TYPES OF COMMUNICATION BUS

Address Bus

- carries memory addresses from the processor to other components such as primary storage and input/output devices. The address bus is **unidirectional**.

STORAGE

Data Bus

- carries the data between the processor and other components. The data bus is **bidirectional.**

- **Serial bus** (single wire to send and receive data between component). Eg: USB & SATA
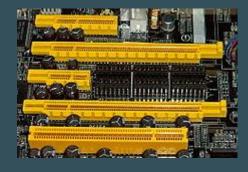
Control Bus

- carries control signals from the processor to other components. The control bus also carries the **clock's pulses**. The control bus is **unidirectional**.

Main bus (PCI Express 1.0 – 1 link)

- High-speed serial computer expansion bus standard.

- It is the common motherboard interface for personal computers' graphics cards, hard disk drive host adapters, SSDs, Wi-Fi and Ethernet hardware connections

- 2.5 Gbit/s, 250 MB/s

Main bus (Zorro II)

- general purpose expansion bus used by the Amiga 2000 computer

- 42.4 Mbit/s, 5.3 MB/s, year 1986

- 16-bit/7.14 MHz

Memory map:

Address	Size [MByte]	Description
0x00 0000	2.0	Chip memory
0x20 0000	8.0	Zorro II memory expansion space
0xA0 0000	1.5	Zorro II I/O expansion space
0xB8 0000	3.0	A2000 motherboard register space
0xE8 0000	0.5	Zorro II I/O
0xF0 0000	1.0	Motherboard ROM

Main buses   [edit]

Technology	Rate		Year
I²C	3.4 Mbit/s	425 kB/s	1992 (standardized)
Apple II series (incl. Apple IIGS) 8-bit/1 MHz	8 Mbit/s	1 MB/s[34][35]	1977
SS-50 Bus 8-bit/1(?) MHz	8 Mbit/s	1 MB/s	1975
STD-80 8-bit/8 MHz	16 Mbit/s	2 MB/s	
ISA 8-Bit/4.77 MHz	0 W/S: every 4 clocks 8 bits 1 W/S: every 5 clocks 8 bits	0 W/S: every 4 clocks 1 byte 1 W/S: every 5 clocks 1 byte	1981 (created)
STD-80 16-bit/8 MHz	32 Mbit/s	4 MB/s	
I3C (HDR mode)[36]	33.3 Mbit/s	4.16 MB/s	2017
Zorro II 16-bit/7.14 MHz[37]	42.4 Mbit/s	5.3 MB/s	1986
ISA 16-Bit/8.33 MHz	66.64 Mbit/s	8.33 MB/s	1984 (created)
Europe Card Bus 8-Bit/10 MHz	66.7 Mbit/s	8.33 MB/s	1977 (created)
S-100 bus 8-bit/10 MHz	80 Mbit/s	10 MB/s	1976 (published)
Serial Peripheral Interface Bus (Up to 100 MHz)	100 Mbit/s	12.5 MB/s	1989
Low Pin Count	125 Mbit/s	15.63 MB/s [x]	2002
STEbus 8-Bit/16 MHz	128 Mbit/s	16 MB/s	1987 (standardized)
C-Bus 16-bit/10 MHz	160 Mbit/s	20 MB/s[38]	1982
HP Precision Bus	184 Mbit/s	23 MB/s	
STD-32 32-bit/8 MHz	256 Mbit/s	32 MB/s[39]	
NESA 32-bit/8 MHz	256 Mbit/s	32 MB/s[40]	
EISA 32-bit/8.33 MHz	266.56 Mbit/s	33.32 MB/s	1988
VME64 32-64bit	400 Mbit/s	40 MB/s	1981
MCA 32bit/10 MHz	400 Mbit/s	40 MB/s	1987
NuBus 10 MHz	400 Mbit/s	40 MB/s	1987 (standardized)

PCI 32-bit/33 MHz	1067 Mbit/s	133.33 MB/s	1993
HP GSC-1X	1136 Mbit/s	142 MB/s	
Zorro III 32-bit/async (eq. 37.5 MHz)[44][45]	1200 Mbit/s	150 MB/s[46]	1990
VESA Local Bus (VLB) 32-bit/40 MHz	1280 Mbit/s	160 MB/s	1992
Sbus 64-bit/25 MHz	1.6 Gbit/s	200 MB/s	1995
HP GSC-2X	2.048 Gbit/s	256 MB/s	
PCI 64-bit/33 MHz	2.133 Gbit/s	266.7 MB/s	1993
PCI 32-bit/66 MHz	2.133 Gbit/s	266.7 MB/s	1995
AGP 1×	2.133 Gbit/s	266.7 MB/s	1997
PCI Express 1.0 (×1 link)[47]	2.5 Gbit/s	250 MB/s [z]	2004
RapidIO Gen1 1×	2.5 Gbit/s	312.5 MB/s	
HIO bus	2.560 Gbit/s	320 MB/s	
GIO64 64-bit/40 MHz	2.560 Gbit/s	320 MB/s	
PCI Express 1.0 (×2 link)[47]	5 Gbit/s	500 MB/s [z]	2011
PCI Express 2.0 (×1 link)[48]	5 Gbit/s	500 MB/s [z]	2007
AGP 2×	4.266 Gbit/s	533.3 MB/s	1997
PCI 64-bit/66 MHz	4.266 Gbit/s	533.3 MB/s	
PCI-X DDR 16-bit	4.266 Gbit/s	533.3 MB/s	
RapidIO Gen2 1×	5 Gbit/s	625 MB/s	
PCI 64-bit/100 MHz	6.4 Gbit/s	800 MB/s	
PCI Express 3.0 (×1 link)[49]	8 Gbit/s	984.6 MB/s [y]	2011
Unified Media Interface (UMI) (×4 link)	10 Gbit/s	1 GB/s [z]	2011
Direct Media Interface (DMI) (×4 link)	10 Gbit/s	1 GB/s [z]	2004
Enterprise Southbridge Interface (ESI)	8 Gbit/s	1 GB/s	

Portable bus (PC Card – Express Card)

- a configuration for computer parallel communication peripheral interface, designed for laptop computers.

Personal Computer Memory Card International Association

A PC Card network adapter

Year created	1990
Superseded by	ExpressCard (2003)
Width in bits	16 or 32
No. of devices	1 per slot
Speed	133 MB/s[citation needed]
Style	Parallel
Hotplugging interface	Yes
External interface	Yes

Storage bus (NVMe M.2)

- open logical-device interface specification for accessing non-volatile storage media attached via PCI Express (PCIe) bus.

- 64 Gbit/s, 7.876 GB/s

Storage Bus

SD (High Speed)	**200 Mbit/s**	25 MB/s	
Ultra DMA ATA 33	**264 Mbit/s**	33 MB/s	1998
Ultra Wide SCSI (16 bits/20 MHz)	**320 Mbit/s**	40 MB/s	
Ultra-2 SCSI 40 (Fast-40 SCSI) (8 bits/40 MHz)	**320 Mbit/s**	40 MB/s	
SDHC/SDXC/SDUC (UHS-I Full Duplex)	**400 Mbit/s**	50 MB/s	
Ultra DMA ATA 66	**533.6 Mbit/s**	66.7 MB/s	2000
Blu-ray Controller (16×)	**576 Mbit/s**	72 MB/s	
Ultra-2 wide SCSI (16 bits/40 MHz)	**640 Mbit/s**	80 MB/s	
Serial Storage Architecture SSA	**640 Mbit/s**	80 MB/s	1990
Ultra DMA ATA 100	**800 Mbit/s**	100 MB/s	2002
Fibre Channel 1GFC (1.0625 GHz)[56]	**850 Mbit/s**	103.23 MB/s	1997
AoE over gigabit Ethernet, jumbo frames[57]	**1 Gbit/s**	124.2 MB/s	2009
iSCSI over gigabit Ethernet, jumbo frames[58]	**1 Gbit/s**	123.9 MB/s	2004
Ultra DMA ATA 133	**1.064 Gbit/s**	133 MB/s	2005
SDHC/SDXC/SDUC (UHS-II Full Duplex)	**1.25 Gbit/s**	156 MB/s	
Ultra-3 SCSI (Ultra 160 SCSI; Fast-80 Wide SCSI) (16 bits/40 MHz DDR)	**1.28 Gbit/s**	160 MB/s	
SATA revision 1.0[59]	**1.500 Gbit/s**	150 MB/s [a]	2003
Fibre Channel 2GFC (2.125 GHz)[56]	**1.700 Gbit/s**	206.5 MB/s	2001
Ultra-320 SCSI (Ultra4 SCSI) (16 bits/80 MHz DDR)	**2.560 Gbit/s**	320 MB/s	
Serial Attached SCSI (SAS) SAS-1[59]	**3 Gbit/s**	300 MB/s [a]	2004
SATA Revision 2.0[59]	**3 Gbit/s**	300 MB/s [a]	2004
SDHC/SDXC/SDUC (UHS-III Full Duplex)	**2.5 Gbit/s**	312 MB/s	
Fibre Channel 4GFC (4.25 GHz)[56]	**3.4 Gbit/s**	413 MB/s	2004
Serial Attached SCSI (SAS) SAS-2[59]	**6 Gbit/s**	600 MB/s [a]	2009
SATA Revision 3.0[59]	**6 Gbit/s**	600 MB/s [a]	2008
Fibre Channel 8GFC (8.50 GHz)[56]	**6.8 Gbit/s**	826 MB/s	2005
SDHC/SDXC/SDUC (SD Express)	**7.9 Gbit/s**	985 MB/s	