

Database Synchronization of Mobile-build by using Synchronization framework

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Abstract-This paper proposes synchronization of mobile database with server database using Microsoft Synchronization Framework. It is a platform for data synchronization developed by Microsoft which is used to synchronize multiple data stores. The Sync Framework lists the each item in a data store which was recognized by an item Id. The Sync services create the session object for the synchronization session. This session synchronizes the data across source data store and destination data store (synchronization providers). The session object gets the instances of both providers. During Synchronization session, the destination provider throws the changes that have been made in the data store. The source provider compare the destination data store with the change set in the source to catalog the variation then passes it to the destination. The destination provider ensures the modification should not clash and combine the changes made in source provider and update the destination data source. To propose this method I have used staff and student model. Student application was installed in mobile then it was synchronized with server database by using this method.

Keywords - sync(synchronization),server database , mobile database, sync agent, sync provider.

I. INTRODUCTION

As modern progression in mobile based technology and equipment leads to the emergence of new computing environment and different types of small sized mobile devices such as smart phones, PDAs (Personal Digital Assistants), HPCs (Handheld PCs), Pocket PCs and Tablets etc become more popularized. Hence processing of business information is started to accessible by using mobile devices and its technology. As a user result, business models that rely on mobile technologies are emerged.

But mobile devices do not have much computing power. As well as it is difficult to access constantly with the network because of narrow level bandwidth. Therefore, processing of large amount data and constant relationship with the server-side database become complicated. Due to these reasons mobile devices has mobile database to facilitate stable data processing.

Using a synchronization device the replications of limited data from associated server-side database has been downloaded to mobile devices which has constant wire communication. Mobile devices use the downloaded data to process various tasks in offline mode. It is critical for mobility support to work on the disconnected network. In such case, there may incompatible between mobile database and server side database. These data inconsistency are solved by synchronization techniques and it guarantees the integrity of data. As a result Synchronization becomes essential subject for mobile device computing environment.

In this paper Microsoft Synchronization Technique are used to synchronize the mobile database with server-side database. This technique offers synchronization of any type of data store over any network. The mobile database was updated by synchronizing with server database.

The server maintains the information necessary for business; the mobile database downloads copies of data the user requires from the server-side database. The synchronization server is located between the two servers to do synchronize.

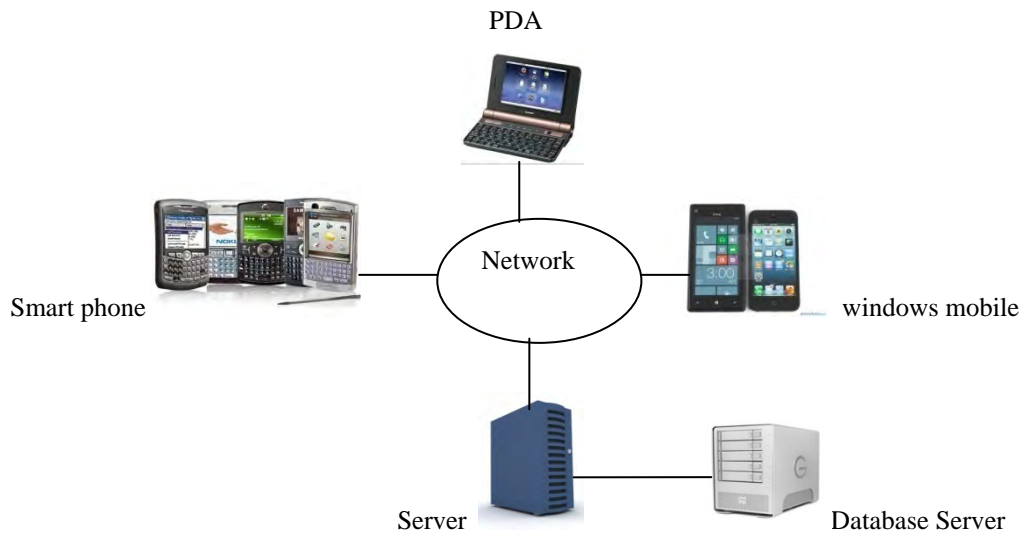


Fig 1: architecture

Existing system

In existing system, the synchronization was done by using message digest algorithm which compares the message digest values of particular rows in both server side database and mobile database. It is necessary to calculate the message digest values of both the servers to do synchronization. But in proposed system the server keeps the information about the current status of the data in mobile database.

Proposed Work:

This paper proposes synchronization between mobile database and server database. Due to this whenever the server database is updated, the mobile receive and updates its database by using Microsoft Synchronization service. The sync providers apply the changes that have been made in the server data store to their specific client system data store. It helps to transform the different schemas between the source and destination systems. In addition to the data store, it also provides some place to store the metadata required for synchronization.

The data is maintained on one host and discussed with two providers. It needs a communication channel to synchronize across the source and destination providers. WCF (Windows Communication Foundation) service is used as communication channel that writes a proxy provider that communicates with the actual provider. WCF is used to track the information, control the metadata and offers the security.

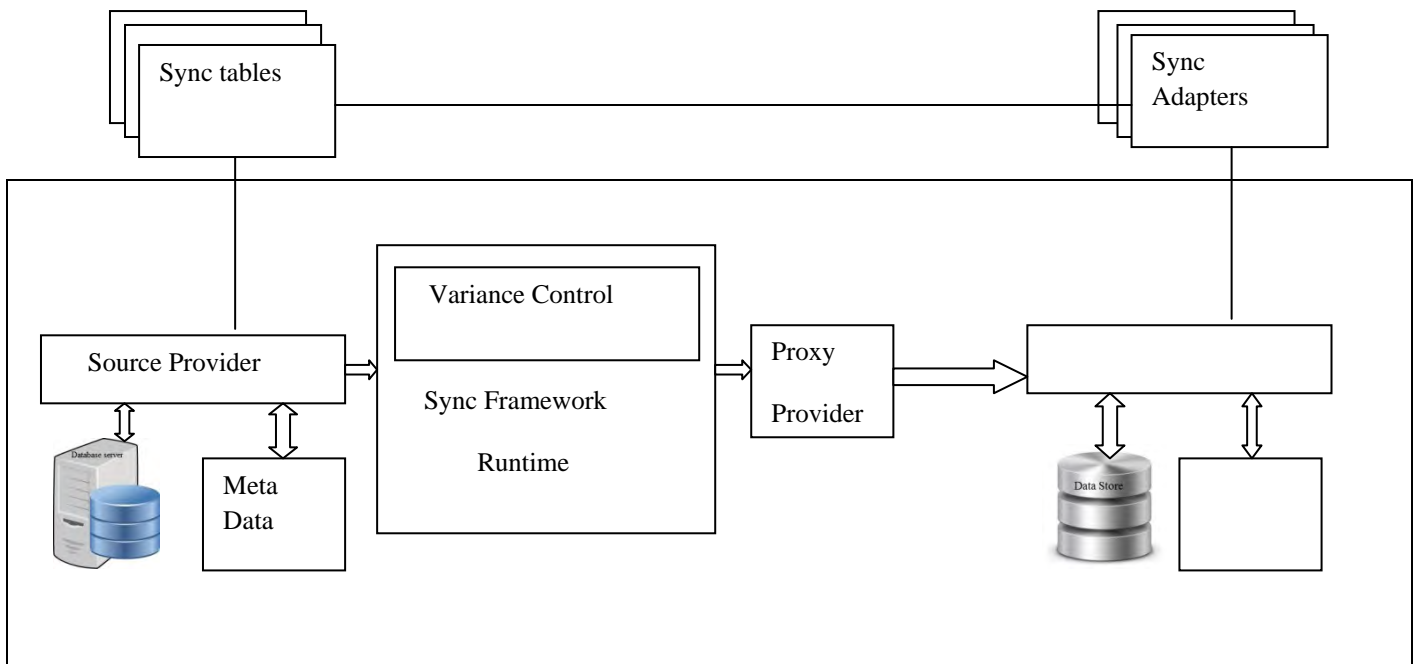


Fig 2: Sync Framework service

The sync agent operates at both the providers. Destination or client system has the data tables which is the copy of the server data table. If the synchronization is Bidirectional type the data can be updated at both client and the server, if the synchronization is download only type, it allows to make change data only on the server side. Sync groups are used to state the groups of tables that are analyzed and synchronized by using foreign key constraints.

The sync adapters are used to describe about the data should be synchronized and it enumerate which server database tables should be used and it holds metadata. The client system uses a local compact edition database and the sync tables to perform synchronization. During synchronization the sync agent downloads the schema from server and uploads the identical set of table in the client system and also transfers the changes between server and client database.

II. Microsoft Synchronization framework:

Microsoft Synchronization framework provides the synchronization platform to synchronize the applications, services and devices. Its synchronization supports any type of data store. Using its synchronization provider the information such as files, data, and media can be synchronized across devices and updates the information. The Providers maintains the status of the data store and synchronization metadata. Providers are used to list the items in the data store by using its identity (ID). By these Providers the data at the source and destination was synchronized.

By using this technique datasets of the source and destination data store was synchronized then persevere to the database server. This framework ensures the security of the data depends upon their synchronization.

PIM (Personal Information Management), Business application, Media Management software uses the Synchronization Framework. This framework provides powerful and flexible approach to synchronization. It automatically handles the conflicts and integrates the multiple data stores. It offers the filters to synchronize the data.

III. DESIGN AND IMPLEMENTATION

In proposes system Sync Services for ADO.net is used to do synchronization. This provider will allow synchronizing databases for remote data access (RDA). On the client side (RDA) it used SQL Server Compact Edition for storing the data.

In this paper, it was implemented in staff student model. The staff maintains the student records in the server and updates the information to student. The information such as result and marks. Student gets those updates and views the detailed information in their application. The student application and local compact edition was installed in mobile. Whenever the staff updates the information in the server database, the mobile databases are also updated by using synchronization techniques. During synchronization the sync agent downloads the server

schema and copies that server database in mobile and updates the table if any changes made in server database. Hence after synchronization the student can view their result from their mobile application.

Three modules are implemented to describe about the student- staff model/ System. They are:

1. Student/User
2. Staff
3. System Admin

Student/user:

1. To use the student application, every student is allowed to register freely at any time.
2. The student does register by specifying their details such as his/her name, address, department, unique ID (Roll number).
3. The staff also follows the same procedure to register them. After registration they will get the message/mail about his/her membership.
4. System admin maintains the information about the staff and validates their membership. The admin should decide about their validation.

Staff/ Decision maker:

1. Administrator does the validation of staff membership.
2. Every Staff has their unique ID and password with which, they will login to their site. The unique ID (Employee ID) was provided by administrator.
3. After login into their site, they can enter updates their details and they can view the list of student under their control.
4. When the staff selects the particular Unique ID of student, the corresponding details of the student will be displayed. The staff can upload results to their students.

System Admin:

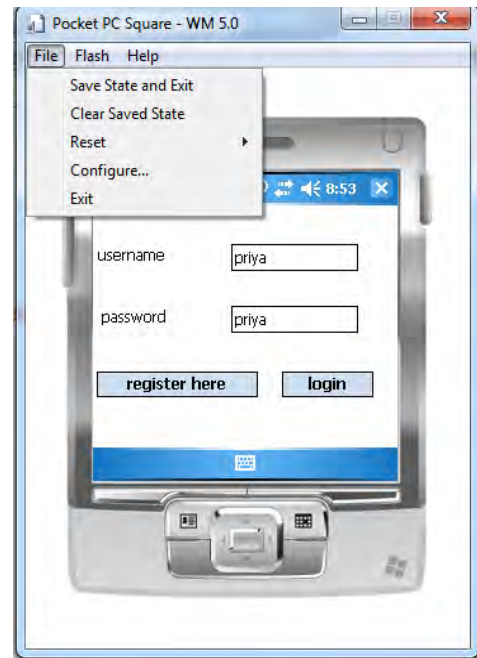
1. The Administrator will collect information about the staff like his/her department for validation.
2. The Administrator will send mail/message about their validation.
3. The Administrator will assign the Unique number (Employee Number) to the staff members.
4. By using that Unique ID the staff can login to their account.

The student application was installed in mobile. When the staff uploads the results in server, the mobile receives the message.

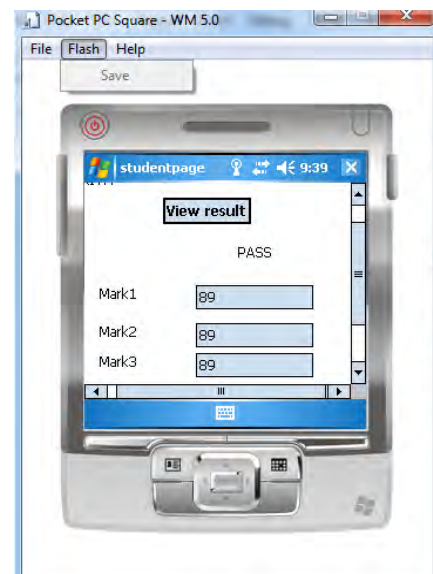
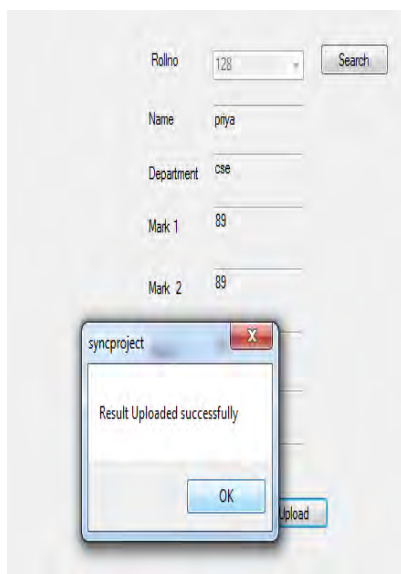
After synchronization of mobile database with the server database by synchronization techniques the mobile databases was updated and the student can views result in this installed application. If staff made any changes in their student information, it was then passed to the mobile application using synchronization service.

Sample Output Screens:

Student Application was installed in mobile in mobile. The sync agent copies the server database into mobile. Hence the students can access their account by their unique ID which was stored in the database. The staff details are maintained by the administrator at the server. Here is the sample output of the student application in mobile



When the staff uploads the result for their student in server database and the sync provider synchronize the server database and mobile database and updates the mobile database according to the changes made in server database then the student gets the alert message about the result and can view their result from their student application which was installed in mobile.



Conclusion:

This paper performs the synchronization for mobile devices. The Sync Framework merely uses the sync agent and providers to perform the synchronization process. This framework helps the developers to extend the synchronization application which leads to collaboration of data between any devices using any data source. By this method the mobile database was synchronized with server database and receives the updates from server.

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