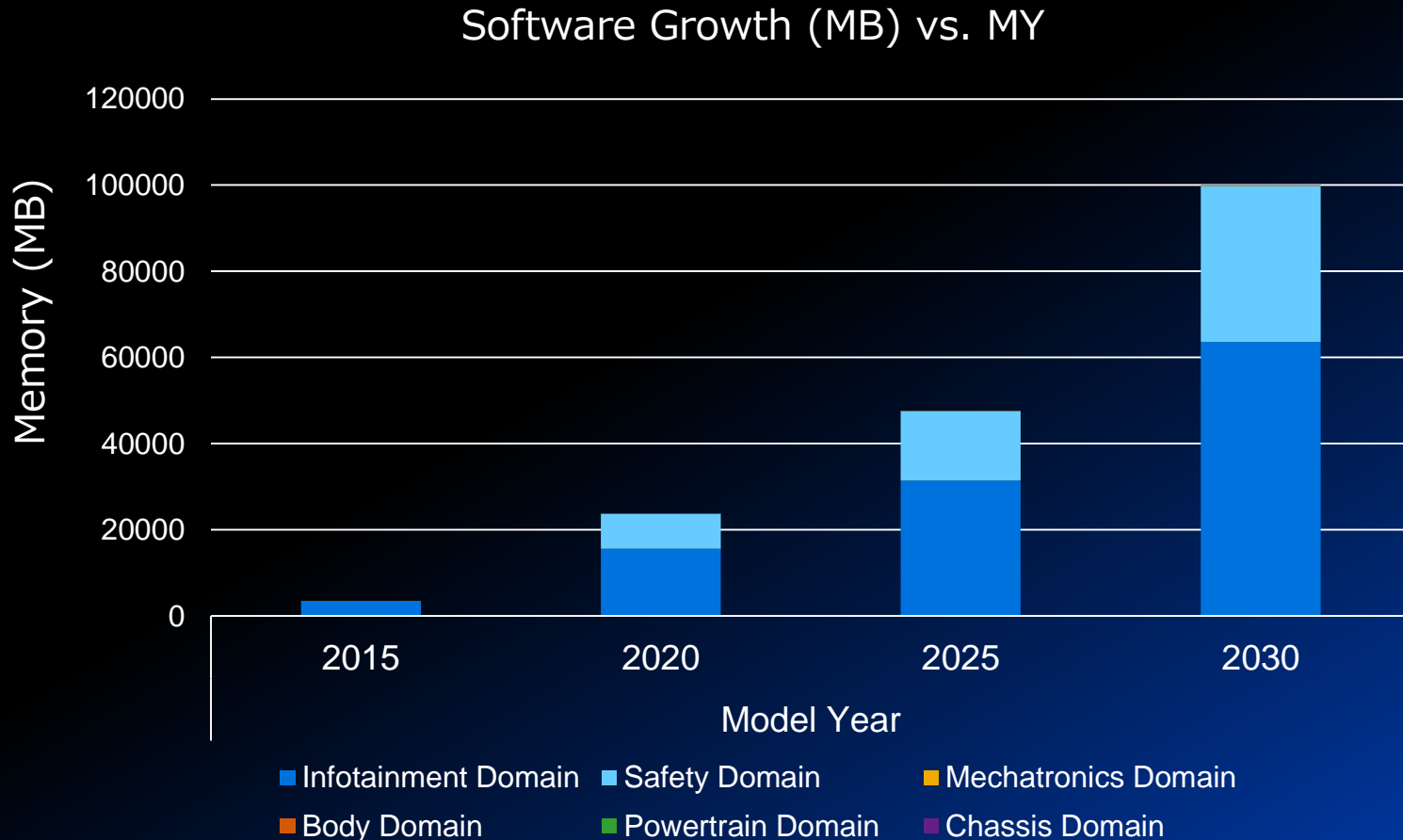


<https://www.linkedin.com/pulse/20140626152045-3625632-car-software-100m-lines-of-code-and-counting>

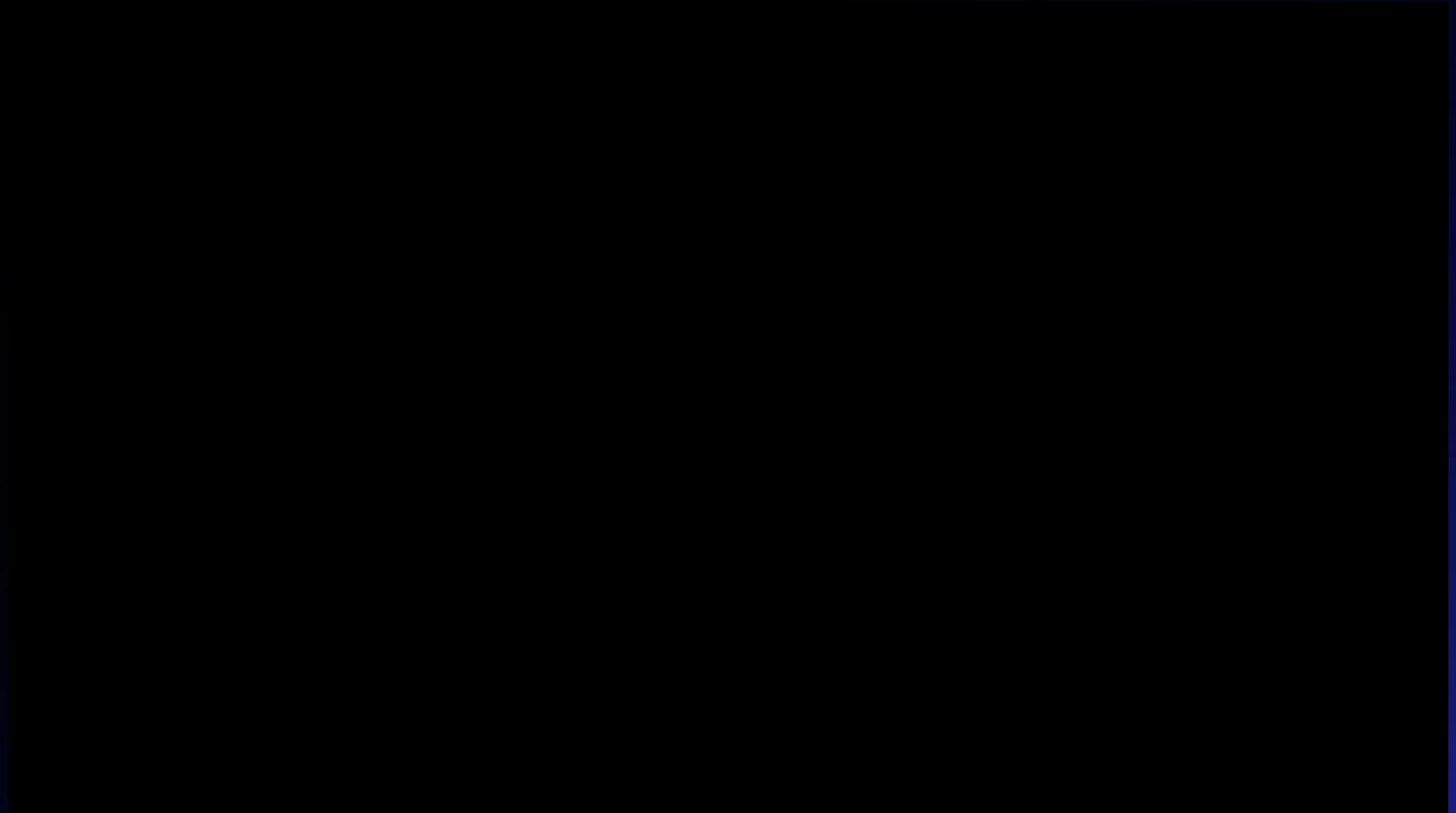
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# Automotive Domain S/W Growth

- Primary Drivers of S/W Growth are in Infotainment and Safety Domains



# CES2015 Jeep



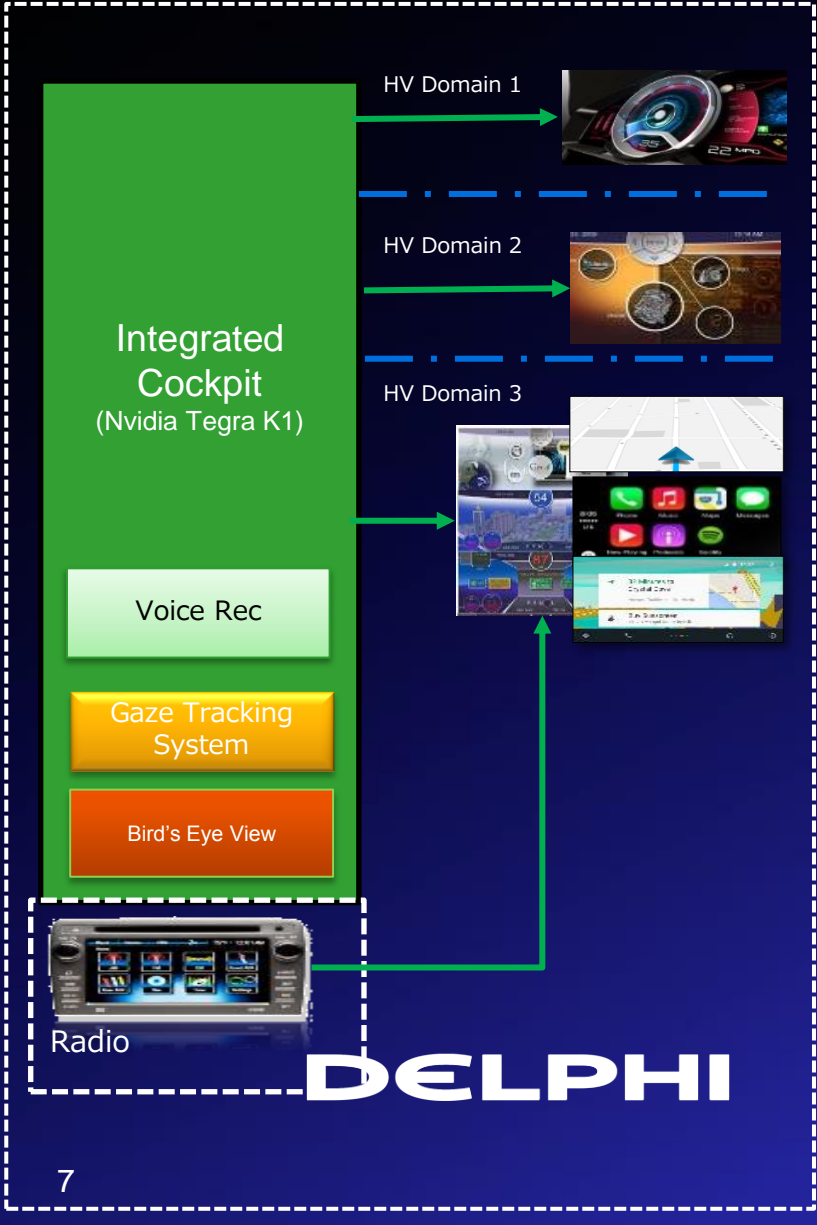
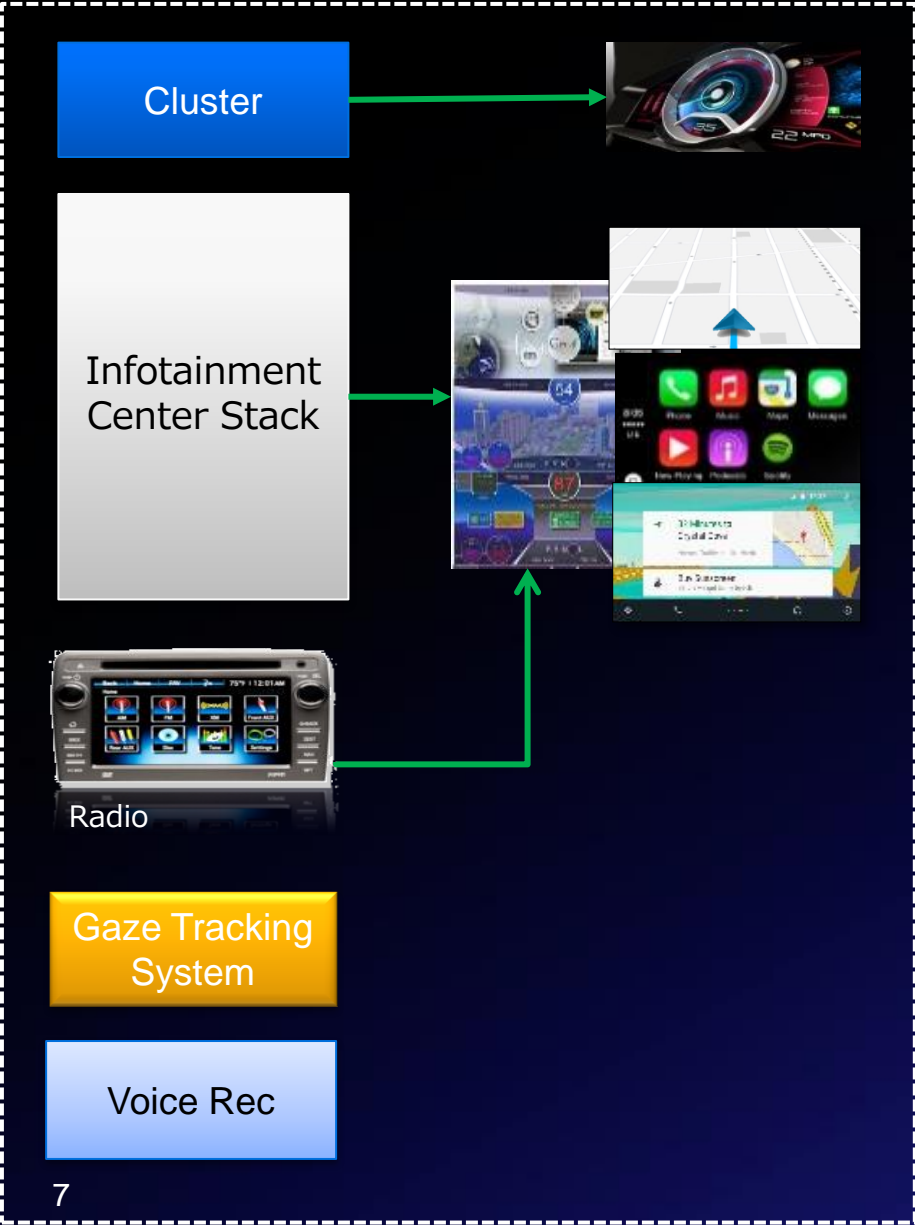
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# CES2015 Automated Driving



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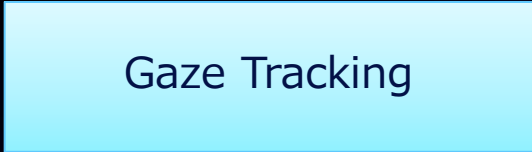
# Integrated Cluster feature migration



# Software Partitioning

CPU  
cores

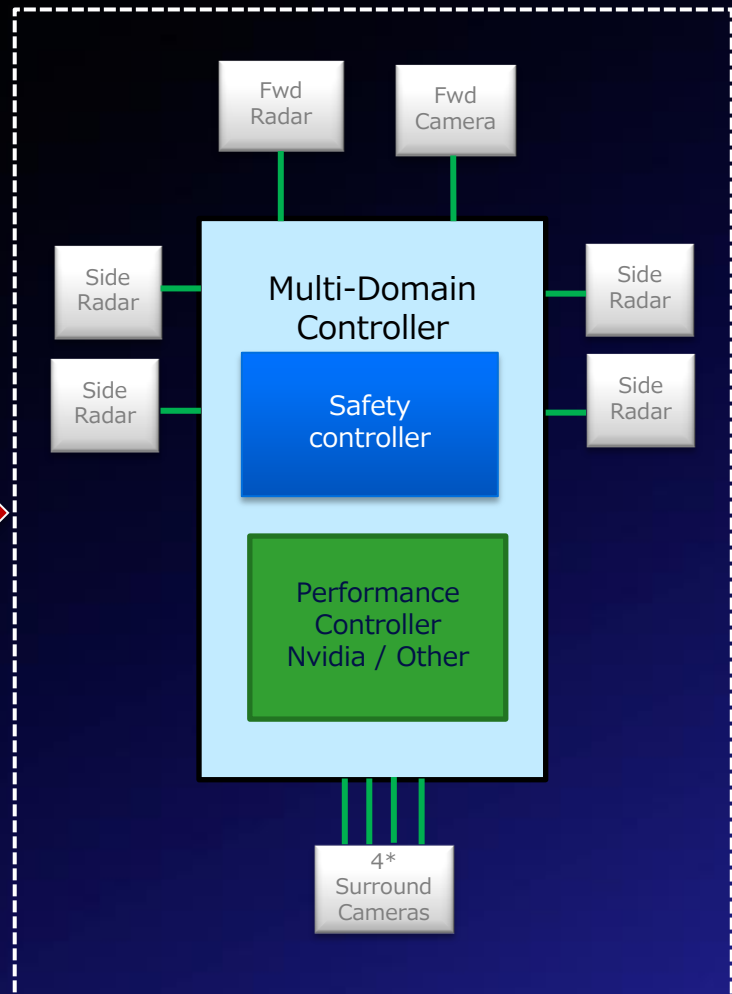
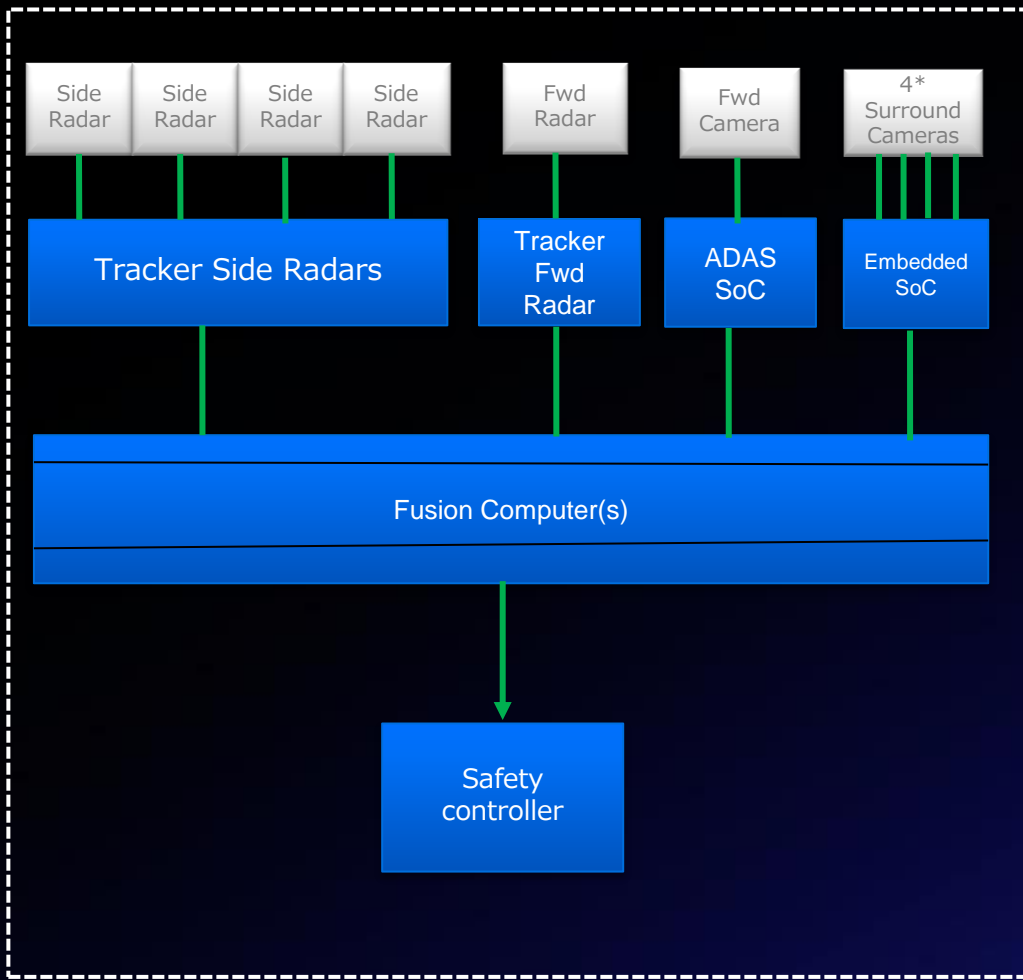
GPU / DSP  
cores



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# Delphi Multi-Domain Controller



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# Software Partitioning

CPU cores

GPU / DSP cores

Target Selection/  
Threat Assessment/  
Situation awareness

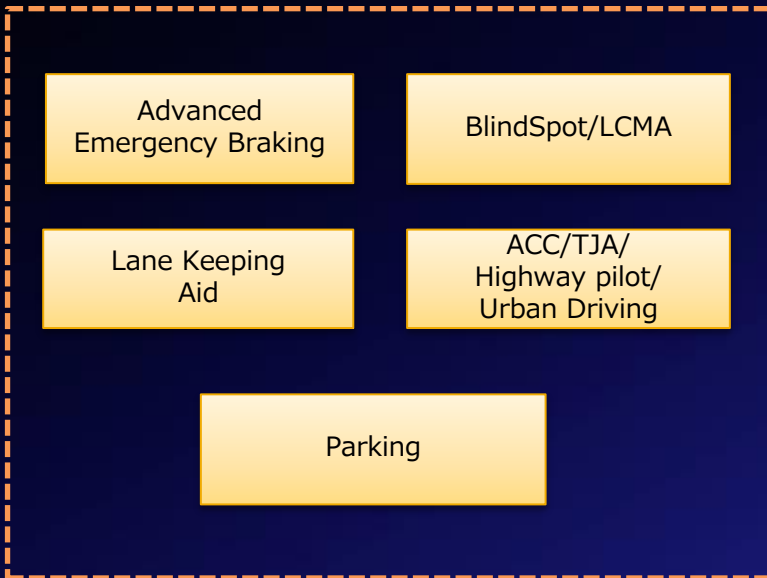
Radars  
Tracker Apps

Stitching

Timing /  
Synchronization

Delphi Fusion  
360

Bus Interface  
Management



360 Obj  
Detection

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# Benefits



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# Challenges



Separation of safety critical and non safety critical components

Functional Safety

Bandwidth Management

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# Questions

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