

Clause 28 Auto-Negotiation and 1000 Mb/s Link Configuration are Different

Prepared for Packet Engines

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They Work on Different Media

Clause 28
Auto-Negotiation

1000 Mb/s Link
Configuration

UTP
links

- ★ For UTP links using RJ-45 connector
- ★ 10 & 100 Mb/s UTP were defined for 100BASE-T
- ★ 1000 Mb/s UTP <future>

Fiber,
TW-cable

- ★ For fiber
- ★ For short copper links
- ★ 1000 Mb/s only



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Clause 28 Auto-Negotiation: Legacy Issues

Clause 28 had to address a lot of constraints

- ★ Legacy 10BASE-T link pulse compatibility
- ★ Parallel detection for non-FLP capable devices
- ★ Communications of scrambler states, master/slave settings, etc.

In response to these constraints, clause 28 developed

- ★ Fast link pulses
 - ★ Next page features
- (It's fairly complex)*



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1000 Mb/s Link Configuration: What's It For?

1000 Mb/s fiber (13000-nm singlemode and multi-mode)

1000 Mb/s fiber (780-nm multi-mode)

Short copper links (25-m TW-style twinax)

Clause 28 Auto-Negotiation is not
defined for any of these media.

Fast link pulses don't work over fiber.



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1000 Mb/s Link Configuration: Basic Assumptions

At 1000 Mb/s, we can make some assumptions

- ★ Assume use of full-duplex, synchronous links
- ★ Assume use of 1000 Mb/s signaling
- ★ Assume use of 8B10B coding

Link configuration takes advantage of the basic assumptions

- ★ It uses a special 8B10B code “C” to mark configuration words
- ★ After that, the configuration word format is similar to Auto-Negotiation

➤ It copies all the relevant parts of Auto-Negotiation, customized to our new situation



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What the Two Systems Have In Common

16-bit control registers

Concept of exchanging registers multiple times

Use of “ACK” bit

Some information bits are the same

Some information bits are different

- ★ No need for scrambler states
- ★ No need for parallel detection
- ★ No need to reserve bits for legacy capabilities that can't work on fiber or TW-style cable



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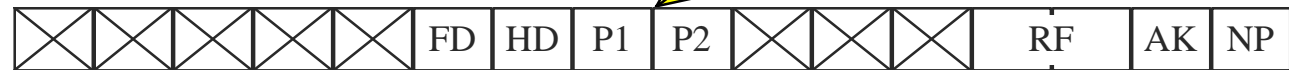
<6>

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Comparison of Control Register Formats

1000 Mb/s Link Configuration

★ Base page



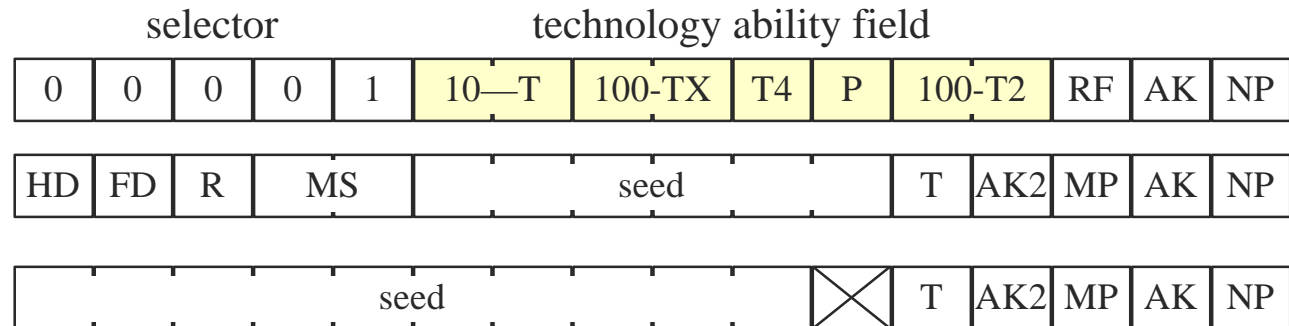
Pause1
Pause2

New at 1000 Mb/s
Not for lower speeds
No backwards compatibility

Auto-Neg. (T2)

★ Base page

★ Next pages
(msg. 7)



We can define next pages and pause bits as needed for 1000BASE-T



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Conclusions

It's OK to have two configuration systems

- ★ 10BASE-T legacy compatibility is not an issue for 1000 Mb/s fiber or short copper

Clause 28
Auto-Negotiation



10/100/1000 Mb/s
UTP

1000 Mb/s Link Configuration



1000 Mb/s
fiber and
TW-style cable
(8B10B-coded)



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