Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

VpnService

Kotlin (/reference/kotlin/android/net/VpnService) | **Java**

```
public class VpnService
extends Service (/reference/android/app/Service)
```

java.lang.Object (/reference/java/lang/Object)
↳ android.content.Context (/reference/android/content/Context)
↳ android.content.ContextWrapper (/reference/android/content/ContextWrapper)
↳ android.app.Service (/reference/android/app/Service)
↳ android.net.VpnService

VpnService is a base class for applications to extend and build their own VPN solutions. In general, it creates a virtual network interface, configures addresses and routing rules, and returns a file descriptor to the application. Each read from the descriptor retrieves an outgoing packet which was routed to the interface. Each write to the descriptor injects an incoming packet just like it was received from the interface. The interface is running on Internet Protocol (IP), so packets are always started with IP headers. The application then completes a VPN connection by processing and exchanging packets with the remote server over a tunnel.

Letting applications intercept packets raises huge security concerns. A VPN application can easily break the network. Besides, two of them may conflict with each other. The system takes several actions to address these issues. Here are some key points:

- User action is required the first time an application creates a VPN connection.
- There can be only one VPN connection running at the same time. The existing interface is deactivated when a new one is created.
- A system-managed notification is shown during the lifetime of a VPN connection.

- A system-managed dialog gives the information of the current VPN connection. It also provides a button to disconnect.
- The network is restored automatically when the file descriptor is closed. It also covers the cases when a VPN application is crashed or killed by the system.

There are two primary methods in this class: `prepare(Context)` (/reference/android/net/VpnService#prepare(android.content.Context)) and `Builder#establish` (/reference/android/net/VpnService.Builder#establish()). The former deals with user action and stops the VPN connection created by another application. The latter creates a VPN interface using the parameters supplied to the `Builder` (/reference/android/net/VpnService.Builder). An application must call `prepare(Context)` (/reference/android/net/VpnService#prepare(android.content.Context)) to grant the right to use other methods in this class, and the right can be revoked at any time. Here are the general steps to create a VPN connection:

1. When the user presses the button to connect, call `prepare(Context)` (/reference/android/net/VpnService#prepare(android.content.Context)) and launch the returned intent, if non-null.
2. When the application becomes prepared, start the service.
3. Create a tunnel to the remote server and negotiate the network parameters for the VPN connection.
4. Supply those parameters to a `Builder` (/reference/android/net/VpnService.Builder) and create a VPN interface by calling `Builder#establish` (/reference/android/net/VpnService.Builder#establish()).
5. Process and exchange packets between the tunnel and the returned file descriptor.
6. When `onRevoke()` (/reference/android/net/VpnService#onRevoke()) is invoked, close the file descriptor and shut down the tunnel gracefully.

Services extending this class need to be declared with an appropriate permission and intent filter. Their access must be secured by `Manifest.permission.BIND_VPN_SERVICE` (/reference/android/Manifest.permission#BIND_VPN_SERVICE) permission, and their intent filter must match `SERVICE_INTERFACE` (/reference/android/net/VpnService#SERVICE_INTERFACE) action. Here is an example of declaring a VPN service in `AndroidManifest.xml`:

```
<service android:name=".ExampleVpnService"
        android:permission="android.permission.BIND_VPN_SERVICE">
```

```
    <intent-filter>
        <action android:name="android.net.VpnService"/>
    </intent-filter>
</service>
```

The Android system starts a VPN in the background by calling `startService()` (/reference/android/content/Context#startService(android.content.Intent)). In Android 8.0 (API level 26) and higher, the system places VPN apps on the temporary allowlist for a short period so the app can start in the background. The VPN app must promote itself to the foreground after it's launched or the system will shut down the app.

Developer's guide

To learn more about developing VPN apps, read the VPN developer's guide (/guide/topics/connectivity/vpn).

See also:

`VpnService.Builder` (/reference/android/net/VpnService.Builder)

Summary

Nested classes

class	`VpnService.Builder` (/reference/android/net/VpnService.Builder) Helper class to create a VPN interface.

Constants

`String` (/reference/java/lang/String)	`SERVICE_INTERFACE` (/reference/android/net/VpnService#SERVICE_INT The action must be matched by the intent filter of this service.

String (/reference/java/lang/String)	SERVICE_META_DATA_SUPPORTS_ALWAYS_ON (/reference/android/net/VpnService#SERVICE_META_DATA_SUPPORTS_ Key for boolean meta-data field indicating whether this VpnService supp on mode.

Inherited constants

From class android.app.Service (/reference/android/app/Service)

int	START_CONTINUATION_MASK (/reference/android/app/Service#START Bits returned by onStartCommand(Intent, int, int) (/reference
int	START_FLAG_REDELIVERY (/reference/android/app/Service#START_F This flag is set in onStartCommand(Intent, int, int) (/reference service had previously returned START_REDELIVER_INTENT (/referen that Intent.
int	START_FLAG_RETRY (/reference/android/app/Service#START_FLAG_R This flag is set in onStartCommand(Intent, int, int) (/reference from onStartCommand(android.content.Intent, int, int) (/
int	START_NOT_STICKY (/reference/android/app/Service#START_NOT_ST Constant to return from onStartCommand(Intent, int, int) (/re from onStartCommand(Intent, int, int) (/reference/android/ap started state and don't recreate until a future explicit call to Context.
int	START_REDELIVER_INTENT (/reference/android/app/Service#START_ Constant to return from onStartCommand(Intent, int, int) (/re from onStartCommand(Intent, int, int) (/reference/android/ap again via onStartCommand(Intent, int, int) (/reference/androi
int	START_STICKY (/reference/android/app/Service#START_STICKY)

	Constant to return from `onStartCommand(Intent, int, int)` (/re from `onStartCommand(Intent, int, int)` (/reference/android/ap
`int`	`START_STICKY_COMPATIBILITY` (/reference/android/app/Service#ST Constant to return from `onStartCommand(Intent, int, int)` (/re (/reference/android/app/Service#START_STICKY) that does not guarar again after being killed.
`int`	`STOP_FOREGROUND_DETACH` (/reference/android/app/Service#STOP_F Selector for `stopForeground(int)` (/reference/android/app/Service# (/reference/android/app/Service#startForeground(int,%20android.app
`int`	`STOP_FOREGROUND_LEGACY` (/reference/android/app/Service#STOP_F *This constant was deprecated in API level 33. Use* `STOP_FOREGROUND_` *unpredictable results.*
`int`	`STOP_FOREGROUND_REMOVE` (/reference/android/app/Service#STOP_F Selector for `stopForeground(int)` (/reference/android/app/Service# (/reference/android/app/Service#startForeground(int,%20android.app

From class `android.content.Context` (/reference/android/content/Context)

`String` (/reference/java/lang/String)	`ACCESSIBILITY_SERVICE` (/reference/android/content/Context#A Use with `getSystemService(java.lang.String)` (/reference/a (/reference/android/view/accessibility/AccessibilityManager) for givi
`String` (/reference/java/lang/String)	`ACCOUNT_SERVICE` (/reference/android/content/Context#ACCOUN Use with `getSystemService(java.lang.String)` (/reference/a intents at a time of your choosing.
`String` (/reference/java/lang/String)	`ACTIVITY_SERVICE` (/reference/android/content/Context#ACTIVIT Use with `getSystemService(java.lang.String)` (/reference/a the global system state.
`String` (/reference/java/lang/String)	`ALARM_SERVICE` (/reference/android/content/Context#ALARM_SER

	Use with **getSystemService(java.lang.String)** (/reference/a time of your choosing.
String (/reference/java/lang/String)	**APPWIDGET_SERVICE** (/reference/android/content/Context#APPWI Use with **getSystemService(java.lang.String)** (/reference/a accessing AppWidgets.
String (/reference/java/lang/String)	**APP_OPS_SERVICE** (/reference/android/content/Context#APP_OPS_ Use with **getSystemService(java.lang.String)** (/reference/a application operations on the device.
String (/reference/java/lang/String)	**APP_SEARCH_SERVICE** (/reference/android/content/Context#APP_S Use with **getSystemService(java.lang.String)** (/reference/a indexing and querying app data managed by the system.
String (/reference/java/lang/String)	**AUDIO_SERVICE** (/reference/android/content/Context#AUDIO_SERV Use with **getSystemService(java.lang.String)** (/reference/a management of volume, ringer modes and audio routing.
String (/reference/java/lang/String)	**BATTERY_SERVICE** (/reference/android/content/Context#BATTERY_ Use with **getSystemService(java.lang.String)** (/reference/a state.
int	**BIND_ABOVE_CLIENT** (/reference/android/content/Context#BIND_A Flag for **bindService(Intent, BindServiceFlags, Executo** (/reference/android/content/Context#bindService(android.content. application binding to this service considers the service to be more
int	**BIND_ADJUST_WITH_ACTIVITY** (/reference/android/content/Conte Flag for **bindService(Intent, BindServiceFlags, Executo** (/reference/android/content/Context#bindService(android.content. allow the target service's process importance to be raised based or to impact it.
int	**BIND_ALLOW_ACTIVITY_STARTS** (/reference/android/content/Con

	Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. is visible, the bound service is allowed to start an activity from back
int	BIND_ALLOW_OOM_MANAGEMENT (/reference/android/content/Conte Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. the bound service to go through its normal memory management.
int	BIND_AUTO_CREATE (/reference/android/content/Context#BIND_AU Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. service as long as the binding exists.
int	BIND_DEBUG_UNBIND (/reference/android/content/Context#BIND_D Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. mismatched calls to unbind.
int	BIND_EXTERNAL_SERVICE (/reference/android/content/Context#B Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. an isolated (/reference/android/R.attr#isolatedProcess), externa
long	BIND_EXTERNAL_SERVICE_LONG (/reference/android/content/Cont Works in the same way as BIND_EXTERNAL_SERVICE (/reference/a (/reference/android/content/Context.BindServiceFlags).
int	BIND_IMPORTANT (/reference/android/content/Context#BIND_IMPO Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. important to the client, so should be brought to the foreground proc
int	BIND_INCLUDE_CAPABILITIES (/reference/android/content/Conte

	Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. has specific capabilities due to its foreground state such as an activ
int	BIND_NOT_FOREGROUND (/reference/android/content/Context#BIND Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. raise the target service's process to the foreground scheduling prio
int	BIND_NOT_PERCEPTIBLE (/reference/android/content/Context#BIN Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. is visible or user-perceptible, lower the target service's importance
int	BIND_SHARED_ISOLATED_PROCESS (/reference/android/content/C Flag for bindIsolatedService(Intent, BindServiceFlags, (/reference/android/content/Context#bindIsolatedService(android.c : Bind the service into a shared isolated process.
int	BIND_WAIVE_PRIORITY (/reference/android/content/Context#BIND Flag for bindService(Intent, BindServiceFlags, Executo (/reference/android/content/Context#bindService(android.content. scheduling or memory management priority of the target service's h
String (/reference/java/lang/String)	BIOMETRIC_SERVICE (/reference/android/content/Context#BIOME Use with getSystemService(java.lang.String) (/reference/a for handling biometric and PIN/pattern/password authentication.
String (/reference/java/lang/String)	BLOB_STORE_SERVICE (/reference/android/content/Context#BLOB Use with getSystemService(java.lang.String) (/reference/a contributing and accessing data blobs from the blob store maintain
String (/reference/java/lang/String)	BLUETOOTH_SERVICE (/reference/android/content/Context#BLUET Use with getSystemService(java.lang.String) (/reference/a Bluetooth.

String (/reference/java/lang/String)	BUGREPORT_SERVICE (/reference/android/content/Context#BUGRE Service to capture a bugreport.
String (/reference/java/lang/String)	CAMERA_SERVICE (/reference/android/content/Context#CAMERA_S Use with getSystemService(java.lang.String) (/reference/a interacting with camera devices.
String (/reference/java/lang/String)	CAPTIONING_SERVICE (/reference/android/content/Context#CAPT Use with getSystemService(java.lang.String) (/reference/a for obtaining captioning properties and listening for changes in cap
String (/reference/java/lang/String)	CARRIER_CONFIG_SERVICE (/reference/android/content/Context# Use with getSystemService(java.lang.String) (/reference/a for reading carrier configuration values.
String (/reference/java/lang/String)	CLIPBOARD_SERVICE (/reference/android/content/Context#CLIPBO Use with getSystemService(java.lang.String) (/reference/a accessing and modifying the contents of the global clipboard.
String (/reference/java/lang/String)	COMPANION_DEVICE_SERVICE (/reference/android/content/Contex Use with getSystemService(java.lang.String) (/reference/a (/reference/android/companion/CompanionDeviceManager) for ma
String (/reference/java/lang/String)	CONNECTIVITY_DIAGNOSTICS_SERVICE (/reference/android/cont Use with getSystemService(java.lang.String) (/reference/a (/reference/android/net/ConnectivityDiagnosticsManager) for perfo
String (/reference/java/lang/String)	CONNECTIVITY_SERVICE (/reference/android/content/Context#CO Use with getSystemService(java.lang.String) (/reference/a handling management of network connections.
String (/reference/java/lang/String)	CONSUMER_IR_SERVICE (/reference/android/content/Context#CON

	Use with `getSystemService(java.lang.String)` (/reference/a transmitting infrared signals from the device.
`String` (/reference/java/lang/String)	`CONTACT_KEYS_SERVICE` (/reference/android/content/Context#CC Use with `getSystemService(java.lang.String)` (/reference/a (/reference/android/provider/E2eeContactKeysManager) to managi
`int`	`CONTEXT_IGNORE_SECURITY` (/reference/android/content/Context Flag for use with `createPackageContext(String, int)` (/refer to always be loaded.
`int`	`CONTEXT_INCLUDE_CODE` (/reference/android/content/Context#CC Flag for use with `createPackageContext(String, int)` (/refer
`int`	`CONTEXT_RESTRICTED` (/reference/android/content/Context#CONT Flag for use with `createPackageContext(String, int)` (/refer
`String` (/reference/java/lang/String)	`CREDENTIAL_SERVICE` (/reference/android/content/Context#CRED Use with `getSystemService(java.lang.String)` (/reference/a authenticate a user to your app.
`String` (/reference/java/lang/String)	`CROSS_PROFILE_APPS_SERVICE` (/reference/android/content/Cont Use with `getSystemService(java.lang.String)` (/reference/a profile operations.
`int`	`DEVICE_ID_DEFAULT` (/reference/android/content/Context#DEVICE The default device ID, which is the ID of the primary (non-virtual) de
`int`	`DEVICE_ID_INVALID` (/reference/android/content/Context#DEVICE Invalid device ID.
`String` (/reference/java/lang/String)	`DEVICE_LOCK_SERVICE` (/reference/android/content/Context#DEV

Use with getSystemService(java.lang.String) (/reference/a

String (/reference/java/lang/String) DEVICE_POLICY_SERVICE (/reference/android/content/Context#D

Use with getSystemService(java.lang.String) (/reference/a working with global device policy management.

String (/reference/java/lang/String) DISPLAY_HASH_SERVICE (/reference/android/content/Context#DIS

Use with getSystemService(java.lang.String) (/reference/a to handle display hashes.

String (/reference/java/lang/String) DISPLAY_SERVICE (/reference/android/content/Context#DISPLAY_

Use with getSystemService(java.lang.String) (/reference/a interacting with display devices.

String (/reference/java/lang/String) DOMAIN_VERIFICATION_SERVICE (/reference/android/content/Co

Use with getSystemService(java.lang.String) (/reference/a (/reference/android/content/pm/verify/domain/DomainVerificationM

String (/reference/java/lang/String) DOWNLOAD_SERVICE (/reference/android/content/Context#DOWNL

Use with getSystemService(java.lang.String) (/reference/a HTTP downloads.

String (/reference/java/lang/String) DROPBOX_SERVICE (/reference/android/content/Context#DROPBO

Use with getSystemService(java.lang.String) (/reference/a recording diagnostic logs.

String (/reference/java/lang/String) EUICC_SERVICE (/reference/android/content/Context#EUICC_SER

Use with getSystemService(java.lang.String) (/reference/a the device eUICC (embedded SIM).

String (/reference/java/lang/String) FILE_INTEGRITY_SERVICE (/reference/android/content/Context#

Use with getSystemService(java.lang.String) (/reference/a

String (/reference/java/lang/String)	FINGERPRINT_SERVICE (/reference/android/content/Context#FINC Use with getSystemService(java.lang.String) (/reference/a (/reference/android/hardware/fingerprint/FingerprintManager) for h
String (/reference/java/lang/String)	GAME_SERVICE (/reference/android/content/Context#GAME_SERVI Use with getSystemService(java.lang.String) (/reference/a
String (/reference/java/lang/String)	GRAMMATICAL_INFLECTION_SERVICE (/reference/android/content Use with getSystemService(java.lang.String) (/reference/a (/reference/android/app/GrammaticalInflectionManager).
String (/reference/java/lang/String)	HARDWARE_PROPERTIES_SERVICE (/reference/android/content/Co Use with getSystemService(java.lang.String) (/reference/a (/reference/android/os/HardwarePropertiesManager) for accessing
String (/reference/java/lang/String)	HEALTHCONNECT_SERVICE (/reference/android/content/Context#H Use with getSystemService(java.lang.String) (/reference/a (/reference/android/health/connect/HealthConnectManager).
String (/reference/java/lang/String)	INPUT_METHOD_SERVICE (/reference/android/content/Context#INF Use with getSystemService(java.lang.String) (/reference/a (/reference/android/view/inputmethod/InputMethodManager) for ac
String (/reference/java/lang/String)	INPUT_SERVICE (/reference/android/content/Context#INPUT_SERV Use with getSystemService(java.lang.String) (/reference/a with input devices.
String (/reference/java/lang/String)	IPSEC_SERVICE (/reference/android/content/Context#IPSEC_SERV Use with getSystemService(java.lang.String) (/reference/a Networks with IPSec.
String (/reference/java/lang/String)	JOB_SCHEDULER_SERVICE (/reference/android/content/Context#JC

	Use with `getSystemService(java.lang.String)` (/reference/a occasional background tasks.
`String` (/reference/java/lang/String)	`KEYGUARD_SERVICE` (/reference/android/content/Context#KEYGUA Use with `getSystemService(java.lang.String)` (/reference/a keyguard.
`String` (/reference/java/lang/String)	`LAUNCHER_APPS_SERVICE` (/reference/android/content/Context#L Use with `getSystemService(java.lang.String)` (/reference/a monitoring launchable apps across profiles of a user.
`String` (/reference/java/lang/String)	`LAYOUT_INFLATER_SERVICE` (/reference/android/content/Context Use with `getSystemService(java.lang.String)` (/reference/a resources in this context.
`String` (/reference/java/lang/String)	`LOCALE_SERVICE` (/reference/android/content/Context#LOCALE_S Use with `getSystemService(java.lang.String)` (/reference/a
`String` (/reference/java/lang/String)	`LOCATION_SERVICE` (/reference/android/content/Context#LOCATI Use with `getSystemService(java.lang.String)` (/reference/a location updates.
`String` (/reference/java/lang/String)	`MEDIA_COMMUNICATION_SERVICE` (/reference/android/content/Co Use with `getSystemService(java.lang.String)` (/reference/a (/reference/android/media/MediaCommunicationManager) for mana
`String` (/reference/java/lang/String)	`MEDIA_METRICS_SERVICE` (/reference/android/content/Context#M Use with `getSystemService(java.lang.String)` (/reference/a (/reference/android/media/metrics/MediaMetricsManager) for inter
`String` (/reference/java/lang/String)	`MEDIA_PROJECTION_SERVICE` (/reference/android/content/Contex Use with `getSystemService(java.lang.String)` (/reference/a (/reference/android/media/projection/MediaProjectionManager) ins

String (/reference/java/lang/String)	MEDIA_ROUTER_SERVICE (/reference/android/content/Context#ME Use with getSystemService(Class) (/reference/android/content of media.
String (/reference/java/lang/String)	MEDIA_SESSION_SERVICE (/reference/android/content/Context#M Use with getSystemService(java.lang.String) (/reference/a (/reference/android/media/session/MediaSessionManager) for man
String (/reference/java/lang/String)	MIDI_SERVICE (/reference/android/content/Context#MIDI_SERVICE Use with getSystemService(java.lang.String) (/reference/a MIDI service.
int	MODE_APPEND (/reference/android/content/Context#MODE_APPEND File creation mode: for use with openFileOutput(String, int) of erasing it.
int	MODE_ENABLE_WRITE_AHEAD_LOGGING (/reference/android/conte Database open flag: when set, the database is opened with write-al
int	MODE_MULTI_PROCESS (/reference/android/content/Context#MODE *This constant was deprecated in API level 23. MODE_MULTI_PROCE processes. Applications should not attempt to use it. Instead, they s*
int	MODE_NO_LOCALIZED_COLLATORS (/reference/android/content/Co Database open flag: when set, the database is opened without supp
int	MODE_PRIVATE (/reference/android/content/Context#MODE_PRIVA File creation mode: the default mode, where the created file can on
int	MODE_WORLD_READABLE (/reference/android/content/Context#MOD *This constant was deprecated in API level 17. Creating world-readab mechanism for interactions such as* ContentProvider (/reference

	There are no guarantees that this access mode will remain on a file,
`int`	`MODE_WORLD_WRITEABLE` (/reference/android/content/Context#MC *This constant was deprecated in API level 17. Creating world-writabl mechanism for interactions such as* `ContentProvider` (/reference *There are no guarantees that this access mode will remain on a file,*
`String` (/reference/java/lang/String)	`NETWORK_STATS_SERVICE` (/reference/android/content/Context#N Use with `getSystemService(java.lang.String)` (/reference/a for querying network usage stats.
`String` (/reference/java/lang/String)	`NFC_SERVICE` (/reference/android/content/Context#NFC_SERVICE) Use with `getSystemService(java.lang.String)` (/reference/a
`String` (/reference/java/lang/String)	`NOTIFICATION_SERVICE` (/reference/android/content/Context#NC Use with `getSystemService(java.lang.String)` (/reference/a informing the user of background events.
`String` (/reference/java/lang/String)	`NSD_SERVICE` (/reference/android/content/Context#NSD_SERVICE) Use with `getSystemService(java.lang.String)` (/reference/a of network service discovery
`String` (/reference/java/lang/String)	`OVERLAY_SERVICE` (/reference/android/content/Context#OVERLAY Use with `getSystemService(java.lang.String)` (/reference/a overlay packages.
`String` (/reference/java/lang/String)	`PEOPLE_SERVICE` (/reference/android/content/Context#PEOPLE_SI Use with `getSystemService(java.lang.String)` (/reference/a your published conversations.
`String` (/reference/java/lang/String)	`PERFORMANCE_HINT_SERVICE` (/reference/android/content/Contex Use with `getSystemService(java.lang.String)` (/reference/a accessing the performance hinting service.

String (/reference/java/lang/String)	POWER_SERVICE (/reference/android/content/Context#POWER_SER Use with getSystemService(java.lang.String) (/reference/a management, including "wake locks," which let you keep the device
String (/reference/java/lang/String)	PRINT_SERVICE (/reference/android/content/Context#PRINT_SERV PrintManager (/reference/android/print/PrintManager) for printing
String (/reference/java/lang/String)	PROFILING_SERVICE (/reference/android/content/Context#PROFIL Use with getSystemService(java.lang.String) (/reference/a
int	RECEIVER_EXPORTED (/reference/android/content/Context#RECEIV Flag for registerReceiver(BroadcastReceiver, IntentFil broadcasts from other Apps.
int	RECEIVER_NOT_EXPORTED (/reference/android/content/Context#R Flag for registerReceiver(BroadcastReceiver, IntentFil receive broadcasts from other Apps.
int	RECEIVER_VISIBLE_TO_INSTANT_APPS (/reference/android/cont Flag for registerReceiver(BroadcastReceiver, IntentFil broadcasts from Instant Apps.
String (/reference/java/lang/String)	RESTRICTIONS_SERVICE (/reference/android/content/Context#RE Use with getSystemService(java.lang.String) (/reference/a retrieving application restrictions and requesting permissions for re
String (/reference/java/lang/String)	ROLE_SERVICE (/reference/android/content/Context#ROLE_SERVIC Use with getSystemService(java.lang.String) (/reference/a
String (/reference/java/lang/String)	SEARCH_SERVICE (/reference/android/content/Context#SEARCH_S Use with getSystemService(java.lang.String) (/reference/a

String (/reference/java/lang/String)	SECURITY_STATE_SERVICE (/reference/android/content/Context# Use with getSystemService(java.lang.String) (/reference/a accessing the security state manager service.
String (/reference/java/lang/String)	SENSOR_SERVICE (/reference/android/content/Context#SENSOR_S Use with getSystemService(java.lang.String) (/reference/a sensors.
String (/reference/java/lang/String)	SHORTCUT_SERVICE (/reference/android/content/Context#SHORTC Use with getSystemService(java.lang.String) (/reference/a accessing the launcher shortcut service.
String (/reference/java/lang/String)	STATUS_BAR_SERVICE (/reference/android/content/Context#STATU Use with getSystemService(java.lang.String) (/reference/a with the status bar and quick settings.
String (/reference/java/lang/String)	STORAGE_SERVICE (/reference/android/content/Context#STORAGE Use with getSystemService(java.lang.String) (/reference/a system storage functions.
String (/reference/java/lang/String)	STORAGE_STATS_SERVICE (/reference/android/content/Context#S Use with getSystemService(java.lang.String) (/reference/a accessing system storage statistics.
String (/reference/java/lang/String)	SYSTEM_HEALTH_SERVICE (/reference/android/content/Context#S Use with getSystemService(java.lang.String) (/reference/a accessing system health (battery, power, memory, etc) metrics.
String (/reference/java/lang/String)	TELECOM_SERVICE (/reference/android/content/Context#TELECOM Use with getSystemService(java.lang.String) (/reference/a telecom-related features of the device.
String (/reference/java/lang/String)	TELEPHONY_IMS_SERVICE (/reference/android/content/Context#T

Use with **getSystemService(java.lang.String)** (/reference/a

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String (/reference/java/lang/String) **TELEPHONY_SERVICE** (/reference/android/content/Context#TELEPI

Use with **getSystemService(java.lang.String)** (/reference/a handling management the telephony features of the device.

String (/reference/java/lang/String) **TELEPHONY_SUBSCRIPTION_SERVICE** (/reference/android/content

Use with **getSystemService(java.lang.String)** (/reference/a handling management the telephony subscriptions of the device.

String (/reference/java/lang/String) **TEXT_CLASSIFICATION_SERVICE** (/reference/android/content/Co

Use with **getSystemService(java.lang.String)** (/reference/a (/reference/android/view/textclassifier/TextClassificationManager) f

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String (/reference/java/lang/String) **TEXT_SERVICES_MANAGER_SERVICE** (/reference/android/content/

Use with **getSystemService(java.lang.String)** (/reference/a (/reference/android/view/textservice/TextServicesManager) for acc

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String (/reference/java/lang/String) **TV_INPUT_SERVICE** (/reference/android/content/Context#TV_INPU

Use with **getSystemService(java.lang.String)** (/reference/a with TV inputs on the device.

String (/reference/java/lang/String) **TV_INTERACTIVE_APP_SERVICE** (/reference/android/content/Con

Use with **getSystemService(java.lang.String)** (/reference/a (/reference/android/media/tv/interactive/TvInteractiveAppManager)

String (/reference/java/lang/String) **UI_MODE_SERVICE** (/reference/android/content/Context#UI_MODE

Use with **getSystemService(java.lang.String)** (/reference/a modes.

String (/reference/java/lang/String) **USAGE_STATS_SERVICE** (/reference/android/content/Context#USA

Use with **getSystemService(java.lang.String)** (/reference/a querying device usage stats.

String (/reference/java/lang/String)	USB_SERVICE (/reference/android/content/Context#USB_SERVICE) Use with getSystemService(java.lang.String) (/reference/a devices (as a USB host) and for controlling this device's behavior as
String (/reference/java/lang/String)	USER_SERVICE (/reference/android/content/Context#USER_SERVIC Use with getSystemService(java.lang.String) (/reference/a devices that support multiple users.
String (/reference/java/lang/String)	VIBRATOR_MANAGER_SERVICE (/reference/android/content/Contex Use with getSystemService(java.lang.String) (/reference/a device vibrators, interacting with individual ones and playing synchr
String (/reference/java/lang/String)	VIBRATOR_SERVICE (/reference/android/content/Context#VIBRATC *This constant was deprecated in API level 31. Use* VibratorManage
String (/reference/java/lang/String)	VIRTUAL_DEVICE_SERVICE (/reference/android/content/Context# Use with getSystemService(java.lang.String) (/reference/a (/reference/android/companion/virtual/VirtualDeviceManager) for m
String (/reference/java/lang/String)	VPN_MANAGEMENT_SERVICE (/reference/android/content/Context# Use with getSystemService(java.lang.String) (/reference/a platform built-in VPN.
String (/reference/java/lang/String)	WALLPAPER_SERVICE (/reference/android/content/Context#WALLP Use with getSystemService(java.lang.String) (/reference/a
String (/reference/java/lang/String)	WIFI_AWARE_SERVICE (/reference/android/content/Context#WIFI_ Use with getSystemService(java.lang.String) (/reference/a handling management of Wi-Fi Aware.
String (/reference/java/lang/String)	WIFI_P2P_SERVICE (/reference/android/content/Context#WIFI_P2

	Use with `getSystemService(java.lang.String)` (/reference/a management of Wi-Fi peer-to-peer connections.
`String` (/reference/java/lang/String)	`WIFI_RTT_RANGING_SERVICE` (/reference/android/content/Contex Use with `getSystemService(java.lang.String)` (/reference/a devices with wifi.
`String` (/reference/java/lang/String)	`WIFI_SERVICE` (/reference/android/content/Context#WIFI_SERVICE Use with `getSystemService(java.lang.String)` (/reference/a of Wi-Fi access.
`String` (/reference/java/lang/String)	`WINDOW_SERVICE` (/reference/android/content/Context#WINDOW_S Use with `getSystemService(java.lang.String)` (/reference/a system's window manager.

From interface `android.content.ComponentCallbacks2` (/reference/android/content/Component

`int`	`TRIM_MEMORY_BACKGROUND` (/reference/android/content/ComponentC Level for `onTrimMemory(int)` (/reference/android/content/Compone
`int`	`TRIM_MEMORY_COMPLETE` (/reference/android/content/ComponentCall Level for `onTrimMemory(int)` (/reference/android/content/Compone
`int`	`TRIM_MEMORY_MODERATE` (/reference/android/content/ComponentCall Level for `onTrimMemory(int)` (/reference/android/content/Compone running later in the list for better overall performance.
`int`	`TRIM_MEMORY_RUNNING_CRITICAL` (/reference/android/content/Com Level for `onTrimMemory(int)` (/reference/android/content/Compone to not be able to keep any background processes running.
`int`	`TRIM_MEMORY_RUNNING_LOW` (/reference/android/content/Component Level for `onTrimMemory(int)` (/reference/android/content/Compone

`int`	`TRIM_MEMORY_RUNNING_MODERATE` (/reference/android/content/Com Level for `onTrimMemory(int)` (/reference/android/content/Compone
`int`	`TRIM_MEMORY_UI_HIDDEN` (/reference/android/content/ComponentCa Level for `onTrimMemory(int)` (/reference/android/content/Compone

Public constructors

`VpnService` (/reference/android/net/VpnService#VpnService())()

Public methods

`final boolean`	`isAlwaysOn` (/reference/android/net/VpnService#isAlwaysOn())() Returns whether the service is running in always-on VPN mode.
`final boolean`	`isLockdownEnabled` (/reference/android/net/VpnService#isLockdow Returns whether the service is running in always-on VPN lockdown mo
`IBinder` (/reference/android/os/IBinder)	`onBind` (/reference/android/net/VpnService#onBind(android.content.Ir (`Intent` (/reference/android/content/Intent) `intent`) Return the communication interface to the service.
`void`	`onRevoke` (/reference/android/net/VpnService#onRevoke())() Invoked when the application is revoked.
`static Intent` (/reference/android/content/Intent)	`prepare` (/reference/android/net/VpnService#prepare(android.content (`Context` (/reference/android/content/Context) `context`) Prepare to establish a VPN connection.

boolean	protect (/reference/android/net/VpnService#protect(java.net.Socket)(/reference/java/net/Socket) socket) Convenience method to protect a Socket (/reference/java/net/Socket) connections.
boolean	protect (/reference/android/net/VpnService#protect(int))(int sock Protect a socket from VPN connections.
boolean	protect (/reference/android/net/VpnService#protect(java.net.Datagra(DatagramSocket (/reference/java/net/DatagramSocket) socket) Convenience method to protect a DatagramSocket (/reference/java/net/DatagramSocket) from VPN connections.
boolean	setUnderlyingNetworks (/reference/android/net/VpnService#setUnderlyingNetworks(android.n(Network[] (/reference/android/net/Network) networks) Sets the underlying networks used by the VPN for its upstream connec

Inherited methods

From class android.app.Service (/reference/android/app/Service)

void	attachBaseContext (/reference/android/ap Set the base context for this ContextWrappe
void	dump (/reference/android/app/Service#dump Print the Service's state into the given stream
final Application (/reference/android/app/Application)	getApplication (/reference/android/app/S Return the application that owns this service.
final int	getForegroundServiceType (/reference/a

	If the service has become a foreground servi (/reference/android/app/Service#startForegr
abstract IBinder (/reference/android/os/IBinder)	onBind (/reference/android/app/Service#onl Return the communication channel to the ser
void	onConfigurationChanged (/reference/and Called by the system when the device config
void	onCreate (/reference/android/app/Service# Called by the system when the service is first
void	onDestroy (/reference/android/app/Service Called by the system to notify a Service that
void	onLowMemory (/reference/android/app/Servi This is called when the overall system is runn
void	onRebind (/reference/android/app/Service# Called when new clients have connected to t
void	onStart (/reference/android/app/Service#o *This method was deprecated in API level 15. I*
int	onStartCommand (/reference/android/app/S Called by the system every time a client expli
void	onTaskRemoved (/reference/android/app/Se This is called if the service is currently runnin
void	onTimeout (/reference/android/app/Service

	Callback called on timeout for **ServiceInfo**
`void`	**onTrimMemory** (/reference/android/app/Serv Called when the operating system has determ
`boolean`	**onUnbind** (/reference/android/app/Service# Called when all clients have disconnected fro
`final void`	**startForeground** (/reference/android/app/ If your service is started (running through **Co**
`final void`	**startForeground** (/reference/android/app/ An overloaded version of **startForeground**
`final void`	**stopForeground** (/reference/android/app/S Remove this service from foreground state, a
`final void`	**stopForeground** (/reference/android/app/S *This method was deprecated in API level 33.* (/reference/android/app/Service#STOP_FOR
`final void`	**stopSelf** (/reference/android/app/Service# Stop the service, if it was previously started.
`final void`	**stopSelf** (/reference/android/app/Service# Old version of **stopSelfResult(int)** (/ref
`final boolean`	**stopSelfResult** (/reference/android/app/S Stop the service if the most recent time it wa

From class **android.content.ContextWrapper** (/reference/android/content/ContextWrapper)

void	attachBaseContext (/referen Set the base context for this Co
boolean	bindIsolatedService (/refer service, int flags, Stri Variation of bindService(Int (/reference/android/content/Co multiple instances of a service fi
boolean	bindService (/reference/andro (/reference/java/util/concurrent/ Same as bindService(Intent
boolean	bindService (/reference/andro (/reference/android/content/Ser See bindService(android.c (/reference/android/content/Co
boolean	bindService (/reference/andro (/reference/android/content/Ser Connects to an application servi
boolean	bindService (/reference/andro service, Context.BindSer See bindService(android.c (/reference/android/content/Co BindServiceFlags object.
int	checkCallingOrSelfPermis Determine whether the calling p
int	checkCallingOrSelfUriPer Determine whether the calling p

`int[]`	`checkCallingOrSelfUriPer` Determine whether the calling p
`int`	`checkCallingPermission` (/r Determine whether the calling p
`int`	`checkCallingUriPermissio` Determine whether the calling p
`int[]`	`checkCallingUriPermissio` Determine whether the calling p
`int`	`checkPermission` (/reference/ Determine whether the given pe
`int`	`checkSelfPermission` (/refer Determine whether *you* have be
`int`	`checkUriPermission` (/refere `String` (/reference/java/lang/St Check both a Uri and normal pe
`int`	`checkUriPermission` (/refere Determine whether a particular
`int[]`	`checkUriPermissions` (/refer Determine whether a particular
`void`	`clearWallpaper` (/reference/a *This method is deprecated. Use*

	This method requires the caller
`Context` (/reference/android/content/Context)	`createAttributionContext` Return a new Context object for
`Context` (/reference/android/content/Context)	`createConfigurationConte` Return a new Context object for
`Context` (/reference/android/content/Context)	`createContext` (/reference/an Creates a context with specific
`Context` (/reference/android/content/Context)	`createDeviceContext` (/refer Returns a new **`Context`** object f
`Context` (/reference/android/content/Context)	`createDeviceProtectedSto` Return a new Context object for
`Context` (/reference/android/content/Context)	`createDisplayContext` (/refe Returns a new **`Context`** object f
`Context` (/reference/android/content/Context)	`createPackageContext` (/refe Return a new Context object for
`Context` (/reference/android/content/Context)	`createWindowContext` (/refer Creates a Context for a non-acti
`Context` (/reference/android/content/Context)	`createWindowContext` (/refer Creates a **`Context`** for a non-`ac`
`String[]` (/reference/java/lang/String)	`databaseList` (/reference/and

	Returns an array of strings nami
boolean	deleteDatabase (/reference/a Delete an existing private SQLite
boolean	deleteFile (/reference/androi Delete the given private file assc
boolean	deleteSharedPreferences (/ Delete an existing shared prefer
void	enforceCallingOrSelfPerm If neither you nor the calling pro
void	enforceCallingOrSelfUriP message) If the calling process of an IPC c
void	enforceCallingPermission If the calling process of an IPC y
void	enforceCallingUriPermiss If the calling process and uid ha
void	enforcePermission (/referen If the given permission is not allc
void	enforceUriPermission (/refe readPermission, String (/r Enforce both a Uri and normal p

void	enforceUriPermission (/refe (/reference/java/lang/String) me If a particular process and uid h
String[] (/reference/java/lang/String)	fileList (/reference/android/c Returns an array of strings nami
Context (/reference/android/content/Context)	getApplicationContext (/re Return the context of the single,
ApplicationInfo (/reference/android/content/pm/ApplicationInfo)	getApplicationInfo (/refere Return the full application info fo
AssetManager (/reference/android/content/res/AssetManager)	getAssets (/reference/android Returns an AssetManager instan
AttributionSource (/reference/android/content/AttributionSource)	getAttributionSource (/refe
Context (/reference/android/content/Context)	getBaseContext (/reference/a
File (/reference/java/io/File)	getCacheDir (/reference/andro Returns the absolute path to the
ClassLoader (/reference/java/lang/ClassLoader)	getClassLoader (/reference/a Return a class loader you can us
File (/reference/java/io/File)	getCodeCacheDir (/reference/ Returns the absolute path to the
ContentResolver (/reference/android/content/ContentResolver)	getContentResolver (/refere

	Return a ContentResolver instan
File (/reference/java/io/File)	getDataDir (/reference/androi Returns the absolute path to the
File (/reference/java/io/File)	getDatabasePath (/reference/ Returns the absolute path on th (/reference/android/content/Cor
int	getDeviceId (/reference/andro Gets the device ID this context i
File (/reference/java/io/File)	getDir (/reference/android/con Retrieve, creating if needed, a n
Display (/reference/android/view/Display)	getDisplay (/reference/androi Get the display this context is as
File (/reference/java/io/File)	getExternalCacheDir (/refer Returns absolute path to applica
File[] (/reference/java/io/File)	getExternalCacheDirs (/refe Returns absolute paths to applic
File (/reference/java/io/File)	getExternalFilesDir (/refer Returns the absolute path to the
File[] (/reference/java/io/File)	getExternalFilesDirs (/refe Returns absolute paths to applic
File[] (/reference/java/io/File)	getExternalMediaDirs (/refe

	This method is deprecated. Thes (/reference/android/provider/Me
File (/reference/java/io/File)	getFileStreamPath (/referen Returns the absolute path on th
File (/reference/java/io/File)	getFilesDir (/reference/andro Returns the absolute path to the
Executor (/reference/java/util/concurrent/Executor)	getMainExecutor (/reference/ Return an Executor (/reference
Looper (/reference/android/os/Looper)	getMainLooper (/reference/an Return the Looper for the main t
File (/reference/java/io/File)	getNoBackupFilesDir (/refer Returns the absolute path to the
File (/reference/java/io/File)	getObbDir (/reference/android Return the primary shared/exter
File[] (/reference/java/io/File)	getObbDirs (/reference/androi Returns absolute paths to applic
String (/reference/java/lang/String)	getPackageCodePath (/refere Return the full path to this conte
PackageManager (/reference/android/content/pm/PackageManager)	getPackageManager (/referen Return PackageManager instanc
String (/reference/java/lang/String)	getPackageName (/reference/a

	Return the name of this applicat
String (/reference/java/lang/String)	getPackageResourcePath (/r Return the full path to this conte
ContextParams (/reference/android/content/ContextParams)	getParams (/reference/android Return the set of parameters wh
Resources (/reference/android/content/res/Resources)	getResources (/reference/and Returns a Resources instance fo
SharedPreferences (/reference/android/content/SharedPreferences)	getSharedPreferences (/refe Retrieve and hold the contents c
Object (/reference/java/lang/Object)	getSystemService (/referenc Return the handle to a system-le
String (/reference/java/lang/String)	getSystemServiceName (/refe Gets the name of the system-lev
Resources.Theme (/reference/android/content/res/Resources.Theme)	getTheme (/reference/android/c Return the Theme object associ
Drawable (/reference/android/graphics/drawable/Drawable)	getWallpaper (/reference/and *This method is deprecated. Use*
int	getWallpaperDesiredMinim *This method is deprecated. Use*
int	getWallpaperDesiredMinim

	This method is deprecated. Use
`void`	`grantUriPermission` (/refere Grant permission to access a sp
`boolean`	`isDeviceProtectedStorage` Indicates if the storage APIs of t
`boolean`	`isRestricted` (/reference/and Indicates whether this Context is
`boolean`	`moveDatabaseFrom` (/referenc Move an existing database file fr
`boolean`	`moveSharedPreferencesFro` Move an existing shared prefere
`FileInputStream` (/reference/java/io/FileInputStream)	`openFileInput` (/reference/an Open a private file associated w
`FileOutputStream` (/reference/java/io/FileOutputStream)	`openFileOutput` (/reference/a Open a private file associated w
`SQLiteDatabase` (/reference/android/database/sqlite/SQLiteDatabase)	`openOrCreateDatabase` (/refe `name, int mode, SQLiteDa` Open a new private SQLiteDatab
`SQLiteDatabase` (/reference/android/database/sqlite/SQLiteDatabase)	`openOrCreateDatabase` (/refe `SQLiteDatabase.CursorFac` Open a new private SQLiteDatab
`Drawable` (/reference/android/graphics/drawable/Drawable)	`peekWallpaper` (/reference/an

	This method is deprecated. Use
`void`	`registerComponentCallbac` Add a new `ComponentCallbac`
`void`	`registerDeviceIdChangeLi` (/reference/java/util/function/Int Adds a new device ID changed li
`Intent` (/reference/android/content/Intent)	`registerReceiver` (/referenc (/reference/android/content/Inte Register a BroadcastReceiver to
`Intent` (/reference/android/content/Intent)	`registerReceiver` (/referenc (/reference/android/content/Inte Register to receive intent broadc
`Intent` (/reference/android/content/Intent)	`registerReceiver` (/referenc (/reference/android/content/Bro Register to receive intent broadc
`Intent` (/reference/android/content/Intent)	`registerReceiver` (/referenc `receiver, IntentFilter` (/r Register to receive intent broadc
`void`	`removeStickyBroadcast` (/re *This method is deprecated. Stick has changed, with another mecl*

`void`	`removeStickyBroadcastAsU`
	`user)`
	
	*This method is deprecated. Stick
	has changed, with another mecl*

void	revokeSelfPermissionsOnK Triggers the revocation of one o
void	revokeUriPermission (/refer Remove all permissions to acces mechanism.
void	revokeUriPermission (/refer Remove permissions to access a package.
void	sendBroadcast (/reference/an Bundle (/reference/android/os/B Broadcast the given intent to all
void	sendBroadcast (/reference/an Broadcast the given intent to all
void	sendBroadcast (/reference/an Broadcast the given intent to all
void	sendBroadcastAsUser (/refer Version of sendBroadcast(an
void	sendBroadcastAsUser (/refer user, String (/reference/java Version of sendBroadcast(an
void	sendOrderedBroadcast (/reference/android/content/Cor (/reference/android/content/Inte (/reference/android/os/Handler)

	Version of sendOrderedBroad (/reference/android/content/Cor restrictions on which receivers t
void	sendOrderedBroadcast (/reference/android/content/Cor (Intent (/reference/android/co resultReceiver, Handler (/
void	sendOrderedBroadcast (/refe (/reference/android/content/Inte initialCode, String (/refer Version of sendBroadcast(an
void	sendOrderedBroadcast (/refe receiverPermission, Bund Broadcast the given intent to all
void	sendOrderedBroadcast (/reference/android/content/Cor (/reference/android/content/Inte (/reference/android/os/Handler) Version of sendBroadcast(an
void	sendOrderedBroadcast (/refe Broadcast the given intent to all
void	sendOrderedBroadcastAsUs (/reference/android/content/Cor (Intent (/reference/android/co Handler (/reference/android/os Version of sendOrderedBroad (/reference/android/content/Cor will be sent to.
void	sendStickyBroadcast (/refer

	This method is deprecated. Stick has changed, with another mecl
void	sendStickyBroadcast (/refer *This method is deprecated. Stick has changed, with another mecl*
void	sendStickyBroadcastAsUse user) *This method is deprecated. Stick has changed, with another mecl*
void	sendStickyOrderedBroadca (/reference/android/content/Inte initialData, Bundle (/refer *This method is deprecated. Stick has changed, with another mecl*
void	sendStickyOrderedBroadca (/reference/android/content/Cor (/reference/android/content/Inte initialCode, String (/refer *This method is deprecated. Stick has changed, with another mecl*
void	setTheme (/reference/android/c Set the base theme for this cont
void	setWallpaper (/reference/and *This method is deprecated. Use* *This method requires the caller*
void	setWallpaper (/reference/and *This method is deprecated. Use*

	This method requires the caller
`void`	`startActivities` (/reference/ Launch multiple new activities.
`void`	`startActivities` (/reference/ Same as `startActivities(a`
`void`	`startActivity` (/reference/an Same as `startActivity(andr`
`void`	`startActivity` (/reference/an Launch a new activity.
`ComponentName` (/reference/android/content/ComponentName)	`startForegroundService` (/r Similar to `startService(andr` (/reference/android/app/Service
`boolean`	`startInstrumentation` (/refe (/reference/java/lang/String) `pr` Start executing an `Instrument`
`void`	`startIntentSender` (/referen (/reference/android/content/Inte Same as `startIntentSender` (/reference/android/content/Co
`void`	`startIntentSender` (/referen (/reference/android/content/Inte Like `startActivity(androic`
`ComponentName` (/reference/android/content/ComponentName)	`startService` (/reference/and

	Request that a given application
boolean	stopService (/reference/andro Request that a given application
void	unbindService (/reference/an Disconnect from an application s
void	unregisterComponentCallb Remove a ComponentCallbac (/reference/android/content/Cor
void	unregisterDeviceIdChangel Removes a device ID changed lis
void	unregisterReceiver (/refere Unregister a previously registere
void	updateServiceGroup (/refere For a service previously bound w (/reference/android/content/Cor in relation to other processes.

From class android.content.Context (/reference/android/content/Context)

boolean	bindIsolatedSer service, int fl Variation of bindSe (/reference/android generate multiple ins
boolean	bindIsolatedSer (/reference/android executor, Servi

	See bindIsolated (/reference/android. (/reference/android.
boolean	bindService (/refe (/reference/java/util Same as bindServ:
boolean	bindService (/refe (/reference/android. See bindService(BindServiceFlag:
abstract boolean	bindService (/refe (/reference/android. Connects to an appl
boolean	bindService (/refe service, Contex See bindService((/reference/android. obtain a BindService
boolean	bindServiceAsUs (/reference/android. Binds to a service in (/reference/android.
boolean	bindServiceAsUs (/reference/android. (/reference/android. See bindServiceA (/reference/android. to obtain a BindServ
abstract int	checkCallingOrS

	Determine whether t
abstract int	checkCallingOrS Determine whether t
int[]	checkCallingOrS Determine whether t
abstract int	checkCallingPer Determine whether t
abstract int	checkCallingUri Determine whether t
int[]	checkCallingUri Determine whether t
abstract int	checkPermission Determine whether t
abstract int	checkSelfPermis Determine whether y
abstract int	checkUriPermiss String (/reference/ Check both a Uri an
abstract int	checkUriPermiss Determine whether a
int[]	checkUriPermiss

	Determine whether a
`abstract void`	`clearWallpaper` (/ *This method was de* *This method require*
`Context` (/reference/android/content/Context)	`createAttributi` Return a new Conte
`abstract Context` (/reference/android/content/Context)	`createConfigura` Return a new Conte
`Context` (/reference/android/content/Context)	`createContext` (/r Creates a context wi
`abstract Context` (/reference/android/content/Context)	`createContextFo` Return a new Conte
`Context` (/reference/android/content/Context)	`createDeviceCon` Returns a new **Cont**
`abstract Context` (/reference/android/content/Context)	`createDevicePro` Return a new Conte
`abstract Context` (/reference/android/content/Context)	`createDisplayCo` Returns a new **Cont**
`abstract Context` (/reference/android/content/Context)	`createPackageCo` Return a new Conte
`Context` (/reference/android/content/Context)	`createWindowCon`

	Creates a Context fo
Context (/reference/android/content/Context)	createWindowCon Creates a Context
abstract String[] (/reference/java/lang/String)	databaseList (/re Returns an array of s
abstract boolean	deleteDatabase (/ Delete an existing pr
abstract boolean	deleteFile (/refer Delete the given priv
abstract boolean	deleteSharedPre Delete an existing sh
abstract void	enforceCallingO If neither you nor the
abstract void	enforceCallingO message) If the calling process
abstract void	enforceCallingP If the calling process
abstract void	enforceCallingU If the calling process
abstract void	enforcePermissi

	If the given permissi
abstract void	enforceUriPermi (/reference/java/lan Enforce both a Uri a
abstract void	enforceUriPermi (/reference/java/lan If a particular proces
abstract String[] (/reference/java/lang/String)	fileList (/referen Returns an array of s
abstract Context (/reference/android/content/Context)	getApplicationC Return the context c
abstract ApplicationInfo (/reference/android/content/pm/ApplicationInfo)	getApplicationI Return the full applic
abstract AssetManager (/reference/android/content/res/AssetManager)	getAssets (/refere Returns an AssetMa
AttributionSource (/reference/android/content/AttributionSource)	getAttributionS
String (/reference/java/lang/String)	getAttributionT Attribution can be us
abstract File (/reference/java/io/File)	getCacheDir (/refe Returns the absolute
abstract ClassLoader (/reference/java/lang/ClassLoader)	getClassLoader (/

	Return a class loade
`abstract` File (/reference/java/io/File)	getCodeCacheDir Returns the absolute
`final int`	getColor (/referen Returns a color asso
`final` ColorStateList (/reference/android/content/res/ColorStateList)	getColorStateLi Returns a color state
`abstract` ContentResolver (/reference/android/content/ContentResolver)	getContentResol Return a ContentRes
`abstract` File (/reference/java/io/File)	getDataDir (/refer Returns the absolute
`abstract` File (/reference/java/io/File)	getDatabasePath Returns the absolute (/reference/android/
`int`	getDeviceId (/refe Gets the device ID tl
`abstract` File (/reference/java/io/File)	getDir (/reference/ Retrieve, creating if
Display (/reference/android/view/Display)	getDisplay (/refer Get the display this
`final` Drawable (/reference/android/graphics/drawable/Drawable)	getDrawable (/refe

	Returns a drawable
`abstract` File (/reference/java/io/File)	`getExternalCach` Returns absolute pa
`abstract` File[] (/reference/java/io/File)	`getExternalCach` Returns absolute pa
`abstract` File (/reference/java/io/File)	`getExternalFile` Returns the absolute
`abstract` File[] (/reference/java/io/File)	`getExternalFile` Returns absolute pa
`abstract` File[] (/reference/java/io/File)	`getExternalMedi` *This method was de* *new media to* `Media`
`abstract` File (/reference/java/io/File)	`getFileStreamPa` Returns the absolute
`abstract` File (/reference/java/io/File)	`getFilesDir` (/refe Returns the absolute
Executor (/reference/java/util/concurrent/Executor)	`getMainExecutor` Return an `Executor`
`abstract` Looper (/reference/android/os/Looper)	`getMainLooper` (/r Return the Looper fo
`abstract` File (/reference/java/io/File)	`getNoBackupFile`

	Returns the absolute
abstract File (/reference/java/io/File)	getObbDir (/refere Return the primary s
abstract File[] (/reference/java/io/File)	getObbDirs (/refer Returns absolute pa
String (/reference/java/lang/String)	getOpPackageNam Return the package
abstract String (/reference/java/lang/String)	getPackageCodeP Return the full path
abstract PackageManager (/reference/android/content/pm/PackageManager)	getPackageManag Return PackageMan
abstract String (/reference/java/lang/String)	getPackageName (Return the name of
abstract String (/reference/java/lang/String)	getPackageResou Return the full path
ContextParams (/reference/android/content/ContextParams)	getParams (/refere Return the set of pa
abstract Resources (/reference/android/content/res/Resources)	getResources (/re Returns a Resources
abstract SharedPreferences (/reference/android/content/SharedPreferences)	getSharedPrefer

	Retrieve and hold th
`final` String (/reference/java/lang/String)	`getString` (/refere Returns a localized s
`final` String (/reference/java/lang/String)	`getString` (/refere Returns a localized f (/reference/java/lan
`final <T> T`	`getSystemServic` Return the handle to
`abstract` Object (/reference/java/lang/Object)	`getSystemServic` Return the handle to
`abstract` String (/reference/java/lang/String)	`getSystemServic` Gets the name of th
`final` CharSequence (/reference/java/lang/CharSequence)	`getText` (/referenc Return a localized, s
`abstract` Resources.Theme (/reference/android/content/res/Resources.Theme)	`getTheme` (/referen Return the Theme ob
`abstract` Drawable (/reference/android/graphics/drawable/Drawable)	`getWallpaper` (/re *This method was de*
`abstract int`	`getWallpaperDes` *This method was de*
`abstract int`	`getWallpaperDes`

	This method was de
`abstract void`	`grantUriPermiss` Grant permission to
`abstract boolean`	`isDeviceProtect` Indicates if the stora
`boolean`	`isRestricted` (/re Indicates whether th
`boolean`	`isUiContext` (/refe Returns `true` if the (/reference/android/
`abstract boolean`	`moveDatabaseFro` Move an existing da
`abstract boolean`	`moveSharedPrefe` Move an existing sha
`final TypedArray` (/reference/android/content/res/TypedArray)	`obtainStyledAtt` Retrieve styled attrib

`final TypedArray` (/reference/android/content/res/TypedArray)	`obtainStyledAtt`
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	Retrieve styled attrib

`final TypedArray` (/reference/android/content/res/TypedArray)	`obtainStyledAtt` Retrieve styled attrib
`final TypedArray` (/reference/android/content/res/TypedArray)	`obtainStyledAtt`

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abstract FileInputStream (/reference/java/io/FileInputStream)	openFileInput (/r Open a private file a
abstract FileOutputStream (/reference/java/io/FileOutputStream)	openFileOutput (Open a private file a
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abstract SQLiteDatabase (/reference/android/database/sqlite/SQLiteDatabase)	openOrCreateDat SQLiteDatabase. Open a new private
abstract Drawable (/reference/android/graphics/drawable/Drawable)	peekWallpaper (/r *This method was de*
void	registerCompone Add a new Compone
void	registerDeviceI (/reference/java/util Adds a new device I
abstract Intent (/reference/android/content/Intent)	registerReceive (/reference/android Register a Broadcas
abstract Intent (/reference/android/content/Intent)	registerReceive (/reference/android

	Register to receive i
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abstract void	removeStickyBro *This method was de broadcast to report*
abstract void	removeStickyBro (/reference/android/ *This method was de broadcast to report*
void	revokeSelfPermi Triggers the asynch
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abstract void	revokeUriPermis Remove all permissi mechanism.
abstract void	revokeUriPermis Remove permissions target package.

`void`	**sendBroadcast** (/r **Bundle** (/reference/ Broadcast the given
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`void`	**sendBroadcastWi** (/reference/java/lan Broadcast the given
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`abstract void`	**sendOrderedBroa** (/reference/android `int initialCode` Version of **sendBro**

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abstract void	setTheme (/referen Set the base theme
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abstract void	setWallpaper (/re *This method was de* *This method require*
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	Same as startAct
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abstract ComponentName (/reference/android/content/ComponentName)	startForeground Similar to startSer (/reference/android
abstract boolean	startInstrument (/reference/java/lan Start executing an I
abstract void	startIntentSend (/reference/android Same as startInte (/reference/android
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abstract boolean	stopService (/refe Request that a giver
abstract void	unbindService (/r Disconnect from an
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	Remove a **Componer** (/reference/android/
`void`	**unregisterDevic** Removes a device ID
`abstract void`	**unregisterRecei** Unregister a previou
`void`	**updateServiceGr** For a service previou (/reference/android/ service's process in

From class **java.lang.Object** (/reference/java/lang/Object)

Object (/reference/java/lang/Object)	**clone** (/reference/java/lang/Object#clone())() Creates and returns a copy of this object.
`boolean`	**equals** (/reference/java/lang/Object#equals(java.lang.Ob Indicates whether some other object is "equal to" this one
`void`	**finalize** (/reference/java/lang/Object#finalize())() Called by the garbage collector on an object when garbag
`final` **Class** (/reference/java/lang/Class)`<?>`	**getClass** (/reference/java/lang/Object#getClass())() Returns the runtime class of this `Object`.
`int`	**hashCode** (/reference/java/lang/Object#hashCode())() Returns a hash code value for the object.
`final void`	**notify** (/reference/java/lang/Object#notify())() Wakes up a single thread that is waiting on this object's m

final void	notifyAll (/reference/java/lang/Object#notifyAll())() Wakes up all threads that are waiting on this object's mon
String (/reference/java/lang/String)	toString (/reference/java/lang/Object#toString())() Returns a string representation of the object.
final void	wait (/reference/java/lang/Object#wait(long,%20int))(lo Causes the current thread to wait until it is awakened, typ
final void	wait (/reference/java/lang/Object#wait(long))(long tir Causes the current thread to wait until it is awakened, typ
final void	wait (/reference/java/lang/Object#wait())() Causes the current thread to wait until it is awakened, typ

From interface android.content.ComponentCallbacks2 (/reference/android/content/Component

abstract void	onTrimMemory (/reference/android/content/ComponentCallbacks2#or Called when the operating system has determined that it is a good time

From interface android.content.ComponentCallbacks (/reference/android/content/ComponentC

abstract void	onConfigurationChanged (/reference/android/content/ComponentC Called by the system when the device configuration changes while you
abstract void	onLowMemory (/reference/android/content/ComponentCallbacks#onLo This is called when the overall system is running low on memory, and a

Constants

SERVICE_INTERFACE Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) SERVICE_INTERFACE
```

The action must be matched by the intent filter of this service. It also needs to require `Manifest.permission.BIND_VPN_SERVICE` (/reference/android/Manifest.permission#BIND_VPN_SERVICE) permission so that other applications cannot abuse it.

Constant Value: "android.net.VpnService"

SERVICE_META_DATA_SUPPORTS_ALWAYS_ON Added in API level 24 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) SERVICE_META_DATA_SUPPORTS_ALWA
```

Key for boolean meta-data field indicating whether this VpnService supports always-on mode.

For a VPN app targeting `API 24` (/reference/android/os/Build.VERSION_CODES#N) or above, Android provides users with the ability to set it as always-on, so that VPN connection is persisted after device reboot and app upgrade. Always-on VPN can also be enabled by device owner and profile owner apps through `DevicePolicyManager#setAlwaysOnVpnPackage` (/reference/android/app/admin/DevicePolicyManager#setAlwaysOnVpnPackage(android.content.ComponentName,%20java.lang.String,%20boolean))
.

VPN apps not supporting this feature should opt out by adding this meta-data field to the `VpnService` component of `AndroidManifest.xml`. In case there is more than one `VpnService` component defined in `AndroidManifest.xml`, opting out any one of them will opt out the entire app. For example,

```
<service android:name=".ExampleVpnService"
        android:permission="android.permission.BIND_VPN_SERVICE">
    <intent-filter>
        <action android:name="android.net.VpnService"/>
```

```
    </intent-filter>
    <meta-data android:name="android.net.VpnService.SUPPORTS_ALWAYS_ON"
            android:value=false/>
</service>
```

This meta-data field defaults to `true` if absent. It will only have effect on `Build.VERSION_CODES.O_MR1` (/reference/android/os/Build.VERSION_CODES#O_MR1) or higher.

Constant Value: "android.net.VpnService.SUPPORTS_ALWAYS_ON"

Public constructors

VpnService

```
public VpnService ()
```

Public methods

isAlwaysOn

Added in API level 29 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public final boolean isAlwaysOn ()
```

Returns whether the service is running in always-on VPN mode. In this mode the system ensures that the service is always running by restarting it when necessary, e.g. after reboot.

Returns

`boolean`

See also:

`DevicePolicyManager.setAlwaysOnVpnPackage(ComponentName, String, boolean, Set)` (/reference/android/app/admin/DevicePolicyManager#setAlwaysOnVpnPackage(android.content.ComponentName,%20java.lang.String,%20boolean,%20java.util.Set<java.lang.String>))

isLockdownEnabled

Added in API level 29 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public final boolean isLockdownEnabled ()
```

Returns whether the service is running in always-on VPN lockdown mode. In this mode the system ensures that the service is always running and that the apps aren't allowed to bypass the VPN.

Returns

`boolean`

See also:

`DevicePolicyManager.setAlwaysOnVpnPackage(ComponentName, String, boolean, Set)` (/reference/android/app/admin/DevicePolicyManager#setAlwaysOnVpnPackage(android.content.ComponentName,%20java.lang.String,%20boolean,%20java.util.Set<java.lang.String>))

onBind

Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public IBinder (/reference/android/os/IBinder) onBind (Intent (/reference/android/content/Intent)
```

Return the communication interface to the service. This method returns `null` on `Intent` (/reference/android/content/Intent)s other than `SERVICE_INTERFACE`

(/reference/android/net/VpnService#SERVICE_INTERFACE) action. Applications overriding this method must identify the intent and return the corresponding interface accordingly.

Parameters

`intent`	`Intent`: The Intent that was used to bind to this service, as given to `Con` (/reference/android/content/Context#bindService(android.content.Inten . Note that any extras that were included with the Intent at that point will

Returns

`IBinder` (/reference/android/os/IBinder)	Return an IBinder through which clients can call on to the service.

See also:

`Service.onBind(Intent)` (/reference/android/app/Service#onBind(android.content.Intent))

onRevoke

Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public void onRevoke ()
```

Invoked when the application is revoked. At this moment, the VPN interface is already deactivated by the system. The application should close the file descriptor and shut down gracefully. The default implementation of this method is calling `Service#stopSelf()` (/reference/android/app/Service#stopSelf()).

Calls to this method may not happen on the main thread of the process.

See also:

`prepare(Context)` (/reference/android/net/VpnService#prepare(android.content.Context))

prepare

Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static Intent (/reference/android/content/Intent) prepare (Context (/reference/android/c
```

Prepare to establish a VPN connection. This method returns `null` if the VPN application is already prepared or if the user has previously consented to the VPN application. Otherwise, it returns an `Intent` (/reference/android/content/Intent) to a system activity. The application should launch the activity using `Activity#startActivityForResult` (/reference/android/app/Activity#startActivityForResult(android.content.Intent,%20int)) to get itself prepared. The activity may pop up a dialog to require user action, and the result will come back via its `Activity#onActivityResult` (/reference/android/app/Activity#onActivityResult(int,%20int,%20android.content.Intent)). If the result is `Activity#RESULT_OK` (/reference/android/app/Activity#RESULT_OK), the application becomes prepared and is granted to use other methods in this class.

Only one application can be granted at the same time. The right is revoked when another application is granted. The application losing the right will be notified via its `onRevoke()` (/reference/android/net/VpnService#onRevoke()). Unless it becomes prepared again, subsequent calls to other methods in this class will fail.

The user may disable the VPN at any time while it is activated, in which case this method will return an intent the next time it is executed to obtain the user's consent again.

Parameters

`context`	`Context`

Returns

`Intent`
(/reference/android/content/Intent)

See also:

`onRevoke()` (/reference/android/net/VpnService#onRevoke())

protect

Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean protect (Socket (/reference/java/net/Socket) socket)
```

Convenience method to protect a `Socket` (/reference/java/net/Socket) from VPN connections.

Parameters

`socket`	`Socket`

Returns

`boolean`	`true` on success.

See also:

`protect(int)` (/reference/android/net/VpnService#protect(int))

protect

Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean protect (int socket)
```

Protect a socket from VPN connections. After protecting, data sent through this socket will go directly to the underlying network, so its traffic will not be forwarded through the VPN. This method is useful if some connections need to be kept outside of VPN. For example, a VPN tunnel should protect itself if its destination is covered by VPN routes. Otherwise its outgoing packets will be sent back to the VPN interface and cause an infinite loop. This method will fail if the application is not prepared or is revoked.

The socket is NOT closed by this method.

Parameters

`socket`	`int`

Returns

`boolean`	`true` on success.

protect

Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean protect (DatagramSocket (/reference/java/net/DatagramSocket) socket)
```

Convenience method to protect a `DatagramSocket` (/reference/java/net/DatagramSocket) from VPN connections.

Parameters

`socket`	`DatagramSocket`

Returns

`boolean`	`true` on success.

See also:

`protect(int)` (/reference/android/net/VpnService#protect(int))

setUnderlyingNetworks

Added in API level 22 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean setUnderlyingNetworks (Network[] (/reference/android/net/Network) networ
```

Sets the underlying networks used by the VPN for its upstream connections.

Used by the system to know the actual networks that carry traffic for apps affected by this VPN in order to present this information to the user (e.g., via status bar icons).

This method only needs to be called if the VPN has explicitly bound its underlying communications channels — such as the socket(s) passed to `protect(int)` (/reference/android/net/VpnService#protect(int)) — to a `Network` using APIs such as `Network#bindSocket(Socket)` (/reference/android/net/Network#bindSocket(java.net.Socket)) or `Network#bindSocket(DatagramSocket)` (/reference/android/net/Network#bindSocket(java.net.DatagramSocket)). The VPN should call this method every time the set of `Network`s it is using changes.

`networks` is one of the following:

- **a non-empty array**: an array of one or more `Network` (/reference/android/net/Network)s, in decreasing preference order. For example, if this VPN uses both wifi and mobile

(cellular) networks to carry app traffic, but prefers or uses wifi more than mobile, wifi should appear first in the array.

- **an empty array**: a zero-element array, meaning that the VPN has no underlying network connection, and thus, app traffic will not be sent or received.
- **null**: (default) signifies that the VPN uses whatever is the system's default network. I.e., it doesn't use the `bindSocket` or `bindDatagramSocket` APIs mentioned above to send traffic over specific channels.

This call will succeed only if the VPN is currently established. For setting this value when the VPN has not yet been established, see `Builder#setUnderlyingNetworks` (/reference/android/net/VpnService.Builder#setUnderlyingNetworks(android.net.Network[])).

Parameters

`networks`	`Network`: An array of networks the VPN uses to tunnel traffic to/from its servers.

Returns

`boolean`	`true` on success.

Last updated 2024-04-11 UTC.