netTerrain 10.1

Database Description, Scripting and Reporting Guide

Contents

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Image: **Alan Turing** (23 June 1912– 7 June 1954)
Alan Turing was an English mathematician and logician who is one of the fathers of theoretical computer science. He is famous for his concept of computability with the Turing machine and for breaking German ciphers during the second World War.

Graphical Networks LLC
Telephone: + 1-240-912-6223
Fax: +1-240-912-6339

1 About this guide

1.1 Who should use it

This guide is for netTerrain advanced users or database administrators who need to query the netTerrain database and are too lazy to do it properly using our API.

Ok, we are kidding here, but we did get your attention with that last statement, didn't we? This guide is a great resource for anything related to querying the database for read-only purposes, such as building queries for reporting and data aggregation tasks. This guide also explains how the dashboard designer works. For many applications it is impractical to write a whole API module, such as when creating a simple query for a dashboard widget. The creation of the query may take 10 minutes and even in the unlikely event of a database structure change that affects it, rewriting it may take very little time.

It is worth noting, however, that an overreliance of querying the database can have negative effects, let alone trying to write data back to it. If there is a change in the netTerrain database schema your scripts may break. This is highly unlikely since most scripts will query from tables and fields that really don't change. Even if the tables change, we almost never take fields out. Still, it is fair to say that scripts against the database may not be forwards compatible.

Understanding the database schema is important for the creation of scripts needed for reports, aggregate functions using expressions, custom table views or queries used by the dashboard designer.

For some reason, from time to time we get the question about how the database is structured "in order to know how to write data back to the database". One word: Yikes! That is an absolute no-no for so many obvious reasons that we could devote an entire chapter to it. For starters, if you do that you are probably bypassing business rules that break data consistency. Use the API instead, which was designed exactly for that purpose.

When interacting with the netTerrain database make sure you always work in read-only mode. If you insist on writing back to the database, you may want to start updating your resume for a nifty career change because you are on your way to putting the mighty 'sh' back in IT.

The design of queries for custom dashboard elements or expressions is covered under the maintenance agreement, but in many cases, you want to still design your own scripts or maybe you just don't feel like talking to us. We understand.

1.2 Assumptions

The database description guide assumes that users have a basic knowledge of Transact SQL, database design and querying, as well as Microsoft Office tools and netTerrain end-user functions.

In short, we suggest you brush up on those mad SQL skills lurking somewhere in the back of your brain or else you will have to resort to your DBA. Studies from Oxford and Harvard University have consistently shown that DBAs are 37.8% more helpful when you offer them food and a whopping 84.1% more excited about writing a script if you give them a Graphical Networks T-shirt.

2 Database Description

This chapter provides a description of the database used by netTerrain. It includes descriptions of the tables, select entity relationships diagrams, sample use cases and other information related to the underlying structure of the data stored in the database. The description of user defined functions, triggers or stored procedures is outside the scope of this guide.

2.1 Admin Tables

The admin tables in netTerrain are all tables that contain data related to the admin functions in netTerrain: the storage of users, groups and audit trail information.

2.1.1 Table: [AuditHistory]

All the netTerrain audit trail records are stored in this table.

2.1.1.1 Sample use case

The following query shows how to retrieve all different diagrams where a specific user (in this case with Id=94000000000004) triggered an INSERT action)

```
SELECT DISTINCT a.ParentId, n.Name

FROM AuditHistory a LEFT OUTER JOIN Nodes n ON a.ParentId=n.Id

WHERE a.UserId=94000000000004 AND a.[Action]='INSERT'

ORDER BY n.Name DESC
```

2.1.1.2 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	InstanceId	decimal(14,0), not null	Id of affected record. In general this is a node, link or type Id
	ParentId	decimal(14,0), null	Parent Id of affected record. In general this is the parent Id of a node or link. In the case of the affected record being an inter diagram link, the Parent Id is usually the parent of the location of the starting leg.
	Table	nvarchar(30), not null	String containing the name of the table of the affected record.
	FieldId	decimal(14,0), null	This is the PropertyId of the affected field. Not all audited events record a FieldId (such as DELETE and INSERT actions).
	FieldAlias	nvarchar(30), null	If applicable, this is the name of the affected Property Id.
	FieldValue	nvarchar(4000), null	If applicable, this is the value of the affected Property, in the event of an UPDATE.
	OldValue	nvarchar(4000), null	In the case of an UPDATE event where the affected field had a non NULL value, this field stores the previous value.
	Timestamp	datetime2(7), not null	Timestamp of the event.
	Action	nvarchar(30), not null	Type of event recorded, such as an INSERT, UPDATE or DELETE action.
	UserId	decimal(14,0), not null	Id of the user who triggered the event.

2.1.2 Table: [AuditLoginHistory]

This table records the login activity of users, including successful logins, failed login attempts and logouts.

2.1.2.1 Sample use case

The following query shows how to retrieve all failed logins.

```
SELECT a.*, u.Name

FROM AuditLoginHistory a INNER JOIN Users u ON a.UserId=u.Id

WHERE a.[Action]='Bad Credentials'

ORDER BY u.Name
```

2.1.2.2 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	UserId	decimal(14,0), null	Id of the user who triggered the event.
	Action	nvarchar(255), null	Type of event recorded, such as a 'Login', 'Logout' or 'Bad Credentials' action.
	Timestamp	datetime2(7), null	Timestamp of the event.
	Purpose	nvarchar(32), null	

2.1.3 : [AuditUserTokensHistory]

This table records the token activity of users.

2.1.3.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	TokenId	decimal(14,0), not null	Id of the token that triggered the event.
	Method	nvarchar(255), null	
	Endpoint	nvarchar(255), null	
	Timestamp	datetime2(7), null	Timestamp of the event.

2.1.4 Table: [DeviceStatusOverrides]

This table is used for storing overrides defined for devices. Each status value entry applies to all device types.

2.1.4.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	
	Effect	tinyint, not null	

2.1.5 Table: [GlobalSettings]

This table is for internal application use only and stores global application server settings.

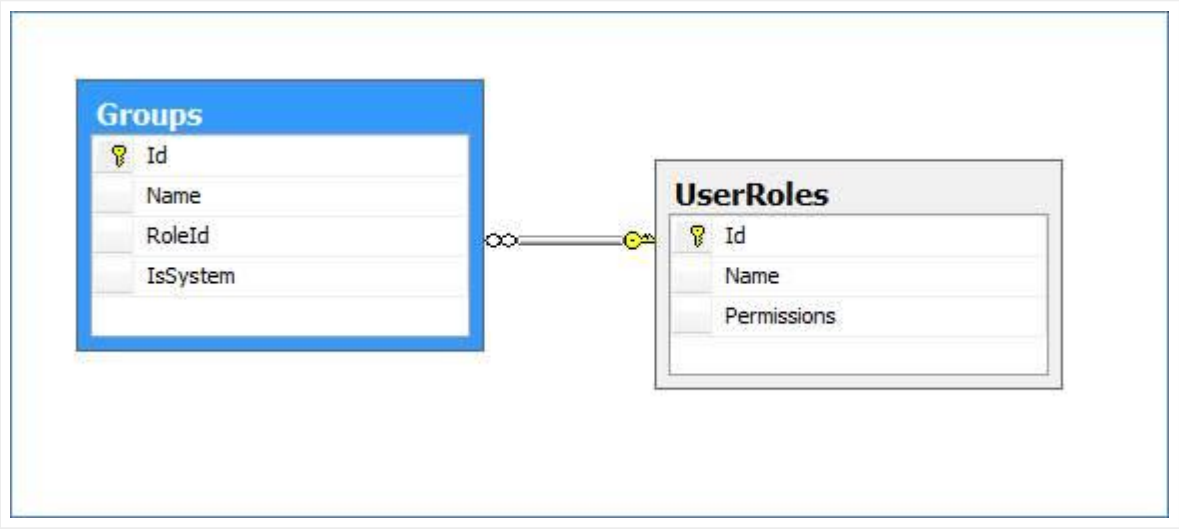
2.1.5.1 Structure

Key	Name	Data Type	Description
PK	Name	nvarchar(255), not null	
	Value	sql_variant, not null	
	IsFloat	bit, null	
	FloatValue	float, null	
	Id	Decimal(14,0) not null	

2.1.6 Table: [Groups]

This table stores all the groups of users that exist in netTerrain. These users are manually created through the admin console interface and can contain manually created users or be synchronized with Active Directory groups.

2.1.6.1 Related ERD



2.1.6.2 Sample use case

The following query shows how to retrieve all groups with admin permissions.

```
SELECT *

FROM Groups g INNER JOIN UserRoles ur ON g.RoleId=ur.Id

WHERE ur.[Permissions]=5
```

2.1.6.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Name of the group.
FK	RoleId	decimal(14,0), not null	Default role Id for the group. Values (In the UserRoles table) include: -1 (Not defined), 0 (No Access), 1 (Read Only), 2 (Annotator), 3 (Editor), 4 (Power User), 5 (Admin).
	IsSystem	bit, null	System groups (such as admin, readonly, etc.) have this flag is set to true.

2.1.7 Table: [ImportSchedule]

Internal table that organizes the scheduler for batch import processes.

2.1.7.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	FileName	nvarchar(255), not null	Name of the file.
FK	UserId	decimal(14,0), not null	User that triggered the batch process

Key	Name	Data Type	Description
	ImportType	int, not null	Importer used.
	Status	Int, not null	
	DateOfSchedule	Datetime, not null	
	LogFile	nvarchar(255)	
	DiagramId	decimal(14, 0)	Target diagram

2.1.8 Table: [IPToolsetParams]

This table retains the IP toolset options for IP based objects.

2.1.8.1 Structure

Key	Name	Data Type	Description
PK	Id	int, not null	
	Name	nvarchar(50), not null	Name of the option.
	Params	nvarchar(254), null	The params to be used for the application.
	App	nvarchar(1023), not null	Application to be called on the user machine.
	Enabled	bit, not null	Availability status of the toolset.

2.1.9 Table: [LinkNotifications]

This table stores the notifications set for links. Notifications provide a mechanism to trigger an email to a set of users based on a value change for a given field and link type.

2.1.9.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14, 0), not null	

Key	Name	Data Type	Description
	PropertyId	decimal(14, 0), not null	Id of property for which the value change triggers the email
	RuleId	int, not null	Rule to be used for the notification (=, <, >, etc.)
	Value	nvarchar(255), null	Value that triggers the notification
	Header	nvarchar(255), null	Email header
	Body	varchar(MAX), null	Email body
	Destination	nvarchar(255), null	Email destination address

2.1.10 Table: [NodeNotifications]

This table stores the notifications set for nodes. Notifications provide a mechanism to trigger an email to a set of users based on a value change for a given field and node type.

2.1.10.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14, 0), not null	
	PropertyId	decimal(14, 0), not null	Id of property for which the value change triggers the email
	RuleId	int, not null	Rule to be used for the notification (=, <, >, etc.)
	Value	nvarchar(255), null	Value that triggers the notification
	Header	nvarchar(255), null	Email header
	Body	varchar(MAX), null	Email body
	Destination	nvarchar(255), null	Email destination address

2.1.11 Table: [ObjectTriggers]

This table stores settings for the event handler.

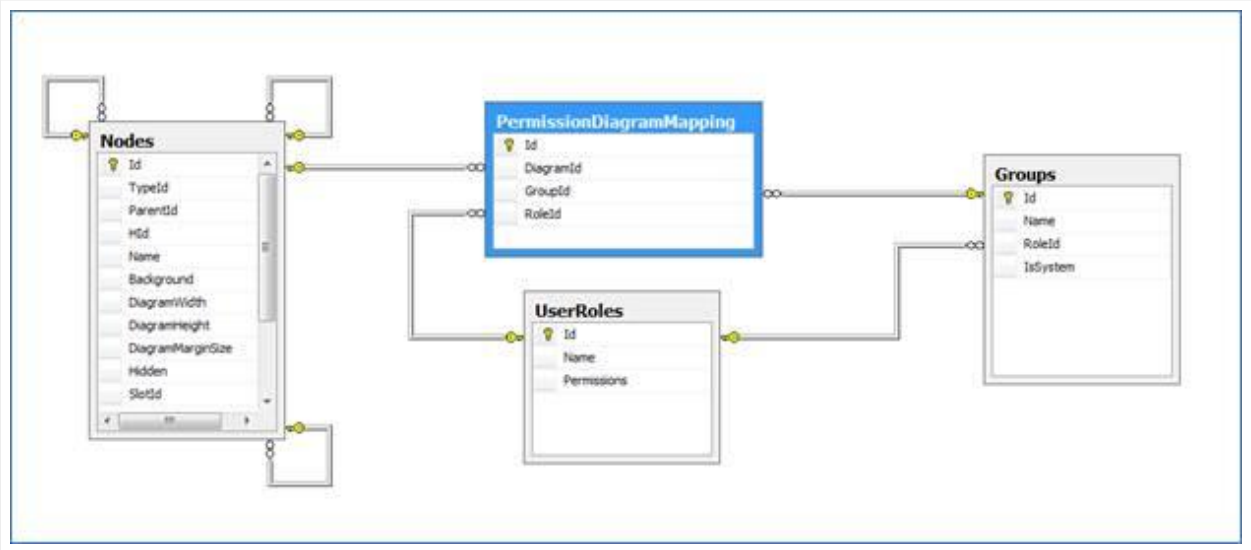
2.1.11.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14, 0), not null	
	ObjectId	decimal(14, 0), not null	
	EventType	int, not null	
	EventArgs	nvarchar(4000), null	
	ActionType	int, not null	
	ActionArgs	nvarchar(4000), null	

2.1.12 Table: [PermissionDiagramMappingForGroups]

This table stores the diagram permissions that are mapped for a given group, or in netTerrain terms, group exceptions.

2.1.12.1 Related ERD



2.1.12.2 Structure

Key	Name	Data Type	Description

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	DiagramId	decimal(14,0), not null	Id of the diagram that has the group exceptions.
FK	GroupId	decimal(14,0), not null	Group id for which an exception is defined.
FK	RoleId	decimal(14,0), not null	Role id associated with the exception.

2.1.13 Table: [PermissionDiagramMappingForUsers]

This table stores the diagram permissions that are mapped for a given user, or in netTerrain terms, user exceptions.

2.1.13.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	DiagramId	decimal(14,0), not null	Id of the diagram that has the group exceptions.
FK	UserId	decimal(14,0), not null	User id for which an exception is defined.
FK	RoleId	decimal(14,0), not null	Role id associated with the exception.

2.1.14 Table: [Tutorials]

This table stores metadata associated with the netTerrain tutorials

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Tutorial name.

Key	Name	Data Type	Description
	Order	tinyint, not null	Tutorial sequence

2.1.15 Table: [UserRoles]

This table stores the roles that can be assigned to groups. Currently netTerrain includes the following roles:

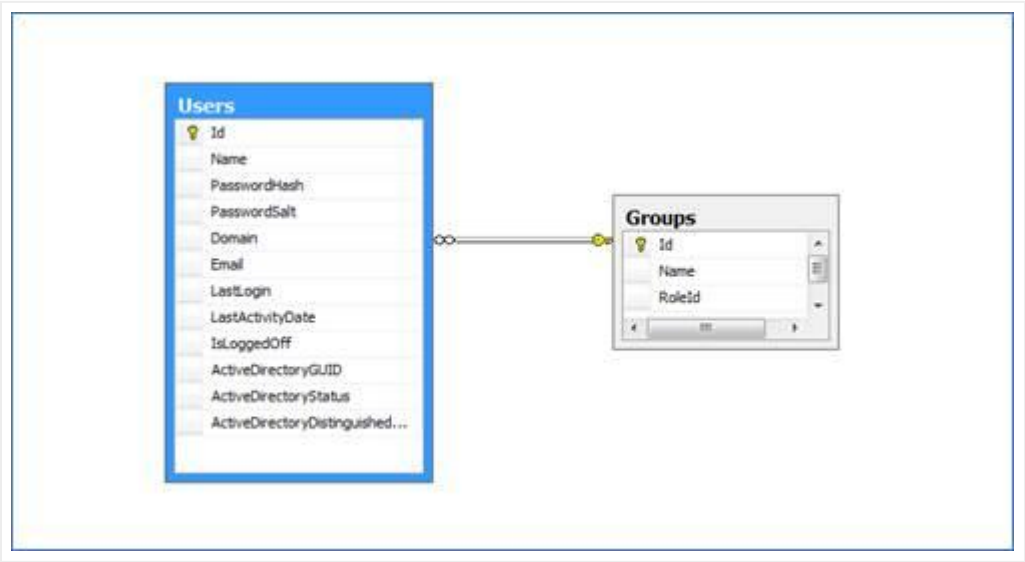
- -1 = Not Defined
- 0 = No Access
- 1 = Read Only
- 2 = Annotator
- 3 = Edit
- 4 = Power User
- 5 = Admin

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Role name.
	Permissions	int, not null	Permission code (-1, 0, 1, 2, 3, 4, 5)

2.1.16 Table: [Users]

This table stores all users in netTerrain. Both, native users and users discovered via Active Directory are contained here.

2.1.16.1 Related ERD



2.1.16.2 Sample Use case

The following query shows a way to retrieve all native users.

```
SELECT * FROM Users WHERE ISNULL(ActiveDirectoryStatus, '') = ''
```

2.1.16.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Name of the user.
	PasswordHash	nvarchar(255), null	
	PasswordSalt	nvarchar(255), null	
FK	Domain	decimal(14,0), not null	The group the user belongs to.

Key	Name	Data Type	Description
	Email	nvarchar(255), null	
	LastLogin	datetime2(7), not null	Datetime value of the last login.
	LastActivityDate	datetime2(7), not null	Datetime value of the last activity.
	IsLoggedOff	bit, null	Flag to determine whether the user is currently logged on or not.
	ActiveDirectoryGUID	nvarchar(255), null	AD related field.
	ActiveDirectoryStatus	nvarchar(255), null	AD related field.
	ActiveDirectoryDistinguishedName	nvarchar(255), null	AD related field.
	IsOverrideADDomain	int, null	AD related field.
	Description	nvarchar(4000), null	User description.
	Comments	nvarchar(4000), null	User comments.
	DateLastAudit	datetime2(7), not null	Date of last audit for the user.
	isLocked	bit, not null	Flag to determine if the user was locked for some reason.
	ShowHelpMessages	bit, not null	Flag to determine if the user will be shown help messages.
	Language	int, not null	Language integer code
	AccountType	int, not null	
	ShowOnlineBar	bit, not null	Flag to determine if user should be see the who's online indicator
	EmailConfirmed	bit, not null	

Key	Name	Data Type	Description
	SecurityStamp	nvarchar(64), null	
	PhoneNumber	nvarchar(32), null	
	PhoneNumberConfirmed	bit, not null	
	TwoFactorEnabled	bit, not null	
	AccessFailedCount	int, not null	
	Selected2FAProvider	int, not null	
	GoogleAuthenticatorConfirmed	bit, not null	
	GoogleAuthenticatorSecretKey	nvarchar(64), null	
	UseMetricSystem	bit, not null	
	Theme	nvarchar(255), null	
	ShowImportWarning	bit, not null	

2.1.17 Table: [UserTokens]

Table to store user tokens.

2.1.17.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Prefix	nvarchar(255), not null	
	TokenHash	nvarchar(255), not null	
	OwnerId	decimal(14,0), not null	
	Issued	datetime2(7), not null	
	Expires	datetime2(7), not null	
	Status	int, not null	
	Description	nvarchar(4000), null	

2.2 Catalog tables

The catalog tables in netTerrain are all tables that contain data related to the power user functions in netTerrain: the storage of node and link types, properties, overrides and other catalog related metadata.

2.2.1 Table: [CircuitListValues]

This table stores all the custom properties defined for the circuit entity.

2.2.1.1 Structure

Key	Name	Data Type	Description
PK	id	decimal(14,0), not null	
	PropertyId	decimal(14,0), not null	Id of the property with the list value
	Value	nvarchar(255), not null	List value

2.2.2 Table: [CircuitProperties]

This table stores all the custom properties defined for the circuit entity.

2.2.2.1 Structure

Key	Name	Data Type	Description
PK	id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Name of the property.
	IsSystem	bit, not null	Flag to determine if this is a system property (not removable) or not
	ShowInACRA	bit, not null	Flag to determine if the field should be displayed in the ACRA dialog

2.2.3 Table: [cities]

This table is a metadata table that contains information about cities that can be used in manually generated backgrounds with embedded lat/long information.

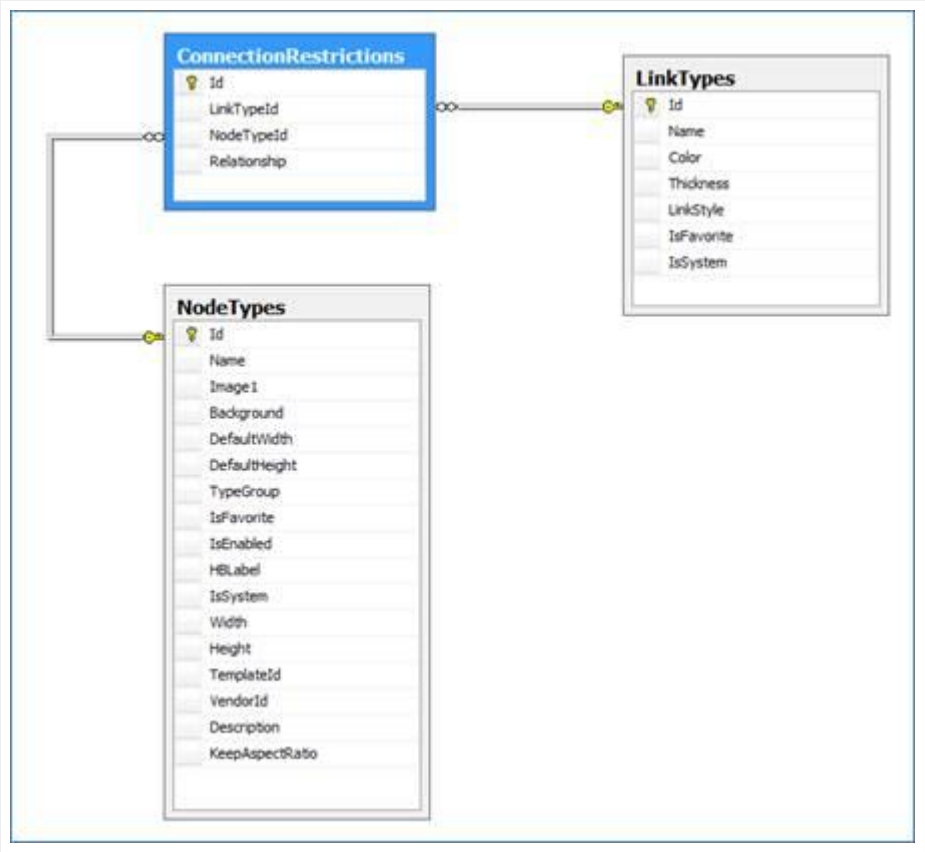
2.2.3.1 Structure

Key	Name	Data Type
PK	id	decimal(14,0), not null
	Name	nvarchar(255), not null
	Latitude	float, null
	Longitude	float, null
	Country	nvarchar(255), not null

2.2.4 Table: [ConnectionRestrictions]

This table stores information about link type restrictions.

2.2.4.1 Related ERD



2.2.4.2 Sample use case

The following query shows how to retrieve all link types for which there are restrictions that prevent them from being connected to nodes of a certain type.

```
SELECT DISTINCT lt.[Name]

FROM LinkTypes lt INNER JOIN ConnectionRestrictions c ON
lt.Id=c.LinkTypeId AND c.Relationship=0
```

2.2.4.3 Structure

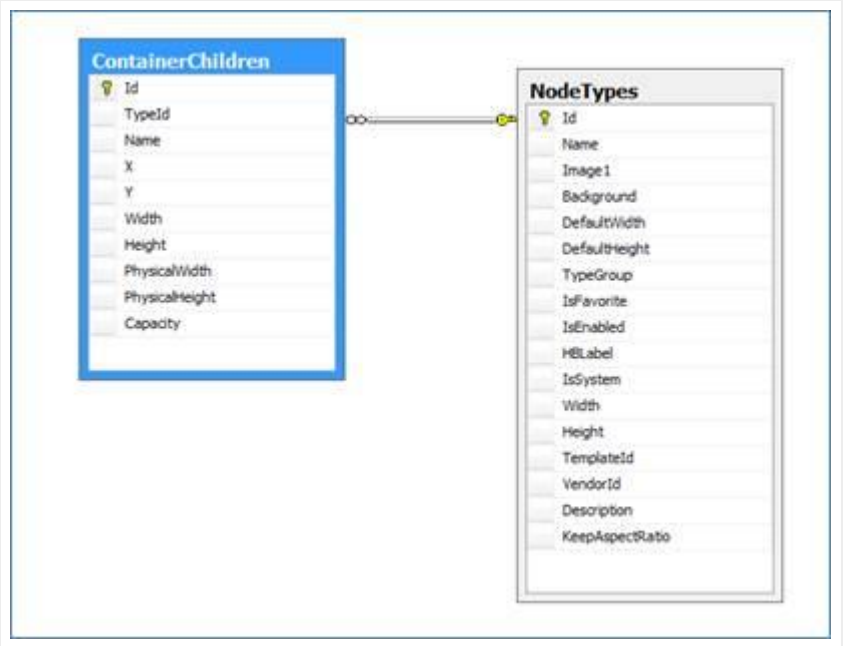
Key	Name	Data Type	Description
PK	Id		

Key	Name	Data Type	Description
		decimal(14,0), not null	
FK	LinkTypeId	decimal(14,0), not null	Link Type Id for which the restriction is applied.
FK	NodeTypeId	decimal(14,0), not null	Restricted or allowed Node Type Id.
	Relationship	smallint, not null	Type of restriction. Two values are currently supported: 0, where netTerrain will prevent an instance of the link type to be connected to an instance of type Node Type, and 1, where netTerrain enforces an instance of the link type to be connected to an instance of the node type (or an instance of any other enforced node type).

2.2.5 Table: [ContainerChildren]

This table contains the information about rack containers. Any containers associated with their parent racks are stored here.

2.2.5.1 Related ERD



2.2.5.2 Sample use case

The following query shows how to retrieve the number of containers assigned per rack type.

```
SELECT r.[Name], COUNT(c.Id) AS [ContainerCount]

FROM ContainerChildren c INNER JOIN NodeTypes r ON c.TypeId=r.Id

GROUP BY r.Name
```

2.2.5.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	TypeId	decimal(14,0), not null	Parent Rack type Id.
	Name	nvarchar(255), null	Name of the container. Currently this field is not in use.
	X	float, null	Left border x value of the container object. The value is in netTerrain units (hundredths of an inch) and does not account for the page margins.
	Y	float, null	Top border y value of the container object. The value is in netTerrain units (hundredths of an inch) and does not account for the page margins.
	Width	float, null	Width of the container object in netTerrain units. This width is the image width of the object on a diagram in hundredths of an inch, not the physical width of the rackmountable area.
	Height	float, null	Height of the container object in netTerrain units. This width is the image width of the object on a diagram in hundredths of an inch, not the physical width of the rackmountable area.
	PhysicalWidth	float, null	Physical width of the container object (usually a rack mountable area for a front or back view of a rack). This unit is in inches.

Key	Name	Data Type	Description
	PhysicalHeight	float, null	Physical height of the container object (usually a rack mountable area for a front or back view of a rack). This unit is in rack units.
	Capacity	int, null	Physical capacity of the container object (usually a rack mountable area for a front or back view of a rack). This is measured in rack units.
	RackPositionOrder	bit, not null	Flag to determine if units should be counted sequentially from bottom to top or in reverse.

2.2.6 Table: [DefaultCustomProperties]

This table stores the default custom fields that should be added to a newly created device, card or rack type by default.

2.2.6.1 Structure

Key	Name	Data Type	Description
	Id	decimal(14,0), not null	
	TypeGroup	nvarchar(250), not null	Name of the category.
	Name	decimal(14,0), null	The id of a parent category or null.

2.2.7 Table: [LinkCategories]

This table stores the categories that links may fall under.

2.2.7.1 Structure

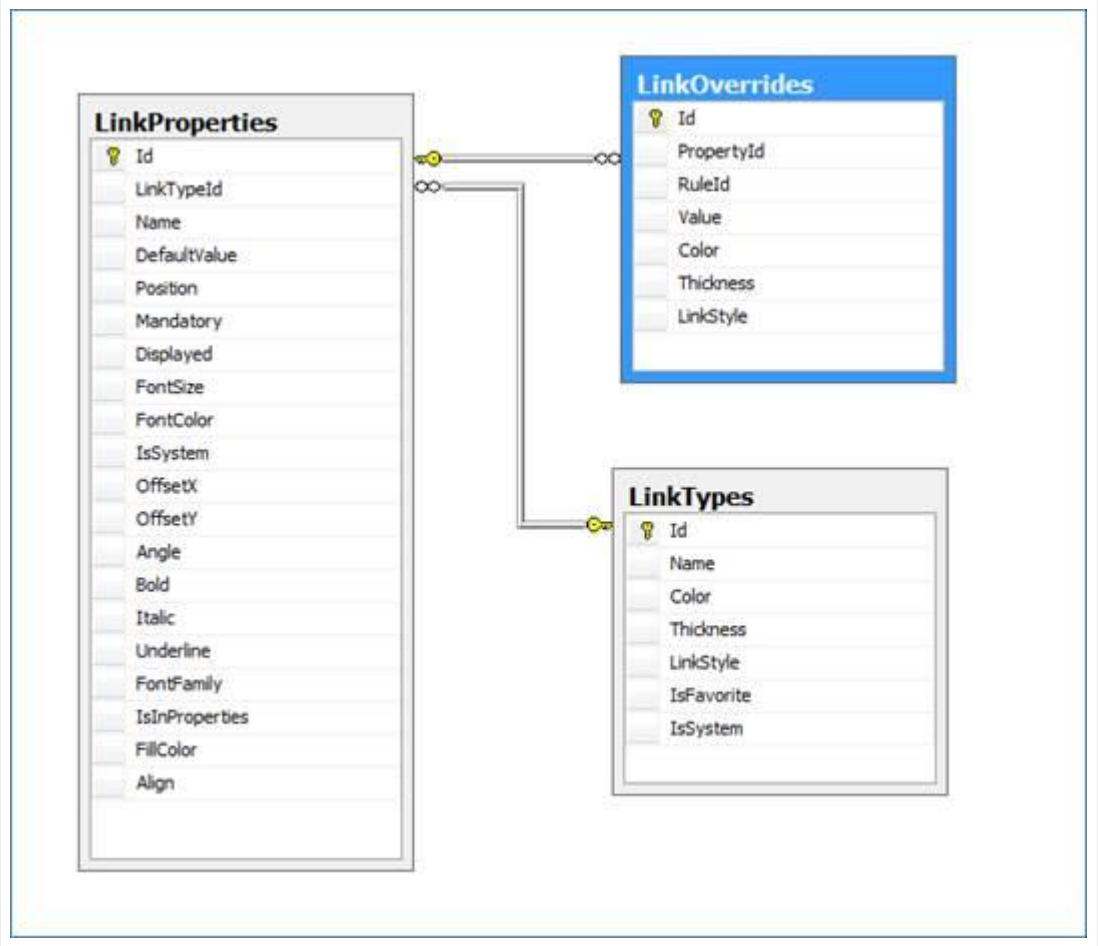
Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(250), not null	Name of the category.

Key	Name	Data Type	Description
FK	ParentId	decimal(14,0), null	The id of a parent category or null.
	HId	hierarchyid, null	
	Icon	nvarchar(255), null	The filename of the icon corresponding to the category.
	IsFavorite	bit, not null	Flag to determine if a type is in the favorites menu.

2.2.8 Table: [LinkOverrides]

This table stores all visual override settings for link types.

2.2.8.1 Related ERD



2.2.8.2 Sample use case

The following query shows how to retrieve the visual override count for each link type.

```
SELECT DISTINCT lt.[Name], COUNT(o.Id) AS [OverrideCount]

FROM LinkTypes lt

 INNER JOIN LinkProperties lp ON lt.Id=lp.LinkTypeId INNER JOIN

 LinkOverrides o ON lp.Id=o.PropertyId

GROUP BY lt.[Name]
```

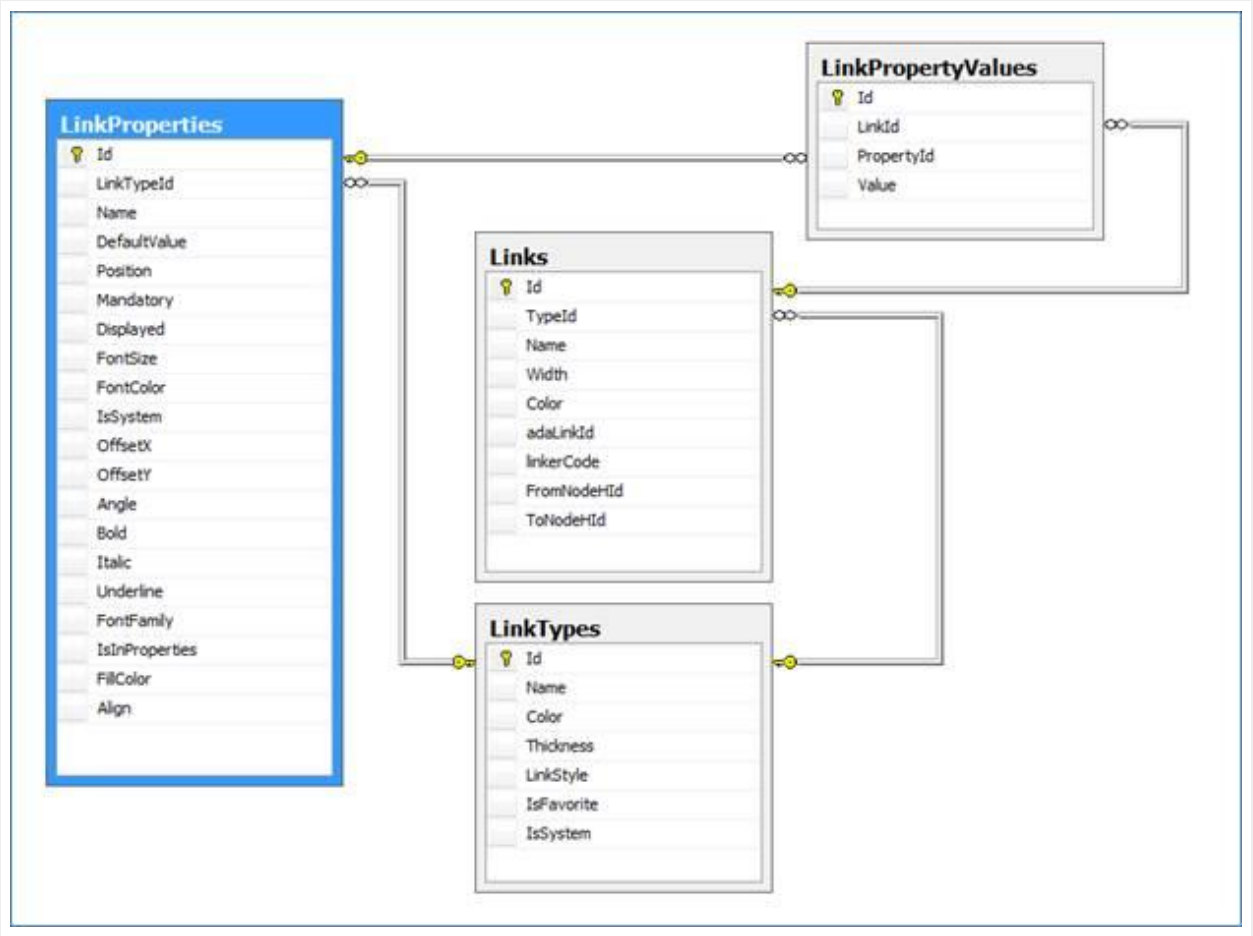
2.2.8.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	PropertyId	decimal(14,0), not null	Id of the property for which the override is being defined.
	RuleId	int, not null	Rule type, such as =, >,< and contains.
	Value	nvarchar(255), not null	The value that needs to be matched for the property in order for the override to be triggered.
	Color	nchar(10), null	Link override color.
	Thickness	int, null	Link override thickness.
	LinkStyle	int, null	Link override style.
	IsOverride	bit, not null	Flag to determine of this attribute is an override or just a list item.
	StartArrow	int, null	Start arrow override value.
	EndArrow	int, null	End arrow override value.

2.2.9 Table: [LinkProperties]

This table stores all the fields defined for each link type in the netTerrain catalog.

2.2.9.1 Related ERD



2.2.9.2 Sample use case

The following query shows how to retrieve the property count for each link type.

```
SELECT DISTINCT lt.[Name], COUNT(lp.Id) AS [PropertyCount]

FROM LinkTypes lt

 INNER JOIN LinkProperties lp ON lt.Id=lp.LinkTypeId
```

```
GROUP BY lt.[Name]
```

2.2.9.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	LinkTypeId	decimal(14,0), not null	Id of the parent link type.
	Name	nvarchar(255), not null	Field name.
	DefaultValue	nvarchar(449), null	Field default value.
	Position	int, not null	Position of the field in the properties window.
	Mandatory	bit, null	Flag to determine whether the field must be filled out.
	Displayed	smallint, null	Default displayed field status. 1 means the field is displayed on the diagram. This value can be overridden on a per instance basis.
	FontSize	int, null	Default font size, in case the field is displayed. This value can be overridden on a per instance basis.
	FontColor	char(7), null	Default font color, in case the field is displayed. This value can be overridden on a per instance basis.
	IsSystem	bit, not null	Fields flagged as true (such as Name) cannot be deleted from the field list.
	OffsetX	float, not null	Default offset of x position, in case the field is displayed. This value can be overridden on a per instance basis.
	OffsetY	float, not null	Default offset of y position, in case the field is displayed. This value can be overridden on a per instance basis.

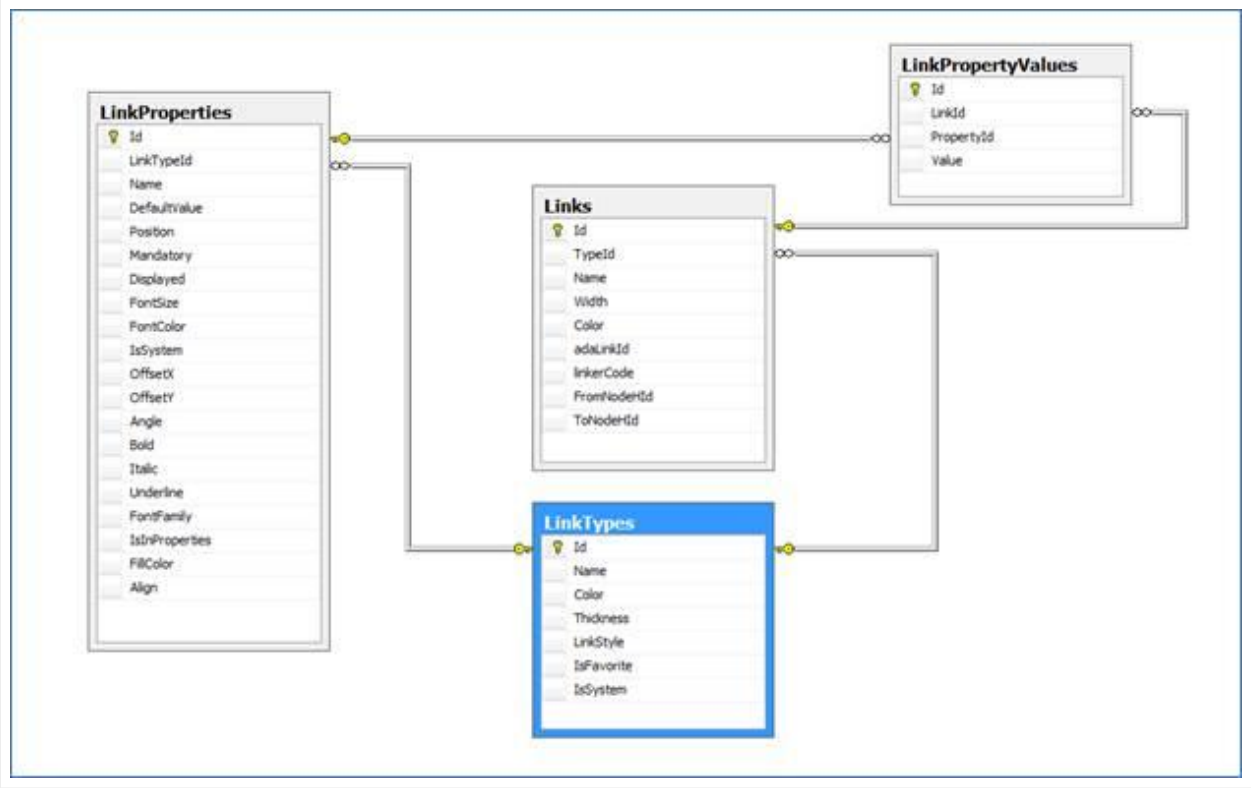
Key	Name	Data Type	Description
	Angle	int, not null	Default angle, in case the field is displayed. This value can be overridden on a per instance basis.
	Bold	bit, null	Default boldness flag, in case the field is displayed. This value can be overridden on a per instance basis.
	Italic	bit, null	Default italics flag, in case the field is displayed. This value can be overridden on a per instance basis.
	Underline	bit, null	Default underline flag, in case the field is displayed. This value can be overridden on a per instance basis.
	FontFamily	nvarchar(255), null	Default font family value, in case the field is displayed. This value can be overridden on a per instance basis.
	IsInProperties	bit, not null	Flag to determine whether the field is displayed in the properties window.
	FillColor	char(7), null	Default fill color value, in case the field is displayed. This value can be overridden on a per instance basis.
	Align	int, not null	Default alignment value, in case the field is displayed. This value can be overridden on a per instance basis. 0 means left alignment, 1 means center alignment and 2 means right alignment.
	Anchor	int, not null	Field to determine anchor properties for that link property.
	LockList	bit, null	Flag to determine whether a list field associated with that property should be locked or editable.
	IsTypeField	bit, null	Flag to determine whether the property is the type property for displayed field purposes.
	IsUniqueForThisType	bit, null	Flag to determine whether the property value for each instance must be unique across instances of the same type.

Key	Name	Data Type	Description
	IsUniqueForAllTypes	bit, null	Flag to determine whether the property value for each instance must be unique across all instances of any type.
	Justification	int, not null	Index that determines the type of justification that applies to the text instance
	UprightAlignment	Bit, not null	Flag that determines whether displayed fields should always look upright or not based on the direction of a link

2.2.10 Table: [LinkTypes]

This table stores all the link types defined in the netTerrain catalog.

2.2.10.1 Related ERD



2.2.10.2 Sample use case

The following query shows how to retrieve the property count for each link type.

```
SELECT DISTINCT lt.[Name], COUNT(lp.Id) AS [PropertyCount]

FROM LinkTypes lt

 INNER JOIN LinkProperties lp ON lt.Id=lp.LinkTypeId

GROUP BY lt.[Name]
```

2.2.10.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Name of the link type.
	Color	char(7), null	Link type default color.
	Thickness	int, null	Link type default thickness.
	LinkStyle	int, null	Link type default style.
	IsFavorite	bit, not null	Flag that sets the link type as favorite in the link type menu button.
	IsSystem	bit, not null	Flag that specifies whether the link type can be deleted.
	CategoryId	decimal(14,0), null	If applies, the category of the link type.
	StartArrow	int, null	Start arrow properties.
	EndArrow	int, null	End arrow properties.
	SnappedToEdge	bit, not null	Flag to determine if the link should be snapped to the edge of the rect value determining the end nodes.
	IsEnabled	bit, not null	

Key	Name	Data Type	Description
			Flag that specifies whether the link type is enabled in the catalog or not.
	MatchingPortConnectors	bit, not null	Flag that specifies whether the link type requires the connectors on each end point to match, in case the endpoints are ports.
	UseForACRAPatch	bit, not null	Flag to determine if a link type is allowed to be presented as a valid patch type during an ACRA patching process
	ExcludableFROMACRA	bit, not null	Flag to determine if a link type should be excluded from an ACRA calculation
	Mode	tinyint, null	Identifier for a cable mode (0=single, 1=multi)

2.2.11 Table: [NodeCategories]

This table stores the categories that nodes may fall under.

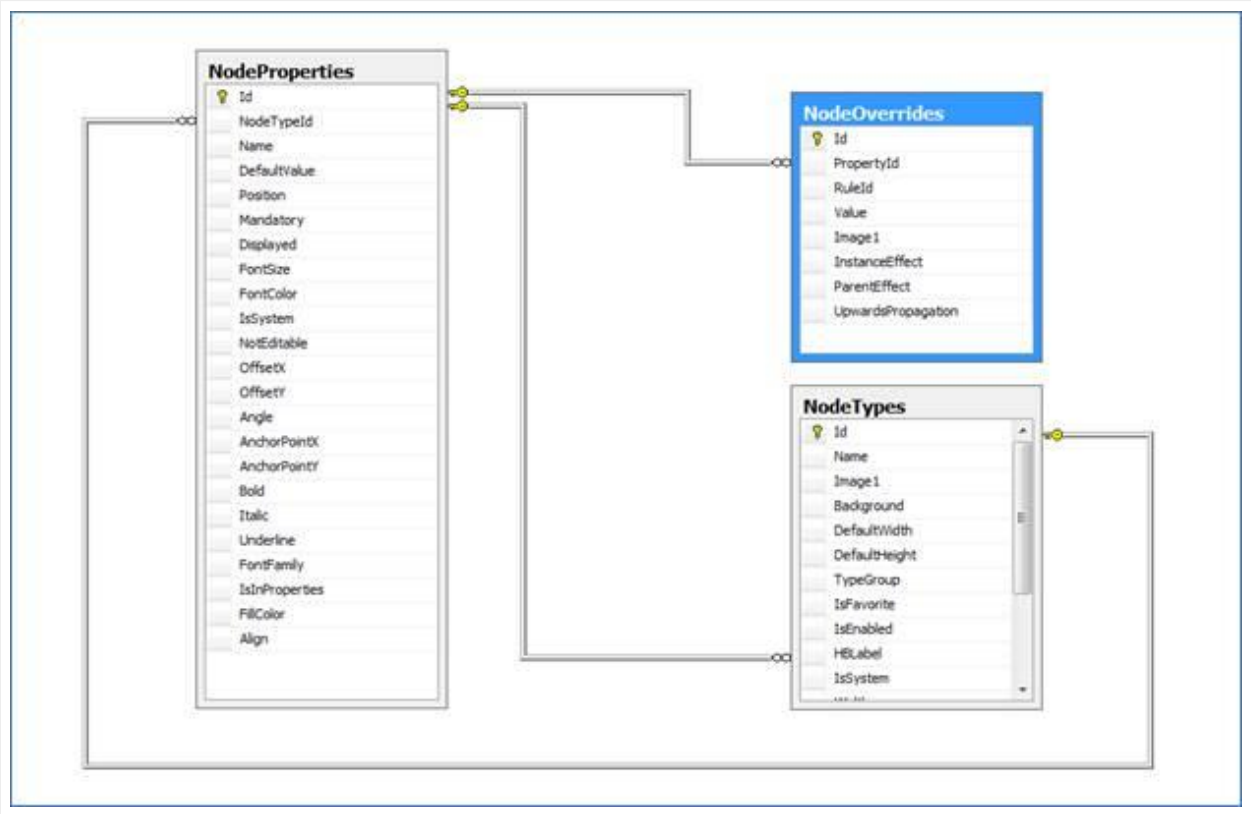
2.2.11.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(250), not null	Name of the category.
FK	ParentId	decimal(14,0), null	The id of a parent category or null.
	HId	hierarchyid, null	
FK	TypeGroup	int, not null	Corresponds to one of the type groups.
	Icon	nvarchar(255), null	The filename of the icon corresponding to the category.
	IsFavorite	bit, not null	Flag to determine of that category should be in the favorites menu.

2.2.12 Table: [NodeOverrides]

The NodeOverrides table stores all the visual overrides assigned to node types.

2.2.12.1 Related ERD



2.2.12.2 Sample use case

The following query shows a count of node overrides per node type.

```
SELECT nt.Name, COUNT(nt.Name) AS [Override Count]

FROM NodeOverrides nov INNER JOIN NodeProperties np ON nov.PropertyId
= np.Id INNER JOIN

 NodeTypes nt ON np.NodeTypeId = nt.Id

GROUP BY nt.Name
```

```
ORDER BY [Override Count] DESC
```

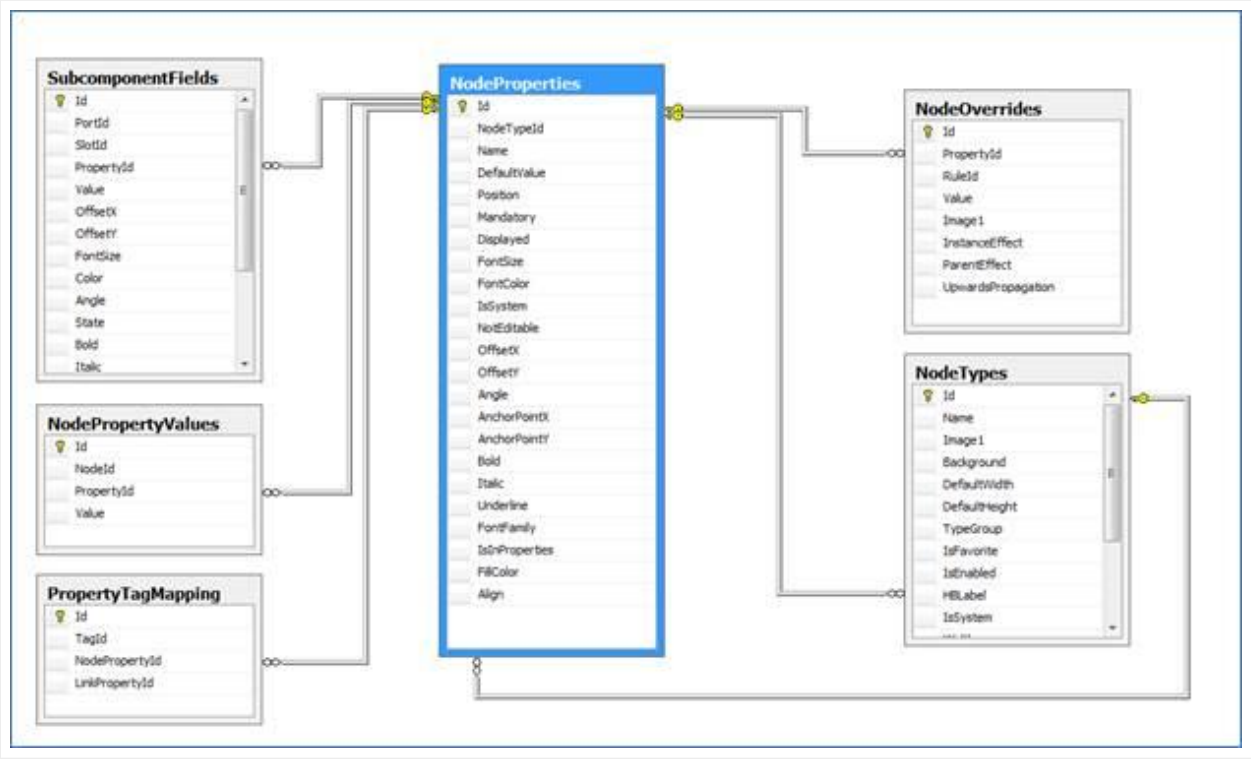
2.2.12.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	PropertyId	decimal(14,0), not null	Id if the property for which the override is applied.
	RuleId	int, not null	The type of override rule that is applied to the property (=, >,< , etc.)
	Value	nvarchar(255), not null	The value that triggers the override.
	Image1	nvarchar(255), null	Image that is applied to the node that triggers the override.
	InstanceEffect	int, not null	Effect that is applied to the node that triggers the override.
	ParentEffect	int, not null	Effect that is applied to the parent of the node that triggers the override.
	UpwardsPropagation	int, not null	type of upwards propagation that is applied to the parent/s of the node that triggers the override.
	IsOverride	bit, not null	Flag to determine of that attribute is an override or a list value.

2.2.13 Table: [NodeProperties]

The NodeProperties table stores all the custom properties assigned to node types.

2.2.13.1 Related ERD



2.2.13.2 Sample use case

The following query shows a count of node properties per node type.

```
SELECT nt.Name, COUNT(nt.Name) AS [Property Count]

FROM NodeProperties np INNER JOIN NodeTypes nt ON np.NodeTypeId =
nt.Id

GROUP BY nt.Name

ORDER BY [Property Count] DESC
```

2.2.13.3 Structure

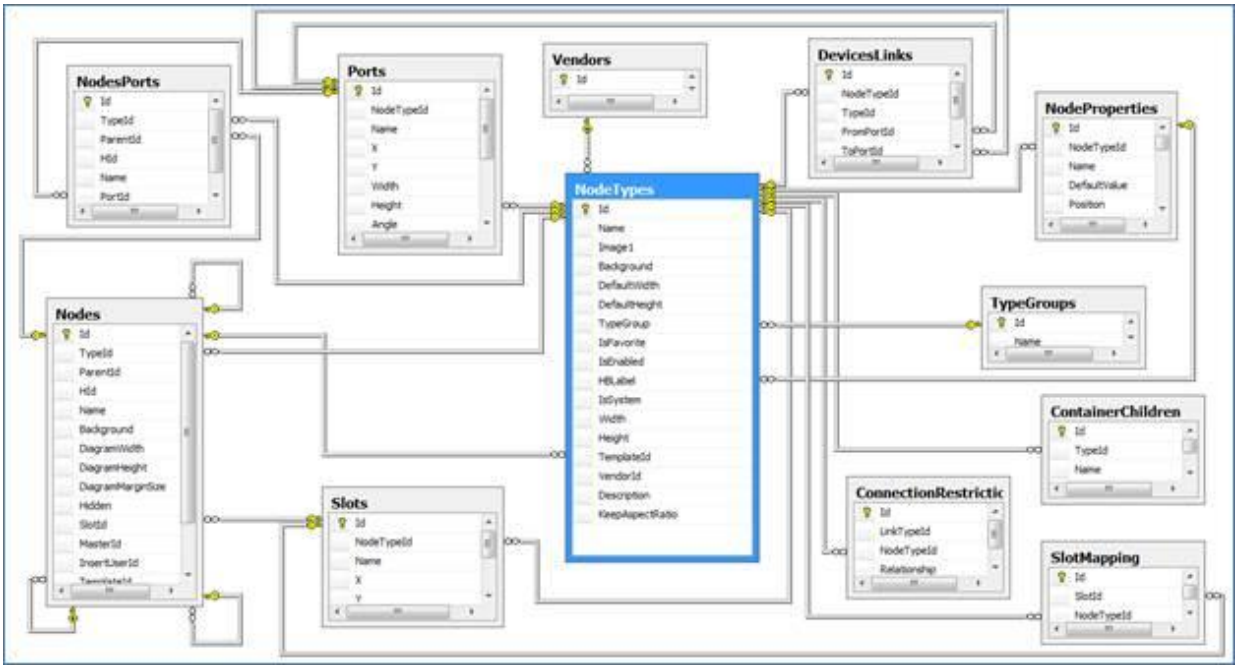
Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	NodeTypeId	decimal(14,0), not null	
	Name	nvarchar(255), not null	Property name.
	DefaultValue	nvarchar(449), null	Property default value.
	Position	int, not null	Property position in properties window.
	Mandatory	bit, null	Flag to specify whether the property is mandatory.
	Displayed	smallint, null	Display status.
	FontSize	int, null	Default font size for property, when set as a displayed field.
	FontColor	char(7), null	Default font color for property, when set as a displayed field.
	IsSystem	bit, not null	Flag to specify whether the property can be deleted or not.
	NotEditable	bit, not null	Flag to specify whether the property can be edited or not.
	OffsetX	float, not null	Default x coordinate offset for property, when set as a displayed field.
	OffsetY	float, not null	Default y coordinate offset for property, when set as a displayed field.
	Angle	int, not null	Default angle for property, when set as a displayed field.
	AnchorPointX	tinyint, not null	Default x coordinate anchor point for property, when set as a displayed field.
	AnchorPointY	tinyint, not null	

Key	Name	Data Type	Description
			Default y coordinate anchor point for property, when set as a displayed field.
	Bold	bit, null	Default font boldness for property, when set as a displayed field.
	Italic	bit, null	Default italics setting for property, when set as a displayed field.
	Underline	bit, null	Default underline setting for property, when set as a displayed field.
	FontFamily	nvarchar(255), null	Default font family for property, when set as a displayed field.
	IsInProperties	bit, not null	Flag to specify if the property is displayed in the properties window.
	FillColor	char(7), null	Default font fill color for property, when set as a displayed field.
	Align	int, not null	Default alignment for property, when set as a displayed field.
	LockList	bit, null	Flag to determine whether a list field associated with that property should be locked or editable
	IsTypeField	bit, null	Flag to determine whether the property is the type property for displayed field purposes.
	IsUniqueForThisType	bit, null	Flag to determine whether the property value for each instance must be unique across instances of the same type.
	IsUniqueForAllTypes	bit, null	Flag to determine whether the property value for each instance must be unique across all instances of any type.
	Justification	int, not null	Index that determines the type of justification that applies to the text instance
	SNMP_OID	nvarchar(255), null	Stores the OID of a device type; used with the collector discovery process

2.2.14 Table: [NodeTypes]

This table stores all the node type definitions that exist in the netTerrain catalog. It includes all type groups, such as generic nodes, devices, card types, rack types and so on.

2.2.14.1 Related ERD



2.2.14.2 Sample use case

The following query retrieves all the properties for generic nodes.

```
SELECT nt.Name AS [Node Type], np.Id AS [Property Id], np.Name AS
[Property Name]

FROM NodeProperties np INNER JOIN NodeTypes nt ON np.NodeTypeId=nt.Id

WHERE nt.TypeGroup=1

ORDER BY [Node Type], np.Name
```

2.2.14.3 Structure

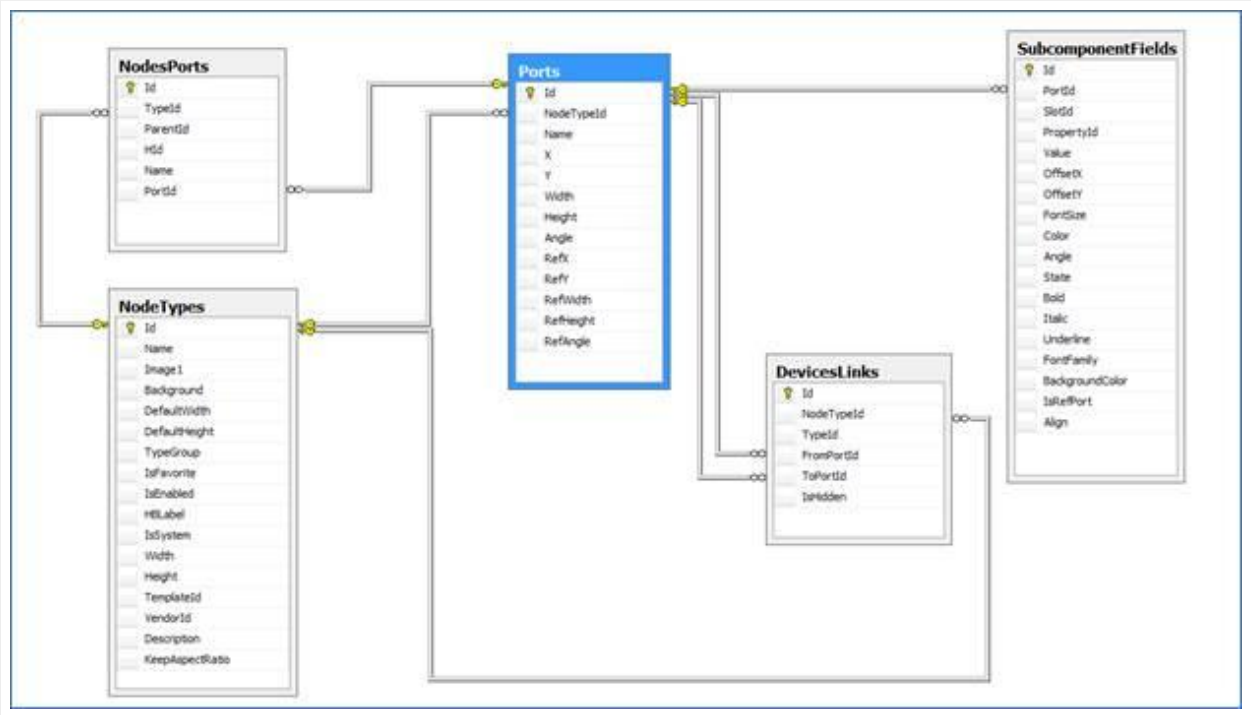
Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Node type name.
	Image1	nvarchar(255), null	Icon image file name.
	Background	nvarchar(255), null	Background image file name.
	DefaultWidth	float, null	Default Width for a new instance of that type.
	DefaultHeight	float, null	Default Height for a new instance of that type.
FK	TypeGroup	int, null	Type group (1= Generic Node, 2=document, 3=comment, 4= stamp, 5=shape, 6= free drawing, 7=Device, 8=rack, 9=port, 10=slot, 11=card, 12 = line node).
	IsFavorite	bit, not null	Flag to determine of the type is a favorite.
	IsEnabled	bit, not null	Flag to determine of the type is enabled in the node type drop down menus.
FK	HBLabel	decimal(14,0), null	Property id that will be used as the hierarchy browser label.
	IsSystem	bit, not null	Flag to determine of the type can be deleted.
	Width	float, null	Default width for smart objects.
	Height	float, null	Default height for smart objects.
FK	TemplateId	decimal(14,0), null	Predefined template id for the type.
FK	VendorId	decimal(14,0), null	Id of vendor.
	Description		Node type description.

Key	Name	Data Type	Description
		nvarchar(max), null	
	KeepAspectRatio	bit, null	Flag to determine whether the aspect ratio should be maintained for instances of that type.
	ShowContainerChildren	bit, not null	
	DClickBehavior	nvarchar(255), not null	Default double click behavior for that node type.
FK	CategoryId	decimal(14,0), null	The node type's category, if there is one set.
	SNMP_OID	nvarchar(255), null	Stores the OID of a device type; used with the collector discovery process
	IndependentMounting	bit, not null	
	InStock	Int, null	Number of items of the type that are in stock that can be instantiated.

2.2.15 Table: [Ports]

This table stores the port definitions for each of the device models in the netTerrain catalog. This table should not be confused with the NodePorts table, which stores the actual port instances.

2.2.15.1 Related ERD



2.2.15.2 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	NodeTypeId	decimal(14,0), not null	Type id of port.
	Name	nvarchar(4000), not null	Name of port (usually a port number).
	X	float, null	X coordinate of the port object.
	Y	float, null	Y coordinate of the port object.
	Width	float, null	Width of the port object.
	Height	float, null	Height of the port object.
	Angle	int, null	Angle of the port object.
	RefX	float, null	

Key	Name	Data Type	Description
			X coordinate of the reference port object.
	RefY	float, null	Y coordinate of the reference port object.
	RefWidth	float, null	Width of the reference port object.
	RefHeight	float, null	Height of the reference port object.
	RefAngle	int, null	Angle of the reference port object.
	Path	nvarchar(max), null	
	PathInverted	nvarchar(max), null	
	AnchorPointX	float, null	X coord for anchor point definition
	AnchorPointX	float, null	Y coord for anchor point definition
	RefAnchorPointX	float, null	X coord for anchor point definition for ref port
	RefAnchorPointY	float, null	Y coord for anchor point definition for ref port
	IsHidden	bit, null	
	Index	Int, null	Index number used to match up SNMP index scans

2.2.16 Table: [PropertyEventTypes]

This table stores the types of events defined in the catalog.

2.2.16.1 Structure

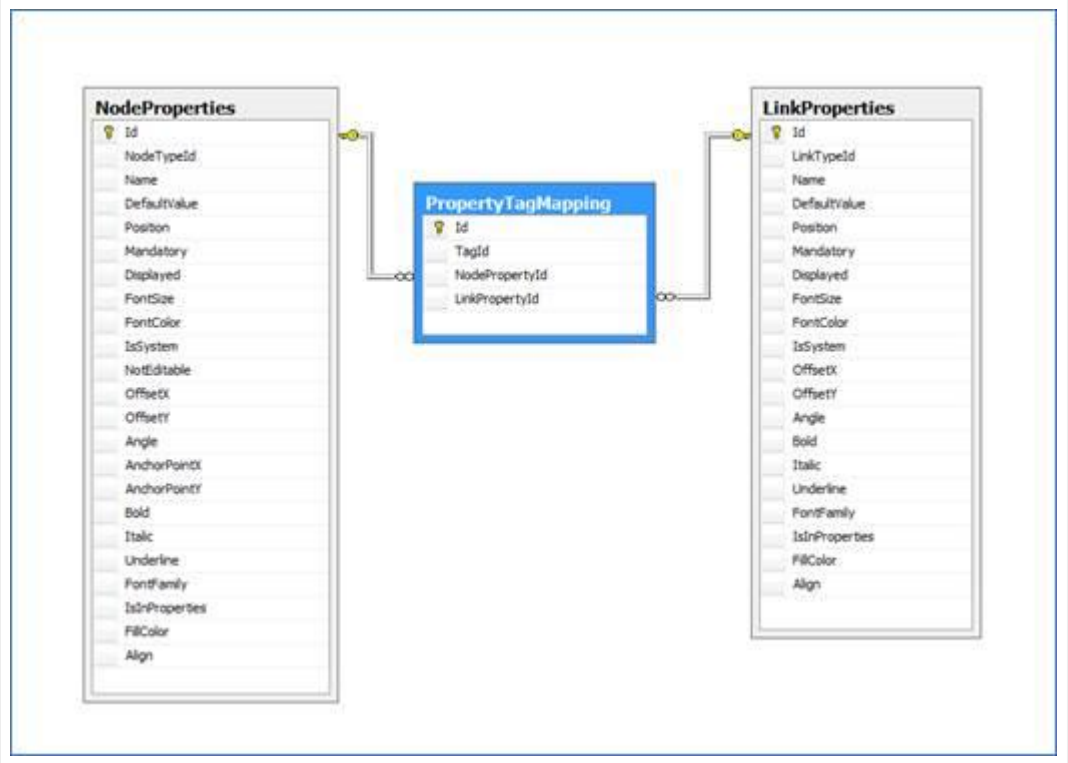
Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Name of the event type
	PropertyId		

Key	Name	Data Type	Description
		decimal(14,0), not null	Id of the related property that triggers the event.
	Severity	Tinyint, not null	Severity level of the event
	Value	nvarchar(255), not null	Value that triggers the event.

2.2.17 Table: [PropertyTagMapping]

This table stores the mappings between field tags and node or link properties.

2.2.17.1 Related ERD



2.2.17.2 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	

Key	Name	Data Type	Description
	TagId	decimal(14,0), not null	Id of the related tag.
FK	NodePropertyId	decimal(14,0), null	Id of the related node property.
FK	LinkPropertyId	decimal(14,0), null	Id of the related link property.

2.2.18 Table: [PropertyTags]

This table stores the tags defined in netTerrain, which are later used to map them to properties for field layering purposes.

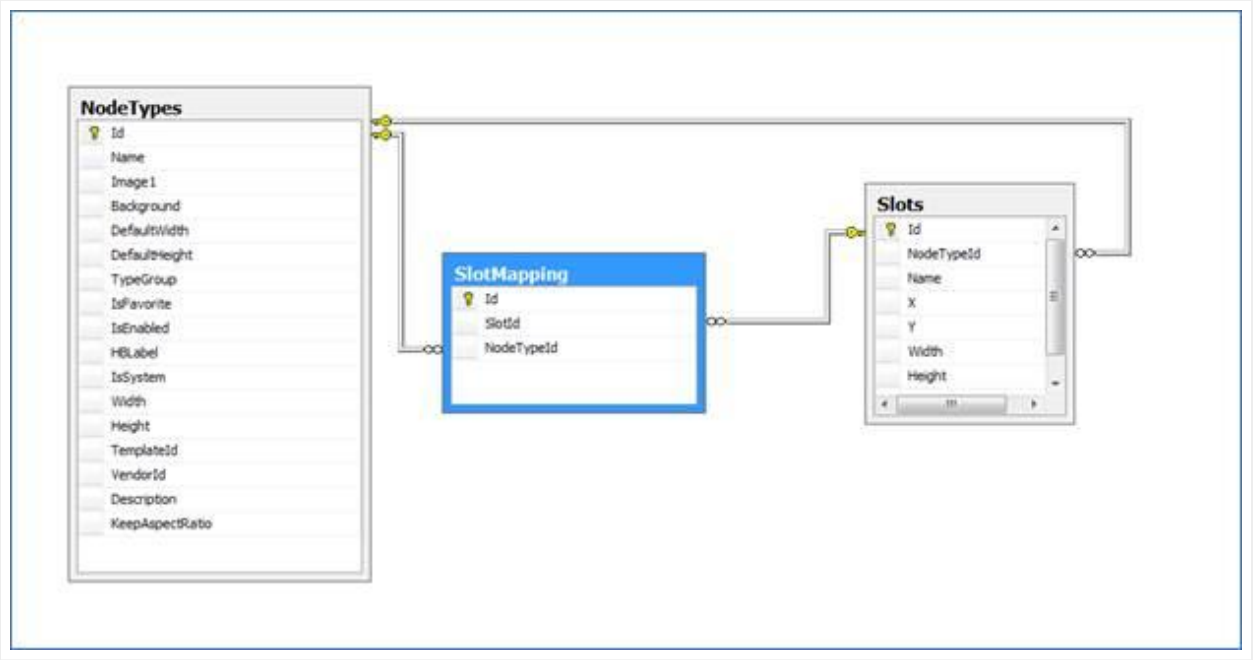
2.2.18.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(100), not null	Name of the tag.
	IsSystem	bit, not null	Flags any system properties for automatic tagging.

2.2.19 Table: [SlotMapping]

This table stores the slot to node type (usually card types) mappings.

2.2.19.1 Related ERD



2.2.19.2 Sample use case

The following query retrieves the slot mapping count on a per device type basis.

```
SELECT nt.Name AS [Device Type], s.Name AS [Slot Name], COUNT(sm.Id)
AS [Mapping Count]

FROM Slots s INNER JOIN NodeTypes nt ON s.NodeTypeId = nt.Id INNER
JOIN SlotMapping sm ON s.Id = sm.SlotId

GROUP BY nt.Name, s.Name, nt.Id, s.Id
```

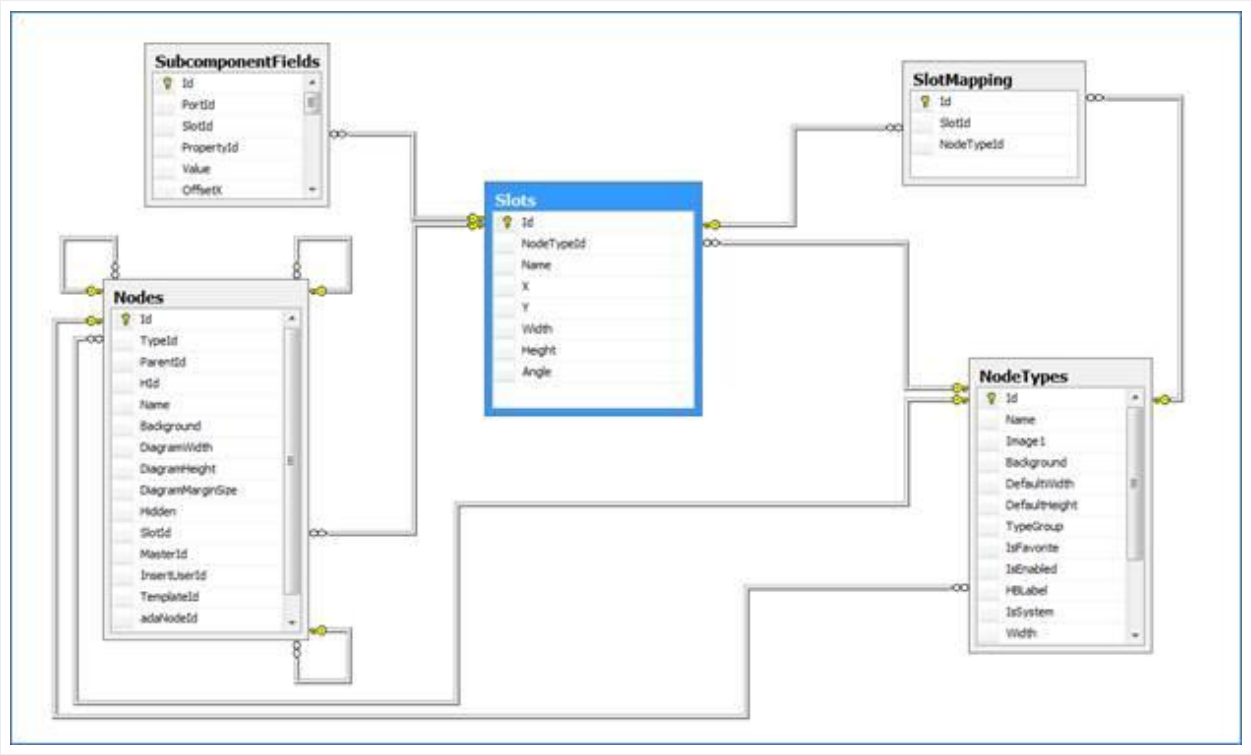
2.2.19.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	SlotId	decimal(14,0), not null	Id of the slot to be mapped.
FK	NodeTypeId	decimal(14,0), not null	Id of the node type to be mapped.

2.2.20 Table: [Slots]

This table stores the slot definitions for each model in the netTerrain catalog.

2.2.20.1 Related ERD



2.2.20.2 Structure

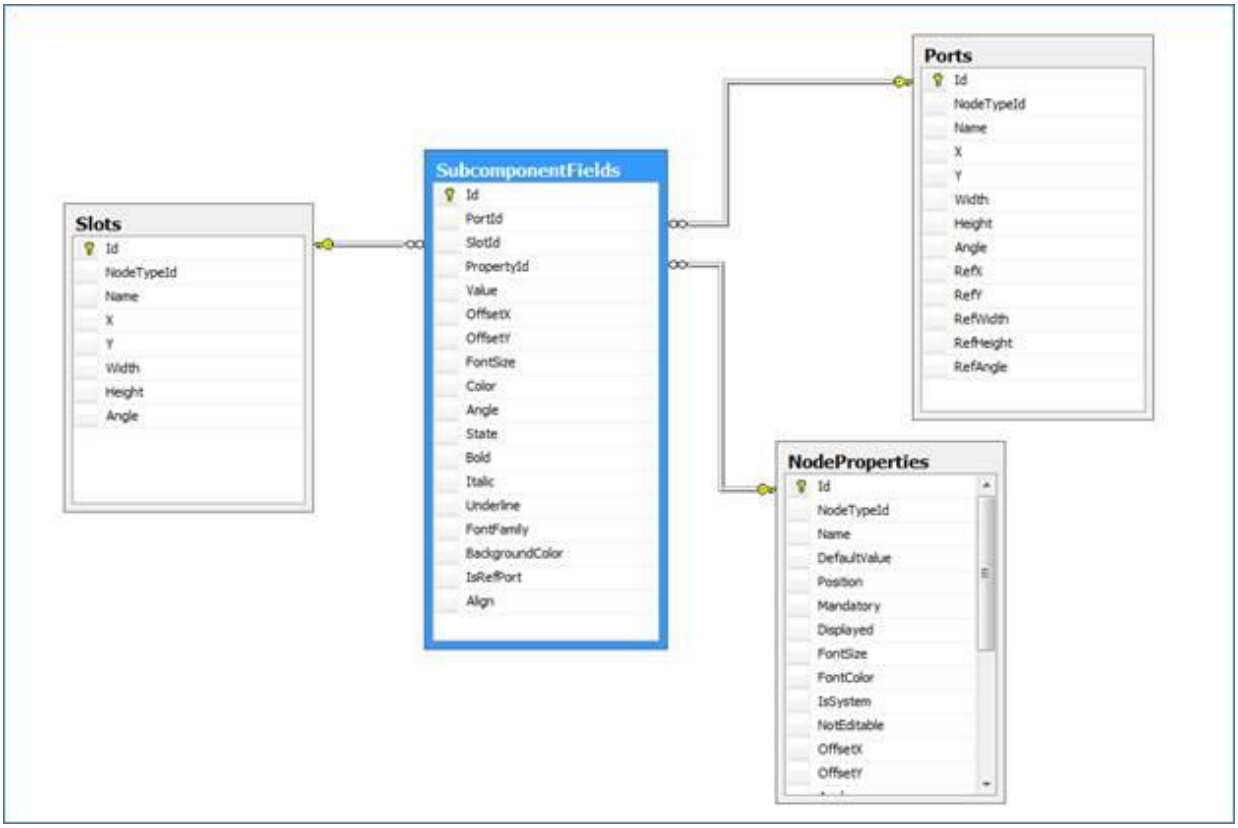
Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	NodeTypeId	decimal(14,0), not null	
	Name	nvarchar(4000), not null	
	X	float, null	X coordinate of the slot object.
	Y	float, null	Y coordinate of the slot object.
	Width	float, null	Width of the slot object.
	Height	float, null	Height of the slot object.

Key	Name	Data Type	Description
	Angle	int, null	Angle of the slot object.

2.2.21 Table: [SubcomponentFields]

This table stores the properties associated with device subcomponents.

2.2.21.1 Related ERD



Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	PortId	decimal(14,0), null	Id of port (if applicable)
FK	SlotId	decimal(14,0), null	Id of slot (if applicable)
FK	PropertyId	decimal(14,0), not null	Id of Property

Key	Name	Data Type	Description
	Value	nvarchar(4000), null	Predefined value for the specific property for the subcomponent
	OffsetX	float, null	X coordinate offset for a displayed field
	OffsetY	float, null	Y coordinate offset for a displayed field
	FontSize	int, null	Font size for a displayed field
	Color	char(7), null	Color for a displayed field
	Angle	int, null	Angle for a displayed field
	State	int, not null	Displayed state
	Bold	bit, null	Boldness for a displayed field
	Italic	bit, null	Italics state for a displayed field
	Underline	bit, null	Underline state for a displayed field
	FontFamily	nvarchar(255), null	Font Family for a displayed field for a displayed field
	BackgroundColor	char(7), null	Fill Color for a displayed field
	IsRefPort	bit, not null	Flag to determine if this is a ref port field
	Align	int, not null	Align state
	Justification	int, not null	Index that determines the type of justification that applies to the text instance

2.2.22 Table: [SublinkListValues]

This table stores all the list values (drop-down values) associated with any custom fields created for sublinks.

Key	Name	Data Type	Description
PK	Id	decimal(14, 0), not null	
FK	PropertyId	decimal(14, 0), not null	Id of property containing list value
	Value	nvarchar(255), not null	List value

2.2.23 Table: [SublinkProperties]

This table stores all the properties (custom fields) created for sublinks.

Key	Name	Data Type	Description
PK	Id	decimal(14, 0), not null	
	Name	nvarchar(255), not null	Property name
	IsSystem	bit, not null	Flag to identify if the property is a system property

2.2.24 Table: [TypeGroups]

This table stores the main categories that node types can be associated with. Currently netTerrain contains the following groups:

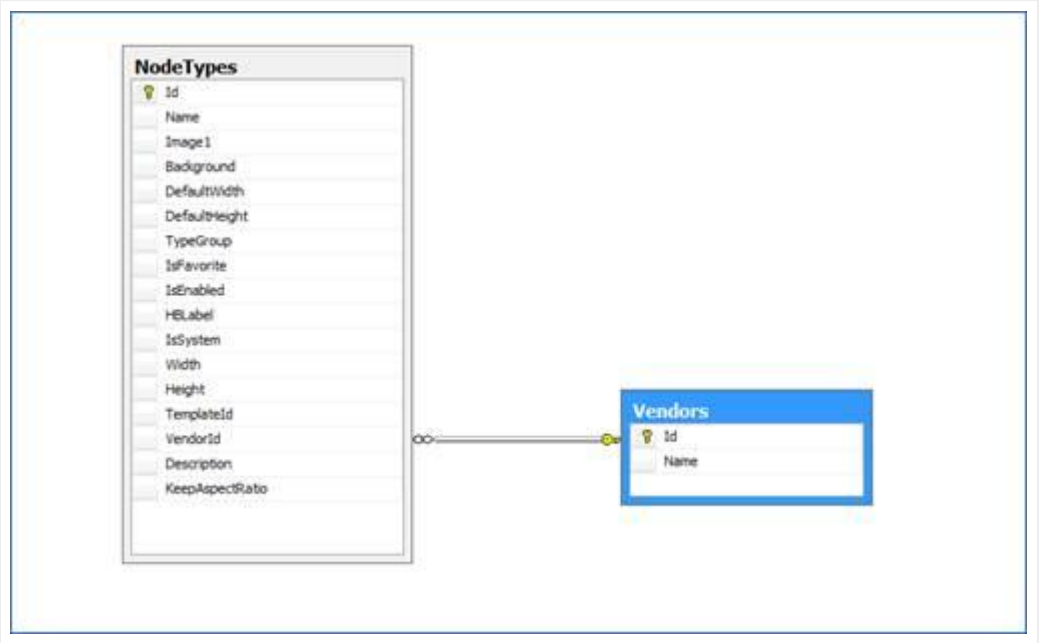
- 1= Generic Node
- 2=document
- 3=comment
- 4= stamp
- 5=shape
- 6= free drawing
- 7=Device
- 8=rack
- 9=port
- 10=slot
- 11=card
- 12 = line node

Key	Name	Data Type	Description
PK	Id	int, not null	Type group id (code).
	Name	nvarchar(255), null	Type group name.

2.2.25 Table: [Vendors]

This table stores vendor names associated with node types.

2.2.25.1 Related ERD



2.2.25.2 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	Vendor name.

2.3 Instance (or project) tables

The instance tables in netTerrain are the tables that contain data related to the project: node and link instances, property values, free text and other instance related data.

2.3.1 Table: [BundledLinksMapping]

This table stores the mapping between bundled links and the corresponding containers.

2.3.1.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	ContainerId	decimal(14,0), not null	The id of the container link
FK	LinkId	decimal(14,0), not null	The id of the bundled link

2.3.2 Table: [CircuitPathHops]

This table is used in the context of Outside Plant (OSP) documentation to store the different hops associated with circuit paths in an OSP circuit.

2.3.2.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	CircuitPathId	decimal(14,0), not null	The id of the path of a given circuit
	OrderInPath	int, not null	The order of the hop within a path
	Sequence		

2.3.3 Table: [CircuitPaths]

This table is used in the context of Outside Plant (OSP) documentation to store the different paths associated with an OSP circuit.

2.3.3.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	CircuitId		

Key	Name	Data Type	Description
		decimal(14,0), not null	The id of the circuit for which the path is defined

2.3.4 Table: [CircuitPropertyValues]

This table stores the actual circuit instance values for each custom property

2.3.4.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	CircuitId	decimal(14,0), not null	Id of the circuit that contains the property value.
FK	PropertyId	decimal(14,0), not null	Id of the property that stores the value.
	Value	nvarchar(4000), null	String that stores the value.

2.3.5 Table: [Circuits]

This table stores all netTerrain circuits. Circuits are not links, but specific point-to-point entities used with netTerrain OSP without a graphical representation in netTerrain.

2.3.5.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(500), not null	
	FromDeviceId	decimal(14,0), not null	Id of starting device.
	ToDeviceId	decimal(14,0), not null	Id of terminating device.

2.3.6 Table: [DevicesLinks]

Link presentation metadata table.

2.3.6.1 Structure

Key	Name	Data Type
PK	Id	decimal(14,0), not null
FK	NodeTypeId	decimal(14,0), not null
FK	TypeId	decimal(14,0), not null
FK	FromPortId	decimal(14,0), not null
FK	ToPortId	decimal(14,0), not null
	IsHidden	bit, null
	Path	nvarchar(MAX)
	FromAnchorPointX	Float
	FromAnchorPointY	Float
	ToAnchorPointX	Float
	ToAnchorPointY	Float

2.3.7 Table: [EmbeddedFiles]

This table stores embedded document information corresponding to objects in the project area.

2.3.7.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	MasterObjectId	decimal(14,0), not null	Id of the object where the document is attached.
	FileName		Title of the document uploaded.

Key	Name	Data Type	Description
		nvarchar(255), not null	
	LockedBy	decimal(14,0), null	When the file is checked out, this will be the id of the user. Otherwise, null.
	DeleteMarker	int, null	

2.3.8 Table: [EmbeddedFilesRevisions]

This table stores revision information corresponding to a record in the EmbeddedFiles table.

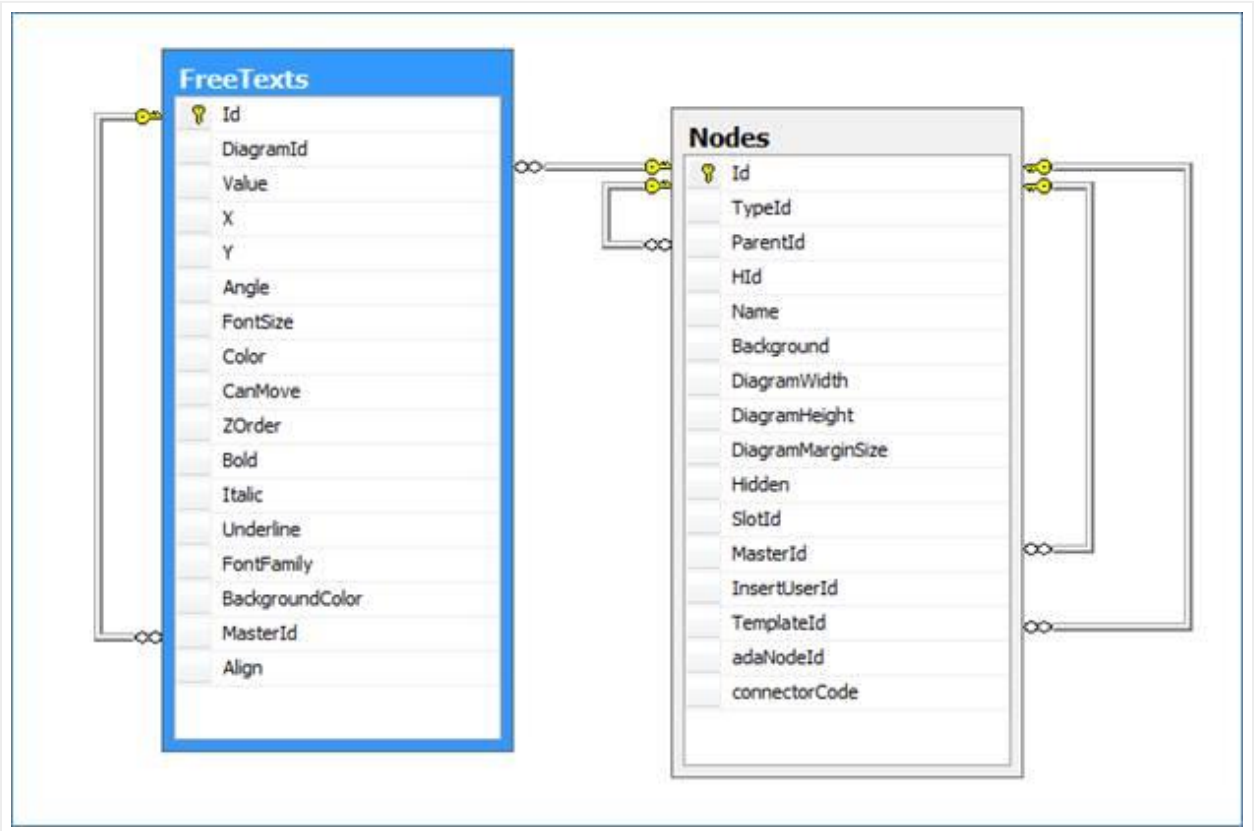
2.3.8.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	EmbeddedFileId	decimal(14,0), not null	Id of the EmbeddedFile record to be mapped.
	Timestamp	datetime2(7), not null	The timestamp of the revision.
	UserId	decimal(14,0), not null	UserId who made the revision.
	ComplexFileName	nvarchar(255), not null	File name as stored in netTerrain.

2.3.9 Table: [FreeTexts]

This table stores all instances of free text in the project.

2.3.9.1 Related ERD



2.3.9.2 Sample use case

The following query shows how to retrieve all text objects that exist on a certain diagram, such as the top level (with Id 24000000000001).

```
SELECT [Value]

FROM FreeTexts

WHERE DiagramId=24000000000001
```

2.3.9.3 Structure

Key	Name	Data Type	Description
PK	Id		

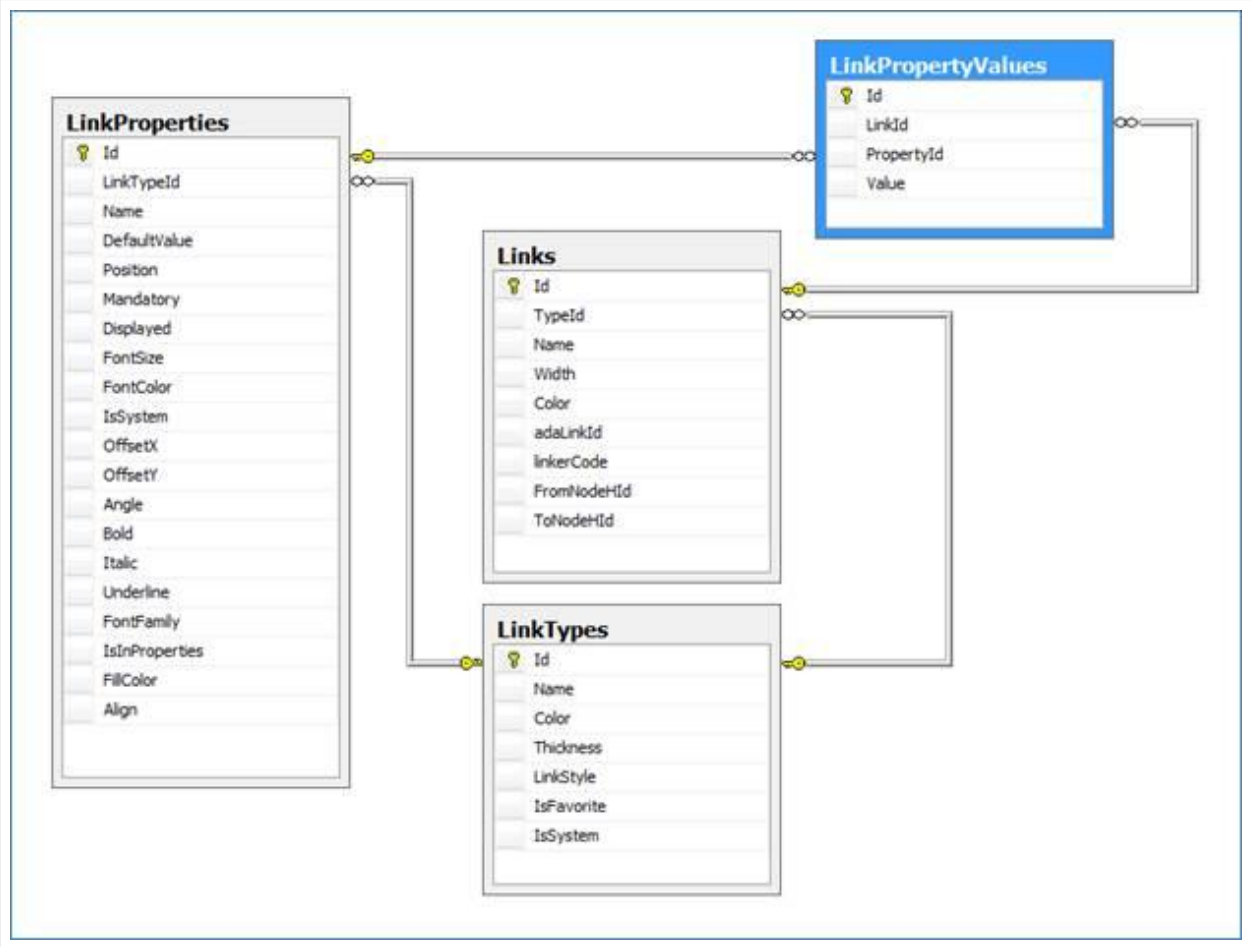
Key	Name	Data Type	Description
		decimal(14,0), not null	
FK	DiagramId	decimal(14,0), not null	Diagram Id that contains the free text instance.
	Value	nvarchar(4000), not null	Free text value.
	X	float, null	Left border x value of the free text rect object. The value is in netTerrain units (hundredths of an inch) and does not account for the page margins.
	Y	float, null	Top border y value of the free text rect object. The value is in netTerrain units (hundredths of an inch) and does not account for the page margins.
	Angle	int, null	Angle of the free text rect object. The unit is in degrees.
	FontSize	int, null	Free text font size.
	Color	char(7), null	Free text font size.
	CanMove	bit, null	Free text color. The values are in HTML hex notation.
	ZOrder	int, null	Z-order of the free text object. A higher number usually means the object is in front of others.
	Bold	bit, null	Free text boldness flag.
	Italic	bit, null	Free text italics flag.
	Underline	bit, null	Free text underline flag.
	FontFamily	nvarchar(255), null	Free text font family, such as 'Arial'.
	BackgroundColor	varchar(7), null	Free text fill color. The values are in HTML hex notation.
FK	MasterId	decimal(14,0), null	Master Id of the free text object, in case it has been aliased.
	Align	int, not null	Free text alignment value.

Key	Name	Data Type	Description
	IsHidden	bit, null	Flag to determine if the free text is hidden on the diagram.
	insertUserId	decimal(14,0), null	Id of the user who inserted the text
	Justification	int, not null	Index that determines the type of justification that applies to the text instance

2.3.10 Table: [LinkPropertyValues]

This table stores the instance values for each property and each link.

2.3.10.1 Related ERD



2.3.10.2 Sample use case

The following query shows how to retrieve the property values just as displayed in the netTerrain properties window for a given link (in this case with id 25000000000011), which also includes NULL values.

```
SELECT lp.Name, lpv.Value

FROM LinkTypes lt INNER JOIN LinkProperties lp ON lt.Id =
lp.LinkTypeId INNER JOIN Links l ON lt.Id = l.TypeId LEFT OUTER JOIN
LinkPropertyValues lpv ON lp.Id = lpv.PropertyId AND l.Id = lpv.LinkId

WHERE l.Id = 25000000000011

ORDER BY lp.Position
```

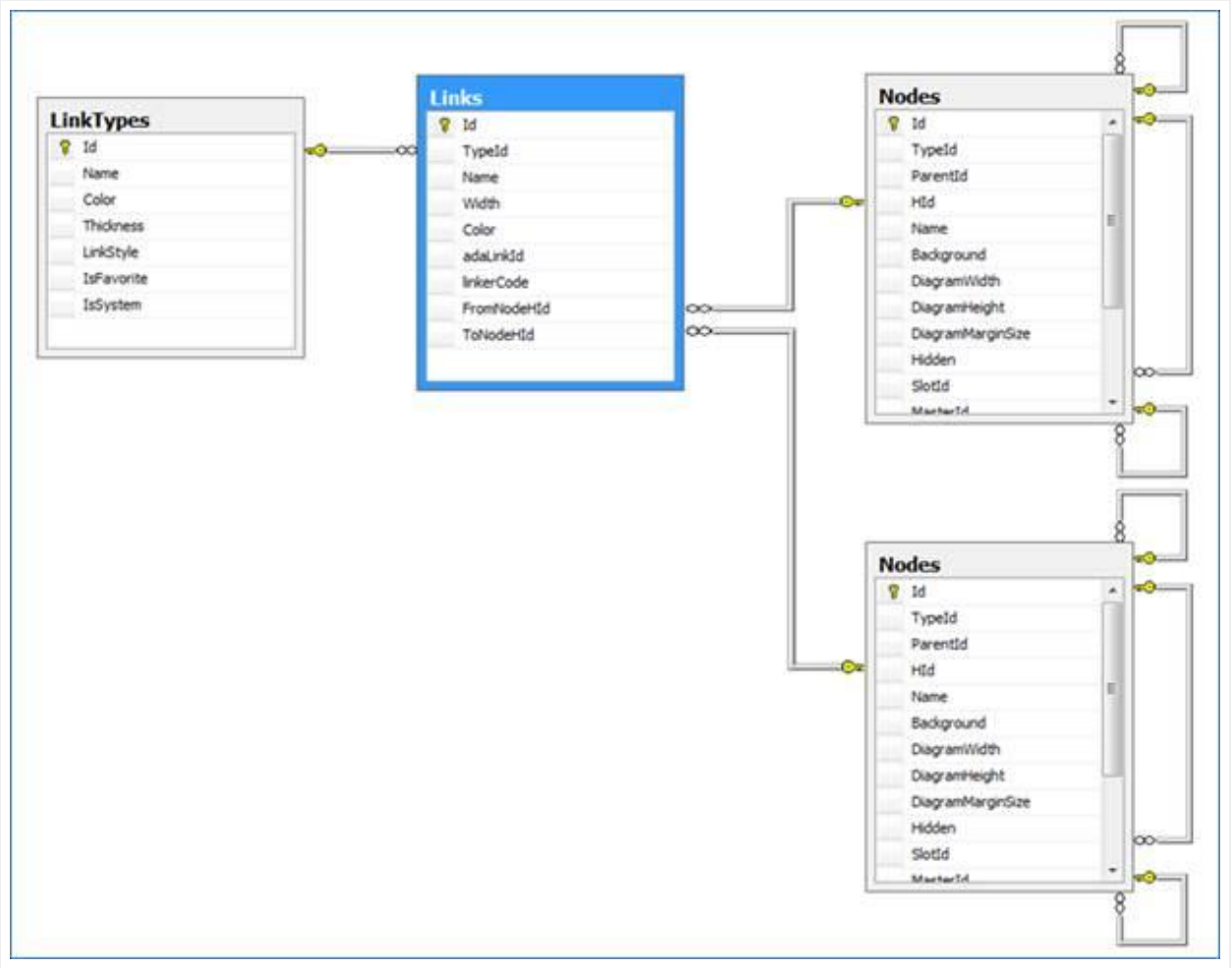
2.3.10.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	LinkId	decimal(14,0), not null	Id of the link that contains the values.
FK	PropertyId	decimal(14,0), not null	Id of the Property that contains the value.
	Value	nvarchar(4000), null	String value.

2.3.11 Table: [Links]

This table stores all instances of links.

2.3.11.1 Related ERD (for node endpoints)

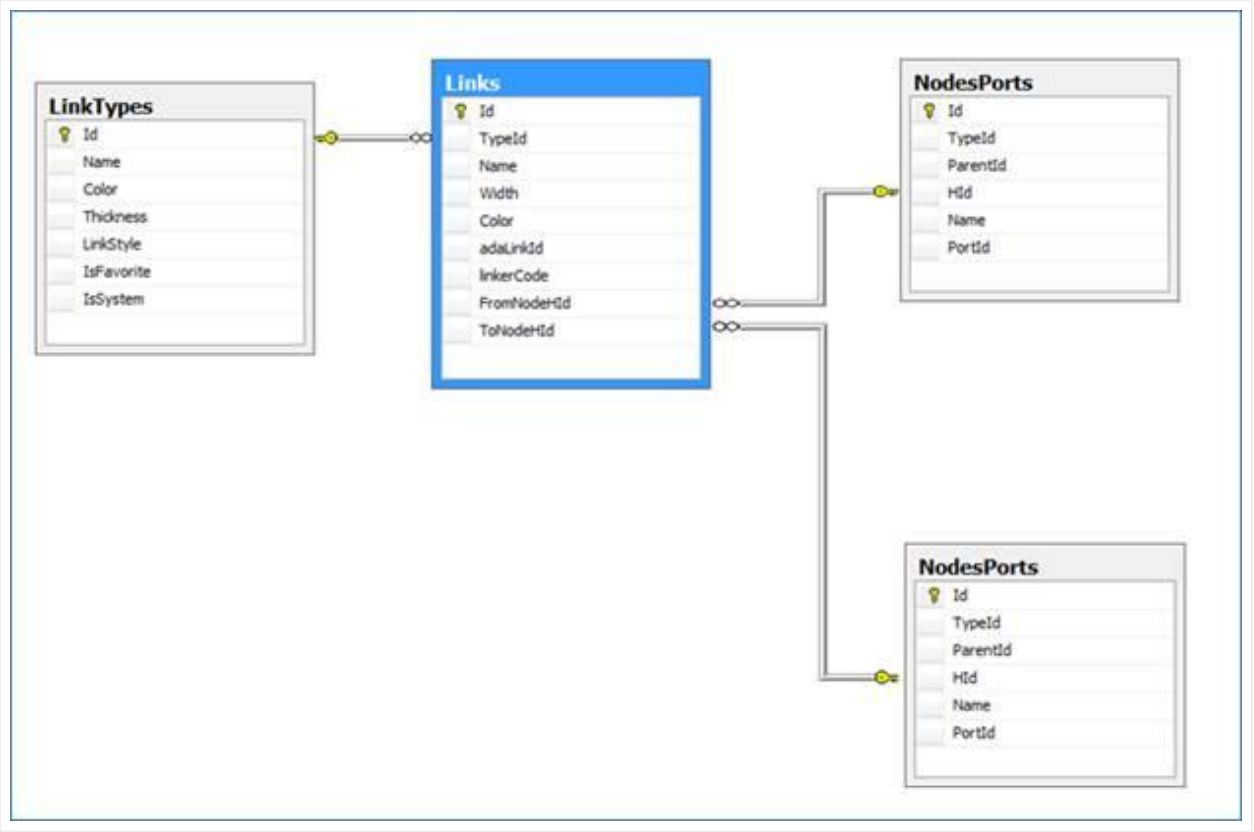


Attention!

Notice that the one-to-many relationship for FromNodeHId and ToNodeHId involves the SQL Server datatype HierarchyId (HId), not the decimal Id of the node endpoints.

Also, this ERD represents the case of links that have node objects as endpoints. Links can also have NodePort objects (NodesPorts table) as endpoints. Therefore, this ERD is not strictly speaking a representation of enforced relationships in the database, but an illustration of how to join endpoints in a SQL statement in case that both endpoints are nodes.

Below is the related ERD for port endpoints but take into account that hybrid scenarios are also possible; in which case querying the database may require unions of 4 possible combinations of endpoint classes.



2.3.11.2 Sample use case

The following query shows how to retrieve the property values just as displayed in the netTerrain properties window for a given link (in this case with id 25000000000011), which also includes NULL values.

```
SELECT lp.Name, lpv.Value

FROM LinkTypes lt INNER JOIN LinkProperties lp ON lt.Id =
lp.LinkTypeId INNER JOIN Links l ON lt.Id = l.TypeId LEFT OUTER JOIN
LinkPropertyValues lpv ON lp.Id = lpv.PropertyId AND l.Id = lpv.LinkId

WHERE l.Id = 25000000000011

ORDER BY lp.Position
```

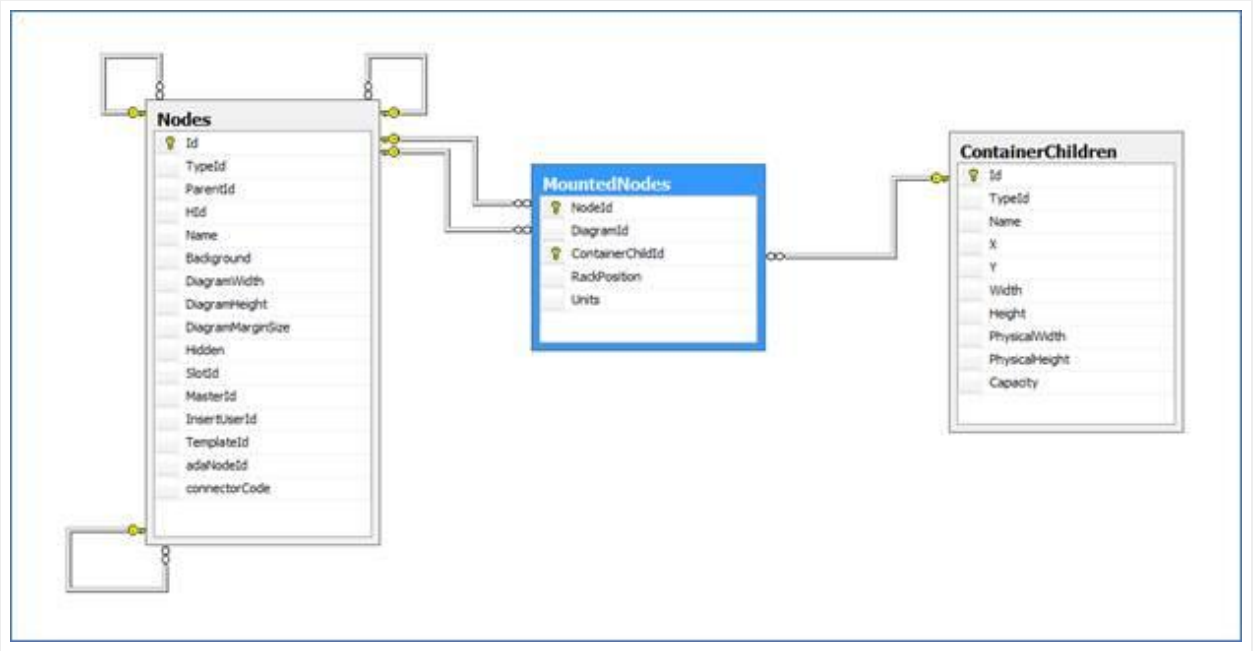
2.3.11.3 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	TypeId	decimal(14,0), not null	Type Id of the link.
	Name	nvarchar(4000), null	Link name.
	Width	float, null	Instance width.
	Color	int, null	Instance color.
	adaLinkId	nvarchar(255), null	Reconciliation field, when links are imported using the ITK.
	linkerCode	int, null	Linker code field, when links are imported using the ITK.
	FromNodeHId	hierarchyid, null	HierarchyId of starting Node (regular nodoe or port).
	ToNodeHId	hierarchyid, null	HierarchyId of ending Node (regular nodoe or port).
	ExcludeFROMACRA	bit, not null	Flag to determine if a link should be excluded from an automated circuit routing algorithm calculation
	CollectorId	nvarchar(255), null	Id of the collector that imported that link in case it was discovered by a collector process.

2.3.12 Table: [MountedNodes]

This table stores all devices that are rack mounted.

2.3.12.1 Related ERD



2.3.12.2 Sample use case

The following query shows how to retrieve all mounted devices that use 10 or more rack units.

```
SELECT

  '<a href="http://localhost/i/Diagram/'+ CONVERT(varchar, prnt.Id) +
'?blink=' + CONVERT(varchar, n.Id) + '">Show on diagram</a>' as url,

 n.Id,

 n.ParentId,

 nt.Name AS [Device Type],

 n.Name,

 prnt.Name AS Rack,

 mn.RackPosition,

 mn.Units AS [Units Used]
```

```
FROM Nodes n

INNER JOIN NodeTypes nt ON nt.Id = n.TypeId

INNER JOIN Nodes prnt ON prnt.Id = n.ParentId

INNER JOIN MountedNodes mn ON n.Id=mn.NodeId

WHERE mn.Units>=10
```

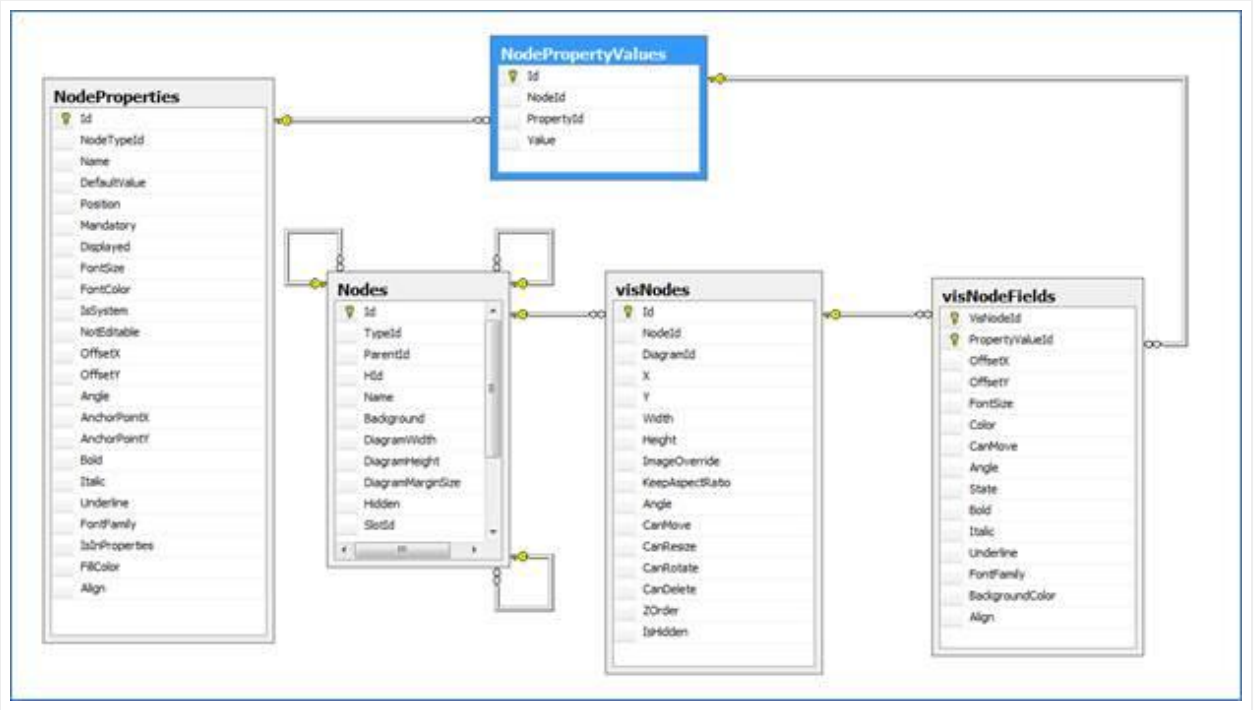
2.3.12.3 Structure

Key	Name	Data Type	Description
FK	NodeId	decimal(14,0), not null	Id of the mounted node.
FK	DiagramId	decimal(14,0), null	Rack diagram that contains the mounted node.
FK	ContainerChildId	decimal(14,0), not null	The rack container id that contains the mounted node.
	RackPosition	float, not null	Rack position of device.
	Units	float, not null	Number of units that device occupies on the container.
PK	Id	decimal(14,0), not null	

2.3.13 Table: [NodePropertyValues]

This table stores each value associated for each node and property. Note that property values that never had a non-null value for a given node are not stored.

2.3.13.1 Related ERD



2.3.13.2 Sample use case

The following query retrieves all node property values formatted as an IP address.

```
SELECT n.id, npv.Value AS [IP Address], nt.Name AS [Node Type],
n.Name AS [Node Name]

FROM NodeProperties np INNER JOIN NodeTypes nt ON np.NodeTypeId=nt.Id

INNER JOIN Nodes n ON nt.Id=n.TypeId INNER JOIN NodePropertyValues
npv ON npv.NodeId=n.Id

WHERE npv.PropertyId=np.Id AND np.Name LIKE '%ip%' AND np.Name LIKE
'%address%'

AND npv.Value LIKE '%_.%_.%_.%_' AND npv.Value NOT LIKE '%.%.%.%.%'
AND npv.Value NOT LIKE '%[^0-9.]%'

AND npv.Value NOT LIKE '%[0-9][0-9][0-9][0-9]%' AND npv.Value NOT
LIKE '%[3-9][0-9][0-9]%'
```

```
AND npv.Value NOT LIKE '%2[6-9][0-9]%' AND npv.Value NOT LIKE
'%25[6-9]%'

ORDER BY CAST(PARSENAME(npv.Value, 4) AS INT),
CAST(PARSENAME(npv.Value, 3) AS INT), CAST(PARSENAME(npv.Value, 2) AS
INT), CAST(PARSENAME(npv.Value, 1) AS INT), n.Name
```

The following query retrieves all repeated IP addresses and their count.

```
SELECT COUNT(npv.Id) AS IP_Count, npv.Value

FROM NodePropertyValues npv INNER JOIN NodeProperties np ON
npv.PropertyId=np.Id

WHERE np.Name LIKE '%ip%' AND np.Name LIKE '%address%'

AND npv.Value LIKE '%_.%_.%_.%_' AND npv.Value NOT LIKE '%.%.%.%.%'
AND npv.Value NOT LIKE '%[^0-9.]%'

AND npv.Value NOT LIKE '%[0-9][0-9][0-9][0-9]%' AND npv.Value NOT
LIKE '%[3-9][0-9][0-9]%'

AND npv.Value NOT LIKE '%2[6-9][0-9]%' AND npv.Value NOT LIKE
'%25[6-9]%'

GROUP BY Value

HAVING COUNT(npv.Id) > 1
```

2.3.13.3 Structure

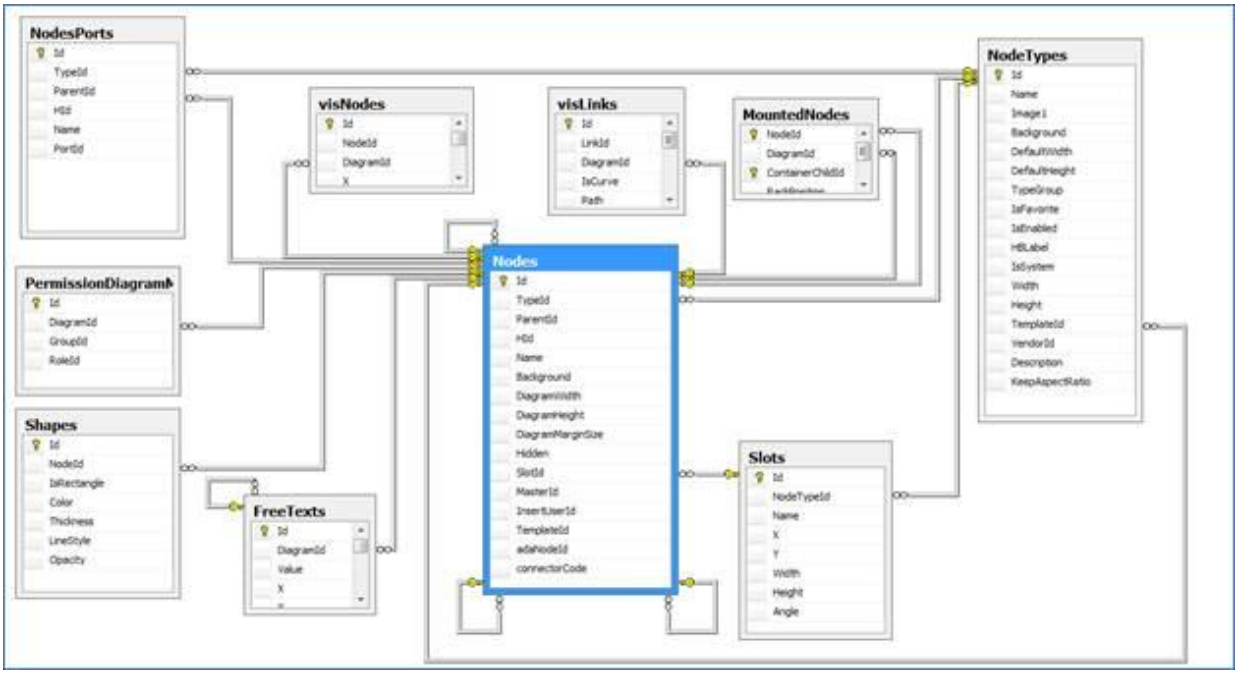
Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	NodeId	decimal(14,0), not null	Id of the node that contains the property value.
FK	PropertyId	decimal(14,0), not null	Id of the property that stores the value.

Key	Name	Data Type	Description
	Value	nvarchar(4000), null	String that stores the value.

2.3.14 Table: [Nodes]

This table stores all node instances in the netTerrain project.

2.3.14.1 Related ERD



2.3.14.2 Sample use case

The following query retrieves all devices that have at least one port connected to another device.

```
SELECT a.url,

       a.Id,

       a.[Device Type],

       a.[Device Name],
```

```
        a.[Parent Diagram],

        MAX(a.[Link count]) AS LinkCount

FROM

(

SELECT DISTINCT

  '<a href="http://localhost/i/Diagram/'+ CONVERT(varchar,
n.ParentId) + '?blink=' +

 CONVERT(varchar, n.Id) + '">Show on diagram</a>' as url, n.Id,

 nt.Name AS [Device Type], n.Name AS [Device Name], n1.Name AS
[Parent Diagram], COUNT(l.Id) AS [Link count]

FROM Nodes n INNER JOIN NodeTypes nt ON n.TypeId = nt.Id INNER JOIN
NodesPorts np ON n.Id = np.ParentId

INNER JOIN Links l ON np.HId = l.FromNodeHId INNER JOIN Nodes n1 ON
n.ParentId = n1.Id INNER JOIN

NodesPorts np1 ON l.ToNodeHId = np1.HId

WHERE nt.TypeGroup = 7 AND np.ParentId!=np1.ParentId

GROUP BY '<a href="http://localhost/i/Diagram/'+ CONVERT(varchar,
n.ParentId) + '?blink=' + CONVERT(varchar, n.Id) + '">Show on
diagram</a>', n.Id, nt.Name, n.Name, n1.Name

UNION

SELECT DISTINCT

 '<a href="http://localhost/i/Diagram/'+ CONVERT(varchar, n.ParentId)
+ '?blink=' +

 CONVERT(varchar, n.Id) + '">Show on diagram</a>' as url, n.Id,
nt.Name AS [Device Type], n.Name AS [Device Name], n1.Name AS [Parent
Diagram], COUNT(l.Id) AS [Link count]
```

```
FROM Nodes n INNER JOIN NodeTypes nt ON n.TypeId = nt.Id INNER JOIN
NodesPorts np ON n.Id = np.ParentId

INNER JOIN Links l ON np.HId = l.ToNodeHId INNER JOIN Nodes n1 ON
n.ParentId = n1.Id INNER JOIN

NodesPorts np1 ON l.FromNodeHId = np1.HId

WHERE nt.TypeGroup = 7 AND np.ParentId!=np1.ParentId

GROUP BY '<a href="http://localhost/i/Diagram/'+ CONVERT(varchar,
n.ParentId) + '?blink=' + CONVERT(varchar, n.Id) + '">Show on
diagram</a>', n.Id, nt.Name, n.Name, n1.Name

) a

GROUP BY a.url, a.Id, a.[Device Type], a.[Device Name], a.[Parent
Diagram]
```

2.3.14.3 Structure

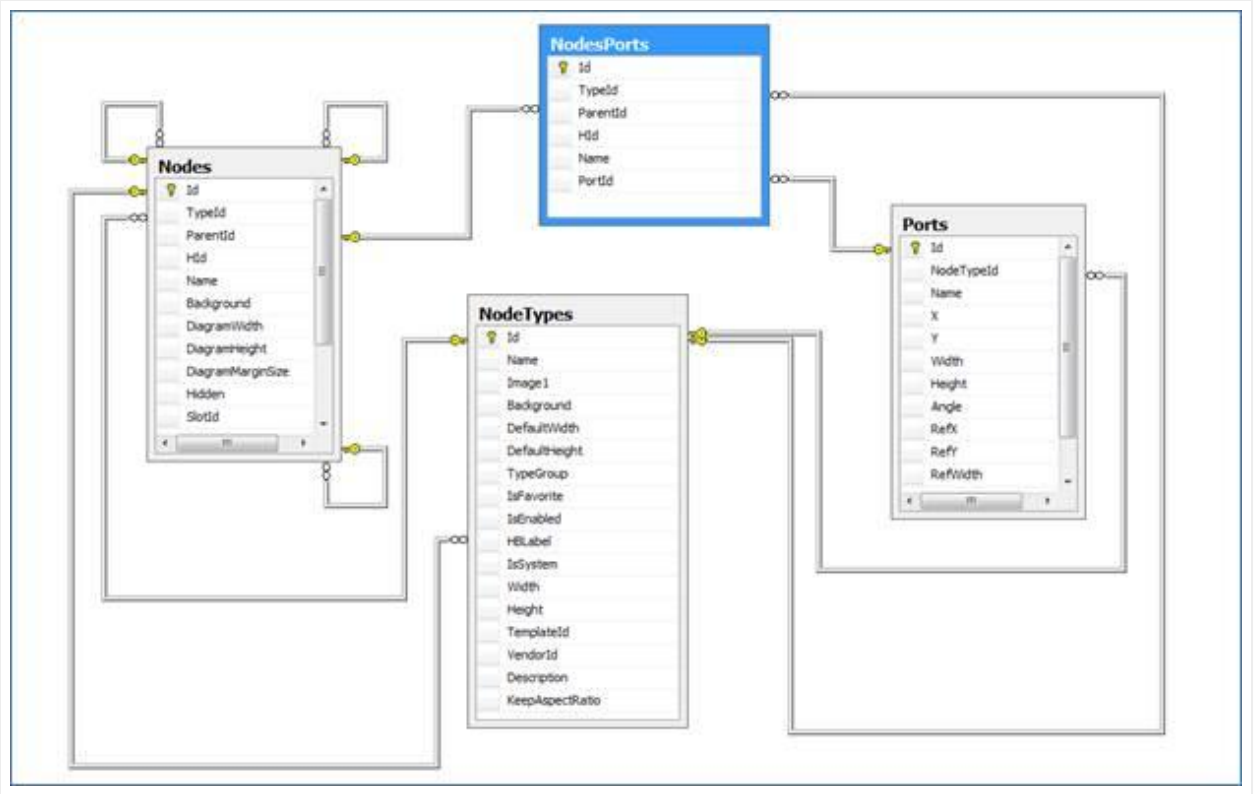
Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	TypeId	decimal(14,0), null	Id of the node type.
FK	ParentId	decimal(14,0), null	Id of the parent that contains the node.
	HId	hierarchyid, null	HierarchyId of the node.
	Name	nvarchar(4000), not null	Node name.
	Background	nvarchar(255), null	Background image file name.
	DiagramWidth	float, null	Width of the diagram associated with the node.
	DiagramHeight	float, null	Height of the diagram associated with the node.
	DiagramMarginSize	float, null	

Key	Name	Data Type	Description
			Margin size of the diagram associated with the node.
	Hidden	nvarchar(255), null	Hidden flag.
FK	SlotId	decimal(14,0), null	Id of the corresponding slot type, if applicable.
FK	MasterId	decimal(14,0), null	Id of the master node, if applicable (when node is an alias).
	InsertUserId	decimal(14,0), null	User id that created the node.
FK	TemplateId	decimal(14,0), null	Id of the template diagram, if applicable.
	adaNodeId	nvarchar(255), null	Id of node in the ITK table, if applicable.
	connectorCode	int, null	Id of the connector, if node was inserted by the ITK.
	isBlocked	bit, not null	Flag to determine the blocking status of a node.
	RackOverrideType	tinyint, null	Override attribute related to racks.
	ShowContainerChildren	bit, not null	
	DClickBehavior	nvarchar(255), not null	The specified double click action.
	MapCoordLeft	float, null	Stores GIS coordinate data.
	MapCoordTop	float, null	Stores GIS coordinate data.
	MapCoordRight	float, null	Stores GIS coordinate data.
	MapCoordBottom	float, null	Stores GIS coordinate data.
	MapUnitsType	int, null	Type of unit used for mapped based diagrams.
	DynamicMapsSupport	bit, null	Flag to determine if this is a dynamic (OSM) map.
	AutoLayoutState	smallint, null	

Key	Name	Data Type	Description
			Number specifying the auto layout algorithm to use when accessing the diagram.
	MapSource	int, null	GIS map source.
	DisplayGrid	bit, null	Display Grid flag.
	SnapToGrid	bit, null	Snap to Grid flag.
	GridSpacingX	float, null	Grid spacing in the x coordinate.
	GridSpacingY	float, null	Grid spacing in the y coordinate.
	PageColor	char(7), null	
	OverrideTemplateGrid	bit, null	
	ReadOnlyForNonAdmins	bit, null	
	CollectorId	nvarchar(255), null	Id of the collector that imported that node in case it was discovered by a collector process.
	AutoResizeState	Smallint, not null	
	ShowHalos	Bit, not null	Flag to determine if the diagram should show halos for nodes that are zoomed out a lot.
	ShowClusters	Bit, not null	Flag to determine if the diagram should show clusters for node groupings.
	ImageOverride	nvarchar(255), null	

2.3.15 Table: [NodesPorts]

This table contains all instances of ports in the netTerrain project. This table should not be confused with the ports table, which contains all the port definitions for the models in the netTerrain catalog.



2.3.15.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	TypeId	decimal(14,0), not null	Device type Id.
FK	ParentId	decimal(14,0), null	Id of the parent device.
	HId	hierarchyid, null	HierarchyId of the port.
	Name	nvarchar(4000), not null	Name of the port instance.
FK	PortId	decimal(14,0), not null	Id of the port definition in the netTerrain catalog,
	IsBlockedForPatching	bit, not null	
	IsInUse	bit, not null	

2.3.16 Table: [Patches]

This table stores all patches associated with circuit definitions in the netTerrain project.

2.3.16.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	CircuitPathId	decimal(14,0), not null	Circuit Path associated with the patch
	PatchId	decimal(14,0), not null	
	FromCrossConnectionId	decimal(14,0), null	
	ToCrossConnectionId	decimal(14,0), null	
	FromHopId	decimal(14,0), null	
	ToHopId	decimal(14,0), null	

2.3.17 Table: [PredefinedSublinkPropertyValues]

This table stores the values for all custom properties used for sublinks (strands).

2.3.17.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	SublinkId	decimal(14,0), not null	Id of the related sublink
FK	PropertyId	decimal(14,0), null	Id of the related property
FK	Value	decimal(14,0), null	Stored value

2.3.18 Table: [PredefinedSublinks]

This table stores all strand instances.

2.3.18.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	LinkTypeId	decimal(14, 0), not null	If of the parent Link type
	Name	nvarchar(4000), null	Name of the strand
	Color	char(7), null	Strand color
	Mode	tinyint, null	Strand mode (inherited from cable)
	BufferColor	char(7), null	Buffer color (inherited from cable)

2.3.19 Table: [PropertyValueEvents]

This table stores events that were triggered by a value change in netTerrain.

2.3.19.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	ObjectId	decimal(14, 0), not null	
	EventTypeId	decimal(14, 0), not null	
	AffectedUserId	decimal(14, 0), not null	
	TimeReceived	datetime2(7), not null	
	AcknowledgedUserId	decimal(14, 0), null	
	AcknowledgedTime	datetime2(7), null	
	IsCleared	bit, not null	
	Notes	nvarchar(500), null	

2.3.20 Table: [RackAudits]

This table stores the audit processes done through the mobile app.

2.3.20.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	UserId	decimal(14, 0), not null	
	Date	date, not null	
	RackId	decimal(14, 0), not null	

2.3.21 Table: [RackAuditsNotFoundBarcodes]

This table stores the records of barcodes not found during an audit process done through the mobile app.

2.3.21.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	AuditId	decimal(14, 0), not null	
	Barcode	nvarchar(255), not null	

2.3.22 Table: [SublinkPropertyValues]

This table stores all the values for all custom fields created for sublinks (strands).

2.3.22.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	SublinkId	decimal(14, 0), not null	If of the strand

Key	Name	Data Type	Description
FK	PropertyId	decimal(14, 0), not null	Id of the associated property
	Value	nvarchar(4000), null	Strand color

2.3.23 Table: [Sublinks]

This table stores the collection of strands.

2.3.23.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	LinkId	decimal(14,0), not null	Id of the parent link containing the strand
	Name	nvarchar(4000), null	Name of the strand
FK	FromPortId	decimal(14,0), null	Id of the starting port for the strand
FK	ToPortId	decimal(14,0), null	Id of the ending port for the strand
FK	PredSublinkId	decimal(14,0), not null	Id of the predefined sublink associated with the link type that produces the strands
	ExcludeFROMACRA	bit, not null	Flag to determine if sublink should be excluded from any ACRA calculations
	Status	tinyint, not null	Strand status value
	IsBlockedForPatching	bit, not null	Flag to determine if that strand should be excluded from a patching process
	Mode	tinyint, null	Strand mode (inherited from strand type)

2.3.24 Table: [SublinkSegments]

This table stores the collection of strand segments.

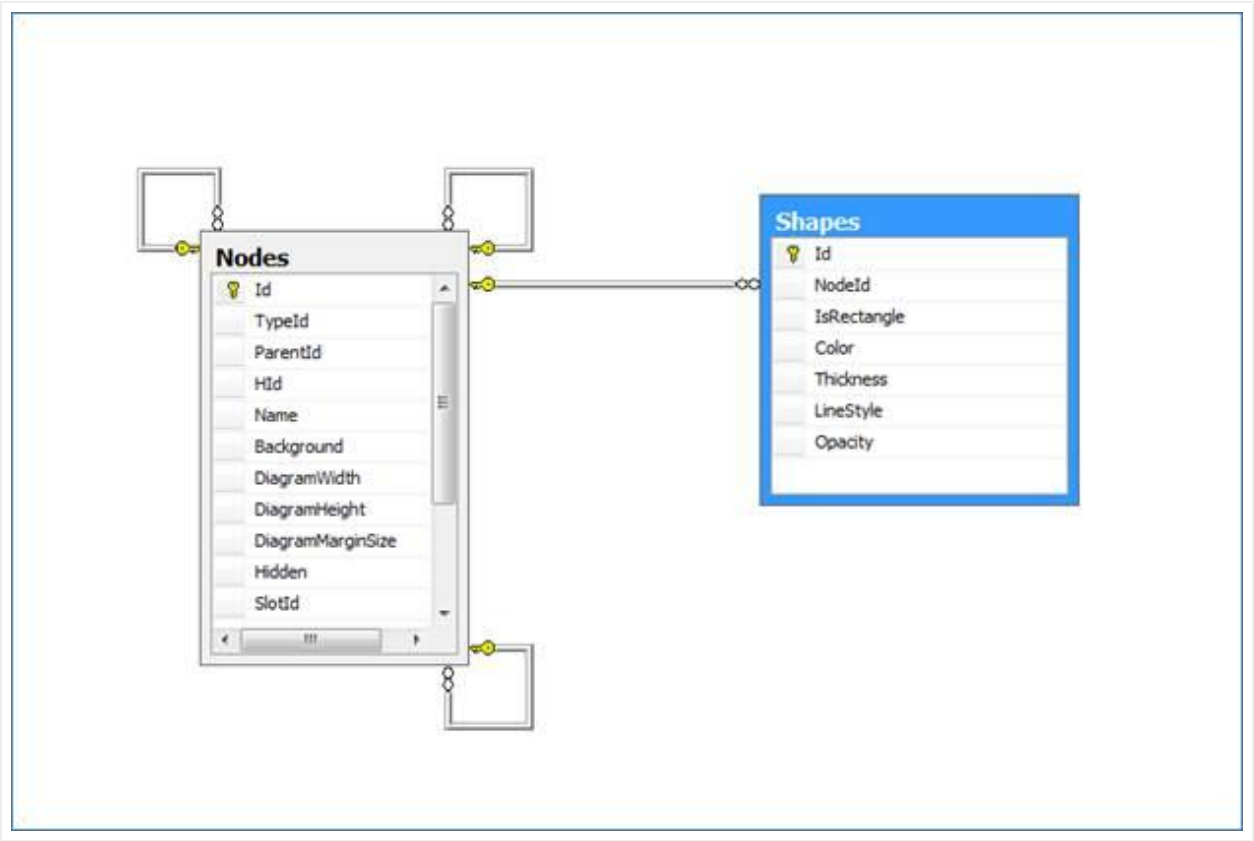
2.3.24.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	SublinkId	decimal(14,0), not null	Id of the parent sublink containing the segment
FK	FromPortId	decimal(14,0), null	Id of the starting port for the segment
FK	ToPortId	decimal(14,0), null	Id of the ending port for the segment
	Index	tinyint, not null	
	IsBlockedForPatching	bit, not null	Flag to determine if that segment should be excluded from patching

2.3.25 Table: [Shapes]

This table stores all shape definitions in the netTerrain project.

2.3.25.1 Related ERD



2.3.25.2 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	NodeId	decimal(14,0), not null	Diagram containing the shape
	Color	char(7), null	
	Thickness	int, null	
	LineStyle	int, null	
	Opacity	float, null	
	ShapeType	int, not null	
	Line Color	char(7), null	

2.3.26 Table: [WorkOrders]

This table stores all the work orders created in the project.

2.3.26.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	Name	nvarchar(255), not null	WO name
	UserId	decimal(14,0), not null	If of user that owns the WO
	DueDate	date, not null	
	IsArchived	bit, null	
	Read	bit, null	
	ReadThatOverdue	bit, null	
	Comments	nvarchar(4000), null	

2.3.27 Table: [WorkOrderTasks]

This table stores all the work order tasks created in the project.

2.3.27.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	WorkorderId	decimal(14,0), not null	Parent work order Id
	Objectid	decimal(14,0), not null	Object associated with the task
	Type	tinyint, not null	Type of task (insert, update, delete)
	Name	nvarchar(255), not null	Task name
	UserId	decimal(14,0), not null	If of user that owns the WO task
	DueDate	date, not null	

Key	Name	Data Type	Description
	Status	tinyint, not null	Status of task (due, closed, etc.)
	Read	bit, null	
	ReadThatOverdue	bit, null	
	Comments	nvarchar(4000), null	
	LocalizeName	bit, not null	
	SpentTime	decimal(5, 2)	

2.4 Vis tables

The so called 'vis' tables contain the actual representation of netTerrain objects on diagrams. We do not recommend using these tables for data extraction.

2.4.1 Table: [visLinkFields]

2.4.1.1 Structure

Key	Name	Data Type	Description
PK ,FK	VisLinkId	decimal(14,0), not null	Link described in the table
PK ,FK	PropertyValueId	decimal(14,0), not null	Property id of the displayed field
	OffsetX	float, null	
	OffsetY	float, null	
	FontSize	int, null	
	CanMove	bit, null	
	Color	char(7), null	
	State	int, not null	
	Angle	int, null	
	Bold	bit, null	
	Italic	bit, null	

Key	Name	Data Type	Description
	Underline	bit, null	
	FontFamily	nvarchar(255), null	
	BackgroundColor	varchar(7), null	
	Align	int, not null	
	Anchor	int, not null	
	UprightAlignment	bit, not null	
	IsNew	bit, not null	
	Justification	int, not null	
	Id	decimal(14,0), not null	

2.4.2 Table: [visLinks]

2.4.2.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
FK	LinkId	decimal(14,0), not null	Link described in the table
FK	DiagramId	decimal(14,0), not null	Diagram containing link (local starting position)
	IsCurve	bit, null	
	Path	nvarchar(max), null	
	FromAnchorPointX	float, not null	
	FromAnchorPointY	float, not null	
	ToAnchorPointX	float, not null	
	ToAnchorPointY	float, not null	
	CanDelete	bit, null	

Key	Name	Data Type	Description
	CanMove	bit, null	
	ZOrder	int, null	
	IsHidden	bit, null	
	SnappedToEdge	bit, not null	

2.4.3 Table: [visNodeFields]

2.4.3.1 Structure

Key	Name	Data Type	Description
PK,FK	VisNodeId	decimal(14,0), not null	Node described in the table
PK,FK	PropertyValueId	decimal(14,0), not null	Property id of the displayed field
	OffsetX	float, null	
	OffsetY	float, null	
	FontSize	int, null	
	Color	char(7), null	
	CanMove	bit, null	
	Angle	int, null	
	State	int, not null	
	Bold	bit, null	
	Italic	bit, null	
	Underline	bit, null	
	FontFamily	nvarchar(255), null	
	BackgroundColor	varchar(7), null	
	Align	int, not null	
	Justification	int, not null	
	Id	decimal(14,0), not null	

2.4.4 Table: [visNodes]

2.4.4.1 Structure

Key	Name	Data Type	Description
PK	Id	decimal(14,0), not null	
	NodeId	decimal(14,0), not null	Node described in the table
FK	DiagramId	decimal(14,0), not null	Diagram containing node
	X	float, null	
	Y	float, null	
	Width	float, null	
	Height	float, null	
	KeepAspectRatio	bit, null	
	Angle	int, null	
	CanMove	bit, null	
	CanResize	bit, null	
	CanRotate	bit, null	
	CanDelete	bit, null	
	ZOrder	int, null	
	IsHidden	bit, null	
	isNew	bit, not null	

2.5 Integration Toolkit (ITK) tables

The ITK tables are a set of tables used to store discovered data and application metadata for the proper functioning of the ITK. The ITK is slowly being replaced by the netTerrain collector, which doesn't normally persist data in this database, so the use of these tables is going to be very limited moving forward. All ITK tables start with the prefix 'ada'.

ITK tables contain preprocessed data, before it is reconciled with the core netTerrain tables (such as the Nodes and the Links tables). Even if you use the ITK, we do not recommend consuming data from these

tables except for some rare instances (such as reporting of raw data or creating connectors against ITK imported records), instead, refer to the tables that contain instance data.

2.5.1 Table: [adaAppSettings]

This table contains the settings for the ITK, which are set through the 'Application settings' dialog in the ITK.

2.5.1.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
	pollingCycle	nvarchar(255), null
	discoveryCycle	nvarchar(255), null
	recordsPerPage	int, null
	serverUrl	nvarchar(255), null
	runUponActivation	nvarchar(255), null
	startAt	time(7), null
	startOn	nvarchar(255), null
	silentMode	nvarchar(255), null
	outputBuffer	nvarchar(255), null
	genericObjects	nvarchar(255), null

2.5.2 Table: [adaAwsBuckets]

This table is the first of a series of tables that stores information that the ITK discovers from AWS. The netTerrain collector (which mostly replaces the ITK) has a much more thorough AWS import and monitoring process so the usage of these tables will be limited.

This table collects AWS information about buckets and could be useful to create custom connectors to display AWS buckets in netTerrain.

2.5.2.1 Structure

Key	Name	Data Type
PK	Name	nvarchar(255), not null
	CreationDate	nvarchar(50), null

2.5.3 Table: [adaAwsHealthChecks]

This table collects AWS information about health checks and could be useful to create custom connectors to display AWS health checks in netTerrain.

2.5.3.1 Structure

Key	Name	Data Type
PK	Id	nvarchar(255), not null
	HealthCheckVersion	nvarchar(255), null
	HealthCheckConfig	nvarchar(255), null

2.5.4 Table: [adaAwsInstances]

This table collects AWS information about discovered AWS instances. The ITK creates a predefined connector for AWS instances when initializing the AWS utility, which imports instances into netTerrain.

2.5.4.1 Structure

Key	Name	Data Type
PK	Id	nvarchar(255), not null
	RegionName	nvarchar(800), null
	PublicDnsName	nvarchar(800), null
	PrivateDnsName	nvarchar(800), null
	PublicIpAddress	nvarchar(800), null
	PrivateIpAddress	nvarchar(800), null

Key	Name	Data Type
	NetworkInterfaces	nvarchar(800), null
	Platform	nvarchar(800), null
	RootDeviceName	nvarchar(800), null
	RootDeviceType	nvarchar(800), null
	State	nvarchar(800), null
	VirtualizationType	nvarchar(800), null
	LaunchTime	nvarchar(800), null
	KeyName	nvarchar(800), null
	Monitoring	nvarchar(800), null
	Tag0	nvarchar(800), null

2.5.5 Table: [adaAwsRegions]

This table stores the AWS regions.

2.5.5.1 Structure

Key	Name	Data Type
PK	Endpoint	nvarchar(255), not null
	Name	nvarchar(800), null

2.5.6 Table: [adaAwsSecurityGroups]

This table collects AWS information about security groups and could be useful to create custom connectors to display AWS security groups in netTerrain.

2.5.6.1 Structure

Key	Name	Data Type
PK	Id	nvarchar(50), not null

Key	Name	Data Type
	GroupName	nvarchar(800), null
	VpcId	nvarchar(50), null
	Description	nvarchar(800), null

2.5.7 Table: [adaAwsSecurityGroupsRules]

This table collects AWS information about security group rules and could be useful to create custom connectors to display AWS security group rules in netTerrain.

2.5.7.1 Structure

Key	Name	Data Type
PK	GroupId	nvarchar(50), not null
	Protocol	nvarchar(800), null
PK	IpRanges	nvarchar(255), not null
PK	PortRanges	nvarchar(800), not null
	Type	nvarchar(800), null
	Category	nvarchar(800), null

2.5.8 Table: [adaAwsVolumeAttachments]

This table collects AWS information about volume attachments and could be useful to create custom connectors to display AWS volume attachments in netTerrain.

2.5.8.1 Structure

Key	Name	Data Type
PK	VolumeId	nvarchar(50), not null
PK	InstanceId	nvarchar(50), not null
PK	Device	nvarchar(255), not null

Key	Name	Data Type
	AttachTime	nvarchar(255), null
	State	nvarchar(50), null

2.5.9 Table: [adaAwsVolumes]

This table collects AWS information about volumes and could be useful to create custom connectors to display AWS volumes in netTerrain.

2.5.9.1 Structure

Key	Name	Data Type
PK	id	nvarchar(50), not null
	VolumeType	nvarchar(50), not null
	AvailabilityZone	nvarchar(800), not null
	CreateTime	nvarchar(255), null
	Size	nvarchar(50), null
	State	nvarchar(50), null
	Iops	nvarchar(50), null

2.5.10 Table: [adaConnectorsources]

This table contains the definitions for node connectors.

2.5.10.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
	alias	nvarchar(255), null
	dbEngine	nvarchar(255), null
	serverName	nvarchar(255), null

Key	Name	Data Type
	dbName	nvarchar(255), null
	isTrusted	nvarchar(255), null
	userName	nvarchar(255), null
	pass	nvarchar(255), null
	icon	nvarchar(255), null
	iconSelected	nvarchar(255), null
	enabledFields	nvarchar(255), null
	nodeQuery	ntext, null
	entityId	decimal(18,0), not null
	dsTable	nvarchar(255), null
	sourceName	nvarchar(255), null
	parentNetworkField	nvarchar(255), null
	ntParent	decimal(18,0), null
	updates	nvarchar(50), null
	inserts	nvarchar(50), null
	deletes	nvarchar(50), null
	reconciliationField	nvarchar(255), null
	statusField	nvarchar(50), null
	statusQuery	ntext, null
	sequence	smallint, null
	dictionaryId	decimal(18,0), null
	reconciliationFieldNt	nvarchar(255), null
	xcoord	nvarchar(255), null
	ycoord	nvarchar(255), null
	deviceTypeField	nvarchar(255), null
	version	nvarchar(255), null

Key	Name	Data Type
	lastReconciled	datetime2(7), null
	lastDiscovered	datetime2(7), null
	postImportFunction	nvarchar(4000), null
	preImportFunction	nvarchar(4000), null
	discoveryOrder	smallint, null
	passes	smallint, null
	deleteCountThreshold	int, null
	pcCode	nvarchar(800), null

2.5.11 Table: [adaDcmConnectorPropertySet]

The tables that start with the adaDCM prefix store environmental data collected by the netTerrain EM monitoring tool. netTerrain collector (which mostly replaces the ITK) has a much more thorough import and monitoring process for DCM, so the usage of these tables will be limited.

This table is currently not in use.

2.5.11.1 Structure

Key	Name	Data Type
	uname	nvarchar(255), null
	property	nvarchar(255), null
	sequence	int, null

2.5.12 Table: [adaDcmConnectors]

This table is currently not in use.

2.5.12.1 Structure

Key	Name	Data Type
PK	id	decmal(18,0), not null
	uname	nvarchar(255), null
	displayName	nvarchar(255), null
	description	nvarchar(255), null
	type	nvarchar(255), null
	version	nvarchar(255), null

2.5.13 Table: [adaDcmDevices]

This table stores devices discovered via the DCM connector.

2.5.13.1 Structure

Key	Name	Data Type
PK	dcmId	nvarchar(255), not null
	entityId	nvarchar(255), null
	DEVICE_MODEL	nvarchar(255), null
	CONNECTOR_NAME	nvarchar(255), null
	NAMEPLATE_PWR	nvarchar(255), null
	DERATED_PWR	nvarchar(255), null
	BMC_ADDRESS	nvarchar(255), null
	BMC_MAC_ADDRESS	nvarchar(255), null
	CAPABILITIES	nvarchar(255), null
	ASSET_TAG	nvarchar(255), null
	DESCRIPTION	nvarchar(255), null
	FIRMWARE_VERSION	nvarchar(255), null

Key	Name	Data Type
	LOCATION	nvarchar(255), null
	MAX_POWER_DRAW	nvarchar(255), null
	MIN_POWER_DRAW	nvarchar(255), null
	NODE_PWR_LIMIT	nvarchar(255), null
	PDU_PWR_LIMIT	nvarchar(255), null
	SERIAL_NUMBER	nvarchar(255), null
	SERVICE_TAG	nvarchar(255), null
	TEMPERATURE_UPPER_LIMIT	nvarchar(255), null
	AVG_INLET_TEMP	nvarchar(255), null
	AVG_CPU_PWR	nvarchar(255), null
	AVG_MEM_PWR	nvarchar(255), null
	AVG_OUTLET_TEMP	nvarchar(255), null
	AVG_PWR	nvarchar(255), null
	CPU_USED	nvarchar(255), null
	CPU_UTIL	nvarchar(255), null
	CUPS	nvarchar(255), null
	DISK_IO	nvarchar(255), null
	DISK_USED	nvarchar(255), null
	ESTIMATED_CPU_USED	nvarchar(255), null
	ESTIMATED_DISK_USED	nvarchar(255), null
	ESTIMATED_MEMORY_USED	nvarchar(255), null
	ESTIMTED_PWR	nvarchar(255), null
	INS_PWR	nvarchar(255), null
	MAX_AVG_PWR	nvarchar(255), null
	MAX_AVG_PWR_CAP	nvarchar(255), null
	MAX_CPU_PWR	nvarchar(255), null

Key	Name	Data Type
	MAX_INLET_TEMP	nvarchar(255), null
	MAX_MEM_PWR	nvarchar(255), null
	MAX_PWR	nvarchar(255), null
	MEMORY_USED	nvarchar(255), null
	MIC_PWR	nvarchar(255), null
	MIN_AVG_PWR	nvarchar(255), null
	MIN_CPU_PWR	nvarchar(255), null
	MIN_MEM_PWR	nvarchar(255), null
	MIN_PWR	nvarchar(255), null
	NETWORK_USED	nvarchar(255), null
	OBSV_MAX_PDU_PWR	nvarchar(255), null
	PDU_PWR	nvarchar(255), null
	TOTAL_AVG_PWR	nvarchar(255), null
	TOTAL_AVG_PWR_CAP	nvarchar(255), null
	TOTAL_MAX_PWR	nvarchar(255), null
	TOTAL_MAX_PWR_CAP	nvarchar(255), null
	TOTAL_MIN_PWR	nvarchar(255), null

2.5.14 Table: [adaDcmEntityPropertyNames]

This table is currently not in use.

2.5.14.1 Structure

Key	Name	Data Type
PK	entityId	int, not null
	propertyName0	nvarchar(255), null
	propertyName1	nvarchar(255), null
	propertyName99	nvarchar(255), null

2.5.15 Table: [adaDcmEntityPropertyValues]

This table is currently not in use.

2.5.15.1 Structure

Key	Name	Data Type
PK	entityId	int, not null
	propertyName0	nvarchar(255), null
	propertyName1	nvarchar(255), null
	propertyName99	nvarchar(255), null

2.5.16 Table: [adaDcmMonitoredPropertySet]

This table stores the properties that the netTerrain environmental monitoring module monitors from DCM enabled devices.

2.5.16.1 Structure

Key	Name	Data Type
	property	nvarchar(255), not null
	ntPropertyName	nvarchar(255), not null
	discoveryType	nvarchar(255), not null
	status	tinyint, not null

2.5.17 Table: [adaDevices_1001]

This table stores devices discovered via SNMP, using the native ITK SNMP discovery engine. Since the native SNMP engine only maps discovered devices to smart devices in the netTerrain catalog, in some cases it may be useful to create a connector against this table to turn these devices into nodes. Also, it may be necessary to create a connector against this table when then ancestry string or name field need to be changed, as those are fixed in the predefined SNMP connector present in the ITK. For more information, please check the ITK guide.

2.5.17.1 Structure

Key	Name	Data Type
PK	id	int, not null
	ip_address	nvarchar(50), not null
	alias	nvarchar(255), null
	DNS	nvarchar(255), null
	sysName	nvarchar(255), null
	vendor	nvarchar(255), null
	lastBoot	nvarchar(255), null
	sysUpTime	nvarchar(255), null
	sysObjectId	nvarchar(255), null
	sysDescr	nvarchar(max), null

Key	Name	Data Type
	sysLocation	nvarchar(max), null
	sysContact	nvarchar(max), null
	status	nvarchar(255), null
	dsId	decimal(18,0), null
	lastDiscovered	dateTime, null
	icon	smallint, null
	iconSelected	smallint, null
	enabledFields	nvarchar(255), null
	priority	nvarchar(50), null
	crudStatus	smallint, null
	sysServices	nvarchar(255), null
	ifNumber	int, null
	baseIpRange	nvarchar(255), null
	customOid101	nvarchar(255), null
	..	nvarchar(255), null
	customOid140	nvarchar(255), null

2.5.18 Table(s): [adaDevices_1xxx]

An instance of the netTerrain database may have between zero and N additional device tables holding any devices discovered by the ITK against a third-party system via a device connector. Each connector has a four-digit id starting with 1 and the raw data (before reconciled into netTerrain) is stored in a table called adaDevices_1xxx, where 1xxx is the id of that connector.

Since the device connectors map discovered devices to smart devices in the netTerrain catalog, in some cases it may be useful to create a connector against this table to transform these devices into nodes. These tables may also be used as intermediate tables to then query them (for example to concatenate data from the same or other similar tables) and create a connector against the resulting query. For more information, please check the ITK guide.

The structure of these tables will depend on the structure of the source table or query, since these tables are created on the fly, by the ITK.

2.5.18.1 Structure

Key	Name	Data Type
PK		nvarchar(255), not null
		nvarchar(255), not null
	..	nvarchar(255), not null
		nvarchar(255), not null
	icon	int null
	iconSelected	int null
	priority	nvarchar(50), null
	crudStatus	smallint null

2.5.19 Table: [adaEntities]

This table contains metadata related to the representation of connector entities in the ITK interface.

2.5.19.1 Structure

Key	Name	Data Type
PK	id	smallint, not null
	categoryId	decimal(18,0), null
	sequence	int, null
	isInTree	smallint, null
	isAAG	smallint, null
	sqlAAGString	nvarchar(max), null
	sqlTreeView	nvarchar(max), null
	sqlEditString	ntext, null
	sqlAddString	nvarchar(max), null
	table	nvarchar(50), null

Key	Name	Data Type
	formCaption	nvarchar(255), null
	listViewIcon	nvarchar(255), null
	menuIcon	nvarchar(255), null
	menuItemIndex	int, null
	contextMenuStrip	nvarchar(255), null

2.5.20 Table: [adaFieldMappings]

This table stores the mappings in the ITK between source and netTerrain fields.

2.5.20.1 Structure

Key	Name	Data Type
PK	dsId	decimal(18,0), not null
PK	sourceField	nvarchar(50), not null
PK	destField	nvarchar(50), not null

2.5.21 Table: [adaFieldRegex]

This table is currently not in use.

2.5.21.1 Structure

Key	Name	Data Type
PK	fieldId	decimal(18,0), not null
PK	dsId	decimal(18,0), not null
	regex	nvarchar(max), null

2.5.22 Table: [adaFields]

This table contains metadata related to the representation of connector fields in the ITK interface.

2.5.22.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
PK	id	decimal(18,0), not null
	entityId	smallint, null
	name	nvarchar(255), null
	isAAG	smallint, null
	AAGSequence	smallint, null
	AAGCaption	nvarchar(50), null
	AAGWidth	float, null
	isEditable	smallint, null
	EditSequence	smallint, null
	comboSourceEdit	nvarchar(max), null
	isDataEntry	smallint, null
	comboSourceAdd	nvarchar(max), null
	tabPage	smallint, null
	allowNulls	smallint, null
	defaultValue	nvarchar(255), null
	comboBaseTable	nvarchar(50), null
	comboBaseEntityId	smallint, null
	dependentField	nvarchar(50), null
	buttonIndexAdd	int, null
	buttonIndexAddCaption	nvarchar(50), null
	buttonIndexEdit	int, null
	buttonIndexEditCaption	nvarchar(50), null

2.5.23 Table: [adaLinkersources]

This table contains the definitions for link connectors.

2.5.23.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
	alias	nvarchar(255), null
	dbEngine	nvarchar(255), null
	serverName	nvarchar(255), null
	dbName	nvarchar(255), null
	isTrusted	nvarchar(255), null
	userName	nvarchar(255), null
	pass	nvarchar(255), null
	icon	nvarchar(255), null
	iconSelected	nvarchar(255), null
	enabledFields	nvarchar(255), null
	nodeQuery	ntext, null
	entityId	decimal(18,0), not null
	dsTable	nvarchar(255), null
	dsAlias	nvarchar(255), null
	sourceName	nvarchar(255), null
	node1	nvarchar(255), null
	node2	nvarchar(255), null
	updates	nvarchar(50), null
	inserts	nvarchar(50), null
	deletes	nvarchar(50), null
	reconciliationField	nvarchar(255), null

Key	Name	Data Type
	statusField	nvarchar(50), null
	statusQuery	ntext, null
	sequence	smallint, null
	dictionaryId	decimal(18,0), null
	reconciliationFieldNt	nvarchar(255), null
	lastReconciled	datetime2(7), null
	lastDiscovered	datetime2(7), null
	postImportFunction	nvarchar(4000), null
	preImportFunction	nvarchar(4000), null
	deleteCountThreshold	int null
	separator	nvarchar(255), null
	pcCode	nvarchar(800), null

2.5.24 Table(s): [adaLinks_20xxx]

An instance of the netTerrain database may have between zero and N additional link tables holding any links discovered by the ITK against a third-party system via a link connector. Each link connector has a five-digit id starting with 20 and the raw data (before reconciled into netTerrain) is stored in a table called adaLinks_20xxx, where 20xxx is the id of that connector.

These tables may be used as intermediate tables to then query them (for example to concatenate data from the same or other similar tables) and create a connector against the resulting query. For more information, please check the ITK guide.

The structure of these tables will depend on the structure of the source table or query, since these tables are created on the fly, by the ITK.

2.5.24.1 Structure

Key	Name	Data Type
PK		nvarchar(255), not null

Key	Name	Data Type
		nvarchar(255), null
	..	nvarchar(255), null
		nvarchar(255), null
	icon	int null
	iconSelected	int null
	priority	nvarchar(50), null
	crudStatus	smallint null

2.5.25 Table: [adaLookups]

This table stores lookup (or helper) data and metadata used by the ITK.

2.5.25.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
	description	nvarchar(255), not null
PK	category	nvarchar(50), not null

2.5.26 Table: [adaMappingLibrary]

This table contains the type mappings for device connectors. It is responsible for matching up device types (makes and models) between the custom source table and the netTerrain NodeTypes table.

2.5.26.1 Structure

Key	Name	Data Type
PK	id	int, not null
	sourceTypeName	nvarchar(255), null
	destTypeName	nvarchar(255), null

Key	Name	Data Type
	dsId	decimal(18,0), null

2.5.27 Table: [adaMappingPorts]

This table stores port index information associated with device types mapped in the ITK.

2.5.27.1 Structure

Key	Name	Data Type
PK	sourceTypeName	nvarchar(255), not null
PK	ifIndex	int, not null
PK	destTypeId	decimal(14,0), not null
	PortId	decimal(14,0), not null

2.5.28 Table: [adaMappingStatus]

This table maps status values between the source data and netTerrain status values.

2.5.28.1 Structure

Key	Name	Data Type
	dsId	decimal(18,0), null
	destStatusId	decimal(18,0), null
	destStatusAlias	nvarchar(255), null
	flagIndex	int, null
	statusId	nvarchar(255), null
	sourceStatusId	nvarchar(255), null

2.5.29 Table: [adaMappingSuggestions]

This is a helper table used by the ITK to suggest device models associated with a certain sysOID MIB value.

2.5.29.1 Structure

Key	Name	Data Type
PK	OID	nvarchar(50), null
PK	Model	nvarchar(255), null
	Vendor	nvarchar(50), null

2.5.30 Table: [adaMonDatabases]

This table contains the databases discovered by the SQL monitor.

2.5.30.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
	database_id	decimal(18,0), null
	databaseName	nvarchar(255), null
	dbServerInstance	nvarchar(255), null
	dbEngine	nvarchar(255), null
	ntName	nvarchar(255), null
	dataFileName	nvarchar(255), null
	logFileName	nvarchar(255), null
	dataFileSize	float, null
	logFileSize	float, null
	workStationId	nvarchar(255), null
	createDate	nvarchar(255), null

2.5.31 Table: [adaMonDbServerInstances]

This table contains statistics for all registered SQL instances discovered by the SQL monitor.

2.5.31.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
	dbServerInstance	nvarchar(255), null
	dbEngine	nvarchar(255), null
	dbServerVersion	nvarchar(255), null
	workstationId	nvarchar(255), null
	isTrusted	nvarchar(255), null
	userName	nvarchar(255), null
	pass	nvarchar(255), null
	memOsPhysicalMb	float, null
	memOsVirtualMb	float, null
	memBufferPoolCommittedMb	float, null
	memBufferPoolUsedMb	float, null
	memNeededWorkloadMb	float, null
	dbProductVersion	nvarchar(255), null
	dbProductLevel	nvarchar(255), null
	dbEdition	nvarchar(255), null

2.5.32 Table(s): [adaNetworks_10xxx]

An instance of the netTerrain database may have between zero and N additional node tables holding any nodes discovered by the ITK against a third-party system via a node connector. Each node connector has a five-digit id starting with 10 and the raw data (before reconciled into netTerrain) is stored in a table called adaNodes_10xxx, where 10xxx is the id of that connector.

These tables may be used as intermediate tables to then query them (for example to concatenate data from the same or other similar tables) and create a connector against the resulting query. For more information, please check the ITK guide.

The structure of these tables will depend on the structure of the source table or query, since these tables are created on the fly, by the ITK.

2.5.32.1 Structure

Key	Name	Data Type
PK		nvarchar(255), not null
		nvarchar(255), null
	..	nvarchar(255), null
		nvarchar(255), null
	icon	int null
	iconSelected	int null
	priority	nvarchar(50), null
	crudStatus	smallint null

2.5.33 Table: [adaOctets]

This table contains all registered IP address ranges used by the SNMP discovery engine.

2.5.33.1 Structure

Key	Name	Data Type
PK	stringId	nvarchar(255), not null
	dsId	decimal(18,0), null
	firstOctetFrom	smallint, null
	secondOctetFrom	smallint, null
	thirdOctetFrom	smallint, null

Key	Name	Data Type
	fourthOctetFrom	smallint, null
	fourthOctetTo	smallint, null
	community	nvarchar(255), null
	port	nvarchar(255), null
	portMonitoring	nvarchar(255), null
	version	nvarchar(255), null
	enabled	smallint, null
	snmpV3AuthenticationEncryptionFlag	nvarchar(50), null
	snmpV3AuthenticationMethod	nvarchar(500), null
	snmpV3EncryptionMethod	nvarchar(500), null
	snmpV3User	nvarchar(500), null
	snmpV3AuthenticationPwd	nvarchar(500), null
	snmpV3EncryptionKey	nvarchar(500), null
	snmpV3Context	nvarchar(500), null

2.5.34 Table: [adaOids]

This is a helper table that contains MIB OID to device type mappings. It is used by the native netTerrain SNMP discovery engine to assign the proper device type to a discovered device.

2.5.34.1 Structure

Key	Name	Data Type
PK	deviceTypeId	decimal(18,0), not null
PK	OID	nvarchar(255), not null
	OIDname	nvarchar(255), null
	deviceFieldName	nvarchar(255), null
	priority	int, null

2.5.35 Table: [adaOidsCustom]

This is a helper table that contains any custom MIB OID to device type mappings. It is used by the native netTerrain SNMP discovery engine to assign custom MIB properties to a discovered device.

2.5.35.1 Structure

Key	Name	Data Type
PK	IPRange	nvarchar(255), not null
PK	OID	nvarchar(255), not null
	sourceFieldName	nvarchar(255), not null
	ntFieldName	nvarchar(255), not null

2.5.36 Table: [adaParsers]

This table is currently not in use.

2.5.36.1 Structure

Key	Name	Data Type
	dsId	decimal(18,0), null
	destSourceField	nvarchar(255), null
	destSourceTable	nvarchar(255), null
	destSourceFilter	nvarchar(255), null
	destTargetField	nvarchar(255), null
	destTargetTable	nvarchar(255), null
	destTargetFilter	nvarchar(255), null
	regex	nvarchar(max), null

2.5.37 Table: [adaPorts]

This table stores the ports discovered by the ITK through an SNMP discovery process.

2.5.37.1 Structure

Key	Name	Data Type
PK	id	nvarchar(255), not null
	ifIndex	int, not null
	parentName	nvarchar(255), not null
	ifDescr	nvarchar(max), null
	ifType	int, null
	ifSpeed	decimal(18,0), null
	ifPhysAddress	nvarchar(50), not null
	ifAdminStatus	smallint, null
	ifOperStatus	smallint, null
	ifLastChange	nvarchar(255), null

2.5.38 Table: [adaSettings]

This table contains metadata for the representation of list views in the ITK.

2.5.38.1 Structure

Key	Name	Data Type
PK	entityId	decimal(18,0), not null
PK	Object	nvarchar(50), not null
PK	Property	nvarchar(50), not null
	Param1	nvarchar(255), null
	Param2	nvarchar(255), null
	Param3	nvarchar(255), null
	Param4	nvarchar(255), null
	Param5	nvarchar(255), null

Key	Name	Data Type
	Param6	nvarchar(255), null
	Param7	nvarchar(255), null
	Param8	nvarchar(255), null
	Param9	nvarchar(255), null
	Param10	nvarchar(255), null
	Param11	nvarchar(255), null
	Param12	nvarchar(255), null
	Param13	nvarchar(255), null
	Param14	nvarchar(255), null
	Param15	nvarchar(255), null
	Param16	nvarchar(255), null
	Param17	nvarchar(255), null
	Param18	nvarchar(255), null
	Param19	nvarchar(255), null
	Param20	nvarchar(255), null
	Param21	nvarchar(255), null
	Param22	nvarchar(255), null
	Param23	nvarchar(255), null
	Param24	nvarchar(255), null
	Param25	nvarchar(255), null
	Param26	nvarchar(255), null
	Param27	nvarchar(255), null
	Param28	nvarchar(255), null
	Param29	nvarchar(255), null
	Param30	nvarchar(255), null
	Param31	nvarchar(255), null

Key	Name	Data Type
	Param32	nvarchar(255), null
	Param33	nvarchar(255), null
	Param34	nvarchar(255), null
	Param35	nvarchar(255), null
	Param36	nvarchar(255), null
	Param37	nvarchar(255), null
	Param38	nvarchar(255), null
	Param39	nvarchar(255), null
	Param40	nvarchar(255), null
	Param41	nvarchar(255), null
	Param42	nvarchar(255), null
	Param43	nvarchar(255), null
	Param44	nvarchar(255), null
	Param45	nvarchar(255), null
	Param46	nvarchar(255), null
	Param47	nvarchar(255), null
	Param48	nvarchar(255), null
	Param49	nvarchar(255), null
	Param50	nvarchar(255), null
	Param51	nvarchar(255), null
	Param52	nvarchar(255), null
	Param53	nvarchar(255), null
	Param54	nvarchar(255), null
	Param55	nvarchar(255), null
	Param56	nvarchar(255), null
	Param57	nvarchar(255), null

Key	Name	Data Type
	Param58	nvarchar(255), null
	Param59	nvarchar(255), null

2.5.39 Table: [adaSNMPipAddrTable]

The tables that start with the adaSNMP prefix store SNMP data collected by the ITK SNMP discovery process. netTerrain collector (which mostly replaces the ITK) has a much more thorough import and monitoring process for SNMP, so the usage of these tables will be limited.

This table stores the IP address tables discovered by the ITK through an SNMP discovery process.

2.5.39.1 Structure

Key	Name	Data Type
PK	sysNames	nvarchar(255), not null
PK	ipAddrEntry	nvarchar(50), not null
	ipAdEntIfIndex	int, null
	ipAdEntNetMask	nvarchar(50), not null

2.5.40 Table: [adaSNMPipRouteTable]

This table stores the IP routing tables discovered by the ITK through an SNMP discovery process.

2.5.40.1 Structure

Key	Name	Data Type
PK	sysNames	nvarchar(255), not null
PK	ipRouteDest	nvarchar(50), not null
	ipRouteIfIndex	int, null
	ipRouteMetric1	int, null
	ipRouteNextHop	nvarchar(50), null

Key	Name	Data Type
	ipRouteType	int, null
	ipRouteProto	int, null
	ipRouteAge	int, null
	ipRouteMask	nvarchar(50), null

2.5.41 Table: [adaSNMPMacForwardingTable]

This table stores the MAC address forwarding tables discovered by the ITK through an SNMP discovery process.

2.5.41.1 Structure

Key	Name	Data Type
PK	sysNames	nvarchar(255), not null
PK	dot1dTpFdbAddress	nvarchar(50), not null
	dot1dTpFdbPort	int, null
	dot1dTpFdbStatus	int, null

2.5.42 Table: [adaWMIApplications]

The tables that start with the adaWMI prefix store WMI data collected by the ITK WMI discovery process. netTerrain collector (which mostly replaces the ITK) has a much more thorough import and monitoring process for WMI, so the usage of these tables will be limited.

This table stores, well, the obvious, applications discovered via WMI.

2.5.42.1 Structure

Key	Name	Data Type
PK	id	nvarchar(400), not null
	Host	nvarchar(255), not null

Key	Name	Data Type
	Name	nvarchar(255), not null
	Description	nvarchar(max), null
	InstallDate	nvarchar(255), null
	InstallLocation	nvarchar(255), null
	IdentifyingNumber	nvarchar(255), null
	SKUNumber	nvarchar(255), null
	Vendor	nvarchar(255), null
	Version	nvarchar(255), null

2.5.43 Table: [adaWMIDevices]

This table stores devices that are registered in the ITK for WMI discovery.

2.5.43.1 Structure

Key	Name	Data Type
PK	id	int, not null
	ip_Address	nvarchar(50), null
	sysName	nvarchar(255), null
	user	nvarchar(255), null
	pwd	nvarchar(255), null
	DNS	nvarchar(255), null
	status	tinyint, null

2.5.44 Table: [adaWMIDevicesProperties]

This table stores the properties for devices during a WMI discovery process.

2.5.44.1 Structure

Key	Name	Data Type
PK	id	int, not null
	LogicalDrives	nvarchar(max), null
	OS	nvarchar(max), null
	BIOS	nvarchar(max), null
	CPU	nvarchar(max), null
	Memory	nvarchar(max), null
	Processes	nvarchar(max), null
	SystemEnclosure	nvarchar(max), null
	ComputerSystem	nvarchar(max), null

2.5.45 Table: [adaWMIMetaData]

As the name implies, this table stores WMI related metadata, the diverse WMI namespaces used by the ITK during a discovery.

2.5.45.1 Structure

Key	Name	Data Type
	Namespace	nvarchar(50), null
	Class	nvarchar(50), null
	Properties	nvarchar(max), null
	TemplateId	int, null

2.5.46 Table: [adaWMINetworkAdapterConf]

This table stores network adapter configuration data discovered via WMI.

2.5.46.1 Structure

Key	Name	Data Type
PK	id	nvarchar(400), not null
	Host	nvarchar(255), not null
	Caption	nvarchar(255), not null
	DefaultIPGateway	nvarchar(50), null
	DHCPServer	nvarchar(255), null
	DNSDomain	nvarchar(255), null
	DNSHostName	nvarchar(255), null
	IPAddress	nvarchar(50), null
	MACAddress	nvarchar(50), null

2.5.47 Table: [adaWMITemplates]

This is another one of those tables that stores WMI related metadata, the WMI categories used by the ITK during a discovery.

2.5.47.1 Structure

Key	Name	Data Type
	Id	int, not null
	Name	nvarchar(50), not null
	State	tinyint, not null

2.5.48 Table: [adaWMIWebsites]

This table stores websites configured in web servers discovered via WMI.

2.5.48.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
	host	nvarchar(500), not null
	path	nvarchar(400), not null
	siteName	nvarchar(255), null
	applicationPool	nvarchar(max), null
	enabledProtocols	nvarchar(255), null
	status	nvarchar(255), null
	lastResponseTime	float, null
	downs	float, null
	invalids	float, null
	ups	float, null

2.5.49 Table: [adaWMIWebsitesHistory]

This table stores historical data for website availability related to websites configured in web servers discovered via WMI.

2.5.49.1 Structure

Key	Name	Data Type
PK	id	decimal(18,0), not null
	status	nvarchar(255), not null
PK	timestamp	datetime2(7), not null
	lastResponseTime	float, null

2.5.50 Table: [adaXMLParsers]

This is a metadata table that stores regular expressions used in text-based connectors.

2.5.50.1 Structure

Key	Name	Data Type
PK	product	nvarchar(50), not null
PK	entity	nvarchar(50), not null
PK	attribute	nvarchar(50), not null
	xmlPath	nvarchar(255), null

3 netTerrain Reports

This chapter provides a guide to creating custom reports for use inside netTerrain, including a description of existing report scripts, the process for creating new custom reports, and tips on how to debug report scripts.

3.1 File location

All reports that are available in netTerrain are located in the following directory:

```
%install_dir%\Graphical Networks\netTerrain\vis\SQLTables
```

When creating a new custom report script, you will need to place your SQL file in this folder for netTerrain to be able to pick it up when used inside the netTerrain UI.

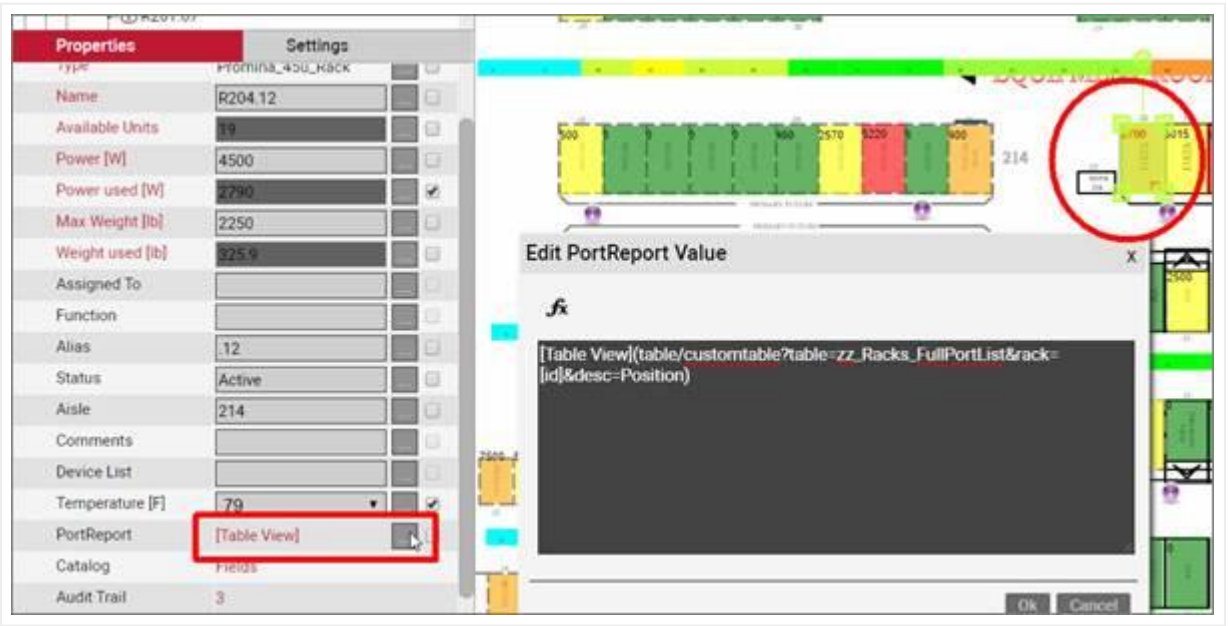
3.2 Displaying a report in netTerrain

Reports in netTerrain can be executed by:

- Double clicking a free text
- Double clicking on a displayed field
- Clicking on the property value of an object
- Double clicking on a node

For all cases above, you need to place a report label and identifier so that it can be executed by netTerrain. For example, by placing the string below in a displayed field, a report can be executed when double clicking on that displayed field:

```
[Displayed Text](table/customtable?table=<Report_filename>)
```



Placing code in a displayed field to launch a report

3.3 Creating a new report

To create a new report in netTerrain you can use an existing pre-built SQL report file or create a new file using any text editor, such as notepad. As mentioned above, these files are placed in the SQLtables folder.

Once your new SQL file is syntactically correct, save it to the SQL reports directory. Use the reports description section as a reference for locating desired information for your report.

3.3.1 The basics

All report scripts must have a unique column that can distinguish records from one another. This column serves as a primary key and must be named “Id” (case sensitive).

Tip

When building a report script, chances are that similar information has been obtained in one of the existing reports below. You could reference the code in the file as a starting point and modify it to your specifications.

When creating a new report, it is important to consider the performance of the query. Slow scripts could slow down the load of netTerrain pages significantly.

3.3.2 Restrictions

Certain restrictions apply to the SQL code placed in reports. These restrictions are put in place to protect the integrity of the netTerrain database.

The SQL syntax for reports is currently limited to SELECT statements. Usage of INSERT, UPDATE, DECLARE or other SQL commands may yield a message such as “BLToolkit.Data.DataException” and follows with an “incorrect syntax…”.

The GO statement is not a SQL statement and is also not allowed in netTerrain reports.

3.3.3 Clickable URLs

To create clickable links in a report in netTerrain, you may use an html hyperlink tag as a series of concatenated string literals for a column. To do this, start by using the tag, which is used to link from one page to another. Then add the HREF attribute to specify the URL destination.

```
'<a href=”URL”> Displayed Text</a>' AS URL
```

Use the URL reference table below to assist in building a desired URL.

```
'<a href="../Diagram/'+ CONVERT(varchar, nodes.ParentId) + '?blink='
+ CONVERT(varchar, nodes.Id) + '">Show on diagram</a>'
```

3.3.3.1 URL href reference table from a report location

The table provides a description of the different sections in your code for netTerrain reports.

Description	Code
Diagram and project area	Diagram/[id]

Description	Code
Node blinking on diagram to make an object blink	?blink=[id_of_object_on_diagram]
Convert an id to string literal	CONVERT(varchar, nodes.ParentId)
Go up one level directory	../
Admin area URL	AdminConsole/

3.3.3.2 Sample case

Here is an example of a report that retrieves a list of netTerrain users and has a modify link which directs to the admin area user management and filters for the specific user id.

```
SELECT

'<a href="../AdminConsole/Users#page=1{!}filter='+ CONVERT(varchar,
u.Id) + '"> Modify ' as url,

u.Id,

u.name

FROM Users u
```

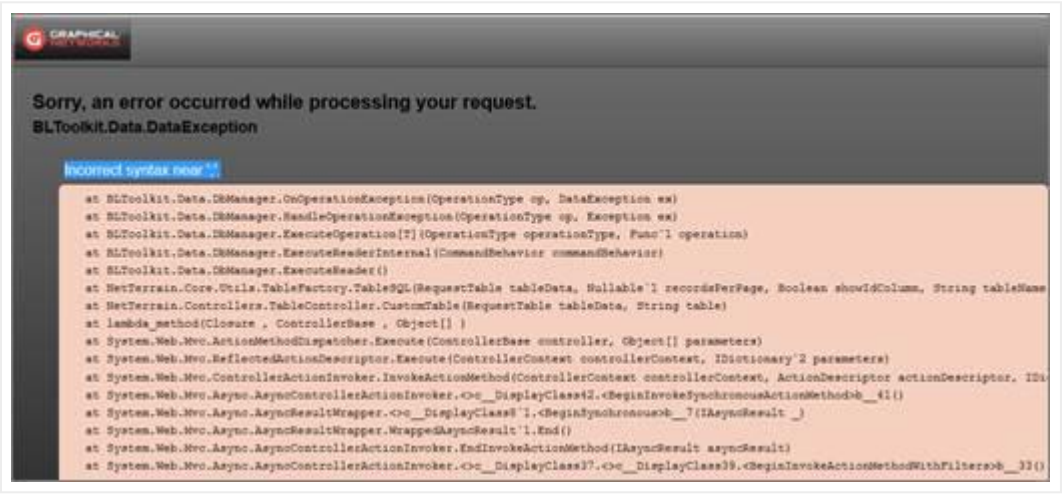
This is how the report above would appear in netTerrain

Sample report output

3.4 Debugging reports

This section will discuss common problems that are encountered when executing a built-in or custom report.

A report that is not functioning will encounter a page such as below:



Sample report execution error seen from the netTerrain interface

3.4.1 Common errors

Error Name: GetId

Example Error:

Method 'GetId' in type 'CustomTable635573502859232177' from assembly 'CustomTable635573502859232177, Version=0.0.0.0, Culture=neutral, PublicKeyToken=null' does not have an implementation.

Resolution:

To resolve this problem, verify that at least one column is named 'Id' (case-Sensitive).

Error Name: Incorrect syntax near '}'

Example Error:

BLToolkit.Data.DataException

Incorrect syntax near '}'.

Resolution:

The report likely has parameters that need to be specified in the URL. You should review the syntax of the report to ensure the parameters are provided values.

Error Name: Syntax restriction

Example Error:

Incorrect syntax near the keyword 'xxx'. Incorrect syntax near ')'.

Resolution:

Reports do not allow non-select statements. To solve this issue, you may have to redesign your report to exclude non SELECT statements.

3.4.2 Report logs

The report logs can be found in:

```
%install_dir%\Graphical Networks\netTerrain\vis\Logs
```

3.5 Reports Reference

This section will be used as a reference for most of the SQL Reports that are included with netTerrain out-of-the-box. Note that users can create their own reports and throughout releases (or upon request) more can be added, so this reference does not pretend to be 100% comprehensive.

The guide will provide the name, description, syntax, returned columns, examples and notes for every report script.

Below is a summary of some of the SQL report references that are included in the default netTerrain installation.

3.5.1 zz_All_Circuits.sql
3.5.2 zz_All_Links.sql
3.5.3 zz_Assets_All.sql
3.5.4 zz_Assets_Cisco.sql
3.5.5 zz_Assets_Dell.sql
3.5.6 zz_Assets_IP_Addresses.sql
3.5.7 zz_Assets_IP_Addresses_Repeated.sql
3.5.8 zz_Assets_In_Racks.sql
3.5.9 zz_Assets_Rackmounted.sql
3.5.10 zz_Assets_Rackmounted_10_Units_Or_Greater.sql
3.5.11 zz_Assets_Rackmounted_5_Units_Or_Greater.sql
3.5.12 zz_Aws_Volumes_PerInstance.sql
3.5.13 zz_Cat_All.sql

3.5.1 zz_All_Circuits.sql

Name: zz_All_Circuits

Description: A report that displays all circuits that have been created in the netTerrain project.

Syntax: `[Displayed Text](/table/customtable?table=zz_All_Circuits)`

Columns:

- URL: Takes the user to the specified diagram where the circuit exists.
- Id: Link id, which is not shown unless the show id field button has been selected.
- Link Type: The type of link.
- Name: The name that was specified for the link.
- End Point 1: Name of the node object at end 1.
- End Point Parent 1: Name of the node's parent at end point 1.
- End Point Type 1: The object type at end point 1.
- End Point 2: Name of the node object at end 2.
- End Point Parent 2: Name of the node's parent at end point 2.
- End Point Type 2: The object type at end point 2

Example:

- [All Circuits](/table/customtable?table=zz_All_Circuits)
- [Report all links](/table/customtable?table=zz_All_Circuits&desc=Name)

Notes:

The second example will order the report in descending order by column "Name".

3.5.2 zz_All_Links.sql

Name: zz_All_Links

Description: A report that displays all links and the starting (source) node to the ending (destination) node.

Syntax: `[Displayed Text](/table/customtable?table=zz_All_Links)`

Columns:

- **Id:** Link id, which is not shown unless the show id field button has been selected.
- **TypeName:** The assigned link type.
- **Name:** The specified link field property name.
- **StartingNode:** The name of the starting node.
- **EndingNode:** The name of the ending node.

Example:

- [Report all links](/table/customtable?table=zz_All_Links)
- [Report all links](/table/customtable?table=zz_All_Links&desc=Name)

Notes:

The second example will order the report in descending order by column "Name".

3.5.3 zz_Assets_All.sql

Name: zz_Assets_All

Description: A report that displays all the assets in the netTerrain project.

Syntax: `[Displayed Text](/table/customtable?table=zz_Assets_All)`

Columns:

- **Id:** The node object's id, this column is hidden by default.
- **ParentId:** The node object's parent id, if one exists.
- **TypeName:** The node object's assigned type.
- **Name:** The name of the node object.
- **Parent:** The name of the parent object.
- **Peak Power (W):** The peak power that has been set on the object, if the field exists.
- **Weight (lb):** The weight value on the object, if the field exists.
- **Width (in):** The width of the object, if the field exists.
- **Height (in):** The height of the object, if the field exists.
- **SlotsOnChassis:** The number of slots on the object, if slots exists.
- **Free Slots:** The number of free slots on the object, if slots exists.
- **TotalPorts:** The number of ports on the object, if they exists.
- **PortsOnChassisOnly:** The number of ports on the chassis, if they exists.

Example:

- [Report all assets](/table/customtable?table=zz_Assets_All)
- [Report all assets, order by Name desc](/table/customtable?table=zz_Assets_All&desc=Name)

Notes:

The second example will order the report in descending order by column "Name".

3.5.4 zz_Assets_Cisco.sql

Name: zz_Assets_Cisco

Description: A report that displays all the Cisco assets in the netTerrain project.

Syntax: `[Displayed Text](/table/customtable?table=zz_Assets_Cisco)`

Columns:

- **Id:** The node object's id, this column is hidden by default.
- **ParentId:** The node object's parent id, if one exists.
- **TypeName:** The node object's assigned type.
- **Name:** The name of the node object.
- **Parent:** The name of the parent object.
- **Peak Power (W):** The peak power that has been set on the object, if the field exists.
- **Weight (lb):** The weight value on the object, if the field exists.
- **Width (in):** The width of the object, if the field exists.
- **Height (in):** The height of the object, if the field exists.
- **SlotsOnChassis:** The number of slots on the object, if slots exists.
- **Free Slots:** The number of free slots on the object, if slots exists.
- **TotalPorts:** The number of ports on the object, if they exists.
- **PortsOnChassisOnly:** The number of ports on the chassis, if they exists.

Example:

- [Report all Cisco assets](/table/customtable?table=zz_Assets_Cisco)
- [Report all Cisco assets, order by name desc](/table/customtable?table=zz_Assets_Cisco&desc=Name)

Notes:

The second example will order the report in descending order by column "Name".

3.5.5 zz_Assets_Dell.sql

Name: zz_Assets_Dell

Description: A report that displays all the Dell assets in the netTerrain project.

Syntax: `[Displayed Text](/table/customtable?table=zz_Assets_Dell)`

Columns:

- **Id:** The node object's id, this column is hidden by default.
- **ParentId:** The node object's parent id, if one exists.
- **TypeName:** The node object's assigned type.
- **Name:** The name of the node object.
- **Parent:** The name of the parent object.
- **Peak Power (W):** The peak power that has been set on the object, if the field exists.
- **Weight (lb):** The weight value on the object, if the field exists.
- **Width (in):** The width of the object, if the field exists.
- **Height (in):** The height of the object, if the field exists.
- **SlotsOnChassis:** The number of slots on the object, if slots exists.
- **Free Slots:** The number of free slots on the object, if slots exists.
- **TotalPorts:** The number of ports on the object, if they exists.
- **PortsOnChassisOnly:** The number of ports on the chassis, if they exists.

Example:

- [Report all dell assets](/table/customtable?table=zz_Assets_Dell)
- [Report all dell assets, order by name desc](/table/customtable?table=zz_Assets_Dell&desc=Name)

Notes:

The second example will order the report in descending order by column "Name".

3.5.6 zz_Assets_IP_Addresses.sql

Name: zz_Assets_IP_Addresses

Description: A report that displays all the assets' IP addresses. The first two parameters will restrict the object field names that contain IP addresses. For a field name to be considered in the result set, the name must contain all of the first and second parameter values. If an object has fields that do not match the specified parameters, they will not be included in the result set. The third parameter will exclude object ids that are smaller than the specified id. A field must contain a valid IPv4 address to be included in the result set.

Syntax: `[Displayed Text](table/customtable?table=zz_Assets_IP_Addresses&param1=<FILTER_FIELD_NAME1>&param2=<FILTER_FIELD_NAME2>&p IDS_SMALLER>)`

Columns:

- **URL:** A URL that will take the user to the asset project location.
- **Id:** The node object's id, this column is hidden by default.
- **IP Address:** The IP address that was assigned to the asset.
- **Node Type:** The object's assigned type.
- **Node Name:** The object's assigned name.
- **Sequence:** The IP address sequence number, always in this format: xxxxxxxxx. EX: 192.168.1.5 would be 192168001005

Example:

The following examples assume there are three fields 'Ip1', 'Ip2', and 'Ip Address' that can represent IPs. The following code will generate a report that includes all objects that have a field value that is in IPv4 address format.

Code: `[Report all asset ips, all fields with ipv4 address](table/customtable?table=zz_Assets_IP_Addresses&param1=&param2=&param3=0)`

The following code will generate a report that includes all objects that have 'ip' in the field name and a value in IPv4 address format. This report would include the following fields: 'Ip1', 'Ip2', and 'Ip Address' - in our case.

```
[Report all asset ips, with 'ip' in field name](table/customtable?table=zz_Assets_IP_Addresses&param1=ip&param2=&param3=0)
```

The following code will generate a report that includes all objects that have 'ip' and 'address' in the field name and a value in IPv4 address format.

```
[Report all asset ips, with 'ip' and 'address' in the field name](table/customtable?table=zz_Assets_IP_Addresses&param1=ip&param2=&param3=0)
```

The following code will generate a report that includes all objects that have a field value that is in IPv4 address format, and object id greater than 24000000005002

`[Report all asset ips, excluding ids smaller than 24000000005002](table/customtable?table=zz_Assets_IP_Addresses&param1=&param2=&param3=24000000005002)`

Notes:

- param1: is the first field name filter, any field not containing this value in the field name will be excluded.
- param2: is the second field name filter, any field not containing this value in the field name will be excluded.
- param3: is the id number that excludes any smaller ids from the result set.

3.5.7 zz_Assets_IP_Addresses_Repeated.sql

Name: zz_Assets_IP_Addresses_Repeated

Description: A report that displays all assets with repeating ips.

Syntax: `[Displayed Text](table/customtable?table=zz_Assets_IP_Addresses_Repeated)`

Columns:

- **Id:** Used as a row differentiator.
- **IP_Count:** The number of times the IP is repeated.
- **Value:** The IP which is being repeated.

Example:

- [All IPv4](table/customtable?table=zz_Assets_IP_Addresses_Repeated)
- [All IPv4, order by ip desc](table/customtable?table=zz_Assets_IP_Addresses_Repeated&desc=Value)

Notes:

The second example will order the report in descending order by column 'Value'

3.5.8 zz_Assets_In_Racks.sql

Name: zz_Assets_In_Racks

Description: A report that shows all assets that are under a rack object. The asset does not have to be mounted.

Syntax: `[Displayed Text](table/customtable?table=zz_Assets_In_Racks)`

Columns:

- Id: The asset's id, this column is hidden by default.
- ParentId: The asset's parent id (The rack).
- TypeName: The asset configured type.
- Name: The name of the asset.
- Rack: The name of the rack.
- Peak Power (W): The peak power value of the asset.
- Weight (lb): The weight of the asset.
- Width (in): The width of the asset.
- Height (in): The height of the asset.
- SlotsOnChassis: The number of slots on the asset.
- FreeSlots: The number of free slots on the asset.
- TotalPorts: The total ports on the asset.
- PortsOnChassisOnly: The number of ports on the chassis.

Example:

- [All assets in racks](table/customtable?table=zz_Assets_In_Racks)
- [All assets in racks, order by asset name desc](table/customtable?table=zz_Assets_In_Racks&desc=Name)

Notes:

The second example will report all assets ordered by the asset name in descending order.

3.5.9 zz_Assets_Rackmounted.sql

Name: zz_Assets_Rackmounted

Description: A report that shows all assets that are rack mounted.

Syntax: `[Displayed Text](table/customtable?table=zz_Assets_Rackmounted)`

Columns:

- **Id:** The asset's id, this column is hidden by default.
- **ParentId:** The asset's parent id (The rack).
- **TypeName:** The asset configured type.
- **Name:** The name of the asset.
- **Rack:** The name of the rack.
- **Peak Power (W):** The peak power value of the asset.
- **Weight (lb):** The weight of the asset.
- **Width (in):** The width of the asset.
- **Height (in):** The height of the asset.
- **SlotsOnChassis:** The number of slots on the asset.
- **FreeSlots:** The number of free slots on the asset.
- **TotalPorts:** The total ports on the asset.
- **PortsOnChassisOnly:** The number of ports on the chassis.

Example:

- [All assets in racks](table/customtable?table=zz_Assets_Rackmounted)
- [All assets in racks, order by asset name desc](table/customtable?table=zz_Assets_Rackmounted&desc=Name)

Notes:

The second example will report all assets ordered by the asset name in descending order.

3.5.10 zz_Assets_Rackmounted_10_Units_Or_Greater.sql

Name: zz_Assets_Rackmounted_10_Units_Or_Greater

Description: The report will show mounted assets that consume 10 or more rack units.

Syntax: `[Displayed Text](table/customtable?table=zz_Assets_Rackmounted_10_Units_Or_Greater)`

Columns:

- **URL:** The URL will take users to the diagram where the asset exists.
- **Id:** The id of the asset, this column is hidden by default.
- **ParentId:** The asset's parent id (The rack id).
- **Device Type:** The configured type of the asset.
- **Name:** The assigned name of the asset.
- **Rack:** The assigned name of the rack where the asset is mounted.
- **Rack Position:** The rack unit position of the asset.
- **Units Used:** The number of rack units consumed.

Example:

- [Rackmounted Assets 10 U or greater](table/customtable?table=zz_Assets_Rackmounted_10_Units_Or_Greater)
- [Rackmounted Assets 10 U or greater, ordered by column name desc](table/customtable?table=zz_Assets_Rackmounted_10_Units_Or_Greater&desc=Name)

Notes:

The second example will report all assets ordered by the asset name in descending order.

3.5.11 zz_Assets_Rackmounted_5_Units_Or_Greater.sql

Name: zz_Assets_Rackmounted_5_Units_Or_Greater

Description: The report will show assets that consume 5 or more rack units.

Syntax: `[Displayed Text](table/customtable?table=zz_Assets_Rackmounted_5_Units_Or_Greater)`

Columns:

- **URL:** The URL will take users to the diagram where the asset exists.
- **Id:** The id of the asset, this column is hidden by default.
- **ParentId:** The asset's parent id (The rack id).
- **Device Type:** The configured type of the asset.
- **Name:** The assigned name of the asset.
- **Rack:** The assigned name of the rack where the asset is mounted.
- **Rack Position:** The rack unit position of the asset.
- **Units Used:** The number of rack units consumed.

Example:

- [Rackmounted Assets 5 U or greater](table/customtable?table=zz_Assets_Rackmounted_5_Units_Or_Greater)
- [Rackmounted Assets 5 U or greater, ordered by column name desc](table/customtable?table=zz_Assets_Rackmounted_5_Units_Or_Greater&desc=Name)

Notes:

The second example will report all assets ordered by the asset name in descending order.

3.5.12 zz_Aws_Volumes_PerInstance.sql

Name: zz_Aws_Volumes_PerInstance

Description: The report will show all the Volumes for a given AWS instance.

Syntax: `[Displayed Text](table/customtable?table=zz_Aws_Volumes_PerInstance&instance=<INSTANCE_ID>)`

Example: `[Mounted Devices on Rack X](table/customtable?table=zz_Aws_Volumes_PerInstance&instance=24000000000010)`

Columns:

- Id: The volume object id, this column is hidden by default.
- instanceId: Id of the instance.
- AttachTime: Timestamp when the volume was attached.
- VolumeType
- AvailabilityZone
- CreateTime
- Size
- State
- Iops

3.5.13 zz_Cat_All.sql

Name: zz_Cat_All

Description: The report will show all the catalog objects.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_All)`

Columns:

- Id: The catalog object id, this column is hidden by default.
- Name: The catalog object name.
- SlotCount: The number of modelled slots.
- PortCount: The number of modelled ports.
- Width: The configured width.
- Height: The configured height.
- Description: The description of the node type.
- Category: The type of netTerrain object (Card, Slot, Node, Device)
- Vendor: The configured vendor of the object, if there exists one.

Example:

- [All Catalog Objects](table/customtable?table=zz_Cat_All)
- [All Catalog Objects, order by name desc](table/customtable?table=zz_Cat_All&desc=name)

3.5.13 zz_Cat_Cisco.sql

Name: zz_Cat_Cisco

Description: The report will show all the catalog objects that were manufactured by Cisco.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_Cisco)`

Columns:

- **Id:** The catalog object id, this column is hidden by default.
- **Name:** The catalog object name.
- **SlotCount:** The number of modelled slots.
- **PortCount:** The number of modelled ports.
- **Width:** The configured width.
- **Height:** The configured height.
- **Description:** The description of the node type.
- **Category:** The type of netTerrain object (Card, Slot, Node, Device)
- **Vendor:** The configured vendor of the object, if there exists one.

Example:

- [All Cisco Catalog Objects](table/customtable?table=zz_Cat_Cisco)
- [All Cisco Catalog Objects, order by name desc](table/customtable?table=zz_Cat_Cisco&desc=name)

3.5.15 zz_Cat_Dell.sql

Name: zz_Cat_Dell

Description: The report will show all the catalog objects that were manufactured by Dell.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_Dell)`

Columns:

- **Id:** The catalog object id, this column is hidden by default.
- **Name:** The catalog object name.
- **SlotCount:** The number of modelled slots.
- **PortCount:** The number of modelled ports.
- **Width:** The configured width.
- **Height:** The configured height.
- **Description:** The description of the node type.
- **Category:** The type of netTerrain object (Card, Slot, Node, Device)
- **Vendor:** The configured vendor of the object, if there exists one.

Example:

- [All Dell Catalog Objects](table/customtable?table=zz_Cat_Dell)
- [All Dell Catalog Objects, order by name desc](table/customtable?table=zz_Cat_Dell&desc=name)

3.5.16 zz_Cat_HP.sql

Name: zz_Cat_HP

Description: The report will show all the catalog objects that were manufactured by HP.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_HP)`

Columns:

- **Id:** The catalog object id, this column is hidden by default.
- **Name:** The catalog object name.
- **SlotCount:** The number of moHPed slots.
- **PortCount:** The number of moHPed ports.
- **Width:** The configured width.
- **Height:** The configured height.
- **Description:** The description of the node type.
- **Category:** The type of netTerrain object (Card, Slot, Node, Device)
- **Vendor:** The configured vendor of the object, if there exists one.

Example:

- [All HP Catalog Objects](table/customtable?table=zz_Cat_HP)
- [All HP Catalog Objects, order by name desc](table/customtable?table=zz_Cat_HP&desc=name)

3.5.17 zz_Cat_Juniper.sql

Name: zz_Cat_Juniper

Description: The report will show all the catalog objects that were manufactured by Juniper.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_Juniper)`

Columns:

- **Id:** The catalog object id, this column is hidden by default.
- **Name:** The catalog object name.
- **SlotCount:** The number of moJunipered slots.
- **PortCount:** The number of moJunipered ports.
- **Width:** The configured width.
- **Height:** The configured height.
- **Description:** The description of the node type.
- **Category:** The type of netTerrain object (Card, Slot, Node, Device)
- **Vendor:** The configured vendor of the object, if there exists one.

Example:

- [All Juniper Catalog Objects](table/customtable?table=zz_Cat_Juniper)
- [All Juniper Catalog Objects, order by name desc](table/customtable?table=zz_Cat_Juniper&desc=name)

3.5.18 zz_Cat_NodeOverridesCount.sql

Name: zz_Cat_NodeOverridesCount

Description: The report will show the count of configured overrides for a catalog object.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_NodeOverridesCount)`

Columns:

- **Id:** A id number that is necessary, the number has no particular meaning except for ordering.
- **Name:** The catalog object name.
- **Override Count:** The number of overrides that exists for this object.

Example:

- [Catalog object override count](table/customtable?table=zz_Cat_NodeOverridesCount)
- [Catalog object override count, order by name desc](table/customtable?table=zz_Cat_NodeOverridesCount&desc=name)

3.5.19 zz_Cat_Nokia.sql

Name: zz_Cat_Nokia

Description: The report will show all the catalog objects that were manufactured by Nokia.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_Nokia)`

Columns:

- **Id:** The catalog object id, this column is hidden by default.
- **Name:** The catalog object name.
- **SlotCount:** The number of moNokiaed slots.
- **PortCount:** The number of moNokiaed ports.
- **Width:** The configured width.
- **Height:** The configured height.
- **Description:** The description of the node type.
- **Category:** The type of netTerrain object (Card, Slot, Node, Device)
- **Vendor:** The configured vendor of the object, if there exists one.

Example:

- [All Nokia Catalog Objects](table/customtable?table=zz_Cat_Nokia)
- [All Nokia Catalog Objects, order by name desc](table/customtable?table=zz_Cat_Nokia&desc=name)

3.5.20 zz_Cat_Nortel.sql

Name: zz_Cat_Nortel

Description: The report will show all the catalog objects that were manufactured by Nortel.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_Nortel)`

Columns:

- **Id:** The catalog object id, this column is hidden by default.
- **Name:** The catalog object name.
- **SlotCount:** The number of moNorteled slots.
- **PortCount:** The number of moNorteled ports.
- **Width:** The configured width.
- **Height:** The configured height.
- **Description:** The description of the node type.
- **Category:** The type of netTerrain object (Card, Slot, Node, Device)
- **Vendor:** The configured vendor of the object, if there exists one.

Example:

- [All Nortel Catalog Objects](table/customtable?table=zz_Cat_Nortel)
- [All Nortel Catalog Objects, order by name desc](table/customtable?table=zz_Cat_Nortel&desc=name)

3.5.21 zz_Cat_SlotMappingCountsPerType.sql

Name: zz_Cat_SlotMappingCountsPerType

Description: The report will show the count of configured slot mappings per catalog object slot.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_SlotMappingCountsPerType)`

Columns:

- **Id:** A id number that is necessary, the number has no particular meaning except for ordering.
- **Device Type:** The object name that contains slots.
- **Slot Name:** The name of the slot.
- **Mapping Counts:** The number of configured mappings to cards that are compatible with this slot.

Example:

- [Catalog object slot card mapping count](table/customtable?table=zz_Cat_SlotMappingCountsPerType)
- [Catalog object slot card mapping count, order by name desc](table/customtable?table=zz_Cat_SlotMappingCountsPerType&desc=Device Type)

3.5.22 zz_Cat_Sun.sql

Name: zz_Cat_Sun

Description: The report will show all the catalog objects that were manufactured by Sun.

Syntax: `[Displayed Text](table/customtable?table=zz_Cat_Sun)`

Columns:

- **Id:** The catalog object id, this column is hidden by default.
- **Name:** The catalog object name.
- **SlotCount:** The number of moSuned slots.
- **PortCount:** The number of moSuned ports.
- **Width:** The configured width.
- **Height:** The configured height.
- **Description:** The description of the node type.
- **Category:** The type of netTerrain object (Card, Slot, Node, Device)
- **Vendor:** The configured vendor of the object, if there exists one.

Example:

- [All Sun Catalog Objects](table/customtable?table=zz_Cat_Sun)
- [All Sun Catalog Objects, order by name desc](table/customtable?table=zz_Cat_Sun&desc=name)

3.5.23 zz_DeviceCardCat.sql

Name: zz_DeviceCardCat

Description: The report will provide records of all the devices and cards that exist in netTerrain.

Syntax: `[Displayed Text](table/customtable?table=zz_DeviceCardCat)`

Columns:

- **Id:** Node type id, this column is usually hidden by default.
- **Model:** The name of the Node type
- **Width:** The configured width amount.
- **Height:** The configured height amount.
- **Category:** The category the catalog object falls under, this will be either 'device' or 'card'.
- **Description:** The configured description of the object.

Example:

- [Catalog objects report - device/card](table/customtable?table=zz_DeviceCardCat)
- [Catalog objects report - device/card, order by model desc](table/customtable?table=zz_DeviceCardCat&desc=model)

3.5.23 zz_Devices_With_Connected_Ports.sql

Name: zz_Devices_With_Connected_Ports

Description: A report of all devices that have a port that has been linked to another.

Syntax: `[Displayed Text](table/customtable?table=zz_Devices_With_Connected_Ports)`

Columns:

- **Id:** The id of the node object
- **URL:** The URL will take users to the diagram where the node object exists.
- **Device Type:** The assigned catalog type for the node object.
- **Device Name:** The node object name.
- **Parent Diagram:** The parent object name of the node object.
- **LinkCount:** The number of ports on the node object that are connected.

Example:

- [Report all devices with connected ports](table/customtable?table=zz_Devices_With_Connected_Ports)

3.5.24 zz_Device_Capacity.sql

Name: zz_DeviceCapacity

Description: A report that displays all the devices in the netTerrain project with port and slot capacity information.

Syntax: `[Displayed Text](/table/customtable?table=zz_Device_Capacity)`

Columns:

- Id: The device id, this column is hidden by default.
- ParentId: The device parent id.
- TypeName: The device type.
- Name: The name of the node device.
- Parent: The name of the parent device.
- Peak Power (W): The peak power that has been set on the device.
- Weight (lb): The weight value on the device.
- Width (in): The width of the device.
- Height (in): The height of the device.
- Slots: The number of slots on the device.
- SlotsFree: The number of free slots on the device.
- SlotsFreePerc: The percentage of free slots on the device.
- Ports: The number of ports on the device.
- PortsFree: The number of free ports on the device.
- PortsFreePerc: The percentage of free ports on the device.

Example:

- [Device capacity report](/table/customtable?table=zz_Device_Capacity)
- [Top 30 Devices by slot occupancy](/table/customtable?table=zz_Device_Capacity&asc=SlotsFreePerc)

Notes: The second example will order the report in ascending order by column "SlotsFreePerc".

3.5.25 zz_Report_allConnectedToObject.sql

Name: zz_Report_allConnectedToObject

Description: The report will show all link connections going to a specified device object.

Syntax: `[Displayed Text](table/customtable?table=zz_Report_allConnectedToObject&did=<OBJECT_ID>)`

Columns:

- Link Source: The hierarchy trail to the source object (The specified object and possibly its port).
- Source Type: The catalog type name of the object.
- Source URL: A url to the diagram of the source connection.
- Link Destination: The hierarchy trail to the destination object
- Destination Type: The catalog type name of the object.
- Destination URL: A url to the diagram of the destination connection.
- Id: The link ID
- Link Name: The name specified for the link, if there is any.
- Link Type: The assigned link type name.

Example:

- [Report all connected](table/customtable?table=zz_Report_allConnectedToObject&did=24000000000010)
- [Report all connected](table/customtable?table=zz_Report_allConnectedToObject&did=[id])
- [Report all connected](table/customtable?table=zz_Report_allConnectedToObject&did=[diagramid])

Notes: The report requires one parameter value to be specified in order to function, the parameter value is sent via the url in the syntax section above.

3.5.26 zz_Assets_NonRackmounted.sql

Name: zz_Assets_NonRackmounted

Description: A report that shows all (non cloned) assets that are not rack mounted.

Syntax: `[Displayed Text](table/customtable?table=zz_Assets_NonRackmounted)`

Columns:

- **url**: Link to the unmounted device
- **Id**: The asset's id, this column is hidden by default.
- **Name**: The name of the asset.
- **Width** (in): The width of the asset.
- **Height** (in): The height of the asset.

Example:

- [All assets in racks](table/customtable?table=zz_Assets_Rackmounted)
- [All assets in racks, order by asset name desc](table/customtable?table=zz_Assets_NonRackmounted&desc=Name)

3.5.27 zz_Assets_NullCoordinates.sql

Name: zz_Assets_NullCoordinates

Description: A report that shows all assets that have never been moved.

Syntax: `[Displayed Text](table/customtable?table=zz_Assets_NullCoordinates)`

Columns:

- **Id:** The id of the node object
- **url**: Link to the unmounted device
- **Id**: The asset's id, this column is hidden by default.
- **Name**: The name of the asset.
- **Width** (in): The width of the asset.
- **Height** (in): The height of the asset.

Example:

- [All assets in racks](table/customtable?table=zz_Assets_NullCoordinates)
- [All assets in racks, order by asset name desc](table/customtable?table=zz_Assets_NullCoordinates&desc=Name)

3.5.28 zz_Devices_Rackmounted.sql

Name: zz_Devices_Rackmounted

Description: A report that shows all devices that are rack mounted.

Syntax: `[Displayed Text](table/customtable?table=zz_Devices_Rackmounted)`

Columns:

- Id: The asset's id, this column is hidden by default.
- ParentId: The asset's parent id (The rack).
- TypeName: The asset configured type.
- Name: The name of the asset.
- Rack: The name of the rack.
- Peak Power (W): The peak power value of the asset.
- Weight (lb): The weight of the asset.
- Width (in): The width of the asset.
- Height (in): The height of the asset.
- SlotsOnChassis: The number of slots on the asset.
- FreeSlots: The number of free slots on the asset.
- TotalPorts: The total ports on the asset.
- PortsOnChassisOnly: The number of ports on the chassis.

Example:

- [All assets in racks](table/customtable?table=zz_Devices_Rackmounted)
- [All assets in racks, order by asset name desc](table/customtable?table=zz_Devices_Rackmounted&desc=Name)

3.5.29 zz_Devices_With_Connected_Ports.sql

Name: zz_Devices_With_Connected_Ports

Description: A report of all devices that have a port that has been linked to another.

Syntax: `[Displayed Text](table/customtable?table=zz_Devices_With_Connected_Ports)`

Columns:

- **Id:** The id of the node object
- **URL:** The URL will take users to the diagram where the node object exists.
- **Device Type:** The assigned catalog type for the node object.
- **Device Name:** The node object name.
- **Parent Diagram:** The parent object name of the node object.
- **LinkCount:** The number of ports on the node object that are connected.

Example:

- [Report all devices with connected ports](table/customtable?table=zz_Devices_With_Connected_Ports)

3.5.30 zz_Diagram_Devices_With_Properties.sql

Name: zz_Diagram_Devices_With_Properties

Description: Provides a report of devices and their configured properties. A device will be included regardless of the hierarchy level as long as it's contained in the specified diagram.

Syntax: `[Displayed Text](table/customtable?table=zz_Diagram_Devices_With_Properties&diagram=<DIAGRAM_ID>)`

Columns:

- **Id:** This is the id of the device object, the column is hidden by default.
- **DeviceName:** The assigned device name.
- **DeviceType:** The assigned device type name from the catalog.
- **PropValue:** The property name and value.
- **Sequence:** The sequence, which is the device id and name. The subsequent property field names and values will only show the id, serving as a visual aid.

Example:

- [All devices under diagram x](table/customtable?table=zz_Diagram_Devices_With_Properties&diagram=24000000000025)

Notes:

- The report requires a parameter to function, the parameter value is sent via the URL.
- diagram=

3.5.31 zz_Diagrams_Ports_By_PropertyValue.sql

Name: zz_Diagrams_Ports_By_PropertyValue

Description: The report will provide a list of devices and their port status (Open or In-use). The report will be generated by using the following parameters: Rack Id, Port Property Name and Port Property value. Any port not matching the criteria will be excluded.

Syntax: `[Displayed Text](table/customtable?table=zz_Diagrams_Ports_By_PropertyValue&Rack=<RACK_ID>&pname=<Port_Prop_Field_Name>&p`

Columns:

- **Link:** A URL that will take the user to the diagram where the port exists.
- **Id:** The port id used by netTerrain.
- **Asset Name:** The configured asset name.
- **Asset Type:** The asset's configured catalog type.
- **Port Name:** The name of the port.
- **Status:** This is the port status, which is either 'Open' or 'In-use'

Example:

- [All Devices with port protocol: power](table/customtable?table=zz_Diagrams_Ports_By_PropertyValue&Rack=24000000000010&pname=protocol&pvalue=power)

Notes:

- The report requires three parameters to function, the parameter value is sent via the URL in the syntax section above.
- rack: The rack id
- pname: The port property name, which must be matched exactly.
- pvalue: The port property correspoding value, which must be matched exactly.

3.5.32 zz_Diagrams_Top_10_Largest.sql

Name: zz_Diagrams_Top_10_Largest

Description: A report showing the top 10 largest diagrams.

Syntax:

```
[Displayed Text](table/customtable?table=zz_Diagrams_Top_10_Largest)
```

Columns:

- **Link:** This URL will take the user to the diagram location.
- **Id:** The diagram id, which is hidden by default.
- **ParentId:** The parent id of the node or diagram.
- **TypeName:** The configured catalog type for the node/diagram.
- **Name:** The name of the node or diagram.
- **Parent:** The parent object name.
- **NodeCount:** The number of nodes on the diagram.

Example:

- [Top 10 largest diagrams](table/customtable?table=zz_Diagrams_Top_10_Largest)
- [Top 10 largest diagrams, sort by diagram size desc](table/customtable?table=zz_Diagrams_Top_10_Largest&desc=NodeCount)
- [Top 10 largest diagrams, sort by diagram size asc](table/customtable?table=zz_Diagrams_Top_10_Largest&asc=NodeCount)

3.5.33 zz_Diagrams_Top_50_Largest.sql

Name: zz_Diagrams_Top_50_Largest

Description: A report showing the top 50 largest diagrams.

Syntax:

```
[Displayed Text](table/customtable?table=zz_Diagrams_Top_50_Largest)
```

Columns:

- **Link:** This URL will take the user to the diagram location.
- **Id:** The diagram id, which is hidden by default.
- **ParentId:** The parent id of the node or diagram.
- **TypeName:** The configured catalog type for the node/diagram.
- **Name:** The name of the node or diagram.
- **Parent:** The parent object name.
- **NodeCount:** The number of nodes on the diagram.

Example:

- [Top 50 largest diagrams](table/customtable?table=zz_Diagrams_Top_50_Largest)
- [Top 50 largest diagrams, sort by diagram size desc](table/customtable?table=zz_Diagrams_Top_50_Largest&desc=NodeCount)
- [Top 50 largest diagrams, sort by diagram size asc](table/customtable?table=zz_Diagrams_Top_50_Largest&asc=NodeCount)

3.5.34 zz_Links_All.sql

Name: zz_Links_All

Description: Provides a report on all the logical links between nodes (port links are not considered).

Syntax: `[Displayed Text](table/customtable?table=zz_Links_All)`

Columns:

- **URL:** The URL will take the user to the diagram where the link exists.
- **Id:** The id of the link, this column is hidden by default.
- **Link Type:** The configured link type.
- **Name:** The configured name for the link.
- **End Point 1:** The name of the node at side one of the link.
- **End Point Parent 1:** The name of the parent node at side one.
- **End Point Type 1:** The type of node at side one.
- **End Point 2:** The name of the node at side two of the link.
- **End Point Parent 2:** The name of the parent node at side two.
- **End Point Type 2:** The type of node at side two.

Example:

- [All Logical Links](table/customtable?table=zz_Links_All)
- [All Logical Links, order by link name desc](table/customtable?table=zz_Links_All&desc=Name)

3.5.35 zz_Nodes_Children_IP_Addresses.sql

Name: zz_Nodes_Children_IP_Addresses

Description: The report will show all the node children IP addresses. Only nodes that satisfy the following criterion will be included: At least one of the node's property field names contain all of both 'pname1' and 'pname2' parameter values. The node id number must be greater than the specified 'nid' number.

Syntax: `[Displayed Text](table/customtable?table=zz_Nodes_Children_IP_Addresses&pname1=<Partial_Property_Name>&pname2=<Partial_Pr`

Columns:

- **URL:** The URL will take the user to the diagram where the node exists.
- **Id:** The id of the node, this column is hidden by default.
- **IP Address:** The IPv4 address of the node
- **Node Type:** The configured type for the node.
- **Node Name:** The assigned name of the node.
- **Sequence:** The IPv4 sequence number, which is in the format: xxxxxxxxx. So 192.168.1.1 would appear as 192168001001

Example:

- [All Nodes children IP addresses](table/customtable?table=zz_Nodes_Children_IP_Addresses&pname1=&pname2=&nid=0)
- [All Logical Links, order by link name desc](table/customtable?table=zz_Nodes_Children_IP_Addresses&desc=Name)

Notes:

- The report requires three parameters to be specified in order to function, the parameter value is sent via the URL in the syntax section above.
- pname1: Partial match for the node property name, leave blank to match all.
- pname2: Partial match for the node property name, leave blank to match all.
- nid:Only ids greater than the specified will be included in the result set. Use 0 to include all.

3.5.36 zz_Ports.sql

Name: zz_Ports

Description: The report shows all the ports that exist in the netTerrain project.

Syntax: `[Displayed Text](table/customtable?table=zz_Ports)`

Columns:

- **URL:** Takes the user to the diagram where the port exists.
- **Id:** The id of the node's port.
- **Container:** The node object's parent name.
- **Device:** The name of the object which contains the port.
- **Card:** The name of the card object which contains the port, if there exists one.
- **Port Name:** The name of the port.
- **Status:** The port's property status field value, if there exists one.
- **Connector:** The port's property connector field value, if there exists one.
- **Protocol:** The port's property protocol field value, if there exists one.
- **Connection Count:** The number of links made to this port.

Example:

- [Report All Ports](table/customtable?table=zz_Ports)

3.5.37 zz_Ports_Connected.sql

Name: zz_Ports_Connected

Description: The report shows all the ports which have been linked to another object/port.

Syntax: `[Displayed Text](table/customtable?table=zz_Ports_Connected)`

Columns:

- **URL:** The link will take users to where the port exists.
- **Id:** The id of the port, the column is hidden by default.
- **Container:** The node's parent container.
- **Device:** The name of the object which contains the port.
- **Card:** The card on the node object where the port is located, if one exists.
- **Port Name:** The name configured for the port.
- **Status:** The port's property status field value, if there exists one.
- **Connector:** The port's property connector field value, if there exists one.
- **Protocol:** The port's property protocol field value, if there exists one.
- **Connection Count:** The number of links made to this port.

Example:

[Ports Connected](table/customtable?table=zz_Ports_Connected)

3.5.38 zz_Ports_Not_Connected.sql

Name: zz_Ports_Not_Connected

Description: The report will show all the ports which have no connection/link.

Syntax: `[Displayed Text](table/customtable?table=zz_Ports_Not_Connected)`

Columns:

- **URL:** The link will take users to where the port exists.
- **Id:** The id of the port, the column is hidden by default.
- **Container:** The node's parent container.
- **Device:** The name of the object which contains the port.
- **Card:** The card on the node object where the port is located, if one exists.
- **Port Name:** The name configured for the port.
- **Status:** The port's property status field value, if there exists one.
- **Connector:** The port's property connector field value, if there exists one.
- **Protocol:** The port's property protocol field value, if there exists one.
- **Connection Count:** The number of links made to this port.

Example:

[Ports Not Connected](table/customtable?table=zz_Ports_Not_Connected)

3.5.39 zz_Ports_VLANs.sql

Name: zz_Ports_VLANs

Description: The report will show all the Collector SNMP discovered VLANs associated with the port index.

Syntax: `[Displayed Text](table/customtable?table=zz_Ports_VLANs&id=<id>)`

Columns:

- Id: The id of the port, the column is hidden by default.
- Vlan: Vlan number.
- Mac Address: Port physical address
- Port Index: Port Index, as per catalog mapped index. Usually the SNMP ifIndex
- Device: The name of the object which contains the port.
- Port Name: The name configured for the port.

Example:

[VLANs](table/customtable?table=zz_Ports_VLANs&id=[id])

3.5.40 zz_Racks_Children_StandardFields.sql

Name: zz_Racks_Children_StandardFields

Description: A report with standard fields that shows all assets that are under a rack object. The asset does not have to be mounted.

Syntax: `[Displayed Text](table/customtable?table=zz_Racks_Children_StandardFields&Rack={rack})`

Columns:

- Url: The url will take users to the diagram where the asset exists.
- Id: The asset's id, this column is hidden by default.
- TypeName: The asset configured type.
- Name: The name of the asset.
- Rack: The name of the rack.
- Peak Power (W): The peak power value of the asset.
- Weight (lb): The weight of the asset.
- Width (in): The width of the asset.
- Height (in): The height of the asset.
- TotalSlots: The number of slots on the asset.
- SlotsAvailable: The number of free slots on the asset.
- TotalPorts: The total ports on the asset.

Example:

[Devices](table/customtable?table=zz_Racks_Children_StandardFields&Rack=[id]&asc=Sequence)

3.5.41 zz_Racks_FullPortList.sql

Name: zz_Racks_FullPortList

Description: The report will show all ports and their status for all devices on a specified rack (mounted or not).

You must use the parameter 'rack' to pass an id value to the report.

Syntax: `[Displayed Text](table/customtable?table=zz_Racks_FullPortList&rack=<RACK_ID>) [Mounted Devices on Rack X](table/customtable?table=zz_Racks_FullPortList&rack=24000000000010)`

Columns:

- **Id**: The id of the node object.
- **DeviceName**: The name of the mounted device.
- **Property**: A property field of the mounted device.
- **RecordIndex**: The id of the device and for the first record also the device name.

Notes:

- The report requires one parameter to be specified in order to function, the parameter value is sent via the url in the syntax section above.

3.5.42 zz_Racks_Mounted_Devices.sql

Name: zz_Racks_Mounted_Devices

Description: The report will show all devices mounted on a specified rack. You must use the parameter 'rack' to pass an id value to the report.

Syntax: `[Displayed Text](table/customtable?table=zz_Racks_Mounted_Devices&rack=<RACK_ID>) [Mounted Devices on Rack X](table/customtable?table=zz_Racks_Mounted_Devices&rack=24000000000010)`

Columns:

- **Id:** The id of the node object,
- **DeviceName:** The name of the mounted device.
- **Property:** A property field of the mounted device.
- **RecordIndex:** The id of the device and for the first record also the device name.

Notes:

- The report requires one parameter to be specified in order to function, the parameter value is sent via the URL in the syntax section above.
- Rack: The rack id where the mounted devices exists.

3.5.43 zz_Racks_Port_To_Port_Links.sql

Name: zz_Racks_Port_To_Port_Links

Description: The report will show all port connections on the specified rack.

Syntax: `[Displayed Text](table/customtable?table=zz_Racks_Port_To_Port_Links&rack=<RACK_ID>)`

Columns:

- **Id:** The id of the link, this column is hidden by default.
- **Rack:** The name of the rack.
- **Local Device:** The device where the link is connected to.
- **Local Card:** The device's card name if applicable.
- **Local Port:** The assigned port name.
- **Remote Rack:** The rack name of the other end of the link.
- **Remote Device:** The remote device name of the other end of the link.
- **Remote Card:** The device's card name if applicable.
- **Remote Port:** The port name of the other end of the link.
- **Link Name:** The link name of the connection.

Example:

[Racks port to port connections](table/customtable?table=zz_Racks_Port_To_Port_Links&rack=24000000000010)

Notes:

- The report requires one parameter to be specified in order to function, the parameter value is sent via the URL in the syntax section above.
- Rack: The rack id where the link exists.

3.5.44 zz_Racks_Port_To_Port_Links_No_Xconnections.sql

Name: zz_Racks_Port_To_Port_Links_No_Xconnections

Description: The report will show all port connections that start on the specified rack, including one custom field.

Syntax: `[Displayed Text](table/customtable?table=zz_Racks_Port_To_Port_Links_No_Xconnections&rack=<RACK_ID>)`

Example:

[Racks port to port connections](table/customtable?table=zz_Racks_Port_To_Port_Links&rack=24000000000010)

3.5.45 zz_Report_AuditWeek.sql

Name: zz_Report_AuditWeek

Description: Provides an audit report of all user actions that occurred in the previous week.

Syntax: `[Displayed Text](table/customtable?table=zz_Report_AuditWeek)`

Columns:

- URL: If applicable the diagram id.
- Id: The audit record id.
- Object ID: The affected object id.
- Object Parent ID: If applicable, the object's parent id.
- Action: The type of action that was taken place i.e
- Timestamp: Date and time of the action or event.

Example:

[Audit for week](table/customtable?table=zz_Report_AuditWeek)

4 netTerrain Expressions

Expressions in netTerrain are aggregate SQL functions that exist in the application server. These functions retrieve a scalar value based on the expression query, for example the number of nodes in the project.

netTerrain 5.2 or better ships with several predefined functions, and advanced users can also create their own expressions and put them in the SQLexpressions folder on the server.

These expressions will then be available to the client and can be displayed on the properties window or on the diagram as a displayed field.

In this chapter we discuss the process of creating new expressions and we also provide a reference for existing expressions that are shipped with the product.

4.1 File location

All expressions that are available in netTerrain are in the following folder:

```
%install_dir%\Graphical Networks\netTerrain\vis\SQLExpressions
```

When creating a new expression script, you will need to place your SQL file in this folder for it to appear as an option in netTerrain.

4.2 Reserved parameters

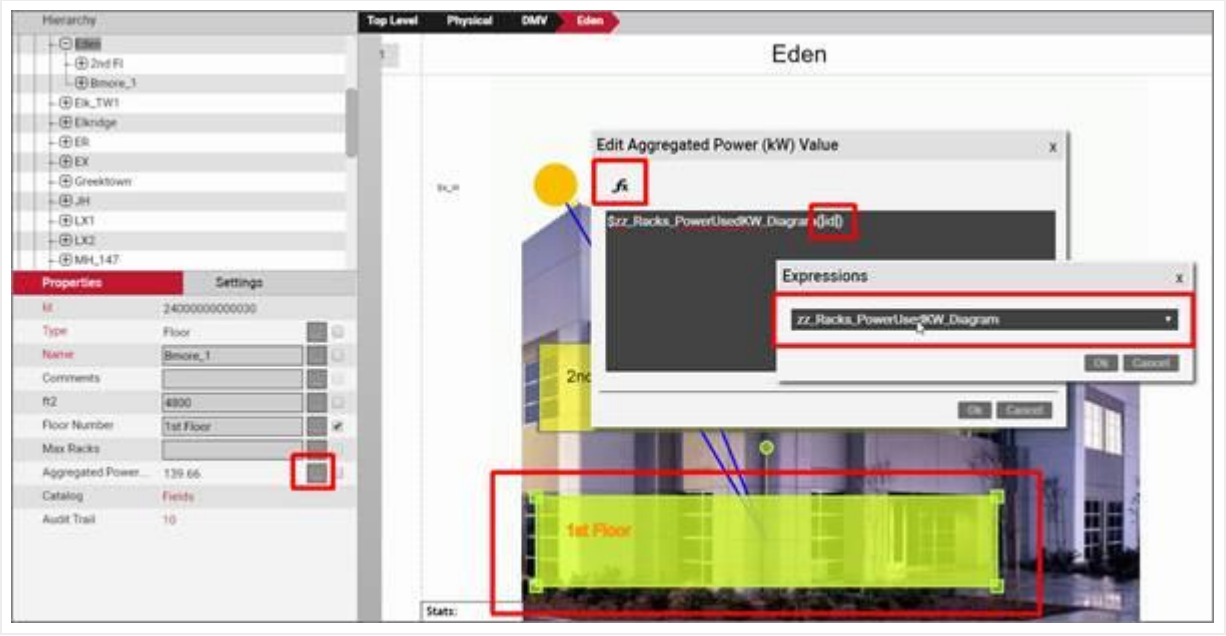
netTerrain currently contains three reserved parameters, which can be used in SQL expressions. These are:

- [userId]: the current user's id.
- [id]: current object id (where the expression is run from)
- [DiagramId]: current object's diagram location.

4.3 Using expressions in netTerrain

Expressions can be used in free text, displayed fields or property values.

To use an expression, type it on the properties field directly if you know the syntax, or retrieve it from the field editor by clicking on the ‘Exp’ button as shown below.



Adding an expression to a field

The example above, shows a node, for which the field 'AggregateValue' will display an expression consisting of the total number of nodes in the project and also display that value on the diagram. The property field uses the following syntax: 'Total nodes: $zz_Proj_TotalNodeCount'

The result is a value such as 'Total nodes: 903' as displayed below.

Result of the expression

In general, an expression has the following syntax pattern:

```
$expression_name(params)
```

4.4 Creating custom expressions

First begin by creating a new SQL file and when complete, save it to the SQL reports directory. Use the reports description section above as a reference for locating desired information for your report.

4.4.1 The basics

An expression in netTerrain is a scalar producing query, which means only a single value should be returned. In this section we will show how to create your own SQL expression.

> Tip:
>
> When building an expression script, chances are that similar information has been obtained in one of the existing expressions below. You could reference the code in the file as a starting point and modify it to your specifications.
>
> When creating a new expression, it is important to consider the performance of the query. Slow scripts could increase the load time of netTerrain diagrams significantly.

4.4.2 Parameters

In the SQL code you may use curly tags to retrieve parameter values. They start with {0}, {1}, {2} and so on for each additional parameter value being sent.

The following code shows three parameters being sent:

```
$zz_Demo('param', 2, 5)
```

This is how the parameters would appear after execution:

```
{0} would be replaced with 'param'

{1} would be replaced with 2

{2} would be replaced with 5
```

4.4.3 Sample case

In our example we would like to show the number of objects on a specified diagram.

We know that all node objects are held in the Nodes table and we would like to count the number of objects whose parent is x.

The SQL code would appear as:

```
SELECT COUNT(id) FROM Nodes WHERE ParentId={0}
```

Notice that we are returning one column and one record by using the COUNT function.

4.5 Expressions Reference

This section provides a reference for most of the predefined SQL Expressions that are included in netTerrain. Note that users can create their own expressions and throughout releases (or upon request) more can be added, so this reference does not pretend to be 100% comprehensive.

The guide provides the name, description, syntax, example and notes for every expression script. Below is a summary of some of the expressions that are included in the default netTerrain installation.

4.5.1 ParamsExample.sql
4.5.2 zz_Audit_CurrentUserId.sql
4.5.3 zz_Audit_GetDate.sql
4.5.4 zz_Audit_GetDate2.sql
4.5.5 zz_Audit_GetDateTime.sql
4.5.6 zz_Audit_GetDateTime2.sql
4.5.7 zz_Audit_InsertAuthor.sql
4.5.8 zz_Audit_InsertDate.sql
4.5.9 zz_Audit_InsertDate2.sql
4.5.10 zz_Audit_InsertDateTime.sql
4.5.11 zz_Audit_InsertDateTime2.sql
4.5.12 zz_Audit_LastNUpdatesAuthorEmailAndDate.sql
4.5.13 zz_Audit_LastUpdateDate.sql
4.5.14 zz_Audit_LastUpdateDate2.sql
4.5.15 zz_Audit_LastUpdateDateTime.sql
4.5.16 zz_Audit_LastUpdateDateTime2.sql
4.5.17 zz_Audit_TotalDeletes.sql

4.5.18 zz_Audit_TotalDeletesCurrentUser.sql
4.5.19 zz_Audit_TotalEntries.sql
4.5.20 zz_Audit_TotalEntriesCurrentUser.sql
4.5.21 zz_Audit_TotalInserts.sql
4.5.22 zz_Audit_TotalInsertsCurrentUser.sql
4.5.23 zz_Audit_TotalUpdates.sql
4.5.24 zz_Audit_TotalUpdatesCurrentUser.sql
4.5.25 zz_Card_OccupancyPerc.sql
4.5.26 zz_Card_TotalCount.sql
4.5.27 zz_Comments_TotalCount.sql
4.5.28 zz_Device_CardUtilization.sql
4.5.29 zz_Device_PortUtilization.sql
4.5.30 zz_Device_TotalCount.sql
4.5.31 zz_Device_TotalCountByModelId.sql
4.5.32 zz_Device_TotalCountByStatusValue.sql
4.5.33 zz_Diagram_1000_Nodes.sql
4.5.34 zz_Diagram_100_To_249_Nodes.sql
4.5.35 zz_Diagram_1_To_49_Nodes.sql
4.5.36 zz_Diagram_250_To_499_Nodes.sql
4.5.37 zz_Diagram_500_To_999_Nodes.sql
4.5.38 zz_Diagram_50_To_99_Nodes.sql
4.5.39 zz_Diagram_TotalCount.sql
4.5.40 zz_Document_TotalCount.sql
4.5.41 zz_Link_TotalCount.sql
4.5.42 zz_Node_TotalCount.sql
4.5.43 zz_Palette_TotalCount.sql
4.5.44 zz_Port_TotalCount.sql
4.5.45 zz_Rack_PowerInUsePerc.sql
4.5.46 zz_Rack_PowerUsed.sql
4.5.47 zz_Rack_PowerUsedKW.sql
4.5.48 zz_Rack_RUsInUsePerc.sql
4.5.49 zz_Rack_RUsUsed.sql
4.5.50 zz_Rack_TotalCount.sql
4.5.51 zz_Rack_TotalPower.sql
4.5.52 zz_Rack_TotalPowerAvailable.sql
4.5.53 zz_Rack_TotalRUs.sql
4.5.54 zz_Rack_TotalWeight.sql

4.5.55 zz_Rack_TotalWeightAvailable.sql

4.5.56 zz_Rack_WeightInUsePerc.sql

4.5.57 zz_Rack_WeightUsed.sql

4.5.58 zz_Rack_kBTUH.sql

4.5.59 zz_Dash_Shapes_TotalCount.sql

4.5.60 zz_Dash_Slots_TotalCount.sql

4.5.61 zz_Dash_Stamps_TotalCount.sql

4.5.62 zz_Dcm_PowerPerRackAvgKW.sql

4.5.63 zz_Dcm_PowerPerRackDeratedKW.sql

4.5.64 zz_Dcm_PowerPerRackMaxDrawKW.sql

4.5.65 zz_Dcm_TemperatureInletPerRackAvgC.sql

4.5.66 zz_Device_GetPortCountByPropertyValue.sql

4.5.67 zz_Device_Power_Derated.sql

4.5.68 zz_Device_kBTUH.sql

4.5.69 zz_Diagram_GetDeviceCount.sql

4.5.70 zz_Diagram_GetPortCount.sql

4.5.71 zz_Diagram_GetPortCountByPropertyValue.sql

4.5.72 zz_ITK_AdaptersCount.sql

4.5.73 zz_ITK_ConnectorsCount.sql

4.5.74 zz_ITK_DeviceConnectorCount.sql

4.5.75 zz_ITK_LinkersCount.sql

4.5.76 zz_ITK_Mon_Databases_Count_Active.sql

4.5.77 zz_ITK_Mon_Databases_Count_Inactive.sql

4.5.78 zz_ITK_Mon_Databases_Count_Unknown.sql

4.5.79 zz_ITK_Mon_Databases_DataFileSize_Active.sql

4.5.80 zz_ITK_Mon_Databases_DataFileSize_Inactive.sql

4.5.81 zz_ITK_Mon_Databases_DataFileSize_Unknown.sql

4.5.82 zz_ITK_Mon_Databases_LogFileSize_Active.sql

4.5.83 zz_ITK_Mon_Databases_LogFileSize_Inactive.sql

4.5.84 zz_ITK_Mon_Databases_LogFileSize_Unknown.sql

4.5.85 zz_Link_GetCountByPropertyAndValue_ExactMatch.sql

4.5.86 zz_Link_GetCountByPropertyAndValue_PartialMatch.sql

4.5.87 zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch.sql

4.5.88 zz_Link_GetCountByTypeAndPropertyAndValue_PartialMatch.sql

4.5.89 zz_Link_GetCountByTypeAndValue_ExactMatch.sql

4.5.90 zz_Link_GetCountByTypeAndValue_PartialMatch.sql

4.5.91 zz_Link_GetCountByType_ExactMatch.sql

4.5.92 zz_Link_GetCountByType_PartialMatch.sql

4.5.93 zz_Link_GetCountByValue_ExactMatch.sql

4.5.94 zz_Link_GetCountByValue_PartialMatch.sql

4.5.95 zz_Link_LinkEndingPoint.sql

4.5.96 zz_Link_LinkEndingPortConnector.sql

4.5.97 zz_Link_LinkEndingPortProtocol.sql

4.5.98 zz_Link_LinkEndingPortStatus.sql

4.5.99 zz_Link_LinkName .sql

4.5.100 zz_Link_LinkStartingPoint.sql

4.5.101 zz_Link_LinkStartingPortConnector.sql

4.5.102 zz_Link_LinkStartingPortProtocol.sql

4.5.103 zz_Link_LinkStartingPortStatus.sql

4.5.104 zz_Link_Name .sql

4.5.105 zz_Link_ValueByPropertyName.sql

4.5.106 zz_Misc_Date.sql

4.5.107 zz_Node_CountChildren.sql

4.5.108 zz_Node_CountChildrenFullSubtree.sql

4.5.109 zz_Node_CountDocuments.sql

4.5.110 zz_Node_CountLinksConnected.sql

4.5.111 zz_Node_GetAncestorFieldValue.sql

4.5.112 zz_Node_GetCountByPropertyAndValue_ExactMatch.sql

4.5.113 zz_Node_GetCountByPropertyAndValue_PartialMatch.sql

4.5.114 zz_Node_GetCountByTypeAndPropertyAndValue_ExactMatch.sql

4.5.115 zz_Node_GetCountByTypeAndPropertyAndValue_PartialMatch.sql

4.5.116 zz_Node_GetCountByTypeAndValue_ExactMatch.sql

4.5.117 zz_Node_GetCountByTypeAndValue_PartialMatch.sql

4.5.118 zz_Node_GetCountByType_ExactMatch.sql

4.5.119 zz_Node_GetCountByType_ExactMatch_WithSearchUrl.sql

4.5.120 zz_Node_GetCountByType_PartialMatch.sql

4.5.121 zz_Node_GetCountByValue_ExactMatch.sql

4.5.122 zz_Node_GetCountByValue_PartialMatch.sql

4.5.123 zz_Node_GetValueByPropertyName.sql

4.5.124 zz_Node_IP_addresses_Children.sql

4.5.125 zz_Node_MultiValuesByFieldNameInOneField.sql

4.5.126 zz_Node_Name.sql

4.5.127 zz_Node_ParentName.sql

4.5.128 zz_Node_RackPosition.sql

4.5.129 zz_Node_Type.sql

4.5.130 zz_Node_getCheckedFieldNames.sql

4.5.131 zz_Object_Id.sql

4.5.132 zz_Port_DeviceParentName.sql

4.5.133 zz_Port_RackDevicePortPath.sql

4.5.134 zz_Project_GenericNodeCount.sql

4.5.1 ParamsExample.sql

Name: $ParamsExample

Description: This expression will reveal the current reserved parameters available for use. The curly tags {0}, {1}, and so on are the params that are being passed to the script.

Syntax: `$ParamsExample(<param0>,<param1>, <param2>, <param3>)`

Example:

- Usage: $ParamsExample([id],[userId],'some text',[DiagramId])
- Sample output: id=24000000031862; userid=94000000000171; text=some text; number=24000000014087;

Notes:

- [userId] - The current user's id.
- [id] - Current object id (Where the expression is run from)
- [DiagramId] - Current object's diagram location.
- A parameter can be a number, a string or a reserved param, such as those above.

4.5.2 zz_Audit_CurrentUserId.sql

Name: $zz_Audit_CurrentUserId

Description: The expression will return the current user's id.

Syntax: `$zz_Audit_CurrentUserId([UserId])`

Example:

- Using: $zz_Audit_CurrentUserId([userId])
- Sample output: '94000000000004'

Notes:

- This expression is most useful in conjunction with other functions or reports that take the UserId as an input.

4.5.3 zz_Audit_GetDate.sql

Name: $zz_Audit_GetDate

Description: The expression will return the system's current date in the following format mm/dd/yyyy. For another format see $zz_Audit_GetDate2

Syntax: `$zz_Audit_GetDate()`

Example:

- Using: $zz_Audit_GetDate()
- Sample output: 12/22/2014

Notes:

- The expression can be useful when exporting diagrams and noting the time it was exported.

4.5.4 zz_Audit_GetDate2.sql

Name: $zz_Audit_GetDate2

Description: Returns the system's date in the following format: DD.Month.YYYY

Syntax: `$zz_Audit_GetDate2()`

Example:

- Using: $zz_Audit_GetDate2()
- Sample output: 22.December.2014

Notes:

- The expression can be useful when exporting diagrams and noting the date it was exported.

4.5.5 zz_Audit_GetDateTime.sql

Name: $zz_Audit_GetDateTime

Description: Gets the current date and time in MM/DD/YYYY HH:MM:SS AM Format.

Syntax: `$zz_Audit_GetDateTime()`

Example:

- Using: $zz_Audit_GetDateTime()
- Sample output: 3/20/2014 9:56:52 PM

Notes:

- Also see $zz_Audit_GetDateTime2 for a different format

4.5.6 zz_Audit_GetDateTime2.sql

Name: $zz_Audit_GetDateTime2

Description: Gets the current date and time in DD.Month Name.yyyy :: 24-hour clock format.

Syntax: `$zz_Audit_GetDateTime2()`

Example:

- Using: $zz_Audit_GetDateTime2()
- Sample output: 24.December.2014 :: 17:20

Notes:

- See $zz_Audit_GetDateTime for a different format.

4.5.7 zz_Audit_InsertAuthor.sql

Name: $zz_Audit_InsertAuthor

Description: Gets the name of the object's creator. If there is none, then '' will be returned. The object's id must be passed.

Syntax: `$zz_Audit_InsertAuthor([id]) or $zz_Audit_InsertAuthor('24000000099864')`

Example:

- Using: $zz_Audit_InsertAuthor([id])
- Sample output: John.Doe

4.5.8 zz_Audit_InsertDate.sql

Name: $zz_Audit_InsertDate

Description: Gets the object's insert date or returns '' if none exists.

Syntax: `$zz_Audit_InsertDate([id])`

Example:

- Using: $zz_Audit_InsertDate([id])
- Sample output: 12/22/2014

Notes:

- See $zz_Audit_InsertDate2 for a different date format.

4.5.9 zz_Audit_InsertDate2.sql

Name: $zz_Audit_InsertDate2

Description: Gets the object's insert date or returns '' if none exists.

Syntax: `$zz_Audit_InsertDate2([id])`

Example:

- Using: $zz_Audit_InsertDate2([id])
- Sample output: 22.December.2014

Notes:

- See $zz_Audit_InsertDate for a different date format.

4.5.10 zz_Audit_InsertDateTime.sql

Name: $zz_Audit_InsertDateTime

Description: Gets the date and time of the insert event of the NodeId associated with the parameter in MM/DD/YYYY HH:MM:SS format

Syntax: `$zz_Audit_InsertDateTime([<NodeId>])`

Example:

- Using: $zz_Audit_InsertDateTime([DiagramId])
- Sample output: 03/12/2014 18:22:39

Notes:

- When no insert time is obtainable from the audit trail the output yields ''.

4.5.11 zz_Audit_InsertDateTime2.sql

Name: $zz_Audit_InsertDateTime2

Description: Gets the date and time (no seconds) of the insert event of the NodeId associated with the parameter in DD.Month.YYYY :: HH:MM format

Syntax: `$zz_Audit_InsertDateTime2([<NodeId>])`

Example:

- Using: $zz_Audit_InsertDateTime2([DiagramId])
- Sample output: 12.March.2014 :: 18:22

Notes:

- When no insert time is obtainable from the audit trail the output yields ''.

4.5.12 Audit_LastNUpdatesAuthorEmailAndDate.sql

Name: $zz_Audit_LastNUpdatesAuthorEmailAndDate

Description: Gets the email of the object's last N updaters. If there is none, then '' will be returned.

Syntax: `$zz_Audit_LastNUpdatesAuthorEmailAndDate([id], 3) or $zz_Audit_LastNUpdatesAuthorEmailAndDate('24000000099864', 3)`

Example:

- Using: $zz_Audit_LastNUpdatesAuthorEmailAndDate([id], 3)
- Sample output:
    - John.Doe@gmail.com on 12.May.2014
    - Storm.Que@gmail.com on 6.May.2014
    - Jane.Doe@gmail.com on 4.May.2014

4.5.13 zz_Audit_LastUpdateDate.sql

Name: $zz_Audit_LastUpdateDate

Description: Gets the date of the latest update event of the NodeId associated with the parameter in MM/DD/YYYY format

Syntax: `$zz_Audit_LastUpdateDate([<NodeId>])`

Example:

- Using: $zz_Audit_LastUpdateDate([DiagramId])
- Sample output: 12/26/2014

Notes:

- When no update date is obtainable from the audit trail the output yields ''.
- See $zz_Audit_LastUpdateDate2 for a different date format.

4.5.14 zz_Audit_LastUpdateDate2.sql

Name: $zz_Audit_LastUpdateDate2

Description: Gets the date of the latest update event of the NodeId associated with the parameter in DD.Month.YYYY format

Syntax: `$zz_Audit_LastUpdateDate2([<NodeId>])`

Example:

- Using: $zz_Audit_LastUpdateDate2([DiagramId])
- Sample output: 21.March.2014

Notes:

- When no update date is obtainable from the audit trail the output yields ''.
- See $zz_Audit_LastUpdateDate for a different date format.

4.5.15 zz_Audit_LastUpdateDateTime.sql

Name: $zz_Audit_LastUpdateDateTime

Description: Gets the date and time of the update event of the NodeId associated with the parameter in MM/DD/YYYY HH:MM:SS format

Syntax: `$zz_Audit_LastUpdateDateTime([<NodeId>])`

Example:

- Using: $zz_Audit_LastUpdateDateTime([DiagramId])
- Sample output: 03/12/2014 18:22:39

Notes:

- When no update time is obtainable from the audit trail the output yields ''.
- Also see $zz_Audit_LastUpdateDateTime2 for an alternate date/time format

4.5.16 zz_Audit_LastUpdateDateTime2.sql

Name: $zz_Audit_LastUpdateDateTime2

Description: Gets the date and time of the update event of the NodeId associated with the parameter in DD.Month.YYYY :: HH:MM format

Syntax: `$zz_Audit_LastUpdateDateTime2([<NodeId>])`

Example:

- Using: $zz_Audit_LastUpdateDateTime2([DiagramId])
- Sample output: 12.March.2014 :: 18:22

Notes:

- When no update time is obtainable from the audit trail the output yields ''.
- Also see $zz_Audit_LastUpdateDateTime for an alternate date/time format

4.5.17 zz_Audit_TotalDeletes.sql

Name: $zz_Audit_TotalDeletes

Description: Retrieves the total delete actions in the audit trail.

Syntax: `$zz_Audit_TotalDeletes()`

Example:

- Using: $zz_Audit_TotalDeletes()
- Sample output: 55

Notes:

- Also review zz_Audit_TotalDeletesCurrentUser for user specific delete actions.

4.5.18 zz_Audit_TotalDeletesCurrentUser.sql

Name: $zz_Audit_TotalDeletesCurrentUser

Description: Retrieves the total delete actions in the audit trail by the given userId

Syntax: `$zz_Audit_TotalDeletesCurrentUser([<userId>])`

Example:

- Using: $zz_Audit_TotalDeletesCurrentUser('94000000000999')
- Sample output: 21

- Using: $zz_Audit_TotalDeletesCurrentUser([userId])
- Sample output: 26

Notes:

- Also review zz_Audit_TotalDeletes for global delete actions.

4.5.19 zz_Audit_TotalEntries.sql

Name: $zz_Audit_TotalEntries

Description: Retrieves the number of audit trail records.

Syntax: `$zz_Audit_TotalEntries()`

Example:

- Using: $zz_Audit_TotalEntries()
- Sample output: 5012

Notes:

- Also see $zz_Audit_TotalEntriesCurrentUser for user specific number of entries.

4.5.20 zz_Audit_TotalEntriesCurrentUser.sql

Name: $zz_Audit_TotalEntriesCurrentUser

Description: Retrieves the number of audit trail records.

Syntax: `$zz_Audit_TotalEntriesCurrentUser([<userId>])`

Example:

- Using: $zz_Audit_TotalEntriesCurrentUser([userId])
- Sample output: 684

Notes:

- Also see zz_Audit_TotalEntries for global number of entries.

4.5.21 zz_Audit_TotalInserts.sql

Name: $zz_Audit_TotalInserts

Description: Retrieves the number of audit trail insert records.

Syntax: `$zz_Audit_TotalInserts()`

Example:

- Using: $zz_Audit_TotalInserts()
- Sample output: 412

Notes:

- Also see $zz_Audit_TotalInsertsCurrentUser for user specific number of records.

4.5.22 zz_Audit_TotalInsertsCurrentUser.sql

Name: $zz_Audit_TotalInsertsCurrentUser

Description: Retrieves the number of audit trail insert records for the specified user id.

Syntax: `$zz_Audit_TotalInsertsCurrentUser([<userId>])`

Example:

- Using: $zz_Audit_TotalInsertsCurrentUser([userId])
- Sample output: 246

Notes:

- Also see zz_Audit_TotalInserts for global number of inserts.

4.5.23 zz_Audit_TotalUpdates.sql

Name: $zz_Audit_TotalUpdates

Description: Retrieves the number of audit trail update records.

Syntax: `$zz_Audit_TotalUpdates()`

Example:

- Using: $zz_Audit_TotalUpdates()
- Sample output: 4000

Notes:

- Also see $zz_Audit_TotalUpdatesCurrentUser for user specific number of update records.

4.5.24 zz_Audit_TotalUpdatesCurrentUser.sql

Name: $zz_Audit_TotalUpdatesCurrentUser

Description: Retrieves the number of audit trail update records by the specified user id.

Syntax: `$zz_Audit_TotalUpdatesCurrentUser()`

Example:

- Using: $zz_Audit_TotalUpdatesCurrentUser()
- Sample output: 549

Notes:

- Also see $zz_Audit_TotalUpdatesCurrentUser for global number of update records.

4.5.25 zz_Card_OccupancyPerc.sql

Name: $zz_Cards_OccupancyPerc

Description: Returns the percentage of occupied card slots.

Syntax: `$zz_Cards_OccupancyPerc()`

Example:

- Using: $zz_Cards_OccupancyPerc()
- Sample output: 55.6

Notes:

- See zz_Cards_TotalCount for total number of cards.
- Expression is most useful with dashboard gauges.

4.5.26 zz_Card_TotalCount.sql

Name: $zz_Cards_TotalCount

Description: Returns the number of card slots in existence.

Syntax: `$zz_Cards_TotalCount()`

Example:

- Using: $zz_Cards_TotalCount()
- Sample output: 5402

Notes:

- See zz_Cards_OccupancyPerc for percentage of occupied slots.

4.5.27 zz_Comments_TotalCount.sql

Name: $zz_Comments_TotalCount

Description: Returns the number of palette comment objects in existence.

Syntax: `$zz_Comments_TotalCount()`

Example:

- Using: $zz_Comments_TotalCount()
- Sample output: 368

4.5.28 zz_Device_CardUtilization.sql

Name: $zz_Devices_CardUtilization

Description: Returns the percentage of device card utilization.

Syntax: `$zz_Devices_CardUtilization()`

Example:

- Using: $zz_Devices_CardUtilization()
- Sample output: 10

Notes:

- See zz_Cards_TotalCount for total number of cards.
- Expression is most useful with dashboard gauges.

4.5.29 zz_Device_PortUtilization.sql

Name: $zz_Devices_PortUtilization

Description: Returns the percentage of all ports in use.

Syntax: `$zz_Devices_PortUtilization()`

Example:

- Using: $zz_Devices_PortUtilization()
- Sample output: 45

Notes:

- Expression is most useful with dashboard gauges.

4.5.30 zz_Device_TotalCount.sql

Name: $zz_Device_TotalCount

Description: Returns the total number of devices in netTerrain.

Syntax: `$zz_Device_TotalCount()`

Example:

- Using: $zz_Device_TotalCount()
- Sample output: 5047

Notes:

- There are other expressions for counting the number of devices by model, or status.

4.5.31 zz_Device_TotalCountByModelId.sql

Name: $zz_Device_TotalCountByModelId

Description: Returns the total number of devices in netTerrain with the specified type id.

Syntax: `$zz_Device_TotalCountByModelId(<Type_ID>)`

Example:

- Using: $zz_Device_TotalCountByModelId('26000000003634')
- Sample output: 300

Notes:

- You can retrieve the type ID of a device in the Catalog.

4.5.32 zz_Device_TotalCountByStatusValue.sql

Name: $zz_Device_TotalCountByStatusValue

Description: The expression will look at the field named "Status" and match the value with the specified parameter.

Syntax: `$zz_Device_TotalCountByStatusValue(<Status>)`

Example:

- Using: $zz_Device_TotalCountByStatusValue('Unknown')
- Sample output: 4

Notes:

- You may need to add a "Status" field to use this expression.

4.5.33 zz_Diagram_1000_Nodes.sql

Name: $zz_Diagram_1000_Nodes

Description: This expression will count the number of diagrams where there exist 1000 or more child nodes.

Syntax: `$zz_Diagram_1000_Nodes()`

Example:

- Using: $zz_Diagram_1000_Nodes()
- Sample output: 4

4.5.34 zz_Diagram_100_To_249_Nodes.sql

Name: $zz_Diagram_100_To_249_Nodes

Description: This expression will count the number of diagrams where there exist between 100-249 nodes.

Syntax: `$zz_Diagram_100_To_249_Nodes()`

Example:

- Using: $zz_Diagram_100_To_249_Nodes()
- Sample output: 4

4.5.35 zz_Diagram_1_To_49_Nodes.sql

Name: $zz_Diagram_1_To_49_Nodes

Description: This expression will count the number of diagrams where there exist between 1-49 nodes.

Syntax: `$zz_Diagram_1_To_49_Nodes()`

Example:

- Using: $zz_Diagram_1_To_49_Nodes()
- Sample output: 4

4.5.36 zz_Diagram_250_To_499_Nodes.sql

Name: $zz_Diagram_250_To_499_Nodes

Description: This expression will count the number of diagrams where there exist between 250-499 nodes.

Syntax: `$zz_Diagram_250_To_499_Nodes()`

Example:

- Using: $zz_Diagram_250_To_499_Nodes()
- Sample output: 4

4.5.37 zz_Diagram_500_To_999_Nodes.sql

Name: $zz_Diagram_500_To_999_Nodes

Description: This expression will count the number of diagrams where there exist between 500-999 nodes.

Syntax: `$zz_Diagram_500_To_999_Nodes()`

Example:

- Using: $zz_Diagram_500_To_999_Nodes()
- Sample output: 4

4.5.38 zz_Diagram_50_To_99_Nodes.sql

Name: $zz_Diagram_50_To_99_Nodes

Description: This expression will count the number of diagrams where there exist between 50-99 nodes.

Syntax: `$zz_Diagram_50_To_99_Nodes()`

Example:

- Using: $zz_Diagram_50_To_99_Nodes()
- Sample output: 4

4.5.39 zz_Diagram_TotalCount.sql

Name: $zz_Diagram_TotalCount

Description: This expression will count the number of unique diagrams.

Syntax: `$zz_Diagram_TotalCount()`

Example:

- Using: $zz_Diagram_TotalCount()
- Sample output: 4

4.5.40 zz_Document_TotalCount.sql

Name: $zz_Document_TotalCount

Description: Returns the number of palette document objects in existence.

Syntax: `$zz_Document_TotalCount()`

Example:

- Using: $zz_Document_TotalCount()
- Sample output: 96

4.5.41 zz_Link_TotalCount.sql

Name: $zz_Link_TotalCount

Description: Returns the number of link objects in netTerrain.

Syntax: `$zz_Link_TotalCount()`

Example:

- Using: $zz_Link_TotalCount()
- Sample Output: 96

4.5.42 zz_Node_TotalCount.sql

Name: $zz_Node_TotalCount

Description: Returns the number of Node objects in netTerrain.

Syntax: `$zz_Node_TotalCount()`

Example:

- Using: $zz_Node_TotalCount()
- Sample output: 53

4.5.43 zz_Palette_TotalCount.sql

Name: $zz_Palette_TotalCount

Description: Returns the number of palette objects in netTerrain.

Syntax: `$zz_Palette_TotalCount()`

Example:

- Using: $zz_Palette_TotalCount()
- Sample output: 96

Notes:

- There are also individual palette object counts for:
- documents, stamps, shapes, and comments.

4.5.44 zz_Port_TotalCount.sql

Name: $zz_Port_TotalCount

Description: Returns the number of port objects in netTerrain.

Syntax: `$zz_Port_TotalCount()`

Example:

- Using: $zz_Port_TotalCount()
- Sample output: 42033

4.5.45 zz_Rack_PowerInUsePerc.sql

Name: $zz_Rack_PowerInUsePerc

Description: Returns the power utilized on all racks with the mounted equipment.

Syntax: `$zz_Rack_PowerInUsePerc()`

Example:

- Using: $zz_Rack_PowerInUsePerc()
- Sample output: 37

Notes:

- Expression is most useful with dashboard gauges.

4.5.46 zz_Rack_PowerUsed.sql

Name: $zz_Rack_PowerUsed

Description: Returns the power used on all racks in Watt units.

Syntax: `$zz_Rack_PowerUsed()`

Example:

- Using: $zz_Rack_PowerUsed()
- Sample output: 37

Notes:

- All devices that should pertain to the power calculation must be mounted on racks.

4.5.47 zz_Rack_PowerUsedKW.sql

Name: $zz_Rack_PowerUsedKW

Description: Returns the power used on all racks in Kilowatt units.

Syntax: `$zz_Rack_PowerUsedKW()`

Example:

- Using: $zz_Rack_PowerUsedKW()
- Sample output: 37

Notes:

- All devices that should pertain to the power calculation must be mounted on racks.

4.5.48 zz_Rack_RUsInUsePerc.sql

Name: $zz_Rack_RUsInUsePerc

Description: Returns the percentage of rack units being utilized.

Syntax: `$zz_Rack_RUsInUsePerc()`

Example:

- Using: $zz_Rack_RUsInUsePerc()
- Sample output: 37

4.5.49 zz_Rack_RUsUsed.sql

Name: $zz_Rack_RUsUsed

Description: Returns the number of rack units utilized.

Syntax: `$zz_Rack_RUsUsed()`

Example:

- Using: $zz_Rack_RUsUsed()
- Sample output: 150

4.5.50 zz_Rack_TotalCount.sql

Name: $zz_Rack_TotalCount

Description: Returns the number of racks in existence.

Syntax: `$zz_Rack_TotalCount()`

Example:

- Using: $zz_Rack_TotalCount()
- Sample output: 180

4.5.51 zz_Rack_TotalPower.sql

Name: $zz_Rack_TotalPower

Description: Returns the total Watt power across all racks.

Syntax: `$zz_Rack_TotalPower()`

Example:

- Using: $zz_Rack_TotalPower()
- Sample output: 18032

4.5.52 zz_Rack_TotalPowerAvailable.sql

Name: $zz_Rack_TotalPowerAvailable

Description: Returns the Watts remaining for use.

Syntax: `$zz_Rack_TotalPowerAvailable()`

Example:

- Using: $zz_Rack_TotalPowerAvailable()
- Sample output: 18032

Notes:

- Also see zz_Rack_TotalPower, and zz_Rack_PowerUsed.

4.5.53 zz_Rack_TotalRUs.sql

Name: $zz_Rack_TotalRUs

Description: Returns the total rack units.

Syntax: `$zz_Rack_TotalRUs()`

Example:

- Using: $zz_Rack_TotalRUs()
- Sample output: 18032

4.5.54 zz_Rack_TotalWeight.sql

Name: $zz_Rack_TotalWeight

Description: Returns the total weight capacity of all racks in netTerrain.

Syntax: `$zz_Rack_TotalWeight()`

Example:

- Using: $zz_Rack_TotalWeight()
- Sample output: 448654

Notes:

- The weight is calculated using the 'Max Weight [lb]' field of rack objects.

4.5.55 zz_Rack_TotalWeightAvailable.sql

Name: $zz_Rack_TotalWeightAvailable

Description: Returns the total remaining weight capacity of all racks in netTerrain.

Syntax: `$zz_Rack_TotalWeightAvailable()`

Example:

- Using: $zz_Rack_TotalWeightAvailable()
- Sample output: 448654

Notes:

- The weight is calculated using the 'Max Weight [lb]' field of rack objects.

4.5.56 zz_Rack_WeightInUsePerc.sql

Name: $zz_Rack_WeightInUsePerc

Description: Returns the percentage of weight capacity used on all racks.

Syntax: `$zz_Rack_WeightInUsePerc()`

Example:

- Using: $zz_Rack_WeightInUsePerc()
- Sample output: 34

Notes:

- The weight is calculated using the 'Max Weight [lb]' and 'Weight used [lb]' fields of rack objects.

4.5.57 zz_Rack_WeightUsed.sql

Name: $zz_Rack_WeightUsed

Description: Returns the total weight used across all racks.

Syntax: `$zz_Rack_WeightUsed()`

Example:

- Using: $zz_Rack_WeightUsed()
- Sample output: 34

Notes:

- The weight is calculated using the 'Weight used [lb]' field of rack objects.

4.5.58 zz_Rack_kBTUH.sql

Name: $zz_Rack_kBTUH

Description: Returns the power used across all racks in kilo British Thermal Unit Hours (kBTUH)

Syntax: `$zz_Rack_kBTUH()`

Example:

- Using: $zz_Rack_kBTUH()
- Sample output: 34

Notes:

- The power is calculated using the 'Power used [W]' field of racks.

4.5.59 zz_Dash_Shapes_TotalCount.sql

Name: $zz_Dash_Shapes_TotalCount

Description: Returns the number of palette shape objects in netTerrain.

Syntax: `$zz_Dash_Shapes_TotalCount()`

Example:

- Using: $zz_Dash_Shapes_TotalCount()
- Sample output: 96

Notes:

- Look for other dash expressions, which begin with zz_Dash_

4.5.60 zz_Dash_Slots_TotalCount.sql

Name: $zz_Dash_Slots_TotalCount

Description: Returns the number of slots unused.

Syntax: `$zz_Dash_Slots_TotalCount()`

Example:

- Using: $zz_Dash_Slots_TotalCount()
- Sample output: 34

Notes:

- A slot that has been filled with a card will be excluded from the count.

4.5.61 zz_Dash_Stamps_TotalCount.sql

Name: $zz_Dash_Stamps_TotalCount

Description: Returns the number of palette stamp objects in netTerrain.

Syntax: `$zz_Dash_Stamps_TotalCount()`

Example:

- Using: $zz_Dash_Stamps_TotalCount()
- Sample output: 96

Notes:

- Look for other palette dash expressions, which begin with zz_Dash_

4.5.62 zz_Dcm_PowerPerRackAvgKW.sql

Name: $zz_Dcm_PowerPerRackAvgKW

Description: Returns the power used on average across all mounted devices on the specified rack in Kilowatt units.

Syntax: `$zz_Dcm_PowerPerRackAvgKW(<Rack_Id>)`

Example:

- Using: $zz_Dcm_PowerPerRackAvgKW('24000000097829')
- Sample output: 2.36 kW

Notes:

- All devices that should pertain to the power calculation must be mounted on racks.

4.5.63 zz_Dcm_PowerPerRackDeratedKW.sql

Name: $zz_Dcm_PowerPerRackDeratedKW

Description: Returns the derated power used on specified rack in Kilowatt units.

Syntax: `$zz_Dcm_PowerPerRackDeratedKW(<RackID>)`

Example:

- Using: $zz_Dcm_PowerPerRackDeratedKW('24000000097829')
- Sample output: 5.7 kW

Notes:

- Must have the netTerrain Environmental Module or DCM software equivalent to use expression.

4.5.64 zz_Dcm_PowerPerRackMaxDrawKW.sql

Name: $zz_Dcm_PowerPerRackMaxDrawKW

Description: Returns the power max draw on the specified rack in Kilowatt units.

Syntax: `$zz_Dcm_PowerPerRackMaxDrawKW(<RackID>)`

Example:

- Using: $zz_Dcm_PowerPerRackMaxDrawKW('24000000097829')
- Sample output: 7.69 kW

Notes:

- Must have the netTerrain Environmental Module or DCM software equivalent to use expression.
- Uses value of 'MAX_POWER_DRAW' fields.

4.5.65 zz_Dcm_TemperatureInletPerRackAvgC.sql

Name: $zz_Dcm_TemperatureInletPerRackAvgC

Description: Returns the average temperature (Celsius) inlet of devices mounted on the specified rack.

Syntax: `$zz_Dcm_TemperatureInletPerRackAvgC(<RackID>)`

Example:

- Using: $zz_Dcm_TemperatureInletPerRackAvgC('24000000097829')
- Sample output: 7.69

Notes:

- Must have the netTerrain Environmental Module or DCM software equivalent to use expression.

4.5.66 zz_Device_GetPortCountByPropertyValue.sql

Name: $zz_Device_GetPortCountByPropertyValue

Description: Returns the number of objects with the specified field name and value, which are located under the specified diagram.

Syntax:
`$zz_Device_GetPortCountByPropertyValue(<Diagram_ID>,<Field_Name>,<Field_Value>)`

Example:

- Using: $zz_Device_GetPortCountByPropertyValue('24000000097829','Location', 'Maryland')
- Sample output: 55

4.5.67 zz_Device_Power_Derated.sql

Name: $zz_Device_Power_Derated

Description: Returns the derated power of the specified node id.

Syntax: `$zz_Device_Power_Derated(<Node_ID>)`

Example:

- Using: $zz_Device_Power_Derated('24000000097829')
- Sample output: 55

Notes:

- The expression uses the field 'Peak Power [W]' for values.

4.5.68 zz_Device_kBTUH.sql

Name: $zz_Device_kBTUH

Description: Returns the peak power in Kilo British Thermal Unit Hours (kBTUH).

Syntax: `$zz_Device_kBTUH(<Node_ID>)`

Example:

- Using: $zz_Device_kBTUH('24000000097829')
- Sample output: 2.39

Notes:

- The expression uses the field 'Peak Power [W]' for values.

4.5.69 zz_Diagram_GetDeviceCount.sql

Name: $zz_Diagram_GetDeviceCount

Description: Returns the number of devices on the specified diagram.

Syntax: `$zz_Diagram_GetDeviceCount(<Diagram_ID>)`

Example:

- Using: $zz_Diagram_GetDeviceCount('24000000097829')
- Sample output: 55

Notes:

- Count does not include devices on sub-diagrams.

4.5.70 zz_Diagram_GetPortCount.sql

Name: $zz_Diagram_GetPortCount

Description: Returns the number of ports on the specified diagram.

Syntax: `$zz_Diagram_GetPortCount(<Diagram_ID>)`

Example:

- Using: $zz_Diagram_GetPortCount('24000000097829')
- Sample output: 55

Notes:

- Count does not include ports on sub-diagrams.

4.5.71 zz_Diagram_GetPortCountByPropertyValue.sql

Name: $zz_Diagram_GetPortCountByPropertyValue

Description: Returns the number of ports by the specified diagram id, port field name and value. Every port of a device on the diagram meeting the specified values will be included in the count.

Syntax: `$zz_Diagram_GetPortCountByPropertyValue(<Diagram_ID>, <Port_Field_Name>, <Port_Field_Value>)`

Example:

- Using: $zz_Diagram_GetPortCountByPropertyValue('24000000097829', 'Description', 'Cisco STP successor path')
- Sample output: 8

Notes:

- Count does not include devices on sub-diagrams.

4.5.72 zz_ITK_AdaptersCount.sql

Name: $zz_ITK_AdaptersCount

Description: Returns the number of data source adapters.

Syntax: `$zz_ITK_AdaptersCount()`

Example:

- Using: $zz_ITK_AdaptersCount()
- Sample output: 8

4.5.73 zz_ITK_ConnectorsCount.sql

Name: $zz_ITK_ConnectorsCount

Description: Returns the number of built in data source connectors.

Syntax: `$zz_ITK_ConnectorsCount()`

Example:

- Using: $zz_ITK_ConnectorsCount()
- Sample output: 8

4.5.74 zz_ITK_DeviceConnectorCount.sql

Name: $zz_ITK_DeviceConnectorCount

Description: Returns the number of Device Connectors set-up in the netTerrain ITK.

Syntax: `$zz_ITK_DeviceConnectorCount()`

Example:

- Using: $zz_ITK_DeviceConnectorCount()
- Sample output: 2

4.5.75 zz_ITK_LinkersCount.sql

Name: $zz_ITK_LinkersCount

Description: Returns the number of linker sources.

Syntax: `$zz_ITK_LinkersCount()`

Example:

- Using: $zz_ITK_LinkersCount()
- Sample output: 77

4.5.76 zz_ITK_Mon_Databases_Count_Active.sql

Name: $zz_ITK_Mon_Databases_Count_Active

Description: Returns the database count with active status.

Syntax: `$zz_ITK_Mon_Databases_Count_Active()`

Example:

- Using: $zz_ITK_Mon_Databases_Count_Active()
- Sample output: 77

4.5.77 zz_ITK_Mon_Databases_Count_Inactive.sql

Name: $zz_ITK_Mon_Databases_Count_Inactive

Description: Returns the database count with inactive status.

Syntax: `$zz_ITK_Mon_Databases_Count_Inactive()`

Example:

- Using: $zz_ITK_Mon_Databases_Count_Inactive()
- Sample output: 55

4.5.78 zz_ITK_Mon_Databases_Count_Unknown.sql

Name: $zz_ITK_Mon_Databases_Count_Unknown

Description: Returns the database count with unknown status.

Syntax: `$zz_ITK_Mon_Databases_Count_Unknown()`

Example:

- Using: $zz_ITK_Mon_Databases_Count_Unknown()
- Sample output: 66

4.5.79 zz_ITK_Mon_Databases_DataFileSize_Active.sql

Name: $zz_ITK_Mon_Databases_DataFileSize_Active

Description: Returns the data file size with active status.

Syntax: `$zz_ITK_Mon_Databases_DataFileSize_Active()`

Example:

- Using: $zz_ITK_Mon_Databases_DataFileSize_Active()
- Sample output: 297.479

4.5.80 zz_ITK_Mon_Databases_DataFileSize_Inactive.sql

Name: $zz_ITK_Mon_Databases_DataFileSize_Inactive

Description: Returns the data file size with inactive status.

Syntax: `$zz_ITK_Mon_Databases_DataFileSize_Inactive()`

Example:

- Using: $zz_ITK_Mon_Databases_DataFileSize_Inactive()
- Sample output: 297.479

4.5.81 zz_ITK_Mon_Databases_DataFileSize_Unknown.sql

Name: $zz_ITK_Mon_Databases_DataFileSize_Unknown

Description: Returns the data file size with unknown status.

Syntax: `$zz_ITK_Mon_Databases_DataFileSize_Unknown()`

Example:

- Using: $zz_ITK_Mon_Databases_DataFileSize_Unknown()
- Sample output: 297.479

4.5.82 zz_ITK_Mon_Databases_LogFileSize_Active.sql

Name: $zz_ITK_Mon_Databases_LogFileSize_Active

Description: Returns the log file size of logs with active status.

Syntax: `$zz_ITK_Mon_Databases_LogFileSize_Active()`

Example:

- Using: $zz_ITK_Mon_Databases_LogFileSize_Active()
- Sample output: 297.479

4.5.83 zz_ITK_Mon_Databases_LogFileSize_Inactive.sql

Name: $zz_ITK_Mon_Databases_LogFileSize_Inactive

Description: Returns the log file size of logs with inactive status.

Syntax: `$zz_ITK_Mon_Databases_LogFileSize_Inactive()`

Example:

- Using: $zz_ITK_Mon_Databases_LogFileSize_Inactive()
- Sample output: 297.479

4.5.84 zz_ITK_Mon_Databases_LogFileSize_Unknown.sql

Name: $zz_ITK_Mon_Databases_LogFileSize_Unknown

Description: Returns the log file size of logs with unknown status.

Syntax: `$zz_ITK_Mon_Databases_LogFileSize_Unknown()`

Example:

- Using: $zz_ITK_Mon_Databases_LogFileSize_Unknown()
- Sample output: 297.479

4.5.85 zz_Link_GetCountByPropertyAndValue_ExactMatch.sql

Name: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch

Description: The expression will return the count of links that match the specified link field name and field value.

Syntax:

`$zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch(<Exact_Field_Name>, <Exact_Field_Value>)`

Example:

- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('Status', 'Online')
- Sample output: 20

- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('Name', 'New')
- Sample output: 5

- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('Location', 'MD')
- Sample output: 2

Notes:

- Notice you must specify the exact field name, and field value.
- See zz_Link_GetCountByPropertyAndValue_PartialMatch for partial value matching.

4.5.86 zz_Link_GetCountByPropertyAndValue_PartialMatch.sql

Name: $zz_Link_GetCountByPropertyAndValue_PartialMatch

Description: The expression will return the count of links that match the specified link field name and field value.

Syntax:

`$zz_Link_GetCountByPropertyAndValue_PartialMatch(<Exact_Field_Name>, <Partial_Field_Value>)`

Example:

- Using: $zz_Link_GetCountByPropertyAndValue_PartialMatch('Status', 'Plan')
- Sample output: 20

- Using: $zz_Link_GetCountByPropertyAndValue_PartialMatch('Name', 'N')
- Sample output: 5

- Using: $zz_Link_GetCountByPropertyAndValue_PartialMatch('Location', 'Mary')
- Sample output: 2

Notes:

- Notice you must specify the exact field name, but partial field value.
- See zz_Link_GetCountByPropertyAndValue_ExactMatch for exact value matching.

4.5.87 zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch.sql

Name: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch

Description: The expression will return the count of links that match the specified link type, field name, and field value.

Syntax:

`$zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch(<Exact_Type_Value>, <Exact_Field_Name>, <Exact_Field_Value>)`

Example:

- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('Ethernet', 'Status', 'Online')
- Sample output: 20

- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('FastEthernet', 'Name', 'New')
- Sample output: 5
- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('FastEthernet', 'Location', 'MD')
- Sample output: 2

Notes:

- Notice you must specify the exact type, field name, and field value.
- See zz_Link_GetCountByTypeAndPropertyAndValue_PartialMatch for partial value matching.

4.5.88 zz_Link_GetCountByTypeAndPropertyAndValue_PartialMatch.sql

Name: $zz_Link_GetCountByTypeAndPropertyAndValue_PartialMatch

Description: The expression will return the count of links that match the specified link type, field name, and partial field value.

Syntax:

```
$zz_Link_GetCountByTypeAndPropertyAndValue_PartialMatch(<Exact_Type_Value>, <Exact_Field_Name>, <Partial_Field_Value>)
```

Example:

- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('Ethernet', 'Status', 'On')
- Sample output: 20

- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('FastEthernet', 'Name', 'N')
- Sample output: 5

- Using: $zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch('FastEthernet', 'Location', 'Mary')
- Sample output: 2

Notes:

- Notice you must specify the exact type, field name, and partial field value.
- See zz_Link_GetCountByTypeAndPropertyAndValue_ExactMatch for exact value matching.

4.5.89 zz_Link_GetCountByTypeAndValue_ExactMatch.sql

Name: $zz_Link_GetCountByTypeAndValue_ExactMatch

Description: The expression will return the count of links that match the specified link type and field value.

Syntax: `$zz_Link_GetCountByTypeAndValue_ExactMatch(<Exact_Type_Value>, <Exact_Field_Value>)`

Example:

- Using: $zz_Link_GetCountByTypeAndValue_ExactMatch('Ethernet', 'Online')
- Sample output: 20

- Using: $zz_Link_GetCountByTypeAndValue_ExactMatch('FastEthernet', 'Offline')
- Sample output: 5

- Using: $zz_Link_GetCountByTypeAndValue_ExactMatch('FastEthern', 'On')
- Sample output: 0

Notes:

- Notice you must specify the exact type and field value
- See zz_Link_GetCountByTypeAndValue_PartialMatch for partial value matching.

4.5.90 zz_Link_GetCountByTypeAndValue_PartialMatch.sql

Name: $zz_Link_GetCountByTypeAndValue_PartialMatch

Description: The expression will return the count of links that match the specified link type and field value. The field value must match at least what was specified in the parameter.

Syntax: `$zz_Link_GetCountByTypeAndValue_PartialMatch(<Exact_Type_Value>, <Partial_Field_Value>)`

Example:

- Using: $zz_Link_GetCountByTypeAndValue_PartialMatch('Ethernet', 'O')
- Sample output: 20

- Using: $zz_Link_GetCountByTypeAndValue_PartialMatch('FastEthernet', 'Offlin')
- Sample output: 4

- Using: $zz_Link_GetCountByTypeAndValue_PartialMatch('FastEthern', 'O')
- Sample output: 5

Notes:

- Notice you do not have to specify the exact field value.
- See zz_Link_GetCountByTypeAndValue_ExactMatch for exact value matching.

4.5.91 zz_Link_GetCountByType_ExactMatch.sql

Name: $zz_Link_GetCountByType_ExactMatch

Description: The expression will return the count of links that match the specified link type value.

Syntax: `$zz_Link_GetCountByType_ExactMatch(<Partial_Type_Value>)`

Example:

- Using: $zz_Link_GetCountByType_ExactMatch('Ethernet')
- Sample output: 22

- Using: $zz_Link_GetCountByType_ExactMatch('FastEthernet')
- Sample output: 55

- Using: $zz_Link_GetCountByType_ExactMatch('FastEthern')
- Sample output: 0

Notes:

- Notice you must specify the exact type value.
- See zz_Link_GetCountByType_PartialMatch for partial type matches.

4.5.92 zz_Link_GetCountByType_PartialMatch.sql

Name: $zz_Link_GetCountByType_PartialMatch

Description: The expression will return the count of links that match the specified link type value. The type value must match at least what was specified in the parameter.

Syntax: `$zz_Link_GetCountByType_PartialMatch(<Partial_Type_Value>)`

Example:

- Using: $zz_Link_GetCountByType_PartialMatch('Ether')
- Sample output: 22

- Using: $zz_Link_GetCountByType_PartialMatch('FastEther')
- Sample output: 55

Notes:

- Notice you do not have to specify the exact type value.
- See zz_Link_GetCountByType_ExactMatch for exact type matches.

4.5.93 zz_Link_GetCountByValue_ExactMatch.sql

Name: $zz_Link_GetCountByValue_ExactMatch

Description: The expression will return the count of links that match the specified field value. The value specified must match exactly.

Syntax: `$zz_Link_GetCountByValue_ExactMatch(<Partial_Field_Value>)`

Example:

- Using: $zz_Link_GetCountByValue_ExactMatch('Name')
- Sample output: 22

- Using: $zz_Link_GetCountByValue_ExactMatch('Carrier ID')
- Sample output: 55

Notes:

- Notice you must specify the exact field value.
- See zz_Link_GetCountByValue_PartialMatch for partial matches.

4.5.94 zz_Link_GetCountByValue_PartialMatch.sql

Name: $zz_Link_GetCountByValue_PartialMatch

Description: The expression will return the count of links by the specified link property value. The value must match at least what was specified in the parameter. This value can be contained in any field that pertains to a link object.

Syntax: `$zz_Link_GetCountByValue_PartialMatch(<Partial_Field_Value>)`

Example:

- Using: $zz_Link_GetCountByValue_PartialMatch('Nam')
- Sample output: 22

- Using: $zz_Link_GetCountByValue_PartialMatch('Name')
- Sample output: 22

- Using: $zz_Link_GetCountByValue_PartialMatch('Carrier I')
- Sample output: 55

- Using: $zz_Link_GetCountByValue_PartialMatch('Carrier ID')
- Sample output: 55

Notes:

- Notice you do not have to specify the exact field value.
- See zz_Link_GetCountByValue_ExactMatch for exact matches.

4.5.95 zz_Link_LinkEndingPoint.sql

Name: $zz_Link_LinkEndingPoint

Description: The expression will return the ending object's name of the link.

Syntax: `$zz_Link_LinkEndingPoint(<Link_ID>)`

Example:

- Using: $zz_Link_LinkEndingPoint('25000000021612')
- Sample output: Port 20

- Using: $zz_Link_LinkStartingPoint('25000000021613')
- Sample output: Node Lvl 22

Notes:

- Please see zz_Link_LinkStartingPoint to retrieve the other link end object's name.

4.5.96 zz_Link_LinkEndingPortConnector.sql

Name: $zz_Link_LinkEndingPortConnector

Description: The expression will return the connector value of the ending port.

Syntax: `$zz_Link_LinkEndingPortConnector(<Link_ID>)`

Example:

- Using: $zz_Link_LinkEndingPortConnector('25000000021612')
- Sample output: Outlet

Notes:

- Please see zz_Link_LinkStartingPortConnector to retrieve the other port Connector.

4.5.97 zz_Link_LinkEndingPortProtocol.sql

Name: $zz_Link_LinkEndingPortProtocol

Description: The expression will return the protocol value of the starting port.

Syntax: `$zz_Link_LinkEndingPortProtocol(<Link_ID>)`

Example:

- Using: $zz_Link_LinkEndingPortProtocol('25000000021612')
- Sample output: Outlet

Notes:

- Please see zz_Link_LinkStartingPortProtocol to retrieve the other port protocol.

4.5.98 zz_Link_LinkEndingPortStatus.sql

Name: $zz_Link_LinkEndingPortStatus

Description: The expression will return the status value of the ending port.

Syntax: `$zz_Link_LinkEndingPortStatus(<Link_ID>)`

Example:

- Using: $zz_Link_LinkEndingPortStatus('25000000021612')
- Sample output: Planned

Notes:

- Please see zz_Link_LinkStartingPortStatus to retrieve the other port status.

4.5.99 zz_Link_LinkName .sql

Name: $zz_Link_LinkName

Description: The expression will return the field name value of the specified link id.

Syntax: `$zz_Link_LinkName (<Link_ID>)`

Example:

- Using: $zz_Link_LinkName ('25000000021612')
- Sample output: Link from Chicago to MD LOC 33

4.5.100 zz_Link_LinkStartingPoint.sql

Name: $zz_Link_LinkStartingPoint

Description: The expression will return the ending object's name of the link.

Syntax: `$zz_Link_LinkStartingPoint(<Link_ID>)`

Example:

- Using: $zz_Link_LinkStartingPoint('25000000021612')
- Sample output: Port 1

- Using: $zz_Link_LinkStartingPoint('25000000021613')
- Sample output: Node Lvl 55

Notes:

- Please see zz_Link_LinkEndingPoint to retrieve the other link end object's name.

4.5.101 zz_Link_LinkStartingPortConnector.sql

Name: $zz_Link_LinkStartingPortConnector

Description: The expression will return the connector value of the starting port.

Syntax: `$zz_Link_LinkStartingPortConnector(<Link_ID>)`

Example:

- Using: $zz_Link_LinkStartingPortConnector('25000000021612')
- Sample output: Outlet

Notes:

- Please see zz_Link_LinkStartingPortProtocol to retrieve the other port protocol.

4.5.102 zz_Link_LinkStartingPortProtocol.sql

Name: $zz_Link_LinkStartingPortProtocol

Description: The expression will return the protocol value of the starting port.

Syntax: `$zz_Link_LinkStartingPortProtocol(<Link_ID>)`

Example:

- Using: $zz_Link_LinkStartingPortProtocol('25000000021612')
- Sample output: Power

Notes:

- Please see zz_Link_LinkEndingPortProtocol to retrieve the other port protocol.

4.5.103 zz_Link_LinkStartingPortStatus.sql

Name: $zz_Link_LinkStartingPortStatus

Description: The expression will return the status value of the starting port.

Syntax: `$zz_Link_LinkStartingPortStatus(<Link_ID>)`

Example:

- Using: $zz_Link_LinkStartingPortStatus('25000000021612')
- Sample output: Planned

Notes:

- Please see zz_Link_LinkEndingPortStatus to retrieve the other port status.

4.5.104 zz_Link_Name .sql

Name: $zz_Link_Name

Description: The expression will return the field name value of the specified link id.

Syntax: `$zz_Link_Name(<Link_ID>)`

Example:

- Using: $zz_Link_Name('25000000021612')
- Sample output: MD to VA Link

4.5.105 zz_Link_ValueByPropertyName.sql

Name: $zz_Link_ValueByPropertyName

Description: The expression will return the field value corresponding to the specified link and field name.

Syntax: `$zz_Link_ValueByPropertyName(<Link_ID>, <Field_Name>)`

Example:

- Using: $zz_Link_ValueByPropertyName('25000000021612', 'Name')
- Sample output: New Link

4.5.106 zz_Misc_Date.sql

Name: $zz_Misc_Date

Description: The expression will return the system's current date and time in the following format mm/dd/yyyy. For another format see $zz_Misc_Date2

Syntax: `$zz_Misc_Date()`

Example:

- Using: $zz_Misc_Date()
- Sample output: 2015-01-09 16:04:26.540

Notes:

- The expression can be useful when exporting diagrams and noting the time it was exported.

4.5.107 zz_Node_CountChildren.sql

Name: $zz_Node_CountChildren

Description: The expression will return the count of objects in the child diagram of the specified node.

Syntax: `$zz_Node_CountChildren(<Node_ID>)`

Example:

- Using: $zz_Node_CountChildren('24000000031910')
- Sample output: 20

4.5.108 zz_Node_CountChildrenFullSubtree.sql

Name: $zz_Node_CountChildrenFullSubtree

Description: The expression will return the count of all descendants of the specified node.

Syntax: `$zz_Node_CountChildrenFullSubtree(<Node_ID>)`

Example:

- Using: $zz_Node_CountChildrenFullSubtree('24000000031910')
- Sample output: 20

- Using: $zz_Node_CountChildrenFullSubtree([id])
- Sample output: 20

4.5.109 zz_Node_CountDocuments.sql

Name: $zz_Node_CountDocuments

Description: Returns the number of documents attached to the node.

Syntax: `$zz_Node_CountDocuments(<Node_ID>)`

Example:

- Using: $zz_Node_CountDocuments('24000000031897')
- 5

4.5.110 zz_Node_CountLinksConnected.sql

Name: $zz_Node_CountLinksConnected

Description: The expression will return the count of links to the specified node.

Syntax: `$zz_Node_CountLinksConnected(<Node_ID>)`

Example:

- Using: $zz_Node_CountLinksConnected('24000000031910')
- Sample output: 5

4.5.111 zz_Node_GetAncestorFieldValue.sql

Name: $zz_Node_GetAncestorFieldValue

Description: The expression will return the count of objects with the specified property field name and partial field property value.

Syntax: `$zz_Node_GetAncestorFieldValue(<Exact_Type_Name>, <Exact_Field_Name>, <Object_ID>)`

Example:

- Using: $zz_Node_GetAncestorFieldValue('42U Rack D','Name', '24000000031910')
- Note: Assume the id number is the id of a mounted device on the specified type name.
- Sample output: Rack Name

- Using: $zz_Node_GetAncestorFieldValue('Node','Name', '24000000032649')
- Note: This outputs the object's parent name.
- Sample output: Working Area Node

4.5.112 zz_Node_GetCountByPropertyAndValue_ExactMatch.sql

Name: $zz_Node_GetCountByPropertyAndValue_ExactMatch

Description: The expression will return the count of objects with the specified property field name and exact field property value.

Syntax: `$zz_Node_GetCountByPropertyAndValue_ExactMatch(<Exact_Field_Name>, <Exact_Field_Value>)`

Example:

- Using: $zz_Node_GetCountByPropertyAndValue_ExactMatch('Location', 'Maryland')
- Sample output: 255

4.5.113 zz_Node_GetCountByPropertyAndValue_PartialMatch.sql

Name: $zz_Node_GetCountByPropertyAndValue_PartialMatch

Description: The expression will return the count of objects with the specified property field name and partial field property value.

Syntax:
`$zz_Node_GetCountByPropertyAndValue_PartialMatch(<Exact_Field_Name>, <Partial_Field_Value>)`

Example:

- Using: $zz_Node_GetCountByPropertyAndValue_PartialMatch('Location', 'Maryl')
- Sample output: 255

4.5.114 zz_Node_GetCountByTypeAndPropertyAndValue_ExactMatch.sql

Name: $zz_Node_GetCountByTypeAndPropertyAndValue_ExactMatch

Description: The expression will return the count of objects with the specified type, exact property field name and exact field property value.

Syntax:

```
$zz_Node_GetCountByTypeAndPropertyAndValue_ExactMatch(<Exact_Type_Value>,
<Exact_Field_Name>, <Exact_Field_Value>)
```

Example:

- Using: $zz_Node_GetCountByTypeAndPropertyAndValue_ExactMatch('Cisco 2960','Location', 'MD')
- Sample output: 5

4.5.115 zz_Node_GetCountByTypeAndPropertyAndValue_PartialMatch.sql

Name: $zz_Node_GetCountByTypeAndPropertyAndValue_PartialMatch

Description: The expression will return the count of objects with the specified type, exact property field name and partial field property value.

Syntax:

```
$zz_Node_GetCountByTypeAndPropertyAndValue_PartialMatch(<Exact_Type_Value>,
<Exact_Field_Name>, <Partial_Field_Value>)
```

Example:

- Using: $zz_Node_GetCountByTypeAndPropertyAndValue_PartialMatch('Cisco 2960','Location', 'MD')
- Sample output: 5

4.5.116 zz_Node_GetCountByTypeAndValue_ExactMatch.sql

Name: $zz_Node_GetCountByTypeAndValue_ExactMatch

Description: The expression will return the count of objects with the specified type and exact field property value.

Syntax: `$zz_Node_GetCountByTypeAndValue_ExactMatch(<Exact_Type_Value>, <Exact_Field_Value>)`

Example:

- Using: $zz_Node_GetCountByTypeAndValue_ExactMatch('Cisco 2960','7')
- Sample output: 5

4.5.117 zz_Node_GetCountByTypeAndValue_PartialMatch.sql

Name: $zz_Node_GetCountByTypeAndValue_PartialMatch

Description: The expression will return the count of objects with the specified type and partial field value match.

Syntax: `$zz_Node_GetCountByTypeAndValue_PartialMatch(<Exact_Type_Value>, <Partial_Field_Value>)`

Example:

- Using: $zz_Node_GetCountByTypeAndValue_PartialMatch('Cisco 2960', 'Maryla')
- Sample output: 5

4.5.118 zz_Node_GetCountByType_ExactMatch.sql

Name: $zz_Node_GetCountByType_ExactMatch

Description: The expression will return the count of objects with the specified type.

Syntax: `$zz_Node_GetCountByType_ExactMatch(<Exact_Field_Value>)`

Example:

- Using: $zz_Node_GetCountByType_ExactMatch('Cisco 29')
- Sample output: 0

- Using: $zz_Node_GetCountByType_ExactMatch('Cisco 2960')
- Sample output: 5

4.5.119 zz_Node_GetCountByType_ExactMatch_WithSearchUrl.sql

Name: $zz_Node_GetCountByType_ExactMatch_WithSearchUrl

Description: The expression will return the count as a click-able object, which opens a new window of all the matched instances. The other window is an information table including the matched objects': project location, name, type, and property value id.

Syntax:
`$zz_Node_GetCountByType_ExactMatch_WithSearchUrl(<Exact_Type_Value>)`

Example:

- Using: $zz_Node_GetCountByType_ExactMatch_WithSearchUrl('Cisco 123456')
- Sample output: [2]

4.5.120 zz_Node_GetCountByType_PartialMatch.sql

Name: $zz_Node_GetCountByType_PartialMatch

Description: The expression will return the count of objects with the specified type. The specified param portion must exist in the type name. See the example usage

Syntax: `$zz_Node_GetCountByType_PartialMatch(<Partial_Field_Value>)`

Example:

- Using: $zz_Node_GetCountByType_PartialMatch('Cisco 29')
- Sample output: 50

- Using: $zz_Node_GetCountByType_PartialMatch('Cisco 2960')
- Sample output: 1

4.5.121 zz_Node_GetCountByValue_ExactMatch.sql

Name: $zz_Node_GetCountByValue_ExactMatch

Description: The expression will return the count of objects which contain exactly the specified value.

Syntax: `$zz_Node_GetCountByValue_ExactMatch(<Exact_Field_Value>)`

Example:

- Using: $zz_Node_GetCountByValue_ExactMatch('Maryland Office 55 Room 1')
- Sample output: 0

- Using: $zz_Node_GetCountByValue_ExactMatch('Maryland Office 55 Room 101')
- Sample output: 1

4.5.122 zz_Node_GetCountByValue_PartialMatch.sql

Name: $zz_Node_GetCountByValue_PartialMatch

Description: The expression will return the count of objects which contain the at least the specified value and possibly more.

Syntax: `$zz_Node_GetCountByValue_PartialMatch(<Partial_Field_Value>)`

Example:

- Using: $zz_Node_GetCountByValue_PartialMatch('Maryland Office 55 Room 1')
- Sample output: 5

- Using: $zz_Node_GetCountByValue_PartialMatch('Maryland Office 55 Room 101')
- Sample output: 1

Notes:

- The above would work for all fields that contain the value Maryland Office 55 Room 1xxxx...

4.5.123 zz_Node_GetValueByPropertyName.sql

Name: $zz_Node_GetValueByPropertyName

Description: The expression will return child object's property field value based on the specified object id and field name.

Syntax: `$zz_Node_GetValueByPropertyName(<Node_ID>, <Field_Name>)`

Example:

- Using: $zz_Node_GetValueByPropertyName('24000000031899', 'Name')
- Sample output: Rack 101

- Using: $zz_Node_GetValueByPropertyName('24000000031899', 'Power [W]')
- Sample output: 250

4.5.124 zz_Node_IP_addresses_Children.sql

Name: $zz_Node_IP_addresses_Children

Description: The expression will return child object's property field ip addresses.

Syntax: `$zz_Node_IP_addresses_Children(<Node_ID>)`

Example:

- Using: $zz_Node_IP_addresses_Children('24000000031897')
- Sample output: 192.168.1.66

4.5.125 zz_Node_MultiValuesByFieldNameInOneField.sql

Name: $zz_Node_MultiValuesByFieldNameInOneField

Description: Returns the field values of the specified node id and field name. Any node (cards included) under the node id will be included in the return.

Syntax: `$zz_Node_MultiValuesByFieldNameInOneField(<Node_ID>, <Field_Name>)`

Example:

- Using: $zz_Node_MultiValuesByFieldNameInOneField('24000000031897', 'Description')
- Sample output: Cisco Device 1; Card slot 1; Node Parent

4.5.126 zz_Node_Name.sql

Name: $zz_Node_Name

Description: Returns the name of the specified id.

Syntax: `$zz_Node_Name(<Node_ID>)`

Example:

- Using: $zz_Node_Name('24000000031897')
- Sample output: New Node

4.5.127 zz_Node_ParentName.sql

Name: $zz_Node_ParentName

Description: The expression will return the node's parent's object name.

Syntax: `$zz_Node_ParentName(<Node_ID>)`

Example:

- Using: $zz_Node_ParentName('24000000031897')
- Sample output: Work area lv5

4.5.128 zz_Node_RackPosition.sql

Name: $zz_Node_RackPosition

Description: The expression will return the object's mounted rack unit location number.

Syntax: `$zz_Node_RackPosition(<Device_ID>)`

Example:

- Using: $zz_Node_RackPosition('24000000031897')
- Sample output: 9

4.5.129 zz_Node_Type.sql

Name: $zz_Node_Type

Description: The expression will return the object's type name based on the specified id.

Syntax: `$zz_Node_Type([UserId])`

Example:

- Using: $zz_Node_Type([DiagramId])
- Sample output: Node

- Using: $zz_Node_Type([id])
- Sample output: Cisco 3945

- Using: $zz_Node_Type('24000000031897')
- Sample output: Cisco 3945

Notes:

- This expression can be used with ease when specifying the id with the reserved params.

4.5.130 zz_Node_getCheckedFieldNames.sql

Name: $zz_Node_getCheckedFieldNames

Description: Returns the field names of the specified node id. The second parameter will exclude the specified field name.

Syntax: `$zz_Node_getCheckedFieldNames(<Node_ID>, <Exclusion_List>)`

Example:

- Using: $zz_Node_getCheckedFieldNames('24000000031897',')
- Sample output:
- Name:
- Peak Power [W]:
- Weight [lb]:
- Field Names:

- Using: $zz_Node_getCheckedFieldNames('24000000031897','Field Names')
- Sample output:
- Name:
- Peak Power [W]:
- Weight [lb]:

Notes:

- This is handy for making diagrams that show the field name and the value beside it.
- To display the value and name, you simply check the desired field and drag the value beside the field name.

4.5.131 zz_Object_Id.sql

Name: $zz_Object_Id

Description: Returns the id of the object using the expression.

Syntax: `$zz_Object_Id([id])`

Example:

- Using: $zz_Object_Id([id])
- Sample output: 24000000031897

- Using: $zz_Object_Id([DiagramId])
- Sample output: 24000000031863

4.5.132 zz_Port_DeviceParentName.sql

Name: $zz_Port_DeviceParentName

Description: Returns the name of the port's parent object:

Syntax: `$zz_Port_DeviceParentName(<Port_ID>)`

Example:

- Using: $zz_Port_DeviceParentName('23000000040569')
- Sample output: Cisco Device

4.5.133 zz_Port_RackDevicePortPath.sql

Name: $zz_Port_RackDevicePortPath

Description: Returns the path of the port in the following format: '::::'

Syntax: `$zz_Port_RackDevicePortPath(<Port_ID>)`

Example:

- Using: $zz_Port_RackDevicePortPath('23000000040569')
- Sample output: Rack::Cisco Device::2

4.5.134 zz_Project_GenericNodeCount.sql

Name: $zz_Project_GenericNodeCount

Description: Returns the netTerrain project number of Nodes.

Syntax: `$zz_Project_GenericNodeCount()`

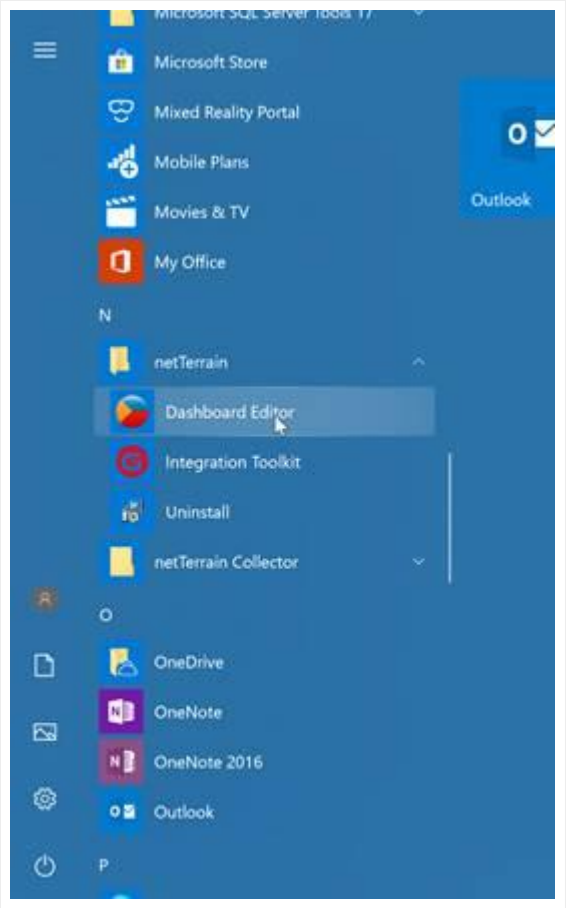
Example:

- Using: $zz_Project_GenericNodeCount()
- Sample output: 20002

5 Dashboard Designer Guide

Every netTerrain server installation comes with a Dashboard Designer (or Editor), a full-fledged business intelligence tool at your disposal, perfectly suited for creating all sorts of dashboards for data visualization, aggregation and presentation. This editor provides a comprehensive UI for designing dashboards from scratch.

The netTerrain Dashboard Editor is typically accessible from the programs menu in your netTerrain server installation:



Dashboard designer access

Since the dashboard designer is a thick client residing on the netTerrain server, read or write permission is usually only granted for administrators that have access to the server. The designer itself does not include a login mechanism since, as mentioned before, it resides on the server already.

Some of the capabilities of the dashboard designer include:

- Supported for a wide array of data providers.
- Dashboard items used to visualize data on the dashboard in various ways
- Filtering elements
- Interactivity features to apply filtering to a dashboard or analyze data at different detail levels
- Data shaping features to use various data shaping operations such as grouping, sorting, filtering, formatting, etc.
- Printing and exporting capabilities

Starting in version 10.0, netTerrain also ships with the base files for installing and running the Grafana reporting engine. This guide does not cover the generation of reports with Grafana.

5.1 Dashboard designer basics

The Dashboard Designer provides an intuitive UI that facilitates data binding and shaping, and layout design.

Many of these normally complex tasks can be accomplished with a simple drag-and-drop operation, allowing you to start creating dashboards immediately. Once a dashboard has been designed, it is saved as an xml and automatically pushed to the netTerrain server so that end users can view it from their web browser.

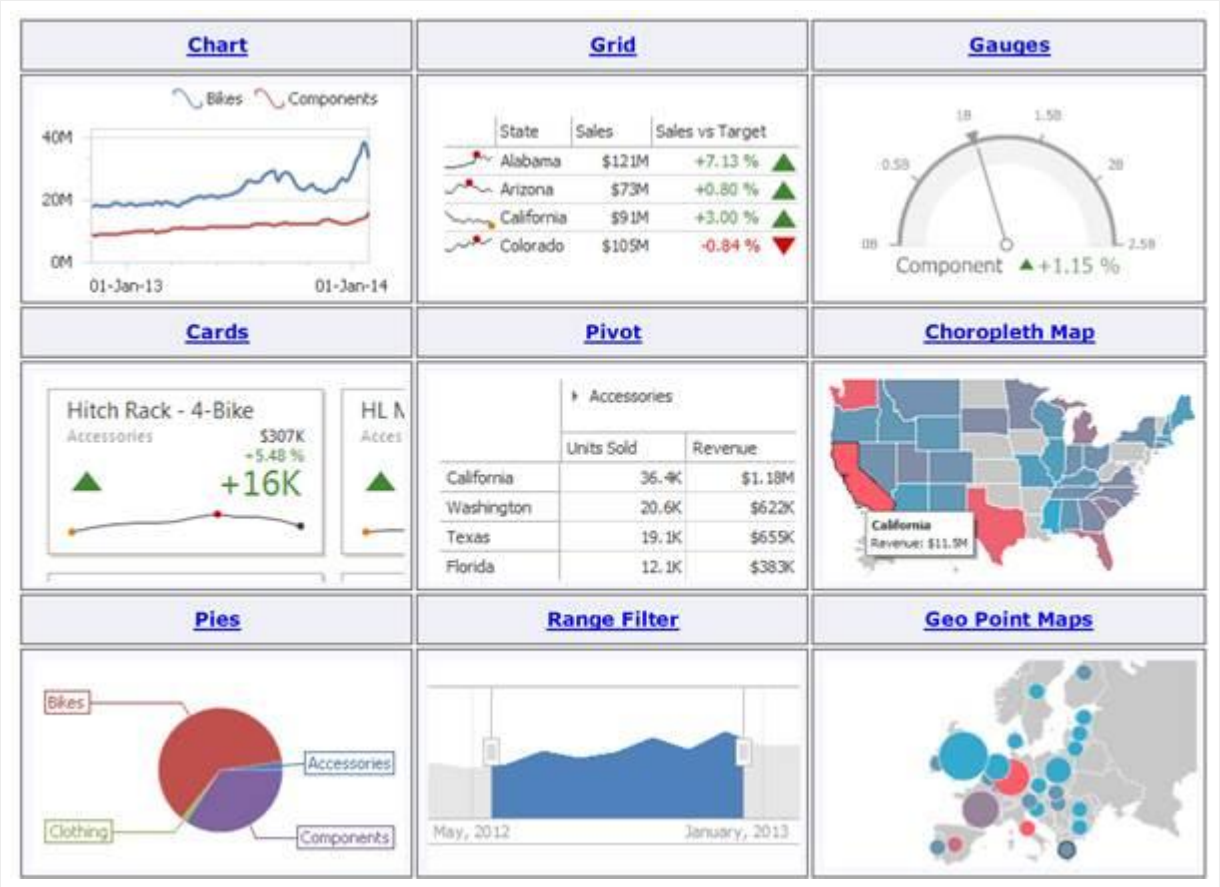
Main dashboard designer view

The main process for creating a dashboard typically involves the following activities:

- Creating a Data Source
- Designing a dashboard layout
- Binding data to the dashboard widgets
- Data shaping and interactivity
- Coloring and other aesthetical design activities
- Saving

5.1.1 Common dashboard widgets

The Dashboard Viewer is used to present dashboards in Windows Forms applications. A wide range of dashboard items (or widgets) are used to display visual or textual information.



Common dashboard widgets

The Dashboard designer also has the capability of including images and text in dashboard, which will be reviewed later.

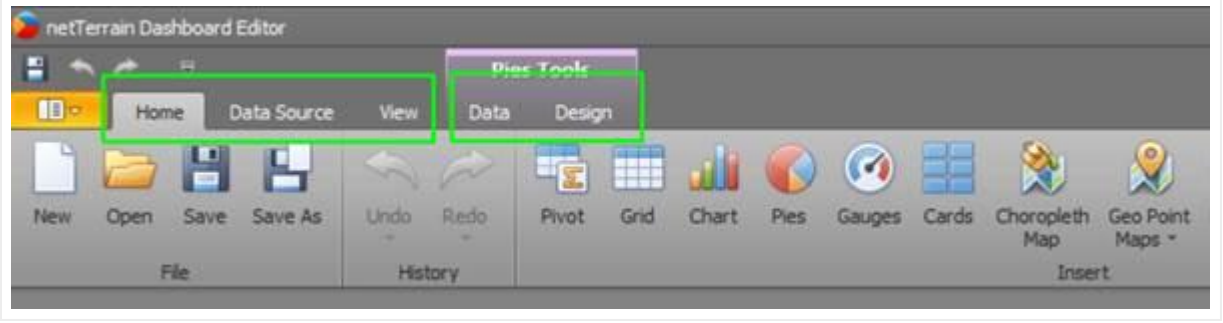
5.1.2 User Interface

The Dashbaord designer UI consists of a thick client windows application with drag-and-drop functionality to speed up the process of designing dashboards. It also includes a variety of themes (which we will switch up throughout this guide), so that you can adjust the look and feel and design to your liking.

5.1.2.1 Main Toolbar

The Dashboard Designer's Ribbon toolbar provides two page categories:

- Main pages
- Contextual pages



Dashboard Ribbon

The main pages are:

- **Home**: contains common dashboard commands allowing you to create a new dashboard and add dashboard items, add a title, save the created dashboard, etc.
- **Data Source**: contains commands related to creating a new data source, calculated fields and parameters
- **View**: allows you to switch between built-in application themes

Contextual pages contain commands related to a specific dashboard item. For instance, these commands allow you to use Pie Tools, or apply filtering to dashboard item data, perform specific layout operations, etc.

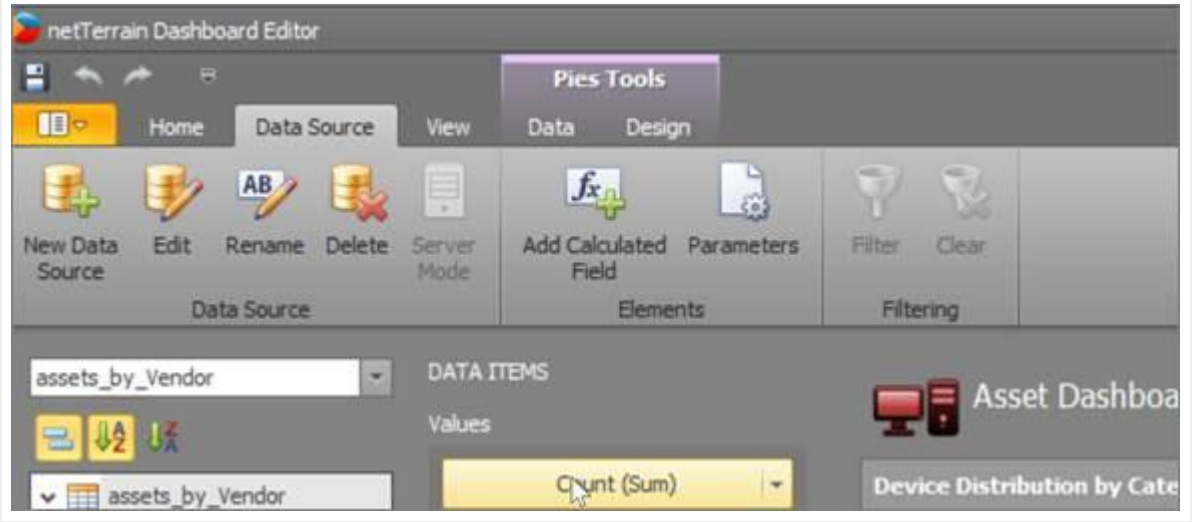
5.1.2.2 Home ribbon

The home Ribbon contains thebasic operations for creating, opening and saving dashboards as well as the widget insert, item operation and data coloring buttons:

Home toolbar

5.1.2.3 Data Source Tab

The Data Source Tab allows you to navigate through dashboard data sources. It displays the data source structure and allows you to bind dashboard items to the required data source fields using drag-and-drop operations. The Data Source Browser also enables you to manage calculated fields and work with parameters. parameters.



Data Source Tab

The Data Source Tab contains the following buttons.

- **Data Source** drop-down list - allows you to select the required data source
- **Query/Data Member** drop-down list - allows you to select the required query or data member

The following Command buttons are available.

The button groups fields by type. The and buttons are used to switch the sort order.
The button is used to refresh the Field List.

Field List displays data source fields. You can drag these fields to the data item placeholders to specify data binding.

The Data Source Browser identifies the following data field types:

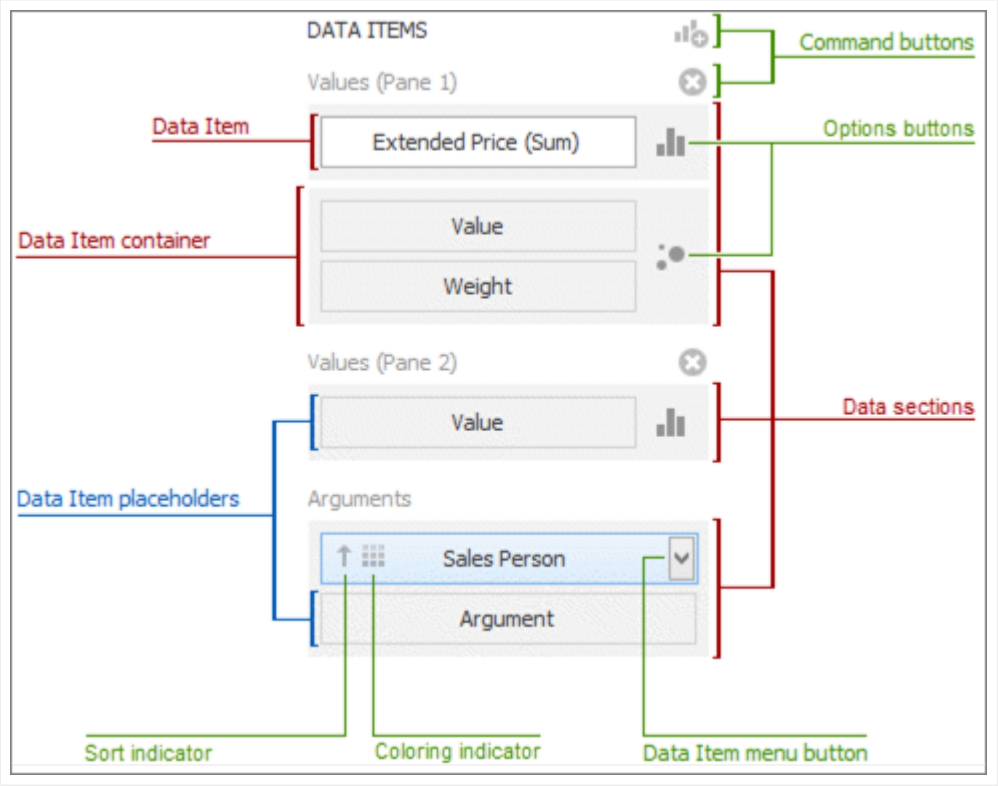
Icon	Description
![image044](./assets/images/image044.png)	Boolean
![image045](./assets/images/image045.png)	Byte
![image046](./assets/images/image046.png)	Date-time
![image047](./assets/images/image047.png) ![image048](./assets/images/image048.png)	Numeric
![image049](./assets/images/image049.png)	String

Icon	Description
![image050](./assets/images/image050.png) ![image051](./assets/images/image051.png)	Calculated field

5.1.2.3.1 Data Items Pane

The Data Items pane is placed side-by-side with the Data Source Browser, and allows you to create and modify data binding using drag-and-drop operations.

To learn how to bind dashboard items to data source fields, see the Binding Dashboard Items to Data in the Designer topic.



Data items pane

The Data Items pane can contain the following elements:

- **Data Item placeholder**: used to create data binding using drag-and-drop operations.
- **Data Item**: identifies data binding by mapping to a particular data source field. Each data item has the Data Item menu button, used to invoke a menu that allows you to perform various data shaping operations.
- **Data Section:** corresponds to a particular dashboard item area or element.
- **Data Item container**: used to provide *data item* sets (e.g., for calculating the difference between two measures). Data item containers have Options buttons that allow you to change specific dashboard item settings (e.g., to switch between chart series types or grid column types).
- **Sort indicator**: shows the current sort order for the data item.
- **Coloring indicator**: indicates whether coloring by hue is enabled for the data item.

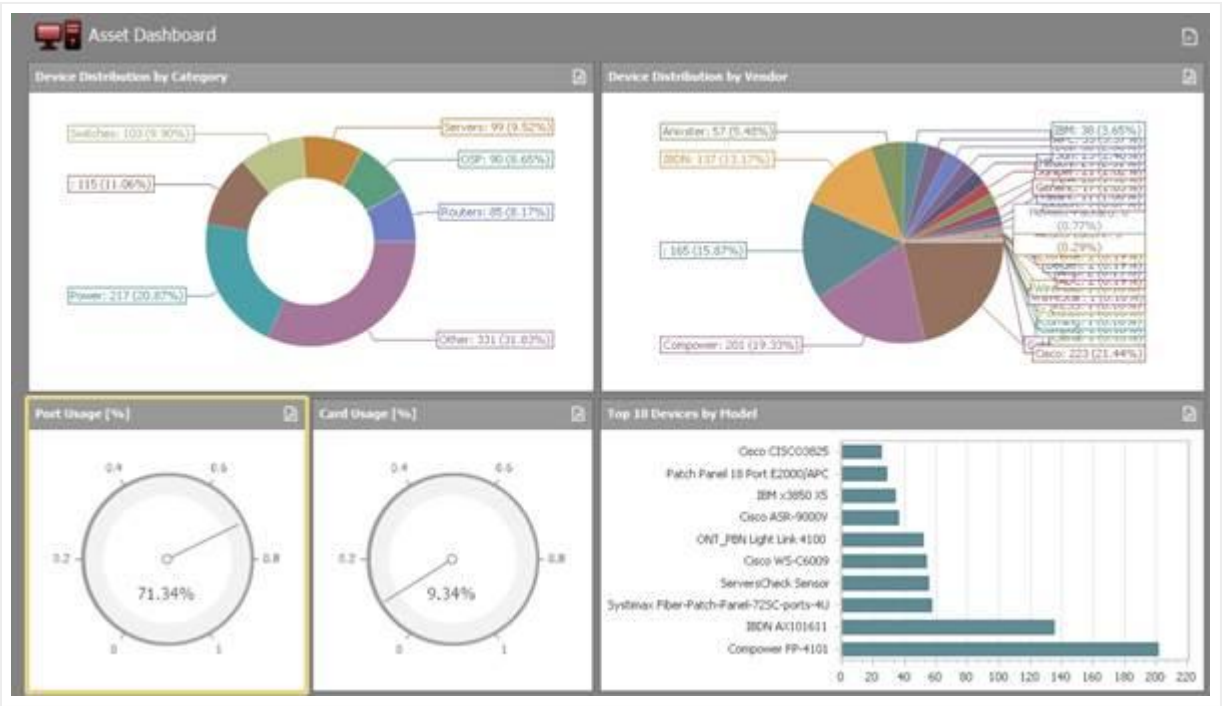
5.1.3 View (themes) menu

To switch between different themes, you can click on the View menu and select between a variety of designed themes. Spice up your Octobers with a sassy Pumpkin theme or get romantic during the month of February with a Valentine's theme:

Designing dashboards can be so romantic__…

5.1.4 Dashboard Surface

The Dashboard Surface is the rectangular area displaying the dashboard that you are designing. This area includes dashboard items and the dashboard title.



Dashboard surface

Here, you can customize a dashboard items layout using drag-and-drop operations, and specify dashboard item settings using its context menus.

5.2 Creating Data Sources

Dashboard widgets show data that is being provided from a myriad of data sources. So, before you start designing your dashboards, you need to learn how to create the underlying data sources.

5.2.1 Supported Providers

The netTerrain dashboard designer not only is able to display data from the netTerrain backend database, it can also display data from other sources such as SQL databases, Microsoft Excel workbooks, XML/CSV data files or OLAP cubes.

The following data source types are supported.

- SQL Database
- OLAP Cube
- Microsoft Excel Workbooks/CSV Files
- Entity Framework Data Source
- Object Data Source

5.2.2 Supported SQL Databases

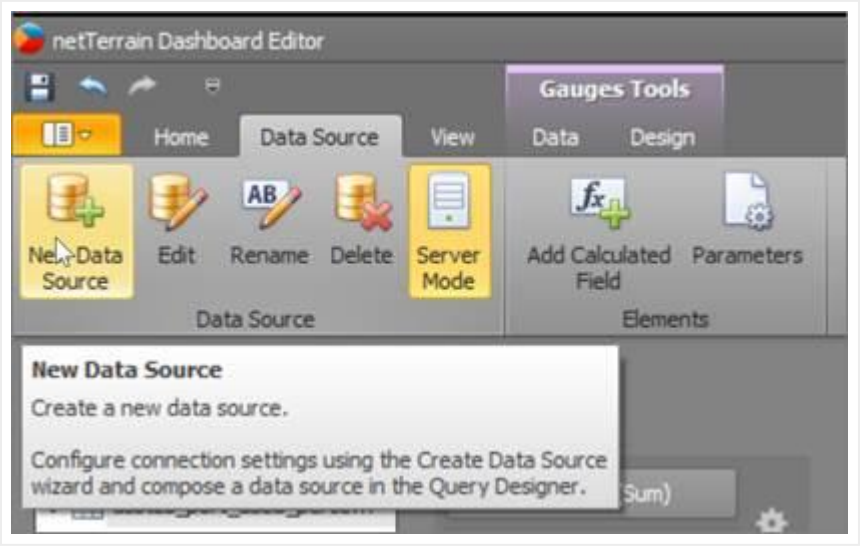
Database Engine	Supported Versions
Microsoft SQL Server	**2005, 2008, 2008R2, 2012, 2014 2005 Express Edition, 2008 R2 Express, 2012 Express, 2014 Express and higher.**
Microsoft Access	97 or higher
Microsoft SQL Server CE	3.5, 4.0
Oracle Database	9i or higher
Teradata	13.0 or higher
SAP Sybase Advantage	Advantage Database Server 9.1 or higher
SAP Sybase ASE	Sybase Adaptive Server 12.0 or higher
IBM DB2	9.5 or higher
Firebird	1.5 or higher, Dialect 3
MySQL	4.1 or higher
Pervasive PSQL	9.x or higher
PostgreSQL	7.x or higher
VistaDB	4, 5
SQLite	3.x
XML file	n/a
Custom connection string	n/a

5.2.3 Creating a connection to the netTerrain database

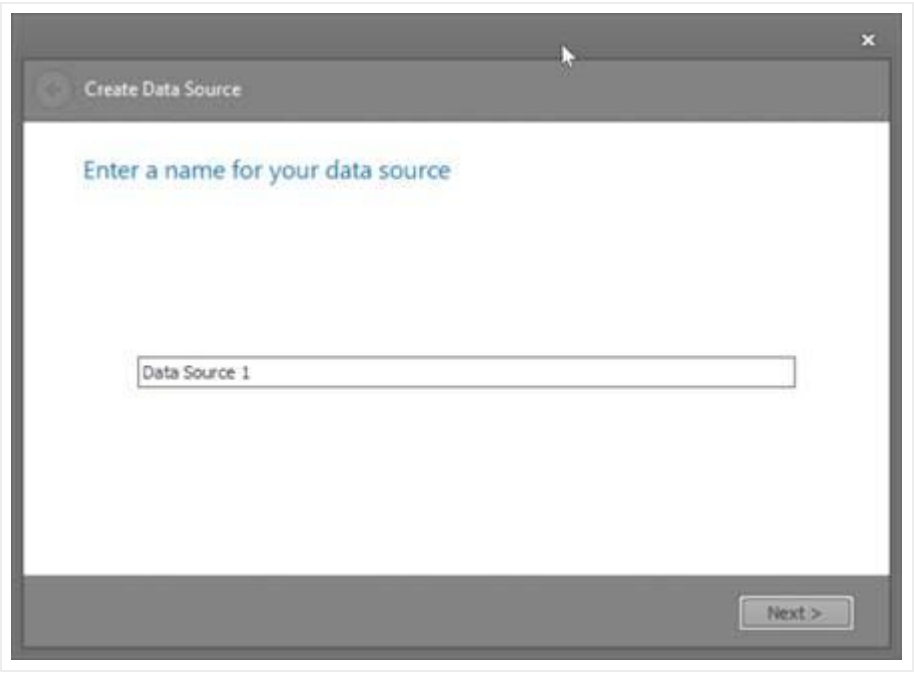
In most cases you will use the dashboards in netTerrain to visualize native netTerrain data. It would not be very practical to have to point to the netTerrain database and provide credentials every time you want to create a new dashboard widget and pull data from netTerrain, especially considering that the netTerrain dashboards live on the same application server where netTerrain is already running and for which netTerrain already has a connection to its database through the web.config file.

As such, and for convenience, netTerrain already has a predefined internal connection that does not require you to enter any database credentials. In this section we will learn how to create a new data source using this internal connection.

1) Click the New Data Source button in the Data Source ribbon tab.



2) On the first page of the invoked Data Source Wizard dialog, type a name for your data source and click Next (you can always go back to the previous dialog using the back arrow on the top left corner).



3) Next select your data connection. Notice the option to choose from a list of predefined connections. netTerrain already ships with a predefined connection called NetTerrainDefault, which is the default connection to your netTerrain database. Choose this option and hit next.

4) From here on you are now connected and working with the internal netTerrain database

Later in this section we will learn how to create queries against the netTerrain database.

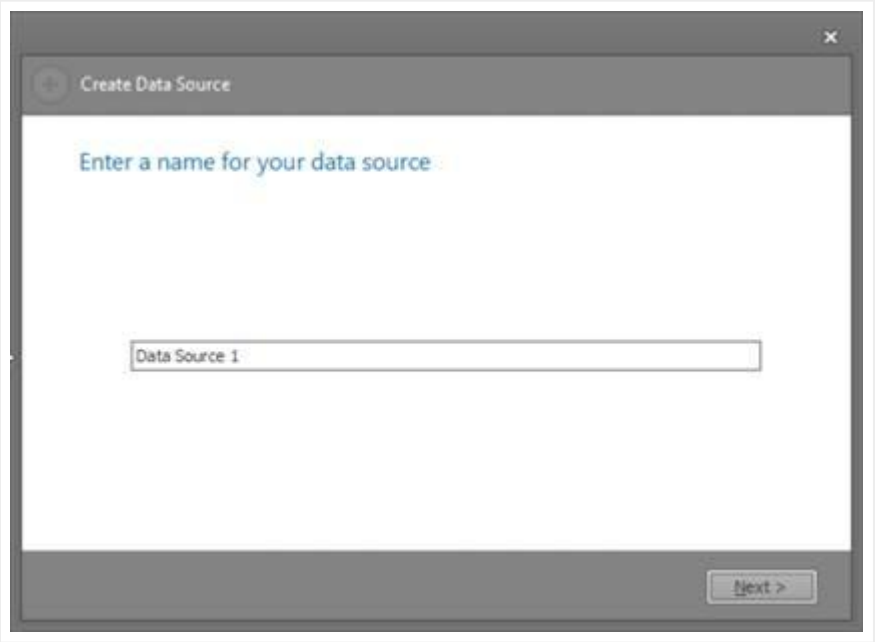
5.2.4 Creating an external SQL Server Data Source

The Dashboard Designer provides the capability to connect to multiple types of SQL databases using the Data Source wizard, besides the native netTerrain database. In this section we show an example of how to connect to an external SQL Server database.

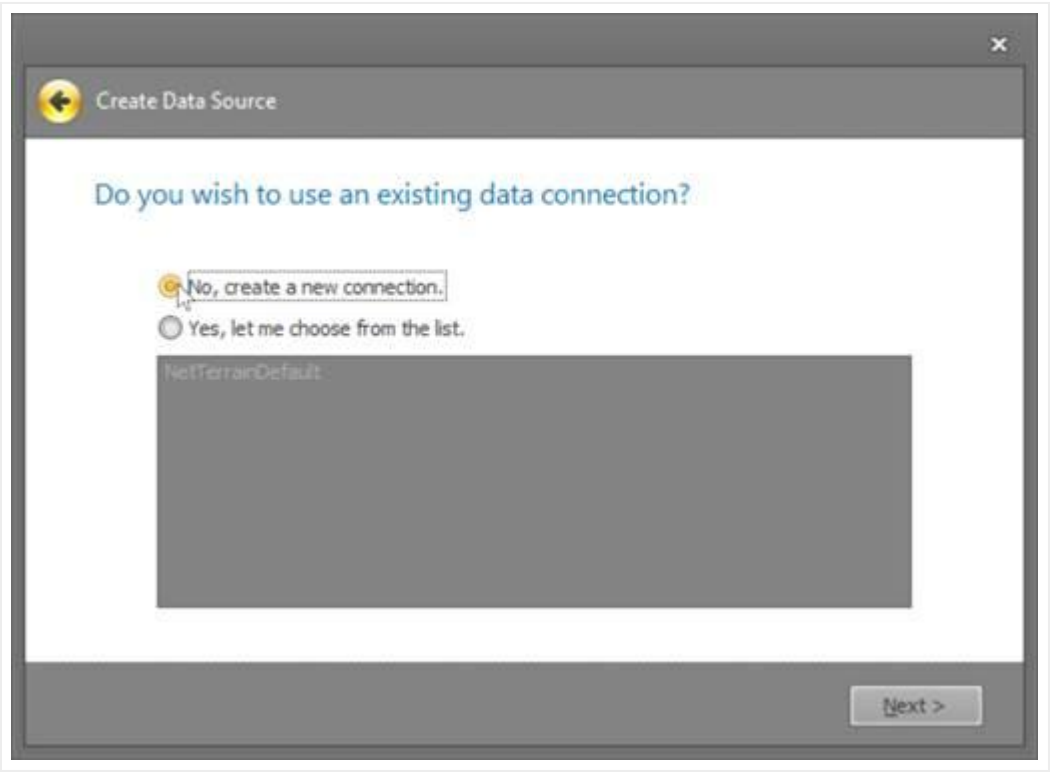
To connect to the MS SQL database in the Dashboard Designer, the first few steps are identical to what we saw before:

1) Click the New Data Source button in the Data Source ribbon tab.

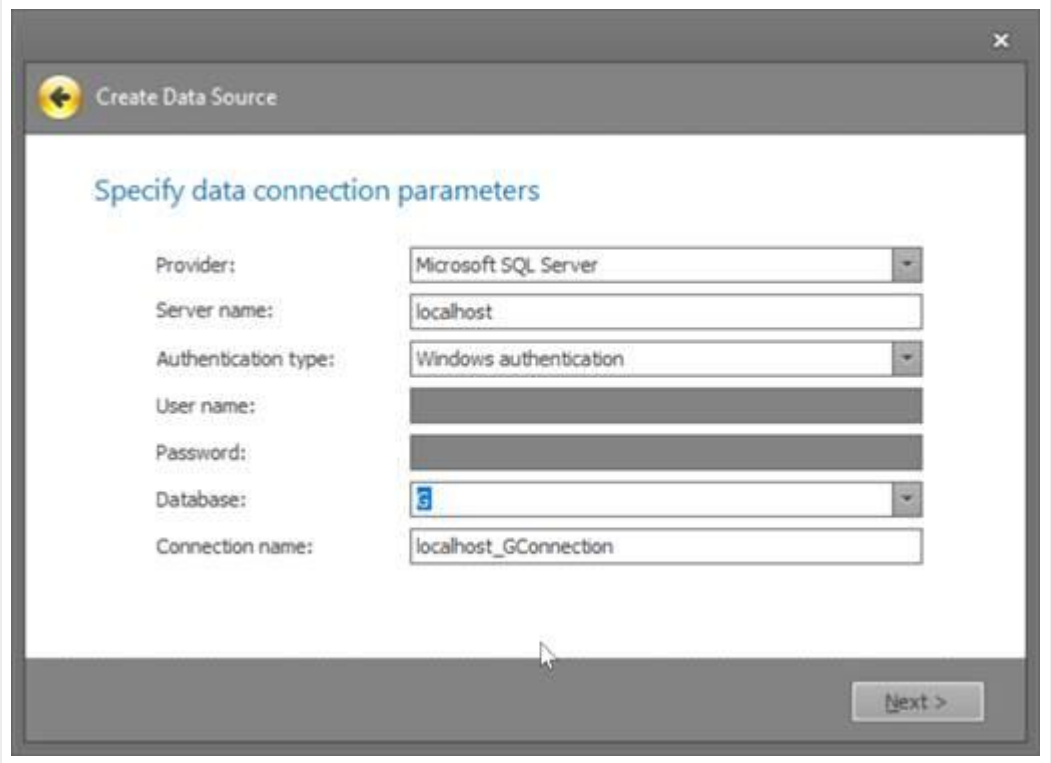
2) On the first page of the invoked Data Source Wizard dialog, type a name for your data source and click Next (you can always go back to the previous dialog using the back arrow on the top left corner).



3) Next select your data connection. Here, we want to create a new connection to an external SQL Server database, choose the 'create new connection' option.



4) On the next page, select the Microsoft SQL Server data provider and specify the required connection parameters.



a. Specify the name of the MS SQL server to which the connection should be established.

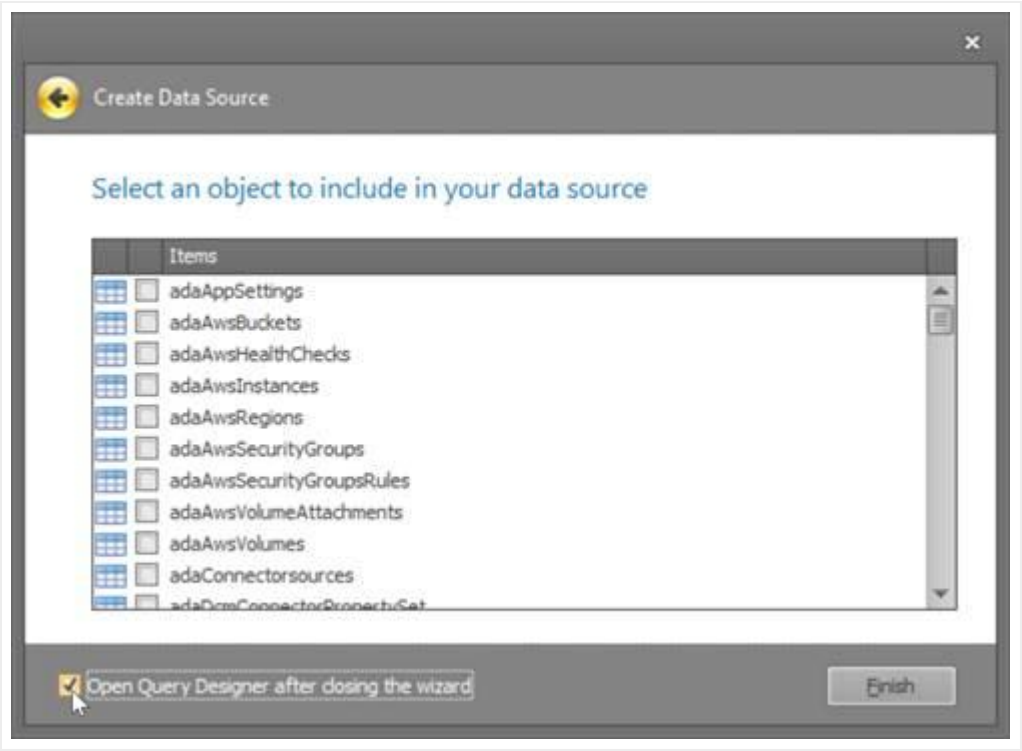
b. Specify the authentication mode of the MS SQL Server. You can choose whether to use Windows authentication or Server authentication.

c. Specify the user name used to authenticate to the MS SQL server.

d. Specify the password used to authenticate to the MS SQL server.

e. Select the database that contains the required data.

5) After you have specified the required connection parameters, click next and specify how to select data from the database. You can select a table from the displayed list view or open the query designer after closing the wizard.

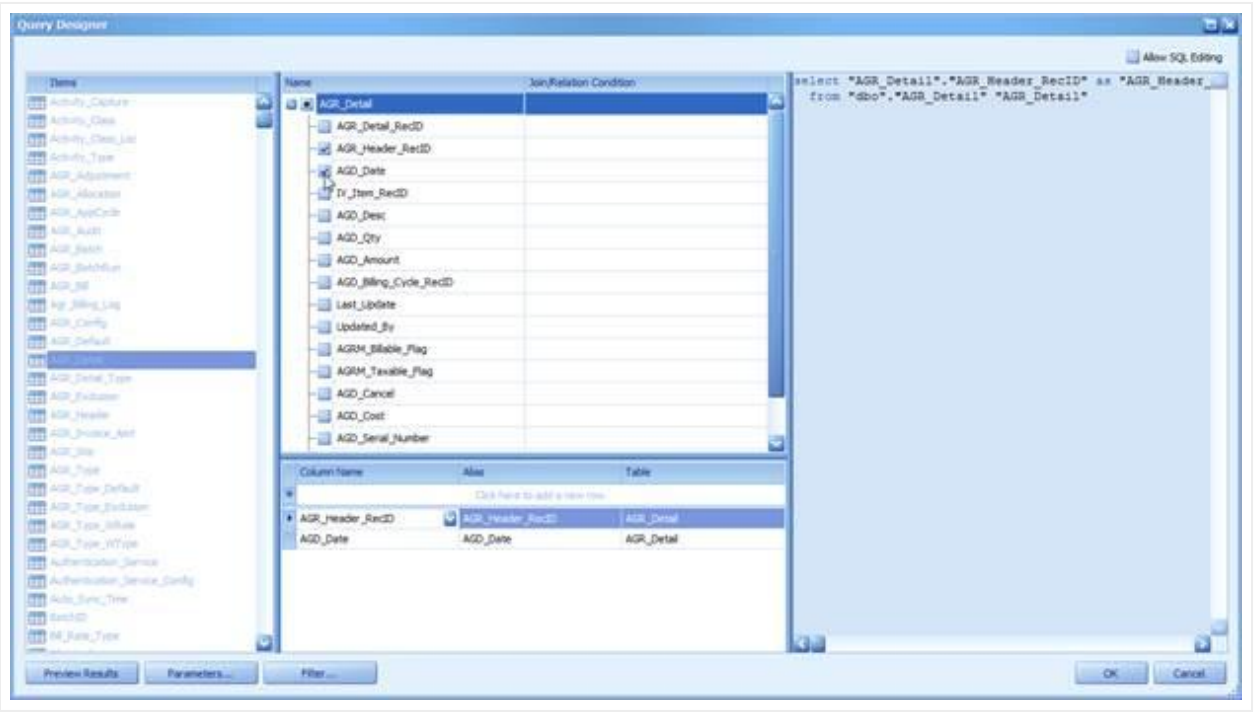


a. If you select a table from the list view, it will serve as your data source and displayed in the data sources hierarchy browser:

b. If, instead, you check the 'Open Query designer' option from the previous dialog, the Query designer dialog will open. We will review the query designer in the next section.

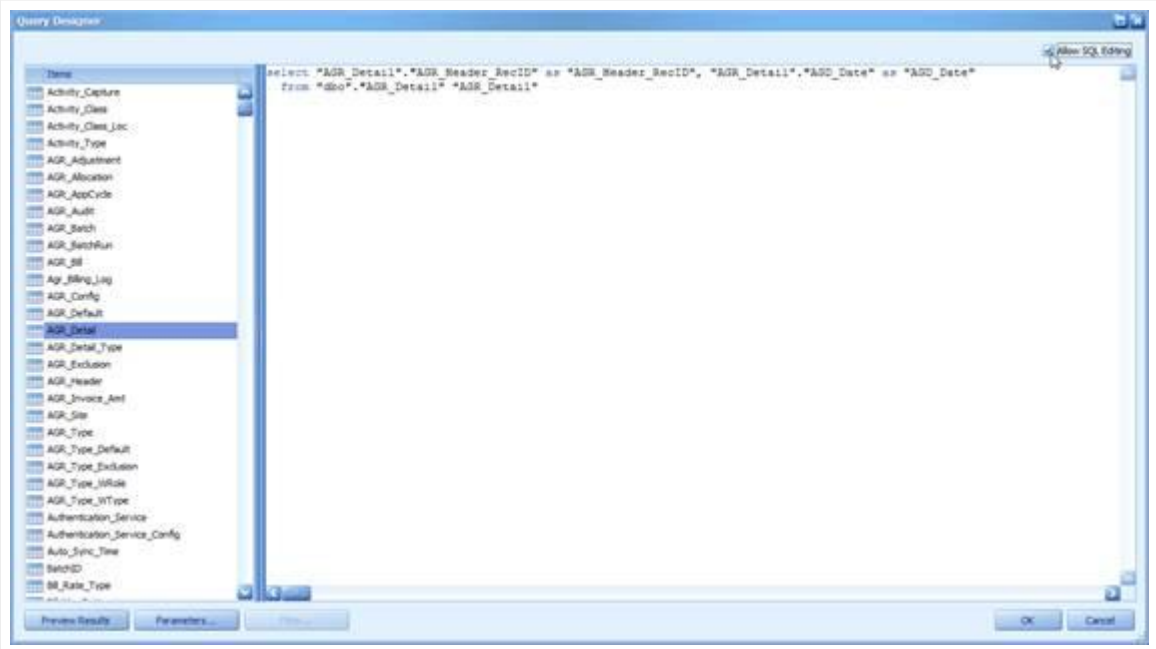
5.2.5 Using the Query Designer

When the data source is configured, you can use the built-in Query Designer to select required data.



Query designer

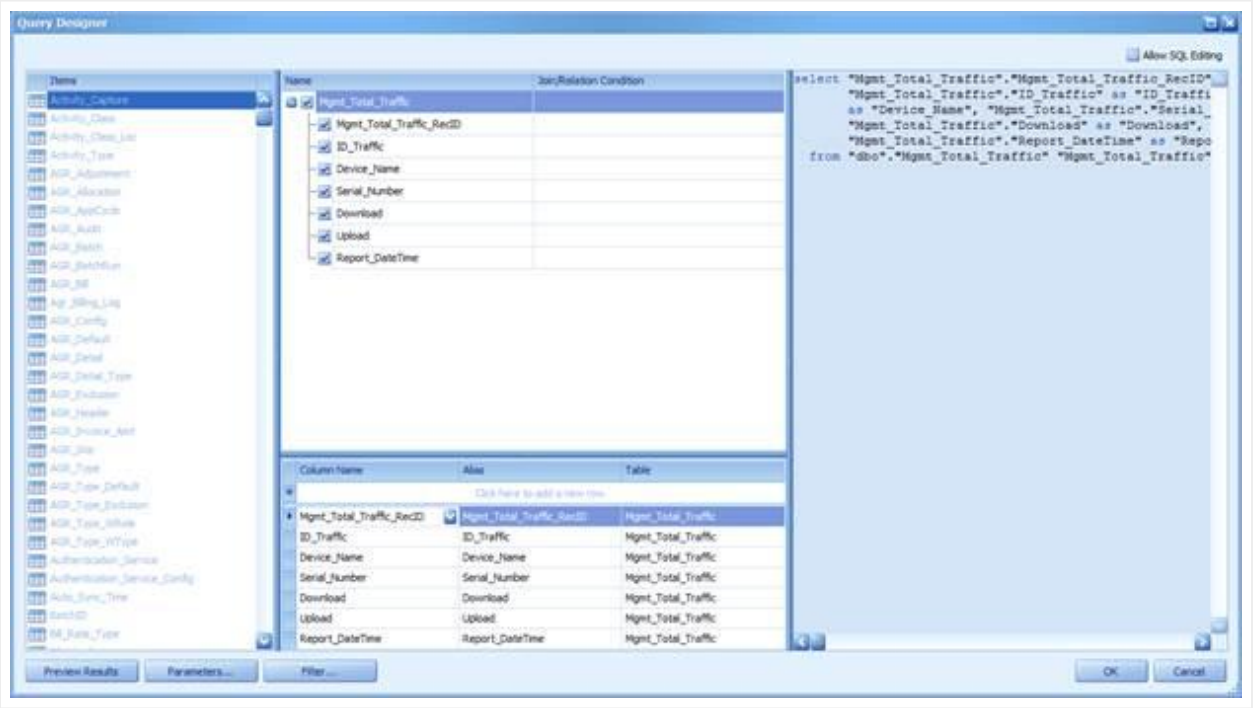
You can select tables, which then automatically detect join/relations and conditions and provide the list of available fields to work with or you can modify the SQL string directly. Click the Allow SQL Editing check box to edit SQL statements directly. However, note that unchecking this box will cancel all your changes.



Designer with SQL editing enabled

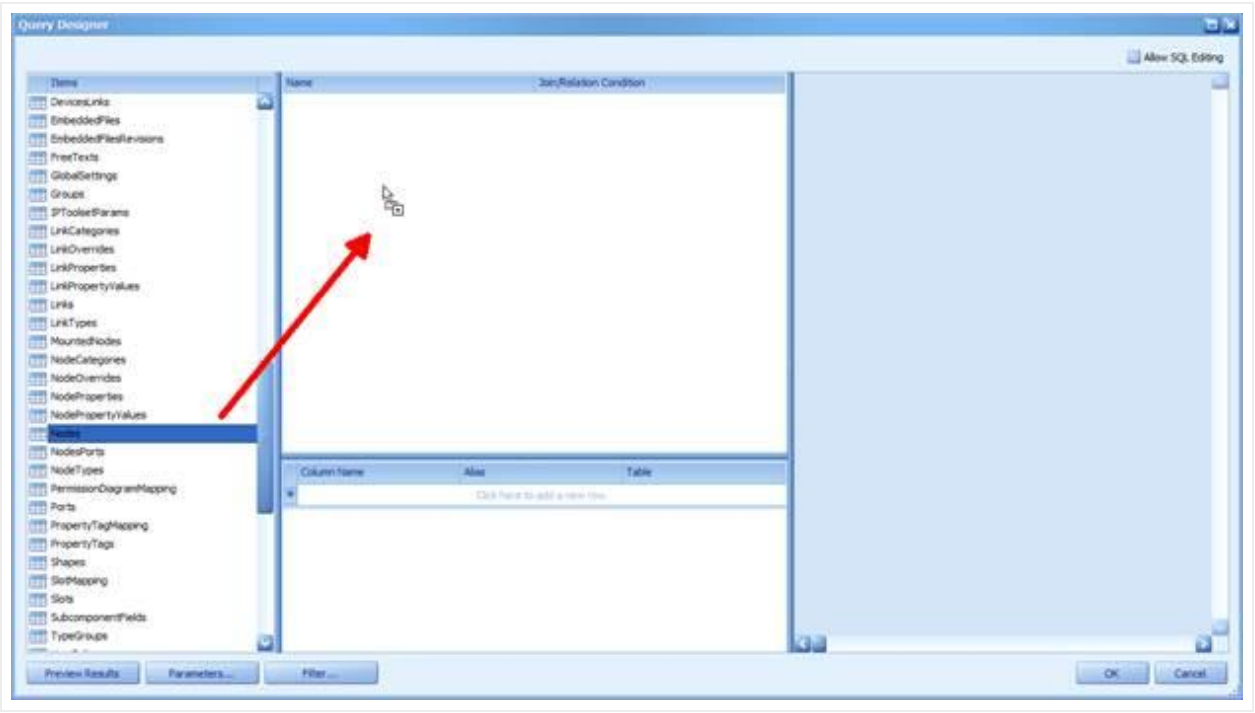
5.2.5.1 Building Queries with the Query Designer

In the Query Designer dialog, you can add data tables and views to the data source, and select which columns to include. The Query Builder automatically joins the related tables, so all you need to do is drag-and-drop.

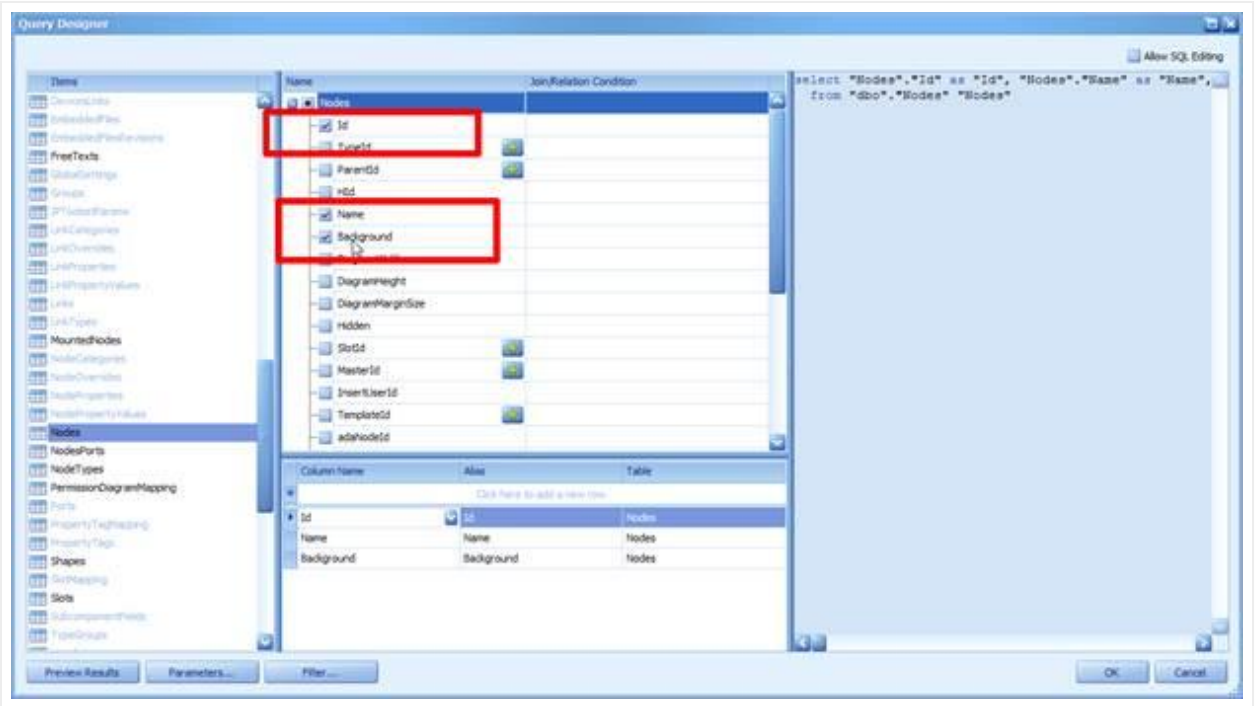


5.2.5.2 Adding Tables

To add the required tables/views to a data source, double-click the table (or view) or drag-and-drop it from the Tables pane onto the Diagram pane.

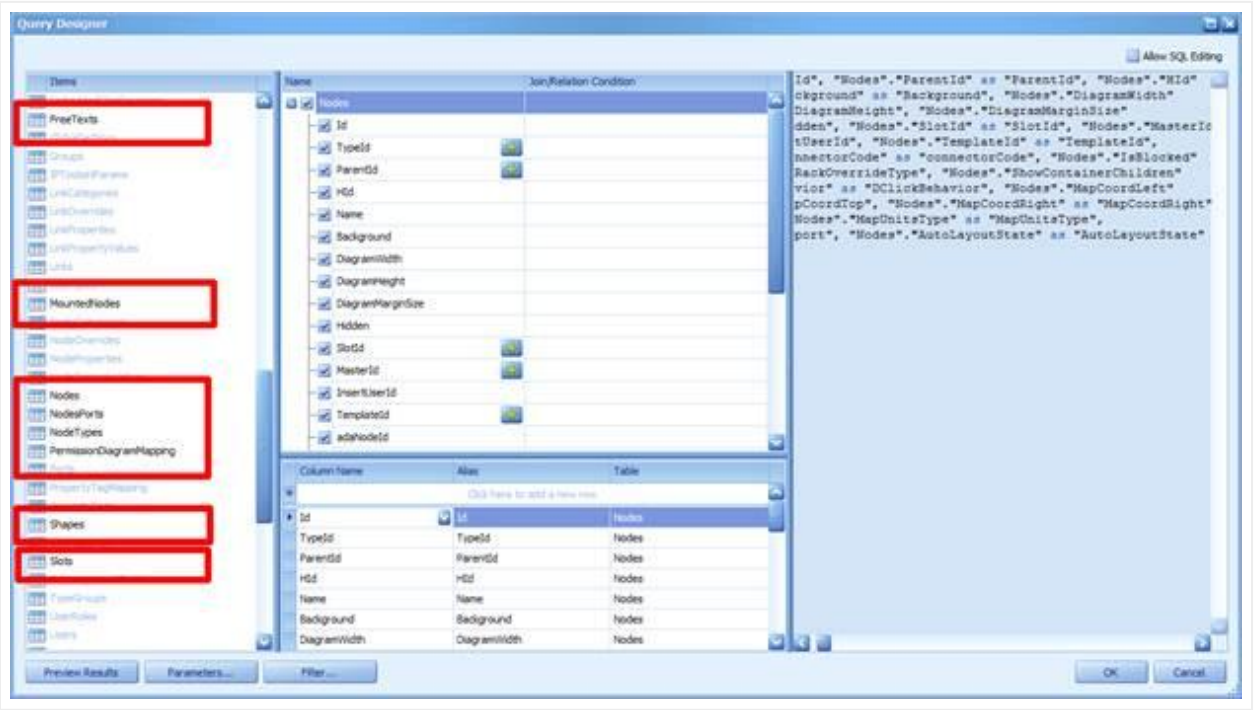


Then, select the required columns.

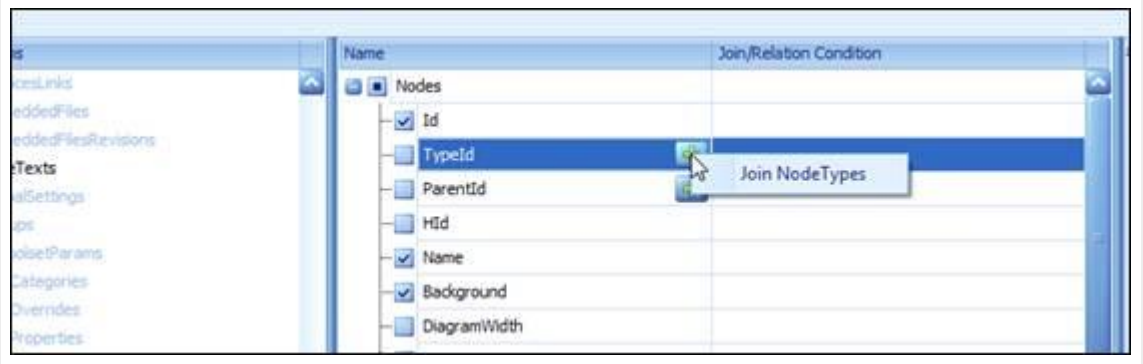


5.2.5.3 Joined Tables

Note that if at least one table has been added to the Diagram pane, the Tables pane highlights tables that have a relationship with any of the recently added tables.

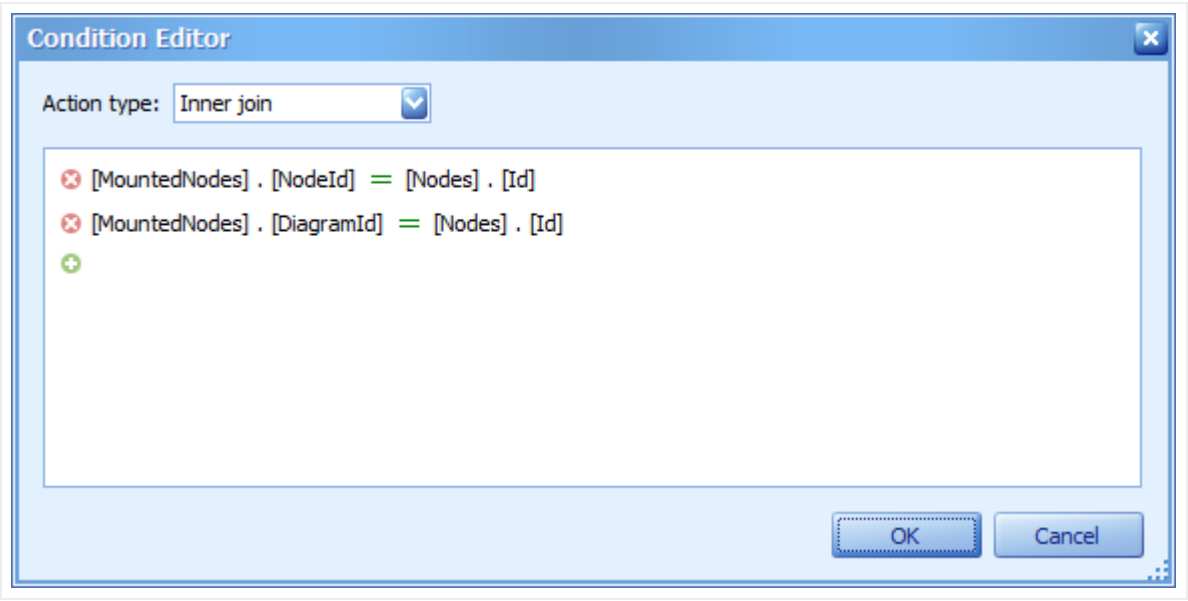


To join the already added table with another table, drag and drop the required table from Tables pane to Diagram pane. As an alternative, in a row corresponding to a foreign key column, click the + button.



5.2.5.4 Condition Editor

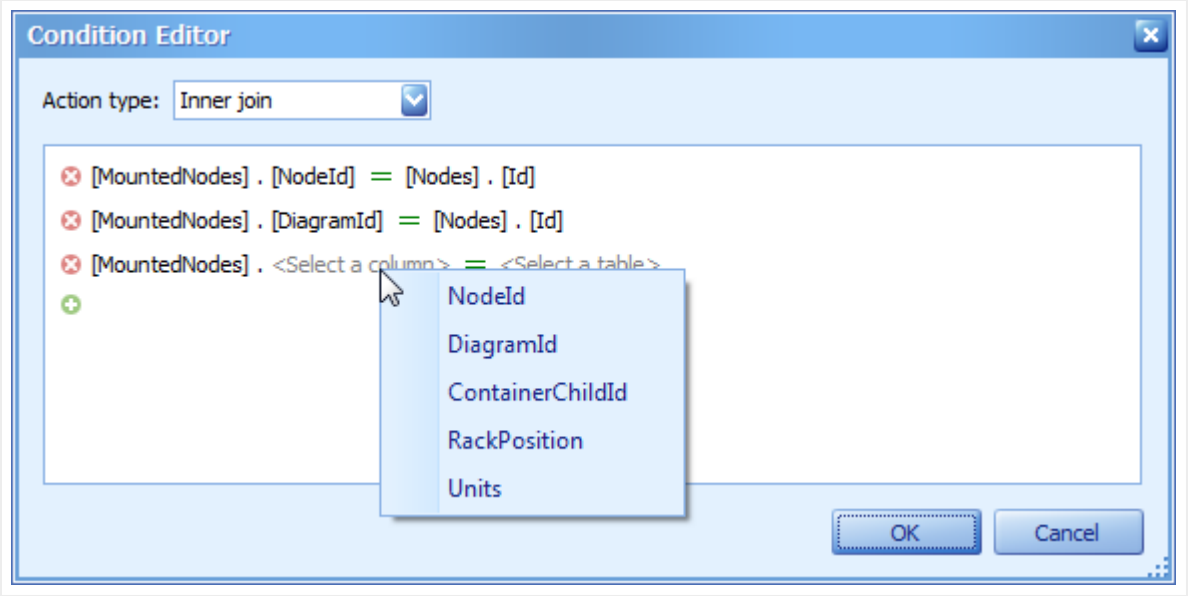
When you drag and drop a second table, the editor will let you choose the join type via the Condition Editor. Please refer to the netTerrain Database Description guide for information on how to consume data from the netTerrain database.

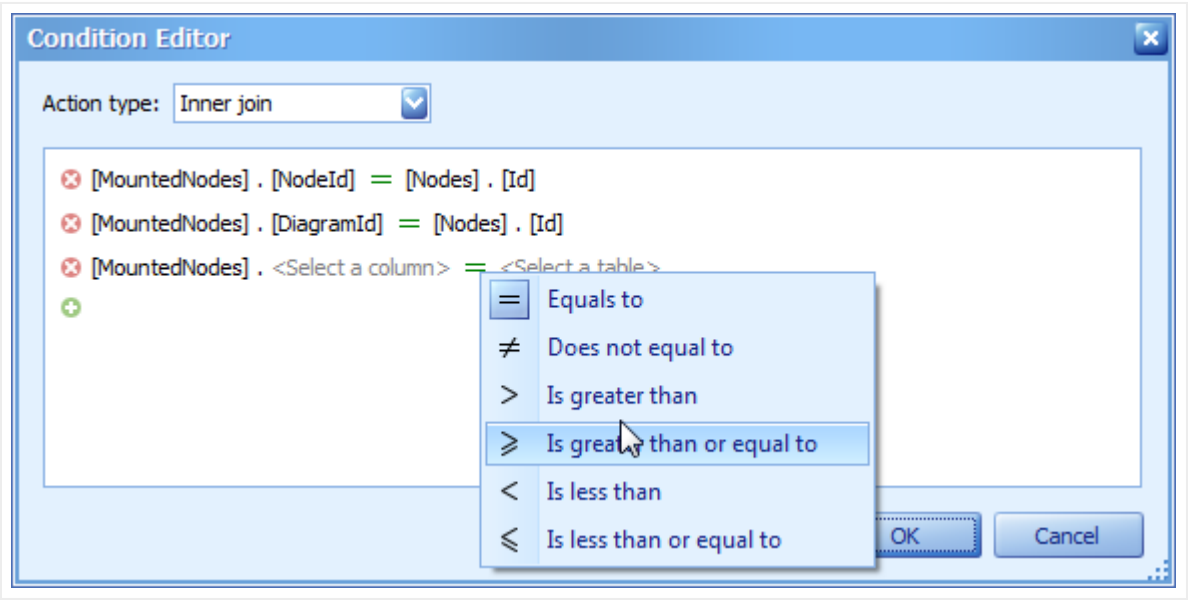


First, check the join type. You can specify it in the Join type combo box. An Inner join and Left outer join are supported.

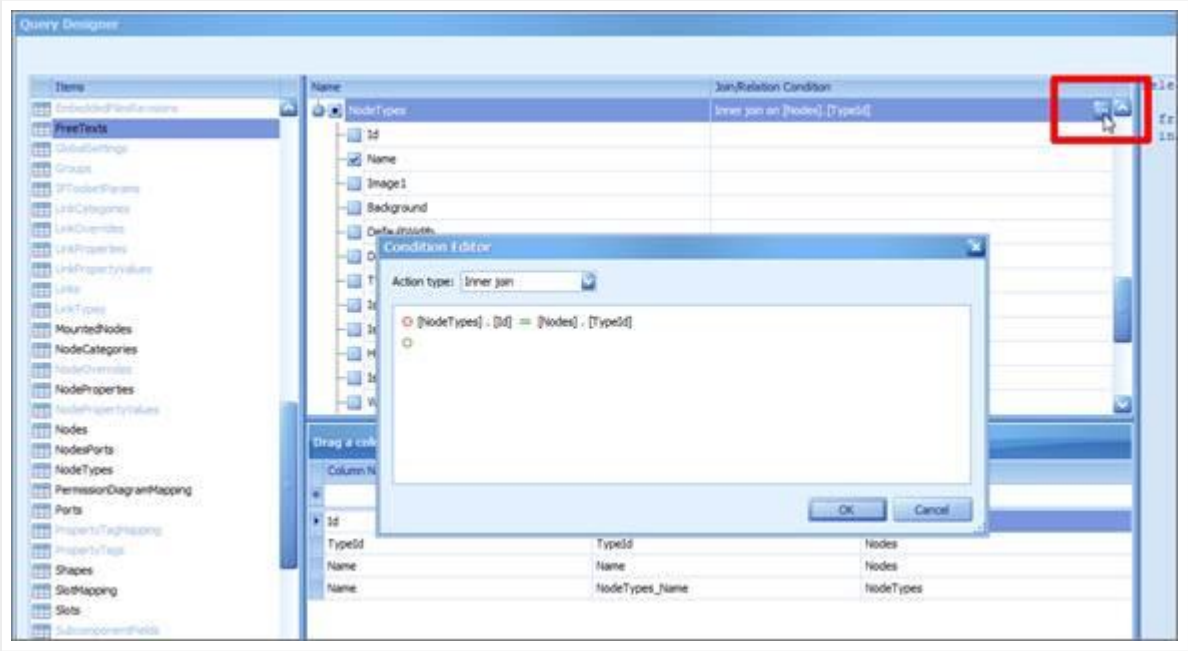
To edit column and table names in the existing condition, click the name you wish to replace and choose a different name from the popup menu.

Columns and conditions will be automatically detected by the condition editor, as displayed below.



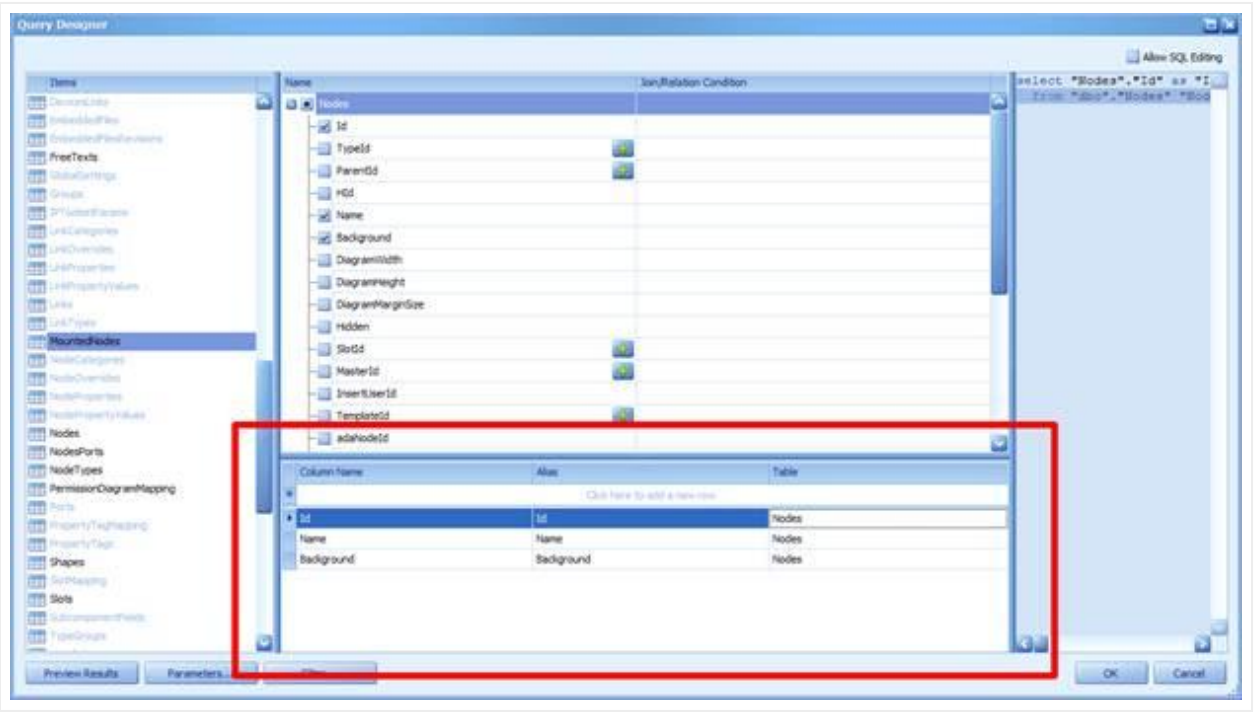


The condition editor can also be invoked by clicking on the ellipsis button next to the table header, as displayed below.



5.2.5.5 Editing column settings

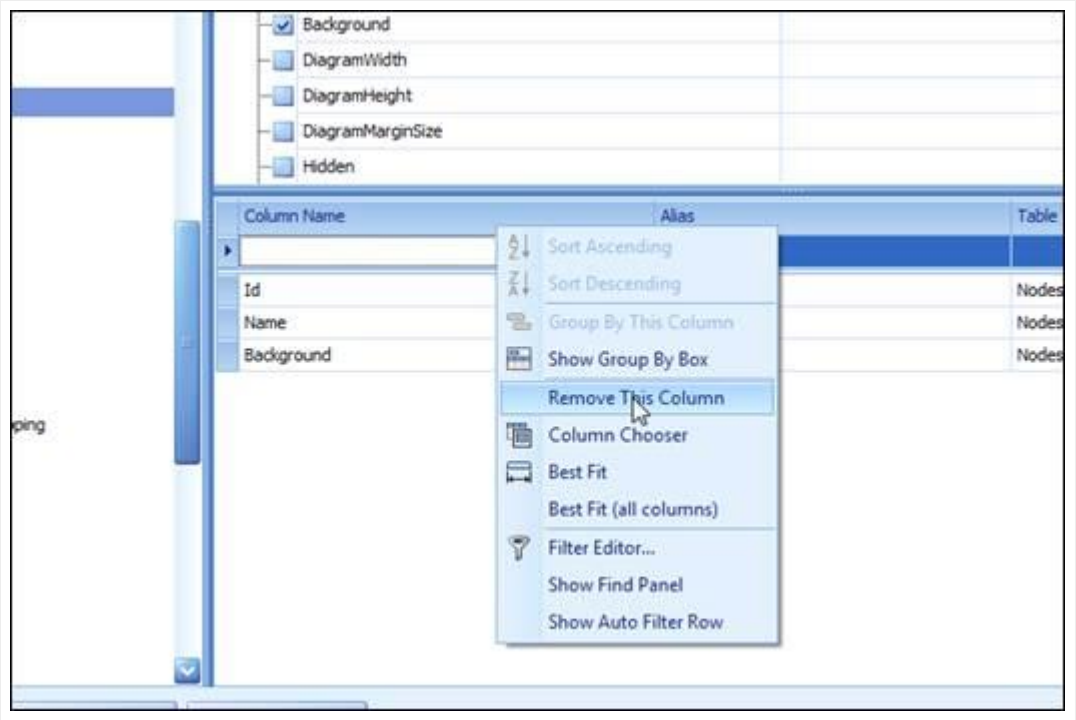
After you have added the tables and selected the required columns, you can change settings for each column in the Grid pane.



The following settings are available for each column.

- Use Column to select the required column from the combo box or add a new column.
- The Table column displays corresponding table names.
- The Alias column allows you to specify the column alias.

Right clicking on any column will reveal additional options to manipulate the fields.

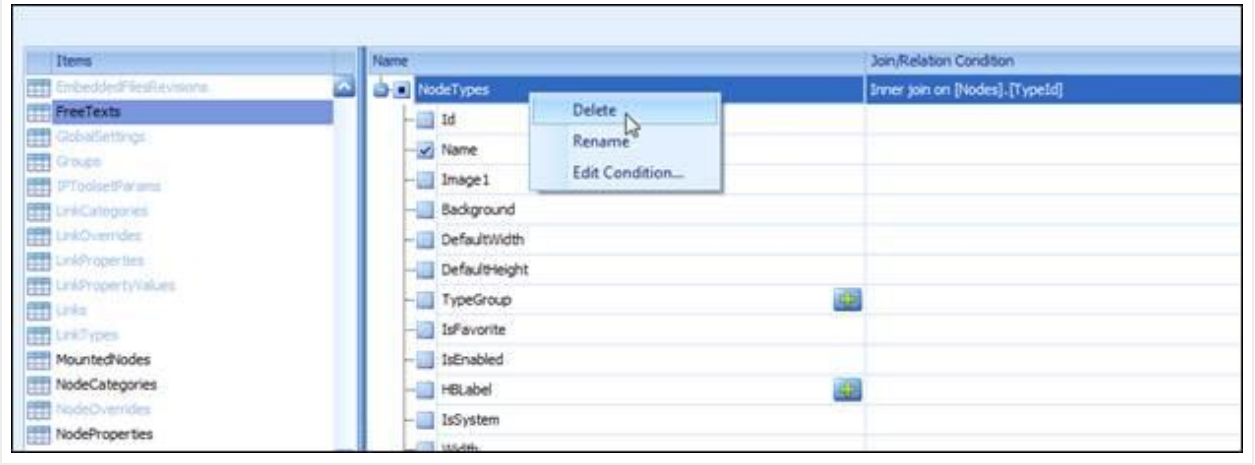


The following options are available:

- Sorting
- Group by options
- Column removal
- Column Chooser
- Column fitting
- Filtering

5.2.5.6 Deleting and Renaming Tables

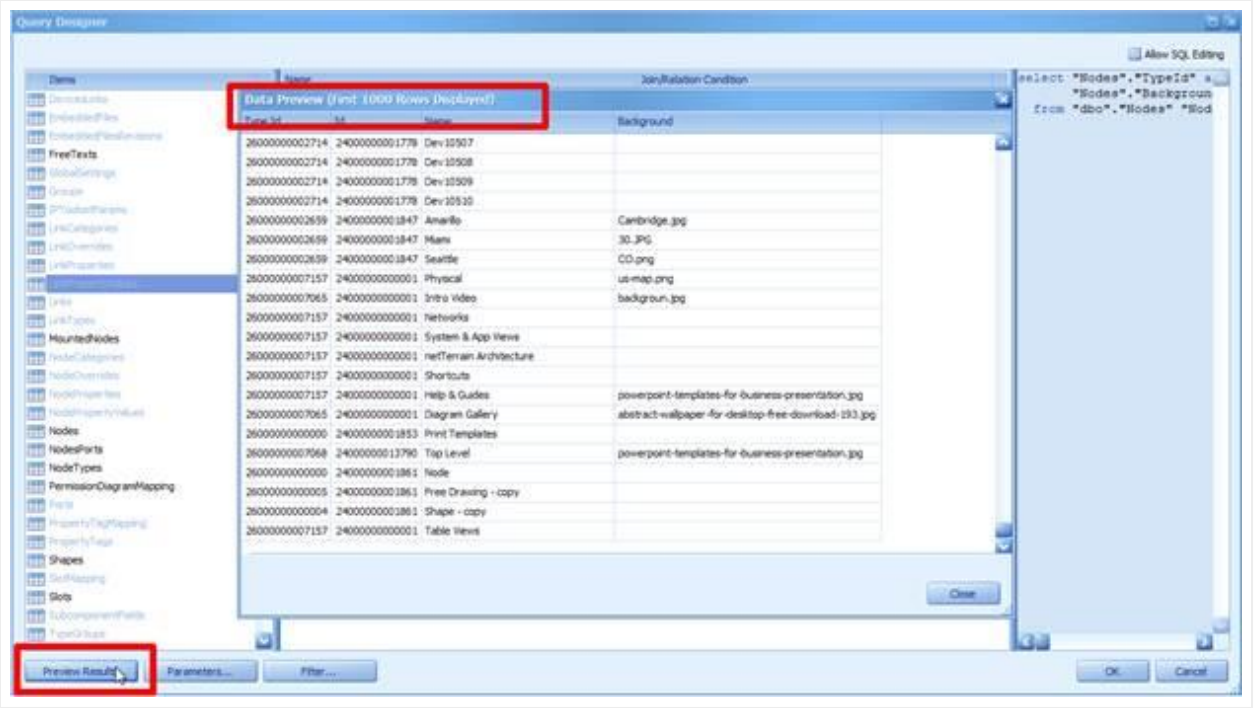
To delete a table from the editor simply click on the table header and hit the 'del' key. You can also right click on the table header and click on the delete option.



Sometimes, for convenience, you may need to rename a table. To do so simply right click on the table header and select the rename option. This will highlight the table name and let you edit it.

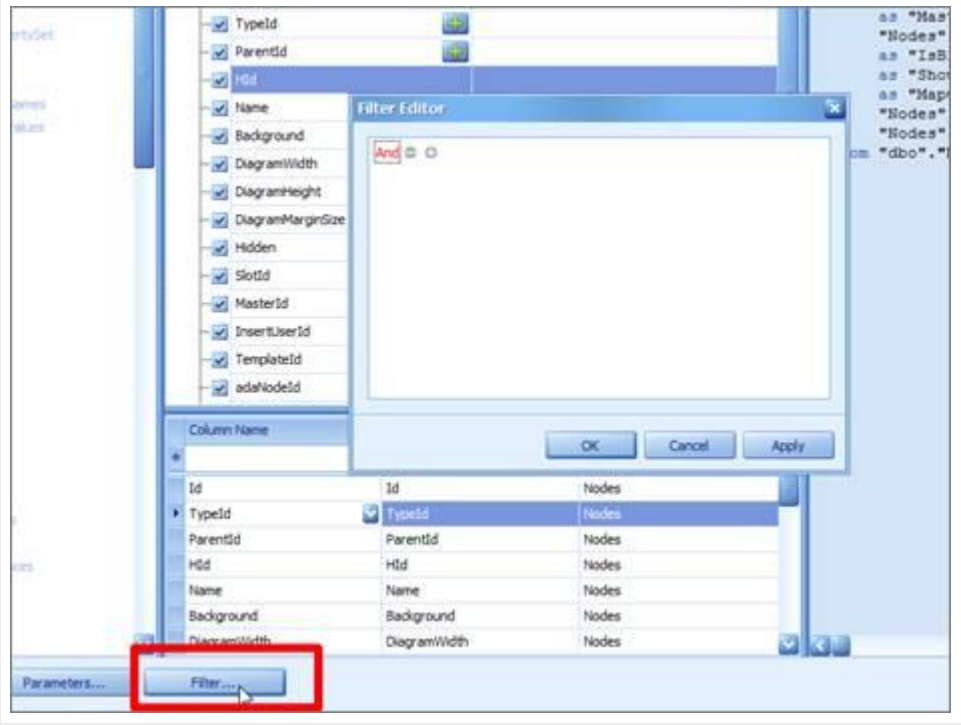
5.2.5.7 Previewing Results

Once the query has been designed you can easily preview the data by using the 'Preview Results' button.

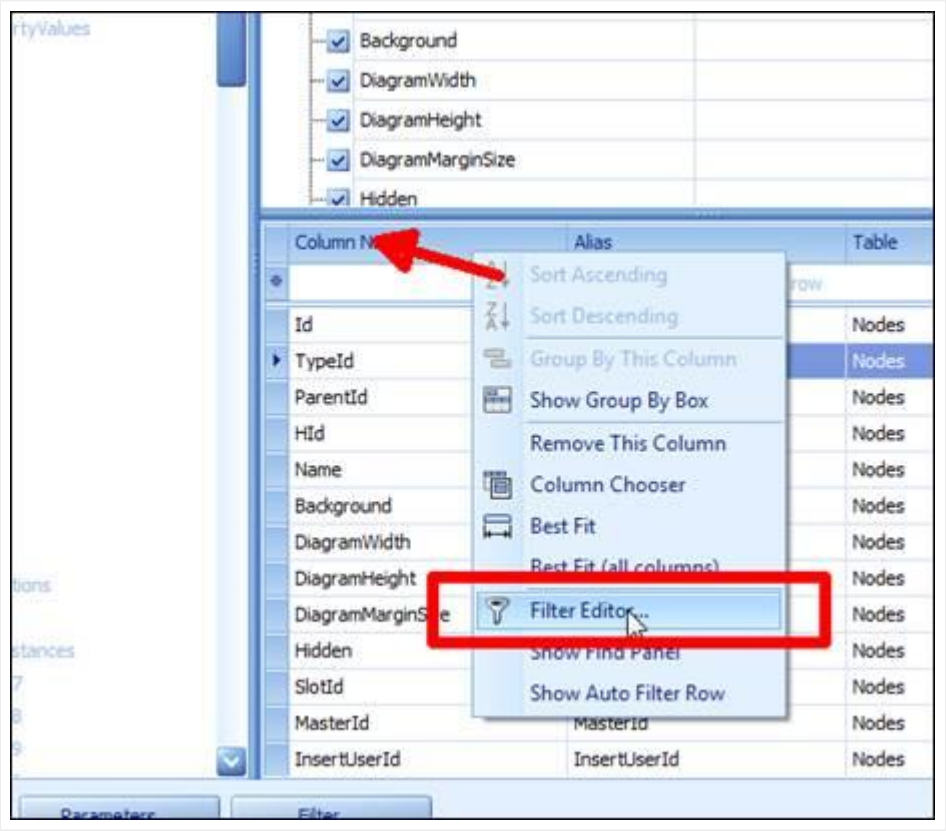


5.2.5.8 Filtering

To filter data in the Query Builder, click the Filter button, as shown below.



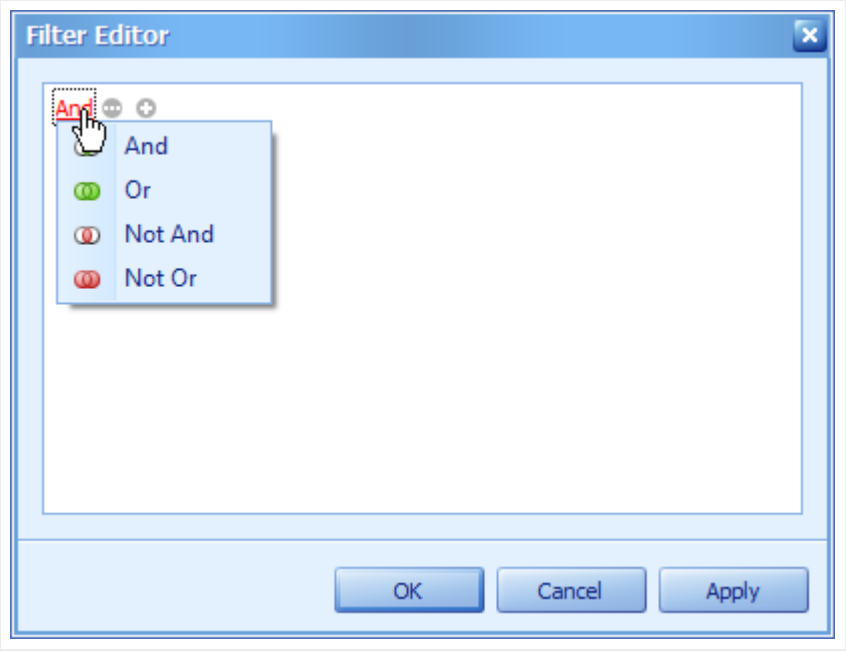
Alternatively you can right click on a column header and select the filter editor option:



This action will invoke the Filter Editor dialog, which allows you to build filter criteria for your queries. Note that the created filter criteria will be included to the SQL query as a WHERE clause.

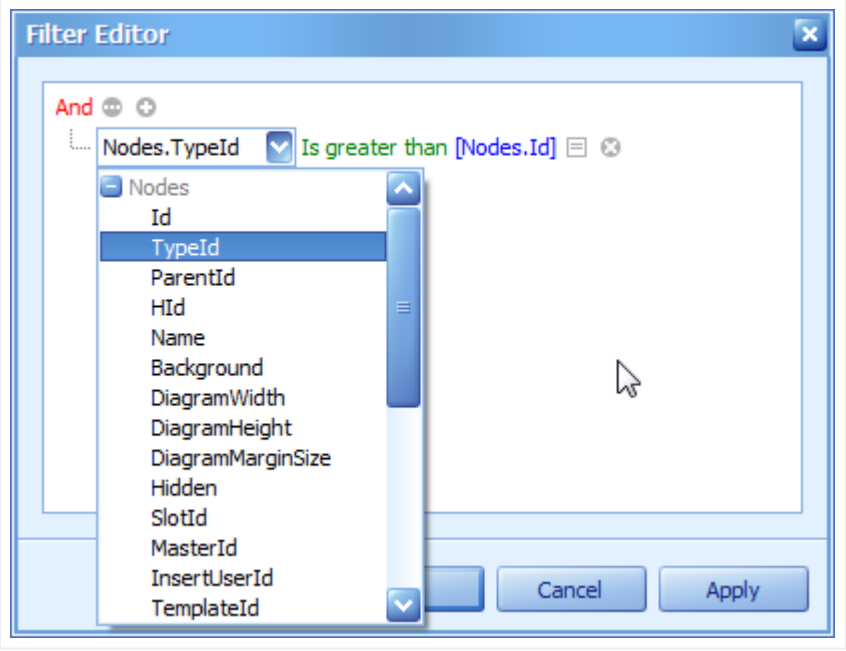
To create a filter, you need to specify a logical operator and a condition or group. The operators include:

- And
- Or
- Not And
- Not Or

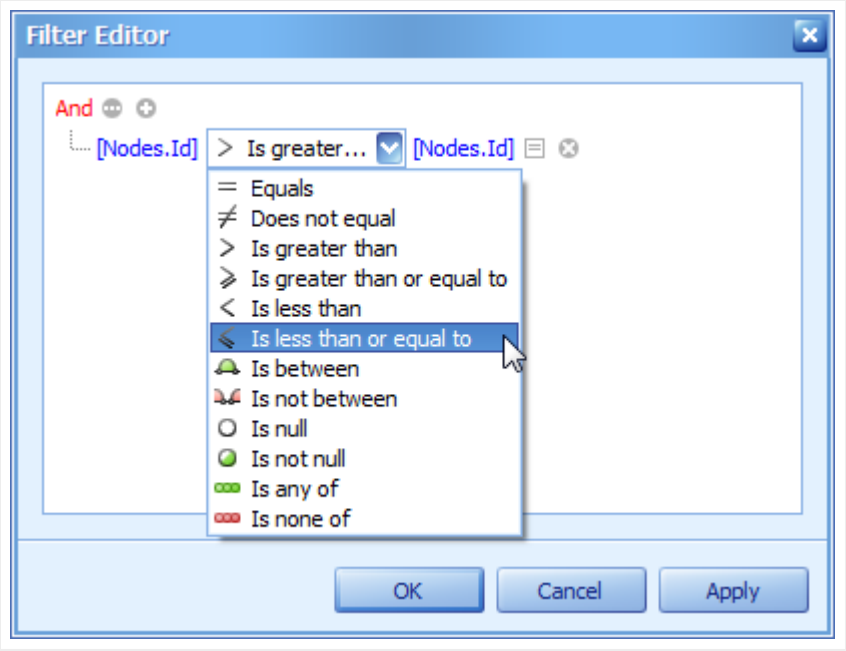


To add a condition, click on the + sign. This will display the field to compare to, an operator and a comparison value, all of which you can specify.

Clicking on the first field, you will get a drop-down box that let's you choose other available fields, based on the tables that were brought into the dialog in previous steps.



Clicking on the green operator, a drop down box with all the possible operators will be displayed.



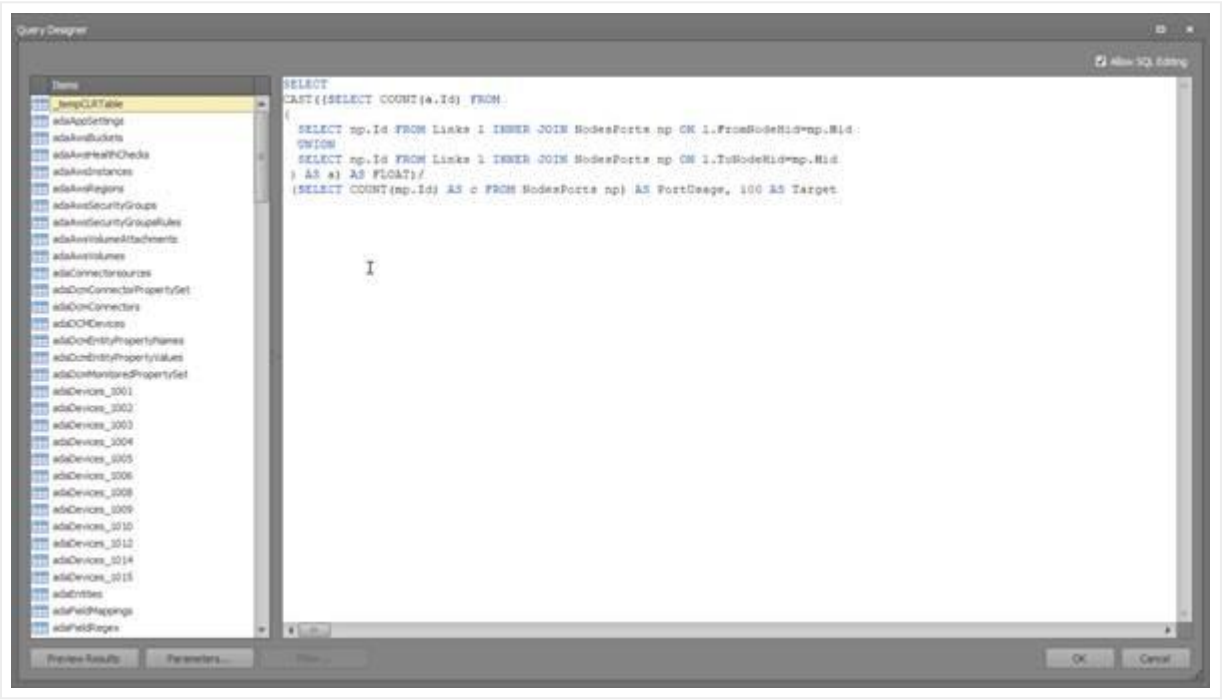
The compared value can be another field as well as a static value or parameter. Click the symbol in the Filter Editor to toggle between a value, another field and a parameter.

5.2.6 Editing connection parameters

After you connect to the data store and select the required data, you can edit the connection parameters used to establish a connection.

To edit connection parameters for the selected data source, click the Edit Connection button in the Data Source ribbon tab.

In the invoked Connection Edit dialog, you can specify new connection parameters.



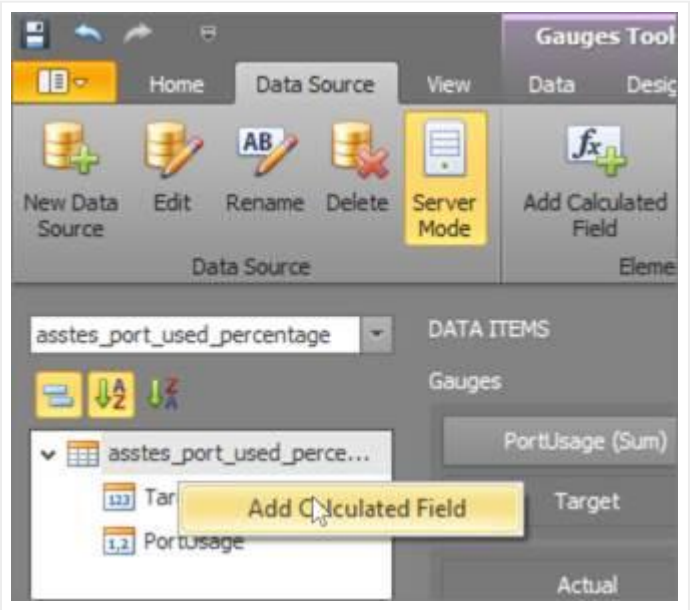
If the data source was generated by typing the SQL string in the query designer directly, the designer will automatically open the corresponding dialog for further editing.

5.2.7 Calculated Fields

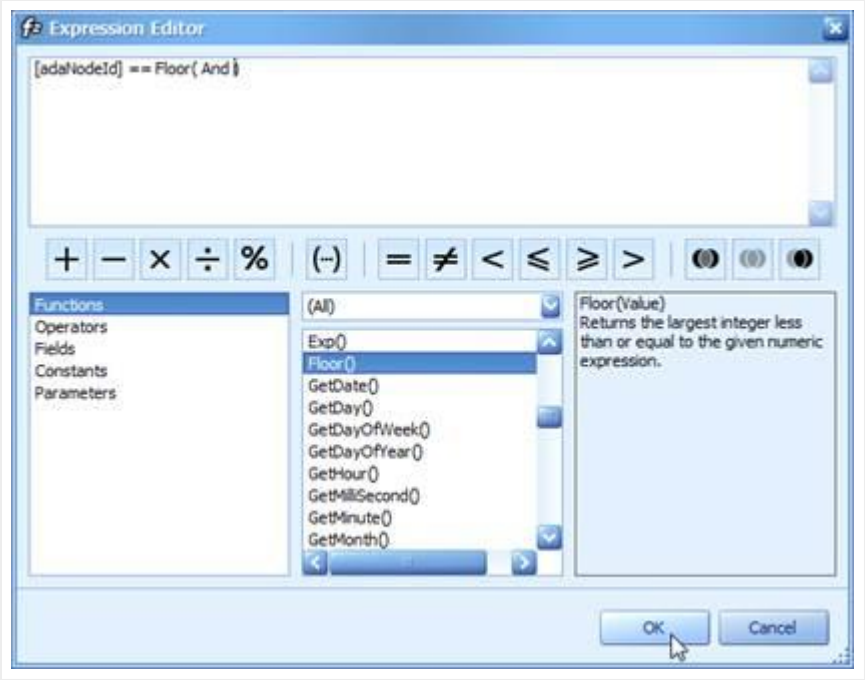
The main purpose of calculated fields is to perform pre-calculations (of virtually any level of complexity) over data fields. A calculated field is similar to an ordinary data field (e.g. you can bind controls to it, and group, sort and filter your report against it).

To add a calculated field to your report, simply click on the add calculated field.

Alternatively, you can add a calculated field by right-clicking any data member, and on the invoked menu, choose Add Calculated Field.



The Expression Editor allows you to edit various Boolean or regular expressions in controls:



In this editor, you can type an expression manually, or select functions, operators and operands using the editor's controls.

An expression is a string that, when parsed and processed, evaluates some value. Expressions consist of column/field names, constants, operators and functions. Column/field names must be wrapped with brackets. The following are examples of regular expressions:

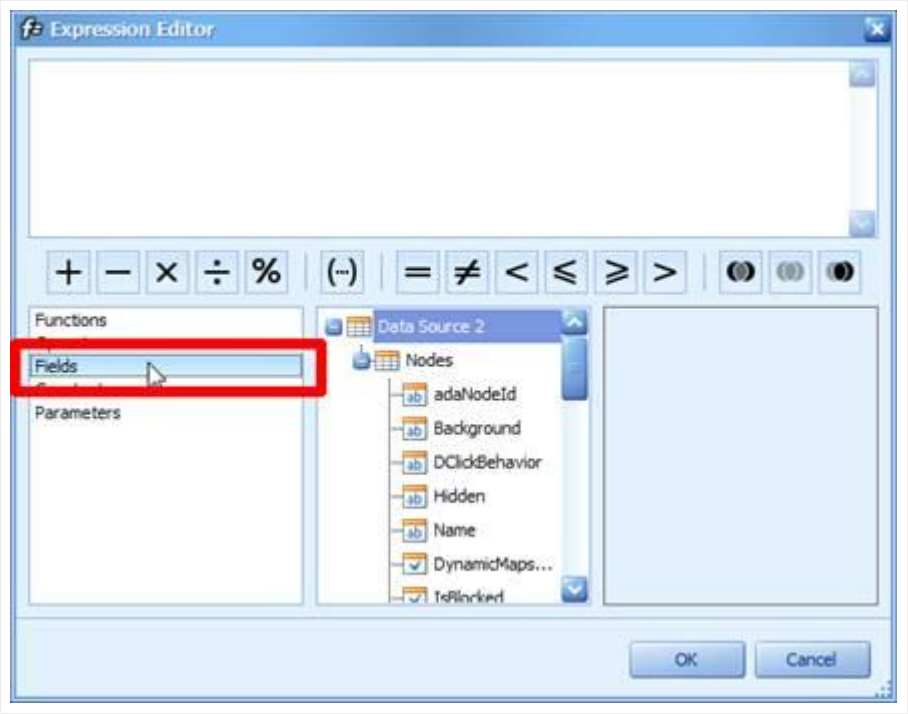
```
"[Quantity] * [UnitPrice] * (1 - [BonusAmount])"

"[FirstName] + ' ' + [LastName]"
```

Boolean expressions:

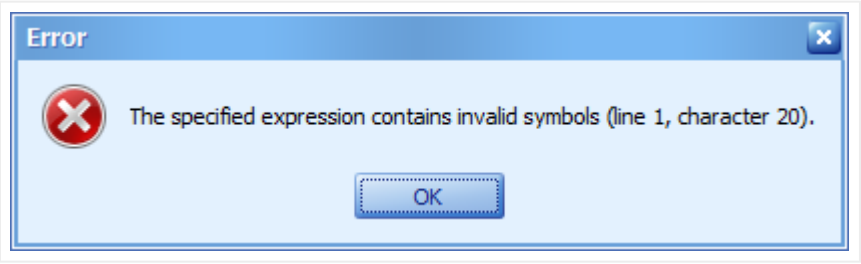
```
"[Country] == 'USA'"

"[OrderDate] > #8/16/1994## AND [Quantity] > 20"
```

The Expression Editor supports numerous standard functions, allowing you to easily perform different string, date-time, logical and math operations over data. You can access the available functions by selecting the Functions category.

Click Fields to see the field list. Double-click field names to add them to the expression string. Use the toolbar to add operators between field names.



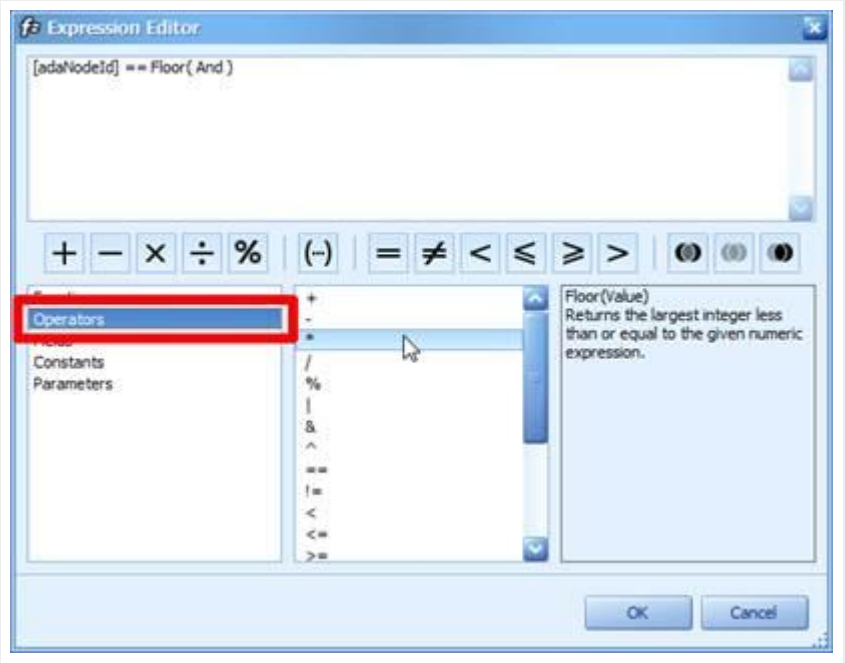
Once you created your expression, the Expression Editor will parse the construct to make sure it is valid. If the expression contains invalid symbols or other inconsistencies, you will get an error.



To close the dialog and save the expression, click OK.

5.2.7.1 Expression Operators

Below we describe all the existing operators that can be used in an expression.

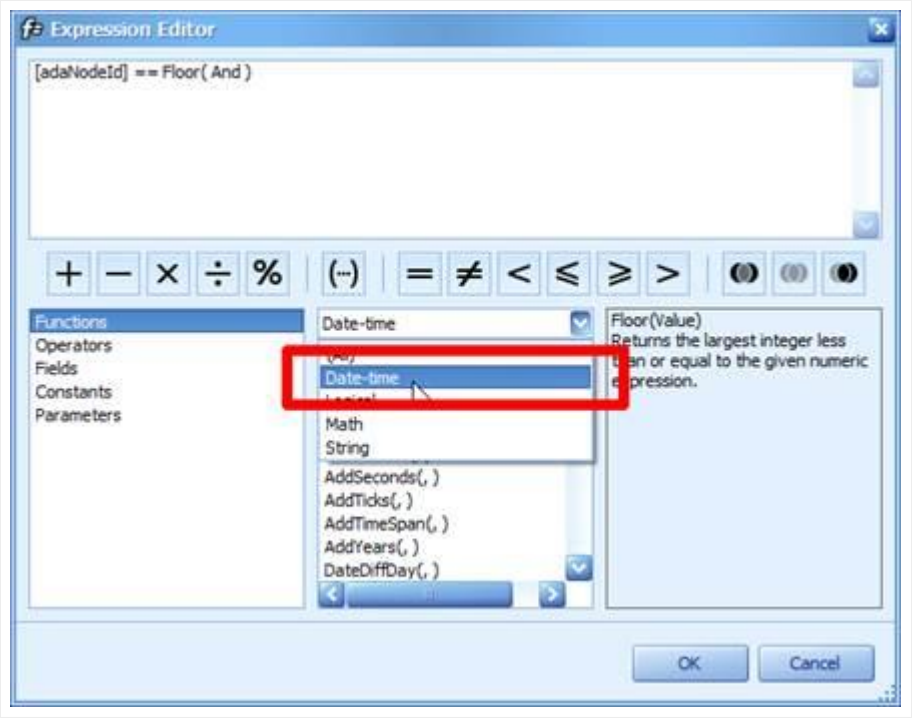


Operator	Description	Example
+	Adds the value of one numeric expression to another, or concatenates two strings.	[FirstName] + ' ' + [LastName] [UnitPrice] + 4
-	Finds the difference between two numbers.	[Price1] - [Price2]
*	Multiplies the value of two expressions.	[Quantity] * [UnitPrice] * (1 - [BonusAmount])
/	Divides the first operand by the second.	[Quantity] / 2
%	Returns the remainder (modulus) obtained by dividing one numeric expression into another.	[Quantity] % 3
|	Compares each bit of its first operand to the corresponding bit of its second operand. If either bit is 1, the corresponding result bit is set to 1\. Otherwise, the corresponding result bit is set to 0.	[Flag1] | [Flag2]
&	Performs a bitwise logical AND operation between two integer values.	[Flag] & 10
^	Performs a logical exclusion on two Boolean expressions, or a bitwise exclusion on two numeric expressions.	[Flag1] ^ [Flag2]
==	Returns true if both operands have the same value; otherwise, it returns false.	[Quantity] == 10

Operator	Description	Example
!=	Returns true if the operands do not have the same value; otherwise, it returns false.	[Country] != 'France'
<	Less than operator. Used to compare expressions.	[UnitPrice] < 20
<=	Less than or equal to operator. Used to compare expressions.	[UnitPrice] <= 20
>=	Greater than or equal to operator. Used to compare expressions.	[UnitPrice] > 30
>	Greater than operator. Used to compare expressions.	[UnitPrice] >= 30
In (,,,)	Tests for the existence of a property in an object.	[Country] In ('USA', 'UK', 'Italy')
Like	Compares a string against a pattern. If the value of the string matches the pattern, result is true. If the string does not match the pattern, result is false. If both string and pattern are empty strings, the result is true.	[Name] Like 'An%'
Between (,)	Specifies a range to test. Returns true if a value is greater than or equal to the first operand and less than or equal to the second operand.	[Quantity] Between (10, 20)
And	Performs a logical conjunction on two expressions.	[InStock] And ([ExtendedPrice]> 100)
Or	Performs a logical disjunction on two Boolean expressions.	[Country]=='USA' Or [Country]=='UK'
Not	Performs logical negation on an expression.	Not [InStock]

5.2.7.2 Expression Functions

Below we describe all the existing functions that can be used in an expression:



5.2.7.2.1 Date-time Functions

Function	Description	Example
AddDays(DateTime, DaysCount)	Returns a date-time value that is the specified number of days away from the specified DateTime.	AddDays([OrderDate], 30)
AddHours(DateTime, HoursCount)	Returns a date-time value that is the specified number of hours away from the specified DateTime.	AddHours([StartTime], 2)
AddMilliSeconds(DateTime, MilliSecondsCount)	Returns a date-time value that is the specified number of milliseconds away from the specified DateTime.	AddMilliSeconds(([StartTime], 5000))
AddMinutes(DateTime, MinutesCount)	Returns a date-time value that is the specified number of minutes away from the specified DateTime.	AddMinutes([StartTime], 30)
AddMonths(DateTime, MonthsCount)	Returns a date-time value that is the specified number of months away from the specified DateTime.	AddMonths([OrderDate], 1)
AddSeconds(DateTime, SecondsCount)	Returns a date-time value that is the specified number of seconds away from the specified DateTime.	AddSeconds([StartTime], 60)
AddTicks(DateTime, TicksCount)	Returns a date-time value that is the specified number of ticks away from the specified DateTime.	AddTicks([StartTime], 5000)
AddTimeSpan(DateTime, TimeSpan)	Returns a date-time value that is away from the specified DateTime for the given TimeSpan.	AddTimeSpan([StartTime], [Duration])
AddYears(DateTime, YearsCount)	Returns a date-time value that is the specified number of years away from the specieid DateTime.	AddYears([EndDate], -1)

Function	Description	Example
GetDate(DateTime)	Extracts a date from the defined DateTime.	GetDate([OrderDateTime])
GetDay(DateTime)	Extracts a day from the defined DateTime.	GetDay([OrderDate])
GetDayOfWeek(DateTime)	Extracts a day of the week from the defined DateTime.	GetDayOfWeek([OrderDate])
GetDayOfYear(DateTime)	Extracts a day of the year from the defined DateTime.	GetDayOfYear([OrderDate])
GetHour(DateTime)	Extracts an hour from the defined DateTime.	GetHour([StartTime])
GetMilliSecond(DateTime)	Extracts milliseconds from the defined DateTime.	GetMilliSecond([StartTime])
GetMinute(DateTime)	Extracts minutes from the defined DateTime.	GetMinute([StartTime])
GetMonth(DateTime)	Extracts a month from the defined DateTime.	GetMonth([StartTime])
GetSecond(DateTime)	Extracts seconds from the defined DateTime.	GetSecond([StartTime])
GetTimeOfDay(DateTime)	Extracts the time of the day from the defined DateTime, in ticks.	GetTimeOfDay([StartTime])
GetYear(DateTime)	Extracts a year from the defined DateTime.	GetYear([StartTime])
Now()	Returns the current system date and time.	AddDays(Now(), 5)
Today()	Returns the current date. Regardless of the actual time, this function returns midnight of the current date.	AddMonths(Today(), 1)
UtcNow()	Returns the current system date and time, expressed as Coordinated Universal Time (UTC).	AddDays(UtcNow(), 7)

5.2.7.2.2 Logical Functions

Function	Description	Example
Iif(Expression, TruePart, FalsePart)	Returns either TruePart or FalsePart, depending on the evaluation of the Boolean Expression.	Iif([Quantity]>=10, 10, 0)
IsNull(Value)	Returns True if the specified Value is NULL.	IsNull([OrderDate])
IsNull(Value1, Value2)	Returns Value1 if it is not set to NULL; otherwise, Value2 is returned.	IsNull([ShipDate], [RequiredDate])
IsNullOrEmpty(String)	Returns True if the specified String object is NULL or an empty string; otherwise, False is returned.	IsNullOrEmpty([ProductName])

5.2.7.2.3 Math Functions

Function	Description	Example
Abs(Value)	Returns the absolute, positive value of the given numeric expression.	Abs(1 - [Discount])
Acos(Value)	Returns the arccosine of a number (the angle, in radians, whose cosine is the given float expression).	Acos([Value])
Asin(Value)	Returns the arcsine of a number (the angle, in radians, whose sine is the given float expression).	Asin([Value])
Atn(Value)	Returns the arctangent of a number (the angle, in radians, whose tangent is the given float expression).	Atn([Value])
Atn2(Value1, Value2)	Returns the angle whose tangent is the quotient of two specified numbers, in radians.	Atn2([Value1], [Value2])
BigMul(Value1, Value2)	Returns an Int64 containing the full product of two specified 32-bit numbers.	BigMul([Amount], [Quantity])
Ceiling(Value)	Returns the smallest integer that is greater than or equal to the given numeric expression.	Ceiling([Value])
Cos(Value)	Returns the cosine of the angle defined in radians.	Cos([Value])
Cosh(Value)	Returns the hyperbolic cosine of the angle defined in radians.	Cosh([Value])
Exp(Value)	Returns the exponential value of the given float expression.	Exp([Value])
Floor(Value)	Returns the largest integer less than or equal to the given numeric expression.	Floor([Value])
Log(Value)	Returns the natural logarithm of a specified number.	Log([Value])
Log(Value, Base)	Returns the logarithm of a specified number in a specified Base.	Log([Value], 2)
Log10(Value)	Returns the base 10 logarithm of a specified number.	Log10([Value])
Power(Value, Power)	Returns a specified number raised to a specified power.	Power([Value], 3)
Rnd()	Returns a random number that is less than 1, but greater than or equal to zero.	Rnd()*100

Function	Description	Example
Round(Value)	Rounds the given value to the nearest integer.	Round([Value])
Sign(Value)	Returns the positive (+1), zero (0), or negative (-1) sign of the given expression.	Sign([Value])
Sin(Value)	Returns the sine of the angle, defined in radians.	Sin([Value])
Sinh(Value)	Returns the hyperbolic sine of the angle defined in radians.	Sinh([Value])
Sqr(Value)	Returns the square root of a given number.	Sqr([Value])
Tan(Value)	Returns the tangent of the angle defined in radians.	Tan([Value])
Tanh(Value)	Returns the hyperbolic tangent of the angle defined in radians.	Tanh([Value])

5.2.7.2.4 String Functions

Function	Description	Example
Ascii(String)	Returns the ASCII code value of the leftmost character in a character expression.	Ascii('a')
Char(Number)	Converts an integerASCIICode to a character.	Char(65) + Char(51)
CharIndex(String1, String2)	Returns the starting position of String1 within String2, beginning from the zero character position to the end of a string.	CharIndex('e', 'netTerrain')
CharIndex(String1, String2, StartLocation)	Returns the starting position of String1 within String2, beginning from the StartLocation character position to the end of a string.	CharIndex('e', 'netTerrain', 2)
Concat(String1, , StringN)	Returns a string value containing the concatenation of the current string with any additional strings.	Concat('A', ')', [ProductName])
Insert(String1, StartPosition, String2)	Inserts String2 into String1 at the position specified by StartPositon	Insert([Name], 0, 'ABC-')
Len(Value)	Returns an integer containing either the number of characters in a string or the nominal number of bytes required to store a variable.	Len([Description])
Lower(String)	Returns String in lowercase.	Lower([ProductName])

Function	Description	Example
PadLeft(String, Length)	Left-aligns characters in the defined string, padding its left side with white space characters up to a specified total length.	
PadLeft(String, Length, Char)	Left-aligns characters in the defined string, padding its left side with the specified Char up to a specified total length.	PadLeft([Name], 30, '<')
PadRight(String, Length)	Right-aligns characters in the defined string, padding its left side with white space characters up to a specified total length.	PadRight([Name], 30)
PadRight(String, Length, Char)	Right-aligns characters in the defined string, padding its left side with the specified Char up to a specified total length.	PadRight([Name], 30, '>')
Remove(String, StartPosition, Length)	Deletes a specified number of characters from this instance, beginning at a specified position.	Remove([Name], 0, 3)
Replace(String, SubString2, String3)	Returns a copy of String1, in which SubString2 has been replaced with String3.	Replace([Name], 'The ', ''
Reverse(String)	Reverses the order of elements within String.	Reverse([Name])
Substring(String, StartPosition, Length)	Retrieves a substring from String. The substring starts at StartPosition and has the specified Length..	Substring([Description], 2, 3)
Substring(String, StartPosition)	Retrieves a substring from String. The substring starts at StartPosition.	Substring([Description], 2)
ToStr(Value)	Returns a string representation of an object.	ToStr([ID])
Trim(String)	Removes all leading and trailing SPACE characters from String.	Trim([ProductName])
Upper(String)	Returns String in uppercase.	Upper([ProductName])

5.2.8 Using Parameters

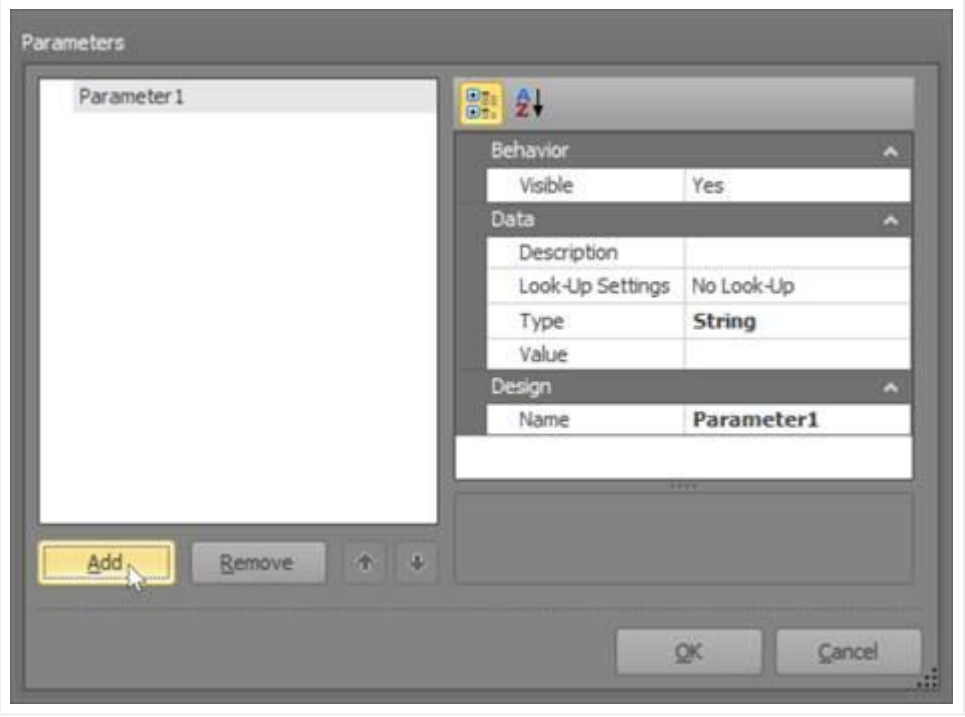
You can use dashboard parameters when it is necessary to pass data of a certain type to a dashboard (e.g., to pass a specific value to the data source filter string or a calculated field).

5.2.8.1 Creating Parameters in the Dashboard Designer

To create dashboard parameters in the Dashboard Designer, do the following.

1) Click the Parameters button on the Ribbon's Home tab.

2) In the invoked dialog, click the Add button to add a new parameter.



3) Specify the following settings:

Settings	Description
Visible	Specifies whether or not the parameter editor is visible within the Dashboard Parameters dialog.
Description	Specifies the parameter's description displayed to an end-user.
Look-Up Settings	Specifies the parameter's look-up editor settings.
Type	Specifies the parameter type.
Value	Specifies the parameter’s value.
Name	Specifies the parameter name.

Then, click OK to add the created parameters to the dashboard.

5.2.9 Passing Parameter Values

There are several ways to pass parameter values in the dashboard designer.

5.2.9.1 Filtering

You can filter an object data source or apply filtering to a specific dashboard item according to the current parameter value using the Filter Editor.

In the Filter Editor, you can compare a field value with the following objects.

- A static value (represented by the icon). Click this button to switch to the next item mode ("another field value") to compare the field value with another field value.
- Another field value (represented by the icon). Click this button to switch to the next item mode (“parameter value”) to compare the field value with a parameter value.
- A parameter value (represented by the icon). Click this button to switch back to the initial mode ("static value") to compare the field value with a static value.

Thus, to compare a field value with a parameter value, click the button, then click the button.

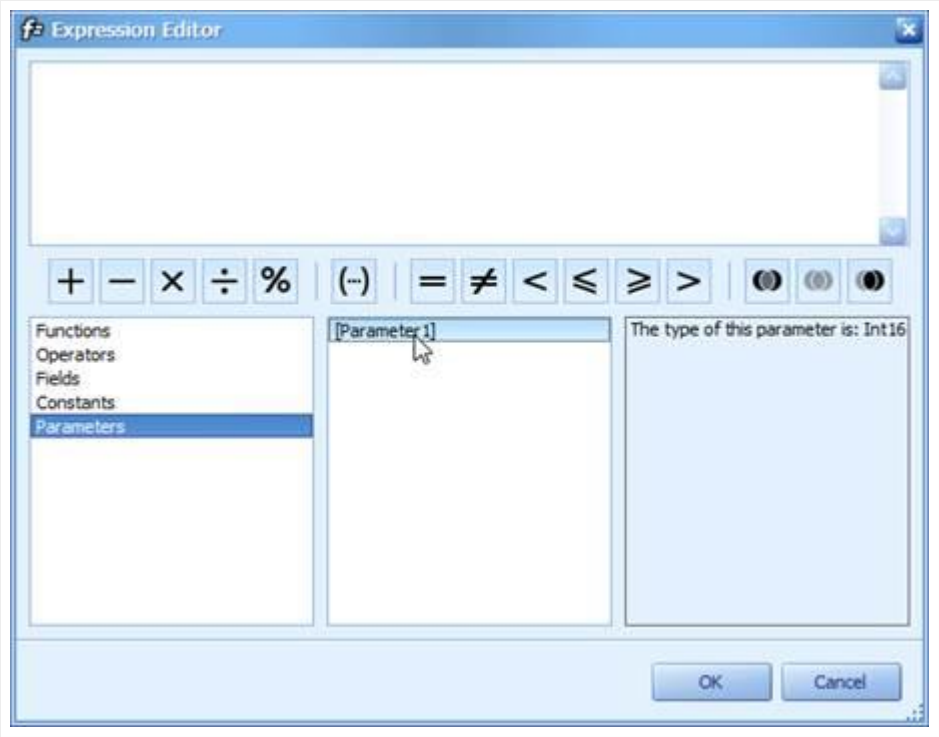
5.2.9.2 Conditional Formatting

You can apply conditional formatting to a specific dashboard item according to the current parameter value when creating the Expression format condition. In the Expression dialog, you can compare a field value with parameter values in the same manner as in the Filter Editor dialog.

5.2.9.3 Calculated Field

You can use parameters when constructing expressions for calculated fields. A parameter is inserted into the expression using the “Parameters.” prefix.

To see a list of available parameters, click Parameters in the Expression Editor dialog.



5.2.9.4 SQL Queries

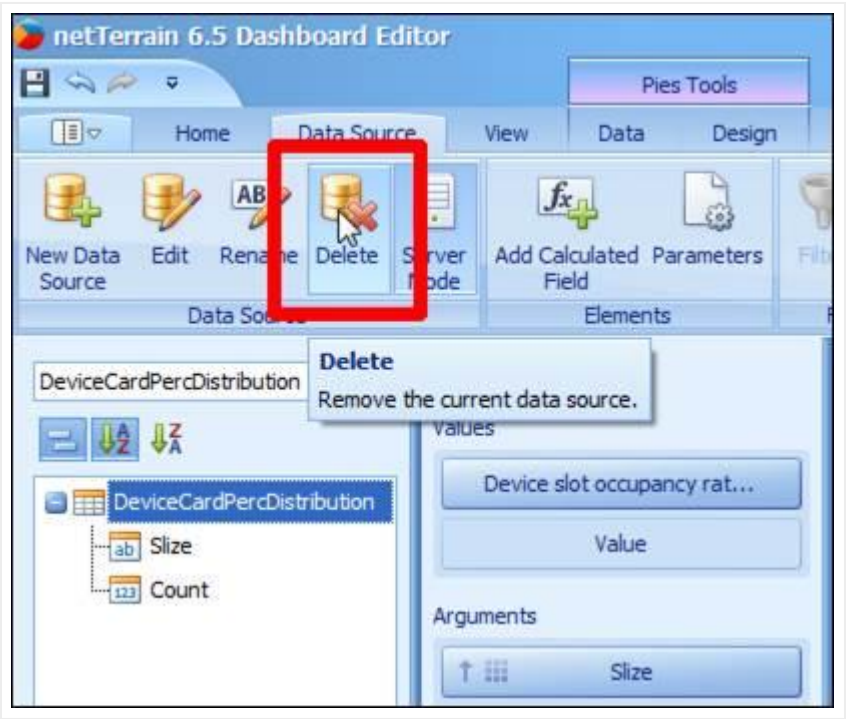
The Dashboard Designer provides the capability to use a dashboard parameter as a SQL query parameter.

You can pass parameters to a data source custom SQL query in the following ways.

- To pass a dashboard parameter to a custom SQL query in the Data Source wizard or Query Editor, select the required dashboard parameter in the Value column.
- To pass a dashboard parameter to a custom SQL query call in the Query Builder, use the parameter name.

5.2.10 Deleting a Data Source

To delete a data source simply select it from the data source hierarchy browser and click on the delete button. Notice that existing widgets using this data source will still pull data in the same way. Deleting the data source will only make it unavailable for future use.

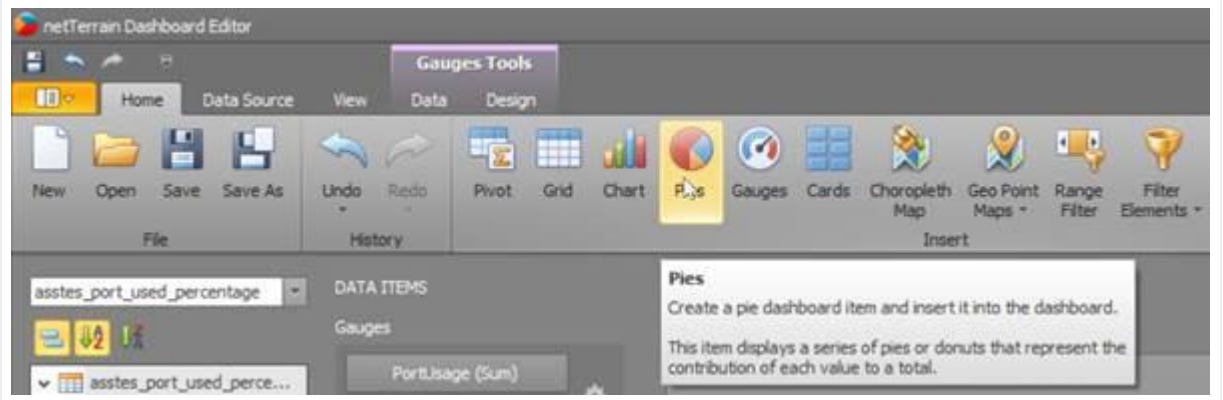


5.3 Designing Dashboards

The netTerrain Dashboard Designer provided an intuitive UI that facilitates the creation and layout of a myriad of widgets to present data in visually appealing ways. Many of these normally complex tasks can be accomplished with simple drag-and-drop operations, allowing users to start creating dashboards immediately.

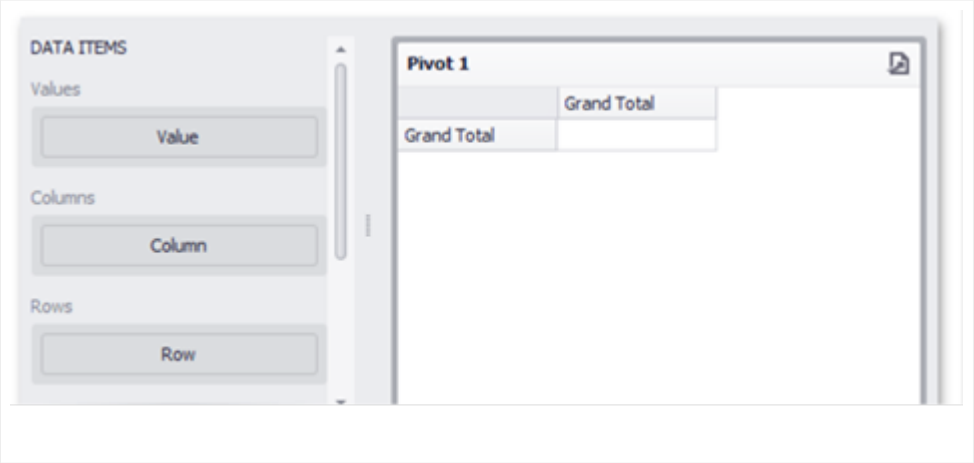
5.3.1 Creating dashboard items in the dashboard surface

To create a dashboard item in the Dashboard Designer, click the corresponding button in the ribbon or the toolbar, which will place it automatically on the dashboard surface:



Clicking on a pie item to add it to a dashboard

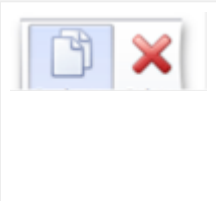
This creates an empty dashboard item, and displays the required data sections for binding this item to data.



Perform the following steps to design a dashboard item:

- Bind the dashboard item to data.
- Perform the required data shaping operations (such as grouping, sorting and filtering).
- Use the interactivity features to enable interaction between various dashboard items.
- Adjust the dashboard item's position and size and specify the dashboard item caption settings.
- Specify specific dashboard item settings based on its type. To learn more, see Dashboard Items.

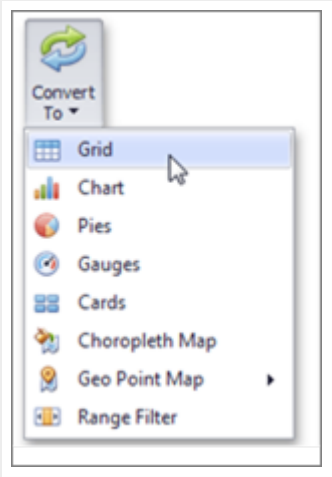
After you have created and designed the dashboard item, you can create an exact copy of it. To do this, click the Duplicate button in the Home ribbon tab…



or use the dashboard item's context menu. To remove the dashboard item from the dashboard, use the Delete button or the corresponding item in the context menu.

5.3.1.1 Converting Dashboard Items

The Dashboard Designer provides the capability to convert data-bound dashboard items to another type. To convert the selected dashboard item to another type, use the Convert button in the ribbon's Home tab or the corresponding command in the item's context menu.



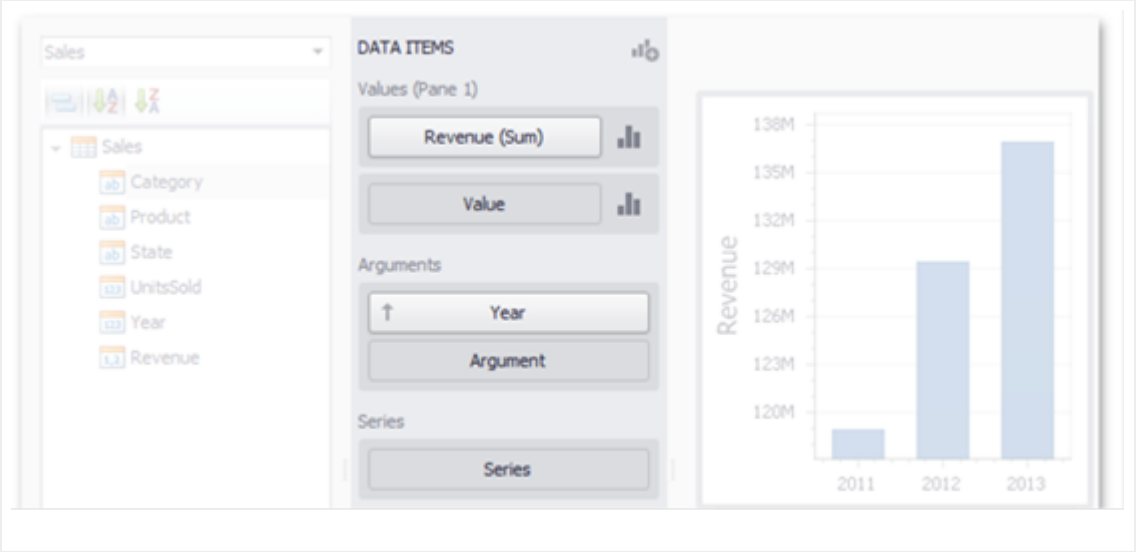
The Dashboard Designer preserves the initial set of data items in the converted dashboard item. The data shaping settings of data items and their names are also persisted.

The following dashboard item settings are preserved, if possible:

- Data item container settings (e.g., delta or sparkline settings).
- Interactivity settings (e.g., the specified master filter mode).
- Specific dashboard item settings (e.g., map extent).

5.3.2 Binding Dashboard Items to Data

To bind dashboard items to data in the Dashboard Designer, the Data Items pane is used.

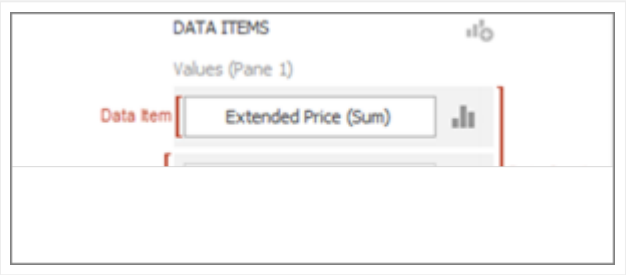


Each dashboard item type has a specific set of data sections, such as Values, Arguments and Series in the chart, Columns and Sparklines in the grid, and Values, Columns and Rows in the pivot grid. Each data

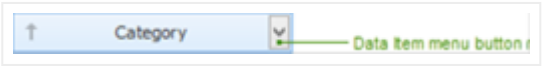
section corresponds to a particular dashboard item area or element, and should be mapped to data to be displayed within this area/element.

Mapping is performed using data items - objects that are used to bind a dashboard item to data source fields. Data items are used to link the dashboard item to the required data source fields and, thus, visualize data within the dashboard item.

Another key concept in data binding is the data item container, which represents a set of data items. It can contain either a single data item or multiple data items, and allows you to specify various options related to how a specific dashboard item visualizes data.

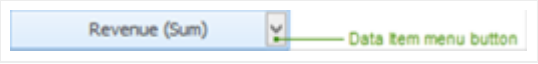


The data item can process data in two ways - as dimensions or measures. This depends on the data section to which the data item is assigned, and the type of the data item container:

- **Dimension** - a data item whose values are not intended to be summarized. These values can be of any type - string, date-time or numeric. In any case, the dashboard does not summarize the dimension values, but groups identical values. You can perform grouping, sorting, or display the top values for the dimension values. You can also customize data format settings for numeric and date-time values. To access the data shaping settings, use the data item's menu button. 

For instance, dimensions are used to provide data for the chart argument axis, pivot grid column and row headers.

- **Measure** - a data item whose values are summarized before they are used in the dashboard. These values can be of any type - numeric, date-time or string. In any case, the dashboard will calculate an appropriate summary function against measure values. You can also customize the data format settings that affect how summary values are displayed. To access these settings, use the data item's menu button.



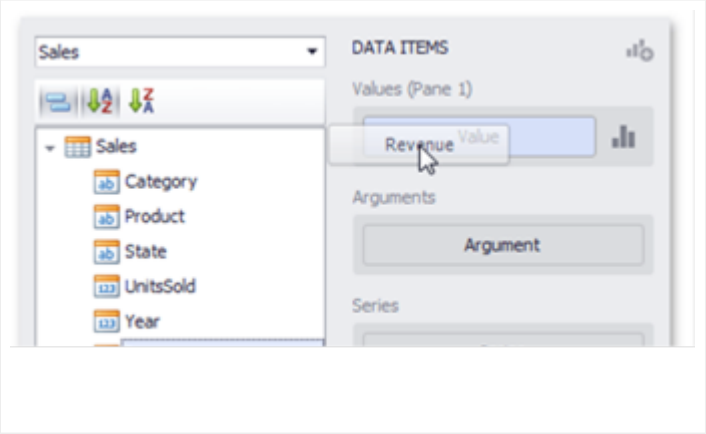
For example, measures are used to provide data for the chart's Y-axis, and to calculate pivot cell values.

Specific data sections display Options buttons for each data item container. Use these buttons to invoke a dialog that allows you to specify the settings of this data item container. These settings affect how a particular dashboard item's area/element displays the provided data.

5.3.2.1 Binding the data

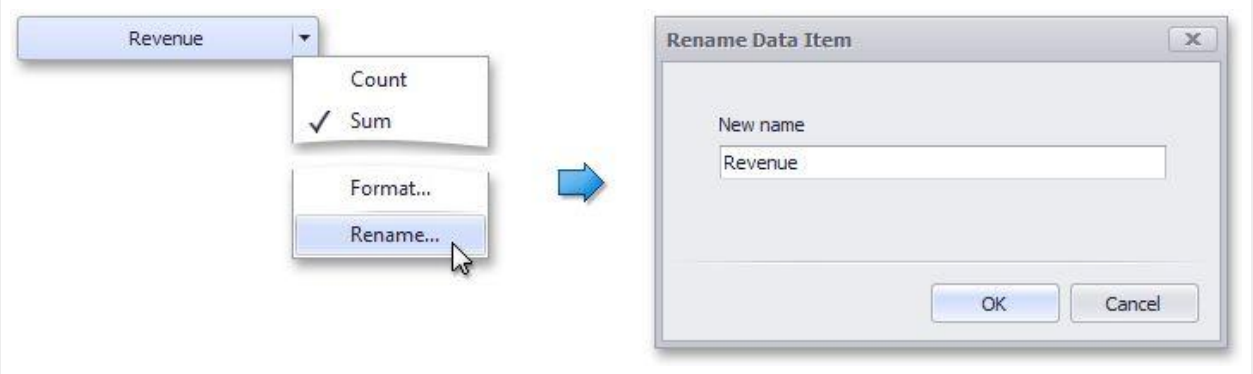
The DATA ITEMS pane displays data sections of the selected dashboard item. It can be used to add, rearrange or remove data items.

To bind a dashboard item to data, select the dashboard item. Then choose the required data field from the Data Source Browser and drop it onto the appropriate section in the Data Items pane.



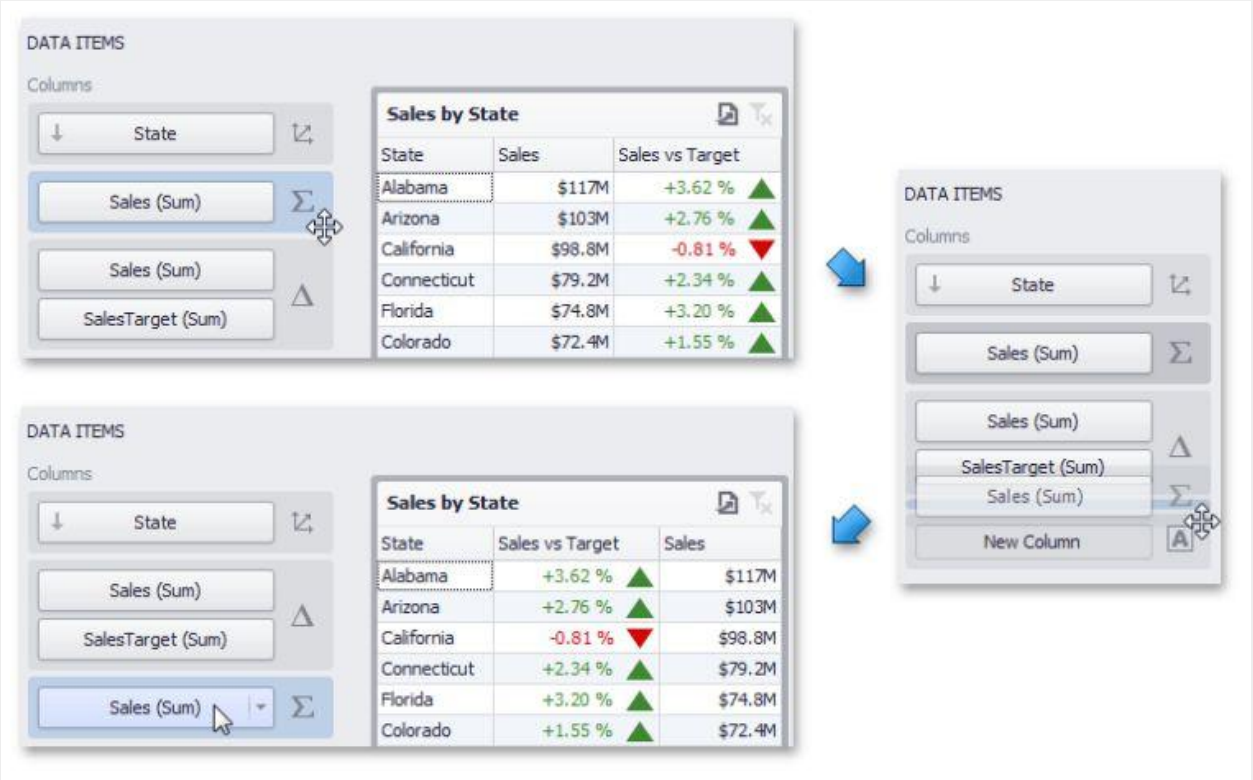
You can remove the data item by dragging it outside the Data Items pane.

To rename the data item, click its menu button and select Rename, to invoke the Rename Data Item dialog.



5.3.2.2 Modify Binding

You can modify data binding by dragging data item containers within a data section. To do this, drag the data item container to the required position.

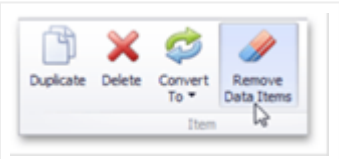


You can also modify data binding by dragging data items within the Data Items pane. This action has the following specifics:

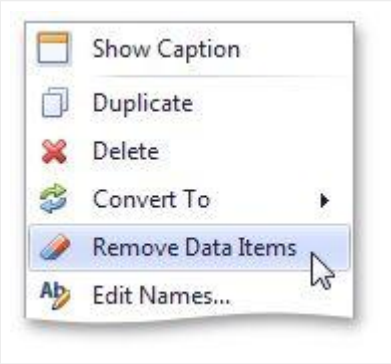
- If you drag the data item to a new position, the settings specified for the corresponding data item container will be restored to the default values.
- If you drag the data item to an existing data item placeholder, the settings of the corresponding data item container will be applied.

5.3.2.3 Clear Binding

To remove all data items for a selected dashboard item, use the Remove Data Items button in the Home ribbon tab.



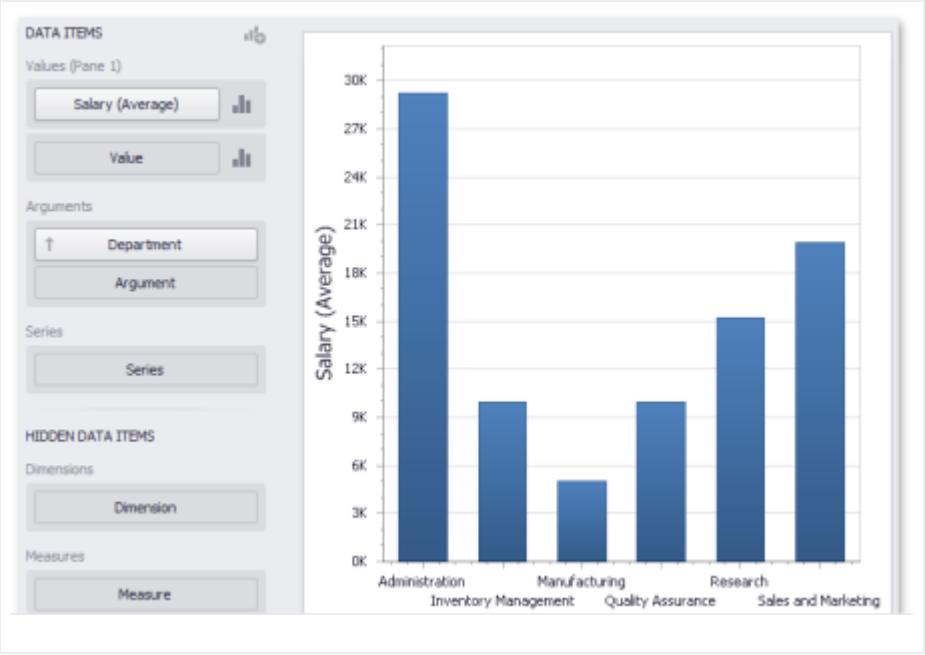
You can also do this via the dashboard item's context menu.



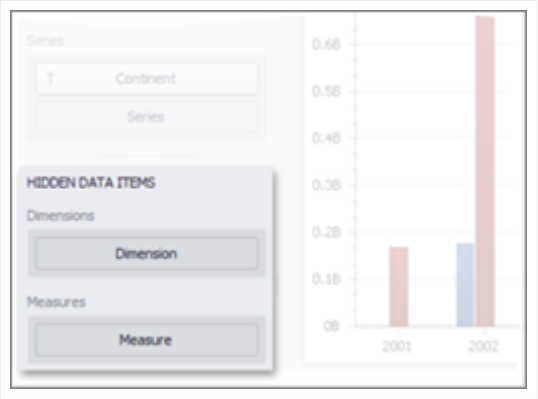
5.3.2.4 Hidden Data Items

The HIDDEN DATA ITEMS area allows you to perform data shaping operations by measures or dimensions that do not directly take part in the visual representation of data.

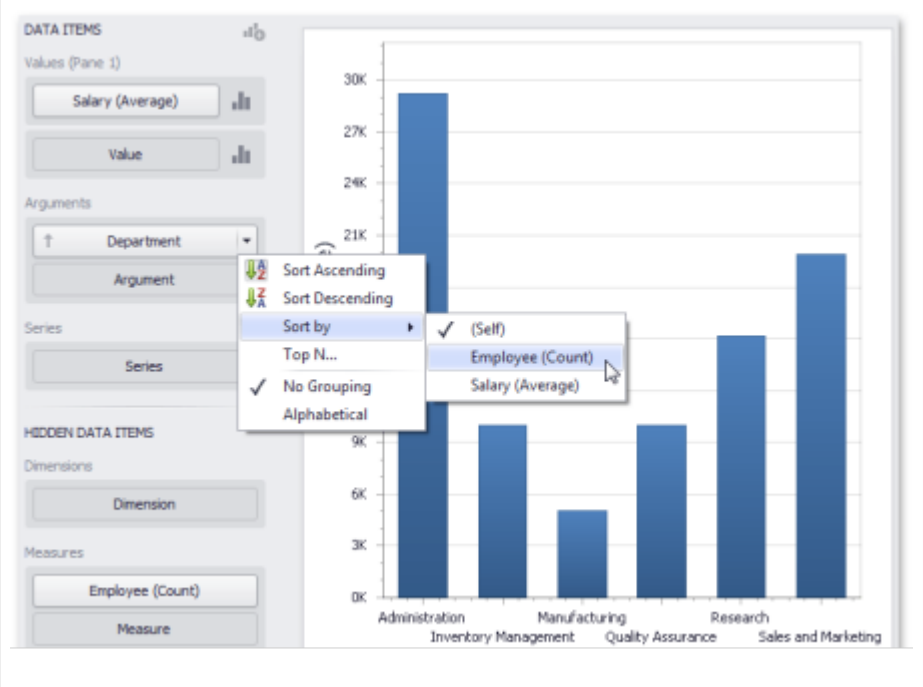
Assume that you have a dashboard containing a chart that shows average salaries in a company by department.



Now imagine that you need to sort departments by the number of employees. To do this, add the Employee measure to the Chart so that its data is not displayed, but only used for sorting.



Drag-and-drop the 'Employee' data field onto the Measures section in the HIDDEN DATA ITEMS area. This will create the Employee (Count) measure, which will be available in the Sort by menu.



Note that the HIDDEN DATA ITEMS area is divided into two sections: Dimensions and Measures:

- Hidden dimensions appear in the Filter Editor dialog, allowing you to create filter criteria based on their values
- Hidden measures appear in the Sort by submenu (to sort dimension values by these measures), and in the Top N Values dialog (to use these measures in Top N conditions).

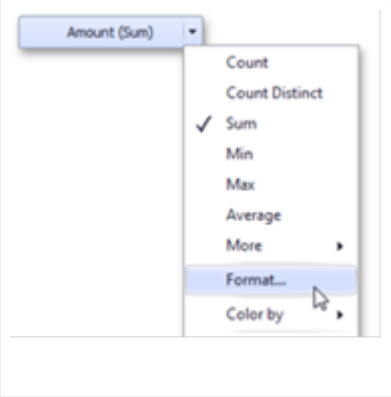
5.3.3 Formatting Data

Dashboard allows you to customize various data format settings for numeric and date-time values:

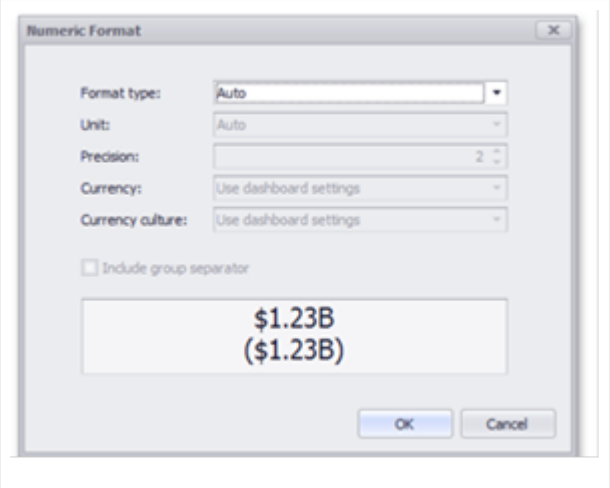
- Numeric Values
- Date-Time Values
- Currency Formatting Specifics

5.3.3.1 Formatting Numeric Values

To specify a format for numeric values, select Format from the data item menu.



This invokes the Numeric Format window.



In the Format type field, select the required format type.

Auto Format settings are automatically determined based on the data type.

General Converts a number to the most compact of either fixed-point or scientific notation, depending on the type of the number.

Number Converts a number to a string of the "-d,ddd,ddd.ddd" form where "-" indicates a neg tive number symbol (if required), "d" indicates a digit (0-9), "," indicates a group separator, and "." indicates a decimal point symbol.

Currency Converts a number to a string that represents a currency amount. To learn about currency formatting specifics.

Scientific Converts a number to a string of the "-d.dddE+ddd" or "-d.ddde+ddd" form where each "d" indicates a digit (0-9).

Percent Multiplies a number by 100 and converts it to a percentage string.

Other format settings are in effect for only specific format types.

Unit The unit to which values should be converted

Precision The number of fractional digits that should be displayed

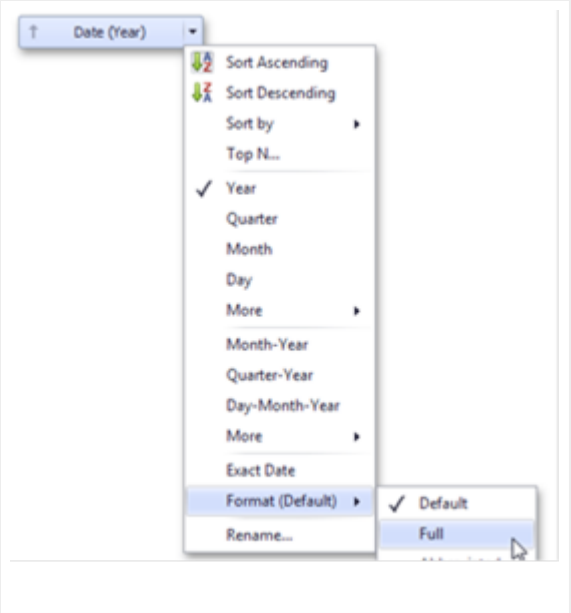
Currency Defines the currency sign and format settings that should be used to display currency values

Currency culture For currencies used in a region with several cultures, specifies the culture that defines format settings

Include group separator Specifies whether or not separators should be inserted between digit groups.

5.3.3.2 Formatting Date-Time Values

To specify a format for date-time values, use the Format submenu in the data item menu.



5.3.4 Interactivity

This section describes features that enable interaction between various dashboard items. These features include Master Filtering and Drill-Down.

5.3.4.1 Master Filtering

The Dashboard allows you to use any data-aware dashboard item as a filter for the entire dashboard (Master Filter). You can select elements in a Master Filter item (chart bars, pie segments, grid records, etc.) to filter data in the rest of the dashboard by the selected values.

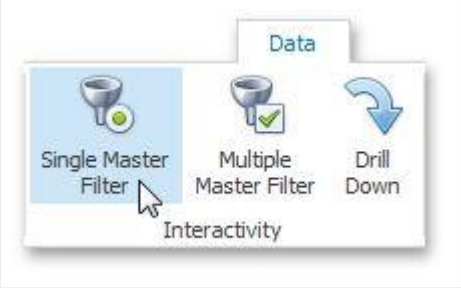
5.3.4.1.1 Master Filtering Modes

The Master Filter item supports two selection modes.

- Multiple - Allows you to select multiple elements in the Master Filter item. To enable this mode, use the Multiple Master Filter button in the Data Ribbon tab.

To clear the selection in the Master Filter item, use the Clear Master Filter button in the dashboard item caption.

- Single - Allows you to select only one element in the Master Filter item. When this mode is enabled, the default selection will be set to a Master Filter element. You can change this selection, but cannot clear it. To enable this mode, use the Single Master Filter button in the Data Ribbon tab.



Attention!

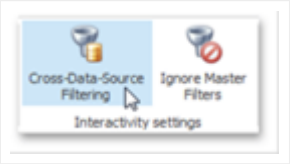
If the selected dashboard item contains several types of elements that can be used for filtering, the Ribbon or Toolbar will provide the appropriate buttons to switch between these types (e.g., the Arguments and Series buttons for the Chart). For details, refer to the documentation for individual dashboard items in the Dashboard Items section.

5.3.4.1.2 Filtering Across Data Sources

When different items in a dashboard are bound to different data sources, you can specify that a particular Master Filter should be applied across data sources. This means that it will apply filtering to fields with matching names in all data sources.

> Attention!
>
> Fields are matched by their full names. For fields in other data sources to be affected by Master Filtering, their names must match the name of the field in the current data source, and they must belong to the same hierarchy level so that their full names also match. For instance, Customer.City and Customer.Address.City will not be treated as matching fields.

To enable filtering across data sources, use the Cross-Data-Source Filtering button in the Data Ribbon tab.



5.3.4.1.3 Preventing Items from Being Filtered

You can prevent specific dashboard items from being affected by Master Filters, so that Master Filtering will never be applied to them. To do this, use the Ignore Master Filters button in the Data Ribbon tab (or the button if you are using the toolbar menu).

5.3.4.2 Drill-Down

Dashboard provides the drill-down feature, which allows you to change the detail level of data displayed in a dashboard item. This feature allows you to drill down to display the details, or drill up to view more general information.

Drill-down requires that the data section contains several dimensions:

To enable drill-down, use the Drill Down button in the Data Ribbon tab:

Attention!

If the selected dashboard item contains several types of elements that can be used for drill-down, the Ribbon or Toolbar will provide the appropriate buttons to switch between these types (e.g., Arguments and Series buttons for the Chart).

To return to the previous detail level (drill up), use the Drill Up button in the dashboard item's caption or in the context menu.

5.3.5 Coloring

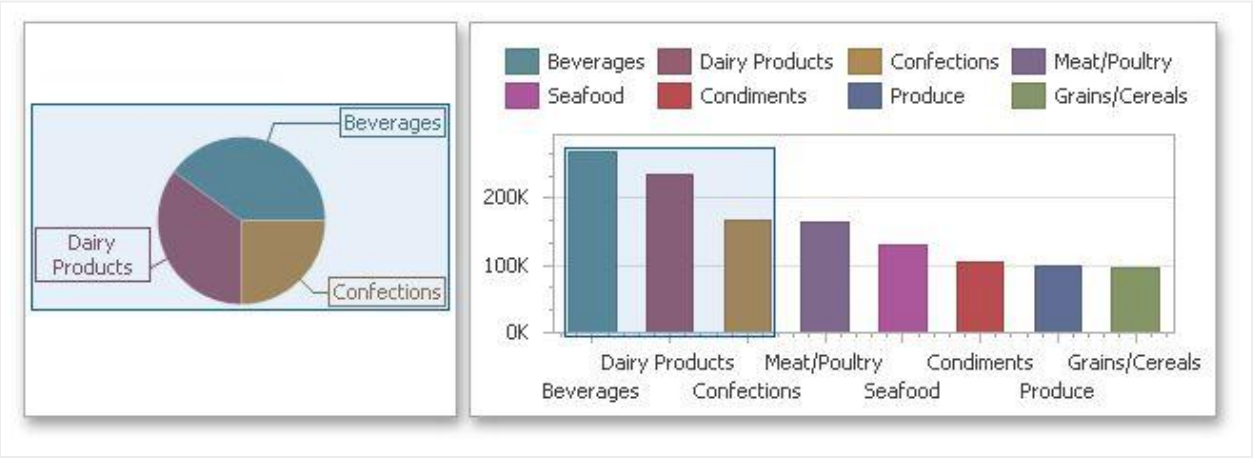
The Dashboard Designer provides the capability to manage coloring of dashboard item elements. You can choose whether to use a global color scheme providing consistent colors for identical values across the dashboard or a local color scheme that provides an independent set of colors for each dashboard item. The Dashboard Designer also allows you to edit colors automatically assigned from the default palette.

5.3.5.1 Coloring Concepts

The Dashboard Designer provides the capability to color dashboard item elements by associating dimension values/measures and specified colors. You can choose whether to use a global color scheme to provide consistent colors for identical values or specify a local color scheme for each dashboard item.

The dashboard provides two ways for coloring dashboard item elements:

- Using a global color scheme that provides consistent colors for identical values across the dashboard. The image below shows the dashboard containing Pie and Chart dashboard items. Pie segments and chart series points corresponding to 'Bevereges', 'Condiments' and 'Diary Products' dimension values are colored using identical colors from the default palette.



To use global colors for coloring dashboard item elements, click the Global Colors button in the Design ribbon tab.

- Using a local color scheme that provides an independent set of colors for each dashboard item. To use local colors for coloring dashboard item elements, click the Local Colors in the Design ribbon tab.

When a local color scheme is used, the dashboard reassigns palette colors when the filter state is changed.

> Attention!
>
> By default, the dashboard colors dimension values/measures use the default palette that contains 20 unique colors.

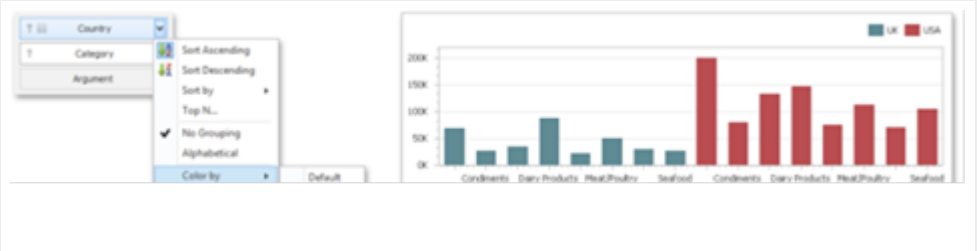
5.3.5.1.1 Coloring Dimensions and Measures

Dashboard items allow you to manage coloring individual dimensions or all dashboard item measures using predefined coloring modes:

- **Default** - Dimension values/measures are colored by default.
- **Hue** - Dimension values/measures are colored by hue. If coloring by hue is enabled, a data item indicates this using the  indicator.
- **None** - Dimension values/measures are colored with the same color.

5.3.5.1.2 Coloring Dimension Values

To specify the coloring mode for the required dimension, click the dimension's menu button and use the Color by submenu. For instance, the image below shows the Chart dashboard item whose 'Country' dimension is colored by hue.



5.3.5.1.3 Coloring Measures

To specify the coloring mode for dashboard item measures, click the menu button of any measure and use the Color by submenu. For instance, the image below shows the Pie dashboard item whose measures are colored by hue.

If you enabled coloring by hue for several dimensions/measures, all combinations of dimension values/ measures will be automatically colored using different colors from the default palette.

5.3.5.2 Customizing a Color Scheme

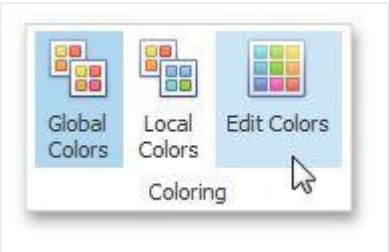
The Dashboard Designer provides the capability to edit colors contained in global and local color schemes. You can select the required color from the default dashboard palette or specify a custom color:

- Invoke a Color Scheme Dialog
- Edit Colors
- Add a New Value
- Add a New Color Table

5.3.5.2.1 Invoke a Color Scheme Dialog

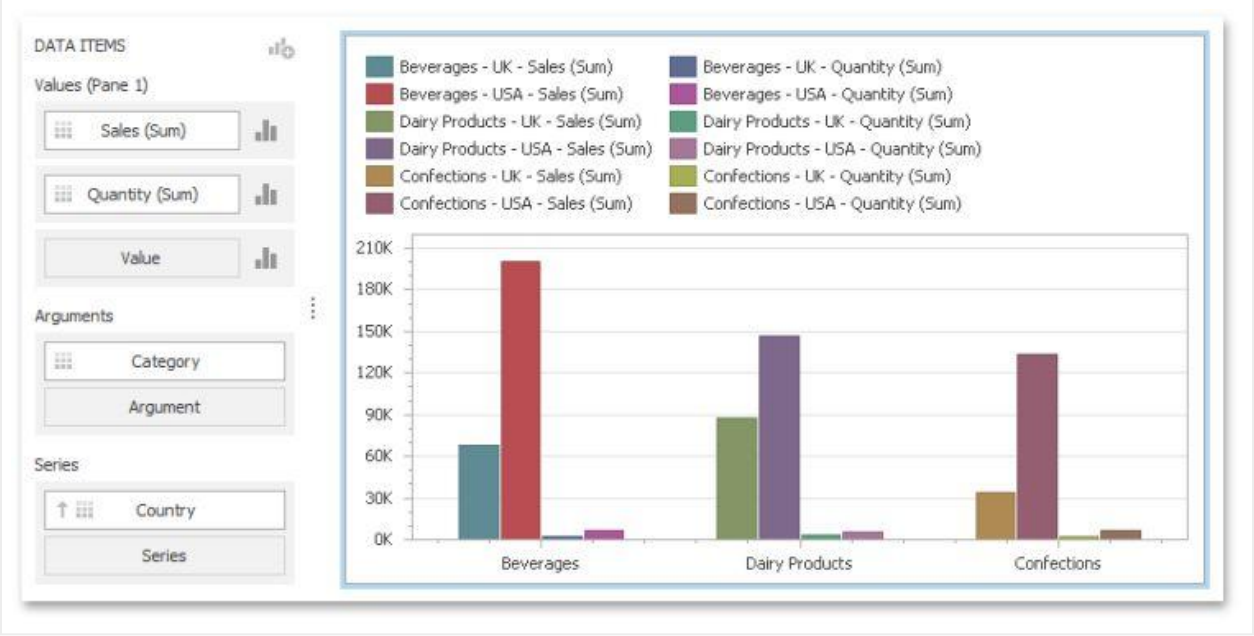
To edit colors, use the Color Scheme dialog. You can invoke this dialog in the following ways.

- To edit colors in a global color scheme, use the Edit Colors button in the Home ribbon tab or the Edit Colors button in the dashboard item's Design tab.

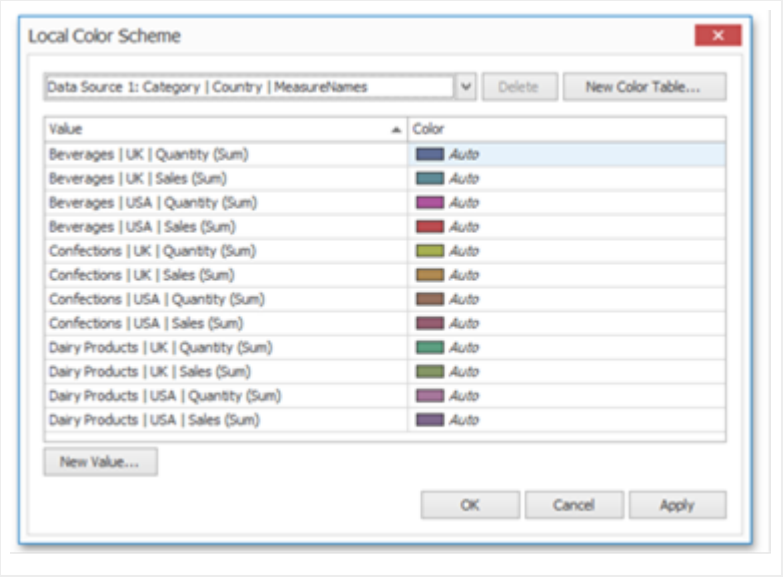


• To edit colors in a local color scheme, use the Edit Colors button in the contextual Design ribbon tab.

Let's consider a Chart dashboard item whose dimensions and measures are colored by hue using local colors.



For this dashboard item, the Color Scheme dialog will contain combinations of all dimension values and a specific measure.



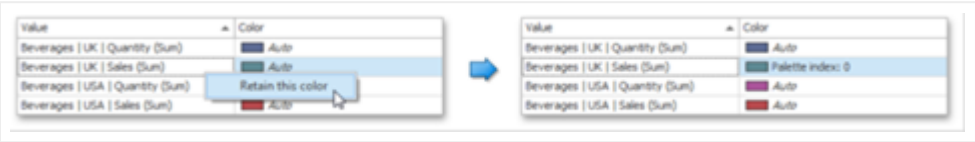
In this dialog, you can perform the following actions:

- Edit automatically assigned colors or specify new colors.
- Add new values to a color table.
- Add new color tables containing values whose colors are not yet assigned.

5.3.5.2.2 Edit Colors

You can customize automatically assigned colors in several ways:

- To retain the automatically assigned color for the selected value, right-click the required value in the Value column and select Retain this color.



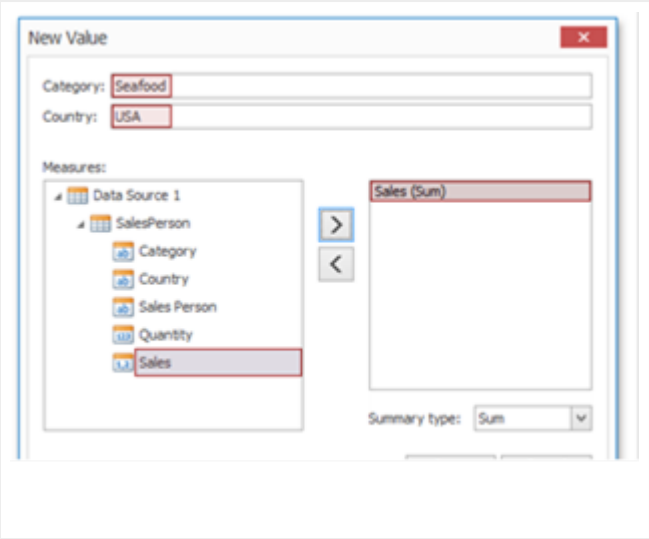
This reserves the current palette color for the selected value.

- You can select another palette color by clicking the required cell in the Color column.

- To specify a custom color, click More Colors and pick any color using the RGB or HSB color model in the invoked Select Color dialog.

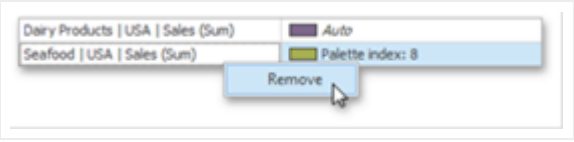
5.3.5.2.3 Add a New Value

The Color Scheme dialog allows you adding a new value with the specified color to the selected color table. To do this, click the New Value button:



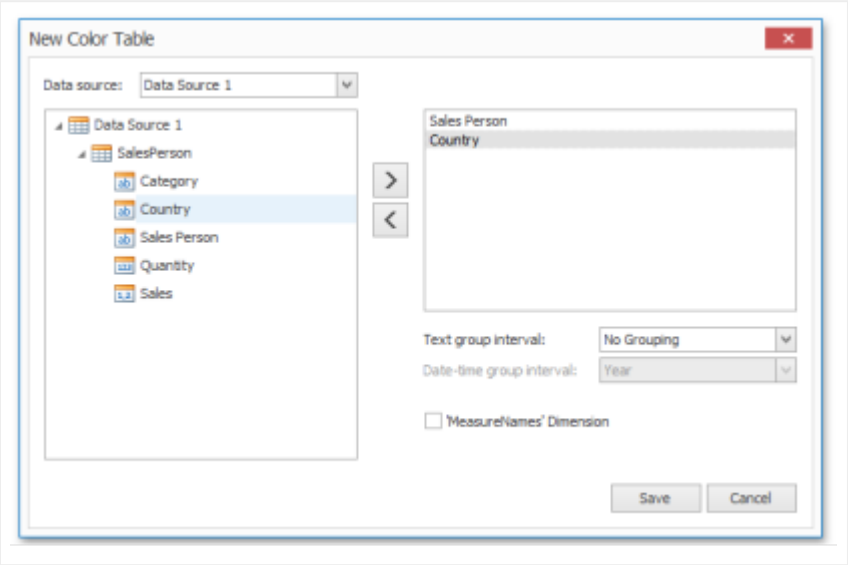
In the invoked New Value dialog, specify the dimension values, add the required measures and click Save. This creates a new value whose color can be specified as described in Edit Colors.

You can remove manually added values using the Remove context menu item.



5.3.5.2.4 Add a New Color Table

The Color Scheme dialog also allows you to add a new color table containing values whose colors are not yet assigned. To do this, click New Color Table button:



In the invoked dialog, specify the data source, add the required dimensions and enable the 'MeasureNames' Dimension check-box if you need to add measures to a color table.

Click Save to add the color table to a color scheme. Then, you can add values to this table.

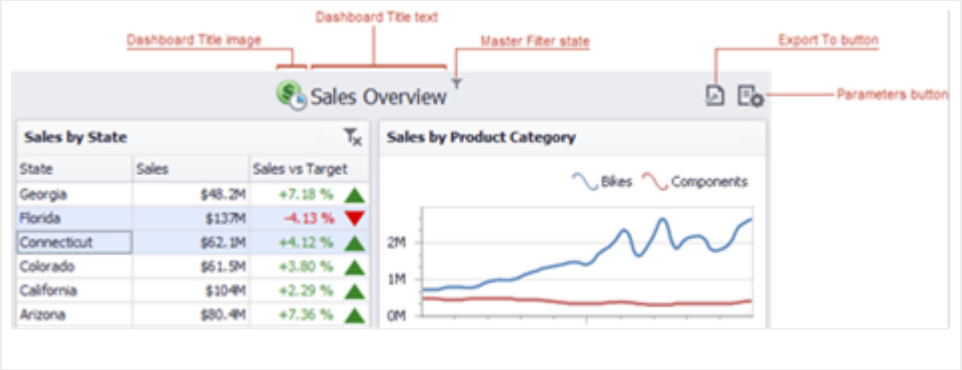
5.3.6 Dashboard layout principles

This section describes the features related to the Dashboard layout process, including:

- Titles
- Laying out items
- Captions

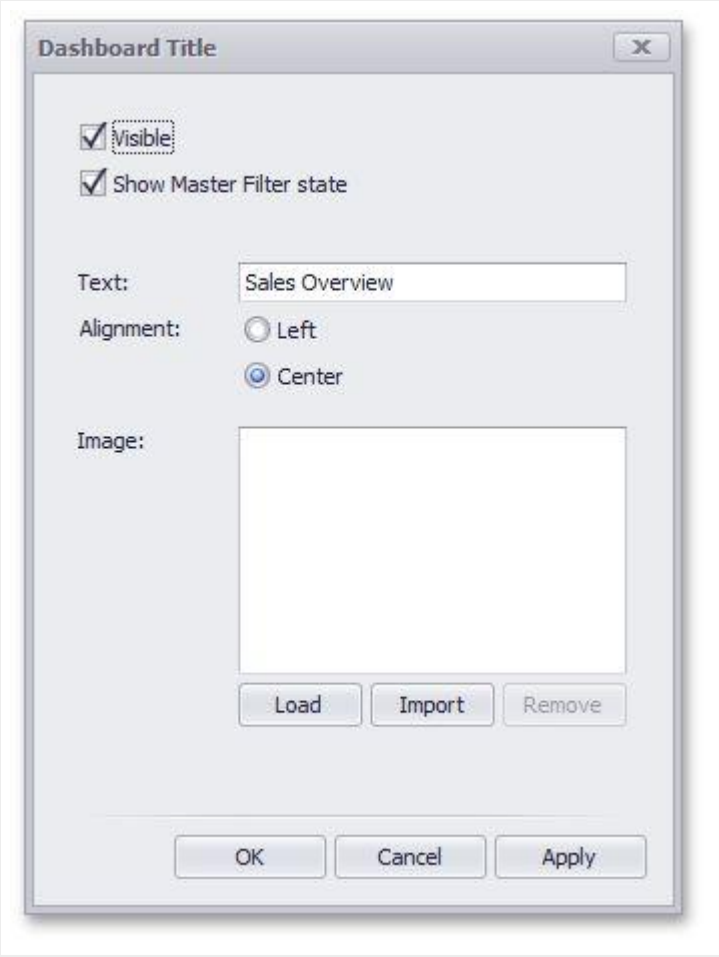
5.3.6.1 Dashboard Title

The Dashboard Title is located at the top of the dashboard surface. It can contain text or image content.



If you are using the Ribbon menu in the Dashboard Designer, you can change title settings by clicking the Title button.

This invokes the Dashboard Title dialog, which allows you to change the text within the dashboard title, add an image, etc.



This dialog allows you to specify the following options:

- Visible - Specifies whether or not the dashboard title is visible.
- Show Master Filter state - Specifies whether or not to show the state of master filter items in the dashboard title. When an end-user hovers over the filter icon ( ), all master filters applied to the dashboard are displayed in the invoked popup.

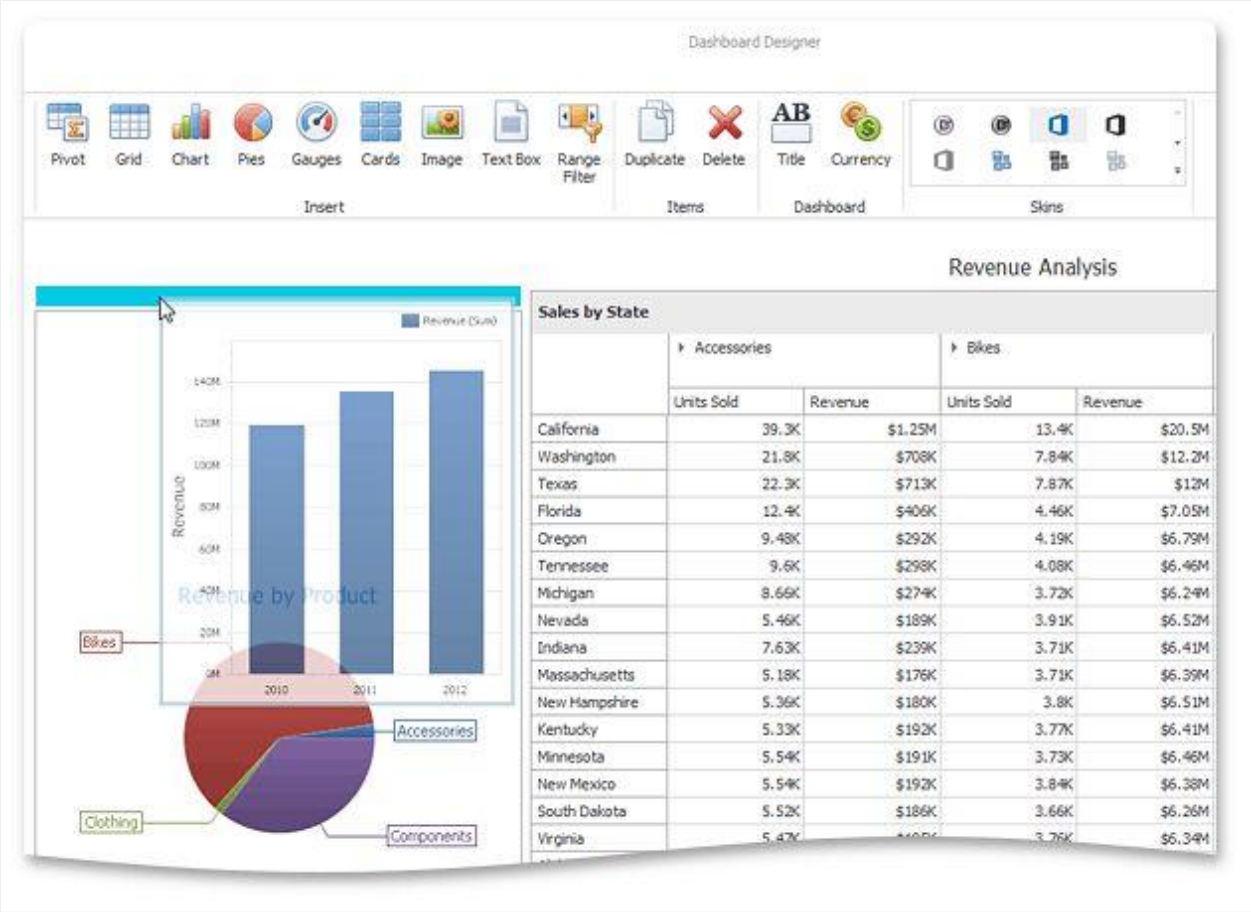
- Alignment - Specifies the alignment of the dashboard title.
- Load button - Allows you to specify the image displayed within the dashboard title. In this case, the dashboard definition will contain the URL to access the image. Import button - Allows you to specify the image displayed within the dashboard title. In this case, the dashboard definition will contain an image as a byte array.

The dashboard title can contain command buttons:

- Export To button - allows you to print/export the dashboard.
- Parameters button - allows you to modify dashboard parameter values.

5.3.6.2 Dashboard Items Layout

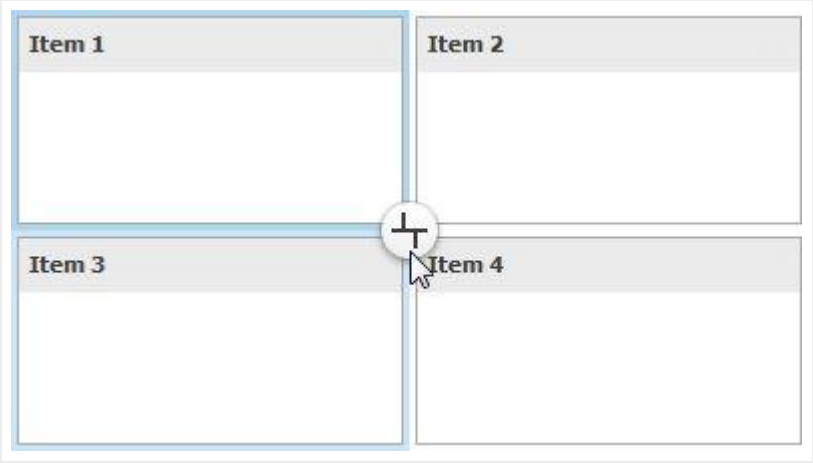
The Dashboard Designer provides the capability to arrange and resize dashboard items in various ways, using simple drag-and-drop operations.



5.3.6.2.1 Item Resizing

You can resize individual items by dragging their edges.

You can also manage resizing 2x2 groups of items using the indicator at the group intersection.



You can switch between different modes by clicking this indicator.

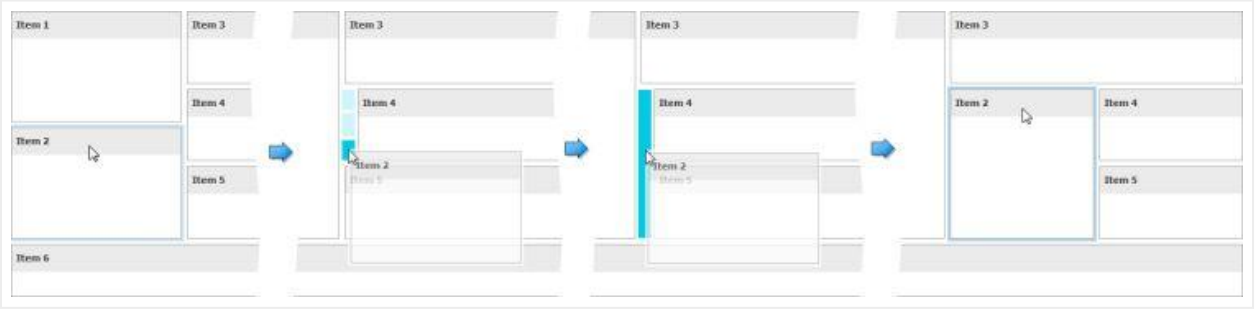
5.3.6.2.2 Item Positioning

You can change the position of a dashboard item via drag-and-drop, using one of the following approaches:

- If the caption of the dashboard item is visible, click it and hold down the left mouse button while dragging the item.
- If the caption of the dashboard item is not visible, click the  icon in the top left corner, and drag the item to its new position.

The drag-and-drop indicator shows possible positions for the dashboard item

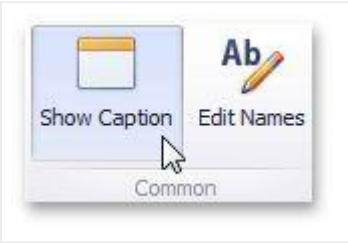
and sequentially displays areas that the dashboard item can occupy. The image below illustrates how a dashboard item is dragged.



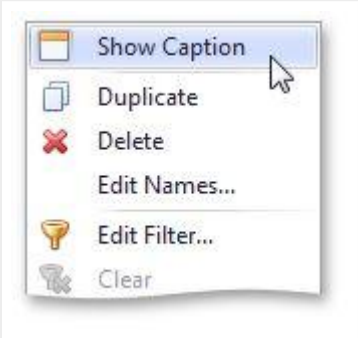
5.3.6.2.3 Dashboard Item Caption

Each dashboard item has a caption that is displayed at the top of the item. The caption contains static text along with other information, as well as command buttons.

To show or hide the caption of a dashboard item, click the Show Caption button in the Design Ribbon tab



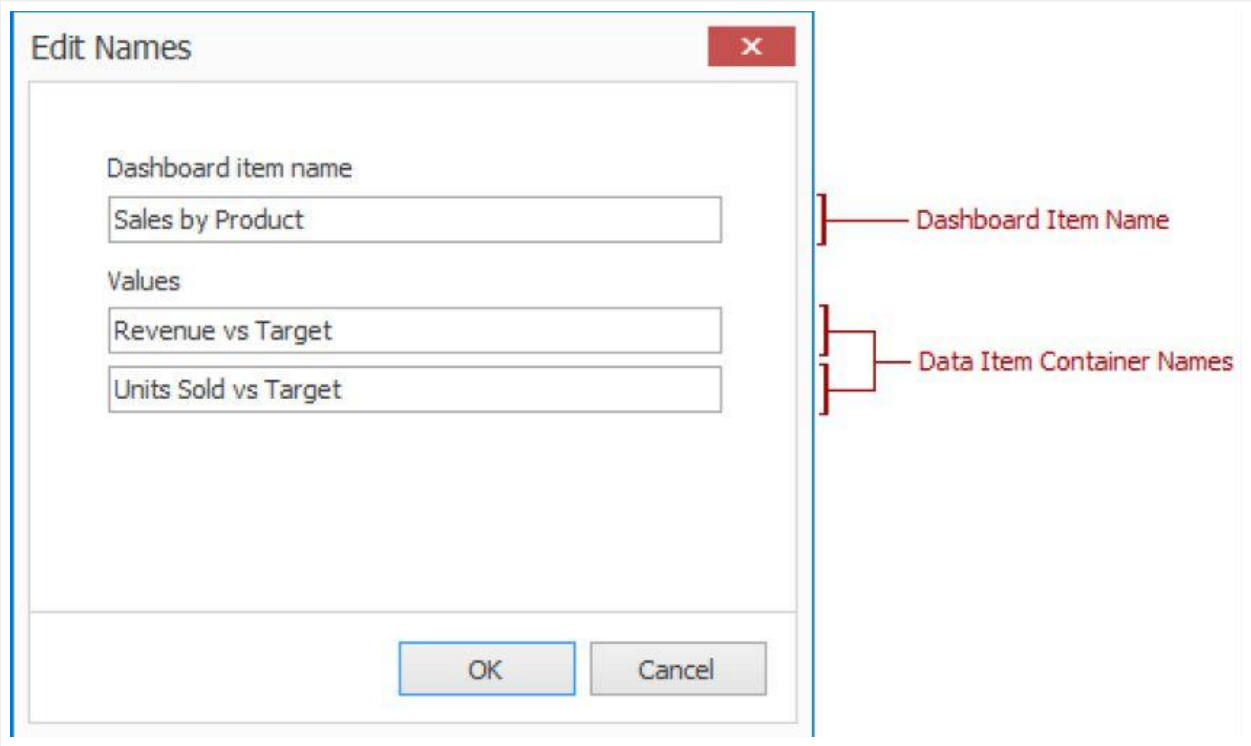
or right-click the item when designing the dashboard, and click the Show Caption menu item.



The caption of the Dashboard item contains the following information and buttons, depending on the dashboard item type:

- **Names**:
- Dashboard Item Name - represents the static text within a dashboard item's caption.
- Data Item Container Name - represents the name of the data item container. To learn more about data item containers, see the Providing Data topic for the corresponding dashboard item.

You can change the default name of the dashboard item or data item container using the Edit Names dialog. To invoke this dialog, right-click the item when designing the dashboard, and click the Edit Names menu item (alternatively, you can use the Edit Names button in the Design Ribbon tab).



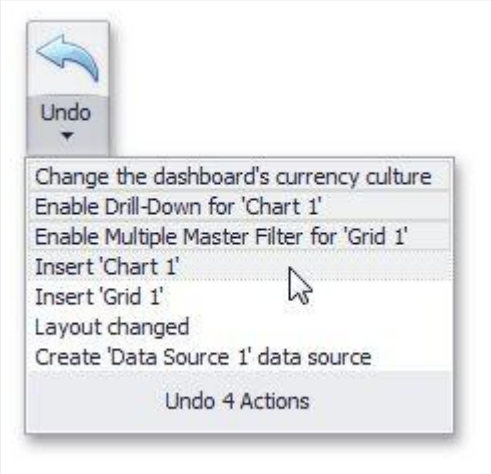
- **Interactivity Information:** Drill-Down value - shows the value or values from the current drill-down hierarchy.
- **Command Buttons:**
- Export to button - allows you to print or export a dashboard item.
- Values button - invokes a drop-down menu that allows you to switch between the provided values (in the pie, card, gauge and map dashboard items).
- Clear Master Filter button - allows you to reset filtering when a dashboard item acts as the Master Filter.
- Drill Up button - allows you to return to the previous detail level when the drill-down capability is enabled for this item.

5.3.6.3 Undo and Redo Operations

The Dashboard Designer keeps track of all user actions, and allows you to undo or repeat them using the Undo/ Redo buttons:

To undo/redo the last action, use the following buttons.

To undo/redo several actions at once, click the arrow next to Undo/Redo button and select the actions in the list that you want to undo/redo.



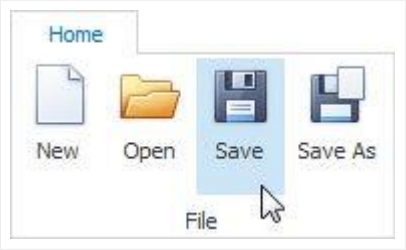
5.3.6.4 Storing Dashboards

A dashboard provides the capability to save a dashboard definition (dashboard items, data sources, data binding, layout settings, etc.) to an XML file, and restore the dashboard from an XML file.

5.3.6.4.1 Saving a Dashboard Definition

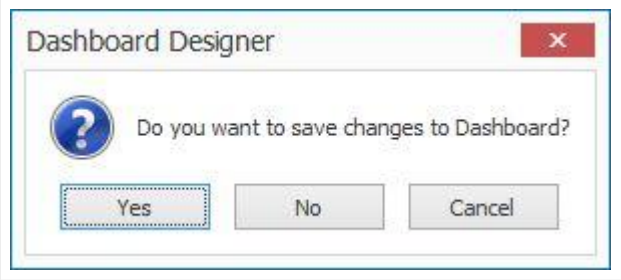
Once a dashboard is designed, you can save its definition to an XML file. In the Dashboard Designer, this can be accomplished in the following ways:

- You can save the dashboard definition by clicking the Save or Save As button in the Ribbon menu of the Designer.



This invokes the Save As dialog, which allows you to locate the folder in which you wish to store your file.

- The dashboard definition can be saved when the window containing the Dashboard Designer is closed. If the dashboard has been modified since the last save, a save confirmation dialog will be invoked.



5.3.6.4.2 Loading a Dashboard Definition

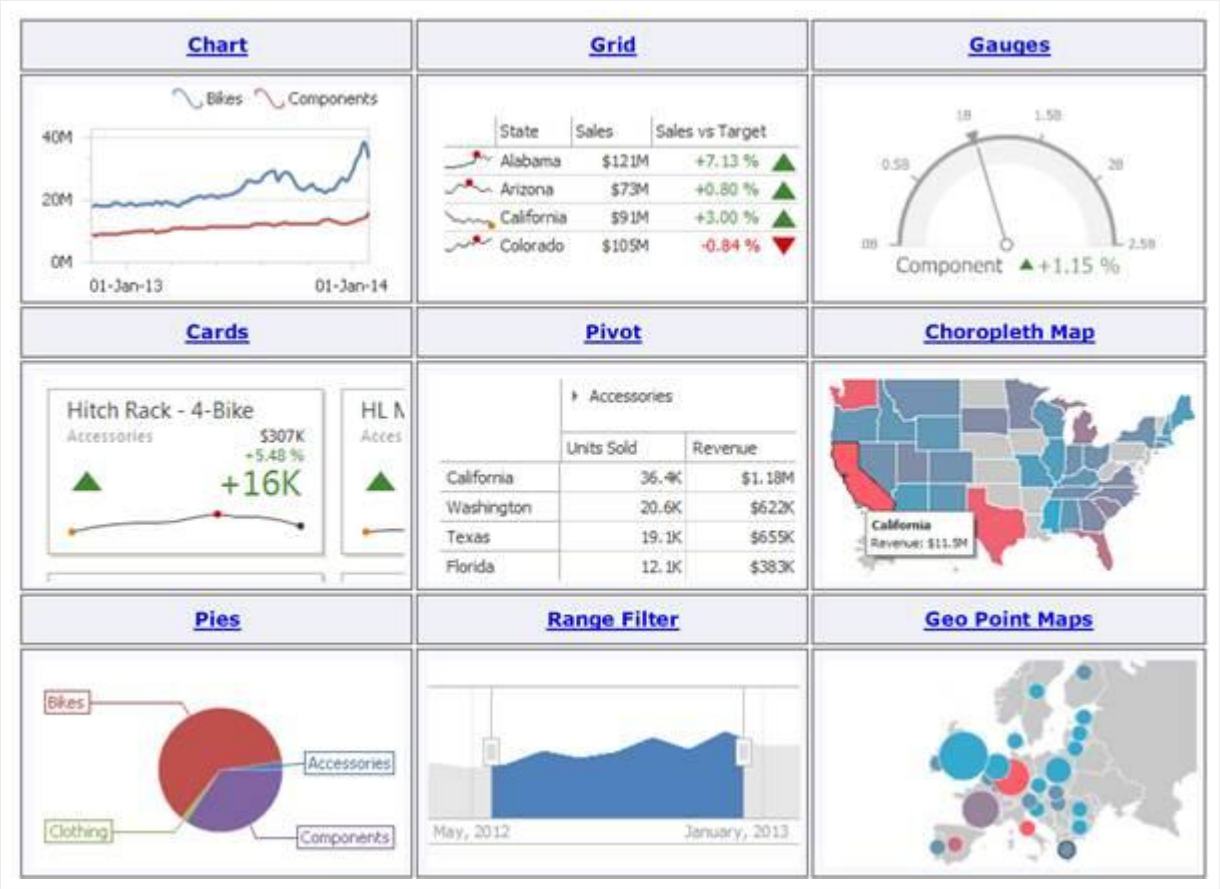
A dashboard definition previously saved to an XML file can be loaded to the Dashboard Designer. You can open the dashboard definition by clicking the Open button in the Ribbon menu of the Designer

This invokes the Open File dialog, which allows you to locate the required dashboard XML file.

5.4 Dashboard Widgets

Dashboard widgets can be divided into the following groups:

- Pivot: The Pivot dashboard item displays a cross-tabular report that presents multi-dimensional data in an easy-to-read format.
- Grid: The Grid item displays a table with rows and columns
- Chart: A Chart is a series of bars that represent data, typically in an x/y style coordinate system.
- Pie: The Pie dashboard item displays a series of pies or donuts that represent the contribution of each value to a total.
- Gauge: The Gauge dashboard item displays a series of gauges. Each gauge can communicate two values - one with a needle and the other with a marker on the scale.
- Card: The Card dashboard item displays a series of cards. Each card illustrates the difference between two values. This difference can be expressed as an absolute value, an absolute variation or a percentage variation.
- Choropleth Map: The Choropleth Map dashboard item allows you to colorize the required areas in a map in proportion to the provided values.
- Range Filter: The Range Filter dashboard item allows you to apply filtering to other dashboard items. This item displays a chart with selection thumbs that allow you to filter out values displayed along the argument axis.
- Image: static image that can be added as a widget
- Text: Free text that can be added to a dashboard



Common dashboard widgets

In the following sections we will review some of the main widgets utitlized in netTerrain dashboards.

5.4.1 Charts

We have all seen charts before: time-series (or some other function) usually represented by bars, lines or points, on a coordinate system, visualizing data that can give us insights into a set of data.

The topics in this section describe the features available in the Chart dashboard item, and provide extensive information on how to create and customize charts in the Dashboard Designer.

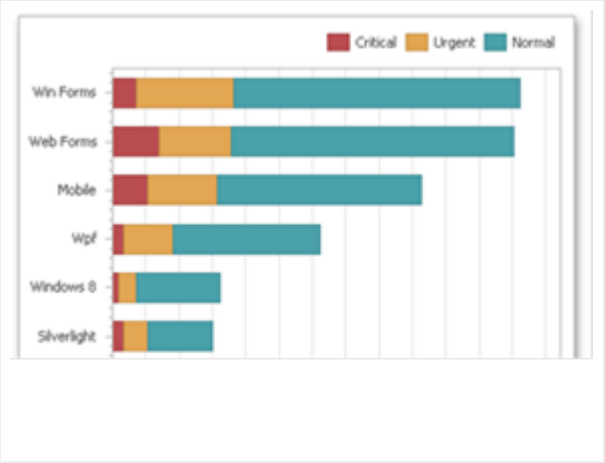


Chart example

This section is divided into the following subsections:

- Providing Data - Provides information on how to supply the Chart dashboard item with data.
- Series - Enumerates and describes different types of series that can be displayed within the Chart dashboard item.
- Panes - Introduces the concept of chart panes (visual areas within a diagram that display chart series), and provides information on how to create them.
- Interactivity - Describes features that enable interaction between the Chart and other dashboard items.
- Axes - Describes how to customize settings related to chart axes.
- Legend - Provides information about the chart legend and its options.
- Orientation - Describes how to toggle the chart's orientation.

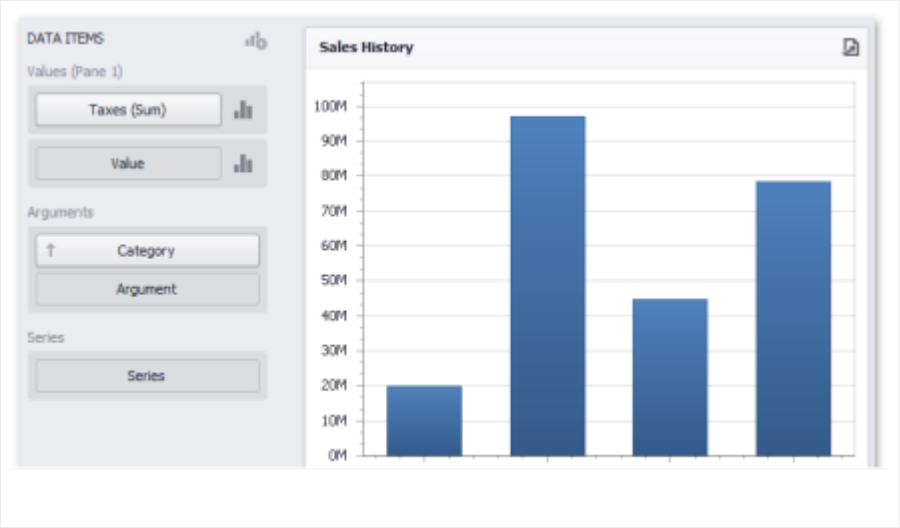
5.4.1.1 Providing Data

This topic describes how to bind a Chart dashboard item to data in the Dashboard Designer.

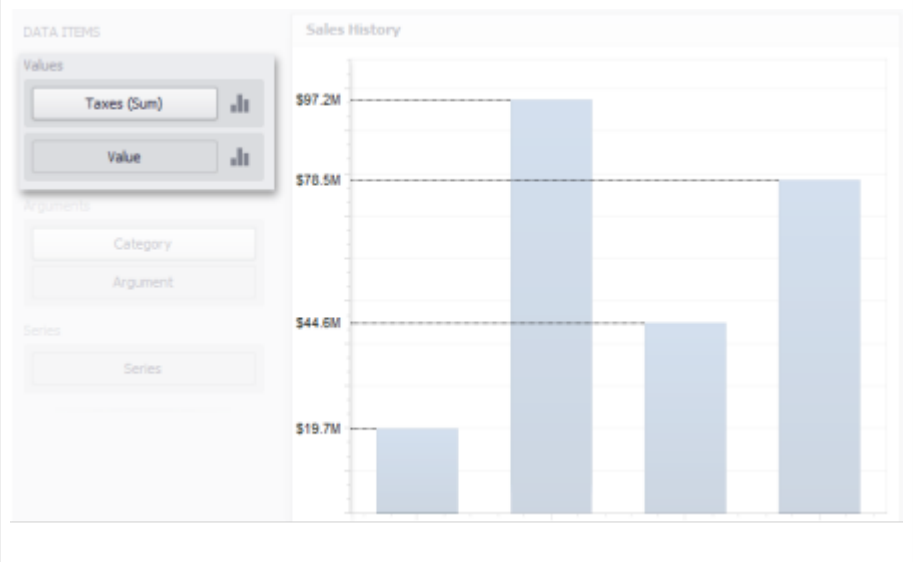
The Dashboard Designer allows you to bind various dashboard items to data in a virtually uniform manner (see Binding Dashboard Items to Data for details). The only difference is in the data sections that these dashboard items have.

5.4.1.1.1 Data Sections

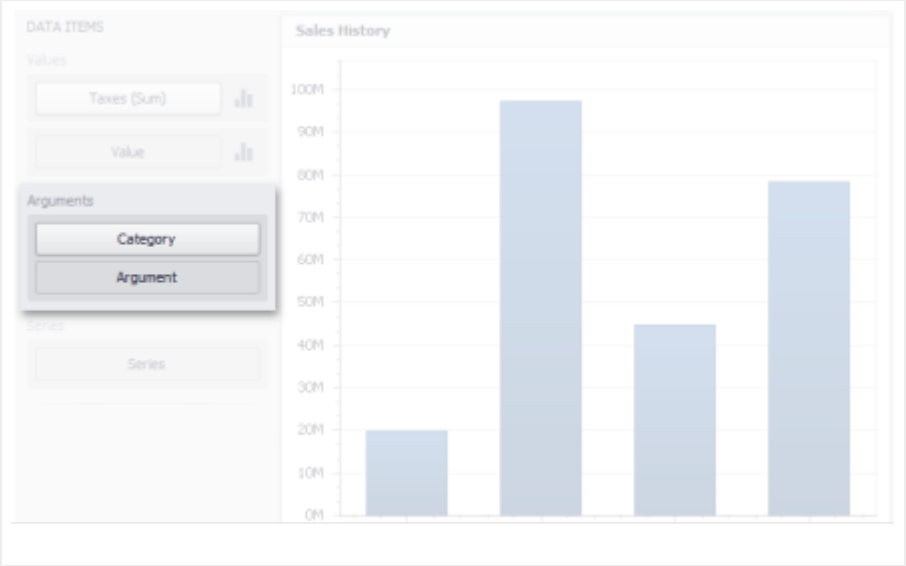
The Chart dashboard item has the following data sections:



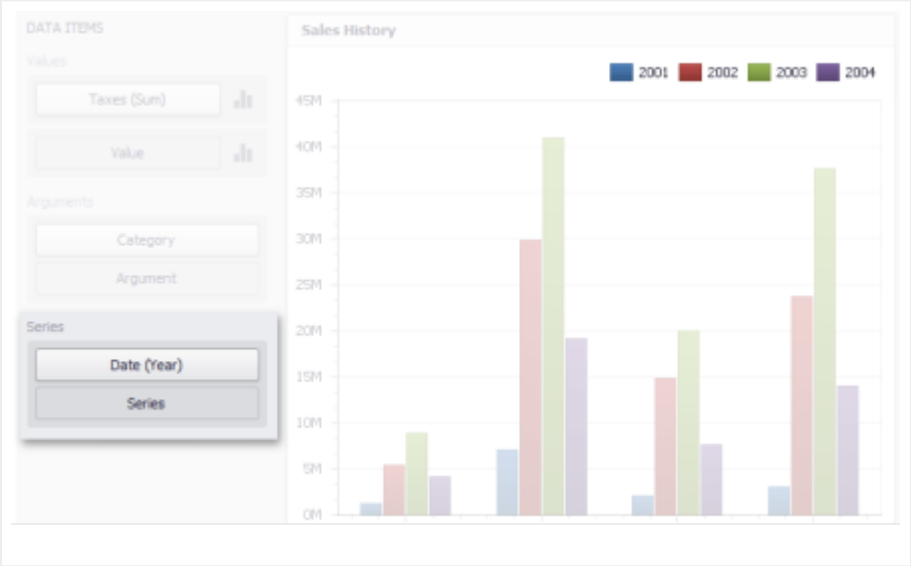
- **Values** - The Values section contains data items whose values are used to calculate the Y-coordinates of data points.



- **Arguments** - The Arguments section contains data items that provide values displayed along the X-axis of the chart.

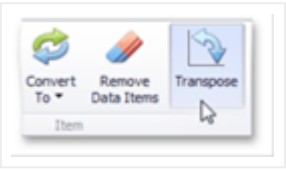


• **Series** - The Series section contains data items whose values are used to create chart series.



5.4.1.1.2 Transposition

The Chart dashboard item provides the capability to transpose chart arguments and series. In this case, data items contained in the Arguments section are moved to the Series section, and vice versa. To transpose the selected Chart dashboard item, use the Transpose button in the Home ribbon tab.



5.4.1.2 Series

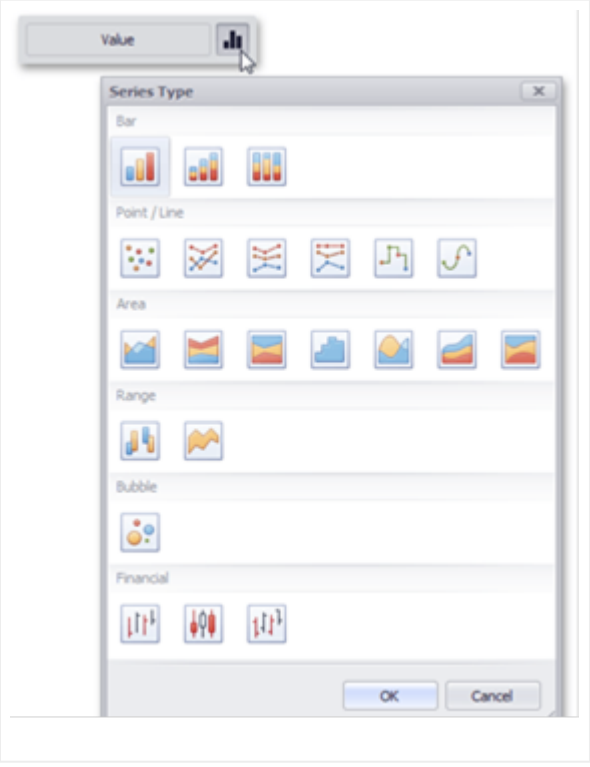
This section describes how to select a desired series type in the overview topic, and lists the variety of available series types.

5.4.1.2.1 Series Overview

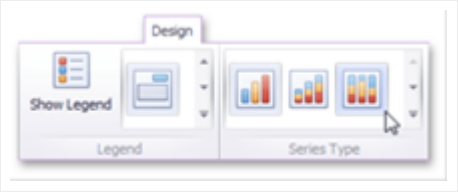
The Chart dashboard item supports a variety of series types - from simple bar and line charts to complex candle stick and bubble graphs:

- Bar Series
- Point and Line Series
- Area Series
- Range Series
- Weighted Series
- Financial Series

To switch between series types in the Designer, click the options button next to the required data item (or placeholder) in the Values section. In the invoked Series Type dialog, select the required series type and click OK.



You can also do this using the Series Type gallery in the Design Ribbon tab.

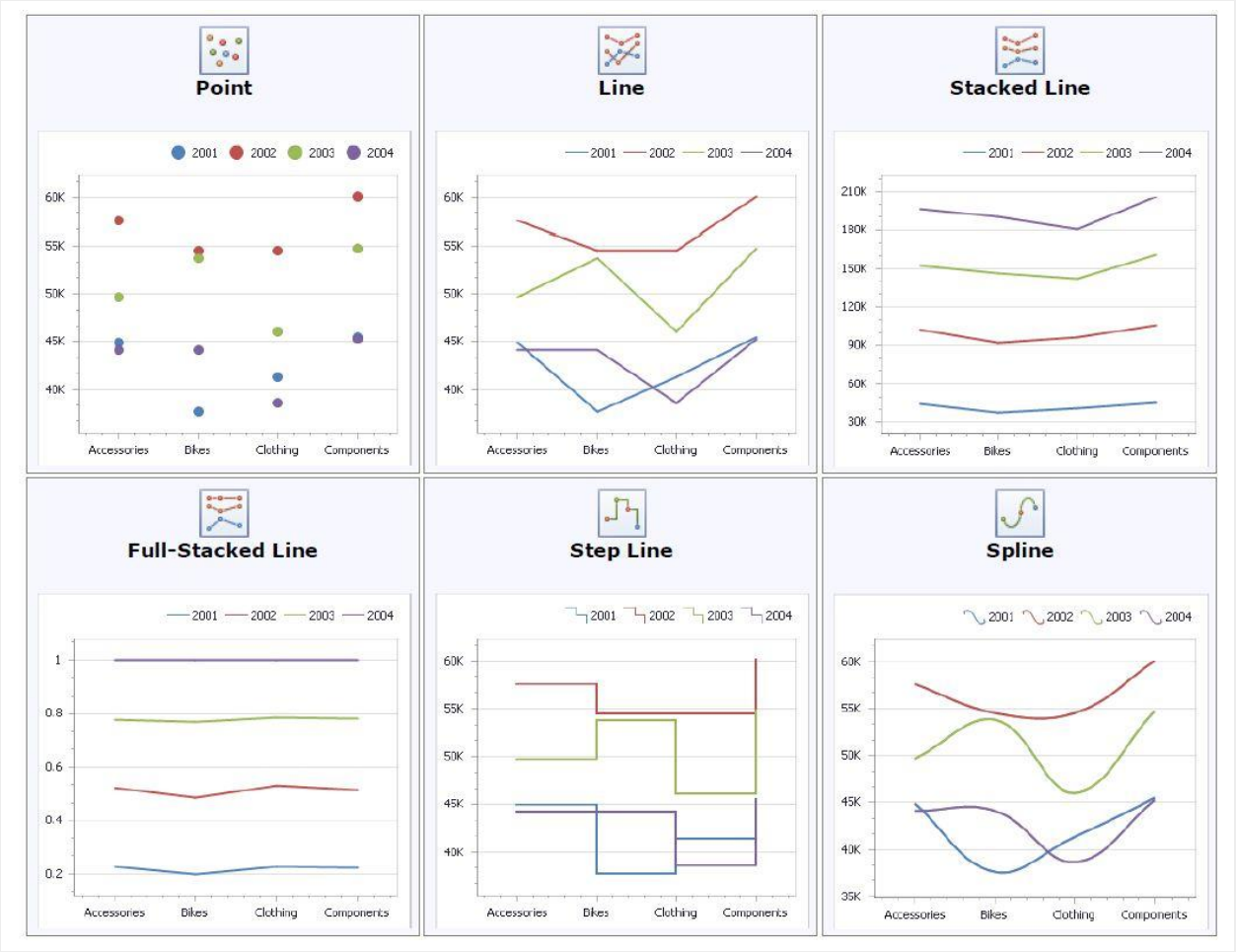


5.4.1.2.2 Bar Series

A Bar series displays data as sets of rectangular bars with lengths proportional to the values that they represent:

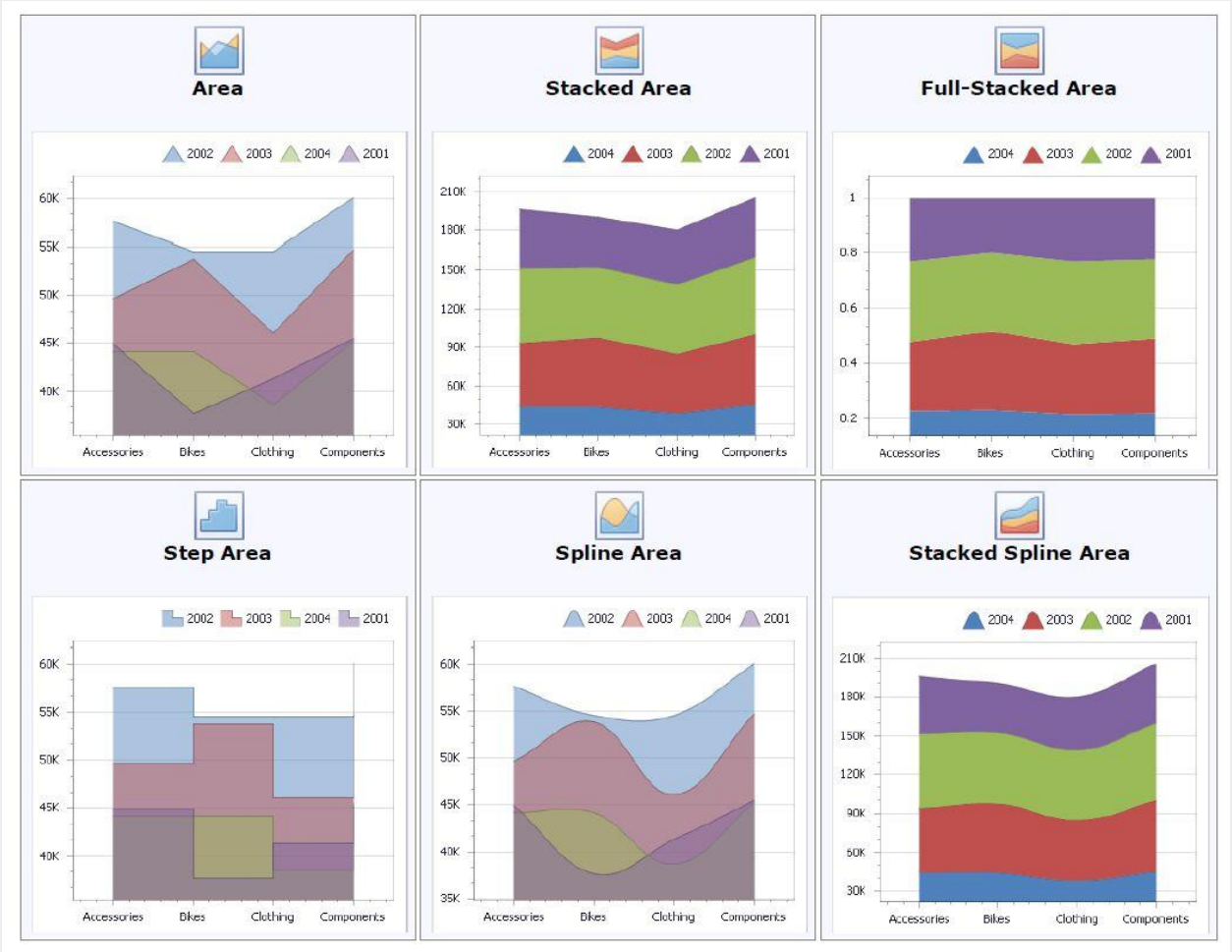
5.4.1.2.3 Point and Line Series

Point and Line series display data as standalone points or points joined by a line:



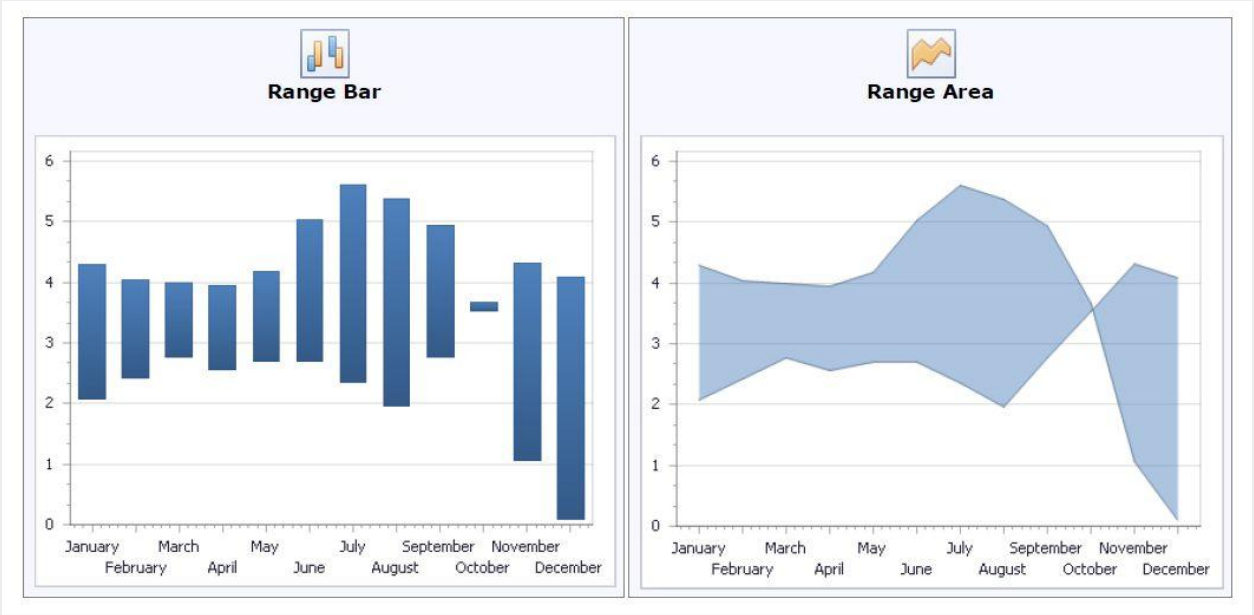
5.4.1.2.4 Area Series

An Area series displays data by a line that joins points, and the shaded area between the line and the argument axis.



5.4.1.2.5 Range Series

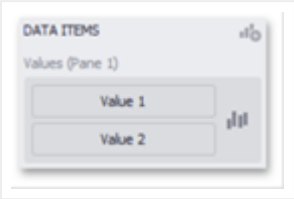
A Range series is the area between two simple series displayed as a shaded area (Range Area), or bars that stretch from a point in one series to the corresponding point in another series (Range Bar).



Because a range series represents the area between two simple series, you need to provide two measures instead of one to display a range series:

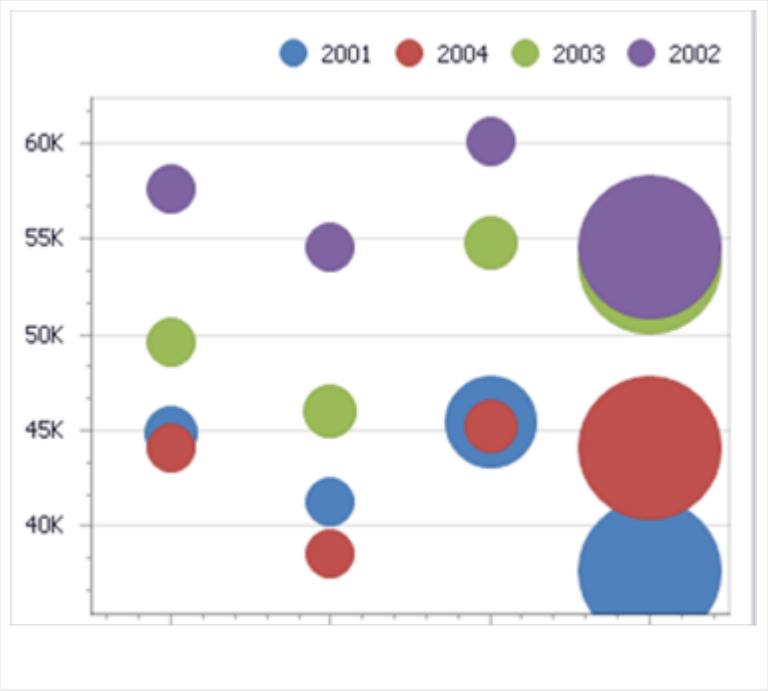
- Value 1 - a measure for calculating the first set of values.
- Value 2 - a measure for calculating the second set of values.

When you select the Range Bar or Range Area series type in the Designer, the DATA ITEMS area displays two data item placeholders.



5.4.1.2.6 Weighted Series

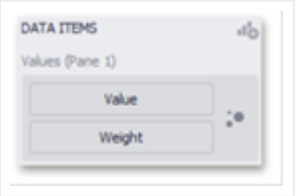
A Weighted series displays data using a third dimension, expressed by a bubble's size.



Data points in a weighted series present the following two measures:

- Value - the Y-coordinate of series points
- Weight - the size of series points.

When you select the Bubble series type in the Designer, the DATA ITEMS area displays two data item placeholders.



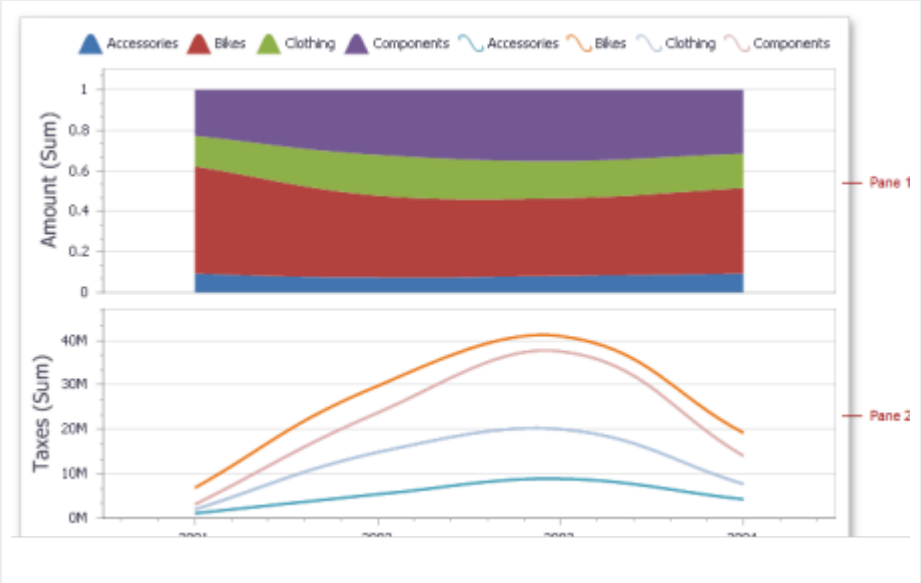
5.4.1.2.7 Financial Series

They may not be directly related with routers, cables or netTerrain elements, but the Financial series are still available for you to use in situations where you bring in financial data from other systems.

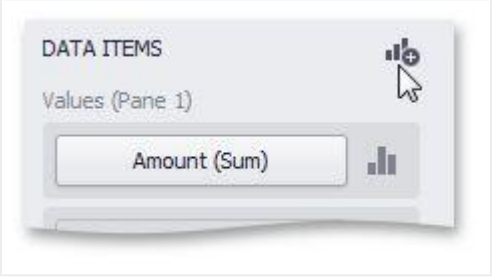
5.4.1.3 Panes

Chart dashboard items can contain any number of panes. Panes are visual areas within a diagram that display chart series.

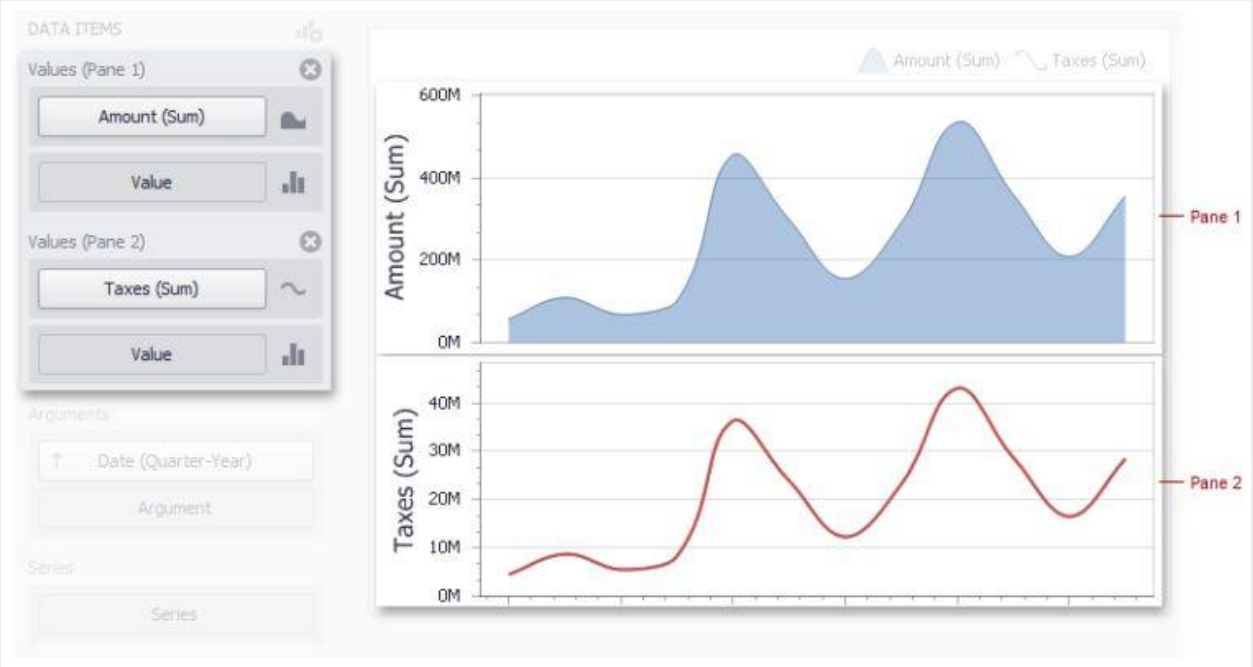
Each pane has its own Y-axis, and displays a specific set of series. All panes in a chart share the same X-axis.



To add a pane, click the  button at the top right of the DATA ITEMS area.

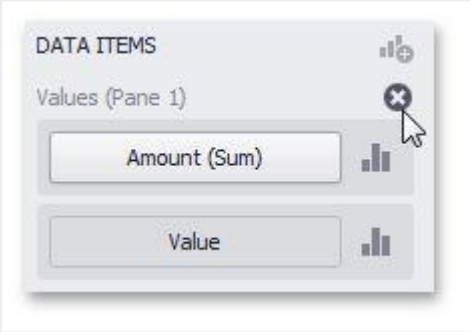


Once a new pane is added, the Dashboard Designer creates another Values section in the DATA ITEMS area.



Use this section to provide data items that supply values to be displayed in the new pane (see Binding Dashboard Items to Data for details on data binding).

To remove a pane, click the  button displayed in the corresponding Values section.



5.4.1.4 Interactivity

This section describes features that enable interaction between the Chart and other dashboard items. These features include Master Filtering and Drill-Down.

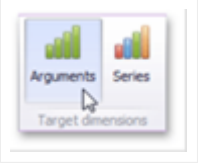
5.4.1.4.1 Master Filtering

The Dashboard designer allows you to use any data-aware dashboard item as a filter for the entire dashboard (Master Filter). To learn more, see the Master Filtering topic, which describes filtering concepts common to all dashboard items.

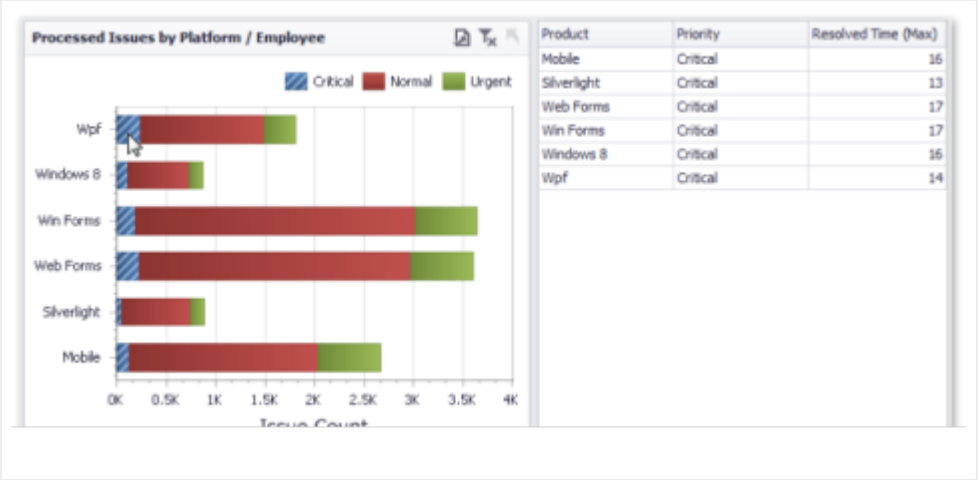
The Chart dashboard item supports filtering by argument or series values.

When filtering by arguments is enabled, you can click series points to make other dashboard items only display data related to selected argument values.

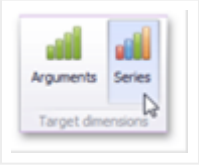
To enable filtering by arguments in the Designer, set the required Master Filter mode and click the Arguments button in the Data Ribbon tab.



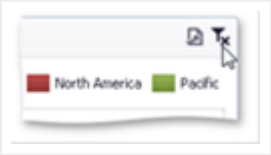
When filtering by series is enabled, you can click a series point to make other dashboard items only display data related to the selected series.



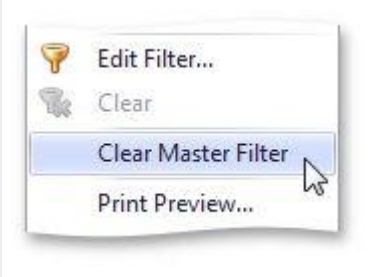
To enable filtering by series in the Designer, set the required Master Filter mode and click the Series button in the Data Ribbon tab.



To reset filtering, use the Clear Master Filter button in the Chart's caption area



or the corresponding command in the Chart's context menu.

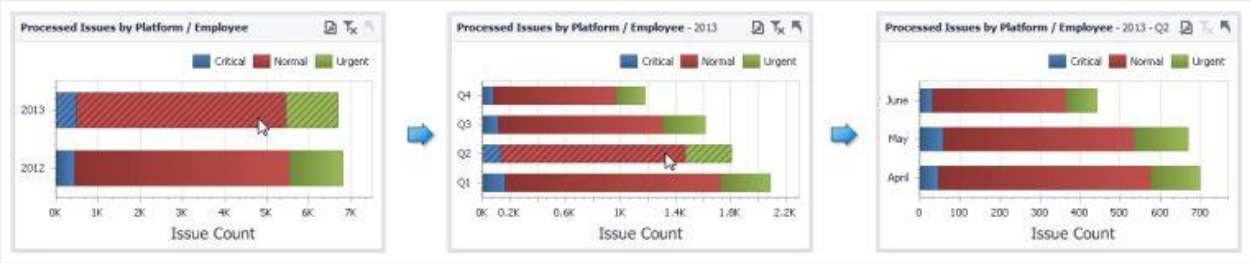


5.4.1.4.2 Drill-Down

The built-in drill-down capability allows you to change the detail level of data displayed in dashboard items on the fly. To learn more about drill-down concepts common to all dashboard items, see the Drill-Down topic.

The Chart dashboard item supports drill down on argument or series values.

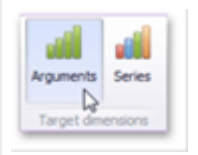
When drill down on arguments is enabled, you can click a series point to view a detail chart for the corresponding argument value.



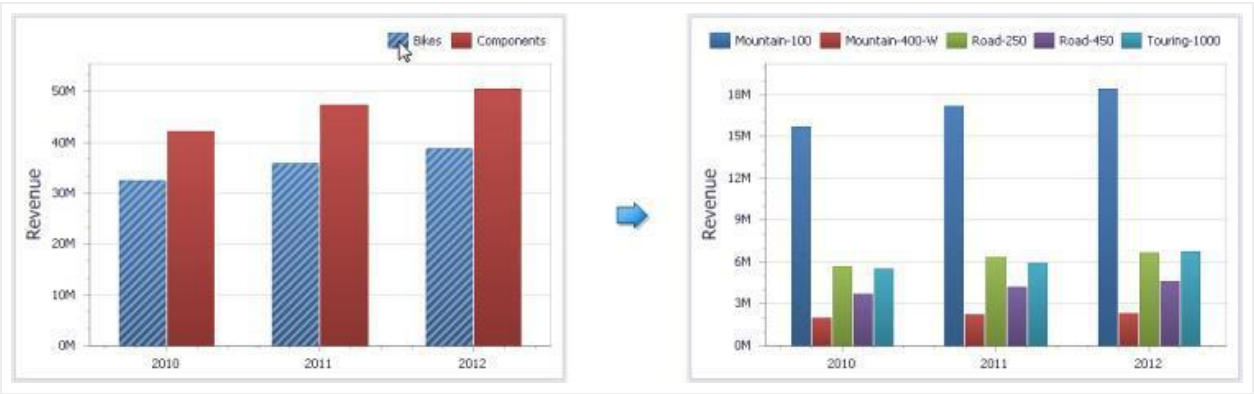
Drill down on arguments requires that the Arguments section contains several data items, from the least detailed to the most detailed item.

To enable drill down on arguments, click the Drill Down button in the Data Ribbon tab…

and the Arguments button.

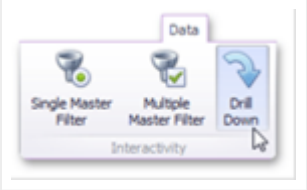


When drill down on a series is enabled, you can click a series point (or corresponding legend item) to view a detail chart for the corresponding series.

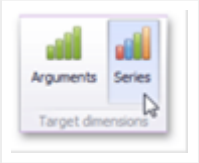


Drill down on a series requires that the Series section contains several data items, from the least detailed to the most detailed item.

To enable drill down on a series, click the Drill Down button in the Data Ribbon tab...



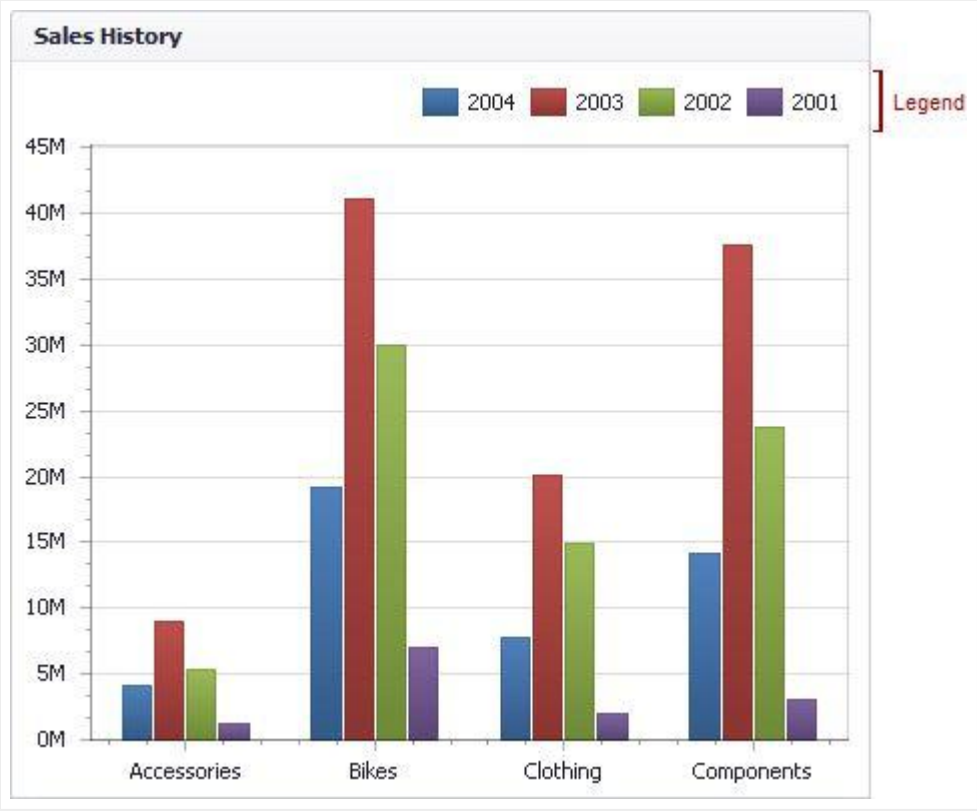
and the Series button.



To return to the previous detail level (drill up), use the Drill Up button within the Chart caption or in the context menu.

5.4.1.5 Legends

A legend is an element of a chart that identifies its series.

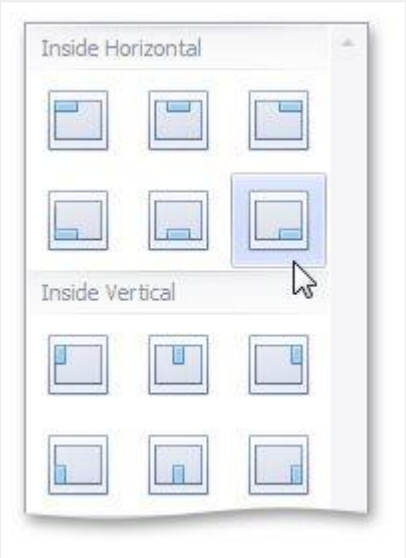


5.4.1.5.1 Visibility

You can specify whether or not a chart should display a legend. In the Designer, use the Show Legend button in the Legend section of the Design Ribbon tab.

5.4.1.5.2 Position and Orientation

To specify the legend's position and orientation, select one of the predefined options from the gallery in the Design Ribbon tab.

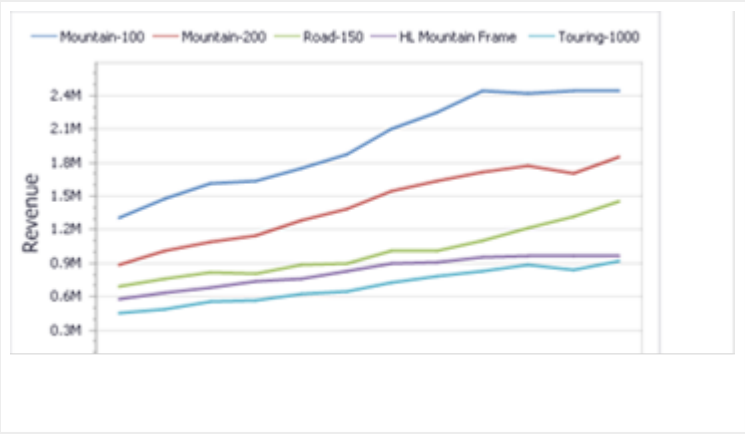


5.4.1.6 Axes

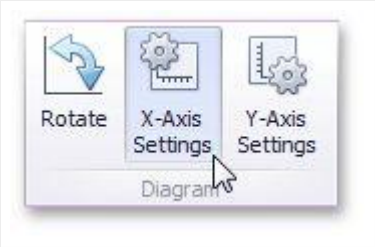
The Chart dashboard item displays two axes by default: the X-axis and the Y-axis.

5.4.1.6.1 X-Axis

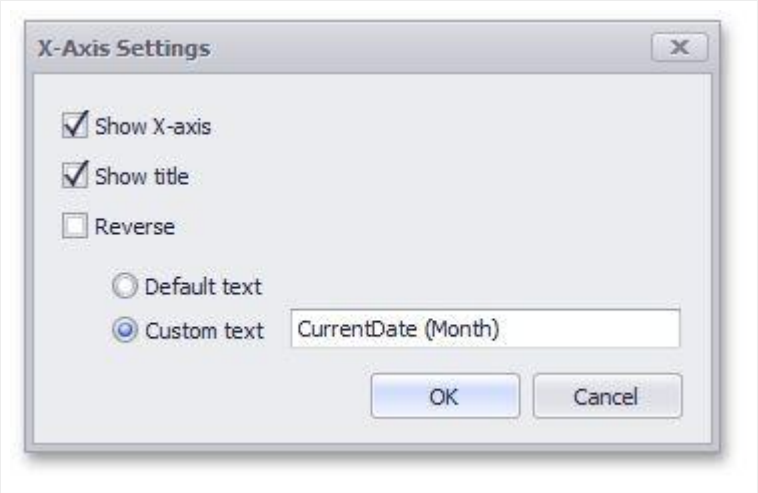
The X-axis is the axis of arguments.



To access X-axis settings, use the X-Axis Settings button in the Diagram section of the Design Ribbon tab.



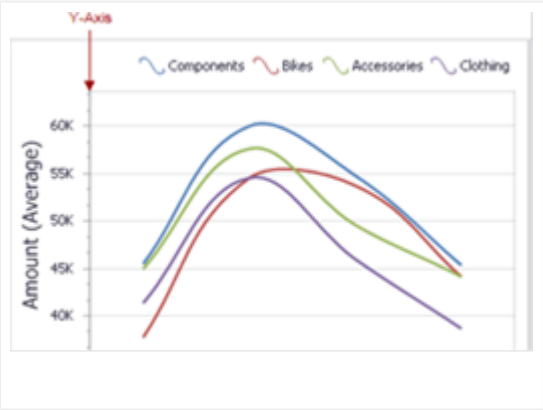
This will invoke the X-Axis Settings dialog.



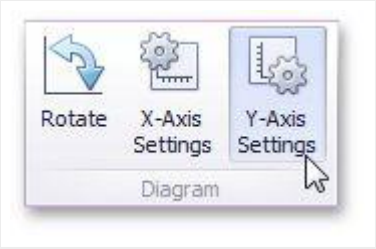
If the dimension in the Arguments section contains numeric data, the Chart can create either a continuous X-axis or a discrete X-axis.

5.4.1.6.2 Y-Axis

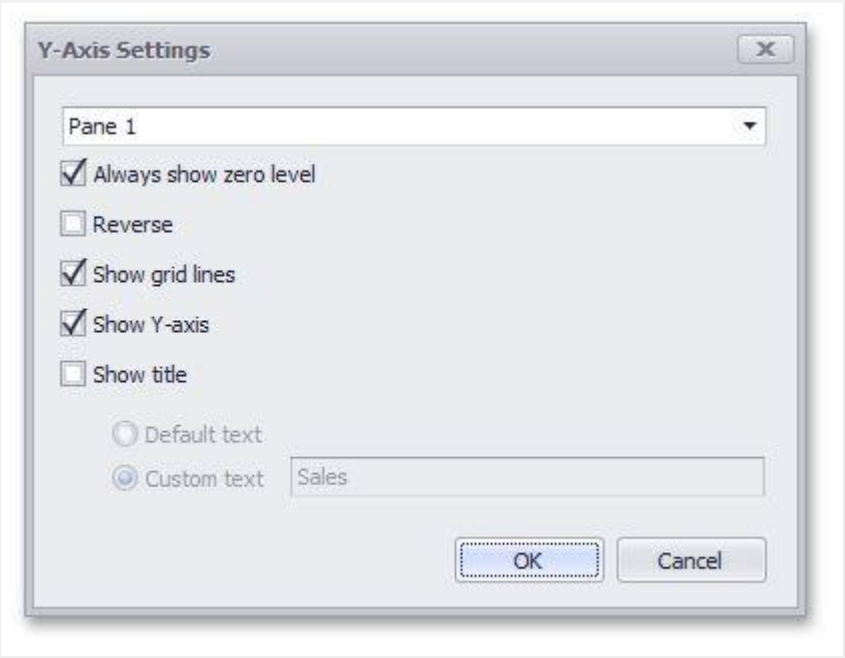
The Y-axis is the numerical axis of values.



To access the Y-axis settings, use the Y-Axis Settings button in the Diagram section of the Design Ribbon tab.

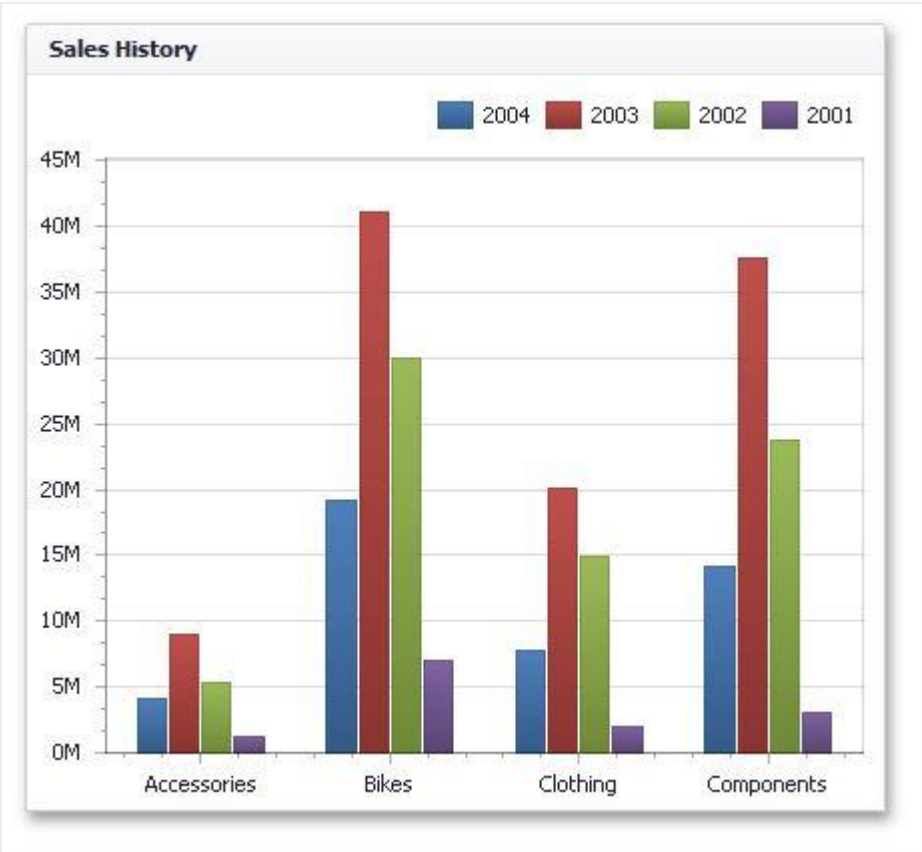


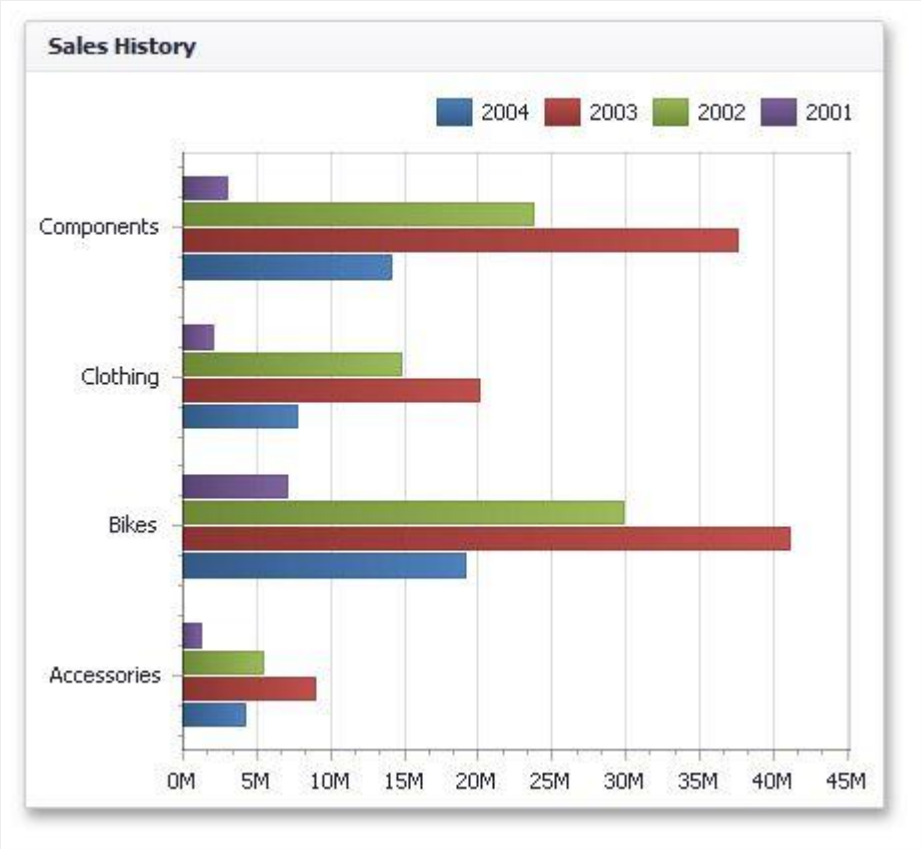
This will invoke the Y-Axis Settings dialog.



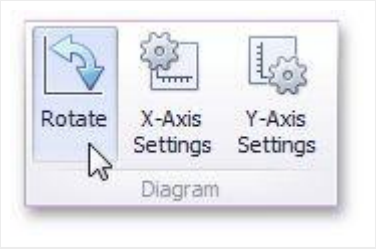
5.4.1.7 Orientation

You can rotate the Chart so that the X-axis becomes vertical, and the Y-axis becomes horizontal.


Sales History
2004
2003
2002
2001
45M
40M
35M
30M
25M
20M
15M
10M
5M
0M
Accessories
Bikes
Clothing
Components

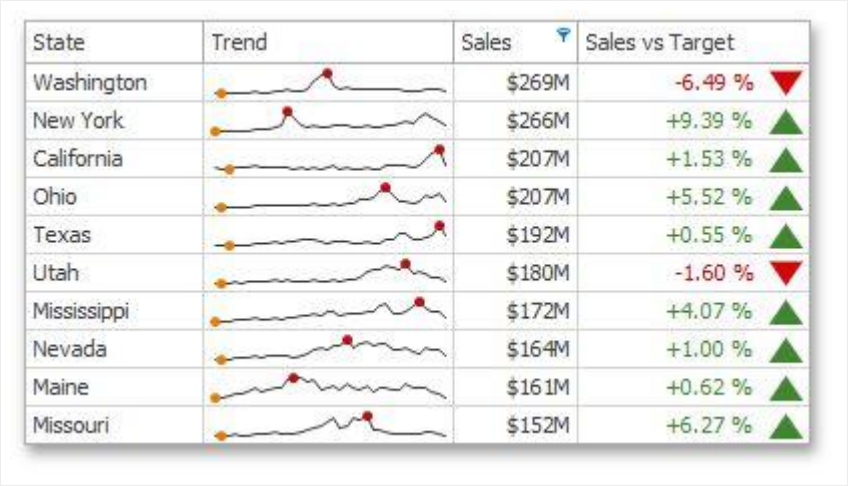


To rotate a Chart in the Designer, use the Rotate button in the Diagram group of the Design Ribbon tab.



5.4.2 Grids

As we know already, the Grid item displays a table with rows and columns. It can be quite a rich table, though, including columns using measures, dimensions, lines and more, as the image below suggests:



State	Trend	Sales	Sales vs Target
Washington		$269M	-6.49 %
New York		$266M	+9.39 %
California		$207M	+1.53 %
Ohio		$207M	+5.52 %
Texas		$192M	+0.55 %
Utah		$180M	-1.60 %
Mississippi		$172M	+4.07 %
Nevada		$164M	+1.00 %
Maine		$161M	+0.62 %
Missouri		$152M	+6.27 %

Grid example

This section is divided into the following subsections:

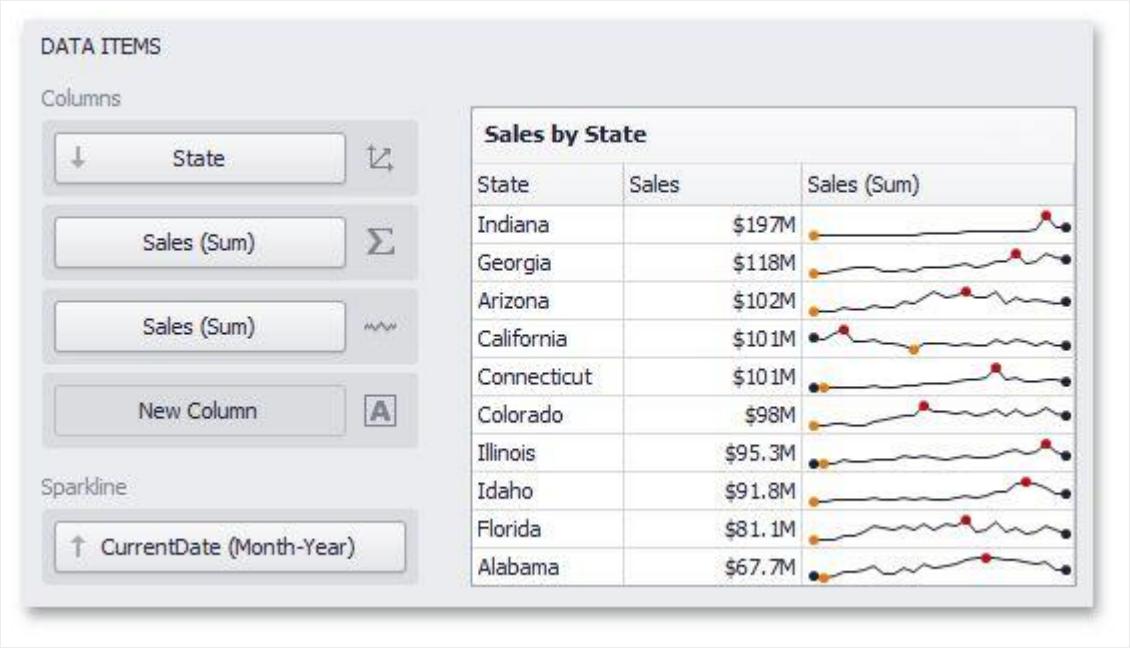
- Providing Data - Provides information on how to supply the Grid item with data.
- Columns - Describes different types of grid columns.
- Interactivity - Describes features that enable interaction between the Grid and other dashboard items.
- Layout - Describes the Grid's layout options.
- Style - Describes the Grid's style settings.

5.4.2.1 Providing Data

This topic describes how to bind a Grid dashboard item to data using the Dashboard Designer.

The Dashboard Designer allows you to bind various dashboard items to data in a virtually uniform manner (see Binding Dashboard Items to Data for details). The only difference is in the data sections that these dashboard items have.

The Grid dashboard item has the Columns and Sparkline data sections, which are used to provide data items based on the columns that are created.



5.4.2.2 Columns

The topics in this section describe the different types of grid columns, and contain information on when to use each column type and how to customize them based on the type.

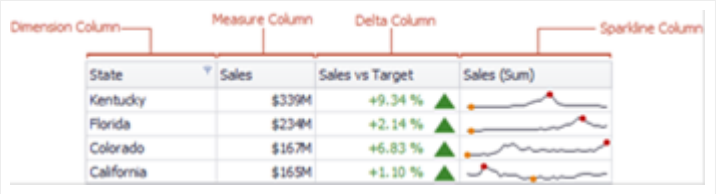
This section consists of the following topics:

- Column Type Overview: Provides general information about column types and describes how to change the type of a particular column.
- Dimension Column: Describes dimension column specifics.
- Measure Column: Describes measure column specifics.
- Delta Column: Describes delta column specifics.
- Sparkline Column: Describes sparkline column specifics.

5.4.2.2.1 Column Type Overview

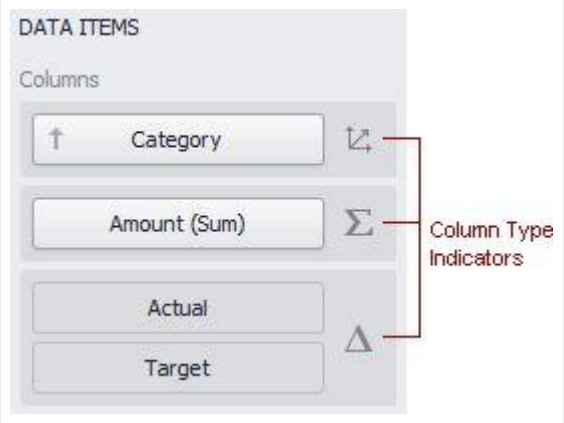
The Grid dashboard item supports four types of columns:

- Dimension Column: Displays values in the bound data item "as is".
- Measure Column: Displays summaries calculated against data in the bound data item.
- Delta Column: Bound to two measures, it calculates summaries for both measures, and displays the difference between these summaries.
- Sparkline Column: Displays values in the bound data item using sparklines.



When you drop a data item into the Columns section, the type for the new column is determined automatically, based on the data type.

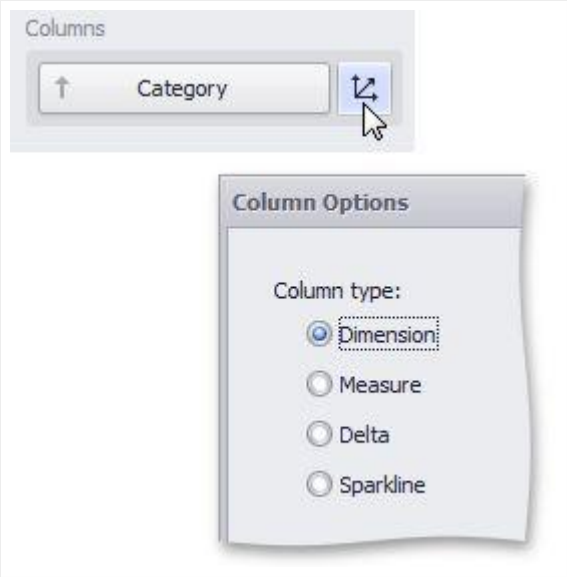
The type of the column is indicated within the corresponding data item container in the DATA ITEMS area.



Column type indicators are defined as follows:

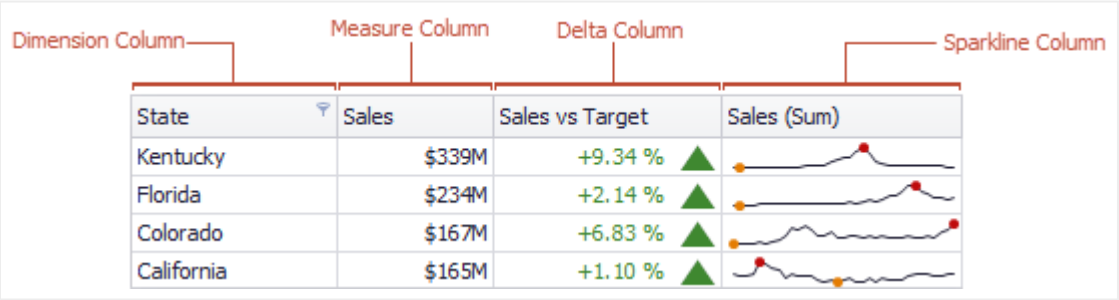
	Dimension Column
Σ	Measure Column
Δ	Delta Column
~~	Sparkline Column

To change the column type, click the column type indicator. In the invoked Column Options window, select the required column type in the Column type section.



5.4.2.2.2 Dimension Column

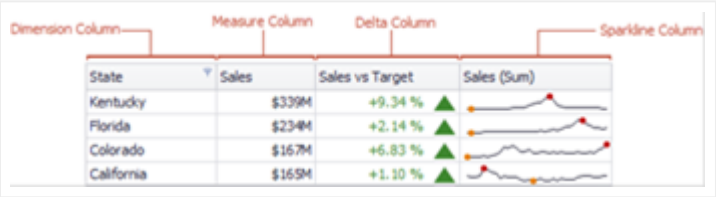
The dimension column displays values from the bound data item "as is".



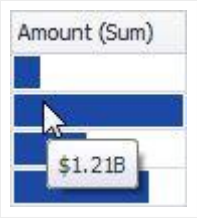
If the dimension column is bound to a data source containing images, it can display images.

5.4.2.2.3 Measure Column

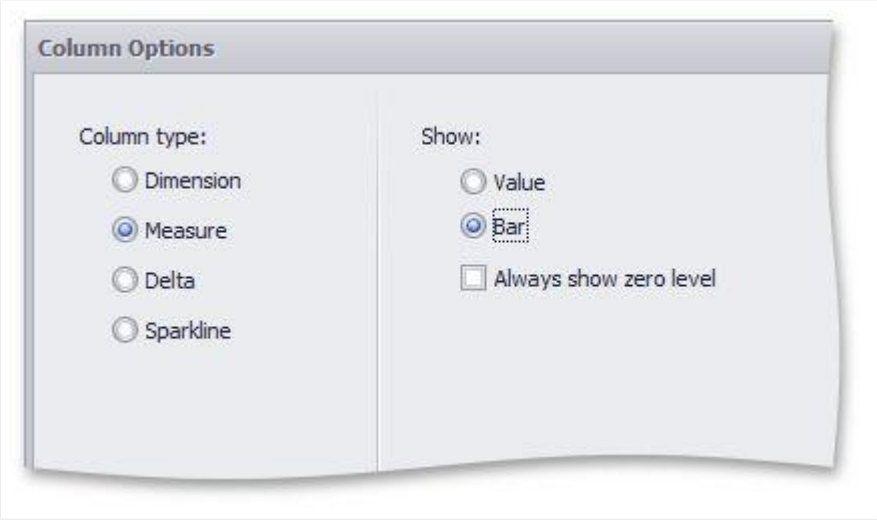
A measure column displays summaries calculated against data in a bound data item.



Values in the measure column can be displayed as text or represented by bars.



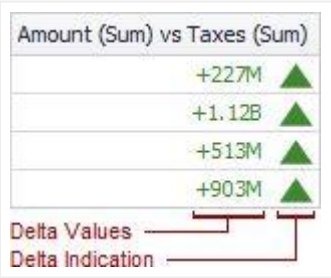
To select between these modes, invoke the Column Options window (see Column Type Overview to learn how to do this) and select Value or Bar.



If bars are displayed, use the Always show zero level check box to specify whether the bar's zero level is always visible.

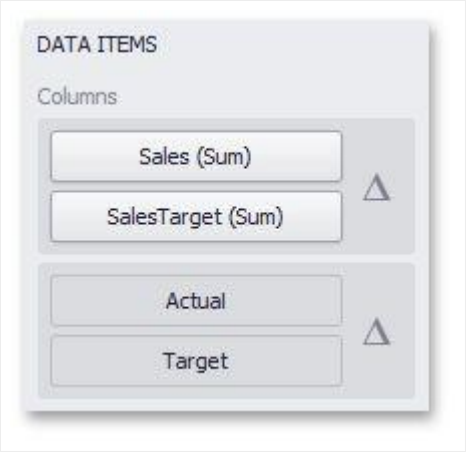
5.4.2.2.4 Delta Column

A delta column calculates summaries against two measures, and displays the difference between these summaries. This difference can be indicated with a numeric value displayed within the delta element and an additional delta indication.

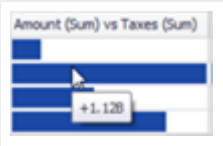


Delta columns are bound to two measures that provide two values: the Actual value and the Target value. The difference between these values is displayed in the column.

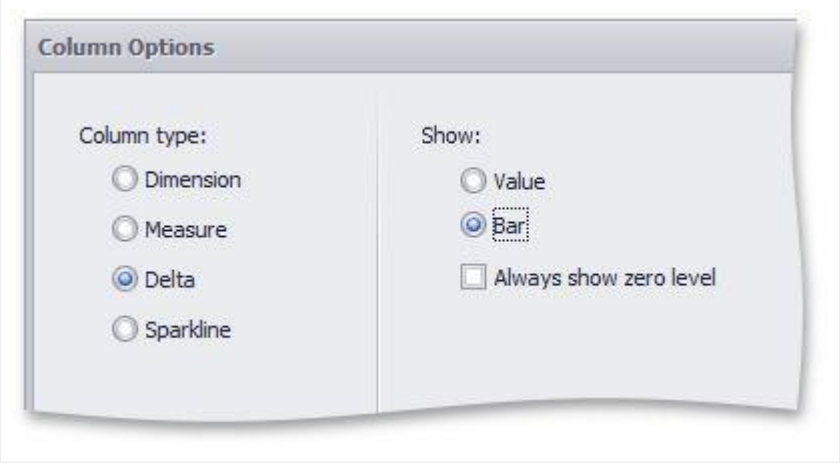
When you switch the column type to Delta, the data item container is changed, to accept the Actual and Target measures.



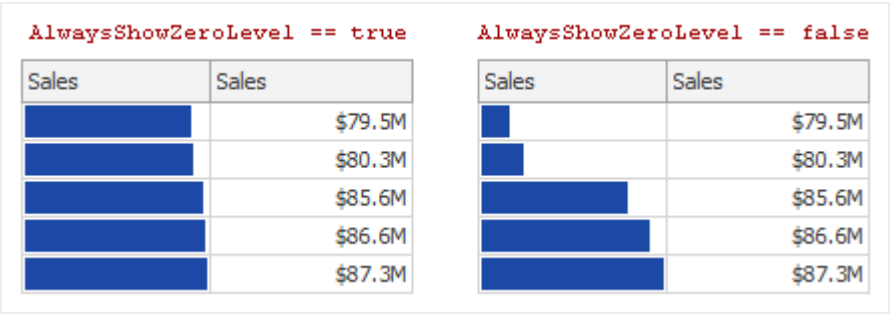
Values in the delta column can be displayed as text, or represented by bars.



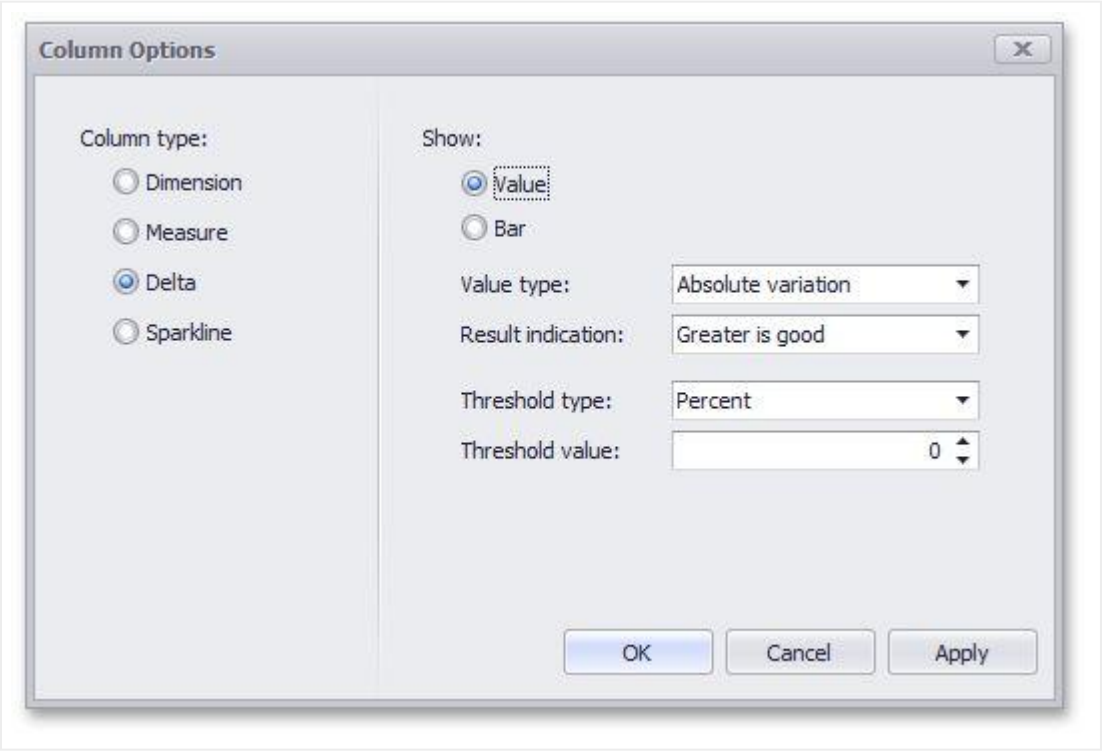
To select between these modes, invoke the Column Options window (see the Column Type Overview topic to learn how to do this) and select Value or Bar.



If bars are displayed, use the Always show zero level check box to specify whether the bar's minimum value is zero (checked) or an automatically selected value that ensures that the difference between bars is clearly displayed (unchecked).



If the display type is set to Value, the Column Options window displays options that allow you to configure delta values and indication.



You can specify which values should be displayed in the delta column. To do this, use the Value type combo box in the Column Options window.

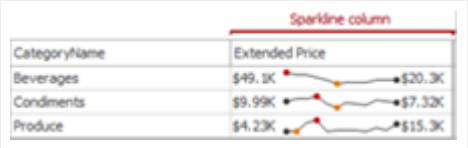
To specify the condition for displaying delta indication, use the Result indication combo box in the Column Options window.

The comparison tolerance allows you to specify more advanced conditions for displaying delta indication. For instance, you can set a specific indication to be displayed when the actual value exceeds the target value by 10% or by $2K.

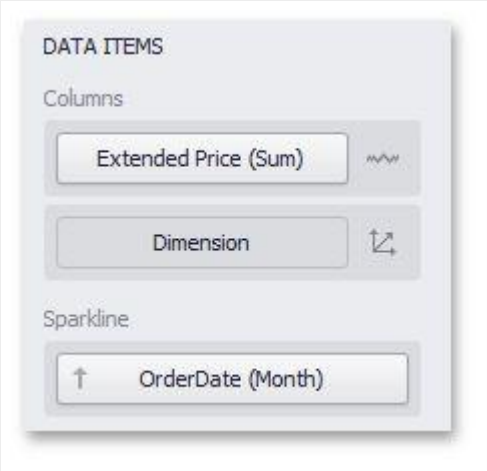
Use the Threshold type combo box to select whether you wish to specify the comparison tolerance in percentage values or in absolute values. Then use the Threshold value box to specify the comparison tolerance.

5.4.2.2.5 Sparkline Column

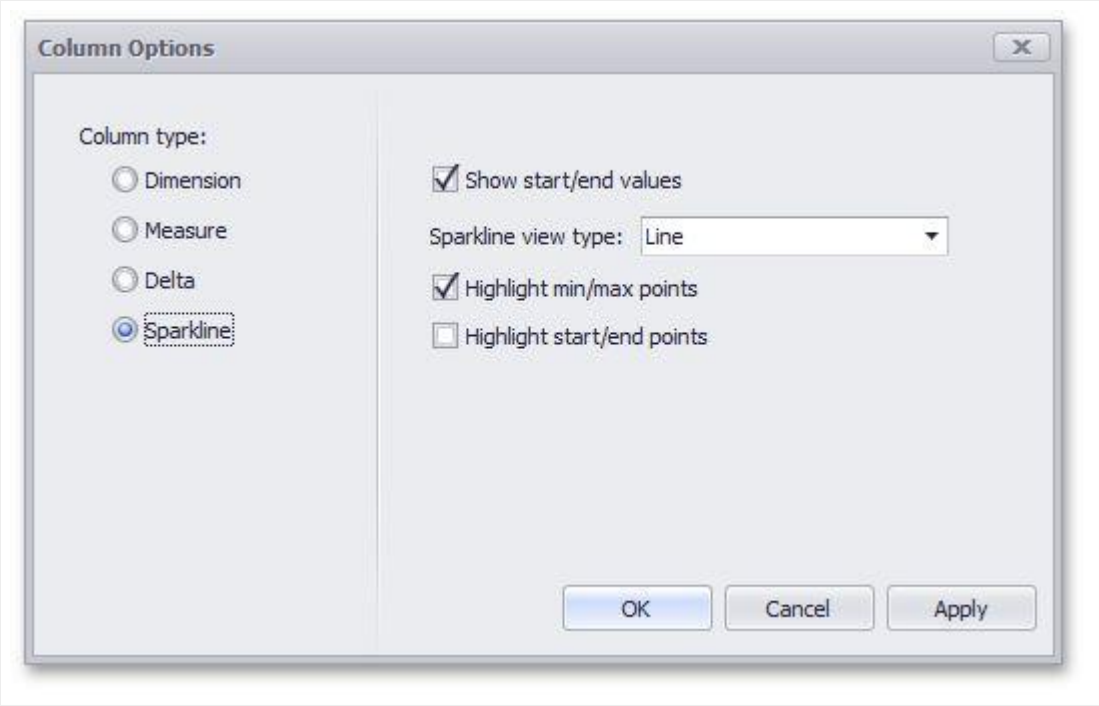
A sparkline column visualizes the variation in summary values over time.



The sparkline column is bound to a measure providing sparkline values and to a dimension providing a date-time interval.



You can control sparkline appearance settings using the Column Options dialog. To invoke this dialog, click the column type indicator ( ).



In this dialog, you can control various settings that affect how the sparkline is displayed within a grid cell.

Sparkline Options	Description
Show start/end values	Species whether or not to display sparkline start/end values within a grid cell.
Sparkline view type	Defines the view type of a sparkline. Sparkline view types include **Line**, **Area**, **Bar**, and **Win/Loss**.
Highlight min/max points	Specifies whether or not to highlight the minimum/ maximum points of a sparkline.
Highlight start/end points	Specifies whether or not to highlight the start/end points of a sparkline.

5.4.2.3 Interactivity

This section describes features that enable interaction between the Grid and other dashboard items. These features include Master Filtering and Drill-Down.

5.4.2.3.1 Master Filtering

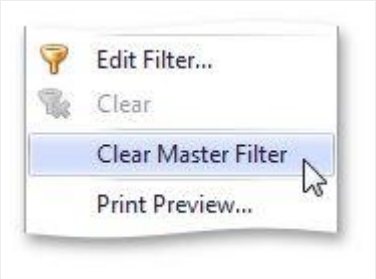
The Dashboard designer allows you to use any data-aware dashboard item as a filter for the entire dashboard (Master Filter). To learn more, see the Master Filtering topic, which describes filtering concepts common to all dashboard items.

The Grid dashboard item supports filtering by rows.

When Master Filtering is enabled, you can click a grid row (or multiple rows by holding down the CTRL key) to make other dashboard items only display data related to the selected record(s).

To learn how to enable Master Filtering in the Designer, see the Master Filtering topic.

To reset filtering, use the Clear Master Filter button (the  icon) in the grid's caption area, or the Clear Master Filter command in the grid's context menu.

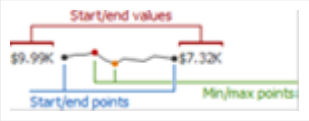


5.4.2.3.2 Drill-Down

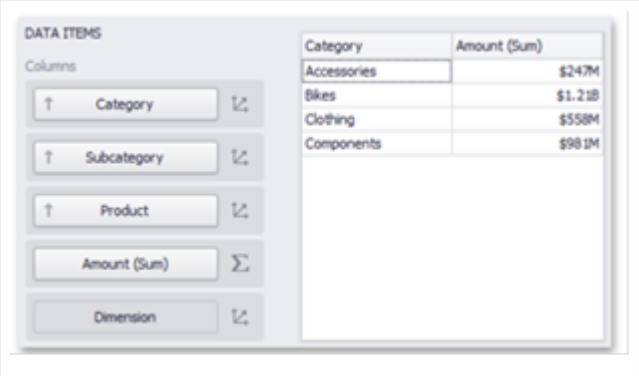
The built-in drill-down capability allows you to change the detail level of data displayed in dashboard items on the fly. To learn more about drill-down concepts common to all dashboard items, see the Drill-Down topic.

The Grid dashboard item supports drill-down for rows.

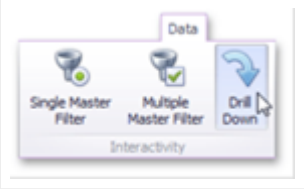
When drill-down is enabled, you can click a grid row to view the details.



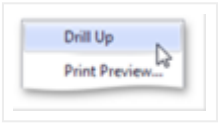
Drill-down requires that the Columns section contains several dimensions at the top, from the least detailed to the most detailed dimension.



To enable drill-down, click the Drill Down button in the Data Ribbon tab.



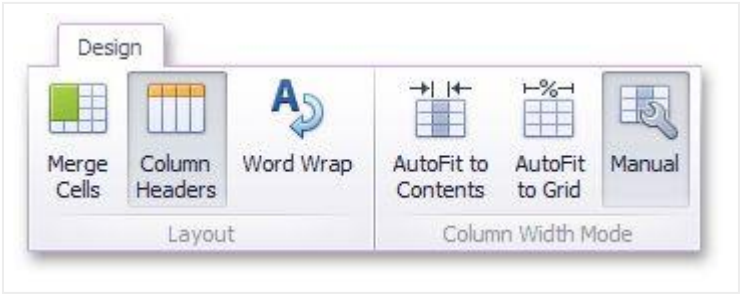
To return to the previous detail level (drill up), use the Drill Up button (the  icon) within the grid's caption area, or the Drill Up command in the grid's context menu.



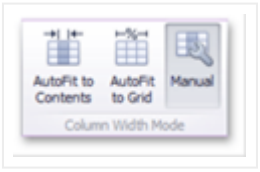
5.4.2.4 Layout

The Grid dashboard item allows you to customize its layout in various ways. You can manage the width of grid columns, specify the visibility of column headers, enable cell merging, etc.

To do this, use the Layout and Column Width Mode groups in the Design Ribbon tab (or the corresponding buttons in the toolbar menu).

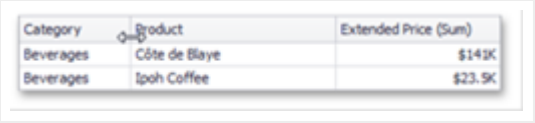


The Grid dashboard item allows you to manage column widths using different modes. Use buttons in the Column Width Mode group to manage the column width modes.



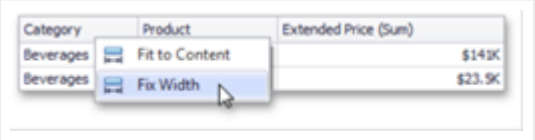
The following modes are available:

- AutoFit to Contents: The grid adjusts columns to the minimum width required to completely display their content automatically. If the entire content cannot be displayed within the dashboard item, horizontal scrolling is enabled.
- AutoFit to Grid: The grid adjusts the width of all columns to fit their content in an optimal way. If you are changing the size of the dashboard item, the width of columns is changed proportionally.
- Manual: The grid allows you to adjust column widths manually. In this mode, you can adjust the width of individual columns in the following ways:
- Specify the width of the required column by dragging the right edge of the column header.



In this case, all columns preserve their relative size when the grid width is changed.

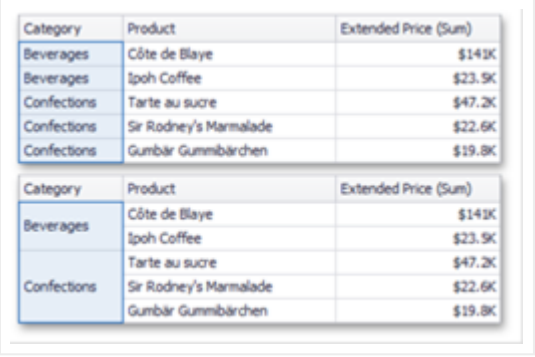
- Specify the column width and fix it by right-clicking the required column header and selecting Fix Width.



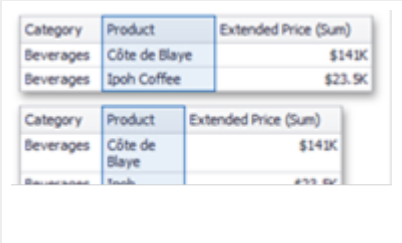
- Fit the column width to its content and fix it by right-clicking the required column header and selecting Fit to Content.

Use the Column Headers button to toggle column header visibility.

The Grid allows you to merge neighboring cells with identical values. To do this, use the Merge Cells button.



The word wrapping feature enables the capability to display cell content on multiple lines if the size of a dashboard item is insufficient to completely display the cell content on a single line.



5.4.2.5 Style

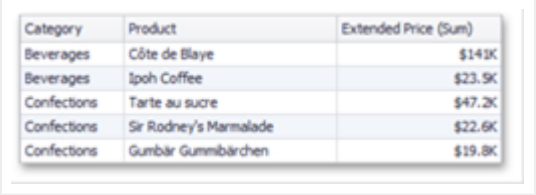
The Grid dashboard item allows you to specify various style settings. To do this, use the Style group in the Design Ribbon tab (or the corresponding buttons in the toolbar menu).

5.4.2.5.1 Grid Lines

The Horizontal Lines and Vertical Lines buttons control grid line visibility.

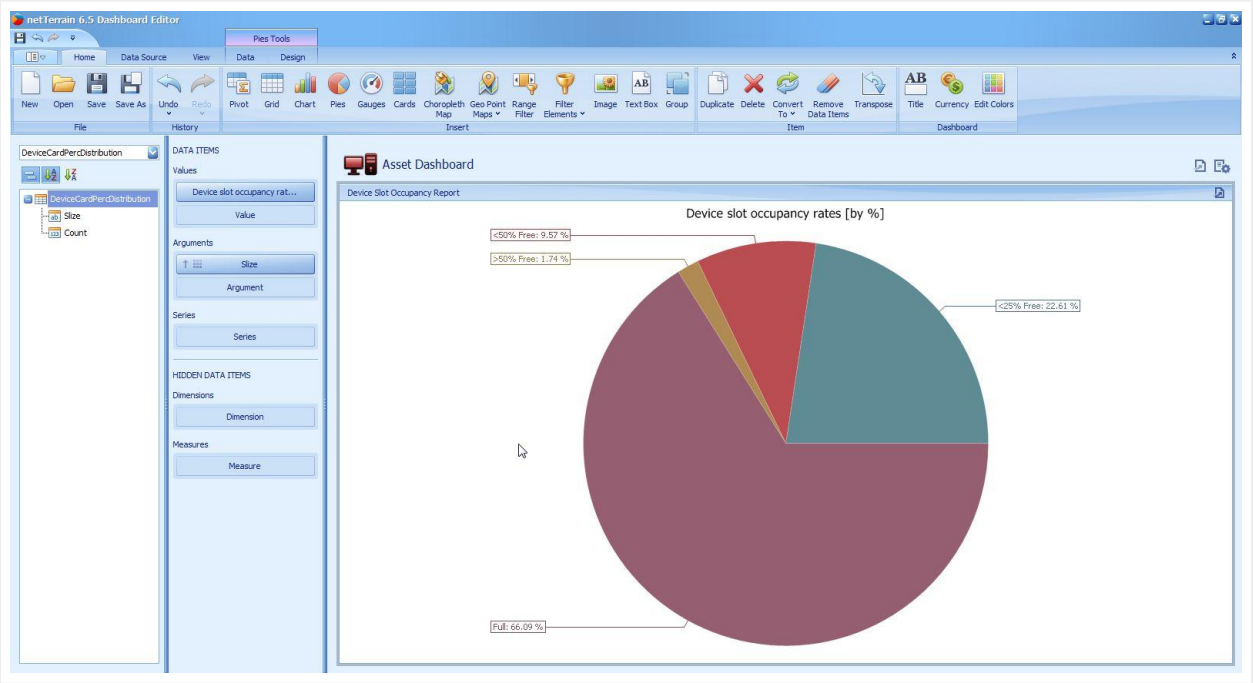
5.4.2.5.2 Banded Rows

To paint the background of odd and even rows differently, use the Banded Rows button.



5.4.3 Pies

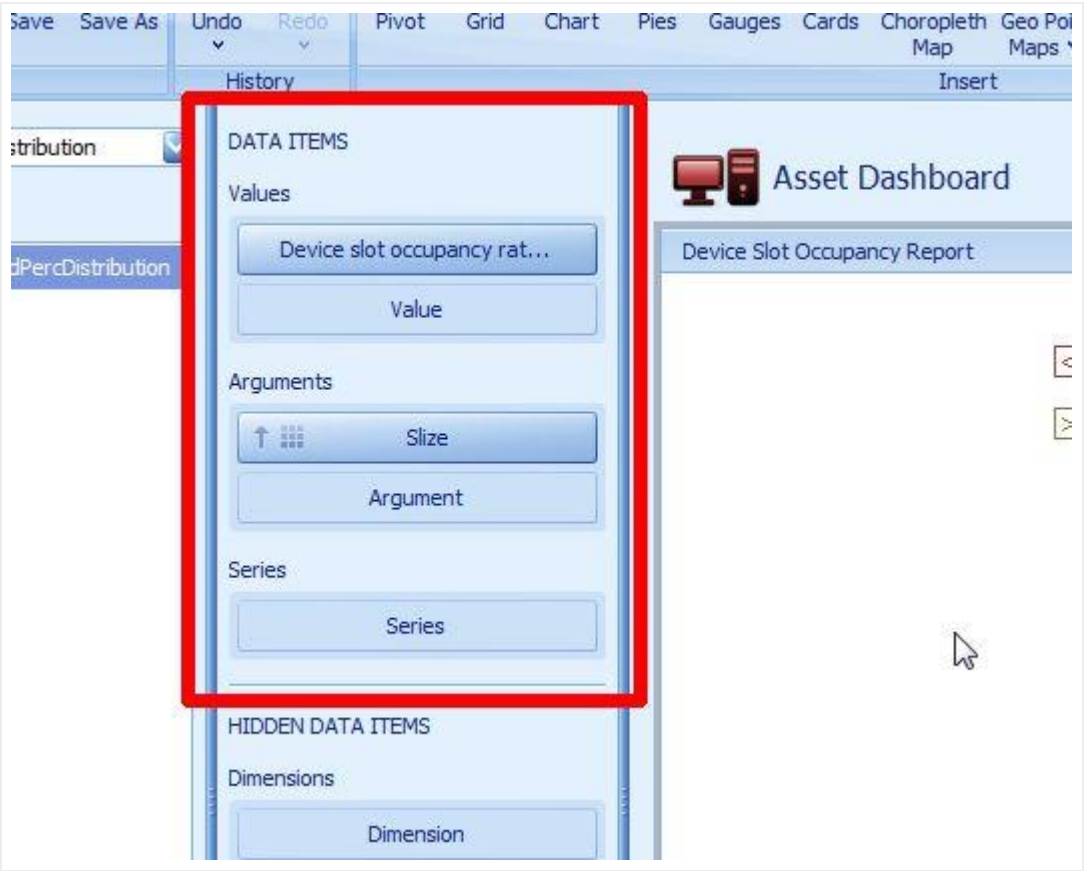
The Pie dashboard item displays a series of pies or donuts that represent the contribution of each value to a total. The Dashboard Designer allows you to bind various dashboard items to data in a virtually uniform manner.



Pie chart example

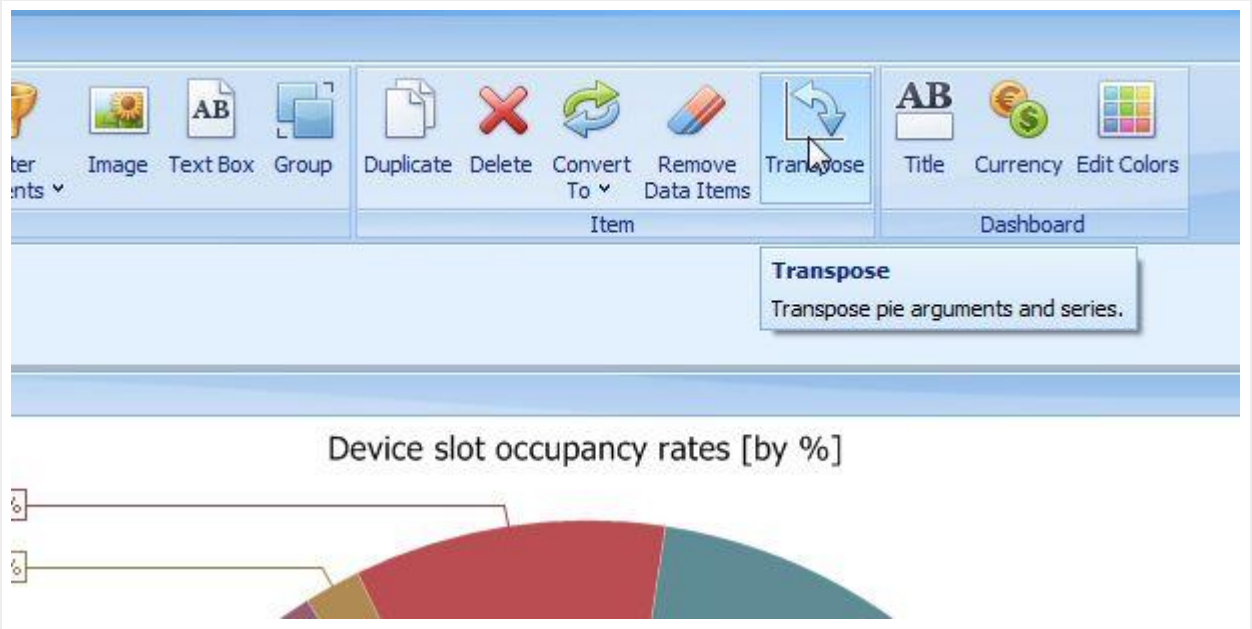
The Pie dashboard item has the following data sections:

- The Values section contains data items that define the share of pie segments.
- The Arguments section contains data items that provide values used to label pie segments.
- The Series section contains data items whose values are used to label pie charts.



The Pie dashboard item allows you to manage coloring of their measures and dimensions. The Pie dashboard item provides the capability to transpose pie arguments and series. In this case, data items contained in the Arguments section are moved to the Series section, and vice versa.

To transpose the selected Pie dashboard item, use the Transpose button in the Home menu.

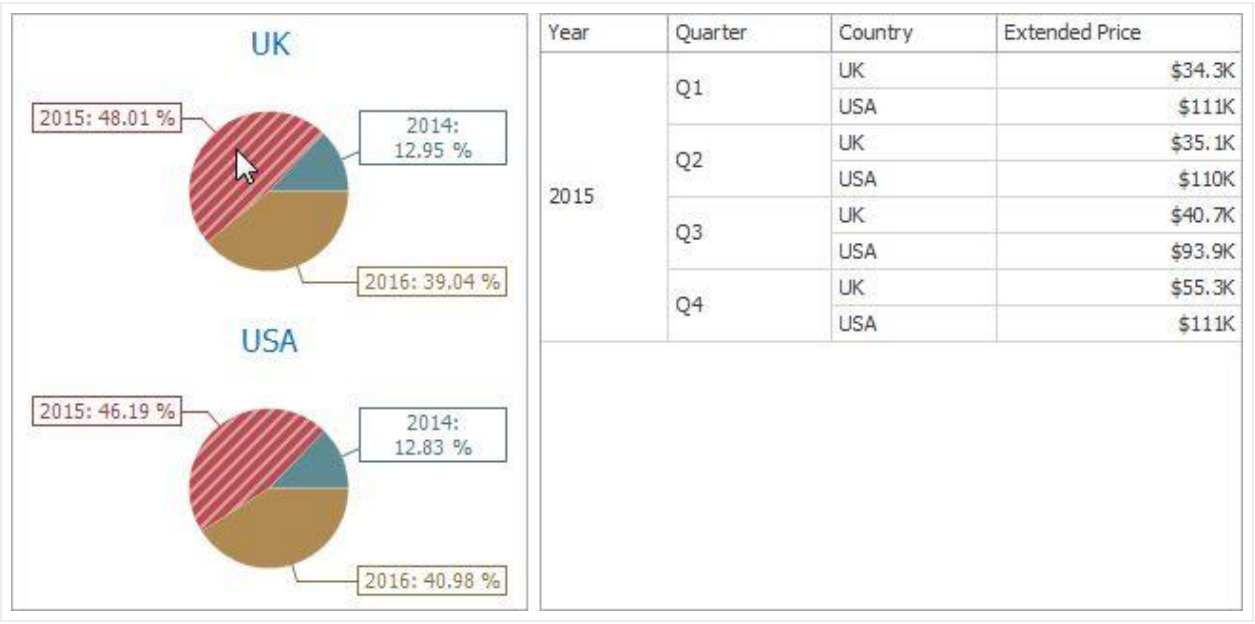


5.4.3.1 Interactivity

Pies enable interaction between the Pie dashboard item and other items. These features include Master Filtering and Drill-Down.

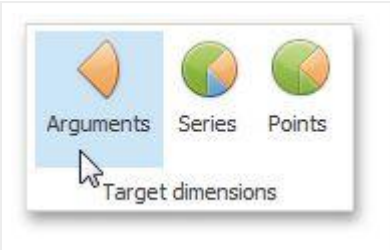
5.4.3.1.1 Master Filtering

The Dashboard allows you to use any data aware dashboard item as a filter for other dashboard items (Master Filter). The Pie dashboard item supports filtering by argument or series values. When filtering by arguments is enabled, an end-user can click a pie segment to make other dashboard items only display data related to the selected argument value.

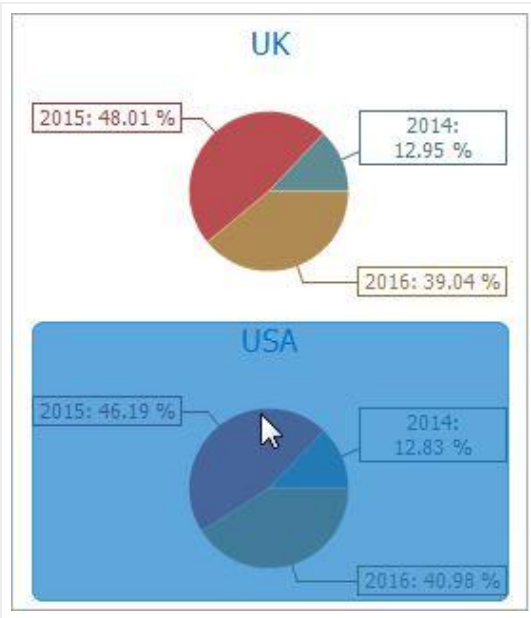


Year	Quarter	Country	Extended Price
2015	Q1	UK	$34.3K
		USA	$111K
	Q2	UK	$35.1K
		USA	$110K
	Q3	UK	$40.7K
		USA	$93.9K
	Q4	UK	$55.3K
		USA	$111K

To enable filtering by arguments in the Designer, set the required Master Filter mode and click the Arguments button in the Data Ribbon tab (or the  button if you are using the toolbar menu).



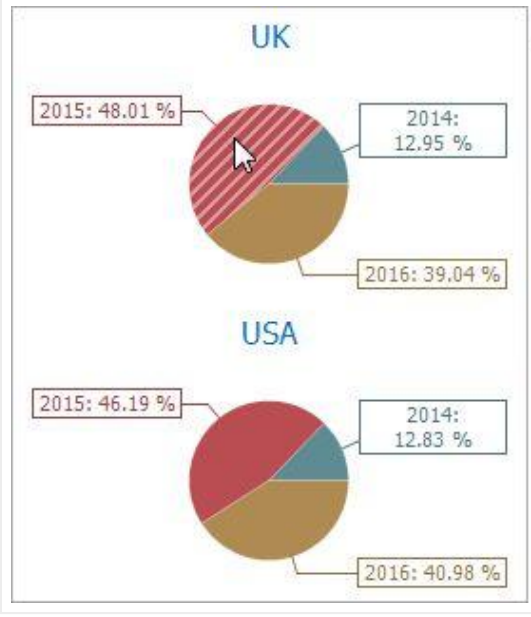
When filtering by series is enabled, an end-user can click a pie to make other dashboard items display only data related to the selected pie.



Year	Quarter	Country	Extended Price
2014	Q3	USA	$41.8K
	Q4		$76.5K
2015	Q1		$111K
	Q2		$110K
	Q3		$93.9K
	Q4		$111K
2016	Q1		$196K
	Q2		$182K

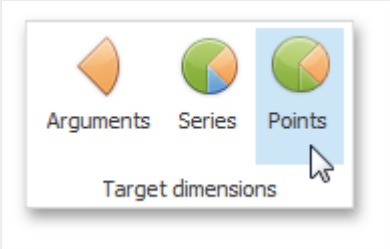
To enable filtering by series in the Designer, set the required Master Filter mode and click the Series button in the Data Ribbon tab (or the button if you are using the toolbar menu).

When filtering by points is enabled, an end-user can click a single pie segment to make other dashboard items display only data related to the selected segment.



Year	Quarter	Country	Extended Price
2015	Q1	UK	$34.3K
	Q2		$35.1K
	Q3		$40.7K
	Q4		$55.3K

To enable filtering by points in the Designer, set the required Master Filter mode and click the Points button in the Data Ribbon tab.



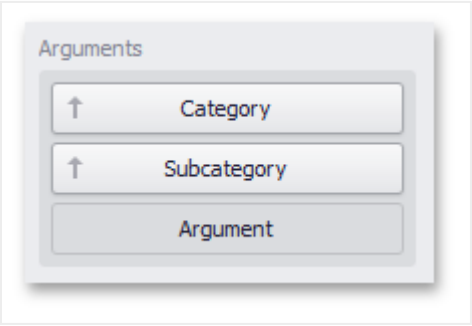
5.4.3.1.2 Drill – Down

The built-in drill-down capability allows end-users to change the detail level of data displayed in dashboard items on the fly. To learn more about drill-down concepts common to all dashboard items, see the Drill-Down topic.

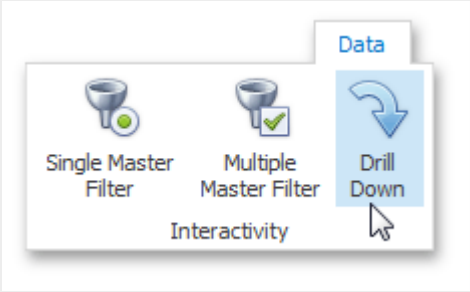
The Pie dashboard item supports drill-down on argument or series values.

When drill-down on arguments is enabled, an end-user can click a pie segment to view a detail diagram for the corresponding argument value. When Filtering by Arguments is enabled, an end-user can view the details by double-clicking a pie segment.

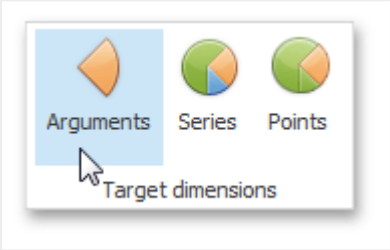
Drill-down on arguments requires that the Arguments section contains several data items, from the least detailed to the most detailed item.



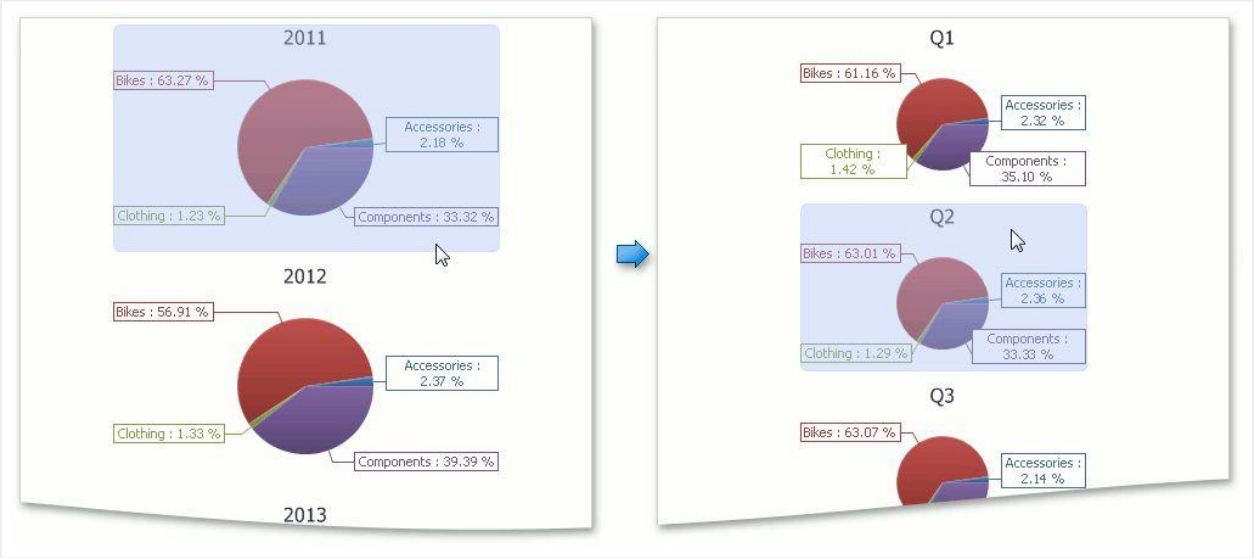
To enable drill-down on arguments, click the Drill Down button in the Data Ribbon tab (or the  button if you are using the toolbar menu)



and the Arguments button (or the  button if you are using the toolbar menu).

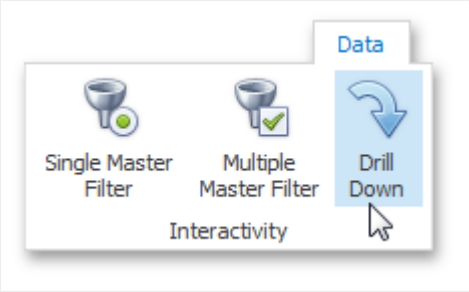


When drill-down on series is enabled, an end-user can click a pie chart to view a detail diagram for the corresponding series value. When Filtering by Series is enabled, an end-user can view the details by double-clicking a pie chart.

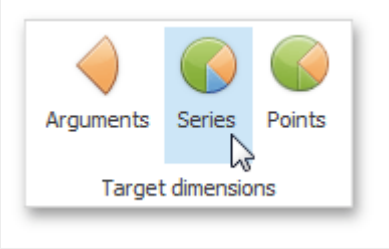


Drill-down on series requires that the Series section contains several data items, from the least detailed to the most detailed item.

To enable drill-down on series, click the Drill Down button in the Data Ribbon tab (or the button if you are using the toolbar menu)



and the Series button (or the button if you are using the toolbar menu).

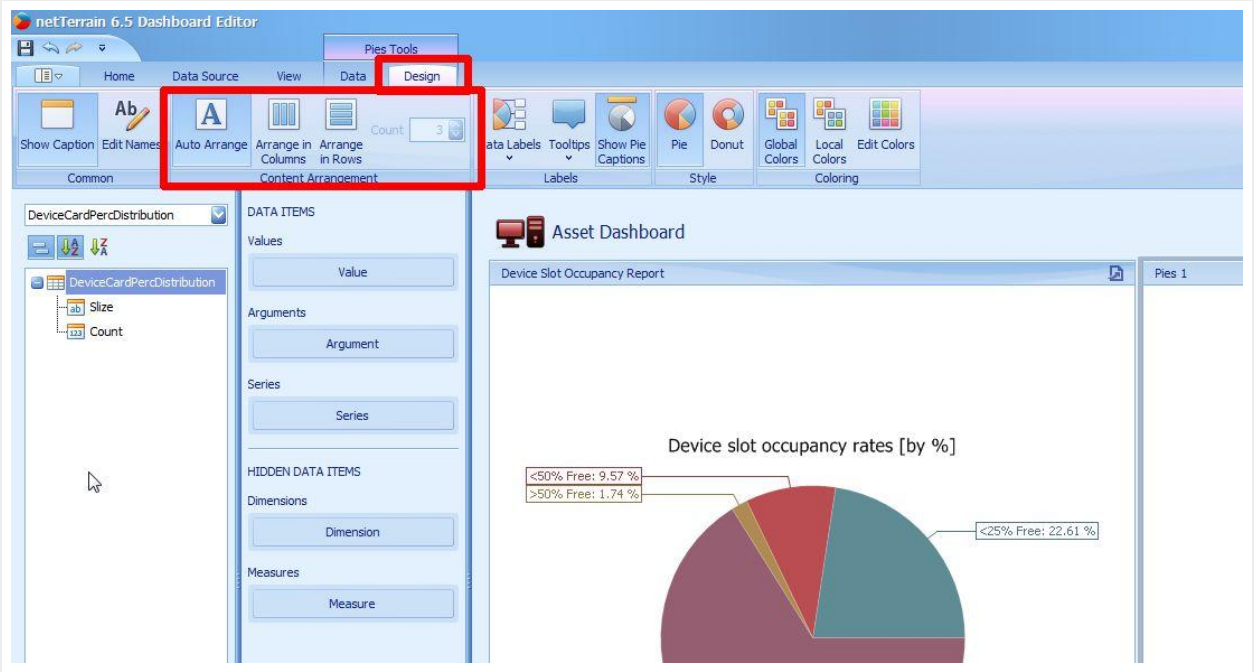


To return to the previous detail level (drill-up), use the Drill Up ( ) button in the caption of the Pie dashboard item, or the Drill Up command in the context menu.

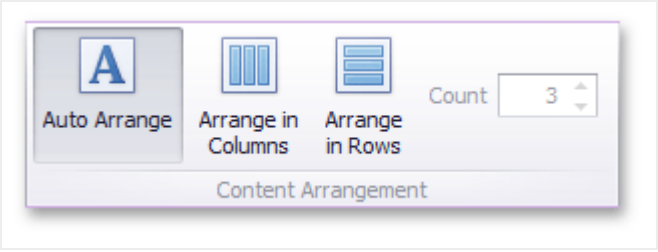
5.4.3.2 Pie Layouts

The Pie dashboard item allows you to specify the number of columns or rows in which individual diagrams are arranged.

To control how pies are arranged, use the Content Arrangement group in the Design Ribbon tab.

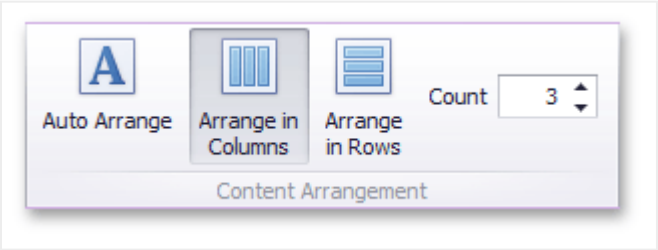


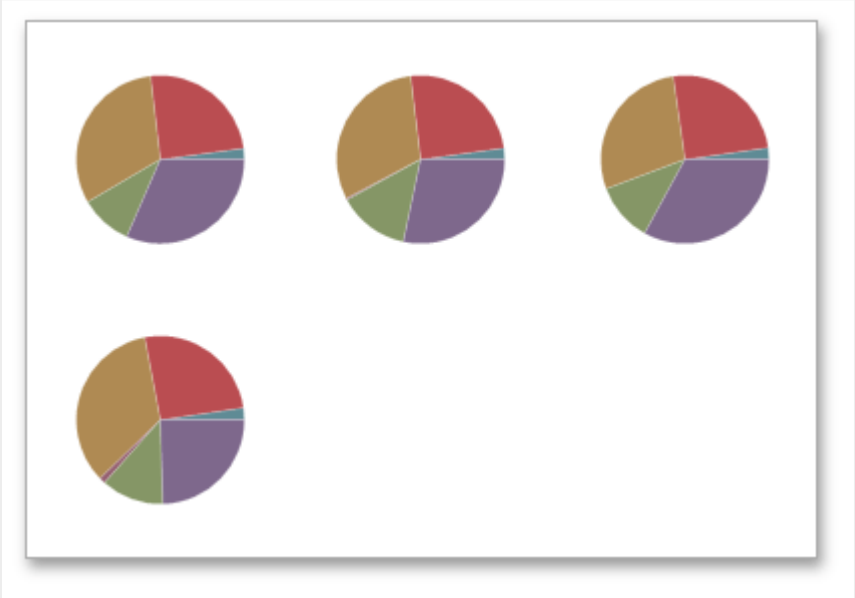
By default, the Auto Arrange option is enabled, which automatically resizes pies to fit within the dashboard item.



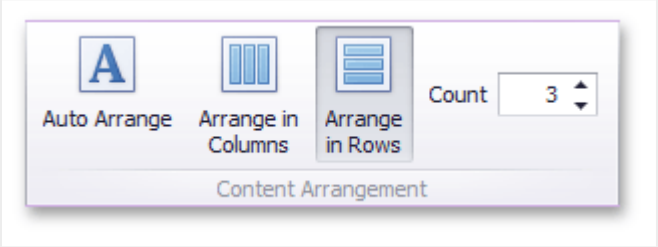
If you are using the toolbar menu, use the  button to enable this mode.

You can also specify the number of columns in which pies are arranged. Click the Arrange in Columns button (or the  button if you are using the toolbar menu) and specify the appropriate number in the Count field.





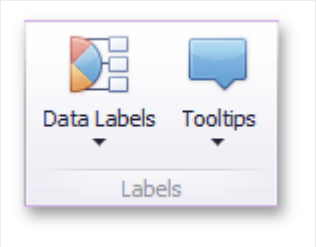
Similarly, you can arrange pies in a specific number of rows (use the  button if you are using the toolbar menu).



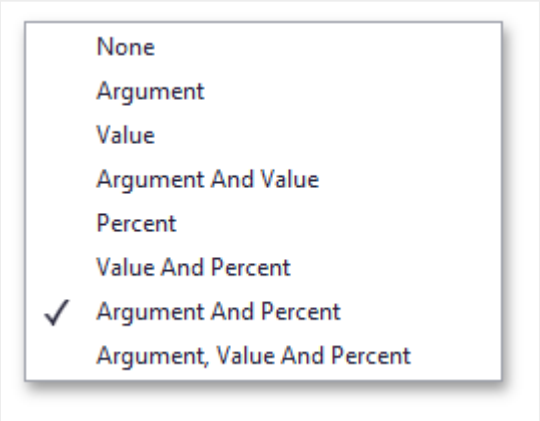
5.4.3.3 Pie Labels

Pies display data labels that contain descriptions for pie segments and provide tooltips with additional information.

You can specify which information should be displayed within data labels and tooltips. To do this, use the Data Labels and Tooltips buttons in the Design Ribbon tab (or the  and  buttons if you are using the toolbar menu).

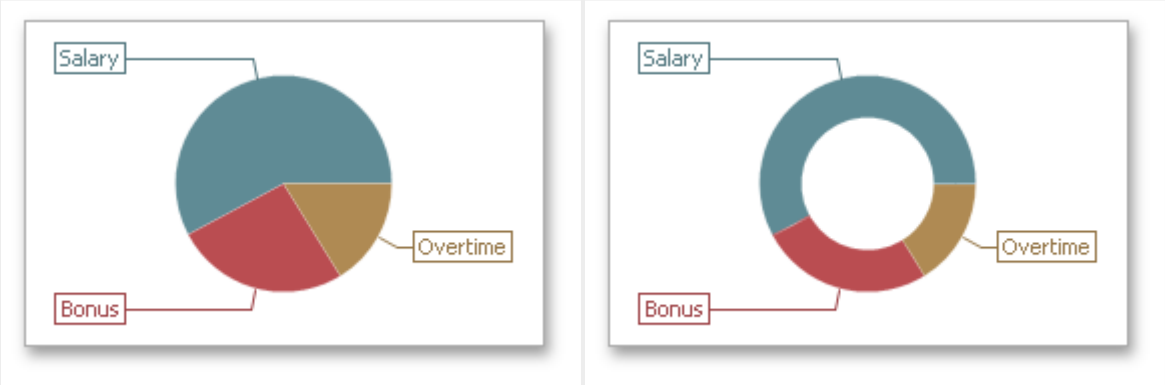


These buttons invoke the drop-down menu, which is similar for both buttons. This menu allows you to specify which values are displayed within data labels or tooltips.

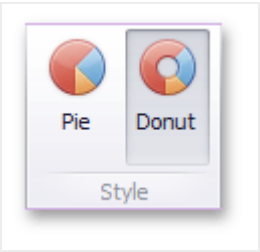


5.4.3.4 Pie Style

The Pie dashboard item allows you to select whether diagrams should be painted as pies or donuts.

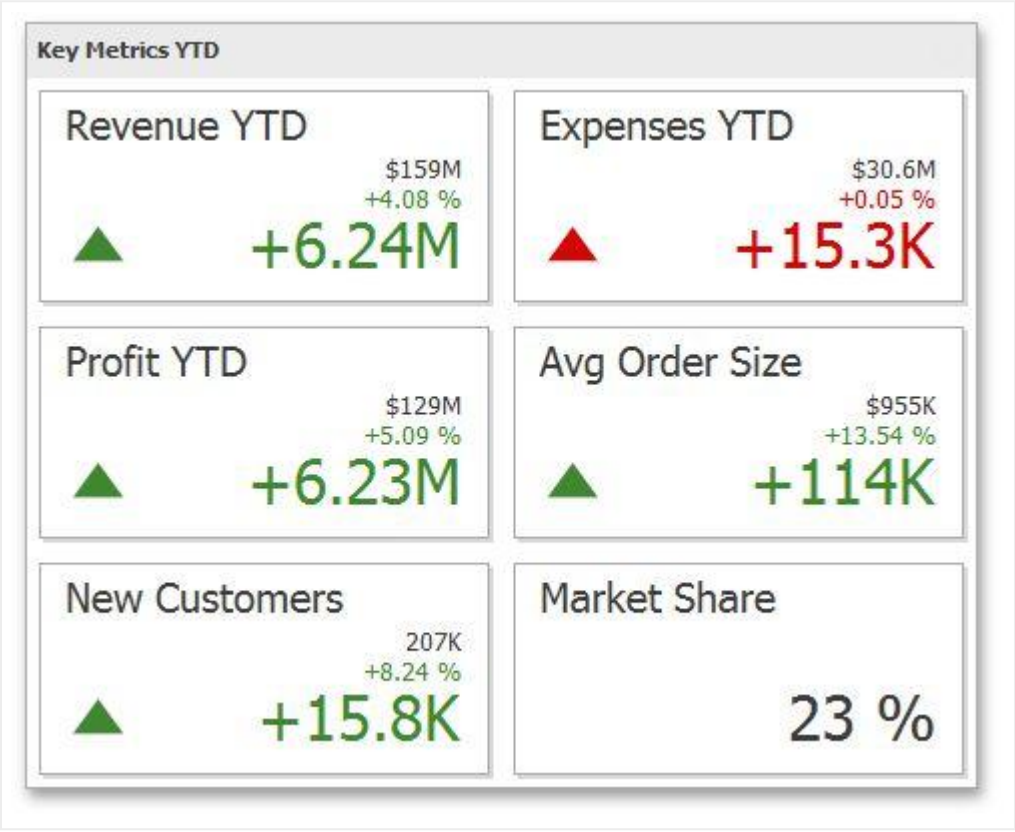


To select the diagram style, use the Pie and Donut buttons in the Style section of the Design Ribbon tab (or the  and  buttons if you are using the toolbar menu).



5.4.4 Cards

The Card dashboard item displays a series of cards. Each card illustrates the difference between two values. This difference can be expressed as an absolute value, an absolute variation or a percentage variation.



Card example

This section consists of the following subsections:

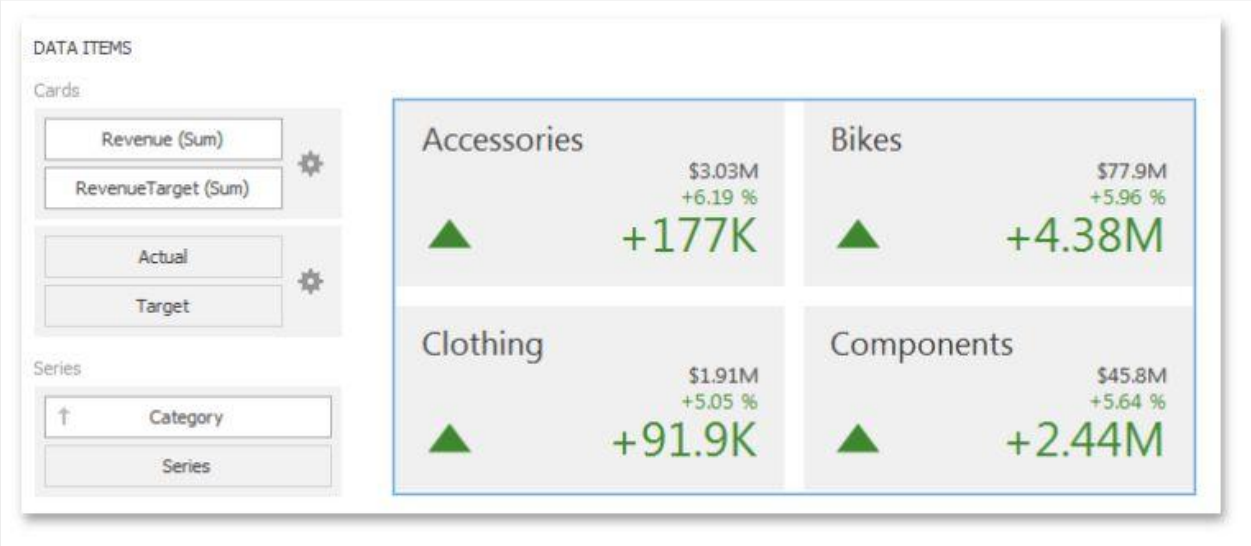
- Providing Data: Provides information about how to supply the Card dashboard item with data.
- Delta: Provides an overview of the Card dashboard item's capability to display the difference between two parameters.
- Sparkline: Provides an overview of the Card dashboard item's capability to visualize data using sparklines.
- Interactivity: Describes features that enable interaction between the Card dashboard item and other items.
- Layout: Describes layout options of the Card dashboard item.

5.4.4.1 Providing Data

This topic describes how to bind a Card dashboard item to data in the Dashboard Designer.

The Dashboard Designer allows you to bind various dashboard items to data in a virtually uniform manner (see the Binding Dashboard Items to Data topic for details).

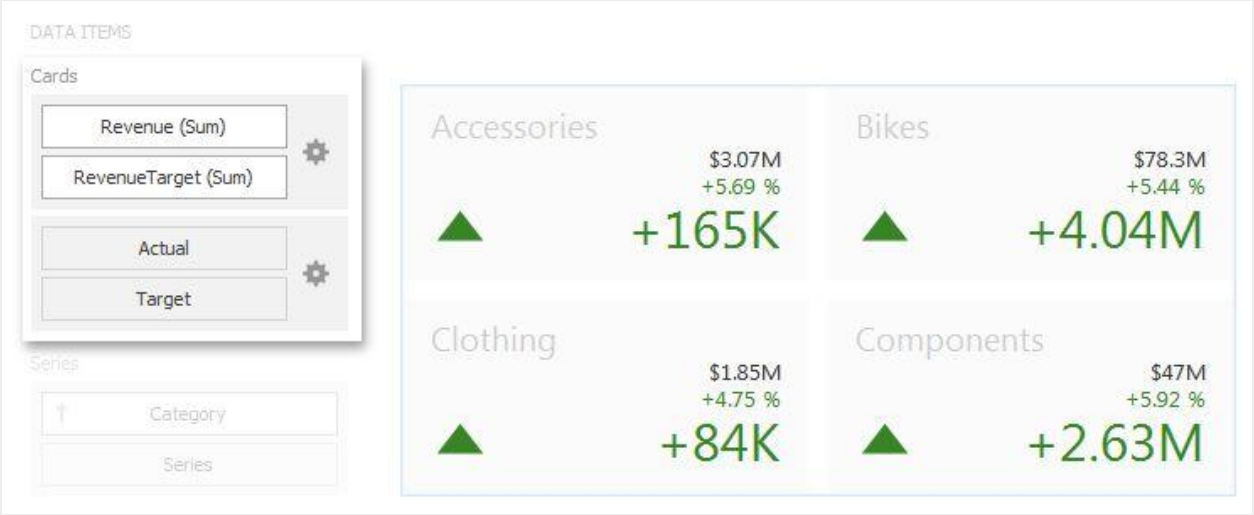
The only difference is in the data sections that these dashboard items have.



5.4.4.1.1 Data Sections

The Cards section contains data items used to calculate values displayed within cards.

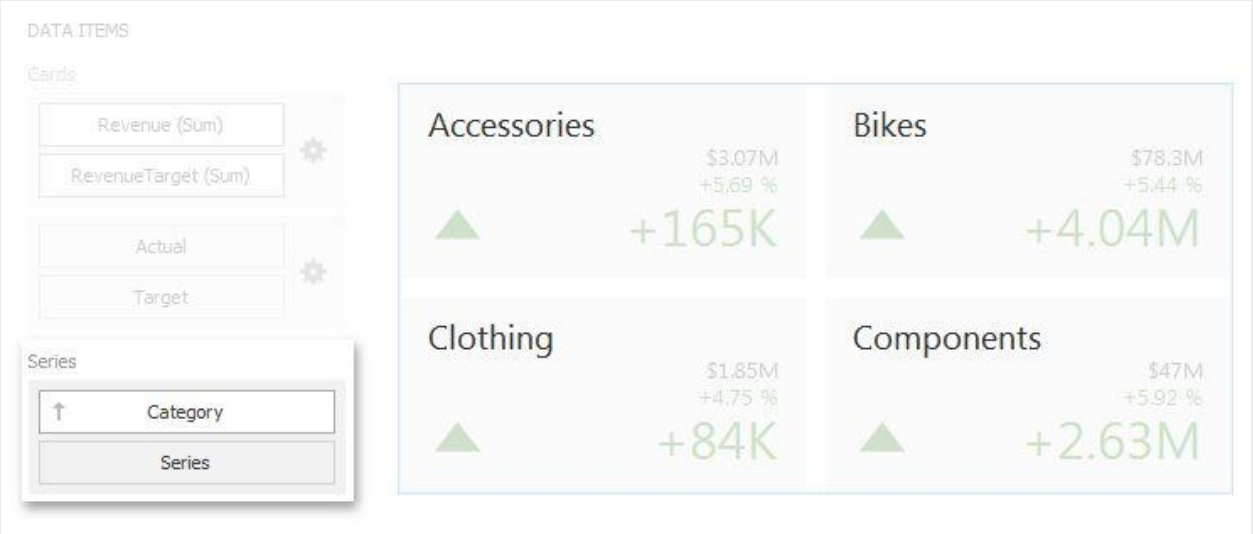
Data items are arranged in containers. Each data item container can hold two data items. The first item contains actual data and the second item (optional) contains target data. If both items are provided, cards show the difference between actual and target values.



If only one item is provided, cards display values from this item.

You can fill several data item containers in the Cards section and use the Values drop-down menu to switch between the provided values. To invoke the Values menu, click the icon in the dashboard item caption.

The Series section contains data items whose values are used to label cards.



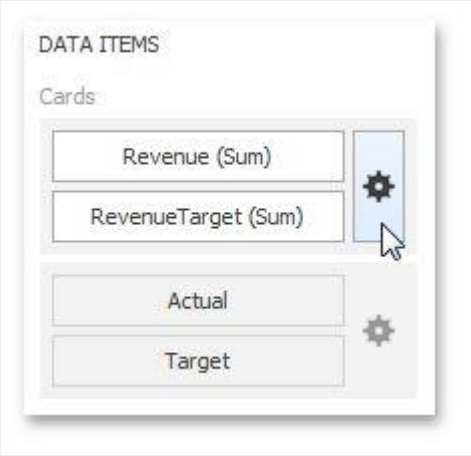
The Sparkline section is used to provide a date-time dimension whose data will be used to visualize values using sparklines.

5.4.4.2 Delta

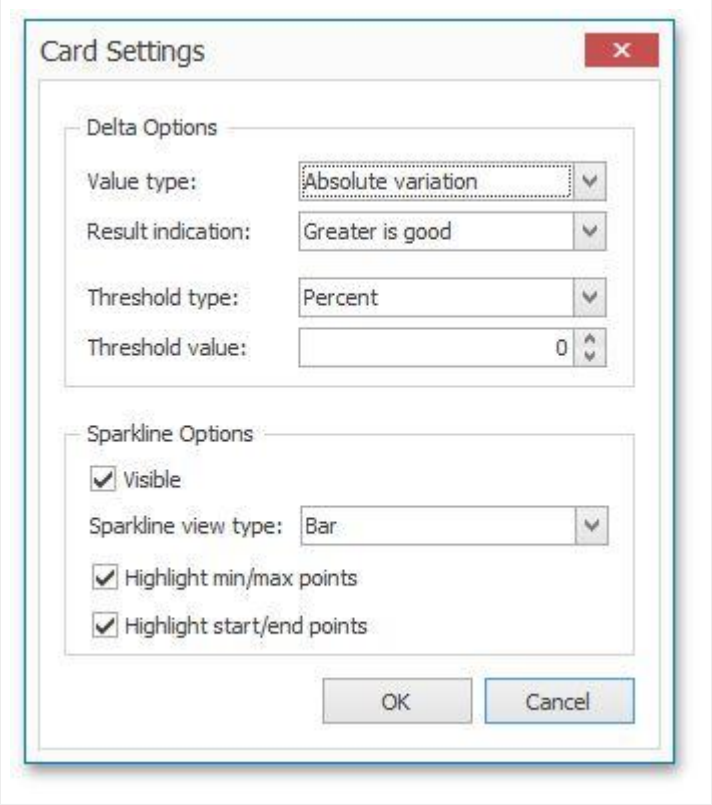
Cards allow you to display the difference between the actual and target values of a particular parameter. This difference is called delta.

Delta is shown with a delta indicator (indicating whether the actual value is less than or greater than the target value) and delta values (representing this difference as an absolute value or a variation).

To customize settings that relate to the calculation and display of deltas, use the options buttons (the  icon) displayed next to the data item container in the Cards section of the DATA ITEMS pane.



These buttons invoke the Card Settings dialog.



Use it to define the conditions for displaying delta indication, specify which delta values should be displayed, and introduce the comparison tolerance. This dialog also allows you to control various sparkline options.

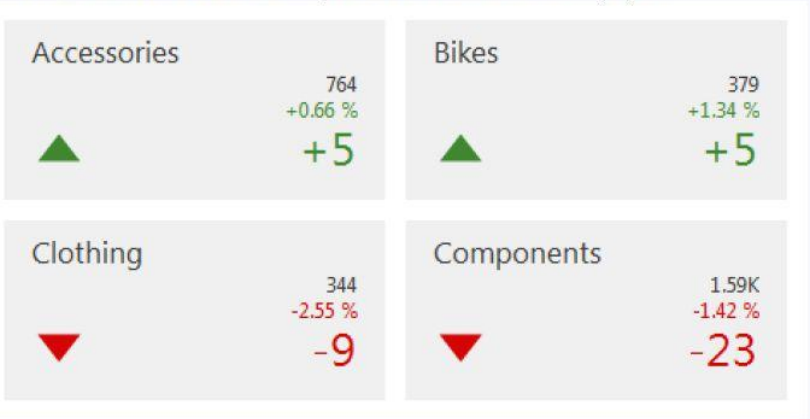
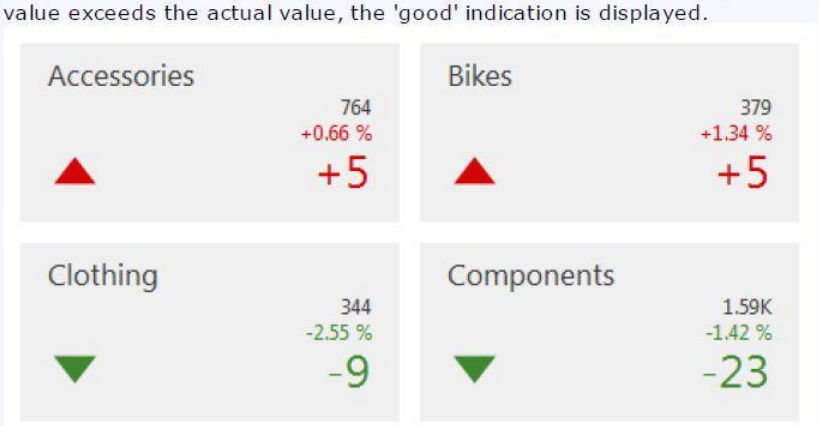
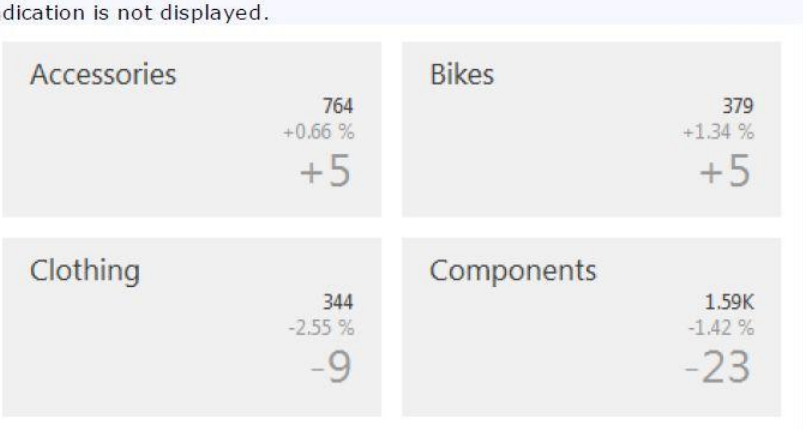
5.4.4.2.1 Delta Values

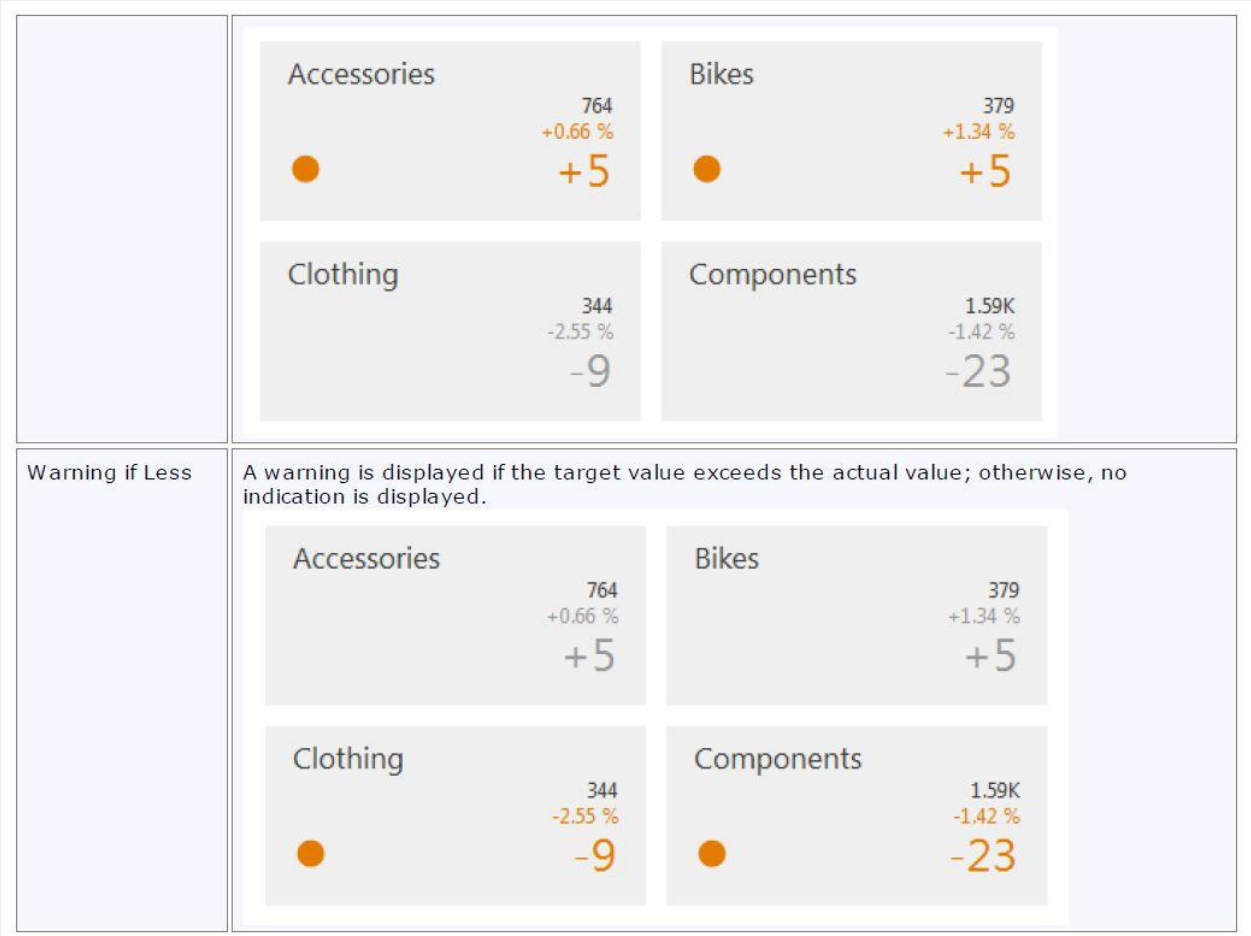
You can specify which values should be displayed within cards. Use the Value type combo box in the Card Settings window to select the value that will be displayed as the main delta value. Additional delta values are selected automatically.

Value Type	Result
Actual Value	Main: actual value Additional: absolute variation, percentage variation 
Absolute Variation	Main: absolute variation Additional: actual value, percentage variation 
Percentage Variation	Main: percentage variation Additional: actual value, absolute variation 
Percentage of Target	Main: percentage of target Additional: actual value, absolute variation 

5.4.4.2.2 Delta Indication

You can specify the condition for displaying delta indication. To do this, use the Result indication combo box in the Card Settings window.

Condition	Result
Greater is Good	The 'good' indication is displayed if the actual value exceeds the target value; if the target value exceeds the actual value, the 'bad' indication is displayed. 
Less is Good	The 'bad' indication is displayed if the actual value exceeds the target value; if the target value exceeds the actual value, the 'good' indication is displayed. 
No Indication	Indication is not displayed. 
Warning if Greater	A warning is displayed if the actual value exceeds the target value; otherwise, no indication is displayed.



5.4.4.2.3 Comparison Tolerance

The comparison tolerance allows you to create more advanced conditions for displaying delta indication. For instance, you can specify that a specific indication should be displayed when the actual value exceeds the target value by 10% or by $2K.

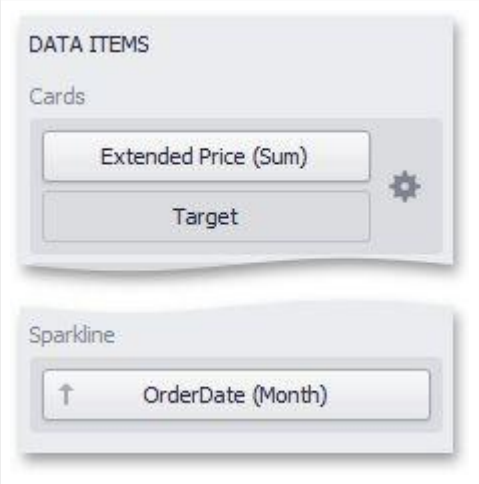
Use the Threshold type combo box to select whether you wish to specify the comparison tolerance in percentage values or in absolute values. Then use the Threshold value box to specify the comparison tolerance.

5.4.4.3 Sparkline

Sparklines can be used in cards to visualize the variation of actual (or target) values over time.

5.4.4.3.1 Data Binding Specifics

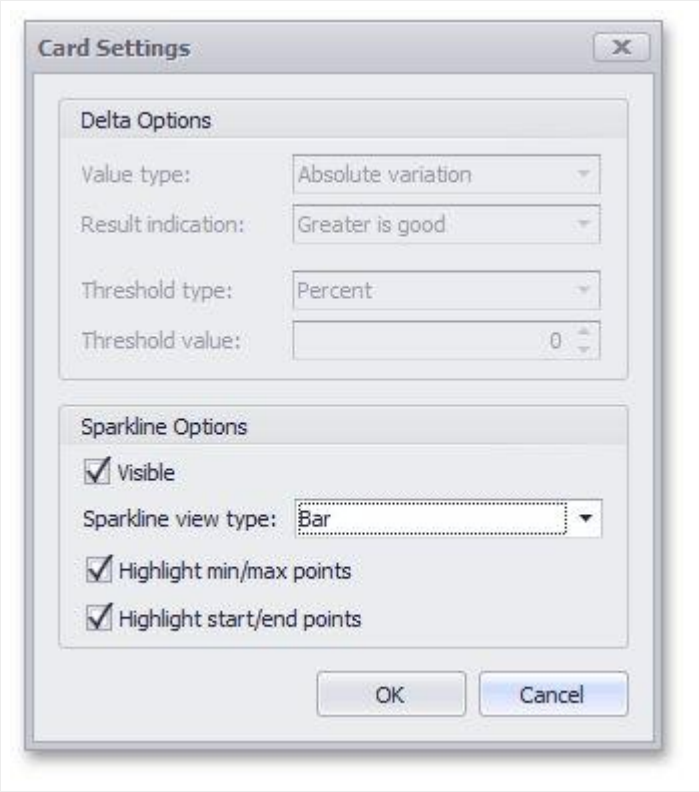
To display a sparkline within a card, provide a date-time dimension whose data will be used to visualize values over time.



Note that if you have provided both actual and target values, a sparkline visualizes the actual value's variation over time.

5.4.4.3.2 Sparkline Options

You can control sparkline appearance settings using the Card Settings dialog. To invoke this dialog, click the options button (the  icon) displayed next to the data item container.



In this dialog, you can control various settings that affect how the sparkline is displayed within a card.

Sparkline Options	Description
Visible	Specifies whether or not to show a sparkline within a card.
Sparkline view type	Defines the view type of a sparkline. Sparkline view types include **Area**, **Line**, **Bar** and **Win/Loss**.
Highlight min/max points	Specifies whether or not to highlight the minimum/ maximum points of a sparkline.
Highlight start/end points	Specifies whether or not to highlight the start/end points of a sparkline.

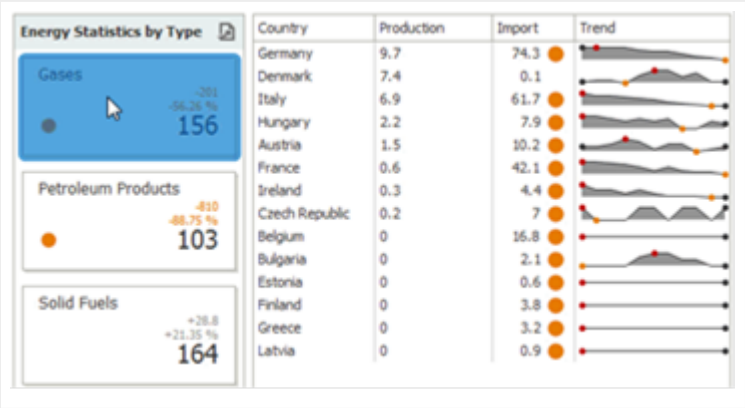
5.4.4.4 Interactivity

This section describes features that enable interaction between the Card dashboard item and other items. These features include Master Filtering and Drill-Down.

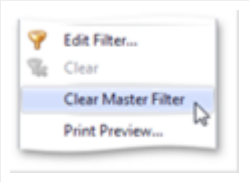
5.4.4.4.1 Master Filtering

The Dashboard designer allows you to use any data-aware dashboard item as a filter for the entire dashboard (Master Filter). To learn more about filtering concepts common to all dashboard items, see the Master Filtering topic.

When Master Filtering is enabled, you can click a card (or multiple cards by holding down the CTRL key) to make other dashboard items only display data related to the selected card(s).



To reset filtering, use the Clear Master Filter button (the  icon) in the caption of the Card dashboard item, or the Clear Master Filter command in the Card's context menu.

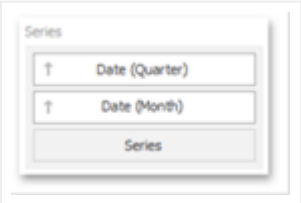


5.4.4.4.2 Drill-Down

The built-in drill-down capability allows you to change the detail level of data displayed in dashboard items on the fly. To learn more about drill-down concepts common to all dashboard items, see the Drill-Down topic.

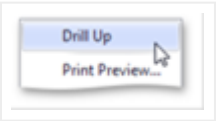
When drill-down is enabled, you can click a card to view the details.

Drill-down requires that the Series section contains several dimensions, from the least to the most detailed dimension.



To enable drill-down, click the Drill Down button in the Data Ribbon tab (or the  button if you are using the toolbar menu).

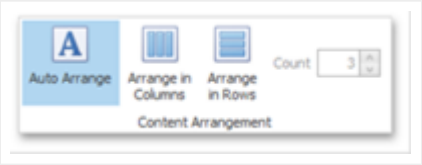
To return to the previous detail level (drill up), use the Drill Up button (the  icon) in the caption of the Card dashboard item, or the Drill Up command in the Card's context menu.

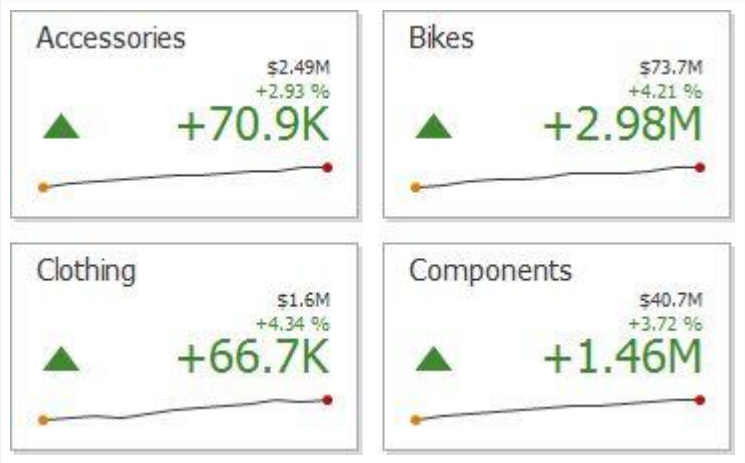


5.4.4.5 Layout

The Card dashboard item allows you to specify the number of columns or rows in which individual cards are arranged.

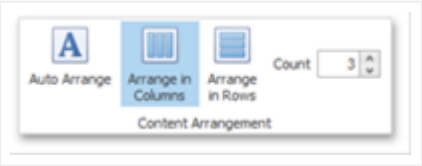
To control how cards are arranged, use the buttons in the Content Arrangement group of the Design Ribbon tab. The Auto Arrange option is enabled by default, which automatically resizes cards to fit within the dashboard item.

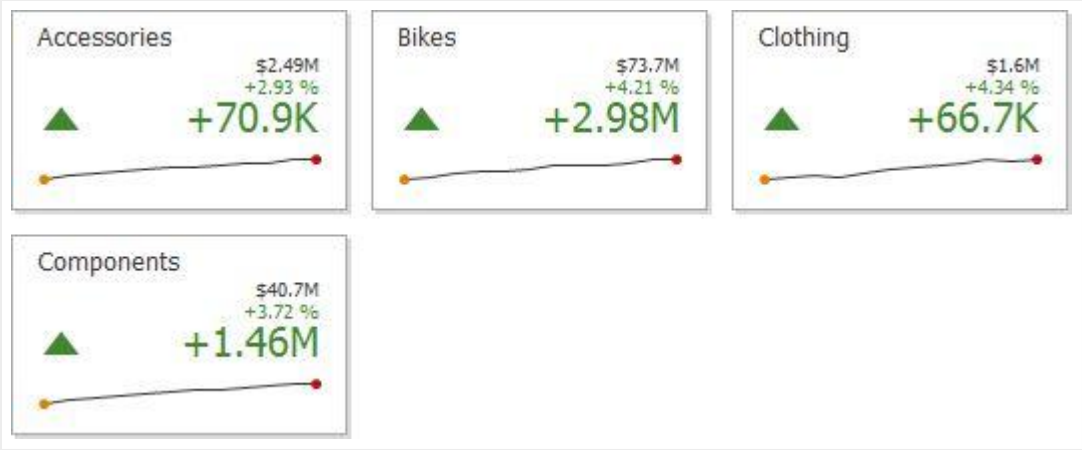




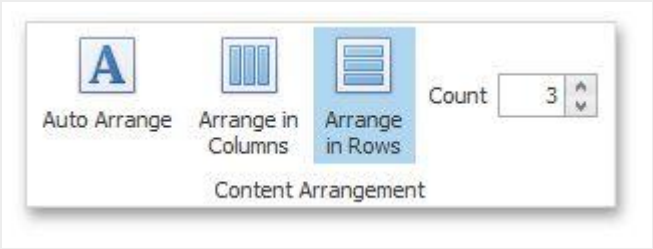
If you are using the toolbar menu, use the  button to enable this mode.

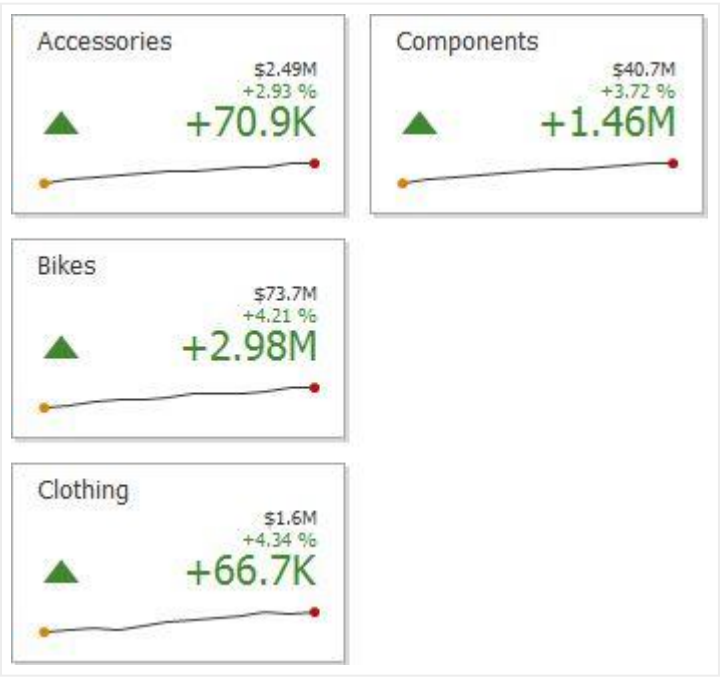
You can also specify the number of columns in which cards are arranged. Click the Arrange in Columns button (or the  button if you are using the toolbar menu) and specify the appropriate number in the Count field.





Similarly, you can arrange cards in a specific number of rows (use the  button if you are using the toolbar menu).





5.4.5 Gauges

The Gauge dashboard item displays a series of gauges. Each gauge can communicate two values - one with a needle and the other with a marker on the scale.

This section consists of the following subsections:

- Providing Data: Provides information about how to supply the Gauge dashboard item with data.
- Delta: Provides an overview of the Gauge dashboard item's capability to display the difference between two parameters.
- Gauge Scale: Describes options that relate to the gauge scales.
- Interactivity: Describes features that enable interaction between the Gauge dashboard item and other items.
- Layout: Describes layout options of the Gauge dashboard item.
- Style: Provides information about how to specify the gauge style.

5.4.5.1 Providing Data

This topic describes how to bind a Gauge dashboard item to data in the Dashboard Designer.

The Dashboard Designer allows you to bind various dashboard items to data in a virtually uniform manner (see Binding Dashboard Items to Data for details). The only difference is in the data sections that these dashboard items have.

5.4.5.1.1 Data Sections

The Gauges section contains data items used to calculate the values displayed by gauges.

Data items are arranged in containers. Each data item container can hold two data items. The first item contains actual data and the second item (optional) contains target data. If both items are provided, gauges show the difference between actual and target values.

If only one item is provided, gauges display values from this item.

You can fill several data item containers in the Gauges section and use the Values drop-down menu to switch between the provided values. To invoke the Values menu, click the icon in the dashboard item caption.

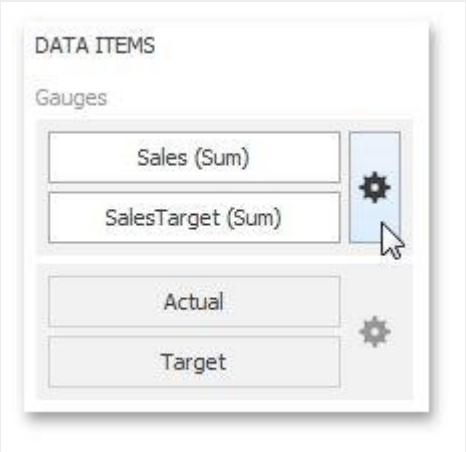
The Series section contains data items whose values are used to label gauges.

5.4.5.2 Delta

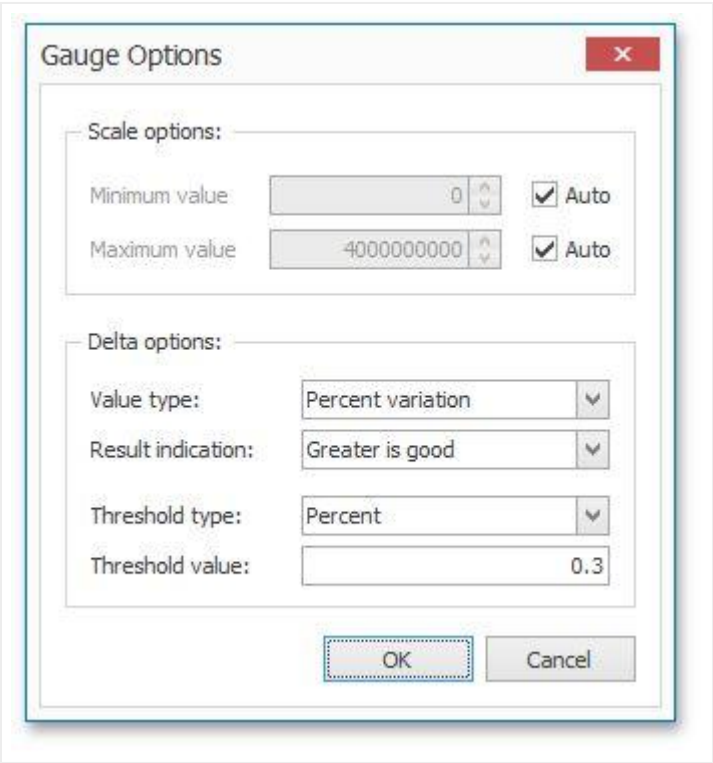
Gauges allow you to display the difference between the actual and target values of a particular parameter. This difference is called delta.

Delta is shown with a delta indicator (indicating whether the actual value is less than or greater than the target value) and delta values (representing this difference as an absolute value or a variation).

To customize settings that relate to the calculation and display of deltas, use the options buttons (the  icon) displayed next to the data item container in the Gauges section of the DATA ITEMS pane.



These buttons invoke the Gauge Options dialog.



Use it to define the condition for displaying delta indication, specify which delta values should be displayed, and introduce the comparison tolerance.

5.4.5.2.1 Delta Values

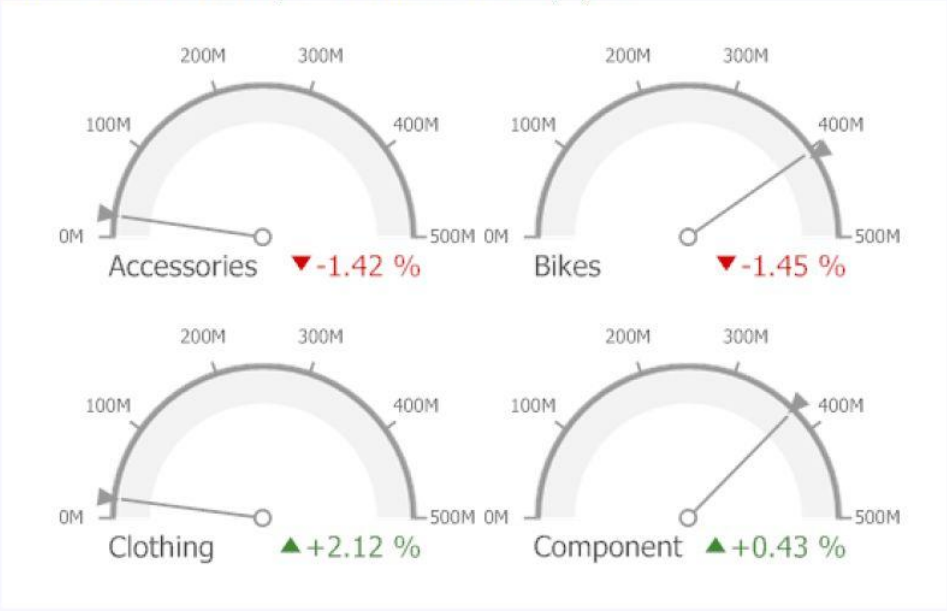
You can specify which values should be displayed within gauges. Use the Value type combo box in the Gauge Options window to select the value that will be displayed as the delta value.

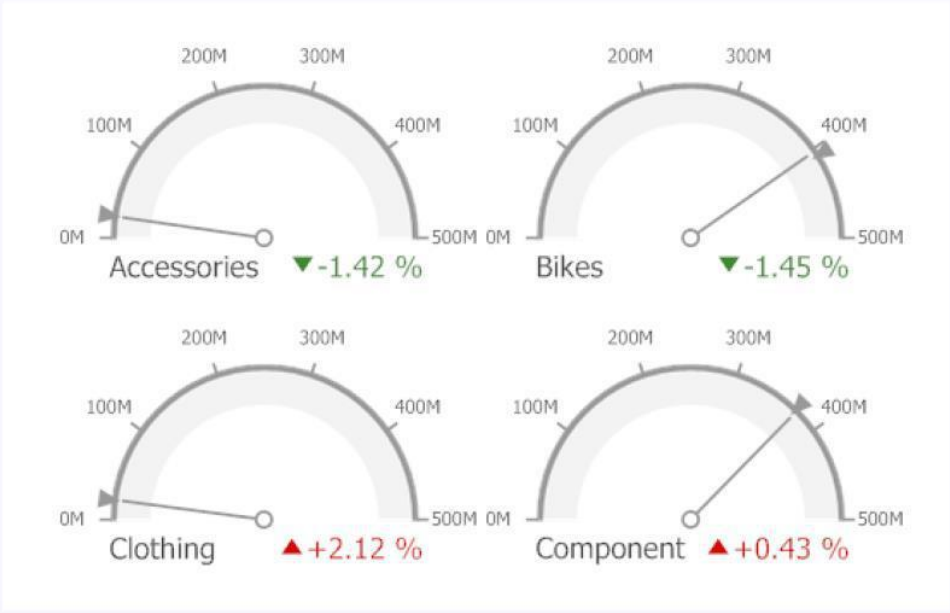
Value Type	Result
Actual Value	
Absolute Variation	

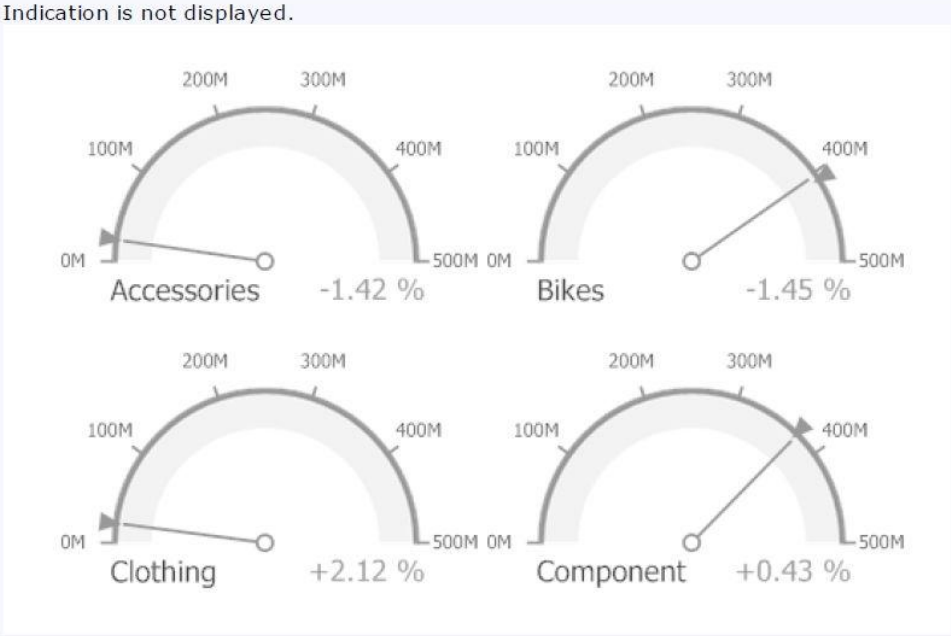
Percentage Variation	
Percentage of Target	

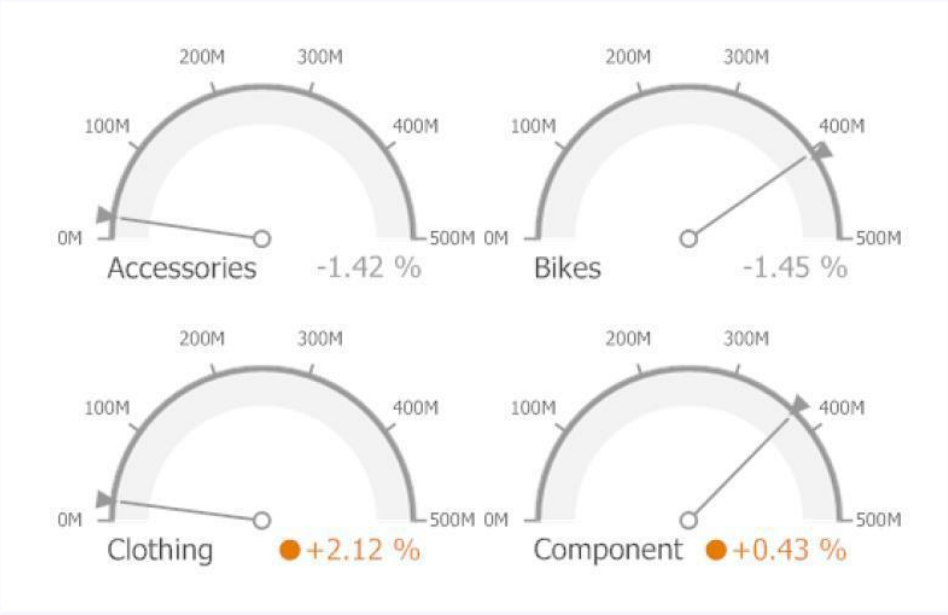
5.4.5.2.2 Delta Indication

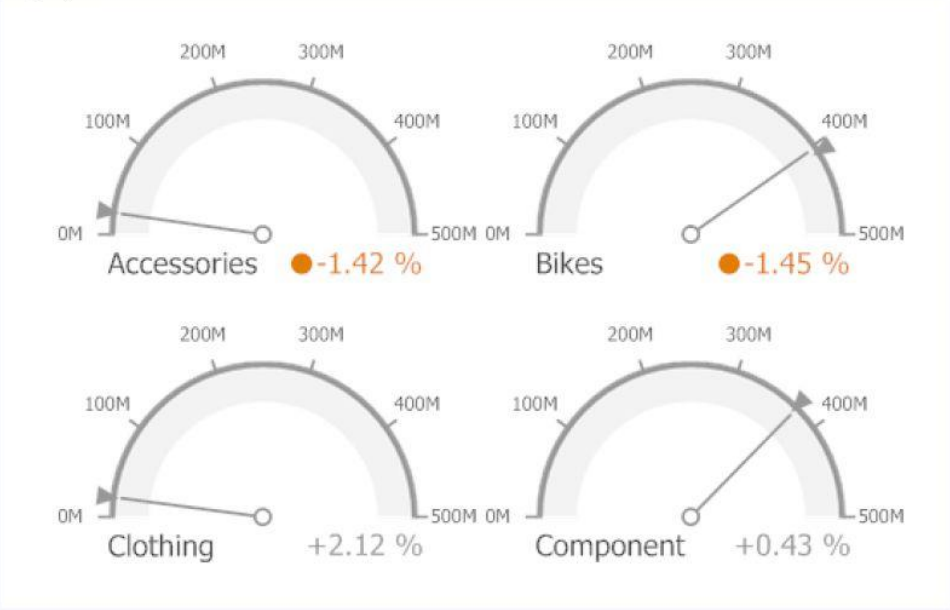
You can specify the condition for displaying delta indication. To do this, use the Result indication combo box in the Gauge Options window.

Condition	Result
Greater is Good	The 'good' indication is displayed if the actual value exceeds the target value; if the target value exceeds the actual value, the 'bad' indication is displayed. 
Less is Good	The 'bad' indication is displayed if the actual value exceeds the target value; if the target value exceeds the actual value, the 'good' indication is displayed.



No Indication	Indication is not displayed. 
Warning if Greater	A warning is displayed if the actual value exceeds the target value; otherwise, no indication is displayed.

Warning if Less	A warning is displayed if the target value exceeds the actual value; otherwise, no indication is displayed. 

5.4.5.2.3 Comparison Tolerance

The comparison tolerance allows you to create more advanced conditions for displaying delta indication. For instance, you can specify that a specific indication should be displayed when the actual value exceeds the target value by 10% or by $2K.

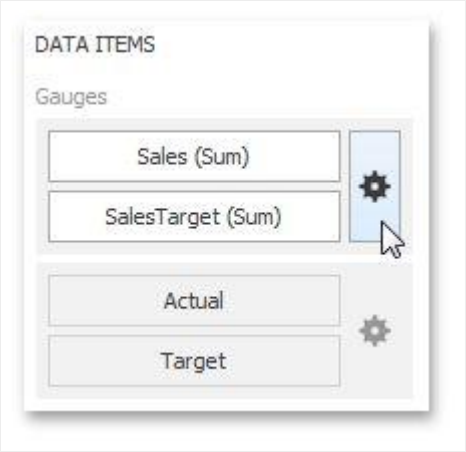
Use the Threshold type combo box to select whether you wish to specify the comparison tolerance in percentage values or in absolute values. Then use the Threshold value box to specify the comparison tolerance.

5.4.5.3 Gauge Scale

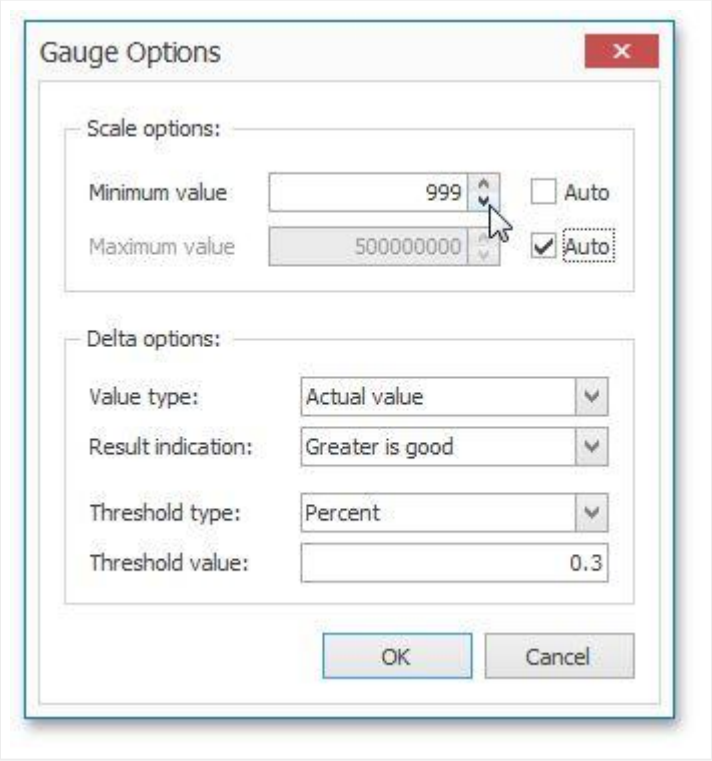
By default, the Gauge dashboard item automatically determines the range of the gauge scales based on the values they display.

You can override this behavior and specify the maximum and minimum values on the scale.

To do this, invoke the Gauge Options window using the Options button displayed in the data item container in the Gauges section of the DATA ITEMS pane.



In the Gauge Options window, uncheck the Auto check box for the maximum or minimum value, and specify this value in the corresponding field.



5.4.5.4 Interactivity

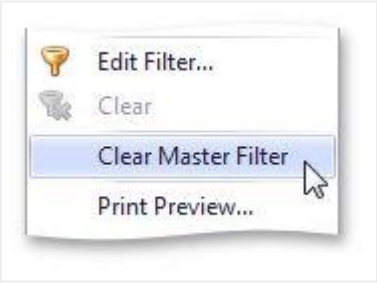
This section describes features that enable interaction between the Gauge dashboard item and other items. These features include Master Filtering and Drill-Down.

5.4.5.4.1 Master Filtering

The Dashboard designer allows you to use any data-aware dashboard item as a filter for the entire dashboard (Master Filter). To learn more about filtering concepts common to all dashboard items, see the Master Filtering topic.

When Master Filtering is enabled, you can click a gauge (or multiple gauges by holding down the CTRL key) to make other dashboard items only display data related to the selected gauge(s).

To reset filtering, use the Clear Master Filter button (the  icon) in the caption of the Gauge dashboard item, or the Clear Master Filter command in the Gauge's context menu.



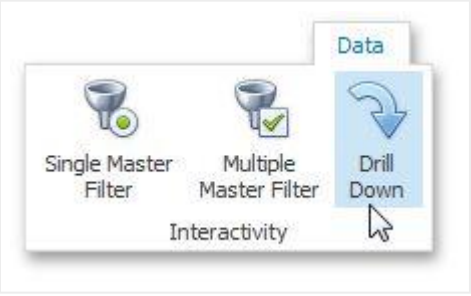
5.4.5.4.2 Drill-Down

The built-in drill-down capability allows you to change the detail level of data displayed in dashboard items on the fly. To learn more about drill-down concepts common to all dashboard items, see the Drill-Down topic.

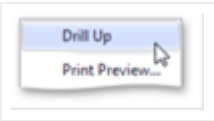
When drill-down is enabled, you can click a gauge to view the details.

Drill-down requires that the Series section contains several dimensions, from the least to the most detailed dimension.

To enable drill-down, click the Drill Down button in the Data Ribbon tab (or the  button if you are using the toolbar menu).



To return to the previous detail level (drill up), use the Drill Up button (the  icon) in the caption of the Gauge dashboard item, or the Drill Up command in the Gauge's context menu.



5.4.5.5 Layout

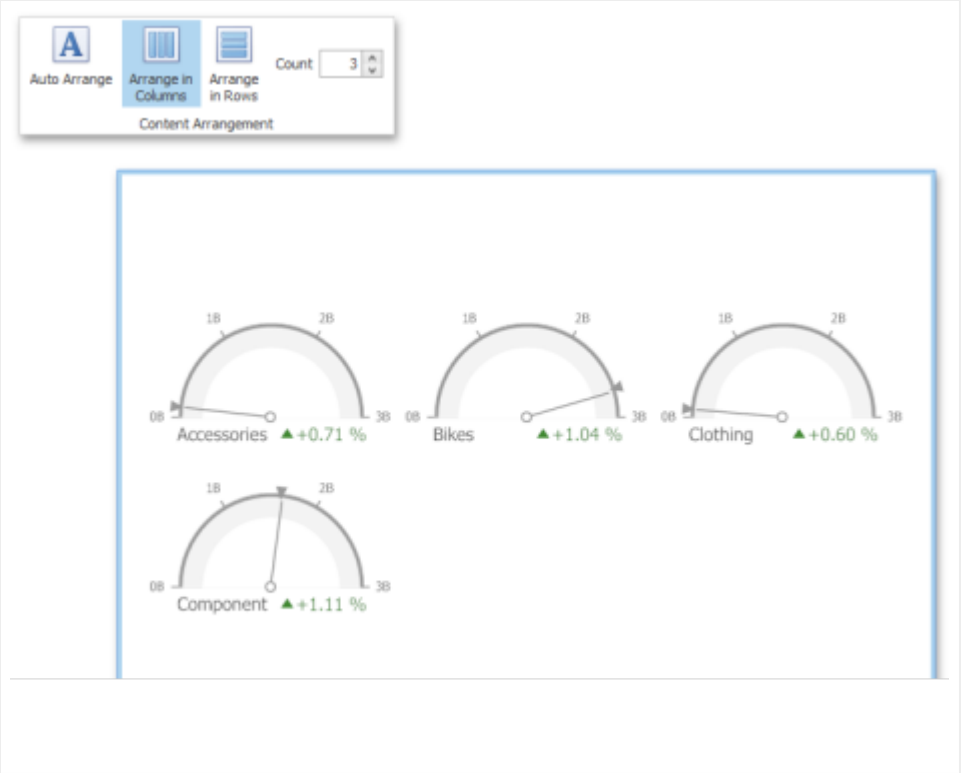
The Gauge dashboard item allows you to specify the number of columns or rows in which individual Gauges are arranged.

To control how Gauges are arranged, use the buttons in the Content Arrangement group of the Design Ribbon tab.

The Auto Arrange option is enabled by default, which automatically resizes Gauges to fit within the dashboard item.

If you are using the toolbar menu, use the  button to enable this mode.

You can also specify the number of columns in which Gauges are arranged. Click the Arrange in Columns button (or the  button if you are using the toolbar menu) and specify the appropriate number in the Count field.

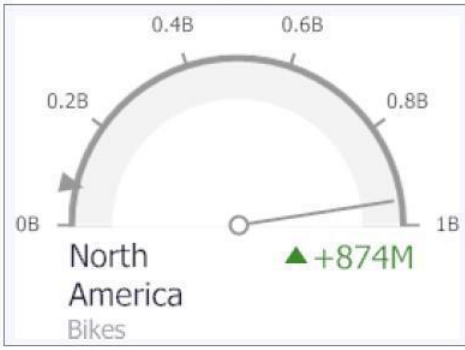


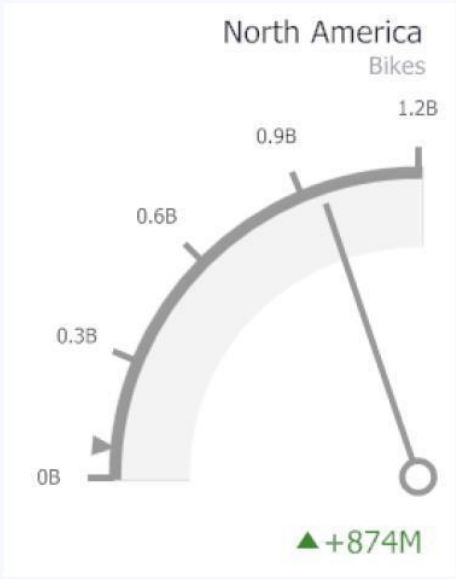
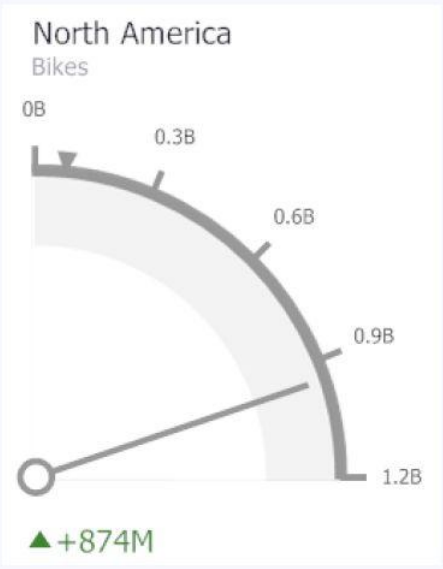
Similarly, you can arrange Gauges in a specific number of rows (use the  button if you are using the toolbar menu).

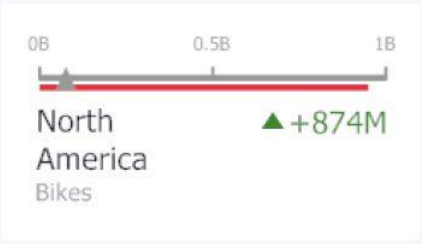
5.4.5.6 Style

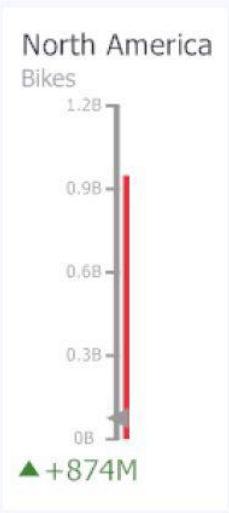
The Gauge dashboard item allows you to select the gauge type.

The following types are supported:

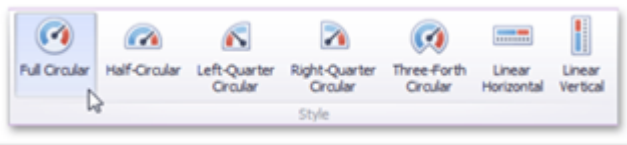
Full Circular	
Half Circular	

Left-Quarter Circular	
Right-Quarter Circular	

Three-Fourths Circular	
Linear Horizontal	

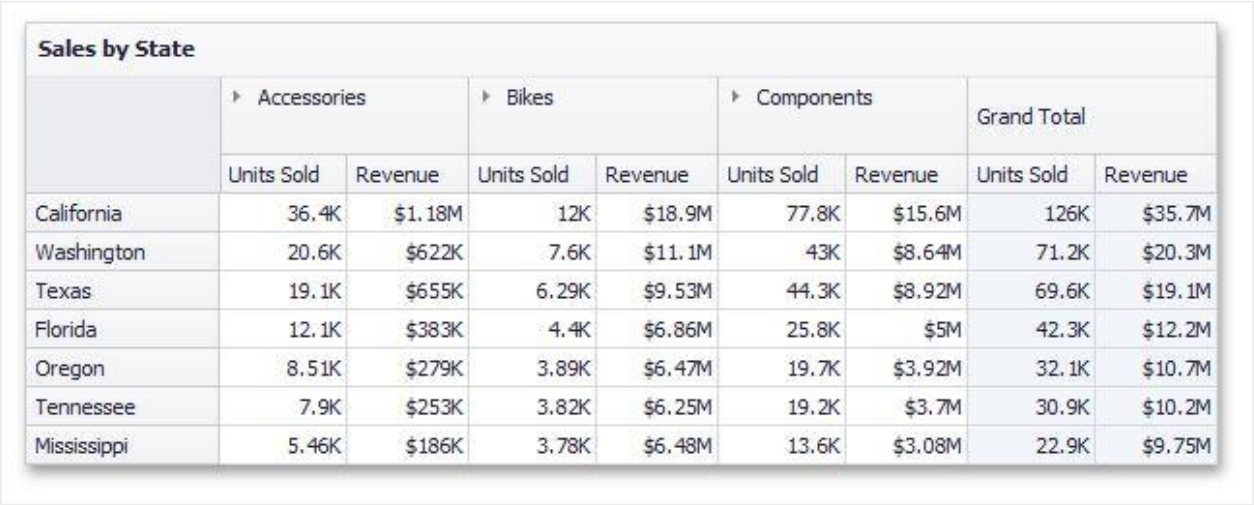
Linear Vertical	

To select the gauge type, use the buttons in the Style group of the Design Ribbon tab.



5.4.6 Pivot

The Pivot dashboard item displays a cross-tabular report that presents multi-dimensional data in an easy-to-read format.



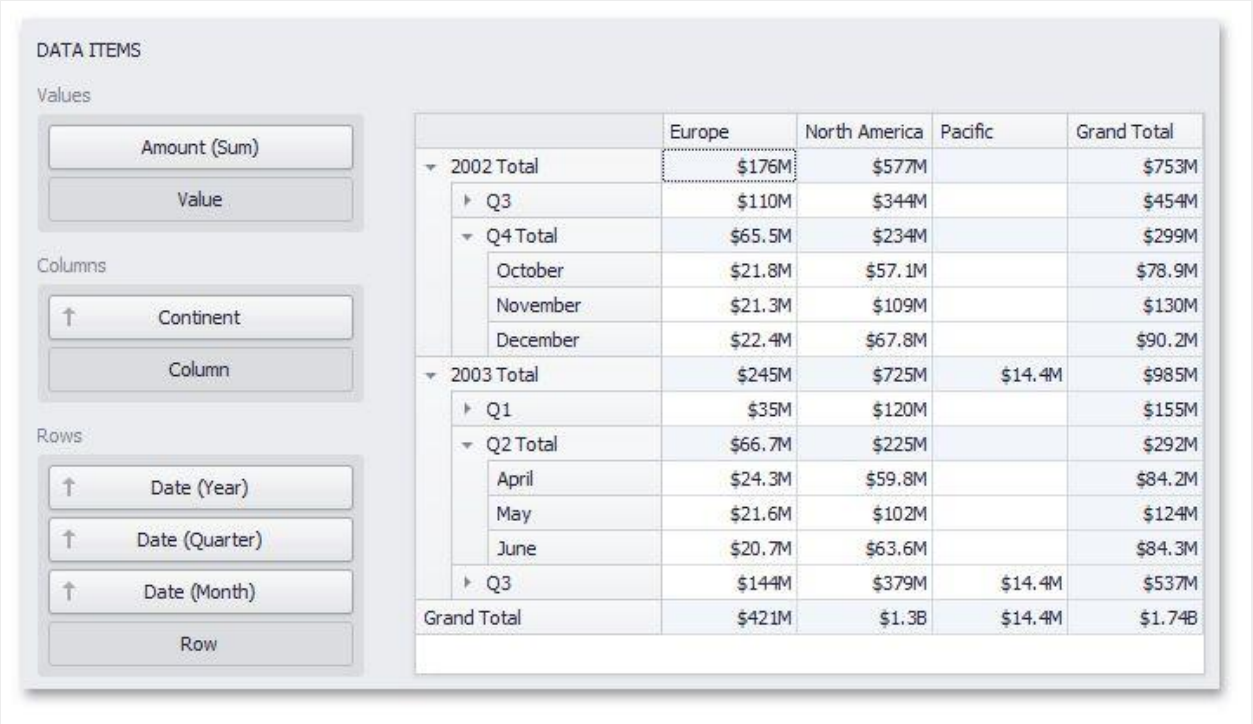
Sales by State

	Accessories		Bikes		Components		Grand Total	
	Units Sold	Revenue	Units Sold	Revenue	Units Sold	Revenue	Units Sold	Revenue
California	36.4K	$1.18M	12K	$18.9M	77.8K	$15.6M	126K	$35.7M
Washington	20.6K	$622K	7.6K	$11.1M	43K	$8.64M	71.2K	$20.3M
Texas	19.1K	$655K	6.29K	$9.53M	44.3K	$8.92M	69.6K	$19.1M
Florida	12.1K	$383K	4.4K	$6.86M	25.8K	$5M	42.3K	$12.2M
Oregon	8.51K	$279K	3.89K	$6.47M	19.7K	$3.92M	32.1K	$10.7M
Tennessee	7.9K	$253K	3.82K	$6.25M	19.2K	$3.7M	30.9K	$10.2M
Mississippi	5.46K	$186K	3.78K	$6.48M	13.6K	$3.08M	22.9K	$9.75M

5.4.6.1 Providing Data

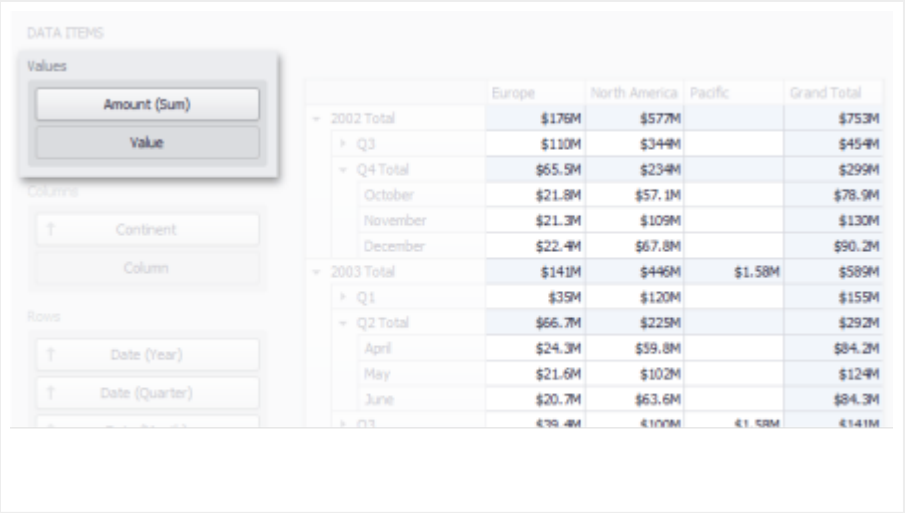
This topic describes how to bind a Pivot dashboard item to data in the Dashboard Designer.

The Dashboard Designer allows you to bind various dashboard items to data in a virtually uniform manner (see Binding Dashboard Items to Data for details). The only difference is in the data sections that these dashboard items have.

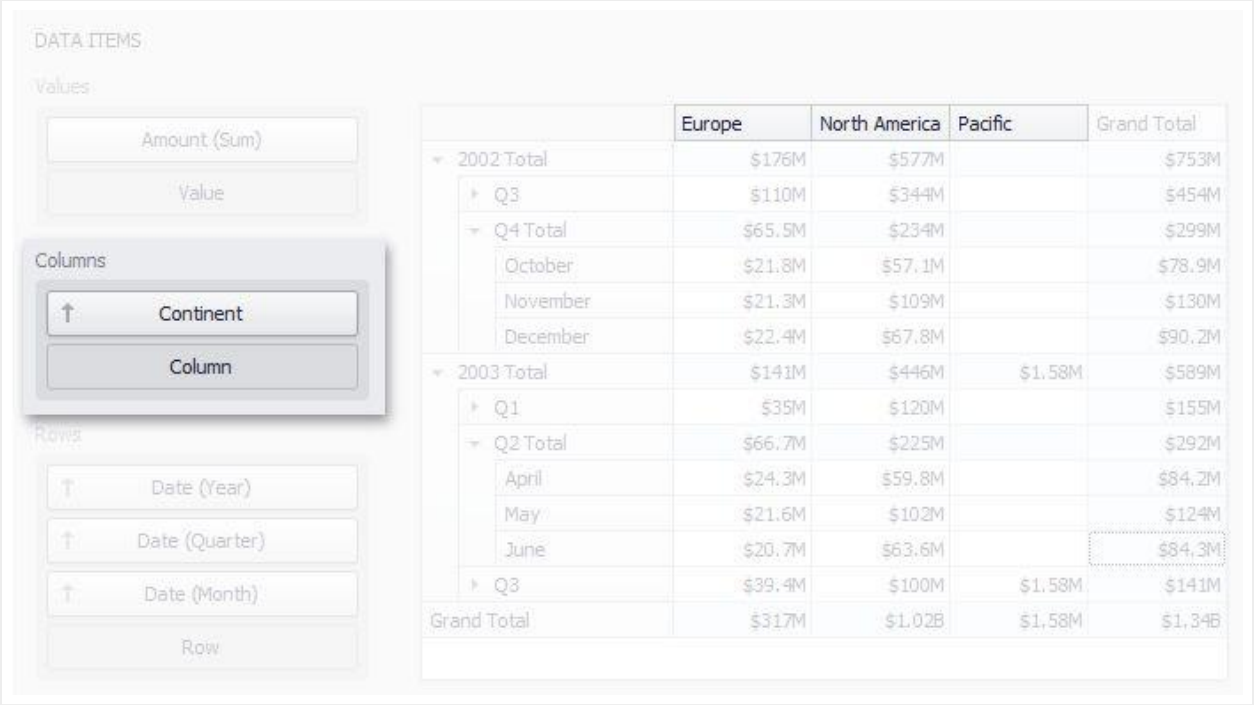


5.4.6.1.1 Data Sections

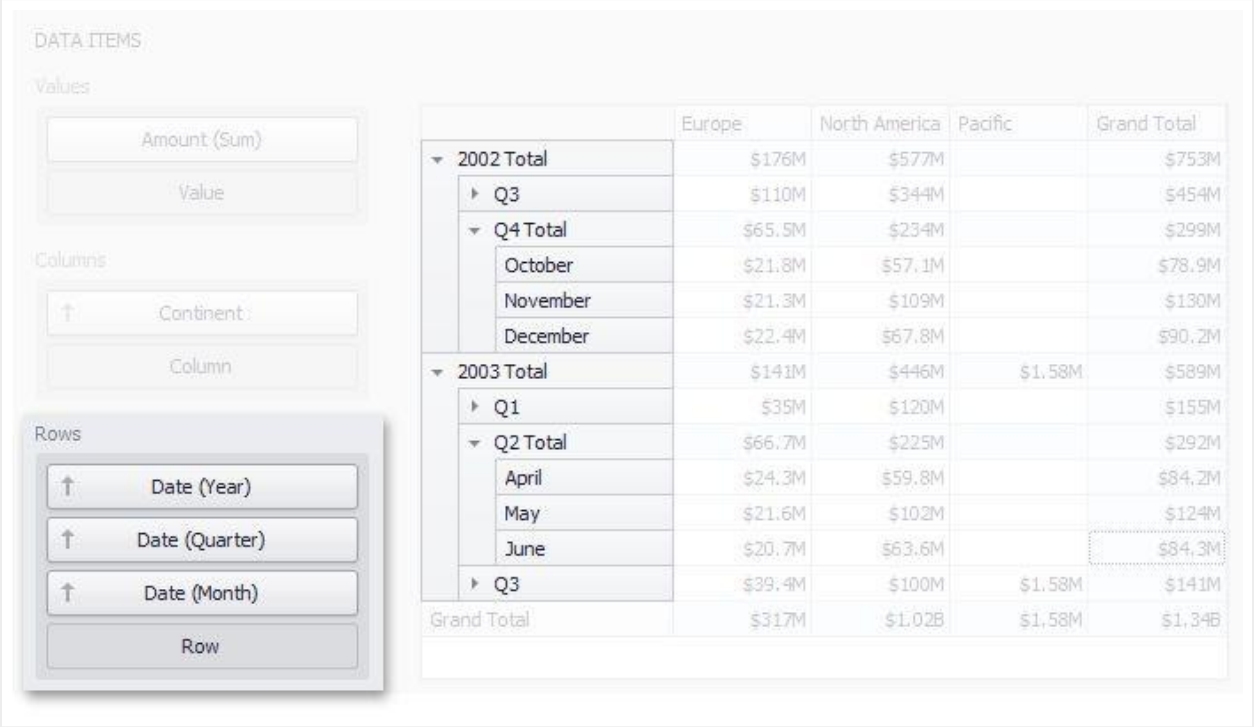
The Values section contains data items used to calculate values displayed in the pivot table.



The Columns section contains data items whose values are used to label columns.



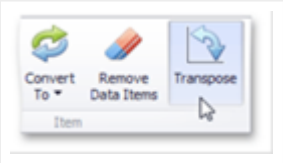
The Rows section contains data items whose values are used to label rows.



5.4.6.1.2 Transposition

The Pivot dashboard item provides the capability to transpose pivot columns and rows. In this case, data items contained in the Columns section is moved to the Rows section, and vice versa.

To transpose the selected Pivot dashboard item, use the Transpose button in the Home ribbon tab.



5.4.6.2 Layout

This topic describes how to control the pivot table layout.

5.4.6.2.1 Expanding and Collapsing Groups

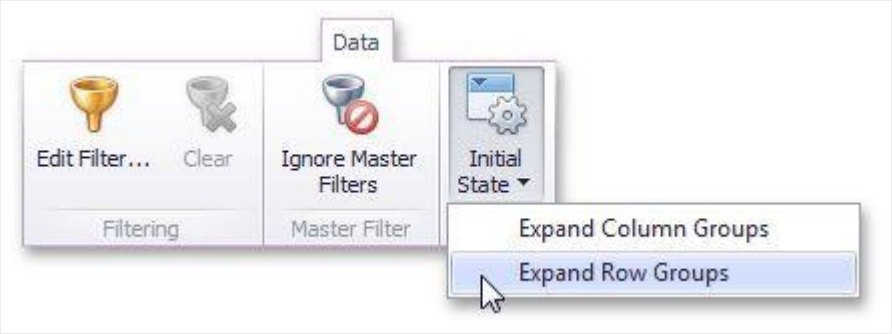
If the Columns section or Rows section contains several data items, the pivot table column and row headers are arranged in a hierarchy and make up column and row groups.

You can collapse and expand row and column groups using the and buttons.

5.4.6.2.2 Initial Collapsed State

The actual collapsed state of column and row groups in the Designer is not saved in the Dashboard. However, the Dashboard allows you to specify the collapsed state to be applied in the Viewer by default.

To do this, use the Initial State button in the Data Ribbon group (or the  button if you are using the toolbar menu).

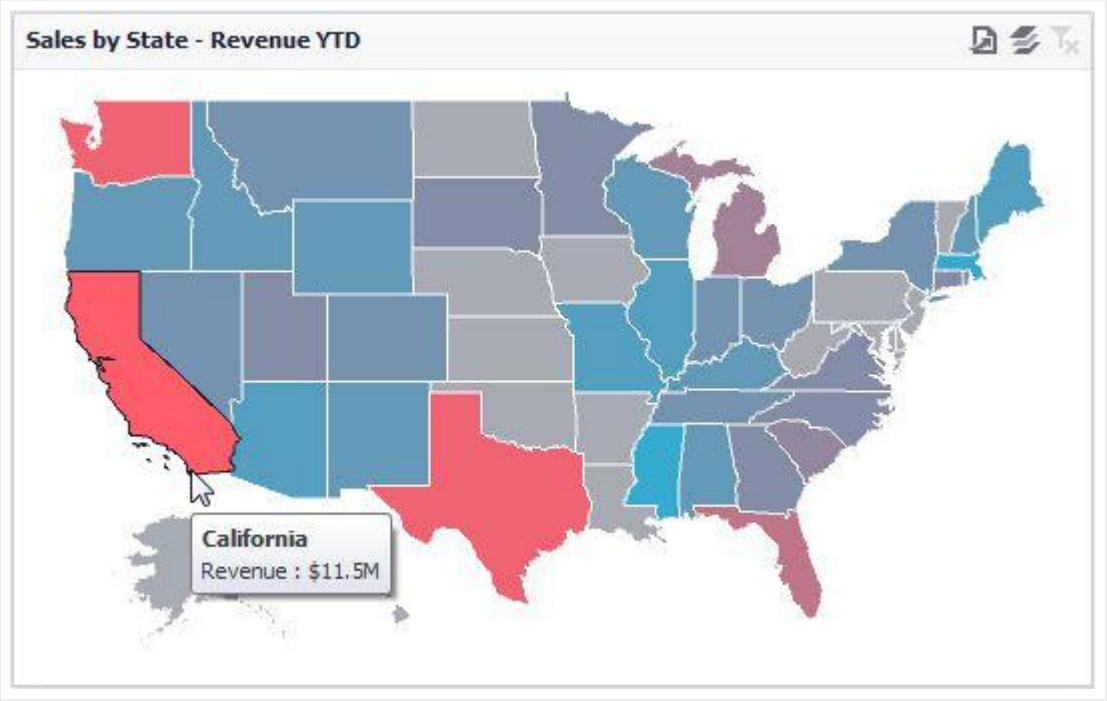


This button invokes a popup menu that allows you to select whether column and row groups should be collapsed or expanded by default in the Dashboard Viewer.

5.4.7 Choropleth Map

The topics in this section describe the features available in the Choropleth Map dashboard item.

The Choropleth Map dashboard item allows you to colorize the required areas in proportion to the provided values.



This section consists of the following subsections:

- Providing Maps: Describes how to use default dashboard maps or provide custom maps.
- Providing Data: Explains how to supply the Choropleth Map dashboard item with data.
- Map Coloring: Details how to color map shapes based on the values provided.
- Map Navigation: Explains how to manage map zooming and scrolling.
- Interactivity: Describes features that enable interaction between the Choropleth Map and other dashboard items.
- Labels: Describes how to display additional information related to map shapes.
- Legend: Explains the map legend and its options.

5.4.7.1 Providing Maps

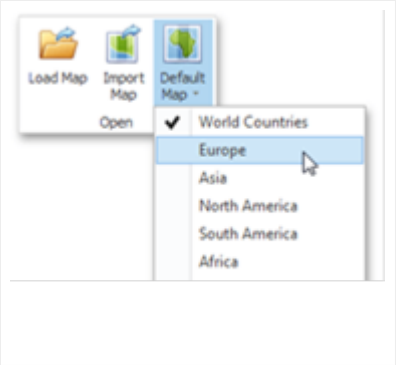
This document explains how to use the default netTerrain Dashboard maps or provide custom maps.

5.4.7.1.1 Default Maps

The netTerrain Dashboard Designer ships with a set of default maps showing various parts of the world. The following maps are included:

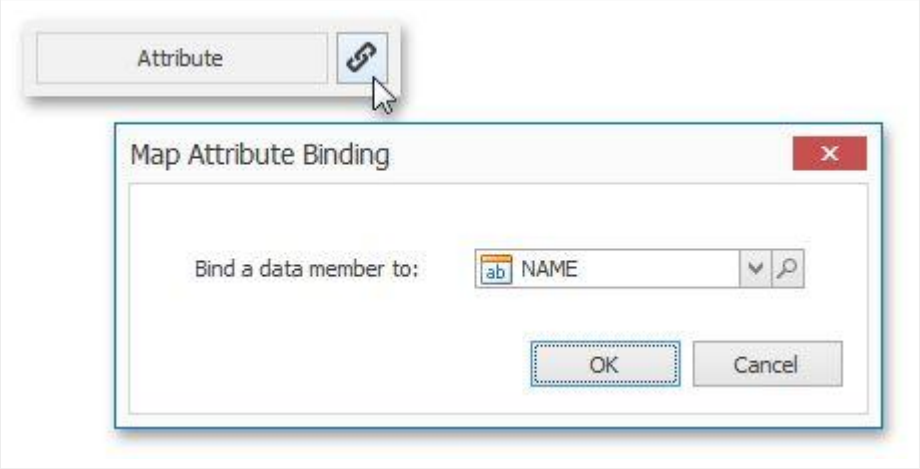
- World
- Europe
- Asia
- North America
- South America
- Africa
- USA
- Canada

To select the required default map, use the Default Map button in the Open group of the Design ribbon tab (or click the  button if you are using the toolbar menu).

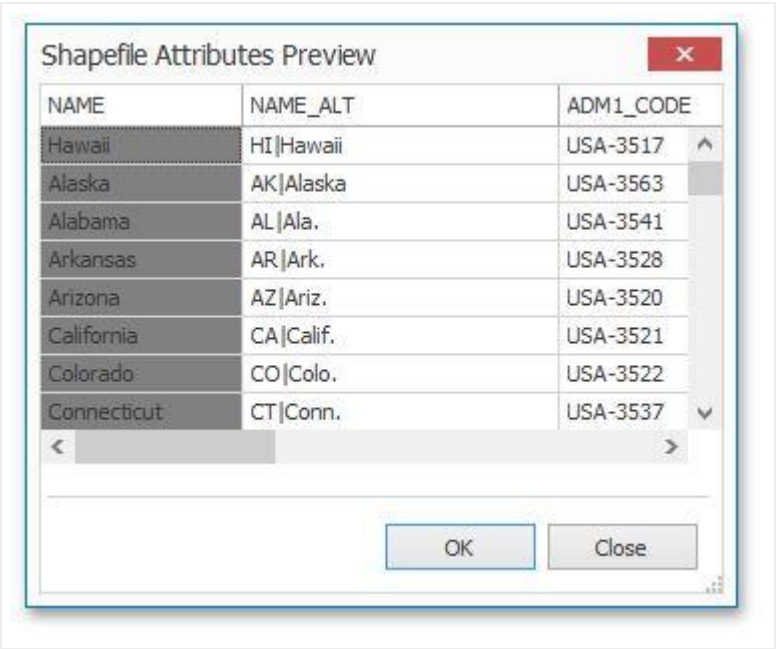


5.4.7.1.2 Map Attributes

After you select the default map or a custom map, you can view supplemental information (such as the name of the country, state, etc.). To do this, click the Options button next to the Attribute placeholder.



In the invoked Map Attribute Binding dialog, click Preview.



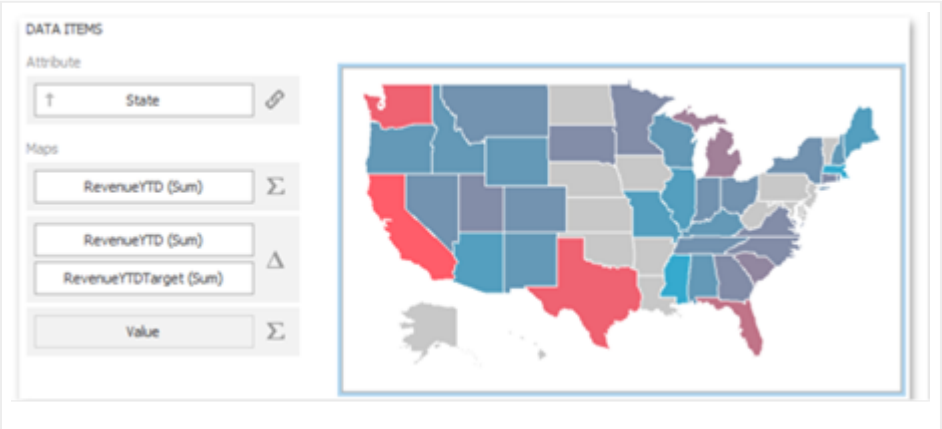
This table displays the available attributes for the current map. Each set of attribute values is related to a specific map shape.

5.4.7.2 Providing Data

This topic describes how to bind a Choropleth Map dashboard item to data using the Dashboard Designer. The Dashboard Designer allows you to bind various dashboard items to data in a virtually uniform manner (see Binding Dashboard Items to Data for details). The only difference is in the data sections that these dashboard items have.

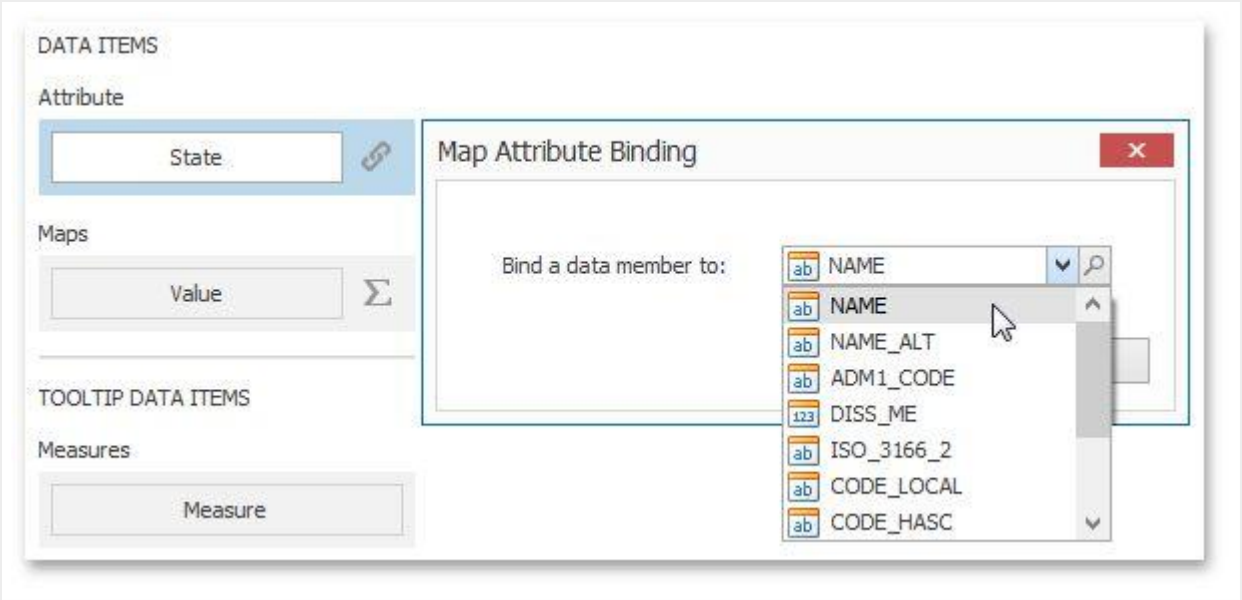
5.4.7.2.1 Data Sections

The Choropleth Map has the Attribute and Maps data sections.



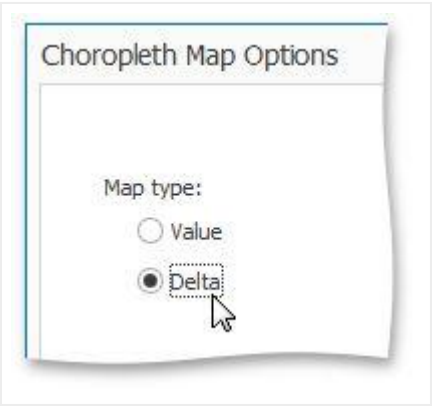
The Attribute data section contains the Attribute data item, which allows you to associate map shapes with data source field values.

To associate map shapes with data source field values, drag-and-drop the required dimension to the data item's placeholder and select the required attribute in the Map Attribute Binding dialog. To invoke this dialog, click the Options button (the  icon) next to the Attribute placeholder.



The Maps data section contains data items whose values are used to color map shapes. Map shape colors vary depending on the map type.

Click the Options button (the  icon) next to the Value placeholder and select the required map type in the invoked Choropleth Map Options dialog.

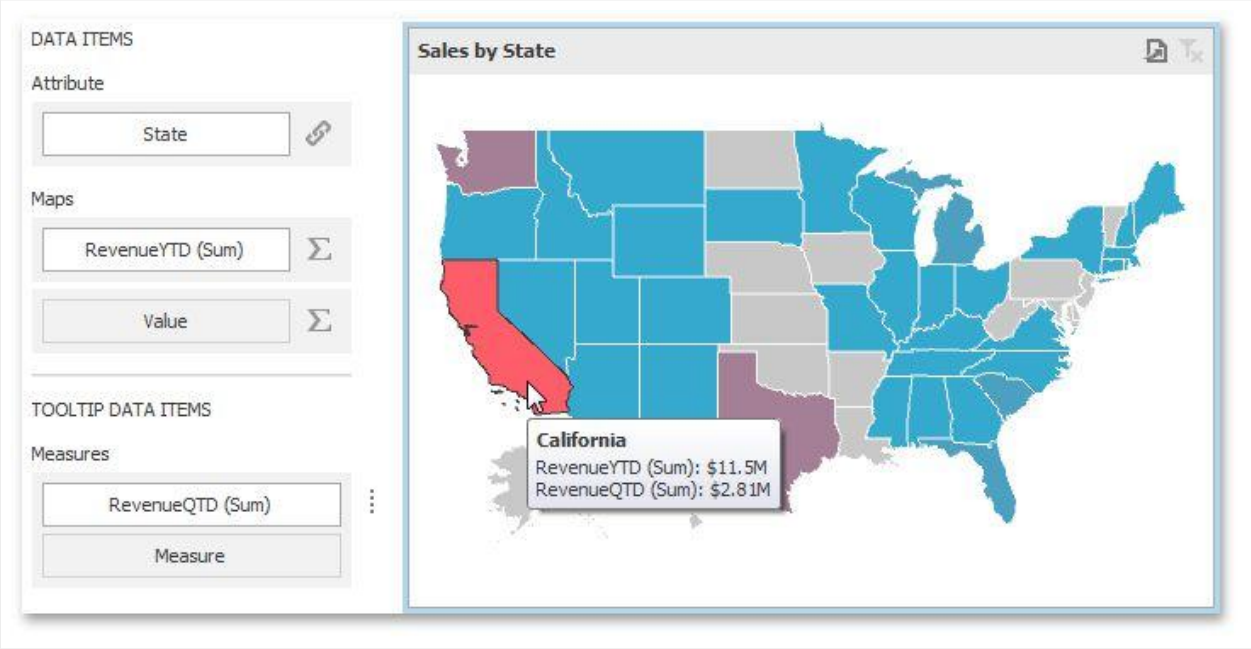


If you select Value, the Choropleth map colors map shapes based on the values provided. To learn more, see Map Coloring.

If you select Delta, the Choropleth map colors map shapes based on the difference between two values. To learn how to specify delta indication settings, see Delta.

5.4.7.2.2 Tooltip Data Items

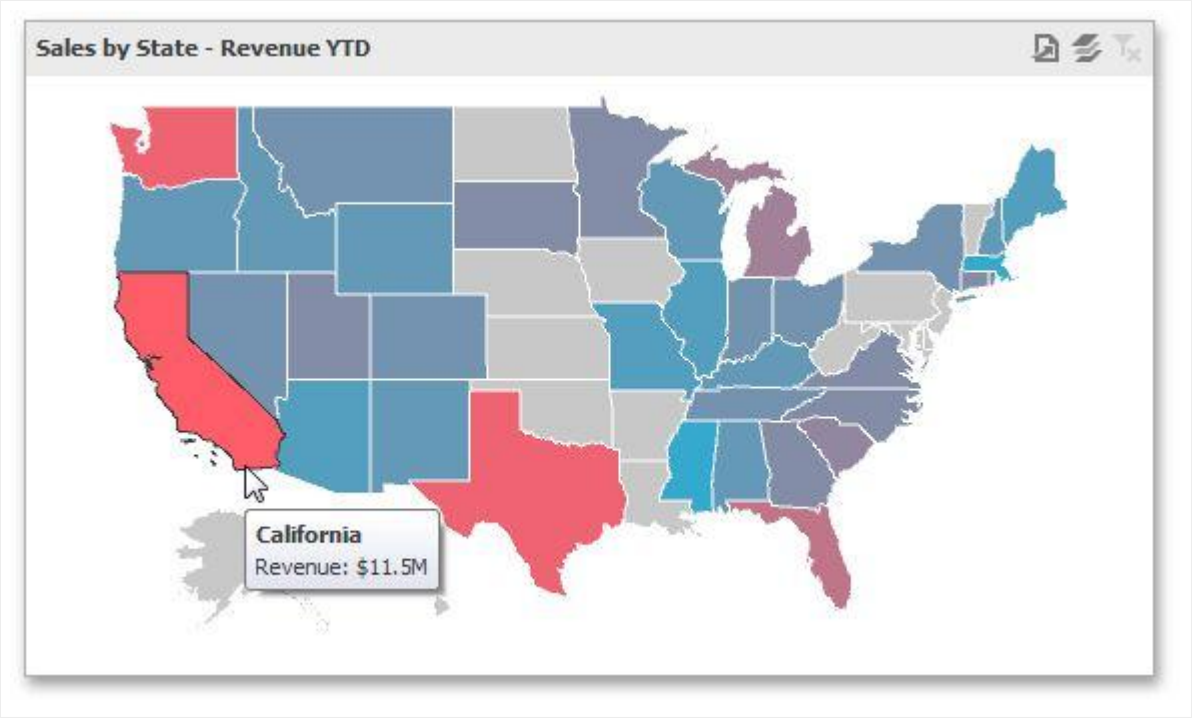
The Choropleth Map allows you to add supplementary content to the tooltips using the TOOLTIP DATA ITEMS area. Drag and drop the required measures to provide additional data.



5.4.7.3 Map Coloring

The Choropleth Map dashboard item colors map shapes depending on the data provided.

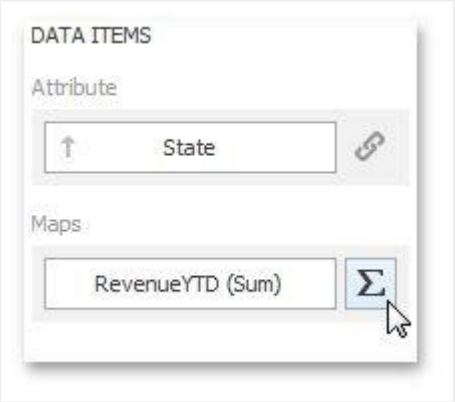
For instance, you can visualize a sales amount or population density.



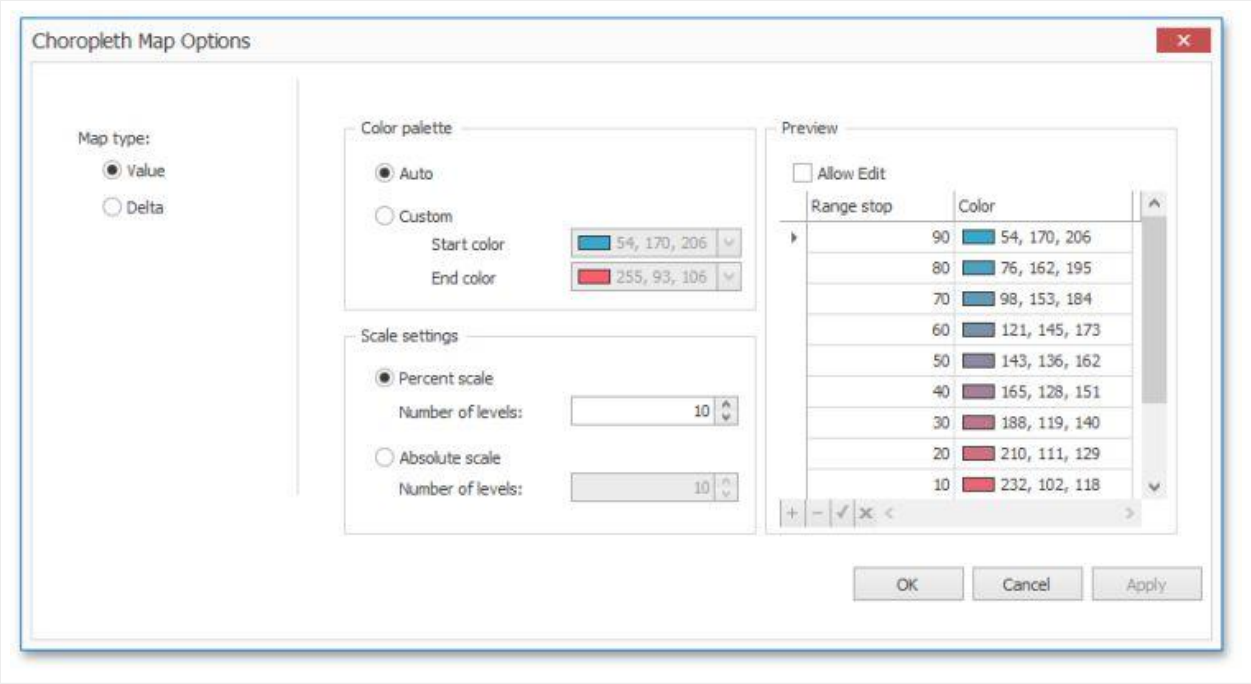
5.4.7.3.1 Palette and Scale Settings

The Choropleth Map automatically selects palette and scale settings to color map shapes.

If you need to customize these settings, click the Options button next to the data item that contains these values.



This invokes the Choropleth Map Options dialog.



You can specify the following settings in this window:

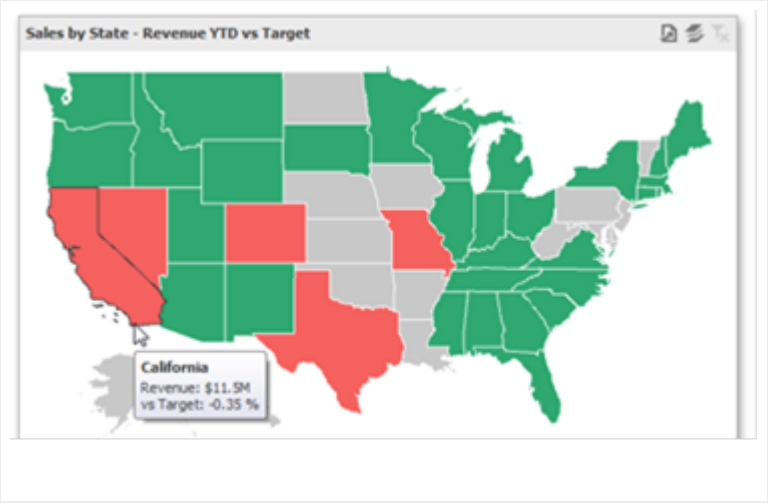
- Color palette - allows you to specify the start and end color of the palette.
- Scale settings - specifies whether a percent scale or an abs olute scale is used to define a set of colors. You can specify the number of levels that represent the number of colors used to color the map.
- Preview is used to display a full set of palette colors generated based on the start/end colors and the number of levels. Use the Allow Edit check box to automatically change the generated colors or specify value ranges for each color.

To learn how to display a map legend, see Legend.

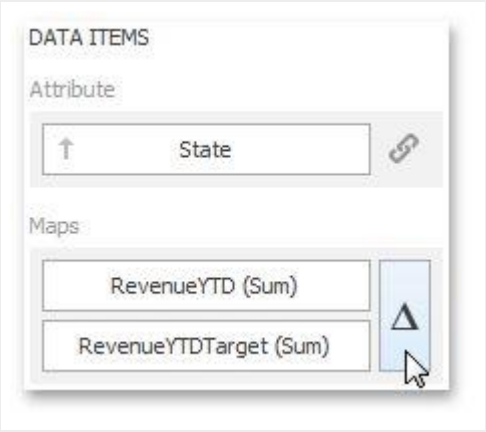
Also, the Choropleth Map allows you to visualize the difference between the actual and target values of a particular parameter. To learn more, see the Delta topic.

5.4.7.3.2 Delta

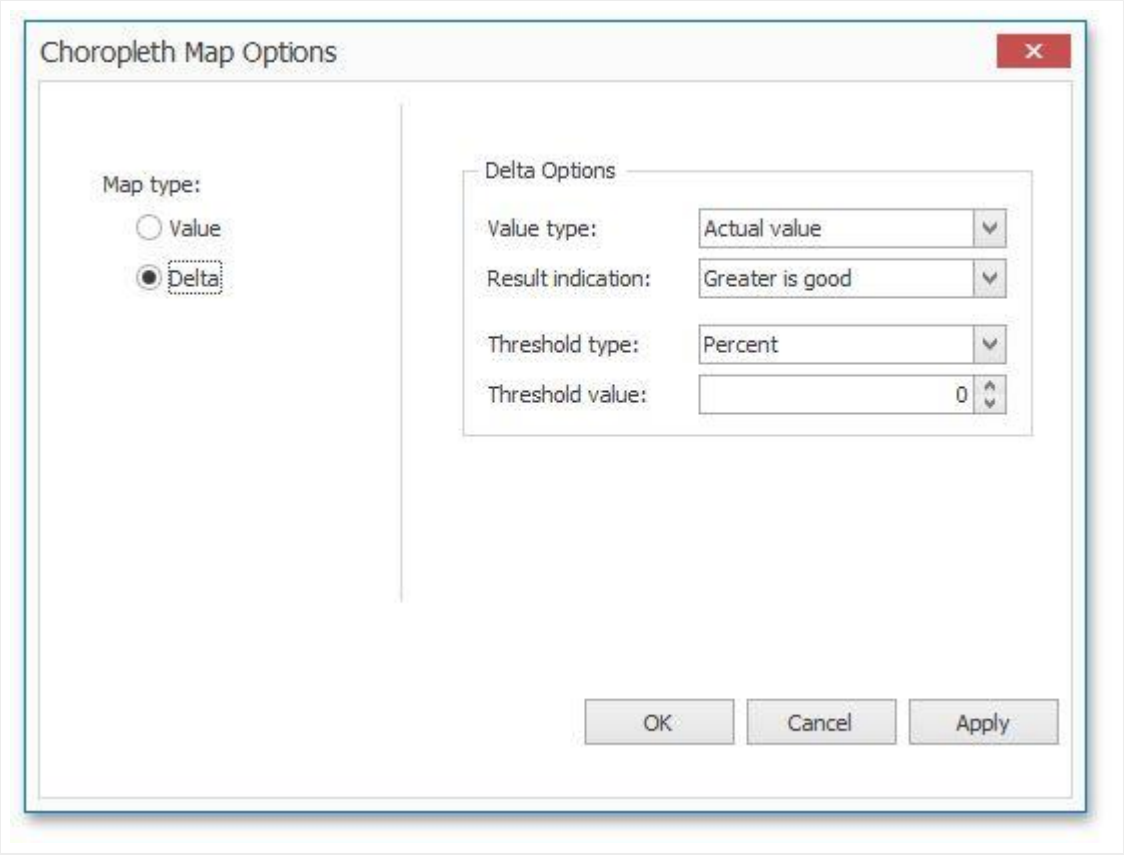
The Choropleth Map allows you to indicate the difference between the actual and target values of a particular parameter. This difference is called delta.



To specify delta indication settings, click the Options button next to the data item container.

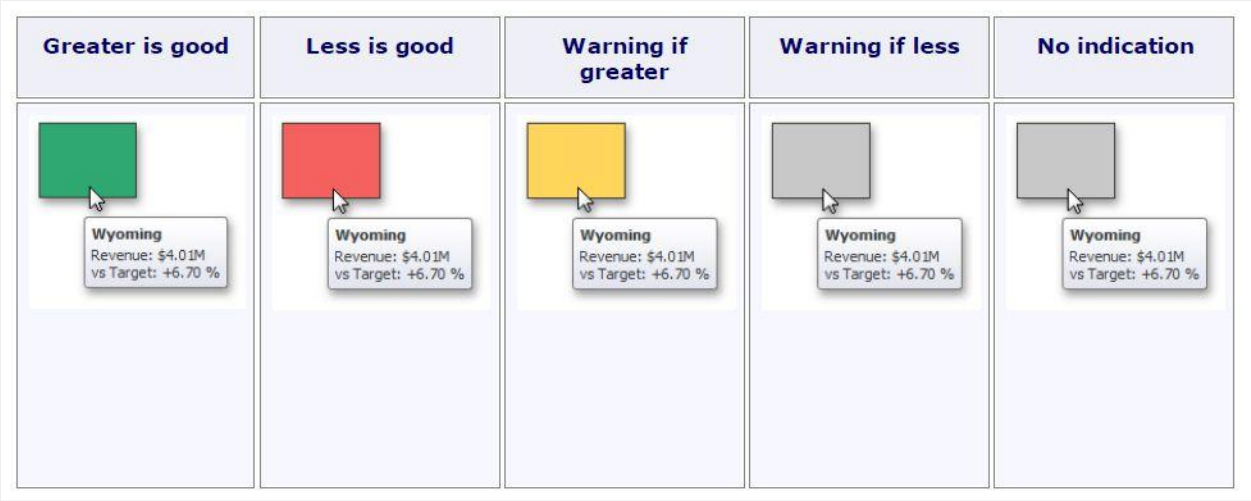


This invokes the Choropleth Map Options dialog. When the map type is set to Delta, this dialog contains the following settings:



- Value type: You can specify which values to display within map tooltips. Use the Value type combo box to select the value that will be displayed as the delta value.

- Result Indication: You can specify the condition that will be used to select the indicator color. To do this, use the Result indication combo box.



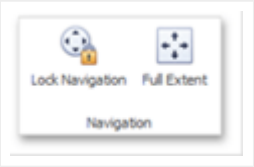
- Threshold type and Threshold value: You can specify that a required indicator should only be displayed when the difference between the actual and target values exceeds a specified value. For instance, the actual value exceeds the target value by 10%, or by $2K. Use the Threshold type combo box to select whether you wish to specify the threshold in percentage values or in absolute values. Then use the Threshold value box to specify the threshold value.

5.4.7.4 Map Navigation

The Choropleth Map dashboard item allows end-users to perform navigation actions such as zooming and scrolling.

The Dashboard Designer allows you to specify the initial zooming/scrolling state for the Choropleth map using the mouse.

You can disable the capability to scroll/zoom the map using the Lock Navigation button in the Design ribbon tab.



Use the Full Extent button to display the entire map within the dashboard item.

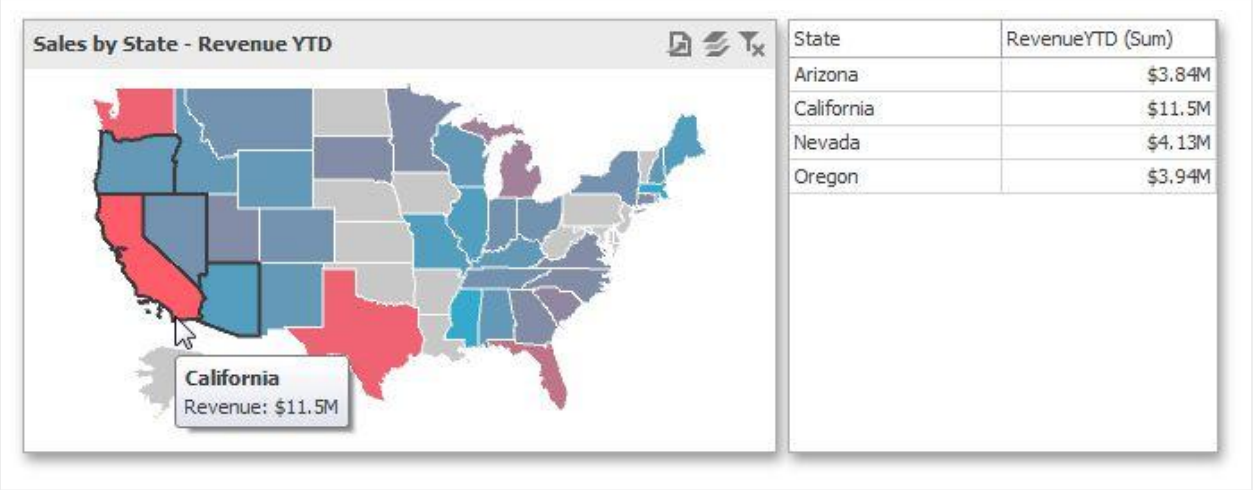
5.4.7.5 Interactivity

This section describes features that enable interaction between the Choropleth Map dashboard item and other items.

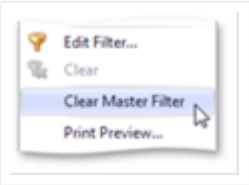
5.4.7.5.1 Master Filtering

The Dashboard designer allows you to use any data-aware dashboard item as a filter for the entire dashboard (Master Filter). To learn more about filtering concepts common to all dashboard items, see the Master Filtering topic.

When Master Filtering is enabled, you can click a shape (or multiple shapes by holding down the CTRL key) to make other dashboard items only display data related to the selected shape(s).



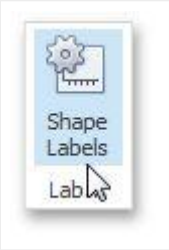
To reset filtering, use the Clear Master Filter button (the  icon) in the caption of the Choropleth Map dashboard item, or the Clear Master Filter command in the map's context menu.



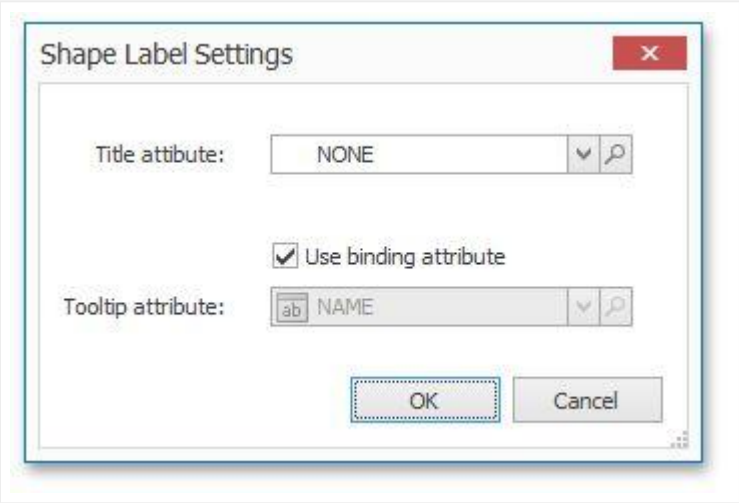
5.4.7.6 Labels

A Choropleth map provides the capability to display titles within map shapes and allows you to manage which data to show in the shape tooltips.

To manage map titles and tooltips, click the Shape Labels button in the Design ribbon tab.



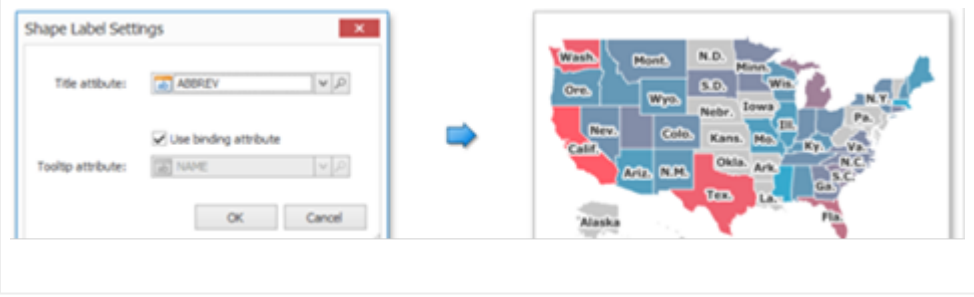
This invokes the Shape Label Settings dialog.



In this dialog, you can specify attributes whose values will be displayed within shapes and tooltips. Use the button to preview the available attributes and their values for the current map.

5.4.7.6.1 Shape Titles

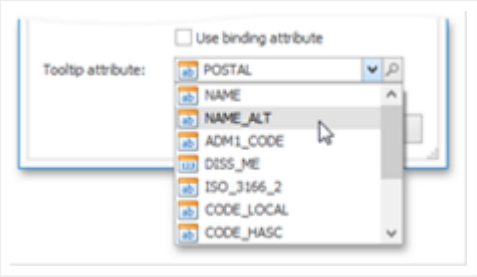
The Title attribute option allows you to select the attribute whose values are displayed within corresponding map shapes.



5.4.7.6.2 Tooltips

The Choropleth Map dashboard item displays a tooltip that shows information related to a hovered shape.

You can choose whether to use a binding attribute to display as the title of shape tooltips (the Use binding attribute checkbox) or specify a custom attribute using the Tooltip attribute option.



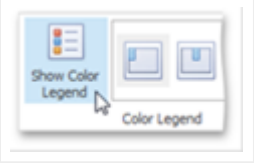
The Choropleth Map also allows you to add supplementary content to the tooltips using the TOOLTIP DATA ITEMS area. To learn more, see the Tooltip Data Items paragraph in the Providing Data topic.

5.4.7.7 Legend

A legend is an element of a map that shows values corresponding to each color.

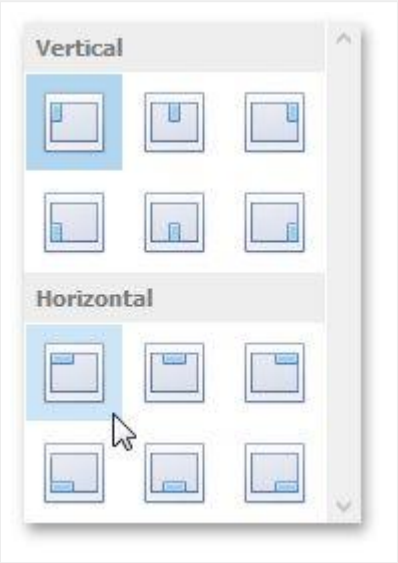
5.4.7.7.1 Visibility

To display a legend within a map, use the Show Legend button in the Legend group of the Design Ribbon tab.



5.4.7.7.2 Position and Orientation

To specify the legend's position and orientation, select one of the predefined options from the gallery in the Design Ribbon tab.



5.4.8 Range Filter

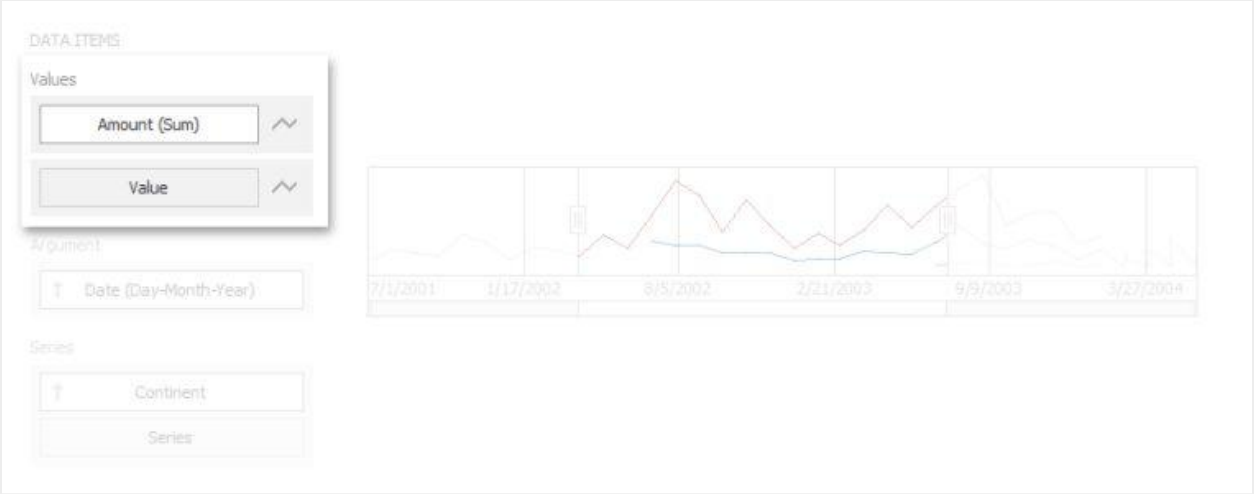
The Range Filter dashboard item allows you to apply filtering to other dashboard items. This item displays a chart with selection thumbs that allow you to filter out values displayed along the argument axis.

5.4.8.1 Providing Data

This topic describes how to bind a Range Filter dashboard item to data in the Dashboard Designer. The Dashboard Designer allows you to bind various dashboard items to data in a virtually uniform manner (see Binding Dashboard Items to Data for details). The only difference is in the data sections that these dashboard items have.

5.4.8.1.1 Data Sections

The Values section contains data items for calculating the Y-coordinates of data points.



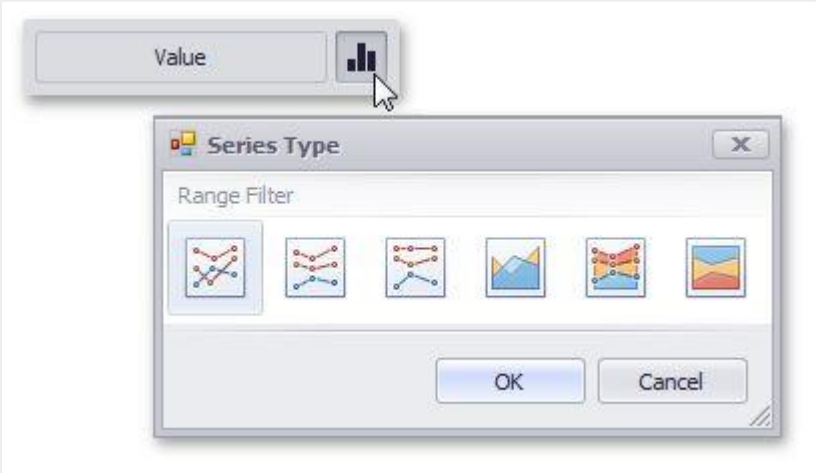
The Arguments section contains data items that provide values displayed along the horizontal axis of the Range Filter. Filtering is performed based on these values.

The Series section contains data items whose values are used to create chart series.

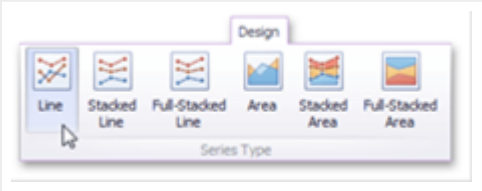
5.4.8.2 Series

The Range Filter dashboard item supports various Line and Area series types.

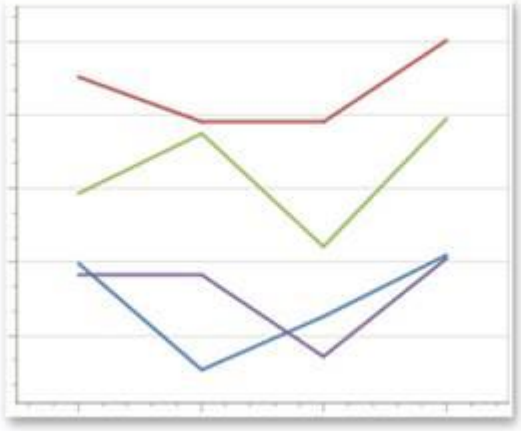
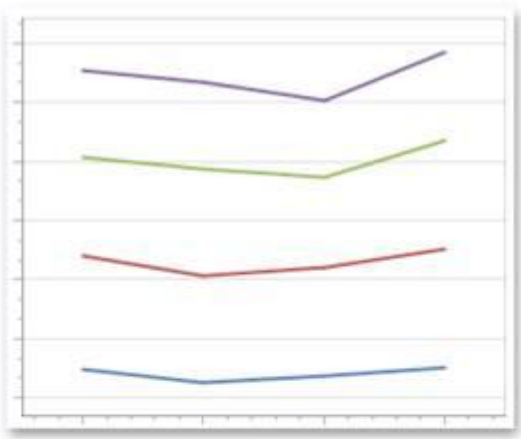
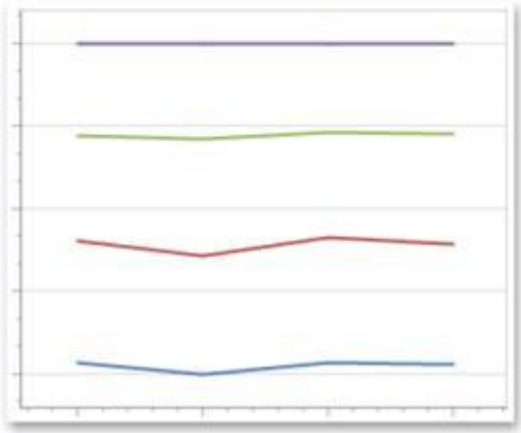
To switch between series types in the Designer, click the options button next to the required data item in the Values section. In the invoked Series Type dialog, select the required series type and click OK.

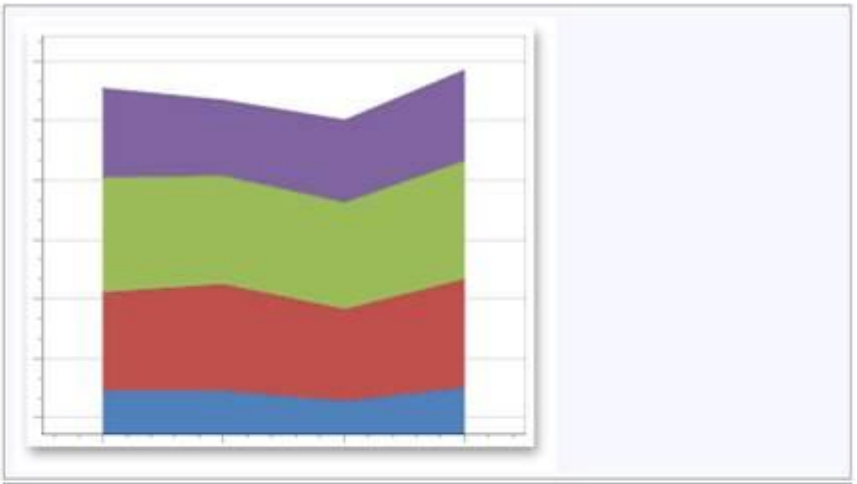
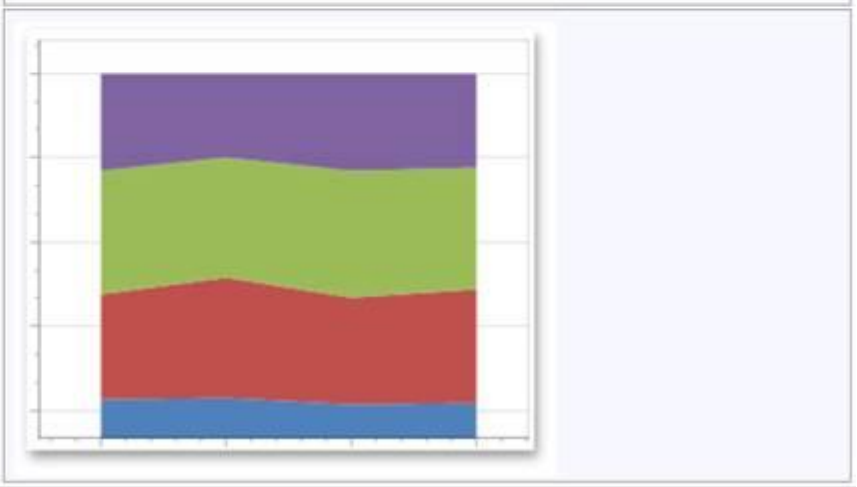


You can also do this using the buttons in the Series Type group of the Design Ribbon tab.



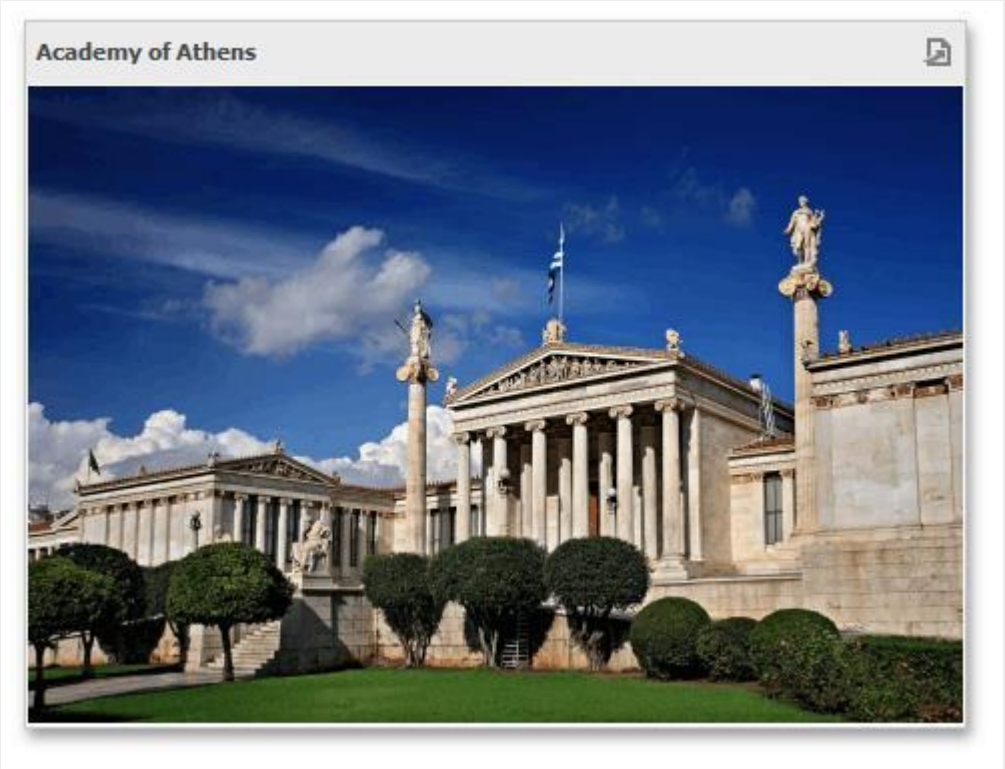
The Range Filter supports the following series types:

Line	
Stacked Line	
Full-Stacked Line	

Area	
Stacked Area	
Full-Stacked Area	

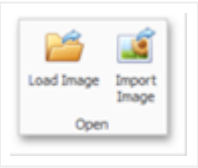
5.4.9 Image

Use the Image dashboard item to add static images to a dashboard.



5.4.9.1 Loading an Image

To load an image to a dashboard item, use the Load Image and Import Image buttons in the Ribbon, the corresponding menu buttons in the toolbar (the  or  buttons, respectively), or commands in the context menu (Load Image and Import Image, respectively).

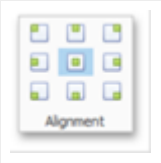


These commands invoke the Open dialog, which allows you to locate the desired image.

The Load Image command saves the path to the image in the dashboard definition, while the Import Image command saves the image itself.

5.4.9.1.1 Image Alignment

To specify how the image is aligned within the dashboard item, use the Alignment group in the Design ribbon tab.



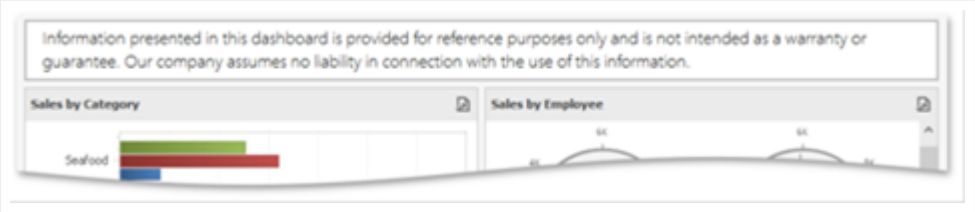
5.4.9.1.2 Image Size Mode

You can specify the image size mode that defines how the image fits within the dashboard item.

To do this, use the Size Mode group in the Ribbon's Design tab.

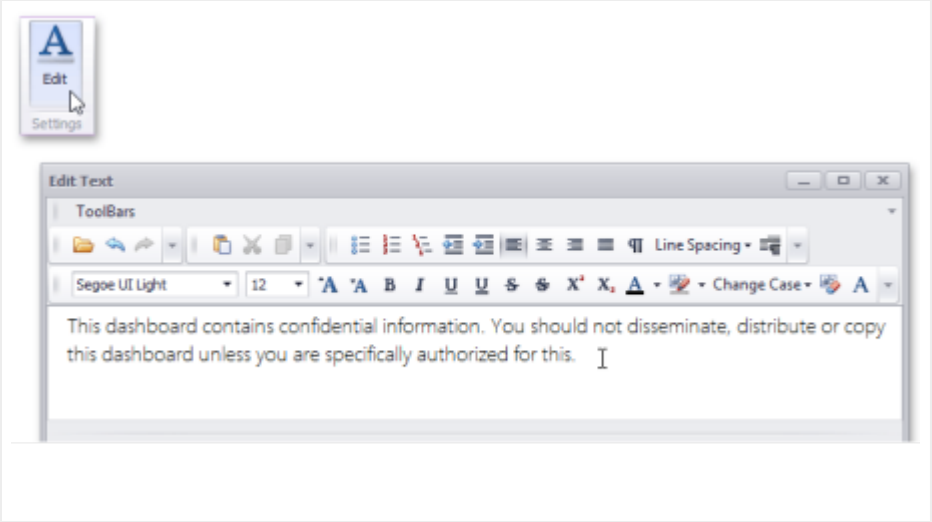
5.4.10 Text Box

Use the Text Box dashboard item to display rich text within a dashboard.



5.4.10.1 Editing Text

To edit text within the text box, click the Edit button in the Design ribbon tab, the corresponding item in the context menu, or double-click the Text Box dashboard item.



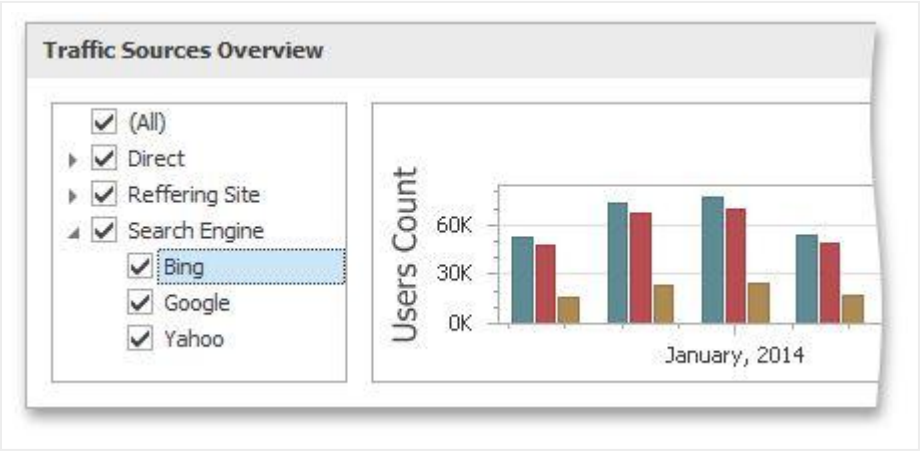
This invokes the Edit Text window in which you can edit the text content and customize its formatting.

5.4.11 Dashboard Item Group

The Dashboard designer provides the capability to combine dashboard items into a group. The dashboard item group serves two main purposes:

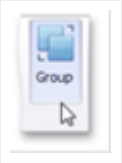
- Combine dashboard items within the dashboard into a separate layout group.
- Manage interaction between dashboard items within and outside the group.

For instance, you can combine related filter elements and data visualization dashboard items into a group.



5.4.11.1 Create a Group

To create a new group, use the Group button in the Home ribbon tab.

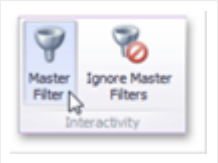


You can add dashboard items to a group and manage item layout using drag-and-drop. To learn how to manage a group's caption, see the Dashboard Item Caption topic.

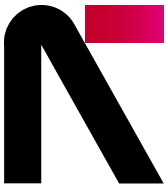
5.4.11.2 Interactivity

The dashboard item group provides the capability to manage interaction between dashboard items within and outside the group.

The Master Filter button allows you to specify whether the current group allows you to filter external dashboard items using master filter items contained within the group. If this option is disabled, master filter items contained within the group can filter only dashboard items from this group.



The Ignore Master Filters button allows you to isolate dashboard items contained within the group from being filtered using external master filter items.



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For more information, please visit
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