Version 02/23/2015 – 5

What’s new: 1. Full-mutant type goes to 14 types.

(PTT, PTF, CRC, CRE, RER, RTT, RTF, RCT, RCF, FPR, FDR, ANF, RNF, RPTE)

Mutant Kill Analysis

(Performance On Intel® Core™ i5-3470 CPU @ 3.20GHz)

**Combining Algorithms of Policies:**

**Conference3.xml:** permit-overrides

**Fedora-rule3.xml:** deny-overrides

**Itrust3.xml:** first-applicable

**Kmarket-blue-policy.xml:** deny-overrides

**Obligation3.xml:** permit-overrides

**Pluto3.xml:** permit-overrides

1. **Test suite: Basic**

Mutants list:

All Mutants list: (PTT, PTF, CRC, CRE, RER, RTT, RTF, RCT, RCF, FPR, FDR, ANF, RNF, RPTE)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 | 107 | 14 |  |  |  |
| fedora-rule3 | 12 |  | 12 |  |  |  |
| itrust3 | 64 |  | 64 |  |  |  |
| kmarket-blue-policy | 4 |  | 3 |  |  |  |
| obligation3 | 2 |  | 1 |  |  |  |
| pluto3 | 21 |  | 20 |  |  |  |

8-kind-mutants-list: (PTT PTF CRC CRE RTT RTF RCT RCF)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 | 64 | 14 | 45 | 0.7031 | 1.071 |
| fedora-rule3 | 12 | 58 | 12 | 33 | 0.569 | 1.756 |
| itrust3 | 64 | 261 | 64 | 193 | 0.7395 | 44.619 |
| kmarket-blue-policy | 4 | 22 | 3 | 13 | 0.5909 | 0.088 |
| obligation3 | 2 | 13 | 1 | 6 | 0.4615 | 0.021 |
| pulto3 | 21 | 88 | 20 | 63 | 0.7159 | 11.041 |

1. **Test suite: Exclusive**

Mutants list:

All Mutants list:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 |  | 14 |  |  |  |
| fedora-rule3 | 12 |  | 1 |  |  |  |
| itrust3 | 64 |  | 64 |  |  |  |
| kmarket-blue-policy | 4 |  | 3 |  |  |  |
| obligation3 | 2 |  | 1 |  |  |  |
| pluto3 | 21 |  | 20 |  |  |  |

8-kind-mutants-list: (PTT PTF CRC CRE RTT RTF RCT RCF)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 | 64 | 14 | 45 | 0.7031 | 0.917 |
| fedora-rule3 | 12 | 58 | 1 | 6 | 0.1034 | 0.105 |
| itrust3 | 64 | 261 | 64 | 193 | 0.7395 | 43.547 |
| kmarket-blue-policy | 4 | 22 | 3 | 12 | 0.5455 | 0.079 |
| obligation3 | 2 | 13 | 1 | 6 | 0.4615 | 0.018 |
| pluto3 | 21 | 88 | 20 | 63 | 0.7159 | 10.263 |

1. **Test suite: Pair**

Mutants list:

All Mutants list:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 |  | 28 |  |  |  |
| fedora-rule3 | 12 |  | 50 |  |  |  |
| itrust3 | 64 |  | N/A |  |  |  |
| kmarket-blue-policy (run test err) | 4 |  | 10 |  |  |  |
| obligation3 | 2 |  | 2 |  |  |  |
| pluto3 | 21 |  | 40 |  |  |  |

8-kind-mutants-list: (PTT PTF CRC CRE RTT RTF RCT RCF)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 | 64 | 28 | 45 | 0.7031 | 1.712 |
| fedora-rule3 | 12 | 58 | 50 | 33 | 0.569 | 3.142 |
| itrust3 | 64 | 261 | N/A | N/A | N/A | N/A |
| kmarket-blue-policy | 4 | 22 | 10 | 13 | 0.5909 | 0.2 |
| obligation3 | 2 | 13 | 2 | 6 | 0.4615 | 0.033 |
| pluto3 | 21 | 88 | 40 | 63 | 0.7159 | 20.504 |

1. **Test suite: PDpair**

Mutants list:

All Mutants list:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 |  | 14 |  |  |  |
| fedora-rule3 | 12 |  | 13 |  |  |  |
| itrust3 | 64 |  | N/A |  |  |  |
| kmarket-blue-policy | 4 |  | 3 |  |  |  |
| obligation3 | 2 |  | 1 |  |  |  |
| pluto3 | 21 |  | 20 |  |  |  |

8-kind-mutants-list: (PTT PTF CRC CRE RTT RTF RCT RCF)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 | 64 | 14 | 45 | 0.7031 | 0.886 |
| fedora-rule3 | 12 | 58 | 13 | 25 | 0.431 | 0.759 |
| itrust3 | 64 | 261 | N/A | N/A | N/A | N/A |
| kmarket-blue-policy | 4 | 22 | 3 | 13 | 0.5909 | 0.068 |
| obligation3 | 2 | 13 | 1 | 6 | 0.4615 | 0.019 |
| pluto3 | 21 | 88 | 20 | 63 | 0.7159 | 10.221 |

1. **Test suite: Decision Coverage as of Jan 19**

Mutants list:

All Mutants list:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 |  | 18 |  |  |  |
| fedora-rule3 | 12 |  | 26 |  |  |  |
| itrust3 | 64 |  | 113 |  |  |  |
| kmarket-blue-policy | 4 |  | 10 |  |  |  |
| obligation3 | 2 |  | 5 |  |  |  |
| pluto3 | 21 |  | 42 |  |  |  |

8-kind-mutants-list: (PTT PTF CRC CRE RTT RTF RCT RCF)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 | 64 | 18 | 64 | 1.0 | 0.989 |
| fedora-rule3 | 12 | 58 | 26 | 39 | 0.6724 | 1.473 |
| itrust3 | 64 | 261 | 113 | 259 | 0.9923 | 78.439 |
| kmarket-blue-policy | 4 | 22 | 10 | 21 | 0.9545 | 0.171 |
| obligation3 | 2 | 13 | 5 | 13 | 1.0 | 0.048 |
| pluto3 | 21 | 88 | 42 | 88 | 1.0 | 22.387 |

1. **Test suite : MCDC as of Jan 19**

Mutants list:

All Mutants list:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 |  | 56 |  |  |  |
| fedora-rule3 | 12 |  | 51 |  |  |  |
| itrust3 | 64 |  | 320 |  |  |  |
| kmarket-blue-policy | 4 |  | 14 |  |  |  |
| obligation3 | 2 |  | 6 |  |  |  |
| pluto3 | 21 |  | Exp too L |  |  |  |

8-kind-mutants-list: (PTT PTF CRC CRE RTT RTF RCT RCF)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Policy** | **# of Rules** | **# of Mutants** | **# of Tests** | **# of Mutants Killed** | **% Killed** | **Time Consumed (s)** |
| conference3 | 15 | 64 | 56 | 64 | 1.0 | 2.868 |
| fedora-rule3 | 12 | 58 | 38 | 49 | 0.8448 | 2.548 |
| itrust3 | 64 | 261 | 320 | 259 | 0.9923 | 228.896 |
| kmarket-blue-policy | 4 | 22 | 14 | 21 | 0.9545 | 0.223 |
| obligation3 | 2 | 13 | 6 | 13 | 1.0 | 0.058 |
| pluto3 | 21 | 88 | Exp too L |  |  |  |

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**Effective mutants used for debugging (fault-localization):**

**Conference3: (PTF, CRC,) CRE, RER, RTT, RTF, RCF**

**Fedora-rule3: (PTF, CRC,) CRE**

**Itrust3: (PTF,) CRE, RER, RTT, RTF, RCF**

**Pluto3: (PTF, CRC) CRE, RER, RTT, RTF, RCF**