IDF2010
INTEL DEVELOPER FORUM

Connected, Intelligent, Pervasive

Transformations in Embedded Computing

Doug Davis
VP Intel Architecture Group
GM Embedded and Communications Group

Embedded Fueling the Intel Architecture Continuum of Computing

CE

Embedded

Handheld

Netbook

Laptop

Desktop

Enterprise Server

High Performance Computing

Internet Data Center

Embedded Fueling the Intel Architecture Continuum of Computing

CE

Embedded

Handheld

Netbook

Laptop

Desktop

Enterprise Server

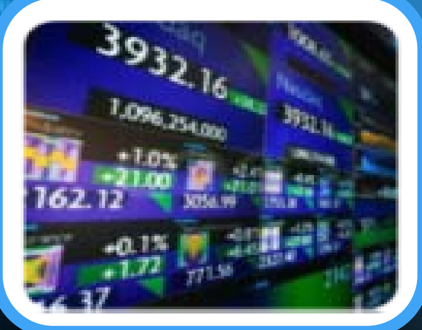
High Performance Computing

Internet Data Center

China Leading in Embedded Computing


Telecom


Digital Security
and Surveillance


Digital Signage


Transportation

Telecommunications

2009:
Telecom Bandwidth Consumption Growing Exponentially

Video

YouTube
Broadcast Yourself

74B minutes

Mobile Devices

72M users
3B downloads

VoIP

skype™

521M Users
Worldwide

M2M

76M Smart Meters
Worldwide

Network Investment Outpacing Revenue Growth

3G & LTE Networks

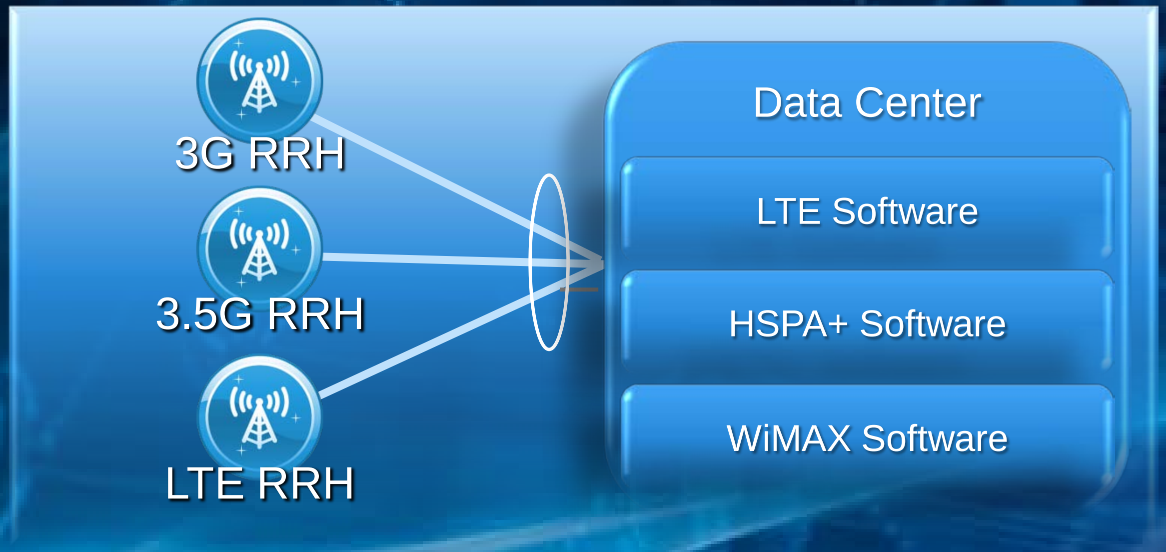
1. Hardware defined Network Elements
2. Highly specialized, multi-architecture hardware

Network Investment Outpacing Revenue Growth

3G & LTE Networks

1. Hardware defined Network Elements
2. Highly specialized, multi-architecture hardware

Next Generation Network



1. Software Defined Network Elements
2. Standard off-the-shelf hardware


中华人民共和国万岁
世界人民大团结万岁

4:1 Workload Consolidation

Unleashed by Multi-Core IA and Software

Wireless Infrastructure

Enterprise Security

Routing & Switching

IP Services

One Instruction Set Architecture
One Tool Suite
Multiple Opportunities

Intel Quick Assist Technology Community

WIND RIVER

6WIND

4:1 Workload Consolidation
Unleashed by Multi-Core IA and Software

Wireless Infrastructure

Enterprise Security

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4:1 Workload Consolidation
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Wireless Infrastructure


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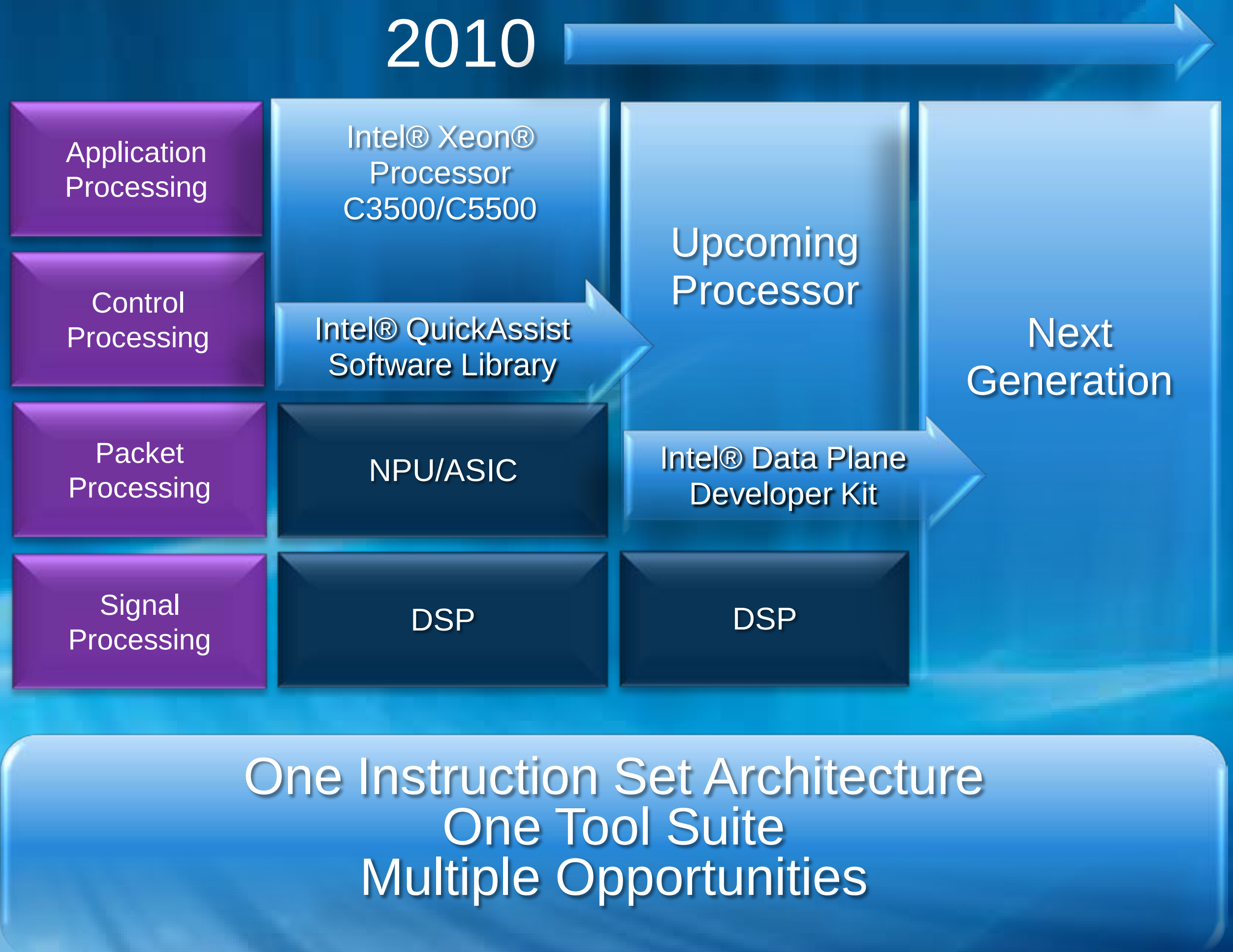
IP Services

intel Xeon inside

intel CORE inside



One Instruction Set Architecture
One Tool Suite
Multiple Opportunities

Intel Quick Assist Technology Community

WIND RIVER

6WIND

4:1 Workload Consolidation
Unleashed by Multi-Core IA and Software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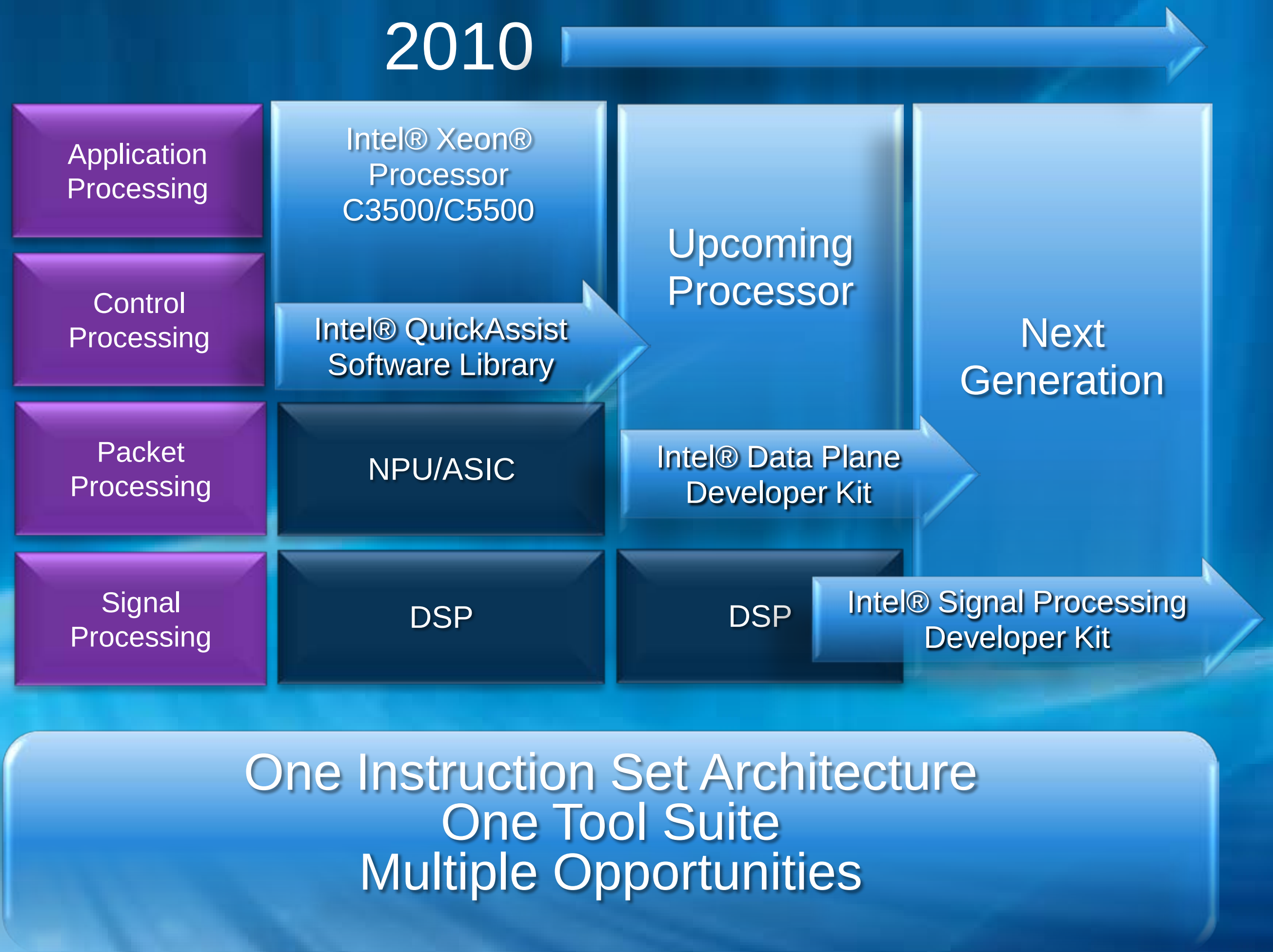

2010

Application Processing

Control Processing

Packet Processing

Signal Processing

Intel® Xeon® Processor C3500/C5500

Intel® QuickAssist Software Library

NPU/ASIC

DSP

Upcoming Processor

Intel® Data Plane Developer Kit

DSP

Next Generation

Intel® Signal Processing Developer Kit

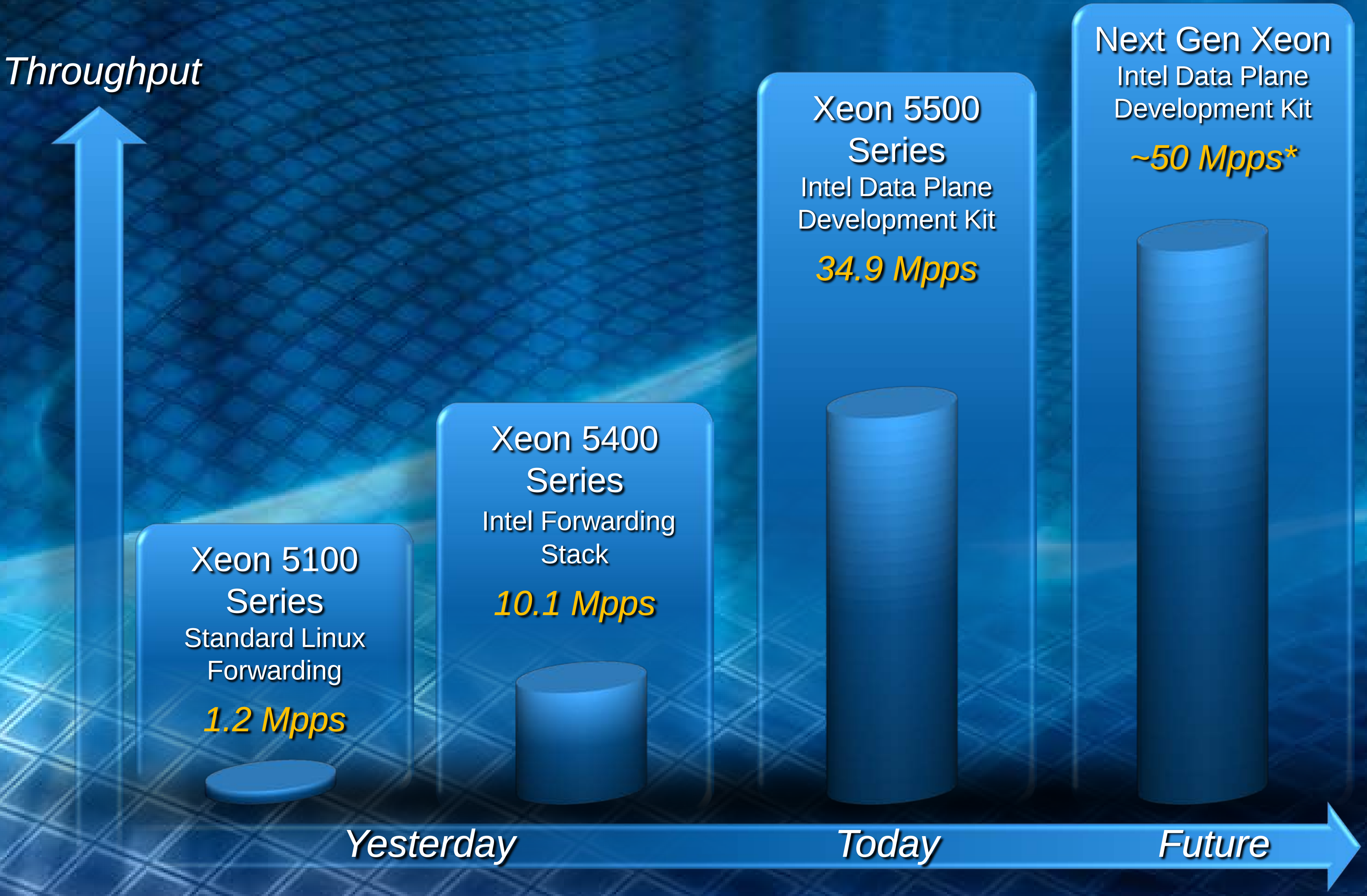
One Instruction Set Architecture
One Tool Suite
Multiple Opportunities

Intel Quick Assist Technology Community

WIND RIVER

6WIND

Packet Forwarding Performance Horizon



Throughput

Xeon 5100 Series
Standard Linux Forwarding
1.2 Mpps

Xeon 5400 Series
Intel Forwarding Stack
10.1 Mpps

Xeon 5500 Series
Intel Data Plane Development Kit
34.9 Mpps

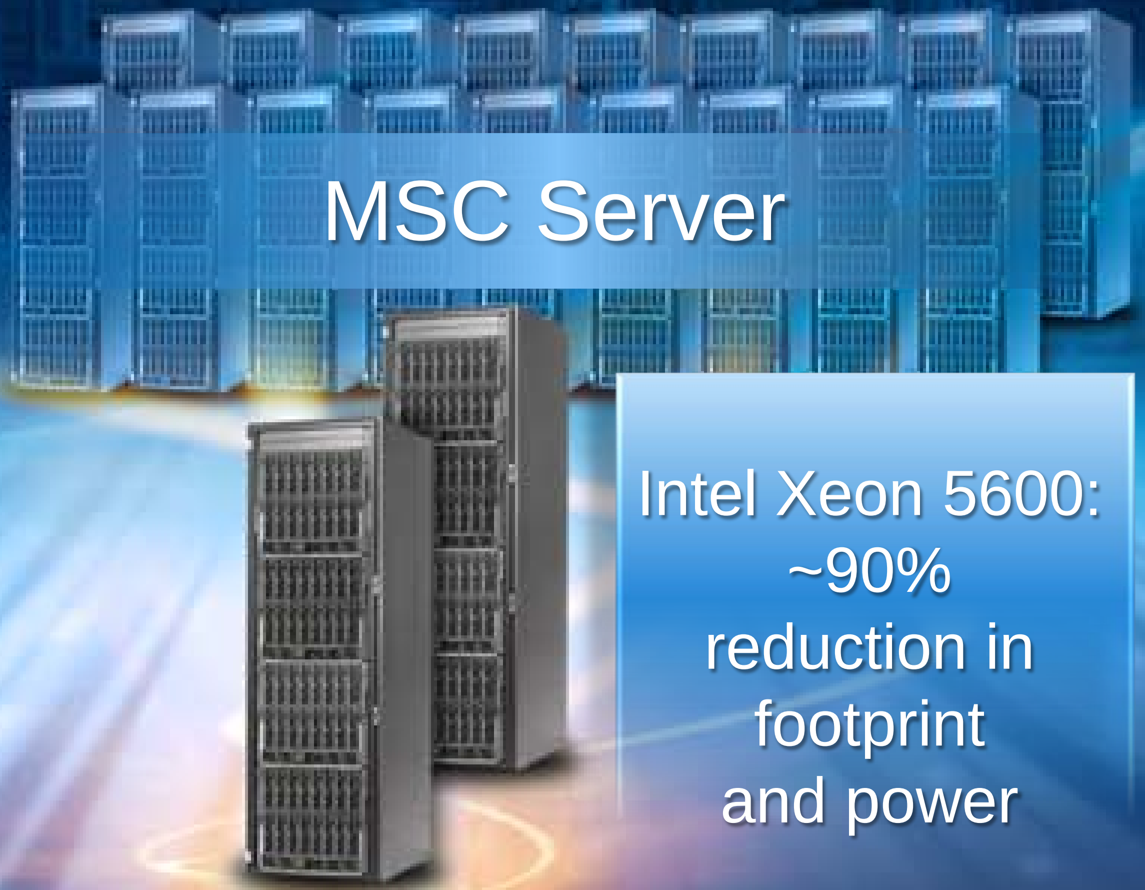
Next Gen Xeon
Intel Data Plane Development Kit
*~50 Mpps**

Yesterday *Today* *Future*

*Projected

IA Delivering Unparalleled Performance Density in Telecom

ERICSSON



Intel Xeon 5600:
~90%
reduction in
footprint
and power

Alcatel·Lucent

Intel Xeon 5600:
15x performance boost
over previous single core platform

Tsinghua Research on IA for Software Defined Radio

Focusing on technology innovations for IA for SDR, algorithms, prototype, architecture and instruction set

Developing cutting edge applications and services with IA for SDR

Leading IA for SDR research in Chinese national and global research initiatives

Fang Zhi Cheng

CTO of Central R&D Hardware Group
Huawei Corporation

HUAWEI

Peace of mind by Managed Services?

See how Huawei Managed Services can help to create business values from Outsourcing

Latest News · Huawei Retains its No.3 Position in the 2009 Global Service Provider IP Router Market

Dr. Cui Chunfeng

Department of Wireless Communications
China Mobile Research Institute

Intel and China Mobile to Collaborate

Prove the feasibility and application of IA based C-RAN architecture

Jointly Develop Technologies to Enhance Cloud Base Station System (BTS)

Jointly deliver the lowest Total Cost of Ownership (TCO) for C-RAN architecture

Digital Signage

Advertising Undergoing a Digital Transformation

Digital Signage Players Installed Base

Source: NSR Analysis 5/09 & 2012-2015 Intel estimates

Digital Signage:
Transforming Advertising

Entry

Lowest Power
Limited Content Blending

SeeYou
PRC Retail Stores

Mainstream

Performance for Analytics
Remote Manageability
Robust Content Blending

DTR
Beijing Airport

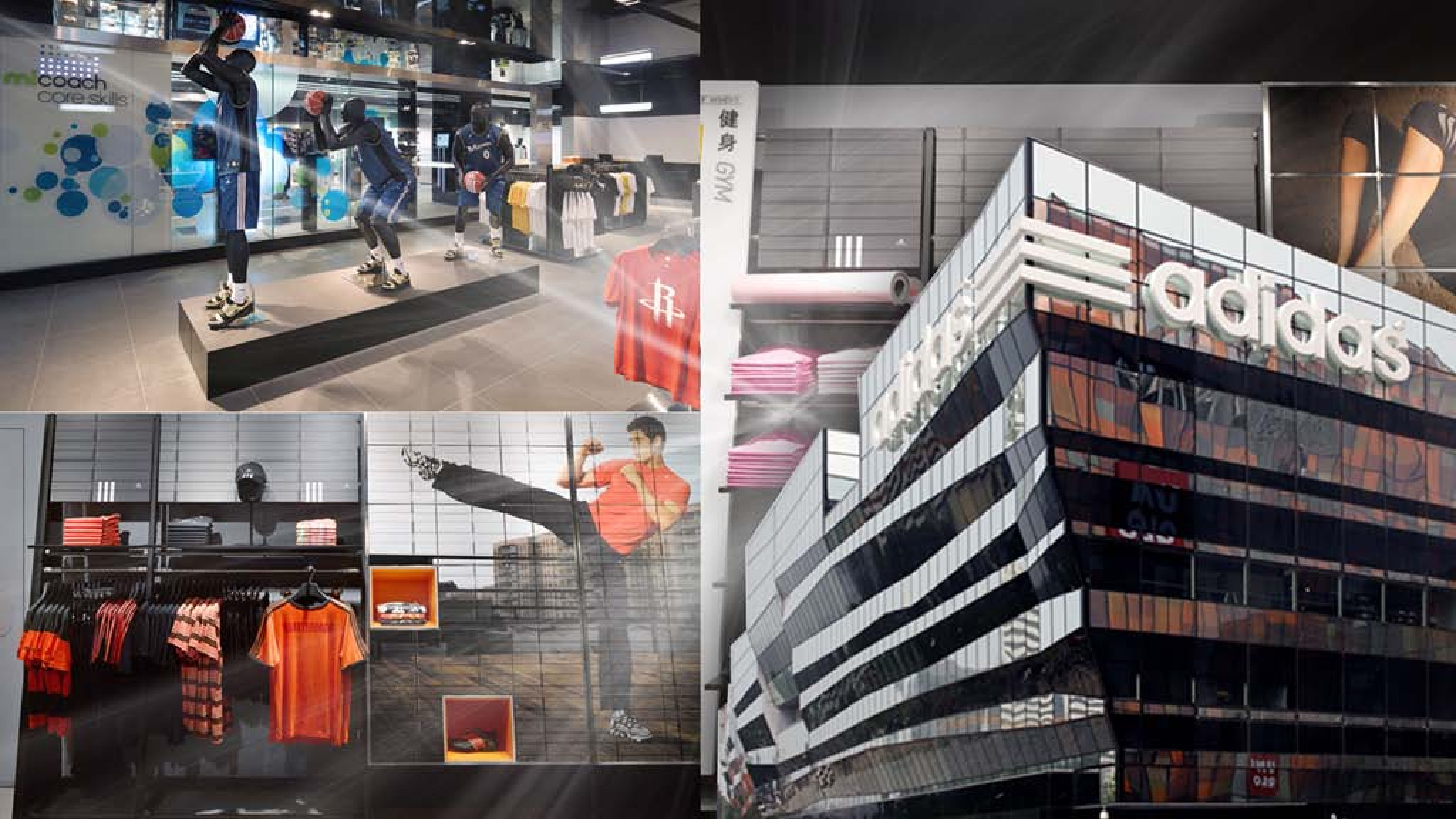
High End

Highest Performance
Remote Manageability
Richest Content Blending
Large Multi-Display

C-Nario
Shanghai Airport

Rowan Lodge

Head of Retail Development, Region Asia Pacific
Adidas Group

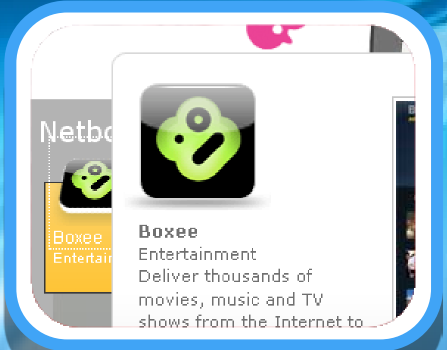

micoach
core skills
健身 GYM
adidas

In-Vehicle Infotainment

In-Vehicle Infotainment:

Transforming the Next Generation of the Connected Car

Services



Netbo

Boxee
Entertai

Boxee
Entertainment
Deliver thousands of
movies, music and TV
shows from the Internet to

Value Added Features

Hardware and Software Complexity

Supply Chain

Compute and Connectivity

Environment

Affordability

Atom for In-Vehicle Infotainment

Performance:

Advanced Usage Models

Multimodal HMI

ECU Consolidation

Energy Efficient CPU

Rich Internet Experience

Rich Ecosystem:

Hardware and Software

Compatibility and Re-use

PC and Consumer

Electronics Ecosystem

Automotive Capable:

Extended Temp (-40C - +85C)
Embedded Lifetime (~7 – 10 yrs)
Auto Spec (Grade 3-AEC-Q100 Rev F)
Auto OS Support (MSFT, QNX, MeeGo)
Lower DPM

Doug Welk

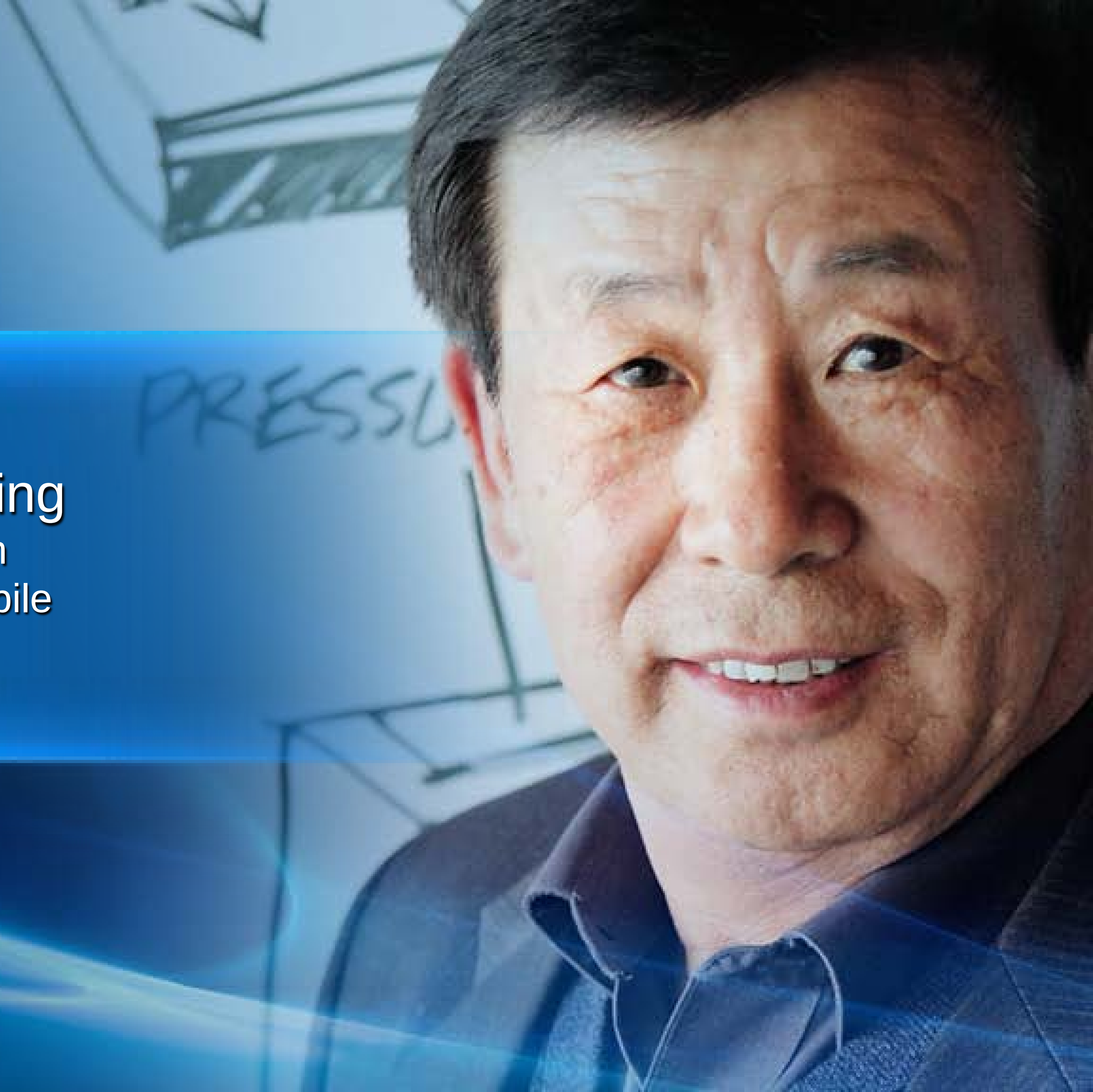
Chief Engineer
Advanced Infotainment and Driver Interface
Delphi Electronics and Safety


InRange
In 0.5 mi turn Right onto
Exit 65A
East 14 mile Road
3
4
5
6
7
50
40
30
20
10


Apps


75%
Distance to empty:
150 miles
PRNDL
DELPHI


My Devices
Apps
Settings



Wang DianMing

Vice Chairman
Haw Tai Automobile

In-Vehicle Infotainment

Phil Zhang

Director of R&D Center
Blue Star

In-Vehicle Infotainment

Over 1 Million units shipped

2/3 of all customers are new to IA

~2,900 Design Engagements

~730 Design Wins

intel
Atom™
inside™

Since 2008
Fueling the Embedded IA Transformation

IDF2010
INTEL DEVELOPER FORUM

Introducing Tunnel Creek

First Atom Processor-Based SoC for Embedded

Tunnel Creek:
Flexibility to Reach the Next 1,000 Customers

Tunnel Creek:
Flexibility to Reach the Next 1,000 Customers

2008 Menlow Platform

Silverthorne CPU

Processor Core

FSB

SCH

FSB

Graphics and Video

Memory Controller

Display Controller

PCIe*

SDIO

PATA

USB

Audio

LPC

INTEGRATION

Tunnel Creek CPU

Display Controller

Processor Core

Audio

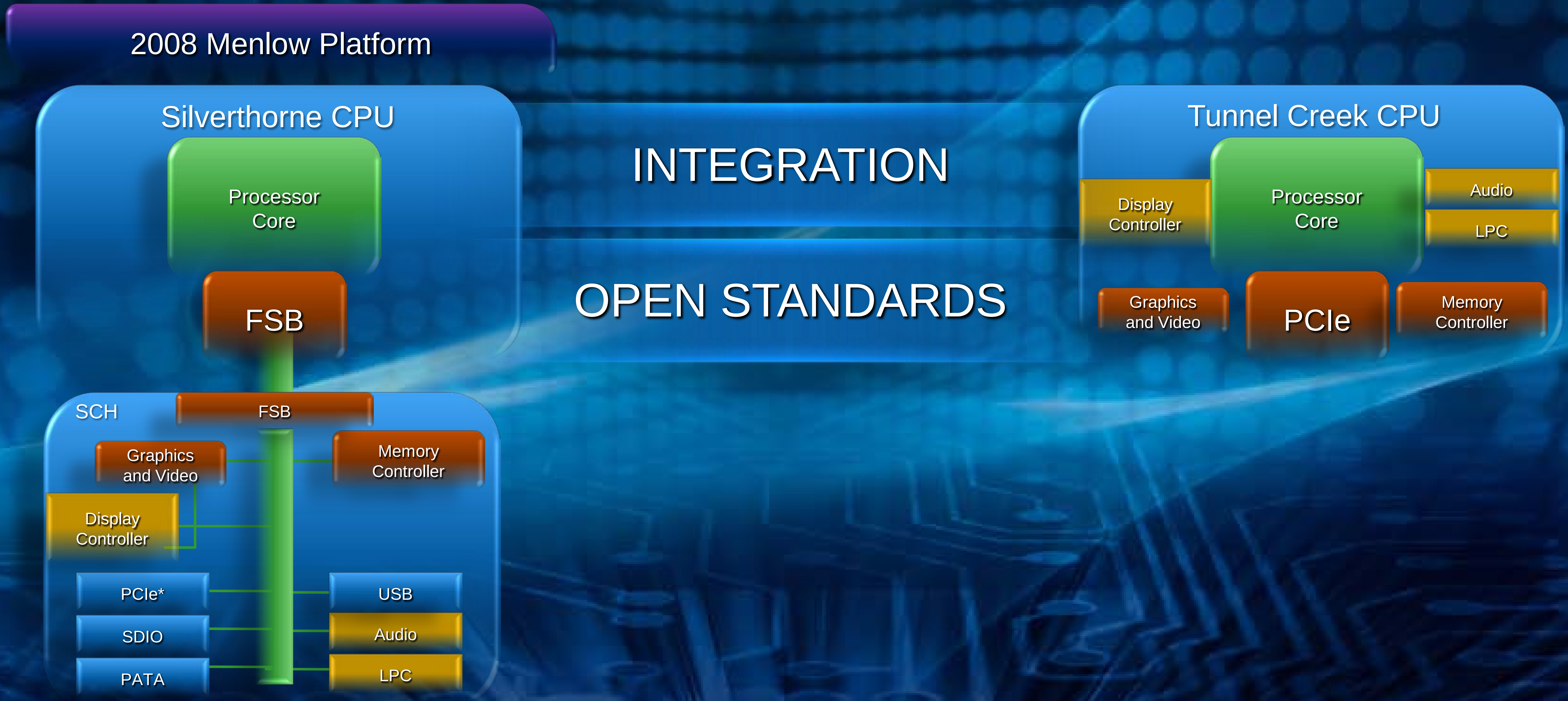
LPC

Graphics and Video

Memory Controller

Tunnel Creek:

Flexibility to Reach the Next 1,000 Customers



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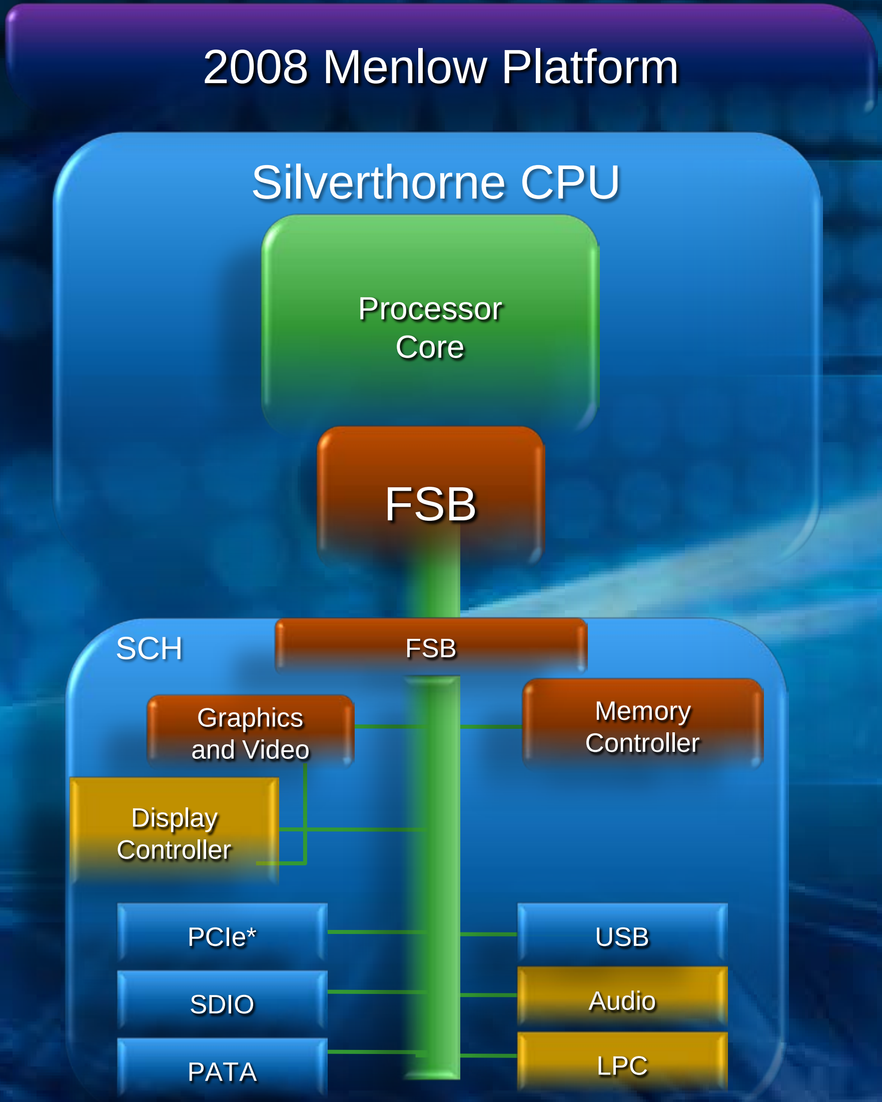

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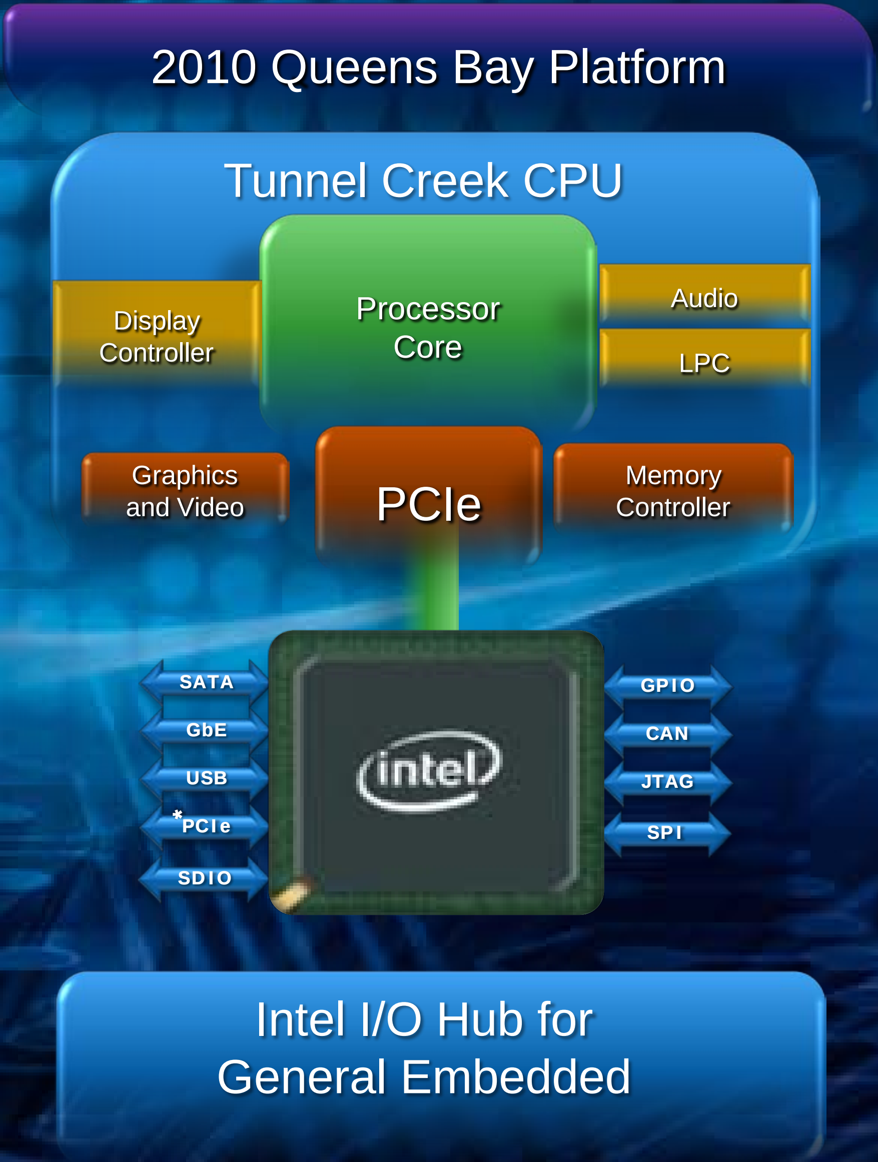
FLEXIBILITY



2010 Queens Bay Platform

Tunnel Creek CPU

Display Controller

Processor Core

Audio

LPC

Graphics and Video

PCIe

Memory Controller

SATA

GbE

USB

*PCIe

SDIO

GPIO

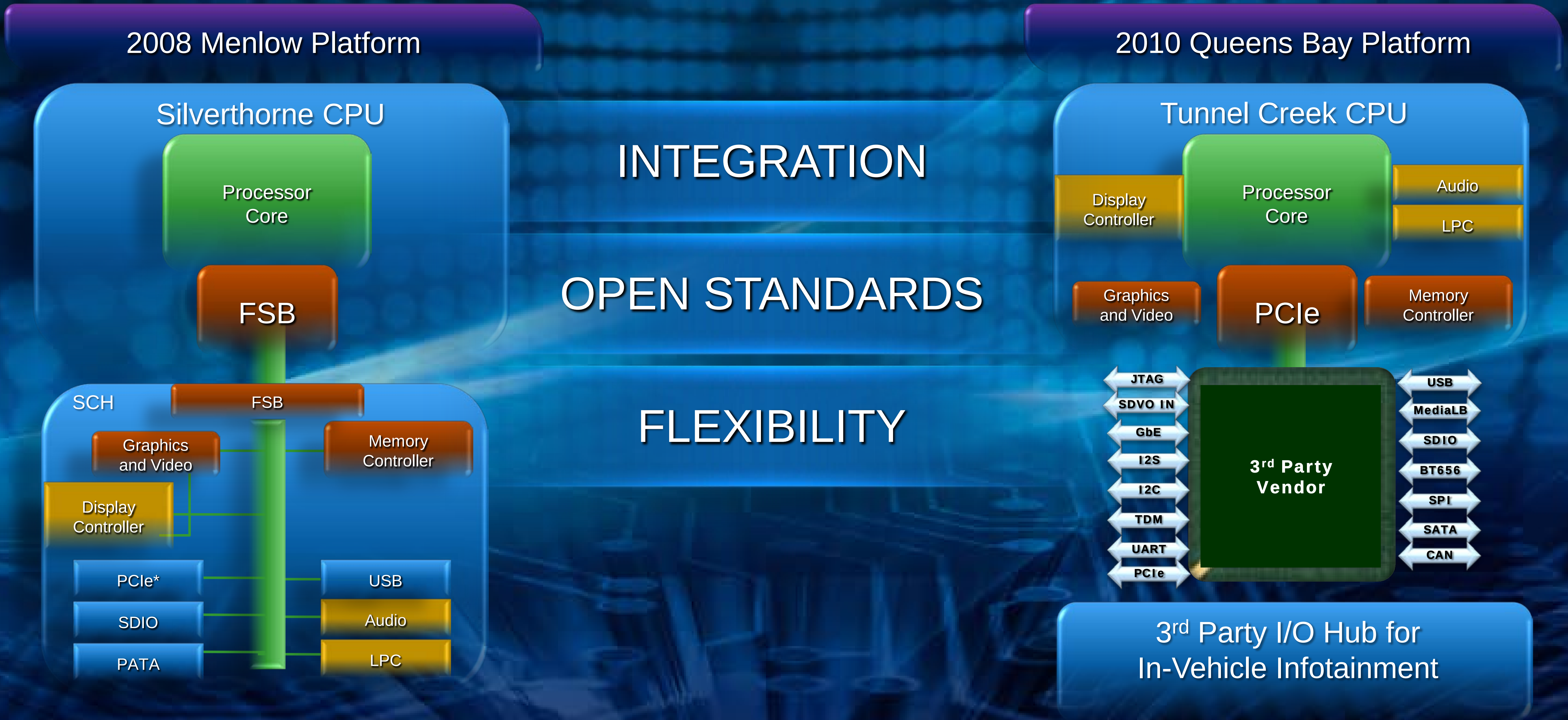
CAN

JTAG

SPI

Intel I/O Hub for General Embedded

Tunnel Creek:
Flexibility to Reach the Next 1,000 Customers



2008 Menlow Platform

Silverthorne CPU
- Processor Core
- FSB

SCH
- FSB
- Graphics and Video
- Memory Controller
- Display Controller
- PCIe*
- SDIO
- PATA
- USB
- Audio
- LPC

INTEGRATION

OPEN STANDARDS

FLEXIBILITY

2010 Queens Bay Platform

Tunnel Creek CPU
- Display Controller
- Processor Core
- Audio
- LPC
- Graphics and Video
- PCIe
- Memory Controller

3rd Party Vendor
- JTAG
- SDVO IN
- GbE
- I2S
- I2C
- TDM
- UART
- PCIe
- USB
- MediaLB
- SDIO
- BT656
- SPI
- SATA
- CAN

3rd Party I/O Hub for In-Vehicle Infotainment

Tunnel Creek:
Flexibility to Reach the Next 1,000 Customers

2008 Menlow Platform

Silverthorne CPU

Processor Core

FSB

SCH

FSB

Graphics and Video

Memory Controller

Display Controller

PCIe*

SDIO

PATA

USB

Audio

LPC

INTEGRATION

OPEN STANDARDS

FLEXIBILITY

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LPC

Graphics and Video

PCIe

Memory Controller

PCIe

SDIO

BT656

JTAG

GbE

3rd Party Vendor

SATA

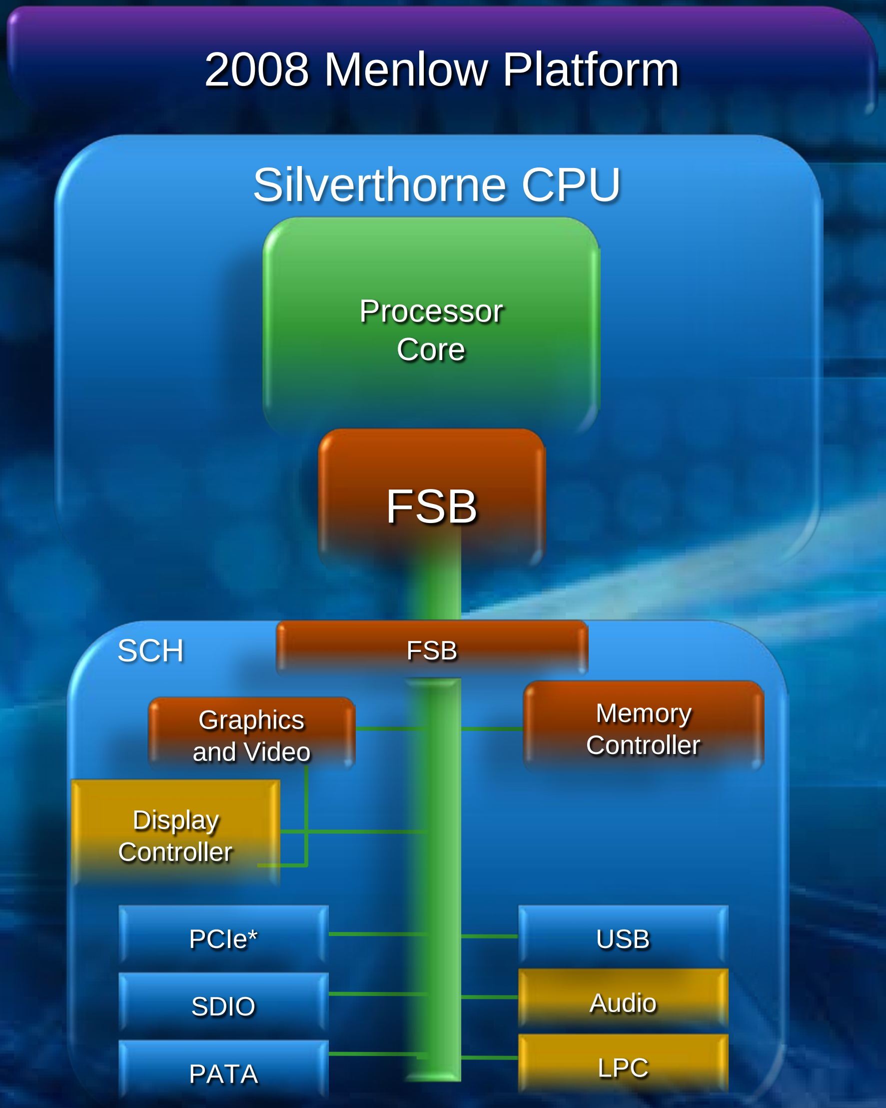
I2C

UART

USB

3rd Party I/O Hub for IP Media Phone

Tunnel Creek:
Flexibility to Reach the Next 1,000 Customers



2008 Menlow Platform

Silverthorne CPU

Processor Core

FSB

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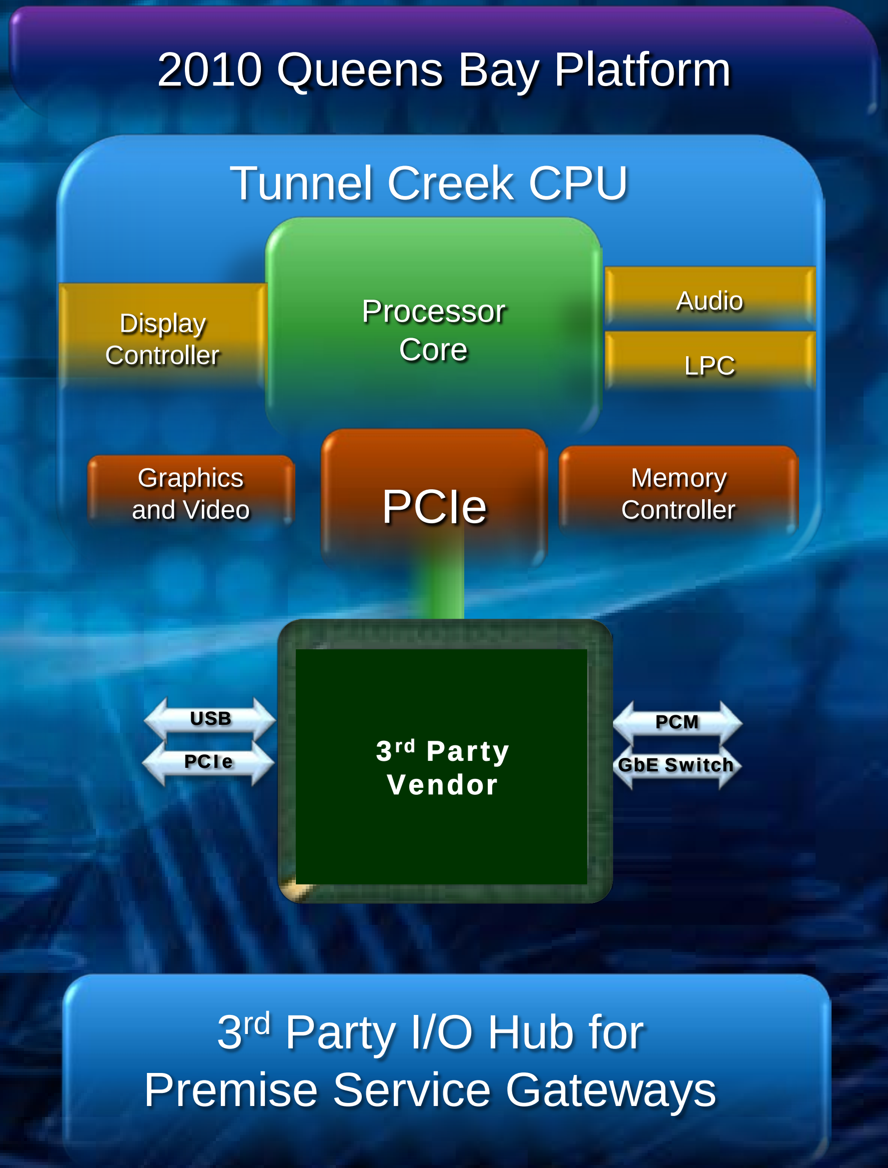
OPEN STANDARDS

FLEXIBILITY



2010 Queens Bay Platform

Tunnel Creek CPU

Display Controller

Processor Core

Audio

LPC

Graphics and Video

PCIe

Memory Controller

USB

PCIe

3rd Party Vendor

PCM

GbE Switch

3rd Party I/O Hub for Premise Service Gateways

The Next Challenge:

How to Enable the Next 1,000 Customers?

Simplify Design Complexity

Innovate with IA

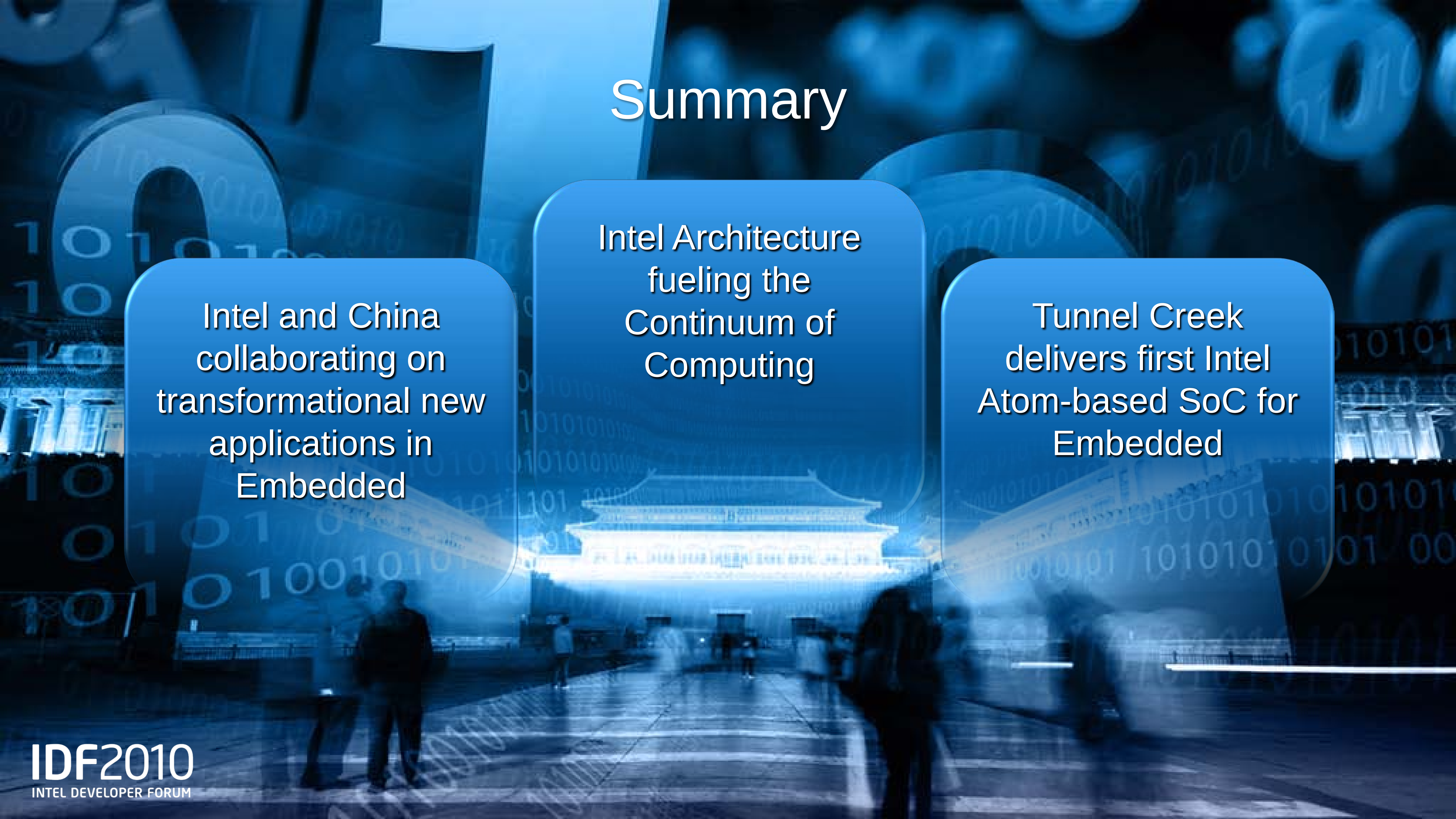
Accelerate Time to Market

The Intel® Embedded Design Center

IDF2010
INTEL DEVELOPER FORUM

Unparalleled Ecosystem Fueling IA Continuum of Computing for Embedded

Summary

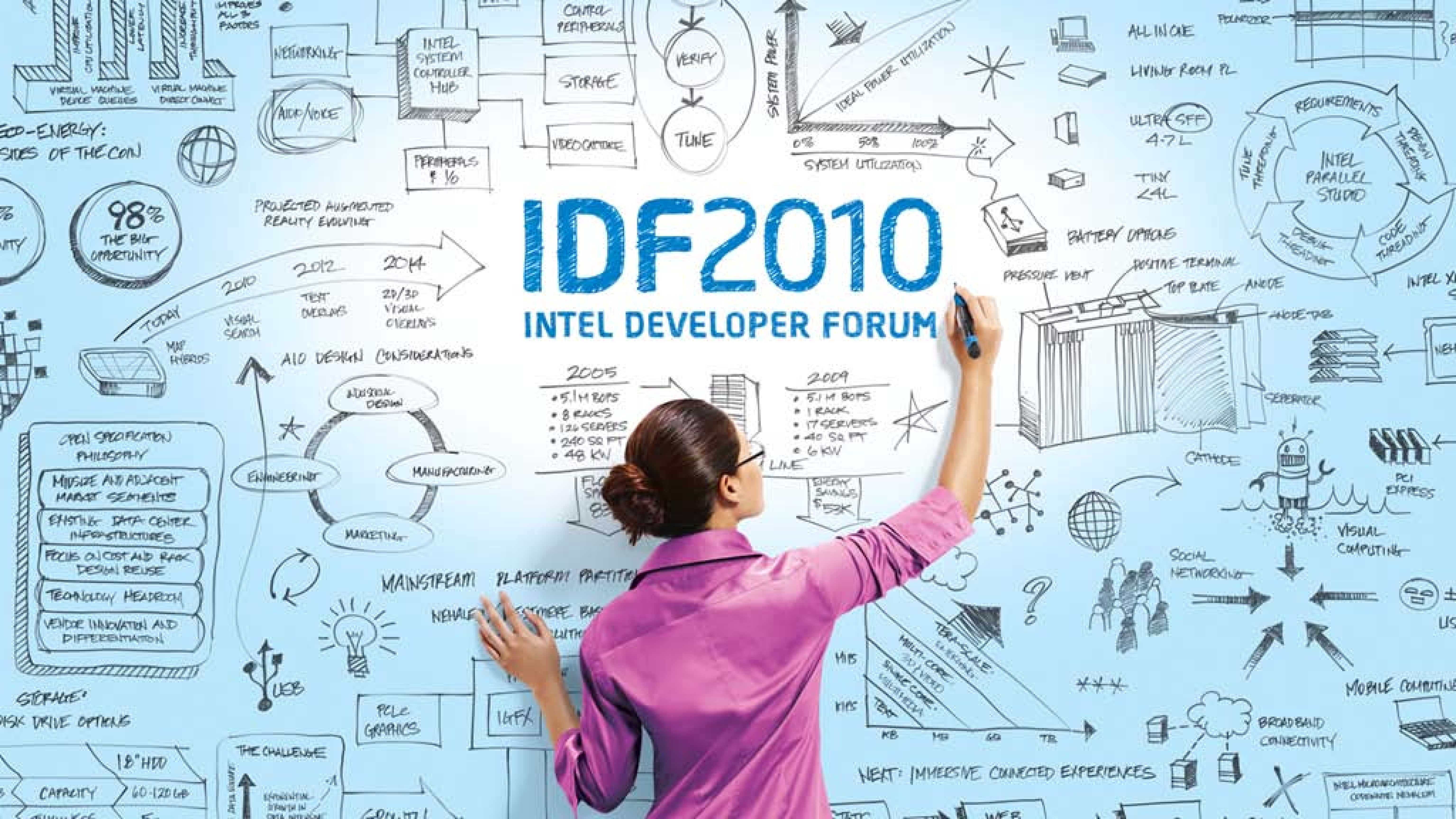


Intel and China collaborating on transformational new applications in Embedded

Intel Architecture fueling the Continuum of Computing

Tunnel Creek delivers first Intel Atom-based SoC for Embedded

Sponsors of Tomorrow.™



IDF2010

INTEL DEVELOPER FORUM

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Rev. 1/14/10