

ping -R

Routen Bestimmung und DNS Anfragen

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ping -R

Wie ermittelt der Befehl ping die Route von ktdsp32 zu ktdsap1.local.

Der Befehl ping zeichnet mit der Option **-R** die Route des Paketes auf. Die Option **-c2** bricht ping nach 2 Durchläufen ab und gibt das Ergebnis aus. Der Aufruf in einer Konsole liefert folgendes Ergebnis.

```
ktdsp32:~ # ping -R ktdsap1.local -c2
PING ktdsap1.local (10.40.20.11) 56(124) bytes of data.
64 bytes from 10.40.20.11: icmp_req=1 ttl=62 time=4.08 ms
RR:   ktdsp32.local (10.20.23.32)
      ktdsrt1.local (10.23.5.61)
      ktdsrt3-40.local (10.40.0.1)
      10.40.20.11
      10.40.20.11
      ktdsrt3.local (10.23.5.63)
      ktdsrt1-20.local (10.20.0.1)
      ktdsp32.local (10.20.23.32)

64 bytes from 10.40.20.11: icmp_req=2 ttl=62 time=3.52 ms      (same route)

--- ktdsap1.local ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 3.528/3.806/4.084/0.278 ms
ktdsp32:~ #
```

Was hat der Aufruf des ping Befehls bewirkt?

Als erstes wurde der Name **ktdsap1.local** vom DNS Server aufgelöst. Dazu wurde eine DNS Anfrage (s. Paket No. 23) an der Nameserver gesendet. Dieser schickt als Antwort (s. Paket No. 24) die IP **10.40.20.11** zurück.

```
ktdsp32:~ # host ktdsap1
ktdsap1.local has address 10.40.20.11
```

Nun kann das System den **Echo (ping) request** (s. Paket No. 25) senden und erhält eine Antwort (s. Paket No. 26) als **Echo (ping) reply**.

Da in der Ausgabe in der Konsole nicht nur die IP Adressen sondern auch die Namen ausgegeben werden muss zu jeder gespeicherten IP eine DNS Anfrage (s. Paket No. 27 bis 42 mit der dazugehörigen Antwort) getätigt werden.

Danach versendet das System den zweiten **Echo (ping) request** (s. Paket No. 43f). *Nicht bekannte Namen* zu IP Adressen werden erneut angefragt (s. Paket No. 45f: zu IP 10.40.20.11).

```
ktdsp32:~ # host 10.40.20.11
Host 11.20.40.10.in-addr.arpa. not found: 3(NXDOMAIN)
```

Grund für die nicht Auflösung der IP ist ein **Zahlendreher** in der zugehörigen Zonendatei (s.u. **20.11** ≠ **11.20**).

```
$TTL 2D
40.10.in-addr.arpa.      IN SOA  ktdss01.local. root.localhost. (
                          2011100501      ; serial
                          1D              ; refresh
                          2H              ; retry
                          1W              ; expiry
                          2D              ; minimum

                          IN NS   ktdss01.local.
                          IN NS   ktdss02.local.
1.0                      IN PTR  ktdsrt3-40.local.
20.11                     IN PTR  ktdsap1.local.
```

Nach der Änderung muss auch die **Seriennummer** der Zonendatei aktualisiert werden.

```
$TTL 2D
40.10.in-addr.arpa.      IN SOA  ktdss01.local. root.localhost. (
                          2011111001      ; serial
...
11.20                     IN PTR  ktdsap1.local.
```

Nun führt die DNS Anfrage zum gewünschten Ergebnis.

```
ktdsp32:~ # host 10.40.20.11
11.20.40.10.in-addr.arpa domain name pointer ktdsap1.local.
```

```
ktdsp32:~ # ping -R ktdsap1.local -c2
PING ktdsap1.local (10.40.20.11) 56(124) bytes of data.
64 bytes from ktdsap1.local (10.40.20.11): icmp_req=1 ttl=62 time=4.05 ms
RR:   ktdsp32.local (10.20.23.32)
      ktdsrt1.local (10.23.5.61)
      ktdsrt3-40.local (10.40.0.1)
      ktdsap1.local (10.40.20.11)
      ktdsap1.local (10.40.20.11)
      ktdsrt3.local (10.23.5.63)
      ktdsrt1-20.local (10.20.0.1)
      ktdsp32.local (10.20.23.32)

64 bytes from ktdsap1.local (10.40.20.11): icmp_req=2 ttl=62 time=3.45 ms      (same route)

--- ktdsap1.local ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 3.451/3.754/4.058/0.309 ms
ktdsp32:~ #
```

Wireshark

No.	Time	Source	Destination	Protocol	Info
23	40.215713	10.20.23.32	10.23.5.1	DNS	Standard query A ktdsap1.local
24	40.216455	10.23.5.1	10.20.23.32	DNS	Standard query response A 10.40.20.11
25	40.216607	10.20.23.32	10.40.20.11	ICMP	Echo (ping) request (id=0x2e8c, seq(be/le)=1/256, ttl=64)
26	40.220683	10.40.20.11	10.20.23.32	ICMP	Echo (ping) reply (id=0x2e8c, seq(be/le)=1/256, ttl=62)
27	40.220818	10.20.23.32	10.23.5.1	DNS	Standard query PTR 11.20.40.10.in-addr.arpa
28	40.221312	10.23.5.1	10.20.23.32	DNS	Standard query response, No such name
29	40.221399	10.20.23.32	10.23.5.1	DNS	Standard query PTR 32.23.20.10.in-addr.arpa
30	40.221860	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsp32.local
31	40.222000	10.20.23.32	10.23.5.1	DNS	Standard query PTR 61.5.23.10.in-addr.arpa
32	40.222485	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsrt1.local
33	40.222564	10.20.23.32	10.23.5.1	DNS	Standard query PTR 1.0.40.10.in-addr.arpa
34	40.223034	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsrt3-40.local
35	40.223122	10.20.23.32	10.23.5.1	DNS	Standard query PTR 11.20.40.10.in-addr.arpa
36	40.223571	10.23.5.1	10.20.23.32	DNS	Standard query response, No such name
37	40.223645	10.20.23.32	10.23.5.1	DNS	Standard query PTR 63.5.23.10.in-addr.arpa
38	40.224113	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsrt3.local
39	40.224191	10.20.23.32	10.23.5.1	DNS	Standard query PTR 1.0.20.10.in-addr.arpa
40	40.224748	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsrt1-20.local
41	40.224860	10.20.23.32	10.23.5.1	DNS	Standard query PTR 32.23.20.10.in-addr.arpa
42	40.225380	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsp32.local
43	41.218466	10.20.23.32	10.40.20.11	ICMP	Echo (ping) request (id=0x2e8c, seq(be/le)=2/512, ttl=64)
44	41.221977	10.40.20.11	10.20.23.32	ICMP	Echo (ping) reply (id=0x2e8c, seq(be/le)=2/512, ttl=62)
45	41.222154	10.20.23.32	10.23.5.1	DNS	Standard query PTR 11.20.40.10.in-addr.arpa
46	41.222870	10.23.5.1	10.20.23.32	DNS	Standard query response, No such name

DNS Standard query A ktdsap1.local

No.	Time	Source	Destination	Protocol	Info
23	40.215713	10.20.23.32	10.23.5.1	DNS	Standard query A ktdsap1.local

Frame 23: 73 bytes on wire (584 bits), 73 bytes captured (584 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

```
Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Address: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Address: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
```

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

```
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
0000 00.. = Differentiated Services Codepoint: Default (0x00)
.... 0... = ECN-Capable Transport (ECT): 0
.... 0... = ECN-CE: 0
Total Length: 59
Identification: 0x6d54 (27988)
Flags: 0x02 (Don't Fragment)
0... .. = Reserved bit: Not set
1... .. = Don't fragment: Set
..0... = More fragments: Not set
Fragment offset: 0
Time to live: 64
Protocol: UDP (17)
Header checksum: 0x9d12 [correct]
[Good: True]
[Bad: False]
Source: 10.20.23.32 (10.20.23.32)
Destination: 10.23.5.1 (10.23.5.1)
```

Header length: 20 bytes

5 * 32 Bit = 160 Bit = 20 Byte

User Datagram Protocol, Src Port: 53288 (53288), Dst Port: domain (53)

```
Source port: 53288 (53288)
Destination port: domain (53)
Length: 39
Checksum: 0x3084 [validation disabled]
[Good Checksum: False]
[Bad Checksum: False]
Domain Name System (query)
[Response In: 24]
Transaction ID: 0x0f4b
Flags: 0x0100 (Standard query)
0... .. = Response: Message is a query
.000 0... = Opcode: Standard query (0)
.... 0... = Truncated: Message is not truncated
.... 1... = Recursion desired: Do query recursively
.... 0... = Z: reserved (0)
.... 0... = Non-authenticated data: Unacceptable
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 0
Queries
ktdsap1.local: type A, class IN
Name: ktdsap1.local
Type: A (Host address)
Class: IN (0x0001)
```

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 3b 6d 54 40 00 40 11 9d 12 0a 14 17 20 0a 17*.....:C...E.
0020 05 01 ;mT@.@..... ..

0030 d0 28 00 35 00 27 30 84 0f 4b 01 00 00 01 ...(.5.'0..K....
0040 00 00 00 00 00 00 07 6b 74 64 73 61 70 31 05 6cktdsap1.l
ocal.....

DNS Standard query response A 10.40.20.11

No.	Time	Source	Destination	Protocol	Info
24	40.216455	10.23.5.1	10.20.23.32	DNS	Standard query response A 10.40.20.11

Frame 24: 165 bytes on wire (1320 bits), 165 bytes captured (1320 bits)

Ethernet II, Src: Cisco fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

```
Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Address: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Address: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
```

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

```
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
0000 00.. = Differentiated Services Codepoint: Default (0x00)
.... 0... = ECN-Capable Transport (ECT): 0
.... 0... = ECN-CE: 0
Total Length: 151
Identification: 0x1100 (4352)
Flags: 0x00
0... .. = Reserved bit: Not set
.0... .. = Don't fragment: Not set
..0... .. = More fragments: Not set
Fragment offset: 0
Time to live: 63
Protocol: UDP (17)
Header checksum: 0x3a0b [correct]
[Good: True]
[Bad: False]
Source: 10.23.5.1 (10.23.5.1)
Destination: 10.20.23.32 (10.20.23.32)
```

Header length: 20 bytes

5 * 32 Bit = 160 Bit = 20 Byte

User Datagram Protocol, Src Port: domain (53), Dst Port: 53288 (53288)

```
Source port: domain (53)
Destination port: 53288 (53288)
Length: 131
Checksum: 0xbde3 [validation disabled]
[Good Checksum: False]
[Bad Checksum: False]
Domain Name System (response)
[Request In: 23]
[Time: 0.000742000 seconds]
Transaction ID: 0x0f4b
Flags: 0x8580 (Standard query response, No error)
1... .. = Response: Message is a response
.000 0... .. = Opcode: Standard query (0)
.... .1... .. = Authoritative: Server is an authority for domain
.... ..0... .. = Truncated: Message is not truncated
.... ...1... .. = Recursion desired: Do query recursively
.... .... 1... .. = Recursion available: Server can do recursive queries
.... .... .0... .. = Z: reserved (0)
.... .... ..0... .. = Answer authenticated: Answer/authority portion was not authenticated by the server
.... .... ...0... .. = Non-authenticated data: Unacceptable
.... .... .... 0000 = Reply code: No error (0)
Questions: 1
Answer RRs: 1
Authority RRs: 2
Additional RRs: 2
Queries
ktdsap1.local: type A, class IN
Name: ktdsap1.local
Type: A (Host address)
Class: IN (0x0001)
Answers
ktdsap1.local: type A, class IN, addr 10.40.20.11
Name: ktdsap1.local
Type: A (Host address)
Class: IN (0x0001)
Time to live: 2 days
Data length: 4
Addr: 10.40.20.11 (10.40.20.11)
Authoritative nameservers
local: type NS, class IN, ns ktdss01.local
Name: local
Type: NS (Authoritative name server)
Class: IN (0x0001)
Time to live: 2 days
Data length: 10
Name server: ktdss01.local
local: type NS, class IN, ns ktdss02.local
Name: local
Type: NS (Authoritative name server)
```

```

Class: IN (0x0001)
Time to live: 2 days
Data length: 10
Name server: ktdss02.local
Additional records
ktdss01.local: type A, class IN, addr 10.23.5.1
Name: ktdss01.local
Type: A (Host address)
Class: IN (0x0001)
Time to live: 2 days
Data length: 4
Addr: 10.23.5.1 (10.23.5.1)
ktdss02.local: type A, class IN, addr 10.23.5.2
Name: ktdss02.local
Type: A (Host address)
Class: IN (0x0001)
Time to live: 2 days
Data length: 4
Addr: 10.23.5.2 (10.23.5.2)

```

```
0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00
```

```

0010 00 97 11 00 00 00 3f 11 3a 0b 0a 17 05 01 0a 14 .....?:.....
0020 17 20

```

```

0030 00 01 00 02 00 02 07 6b 74 64 73 61 70 31 05 6c .....ktdsap1.l
0040 6f 63 61 6c 00 00 01 00 01 c0 0c 00 01 00 01 00 ocal.....
0050 02 a3 00 00 04 0a 28 14 0b c0 14 00 02 00 01 00 .....(.....
0060 02 a3 00 00 0a 07 6b 74 64 73 73 30 31 c0 14 c0 .....ktdss01...
0070 14 00 02 00 01 00 02 a3 00 00 0a 07 6b 74 64 73 .....ktds
0080 73 30 32 c0 14 c0 3b 00 01 00 01 00 02 a3 00 00 s02...;.....
0090 04 0a 17 05 01 c0 51 00 01 00 01 00 02 a3 00 00 .....Q.....
00a0 04 0a 17 05 02 .....

```

ICMP Echo (ping) request

No.	Time	Source	Destination	Protocol	Info
25	40.216607	10.20.23.32	10.40.20.11	ICMP	Echo (ping) request (id=0x2e8c, seq=(be/le)=1/256, ttl=64)

Frame 25: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco fe:2a:81 (00:09:b7:fe:2a:81)

```
Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Address: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Address: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
```

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.40.20.11 (10.40.20.11)

```
Version: 4
Header length: 60 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
0000 00.. = Differentiated Services Codepoint: Default (0x00)
.... 0.. = ECN-Capable Transport (ECT): 0
.... 0.. = ECN-CE: 0
Total Length: 124
Identification: 0x0000 (0)
Flags: 0x02 (Don't Fragment)
0... .. = Reserved bit: Not set
1... .. = Don't fragment: Set
..0. ... = More fragments: Not set
Fragment offset: 0
Time to live: 64
Protocol: ICMP (1)
Header checksum: 0xa7d7 [correct]
[Good: True]
[Bad: False]
Source: 10.20.23.32 (10.20.23.32)
Destination: 10.40.20.11 (10.40.20.11)
Options: (40 bytes)
NOP
Record route (39 bytes)
Pointer: 8
10.20.23.32
- <- (current)
-
-
-
-
-
```

Header length: 60 bytes
0xf → 15 * 32 Bit = 480 Bit = 60 Byte

Internet Control Message Protocol

```
Type: 8 (Echo (ping) request)
Code: 0
Checksum: 0x823f [correct]
Identifier: 0x2e8c
Sequence number: 1 (0x0001)
Sequence number (LE): 256 (0x0100)
```

Data (56 bytes)

```
Data: 9339b94e0000000037d80400000001011121314151617...
[Length: 56]
```

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

```
0010 00 7c 00 00 40 00 40 01 a7 d7 0a 14 17 20 0a 28 .....*.....C...0.
0020 14 0b 01 07 27 08 0a 14 17 20 00 00 00 00 00 ..|..@.@......(
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
```

0050 00 01 08 00 82 3f 2e 8c?..

```
0060 93 39 b9 4e 00 00 00 37 d8 04 00 00 00 ...9.N...7.....
0070 00 00 10 11 12 13 14 15 16 17 18 19 1a 1b 1c 1d .....
0080 1e 1f 20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d .. !"#%&'()*+,-
0080 2e 2f 30 31 32 33 34 35 36 37 ./01234567
```

ICMP Echo (ping) reply

No. 26 Time 40.220683 Source 10.40.20.11 Destination 10.20.23.32 Protocol ICMP Info Echo (ping) reply (id=0x2e8c, seq=(be/le)=1/256, ttl=62)

Frame 26: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits)

Ethernet II, Src: Cisco fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell 3a:43:f4 (00:1e:c9:3a:43:f4)

```
Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Address: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Address: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
.... 0... = IG bit: Individual address (unicast)
.... 0... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
```

Internet Protocol, Src: 10.40.20.11 (10.40.20.11), Dst: 10.20.23.32 (10.20.23.32)

```
Version: 4
Header length: 60 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
0000 00.. = Differentiated Services Codepoint: Default (0x00)
.... 0.. = ECN-Capable Transport (ECT): 0
.... 0.. = ECN-CE: 0
Total Length: 124
Identification: 0x5a5a (23130)
Flags: 0x00
0... .. = Reserved bit: Not set
.0.. .. = Don't fragment: Not set
..0. .. = More fragments: Not set
Fragment offset: 0
Time to live: 62
Protocol: ICMP (1)
Header checksum: 0x2f09 [correct]
[Good: True]
[Bad: False]
Source: 10.40.20.11 (10.40.20.11)
Destination: 10.20.23.32 (10.20.23.32)
Options: (40 bytes)
Record route (39 bytes)
Pointer: 32
10.20.23.32
10.23.5.61
10.40.0.1
10.40.20.11
10.40.20.11
10.23.5.63
10.20.0.1
- <- (current)
-
EOL
```

Header length: 60 bytes
0xf → 15 * 32 Bit = 480 Bit = 60 Byte

Internet Control Message Protocol

```
Type: 0 (Echo (ping) reply)
Code: 0
Checksum: 0x8a3f [correct]
Identifier: 0x2e8c
Sequence number: 1 (0x0001)
Sequence number (LE): 256 (0x0100)
```

Data (56 bytes)

```
Data: 9339b94e0000000037d80400000001011121314151617...
[Length: 56]
```

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

```
0010 00 7c 5a 5a 00 00 3e 01 2f 09 0a 28 14 0b 0a 14 ...:C.....*...0.
0020 17 20 07 27 20 0a 14 17 20 0a 17 05 3d 0a 28 00 .|ZZ..>./..(....
0030 01 0a 28 14 0b 0a 28 14 0b 0a 17 05 3f 0a 14 00 ..(...(.....?...
0040 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

0050 00 01 00 00 8a 3f 2e 8c?..

```
0060 93 39 b9 4e 00 00 00 00 37 d8 04 00 00 00 ...9.N....7.....
0070 0e 1f 20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d .. !"#$$%&'()*+,-
0080 2e 2f 30 31 32 33 34 35 36 37 ./01234567
```


DNS Standard query PTR 11.20.40.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
27	40.220818	10.20.23.32	10.23.5.1	DNS	Standard query PTR 11.20.40.10.in-addr.arpa

Frame 27: 84 bytes on wire (672 bits), 84 bytes captured (672 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
Total Length: 70
Identification: 0x6d59 (27993)
Flags: 0x02 (Don't Fragment)
Fragment offset: 0
Time to live: 64
Protocol: UDP (17)
Header checksum: 0x9d02 [correct]
Source: 10.20.23.32 (10.20.23.32)
Destination: 10.23.5.1 (10.23.5.1)

User Datagram Protocol, Src Port: 59116 (59116), Dst Port: domain (53)

Source port: 59116 (59116)
Destination port: domain (53)
Length: 50
Checksum: 0x308f [validation disabled]
Domain Name System (query)
[Response In: 28]
Transaction ID: 0x2dd7
Flags: 0x0100 (Standard query)
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 0
Queries
11.20.40.10.in-addr.arpa: type PTR, class IN
Name: 11.20.40.10.in-addr.arpa
Type: PTR (Domain name pointer)
Class: IN (0x0001)

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 46 6d 59 40 00 40 11 9d 02 0a 14 17 20 0a 17*:C...E.
0020 05 01 .FmY@.@..... ..

0030 00 00 00 00 00 00 02 31 31 02 32 30 02 34 30 025.20.-.....
0040 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 0011.20.40.
0050 00 0c 00 01 10.in-addr.arpa.
....

DNS Standard query response

No.	Time	Source	Destination	Protocol	Info
28	40.221312	10.23.5.1	10.20.23.32	DNS	Standard query response, No such name

Frame 28: 147 bytes on wire (1176 bits), 147 bytes captured (1176 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
 Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
 Type: IP (0x0800)

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

Version: 4
 Header length: 20 bytes
 Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
 Total Length: 133
 Identification: 0x1101 (4353)
 Flags: 0x00
 Fragment offset: 0
 Time to live: 63
 Protocol: UDP (17)
 Header checksum: 0x3a1c [correct]
 Source: 10.23.5.1 (10.23.5.1)
 Destination: 10.20.23.32 (10.20.23.32)

User Datagram Protocol, Src Port: domain (53), Dst Port: 59116 (59116)

Source port: domain (53)
 Destination port: 59116 (59116)
 Length: 113
 Checksum: 0x056d [validation disabled]
 Domain Name System (response)
 [Request In: 27]
 [Time: 0.000494000 seconds]
 Transaction ID: 0x2dd7
 Flags: 0x8583 (Standard query response, *No such name*)
 Questions: 1
 Answer RRs: 0
 Authority RRs: 1
 Additional RRs: 0
 Queries
 11.20.40.10.in-addr.arpa: type PTR, class IN
 Name: 11.20.40.10.in-addr.arpa
 Type: PTR (Domain name pointer)
 Class: IN (0x0001)
 Authoritative nameservers
 40.10.in-addr.arpa: type SOA, class IN, mname ktdss01.local
 Name: 40.10.in-addr.arpa
 Type: SOA (Start of zone of authority)
 Class: IN (0x0001)
 Time to live: 2 days
 Data length: 51
 Primary name server: ktdss01.local
 Responsible authority's mailbox: root.localhost
 Serial number: 2011100501
 Refresh interval: 1 day
 Retry interval: 2 hours
 Expiration limit: 7 days
 Minimum TTL: 2 days

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 85 11 01 00 00 3f 11 3a 1c 0a 17 05 01 0a 14 ...:C.....*...E.
 0020 17 20?:.....

0030 00 00 00 01 00 00 02 31 31 02 32 30 02 34 30 02 . .5...q.m-.....
 0040 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 0011.20.40.
 0050 00 0c 00 01 c0 12 00 06 00 01 00 02 a3 00 00 333
 0060 07 6b 74 64 73 73 30 31 05 6c 6f 63 61 6c 00 04 .ktdss01.local..
 0070 72 6f 6f 74 09 6c 6f 63 61 6c 68 6f 73 74 00 77 root.localhost.w
 0080 de f5 55 00 01 51 80 00 00 1c 20 00 09 3a 80 00 ..U..Q.... ..:..
 0090 02 a3 00 ...

DNS Standard query PTR 32.23.20.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
29	40.221399	10.20.23.32	10.23.5.1	DNS	Standard query PTR 32.23.20.10.in-addr.arpa

Frame 29: 84 bytes on wire (672 bits), 84 bytes captured (672 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

... Identification: 0x6d5a (27994)
...

User Datagram Protocol, Src Port: 40180 (40180), Dst Port: domain (53)

Source port: 40180 (40180)
...
Domain Name System (query)
Queries
32.23.20.10.in-addr.arpa: type PTR, class IN
Name: 32.23.20.10.in-addr.arpa
Type: PTR (Domain name pointer)
Class: IN (0x0001)

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 46 6d 5a 40 00 40 11 9d 01 0a 14 17 20 0a 17*.:.:C...E.
0020 05 01 .FmZ@.@..... ..

0030 00 00 00 00 00 00 02 33 32 02 32 33 02 32 30 025.20.....
0040 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 0032.23.20.
0050 00 0c 00 01 10.in-addr.arpa.
....

DNS Standard query response PTR ktdsp32.local

No.	Time	Source	Destination	Protocol	Info
30	40.221860	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsp32.local

Frame 30: 187 bytes on wire (1496 bits), 187 bytes captured (1496 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
 Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
 Type: IP (0x0800)

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

... Identification: 0x1102 (4354)
 ...

User Datagram Protocol, Src Port: domain (53), Dst Port: 40180 (40180)

... Length: 153
 ...

Queries

32.23.20.10.in-addr.arpa: type PTR, class IN
 Name: 32.23.20.10.in-addr.arpa
 Type: PTR (Domain name pointer)
 Class: IN (0x0001)

Answers

32.23.20.10.in-addr.arpa: type PTR, class IN, ktdsp32.local
 Name: 32.23.20.10.in-addr.arpa
 Type: PTR (Domain name pointer)
 Class: IN (0x0001)
 Time to live: 2 days
 Data length: 15
 Domain name: ktdsp32.local

Authoritative nameservers

20.10.in-addr.arpa: type NS, class IN, ns ktdss02.local
 Name: 20.10.in-addr.arpa
 Type: NS (Authoritative name server)
 Class: IN (0x0001)
 Time to live: 2 days
 Data length: 10
 Name server: ktdss02.local

20.10.in-addr.arpa: type NS, class IN, ns ktdss01.local
 Name: 20.10.in-addr.arpa
 Type: NS (Authoritative name server)
 Class: IN (0x0001)
 Time to live: 2 days
 Data length: 10
 Name server: ktdss01.local

Additional records

ktdss01.local: type A, class IN, addr 10.23.5.1
 Name: ktdss01.local
 Type: A (Host address)
 Class: IN (0x0001)
 Time to live: 2 days
 Data length: 4
 Addr: 10.23.5.1 (10.23.5.1)

ktdss02.local: type A, class IN, addr 10.23.5.2
 Name: ktdss02.local
 Type: A (Host address)
 Class: IN (0x0001)
 Time to live: 2 days
 Data length: 4
 Addr: 10.23.5.2 (10.23.5.2)

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 ad 11 02 00 00 3f 11 39 f3 0a 17 05 01 0a 14 ...:C.....*...E.
 0020 17 20?.9.....

0030 00 01 00 02 00 02 02 33 32 02 32 33 02 32 30 02 . .5.....
 0040 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 0032.23.20.
 0050 00 0c 00 01 c0 0c 00 0c 00 01 00 02 a3 00 00 0f
 0060 07 6b 74 64 73 70 33 32 05 6c 6f 63 61 6c 00 c0 .ktdsp32.local..
 0070 12 00 02 00 01 00 02 a3 00 00 0a 07 6b 74 64 73ktds
 0080 73 30 32 c0 3e c0 12 00 02 00 01 00 02 a3 00 00 s02.>.....
 0090 0a 07 6b 74 64 73 73 30 31 c0 3e c0 67 00 01 00 ..ktdss01.>.g...
 00a0 01 00 02 a3 00 00 04 0a 17 05 01 c0 51 00 01 00Q...
 00b0 01 00 02 a3 00 00 04 0a 17 05 02

DNS Standard query PTR 61.5.23.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
31	40.222000	10.20.23.32	10.23.5.1	DNS	Standard query PTR 61.5.23.10.in-addr.arpa

Frame 31: 83 bytes on wire (664 bits), 83 bytes captured (664 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

... Identification: 0x6d5b (27995)
...

User Datagram Protocol, Src Port: 57214 (57214), Dst Port: domain (53)

... Queries
61.5.23.10.in-addr.arpa: type PTR, class IN
...

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 45 6d 5b 40 00 40 11 9d 01 0a 14 17 20 0a 17*:...:C...E.
0020 05 01 .Em[.@..... ..

0030 df 7e 00 35 00 31 30 8e 03 51 01 00 00 01 ...~.5.10..Q....
0040 00 00 00 00 00 02 36 31 01 35 02 32 33 02 3161.5.23.1
0050 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 00 0.in-addr.arpa..
0050 0c 00 01 ...

DNS Standard query response PTR ktdsrt1.local

No.	Time	Source	Destination	Protocol	Info
32	40.222485	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsrt1.local

Frame 32: 148 bytes on wire (1184 bits), 148 bytes captured (1184 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Type: IP (0x0800)

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

... Identification: 0x1103 (4355)
...

User Datagram Protocol, Src Port: domain (53), Dst Port: 57214 (57214)

... Answers
... Authoritative nameservers
23.10.in-addr.arpa: type NS, class IN, ns ktdss01.local
... Additional records
ktdss01.local: type A, class IN, addr 10.23.5.1
...

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 86 11 03 00 00 3f 11 3a 19 0a 17 05 01 0a 14 ...:C.....*...E.
0020 17 20?:.....

0030 00 01 00 01 00 01 02 36 31 01 35 02 32 33 02 31 . .5~.r...Q....
0040 00 00 00 00 00 02 36 31 01 35 02 32 33 02 3161.5.23.1
0050 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 00 0.in-addr.arpa..
0060 0c 00 01 c0 0c 00 0c 00 01 00 02 a3 00 00 0f 07
0070 6b 74 64 73 72 74 31 05 6c 6f 63 61 6c 00 c0 11 ktdsrt1.local...
0080 00 02 00 01 00 02 a3 00 00 0a 07 6b 74 64 73 73ktdss
0090 30 31 c0 3d c0 50 00 01 00 01 00 02 a3 00 00 04 01.=.P.....
0090 0a 17 05 01

DNS Standard query PTR 1.0.40.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
33	40.222564	10.20.23.32	10.23.5.1	DNS	Standard query PTR 1.0.40.10.in-addr.arpa

Frame 33: 82 bytes on wire (656 bits), 82 bytes captured (656 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

```

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Type: IP (0x0800)
  
```

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

```

... Identification: 0x6d5b (27995)
...
  
```

User Datagram Protocol, Src Port: 60224 (60224), Dst Port: domain (53)

```

... Queries
  1.0.40.10.in-addr.arpa: type PTR, class IN
...
  
```

```

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00
  
```

```

0010 00 44 6d 5b 40 00 40 11 9d 02 0a 14 17 20 0a 17 45 00 ....*:...:C...E.
0020 05 01 .Dm[.@..... ..
  
```

```

0030 eb 40 00 35 00 30 30 8d 05 98 01 00 00 01 ...@.5.00.....
0040 00 00 00 00 00 01 31 01 30 02 34 30 02 31 30 .....1.0.40.10
0050 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 00 0c .in-addr.arpa...
0050 00 01 ..
  
```

DNS Standard query response PTR ktdsrt3-40.local

No.	Time	Source	Destination	Protocol	Info
34	40.223034	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsrt3-40.local

Frame 34: 188 bytes on wire (1504 bits), 188 bytes captured (1504 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

```

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Type: IP (0x0800)
  
```

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

```

... Identification: 0x1104 (4356)
...
  
```

User Datagram Protocol, Src Port: domain (53), Dst Port: 60224 (60224)

```

... Answers
  1.0.40.10.in-addr.arpa: type PTR, class IN, ktdsrt3-40.local
...
  
```

```

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00
  
```

```

0010 00 ae 11 04 00 00 3f 11 39 f0 0a 17 05 01 0a 14 45 00 ...:C.....*...E.
0020 17 20 .....?.9.....
  
```

```

0030 00 01 00 02 00 02 01 31 01 30 02 34 30 02 31 30 . .5.@...q.....
0040 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 00 0c .....1.0.40.10
0050 00 01 c0 0c 00 0c 00 01 00 02 a3 00 00 12 0a 6b .in-addr.arpa...
0060 74 64 73 72 74 33 2d 34 30 05 6c 6f 63 61 6c 00 .....k
0070 c0 10 00 02 00 01 00 02 a3 00 00 0a 07 6b 74 64 tdsrt3-40.local.
0080 73 73 30 31 c0 3f c0 10 00 02 00 01 00 02 a3 00 .....ktd
0090 00 0a 07 6b 74 64 73 73 30 32 c0 3f c0 52 00 01 ss01.?.....
00a0 00 01 00 02 a3 00 00 04 0a 17 05 01 c0 68 00 01 ...ktdss02?.R..
00b0 00 01 00 02 a3 00 00 04 0a 17 05 02 .....h..
  
```

DNS Standard query PTR 11.20.40.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
35	40.223122	10.20.23.32	10.23.5.1	DNS	Standard query PTR 11.20.40.10.in-addr.arpa

Frame 35: 84 bytes on wire (672 bits), 84 bytes captured (672 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

... Identification: 0x6d5c (27996)
...

User Datagram Protocol, Src Port: 56292 (56292), Dst Port: domain (53)

... Queries
11.20.40.10.in-addr.arpa: type PTR, class IN
...

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 46 6d 5c 40 00 40 11 9c ff 0a 14 17 20 0a 17*:C...E.
0020 05 01 .Fm\@.@..... ..

0030 db e4 00 35 00 32 30 8f a9 3a 01 00 00 015.20.....
0040 00 00 00 00 00 02 31 31 02 32 30 02 34 30 0211.20.40.
0050 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 10.in-addr.arpa.
0050 00 0c 00 01

DNS Standard query response, No such name

No.	Time	Source	Destination	Protocol	Info
36	40.223571	10.23.5.1	10.20.23.32	DNS	Standard query response, No such name

Frame 36: 147 bytes on wire (1176 bits), 147 bytes captured (1176 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Type: IP (0x0800)

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

... Identification: 0x1105 (4357)
...

User Datagram Protocol, Src Port: domain (53), Dst Port: 56292 (56292)

... Authoritative nameservers
40.10.in-addr.arpa: type SOA, class IN, mname ktdss01.local
Name: 40.10.in-addr.arpa
Type: SOA (Start of zone of authority)
Class: IN (0x0001)
Time to live: 2 days
Data length: 51
Primary name server: ktdss01.local
Responsible authority's mailbox: root.localhost
Serial number: 2011100501
Refresh interval: 1 day
Retry interval: 2 hours
Expiration limit: 7 days
Minimum TTL: 2 days

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 85 11 05 00 00 3f 11 3a 18 0a 17 05 01 0a 14 ...:C.....*:...E.
0020 17 20?:.....

0030 00 35 db e4 00 71 95 11 a9 3a 85 83 00 01 . .5...q....:.....
0040 00 00 00 01 00 02 31 31 02 32 30 02 34 30 0211.20.40.
0050 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 10.in-addr.arpa.
0060 00 0c 00 01 c0 12 00 06 00 01 00 02 a3 00 00 333
0070 07 6b 74 64 73 73 30 31 05 6c 6f 63 61 6c 00 04 .ktdss01.local..
0080 72 6f 6f 74 09 6c 6f 63 61 6c 68 6f 73 74 00 77 root.localhost.w
0090 de f5 55 00 01 51 80 00 00 1c 20 00 09 3a 80 00 ..U..Q.... :...
0090 02 a3 00 ...

DNS Standard query PTR 63.5.23.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
37	40.223645	10.20.23.32	10.23.5.1	DNS	Standard query PTR 63.5.23.10.in-addr.arpa

Frame 37: 83 bytes on wire (664 bits), 83 bytes captured (664 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
 Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
 Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

... Identification: 0x6d5c (27996)
 ...

User Datagram Protocol, Src Port: 54296 (54296), Dst Port: domain (53)

... Queries
 63.5.23.10.in-addr.arpa: type PTR, class IN
 ...

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 45 6d 5c 40 00 40 11 9d 00 0a 14 17 20 0a 17 45 00 ...*...:C...E.
 0020 05 01 .Em\@.@..... ..

0030 00 00 00 00 00 00 02 36 33 01 35 02 32 33 02 315.10.....
 0040 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 0063.5.23.1
 0050 0c 00 01 0. in-addr.arpa..
 ...

DNS Standard query response PTR ktdsrt3.local

No.	Time	Source	Destination	Protocol	Info
38	40.224113	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsrt3.local

Frame 38: 148 bytes on wire (1184 bits), 148 bytes captured (1184 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
 Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
 Type: IP (0x0800)

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

... Identification: 0x1106 (4358)
 ...

User Datagram Protocol, Src Port: domain (53), Dst Port: 54296 (54296)

... Answers
 63.5.23.10.in-addr.arpa: type PTR, class IN, ktdsrt3.local
 ... Authoritative nameservers
 23.10.in-addr.arpa: type NS, class IN, ns ktdss01.local
 ... Additional records
 ktdss01.local: type A, class IN, addr 10.23.5.1
 ...

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 86 11 06 00 00 3f 11 3a 16 0a 17 05 01 0a 14 45 00 ...:C.....*...E.
 0020 17 20?:.....

0030 00 01 00 01 00 01 02 36 33 01 35 02 32 33 02 31 . .5...r_.....
 0040 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 0063.5.23.1
 0050 0c 00 01 c0 0c 00 0c 00 01 00 02 a3 00 00 0f 07
 0060 6b 74 64 73 72 74 33 05 6c 6f 63 61 6c 00 c0 11 ktdsrt3.local...
 0070 00 02 00 01 00 02 a3 00 00 0a 07 6b 74 64 73 73ktdss
 0080 30 31 c0 3d c0 50 00 01 00 01 00 02 a3 00 00 04 01.=.P.....
 0090 0a 17 05 01

DNS Standard query PTR 1.0.20.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
39	40.224191	10.20.23.32	10.23.5.1	DNS	Standard query PTR 1.0.20.10.in-addr.arpa

Frame 39: 82 bytes on wire (656 bits), 82 bytes captured (656 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

... Identification: 0x6d5d (27997)
...

User Datagram Protocol, Src Port: 52113 (52113), Dst Port: domain (53)

... Queries
1.0.20.10.in-addr.arpa: type PTR, class IN
...

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 44 6d 5d 40 00 40 11 9d 00 0a 14 17 20 0a 17*:C...E.
0020 05 01 .Dm]@.@..... ..

0030 00 00 00 00 00 00 01 31 01 30 02 32 30 02 31 305.00.....
0040 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 00 0c1.0.20.10
0050 00 01 .in-addr.arpa...
..

DNS Standard query response PTR ktdsrt1-20.local

No.	Time	Source	Destination	Protocol	Info
40	40.224748	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsrt1-20.local

Frame 40: 188 bytes on wire (1504 bits), 188 bytes captured (1504 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Type: IP (0x0800)

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

... Identification: 0x1107 (4359)
...

User Datagram Protocol, Src Port: domain (53), Dst Port: 52113 (52113)

... Answers
1.0.20.10.in-addr.arpa: type PTR, class IN, ktdsrt1-20.local
... Authoritative nameservers
20.10.in-addr.arpa: type NS, class IN, ns ktdss01.local
... 20.10.in-addr.arpa: type NS, class IN, ns ktdss02.local
... Additional records
ktdss01.local: type A, class IN, addr 10.23.5.1
... ktdss02.local: type A, class IN, addr 10.23.5.2
...

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 ae 11 07 00 00 3f 11 39 ed 0a 17 05 01 0a 14 ...:C.....*...E.
0020 17 20?.9.....

0030 00 01 00 02 00 02 01 31 01 30 02 32 30 02 31 30 . .5.....
0040 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 00 0c1.0.20.10
0050 00 01 c0 0c 00 0c 00 01 00 02 a3 00 00 12 0a 6bk
0060 74 64 73 72 74 31 2d 32 30 05 6c 6f 63 61 6c 00 tdsrt1-20.local.
0070 c0 10 00 02 00 01 00 02 a3 00 00 0a 07 6b 74 64ktd
0080 73 73 30 31 c0 3f c0 10 00 02 00 01 00 02 a3 00 ss01.?.....
0090 00 0a 07 6b 74 64 73 73 30 32 c0 3f c0 52 00 01 ...ktdss02.?..R..
00a0 00 01 00 02 a3 00 00 04 0a 17 05 01 c0 68 00 01h..
00b0 00 01 00 02 a3 00 00 04 0a 17 05 02

DNS Standard query PTR 32.23.20.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
41	40.224860	10.20.23.32	10.23.5.1	DNS	Standard query PTR 32.23.20.10.in-addr.arpa

Frame 41: 84 bytes on wire (672 bits), 84 bytes captured (672 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
 Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
 Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

... Identification: 0x6d5d (27997)
 ...

User Datagram Protocol, Src Port: 35917 (35917), Dst Port: domain (53)

... Queries
 32.23.20.10.in-addr.arpa: type PTR, class IN
 ...

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 46 6d 5d 40 00 40 11 9c fe 0a 14 17 20 0a 17 45 00*:...:C...E.
 0020 05 01 .Fm]@.@..... ..

0030 8c 4d 00 35 00 32 30 8f b1 c8 01 00 00 01 ...M.5.20.....
 0040 00 00 00 00 00 02 33 32 02 32 33 02 32 30 0232.23.20.
 0050 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 00 10.in-addr.arpa.
 0050 00 0c 00 01

DNS Standard query response PTR ktdsp32.local

No.	Time	Source	Destination	Protocol	Info
42	40.225380	10.23.5.1	10.20.23.32	DNS	Standard query response PTR ktdsp32.local

Frame 42: 187 bytes on wire (1496 bits), 187 bytes captured (1496 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
 Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
 Type: IP (0x0800)

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

... Identification: 0x1108 (4360)
 ...

User Datagram Protocol, Src Port: domain (53), Dst Port: 35917 (35917)

... Answers
 32.23.20.10.in-addr.arpa: type PTR, class IN, ktdsp32.local
 ... Authoritative nameservers
 20.10.in-addr.arpa: type NS, class IN, ns ktdss02.local
 ... 20.10.in-addr.arpa: type NS, class IN, ns ktdss01.local
 ...

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 ad 11 08 00 00 3f 11 39 ed 0a 17 05 01 0a 14 45 00 ...:C.....*...E.
 0020 17 20?.9.....

0030 00 01 00 02 00 02 33 32 02 32 33 02 32 30 02 . .5.M..*B.....
 0040 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 0032.23.20.
 0050 00 0c 00 01 c0 0c 00 0c 00 01 00 02 a3 00 00 0f 10.in-addr.arpa.
 0060 07 6b 74 64 73 70 33 32 05 6c 6f 63 61 6c 00 c0 .ktdsp32.local..
 0070 12 00 02 00 01 00 02 a3 00 00 0a 07 6b 74 64 73ktds
 0080 73 30 32 c0 3e c0 12 00 02 00 01 00 02 a3 00 00 s02.>.....
 0090 0a 07 6b 74 64 73 73 30 31 c0 3e c0 67 00 01 00 ..ktdss01.>.g...
 00a0 01 00 02 a3 00 00 04 0a 17 05 01 c0 51 00 01 00Q...
 00b0 01 00 02 a3 00 00 04 0a 17 05 02

ICMP Echo (ping) request

No.	Time	Source	Destination	Protocol	Info
43	41.218466	10.20.23.32	10.40.20.11	ICMP	Echo (ping) request

Frame 43: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.40.20.11 (10.40.20.11)

... Time to live: 64

... Record route (39 bytes)

Pointer: 8
10.20.23.32
- <- (current)

Internet Control Message Protocol

... Sequence number: 2 (0x0002)
Sequence number (LE): 512 (0x0200)

Data (56 bytes)

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 7c 00 00 40 00 4f 01 a7 d7 0a 14 17 20 0a 28*.....C...0.
0020 14 0b 01 07 27 08 0a 14 17 20 00 00 00 00 00|. @.@..... .(
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00

0050 00 02 08 00 47 37 2e 8cG7..

ICMP Echo (ping) reply

No.	Time	Source	Destination	Protocol	Info
44	41.221977	10.40.20.11	10.20.23.32	ICMP	Echo (ping) reply

Frame 44: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Type: IP (0x0800)

Internet Protocol, Src: 10.40.20.11 (10.40.20.11), Dst: 10.20.23.32 (10.20.23.32)

... Time to live: 62

... Record route (39 bytes)

Pointer: 32
10.20.23.32
10.23.5.61
10.40.0.1
10.40.20.11
10.40.20.11
10.23.5.63
10.20.0.1

Internet Control Message Protocol

... Sequence number: 2 (0x0002)
Sequence number (LE): 512 (0x0200)

Data (56 bytes)

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 7c 5a 5b 00 00 3e 01 2f 08 0a 28 14 0b 0a 14:C.....*...0.
0020 17 20 07 27 20 0a 14 17 20 0a 17 05 3d 0a 28 00|Z[.>./..(....
0030 01 0a 28 14 0b 0a 28 14 0b 0a 17 05 3f 0a 14 00'=(.
0040 01 00 00 00 00 00 00 00 00 00 00 00 00 00(....(.....?...

0050 00 02 00 00 4f 37 2e 8c07..

DNS Standard query PTR 11.20.40.10.in-addr.arpa

No.	Time	Source	Destination	Protocol	Info
45	41.222154	10.20.23.32	10.23.5.1	DNS	Standard query PTR 11.20.40.10.in-addr.arpa

Frame 45: 84 bytes on wire (672 bits), 84 bytes captured (672 bits)

Ethernet II, Src: Dell_3a:43:f4 (00:1e:c9:3a:43:f4), Dst: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)

Destination: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Source: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Type: IP (0x0800)

Internet Protocol, Src: 10.20.23.32 (10.20.23.32), Dst: 10.23.5.1 (10.23.5.1)

... Identification: 0x7143 (28995)
...

User Datagram Protocol, Src Port: 59123 (59123), Dst Port: domain (53)

... Queries
11.20.40.10.in-addr.arpa: type PTR, class IN
...

0000 00 09 b7 fe 2a 81 00 1e c9 3a 43 f4 08 00

0010 00 46 71 43 40 00 40 11 99 18 0a 14 17 20 0a 17 45 00*:...E.
0020 05 01 .FqC@.@..... ..

0030 00 00 00 00 00 00 02 31 31 02 32 30 02 34 30 025.20..p....
0040 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 0011.20.40.
0050 00 0c 00 01 10.in-addr.arpa.
....

DNS Standard query response, No such name

No.	Time	Source	Destination	Protocol	Info
46	41.222870	10.23.5.1	10.20.23.32	DNS	Standard query response, No such name

Frame 46: 147 bytes on wire (1176 bits), 147 bytes captured (1176 bits)

Ethernet II, Src: Cisco_fe:2a:81 (00:09:b7:fe:2a:81), Dst: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)

Destination: Dell_3a:43:f4 (00:1e:c9:3a:43:f4)
Source: Cisco_fe:2a:81 (00:09:b7:fe:2a:81)
Type: IP (0x0800)

Internet Protocol, Src: 10.23.5.1 (10.23.5.1), Dst: 10.20.23.32 (10.20.23.32)

... Identification: 0x1109 (4361)
...

User Datagram Protocol, Src Port: domain (53), Dst Port: 59123 (59123)

... Flags: 0x8583 (Standard query response, No such name)
... Queries
11.20.40.10.in-addr.arpa: type PTR, class IN
... Authoritative nameservers
40.10.in-addr.arpa: type SOA, class IN, mname ktdss01.local
Name: 40.10.in-addr.arpa
Type: SOA (Start of zone of authority)
Class: IN (0x0001)
Time to live: 2 days
Data length: 51
Primary name server: ktdss01.local
Responsible authority's mailbox: root.localhost
Serial number: 2011100501
Refresh interval: 1 day
Retry interval: 2 hours
Expiration limit: 7 days
Minimum TTL: 2 days

0000 00 1e c9 3a 43 f4 00 09 b7 fe 2a 81 08 00

0010 00 85 11 09 00 00 3f 11 3a 14 0a 17 05 01 0a 14 45 00 ...:C.....*...E.
0020 17 20?:.....

0030 00 00 00 01 00 00 02 31 31 02 32 30 02 34 30 02 . .5...q]..p....
0040 31 30 07 69 6e 2d 61 64 64 72 04 61 72 70 61 0011.20.40.
0050 00 0c 00 01 c0 12 00 06 00 01 00 02 a3 00 00 33 10.in-addr.arpa.
0060 07 6b 74 64 73 73 30 31 05 6c 6f 63 61 6c 00 043
0070 72 6f 6f 74 09 6c 6f 63 61 6c 68 6f 73 74 00 77 .ktdss01.local..
0080 de f5 55 00 01 51 80 00 00 1c 20 00 09 3a 80 00 root.localhost.w
0090 02 a3 00 ..U..Q.... ..:..
...