

that derived from <resulttag>
<executable_file> - If the type is 'execute' then <operator> is a filename of an executable.

<resulttag> -- One of the symbolic names defined in the results.config file. The value is interpreted as either a string or an integer, depending on the operator as defined above. Alternately, for integer operators within matchany types, this may be an arithmetic expression within parentheses. For example, "(frame_number-44)".

<answertag> -- Either a literal value (string, integer or hexadecimal), or a symbolic name defined in the results.config file or the parameters.config file:

```
answer=<literal>      -- literal string, integer or hex value
                        (leading with 0x), interpretation depending
                        on the operator as described above.
result.<symbol>        -- symbol from the results.config file
parameter.<symbol>     -- symbol from the parameters.config file
parameter_ascii.<symbol> -- same as above, but the value parsed as
                        an integer or hexadecimal and converted to an
                        ascii character.
```

Note that values derived from the parameters.config file are assigned the same values as were assigned when the lab was parameterized for the student.

6.3.2 Distinguish between results generated before and after configuration changes

Some labs direct students to configure a system so that it is “secure”, or meeting some criteria germane to lab learning objectives. Once the system is so configured, the student is then directed to perform a specific set of actions to demonstrate the correctness of the configuration. For purposes of automated assessment, we would like evidence that the student performed all the prescribed demonstration steps without intervening configuration changes. In other words, though the student may perform a myriad of configuration changes and demonstrate steps (encourage experimentation!), we’d like to know if there ever was a single configuration in which all of the demonstration steps were performed.

Labtainers provides the LOG_RANGE and TIME_DELIM result types to establish time ranges over which we can assert that no configuration changes were made. Once those time ranges are established, i.e., as a set of results with a single tag, the `time_during` and `time_not_during` goal operators bin **other results** into those time ranges. Once so binned, the boolean operator can be used to determine if the desired conditions were met within a single configuration state. See sections [6.6.6](#) and [6.6.7](#) for examples.

6.3.3 Replace answers with hashes

Automated assessment files include expected results, which sometimes reflect “answers” to problems that instructors would prefer not to publish, e.g., how many packets did source X send? While automated assessment can help the instructor confirm that the student ran a program that generated the desired output, not all instructors use automated assessment. For