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## 1. What is VoIP/ IPT?

A Voice over Internet Protocol (VoIP) phone call is transmitted over a data network. Internet Protocol Telephony describes the technologies that use the Internet Protocol's packet-switched connections to exchange voice, fax, and other forms of information that have traditionally been carried over the dedicated circuit-switched connections of the public switched telephone network (PSTN). Calls are transported over data networks, allowing customer's to employ a single, converged network rather than maintain separate infrastructure for voice and data.

This document refers to a **hosted** IP Telephony service. However, once the decision to implement VoIP via a dedicated IP network has been made, you have choice of the following options:

- In a **do-it-yourself** approach, the IP Telephony solution, which would be either leased or purchased (resides at the customer site and is self-managed by the customer. The service provider's role is limited to providing IP connectivity.
- The **managed IP PBX** approach involves deployment of an IP PBX at the customer's site, with the service provider responsible for ongoing remote management of the platform and service delivery. The service provider provides a range of services for the premises-based IP Telephony solution, including fault monitoring; configuration management; performance management; moves, adds, and changes, Customers have the option to buy or lease the onsite equipment or rent it as part of the service.
- IP Telephony also can be offered as a **hosted IP PBX solution**. Here, the IP PBX is housed in the service provider facility and managed on dedicated servers. The customer simply rents the service on a per-user basis. The IP phones on the customer premises may be bundled as part of the hosted IP PBX service fee, or may be leased or bought directly by the end customer.

## 2. Should I use a Hosted or DIY IP Telephony service??

Attribute	Hosted PBX	In house IPT
Hosted PBX offers a viable alternative to IP PBX and Centrex	<ul style="list-style-type: none"> <li>• Significant value proposition to service providers and enterprises</li> <li>• Hosted PBX can offer a better TCO (total cost of ownership)</li> <li>• Large enterprises starting to embrace Hosted PBX</li> <li>• Carrier-grade platform</li> <li>• Multi-location and multi-tenant</li> <li>• Meets regulatory requirements</li> <li>• Support multi-tenant functions</li> <li>• Rich networking functions</li> <li>• Located centrally at data centre</li> </ul>	<ul style="list-style-type: none"> <li>• Enterprise-grade platform</li> <li>• Small number of locations</li> <li>• No regulatory support required</li> <li>• Support single-enterprise location</li> <li>• Independent, non-networked</li> <li>• Located at the customer premises</li> </ul>
Scale	<ul style="list-style-type: none"> <li>• Unlimited</li> </ul>	<ul style="list-style-type: none"> <li>• 1-10K users</li> <li>• Lower numbers of IP phones</li> </ul>
Networking	<ul style="list-style-type: none"> <li>• Centralized mgmt. and MACs</li> <li>• Uniform dialling plans</li> <li>• Uniform service set</li> </ul>	<ul style="list-style-type: none"> <li>• Hard-to-manage dialling plans</li> <li>• Service islands</li> </ul>
Total Cost of Ownership	<ul style="list-style-type: none"> <li>• Lower cost with outsource</li> </ul>	<ul style="list-style-type: none"> <li>• Higher when total costs factored in</li> </ul>
Survivability	<ul style="list-style-type: none"> <li>• Robust, IP + geographic</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple points of failure</li> </ul>
Reliability	<ul style="list-style-type: none"> <li>• 5 9's for system</li> <li>• Solaris-based</li> </ul>	<ul style="list-style-type: none"> <li>• 4 9's for system</li> <li>• Windows-based?</li> </ul>
Technology Risk	<ul style="list-style-type: none"> <li>• Borne by service provider</li> </ul>	<ul style="list-style-type: none"> <li>• Borne by enterprise</li> </ul>
Management	<ul style="list-style-type: none"> <li>• Centralized system mgmt.</li> </ul>	<ul style="list-style-type: none"> <li>• Mgmt. based on each system</li> </ul>

## 3. Why should you now seriously consider using VoIP?

### A migration path to suit your needs

BT can offer a phased IP migration. By using our tiered approach customers can continue to take advantage of their existing TDM PBX investments in one site, while moving to fully hosted IP phones in other locations.

### Maximise value and simplicity with a single network

By combining voice and data over a single network infrastructure, you can simplify network management, cut administration overheads and increase functionality.

### Cost Management

Zero charge for on-net calls and competitive voice rates for international off-net calls are some of the cost benefits that can be realised with BT's IPT services. And you can manage budgets more efficiently; with per site call detail and accurate forecast billing.

### Enhance business efficiency

It no longer matters where a person is, but how they are connected and what tools they have at their disposal. With a reliable and secure VoIP and multimedia solution from BT, you can use our advanced features to work collaboratively in real time and from anywhere in the world.

### Increase accessibility

BT's IPT services will ensure you never lose revenue by missing out on a call thanks to advanced telephony features such as voice messaging, call waiting, call forwarding, number portability and caller ID.

### **Support flexible working**

Whether working from home or abroad, the ability to communicate quickly, securely and effectively is key to the transition to full mobility. BT can provide the technology you need to make this a reality.

## **4. Why should I use BT?**

BT is a company unmatched in the depth and breadth of both its services and its expertise. This is supported by two decades of world-class experience, serving the needs of global customers across many different markets.

We have a history of success of merging voice and data systems reliably and securely for small and large enterprises – both in the UK and globally – leading to telephony cost savings of as much as 30%.

Our phased approach to IP migration ensures that customers can continue to take advantage of their existing TDM PBX investments in one location, while moving to fully hosted IP phones in others.

BT's investment in an IP infrastructure shows that BT is committed to VoIP. It is also committed to ensuring that VoIP will work with our existing products. ICT is at the key of BT's product strategy – both for itself and for its customers. BT is deploying 30,000 IP Telephones for its own use, and always installs IP Telephony at new sites.

## **5. Why should I use BT for Hosted IPT?**

BT has an end-to-end solution capability

BT has an impressive background in delivering cutting edge technology solutions utilising the expertise in its world-renowned laboratories at Adastral Park.

BT has a proven background in both voice AND data communications.

BT offers a strong capability for integrating with existing voice and data platforms.

BT offers dedicated international support.

BT offers international coverage in a number of countries (subject to individual site survey)

## **6. What do I need to do to get my organisation ready for Hosted IPT?**

In order to use voice, video and data as an application over your IP network, your network will need to meet some specifications.

- An appropriately-dimensioned WAN with Class of Service support or plans to move to such a WAN. The customer will be offered the ability to use their existing WANs (this includes a number of possible infrastructures, ranging from IP VPNs to DIY WANs) to deliver the voice traffic. The customer will then be able to deliver IP directly to their desktop (i.e. over the LAN), allowing them to benefit from the 'value-add' of IP applications.
- LAN infrastructure able to support voice Quality of Service, or plans to upgrade. It is important that the LAN and WAN infrastructure can support "Quality of Service" (prioritisation of Voice over Data) and Class of Service (for IP VPNs, reserving a portion of the available bandwidth for voice at any one time). Depending upon the current LAN equipment, it may be necessary to upgrade existing LAN infrastructure.
- The appropriate Customer Premises Equipment. The product may require the customer to purchase or rent new customer premises equipment, primarily IP phones or PC soft phones.
- If the customer wants to inter-work with legacy equipment, then a gateway will be required.

## 7. What IP phones can be supported?

Currently, the Service supports a range of Cisco IP Phones. The Cisco family of IP and wireless IP phones provides a complete range of communication devices designed to take full advantage of the power of your data network, while providing the convenience and ease-of-use you've come to expect from your business phone. From the home office to the manufacturing floor, from the lobby to the executive suite, there is a Cisco IP Phone for you.

For more information visit the Cisco web site

<http://www.cisco.com/en/US/products/hw/phones/ps379/index.html>

## 8. Can analogue phones be supported?

There are a number of devices that will support analogue phones, ranging from a single-port IP phone gateway to a 48-port analogue gateway. The ATA186 and the ATA188 adaptors are both supported.

For more information visit the Cisco web site

<http://www.cisco.com/en/US/products/hw/gatecont/ps514/index.html>

## 9. Is the VoIP gateway included?

No, Customers may have existing LAN maintenance arrangements and choose to purchase a wires only WAN product. In this case they may be able to insert a Voice card in an existing router with the correct software build for VoIP. Where they have no arrangement, the router choice will depend on voice signalling requirement and the size of their connection, (channels to be supported). The Voice card option will be supplied as part of the WAN (MPLS) product.

## 10. What quality levels can I expect from Hosted IP Telephony?

Recent advances in VOIP technology, coupled with extensive testing of VoIP voice quality has indicated that the voice quality which will be achieved will be very good. To minimise the amount of CoS1 bandwidth required, BT strongly advises customers to compress their voice across their WAN. The ITU standard for voice quality measurement is based on its Mean Opinion Score (MOS) algorithm. MOS is rated on a scale of 1 (noise) to 5 (perfect quality), with "Toll Quality" generally accepted as 4 or better. The CODEC used by MM VoIP to compress voice across the WAN is G.729a, which produces a maximum theoretical MOS of 3.92. Customer experience has proved that this is an acceptable level for business use. In addition to MOS, MM VoIP service is monitored against other quality benchmarks. MM VoIP users should expect to see the following minimum quality standards:

- **MOS score of 3.7 or greater.**
- **Jitter of no more than 25 ms**
- **Packet Loss** of no more than 0.5%
- **Round Trip Delay** of less than 150ms

Customer experience has proven that these standards are exceeded in most calls made.

## **11. How easy will it be for customers to add on sites/take sites off and take care of moves and changes in their organisation?**

BT needs to register and configure individual users when the service is activated. The user can make simple changes such as programming speed dials and adjusting ring tones. More complex additions or changes (like changing DDI numbers) should be carried out through the BT Account Manager and will incur a charge. The benefits of VoIP means the majority of these additions and changes can be carried out quickly and easily.

## **12. How will calls be routed?**

Calls within a customer's network will be routed over their LAN and WAN infrastructure. A signal is sent from the calling party to the Hosted IPT Call Servers which allows the latter to set up the real-time communications path. This path routes directly between the calling and the called parties.

Calls to and from traditional networks such as the PSTN will be routed via the BT Hosted IPT platform.

## **13. How Secure is Hosted IPT from BT?**

Our IPT services are protected with the same security measures we use on our own core network. You can carry on with your business with the knowledge that your network is secure and there is no fear of eavesdropping or hacking.

- Fully managed round the clock service
- All network hardware and software is constantly monitored and maintained and our expert support team is always on hand to offer advice.

The platform makes use of firewalls to guard against unauthorised access to BT's network infrastructure and components. Further, a Security Management Team has been incorporated who respond to Incident Management Procedures, and the platform uses a comprehensive Backup Policy to be able to restore from most major incidents. As a final measure, a comprehensive auditing policy is used to identify inappropriate activity. For more information please see the Hosted VoIP security white paper.

## **14. Is a converged network resilient?**

One of the key benefits to VoIP is to enable business customers to consolidate their voice and data network into a single infrastructure. Since the data network now carries voice as well as data, businesses will need to address how the current capabilities and limitations of their data infrastructure.

BT offers resilient WAN products to ensure that VoIP can achieve the appropriate level of availability. Alternatively, ISDN resilience options can be discussed.

## **15. How much voice and data can I carry on my network?**

The only limit is the size of the WAN. The underlying data network will need to be appropriately dimensioned to carry both voice and data traffic. Each voice call equates to about 24Kbps of bandwidth on MPLS, and 40.2Kbps on ATM, including WAN overheads.

## 16. What BT Network products will be appropriate for BT Hosted IPT services

Any products that support Quality-of-Service can be used for this product. In the UK this is currently Cellstream or Class-of-Service enabled IP-VPNs like BT Equip, Metro, and IP Clear. Outside the UK, BT MPLS, BT Frame Relay in Spain are suitable.

## 17. How is Hosted IPT priced?

BT hosted IPT Pricing Structure is comprised of the following components:

- Service Installation
- Recurring Monthly Service Subscription
- On-net Calling: Zero-Tariff to other users within the customer network; Flat Fee
- Call Charges: call which terminates off the customers network are charged at competitive usage based rate
- Equipment Costs Buy/Lease: IP Phones leased or purchased by customer.

## 18. How are orders placed?

Orders are placed through your BT Account Manager. A Customer Requirements Form (CRF) needs to be completed, and a project manager assigned. The appropriate LAN/WAN upgrades need to be ordered in parallel.

## 19. Who can I contact for further information?

Contact your BT Global Services Channel manager or contact your local Account Manager.

In the UK contact [Sarah Kafetz](#) or [Alan Boothroyd](#) for further details..