

BT Innovate & Design

WHITE PAPER

Keeping an open mind

How BT's changing infrastructure has become a blueprint for new ways of doing business

Introducing the SDK

With one of the world's largest networks and a business built up over many decades of innovation, BT is currently at a critical point in its history. As the internet revolutionises the way people and businesses communicate, the processes and systems inside BT are changing forever.

With openness and reusability the watchwords in today's technology conversations, BT is moving its own model from distributed, bespoke services and products to a centralised, modular one. At the same time, new acquisitions and innovations are adding complexity while creating new opportunities for services – from voice-enabled CRM to integrated web-based services for businesses of all sizes.

Much interest has been created over BT's move to open up its platform. In reality it has been a complex project, years in development. 1,000s of systems have already been consolidated into around 30 platforms that deliver core BT services such as billing, CRM and domain management. But these projects and structural changes are bringing the power of BT's network to a wider audience, meaning many more organisations and individuals can test, develop and deliver innovative solutions via BT's 21CN platform.

Is the move to open standards really that much of a change for BT? What will this openness eventually bring to market? What kind of applications will be created and what will they mean to customers?

What is an SDK?

Software development kits are a world-wide practice. One accepted industry definition of SDK is:

A software development kit (SDK or "devkit") is typically a set of development tools that allows a software engineer to create applications for a certain software package, software framework, hardware platform, computer system, video game console, operating system, or similar platform.

An SDK, in practical terms, is a software library with supporting documentation that allows a software developer to do something useful while supporting the reuse of software. Most (if not all) software today is built using common libraries. It is rare to find developers today writing code that works in a standalone format only.

Examples of SDKs common to the business world are Microsoft's Foundation Classes (MFC) or .Net library, and Oracle's OracleApps foundation. But a lot of us already benefit from SDKs in our social lives – Facebook's SDK and Apple's iPhone SDK both allow developers to create applications that run on their platforms. So if you've ever downloaded an iPhone app or installed a game on your Facebook page, you're making the most of the SDK used by the development community.

The minimum components of specialist SDKs are:

- Interface contract document
- Sample code
- Language specific software libraries (e.g. jar or dll)
- Debugging tools/libraries
- Service definitions and datasets (eg. XML, WSDL)
- A 'read me' file (Help Notes)

APIs and SDKs

An Application Programme Interface (API) defines the way a programme interacts with other elements around it, such as information libraries, databases or operating systems. Essentially an outward-facing 'building block', APIs enable developers to allow applications to interact with existing systems, or other applications, to create specific services or outcomes. One example of a common API would be Apple's iPhone API, which allows developers to create applications that access the iPhone's hardware elements, such as its GPS services, hardware accelerometer and touchscreen. APIs form an intrinsic part of SDKs, which go further to package the APIs with the documentation and tools to ensure developers have all the information needed to create services around the application, or group of applications. As a result, APIs and SDKs are critical in interconnected and cloud-based IT approaches.

Why is BT offering an SDK to developers?

BT is, in a way, the embodiment of an empty supermarket. What BT has done is give people the detailed specifications of its warehouse, shop floor, shelves and tills, to allow people to sell things easily and quickly, and via a seamless transaction. BT wants to make it as easy as possible for people to build products. The company has put a lot of time, effort and investment into building and implementing its core platform. BT is, in effect, opening up that core platform for others to use. It's really a set of tools that allow people to ship products via BT's 'shelves' automatically.

It is useful to consider the scale at which BT is operating. There are over 10,000 developers supporting around 2,400 systems within BT's platform architecture. These platforms interact with each other delivering a customer experience for a specific product within a BT line of business.

At the edge of these platforms, there are interfaces with suppliers, partners and other network operators. Creating a way for developers to access and manipulate these interfaces creates the separate SDKs. It is this complexity that is driving BT to seek the ability for others to effectively use and build on BT's platform more freely.

What are BT's SDKs?

BT has introduced a number of distinct classes of SDKs. Each one is designed for different stakeholders, and therefore offers varying propositions and outcomes. Users of these disparate SDKs range from service providers that use BT's networks and services, to independent application developers that leverage the power of BT's existing relationships to add value through applications.

In reality, the different classes of SDKs will have different 'consumers'. At the simplest level, a BT SDK may give a BT Wholesale partner secure access to a BT database of, for example, its billing system for retail customers. This would allow a network operator to see and manipulate data inside BT's networks, easing the ability for that partner to bill for services it delivers and removing a lot of manual or repetitive processes in that workflow.

At the complex end of the spectrum, BT's SDKs can automate far more complex procedures, such as voice termination via IP or micro-payments across millions of lines simultaneously. Work that BT is doing via its Ribbit acquisition, for example, means that companies can use the relevant SDK to build voice-driven apps into their customer relationship management systems, enabling sales teams to interact directly with large corporate databases using voice, or for voicemails to be captured, converted into text and then databases automatically updated.

Benefits of the SDK structure

Strategically, BT's SDKs are designed to improve those processes inside the organisation, or give external parties access to BT's infrastructure, network and processes. As BT opens up data stores and internal services, it will be able to services that once wouldn't have been possible.

The Enterprise Work Management Platform (EWMP), for example, is used by BT to schedule and dispatch a technician to someone at home, who perhaps needs some work doing. Opening up that process via an SDK – which will enable external companies to reuse that platform and data – could allow companies from other network providers to use the same dispatch service and book simultaneous or related work.

Overall, it could be said the development and use of the BT SDK has two main benefits:

1. Enabling new eco-systems and business models

SDKs have become a key means through which leading software companies, such as Google, Microsoft and Amazon, leverage their business models and ecosystems. Google and Microsoft have thousands of third party developers using their SDK to embed their services in their own applications. Hence it has enabled these kinds of organisations to achieve a range of benefits including increasing market reach, speed to market, reuse, and innovation. Their services and SDKs have become de facto industry standards.

This industry model of an SDK-based approach is a useful reference point. BT has been on the same journey. Its 21C SDK (the Network SDK), and the acquisition of Ribbit enable the creation of an eco-system around “Communication Capabilities” so they can be used directly by third parties. The SaaS platform as well as the potential to interface with other key service packages such as BT Vision would all be examples of SDK-enabled eco-systems.

2. Cost reduction through re-use

The SDK framework establishes the standards across platforms to make the reuse of technology happen. This is where real efficiencies can be found by utilising existing processes, platforms and data to create new applications and solutions. BT's platform architecture has established a pre-defined set of platform interactions via specific SDKs meaning transactions across our ordering and fulfillment platforms will not be re-invented for each new product launched. As a result, the use of SDKs not only improves integration between platforms, it also shields the impact of a change of technology within one platform upon the others.

To demonstrate how this would work in a real-life environment, BT benchmarked two teams working on an identical assignment. One was given the SDK to use and the other wasn't. The team without the SDK accomplished their task in five days. The team using the SDK accomplished their task in half an hour.

What kinds of new services will be created?

We are already seeing the results of the work being done to standardise BT's platform as a series of SDKs, particularly in BT Business' delivery of on-demand applications to small businesses. Salesforce.com is one example of a partner that has used the BT SDK to deliver its own on-demand application via BT's SaaS platform.

BT Business will resell salesforce.com's flagship Salesforce CRM application that has revolutionised the way businesses manage and share information – utilising the collaborative power of the internet. This agreement extends the benefits of salesforce.com's market-leading CRM solution to even more small and medium-sized businesses in the UK.

Salesforce CRM will allow BT Business' customers to manage their client relationships more effectively and gain a clearer insight into their business processes and without the prohibitive costs and management of installed, on-premise software.

Ribbit for Salesforce

The extension of the application via Ribbit enables all Salesforce CRM customers to link mobile voice communications with their existing Salesforce CRM account for increased sales productivity.

Awarded Best Mobile App for 2008 by US Salesforce CRM users, the application features voice-to-text conversion to allow users – especially sales teams – to dictate notes and memos verbally on their mobile phones. The notes flow directly into Salesforce CRM and into the user's email inbox, eliminating the need to type updates and helping support better productivity.

Ribbit for Salesforce provided by BT simplifies sales management by storing and organising voicemail as email in Salesforce CRM, categorising leads, contacts and in-progress deals. In addition, all voice messages are delivered as SMS or email so users can respond or forward immediately without dialling into voicemail.

The road to change

It is worth noting that BT's move to an SDK-driven environment has not been a quick and seamless transition. With complex OSS/BSS environments – part of the legacy of being one of the world's largest telecommunications providers – and a number of disparate solutions and systems built up over a number of years of development, the move to more 'open' systems and processes has been a huge task.

As a result, the work done by BT to integrate systems and processes into SDKs has been iterative – and a world apart from newer organisations or devices (such as the iPhone), which have been able to build APIs from the ground up. But now the background work has been done to simplify the BT infrastructure and open up its network – effectively allowing them to manipulate it and extend it into their own solutions and services. So what are the real-world results?

1. Speed

As demonstrated above, the amount of time it takes for new processes to be integrated within the standardised, SDK-driven BT infrastructure is far less than in a more closed, proprietary environment.

Imagine the difference between building a wardrobe from scratch using raw materials, compared to a flat-packed wardrobe that comes with instructions. In the first case, it's up to you to plan, build and fit every piece without prior knowledge or preparation. In the second, much of the work has already been done based on a pre-prepared plan, and delivered to you with guidance on how to finish the job.

In much of today's software development practices, agility is a vital part. Technology innovation moves ahead quickly as new networks, protocols and hardware enter the market. Those who spend too long developing solutions for a specific environment can find that the environment itself has become out of date before the solution is even finished.

The ability to develop in an agile way, using pre-configured, 'packaged' interfaces and procedures is crucial to ensuring development can keep up.

2. Quality

Fault correction, versioning and integration are three places where software and platform development can suffer. Quality assurance practices during development are designed to ensure bugs are slowly programmed out of any solution being developed, but this process can be lengthy and iterative.

'Right First Time', a central part of BT's 21CN roadmap, is arguably critically dependent on the ability for new software solutions or processes to work seamlessly from the outset.

With thousands of standalone systems interoperating, and the need for new services to travel across one or all of them, the ability for smooth handovers is critical. The SDKs act as interpreters during the development phase to ensure any services travelling across BT's systems – both internally and from outside – can be handed off between each system without a problem.

As a result, third-parties are able to develop using BT's platform to create robust and reliable applications. This not only improves the quality of the applications available via the BT platform, but also greatly increases the variety of solutions in the ecosystem.

3. Price

The ability to develop applications quickly and at a higher quality means the cost of rolling out solutions to market is reduced. Much of the value from an application is from its use, while most of the cost comes from the development phase.

Agile software development practices are designed to bring this cost down through a fast iterative approach, with a number of teams collaborating on one project to spot faults or opportunities for efficiency more quickly. SDKs enable this collaborative approach, as the pre-packaged instructions and methodologies mean teams can come on stream faster, and solutions communicate via a common language.

BT's SDKs, therefore, represent a far lower cost-to-market for external parties looking to leverage the reach and power of BT's network at a lower cost of entry. At the same time, efficiency has become an intrinsic part of BT's core platform, producing savings that can be passed on through the supply chain to the customer.

Summary

BT's SDK approach is a central part of its major strategic move towards openness and reusability, to benefit not only its own efficiency and agility but also to enable others to exploit the capabilities of its extensive and powerful network infrastructures.

BT's SDKs

The B2B Customer SDK

This is the SDK BT provides to its business customers (for example UK communication providers) to allow them to interact with BT. This is also the same SDK that retail developers use to consume Openreach services. Its function covers interfaces for orders and faults as well as services for pre-order checks and validations, and network testing and diagnostics.

The B2B Supplier SDK

This is the SDK used by BT suppliers, including services such as equipment supply chain, global dispatch company, and network access for Global Services clients. This SDK enables a flexible ecosystem rather than supplier specific processes.

The Channel SDK

This Channel SDK is for third-party product and service providers to sell their products via BT's self-service channels. The SDK has four main components – order, fault, configuration and bill. The Software-as-a-Service (SaaS) platform is the preferred delivery mechanism for the emerging real-time, self-service applications, and this SDK allows developers to create applications for that platform.

The Infrastructure SDK

This is an emerging SDK in the industry. Capacity control within an on-demand computing framework or virtual datacenter is an example of where this SDK is useful. Cloud computing frameworks and content distribution networks will be significant applications of this SDK. BT's customers are increasingly embedding capacity-on-demand APIs into their applications to enable dynamic load balancing based on application load.

The Network SDK

This SDK truly unlocks BT's 21CN network platform. Originally called the 21C SDK, it covers capabilities such as call control, messaging, presence and location services. Part of BT's converged 21CN architecture, the Network SDK makes hosted call centre platforms, voice over IP (VoIP) clients and unified communications applications a reality.

The Service Creation SDK

The Service Creation SDK allows BT to build the presentation layer for end user applications. This SDK in turn consumes the services exposed by other SDKs (most importantly, the Network SDK). Ribbit, the Silicon Valley-based network operator owned by BT, will use this ecosystem to power many of its services, such as click-to-call applications and web-based voicemail.

The Inter-platform SDK

This SDK covers the bulk of what BT delivers in OSS/BSS solutions. Each platform within its architecture exposes a set of services that other platforms consume. For example, ordering to workflow to activate to dispatch is a simple sequence of a service order. Each platform has well defined interfaces that are published into the Inter-platform SDK. Integrating platforms is merely a way for those platforms to integrate.

For more information:

<http://sdk.bt.com>

<http://www.ribbit.com>

http://en.wikipedia.org/wiki/Software_development_kit

About BT

Operating in more than 170 countries, BT is one of the world's leading providers of communications solutions and services. Its principal activities include networked IT services, local, national and international telecommunications services, and higher value broadband and internet products and services.



Offices worldwide

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