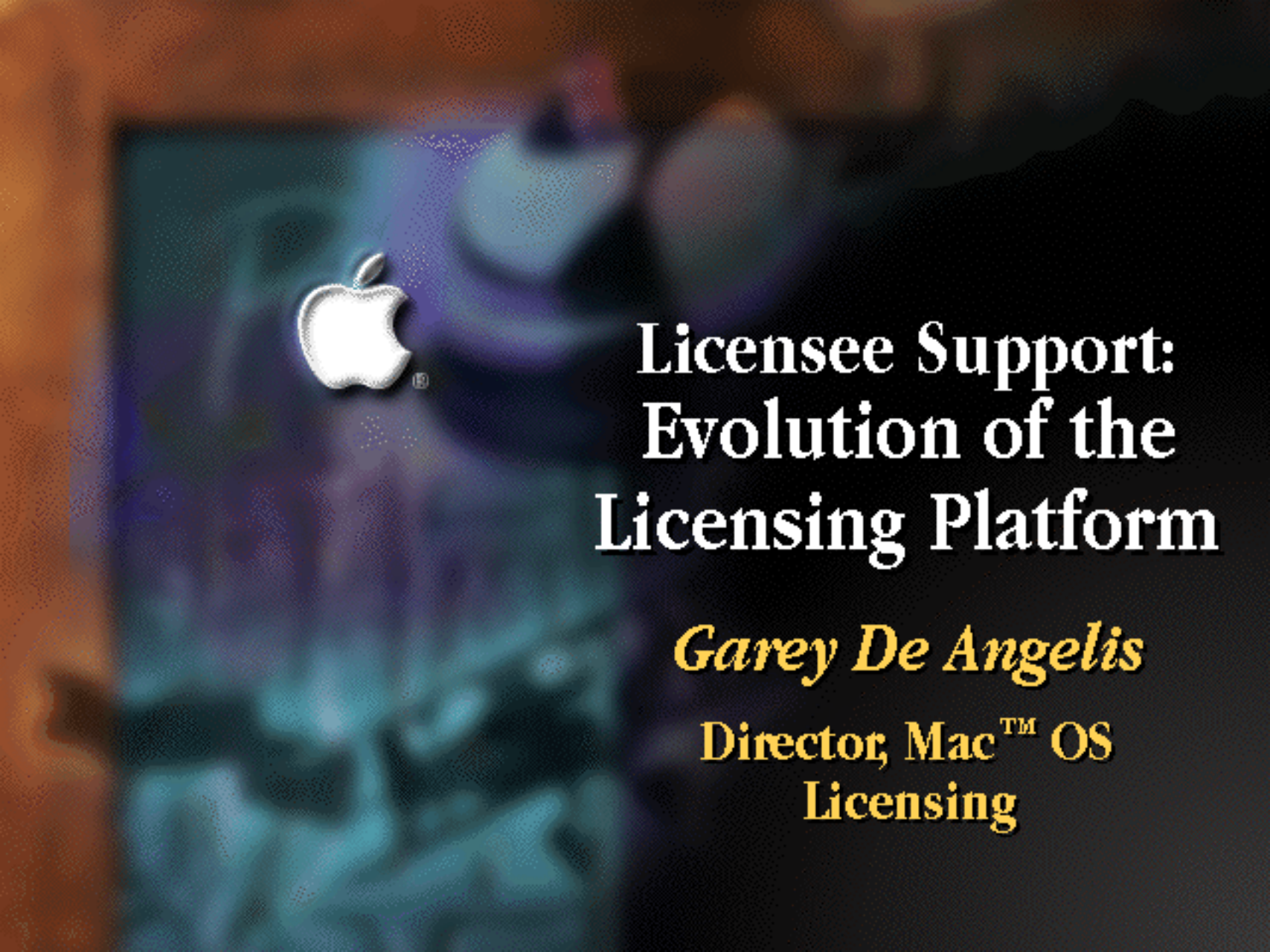
Worldwide
Developers
Conference


Licensee Support:
Evolution of the
Licensing Platform
Garey De Angelis
Director, Mac™ OS
Licensing

# Agenda

- Definition, accomplishments, status
- Evolution
- Goals
- Expected Results
- Summary
- Demos
- Q&A

# What Is CHRP?

*Reference platform architecture and spec for PowerPC™ systems...*

- Open, flexible and extensible
- No special licensing fees
- Convergence of PReP and Power Mac architectures
- Takes advantage of commodity silicon parts
- Uniform OS programming model
- Alternative to Wintel for the Industry

# CHRP

*Accomplishments...*

Specifications → Proven

Chip set logic & performance → Verified

Open FirmWare compatibility → Confirmed

IBM

MOTOROLA INC.

# CHRP and Mac OS

*Current Status…*

- Mac OS 8.0 for CHRP → Near completion
- Reference Platforms → Available
- Open FirmWare → Available
- Industry-Standard Chipsets → Available
- Products → Under development

***CHRP is REAL!***

# Evolution of CHRP

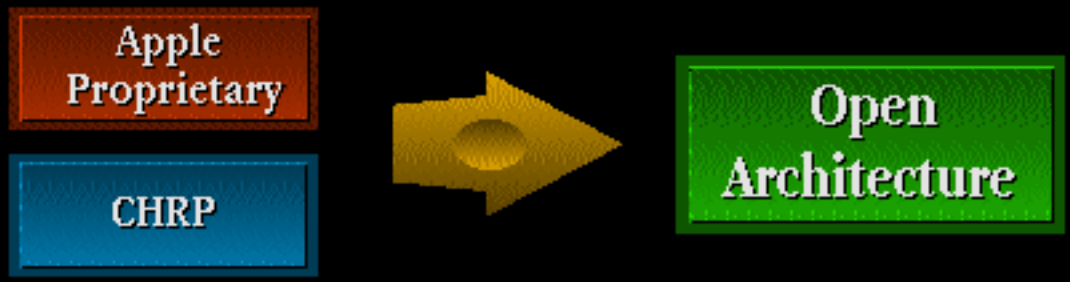
*Short Term…*

- Release minimum sets of drivers and features
- Further abstraction for new PPC processors
- Investigate support for portables
- Investigate "ROM in RAM" to enhance performance
- Encouragement of broad Industry adoption

# Evolution of CHRP

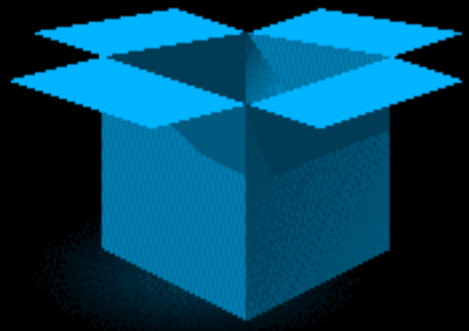
*Long Term…*

- Evolve the spec for improved flexibility
  - Relax I/O requirements
  - Support new technologies e.g., USB…
- More Mac OS abstraction will offer more freedom



# Goals for the Evolution

- Expand the open architecture market
- Expand the market for Mac OS
- Continue to be a flexible and extensible reference platform
- Preserve compatibility
- Provide mobility



# Expected Results

*For Developers, Industry, PowerPC, Mac OS…*

- Open platform to innovate on
- Delivery of value-added differentiation to the market
- True alternative to Wintel
- Open new markets

# Summary

*Open Architecture for Mac OS and PowerPC…*

- There is an alternative to Wintel
- AIM committed to evolve the specification
  - Drive innovation and differentiation
- New markets and segments will open for Mac OS and PowerPC
- CHRP is REAL!

# Long Trail Reference Design

*Steve Fauré*

PowerPC App. Eng.
IBM Microelectronics
Austin, Texas

# The Long Trail Difference: CHRP with a PC Heritage

*Low cost, PC standard hardware*

- 4 Layer (2S+2P) motherboard
  - ATX form factor
  - <$20 bare card in mass quantity
- COASt L2 Cache support
- PGA processor support
  - Easy upgrade to G3
- VRM core voltage regulation
- Uses ATX standard power supply

# Long Trail Core Logic

*Golden Gate II chipset from VLSI*

- PPC to PCI bus bridging
  - PPC bus at 66MHz
  - Supports split transactions
- L2 Cache controller
  - Up to 1MB supported
- DRAM controller
  - Supports 512MB SDRAM
  - Or 768MB EDO DRAM (not mixed)

# Long Trail Is Proof of CHRP Concept

- CHRP OS initial development without Long Trail prototype
- GG chipset developed outside AIM alliance by VLSI
- IBM Microelectronics offers design data on public FTP
  - ftp://ftp.austin.ibm.com/PPC_support/reference_designs/longtrail

Demo

Yellowknife
CHRP
Reference Design
Jeff Nutt
Motorola
Program Manager

# Reference Design

- Sophisticated Application Note for systems developer
  - NO special licensing fees
- Lower investment costs via design kits
- Industry standard components, form factor, features
- Designed and offered by PPC silicon supplier

# Yellowknife Reference Design

- Supports all PPC CPUs
- Low cost 4 layer PCB; ATX format
- 3 PCI and 2 ISA slots
- 66 MHz CPU Bus and 33 MHz PCI
- Single chip MPC 106 PCI bridge
- 512KB L2 Coast module
- Firmworks Open Firmware
- Mac and PC I/O
- ATI Graphics card and Crystal 4236 card

# Reference Design Info

- CHRP Specification
- Yellowknife Design Guide
  - Schematics and BOM
  - Engineering Spec
  - Artwork and gerber (upon request)
- www.mot.com/powerpc

# CHRP Proof of Concept: VIPER


*Bill Hede*

StarMax Product Engineer

*Tai Patwardhan*

Program Manager
Motorola Computer Group

# Viper

- MCG's first-generation CHRP system
- Designed and developed in conjunction with Apple
- CHRP Compliant
- Industry standard components
- LPX form factor
- CHRP reference platform for Mac OS 7.6 and Tempo development
- Available to Software and Hardware developers

# Viper Features

- Supports current and next-generation (G3) PowerPC CPUs
- 66 MHz system bus
- Single chip MPC 106 PCI bridge
- PowerFirmware (IEEE OF 1275)
- ADB, PS/2, SVGA/RGB ports
- Supports standard Mac and PC peripherals
- Onboard video
- Onboard Ethernet

# Developer Program

- Available at special pricing
- Free upgrade from 7.6 CHRP to Tempo
- StarMax Developers Program:
  http://www.mot.com/starmax/developer

Demo

Q&A

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