# Department of Information Technology

## CASE TOOLS & SOFTWARE TESTING LAB MANUALS

(IV B.tech -I Sem A & B)

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## UML (Unified Modeling Language)

UML is a language for visualizing, specifying, constructing and documenting the artifacts of a software intensive system.

UML is simply another graphical representation of a common semantic model. UML provides a comprehensive notation for the full lifecycle of object-oriented development.

### Advantages:

- To represent complete systems (instead of only the software portion) using object-oriented concepts
- To establish an explicit coupling between concepts and executable code
- To take into account the scaling factors that are inherent to complex and critical systems
- To creating a modeling language usable by both humans and machines

### **UML** defines several models for representing systems :

- The class model captures the static structure
- The state model expresses the dynamic behavior of objects.
- The use case model describes the requirements of the user.
- The interaction model represents the scenarios and messages flows
- The implementation model shows the work units
- The deployment model provides details that pertain to process allocation

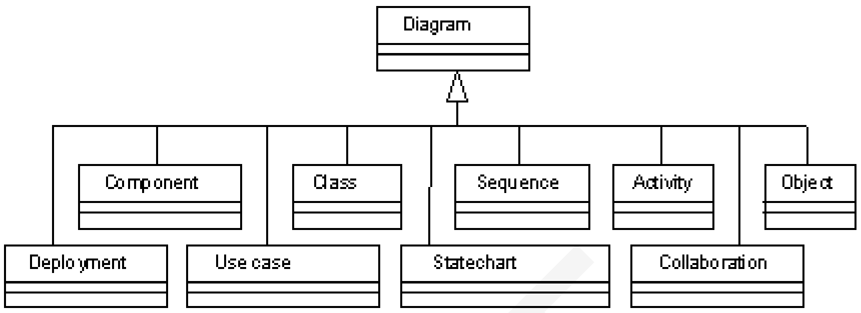
### UML Diagrams

UML defines ***nine*** different types of diagram:

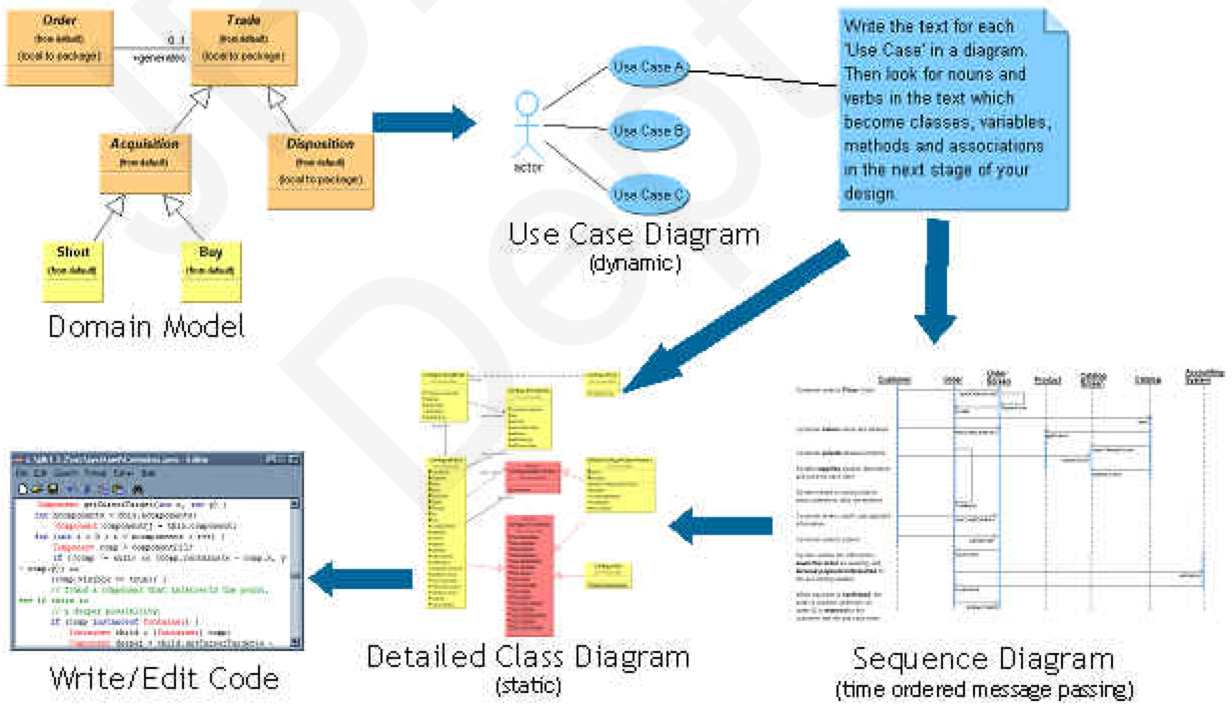
1. **Use case diagrams:** represent the ***functions*** of a system from the **user's point of view**.
2. **Class diagrams :** represent the static structure in terms of classes and relationships
3. **Object diagrams :** represent ***objects*** and their ***relationships*** and correspond to simplified collaboration diagrams that do not represent message broadcasts.
4. **Sequence diagrams**: are a temporal representation of **objects and their interactions.**
5. **Collaboration diagrams**: spatial representation of ***objects, links***, and ***interactions.***

6. **State chart diagrams :** represent the ***behavior of a class*** in terms of states at **run time**.
7. **Activity diagrams:** represent the ***behavior of an operation*** as a set of actions
8. **Component diagrams:** represent the ***physical components*** of an application
9. **Deployment diagrams:** represent the deployment of ***components*** on particular pieces of **hardware**

***The different types of diagrams defined by UML***



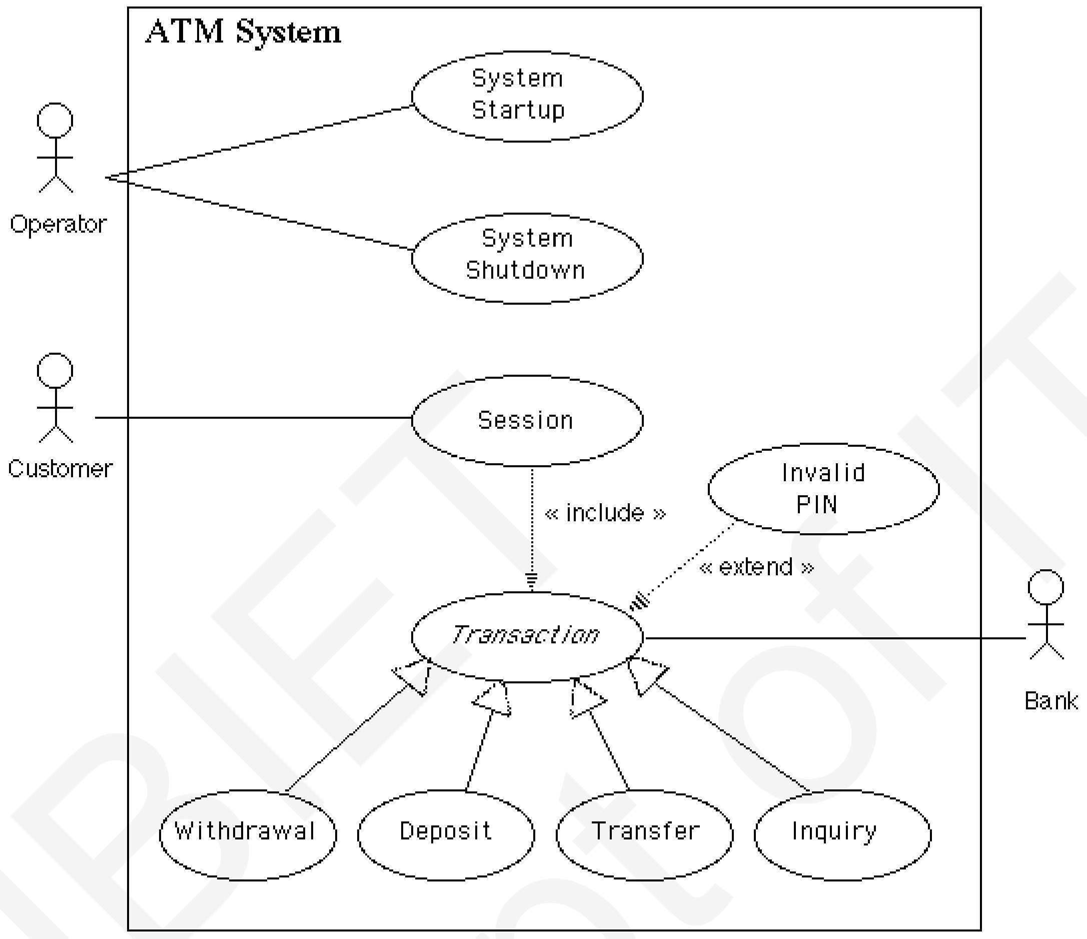
**Relationship** among various UML Diagrams in OOAD ( Object Oriented Analysis and design) is illustrated in the following diagrams of **Business Model**, **Use Case** Diagram , Sequence Diagram , Class Diagram and Code generation..



Write the text for each 'Use Case' in a diagram. Then look for nouns and verbs in the text which become classes, variables, methods and associations in the next stage of your design.

**1. Use Case Diagram:**

**Use Cases for ATM**



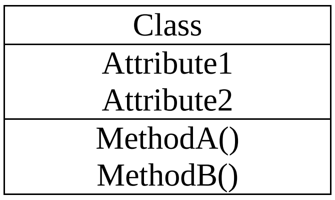
***System:***

***Use Case Specification:***

- A flow of events document is created for each use cases
- Written from an actor point of view
- Details what the system must provide to the actor when the use cases is executed
- Typical contents
    - How the use case starts and ends
    - Normal flow of events
    - Alternate flow of events
    - Exceptional flow of events

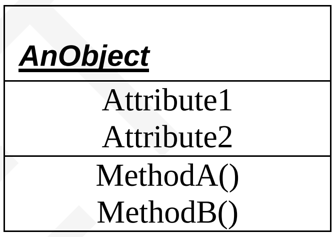
## 2. Class Diagram:

**Class:** A ***Class*** is represented like this:



The top part showing the **class name**, the second showing the **attributes** and the third showing the **methods**.

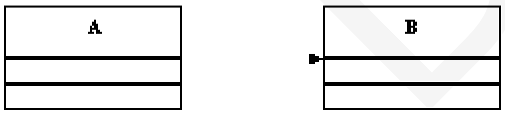
**Object:** An **object** looks very similar to a class, except that its **name is *underlined*:**



**Relationships:**

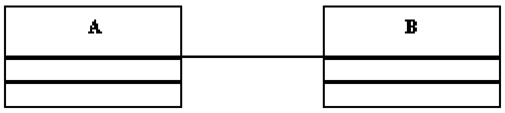
Relationships between classes are generally represented in class diagrams by a **line** or an **arrow joining the two classes**. UML can represent the following, different types of object relationships.

If **A depends** on **B,** then this is shown by **a dashed arrow between A and B,** with the arrowhead **pointing at B:**



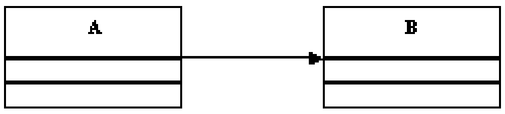
**Association:** An association between **A** and **B** is shown by a **line joining** the two classes:

**Bidirectional:**



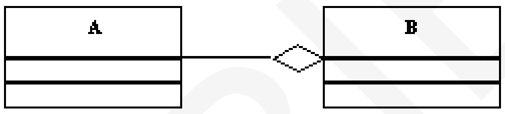
If there is no arrow on the line, the association is taken to **be bidirectional**.

A **unidirectional** association is indicated like this:



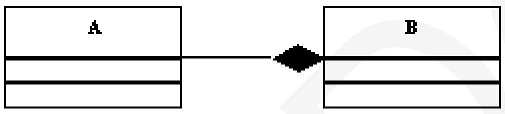
**Aggregation:**

An aggregation relationship is indicated by placing a **white diamond** at the end of the association next to the aggregate class. If **Baggregates A**, then **A is a part** of **B**, but their **lifetimes are independent:**



**Composition:**

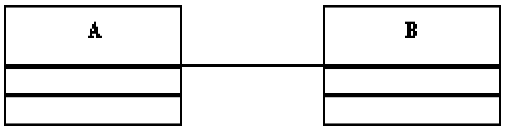
Composition, on the other hand, is shown by a black diamond on the end of association next to the composite class. If **B** is **composed** of **A**, then **B controls the lifetime of A**.



**Multiplicity:**

The multiplicity of a relationship is indicated by a number (or *__*)__* placed at the end of an association.

The following diagram indicates a **one-to-one** relationship between **A** and **B**:

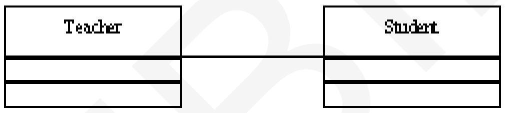


A multiplicity can also be a range of values. Some examples are shown below:

| | |
|---|---|
| 1 | One and only one |
| * | Any number from 0 to infinity |
| 0..1 | Either 0 or 1 |
| n..m | Any number in the range n to m inclusive |
| 1..* | Any positive integer |

**Naming an Association**

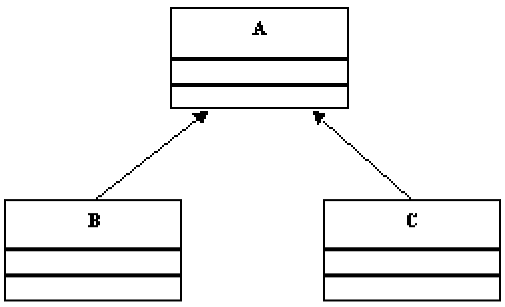
To improve the **clarity** of a class diagram, the association between two objects may be named:



**Inheritance:**

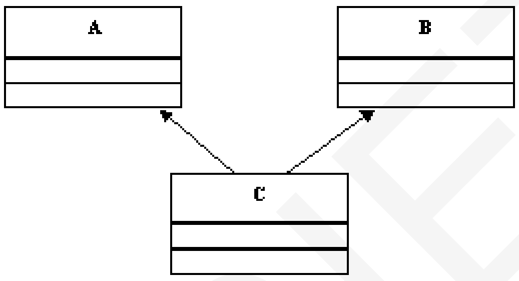
An inheritance (**generalization/specialization) relationship** is indicated in the UML by an arrow with a **triangular arrowhead** pointing **towards** the**generalized** class.

If **A** is a **base class**, and **B** and **C** are classes **derived** from **A**, then this would be represented by the following class diagram:

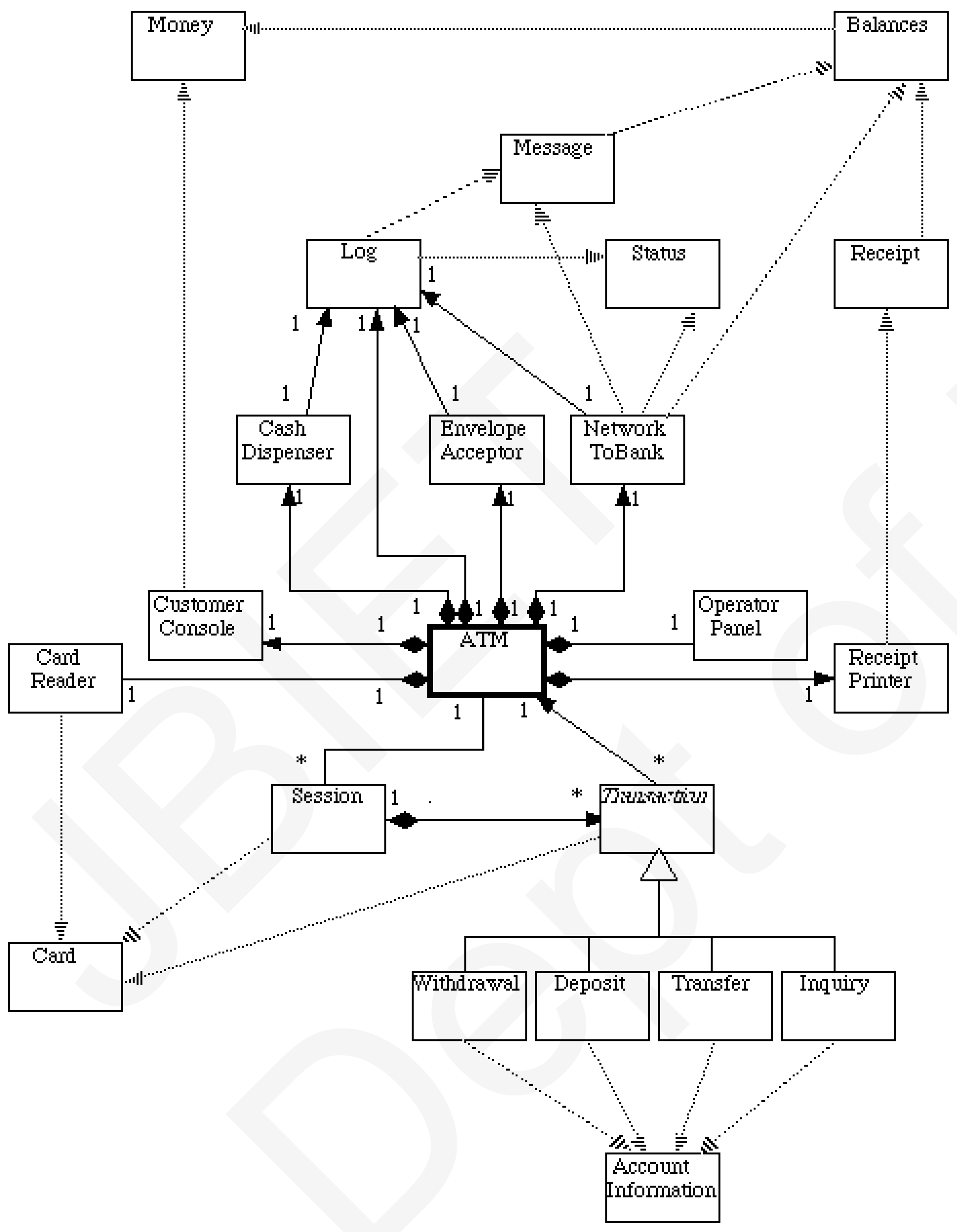


## Multiple Inheritance

The next diagram represents the case where class **C** is derived from **classes A and B:**



## Class Diagram for ATM System:



***Object <u>Interactions</u> :( Sequence and Collaboration : Complimentary to each other) diagrams.***

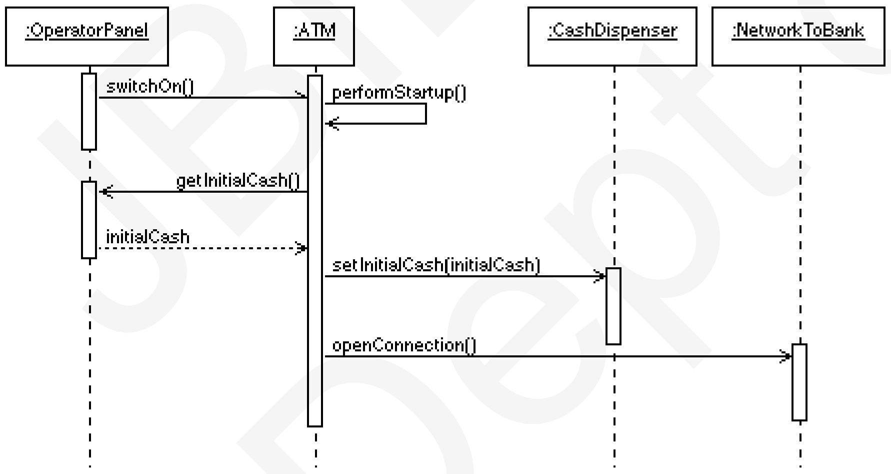
Interactions between ***objects*** are represented by interaction diagrams – both ***sequence*** and ***collaboration*** diagrams. An example of a collaboration diagram is shown below. Objects are drawn as rectangles and the lines between them indicate links – *a link is an instance of an association.* The **order of the messages** along the links between the objects is indicated by the number at the head of the message:

Sequence diagrams show essentially the same information, but concentrate on ***the time-ordered communication*** between objects, rather than their relationships. An example of a sequence diagram is shown below. The dashed vertical lines represent the lifeline of the object:

**4. Sequence Diagram:**

→Time ordered message passing:

System Startup Sequence Diagram



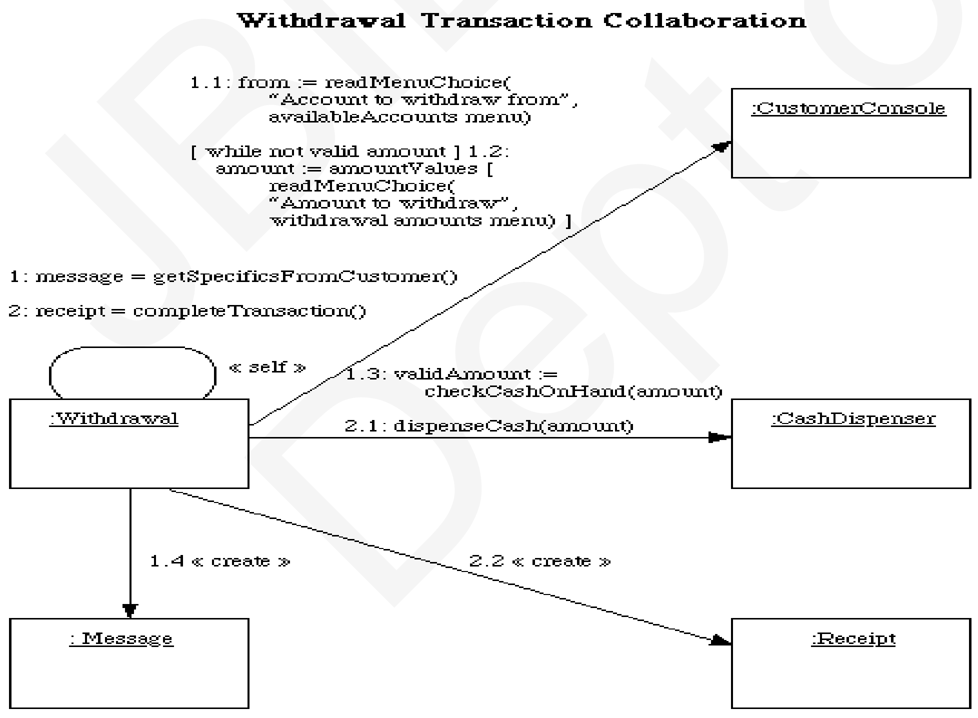
## Withdrawal Transaction Use Case

A withdrawal transaction asks the customer to choose a **type of account** to withdraw from (e.g. checking) from a menu of possible accounts, and to choose a dollar **amount** from a menu of possible amounts. The system verifies that it has sufficient money on hand to satisfy the request before sending the transaction to the bank. (If not, the customer is informed and asked to enter a different amount.) If the transaction is approved by the bank, the appropriate amount of cash is dispensed by the machine before it **issues a receipt.** (The dispensing of cash is also recorded in the ATM's log.)

A withdrawal transaction can be cancelled by the customer pressing the **Cancel key** any time prior to choosing the dollar amount.

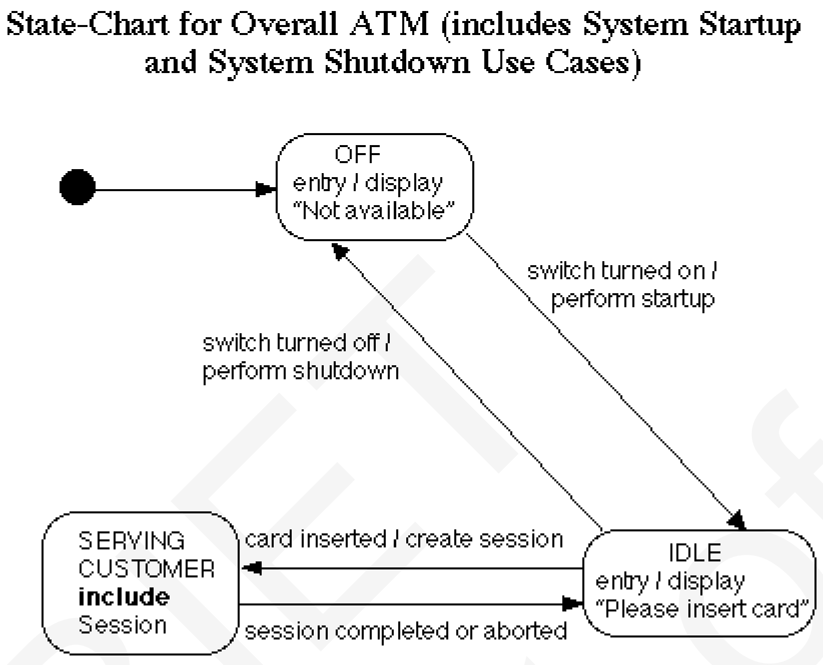
## 5. Collaboration Diagram:

→Relationship among Objects and Messages.


Withdrawal Transaction Collaboration
1.1: from := readMenuChoice( "Account to withdraw from", availableAccounts menu)
[ while not valid amount ] 1.2: amount := amountValues [ readMenuChoice( "Amount to withdraw", withdrawal amounts menu) ]
1: message = getSpecificsFromCustomer()
2: receipt = completeTransaction()
« self »
1.3: validAmount := checkCashOnHand(amount)
2.1: dispenseCash(amount)
1.4 « create »
2.2 « create »
:Withdrawal
:CustomerConsole
:CashDispenser
: Message
:Receipt

## 6. State Diagram:

**State**s of **object**s are represented as rectangles with rounded corners. The ***transition*** between difference states is represented as an arrow between states, and a ***condition*** of that transition occurring may be added between square braced. This condition is called a ***guard.***

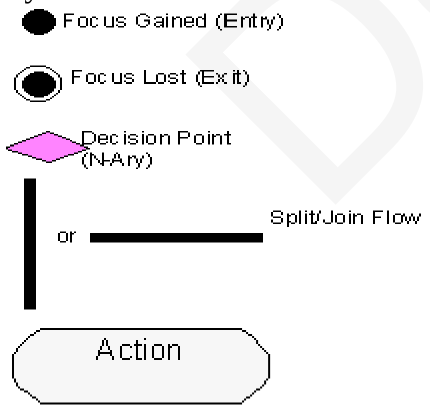

State-Chart for Overall ATM (includes System Startup and System Shutdown Use Cases)
OFF
entry / display "Not available"
switch turned on / perform startup
switch turned off / perform shutdown
SERVING CUSTOMER include Session
card inserted / create session
session completed or aborted
IDLE
entry / display "Please insert card"

## 7. Activity Diagram:

→Used to document complex use case logic.

→ It is not required for simple use case logic.

- Symbols:



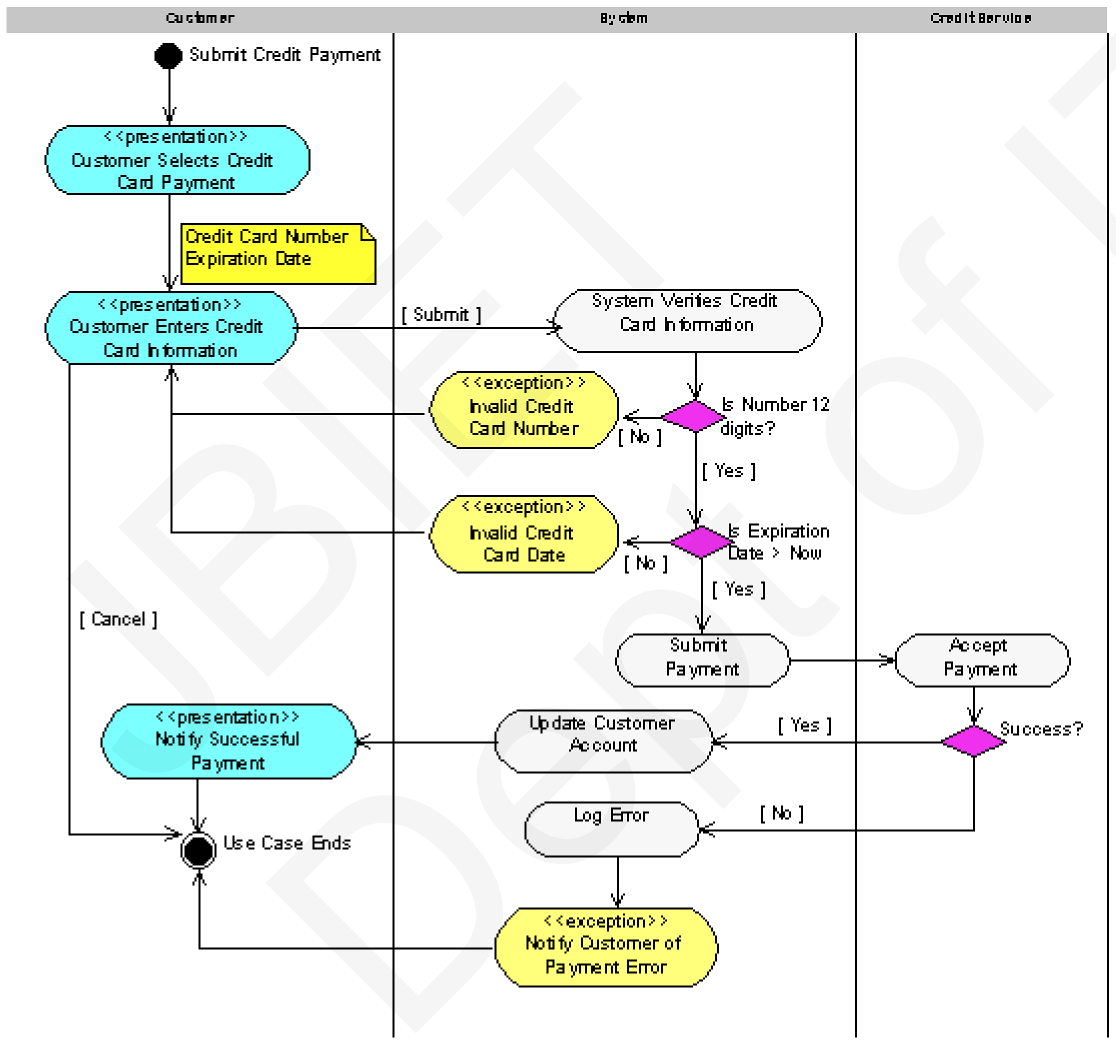
-

**Use Case to accept credit Card Payment**:

1. The customer then **enters** and submits her card details.

2. The system **validates** these values and either returns to the customer if there is an error or submits the payment to the Credit Card Service.

3. If the card payment is **accepted**, then the system notifies the customer of success. If not, then the **error** is logged, and the customer is notified of the failure (and perhaps directed to handle the payment some other way).

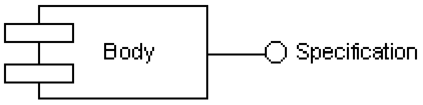


Customer
System
Credit Service
Submit Credit Payment
<<presentation>> Customer Selects Credit Card Payment
Credit Card Number Expiration Date
<<presentation>> Customer Enters Credit Card Information
[ Submit ]
System Verifies Credit Card Information
<<exception>> Invalid Credit Card Number
[ No ]
Is Number 12 digits?
[ Yes ]
<<exception>> Invalid Credit Card Date
[ No ]
Is Expiration Date > Now
[ Yes ]
[ Cancel ]
Submit Payment
Accept Payment
<<presentation>> Notify Successful Payment
Update Customer Account
[ Yes ]
Success?
Log Error
[ No ]
Use Case Ends
<<exception>> Notify Customer of Payment Error

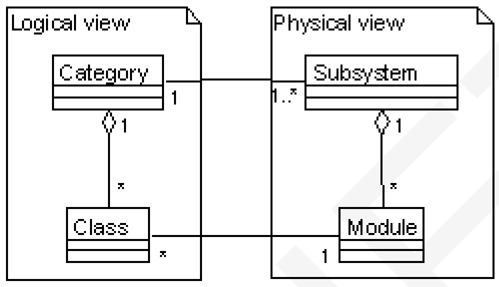
## 8. Component Diagrams:

Component diagrams describe software ***components* and *their relationships*** within the **implementation** environment; they indicate the choices made at implementation time.

They may be ***simple files***, or ***libraries*** loaded dynamically.



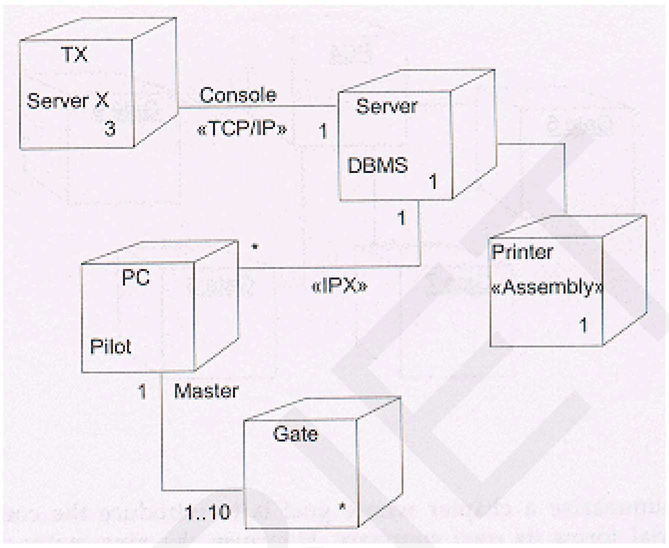
In C++, a **specification** corresponds to a file with a **`.h`** suffix, and a **body** corresponds to a file with the suffix **`.cpp.`**



## 9. Deployment Diagrams

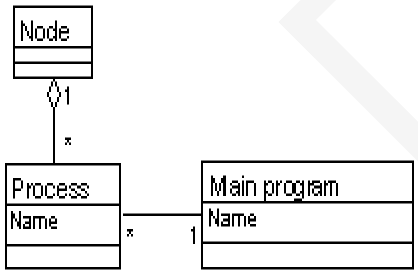
Deployment diagrams show the *physical layout* of the various hardware components (nodes) that compose a system, as well as the distribution of executable programs on this hardware.

Deployment diagrams may show ***node classes*** or ***node instances***. As with other types of diagram, the graphical difference between classes and objects is implemented by underlining the object name. The following example shows the deployment diagram of a building access management system:



The diagram describes the nature of the **communication links** between the various nodes. The server and the PCs are connected via an **IPX link**; the X-terminals and the server communicate via **TCP/IP**. The nature of the connections between other nodes is not specified.

Each process named in the deployment diagram executes a main program with the same name as the one described within the component diagram.



## ATM System

Theory :-

Recently, because of the ongoing importance of globalization procedure, banking sector is in enormous use by the public all over the world. Traditional system of withdrawing the money in the bank is a long procedure and cannot be applicable in this fast pacing world. So, there arose a need for withdrawal of money any time and any where .The system that allows this is nothing but ATM system.

In this system, generally customer go to the ATM center and there in the ATM system he inserts card and enter his pin no to prove his identity. Next he enters the amount to be withdrawn .If balance is available he will get the desired amount.

## Use Case Diagram:

**Aim:-** To implement ATM system through Use Case Diagram.

**Procedure:-**

**Step1:** First an actor is created and named as user.

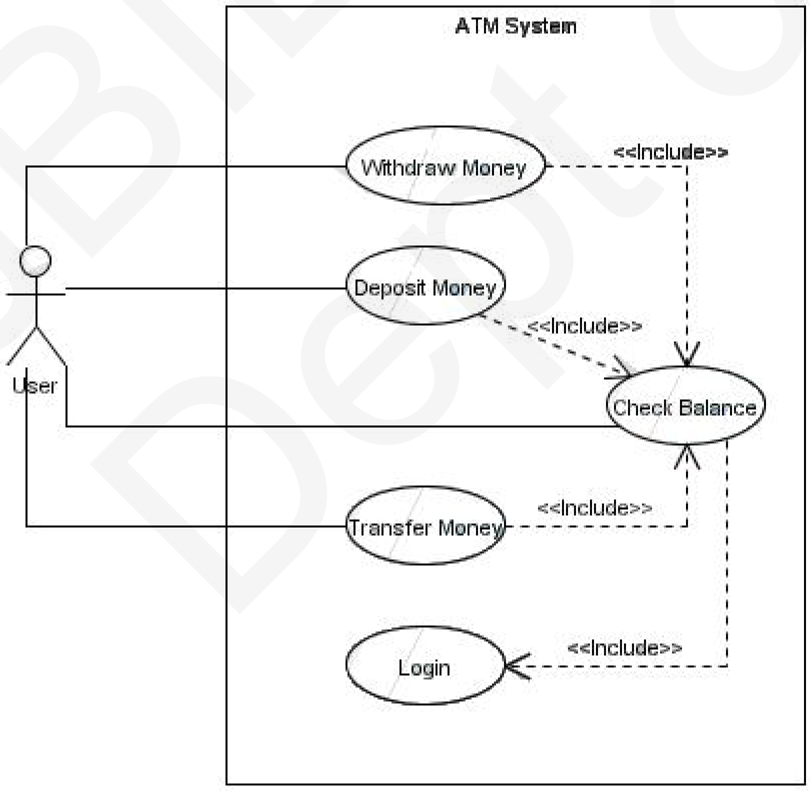
**Step2:** Secondly a system is created for ATM.

**Step3:** A use case Withdraw money is created and connected with user a association relationship.

**Step4**: Similarly various use cases like Deposit money, check balance, transfer money etc are created and appropriate relationships are associated with each of them.

**Static aspects:-**

In UML the static aspects of this view are represented through use case diagrams.



## <u>**Class Diagram:**</u>

**Aim:-** To implement ATM system through Class Diagram.

**Procedure:-**

**Step1**: First 3 packages are created.

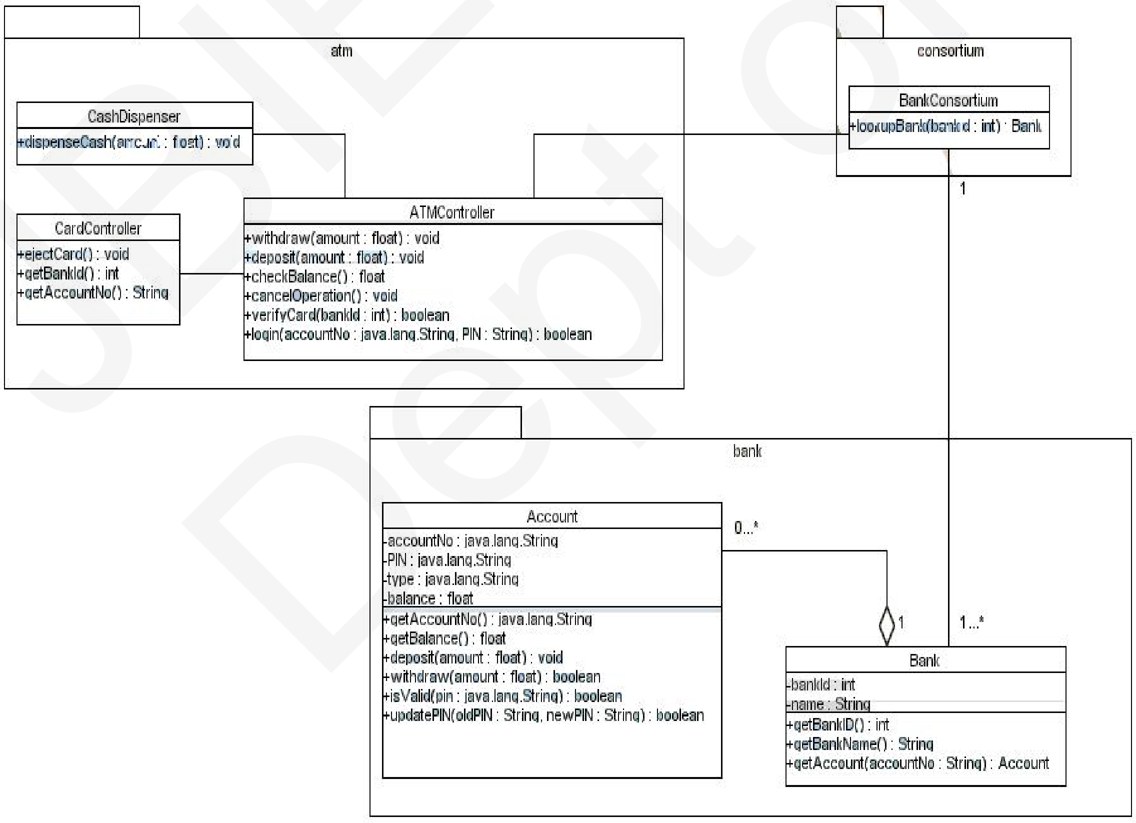
**Step2**: In package1 ATM, cash dispenser, card controller, ATM controller classes are created.

**Step3**: In pack2 consortium, bank consortium class is created.

**Step4**: In pack3 bank, account and bank classes are created.

**Step5**: Appropriate relationships are maintained between them.

**Class Diagram:**


atm
CashDispenser
+dispenseCash(amount : float) : void
CardController
+ejectCard() : void
+getBankId() : int
+getAccountNo() : String
ATMController
+withdraw(amount : float) : void
+deposit(amount : float) : void
+checkBalance() : float
+cancelOperation() : void
+verifyCard(bankId : int) : boolean
+login(accountNo : java.lang.String, PIN : String) : boolean
consortium
BankConsortium
+lookupBank(bankId : int) : Bank
1
bank
Account
-accountNo : java.lang.String
-PIN : java.lang.String
-type : java.lang.String
-balance : float
+getAccountNo() : java.lang.String
+getBalance() : float
+deposit(amount : float) : void
+withdraw(amount : float) : boolean
+isValid(pin : java.lang.String) : boolean
+updatePIN(oldPIN : String, newPIN : String) : boolean
0...*
1
1...*
Bank
-bankId : int
-name : String
+getBankID() : int
+getBankName() : String
+getAccount(accountNo : String) : Account

## Sequence Diagram:

**Aim :-** To implement ATM system through Sequence Diagram.

**Procedure:-**

**Step1:** First An actor is created and named as user.

**Step2:** Secondly an object is created for ATM.

**Step3:** Timelines and lifelines are created automatically for them.

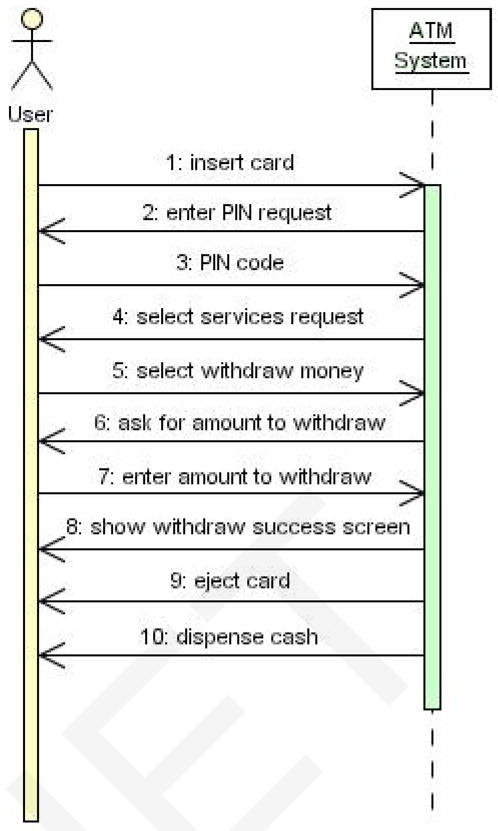
**Step4**: In sequence diagram interaction is done through time ordering of messages. So appropriate messages are passed between user and ATM as shown in the figure.

**Dynamic Aspects:-**

In UML the dynamic aspects of use case view are implemented through interaction diagrams that are sequence diagram and collaboration diagram, state chart diagrams and activity diagrams.

All those diagrams are implemented here.

**Sequence Diagram:**



User
ATM System
1: insert card
2: enter PIN request
3: PIN code
4: select services request
5: select withdraw money
6: ask for amount to withdraw
7: enter amount to withdraw
8: show withdraw success screen
9: eject card
10: dispense cash

**Collaboration Diagram:**

**Aim :-** To implement ATM system through Collaboration Diagram.

**Procedure:-**

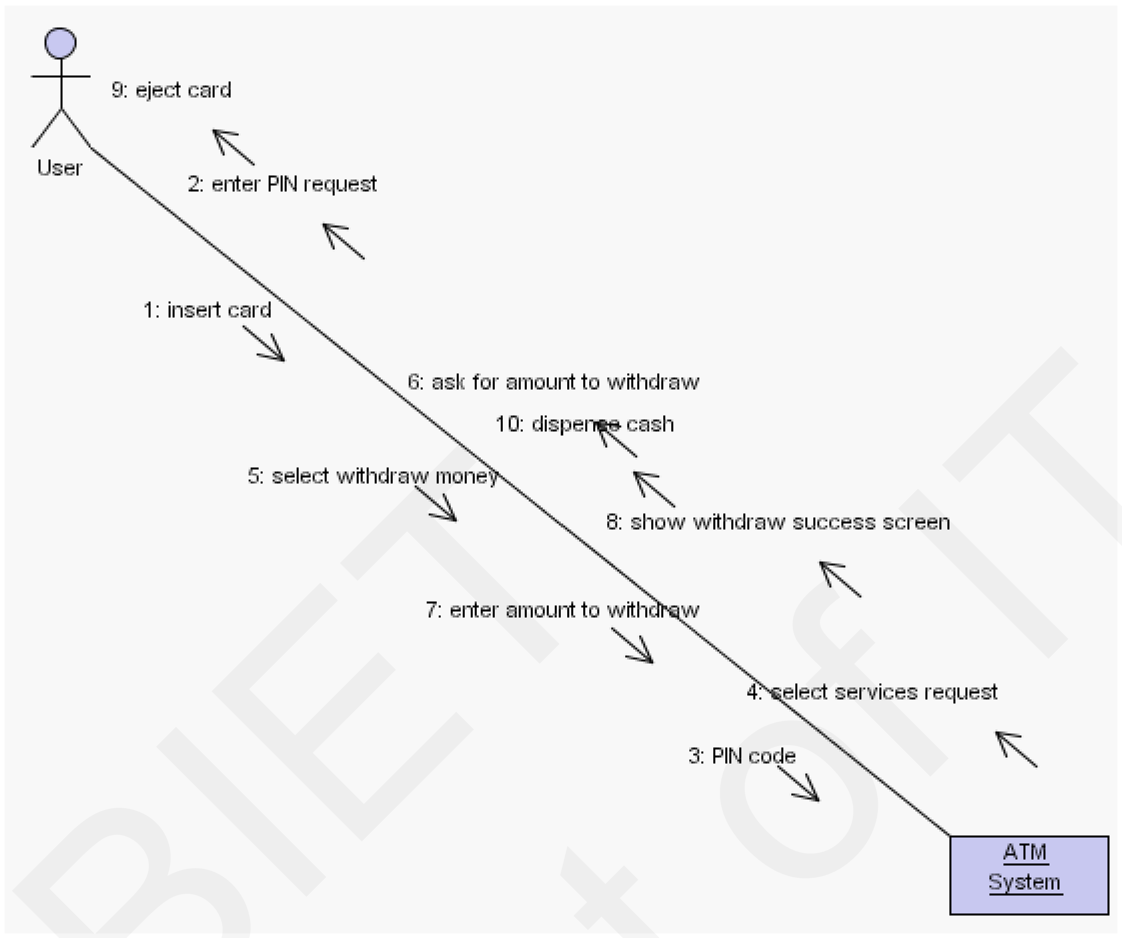
**Step1:** First an actor is created and named as user.

**Step2:** Secondly an object is created for ATM.

**Step3**: In collaboration diagram interaction is done through organization.

**Step4:** So appropriate messages are passed between user and ATM as shown in the figure.

**Collaboration Diagram:**


User
9: eject card
2: enter PIN request
1: insert card
6: ask for amount to withdraw
10: dispense cash
5: select withdraw money
8: show withdraw success screen
7: enter amount to withdraw
4: select services request
3: PIN code
ATM System

## State Diagram:

**Aim :-** To implement ATM system through State Diagram.

**Procedure:-**

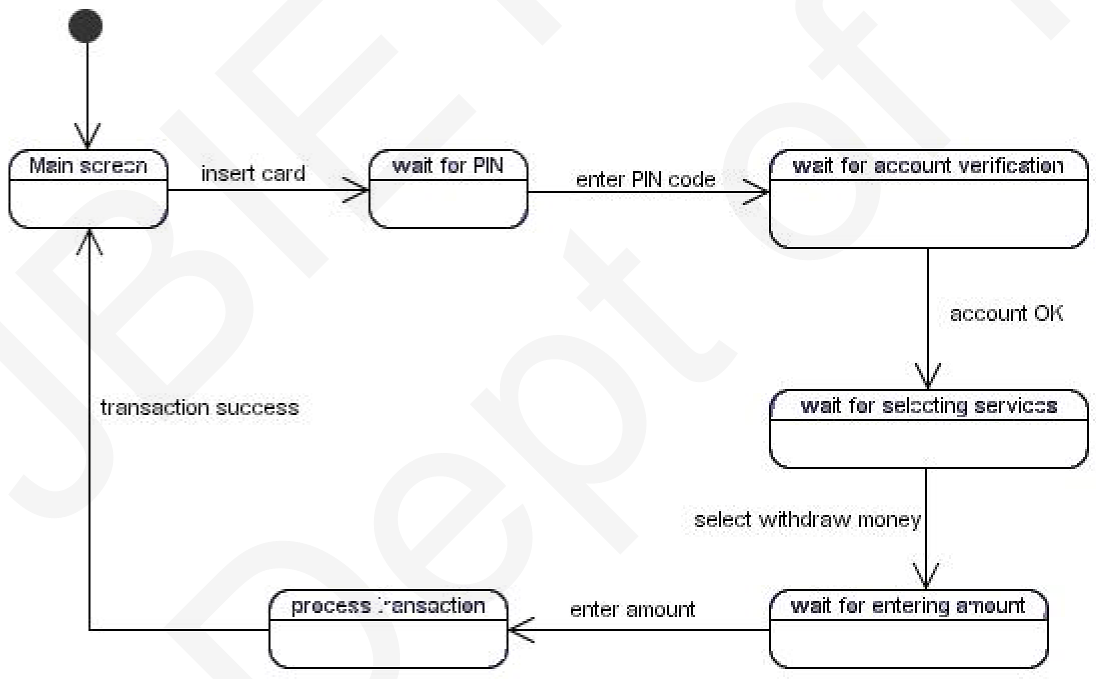
**Step1:** First after initial state control undergoes transition to ATM screen.

**Step2:** After inserting card it goes to the state wait for pin.

**Step3:** After entering pin it goes to the state account verification.

**Step4:**.In this way it undergoes transitions to various states and finally reaches the ATM screen state as shown in the fig.

**State Diagram:**



## Activity Diagram:

**Aim:-** To implement ATM system through Activity Diagram.

**Procedure:-**

**Step1:_** first initial state is created.

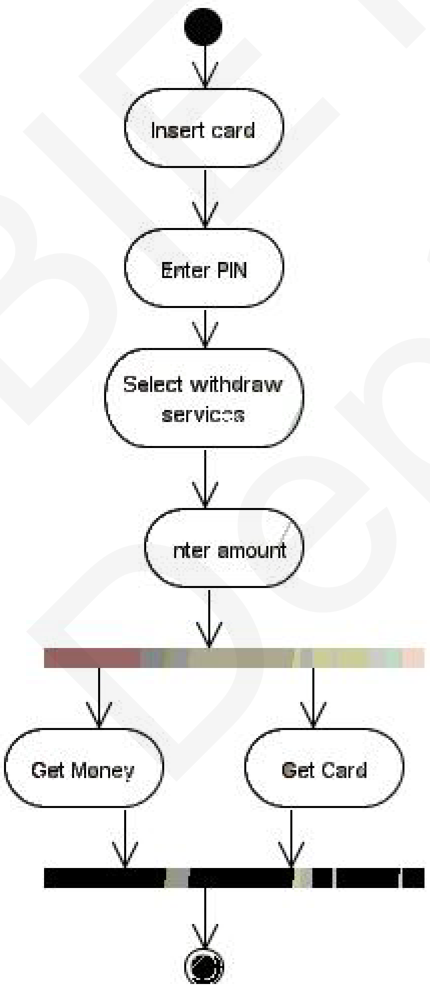
**Step2:** After that it goes to the action state insert card.

**Step3:** Next it undergoes transition to the state enter pin

**Step4**: In this way it undergoes transitions to the various states.

**Step5:** Use forking and joining wherever necessary.

**Activity Diagram:**



## Component Diagram:

**Aim:-** To implement ATM system through Component Diagram.

**Procedure:-**

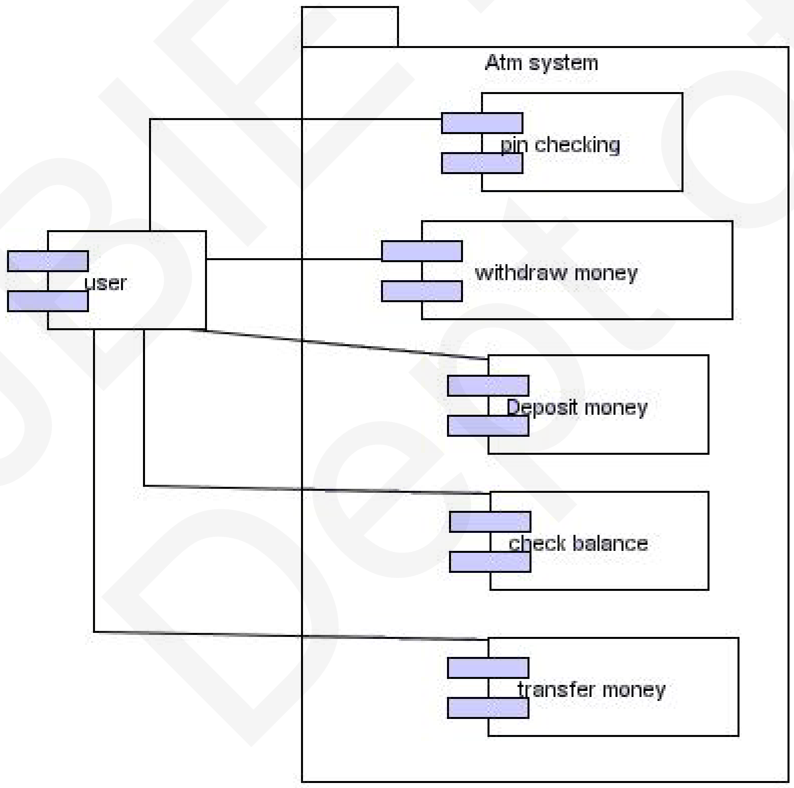
Step1: First user component is created.

Step2: ATM system package is created.

Step3: In it various components withdraw money, deposit money, check balance, transfer money etc are created.

Step4: Association relationship is established between user and other components.

**Component Diagram:**



## Deployment Diagram:

**Aim:-** To implement ATM system through Deployment Diagram.

**Procedure:-**

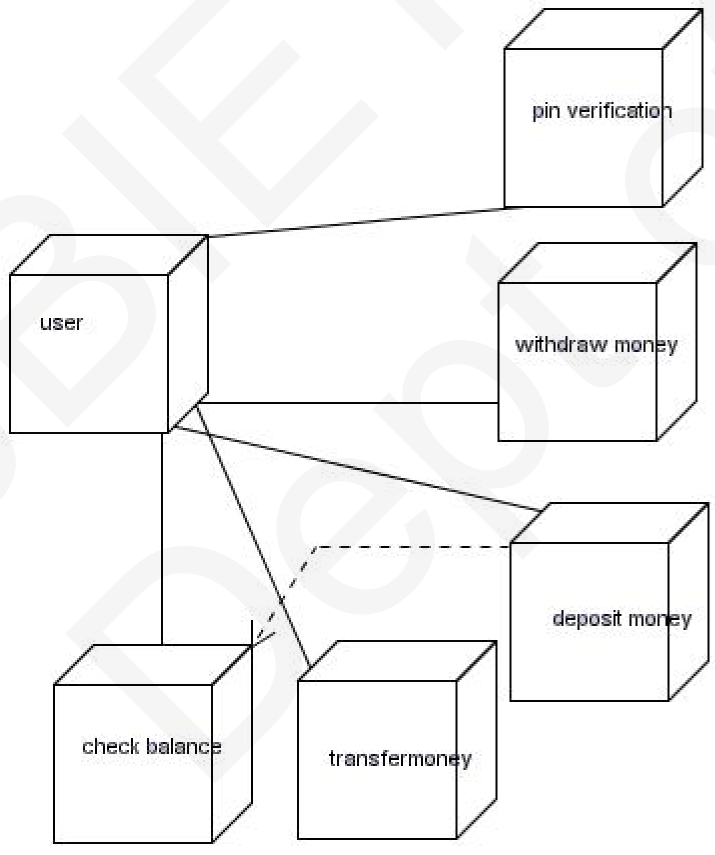
**Step1:** First user node is created

**Step2:** various nodes withdraw money, deposit money, check balance, transfer money etc are created.

**Step3:** Association relationship is established between user and other nodes.

**Step4:** Dependency is established between deposit money and check balance.

**Deployment View:**

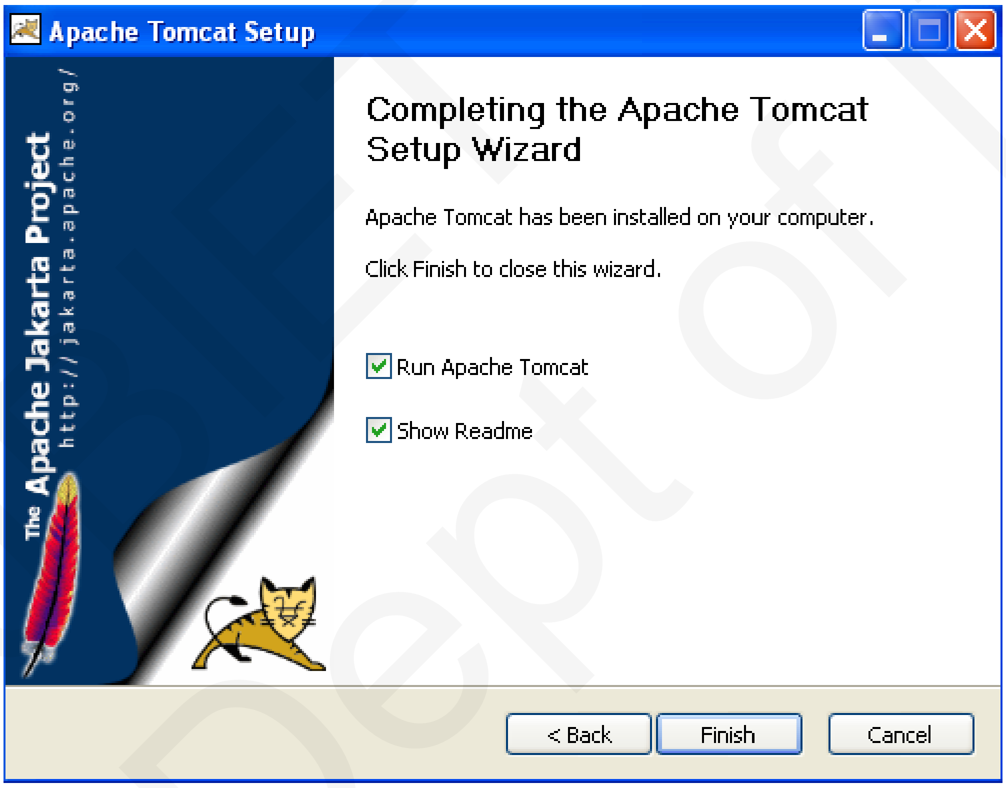


**Step 7:**

After we click the install button on the previous window the following windows are opened

**Step 8:**

Finally the following window is displayed. Click on finish to finish the installation.



Completing the Apache Tomcat Setup Wizard

Apache Tomcat has been installed on your computer.

Click Finish to close this wizard.

[✓] Run Apache Tomcat

[✓] Show Readme

**7. Write a program using JSP to insert data into the database through Servlets and retrieving data   from the database**

**details.jsp**

```
import javax.servlet.*;
import javax.servlet.http.*;
import java.sql.*;
import java.io.*;
public class  details extends HttpServlet {
   public void service(HttpServletRequest req,HttpServletResponse res) throws
ServletException,IOException {
      res.setContentType("text/html");
      PrintWriter out=res.getWriter();
      String sname=req.getParameter("name");
      out.println(sname);
      Connection con=null;
       try
{

         Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");

         con=DriverManager.getConnection("jdbc:odbc:frnd");

         PreparedStatement ps=con.prepareStatement("select  *  from  sai  where  name=?");

         ps.setString(1,sname);

         ResultSet rs=ps.executeQuery();

          if(rs.next())
         {

            out.println("Name: "+rs.getString(1));
            out.println("RollNo: "+rs.getString(2));
            out.println("Branch: "+rs.getString(3));
            out.println(" Ph_No: "+rs.getString(4));
          }
 }

  catch(Exception e)
    {

            e.printStackTrace();
     }
  finally
{

     try {
             con.close();
          }
     catch(Exception e) {
            }
   }
    }
}
```

**web.xml**

```
<web-app>
<servlet>
   <servlet-name>details</servlet-name>
   <servlet-class>details</servlet-class>
</servlet>
<servlet-mapping>
    <servlet-name>details</servlet-name>
    <url-pattern>/detail</url-pattern>
</servlet-mapping>
</web-app>
```

**register.jsp**

```
import javax.servlet.*;
import javax.servlet.http.*;
import java.sql.*;
import java.io.*;
public class register extends HttpServlet {
  public void service(HttpServletRequest req,HttpServletResponse res) throws
ServletException,IOException {
  res.setContentType("text/html");
  PrintWriter out=res.getWriter();
  Connection con=null;
  String sname=req.getParameter("name");
  String srollno=req.getParameter("rollno");
  String sbranch=req.getParameter("branch");
  String sphno=req.getParameter("phno");
   System.out.println(sname);
   try {
      Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
      con=DriverManager.getConnection("jdbc:odbc:frnd");
      PreparedStatement ps=con.prepareStatement("insert into sai  values(?,?,?,?)");
      ps.setString(1,sname);
```

```
        ps.setString(2,srollno);
        ps.setString(3,sbranch);
        ps.setString(4,sphno);
        int re=ps.executeUpdate();
        ps.clearParameters();
     }
       catch(Exception e) {
        e.printStackTrace();
        }
          finally {
             try {
                con.close();
             }
                catch(Exception e) {
                 }
    }
}
}
```

**web.xml**

```
<web-app>
<servlet>
    <servlet-name>regs</servlet-name>
    <servlet-class>register</servlet-class>
</servlet>
<servlet-mapping>
     <servlet-name>regs</servlet-name>
     <url-pattern>/register</url-pattern>
</servlet-mapping>
</web-app>
```

**AIM:** Write Programs in ‘C’ Language to demonstrate the working of the following constructs

i) do…while
ii) while..do
iii) if..else
iv) switch
v) for

**Program:**

**i) do..while**

```
#include<stdio.h>

void main()

{

    int x=0;

    clrscr();

    do{

            x++;

            printf("%d\n",x);

          }

    while(x<100);

getch();

}
```

**Output:** 0   1   2   3   4   5   6   7   8   9

**ii) While Loop**

```
#include<stdio.h>

void main()

{
        int x=0;

        clrscr();

        while(x<6)

        {
        x++;

        printf("%d\n",x);

        }

        getch();
}
```

**Output:** 1 2 3 4 5

**iii) If …else**

```
#include<stdio.h>

void main()

{

        int x;

        clrscr();

        printf("Enter a number");

        scanf("%d",&x);


        if(x%2==0)
```

```
                printf("%d is an even number",x);

        else

                printf("%d is an odd number",x);

        getch();
}
```

**Output:** Enter a number 5

```
            5 is an odd number
```

**iv) Switch Case**

```
#include<stdio.h>

#include<conio.h>

void main()
{
int a,b;

char c;

clrscr();

printf("enter the first number");

scanf("%d",&a);

printf("enter the second number");

scanf("%d",&b);

printf("Enter the operator");

scanf("%c",&c);



switch(c)
```

```
{
case '+':
          {

          printf("%d",a+b);

          break;

          }
case '-':
          {
          printf("%d",a-b);

          break;

          }

case '*':{

          printf("%d",a*b);

          break;
            }
case '/':
         {
          printf("%d",a/b);

          break;
         }

case '%':
         {
          printf("%d",a%b);

          break;
         }
default:

          printf("Enter a valid arithmetic operator");
 }

 getch();
```

```
}
```

**Output:**

```
Enter the first number: 15
Enter the second number: 10
Enter the operator:  +      25
```

**v) For Loop**

```
#include<stdio.h>

void main()
{
int i=1;

clrscr();

for(i=1;i<=10;i++)
{

printf("%d\t",i);

}
getch();

}
```

**Output:**

```
1       2       3       4       5       6       7       8       9       10
```

**AIM:** A program written in ‘C’ Language for Matrix Multiplication fails “Introspect the causes for its failure and write down the possible reasons for its failure.

**Program:**

```
#include<stdio.h>

void main()
{

int a[3][3]={1,0,0,0,1,0,0,0,1};

int b[3][3]={9,8,7,6,5,4,3,2,1};

int c[3][3];

int i=0,j=0,k=0;

clrscr();

for(i=0;i<3;i++)

{

for(j=0;j<3;j++)

{

c[i][j]=0;

for(k=0;k<3;k++)

{

c[i][j]=c[i][j]+a[i][k]*b[k][j];
}

}

}
for(i=0;i<3;i++)

{

for(j=0;j<3;j++)

{

printf("%d\t",c[i][j]);

}

printf("\n");

}

getch();

}
```

**Output:**

```
 9  8  7
6  5  4
3  2  1
```

**AIM:** Take any system (e.g. ATM system) and study its system specifications and report the various bugs.

**Program:**

**Features to be tested:**

1. Validity of the card.
2. Withdraw Transaction flow of ATM.
3. Authentication of the user's.
4. Dispense the cash from the account.
5. Verify the balance enquiry.
6. Change of PIN number.

**Bugs Identified:**

| Bug-Id | Bug Name |
|---|---|
| ATM_001 | Invalid Card |
| ATM_002 | Invalid PIN |
| ATM_003 | Invalid Account type |
| ATM_004 | Insufficient Balance |
| ATM_005 | Transaction Limit |
| ATM_006 | Day limit |
| ATM_007 | Invalid money denominations |
| ATM_008 | Receipt not printed |
| ATM_009 | PIN change mismatch |

**Bug Report:**

| |
|---|
| **Bug Id:** ATM_001 |
| **Bug Description:** Invalid card |
| **Steps to reproduce:** 1. Keep valid card in the ATM. |
| **Expected Result:** Welcome Screen |
| **Actual Result:** Invalid card |
| **Status :** Pass/Fail |

| |
|---|
| **Bug Id:** ATM_002 |
| **Bug Description:** Invalid PIN entered |
| **Steps to reproduce:**<br>1. Keep a valid card in ATM.<br>2. Enter the authorized PIN.<br>3. Menu screen should be displayed. |
| **Expected Result:** Menu screen displayed |
| **Actual Result:** Invalid PIN screen is displayed |
| **Status :** Pass/Fail |

| |
|---|
| **Bug Id:** ATM_003 |
| **Bug Description:** Invalid Account type selected. |
| **Steps to reproduce:**<br>1. Enter a valid user PIN number.<br>2. Select the withdraw option on the main menu.<br>3. Choose the correct type of account (either savings or current account). |
| **Expected Result:** Enter the Amount screen displayed |
| **Actual Result:** Invalid Account type screen is displayed. |
| **Status :** Pass/~~Fail~~ |

| |
|---|
| **Bug Id:** ATM_004 |
| **Bug Description:** Insufficient Balance |
| **Steps to reproduce:**<br>1. Menu screen should be displayed.<br>2. Select the withdraw option.<br>3. Select the correct type of account.<br>4. Enter the sufficient amount to withdraw from the account.<br>5. Dispense the cash screen & amount to be deducted from account |
| **Expected Result:** Collect the amount screen displayed |
| **Actual Result:** Insufficient balance in the account |
| **Status :** Pass/~~Fail~~ |

**Bug Id:** ATM_005

**Bug Description:** Withdraw Limit per transaction.

**Steps to reproduce:**

1. Menu screen should be displayed.
2. Select the withdraw option.
3. Select the correct type of account.
4. Enter sufficient amount to withdraw from the account Transaction within the limit.
5. Dispense the cash screen & amount to be deducted from account.

**Expected Result:** Cash is dispensed and collect the receipt

**Actual Result:** Transaction limit exceeded screen is displayed

**Status :** Pass/Fail

**Bug Id:** ATM_006

**Bug Description:** Withdraw limit per day

**Steps to reproduce:**

1. Keep a valid card in ATM.
2. Enter the authorized PIN.
3. Enter the amount to withdraw from the account.
4. Amount enter is over the day limit (>40000)
5. Amount enter is over the day limit and display screen is displayed.

**Expected Result:** Cash is dispensed and collect the receipt.

**Actual Result:** Day limit exceeded screen is displayed.

**Status :** Pass/Fail

**Bug Id:** ATM_007

**Bug Description:** Amount enter denominations

**Steps to reproduce:**

1. Keep a valid card in ATM.
2. Enter the authorized PIN.
3. Enter the amount which should be in multiples of 100.
4. Cash Dispenser screen is displayed.

**Expected Result:** Collect the amount screen is displayed.

**Actual Result:** Amount enter not in required denominations.

| |
|---|
| **Status :** Pass/Fail |

| |
|---|
| **Bug Id:** ATM_008 |
| **Bug Description:** Statement not printed |
| **Steps to reproduce:**<br>1. Keep a valid card in ATM.<br>2. Enter the authorized PIN.<br>3. Select the mini statement.<br>4. Current balance is displayed on the screen.<br>5. Collect printed receipt of the statement. |
| **Expected Result:** Collect the mini statement receipt |
| **Actual Result:** receipt not printed. |
| **Status :** Pass/Fail |

| |
|---|
| **Bug Id:** ATM_009 |
| **Bug Description:** PIN mismatch |
| **Steps to reproduce:**<br>1. Keep a valid card in ATM.<br>2. Enter the authorized PIN.<br>3. Select the change PIN option on the menu.<br>4. Enter the current PIN.<br>5. Enter the new PIN.<br>6. Retype the new PIN<br>7. PIN successfully changed displayed on the screen. |
| **Expected Result:** PIN change successful. |
| **Actual Result:** PIN mismatched due to wrong PIN entered |
| **Status :** Pass/Fail |

**AIM:** Create a Test Plan document for any application (e.g. Library Management System).

**Program**

## Document Control

| | | | |
|---|---|---|---|
| Prepared by: | Prabhu | Designation: | Student |
| Date: | | Signature: | |

| | | | |
|---|---|---|---|
| Reviewed by: | Ch.Srinivasulu | Designation: | |
| Date: | | Signature: | |

| | | | |
|---|---|---|---|
| Approved by: | | Designation: | |
| Date: | | Signature: | |

## Change History

| Date | Version | Section | Description of the Change | Author |
|---|---|---|---|---|
| NA | NA | NA | NA | NA |

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## Revision History

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## Inputs Check List

| Document | Submitted (Yes/No) |
|---|---|
| NA | NA |

## Approvals

| Authorization | NA |
|---|---|
| Test Manager | NA |
| Project Manager | NA |
| Client | NA |

## 1. Purpose

To test the library management system functionality.

### 1.1. Test Scope

To verify the functionality of the different features in the library management system

### 1.2. Test Milestones

| S. No | Activity | Output | Date <dd/mmm/yyyy> |
|---|---|---|---|
| 1. | Test Planning | Test Plan | 1 week |
| 2. | Pre-Acceptance test case designing | Pre-Acceptance test case specification | 2 weeks |
| 3. | System test case designing | System test case specification | 3 weeks |
| 4. | Integration test case designing | Integration test case specification | 2 weeks |
| 5. | Execute Integration Test cases | Integration test report | 1 week |
| 6. | Execute System Test cases | System test report | 1 weeks |
| 7. | Execute Pre-Acceptance Test cases | Pre-Acceptance test report | 1 week |

## 2. Project Document References

## 3. Entry Criteria

### 3.1 Integration Testing

### 3.2 System Testing

### 3.3 Pre-Acceptance Testing

## 4. Test Strategy

| Test Types | Required (Yes/No) |
|---|---|
| **Integration Testing** | |
| Functional Testing | YES |
| **System Testing** | |
| Functional Testing | YES |
| Performance Testing | NO |
| Load Testing | NO |
| Stress Testing | NO |
| GUI Testing | YES |
| **Pre-Acceptance Testing** | |
| Functional Testing | YES |
| Performance Testing | NO |
| Load Testing | NO |
| Stress Testing | NO |
| GUI Testing | YES |

### 4.1 Integration Testing

#### 4.1.1 Type of Testing: Functional testing

| | |
|---|---|
| Test Objective: | VERIFYING THE LIBRARY MANAGEMENT SYSTEM |
| Technique: | Black box testing |
| Completion Criteria: | *NA* |
| Special Considerations: | *NA* |

### 4.2 System Testing

#### 4.2.1 Type Of Testing :

| | |
|---|---|
| Test Objective: | |
| Technique: | |
| Completion Criteria: | |
| Special Considerations: | |

## 5. Exit Criteria

### 5.1 Integration Testing

### 5.2 System Testing

### 5.3 Pre-Acceptance Testing

## 6. Defect Fixing Threshold Time

| **Defect Type** | **Severity** | **Threshold** |
|---|---|---|
| Integration Testing | | |
| Critical | S1 | NA |
| Major | S2 | NA |
| Minor | S3 | NA |
| System Testing | | |
| Critical | S1 | NA |
| Major | S2 | NA |
| Minor | S3 | NA |

## 7. Test Coverage Criteria: Top-down approach

## 8. Suspension and Resumption Criteria: NA

### 8.1 Hardware Environment: ram, h/d,

### 8.2 Software Environment: Visual Basic-front end, MS- Access- backend, os, testing tools (Test Director)

## 9. Test Environments

## 10. Testing Tools:

| S.NO | Testing Type & Level | Tool | Remarks |
|---|---|---|---|
| 01 | **Functional testing** | **Win Runner 8.2** | |
| 02 | **Test management tool** | **Test Director 8.0** | **1. To upload the test plan.** **2. Create the test scripts/ test cases.** **3. Execute the test cases.** **4. Reporting the defects.** **5. Analyze the test reports / results.** |

## 11. Test Reports

Bug trends
Traceability Matrix
Status Reports

## 12. Test Scheduling & Resource Planning

### 5.1 Scheduling

| Functional Task | Resource Name | Effort | | Schedule (dd/mmm/yyyy) | | | |
|---|---|---|---|---|---|---|---|
| | | Estimated | Actual | Planned Start Dt. | Actual Start Dt. | Planned End Dt. | Actual End Dt. |
| Review Project Plan | | 30 man /hrs | 35 man/hrs | | | | |
| Create test plan | | | | | | | |
| Review Test Plan | | | | | | | |
| Participate in peer review of SRS | | | | | | | |
| Analyze SRS | | | | | | | |
| Design Pre-Acceptance test cases | | | | | | | |
| Design System test cases | | | | | | | |
| Participate in | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| peer review of HLDD | | | | | | | |
| Participate in peer review of LLDD | | | | | | | |
| Analyze HLDD and LLDD | | | | | | | |
| Design integration test cases | | | | | | | |
| Execute integration test cases | | | | | | | |
| Evaluate integration test reports | | | | | | | |
| Update System cases | | | | | | | |
| Execute system test cases | | | | | | | |
| Evaluate system test reports | | | | | | | |
| Execute Pre-Acceptance test cases | | | | | | | |
| Evaluate Pre-Acceptance test reports | | | | | | | |
| Create test closure report | | | | | | | |

## 5.2 Training Needs

| S.No | Resource Name | Training Needs | Status |
|---|---|---|---|
| | 18 studnets | Win Runner 8.2 | In progress |
| | | | |
| | | | |

## 13. Inter-Group coordination

| S. No | Group | Representative Name |
|---|---|---|
| | NA | |

## 14. Metrics Plan

Traceability matrix

**AIM:** Study of any test management tool (e.g. Test Director).

## TEST DIRECTOR

Mercury Test Director is an excellent tool for managing the testing process effectively and allows you to deploy high-quality applications quickly and effectively by providing a consistent, repeatable process for gathering requirements, planning and scheduling tests, analysing results, and managing defects and issues.

Test Director supports high levels of communication and collaboration among IT teams. Whether you are coordinating the work of many disparate QA teams, or working with a large, distributed Centre of Excellence, this test management tool helps facilitate information access across geographical and organization boundaries.

Using Test Director, multiple groups throughout the organisation can contribute to the quality process:

* Business analysts define application requirements and testing objectives
* Test managers and project leads design test plans and develop test cases
* Test automation engineers create automated scripts and store them in the repository
* QA testers run manual and automated tests, report execution results, and enter defects
* Developers review and fix defects logged into the database
* Project managers create application status reports and manage resource allocation
* Product managers decide whether an application is ready to be released.

The important features of Test Director are:

- It is a web based tool and hence it facilitates distributing testing.
- As testing the software is linked to the requirements of the software, it provides the feature of linking the software requirements to the testing plan.

- It provides the features to document the testing procedures.
- It provides the features of scheduling the manual and automated tests-the testing can be done during nighttimes or when the system load is less.
- It keeps history of all the test runs.
- It provides the feature of setting groups of machines to carry out testing.
- The audit trail feature allows keeping track of changes in the tests and test runs.
- It keeps a log of all defects found and the status of each bug can be changed by authorized persons only.
- It provides the features of creating different users with different privileges.
- It generates test reports and analysis for the QA manager to decide when the software can be released into the market.

There are 4 tabs in Test Director

1.Requirements
2.Test Plan
3.Test Lab
4.Defect

1. In **requirements tab** we will place the requirements of the application, through this requirements we can map with test cases.
2. **Test Plan**- After uploading the test cases to the test director, the scripts will be placed in test plan.
3. **Test Lab**- We can execute the test scripts in the Test Lab. we can change the status of the script
4. **Defect**- We can raise the defect by using the Defects tab in Test Director.

## Specifying Requirements

You begin the application testing process by specifying testing requirements.
In this phase you perform the following tasks:

**Define Testing Scope** Examine application documentation to determine your testing scope—test goals, objectives, and strategies.
**Create Requirements** Build a *requirements tree* to define your overall testing requirements.
**Detail Requirements** For each requirement topic in the requirements tree, create a list of detailed testing requirements. Describe each requirement, assign it a priority level, and add attachments if necessary.
**Analyze Requirements Specification**
Generate reports and graphs to assist in analyzing your testing requirements. Review your requirements to ensure they meet your testing scope.

## Planning Tests

You create a test plan based on your testing requirements.
In this phase you perform the following tasks:
**Define Testing Strategy** Examine your application, system environment, and testing resources to determine your testing goals.
**Define Test Subjects** Divide your application into subjects or functions to be tested. Build a *test plan tree* to hierarchically divide your application into testing units, or *subjects*.
**Define Tests** Determine the types of tests you need for each subject. Add a basic definition of each test to the test plan tree.
**Create Requirements Coverage**
Link each test with a testing requirement(s).
**Design Test Steps** Develop manual tests by adding steps to the tests in your test plan tree. *Test steps* describe the test operations and the expected outcome of each test. Decide which tests to automate.
**Automate Tests** For tests that you decide to automate, create test scripts with a Mercury Interactive testing tool, or a custom or third-party testing tool.
**Analyze Test Plan** Generate reports and graphs to assist in analyzing test planning data. Review your tests to determine their suitability to your testing goals.

## **Running Tests**

After you build a test plan tree, you run your tests to locate defects and assess quality.

In this phase you perform the following tasks:

.

**Create Test Sets** Define groups of tests to meet the various testing goals in your project. These might include, for example, testing a new version or a specific function in an application. Determine which tests to include in each test set.

**Schedule Runs** Schedule test execution and assign tasks to testers.

**Run Tests** Execute the tests in your test set automatically or manually.

**Analyze Test Results** View the results of your test runs to determine whether a defect has been detected in your application. Generate reports and graphs to help analyze these results.

## **Tracking Defects**

Locating and repairing application defects efficiently is essential to the testing process. Defects can be detected and added during all stages of the testing process. In this phase you perform the following tasks:

**Add Defects** Report new defects detected in your application. Quality assurance testers, developers, project managers, and end users can add defects during any phase in the testing process.

**Review New Defects** Review new defects and determine which ones should be fixed.

**Repair Open Defects** Correct the defects that you decided to fix.

**Test New Build** Test a new build of your application. Continue this process until defects are repaired.

**Analyze Defect Data** Generate reports and graphs to assist in analyzing the progress of defect repairs, and to help determine when to release the application.

**Starting Test Director**

You start Test Director from your Web browser, using the Test Director URL.

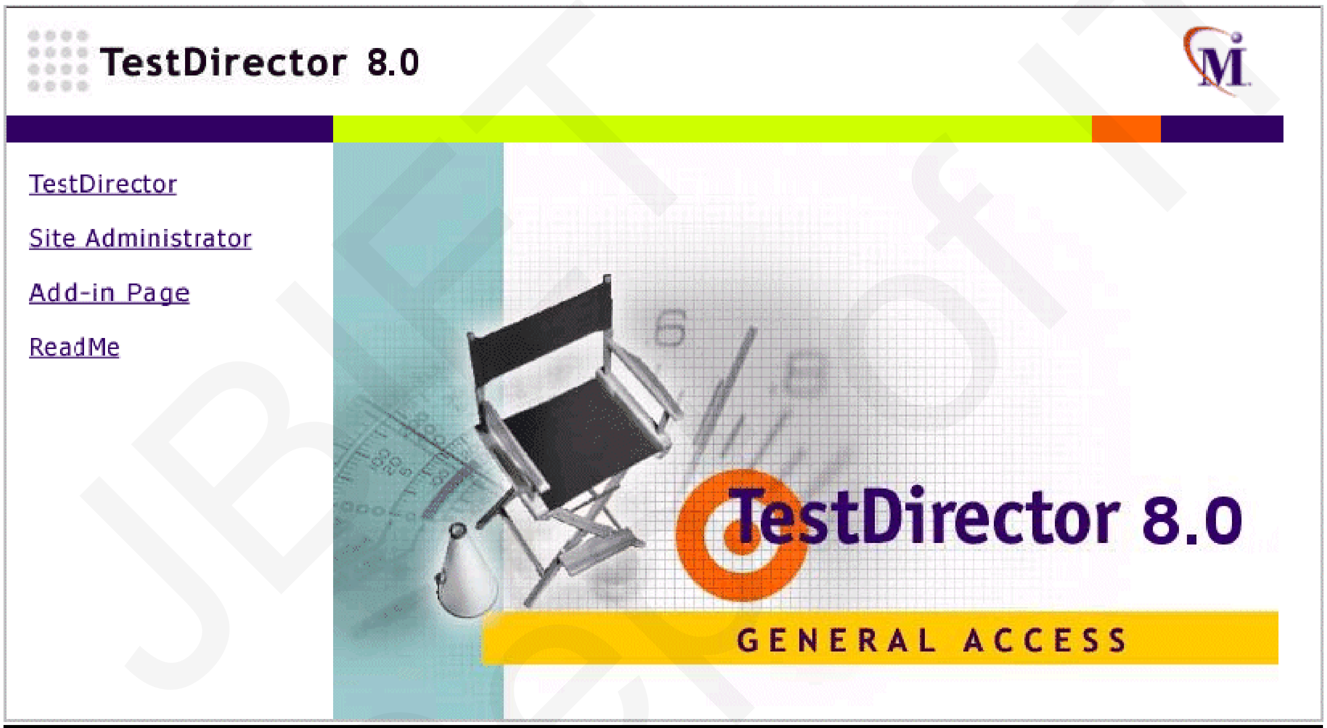
**To start Test Director:**

**1 Open the Test Director Options window.**

In your Web browser, type your Test Director URL:

**http://<TestDirector server name>/<virtual directory name>/default**.htm

The Test Director Options window opens.

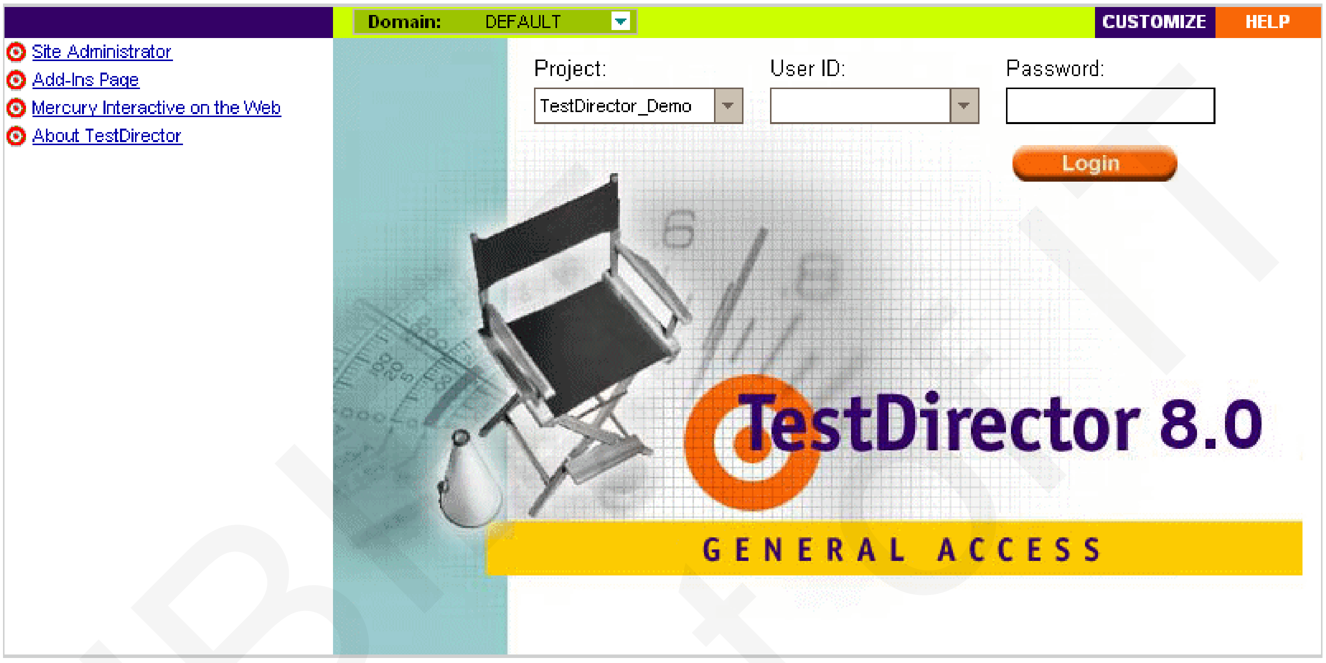


**2 Open Test Director.**

Click the **Test Director** link.

The first time you run Test Director, the application is downloaded to your computer. Then, each time you open Test Director, it automatically carries out a version check. If Test Director detects a newer version, it downloads the latest version to your machine.

The Test Director Login window opens.


Domain: DEFAULT

Project: TestDirector_Demo

User ID:

Password:

**3 Select a domain.**

In the **Domain** list, select **DEFAULT**.

**4 Select a project**.

In the Project list, select TestDirector_Demo.

**5 Log on to the project as a QA tester.**

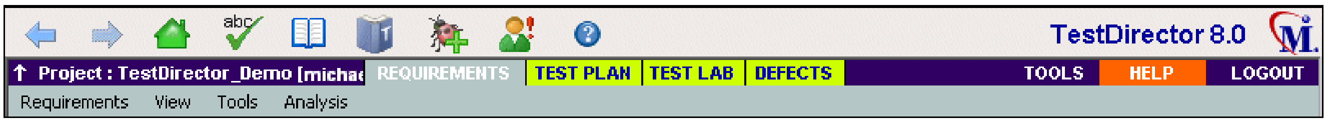
In the **User ID** box, type one of the following user names: **alice_td, cecil_td, or michael_td.**

Skip the **Password** box. A password was not assigned to any of the above user names.

Click the **Login** button. Login

Test Director opens and displays the module in which you were last working.

In the title bar, Test Director displays the project name and your user name.


Project : TestDirector_Demo [michae

## The Test Director Window

In the following exercise, you will explore the Test Director modules and their common elements.

**To explore the Test Director window:**

**1 Explore the Test Director modules.**

➢ Click the **Requirements** tab. The Requirements module enables you to specify your testing requirements. This includes defining what you are testing, defining requirement topics and items, and analyzing the requirements.

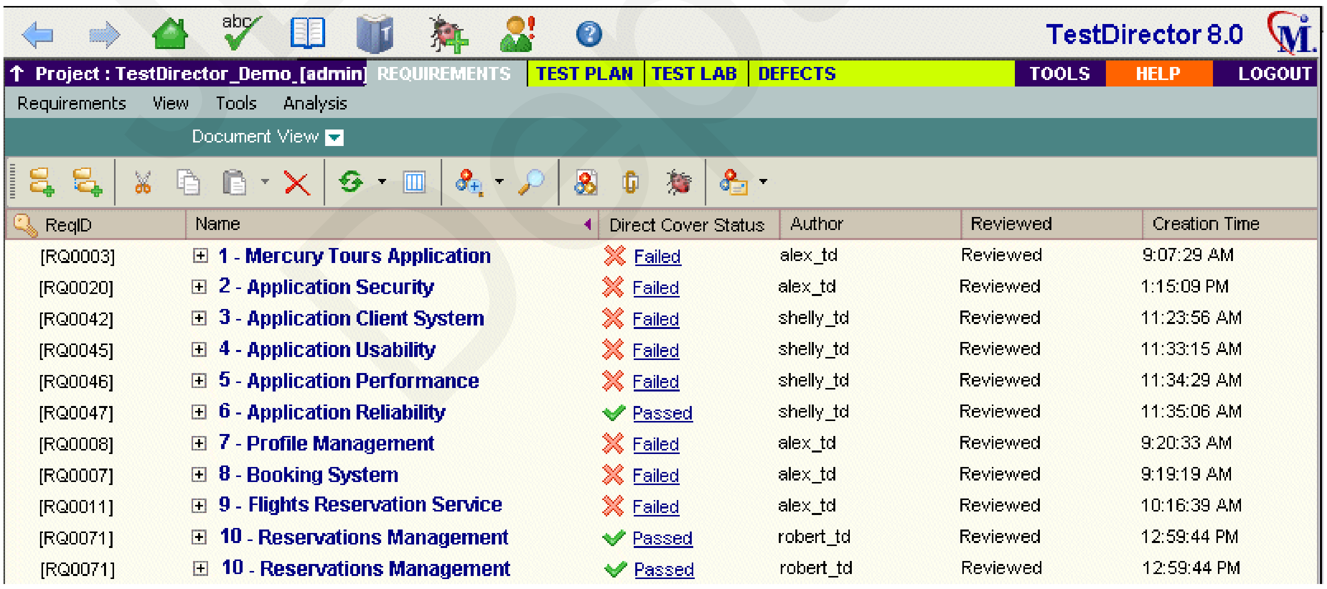
➢ Click the **Test Plan** tab. The Test Plan module enables you to develop a test plan based on your testing requirements. This includes defining goals and strategies, dividing your plan into categories, developing tests, automating tests where beneficial, and analyzing the plan.

➢ Click the **Test Lab** tab**.** The Test Lab module enables you to run tests on your application and analyze the results.

➢ Click the **Defects** tab. The Defects module enables you to add defects, determine repair priorities, repair open defects, and analyze the data.

**2 Explore the common TestDirector elements.**

All the TestDirector modules have common elements. For example, click the **Requirements** tab.



| ReqID | Name | Direct Cover Status | Author | Reviewed | Creation Time |
|---|---|---|---|---|---|
| [RQ0003] | 1 - Mercury Tours Application | Failed | alex_td | Reviewed | 9:07:29 AM |
| [RQ0020] | 2 - Application Security | Failed | alex_td | Reviewed | 1:15:09 PM |
| [RQ0042] | 3 - Application Client System | Failed | shelly_td | Reviewed | 11:23:56 AM |
| [RQ0045] | 4 - Application Usability | Failed | shelly_td | Reviewed | 11:33:15 AM |
| [RQ0046] | 5 - Application Performance | Failed | shelly_td | Reviewed | 11:34:29 AM |
| [RQ0047] | 6 - Application Reliability | Passed | shelly_td | Reviewed | 11:35:06 AM |
| [RQ0008] | 7 - Profile Management | Failed | alex_td | Reviewed | 9:20:33 AM |
| [RQ0007] | 8 - Booking System | Failed | alex_td | Reviewed | 9:19:19 AM |
| [RQ0011] | 9 - Flights Reservation Service | Failed | alex_td | Reviewed | 10:16:39 AM |
| [RQ0071] | 10 - Reservations Management | Passed | robert_td | Reviewed | 12:59:44 PM |
| [RQ0071] | 10 - Reservations Management | Passed | robert_td | Reviewed | 12:59:44 PM |

Each of the Test Director modules contains the following key elements:

➢ The *Test Director toolbar* is located directly above the Test Director project name. If the toolbar is not visible, click the **Show Toolbar** button. The common Test Director toolbar is accessible from all Test Director modules and contains the following buttons:

**Back:** Navigates back to your previous location in Test Director.

**Forward:** If you navigated back, enables you to navigate forward.

**Home:** Logs out and takes you to the Test Director Login window.

**Check Spelling:** Checks the spelling for the selected word or text box. If there are no errors, a confirmation message opens. If errors are found, the Spelling dialog box opens and displays the word together with replacement suggestions.

**Spelling Options:** Opens the Spelling Options dialog box, enabling you to configure the way Test Director checks spelling.

**Thesaurus:** Opens the Thesaurus dialog box and displays a synonym, antonym, or related word for the selected word. You can replace the selected word or look up new words.

**Add Defect:** Opens the Add Defect dialog box, enabling you to add a new defect.

**Trace All Changes:** Opens the Trace All Changes dialog box, enabling you to view traceability alerts.

**Help:** Opens the Online Help and displays the help topic for the current context.

➢ The ***menu bar***, located directly below the Test Director project name, displays the names of menus from which you select commands.

➢ The ***module toolbar***, located below the menu bar, contains buttons for frequently-used commands in the current Test Director module.

➢ The **Tools** button, located on the upper-right side of the window, enables you to change your user password and other user properties, open the Document Generator, and view version information for each Test Director client component. TOOLS

➢ The **Help** button, located on the upper-right side of the window, enables you to access Test Director's online resources. HELP

➢ The **Logout** button, located on the upper-right side of the window, enables you to exit and return to the Test Director Login window. LOGOUT

## Specifying Testing Requirements

You begin the testing process by specifying testing requirements in Test Director's Requirements module. Requirements describe in detail what needs to be tested in your application and provide the test team with the foundation on which the entire testing process is based.

You define the requirements in Test Director by creating a *requirements tree*. This is a graphical representation of your requirements specification, displaying your requirements hierarchically. You can group and sort requirements in the tree, monitor task allocation and progress of requirements, and generate detailed reports and graphs.

After you create tests in the Test Plan module, you can link requirements to tests. Later, after you begin logging defects, you can also associate requirements with defects. In this way, you can keep track of your testing needs at all stages of the testing process. If a testing requirement changes, you can immediately identify which tests and defects are affected, and who is responsible for them.

In this we will describe about:

➢ Defining Requirements
➢ Viewing Requirements
➢ Modifying Requirements
➢ Converting Requirements

## Defining Requirements

In the following exercise, you will define requirements for testing the functionality of reserving cruises in Mercury Tours.

**To define a requirement:**

**1 Open the Test Director_Demo project.**

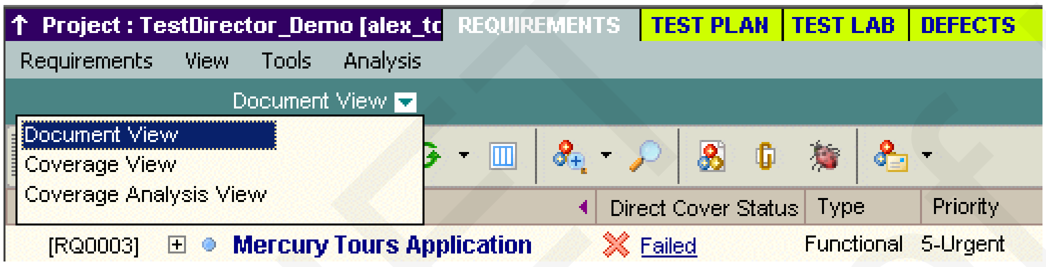
If the **TestDirector_Demo** project is not already open, log on to the project.

**2 Display the Requirements module.**

Click the **Requirements** tab. The Requirements module displays the requirements tree.

**3 Display the requirements tree in Document View.**

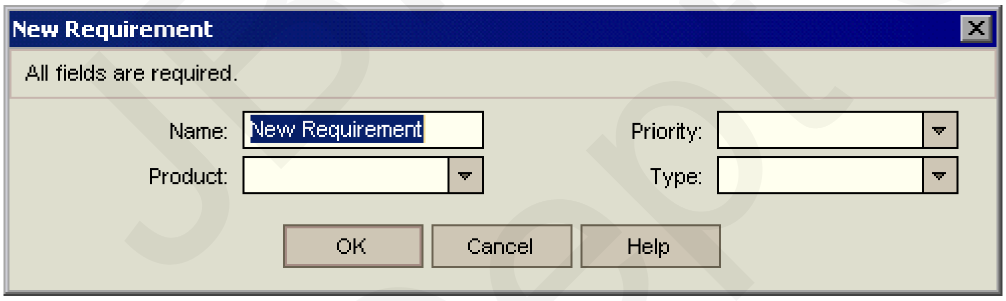
Make sure the **Document View** of the requirements tree is displayed



| | | | | |
|---|---|---|---|---|
| [RQ0003] | Mercury Tours Application | Failed | Functional | 5-Urgent |

**4 Create a new requirement.**

Click the **New Requirement** button. The New Requirement dialog box Opens



All fields are required.

| | | | |
|---|---|---|---|
| Name: | New Requirement | Priority: | |
| Product: | | Type: | |

Type or select the following:

**Name:** Cruise Reservation

**Product:** Mercury Tours (HTML Edition)

**Priority:** 4-Very High

**Type:** Functional

Click **OK**. TestDirector adds the **Cruise Reservation** requirement to the requirements tree.

**5 Add a child requirement.**

Click the **New Child Requirement** button to add the next requirement below

**Cruise Reservation**, at a lower hierarchical level. The New Requirement dialog box opens.

Type or select the following:

**Name:** Cruise Search

**Product:** Mercury Tours (HTML Edition)

**Priority:** 4-Very High

**Type:** Functional

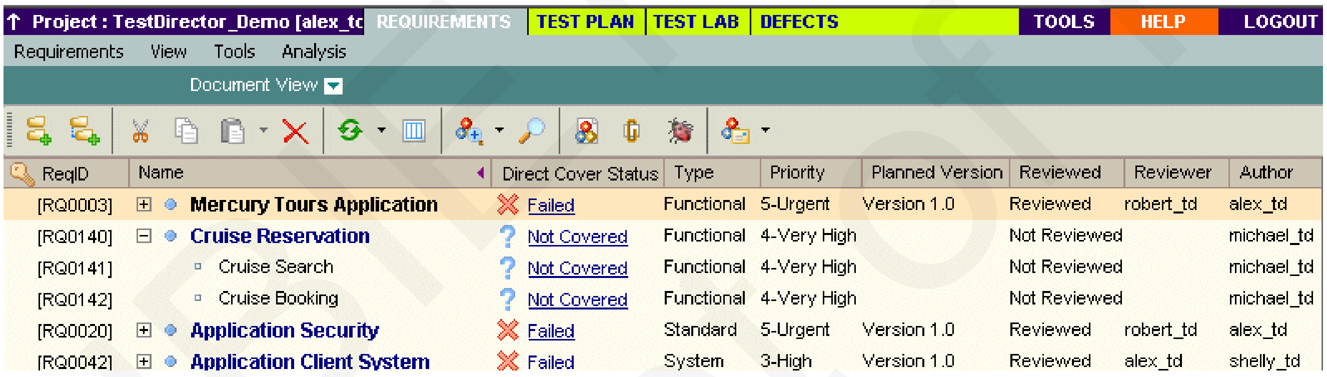
Click **OK**. Test Director adds the **Cruise Search** requirement as a child of the **Cruise Reservation** requirement.

**6 Add an additional child requirement.**

In the requirements tree, select **Cruise Reservation**.

Repeat step **5**. This time in the **Name** box, type Cruise Booking.

Test Director adds the **Cruise Booking** requirement as a child of the **Cruise Reservation** requirement.



| ReqID | Name | Direct Cover Status | Type | Priority | Planned Version | Reviewed | Reviewer | Author |
|---|---|---|---|---|---|---|---|---|
| [RQ0003] | ⊞ Mercury Tours Application | Failed | Functional | 5-Urgent | Version 1.0 | Reviewed | robert_td | alex_td |
| [RQ0140] | ⊟ Cruise Reservation | Not Covered | Functional | 4-Very High | | Not Reviewed | | michael_td |
| [RQ0141] | Cruise Search | Not Covered | Functional | 4-Very High | | Not Reviewed | | michael_td |
| [RQ0142] | Cruise Booking | Not Covered | Functional | 4-Very High | | Not Reviewed | | michael_td |
| [RQ0020] | ⊞ Application Security | Failed | Standard | 5-Urgent | Version 1.0 | Reviewed | robert_td | alex_td |
| [RQ0042] | ⊞ Application Client System | Failed | System | 3-High | Version 1.0 | Reviewed | alex_td | shelly_td |

## Viewing Requirements

You can change the way Test Director displays requirements in the requirements tree. In the following exercise, you will learn how to zoom in and out of the tree and display numeration.

**To view requirements:**

**1 Make sure the Requirements module is displayed.**

If the Requirements module is not displayed, click the **Requirements** tab.

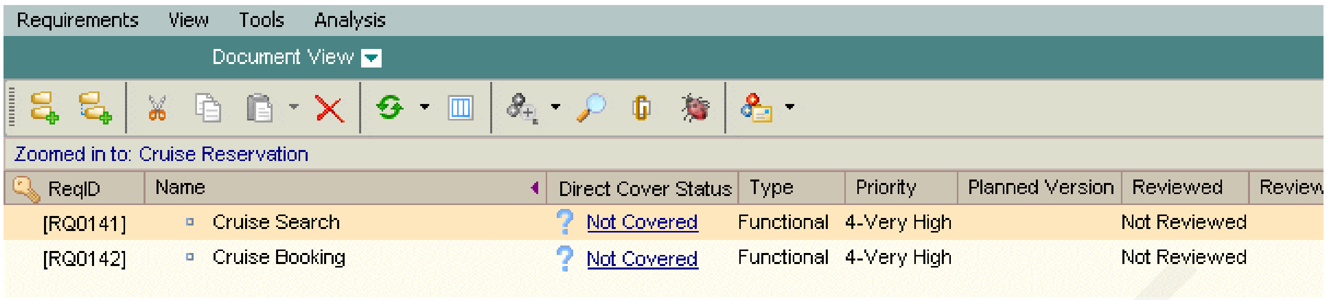
The Requirements module displays the requirements tree.

Make sure the requirements tree is displayed in **Document View**.

**2 Zoom in and out of the requirement.**

To zoom in, select **Cruise Reservation** in the requirements tree.

Click the **Zoom In** button on the toolbar. The requirements tree displays only the **Cruise Reservation** child requirements.



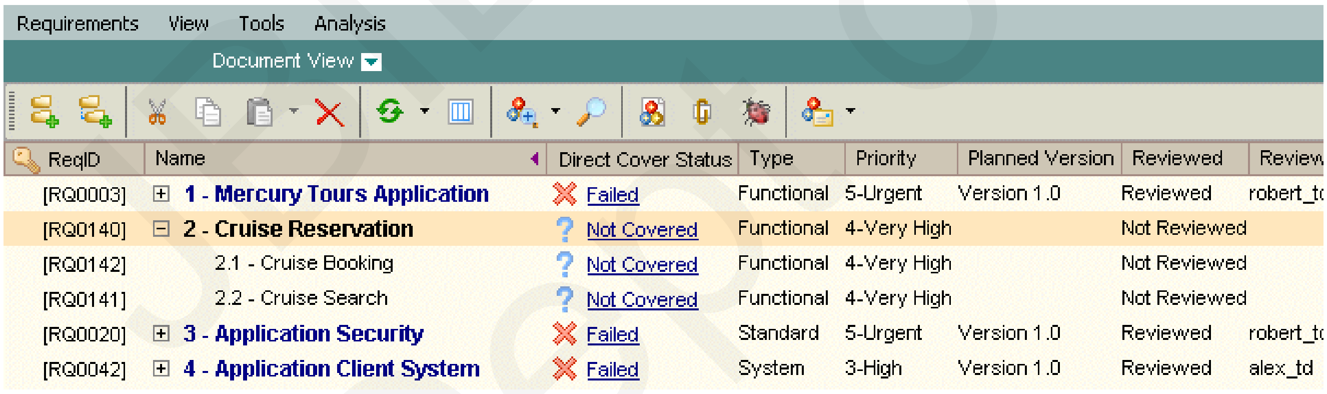
Zoomed in to: Cruise Reservation

| ReqID | Name | Direct Cover Status | Type | Priority | Planned Version | Reviewed | Review |
|---|---|---|---|---|---|---|---|
| [RQ0141] | Cruise Search | Not Covered | Functional | 4-Very High | | Not Reviewed | |
| [RQ0142] | Cruise Booking | Not Covered | Functional | 4-Very High | | Not Reviewed | |

To reverse the zoom in action and display the entire requirements tree, click the **Zoom In** arrow and choose **Zoom Out To Root**.

**3 Display numerations in the requirements tree.**

To assign hierarchical numbers to each requirement in the tree, choose **View** > **Numeration**. As you make changes to the tree, Test Director automatically renumbers the requirements. Note that the numbers are not related to the unique Req ID assigned to each requirement.



| ReqID | Name | Direct Cover Status | Type | Priority | Planned Version | Reviewed | Review |
|---|---|---|---|---|---|---|---|
| [RQ0003] | ⊞ 1 - Mercury Tours Application | Failed | Functional | 5-Urgent | Version 1.0 | Reviewed | robert_t |
| [RQ0140] | ⊟ 2 - Cruise Reservation | Not Covered | Functional | 4-Very High | | Not Reviewed | |
| [RQ0142] | 2.1 - Cruise Booking | Not Covered | Functional | 4-Very High | | Not Reviewed | |
| [RQ0141] | 2.2 - Cruise Search | Not Covered | Functional | 4-Very High | | Not Reviewed | |
| [RQ0020] | ⊞ 3 - Application Security | Failed | Standard | 5-Urgent | Version 1.0 | Reviewed | robert_t |
| [RQ0042] | ⊞ 4 - Application Client System | Failed | System | 3-High | Version 1.0 | Reviewed | alex_td |

**4 Remove the numeration from the requirements tree.**

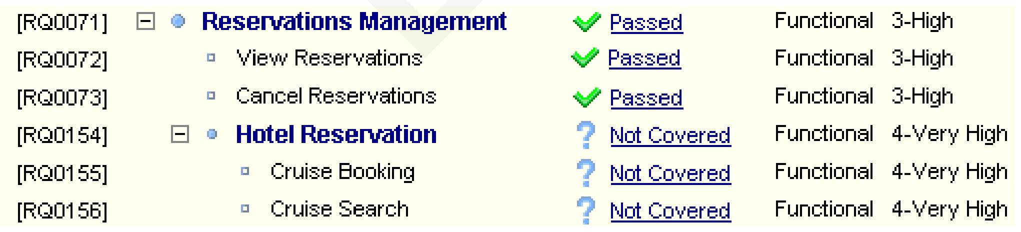
To remove the hierarchical numbering, choose **View** > **Numeration**

## Modifying Requirements

You can modify the requirements in the requirements tree. In the following exercise, you will learn how to copy, rename, move, or delete requirements.

**To modify requirements:**

**1 Make sure the Requirements module is displayed.**
If the Requirements module is not displayed, click the **Requirements** tab.
The Requirements module displays the requirements tree.
**2 Copy a requirement.**
In the requirements tree, select **Cruise Reservation** and click the **Copy** button.
Click the **Paste** button.
A warning box opens because you are duplicating the requirement name. Click **OK**.
The requirement is pasted below the selected requirement, at the same hierarchical level. _Copy_ is added to the end of the requirement's name.
**3 Rename the Cruise Reservation_Copy_ requirement.**
Right-click the **Cruise Reservation_Copy_** requirement and choose **Rename**.
Edit the requirement name to Hotel Reservation and press **Enter**.
**4 Move the Hotel Reservation requirement to a different location in the requirements tree.**
Select **Hotel Reservation**.
Click the **Cut** button.
Select **Reservations Management**.
To paste **Hotel Reservation** below the selected requirement, click the **Paste** arrow and choose **Paste as Child**.
Click **Yes** to confirm.



| | | | | |
|---|---|---|---|---|
| [RQ0071] | ⊟ ● **Reservations Management** | ✓ Passed | Functional | 3-High |
| [RQ0072] | ▫ View Reservations | ✓ Passed | Functional | 3-High |
| [RQ0073] | ▫ Cancel Reservations | ✓ Passed | Functional | 3-High |
| [RQ0154] | ⊟ ● **Hotel Reservation** | ? Not Covered | Functional | 4-Very High |
| [RQ0155] | ▫ Cruise Booking | ? Not Covered | Functional | 4-Very High |
| [RQ0156] | ▫ Cruise Search | ? Not Covered | Functional | 4-Very High |

**5 Delete the Hotel Reservation requirement.**

Select **Hotel Reservation**.
Click the **Delete** button.
Click **Yes** to confirm. Test Director deletes the requirement and its children

## Converting Requirements

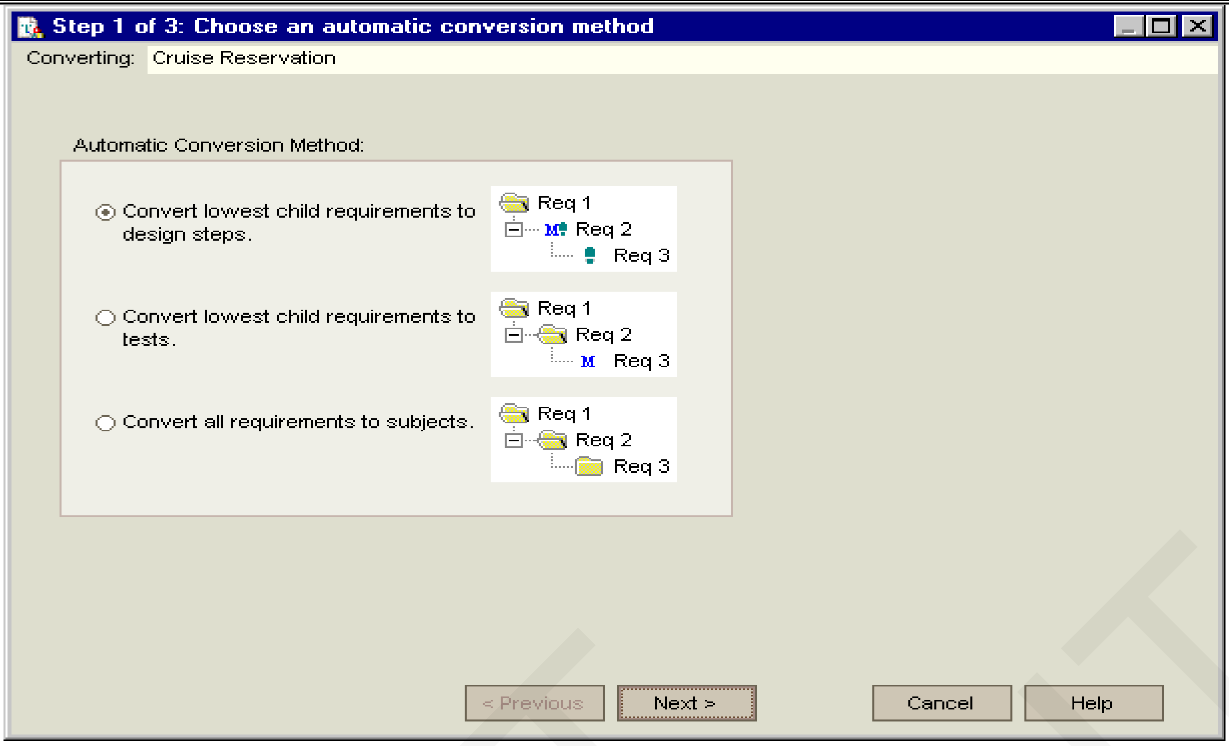
After you create the requirements tree, you use the requirements as a basis for defining your *test plan tree* in the Test Plan module

You can use the Convert to Tests wizard to assist you when designing your test plan tree. The wizard enables you to convert selected requirements or all requirements in the requirements tree to tests or subjects in the test plan tree.

In the following exercise, you will convert the **Cruise Reservation** requirement to a subject in the test plan tree and the **Cruise Reservation** child requirements to tests.

**To convert a requirement:**

**1 Make sure the Requirements module is displayed.**
If the Requirements module is not displayed, click the **Requirements** tab.
The Requirements module displays the requirements tree.
**2 Select a requirement.**
In the requirements tree, select **Cruise Reservation**.
**3 Open the Convert to Tests wizard.**
Choose **Tools** > **Convert to Test > Convert Selected**. The Step 1 dialog box opens.


Step 1 of 3: Choose an automatic conversion method

Converting: Cruise Reservation

Automatic Conversion Method:

(●) Convert lowest child requirements to design steps.

( ) Convert lowest child requirements to tests.

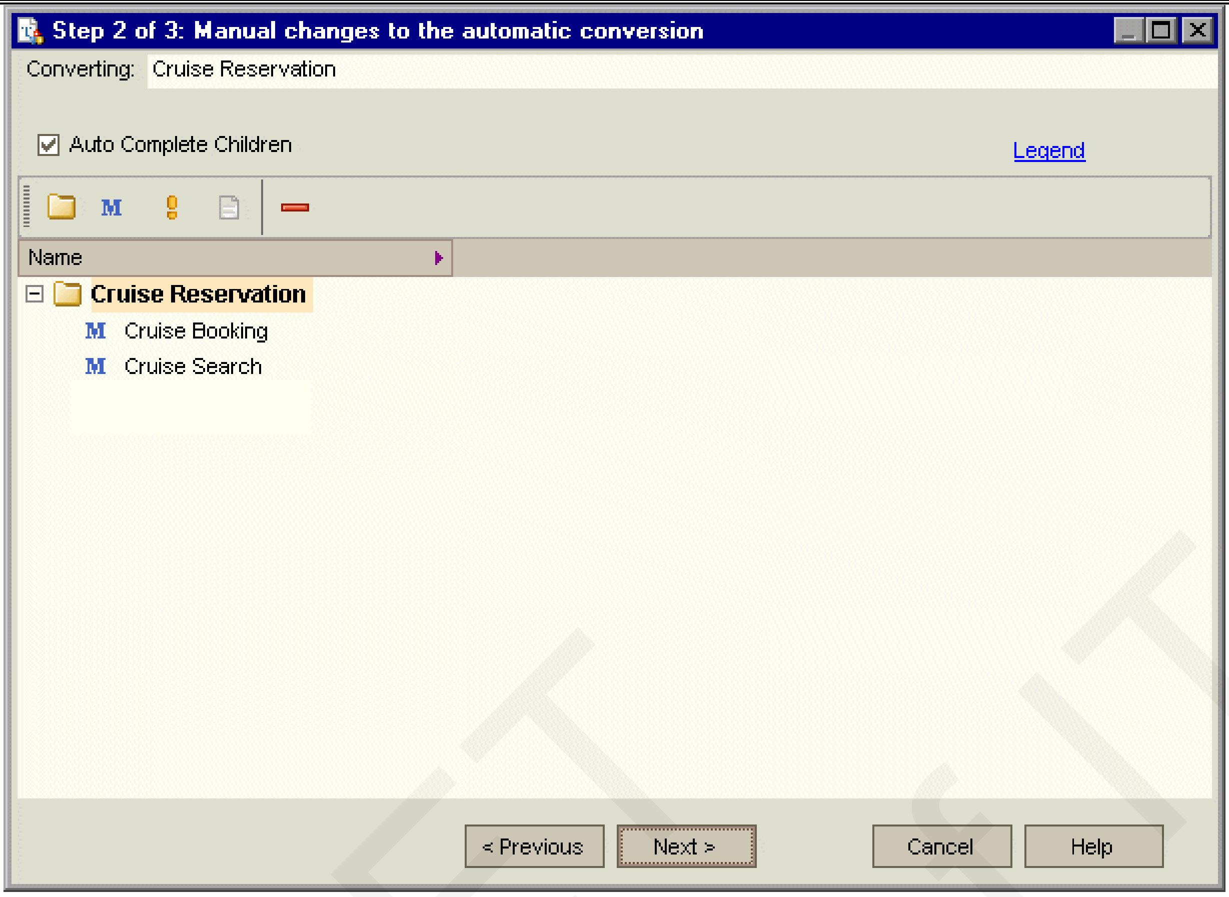
( ) Convert all requirements to subjects.

**4 Choose an automatic conversion method.**

Select the second option, **Convert lowest child requirements to tests,** to convert the selected requirements to tests.

**5 Start the conversion process.**

Click **Next** to begin converting the requirements. When the conversion process is complete, Test Director displays the results in the Step 2 dialog box.


Step 2 of 3: Manual changes to the automatic conversion

Converting: Cruise Reservation

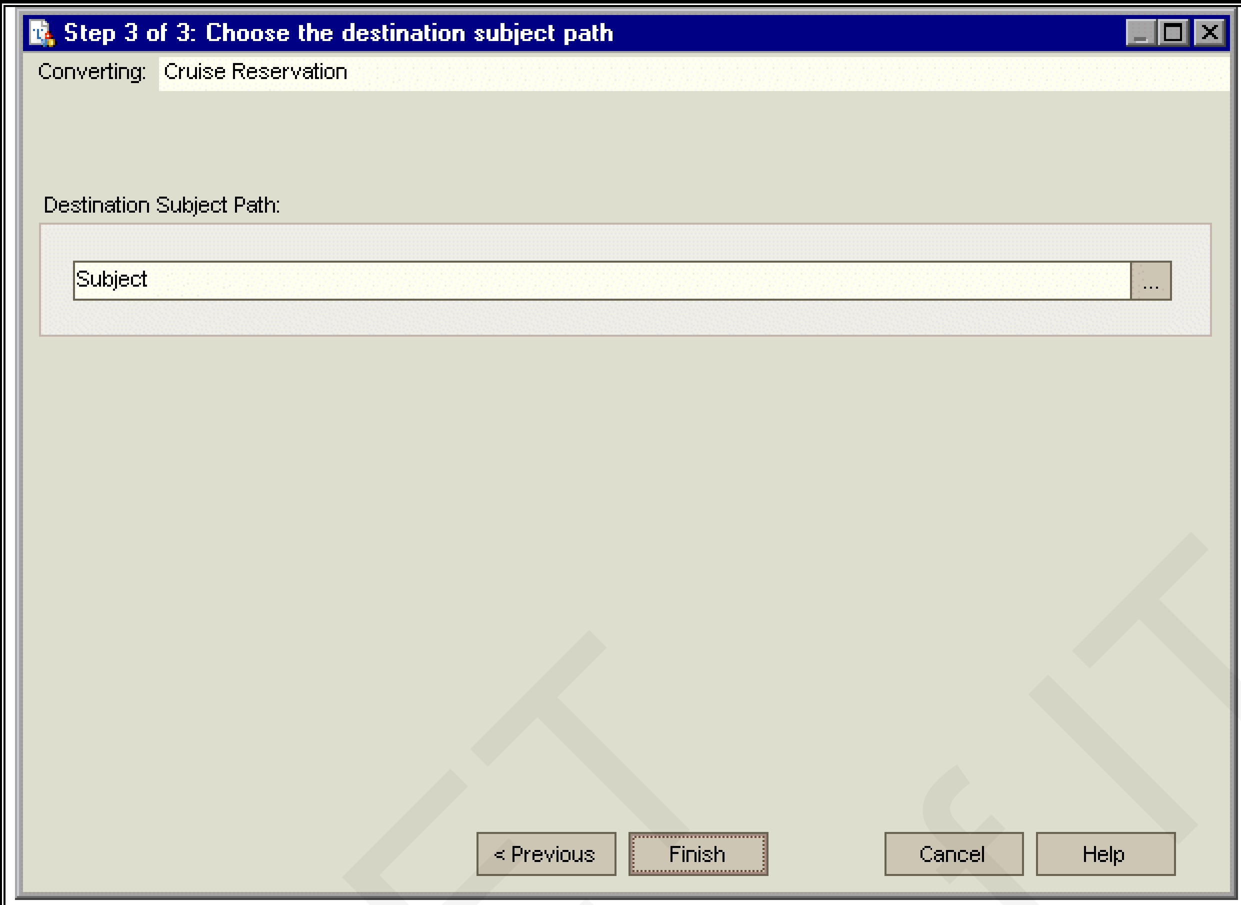
Auto Complete Children ✓

- Cruise Reservation
  - Cruise Booking
  - Cruise Search

**6 Convert Cruise Search to a step and restore it.**

Select **Cruise Search** and click the **Convert to Step** button. Test Director converts the **Cruise Search** test to a step. With **Cruise Search** selected, click the **Convert to Test** button. Test Director converts the **Cruise Search** step back to a test.

Click **Next**. The Step 3 dialog box opens.


Step 3 of 3: Choose the destination subject path

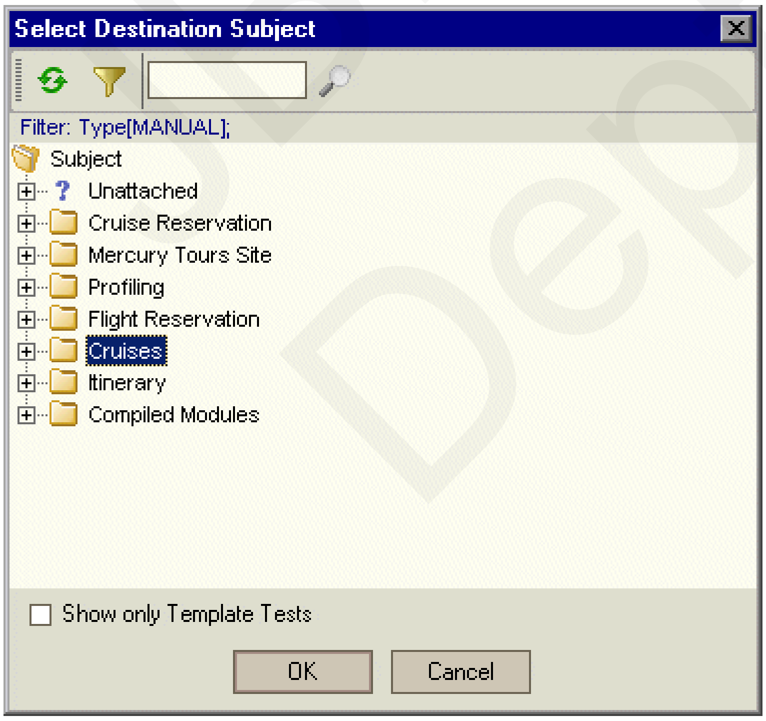
Converting: Cruise Reservation

Destination Subject Path:

Subject

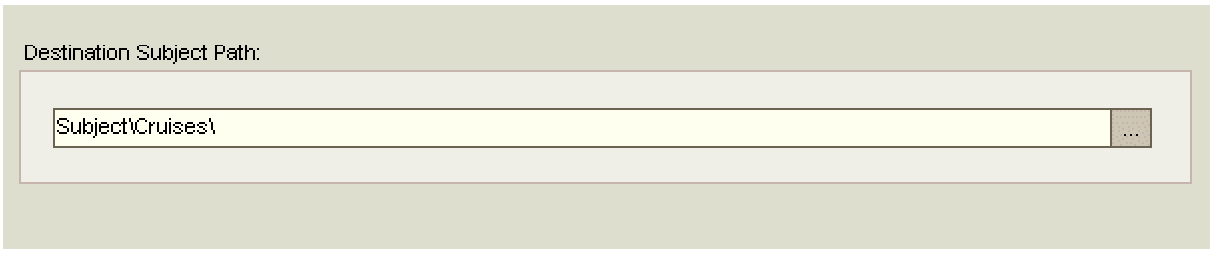
**7 Choose the destination subject path.**

In the **Destination Subject Path**, click the browse button. The Select Destination Subject dialog box opens. In the test plan tree, select the **Cruises** subject.


Select Destination Subject

Filter: Type[MANUAL];

Click **OK** to close the Select Destination Subject dialog box. The **Destination Subject Path** box now indicates the following path:



Subject\Cruises\

**8 Finalize the conversion process.**

Click **Finish**.

Click **OK** to confirm.

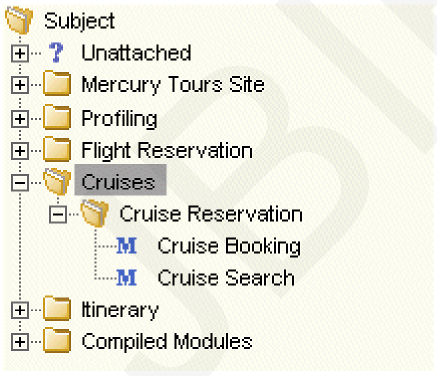
**9 View the tests in the test plan tree.**

Click the **Test Plan** tab to display the Test Plan module.

In the test plan tree, select **Cruises** and click the **Refresh Selected** button.

The test plan tree displays **Cruise Reservation** under **Cruises**.

Expand **Cruise Reservation**. The test plan tree displays the **Cruise Booking** and **Cruise Search** manual tests.



Now that you are familiar with defining requirements, viewing and modifying the requirements tree, and converting requirements "Planning Tests". In Lesson 3, you will learn how to define your test plan tree.

## Planning Tests

After you define your requirements, you need to determine your testing goals. To do this, examine your application, system environment, and testing process to outline the testing strategy for achieving your goals.

After you determine your testing goals, you build a *test plan tree,* which hierarchically divides your application into testing units, or *subjects*. For each subject in the test plan tree, you define tests that contain steps.

For each test step, you specify the actions to be performed on your application and the expected result. You can increase the flexibility of a test step by adding parameters.

To keep track of the relationship between your tests and your requirements, you can add links between them. By creating links, you ensure compliance with your requirements throughout the testing process.

After you design your tests, you can decide which tests to automate. When you automate a test, you can generate a test script and then complete it using other Mercury Interactive testing tools (for example, Quick Test Professional, Astra Quick Test, or WinRunner).

In this we will describe about:

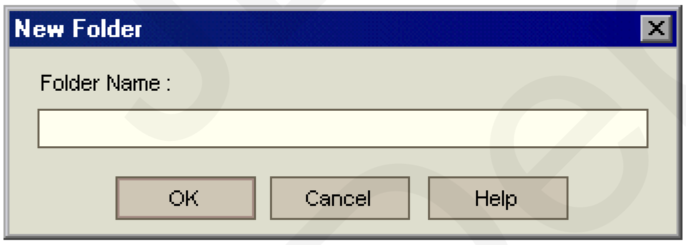
- ➢ Developing a Test Plan Tree
- ➢ Designing Test Steps
- ➢ Copying Test Steps
- ➢ Calling Tests with Parameters
- ➢ Creating and Viewing Requirements Coverage
- ➢ Generating Automated Test Scripts

## Developing a Test Plan Tree

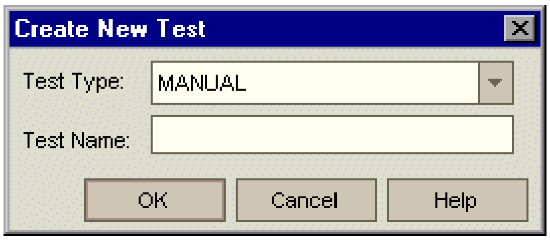
The typical application is too large to test as a whole. The Test Plan module enables you to divide your application according to functionality. You divide your application into units, or *subjects,* by creating a *test plan tree*. The test plan tree is a graphical representation of your test plan, displaying your tests according to the hierarchical relationship of their functions. After you define subjects in the tree, you decide which tests to create for each subject and add them to the tree.
we converted the **Cruise Reservation** requirement and its child requirements to subjects and tests in the test plan tree. In the following exercise, you will add a subject and a test to the test plan tree in the Test Plan module.

**To develop a test plan tree:**

**1 Open the TestDirector_Demo project.**
If the **TestDirector_Demo** project is not already open, log on to the project.
**2 Display the Test Plan module.**
Click the **Test Plan** tab.
**3 Add a subject folder to the test plan tree.**
Select the **Cruises** subject folder and click the **New Folder** button.
The New Folder dialog box opens.



In the **Folder Name** box, type Cruise Cancellation. Click **OK**. The new subject folder appears under the **Cruises** subject folder in the test plan tree.
In the **Description** tab in the right pane, type a description of the subject: This folder contains tests that verify the Cancel Reservation functionality.
**4 Add a test to the subject folder.**
Select **Cruise Cancellation** and click the **New Test** button. The Create New Test dialog box opens.



In the **Test Type** box, select **QUICKTEST_TEST** to create a Quick Test Professional/Astra Quick Test test, or select **WR-AUTOMATED** to create a WinRunner test.

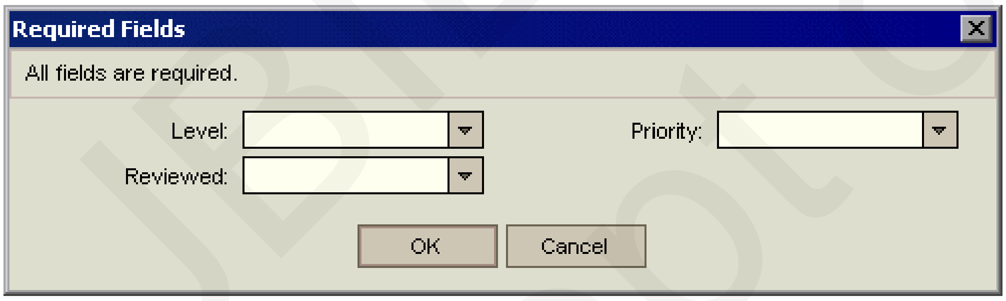
**Notes:**

➢ The **QUICKTEST_TEST** test type is only available if you have installed the Quick Test Professional/Astra Quick Test Add-in from the Test Director Addins page. For more information on installing the add-in, refer to the *Test Director Installation Guide*.

➢ If you selected **QUICKTEST_TEST** from the **Test Type** list, the **Template** box is available. You can create your new test based on another Quick Test Professional/Astra Quick Test test, defined as a template test. Test Director copies the template test to your new test without the test results.

In the **Test Name** box, type a name for the test: Cancel All Reservations.

Click **OK**. The Required Fields dialog box opens.



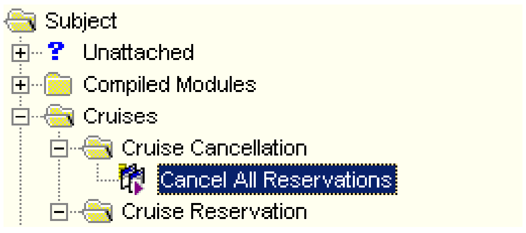
Select the following:

**Level:** Basic

**Reviewed:** Not Reviewed

**Priority:** 4-Very High

Click **OK**.



The new test is added to the test plan tree under the **Cruise Cancellation** subject folder.

**5 Add a test description.**

In the **Details** tab, you can see the test name, test designer, creation date, test status, and other information.

In the **Description** box, type a description for the test: The test verifies cancellation of cruise reservations in the Itinerary page.

## Designing Test Steps

After you add a test to the test plan tree and define basic test information, you define test steps—detailed, step-by-step instructions that specify how to execute a test. A step includes the actions to be performed on your application and the expected results.

You can create test steps for both manual and automated tests. For manual tests, you complete test planning by designing the test steps. Using your plan, you can begin test execution immediately. For automated tests, you create an automated test script using a Mercury Interactive testing tool, a custom testing tool, or a third-party testing tool.

In the following exercise, you will create the **Cruise Booking** test. This test verifies the process of booking a cruise through the Mercury Tours site.

**To design a test step:**

**1 Make sure the Test Plan module is displayed.**

If the Test Plan module is not displayed, click the **Test Plan** tab.

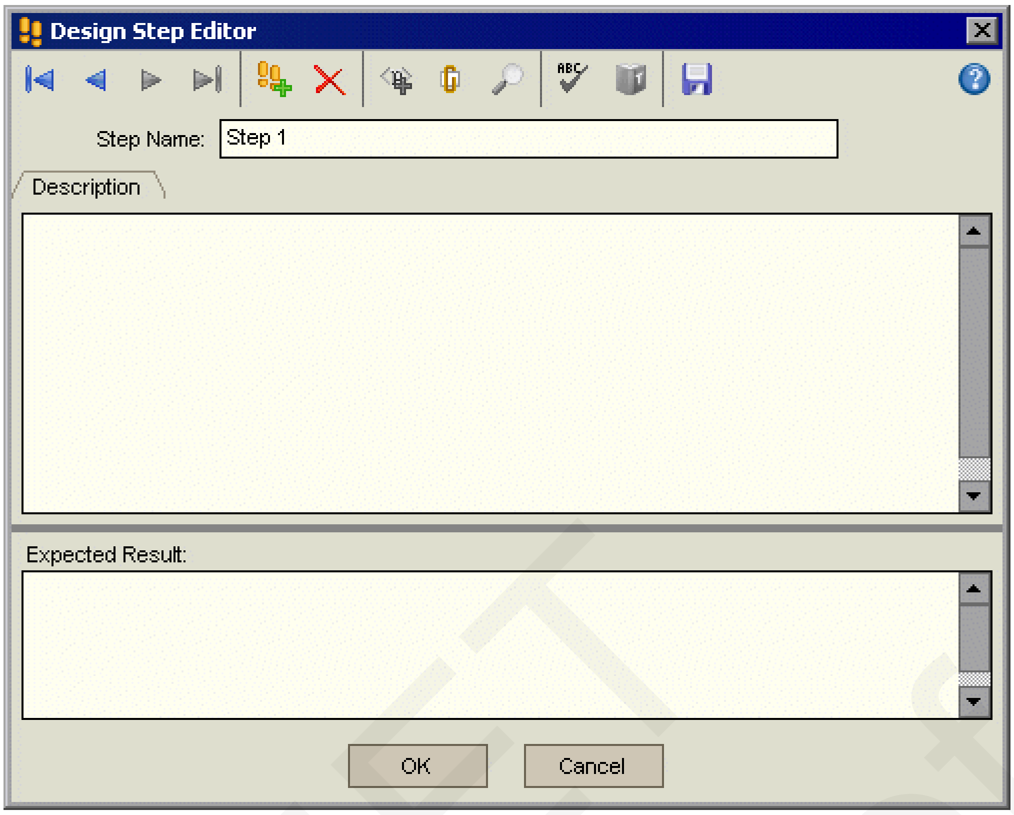
**2 Display the Cruise Booking test.**

Under the **Cruise Reservation** folder, select the **Cruise Booking** test.

**3 Open the Design Step Editor.**

Click the **Design Steps** tab.

Click the **New Step** button. The Design Step Editor opens



In the **Step Name** box, Test Director displays a step name. The default name is the sequential number of the test step (**Step 1** if you are adding steps to a test for the first time).

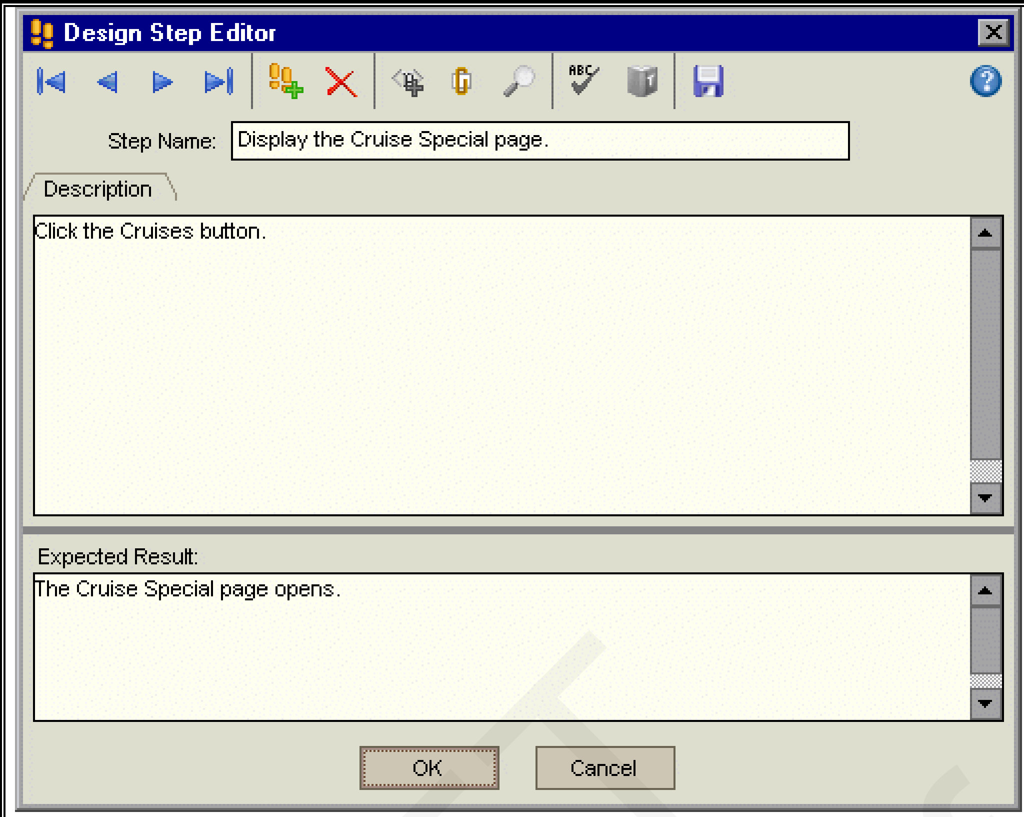
**4 Define a step for displaying the Cruise Special page.**

In the Design Step Editor, type the following:

**Step Name:** Display the Cruise Special page.

**Description:** Click the Cruises button.

**Expected Result:** The Cruise Special page opens.



Step Name: Display the Cruise Special page.

Click the Cruises button.

The Cruise Special page opens.

**5 Define a step for reserving the cruise.**

In the Design Step Editor, click the **New Step** button. The **Step Name** box displays **Step 2**.

Type the following:

**Step Name:** Display the Cruise Reservation page.

**Description:** Click the Now Accepting Reservations button.

**Expected Result:** The Cruise Reservation page opens.

**6 Define a step for booking the cruise.**

In the Design Step Editor, click the **New Step** button. The **Step Name** box displays **Step 3**.

Type the following:

**Step Name:** Book the cruise.

**Description:** Enter passenger name, credit card information, and address. Click OK.

**Expected Result:** The Cruise Confirmation page opens.

**7 Define a step for printing the cruise confirmation information.**

In the Design Step Editor, click the **New Step** button. The **Step Name** box displays **Step 4**.

Type the following:

**Step Name:** Print cruise confirmation.

**Description:** Click the Print button.

**Expected Result:** A confirmation page is printed.

**8 Define a step for logging off the Mercury Tours site.**

In the Design Step Editor, click the **New Step** button. The **Step Name** box displays **Step 5**.

Type the following:

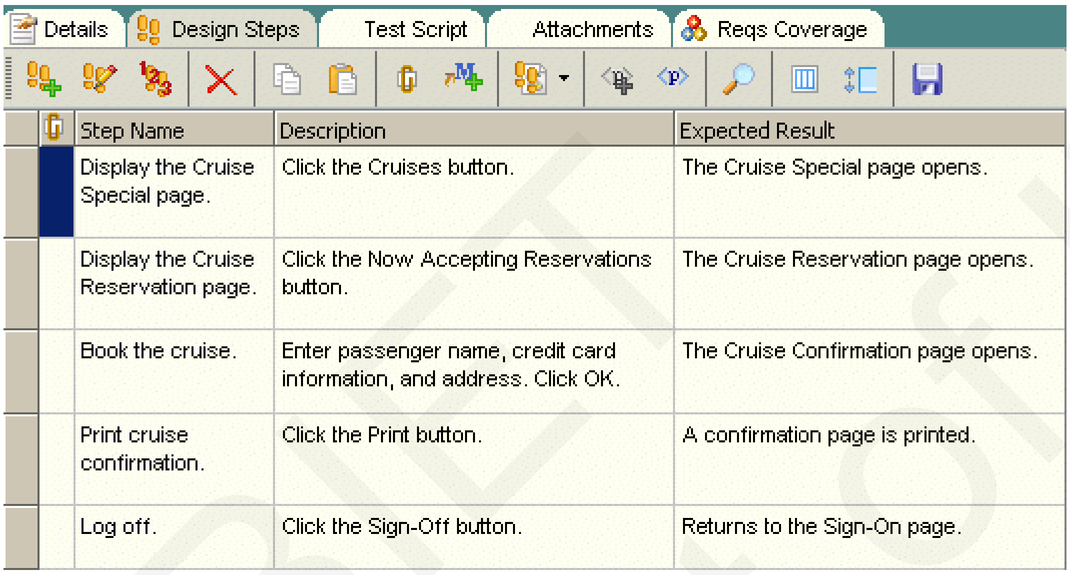
**Step Name:** Log off.

**Description:** Click the Sign-Off button.

**Expected Result:** Returns to the Sign-On page.

**9 Close the Design Step Editor.**

Click **OK**. The Design Steps tab displays the design steps.



| Step Name | Description | Expected Result |
|---|---|---|
| Display the Cruise Special page. | Click the Cruises button. | The Cruise Special page opens. |
| Display the Cruise Reservation page. | Click the Now Accepting Reservations button. | The Cruise Reservation page opens. |
| Book the cruise. | Enter passenger name, credit card information, and address. Click OK. | The Cruise Confirmation page opens. |
| Print cruise confirmation. | Click the Print button. | A confirmation page is printed. |
| Log off. | Click the Sign-Off button. | Returns to the Sign-On page. |

## Copying Test Steps

You can copy steps from another test in the same project or from a different project. In the following exercise, you will copy the test steps from the **Cruise Booking** test and paste them into the **Cruise Search** test.

**To copy a test step:**

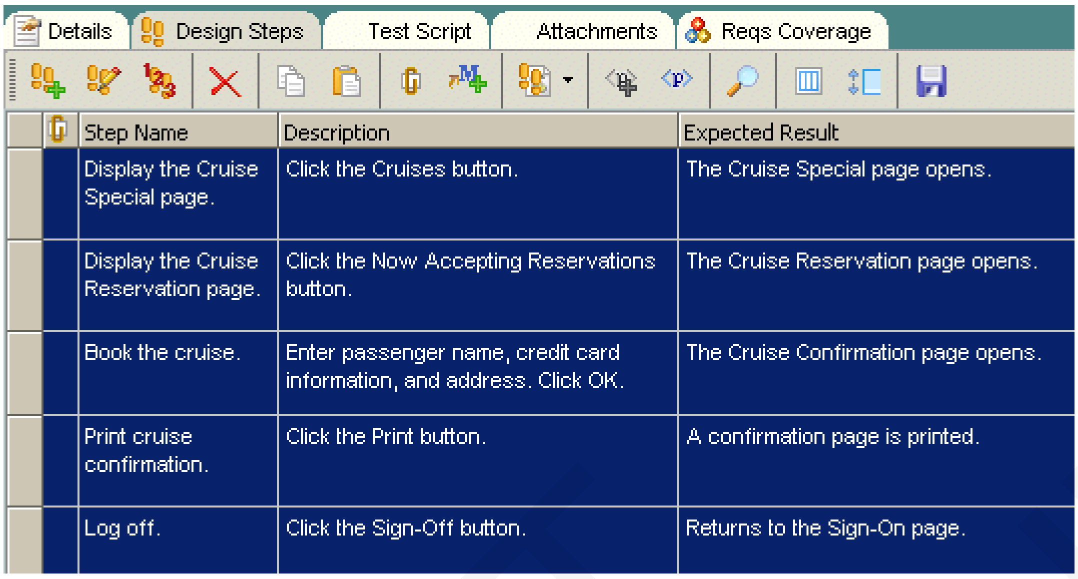
**1 Display the Design Steps tab for the Cruise Booking test.**

In the test plan tree, under **Cruise Reservation**, select the **Cruise Booking** test.

Click the **Design Steps** tab.

**2 Select the steps that you want to copy.**

Position the mouse pointer in the gray sidebar on the left. The mouse pointer changes to . Press the **Shift** or **Ctrl** key and select all the steps.



| Step Name | Description | Expected Result |
|---|---|---|
| Display the Cruise Special page. | Click the Cruises button. | The Cruise Special page opens. |
| Display the Cruise Reservation page. | Click the Now Accepting Reservations button. | The Cruise Reservation page opens. |
| Book the cruise. | Enter passenger name, credit card information, and address. Click OK. | The Cruise Confirmation page opens. |
| Print cruise confirmation. | Click the Print button. | A confirmation page is printed. |
| Log off. | Click the Sign-Off button. | Returns to the Sign-On page. |

**3 Copy the selected steps.**

Click the **Copy Steps** button.

**4 Paste the steps in the Cruise Search test.**

In the test plan tree, under **Cruise Reservation**, select the **Cruise Search** test.

In the **Design Steps** tab, click the **Paste Steps** button. Test Director copies the test steps to the Design Steps tab.

## Calling Tests with Parameters

When you design test steps, you can include a call to a manual test. When you run the test, the test steps include the steps from the called test as part of the test. The test that you call is a *template* test. This is a reusable test that can be called by other tests. A template test can include *parameters*. A parameter is a variable that replaces a fixed value. You can modify the value of a parameter according to the test that is calling it, or for various instances of the same test.

For example, suppose you have a test which logs in a user with a specific password when you start your application. You need to call this test at the beginning of each test. In some cases, you may want to log on as a regular user while in other cases, you may want to log on as the administrator. To accomplish this, you create two parameters, <<<user name>>> and <<<password>>>, and modify the value of each parameter according to the type of test that is calling your template test.

In the following exercise, you will enhance your test by calling the **Connect And Sign-On** test. This template test includes parameters for the Mercury Tours URL address and for the user name and password used to log on to the site.

**To call a test with parameters:**

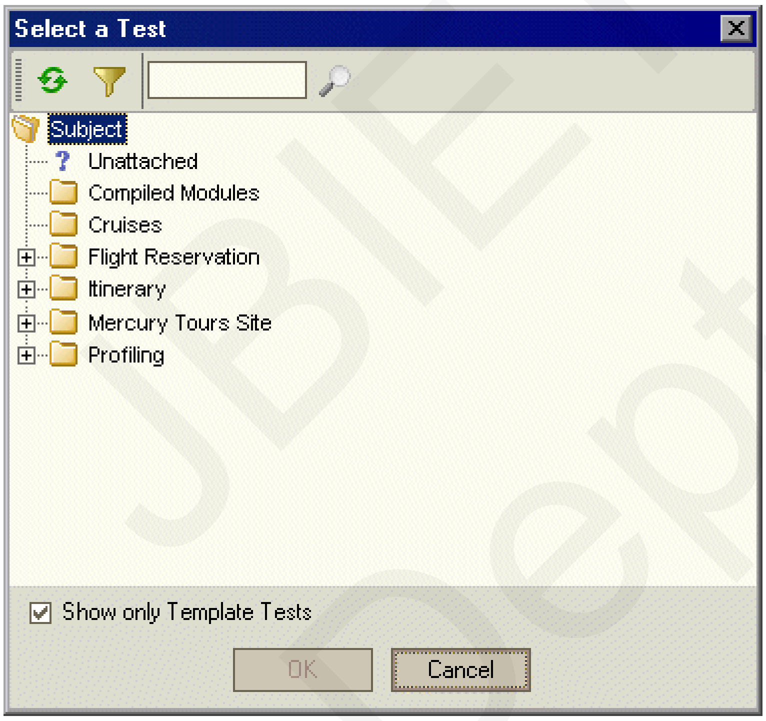
**1 Display the Design Steps tab for the Cruise Booking test.**

In the test plan tree, under **Cruise Reservation**, select the **Cruise Booking** test.

Click the **Design Steps** tab.

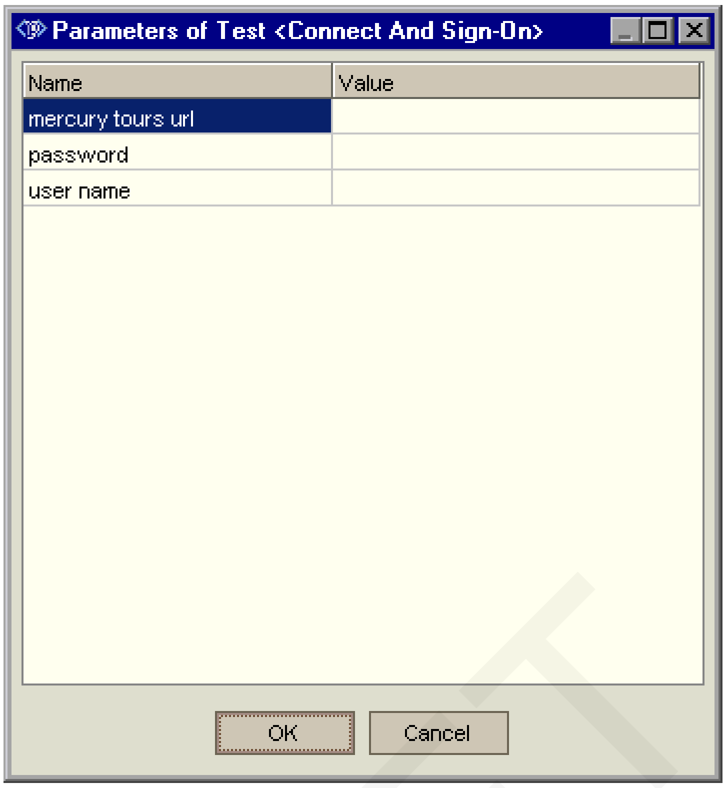
**2 Select the test with parameters that you want to call.**

Click the **Call to Test** button. The Select a Test dialog box opens.



In the **Find** box, type Connect, and click the **Find** button. Test Director highlights the **Connect And Sign-On** test.

Click **OK**. The Parameters of Test dialog box opens and displays the parameters contained in the called test.


Parameters of Test <Connect And Sign-On>

| Name | Value |
|---|---|
| mercury tours url | |
| password | |
| user name | |

**3 Assign values to the parameters.**

In the **Value** column, type the following:

**mercury tours url:** http://<TestDirector server name>/mtours/index.html **password:** Leave blank. You will assign a value to this parameter when you run your test

**user name:** your user name

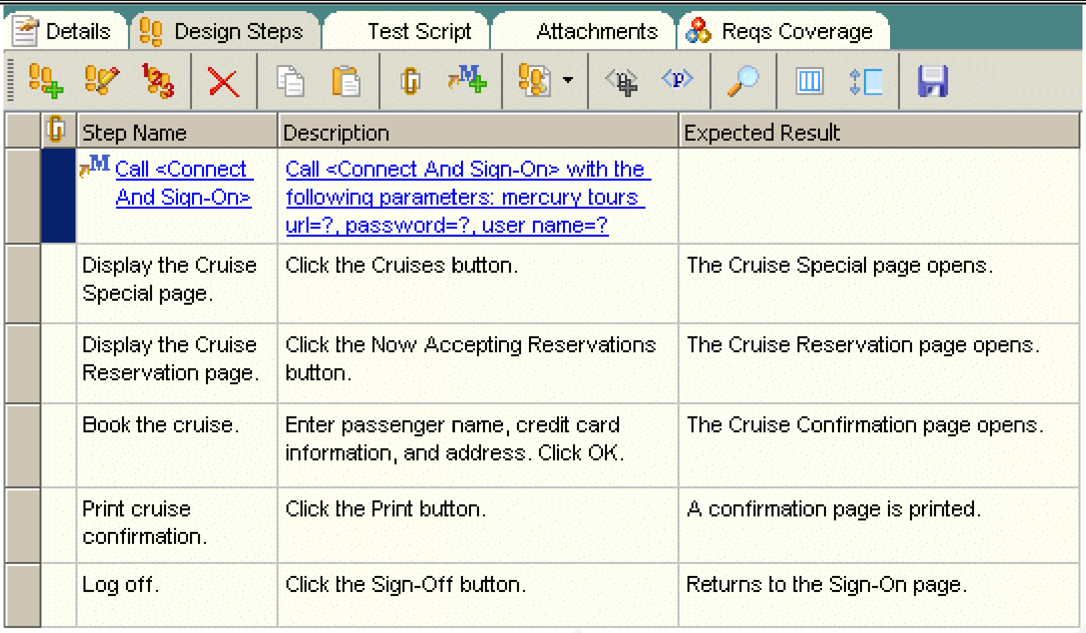
**Note:** You can also assign values to parameters when you create a test that calls your test, when you add your test to a test set, or when you run your test.

Click **OK**. Test Director adds the **Call Connect And Sign-On** step to your design steps.

Test Director Tutorial

**4 Reorder the steps.**

Position the mouse pointer on the gray sidebar to the left of the **Call Connect And Sign-On** step. The mouse pointer changes to. Click and drag the step to the top row.



| Step Name | Description | Expected Result |
|---|---|---|
| Call <Connect And Sign-On> | Call <Connect And Sign-On> with the following parameters: mercury tours url=?, password=?, user name=? | |
| Display the Cruise Special page. | Click the Cruises button. | The Cruise Special page opens. |
| Display the Cruise Reservation page. | Click the Now Accepting Reservations button. | The Cruise Reservation page opens. |
| Book the cruise. | Enter passenger name, credit card information, and address. Click OK. | The Cruise Confirmation page opens. |
| Print cruise confirmation. | Click the Print button. | A confirmation page is printed. |
| Log off. | Click the Sign-Off button. | Returns to the Sign-On page. |

**5 Adjust the size of the steps.**

Click the **Adjust Rows Height** button. Test Director expands the size of the rows in which the text is too long to view. Note that if you close and reopen the Design Steps tab, Test Director restores the default step size.

## Creating and Viewing Requirements Coverage

It is essential that the tests in your test plan comply with your testing requirements. To help ensure compliance throughout the testing process, you can add links between your tests in the Test Plan module and your requirements in the Requirements module.

In the Test Plan module, you create *requirements coverage* by selecting requirements to link to a test. Alternatively, in the Requirements module, you create *tests coverage* by selecting tests to link to a requirement. A test can cover more than one requirement, and a requirement can be covered by more than one test.

To further ensure compliance with your testing requirements, after you log defects, you can link your tests to defects .This ensures that if a requirement changes, you can identify which tests and defects are affected, and who is responsible for them.

In the following exercises, you will create requirements coverage and tests coverage. You will also view a graphic representation of tests coverage.

## Linking Requirements to a Test

In the following exercise you will view existing requirements coverage for the **Cruise Booking** test and create new requirements coverage by linking the **View Reservations** requirement to the **Cruise Booking** test.

**To link a requirement to a test:**

**1 Make sure that the Test Plan module is displayed.**

If the Test Plan module is not displayed, click the **Test Plan** tab.

**2 Display the Cruise Booking test.**

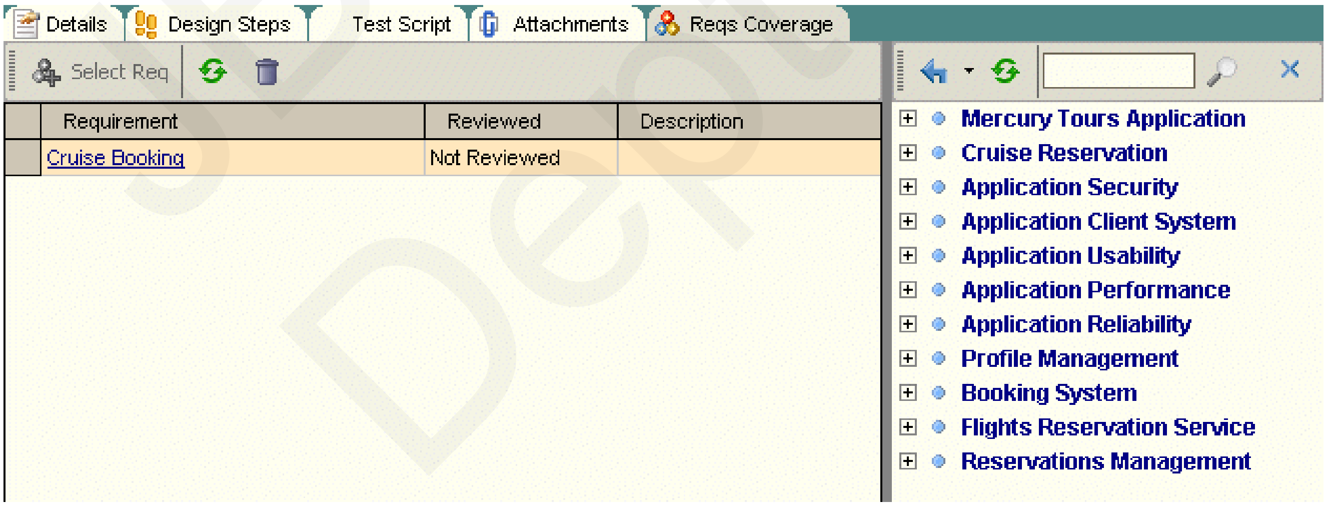
Under the **Cruise Reservation** folder, select the **Cruise Booking** test.

**3 Display the Reqs Coverage tab.**

In the right pane, click the **Reqs Coverage** tab. Test Director displays the existing requirements coverage in the coverage grid. Note that the **Cruise Booking** requirement is already linked to the **Cruise Booking** test because

**4 Display the requirements tree.**

Click the **Select Req** button to show the requirements tree on the right.



| Requirement | Reviewed | Description |
|---|---|---|
| Cruise Booking | Not Reviewed | |

- Mercury Tours Application
- Cruise Reservation
- Application Security
- Application Client System
- Application Usability
- Application Performance
- Application Reliability
- Profile Management
- Booking System
- Flights Reservation Service
- Reservations Management

**5 Search for the View Reservations requirement in the requirements tree.**

In the **Find** box, type View and click the **Find** button. Tes tDirector highlights the **View Reservations** requirement in the tree.

**6 Add the requirement to the coverage grid.**

Click the **Add to Coverage (Include Children)** button. Test Director adds the **View Reservations** requirement to the coverage grid.

**Tip:** You can also drag a requirement or requirement topic in the requirements tree to the coverage grid.

**7 Hide the requirements tree.**

Click the **Close** button.

**Linking Tests to a Requirement**

In the following exercise, you will create tests coverage by linking the **Cruise Search** test to the **Cruise Booking** requirement.

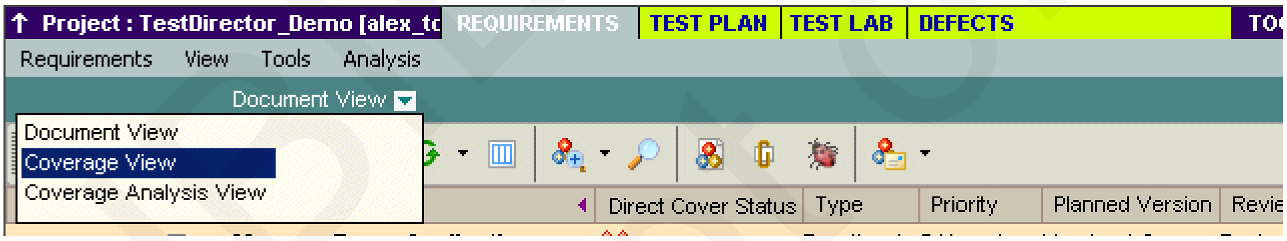
**To link a test to a requirement:**

**1 Display the Requirements module.**

Click the **Requirements** tab.

**2 Display the requirements tree in Coverage View.**

Select the **Coverage View** of the requirements tree.



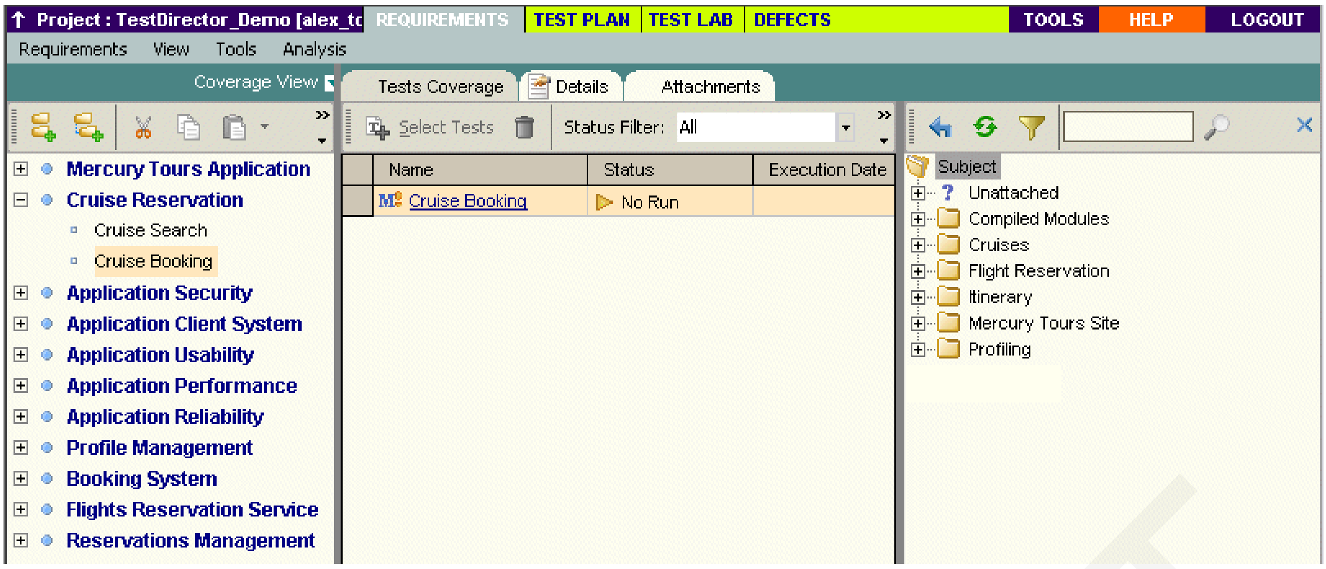
The Test Coverage tab is displayed in the right pane.

**3 Display the Cruise Booking requirement.**

In the requirements tree, under **Cruise Reservation**, select the **Cruise Booking** requirement. Test Director displays the existing tests coverage in the coverage grid. Note that the **Cruise Booking** test is already linked to the **Cruise Booking** requirement because you generated the test from the requirement.

**4 Display the test plan tree.**

In the Tests Coverage tab, click the **Select Tests** button to show the test plan tree on the right.



| Name | Status | Execution Date |
|---|---|---|
| Cruise Booking | No Run | |

**5 Select the Cruise Search test in the test plan tree.**

In the **Cruises** folder, expand the **Cruise Reservation** sub-folder. Select the **Cruise Search** test.

**6 Add the test to the coverage grid.**

Click the **Add to Coverage** button. Test Director adds the **Cruise Search** test to the coverage grid.

**Tip:** You can also drag a test or a subject folder in the test plan tree to the coverage grid.

**7 Hide the test plan tree.**

Click the **Close** button.

## Analyzing Tests Coverage

After you create tests coverage, you can use the *Coverage Analysis View* in the Requirements module to analyze the breakdown of child requirements according to tests coverage.

In this exercise, you will analyze the **Mercury Tours Application** requirement. In the Coverage Analysis View, you will see that five of the requirement's children have a "Failed" status (one or more of the tests covered by the requirement failed) and seven have a not

Covered status (the requirement has not been linked to a test). You will then analyze the failed requirements in more detail.

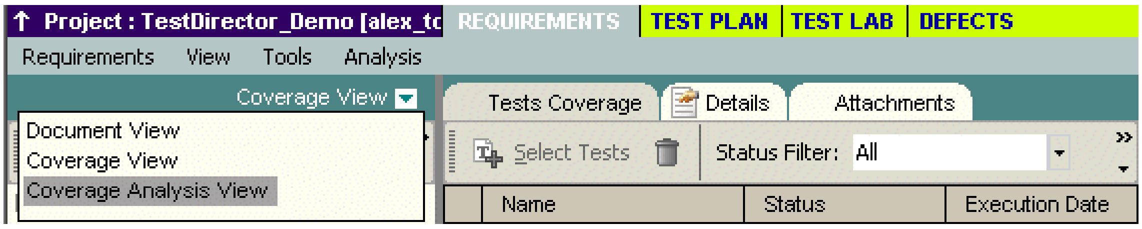
**To analyze tests coverage:**

**1 Make sure that the Requirements module is displayed.**

If the Requirements module is not displayed, click the **Requirements** tab.

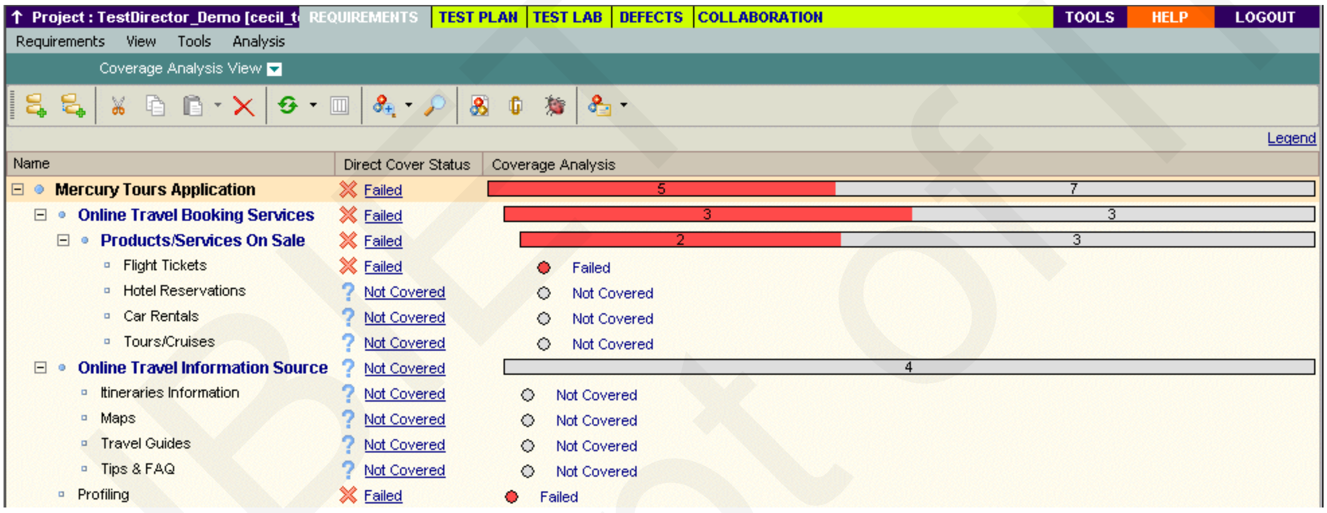
**2 Display the requirements tree in Coverage Analysis View.**

Select the **Coverage Analysis View** of the requirements tree.



Test Director displays the Coverage Analysis View.

**3 Display the Mercury Tours Application requirement in Coverage Analysis View.**



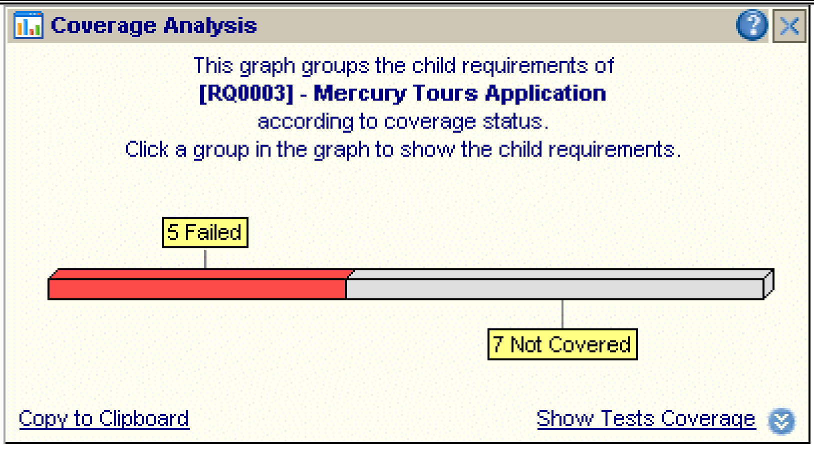
| Name | Direct Cover Status | Coverage Analysis |
|---|---|---|
| Mercury Tours Application | Failed | 5 / 7 |
| Online Travel Booking Services | Failed | 3 / 3 |
| Products/Services On Sale | Failed | 2 / 3 |
| Flight Tickets | Failed | Failed |
| Hotel Reservations | Not Covered | Not Covered |
| Car Rentals | Not Covered | Not Covered |
| Tours/Cruises | Not Covered | Not Covered |
| Online Travel Information Source | Not Covered | 4 |
| Itineraries Information | Not Covered | Not Covered |
| Maps | Not Covered | Not Covered |
| Travel Guides | Not Covered | Not Covered |
| Tips & FAQ | Not Covered | Not Covered |
| Profiling | Failed | Failed |

Expand the **Mercury Tours Application** requirement and its children.

You can see that this requirement has a **Direct Cover Status** of “Failed”. In the Coverage Analysis column, you can see graphically that of the 12 children, only five have “Failed” and seven are not yet covered.

**4 Display coverage analysis for the Mercury Tours Application requirement.**

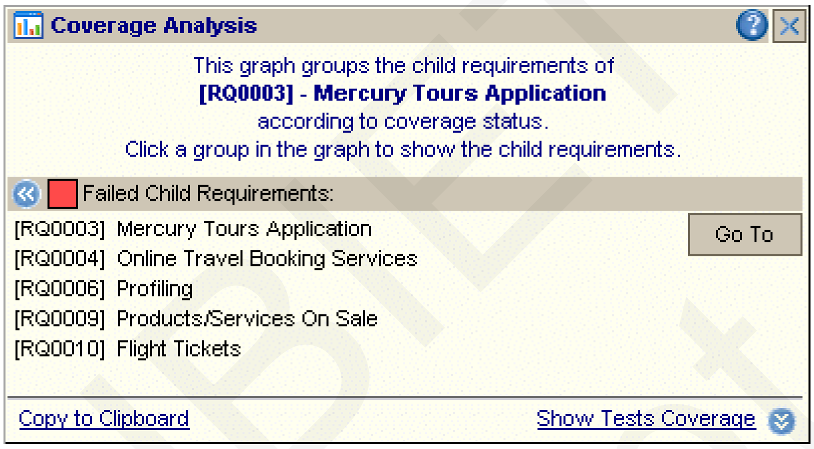
Select the **Mercury Tours Application** requirement and click the **Coverage Analysis** button. The Coverage Analysis dialog box opens.


Coverage Analysis
This graph groups the child requirements of
[RQ0003] - Mercury Tours Application
according to coverage status.
Click a group in the graph to show the child requirements.
5 Failed
7 Not Covered
Copy to Clipboard
Show Tests Coverage

This graph displays the five “Failed” requirements in red and the seven “Not Covered” requirements in gray.

**5 Display the child requirements with a “Failed” status.**

Click the red **Failed** area of the graph. TestDirector lists the five child requirements with a “Failed” status.

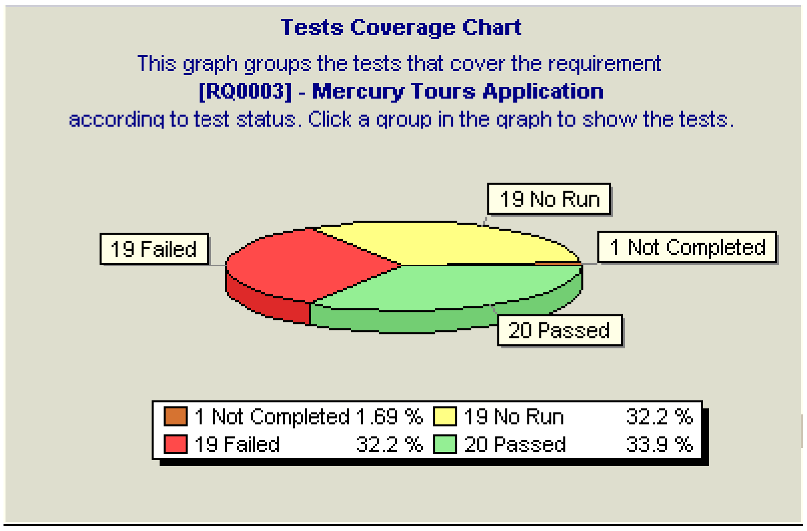

Coverage Analysis
This graph groups the child requirements of
[RQ0003] - Mercury Tours Application
according to coverage status.
Click a group in the graph to show the child requirements.
Failed Child Requirements:
Go To
Copy to Clipboard
Show Tests Coverage

[RQ0003] Mercury Tours Application
[RQ0004] Online Travel Booking Services
[RQ0006] Profiling
[RQ0009] Products/Services On Sale
[RQ0010] Flight Tickets

Note that you can select a requirement and click **Go To** highlight the requirement in the requirements tree.

**6 Display tests coverage for the requirement.**

Click the **Show Tests Coverage** link to extend the Coverage Analysis dialog box and display the Tests Coverage Chart.



You can see, for example, that 19 of the tests associated with the **Mercury Tours Application** requirement have a "Failed" status. The **Mercury Tours Application** requirement's direct cover status of "Failed" therefore means that 32.2% of the tests associated with this requirement failed. Note that you can click a section of the chart to open the Tests Coverage dialog box and display the list of tests with the selected status.

**7 Close the Coverage Analysis dialog box.**

Click the **Close** button.

## Generating Automated Test Scripts

Test planning involves deciding which tests to automate. If you choose to perform tests manually, the tests are ready for execution as soon as you define the test steps. If you choose to automate tests, you can generate test scripts and complete them using other Mercury Interactive testing tools (for example, QuickTest Professional, Astra QuickTest, or WinRunner). Consider the following issues when deciding whether to automate a test.

**Do automate:**

• Tests that will run with each new version of your application to check the stability of basic functionality across the entire application (regression test).

• Tests that use multiple data values for the same operation (data-driven tests).

• Tests that are run many times (stress tests) and tests that check a multi-user client/server system (load tests).

**Do not automate:**

• Tests that will be executed only once.

• Tests that require immediate execution.

• Tests that check how easy the application is to use (usability tests).

• Tests that do not have predictable results.

In the following exercise, you will generate an automated test script for the **Cruise Search** test.

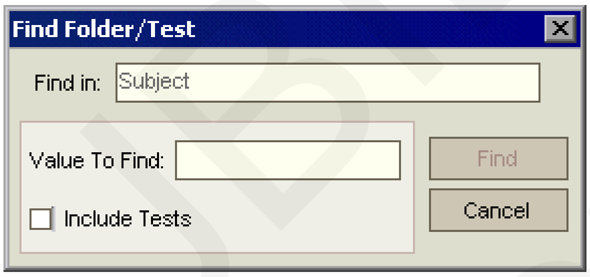
**To generate an automated test script:**

**1 Display the Test Plan module.**

Click the **Test Plan** tab.

**2 Locate the Cruise Search manual test to automate.**

Select the **Subject** folder at the root of the test plan tree and click the **Find Folder/Test** button. The Find Folder/Test dialog box opens.



Do the following:

**Value to Find**: type: Cruise

**Include Tests:** Select this checkbox to instruct Test Director to search for folders and tests.

Click **Find**. The Search Results dialog box opens and displays a list of possible matches.

Select **Cruises\Cruise Reservation\Cruise Search** and click the **Go To** button to highlight the test in the test plan tree.

Click **Close** to close the Search Results dialog box.

**3 Display the Design Steps tab.**

In the right pane, click the **Design Steps** tab.

**4 Generate a test script.**

Click the **Generate Script** button.

Choose **QUICKTEST_TEST** to generate a QuickTest Professional or Astra QuickTest test, or choose **WR-AUTOMATED** to generate a WinRunner test. TestDirector uses the steps in the **Cruise Search** test to create an automated test script. In the test plan tree, note that the manual test icon next to the test is now replaced with the automated test icon.

**5 View the test script.**

Click the **Test Script** tab.

To display and modify your test script in the testing tool in which it was created, click the **Launch** button.

Now that you are familiar with creating a test plan tree, designing test steps, copying test steps, calling a test with parameters, linking tests to requirements, analyzing tests coverage, and automating your manual tests.

## Running Tests

Running tests is the core of the testing process. As your application changes, you run manual and automated tests in your project to locate defects and assess quality.

You start by creating *test sets* and choosing which tests to include in each set. A test set is a group of tests in a Test Director project designed to achieve specific testing goals. Test Director enables you to control the execution of tests in a test set by setting conditions and scheduling the date and time for executing your tests.

After you define test sets, you can begin to execute your tests. When you run a test manually, you execute the test steps you defined in test planning. You pass or fail each step, depending on whether the actual results match the expected output. When you run a test automatically, Test Director opens the selected testing tool, runs the test, and exports the test results to
Test Director.

In this lesson, you will learn about:

➢ Defining Test Sets

➢ Adding Tests to a Test Set

➢ Scheduling Test Runs

➢ Running Tests Manually

➢ Running Tests Automati

## Defining Test Sets

After you design tests in the Test Plan module, you create a *test sets tree*. A test sets tree enables you to organize your testing process by grouping *test sets* in folders and organizing them in different hierarchical levels in the Test Lab module. Test sets can include both manual and automated tests. You can also include the same test in different test sets.

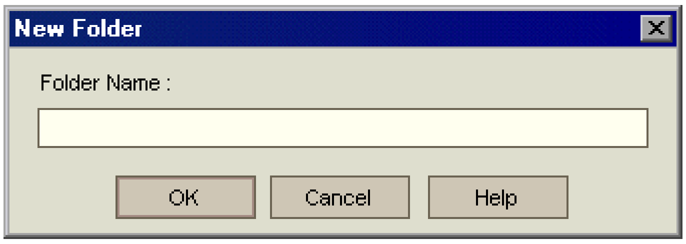
To decide which test sets to create, think about the testing goals you defined at the beginning of the testing process. Consider issues such as the current state of the application and the addition or modification of new features.

Following are examples of general categories of test sets you can create:

**Sanity** Tests the entire application at a basic level to check that it is functional and stable.
**Normal** Tests the system in a more in-depth manner than the sanity test. A Normal test set can contain both positive and negative checks. Positive checks test that the application responds to input as expected. Negative tests attempt to crash an application to demonstrate that the application is not functioning properly.
**Advanced** Checks the entire application, including its most advanced features.
**Regression** Verifies that a change to one part of the application does not prevent the rest of the application from functioning.
**Function** Tests a specific feature or a group of features in the application.
In the following exercise, you will define the **Mercury Tours Site** test set.

**To define a test set:**

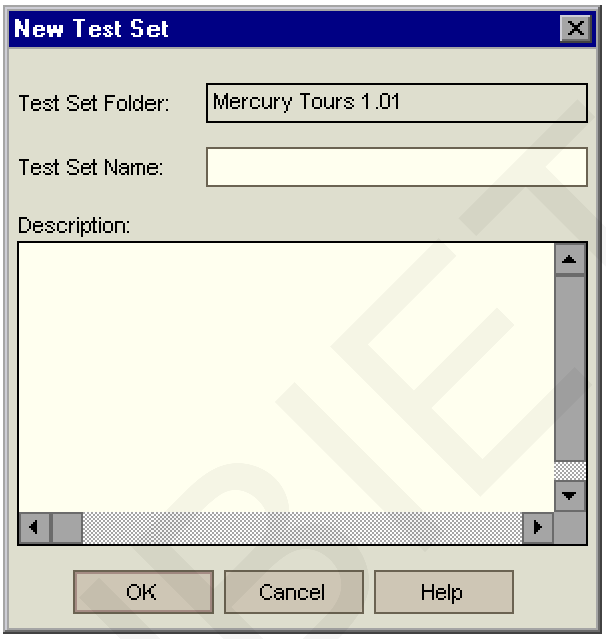
**1 Open the TestDirector_Demo project.**
If the **TestDirector_Demo** project is not already open, log on to the project.
**2 Display the Test Lab module.**
Click the **Test Lab** tab.
**3 Add a folder to the test sets tree.**
In the test sets tree in the left pane, select the **Root** folder.
Click the **New Folder** button. The New Folder dialog box opens.



In the **Folder Name** box, type Mercury Tours 1.01 and click **OK**.

**4 Add a test set to the Test Sets list.**

Click the **New Test Set** button. The New Test Set dialog box opens.



Test Set Folder: Mercury Tours 1.01

Test Set Name:

Type the following:

**Test Set Name:** Mercury Tours Site

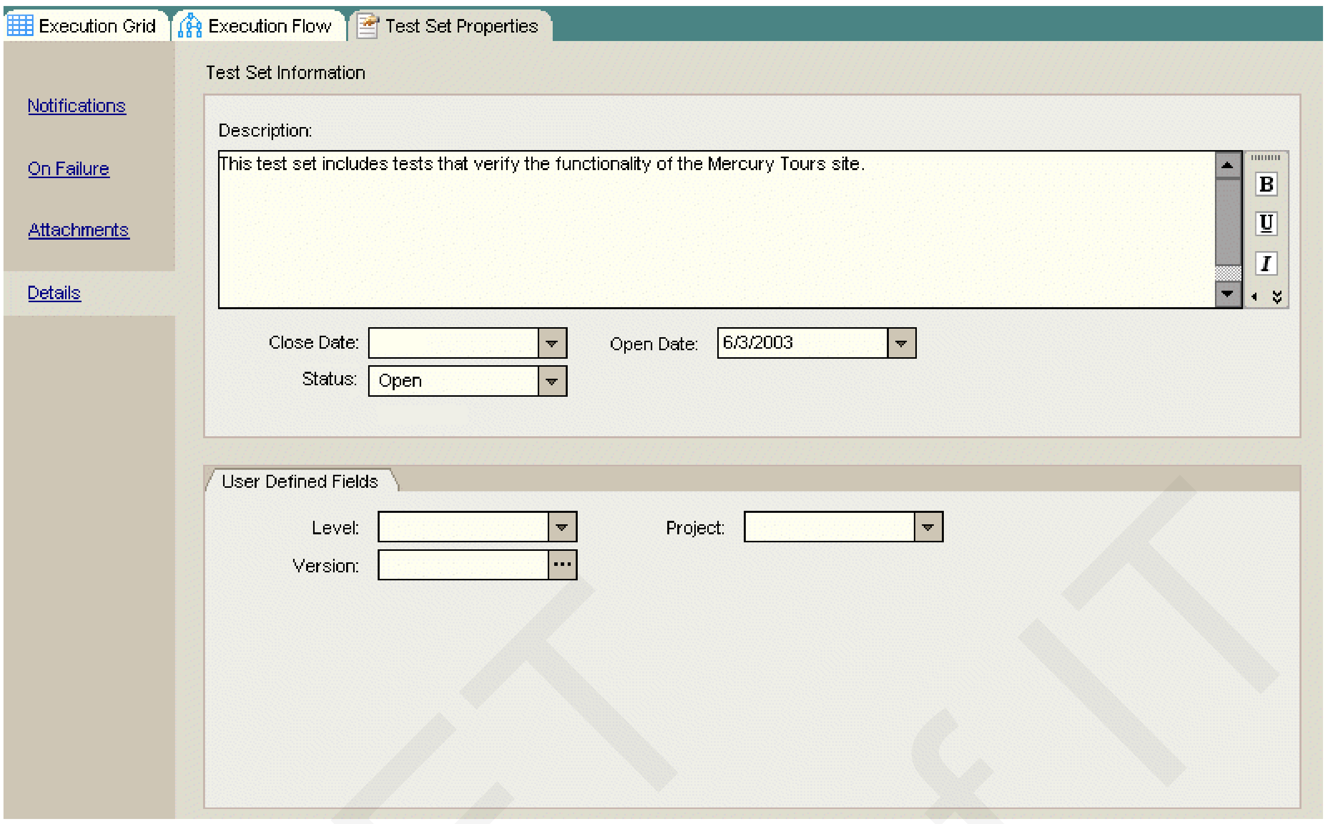
**Description:** This test set includes tests that verify the functionality of the

Mercury Tours site.

Click **OK**. Test Director adds the **Mercury Tours Site** test set to the test sets tree in the left pane.

**5 Define the test set details.**

Click the **Test Set Properties** tab and select the **Details** link.



Test Set Information

Description:

This test set includes tests that verify the functionality of the Mercury Tours site.

| | | | |
|---|---|---|---|
| Close Date: | | Open Date: | 6/3/2003 |
| Status: | Open | | |

User Defined Fields

| | | | |
|---|---|---|---|
| Level: | | Project: | |
| Version: | | | |

By default, the **Status** indicates that the test set is **Open**.

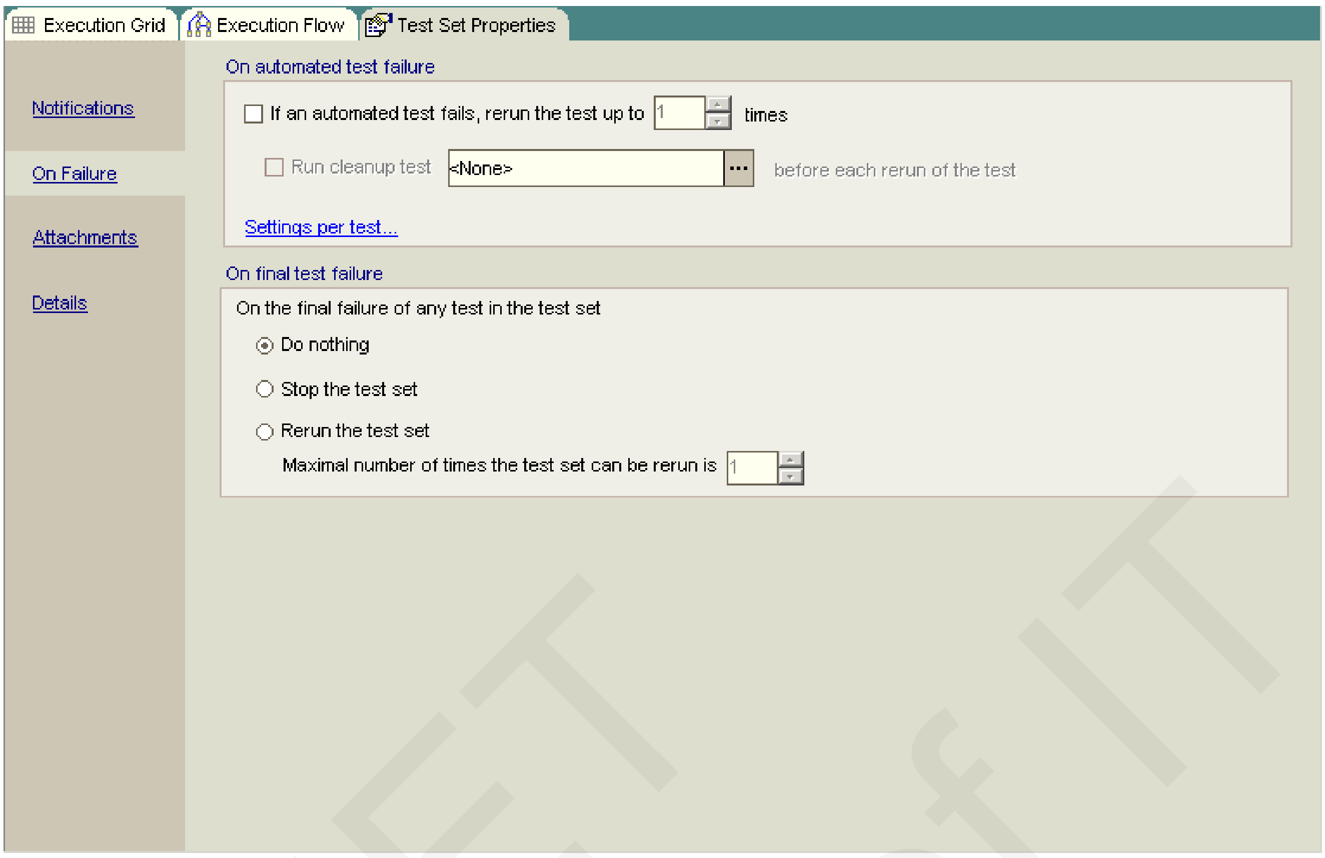
Do the following:

**Open Date**: Select a date from the calendar. By default, Test Director displays the current date.

**Close Date:** Select the planned closing date for the test set.

**6 Set rules for the automated tests in the test set in the event of a test failure.**

Click the **On Failure** link.


Execution Grid | Execution Flow | Test Set Properties

Notifications

On Failure

Attachments

Details

On automated test failure

☐ If an automated test fails, rerun the test up to 1 times

☐ Run cleanup test <None> before each rerun of the test

Settings per test...

On final test failure

On the final failure of any test in the test set

[✓ Do nothing]

Stop the test set

Rerun the test set

Maximal number of times the test set can be rerun is 1

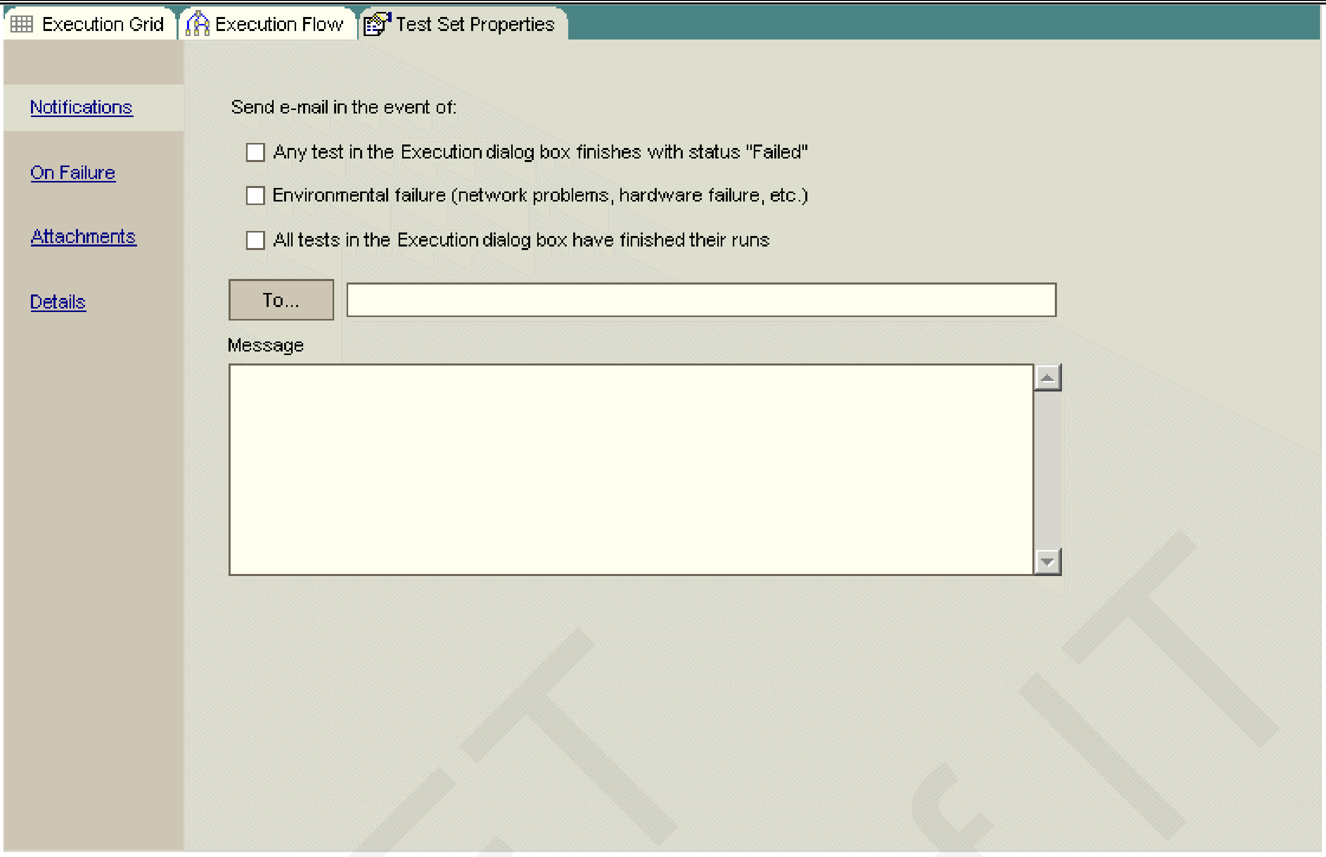
Do the following:

**On automated test failure**: Select the first check box and make sure that the number of times an automated test can be rerun is set to **1**.

**On final test failure**: Make sure that the **Do nothing** option is selected.

**7 Instruct Test Director to send an e-mail to specified users if certain events occur.**

Click the **Notifications** link.



Send e-mail in the event of:

- [ ] Any test in the Execution dialog box finishes with status "Failed"
- [ ] Environmental failure (network problems, hardware failure, etc.)
- [ ] All tests in the Execution dialog box have finished their runs

Do the following:

**Send e-mail in the event of:** Select the first check box to send an e-mail notification if any test in the test set fails.

**To:** Type your e-mail address.

**Message**: Type the following:

This test failed. Please review the test results and submit a defect.

## Adding Tests to a Test Set

After you define a test set, you can add copies of tests from the project to your test set. In the following exercise, you will add tests to the **Mercury Tours Site** test set.

**To add a test to a test set:**

**1 Make sure the Test Lab module is displayed.**

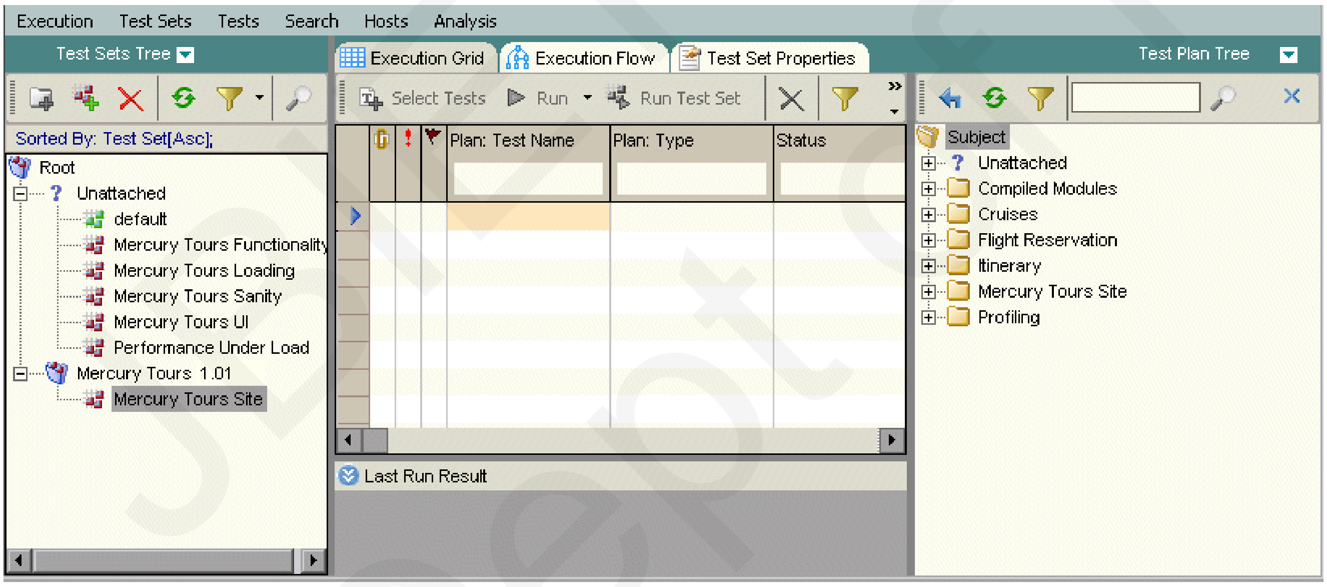
If the Test Lab module is not displayed, click the **Test Lab** tab.

**2 Display the Execution Grid tab.**

From the test sets tree, select the **Mercury Tours Site** tests set and click the **Execution Grid** tab.

**3 Display the test plan tree.**

Click the **Select Tests** button. The right pane displays the test plan tree.



**4 Add the Cruises folder to the test set.**

Select the **Cruises** folder and click the **Add Tests to Test Set** button. Click **Yes** to confirm. The Parameters of Test dialog box opens because you are adding a test with an unassigned parameter value to a test set. Click **Cancel** to close the dialog box. You will assign this parameter value when you run the Cruise Booking test .Test Director adds the tests to the test set.

**5 Add the Airline Preference test to the test set.**

To search for the test, in the **Find** box, type airline and click the **Find** button.

Test Director highlights the **Airline Preference** test in the test plan tree.

Click the **Add Tests to Test Set** button. Test Director adds the test to the test set.

**6 Add the Number of Passengers test to the test set.**

To search for the test, in the **Find** box, type Number of Passengers and click the **Find** button. Test Director highlights the **Number of Passengers** test in the test plan tree.

Click the **Add Tests to Test Set** button. Test Director adds the test to the test set.

**Tip:** You can also add tests by dragging a folder or test in the test plan tree to the Execution Grid or Execution Flow.

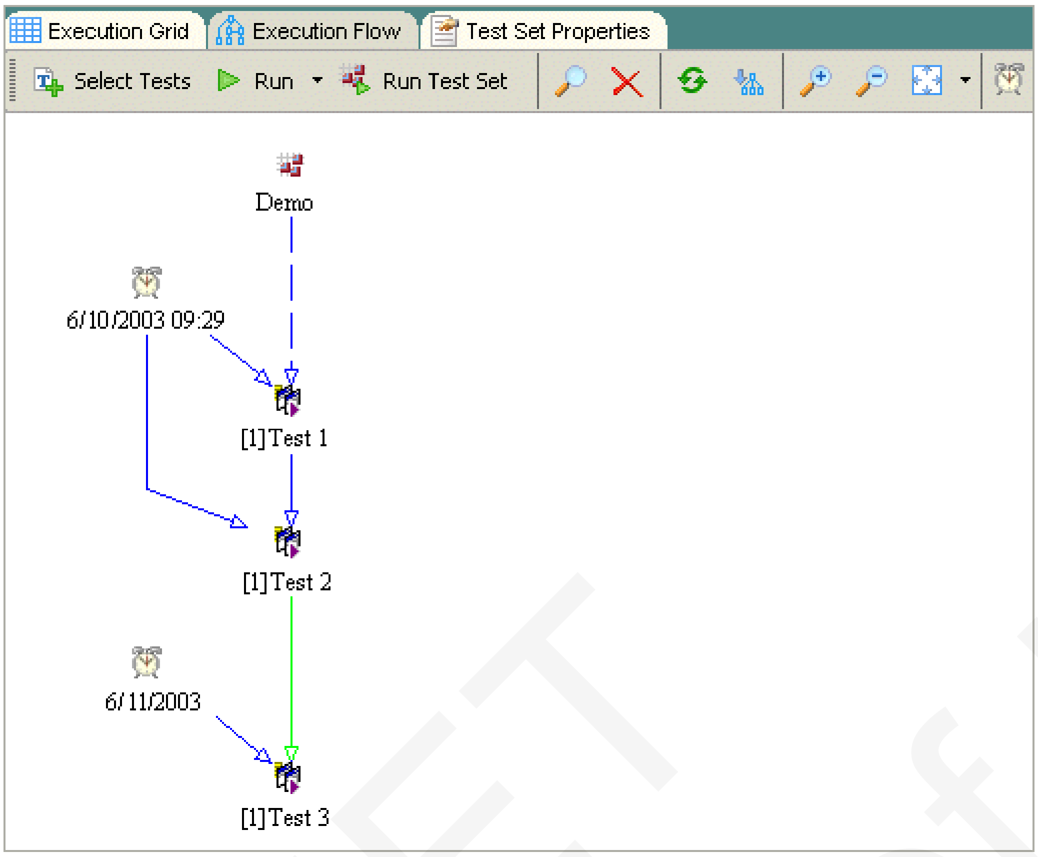
**7 Close the test plan tree pane.**

Click the **Close** button.

## Scheduling Test Runs

The Execution Flow tab enables you to specify a date and time to execute a test and set conditions for it. A *condition* is based on the results of another specified test in the Execution Flow. By setting conditions, you can instruct Test Director to postpone the execution of the current test until another specified test finishes running or passes. You can also set the sequence in which to execute the tests.

For example, you can schedule *Test 2* to run only after *Test 1* finishes, and *Test 3* to run only if *Test 2* passes. You can also schedule *Test 1* and *Test 2* to run a day before *Test 3.* The Execution Flow displays the tests and their conditions in a diagram.



**Note:**

➢ A **dashed line** arrow indicates a test with no conditions.

➢ A **solid line** arrow indicates a condition and can be blue or green. If the solid line is blue, it indicates that the condition status is set to "Finished". If the solid line is green, it indicates that the condition is set to "Passed".

➢ A **Time Dependency** icon is displayed for time dependent tests. In the following exercise, you will create a new test set and add to it three tests that verify the login procedure on the Sign-On page of the Mercury Tours site. Then, you will set the conditions for each test and specify when each test is to be executed.

**To schedule a test run:**

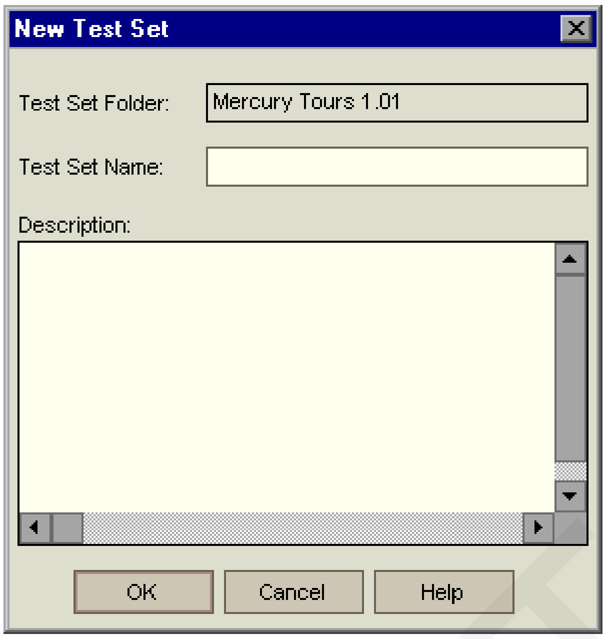
**1 Make sure the Test Lab module is displayed.**

If the Test Lab module is not displayed, click the **Test Lab** tab.

**2 Create a new test set.**

In the Test Lab module, click the **Execution Flow** tab.

In the test sets tree, choose the **Mercury Tours 1.01** folder and click the **New Test Set** button. The New Test Set dialog box opens.



Test Set Folder: Mercury Tours 1.01

Type the following:

**Test Set Name:** Test Run Schedule

**Description:** This test set is used to explain how to schedule a test run.

Click **OK**. Test Director adds the **Test Run Schedule** test set to the test sets tree in the left pane.

**3 Add a test from the Sign-On/Sign-Off folder to the Test Run Schedule test set.**

Click the **Select Tests** button. Test Director displays the test plan tree in the right pane.

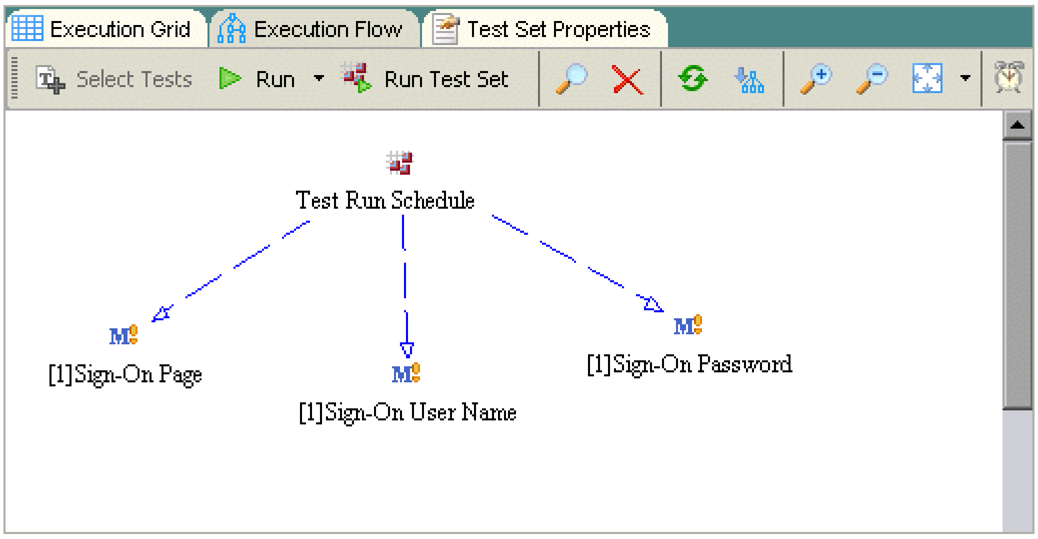
In the **Find** box in the test plan tree, type sign and click the **Find** button to search for the **Sign-On/Sign-Off** folder. Test Director highlights the **Sign-On/ Sign-Off** folder in the test plan tree.

Select the **Sign-On Page** test. Click the **Add Tests to Test Set** button. Test Director adds the test to the test set.

**4 Add two additional tests to the test set.**

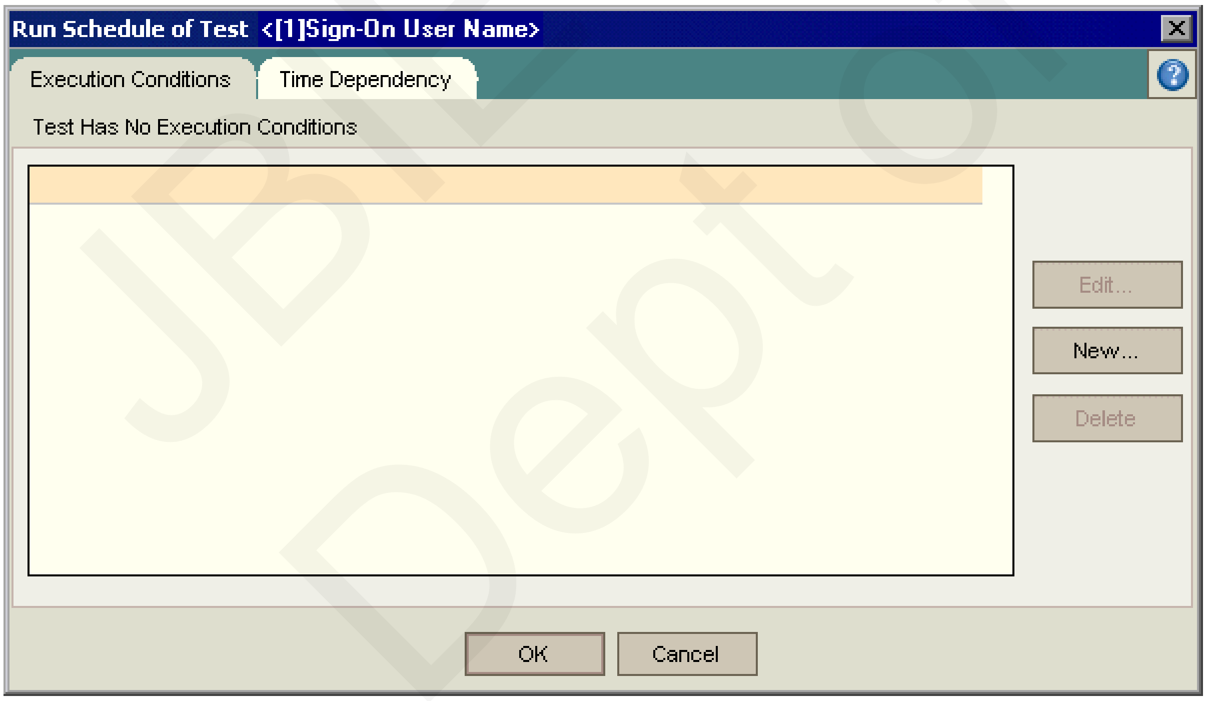
Drag the **Sign-On User Name** test to the Execution Flow area.

Double-click the **Sign-On Password** test to add it to the Execution Flow.



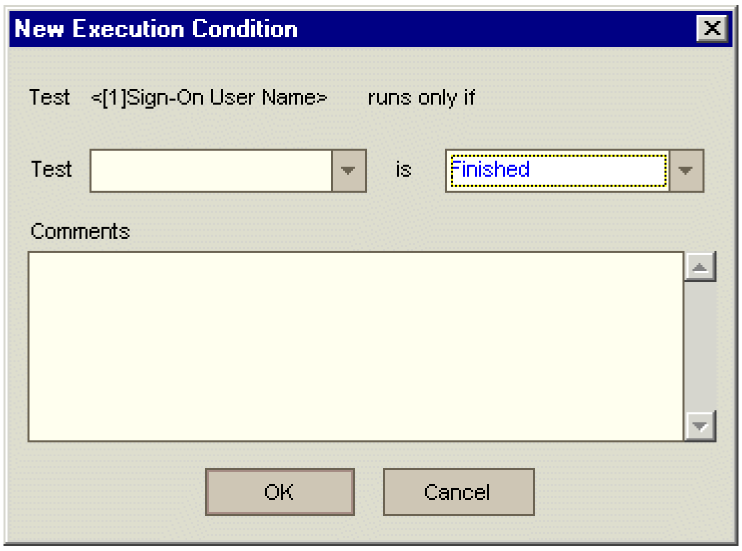
**5 Add an execution condition to the Sign-On User Name test.**

Right-click the **Sign-On User Name** test and choose **Test Run Schedule**. The Run Schedule of Test dialog box opens and displays the Execution Conditions tab.


Run Schedule of Test <[1]Sign-On User Name>

Test Has No Execution Conditions

Click **New**. The New Execution Condition dialog box opens.


New Execution Condition

Test <[1]Sign-On User Name> runs only if

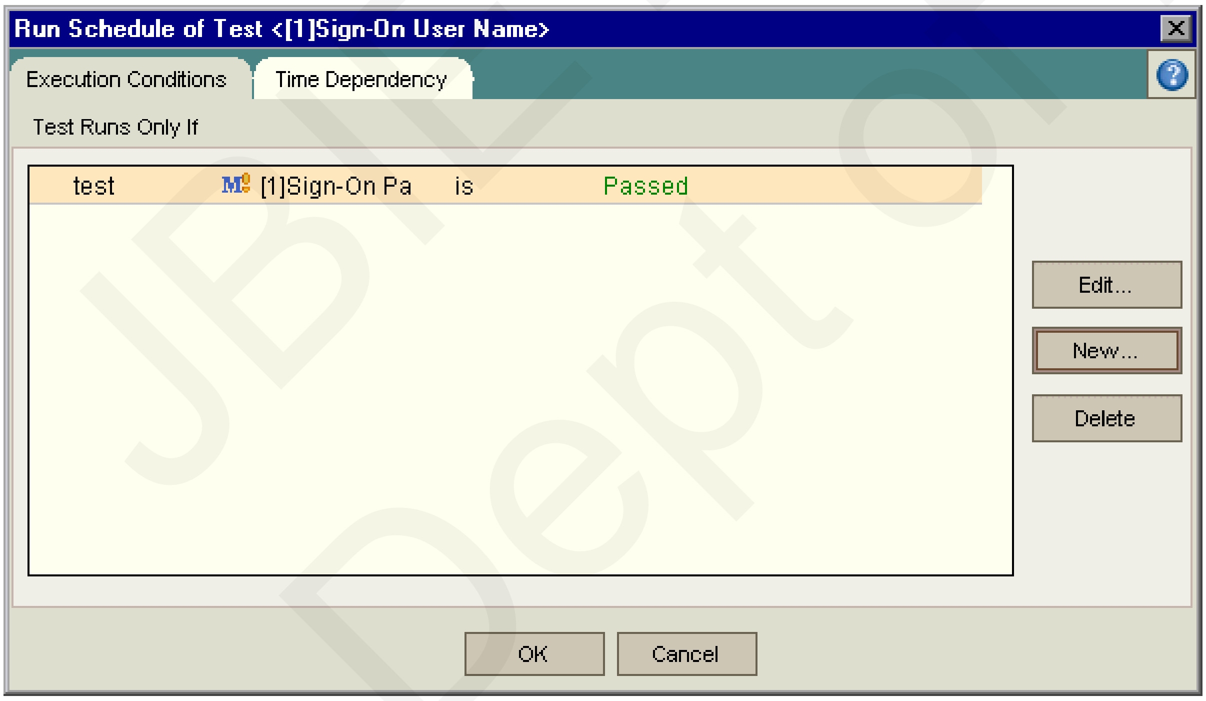
Test [ ] is Finished

Comments

OK Cancel

In the **Test** box, select **< [1]Sign-On Page>**.

Select **Passed** to instruct Test Director to execute the **Sign-On User Name** test only if the **Sign-On Page** test finishes executing and passes. Click **OK**. Test Director adds the condition to the Run Schedule of Test dialog box.


Run Schedule of Test <[1]Sign-On User Name>

Execution Conditions | Time Dependency

Test Runs Only If

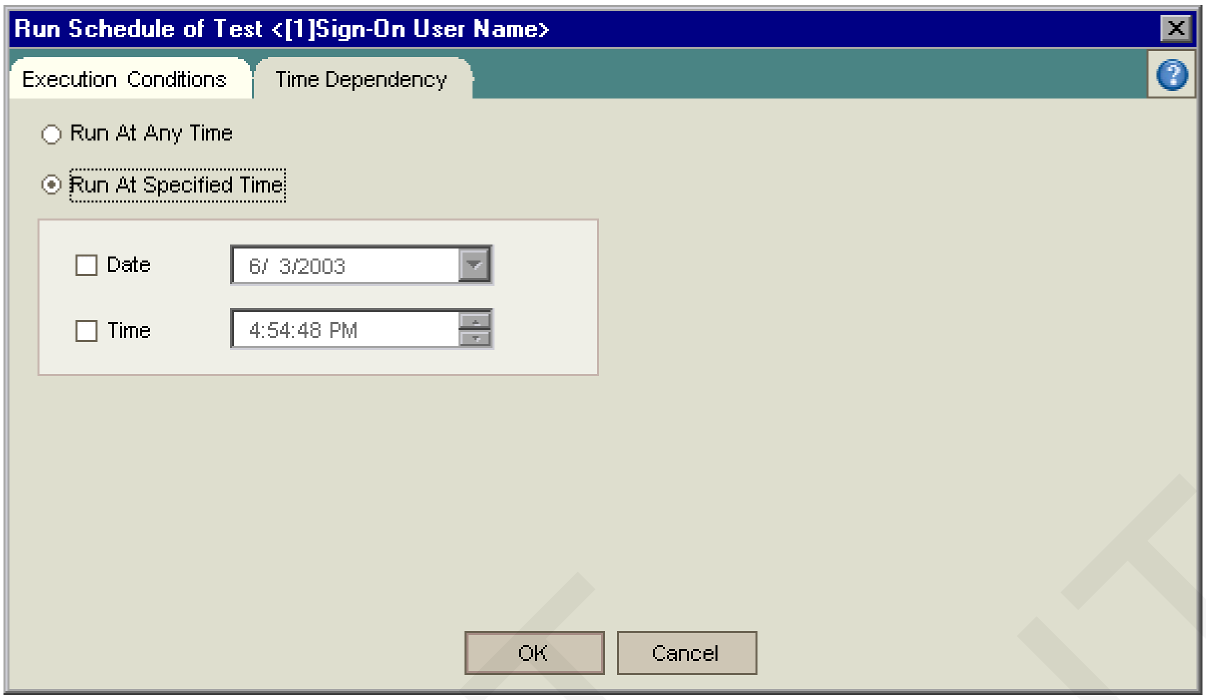
```
test      [1]Sign-On Pa    is          Passed
```

Edit... New... Delete

OK Cancel

**6 Add a time dependency condition to the Sign-On User Name test.**

Click the **Time Dependency** tab.


Run Schedule of Test <[1]Sign-On User Name>

Execution Conditions | Time Dependency

( ) Run At Any Time

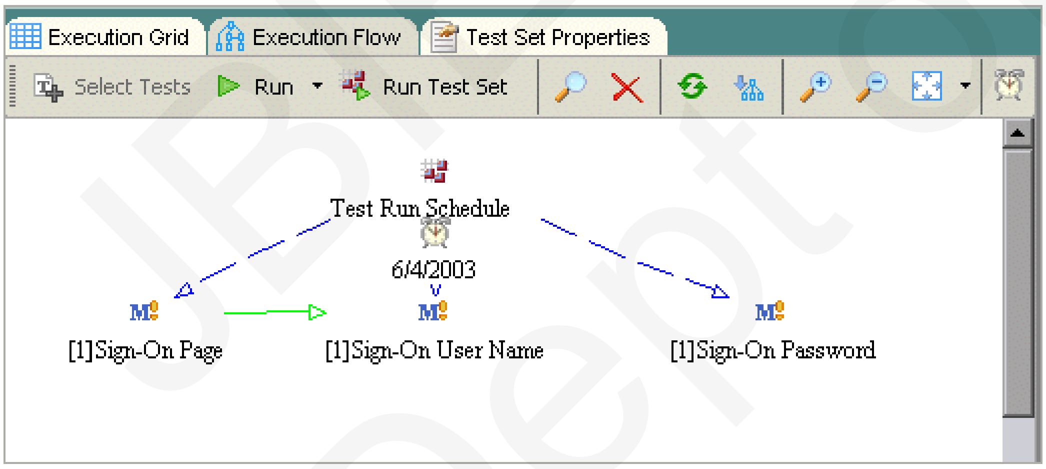
(•) Run At Specified Time

[ ] Date 6/ 3/2003

[ ] Time 4:54:48 PM

Under **Run At Specified Time**, select the **Date** checkbox and select tomorrow's date.

Click **OK** to close the Run Schedule of Test dialog box. Test Director displays your conditions in the Execution Flow diagram.



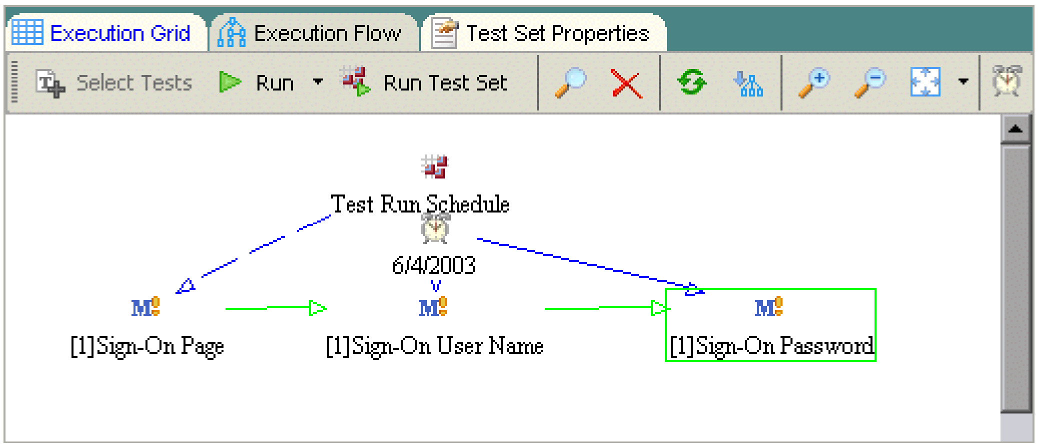
**7 Add an execution condition to the Sign-On Password test.**

Add the same execution condition as described in Step 5 for the **Sign-On Password** test. This time select **Sign-On User Name** from the **Test** box in the New Execution Condition dialog box.

**8 Add a time dependency condition to the Sign-On Password test.**

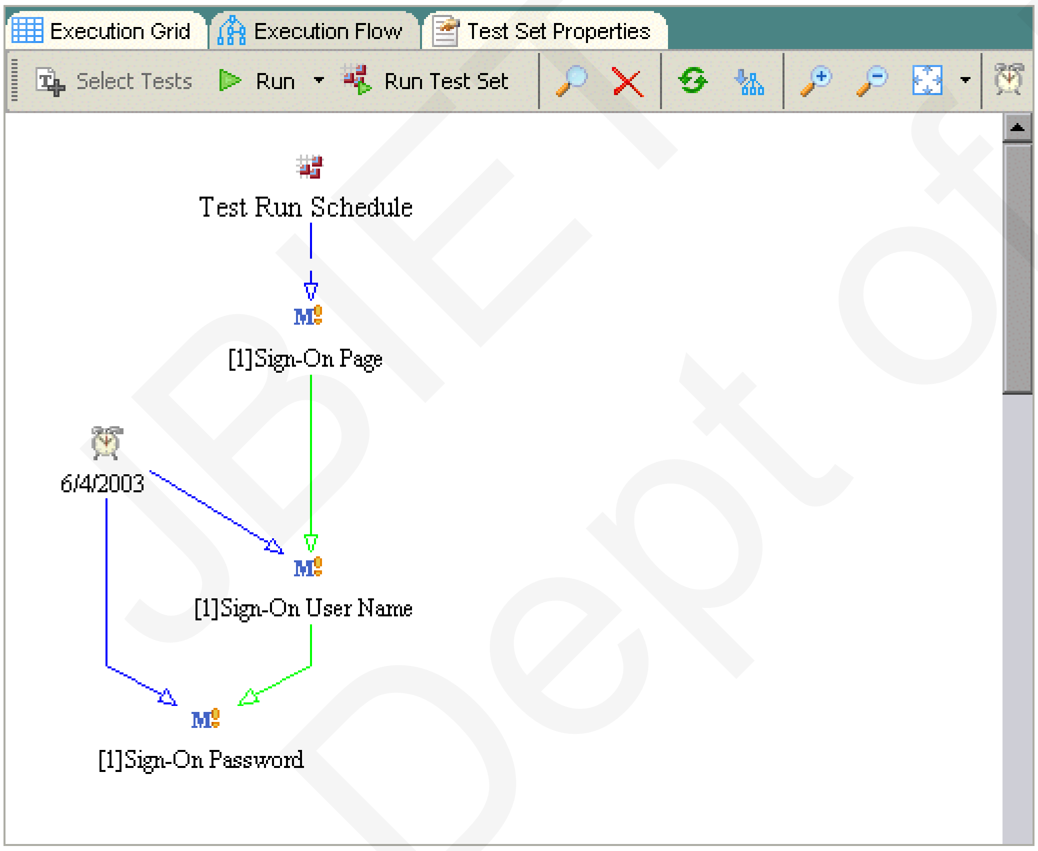
Add the same execution condition as described in Step 6 for the **Sign-On Password** test.

Click **OK** to close the Run Schedule of Test dialog box. Test Director displays your conditions in the Execution flow diagram.



## 9 Rearrange the tests in a hierarchical layout.

Click the **Perform Layout** button to clearly view dependencies between the tests.



## Running Tests Manually

When you run a test manually, you follow the test steps and perform operations on your application. Then, you compare the expected results with the actual outcome and record the results. You can execute a manual test as many times as needed. Test Director stores the results separately for each run.

Note that you can run both manual and automated tests manually. You can also choose to run a single test or to run an entire test set.

In the following exercise, you will run the **Cruise Booking** test.

**To run a test manually:**

**1 Make sure the Test Lab module is displayed.**

If the Test Lab module is not displayed, click the **Test Lab** tab.

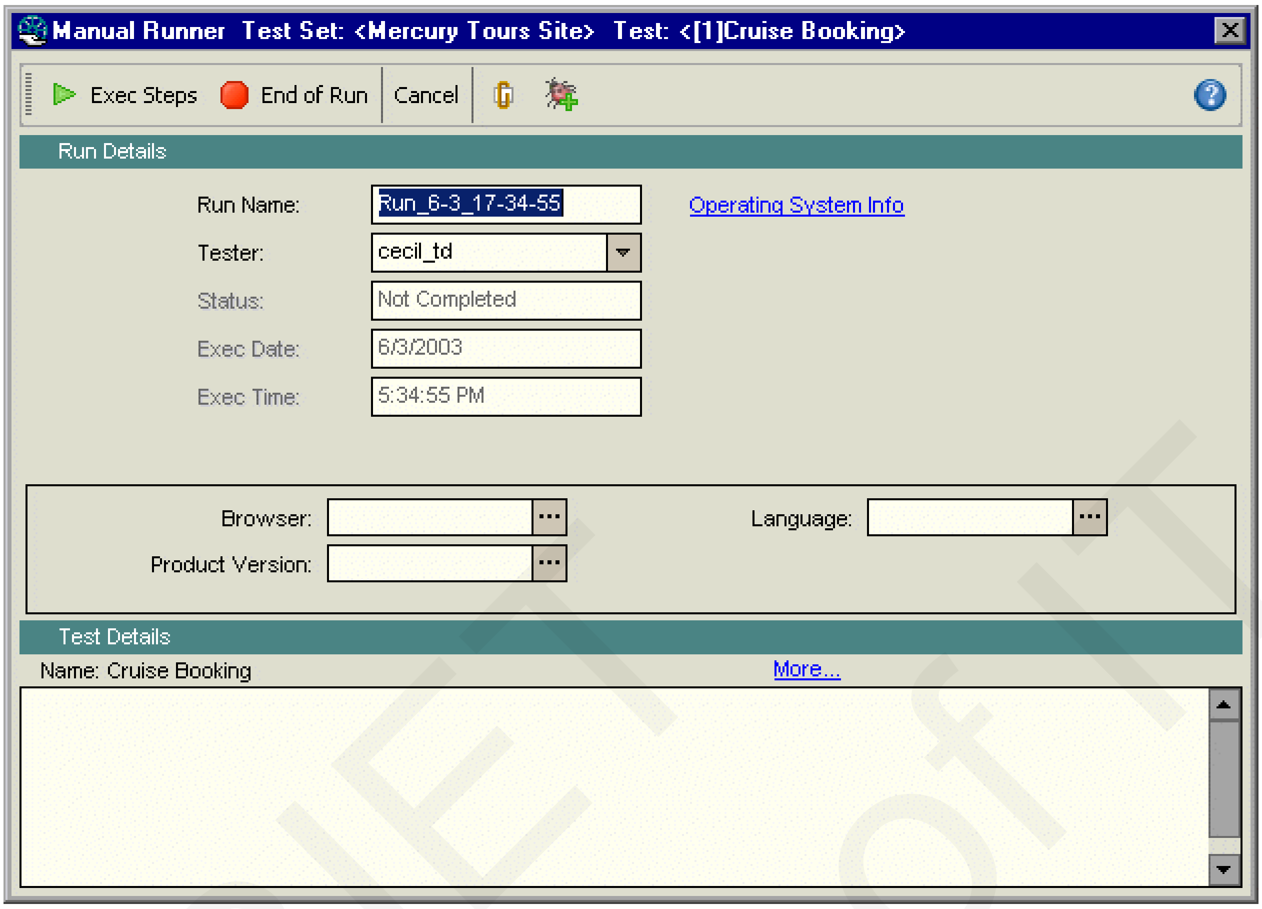
**2 Select the Mercury Tours Site test set.**

In the test sets tree, select the **Mercury Tours Site** test set.

**3 Select the Cruise Booking test from the Execution Grid.**

**In the Execution Grid tab, select the** Cruise Booking **test.**

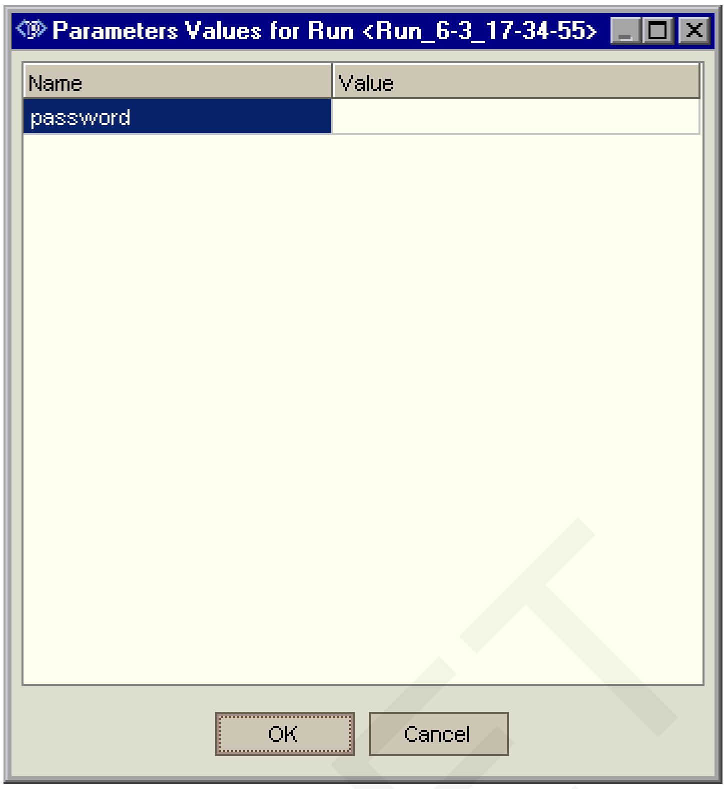
Click the **Run** button. The Manual Runner dialog box opens


Manual Runner Test Set: <Mercury Tours Site> Test: <[1]Cruise Booking>

Run Name: Run_6-3_17-34-55
Tester: cecil_td
Status: Not Completed
Exec Date: 6/3/2003
Exec Time: 5:34:55 PM
Browser:
Language:
Product Version:
Name: Cruise Booking

**4 Start the test run.**

Click the **Exec Steps** button. The Parameters Values for Run dialog box opens because you have an unassigned parameter in the test.

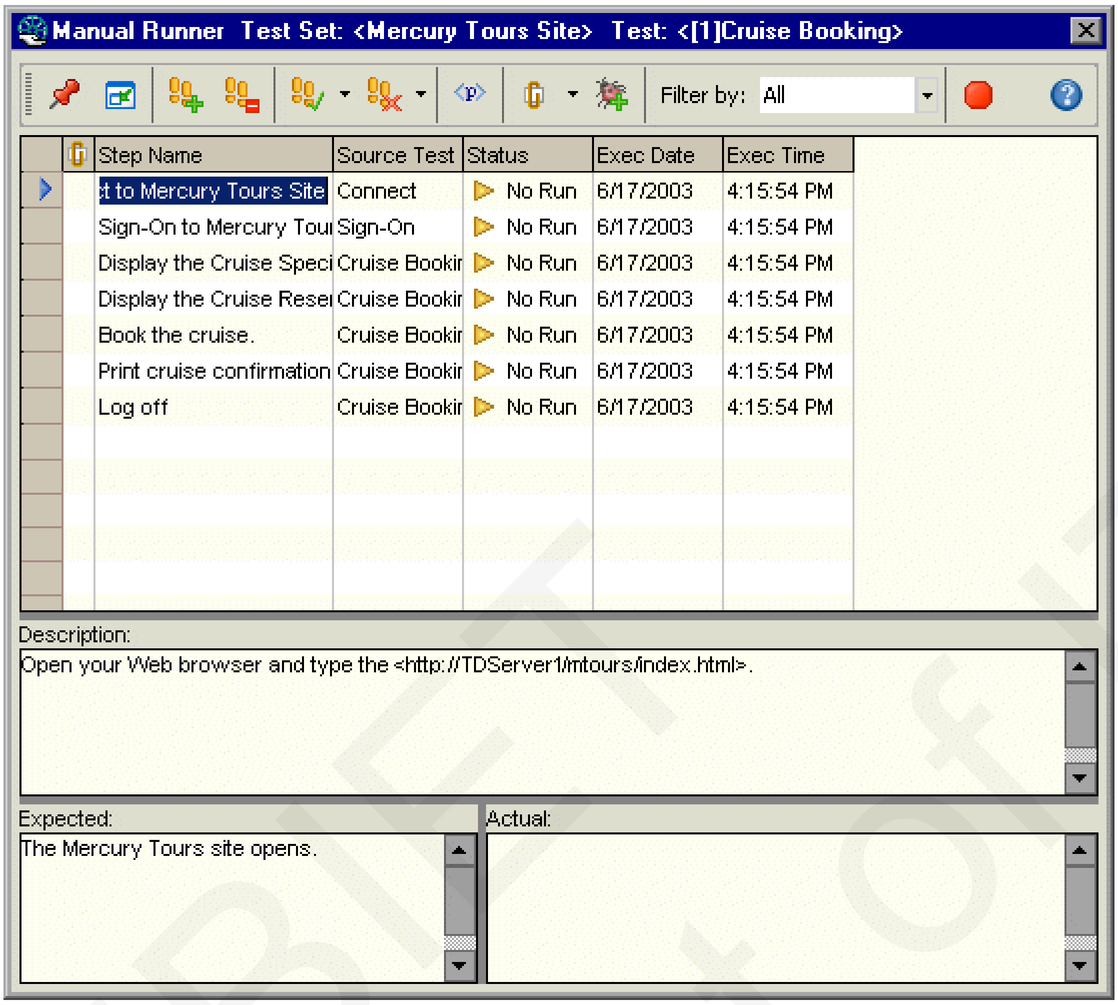

Parameters Values for Run <Run_6-3_17-34-55>

| Name | Value |
|---|---|
| password | |

**5 Assign a value for the password parameter.**

Click the **Value** box for **password** and type the same password you used in "The Mercury Tours Sample Web Site".

Click **OK**. The Manual Runner: Step Details dialog box opens.


Manual Runner Test Set: <Mercury Tours Site> Test: <[1]Cruise Booking>
Filter by: All

| Step Name | Source Test | Status | Exec Date | Exec Time |
|---|---|---|---|---|
| :t to Mercury Tours Site | Connect | No Run | 6/17/2003 | 4:15:54 PM |
| Sign-On to Mercury Tour | Sign-On | No Run | 6/17/2003 | 4:15:54 PM |
| Display the Cruise Speci | Cruise Bookir | No Run | 6/17/2003 | 4:15:54 PM |
| Display the Cruise Reser | Cruise Bookir | No Run | 6/17/2003 | 4:15:54 PM |
| Book the cruise. | Cruise Bookir | No Run | 6/17/2003 | 4:15:54 PM |
| Print cruise confirmation | Cruise Bookir | No Run | 6/17/2003 | 4:15:54 PM |
| Log off | Cruise Bookir | No Run | 6/17/2003 | 4:15:54 PM |

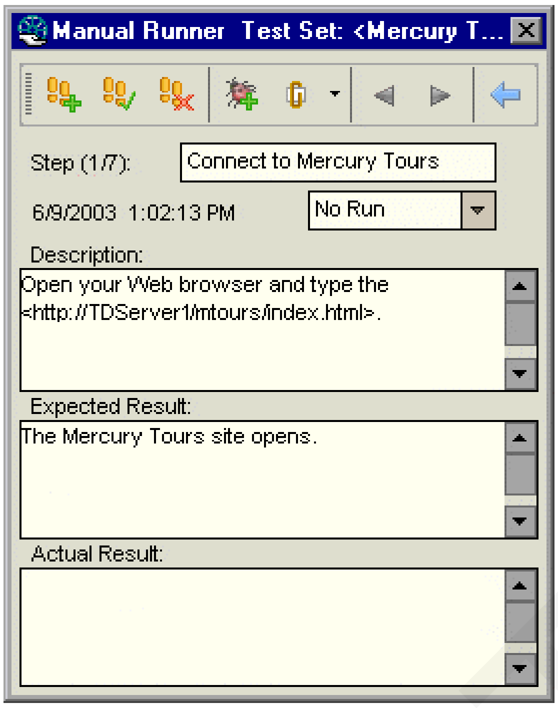
Description:
Open your Web browser and type the <http://TDServer1/mtours/index.html>.

Expected:
The Mercury Tours site opens.

Actual:

**6 Display the Manual Runner dialog box in a compact view.**

Click the **Compact View** button. This enables you to conveniently read each step and record the results.


Manual Runner Test Set: <Mercury T...

Step (1/7): Connect to Mercury Tours

6/9/2003 1:02:13 PM No Run

Description:
Open your Web browser and type the <http://TDServer1/mtours/index.html>.

Expected Result:
The Mercury Tours site opens.

Actual Result:

**7 Perform the first step.**

Perform the procedure described in the **Description** box.

If the actual result is the same as the expected result, in the **Actual** box, type:

The Mercury Tours site opens.

Click the **Pass Selected** button. Test Director displays step 2.

**8 Perform the second step.**

Perform the procedure described in the **Description** box.

If the actual result is the same as the expected result, in the **Actual** box, type:

The Flight Finder page opens.

Click the **Pass Selected** button. Test Director displays step 3. Test Director Tutorial

**9 Perform the third step.**

Perform the procedure described in the **Description** box.

If the actual result is the same as the expected result, in the **Actual** box, type:

The Cruise Special page opens.

Click the **Pass Selected** button. Test Director displays step 4.

**10 Perform the fourth step.**

Perform the procedure described in the **Description** box.

If the actual result is different than the expected result, in the **Actual** box, type: The Flight

Finder page opens instead of the Cruise Reservation page.

Click the **Fail Selected** button.

**Note:** When you detect an application flaw while running the test, you can click the **Add Defect** button to open the Add Defect dialog box and add a defect. For the purpose of this exercise, you will submit this defect in "Adding New Defects,".

**11 Return to the default display of the Manual Runner.**

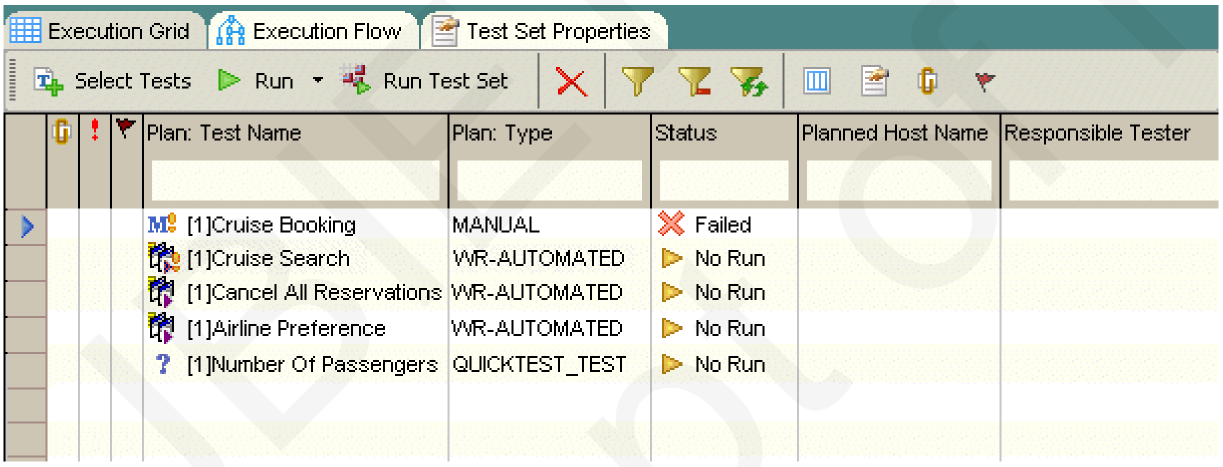
Click the **Back to Steps Grid** button. The default display of the Manual Runner: Step Details dialog box is displayed.

**12 End the test run.**

Click the **End of Run** button to end your test run.

**13 View the test run results in the Execution Grid.**

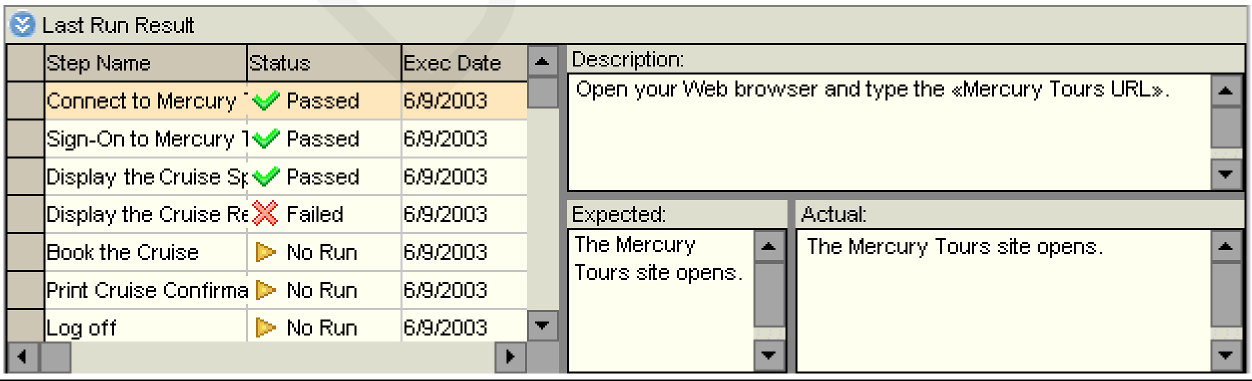
Following the execution of your test, you can view the test run results of your last run in the Execution Grid. Note that Test Director updates the test run status from "No Run" to "Failed".



| Plan: Test Name | Plan: Type | Status | Planned Host Name | Responsible Tester |
|---|---|---|---|---|
| [1]Cruise Booking | MANUAL | Failed | | |
| [1]Cruise Search | WR-AUTOMATED | No Run | | |
| [1]Cancel All Reservations | WR-AUTOMATED | No Run | | |
| [1]Airline Preference | WR-AUTOMATED | No Run | | |
| [1]Number Of Passengers | QUICKTEST_TEST | No Run | | |

**14 View the results of each test step in the Last Run Result pane.**

If the Last Run Result pane is not displayed, click the **Last Run Result** button on the bottom of the pane. The Last Run Result pane is displayed below the Execution Grid.



| Step Name | Status | Exec Date |
|---|---|---|
| Connect to Mercury ` | Passed | 6/9/2003 |
| Sign-On to Mercury 1 | Passed | 6/9/2003 |
| Display the Cruise Sp | Passed | 6/9/2003 |
| Display the Cruise Re | Failed | 6/9/2003 |
| Book the Cruise | No Run | 6/9/2003 |
| Print Cruise Confirma | No Run | 6/9/2003 |
| Log off | No Run | 6/9/2003 |

Description:
Open your Web browser and type the «Mercury Tours URL».

Expected:
The Mercury Tours site opens.

Actual:
The Mercury Tours site opens.

Click each step to view the step’s description, as well as the expected and actual results. Note that you can view more detailed results in the Test Run Properties dialog box

## Running Tests Automatically

When you run an automated test, Test Director opens the selected testing tool automatically, runs the test on your local machine or on remote hosts, and exports the results to Test Director.

Note that you can run all tests in a test set or run specific tests. You can run tests from the Execution Grid tab or the Execution Flow tab.

In the following exercise, you will run an automated test from the Mercury Tours Site test set. After the test run is complete, you will view the test results from the Test Run Properties dialog box.

**Note:** To perform the following exercise, you must have one of the following tools installed on your computer:

➢ Quick Test Professional

➢ Astra Quick Test

➢ WinRunner

To launch Quick Test Professional or Astra Quick Test from Test Director, you must install the Quick Test Professional/Astra Quick Test Add-in and the Test Director Connectivity Add-in from the Test Director Add-ins page. For
more information, refer to the *Test Director Installation Guide*.

**To run a test automatically:**

**1 Make sure the Test Lab module is displayed.**

If the Test Lab module is not displayed, click the **Test Lab** tab.

**2 Display the Mercury Tours Site test set in the Execution Grid.**

Click the **Execution Grid** tab.

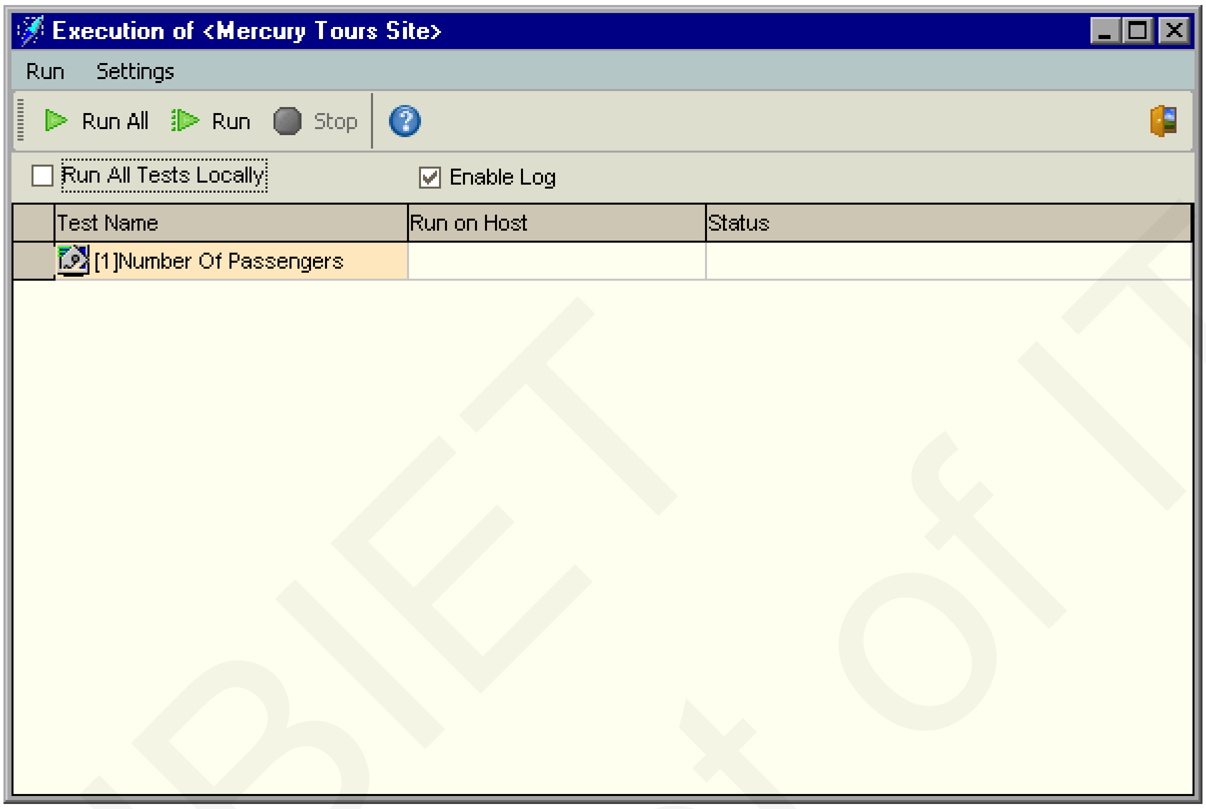
In the test sets tree, select the **Mercury Tours Site** test set.

**3 Select a test.**

To run a WinRunner test, select the **Airline Preference** test.

To run a Quick Test Professional or Astra Quick Test test, select the **Number of Passengers** test.

Click the **Run** button. The Execution dialog box opens and displays the selected test.



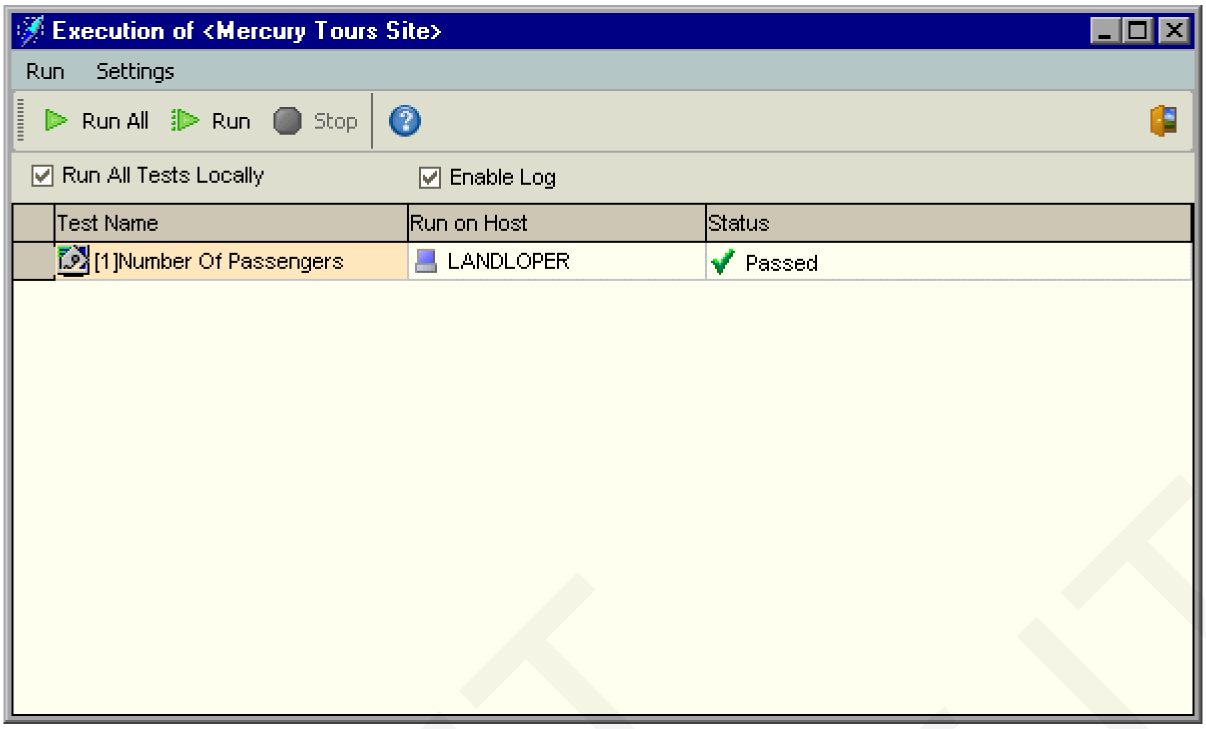
| Test Name | Run on Host | Status |
|---|---|---|
| [1]Number Of Passengers | | |

**4 Set the test run settings.**

Select the **Run All Tests Locally** check box to run the test on your local Computer

**5 Run the test.**

Click the **Run** button. Test Director opens the selected testing tool automatically and runs the test. You view the test execution progress in the **Status** column.



☑ Run All Tests Locally ☑ Enable Log

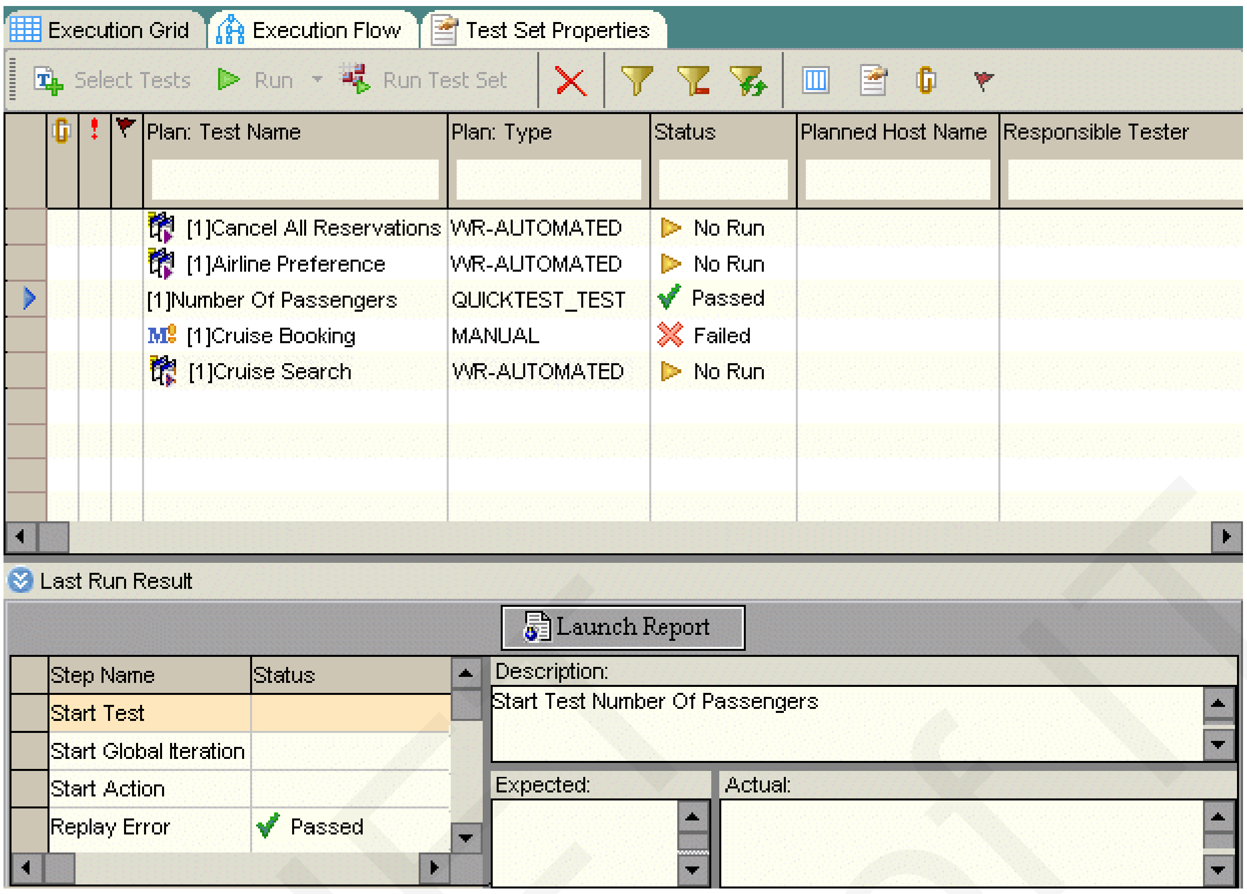
| Test Name | Run on Host | Status |
|---|---|---|
| [1]Number Of Passengers | LANDLOPER | ✓ Passed |

**6 Close the Execution dialog box.**

After the test run is complete, click **Exit**.

**7 View a summary of test results in the Execution Grid.**

The Execution Grid displays the updated status for the test run. Results for each test step appear in the Last Run Result pane.



| | Plan: Test Name | Plan: Type | Status | Planned Host Name | Responsible Tester |
|---|---|---|---|---|---|
| | [1]Cancel All Reservations | WR-AUTOMATED | No Run | | |
| | [1]Airline Preference | WR-AUTOMATED | No Run | | |
| ▶ | [1]Number Of Passengers | QUICKTEST_TEST | ✓ Passed | | |
| | [1]Cruise Booking | MANUAL | ✗ Failed | | |
| | [1]Cruise Search | WR-AUTOMATED | No Run | | |

| Step Name | Status |
|---|---|
| Start Test | |
| Start Global Iteration | |
| Start Action | |
| Replay Error | ✓ Passed |

Description:
Start Test Number Of Passengers

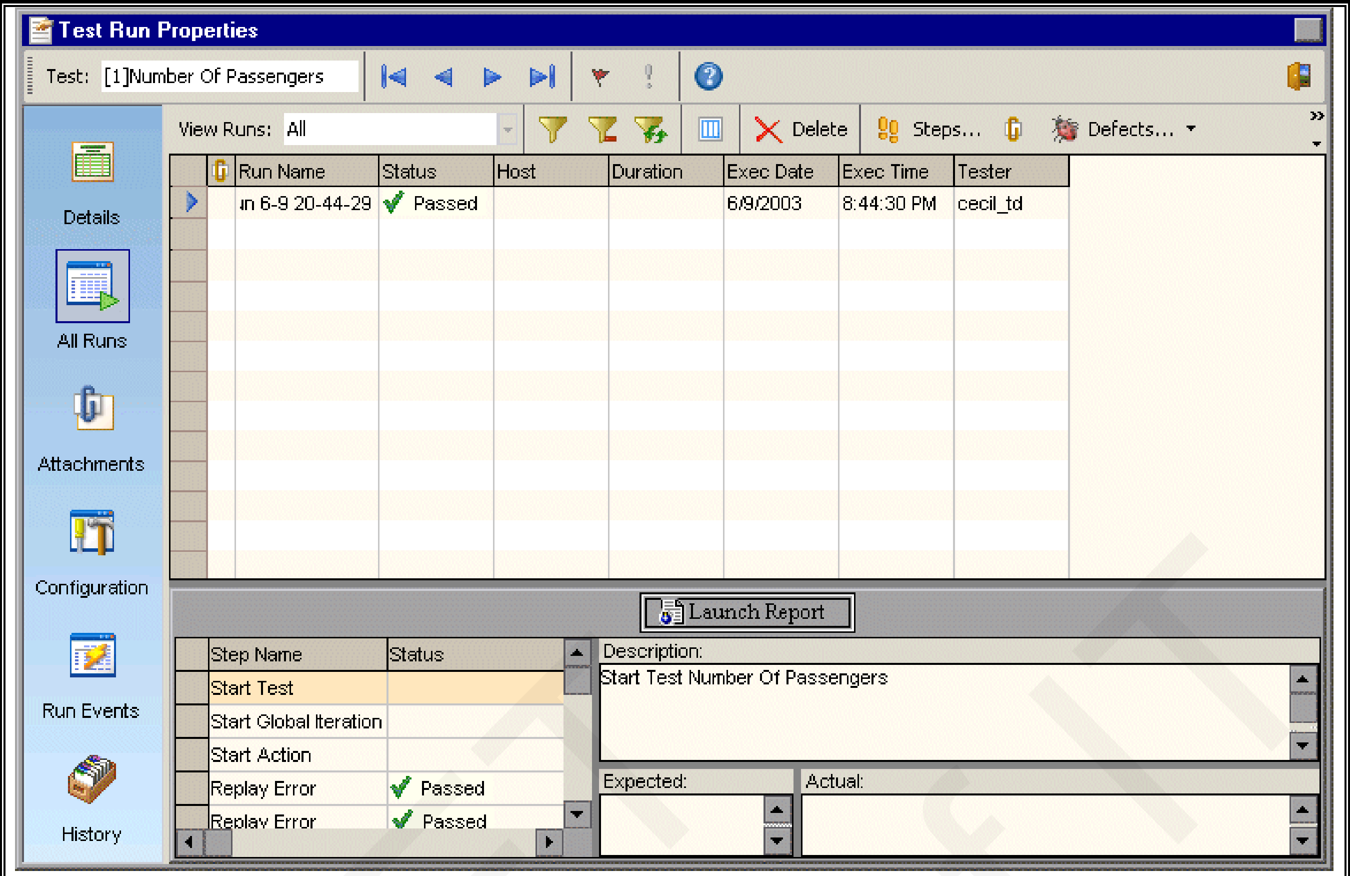
Expected:

Actual:

**8 View detailed test results from the Test Run Properties dialog box.**

In the Execution Grid, make sure your test is selected. Click the **Test Run Properties** button.

The Test Run Properties dialog box opens and displays the All Runs view.



Test: [1]Number Of Passengers

View Runs: All

| Run Name | Status | Host | Duration | Exec Date | Exec Time | Tester |
|---|---|---|---|---|---|---|
| ın 6-9 20-44-29 | ✓ Passed | | | 6/9/2003 | 8:44:30 PM | cecil_td |

| Step Name | Status |
|---|---|
| Start Test | |
| Start Global Iteration | |
| Start Action | |
| Replay Error | ✓ Passed |
| Replay Error | ✓ Passed |

Description:
Start Test Number Of Passengers

Expected:

Actual:

**9 View the test results in your selected testing tool.**

➢ To view the test results in Quick Test Professional or Astra Quick Test, click the **Launch Report** button.

➢ To view the test results in WinRunner, click the **View Report** button.

**10 View other test run information in the Test Run Properties dialog box.**

➢ To view run details of the test, in the left menu, click **Details**.

➢ To view any attachments to a test, in the left menu, click **Attachments**.

➢ To view the parameters for a manual or WinRunner test, in the left menu, click **Configuration**. Note that any changes that you make will be implemented in the next test run.

➢ To view the on failure rules for an automated test, in the left menu, click **Run Events**. This view also enables you to change your rules. Note that any changes that you make will be implemented in the next test run.

➢ To view a list of changes made to the test run fields, in the left menu, click **History**.

**11 Close the Test Run Properties dialog box.** Click **Exit**.

**12 Close your selected testing tool.**

In QuickTest Professional, Astra QuickTest, or WinRunner, chooses **File > Exit**.

## Adding and Tracking Defects

Locating and repairing defects is an essential phase in application development. Defects can be detected and submitted by developers, testers, and end users in all stages of the testing process. Using Test Director, you can submit defects detected in the application and track them until they are repaired.

In this we will describe about:

- ➢ How to Track Defects
- ➢ Adding New Defects
- ➢ Matching Defects
- ➢ Updating Defects
- ➢ Mailing Defects
- ➢ Associating Defects with Tests
- ➢ Creating Favorite Views

### How to Track Defects

When you submit a defect to a Test Director project, it is tracked through the following stages: *New*, *Open*, *Fixed*, and *Closed*. A defect may also be *Rejected* or *Reopened* after it is fixed.

When you initially report the defect to the Test Director project, it is assigned the status *New*, by default. A quality assurance or project manager reviews the defect and determines whether or not to consider the defect for repair. If the defect is refused, it is assigned the status *Rejected*. If the defect is accepted, the quality assurance or project manager determines a repair priority, changes its status to *Open*, and assigns it to a member of the development team. A developer repairs the defect and assigns it the status *Fixed*. You retest the application, making sure that the defect does not recur. If the defect recurs, the quality assurance or project manager assigns it the status *Reopened*. If the defect is actually repaired, the quality assurance or project manager assigns it the status *Closed*.

## Adding New Defects

You can add a new defect to a TestDirector project at any stage of the testing process. In the following exercise you will submit the defect that was detected while running the **Cruise Booking** test.

**To add a new defect:**

**1 Open the TestDirector_Demo project.**

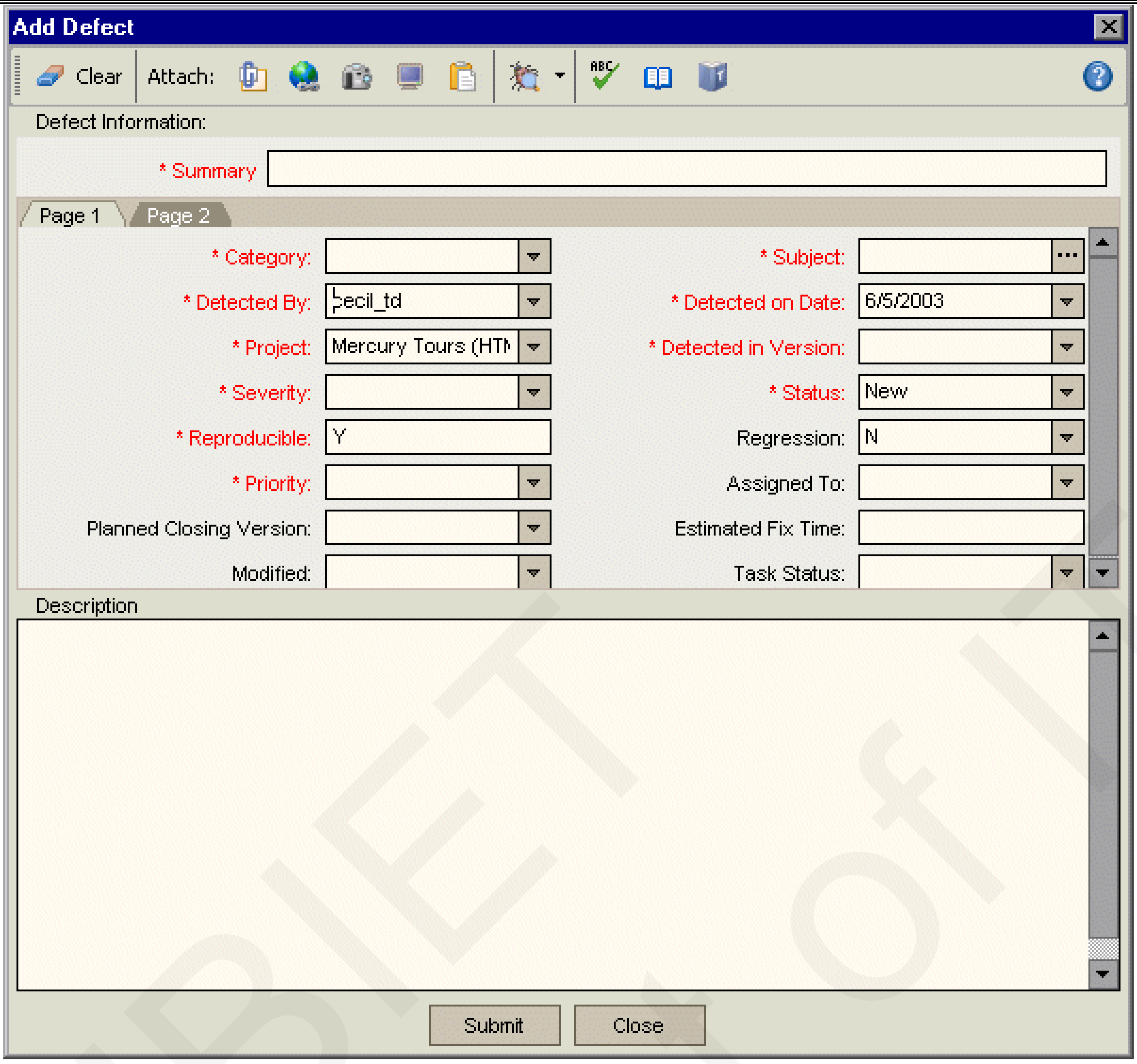
If the **TestDirector_Demo** project is not already open, log on to the project.

**2 Display the Defects module.**

Click the **Defects** tab. The Defects Grid displays defect data in a grid. Each row in the grid displays a separate defect record.

**3 Open the Add Defect dialog box.**

Click the **Add Defect** button. The Add Defect dialog box opens. Note that fields in red are required.


Add Defect

Clear Attach:

Defect Information:

| | | | |
|---|---|---|---|
| * Summary | | | |
| * Category: | | * Subject: | |
| * Detected By: | cecil_td | * Detected on Date: | 6/5/2003 |
| * Project: | Mercury Tours (HTM | * Detected in Version: | |
| * Severity: | | * Status: | New |
| * Reproducible: | Y | Regression: | N |
| * Priority: | | Assigned To: | |
| Planned Closing Version: | | Estimated Fix Time: | |
| Modified: | | Task Status: | |

**4 Describe the defect.**

Type or select the following:

**Summary:** Unable to reserve a cruise from the Cruise page.

**Category**: Defect

**Severity:** 2-Medium

**Subject:** Cruises

**Detected in Version:** Version 1.01

**Description:** The defect was detected in the Cruise Booking test. When you click the Now Accepting Reservations button, the Flight Finder page opens instead of the Cruise Reservation page.

**5 Attach the URL address for the Mercury Tours page where the defect was detected.**

Click the **Attach URL** button. The Attach URL dialog box opens.

Type the URL address of the Mercury Tours page:
http://<server name>/mtours/servlet/com.mercurytours.servlet.CruisesServlet
Click **OK**. Test Director displays the URL above the **Description** box.
**6 Spell check your text.**
Place the cursor in the **Description** box and click the **Check Spelling** button.
If there are no errors, a confirmation message box opens. If errors are found, the Spelling dialog box opens and displays the word together with replacement suggestions.
**7 Add the defect to the Test Director project.**
Click the **Submit** button. Click **OK** to confirm.
**8 Close the Add Defect dialog box.**
Click **Close**. Test Director adds the defect to the Defects Grid.

## Matching Defects

Matching defects enables you to eliminate duplicate or similar defects in your project. Each time you add a new defect, TestDirector stores lists of keywords from the **Summary** and **Description** fields. When you search for similar defects, keywords in these fields are matched against other defects.
Note that keywords are more than two characters and letter case does not affect your results. TestDirector ignores the following: articles (a, an, the); coordinate conjunctions (and, but, for, nor, or); boolean operators (and, or, not, if, or then); and wildcards (?, *, [ ]).
In the following exercise, you will match defects by comparing a selected defect with all other existing defects in the **TestDirector_Demo** project.

**To match defects:**

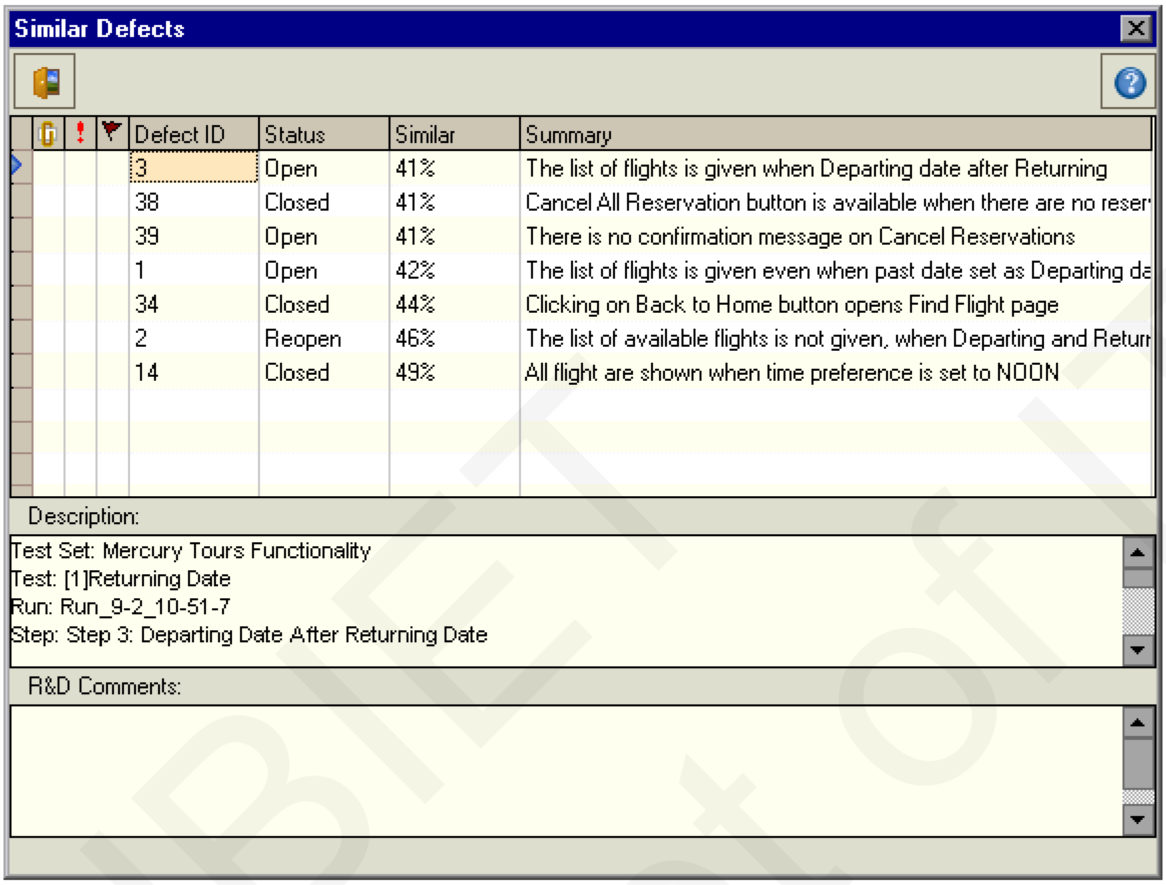
**1 Make sure that the Defects module is displayed.**
If the Defects module is not displayed, click the **Defects** tab.
**2 Select Defect ID 37.**
In the Defects Grid, select **Defect ID** 37.
**Note:** If you cannot find **Defect ID 37**, click the **Clear Filter/Sort** button to clear the filter that is applied to the grid.

**3 Find similar defects.**

Click the **Find Similar Defects** button.

Test Director displays the results in the Similar Defects dialog box.

Test Director displays similar defects according to the percentage of detected similarity.



| Defect ID | Status | Similar | Summary |
|---|---|---|---|
| 3 | Open | 41% | The list of flights is given when Departing date after Returning |
| 38 | Closed | 41% | Cancel All Reservation button is available when there are no reser |
| 39 | Open | 41% | There is no confirmation message on Cancel Reservations |
| 1 | Open | 42% | The list of flights is given even when past date set as Departing da |
| 34 | Closed | 44% | Clicking on Back to Home button opens Find Flight page |
| 2 | Reopen | 46% | The list of available flights is not given, when Departing and Retur |
| 14 | Closed | 49% | All flight are shown when time preference is set to NOON |

Description:

Test Set: Mercury Tours Functionality
Test: [1]Returning Date
Run: Run_9-2_10-51-7
Step: Step 3: Departing Date After Returning Date

R&D Comments:

Click **Close** to close the Similar Defects dialog box.

## Updating Defects

Tracking the repair of defects in a project requires that you periodically update defects. You can do so directly in the Defects Grid or in the Defect Details dialog box. Note that the ability to update some defect fields depends on your permission settings.

In this exercise, you will update your defect information by assigning the defect to a member of the development team, changing the severity of the defect, and adding a comment.

**To update a defect:**

**1 Make sure that the Defects module is displayed.**

If the Defects module is not displayed, click the **Defects** tab.

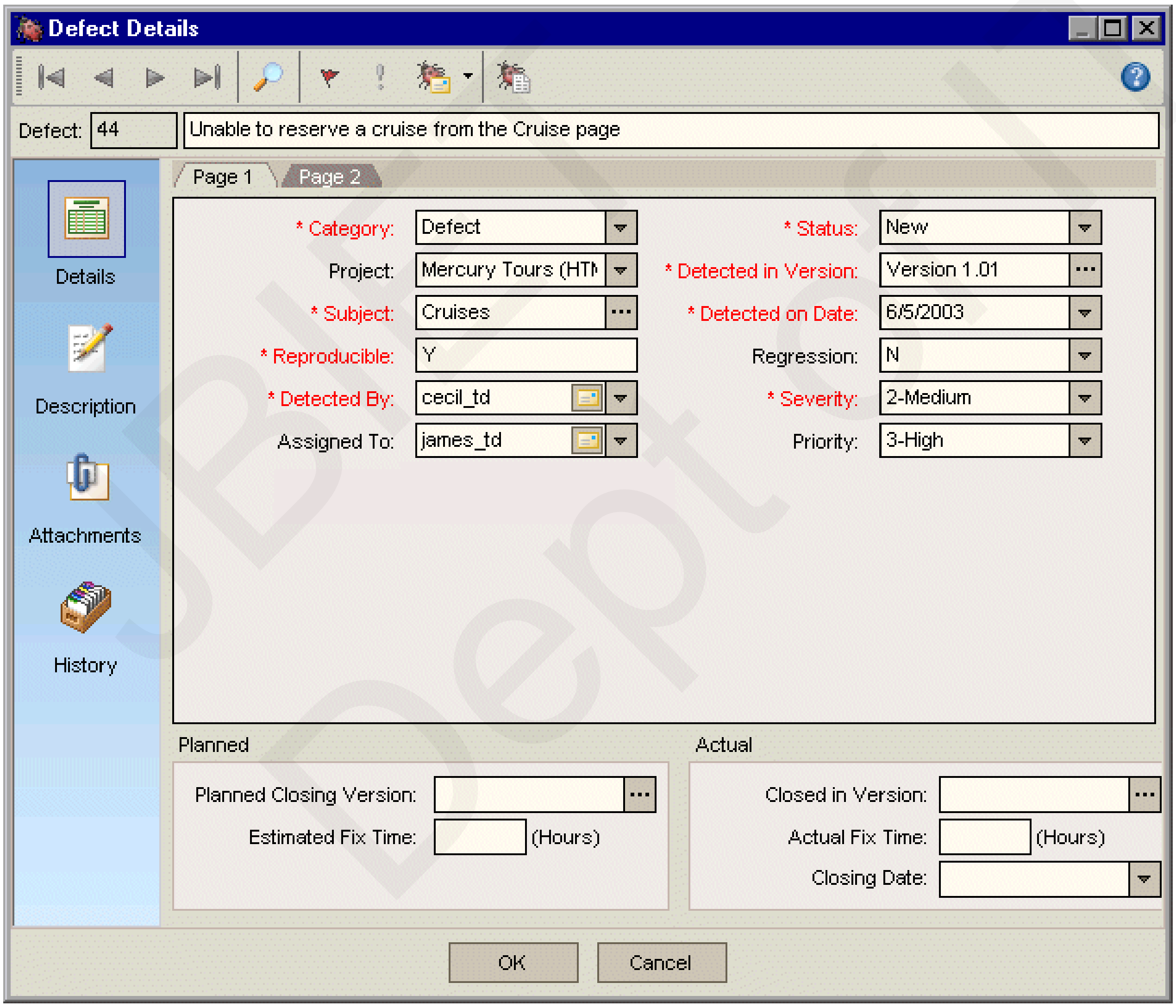
**2 Update the defect directly in the Defects Grid.**

In the Defects Grid, select the defect you added in "Adding New Defects"

To assign the defect to a member of the development team, in the **Assigned to** box in the defect record, click the down arrow and select **james_td** from the list.

**3 Open the Defect Details dialog box.**

Click the **Defect Details** button. The Defect Details dialog box opens.



Defect Details

Defect: 44 Unable to reserve a cruise from the Cruise page

Page 1 Page 2

| | | | |
|---|---|---|---|
| * Category: | Defect | * Status: | New |
| Project: | Mercury Tours (HTM | * Detected in Version: | Version 1.01 |
| * Subject: | Cruises | * Detected on Date: | 6/5/2003 |
| * Reproducible: | Y | Regression: | N |
| * Detected By: | cecil_td | * Severity: | 2-Medium |
| Assigned To: | james_td | Priority: | 3-High |

Planned

Planned Closing Version:

Estimated Fix Time: (Hours)

Actual

Closed in Version:

Actual Fix Time: (Hours)

Closing Date:

**4 Change the severity level of the defect.**

In the **Severity** box, select **5-Urgent**.

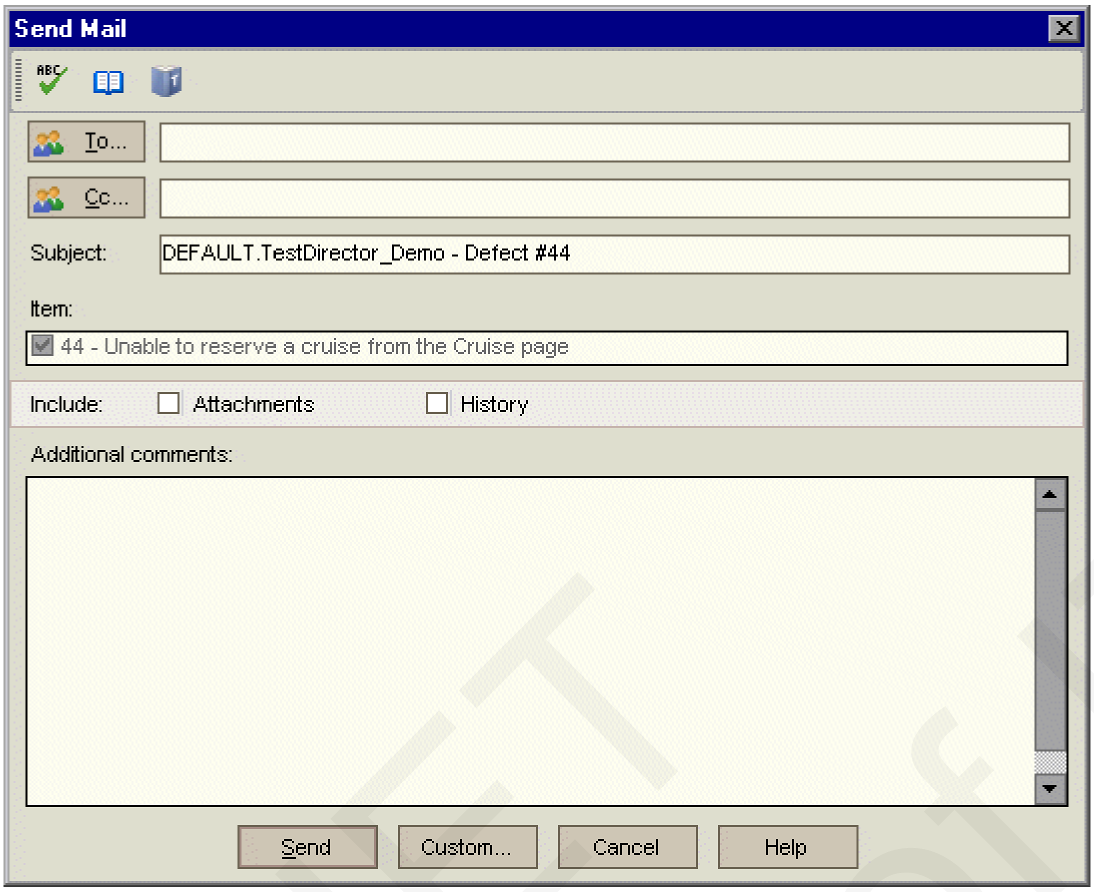
**5 Add a new R&D comment to explain the change in the severity level.**
Click **Description** in the left menu.
Click the **Add Comment** button. A new section is added to the **Comments** box, displaying your user name and the current date.
Type: This defect also occurs in Mercury Tours version 1.0.
**6 View the Attachments.**
Click **Attachments** in the left menu. Note that the URL attachment is listed
**7 View the History.**
Click **History** in the left menu to view the history of changes made to the defect. For each changed field, TestDirector displays the date of the change, the name of the person who made the change, and the new value.
**8 Close the Defect Details dialog box.**
Click **OK** to exit the dialog box and save your changes.

## Mailing Defects

You can send an e-mail about a defect to another user. This enables you to routinely inform development and quality assurance personnel about defect repair activity. Test Director includes a **Go To Defect** link in the e-mail which enables the recipient to go directly to the defect.
In the following exercise, you will e-mail your defect to your mailbox.

**To mail a defect:**

**1 Make sure that the Defects module is displayed.**
If the Defects module is not displayed, click the **Defects** tab.
**2 Select a defect.**
Select the defect you added in “Adding New Defects”, and click the **Mail Defects** button. The Send Mail dialog box opens.



Subject: DEFAULT.TestDirector_Demo - Defect #44

Item:

☑ 44 - Unable to reserve a cruise from the Cruise page

Include: ☐ Attachments ☐ History

Additional comments:

**3 Type a valid e-mail address.**

In the **To** box, type your e-mail address.

**4 Include the attachments and history of the defect.**

In the **Include** box, select **Attachments** and **History**.

**5 Add your comments.**

Under **Additional comments**, type: I will send you more information tomorrow.

**6 E-mail the defect.**

Click **Send**. A message box opens. Click **OK**.

**7 View the e-mail.**

Open your mailbox and view the defect you sent.

## Associating Defects with Tests

You can associate a test in your test plan with a specific defect in the Defects Grid. This is useful, for example, when a new test is created specifically for a known defect. By creating an association, you can determine if the test should be run based on the status of the defect. Note that any requirements covered by the test are also associated with the defect.

You can also create an association during a manual test run. When you submit a defect, Test Director automatically creates an association between the test run and the new defect.

In the following exercise, you will associate your defect with the **Cruise Booking** test in the Test Plan module, and view the associated test in the Defects Grid.

## Creating Favourite Views

A *favourite view* is a view of a Test Director window with the settings you applied to it. For example, in the Defects Grid, you may want to apply a filter to display only the defects that were detected by you, are assigned to you, or have the status “Not Closed”.

**AIM:** study on the test management tool(eg winrunner)

**Objective:**

Win Runner is a powerful automated testing tool for functional and regression testing.

***BRIEF SUMMARY:***

Win Runner allows you to record GUI operations, while recording it automatically creates a ***test script.***

**Test Script**: An automated test program is called test script. Every test script consists of two types of statements such as:

***Navigational Statements*** to operate on build and ***check points*** to conduct testing.

***Important Features of Win Runner:***

- Runs on Win Runner family operating system and different browser environments.
- Records the GUI operations in the record mode, automatically creates a test script .This test can be modified if required and can be executed later in unattended mode.
- Can do functional/regression testing of application software written in programming language such as Power Builder, VB,C/C++ and Java and can also carry out the testing on ERP/CRM software packages.
- Checkpoints can be added to compare actual and expected results. Checkpoints can be GUI checkpoints, bitmap and Web Links.
- Database checkpoints are used to verify data in a database during automated testing. The records that are inserted, deleted, modified or updated will be highlighted so that you can ensure database integrity and transaction accuracy.
- Virtual object wizard of Win Runner is used to teach Win Runner to recognize record.

***Procedure:***

**There are 6 steps in testing process:**

1. **GUI map file creation:** By creating GUI map file the win runner can identify the GUI objects in the application going to be created.
2. **Test scripts creation:** This process involves recording, programming or both. During the process of recording tests, insert checkpoints when the responses of the application need to be tested.
3. **Debug The Test:** Run the tests in debug mode to make sure whether they run smoothly.
4. **Run Tests:** Run tests in verify mode to test the application.
5. **View Results:** This determines the success or failures of the test.
6. **Report Defects:** If a particular test run fails due to the defect in the application being tested, defects can be directly reported through the test results window.

**Two types of recording modes :**

- ***Context Sensitive Mode***
- ***Analog Recording Mode***

**Context Sensitive Mode:** Win runner captures and records the GUI objects, windows, keyboards inputs and mouse click activities through context sensitive recording.

**Analog Recording Mode:** It captures and records the keywords inputs, mouse movement. It does not capture the GUI object and windows. GUI map files the stored information, it learns about the GUI objects and windows. A checkpoint enables you to check your application by comparing its expected results of application to actual results.

By default **Win Runner** starts recording ***in context sensitive mode.*** If we want to change it into ***analog mode*** we can follow below navigations.

Click **Start** recording twice or

Create **Menu->record-analog** or

**F2** is the short key to change from *one mode* to *another mode.*

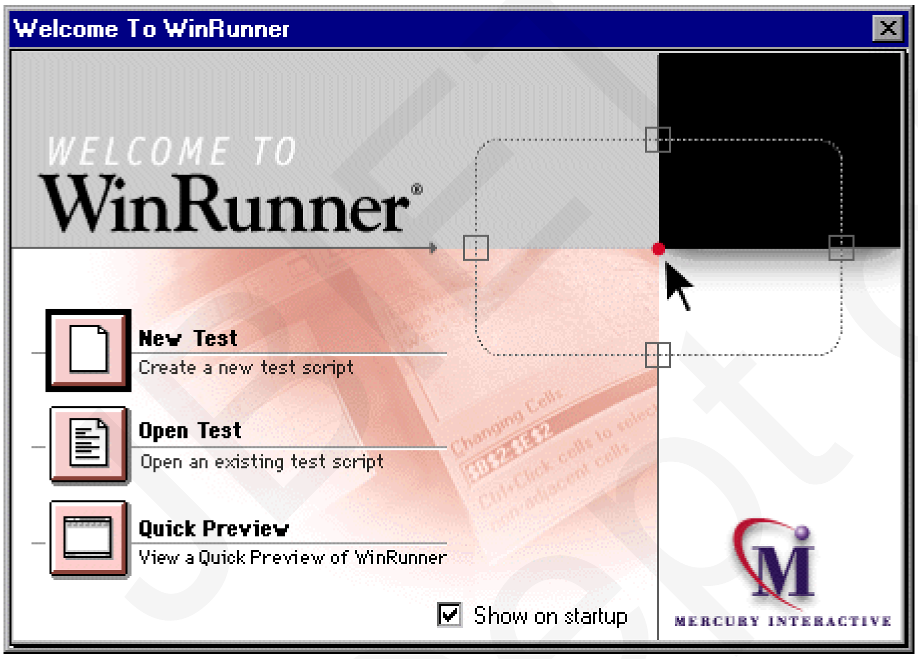
## Exploring the WinRunner Window:

Before you begin creating tests, you should familiarize yourself with the
Win Runner main window.

**To start WinRunner:**

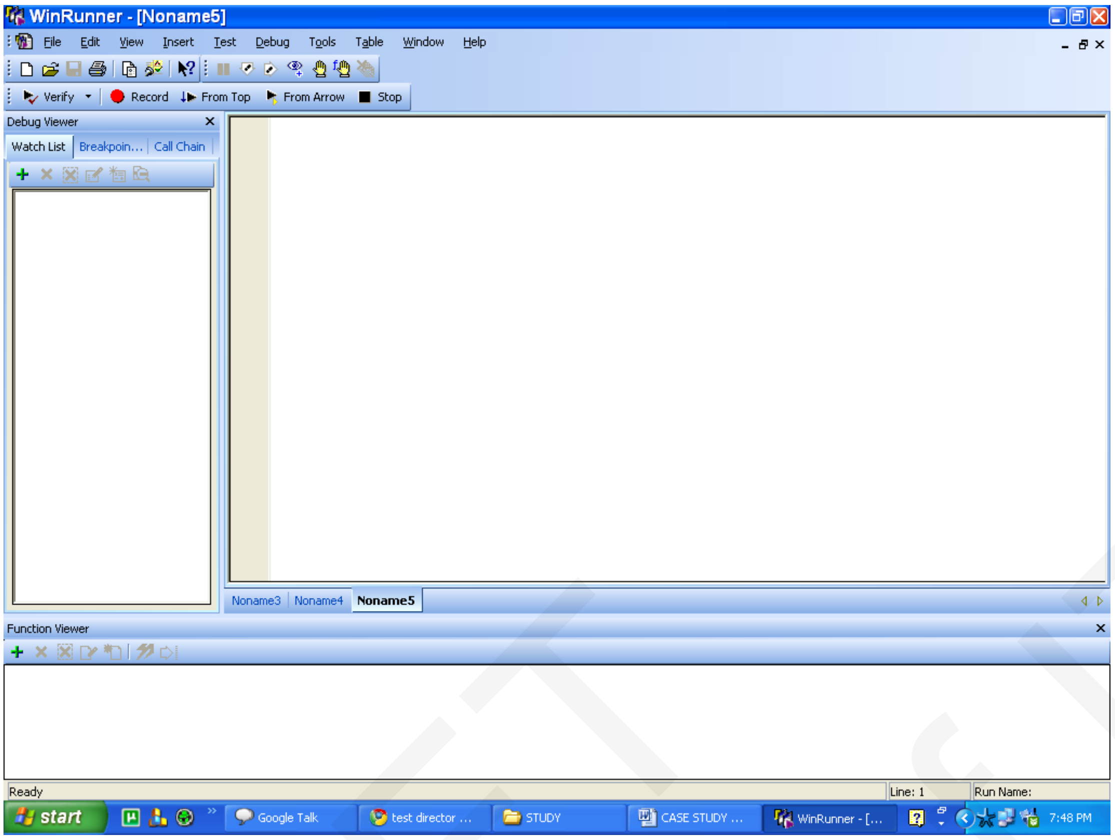
Choose **Programs** > **WinRunner** > **WinRunner** on the **Start** menu.

The first time you start **WinRunner**, the ***Welcome to WinRunner window opens***.
From the welcome window you can create a *new test*, open an *existing test*, or
View an overview of WinRunner in your default browser.



The first time you select one of these options, the **WinRunner** main screen opens
With the **"What's New in WinRunner"** section of the help file on top. If you do not
Want the welcome window to appear the next time you start WinRunner, clear the show on start-up check box.

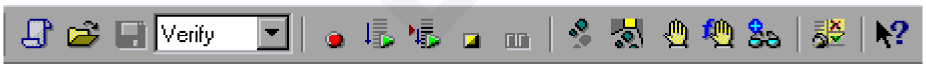
Each test you create or run is displayed by WinRunner in a **test window**. You can open many tests at one time.


WinRunner - [Noname5]
File Edit View Insert Test Debug Tools Table Window Help
Verify Record From Top From Arrow Stop
Debug Viewer
Watch List Breakpoin... Call Chain
Noname3 Noname4 Noname5
Function Viewer
Ready
Line: 1
Run Name:
start Google Talk test director ... STUDY CASE STUDY ... WinRunner - [... 7:48 PM

.

1. The ***Win Runner window*** displays all open tests.
2. Each test appears in its own **test window**. You use this window to **record, program,** and **edit test scripts.**
3. Buttons on the **Standard toolbar** help you quickly open, run, and save tests.
4. The **User toolbar** (right side) provides easy access to test creation tools.
5. The **status bar** (Run Name) displays information about selected commands and the current.

The **Standard toolbar** provides easy access to frequently performed tasks, such as ***opening, executing***, and ***saving tests,*** and ***viewing test results.***



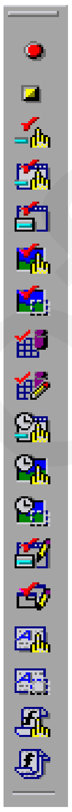
1. New Test
2. Open
3. Save
4. Run mode
5. Context sensitive mode
6. Run from top

7. Stop
8. Pause
9. Step
10. Step into
11. Toggle breakpoint
12. Break in function
13. Add watch
14. Test results
15. Help

The ***User toolbar*** displays the tools you frequently use to create test scripts. By default, the User toolbar is hidden.

To display the User toolbar choose **Window** > **User Toolbar**. When you create Tests, you can minimize the WinRunner window and work exclusively from the Toolbar.

1. Record - Context Sensitive
2. Stop
3. GUI Checkpoint for Single Property
4. GUI Checkpoint for Object/Window
5. GUI Checkpoint for Multiple Objects
6. Bitmap Checkpoint for Object/Window
7. Bitmap Checkpoint for Screen Area
8. Default Database Checkpoint
9. Custom Database Checkpoint
10. Synchronization Point for Object/Window Property
11. Synchronization Point for Object/Window Bitmap
12. Synchronization Point for Screen Area Bitmap
13. Edit GUI Checklist
14. Edit Database Checklist
15. Get Text from Object/Window
16. Get Text from Screen Area
17. Insert Function from object window
18. Insert Function from Function generator



The **User toolbar** is customizable. You choose to **add** or **remove** buttons using the **Settings** > **Customize User Toolbar** menu option. When you re-open Win Runner, the User toolbar appears as it was when you last closed it.

Note that you can also execute many commands using soft keys. Soft keys are Key board shortcuts for carrying out menu commands. You can configure the Soft key combinations for your keyboard using the Soft key Configuration utility in Your WinRunner program group. For more information, see the “WinRunner at a Glance” chapter in your WinRunner User’s Guide.

**How Does Win Runner Identify GUI Objects?**

GUI applications are made up of GUI objects such as **windows, buttons, lists,** and **Menus.** When Win Runner learns the description of a GUI object, it looks at the object's Physical properties. Each GUI object has many ***physical properties*** such as **"Class," "label," "width," "height", "handle," and "enabled"** to name a few. Win Runner, however, only learns the properties that uniquely distinguish an Object from all other objects in the application. For more information regarding Properties, refer to the "Configuring the GUI Map" chapter in the WinRunner User's Guide.

## Choosing a GUI Map Mode:

Before you start teaching Win Runner the GUI of an application, you should
Consider whether you want to organize your **GUI map files** in the ***GUI Map File per Test mode*** or ***the Global GUI Map File mode.***

## The GUI Map File per Test Mode:

In the *GUI Map File per Test mode*, Win Runner automatically creates a **new GUI map file** for every new test you create. WinRunner automatically saves and opens the GUI map file that corresponds to your test.
If you are new to WinRunner or to testing, you may want to consider working in the GUI Map File per Test mode. In this mode, a GUI map file is created automatically every time you create a new test. The GUI map file that corresponds to your test is automatically saved whenever you save your test and automatically loaded whenever you open your test. This is the simplest mode for inexperienced testers and for ensuring that updated GUI Map files are saved and loaded.

### The Global GUI Map File Mode:

In the *Global GUI Map File mode*, you can use a **single GUI map** for a **group of tests.** When you work in the Global GUI Map File mode, you need to save the information that WinRunner learns about the properties into a GUI map file. When you run a test, you must load the appropriate GUI map file. If you are familiar with WinRunner or with testing, it is probably most efficient to work in the Global GUI Map File mode.

By default, **WinRunner** is set to the ***Global GUI Map File mode***.
To change the mode to the GUI Map File per Test mode

**choose Settings > General Options,**

click the Environment tab, and select GUI Map File per Test. Click OK to close the dialog box.

**Note: 1)**If you change the GUI Map File mode, you must restart WinRunner for the changes to take effect.

2)If you choose to work in the *Global GUI Map File* mode, proceed to the section below on **Using the Rapid Test Script Wizard**.

## Using the Rapid Test Script Wizard

If you choose the Global GUI Map File mode, the Rapid Test Script wizard is usually the easiest and quickest way to start the testing process.

**Note:** The **Rapid Test Script Wizard** is not available when you work in **GUI Map File per Test mode.**

The Rapid Test Script Wizard systematically opens the windows in your application and learns the description of every GUI object. The wizard stores this information in a GUI map file. To observe Win Runner’s learning process, use the **Rapid Test Script Wizard** on the **Flight Reservation application.**

**Note**: The Rapid Test Script Wizard is not available when the **Terminal Emulator, the Web Test** or **the Java** add-in is loaded. Therefore, if you are using one or more of these add-ins, skip the remaining sections of this lesson.

**EXAMPLE:**

**FLIGHT RESERVATION APPLICATION:**

1. **Log in to the Flight Reservation application.**

If the Login window is open, type your name in the Agent Name field and mercury in the Password field and click OK. The name you type must be at least four characters long. If the Login window is not already open on your desktop, choose **Programs > WinRunner > Sample Applications > Flight 1A** on the **Start menu** and then **log in**, as described in the previous paragraph.

**2. Start Win Runner.**

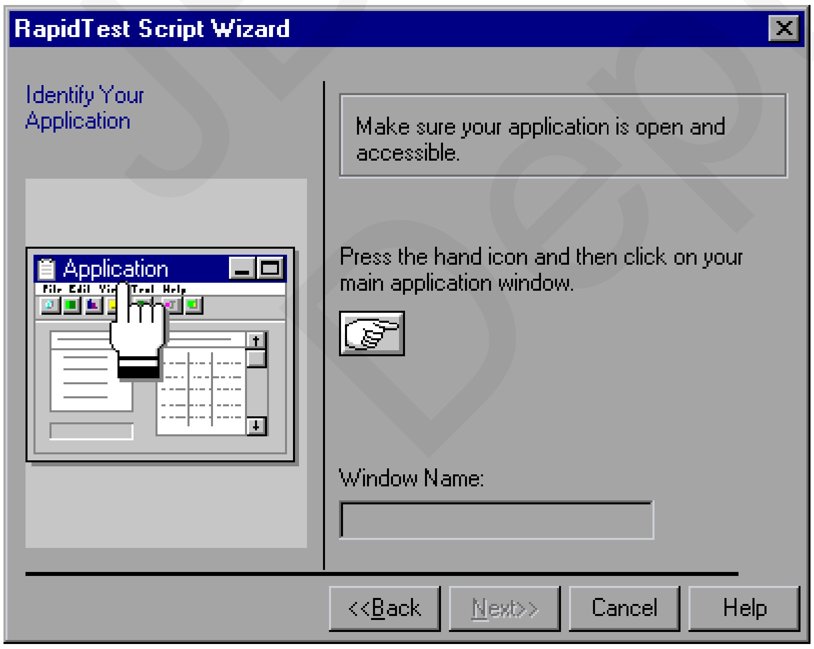
If Win Runner is not already open, choose **Programs > WinRunner > Win Runner** on the **Start menu.**

**3. Open a new test.**

If the Welcome window is open, click the **New Test** button. Otherwise, choose **File > New**. A new test window opens in WinRunner

**4. Start the Rapid Test Script wizard.**

**Choose Create > Rapid Test Script Wizard**. Click Next in the wizard's Welcome Screen to advance to the next screen.


RapidTest Script Wizard

Identify Your Application

Make sure your application is open and accessible.

Press the hand icon and then click on your main application window.

Window Name:

6. **Point to the application you want to test.**

Click the ***hand button*** and then click anywhere in the Flight Reservation application. The application's window name appears in the *wizard's Window Name box.* Click Next

6 .**Make sure that all the check boxes are cleared.**

For the purposes of this exercise, confirm that all the check boxes are cleared.

You will use the wizard only to learn the GUI of the Flight Reservation application. Click Next.

**Note:** A regression test is performed when the tester wishes to see the progress of the testing process by performing identical tests before and after a bug has been fixed. A regression test allows the tester to compare expected test results with the actual results.

7. **Accept the default navigation controls.**

Navigation controls tell WinRunner which GUI objects are used to open windows. The Flight Reservation application uses the default navigation controls (... and > >) so you do not need to define additional controls. Click Next.

8. **Set the learning flow to "Express."**

The *learning flow* determines how WinRunner walks through your application.

Two modes are available: **Express** and **Comprehensiv**e. Comprehensive mode lets you customize how the wizard learns GUI object descriptions. First-time WinRunner users should use Express mode. Click the Learn button. The wizard begins walking through the application, pulling down menus, opening windows, and learning object descriptions. This process takes a few minutes. If a pop-up message notifies you that an interface element is disabled, click the Continue button in the message box. If the wizard cannot close a window, it will ask you to show it how to close the window. Follow the directions on the screen.

9. **Accept "No" in the Start Application screen.**

You can choose to have WinRunner automatically open the Flight Reservation application each time you start WinRunner. Accept the default **"No."** Click Next.

10. **Save the GUI information and a start up script.**

The wizard saves the GUI information in a GUI map file. The wizard also creates a start up script. This script runs automatically each time you start WinRunner. It contains a command which loads the GUI map file so that WinRunner will be ready to test your application. Accept the default paths and file names or define different ones. Make sure that you have write permission for the selected folders. Click Next.

11. **Click OK in the Congratulations screen.**

The information WinRunner learned about the application is stored in a **GUI map file.**

## Running the Test:

You are now ready to run your recorded test script and to analyze the test results. WinRunner provides **three modes** for running tests. You select a mode from the toolbar.

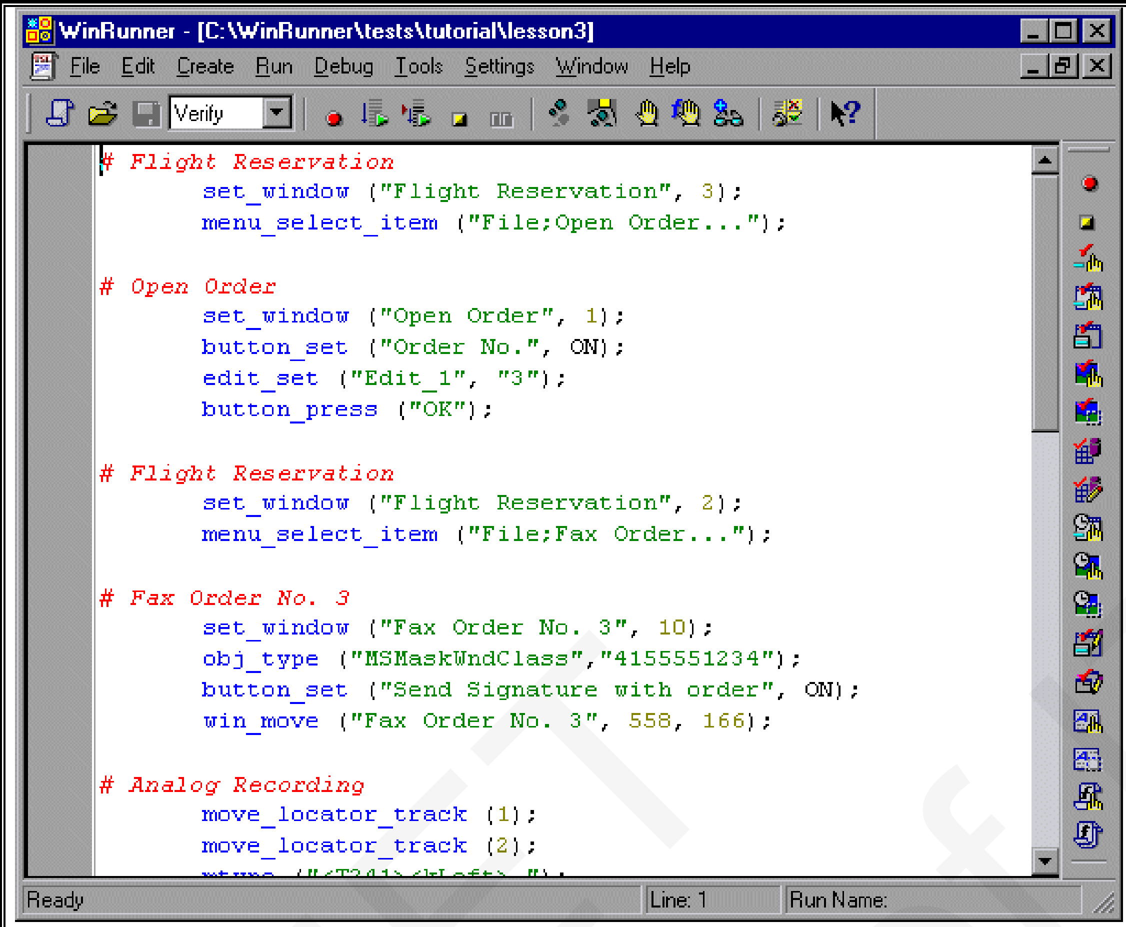
☐Use **Verify mode** when running a test to check the behavior of your application, and when you want to save the test results.

☐Use **Debug mode** when you want to check that the test script runs smoothly without errors in syntax.

☐Use **Update mode** when you want to create new expected results for a GUI checkpoint or bitmap checkpoint.

**To Run the test:**

**1 Check that WinRunner and the main window of the Flight Reservation application are open on your desktop.**


WinRunner - [C:\WinRunner\tests\tutorial\lesson3]
File Edit Create Run Debug Tools Settings Window Help
Verify

```
# Flight Reservation
        set_window ("Flight Reservation", 3);
        menu_select_item ("File;Open Order...");

# Open Order
        set_window ("Open Order", 1);
        button_set ("Order No.", ON);
        edit_set ("Edit_1", "3");
        button_press ("OK");

# Flight Reservation
        set_window ("Flight Reservation", 2);
        menu_select_item ("File;Fax Order...");

# Fax Order No. 3
        set_window ("Fax Order No. 3", 10);
        obj_type ("MSMaskWndClass","4155551234");
        button_set ("Send Signature with order", ON);
        win_move ("Fax Order No. 3", 558, 166);

# Analog Recording
        move_locator_track (1);
        move_locator_track (2);
```

Ready | Line: 1 | Run Name:

**2 Make sure that the *lesson3* test window is active in WinRunner.**

Click the title bar of the *lesson3* test window. If the test is not already open, choose **File > Open** and select the test.

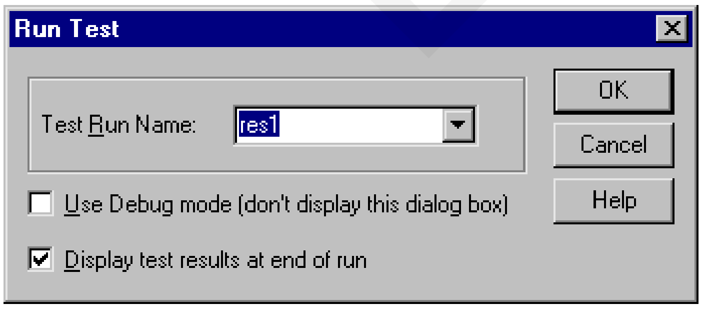
**3 Make sure the main window of the Flight Reservation application is active.**

If any dialog boxes are open, close them.

**4 Make sure that Verify mode is selected in the toolbar.**

**5 Choose Run from Top.**

Choose **Run** > **Run from Top** or click the **Run from Top** button. The **Run Test** dialog box opens



Test Run Name: res1

[ ] Use Debug mode (don't display this dialog box)

[✓] Display test results at end of run

**6 Choose a Test Run name.**

Define the name of the folder in which WinRunner will store the results of the test. Accept the default folder name **"res1."** The results folder will be stored within the test's folder.

Note the **Display Test Results at end of run** check box at the bottom of the dialog box. When this check box is selected, WinRunner automatically displays the test results when the test run is completed. Make sure that this check box is selected.

**7 Run the test.**

Click **OK** in the Run Test dialog box. WinRunner immediately begins running the test.

Watch how WinRunner opens each window in the Flight Reservation application.

**8 Review the test results.**

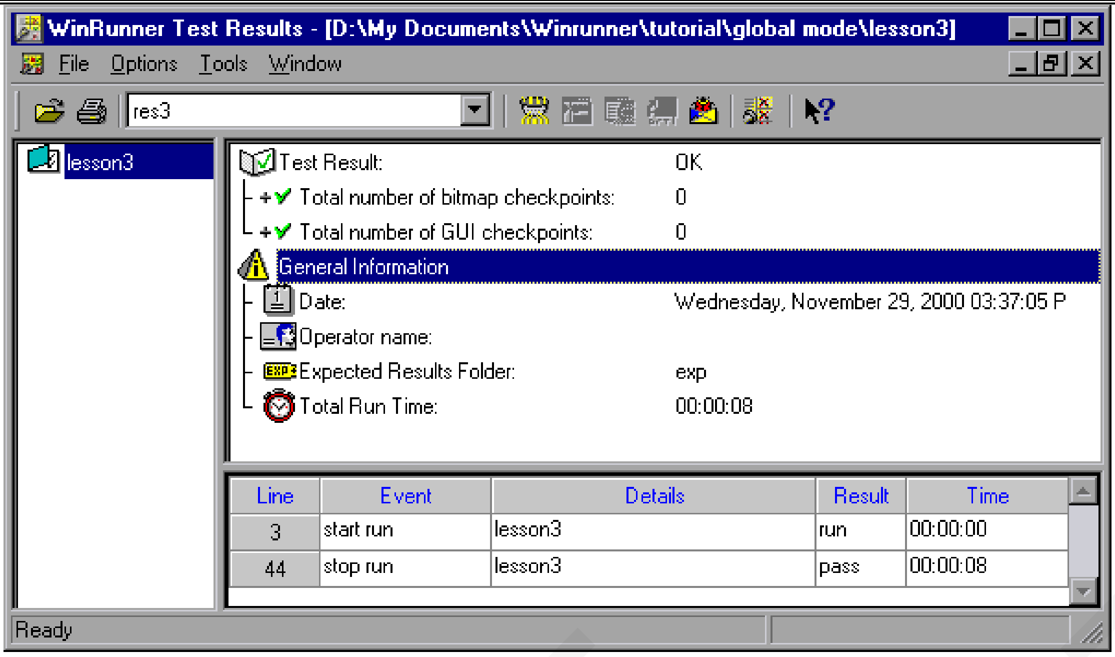
When the test run is completed, the test results automatically appear in the WinRunner Test Results window. See the next section to learn how to analyze the test results.

## Analyzing Test Results:

Once a test run is completed, you can immediately review the test results in the **WinRunner Test Results window.** WinRunner color-codes results (**green** indicates ***passed*** and **red** indicates ***failed***) so that you can quickly draw conclusions about the success or failure of the test.

**1 Make sure that the WinRunner Test Results window is open and displays the test results.**

If the WinRunner Test Results window is not currently open, first click the test window to activate it, and then choose **Tools** > **Test Results** or click the **Test Results** button.


WinRunner Test Results - [D:\My Documents\Winrunner\tutorial\global mode\lesson3]

Test Result: OK
Total number of bitmap checkpoints: 0
Total number of GUI checkpoints: 0
General Information
Date: Wednesday, November 29, 2000 03:37:05 P
Operator name:
Expected Results Folder: exp
Total Run Time: 00:00:08

| Line | Event | Details | Result | Time |
|---|---|---|---|---|
| 3 | start run | lesson3 | run | 00:00:00 |
| 44 | stop run | lesson3 | pass | 00:00:08 |

1. Displays the name of the current test.
2. Shows the current results directory name.
3. Shows whether a test run passed or failed.
4. Includes general information about the test run such as date, operator name, and total run time. To view these details, double click the Information icon.
5. The test log section lists the major events that occurred during the test run. It also lists the test script line at which each event occurred

**2 Review the results.**

**3 Close the Test Results window.**

Choose **File** > **Exit** in the WinRunner Test Results window.

**4 Close the test.**

Choose **File** > **Close**.

**5 Close the Flight Reservation application.**

Choose **File** > **Exit**.