



Xilinx is Shipping The Real 64/66 PCI™

Industry's First General-Purpose
64-bit, 66MHz PCI Solution

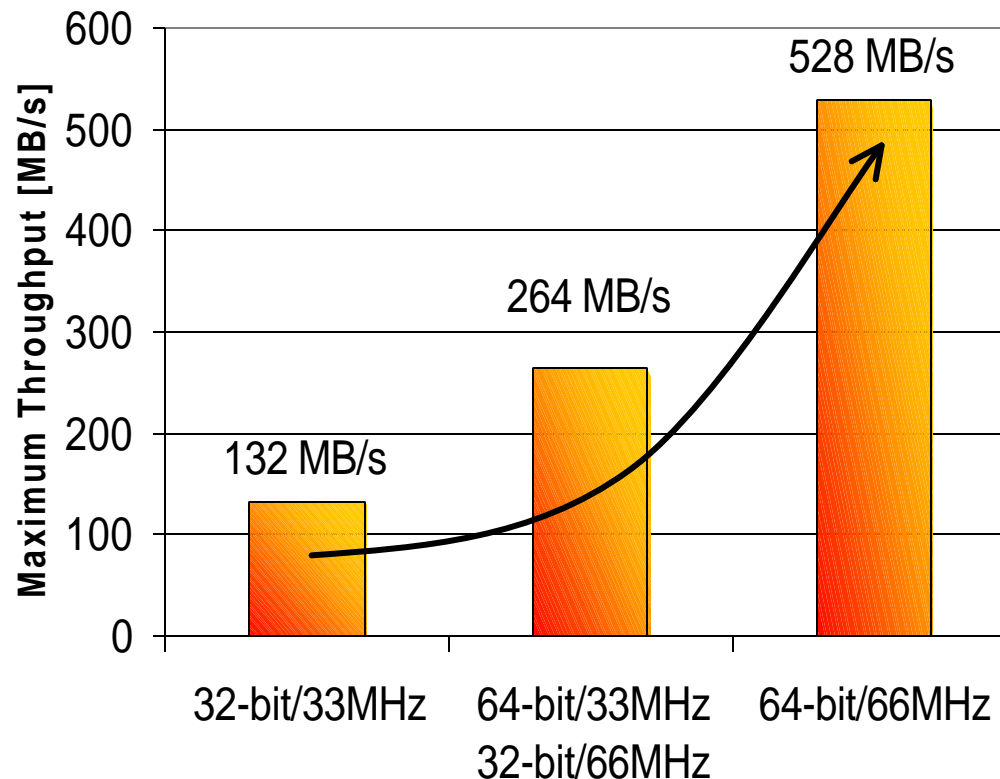
Publication Embargo Date: March 22, 1999

A Complete Solution for 64-bit 66MHz PCI

- ◆ New *64/66 PCI core* implemented in Xilinx standard Virtex FPGA family
- ◆ New *PCI customer classes* from Xilinx
- ◆ *Synplicity adds support* for The Real 64/66 PCI™ from Xilinx (in addition to Synopsys)
- ◆ Third party *design services*

Emerging Applications Require Higher PCI Bandwidth

PCI Performance



- ◆ Gigabit Ethernet
- ◆ ATM, Fibre Channel
- ◆ DSP/Imaging
- ◆ Mass-Storage/RAID
- ◆ High-end Printer I/Fs

Requirements on a Commercial 64-bit 66MHz PCI Product

1. Full compliance

- PCI design must be proven
- Timing & electrical spec must be guaranteed

2. Full flexibility

- Ability to customize and integrate PCI & user logic
- Ability to adopt future changes and requirements

3. Full performance

- Up to maximum 528 Mbytes per second sustained throughput

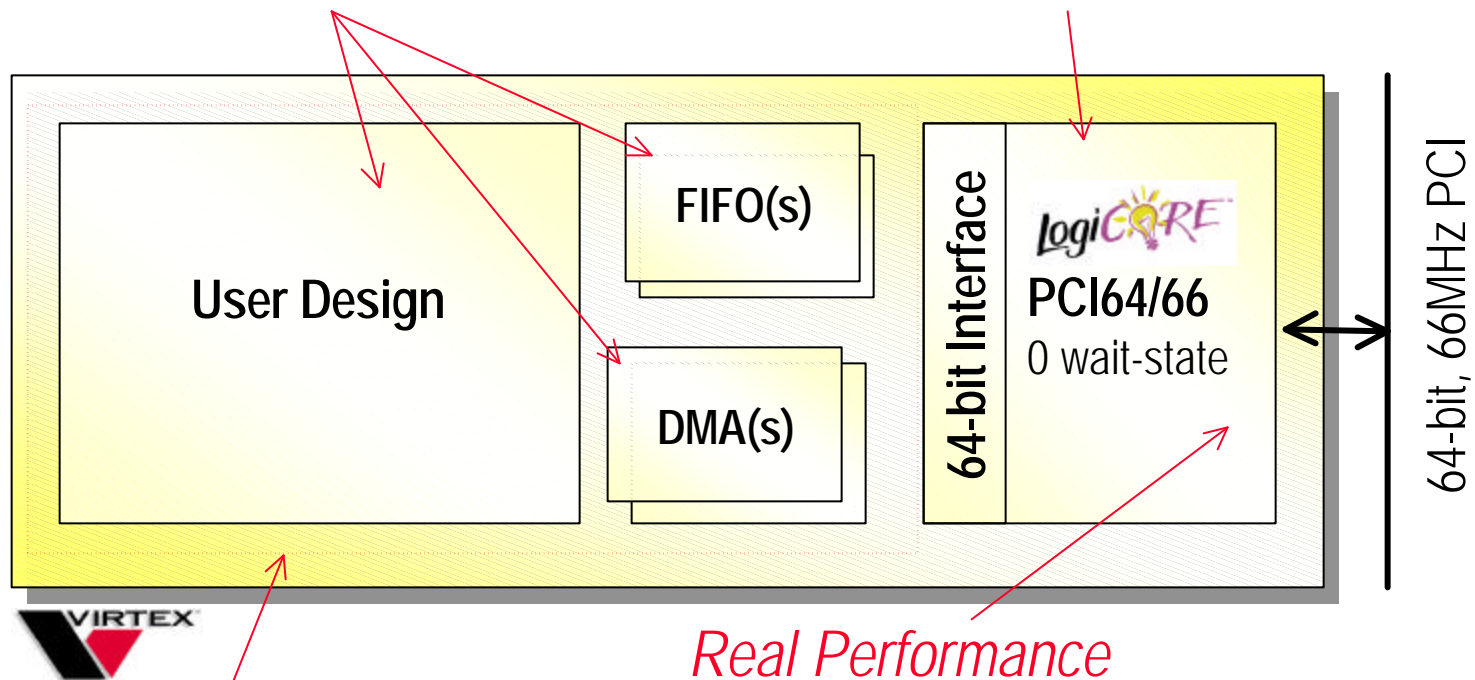
The Real 64/66 PCI from Xilinx

Real Flexibility

- Uses standard Virtex FPGA
- Back-end de-coupled from core

Real Compliance

- PCI v2.2 Initiator and Target
- Guaranteed timing



260,000 gates in V300
1 million gates in V1000

Real Performance

- Compliant 0 wait-state at 66MHz
- Full 64-bit data path

Downloadable Today



PRODUCTS

WEBLINX
THE HOME PAGE FOR PROGRAMMABLE LOGIC

XILINX®

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- ◆ All design files are released on WebLINX
- ◆ Instant access of new releases and updates
- ◆ Intuitive GUI generates guaranteed design files
- ◆ Verified for
 - Synopsys
 - Synplicity **NEW!**
 - MTI

Virtex Configuration Space Header XPCI Virtex64

31		16		15		0		
Device ID: 0300h				Vendor ID: 10EEh				00h
Status				Command				04h
Class Code: 0B4000h				Rev ID: 00h				08h
BIST	Header Type	Latency Timer	Cache Ln Size					0Ch
Base Address Register 0: 01000000h								10h
Base Address Register 1: 01000000h								14h
Base Address Register 2: 01000000h								18h
Base Address Register 3								1Ch
Base Address Register 4								20h
Base Address Register 5								24h
Cardbus CIS Pointer								28h
Subsystem ID: 0000h				Subsystem Vndr ID: 0000h				2Ch
Expansion ROM Base Address								30h
Reserved						CLst Ptr: 80h		34h
Reserved								38h
Max_Lat: 80h	Min_Gnt: 80h	Irpt Pin: 01h	Irpt Line: FFh					3Ch
Reserved								40h-7Ch

☒ Latency Tmr Enable
☒ BAR 0 Enable
☒ BAR 1 Enable
☒ BAR 2 Enable
☐ External Subsystem
☒ Cap List Enable
☒ INTA Enable
☒ User Config Space

☒ Programming
☐ Log

Real Availability

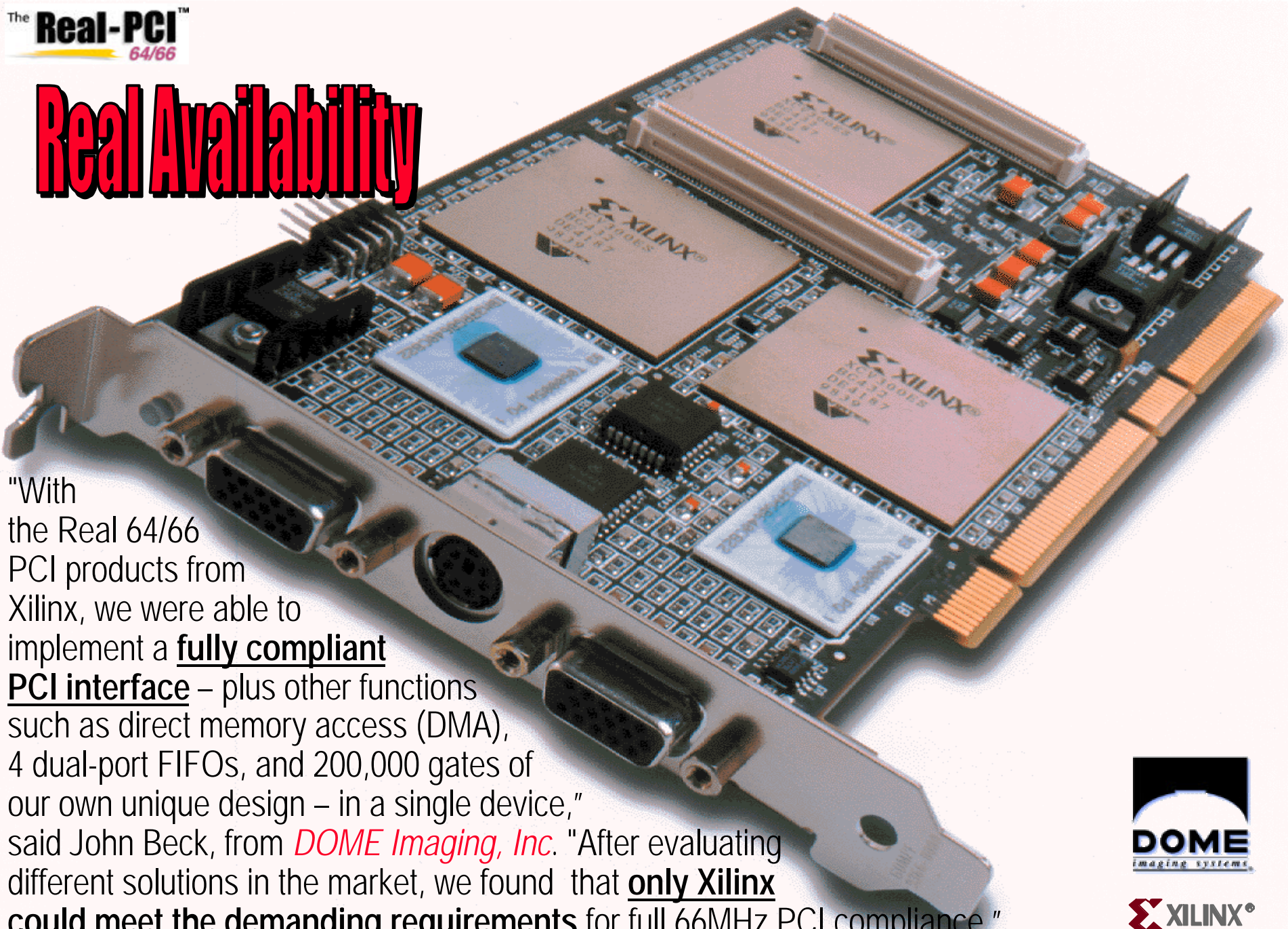
Xilinx 64/66 PCI Beta Program Since September

- ◆ Fifteen customers have actively been designing 64-bit 66MHz PCI systems with the products from Xilinx
 - Customer examples: Ascend, Dome Imaging, and Kodak
- ◆ Allowed us to *secure critical design wins* and get *customer feedback* early in the development

Real Availability

The **Real-PCI™**
64/66

Real Availability



"With the Real 64/66 PCI products from Xilinx, we were able to implement a **fully compliant PCI interface** – plus other functions such as direct memory access (DMA), 4 dual-port FIFOs, and 200,000 gates of our own unique design – in a single device," said John Beck, from *DOME Imaging, Inc.* "After evaluating different solutions in the market, we found that **only Xilinx could meet the demanding requirements** for full 66MHz PCI compliance."



Full 528 MB/s Sustained Throughput

- ◆ Compliant *zero wait-state* burst at 66MHz
- ◆ Full *64-bit data path* on PCI side and back-end interface
- ◆ *On-chip dual-port FIFOs* can be added to support maximum performance

Real Performance

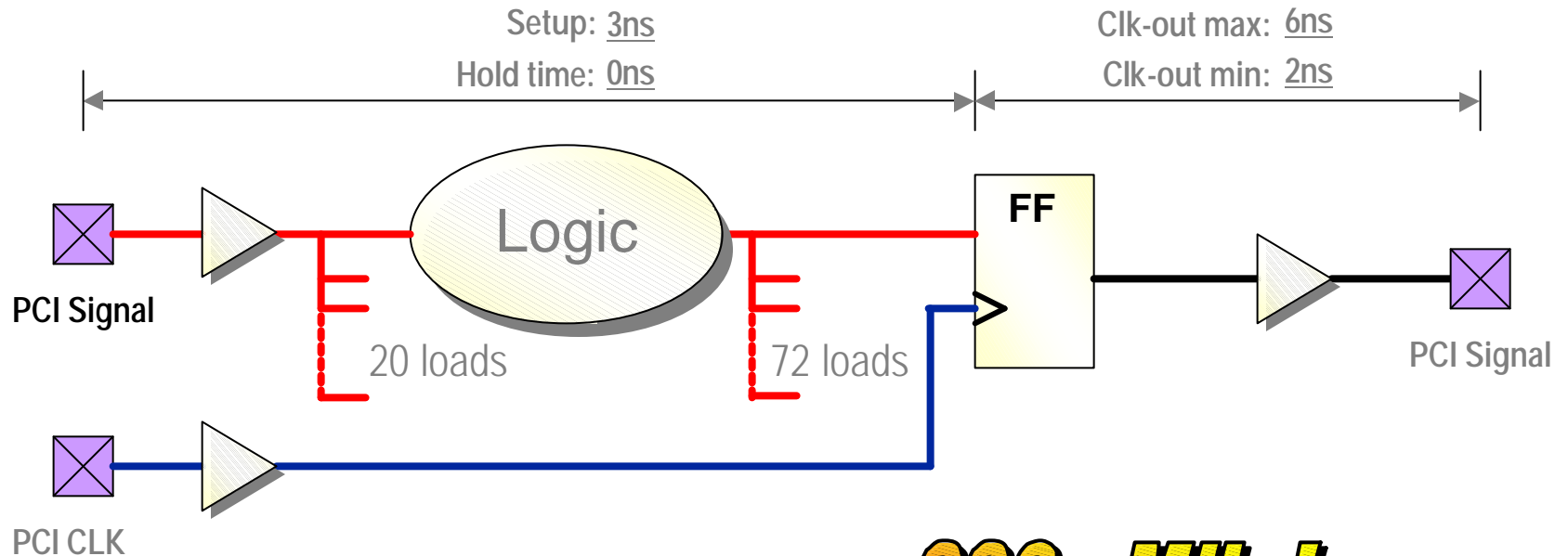
New PCI64/66 Core Based on Proven PCI32 Design

- ◆ PCI32 has been used in *over 1,000 customer designs*, of which many are fully compliant add-in boards
- ◆ PCI protocol verified with internal testbench simulating over *6 million PCI cycles*
- ◆ Automatically sets up correct *64-bit or 32-bit transactions* depending on the target

Real Compliance

The Real 64/66 PCI

Guarantees *The Critical Path*



- ◆ The critical path is equivalent to **220+ MHz!**
- ◆ Uses Xilinx unique Smart-IP technology to guarantee *min, max & hold* time
 - Core and silicon characterized together

Real Compliance

Real Flexibility

Implemented in Xilinx Standard Virtex FPGAs

- ◆ Up to 300,000 system gates on one XCV300 FPGA

— PCI
— Dual-port FIFOs
— DMA
— Customer design

- ◆ Usage

— 12% of an XCV300 BG432

— 3% of an XCV1000 FG680

- ◆ Design can be adopted to future changes and requirements

Picture shows the EPIC view of PCI64/66 implemented in XCV300



Real Flexibility

Implemented in Xilinx Standard Virtex FPGAs

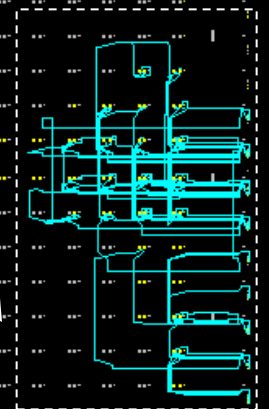
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- Dual-port FIFOs
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- Customer design

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Section with
guaranteed timing

Picture shows the EPIC view of the pre-implemented section in XCV300

New PCI Training Classes

- ◆ Two day PCI course
 - Basic PCI concepts
 - Xilinx PCI solution
 - Designing with Xilinx PCI
 - Design debug
- ◆ Starting in May 1999 in US



SUPPORT & TRAINING

support.xilinx.com

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XILINX[®]

PCI Expertise

- ◆ Provide worldwide access to certified PCI experts that can provide:
 - Support for targeting additional devices
 - Implementation of additional features
 - Complete turnkey integration



MULTI VIDEO DESIGN



Xilinx Has a Rich PCI Heritage

- 01/96: LogiCORE PCI v1.0 - First PCI core for FPGAs
- 04/97: PCI v1.2 & First web-based core configuration tool
- 12/97: PCI V2.0 - First fully-compliant 0 wait-state core
- 05/98: Xilinx PCI - First complete design kit for FPGA-based PCI
- 01/99: PCI32 Spartan XL - Industry's lowest cost PCI solution
- 03/99: *The Real 64/66 PCI - Industry's First General-Purpose 64-bit, 66MHz PCI Solution*

Real Availability



The Real 64/66 PCI Summary

- ◆ *Real Compliance* - guaranteed timing
- ◆ *Real Flexibility* - implemented in standard Virtex FPGAs
- ◆ *Real Performance* - full 528 Mbytes per second
- ◆ *Real Availability* - downloadable from Xilinx web-site now

Reference Slides

The Real 64/66 PCI™ Products

- ◆ LogiCORE™ PCI64/66
 - Includes all design files and documentation required to do a 64-bit 66MHz PCI core
 - Supports XCV300 now
 - Part no: DO-DI-PCI64
 - Price: \$14,995
 - *Available now*

U.S. Partners



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Mesa, Arizona 85202, USA



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