In chaos engineering, a "DNS error" refers to a deliberate disruption or manipulation of Domain Name System (DNS) resolution mechanisms within a system. DNS is responsible for translating domain names (e.g., www.example.com) into IP addresses, allowing devices to locate and communicate with each other over the internet or a network.

Introducing DNS errors as part of chaos engineering experiments involves scenarios where DNS resolution fails or returns incorrect results. This can include:

1. DNS resolution timeouts: Deliberately delaying or preventing DNS responses, causing requests to time out.

2. DNS misconfiguration: Intentionally misconfiguring DNS settings to redirect requests to invalid or non-existent IP addresses.

3. DNS spoofing: Falsifying DNS responses to direct traffic to malicious or unauthorized destinations.

4. DNS server failures: Simulating failures or disruptions in DNS servers, leading to inconsistent or unavailable DNS resolution services.

By inducing DNS errors, engineers can assess how the system handles such failures and whether it can maintain functionality and availability. They may evaluate whether the system's error handling mechanisms, DNS caching strategies, or failover procedures are effective in mitigating the impact of DNS errors on overall system performance.

The purpose of conducting DNS error experiments in chaos engineering is to identify weaknesses in the system's DNS infrastructure and to validate the effectiveness of mitigation strategies. This allows engineers to improve the system's resilience to DNS-related failures and ensure reliable operation in production environments.

**ping <target-hostname>** command

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| **Variables** | **Description** | **Notes** |
| TARGET\_CONTAINER | Name of container which is subjected to dns-error | None |
| TOTAL\_CHAOS\_DURATION | The time duration for chaos insertion (seconds) | Default (60s) |
| TARGET\_HOSTNAMES | List of the target hostnames or keywords eg. '["litmuschaos"]' | If not provided, all hostnames/domains will be targeted |
| MATCH\_SCHEME | Determines whether the dns query has to match exactly with one of the targets or can have any of the targets as substring. Can be either exact or substring | if not provided, it will be set as exact |
| PODS\_AFFECTED\_PERC | The Percentage of total pods to target | Defaults to 0 (corresponds to 1 replica), provide numeric value only |
| CONTAINER\_RUNTIME | container runtime interface for the cluster | Defaults to containerd, supported values: docker |
| SOCKET\_PATH | Path of the docker socket file | Defaults to /run/containerd/containerd.sock |
| LIB | The chaos lib used to inject the chaos | Default value: litmus, supported values: litmus |
| LIB\_IMAGE | Image used to run the netem command | Defaults to litmuschaos/go-runner:latest |
| RAMP\_TIME | Period to wait before and after injection of chaos in sec |  |
| SEQUENCE | It defines sequence of chaos execution for multiple target pods | Default value: parallel. Supported: serial, parallel |