Level: Intermediate
Works with: LD Everyplace
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Knowledge
in the palm of your hand

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It's easy to fall in love with Lotus Discovery Server. After you've used its knowledge management features such as search, people location, and K-map, you'll consider them essential for organizing and making sense of your corporation's repositories of information. But in these mobile times, people often find themselves away from the office—and away from the software tools they've come to rely upon. Wouldn't it be great if you could somehow take Discovery Server on the road with you? For example, imagine you are meeting with a customer and a question comes up about a product related to the one you are trying to sell. You know you have seen this information in Discovery Server. If only you had that information with you…well, now you can.

LDS Everyplace is a program that you can download from the **Sandbox**. With LDS Everyplace, you can quickly navigate and search a selected subset of Discovery Server content, including documents and people profiles, from any Palm OS-based (PDA) device, including Visor and Sony. You do this by taking "snapshots" of your most valuable Discovery Server information, which you can later view while on the road and disconnected from the network.

LDS Everyplace lets you:
- Navigate and browse the complete K-map
- Subscribe to LDS categories to locally download content (document summaries, people profiles)
- Download full versions of selected documents
- Perform fast, high quality search on local content
- Subscribe to search queries that broaden your local content Discovery Server search results
- Copy items to the Palm clipboard, Address book, and memo pad
- Beam items to other PDAs

To use LDS Everyplace, you must have the following:
- Palm OS hand-held device running Palm OS 3.0 or later, or a Visor or Sony PDA
- Palm HotSync Manager version 3.0 or later installed
- Desktop PC running Windows NT/95/98/2000

This article describes LDS Everyplace and examines its major components and how they work together. It also explains how to install and use Discovery Server features. Finally, it offers a sneak peek at possible future enhancements.

For this article, we assume you're an experienced user of PDAs and know how to use standard PDA features such as the HotSync program. You should also be familiar with Discovery Server features and terminology. You can view Discovery Server information on the **LDD Discovery Server page** and examine the **Discovery Server documentation** in the **Documentation Library**.

How LDS Everyplace works

LDS Everyplace uses the KDS API Toolkit and consists of two applications. One runs on your PDA, and the other runs on your desktop PC.

- The PDA application includes the interface for using Discovery Server features on your Palm OS-compliant device. This is the front-end component of LDS Everyplace. This application uses standard Palm databases (PDBs) to store and access Discovery Server information. There are separate PDBs for categories, documents, and people. Several additional databases track subscriptions and user preferences. The PDA application is written in C.
- The desktop application (sometimes called simply *the desktop*) includes the replica refresh client, settings dialog box, and a "conduit" program invoked by your PDA's HotSync Manager. This is the back-end piece of LDS Everyplace. This application reads user requests from the PDA during synchronization and contacts Discovery Server to load the requested items. At the end of the synchronization process, the updated data is saved to the PDA in PDB files. The desktop application also identifies new and modified items and marks them as such for the New Items view. This application is written in Java.

PDA and desktop application features are described in more detail later in this article.

In simple terms, the PDA communicates with the desktop, and the desktop communicates with Discovery Server. This helps minimize the amount of processing done on the PDA. Note that you do not have to install any additional software on Discovery Server itself to use LDS Everyplace. The desktop communicates with Discovery Server by using the standard API that ships with the product.

The basic process for using LDS Everyplace is:

1. Install the LDS Everyplace program files on your desktop PC. During this step, you'll be asked whether you want to connect to the Discovery Server. We recommend you do this to load the Discovery Server K-map locally on your desktop. (This K-map provides a snapshot of the content on your Discovery Server.)
2. Connect your PDA to your desktop and synchronize it by tapping Sync on the PDA. This installs the LDS Everyplace application on your PDA, as well as the Discovery Server K-map.
3. Tap the LDS Everyplace icon on your PDA to display the K-map.
4. Browse the K-map. As you do this, you can mark categories and documents you want to load locally. (This process is called *subscribing*.)
5. Synchronize your PDA again. The desktop contacts Discovery Server, retrieves the categories and documents you subscribed to, and loads them on your PDA along with any updates to the Discovery Server K-map.

You can now browse, read, and search the selected categories and documents on your PDA. To make further updates on your PDA, you simply repeat steps 4 and 5.

What can you do with LDS Everyplace?

As mentioned previously, LDS Everyplace consists of two applications, one that runs on the PDA and one that runs on your desktop. Most of the setup and maintenance work is done on the desktop. In fact, you must install the desktop software before you can use LDS Everyplace—it's the desktop application that loads the PDA application onto your hand-held device. However, the PDA application includes the interface for all the really interesting user features, so we'll describe them first.

For example, LDS Everyplace provides an overview of the K-map and data stored on your Discovery Server. You can load the entire K-map on your PDA when you first install LDS Everyplace and synchronize it. A simple and intuitive user interface, shown in the following screen, allows you to "stroll" along the K-map. For each category, its subcategories are displayed as well as an indication of the number of documents and people that are associated with the category.

Subscribing to categories and documents
Because of the obvious space limitations, it's not feasible to store all of your Discovery Server content on a PDA. Fortunately, LDS Everyplace lets you select only the content most relevant and important to you. The subscription feature lets you specify the documents and categories you need, ensuring that only the minimal data you require is on your PDA at any given time.
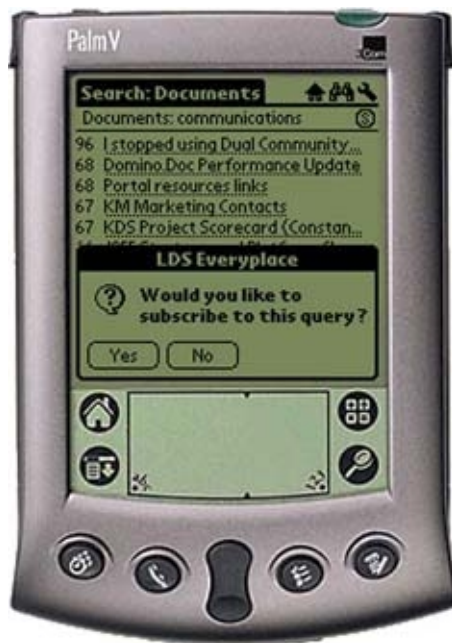
Subscribing is simple: Display the K-map on your PDA, highlight the category or document you want to subscribe to, and then tap the S icon in the upper-right corner of the screen. When you next synchronize your PDA, LDS Everyplace will process your subscription requests as follows:

- Categories
  The desktop downloads summaries of all documents, as well as user profiles, contained in the category. Note that the entire content of the documents is not loaded, only short summaries. You can read the summary to determine whether this is a document you want to load onto your PDA.
- Documents
  The desktop downloads the complete document from Discovery Server and places it on your PDA.

Once you subscribe to a category or document, you will always have the latest version on your PDA. LDS Everyplace continuously monitors this category or document and downloads updates from Discovery Server as they become available.

Searching and subscribing to queries
In addition to browsing the K-map, you can also search downloaded Discovery Server content on your PDA. To do this, tap the binoculars icon on the main LDS Everyplace screen. You will then see the results of your search:

When you view the search results, you can tap on the S icon to display a prompt asking you whether you want to subscribe to this query. If you answer Yes, this search query will be passed to the desktop the next time you synchronize your PDA. The desktop will then search the full Discovery Server content and display the results of the search on your PDA. In this way, you can effectively search Discovery Server from your PDA (although not in real-time of course). Note that as with category subscriptions, you can instruct LDS Everyplace to execute your search query every time it syncs with Discovery Server and to download any changes to your PDA.

You can create four types of queries by searching:
- Categories
- Documents
- People
- Everything that matches your query

LDS Everyplace also offers one-click access to previously issued queries and the highlighting of matched words within the search results.

Internally, LDS Everyplace uses Pirate Search, an advanced full-text search application for PDAs. Pirate Search was developed by the Information Retrieval group at the IBM Haifa Research lab in Israel. Pirate Search technology consists of two main components:
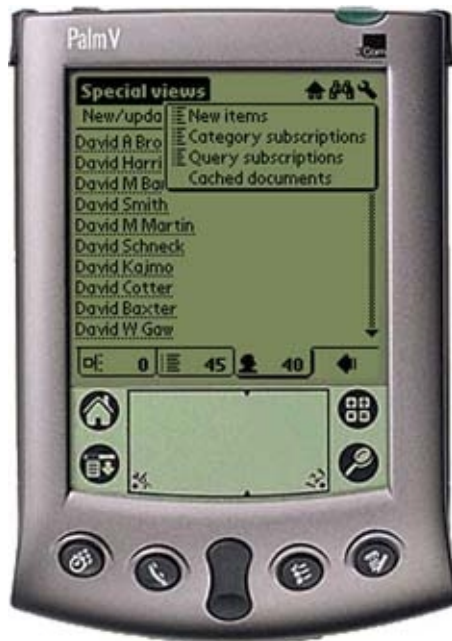- Desktop-based indexing, which builds full-text indices of textual content
- PDA shared library, which makes use of the indices to provide fast and accurate search capabilities on the PDA

For more information, see the **Pirate Search home page**.

Staying up-to-date: the New items view
Each time you sync your PDA (which in turn launches the LDS Everyplace desktop application), the Discovery Server information stored locally on your PDA is updated to reflect changes made on the server. These changes may include new categories that have been added to the Discovery Server or there may be new data in any of your subscribed categories, documents, or queries. Also, any outstanding new subscription requests are executed.

To help keep track of this new information, LDS Everyplace offers the New items view. This view shows all the new content (documents, categories, person information, and so on) that has been loaded onto your PDA during this session. To see the New items view, tap the wrench icon and select New Items from the Special views menu.
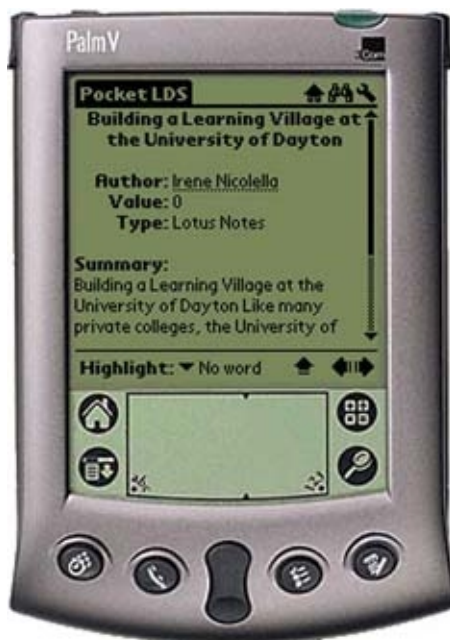
Other special purpose views allow you to quickly access and manage category, query, and document subscriptions.

Other LDS Everyplace PDA application features
In addition to the features we've just discussed, the LDS Everyplace PDA application offers the following features:
- Document summary and person profile views to display information about documents/people associated with subscribed categories. The document summary includes the title of the document, author, value, type, and summary.

If the author is included in the local snapshot, you can tap on the name and open the corresponding person profile view. The person profile view includes the name, title, location, department, and phone number of the person. The person's affinities are also listed. Tap on any of the affinities to open the corresponding category.

- A Full document view, enabling you to read the entire content of subscribed documents.
- Intuitive navigation through the view history using back and forward arrows. The back arrow takes you to the last screen you viewed, while the forward arrow takes you forward in your view history. The forward arrow only appears once you have taken at least one step back in the view history.
- One-click navigation to the home category and to the parent category from anywhere within LDS Everyplace. Tap the house icon to return to the home category from any view.
- Counters displaying the number of items belonging to each category. These counters apply both to items residing locally on the PDA and items on the server. Server counters help you determine how much information will be downloaded to your PDA when you subscribe to the category.
- Visual cues identifying categories that contain local data.
- Copy and paste to the PDA clipboard. This option is available from the LDS Everyplace main menu. You can copy selected text into the device's clipboard and then later paste it into other applications.

Also, LDS Everyplace is integrated with several standard PDA features. These include:
- The ability to add a document into the Memo pad by opening the document view, tapping Edit, and then selecting Add document as a Memo. This document will now be available as a memo from your PDA's Memo pad.
- The ability to add a person to the Address Book by opening the person's profile and selecting Add person to Address Book. This person's information will now be accessible from your PDA's address book. The name and phone number are taken from the person profile.
- The ability to beam a document or person profile to your colleague's PDA application. To beam a document, open the document view, tap Edit, and then select Beam document to Memo. This document will be beamed to the device it is aligned with and will be available from the Memo pad. (For more information about the beam feature, see the documentation that comes with your PDA.)
- Context-sensitive help, available at any time from the Options menu.
- Consistency checking to verify that the previous sync operation ended successfully.

For more information on these and all other LDS Everyplace PDA features, consult the online Help that comes with the product.

The LDS Everyplace desktop application

The desktop application certainly isn't the glamorous part of LDS Everyplace, but it's a critical component. The desktop communicates with Discovery Server, loading and processing Discovery Server information and making it available to your PDA. By doing all the heavy lifting, the desktop helps ensure the amount of processing done on the PDA is kept to a minimum. In effect, the desktop serves as the middleman between your PDA and Discovery Server.

As mentioned previously, the desktop application consists of three programs:

- The conduit program runs when you synchronize the PDA. It manages the flow of information between your PDA and the desktop. It is responsible for handling new requests (such as category and document subscriptions) made on the PDA since the last synchronization, and updating your PDA information accordingly. By default, the conduit connects to Discovery Server during each synchronization session and performs a complete refresh of the local Discovery Server information.
- The Settings dialog box lets you control how LDS Everyplace runs. These settings help determine which Discovery Server to connect to, how information is loaded from Discovery Server to the desktop, and how desktop data is loaded on the PDA.
- The refresh client lets you maintain the "freshness" of the local Discovery Server information. The client is your primary interface for connecting to the Discovery Server to obtain the latest versions of documents, K-map, and other items. The refresh client usually runs during HotSync sessions, but you can also run it standalone by clicking the Start menu and then choosing Programs - LDS Everyplace - Refresh LDS Everyplace data.

For more information on the conduit, the settings dialog, and the refresh client, consult the on-line Help that comes with LDS Everyplace.

Installing the desktop application
To use LDS Everyplace, you must first install and set up the desktop application:
1. On your desktop PC, download the Discovery Server software from the **Sandbox**.
2. Unpack the files and run the install program.
3. Follow the online installation instructions. During this process you will be asked to:
   - Select the PDA on which LDS Everyplace is to be installed. LDS Everyplace can only be used with a single PDA.
   - Specify your connection settings, including your Discovery Server's Internet address and your Discovery Server user name and password.
4. Select whether or not to connect to Discovery Server during installation. (We recommend you do this.) If you choose to connect, the Discovery Server K-map is loaded from Discovery Server to your desktop. If you select not to connect, an empty K-map is created. The complete K-map can later be loaded from the server when you synchronize your PDA or when you run the refresh client.

Running the desktop application
After you install the desktop application, it will launch every time you synchronize your PDA. You can also start up the desktop application manually from the Start menu.

One of the primary purposes of the LDS Everyplace desktop application is maintaining up-to-date Discovery Server information for the PDA. For example, when you first install and run the desktop, you can instruct it to make a copy of your Discovery Server's K-map. The desktop then stores this K-map locally. When you subsequently synchronize your PDA, the desktop loads the K-map onto the PDA. Bear in mind that only the K-map itself now resides on the PDA; the documents listed in the K-map do not. (This would require far more memory than you're likely to have available on the PDA.) As you browse the K-map on the PDA, you select categories and documents to subscribe to. When you next synchronize your PDA, the desktop reads your subscription requests, contacts Discovery Server, and loads the requested information onto the PDA. At the same time, the desktop updates its local K-map to ensure it matches the server's current K-map.

By handling all direct client/server transactions, the desktop helps give the PDA the best of both worlds: You can see the entire K-map, but you don't have to load every document in it onto the PDA, only ones you select.

The desktop also handles search requests. You can perform two kinds of searches with LDS Everyplace. You can search the content on your PDA, or you can search the full set of Discovery Server content. To do the latter, you enter a search request subscription on the PDA. Then when you synchronize your PDA, the desktop reads your search request, connects to Discovery Server, and searches the full set of content. The desktop then passes the search results to the PDA where you can examine them.

You also use the desktop to change connection settings and to select an appropriate sync policy. For example, to validate the connection settings:
1. Run the desktop application by clicking the Start button on your PC and selecting Programs - LDS Everyplace - LDS Everyplace Settings. This displays the Configuration dialog box.
2. To validate your connection settings, click the Test button on the Connection Settings tab.

The Refresh Policy tab in the Configuration dialog box determines the speed of the HotSync operation.

If your network connection is very fast and/or you're not pressed for time, selecting a refresh policy of "Retrieve all items" is most convenient. But if you need a faster sync operation, select "Retrieve only newly requested items" and perform a manual refresh on a regular basis (for example, once a day).

The desktop application has many additional features, most of which happen behind the scenes but are nevertheless useful for LDS Everyplace operation (especially in cases where error conditions are reported). These features include:
- A locking mechanism to prevent conflicts between a sync operation and a manual operation
- Consistency problem detection and recovery
- A logging mechanism for efficient problem tracking

For more information about running and configuring the desktop application, see the LDS Everyplace online Help.

What's in store for LDS Everyplace?

While LDS Everyplace is already a versatile application that empowers mobile knowledge workers, we're looking at several possibilities to develop this product further. Possibilities include:
- Porting LDS Everyplace to additional platforms, such as the Pocket PC
- Scheduling automatic server refreshes
- Supporting full document viewing for additional document formats
- Developing the desktop application to further support subscription management
- Adding memory estimates so that users know in advance if added subscriptions can fit on the PDA
- Creating subscription suggestions based on user profiles
- Enhancing the New items views

- Adding an import/export utility to easily create and distribute predefined snapshots of Discovery Server information

In the meantime, we hope you'll find LDS Everyplace a useful and important tool for extending Discovery Server features beyond the confines of the office. Please give it a try, and let us know your experiences!

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Aya Soffer is a Research Staff Member at the IBM Research Lab in Haifa, Israel, where she manages the Information Retrieval (IR) group. Her group is involved in the development of several knowledge management solutions for IBM products. In particular, the IR group is developing alternate client interfaces for the Lotus Discovery Server. Aya received her MS and PhD degrees in Computer Science from the University of Maryland at College Park in 1992 and 1995, respectively. Before joining IBM, she was a research scientist at NASA Goddard space flight center, where she worked on digital libraries for earth science data. Aya has published over 25 papers in referred journals and conferences. Her research interests include information retrieval, pictorial information systems, link analysis, multidimensional indexing, and nontraditional database systems.

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