

# Developer Glossary

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*Livescribe™ Platform SDK*  
*Version 1.5*

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# Glossary

This document lists terms and definitions important to developing applications for Livescribe smartpens.

**3D Recording Headset:** Earphones with embedded microphones that capture multi-directional, far-field audio and place objects in the sound landscape surrounding you.

**Active Area:** See **Active Region**.

**Active Ink:** Digitized writing/drawing that can be viewed in Livescribe Desktop—in normal mode or in animation mode. Clicking on a note starts playing the audio at the associated point in the audio stream. Related concepts: **Animation**

**Active Region:** A portion of paper defined such that when a user taps on it, the associated penlet responds. You can think of an Active Region like a paper button or control. Active Regions may overlap in which case their Z-order defines the ordering of events delivered and their occlusive property defines whether active regions with lower Z-orders are processed at all. Active Regions can be dynamic (created at runtime – like the Livescribe Piano) or static (pre-defined in a paper product's AFD and established at penlet installation time – like standard Paper Replay controls). See **Dynamic Regions** and **Static Regions**.

**Active Verb:** Small applications that can be activated on the Livescribe smartpen by writing a single word. The user must first enter the Active Verb mode by performing a defined action. At present, that action consists of the user double-tapping the center of a Nav Plus.

**AFD:** The persistent electronic representation of a paper product. It is used for communication between the Livescribe system components (that is: the Livescribe smartpen, Livescribe Desktop, Livescribe Online, and Livescribe Developer Tools). A ZIP-like archive that can hold arbitrary content, it is accessed via the Anoto Functionality Platform Document API. Each step in the application and UGC lifecycle adds or removes items in an AFD. The components of an AFD include: Anoto License, GFX File, Regions File, Info File, Java JAR, Resources, and Tools Data.

**AFP:** Anoto Functionality Platform. Software modules created by Anoto and licensed by Livescribe. Contains the functionality for creating AFDs, printing paper products, and licensing Anoto dots. All AFP services are abstracted by the Livescribe Java Abstraction Layer.

**Animation:** A mode for displaying Paper Replay notes in Livescribe Desktop. Normal mode reveals all the notes when the page is first displayed. Animation mode initially hides (or grays out) the notes. As the audio plays, notes are revealed onscreen in sequence with the audio stream. To the user, the notes look like they are writing themselves on the screen as the audio plays.

**Anoto License:** License for Anoto pattern page(s). A component of an AFD (Anoto Functionality Document).

**Anoto pattern:** consists of small dots (100 micrometers in diameter) arranged with a spacing of approximately 0.3 mm on an imaginary square grid.

**Anoto Units:** An Anoto Unit (AU) is the native resolution of the smartpen. One AU = 0.3/8 mm or roughly 677 DPI. This unit is the maximum precision of the Livescribe smartpen and also the maximum precision that, for example a paper product's page size or an active region can be set to.

**APM:** Audio Punctuation Mark. The sounds the Livescribe smartpen makes that give the user audio feedback.

**Application Id:** A locally-unique identifier within an AFD that specifies what penlet class name to link the Active Region to. The Application Id is a part of the Region Id. For Static Active Regions, it occupies the same location in the Region Id as the Instance Id. The application Id is only relevant when creating paper products and will be translated in the smartpen to the Instance Id of the application. See **Area Id**, **Region Id**, and **Instance Id**.

**Application Mapping:** A key-value pair table that resides in the AFD. The table has one entry for each application used on each paper product, and each key-value pair contains the Application Id and the class name.

At run time, when a Static Active Region is tapped by the user, the system takes the Application Id from the Active Region and fetches the class from the current document's Application Mapping table. With the class name, the system looks up the Instance Id for the current smartpen. It then modifies the event Region Id and exchanges the Application Id with the Instance Id. Therefore, Static Regions (drawn using the Paper Designer) use an Application Id that will be translated at run time to the Instance Id.

In contrast, Dynamic Regions (drawn at runtime and generated by penlet code), use the Instance Id of the application that created it.

For example, assume a smartpen has two applications, Paper Replay and Timer, with the following Instance Ids at run time:

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Class = com.livescribe.paperreplay Instance Id = 10

Class = com.livescribe.timer Instance Id = 11

The Application Mapping Table for the smartpen is:

Application Id = 1 Class = com.livescribe.timer

Application Id = 2 Class = com.livescribe.paperreplay

Here, a Static Region, like the Record button for Paper Replay, would have Area Id = 2 and Application Id = 2. At run time, when the Static Region is tapped by the user, the event that is thrown will have Area Id = 2 and Instance Id = 10 (since Paper Replay has Instance Id = 10 in this particular smartpen)

**Area:** A collection of regions, possibly in multiple AFDs, with the same Area Id and that thus provide the same functionality.

**Area Id:** A 16-bit number that is a subset of the Region Id. It represents a smartpen behavior or action triggered when a user interacts with an Active Region. It is up to the developer to define which Area Id maps to which behavior, and implement the corresponding code. Multiple Active Regions on the same page or multiple pages, can share the same Area Id. In this case, each region will map to the same behavior in the penlet. For example, the mute button on each page of a Livescribe notebook is represented by multiple Active Regions (one per notebook page), but each share the same Area Id. Therefore, when a user taps on the Mute button on any page, the same Area Id is generated, which triggers the penlet code that activates the mute function. AreaId starts on 1 since the AreaId 0 is reserved for the system Crop region. See **Application Id**, **Region Id**, and **Instance Id**.

**Bundle:** Bundle files (.bnd) are containers for JAR, AFD, and other files. They also contain information (like group names and versions) that is used by smartpens for installation and updates. All Livescribe smartpen applications distributed to end users are installed as bundles through Livescribe Desktop. Livescribe requires that bundles be approved and signed before they can be distributed.

**Claimed Open Paper:** an expanse of dot paper that a penlet has claimed at run time by means of a **Dynamic Region**.

**Claiming:** The process by which a penlet associates a user Active Region with an expanse of dots in a paper product. When claimed, the dots become "active." Claiming can happen at penlet installation (for Static Regions) or during penlet runtime (for Dynamic Regions).

**Class Name:** The base class in a penlet that subclasses com.livescribe.penlet.Penlet. The class name links an Active Region in a paper product to the penlet.

**Custom Paper Product:** A paper product that contains pre-printed graphics (other than lines) on more than 15% of its surface Region.

**Data On Display:** The state of an application indicating it has some data to display to the user when the Livescribe smartpen goes into Notes Mode. This state allows the system to delay showing the Default Screen. For example, a calculator application might have some result (such as data on the display). The Data On Display state allows the system to write out the result without activating Notes Mode.

**Default Screen:** This is the screen that is shown on the display when no application owns the display.

**DFU:** Device Firmware Upgrade. The process of upgrading the Livescribe smartpen firmware. This process is also known as flashing the Livescribe smartpen.

**Dot Paper:** Physical paper with predefined Livescribe dot pattern printed on it.

**Dots:** Navigation points printed on dot paper that allow the Livescribe smartpen to know its own location on the paper. Developed by Anoto, Inc.

**DRM:** Digital Rights Management.

**Dynamic Region:** An Active Region created during run time on Open Paper in response to user interaction with the Livescribe smartpen. The penlet creates dynamic regions that encompass the written input and can be tapped on like a “paper button” to trigger behavior in the penlet. For example, in Piano, the user creates dynamic regions when drawing piano keys and rhythm and instrument buttons. In Paper Replay, the user creates dynamic regions as the user takes notes during a recording. Later, the user taps on a note and the associated point in the audio starts to play. See **Open Paper, Active Region, Static Region, Claiming, Linking,** and **Fixed Print.**

**Fixed Print (FP):** Refers to a region of dot space on a Livescribe page that is pre-claimed by a Livescribe smartpen application during application development. No other application can claim these Regions dynamically at runtime. Usually, printed graphics on the page identify these Regions to the Livescribe smartpen user as “paper controls” for operating the application. Fixed Print regions can also pre-claim Active Regions for interpreting strokes. **Open Paper, Active Region, Static Region, Claiming, Linking,** and **Fixed Print.**

**Fixed Print Application:** An application that owns one or more Fixed Print (static) regions. The region is defined during the development of the application. Tapping on one of the static regions activates the application. An FP application can also be

activated from the Main Menu system. All FP applications *must* be bound to a Paper Product via its AFD file.

**Flashing a Livescribe smartpen:** See DFU.

**FP:** See **Fixed Print**.

**GFX File:** Anoto dots for page(s) and reference to background image in Resources. A component of an AFD (Anoto Functionality Document).

**ICR:** Intelligent character recognition (handwriting recognition).

**Info File:** Creator, version info, and so on. A component of an AFD (Anoto Functionality Document).

**Instance Id:** A 16-bit number to specify locally in a smartpen which application is running, and which instance of that application is running. The Instance Ids are assigned by the system either on installation of an application or when that application is started. The Instance Id for a specific application varies between different smartpens depending on user actions and what order the applications are installed. There may be multiple Instance Ids for the same application. For example, each Piano drawn on paper is a new instance. See **Application Id** and **Region Id**.

**JAR:** Archive file of Java classes for a Livescribe smartpen penlet. A component of an AFD (Anoto Functionality Document).

**Linking:** The process by which a paper product's AFD is associated to one or more. Linking is done by the developer in the Paper Designer by adding applications to the paper product's application list.

**Livescribe Desktop:** The computer component of the Livescribe Platform. Livescribe Desktop that allows you to transfer, store, search, and replay notes from your computer. You can also upload your content to the Web, and manage applications and content on your Livescribe smartpen.

**Livescribe Online:** The web community of Livescribe smartpen users who post and share smartpen content.

**MIDlet:** A Java application conforming to the Mobile Information Device profile.

**myLivescribe profile:** 250MB of personal space a Livescribe smartpen user is allotted at Livescribe Online to store and share notes.

**Nav Plus:** A pre-printed or hand-drawn plus sign that lets you navigate your Livescribe smartpen applications and files via the Menu system. Nav Plus controls are pre-printed on Livescribe paper products, on the USB mobile charging cradle, and elsewhere. Users can create these dynamically on any unclaimed dot space by drawing a cross and double tapping on the center of the cross.

**Note Pad:** A collection of sheets of Open Paper, in which each sheet may have pre-printed graphical materials on no more than 15% of its surface Region (such as controls and tool bars), excluding ruled lines, grids, and page numbers which may appear on all or any part of the surface Region.

**Notebook:** Either a dot paper notebook or a Digitized version of one that the Livescribe smartpen can interact with and that Livescribe Desktop can recognize and interact with.

**Notes Mode:** The state of the Livescribe smartpen system in which no applications are running and the system is just capturing strokes written by the user on dot paper. The Livescribe smartpen shows the Default Screen when the smartpen is in Notes Mode.

**OLED:** Organic Light-Emitting Diode. A display technology that requires no backlight and draws far less power than LCDs. The Livescribe smartpen has an OLED display that is 18 x 96 pixels.

**OP:** See **Open Paper**.

**Open Paper (OP) Application:** An application that can dynamically claim Open Paper regions during runtime. OP applications are not bound to any Paper Product's AFD file, allowing the application to use any unclaimed dot space. Once OP applications are launched (by the Main Menu or through some other gesture) the application may create dynamic regions for input UI controls.

**Open Paper (OP):** Sections of a Livescribe dot page that are not currently claimed by a Livescribe smartpen application, but are available to be claimed at runtime. When a user runs an application and writes on the dots, the currently active application can claim them. In general, a surface, or a portion of surface that is printed with parts of the dot pattern and on which no pre-printed materials other than ruled lines, grids, or page numbers appear. Open Paper has an Area Id of 0. When the system detects actions on Open Paper such as penDown, a Region Id with an Area Id of 0 is passed to the appropriate event handlers.

**Page Viewer:** Livescribe Desktop mode that allows users to view individual pages or sets of thumbnails of pages from their Paper Sources.

**Page:** Single piece of either dot paper (loose-leaf or bound), or the digitized version of one that Livescribe Desktop can recognize and interact with.

**Paper Button:** So called because it resembles an onscreen button in a standard computer application. A Livescribe smartpen user can tap on a paper button to trigger particular functionality of the penlet.

**Paper Product Developers:** A team of developers that typically create one or more Livescribe dot enabled files used to print active paper. Typically, this team includes: graphic/production artists to create the layout and art for the paper and a Java developer who maps the paper art to static regions associated with the penlet application – a process called “shaping”.

**Paper Product Only Application:** Consists of paper definitions and the physical paper created by printing with these definitions. Paper products are installed on a Livescribe smartpen (without penlet code). This paper is designed to interact with pre-existing penlet code on the Livescribe smartpen. For example, a publishing company might want to create new notebooks for Livescribe, branded with a special background image.

**Paper Product:** Any open paper or note pad printed with any part of the dot pattern and that are used along with a penlet in an application. In general, the definitions and resources required to identify and print dot paper. Paper Products are represented electronically to Penlets and Livescribe Desktop as Anoto Functionality Documents (AFDs). See also **Custom Paper Product**.

**Paper Replay:** Livescribe smartpen application that records audio (such as a lecture) at the same time that the user takes notes on Open Paper. Paper Replay synchronizes the notes with the recorded audio. Later, the user can tap on a note and play the audio that was recorded while that note was being written. The notes are considered indexes into the audio stream.

**Paper Source:** Any of the real-world or virtual paper sources that Livescribe Desktop can recognize and work with, including notebooks and journals.

**Pattern Page:** Identified by a page address: segment.shelf.book.page. For example, 1.2.3.4 denotes pattern page 4 in book 3, which is located on shelf 2 in segment 1.

**Pencast:** A type of content sharing via the web.

**Penlet Developers:** Java programmers who create the penlet application using the Livescribe Platform Java API and an IDE.

**Penlet:** Java application installed on the Livescribe smartpen. Penlets are created using the Livescribe Platform Java API and are based on the Java Platform, Micro Edition (Java ME) and CLDC (Connected Limited Device Configuration). When a user taps (a penDown event) on an active region of a penlet, it will de-active the current running penlet and activate the new one. See **Syslet**.

**Quick Commands:** A series of commands you can write on dotted paper to quickly learn the current status of your Livescribe smartpen.

**Quick Record:** A method of quickly recording with your Livescribe smartpen. Activate Quick Record by pressing and holding your smartpen power button for two seconds.

**Region Collection:** A collection of regions on a single page of dot paper.

**Region Id:** An internal 64-bit number that uniquely identifies an Active Region to a smartpen. The Region Id encodes: Area Id, Instance Id, Occlusiveness, and Z-order, among other things.

Region Id: An internal 64-bit number that uniquely identifies an Active Region to a smartpen. The Region Id encodes: Area Id, Instance Id, Occlusiveness, and Z-order, amongst other things. An Active Region is a portion of paper. Active Regions may overlap in which case their Z-order defines the ordering of events delivered and their occlusive property defines whether active regions with lower Z-orders are processed at all.

**Region:** See **Active Region**.

**Resources:** Images and audio files used by a penlet. They are included in the project and are packed into the JAR when the penlet is built.

**Session:** (in Paper Replay). The audio (with or without linked notes) that is recorded between the time the user taps Start and Stop on the Paper Replay paper controls. Also known as a **Paper Replay Recording**.

**Share:** Upload file(s) to online account (myLivescribe), presumably for sharing with others.

**Smartpen Application:** The combination of a penlet and Paper Product that enables a Livescribe smartpen to interact with dot paper.

**Smartpen Movie:** An animation that plays on the Livescribe smartpen's OLED.

**Smartpen:** The Livescribe™ smartpen, and subsequent generations of smartpens, sold by Livescribe.

**Static Region:** An Active Region specified by the developer in the paper product definition (see **AFD**). The dot paper usually has a printed graphic to indicate the location and usage of the static Region. For example, the Paper Replay control bar at the bottom of each page in a Livescribe notebook is implemented as a group of static regions. See **Active Region**, **Dynamic Region**, **Claiming**, **Linking**, and **Fixed Print**.

**Syslet:** A special kind of system-level penlet that provides system-level functionality for menuing and volume control. Unlike normal penlets, when a penDown occurs on a Region ID of a syslet, the currently active penlet does not lose focus. See **Penlet**.

**TTS:** Text to Speech.

**UGC:** User Generated Content. Data generated by a Livescribe smartpen user. This information can be shared with the Livescribe Online community.

**USB Mobile Charging Cradle:** The included cradle that charges and connects your Livescribe smartpen to your computer.

**User Input:** The most common way for users to enter commands and data to a penlet is by writing or tapping on paper. User input is captured through smartpen events (such as penDown and strokeCreated) which are handled by a penlet.

**Virtual Notebook:** Collection of digitized pages gathered into a notebook that does not necessarily have a physical paper counterpart.

**Virtual Page:** Collection of ink or audio or both, gathered from other pages, collected into a digitized page that does not necessarily have a physical paper counterpart.

**Web Services:** A comprehensive set of on-line services to support users, developers, and Livescribe smartpen partners.