

Connecting to Databases

From Metamorphosis

Preamble

The purpose here is provide some guidance to people who want to connect Metamorphosis lessons to a database. Unfortunately some of the information that is here is necessarily technical in nature and, as a result, you may need advice from your IT specialist or support personnel.

Preamble
Introduction

Local Area Network

Introduction

Metamorphosis allows you to create a lesson that can communicate with a database on your local computer or LAN. When you publish your lesson using the LAN option from the Publish tab, Metamorphosis automatically creates a Microsoft Access database called 'mph.mdb' along with the published files. This database can be renamed and/or moved to a location of your choice. Alternatively you can use an entirely different database as long as the columns in the nominated table in the other database exactly match those in **mph.mdb** in name, number, and data type.

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Notes

The database must reside somewhere the server can find it (spaces in a file path are problematic.)

The database must be given appropriate read/write permissions.

Known Limitations

If the lesson is to be accessed using a URL (eg. <http://MyIntranetServer/MyLesson>) then you must web-publish the lesson instead. LAN publishing cannot work with URLs.

Published lessons may only be viewed with the browser Internet Explorer.

Published lessons may only be viewed on a computer running Microsoft Windows.

Published lessons may only be hosted on a Microsoft Windows LAN.

Microsoft has increased the default security in Internet Explorer 6+ which will prevent the seamless recording of data unless the following changes are made on each end user computer - select 'Internet options' under the 'Tools' menu of Internet Explorer:

1. Enable "Access data sources across domains" in the Local Intranet Security Settings (Custom Level).
2. Select "Automatic logon with current username and password" in the Logon section of User Authentication in the Local Intranet Security Settings (Custom Level).
3. Enable "Access data sources across domains" in the Internet Security Settings (Custom Level).
4. Select "Automatic logon with current username and password" in the Logon section of User Authentication in the Internet Security Settings (Custom Level).

If you don't change the security settings in Internet Explorer (on each user's computer) then they will get warning messages such as: "This website uses a data provider that may be unsafe. If you trust the website, click OK, otherwise click Cancel." and "This website is using your identity to access a data source. If you trust this website, click OK to continue, otherwise click Cancel."

More information on Microsoft security settings for Internet Explorer can be found here <http://technet.microsoft.com/en-us/library/bb457150.aspx#EIAA> .

Data Source Name - DSN

A DSN is single word identifier, such as myDBConnection, that points to the database and contains all the information needed to connect to it. You define a DSN in Windows. A Metamorphosis lesson can make a connection to a database by using a DSN.

Advantages

- A DSN requires no knowledge of the specifics of the database except for (usually) location, user name, and password
- Provides easy to remember data source names
- Can provide a central repository to hold the collection of data sources

Disadvantages

- DSN is often slower than using a connection string (though given the limited amount of database access a Metamorphosis lesson makes this would not be a big issue)
- For a LAN database they may need to be setup on each end user computer

How to Setup a DSN in Windows using the Windows Control Panel

- From the Start Menu, select Settings then Control Panel.
 - Windows 2000: Choose Start \ Settings \ Control Panel \ Administrative Tools \ Data Sources, then click the Drivers tab.

- Windows XP: Choose Start \ Control Panel \ Administrative Tools, then double-click Data Sources (ODBC).
- In the ODBC Data Source Administrator dialog box, click the System DSN tab. The tab displays the list of DSNs currently on your system.
- Click Add to add a new DSN to the list. The Create New Data Source dialog box appears, listing all the drivers currently loaded on your system.
- Select a driver from the list, then click Finish. For example, if your database is a Microsoft Access file, select Microsoft Access Driver (*.mdb). If a driver for your product does not appear in the list, you'll have to download the driver from a vendor's Web site and install it. Remember, you will only be able to create a DSN for a driver that is available on your system.
- In the dialog box that appears, enter a name for the DSN and specify the connection parameters. The dialog boxes for specifying parameters differ depending on the driver you selected. For the Microsoft Access Driver, you enter a name, click Select, locate the database file on the hard disk, and click OK.
- Click OK to close the dialog box. The new DSN is added to your list of system DSNs.

How to Add to Metamorphosis

- Within Metamorphosis select the Settings window.
- Click the Management icon (in the left hand vertical bar).
- Select the 'Lan-based database' tab.
- Make sure that 'Data source name' option is selected.
- Enter the name in the DSN field to exactly match the name used when the DSN was created.
- If the DSN requires a user ID enter it into the UID field. If not, then the UID can be left at the default value Admin
- If the DSN requires a password then enter it into the Pwd field. If not, then leave the field blank.

Note, the default table name is **Table1**. If your database has a different table name then enter the name in the 'Table name' field.

Connection String (DSN-Less Connection)

Description

A connection string specifies everything that the system needs to know to connect to a database.

More technical information on connections strings can be found at this link, <http://www.carlprothman.net/Default.aspx?tabid=81> .

Advantages

- Can connect to a database directly
- No need to register a DSN on a computer
- Often provides faster database access than a DSN.

Disadvantages

- If the database is moved then the connection string needs to be recreated (and the lesson republished).

How to Setup

If you don't know how to write a connection string then this procedure can make it easier for you:

1. Create a new text file on you desktop
2. Rename the extension to from .txt to .udl - click Yes to allow the extension to be changed. If you can't see the extension then they can be turned on by:
 - Opening Windows Explorer
 - Selecting Folder options... from the Tools menu
 - Selecting the View tab
 - Unselecting the check box to the option 'Hide extensions for known file types
 - Clicking OK.
3. Double-click the file to open it
4. Under the Provider tab select Microsoft Jet 4.0 OLE DB Provider
5. Under Connection tab, at point 1, browse for your database
6. Set the username and password, if any. If none, leave the user name as Admin and check the 'Blank password' checkbox.
7. Do not check the 'Allow saving password' checkbox
8. Click Test Connection to test the connection to the database. If everything is ok, continue with the next step. If not, correct any errors and test again.
9. Click OK to close the file
10. Open the file with Notepad
11. Note that the 3rd line is the connection string you're after.

How to Add to Metamorphosis

Paste the appropriate parts of the connection string into the fields in Metamorphosis / Settings / LAN-based database / Connection string - OLE DB Providers.

For example, if the full string was

```
Provider=Microsoft.Jet.OLEDB.4.0;Data Source=E:\Database\mph.mdb;Persist Security Info=False;
```

then paste:

```
Provider=Microsoft.Jet.OLEDB.4.0;
```

into the Provider field,

```
Data Source=E:\\Database\\mph.mdb;
```

into the Data source field, (note you must convert any backslashes to double backslashes or to a forward slash)

Persist Security Info=False;

into the Sundry field.

Note, the default table name is **Table1**. If your database has a different table name then enter the name in the 'Table name' field.

Web Server

Introduction

A web server is software that accepts HTTP requests (for instance, a URL) from a web browser (such as Internet Explorer) and provides a response such as a HTML file, an image or some other document type.

Using a web server with Metamorphosis published content usually means that there'll be little or no security concerns at the end users computer (unlike the LAN-based version.) However do not put your database in a folder that the web server read permissions enabled (as any casual web browser will be able to download the database file if the file name is known).

To allow Metamorphosis published content to communicate with a database a scripting language needs to be installed with the web server. Of the server-side scripting languages available Metamorphosis supports two of the most common: Active Server Pages (ASP) and PHP. Its important, then, to know which your server supports.

Note that while within Metamorphosis you can give a course a name that includes single quotes ('), double quotes ("), and backslashes (\) those characters are not acceptable for use within the database. The course name that will be used if the course name given within Metamorphosis with the unacceptable characters stripped. This means that if you are manually populating the database and the course name is **John's First Course** then within the database you must enter it as **Johns First Course**.

ASP

ASP is Microsoft's web server-side scripting engine (also called an application server) for dynamically-generated web pages. Metamorphosis can use ASP to communicate with a database.

Metamorphosis uses ASP version 3.0 - this was released with Microsoft's Internet Information Services (IIS) version 5.0.

Metamorphosis uses "classic" ASP and not ASP.NET. "Classic" ASP is supported by IIS but with more recent versions of IIS is not enabled by default. You will need to enable it.

To learn more about ASP, visit the Microsoft website
<http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnanchor/html/activeservpages.asp>.

Important: you will need to mark the folder containing your lesson, created with Metamorphosis version 2 and below, as an 'application' using Internet Information Services (IIS MMC). Projects published from Metamorphosis 3 and above do **not** need to have the containing folder marked as an 'application'.

Data Source Name - DSN

Description

You can use a DSN defined on a remote computer to create database connections. If you want to use a remote DSN, the DSN must be defined on the Windows computer running your application server (probably IIS).

Note: Because you can only specify an ODBC driver in a DSN, you must use a connection string if you want to use an OLE DB provider.

With the IIS web server, it is often recommended that you use the native Jet OLE DB Provider (a connection string) in place of the Microsoft Access ODBC driver (a DSN).

How to Setup

For instructions on defining a DSN on the remote system running your application server see the following articles on the Microsoft website:

- If the remote computer runs Windows 2000, see Microsoft Knowledge Base Article 300596 <http://support.microsoft.com/default.aspx?scid=kb;en-us;300596>.
- If the remote computer runs Windows XP, see Microsoft Knowledge Base Article 305599 <http://support.microsoft.com/default.aspx?scid=kb;en-us;305599>.

How to Add to Metamorphosis

Paste the appropriate parts of the connection string into the fields in Metamorphosis / Settings / Web-based database / ASP / Data source name.

- Enter the name in the DSN field to exactly match the name used when the DSN was created.
- If the DSN requires a user ID enter it into the UID field. If not, then the UID can be left at the default value Admin.
- If the DSN requires a password then enter it into the Pwd field. If not, then leave the field blank.

Note, the default table name is 'Table1'. If your database has a different table name then enter the name in the 'Table name' field.

Connection String

Description

When your web application connects to a database or a data file you use a provider (a way of connecting) to make the connection. The connection string contains the information that the provider needs to know to establish the connection to the database.

Because there are different providers and each provider has multiple ways to make a connection there are many different ways to write a connection string.

For example, the provider needs the address (the path) of the server. This is often named "Data Source" or "Server". The value specified for this in the connection string is passed to the provider for the provider to know where to connect.

- A connection string consists of a series of keyword - value pairs separated by semicolons (;)
- The equal sign (=) connects each keyword and its value
- Example: Keyword1=Value1;Keyword2=Value2;Keyword3=Value3;
- The information in the connection string is passed on to the provider

Here are the basic rules for connection strings adopted by most providers:

- All blank characters, except those placed within a value or within quotation marks, are ignored
- Blank characters affect the connection pooling mechanism, pooled connections must have exactly the same connection string
- If a semicolon (;) is part of a value it must be delimited by quotation marks (")
- Use a single-quote (') if the value begins with a double-quote (")
- Use a double quote (") if the value begins with a single quote (')
- No escape sequences are supported
- The value type is irrelevant
- Names are case insensitive
- If a KEYWORD=VALUE pair occurs more than once in the connection string, the value associated with the last occurrence is used
- If the PROVIDER keyword occurs multiple times in the string, the first occurrence is used.
- If a keyword contains an equal sign (=), it must be preceded by an additional equal sign to indicate that it is part of the keyword.

Two links that provide more information on connections strings are

<http://www.connectionstrings.com/default.aspx> and
<http://www.carlprothman.net/Default.aspx?tabid=81> .

How to Setup

It's been recommended to use the OLE DB providers: Microsoft.Jet.OLEDB.4.0 and SQLOLEDB. Microsoft.Jet.OLEDB.4.0 is for use with Microsoft Access and SQLOLEDB is for use with Microsoft SQL Server.

- Microsoft.Jet.OLEDB.4.0

This is the OLE DB provider for Access. To connect to an Access database using this provider, the only other attribute required to make a connection is the Data Source

attribute which is used to specify the full path and file name of the Access .mdb file. A minimal OLE DB Provider for Jet connection string would therefore look something like this:

```
Provider=Microsoft.Jet.OLEDB.4.0; Data Source=C:\path\filename.mdb;
```

The only other commonly used parameters are User ID and Password which are used to specify user authentication values. A user name of "admin" and a blank password are the defaults we tend to use resulting in the following default connection string:

```
Provider=Microsoft.Jet.OLEDB.4.0; Data Source=C:\path\filename.mdb; User ID=admin; Password=;
```

- **SQLOLEDB**

The OLE DB provider for MS SQL Server is more complex. The Data Source parameter is once again used, but this time it specifies the name or address of the SQL Server. Because SQL Server can run multiple databases and we haven't yet picked one we need another parameter to indicate the database we want to use. This parameter is called Initial Catalog. That combined with the same parameters as above for User ID and Password results in this basic form:

```
Provider=SQLOLEDB; Data Source=server_name_or_address; Initial Catalog=database_name; User ID=username; Password=password;
```

To connect to an SQL Server named instance include the instance name when specifying the name or address of the SQL Server you're connecting to.

For example, if you're using the OLE DB provider for MS SQL Server, instead of (the connection string listed above):

```
Provider=SQLOLEDB; Data Source=server_name_or_address; Initial Catalog=database_name; User ID=username; Password=password;
```

you would need to use:

```
Provider=SQLOLEDB; Data Source=server_name_or_address\instance_name; Initial Catalog=database_name; User ID=username; Password=password;
```

- **Oracle**

It seems that the Oracle Provider for OLE DB works more consistently for (some) users with Oracle 10g than the Microsoft OLE DB Provider for Oracle.

Here's an example Oracle connection string using standard security.

```
Provider=OraOLEDB.Oracle.1;Password=mxpi671;User ID=admin;Data Source=metam;
```

How to Add to Metamorphosis

Paste the appropriate parts of the connection string into the fields in Metamorphosis / Settings / Web-based database / ASP / Connection string - OLE DB Providers.

For example, if the full string was

```
Provider=Microsoft.Jet.OLEDB.4.0;Data Source=E:\Database\mph.mdb;User ID=admin; Password=;
```

then paste:

Provider=Microsoft.Jet.OLEDB.4.0;

into the Provider field,

Data Source=E:\\Database\\mph.mdb;

into the Data source field, (note you must convert any backslashes to double backslashes or to a forward slash)

User ID=admin; Password=;

into the Sundry field.

Note, the default table name is 'Table1'. If your database has a different table name then enter the name in the 'Table name' field.

PHP

PHP is a web server-side scripting language (also called an application server) for dynamically-generated web pages. Metamorphosis can use PHP to communicate with a database.

Metamorphosis uses PHP version 5.0 but may work correctly with version 4.0.

Metamorphosis uses the PHP ADOdb Database Abstraction library to allow connection to a variety of databases. For further information on the library click this link <http://adodb.sourceforge.net/>.

To learn more about PHP visit <http://www.php.net/>.

'Four' Parameters

Description

Server (or host)

The host computer on which the database resides. Often the database is on the same computer as the web server and therefore the value is localhost.

Database

The name of the database to connect to.

The 'Persistent' checkbox refers to whether or not to make persistent connections to the database. The advantage of persistent connections is that they are faster, as the database connection is never closed. Non-persistent connections take up much fewer resources though, reducing the risk of your database and your web server becoming overloaded. We

recommend non-persistence unless you are sure of your database and web server suitability for persistence.

User ID

The user ID, if any, required to access the database.

Password

The password, if any, required to access the database.

Note, the default table name is 'Table1'. If your database has a different table name then enter the name in the 'Table name' field.

Example

Here is an example of the four parameters used to connect to a mySQL database:

- your_mysqlserver.secureserver.net (is the server or host name)
- your_dbname (is the database name)
- your_dbusername (is the database user ID)
- your_dbpassword (is the database password)

Connection String

Description

If your server is a Microsoft Windows server such as IIS then you may create a connection string for your lesson to use.

As it is, if you are using a Microsoft Windows server we still recommend using the 'Four' parameters method as it uses the ADOdb library which is relatively fast, robust and reliable.

How to Add to Metamorphosis

- Within Metamorphosis go to Settings/Management
- Select the Web-based database tab
- Select the server technology PHP
- Select Connection string (Windows web servers only)
- Enter the connection string in the field provided.

Note, the default table name is 'Table1'. If your database has a different table name then enter the name in the 'Table name' field.

Mph.DB

1. The database that Metamorphosis connect to consists of two separate table. A "main" table that stores user details, progress, and any scoring. The other table is a "support" table whose purpose is to store responses from any free form text entry questions.
2. If you create your own database you need to make sure that the data types for each of the required fields, as listed in the tables below, are matched in your database. Data types for MS Access and their equivalents in Microsoft SQL, and mySQL are shown.
3. Whenever you publish a LAN-based or Web-based database lesson from Metamorphosis a copy of mph.db will be created along with your published lesson.
4. This is a description of the fields in the "main" table (the table's default name is **Table1**):

Field Name	Data Type MS Access	Data Type MS SQL	Data Type mySQL	Description
KeyNum	AutoNumber	[not used]	[not used]	A primary key
Name	Text (field size 100) Default: ("")	VARCHAR(100) NULL Default: ('')	varchar(100) Default: ''	The name of the user
ID	Text (field size 100) Default: ("")	VARCHAR(100) NULL Default: ('')	varchar(100) Default: ''	Any 'word' the user may have to identify themselves
UserPwd	Text (field size 100) Default: ("")	VARCHAR(100) NULL Default: ('')	varchar(100) Default: ''	A password the user needs to access the lesson
CourseCode	Text (field size 200) Default: ("")	VARCHAR(200) NULL Default: ('')	varchar(200) Default: ''	A code to identify the lesson
CourseName	Text (field size 200) Default: ("")	VARCHAR(200) NULL Default: ('')	varchar(200) Default: ''	The name/title of this lesson
Progress	Text (field size 200) Default: ("")	VARCHAR(200) NULL Default: ('')	varchar(20) Default: ''	What topics have been started and/or completed
Score	Number (long integer) Default: 0	INT(3) NULL Default: ((0))	int(3) Default: '0'	An assessment score as a percentage
CourseDay	Number (long integer)	INT(2) NULL	int(2)	Day the lesson was last accessed

	Default: 0	Default: ((0))	Default: '0'	
CourseMonth	Number (long integer) Default: 0	INT(2) NULL Default: ((0))	int(2) Default: '0'	Month the lesson was last accessed
CourseYear	Number (long integer) Default: 0	INT(4) NULL Default: ((0))	int(4) Default: '0'	Year the lesson was last accessed
CourseLimit	Number (long integer) Default: 0	INT(3) NOT NULL Default: ((0))	int(3) Default: '0'	The number of permitted assessment attempts
CourseNotes	Memo Default: "{}"	TEXT NULL Default: ({}")	mediumtext (1)	User notes for the lesson

5. Note some users have, for MS SQL, prefer to use NVARCHAR in place of VARCHAR and NTEXT in place of TEXT.
6. (1) When manually adding users to a mySQL database set the value for CourseNotes to {}.
7. This is a description of the fields in the "support" table (the table's default name is **Table2**):

Field Name	Data Type MS Access	Data Type MS SQL	Data Type mySQL	Description
KeyNum	AutoNumber	[not used]	[not used]	A primary key
Name	Text (field size 100) Default: ""	VARCHAR(100) Default: (')	varchar(100) Default: ' '	The name of the user
ID	Text (field size 100) Default: ""	VARCHAR(100) Default: (')	varchar(100) Default: ' '	Any 'word' the user may have to identify themselves
UserPwd	Text (field size 100) Default: ""	VARCHAR(100) Default: (')	varchar(100) Default: ' '	A password the user needs to access the lesson
CourseCode	Text (field size 200)	VARCHAR(200) Default: (')	varchar(200) Default: ' '	A code to identify the lesson

	Default: ""			
CourseName	Text (field size 200) Default: ""	VARCHAR(200) Default: (')	varchar(200) Default: ' '	The name/title of this lesson
Responses	Memo Default: ""	TEXT NULL Default: (')	mediumtext	Free form text entry responses

8.

Sample MS SQL Server SQL

9. The following is a sample SQL dump from MS SQL Server that could be used to create the tables within an MS SQL Server database (note that the sample has the default table names of "table1" and "table2"):
10. IF NOT EXISTS (SELECT * FROM sys.database_principals WHERE name = N'NT AUTHORITY\IUSR') CREATE USER [NT AUTHORITY\IUSR] FOR LOGIN [NT AUTHORITY\IUSR] GO SET ANSI_NULLS ON GO SET QUOTED_IDENTIFIER ON GO IF NOT EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].[Table1]') AND type in (N'U')) BEGIN CREATE TABLE [dbo].[Table1](
11. [Name] [varchar](100) NULL,
12. [ID] [varchar](100) NULL,
13. [UserPwd] [varchar](100) NULL,
14. [CourseCode] [varchar](200) NULL,
15. [CourseName] [varchar](200) NULL,
16. [Progress] [varchar](200) NULL,
17. [Score] [int] NULL,
18. [CourseDay] [int] NULL,
19. [CourseMonth] [int] NULL,
20. [CourseYear] [int] NULL,
21. [CourseLimit] [int] NOT NULL CONSTRAINT [DF_Table1_CourseLimit] DEFAULT ((0)),
22. [CourseNotes] [text] NULL
23.) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY] END GO SET ANSI_NULLS ON GO SET QUOTED_IDENTIFIER ON GO IF NOT EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].[Table2]') AND type in (N'U')) BEGIN CREATE TABLE [dbo].[Table2](
24. [Name] [varchar](100) NULL,
25. [ID] [varchar](100) NULL,
26. [UserPwd] [varchar](100) NULL,
27. [CourseCode] [varchar](200) NULL,
28. [CourseName] [varchar](200) NULL,
29. [Responses] [text] NULL
30.) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY] END
31. Click here to download this MS SQL dump
http://www.apixel.com/tools/mph_mssql.zip .

32.

Sample MySQL SQL

33. The following is a sample SQL dump from a MySQL database that could be used to create the database within MySQL (note that the sample has the default table names of "table1" and "table2", and the database name "mph"):

34. /*!40101 SET NAMES utf8 */;

35. /*!40101 SET SQL_MODE=*/;

36. /*!40014 SET

 @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS,

 FOREIGN_KEY_CHECKS=0 */; /*!40101 SET

 @OLD_SQL_MODE=@@SQL_MODE,

 SQL_MODE='NO_AUTO_VALUE_ON_ZERO' */;

37. CREATE DATABASE /*!32312 IF NOT EXISTS*/ `mph` /*!40100 DEFAULT CHARACTER SET latin1 */;

38. USE `mph`;

39. /*Table structure for table `table1` */

40. DROP TABLE IF EXISTS `table1`;

41. CREATE TABLE `table1` (

42. `Name` varchar(100) default NULL,

43. `ID` varchar(100) default NULL,

44. `UserPwd` varchar(100) default NULL,

45. `CourseCode` varchar(200) default NULL,

46. `CourseName` varchar(200) default NULL,

47. `Progress` varchar(200) default NULL,

48. `Score` int(3) default NULL,

49. `CourseDay` int(2) default NULL,

50. `CourseMonth` int(2) default NULL,

51. `CourseYear` int(4) default NULL,

52. `CourseLimit` int(3) default '0',

53. `CourseNotes` mediumtext

54.) ENGINE=MyISAM DEFAULT CHARSET=latin1;

55. /*Table structure for table `table2` */

56. DROP TABLE IF EXISTS `table2`;

57. CREATE TABLE `table2` (

58. `Name` varchar(100) default NULL,

59. `ID` varchar(100) default NULL,

60. `UserPwd` varchar(100) default NULL,

61. `CourseCode` varchar(200) default NULL,

62. `CourseName` varchar(200) default NULL,

63. `Responses` mediumtext

64.) ENGINE=MyISAM DEFAULT CHARSET=latin1;

65. /*!40101 SET SQL_MODE=@OLD_SQL_MODE */; /*!40014 SET

 FOREIGN_KEY_CHECKS=@OLD_FOREIGN_KEY_CHECKS */;

66. Click here to download this SQL dump http://www.apixel.com/tools/mph_mysql.zip .

Populating the Database

This section is about getting user sign in information (credentials) into the database.

Populating

A Metamorphosis lesson cannot automatically populate the database with user credentials unless the lesson has been set to allow self registration. You will need to do this manually (or to develop a your own page(s) appropriate to the task).

First, within Metamorphosis make these settings to your lesson:

1. Settings > General > Course Name

Set a course name for your project.

2. Settings > General > Course Code

Set a course code for your project.

3. Settings > Management > Record data

Allow the recording of data - check the box.

4. Settings > Management > Sign in

Allow for a sign in - check the box.

5. Settings > Management > Sign in > Name

Settings > Management > Sign in > ID

Settings > Management > Sign in > Password

Decide which credentials a user is required to enter - check the appropriate boxes.

Then open the database (you may need to download the database to open it: uploading when you've finished) and enter appropriate values for each user that is required to sign in to the course.

In the table **Table1** enter (if a user credential is not required, see point 5 above, leave the field blank):

- The user's name in the Name field
- The user's ID in the ID field
- The user's password in the UserPwd field
- The course code in the CourseCode field
- The course name in the CourseName field
- 0 in the CourseLimit field

Leave all the other fields "blank".

Note that more than one lesson can use the same database but the course names and codes must be unique, relative to each lesson.

Self Registration

If, in addition to the settings in the Populate section above, you also check the box Settings > Management > Sign in > User may self register then user credentials, and any subsequent data, will automatically populate the database.

The "danger" with self registration is that a user may populate the database multiple times using different credentials.

Note that more than one lesson can use the same database but the course names and codes must be unique, relative to each lesson.

Hosting Your Lesson on the Web

When choosing when and how to host your lesson, you will need to decide whether to deploy your lesson from a new or existing web site.

If you plan to develop a new web site you need to determine who will be responsible for designing, developing, and setting up the site, as well as providing ongoing maintenance and support. You will also need to select a web server. When choosing a web server, you need to check the compatibility of the server software and operating system, with any database software and middleware that you plan to use to track your lessons.

If you plan to deploy your lessons on an existing site, you'll need to determine if that site is suitable for your lesson. Focus on questions of security, compatibility, performance, and administration:

- What kind of access and administrative privileges will you have?
- Is the software environment compatible with your system requirements?
- Will the existing server and infrastructure support the additional workload and traffic your lesson will generate?

Finally, just as when you develop a new site, you must determine who will add content to your site and perform ongoing support and maintenance.

Web performance considerations

There are a number of points to consider when estimating the performance demands your lessons will place on a web server.

In web jargon, a web server "hit" is a request a server receives from a browser. Every time a user browsing the web visits a new HTML page or makes other requests for data, a "hit" is made on the server.

The number of "hits" a web server handles affects its performance. The size of your user population and the number of lessons you offer drive the number of hits. While the overall

number of hits is important, the most critical factor affecting server performance is the number of simultaneous hits.

For example, if you have 500 users who all decide to take the same lesson at noon on Monday, you may have a performance problem. However, if you have 1,000 users but only 10 of them are taking lessons at any one time, then there may be no problem at all.

Your lesson's actual performance will depend on the number of simultaneous hits you lesson receives as well as many other factors. Among those are the processing power of your server, the size of you lesson content files, the bandwidth of your users' connections, and the speed and quality of your server's connections.

If your user population is large and frequently accesses your online lessons, you may need two or more servers. In the end, calculating server and network capacity is a difficult task and is really a job for an expert.

Web Hosting

You may decide to host your lesson on a server that is internal to your organisation or an external hosting service. If you are hosting on an internal server it is especially important that all databases and files are backed up regularly. Most web masters and network administrators should be using standard security measures such as regular backups and using a firewall.

If you have decided to develop an online lesson but you have neither the time nor the expertise to tackle the task of setting up a server in-house your best option may be to use an external commercial hosting service.

Commercial hosting services have been around for many years now. These services sell space for a web site on a shared server or a server that is dedicated to your site. The management, security and backup of the web site are administered by the hosting service.

Hosting services vary in the features they offer. When choosing a hosting service, make sure that they provide the specific features you need for your lessons. Compare the following important service capabilities:

- Software compatibilities
- Ancillary services
- Service plans
- Performance
- Support

Software compatibility is important because the database software you plan to use may only run on selected web servers. Ancillary services can include email services. If you are using a database for data tracking you will need to find a service that can either host or supply the appropriate database software and any middleware you are using for data tracking.

Web hosting services offer a variety of service plans with different allocations for disk storage space, the amount of data that may be transferred in a month, and the number of

email boxes provided. A dedicated server allows you to manage the server remotely, install any software you want, and maintain complete control over the site content.

Your lesson's actual performance will depend on the number of simultaneous hits your lesson receives as well as many other factors. Among these are the processing power of your server, the size of your lesson content files, the bandwidth or your users' connections, and the speed and quality of your server's connection to the internet, intranet or network.

Finally, consider the quality of the technical support the hosting service provides. Evaluate their ability to backup your site and recover it in the event of a crash, or to keep it running in the event of a power outage.

Testing Your Lessons

The most important thing to know about testing your lesson is that you can't do it too early or too often. You should test individual lessons as you create them. Remember that you will need several iterations of the test, fix and test again cycle before your completed lesson is ready to go.

Many problem come down to missing files or components or improperly set permissions.

Trouble Shooting

When you have a problem with no obvious solution, remember to check the FAQ web page and the user guide.

Why can't I access a database on a web server?

The most common reason is because the database has not been given anonymous access. Under IIS you need to set access permissions for the (the Internet Guest Account) IUSR_Machine (where 'Machine' is the name of the server on which IIS is running) account for the database.

Check or change the database file permissions (Windows XP):

1. Make sure that you have administrator privileges on the computer.
2. In Windows Explorer, locate the database file or the folder containing the database, right-click the file or folder, and select Properties.
3. Select the Security tab.

Note: This step applies only if you have an NTFS file system. If you have an FAT file system, the dialog box won't have a Security tab.

4. If the IUSR_Machine account is not listed in the Group or User Names list, click the Add button to add it.
5. In the Select Users or Groups dialog box, click Advanced.

The dialog box changes to show more options.

6. Click Locations and select the computer's name.
7. Click Find Now to display a list of account names associated with the computer.
8. Select the IUSR_Machine account and click OK; then click OK again to clear the dialog box.
9. To assign the IUSR account full permissions, select Full Control and click OK.

Setting IIS Web Server Permissions

Web server permissions apply to all users accessing a web site. NTFS permissions apply only to a specific user or group of users with a valid Windows account. NTFS controls access to physical directories on the server, whereas web permissions control access to the virtual directories comprising the web site.

Web access permissions use the Windows account IUSR_MACHINE. When users access a site using anonymous authentication, they use this account. By default, IUSR_computername is given the "Guest" group's NTFS permissions by IIS for the actual folders that comprise the web site. These permissions can, however, be changed for any folder or file in a site. For example, web server permissions can be used to control whether users visiting a web site are allowed to view a particular page, upload information, or run scripts and executables on the site. NTFS permissions can be applied to prevent ordinary users from accessing private files and directories.

Note: Disabling web server permissions in IIS, such as disabling the Read permission, restricts all users from viewing a file, regardless of the NTFS permissions applied to those users' accounts. Enabling Read permission in IIS will allow all users to view that file, unless NTFS permissions that restrict access have been applied. If both web server and NTFS permission are set, the permissions that explicitly deny access take precedence over permissions that grant access. If web permissions and NTFS permissions differ for a directory or file, the more restrictive settings are used.

With Vista there are two accounts to which you need to add and give appropriate permissions to: IUSR and IIS_IUSR.

1. In the Internet Service Manager (Windows NT) or Internet Services Manager (Windows 2000), right-click on a web site, virtual directory or file, and select Properties.
2. On the Home Directory, Virtual Directory, or File property sheet, select or clear any of the following check boxes (if available):
 - Read (selected by default) Users can view directory or file content and properties.
 - Write Users can change directory or file content and properties.
 - Script Source Access Users can access source files. If Read is selected, then source can be read, if Write is selected, then source can be written to. Script

Source Access includes the source code for scripts, such as the scripts in an ASP application. This option is not available if neither Read nor Write is selected.

- Directory browsing Users can view file lists and collections.
 - Log visits A log entry is created for each visit to the Web site.
 - Index this resource Allows Indexing Service to index this resource. This allows searches to be performed on the resource.
3. Under Execute Permissions select the appropriate level of script execution:
- None Do not run scripts, such as ASP applications, or executables on the server. ASP pages will not work if this permission is set to None.
 - Scripts only Run only scripts, such as ASP applications, on the server. This is the recommended setting for ASP web applications.
 - Scripts and Executables Run both scripts, such as ASP applications, and executables on the server.
4. Click OK.

Common Microsoft Error Messages

1. 80004005 - Data source name not found and no default driver specified

This error occurs when you attempt to view a dynamic page in a browser. The error message may vary depending on your database and web server.

The page can't find the database. If using a connection string, make sure the path you entered is correct. If using a DSN, make sure a DSN has been created on both the web server and on the local machine.

If using a DSN, the DSN might have been set up as a user DSN, not as a system DSN. Delete the user DSN and create a system DSN to replace it. If you don't delete the user DSN, the duplicate DSN names produce a new ODBC error.

If you use Microsoft Access, the database file (.mdb) might be locked. The lock might be due to a DSN with a different name accessing the database. In Windows Explorer, search for the lock file (.ldb) in the folder containing the database file (.mdb) and delete the .ldb file. If another DSN is pointing to the same database file, delete the DSN to prevent the error in the future. Reboot the computer after making any changes.

2. 80004005 - Operation must use an updateable query

This error occurs when a lesson tries to update data in a database. Here are possible causes and solutions:

- The permissions set on the folder containing the database are too restrictive. IUSR privileges must be set to read/write.
- The permissions on the database file itself does not have full read/write privileges in effect.
- The database might be located outside the Inetpub/wwwroot directory. Though you can view and search the data, you might not be able to update it unless the database is located in the wwwroot directory.

Its also explained by Microsoft here <http://support.microsoft.com/kb/175168> .

3. 80004005 - Could not find installable ISAM

One of a number of things may cause this error:

- The path of the ISAM driver in your Windows Registry is not valid, or the ISAM driver does not exist. In which case MDAC needs to be reinstalled on the server.
- Or, more likely, the web server does not have support for the database vendor (eg. MS Access) you are using installed/activated.
- Or, most likely, the error occurs because the connection string, used to connect to the database, is syntactically incorrect. Verify that the connection string is indeed correct. This is usually the case when the connection string has a parameter that is not recognised. For example:

Provider=Microsoft.Jet.OLEDB.4.0;DataSource=E:\\mph.mdb;

It looks correct but "DataSource" is wrong. It should have a space i.e. "Data Source".

4. [When trying to sign in or self-register with a web-database published course I get the error, "The field is too small to accept the amount of data you attempted to add. Try inserting or pasting less data."](#) This happens even if I insert just 1 character. How do I resolve this?

Disclaimer

Introduction

If you are not using an Learning Management System (LMS) and you want to provide at least some tracking of users then you'll need a database in which to store information. This is not to be considered a substitute for (or a surrogate) LMS. Connecting a Metamorphosis lesson to a database will not provide the level or granularity, reporting or control that's close to what the typical LMS provides.

For even simpler tracking you could consider using the Metamorphosis / Settings / Management / Enable emailing of notifications option to email results from a standalone project.

Connecting a Metamorphosis lesson to a database is creating what is often referred to as an application (or a web application if the lesson is hosted on a web server).

A web application needs the following software:

- A web server

An application server that works with your web server

Note: In the context of web applications, the terms web server and application server refer to software, not hardware.

To use a database with your application, you require the following additional software:

- A database system
- A database driver that supports your database

Web hosting companies often offer plans that let you use their software to test and deploy web applications.

To use a database with a web application, the web application must be able to connect to it.

To connect a Metamorphosis lesson to a database you have two options, depending on where or how your lessons will be accessed:

1. If the lesson(s) and the database will reside on a local area network then you may use the LAN-based option.
2. If the lesson(s) and the database will reside on a web server then you may use the Web-based option.

Important Notes

For each user there will be one record per course the user is "enrolled" in. The database will recognise the record based on a combination of the user's credentials and the course name and code. For this reason it is very important that you give each of the courses unique names and codes (with respect to other courses in the database).

If you make a non trivial change to a course (eg. change a multiple topic to a single topic course) it is often better to put the course up as a "new" course rather than to simply replace the existing course. This is because data that was saved during user attempt at the existing course may become invalid in the "new" course.

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