Automated Substring Hole Analysis

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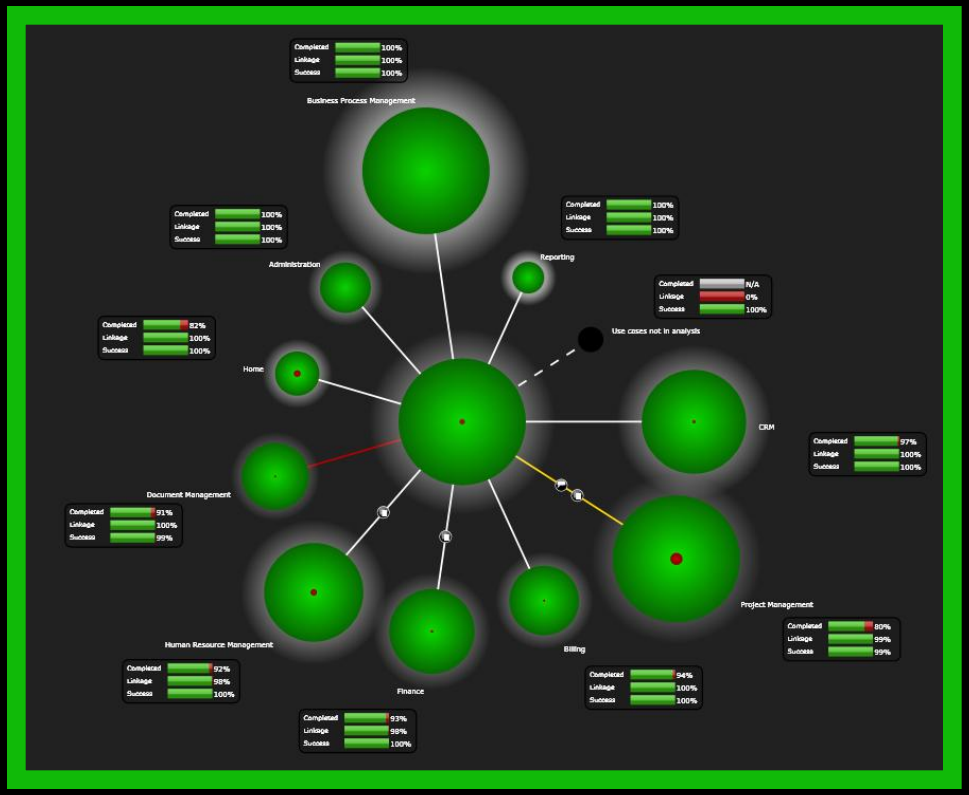
The System Test Coverage Problem



Genesis project overview

Coverage report: /tmp/test1.lisp

Kind	Covered	All	%
expression	17	29	58.6
branch	6	10	60.0

Key

Not instrumented
Conditionalized out
Executed
Not executed

Both branches taken
One branch taken
Neither branch taken

```
 1  (declaim (optimize sb-cover:store-cover
 2
 3  (defun test (n)
 4    (when (zerop n)
 5      (if (eql n 0)
 6          (print 'zero)
 7          (if (eql n 0.0)
 8              (print 'single-fp-zero)
 9              (print 'double-fp-zero))))
10    (when (minusp n)
11      (print 'negative))
12    (when (plusp n)
13      (tagbody
14         (print 'positive)
15         (go end)
16         (print 'dummy)
17        end)))
18
19  (test 0)
20  (test 1)
21
```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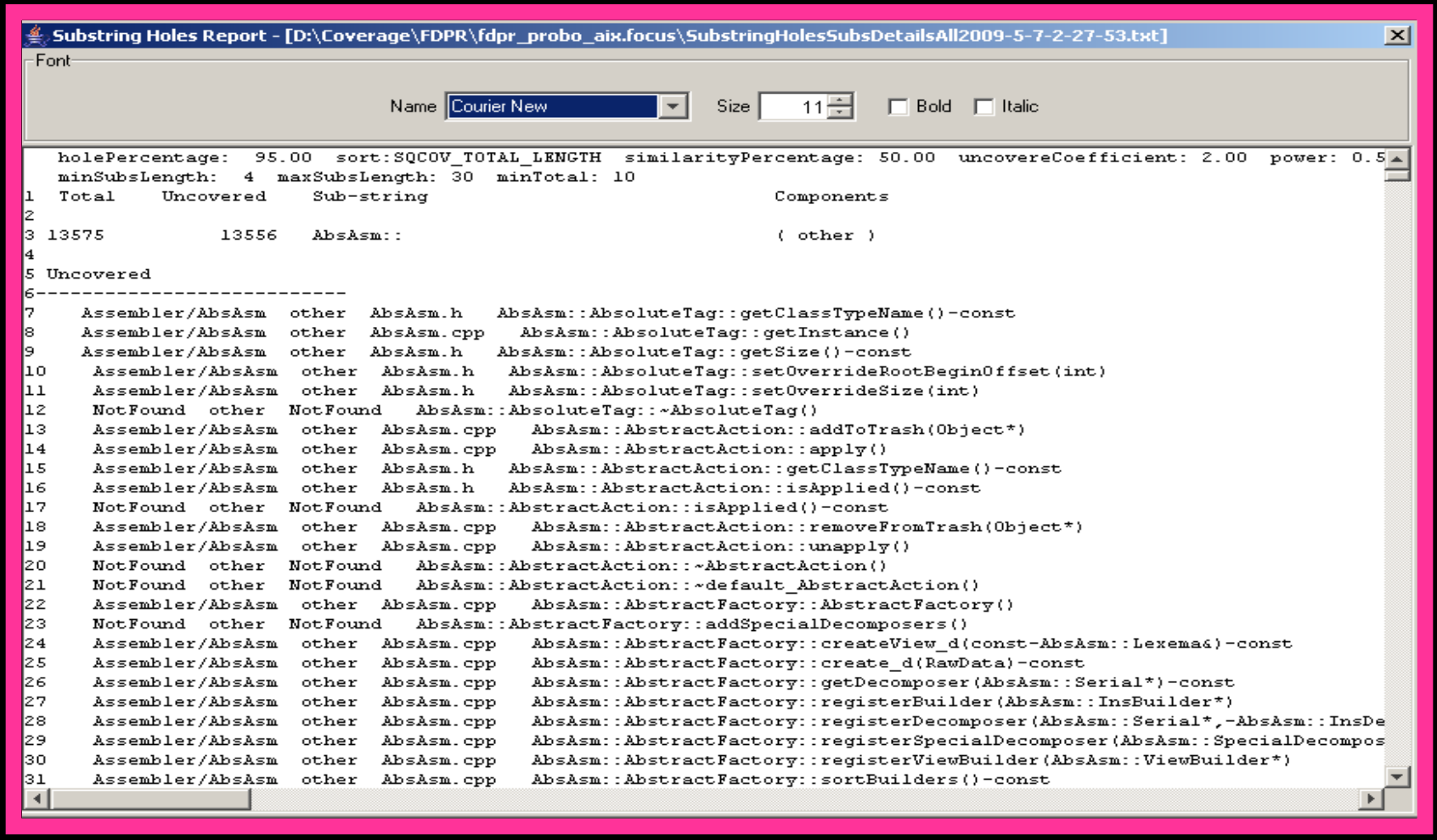
Introducing the concept of a hole - a substring that exists in many functions/file names for which there is poor coverage



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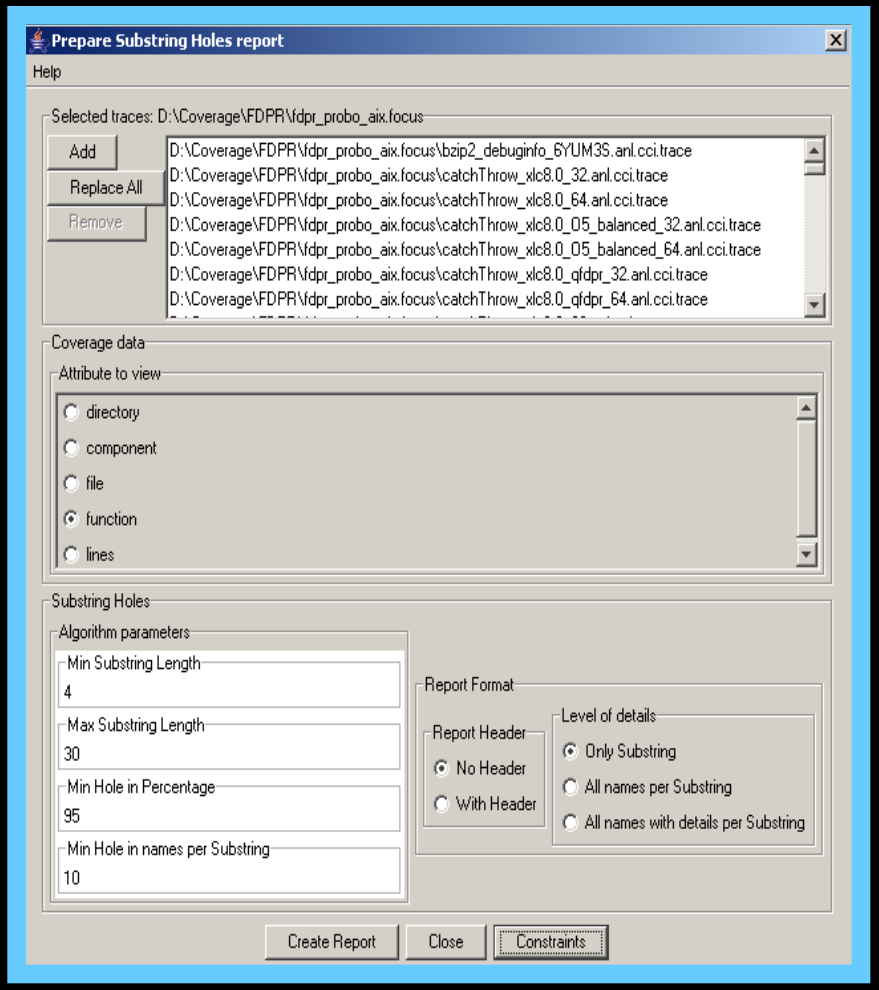
User Interface of FoCuS when Looking for Holes



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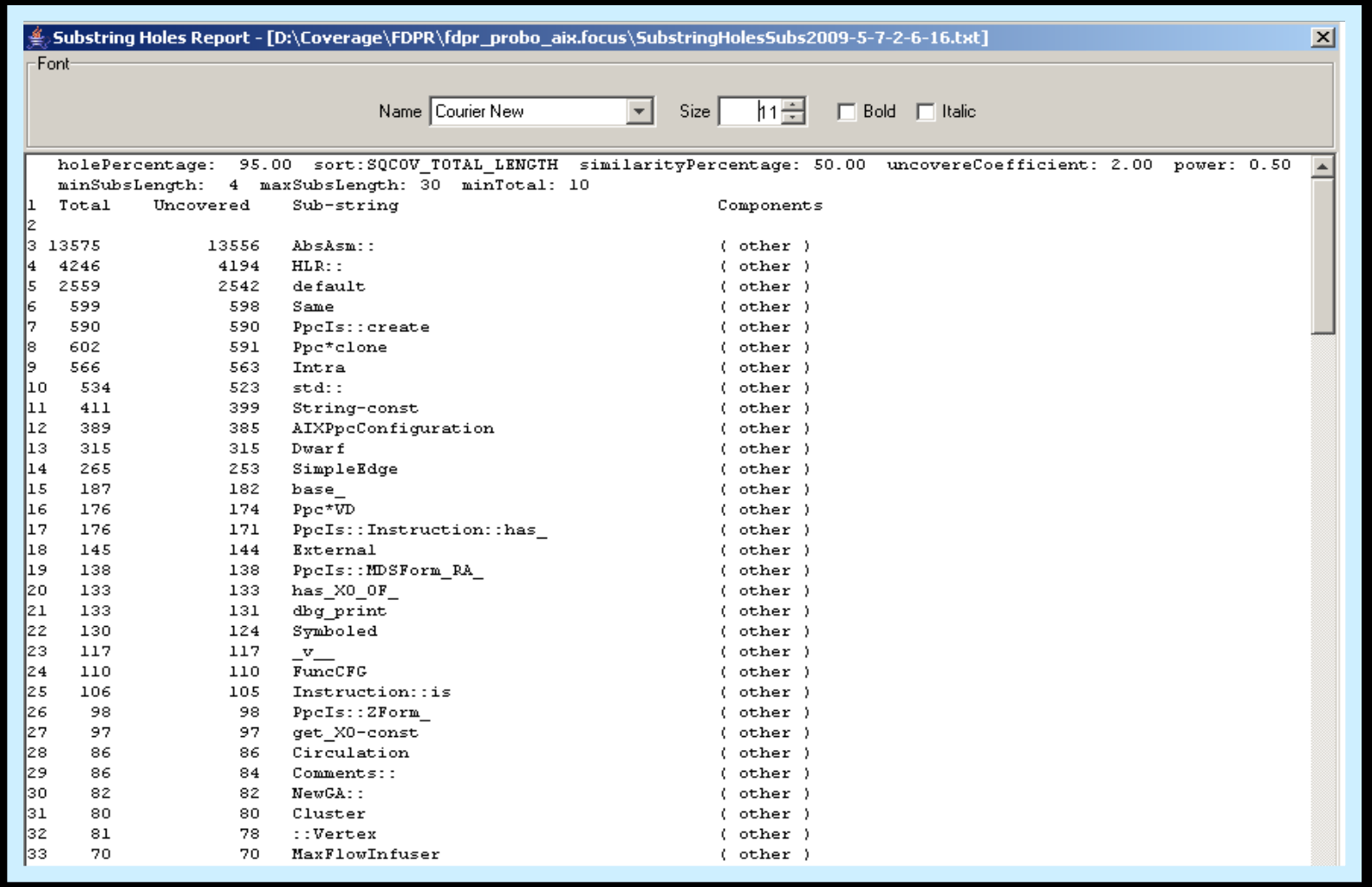
Output of FoCuS with Holes Defined



Substring Holes Report - [D:\Coverage\FDPR\fdpr_probo_aix.focus\SubstringHolesSubs2009-5-7-2-6-16.txt]

Font

Name: Courier New Size: 11 Bold Italic

holePercentage: 95.00 sort:SQCOV_TOTAL_LENGTH similarityPercentage: 50.00 uncovereCoefficient: 2.00 power: 0.50
minSubsLength: 4 maxSubsLength: 30 minTotal: 10

	Total	Uncovered	Sub-string	Components
1				
2				
3	13575	13556	AbsAsm::	(other)
4	4246	4194	HLR::	(other)
5	2559	2542	default	(other)
6	599	598	Same	(other)
7	590	590	PpcIs::create	(other)
8	602	591	Ppc*clone	(other)
9	566	563	Intra	(other)
10	534	523	std::	(other)
11	411	399	String-const	(other)
12	389	385	AIXPpcConfiguration	(other)
13	315	315	Dwarf	(other)
14	265	253	SimpleEdge	(other)
15	187	182	base_	(other)
16	176	174	Ppc*VD	(other)
17	176	171	PpcIs::Instruction::has_	(other)
18	145	144	External	(other)
19	138	138	PpcIs::MDSForm_RA_	(other)
20	133	133	has_XO_OF_	(other)
21	133	131	dbg_print	(other)
22	130	124	Symboled	(other)
23	117	117	_v__	(other)
24	110	110	FuncCFG	(other)
25	106	105	Instruction::is	(other)
26	98	98	PpcIs::ZForm_	(other)
27	97	97	get_XO-const	(other)
28	86	86	Circulation	(other)
29	86	84	Comments::	(other)
30	82	82	NewGA::	(other)
31	80	80	Cluster	(other)
32	81	78	::Vertex	(other)
33	70	70	MaxFlowInfuser	(other)

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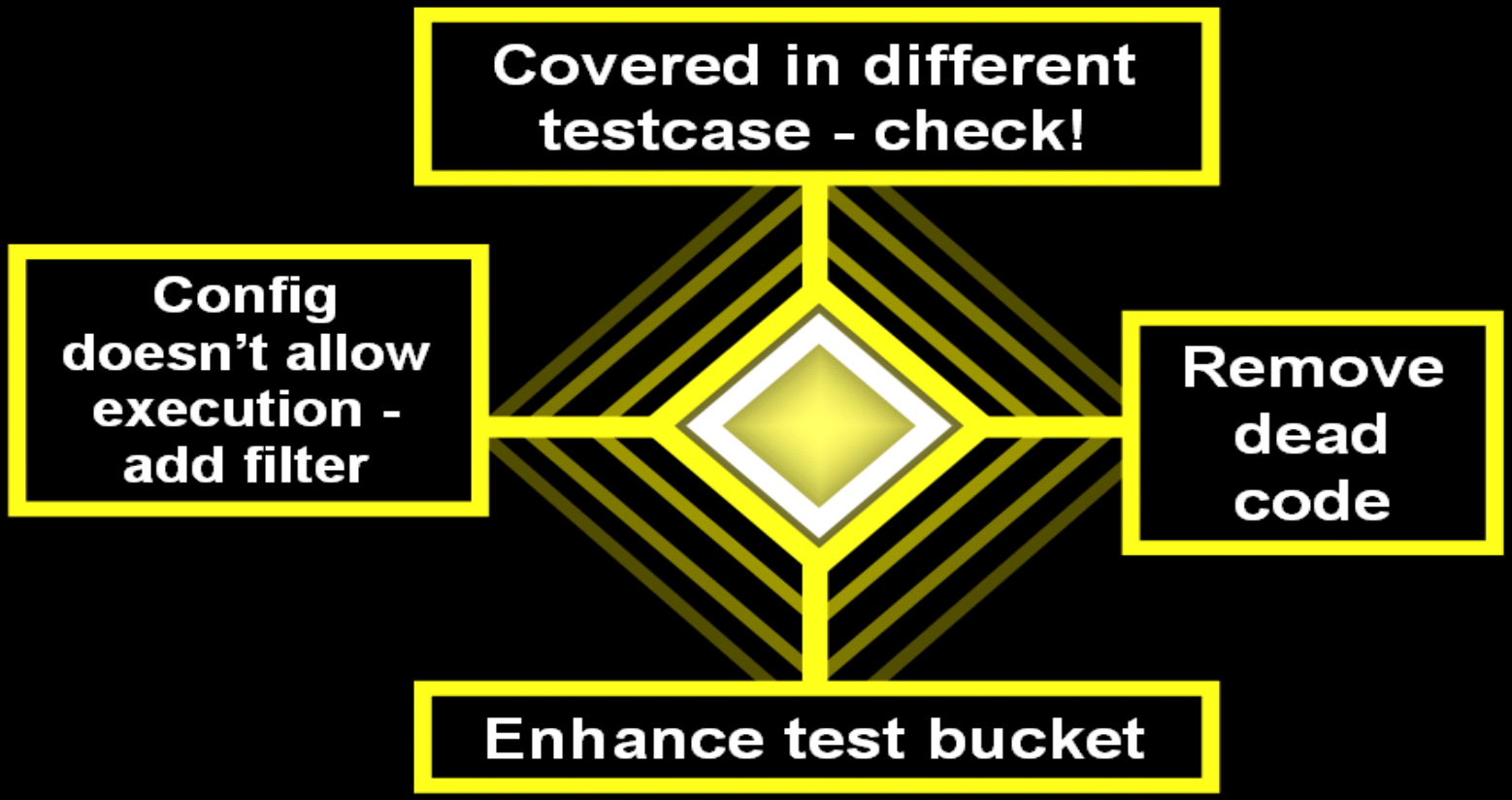
Action Item for a Hole



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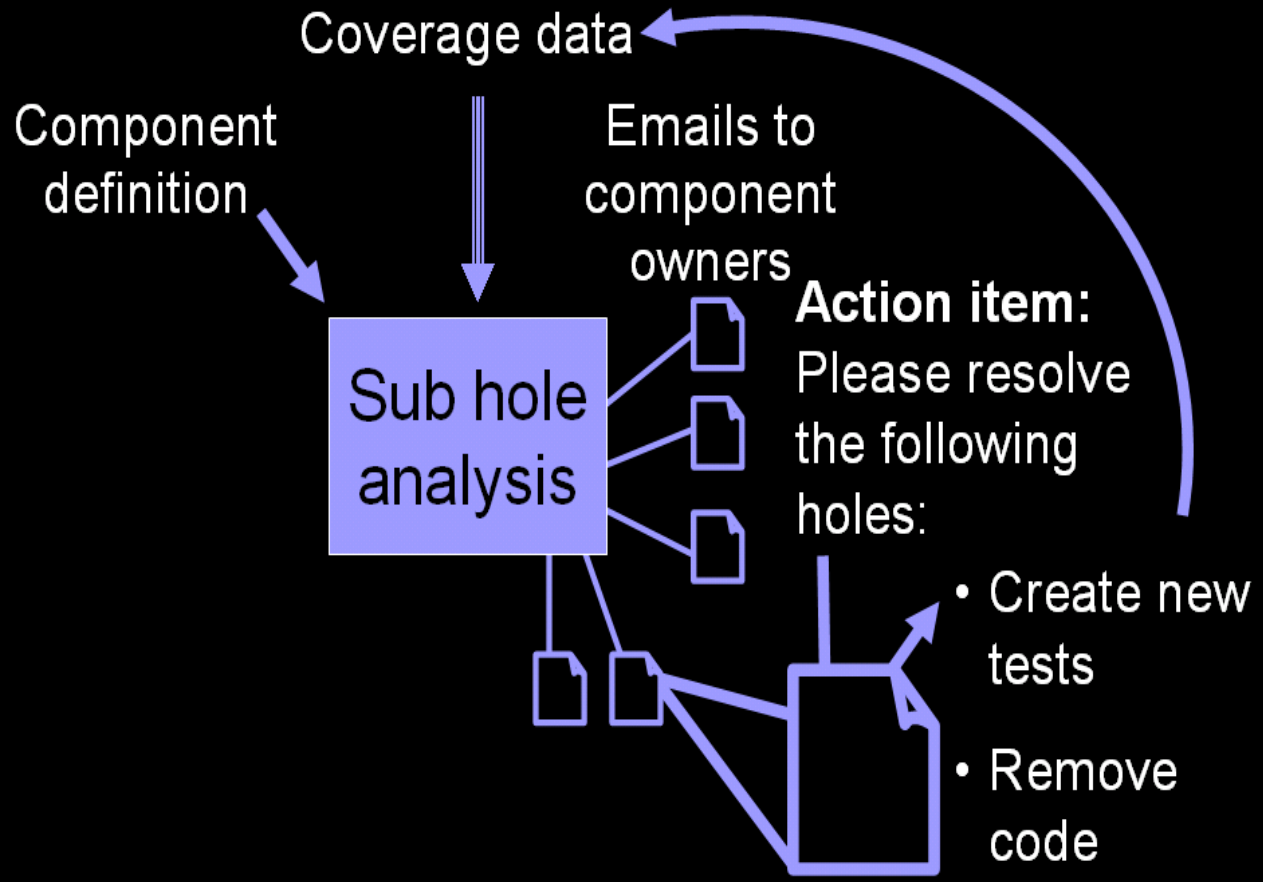
Coverage Driven Testing Workflow



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