



# PCI Express Technology 3.0

*By Mike Jackson, Ravi Budruk*

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## PCI Express Technology 3.0 By Mike Jackson, Ravi Budruk

"MindShare books are critical in the understanding of complex technical topics, such as PCI Express 3.0 architecture. Many of our customers and industry partners depend on these books for the success of their projects."

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**PCI Express 3.0** is the latest generation of the popular peripheral interface found in virtually every PC, server, and industrial computer. Its high bandwidth, low latency, and cost-to-performance ratio make it a natural choice for many peripheral devices today. Each new generation of PCI Express adds more features, capabilities and bandwidth, which maintains its popularity as a device interconnect.

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### Essential topics covered include:

- PCI Express Origins
- Configuration Space and Access Methods
- Enumeration Process
- Packet Types and Fields
- Transaction Ordering
- Traffic Classes, Virtual Channels and Arbitration (QoS)
- Flow Control
- ACK/NAK Protocol
- Logical PHY (8b/10b, 128b/130b, Scrambling)
- Electrical PHY
- Link Training and Initialization
- Interrupt Delivery (Legacy, MSI, MSI-X)
- Error Detection and Reporting
- Power Management (for both software and hardware)
- 2.0 and 2.1 Features (such as 5.0GT/s, TLP Hints, and Multi-Casting)

- 3.0 Features (such as 8.0GT/s, and a new encoding scheme)
- Considerations for High Speed Signaling (such as Equalization)

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## **PCI Express Technology 3.0** By Mike Jackson, Ravi Budruk Bibliography

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## **Editorial Review**

### **About the Author**

**Mike Jackson** is a Senior Staff Engineer with MindShare and has trained thousands of engineers around the world on the workings of PCI Express. Mike has developed materials and taught courses on such topics as PC Architecture, PCI, PCI-X, and SAS. Mike brings several years of design experience to MindShare, including both systems integration work and development of several ASIC designs.

**Ravi Budruk** is a senior staff engineer and instructor with MindShare, Inc., where he has trained hundreds of engineers. He is an industry expert on such topics as Intel Processor and PC architecture, as well as such bus architectures as PCI Express, PCI, PCI-X, QuickPath Interconnect and more. Before working at MindShare, Mr. Budruk was a PC chipset architect and designer at VLSI Technology, Inc.

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#### **Jeffrey Cooks:**

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#### **Terry Burrows:**

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**Karen Delamora:**

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