Policies

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Concept

A *policy* is a set of policy *statements*. A policy statement *conditionally* applies a policy *action* to a *resource*. Resources can be destinations, tiers, blobs, buckets, I/O operations, etc. Depending on the resource type different actions and conditionals might be available.

Policy:

Statement1

- Resource1
- Action1
- Condition1

... (other statements)

StatementN

- ResourceN
- ActionN
- ConditionN

For the moment, we don't worry about how we identify resources or the syntax of the conditions we might impose. We also assume that the policy statements are consistent (non-contradictory). Whether the order of the statements is important, or if the statements are prioritized, is another thing we ignore for now.

Another interesting question is how we treat policy violations. For example, does a data placement fail if a governing policy cannot be implemented to the letter? Do we interpret policies dogmatically or pragmatically?

Are policies *transitive*, i.e., does a policy imposed on a bucket apply to all BLOBs in that bucket?

Examples

Speed

A "speed policy" statement is one where the action aims at maximizing I/O speed or bandwidth, or at minimizing latency. The statement resource could be a bucket, a blob, or an (kind of) operation. A condition could be a cap on or a minimum BLOB size.

Balance

A "balance policy" statement is one where the action aims at maintaining a degree of balance among targeted resources. The statement resource could be a tier or a destination or a blob. A condition could be a cap on or a minimum capacity (remaining). The statement could also be conditional on load or other target resource characteristics.

The action can make reference to other resources, e.g., place at least 4 times as much data into this tier rather than that one.

Topology-aware Utilization (or concurrent placement)

A *topology* is a partitioning of destinations. For example, we can group destinations into tiers, where each partition represents a tier.

The properties or characteristics of such partitions are derived from the underlying destinations plus external information such as network topology, etc.

A policy statement in this category could state, for example, that BLOBs below a certain size (e.g., MD candidates) get placed into a particular tier or set of tiers (concurrency).

Data-ware

The resources for policy statements in this category are most likely BLOBs and buckets. For example, a policy statement might call for all BLOBs in a given bucket or set of buckets to be placed in a particular tier. This could be conditional on BLOB size. There could be one policy statement for MD and one for non-MD.

If there is such a thing as data "temperature", a policy statement can be conditioned on that. Ditto w/ priority.
