How to Create a Pinpoint DNS Entry

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Introduction

This document describes how to create pinpoint entries for service records (SRV) on the internal Name Server (NS) in order to work around the lack of split Domain Name System (DNS) setups.

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Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Basic understanding of DNS
- A domain which is correctly configured on the public authoritative NS

Components Used

The information in this document is based on these software and hardware versions:

- Microsoft Windows Server 2012
- Video Communication System (VCS) / Expressway

> **Note**: The information in this document can be used either with Microsoft DNS server, or BIND. You only need to use the steps appropriate for your particular DNS server. Instructions for other types of DNS servers are not provided, but the concept can be used

with any other DNS server if the server supports this configuration.

Note: The internal NS is used by internal users, as well as Video Communication System (VCS) / Cisco Expressway-C.

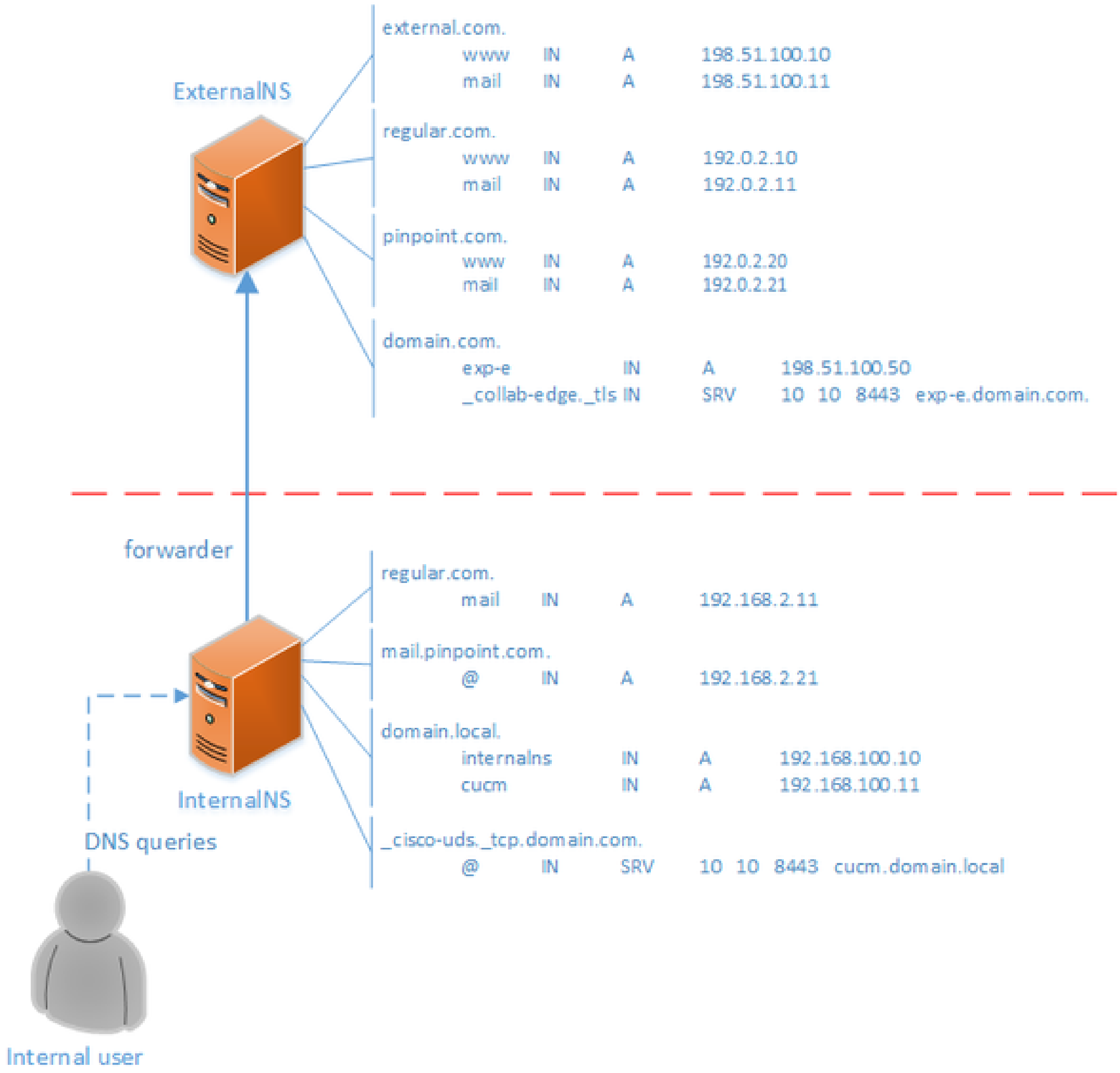
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Pinpoint DNS overview

The pinpoint DNS entry is a zone created for a single host only. This entry can be defined as authoritative on a Name Server, which is not authoritative for the parent domain. This allows other DNS queries for this domain to be forwarded to the authoritative sever.

The pinpoint zone usually contains a single record besides the required Start of Authority (SOA) and Name Server records. This record is a self-reference, identical to the name of the zone and show up as **same as parent folder** in **Microsoft DNS**, or is referred to by an @ symbol in the **BIND zone** file. The record can be of any type supported by the DNS. The @ symbol is also used in Windows Command Line Interface (CLI) tools, and works the same way as in BIND.

The following image provides an example of these records:



```
external.com.
        www     IN      A       198.51.100.10
        mail    IN      A       198.51.100.11

regular.com.
        www     IN      A       192.0.2.10
        mail    IN      A       192.0.2.11

pinpoint.com.
        www     IN      A       192.0.2.20
        mail    IN      A       192.0.2.21

domain.com.
        exp-e                   IN      A       198.51.100.50
        _collab-edge._tls IN    SRV     10  10  8443  exp-e.domain.com.
```

```
regular.com.
        mail    IN      A       192.168.2.11

mail.pinpoint.com.
        @       IN      A       192.168.2.21

domain.local.
        internalns      IN      A       192.168.100.10
        cucm            IN      A       192.168.100.11

_cisco-uds._tcp.domain.com.
        @       IN      SRV     10  10  8443  cucm.domain.local
```

This is a feature of the DNS system and does not rely on any mechanism in the Cisco Jabber or Cisco Expressway applications. It is also a supported solution for Cisco Jabber deployment if split DNS is not available.

If a Name Server is configured as authoritative or master for a domain, then queries are not forwarded for names within that domain to its forwarders, even if it can be unable to resolve a specific name. Thus, in order to provide different name resolution within the same domain to internal and external users of the domain normally, a split DNS would be used. In a split DNS configuration, an internal DNS server maintains a copy of the zone with internal-specific entries and an external DNS server maintains a copy of the zone with external-specific entries. Entries present in the external zone, but not in the internal zone must fail to resolve for internal queries.

Since this can lead to management overhead, some network administrators prefer to avoid split DNS configurations. Pinpoint DNS entries offer an alternative in these cases.

Configure

Create DNS SRV records

For Cisco Jabber auto-provisioning, as well as Mobile and Remote Access (MRA) service, two SRV records are involved for each domain (using **domain.com** as an example):

- **_collab-edge._tls.domain.com**
- **_cisco-uds._tcp.domain.com**

You can have multiple entries for these records if the Expressway and/or the Cisco Unified Communications Manager (CUCM) is clustered.

When the authorative zone file for **domain.com** only exists on the external NS, a pinpoint DNS entry for **`_cisco-uds._tcp`** is required on the internal NS. First the pinpoint DNS zone needs to be created, then the SRV within the zone.

> The **`_cisco-uds._tcp`** SRV record must be only resolvable on the internal network, not from the external, and must resolve to the fully qualified domain name (FQDN) of the CUCM node(s) with User Data Services (UDS).

> The **`_collab-edge._tls`** SRV record must be resolvable from the external network, and resolves to the Fully Qualified Domain Name (FQDN) of the Expressway-E server.

Configure Windows DNS server

The pinpoint DNS entry is created as any other zone, and its name must contain the entire SRV name (for example, **`_cisco-uds._tcp.domain.com`**). This step can be performed through the Graphical User Interface (GUI) as well, although the example below assumes that the pinpoint DNS entry has not already been created.

In order to add the SRV record itself, a CLI tool must be used. You must not add an SRV record to a pinpoint DNS entry through the GUI, as this does not work. Once added via CLI, these SRV records are manageable with the regular tools just as any other entry. Windows CLI presents two methods - either **dnscmd** or **PowerShell** commands. Both of the examples that follow create the two pinpoint DNS entries and add one SRV record for **`_cisco-uds._tcp`**

Only one of these two methods at a time can be used:

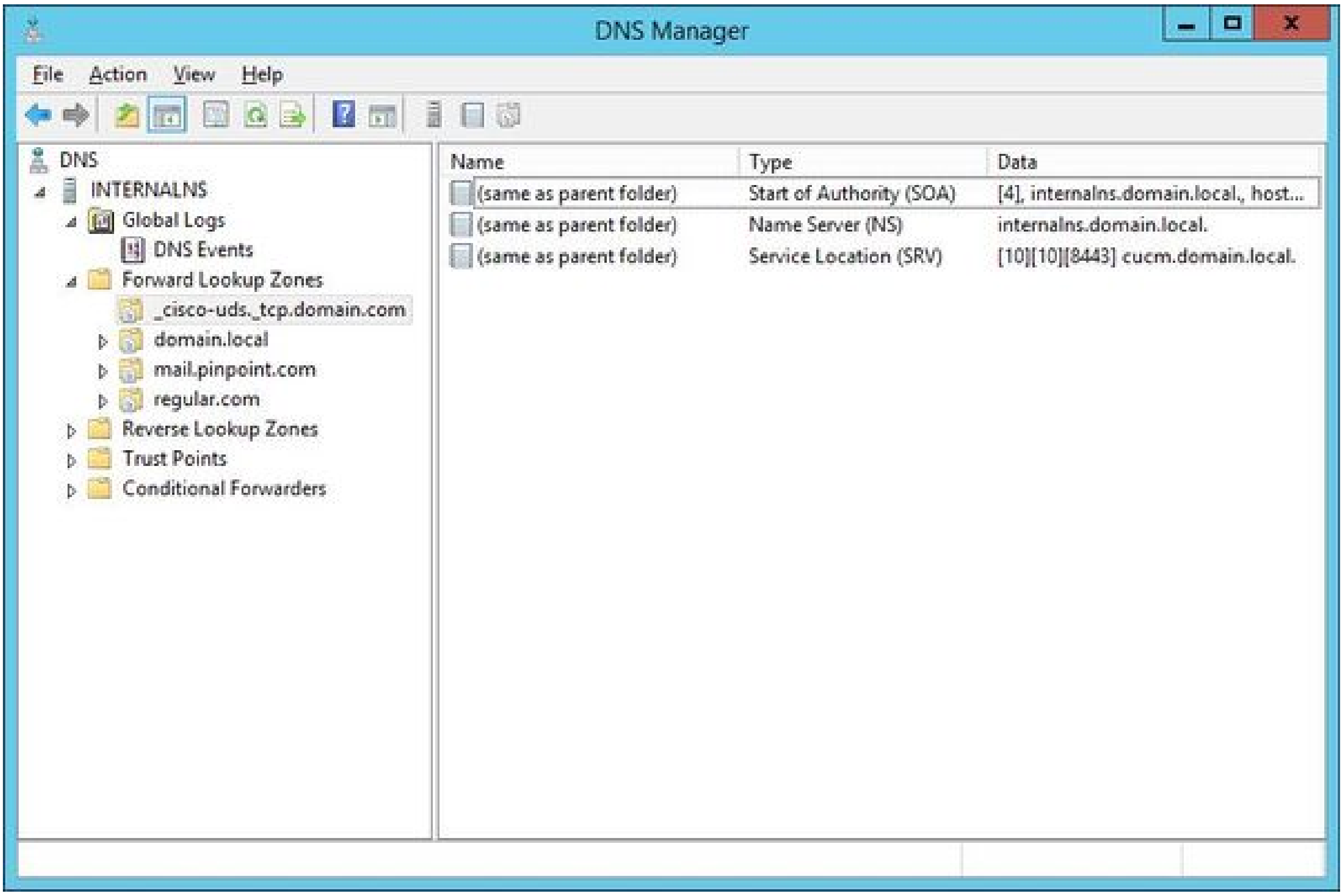
- example 1 - using **dnscmd**

```
dnscmd . /zoneadd _cisco-uds._tcp.domain.com. /dsprimary
dnscmd . /recordadd _cisco-uds._tcp.domain.com. "@" SRV 10 10 8443 cucm.domain.local
```

- example 2 - using **PowerShell** commands (as **dnscmd** is to be deprecated in future versions of Microsoft Windows Server, **PowerShell** can be used for the same purpose). **Replication Scope** options are **Domain**, **Forest**, or you can set up a file with the **-ZoneFile** parameter, if the zone is not Active Directory (AD) integrated

```
Import-Module DnsServer
Add-DnsServerPrimaryZone -Name "_cisco-uds._tcp.domain.com" -ReplicationScope "Domain"
Add-DnsServerResourceRecord -Srv -ZoneName "_cisco-uds._tcp.domain.com" -Name "@" -Priority 10 -
Weight 10 -Port 8443 -DomainName "cucm.domain.local"
```

The following image provides an example of how the pinpoint DNS entry with SRV record looks like in the GUI:



Name	Type	Data
(same as parent folder)	Start of Authority (SOA)	[4], internalns.domain.local., host...
(same as parent folder)	Name Server (NS)	internalns.domain.local.
(same as parent folder)	Service Location (SRV)	[10][10][8443] cucm.domain.local.

Configure BIND DNS server

With BIND DNS server, the pinpoint DNS entry is created the same way as a regular zone file.

The **`$ORIGIN`** entry must point to the FQDN of the SRV record (for example, **`_cisco-uds._tcp.domain.com`**) and SOA and NS records are added as usual. The SRV is optional (whether the pinpoint DNS entry defines or overrides the SRV record) and the name used is @ which is equivalent to the name / ORIGIN of the zone.

Here is an example of a **_cisco-uds._tcp.domain.com.zone** file content:

```
$TTL 1h
$ORIGIN _cisco-uds._tcp.domain.com.
@       IN      SOA     internalns.domain.local. hostmaster.domain.local. (
                2016033000;
                12h;
                15m;
                3w;
                3h;
        )
        IN      NS      internalns.domain.local.
```

```
@       IN      SRV     10  10  8443  cucm.domain.local.
```

Here is an example of how to**Add** the zone definition to **named.conf**:

```
zone "_cisco-uds._tcp.domain.com" IN {
        type master;
        file "_cisco-uds._tcp.domain.com.zone";
};
```

Verify

Use this section to confirm that your configuration works properly.

- Use the command **nslookup** with server set to the internal NS, in order to verify pinpoint DNS entries.

Here is an example of how to look up one hostname from the parent domain and how to look up the SRV record created on the internal NS:

```
C:\>nslookup exp-e.domain.com internalNS.domain.local

Non-authorative answer:
Name: exp-e.domain.com Address: 198.51.100.50 C:\>nslookup -type=srv _cisco-uds._tcp.domain.com
internalNS.domain.local _cisco-uds._tcp.domain.com SRV service location: priority = 10 weight =
10 port = 8443 svr hostname = cucm.domain.local cucm.domain.local internet address =
192.168.100.11
```

Here is an example of how to look up one hostname which is not configured on the internal NS, in order to verify that the requests are forwarded as expected.

```
C:\>nslookup www.example.com internalNS.domain.local

Non-authoritative answer:
Name:    www.example.com
Addresses:  203.0.113.42
```

- Set server to a public NS, or to the external NS, and repeat the same steps. The SRV lookup for **_cisco-uds._tcp SRV** record fails.

Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

If **nslookup** verification returns a hostname with duplicate parts (for example, **cucm.domain.local.domain.local**), then the DNS entries must be verified to be terminated by a full stop sign, otherwise the origin of the zone would be added to the resolved hostname.

If there are concerns with the created entries, they can be simply deleted from the DNS server. Although CLI is required to add the entries to Microsoft DNS, entries can be safely and simply deleted in the GUI.

Related Information

For a multi-domain deployment (different internal and external domain names) of MRA consult this document:

Configuration Example: Mobile and Remote Access through Expressway/VCS in a multi-domain deployment