I-Twin Technology

SEMINAR REPORT

Submitted by

ABHISHEK R

NCE19CS002

to

the APJ Abdul Kalam Technological University
in partial fulfillment of the requirements for the award of the Degree

of

Bachelor of Technology
In
Computer Science and Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE

PAMPADY, THIRUVILWAMALA, THRISSUR - 680 588

(Approved by AICTE, ISO 9001:2015 Certified, NAAC 'A'ACCREDITED,NBA ACCREDITED)

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DECLARATION

Undersigned hereby declare that the seminar report “I-Twin Technology”, submitted for partial fulfillment of the requirements for the award of degree of bachelor of Technology of the APJ Abdul Kalam Technological University, Kerala is a bonafide work done by me under super vision of Ms.Sruthy MR. This submission represents my ideas in my own words and where ideas or words of others have been included, I have adequately and accurately cited and referenced the original sources. I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. I understand that any violation of the above will be a cause for disciplinary action by the institute and the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed the basis for the award of any degree, diploma or similar title of any other University.

Place: Pampady

Date: **ABHISHEK R**

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CERTIFICATE

This is to certify that the report entitled, **I-Twin Technology** submitted by, **ABHISHEK R** to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of **Bachelor of Technology in Computer Science and Engineering** is a bonafide record of the seminar report carried out by her under our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Internal Supervisor **Seminar Coordinator** **Head of Department/vice principal**

ACKNOWLEDGEMENT

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(NCE19CS002)

ABSTRACT

USB flash drive is device that is used to store the data. Cloud storage is also used to store the data on the middle server. But the USB flash drive has the drawback that it is too small in size, because of that it can be easily misplaced or lost. In case of cloud storage data can be misused if the username and password is hacked by someone else. To overcome all these problems, i-Twin is the best solution. It is the secure USB device that can be used to access, share edit all the files and media between any two online computers anywhere in the world. It allows remote file access without any security and privacy risks.

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LIST OF ABBREVIATIONS

I – TWIN	: *Identical Twin*
USB	: *Universal serial bus*
PCS	: *Provincial Civil Service Examination*
VPN	: *Virtual private network*
AES	: *Advanced Encryption Standard*
MAC	: *Media Access Control Address*

CHAPTER 1
INTRODUCTION

For accessing the data while you are far away from your PC, there is one option that is to make use of high capacity USB storage device. But what if you told that, you could securely access your PC or any other computer while you are travelling on the road? iTwin is a device that connects to your PC and it allows you to access files and devices that are connected to your home network remotely.

It looks similar as USB device and it is designed by joining two halves. One half is connected to your house or office PC and you have to carry other half always with you. The part that you bring with you is used as a key for obtaining the connection to your PC when you are far away from your PC. When you connect another part of the iTwin device to your laptop when you are on the road, the device makes a Virtual Private Network (VPN) to your house or to the PC that you use in your office. iTwin is completely new file sharing and remote access device developed by a company named as iTwin. It is very similar like two ends of a cable, but is does not need the cable. It is simpler to use than a flash drive. It is just a plug and play device. With iTwin, it is possible to connect any two online computers located anywhere in the world.USB flash drive is device that is used to store the data. Cloud storage is also used to store the data on the middle server. But the USB flash drive has the drawback that it is too small in size, because of that it can be easily misplaced or lost. In case of cloud storage data can be misused if the username and password is hacked by someone else. To overcome all these problems, iTwin is the best solution. It is the secure USB device that can be used to access, share edit all the files and media between any two online computers anywhere in the world. It allows remote file access without any security and privacy risks.

iTwin is a revolutionary new file sharing and remote access device brought to you by a company called iTwin. It's like two ends of a cable, without the cable. It's as simple to use as a flash drive. It's literally plug-and-play. iTwin can connect any two online computers anywhere in the world. iTwin enables you to have access to any or all of your home computer's files and folders while you're on the go. Similarly, you can also use iTwin to access any or all of your office computer's files and folders while on the go. There's no in-built limit to the amount of storage you can access with iTwin while you're on the go. The only limit is the size of your hard drives. The only other "limit" is the speed of your Internet connection. The faster it is, the better your experience.

You can select files for accessing later on the go, or you can edit them remotely, without the files leaving your computer. You can also back up files to your home or office computer while you're out on the go. It's so easy, it's unbelievable.

iTwin is like two ends of a rod, without a rod. It is simple to use as a flash drive. It is exactly like plug-and-play. iTwin enables you to have access to your desktop files while you are traveling. Similarly, you can also use iTwin to access your office desktop's files while on the go. The only drawback is the speed of your internet connection. The faster it is better is your experience. You can edit files on your desktop remotely when you have access to the desktop. You can also backup files to your desktop or office desktop.iTwin is a Singaporean-based start-up that made it to the presentation stage at the TechCrunch 50 conference. The founders, Lux and Kal designed and implemented a product known as iTwin that allows plug play remote file access. So, we catch them both here to tell us their story, the product iTwin and its features, and also their next steps on the product.

CHAPTER 2

LITERATURE SURVEY

A literature review is an account of what has been published on a topic by accredited scholars and researchers. It includes the current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. Literature reviews use secondary sources and do not report new or original experimental work. A literature review let us gain and demonstrate skills in two areas, mainly, information seeking and critical appraisal.

2.1 Data On-boarding in Federated Storage Clouds

Cloud platforms[5] should fulfill the requirements for scalability and flexibility, allowing rapidly redeploying and moving resources. This is achievable for compute resources, but it is not common practice for storage. Existing storage clouds still do not allow true data mobility and cannot easily migrate their data across providers. The work "Above the Clouds" of Armbrust et al. [1], named the problem of "vendor lock-in" of the stored data to be the second among top ten obstacles for growth in Cloud Computing. The authors named the lack of standardized storage access APIs as one reason. Today, the Cloud Data Management Interface standard from the SNIA (CDMI [2]) exists. However, it lacks adoption by the larger cloud storage providers. In addition, applications generate so much data today that the resulting transfer time could require longer interruptions to services.

Our goal is to prevent vendor lock-in by introducing a special federation layer as part of the storage cloud infrastructure. Our approach covers three areas: (1) standard API and interoperability; (2) efficient and transparent data migration; and (3) system security and access control. To cover the first issue, we adhere to the CDMI standard, allowing for interoperability between CDMI-compliant storage providers. Second, we introduce the concept of on-boarding federation, allowing an enterprise to move its data from one storage cloud provider to another (e.g., due to economical, legal or functional considerations) while providing continuous access and a unified view over the data in the old cloud and the new cloud, and over data in transit. Our approach forms a federation between the clouds. The data is migrated by a background process without interrupting services. The third area is the access control architecture, which targets the federation of two autonomous access control systems protecting the data in the two clouds.

Here, we present an implementation over a VISION Cloud [3] system, which is an EU-funded project for a scalable and federated storage system providing content-centric access to its storage. In contrast to public cloud offerings such as Amazon S3 and Windows Azure Blob Storage, or specific hardware appliances, VISION Cloud stresses support for rich metadata as an integral part of the storage. As part of this project, partners also develop use case applications for telecommunications services, media production systems, healthcare services and enterprise applications.

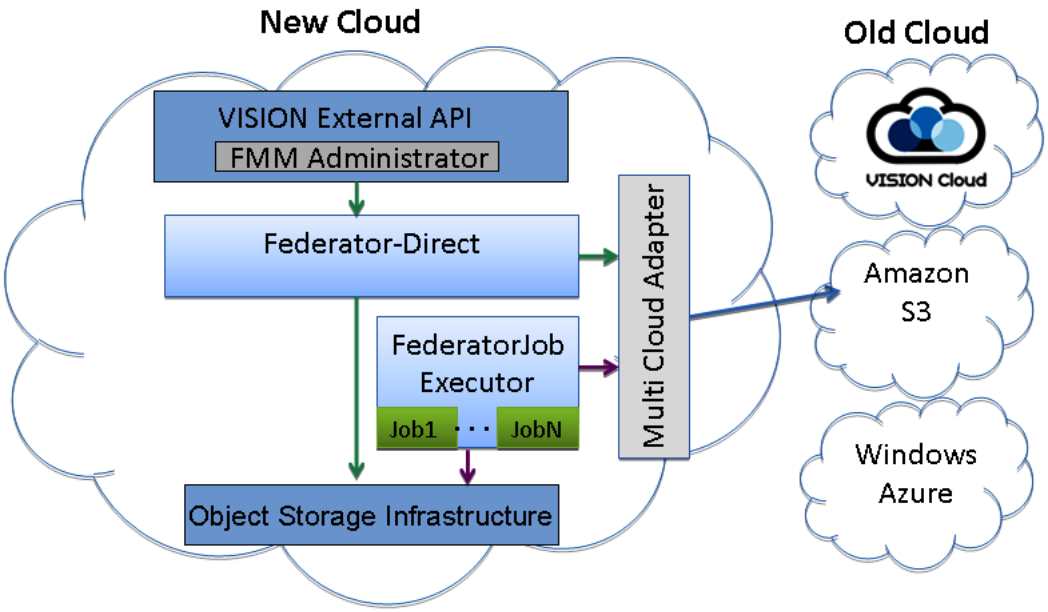

Figure 2.1: High Level Federation Components

2.2 i-Twin Technology

USB flash drive is device that[3] is used to store the data. Cloud storage is also used to store the data on the middle server. But the USB flash drive has the drawback that it is too small in size, because of that it can be easily misplaced or lost. In case of cloud storage data can be misused if the username and password is hacked by someone else. To overcome all these problems, iTwin is the best solution. It is the secure USB device that can be used to access, share edit all the files and media between any two online computers anywhere in the world. It allows remote file access without any security and privacy risks.

The iTwin Connect is a device similar to a USB flash drive but, is designed with two USB connections. The iTwin device is very dense and it establishes a secure connection between two computers or a secure connection between one computer and the iTwin server.

When you connect the iTwin Connect device to the main computer in your home or at office, the software is automatically installed configure the computer for remote connection.When the device is disconnected from the main computer, you have to separate the two parts of the USB ports which are separated in two separate USB devices. The two separate devices are very dense at less than two inches. Small size makes it convenient and easy to carry with you all the time. When you connect the second half to your laptop while travelling on the road, it will routinely install itself without any user interference. In addition, you can set up a special password that disables the device if you are going to lose it. This ensures you can lock down your files to avoid access by an illegal user.One of the best features of iTwin device is the ability to securely access your data by establishing a personal Virtual Private Network which is capable of managing several tasks. You can able to access all your files and data on your home or office PC by using Windows Explorer. Otherwise you can access definite files that are stored in desktop applications. As well as it is possible to access files from your isolated computer and save that files to the device that you are currently using, till both the devices are enabled with iTwin Connect device.

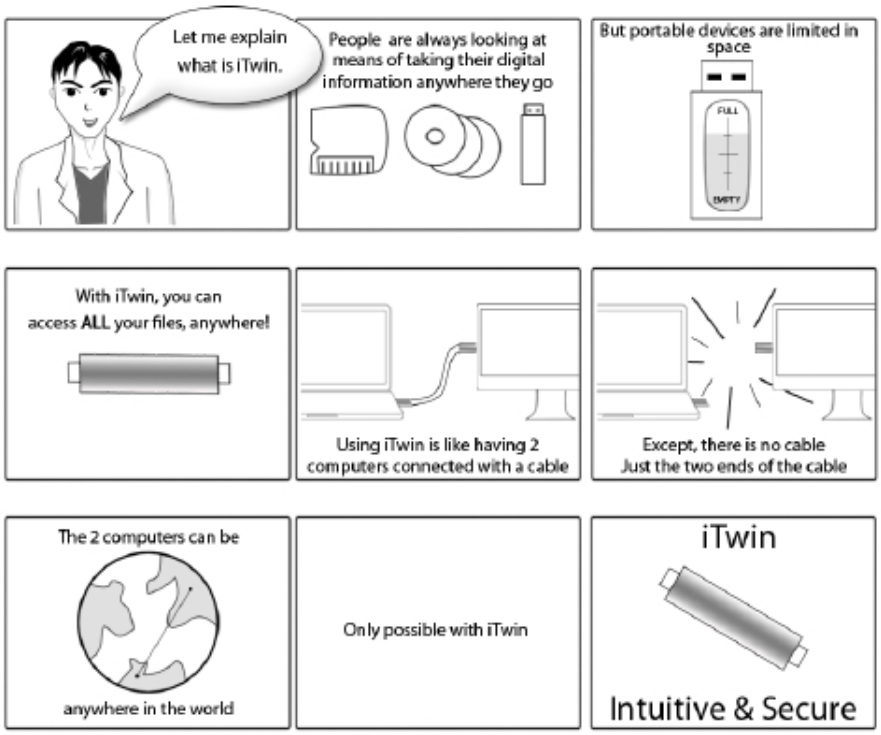

Figure 2.2: Working of iTwin

Most of the mobile professionals and individuals that want to access their files and information in spite of where they are, select cloud services for backing up and storing important documents. A cloud service is suitable and enables you to access your files from some

device with an Internet connection. Many cloud service providers deploy security technologies to guarantee their customers that documents are securely transmitted and stored. On the other hand, not anything is one hundred percent perfect hat means a device like iTwin Connect can help you cover up all of your bases in the event of data break or loss. iTwin Connect device makes sure that your files reside private and protected. as you own the device, it is just functional when attached to the computer; it uses two- factor authentication and military grade security, as well as performs functions that we have discussed in this article. Even if you leave the main computer powered up so you can connect to it from any place, your data and records stay protected iTwin Connect device also provides suitable browsing in any case of where you are positioned across the world. 'Teleport Me' feature enables you to select your continent even if you are travelling across the road. iTwin Connect device makes sure that your files reside private and protected. as you own the device, it is just functional when attached to the computer; it uses two- factor authentication and military grade security, as well as performs functions that we have discussed in this article. Even if you leave the main computer powered up so you can connect to it from any place, your data and records stay protected iTwin Connect device also provides suitable browsing in any case of where you are positioned across the world. 'Teleport Me' feature enables you to select your continent even if you are travelling across the road. For example, if you live in the United States and you are travelling out of the country, you can select your continent as the US and still have the benefit of the programs you watch in the US. This benefit may also work vice versa. If you are travelling in the US and enjoy shows in UK, you can set browsing tool to the UK and access each and every one of the shows you enjoy while travelling. If you are sitting in an airfield waiting for your flight, you can access your desired shows and news sites from any continent. This is a benefit because your device and its IP address otherwise would not allow you to access programming outside of a specific geographic region. iTwin Connect enables you to choose from locations in the United States, Europe or the Asia Pacific. This means you can grab up on your beloved shows and news while sitting in an airport waiting for your flight since iTwin directs the traffic through their dedicated servers in these locations.

2.3 PCS Network Survivability

Research and[2] development on the survivability of networks has largely focused on public switched telecommunications networks and high speed data networks with little attention on the survivability of wireless access networks supporting cellular and PCS communications. This paper provides an overview of the survivability issues in PCS networks with emphasis on the unique difficulties presented by user mobility and the wireless channel environment. A multi-layer framework for the study of PCS network survivability is proposed. Metrics for

quantifying network survivability are identified at each layer It is shown that user mobility significantly worsens network performance after even small failures, as disconnected users move among adjacent cells and attempt to reconnect to the network. Thus survivability strategies must be designed to contend with spatial as well as temporal network behavior: Possible survivability strategies and restoration techniques for each layer in the framework are also discussed. The past decade has seen an increase in the deployment of wireless networks supporting mobile communication and an exponential growth rate in the number of users. The majority of recent wireless networks function as wireless access networks to provide mobile users with untethered access to resources that reside primarily in a wired network. Typical wireless access networks include analog and digital celIularPCS networks, and mobile data services (e.g., Cellular Digital Packet Data (CDPD)). In general, the flexibility provided by mobility has satisfied users of current wireless networks, despite the lower quality and reduced service offerings as compared to wired networks. Research is ongoing to extend the scope of services made available to mobile users to achieve the "anytime, anyplace, any form" communications vision. As societal dependence on mobile terminals increases, users will demand the same system functionality, in terms of reliable service, that is characteristic of today's wireline based telecommunications and data networks. This implies that failures that inhibit communications or result in loss of critical data will not be tolerated.

1 illustrates a generic wireless network architecture for support of mobile communications [7]. The architecture shown illustrates what is typical of current cellular/PCS networks. The wireless network service area is divided into many small geographical service regions called cells. Each cell is served by a base station (BS) that serves as a fixed access point for all mobile terminals (MT) within the cell. The BS terminates the wireless communication links (or channels) to the user on the network side of the user-to-network interface. The wireless links between the BS and MTs within a cell are digital and employ either time division multiple access (TDMA) or spread-spectrum code division multiple access (CDMA) techniques. The network may include base station controllers (BSC) which manage a group of base stations and does radio level channel management and call handoff assist. The BSs and BSCs are connected to backbone networks via mobile switching centers (MSC). The MSC is connected both to the transmission networks and to the signaling network which uses signaling system 7 (SS7) for network control. The MSC provides switching functions, coordinates location trackinghpdating and call delivery. Associated with the signaling network and MSCs are databases to support user and service mobility (e.g., authentication and roaming). These databases include a Home Location Register (HLR), Visitor Location Register (VLR), and possibly anEquipment Identity Register(EIR), and Authentication center (AUC). The HLR contains user profile information such as the types of service subscribed, billing information and location information. The VLR stores information about the mobile users visiting an associated MSC coverage

area. The communications links between the BS, BSC, and MSC are typically wireline or fixed microwave links. Given the framework above to conduct a survivability analysis, one must identify performance-oriented survivability metrics along with techniques for evaluating the metrics over various modes of operation. The modes of operation include normal, single-failure, and multiple-failure modes. Table I1 lists examples of possible survivability metrics and sample failure conditions at each layer in the framework. Table I1 also lists some of the potential impacts of a failure in terms of the area affected and network service disruption. At the access layer, a typical failure would be the loss of a BS, with appropriate survivability metrics of call blocking probability and forced call termination probability. The call blocking probability measures the percentage of call requests turned down due to lack of resources, where as the forced call termination probability measures the percentage of calls which are prematurely terminated, including those dropped at handoff. At the transport layer a typical failure would be the loss of a BSC-MSC link, resulting in loss of service to a cluster of cells. Appropriate metrics include call blocking probability, forced call termination probability as in the access layer case. Since a large number of users are affected by the failure and may attempt to reconnect one must also consider metrics such as the call setup delay, call release delay and location update delay among other metrics listed in Table 11. Such metrics are defined for an entire MSCNLR coverage area and have target mean and .95 percentile values recommended by ITU [8], [13]. At the intelligent layer a possible failure scenario would be the loss of a VLR database, resulting in the partial or complete loss of roaming service in a VLR/MSC coverage area. Possible survivability metrics would include, the lost user load (i.e., user lost Erlangs), and the information accuracy probability at the HLR. The information accuracy probability measures the percentage of queries to the HLR that result in accurate responses (e.g., location information request). In order to see the area affected by a failure one must consider both the steady state and transient network performance of the network after a failure. Note that, as listed in Table 11, the region of impact of a failure is generally larger than the actual service area covered by the failed devices, due to transient conditions. Transient conditions occur after a failure due to a combination of delays in detecting a fault, reporting it and invoking restoration algorithms; coupled with increased call-initiation requests from disconnected users attempting to reconnect in circuit switched networks or dropped packets needing retransmission in packet networks. The importance of transient conditions after a failure has been documented for circuit switched, packet switched (both connectionless and connection oriented) and signalling networks. In wireless access networks, user mobility only worsens transient conditions as disconnected users move among geographical areas to attempt to reconnect to the network.

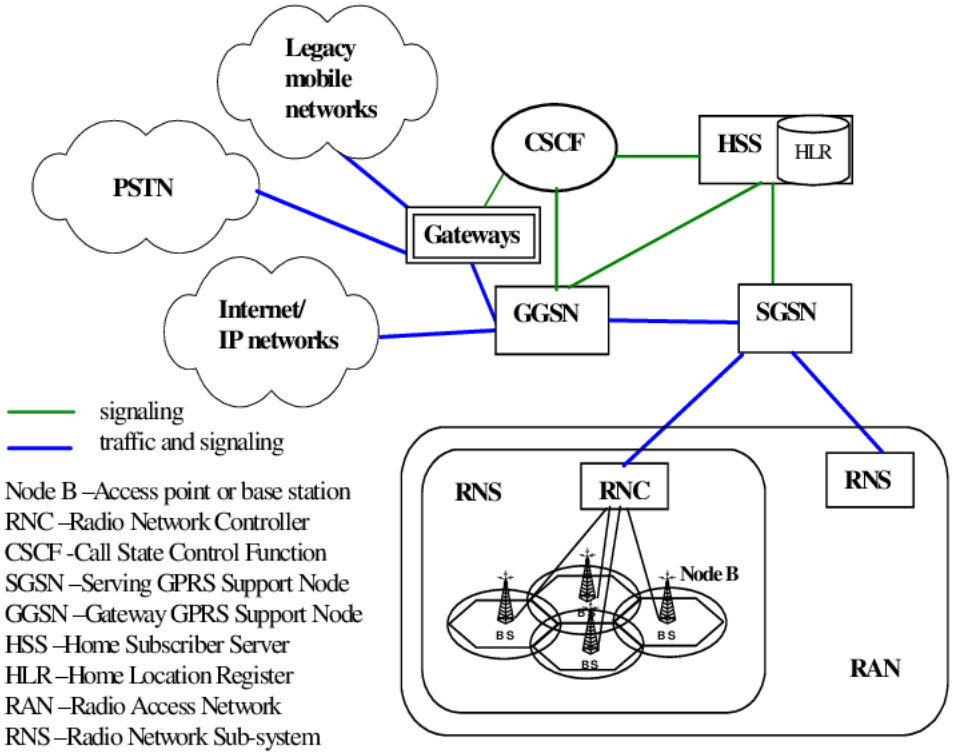

Figure 2.3: System Architecture

2.4 Study Of Working Technique Itwin For High Speed Data Transfer, From Point To Point On Internet

In this research Paper I am focusing on The A USB flash drive is a data storage device that consists of flash memory with an integrated[1] Universal Serial Bus (USB) interface. A Cloud Storage is also a similar case where in the data is stored remotely and is accessed whenever needed. But a drawback of this USB flash drives is it's small size cause of which it can easily be misplaced or lost. This is a particular problem if the data it contains is sensitive and confidential. In Cloud Storages the data can be stolen or misused if the username and password of an account to access the storage is hacked by someone. There are many more drawbacks like limited storage, no security, back up, temp files, no remote disable etc.iTwin is a 'limitless' secure USB device that enables users to access, edit share all their files mediabetween any two online computers anywhere in the world. The only limit is the size of your computer's harddrive. iTwin is an innovative solution that allows remote file access without the security and privacy risks of thecloud and USB flash drives. It's very easy to access as a USB device and no special installation is required.iTwin uses thoroughly analyzed crypto protocols and algorithms(AES 256 bit encryption). It has features like bidirectional file access, no temp files, remote disable,

smart key generation, password support and twintrust authentication.

iTwin was invented by an Indian named Lux Anantharaman. After achieving a Bachelors degree in Electrical and Electronic Engineering from IIT in Chennai and a Masters degree from IISc in Bangalore, Lux worked first as an IT security researcher at the Institute of Systems Science, Singapore and then as senior researcher at Kent Ridge Digital Labs and the Institute for Infocomm Research. Lux specializes in PKI implementations, efficient digital certificate revocations and usable security. Lux was pursuing a part-time MBA at NUS Business School, Singapore, but put studies on hold because of potential of iTwin. When you connect iTwin, you'll see a regular window pop-up, just as you would if you plugged in a regular USB flash drive. Drag and drop files and folders into this window to share them - as many as you want. Leave your computer with one half of iTwin connected to it. Detach the other half of iTwin and take it with you. Wherever you go, you can remotely access the shared files, simply by plugging the half you are carrying into any online Windows computer, anywhere. I wonder if there is any law similar to Moore's law for the evolution of semiconductor chips that would apply to perceived human needs. We needed an electrical typewriter, then a calculating machine, a computer, more memory, faster processors, local networks, the Internet, laptops, tablets, smart phones and now remote access to our home computers, all in a span of less than thirty years! Do our needs double every two years. Seriously, those of us who deposit the fruits of our labor — be they from counting beans, a life-saving project or a creative piece of literature — on the innards of a computer, know well how important it is to access that work remotely while we are away on business or vacation. You may be at a business meeting where your colleagues or clients may want to see figures that you forgot to take with you. If you are a writer and while sipping your favorite drink an expression or a plot suddenly comes to your mind that you want to integrate with the rest of the text you have been busy with recently? Yes, you could certainly load up your laptop with the data that you may expect to use while away or you could carry them in a flash drive. But your laptop and the invaluable information inside it vulnerable, it may be stolen or you might lose the flash drive in a cab while paying for your ride. There are all sorts of situations that can cause you unexpected pains. Software such as LogMein can give you a bit of solace. But after a free trial period you have to pay a monthly fee. This software lets you access every feature of your ―home‖ computer. For some telecommuters it is a great advantage and worth the money. But the danger to most of us is that anybody can access the ―home‖ computer with stolen user's name and password. In spite of these dangers lurking around there are people who advocate the use of cloud- based remote access. In theory, cloud computing sounds great. But what happens in practice? Do we know where in the cloud the data are stored? How secure they are? Can a hacker suck out the life blood of a honest user? What happens in the event of a disaster? How does one get some urgently wanted data in a hurry if that ―cloud‖ for some reason or the other may not be visible at that moment of need?

Are they doing routine maintenance? How is one to know? There are all kinds of issues in this game.

Figure 2.4: System Architecture

2.5 Supporting Concern-Based Regression Testing and Prioritization in a Model-Driven Environment

Traditional regression testing and prioritization approaches are bottom-up (or white-box). They rely on the analysis of the impact[4] of changes in source code artifacts, identifying corresponding parts of software to retest. While effective in minimizing the amount of testing required to validate code changes, they do not leverage on specificationlevel design and requirements concerns that motivated these changes. Model-based testing approaches support a top-down (or black box) testing approach, where design and requirements models are used in support of test generation. They augment code-based approaches with the ability to test from a higher-level design and requirements perspective. In this paper, we present a model-based regression testing and prioritization approach that efficiently selects test cases for regression testing based on different concerns. It relies on traceability links between models, test cases and code artifacts, together with user-defined properties associated to model elements. In particular we describe how to support concernbased regression testing and prioritization using

TDE/UML, an extensible model-based testing environment.

Two important techniques: change impact analysis and prioritization are usually combined in the production of optimal regression test suites [2]. Change impact analysis approaches apply different strategies in the selection of test cases to validate the software after an evolution step. They strive to balance attributes such as inclusiveness, precision, efficiency and generality, while minimizing the number of tests to execute [3]. Likewise, prioritization strategies' goal is to reorder tests based on different criteria such as their fault revealing potential [4]. This information can be used to schedule test execution in order to more effectively reveal faults in the program. Code-based (or white-box) prioritization approaches have focused on ranking tests based on their ability to reveal errors in the code. A common approach has been to apply code-level metrics based on test coverage, as criteria for prioritization [2], [5]. While very effective in selecting a subset of tests that cover specific code changes, these approaches are agnostic to requirements, organizational and architectural-level concerns such as: features, non-functional requirements, risks, and client-base priorities, to cite a few. Recently specification-based (black-box) approaches as model-driven engineering (or MDE) [6] have been applied in the development and testing of complex software systems. MDE facilitate software development by focusing on the use of models rather than source code as its primary artifact. By relying on abstractions that are closer to the problem domain requirements, MDE helps to bridge the gap between problem and software implementation domains. MDE achieves this goal through the automation of the process of transforming high-level software models into lower-level artifacts, including tests and reports.

UML Model: TDE/UML currently supports UML activity and sequence diagrams, as well as class diagrams representing choices and categories in the category partition method. Model Importer: The use of UML diagrams allows TDE/UML to interoperate with existing modeling tools. This integration is implemented by custom model importers. Model Editor: Different UML diagrams can be supported. For such, custom model editors, supporting specific UML diagrams and their respective editing commands (e.g. create activity, create note, add guard, etc.) can be defined. Model Rule Verification: During its development, models can be checked for different consistency and style rules. In particular, TDE/UML supports syntax and semantic checking of OCL data and control constraints, defined within notes in the model, that specify data-driven guards and data input constraints for activity diagram elements. Model Report Generation: Supports of the process of exporting UML models to different formats, and the generation of model documents. For example: HTML and word processing documents reports, or formats compatible to other UML tools. Test Generation: During the test generation, the annotated UML model is used to produce a Test Suite. This

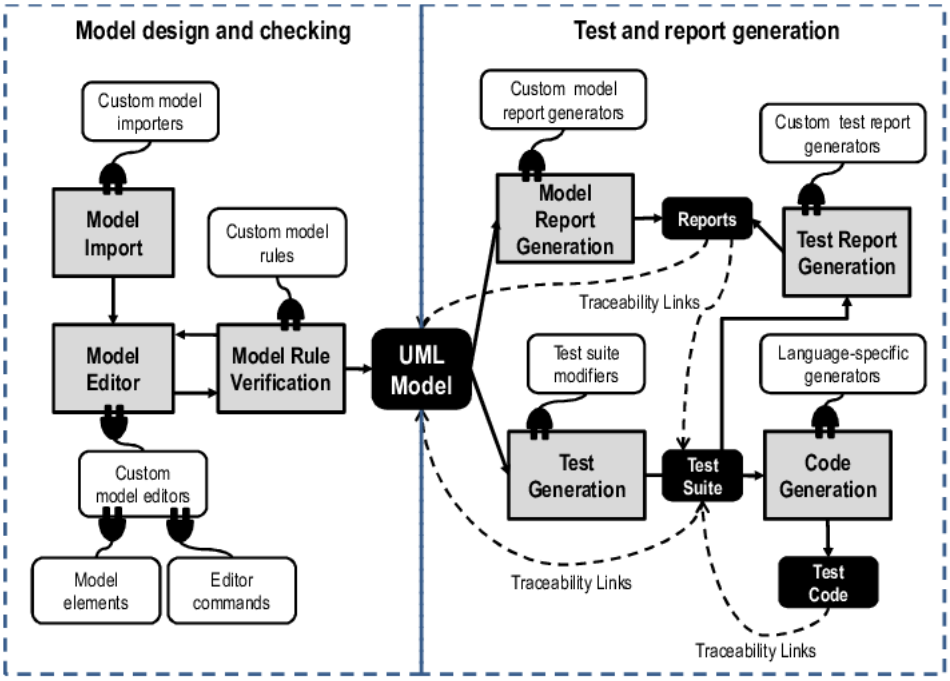

Figure 2.5: TDE/UML Model-Based Architecture Overview

0RGHO ,PSRUW 0RGHO (GLWRU 0RGHO5XOH 9HULILFDWLRQ 0RGHO 5HSRUW *HQHUDWLRQ 7HVW *HQHUDWLRQ RGH *HQHUDWLRQ 7HVWVXLWH PRGLILHUV /DQJXDJHVSHFLILF JHQHUDWRUV XVWRPPRGHO UHSRUWJHQHUDWRUV XVWRPPRGHO UXOHV XVWRP PRGHOHGLWRUV XVWRPPRGHO LPSRUWHUV 7HVW 6XLWH 5HSRUWV 7HVW RGH 7UDFHDELOLWLQNV 7UDFHDELOLWLQNV (GLWRU FRPPDQGV 7UDFHDELOLWLQNV 0RGHOGHVLJQDQGFKHFNLQJ 7HVWDQGUHSRUWJHQHUDWLRQ 80/ 0RGHO 7HVW5HSRUW *HQHUDWLRQ XVWRPWHVWUHSRUW JHQHUDWRUV 0RGHO HOHPHQWV 350 324 process is configurable and supports different data and path modifiers, which implement coverage algorithms, including the happy path (user-defined critical path), data coverage, path coverage, path-data coverage and others. Test Suite: Is a data structure representing a set of test procedures derived from UML models. Test procedures are the basic product of test generation. They describe a set of test steps, operating over specific data bindings, as well as generic template code to be used in code generation. Traceability Links: are defined between individual test steps, artifacts and the model. Optionally, traceability links from generated code to their originating test steps are also generated. These links help in the process of regression testing as described in III.E. Code Generation: The code generation is based on the test procedures described in Test Suites, and on the traceability links to the model. Based on that information, generators (each specific to a programming language) are used to produce executable test procedures. Report Generation: Test Suites can also be used as a basis for generating more detailed test reports, for example,

summarizing coverage information.

CHAPTER 3

HOW ITWIN WORK

The iTwin Connect is a device similar to a USB flash drive but, is designed with two USB connections. The iTwin device is very dense and it establishes a secure connection between two computers or a secure connection between one computer and the iTwin server. When you connect the iTwin Connect device to the main computer in your home or at office, the software is automatically installed configure the computer for remote connection. When the device is disconnected from the main computer, you have to separate the two parts of the USB ports which are separated in two separate USB devices. The two separate devices are very dense at less than two inches. Small size makes it convenient and easy to carry with you all the time. When you connect the second half to your laptop while travelling on the road, it will routinely install itself without any user interference. In addition, you can set up a special password that disables the device if you are going to lose it. This ensures you can lock down your files to avoid access by an illegal user.

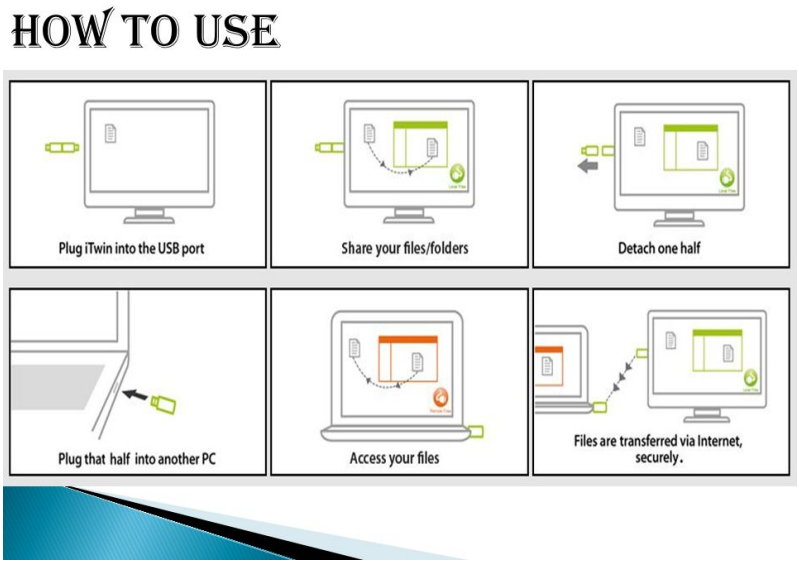

Figure 3.1: Working of iTwin

3.1 ITWIN FEATURE

One of the best features of iTwin device is the ability to securely access your data by

establishing a personal Virtual Private Network which is capable of managing several tasks. You can able to access all your files and data on your home or office PC by using Windows Explorer. Otherwise you can access definite files that are stored in desktop applications. As well as it is possible to access files from your isolated computer and save that files to the device that you are currently using, till both the devices are enabled with iTwin Connect device.

Figure 3.2: iTwin Features

- **Remote Desktop** This feature enables you to observe the desktop of the main computer and allows you to manage the device. This is very useful medium for managing your computer from a remote position and it can also be used to offer tech support to somebody who experiencing computer problems without actually being seated in front of the PC. By making use of isolated Desktop you can also start Windows Remote Desktop. This can be done with a single click which provides you the access to multiple different applications as well as the data enclosed in them on the remote PC.

- **Teleport Me** The Teleport Me feature is the secret browsing tool that enables you to surf the Internet lacking any limitations. Any websites that you open or any information that you transmit passes through the protected Virtual Private Network channel and uses the similar Internet connection that your house or workplace PC uses. If the main workstation cannot be left operating for some reason, Teleport Me is intended to connect to the iTwin dedicated network services to provide you a private connection. The company maintains dedicated servers all over the Europe, Asia Pacific and the United States. The Teleport Me feature is a helpful tool, mainly if you are browsing the Internet on hotel or other types of public wireless networks where security is an important issue. Teleport Me takes care that your private information is protected from snooping eyes. It also ensures that no one is tracking your browsing movement. There are no browsing limits which denote that you can browse your social media accounts, can watch programs, and connect

in any other activity you usually do online.

- **Office and Home Network Access** You can access approximately everything that is connected to your office or home network using the iTwin connect device. This includes devices such as drives or network applications on an office network, or devices like media servers, cameras, and televisions on your home server. For accessing the network it does not require any set of connections and arrangement. It automatically makes a secure VPN to your network..

- **Secure AES 256-bit Encryption** Hardware grade security is provided in iTwin. AES (Advanced Encryption Standard) 256-bit encryption is a security technology adopted by the US government to defend top secret classified information. When every part of the iTwin Connect device is paired with one another, a unique encryption key is generated for each session to make sure all information is protected prior to being transmitted over the Internet. You can also configure the two-factor authentication integrated with the iTwin Connect device. This enables you to setup an optional second password on the one half of the USB device which you bring with you. If you come about to lose this half of iTwin device, without using the second password it cannot be accessed.

– **No Subscription or Contract Promise** While using iTwin Connect, there is no subscription necessity or contract commitment, you just have to pay a one-time cost of $130 for lifetime access to the iTwin device. You can also own the device and be able to use it in several way

3.2 BENEFITS OF USING ITWIN CONNECT DEVICE

Most of the mobile professionals and individuals that want to access their files and information in spite of where they are, select cloud services for backing up and storing important documents. A cloud service is suitable and enables you to access your files from some device with an Internet connection.

Many cloud service providers deploy security technologies to guarantee their customers that documents are securely transmitted and stored. On the other hand, not anything is one hundred percent perfect that means a device like iTwin Connect can help you cover up all of your bases in the event of data break or loss. iTwin Connect device makes sure that

Figure 3.3: iTwin Device

your files reside private and protected. as you own the device, it is just functional when attached to the computer; it uses two- factor authentication and military grade security, as well as performs functions that we have discussed in this article. Even if you leave the main computer powered up so you can connect to it from any place, your data and records stay protected iTwin Connect device also provides suitable browsing in any case of where you are positioned across the world. 'Teleport Me' feature enables you to select your continent even if you are travelling across the road. For example, if you live in the United States and you are travelling out of the country, you can select your continent as the US and still have the benefit of the programs you watch in the US. This benefit may also work vice versa. If you are travelling in the US and enjoy shows in UK, you can set browsing tool to the UK and access each and every one of the shows you enjoy while travelling. If you are sitting in an airfield waiting for your flight, you can access your desired shows and news sites from any continent. This is a benefit because your device and its IP address otherwise would not allow you to access programming outside of a specific geographic region. iTwin Connect enables you to choose from locations in the United States, Europe or the Asia Pacific. This means you can grab up on your beloved shows and news while sitting in an airport waiting for your flight since iTwin directs the traffic through their dedicated servers in these locations.

Figure 3.4: ITWIN SECURITY

3.3 ITWIN SECURITY

3.4 Hardware Grade Security

When two parts of iTwin connect are attached together and inserted into a computer, a arbitrary 256-bit cryptographic key is generated on-board the iTwin device. This cryptographic key is shared among the two halves of the iTwin device using the particular iTwin connector. The cryptographic key never leaves the device. All data and information transferred by means of the two halves of iTwin is encrypted using this cryptographic key. The user can 'join up' the device to generate the keys anytime and any number of times. The keys are saved only inside the device and not known to any other entity.

3.5 Two Factor Authentication

iTwin device provides 2-factor authentication for advanced security. Access to your data is provided based on two different factors: Something you have – your physical iTwin device. Something you be familiar with –a password which you have to enter before the iTwin device can be used. Setting an iTwin device password is optional however we suggest that you set the optional password throughout device initialization to protect your

data and network in the event that you lose the device. The password set for your iTwin is stored only on the two halves of your iTwin and nowhere else.

3.6 Remote Disable

In the one half of the iTwin is lost; connection between the two halves of the device can be disconnected using the Remote Disable Feature. This is done by entering a unique disable code in the iTwin Disable Web Centre. The connection between the two halves of iTwin will be disabled within 90 seconds and after that, it is impossible to gain access to your data via the lost device even if somebody finds it.

3.7 End-to-End Encryption

The shared cryptographic key stored in the two parts of the iTwin device are used to produce session keys which protect all information transmitted over the Internet using industrial strength AES-256 bit encryption.

CHAPTER 4

I-Twin

Figure 4.1: I-Twin

iTwin Connect device makes sure that your files reside private and protected. as you own the device, it is just functional when attached to the computer; it uses two- factor authentication and military grade security, as well as performs functions that we have discussed in this article. Even if you leave the main computer powered up so you can connect to it from any place, your data and records stay protected iTwin Connect device also provides suitable browsing in any case of where you are positioned across the world. 'Teleport Me' feature enables you to select your continent even if you are travelling across the road. For example, if you live in the United States and you are travelling out of the country, you can select your continent as the US and still have the benefit of the programs you watch in the US. This benefit may also work vice versa. If you are travelling in the US and enjoy shows in UK, you can set browsing tool to the UK and access each and every one of the shows you enjoy while travelling. If you are sitting in an airfield waiting for your flight, you can access your desired shows and news sites from any continent. This is a benefit because your device and its IP address otherwise would not allow you to access programming outside of a specific geographic region. iTwin Connect enables you to choose from locations in the United States, Europe or the Asia Pacific. This means you can grab up on your beloved shows and news while sitting in an airport waiting for your flight since iTwin directs the traffic through their dedicated servers in these locations. It looks similar as USB device and it is designed by joining two halves. One half is connected to your house or office PC and you have to carry other half always with you. The part that you bring with you is used as a key for obtaining the connection to your PC

when you are far away from your PC. When you connect another part of the iTwin device to your laptop when you are on the road, the device makes a Virtual Private Network (VPN) to your house or to the PC that you use in your office. iTwin is completely new file sharing and remote access device developed by a company named as iTwin. It is very similar like two ends of a cable, but is does not need the cable. It is simpler to use than a flash drive. It is just a plug and play device. With iTwin, it is possible to connect any two online computers located anywhere in the world. When the device is disconnected from the main computer, you have to separate the two parts of the USB ports which are separated in two separate USB devices. The two separate devices are very dense at less than two inches. Small size makes it convenient and easy to carry with you all the time. When you connect the second half to your laptop while travelling on the road, it will routinely install itself without any user interference. In addition, you can set up a special password that disables the device if you are going to lose it. This ensures you can lock down your files to avoid access by an illegal user. One of the best features of iTwin device is the ability to securely access your data by establishing a personal Virtual Private Network which is capable of managing several tasks. You can able to access all your files and data on your home or office PC by using Windows Explorer. Otherwise you can access definite files that are stored in desktop applications. As well as it is possible to access files from your isolated computer and save that files to the device that you are currently using, till both the devices are enabled with iTwin Connect device.

CHAPTER 5

PROBLEM STATEMENT

iTwin connect device is 3.5 inches long in total that means when the parts are separated they are very easy to misplace. When the iTwin Connect USB dongle is plugged in it can slow down network performance.You have to set up files to share in advance to access them. Require support for mobile devices.iTwin Connect is 3.5 inches long in total which means when the parts are divided they are very easy to lose./li>.When the itwin connect USB dongle is plugged in it can low down network performance.You must set up files to share in advance in order to access them.

CHAPTER 6

PROPOSED SYSTEM

In the case of network interruption itwin files transfers pause.When the Internet connection is resumed itwin software continues the file transfer from where it is left off.iTwin progress bar indicates the amount left to be transferred.If the iTwin is lost you can easily disable it.If the password is forgotten we can change it easily by attaching both half and set a new one.iTwin Connect is compatible with both Windows and Mac OS.VPN protects you on hotel and public Wi-Fi networks.There are no limitations in terms of file size or type.One-time straight payment gives you lifetime access of the device.The capability to disable the device remotely if it is lost or stolen.There are no restrictions in terms of file size or type.It has secure military grade AES encryption ensures secure file and data transport.Two-factor authentication provides additional security.Personal VPN protects you on hotel as well as public Wi-Fi networks.Access to additional features such as your home or office network as well as the devices connected to it.Stretchy and safe browsing allows you to maintain your usual browsing activities while you are travelling.

6.1 Advantages and Disadvantages of i-twin

The advantages and disadvantages of i-twin will give the good part and the bad part of the i-twin technology.By that we get the breif discription of the i-twin technology.

1. **Advantages**
   One-time straight payment gives you lifetime access of the device. • The capability to disable the device remotely if it is lost or stolen. • There are no restrictions in terms of file size or type. • It has secure military grade AES encryption ensures secure file and data transport. • Personal VPN protects you on hotel as well as public Wi-Fi networks. • Two-factor authentication provides additional security. • Access to additional features such as your home or office network as well as the devices connected to it. • stretchy and safe browsing allows you to maintain your usual browsing activities while you are travelling. • iTwin Connect is well-suited with both Windows and Mac devices

2. **Disadvantages**
   iTwin connect device is 3.5 inches long in total that means when the parts are separated they are very easy to misplace When the iTwin Connect USB dongle is plugged in it can

slow down network performance. You have to set up files to share in advance to access them. require support for mobile devices Industry 4.0, often known as the Internet of Things (IoT), is supposed to help the manufacturing landscape undergo a massive overhaul to improve revenues, optimize worker productivity and increase operational agility to meet demanding market conditions. The "digital twin" concept is becoming a part of this productivity improvement and decision making process by connecting the silos between digital data. But part of the challenge with this concept is that industry leaders define the concept differently. The digital twin was first introduced and clearly defined by Dr. Michael Grieves in 2003 at University of Michigan. CAD technology companies like PTC and Dassault Systemes, for example, perceive it differently to address the key concerns of their current and future customers. To clear the air, the basic concept of the digital twin model is to build rich digital information for virtual products; digital information that is indistinguishable from the physical counterpart. This digital information will serve as a "twin" of the information embedded within the physical. product or system itself and will be linked to it throughout the lifecycle of the system. The digital twin concept model as defined by Dr. Grieves consists of three main parts: physical products in real space, virtual products in virtual space and the connected data that tie the physical and virtual products together.

CHAPTER 7

SOFTWARE REQUIREMENTS

Figure 7.1: SOFTWARE REQUIRMENTS

7.1 Hardware Requirements

Operating Requirements Operating temperature: 32° to 158° F (0° to 70° C). Relative humidity: 5Maximum operating altitude: 10,000 feet (3000 m). Size and weight Length : 3.54 inches (90 mm). Width : 0.82 inch (21 mm). Depth : 0.314 inch (8.0 mm). Weight : 0.11 pound (50g). The Design Validation service runs in your web browser and does not require any client software or plug-in to be installed on your computer. Below you will find information about supported browsers and hardware recommendations to provide you the best navigation experience. Minimum System Requirements In order to run Design Validation you will need this minimum hardware specification.

Processor:Intel® or AMD® 64 bit processor 1.0 GHz or greater.

Memory :2 GB

Video:Intel HD Graphics 520

Graphics API:Direct 3D version 11 or later OpenGL

Screen Resolution:1024 x 768 or higher

7.2 Software Requirements

When you plug iTwin into a computer for the first time, iTwin software gets installed on the computer

7.3 Browser Support

The Design Validation service is supported on the latest versions of these browsers.

Chrome Firefox Safari Opera Edge "New Chromium-based version"

Note: Internet Explorer and Edge "old version" are not supported.

Note: Other Chromium-based browsers will likely work fine, but are untested

CHAPTER 8

CONCLUSION

Without a hesitation, iTwin Connect represents a unique solution for providing secure access to your files and information from a remote location, credit to the AES 256bit encryption technology. The iTwin connect device performs like to Peer to Peer access excluding the data is only being shared between you and your main computer. If you are travelling with a Windows device and your main computer is a Mac, you can still access your files since iTwin Connect will work with both systems. The iTwin is a unbelievable solution for the house user who desires to access and change their files remotely and securely. The iTwin bypasses the virtual world of cloud services to turn your physical storage into its own networking solution. The iTwin is simple to use and inexpensively solves the Drop box limitations. For peoples who want to maintain files up-to-date among two computers the iTwin is for them. iTwin is the best solution. It is the secure USB device that can be used to access, share edit all the files and media between any two online computers anywhere in the world. It allows remote file access without any security and privacy risks. The iTwin - A fantastic solution for the home user who wishes to access and change their files remotely and securely. The iTwin bypasses the virtual world of cloud services to turn your physical storage into its own networking solution. The iTwin is simple to use and inexpensively solves the Dropbox limitations. For those who want to keep files up-to-date between two computers the iTwin is for you

CHAPTER 9

FUTURE SCOPE OF I-TWIN

Infrastructure businesses face enormous pressure to deliver economically viable and environmentally sustainable facilities. And more organizations than ever, in utilities, construction, mining, insurance, and more, are developing digital twins to achieve these objectives. That's because itwins provide the unrivaled insights and connectivity required for efficient, productive, and sustainable infrastructure. Indeed, in 2021, the itwin market was valued at approximately USD 7.5 billion. And it's projected to grow at a compound annual growth rate (CAGR) of 39

i twins are virtual representations of the physical world, including assets, processes, relationships, and behaviors. They allow organizations to accurately understand their facilities using a 3+ dimensional view to operate and evaluate natural and built environments. Moreover, they uniquely integrate different digital models and provide in-depth information about infrastructure.

The challenge for many businesses looking to deploy itwins involves understanding the best technology options available. Moreover, developing an optimized itwin is labor-intensive. Luckily, there's a solution.

Modern, open geospatial systems provide a perfect foundation for building a i twin that both leverages existing investments in data and technology as well as provides an integration platform for the future. They seamlessly connect to existing enterprise systems and combine CAD, GIS, remote sensing, imagery products, and asset management systems for a holistic solution that includes advanced modeling and analysis tools.

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