CubeGrid Quick Reference

SmartClient™ Analytics Module

SmartClient v6.5
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Isomorphic Software, Inc.
109 Stevenson Street, Level 4
San Francisco, CA 94105
U.S.A.

Web: **www.isomorphic.com**

Email: **info@isomorphic.com**
support@smartclient.com
feedback@smartclient.com

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Description

The ***CubeGrid*** is an interactive grid component that presents very large, multi-dimensional data sets (also known as *data cubes*) for reporting or analytic applications.

CubeGrids are often called *crosstabs*, for their cross-tabular display of data dimensions in stacked/nested rows and columns, or *pivot tables*, for their ability to "pivot" dimensions between rows and columns to view a data cube from different perspectives. They are typically used in the querying and reporting front-ends of data warehousing, decision support, OLAP, and business intelligence systems.

Multi-Dimensional Data Terminology

This manual refers to the dimensions of a data cube as ***facets***, to the possible values in each facet as ***facet values***, and to the values within the data cube as ***data values*** or ***cell values***. Equivalent terms that are commonly used in data warehousing or business intelligence systems include:

facet..... *dimension,*
attribute,
feature

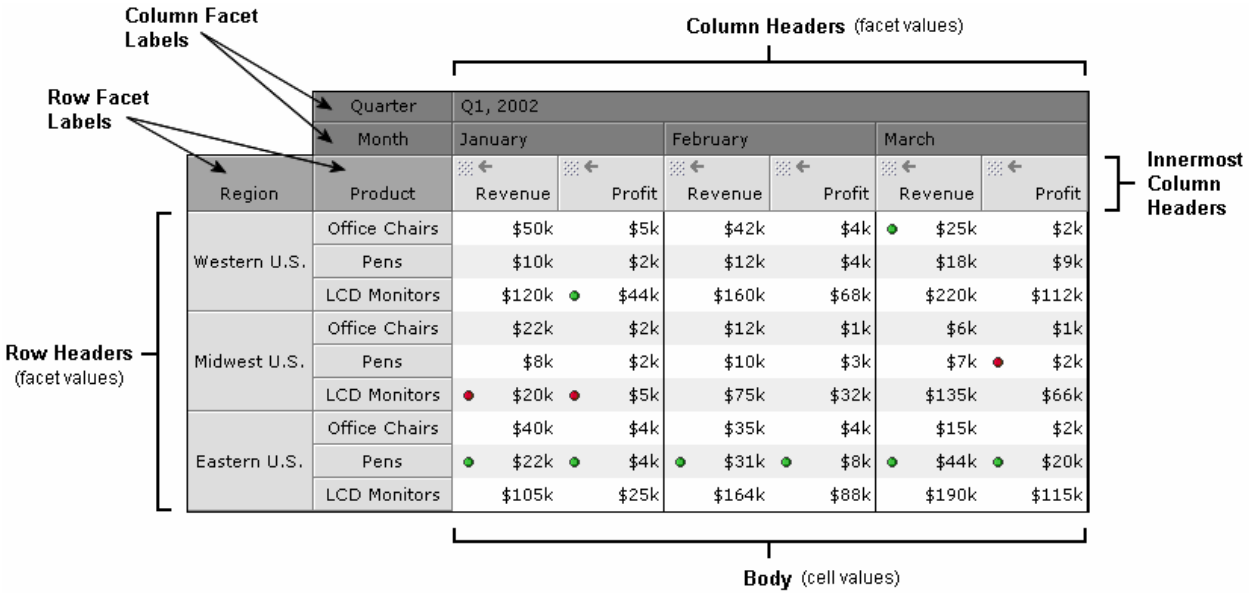
facet value ..... *dimension member*
attribute value,
feature value

cell value..... *data value,*
metric value,
measure

Visual Structure

Like the ListGrid and TreeGrid components, the CubeGrid displays data values in a tabular *body* with adjacent *headers*. While the ListGrid and TreeGrid display rows of *records* with *field values*, the CubeGrid displays a body of individual *cell values*, each associated with a combination of *facet values*. The facet values for a cell are displayed in the *column headers* above the cell and *row headers* to the left of the cell. CubeGrids can display an arbitrary number of facets, by stacking multiple levels of row and/or column headers.

The CubeGrid depicted below displays five facets of a data cube. Region and Product are presented as *row facets*, with facet values displayed in two columns of *row headers* to the left of the body. Quarter, Month, and Metric are presented as *column facets*, with facet values displayed in three stacked rows of *column headers* above the body.



Except for the innermost column facet, each facet in a CubeGrid has a *facet label* adjacent to its row or column headers. The facet labels serve two main purposes: they display the titles of the facets, and they provide drag-and-drop reordering or pivoting of facets within the . The *row facet labels* also provide interactive selection, resizing, and other operations on the columns of row facet values.

The *innermost column headers* provide special behaviors and controls for manipulating the columns of data in a CubeGrid. End users may select, resize, reorder, minimize, maximize, or auto-fit the columns of data via mouse interactions with these headers. Customizable indicators and controls may be included at the top of each innermost column header. The CubeGrid in Figure 1.1 shows the column reorder and column minimize controls.

If a CubeGrid is not large enough to display all of its cell values, horizontal and/or vertical scrollbars will appear below and to the right of the body. The body of the CubeGrid may be scrolled on either axis. The headers are “frozen” from scrolling on one axis—row headers only scroll vertically, while column headers only scroll horizontally—so the facet values for the visible cells are always displayed.

CubeGrid Examples

Two detailed CubeGrid examples are provided in this release:

- `examples/components/cubeGrid_chart_example.html`
- `examples/analytics/databound_cubegrid.jsp`

`cubeGrid_chart_example` is a client-only example that uses a small local data set to demonstrate:

- basic facet and facet value (metadata) definition
- facet layout
- grid layout and formatting (alignments, borders, widths)
- interactive grid layout (resize/reorder/minimize columns)
- interactive hover windows
- cell highlighting (interactive and programmatic)
- context menus (default and customized)
- cell selection (interactive and programmatic)
- cell formatters
- shared data (with a ListGrid)

`databound_cubegrid` is a client/server example, requiring installation of the ISC server components. This example binds a cubeGrid to a live datasource with approximately 50,000 data values, to demonstrate:

- hierarchical facets
- automatic query building
- load on demand
- incremental rendering
- facet value expand/collapse
- facet value minimize/maximize
- basic inline cell editing
- interactive facet layout (drag & drop pivoting, menu-based filters)

Client API Summary

The following pages provide a complete quick reference to the CubeGrid client-side APIs.

These APIs are grouped into the following functional categories:

Data & Metadata	*Mouse Events*
Facet Layout	*Inline Editing*
Facet Expansion	*Hover Tips*
Grid Layout	*Context Menus*
Grid Formatting	*Column Controls*
Highlighting	*Advanced/Internal*
Selection	

CubeGrid instances provide most of these properties and methods directly.

Facet and *FacetValue* objects also provide many properties. These properties are covered under the appropriate functional categories, and also in the *Facet* and *FacetValue* categories at the end of this quick reference.

CellValue and *Hilite* objects provide a handful of properties, which are covered in the appropriate functional categories only.

For more detail, please refer to the following sections of the online *SmartClient Reference*:

Client Reference > Components > Grids > CubeGrid
Client Reference > Components > Grids > CubeGrid > CubeGridFacet
Client Reference > Components > Grids > CubeGrid > CubeGridFacetValue

CubeGrid APIs may be accessed via JavaScript programming or Isomorphic XML tags. The schema for these APIs are defined in the following files in `isomorphic/system/schema`:

```
CubeGrid.ds.xml
CubeGridCell.ds.xml
CubeGridFacet.ds.xml
CubeGridFacetValue.ds.xml
GridHilite.ds.xml
```

Data & Metadata		
data	valueArray	
dataSource	datasourceId	
cellIdProperty	string	"ID"
valueProperty	string	"_value"
facets	facetArray	
facet.		
id	string	
title	string	
values	facetValuesArray	
facetValues	facetValuesArray	
rollupValue	facetValueId	
isTree	boolean	
facetValue.		
id	string	
title	string	
parentId	facetValueId	
cellValue.		
cellIdProperty	any	
valueProperty	any	
facetId	facetValueId	
rollupValue	facetValueId	"sum"
metricFacetId	facetId	"metric"
setFacetTitle	setter	facetId, titleString
setFacetValueTitle	setter	facetId, facetValueId, titleString

Facet Layout		
columnFacets	facetIdArray	
rowFacets	facetIdArray	
fixedFacetValues	facetValues	
facetValueGroups	facetValueGroupArray	
facetValueGroup.		
id	string	
values	facetValuesArray	
facetValues	facetValuesArray	
facet.		
showParentsLast	boolean	
hideEmptyFacetValues	boolean	false
getFacetValueLayout	getter	groupId (facetValueGroupId or facetId)
getRowFacetLayout	getter	
addRowFacet	action	facetId, position
addColumnFacet	action	facetId, position
removeFacet	action	facetId, fixedFacetValueId
setFixedFacetValue	setter	facetId, fixedFacetValueId
facetAdded	handler	facetId
facetRemoved	handler	facetId
canMoveFacets	boolean	false
facetMoved	handler	
canReorderColumns	boolean	
facetValue.		
moveGroup	moveGroupId	
facetValueReordered	handler	groupId (facetValueGroupId or facetId)

Facet Expansion		
canCollapseFacets	boolean	true
canMinimizeFacets	boolean	true
facet.		
canCollapse	boolean	
collapsed	boolean	
canMinimize	boolean	
minimized	boolean	
facetValue.		
canCollapse	boolean	
collapsed	boolean	
canMinimize	boolean	
minimized	boolean	
isMinimizeValue	boolean	

Grid Layout		
bodyMinWidth	number	
defaultFacetWidth	number	100
padTitles	boolean	true
wrapFacetTitles	boolean	false
wrapFacetValueTitles	boolean	false
autoSizeHeaders	boolean	false
facetTitleAlign	alignment	“center”
facetValueAlign	alignment	“center”
cellAlign	alignment	“center”
facet.		
width	number	
align	alignment	
titleAlign	alignment	
cellAlign	alignment	
facetValue.		
width	number	
align	alignment	
cellAlign	alignment	
setFacetTitleAlign	setter	facetId, alignment
setFacetValueTitleAlign	setter	facetId, facetValueId, alignment
canResizeColumns	boolean	
canMinimizeColumns	boolean	false
resized	handler	

Grid Formatting

baseStyle	string	"cubeCell"
bodyBackgroundColor	color	"white"
alternateRecordStyles	boolean	true
facet.		
borderBefore	lineStyle	
borderAfter	lineStyle	
facetValue.		
borderBefore	lineStyle	
borderAfter	lineStyle	

Highlighting

hilites	array	
hiliteProperty	string	“_hilite”
hilite.		
id	string	
title	string	
htmlBefore	html	
htmlAfter	html	
style	cssText	
disabled	boolean	
facet.		
hiliteProperty	hiliteId	
facetValue.		
hiliteProperty	hiliteId	
titleHilite	hiliteId	
cellValue.		
hiliteProperty	hiliteId	
hiliteCell	action	cell, hiliteId
hiliteCellList	action	cellist, hiliteId
hiliteFacetValue	action	facetId, facetValueId, hiliteId
enableHilite	action	hiliteId
disableHilite	action	hiliteId

Selection		
canSelectValues	boolean	true
canSelectHeaders	boolean	true
canDragSelect	boolean	true
autoSelectValues	cols | rows | both | none	"both"
autoSelectHeaders	boolean	true
simpleDeselect	boolean	
facet.		
selectionBoundary	before | after | both	
facetValue.		
selectionBoundary	before | after | both	
cellValue.		
enabled	boolean	
cellSelectionChanged	handler	
facetValueSelectionChanged	handler	facetValues, newState
selectCell	action	cell, [state]
deselectCell	action	cell
selectCells	action	cellList, [state]
deselectCells	action	cellList
selectAllCells	action	
deselectAllCells	action	
deselectAll	action	
selectFacetValue	action	facetId, facetValueId, [state]
deselectFacetValue	action	facetId, facetValueId
selectFacetValues	action	facetValues, [state]
deselectFacetValues	action	facetValues
selectAllFacetValues	action	[facetId], [state]
deselectAllFacetValues	action	[facetId]
anyCellSelected	tester	
cellIsSelected	tester	cell
getSelectedCells	getter	
getSelectedCellIds	getter	
facetValuesSelected	tester	facetValues
facetHasSelection	tester	[facetId]
getSelectedFacetValues	getter	[facetId]
getFacetsHavingSelection	getter	

Mouse Events		
cellOver	handler	cellRecord
cellOut	handler	cellRecord
cellHover	handler	cellRecord
cellContextClick	handler	cellRecord
facetValueOver	handler	facetValues
facetValueOut	handler	facetValues
facetValueHover	handler	facetValues
facetValueContextClick	handler	facetValues, facetId
facetLabelOver	handler	facetId
facetLabelOut	handler	facetId
facetLabelHover	handler	facetId
facetLabelContextClick	handler	facetId

Inline Editing		
canEdit	boolean	false
cellChanged	handler	record, newValue, oldValue, rowNum, colNum
cellValue.		
canEdit	boolean	
facetValue.		
canEdit	boolean	

Hover Tips		
canHover	boolean	
showHover	boolean	
hoverProperties	object	
cellHoverHTML	callback	cellRecord
facetValueHoverHTML	callback	facetValues
facetLabelHoverHTML	callback	facetId

Context Menus		
showCellContextMenus	boolean	
showFacetValueContextMenus	boolean	
showFacetContextMenus	boolean	
contextMenuProperties	properties	

Column Controls		
controlLabels	map	
canCloseColumns	boolean	true
canSortData	boolean	true
canSortFacets	boolean	true
facet.		
canClose	boolean	
canSort	boolean	
facetValue.		
canClose	boolean	
canSort	boolean	
sortedFacetValues	facetValues	
sortedFacetId	facetId	
sortDirection	arrayDirection	Array.ASCENDING
closeFacet	handler	facetId
closeColumn	handler	facetValues
sortByFacetValues	handler	facetValues, sortDirection
sortByFacetId	handler	facetId, sortDirection

Advanced/Internal		
rowHeaderGridMode	boolean	false
innerHeaderControlSize	number	13
innerHeaderReorderHandleWidth	number	7
facetValue.		
getCellValue	callback	viewer, record, rowNum, colNum
facet.		
synchColumnLayout	boolean	true

All Facet Properties (compiled from above)		
id	string	
title	string	
values	facetValuesArray	
rollupValue	facetValueId	
isTree	boolean	
showParentsLast	boolean	
canCollapse	boolean	
collapsed	boolean	
canMinimize	boolean	
minimized	boolean	
width	number	
align	alignment	
titleAlign	alignment	
cellAlign	alignment	
borderBefore	lineStyle	
borderAfter	lineStyle	
hiliteProperty	hiliteId	
selectionBoundary	before | after | both	
canClose	boolean	
canSort	boolean	
summaryValue	facetValueId	
summaryTitle	string	
synchColumnLayout	boolean	true

All FacetValue Properties (compiled from above)		
id	string	
title	string	
parentId	facetValueId	
moveGroup	moveGroupId	
canCollapse	boolean	
collapsed	boolean	
canMinimize	boolean	
minimized	boolean	
isMinimizeValue	boolean	
width	number	
align	alignment	
cellAlign	alignment	
borderBefore	lineStyle	
borderAfter	lineStyle	
hiliteProperty	hiliteId	
titleHilite	hiliteId	
selectionBoundary	before | after | both	
canEdit	boolean	
canClose	boolean	
canSort	boolean	
getCellValue	callback	viewer, record, rowNum, colNum