TIPT Customer Integration Guide

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1. Document Purpose

This document is designed to assist the customer with their TIPT integration, training & deployment activities. Additionally, this document provides a pre-deployment validation that must be completed and signed off prior to any on-site activities including IP handset installation or training, moreover any identified gaps must be addressed before the implementation can commence.

Note: This document does not constitute TIPT solution design but serves as a generic reference guide for the adoption of TIPT products and applications within the customer's environment.

2. Intended Audience

There are two specific targets for this document. The Primary audience are those who will need to read, acknowledge acceptance and compliance for the sections noted in this document.

- Customer Network Administrators
- Customer Authorised Representative
- Customer ICT Managers
- Customer Project Managers
- Telstra Project Managers

The Secondary audience are those who will assist the customer representative throughout this process.

- Solution Consultants/Communication Consultant
- UC Sales Specialists/Architects

3. Product Description

TIPT is a hosted telephony and UC application that requires access to users and devices on your network to work.

Handsets and other TIPT equipment require connectivity to your network or the internet using suitable internet access. Your Telstra NEXT IP MPLS or Internet access should already be in place before you attempt to set up your equipment.

Your network needs to be configured to be able to support TIPT. Your network may be provided by Telstra, or a third-party internet provider. This guide provides high level configuration requirements for networks to support TIPT.

Given that there are many possible network service and equipment providers, this guide does not provide lower-level network equipment configuration details.

TIPT solution aims to deliver a full set of unified communication and collaboration services, including:

- Voice
- Video
- Voicemail (VM)
- Presence & Instant Messaging & Rich Desktop Clients (Telstra Business Connect)
- Compatible Mobility Services (Liberate, Telstra business Connect App on Mobile and Tablet)

4. Product Variance

TIPT over NEXT IP MPLS & TIPT over Internet

Your TIPT equipment will be configured to support your ordered solution, either for Telstra NEXT IP MPLS or TIPT over the Internet. There are some differences in the way your network needs to be configured depending on whether you have a Telstra NEXT IP MPLS or an internet service.

5. Architectural & Infrastructure Overview

The following section will describe the high-level technology, common infrastructure and architectural touch points for TIPT – it is not designed to provide a complete detail view of the TIPT components.

At a high-level overview, the end-to-end Network "Ecosystem" comprises of 4 key areas, listed in order of their logical flow:

1. Customer Premises (including Onsite switches, routers, voice gateway, handset, soft clients, Analogue devices)
2. VPN - MPLS Core Networks (NEXT IP MPLS) or 3RD Party Internet providers
3. Hosted Infrastructure – Application Servers, Provisioning servers, Firewalls etc.
4. Call Routing/Flow - SBC and Broadsoft soft switch, IMS etc
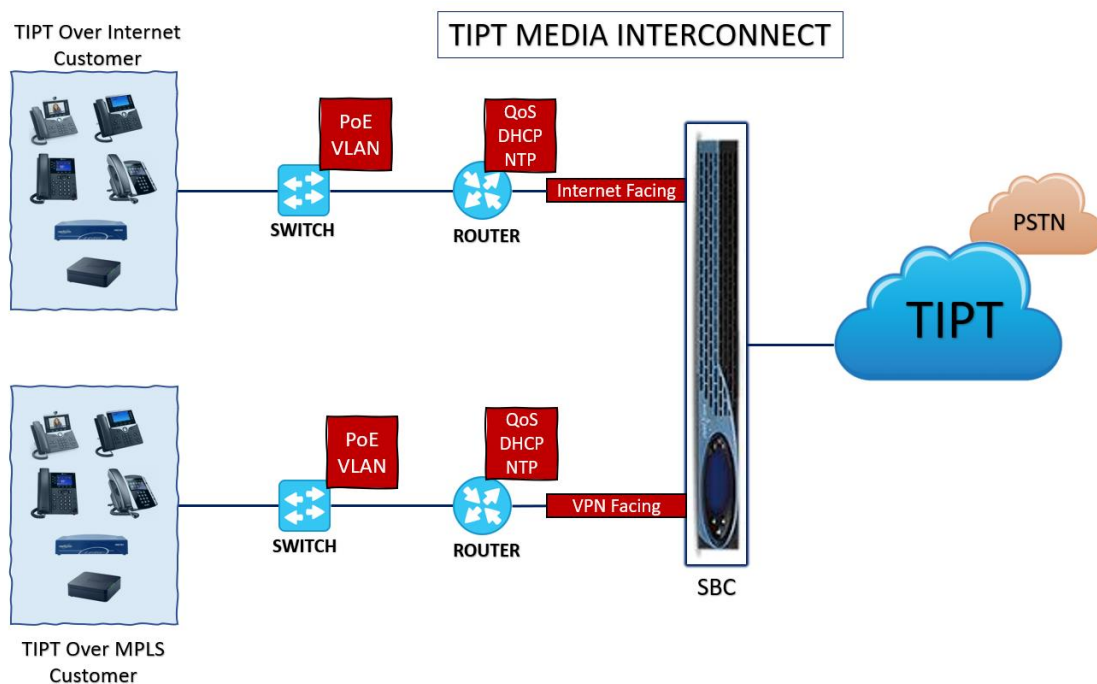
Figure 01: TIPT Media Interconnect High Level Network Diagram
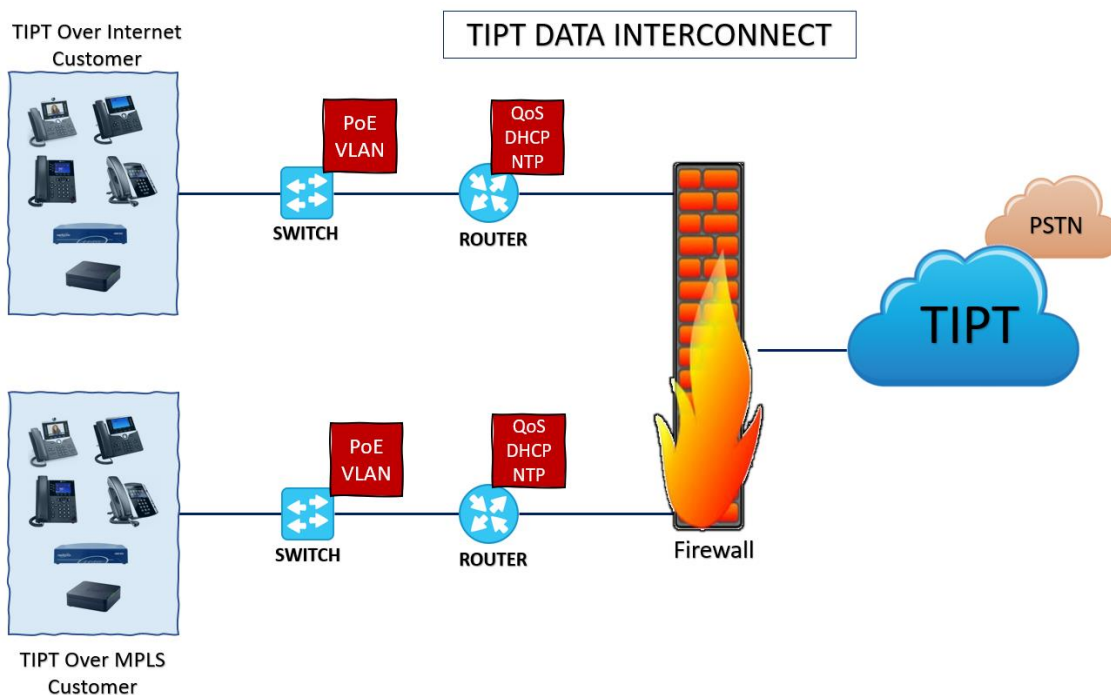
Figure 02: TIPT Data Interconnect High Level Network Diagram

6. IP ROUTING

TIPT over NEXT IP MPLS and **TIPT over Internet** is enabled by a range of applications and network structures.

For your TIPT service to work, your devices (including soft phones) need to be able to access those structures. Your network must be modified to be able to send information to, and receive information from, these subnets.

The customer must be able to route to these networks to reach the TIPT platform. IP routing can be configured via static or dynamic routing protocols at the customer edge device (BGP is preferred).

A **traceroute** to these hosts should be performed prior to deployment. The traceroute will only show the first few hops as **ICMP** is blocked inside the Telstra core.

The following table shows the subnet accesses that are required for TIPT.

Interconnects	Configuration	Description
Data interconnects	203.52.0.0/23	Kent St and Lonsdale St – Media and Data
	144.140.208.16/29	Broadworks Data services (e.g., Commpilot, DMS etc)
	144.140.208.32/28	
	144.140.208.80/28	
(Mandatory) For Next IP MPLS and	144.140.162.40/29	
	144.140.162.48/28	
	144.140.162.80/28	

TIPT over TBB / Internet	144.140.181.80/28	
	144.140.218.96/28	
	144.140.222.32/28	
	144.140.224.32/28	
TIPT Over NEXT IP MPLS Customers		
Media interconnects (As required)	203.52.0.160/28	Victoria – SBC 1
	203.44.42.96/28	Victoria – SBC 2
	203.52.1.160/28	NSW – SBC 1
	203.44.42.112/28	NSW – SBC 2
	203.52.3.160/28	Queensland – SBC 1
	203.44.42.144/28	Queensland – SBC 2
	203.44.43.160/28	South Australia – SBC 1
	203.44.42.160/28	South Australia – SBC 2
	203.52.2.160/28	Western Australia – SBC 1
	203.44.42.128/28	Western Australia – SBC 2
TIPT Over TBB Customers		
Media interconnects (As required)	192.148.131.103/32	NSW – TBB Facing - SBC 1
	192.148.131.119/32	NSW - TBB Facing – SBC 2
	192.148.131.135/32	QLD - TBB Facing - SBC 1
	192.148.131.148/32	QLD – TBB Facing – SBC 2
	192.148.131.164/32	WA – TBB Facing - SBC 1
	192.148.131.196/32	SA – TBB Facing - SBC 1
	192.148.131.71/32	VIC – TBB Facing - SBC 1
	192.148.131.87 /32	VIC – TBB Facing – SBC 2
TIPT Over 3RD Party Internet Customers		
Media interconnects (As required)	192.148.164.20 /32	SA – 3RD Party Internet facing - SBC 1
	192.148.164.24 /32	SA – 3RD Party Internet facing - SBC 2
	192.148.164.4/32	VIC - 3RD Party Internet facing - SBC 1
	192.148.164.8/32	VIC - 3RD Party Internet facing - SBC 2

7.   LAN Environment

LAN & Internal Cabling

As a rule, the customer's LAN environment (routers/desktops and end points) must have structured cabling of CAT5e or better, though (CAT 6) is recommended to support TIPT for voice, data and video transmission. All cablings including network patching is the responsibility of the customer and must be completed prior to the deployment of the TIPT solution.

WAN Router

WAN router must be designed and configured with a suitable QoS policy to categorise and prioritise VoIP traffic to ensure Grade of Service. A LAN design must be undertaken to ensure that the converged solution meets TIPT requirements. Site documentation (e.g. network diagrams) should be updated to support the IP Telephony solution.

For TIPT customers connecting over the internet, QoS is not mandatory, however a separate prioritised voice VLAN should be implemented where possible.

SDWAN

If using SDWAN, need to make sure the SDWAN design routes natively into underlay, i.e. Allows MPLS native access for TIPT.

If it is a mix of SDWAN and MPLS need to make sure the routing is in place from SDWAN site to the remaining MPLS sites. This needs to be confirmed with the Telstra Project delivery team.

4G Access

Telstra doesn't recommend consumer-grade 4G devices, If there is no choice then make sure

- The device is placed in the best location for 4G signal
- Any sleep functions are deactivated

LAN Switch

IP Telephony enabled LAN switches supporting VLANs, IEEE8021.Q (VLAN Tagging), IEEE 802.3af (Power over Ethernet), Quality of Service (QoS) must be used. VLAN segmentation is required to demarcate and allow prioritisation of voice traffic. VLAN ID 100 is recommended as the Voice VLAN to ensure configuration consistency across all sites. PC's will typically piggy-back from the IP Phone but reside in the Data VLAN (that is: VLAN ID 1).

The use of Cisco switches with CDP provides automatic VLAN assignment of Polycom IP Phones where Voice VLAN's have been configured.

In non-Cisco LAN switch environments, the VLAN ID (that is: VLAN 100) will need to be manually configured, unless the IP handset has support for LLDP. (All our handsets support LLDP, so LLDP will need to be configured on the switch or alternatively handsets will need to be manually set with the voice VLAN (not recommended).

For **TIPT customers** connecting over the internet, QoS is not mandatory, however a separate prioritised voice VLAN should be implemented where possible.

The customer must ensure that they deploy on their LAN switch multiple VLAN's (Voice and Data) – this is required as Voice is particularly time sensitive whereas Data can be delivered on best effort.

In terms of key benefits of having separate VLAN's:

- Logical separation of the network
- Broadcast packets from the data network are not sent to the voice network
- Easier to implement Access Control Lists
- Provides a control point for management traffic

Power over Ethernet

Using PoE allows flexibility in the deployment of IP Telephony within the customer site. Importantly, the LAN design must also factor in PoE budgeting (especially in high density environments) to ensure the LAN can support the necessary PoE requirements of the site.

Network Time Protocol

Note: A time server is recommended but not essential as part of the DHCP configuration if it is a **TIPT Over Internet site**

For **TIPT Over NEXT IP MPLS** site Network Time Protocol is a critical Network Service function, it provides the required time synchronisation for all UC applications, such as logging function e.g. CDR and Billing records.

NTP source is more critically needed for HTTPS certificate validation, and if the NTP source is not available, new devices may fail to boot, and existing devices fail to load a configuration or firmware update. In large environments it is recommended that an NTP hierarchy be used to ensure accurate time synchronisation whilst minimising WAN time traffic.

The location of the Time Server is specified using DHCP Option 42. The DHCP server must be configured correctly to provide this parameter.

The NTP IP addresses is for reference only:

(Example IP's from au.pool.ntp.org – Best config is an internal IP synced to au.pool.ntp.org)

NTP Server IP Address	129.250.35.251
NTP Server IP Address)	139.99.194.24

8. DHCP Requirements

All TIPT deployments require a DHCP server with additional options listed below. Note TIPT over MPLS requires specific DNS servers, see table below. Hence why it's usually best practice to use a separate voice VLAN with dedicated DHCP scope.

Note: Static IP configuration is not supported and the required DHCP options may not be available on low-end consumer or even some business grade routers.

The Netgear V7610 router supplied with TBB carriage is preconfigured with the required TIPT DHCP options.

DHCP option	Purpose	Field format	Value
DNS	Name Resolution	IP Address	Primary - 203.52.0.221 Secondary - 203.52.1.222
Option 42	Time server	IP Address	IP Address of NTP (Time) Server
Option 66	Device Config servers	ASCII	Hostname of DMS TFTP bootstrap server dms.digitalbusiness.telstra.com DHCP Option 66 will still be required for capped (at 3.1.3 rev C) Polycom phones and Linksys IADs. Any Poly DMS CPE would be running firmware 4 or later, this is only needed for legacy SPA8000 DMS devices everything else will boot from option 160 only
Option 160	Device Config servers	ASCII	FQDN of HTTP/S DMS "http://polydms.digitalbusiness.telstra.com/dms/bootstrap"

TIPT over Internet DHCP Server Requirements (TIPT Specific)

DHCP option	Purpose	Field format	Value
DNS	Name Resolution	IP Address	Any Internet DNS can be used e.g., Google 8.8.8.8, 8.8.4.4 or , Cloudflare 1.1.1.1, 1.0.0.1
Option 42	Time server	IP Address	IP Address of NTP (Time) Server (If the Router supports Option 42)
Option 160	Device Config servers	ASCII	Hostname of DMS HTTP http://polydms.digitalbusiness.telstra.com/dms/bootstrap"

9. DNS Server

DNS Conditional Forwarding – TIPT over MPLS / Next IP only

Note: "Required for TIPT on Next IP only

TIPT Over Next IP site customer DNS server(s) must be configured for DNS conditional forwarding for the "nipt.telstra.com" and "tipt.telstra.com" domains as per the table below. This is required to utilise the TIPT applications including Call Centre, miRECEPTION and CommPilot web

Parameter	Configuration
Forwarder – DNS Domain Name	nipt.telstra.com tipt.telstra.com
Primary Domain Forwarder	203.52.0.221
Secondary Domain Forwarder	203.52.1.222

Web Proxy (Caching) Server

The customers Web Proxy server should be configured for http(s) cache bypass for all "*.nipt.telstra.com" and "*.tipt.telstra.com" web requests. Alternatively, the customer can configure Internet Explorer as below.

If cache bypass is not configured the customer administrator may find that stale web pages are presented whilst trying to manage TIPT via CommPilot Web. This is especially critical where the customer is using an internal web proxy server to gain access to the Internet.
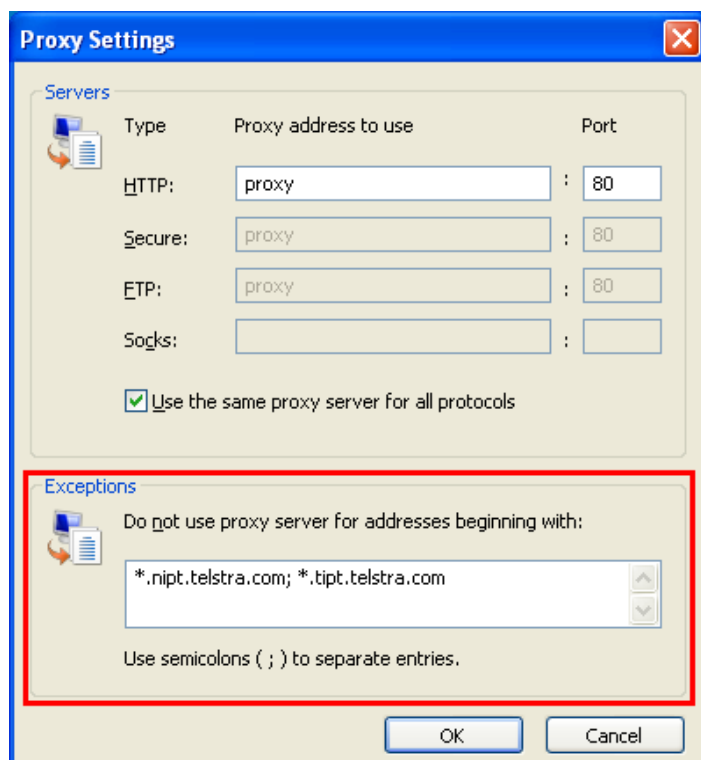
10. Firewall and Ports

The use of customer firewalls (or NAT devices) to limit Voice Traffic - SIP (signalling) and dynamic RTP (Media) is not recommended and should be avoided. VoIP firewall traversal has the potential to impact performance (voice quality due to additional network delay) and service quality.

Service	Protocol	Port	Description	IP ranges	Comments	Inbound	Outbound
MEDIA & SIGNALLING - TIPT over IPVPN (MPLS / NEXT IP)							
SIP	UDP	5060	Signalling protocol used by IP Handsets and IADs.	203.52.0.160/28	VIC – SBC 1	Yes	Yes
				203.44.42.96/28	VIC – SBC 2		
				203.52.1.160/28	NSW – SBC 1		
RTP	UDP	Dynamic (16384-32767)	Real-time Transport Protocol (Media) used to deliver audio between VoIP endpoints	203.44.42.112/28	NSW – SBC 2		
				203.52.3.160/28	QLD – SBC 1		
				203.44.42.144/28	QLD – SBC 2		
				203.44.43.160/28	SA – SBC 1		
				203.44.42.160/28	SA – SBC 2		
				203.52.2.160/28	WA – SBC 1		
				203.44.42.128/28	WA – SBC 2		
MEDIA & SIGNALLING - TIPT over Telstra Business Broadband							
SIP	UDP /TCP	5060	Signalling protocol used by IP Handsets and IADs.	192.148.131.103/32	NSW - Kent – Unencrypted	Yes	Yes
				192.148.131.119/32	NSW - Chatswood – Unencrypted		
				192.148.131.135/32	QLD - Woolloongabba – Unencrypted		
RTP	UDP	Dynamic (16384-32767)	Real-time Transport Protocol (Media) used to deliver audio between VoIP endpoints	192.148.131.148/32	QLD – Charlotte – Unencrypted		
				192.148.131.164/32	WA – Wellington – Unencrypted		
				192.148.131.196/32	SA - Waymouth – Unencrypted		
				192.148.131.71/32	VIC - Exhibition – Unencrypted		
				192.148.131.87 /32	VIC - Windsor – Unencrypted		
MEDIA & SIGNALLING - TIPT over 3RD Party Internet							
SIP	TLS	5061	Secure Signalling protocol used by IP Handsets and IADs	192.148.164.20 /32	SA - Waymouth Internet facing – Encrypted	Yes	Yes
				192.148.164.24/32	SA - Waymouth Internet facing – Encrypted		
RTP / SRTP	UDP	Dynamic (16384-32767)	Real-time Transport Protocol (Media) used to deliver audio between VoIP endpoints	192.148.164.4/32	Exhibition Internet facing – Encrypted		
				192.148.164.8/32	Exhibition Internet facing - Unencrypted		

Data and Provisioning – Required for all types of Carriage/ access								
DNS	UDP	53	Used for Name Resolution via TIPT DNS servers (For TIPT over NEXT IP Only)	203.52.0.221 203.52.1.222	TIPT MPLS DNS SERVER	Yes (Return Traffic)	Yes
HTTPS	TCP	80, 443	Broadworks Data Services (Ex: Commpilot, Dms Etc)	144.140.208.16/29 144.140.208.32/28 144.140.208.80/28 144.140.162.40/29 144.140.162.48/28 144.140.162.80/28 144.140.181.80/28 144.140.218.96/28 144.140.222.32/28 144.140.224.32/28	Broadworks Data Services (Ex: Commpilot, Dms Etc)	Yes	Yes
NTP	UDP	123	Handsets will obtain their NTP time source via a specified synchronised time source (telstra.tic and telstra.toc)	Customer configured	Time server	Yes (Return Traffic)	Yes
WebEx for Broadworks	UDP /TCP / TLS / SRTP over UDP	5004, 9000, 443	Ports for WebEx	3.22.157.0/26 18.181.204.0/25 69.26.160.0/19 3.25.56.0/25 18.230.160.0/25 114.29.192.0/19 3.101.70.0/25 20.50.235.0/24 150.253.128.0/17 3.101.71.0/24 20.53.87.0/24 170.72.0.0/16 3.101.77.128/28 20.68.154.0/24 170.133.128.0/18 3.235.73.128/25 23.89.0.0/16 173.39.224.0/19 3.235.80.0/23 40.119.234.0/24 173.243.0.0/20 3.235.122.0/24 44.234.52.192/26 207.182.160.0/19 3.235.123.0/25 52.232.210.0/24 209.197.192.0/19 18.132.77.0/25 62.109.192.0/18 210.4.192.0/20 18.141.157.0/25 64.68.96.0/19 216.151.128.0/19 18.181.18.0/25 66.114.160.0/20	Ports for WebEx	Yes	Yes

				18.181.178.128/25			
				66.163.32.0/19			
				18.141.157.0/25			
				64.68.96.0/19			
				216.151.128.0/19			
				18.181.18.0/25			
				66.114.160.0/20			
				18.181.178.128/25			
				66.163.32.0/19			

11. NAPTR

Cisco MPP and Polycom VVX Ranges (excluding VVX 1500) support NAPTR. The phone performs NAPTR and SRV look-ups that discover the transport, ports, and servers.

Using the state-naptr tag value, the phones would be able to register through MPLS, TBB or 3RD Party internet. Based on the network the phone is plugged into the device would pick the SBC as mentioned in firewall and ports section of this document to register to the TIPT platform.

By default, the Polycom VVX (Excluding VVX 1500) and Cisco phones are provisioned with the TIPT_STATE tag at group level with state-naptr

Note: The phones can register to the TIPT platform from any network, but the network firewalls should be configured as per the details provided in Firewall and ports section of this document

Default Polycom TAGS at group level

For VVX300, VVX410, VVX600

Tag Name	Tag Value
FIRMWARE_VVX4	5.9.6
TIPT_STATE	state-naptr (act, vic, nsw, nt, qld, sa, tas, wa)
TIPT_CODEC	g722
SCA_FORWARD	0
SOFTKEY_DIRECTORIES	1
IFOLDER	1 (increment as required)

For VVX500

Tag Name	Tag Value
FIRMWARE	5.9.6
TIPT_STATE	state-naptr (act, vic, nsw, nt, qld, sa, tas, wa)
TIPT_CODEC	g722
SCA_FORWARD	0
SOFTKEY_DIRECTORIES	1
IFOLDER	1 (increment as required)

For VVX101, VVX201, VVX301, VVX411, VVX 501, VVX 601

Tag Name	Tag Value
FIRMWARE_VVX4	6.3.1
TIPT_STATE	state-naptr (act, vic, nsw, nt, qld, sa, tas, wa)
TIPT_CODEC	g722
SCA_FORWARD	0
SOFTKEY_DIRECTORIES	1
IFOLDER	1 (increment as required)

For VVX250, VVX350, VVX 450

Tag Name	Tag Value
FIRMWARE_VVX	6.3.1
TIPT_STATE	state-naptr (act, vic, nsw, nt, qld, sa, tas, wa)
TIPT_CODEC	g722
SCA_FORWARD	0
SOFTKEY_DIRECTORIES	1
IFOLDER	1 (increment as required)

Default Cisco MPP TAGS at group level

Tag Name	Tag Value
TIPT_STATE	State-naptr (act, vic, nsw, nt, qld, sa, tas, wa)
TIPT_CODEC	g722
IFOLDER	1 (increment as required)

12. SIP ALG

What is SIP ALG?

SIP (Session Initiation Protocol) ALG (Application Layer Gateway) is an application within many routers. It inspects any VoIP traffic to prevent problems caused by firewalls and if necessary, modifies the VoIP packets. Routers will often have SIP ALG activated by default.

What problems can SIP ALG cause?

This can stop your TIPT Voice devices from:

- Registering on the service
- Making internal calls
- Receiving incoming calls

Additionally can cause voice quality issues

TIPT over Internet customers using 3RD Party access need to make sure to turn off SIPALG on the router.

Quality of Service

Quality of Service (QoS) is the ability to provide differential levels of treatment to specific classes of traffic. This traffic, being voice, video or data, must be identified and sorted into different classes to which differential treatment is applied.

Implementation of a network wide QoS design on site switches and routers is proposed to ensure that voice receives prioritisation within the Local Area Network and that

Implementation of Telstra's IP MAN/IP WAN Dynamic CoS will ensure that voice receives prioritisation within the Wide Area Network and that network congestion is obviated through the implementation of techniques such as "Egress Queuing".

A Quality of Service Policy will address the key issues of:

- Classification and Marking
- Congestion Management
- Congestion Avoidance
- Traffic Policing and Shaping, and
- Link Efficiency

In order to provide an enterprise grade of service for TIPT is required that the customer's network support end-to-end QoS. The WAN edge router must be configured to categorise and prioritise TIPT traffic accordingly.

 Note: For **TIPT Over Internet site,** it's **Best Effort** as the traffic is coming through Public Internet.

In order to provide an enterprise grade of service for TIPT is required that the customer's network support end-to-end QoS. The WAN edge router must be configured to categorise and prioritise TIPT traffic accordingly.

Differentiated Service (DSCP)	Class of Service (COS)	Value	Queuing Method
EF	5	RTP Audio	Bandwidth allocation Strict Priority Queuing (LLQ)
AF (31) Video Endpoints	3	RTP Video H.264	Bandwidth %
CS3	3	SIP (Signalling), RTCP	Bandwidth %
BE (0)	0	Other (that is: DNS, HTTP(s), FTP, TFTP)	

Bandwidth:

Although there is no set bandwidth that is mandated the customer will still need to ensure there is enough WAN link bandwidth available for TIPT traffic, as a guide customer should nominally base their total voice bandwidth requirement around the 30% mark.

The voice bandwidth of the access product must be dimensioned using at least 100Kbit/s in each direction for each concurrent phone call provisioned on the service. See the table below for examples.

Number of concurrent calls	Minimum Downstream Voice Bandwidth	Minimum Upstream Voice Bandwidth
2	200 Kbit/s	200 Kbit/s
4	400 Kbit/s	400 Kbit/s
6	600 Kbit/s	600 Kbit/s
8	800 Kbit/s	800 Kbit/s
10	1 Mbit/s	1 Mbit/s
30	3 Mbit/s	3 Mbit/s
50	5 Mbit/s	5 Mbit/s
60	6 Mbit/s	6 Mbit/s
100	10 Mbit/s	10 Mbit/s
150	15 Mbit/s	15 Mbit/s

13. CPE Configuration

For all end points – TIPT DMS (Device Management system) will push the appropriate phone configuration down to the customer's end point, based on the handset type.

Telstra will initially set up the required access to phone feature as part of the implementation.

The DHCP options 66, 160 are mandatory to provision the Devices (Details in DHCP section) This solution is "internet ready", with the use of HTTPS for security. The Device Management Solution will also deliver enhanced firmware management capability and new user features.

The other key change brought about by DMS, is that provisioning/activation of devices is based on username and password for the IP Phones and One Access IAD/ ATA and MAC address is used only for the Cisco / Linksys ATA (2102/ 8000/ 122/ 192). This provides more flexibility for provisioning, upgrading and replacing phones. You will be advised of your Username and Password from your Customer Group Administrator. The username will be your phone number.

Using the CommPilot web portal a suitably trained customer administrator can perform their own **Add Moves and Changes** (AMCs). Alternatively, this function can be performed by the Telstra Integrated Service Desk **– ISD** if that service has been purchased.

BYO Devices / Soft Client configuration

If you have a BYO device that is not a supported Device management system device, you could still use that device using manual configuration. Refer to Useful links on *User guide to retrieve SIP details.*

Minimum settings required to register a BYO device / Soft Client successfully:

For most SIP devices, the below fields must be entered for the SIP device to register with TIPT.

- "SIP Password"
- "Auth Username"
- "Username"
- "Domain"
- "Outbound Proxy"
- "Port"

Each SIP device may call these fields something different. Here are some examples:

- "SIP Password" may be called => auth password or just password
- "Auth Username" may be called => authorization username or auth user id
- "Username" may be called => user, phone number or Line port (E.g. p0380001234@telstra.com)
- "Domain" may be called => proxy, domain, registrar
- "Outbound Proxy" may be called => outbound proxy, proxy or registrar server or SIP server. Based on the STATE the device is located on use the FQDN / IP Address provided in IP ROUTING section depending on whether it is an NEXT IP MPLS or Internet Site.
- "Port" 5060 if UDP / TCP and 5061 if using TLS as transport type.

If the BYO device supports Encryption, make sure it supports **QuoVadis certificate** (QuoVadis Global SSL ICA G2, QuoVadis Limited) which would allow the device to register through the internet SBC over TLS and use SRTP for Media.

Most CPE vendors have default Dial plans that should work off the shelf. If any issues with calls make sure the dial plans are set properly.

14. IP Handsets

Polycom IP Phones – Currently supported Models

Polycom VVX 301 - Entry Level Monochrome Business Media Phone

Application target: cubicle office worker
6 lines (standalone) with Expansion Module capability
Integrated PoE support (IEEE 802.3af)
Polycom HD Voice for all audio paths
208 x 104 backlit graphical LCD (Monochrome)
12-key dialpad, home, speaker, mute, headset, volume, messages, hold, transfer
Two-port 10/100 Ethernet switch

Polycom VVX 411 - Colour Display Mid Range Business Phone

Application target: A color display mid-range phone for office workers
12 lines (standalone) with Expansion Module capability
Integrated PoE support (IEEE 802.3af)
Polycom HD Voice for all audio paths
320 x 240 3.5 in TFT LCD
12-key dialpad, home, speaker, mute, headset, volume, messages, hold, transfer
Single USB 2.0 Port - Headset
Two-port 10/100/1000 Ethernet switch

VVX501 - Premium IP Media Phone, Touch Screen, Colour Display and Video Capable

Application target: office worker
12 lines (standalone) with Expansion Module capability
Integrated PoE support (IEEE 802.3af)
Polycom HD Voice for all audio paths
320 x 240 3.5 in TFT Colour LCD Display
Gesture-based, multitouch-capable, capacitive touchscreen
15 context-sensitive soft keys
Dual USB 2.0 Ports - Camera Support & Headset
Two-port 10/100/1000 Ethernet switch

VVX601 - Premium IP Media Phone, Touch Screen, Colour Display and Video Capable

Application target: Executive
12 lines (standalone) with Expansion Module capability
Integrated PoE support (IEEE 802.3af)
Polycom HD Voice for all audio paths
480 x 272 4.3 in Colour LCD display
Gesture-based, multitouch-capable, capacitive touchscreen
15 context-sensitive soft keys
Dual USB 2.0 Ports - Camera Support & Headset
Bluetooth Support
Two-port 10/100/1000 Ethernet switch

Colour & Paper Insert Expansion Modules - VVX 300/301/410/411/500/501/600/601

Application target: telephone attendant's desk
28 illuminated bi-color programmable line keys (Colour Version)
4.3" TFT (480 x 272) LCD screen (Colour Version)
Daisy-chainable for a total of 84 contacts (3 x 40) (Colour Version)
40 illuminated bi-color LED keys programmable line keys (Paper Version)
Daisy-chainable for a total of 120 contacts (3 x 40) (Paper Version)
Power and signalling are provided by the host phone - no AC power required

Polycom EE Mini USB Camera – Video Enable Your Deskphone

Instantly turn your desktop device into a video conferencing phone
Simple plug and play capability with USB power and no software drivers
24-bit true colour; supports up to 1080p @ 30fps transmit video (H.264)
Available for VVX501/VVX601 v 5.8.1 or above

Polycom Trio 8500 Audio & Video Conferencing - Small to Medium Room

4.3 Metre microphone pickup range
Integrated PoE support (IEEE 802.3af)
Patented Polycom Acoustic Clarity™
Polycom HD Voice for all audio paths (160-22,00Hz)
Optional Real Presence Trio Visual + for enabling content presentation and video
Gesture-based, multitouch-capable capacitive touch screen
Supports External Microphones
Two-port 10/100/1000 Ethernet switch
Bluetooth Support

Polycom Trio 8800 Audio & Video Conferencing- Medium to Large Room

6 Metre microphone pickup range
Integrated PoE support (IEEE 802.3af)
Patented Polycom Acoustic Clarity™
Polycom HD Voice for all audio paths (160-22,00Hz)
Optional Real Presence Trio Visual + for enabling content presentation and video
Gesture-based, multitouch-capable capacitive touch screen
Supports External Microphones
Two-port 10/100/1000 Ethernet switch & 802.11 a/b/g/ WiFi
Bluetooth Support

Polycom Matrix

	VVX 301	VVX 411	VVX 501	VVX 601
Video Calling			(With camera accessory)	(With camera accessory)
Display	208 x 104 backlit graphical LCD (B&W)	320 x 240 3.5 in TFT LCD (Colour)	320 x 240 3.5 in TFT LCD Display (Colour)	480 x 272 4.3 in MVA LCD display (Colour)
Expansion Module Support	Up to 3	Up to 3	Up to 3	Up to 3
USB Port		✓	✓	✓
Power over Ethernet (IEEE 802.3af)	✓	✓	✓	✓
Audio Features				
Polycom HD Voice Technology	✓	✓	✓	✓
Full Duplex Speakerphone with Acoustic Clarity Technology	✓	✓	✓	✓
Telephony Keys				
Line / Speed Dial Keys	6	12	12	16
Handsfree & Mute	✓	✓	✓	✓
Headset & EHS	✓	✓	✓	✓
Context Sensitive Soft Keys	4	4	4	4
Display / Navigation Keys	4-way navigation cluster with center "select" key	4-way navigation cluster with center "select" key	Touch Screen Interface	Touch Screen Interface
Advance Features				
Busy Lamp Field Functionality	✓	✓	✓	✓
Shared Call Line Appearance	✓	✓	✓	✓
Multicall Appearances	✓	✓	✓	✓
XHTML Micro-browser	✓	✓	✓	✓
USB Headset		✓	✓	✓
Bluetooth				✓
LAN / PC Connectivity				
Ports / Speed Mbps	Two Port 10/100	Two Port 10/100/1000	Two Port 10/100/1000	Two Port 10/100/1000

Cisco Handsets

Cisco 6851 - Entry Level Monochrome Business Phone

Application target: cubicle office worker
4 lines (standalone) with expansion module capability
Integrated PoE support (IEEE 802.3af)
Duplex Speakerphone
Wideband audio
3.5-inch (396x162-pixel) grayscale display
RJ 11 Headset
Two-port 10/100/1000 Ethernet switch

Cisco 7861 - Easy-to-Use, Cost-Effective Voice Collaboration

Application target: Managers and Staff and Speed dial / BLF needs
16 lines (standalone)
Integrated PoE support (IEEE 802.3af)
Wideband audio
396 x 162 pixel (89 mm)
Duplex Speakerphone
RJ 11 Headset
Two-port 10/100 Ethernet switch

Cisco 8851- Premium IP Phone with Colour Display

Application target: office worker
10 lines (standalone) with Expansion Module capability
Wideband audio
Integrated PoE support (IEEE 802.3af)
5-inch widescreen VGA (800x480 pixel), 24-bit color
USB Headset Support
Bluetooth Support
Two-port 10/100/1000 Ethernet switch

Cisco 8865 Affordable, High-Quality Desktop HD Video

Application target: Executive
10 lines (standalone) with Expansion Module capability
Wideband audio
Integrated PoE support (IEEE 802.3af)
720p HD desktop video
5-inch widescreen VGA (800x480 pixel), 24-bit color
USB Headset Support
Bluetooth Support
WiFi - 802.11a/b/g/n/ac
Two-port 10/100/1000 Ethernet switch

Cisco 6800 Expansion Module

Application target: telephone attendant's desk
14 Physical Buttons
Up to 28 buttons across 2 pages
Power and signalling are provided by the host phone - no AC power required
Note: Does not support SIP Line Registrations
Expands Cisco 6851 only

Cisco 8800 Expansion Module

Application target: telephone attendant's desk
Graphical, backlit, high-resolution color display
18 Physical Buttons
Up to 36 buttons across 2 pages
Power options include Power over Ethernet (POE) and a local power cube
Expands Cisco 8851,8861 and 8865 only

Cisco Matrix

	Cisco 6851	Cisco 7861	Cisco 8851	Cisco 8865
Video Calling				✔
Display	3.5-inch (396x162-pixel) grayscale display	396 x 162 pixel (89 mm)	5-inch widescreen VGA (800x480 pixel), 24-bit color	5-inch widescreen VGA (800x480 pixel), 24-bit color
Expansion Module Support	✔		✔	✔
Power over Ethernet (IEEE 802.3af)			✔	✔
Audio Features				
Wideband Voice Technology	✔	✔	✔	✔
Full Duplex Speakerphone	✔	✔	✔	✔
Telephony Keys				
Line / Speed Dial Keys	4	16	10	10
Handsfree & Mute	✔	✔	✔	✔
Headset & EHS	✔	✔	✔	✔
Advance Features				
Busy Lamp Field Functionality	✔	✔	✔	✔
Shared Call Line Appearance	✔	✔	✔	✔
Multicall Appearances	✔	✔	✔	✔
USB Headset			✔	✔
Bluetooth				✔
LAN / PC Connectivity				
Ports / Speed Mbps	Two Port 10/100	Two Port 10/100/1000	Two Port 10/100/1000	Two Port 10/100/1000
WiFi				✔

Panasonic Handsets

Panasonic KX-TPG 600 Base

Support for eight DECT wireless handsets and simultaneous outside lines
PoE or Power supply (Included)
Compatible with a variety of Panasonic handsets and a repeater to increase
coverage

Panasonic - KX-TPA60 - Basic Wireless Handset

1.8" colour LCD with backlight
HD wideband audio (G.722)
500 phone book address/20 last dialled number memory
Soft keys
Local or network intercom

Panasonic - KX-UDT121 - Slim and light DECT handset

1.8" Colour LCD display
Vibration call alert
Ni-MH battery pack
UDT121 200 hours standby, approx. 13 hours talk time
500 number phonebook
"Over the air" maintenance
Built-in Bluetooth
Headset support via 2.5mm jack

Panasonic - KX-UDT131 - IP65 Tough DECT handset

High quality wideband voice
Background Noise reduction
Full-duplex hands free
"Over the air" maintenance
Vibration call alert
Hazard Level IP65 Protection (IEC529)
500 number phonebook
Built-in Bluetooth
Headset support via 2.5mm jack

KX-TPA65 - Wireless Dect Desk Phone

1.8" colour LCD with backlight
3-colour LED indicator
HD wideband audio (G.722)
Headset jack
Easy installation without wired LAN

KX-A406 - Wireless Repeater

Compatible with wideband audio
Up to 4 calls simultaneously
Up to 3 units installable with a cascade connection
Up to 6 units registrable to the KX-TGP600

IAD / ATA

Integrated Access Device - One Access – 2 Port IAD -One100 SX5E 2V

Connects up to a total of 2 analogue devices
Features two RJ-11 FXS ports
Supports up to 2 Standard Telephones (POT)
Supports up to 2 FAX machines
Supports up to 2 analogue data devices such as EFTPOS terminals

Integrated Access Device - One Access – 8 Port IAD - One100 SX5E 2V

Connects up to a total of 8 analogue devices
Features two RJ-11 FXS ports
Supports up to 8 Standard Telephones (POT)
Supports up to 8 FAX machines
Supports up to 8 analogue data devices such as EFTPOS terminals

Integrated Access Device - One Access - 24 Port IAD - One700 Gb5T 24V

Connects up to a total of 24 analogue devices
Features 24 RJ-11 FXS ports via RJ-21 cable
Supports up to 24 Standard Telephones (POT)
Supports up to 24 FAX machines
Supports up to 24 analogue data devices such as EFTPOS terminals
Includes a single multi-port RJ-21 50-pin connector

Integrated Access Device – Cisco – 2 Port IAD - 192

Connects up to a total a of 2 analogue devices
Features two RJ-11 FXS ports
Supports up to 2 Standard Telephones (POTS)
Supports up to 2 FAX Machines
Supports up to 2 Analogue data devices such as EFTPOS terminals

15. Telstra Business Connect Client

The Telstra Business Connect Client is a multi-platform IM and Presence application that can be used on both desktops and compatible mobile devices– allowing for collaboration & connectivity on the move. Customers are advised to ensure their hardware/software meets the following minimum system requirement to ensure optimal user experience for the TBC (Telstra Business Connect) clients.

The TBC clients are provisioned by default for all users as an SCA (Shared call appearance). If the SCA's have not been provisioned, use the below PORTAL to self-serve.

https://ucp.tipt.telstra.com/login . Use your CGA (Customer Group administrator) credentials to login and provision TBC.

TBC Desktop client – Microsoft Windows & MAC

The TBC PC Client allows customers to connect to TIPT Solution from any Network access type to make and receive calls (voice or video) over IP; it also features IM and Presence information and collaboration tools such as Desktop / file sharing on Windows and MAC

TBC Mobile and Tablet client

The TBC PC Client allows customers to connect to TIPT Solution from any Network access type to make and receive calls (voice or video) over IP; it also features IM and Presence information on Apple and Android platforms.

The client enables collaboration across multiple devices such feature as IM and presence, Voice & Video, voicemail. In terms of TBC Mobile & Tablet Client inter-operability TIPT currently supports the following Smart phones:

- Samsung Models S8 and above
- Samsung Galaxy Note S8 and above
- HTC Desire S
- Motorola Defy
- Apple iPhone 6 and above
- Apple iPad 3rd Generation
- Apple iPad Mini

NB: The above list represents the most current device version Telstra has accredited, Telstra will add or remove handset from time to time, to maintain accuracy and keep up to date with new hardware/firmware as they are introduced – this will be part of our ongoing device accreditation process.

16. TIPT Add-Ons

Liberate

Telstra **Liberate** combines the best features of your desk phone and mobile, so you can get an office-like experience on the go. Boost productivity and address the challenges of fixed mobile convergence, even if your teams are mobile only. Our solution keeps your corporate identity without needing to introduce new devices and optimises the tools you already have in place while increasing functionality and features. Empower individuals, teams and call groups with true mobility.

Unlike Over the Top (OTT) apps or VoIP, intelligence within the Telstra network delivers unified communications functions and voice to the mobile phone natively. And, because mobile calls use the Telstra mobile network, you also benefit from better call quality than apps using data channels.

Cloud Call Recording

We have accredited some of the best providers and integrated with our core network, so that you can benefit from their products offering securely through our integrated solutions. You can now take up 3rd party Cloud Call Recording products from one of our accredited partners across your business. It can also record calls that are answered directly on a mobile phone, ensuring your organisation addresses regulatory and compliance requirements.

Benefits:

At Telstra, we have accredited and integrated best-in-breed call recording providers from market so that you can benefit from the partners' products offerings. Recording is done within the core of the platform and is available across all devices, from handsets to softphones and mobiles. If you are looking at recording your mobile calls as well, you can activate Liberate feature as an add-on on your fixed service and take up the Call recording product from one of our accredited partners.

- Access to leading call recording providers' analytics and transcribe capabilities
- Cloud-based network integration
- Record from any device from anywhere securely
- Easy to implement
- Choose from products that is reliable and fully compliant

What you need to do?

We teamed with 3 accredited partners who offers variety of call recording and analytics service. If you would like to take up comms recording, you will need to choose from one of the below listed partners.

Please contact them to find out more about their products, get a demo to ensure it suits your requirements. The partner will capture your details to submit the order; Once we receive the application, we will simply ask you to "authorise" us via Consent form in order to share your media with the partner to record your calls.

Our accredited partners

- Dubber Pty Ltd: visit **https://www.dubber.net/**
- CallN Pty Ltd: visit **https://calln.com/**
- ITIC Pty Ltd: visit **https://commsrecording.com.au**

WebEx for TIPT

You can add WebEx with your TIPT service as a feature bundle, with the option to choose from Softphone, Basic, Standard, and Premium packs.

Contact your Telstra account representative for more **details**.

17. Call Centre

The Telstra IP Telephony Call Centre provides a mechanism for incoming calls to be queued and distributed to agents. The Call Centre Supervisor has management capabilities to monitor and assist agents, and to manage the queued calls in real time.

NEXT IP MPLS Customer URL - **https://callcentre.tipt.telstra.com/callcentre**

Internet Customers URL - **https://icallcentre.tipt.telstra.com/callcentre**

18. miRECEPTION

The miRECEPTION application, which requires the optional miRECEPTION feature pack, is used in conjunction with Polycom or Cisco IP Phone to provide a reception console solution. Additionally, calls can be queued using the optional Call Centre pack.

NEXT IP MPLS Customer URL - **https://mireception.tipt.telstra.com/mireception**

Internet Customers URL - **https://imireception.tipt.telstra.com/mireception**

19. Supplementary Information

Supported Codecs for TIPT

To simplify the choice for our customers TIPT recommends the use of G.722 codec where possible and G.711a as second option and G729a. Below table contains sample calculations for the default voice payload sizes

Codec Information				Bandwidth Calculations					
Codec & Bit Rate (Kbps)	Codec Sample Size (Bytes)	Codec Sample Interval (ms)	Mean Opinion Score (MOS)	Voice Payload Size (Bytes)	Voice Payload Size (ms)	Packets Per Second (PPS)	Bandwidth MP or FRF.12 (Kbps)	Bandwidth w/cRTP MP or FRF.12 (Kbps)	Bandwidth Ethernet (Kbps)
G722_64k (64 Kbps)	80 Bytes	10 ms	4.13	160 Bytes	20 ms	50	82.8 Kbps	67.6 Kbps	87.2 Kbps
G.711a (64 Kbps)	80 Bytes	10 ms	4.1	160 Bytes	20 ms	50	82.8 Kbps	67.6 Kbps	87.2 Kbps
G.729 (8 Kbps)	10 Bytes	10 ms	3.92	20 Bytes	20 ms	50	26.8 Kbps	11.6 Kbps	31.2 Kbps
G.711u (64 Kbps)	80 Bytes	10 ms	4.1	160 Bytes	20 ms	50	82.8 Kbps	67.6 Kbps	87.2 Kbps

TIPT Web portal

TIPT Web portal is accessible via the NEXT IP MPLS and Internet.

- TIPT over NEXT IP MPLS URL: **https://ews.tipt.telstra.com**

- TIPT over Internet URL: **https://toti.tipt.telstra.com/**

For **TIPT over NEXT IP MPLS** Customers, Username/passwords are supplied by email to the customer administrator at the time-of-service establishment. If you need to RESET or Forgot password, call **TIPT** Support.

For New **TIPT over Internet** Customers, Username/passwords are supplied by email to the customer administrator at the time-of-service establishment.

For an Enterprise Admin access, need to raise with to TIPT Support and one of the provisioners. For Existing TIPT customers moving from NEXT IP MPLS to Internet to gain access through Internet, talk to TIPT support.

Telstra UC Self-service portal

Telstra's UC Self-Service Portal for our TIPT and SIP Connect customers, which allows customers to submit change requests that will be implemented in near real-time!

https://ucp.tipt.telstra.com

The UC Self Service Portal allows:

TIPT:

- Create new TIPT users complete with packs and Business Connect
- Create Multiple users at once
- Create Liberate Mobile users – ready to be assigned Liberate.
- Order a selection of handsets and IADs shipped straight from the warehouse
- Login credentials for Business Connect
- Add user packs to an existing TIPT site:
- Manage your existing packs – increase as required
- Add new service packs to a site
- All applied to the platform in near real time
- Available to assign to users in comm pilot shortly after submission

Manage Business Connect:

- Assign the Business Connect soft client to any users in your group that has a standard or an executive pack but has not had Business Connect assigned

SIP Connect:

- Manage channel capacity on both Enterprise and Standard SIP Connect Trunks
- Increase capacity in near real time

20. Configuration and Troubleshooting – Quick tips

DMS (Provisioning server) Connectivity test

Check you have routing to DMS by browsing to the link from the VLAN - To test that your handset correctly obtains configuration information and locates DHCP options, you can connect a PC to the router's port used by the IP phone to obtain an IP address from LAN or WLAN.

The following URL should be tested:

https://polydms.digitalbusiness.telstra.com/dms/Polycom_VVX_501_DMS/beach.jpg

A successful test should display the following picture:
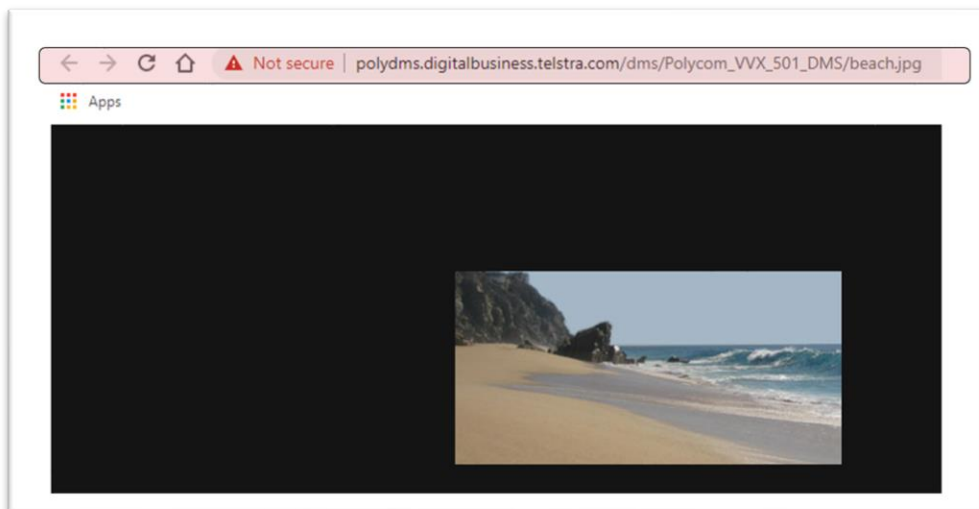
Music on Hold (MOH)

MoH can be customised by loading of a G711 A-law encoded wav file by the Customer Administrator. MoH can be loaded at the Group and Department level. Recommended MoH audio duration should not exceed 10 minutes.

Audacity can be used to encode MoH and change volume levels. Audacity is free cross-platform sound editor can be downloaded from **http://audacity.sourceforge.net**

21. Useful links

Description	URL/Link
TIPT Administration Portal (Commpilot)	NEXT IP/ MPLS Customers - **https://ews.tipt.telstra.com/Login/**
TIPT Administration Portal (Commpilot)	Internet Customers - **https://toti.tipt.telstra.com/Login/**
TIPT Call Centre	NEXT IP MPLS Customers - **https://callcentre-stld.tipt.telstra.com/callcentre**
TIPT Call Centre	Internet Customers - **https://icallcentre-stld.tipt.telstra.com/callcentre**
TIPT miReception	NEXT IP MPLS Customers -
TIPT miReception	Internet Customers - **https://imireception.tipt.telstra.com/mireception**
TBC Self-serve	**https://ucone.tipt.telstra.com/login**
AMC Portal	**https://ucp.tipt.telstra.com/login**
Liberate Portal	**https://liberate.telstra.com/login**
TIPT Password Expiry	**https://enterprise-support.telstra.com.au/t5/FAQs/TIPT-Password-Expiry-Webform/ta-p/4561**
TIPT Guides & Docs	**https://enterprise-support.telstra.com.au/t5/Telstra-IP-Telephony-TIPT/ct-p/TIPT**

WebEx Datasheet	**https://www.telstra.com.au/content/dam/shared-component-assets/tecom/uc&c/calling-productivity/tipt/pdf/webex-for-tipt-datasheet.pdf**

22. Glossary

The following words, acronyms and abbreviations are referred to in this document:

Term	Definition
BEM	Backlit Expansion Module
CAP	Client Access Protocol
CDP	Cisco Discovery Protocol
CIP	Connect IP
CoS	Class of Service
DHCP	Dynamic Host Configuration Protocol
DMS	Device Management Solution
DNS	Domain Name Services
FTP	File Transfer Protocol
HTTP	Hyper Text Transfer Protocol
HTTPS	Hyper Text Transfer Protocol Secure
IAD	Integrated Access Device
IP	Internet Protocol
IP MAN	Internet Protocol Metropolitan Area Network
IP WAN	Internet Protocol Wide Area Network
LAN	Local Area Network
LLDP	Link Layer Discovery Protocol
TIPT	Telstra Internet Protocol Telephony
NTP	Network Time Protocol

23. Version Control

Date	Details
02/03/2022	Updates to Firewall and ports, DHCP Requirements and NAPTR details
03/03/2022	Added WebEx for TIPT, What's Next

24. What's Next

- New Polycom CCX models
- Grandstream Wi-Fi handsets

25. Customer Support

For support in setting up and managing your TIPT service please visit:
https://www.telstra.com.au/business-enterprise/support/tipt

Telstra IP Telephony Helpdesk - **1800 287 289**

For escalations Contact your **Telstra Account Executive**