Security policy – defines secure for a system or set of systems.

Policies can be informal or mathematical in nature.

security policy is statement that partitions state of system into set of authorized or secure states and set of unauthorized or nonsecure, states.

Policy – sets context in which we can define a secure system.

A secure system is system that starts with authorized state and cannot enter an unauthorized state.

Security policy partitions states of system into set of authorized states A={s1,s2} and set of unauthorized states UA={s3,s4}.

Breach of security occurs when system enters unauthorized state.

Let X be set of entities and let I be some information or a resource.

I has integrity with respect to X if all members of X trust I.

Let X be set of entities and let I be some information or a resource.

I has confidentiality with respect to X if no member of X can obtain information about I.

Security policy considers all relevant aspects of confidentiality, integrity and

availability .

With respect to confidentiality, policy identifies those states in which information leaks to those not authorized to receive it.

With respect to integrity, policy identifies authorized ways in which information may be altered and entities authorized to alter it.

With respect to availability , policy describes what services must be provided.

Statement of security policy – states desired properties of system.

**Security mechanism** – entity or procedure that enforces some part of a security policy.

Policy model - model that represents a policy or class of policies.

A military security policy is policy developed primarily to protect confidentiality.

A commercial security policy is policy developed primarily to protect integrity.

Confidentiality policy security policy dealing only with confidentiality.

If an individual user can set an access control mechanism to allow or deny access to an object, mechanism is discretionary access control also called identity based access control.

Confidentiality policies

A confidentiality policy, also called information flow policy, prevents unauthorized disclosure of information.

Bell LaPadula Model

A close-up of a document

Description automatically generated

A close-up of a computer

Description automatically generated

Biba model

Integrity policy

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Dual of Bell LaPadula Model

System consists of set S of subjects, set O of objects and set I of integrity levels.

s of S can read o of O only if I(s)<=I(o)

s of S can write to o of O only if I(o)<=I(s)

s1 of S can execute s2 of S only if i(s2)<=i(s1)

No read down and no write up ,exact opposite of Bell Lapadula .

Low water mark policy

Whenever a subject accesses an object ,low water mark policy changes integrity level of subject to the lower of the subject and object respectively.

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