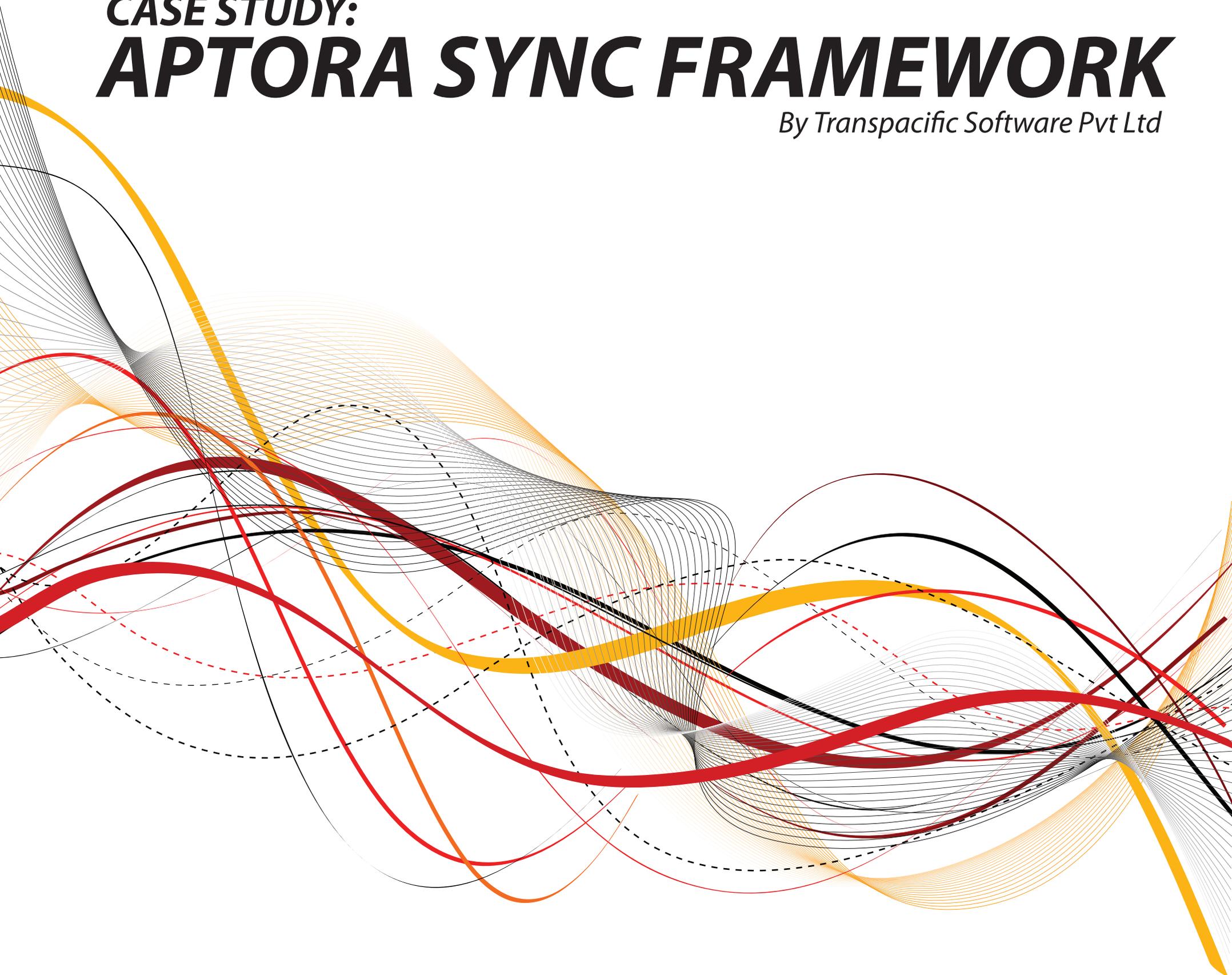# CASE STUDY:
APTORA SYNC FRAMEWORK

By Transpacific Software Pvt Ltd

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A pioneer in the service and contracting industry and producer of an award winning accounting and dispatching software, needed to overcome their limitations to work in an offline environment. They partnered with Transpacific Softwares PVT ltd, whose expertise in customized IT solutions met their need to create a reliable framework to do so. The end result came out as a new innovation to bridge the gap between offline and online working through data synchronization solution.

The Client

With a background in contracting, Aptora Corporation is an innovator in the field of HVAC software development. They have revolutionized the service and contracting industry with a wide product line that ranges from financial analysis software, heat load/gain software, GPS vehicle tracking, sales and marketing systems, CRM software, to flat rate pricing books, company policy manuals, service agreement forms, service invoices, sales proposal forms, safety manuals and more.

Graced as the creator of award winning accounting and dispatching software "Total Office Manager (TOM)" and the one of the best flat rate pricing software "Flat Rate Plus", they have also diversified as services providers in custom software programming, accounting & bookkeeping.

The Situation

Aptora Corporation had engineers working across the continent on various HVAC project implementation sites where they would be meeting clients, closing deals and making new customers. These engineers often had to work on their local machines like laptops, Notebooks, hand held devices etc in an offline environment due to uncertain online connectivity at such sites.

Aptora Corporation realized that updating this information to a central location was crucial with a view to integrate the data and make the most updated data available to their managers and executives as fast as possible enabling better business decision making .

Build sync enabled applications for offline and roaming scenarios
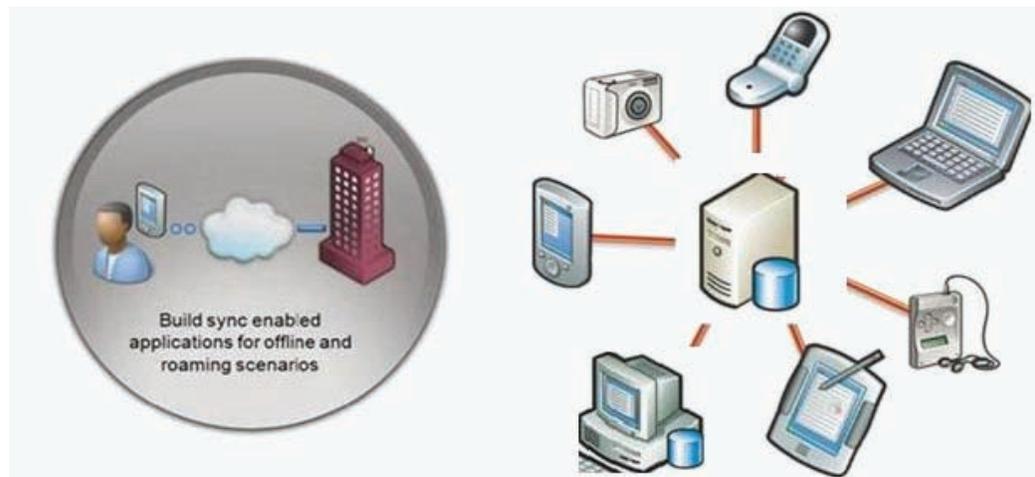
They thus came up with an idea of developing a bi directional comprehensive synchronization platform that enables collaboration of offline scenarios of Database synchronization for applications, services, and devices.

Highlights

Building a two way synchronization framework, in a client-server environment that enabled people to work offline, incorporated tight security measures and handled various conflict scenarios was a gargantuan task achieved by the team with considerable precision.

The Sync Framework enabled users to download files from the central server, work on them offline, and automatically synchronize with the main Server whenever they plug back into the network.

Leveraging over the "Last Writer Wins" concept, the framework efficiently tackled conflict scenarios.

The Sync Framework was capable to integrate any application, any type of data, using any protocol over any network.

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The Challenge

Aptora Corporation needed to synchronize their local machines with central location preferably a central Server Database. The major challenge in developing such a two way synchronization framework was to integrate any application, any type of data, using any protocol over any network. Getting synchronization right in all cases, in a client-server environment that enables people to work offline, and that incorporates tight security measures was a difficult work, and the testing scenarios could be extremely challenging.". Adding to the challenge was that executives generally worked in different time zones and would update the information to the central server as and when internet connection was available. Building up over such complex conflict situations both DB and file Synchronization were to be achieved.

Working Towards a solution

Aptora Corporation and TPS collaborated through a four week rapid inception process to identify, capture, model and prioritize the key requirements and understand risks and risk mitigation. The TPS team then worked to deliver the initial releases of the Framework.

Following the initial release and approval by the client, TPS team started looking at the bigger picture.

Basing the design on Hub and spoke topology with central Server acting as a single Hub supporting multiple client or spokes the team looked forward to achieve synchronization while maintaining data integrity.
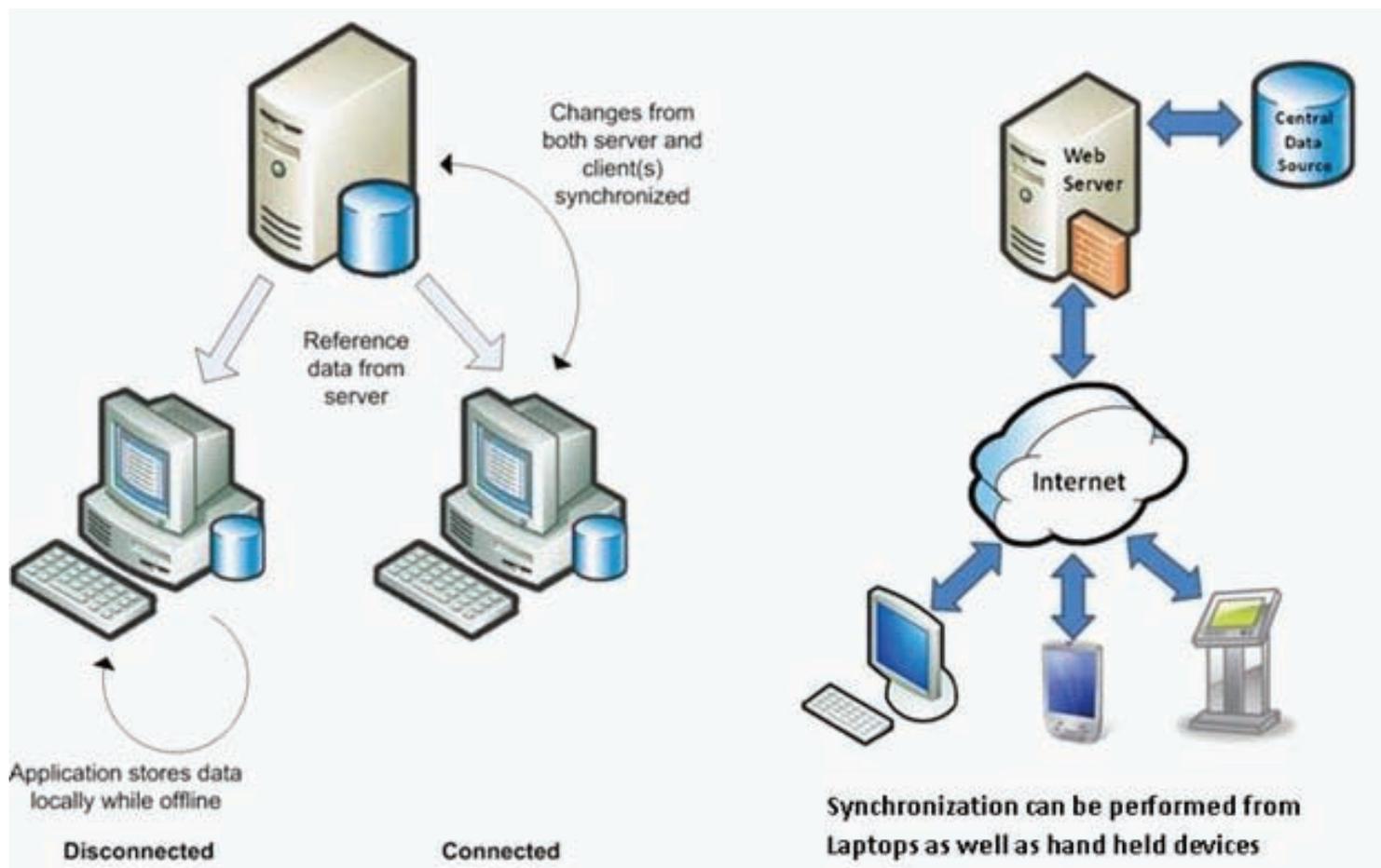
Leveraging over the "Last Writer Wins" concept, the framework efficiently tackled conflict scenarios. TPS team used .Net platform to make the framework flexible enough to enable collaboration and offline scenarios for virtually any endpoint without requiring changes to be made to the data store itself.

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The framework development process marked its success by achieving both DB and file synchronization without changing the existing structure of the client Database.
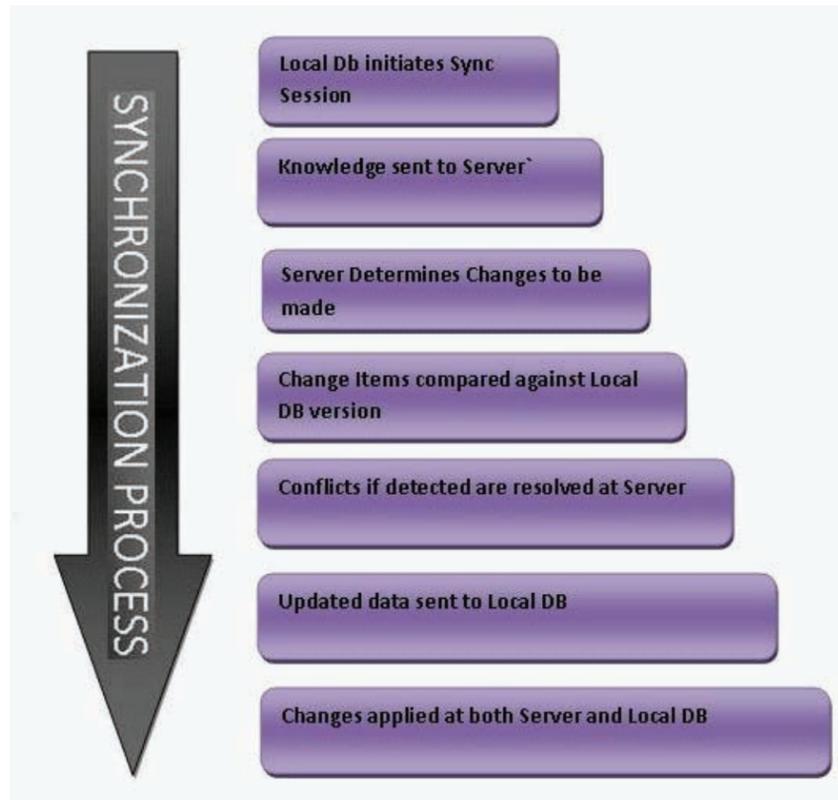
The Sync Framework enabled users to download files from the central server, work on them offline, and automatically synchronize with the main Server whenever they plug back into the network. This process was further streamlined by introduction of a Change tracking Mechanism.

The final framework supported data sources other than relational database, like an XML database or web service. Other features included batch Uploading, Encryption, Meta data store, Inline Tracking and Asynchronous tracking. The framework is also capable for synchronizing with Laptops, handheld devices (Palm OS, Pocket PC) etc.
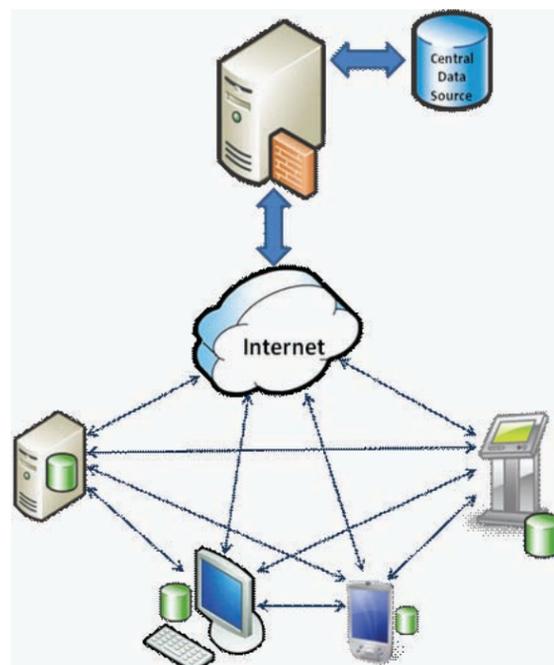

The Future

TPS is working towards developing a more powerful Synchronization model. This framework would have additional functionalities to enable peer-to-peer as well Full Mesh topologies. The framework would also support removable media such as flash drives, USB thumb drives, etc.

Peer To Peer Synchronization

Full Mesh Topology