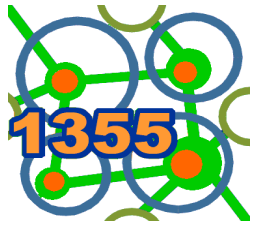


IEEE 1355

**Why yet another high-speed
serial interface standard?**

Paul Walker, 4Links, www.4Links.co.uk

IEEE 1355 at IEE Electronics and Communications Open
Forum, 1 July 1999, Paul Walker, 4Links



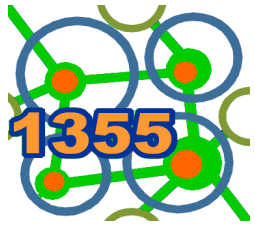
IEEE 1355 port is like a UART

UART/RS232

- Asynchronous
- Serial
- Autobaud
- Point-to-point
- Simple

IEEE 1355

- Asynchronous
- Serial
- Autobaud
- Point-to-point
- Simple: Users say (much) easier to use than RS232



Like UART but faster, more reliable, less logic

UART/RS232

- Flow-control with escapes or extra wires
- Packet protocol(s) with escapes
- Fastest ~ 10 Mbaud
- UART core in Xilinx:

1.5 MBaud
350 CLBs

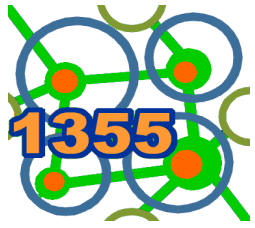
IEEE 1355

- Flow-control built-in, never loses data
- Simple packet protocol built in
- to 200 Mbaud for DS, to 2GBaud for HS
- 1355 DS core in Xilinx:

140 Mbaud
100 CLBs

100 times UART performance in 1/3 logic

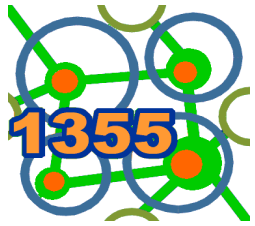
IEEE 1355 at IEE Electronics and Communications Open Forum, 1 July 1999, Paul Walker, 4Links



Ports connect into networks: Plenty to choose from!

- **USB: Bus, bottleneck, single point failure**
- **1394: Bus, bottleneck, single point failure**
- (**Buses are obsolete: new networks are switched, scalable and fault-tolerant**)
- **Ethernet: Designed as bus, now switched**
- **ATM: Designed for switched global network**
- **1355: Designed for switched chip-chip network**

IEEE 1355 at IEE Electronics and Communications Open Forum, 1 July 1999, Paul Walker, 4Links



1355's flexible packet protocol

EOP	188 byte MPEG frame	Hdr
-----	---------------------	-----

EOP	1 byte	Hdr
-----	--------	-----

EOP	53 byte ATM cell	Hdr
-----	------------------	-----

EOP	48 byte	ATM Hdr
-----	---------	---------

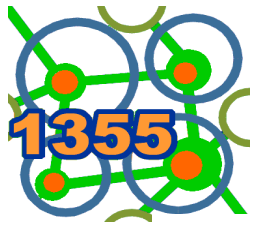
EOP	Data	Address
-----	------	---------

EOP	1.5 kbyte IP packet	Hdr
-----	---------------------	-----

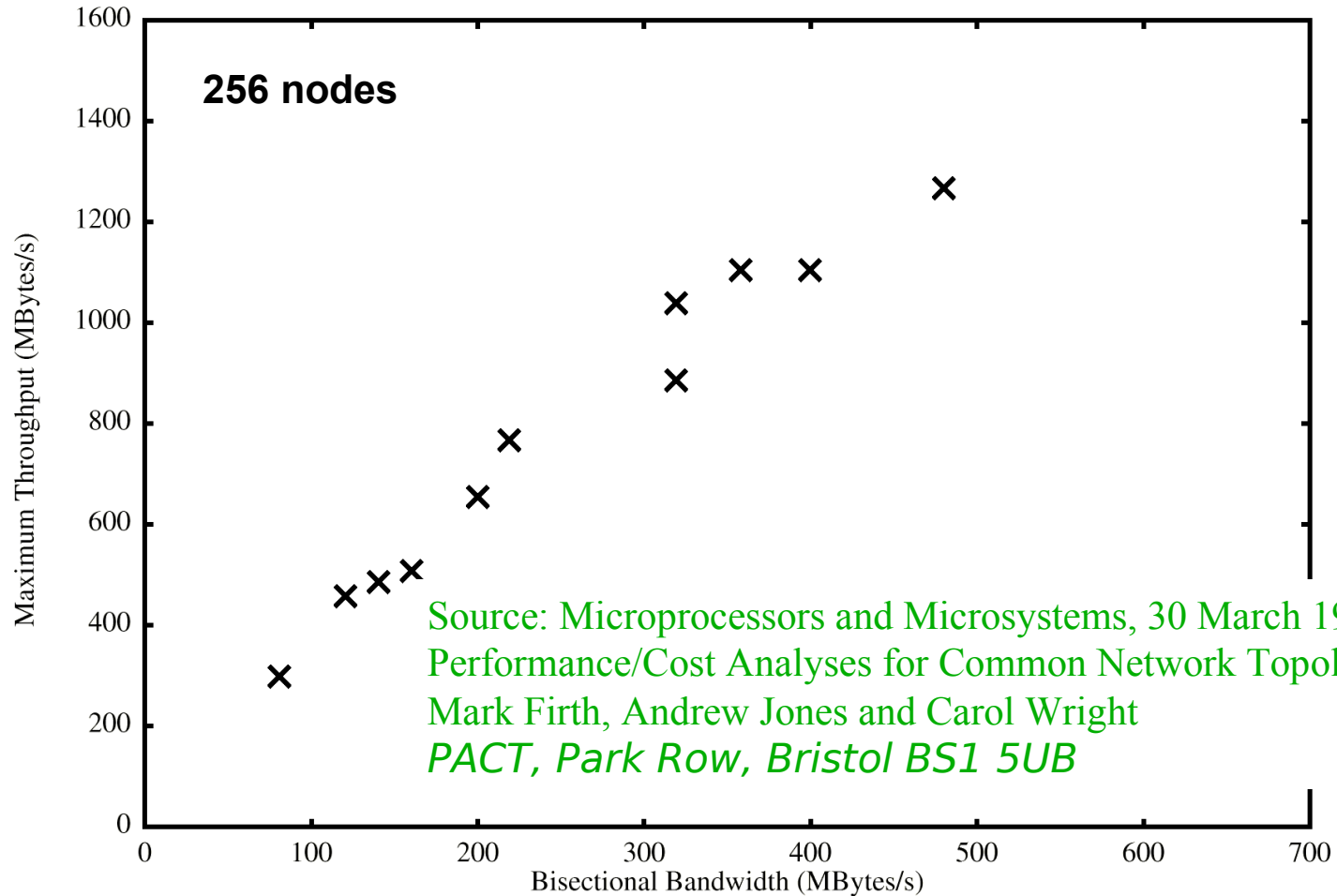
EOP	4 kbyte disc sector	Hdr
-----	---------------------	-----

**1355 network can carry multiple encapsulated protocols
on same network**

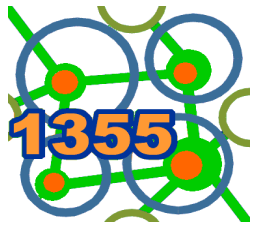
IEEE 1355 at IEE Electronics and Communications Open
Forum, 1 July 1999, Paul Walker, 4Links



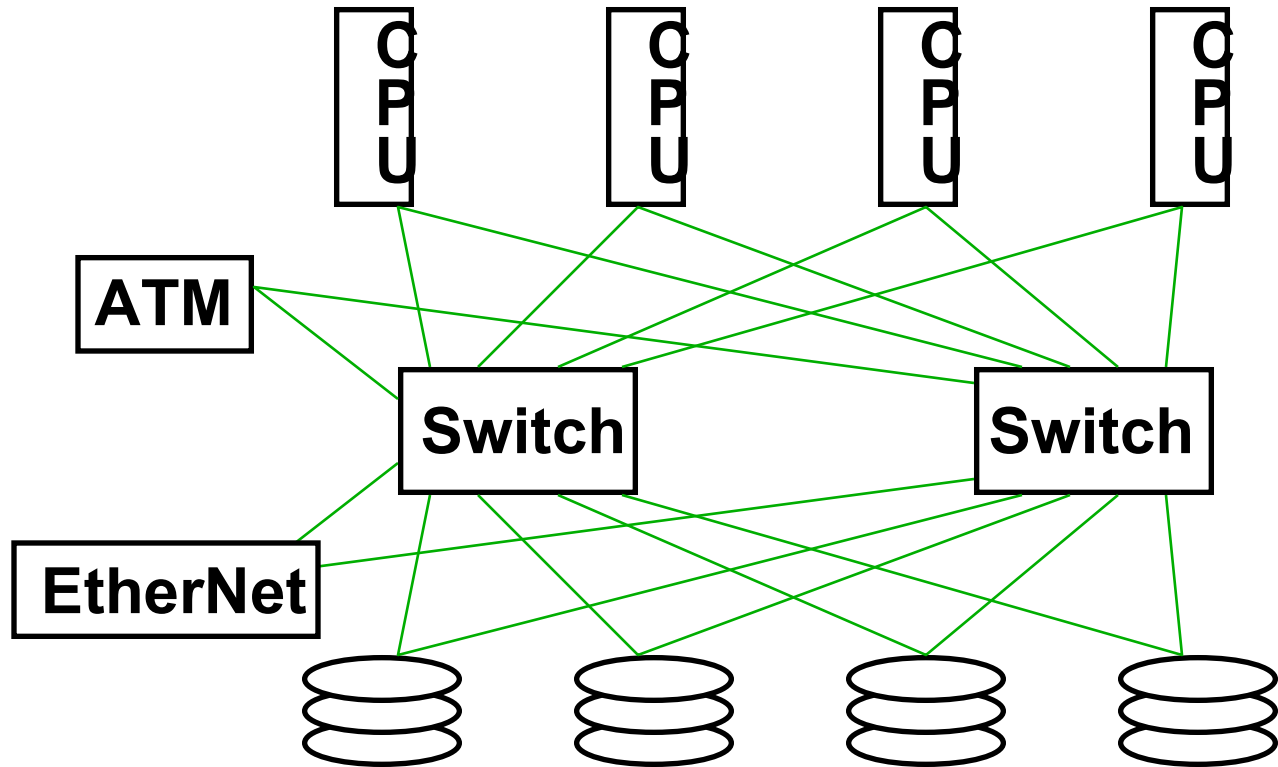
1355's bandwidth scales



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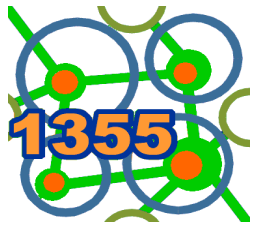


Network router/server

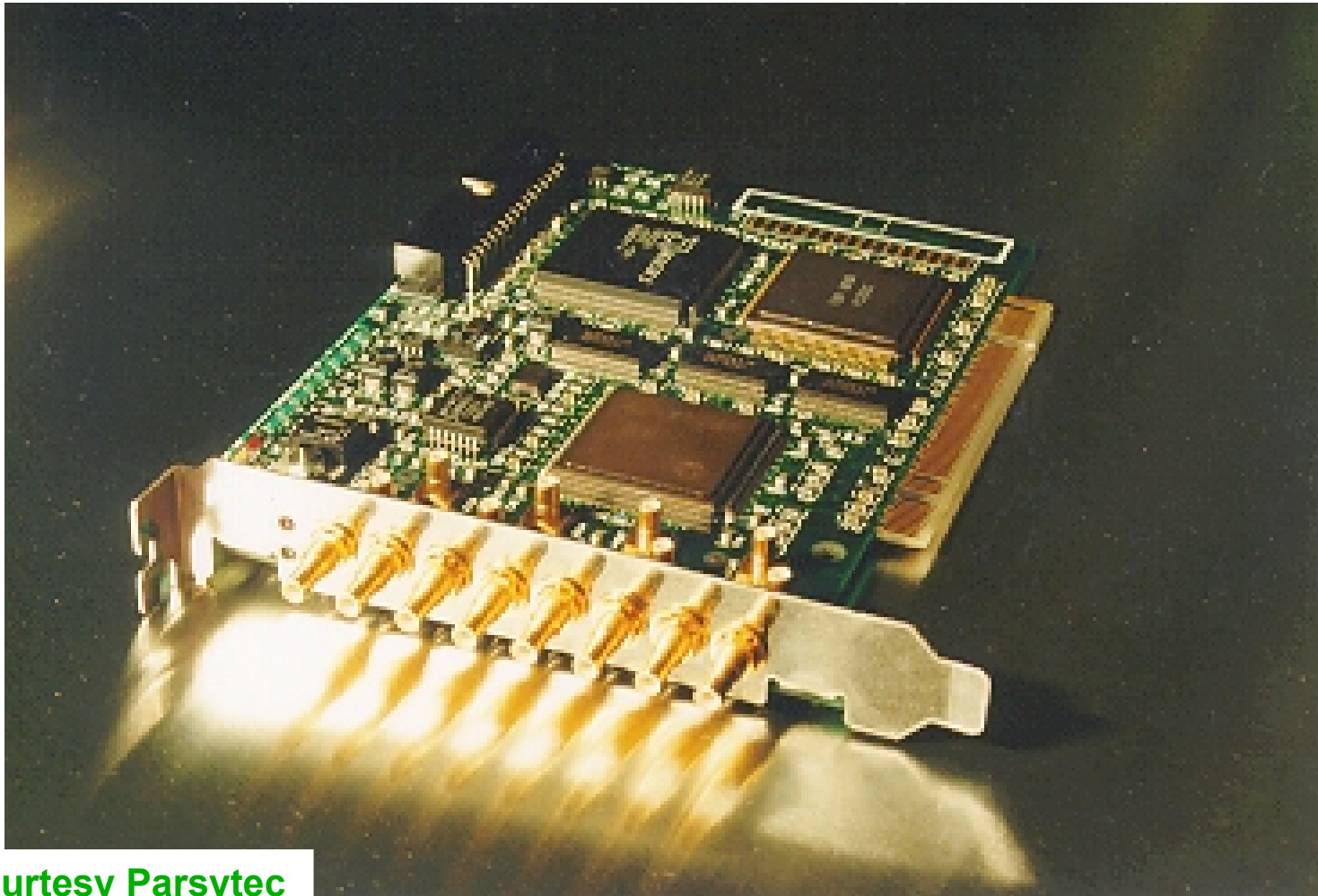


No single point of failure,

Network can share many different types of traffic



HS-link PCI routing switch

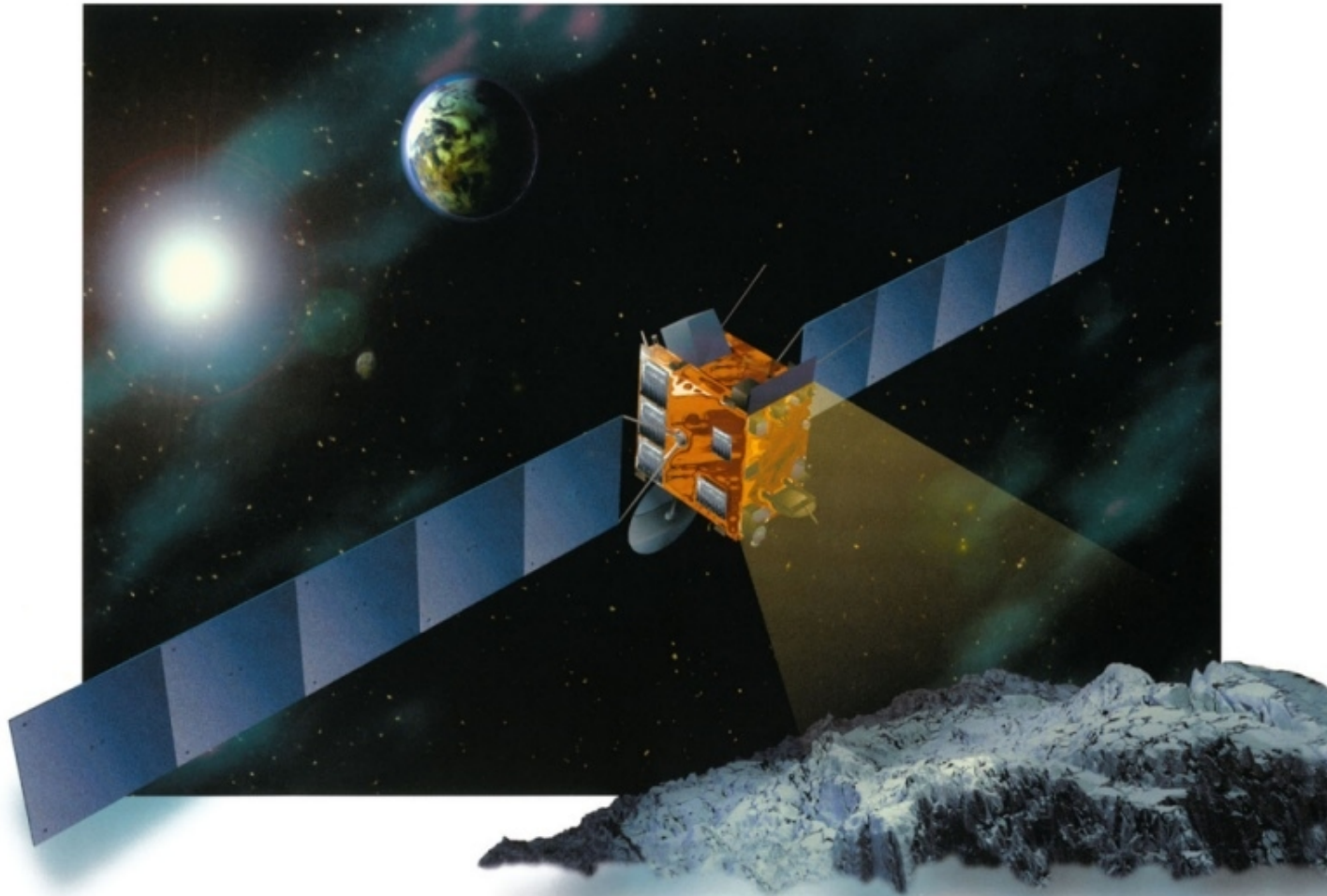


Courtesy Parsytec

IEEE 1355 at IEEE Electronics and Communications Open Forum, 1 July 1999, Paul Walker, 4Links



Rosetta Spacecraft to use 1355



<http://www.estec.esa.nl/spdwww/rosetta/pics/rosetta.jpg>

TELE 1355 at IEE Electronics and Communications Open Forum, 1 July 1999, Paul Walker, 4Links

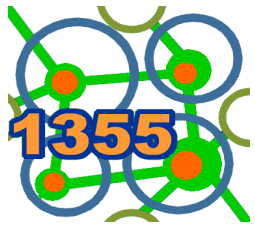
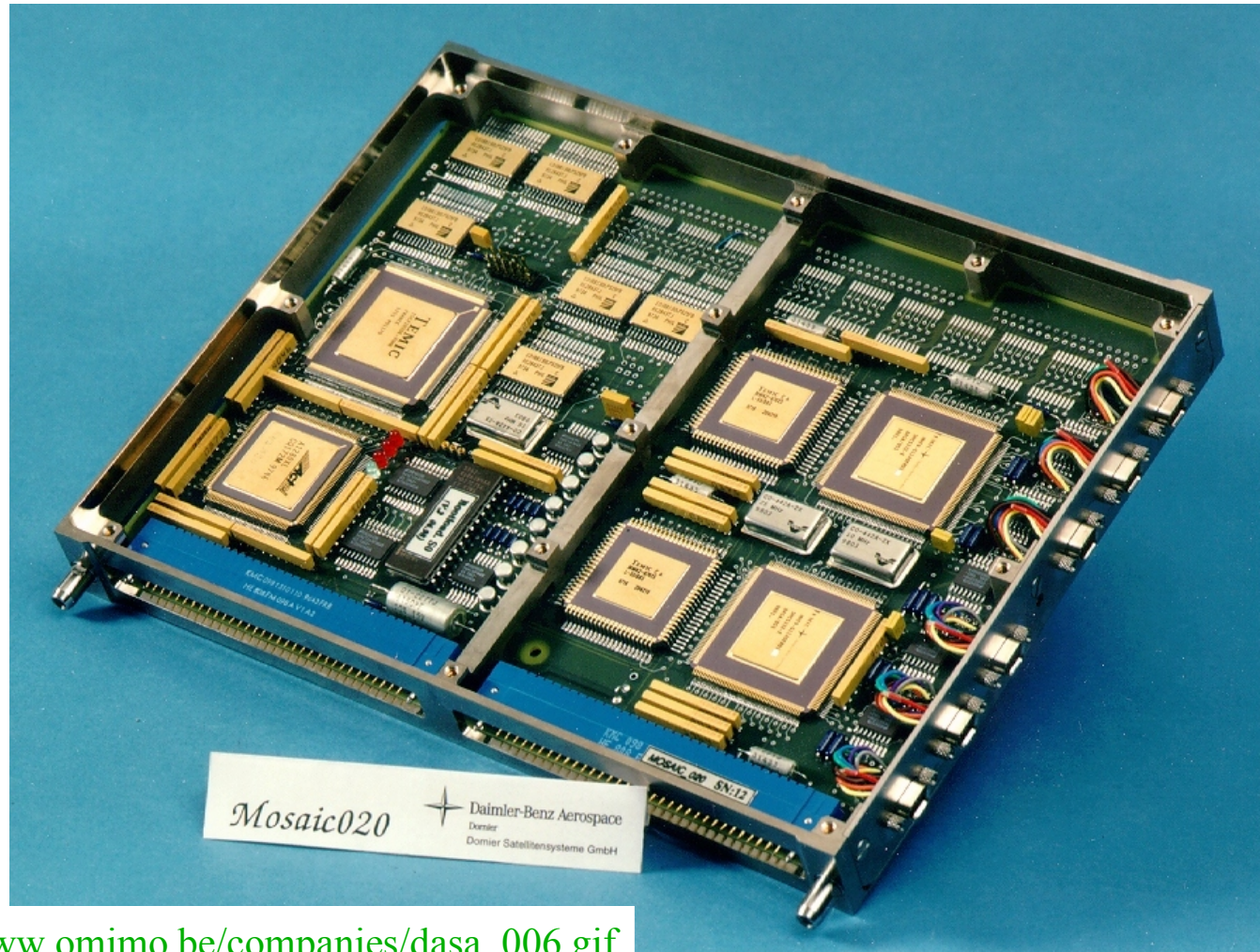
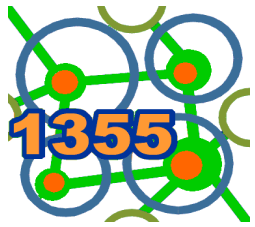


Image-processing DSP for Space

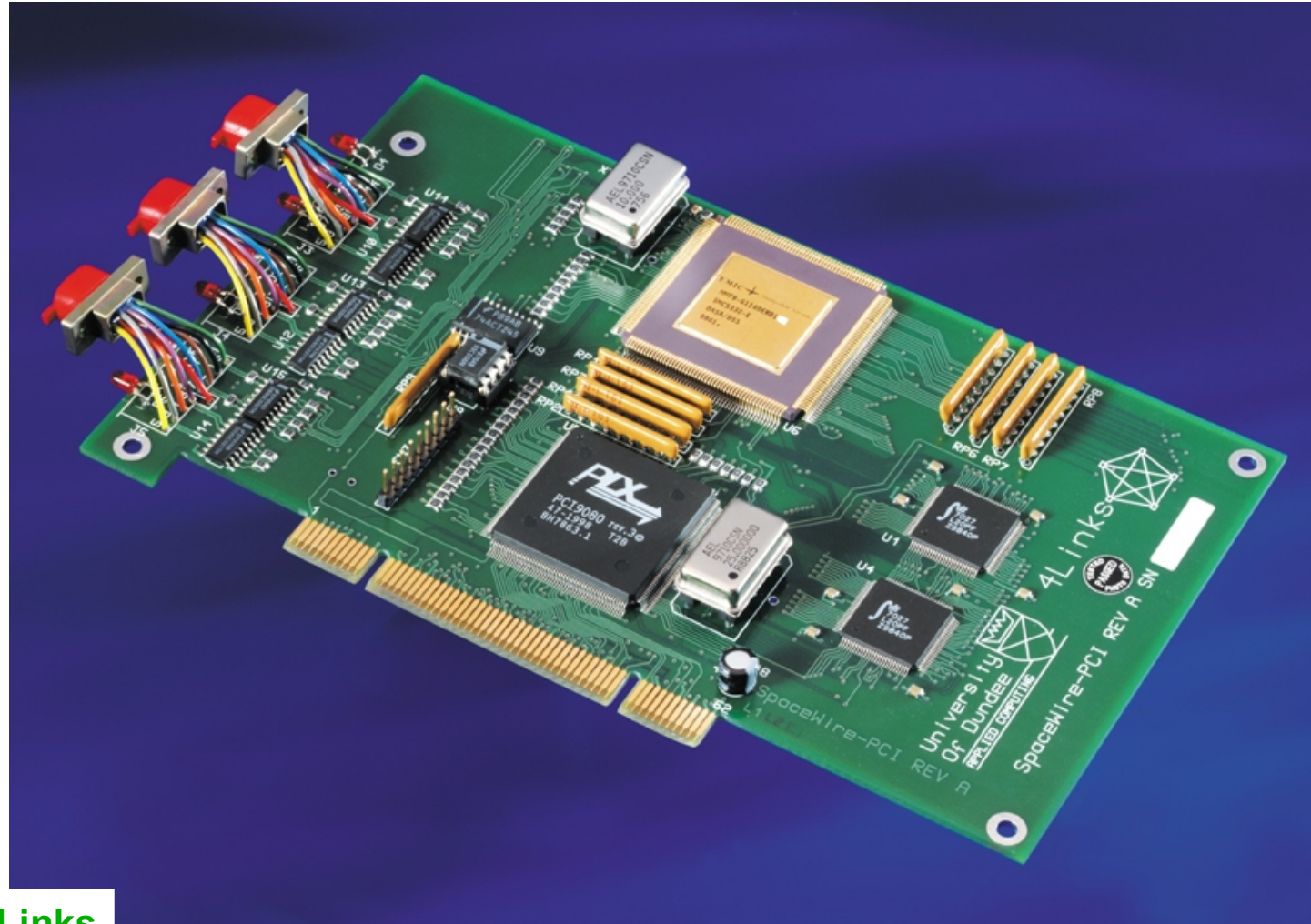


http://www.omimo.be/companies/dasa_006.gif

TELE 1355 at IEE ELECTRONICS and Communications Open Forum, 1 July 1999, Paul Walker, 4Links



“SpaceWire”-PCI

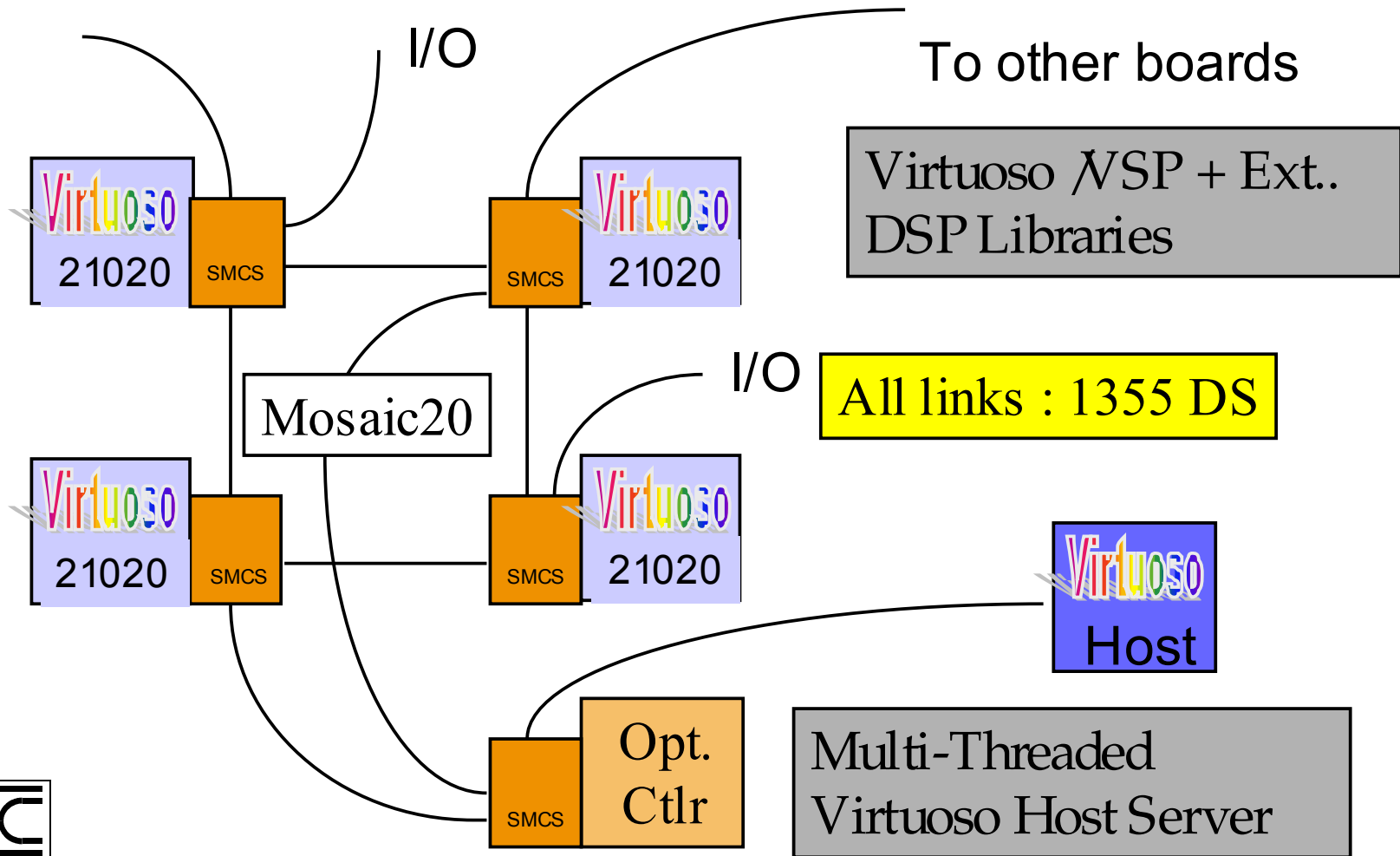


From 4Links

IEEE 1355 at IEE Electronics and Communications Open Forum, 1 July 1999, Paul Walker, 4Links

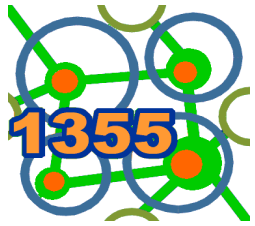
Virtuoso VSP on 21020 DSP

From Deep Space to Deep Sea



29th Jun-99

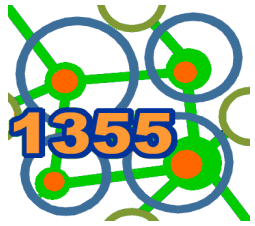
Eonic Systems



What's wrong with IEEE 1355?

- Transputer links demonstrated convergence of computers and communications in 1985
- Abandoned by companies who started it
- Used in niche markets such as Space
- Not quite enough products yet
- **No one has heard of it**

IEEE 1355 at IEE Electronics and Communications Open Forum, 1 July 1999, Paul Walker, 4Links



What's right with IEEE 1355?

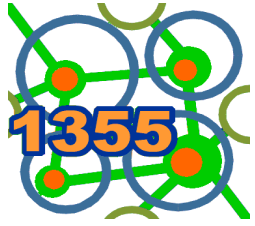
- **Low-cost:** Port uses fewer gates than RS232, Switches use fewer gates than USB Hubs
- **Scalable** to Terabits/s total network throughput
- **Reliable,** resilient, no single points of failure
- **Flexible:** ATM, IP, MPEG... on same network

No other network has this combination

You need this combination

That's why the 1355 standard

IEEE 1355 at IEE Electronics and Communications Open Forum, 1 July 1999, Paul Walker, 4Links



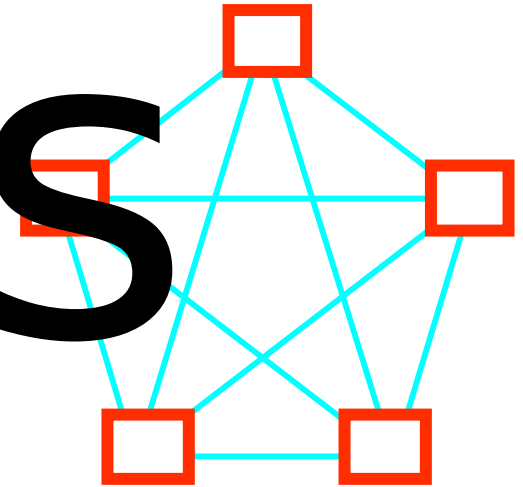
What's right with IEEE 1355?

- You have heard of it
now

www.1355.org

IEEE 1355 at IEE Electronics and Communications Open
Forum, 1 July 1999, Paul Walker, 4Links

4Links



for links

www.4Links.co.uk