

IP Flexible Reach Dial Plan Guide

1. IP Flexible Reach Dial Plans Overview

IP Flexible Reach is the AT&T Business VoIP service for customers using premises-based PBXs, providing the flexibility of private or public dialing between customer locations, and off-net to the PSTN.

Dial plans describe the number and pattern of digits that a user dials to reach a particular telephone number, consisting of Private dial digits and Public dial digits. Access codes, area codes, specialized codes, and combinations of the number of digits dialed are all part of a dial plan.

IP Flexible Reach Public dial digits for US Domestic, World Zone 1 (WZ1; North America belongs to World Zone 1), are defined by the North American Numbering Plan (NANP). NANP is a subset of the industry standard International E.164 Numbering Plan. The E.164 Numbering Plan consists of up to 15-digits, in the form CCNN, where CC represents Country Code and NN represents National Number. Country Code for NANP is always "1". National Number consists of NPA (3-digit Area Code), NXX (3-digit Exchange), and XXXX (4-digit Extension).

In addition to the NANP Public format, E.164 defines industry standard dialing rules. To dial internal to the "Country" (or within all of WZ1), it is necessary to dial the "Domestic Prefix". For NANP, the Domestic Prefix is always "1". IP Flexible Reach honors these international dialing rules, although the service does allow (for Customer convenience) 10-digit dialing for Public dialed numbers, since currently, the Public Dial Plans are only WZ1.

To dial outside a Country (or outside of all of WZ1), it is necessary to dial the International Prefix. For NANP, the International Prefix is always "011".

Except where specifically noted, private or "abbreviated" dial plans can also be implemented. However, all dial plans must comply with the AT&T IP Flexible Reach service to which they are connected.

Typically, each customer location is configured with one of the following:

- An AT&T Managed Router with voice card in front of a customer's TDM PBX
- An AT&T Managed Router in front of a customer's IP PBX, or
- An AT&T Managed Router with voice card in front of a customer's key system configuration along with a customer provided channel bank or terminal adaptor to convert from Analog to Digital as a Channel Associated Switching (CAS) interface

A customer PBX is programmed by the customer with dialing capabilities specific to completing calls to stations on the PBX. A PBX Administrator might choose to define a prefix (digit or digits prefixed to the dialed digits) that indicate (to the PBX) if the call needs to stay on the PBX or be sent somewhere else (for example, the call could be heading for a Private Network or to the PSTN). IP Flexible Reach has a flexible

design and allows the customer to define the number of extension digits and PBX Prefix digits terminating to the Customer's PBX.

2. Dial Plan Terminology

<u>Dial Plan</u> - Describes the number and pattern of digits that a user dials to reach a particular telephone number at a customer's VoIP-enabled site. Access codes, area codes, specialized codes, and combinations of the number of digits dialed are all part of a dial plan.

<u>Public Dial Plan –</u> Customer North American Numbering Plan (NANP) E.164 numbers for the Customer Location(s).

<u>Private Dial Plan</u> – Definition of the digits the Customer dials to reach another Customer Location within the Customer Dial Plan. A private dial plan allows the customer to design interoffice dialing plans with "short-cut" dialing patterns. For example, a private dial plan could allow employees to dial a four-digit extension between on-net inter-office locations across the country. IP Flexible Reach translates the four-digit "short-cut" (the abbreviated dialed digits) that can automatically route and terminate accordingly.

When both Public and Private digits are required for a Customer Location Dial Plan, the private dial digits must be a sub-set of the public dial digits.

<u>Abbreviated Private Dialing</u> - Abbreviated dialing is another name for Private Dialing. With an abbreviated or Private Dial Plan, the user has the ability to connect to another number or location within the Customer Dial Plan using as few number of digits as possible, thus bypassing the standard 10 digit dialing. Private dialing consists of dialing a "Private Dial Plan Prefix", as defined by the customer, plus "Extension" digits.

IMPORTANT NOTE: IP Flexible Reach does not support a mix of Private only and Public only numbers where the Private numbers are NOT a sub-set of the Public numbers.

<u>Private Dial Plan Prefix (a.k.a. Site Code)</u> - The prefix digits dialed in a Private Dialed Number (DN) that identify the Customer Location. A Private Dial Plan Prefix is required for any Private Dial Plan.

IMPORTANT NOTE: IP Flexible Reach service only allows One (1) "Private Dial Plan Prefix" per individual customer site. Multiple "Private Dial Plan Prefixes" are not currently supported.

<u>Extension Prefix</u> – Prefix digits that IP Flexible Reach uses when building the terminating number, consisting of "Guiding Digits" + "PBX Extension Prefix Digits."

<u>Dial Plan Range</u> – As the Dialed Number (DN) is made up of Site Code (or NXX) + dialed Extension digits, the Dial Plan Range is the set of Start/End numbers that identify the specific station extensions. For example: For a Private Dial Plan with site code 500 and extensions numbered 4999-8000, the Dial Plan Range is 500-4999 through 500-8000.

<u>Guiding Digits</u> – Used by the AT&T Managed Router to "guide" the traffic to the correct Trunk Group (TG) in the customer PBX. These digits are required for TDM PBXs, optional for IP PBXs. The field is 5-digits in length, with the default "00000".

<u>Gateway City Code</u> – City Code of the E.164 number range belonging to the Customer Location, 10-digits in length. For US Domestic Customer Locations, this represents the NPA (area code), and will be 3-digits in length.

<u>On-net -</u> Calling between customer locations that have IP Flexible Reach service or Voice DNA service. Note: Access to AT&T IP Teleconferencing bridges is treated as an On-net call.

<u>Off-net -</u> Calling from AT&T IP Flexible Reach customer sites to any U.S. or non-U.S. locations not served by AT&T BVoIP service, delivered via the PSTN.

<u>Hairpinning</u> - The terms On-net Prefix and Off-net Prefix are sometimes used in the context of Hairpinning. Hairpinning allows Failed Calls to be routed from the PBX back to the AT&T Managed Router. If the Managed router cannot complete the call, hairpinning allows the router to send the call back to the customer PBX with an optional prefix so the call can be completed using another trunk on the PBX. The call will be routed out to the PSTN (or private network) for completion. Hairpinning is an option the customer can select by indicating a PSTN Access Code (Off-net), or a Private Access Code (On-net), which is actually the customer's private network. Also note that hairpinning is specific only to Managed Routers with VoIP Module Cards and is not applicable to IP PBXs.

<u>Virtual Telephone Number (VTN)</u>: VTNs enable customers to assign a telephone number to a phone that is not physically located within customer's location local calling area, allowing them to establish a local presence within that local calling area.

<u>Branch Office IP PBX Extensions</u> – AT&T IP Flexible Reach provides the capability to deliver telephone numbers for all branch office sites supported by a client's single centralized IP PBX. Customer is able to use their existing data network to distribute the calls to their branch office sites. Branch office locations where TN's or VTN's are assigned must be within the 911 footprint of AT&T's Flexible service area and must use either Calling Plan B or C. AT&T must collect address data on the remote branch location so directory listing, taxing, regulatory fees, E911 and TN assignments can be associated with the remote branch. The customer is required to provide correct information to AT&T regarding the address and telephone numbers of its branch offices, and Customer's IP PBX must transmit the necessary address information to permit AT&T to route branch office E911 calls to the proper PSAP

Categories of Off-net calling: Local, Long Distance and International.

- Local inbound and outbound calling uses AT&T's network-based hop-off gateways connected to AT&T's IP Flexible Reach Local Footprint for full local service feature/functionality, including: new telephone number assignments, local number portability, Direct Inward Dialing (DID) and Direct Outward Dialing (DOD), E911, Directory Listing, Directory Assistance, originating 8YY, Operator Assistance, Blocking options and more.
- 2) Off-net Long Distance calling uses AT&T's network-based hop-off gateways, to connect to the PSTN for calling termination to any (Domestic WZ1) location.
- 3) Off-net International calling uses AT&T's network-based hop-off gateways to provide International per minute calling with per-country rates.

3. AT&T Business VoIP Calling Plans

AT&T offers both a bundled or "flat rate" like plan with included US minutes per Concurrent Call to provide the cost certainty of a flat rate service, or a per minute plan to allow customers the flexibility to choose the optimal calling plan that best meets their calling patterns.

AT&T IP Flexible Reach Services offer three (3) Calling Plans to allow Customers to choose the calling plan that meets their calling needs.

Calling Plan A includes:

- Unlimited On-Net Calling,
- U.S. Off-Net Calling for a single per minute rate, and
- International Off-Net Calling at per minute rates based on the country called.

Calling Plan B includes, in addition to what is included in Calling Plan A:

- Unlimited Local Calls,
- Directory Assistance, Operator Services, and Directory Listing at per use or per number rates.

Calling Plan C includes, in addition to what is included in Calling Plan B:

• 1750 minutes of included Interstate and Intrastate Toll U.S. Off-Net Calling per month per Concurrent Call ordered.

4. IP Flexible Reach Dial Plan Rules

4.1. IP Flexible Reach Calling Plan A Dial Plan Rules Matrix

Calling Plan A **					
Dial Plan Type	Rules	Originating Processing	Terminating Processing		
Private only	 Optional, but must choose 1 of the 3 options. No Public dialing to this Customer Location with this option. 	 Can Private dial to other customers provisioned in the Customer Dial Plan Can Public dial on or off- net. 	• Can only be reached by other Customer Locations provisioned in the Customer Dial Plan.		
Public only	 Optional, but must choose 1 of the 3 options. No abbreviated dialing with this option. 	 Can Public dial to other customers provisioned in the Customer Dial Plan Can Public dial on or off- net. 	 Can be reached by other Locations in the Customer Dial Plan with the Public TN Can be reached by other BVoIP on-net Customers with the Public TN, if the User Group is open 		
Private and Public	 Optional, but must choose 1 of the 3 options. Private Extension must be a sub-set of the Public TNs for the Customer Location. 	 Can Public dial to other Locations provisioned in the Customer Dial Plan Can Private dial to other Locations provisioned in the Customer Dial Plan Can Public dial on or off- net 	 Can be reached by other Locations in the Customer Dial Plan with the Private TNs Can be reached by other Locations in the Customer Dial Plan with the Public TNs Can be reached by other BVoIP on-net Customers with the Public TN, if the User Group is open 		

**For the Calling Plan A, all Public dialed numbers completed off-net are subject to toll charges. Public dialed numbers that complete on-net do not incur additional costs.

4.2. IP Flexible Reach Calling Plan A – Summary of Dial Plan Rules

To reach an ON-NET end-point, the Customer can dial the following number formats:

- Private (Private Dial Plan Prefix + Extension Digits) only within the Customer Dial Plan
- Public Dialed Number: NPA-NXX-XXXX, or 1-NPA-NXX-XXXX

To reach an OFF-NET (PSTN) Domestic US (WZ1) end-point, the Customer <u>MUST ALWAYS</u> dial the following number formats: NPA-NXX-XXXX, or 1-NPA-NXX-XXXX

There is one exception to the OFF-NET Dial Plan rule: in multiple site configurations, when a call from one site to another fails, it will be routed through the PSTN. This will result in an OFF-NET call charge.

NOTE: ALL off-net calls are subject to the IP Flexible Reach billing rules **5. IP Flexible Reach Calling Plans B & C Dial Plan Rules**

5.1. IP Flexible Reach Calling Plans B & C Dial Plan Rules Matrix

Calling Plans B & C				
Dial Plan Type	Rules	Originating Processing	Terminating Processing	
Private only	Not an option	N/A	N/A	
Public only***	 Calling Plans B & C must use a Public Dial Plan No abbreviated dialing with this option. 	 Can Public dial to other customers provisioned in the Customer Dial Plan Can Public dial on or off-net. 	 Can be reached by other Locations in the Customer Dial Plan with the Public TN Can be reached by other BVoIP on-net Customers with the Public TN, the User Group is always open 	
Private and Public	 Optional Private Extension must be a sub-set of the Public TNs for the Customer Location. Not an option if VTNs in use 	 Can Public dial to other Locations provisioned in the Customer Dial Plan Can Private dial to other Locations provisioned in the Customer Dial Plan Can Public dial on or off-net 	 Can be reached by other Locations in the Customer Dial Plan with the Private TNs Can be reached by other Locations in the Customer Dial Plan with the Public TNs Can be reached by other BVoIP on-net Customers with the Public TN, the User Group is always open 	

***VTN/ Branch Office IP PBX Extensions are a sub-set of Calling Plans B & C, with only Public dial plans available (no abbreviated dialing allowed.)

5.2. IP Flexible Reach Calling Plans B & C – Summary of Dial Plan Rules

Customers using Calling Plans B or C inherit Calling Plan A Dial Plan rules, with the following modifications to accommodate special types of Local calls:

- A Public Dial Plan is Mandatory
- Customer may optionally choose a Private Dial Plan
- Customers that use VTNs at any of their locations can <u>ONLY USE</u> Public Dial Plans.

6. An Overview of Private Dial Plan Rules (All Calling Plans)

Generally, IP Flexible Reach can support abbreviated dialing between services including:

- between sites with different calling plans (A, B & C),
- between IP Flexible Reach sites and Voice DNA sites

As noted above, customers cannot order Private Dialing at any AT&T IP Flexible Reach, Plan B or C or a site with VTN Branch Office IP PBX Extensions, if the customer orders Virtual Telephone Numbers at the Site

The following attributes apply to Private Dial Plans:

- a. A Private or Abbreviated Dial Plan is used to define on-net calling between a Customer's Locations.
- b. The Private Dialed Number (DN) consists of "Private Dial Plan Prefix" + Extension digits.
- c. The "Private Dial Plan Prefix" (Site Code) is defined one for each Customer Location, and is 1 to 15 digits in length. However, a single Private dial plan prefix can be used across multiple IP Flexible Reach Sites that share the same dial plan. In this case, the customer does not need to choose a different prefix for every site. As long as the last four digits (extension digits) are unique, private dialing will work with the same prefix across different sites.
- d. The Extension digits can be 1 12 digits in length.
- e. In all cases, Private Dialed Numbers must start with digits 2 through 9.
- f. Extension Ranges must be unique within the Customer Location.

7. An Overview of Public Dial Plan Rules (All Calling Plans)

- a. A Public Dialed Number can complete both an ON-NET call, as well as an OFF-NET (Hop-off to the PSTN). (Note: this is consistent across all Calling Plans A, B & C)
- b. A Domestic Public Dialed Number can be dialed in the full NANP E.164 format: 1NPANXXXXX, or without Domestic Prefix in the form: "NPANXXXXXX".

Customers that use VTNs at any of their locations as part of Calling Plans B or C <u>can only select</u> Public Dialing plans. All numbers <u>MUST BE</u> dialed in the format: "NPANXXXXX", or "1NPANXXXXXX"

8. IP Flexible Reach Private and Public Dial Plans – General Considerations

The following rules apply consistently to all IP Flexible Reach implementations unless otherwise indicated:

- Support of N11 (211, 311, 411, 511, 711, and 911), 8YY, NPA-555-1212, and Operator (0, 0+, 00, 01) number requires either Calling Plan B or C
- IP Flexible Reach Calling Plans B and C do not support the following Public DNs: 611, 811, 700NPANXXXXX, 500NPANXXXXX, NPA-555-XXXX (except NPA-555-1212), 900-NXX-XXXX or NPA 976-XXXX dialing.
- The following Private DNs (for all Calling Plans) are supported for Private Dialing: 900xxxxxx, 500xxxxxxx, 70xxxxxxx, NPA976xxxx, and NPA555xxxx.

- N11 Private Dialed Numbers are not supported for any of the BVoIP Calling Plans; Private Dial Plans take precedence over Public Dial Plans.
- If the DN is determined not to be a Private Dialed Number, then the IP Flexible Reach service will try to match the DN as a Public on-net number.
- If there is no match and the DN is 10-digits, the IP Flexible Reach service assumes the Domestic Prefix of "1" and the call is sent to the PSTN.
- A site with Calling Plan A may be provisioned with Private and Public Dial Plans, or Private Dial Plan only
- If the Customer Location has both Public and Private Dial Plans, the Private Extension digits must be a sub-set of the Public E.164 # (up to 7-digits)
- If a Calling Plan A Private/Public DN does not complete on-net, the call will route to the PSTN, if access to the PSTN is available
- IP Flexible Reach service only allows One (1) "Private Dial Plan Prefix" per individual customer site. Multiple "Private Dial Plan Prefixes" are not currently supported

9. AT&T IP Flexible Reach Dial Plan - Terminating Number

The Customer Location Dial Plan defines the terminating numbers required for the terminating PBX. These Terminating Digits signaled to the CPE consist of:

- Guiding Digits required for TDM PBX, optional for IP PBX, 5 digits (default 00000)
- PBX Extension Prefix optional, 1-6 digits
- Extension digits required, as defined for the Dialed Number, 1-12 digits for Private only, 7 digits for Public

10. Dial Plan Administration

Customer web-based dial plan administration can be made through the BusinessDirect portal.

Currently, the only MACD that can be completed via eOrder on BusinessDirect is:

• Change VoIP Dial Plan Range

11. Calling Party Number Considerations

• For PBX's, which are connected to the voice gateway card in the AT&T Managed Router via Channel Associated Signaling (CAS) the voice gateway is configured with a Site Calling Party Number (CPN). The Site CPN is used as the Calling Party Number on all calls.

• When implementing Local TNs, that is VoIP sites with either Calling Plan B or C, the voice gateway on an AT&T managed router is configured with a Site CPN. The Site CPN is used as the Calling Party Number on all 911 calls and is also used on calls where a CPN is not signaled by the PBX. Specifically for Calling Plan B or C, the rules for CPN are:

- For a CAS connected PBX, if any number is called, any CPN (including null) is replaced with local site number
- For PRI connected PBX, there are two rules:

- If 911 is called, any CPN is replaced with the local site number
- If any number other than 911 is called, the CPN is replaced only if the CPN is null (empty).
- For Calling Plan A, no site number (CPN) is configured in the AT&T managed router.
- For VoIP sites with Calling Plans B & C, the customer is required to configure the CPE at each VoIP site to transmit a Calling Party Number (CPN) for all VoIP calls. The CPN must be one of the valid AT&T provided telephone numbers associated with the physical location of the VoIP site. For CAS TDM digital PBX configurations, the customer will be required to provide a valid TN that AT&T will use in the absence of a CPN.
- For Branch Office IP PBX Extensions, the same rules apply for CPN as noted above for calling plans B & C.

12. Dial Plan examples 12.1. Example A

A customer has two locations: 1 in New York, and 1 in Virginia.

The New York location is defined with Private Dial Plan Prefix of 5, with a range of 212-487-2000 to 212-487-2999, and an Extension length of 3.

The Virginia location is defined with Private Dial Plan Prefix of 7, with a range of 276-202-3400 to 276-202-3599, with an Extension length of 4.

If the Customer in New York wants to Private dial the Customer in Virginia, they would dial: "73521".

If the Customer in Virginia wants to dial the Customer in New York, they would dial: "5123".

12.2. Example B

Continuing with our example above, if the Customer New York chooses to dial a Customer end-point in Virginia with a Public DN, they can dial: "1-276-202-3521" or "276-202-3521".

If the Virginia Customer chooses to dial a New York Customer end-point with a Public DN, they can dial: "1-212-487-2123" or "212-487-2123".