

Products &amp; Services

# United Kingdom Numbering Plan for CallManager

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Document ID: 45704

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## Introduction

This document provides information about how to install and configure the United Kingdom Numbering Plan (UKNP).

## Prerequisites

## Requirements

Readers of this document should have knowledge of Cisco CallManager route patterns and dial plans.

## Components Used

The information in this document is based on Cisco CallManager 3.3(4), 4.0(1), and later.

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, make sure that you understand the potential impact of any command.

## Conventions

Refer to [Cisco Technical Tips Conventions](#) for more information on document conventions.

## Installation

Follow these steps to install the UKNP on the Cisco CallManager Publisher and on all Subscribers:

1. Download the latest International Dial Plan for Great Britain from [International Dial Plan Software Downloads](#).
2. Run the installation file on the Publisher Call Manager.

Follow the instructions.

3. Restart the Cisco CallManager service.

This allows the changes made by the installation file to take effect.

4. Run the installation on all Subscribers.

### UKNP Activation

To activate the UK Numbering Plan, add a route pattern with the @ symbol in it. Make sure that you select **UKNP (United Kingdom Numbering Plan)** and not the NANP (North American Numbering Plan).

Route Pattern	Partition	Description	Route Filter	Gateway
9.@	PSTN	UKNP	—	10.48.79.13

This allows full access the UK public switched telephone network (PSTN). All valid UK numbers can be dialed without restriction. However, restrictions can be applied using Route Filters, which is detailed in the next section ([Route Filter for Basic Access](#)).

### Route Filter for Basic Access

In most systems, it is usually desirable to block calls to some numbers (premium rate, directory services, and so forth). Most categories of numbers can be blocked in a route filter. See [Appendix B - Filter Categories](#) for all categories.

1. Add a new route filter and select the United Kingdom Numbering Plan.
2. Enter a name for the filter.
3. Change the filter category settings to DOES-NOT-EXIST for categories to which you want to block access.

Leave others at NOT-SELECTED.

```
( PREMIUM-RATE-NUMBER DOES-NOT-EXIST AND
  DIRECTORY-SERVICE DOES-NOT-EXIST AND
  INTERNATIONAL-ACCESS DOES-NOT-EXIST )
```

This example will block calls to numbers that start with 090 and 091, 118XXX directory services, and international numbers.

4. Apply the route filter to the route pattern.

In this example, with a 9.@ route pattern, a user that dials 9091, 9118, or 900 hears a “number unobtainable” tone.

### Local Access

In the UK, local subscriber numbers can be 4, 5, 6, 7, or 8 digits long, which depends on the area code. The UKNP contains five route patterns that overlap, for local access:

Number	Route Pattern
LOCAL-4-DIGIT	[2-3]XXX
LOCAL-5-DIGIT	[2-9]XXXX
LOCAL-6-DIGIT	[2-9]XXXXX
LOCAL-7-DIGIT	[2-9]XXXXXX
LOCAL-8-DIGIT	[2-9]XXXXXXX

You must modify the route filter so that only the required local subscriber route pattern or patterns are selected. If not, you might get interdigit timeouts when you dial local numbers and service codes.

For example, a gateway in a 2-digit area code with 8-digit subscribers has this filter:

```
( LOCAL-4-DIGIT DOES-NOT-EXIST AND
  LOCAL-5-DIGIT DOES-NOT-EXIST AND
  LOCAL-6-DIGIT DOES-NOT-EXIST AND
  LOCAL-7-DIGIT DOES-NOT-EXIST )
```

If you have gateways in different area codes, then use a route pattern and appropriate filter for each gateway.

For areas with mixed 5-digit and 6-digit subscribers, a more complex filter is needed to avoid interdigit timeouts. For example, Bodmin has 5-digit subscribers in the range 72XXX to 79XXX, but the rest of the area is 6-digit. Therefore, it has this filter:

Route Pattern	Partition	Route Filter
9.@	Local	( LOCAL-6-DIGIT == [ 2-689 ]XXXXX ) OR ( LOCAL-6-DIGIT == 7[ 01 ]XXXX ) OR ( LOCAL-5-DIGIT == 7[ 2-9 ]XXX )

The OR statements appear when you add a new Clause to the filter. See [Appendix D - Five-digit Subscriber Numbers](#) for lists of area codes with 5-digit subscribers.

**Note:** Be aware that one area code also has some four-digit Subscriber Numbers.

### Partition Use

For more complicated systems, you can split the dial plan up into various partitions with the use of route patterns and route filters, as desired:

Route Pattern	Partition	Route Filter
9.@	Local	( LOCAL-6-DIGIT EXISTS )
9.@	International	( INTERNATIONAL-ACCESS EXISTS AND COUNTRY-CODE EXISTS AND NATIONAL-NUMBER EXISTS )
9.@	Premium	( NATIONAL-ACCESS EXISTS AND PREMIUM-RATE EXISTS )
		( NATIONAL-ACCESS EXISTS AND

9.@	National	AREA-CODE EXISTS AND SUBSCRIBER EXISTS)
9.@	Mobile	(NATIONAL-ACCESS EXISTS AND MOBILE-ACCESS EXISTS AND MOBILE-SUBSCRIBER EXISTS)
9.@	Services	(SERVICE EXISTS AND DIRECTORY-SERVICE EXISTS)
...and so forth.		

Partitions can then be assigned to Calling Search Spaces as normal. See [Appendix B - Filter Categories](#) for valid [Tag Combinations](#).

### National Toll Bypass

To use this numbering plan in a National Toll Bypass configuration, set up a route filter to filter desired area codes. For example, calls from the London office to the Reading area can be routed as local calls through a gateway in the Reading office:

Route Pattern	Partition	Route Filter	Gateway
9.@	TollBypass	(AREA-CODE == 118)	Rdg-GW

If you want, you can set the Digit Discard Instructions (DDIs) to one that specifies `Nat->Local`. This removes the leading 0 and the area code.

### Extended National Toll Bypass

Suppose you want to take advantage of the fact that calls from one area to neighboring areas are charged at the local rate rather than the national rate. (British Telecom [BT] only, other operators might charge differently.)

For example, calls from Reading (118) to Henley-on-Thames (1491), Maidenhead (1628), Camberley (1276), Bracknell (1344), Aldershot (1252), Basingstoke (1256) and Newbury (1635) are charged at the local rate. Therefore, you can route calls for all of these areas out of the Reading gateway and only be charged the local rate:

Route Pattern	Partition	Route Filter	Gateway
9.@	TollBypass	(AREA-CODE == 118) OR (AREA-CODE ==1491) OR (AREA-CODE ==1628) OR (AREA-CODE ==1276) OR (AREA-CODE ==1344) OR (AREA-CODE ==1252) OR (AREA-CODE ==1256) OR (AREA-CODE ==1635)	Rdg-GW

The OR statements appear when you add a new Clause to the filter.

**Tip:** Refer to the [BT site](#)  for details of neighboring areas.

**Note:** You can not remove the area code and leading 0 for these extra areas, so leave the Digit Discard Instructions as just `Pre-Dot` or `none`.

## Number Blocking

You can use a route filter to block certain numbers.

Set up a route pattern and route filter that specifies a particular number, or use wildcards to block ranges of numbers:

Route Pattern	Partition	Route Filter
9.@	Blocked	(AREA-CODE == 20) AND (SUBSCRIBER == 88244000)
9.@	Blocked	(MOBILE-ACCESS == 7973) AND (MOBILE-SUBSCRIBER == 83XXXX)

Click the **Block this Pattern** radio button on the Route Pattern page.

## Interdigit Timeouts

Dial plans that overlap cause interdigit timeouts, which are the amount of time that CallManager waits for additional key presses before it decides that the user has finished dialing the number and routes the call. The default timeout is 15 seconds, which can be quite noticeable.

The UKNP tried to remove as many interdigit timeouts as possible.

- In the geographical numbering ranges, this has been programmed into the plan.
- For local access, a filter that specifies the local dialing length is needed (see the [Local Access](#) section).
- Some 0800 Freephone numbers are 10 digits and some are 11 digits. It is impractical to program so many variations into the dial plan, so interdigit timeouts exist in this range.
- On international calls, except to North America (country code 1), there will still be interdigit timeouts.

These are recommendations to reduce the impact of interdigit timeouts:

- Reduce Service Parameter T302 from 15 seconds to around 5 seconds.
- Train users to press # after they dial the number, because the plan allows for this and # immediately cancels the T302 timer.

## Troubleshoot

You can use these tips to help troubleshoot route pattern and route filter issues with the UKNP:

- Turn Cisco CallManager tracing up to Detailed, so that Digit Analysis is visible.
- Use the Dialed Number Analyzer—which you must install from the Plug-ins menu—to show pattern matching.

## Appendix A - UK PSTN Numbering Overview

The UK PSTN does not have a uniform structure like the NANP. Area codes can be 2, 3, 4, or 5 digits; subscriber numbers can be 4, 5, 6, 7, or 8 digits; and service codes can be

3, 4, 5, or 6 digits. National numbers can be 10 or 11 digits (including the leading 0). There are also two 8 digit numbers (0800 1111 and 0845 4647).

**Note:** The leading 0 is not considered part of the area code, although it is commonly written that way.

These are the rules for geographic numbers:

- 2-digit area codes have 8-digit subscribers.
- 3-digit area codes have 7-digit subscribers.
- 4-digit area codes have 6-digit subscribers.
- Some 4-digit area codes have both 5- and 6-digit subscribers.
- 5-digit area codes have 5-digit subscribers.
- One 5-digit area code has both 4- and 5-digit subscribers.
- All 5-digit area codes overlap with 4-digit area codes.

**Geographic Number Examples**

Access	Area Code	Subscriber	Place
0	20	XXXXXXXX	London
0	23	XXXXXXXX	Portsmouth/Southampton
0	118	XXXXXXX	Reading
0	161	XXXXXXX	Manchester
0	1253	XXXXXX	Blackpool
0	1208	XXXXXX	Bodmin 6-digit
0	1208	XXXXX	Bodmin 5-digit
0	1539	XXXXXX	Kendal
0	15396	XXXXX	Sedburgh
0	16977	XXXXX	Brampton 5-digit
0	16977	XXXX	Brampton 4-digit

As previously stated, national numbers have either 10 or 11 digits (including the leading 0); they are in the format 0SABCXXXXXX.

**National Numbers**

Access	SABC	Type	Length	
0	300,302,303,306,330,333,343,344,345,370,371,372	UK Wide	11	
0	500	Freephone	10	
0	55X	Corporate	11	
0	56X	VoIP	11	
0	70X	Personal	11	
0	76X	Pagers	11	
0	72X,73X,74X,75X,7624,77X	78X 79X	Mobiles	11
0	800	Freephone	10 or	

			11	
0	808	Freephone	11	
0	82X	Schools Internet	11	
0	842,843	844	Special Rate (Local)	11
0	845		Lower Special Rate (Local)	11
0	870		Higher Special Rate (National)	11
0	871,872,873		Lower Premium Rate (National)	11
0	89X		Routing codes	11
0	90X	91X	Premium Rate	11
0	92X-99X		Broadband	11

There are also two 8-digit short numbers:

- Childline—08001111 (Freephone)
- NHS Direct—08454647 (Lower Special Rate)

#### Service Numbers

Service Codes	Services
100	Operator
999	Emergency
1XX	Services
18XX	Services
118XXX	Directory Services
116XXX	National Helplines

#### Appendix B - Filter Categories

Category	Numbers*	Example
NATIONAL-ACCESS	Always 0	—
AREA-CODE	2, 3, 4, or 5 digits	20, 161, 1208, 15395
SUBSCRIBER	4, 5, 6, 7, or 8 digits	—
INTERNATIONAL-ACCESS	Always 00	—
COUNTRY-CODE	1, 2, or 3	1, 32, 353

	digits	
NATIONAL-NUMBER	> 3 digits	—
SERVICE	3 or 4 digits	144
DIRECTORY-SERVICE	6 digits	118118
FREEPHONE-NUMBER	9 or 10 digits	800123456
CORPORATE-NUMBER	10 digits	5511334455
MOBILE-ACCESS	4 digits	7973
MOBILE-SUBSCRIBER	6 digits	234567
PAGING-ACCESS	4 digits	7601
PAGING-SUBSCRIBER	6 digits	234567
PERSONAL-ACCESS	Always 70	—
PERSONAL-SUBSCRIBER	8 digits	8765432
LOCAL-RATE-ACCESS	842 or 843 or 844 or 845	—
LOCAL-RATE-SUBSCRIBER	7 digits	7766554
NATIONAL-RATE-ACCESS	870 or 871 or 872 or 873	—
NATIONAL-RATE-SUBSCRIBER	7 digits	1112223
PREMIUM-RATE-NUMBER	10 digits	9008765432
BROADBAND-SERVICE	10 digits	9223456789
SPECIAL-RATE-ACCESS	3 digits	820
SPECIAL-RATE-SUBSCRIBER	7 digits	1234567
LOCAL-5-DIGIT	5 digits	—
VOIP-NUMBER	10 digits	5601234567
LOCAL-6-DIGIT	6 digits	—
LOCAL-7-DIGIT	7 digits	—
LOCAL-8-DIGIT	8 digits	—
NATIONAL-HELPLINES	6 digits	116123
LOCAL-4-DIGIT	4 digits	—
UK-WIDE-ACCESS	30X, 33X, 34X, 37X	—
UK-WIDE-SUBSCRIBER	7 digits	222 3333

\* Number lengths do not include the leading 0 for national numbers.

### Tag Combinations

INTERNATIONAL-ACCESS : COUNTRY-CODE : NATIONAL-NUMBER



INTERNATIONAL-ACCESS : COUNTRY-CODE : NATIONAL-NUMBER : END-OF-DIALING  
 NATIONAL-ACCESS : AREA-CODE : SUBSCRIBER  
 NATIONAL-ACCESS : MOBILE-ACCESS : MOBILE-SUBSCRIBER  
 NATIONAL-ACCESS : FREEPHONE-NUMBER  
 NATIONAL-ACCESS : FREEPHONE-NUMBER : END-OF-DIALING  
 NATIONAL-ACCESS : LOCAL-RATE-ACCESS : LOCAL-RATE-SUBSCRIBER  
 NATIONAL-ACCESS : CORPORATE-NUMBER  
 NATIONAL-ACCESS : BROADBAND-SERVICE  
 NATIONAL-ACCESS : PAGING-ACCESS : PAGING-SUBSCRIBER  
 NATIONAL-ACCESS : PREMIUM-RATE-NUMBER  
 NATIONAL-ACCESS : NATIONAL-RATE-ACCESS : NATIONAL-RATE-SUBSCRIBER  
 NATIONAL-ACCESS : SPECIAL-RATE-ACCESS : SPECIAL-RATE-SUBSCRIBER  
 NATIONAL-ACCESS : PERSONAL-ACCESS : PERSONAL-SUBSCRIBER  
 NATIONAL-ACCESS : VOIP-NUMBER  
 SERVICE  
 DIRECTORY-SERVICE  
 LOCAL-4-DIGIT  
 LOCAL-5-DIGIT  
 LOCAL-6-DIGIT  
 LOCAL-7-DIGIT  
 LOCAL-8-DIGIT

**Appendix C - Digit Discard Instructions**

**UKNP Specific**

DDI	Operation	Example
Nat->Local	Removes leading 0 and area code for geographic numbers.	01752808080 becomes 808080
Nat->Internat	Removes leading 0 for geographic numbers.	01752808080 becomes 1752808080
Internat->Nat	Removes international access and country code.	003227045900 becomes 27045900
Mobile->Internat	Removes leading 0 for mobile numbers.	07973876543 becomes 7973876543
InternatDirectDial	Removes international access code only.	003227045000 becomes 3227045000

**General**

DDI	Operation
Pre-Dot	Removes anything before the dot.
Pre-At	Removes anything before the @.

Trailing-#	Removes trailing #.
------------	---------------------

**Note:** When you apply an inappropriate DDI, called numbers are truncated. For example, when you apply `Nat->Local` to a Freephone number.

#### Appendix D - Five-digit Subscriber Numbers

##### 5-digit Area Codes with 5-digit Subscribers

Location	Area Codes
Langholm	13873
Hornby-with-Farleton	15242
Hawkshead	15394
Grange-over-Sands	15395
Sedbergh	15396
Wigton	16973
Raughton Head	16974
Brampton	16977
Appleby-in-Westmorland	17683
Pooley Bridge	17684
Keswick	17687
Gosforth	19467

##### 4-digit Area Codes with Mixed 5-digit and 6-digit Subscribers

Location	Area Codes	5-digit Subscriber Number Ranges		
Camberley	1276	2XXXX	3[1-8] XXX	6[1-6] XXX
Lancaster	1524	3[2-79]XXX		6XXXX
Tamworth	1827	[56]XXXX		
Bolton	1204	6[1-4]XXX		
Bodmin	1208	7[2-9]XXX		
Blackburn	1254	5[1-79]XXX		
Axminster	1297	2[0-4]XXX	3[2-5]XXX	
Buxton	1298	2[2-8] XXX	7[0-47-9] XXX	8[3-5] XXX
Crediton	1363	8[2-5]XXX		
Ashburton	1364	7[23]XXX		
Dudley	1384	7[04-9]XXX		
Evesham	1386	4[0157-9]XXX		
Honiton	1404	4[1-7]XXX		
Alton	1420	2[23]XXX	8XXXX	
Chard	1460	30XXX	6[1-8] XXX	5[2-57] XXX
7[2-8] XXX				
Gretna	1461	40XXX		

Huntingdon	1480	52XXX	
Hungerford	1488	7[1-3]XXX	
Redditch	1527	6XXXX	
Kidderminster	1562	6[06-9]XXX	
Launceston	1566	86XXX	
Northwich	1606	4XXXX	7[4-79]XXX
Matlock	1629	5[5-7]XXX	
Newbury	1635	[34]XXXX	
Moretonhampstead	1647	24XXX	61XXX
Sanquhar	1659	5[08] XXX	6[67]XXX 74XXX
Skelmersdale	1695	5[0-4]XXX	
St. Austell	1726	6[13-9]XXX	7[0-7]XXX
St Helens	1744	2XXXX	
Selkirk	1750	2[0-3] XXX	[3-68] 2XXX 76XXX
Okehampton	1837	5[2-5]XXX	8[239]XXX
Tiverton	1884	3[2-58]XXX	
Workington	1900	6[1-8]XXX	85XXX
Worcester	1905	2XXXX	
Yeovil	1935	83XXX	
Whitehaven	1946	6[1-8]XXX	
Whatton	1949	2[01]XXX	81XXX
Wincanton	1963	23XXX	3[1-4]XXX
Garstang	1995	61XXX	
Penrith	1768	88[2-46-8]XX	

### Appendix E - Four-digit Subscriber Numbers

#### 5-digit Area Codes with Mixed 4-digit and 5-digit Subscribers

Location	Area Code	4-digit Subscriber Number Ranges
Brampton	16977	[23]XXX

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Updated: Jan 05, 2012

Document ID: 45704

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