

CROSS DOMAIN SOLUTION

BAE SYSTEMS

INSPIRED WORK

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BACKGROUND

- A Cross Domain Solution (CDS) has the capability to validate, inspect and sanitize incoming data.
- The three phases, validation, inspection, and sanitization are non-bypassable and one way.
- A CDS is a very secure layer-7 firewall/router, that guarantees only clean, correct, and valid data is allowed to flow.
- Ensures secure information sharing between networks of various security classifications.
- CDS's are also known as "guards."

OBJECTIVE

- Establish a set of accept/reject criteria to allow data to flow one way through a pipeline of processes.
- It is to be implemented on the STOP OS, which allows for a secure and un-hackable CDS.

TOOLS

- We used an operating system developed by BAE Systems, called STOP OS, to implement our CDS.

APPROACH

The CDS will:

1. Receive files delivered from a client computer.
2. Detect the presence of the new file and move the file into a filtering area.
3. Filter the file and ensure that it meets the established criteria.
4. Move accepted data to an output area, or
5. Move rejected data to a quarantine area.

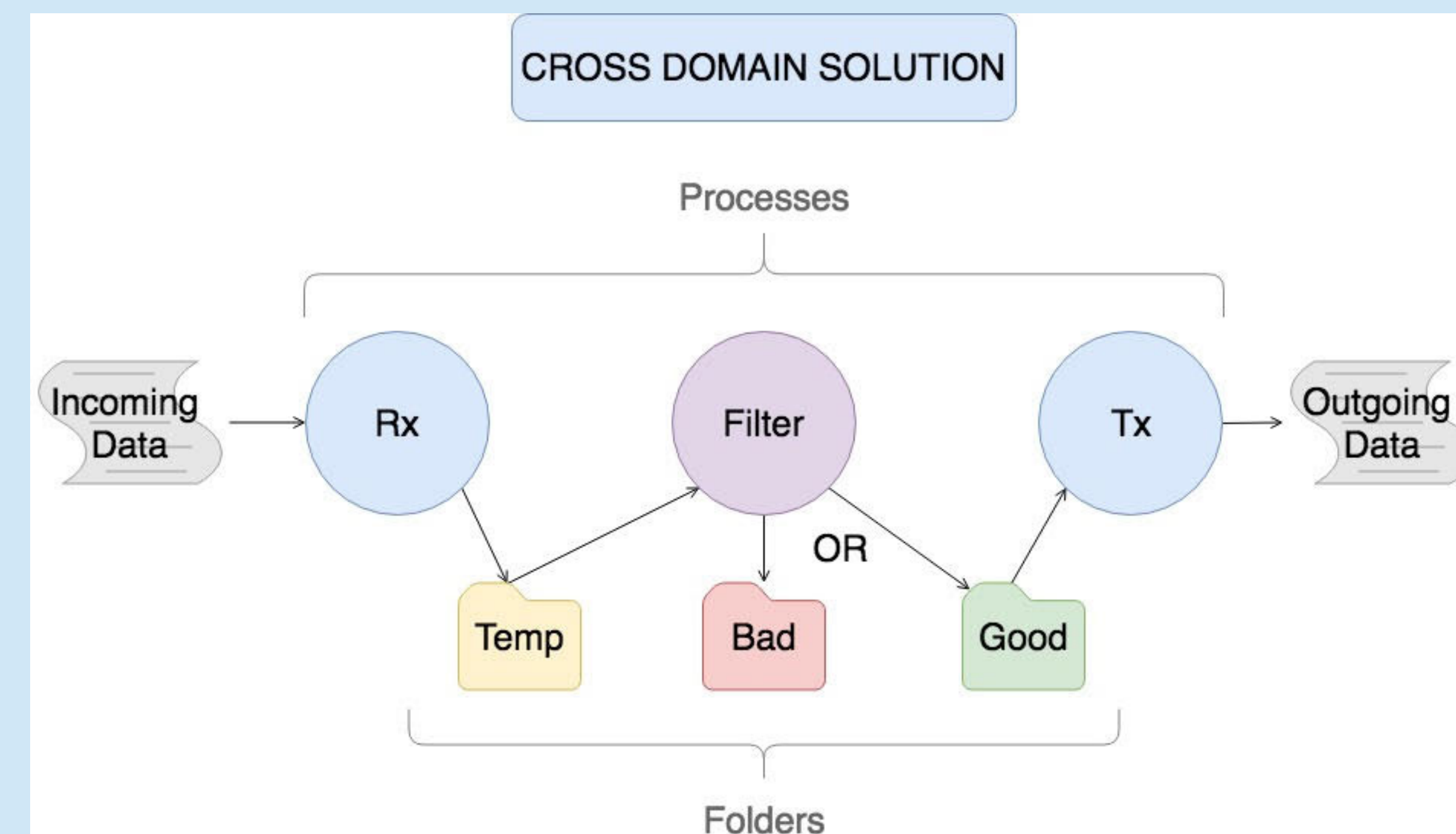


Figure 1: Design architecture of CDS. The three main processes are show, Rx, filter, and Tx. The flow is also noted from the beginning of the CDS to the end.

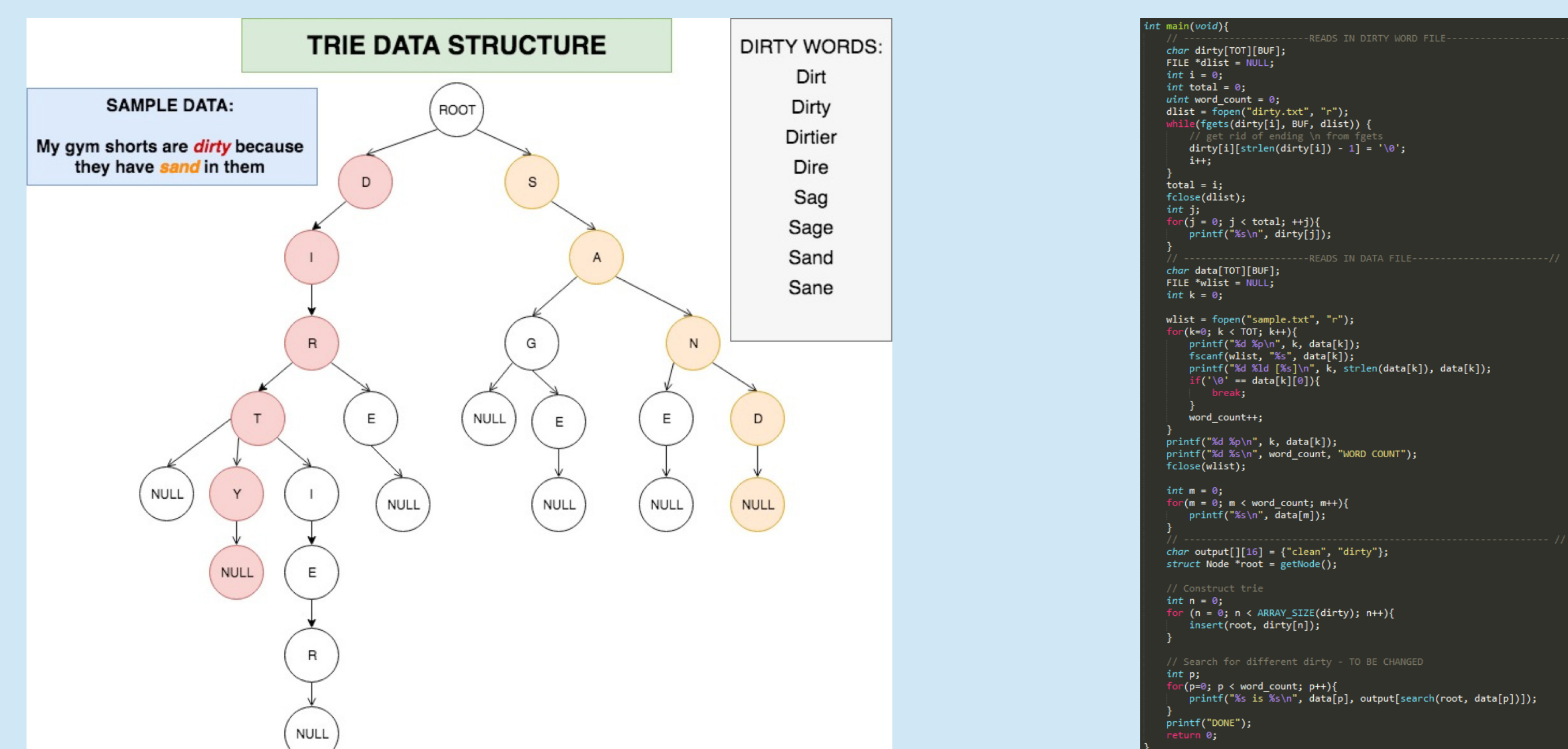


Figure 2: Visual representation of a trie data structure (left). Code for the filtering algorithm (right).

RESULTS AND CONCLUSION

- Successful implementation of a CDS.
- STOP OS's security labeling makes the CDS virtually un-hackable.
- Having a secure process that allows sensitive information to be transferred between agencies or within military operations prevents information from being leaked, spoofed, or compromised.

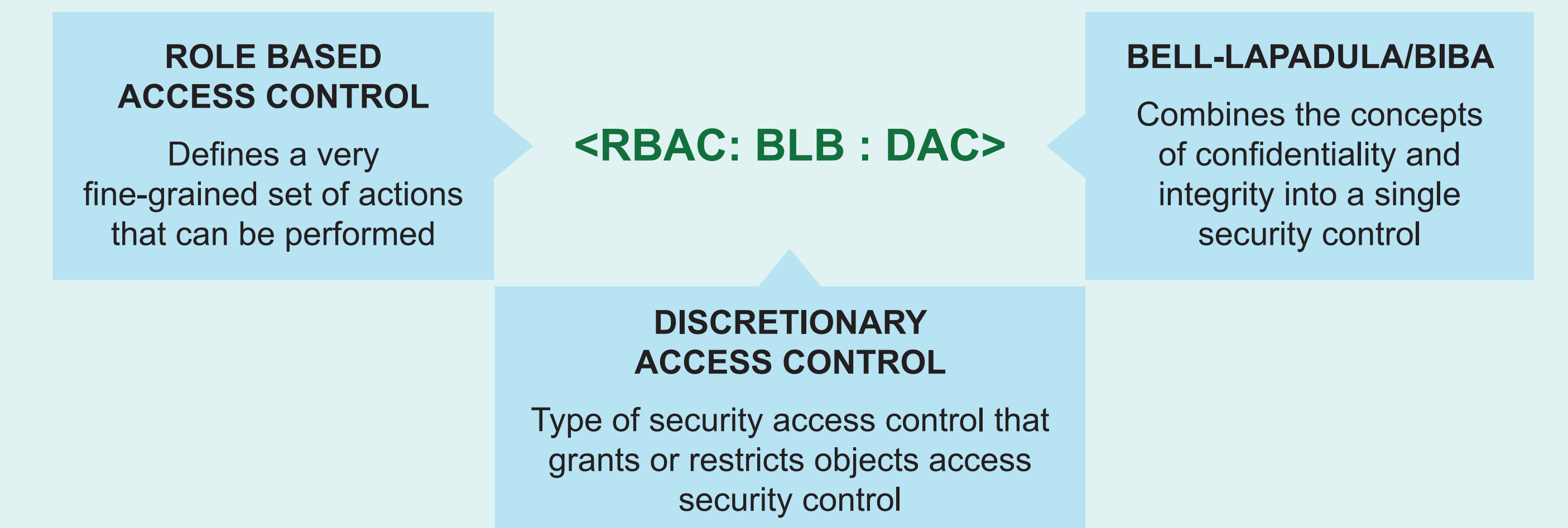


Figure 3: This is the security label that is defined within STOP.

ACKNOWLEDGMENT

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References:

- [1] BAE Systems. STOP training manual: an introduction to the stop operating system. BAE Systems, Reston, VA: BAE Systems, 2017
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