

The hardest sudokus (new thread)

Re: The hardest sudokus (new thread)

By champagne » Tue Nov 30, 2010 6:22 pm

Here are 4 puzzles produced during the pattern game 126.

```
CODE: SELECT ALL

9...8...7...6...5.4.9.3.2...8...4.3...6..7.1...26.....1..3...3...8...5 385 10 ;10;7;10;7;9;3
9...8...7...6...8.5.4.3.2...1...5.9...4..3.5..23.....7..6...8...4...1 380 3 ;9;8;9;8;9;4
9...8...7...6...8.5.4.3.4...5...2.4...6..3.1..73.....3..5...8...4...9 284 5 ;10;7;10;7;9;5
9...8...7...6...5.4.3.6.2...8...3.9...7..4.1..23.....1..5...4...8...5 256 5 ;10;5;10;5;8;8
9...8...7...6...8.5.4.3.2.1...3...4.9...4..6.1..72.....6...3...1...4...5 254 9 ;10;6;10;6;3;4
9...8...7...6...5.4.3.4.2...5...4.1...6..1.1...76.....6...4...3...5...9 236 3 ;10;6;10;6;9;5
```

These puzzles are (seen by my solver) the toughest out of "swampy soil" I got in that game.

They have a relatively poor SE rating and, one can see that none of the highest rating of the game is there.

The "raw" difficulty is slightly above the last one from eleven.
.all of them solved using only AAHS 2 cells
.print in the range 230k - 300k
.2 of them have a high level of nested weak links (respectively 10 and 9)

4 out of the 6 have a rank 0 logic

I am suspecting that, when the number of clues is growing, SE rating quality to select hardest puzzles is deteriorating.

But may-be somebody will come with easy solutions for that lot

champagne

Re: The hardest sudokus (new thread)

By rank » Wed Dec 01, 2010 4:52 pm

```
tt wrote:
Yes, I did study more and remind me Silver Plate

CODE: SELECT ALL

00300600000100206000070005004000000300004090098020000030008006000000107000500000 11.5

eleven's puzzle ER11.5 Raw Rank = 5 (linksets - sets)
17 Sets = {1R157 5R157 7R157 157C6 157C8 46N1}
22 Links = {157c1 1n2 5n57 7n3 1b34568 5b24569 7b34568}
2 AURs = {51R64C61, 75R64C81 AUR points {aur 54c1 1r6c6 7r6c8}
1 Elimination -> r4c1<5
```

ttt, your AURs for this one involve three layers, rather than just two as in the Silver Plate link ... so excellent find. While I don't totally understand the logic, the visual certainly helps.

```
champagne wrote:
No surprise, using Allan model, many things can be done in once.
```

Since ttt's logic is for a single exclusion, how is "many things can be done in once" relevant?

Re: The hardest sudokus (new thread)

By champagne » Wed Dec 01, 2010 5:36 pm

```
rank wrote:

champagne wrote:
No surprise, using Allan model, many things can be done in once.
```

Since ttt's logic is for a single exclusion, how is "many things can be done in once" relevant?

If you look carefully, you will see that the diagram clean the target of the EXOCET and 5r4c1.

The cleaning of the target is partially hidden by the AUR notation

champagne

Re: The hardest sudokus (new thread)

By rank » Wed Dec 01, 2010 5:58 pm

```
champagne wrote:
If you look carefully, you will see that the diagram clean the target of the EXOCET and 5r4c1.

The cleaning of the target is partially hidden by the AUR notation
```

I suspect a lot is lost in language translation here. If not, please send me some of what you're smoking

Re: The hardest sudokus (new thread)

By champagne » Wed Dec 01, 2010 6:17 pm

```
rank wrote:

champagne wrote:
If you look carefully, you will see that the diagram clean the target of the EXOCET and 5r4c1.

The cleaning of the target is partially hidden by the AUR notation
```

I suspect a lot is lost in language translation here. If not, please send me some of what you're smoking

Sorry I looked at it too fast.

I took the 2 red dots in r6c8 as indication of a vertical cleaning.

The target is not there (and could not be in the same row)

champagne

Re: The hardest sudokus (new thread)

By eleven » Thu Dec 02, 2010 3:25 pm

This came very early, ER 11.9/11.9/9.9
I guess its not that hard, at least SE was relatively quick with solving:

```
CODE: SELECT ALL

+---+
| 1 2 | 3 | | | |
| 4 . | 5 | | | |
| . 6 | 1 7 | | | |
+---+
| . 1 | . 6 | 8 | |
| 3 . | 4 | 7 7 | |
| . . | 2 . | 5 | |
+---+
| . 1 | . . | 9 . | |
| . 9 | . . | 6 8 |
| . . | 9 | 7 | |
+---+
```

Imam bayildi

Re: The hardest sudokus (new thread)

By RW » Thu Dec 02, 2010 3:40 pm

```
eleven wrote:
This came very early, ER 11.9/11.9/9.9
I guess its not that hard, at least SE was relatively quick with solving:

CODE: SELECT ALL

+---+
| 1 2 | 3 | | | |
| 4 . | 5 | | | |
| . 6 | 1 7 | | | |
+---+
| . 1 | . 6 | 8 | |
| 3 . | 4 | 7 7 | |
| . . | 2 . | 5 | |
+---+
| . 1 | . . | 9 . | |
| . 9 | . . | 6 8 |
| . . | 9 | 7 | |
+---+
```

Nice puzzle! Only 6 strong links in the opening, that's the smallest amount of strong links I've seen. Though it has a bivalence cell, which is not very common in superhard puzzles.

Btw. is there any tool that could count the amount of strong links/bivalence cells in the opening grid (after potential singles) for a batch of puzzles? Would be interesting to see how these numbers correlate with our difficulty ratings.

RW

Re: The hardest sudokus (new thread)

By eleven » Thu Dec 02, 2010 3:51 pm

In my program i count them in the grid with the first hard step. In champagne's hardest ER list i saw three with 4 links.
In the meantime i have found 9 puzzles with 3 links (no bivalues), but they did not rate very high.

Re: The hardest sudokus (new thread)

By RW » Thu Dec 02, 2010 3:57 pm

Ok, thanks. After counting a few puzzles from the list i had a feeling that there isn't a very strong correlation, which apparently is the case. Could you post the 9 puzzles with only 3 links anyway?

RW

Re: The hardest sudokus (new thread)

By rank » Thu Dec 02, 2010 4:11 pm

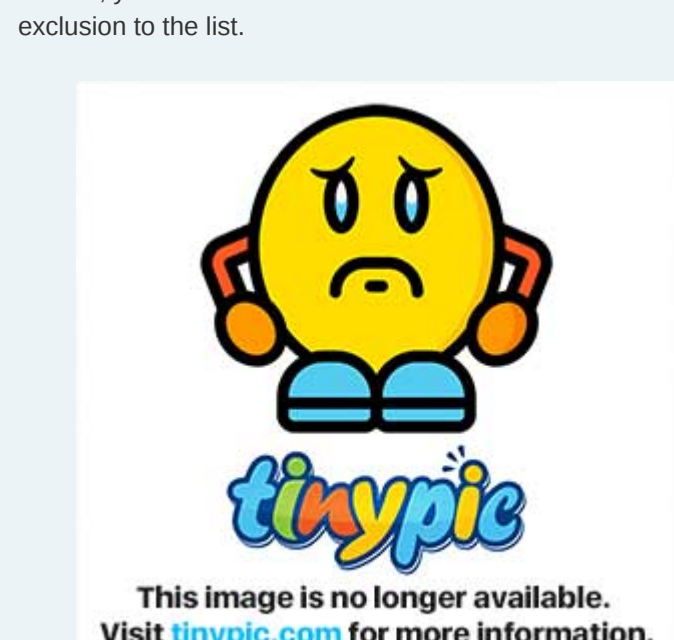
```
eleven wrote:
This came very early, ER 11.9/11.9/9.9

CODE: SELECT ALL

+---+
| 1 2 | 3 | | | |
| 4 . | 5 | | | |
| . 6 | 1 7 | | | |
+---+
| . 1 | . 6 | 8 | |
| 3 . | 4 | 7 7 | |
| . . | 2 . | 5 | |
+---+
| . 1 | . . | 9 . | |
| . 9 | . . | 6 8 |
| . . | 9 | 7 | |
+---+
```

Imam bayildi

eleven, you're on a roll! The start for this one has a similar "almost sk-loop" to at least three other of your recent puzzles. The addition of the four U4 cover sets -- 23r37c89, 23r47c89, 34r37c89 and 34r47c89 -- adds the r7c9<3 exclusion to the list.



Hidden Text: Show

[edit: tweaked the links (cover sets) for digit 5 in b4 and b5]

Last edited by rank on Thu Dec 02, 2010 4:41 pm, edited 1 time in total.

Re: The hardest sudokus (new thread)

By eleven » Thu Dec 02, 2010 4:16 pm

Thanks Ron.

For RW the puzzles with 3 links:

```
CODE: SELECT ALL

.....8.5.1.....6.....71...8.7...6...4.3...9...2..53...74..2.7.2..6.....9...7
..4.....92..6...7...1.7.3...3..6.81..5...35...1..8...2..19...1..84..
..34..7...9..6...2..1..8.43.715..8.....4...8.....28...6..9...67..1..
..34..7...5..8..32.....6.2.....19..3...6...8.51..8..4.....9..8..73...3
..34..7...5..8...2.....6.2.....19..3...6...8.51..8..4.....9..8..73..8...3
2...7.9..73...3.6.67...2...4...9.5...8...6.9.3...8...4..2.3.9..9.....5
2..5...94...9.3...91...4..8...7...6...6...7..3.1..9...8..52...9...43..
.....67..4...1.6.4...3...2.8...5..1...6.2...45...3...1.8...6
1...56.8...71.....96...1...7..3...2...46..5..8.....4..27..8..5.....5.3.
```

Re: The hardest sudokus (new thread)

By champagne » Thu Dec 02, 2010 4:39 pm

some comments on the last from eleven 11.9 11.9 9.9

1) He is right, it does not worth a name, but it is in the family of "hardest".

.solved using only 2 cells AAHS (print 250K)

.EXOCET in r7c89 (Ronk's SLG is built on it)

.(I did not find rank 0 logic)

2) before eleven sent this lot of high ER, I had the following in my database :

er count
11.9 1 (golden nugget)
11.8 10
11.7 10
11.6 14
11.5 17

So clearly, eleven found a key to locate high SE ratings, but only one puzzle is among the hardest.

champagne

Re: The hardest sudokus (new thread)

By rank » Thu Dec 02, 2010 5:06 pm

```
champagne wrote:
. solved using only 2 cells AAHS (print 250K)
. EXOCET in r7c89 (Ronk's SLG is built on it)
```

I've read about this "2 cell AAHS" umpteen times recently ... and it makes no sense to me. An AALS may be said to have a certain number of cells, but an AAHS has a certain number of digits. [edit: Note that the "number" is then the quantity of truths (base sets, strong inference sets) for each. Remember, it's strong sets that makes the sudoku world go around.]

Additionally, the logic set of my post is built on 18 truths. IMO the two truths of cells r7c89 are no more and no less important than any of the other sixteen truths.

Re: The hardest sudokus (new thread)

By champagne » Thu Dec 02, 2010 5:30 pm

```
rank wrote:

champagne wrote:
. solved using only 2 cells AAHS (print 250K)
. EXOCET in r7c89 (Ronk's SLG is built on it)
```

I've read about this "2 cell AAHS" umpteen times recently ... and it makes no sense to me. An AALS may be said to have a certain number of cells, but an AAHS has a certain number of digits.

Additionally, the logic set of my post is built on 18 truths. IMO the two truths of cells r7c89 are no more and no less important than any of the other sixteen truths.

1) AAHS

may be we have a problem with names of objects

My understanding is the following

ALS n cells n+1 digits
AHS/AC n cells n-1 known digit (the smallest AHS/AC is a cell)

AALS n cells n+2 digits
AAHS/AC2 n cells n-2 known digits

in fact, 2 cells with no known digit is both an AAHS and an AALS.

If the solver fails in solving using AHS/AC, then the next step is to use the 2 cells AAHS/AALS/AC2 and only if it fails again, it start with the full set of AAHS/AC2.

2) Regarding the SLG, no comment on how you built it.

Just the fact that we have in that puzzle an EXOCET

base r7c89
target r8c6 r9c3

just where your eliminations take place

champagne

Re: The hardest sudokus (new thread)

By tarek » Thu Dec 02, 2010 5:31 pm

```
eleven wrote:
Imam bayildi
```

So I guess this is a taster from what we could expect from you

Looking forward to seeing those records broken & well done on hitting those high notes

tarek

