Consul Service discovery and KV

START HERE

`consul agent -dev`
Throwaway local cluster

`consul members`
List cluster members

`consul catalog services`
List registered services

`consul services register <file>`
Register a service

`consul kv put <key> <value>`
Write a key

`consul kv get -recurse <prefix>`
Read a subtree

`consul snapshot save <file>`
Back up server state

`consul monitor`
Stream agent logs

Service your app → register → **Client agent** on each node → RPC → **Server agents** Raft quorum → query → **Catalog** DNS and HTTP

CONCEPTS

Every command talks to a local agent over HTTP (default 127.0.0.1:8500). Point it elsewhere with -http-addr or CONSUL_HTTP_ADDR, and authenticate with CONSUL_HTTP_TOKEN.

Run 3 or 5 servers so Raft keeps a quorum. Losing the majority stops writes; -dev mode is one in-memory server and never for production.

Agents gossip membership (Serf) between themselves; servers additionally replicate data with Raft. Members and Raft peers are different lists.

AGENT

`consul agent -dev`
Run a single in-memory dev server
No persistence; UI available with -ui.

`consul agent -server -bootstrap-expect=<n> -data-dir=<dir>`
Start a server in a new cluster

`consul agent -data-dir=<dir> -retry-join=<addr>`
Start a client that joins a server

`consul agent -config-dir=<dir>`
Load .json and .hcl config files

`consul agent -node=<name> -datacenter=<dc>`
Set node name and datacenter

`consul agent -bind=<ip> -client=<ip>`
Choose cluster and client addresses
-client defaults to loopback only.

`consul agent -ui`
Enable the web UI

`consul validate <file-or-dir>`
Check config before starting

`consul version`
Print the version

`consul tls ca create`
Create a CA for TLS

`consul tls cert create -server`
Create a server certificate

CLUSTER

`consul members`
List members and their status

`consul members -detailed`
Include tags and versions

`consul members -wan`
Show the WAN pool (server members)

`consul join <addr>`
Join this agent to a cluster

`consul leave`
Leave gracefully and shut down
On a server this also removes it from the Raft peer set.

`consul force-leave <node>`
Mark a failed node as left

`consul reload`
Re-read config without a restart

`consul monitor`
Stream logs from the agent

`consul monitor -log-level=debug`
Raise the streamed log level

`consul maint -enable -reason="<why>"`
Put the node in maintenance mode

`consul keygen`
Generate a gossip encryption key

CATALOG AND SERVICES

`consul catalog services`
List services

`consul catalog nodes`
List nodes

`consul catalog nodes -service=<name>`
Nodes that provide a service

`consul catalog services -node=<node>`
Services on a node

`consul services register <file>`
Register services from HCL or JSON

`consul services register -name=<name> -port=<port>`
Register one service from flags

`consul services register -tag=<tag> -meta=<k>=<v>`
Add tags and metadata

`consul services deregister -id=<id>`
Remove a service instance

CATALOG AND SERVICES (cont.)

`consul services deregister <file>`
Remove services defined in a file

KEY-VALUE STORE

`consul kv put <key> <value>`
Set or update a key

`consul kv get <key>`
Read a key

`consul kv get -recurse <prefix>/`
Read all keys under a prefix

`consul kv get -keys <prefix>/`
List key names only

`consul kv get -detailed <key>`
Show index, flags and session

`consul kv delete <key>`
Delete a key

`consul kv delete -recurse <prefix>/`
Delete a whole subtree
Keep the trailing slash: foo also matches food.

`consul kv put <key> @<file>`
Take the value from a file

`consul kv put -cas -modify-index=<n> <key> <value>`
Write only if unchanged
Fails if ModifyIndex no longer matches; not allowed with -recurse on delete.

`consul kv export <prefix>/`
Dump a subtree as JSON

`consul kv import @<file>`
Load a JSON export

SNAPSHOTS AND RAFT

`consul snapshot save <file>`
Save a point-in-time snapshot

`consul snapshot restore <file>`
Restore a snapshot to the servers

`consul snapshot inspect <file>`
Show snapshot metadata

`consul operator raft list-peers`
Show Raft servers and leader

`consul operator raft remove-peer -id=<id>`
Remove a dead server

ACL

`consul acl bootstrap`
Create the first management token
Works once; save the SecretID.

`consul acl policy create -name <name> -rules @<file>`
Create a policy from rules

`consul acl policy list`
List policies

`consul acl token create -policy-name <name> -description <text>`
Create a token for a policy

`consul acl token list`
List tokens

SERVICE MESH

`consul intention create <src> <dst>`
Allow src to reach dst
Deprecated since 1.9; prefer service-intentions config entries.

`consul intention create -deny <src> <dst>`
Deny src to dst

`consul intention check <src> <dst>`
Test whether a connection is allowed

DNS

`dig @127.0.0.1 -p 8600 <name>.service.consul`
Resolve a service's addresses

`dig @127.0.0.1 -p 8600 <name>.service.consul SRV`
Get addresses and ports

RECIPES

Dev cluster with a service

```
consul agent -dev -ui &
consul services register -name=web -port=8080
consul catalog services
dig @127.0.0.1 -p 8600 web.service.consul SRV
```

Move a KV subtree between clusters

```
consul kv export app/ > app.json
CONSUL_HTTP_ADDR=<other>:8500
consul kv import @app.json
```

Back up before an upgrade

```
consul snapshot save pre-upgrade.snap
consul snapshot inspect pre-upgrade.snap
consul operator raft list-peers
```