SNEWS Update

Neutrino 2008

Kate Scholberg (for the working group)

- What's new since Nu2006
- Review of operational mode/nomenclature
- Operational mode history
- Other notes

Since last SNEWS meeting at Neutrino 2006:

- Server has been running smoothly at BNL;
  regular shift checks by SNEWS 'subgroup'

- SNEWS technical paper published featured
  New J. Phys 10th anniversary highlight

- Fall 2006: backup server installed at
  the U. of Bologna, and MOU with
  INFN Sezione di Bologna established

  - sysadmin: Andrea Paolucci
  - receives alarms from clients
  - email output only enabled if other server
    or BNL network disabled (rarely happens)
  - part of regular shift check

Operational Mode History

- April 2006: Operational Mode 3.0 in effect
  SK+LVD+AMANDA/IceCube+SNO
  (reported at Nu2006):
  with new INDIVIDUAL type

- January 2007: Operational Mode 3.1 in effect: with new Bologna backup server
  SK+LVD+AMANDA/IceCube

3.2: +Borexino?

Reminder of Operational Modes

GOLD alert: clean, unambiguous AUTOMATED alert, to experimenters and astronomers

SILVER alert: coincidence with one or more problems, to experimenters only (NOT lost, just delayed)

- calibration or other tag on any alarm
- too few in coincidence at distant locations
- history of high rate

Experiments define procedure for each

Review of Definitions

Packet types

PING: test only

ALARM: action depends on level flag

RETRACTION: remove alarm from queue in time windows (for given expt)

Level flags (decided by individual experiment)

TEST: for test queue

POSSIBLE: for alarm queue, lower quality

GOOD: for alarm queue, all OK

RETRACTED: removal packet (redundant)

OVERRIDE: for alarm queue, confirmed good

GOLD alert must have *all* of the following conditions met: (otherwise, it's SILVER)

1. A two- or more fold coincidence within 10 seconds

   (can modify for more experiments)

2. At least two experiments at different laboratories (automatically satisfied in current mode)

3. Two or more alarms flagged as GOOD

4. Rate of alarms in past time intervals for at least 2 experiments involved must not be too high (require< 1/100 yr accidental coincidence)

Notes on Rate Lookback Criterion

For intervals $\{T_i\}$={10 min, 1 hr, 10 hr,1 d, 3 d, 1 wk, 1 mo}

require *consistency with ~1/week rate*

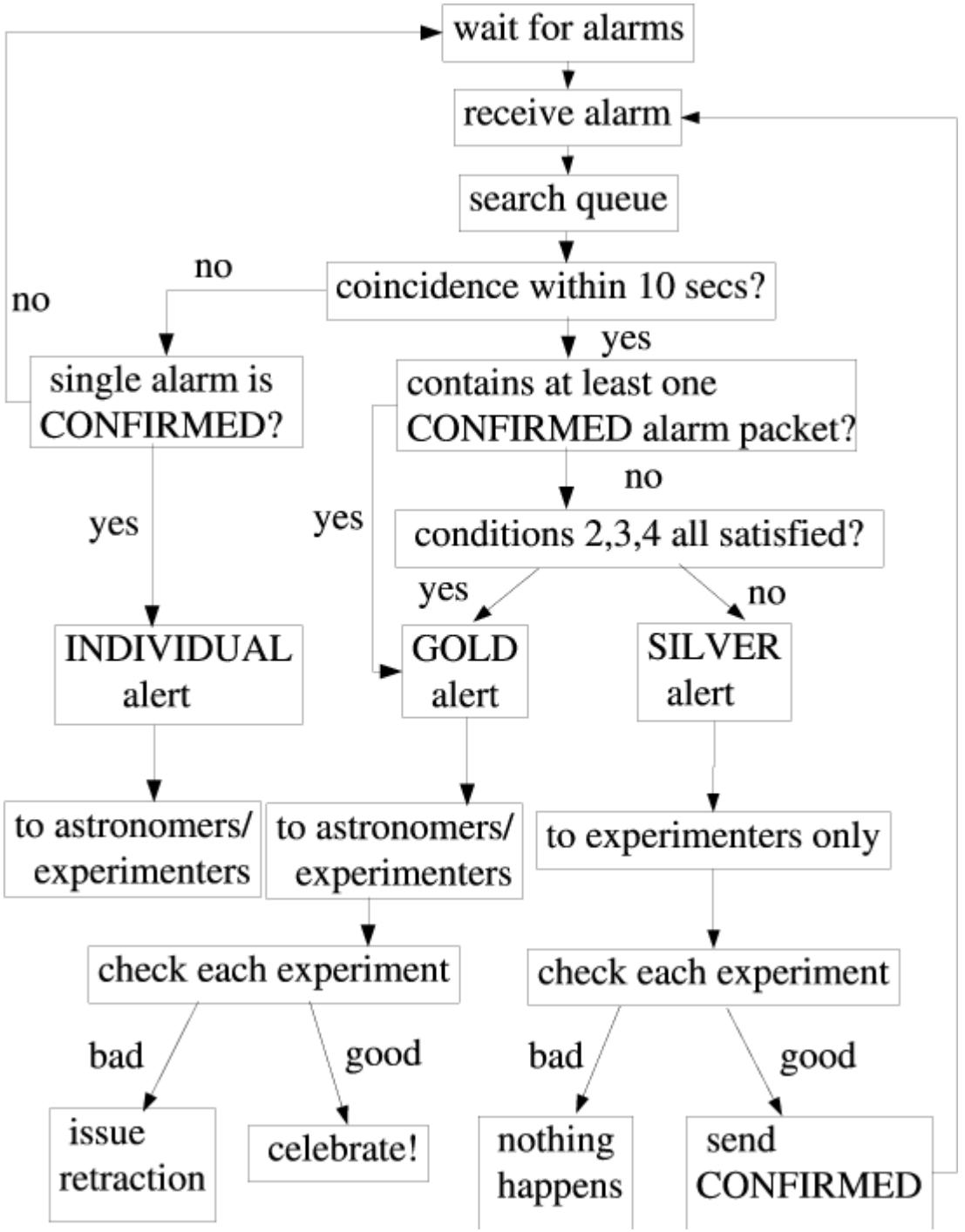
For the $\{n_i\}$ alarms sent by each experiment, require the Poisson probabilities $\{P_i\}$

$$\mathcal{P}_i = \sum_{n=n_i}^{\infty} (\lambda_{\max} T_i)^n e^{-\lambda_{\max} T_i} / n!$$

each to be greater than P_{thr}

P_{thr}=0.5% corresponds to requirement of $\{n_i\}$<{1,2,2,3,4,5,11} for each experiment

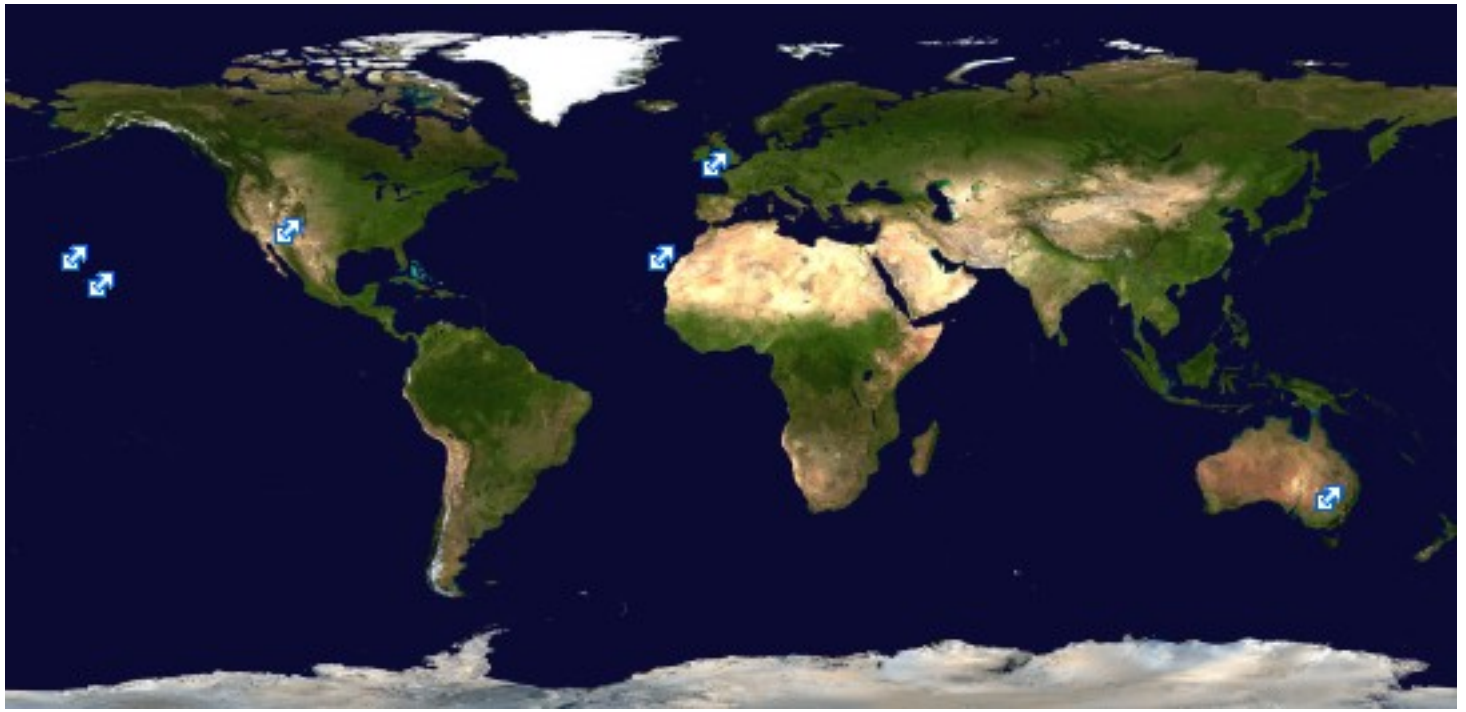
Flowchart


wait for alarms
receive alarm
search queue
coincidence within 10 secs?
no
no
yes
single alarm is CONFIRMED?
contains at least one CONFIRMED alarm packet?
yes
yes
no
conditions 2,3,4 all satisfied?
yes
no
INDIVIDUAL alert
GOLD alert
SILVER alert
to astronomers/ experimenters
to astronomers/ experimenters
to experimenters only
check each experiment
check each experiment
bad
good
bad
good
issue retraction
celebrate!
nothing happens
send CONFIRMED

Current project: direct alert to eStar robotic telescope network using VOEvent protocol

eSTAR

(A. Allan and T. Naylor at U. of Exeter)



Summary

SNEWS server running smoothly at BNL;
SK III, LVD, AMANDA/IceCube
(SNO gone; Borexino soon?)

Version 3.1 of operational mode in effect

Continuing to expand recipient networks