Name Space, Fundamentals

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Lecture 11

The CDS

- The Cell Directory Service is THE name space for DCE which is really a “junction” of many name spaces.
- Every name can be found here including names for files, hosts, applications, and principals.
- The things that the names point to are NOT in the CDS with the exception of limited application information.

The root of the CDS

- In a similar way as “/” is the root of the UNIX file system, “/...” is the root of the CDS name space.
- “/.../stanford.edu” is the name of our local production cell. We are using DNS to expose our cell’s name to the world.
- “/.:” translates to the local cell name

What is a Cell?

- Unit of administration
- One splice of the global name space
- Defines a collection of hosts, applications, and principals which share, core services, security, name space, and administration staff.
- Trust within a cell is easy, trust between cells is harder, trust outside the cell is near zero.

At the Root Level

- /.:/hosts - list of all computers in the cell.
- /.:/sec - the security junction
- /.:/fs - the file system junction
- /.:/cell-profile, default cell profile
- /.:/lan-profile, time services
- /.:/clearinghouse_name_ch
- /.:/subsys, dce services
- any other you wish to create

/.:/sec , one level down

- /.:/sec/principals, list of all principals
- /.:/sec/group, list of all groups
- /.:/sec/org, list of all organizations
- /.:/sec/policy, list of all policies
- /.:/sec is both the junction and a directory of all master and slave security servers

/.:/subsys, two levels down

- /.:/subsys/dce/sec/master
- /.:/subsys/dce/sec/rep
- /.:/subsys/dce/dfs

/.:/hosts

- /.:/hosts/host_name, directory
- /.:/hosts/host_name/config, the junction for the machine configuration data bases
- /.:/hosts/host_name/cds-clerk, bindings
- /.:/hosts/host_name/cds-server, bindings
- /.:/hosts/host_name/profile
- /.:/hosts/host_name/self, binding to the dced daemon and the principal of the host

/.:/host/host_name/config

- /.:/host/host_name/config/hostdata
- /.:/host/host_name/config/keytab
- /.:/host/host_name/config/secval
- /.:/host/host_name/config/srvrconf
- /.:/host/host_name/config/srvrexec
- /.:/host/host_name/config/xattrschema

/.:/fs

- /: is short for the local file system, /.:/fs
- @sys becomes operating type
- @host becomes local machine identity

Components of CDS

- sub-directories (in CDS they are called child pointers)
- links (in CDS they are called soft links)
- junctions, point where other name spaces are spliced into the CDS
- objects, minimal storage on information used for profiles, groups, and application binding information

Partitions

- The Logical CDS name space may be vertically partitioned into many physical clearing houses
- A common partition is to place /.:/hosts into a clearing house and the rest into another clearing house
- Each partition has a copy of the root level information

Replication

- Each clearing house partition can have a master and many slave replicates
- Each replicate has a copy of the root level information

Skulking

- Each replicate is keep current by skulking
- Several levels of convergence
  - high, keep all replicates up to date, skulk every hour
  - medium, keep all replicates up to date, skulk every 12 hours
  - low, only skulk every 24 hours
- The CDS contains stale information!

Caching

- CDS information is cached both at the client and the servers.
- The client cache is disk resident. This cache is used to contact servers even if the CDS is down. The local cache can be flushed.
- The server cache is write through, RAM resident.

Clearing house names

- DCE does not specify a format of a clearing house name. By common convention, people have used the extension "_ch" to signal a clearing house name and place the name at the root level.
- Note: The name object is stored in the CDS and not the CDS itself. That is stored in the file system

ACLs

- The names in the CDS have ACLs
- The things that the names point to also have ACLs.
- In DCEcp, a ACL edit modifies the ACL on the name. The option "-e" edits the ACL on the thing.

More on Objects

- Objects both have a name and a limited set of information
- Several key objects
  - clearing house object
  - rpc, application name
  - directory object

CDS Clerks

- Every computer runs a cds clerk, even the cds servers.
- All requests go through this clerk.
- The clerk managers the cache.
- The servers manage the clearing houses.